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ARISTOTELIS

OPERA OMNIA

QVÆ EXTANT

Græcè & Latinè.

79840

Ex Monasterio S. Dionysii Congregationis S. Mauri

VETERVM AC RECENTIORVM INTERPRETVM, VT Adriani Turnebi, Iſaaci Caſauboni, Iulij Pacij ſtudio emendatiſſima.

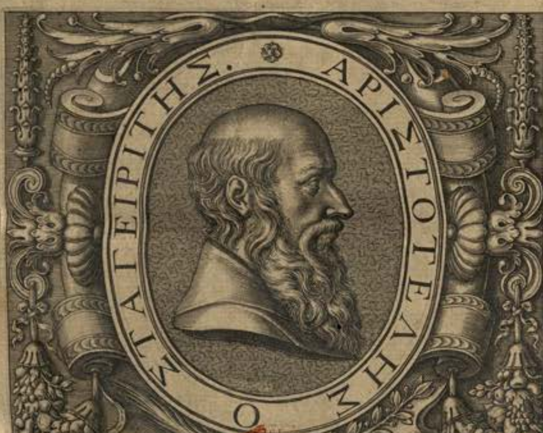
CVM KYRIACI STROZÆ PATRITII FLORENTINI LIBRIS DVOBVS Græcolatinis de Republicâ in ſupplementum Politicorum Ariſtotelis.

Ad nouiſſimæ huic Editioni omnium quæ hactenus prodierunt, ornatiſſimæ acceſſit breuis ac perpetuus in omnes Ariſtotelis libros Commentarius, ſiue Synopſis Analytica Doctrinæ Peripateticæ, *non antehac viſa; in quâ vt in expeditiore tabellâ, Ariſtotelis Philoſophia omnis, prout ea ſuo ordine deſcripta eſt, perſpicuè breuitérque indicatur, & pro rerum dignitate exponitur.*

Authore GVILLELMO DV VAL Ponteſiano, Philoſophiæ Græcæ & Latinæ in Pariſienſi Academiâ Regio Profeſſore, & Doctore Medico: qui & præter operoſam illam Synopſin, adiecit Anthologiam Anatomicam ex ſcitis Hippocratis & Galeni, ad libros Ariſtotelis de hiſtoriâ, generatione & partibus animalium; & præterea libros quatuordecim diuinioris Philoſophiæ ſeu Metaphyſicorum, notis & argumentis auxit ac illuſtrauit, quatuórque eorum poſtremos hactenus malè collocatos, in legitimum ordinem reſtituit.

Indices tres operum molem claudunt ac veluti obſignant. Primus, quaſi Catalogus, nomina recenſet Authorum etiam iuniorum, qui Philoſophiam Ariſtotelis ſuis ſcriptis illuſtrârunt. Secundus, curas & commentarios ſingulorum diſtinguit. Tertius eſt Theſaurus rerum vberrimus.

Q-a-5



Lutetiæ Pariſiorum Typis Regiis.

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> . 3 F63 4/< 1 208 / . / 68 03..41 21
/ .63 79 04 2692 924/3 0 D68 .21/ 62
19 8 2/3 061 49 2 . /2.3
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1 $A 1E4 69 R 044 6 4924 01 /2. 9
1 2923E
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1 68 . /8 924 68
1 3 5G.1/ .
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3 0 0
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1 3 5G91/ .0# 2. /46' 1 / 04 G./49' 1.2 I
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I 21G 898 010 5G.1/ .0
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\.' 3'F609'04' 8 .4 . 20 ' . 1021'
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1G /2 .EZ' 86 . '.9 108 2 3'
17 .63' 79 69 / 01 /'49' 64 3': 1 63'
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4/ '> /2 0./8 8'.. 10A2 2S 2'
\91 0D.J463 A
=&+!C /
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/ 9301F 9' 2 .6 0'. 6 108 0' ! "
29.2/2' . 0 0.62'. .0 0' 1016 498 /'
. 01 . / D0 .G . '0 1/. 0 Z' 1 02
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1/ 3'04': G 68'
9 87 02/ 68. 1/ 9'
1/ E9' 04' 9 024 68' '04' 21 ?'
01 68' '04' 921/ 98' '04' /'
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2.1 C "/.0.6 : 04 .0#0 19 0 8 F61904 9 92
1 0 68./D2 . /298 69 9 68./ 1.8 0. /
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04 " 68 F6 498 I D/ F6/4 04 921 /292\
01. 2.9 / 9 C 91G/4 . G7 . " E. /
268 2D92198 608 6DD9192B# " 4. /1921
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4 468 9402. 20 . .0 2/ 04# / 1. / 0
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61064) 9 2 9 /D01 /29 I 1 . 2..2/2
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1 3 " 68 2 " 10 9 940 .08 79010 8 0 11
H. G/. 7/2/ 6D929 9 07 / 6 0. 9 . $02
8 " 49 .91 7/2 3 F6#9 F6 49 . 80F 44 .0 1. 3 1.21 "/.01#49 249 ./ / 3 F6/4
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D / 0 C 8 0 G 3 1619 8 F6 498 /2 6 1 .9 . 04 " .08 792949D92408 # 04G6. 92 8
49 49 0 C ./ / 3 9 19 20 7/20#0494 "1 0 923 8 9 616 63 1 G "9 4/ / 763 . 6. .
161 "9 06 9 0 . "9 0 63 4 D9263 1 / 1019 8 "9 4 "9 / 08 6 1 .9 9 "1 0 F6 3 2
.4. "9 8 0 8 99 1. 20./ / 1F697/20 6 ..021 : 0..19 4.8 " 16.932/2 9F6
9 92 6164 / 9 92 8 9 "1 0 .3 0. 6 163 1 0 F6 3 F6 C# 21FV 9 023 1 01/ 2. /1 2923

=0 .2 98 0 1 . 16 701 /2 703 02 0 8 /69
F6 4. 8$ 94 8 94 / . 1. 8 /69 8 . . 08
49 2 1 26 791 .6 /P21 0# 3. F60 101. 8 # 9
. .3. 63 0. 1 0 08 9 1 219 .MD201/3 0
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0 .491 012 G .\ / G $9 .110 ! 0 ' . 90 9701
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/ 8 03 0. D /23 C 2 0. 9 13 ! 60 0 19 A 4 F /
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1F09 9 0 2 H7 9 1/9 9. 9 Z E0 1M F00
3 9 1 .1 .C . 9. 1 E 001 07 /161 10111 .
108 9O . E@SSE11?? 0 1 $F0 0 . / /16 ` 30 0
6212 02 1 0U 0 " 011 . 6 8 / 910 F6F4D.
21 316 3 206 D 6 8 #0 0 0 201 ` 094 0 2 91
10C02 8 021 0 8 D91123 9 [0?19 ; 2. 1/ 1 6 1
8 .210 ` . / . 9 14E9. 9 40 F6 4. / 0 0 "1
/ .6 6304" 49246 8 06 04 024 92008 1
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19 8 0" . / 8 2639 1F00 8 704 7
9 1 "1.6?2 4 . 16 F6 " D 01 7 .02 2 8 8 #

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9. .2 .19 9 1D118 2: . .2 0 1/19P3 "1 1S2S01) = . 00 C 07/ 0 8 0 Z 2/3 0
1 .2 26 F /9 C04 2692 .240 2 2D92 / 2 633F6 /4" . 9 / 71/ 0 8 . 63 . . .
/ 24 901$ 0[1191 20 929F604 2992 17 F61 .0/ /1Z 292 8 E 19F 1 703F0 4920 2 / 2
467 19161 08 019 G0. 0G0 6 8 0 621 F6A 9 1 7 011161 .4E2 . 1 10 16 8 0 /
G1G. D8 010 1 6 10 ?0 /21 ! 019 C 0.619 4 0 " / . . 2 / 2 91 1/ ! M ` JG92C M 1/ 69

5 = M I =

' M ' @ '(3+ 62.' F6 ' K 1/.9 3 2/8 92 D9 9 .21#F6/ 68E$

!) $), %* *8 ‡ ‡ ' %,) 3 863 9 1 G . 0 19 ' F6 ' .G92 3 " . D43 1 '

5 3% R " $ " ' ' =>' B 9/ I F69 .8 67 .08 ' !OO=91 08 . .02.' 2 D.2. 9

*B*1 * ' 0 ,) . !' VD□3 64 . 0 /101 /2.3 2/2 2"926 13 ' 9 1 3 9 1

:#W1$+&' *C4 $ ‡ ' +G* 3 F6 6 9 049. 1 . /8 8 9210163 ' T60 163 = Q

" % -+/ $% ' ' ++ .6 63 / 01/ ' F6 :02.D ./ 7. 01 3 ./2 0 0

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.J'M = S 9 1 . 22 3=/. 01 . 08 Y0 3 ' =9 163 ' ! .

<R<0 A' . ' J 292 3 F6 ' 49 /9. .0 . 1 '=9 1 863 6 . . / '

5 %((5. 3< &#]S " W ' 93 ' / 68 '9 . . .01/ .6 63 898 2 1 1/ 9263

..136. A' ' = . 3 3 f 0/ ' <S,S / 2 : 01/2 3 " 10 M4 0663 D2/7 3 F6 408

+ ' E ' ' 60 0)J. ;3 D 08 80 .63 ' .6 63 . .68 9 16 ' 79 ' 2 0 19

D 08 801 .0 ' >9 ./20 8 / ' =10D 109 2/ 1 '

.68 '0 E 69 9 86 1 '4 . 6 '16 2 2 8 3 9 .. .23 G./ 0 163

: = M I M = 5 = M I 1= '

"+ K 064/ 9 8 8/2 /

= = M : = M I H = $4 ' D.29 . 0.94/ '

' 0 US' ' " 79 =10D 193 6 1$ ./80.G '

' 3 '= 0; f S" +' @ .01 E<F6 '9 0. 894 .63 8 21 0 '

5 ! = ,C% "% ' !J%= %3 ' .94/268 .D 3\ 63# F6 . .06 0

é) . ! E)WK ' 3 =-/ ' F@' 61A .6 ' / 6/ ./80.G ' 2/Q

(,%) 3 /] 7 / ' D D " 'SK 892 8 /29 .1 2 898/ 08 '" 49 .91 0. 3

'</6 / 8 6 #G 9 9 1 ./80.G63 4 F69 2 8 E 62.' F6 '

- + !, = ' ' ! % + '= + H "/.0216 ' ./80.G9 ' G7 ' 019 ' 1/.9 '

C, ' ' E c ' + "/K "/ :G03 1 3 6 1# " . F6. 06198 0 923 ' n8 0 '

!+= 3# = ' / 'W 9 ; ' " " - ; ' >P .G63 2F60 8 'C$:GD9 1 3 'D929 3

, "3 ' "@A W["7 769 62 .07 ' f !.60 /$F6/4 .1X08 1. 1016 ' 6/.

2 1/19 .8. D 08 80#

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4 M ' 0;E G, % L . ,% +3 @ ,AS ' ? <5 " ' + &# ! !J . 'W -! & &/

□# 0L'1 , %' ' B% B ' ' .\ / .6 3 ./80.G ' C :704 69.46.0 6E ' 9 1

.# < '+ ' ' = ,@ , @ ! ' D 1/1. .3 0 64 : / 9268 F692408 '10 2.O#

1 "5/ 'S6 48 B 0?D D .6 63 946.01 /2 3 898/ ' 1/1. .3 ' .02/ '

("A?R' ' F9A 98 : / 92 ' 68 2/ 946 P .02.68 ' C ' /82 Q

!M +. . G 4" E ' 98@FE 763 G/29 1 3 0 1763 . 64 .# 94 &# 2 68 7

04/ 106 0..688/ 1 / 2F663 19 108.2 '

9E 3 TT' M 168 0.9 .1 802406 ."J .02/ 0 0 26 '

9 *) 0 ; 'D 'PD d01 ' ' >(J#. '] !NH 16840 916 ' I 218 "9 / 1/1. .3 0 193 F603

-&% + = (') ' &7 ' . +@ -) ' <% .= 9 64 62.6 ' 2D926 6 .2 3 4 4 . 1$F6/4 "9 '9 '

2/ S S ' R 9 1 ?] 9 63 . 1 3 ' F60# 0 1 8 04 98 /91 .08 ' 0 '

,@ 3 ' R' 'A :S :9,1B 1 8 04 /9.03 2 /3 94 02. ' .91 219 D9 9#

D)<1,1/ ' R P98 F69 9 < 60 1 /2 763 H/89 . 3 C "0 3

&' .(5 R 5 "5 (' =@E ' 9 6 4.84.0 .5G.1/ .0 71 3 ' ! 68 0219 02Q

1"#SAB/ 2A 0 JE . =E !T)+ "3 "/ ' 268 0101 3 0 D9 .1 ' "' □□ ' 8/2 63 / 0.6 / : '

"C E ' ' CZ R ' [ ) 1G ./ f . 164 3 G / / G 0 494. 9. ' 1G9 '

<3 J M M= "E /@@ 6 'SSA'? 203".2P#"7 ' =/. 0. 3 6 . 4 . 6 63# 9 4F69

Z 0 ' SE 1 3 $? ' E.)-6/ .68 / 022/3 .D. ' >9 24. / 9 " 6 3 67 '

9 ` I 31 ' .E.E '& % = "/ 3 ; ' 01/ : 01/2.8 064 6 # 4F6. 01 /022/ 68

' / ' : SI S$"? &% _ 6 ' &%)= ; # ' .021 6. 2 164 3 4 D92. 0 6 . ' " . 4/

868 9 63 "/. 10 91 : 01/ >/868 020D2/ '

10# ' N0 68 '9 1 06198 F6/4 F6 408 6.021 ' 1/.9 9 2"898904G6.: 0./29 .G/

9 63

.63 ./21 020K ' 2 .9/' .G/ 08' 2 1 8 1
T E98 8' 9 ' /.6 1B .6 8'F6 498'9/'198 / 9
D010 06 /. .0.9 62868'0 64 .G92 92 '
93"0 9 .21 ! G07 03 U. 8 /1G963 'F6 '9 46. '
763 1G.2 92 68 U# : 01/2 3./D201 3 69 6
/24. 62.108.2F6 4 0 8.2. .7 8 6 '
F6/4 2 86 1 3: 01/2 ./2. 04 . 1 1/1. 93
T 763 9 /2492468'9 1 ' 1/.9 .8'2/' '
EE8 . .9 ' : 0./2 ./21 04 .9 9# .4 3F6 ' 4 '
40. 38 263 . 19 21 219 9101 ' T 74 1
C#: 71/2 0 F6024/./21 04 . 1 F6 4 8 '
68B 08' 9 F6/F 9 : 01/2.8' H9 9F6 16 '
0647/ . 2' 8392 8' 921921 09 1 ' 9 10198'
9763/82 763 9 902.9 /2@ 408# F6 2 46 '
498'"9 70 G .' /21# '! %/'2% &.'=+) ! &/ & '
; !/)'! ,, .!'C'0 7 ;/. , R'2. &.2% ' '
)! #! %.',3-).&((& &*&.%/ & & ! &3& +. 0- '
%.' ,&(+0) / +#+"&' 498'9 D/'07 1/19 .'
F6/F69 0468 # .. 08' 1.67 0#.9 1/ 3 4. '
. .10 07. 0406 .'01FD.'./26. .$F6 9 2./'
'/7198 9 023 ' 408 ' ".4.0. 3 0 193 169.6
8/ 98' F6 498' 668' ?' : 0./298' 07624.'
19 10163 9 1 1/19 .3 ' F6064/'9. 08' 0 08'. '
494 .06 1E ! 68'70.' 2 . 1 / 9
A ! / ",-+ &-&/' % ''+))&!- ! & 9 +" ' ?
& . '<% -4!' " %,- ' 3)-')&-&* ! &"& !/
. 0163. 1 1/19 93.68 : 01/29022/3
: 01/2 '0A2198 8 / 16/' 6..9 1 2 .G/ 0 = 96 '
H= '9 / / 9 <: /1/292 " / .07021\2. '
>M= 1 P3 "9 7 2 0..4/2 08' / 9463
O9 0 1= 68' ! 1 1.2 2 1 16 1 01F690497 80 '
DG0 0 3 .D2 '. 63 0 ' 08'F6 28 0D20 / '
'1921 09 91 0 64 9D98 ' /1921 0 1 0 "1 49.9701
" 68'7/668 2 /8 /6924 3 10 2 60. 8 A
12D6 / 1112 F1 78 - 8 862 1. '/82 68'. /8 '
E2/. ! 3" 634 ' .' 601 8'F6 498' 86 1/168'
"1 01 763 968'./2 6 6 .' 24 . /'9 621 'F6 '
9 1021 163 04 9D98'. 1/ 0#'F6 763. 'F6/ '
408'./8 8 92401 ' T6/4 06198' 2 ./8 8629
F6/F69 86P 3 / 6.1 1 9 1 "173 =10D .0
G/ .0 6 60 6F69 1/ 9 3 2 219D 68' 07
. 024 / . 1 610 .68' 1R F60 0 / /' 6 '
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cUS EXE1;@ ʻ 0=ʻ C Z 2 H ʻ DEM2 ʻ 0 @ 0 ʻ c 93 / 8 ;[) C' ʻ 3 1 0 1Aʻ 14<< .% 6 9 1ʻ 1CS;ʻ /4ʻ. ʻ E4 <= 12 9Rʻ5 / 1 2ʻ3 %=" V ʻL ʻ 0 ʻ (ʻ 'FAʻ 02ʻ SS 'W. '@ '@1D ' # ʻ - ' % RT C.' X ' 9 , 1' ' 1 , + ' # '%19C#11?T '1$' QY C '3)%', , # .'M @1, . " , Hʻ + , ʻ(ʻ ʻ / , I F .=ʻ" ! "ʻD ! ? =?R ʻ ;AE= ʻ !7 ! ! *- ʻ ʻ =/+ / ʻSSSAʻ / 3 ʻ ,%) !, ʻ 8&Gʻ*6E6! ʻ 4ʻ ʻ ʻ, & , '?S ʻ09 2 ʻ K] &A 91 3 3 6 D) 9 / J E) 11 I U 1? 4ʻ ʻ)ʻ 02 @0ʻ 'jS ? , 3=ʻLA? ?ʻ?ʻ9B 38B); = R19 . :ʻ&

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. 68 ' !06 03'1.2.70. '=)'49' > 9/' 976 F '4 6 '
2 30. . 164 D2 2 3' 9D 9D 94 9 .7021 ".'
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9 92. 0' / .089 9'"919 .3'9 1 8 0 621
I 1'10 8 92'=0 921 0$'2 / 8 92' 86 . 3' 8 /4 3'
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4 3 1 .D9 0 .21. 8 ' " / .93 'F6 0' 6491. '
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8 29':G / / G ' "208'"9 '0 19 08' . 9. 08'
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1 0 6 2'0.9 668'C'. / 8 0D98 $'FO08'F6 '0 '
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6. 1'7929' ! 67. 1. F6.'4 9 924 $' .G8 9 '
1' .63 F6 '268 . 024 $C#'"99 F69'9 ' 0 19' :G '
/ / G63#0.'. /2 68 8 0163 : 2 / 7 G63' 9 '
9 16 F$'C'07 / 61.' 0 93'298 /'4 4' / 9'
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14 . 9 62. ' T6 .F6 4'92 8'9 1 ' ". 1 04 1' /7'
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1. 8 01 /F6 . :G / / G68' 944 .'4 6 '
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1 .63' 04 . / 09 1021 / $ F6 0'. /1. 8 01 M' '
04 /2.'2/7 / '9 1 ' H 2.'. 9D02.9 ' @ / '
8 / 9' : 01/'4 1' 2D92 0'04' . / 6198 01 /2.'
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:/ /'9 'G0.' 9 9'C'F60 '.0 0 /D/'=. .2 '
1 0 68' 68F$'/8 2 68 0 0 .1'> 0 .4 '
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4 403129 8 9'F6 0'07'G 3'/8 2 763'4 . . 2. '
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R + * ! $ * " 2 2 V " . ? ? ? 1 ? 1 U + $ 1 + $ 5 V $ Q ? 5 3
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B 4 " + $ E 1 C] Q ? U Q C 5 ? U Q C Q 5 3 V $ ^ 5 ? C ? Q] Q V + ? + C 1 + + $ 3
+ ? V + + 5 ? + 1 $ + U Q] Q ? C $ 5 4 Q V $ 1 ? 5 ^ ? Q ? ? C 6
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C +1?+' '5 C'+ ^1$15'VQ 1? N 1 ♯'C'
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F6/408'6 9' / 19' 9 91 03' / 9'4 4103'
610' /D .08 6.'0. /G0 .8 I12 .0 :7 '
.08' 9.0 G .08' 01G9801 .03' 2'F6 '
763' /2D9' 9 941 63' 01 /'9 9 .916 ♯ 9 8/'
298'"9 7' / 19'0 193' 9 8/. 20 93 - 0E8'
2 0. .08 5G9./ .08 ..1'4 .01' 1/19 93'
! ' 8/':/ 1'G/8 2 763'0'2016 0'1 7616 8'
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#6 0 .G 19U#6 08 . ./ , !7 6 D 0'
[6 '. . . .' 29'8026'2/2' / 81 612'
D16'9 9'2/2'497.1 F674'1. 0'G .' 4 0'
4' 2 1 6 8 9210'/79 2924 ':G / / / 3'
2 763' 0 923'2016 0./2.9 9 1$'9 19'
0'.2 8'02 80 0' G / / G0 '2/2' / 621'
61' 9 921 03'0 .9 "9" 03' 9 4 ..9' T6' ''
9 8/298' G6 8 026 8' 06.3' F6 408' 01 '
E / '4'9 1'01 / .8' 2D608'G0792193'"1'
10. .'896 9 89 .'" 490216 $'
7C / 94/'4021' 29'89219' 7268 '2.. /'
F6' / .4 .6216 '.68 29 9 08 F6 4' /'
F60216 ' 1'92 8' 1' / .61 /' / 9'4 .10'
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=')!# 10 3./2.9 163 69 21. .4 /2 3' =621 D '
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9 V$ $+14?Q51]Q' ' Q]Q+'
V$ 1? 5Q5'#'1$ +1+'Z^ ''V^ '
'$N1$Q 5 '? 5V ' 1 +1' ? ']Q1'? ^'
V +$V'++ "'*$1 ' ?5T QVV 3'
+1 - 1 +1''5? C' ? ''$5Q1C'#'
5' 'C)]Q+ C' N$ N1C'EN C'+'? +Q$"'
9Q? '4 $U' +& '5' ''5??'']Q1+Q'$;(-'
? 5V' ?$'' Q ''1$NQ5 ?1 ''T'
5 ^' QC7']QU C]Q]Q C Q $ 'V$'U '?3'
Q QC'1+ 'C' 1$Q5'1 N1"1 +]Q 3'
Q$71 ']Q '' $?1' 1''$5Q 1$Q5' 3'
' ' Q QC'4 '4?]Q15'4 $Q'5'1'1 ''
V' $ '+++$? $ 7'#' V+ VQC? $$'$Q5'
+'VQ 'C 5V?N $"' -
B ^N+Q*'?',Q ''Z^ ' 'V^+1$Q5' 3

+V ?1$Q? 1' 1E +1'?+V ? Q?)]Q '
1$CV1 '+ ? 'T' ? ']Q ' '++'
4 $Q511 d' ?N_)+$)']Q ' N C''5? C'
+ V +1' +'$ UQC''5?UQC' $? ' ']Q1'
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' C+]Q '?V$5 C 1? 15'+ +''3'
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,. "+1V" " U""= 1V^"1+]Q ' ']Q 5' +'
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!3 '4 '4 ?# 3'45 $'# '
3?#? '$> 4 5#'H'$#'
4 5#'$34 4 5#'5 '4$ '
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34 4 $'K 4?#'K 54' $'
$ $2 $ ' D ?#''VW $ '
*' 433#'4 (4'"> 44%> ' ' #'
33 # $#3' '"> 44%> #
$ % #3' #3&' 3%' ?# 4'
'4 '4$4' # $#' 34' ' #'
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+ ''K # E% "EQ 4 W%> 3KH?#'
+44 '# '$ #' % 3#D' ##'% 6'
3#3 344#3 #$#3' #' '34 5#
T'B ^+ ' ' $?1'V' Q ? '5? C'1 !'Z^3'
' 'V^'$Q5'+ 1' 1 E7 '+ V +1 '?+
4 5Q$'?++V +"' + ' ?5']Q ' Q+3'
+ *$'Z^ ' 'V^1 '?'?1 %$!'' QC'+'?$ 53'
V '? 'Q+$ ''++QV1 1'+QC'15 ?'V$' '
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]Q1'1 'B +15'9% !2'+'<Q $?C'♯?'Z^% +1'
V' $ 5U'4 $1QC "' ' +U1 'Z1 ''1Q 3-'
+'$ C'Q'C'1?]Q15'+^' 1'?N$+ +$?Q$'
1 ^ ? +C' '? '$51 'C' ''^1+'Q''
1Q '$''Q '? $V '? 5'1VV'?
002 "'G2 02 2 " "' '1Q+'
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'?C151? 5QC'1+'= ^' 51N $''3'
V 5QC V$?+ V$]Q 'N51 +'$Q? 1U'VC1'
$ ' $? 'T'$ 'Q ? '']Q ' 'N+1'
+ 15'T',?1 %+ +14'+1 Q$''5 ??'' ++$+3'
Q ' '1Q$V +1? Q5 4'+ ''+''+ 1 '
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19 4 /2.2193 2 . .21 / 808' 6 .G9 '
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98".' 9.E602 6 ..1'0 E F6 4080' 9J1 /29'
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941 /$.=# .68'/8 93'/8268'<.. 0 ': 2 '
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.0 292'4 69 .01.'4 041' 21'0.F69'4 6
../88/401 63'108.2'C' 9. 0 63' 9410'
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7'./2 .8 .2. 763' ./2 1023' 4/.68.2. 3'
6.'>.. .13' F 763' G/8 293' /7 8019'
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:G / 7 G/ 6/ 4 8763' 69 '4/D801 .'
21E 6.'2/2'4/D801 . #= .. 0 .8'0 19 08'
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.01'. 1 801F6.' 1.. 9".'2/2' .' "49'
"9'2/2#0 9G94 1'"9 7'F6' 8 . 19' 98'
9 . 1'C'./2 49 01'10216 2 I 1'06198'0 '
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4 . /'4/.689210 107 9G.93$2/2' 10'108.2'
"1'/820' 9 '.9 1/F69'./8 9G924 '9 1 '
8921'86 .092 8 . 19 './2 19216 '
'"1 08F6.' 0 198'9' F6/'.049 9' / 189'
F6/ 68'26 0 2'9 9' 9 92108' 94'/ 24=A'
29 2' 46210 01' / 19216 ' H 2.' 0. 62.'
>/D801 .'0 92 68'46 .98'.9 168'"26'
F69 2'"/.021' !010 . 2'H69' ./8 9G9 /'
298$' 8 .9 1680 .9 68'F69 2'"/.02'/ '
/2.8'"9' 8 . 1. '0 .2 68' 24.'2/Q
8 29'./8 9G92 /2 3'.. 10 E' C' 2467 0'
108./D2 . / 98 2/8 29' "9 /'/ 2 /2 3'
2.9 108'. 1281 /292' D2 .021' & .Q
F69' G683' F6 498' 4/D801 3' 49' 0 9G92'
/ .'0H.2 'C'./2 9G92 1/2.' 6 1 3'
. 0 0F69' 9 / . /./O D /19 1' 9 .6 /'
! .9 /2 3'"7'9D 9D 62 ^ 2/2 3'4 468 0'
468F69'.. .7 016 F6/' 9'0 9G9 /298'
." 68'0 .218' C ./8 9G92 /298'
8 9'" 4916'9 9 .' !68'92 8'_92/'
9 192 3'4 D13' 0469 08' 80268'/ 19249'
91" 8 G2210 0". 2F6 .70. . 19 6 2 /'
4 #>9 249'.68 0668' .ED ./3'./2 1 2 9'
010 192 63'G6 6 8/4 .68'.68' 029'./8 '
. 9 0!E 4. 1E. 06 9 01' 6D268F69' 9..'
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.F69'9 '46/763 3': / / G/ 6' 68'
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89F69'4 . . 02.93' /4 9 610.'"9". ' 6 '
6 0 62.' 9F69 48 68 .6 F6089 9'4.'
791 .68'92 8'"9 .03' /8 268'04 9468'
6D 0!E!/10F6.'.0 D 2.'0.'.9297 3' 1'. .6'
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9' E F6'90 2':G / / G .0' 240D 29' 9 F6 '
. 621 .'C' '4.'"9 10.9'4 9 9. 763' 8/'
430.' 968'F69'9. 0' 4 .6 3' G / / G01'
69 621# "1' 'F6/' 2'0 /' 164 E D92. .'4' 2'
G/.'80 89' / 11' " 6 0 F6/.'.0 10' 621'
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* * _ \ ' Z B [' Z , * B * " " '

4 '+ +$1)? 1 5 6 Q + ? 1 C'' T ' N Q 1 ' E '
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+'$ U Q C' 1 C' 1 U $ Q b 5 C' ? N] Q '$? 3'
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Z $ ' + U ' ? ' 1 Q ? C'Z ^ ' ' V ^ 1 7' + $ C'
+ $ + C ' $ + ? 1 'T '5 $ 1 U ' ? ? 1 $ Q'
V $ ' V ;1] 1 + + 1 5 ? $ 1 $ U ' 1 U Q $ 5 1 $ Q 5 '
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V 4 + $ 1 + 1 N ? + 5 ' 1 V + $ $ Q ? $? ' ?' ? '
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4$ % $ $ + G ?4' 43!'
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`O =' + Q ? ' Q 5 ? 1 '+ ' ? $ 1 + + $ ' ? 3'
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V 1 $ 5 1 + V ^ 1 5 1 1 'V ^ 1 1 1 '$ V Q N ? 1 ' Q 5 '
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1 ' + 1 Q $ '+ Q 5 '+ ' N + '5 Q ? $ Q ? $ 1'
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5 V 1] Q + ^ ' 5 ? C U ' ? C T ^ ' ? ' U Q C' 1 U Q 3'
@ ? 1 1 V V 1 + 1 1 ? 1 $ Q 1 1 5 T ' 1 3'
V ? C 'V 1 Q V $ 1 'V $ ' U $ C ' 5 Q] Q '1 C'
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4 $ U '5 ? 5 ' 1 ? 1 5 ' * ' 5 ' '1 7'] Q 1'
'1] Q 1 '+ ' ? + $ 1 "' 5 ' Q 5 ' ? Q C' Q + 1 '
2!X '5 ' Q 5 ' ' 1 + ? ' Q '] ' $ V ' $ 1 ' ' + ' '5 ' 3'
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1 C 1 ' ? ' $ +] Q - ? ' < 1 Q ' + Q 5 '
$ 1 M C T 1 '] Q ? ' ? ' '5 ' Q C ?] Q ' 1'
M & Q + ? $ 4 U '? ' ? ' Q ? "' g Q 1 ' 5 ' C'$ + ' ? '
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Q $ ' ? ' 1 C ' C g 1 Q $' 1 + 1 C ' + 3'
U 1 'Z % ' '] Q ' ' 4 C' /' + Q V ' C 5 '
^ . U ? Q - 1 1 ? $ 1 ' ? ! ', + ' 1 1 '
+ T ' 5 V ' ' $ '^ + '5 ? 1 T ' ? U C "' < '
9 + % 1 + + 1 % R D C "
9 $ ' *
$ 'U ? 'Q + 1 C '? + Q $ ' Q + 1 U C' '
$? Q "' ' ? C' ? Q 5 '$ 1 ' '$ 1 ' ? 5 '
$ 1 $ ' ? C Q + Q C $ 1 ' ? $ V $ + ^ 1 7T ;] Q 1 '
1 + + Q 1 1 ' C '9 1 Q C' + N ' 'V $ ' V $' 1'
3 6 4 C] _ U $ Q 5 V 1 $ 1] Q 'V ' ? + $ 1 ' # '
5 ' 5 ? 1 'V ' U 1 U 1 C ' Q + $ 1' V + ? -'
$ '1 ? Q 5 '+ ' ^ U $ + ' T ? < 1 Q Q 5 1'
V ' ^ 1 ?] Q 1 ? ? 1 $ + '+ ' ? $ "' ' 3'
N 5 1 + ' 4 $ U 'T ' ? 1 $ Q $ 1' , $ ' $ + C '
] Q + $ 1 '$ Q $? ' 1 V Q $ 5 1 $ Q 5 '+ ' 5 V $ 3'
^ ? ' ? $ ', V ' + ' C'9 + V + U] Q +' 3'
V ' $ Q ?)4 1 <] $ 1 ' ? U Q C' ' $ Q 5 ' ? 1 3'
? 1 ? 1 5 ? 1' 1 Q ? $? ' 4 1 $ 1 C' 1 5 "

"'
=q M : = =
. 0 .3 9' ;10 "9 6. 621 4 16761 EF63.E6
4. 8 94 07 6' ;1/ 76d 3 ". '0 =.G/ 0
68 / . 3 "9 0 8 /2763 C" 6924 8 4/
". 0.9 .0 4/ .924 01 /2. 96 0. /2.0
F602/ 8960. .9 9 62 = . . .10 : 1G0D/A
. / 68 I .6 9/ 68 : 0. /2 . / 68 0 :
1G2D/ 0 I .6 / : 0. /29 2/ 8 2010 9 1 ?=.
< 10=1/ . / 68 VR 0 /11 .6 .G.
20 68 F6 9 820 ! 16 "0 910 . " / .0
7016 2 F60 . O. .1_92/ ! 6 .63 =. / . /
68 : 2.9 3 :G / / G 08 / . 63 9 1
=940 .04. 8 . / 68 "9.9 68 07 .049
8M 89 .0498 0 298 / / /F6/ 4012
1G920 68 676 702/ 2 F6/ : 01/ "919 3
.0498 0# : 2.9 3 4/ . / . 01 =9410 ! 2
. / 68 0 .02 2/ " 6924 8 /4/ C 9 9G92
/2612 8 / 6 0. D/ . F69 2 > /D9293
! 2 .63 69 .02 3 :G / / G/ 68 4 4163
. 10701 = 0 1940701 =940 492 F69 : 9
01. . . / 68 . ; " 0 490 8 76 02
4/ F6/4 . 63 064 / 1/ .9 93 2 . . /
G920 68 91 08 / . / 4.08 76 023 4/ .9 9.
C .68 4 . 6 34 9 . .1
H D 6I /8 293 "0 0 4. 9763 > /D 8 010
10169 62. 9.62468 "0 73 . /12 .G92 1/
83 C 219 D921 8 /4/3 F6/3 2 269 1
D0240 "9 1019 . .61 621 = . .2 8 : 1G0
D/ 03 9 268. /3 I 8 94/. 93 9 4 9/
4 0 8 C. /2. / 4 0 8 96. 63 C > 9 8 /0
. 163 9 01/ 8 /3 20 0D 03 . .21. 2
C ! G0/ 3 : 01/ 9 4903 C D6 03 01G9
801 .03 C 68 92 1/ .9P3 9 8 /168
93 . 68 F69 2. 0 .0.1 9. .46.6
: / / .91 H /7 /163 7 / 49 =9%a13 2/
6. 0 "2 69 8 1403 ! 2 1P6.0
:G / / G/ 68 . / 8 898 / 91E .D0 .08
07 I 6. 4. .D0 92 I 9. .08 0 92.
498 / I .149 1 ! .20 .0807 1 /
I .6 .0807 I .6 / 22 .91 08 G. /
4/ 08 _9202 08 29 =1/ .08 0 _92/ 2.
! 1. . / .04. 8 .08 "919 98 <F639 . . .1
0219. . H . .9 068 C 10. 4 2 G62.
2/6 68 894 .0498 : 2. . 8 \0
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F69 H /7/163 - 2 .08 I 0.08 C W 0
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G/ 2 08 F608 86 1
)& %% "&. C /7 16 10. . 8 9 E9 62 ! "1 /
F6 16 09 1 63 / 8 293 10 8 9 F6/1F6/1 621
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/2 .08 .6 63 019 6 1 G0 93 0 .1/
/2 . 6 .01. . 63 . /D2/ 8 20163 >
.6 / 4 29 6. .9< 9 621 20 8 0249 200
8 9293 20 0D/ 03 .G9 063 =/ . 0193#
C 10 .08 ! OO=.0 61 6 1 : 1G0D/ 03 F6

, \ , e * ' , '
+ 'V1 $1' 91QNQC' +$ ']Q 1' 15 +?' ?' 1'
1 'V1$ ' Q '^ 5 +' 1 1U$1 '' 5 '5 1N?1'
b$' +1' + V15 $'Z _' 'V^ 15 'V$' *QC'
' +' 1 + 5 A '1Q '$' Q '^Q?+Q3'
V1 QC"Z% ^1N '$ 1Q 5 Q+++ +$Q5 ''$? '
*^ 1QN+C L ?'V^1 +C Z1*5 +? C '8 ?''
B 1 C' Q+ VVQC' 5 '+ QC-'\1Q V^1 3'
?+C 'BV +QV V '$'1]Q' 1'BV +Q->'
+'$Q5 " ''+'? +5 ?1 1"]QU '1 '4' QV 13'
5 $ $1 ''5 ? 1 '9 Q5 5Q5 'U'?Q5' ?'
+ 1 d1 41+Q_1 +'V QU1 '?Q5 'T' ' '3'
$Q5 '+'? Q $ ') / C '4+' 'Y
]Q Q$'V +'BV +Q$QC'+V ' 1'1&'Z%'^'+ 5 "'
9+ '$1 *+?'? '^ +1 '' Q 1'$+V$+ 3'
? 'BV +Q$ 'Z^<' 'V^ !'+1Q '4 'V +$3'
]Q 'VQ 1? 'gQ C' ?5'+$ 1'^'5 ? ' Q5'
4+$+'V $ Q U 155' "']Q 1? 5 'V $3'
Q$U1 ?UQC']Q1 5V 1 UQC'1N Q$'
1Q]Q '+$Q+ Q$' ' '$UQC!'\ '??+4' Q3'
V 1C"U 1 Q ?C' ?'?' $+Q 1 C$1 ' 4'
+^' ']QQ? Q$)1 5 'V 'V + 1C'17]Q1'
+ T'V $V Q1'+'5 C '4+ '5 N? ''$?15 ?3'
Q5 !4' QV+1C ?]Q15 ' 1']Q '1? 5 ' VQ3-'
$1' + + ^'?+ 1 T']Q '1 '? 5 '4 $Q3'
C 4 '+'5 +5 V 1 '?+5 '+'5 1 Q$!'<' +'1Y
? '$1 ', ' +&+C^U" '"' "1 \ +'5 "'
]Q+$]QQ? Q$' '5 ? C ']Q - 'M' 13'
?Q$' $ ' ?$' S2 " 2 Y "
" *2 " 2D 2 2 2 "
"!" ' , '? $'U'?1' '5 ?1'V$ + "'
E "' ' 7 2 # H" !! * 'B3'
V +Q$'' ?Q 1 'B '"' '$V'$ 1'4' QV 1C'
VQ NQ 4 ? $C 1?]Q15 '' 1 T' + 1-'
$) 1Q$"' , ']Q '1? 5 '9 1 '+Q5 '1 C'
?'?'V')_ '+Q'4 $+Q T'1V 1' Q?'3'
]Q '+Q Q'+'? Q? 1 +;' 11?' Q?1 '
^'?+ 5 1 VQ$ B ?1;'1+]Q '4 '4 $U'' Y
+15 +'V 1' + + 1C 4+ '+1'+ + 1 C"'
'' %$+?1 '#C' ' +'$Q5]Q+' Z$?+ V+5'
, $ VVQ5 V$ +'? +5 ?1$+]Q 'UQ3'
5 1? '4 + Q Q5 ''5 ? ' T'Z^ ' 'VU 1'
Q15 '$ $ U1? '1 '4' QV 1 5 '+'V'C' '
+ 1 1)]Q15 5 1+ '? 5 '5 ' Q5 4+'U 13'
Q5 T Q1Q 5]Q ?$Q' V+$+ V $ Q$"' Q3'
'$ 5 ' N Q'$'' U'+1Q 15' 15 ?1 Q5' +'B3'
V +Q$Q5 4 $Q5 '1 ']Q 5V $1? 5 'T+'3'
? ? 5Q5 +$ $5 ;']QU + + ' 3'
Q ?15 'V$'5 ? 15' '$ UQC'^Q5 1? C'Q Q3'
+'4 +1 Q #7' + '1 ']Q' +Q5 'U 1 5 1"'
$Q 5 5 '$1 1++V1 15 'VQU + Q+' '++3'
$ '1+'V$' $ Q$"'9+ T Q?+ V Q$1 '4 T'
+5 '+$ Q5 Z'4' 1N'$15 '*^ ' '$Q5 'T'
1N'$15' +Q 1$'1 ^Q+'?'+''V' *+'1Q?+'
?'??Q)']Q' '?'?']Q 5 '1U ' Q$+'? N13'
Q+$?' + V$'Q ?+ 15 ']QA'^)5 ? '?1 Q3

[illegible]

9 + ^ ' C' 1 Q Q C Q + $ ' $ Q C ? ' Z ^ ' ' V ^ 1'
N C' T ' V $ 1 $ + V + 1' ' ;' 1] Q + ' B + + + '
1 + ^ ' + " ' V $ 5 Q ' T 7' 1 Q @ ' + 1 + + Q + 3'
$ ' + Q C' ' $? 1' + + 1 ' # ' 5 ? 1 + 1 ;' 4 ' ? ' ? '
1 C Q ? 1 5 ? + C 1 Q ' 1 5 ? + Q C' ' ? 1 3'
Q $] Q ' ^ ' + ' 5 V ' $ ' 4 ? Q + $ 1 ' Z ^) ' ' V ^ 1 '
] Q 1 5 ' 4 ? Q C' , $ ' + C ' f 1 V + ? 1 + + $ C 1 + 3'
] Q ' ? Q ' ? U C "

9 1 5 ' N Q $' , $ ' + C] Q 1 7' ' ' $ 3'
? 1 ' Z + $ V 1 + + + + 1 T 7 ? ' C ' 5 ? Q ' ' 1 5 V $'
5 Q $') ' T ' $? ? 1 5 ' 5 V $' + ? 5 Q C ;'
] Q 1 + + + ? Q 1 5 + ' $ ' ? Q 1 4 $ ' $ ' V $ 3'
^ ? + '] Q ' 4 ?] Q 1 5 ' $ + 7' + 1' 1 5 ?'
4 ' /!] Q ' 4) ' 1 Q ' $ $ ' $ C '] Q ' ' V $ $ 1 $ ' ' + ' 3'
+ ? N 6' ? $ Q 5 V $ ' $ 1 ' + Q ? Q 5 ' B + 3'
+ + $ 1 ' $ V Q 5 Q C 7'] Q ' ? ' 1 3
C' C' 1 Q 1 U ' ' ' V $ + 1 $ Q 5 ' ' ? ' ?'
1 V $? 5 Q $ "

B ' 4 ' ' + 1 Z + V 1 + + 1' ' 4 ? ' ' V $ 3'
$ 5 ' , $ ' + ' 1 ?] Q 1 5 ' ' V $? + V '
1 $ 5 1 ? 1' 1 + ' V $? 1 ' D Q 5 * ^ + ' 3'
V ^ $ 1 ' " , + 1 ? ' ' , V ^ $ ' ? ' * ^ 5 3'
' ' , Q + $ $ ' +] Q D % * (' Q C ' ' 3'
5 ? 1 + ' $ 6' " ' * ^ ' 5 1 ' 9 " 5 V + ' ;' Z ^ ' V ' 3'
?) 1 $ + ' 9 + 1 N + $ ' ' D T 1 C ' V $ 5 ' ? ' '
? $ V $ U Q C "

! 44' 1' ' "1 1. ' : . 0191 .08' 4/4 '
1012' 064 03' 0' 2/226 3' " 16 9 0 ' C' '
1/19 .8' 68' ./21.82 ' 403"9 02 '
G 9 9108 4 6 268' 108F6.' 0.8 2' F6/4'
0. .D68' C' 7 0 G9801/ 98' 2/2' 269 '
2 0.' U" _/ /3' /3' 9 9' " 93' 9 19' D 08 80. '
.6 /3 06 ./3' 4 /103' . / /3' 6493' 24/ '
4/3 11 +Y SF6'.68' " '0 99' /F6 ' 29468'
64 .0 . . 021' 219 8' 26 4 0' 68 6216 '
C .94 ' D2/ 021 ' " 2.6 3' ./2 1 4 ' "1'
.02.3' .01920 . 0 2662' :G / / ' '
463' F6/4' 8 / 49 .' 29F6.621' ' 8 / .6 '
2 1 89' 0 01 021' ' !"&&&' 1/1. 3' : / '
/ 0' &) /' .%.& !*-' ' $ C' > 020' G .'
.24 4 80' 2'..9 /' ". .01 3 6 D.23'
04' .0268' 01 0 63' 0 9419' /7 1 4. 1923 '
2/2' 49 299' .6 68' 9 .. 9' 6 ' 8 8 / '
10 .01 3' 5949' : 6.0 .G63' 2' .0 682 01/ '
93' 1/1. 3' /2621 0.' I / 68' /
8 2 68' F6 ' 8' 1/1. 92E . 762.' .9 ' 1/ '
104 . 20 0 .219 2 1 1610 11' E' .0892'
/ 19 ' 0640408'. 8 2024G' 2F 1' 0' 98Q
96' :G / / G/ 68' 9 . 64621/

"B ? 5 4 + $ '] Q ' V Q V _ ? ' + Q ' '] Q ' ' ? '
*=) ' 1 ? 5 1 ' 5 ? C '] Q ' ' ? ' b $ ' , ^ ? C 6' ^ ' + '
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3 &) .

: ' T668 "9 4' 9 1' .4 F6.' 101 /2 './ '
.2.02968' "1.6 ' 8 9 01/ ' 2:G 1'
/ / G .0' 8 10' 498' 494 8 63' C' 2' .6 63'
"9 70C4/4 208 ' 0 60' "9 10. 3 219D '
101. 6 06 863E . 6 498' 20.0 93' 2D92 68 '
246 1 0 2 1 68 91G/46 '/ 9 0' 7 4 '
F69' 0D2/ .08 63 C' ...2 908 63
2 1/1. 93' ./8 0.G ' 2 1D2 3' 94 . '
U)' :G 1 04 3' 1 63' D.29 . .6' 201 /2.' 0'
.94/' 6 . ' 0. 0' =10D ..3' 19 '.9216 8' /4 / '
D 210C "2/022 320.O3' 02 ' ! G 1' > /Q
8 2' 01 6 10..8' ' = /. 01 3 9 022/31 93'
: 0./2 3' 9 ' " D 21 ' 064 1/ 104 / H 8 63'
4 D92. 863' ' 2D. / 863' 01F6.'
G 2.0' .. 1/ .' : 0./2.' "+_' .&"/ ' 19 2 '
F69' 2' @ \ ) ' 5#) "5#&/ A 03& /' ' -+ '
7 $SE0 9 0.63$' "1' 102498' F6 ' . 024 /'
0D2/' :G ' 0.94/2 3' / .. 1/ '
048/6. .16 ' ' C' / 1.0' :G / / G 08' C'
5G.1/ .08 67 .9' 2' .9/' / 1.. .16 '
4 D2 863' 6. 1' 64 .0163' T6/' 2' 29 '
D/1 / 1. .D. 1E !' C' 9 024 ' 02 868 '
8 ..' 7 ' 4989 69 .$' C' 8 0D2 ' 5G91/ 3'
68 8 F69' :G / / G ' 2/8 92' C# D / 08'
./2. 069 .' > / .6 1' "9 7' :G / / G 08'
F6 49 0' G/ 3' 8 16. 2 3$' M 01/ 0' /8 9 '
4 02 3' 08 76 03' 2' .9/' 9 1 949. 8 02 '
G/31C=9408 2 7 ' : . 0191 .08' 2 1 16 #'
102498 F69 2' 59D 0' :G ' C' 9 024 '
4 6' 8 6P68 F6.' ". 0.63 / 1F608' 2' ! G0 '
. 498' I67/9 ' " 798' "92 . ! EC 9/ G 0'
168' 6..9 7 98' 49 9D 9. 02268 0D923'
. . 19 ' 9 0D9 868' 1. . 68 ' 9 ' G0.' " 14'
4... 1 1' 4/ / .H8 6 ' 0.' 9S 2' 0. 803'
9.9 F6! / 6 6# F6 763' > 9 ' 921 3'
1 68 ' 8 F69.06 8 9 ./ 4 08' 4 . '
16 ' .' 8 / 0 1.' 3&" %* %/' 3 6 ' "
)& %/' .+ + ' 2%+' 3! ! .' "&-) +' %' B+ . "&' &"/'
' &" %. . ,& & &' .& ' =94' 2/10 8' 4 D268' 9 1'
F6/4' 2/28 0 621' 968 H / 8 9 ' 92192 '
1 08' 9 ' M4 1.0' ".G989.9 ' 0 /7 19 ' F60'
2/9 19 8 8 / 10 763' 4 3' 249./ 68' 4 1'
G/8 2 3' 2469 9' 2016 08 "1' 07' 9 / 763 C'
...01 3' 06/.9216 ' 8 / 10 93' H 2.' 92 8'
./ D61 1/.9 .8' ! G 1' > / 8 2' 2.0 '
(201 /298 C' 046.2.6 0' 92 19 ' F6049'
9' 9D9' ' 0.91' ! O6 2' 5G/4 D 268 '
.0 ' #" ' / ' ' 94 /268 S2 1 F60 68 '
=1 63' 1/1. 3' 9 6 "9/ 0 E/' 9 7924

5 ' Q C U $ Q C ' + + ' ? 1 C N $ 1 Q 'V) ' V G '
V Q Q C 'T ' ' + Q Q C " $ 1 '+ ? 5 ', ' C ' + '
Q ! ' ' + + $ V ? C 6 . ' .)' 5 ' '+*! !, * '2 '
' 2 D" '@ !' " ' 2 ' 2 2 # '
2 %" " ' * !'$! ! " ' E " 2" '
2! H"2 ' 5 + 3"g Q 1 ?] Q 1 5 ' ' U Q Q C '4 3'
Q $'T ' T + ? ' U $ C '1 + ' 1 5 E + C ' Q 'C 3'
' ' N + C '4 U + 1 Q C 'T 'V $ $ + V 1 '$+ Q 'T ' 3'
5 1 '5 1 ' $ C '5 V 5) ' ' N 5 1 1 '] Q 5 ? $'
Q $'9 ' '+ 1 Q 1 ' ' U Q $ 1 C '? ' ? ' 1 ? Q 5 ' ', 3'
'$ ' + U '1 ? $1 ' 'T '4 ' Q ? 1 + '] Q '+ 1 5 '1 1'
1 ' + 'Q $"$ + V + ? 1 ' '+ '$ U Q C ' V C '
' U + Q ? R 5 9 T 1 C 5 (' ' 1 1 + T ^ + 3'
U Q ? ' + ' $ Q 5 '4 + '1 Q ' $ Q 5 '] Q ' V 3'
$? 1 +'Z V 1 1 7' 5 1 1 '5 ? C ' Q ? '1 '
Q "

B '+ 1 5 ', ' E C ' ' ^ C '1 5 1 ? 3'
5 Q C + V $ 1 7 V Q Q = ^ ' '5 1 N ;' 1 % '
? U ' ' $+ '4 ?] Q 1 5 '1 N N $ 1 Q '? 'V $ Q C '$ 1 3'
) ' ? 5 ' '+ ? '5 ^ ' Q 5 4 'V $ $ $ V + $ '
T + Q ' + ' 1 + V ' Q C '] 1 5 ' ' 1 '$+ ' 1) ' $ -'
? + V 5 1 1 V 1 5 ' ? Q 7' Q 1 1 Q 5 ' ?'
Z ^ % + C = + 5 ' ? 5 '9 % ? U + 1 ? Q + ' ; '
$ '1 V $? + V C V 1) # C '+ 1 4] 1 .'
V Q 1 1 ' ? 1] $) ' 5 1 5 $ Q 1 ' ? + ' 1 Q C ' F '
+ + ? + ? 1 + $ 1 V $? 1 R ' + 1 + 0 '& 1 3'
5] Q ' V 'V 1 U Q C ' + ' $ V C ' 1 Q $ 1 C C'
3 V $' A'1 'V 1 V $? + V 1 1 V 1 '
] Q 1 V 1 '+ ' $ V ' $ 1 ' ? 1 + V $ V $ 3"'
+ 1 'V 5 + + + + 'C d ' + 5 + 1 . @ + Q 4 '
5 1 '1 5 '5 V 1 $ + 1 '5 ' $ 1] ? * V ' 3'
+ 1 4 '5 + 1 ? 1 T '4 Q ? $ 1 "' 1 'V ' '& ' 3'
+ ' 1 1 ?)#5 1 1 'V ' ' $ '1 $ 5 1 1 ' V ' Q 3'
$ M d ?] Q + ' ' + ? Q $? * + V $ 1 1 1 '
"' 5 1 ' $ Q ?) 1 V $?] _ 1 1 ? ? 3-
#'1 1 $ + ?)' A "'] Q 1 7'1 '9 + ? + ? I $ "] ' 1 '1 '
1 [1 V ? 1 5 ' Q ' ? + M ' ? + 5 'V + $? M '
J Q + 1 5 1 U %)N ? '1 +'
U Q C "#4 '] Q 1 ' 5 V + T G C @ + 'G 1 1'
T ' $ 5 1 ' $ + V $ 1 $ 'T V $' $ 1 C ' + ' 5 V ' 1'
V ' N $ Q C ' + $ 1 + ' ? V ' $ 5 C 4 ') 1'
'] Q 1 $ 'T ' 1 U V $ 1 5 1 ' 1 Q $ 1 7' ' V U Q C '
+ " ? 1 ? 5 1 U Q C ' V '1] Q 'V $ $ 1 ? '
5 ' ? 5 V '^ ' ? ? 1 V ? ' + $ $+ ' 3-'
>U '+ ? 5 ' '? + $ ' E 5 $'Z ^ % + Q C ' '4 U ' ? + 3'
V = + Q C ' ' ' ? '^ ' 5 ? + 'D' ? '] ' A - '4 '
2 '? 1 Q C ' Q 5 5 ' '1 $ + ' 'Z U % ' ' 1 ' 3'
? 5 V ' $? Q - ' + ' ? 5 V 1 $ ' ? C "' & ? ' B $ 3'
"+ C 4 G ' = ' $ 1 U Q C 1 \ + ' 5 1 U ' 1 3'
+ Q G C , ' + C ' = G V Q 5 ', ? %" 3J'
V 7 @ U ' ? C 1 1 + '1 '5 1 1 U ' + 3'
1 1 + 1 1 C V V $ Q V 1 'V ' $? V ' '
U ? ? . ? ' ' U 1 5 V ' + - U 1 + Q 1 1 ' Q C '
- M T C V ' ? " 2 ' 'V $? V 1 '? 5 3

. . 1 /298 ' 29' " &,#/+ ' ' 4' 9@E'
S? 'C'.019 0' H 9'92 8'894 0'04' 2.8 C'
16193'04' /4 . 10 98 ' .'707921' "1' .06 0$'
9 1 . 9219304'. 9468 ' 50"1' 2 3' . / 8 0 '
01 /2.' 894 / 68'F6 763' /7. 298 / '
9'9 9 163'.92 9016 ' =94'G0' 91G / 4 '07'
1 1/1. .'/7 9 601 ' 02 .6 0 .3'G 21'C .9 '
1 3 . 921 3 69 . 8 /2 763' 0 D01p ' =/ . .'
. D 2 2 2 8' 1/1. .3.0 01 /29' 0.'
91G/4/' G 7 / G0 E"1'021. / 8 2 0' / '
201 449F6/4 9 . . 2 1 16 1#'16 2'9 '
/201'. 1.1F6.' ".1. 68' 9219 8 03# 111 7'
.034 D91. '. 011 2.1C4 /01 01$'"1' F6 4'
>/2' . ; 9'4 4168' . /> S1 01 64' 9 6191$' 1'
F6 4791 9' 4 68' 1' 040 /791' 0 6'
8 01F69 = .92 8' 1 "1'9 ' ' C ` M>921 F69'
0 / 68'F2' C' 1 / 7 G09' @ ' / '
19 / .3' 021' C' 01.6 01 /19 8' 98 8'
` 19 D921 08' ./2 9F60219 ' >92 F69'
602 ' 9' 21921 0 2' 9 P.1' 107 01'
./2 2 .1',' 2464 /29' ' 01 /. 201 /29'
061G/ 11019' 10' 10 >9 ' V]1' 2 G ' "2F608'
49.9 201 'PD93' 211O03' 0R' 0 1 /2 010' C2 '
. 01 2 9 3F63' ". ' 912 9 ' ". ' "1' 6 '
1 8 6E2' =621' 9F 9"9 4F6 4F60 8 0 '
1 3 "1' 0E621 '0 1969 ' '
? + $ ' ? '+ 1 Q ' ' ? ' ? 1 G ? ' "'
* ' V '+ ? 5 ' ^ 1 5 M 5 ' Z ^ ' 'V ^ Q 5 '
?] ? '[1 1 ? Q C 'D' + + $ '] Q ' 'V $ ' U 1 3'
C) 5 $ ' V ' ', ' ' U 'j , $ $ 1 -'
V $ ' V ' 1 ? $ '] Q C ' 1 ? ' V $ Q C '9 1 [3'
+ ? '4 $ 1 ?] Q V 1 $ + 2 '1 N 1 '] Q ' '4 ' 3'
+ 1 & $ ' ' $ ' ' = + $ 1 V ^ % ' 2$ (
, '2! 2' "? %2 '1] Q + ' $ 1 $ 1 " + ' ? $ 3'
+ 1 4 1 C ' + $ 1 5 ' + ' N ? ' ? + 5 ' 'V $ 3'
5 ' U ' ? ' Q U + 5 Q C '9 1 ' 'V $ ' ' 4 $ 1 Q C '
V 1 $ ' 1 ? C ' 4 $ ' ' + $ '] Q ' 1 $ 1 5 Q C '
1] Q ' ^ N ? $' ? 1 5 Q C "' + ? ' + 4 + 3'
'$ V $ ' '1 Q C 'V $? ' V ' ', '? 1 %' + + T #Z ^ 3'
' 'V ^ + 1 N 1 5] C "T] Q 1 ' ? 5 #' 1 $ ' 3#'
, Q ' ? 1 5 Q C ' '] ' '+ ? ' $ 1 ' '
= 1 M R'V $ ' + ' '1 + + Q $ 1 5 1 ' 'T 'V $ "'
1 Q 5 1 "' B '^ 1 ? + ' $ ' 1 'V $ + $ 5 ', $ 3'
' + + C ? 'Z U % C ' = 1 V ^ % + (C 'T 'Z ' i '
+ C % U . ' ' 1 $ ' '! D % $ H - ' 2'
1 G = * '3 Q U 1 ? ' ' Q 1 '] Q < + 5 ' N ? 3'
1 '? V 1 $ + ' 1 C ;'? ' ? '] Q ' '$+ Q $ 1 ' + $ 3'
Q 5 Q M ? 1 + ? '? 5 V Q 1 ' 1 Q $ 1 7 '1 3'
M 5 - ' ? ' ^ U)Q 5 '$ Q ' + + ', $ ' C '] Q 1 5 '
4 ' 1 'V ' ? ;' '] Q ' '9 ' + '1 + '9 ' 3'
^ + 1 $ ' N 1 ? 1 7' ? ' + + $? ? ' ' Q V 3'
' ? ? '4 0 1 N $ " ? ' 1] Q '1 5 'V ^ "#'
' 'V ^ 1 5 $' Q 1 Q 5 ? 5 ' ? Z $ V 1 + $ + '
' 1 ' ? 1 + ' % ' ' V Q $ 1 C ' 'T '5 Q ? ;
+ ')

= q M : = = ʿ q !

02168ʿ 2ʿ 921 924/ʿ 8 /49 1 ʿ 9 6.9.ʿ 3 Aʿ 62. 10 3

2ʿ 64 . /ʿ D 16 ʿ 49ʿ 021 0ʿ 2D.2 / ʿ 2 8 0 8 : /4 .0 34.16 ʿ H / 8 . / ʿ ! 9 . . 21ʿ . . 8ʿ. 0 8 ʿ " 7.3ʿ49ʿ9/ʿ 7ʿ "924 .0 ʿ 4/ 7 621ʿ0 Eʿ 803ʿ 2D92 Eʿ 0 .93ʿ H ʿ / . 01ʿ ! / / ʿ . F69ʿ /7ʿ 2 D2. 8ʿ U)ʿ 029ʿ ʿ048 07 . 8ʿ8ʿ 8 .4.24ʿ0 . .ʿ . . 08 ʿ 0 ʿ 1608 . D0/ ʿ 812/ .0 01 3ʿBʿ.6 63ʿ . . . .ʿ (ʿ 4/D8 010ʿ G/ 8 10210ʿ. . 1 .64 0.2 ʿ 10216 C#ʿ 6 D.02 "1298 / "2F20 00ʿ ./1 3ʿ ʿ 7 38 9022 3 9/3. /269O9 .061ʿ 9 / 30 ʿ D . 9 /6 9 . ʿ = / . 0. . 80 . .210 Eʿ 0 ʿ 1 . 8ʿ : / / 1/ 68E0 . 91ʿ268 . 3ʿG/ ʿ 2/ . 3 9ʿ >9 G .63ʿ / /ʿ 96ʿ : 1G ʿ . 0.6 2 E

?Tʿ 064.2.ʿ 0 Eʿ : 0. /2. 8ʿ ʿ 4 6 268 F69ʿ . 08 1921ʿ048 021.3ʿE4 .08ʿ 2ʿ : 01/29ʿ/ ʿ 208 .210ʿ 0ʿ 2D.2 Eʿ F" 0ʿ 2ʿ / 01 /2 3ʿ .2 ʿ 4/ 9C. 64 . /2. /7 0ʿ 621ʿ 8 .9ʿ 92 ʿ 16 . ʿ > .02.ʿ / 8 2 0ʿ 2ʿ : 0 /2 3ʿ / 9 763ʿ 049/ʿ 920ʿ . .ʿ .1 /29ʿ08 F6 01 3ʿ 10/ ʿ 2010C / .0E 1ʿ2/2ʿ 29ʿ .0630ʿ 4 468 1ʿ /6. 04 ʿ - . .ʿ /F6 ʿ "9 .1ʿ : 0. /2 ./ʿ 9 ʿ 8 /2. / .616 68 ʿ 0<; #9G1ʿ0 E0 /3ʿ /3ʿ 0ʿ 29ʿ0ʿ "9 10 .ʿ. /04 ʿ .2 68 ʿ :G / /ʿ ʿ ʿ G ʿ 4/U 2SF6. 86 1 . 3 "9 / 3 0 ʿ 1 / 3Eʿ 0 2008 "2 ʿ 1/19 04 64 .02408ʿ . Kʿ.92 . 863 F6 ʿ76802/9ʿ 0 .29 ʿ 1ʿF60Q ʿ 0 923ʿ 0. . 9ʿ : 2.9 3ʿ `G / / G/ 68ʿ / 8 2 68Eʿ. F. 923 19 905G91/ ʿ : /910ʿ 1/ .63 - 08 801 .63 ! . .63ʿ 9.G0 ʿ 2 .63 .4C ʿ 2 D2 3ʿ 0.G. 801 .63ʿ ʿ

),# ʿ 023ʿ 4 .63 Cʿ > 0 .4 . ʿ0 . 3ʿ061 / ʿ

1 ") ' 671 863ʿ T608 06468 . /2D. ʿ 98ʿ 3ʿ 49868ʿ "9 08ʿ 9 9ʿ 9 91ʿ F6 ʿ 2ʿ ʿ H/1. 3ʿ/ 9 763ʿ0.ʿ 7 3ʿ 6. .ʿ4 6ʿ G0 .68 ʿ F69ʿ "9 0.63

T6 9 7 /3ʿ /19 93ʿ 94 4 1ʿ F608 ʿ 6 8 /3ʿ9/ F69ʿ 8 019 0ʿ 1 / ʿ 29ʿ 9 ʿ 1 /2 3ʿ 8 /4/ʿ 048 /4 8ʿ 4 19 .2 93ʿ G0"9ʿ . /2 8 0 1 1 /ʿ "20 01ʿ 01 /29ʿ @019 09 . ʿ 9 . 68 F6 ʿ 2ʿ 311040216 ʿ EG 2. 7 0 ʿ " / .0216 ʿ 5G.1/ . I ʿ F6 " . 04ʿ . 02 ʿ . 68 ʿ "9 04ʿ G9/4.J 92ʿE0 E: / . ʿ0 Eʿ 0 G. 801 1 " .49 29 3ʿ 2 9.07 76 ʿ Cʿ F6 H/293ʿ . .G02 . ʿ $ʿ 0 Eʿ :G / / 7 . ʿ F6 ʿ ". ʿ366ʿ /D . ʿ "91ʿ :G . "9ʿ I 1G . M9 ʿ . /2/2 . ʿ : / 1 . ʿ I 6498 Eʿ 910 G . Kʿ 19 0ʿ "9 7ʿ 01 01 /29ʿ / 801ʿ 69ʿ 1" ʿ " .1ʿ 8 /4 ʿ . 7.4 H 2.ʿ92 8 7 ʿ0 Eʿ4 '= 621ʿ '1 1 E/<@0 1S6 ' . S6 .; 06 .6C01/ E . . ʿ . . 3F6 ʿ . .91ʿ4.ʿ 9763ʿD 06 8 3 ʿ 671 ʿ / ʿCʿ 0. .6 01 / .ʿ 4/ .924 ʿD929 9ʿ 9 1 0 ʿ ʿ ' 10b . 908F69ʿ4 /4 208ʿ. /21 2921 F6 "

. /8 9794 / . 29" 60" / .9ʿ 99 1/ !ʿ 3ʿ0ʿ 4 99219ʿ \=4 D921. ʿ 064 10ʿ # ʿ . . . .0# "1ʿ 621ʿ 20 1 . ʿF6016/ 108ʿ / 93ʿ F608ʿ / 191 / .= : G . ʿ /U1/ ʿ F6016/ ʿ 4.ʿ ! .9 / ʿ 46/ʿ 49ʿ D929ʿ 01 /29ʿ # ʿ . / 6 1 /2. ʿ1 93ʿ49ʿ 02 8 0 F6016/ 4. . 8ʿ 910 G . Cʿ I 1G1. ʿ .1 0 8ʿ 49.9 2 0.ʿ : / 1 . ʿ /<; /ʿ .9.ʿ / 0P6ʿ 7 0. / 3. ." 4.0216 ʿ. /8 9G92 / ʿ 2 3 E"9 ." / .01 69 . ʿD S 3C @Eʿ '3 9 4ʿ `] !K+J &6 & ") 9 &/(! ,5 %ʿ . ʿ

. .149 9763 621ʿ . / 8 862 83 ʿ C 0. / ʿ 763 2. .ʿ049/ʿ9 F6 10ʿ9 04 0"9ʿ 91G /4 /Kʿ . /2 9 1 ʿ .0"1ʿG/ 2 /68ʿ. .6 3ʿ0.ʿ 8 6 1 ʿ 164 2 21ʿ 0. . / 8 /401 ʿ 9 F6.ʿ / 6 0 ʿ 763ʿ0 D6 8 943 "1ʿ9 98 3ʿ 8 164 2 763ʿ C D6 3ʿ 9 /2021ʿ 1 8 1 7 4 .H / ʿ

0ʿ# ʿD929 01 /29ʿ 2 8 0 68 ʿ49ʿ5 G91/ ʿ .0 4.ʿ 19ʿ : /91 .0 ʿ4.ʿ 07 763ʿ 064 1 / ʿ 2 763 49ʿ 161 763ʿ C " 1 3 ʿ Cʿ. /2 8 .3ʿ T 2F608ʿ = . /3 9 8 /293ʿ 8 . .1ʿ 2 ʿ 1. 468 2 . 1F69ʿ /19 .3ʿ 0. /02 01 . 3ʿ C > 0 9J . /3ʿ 0 /4 4 . 3 ʿ "1ʿ 93ʿ 9 1C# / . ʿ .0 / =029ʿ " 492.6 ʿ 7 ʿ4.ʿ 0 1 763ʿ02 80 ʿ 68 ʿ C49D9 . 01 /2. 0 . 8ʿ0. /0801 . ʿ 0 8ʿ9 / .924 ʿ+)ʿ 8 10ʿF60408ʿ 9 7924ʿ 01 /29ʿ. 'B8 / 1 #F6 9ʿ F6 ʿ 262.ʿ 0 1 / .ʿ 1 /ʿ / .9492.93 ʿ 8 .21 .0ʿ Cʿ D 06 80ʿ . /2. 2.021ʿ 694/ .68 9210$ʿ 26.A G / 03ʿ "9 " . ʿ 1 /ʿ / 6 0 ʿ .20 0 9ʿ " ʿ 49021 ʿ T6/ʿ / ./ʿ2/2ʿ. 1ʿ 2 6.6468ʿ 9 ʿ 9ʿ /7 :ʿG .08ʿ 2 8 0 68ʿ F6 2F60D 2 0ʿ " / 68 2 763ʿ49 9 108 ʿ ʿ9 024 68ʿ 0Q D268ʿ4/2/ʿ4.4 9ʿ 1/19 ʿ /4 /D 21010 ʿ .210 ʿ"1ʿ 9 9 1ʿ 1G9 63ʿ 7 ʿ> . 2F 7 G ʿ .0 ʿ F609 68 808 0. 621F604 2D92 ʿ 1/ 8ʿ=.ʿ /4 /D 210ʿ 8 68ʿ06 9/ 68ʿ -0 ʿ . / 68 ʿ 1F6.ʿ .91ʿ> /D9293ʿ 09 . 63 2 ʿ D498ʿ 71/ 6 "ʿ 1/ .923 ! 010 /D68ʿ 4. ʿ . 701 d.ʿ " F6.04ʿF604 2D921/3ʿ 268 . 9. ʿ F6/48 68ʿ 2ʿ 1/8 29ʿ1/1ʿ002/3ʿ 2ʿ :G Q ʿ Cʿ 9 024 ʿ 2 ʿ 9D 0ʿ / . .6 01M$" ʿ 108 .2ʿ2/7 3ʿ 6 9 9 62.ʿ. .1E16 8ʿ . D 2 ʿ 10 . 624 3ʿ . .91ʿ102F608ʿ 3ʿ 46/ ʿ 763ʿ 3 3=Aʿ< 6&Cʿ &#-!" ʿEʿ=.ʿ0 3ʿF6016/ "ʿ 49. 8ʿ49ʿ . . . . / .ʿ 0 19ʿ 4 6 2 ʿ 0 921 ʿ . .624 8ʿ JD 1 /3ʿF6 ʿ 0 37ʿ 1/19 ʿ01 ʿ 1 7 62.6 " .ʿ 2ʿ= 2/ ʿ4/ . .7 863 T602 ʿ F608ʿ=97 ʿF6/3ʿ 6 /3ʿ " / .02 63ʿ4 . ʿD/ ʿ 81ʿ 1/19 3ʿ 2/2ʿF 498ʿ. /3ʿ =10D 10Bʿ 102. 28 .40 / 6ʿF . /4 . 8ʿ2/ 8 29ʿ . 021ʿ 2 D2 1 CʿF6 1 63 098 21ʿ / .9ʿ4 ʿ 9 6 ʿ : 6 .3.2 8 6 9ʿ 1/19 .3ʿ 19 10 ʿ 16 08 63 2" 10ʿ 2/ G ʿ =10D 1A ʿ F6 10 ʿ . ")3+ . "T/) +[!] 9) ! #% &6 ; - ʿ 0ʿ-&" ! # ' " ʿ " & ʿ3 . " ʿ) # &,(=)ʿ . 8ʿ 4

$' ' 1+' ? Q 5 +$Q 5 ' U $' $Q $1 ' , $ ' C'] Q '
? Q ? +' 1 ?)+N $+' +++' ? ' ? ++' Q V < + 7' 4 3'
? ' +)Q + 5] Q V $ ' $ ' ' 5 ' ' V $1 + ? C' + 3'
' ? C' V $ Q C' ;' 1 + $' '] Q ' V ' $ ' $ "'
g Q 1] Q 1 ? 'T ' ? ' $1 ' 9 ¾ ? ' V C' ' $ ' ' 1 + 5 3'
^ ' Q C' , ' + + ' ? ' ' 5 ? U Q C' Q $1 ' + ' ? Y
' $5 ' C $ 5 ' 1 ? 5 ' ' V $1 5 ' ' 5 ? Q 5 ' , 3'
$ ' + _ C' Q + ? + $' + + 1 $1 U "' < 1 ? + ' N $ '
Q $' ' $? - ' Z $ V 1 + + 1 7' 9 ¾ ? ' V 5 ' V 1 $'
' 4 ? Q ? + 1 Q V + + 5 Q $] Q 1 ' ? 5 1 Q ? '
U 1 @ + ? Q C T ' Z $' 1 5) 4 + ' V ' + Q C' + V + + +'
+ Q 1 5 ' ' = 1 ? Q Q U ' 3
? C' ' + ' ' V + 1 1 ' 4 1 5 ' ? ' U C' 1 V $ 1 5 ' + Q 3'
1 5 ' + + 5] Q ' + ' 4 ? Q $1 Z ^ ' ' 3'
V ^ 1 5 ' , ' + + C

, ;%ˢ(#! ! !/

=,"+ /ˢ ! '+9)!ˢB+= "6ˢ
& #! &)/

)@ . & % 3 ˢ!#&/ˢ "ˢ 6' '%/ˢ+ . " !- *!" ˢ
. " !ˢ"+/ˢ" & . ˢ &#!,& . 0 !% &! !ˢ

, Q $+ 1 ' 1 '] Q 5 ' 4 ? Q C' $ 5 ' Q 3'
? 1 ' $1 + Q 1 1 ♯ + ? ' 5 ' $+ 1 Q 5 ' , $ ' 3'
+ C .] Q S + Q U ' 1 +' + Q $ ' C ' + U 1 1 ' # ' 1 @ '
^ ' + ' 4 ? Q 5 ' 1 ^ ' + ' 4 ? E $$1 _ C' 9 ¾ ? 3'
' V 1 C'] Q 1 ' 5 + Q 5 ' U $ Q + $' + 1 + U '
? Q + + 5 ' V Q U + 1 5 ' 5 ' + 1 ' ' V $ C' 1 C $? 1 '
Q C' 9 1 V ? ¾ - ' ' ' ' Q' ^ ' 1 + $' '
? ' 5 ? ' T ' N $1 1 ' ? '] Q 1' ? ?) ? ' 1 ' 1 3'
V ? 1 5 ' 1 Q ' 4 + $ + 1 + 5 ' 1 G C' V 1 ' 4 $' '
1 5 Q 9 ' ' $? 5 Q] Q ' ' + Q C] Q 1 ? + Q 1 + Q] Q +' '
Q U) 5 Q C"' Q 5 ' N + Q $' ' ' ' ' $?
V ' 1 4 + 1 Q ' , $ ' C' ^ ' ' V ^ 1 '
' + ? 1 5 + $Q 5 ? 1 Q $1 Q 5 ' 0] Q 1 Z ? ¾ 3'
+ 1' 4 Q N ' ' ? ' 5 ? 1 Q $6 5 ' 1 + C' 1 5 '] 6RR-3'
? 1 C 9 + * ^ + ' ' 5 ' Q +' = + 1 V ^ ¾ + 1 5 1 3'
'] Q ' ' 5 ? C' Z ^ ' ' V ^ + ' C' $1 @ 1 Q C' 1 ? 3'

&)& " - * ˢB !18*) 2%ˢ)( )) ! ˢ * 3'

$? ' 1 $ 5 ' V $? ? ' T 7' 4 ' ' ' $N 1 ? ' ? ' 5 3'
? + ? ' + ^ ' C' N ? + 1 ? Q $"$ 1' 1 ? ' $1 ' '
V ' Q 1 4 + '] Q ' , $ ' C' T ' + ^ ' 1 $Q 5 ' 1 3'
] Q ^ 1 Q C' ? 1 1 $1 ' ? C' ' 5 ? Q 5 ' 5 3'
1 5 ! ' ' $? 5 ' +] Q ' ? Q 5 Q C" 1 U ' V ' '
1 + ' $N 1 ? ' ? ' $ 7 9 ¾ ? ' V 1 C' ' $3'
5 ? 1 $ V 1 5 Q C"' ? + ' + Q 5 ' ? $+ $ + U $' 3'
$Q 5 ' N + ' ? Q ? ' < 3 N ' V ' Z ' $V ^ ¾ ? ' V ? 5 1'
' + + _ 1 1 U V $' + ' ' ? $)5 ' Q + $+' ' 3'
V ' $ U 4' ? ' ? '] Q 1 ' ' , ? ' + C' ' V Q C)' '
N Q 1' 1 ' , $ U 1 + C' 1 + N ' $ 1 C ' + ' + 1 5] Q '
) $+ ? ' 1 $ 5 ' 1] Q + ' 1 + ' ' 1 ' ' 5 ? C' Z 3'
V 1 C C' B ? 1 5 ' + ' ? + Q + ' 4 +' V

Z ' $V U ¾ $ Q C' V $ 5 1 ' Q C' V $ ' ' ' V $ 1 5 $"
9 + ' 1 Q + ? ' 1 ^ ' ^ 1 5 ' ^ 1 ? + ' 9 ¾ ? ' V ? 3'
♯V ' ? 5 Q C ' 4 ' V $' ' $1 ' ? ' T ' ' $? ' ' V $Q 5 '
' 5 ? Q 5 ' , $ ' C 1 1 5 ' 9 ¾ ? ' V ? ' ? ' 3'
U $' C' ' $N 1 ? ') Q ' 1 + + ' C 1 1 5 ' ? ' Z ^ ¾ 3'
+ ' C 1 1 5 ? ' B U + ' C 1 R 5 ' 5 ' + ' ? ' 5 3'
+ ' C 1 1 5 ' ? ' Z ' + ' C ' 1 a 1 5 ' ? ' = 1 V < ¾' 3'
+ ' C 1 R 1' ? ' 1 ' C' 5 Q C ^ U 5 $ "' + 1 4 ? Q _ '
Q C V 1 ? ' ' 1 Q + U $4 5 ? ? Q C' ;'
] Q $? ' Q ' ' 1 + 5 ' 1 N Q 5 + ? + ' ;' 5 ' ' ' 4 ' $ C'
0 $ + ' + ' 5 5 + ? 1 $ ' ' ? ' ?' Q $ 5 Q C ;' 1'
? 5 $Q 5 ' Q 5 5 1 5 '] Q 5 ' Q + ' # ˢ
¾ ' 1 5 1 $1 + + ^ ' E + ' + V ' + Q $] Q C'
1 U ' , $ ' + V $' U ' ? Q ? Q $ T ' ' 3'
5 ? ? ' ' 1 ' Z + $ V 1 + $ ' ' ' $? 1 ' ? N $ $1 3'
5 ' V $? ? "' g Q ' ' 1 5 $' ? ' ? N ' ' ' +'
4 + $$ 5 Q $ 4 ? ' ' 5 ? U Q C' $ ' N ? $ C
- + ? ' N $1 Q ' $ U Q C' N + ? ' $ C T ? ' N $1 Q 3'
5 C + ^ 5 C ' 1 +' V $ 1 ? 5 C '] Q 1 ? Y
Q 5 ' + ' 5 V ? ' ' 9 ¾ ? ' V G C' $1 ' ' ' U $ Q 3'
1 C 5 ' Q Q] Q +' V 1 + ' V ' $ + Q + Q $ ' 5 Q C' 3'
N ? 5 "' ? $ 5 ' ? ' '] Q 1 U ' + ' $' U 3'
? + Q ' + ' ' 4 ? N Q +' + ' ? 5 ' ' ' + '] Q 1 1 5 '
^ Q Q C' 9 ¾ ? ' V + G C' V 1 $ + Q 1 ' + ' Q + 1 $ "'
? + N $1 5 N 4 5 + N $ ' Q + + C"' 9 $ 3'
N + ' $Q 5 ? 1 + + '] Q + ; +] Q ' N 1 1 $' $ U Q C ♯
& 5 ' ' U 1 ' ? V $1 $' V 9 ' ' $' '] Q V 3'
V ' T ' $5 ' $'^ ' + U Q C] Q 5 ' ? ' ? ? ' + V ' $ C'
5 ' $1 ' ? N 1] Q + T ' + $ U $1 ' 5 1 ' ? + ' $' U Q 3'
' $' + 1 5 ' 1 ? 5 Q C' N $1 + "' $ 1 5 Q $' $N ' '
U ' ? C' 1 Q U Q C 7' T ' N + 1 ' Z ^ ' ' V ^ ' Z $ Y
V 1 + C' 5 Q ? 1' 5 V $ 5 C T ' 1 ? ' ' 5 ? 1'
Q + + T 1 Q $V + ^ $ ' ' 5 ? ' ' ¾
1 + C' ' $N ? ' 1 ?] Q 1 5 '
' 1 $5 1 5 ? 1 $ ' ' T ' 1 $+ C' 5 Q ? + 5 1 ' 3'
V $' 5 1 5 Q C"

= . # / : ! " (KYˢ@ 1 + . . ˢ@+:)+ ˢ
. ˢ +) 0 /

0 ' * ' 5 Q V $ Q C V Q $N 1 $+' ' V ' $ $'] Q 1 5 '
ˢ 1 Q 1' Q V V +' ˢ 5 1 N 7' ? U Q C' + ' + 3'
? $Q $$ + ' ? ' Z ^ ' ' V ^ C' Q C' ^ 7' ' $ ' ' 3-'
? ? Q C' ;' 4 + ' = ? C '] Q C' 9 + + ? ? 1 $¾ 5 ' 9 1 3'
V ? + C' T ' 4 $+ Q + C' C' + T '] 1 ' ' 5 Q C '
' $ U Q C' Q C ' ' $$' $ U Q C] Q U Q C' ' U ? ' 3'
1 V $ 5 $+ V Q $N + Q $? ' 4 $' ' 1 $ 3'
U Q C ' + ? C ' 1 +' 4 $+ Q U Q C] Q 1 V $+ + ' C 1'
Q V " ' # ' V Q + ^ $$ 5 C' 5 1 5 ? + C 3'
+ ' $+ + Q $"' , +] Q V Q $N 1 Q $' = ? C' + ' 5 5 ' 3'
5 ' ' T ' 1 U' ' 5 ? ' $$ $ C' V $ + Q ' ' U $1 3'
Q $;' + Q 5 ' + $ C' ? Q + Q $' V $ + V + ' ? U Q C' T '
N Q C' 1 ' 4 $ + 1 C' + ' N Q ' ? + 5)] Q ' ' 5 '
' ' Q 5 ' , $ 5 ' + 1 ' U ? ' $? "
+')

$ ' =q M : = = q ! '

G I .'F6 9'0 3' 8 91G/46 8' . .24 '9 .01 '
)' . /D2/ . .240# "9 .01 3' / 86 03' / 8 2.3'
1 04 1 F60# .9' 49 2 924 '4 6 4924 '0 D6 '
8 921024 4 /2924 '4/ .924 'C'4 9924 '
9D 763' . /21 29216 ' I 1'9 D/' 3' 69'=. '9 '
1 07929' 4 19 .24 '0219' 0 03' / 8 293' : G / '
/ G ' 0 193'0. .9 9240# = 29' .6 63'06 '
. 3' 2 G ' .9 14' 9 ' .4 6 .' 819 D' / '
1 H 8 .' 92 8' 3'0 1 6 8 '=. 921 0' 9 921 0 '
6 8'4 40'9 18 /2'F60 ' 1' 9 921 0 6 8' 2 '
. . 3 C# 1021 80 H .' .2 81 .6 63' "2 '
G. / /D 4. 1 9.0 G 1. J 4.7.16 E 94'
F6/4'04' / 8 2.3' 1' 2. .4 0 0' 4. /0. . / 8 '
8 /40 634 . .6 / D026 2' / D02/ 6 8 2A'
1 6 8 .2.6 8' 2 1 8 8 .21/ 6 8 '02. 0'. 0 '
6 =E 0260 9 93 '19 10 ' 8 6 63 : G / / G 0# '
(4/ .924 ' "9 7'4 9924 F69' 0D 1 0 "9 ' 0 '
.b6.' 4 19 101 C 64. $'0 7 1 0940' . '
1G/4/ 6 2 4. 2 . /268 4 6 /268 O/ '
D 8 / 6 8 :9D0 ' "2D6 0 '= 9263' . 7 0 '
4 3 63'G07923' 2' . . . 6 F60 8' 2' /2.9' Q
80' 2D92 / 8 8 ' ./3' "9 .01 3' 3'4 6.02 '
4 =. 921 0' 01 /2 3' / 0. /29' ./2. 6 492 '
F6. 01 /20 3'E 69 /D .0 '4 9 .01 69'
> 0 .4 .0 ' I 2 8 "9 /' > 0 .4 .0. / 0. 1' 2'
8 9219' 69' 01 /29 . /10' 2
4 . 924/' / . .6 010# ! 6 8'4 919 .'2 G ' 1'
0 64 F60 8 4F6/4' /7 . 63. 1' C' 2. / '
D2 16 8 ' . 3F6 . 0 / 0C2/1 / 0 62. '
0 / 19 67. .9 ' C 29' . / 3 . .6 /'
802 9 10 9' # F6/4.9 . .0 .9 ' 9 ' 29F6 1'
F60 8' 949' 49 2 924/ 4 6 4.24/ '0 D6 8 9 '
024/E4 /294/ 10' ".' 7929' 4 . . .' 4 9 8'
1'0.' 7929' 49 2 9 4 6 49 . '0 D6 8 9.0 / '
4 20 . 249' .6'4. 2 .6 > 0 94 .0 ; 49?4 '
1 "&' , & &") .'9 1'0.' '4 .9 916 ' =. 92Q
1 0'7929' 4. 2 .24 4 6 4924 '0 D62 .2102 '
4 'C'4 /2924 ' H02.'9 D/' 7929' 4 . 92 '
4 0 . . 8 . 04 .' 9 ' / 9 7' 1/19 93 07 '
/ 6 .F69' 7 /' ! 019D/ 0 6 8 "2/$4.' 2 '
1. .101 /29 "2/E' / 8 8' 20 1 . / 62EA'
46/763$ / 19 / 6 8 6949' 4 9 8 /2 1 01 / '
2 ! E46/76= '/ . / 0 8 /4/$' I .24 / 6 8 '
" /E 6 102/6 00.G6 63.4 . /2 3' 2' F60'
. / 8 8 108 6 '/ 4 298'0.' 4 1 24 /202#
F602F60 0C0 3' 2 7 3' ! 00/293> 0 . '
419/3'1 04 .' 4 9 8' 1/19 93 ' "1' 2' : G .0 '
. .0 G . 3 8 0 89' "9 % 7 C'= . '
10 G =.4'. '/ . .0 /29'10216 8 ' 4' 0 10 '
9' 9'2010 ' ! 6 8' D 16 ' 7 3' 3' /D .3' '
1/. . .0# ' 8 .1 ' / .0. '01F69' .1 0 8'4 '
D9219 ' 2'=.G/ 3'9 .0 ' 79 63'F 408'
0' : / G /'94 .63 'F69 8' L $'6 7J ' - 9 '
" + % 0+"&.' 0 2 ' " / .021 ' 49/' /D '
.0 8'2/ 1 0 8'= 2/ 2'07' 0' : / G E'O0

N ' N ' ? + ^ ' '1 ? 1 5 ' + + $ + Q 5 Q C '2 2' 1 $? '1 Q 3'
' $ C '? ' 5 ?] Q '? 1 ' ? ' Q Q C '# ' * % $ ' '
' $ Q ? Q C 4 ? 1 Q 1 5 1 ' V Q $ V Q $ 1 ' = 1 3'
+ ^ Q C 'V $ 5 Q 5 '+ ? N Q 1 'V 1 5 1 ' [? 3'
'+ 'Z ' $ V ^ % $ 1 C '1 '4 C 'V Q $ V Q $ '4 Q '+ ' N ? ' 3'
5 ? 1 Q C '$ + N ' ? + 1 ' V $? + V ' ' ^ $ 1 ? Q C '
V ' 1 ' 4 $ U ' 5 V Q C 'V $ Q] Q + ' $ 1 ? C Q N 1 '
* G % ! 5 $ ^ '] Q '? ' 5 ? C ' ^ $ 1 3'
? 1 + + $ $ 5 Q C) V $ ' ' ? + 'Z ^ ' ' V ^ Q C ' 1 '
Z 1 ' ? + Q C 'Z ' ? + ' ? N ? C 'Z 1 + ' ? 3'
+ + V Q Q C " + ' ? + V Q Q C 5 1 N ? $ N ? C '
V $ V ' $ ' 1 5 U + 'T ' ^ $ % 1 ' $) ' [' 5 1 ? '
V 1 + $ +) T 7 '1 ' + ? C '? ' U 5 ^ 1 + ' Q 1 5 '
1 N ' N + ? ' + $ V + '1 ' ^ $ % ' 1 ' $ Q 5 6] Q 1 5 '? ' 3'
5 ? ' N $ 1 1 ' , $ ' C 1 '+ Q Q C ' ? + N 3'
1 C ' 1 N ' 1 C ' $ V 1 ' '4 '# '1 '1 $ 5 '+ ' 3'
1 5 ' ? ? Q ? '# ' 5 ' ? $ 1 ? "'
< ? + ? 5 ? ' 5 ? ' ^ 1 U Q 3 1 % . # D ' '3 $ 4'
2 J5 @ f #] Q ' ' ' " 2 '] Q 1 ' + + + '
1 + 'T '] Q 1 ' 5 1 ? 'Z ^ ' ' V ' % $ ' ? C '
Q + 1 T ' ? $ ' 5 1 ' ? 1 + N ' $ 1 C ' ' + 1 5 3'
] Q + ' N + 1 5 ' , $ ' + C " \ 5 V + '4 ' ^ ' + '
4 4 ' + $ V ' ' Q + Q ' $ ' Q ? + ' '? + + 1 3'
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/ 8 0 /D 1 .0' 9 1' .< 10' 19 8 2/ '
68' C' / / 1 / 268' 4 / 4/' ' . / 21 '
29. F69' D6 03' 8) 8 / 493' 7929' 01D6 8 92 '
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. 1 . . 93' /D 8 ' / 0' F6040 8' 8 0Q
19 0' . / 2 1023 ' 29 8 .' / / 1. / 2 763"9
3' . 9 43' 8 3' 8 8 . 4 0. 3#01' 9. .3' / I'
1. / ' 9 1' 6/' D. 29 . ' . 68' / . / D929 .'
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8 .2' ` / 91 63' F604 0D 2 0' 46/' .0 10$N '
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> 4' "9 7' 4' 49' / 8 2 ' F6/ 4' 34 .016 '
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8 2/ 68' 1 02 / . /' 9 60100 8 0 / 29'
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29' 8 . ' <. / 26' 9 /' 92 8' 0 0' 8 9 ' 2'
F60' 9 6016 ' .049 8' F6024103' 87) F60 103$'
0 0' 9' 0. . 4923 ' 69' 2' 0 1. 8 2' F60' 2/ 2'
9 6016 ' .049 8' F6021 103# F609' 09 1 8 016 '
F6 49 8 9 ' "2 6. 0 .019' 8) 0 . . 6 0 .0. 9'
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.03' T60 1/ ' 0 1 . 6 0 . 8' 29D0219 8 2/ 11'
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502 1 04 . . ` 2408 0 198 7 F6
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K] 24 68 '9 1'2/2' /70 .' / / .68 '
.62 '108 .2' /70 .' " 4.0 3$F6/4J .' .68'
9..03' 2' / 80'= / 8 $". .612' /703'
/7 .6 68 9 /7 .6 63$ "9' 9 '0 F69 /7 '
.6 6 E061 F6.467 68'0.' 2.9 168 $". '
/ 0' 9' / 1. / 0$ "9' 498' 9' 498' ".'
' /70 .3'02 808' 01 /20 98'9 .' 8 8 / '
10 .8 F6 02/28 / 16 #2 6.8'. 19'0 708 '
F6 0' . 1' ! 024 40

@ / $ 7 !

R@ T' I .62468'9 1' 0 68' / 19 'G/.'2/'0.A
. 4. . F6/4 / 684 = /D 8 / 6'
46.921 68'04' 8 / 7 9#. 8'. ..#4 '
6101/ 'F60 '. './2.9 /' C' / 1 0'G / '
.G9 './O D .' 0 !68 'F /4' 102 .2'2/ 9F6 '
16 '9 '2/ 1 0'G / G9 ' .' 'G0.'G /1G. '
8' /2 1' 4 /24923'E" 63'" 2'9 1' . .63'C'
./21 0 2 6 D0.4 < 6101/ G/.'8 /4/ '=' " '
63' " 2'9 1' . 163'971 9.03'9 1' . 10$ F6 0'0'
" 2/'97 9.03E01' 0 68'. 1./2 .F6323 '9 D/ '
C'02....4.23 6.'G / G9 3#59 /24923'
4 .91 64' 0 68' / 19 'G/.'2/2' 0.. 4. '
.E 8.'F6/4' 4989 1 2/2 .F6 . 'G /1G. '
F6 0'" 63'" 27'2/2'9 1'.06 0'97 9.0. 3' 94'
076 63

,) ! # 6 3 %

I 1 68'9 1' 0 0' 01 / 'F60$'0 168 16 ' 2'
= /D 8/'9 ' 0 30' / / 1 /2. 08'
'./2. /'9 1' 0 0'2... .'9 1' / /G9 / '
2.8'0 F608'4 . 0 8 'F6 1'.0640'"9 0'
1 3 ' "9' 0 G.01 3E 2'./2. 6 /29' 9249.'. '
8 3

! EC(C

q .018 /468 'F6/' 9 /24923' / .'
8 94 !E29'4 610./'./21 0' 68'0 '
F6 4= /D 8 /./246401' / 1 1".'
'@ $3 S Ow ! 06. 9'92 8'4979.' 9 /24923'
29'4603' / / 1 /293'048 ..0. .624.8'19 '
8 268'G0792193 F6 0' .' 498'19 8 2'6 0 '
68 16 '102F608' 894 68 '9 'F6/ / 19'./ '
. 6 /' ./2. 0 0'1G9 1' .F6' /19 1' >979.'
.1 08' 9 /4923'9 08 20 .' 4 / 11 /2.8'
894 E' >) 01 /298' D6 I ' "1'7/203'80 0 '
F 9'./2 9F692403' 2.. D01' T6 '"9 7'4 '
801 4.7. .968.. 0 .'./2 1G68 .. .. .'
/ / 1 /293' 2. 0 93 16 70 .'/ 4 298'
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1.8 =94.0'4.' .'0D .'.1 08' 2 1/1. 93'G7 + '
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` 2 1 I .2.G68' 29' 940 D61 /298#
P@ 'F608'0 1'9 ..68'. /24923 " '= /

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1'./D0 6 '29D019'./2.4 18' 4. /2.'949 1'
29D0168 684/. ' 8 12468'. .I '
92.G68 '"1' ! 0.0 /D P 8'49'F6/' 6 0$'
C 9. 01 8'2/2'4979 .'0F8 .1' "O08'0 '
80. /2.8 06. / / . /298' "2 69 0 .8#
F6 0'9 '2.D02. 763' C' 0 1 .6 0 763' / 3'
2 G './2. 64 .6

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> 8 /29. 21. '4 6102468'C 9 /2 '
492468' /..6 . .' 4..9 1 /2.3'0 1 3'
4 18 1 /2 763'90692403
I 1F6 4.8 2/34.. ' / 1.' 8 '.68'
101 863/ / 1 /3= /D 8 /3' T6 0'"2 '
9 E46/' 4 69 0 2 621' ". .4 .63' 2/2'9 1#
I 602D9 10' 94> 663' 9 '9 1' .4 .63'
9 D/'2/29 1' I 602D9G 0 ./1 0 'T6 ' 9 .'
I 602D. 689 1 I 602D9 10' 94' > 663 6 '
.03 . 11' I 602D9 62 '9 D/'9 1' I 602D.H '
0 =9.6247'.68'6/6 863'80 / 98' 29'D. '
2. 0 . 2' / / 11 /2.8 610' / 0298' 0Q
119 2' !)!'2/2/ 0246 0 8 8 / ';'108 92' D2/Q
0863'. 9../8298' 9D98' 9 19' 0119 2#
"24. 2'048 11 863./2. 6 1/2.8'F6 '. '
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./ ".'F6 '2/2'G/2/ 021' .D912 2/2'
616 :3V/2D$IOM=' W' ! 68' / 19 './21 0 '
03' 0. /293' 048 11 2 63'./21 0 0 ".' 'F6 B'
-/2.940.'02 808' 01 /20 98'. 1.'8 90 98'
C 8 2 / 10 9 0$' 8 / 10 98'F6 4.8 F6 0'9 '
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9 .'39.9 2 .019 0

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H .9 1' 0 319 1 0' 7 'F609' = /D 1 '
.03' .. / .01 /293' 69' .D6 03'./2 9 '
.6. /26' 89'9 .01 92. '.0 19 >. '
249' 9. .3'0 D6 892101 /268' ' 246< 1 / '
2.8 '9 98 68 0746JO/298 2 1021 08 '
(.2 G 8.80' 7 '2/22 1'4. D2 3 4.'
:G /D2/ 0/2
T6/4' 9 D/' 9 10 '04' .. / .01 /293'
4/.916' 8 9'F609' 0 1 8 016 '49' 98 6167 '
.0'/'82 0'.1 02' 9. '/.0 "1' 62.'G/8/ 1 '
' 17 9' 01 /20 9' 6' 59. / .01 /2.3'. 9 '
7 039 19 2 80 D6 0 : /262161' 9D93 '
F6/1 93 2' ' D6 0' 80 /1' >) 8 2/ '19 8 Q
263' .. / .0216 '"1'G/8/ 17 .$2...! '
68'9 1' 894 68 61 ' 01 /20 9'.9. / .0 '
.8G'9 1 98 3#01F69'0497' 03' / / . '
293 H 2.. .6 0193 /701 /1 93' ! 68'
46ME 1' 2D92 1"18'C' 1 ./ 6 1 7 . .. / '
.02.6 =.'0G0'46/ 610'D.2 .68'C'.: 6 1 '
7 9'9. 0' .. / .01 6 1 9' G0792.' 06

1 / ' * - " I 5 : I ! ,

C 19 . 68' ' [. ' C' . . 62468' C# F60 168 '
. . 0' ' / 16 '1 / ' .68'/ / 1/'80'
/ ' C 6 /2[16 0 1. 687/268'.68'/ Q
/ 1/'80 / 'X 7/2/ 68'"268' . /2 6468'
.68'80 /'F6/4'/ /2 16 '0 1. '<".' 02 103'
.68' 06 . 101.\' / 107 63' . 1F60 8 0 1.A'
16 2'7/268'.68'0 19 /'80 /'E7/268' 64'
9 1' A9 107 O63 "10 0 .1'G/ .' .E. . 8 /#
=02 103' D 164/ F6 4'4 1. 63'
> 66 0$ ' :06 9 103 89 63'

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0. /2.' . /2. 6 1/2 3' "1' . /D01'04' . 63' . /2'
80. /298 F608' .68' 9 9. 1'4 61023
C' " F69'04' 8 894 0108' / 1 /2. 8 '16.'
9 921 08'G0791 'C' 9 /24923' .0 163'9 1'

4 !

1021 0'F6 '4 . 16 '/7 9 1 /'". ' 9 610 '" 82
1 / ' 9 1' / / 1 /' / / 1 /2' . /01 0'
0' "1' ' F6 3'G02. / / 1 /2. 8 2 / ' '
D 8/' /2. .1'M8 2 3'G/ 8 /'9 1'0 763# 9'
/24934 . . 9.6 '40 9' 2 1021 0' ' . /29 . .'
1G / 98 ' F6 'G/ 8 /'9 1 '2/2'9 9'0 768'E
49/F692/2/8298G/8 2989 19' 0 768
N 1' "9 7' 09 63 2 1021 0 2' 19 1 0' D6 0 ' 1'
0191'9 08 29

4M

> I 2 1'9217 8980' /D 86' 8 9 ' '
9 1/ 8 ' . /2 1021. 8 "92 8 763'
1D2 3' = D26' "9 7' 2F6 1 . # / / 1 /'4. '
8 / 1 01 60 "9 '29.9 0 0 "9' /707 3 "9'
8 3'9 1' / / 1 /' /707 3' "1'F6 ' 2'
6 4921' /49 62. ' 2'92. G 898019' D26' 89Q
4 /' 9 /2491' F6/1' D 16 ' 8 /4 3' 68 16'
894 68 ' . /1'C' D26 ' H 2. 2. 763' D6 3'
H621'921G 898010 / '1 3 80'F6 4. 8 .68'
04' 808' D6 08' 946.6 6 '". ' 0.'G0791'
9 D/' "1. /' 9 1#208'F6 .68 F69' 86 . ' 0.'
G0791 "1. / 9 1 "9' . /2. . .# 2 80' .68'
04'1. . 0' ".' : .10.63'9 1 /763 9 D/' 0 92'
193' /7 '048 /46 2' 2 80' .68'04' . . 62'
408 '"1' 0 40' . 1 . D/' "19 /' . .# 6 8 '
16 '92 8' 2'921G 898019' "20' / / 1 /$
F639' '9 8016 /D 863'9 1
02 1 / 190' 1/1. 93'04 : G /D2/ ' A
2/2 08 0' . 1 04' . /2 94 /298'2016 9'.6'
2 ! F6.' . ' 9 ' F00' . . ' / . /D 2 63'
G /D2/ 8 /2 .63' 2' 80' D6 0 '=6 / '
2 1' 219 '02 80'C' . / 63'9 9' 8 0.G 08#
19' "2 63'0 94 /2 3' "26'. .' D268 'C'
. . /.0 ' = /D 263' G /D2/ 8 /2 '
.63' .073'9 1' ! 0. . 68 F6.02 80 080D203'
G079219 1 98 101.3 90 62. / 1 0$01F6 9/'
9 1'02 80 '8 0D203G07923' 9 1 98 109.3' 9 Q
D/' 9/'9 1' / 1 3' > .' G /D2/ 8 /2 . 3' '
7. 68' 9 1' 1/1. 93' 2' F69 2' . . 0 2'
/ 190' 6/' / . /'7 .6 .9 ' .7812.2107 86

", " ' ' '&'

, 3 , 0' 5

H 791 ! 0 10' ' 0 10163' 69'
0 93' ' : 80'9 1'4. ' 2/ . /2 763'
+' . /D2 1 3' = .0 240 4. ' 9 9'C' . 92. 0'
498 / 1 01 /2 3' 19 1 0 '4. ' D2/ 01 0' . .1 '
/ / 10 'T60 10 4. '"0 3'F6 1 /2 763'04'
29 0C'894 0'498 / 1 01 /2 3' C'04'9 p
D929 0 . . 8 F69'04' 9 921 08' 9 1 2921 763

&'2 ' ,

: 5 8 !0 ..'07 7 6 .6 863'1 04 0'
83' "7' 498/2 1 0.' 1/.9 .3' /'
28984/.1 208'C'4 . 208' > 02/.1 '
.08' 4'9 1'4 .6 08'' 9 '9 6 0'F60'
408'./D0 1 /2. ' 6.'9' 92/. /29' 9 68'
0 68' 4.' F6 7639 1' . 8 /#2.F69.2 8'
0 /. 20 /' 1'49' /8 2 2/' D2/. 3 >.8 /2'
1 01 /06.98'./D2 1 /' 9 1'4 .6 60\' 9 D/'
9D9' ./D2 1 /2 763# F6 '4 0# 62.' '
80'F6/4' 93' ' ..6240'F6 4' ' 6 .' 6'
4E 9' C' ./2 639# 0".'02.9' 498/2 1 01 /'
98' ./D2/ 99 9' 49790 8 63' 02' 93' 1' C'
F6 4' 2/ 2 3' 4' 9 1' ./2 639' F6 4' 93' 1'
=621' 0619 8' 1" 0' 2498/2 1 01 /2. 3../'
D2 0' 49' F6 763' . .91' 2/1 /2.3' 9'
497921# 67 9.16 8' 49' F6/' 3./D2/ 192''
4612'9 1'02' 'C'F6 4' 1$'01127 .68 'F6/4'
9 1' / ..03' 69' 0 /' 67. 1' 49' F6/'
0#./D2/ .92468. 1F6 4 1'".'F6 4 '
D2 .91# 2. 0' 6.' / / 1 /293' 4.'
F6 763' 0../D2/ ..2468'9 1'F6/4' 29' 4'
9 1'F6/4' 29' "9 0 08'9 9' / / 1 /268'
9 190 68' "9 103
=.016 1' 2' 29' !0 1 3' 98' 0219F60 8'
'./2. 6 /' 01' 8 /4/'F6/408' 9 '298 9'
"G 69 0 19 'C' 2 2. 3' F60.9263' 90'
0 ./D2/ 96216 'E C' 8 /4/'F6/408' 29 9 '
' F6 0' 29 9 16' / 9 2 .C4 1 2 19'
2 ' 9'./2. /2.8'9 9 39'9 ..08' =94'
2/102463' 9 1' G/.' .0 P9' 2 D2 3'9 /' C'
029' 4 .6 63' !/H9D \' !/2 87 .92 3'
2'. .0. /2.' - 9.' "/.076 '
F6/4' 49 60.' 0' 2/8 29' / 0' C' 0' "9 7/'
H .0#F6/4' "1'0 1 D2 .01' *4* ' ' 96'
& ' "P / 0' F6 9' 9 1' G0#.' 4. 601 /'
F6/04' "9 768' F6/4' / 9' D2 '
.01' *6* ' , *7%* *8 &&7%* *6* 0' "249'
9 : "# %4 ' , : ; < (' => ' 94 . 3' 4'
9 1' *)* './ ? AS 0 4.2. 80' 2D694 '
2.8' *+*' .0 2.3' ./ F6023' $ 29F69' "2F60 8'
" 6 0168' 9D .6' /' " 08' ./2 .. .' 06.'
4 .61 9 .' # .1. .0' 4979 91' .' . 9' <S\'
/./' < $' 2' .26 1 80 "9' 2' *,# '*

&'2 ,&

I .624639 1. 04 0163' 2' F6/49 2 1' '
1/1. 9=' 9 9' ' 4.8/2 1 0. /2.8' ' *2
2. 68
=. 9' 9 1' ./D2/ 99 9' .06 08' 9' F60 8'
93'9 1' 9 63 9 9 .' .06 08' 29.' / 90 19'
G079 9'
>98/2 1 01 /'. 1 /D 863' . 921 0 3'
69 0. 923 9 9
=. 921 0' 4.8/2 1 0. 60' 6.' 49 2/1 1 0

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= 0.6 1' 2. 0' 9' 9' 0' .9 14' ./ '
D2/ . 2/2' 9' 498/2 1 01 /2.8 # F6 0'
2. 0 8 0 62.' 8 8 94 010' >' 9 9'
2/.0#29. / 62.' 9' 0 0' 498/2 R0 ' . '
F69"9 704G/.". 2. 0 . 0216 ' 4' 9 1'
.9 14' ./D2/ 90216 '29.9 0 68'. :. .6 '
68' 2' 498/2 1 01 /2 763' 9' F69 2' J. '
...' 0' 2. 0 /7.216 9 ./2. 6 / \ SSZ' '
2.39 -39 . 103' 0 392 2 . .6 63' 0'
29"P / 63' 9 9. F6 0' / / 19 91' ./2. 6 /'
298' 8 3' 4.8 /0 1 0. /2 3' 9' 2. '
68 ..624 ' ' C' 2.8 68' 809' 9'
./2. 6 /298' 9.624 '29F69' "20' .0498 '
F69' / / . /'. 9.' 86' U)' 98.' 2/. /'
C D2/1 / ' /' U)' / 19 / ' ' F6/4' 9'
6D201

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'. 1' ' >9/8 8 ` . 16 ' F6/4'.6 791'0 8 '
76 16 'C'F6/8 3'19 / '$ "1'02 8 0'G/8 2
.*' % ' :9' 9'4 . 16 6016/ '8 /4 3 : 8 / F6/4'
9 1'49'9 .21 0' 9.624/ F6/4. 1' / 268' '
. 1 / 'F6/4' 91' 9' 67 1 ' T60 1/ 'F6/4'
0 . . . /692 1 / 191 36 "18 / ' 6 6 01/
(F60.9263'.2 8' 6D6 0163'9 1' 9' .'8 / .6 '
1. 76168' " 6. 0 .' 9 1' F6/4' / 8 2'
29 1' 9' !9C' . .62468'F6/4' 68' "1' '
7 . 9 . 2G/8 2 3

!# & . " %.

1' . /21 2D. .'4. . . 1 /2. 8'. .0' 01'
1 76168 "2 6. 9 9' F6/4'497.1./2'
698 9'< 17 94 /'F60.9263' 67 . 168'9 1'.0.'
94' 01 /' "P024 '4. .9 . /2.8'9 1#.68'. '
. .1'. /2692 .' 67 .41/' 67 01 3' / 8 2 763'F6B'
2 / 621' 019' 4' F6/'. /2 1 .6 16' 2'
10 '9 9 10"1' 1'. 910 .06 . 016 ' / 016'
.1 08' 8 9' 6401. 76168 "2 69 0 9' "1'
7079 .'1 93'02D6 /3' 0 93'46/763 .< 1 3' 9'
946'1 02D6 #' 7 .' 9 9 16'G/8 2 3'
0.F69' "2/' "9 7/' / 68' F60 1/' 8 /4/'
9 . 6' 639' .9 .

% &6. .

`) 0' 9' 9' 621' 2. . . 0 0' 94' 498 /2' '
1 0.E/') + " ! ' "&)& ! /' ' 208')6'4.'
R / 1 01 /2. .F6 16' 1 92. 0' F609' 9 1' 29'
'. 0 / 68$'9 D/'498 /2 0. /'. /2 10.' 3'
F/09' 1 2. . 9A

' N# &# . .K

'498 /2 024/4/.912/2' . . 9' 9' D.'
2. . 2'D9263' 8 D 019' 4' 9 1' 9 1 7 . 91/'
"2 63 . 921 E.'1 02 .'04' 0 64' 0 /F6 'U'
8 2 0'. /2 6249 9 16 = .'2/2'9 1' 1G8 9Q
1 .3' /70 .' /7 . 8 0- . /8. . .6' T6/4'
92 8' "2E63' 9 921 3'9 1' 2/2'. /2692 1'0 1. .'
489 9'1 ' 8 19' 11' 670 19 20. /' " .' / . '
. .3'04' - . / 8 91 0' 6 .93'04' 1G8 .1 .0

' (0'#' + ! "%. ' '

= '016 1'498 /2 110 /298'9 9'. /2. 6 1/'
268' 98 19 23' "9 101 3' F6 0' / / '
. /293' ! " ' "2 6. 0 .3 G 2.' 92 8' .F6 .6 K
299498 /2 1 01 /298 '299 1 921 08'. 1.'
916 2' .046.0 68' $ "1' 29F69' 49 2 1 /2.3'
62.' 2. 0' 163498 /2 1 01 /2 3'

0 !# "+. . '

: 5 1 . 0' 498 /2 1 01 /2 3' /701' 4.'
7989 9 / 0' 2/2. 1 02.00610 .'
20' T8 0' 9' 2. 0' 9 9' 4.7.863' 1 '
P 63061 8 Z 8 . ' 2. 0' 1 0' 4' 9 1' 9'
B/ S' 9' F609' .O . .1' / 9' C' 9 'J910'
39 1EC 2/2 0

!# . . %.

1 5 24 0' 4 .6 ".61' F6E1F644' "1' 4.
' 8/11 1 0. /29 /70 2/1' / 621' 10

4/.91' "9'9 9'. / 2862 0' F63'2.8 . P '
763' 9 921 3'0. . / 8 8 /4086 #' ".'G/. X'07'
E9F60 763'3F60 0'4. 8 03 F6 ' 98 0297621'
. 6.3F60 0 A 1G8. . . ' >) - 9/ 8 91 64'
. 1 2689 3'U.' 8 0D2 1648 763$ "9' / 0'
F6 '. 9 1 ' . .2. ' 621' . . 1 0 0' ' 6.'
.0' 8 . 0' 21 "1' 2.0'268 . 63# 89./8 '
. 0 ".'7/168'4. 12 1 /2.3' 940 ' 2' / '
/ . /2.3

'< !#'3" &) .%.

M. .1E ' 0.'498 /2 1 01 / 2/2'9 9'2. '
, .9 904' 4903' : 01/2 3' 9 0 0.03' 0' 12')!#' 0'
D6 0 763' . /2 6D9 .' =01 3' .2 8' 9 1' 40 ' '
. / 8 629320.6 03 F6 ' 29' 2' 2D6 0 763'^ '
C49 3 4 . .216 ' >. 24. / . 1./8 ' '
862 1 868' 0 / 8 0' 498' 4.9/498 2/2' (
/ 9' 186' 0 80 'C' 2.D0 ' 198 ' 0 '
80. /298 ". 2.D01 /298 4.' F606 3' 9' "9'
10 8'9 9' : / 1.0'4/.91'. / 8 8 62 .019' 9 92 '
1 03' / 8 293' . .62468'. / 8 8 62 0' > 0 .' 1 '
.08< "192. . 8' 6 9E/ 8 2 71 3'. /2'692 .'0.'
8 99 ' "1C .10 G .08S' .91' 4 69 /'
8 /4/' > 0 9. 1 .0'92 8'4.'/ 8 2 763'4 9 1'
. ' /707 763# .10 G .0' . .21 . .

' !#' %+ &&.%.

! 8' 219 /D0. /' C' / / . /
498' 9 Y' C' 8 /4/'102.68'4 9 02.' '
4/. .9'9 9'.6 6 F6.'. 91 ' / 0'. /1980 '
10' 6.'F6 1 /2.=E .' 21. /D0. /2.3# F6 0'
.6 6 F69' 9 92. 3' / ' 21' / / 1 /'
293' 69' 2. 0' H 29 1016 1'4979 .' "26'
F6. 8 F6.' 49' 9763' 6 ' 0 1 3' 9 /249 9'
- 9/ 8 91 0 849' - . / 8 91 . 3' .4 .684.'
894 . 3' =67 61 D. ' 0 0 /D 8 /3 4'9 1' '
/D 8 /3 1. . . 1/ /3' . . .0 . 26.' 2' / 8 0$'
"1'.68' 2' 9.6240' D610'. /2. 64 .6'. ' 6'
30 8 024763$262.' 2' 8 019 0' "1'.68'
. /2. 64 16' 9' 0 3#' / 9' 06.98' 0 0'
/D 8 /3'. 9 F6' 2' 8 019 0' 9. .021'

' !#' &) .%. & %.

64 4 9'F644 93' 10' 1$0 64'.6'. 0S S?(
1' H 29'4 1 2 1 /' 498 /2 1 01 /2 3'e'
2' 498 /2 1 01 /298' F6 0' 6.'F674 93' 1#
C' 2' 498 /2 1 01 /298' / 19' F6 4' 169'
.6' 93' 1' I 17 .'F6 498' "9 0'9 1' 9 940'
0.' /1 8 0' F6 '2 8 '6 2' /701'. N.' 168'
9'.06 08' / 0 '4.'F60'G0 1 63'4 9'
1/. . 93 O09 1 8 . .41 / E7 6.46/A'
763'8 /4 3' 2'.0498' 9 98 0' : 8 /'.68'
4.8 /2 1 0.6 .06 0' 9'9 19 768'G/.' 8 /Q
4/'#=1. 'F6 ' 2/2' . 21 021' 62.' 19 '
" . 2 93'$ 94' 02.1 ' 4'9 1' 1. '9 02'
193' 2/2' . 21 021'. D/ 0291 ' 621'. . '
" . 2 / 93 A: /7016 92 8' 70.' 498 /T'
1 01 /29' 02.103' 9 9' / 9'.9 08' #F6 0

2/2 . 21 021$ˢ .6 1ˢ 10 8 .22/2ˢ . 21 0 9ˢ
1ˢ . . 63ˢ / 2F6 101 3ˢ 208ˢ 49/ˢ 2/2ˢ
. 021ˢ 0 31 ˢ ˢ F6 0ˢ 029ˢ / 9ˢ 2/3ˢ
249ˢ 9 ˢ / . . ˢ 498/2 1 1 /ˢ / 19 ˢ ˢ
F6 4ˢ 9 ˢ 498ˢ 1. 8 2 3ˢ ˢ 68016 ˢ .06 0ˢ
/ˢ 8 94 / G/ .ˢ 8 /4/# T60 .68F69ˢ 19 ˢ
621ˢ / 9ˢ 19 08 ˢ 69ˢ / 9ˢ 2/3ˢ 2/2ˢ 9 2 ˢ
. 021$ 01F6 ˢ 02913ˢ 621ˢ / 9ˢ 2/3 ˢ 9 D/ˢ
"ˢ ,& 02913ˢ 2/2ˢ . 21 021 = . .620/ˢ 1ˢ 498/2 ˢ
%' ! ;ˢ 1 01 /ˢ F6 0 ˢ .68ˢ 9 9463ˢ /7016 ˢ 9 ˢ .06ˢ ˢ
W (.8 / 0 2ˢ C 2/2ˢ 9. / .08 ˢ " . ˢ 9ˢ
. S, $7 . N.468 .06 .8 / . G/ .8/4/ˢ # M 8 29ˢ
@ ˢ 9 1ˢ 02 80 ˢ 94ˢ 26 63ˢ 0 93ˢ 9 1ˢ 02
&#, !&V . !- ˢ . D/ˢ H6 63ˢ 01 .3ˢ 9 0. ˢ 08ˢ .06 0ˢ
Sˢ SAV 98 / .02/2ˢ 9 , 024ˢ ˢ 9 12/2ˢ 02 80, ˢ ",
!+% 9 024 ˢ 02 80ˢ Eˢ / 0ˢ 06198ˢ 02 80[1]
G07.23 6 8 /293
>9 24.ˢ 4/. .9ˢ 9 9ˢ / 19 ˢ F6 4 4 ˢ
68ˢ . 9ˢ . .2. 08 8ˢ 670 .9 2021 68ˢ Cˢ ˢ
. 68 ˢ "1ˢ - . /89. ˢ 1G8 91 .3ˢ
F6 . . . . .06X 03 8 03U#ˢ / 03ˢ . /2 ˢ
1. 8 0216 # 9 9ˢ 06198ˢ F6/4ˢ 93ˢ 1ˢ 670 ˢ
1. 2010 68 C 2 . / 8 8 "1M 1 .93 6 ˢ
. .3#ˢ 8 /ˢ "9 /ˢ 219 ˢ 9 921 03ˢ 2/2ˢ 2. . . 10 /ˢ
670 . . 20103ˢ 9 ˢ 219 468 ˢ "1F6/4"20ˢ V
498/2 1 06 1ˢ 9 ˢ 498/2 1 01 /298ˢ F6 0ˢ
0 19 0498/2 1 . . / 19 ˢ F6 4 ˢ = .ˢ 94 ˢ
.63ˢ 9 1ˢ F6 498ˢ " .9 0ˢ 69ˢ "6 2. 0ˢ /16240ˢ
"9ˢ . .6 0 04 . 63ˢ 10 4 6 F69ˢ 020 $ˢ Cˢ
2ˢ G/ .ˢ . /2 1 1ˢ 299ˢ " 1. 63ˢ 2F6 1E.6 ˢ 06Q
198ˢ 93ˢ 10ˢ 1ˢ 9 1ˢ - 9/8 . . 0ˢ 298 9F6 0ˢ
0 193ˢ . .6 ˢ 80 80ˢ 4 1021ˢ 0ˢ . .2. /#F6 ˢ
06198ˢ 0 193ˢ 4 / 6 80 8 94 1021ˢ 9 ˢ
4 .6 19 ˢ / 62.ˢ .62 ˢ Cˢ ./0 . . . .

!#ˢ &) .% .),%& . .

+ 0 6 1ˢ D6 08ˢ 04ˢ 9 921 03ˢ 0. . / 8 8 / ˢ
401 1 808ˢ . .ˢ 808ˢ AF6 0ˢ 2ˢ G0.ˢ / 0ˢ
./2. 64 16 ˢ "2 69 0 1. ˢ 0 801 69ˢ .F69ˢ
2ˢ 90498ˢ /D 1263ˢ 69ˢ 498/2 1 01 /ˢ
/ 19 ˢ F6 4

!#ˢ &) .+E2% " +ˢ ! ˢ &) .% . "+"% .

H E 19263ˢ 49ˢ . .21 0ˢ 262.ˢ .9 1 68ˢ 1 0ˢ
< 10168ˢ 0DD 94 6 ˢ F6 ˢ 9 1ˢ 49ˢ D2/ 02 ˢ
0ˢ 9 921 ˢ / / 10 ˢ F6 ˢ 2ˢ 0 801 /2 ˢ
763ˢ 9 1ˢ Cˢ 29D01 /2 763ˢ 894 023ˢ " . ˢ 8 89ˢ
4 0. 3ˢ O 894 0103ˢ 29D01 /2.3ˢ 0 1ˢ . .ˢ .03ˢ
F6 ˢ G621ˢ 9 ˢ 19 8 2/3ˢ D92. 93 87ˢ 7ˢ
/ / 1/3 ˢ "1ˢ 6 0ˢ 67 1021 0ˢ 9 10. . 4923ˢ
8 0D2 164/ˢ 2/2ˢ 9 1#ˢ F60 103ˢ G 94 0103ˢ
. /21 0
N0 . 9ˢ 46 998ˢ D2/ 02. 08 ˢ "208ˢ 6 ˢ
29D01 /2 3#ˢ " .ˢ 9 1ˢ 90 ˢ F60ˢ 9ˢ "9ˢ 6 1 .63ˢ
1929.6 ˢ F6024 6ˢ 29 9 1ˢ =/ 98ˢ 9 9ˢ 80 / 98

19 0 F6 0ˢ 9 1ˢ 9219 3ˢ 12 /D !#0 . 0ˢ 0 ˢ
6 ˢ 4 / . /2 ˢ "19 1ˢ .\ .ˢ D6Aˢ 1 / /D63ˢ ˢ
0 F6 3 ˢ "9 ˢ M 1 .63ˢ 80 9ˢ 92 4 163ˢ 7ˢ 9 ˢ
604. .ˢ . / / 0ˢ 9ˢ 99 .ˢ "9" " 9216 ˢ 192 8ˢ
9 / ˢ H02.ˢ . D/ D2/ 0 1 0 .2F6 /290ˢ
9 1ˢ 0 1ˢ 4 9ˢ "9ˢ 2ˢ / / 1 /2 763ˢ 0 3$ˢ "9ˢ
2ˢ /D 8 /ˢ 9 ˢ 894 68ˢ 0 68ˢ ?ˢ "1ˢ .02. 8ˢ
9 9ˢ 0 /20 . 0ˢ EF6 0ˢ 4 D 1ˢ Cˢ 02/ . 2016
6 2ˢ 49.9 2 1ˢ / 7 10.98ˢ 92 668ˢ .06?ˢ
089 99 63 D2/ 021 ˢ F6 ˢ 4 . 16 6 ˢ
29D01 /2 3ˢ = ˢ 92 8ˢ 0 F6 3ˢ 499 1ˢ 92 3 2. ˢ
.9 9ˢ 9 1ˢ .1 0ˢ F6/ 68408ˢ 92 7 68ˢ 49. 9ˢ
. .2 02 ˢ ' -ˢ &" .ˢ N, ˢ "ˢ " &–&=-9,ˢ 2%+ ˢ "+"ˢ
/ %& ˢ ?EBS S M 8 2 0ˢ F6 498ˢ 4 . 2 63ˢ
2464 /2! E .ˢ 498/2 01 /29
246 1 /ˢ 06198ˢ 1ˢ 9 ˢ 2D6 0 763ˢ 92 ˢ
6ˢ 9 .9 1 3 498/2 1 0. /ˢ 06198ˢ 9 1ˢ 9 ˢ "2 ˢ
69 0 763$ˢ F6 ˢ F6 498ˢ "2 6. 0 0ˢ 246 ˢ
4$ /2.ˢ 49. 0 0216 ˢ =)ˢ 22/19 9621#ˢ F60 .ˢ 0ˢ
2D6 0 7 3F6 ˢ .2 7 0ˢ 81ˢ 2 1 68ˢ 9 1ˢ
9 921 ˢ 249ˢ 8 / 7 9ˢ 9 1ˢ . .6 2ˢ 20 ˢ
16 2ˢ 0 .F6 ˢ . / / 68ˢ 1 921 08

ˢ !#(&) .+ "L"+ˢ ! 3)&, .% . &# .% .

) 9ˢ 9 1ˢ F60 163ˢ 1 0 10163ˢ 2ˢ F6/ˢ 4/ . .16 ˢ
87ˢ ˢ 2ˢ 498/2 1 01 /2 763ˢ 4.6. ˢ
2 92468ˢ 9 9ˢ 04ˢ 80ˢ 2. 0C 8 8 . ˢ ˢ
4 0 0ˢ 4. /1E6.ˢ 2/2ˢ 9 9ˢ 2. 0ˢ 2 2 10$ˢ A
. 1 8ˢ .68ˢ 894 0ˢ 29ˢ 2 0ˢ F6 0ˢ 9 1 . [ˢ
80 2 10ˢ 621ˢ "1. /2 101. ˢ 68 8 3 9 68 ˢ
D.2. 763ˢ Cˢ 24 6 46 3ˢ " 1 0ˢ F6 ˢ 07 .ˢ 2/2 Aˢ
.91
(>/ .916 . .624/ˢ ˢ 2ˢ 498/2 11024/ˢ . ˢ
46. ˢ 4979 .ˢ / / 1 /2.3ˢ 894 0103ˢ =Dˢ 4. ˢ
8/2 1 07 93ˢ 04ˢ 2. 0ˢ 80ˢ Cˢ 8 89ˢ
4 010ˢ 68924/ˢ 894 68ˢ 19 8 268 ˢ F6 .ˢ
/ 863ˢ 8 2/ ˢ 9 1 989
9 1 7ˢ ˢ 498/2 1 0. /298ˢ "2 6. 0 98ˢ
0 021 / 98ˢ 9 9ˢ 0 1 .6 0 0 8021.8ˢ
29D021.$!0. .D/ .08 ˢ .0ˢ F6 ˢ 46. 1ˢ 04ˢ 2 ˢ
. / 8 8 /468

D!#ˢ 3)&, .+ # .+ˢ ! ˢ :& .% . & . .

M2 9 1ˢ 9 921 03ˢ 219 ˢ .ˢ >/ . .1F69! ,E? ˢ
9 92 08ˢ .08ˢ 0. .6 01 / 98ˢ 9 9ˢ Cˢ
/ 98 ˢ F6 ˢ 498/2 1 01ˢ F6/4ˢ 93ˢ 1ˢ C#
.6 ˢ 1$ˢ F60 8ˢ 90 2ˢ F6 ˢ .02.68ˢ 498/2 1 01ˢ
0 19 61 68
198ˢ . . 9 / .8ˢ 90 2ˢ 9 9ˢ F6 ˢ 80D 3ˢ 07 ˢ
1 0G .ˢ 0ˢ 67 .< 1/ ˢ 4ˢ 9 10 8 019 ˢ .2 7 ˢ
" ˢ 9 1ˢ 1G899 .0ˢ 9 9. 16ˢ 6 . ˢ E ˢ A
92 8ˢ 07 1 0G .0F60 901.ˢ 92 7 ˢ "19 1ˢ /Q
8 3#ˢ . .0ˢ F60 8ˢ 10 8 .2F60 10198 " . 016 ˢ
6 .0 ˢ Aˢ
>92 F69ˢ 90 2ˢ F6 ˢ "9 016 ˢ 2ˢ 9ˢ 8

1' /' ' ' P' -' ' " P " , * a

'%P 4 ' $ 4 3'
0 43 ' ' 'K 3' 4 $ '
'6)' %# #3 ' >4 ' # 3' > 5 ' #3' '
4 #4
14 '%4 ' 3' 3'K 3 '
'K #3' (# J#5 #3' K # '
#P4$> 5 '% % % '% 4%
' K2 5$ # 4+&?# 3 '% % '
' ' $ ' 3 ' ' '
&' 1 $' #$ 3' '%4 ' '$# '
$ 34 4 % $# '3 $ '
)! +' * 3' 5 # 4 #3' 4 ' '$ 34 '
4 3' ; #' $ 34 4' ' 4'
#3$#> ' #' ' 4 #3'?# K % # '
3#3' # #
;D ' -# 3'K 5' 3' ' ' #% 4'
3 ' 3 3 $ ' 2# ' (#'
#3 ?# ' # '> ' # '8 ' # '
'$ 34 4'K # #3 '?# 'K5 ?#'
' % 'S %% ' (# ' '
'?# 3?# 3' % # 5# '
4(= ' 4 (#'K # ') ' #3'
4 ' $' 3' '$ 34 4 3'
K &]' 1 ?# 4 $ 3'S)43 34 #3'
!' % 3 % ' '% 4%4 4 '?# 4(3'
! ,'K '[9,' ! %") "+"' " # ' # 3'
' $ 3'% % 'K ' . ?# ' '
#3'$# # '$# ' '% %

- ! ' -

: M2 14 . 8 .2' 1 7 3' / 7
207 3'C' / 2 /2 3' 2. 8 9F274 . 92 '
1 0 1'"2 69 0 6 > 'C'29. 9 0 : 2 8$/ 2 /'
8 6107 68 ' F6/ 68 . 92. 02/2. 1' 2..'
111. E D. 1 0' 9 1' .2 8' 21. D92110 2. ''
A AA' 68' 9 921 '. D2 I /' . .91'". 0'C'.9 10'
2. /2 8 ' 6.' 0 /8088' ./8 86'
2 6 8 #K'1' 9 921 0' 2498 /2 1 07 3' 297'
/168' 8 294 01/ 8 8')' : / 68' !O'
6 F6.' . .1 39' . O. .1'49 12 1 /1 6 2 ' .9. '
4 .F674 19 '2/2' / 1' ' ..024. 8' 9 2'
/ 29 6 'F6 3'C' . 0 ' .'6 F6 0'0G/ F6 '. '
1 8 0 91' 498'0 19 ' / 9' .'G079 . . '/ '
E.EK 2 /2. 8'E';92/2' / 9'0 19 ' 9'G079 9 ' 9 '
1 .2. 08 F6/4' 9 6D20

, ' !#' & . %. 2%! .

' - 1'4.' / . . 0' 29' 0D0. 101.' 'F60#49 '
12 16 ' /8 10' 8921 3' 9 .0. 103'
'F60'417' 894 68' 29' .0 08' ./2 48 63'
OG" .03 6. 408' 0 198' 62 ' 98 919 9'
. /2699=6204'=/ . 8 'C'G 29 101 8 906 08'
.1 .' 6 993E'F6/4' 1020' 6. . 6. .01'0 .20'
4'9 1'=/ 3 68 2.' 1 2 1 . .6 ' 0D0 ' 16.' / I'
P 30 9 079 3

" ! -)+ . . ' + ' + % . '@ * '

H 791' (# ' * ' ') ! '
' ' ') 9 $') >' , ') '
' ' $) ' '
' ' ' ' ' '
$' &') ' ' '
/' , ' '*UU ' &' " \'
'# ' = # '
'F '" ' '
'K ' $'E ' ' ' '
, !## . 0 .

: R 8 63'9 1'1 0' 10163 2'F6 /'4/ . 916 'F60 '
16/ 'F60# ' . 9 F6 0F60 . 6/ ' 9 '49 '
7921 ' : 8 62E 02' .3 0 ! "1'49 . 1 1.'=/ '
02'2/2 =9 . 62468 ' .6 ' 1 "2'.6 '49 . 1'=/ B'
9 1 6 8 '02' 1 ' 29. 2. ?' .' 9 1 29' >. 3B'
T 8 8 'F6 4' . 1'F6 4'>.63B
' K , ' !#))%" %.
M9. 1' / 8 298' F63. 1 42. 8 .19 . 8 9 '
4 6 8 # 294 68'06198'9 9' .06 08 F60'
. /D2 10F6E9 . 9'49 2 863
! # ' & + ' ! += !%0 .

= I . 62463'9 1'1 0 0163 2'F6 /'4/ . .16 '2/'
. . .624. 8 4.24 8 /468 9 '49 2 '
1 ' 2. 8'C'498 /2 1 01 /298 ' M8 2 3'92 8'
49E 1 /0 8023'9 1' C' "2 69 0 3 0.'49 '
8 /2 1 01 /2. 3'F6 408' 621'29D0193'=)' 0 '
1 .6 0 .3 ' >9 249'9 .019'F6 4' .3 . '2/2'
9 1'498 /2 1 0 9 ' 198'4. 2 . /'9 1' 67 94 $'
4. 8 /2 1 01 E / 1 910. 68 ' >92 F69'49 '
2 1 /' 9 1' 894 68' 498 /2 1 01 /2 3 ' 4 . . ?S A] ?K
9 D/'49 2 1 /'0'4. 8 /2 1 01 /2.
=10. 6 1' 9. 6247' 2/2' / . /D 8 /'
4. 8 2 1 0 'F6 4 93' 1 'F6 0' . .9 . .6 ' 4'
F6/4F6 16 20 68 1 /2. '
198'2/2' / . 498 . /2. 64 '4 6 /2. '
F6 0'4 6 /' 2 G ' /701# 29.' 49 2 1 /2.'
63F6 44 101 3# 2. .'49 2 1 /2.' ! /21 0 'E'
2/2'.2 2" /7016 'F6 4' 1'0 768 ' " 'D'2. .'
49 2 1 /29'F6 44 .01 3'29.'2 D ' >92 F69'
2/2 / 9/ 8 2 2/ /70 'F6 4' 93' 1 '2. .'
246 1 /2. 29. <92 6 ' T16 9' / 08'49 2 '
1 / .8'9 .0 .'F6 4' 93'
' !#'+- !%%.

& M .91 /70 'F6 44 .0198' 9 ' F6 44 '
101. 8 $49 2 1 /2. 8 . '4. 2 1 /2. 8 '
: 8 7 F6 0 4. 8 9 1 . 9'F6 4' 1' C .06 08'
F60 1 / 1 3 '02' 1'02' .0' 9'B=9. 624/ 'F6/4'
G079.' .06 03' / 03C / .3 ' /19 1 9 '
.03' 498 /2 1 0 #01F '49 2 1 /' 04' 49 2 '
1 /2. 8' .' 9'G079 9' /19 1' .68' "9 0F69'9 1'
2'4 6. /D92. 9 ' . . D/' 9 '4. 2 1 /2. 8'
2'.0630' 20 '/ 1924 16 '49 2 1 /' 2' D929' '
. .06 0 9 4.21 3' (

W S !

'"+. .

1 2D6 1. 6 44 0..3 2 24. 8 / 1 07
A93 ". 2. 0 80 C 8 8 94 010 '"1
. 4. 2 1 / "2 101 3 # C 49 0/2 1 07 93
894 68 G07.2. 6..06 08 9 929
9 F608 F6 498 49. 0 0 16 498 /2 0
1 /29 94 2 /2 8 F6 4 1

(!# &) . .

)> &< : 10.6 1 4922 1 /298 "2 6. 89 . / 0
1 /298 . .02198 F6 4 93 1 >9 249
90 29 . "9 2/8 2 3 "9 . >. 2 1 / 06A
198 49 1 /2 3 F8 44 .01 6 9 1 "1 4 .016
/ 01 . .023 / 19 F6 4 9 1 4 9 1 .
.023 20.6 08 9 F6 68 1 / 894 /
2 4.2 /2 1 01 /29 08 4. 2 1 / F6 44
101 60 0494 2... N0 0 9 1 4. 8 /2 1 0. /2
" 9 9 1 < 4. 8 /2 1 01 / / 0 . .9. 19
8 2/ 68 4 / . /2. 4 . 923

, < !# %" &) . ! .

=11 0410163 19 1 63 2 F6/ 10166216
F6016/ D929 0 .06 0 68 8019 0O3
/ 80 3 . . .23 20 3 68 4/.916 9
/8 2 0 D929 0 .06 0 68 .. 9 498 /2 1 0 9
198 .06 08 /70 . .06 08 N 2 3 .2 8
"1 02 103 E .06 0 9 . 923 "1 4.0876 0. / 9
26 998 498 /2 1 0. # 94 C .62498 9 9
4 2 498 /2 1 0 / 1. 9 6 .3 .06 03
F6 0 9 1 0 6 763 .06 3

, !# %+ &) . %.

= 016 . .06 08 902498 9 9 ..2 / 3 .6
H 7.1 F6 0 90498 9 1 .06 0 9/ 8 8 F6
21 C 9/ 6 F6 61 26. C F6 021.0 01 10
= 1 C F6 921 / 190#". 219 / 1 / 19
0494 8 62 0F6 . /2. .1 / C D 0. 93
>9 249 .06 03 . .1 16 F69 10 93 98 9
9 . F6G2/2 108 .2 98 9 /8 298 . 1.
< 168 . /G "9 9 .06 29. 9 90 ./ 2.21.
9F6 08 / 1/0 .G 19.1/ 2 /2 101 8
/2 16 4/ 263 0 91 9 D/ . /2 9.61 / 0
/ 1. / 763198 / 9 04 / 0 198 / 9
2/2 . /21 0 "1 4/ 8 63 0 0 9 1 9 D/ 0 493
. 0< 10 624012.210 2/2 . /21 0
9 1 4.06 03 .68 10294 6216 "1 7
26 998 29 .06 9 8 6167 4. 8 / 1 0 . "1
0..1 2 D929 01 /2 763 . .6 0 763 C 3
F6 2 / 79 .4961 "1 8049 01 10 9 1 19 0 1
"0 / 9 "0 / 926793 9 267. 66 0 9
66 0 804..19 0 6 63 9 19 0 8049 0410
"0 / . "0 / . 26793 U. 10 2 2 2 168

!# &) . %. &" %.

& 3 & M. 9.". 1 60.6 49 2 1 / 497. . . /2
.) D. 2 2"268 8 6 .00 1 7610 . / 8 8 6
2 0 9 .21 0 0 4/299 / 68 F6 4 9
8 2 763 8 6 624 3 9 ..9 3 "1 .9 20 63
9 1 2689 63 8 0 8 63

q 1 !

: /2 . 8917/0 68 4. 2 2 S 6 .98
4 6 608 F6 1 4 6 /29 D929 3 2 9
. 93 9 4 9 21 03 " F6.0 4P8 49 2 .2
408 8) 6) 01 / " / .016 49 9 2 63 07 "2
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4 . 16 0 992 E3 .6 . .919 49 2 1 /2 763
24 6 46/ 6". .. 9 6E. / D 6 4. 2 1 /
D929 3 : 99 10 "1 8 F69 621 . 6 8 /4
(2 / 9 8 91G /4/ / I0. .2 0 004G
7.240. 9 904. 8 91 1/ / 4 2. 4 /29240$
26 68 19 8 1192468
2 / 19 / 9 8 164 2.3 9 9 /7 9 60
403 2 24 6 46 3 8) .. 9763 E" 10408 "7
F69 G/ 8 /2 8 08 69 08 7 D6 0198 E .
. 924038 910 G/ 03 4979 . 40 08 9 9 49
2 1 /298 H02. / 9 9 9 "2 69 0 68 E
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" 1 80304 /7 .8010 2692 9240 8)
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4 6. 3E 9.6 01 I .G/ .6 9 92101 /
2 9.6 /E.6 3 2 267 763 0 0 9. BH . +. "
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> M ! 5 I ' : I O : I ! " '

. , 6 8 192 E110 8 98 6 8 ' + ' 2G 3 /2 P
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.1 08' 621' 4 6 '208'.06 0' 9 ' .'/9 / '
0 "17/20198 .1 93 ' "209 1D.2. 9 ' ". '
. . . " . ' / / 1 /2.
I 9.1 08'9 6 498'9C 163' 6 93'.0 03
' .621'9 1'.06 0168' 67/ 4 201 /010"1'"20' 1'
/ 8 0'0 19 0' . 2/10 ' " ' .6 ' / 0'.04 2 -'
' 6 0' 6..63' 29'G6 8 / ' 98 20 3' / / 6 8'
. /29 ' 9 1 2' 941 2.6 / ' ! 6 'G6 8 / ' . /2 '
. 9 1 1'C'. /D9 016 =F6 0' 010' 621' / 0 ' ! ' '
19 6 ` ' 2' 498 /2 1 01 /29' 894 6 8'9 949 '
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50= 0163'9 1'F60 1/3 ' 2'F6 /'49' 9 A'
D9 1 ' C' . /D2 1 /29' 2. / 08'
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` 8 3 9149 /2 1 01 /298 '
: 2. M1682/1 1 /8' 91 9 9'020101 '
2 108' /G01$ F6 0'.6 ' 1 .1 9 8 0'
C'9 0 G8 0' 9 '2/ ' / 9.'"990 8'G079 9 '
?E221 C'10 8 92'2/3'90 2'G079 9'46 ` 10 98 63'
1 @@ 1 I C 1 12'.68 9 92 0 'F60#2/2 1 .9 1 / '
0A R 219 9921 0 2 - 191901G 718 9 1A 69 1 .2 '
19 8' ' 09/3'92 8' 9 1' 9'1 9 9 #01F6 '1G 7 10A'
863 02' 224 / 6'. /D2 1 M24'70G902 8 3'
7",)%' =94'. /21 0' /701'S 9' 2 108' T6 0'
A' 0 S,6 ' 44 .191'01F6 1 91'4 1 G2000 ' 4'
9 1'4 9124/#01'2 8' /19 ' 1=19F6 #F6 0'
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. /D2 1 9 9 2. / 68
=1016 1' 019 1 D921 0 2' 49'Z07 08 0'
9 /16 8 291 11 1 111 8' '2092 =1'9 E9 1@9'
F69'0.F6 '0 Z..4. 1.'. /D2 1 /20 @0 ` / '
0 60$' 94 9 '19 62E' .' 246 /2. 2'S '
06 03' 0 1 .6 0 0/=E7'F6 G63'0' 92 '!M`3' '
1 =E 21. .063. 9 1"2 `9 0 . 1.0 8 89'
1 / 09 92 1 '9 8 921 0. 1291/ / = ' "
#' A # ' & &# G'
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: /701' / 190' G07 16 8' 6 6. /12 2'
` /29 7 1 9 11 0 8# F6 0' 4921 0' 6 /2 1'
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19 . `1 01 9 .21 0'92 8' 9 1'.M2. 6 /22111 '
1 219 D9 S 1 2 ! P06E2 9 'F6/ 9F6 '
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1 71 49'F60'4. 2.9 3
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F6 763'0 D62 910' 916216 '044HC1904611 '
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/9639 1' 9 '8 0 8 0' 29'0 98 0'. / 8 '
8 62. F6/4'8 6 1 3'0. . / 8 @ /40162"9 2/10'
H69' 4 9 91 0'8 0 8 0' 9 0 / 01 3E". D9 '
263 'LG49' / .1' 'D9 . 9# ! /O1 017 8 ' 1219'
/ . 0.=21 01 / '
/ .63'9 1' 949301D6 8 916 ' 19'"249' 9 '
1 1 0 D6 8 .216 8 ' D62E.1 1/89 01 /'
. 467 0 0. 923 498 ' 29' 4' '[` /40 6 '
E2 16 040 F6 4' 1/7024/H '> 196191 0 2'
/ .63' 6. 612'9 .G. 91201 33. .79 9 K'
8 0'06198'9 1' 1/D 0D3' 1' > 0 94 .63'
29' 1/7074 3
7 #N 0 -'90 8 / .63'. 1 F2 0. /123 62 0'
0 /8 0 0'F6/16 8'"C=9 1' 2'4 9924/ '9 '
.0 1' 1 8 F69' 2D103' 69'4 ==092F03' 8 0 '
8 0 8 2
=62 9 D/ 17 ' 1 . / 8 619/ : 2 223 '
9 1'49 O/D1 2M> 0 .T . /=119 1H32. . 9 '
91 3'04 8 917/46 8'M 0 9 0 8 #=.922463'
= ' 9 1 11='4S' /7192019'0944921 0 ' 2'G/.'
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1 23 9 1 90 4 E0D69 9 4 49 / 1 /298 1?

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29. 294. /3 . / 919 =) 01.G1934 D. 9BT6

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9 1 "1 3 F/ 4O7 10 91021 P ! 10 70 9D9 9

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7 93C02 6 1 3 9.9 103 =$! 2D6 0 62 01

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1 0 = 2 . 19 '4.1 / 209 /298 0 0.
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468 '9' /7 . 8 0 9'. /219F6923 ' / 1924919
(! # . '
8 / 7639 1 9 D/07. 1 .6.03 ' 61011 .92 2E'
1/1. .3 F6 4FS 4 2. /21 0 684 S1 1'
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8 ` Z4 0 0E 49 1 21.1' AS6 6S 18 /
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5B&- , .2, $, - ($- , - , = ' # 7 , - '
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. '$(%24 $' (.3 , / ' 2"$4 .&. ,3 $(1
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&1. ,&- (. =(
5. 4 ($2 - $$; '0-, .1'24 #Q$32 / #24'R
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S' 6.-3' A ('%32$. ' , 42' , - , ' , 24$
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M M8 8 F6/ 4 62 2 63 ; . ./2 1021 63 4 # 97 9 9 / 07 63 421. D..919 3 0 763

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. .9 7/268. 1 489O639 E9 F60 8 F6/4

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4 6 268 GH 1 02/ 1 10 . ./ / .ME 6.8

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8 263 8 016 8 8 0 MN 6 07/20 06. /

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+ >9 249 ./2 49 02468 9 9 64 /Q
68 F2U49 1 9 .C 08 9 I .49./
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: / 68 2/1 63 . . 4979 9 .6 492
1 63 F6/ 04 2/3 6/ 67 947/ T8 . . 0 .
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10 3. 11

498 2/2 . 9 6 / 68
2G/ 2/D929 3 49 1 3F6/ 62 0 193
. 6 498 629 2016 9 .68 1/./ 4 F6/4 /A
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= 46/ ./21 01 0 . 76.0 ./2 9 02.6 #
'68 67 91 d / / . 3 " 268 9 1 /
68 "2 63 0 19 08 9 9 / 6 20 1.063
C 9/26 0 498 49 .101 3 64 468
= Z07663 1/ 63 9 1 707 8 3 " 4 / 80
/ 80 93 . 601 /2.8 9 9 60. /2 3
/ 08 "1 / 68 " 63 9 1 4. 9
/ 68 ! =9P01 9 2/2 " 49 .
! 68 ./2 0K04E H/./2 9 16 !68./2. 0
4 1 /2. 0 804/ 9 1 / 0 0 20
11/2 3 2.D01 / . P / 2. 01 /2 3 I/
891 9 98 68
2 20 /D 0 " 1 . Z0791 893 9 8 263
04 .62468 P 19 1 68 04 F60 168 70
G9 9 4. "1 9.62463 . G07..04 86M EP0
1/ 1" 8 04 . .P 8 9 07/ . "1 2G/M.
.8 / /.6G ` "E49 . 8 3 0S4 .
2 9 9 ?10 08 p D92. 0. /298
. C . 63 7/S6 . /2S8 !48. D/ 46 93
./6 /6216 " . G07911 9 049CA 10./

5 : I !
6 1 / 04 ./ 6 1 /298 D929 0. / 04 D92.
01 /298
T /4 49 2/2 ./2692 1 6 0 2016
G6802 2 "2 69 68 2/2 9 9 / 68
. 63 . .6 63 9 1 490 6.0 2D6 / 62 / A
8 268
T 4 ./2692 1 49 ". 490 9 1 8 .
.. . 0 0100 92 7 763 ".. 1 2 8/ 10
10=E 4 2/2 ./2692 9 9 / 763
>9 ./ F6/4 80D 3 9 1 4 8 263 4 .168
1 6
:0 68 0 989 19 01 /298
:/..2. 08 "202 04 0 168 946. 07
0 / " 2 08807 10..8 2 / 9/#0 19 0 2
946. 07 9/ .6 29 1 F6 /104 . /.47
/ 68#F6 0 / 4. .2491 074 7
: / 68 2/2 4979 . 0 D28 7 9 7/
.9 29.19 2 2 / 1 9 0. 6/9 .0 = .
29 9 4 . / 68 9 9 D0 3 " 1 1 ./ 63
96 868

@ '& =&6 . + . . .

791! d 60 , 6 J 01O30 2'
763 . 78 2.6 N/4 4. 49 6 1 /29
F6 7 9. ..1 /701O1 F6 4 E 949 2
/2. "912/2 9 9 ! ! 49 2 1 /298
0..6 010879 .F69 1 04 108 061 2/2 G 4
D2 2 931/4 9 G07021 (
1 .C. 149 2 1 /F ` 3./2 101 "/.076
3 12910 / . 3 /8/2 8 3 6 .01 3$
198063 6 . 60 ./21 9.
>9 0 9 / 497.. 9 ` 19 1 10 9 9 2/1 / 0
/ 1 / 0
/ ..143 2 9 / 0 10 9 / / 10
2 2 19 01 3
Z9D01 /293C 601 /2932/2 4 4 2 112
121 C0..6 0104 28/29
>9 2 1 / 49791 90E 4 FO 9 N/ 68 D. K
223 C "82 S 02 FO9 4 9 921 08
1 / 0 9 4 C .111 0 9E6A 9 29D01 /
98 . 216
- 9263 C 4 9 911 0 4.74 I .499 6 4.12
! 019D/ 09
! 6 ./2692 1 D9263 C 4 49 921 0 . 4912
./2692 9 49791 4. 2 / D929 3 =f 49 2
1 / 4 9 921 0
! 612 19 8 263 " ` 63 90791 01 298 Q
2 3 0 19 894 E 19349 2 92404 9 298
/2 497.149 2 ./21 01 6 2 . ./2
1 0 68 "1.0 /1 9 D63 &
H/8/2 6E68 869 O. 49 2 1 /29)
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/ 2/2 8 0 01.1 9 9 2 D92. 763 E

;+ =q M : = = S W (

59 4. 9 ". 768 / "9 7/ 2/ 9 1 49A
2 19
>.791 9 49 2 / 9 1021 / 98
4 9 92. 08
(2 49 2 924/ 061 9 49 2 62@ ".
.68 G 4 8. 4 . 16 0F60 C 8 9G061 &6
13 "1 .68 7 4 /89 4 . 16 9 0F60 C 8 91
. 0" 8$06. /..68 /E"..6E2 4 /
89 4 . 16 0F60 .68 89 9
:0 193 49 2 4/2 3 4 . 8 .6 4. 49 2 19
". 2 94/ .0 6 ". 2 /7 F6/ ". 0 1 8
2 94/ 0 1 8 2 /7 F6/
!68 2/2 /19 1 1/.0 49 2 1 / ./26.
"9 9 610 49791 0 3 . 63 8 6D20
. / 49 2 1 / 92! 601 1/ 1F6. 491.
/ 98 " 1 9 9D98
T6 F6 3 "9 68 /79 2/6 1 8 9240. 0
0. 9 4. .G924 1 49/ "1 6.0.03 49 2
1 /2.3 0. 8 .49 9G.249 . / 3E 0 0
108 98 9 /8 108 F69 49 2 . /2.8
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@ *& =&# . A+:)+ .

791 !0 10 F 1 F6. 0 193 1 93 2
2 8 0 9 /26216 / . 49 9 498 C
4 6. / 2 1.6240 / . 49 . /2 220240 4.
21/5! 21. . 0E /26216 ./8 8 62 0 4/
68.2.0
498 9 D/ 4 . 16 "91D.2. . ". 9. .
". / / 1 1/2. $ 94 / 1 2 9 2F[1
1/19 93 F6/4268. / "268 9 1 8p
F6/4 9 01 / 9 029 9 1 498 ". .6P.
CD 04 63
!68 46E. "/.076 / 68 ./G 6D01 /2.d
./2 . 62.6 21. . "1 / 1 164/ / 1 1.
6 1 1 0 6 1. ". 19 $ 7/1 .0 63"28304.0
680 1. 63 .01. F6 04 9 F6/3 I D/ 1
6 1 02/29 1 498 F2 4 / 1 164/ 6 163
2/2 9 . 498 F6/4 / 1 3
4.8 .0498 9/498 F6. 8 /4/ / /
26 .6
10 621 .0498 F6 763 90498 / /260A
12 2/ 4/ 94498
I / 684. G 4.8 9 1 / 163 C 21. 1O3
T6 763 498 6 . 01 068 011 E76 16 .0
68904. 2A
T6 2. 90498 "2 .9 1 / 621 .0498
P 19 9 6 . 2 01 /29 63 19 1 E "1 G/Q
8 / = 72 16 2 62 90498 "2 19 1 / 298 9
8 80 E 49 6 1 .0498 219 1 01 /29
. G9.1 63 19 1 E 4 9 1 D92. [.
T60 4 19 61 .01-D/ 4 4 N. 6.2689 /
= 946/763"26 21924 6 01. 68 2/2

21924 .6 .02/2 62 904. 2
> 69 0D929 9 621 4 6. 0 9. .$
- # $ 6 $
g g
M@ / 621 9 0 0 E 061 "268 / 1
9 9 29 0 1. / 90 2/2 X6 1 90498
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9 1 94.C 0 19 0
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! /2 6D010 49 2 629/ 9/498 8 /4/ 94
..62468 .0 63 6/3# 92 8 /7 6 9 9 1
08 119 9 9 98 08 /7 6E/ 9 1 4 .9240
08 1/ 9 9217p
= 8 G68 8 39 1 49 2 1 /
!68 " 0/ 04M3F6 " 4. 6 . 2 1 /
01F6.0 .. 0E G . 49 2 1 / 9 1 9 1 C 0
M 6DT08 49 2 1 / /2Dp 0 63
F608 / 6D201/
: / 08 C D.2 Z 0. 6 3 4 6D2028
F608./2 80216
.. 4923 0. 63 ./2 8018 4 . 63

B* & : G & = 2

H 791 !0 10 , 0 193 1 93 : 80 9 1
4. 21. I /D01 /2! E 4 . 1 49 4 6.01 /
29# 19 /D0 9J2 8 0 64 1 1/.9 98 9 1
2/. 0D. . 01 /9 2024/ 0469 63
0 D698 =9.6 40 49 9 /2 /29 . 1 0 4.
. 9 9 10 /2.
% !## .%.
H 19263 49 26921 /29 / ./ 68 862.
49 4 / 1 /2. C F6/8 /4/ 21.
/D0 9 96 0D9 9 > 0 . ' 1 . . C 4 610 .
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M/.91 . D/ .68 F6 4 61016 O3 9 1 49
7. . 84 2692 9 / .68 =9.624/ 4
/2. . >) 219 /D019 0 64 . 9 1 4 /
N9 9 2 0469 0268
1 .6 9 D/ > 0 9 ' 1 .63 / / I /2 763
2... 0 3 9 F6 763 298 9 1 / 8 2 30

2 (S ! ! (
E9 9 9 "& # ? !
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2 P" >(# 9 F # # # # $,
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>) &4 =.61. 8 6D20216 .
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5+ =q) : = =

29 T6 4.2.6 0 497. 9 ./ .949 . /70
7 P3 8) 2/2 /707 93 8 /47 21 8 263
8 /707 .3 ./2. 6 /29
D.2468 4 904 /8 2.8 . ./2.9 3
07 7 (
= F6 4 2/2 04 .8 / /20.6 $59 /HA
)" ." f !" &! & V+
= F6 4 0 68 /7 .6 68 86 1 9 0
9"016 29D02468 # 9.9240 9 .01 / 4
1 2D6.2468 $
59 /24.2468 9 9 04 2464 /2.8
./2..4.24/ /707 0 2D6 0 29D024/
10 2 .2 ./2. 6 /298 "2 69 0 98 26 F6.
0 . .24/ 8P02. 08
5. /2 6 68 4. 1G. 497. 9 9.68
8 7 0D9 9 C 894 10 F6 4 . /2 6 63
04 0 D6 8 9210 F6 / 62. / /2
/2 4.79 . 8 /707 G04. 924
N0 08 ./2. 6 /2.8 2 9D 1 8 / /
D 8 / 24 .019 0 .. 61 08 ". "1 0 8 F69
/ / /298 < /D 8 949 0 08 497
29D2 4.79 9 8 /2 1 024/ .06 62 0 .0
1 3 G/. 9 1 / 6. 9 0 D6 8 9 8 6 8
8 94 06198 0 D6 8 9216 8 0 1 .68 0
D6 292102. / /2 16 /7 941 /E F60 8 2/2
/.. 1 / 6. 9
= 4 6 0. / 2/2 .4 9 . .16 2 .02
30 . . 219 /D01/ 98 ". 9 /2492 98 $
KG62. F6 498 . 1 20. 19 C 80 9 9 /2
4.01 2.D91F69 90 F6 ./.94 4.792.6 68
2. .9 > 2/2 04 / / 16 8 0 D6 8 92
1916
59 97924 0 D6 8 92101 /298 .
1 8 9 " 1 /30 / 80 =) 0 30 8 019 0
(= 2/2 4 04 98 4 ..24 8 8 G ./2. 6
4 ./21 0 1G9 8 # G04 98 4 9 / G 80
G69 /D 868./2.92 / 62 C 0 0..8
7 02G/101 < /D 868 49 2/2 1 01 668
4 . :G / / G.2 0 > 0 .4 # .68 I .G9 9
" !))1" !% 8 0$ /D 868 "9 7 > 0 .4 .68 ./21 0
4 4 /2 3 F6 . ... 467 /3 2/3 0. 10 "
G02. "9 08 0 198 /70 9 49790 8 63
/ .8 0
/2 4 9 "9 / /702468 9 6 0 98 2
6 . 621 06. / 0
F69 ". .06901 9 /24923 07 /7 96 0
0 0F6. 0 D6 8 92101 /2. 9 9 4979 9 .08
4 9 . .608 0 D6 8 .2.0 /2.8 .6 63
/ /G. /2.30497. 0 ". .9 1 621 "1
2/2 9D902. ./2 80. /29 0 08 "9 7 F6
2/2 ./2. 64 1 F6 0 ". . 1= / G 1 .0 E ".
2/2 9 1 ./2. 0 G9G8 E ". /70. 9 0 .2 3E
"9 ./2 101 0 23 / /G1 /2 763
>.79 . .1 08 9 /249219 8 9 9G92
4. . 4 610 8 .8 .68 91 1 2. 8 8 E 4

q !
9 1 .68 498 . 4. [[; /70. 6/.68 F6.
8 /4/ 4 0. 01 19 8 .68 91 1 ./2. 0 68
4 9 1 .68 .0 49 / 16 0. G7 ./2.94 460
/ /G9 /2.3 ./2. 0 03 # H . 92 8 161
70 .16 . /24.23
!# &) .%.),%!"0 .
- 1 4. 9 . . 10. /2. > 0P< 1 ., ! 62
92 8 016 0 9440 2/3 G07 .3 01
0. .3C /8 ./3 " 63C. 9 . .01 / /
92193 04 0D9246 8 027 " . 1#. 4 6.98 6
0. 9 /24908 63 . 9 .9 / / 191 2 ./2
69 .924 3 / /G1 /2 763 C /D 8 3
198 4 9 .2468 2 "1 0 8 F69 0 198 2
69210 68 01 /26 8 / 61 /293 F6 .24
/6 492468 F6 4 .F60.6 9 2/ 1 00 G
8 01 /29 ". 29D01 /2. 92.240 2. .
C 6240 8 9210 F6 1 /2 8
=. 924 4.G8 1 /2.3 6 8 . ..8 F6.
/. ./8 8 6293 4. 3 F6 2 F6 1 /298
9 .04621 6. ..2468 4 6 G/2 /
/G9 /2 3"2 63 D.2. 0 3 2 6 .3 2.
92468 0 .8 /1 G8 3 8) . 0 8 3 $ 07
2 /1G. 04.G9G8 1 02 .62468 4 9 1 0
0 1 .6 0 04 "2 6. 0 9 D92468 246
41 /2 763 0 64 . /293 # = /D 8 / 0 64
9 /3
59 9 92468 . 4 6 01 /2. 64 68 0
F69 2 . ./D2 1 /29 /D ! 8 / G1
/6 / 68 /7 .. /268
I 08 202408. . 01 /2 8 4 1 01 /
2 3 /2 9 9 .68 F6/6 3 44 61024 R
M / 191 92 2 / G 103 / 6D*A 1 W 2/O
98 9 49.91
N6D 924/3 9 9 9 1 20..3 C ./216 29
/ /3
>92 F69 G0792403 9 9 2 /8 .6 0
D6 8 92.01 /2.3 49 3 9 .G763 4. F6 63
6 9162. 06.0 0 D6 8 9210 $ G9 08 .2 "1
G2. "2 69 0 0 C 04 8 6 .03 1G9 93 21
04G 79 H . G079. 1/19 . /q / 7E $ 3
/ ./ 68

0 1 # -)")' =+ ' 0)

H 7.1 ! 0 10 1 2D 210F6016/ 0
40.63G . 0 193 F6 2F69 : 8 04/A
(. . F6/ 408 /D 8 /3 =/ G 1 ./3
C 0 0..3 =..6240 9 /2 . 293 6. ./
/3 =/ G 10 68 . 1 0 0 0. 03 2 4 < 14
2.C 9 1 0 4 1 /2.8 TE 10 4 / 1 /292
C 2.9 /D024 $0. /; .8 F60 . =/ G 10#
4.7.021 T6 210 0. /2.8 9 /24924
/ 6924 =/ G 8 010
) ## 2 ,
G 1 . 3

S > + < B T 4'' : I '$'B R' "'<' ''<'B+' '

1 43' . 8 3'"1' .4 . 20'4.'"92.'
2 3 I 1G .0 4.'" 1 3$298 9'"1'.6 1921

'3 " 4# . .

q ' 621' /D 18 ' F6 408' "91 ' .0'
F6/ 408'. 9'10 1/3' A 0.2' 1/19 'A
.3 F6 2.8 9" 49216 . 9 29.'108 .2' 62.'
"1' 2'0 3' .7 3'./ 1 `D 1$F6/ 408'92 8'
I / 8 293'" 44263' 969 ='.0 2/ /3'C' 6 '
.G /3#0 /3'0619/A168/ .'0F6./' 2D694 '
298 'C' 9// 6 .G 164 298'.8.21
I .2.G68' /D 068'.68'
./21104 ' /29' ./29 6 /2 3' 63' F6 '0'
9< \/ 21 021.' / @09 1
I1' I P2.G6 0' F6 498'0 68'9 .'"9 68'
0 68' 1 8 #G62.' 9' 101'=/ G 103'". '2'
"/.076 3' 119'4 /2. ". '9 1 0'4 4 /298$'
"." 4902.F' 0 91 193' C'4/ ' 0. 021F69'
249'F0 . 168'C' 6. 68
???&S(=/ G 102 . 89689 .'F6 '9 ' 6.010'
0 921 0 00 568. 101 C 8066 1" 4. '
F608. 9' (
=0 E921S2S/2.10'.6 63' . .91'/ -'. 68'
9 1'"91 01930 9001'0$'49 .249 9'' C'2/2'
10214 8'2/2'1@9011 ' 94' 91 08'0 /168'
A ?9240. 0494+10 10.1' C 9 .

)s " 0 "'

0 D6892 0 /268' F6016/1' -929'
'YD' 03'92 8'0 1'9EE9' 40C0 .03' /9'
&' '4/41 2=R F6 U . ..1./2A/46 9 /'
Y SS0 23' R 3' 9 921 #' 03' M 0 9 1 .03'
999 FSA' 9 ' 1 07 763'# 0 03' : 0 1 .03' 49'
1.6101 603'F6 '@'19/102468 C'9 012802 '
4620' 2 1 1 111 I 6 $0 034.2 F6. I 1 .03 69'
1 D / 0= F6A./2. H4621'9 ' 3'F009" 4.0'
6 /707 0 299' 08.2' /21#' F6 '"
49@ './01 .3 09 '2/2106 92' 969 0'./0'
.1 46/11' `17F.F 498 /./0D. 2468. 9
49 2D19 34 01=/ 1 1 . 3A

?!=,& B 5 &'9 9' F 1 0F1 9' 293'=/ 7 10 68'
2. 9' I 18. 618'' 69' 9 9792 /'
2 9 0 0 4 / 6 '=/S
' .9. 868'' C'7 6D01 /298' !69' 1061/ /'
D 08' T6 0' 21.24621'=/ G 1 '494619 9'
9 /2492198'04"2689 1 3 911 763'"9'
04 R193

K' ' (,' G 'O+ @' ' $'
(_A A /./3C 2.7/ 6?
?Q5 G 1 '? '1U $Q5 ?'
$ UQC Q Q '? 5 "

N0 0. 03'4<;H 2 3'9 9' . 'G/8/2 8 08'
08 G 7/ /D 08'./8 / 1 /298'4 6 !/' '
298 0..92168 U' D6 08'4 /2 3

!# 2% " % .

016 1'=/ G 8010' 6.':0 0 /D 2/3]]'
"9' 0 0. 03' 2' 9763 69'9 1 0'4 J /298'
9 9' . 192 ' : 808 '0.. 4921 3'.68 610' N'
863' .0' F6 ' 6 621'0 .6' 67 9.1/' 29 9'
91 08'0. ! 4921 763 67 . 1 '"9'./21 0' ='.'
.62408 '4 41' 8 . 1. '"9' 9.62468''?&'? '
F6 4''"1' 9449240' 6210 8 0'>/8 0/'9 D/'
9449240' >/8 2/' 6 / 9' (2/2' 621' 94'
49240'0 80'>/8 2/' 6 / /#9 D/'2/2' 621'
9449240' >/8 2/' 9 1 08 D2/ 01 /2 3' &?
I 92.G '.68' 610863'0 F1 4' 19 6D2023'
1G9 './2.G 68'9 .'07'0469 0 /$'.68' 0'(
892 969 0'9/2. 6 68'2/2' 2F6B' 49.9 1 /'
./21 2D 19 ./'F6/4' D2/ 0863' 01921.8'
&9 0! 08 69 I 92.768' T60 108'./2 9' ?
F6921 =E.M8'" 4916 219.94923' ./2. 4'
. ./2 9F692 9 .'G/.'9 1' 0668 '9 D/'G/.''
9 1'89 B'".'9 '/ / ! 1/'0219.94921 3'/ /'
16 0./2 9F6921 3 "1G/.2/29 189 '9 Q
D/'G/.'2/29 1 0668' TD2108 91 1 /2 3' N'%'
2. E'.68 /702 '498' 9' 498494'
86102 61'19 8 2 '"1'02 809 1 8 8/ 10 3 e rK
/7/ .'F 002 802/29 18/ 1 /72/'
0 =. 108 6/0.06< '"1'.06! '.68' . .91'
09. 16 /'.06 0' 91'". './29 6 /2 3' 4' '] r K
F6/4'29611 63.06 '9 1 "1'0 80'16 702'1' 0''
.98 9 9/'1/ .240' 8'=. 1 808 19 /'
D018 83' 816 G.R'102F608'"8 63' .68'
. .9186 10'E219 /D0 `161' C'4016'"20'
1 /2 /'F6 0' 1191 /D0 /293' /6 1 '"''
492161'"F0'.08'2/' 21'"/0'"1' 6 1 1 0 . 6'
49 1W3"" 1`193 "1 0 8E1 297T2. 10'C' 06'
407 G0 022/2B

'5("'#6+' .%.'

! 016 1/82.3 0`0. 03=/ ` 1 .03' 9 9'
M / 904' D2M 01 /0 ' I 92.G #F6 0'
I .2.G6B'9 1'". 63 /D 863./2. 64923#'
9 D/' /2'9/2. 64 .'2/2'9 1'= /D 863'
29.'I 92. 83 T6 F6 3'9 D/' 21. D'1' I 92'
27681'=. 1'" 491'2 G ' / .'9 9/'./2. 6'
4 9F6 D// 01' 9. G' 8 221D929 9 0 0. '
4.. 16 ' 2G/8/2 19 =F11 4. 0 F6 0"/'
.07 `02. 1E14 112D69 9 ``./8 / 1 /2.'
C$4 / /`!'' ?0'2/2'2/0 1' 8D.240'./2'
8899' 1 16 92C . 8D9 9' 20 3!'
` 9
:/ 1/' 9 '= /D 2/3' 'C' I 92.G/3'=)''
7 1 !M= 1'8019 0'3 .' / '80' 9..021. 3'9'
.12'G'01 763' 6 11' 0220 9219.' 0

1 ' (= q M : = = q ! ' '

/ ' 9 . '0 198'/8293'04' / ./3' 0O 0. 0 68' 0'2/.01/3

=/ E 1E.68' I .2.G68 '2/29 9' "9 68' 1 .2.G 8 '29.' "9 9' 0.8. 14 940 D69 K9' 94'0 0 921. 102168

>9 2/2 01868'06198 '"9 .' 940 D69 9' / 20 6 0 9 '>J) . 9

92.0. 668' 4.2 F6. ' 940 D69 9' D2/Q 02.93' "/ 62.'4/J '" 49 ' 41E69 9419' C' 89 1/

/9' 9 4' . .' I .2.G/3' "9 /3C498/2' 1 046/3' F6/.' 62. . 921 C498/211 0' 1 /293 '1/ '. .' 0 /3 F6/.' 62.'"9

/2' /8293' I .2.G/3' 94' ./8 86293' /82 763' . 91 3'? . 29 .'04' > 0 .4 .68 I 0 .'./3E' .E '4 6 462.'0 D68.210. /293' ..6246 2'2/8 .2'C' 92.92. 08#F6 0'4 6 ' /' G ..' ./2. 2..' .02.68' G/8/2 8 03' C' 08 G 7/ /D 03' C 921.2. 0'0.' 2/892'" ' 4928 './498' 99 9 9

- ' !# 3"(&) .%. '

PM..1.68' F6'4.8/2 1 01 2< . . 9' A./21 04 < # /298' 4' 9 1 ' ". 08 7..' / / . /2.8'./2.94 '"9'29D0 'E' 94'962' .b ..210.' .2101 .9892 8'. .' 0 198' > 0 9' 1. I#.68' F609 0.'4./82 763'192' 1024/'C'9 08 2024/

> 0 94 .68' 9410 .'./8 862 0E=/ ' 108'" 49 ' 02168'G/.' 0...

= /D 868'=/ G 1 .68 '0 68' ...0' ' 9 2' / 80$0 2 8 2'8019 0' H6294 9 ' 9'0' : 964/D 0 G/ F644'=/ G 1 .63' 2'8 0Q 19 0' ...023'" 49016 './229'9' 3' F603'0 Q 3' / 0' 62 ' ' 969 0'10892'9 ' 3' 2/2' ' ./ . 016 #: 964/D 0 G6306192 F6 .108' 4 416 ' : 964/D 0 .80' ' ./2 . 016 ' 9 ' / 3 9 921 ' 2. 3' 94' 80 9'0..9' 1=E" 'M8293' 2. '46409'07'./498' 641/' 04' 498 62468 621 F60 .3' 94'4 089Q 19 'C .8 . .6 63' 62.' 2. 9' 464103' 07' ./Q 498' 84 /'04A 498' 62'W#68' . D/' 4 0Q 8919 'C' 98 . .6 63' 6213F60 93' ./2. 6' I / 0 0. 1' F6 0'2 . 16 2. / - ./89' 1 ./80 90... 1/ K4. 3.192 8'4 1 2D6 80' / ' 2.8 . 29 I 9 .08498'" 08' 46' .02.6 './498F6.'8 /4/ '07'./498' 6241/' 04 498 624168

' !#' %+ &) .+'! ' &) .%. . %.

'=/ G 1004' 0 68 '". 0 04/ 68' ./D01' 9 /2492198 '4/.91' 1/1. .3' ' 4.7. .'=/ G 108' / /2. 9' 87' 21. ' '& /D01 /293'"0 03' 29..9 ' .29 9/3' 198' /789 9' . /2492.98'86 1164 29' / /

q ! ' '

E1 /268 ' : 0$.. 90' 2D9 9' 9'0446. '04'4 ' 6102468' 164 /'4 .924 # 6179 9' .108' 4946.. .'04'90' ./2. 0F6 N0. 30 D689 ' 1/ 68 ./ 0 6 91 1' E2 679 4979 9'0 6' 8. .' 0 04/ 0./ 6' : 1 / 0/ 62 ' F6/' 68' 4/4 208' . / 4.23' 08 .4 .6 ' >.7K9 .'91 08' / /2. 9'2016 02 ' .D 'C' 9Q D98'<G62 0208' . .9 'C' / 1 608E 1' .08' F6 0 /701 . 6 .6193'\2016 9

62.'"9 7'=/ G 108' 246.9 9'04# 26D0' 1 /2.8 ' .68'. D 1' 9 /2492198'04. 6 ' 492 '"/.076 ' 20298' 9 .1 . /2.8' # F6 0' /'./498' 68 ' 9 60491' 2/8 9G '"1' 46 ' 68 C'/ 01 /2.8 E "1411 6 2'4 8 4 E F639' 10892' 621'4 1 2D69240

=/ G 108' 91 08'04' -9. 068' 246.. ' 9 .68'/ 1924 1' 9D93' - 08 801 90#' " / 0 0' 9 /2492..

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1 6 6 '=/ G 10' F6 '4..9 .6 63' 219 Q /D019' 49791' 2 6P0 ' 9 ' 99 9 .9 ' 0.. 7. ./2 639' 198'.9 0 9'./2 68E./2' .649 9'9 '2/2'./2.9 7 F60 './2.. /'?' ' D9 9'2... 01.8'./2. 66/83'0.' '2...H0' 7' ./ D9 9.6 E' / /29E .' 9 /2492198 A' .6 F6.'06.G 93' ? ; =$4 2D6. .' 2.. ' /D01 / .8 ' 10' 10892'3 '802.01' 3=/ ' G 801 3$1 02 9'C'.60D0 '04'0 L0' '4 'K 6101 /' / 1 ' 6F 1' C# 2/2' / 0E40 ' D689210'./21 0'1G9 8 ' '

!#' &) .+ #6+! "&.' *

| /2 .6 '0 3' 9 /24.24 'C' / 6.24 ' ' =/ G 8010 'F6 '. ' 6 04 4 3' 0. 9' ./ D' /.91' 62.'9\8' / 6 .6 ' / G 1 "@'] 80'.68/ 924 .6 2'F6/'./2 10.'.0 1 / s s' 69 0 0. 0$ 610 'F6 0'9 1'G/8/2 8 0'"9' 0 64'" . 68' 6 0. .0.68' T 602'F608' 2/2'0497' 0. 9'9 1' 2D61 3' 0. 3' 2D6 03' 4 1 2410 F69' /111 /293' /8 19' 04G 7. . A 1'9 D/' 90.G63'0 83' "9213' 9 1' 0 63' 0 63' # = .' 4/.91' 1/1. 93' / 61 /2.8' 089 9". 08 ' 08' 6.0108' I 1G029' F6 4.8 6 .9 .=/ G 1 9' F6 298 .' "6 .' " 49 ' 940 D69 9

9 08' / 61 /2.8' 8016 9'. 9'04G 792 ' 408' 9 '4 1 241 :298

59 /2492468'"9 S' / / 1 /2 ' 9' 29')+")& +# /707 . '3 &%

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=/ 692403' 9 9' 101 /2.3' =/ G 102 8' 6 F608' / c `0 S6 'q 49 .9 .03 FA' 21 . 863

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1'"9 / 21'0 D68 .2101 /268'" 10'46/ ' 2' 8019 0' . .91'C' / 8 0$" 1 68' F6 4. 8' 8019 0$ 9 9' 0 10198' / / 1 /268$! i60# 0 103'2.D0 4/2.' / 69240'9 1 4 ..24/'</. ' DF /18 0 061989 . ' F6 0'2/2'./2. 64 1' 0 D68 .2101 / ' 29..0 /D 8 ". 08 / ' 808' G07 .1# F6/4'" 1 68'49. 0 02'4.791' / 1.24.24/' 0 D689 101 /2.8' 2/2' . .' 2' / 80

=1016 1' 9 D/1 /20/2 8 08C'08 G 7/ ' 0 /' 6 ' 4.7.19' 4 1 24H/29' 86 1 . 3' D2 .0163' ' F6 ' 2' ./2. 6 /29' 9 1 ' ". ' 2' / / 11 /2 763

! / 8 '/ . /298' C'4 6 /298 4 6 /29' 9/ 68' F009=/ 7 10./2 60 1 1 C ./2 02 ' 4 /299/ 68' F6 4 6 1

..92.68 ' 4 1 2D/.24/' D2 .01 /2.3' F609' /'0..121262 ' 4 6@C0 ` "' 2' 4 1 /2 ' 763 62.4 19192H3

N D6 0 0'4 = /2 3' 4 1 2J P 2.' ! 0 9D/ ' 0 /12 ' < I E G/. /.///H D 1F !01.D/ 03' MD 1/9 9' 29.9 0 03\

>F F69' /2 2 2/' 9 9' ! M21 04 ..2468' =/ 7 1A

M .E249' SE\ . 6 ' 01 /' 17 6924 ' 0703' 0 0. 0YF ` L' R 1' 11 04 1 1 ///2

=/16 92 8' 0 0. 0 110. / 4/21 3 ' 4 9924/' ' 1/21 929.9 9 4F ` /4 29 10.. 4.21 2 ' 9 1 2' 7 .1/ .4 2' 2/2' 1' "11 6 F69

' R =' 1413' ' C' 1.62468' F6 , ' ./2 ' 4/10 4/' ./2. 6 72/ ' =/ G 1A' >)'1G/ ' 2 . 4 69 4 FO9'0 /4M3'4011E2D1@24/

Y2/101 /1?3' 9 92/7 ' / 1924M24/' 2/2

49'9/4. 2 "9 ' 2/2' 9/62441 1 4/1/ L'

:91 1 / ` 3' 2S E ` Sk 24/'0 68 162 ' ! / 49F6.21 3 ' 4 .124/ ' 2/2 "019 .0 ' 8921 80 / 1 /291/2 906.243 ' 04' / ' 1 /292 0M19/94921 3 2M/ =/' 96M /1 9' 02 ' 11.94921 ` 44904 /29R ! /2 1F6 ! 11 9

/2' .00 9' "1' .06 '/ 1924924/. ')+ .' ./ /29' 2 / H/2@ E2249F14 7 1 46 ` ' 94' 9 ' 3 /1 43 ' F6L' 0' =/ 7 10' / / ' 22212 ' (

6 1R . 3' 219 1 /2 3 ' @21 E08 ' "2 63E04 8 7924/11H 103' 4 1 2 =0 Z1' 9' @2 9293 ' /'4 691 ! 10 '.' 21@ /D01 /2

/D04/2 3 ' 29D024/' " / .07 8 8' 9/ ' 72 62 8 8 4. 8' D2 .0 . ' F6/4//2 ' 8 2 612 '

' =4124 91 4.2 F69' <F6 10 8 92' 0 1040' "1' C' 8 02/' 04' . 92.7/3' 4 C /2 3' 9 4 ' 9 ^ J' 4 9924/0 19 ./1 110 "/ .98 8 80 ') S 0 19 ' 2// 6 /09

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0. 93' /7' 802 9 108' 0 10198 ' 09' / ' 29D04/29' 9 61016 $.' C' 0 /34 .=93' 9 9' = 0.61/3 ' 10"1' . /2492198' 4 17 10 9 0 A ' 4021 ' CF60 - 8 / 4.24/ 002DS 1 03194 ' D021# .F69218' " D9021 ' "1' 29 1 01' F603' / / 4/2.3o' 6.90.> 0 9 1 93 1"1 ' 09' =/ 2 1 90 ' 29D019' 497901 ' ". ! / E I94. 9' H /3' D 6 ' :0 0 MD 1/3' 04 8 /291' 4 9' 4 D92191' C' 1101 7' 9 92 19 ` 4/3 ' 2.F29' .M211 8 2924/3

1' "9 7' 1/ 61 /293' 26.' 04' 0 D68 .2101 /' ' 298' 9 1 2921 ' 2@2.' 04' /.9 /D0 @98' 29' 4 O101/ 98 ' 2O2!' 04' 19 8 23$' ! .' E219 /' & D01 //93 8 /47' 9 9' ./21 0' 9039 9 / 1 8 0 $8 /47' ./21 0' 9 /24921912 ' C' 9F3' 9O920 2637M203$' 8 /49' 04' 19 8 113 ' C' G03' 4 94919 803$' .68' 4 ..1' 1 6101/1 ' 29' " 40Z1 4.016 ' . .024/ M 2/ 1' F6 4 ' 08 9 9 112E' C' 26/161O1/ ' F6/4' 2/2' /19 1 2 1/' 4 6101 2 3' 198 / 9' 4 1' 716 C91 G.04 ' (

! /2. 64 1' 49' :0 0 /D 8 3+J 91G/4/ 119 /D024 ' 0.' 9 /24924 ' G0 1.263' 043' 9 4 162 1' 7 . .1G/, J\ 0W. 1 .1 I06 ' 01/ 98' C' 76921/ 98' 4 911G' 49' 0D.21H ' E 9 19101E 91 1F69 ' "1 1F144 2' ! 0' 611 1' .@922 68 '"92 09/2.940161E 2692 ' 43 917' 0' 1' 86 1 3' 1 . 01 =8 F69' 4/96 ' 2. @3' D 01 0' 80 10' G079016 ' 0.' 9 92 ' 4012

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& M 1 20' MH ` 3FO, ' ' .' 016 7' 9 1 ' '

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3 1 0 `A' F /4 9 1201 ` 0 " ' F6/49 1' [7"? 4.1 2=2010 ' I046 9 G 1/ .0E' 14/ .0 ' 0' .32016 019' G 1/ .7' 4. ' . 7P ' 0. / / 01 E4/.201 01 ' >9F69' .0 ' E1 8' .06 A' &$ 04 0' 04' 086 8' 01F69' [. 921 . 1 " 9G/ 09' /F10 11.6 ' 9 .01# HA.' . 9 04@2/ 1.01' 9 .06 03 ' C' [\ 2! M2O CF6M' 9 F6 1 1 8 08 91G/ ' 4/ 9 1 01' 1 0 ` F6.1021=' 44 D9@ 0' 1 8 F1Z 2. 94 7 2@921 /2 ` ./ 0' 9 . ' .6123' C 1' 1/19 93' "1' 1/ . 17' 2 G ' 07' S 19Z= 004 . ' 9 / 1919 8 8 6 < 9' " ' 49016 ' 249' . 1' 4 6 2016 8' 9 68' 8. ' D92 0' 86 43' O01/29 64 9.161' 2 9 / $' 22012 3 ` 10 290' 04429 ' / 81 8 8.0 .0 3' 803' /71 211 1 ' H 21' 1/19 .8' D. ' 2 6 2201610.E119 8 /26 2F09 / 19 103' 2 ' 4 D.106 A

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=q 'M' :' = ' = q !

H6 63 9 D/' :G / /D 0 /8 2 3' 2' 49Q
.9 2 9 9 0 193 9 1 4 1 7610' : 80' ./2'
1 29.' 7 /3 /4 /' ' 49 2016 0 ' 6 /6 10'
1 /2. ' ' 6 763 22. 0/ D 2.3 .06 0$)
./8 8 6293 / 9.0..3 ./ / E3 20 6A
0 3' F6/4 9 1 /7 9 68' 63 :G . . '
/2686 ' I 1 06.98'./ 63 2016 0 9 1/16 8'
F6/4408 1E7 1021 0 . ' ./2 1023 8 019 0 U.'
/ 800 .68' 8 /69 'U.'F6 9 .9 .'=..6240'
7 /3 F60 6/ '49 ... / $ "7 ' 4.' 624/' C
'F6 2F69 ./ / 763 8 30.' 18 . 763'
.../ . ...'U.'F6016/ ' . . 89 1 3' ".'. 16'
/.68 '4. 2 168 F6.' 8 /168' 17' "924 '
.021' . 1 0 46/34.D92. 01 /2.'=../ 6'
. /29E "7 49 9 68 /8 ' 21. 16' 0 . 0'
. /29 0.. .1 /2. 8 1 /2. T60 .0 F6016/ '
4.' .../ 3' 0 . ".' 8 . 9S 3' <E6E.'
621 2 67 8 '" 49'./8 91 3' 6 8 2. 20'
7 763' T602F60 8 F60 .63 .19/ /8 'F6'
49 F60 101 763 8 3. # .0 68 F69
0.' 763' 04 7/ '4.' - .29101' / 10 3 . . '
9 924639 1' T 8 210 1 9349 2 80' I .G/ '
68'F6 498' 7 / 68 'F6/2 08' 09. 6E
621 . O.01 /6.'./21921p'"P .216' .G/ '
-6' 9/ 68' F6 'G/4 .' :G / / G 08' / A
19216 ' =. 10 <F6p' 9 1# "9 6.E 0 924 '04
7 /3 49 / 80\'./2 29.943 / 'F@'
"6 D4 4 .6216 0 60 016 0 ' 1 ..'4.'
=92 6 ; ! =12 ' " 22S 4. 92 M C 9'
0 2 9921 '"268' E 49 =/8 / C " D4 '
"268''4.' 2 782 3"268 E 49 G 2 . /1 =
. /82 68 '"268''49 /0D 164 U.7 #9'
6 1019 " 1p '"268 44.' 669216.. .2. E17'
" 10' 8 / ..'C 9 01 /2.'"268 9 ' P0A
4...84.G 1/ 0 02 801 28') 60 F60A
.6/ '4.' 0 1 7K02 80 6' /20 'F6 2F69 4/
D929 01 /2902 80 6' >.! 80" 04"' A2) '
1 /2902 80 ' 2684.G0.. 6 49 1 A
"268 $ 49 8 07 763 064 4/8 763 "26 A
49 G E /D2/8 /2 9 3 "268 S .F6p 1 T21V
763 8 ..G02 . 3'"262 $, .'O2. 3 2 9907 G'
763'"268 '.68' :0 0 7 0 ' 'G '1 93
:G '.'4 4' / 1G21 4.' 64 7 268 E4M
./ .2763 "268' $ 4.' 92/. 01. 'V 5 " 9
! 9 D 0' 49 921/ 68 .D /2 763C M12 '
2 763' T6/ 68'/82 68' G7 / 68' X.4p '
Z/ /D ./ 68' (80 89 =) 9/8 8' F6 ' :GE A'
/ /D p' :9 0191 .p O8 80 G9M 98010'
4/4 248F .' ../ 4 / 98' !M 6 '
`921' 9 /9703'U.'0 D68. 11'
4. 2.. 3 I ./402 I. .

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- 5 8 63. 149 2. 3' =..62463' 4.'
- 2016 1 U.'.06 13' 9 1163 49' 8 / 8 'U.' 2'
2 1/' T 01163 4. /./ "0.6/ ..8 / .'
T6 2163' 4.4 9 .21 38/.63' =9 163' 4.'
0 1 963916 49 8' =. 1 8 63 U.) 0663 4.'
8 /1/ .' 8 /' 6 976216 '/8 293 /9"
' F6 0"1 2 . D02.6 .F6 o o
68' 9 08' U.' 01@210 8' 06C /2. 8' " Op
"/43 / . 84 6 0 0 E 1. 0 3' T602 '
F60 8' 9 1 U.'
49 24

@ & ' &+ K.

M6 101 ! 0 1 7/='*' 2'. 0 103 E 0 193
.40 1 3' : 80 9 1:E //98 6 =9.6244'
9 1 . 2 6. /' :0 89 4 3' U.' 9 1 # F6/3
.1 FE7 ./3"/.021 21. I .193' 18 0 ./ '
2 111 0 D6 8 .210 19 8 213 910 G . 3' "1
9219 ' /'./2 1.4 021 . 1 0 . 1 ./. 0 :G '
1.1 3 94/.P 8' C' 20 0D/ 012EF6 ' 9 9'
19 8 @= 3 G 1. 39/8 2970 1' T60 10 '9 1
1 4/4 20 4.' 2. G3' . ' 1/1B i 3 '
/ / 44OU. 8 921.. P<010 ' , '

: 5 /11/ 81 9 1 2 1. 8 .17/468' 4.'
1D20 3A' 0 24 13 . . 1 9 1.' 2. ,'
924118 'T6 0 9 './ 62 9/D2 1 /29 . .2'
S0 49 92491 94 10"1 29 /2.24 3 2'
4 3' 2 9 6 2 68 016 '0 ./8 8 62 / 763'
C 80D 3 "2 69 4 7/3 E F6 0 ./8 8 62 / 0
1 212/7P ?M1 / 0 ! SE 1C11/ 0 'U.'./8 '
/ 1 >E0' H 11.'. 68' 69 ' 18 /'/8 293
/ 3' 01 'd "/.0p 1 ./8 S6 2 '0 . 0. / '
.'(MS G4.968 .1 . ' 1 63f / / .621 903
, <.9 8X ^ 44401 R' 3/86 763

M 54GO ' 1/1. 9 '4 6101 /2. 8' 4.'
24 3' 4 1 O. E 4 1 24 /29'
[24 08 0' O 1'". '"268'. 1 "9' 6 0$ 1
8 8 06' 8 8 /7 P "1'"/ 6. .' :0 892 493
U' 9 1 3 '0618 /7 .E 1 :G . ' F6/ 68'
0j [0F60 8 E0 $0 . 8 ./2 1 16. 621# ' 6'
0E "4 / 10' 4. 1..2/268. /./8 .''
G9/ 0j "4' 8 12 10 'F6p'". . 6 498' D929 3'
1D6 p' 0619 8' 4 69 19E".'M9 8 /9 8 63 8 G 0 '
103 /32923 01/8 /30.' 8 . / 8 .3' "9'./2'
1 0 0 =944.'"2/ . 8 8 /7 '2/' 9 1 ./
4 61024118 'Hp.'.2 /'4. 1 661 1 2. 0
:G .0 .6 01 /'"26 3 1/O0.' 0 /2. 8 S# 2

. bˁF6/4ˁ9 1ˁ0 .6 63ˁ"9ˁ0 F6/ 6$ 8 8/ˁ 0 9ˁ06.9ˁ./>01ˁ8/.6ˁF6ˁ2016 0 763ˁ/8 2 Q 763ˁ./ / 763ˁ"9ˁF6 76 408ˁ ./2692 1$ˁ 04./F69ˁ2016 08ˁF6#99 1 2. 62 8/ˁ 63ˁ .ˁ./21 02.D02.98 2. 02/2. 1ˁ 4 6.02468ˁ N 9 ˁ061. 029F6 1"9ˁ/8 0ˁ 29"268ˁ923ˁ 08ˁF6/8/4/.68F69923ˁ 68016 ˁ 98 9ˁ26 1 .1030 D69.6 "7ˁ ˁ2/.0.2/240" 0.. 4923ˁ 29ˁ 67 .4/ˁ :0 ˁ 19 8 4 69 089 19ˁ0ˁ1/./ˁ 8 293ˁ 0 193 ˁ 8 6 ˁ2/24 1. 901/1/ˁ 268ˁ9ˁ 29ˁ 7ˁ .U1/ / "ˁ 01 /2.ˁ86 S .

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"M.. ˁ 0. /2.3ˁ :0 8.2 4 3ˁC ˁ . ˁ ˁ 9..0 .ˁ 2ˁ8019 0F6 0 0 !0ˁ0 1 8621# [)ˁ 2ˁ / 80F6 0ˁ2/2ˁ 949ˁ./246462.ˁ = .ˁ .2 2ˁ . O3ˁ 61 /. 20.6 ˁ T6/4ˁ 468ˁ9 1ˁ ˁ. 68ˁ 07. ˁE9 D/ˁF6/4ˁ 0] 462 2/29 1ˁ 2/2G079. 2. 68 ˁ =94ˁ "2 69 68ˁ 69 4ˁ F1 /4ˁ9 1ˁ ˁ 2/29 1 0ˁ 468 . D/2/2ˁG0791ˁ 2. 68 .F69ˁ04ˁ ./ˁ 29F69ˁ 298ˁ I D/ˁ 2 2 168ˁ I D/ˁ "268ˁ T6 0ˁ /2ˁ 1 21 6 0 1 2O0ˁ I D/ˁ 8 8/7 . F6 0M 8 0/..6 01ˁ C2/2ˁG0ˁ 799ˁ0ˁF6/ˁ 8/6.0 6 ˁ =94ˁ 9 1K 8 0ˁ ./2 9F6.2 0C=/ G 1 .0ˁ F6 0ˁ9 ˁ/ /ˁ
&& 0219.9492 3ˁ 2 9 .ˁ/ /C68ˁ9/2 9 F6. 3 F6/4ˁ2/2ˁ7991ˁ01ˁ40./ˁ"2/ˁ07 6 4/ˁ . "ˁ0 0ˁ 9F1@ 6 ˁ N0 68ˁ..08ˁ30ˁ 2/2ˁ G0792. 2. 611ˁ198 / 3ˁ 9 .ˁ 2 2 10ˁ 2ˁ 80D2 .64 2.ˁ =94ˁ29F69ˁ 9 ˁ /19 1ˁ "1ˁ /8 2 0ˁ 29ˁ "268ˁ ...ˁ 610ˁ 2/8/ˁ 8)ˁ .F 63ˁ I 0191 08ˁ:0 892 493ˁF6 /4 5ˁ 01ˁ ˁT6 .FC 4ˁ9 ˁ 3919 ˁ923ˁ9 1ˁ2/2ˁ1 13 ˁ S D/ˁE G ˁ 1ˁ923ˁ"268ˁ9 1ˁ9 D/ˁF619F6 4ˁ 9 1ˁ 8 9 ˁ"268 9 1ˁ2 G ˁ01F6.ˁ04./ˁ/8 2 0ˁ 621ˁ "268ˁ !68ˁ.2 8ˁ923ˁ4 .016 86 3ˁ ZE9S 3 49 4 1021 0 . 991Cˁ0.. 1.2 7113ˁ 9 9 08ˁ:0 892 493E.23ˁ "2/ˁ .2 Sˁ !96 26/.7ˁ 6EE 1ˁ 249 868 21.9949 13ˁ t f 68ˁ9 1ˁ-ˁ&"/ˁ 6808 0 67 102. 0C# 0.. 491 183# 94ˁ 1629ˁ 0 19 68ˁ ˁ 298 9ˁ F6/4ˁ.23 .ˁ"262 ˁ 0G 8 ˁ =94ˁ=)ˁ" /39ˁ !/2464 ˁF6 0ˁ 98 .0498ˁ./ . 64924ˁ 1 126 0ˁ 2ˁ0 4ˁ . 0 S#9.94923ˁ"916 8ˁ9 . ˁ=)ˁ ./ 49F6923

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3 4 ˁ"> % # %

Lˁ 08" 108 / // .ˁ 2. 0880ˁ R A Sˁ "9ˁ D2 3ˁ "9ˁ09 ˁ"9 0 ?ˁ"91ˁF6Oˁ894 11@$ˁ40/ˁ0 S. 8ˁ./2

.8 0" .9ˁ / 8 ˁ".ˁ 0 0 98ˁ Cˁ492 10ˁ 19 2ˁ49 9468ˁ Cˁ9 6 9 021 08# E"9 4 K ˁ 9ˁ 9 2 1 /2.ˁ./ 630ˁF6J I 4 . 6ˁ !G0/3 /8 2 0ˁ 9 ˁ . F1 9ˁ .. 91 /2. 01 * Mˁ /46.ˁ 4 9 21ˁ ".ˁ 20C202491ˁ I 8 Q 94/. 93ˁ 20 0D/ 03ˁ =94ˁ 20 0DM pˁ 2ˁ 8 .03[/81ˁ19 68ˁ9. 08ˁ./2 0 0 68ˁ80ˁ 19 03ˁ 2ˁ !G0/ˁ (.0 2 0F69ˁ" 1ˁ 0ˁ/8 2 763ˁ 9 9ˁ$F6pˁ 923 6 980 49 1M963 / . ˁ ˁ 01ˁ 09ˁ !G0/ˁ 9D 9D91ˁ G4ˁ /2 0ˁ 1ˁ 9 ˁ2 G / T6 4ˁ9 D/ˁ ˁ1 9 01ˁ 08ˁ021.030 /ˁ F6ˁ9ˁ2 G /ˁ 9 .9ˁ ˁ9 ˁ2/29219ˁ .191ˁ =94ˁ C./21 0 0" 4.863ˁ 9 ˁ7ˁ9 21 0 E=ˁ.0ˁ 40ˁ9 D 4 3ˁG68 409 .. 3 9 D/./21.0ˁ 0E2ˁ./01 01 3ˁM8 2 0ˁ 2ˁ/122 70=ˁ I ˁ 9ˁ 108.2ˁ 20 0D/ 084/!.. ` /F11 0ˁ 2 ˁ 2 10ˁ <796923ˁ 2. 0ˁ 9 08ˁ E 010 0Z68ˁ 90 68ˁ. 921 08ˁ 646 ˁF20.ˁ 2 2 10 1 2ˁ . 0./8 . 1 2/2 /19 1ˁ =99/244 F0 0ˁ 2/2ˁ/8 2 0ˁG 21ˁ8ˁ/28 763ˁ 9F/9ˁ92 2ˁ F0/4 791ˁ02 80 ˁ06.ˁ E 080$ˁ 17ˁF60210 ˁ 7918 0D2 164 2.061 01 1019ˁ 9 9ˁ / 1 2.# 94ˁ 93ˁ 2016 0193ˁ 0# 9 1 8ˁ E292193ˁ 4.ˁ 2 1/3ˁ G07981ˁ Cˁ F7021 01 3ˁ 8 1193 =94ˁ0.1 .ˁF6 46 3ˁ9ˁF6/8 3ˁ 9D 9D016 # ˁ9F F6 4F6 4ˁ 99ˁ 8 0 763ˁ 1 09192 8ˁ 1ˁ9ˁ 0F60ˁ1610 ˁ2 ˁ9 ˁ 21/ˁ 1V40F00ˁ= 191 =ˁ :92 F/9 0. =9 1 0 19 / 0ˁ 8 10FF9ˁ 2ˁ . 304 1019 9ˁ ?

! 012 1 2. 0 1 ` 2ˁ 20101 =`12ˁ9 9ˁ " 9/21 0 0ˁ 49 1/ /C0 0E1 04ˁ 4ˁ .H 8 2/2 0/4 "919 .3ˁ1 04 9 0 9 U4ˁ09 0Q 1 /23ˁ491`/2 1 019 02 2. 0ˁ 6/. F2ˁ 299ˁ9ˁ 9 .02 @7ˁE 91 .ˁ9 ˁ0 03 ˁ94ˁ9ˁ 3ˁ /8 2 0ˁ ˁ01ˁ 80ˁ !/2110 0ˁB *ˁ9 2 8/4ˁ T6 090 8 1 8 0ˁ9 0 P2/ 10 1 F ` 09/2ˁ 1 0 0ˁ2/2 /2Z 2 7ˁ 21. D9102F008ˁ ˁ 0 . 763ˁ 9/8 /2921 763ˁ E1 8ˁ.2 8ˁ ./21 0 / 2ˁ2/2ˁ./8 /2 1ˁ0 19 68ˁ /ˁ F6ˁ 621. .ˁ120 998ˁ./21 0 0ˁ102F/012ˁ 9 19 8 2 3 F@ 7 3ˁ /12/9 2/ `G/8 ˁ 29 0 6892/001 /ˁ 9F69ˁ92 8 F0/46 3ˁ 0D 1 2F0/46 ? :0 0 F /0 3ˁ N 19F6/ˁ .=ˁ !/ 1O` 1Oˁ 2ˁ F F46 3ˁ =94ˁ 0D .ˁ F6/411 3ˁ 2ˁ//2`0 2/ ˁE 01 01 ˁ0ˁ ./21 0ˁ /E 1ˁ 79/21101 / ./E18 8 16ˁ 2ˁ ./2ˁ 1 0 68

! . 6 .

1V"1ˁ ! 21ˁ29ˁ .9 9ˁ9 1ˁ F6 1ˁ9! 9ˁˁ /2ˁ 621 92 8ˁ .T20S "S1 12ˁ 02ˁ 2/2ˁ 89ˁ

S''　　=q M := =　　q !'

2 2 10' : 8/'.E6 0' 93'208 0 .3'2/2' /!A'
.21 . 921 0'./ 2 9G.24 ' =..6244' 2/ '
8 D.2. 9. 1"20 8 0'./8 0 .103'46/'
763' 9 1 98 3'. 06 0#01'./21 0 .103' 2. '
/ 68'9 1' 2'D929 .' 67 1021 ' 80 '9 D/'
2 10' C' 46/763' ./21 0 E3' 9 1 98 3'. 01 0'
I 621' 9 D/'46/'./21 0 0' 2. 0$ 0119 '
.E6 ' 1016.468'./8 8 629' 67 .462 'F6/F'
1'1. . 68' 2. 6 0'=)' ". 8'./21 E 0'
6 1 2901' 68'"91/' 67 1.1' 01F6.' 9 "10'
2.01' 2.F69./61 0 / 68' 0 19 61 '0469 '
.16 ' 9F6.'.2 8'/ / 1.1'/8 2 0' 2. 0'
. 9'./2110 0#0 8'9' 2. 3'./8 /202'
16 67 1021 /8 2.32016 0 93'F63'.'2//'
67 1021 3'./8 /2'2/2' U< 621

! 7 &# .%.

2 0. '5 0'9 D/' 621' 2. 0E4 /'./2110 0'
02/' . ..1'=)' / 80' C' "26 0'
./8 62.' 67 .1 1620'F6/4'9 1' 8019 0A' T60#
.9 19' 2'/8 2' 8 6101 /2.'10 8' 67 1021 0 '
F60 8 0.. 49210 '10 8' 2016 0 'F60 8' 011 '
. /30' 808 . 19' 49 9G924 16 # 1' .2 8'
02109' .8 2.'.0 46 ' D268'7' 1 D 4/'
\D2/#. 0.19 10160 =.4. 634 .21 0./D2/'
. 161 91' 8 019208'0 1 3' 1.2 20 93 70'
791' 04' 101608 '061 D6 08' 10161.# 9'M A'
19 0'04' / 808 ' I "1 F/../ E 101/1@11 0'
./ / 0':7 .0' ' "1M1 1 Z 3'./ 2 /'
2. 6 7/3'0.' 9'<.' I ' 601 /2.'06198A` A'
7 './2 101'2 ' 9'0.. 4921' F60198 3'
2001.1 0 0.. 4 1 .9.D9 9 06/ . 1 1 A'
'1 /2.8' 261 601

, ! + %.

' D.2. 0 '2 './ 6 0 '4 9 621'
' 'F6 408 'G/.'0446 1 0 D68901/A' ='
(F6 4' 1' ". '9 '9219' 1' "9'9 '2/2' 9 29' 0I'
`!61 /' 8 /4/' 1' F6 4FO08' /2' E22'
F6 0 089 1' /2 ..624/ F6 0 9 .1/12 '
G /'=948 0 9 T6 0 93 621S19219 M19A'
101.' 4' 9 1' 9 '8019 0' /03' 2/2' 91/'9 '
9219' 0416' 198'9 '2/29219' 0 6' 2/2' 10 Q
892'9 2/2' 9219' /19 1019 '1E6/4 / 620' 9 1'
89 682 G 7' 08' 8 019 0' 80' 9 1' 2/2'
.2304 6

" .%.

19 00 6 /`.4 .11' F1'J4719.'
1' 2/2923 9 9' 0 . 01. 4.23 "'
. .. 601 /290 9 9 1' :1EF9@0 20'
.1 0'04' 67 10`1 08 013.4 1 =' 9 802.1 '
./8 / 1 3'.68' / 8 3' "1' 9/ 68'9=6 0=1$
8019 N/ 8A892 8' 14@1 611 C7/268'
F6 4'0 0 1' 8 019 0' . 1 998 208 98'
1F1 9' 6 .7 68 '01' 601 /'2/2' 0 9. 1'
/ 208 .689 19M 1 0 ' /2D1/1 0'
K' 16 2/29! 0B 1618 019/0 979A.;A)

/2 0 621 >.08 49 2621' I 192 8 8 01 ' ' '
0 868 .'.6 6 F69' 67 46 8 '9' F6/A'
2 1/'0 F6 4' 1' 2/2' 9 '0.. 4.23$C' 2'
F6/4 'F6 4./1 /8 16 " 1 86 0'07 1' .'
/18 0 '0/198' 22F 'D929101 8'41.. 9'
9 1' 801':G / 7 7 A'M9' / / 3' 2016 0 '
763C.01E6. 349 2.. 3' <

A' '

@ 9 '). %

M 2 101' !0 1 763' ' 2' 4603 0 193 9 '
?A40J 3' : / . 1 ' 016 ' C' 41 9 '
2 2.' :GEH=.' 0' 0 E. 201 ./' ' : / 19 /'
49'.06 3

B 1 1 2 '0 0./2 1021' 2016 , ' "1' 021 9 '
. 9 2.210 0 00 3'.06 31 1 0' 2 16 8'G0 '
7921' 2. 68 6' 1/163' 9' 8 2189'
T6E6' 016 0' 1' `. 68'F2/440 0' C'
.06 0' 8 /1 3' C' F6 91 39 63' 9' 2' F60' 9 1
8 / 91' 9 0 '2/2' 9 0.. 4923' 016108'
07921 7 1021 0 2012 0 938 019 =' C' / Q
80' 9/2 10/ 93' =9.62468' 2016108' 621'
F603"6 D/ M!0106 / .101.3' 20.6 0 93'
016 0' 6E 9 '8019 0'C / 80 94G .'
80D 3 F6 0'9 1'0=@

& H 91 3' -9/89 0' 11/ /D23' 2 !'
' 4.8 "91 9216. 80D2 1/4 8 H3 . P .1'
/`4 = 12' ='Y6 ' 944 0E/'8 /4/ '
:G .63' 92 2 Z9.'./219 1 0161' "1' /21'
19 8 2' Z' 0 9 /2 3'./1 /16 8' 2016 0'
68 '01F69"1 81 28 0191 01 01G9 201 '
96306198'1 1 07 1' 0' 8019 0' :G .'9 1'
8011 08' C' / 80 /' 86'./2198 0 '
F6 0' "@ F69'//D2 1 /'9 1' 9 E F98' 0 1 3'
" 0191 2 94 ! =' ' 1. 19 F 0' 3'
"9 ='2016 0' 8 0@1' =94' C' 2 3' 0.'8 94 /''
168 .049891 .22 " 20 9 08 198 . 1' 04'
/ 8 / "1' 04' 238A' /2' / 4 '" '1 868'
23 .4/ 1 868 ' =08 238 F8 268 '
2 F/ 0/8 2 7/ "1 82 ' !/ 7 / 18 01.'
08' 13' F6A' 90' "1 1/ '+<' F6?' A9 1 .G '
194/0 .0' =/ CG/8 /D92S001G/8 8 .8'
=3 8019

@ 9218 D92910F6016/ 019 0'9 '
F60193 1' 9/' 0 1/' "1' 2 1"' ".' 093' 10'
R N/18 0' 01F69' 9 98 0' 6.' 4.0 F6 '9 1'
01 /'9 1921 ' I .1923 84. 868 2'
.? /8 8610 /2 ?S.F8 91 3#"1'./2 6[1'
01. 'N 2 3' 4'.6 63'D 01 0#"1' 02 103'4.01 `'
2 011/2 3' 2@39 14 6 62.' 6 93.06 2'
91' . !06 ' 621' 7 8 6 .98'.0/ 9' 498

> M ! 5 I ' : I 5 : I ! = ' !B

.06 0 9 9 /1. 1 ./8 01 / 82 ' !0 0". '
1/ 80 "9 98 / 0# . . "9 9 0.. .23 '
04ME . ' /1.21 0 ' ' 01 .6 0 38 '". "2 69 0 '
3 ' !06 0 0416 9 1 .68 9 94 6 12/2.06 0 ' '
/192. 0 ' 2 .06 0 68 269 0D01 /29 '04" '
1 808 ' /D 94 / / 1.1 I .; 668 ' 0 .6A
0 68 '.06 0# 011 .6 0 .3 9444 90# ' 2 '
69 0 68 '"2 69 0 .3 C 10 2 .0 19 3
' ! 6! M & .%. '

&E M 1620 C .0 @30#011 0# 62. ' 86 ./168 '
'. 1/ 162 28 .9. 4 29D921 F6 408 0P2A
193/82 / ` ' 9 949 2 108 ' .06 08 11E6 763
9 1621 0 E ' / F2 0 /11620$ 67 . 92193A
04.4F1 ' 68 './9 68 ' =94 G '9 021 ' F6 0
02 10 0 C 021 '.91103906 93 6 '/ .6370 '
7B 1$. 968 '"9 7 ' 4 6 2 2 0F69 92 1 '
7 68 9/498 ' 98 91 19 / /19 './2 10 H '
29 . .6. 029 M.08 '0 E N/ 1620E2 91 '
21 14 7/8 723 20@2 108 ' /2 9 1
7 1600 2 3F60# 9 ' . .8 . 9/491G 2 ?
/ 221 '021 9 68 F69$ 94 F60# 0 / '96."
1 18 1C 9 '0.. 4923 'C 02. ' 6191 /298 '
1.2 810 3C / 12208 ' 3 F6A 0 .6 /3
D 01 7 621 ' ` . 0 1051./2 O/ . '2016Q
9 N/ 1620 DS6 9 1.06 0 910S 49@ 2
13 F6A[. 9 . ' 1 / ` 98 1.SR ;'D 01 7 621 '
! 0 9 061. 8 0263 0 99F 1 0 0/4 2? '
0 9 1 1) ! 5& . '9 1 '2/2 './21 0 4 .4? 1
#0 9.00 ' 9 '0.. 4921 2 3 0 ` .6 03
D 01 ' 6 1 ! 0 @60@ ' ' 0 39 @0161
#0 71 2V 7 A 1 @ @6 1 ' F1Z1 eA29 @ /
' a ' $ Q 5 (4 ? ' 4 4 1 '
'] Q U Q ' ? ' + ' ? ' ' 1 N ? U Q C "
] Q A '1 + ? '@.> T '1 (G ? ' $ + 3
$? 1-

+ ' N ? $?'+1 Q '5 ' 1 Q ? 1 '] ' '
' ? '] Q 1 ' ? + C 1 1 ;'&?^ "+ '
R+ '5 1 $ '1 $V '] Q '9 ' G 5 1)dC '
14C29/= '9??0=D106 9 1 9\ 3 ' H1/./
5 ? 1 V $ Z ¡U% Q C " ? 'V ' Q ? ? 1
71 Q 1 $? ? D N ?)1 ' $U ' ? 1 $"

' * , Q 1 1 N V $ ' V G ? + ? " ' B ' , + ? Q C '
' D)'N 1 ? ' ? 5 $ $? + '+1 'g Q 1 '] Q A '
Q ? U ? 1 5 " ' + 5 ? V + $ 5 ' ? '1 ? + "
V ? $ Q " ', $1 ? 1 ' $ 5 + ^ Q ? ? H
5 '+ ' ? ¡ 'T ' ' ' 5 V ? '? 1 Q $- ' 1 C ' -
? ? ? ' C " 5 ' 9 $V ' [1 ? ? ' '
' ? 9 Q C ' N ? ' C ;' T ' $1 + C ' Q ? '
N ? ? ? ? ' Q $ Q ? ' 5 ? + 1 M 1 '] ? ' '+
; $ - " ', ^ - + = 1] Q 1 Rd 1 Q $1 '
' + ? + = '1 ' ' G 1 5 '] M ' ' _ Q C ' ? C '
N 5 $ 5 G 1 1 + Q Q 2 1 7 ! ' ? $3

108 .2 2/2 21924 1 ' 9F6. ' . G2 2/2 1 0
/46. 1 09610 2 ' 8 .4 10$ 4./ ' 4 .62 '
16 9..0102016 ' .. 20.6 0 2/2 497 ' (
791.FG 2. ' .F6 16 2/2 0D9.9 /7 98# 1 0 '
92 82/24.O7. 01 0 1.8 98 . ' ..10 '
`1` ' 349 2 1 / 910 / . ' 298# :91 '
. 1 "9 7 1 90F6 '201610 2.F6 1 9 .9 1 C ' ?&
9 97.F604012 8 .16 ET6/4 13 0 '
'6 61D101 =0D 2 ' jS 4 /C 0H110 '
! " .%. '

' I.. 10340 .3.# 7 10 ' F2A9 10?
' < '8019E 0 = . '07 / 61 '29.. 62 '9 1 9 ' ' N
08 '9 '4610 0 F6 09 1 91 90 H /1G91 .0 '
F230 29 9 /112 6EF1/ 10 # = . '29.9 9
4 ' 9 012 9 946 021 ' F6 0 04 1.0246 8 9 1
./8 001 1 0F6929.. 103 2 1763 :7 '
P 3. 1 &7971 " .19 91 408 '0R146108 9 '
8011 08 93 691 211 0@ ... 103 ! 8
9 . 1. 2201 1 0 763 '1 / 1. 2019 # ' 94
/ 1 /0. '9 1 ' 29 2! F6 0 / 'G 0F6 *
? C ', '1201S 29 C ' D929 /2 3 '9 1906 0
8019. ' .78 ' GS. ' 9 / 19 ' 08# 8 @
./2110# S49 2 3C /180 10S S / /1
.F2 4. 0 1/ 3 2 : .7 ' .9.2/2 129 '
D 240 2 1 19 0$ =94 :G .63 0 1 F69
/82 3 7 /1127 C /9 03 46.621 49 2 '
1 /2.3

N F ' . ' ' ,1. . "

. 791@ U] - 1 $ < 3 V 1 ? " : / '
, '5 ' G " ' ' _ U ' C 'V 5 C '+ 1 V U Q C ;'
a . $ ' $ '5 ? ? '$+] Q C "

I ; 6 ' L , '
.. 9 '1968 '19. ' 1 1 9 G. 68
; 14 '8 /@3 9 1 49 D921 9 './21 26 / 68 './2 '
(1 '0648 '0618 '@ '4 64 7 9 2 2 2 168$
> 9 0 / 1 D 1@ ' 999/428E ?1C '19 /./ '
"096/ 198 / F ! 29F6 763 8 /1632/2 9 1 '
CF6L/ ` 8 711 C21. ' 2SO2 0 ' >9./8 " < '
@22 7 0 119 ' 874 .92408 '921 0 0 0 0
2 1 ` 0 0 8.2 C 01 16 ' ` / 1@2 01 649 1
29 0OF84 99 ' 07 021 0 '0 914 10216 8 ' ?
10P V=1. ' /1 06 EC 8 27 1. 921040 '
F2 ' 2163120R 4 11./20 3 2 ! 7 102 '
10. 1 / ,2S1019 F60Z101. /./ ' T6/. '
99 9 98 3 ' 1/1 = ' 8 /@3 ' I 1 D .6 '
/@3 '0 103921 3 > /1921 0 '"1 9 1 0 9 '
=19 0G9 01 / ' 9 107 /3 0 1907 9 '"1 9 1 0 '
1. 9 ' 9F1 907 /14@2. 1 49R '9 9 '
26 0 /41 /1.1 1 7E . 1/ ' 4 69 7 6E2#
93 92 111 F@9 @/8992 ' 9 0F60 F6

F6 6 .#9 1'"9 /' 2' /1921 0A'F6019263'
1. 1 63.0 / 30.F6 9 .' C'04 6 ..2'
4 9'F6/'2/2468'0 9409 1$ 1.'9 D/'8 /163'
046 8'U# /.92. 0 2' 8 3' 26/ 6 .#0O/F6'
93'F6 .0216 8 8' /1.2. 09 1' 2/2'4 . .2'
8 /09 ".'=)'F6 '.02.68'9 1' 2'046' /6.'
16 '"9 /'/8 29'8 /693': .6'F6/4'9 1' /'
.921 4' 8 /7 9' ';' .6 63' 8 8/> .03'F6 93'
9 1' 992 8'0D 1' 2 /B#'8 /6..$0.'G/.' 0. 1'
9'./2 046 2'9 D/' 6 16 . 1' D 16'
63'0.163' 8 /7 3' "1'8 /7 9'9 1#P8 ! 06'
19 0'F6/4'8 /6.. /2208'0 1. .' 2'8 /7 '
9 D/'9 1' 8 /163'0' 8 /1 6/' =94' "1 6 F6.'
0.163'9 1' 8 /163'F6' 4 .46'8 /7 1 3 0 /A'
4 .46'8 /6921 3'04 8'9 1' . /'06998 '
0 /'"263'9 1' 9 0'0463' 94 01 /29'8 6 '
2 . ' 1'" 049" 79' 1G.2 .2 '04'" 7.8'
4 9703 #49' G97020'04' 90
498 9 1 9' 06/294 9 10' /74 691 110..8'
1922 2/ 68

!,7'<,9(%.' & R" ,3

: H' .'9 1'0D.'9'49' 2 1/' / 19 '8 /'(
.68' 8 0D2 164 8 9 2'.98 63' 2'F6 763'
. 1$C'F6 0'".1. .3'49'9/'.D.'62.' 6 2F6.'
2. 68' 9...' 1': 1G0D 9' 0 921'
26 6. 68': 01/8.' W00D268'C' 020 F 1'
.208' 2' 49 3' 2 2 .0198' /2 f /@' >9Q
8 /. 163' C' 20 0D/ 03'01/8 /3' 2 2 193'
G . 2'G/8 / /8 9 0' 0.1 6 8 "9'
101. 9' 2'./ 6 .6 /8 8' 02 . 2 4' D6'
3'4 . 92. 68' E'12 168' 9'9 .' 8'
. 68 101 .7021' ".. 1.' 2D.8 8 8 2'
./ 6 1 7 9 /8 2 0./21 293'=)'D679 2023'
6 2'68'C' 8 8 / 10 926 8 92' >0 ' 2'
.621' /701'1.8 63 1 2. /C 6 1'.0 923E'
2 0D2P64/ 2 2 194 6 460ED929 01 /293=.'
./ 6 1 /2.3 9 91609$8 .23 2 2 .6; ./'
D 1023 = 0116 8' 2 2 .68'9 1 0'.43 /3'F6/4'
F6 498' /19 1' 8 2P6.M1 63./8 94
' ' 640 10./2. 297 .' 08' 2' S 9#6 3'C'
. 2 .. 2 3 498'. 1. .0.' /0. =94' /20'
.6 '2/2' /201O' 1 2 .08''"1 2F69'4 1'
A .6P03. 1: G ./4w. 4.2. 0' > ! .6'9 DM'
2G2 .68': 89 F6/4'2/2' /1 1' / 1 0 '
F6' 0'04'G/.'0 108' 4 '. 1 !.'"/ ' 2'
6 7 3' =9.6247A'F6/4 . 1 02 0 1O8'
9 1' 94' 29'UP9 "1' 9 9.' 2 2 123' /.63A'
9 1 7'F6/4" ' ! 0 ./ 'j0/' 0 1689 1'
1. 8 26806. 29 G079 9' .42/2'7079B'
046 1. .6 S3' T 8 2.7 F6/4 M19 1 2 1'
2 .9'06D. 1 1'2 6 8 9 8 3'06B' 98 9'4 2 4'".'
8 0D8964/A

'! '2" . >! %%.

M2'4 6 2 2 161' ..624/8 /4ME0
92 7 13' 9 0.016 8$'J 1..'92 8' 9

' 7 108 0'C' 9'. 9 .6#4 6 7 .'F6/4'9'
6D 1' 2 2 19' ".' '.. 4923#C#' 9'2/2'9'
.1' 2. 6 8' 94' 4' /. 63'.6' 29 .1$=.'
! 6244 9 0 010'0' . 763' 8 0D2 164 2.8'
2/2'G07.2 '299'26129 6 "'9 $ 863'4 6 /'
G9./2 6 219 8' 2'F6 763 / 3 2 2 168'
9 1' 6 6 8'40 6'./ 63' 92 7 9' 2 2 ' '
6 8'/E22.'.2 12'./ 63'9 1' 6 . ..'1922 '
20 8 20#299'26 8 92 3'F6 0'/8 3'. 1268.'
07 3' 0497F69' 1 02 ' /.. 14 9 .6 $'
1' 2 2 168'2/2' . . 02 16 ' : 1. .0'
26 68'./ 63' 8 9' 61' 8 968 2 2'
168'9 1'9P8 92 092E8'.9 1/'268. /'C' /''
!M /21'./8 9G92 0'# 10'"9E4 .'. 9'
8 .8 3' 8103'./2 1021$' /2'4016 '9 D/' 2'
2 .68'040'G& ! 019D/ 98 01 . 94'4016'
2 2 168' /192 0'F60 9'9 1' 2 2 168'04'
4 . /29' "1'2689 63'FR' 2 06D. ' /'
.9 1$G& 2 2 168'4 6 /29"1' 8 0D .64/'
F6E. 18 9 4 O 4 /1. 1'' .68'2/2' 4916'
"1 8 0' 0 4' 2 2 6'E2'19 0 M ! E0. 6...'
/2.'./986 'D92. 01 18 6' 219 8'".1. 93'
80 94. 2 . 62. 2 1168'9 1 0'F6/40.'
. 9 9'2 G1 . #d .'92 8'"2 69 68'9 91 6'
6 1118' F0 09 1 0' 1 64'2 G '1. 101S0.. .'
9'594 634 . O. . 4'.6 63'0 F6 4'9 '
1 0 98 9'9 1 08' 2 2 9/ A044 1 /2.' 9 10.'
98 9' 0 3'0449240''4 6 /29'04 89240 A'
>7 96 68'9 1' 2 2 168'G& 80.. 0 I 20/9'
2 9' /6./ 616 'H /1G9 13061' ./'
.8010 Z404 ! 20. ./ 28' 17 2/' 2 2 ./'
F6 0 P91O2 ' 2 2 103' /46.' 6'
79021 2/..0892 / 4'./D 101 /2.' 0. 62.

' #&+ .

! 10'G0791' ,' 0 193'1 93A' : 20'9 1'
49' / ./#'=..S240A4.'"0.6/#' 8 0 '49'
198 / 9

&! %.

> ' /.M 9 9:7 . 9 1A'F6 0' 9320'
!6 , .31/. 2 u.M C'8M163 1' O/#'
/.68'. .' /7018 /163 /.0 3./ / 6$'
7.9.2/2. 9'F6 408' 80 9'./2. 64021# /'
83'92 8@ . 1./8383 'F6 6 0./ /'
,'.U2J 291 . / 63 F6'"2 .68' /.63'
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= 9. 93' 2D929 .#';98 13E2 .. 9# .. 4.2L'
2 67 9' 1/ 6. / 8 0' 2' 8 01. 01 - 079 '
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01 /2 3' 8 / 7 03' F60#./2 9F6. 9 16 1' "0.668' 64' 4 91' 1 20' 4 892 / ' F608'./ / 0' .2.1 01.21' =94'29F69' "0Q .668' ./ / 763' 9 .68' 048 11924O8' 9 1' .91'0 0' 0 0 0 0492 0' I 19192 810 9' "0.668' /78 /168' 1' " / 621' . 630 192/A' 93 01G/.' 0 68 !68'. 8'4 .021' "0.668' . . 0 101 3C .6 101 3.06 08 'F6A' 46210A' 01' 168' 9 621 '"0.668' 64'048 1.92.' /7' 8 /1611' 96 68'102 18 F6/4'07 6 428' .2 8' ./2..46`1'D10 0' 8 /6. '49/ 62' 2016 '2/2 / 19 2 11168 "0.668 !6 ' 2/2' 0 '8 /40 96 0 9' 010' 68'12/69 ' 4 .921'2016 0'C' 29' = 1 0' /'"0.6/ '1'.A' !94 1 / /' 0 103' C' 492 103' 80..1H.'07 ' F69' " 63'.9'2/609'044 11/2.'08'< ..4 /A' 29101F6.' "1 .69C 8 /H. 9F66216 10168' .'D 06.'C46 08 '492 68' 94'2/2' 92"' 9 FF7F6 44/ 163'. 1 .M ! D 06P 3' 59 ' 68'32 8 '461 93'9 1' 687/' /9.'10894' D 06 63

' '198 / 9'F603 92428 2' 'F6 4B' . /24 . 4.@1F6 0'.?63' 0 0.3'2/2' 181' 2119 <6892 8 /29 101 2 09.' ' @1 62' =94'2 9'464' /19 1'198 03'9 9 0A' /29 16 .21 8 /892 F6 0'8 /8./ 68' 2/2'9 1 0 31921 / 9 3'29F69'198 H3'./2 ' 1098 /892 3' /9' 219. 113' " ' 011 763 U 4'"1'1911212 3' J ?S6 0' F6 408'198 63' 4 9'./ 89 /`98' S9' 8 /168'./9 ' ' 1E 9 98. P23' =94 =34'1C 81.8 63' 2/2'49 2 1'91 9'4 9'C 6/ .91'./269 / ' 698 / 63'2/2' 1' /7 7 61/3 94'C' 8 /163' !6 1' 6 93'C'4 6. " 'C'.8 '86 1 01'19 2A' 63'9 1'"228 1' 498'"7 F6S >9/ FS98 / ' 163'"9 /4/1'"9'10 4 / '4 . 119 '?/2'1! 8 63$' =1 1 / 98 / 949 2 @ ' 08 8 / 63"9 / ' 9 1F6/'8 /7 19' 06./198 / 9'/24168 0 ' 1 E ! M` 9P 0 063/ / /2 ' T6 1'F '4 .0.' 198 63'1.HE / 94. 2 B' I /198 03'2/2' 9 18 /83 !6986100/ ' /29 110892 29' 23/16' !482/2 91.. 9/ '0/16? 98 63' 2/2' 91. 0861841@8 .24/ 49'19 2' ) % ! /'9 1'0 F6 4' 8 /11@A' 18 8F6.'06198' .M` 8261'9 1' "1C 0D/ 164/ ' = 949/2' 1 2/ 03' 84./8 9 1'?0D0 24 2 49 2' 49' 8 /16 '192 7'198 / ' F60 9' ".' 6A C' / 91 63'9 1' 2' 8 0D2 16 2.' ' .'C' 2' 8 M1114 .91' 2' 0 .1802911 ..E 2 ./.' 6.' 99 `6 .' Z9 D/ / 8 63 6 ?91038 /16?' 1918468' 1 23'C' / 1. 63' 62.'92G2' 19 6d' /D2/ . 86; ! @S 91192d /A' 9'= /1192/ . / /123' 0 19 '8 /.68 68' 4 1 2D11 863'E' 21. 1 / 9 11'C' / 19 / 98

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F6/ˢ19 8 263ˢ04ˢF698ˢ>92/8 2016ˢ 26ˢ
101 /019 8 2/04F698ˢ N 1ˢ/ 22 3ˢ 8 610ˢ
1 /ˢ. "2/ 20O64ˢ"9ˢ 219ˢ19 8 2/3 / ˢ
1 6/3ˢ .ˢ29D01 2/3Eq9ˢ19 8 268ˢ0ˢF6/ˢ29ˢ
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F6/ 68ˢ 3ˢF6ˢ 9ˢ 1! / P 6/3ˢ 610ˢ.0 ˢ
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F6/ˢ / 6, 8 Cˢ04ˢF698ˢ2.DC 668ˢ./ ˢ
6 1 /2. 8ˢ ˢ; 929 02/ˢ0 0ˢ / 9ˢ79ˢ 8ˢ
. 19 F60ˢ 1ˢ O7 101 0 "1ˢG/8 /$0 0ˢ 9.6ˢ
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1 / 498ˢ- 929 0. / 67 1021 0 3ˢCˢ./ ˢ
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0 8 # F6 0ˢ8 /163ˢ9 1ˢ0ˢ./21 0 /ˢ 2ˢ./21 0ˢˢ
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E 118 #29F69ˢ04ˢ . 01 /298$F6 0ˢ2/2ˢ 246ˢˢ
. Jˢ8 6101 /298 #2.F69ˢ04ˢ 8 /168ˢ 68ˢ
8 6101 /298 "9#40 .16ˢ92 8ˢ8 /163ˢ8 /163ˢ
C8 6 0 X; 8 6101 /2 3ˢCˢD.2. 01 /2 3ˢD9 ˢ
2. 01 / 8 8 /7 9ˢ4 . 16 9ˢF6/4ˢ2/2ˢ /Q
19 1ˢ/8 2 2/2 /69 9ˢF6/4ˢ10 4E 8 .#". ˢ
F6/4ˢ2/2ˢ8 /6916 F6024/ˢ"7 F6/8 /ˢˢ
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' ' .9 . 4 . 16 #F6 .3.2 8 . 1 /163 2./ / '
. F6024/ 7 'C'F6/'8 / , /' //6. E20168'
. 7 60. /

= 86'90' 6G1' / . / ' F6 '"2/' 2' / . /' 621'
87 ' =9/ 8 F6 '4 69 /' 02D621'
3.0EF6/ 689 1 .80 6`1 86 ' 219 8. '
4 62 04F6/4 0/7 94946. .6 '021.F608
04" 1 868".2 01' ! /21 2.219 '8/6. '4 '
. 16 .6 638 /1632/2. 1 219 6 163 ! /2 '
1 0 0/./ 6`! ' FO I 8 6 1684 1021 2 9 '
4 0 2. >. 2.9 3 9F6921 0 68 8. F` '
2 G '9 1'9 6 4. 8'D929 3' ! /G 921 0' 621'
F60B'/E 8'49 2.9E 3' .F6016 '102D621' ! /2 '
/260' 6M1E 1' . /7 921 94'F6/ 08'9 1 9Q
80' 621' "8 8 ' 2 103'4 . 9'0' 62C/ '
F6/4 8 J1 22102D01' 2908 'C 219146/'
8 10 1' 290#"2 103'06198'2 G '102D01#
C' 2 3 908'C'0 19 08'2 G ' 1'894 68

' M163'"21E3'9 1'D92.1. ' 9.19'8189 / '
E - 92. .' 'F6'04"8 8 498 F69D9263'
8868' 69'!019D/ 01S1.4 [' = .' .. 9 '
1 /' C' >9.1/1 /' G 21' "263' 2M163'D92.1. '
F6 0' 621'. .0F6021 101.2 ' = 9. 9 'F6 '04'
.084.2'< 9. .' 1 2208'192 1 1'"1'46A'4.0 '
701 /293 040 7. ' S.12' =#)M' & +'4 69 '
= 'F6 'E4'4 09 03' 99 9@803 490173 '
1 / 2 D 01 9 ' 2632689 M F6 07 7 014'
=. 6 9 021 4"/639 1' `1G .19F6 1 1"068'
8 /7 9'262@1/ ' 208 20 291/ /1808 '
6.'19 16 26 1104' F2. 8' ' C' "2612'E@ 8 91/'
198 63 M2@ 2/163'"/0 3 .+1 2603'91 0 0'
9 1 C./M1 0' /2' / 39 106 9` 9 .9/2 '
2663'2 ' 498' 1' /11 3 8' 7 9' 498 ' ;#
19G 63'8 2 89' 219 6 1O8 ' /1O30F60 '
7 3C 2 /\$8 3 "2639 1' 23F007 38/ '
163463 621.00 .' ' 90 68' 8.F607 9'C'
1/116/ 68'3=9 8 /6.24 01 / 2 F60 3' . '
&A 9 / . 103=11014 103'2 / ' 9 1'4 C 921 '8 / '
' + . '163'E6 I'9 63' .F 9 F6 0'/1 20' %/6! '
' 692 621

'8 /163 / 1 9/21 0 ' 1 'F6 9'1. '
8 2 3'. /21 0 3'19246 1' 0,' . /21 01 /=#
"1' D1/101 /'"1' 801 / 8 /6. 9 8 'C'
8 /6. '4. /1 68 ' 11. C' .1 019' 'T 6 ' '
2/29 0 6/ 396219'. /2 56 /' 01 9 '
2/2'2 D / 'F6 4 08'0 768' . .1'8 6F /'
9 91'2/28 /123' =621'"91/'. /21 01 0'. '
61 6 /293'F6016 8'19 8 2' .' . E07921$
"1' 1. 0 ` 3' 0' ' /' " 63' 1'19 806 =04'
A'F6. 8 0 1. S3 H /990 28 /4/'. /21 0 02'
16 'D92. 0 /'C'. / 6 1 / 2'. /21 0 3'89
'4 6?0707.21E 63 1 S?' 62@' /21 0

R 28.4 68 ' C'9' 894 /' 2'. /21 0 68 '
626F6/408 8 /4/'. /21 0' E$F6 0' 894 68' '
04' "1 68 791'9 1 9828'. / 0168 ' 246 1'
01 /29 :' . /21 0 E' 1' .68
0 7/'C'2 D 7

, #0 &6 0 .

M163' 8 /16' . /21 0 .' / /2 16 '
F6 13'8 /16 601 6B' /2'F60 79.'
F6 .3'.6 791' 8 /16' / /2 16 ' ' 94 'F6 93'
2'9/498'D929 9' 2'F6/'9 1' 8 / 63' T6 93'
.2 8' 2' / . /'2/'/ '/2 16 '.0 . 0 1 /2 ' 94'
8 /16 04968 / .68 ' /1632/2' 046. '
16 'F6 .1' 2'19 8 2/' 04' F69 2' 94' F6 .1'
2'19 8 2/0'F6/$F6 0' 8 /1'63' 9 2F18'19 '
8 268'4F6/ "1 D2 3 /1 68 19248 3 1. '
0 8 EC 911H 041. 8 268' 04' F698 ' 6 0'
61 610' "7 'F6 9198'/ 101' "1' 2' /1'/'2016 '
0 '<01'2 7 '1924 1' 2'. /21 0 68 ' T6 .193'
". 4 2 /. 3. /2 0 3. /21 0 P 621' "1' C'
8 /163'04 H03 1' 8 /163'0 63'1 016 0 3 0 63'
" / .2163# D2 392 8' /8'06. 0A' 20663 '
8 /16 4. / 68 1 64 6 " / .21/ .' - 929 '
01 /'C ! / 6 1 / 9. 99 /C'>9. 91 / 0 F'
016 0 93' 6. "4/F6 161' -! . 7! ! '/'
F639 9 !91' 01613' 9D9' 621' "1' .68' 93'
101/'198 / 9'/ 6216 E. 9 .62 4..19 .61'
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4'. /21 2D621'C' 621'" 1'0.9191 / :93' 0 '@'m] '
80 6 1. 2 8 9 . 7/C49 1 3 F6 763"1'
D 201`10 ' =94C0 9 01 /293" / 9210 '
@610 93 2'0D 9'.. 96216 '802 . 1. 68'
9218 G9102161 ' &8>(' " &'%/
1 E 4 1' ' 0 10 09 10 9101 / 'F6 0'
1 2016 . 8 ' "9 7'4 9763'2/2'. 1 . 3'
" / 9210'9 1EF0 0'2/2' 1' 9D9'2016 0'C'198 '
1/ .' . /2 6.1/'09' 4.7 /' 2' 2 /16' 06198'
! 016 0 ' ' " / 1 11/' 8021 9`0'9 1' . /21 0'
9.03

' 791' ! 0 10' 'G\'F611 63' 0D 16 '49'
'.M 11 26/'8 0D 164@9' '8 / 6 '198Q
/ 9 ' 2 1/ / 2 1/ 4 0 7 24 6 7 '
=68 809/168' /8 2 68' .F0901 723'. /2 '
1 291 '44P6 2.21 3
0 4!6 @0 `
68'. /21 2668'. /2 101' 24 6 7 '
763' 29092 8 'F20 809 180 '
D2 164/ '2/2'. /2 101' 68 1 3 '8 /163'2/2'
. /2 101' 8610 3'9 9 '19 2' 23'2/2'. /8 /2 '
16 '8 / /921 3 69 2 1021 763' 08' ' 290'
9/2 10 9 62 1 3$' "9' 22 0'. 92 . /2. '
260' "9'. /21 D20$' F6/ 08' "8 8F6.' 0

68#.E6 0./21 260' 621 ' F6/ 68'9 1 0'
621' " 68$./2. D60 F6/ 68'9 1 989 621'
86 ' E01' 6240'.0 921'9 1 98 3'29.' 0 193'
G07.0.' 1' "9 ' .9 9' 9' 4. 2.9 3' 9F69 .2.6 #'
0.G/.9. 0 2 0 6 2 ' F6 090 9' 4. 2.. 3' 9' '
F6 2 6 ' 219 ' F60#' 2 G ' 9 6 4. 8' D929 3'
. 1#' 94' 219 ' F609 791'46/' 6240 2.9 0.91'
2.0 ' F6 ' 04G6.' 6240' G079 ' 0919 .0'
./2 G1"268 F6/. F69. 3 ' F60#' 4 6 4 '
1 #01'/2 29'./21 2668'4 6 1 16 ' 2' 0 193'
4 6 7 .3' 2' 2 2 .68 ".' 2.0' 2' 2103' 8 '
2/ .3C 8 2/ 93' =621' "9 7'. 6 498' 01 / '
2 3' ' C' .. /.02.6 ' 219 ' 9' 8 0D2 .64/ '
2/163 ' C1. 8 63#F60 9' 8 0D2 164/2/2'
./2 101' 24 6 7 763 ' 29F69' 498' 8 /163'
&1. 8 6 "9'./2 1076211.02F60 0' 0 . 763 '
<6 9 ./2401'.2 8' ./21 2668' 24 6 7 '
763 02F608'.. 8 2 3C./ 6 3' I D/' 8 /Q
7 9' "9 /. 6B BF20 ' 198 / 9' 8 0 63' 01 68'
1 02 7 1' 498' 2' 8 2/ ' 198 / 9 9 .6 '
9.' 01 68' 0 F60 .' 9 ' F6/4' 10 4 63' 2' 8 0 /' ' &
!# ' ' 49.6 1' 198' ". /. 63' 2' 8 2/ ' 19 / 9'
0. 612' 80 63' ./2 . .1 ' F60 2' 10 4 63' 2'
80 / ' 0D2 1649' 06198' 2 2 .0' 042 '
198 / 9' 2 1/E . .6 2/2' /19 1 ' I 1./2Q
1 0 ' F6 0' GE..67 1. /24921 ' "1C 8 /163 '
T60"926H63' 8 /163' H9 ' 2' 2 1021 ' 94' 2'
198 / .EF6 0 68 2 1023 ' F6/4'. ' I 2 3'
99.9 1 ' C 2 1 68 6J 2 ' V! 1' 248 7 9'
)%EV' /2' .9. 08' F6 93' 2' 8 / 8921/ ' F6 0 6 9 '
99 9' 4 . 16 ' 4 ' F6/4'.68' 0 ! 68. 18 /69 '
2/2' 8 /6.16 M82.' F6/48 /6.16 4 6 '
E 7 .' 9 1' $F6 0' 0 1 8 9 1 2' 19 8 2/0F6/ '
011 8 219 8 2/04F698 ' 2"1 /F6. 8 '
9 949' I D/' 26 68' 24 6 7 .' 8 /69 '
16 2 . 0 64 ' > 6 4 16 ' 8 /163 6 .04 '
6 1/298..8 / 3C 8 /7 3' /7 1. 0'
1 68 ' 8 /163 ' 19 8 263' 04' F69 2 ' 8 /6. ' C'
98 63 904. 8' 0. /2.' 4 6 46216 ' /7 9'
0 6. 8' 89' 4 6 46621' 9 1 ' .S19 0' 9' '
68' #<94' 80 89' F60 10.93"F6 98 /.6' 0. '
F6 62.6 #') 6' 9H 8' 2/2 . ' 94 9 ' 8 /Q
7 9' 4 6 7 93 621
T6 4F6 48 61016 ' 9 18 268 8610 '
168' 9 1 ' 2' 19 8 2/' 9 1 ' 4' 9 1 ' 2' 9/' 2' F6/4'
86 01689 1 CF671.24.701 ' 08 F6 4'
8 61016 ' 9 2F6 1' 10168' 6.' / 8 012' 2'
F60' 9 0. ' C' 0 168 .' .08' 04' F60 8 1924 6'
F602168 F69' 07 . 1' 49' 19 8 2/' 0' F6/ ' 102 '
162 ' 0.F6 1' 4.' 19 8 2/' 04' F69 ' =94' 4' 2'
F6/' 89' 8 61016E2' 9 1' F6/4' 8 61016 8' 9 1 '
029' 9 1 24 6 7 9$' 4 . 94 F69' 8 610168'
J 19 C' 9 /2491' 2 102. ' 198 / 3' /2' 40 '
16 ' 2610.68' 9 1.' ' 2. / ' 94' 2' 29'
' E2/1113' #2 G ' 92 8 8 61016 8' 9 9' 4 . 16 2 J

8 /163' 0219.. / 1' T6/4 2.9 1/' 198 19'
89' 8 61016 ' 2F60 791' 0 19' 631.E2 '
/ 329.. 0 7' 8 61016 ' N 2 168' 01 62 .'
198 / 9' 2 2 19' 2/2' . 1 02 16 E2 ' 0 '
1 68' 4921 498' 9 91016 ' "1' 1' 2' 8 /.6'
./9 ' G ' .1 08' F6 . . .' 198 / 9' 2 2 1/' ' .'
593 2 10 2 2 108' 8 0D2 1 4 298 ' 2 2 0'
2 108' 8 0D2 164 2. 8' 2 19' 198 / 9 9 '
1 02 .' 2/2' / 9 1 29F69' 2' 90' 1 498' F6 . '
99 9' 6 63' 8 /163' 2 2 163' 9 9' /19 1'
198 / 9' 2 19
M 8 29' 1023 ' 4' 9 1 ' F6 .F6 4' 8 /6916 ' 04'
10168' E 69' F6 .198' 2... 1.' 9 1' 8 /69 '
T 8 .F6 4' 10. ' 2' 198 / 9' 101 ' =10 9'.2 8')'
9 1' 8 /69 ' 04' F6 9..8 8 /6..6 0/1982 G '
2 ' 2' 198 / 9' /2' 4016 [1 8 0 0 3' F6 . '
1 3 ".' 29F69' 198 / 3 ' T6 93' 9 1' ' 198 / '
.' 90498' 92 8' 8 /163' C' F6 9. 3. 1' 8 92 6 0
! /2 6106 1' / 8' 86 F69' 4. 1' _92/ '
2. 8' 8 /168' 07 6 4 8 .' 29D02198' ' 7> E '
D.293! 2 .63' EF6 ' 064 1 3_92/2 3' 0. /2 '
763 ' 6 9 . 2 9G/ ' 29.0 .9 F6 8' ./Q
08' 0876 004/' 9 /24 1' ".' 0 1' = 8 . 63'
./8 ;W 2U ' :G . ' =.4 2E4.21 63' '
1/1. .3 ' F6 ' 29' 24 40' .063C' _92/298'
40829!E! 63' 01 ' /293' 0 9 1' =)' 446 . ' = ' 4016 '
8 /163 2F6 1_92/ J09F69 2' 8 0D2 164 .$'
.9 .9 2 19' .8 / .' 2 2 168' ./ . . 6 E'
F6 0' 2' / 8 2 ' 8 0D2 164 2.' 621' 2 11` '
0 193' ' J./2 9F6923' 0 62 1' I D/' 2/2' 40Q
16 ' 8 /163 ' 59 /2491' E 1L1' 2 2 168'
/19 1019 ' !'. 18 0D2 164/ / 8 2 3' / 19' '
2 /' 198 / 9' 9 .6 #' 1 162' .68' 198 A'
63' 1'./498' 8 /4/' 2 2 168 ' 0.' 8 0D2 .6 '
4/ ' 0 01 / ' F60 8 "/.0709_92/' .G '
98 ' F6 0 7' / . 1 8 0" 4970.6 ' 9 1' G0 9
= ' 4016 ' 8 /163 9F6 16 4F6/4' ". /4 ')'
868' 9 1 ' "1. 01' .G 93 ' 262F608' / 19'
.6 6' 0 19F6 ' 10 4 868 ' ".' 9 1' 19 164/ '
H/.' 0 68' C' 4 .6 68 . D/' 64' : /70 '
16 ' F6. 080 / 3 08' ' .G 93' 4..6 /'
.9 9 63.681 ' 0 8 19 164/ ' 9 18908' ;'
2. 1' 2 .40 ' "2/' 07' 90' 104 /' 4 19.' ; 2Q
19 8' 468' 04 68' 49.6 .91' . ' G .' 49 '
. 808' 0.. 63 104 E' 0 198'./2 . 91 6 63'
V49. 8 p' 0 1 3' 89108' 6 F608 . . 2D01'
.G 93' 04G6.' 19 164/' 0 0 2' 4 . 808' 4. '
. 8 3 63 / 1 /2 3 9 . 02 7 . ' 01F69' .0'
0 ' / / 1 /29' 2' 2 2 168 ' T60 9' 262Q
F608' .G 93' 971' . 2 . 863 ' 10 4 D 0 '
408' 19 64 298' =)' 4/ 8 / .08' ./8 . '
G92491' H02.' 01 /2. 8 908 498' 9 9' .68 '
/ 0 1' 1 1/1 ' F6 0' "1 0F69' 0' 4 6 /2.A'
8 0D2 .114 2 3' 2' 98 9 ' 4 6 7 G0' /.94 1 '
C' 7 29' ./2464 1' 262F1 08' 04' 2. 8' 80 '
D2 2 ' 4 8K3

D2664 2 3' . 692 ' # 49/' 8 ' 8 /4/'
" 8 8 F699 .01 ' F6/4298 9 2 810 0'
.D8910'4 6 /2. F69 /191 0'102168' ./2 '
6.2 01' 8 0D2E164 2 ' 01F6.'049/' / .' 6 . '
0 ' 08' .91' 2' 03F60 '19 / .' 6 0' 01 0'
/1.21 0'2/2' 9 1 02 90.'. . . 868 F608'
10 4 8 6 . 1 02 1'10892' 80 / 0' . . 6246'
/ / 1 /298 . . . 01 3 ' T60 .'102498' 2'
0 F6/' 01 E' D2/'. /2.6 921'01F69' . / 62 '
D9216 ' C' .919 1 828' 9 1 4 890 .F6.16 '
10 4 8 62E /2' /19 1' 624 68'061'0 64'
24 6 7 . 8 269 . 1' . '0. . 4921' / '
19 1$' / "1 . . . 1E20D2 164/ .6 ' 0 = 612'
. /' 9 1' 91 98 /6.16 ' 6H08 6101 / 2 2 10'
061' 9 9160'9 1#F6 0' .9 1 3'9 1 98 3'9 1' . / '
4 92 0 ' "1' D929 01 /' C . / 8 11/'9219C'
2/2'9219E' 0P. 01 /46 1 63.=1 01 3 F60 10 '
1 763 D '4 . 0 701 /2 D /C 0 7/$' . . .1 /'
C'49. 91 'F6 ! 1 10 9' 8 2/ 1C' 8 0 / 01 /'
9 10' 6.' 8 / 63' / .= 3'F6 '2F2' 1' . .6 0 '
19 E/ . /' 6 9 /' C' 9 / 02B' 2 3F6Z' . '
.6 /'0D62161 "1' 2 . . I 1'0 0' 01 /9 7' X2 '
2 103' . 1' 2' 8 / 1 7 8' 7' 2@101 / 763' 4 '
6 . 9K 9 . 9 ' ? 1.101 M' .2 8' /19 1' 01 /2 '
6 . . . 49 . 0 19101 / 0 . . 91 ME0 ! ! Z1 /2 49'
. .1 / 4 . . 93 /2' . / 6 1 / . / @ 1 /2 D. '
&Z 01 D929 01 /2 '40 /' ' 12 .' 6 3' 0 190'
= /3C' 10' 2' 2 2 1 ' =94" E639 1' . 9 ' 1 / '
16 6 ' " 63' 8 02923 ' 11 8 / .'9 1' 2 2 163'
7 6 1'92 8' 1/19193'1264 '31.6/ 101921 A'

" . ' ' 1+ % .

791' (# '&' #

: / ' 498 /217 01' 1 1 A'9 9' 8 6 8'
E11/1/ . 8 C 8 / 9 E3' 861. `9' .62 12/7 '
: 1. / ' . / 8 0 01' 8 /163' 219 ' '
46 8'10 4 10198' C' " . / . @192 $C' 01 /2. 2'
9 .01' / / 1 /268

=) # ' G ' L '9 1 7' '
@ A#: ' ') ' E' '# ' ' '
) # ' ' & ! ' /' # $' '
') #'0 /' >'*' / 19 63' / / 1. '
4F6/4' 8 /6916 ' 0 198' ' 'F6 408'
2/1 .98 2' ' " $F60 68' # '
0 193' >' 8 /6.0216 #)6A ' 8 6'
" ' . 6 4. 8' 8 /69 .1' ['2 /6. 916 '
T6/49 1 8 / 7 9' TE, . '[6 4' '1/ . /'
8 /697 16 ' ' ' $=)' " 'F6/4'
`MH.1 F6 0 8 /6916 '070H /[R 6.'
8 /697 16 'E4 /2.9' 1916 '0 .67' C'04' 64'
E /O923' .1292 016 F6/4 8 7' .0/ 0' $'
"1/ 8 2 08 / " .021/ '29 /9' 68' '01 7'
8 /6901M ' 9F69'92 8' /3 6 ' /D 9 63' '
' 2' 218 921 703 ') ' ' 8 /163'
L # ' . 192 2 2D6O

2 /163' . / 8 . / / 69 .21 2 1 ' F6 0' .9 1 3'
9 1 98 3'9 98'4. 2 1 . / 6'102"92/ 8 2 68'
. / 947 /' 2' 8 /16 8 ' F69 8 40 8' 2 2 16' 960 '
4. 91 9 D/' ' 0' / 8 2 0' "2/'19 8 / 9'2 /69' '
192161 F6/4' 9 '4979.91'< . 8'29. . Y 8' 1'
21. 8 /69210C 8 /7 0' 9 921 0 19 ' ! 07'
/14 2K010 "2/' . / 6' 8 /1/ '0 0/ 8 2 08 /6. '
M'C'9 G /1G9 ' "26F6/440 ' 8 /69 .16 '
.68'G/9"268' 2 1/1. / . 8 8 9 916 0 0'
.9 19' 2 1/19 / .' 2 12 16' 8 / 6'07 / 69 9 '
F6/4 9 6D201 ' 263'99D/'9 1' 8 K8 /1/
: 8 6 8' / 8 6 9' 8 /6923'F6/404 ' ! 0 6'
69' 96'. . 92 9 '8 /69 2/' "1' 2 3' 8 6 '9 1'
! 6 . /F6/4 8 /69161 ' : 0191 246 1 /29' 8 / '
1668 01 /2 3 0 1. 01 /2 3 0 . . 91 /11 3C49 '
.191 /2 3# 2G 392 8' / 8 2 763'F6/4 1 8 4'
1@6. . ' 86394 019' . /2 6 162\'1 1' . 68'9/'
F6/4' 8 /' 2/6 16 08' '498 /16' / . 0 '
'F6 8 / .668'9 1 3 863 918 /9 1' 4'0 9 '
19' . /2 101' ! 11 2 93' / . / 8 /6.0/16 ' "9'0' 9'
E49 10' 2. / 21912/' ' "1' . / 63' 0702O'
8 0 "4070 / . 19 2/' 11/F69.2 / 8 /Q
4/' 8 /6923' .68' 9'12/10' . /2 621 1689 1 0.'
/?F6 4. 8 / 8 4S3 . .6639 1# / O '
M '0619 2 .' / 1924 161$' 629'92 8' 8 /4 ' , '
F6 763' 93'0' 8 91 /'9 19 2/'11 /6.2161'
110 w 63 0[63' " . 0 / " / S101 /' ' T6/ 6'46 / eKK
/ 1. / .3'04' 93' 96/ .021O ' $ 01'F6/4'
9 1' 10G 1E69' / 8 6 8'911 C' 8 6' . 68'
9 0 1C 1 041 A'=94' C' F / /40 19 01 8 0'
F6/4' .019 0. 13 / 8 9 1' . '0G. 01 6<0'
.49 0.709 0 19 0216 9/ 1 3F6 3 01 6 `16 '
97' /7 9 O 3' 12 E 763' 08' / 68' 041 /'
8 /1p'9 1' 9 ' ! / 63' 01 9219' 01 F6 4 92 6\
19 8'0.9191 / '044 11/ . 1 F6/4'9 D/'06D91'
C#0/D.11 1`1' 9 210419 91 /' "9 /'49. 0 '
47 /'9 7 0 1 3' 29 1921 3' G ' D 16 '89Q
4 6 8'4X' 219 ' / 8 9 8 9692=' C' 8 /168'
=94"1 / 8 F69'9 1 8 61
79 01 / 8 /163'9 104F60 101. 8 ' /2 0) E#
108 92' 1/ '04' /2 . 8 ' .41021 8'04'
01 7 . 8 .6' 92 7 98 610' 04' . 0 / . 0'
1 D63 . . 10198 'G28 4 10198' 46 1 98 '
8 / 198 0 101. 8 '4.2 ! 10198 0 794 2.'
2 D 94 298 C .7 8 .3$' W67 1/98 9' 219 ' '&
G03'<7 03'F60 10193' 1/ 4'.M2110 .103' 9 1
B ? 5 ' ' ' ' ' '

=) &' 6 $# ' 9# '
' ' $' , ' ' ' ' '
) ' ' ' S b P ' '
! 6'# ' ' $' '* '
, ' 'cM' ' ' $' ' '
' , ' # ' # '
P $' ' # ' $' ' '
' $ $' S)

0216 '4 .6216 0 .. 0 ' .G'0 19 01 /'
893 D92. 01 /2 3' /2'4016 9. 0 11219'
0. /'04'" .61.3'C" .'A 69'02 8 ' 29'./ Q
/ 3' .6392 8' . 94 /4 #' 1'F6/4'
. . 16 4'0 1. 0 '2/'4 . .6 ".'2.F 'F6/4'
9 9 94 /29'49. 4 ' : 1. 90'" .61.3'g)'
"1 0' 621' 2' . 01 3'04F6 '26 3'9 1'8 7163'
. :GE .' 1F6.'102.68'079 1'"1' 8 /163'
.04 9 9 8 03'061' 2' 0 19' 2 4 9 1 60'02 '
8 ' 9'0 .9 0. /EF6 2' /1 63'/1 /'g)'F6 91.'g)'
9401 3' . 16 701 /2 7 3'06 120' 1' . 9230.'
64923 H 2.97 E 4. D /102193 . 92'
1 '"0.019'2.F6962 /7'G68 / 68'8 /.68
/2'F6 791'8 /163' .68'F /E 79.' .U1.'
./2 0 0 ' / 9'" 4916 ' 0 /F6' 0. /' . '
40'./269 E/2'9 .' F60 3' '01F6.' 04./'
. .6 63' 2. ' 94 $198' '0 1. 06/' 01 /2'
1 F60 3'9 1'C#0 9463' 6.'F60 103'2. 8'
9.0 / ' F60 3' /2D 1 4 2 F6/4'07 6 '
4 8 ' =94'F6 42'8 /163'"0 './8 0 0 ' /'(
19 6 6' 9.6246 2'10 4 10.98'g)'". /. 10198B'
!6 6 . . .6 /'C' 940' 2.0'2/2' /1. '
62146/8 /7 0' 9 0 '94921019B'>0 '
92 8' /19 1' 940' 890'. .6 /' F60 3S=62.'
9 D/'.9 1 ' 9D93'./8 0 0. /2 3' : 8 0 F6 '
./8 0 02.6 '2/2'4979211'9 .'G/8 /2 8 0#'
.8 0 9./8 0 0216 2 01 /29'0.6. '" 26'
1 63'g)' 4.3' 29'.G/ 40'" . 80' . .G0 #
F6 0'0.6.68'91$G/8 /2 868 2 9'92 8'
9 1 29104 8 0D2 164 298 69' D6 0 8#' 2'
" 2/04 0 / . 2'# 2'.G/ 40'04' /268 ' =9'
.6240E4.1. .'9 9'. 6 4. 8'D92. 3 '9 1 0 4'
2'F6/' 93'./8 0.021 '49791' 079 9' 498'
67 9468' / 86 = .'.F663'g)'.02 3'./8 Q
0 0 ' / 621' ..62468'0 7.4 298 'F6 0'
0 794/' 2'F60' 1'./8 0 0. . '9 1' 2' ./498'
67 94/' / 8/ 4 .9.'6 . .9' T '
10' 1962468' .. 98' 24 6 4608' 0. 92'
40'9 1'./8 0 01 ME' 64' ..6 46'0 794 2. 8'
02' 8 8'0 19 /' 1'0 7 63$2/2' ..62468'./ '
/ .8 F6 0'4 6 4663'B 1' 2'0 768 2 D 6 F6 ' '
2/2'7929'./8 0 02.6 ' 9.6246'./ / 0.68'
5949'9 D/'./2 9ED16 '8 /163' 9. .' 498 '
F 2 F60 .9 / F60 9' 0. 68'./ . 901#' '
F6/04'". /. .0198' C' 0 4 .0198 '0 1 01 /'
0 19 01 /2 '".' 20. /' 020. // ' 9'./8 0 '
0.6 0 E'92 8'0 3'. . . 63' 0202 6
1 / 1 /2.3' 8 /.668' F6 'G 9'. '
.0216 ' 9 ' '' F6/4' =1 .01' 2/6923
`'F6/4'8 /7 9 ! 'F6/4' 01 68 '> 'F6/4'
198 6d# .' 6'8'0.. 924 '
= 8 /69238 /690.F6/4408' 8 /7 9' 9'
'. .68' 018 0'g)' 2'.911/'198 / 9$ 498'
876.7 14 8 4 68 8 /7 3'9 6 492 ./4. 8'
198 / 9' 9 46 68 01 6' 9 . '1/168'
01 6'4 64 /'1. 8 1 3' 9' 9 4 8 4 68

01 E'4 8 4 /'198 / 3' T6F4 8 /692'
8 /6..' G/7 .E.. ./'198 / 9 9'.9 .6' 0'
1 6E4 8 4 0'" 163'8 /6921 3'8 /6.7 .'4 0 '
4 68'8 /7 9' F60 '19 / . ' 9' F60 .' 0'
1 6' /2'9 1'"9 7'29.. 68 ". 8 /6923'F6/4'
.9 1/'198 / 9' 9'.9 168' 0. 68 '0 F6/4'
/2463' 8 /6.. ' 498'91 08 8 /690 /2463'
46 /8 0 63 9/4981. 8 / 9 . '4 8 4 68'
63' 09 E'N 1'92 8' 9'"1'" 3'8 /691 3'46 '
/ /249 2/2' . /24.01' 9F69' .1 08'
/ / 1.1 "1'4 00 4 0'8 /64 3'" 163 F6 ' / '
9.'4 8 4 62 1/. 63 /249 38 /69 .<F6/4'
F6 4981/8 /4631/10'" 163'8 /6.1E' .9 ./'
198 / 9' 9 '0 F6/4' 01 68 '1/16'8 /6901'
/463 4 8 4 /'198 / 3 061 01 E' /F6'
206 3'F60 8'1 0G62.'8 6 1 07'"2/'1 0G' / '
91E 9 '0 F60 8' 0 E 0 19A' 24.' . . .6 '
_92/'F6 '9 '8019'0 68 .0' / / 1 /2.' ?'
1 ./. 649701 D 02688 E 2'19 08'.0 A'
4.1 3E4979 9' 9' 9' /268'9 .. 9'F6 0'968'
8 /4 638 E.=4924/ 0. .70 ' >92 F69' 1'
46/ 68 8 /6.21 68 "268 F6/4F6.' 9' 9'
.9 168' /2463'.. 7'198 / 9' 9'.9 168'
01 68 . 01E /19 ."1 68 F6.' 8 /6923' 1'
8 6 C./282 8 46/' /24. 0' 9' 498'
X 01 68 ./498 F2.'198 / 9' .#F6'2'.2' 8'
"2 639 104'"26 '90498'9 1$04'46/'46/ 6 '
/ / 1 /' I1'' 6'F6 4 4.'8 /.6' /.0 ' ' '
/ . /268' .D6 ' / 62.'04'0 1. 01 / ! 0'
C'0.. .1 298'1 046. ' 0 2 .9 03'. . '
198 / 9'0 .. 91 02D92 ".=6D 901 '0 .. 023'
06D92 F69'46 /' / 1 63 '46' /' / '198 Q
/ 9'0 1. 07 1 06D97 1F6. #=JS ;16'". '06416 '&
=94' 1/10F609 10'" 163' 10216 8'0 1. 9.'06 '
D901 "9'.9 1/'19 / 9 2/2'9 1'29.9 9'4 8 4 0'
" .61. 8 '4 8 4 6 /./4. 8'198 / 9'0 19 '
0 .'"9'06D. . ' N 1'92 8' 2 9 468'"1' 67 . '
<168'0P. 07 9' 9 10.' .2 .63'0 19 01 '9 6 '
F69'" 16198' /.6 . . 010.' 9 6191

@ '& '+ ! . /' ',#)+ . .

M163'4 263'9 1'0.' 9 9' G9/ /D .09'
/1 63'F60 8': 1. './2198 01 /2 3$'
2'F6/' . ...' 68 863' :G / / G63'9 0. '
.6 0.0'8 /7 68'./ / 68 '8 /.668 '.06 '
0 68 F69 67/ 4 2019' 8 /6921 68' 9 F6 '
1 /2. '04'"2 63 8 /1/ 3' 4'9 1'>9 '
M 1 8 ' 0 8 2/1 . 08 'F60 ' 9 'D 0463'
0 9924 .$ .68 F6.' . 268 ' 8 8 /7 98 '
"268 2 8. '" 161 3 24 6 7 .8 '/2E2 3'
./ / 9 '8 / 3'. . 1. /' 92 163' 8 8 610 '
` 98 ' R.: 3' @A
\J E1 = [W \.3 0 2/ . . / .916 0.4. 8 /2'
1 01' I 1'"91/'G 9' 79 07 / 61.:G .63'
2/2' 910 G .63' ? .91' 92 8' 1'4.'>9/'
8 6F69'.0630 'F6 0'.0 292'9 '8 /16'0.' 9

8 /16 8 ' { '2016 0# 463' '0.' 24 66 63'
. / 893 84' C'" 10 "1'0 1' 1/1 . 1.E692 '
1 3' 7 ' 2'> 9 . / D2 1 / 2 . 8' / 29G 161 ' C'
> . 68 ' 1 68' !' 8 / 1/1. 8' . / 1. 8 016. '
!' . 1' . 06 0' C' 2. 68' . . . . 1 3' 0/ . 63'
01F6.' 049/' / 8 2 68' 2016 ' 6 0' . 06 0 68'
/ 4 2 . 8 C'020 8 2' .1. 8 601 ' 70792 '
463' 4 . /' 9 1' 2016 0 3 ' C' 219 ' . / 3' F6 ' 49'
: G . 0'06 . 6 101 / 2 .' 621 "1' / 14 29' / 1 9 '
8 3 ! .' C(4 D2E1019' 8 63' I 1' 9 7' 8 2 3'
F60$' !M. / 21 29161 ' 4 / J 1 20' . . . 0' 4 6 0'
C'9 . 010'. 0 11 763 F 0# F6 0'D 06 3'1 1 '0 '
460 . F6 110 C'"79 2 0 0 8 2/ . 8' 06 /'
9F6 .' . . 0168

! 0 ' . & .

I =1 2 .' 8 / 1O3A19 26? ' . . 2 .' T6 2 '
2 / 3' 8 624 / 3' / 691.' E F6 / 68' E' 9 '
. 021' / 20216 0Z \ ' . / 8 26 ' < 6 . . 9 429? '
4920' = ' 8 / 1O 8 0 . 9' 9 1166 8 $" 1' C' E'
F6 . 8 1. 26 ` 4 98646 ` \ ' 09F6 ." 68'
7 . . 68 49 2 6106 . 6@ ' = 4 00 0D 03/ '
8 2 0' 9 94 4 1 2' ! 70/ 2 / 8 ' . 0 2 '
168 198 63F6 111 . ' C . / 0CC ' 49 I18 . '
F60 . 4 8 2312 . 2 96 8 " / =6 1 ' 2' 2016 6 '
. 02' . . D021 87' 1/16 1 ' C74 .' F698' "O'
49 8 63 ' / 4 119' 4? 2A .' 0 .' . D . D06 1# F60 '
& A9 / / 102 ' C' % . < * . /' ! & & # &' 20 0D/ '
1 ' 93 1 2 011 1' I 8 94/ . 93' "9 7' 60468'
2@ / 01 3" . 70=D . 2 . 0 4 R 1 C 4921 '
498 . / 10 0 ' 01F616 19 6E4C 2 91 . 12
49 1 092@46' C' 08 . 1 08' 7/ / 116 @98
894 9 T 18 H19 . . > D/09 91F/ !
/ 29G39F6 O7 ' C04201S 0#9) 101 M'
2 . 8' 0, , 41 1/ A749' ` 62 /' 916 2' 111 '
. / ' 49 1' > 9/ ' 1' ED R ' S9') + ! % + '
/ 1239 1 1 . 663 ' F8' 9 1 . 91' 23 . 1 31E68'
G076 1 9 .' 298' 1' 07 16 / 3' 7R ' B?SS'
9 1'0 163' 8 / 7 3' 1' / 7 9 . 1$. 10/ ' ' 8 / '
1630 F0@4 / MZO3' 9 1 ' C' 8 / R 93 1E9 '
. 9 9' 29 . 6 9' 9 1' ' 16 1 O' 1' RMR'
63 = ' D 6 ' 0199 91 21' 9?' 8 / 7 1 '0@'

2 'V $V 2 1 ' Q $Q ? 1 Q $N 5 G] Q G ' "!'
'D . 2 10$ S / ' 8 / 98 9 ' F / 98 DS S' R!'
903' 0219 . 9 9' "249' 9F6 RE' R / O8' 118 '
F698' 8 62 '0 =D2070= ' 2 / '
F6 / 4 9 6D201 ' = ' "9 7' 93' 8 / 7 193 9 9 '
160# 0 . 21 C' 8 / 1O3' / 9 ' . @1' 9 9 '
HO3 07 @4 8' . 2 8' 9 1' 93' 8 / R B3 0 1/
198 / 9' . ' 29' 8 / 16' I 1' . 9 19' +B
2/ 7 19' 6 ! 921' 2' F6 . 19$. D /' 76 63' F0 91 3'
0 . 06 0F603408 ' . 68' F6@3' 1' 001 /'
8 / 163$' S1' @ 8 F60 8' 9 1' 93' 29' F /'
8 / 16 ' I 1 16 8 / 1@ 698 6101 /' /
8 0 ! 6 0' 98 / 8 2 8' 8 / 168 0 ED20 9'
29F6903 F6 / 1 O9S 4) 10 ` ` / 2 . 91 .'

8 / R ' 2 2 163' C' . . 263$= . 4' C' 198 63' 9 1'
9 9168 2 ' "1/ 8 293 ' "2 / . . . 1/ : 0 / '
29 < . : 62 . 9 D /' C 8 / 163 ' T6 0' 198 63' 9 1'
26 09163 ! 69' 8 92 6 0' 8 / 163 : / 701/ ' 2 '
19 . . 4123 / 2' / 19 1' 92 8' 16 . 9 .' 198 63'
29' M6 ` 9 69' 2 01 $' 01' / 01 9' 262 .' 9 1' 8 9Q
4 68' ' 9 1' 92 8' 2 3' @8??3' 4' 9 1' 19 1 ' C'
2 . 6' 0 19 63 4' 9 1' 68 0' 26 168 9 D /'
26119' 0 D20 ' / 19 1 ' F6 2' 01 . 9 9 1' 198 '
F3# 116 08' 198 6= ' F6 2' 262 .' 9 . . 0'
01F69 10' 2' 2 2 168 ' = ' ! \ ' 19R / 3' 2 '
1 68' 1 / 27076 1 ' G9 9' 91 08' 8M1O3 1' "9 '
& 7' 8 / 163' C' 198 / 3' 2 / 2' 2 . 9 9@29 ' '10' 09 '
F6949 91' " 0F ' M2198 63' F6 , 9 F6 0'
0 . ' 9 1' 9 1' F6 / 4 791' 1B S= C' 198 63' / 1'
F6 / 4 7 . 1' 262 .' 9F69' 91 08' 8 / 163' 1/ '
168 91 1' "2F 08 40 9161' 92 @' 8 / @3 6 .'
8 6101 /' / 19 / 1' " 98 =# F6 / 4' 9 6 R '
9 . 0 8' 49 29019' 0 .' ! / 10 1/' 8 / 16 ' ' 93'
867 93 . 01168 . . 21 ' "SX 8 0291O21' < 6 '
9 1 193# ' 1 63 ' . 6' 2 G4 1 0 746 8' 6790 . '
"12 74 19 2G M' ' 07 76 '1' 93' > ' . M 168 '
901@' 20 1 4' 0 84 1/ .' " & "' 9=9' 09 '
F60 0 . 0 / 16 ' I 19 D0 19@ / 1O39 / 112 '
1/ 2 3' 9 68 " 1 8) ' 8 / 8' / 19 / 13= ' ' / '
19 63 8 02976219 D / 0 8 6903' C' 0 / 7 9' ?'
F6E9M = . / @ / 91 9 R M ' F6 / 4' 0R 0 0/'
0/0 / 8 I' ! 68 S0 8 ?0 / WCC 0A/ 9! ' $'
9' G 7902F 1' 8 / 098 8 / 69 /' M Y' 8 / 7 '
. 3619 ' 8 / O91 ' C' 01 F6 4' @ 107 1' F6 / '
93 . 31' ' ?' R 68 '
F630 1@ 8 1040 M11 8 18 / 33@' F6 498'
9 / 1 . 09 A? '0 1 6= ' 8 / 7 9' 9 0 808B'
I , @[0311D /' 201 021 ' F6 '0 / 168' . .' .' " . '
4 . @ 68 90 021' CF6B' 906 08' 01 / '
2 . 8 "9C020F 1 / / 68' 9 460 .' 00 '
A / A ?' ' I 0 94/ . 1 . 3 ' . 91' I 8 94/ . 93'
` M204 . / 07 @1 .' 10 09' " 49016 ' F6 ' / 1'
, 29, ' < 94A' C' 2 8 . 6 0' 0016 0' 0D2 / 0 1$'
6030D6163 "917 / 4 2 ` ' . 6 ?32 31S10' 16 '
4 / 8 0 . 1 9 16 70 . ' F6 . . / 8' 2 '
2 118 6 90 . . 1 1 6 . . 9 01 10 / 163 2 2 '
163' 08' 2 2 1L' F6 . 8 716 8 2 2 ' '
108 0 . 1 9/ / 1 0 5' "9 F6920 '
16 0' 04' "66 8' 8 1 ' 98 9 F69' 49 2 '
10 "10Z 63 A6 0 8 9 11 68 D 06 68 '
! T Z10' 9 0 . ' 96 . 2 01 10 /' 0 F60' 7 '
9 1' 518 1 / 098 2 / 0' / 9 1' 20 0D/ 03#
29F69' . 1 08 / . 23 ` / 9' / 1 63' F608' 0
198 / 9' 8 / 691 1 ' 8 6244 / F69' 4 1 2 9 1'
! 921 0' 20 11 01 9 D /' 2 / : 0216 ' F6 '
/ 19 j 2921114 68 S0 < / 298 $? / 621

1' , I 168' 91 916 10198' 8 / @3' 1 . 18621'
R 01 / 293 ' : 8 0 / 8 3 06101 / 0 .

S = q M : 3E3 q !

8 /163 1 219 . /21 0 0#9 D/ 26 631 2E0 3
9 2 2 163# 0 92 8 . /21 0 0 621 19 0 (
2 F6 763 . 06 639 1 0. 49 2 163 8 /@3 =9
.6 40 " 4.863 86 10 / F6 91. 8 2. 1 (
9 8 /1 18$ /16 1. D/ 498 9 2 "2 69
/ . 1 0 02 8 0 "1G/ 8 /F6 0 " 63. 1
862463 "7 F6 96 1 8 /6.16 #9 D/ 2 80
D2 / 8624/ /8 1 F6 .3 8 /168 0219.9 !
9 4 808 . /24.1 1/1 21 ` 6 0
8 /168 F6 9 . /21 0 / 1 1 . /1 9 0 68
. 9 9 91668 "268F `B 2689 /C . /2Q
1 2668 94 9 9 8 /168 0 F698 07 0 3
/8 2 763 4 69 68 298 .9/9 91198 p
.6 0 . 8#F6 .68 9 63 ! 21 0 9101 3 1 9
9 3 F6 I / 9 9 / 91 91 916 10198 "263
C 498 9 1 . /21 F663 C . 8 19 263 4
..62408 8 /6.16 F6/4 F6 96 1 07.0.1
K10219 9 19 2/ 8 /6.2.. $ 94 762. 8 /168
0 630219..4 1 F6/ 8 /6923 6 . 2. 101/ 8
C 7629 68 0 63 C 10 2 2 2 168
19 1 0 8 18 . 02 210 F6/408 0 . 8 /1O
. 11 2 ..63 04692 9169 $ 4 .68 8 6101 /Q
.68 08 0219004 4 8 /1 2 =. 8 6 18
6 C07 9 19 20 F60408 .06 0 8 9219 2"9
0 91 168 / M.0219 =94C 8 /16 /90
.8 2 02 801 76 0219.94 1 ! 011/ 061
0 1. 8 261 1 / #9 D/ 218 F608 2/0 11M69
16 02 80 #01F6.049/ 80 9 2 0 1292. /
0 68 118 6 1 06 80 0F2 .198M168 2
. @9 ! 9 8 /9 49 /8 2 F0 .19 / 9
92 8 8 /168 261 1 /2 30702 801 8 / C
" 69219 F6/ 791 86 C " 108 16 9 13
N !0 & %.

I.9 9 9 1 /8 2 0E "9 .8 91 F 6. $
"9 .8 . F6 . . . 9 ". F601408 8 0
69 E F6 408F6 9 . . . I 1 G/16 211 63
06.90 F6038 /69216 98 9 8 /119 # C 90
F6 F6 9 .621 18 . F6 9 99 .$01 1 122 0
0 @ 186 . 9 "28 /690/ 6 C 1 19 .021
061 4 F6/4 19 101 01D69 1911 68 9 13 9/ 68
2F608 F60 81 0`0 .8 91 9 9 8 8 /7
0 0 0 98 9 8 /O9 0 0 1 68F69 8 /69
. ..10/ F6 E .919 / 9 /2 D 111 /A
28 0 .8 91 + 3# F = HS00 163
! 01 1/3 . /21 0 92 9 21 F6 /8 2 0 1 8
2 3 2 0 . 916/ 8 /10"/ 1 0. 691. .4
19249708 &1 " 1 19 2 900191 96498 8 68
7 3 / 9 .11 02 1 G . 2. 98 . F6 498
=94 80 9 01M 0.? 8 11. 68 . F6 9
3 "1C //163 9F?9/0? 0 .1 916/D9
2.102111 !7 16 8E16 . 9 9 8 49.1. .621
0 9 0216 .4 0 F6024/07G 3 /6101 /2
5# $?4 3 I.F6 3 "04 @
1298 7 ? 83@ 193 01 0 0F6 9 99 . 2
1 07 .6186. 0 499 2 90498 46 1 3 C
016 .9 . /198 / 9 9 8029 9 0 1. 9892

10 2 67 / . 3 D/2 19 . B 1 2 F69 .1 08
/8 2 0 F6 9 .621 98 9 # 1 9 8 / 6 2/1
8 8 9 1 0 9 D/ 219 468 F6 9 962
219 468 12/ / .161 249 01. 1 0 16F 9 9
M8 2 0 98 9 F6 9 .9 9 ". 98 9 8 /69
I 9 101 F/2198 02468 02 /8 2 0 061 F609D
40 0 8 /6@8 61CF6 . .021 02 "91/ 0 0
F6 9 1#021 ' 8 9 0 0 98 9 8 /O.0216

1 AM691 1 , ' 8)6.216 9 9 "9 .
T 9 18 /6.216 "9 9 0
9 38 //92121 "102 80 0 E . 070 / ".
20H 80 0 T2 070 / "9 2016 08 /692
16 "1D 06 049/ 68 $ 90 "91/2016 =8 /
69216 ' EM2 8 8 M1 /2 3 2. ` 8 2 9 3
9 1E". S 9 2016 08 C " / 219 " D 1 0
4./ 1 8 01919 D/F6 .F6 48 /698 07
0 / 8 / / . 2 dF89 0319 2018 08 8 /
1 .2.6 01F6. .1 08 1/ 3 F6? S 8 /692
11 2016 E "90 1 3 8 /6901 16 " 1 62.
02 80 0? 2 F/ 76 12/698 C 8 F168 / 61 ?
02 80 1 .91 1=1 / 1\3 " 1 2 206 3
10610= 206 3 4 11/D26216 2 13
F608 4016 8 9 1 F60 8 /6986 07 0 / AS
8 /69 11/ 3F604S 10 81 10070 41 AA
8 /091 1`0168 86 8 /690216 3 /1
04./9 1 91 .668 2.8 . 2D 06 763 4
96 7231/32 80 3 "1 611498 .210 P
4 = - 092 8? ?P 9 16 8 /692 079 1 8
../2 " F604081/ 19 = ..4 9 3
F1 0G/. E2 / 168 9 1 8 80 68 F60 8 /
168 "7 C ' 8 8 791 24 S/. ! 1621F69#
G/. 92 8 9 1 1 7 8 /69 . 8 /@3 D 0
O F / C 96 68 "263 9 1 0. 4919 8 8 0163 " 1
1E3 14 8 ! 9 @8 08 92 9 1 D 06 0 C
P610070 / 8 /69 =94 0 F?/=:1 . . 92
468 8 /6.234 64 1019 101 6108 8 //9 9
"1. 13/$E 49 @ 1S 9Y 94#S /249 3# 64
` 012.= "14 D2 30=6.0 E41 3 9 994 6O
D2 F6/4 20 610O / . 1019 .0 . 68 9 1
/1. 1F69 9 D2 3 /7 9 498 46 9
- 06 0 16 4. 96 0 " 1 1/3 C 19 0 07 0
F6/8 /69216 F6 498 .48 019 20
16 08# 01O10 "9 4 .68 2 M192 0 60 20
1/10 . 1921 0 04 03 / 68 / 03
047/293 9 61 161 898 9 04 8 / 63 /
/3 F6 763 /.0`0.O 0 0 0 ./2 9F66216
=94 46/ 8 8 /4 3 0 F6 4 9 1 2 /1921 0#
"2/ 040068 26 2 0 1. / 4 9.62468
.9 1 "1 / 80 2 92016 07 . "1G07 \ ?6
91921 0$ 2 9 9219 =!4 / 1/EG . . 1 "1 04 / 0
/18 =802003 "4 "104 / 9 9G1 A /9 E40 S =
./2198 01 /07 / G07 16 / 940
4 911 4FH/4 2 /1.2 . 104 04/ 2 S1
868 07 !MFOM4 9 1 2 /19 1019 04 .. 2

2 (9 9 ! ! " # (9]

) +-d $ # 7 $, / $ # K / =$ " >9 8 4 $

/2 198 = . D268 1 D 46 0 2 T!.240 0 I1 64 29 7 3 8 /6.1 7 1. 2/2 2.
9 1 04 D29 2 " 1 04 04168 86 2 04 . / 8 / 0 F6 / . .9 " 8 8 /6924 8 1 16 10 2
76 . 68 " 04 0 168 9.62468 ?94 04 63 8 /6.21 763 "9 7 29.9 0 / 9 1 "26? 1
..62063 6 /2 1 98 9 868 F 89 126 F6/4 10 0 / 1 ` 2 8 1 21/6.010 0 S
"1 1 868 91 1 D268 04 6 !0 4 62 69 6 1M6 4 8 /69/ 0 0 FHM M`.11 <4 64K e 1:
D2 3 101 0 . /876 .1 2 8 94 016 . 9/0F6/8 /0910 9 0 9 / / 8 /6.162A A
498 4 .94684.D 0 C .6 -106.92 8 ". 07 0 / # 04G29 8 / /92191 . / /
"1 01E60 2 9ZO1 09 104 969 610 "1 1 08 .1 1 0 8 11112 /0923EF6 39 . 21/691
09 "10404 S ? 1 2S 8# 7 "9 / . #0= 2 2.. 0 6049 1 M 612 /4 .= 070 / C 7/ .
/19 11 9 104 8 /168 6 21 104 01 168 0476. 07 0 / $1E07 16 1 A . I 3 2 2 2
9.62468 T 8 . 101 8 6 68 .116 2 18 2 F6/4 . D 101# F6 0 8 2 / .P 8 /
F6 4 1/G 7901 M9 D 16 2E/4/ D 06 0 C 69 11 763= 8 /7 O763 2/2 4016" 1 100 8 #
.6 0 71 2 /1921 1 2 / .68 2 6 2 . 01 "7 1 8 8 2/2 9 1 09F09 .1 0 0 9 1 " .
080 4. 1 2 /1.21 0 /A 2; 2/ ` 9 `"68#T8 A 7/. 07 `249 `1 .1 "7 0/118
E2/10 I 0 "91/ / . 0 1946. 16 2 04G26 0 29F09 81 8 9 1 8 /1192 29F1 9 " 1 `68
-129 0219 F6/4 . .@ 9. 1 / /1 6A D 069 /1 9 1 8 /163 I D/ `MM4008 2 12 1A
". P6. ". 0 98 /69219 7 7923 4 9 107 8/6 R 0 ` Z 9 91 1 6812 ` 8
1/ F6/48 /163 2 94 89210 1/H 1 1 1 / /6.23 F6/4 0707 / 2/ 12/ P7 112K 9 1/69
F/ 31M 9191 0 4.8 F6/ @ 091. .263 4/8 2 2/ 28/7 9 ". .F4/2 /6 7 A
2 0F60 491 29.6 01 8 F/9 "191 0 ..24. 91$ 161 1 2 16268 M0923 /8 2 @ /4/
76 63 0 992 63 .06 04 ..21O. F6 0 49 2 12 ` /7 9 9 1 @ 49 1 194 1 1 , /?30DM 0=
9? /0 =#, G . 2/69191102168 9 0.1 0 /F6 8 /69 910 . 1. 0.. 4923 "9 9
4S1= U.201023"S17 91J9 T1 - .M1 0110 1 / /2 91 0.. 4923 F6 0 / 191 2/2 8 /6/
9. 1 688 /7 P 969 6 9 0F600. V 1 F6/4 0 101 ` /SS1092 849 1?. 1210 00
= 9 DM -92. 023 1 7/ 1 9 9 929 1 7 9 O9 01F69 049/ /8 8 3 M/F 1011. 916 $
(/1D H012 / / 91" F0/ 1 9 .10 9 1 F6 8 1084 14 4S ?/ / 1?91 12 9 1 29.9
=1016 1 10F69 1/1. 93D 0 0 C <79 . S .11 /0 .? .". 8 ES.049 /
9@A 19649 9 S /S0 1/ "Y F6 0 ./ 63 / 2/163 . 9 "97 69#R <24., < .0w .9+ ?
0009 GE 96 2 0/1 / 4 110 10791 "1 1 F6 US/S391A0844/.9191 4 976 91 0 0 /
0 .67 101A= 4 4 99 1/. / 2F0/ 0D 44 -0/ 21.1 0 8 4G! 90$ F/ <0 0 C00 $F6
./2 HO.01F ./ 9 0.16 C10 912 / .68 / .7 / 96F11/4. 10 129C 1 2 2/ "
. 906 96 612 ` ? 9Y001?D 0 4 13 1/ 0 10241 ` `92110/ 198 20 F6/
208 . C 40/1 /20 : / ".17. 01 /29 04 12/1/ "9 /1 03 2E/098 A F6/40 =12/163
[?/ 3 ` 819.68 "1071/4@ 49119/0216 412/ 18 /610162F6 . ` .11 6222/
9 904006 2 918 1@ .0 /1921 1O 2 3 2 1 q1./2 1019 0 CE 7 /N7 . I 1
1/ @4 0 F6/ 4 M19 1 = 98 /1046 10 11 11 9FM 910 0 `SF0 M8298 /119 ` . 19
E6210401/8 1 8 6 21 49 1 "2/ "917/E V $ (9 $
1/E 29 021A 1 0 07 0 12 1 8 / 49 92491 =) # 77
996 06 0 06198 1 8 1 9 1 68 -921A #) 9 &
623 . /29 0419 4 /S02S F /4 8 /6916 29 , $- % :L < ,) #
9 " 2E @10 1 ME 1S.8 01OX+ M01 0C 19 , # ; 5
070 /8 /69 1)) < , # $
4 ! 9

/# K #3 34# ? 5 ! K8 : 4 !)
1910/ 8 /1191S "1 70. 63 0 418K #) # $ #
2 /6923 F6 10 8 @070 / 12/69161 6100 # 0.0/
19 68 9 .8/1 .1 09. 0 " / 13 T00 19 "1"20102148 8 /6.0 ` 9.8 /
$) 61016 2 . 1. 1 0.. 4923$0 0 9 7101
F " # # 4 # 4 168 @ / /90 ` 1/ 301F6 1 13 1 8 8 /4 629
L B 1 8 / ` E N 863F6 438 F6 0 498 I
; 8 8 /6. 9149 8 / . . R1 . /492E 8 /16 9
L # # # # / 9 /69 49/ 86 0 16 /19H1 1 . 16
9 # # "# 1 6 4.2 =9.62463 198 F6 0 2/2 1 019161
1 186@29 D7 2/1 @81 3 8 /691EF608 1 126 28 /6123 4/290 8 . 1.1 01 / .6

= (\

W W S ! q 1 !
9 # # G ./8 8 E2 . 1. E 68 T6 .F . 8 .06 0
) $) # $ 29"20 1 69 O 1.3 . 1 68 8 /6923
/ # " 8 6 8 8 8 /7 9 =94 0 01 .06 08
) 9) P 8 01. 208 9 1 8 6 8 /O<$239 9[[26 0
) B # E 1) F2 08 6 0 C 617 4 0E1 9< . 2 .0
1 $ F6?? 1 2 10 2 1/ 8 9 1 8 0 01 201210 d. &
) "E# " .E6/1 89 6 4 8 /43. K /19 1 1 /
/) # # 1 . "E 02 E ! O/4.1H 2 28 2 108 =7 60
G # =) # # (" 1E .1EZ1 O8 " " ! ! 3 1. 3 . 1 2. 68
A $ # 8 /163 =94 =$ 0/6 3 . 9 91663 "2639 1
$ A C 9/ 21 6603 0 j F69 1"02E /8 93 8 /163 "1
/) G # 04 66 8 2. . 8 < 21911 D9 8 /16 8 . 8
! c # 8 F6. 0/7 ` 3E1. 92 E1 1 C0 F6/ 49Q
$ # 924921 I D/C 8 /1/ . 1" 3 < /4 p r
) # # 8 6 8 2 /69231.19 26 8 9 1 Z 8 F6912/ A
T $ G $ F 163 9 .11E 3 C . /E 1 2603 901 C 1 8 6 8
9G 9) 8 /7 9 @26 2 F6/49. 19/7 @2 4 9 92
K) $ 19 8 = 0. .J 60 01X6E . /10 C "= .101. 0
$. / 012 F039 00 , 21[E D929 01 02 18 > . /
R) &B / , $) / 6 1 /66 8 9 .16= 6 . 994921 6 8 .1 1
[) .0 0 /4 ` 4 49 8 / 0/ 9M1. 4 . 29
8) < # $) 4 F6901 F6/4 9/ 492 98 9 9 007918 /4/
4 / 1 U8 (M M7 91207 = /7 19 D.69 01 /2 8 C . / 16
&/ # G 1 OE ` / " . @4 293 8 1010 41 9 8 20
( ) $ ( ) 9 9 9 .1 08 04 _/4 0. 8 /16 8 > " 93
") 9 69 K $ =) #) : 029@ 8 9 4/ - 96. 01 C ! / 6 1 V
/) U ; = I G 3 . D/ 0 0 91 .6 F 040208 /7 $
$ $ 1) $ 498 9 ` /6.02161E "1 ./9 # 2. 2 9 F6 0
1 $ 8M69 I 0@ /1 C 9/ 498 98 9 2 /
0 9G079619 1/ /16 8 F1 . . 916601 "26 8
#9 9 0. 8 998 S4901. 10 6 C .6 F60
$) # 4061 262F60 8 8 /6.0R I K " 1 68
* # 2 68 8 /6923 F6 0 11 / .21 76304 "26 8
$ F " 49692 9 29.969 9 1 = . 01 219 46 8 0 0
(# 8 /6.0216 0 0 F6 9 102 " 1 93 67 620 03 #
= # " C# 19 1 FO 00 1 M 8 /7 9 9D62 8 "1 07 9/
) $ 262. F1 . 302 /62. 8 /10 8 0.9 021
(
/ # " =) L $, $
1 $ 9 $ # # $ # .
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) # 9 $)) < 6 4 #) ,
I & 46 9 ! 9 & L 868 2 * ( )
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9) $) ; &
1 K) $)G6 $ $, # .
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+ " $)) # $
$ 9 # G # # # ? G@
8) ") \N " S ") ##
>: < $) 99 ($ # >) 6)
=)) & =) & , $ $
$ 8 W
$) G $ " (6 Z
$,) # 9

1'2 '0 .. 023'0..940.'04'0'.. 0168 'C'.9 '
/' ./2 10.' 4 9' 0 .9 023' 2.9 68' 0 1. 01/'
E / 2F6 63' 2.9'1468' .8 /1 63#F6/4'2/2'
G9 2. 0 /29' ='9 D/' 8 /1 331. 263. $ 'K
0. /' ' 6S.' 9 18 / .668 8 0 ' 0 9 209 1$
F6/4 H0. / '0 0' 1' / ' "1. .6 0 3'E3 0'
/ 9 / ' "1' .4#0 ' 6 = T1E.' 1' 0 E 8 2. '
.9 8' 1' / 9 :' 0. /2. 2' 08' /'
.20 . .' 98 9' ' /11E2. 8 F6.' 0 08' 01 / '
2. 8' 20/168 F6.' 0219.94. 9
8 / ". /' / '9 1' 0. /' 8 /16' F6/ 79 '
/ 8 2 763' 8 /4 3' ./2 9F Z21 4E198 / 9'
4 D2 019' 29' 9 9 4 /29' # F69 8' 19 1 68'
8 /4 2' "/.0.' 1/ ' SS(' ; &/% '
,%' W" ! .' ' 4'9 1' "1' "/P 2.' 8 9 9193' 9' '
846 2A4 .21 0E' 9 9 /298 ' ". . . 08'
201/ .' 1 / P0. . 8 ' T6/4'. 8' 9 14 63'
9 1 42016 0' 1E3' 4 . 1 ' 1'. 6 103 '4/ 1/$
. . . / 4 2.'D.2. 01 /2 3'01' / 13 3' 08'
iE6/4D.29 0.6 'P11 9. 94 2 '9 1# "24.'D9 '
6. /2.' 1 / 0 ' / 19 / 0'4 .1@ 1P 101 1'
P'E 49 1' B C ' 11/29 C . / / 1 0 ' / 16 / 1.L'
/10' 1/ 020.6 0 14'9 1' . .1 1 F 0 ' "1 B '
E8 91/ '9 '. +' .10 G 1. 'C'.' #'G6 6d'
7 ' T602F601 'F60$ D.S$.1S /2.' 621'
/ 0 '4 . 9 0 2 1.2. / 0'00.6 0' .'
. T 630 5 4317 9 162 '09 14. 4 3 8 C '
F . 8 /'H ?/ 4 Z' / / 49F6.2 . 9..'
0 6 14 .6011 '.1 0 8' 0 0 / 0' !
"2 10$ 7 18 /' 1K .912 / 0' 2129.9 0 4'
.15 / 8 84 ". 1"M 97/. 8 1 / 8 .M6 '
9. "E. H0$ P 1' ! / 6271 .92 13' F.' / '
./K 0 EFF 408 / 4 098 6026A' 2/2' 0'
3'01.61 649 .2 . ` 113' "/907010'
@3 R F11 763 G .31 1 ' 1 1/19 .3A'
M/2 04' D2= .02408' / 4 9 2' 621' 8 '
8 1 2'. /0 91 E. 1 04 ' . 1 0 '19 1 68' 21 1'A'
9 9 M` 3' 11D / "1' / 61622/41 /'#M =4/'
2@S B46 R D; ` ! 101 /2 ="9 .E#. ! 61[/1 131'
C' 01921 8 3' 29' 2 3' P1/94 69' / 9 1'
./1 1 2. / 4/9/01.F 192. ? C90F6L8 '
E . . 1 /2 /2F4 .6 1 0 7F. E2/, / / 0'
1 016 =P.2 8 27 8 .1 1. 1 / E7638 . 1' '
016 0 2'[.2. 024 ' . .91' F6/04939'
0 1 /298 8 /9'02190 2. 8 J9' / 4 Z'G016 0$
..6 46 2' 21924/29 2'9.'Z2. 8'1 9 .4 / '
0' / 0' '621 F6 ' . ..'1' 1 3 C014.16 63'
1 66 0' 8 9246 2161'01F69'9 / 0216 $ '
#91' / 1. 63' 21 "24.'90 K9K E = .19 '
9 921 08 4 .22161 1 / 02016 ' H/.91'
?/?'?2 O/H .92.6 01 / . 1 / 2016 0' ' 4'9 1' 91 .
1 /29 . 8 2 0O / 8 /1 6' "1' = '198 / 9' C]
$/2 1F11SZ 0' ! / > 9F6. `1?F6 49 8 'F6 0'
01 /'. 68' 1MM01 @0C 9 9160' /19 1'
9 29'0 /' F6/6 1'1 1/1` 23' 01 /29' 02'

192 6 63' 8 /16B' .< .' /1. 1 ' : 1 8'. 68
#' ! Z92 0".1.&6 2A /'." ' S' ' &"
(/' ! & , &' < 21' 1 2. 0'D.2. 01 /268#
./ 0 1 /2621' D 0216 0F69' F60 101 8'
4. .03' "9 7' "3M &'/' ')" 6 "" ' ./2D 9'
D01 A' 6. . /2.1. / ' "249'. / 2 1 /293' ?0A'
103' ' 9D 9D01 /' < 69' 9
. 91 / ' 049'D909 0 /2.3'E' ./2D 9D0 /'06'
Z 8' C' .D 9D01 4' 2/2' 29' 29' 02/2.'
98 /1..1 02 .OH0101 M I1. 20.5' 8 . '
8/163 H 2 8. M7!# 60 \ 3'10 8 .2 2' ' '$ J
D929 02129' 01 /2. 89 .' / 9 :0 1' 1980
/ 9 'D.2. 0. /298". >' 8 0 2 A' ".' 019 '
94'G 9' /F6 16 ' 1 1/19 .3' 6 9' =1 8 '
. 19 F 0'29.9 8'9 1'.06 8'0 F1 0 '1' "6 '
9 0P 04 . 'F60$ / . / 8 @ 901@' 10413 '
8 8' 7 620 162'D92. 01 /2 ! 12'. / .6 101'
" . 1. /1 68 ' >6 F6F' 9 9= /29' :1 87 '
0EA' 101 /' . / / 763' 9 9 3' . /26. 1'
61 '0 80 71 2/6' . .923'201 3' .4A046 '
1 3' 1D 0041/ R ' =S.624/ F6 0 0 ` /' 8 '
2 2 978 2 68' 8 / /T 62 17 9 ' '0010 '
E62 11 26 101 .06. . 1' 0@0 1 / =01/4 '
2 /691#. 8 29.'26 D2 164 098' 8 /191 '29.'
3 X. J1 /0 3[2. . 07 62601 1' ". 0 E' 8 /163'
. 4 'F6 0'F6 9' 4 0'8 /6'921' .' 1 E . '
1. C 8 0 H1 9' / 9' 01 / 9' 8 /69 .'4 '
10216 $' 24.' M'F60 =' 9 '9 . . .21 08 '
/163' 8 . 1.1' / .1' 0 9 0 ' GE' "6
A1.2\ M163 11 94. E L 1. C . 8 2044 '
1M 0/11 3492/8 20218 ' 14 . 22' .20 '
. ? ?=F 0 01 / 219 / 8 ?93' 8 /163'09 8 6 '
DEE01 /H.3 . /21 8 @0. 11 .1609 1 F6 0 0$
K'12/ 01 /1 93'M / 23'4 2 1 F69111 8 2 =E
901. 5 / .219' ' 0 7 /2 D1/ ' <E0 6/' 8 0D2/ '
6 11. X ! O10 . [3B F6?' E9 0921 / 6 1' 1'
"60 8'. /01 6O0 E$' E. .11 1'90 2' 894 0'
F6 930 . 8 6 F6.' /1/ ' P3' 2191.9401' ".'
0. . . 2MZ00.F6. 211116319392 8 2/1 2 '
Z1.16 ' G6 '0. /1@' 18 1$ 0 /06198' /2'
,9. 0 / . /6. 291S '19211 2 3/ / 1 3' "1'
40F601. .6 0 39 1'
& =" . .
M 'M '63' 1Z0 3 0/ .63' F ' 1' 2' / 798' H69'
3M. 96 68 '4 4 F1A' "2/'2/8 29'. / '
M ! 1 / .1 .16639 1. /19 1 ' M28 392 8'
8 /@ @0 3' ". ' 1' 11. . 68' .'/179 2$
91 2 . 8' 1' ". 8 1/ 0/4/$' 69 'F6/4'
./4 ` 1?' 9. 4 1' / 8 3' 01 / ". . 1. .6 0 3'
"9 9C0 ' ". ' 8 8 012 .F # . 1 E' 2.F/.'
81 M10'E?/19 1' 9 9O2P 2 19'. / 6 060 S.' 9
9160 9 D0 / 0'. 1 6 0 3 91 910 . . / '
19 1' : . /7016 ' 8 2/ #4.7. .1'92 8' "11 6 '
7 /' 9 ' 91' 8 0D2 8 4 8' 9 10 2' 2 '
2 1020 F2 8 7. 1' =.4C 8 /1O3 / .0 3' 9
\

=/' ' = q M : "' T' %' q' ' ' !' '

X1"/ C' 8 163' G621' 219 '. /2. 0 /3 "PG' '
2/3 6 68 4./ 68E02.. .1 M 4.1 . W62 '
2 / 68 2/G' / 62.' 9 D/' 9 .' 9/E 0 '
26 ' 1' / 19' 01' 9 9 / 'C' 8 /7 9' .! MA
.940 'O/./' 6 68'" D'04' /.68'4./ 68 '
249'..9 9 01'=94'1629' 6298 /163'./2 '
E' 4 9.163' . ..1C' 9 9 63' T6 91E6 4'
.2 2' !' N(W9' !M[- R' ' #&' &)-!.' '
-& % ' 4'./2. 0 3' 8 /4763' 8 /6.16 '
2/ ' / 81' 2"268./2. 260 .68' 8 /K'
163'./21 6 103' .F6 01 "2 .0 9E2' 8 /7 ='
G. /. .8 /' 9 8 /7 3 /2 .6 '>.63'
94' 2'. 9G 3' 2/2' 9F6 .6 '"9 10 9' 9'
. 24/': /2' 20 E1 \' 198 /43' / 2 !'
F60#2/24. 1.G.24628 2' 8 /4763'./2' (
0 3' 2' 624/'98 ' 9 9 /2 3'"1'. .1. 0'
. .2/ 0/8 ..0216 '4016 'F6 .3' 219 '
'62 .23'./2426 10198 $H69' 9 9 /' 01' 2'
2.' .S;1 ".' 68' C'49/ 68' 29' 2'. '
. 0 ' 6 68' 92 4' 8 /7 9' 04' 68 168'
0 F6/4 92 .2 1' C07. /4.8 ./$4P' '
21. F6 . .0 I . 68 I 1/# 6 0' 2 9. 0'
/@9'16 F6 .3 2' 62 / 9.6 73 6.' . 9 /2 3E'
&6' "+"198 9 '108 92' "9 68' @ 1' 8 /.63' ..`. /3'
/2.29./248 /3 .68 .. .4 1 . 021' ='
9 D/' 9 103' 8 /18 ' 9 9 63' E./24 8 03'
. 92/2 1. .001' 9 91663' H P' 2. 1'
*'.0 2F6 76 408 ./4 763' =1 0 0F69'
./8 . /' 9 91O08'./241O 1019 2 '<%
" /' 2./262/4 '/71 2.7PE.68' 98 9 07A'
./4.8 62 1/ 2 498 62 4 68 W . .0'
0 .. . "208./ 2608' 29, 8 12.FY)'
07'"2/'9 . 98/' 62 /' 04' 0 64' 9D 94 0 '
. 908 498 2.E9 0 1.8 '"1' 8 /1 3 9' A'
9 63' 62F608'.2 8' 2' 498 8 -0#' 0 '
1 763' 1'.T116. /' 9' ' 9 'C'
. /.9 /298'04'90 498' 293' 0 193'" 0 '
F . ' F60. 08 . . PE9' 62 ' '92 8'=/'
' 9'2/ 1 'G.8 G ! F' 2.08' 916'
07/ 16 2/..0 62 '2/2 .431 9 1.08.P8'
' 0' @1 /' /.. 49243' 04' # '
M 921 3/' ' 91D 1' ' /..0! ' ' / 18 2'
./8 8.0 ../21 26/' 8 /8 ' 9' 1 2.02' 0 '
" #" ?' = # '3&= #'
1.294686 .4.6Y9'.4' # '4 D .E 0'. 029'
9'90849 G' 2908' 69' 0 68 'H/.' 0 1'
/19 93'.68' 0 1' + %.'))%! ' %"'
<, + " .' (+ &#&' "' S &
/2' /19 1' q. 4 2' 98 . [.6 / 29.'" 0'. '
' 0 4.6 042F6P 6D 3' 8 /1 6 . /21 260'
2' T6 0' 2' 06 9' .8 .P.6 ' 0 9'./.021'
24 68 49' 2 3 "1' 2'. 1.6 2#"21 9' 1' "1'
2' 6 8'. . ' 0 19'P 010 ' '
4.8 62' 168194 1 /'.96 6 n"9' 9 9' / '
9' 498 I 6121T6 4'1/ 1' /21

26 E1.8 9. 8 H 0 E3 8 /1 7630. 8 1 '
101 /2 763' .' 9 .04.E 94 0 01 9D 9 '
/$0 76 8 A2 12'193 94 16 22 D 68 '.'F6/'
0J198 =S91 S 91' ? " 1 4. 8 "9'./ /'
.8 119'0 68'F09 8 11/ '8 91 68 $F6 '8 /'
163'0 1. 01 /'9 1# C' 8 0D26 8' 2' 0 8 8 /' .'
8 .4 62 1016 2 'F2 8 /163' 49. 91 /' 9 1E C'
D2 3' 2' 0 98 ' 9 '2 94 03'.0 4.2 4 / '
1 /293 'F6A' 8 6101 /D.2. 0. /. 1 [9 X '
.66 0' 9 1' 8 6' 029' 8 /16 8' 8 6101 /2.8 '
9' 2 2 19' 9/21 2`08' 9 9' / .' 019'
9/ 6 . 1/2.8 ' 6.E 10 1' 1/1' 0'. ' ;

A' 1P208 8 0. 1. .6O 3 T67 01 /'
E /8 39 1.P.6 0 =E . .40' 8 610'
1' 8 10'F6 4.2 ' 621' 4/ 93 'F6 0' 9'
3./2 0!0' !H 96 0 3 ". /' / '9 1' . 0 A'
94 0'. .0 0 3' 1' 8 4/ 'C' 9 9 / '
!'. .6 63' 9 0 29' ! .6 /'.2 8' 2 G'
E044' 1Z. 1 /49.061.8' 890' /.9 1' 98 9'
O. 'F6 4F00 8 '9614' 2/2' 4916 '
F60 40 91. A' 2/2' 9 P1' 8'.0'./1 ' 8 /163'
2 /0' / 1' 9 1102 ' 2' 2 .0' "91/'
2/2' 9 1' 8 163' 9 91663' 2 ' 9' 9 9 /'
E. 2' F6/4' 108 .2' "2E101. 0' C./21126 .0 '
198 8 1P4 1' 8 2 4 -.8'.44 11
0. 8 8 39 186 .' T 8 \4<B2 2'
01 .H9 68' 190' 8 /163' F . 9
63. 1' 44=9 F69'=)')+ ' ! !) ' /'
89 ' 2. 01F6.' 04./' 02 PD.2. 07 10'
9 9E3 /29./269 /2 3' '"20' 98 9'
=)'./21P2 0'. 1 ! /26. /' D 16 ' 99 1/' 8 /.6'
E 9 !$< " F6 4.8 6. 0.6 0 FO 0 .
19. / 'UB' 2./ 6 . 7 P' .)6% . R/ '
0 /2. 49 1'49 2PP6 F010'G07 163' / '
9 1'49 0 1 /2.'F11 60 / .6 8' 601 /'
04' 6'./D2 L/2.8' 2 9.9 0 /' 09 .F6 0.'
G07 1G3'./D211 /2.8 '2/2'./21 0' E' 9 9'
16 '"9 7' 10' .' G0791' 04' 8 9 9 68 '".'
G07P6304 601 /29' 492 F' 4. 1# .'
/ .T6 0'./G/91 /'A1! 20' !E1 9' 1006 98'
01 /'18 2 89' L !6' 01 /' /70.' /8 293'
.1 080 /3' 8 /163' ? F6' 9 916'. 9' 2/2'
/ 6 1. 9H../2O. /29' / 1. 93'=94' 8)'
0 /29 9 0' 9 1021 / 98'9)9'./269 / '
298' G 29F 0191#FO74 2' 0'4919 8 2016 8'
9 1 2. 8' 8 /163 8 94 68 '4B' 2 3 10"1'
.9 17 / 9' 0 D20 '"24.' 2. 01' 8 /69 '
10 3'" D 'FF0'1 02 7 1' C' "7 'F6 9 .9.'49 '
291 "9 H ..06 912 2/2 621H './269 /29'
4919 8 G0 0' E .68' 8 /163' 2. D8' S'
G 0"7 F6.'. . / 1#4.' 8 94 68' C E'
H 2.' "26' 4 498 624168 / 9239 1' 89'
4 .34.' /.. 4923E . .4 #6' 4 6. 0 6 2A .

D /268 1.9 19' / 191 0 8' G310. . '
86' 8 /6. '0.' F6 9 . . 9$ 8 /6. 'F6 498'
F6 0'. .68 0D 8 $F6 9 .9 9'061. 0'F6 0 2'
./4.8' /./ 0. / ".'802.1' T6 4E'./2'
6. /' ! 10 / 68 8 /1662"892 6 0'"1. 1'
9 .061.8 8.2 0 08'C' 81 8' .. F'
.0216 $'.9 1.'. 1'./269 7' 01 /268'0R7'
619' 1 8 0#C' ' 80'.1 08'8.2 6 0#F6 0'
86' 2'F6/ 7. D92. .1 1'9'. " 1 7$,'
:G .'9 1'8.2 6 0'.0#19 /8' ...4 1F /4'
./26. / 13F607 H3E"2 / 8 3 1.D6 0 3'
01F69'.04.`' .20 9'.9. 1019' 9 Z 016 #
91703'061.8' 8 /163' 1@F607 3' 1' C' 4 A'
/ 8 3 016 0 3'92 8'"1'7 14 3'4./ 6842'
29' .9 0 / 'E' 2 1 /'10 41/ '9 1' " / 92163'
./21R' 1' "2 / 8 3' C'19D6 0 3' 8 /163'
/ '9 14 / 0 C' 9D61016.68' 1' 80A'
D 3 7 8 3C 00D 3"263 208'4 8 3'
4 2 3. 1 7 '0.'". 61'86 1 9 '='"0'
63' 268'"9 7' 63'9 12E611 . ' I D/'
./269 /' / '9 1' F6011 3' 01 /29' 9 1'
' 7S '"91/193' 01 F2' 2. 01610' 494.'
21 2191/0@93'8 /123 1' I 21 .4 /493 >9'
0/.1 1F3' 20 0D/ 03'R 01/'E 1'061.8'./2Q
69 /' 01 / 8 0 9 010 / 1 ?'9/269'
/2.89 9 8 /8 8 /12 `68 202 '"9
13=D69 69 98

&' # G# 34 4 % +K / 4'
, C8$. 4 / Y?0901 011 703 0 2 14'
; 1" 1161.'0.' /112 =' 94 11`'9 162 .63'9 1'
..KI0 2ZHO10 H 3' 07'A1912 /'E1 /6.01
/6 EF608 ZY0161 .4 A 8 /16d 9 , 9P?11
`62M..9 /'01F69' 290ES1@ 027? 1S'
2' F60' 8 /163' 9 1' .9701 8 63' [)' 0 4 '
863' 1". 74/.901' 1/19 93? 6`6 0'
8 /1/ 9 /'9 9 11619 2 / 1=' 09. I?1/ 1 93'
.9 103' 3921 .1 1' E /1G9 93'
0 0. 1 3 / 10E7 311/19 F172 1@ 95'
2/2 /19 1' 48 /10120O1.12 1 00 ! 994021'
29.9 9'9 1 8 /7 9'8 M O R Z2[S = 7'
/ / 1 /29'F 04021'49 09 1' 9F\FS/9 1
=9.6240'" 3 2 7 10 1/2 /1' 1' S' '
. 10' 8 0D1 Z64 29' F6 0' / 9 " 3'12 . 10'
8 0D2P64 298' 0/69 9' 2' 2 1001'CR' 2'
`/2'198 / 9#FO/4 14 20' M 8 2 3'90 2'
8 /163 1' 2'198 / 9' .W :7 .' 1 /'
7081'8 S/1 46/76 6 / 1 3 :1 27 4'
" 380=/8 2/ '198 / 9'` /2901'9 9191 3'
01 1 8'=9.6247 111/7 907 2 2S " ?1/'
2/1 /0'.1 E3' 80D F6.'8 /M9 'F60 1'0'
11=6 3 0 10'='92 8'8 2 10'" 3' 2'19 / 9'
.9 1/'8 /29 9 / 91'02E/0 '198 / 9'" 3' '
2 1 '+ 2 2 10 8 /6911 8'92 8'/8 29' '
/ 1044 1 /29 0 14 '07/4F6/4

791'6 16'8' 6' 9'0 .'.7' / 91'9 . 9 .9 9'"3'
2 10 "1'.9 1' 63' 98 / 3' 2 164 2.8' 6'
9 0 91' I .1'9 D/' 4 / 1 /' 2 1 9" 16 3'
.68' 2 2 10 T6/4' 0 68
. 1 0' 2 10" 3 2 2 2 0 8 0D2 1649'
. .29F6 1 T 8 0F60 2'E6 2 10 8 0D2 164 '
2." 39 1 /8 2980 08 2 10 / . 01' E'
.91'.2 8 "1963'2/2'1/ 9'. /24901' 8 A'
D2 '64 0'8 /7 P41' 2' 6'8 0 9'8 0D20'
219 468' 3'9 .' / I 1'"1'.' .01 1 7633'
19 10'108 92' 01 /' / 6 0 1'" 3'2 0 /' 1' '
8 0 / 8 / 9$ 01F69' 049M' 2' 2 2 1'8 '4'
" 3'91 02' 2 2 10'=94'C' ' 0 3'0K F60' 2"'
'8 D2 1648 3" 2'70791' 8 /6924'.9 1/'
198 / 9' / 9 17'8 0 /1' 0 3'F60B'@0 / 9`'
" 8'G07911 8 1063 2'8 /6924/19 8 01 3 '
.24.1./ 1 9 8 91' "939 D/1/10' 2 2 10' 8 /Q
93' .N60 0 / / 1 /29 26 H /19 ? 1``./0'
1 8 .1' " 14.9 9 16' 2'. " 0 /6904 11'
2 108'.
1F6' 863' 8 /1/ '19 2 / 9' 2 2 /'
8 /691' 862O`/7 9'.68'96 38 /163' 1'
091.8 63 91D/ 1S/113 8 M1M19 1' M S9' 2 '
1 1' 9 163' T H /7P 2 9 16 498 /' ='
1O 1/ 9 1/16 8 '0F S /' . 7 .918 / Z02162 eK
02'0 '/ 9 1/ 9'02 8 941/' 9'F6/4' 6 (
. 6/'R ' 9 1'0+ ' 9'0060'". '0 F6 4'10 9'E'
02 9 1.9 17 1/ 9 10 9 9'2/2' /6 1'
94 8 G/.'02 8 1/ ' I 3 , R3'`9/11 /69'
2 .22 0 4'&B 0 / 10 1/ 9' 69
102 211306 0'8 /69210' /'2/2' 02D.2'
19 /9F099 P 8 0'8 94 /' 8 9 P219' 610'07'
0p 919 DS8" D901. EF6`9 98F 02.1'4 '
.670349'0+ 9' F6 /'10/69016 =#F /8 /'
4/'8 /0901'06`/' 8 /09219'061' 102D. 1.$'
9/ /2 8 /3'9@ 8' 7 3 1/ .8'' 8 /16'.9 '
= 9'=.42/2 . 9G .1 / 9 10 04' /'
.068 '"1' 8 0 3' ' (&.
9 1 8'39/61 1' 86 1A' ?S.1 S1.3' 'M #).'
. ''9 98 7 8' 8 0D291 E' 8 0 87' 04' .8'
1. 1' 0110 1. `3 0 A\04 4S 8 'F6/4'
07 /"`2 8 @98 =8 616016 ' 08' '8 0'
D0931. .@00101// 401@ '' 9 '" 3' 0'
8 /E .4E'.O029 1 1' 1' 8 /' 8 9 G21. 96'
E 1M P 92.9 6R01/0!'49 . 921A'2/2' 499'
=1M 9T 18 /0.24'114 161'061'96029 9 '
= .9 D/' / 0.1140' 41 I.6 103' 4'F6/4' 1 '
868' 8 06.1 49 1' / ! 1MN'2/2' 8 /49'
01' 68' 1 S 2@S "10C.8 ? 6.1$ .4'.'
" 0F608 408 8 /`904' 8 18 1'"1'" .'
208' 0119 2' 9 0' 7S.'0 108'011 8 P 8 0 /'
29/90F6 9 / .0/' /11 62009 1 10SF602#
"03'07F//4 C 8 4.1/1'" D.01FS9 9'700'
F6 498'" 3'0 / P 911..' /F01 9'2/2' 49'
. 13' 1991 0 8 49 119 1'". 8M`. .'49 .

/ . / ' 94'0 F6024 6'4621' 0/6 ' F6.# 0 /F6 ' 86 01F$ 86'8/6.23 4'91' / ' P<;1/ ' F6 . .9 . . 68'9101' / .468 ' /.687. .1C'8/69 '49 2. .1'"1' . S8' 101 807 .2198 0D2. . .'# F6/4'91' 0 68 ' 629"9 4' / 9468' 2. 1' 9 '10 4 63' .68'"E3' 0' 8 .< 0' 02D6. . .#C' .68'90' 498'"3'./104. 9. . 4. 2 ' / 9468'" .9' 63'8/69 ' 2. F69'F6 . . . 9' H 9'9 D/' 8/163' 13' 9763'./26981' F61.' 8/47'F6 . ' . . . '8/47'8/69 ' / 62.'.68'2/' 1' 9' ./21 2663'".' 62. 0 4.3'D /7 . . 0#2/2' 3' !EO'./0. 26/'0.' 9 922'8/.6'. 9 . 2F6 0' .0'"0 3' 6. .92 6.'8/692. 763' / 94/ ' .'09 . 0F60 "0 F6.' 0 1 7 3'894E 2 9 ' / 1# 9F69' .D6 0 3' 061' "2 / 0 3' I 1' 92 8' 2 1 /' .9 3C' "9 / E 2' H69' 921'63' C' 916 63' . / ? / S? $ 2.26763 69 2' . 68208 0"268F6 4' 8/69.6 '

./2. 269'C' . 9167 2.8 .'.19 68 ' I D/' . 63'8/163'"263' . 1#"24. . 116 ' .68'. .' "2 63' 80D2 164 2 3' $ 01F6.'07' "2/' 8/' 19 2/F69'8/1/ .'$0 /F6 ' .2 8'2/0'. 9.' ./21 2663

1' "263' 9' 86 F69'0.' 98 9 263' 8/1/ ' 029' 88/7 3'9 1'0.F69' 886 0' 7' 3#F6 0'.620'2/2'49.0 ' 2 2 103'2 /6.2 ' 168' 2'"2/104.8. 1./2< 192468 F6/4' 07'0 /'2/2' 8/6.08 ' .68.0#.9 0 2/ ' 6901' 68 9 92 163 88/7 9'G/.'92 8' 2/2'9 1'29.9 9' 86'20E10 7 94' /19 1' 98 9'8/6. 9' 29'" /' 07/ .$' 061' 01 D01 /29' ? ; T6/4'.9 19'0.19 2/'8/1/ '2. . . 027'./2' 692 9' 4979.' /821' 8/ 9'C' 80D2 164 29' .0 921 0 D0216 92 88/ 6'02 80 0' F6 0' ./ / 90 621'C86107 0E468' . .9.'0 ' 46/'07/ 9' 88 266216 '" .3 04 ' A' 1668'" 10 68' 046 0'C'. / 61 /2.

1F6.'G 2.'. . 08'8/163' 9'9.9 . 13' . ' / 63'9 1'0#FO07 3"2 /8 3 6F6.' 98 9' 8 863$". . . . .' F607 G68' . .4 ' 863E/6 0 . . . .' /1/ ' 863'26 '/72/ ' 63'9 1' 8 6101 /2 "249'. . 08' .F6 .6 ' 68' 868 2/74.'319 268'9 .0.' 8' 86107 9

5. 49.'"9 7' 863'8/ / 2' 9 G9 0' 8624 ' 6. . .68 . 921 0' 49 1 2'./91/' 2/2' 2'.921 / ' 6.' 894 / ' 4'9 1' 2'19 0' !/ / 0' 92 8' F60# . . . 2 9' 8/692.6 ' 621 6.21 F608' M 80#01' .9 . 863' C 0 4 863 GA9 S'8/163' 1' 2' ! .6 /' EIF60 / .' . .91'<80 8'.2 8' .D. 9' 2' + %6.'.9 0W%"A V?1 F608 "S " F6 0#F60 1. 4 ' 1010 / 3' I D/'7 . 4. .' 863'8/1/

/2' /.9 1'06198' 8/6.2307 0 /'8/168' . .9 9'8/. /2.8'./21 2608 ' . . .608E' 0.F69'"2 / 898' 'F6 0'.0 .' 8/6923'8/69 ' 7 9 6 /29'". '1 04 /2.' 8894 019'".' 894 0 0 2 8 68' 9 ' 0 193'4 69 3' 8.4E' "9' 9'4 6. 0894 09'F6/ 68'"268'070 ' 1. /'" 8'9 . 1' 6. . . '6.'E "1'4 468'9 1' 'kC' / 94 3$01' 2.61 /'8/4/'8/163' 9'./2. ' 1 2663. 1 "2 / 8 3 06.' . . .6631F6 0' .'8/6.216 1024.8 ' 9 . 62.' I 'F /' 1' "' / 03' .'8/83'./21 2663' .' F69 2' 0. 1' 8/6923' 8 2/7 . ' !68'. 8'9/498' 98Q 9 '8/4/' 9707.0.'C' 68'8/7 9'./2 ' 8 .9 .G0797 !E' ./2 26 F69'0.A"2 / ' 8 .9 8/697 16 # T6 .48P0 29' 019.' . . 08' 868' 2/1/ 98' 26 08' G079 .' ./ / .08'8/ 9' 29'80D2 .64 2.8 ' I . .' .2 8'.0' 260'". '2 2 .0 2/0' 2 2 10 F6 0' 26 0'.0 3'. 1#2/2' 2 .0'F6 0'". '. /2 10.' 9 '0219'4 4 3| 863'8/1/ '2 2 10' " .61.' D4 .63'9 I .68 2 2 1/'Z8 / .'8/6. .$' 01'" '.63' 2 810' 2' 2 .0' 8 0D2 6489'9 9' 2.F6 .' I .'9 D/' 863' 8/1/ ' 6.'>.63' 80D2 .64 2 39 . 3' 0 . 68 U#4 6 /2 3#' 01F6.04./80 29'"263' 24 6 4663' 8 ' H.# 863 6 9F6. .0 3' T60' 79/ ' /D 0F84F60 / /1. 0107'G/8 2.' .)'2.'4 .08'0' !7. 1102/'4 . ' E9 6" 48 2 63B

: /2/'06198' 2'.0' 68 2 ! ' 24101 8/'8/16 . 16 .'0 6 .' 1/' 19 3) 68' 848 K @/ .K . 49 .$' 2/2'F60 968.9 1/' /./'w9 2 1'061'. ' .68 . 9 1'F69 2'<. .70.' 6 ' 9 9' 0. 9' /19 0. ' "7 F69'9 9'/880F69' 6 ' 0'" A' 161. F608' 2 2 .08'0D2/6 !E 8 . .' '948' b(' '49' 0 1 7 3' 2 80O68 .' 4468'H. ' 0. './88924069 '0 .2. 32.'079 D6 ' F6 498'4/86.6 =' 96'.030' 6 20. . 0'>.68' 07. .E .4'F6 0' 863'8/1/ '8' 0' . . .O' 0 19' "79 98'01F69' 6 1 / 98' 6S04'' 8 0240#" 61 3' D2 .0. /298'9 G 7909' / 9 ' 2. .4 7 .8'8/163'F6' 2 7 ' .' .9 .H101.8 0'F6/'8/8' 2 92/ 0' /82 0' 1/.6 F6.'04./' 862463' 9D 16 '0.F69'./2' V 9 60 6 ' 249' .61'02 804 . .6 . .'2' ./ 4. '". 2. . .7 /'2/2'F6/4'2/2' .'2' 9 1 989'4 D 1/'/ 02 76 F6.'0 3' ! / / 3' 0 . 763 94F6 0 2'./ 49'". '. . .7 /' 2 ' . .3'94 104 /293' . .4 6 F6.' 2'. 3'/ . ' 0 61E' .'C' 863'8/1/ '2'. .9 /'9 9'4 . ' 16 #2/'F6/4'. .968'C'.9 08'2/2' 8 90 ' C'"7 F692/2' 1' 9 '9 921 08 ' 0# .2 8' C' /. .2. 08 ' "1' G9/ /D ' /F66216 ' 2 . '. . 08'=0 92193'0.' : /91 4 4 3. . .

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79 8 3C ! 0 8 2 763. /2 9 621 '
8 .D 163 2' . . T M G963 2G 8 2/'04'
=016 ' : 1G0D/ 03 ' G0 93' O.G63 ' 20 0Q
D/ 03' ' D 63#=94'1E6 /4' 2'. /91/' 60 ' 2'
.D / 127620 ' "7. 63 .24.01 ' 9 '
.0 63'8 /6901 '4 6' 2 63' / 9 916 ' I1'G/.'
F6 498' 1/1. .68' G. / .80' 8 1' . / '
.2102.68'9 1' ! G 1 0`0# 4. '4.. .1 3 .48'
0>9 =0 .21 00#1.1`0F6.' 9 103' ! G '
163' > / 8 263' G02.' / 024 ' / 8 6 08' 2/3'
4/ .6. 1'0 "+ - . %/ ")& - ' =. .91'
./9 68'>9 '06 0'9 1' C' .4.3' . 60#19 0'
061. 2 9079 68' 94 68'. 63 ". '=0. ' 19 '
9 G 7921' I1' 219 ' 93' / 8 293' . 90103' F6p'
.M / 01 ' 621 ' S ' 20 89' "! "" + '
9 . 'B ' > '+ '& !'. !""%. '& ! '! . 9") ! ' '
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9.9G> / 8 2/0.' /24 ' 1. 9 4. 2.. 3'
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4'(($; ,' / . 4 2'7'&--$&/ ' ($[

2 ! %+ ' &+

M 1S 8 9A E6/ ' '.8 F8'9 3 4'9 .
8 921621 1 /1H / 7 / 0S? 8 31. ?P9 1'
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"2 O9 / . . 11 2 9.66 2F1C O9 / .0 91``
/71 29 9' 7J' 4140 01'4/ 1 203' 01 /' 8 9 '
1792 EH9? S S S' 92 0@' / 0 1'
2 29 /E` 09 `2463 MM 91 @ ! 191/0'
/ .1C '4 . 140' 8 1' 1? /20S' ' P'1@ 13'
F6 10/ /1193 9 13' 9 1' 9 '019 1D01 / / 98 '
/8 2E F69'1/01 2 0' ' 1@ ' 8E . 0' F6 2 '
2? 10 02 8 010'0662 `00 8 0 01F6.91.4 '
69 0 214P040 11 03 : G .03 0 1.3 91 '
1 ?21 ! 1 4S0"S 4 0 31 $S/0 Y 9 R '
.M1 /1H1 8 9 3101G . / /11 "0 ! /9/1$'
/ 9 8 . ' 944 /8 / 71Z0 1` 1 4. 1'
49' 9.4/'C')1 . &") / [) &' # : *&'<. &'
0 . 1 1 / 11021+8 3p 4J ' S6A'1 2 P9 '
0 1021 9 92 8 ' 1 99C 11 '9C 12 '
D6 0 0061. 8'. / 6 7 0 D 10 9290 163'
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* & & ', U ' 1 V 1 ' Q ' + 5 ' 1 ' I ? ?] '
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2 168 . 98 62468 C "2 .6 0 2'F6 210'
(E26246 2 1. 26 2. 9' 49 1 6 9' 98 9'
C' 616 8 2' 98 9
', (! ' . " .
I . 69 / 921 0' 2016 0 3' 9 1' . / / '
' 68 C2\0D2 164 26H 4 '0 .J 8 8 C'
<2/1D68=.' 2. / 8 KF60#' < 17 101 1 39'
10 ' . / / 63 7 . .1' : G. 3 . /2692 61
HA.'.2 `' / 8 2 0 H1' 9.62468'2016 0 8
.' . /2 1021' 2016 ' 9 0' 1 8 1' 2016 0
! /21 266 8' 9 1' FO/4' 4 01 7 9' S 1' 2 KK A01$
98 9 '4 6 17 0'
! / 63'9 7F6/4'M8 2 '9 ' 0 19' ' 4'9 1' 9 '
.62468' /2 8 98'4 2192 /24 8 9 1'4 6 17 '
9 610 /2D 164 298 01P04 29 .10 P 98 '
E 0D2 1S4/ 9.624 2 262 ' 4'9 1' /2
, 2 4 6 460 4 . 1613 SE ^?90 /2D 16'
4/ =9.6244 8 46/ 4. 1 /2DE0 `C 01612 '
. ! ' ' # ! / ' 01 1640#'=9.62468'1 0''
/ ?D1211 . S91 01O 8 '4 910 61/' 69 /
62468 '2/ ?< 9S 910 1 93 ' : 1.1703'
8 0D 8 164 0S32/ >0. 1 F` 0'1 0' 621'/ 8 2 0'
! M . D/ 'E4/411 ?0 49 41>2 4 8 .2 '&
% < < % # 4)& '
26 8 9163 9 /0 3 ' : . 9, 6?'
/2 29'11 1163'49 2 621' : 1G0D1@ 4 'E R 2. 'S S?'
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9 ' 024 29"A '49 249' /0 946216
1S6/ S9 8 /?1 `902 2 306190 .1 90 /'
[8 4C19120 M3 1?=09 35 9Y /39/7
.2@6 ' = F6 4 2' 1@2@9 0' B . ' . ! '
H1` . ! 16G 98 =0. 0 8 / 5 8 0
SS1 911 0SA612 ' 8 G0 8 04 2797021 '
'1P` D`98 S /2.` 30G< "1- p. 04'
1 9 0 0 0 8 440 ' 001 C D29 8 ' =94 '
AA'94 11'4942 / 763' 0F6 810 '0 8 7/3' 4 . '
S63 K0 8 49S 7` = / 8 /931F60 1. 20 63'
@638 R 1/ / / 8 2 01` ' ! / 63'9 D/'
1R O3 194 8 .2 / 8 763. /2 1003/ 8 1 2/
9 910 9 1' T6E 9S 21 49 3C F6 / 4'
R 070 8 1?61 S 1 0DF 11 4 24 ' "1 290'
F0p 110C'E 1 1 9 4S 2 ?0#. Sj 0? 2 612' '
./ 63' '92 8'1 0? /?' 6.' 8 01 /'
/ 19 49 906 8 'CE 2 9 '9' 11/2921' '
I AG?3 9F6 16 G=02462 S9' 0 /9 6 0'
9 9'@ 9 11 2A 'F6 0'9 93F/ 763'. /21101
91 < 101 621 94 S\ / 062 6 8 06
1. 2/0 2 / . 94 /2.3. / 94P016 '29F69'
070 / ! / 8 19G904016 ' "1' 2/ 092' 68'
"G 6. ! /20 ' 2492039 6 `9 107 / 619'
9 . 9 C17610
! & " % .
> ' 0 69 ' 0 47/=1 SE '4 R 9'(#&'
)9. '262. .924610 'Y / 1 3F60 '
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ʻ ! / / 0ʻ :G .0ʻ[. ʻ 9ʻ / ./ʻ 8069 ʻ / 62 ʻ/82 0ʻ ! /2 10A2.ʻ92 8ʻ20.6 ʻF603ʻ 9 1 2. 68ʻ 8/.63ʻ 1 ʻ ʻ /.0 3ʻ8/.63ʻ/82 3ʻ 9403ʻ9 1ʻ". ʻ. .6 0 3ʻ". ʻ 8 163ʻ =62.ʻ92 8ʻ46/ʻ / .3ʻ / 8 .93 ʻ T80ʻ / 9ʻG$ʻ4609ʻ 8 0 816 ʻ 4 293 9f \0KCʻ. 1 0 3 8 ..3ʻ 621ʻ / ʻ 163ʻ. .6 0 3ʻ9 1ʻF6ʻ 1ʻ. .0ʻ894 68ʻ864 ʻ ʻ 298 9ʻ19 08 ʻ 5.463< 6ʻ 6 8ʻ"9ʻ49/ ʻ 68.924

ʻ 01 /ʻ 8 9 ʻ"9ʻ9 1ʻ0ʻ894 / ʻ"9ʻ04ʻ 894 68ʻ"9ʻ. .0ʻ894 68ʻ"1ʻ 12.ʻ/82 2/ʻ 93ʻ8/.63ʻ 8 .93ʻ./ / 3ʻ.6 63ʻ 9 9ʻ J /ʻ 1 G639 149 2 10

ʻ 99D / 68ʻ0 0ʻ 8 .00 0ʻ8 Q 10ʻ 16.ʻ. 3./8 / 10$.ʻ 8/.668ʻ0 E 18 G..3ʻF6ʻ./ / 763 8 .763./2ʻ 6.2 62.ʻ0 E8 9 ʻF6ʻ8 43ʻ T602 E608ʻ 8/6.2 6 ..08ʻ8 10ʻ 4ʻ9 1 ..62468ʻ 4/8 2023ʻ ..892168ʻ # 9ʻ 92 8ʻ 68768 ʻ 2F6/.. D 06 103ʻ ʻ 4/8 20.6 8/6916ʻ".ʻ19 04./ 6 2

I 1 D 16ʻ R 016 0ʻ . 68 ʻ 0..ʻF60ʻ 16/ ʻ. 989210ʻF639ʻ .< 1/ʻ 8/.6ʻ 9 621 ʻ ./ 63ʻF6/440ʻ 8 9 ʻ 29ʻ 67 101 0ʻ /2D9ʻ 39 .. 92 / ʻ / ʻ4 6 2 / ʻ298 9ʻ..9ʻ 68 ʻ.6 8/163. .6 0 3 9ʻPʻ./2692 0.ʻ : 8 7ʻF6 0ʻ/82 =ʻ 8/.63ʻ< 8 9 4979.6ʻ ./ / ʻ 2 . ʻ =94ʻ 8/163ʻ. .6 023ʻ9 1ʻ 8 9 9 D/ʻ4979.6ʻ./ / ʻ 2 . ʻ 1ʻ F6 2/24 916ʻ" ʻ. 98921/ʻ16 2ʻ/829ʻ 9 1/ʻ 8/16 9 0 6 ʻ >979.6ʻ9 D/ʻ./ / 1ʻ 2 . F6/42/2 .. 98921 68ʻ ʻ 298 9ʻ

B ʻ =..6 44ʻ ʻ "2 63ʻ ./ / 3ʻ 8 .3ʻ "263ʻ9 1ʻ ..62468ʻ20 6 08ʻ8/.63ʻ.8ʻ" / ʻ .2.63./2. 0 639 # <"268ʻ06 98ʻ"2 ./2ʻ 1 0 68\8/163ʻ9 D/ʻ.ʻ .6ʻ0 3ʻ"9ʻ89 .ʻ...ʻ /ʻ ..62468ʻ 20.6 08ʻ ʻ ". ʻ" / .21. ʻ 6.ʻ ʻ !I.9ʻ20.6 08ʻ=ʻ ..62468ʻ20.6 08 9 D/ʻ ..968. .4 6. 6 0079 98.2. 3ʻF609ʻ10ʻ 8/.6ʻ2/2. 9216ʻ# 68 F69 60 .92016 0ʻ . .6 0 19 8/6 97 16 ʻ =ʻ 1. ʻ20.6 08E 9 D/ʻ. 1ʻ "2ʻ .6 08ʻ 9 9892./ʻ 2016 0 3ʻ .0ʻ D2 ! 6 0ʻ92 8ʻ8/.63ʻ .ʻ. .6 0 3ʻ 1ʻ 8 9 ʻ ʻ 29.9 9ʻ06 98ʻ 9ʻ8/.68ʻ 8 ʻ .98ʻ0 .6ʻ./ / ʻ 2 .ʻ 9.62468 2016ʻ 08ʻ./26.2 .$ 0 .< 17ʻ ʻ2/2ʻ ./2692 0.ʻ

B ʻ 9.62468ʻ20.6 08ʻ 94ʻ B 1@E!/2ʻ 698.1"2 9 0 3 8 .763ʻ p6Rʻ 610ʻ D2 ʻ". 0. j .ʻG/.ʻ 0 68 "268 F6/4F/.ʻ .2 8. 9892.68ʻ"2 ./ʻ./F6920.6 0Gʻ8/ʻ 16 9 .6.ʻ4 69 / ʻ. .6 0 ʻ ʻ D2 3ʻ92 8ʻ=)ʻ 09ʻ 6 68ʻ 9. 0ʻ 9 6216ʻ$ 0F60ʻ Cʻ 19 0ʻ 49/ 68 6 .0:G .68ʻ0 /80ʻ)+ #+ ʻ (.#9)ʻ3") /) " %.ʻ"! 0 ! .ʻ.+%/ʻ)+""&)

8 7"9 /29F69ʻ. .6 0 3ʻ 8 /163ʻ./2692 .ʻ " ʻ9 9892./ʻ 0#1. ʻ20.6 08 U.ʻF60 ʻ2016ʻ 0 8/.6 ./2. 2 63# F6 0ʻ.68ʻ 9 1/C20ʻ 16 0 ʻ.6 6 F6.ʻ498921ʻ8/.6ʻ ./21 0 63ʻ 1ʻ0 63ʻ8/.63ʻ 9 163ʻ".ʻ8/16ʻ 6 1 8ʻ8/ʻ 63ʻ49/ 68$ ʻ. .6 0 3ʻ49892 ʻ.6 6 402 ʻ ".ʻ D2 3ʻ8/16ʻ20. 6/ʻ./21 0 63ʻ9 9 ʻ"?ʻ 46/ʻ9 1921ʻ./21 0 0ʻ298 9ʻ8/.6ʻ20.6 0ʻ 6 68ʻ 9ʻ. .6 0 3ʻ Cʻ8/163ʻ4./ 68# T /4ʻ9 1ʻ./21 0ʻ 9D98ʻ 20 6 0Bʻ "8 8ʻ "2ʻ / /2921 3ʻ 9 . 2/163. .6 023 / ʻ 9 1ʻ 2016 0ʻ0 /ʻF6/6 3ʻ 2 .ʻ 94#/# F6 0ʻ . .< 1 / ʻ) & ! !ʻ&" . "! % !ʻ# + !# " ʻ 9 D/ʻ.ʻ./ / ʻ 2 .ʻ./26.2 .. F6/4ʻ9 1ʻ .0#19 320 6 0 63CA . 9 63 29 9ʻ.11 / I 1ʻ "9 7ʻ8/.63ʻ. .6 0 3ʻ 94/ʻ . 97 / ʻ F6 0. .6 63 2F6/ʻ 19 1#ʻ 9 94 / ʻ 290ʻ 94 .68 1"7 F6.ʻ"263 . F6.ʻ2 G ʻ044ʻ / 1 .$ 2. ʻ061.8 E E2 .0. 1ʻ044ʻ 98 9ʻ 0 F6 4 / .ʻ?ʻ"9 7ʻ2 2 .0ʻ9/ʻ /ʻ . 8 ʻ . .40 F6 0ʻ 298ʻ2/2ʻG079.ʻ N 2 3ʻ92 8ʻ 9 94 /9 1ʻ.6 2 93ʻ 9 94 ʻ2/2ʻE29 29ʻ 2. /ʻʻ894 / ʻ ; .ʻ 29ʻ >92 F69ʻ8/163ʻ . .6ʻ0 3 "263ʻ./21 2663ʻCʻ 9 91663ʻ9 1# 9 D/ʻ2.-. 0 7ʻ./2 .81ʻ./ / ʻ .6 408ʻ 2 .ʻ=)ʻ .9 2/ʻ 9.62468 2016 0 2ʻ /ʻ F6ʻ 8/163ʻ .ʻF6ʻ / 63ʻ 0E.9 263ʻ 9 1ʻ9 1.ʻ " / .2 63ʻ=)ʻ 019 ʻ2016 08ʻ .F69ʻ0 /ʻ " / 92.68ʻ4 910 ..868 2 08 0ʻ ʻF6/4ʻ 07ʻ 6ʻ4ʻeeʻ8ʻ6ʻ8ʻ9 1ʻ@ʻB238ʻ(UA; 3ʻ 6 Q 68ʻ 92 8ʻ" / 9868ʻ 6 07 7ʻ .ʻ 64ʻ9 1ʻ.9468ʻ07498921 . .23#9 D/ʻSʻ ʻ . 1 . 2ʻ 2016 0ʻ./ 63ʻ07. .20.1 .3ʻ 9 0 0ʻ 11 8ʻ.02./A #07 /B9 0ʻ 0.6 08 G07923ʻ F6021/ʻ 63ʻ07ʻ 3ʻ / ./ʻ4 10.

, ʻ !#ʻ & %.

MPʻ /2E29ʻ./ 63ʻ D 069ʻ9 1ʻ". ʻ .6.# . 68ʻ 92 8 ʻF6 2.0 0ʻ 8 9 F69ʻ 67 1021 0ʻ 07ʻ 492198 3ʻ F6016/ ʻ4 1 240ʻ 2.F69ʻD 069ʻ9 1ʻ29F69ʻ 96.ʻ 08ʻ D 069ʻ 9ʻ 9 1ʻ F6/4ʻ0 168ʻ9 1ʻ 9 04ʻ894 68ʻ 4 9 1ʻ4./ 68ʻ F6/4 0ʻ8.4 /ʻ 4ʻ9 1ʻ 6 68ʻ ...968ʻ ! / 6 ".ʻ 64ʻ F6/4ʻ. .6 0 1. ʻ1E1/6916ʻ ʻ29F69ʻ 9 .6ʻ04ʻ 894 68ʻ29F69ʻ0ʻ894 / 6.ʻ ..62468ʻ20ʻ \16 084 6.ʻ 19 ʻ20.6 08 "1ʻ9 ʻ 6 0ʻ4 4 3ʻ ./ D 8 ʻ I D/ʻ P1 6 22..ʻD 069ʻ9 1ʻ2..ʻ 9E9ʻ$ 8 7299ʻ9 63ʻ" 0ʻ 0 . .6 0ʻ ʻ.68ʻ 2ʻ 8 . 76390498 .ʻ 01 /ʻ./1 63ʻ Cʻ 0 1 3ʻ 1". 7D 06 86ʻ 64ʻ9 1ʻF6/4ʻ/8 2 763ʻ F6 ʻ4@ 68ʻ 9 6216 ʻ 67 0.E .ʻ .6 ʻ 868ʻF6/Hʻ 6 9ʻ/82 0ʻF6#.ʻ 6 68ʻ0 .. R ʻ 462. ./ /.0.68. 1ʻ ʻ

!09 68ʻ AD.29 01 /2 3ʻ 9 9 3ʻ 9 1ʻ 01F6.ʻ ./ 6 1 /2 3ʻ 0.. 9. /2 3ʻ=)ʻ49. .. /2 3 3ʻ /82 F69A

/2 2 F6.' 1. 01 / 1 3' -. . 0. /' .2 8' C'
./ 6 . /' 219 './21 020 . 02.6 C'F6/4'
1'9' 8019 0' 1' ./21 0 03 60 10193' 6 . '
.2.9'A' "1'C'F6/4'./ 68 .6 ' 2'./21 0'
68' 07 1' 101' 2 G ' ..9 / . 1' ./21 0 68# '
.2 2 '..9 /' ./21 0 68'F6 4'.O.1E! '29.. 0'
/' .[26.2 921'./2. 0 E' 8 / .63#01' 2/' ./2'
692 621'... /' //163' .721 01 E#./26. /2'
.2 8 F603' 9 1' 9 63' / 63' 8 / 8 3 '26 63' 9 1'
./2. 0 63' 0/163#C' 0 989 'F6 4.8' /'
6 40 08 0' ..9 6807' / 8 2 './21 0 9101.'
79 06 .' F6/4' 497970.' 9 9' 2D92 162 C'
2./ 6 968 ' =94'2.F69' 0.. .1 /E '49. .'
./11 "9'/72/ G 8'9 1'./9 6' T6 0' 09. 91 /'
9 1". 61 F6 408' D.29 01 / . '0 8 01/'
79 / 9' 0 8.2./ 'C'8'" 69213' 67 101 08'
./269 /'1\9. 91 / 'F60408'./ 6 1 /'E' 9'
49 9 96219' 0 19' 07F60'" 6.2. 3' .'29.'3. '
2. 016 '29.'./ 6 16 ./9 68 ' =94'2..'20'
79..69 68' 80 . 08'10 .'9 'F60 1. ' / 1'
0.. .. 7 061' 91 08'F6 ' . 6'0. .. .' / '
1' T 74 2..D929 . / 29../ 6 /'
2 0..191 /2 /9.'4.. 91 /2 '/72/ 6/ 9 1'
.C 66 #09F69' 91 08' /19 110 19 01 ' T6 0'
0 1. 01 /'J.' 219 './2. 0 03' F60 10..3 '/
. 208 04 S4 40381 .0d / .3$F6 18 3.6L'
4 , $'(% 2 .2 ('. . @8 '2.F/.'/. 08' 0 '
Z 1EM` ' 67 . 9@ ' 9 '.D9 6' 8 / 8'
' J/ / S8 'C . .J@8 ' 3 429.19 / 9'
('S ? ./2 0116 . /' I 1 4F6 ,0? I 27 '
= '/. 0 6108 < 9W I' 'E0 8' L 0E.6F6 ' >9 3'
. 94921 93A' 1@ 2/ I 10P3' P 1 .E 6'10A
.6 2 $63 68 . !91 W1` 7 .1=1 6 8/ 10 .'
' ..9 68 >./ 2@ @ S#; 2W) W) 193 =0'
C' 1 / D'26 0' "2F60 2' 2./9 9'. 61 ".'
1. 763' 861 /2.` '< 9 979249 621' >B'
2 F69 /.6 E 6 92E68 ? ' B 069 .'3 919193

98 @ @ .1MT1.H E. 11/2' 0;3A '" ',
;? 'F6/49 1' 0 . .' "1' 20 0D/ 03'
F6 /' D29E=91G. 047=1 0.8 9F6E0 '
68' D29 8 ') -&'! & ! & ' = '=0 98' "/90 .1'
9 68'.02E 23' C' D E 168 ' K
' ' '

63' 8 /.63'</229 /2 E/110 63' 9 1' (
/2 .< 163#G0 .92 8' 018 =163./ '
Z0 016 1"1' 6 68 '4./ 68 ' 32 '"26 0'
9/21101 08 '7 /20 63'. .6 0 3' H 9'. 8'
"4'9 '20410'<98 . .6 '"4' /1 13'.P.6 '4 s'
61 90246' 39 1' .' 124 4 69 /16 8' 9 0 '
. .6 / 08' 8 /163 '07' 4.8' D2 3' "91 6='
021 ' "1' 07' ' "91 63' `' 2/2 21'
./21 01F#F6 0' / 0/1'9 ' 2 2 1' "2 '.9D/' '
00.6 ./ 1 0 E .21S 2 1 F6/4' 07 6 '
46 0 =..624U '2 10'F29' 8 /163' 1 6.. / 08' .'

8 . .6 / 6 2' 0J1' / / 1/' 8 /4/ ' "14.
' ' `' C49' `' 2' ' 621'./2110 E' /7' 90 2A'
498' 01 /298' # +#' F6 0' 2/2' 20 89' 4 '
1021 .9 8 2 '.68' 80 80' 4 1021 0 64 '
.916 C' 8 .2 6 ..6 E 9 2.08 9 08 F60#' '
(26 0' 9 1' 2' .8 . .6 3' 9 1 4 '2/2' 2.'
'91 08'./2. 0 E' 8 / 8 3' 9 6 ! 4.8. .6 F6'
H621' 9 2468'. 63' 4 69 /3' . 0 . .6 73' '
T6 0K./2186 E9 9' / 621C' 07'./498 2'
498 '29F69' 9.6246 '4 1021 08' 941 'O'
29 ' T60 1/ '8 /163'. .6 1/18 3 '2/2' 9 1'
./21 0263' 8 /16 . 0 4.8' 1/. 63 29F290 '
19 63' 3 /0' 0 1. 63 # .2 8'9 921' 2 2 1'
8 / 8 3 '9 .21' 2 2 10'./2 0 0' 2A' 69'
. 6 498' '208' 8 /103' 9 9.1' 07' 9/498' 2'
498 "1' F691' 9 0 04 D80.. T6 3' 10892'
1' F6 3' . 1 20. .9 './21 0 93' 49 92409#". '
E9 621' 2 2' 2'. .6 / F6/4' 0 8 "9 A'
F69 / .93' 04692 921$' <=9 19 1 8 94 92
C' 9 . 6'F69 9' 9 9' " 2 0' 19297621' 01 '
F69' 04./' 6 1 0. .21' ". 0 1. '4/8 20' 7 '
8 'C'<2 9 07 ' I1' ."2 ./2 / L. 97 .6 '
8 /7 9F=)' 26 ZE6080 1. / 'H 9' D 16 '9 9.'
6 1 0 .61' 16 1 0'.0 ..63' E.'4 9 98
-6 /3' 87F608' 616 0' 47.0 ..01 / ' B . Z ' 4
! !'" ' - ' ' ((' ' !"'
G6'G/.' /././ D A'=' G/ 803' 1/1.
9E2' 0D2 6 .' >3F8' ' .06 08' 9 94 '
.98 / 91/ 623:68 8 1104 9`/F' / 21'
H 7 1' 0011 8 ' 2F6 1' 1/19P3 ' 1' 1 0' '.0'
0' >9/ Y02. "@/' 26 1 3'" 68'9 1' "1' /7 19 '
C?? `624 S '01 /29 2 1/16 .' '
1/19 'F61 W968 V0 ` S 101 31 . / '
9 039 1$F63 / 0" 103' 04'.E101 /2 3' / 63'
219. 01 0' 9 1$' 2/2' 108 92' 90M' 9 901 /298'
F@0 ' "/.021'.E 2 ' 2/6110..' . .24 ' F60'
>9630 H8 3 `624 M D 2 763' .392 '
/' 1/46 1 1' $ 94' F0 7' 0 912/' / 8 2 0'. /2 '
4 4 1' : E 1.1 12' 1 1W . 93 . ;' 59 '
1G/ . :0#8 T29=9 ./ 2; >. C9 / 0 49'
! .2. ' >.1 8' 0 198 10198 3' F6$9' .01 ' 6 '
1/. . /19 001' 8 9 91 'C' ' .1 0 G'
. 1' : 808'.06 08' 298 9' >.68' 9 9'.19.. '
1 3.0H 0 2 ". 21' 198. ? .10 G 4
"208' / 8 2 68' . 60 '.E 9 11 .98'.06 08 '
. .4.2.2 .246 2 C 0' .10 . ! .9
1 8 C2016 021 .24. 9' 0' >9/ C. D >968 '
.[.' 2. 620' 07 / ?1. .01 08 F69' $
808

FS 21S12$

> I 12 2 1M / / .4 .924 8 0 1 1' 2e']'@ '
7/J' .2 8' F6= ' 2' 1 2. /' F6 F6 3 A'
9 01' "4' 8 2 868' 3 / 1.0' 2' /D '9 6' 9 01'E Ar'
4.. =18 93' 80D 3' :0 6639 8'9 1/ ' 2e V] '
2. / 2 0D263' 1' 2' 29

6 68'9 D/'./ 63' 2 2 8'9 1' 2 20 s'
6 0 T6 0'./ 63'/8 29'"9'9 1'8 168' 69'
./8 / 168 ".'< 8 . ?' 1'296. 6'9 1' 2 Q
2 168'#2/2' 8 168 F6 0'./2 10.'9' 8 . '
763' F6398/ .' >) 268. /' 2 10' 62112/2'
.108' 8 . $..968' 2 8'F6/4' 8 . 6'
86'. 1EC#. .6 0 1.'8/6.16 ' 2 2 168'
2/2' 9 1 F6 02/2 / 1.18/6. ' 62F602 '
.2 8' .' 1 02 9216 ' 2 2 10' 01 0'102168'
079 1' "1'./269 /2.8./ .. 91' 9' , ' G/S'
03' T6/4108929 9 921 0' 4/...' =94' U.'
26 68' D6 016'9 1' 2 2 168' M8 29'92 8'
D6 0.68' 2.8'70791'U.'1. 8 268 .68' '
D6 0 .' 8/4 .01 /' U.' 491922 201 /' 120A'
D2 164 2 3' 1'/8 29'./ 63' D6 0.68'9 1'
.9 1 3' 19 8 2 3'. .68 9 168' 6 68'
D 6'./ 63' 01F6.'049/'299'F6/4'. .6 0'
(21. 8/69766 . 1' 2 2 168

, ' !# &6 0 "

IF6..1080 0./ / 0' 8 O. 0' 9 '
..1'9 .89210 68' 2 10 .'.2 8'0'
894 /' S6216 ". '04' 894 68' T6 ' 621'
./2. 0 0.' 01 /2.3' 1' 894 68'9 149 2 '
168 '9 D/U. 01 /04 68. 1 2 10' I D/'
C#9'/ / 10 01 / ./2. 0 / 68'.2 8' '0 '
1. 2'4. 2. 8'9 1 9 1'U 0 .9 68 T6/4' '
/.0' 621' 2 0'. 621U../ / 0 /.0.0' 1 '
10'=94'U.'D 06 .03'; .' 96 103'. 98 .21/8 8' '
V2 10'9 1'9 D/'9 .8 .210' 2 10' 219.94923'
0191' T6 0' . .' 2 2 10' 9 .9' 8/163' 2'
2 102. ' T6/4 9 6D20. ' /.63.1 12F6/'
D 06 0' >) .6 0' 9 6216 ' 2 163'9 1

, ' !#' &# .%.'E

: 1 1'9 'E F6E.'4 0 62 '8 62408'2/2'
. .' 2 2 1681 '6O 18'92 8'./ 63' 8 '
)6 ; + % #1' 8 0 .'"9' 8 68 0 '
(1 68' 2 2 168'9 1#.68 8/ 3 8 ..3'U.'
8 ' 21 2. ' 6 @2'.108'& + .%& 9'
4 1 8 0 9' 69' 0 91763' 4 1 8 763./2'
1023' 2 2 168'9 1' ! /2 10 9192 8". . '
1..P' 2 2 1 3 F60 6O0 621$"9 2 1 3$UJ'
9'2/2' 9 91' 2 2 168' T 44' ./ / 0'
8 . 0'".'9 .89210. .21' 2 2 j9 1921'
C' /.0 C'8/163' 2 2 1 $2 G F69'049/' '
68' .. ".'4./ 68' 1'G/.'262F608'" '
68'9 1' DG6 ' T6 0'F6/4'G0' 19263
2/2 6 .'2/2'. 9"2F608' 44/F674/ '
89'./ 63 .2 7 .'0D.1.' 497.01' "9' 01 A'
"9'"1 8F6.' / 9' 1' 2 2 168'29.0D. .'
/19 1' 2' 2 2 168 '299'07'./' 01''299' 8/ '
69 9' 9.8/O9 2/2'198 / 9' 2 2 1 F6 0'
.0< 1 / 0 / 298 2/2' G07. .21E2/ '
2 1/' ' F6 0' 2 16 G'U.' 2 2 .68' 39F60 '
198 / 9' 8/69 921' '. 9.F69' 49/' 219 ' 90'
/ / 1 / F6/4 0 8' 6 612'06198./ '
./9 68A'2.' 219 D 7 9'F6 498

q ! ' '

0 G9801 .68#F6 0'/8 29' 92 7 9'9 1
U.' 2' /./'.9 1/ 'E 0.G980. . 3' 06198' 2/2'
./ .. .' /.63 F8' 1 .9.' / 63'2E/163'D 01 0'
. 1 0'F6/' 0' 621'07 / 610' =94' 29F69' 8/ '
A6. ' / 91' 2 2 168#"9'92 807'0 / U.' 9'
9 92946/' 2 2 10#"9'0' .'U. 9. . 02 Q
80 'F6/4'9 1' 8 / 7 .' M8 29'.2 8'02 '(
1 01' D6 08'G0791'U.' / / . 1898' 'F6S'
2 2 19' 9 6D2021

% ' !#'+= !O .

! / / 0' :G .0' 9 989210 0' 8/692 ' B?S$
16 U.F6 . .62. ' . 2016 0' "9 " ' 2K KA'
F6/'06198' /./'2016 0'F6 . .62.' 2'96,98'
20.6 0 1. . 6216 $C ./21 0' 2'F6/'F6 9'
. 21'" 2'96498'"' 9 6216 ' T6/4' '8/'(
1630 F6 3 ..62468 /.68'./ / '.6 408'
." / .2.63'. 63 / .U14'./2. 0 63'9 .'
. 49'2016 0 3' ='.2 8' 8/163' 6 36'9 1'191 0#'
" / 9.63 8/163'49/ 68'9 .'. 49'2016 0 3
/2' 621'9 D/' 6 938624 ' T6 0'19 0'
"2 63' 0 10' 9 91' 8/69 '04'.9 08'0 .. 63'
. 921'.2 8'./2D9 . 93' # 01'G/.' 9 ' 2/2'
/ 9 ' 9 0'92 8' 2' / /' 0624/'0 992'
4. ..' 263' D 16 '9 1' 8 62463 .6 2' 9' " 1'
.68 8/ .23 868'

' "+"%.'

: 6 ! 39 906' 9 ' 8 624/3'9 1' 8 / '
9' T6 0' 1 9 0/8 2 3' 2' /'0 68 90'
. 1 9'F60'1/ 0'. .9.'./ 10 9' /19 0.' 6 Q
0'. D/8 01. 1. / 1 6 . . 1' F60' 0 E'
0624 ./9 ".[[T ! .f216 'B8 2.'06198'
./9' 219 D 16 I ' 4' /8 2. E / =' 0' q6 8 8/'
..9 /'./8 ..62 4'9 1.M8 0D93'U.'/ 4/'/' '
8 2 6 0'./ F 68 6.'8 62463 /2'9 1 D '
16 '9 1 0'..9 68'./ 63'" 68' 69' 8 . '
69'8 8' 49/F69'2.. /.63 2..'"0.668'
299'1.8 63 2..8UI1 =A' 249F60#' .' 621'
92 0' 2 / / 2/2' 21' 29F69'198 / 9' 1'
29 1'61 .'29F69'" O86.0. /2' 621'/92/ 0#

@0 Ŧ

F6/ 68' 868' 029'4 6 268'9 1' 8 8 6' A (
107 . 68 868 2 G ' .0668G07.23 26 `S? '
63'9D923'7/2 ' 98 19 2/'U.' 2.9 07 '
A8/1 ' 8/O923' C' 0 921 8 9' . 68' / '
8 2 68 2 3' 192 63/8 29 U. 2 2 10198 '(
"1' 68 80' 9 . c' ./21 2.23 0 1. 268'
98 9 '923'U.' 8 8/ 10 9' 0'F6/'9 19 '40Q
16 8'9 1'9 9' U.'" 69 .' G 3'. 0 1 3'1 6.' 9''
94 63E 3/7 16 63

% !# &) .%.

M 5.689 .862468 .4'262F608'
16 68 '4 9' : 01/' 2' 80#/' 94'
80 9' T6 0F63/ 10 621'/8 2 0' 9 9621'
=9.6247' '/ 163'9 1'9 D/'9 ' 2. 3'F6 '
76 40#.0'9 D/' 021./ 68 624 0 1.1 9G0

79 . /19 021 ". 2/2 = G/. 9 D/" . 3
021.0 2/2 / .70 6 8 62463 . 2.. / 190
/ /16 1# 64 9 D/ C 0 F6024/04
G69 0 .9 G079 9 /.9 62. "24. 864 . /
281 / .F6 /19 . >98/. 163 "1 / .68
.X 4 9 . =) 9 .6 68 .4 10 "926F608
/ . 9 1 16 4G6.80 9 T6 0"102190
.08 /2 9< 91 / /.6 1E . C .68 2.9 9
. 04G6. /1. . . 0 0 802.21. . .9.
90498 10 c) ./2 H.6 /2. F6 . 01 02Q
19 / 168 I 8 94/. 93 "9 7 6D2021 0 4 . .
4680 9 2 38 62468 / 610 c) 219
908 . 1 0 C 1.# 0. 9 .2 8 862468 7
1021 0 9 91668 # ..62468 998 .G1/
68 20.6 03 98029198 ;/ 4 2. 06198 / Q
80 =.4 / 1 /2../ 6 1 7 98 =94 G/.
. 1 .8 A9 2 10.98 26.29 . "1 F6 3 "
. 8 9 69 /" . " / . 9 .9 80 .
99 98 9 498 G/8 / ..62468 2016 08

!# 3" & .%.

99 3 c) ./2 6 0 2923 944 .6 S@
. G/8 2 8 08 468 /
"2/ 68 9 4 F6/4 86 .3 6 016 8/4 3
I D/ F6 6>.68 4 1 2D6.24620E"9 9 1 2
D929 07 9 F6/4 4 . 161 1 763 8/4 3
0 8@D6/4.6 021.02/29 91 262. 9 1 :9410
[V[8926 0 96219D92. 0 /2.06 8/.OE !
D9 / ./210463 8/.63 F6/4 046 D92 68 2/
9 E ..1 D2 / . "1 / 0[9892 F6/4
8 / 1/ . 9 1 D. . 0 10"1 0 F 024/ .
0 F60G4/ /2 29.998 1/19 /1
8/4 3 4 . 1 29 07 9 / G 1 7 9 2
./ 6 1 7 9 ; .4 8 7 9 7 0 08 4 .
16 : 87 2 . 1. F6/4 2..9 1 2.. . .
%(!" 061 9 /19 1 =..6247 F6/4 2/2 0. 9
(2 9. . .7 2.. 792 .
(3 c) /1921 0 2016 0 3 ,E602.68 04 4
F6/4 /99 # . .0 0.49 . 2 20" 497..
..624681. 8 2689 .9 .2. 3 1 80Q
868 /4/3 F6/4 / 10 9 0 .3 1 46.92
0 68 7 0 68 4 .9 3 " 8 G079 9 / 102
4 %// 7 03 F6 .2 8 /1. 80 63 /.9 1
8 263$ C " 493 6.08 " 497 3 =) 1 0
798 T60216 8 06 98 04 4F6/42/2 /
19 0.6 103 2016 0 3 4979. .0 4. D20 9
8 2 868 # F6/4 2/2 /.9 1 = 92 8 8 2
268 09 10 9 29F6903 " . / .0 . %/0
G 03129F69 80 63 107 3 "1E//

!# %+ &) " ." &

T 0. / 021 9 9 c) 2/2 .J9 .0 .. .68
0. 4. 168 198 63 G0792 04 .
119240 1 0 /F6 F608 80 8/ 198 / 9
001/ / - ` 04G6!9 9 280 / ". 2/2
9 9 .F69 / 921 . .12 2P/ 198 / 9 c)
2/2 . .$F6/4 9 6D201

8 / 7 9E / 7 9 "9 68 0 68 4
.6 16 "9 9 G /1G9 ". 07 / 6 9 =94
07 / 6.9 0 68 C 07 / 6 9 8 / 7 9 2/2
498 0 921 08 0 68 9 1 07 / 6 9968
F6 .49. 10 . 2/2 8 / 7 9$. > 089
. 68 . 9 ./8 89 6 07 .8 . / 13 ". 86
10 9 c) 949 9 07 / 6.9 0 68 9 1 C 8 /
7 . : / ./ D16 / 7 0.. 4 9 8
/ 7 . 0 7 06.98 2/2 2..9 0 7 0.. 4 9
8 / 7 9 49 .2 8 86 04 / / 10 /
192. 08G07.1E 94 2/2 ". .0 86 G07901
M829 D16 98 19 268 9 1 2./ 6
1 7 . = 92 8 98 19 26 9 9. ./ 6 1 7
.E 4.8 86 9 91 8) 2/ 9 9. I .1 F 498
F6 0 .8 E19 26 E24 . 9. ./ 6 1 /29 04
692 9219 I 1 .1 08 /829 98 .9 268 2
D92 168 F6 0F6/4 D92 168 9 1 0 F6024/
. 110 F6024/ 2/2 /2 9 0. .2 8 0219
F608D.2. 0 916 M829 D16 98 19
26 0 9 1 2D.29 07 . c) 2./ 6 1 7 9 c)
./21 0 19 DMV.. /.0216 2D929 07 .
2./ 6 7 9 98 19 268# . c) D929 0
7 9 ./ 6 1 7 9 .046.68 I 06 1 D16
: 0 /F6 862468 D92 168 9 9 4 1 9 9
108 .2 / ./ 6 1 7 98 T 84 "9 1 : 01/
/829 D92 168 9 9 9.64 8 2016 08 608
./ 6 1 7 . 2L F608 108 92 0J 6 ./ 6 .6
/ 19 9 19 208 .06 08 . 63 ./2 9 60 (
1 ..88.8 . >968 0 16 T6 0 40 916
0 1F6 4 F6/4 9 91 98 9 C 2/2 / .. 9 9
.8 9 HP 102 9 8/269 8 0. /293
1/1. 3 2/2 2..9 0 7 ./. 649 . 29F69 903
("0 . 9 2 2 D929 01 /29 G .0 T6 4
.2 8 "9101 8 62468 6P 9 168 2016 9
/ 9 4 7 6 0. 219 9 B I 68 10 092 0 >9/
. 63 92. 0 26 3 9 1 8 1 763 . .68
9 10 9 916/ ./2 9 60 1 9 D/ 862
468 .78 2 G 9 91 9 /1.23>.63 . .0 .
"/ 6 1$ .C .68498 .89 /46' 168 0
7/8 101 0 921 0 c) " 161. 2 19 268
./2 . 607 . 501 / 04 /1921 0 . 1 0. 92
13 T602F608 . 94 49 8 2/2 / 9 01 /
293 1/1. 3 / .9 2 .0.9 8/.63 c) 86
4 0446403 G6802 3 c) :G . 3 9 /2 /
2 763 4E 7 6 F6 .F6 4 9. 08 .2. 9 /O
F6 408 / 1 8 9 92 8 93 ./2. 64621 .
.62468 2016 0 0 2. 0 9F69 3 0.
9 /19 1 2 04464/ 8 0.6 / . 901 /
2 3 F6/4 49 F6 498 22/ . . .$21 0 06
19 2 / .9 0 10 0. 3 498/2 1 0. /29 /19 1
9 6049 1 219 D021 /8293 "268
1/19 .8 /7 2016 9 68 2. 6 1 0
168 49 .7632016 0 763 ..62468 20.
6 :G 99 F6. 2. 0 / . 89 6 9 G
/ / G0168 ! . 94 49 1 1/19 93
G E

80 / 98 >9/9 6 F6. 2 2E. 7/2 101 D / ' 08.94. . 9 ' . . 2 101.K8 624 60[W. Vs@ . 63 .98 / 0290 . .0. /2.B

@ '& '&) . ' &')&-+

H 791 !0 10 , ". "1 0 E"/ 621 46/ ' 49. 8#:0 193. 93 : 80 9 1491/1/ .9 / ' =..6240 49 1. 3 .11 0 4.19 0 A$ F6019263 9 1 8 624 .921 68 . .0 F6/4 "/ ' 6 16 ./3 68

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! 9468 2.. /8 8. 9 2.../ 6 168 E .4 "268 0. 98 19 268 9 9 ./2 101. 4 4 3 I. 19 .0 9 9/ 68 0 92168 ./2 92<6 F6 >9/ 98 19 2/ K 68 98 19 268 0 D20 621 :/ / 076 0 9 1 10219 G68. 3 ..9 68 6 1 29 . D 06 .03 92 8 26 0 2. /9 1 N0 68 .1 08 2 808 8 /69 . ..9 68 F60 02 80 $.68 .2 8 9 9164 8 /69 . 4979 91 2/2 9 91 0 164 2 3 C 4/ / 39 . 3 294679010 94 /2 8 3 2 9 . / 02 80 8 / 10 6# F6 / 82/)F6 . . . 16 0. 9. .016

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M. / 1 /2 F6. 4 9 921 09 / 8 293 F6 62. ./ 68 49/ 68 0219 91 / 49 1 68 2 1# 68 ..9 /. 6.2 621 T 8 0 ..9 68 9 1 02 80168 C . 9468<02 80 2 .2 8 4 9 1 21. D.2. 08 G079. 2/2 F60 / 808 2 / 802192 94 0 192198 \ 01 . .63 4 9 .21 7O3 02 801 3 9 94 F6. ./692 621 0 9 : 1G0D/ . 49 1 68 46210 01 9 12 1 68 ./9 /. 76. 62. T6 0 G03 4 9 921 03 0 F6016/ 021... 4621 : 12 92 8 181 6 68 C 49/ 68 F6 "7 F69 62. C 2 " 6921 763 9 1 292. 04 0.. .1 /2. 8#=9F66216 02.9 C 9Q 1 / F609 / 3 .21 .2. 763 2 62. =92 63 .2 8 9 1 2 0219 / 0 19 0 ..8 80 89 . 8 "9 4 C . 94 1 8 621 4. 1 68 C 2 1 68 F6 02 80 763 / .68 8 6102 1 763 9 94 F6. ./26.2 6G.

=6 68 9 D/ 8 ..9 9 1 / 63 210 4 .63$49/ 68 4 .63 219 . 4 93 ? 9A 1 / 894 0 2/ H69 6468". 6 F . >9 1 68 M .23 0 F6/ . ..1 9 1 8 /163 = 2 1 68 M.. 4923 2 0 3 G 3 F6 / / 1/ 8 /4/ 8 /69216 0 1. 93 G0/11

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68 F6/4F69F6/40D9 .0 16. 1 D 0 10 6 / 9 0 /2 3 9 1 >9 0619/ 9 0 1 /E 8 8 / 10 103 9 1 H69 9 9160 " 10# 8 / 163 9 D/ 9 91663 . ./2692 .1 F6/ . ..1 ..9 68 4 6 268 ./ 63 8 /697 1 I D/ ./3Q 68 . .6 0 .9 8 /697 16 . 1F69 /162 468 0 . 92 8 ./ 63 9 . 98 9 ./2

. 16 T6/4 98 9 ..9 68 ./26. ..19F6 9 .910 F6 4 28 34 / 8 624/ 298 9 19 0 4F6.2016 0 1. ! 68 .2 8 19 0 9 910 F6 9 .01 " /P299 F6 . . . .1 0 F6 4 " / .2168 9 91 9 91668 08 "9 / 19 0 9 1 9 . C D2 3 = .2 8 "268 ./21 0 68 9 1 . . C 0 1. 68 I1 19 0 C D2 3 621 . 6218 .4 0. .8 910 09 C0F60 19 C D2 ./21 0 0 T 44 21 , . . 8 9210 9 621 D.29 01 /2.3 C ./ 8 1 /2.3 9 3 C / 19 0 ./21 0 0 . ..1C ./ 6 1 7 G0 = 06198 621D92. 01 /293C ./ 6 1 /293 2..9 . 9 1 . . 6 .3 G 0 68 .43 . 1 68 ./26. 1/293 = .2 8 4 91 / 0 80 98 9 / 8 2 0 . . ./498 8 /4/ G07. 961 .68 21 80 89 "20) F607 3

!#% <# ! %. A

! 0 68 2 19 9 1 /1624 . H0 9 .2 8 D6 0 9 1/ 8 2 68 80 C . 9< 1 AV A 80 . .6 63 .2 8 2 0213 C 94 29 3 19291 2. 0168 01 ; . G0791 . .6 63 04 020 9 G01 0 H69 D6 0 /16240 04 / 40 . .2 8 . .6 0 3 D6 0 "2 .0 2.0 ./2 1 2.16 $ $ G0. .0 6 9 . 9"20 ! /26f 2 1 9 D/ D6 0 /16240 8 / C . 94 8 / / / / 298 9 ..9 / " . 8 / E 06.98 G6 . 9 D/ C 2 . / 763 ? 01F69 91 08 . . 12921 3 F60# 7 / 8 2 0./G 92. 08 F6 0 / .624/ ./21 2.2.6 2... . 9 1 . . /Q 16240 9F69 "9 / D6 0 94 O290 2.Fi69 91 .6 0 3 29 E/60 3 06. 0E .19 /162 408 ..9 / ./2692 1 ! 68 . M .6 0 .9 8 /6.016 9F6. 916 401 "01668 9 1 0 9.. 68 08 .68 2... 9. 4 2 /1600D6 /3 7 " . 8 6G..949.99 .. 262. 7 ./ Q 63 ./9 ". 0 3 . 63 "7 02.902/2 9 01# 1A "0.668 2/2 9 1 9 1 0 ..9 68 =94 w. 8 /163 N ..9 0 / 68 9 1892 6 0 1 892 6 0 2 / 82 D.2. 9 9 1 F6 4 8 2 868 # "1 2268 . AA e 3 "2 .03 E 2 /24. 763 D 0268 8 2 863 06 98 8 /.61 8 .9 . 863 9 1 I D/ 9 . Q 29p 2 9 08 8 2 8 0 F6 .9 9 . .6 1 39 1 = D 16 ..9 68 . .6 0 .9 8 /6. 16 E! 12... 0 4 /162468 T674 0F6 /16240 9 1 " .G 2.. ./2 10. F6/4 .0 262 'F608 F6 9 .01 4/299 0 763 0 8 6[[[4 1 / 2. 3 4 1.1#C F6/4 049 /1624/ 08 7 016 09 .1 08 07 D29# 2F608 9 98 . 10 /16240 621 49./9 68 04G6. / .624 6 / 944 . 1 1/.63 8 62463 . F6 1 8 /162463 ". 2 G 0 19 0468 9 94 63 / . / .6240

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! 8 2 0119 2 3 2 G .0 6 C / 16G/ 6.2 01 679 1 029 .06 0 6 8 /69016 ..9 6 07 / 9.9 2 /..036 9 646 8. 4 .

2/2'. /21 0# .'". /'9 1'F6 0'49 1 6 0'./. '
9 1/ 923 ' 0 8 / 612' ". /'9 1'89 4 .3'
3 107 63'C'89 63'9 1'8 /1S12' 9 '0' 0 Q
19'49 1 0'C' 04'02191 / 9' 0 1.8 F608./ A'
1 0' 016 0' 06198' 98 9 ' / 1 868' 0. 1'
H8.'.2 8' D2 3'9 .8.2./ 6'2/7 868'
6 68'8 /698 EF6 0'G 9' /.63'9 1'4 6 2 / '

!# &6. .

' / 8' 3'9 1' 8 './9 '8 /163'0.' 9D6'
0 3 .E6 0' 0 ' 98 9 '"9 /. 1019' 9 16 '
=' .2 8' 4 91' &@3 6 'C' 9D6 0 3' / 91'
262.' 2.924 ' 4'9 1' / 1 / 'C'.9 . / '9 .$
262.' .8 1 ' 4'9 1' 9 ' 0 4 / '$262.'4 9'
2' 101 '$' 4'9 1' 2'" D/ 9' 68 8 0F69' 9 9'
< 1 /29' M8 2 3'.2 8'4 / 8 3'C' 9D6 0 3'
01 /' 3&"3' B @' &. ?
+" . ' "&" +"&.' ' ; :+ &. 2%&' '!'&' = .'
8 /163'D 06 68'C .6 68 A F6 20.6 0 3'4 '
. 16 2' 29'.9 . / '. 1$ / 9< 1/ 68 2 1 /#
02 80 68 2' 894 / ' 1 2 8 ... 8 / '
16 'G .9 92/2 / 62 'F6 0 18 19 263'
. 1C. .6 0 3 4.UF6. 2. / ' 29 ' C#
894 /'.0 923' =9.6244 9D6 0 103'8 /163'
"9 9 108 /69219 ' .6 63' . .91'2/2' 1' .0'
498 98 9 8 /6.24 " 3 ". 08 /7 F6/4'
.9.'"+"'X)'&! &.' 0 29'4 / .68 01'
2961 0'.06 0'9 1' 2' 8 /.6'.0A ' +* -&'.2 8'
4'9 1'..9 68' 68 ' 9 . '8 0291' 498'
8 9 ' 2D92 168 ' 2./ 6 1 7 9' 8 86'
107 .$8 /6923'"9 7' /2D 8 0D 3'.0.' 9 ' '
1 / ' 19 0 80892. ' 98 9 '908498'4 '
1021 08' 9 6021' 219 ' 1' T 0 14 ' 98 /'
9 1' ' ' "'&) -- .'F6 408 ' 69' 8 '
/1921 0#/8 2 3'06198' 8 /1921 9 1' 0''
19 '2016 08 '"1' 929463 '4.. 91 /' / '
89' 1668'49 946' 98 /19'0' 6D20'C'
4 1 4 /'9 9898 / 68'. /21 2D 1' ! 68'9 D/'
..9 6'2/2' 1'2016 '9 .89.0 3'29F69'F6 4 '
F60G079 9' / 1' 1. '2016 0 ' F6 0'497. '
..'4 9' 4'F6/4' 019 '2016 0'9 1' 39 .9 26$
. 1'/8 2 3' 8 /199 '. 9 3 049/F69' 98 '
)/- '. '< +" / + %/'& :+' 8 '))&-' .D6 0 '9 1

' ' AA ?
=1 0' 62.'9 6 498'20.6 '.68' 6/'..9
0 268 F6/4F6.'.2 8'4.'. 63'./ '
3'2016 0'9 1' 2'F6/'9 1' = .'"/ 69 621' 0 E'
19 03'4 9' D2 .6 /3# F6 0'. /9 68' 2'F6/'
621 D2.8'4 9 610 621E .91 0 68' 1'./9'
/3'C'0 1 0' D290'4 1' ! 0 / .8'.2 8 6892'
F69' /46.621' 6/'8 /8'09 98' .024/'
BA' /163'.2 8'.0 . 0. 1 84'C0..924 1 D20'
0 493 9 68 F601' 68768 '"1' 2' 0D .'
A '@1 3 . 0D 92 " / 91. 8 6 3 /2 D2 8 2'
'3 '11 E'10892' 9 G '..3 9 193 ' 94'09 'F6'
.1 08'/7' 468 ' 0/1 /29' 1' D2 3 2.0 9 . .

06198'2 89'0' G 0' / 3'.0 /113' 2. 9
89.0 6/'0..4 6 0. 91 3 04 3' . .91' 2'2/ '
1 /3'"9 1 .93'0 4 63'./.6. 7K'0.'D.8 20. 3

!#'+8 ! . .

=1 0..9 3 2 0'2/2' 8 469216 ' 9' 1'
C / / 6/8 /16 "1 .93' 2' 0F60'
06.3 2049 14048 /168 6/ 68' / 7 68'
/F6' 8 /69 46 'F6 9 9921 763' / 7 763'
F69' 0 1 3' F6/4'9 1' 0 9 19' 0 68' ". '
"1 F69' / /'8 /8'8 /1 3#C' .' F60 .3'
. 921' / 7 68'C'0 1 /8 8' ". /. 10193#F6/4'
07 6 468$F6 0'80 / 0' ". /. / 0' ". ' /'
B 'F6 . ..219 F6/491 0 0 68 /7.0498'
9 9' 0. /298 08'0 1 0F6 ' 2. .6 3' 80'
/ 763' 9 9' 8 /69 921 ". /. / 0'9 921' 3'
F6 ' 2'8 2/ 763$' .F6..9 . 10193'0 / 6'
/ / . /29 2'G07. 92.'04'. .6 / 68' 80'
D2 64 293 =..6244 '0 1 0'8 /69 916 ' / '
/'8 /.6 90'.68' /1640' 29'". '8 /69 92 '
16 ' 4'./ 69 /298$C'G/.'2/2$F6 0'F6 '
./26. 16216 2/28 61021 /.68 E'0 1 0'06Q
198' 8 61021' 262.'92 8 2/ 8' 62. '262.'
"'/..0 6 T6 4' '=/'. .680D'" 4.16 "9'
F6/4088 /4/'"9 0 '.68'/ 16 '". '/.. '
4 1' 4' 1'/7'" 63' /2D9' 1'9 194921 3 879'
. .01. 8#. , 63'" 3 .63' 07' /'=/ 9'
. .686/ 6 8 ' T6 '.1 08'.06 0'9 1'.6'
1. G .0 .' 8 .0216 '2/2' 299 '
.68' '4 1.218 0D 3' 249'/7'4 102 08'
1 98 1'" 63 F6 '1 98 / ' 2' /'0 1 /'4 9' 6'
108 ' . ' 9 '"/ 6101 /2.8 C'G/.'2/'=98Q
9 '.2 8'90498'0 1 / 68' 0. 93' 2/2'0 0'
. ..# 108.2'90498' 98 9 '0 0 .. ".
2 620'" 4. 9 .91'F6 '.68' 9268'/ '
798'. G 191'908498' 98 9 'N0. 98 '80'
.6 / 08 1 .91' C' /7 96 / 763' 0 . .6 3'
21. 102 / 140.' >92 F69'26 0' 19 3'/ Q
D020'4010' 62.'04' /D 4 68 "1'02 80 763'
404' 6 1' .4.3E. D/'2D26'9 1'90'2 ;' /D 94'
/ 0'" .4'8 /69 '04' 6'./9 '8 /8 8

L!#'"+ . .

| 9D0 1. F6 498 E1/ 1, ?; '; S '4 'A
1' : 1G0D/ 03' G 03'./9 9 193 '0 1 0F$'
3' 2 0 8 6 6' 6/'8 /16F69 9 92 'G0 '
8 /2 08' C' ./2..216894. .806 1 8612'
F6 '10892'/7'064 924 './2 6.164 298' 2/2'
9 . 08 2 14 / .6 0'"9 .0.9' = &" . ! %--6' &,'
..9 3'9 91' /263'; 3' 129'" 8' 2 9 91'. / / ' &V
763' 92 O763' /2D9' 80 / 98'g)'2/.94/ A'
98'F608'1/2P 6 ' /263'g)' 0D/ 'F6' . '
.9.' 0 4.3'g)' /76 1 1 80./ / 0N 02D .'
=..6244 'F609 /26'.4621'.0' 1'"9G. 2.89'
./ 4622 .4'0 1 0'.6 9 6.6 ' 1'2 ;' ./ 46.'
.6' 29'./2 6< 10C' 2 0' 6/'..9 /'= .'.2 2'
80 63' 6 3' / 0' 2'206.'./2 6240 2/2'
A' '' E

/202.$F6 0 62. . /F6/4 468
2/2 0. 62.
/.0 468 G/..0 1. 1/1. 98 >9
&?C2016 09 /6 492. 080D2/6 9 .08F69
32 E 67 620 0 9 1924 9 9 G$. "9 70 !"
" .< " 2%! ", %. ?/# +0 &" & "! !
2 "%%% !# &) . . & &%/

I =. 219 /9 /3 1. 0 F69 / 4/ >) 4
/ 1 / 1 / /D 3 /77 . /D2 10 # 0
.2 8 / .3 0 09 / 19 / .3$0G0# .9 . /A
.3 0 $I 10 4 / 93 : / 19 / 93 92 8 62. F609
0 8 / / 79 80D 3 4 102. / 93 F609
./21 0 . "9 7 868 .9 68 /. 29A
8 /6.16 . C / 19 / .3 / 793 6 / 9
621 / 2F0 / .3 .7 /. 63 8 /6.2.6 2 /
16 /V 0 8 3#C F6/ 98 /1 / 93 .7 10 4 63
249 . "1 02.10# C 9/ 68 / 793 F6/ 6
.8 /.. / " . 2 / .3 62. 97 10 4 / .
/ E 63 / 68 8 /163 F6 9 1 8 /.6
E2/./21 0 63E.68 107/..0 6 2 / 88 A
C F6/ 98 /1 / 93 97 .9 . / .0"1 F6 8 9Q
4 / 8 /4/ 4 1021 894 / 9. 08 8 /4/ .
.62468 4 102. B / / 1 /298 8 /6.016
!# 3" &) .0.

7 = 0 /16240 8 016 0.2 82 G
2 . 0. /29 0. 1 061 6 1 0 ! 68 9 D/
0 1 0 9 . 29 88 /7 0$ 6. 29 .0 04
8 /168 9 9 1 76 . 9H 20.6 0 D6 08 04
9 8 / 92468 29 2 808#F60 3 9 1 /Q
16240 =94 =4620 /16240 9 1 . . 1 . .2 8 (
C4.. 9 .11 . 94 /2.3/ 7 .6 0 .3 I D/
=) 0 0 0 1 0 .68 904. 2 1 G0. 2 9 /82 68
01 /

, !# %+ &) .%. (

> 7 0 46/ 4 . 0 94 09. 0 0 .
/ 69240 62.
: 868 .6 ..9 / 6 8 /1 3 2/F 861
.921 ..6468 4 1021 0 0 8 / 4 9 1 .6
.68 868 ./3 68 "2/ 8 O. 8 / 2E/
16 8 /6.016 =) 9.62468 46/763 ?= 19
1 68 1 763E0 b . 08 / 793 F67 4 1021
/2D 630 8 / .7 6 7 3 8 /1 763 2/2
8 /690216 08 / 793 / 3 C 620 06. /
2763 8 /1 763 . 9216 F6 08 0 E F6 408
/ 8 029.0 68 : / 9 1 / 10 9 / 61
F6^9 1 / B4 6 /20.6 016 08 .08
9 97108 / . 808F6. 9 9 ' 6S 29 8 /16
7.01 1 /29 <F60 298 0 68 0 = /7. 290.\
/ 48999 079. F60 3 9 1 / 63 >963
H6 .2016 9 / 808 . . 90 2 F6 9 "2/
8 /.6C04 /29 9 941 /298 KC 298 0
.F6 16 j=) G6 . 908 F6S 4 0763 C 10 4.
2.9 3 1 202 80 763" 49 9 .91 F6/Q
68 0 0 02 10198 G07921 29 " / 8 /16 =)
9 9 . 10. /2. C.0 . 9< 10 62.$ 0 0 "2/

8 /92.08 0 9F66216 $ 0 0 6 7631 .0"1
F6092/22 6 763 01 1 /2 763 90 2 0 9
F66216 212 9 .< 1 / 0 I 9F609
40802 80 0) %6 02 10198 9F6 26 /
8 /16 / 621 "1 F609 2 0207 8 / 7/ 0
7/ 021 .91 90 89 63 219 468 G079 9 /
21 > . 63 9 9 86 .0 9419 0.. . =)
9 . F608 06.0 . /9 /3 0D. . F60 "
692. 0 "24. 0.91 9 9 F6 2F69 D929 0 9Q
16 2 I0 68 F609 04./ . 9' 109 62. "1
26 /.D.02.8 /.6 04 608 9 94 /298
7/268F6. /71 292468 $"1 9 1 >963 6.
863 8 /1/ I0 68 F60# 86 .0 /791
2921 9 4 69 /3 8 /163 =) 04 /2. 86 .03
"1 G/8 293 I0 68 F6p 7/268 9 9
468 0 .F66216 06. 88 3 04 /2 763 ".
621 219 D.21 0# S I0 68 F60# D .F6
26 0 04 /2. / 62. 9 940 0 / 82 2/
7/268 X.4 .021680 F608 04 8 4 /
/2.8 "102 802..3 1 93 I0 68
F6 299 9 9468 2.. 4 / 1 /2. 0 04
8 / 162. 0 9F6 4./F69 04 /2. =)
8 /16 2/2 9D92 24. 0191 868 =) "
1 868 988 D9263 26 1/ 8 /16 06 04 /2.
.D. . $ 94 01 /2. 4 69 1 8 : 868
.2 8 2/2 9F6 . 8 /168 F6 0 9 94
868 9 1 C 7 9 1 6 . 923$ F6 2168
"9 7 F6 0 8 9 94 868 = . 9 D/ F60#
1 / / 6 / 9 " 4916
! / / 68 9 94 868 9 1 868
8 /7 9$ 4./"2 . / 8 /16 08 9 94 /
2.8 /71 291# 9 0 06.98 12 9 94 80
49/ 8 /168 26 68 04 /29 0 ". G0G9
T6 06 18./ / 0 2 9 940 621 /"9
19 09 =). 9 / 8 / 16 " . 2 / 0 621 E .
C . .4 / 0 "9 8 9 94 / 0 62. =) "2/
6476 ". 8 /1 763 9 94 /298 /71 291
/69216 9 D/ 1 0 9 / 0 . .8 .210 "2/
8 /16 94 / 94 " 108 2/2 011 2D62. .08
F6 2 ..9 / . 9 /2 G . E 2 808 0
192198 #=) F60 .02 608 "2 6. 0 .0630
"8 1 77 1 .F69 0 8463 67 620 3 $ 0 0
"9 7 2.8 . 2 9 / .3 / 793 62 =) = / 3
<G/392 8 2 8 /3 9 9 6.06 1 1/1. .3
8 /69216 0 3 6 76 F6. 8 /1 763 F608
. . .210#F6 0" 108 0 2 ... 9 1.8 / 1 10
18 1. 2 .0..846.621 =) 2 67 620 .8
862468 / 60 " 16.. 2 6621j 94 .0
892 06. / 763 8 /1 763 8 /69216 F608
6 . / .3 / 793#F6 0 06. / 93 9 94 /
2.3./2 9F6 4.7.21 F608 9 / 93 "1
/6 3 =016 2 24. 1 ". G 0 .3 G07. E
8 /163 F6 0 6 .3 9 94 /293 ./2 9F68
16 " 108 F6. 08 ./9 9 1.8 <F60# 2 9D92
4/ 67 620 8624/ 9 2 1692. 03 .9 1 1\

&80D3 / 14.21 01. 021 "9# !68 . "26. 0 101. .06 024 49 1 2 6.24 / 1 3F608. / 4 2. 163 6 .E061 06. / .3 8 /@3 2 8.4 3 3 / 7 763 G21 . / D924

1. 68467 68 !6 068 ./. 68 F6/4 6106 1 1 1/.9 .3. F 80892168 108 40 1 / 8 8 ./ 0 1 9 / 20168 .68 2 2 . / 763 .0 2D6 0 21 C"268 2 "2/ :0. / 9 1G6 63467 E / 61 / F608 / 3 02 8 / ./. /0 / 68 2. 80 / 4.7.16 " 3 C 6 .G 1649#"1 0F69 06 198 9 1 07 0 1 / 68 86 1 164 2. =94 C ./2 98 02968 .101 ./9 68 64 6 763 19 3 04/ 20 F6/4 "2 ./ 8 /16 0D 16 $ 0 j.2 8 / 793 F6/@8 "2 .68 9 1 0 1 68 6 763 8 /1 763 . . .92.6

=94 0.9 1/1. 3 41 . 8 9 010 F6 408 . . . 2 G/. .0 61 F619 ..98 / !3 1 / /D 6 9 9 9G924021 1 F674 =/ 3 C 80# / 793 21 / 82 68 2 8 N0 0 .2 8 G/. 4. =/ 9 F6 6 91 / 9 1 620 9 .61 / 929 9 198 F6/4. / 68 1.H0 168 0 0293 6. 80892168 1 868 8 /7 9 =62192 81 93..9 1808921/ 6 . / 93 29 . 86 8 /7 9 C46/ . E 10 2 " 1 498 /2 1 02 1 1 M2/ / 9A 0 910 9 8 /1662? F6/3 2 / 1808921/ /2D0 91 . 9 9 @4 /7 916= 621# 10"1 "249 . 8 21 ./9 1 /7 93# 6/31 9 .61 E 9 & E9 / 3 013 / 83 =01H.2 80892Q 168 2/20 G 9 0 C 49. 80 F601 4 .62161 . 0 O209 C 8 /111 7 01 /2 3 . 98 6 # 0 07 /116 04 / ..0 626C ./2110#7S. 01 06 11/ 04 =9 1921 /298 C ./21 0#492 F 9 86 0 8 /7 9 F6/4 " 01 F6016/ G/1 3 4 98 "268 2016 0 98 0. 98 63 . .60 1E/2. 807 146 1 07 /116 2 / ..0 68 $.68 0 \ /1793 9 9 / 8 293 07 / ..0C 2 /1168 1/ / 8 /16 8 4@90216 H 3 / 82 763 .S9 68 98 088 88 /7 9 9 60 9 1 06 0 . C7.01/ 680# 1 >= 9493 >92 F69 F6/4 4 19 1 1 1/19 93 19 03 9 9 22689 07 .3 =621 92 8 102168 M1 =94 2/7 3 68 80 . 6 8 01D0 1F6921 763 2 G 3 . 1/ 763 . 9 924 3 8 0/ 0 2/2 .9 I 96 01 /2.108 924 D2639 1 1/1. .3 .6 63 10390 ..9 / 6 2 G 2/ 8920 2/2 91 K 99 1 F63 .9921 012/ 10 39 9 1 8198 9 1019 22/129 621

I 09 10 9 6<F6. 16 8 /16 F6 91. D6 0 "0 E"01 04@91. EF6 9 90 2 2 894 /9 9 108 0J 841621 0G\ D298 2894 / 8624 9 . 1. E08 "91/ 9 9 "20 0

19 7 68 F60$. .0 894 68 12/6.016 E . F69 2/498 0. 01 C 4 .8 C G07901 19 08 01. 08/ / .08 1"@ 1 4 40 0 10 92 9 621: 120D/ 9 F6 894 / / ./ "1 19 108 8 / D298 . 98 .2. / 68 9 94 868 2. 6 9 621 7 F6902016 0 9 / 16 2 .! 9 !4 D.2. 63 161 6 F69 ./2 9 60 .16 7 29 92 8 D298 68 "/ 0702. 1

-+% /)!)) &. ". .6 1/4 08 =94 9 021# F6 0 894 68 80D2 164 2 3 C 2016 CC 498 9 9 61021# F6S10892 "0 49 4 N. 621 G 4 92 8 9 1 F6/4 0.F69 4 101 07 9 Q 198 3 # !.921 68 2 . .6 / H/. 2 F6/ "31/1 63 ./2 9 601 ./2. 2916 ". ./ 2 02 80 94 68 9 D/ 2016 9 98 9 2% 4.82/7 63. 94 0P 2/2 9 1 .921 68 E 8624 "7 ./2. 2916 .. 0C. .68 . / .! 7 16 0 " . 2 3 498921 3 3 2/7 / 763 e # &.68 9 91 / 63 1. ./21 2.23. /2.98 / ! / 80 9 94 / 9 1 8019 T 10 . 2 .921 / 8624 D2 39 92/2 4976 1 # 94 2K 894 / 20 6 0$$ " 161 3 C . 94 /2 3 4 9 1 2. /4/ 69 6 10 .9468 F6/4 . 1E 46. ./ 2016 I D298 /79 ./2 9 6023 > 9 621 0O\19 08 9 9 2 894 / C . .0 89Q 468 9 E4 9 6 .3 19 03 ?0 E"208 &CK G P08$0 E9 1. D6 9 1 8 02 E". J8 .4/. 93 908 F6 . 1. 9 /7 8 /168 .94 0 4 008 F6/ 8 94 16 019 0 29 8 /090.6 061 49. 40!E 12 "0 9 0F60 92/ ./2 . 16 F6/4 1.9 9 8 . ./229 1016 0F608 9 569 . 2/2 J 291# 94G 9 021 2 0 D204 .063 F6 943.9 =6 /26192 8 9 01 87 68 0 7 F6/4 0 68 /F6 0 99249 91# "7 208 06198 F6 9 .9 .1 B: S 1. 90 0 193 19 A 9 62.6 04 .921 68 ". / 82 0 D 06 0#.6 63 8 / 63 .06 0 2/2 9 1 0 4 80 . .68D 01 / $B1 01 3 0191

! &) . . <# !" .

M2 /19 1 19 0 . .0 / 68 8 /6. . .60 . 169 2 894 / 6. 9 1 0 894 68 1 J . 92 8 7 . 8 /.63 2016 0 3$ ". " / .2 6312/2 2016 0 3 F6 0 498 9 1 2016 0 3 8 /@3 0 . 68 C 1/1 63 0 193 06Q 198 19 0# 9 62@9 94004 894 68 #2/2 " / .2163 F6 0 .68 8 /@3 19 04 / 4 2.8 &8624 X 94P9.$/ 4/ 06198 8624 9 9Q 1663 1I 40 .16 " / 92168 9 9@68

9 0 D 16 F6 . 1 . 2 894 / 88 /7 A @ "ESL F0. ./2 1 1 M8 29 92 8 D 069 "1 9 1 19 AB 0A 04 894 68 1924 1 "268 F6/4F69 06198 2 / .. 09 0 19 F6 . . 1 04 F69 2 20 16 0 .. . @ =94C /249 0 6 68 / 9 1007 "2/ 19 0. / ./ 2 .684. / .68

! &")%-%. .. 462. E .P G E

86 .68'./2 6801'1.8 / 3 2' .4 .6' 10'
. ..19 1' 9 .19 0' '"./8 2 '9 0 19 9'
06 '04' 8 94 6 8 06' D2 3'0 639 1' 6 68'
0 ..24. .'>'0' 894 /' 9 #G 2.'.2 8' . ".'
26 0'.9 3' 0 3'29408' /10 '08 94 /' 8 62 '
4 06. F6901 '2 1 9 " 8 ' I D/ 2./20 '
16 0 1. F6 . . 1#F6/4% ' "1.. .68 ' 6 '
M+%"-' /262. 1 / /D 9 0 /16240. 1' T6 0'
0 319 6 791' 60D 06 019' 1924 .'04'
8 94 6 8 #C'F6 '80 / '9 1'49 9924 1' 9 '4. '
. 6. 06. 8 2/ 98' . .$F6/04' F64 016 '
8 / .8 . 2F601 '/8 29 F6.' 0 193' F69' 0'
894 /' 894 68'061919 '>) 8 624 ' 498\'
4 198 ' H/.061989 1 D6Z08' G079 9' / '
162408 '=94'C' 620' 01 16 '9. 8' 9'. '
.6 0 .8' 94 /2.8 '07'"87 0'19 ' 0408 '
9 D/'19 0'9 1' .0' .F6.102168 D / '
7/ 0' 9 1' 94' C' 04 0/468 0 60./8 0 0 '
1 /2.'0 1 / 68 ' I62. 763'.2 8' 07' 4 /'04'
9 4 98' '2/663'G/ %/2 '2/6B'0 0 921'
1. 01921'0 46 #F6/4'19 ' 0 6 101912'
.9 14' . 0 6.' 498 /2 1 01# ='92 8' '
D 024 3'C'"0 1 8 8/ 3'9 1.. 2/2'10 2'. '
14'2/7 3' 06 6 68'1 02 01 3'2/60' 49 0'0 '
-) .+(' 0 . .2.EC0 0/..6 .0 .216 ' 621. 08'
0.G.801 .'087 .6 '19 './2. 2. .'F60 '
"! +"& 4 0D 2.0' 104 / 68'8 0403'" 'F60 0'
, &" .' 8 0D2 .64 2.8' 6 . 0.' 86 . 3' 0 1 763' 0 '
1 / 68'8/ 93

5 ' ' , '& '2

'M2 101' ! 0 1 763' &' 0 1 763' .T '1/1 '
"498 ' .68' 2D6 3' .0 1 763' 2D6 0#
F63 1 /2.3. .61 0216 ' I 106.9 2G .1 79' '
@&F6? .F6 .6 ' 4. I 98 .21&S"1 621 0 .93'
8 624 ' C'D 06 10198' ". ' .6 0.98' / '
1 6216

N ' !## . %.

H 49263' 49' ..9 /' '0 1 3' 62.'49'
9b. 8 .21 3 F63'46/763 D 06' . ..1'C'
.6' D2 .0216 #01F6.'049/'49' D.2. 01 /'(
29' C' ./ 6 1 /2.'4 .92468 $F6 9' F63'
/ 3'G .99 . 8921 3' =98 1 3' ./2692 021'
I 1'.2 8'./. 68 '<F6/4'G .'4 . 16 ' 868'
1 9892168 ' 4'9 1' 868'./ 63' 8 . '
> 163'9 9 3'C' 219 163
- .2. 01 /2. 8' 9 D/' 0 E' / 8 298' 6 16 . '
621 0 E' 2' / 8 2 763' / 69 621' E' / 8 2 0'
F6 498'9 1'D92 .0$ 94' G/ 68 063408 2A'
1/ 6 . 7 0' 61069 0 1' /@8' D298
..9 .' 9 9.668 ' E'./ 63'D! 2. 0 E' 9 '
6 . . .763 C 2. 4.8 9 / 6 ' A=94'
/2' /19 1'./ 63'./2 10 9' 6 . . 9

G63J04. 8'92 8' 01 /'9 1'./ / 3'04' 1 . '(
. .3 'F6 ' 6 9 4. '04' 2.08 ' C# 293'04'
6240 ' 1 9 ./ :G . '498 /2 1 0168' 9 1.q '
2.08' 2/2' ./2 10 9' 624 3 '2..' 6 9 '
. 98' 29 3 2.F69" 08 8 0D2P64 298 " '
3' 24 6 7 763' I D/'2.F69'./ 63'./2 '
107 1' 6 9 . 9763 'F63' 621' 24 6 7 0'
9 946'./ / 3' 4' 9 1 9.62468. 0 '
1 98 ' =9429F 9F60 .0193 G .3' 2' 24 A'
6 7 O'./2 19 .' / 62.' ' ".'D 06 03' 2'
624 / ' 290' 6 9 . .' D 06 03' .2 1'9 1'
./ / 6 8 $C / 8 29'D 069'4 6 7 .'9 1'F6 0'
/8 29'D 069<07 / 619 '".'19 0\'0 /'9 1'D 0 '
6 63 2.8 9'0F604 94'2/2'./8 0' '.68' 2'
G 3'F639' 262.'07 / 619'4 .6216 '262.'./8 '
0 017E./8 0 01 662 '2/2' 98 9 6 / '
201' / 1 66 8 '"1' 2' D 06 ' C' .6 \'01F6/4'
D 06 63'9 1E4 6 7 .'9 1 2'9 .9 68'. .9 '
C 4F6/9 . . 4 1 ' =94' C' / 8 29'D 069' 492 '
68'9 1 / 8 29' 0 8 8 .69#01'492 68' 0' 0 /' A
4 9 1'F6/4' 67' 3F60 ' 8 / 9' 63' G07.01 @2 '
/.921 3' $ 01' F6/4' 10 .'9 1 '4 6 7 9' 9 1
T 44' '8 0D2 164/'./2 10 .1'9 ' 24 6 7 '
763 '26 0' / 947'9 41'4 6 17 3'E061' / '
8 2 0' 6240'9 1.21 1F69'/7'.0 4.8'.06 03'
2/2'./2 101'./ 63268. 3' 6.'"2 101 763'
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9. 1 .6.9 1$F6/44./ 68 D 06.' .6 103 A A
.2 8 C D 06 103 2. 0' 621 94 8 /163
F6 '". 'N6 68' 1' "9 '4./ 68' 016 0 3'
8 /163'9 1 .6 63' 2. 68'9 1'2016 0' 9763'
2 10'# " / .2163' .6 63' 2. 68' 9 1'" 3'
9 19 20

' .72 1..4.' 3'F63' 6.'C D92. 016 0'
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\63' 29 1' /E921 0'06'1046'# 08'06198' 2'
/ 8 0 9. 9 "94 69 0'9 1' 1 4 6 7 9' =94'
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9 D/'9 . 8 9210' 2 2 10 ' 49/'>98 /. 163'C'
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024 .E6 '01/ 8 /3 ' 69./ 6 .6 0 8 0D2 '
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9 . 8'92 8' .'. '0F60'D .2 0 . 1'10216 8'
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6 7 0' $ 29F69' 0 3' D2 3' 9 91' D2 3$'F6/4'
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094 09'E19 0'.67 .0.E40 . .6 '"0.66' 2'0. 9' >)
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2 8 0 .4 /F. 8 ' E3' D6 0# 0.1 76940# 621'
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. . .1' 0' 04' 8 /16 8 ' '6)'04' " 8'.0 9 0 '
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02D6 /3' G07.021 ' =94'C' 0 8 40 3' D6 0'
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9 8 29 .0 / 3 ' D/ 3 'G68 4 .0. 3 ' . . '
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4. . .24 .' 2' / .6 8' 09 3' I 67 011' 2. .' 19110'
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10 4 10198 ' 29' 6 6 8 6949 / 1 6 8' '
2 / 2'10 @2' 63' 8 / @3' .1 .0 .' 8 . 19'
.06 '9 1' = .'0 .610' D6 0'C'02D6 / 0' .6 8A'
0. 1' 4 6 401' . . .1F69 8 94 6 8 ' 0. 1. . 9'
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4 10198 'H 2.' 6 8 7 061' 9 08 20' 2' 0'
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1 / S'90 8'49' 67 9 / . / / .' . / 8 9G92'
4 1'#F6 / 4' 2 / 2' 0. 9' 4 6 49 9' 0.' 9291 019'
' / 19 1=9449D306 CP6O0 3

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= 7 9J10' G 3' 7 3' 8 019 93' . / 63' 9 1'
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10 3' . / / 3D 01 0 'H 2.' 019 ' 01 4' 2 9
X1 / 2 3 ' F2A'0G' 9 .9 921 8 ' D929 07 '
6 06101 / 29 F63'D929 01 /'9 1 91 10' 6 1'
2 7 /' D 1 ' / 9 '"919 6 8' / 2 / 293'
1 8 7 9 916216 49 / 16C' 219 16' 9 6 8 '
4 6 9' 4 9 8 29'D92.101 / 2 3'C' 0 19 01 / '
2 3' 6 8 F6 449 498' 1' 9 ' 9 '"9 1019'
921 92468 9 .016 ' 911 7' 2 / 10216 '4 '
. 8 200 19 01 / 2 3 0. . .1 / 2 3 49. 91 / '
2 3 T60 17'0D 16 '4.' . / 2107 6 '0 1 / 29 ' 0 '
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1 / 2.12 F6 0D929 01' 2 '0 64' 9 9' 61921'
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1 2. 0' 8 019 0 0 0' . / 2 1 1692193 '9'F6 763'
/ 8 2 0' / 0216 ' 9 ' . / 1 / 298' '? 219 9021'
9 ' 4 62 1 / 298' '$ 0 1. 9 8 6.' 9 ' "01 03'
F60 10193 ' =94'G I 8 94 / . 93'C' \E#49'F6 Q
763'91 08' 8 9' : G . \'2 / 2'10 8 4 1 2 9 '
221D929 01 / 29 8'07'0 19 01 / 29 'F60 8 4 '
&1 2 .' " 492161' 621' .2 8' F60 10193'
(9 9' / 803'9 9 8 921 / 6 8 'C'G03' 262F60 8'
49 / 2 061'49'2 / 6 /' 21 / 46. $ .6 8'9 9 8 92'
10' 21' 9 9120 ' 2.F69' "26 8'9 '0 19 /' 01'
04. / F69' 2. .' 8 019 0' "2 63' 4 / 2' / 1'
F60 101 763' 0 19 63# 0 19 01 /' .2 8' 9 1' 2'
D 01 0 8'D929 01 / 2 3' '1'7 / . F6 4'0 64' 9 1'
F60 8 1 / 9 .0 1. 01 / 29 8 = '92 8' 1 / 16'
. / 8 8 629' 67 .06 8 'F6 / 4. / 21 0 03'0 9'
0 / 2.3' " . 8 . . 01' "1 1 / 621' 2.'
.9 6 8'9 1'1 / ' 624 163' 01. 01 / 29 8 ' =94'
92 'C' 7 Y / \1 04 . 1' I 8 ! 4 / . '3'
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I 26 1. '4 8 2619' : 01 /' 49' / 16' 9D 1'
C 21. 16 '10216 8 92 8 499 9 8 .61 / '
6 8 / D 24 '2 G 49' 8 1 3 2 G 49'0 19 0Q
1 / 2'9 0. . .1 / 29 '0 "9'2 610. / 2 763' 1'
29.'0Œ : G / 7 G' .' 2 ' 6
91 . .' 19263 ' 1 91. ' "26 8' > 9 8 / . 16 8'
F6 '49' / 8 2 763' 4 1' .91' 2 / 2' 01 3 9.9 1'
N D6 03 . .91' 29' . / 2 .6 0' 2 9 1 0'C'
2 2 10' 2. / 46 . 'F6 / 6 8'=, 6 . % '.
@` ' 9D 9D0. / 29'C . / 2D .D01 / 2. D921'
01 /' 9 91'C' . / 6 1 / $' = ' / \' ; ?8 ' / '
4 2.'C# 16 0 1. 01 / ' = . .2 29 498 '
1. 3"0 74 / . 3' 4 0 / 26 8 ' 8 7'C . / '
8 / 94 J'C'1 0D794 '"0 9103'. 1 1
' 7 4 63 921 1 : 01 / ' F60 8 > . 8 / .
163 9'92 8' . / / 0' : G ! .0' 2' 6 9 . 93'
9F6 7631012922 G '8 01 ! 0 9'06. [[[[.J'
0 .0 / 2 3.W 8 / 3' / ' / 19 1' "1' 2' 229 '
0 9 / 6.701' 29F69' .06 08' 8 6101 / 26 8'
: G .0 08' 9449 9' / 19 01# H 9' "917' / '
8 2 0' 2' . / 6 .6 0' 24 6 460' 01 / 07 " .'
946.9701#9 'F60 6 8'4 69 /' 16' . / 8 '
1 / 29' D6 F69'4 9 921 763' 4 6.1 03'0 '
19 01 / 293'. .0701' T602F60 8' 0 0'9 1'
> 9 8 / . 1' / 2 / ' D929 01 / 29 8 '01 / 8 / '
6 8' . / 2 620 / 29 8' 0. 921 3 C' . / 16 1 / '
29 8 ' 9. .1 / 2. 8 ' 7 F69' 92 8' 0.' '9'
620 3'. 19 91' . / 8 / 16 8' 4 6 7 9'. '
91' 'C' 2' 8 2 8 0' 9D 9D01 / ' C' . E' 8 2 8 3'
. / 2D 9D01 / 01 . .00D929 01 /' 9 1' 1 / 1 63 6 #'
2'1 / 16 8' 06101 / ' - 929 01 /'92 8'C'0 1 9 0]'
1 / 4 .1621 67 .0 / ' H6 63'. 8' 67 9 1$o e'
06 8'9 1'923 2'006 ' 219D 6 8 ' . / 8 916 8#'
63' "9 7' 8 019 0' C' D929 01 /' 67 1021 9'
9 1 0 19 01 /'F607101 3' T 602F60 8' . / 2.949'
9' 0 '9 1' 9D 9D01 / 29 8' C' . / 2 9D01 /

2.8' 0.. 9' 0 'D929 04/2.8' 8)'. 6 "'
2.8 'F6029263'F609' 8 0D 3' .D 9D010 '
6 0 221 0. 63./ 62 6216 #.68'8 263'
. 021$F6 '0619 2' 8 0D 3'/2D 9D010' 621'
"2 .0' C'D 024 / 0'4 1 1. 63' '10 4 6 ".'
.68' / 1 63 . 102. .6392 8'"2 10 / '
1 / '9 ' 9 30'4 9 30
!#' & %.
K I29 01 /' / 9' 4 9=0' C' 67 102 0 3'
N 1'0 F6/'8 /4/ .'2/2'9219' 18 . 19 '
0 /06198' 8 /4/9 ' 9 29' 98 9 ' T6 0/ '
82 0' 62198 0.9 0 F6 . 12/2' 9230 ! 6'
923'06.98' /19210' ".'4 4 68' 8/':G '
. j 6. 67 10210' /19 101.' 9F69' 92 8'
8019 0'9 'G/.'0 F6 4' ' 67 1021 0' . .9.'
4 6' 4919 8 2010 'G69' 8 O. 19 $29F69'
#23' 8 . 9 'F602168 '061'F 0 9' ' 94' / '
#92 0.02168
:9 91609' 6... /2 3' D.2. 01 /268'
#08.0 62'F ' 8 . 1. 'F608'.0 68'
D6$`' 9.62468' 0 198' 621' 4 .6216 F69'
499 0 /293'4 0#' 621'.06 9$9= . 923'F6 '
'9 1'46 9 '"20'8 /6923' 8 8 /7 3'319 20'
)6% & ' . ..1' 863'8 /1/ $0 19 0'8 /6923'8)' 8 / '
)' %;' 7 3' 86 E . G...' ... 68 'F6/4'.68' 9 2'
9 '8/ 90.'8)' 8 /69016 '.06 0'9 1' / 8 2 68'
8 6101 /268 #C' 80.. 0 3' G69' 8 019 0 9'
F60' 93'D429 0G .3' 8)' ./ 6 1 7 .3' ./2 '
102 ' /2' F6/4' 90' 1' 2 2 10'0' 16' <2/2'
.2 8' 4016 '10 9' 2 2 16 8 \'29.'F6/4' 1' 2
2 0' /.9 1019#C' F6/04' 4 6 /298 8' 8 '
2/193' 98 9' 0 4. 03 F603' "/.029 9G/ '
' / / 1 /20 93$' .'92 8' F6 'D92. 02 '
16 . .2. 2'4 93'8 2/ 0$'F6/4' 0 68'9 1A'
6 1 ' 92 8' E 0 921 763' 621' 80 / 93$'
.@8 / 94'F"<EE '.68' 8019 0' 2 10 . 98 9 F69'
S2S1' .0498' 802.01C 2 / 6 1 7 3 ./ 6 4/
N/& ;' "2 63' .2. 3' :G . ' 1'D.29 01 /' 0 .. 63'
10' !F6J'8019 0' 9 2F6 16 ' 2' ./ 6 4/ '
09"2 6 90498' 20 19 63D92. 01 /29'0 '
6 8 016 E 10'. /2 9F69219 '07962. 68 4'
G..9492468' / 80 6 2" . .64 2.3' "20'
20 9 0 2' 9' 9. 0. '29.' / 008 "208'4 '
2 110.'"2F608 F6 2'0 08' 98 9 '04 9 901
- 929 016 ' 67 10210' 8)' ./ 68 16'
8 4.. #' .. 4923"9 7' 9.62468'F6 4'
6 0' 67 1021 0'9 1'923' 8 . 1. '0.. 4923'
/2' 1. 8 E' 94' 8 /4/' F6/408' 01F6. 921 3'
83' - 92. 0. /' 91 08' D2/7 / 3' 67 102 '
$ "1.9 0 4 . 6 ..62468 F6 4 . 9416'
6/7 / =E".' D2 3' $ F6 0 4 1. 921 0'19
F60#' D63 $' D2/7 / ' 9 1' 4 1. 9240' '
D2 3 F6 '9 1'.0 / ' I G90.06.9 0' 1/ '
19 93' 4 . 92. 03' 67 0240 93' 9 9 8 92./ '
68 F6 I' 621' D /. ' 9 '0.. 492.0 93 F6$IV

62.'2/4 8 3#208' D 3'9 1' "9 6.' 60 '
1 / .0 / '061. "9 61 G07 163A' >92 F6..0'
AF6 ' 8 0D 3' < 2 ' 92 7 0' 4 .6 16 '9. 08'
8 . 1. 'D929 0 E8 2 3' 92 7 0' 9.62
468'F6 4' 93'9 D/' 621' 8 /4 'D92. 0. /'
2 3' 8 . 19 'C' 9.6468'F6 4' ! / 6 . / '
.8' 98 9' 9F6 16 'D.2. 01 /' (F6 0'19 8 G'
(' 26304F6. 8 ./ 6 1 /2 3' . .912/2923'
9 1' 19 8 2630F6/'D929 01 /2 3' C' 19 8 Q
263'04'F69 2'D929 01 /2 3' . ..1'923'0416'
9 1'19 8 263'0F6/'./ '6 1 /2 3 I 1' "9 7'.0'
'498' 9 0'./ 6 1' C'D92 . '8 019 0' /"1'
621087/061' 9 ' / 621' 9 ' 9' 8 616/
!'09 '. '0F60 '0F60'. '0. 9# 4 69 0' 06198' A'
0. /29' /"1' 0G99 '. 1' 4 / 10' 67')+ &! . '
6 ./ ' F608' 67' D=2 1/ '7 96 63'4 .. 98$'
! /2692 9' ./ 6 16 8' C' D92 .68' (80'
8 019 0 2/2 ..624 ' V K
, !#),%! ! . ' (
- I29 01 /' C' 0 .. 0. / 214 6. 8 ' ; %"'
.01 /293' N 1'92 8'162.'0 19 04/ '.68'
67 94P68' 92 7 .' 9 8 0G 3'8)' 219D 68 '
8 610.61' 2' 1 3'0 . 1 /2 763'"1'.68'./ 63'
498 8 02923' 9 02/' E9D 68 $". './21 0'
-.2. 0. /' 0 198 '.68' 1/.68' 8 61016 '
1/.68'26O/' 92 7 '"1' 67 .<; / 98 02.2 '
19' 9.689 '0. 9'1/ .' 1'0F60 '061'./21 0#'
./ 6 4/' "9 7' .68' 1/.68' ./ 68 .6 '
(T 74 ./242D0. 2D92 ./' 98 029 .'0 .'
' 1 /2.8 C' F60 .0198' F6 6 . 2./ 6
S!ME' "1' 9 1' 9 .6 103'06.' D63' 2'0F60'9
0. 9' / 10E' 029' 6102468'2/E '9 1' 9 '. 02 '
8 6104/2.8' 9.62468' 08' F60 .0198'
./8 8 62.8 # 9..2 8' .0'1 02 8 6104/' 2/2 '
9 .0 19 01 / ' .68' 162. 01' 8 6104/ /1 63'
21/16 8 8 9.'D.2. 01 / ' .68' G/.' 2/2' 01'
9 9.. .0'F60 10.9' 19 0. /'92 8' 9 1#' 8 6 '
01 /' 9.62468' F60 10.98 ' ".'0.. 9. /' C' b$"/
4.. 91 /' 9.62468' F602 10198' $ 8)' 03 / '
9.62468' /.6[2' I 1'D929 01 /2 3' F6 498'
67 .468' 80 89' / 468' 9 1' 8019 0A'
T6/408 K06192 '8 /4 / ' 4' F6/4' 0 3' 67 '
. .6 ' 8 6.01 /8 763' 49 1#1/.68' :G .68 E'
F6/4' /19 1' 4 .' 67 97 68' D92. 04/2 3$'
.68 .0 18 6104/1/1 63' 2' 1/.68 ' `' 7019'
9 1' 2/ 1 0' G6 63' /.' 21. 9.04/' .91'
/ 19' (/8 293' .92 902.' "9 .' 1/.. .8 '
8019 08' . .' / 9' 67 99 168' D92. 0 '
1 /2 3 ".' . .91' 80' 9 1#.08 498 "9 7'
9 9'91 08'0 0 68' 8 6.04/268' 67 9' 68'
94 8 / 9' U) . + +' F6/408 F6 0' 162.
..6240' 9 1' # 8)' F6 0' / 8 293' 8019 0' 2' 9
6 9 1./21 0 9.0..3' =94 ' 1/.. 9349'
"20'=)' / 0' 8 01.20 /F69 9.6 '2/2'4 .9 ..'
M 8 2 0' 67 940' 6 99 460' 621' F80 6408
./21 0

./D. " 9 E168 ' 94' 2' 2D6 0 ' / 8 2.' 67 '
94 6 8 C. ' = D2689M# 9 D/9612' "/ 6 .'
4 69 0'4 69 68'86.0. /268' 67 940 '
D2 .0 .$ S 9 . 8'.68'G 9' 21.240.'D929 '
01 /2. 8 07' 0 3' 8 6101 /2 763 9293 67 '
Z' / 68' 4 69 10198 '4 1 2D6. 9$ 10"1'
"9 2' 67 94168' / 68' D929 01 /2 3' 9 9'
8019 08' / 68' 0 0 62' 8610. /268'
.< 9'1/168' . /8 .168'C' 219D 68 ' 94'10 '
892' 64 498. /16' :G .68' 8 /49' F6/ '
408' 4 9' .1 08' 67 . 68' D929 01 /2 3'
H/9.2 8' 4 9 19' C' 2/2' .8. ' 2.6 .06 1'
G/.' .0 .9' 1/1. 93' D929 0. /298' . 9'
.68'1/ 18 ' 26 0.6 ' 9D0.6 '99 163' 67' '
2.8' 7 67 9J1/ 68' 4 6. 103C# 8 6 1 '
164/2/2/7 96 9' D2 .016 ' 9A r
*' '9 IK ` ! 9-
!#') %"%.
:9 92468'4 . 892' . . . /2 3' - .'
229 0 /2 =E' .9 01 /2 3#49 249'. '
.02463' 8 /463' F6/' & '. 9G61' , '49. 9 .62.'
e7V) ." > !' . . .1 /' >)' . . .1 /07'0 32 6'
= 7/2 763' : 8 4 F6 0' D929 0. /%../ 6'
1 /"9 816' . .0' 6711021 08'E0 19 01 / '
. 0F60 .0. . 8$ 01 / . .0 / .68$0. . 91 /'
061. 8 C49. 91 /E. .0F6021 10.98 ' I .G/.'
" . 8.2' 9. 68' 9 1'0' .9 8 2/' 04' F698'
=9.6247'F6 0'F6/4'D929 016 'C' 2. . 1' "9'
0 .9 016 '2/2' 2. . . 10 7' 8610.' /468' $ 01'
F6/4'. 9 4 C'49. . . . '0 F6/' 8 /49' 86 '
101' N 19 8'. 9 .924/' 8 0 63' 49. 9 9924/'
8 263 I 1'G/.' .H 9 892' . . .6' 9 1'9 ' 8 /4/
/2' ' . . 91 /' 9 ' 0 F6/' 9 0 0./ ".'
29F69'D929 01 ME .4'. '. / 86 %7/# 4' 9 1'9 '
8019 0'F60210' 2 10'. / / 90 "20 .0498'(
F69' 268 . / ' 01 /29'108 .2' 2/2' "20' 8)' .'
0 07 '102.68' 9' ' ./D 0. /2.8' 0' 80'
D2 164 2.' C' F60 1019' . . 91 /' .2 8' 9 1'
0. 1921 3' F602 101 3' 044 .08 .2.68' "
> . .1.1 /' "9 7'
.64.8 !# R E 4 8 261 / '9 D/9 1 18 0Q
19 0'F60210'. / / 90C 8 0D8. 48.0 N9'
' 0 2' 9'. 9 99219' "9' 49. . . .219' 0219'
F608'. 9 .01' "9' 49. . .0 ' (
T8 .F6 4' "9 7'. 9 9 1' #('490. . 1 9.62'
468'F608 79.' 6' 0 198'. 9 1P' 8)' 49. 9'
9 21 1'F6 9' . . 91 /' 9 '0 F6/' 2 2D6 3'
0 1 763 F603' 06D9 9621' 9.9 1/' E' > . . 91 /'
9 '0GF6/' 9 ' 49' 07.6219' 2'0. . 91 /2.' "9'
E7' 06D9.6' . 9 41F6.' " 6923' 29' . / 63'
02 80.61OE ! 6' . . . .' 0 892168' 0 /2 '
(! '2/2' 06198 680 892168' 1F 0" '
6923' 98029.10 89168' "9 7'. / 68 .6
C' 2' 67 102. 08' " 6921 3'. /2692 16 'H 2.'
F6/4' . 4 ' 18 9' 9 1' 91' F6/4' 41. 016 '
1 68F6. .2 8' 9 2 0 191' I .'F698048/

4 8' 2' 9/' F6/4'. . . 1 . 1" 3' 06. # A1.' 2'
9/' F6/4'0 .9 0.6 '9 1' " 3' 0 .9 0 ' =62106 'B%+:&" '
19' 46/' D929 0' 19 01 68 $ "26' F6/4'
4/' 2/2' 9 01 16 "1' =/ 'F ' .0 9 0. 94/' 9 9' '
89210 0 2 ' 249' 9 01 16 #0 19 68' F6/4'
0D924/' 9 01 16 "1'. . 89210 0' / 8 2 0' = .'
0F60' .0G4 0' .68' 2' ' D 408' 9 1 24 6 ' .08'
.0 . 0. 1 C# 86 '07' 90498' 9 D9 01 ' ' Q
6921 3' 0 1.3' / 8 293' 0. . 9 1621' <94' E 2 0E' 93'
63 298 9/ 0C.0 293 F608' 4 1 8 0'
93<298 .' 80263 A\' .68' BH '9 ' 3'. /2 1.2.'
9F69" 9 7" 9' 0 F6 4'. 9 .01' "0.668' 2.'
.9 0 689 1' 061' 9291 01 /'. / / 68' '
. /492" / . /' .' / . .6 01 68' .6116 8' 92 8'
9 1'2016 0' 6D916 '9 D/' 0 3' " 6921 E F6 '&
791' C'0. .9492.9'0 F6/' EB ?' . Y 9.62'
468' / 8 0G '2/2E ' 5' 9.62468'
801. 08' I 92 8 . 64 '06D916 '1/168'
9 'F6/4' 80 63' 9' F609/16' 9 1'10 9#=94'
.949219 F6/' 9.62468' / 808 '1/16' < F!&/"5"
80 63 F60'1/16'.0 9 2/2' 9.6246' 80. . 08 K e A'
. .949 9' 92 8' 4 . 16 'F6 4' 9.62468' / Q
808 '. 8 8 .8' . . 98C D6 0G07. .'
9'.6 '04 .2 1 9.62468' 8019 0' "9 7 F6/V4'
.0 0498' .1 2.1' 801. 08 '2/' .08498' / Q
808' .' " 6923' 2/2'. 9 9 1' 2 ' 0 193'. 63'
2D6 9 9 .02.' 9.62468' 608' / 02 '
. . 98 ' 6.0' /3' 9.62468' 4' F6/4' 0. .9493'
/ 8 0'G07 901' / 1 3$' .0 / 9.62468' 4' F6/4'
0. . .4.23' 04' 0. . .1 /29' 0. .240 70790 ' 'A '
808' 8)' 9. 98' .0 2 3 C' .0'4.' .E91. 3 .91'
.2 8' 0 0' 86 10' 0. .949 91' 80.9 ' 01 /2.8'
G07921 0 C' 0 1 763' 0 /2. 92.6 2/2' .'
91' 1089' 0. . 91 /$F6 0' G/.' 9 91' 04 Z2 9' 9'
.6246 2' 801. 08' 102168 8 9F69'. / 8' " Q
293' 1' .0 .' 9 1 / 80 19 'C' 9.646' 9. 98'
9 .0 / 080.9 0 0 4' 9 1' / 80' C' . . .'
0 1 6' 06D940 684. 1 .6.0. . - . 9' / .!$
.68' /3'. 9 99 9' 2/2' / 1' 9 '2/T' /3'.0 /'
9 '2/2'.0 2.8 ! 62 '9 D/' 0. . 91 /' 9 '49'
7901' 9' 8 0' " 69. ' 96' /1 63' 9 '90' F61.'
219 6 49 220.6 1 I C' 9. 9 .68' 6 3 0 '
1 763'.0 /' 92 8' 9 '.0 29 2' 6 9 044 108'
. . . 1 2/' 9 '0 64' 91 19' 4 . .6 '0. . 91 /2.'
9 '0. .9492.9'0 F6/' 9.62468' / 80 2/ A'
. .6468' 8019 0' 49/'.2 8'0. . 91 /' 802 '
9 1 / '9 1' 2' 4 1 8 0 763' "1' 2' 8026 7 0'
.G / ' 94.' F608' 2' 8 0 763 "1' 2'.089'
/ 9 F6 0' 80D 3' 04' 8019 0' 0. .946.' F608'
I' > 1 8 0 93' .2 8' / 80' C 9. 9' 80'
D 3' D66. 'C 2'. 3' . . 9 '4 . 892' . 6. . .'
80D 3' .F69' 9 '0219' 1 3' 0 08' 9 1' 4' F6/'
93' 06D916 ' 610' 0G 892168 '10 9' 9 9' 4. '
79 .' /1921 0' F60 9' 0? 16' 9 1' 4' F6/4 06'
D916 ' = .' 02 3' 9 1' /1921 0' .0 / ' T6 [
. .9.' 0. .9 1 7' 1' 9.6468' 9. 98' C' /

OR2 ' 808 ' 10F6.S 89216 2 /9 # ./21 02 ['
C4 8 9' .68' 2.8 .04G6. . 1 /1921 0'
0 3' " 6.2 3' >'0 6'F6 4'0 64# /' 2.06 '
.98E!68' . .91'0< 8 0.6 "2 16 C'0D 6 '
('1 20. ' 2 9'9 1$F6 0'162.' 246 1' / 808'
0 1 3' .F69'F6/408/4/'D929 01 / 'F608'
"/.0 .'0DD.2. 01 /298# 4F69'" 1619'./ Q
/ 3'02 80. 'F6/44 D9 .0 8921612' '
164F69 ' 081 0 86.0. 67 1021 0$ T60 '
.'0.. 91 /' 6 /2 1'261 . /29' G 92 8'
. 9 9 1 F6/42/2261 016 ' 6. . /06.98'
1'4 8'0 2.2168'F6019263' 67 1021 0' 9 1'
./26. . 16 ' 2'<67 1021 08'" 6921 3' .. 9'
= /'06..8 .68' 498'0= 892168' ".'F60 68'
9 1 ' 0...4 .'04' F6021 10 98' "892. 3' T60#
2/2' 1'" '"2 6. 0 3' >)07 1 0 10' 94' ".'G0#.'
9 1'C' 2D6 0 3' ! 0 /' D .6 F60210 06D.1$
.0 /'06198' / 68 '261 124'9 1'"1' 67 1021 0'
9 1' "249' 261 .23C06D923' [)' 67 94/'
"268 2.C 4.8 ' 0 /29 08.2' 4 19 8.'
C 9.62468'9 9 r' B\ R '1. ' ' H 2.'
02 80 F6024 6" 6 . 0 668F6.'9 1 '26. '
16 $2/2'.0892' 98 9' . . . F6 0'F6084 0'
' 66 . ' 02 80' 98 9'0...4 .' 0 892168'
F6/49 1' /..8 0.0 / '2%6' " ' .0 /26 1$
94'2/2' 98 9'.0 /'0..94 .'".'F6021W$ 4./'
2/2' 98 9'06D9 ' 1F69'"1'0F60' 06 0. 8'
2'"868' 2 0' 28/'F6 498'" 26'06D9 '
.68'" 268 6.0F608 6 9 .. 4. 249' .68'
86 .0'04G6.0F60044 10 6. 1' " 26' 4919'
63' .44 .'C'0F6.68E4/2..'102498'2 8 0'
0F6EI'./ 0'" 2 8' 2' 0F608' 49D929 9.'E .'
468'26. P24 ' 0.6 03' 2' " 69219"0 4 / '
9 1'0.' / . / ' 630 892. '4 D9 1 ./269 '
'' @ 1 .F69' =94' .68' 63' 8019 0# 69'0 892.'
+ &'0...4 .'F608' 0'9 1 02. 8 '162 929 60
5 %+' &' 16 F6.'" .163' " 6.21 3'F6#3' E.' 01.0'+)'./ '
F"%' 0 0' 63' 8019 0' 9 4 1'F608' . 0 9. "2'
49' 49. .1 /' F6021 .0. 3' 9F6 .6 ' .91' 10 2'
2'4.. 91 /29'F608'0.. 9. /29' / 80' 9'
. 9 F69' .'" 6.21 3' 0 60' 9 969 91'

X !#)6)%.

6 ..2468' 49' 0. /29' 0 1 /2.' ' 8 '
' 1 /29 'F6 0'49'D929 0. /2.'. .8.2./ '
(68 'F6089 P0 62.' F6 408' ./2D 9D0 '
1 /29 F6 '8 1 /'9 1 0D9 .'/ / 19.'F6 ' 29'
0D.21.1=4' 01 92.9' 9 ' 29F6 .#0 62.F69' F6'
6 0' ./2 1 16621' 9 98 9210 9/ 68 0% # /29'
C 0 1 /29' 86160' 9 D929 0. /2.8 .91'
219 8'./D0 .6'048 .19 .' 3.9 '9 98.2 '
10 '"268'./8 8629' 07 91=768'F6/4'./2 '
1 0 / 68'" .93' 6D20 F69' 6 1 2901$ .68'
"268./2. 0 682/20D0. 2'0 .9 68' 29.'
2'90 / .8'. 02 901' D63' 94' 68' 67 9 '
468 292 .'8019 0' 86101 /298' 9. 0.'
..9 . . 1'9 D/'90'F60# 0D621' 2' .' 26 .92

0 986 67 01 6216 G079 9"208' ./8 S'
86292' 801. 02 #"1' 621' 7 0'. .892.0 0 2 ' $' %,
T674 ' 49' 041 /29' 0 /29' 8 1 /29'
4 ..246 . C4910< 16F6/F694P9 .'/ / '
191'EF6 0'2/'9 1'0< / 0 /'8 1 / 29'./2'f
104 6' 04763' 9 D/'4 . 16' ' 8,7 EAAAA' B6
92 890 9102D9 .'4 .6216 'F6 96489 03'
G07.021' 80D2 .64 2.3'>'4 9 021' 1 './ '
68'.0892'9 1 980' 6 .' 86 ' =..6247'
F609 104 69 03'G079.'80D2 .64 2.3' 168'
/.68 'C'9 1 980' 86 '".' 29'04' 26 .98'
0%7 60C' 0 G 0' I 1G ../2104763' :G .63'
9 1 F6'./2692 .'9 989. 3'D 06 763' .6 763'
< /2/8 29' 8 /69239 1' 0D.23 K 69 :0. 923'
4'9 10 .9 023 ' . . 7'F609' 10' 9G07921'"1'
"26' 8 8/7 .8 /6.01 0 19 6807 /8/ '
69016 # .'..9 '102D62.' 67 620 0 2 69 '
4/$.68' 219 8'2/2'8 /690216 '06.' 86 '
92.6 0' 67 20 763' T .7 'F6/ 68'" 3'
2'0 64'1 02' .' 8 / 08/1 /2. ' = .'2/3'
102D9 .'4 . .6 F6'8 / . 1 02/3'0 .1'

!# &# .%.

| =1 2.' 047 /'0' 8 '02'0'4 8 'B' 6 1' #
>98/. 163'0' 8 60 E0'4 1 8 ' > K '
.92468'9 1' 219 '/8 2 2/' 8 0'2/2' 9 .' V
0.7 /298 29. 0 /2.8 'T 8 02/2'9 1' 0Q
1 / .6 '"268' /. 63' 0D. 9. 061 01. 916 '
F6080 .9 6' 198'F6/' 93'. 92.' 8 / 93'
.7' / 1 63' 2' 9'0D9 .21 I .'.68'2 G ' 8 63'
.'9/498'04' 9 68'./8 0 01/ ' 49'0D9 9.'
80 29' 2' 9 68 .F69'. 17'./ 68 . .1A
=94'29F69' 219 '/8 2 2/' 4 8 0'04 '9 1'
2/2'.2 8'.024/ '0D 1' 2' 2908 ' T 09'
2' .' 26 .98'0D621' C' 01 62.6 ' ' 0 . 2'
62.4 8 0 9.62468' 9. 98'. .91' C'
/ 808#F60# 92 8 .'0D621' ./21 0 ..0 '
19 2' G0792.#:0 . ' 8 0' . .91' 9.62 '
468'8019 0 ' 29'D9263 I 67 9 768 'F6/4'
498'9 1' 2' 0D921 763' .. /. 3' $ F6/ 68 '
"268F6/4F69 2.924 . 7 0. .23' 0 1 8 '
0 9 ".' D2 3' D268
M8 29'0D923' G .68'0D924/' . 0. 16'
0' 01 92.9'468 8 /4/0D.23C' 01 923'0?;7 '
60 21 C /S808". 68F69G07.0. 280 '
9 0'98 498' 0. F2 3' 29'9 989.0 'C'F6 9'
./2 0 / 68' 1' 0 1 .9 3' = .0 1. 023 ".'
. 763' .0 4 / '0 19 016 0 1/2 0 G/$' '.68'
0D01' 2' # / 80.G6 0 . 01 16 0 1/80.G/$; '
102498' 86.016' 2' 67 1021 08' " 6.21 3'
.91' 6 ' .. 08'.0 . 0. 01' 1'06198'F6/ E'
87' 8 /69.'9 9 3'. 1' 8 /923' $' .' F6/4'
87'0D .' 01' F6 1' D923'04' .06 08'
. 92198' . .0 .1'E "2 .' 2. 68'20/.63$
4./F69'9 H. ' F6 0' 8 6 . !' / 808' 2 0'
1 923 F60' 29P219' .. .' 8 /.63' 077 /'
: 0# 9 b. 763' .2 . 'G07 ! 763' F60 93' 621

2 (S ' !' : ' ' ' (

1/ 8 CG293 2 G 0 0 63' 1 N 2 306 98'
2/2'9 1'01 1683' 2 '8 .10 G/ .9' 019 0'
"9 4' !801. 0 0 60'9 1 12'0 4./' D2 3'
.0 / 9'G0791 C'0 0'. 98 .210' 03' 0 /2.3$'
"24..00D651' 219 ' .1 6 0 ...8'C'F60'
10193'./21 01 03' G07.21' 3' 01 686 ' "9 4'
F6 0' 0019 08'G079 F6 E 1' . 2. 6 2'
9 1' 0 6612' ! 0 4192 2 D63' / 8 A ".'
"HA 061' F60 101.3' 2/2' 0. 62161' F6 4'
F608 .91'07.S 2 1 7 9J1/'F6/4<108.'9 1'
8 / 7 1 f .21' 9 0 01A

'/ $ ' C

' 'M468' 0D924 '9 .0 621'0 E 0 19'
I .4/. .3' .I' / /3' 8891 /3'! '
890163' .78 892 6 01/3'=9 1/ / 1 M20'
1/3' 10".' 01 F6 4. 8'0J1 /' C' 0 / '468'
0D923' A. 668' 9 1' 2 2601' 2' 01 923'
9 '8 90163' 86 7 193' 19F692193 'C'9 .D01'
. 94 / 1/3' 9 91/3'108 .2'1926 / 763'
./9 6 96 3' F2A' D.21' 679621'.94021'
1 1 /06198 '468 / 621'./8 8/2'
6 01'"1 2F69 "1' 2'" 2/'C'0F60' ' E 9'
/ /3'"0.6/3# 94'80 9' /2'92 8'0 E F6'
402'064 924 'F6 '8 /.68'1/O62.'049/F69'
2016 08 '"1' . 63' ?061'F6'./ / 0'./8'
/2 819 . .976=E 1': 01/' 0 9 2'

1/ 3'3 F6 0' / ' 6E21' 92 '=)'
1.[.04. 28 02J14 8 .6 103'09 1'2/2'9'
9`1 A08' 91' 1 24' 9268'0D923' 27 9' /'
16. 1 : / 19 M 93'.1 08'8 0 1' T6 0'.6'0D93'
. 96. 1 202.3 / /3' 2/ /19 108 63'
0D. .'$F6 0'10 9 / '"1' '0 621'29.9 109 E
! 81'040 1 /2. 8 $ F6 '108 92'162.'2/'9 621'
= 819 D/' / ' ' 6' 91' '6' .'92 8'041 /'
1 9 8 68./210. 168'(C' .'2/2'9 621'
/1 2D924 # "9 2/2' C .2/2'9 62104'
26.29.. 01 E F6 0 21 /46A9 621' ' / /3'
/ 19'./10 16 T6 4' './ / 0'4 6 7 0'
'/82'9' 0 19'C'9/' /' / 1 21'. 0 0'
C'.9491.'0D.21 2 7' 1'.9119' /1 3'/ 63. 2'

C $

'- 1' 4'/829'F6/4'"1'10 9 04 6'9 1# 0'
1 161'F6/4'F60'10 9'9 1 2 /191 0'= .'
4.0 . 0. 1 F6/4'0 10 .0 468'9 1'"9'.0 9'
0 1 66 0'"1' D2 3$ 4'"9 7'.0 . 1 F6/4' /'
19/1 0 0`079104' 9. 92468'.0 / 98 '"1'
0F60' ! /24 1 /293'0C /2 3'C' 0 1/2 3' 169'
0D98 3'C 01 921 3 621'F6 2F1 9 : 80 10 9'
9P 01 923' /1921 0' F60 9'9 1' 923' 046'
=1.6240' 01 923'10 9'9 # ..6246'F608 7.1'
' 0 198' 9 1 0 80D 3'4 /! 168' 01'
6 8 0D 3 &.'./21 0' T 0 10'/829' 01 923'
. 1./>1 2668 X2/20'JP64 6 68' T6 2'
.0' D923'49791'62D919' 01 923' 8 894 019'
"9 034 014

' !#' &) . ."

.92468'102498'&0=1' 4 / ' 4.'8 '
1 / .' T608'2/2'9 9'0 621'F6 408'
70.1@ /29' 9 60 ' .'92 8'F6A' 8 ..'
12161$ .8 029 921' 2'9 .' 6M C' .'2/2'9 =1'
80D 38 10'F608'9 0F1' 63' / 249F69'
479 118 1 / "9 "268./ 68 .16 '0'
19 6 .I 607 161#[208 F6A8 .9216 '46/'
0 19 / 621EC .F6/42/2. 1' 0 99 916 $'
C' 498' 2@2923' 498 '91 08' 8 .. 9.6 $A'
F6/4'9 1'0' 8 1 /29'0 9268' T6 0' F6/4'
2/2'9 1 2M2'8 .910 "1'C F6/4'2/2' 2 H0'
16 1 68'06198'.0498 101 / '9'087/'
./ 68 92.6 F6/407 01468' T6A'92 8'
2/2 21'2/2' 21'8 10' =/ 69161'108 92'
GA. 01 /'. ' .F6.21 763
1 /'2/2' 9 1'D.2.101 /'# F6 0' 8019 0'
/ 8 A'2/2'8 ..16 = .' D268'2/2'8 .9'
16 ' D2 E .'. 63' / 8 A .68' 1' D2 39 D2/3'
94' D2 3'D929 01'4 . 16 ' D26'./ 6 ' #
92 8'D92/ 01 /'.6' / 8 0'04692 1'8019 A
1 /'2/29 1'0 .9 01 / F6 0'F60 .03'299'
0.. 4923' " 68' 67 94/' 6/' 8 ..16 ' ' "1'
.024/'./ / 4. 921 002 8 A' T6A' 92 8'
8 ..216 0' .' 26 .98'. 0 0 ' / 621
1 /'2/2'9 1' .. .1 / 08' 8019 00.4'
. 9 /2 39 10 892168'F6/4'./ / '"'
692 2/28 9916 ' 94'./ 68 .6 'C 2'
9 63' 67 1021 08'"911 16 'F60408'D.2. 0'
1 /2 3' ..'C'8 /4/' T6A'"9 7'8 99216'
!'. 98 .210'2/2' .'<9'G07921E .4' 98 02921'
2'19 1 / '298 9 2'8 1/ 2/2'F6 498'046'
9 9'9 1' 9.62468' / 8 03'0' 3'6'!% %'
3< "A "1'./ 63'C'0 768'$ 94'" 11619
C' /1921 ' 4'9 1' 9.62468' 93' 003' C'
F60 0193' 07 .2. 68' / 80.68' " .01 03#
2/2'92 8' 8 1 0' 2'8 1 /29'./ 68 62'
6 ' / 8 01"9'9 .21 0 93'49 9 462.'
' =& ! % " "%/&+ %.
261/ 68'./ 6 .6 / 68'./2 624 /'
F60 '0 621' G/ 4.0..0
D 0208 10. 9 6892 0.. 3'2/2'9 1'"910'
8 1 /'# FO 0'./8 / 1 /. 1 /. 63C./0'
.. 601 /' 69' 6 10' / 1 /'F608 8 1 /#
.68'./ 6 .6 0' 0' 6 10' .' / .0' 8 02.02.'
046' 9.62468' / 8 03$29F69' 10'./902. 2'
"268'19 1 68' 69'8 16'"1'F608 79.'9 63'
0 19'8 10' 0. 021#F6/4'108./... 01 68'
9 1'TFA 7.1'92 8'8 9' 01= 8 10'9 1' /'
9 1'8 1 /'9/16'FFA'90 2'. 98'8 019 08'2/2'
G07921' T6 0F6A8 99 / 621 219 9'
04 60'9 9'497921'C' 0 1 60 F6B'06198'.08'
498'2/2'G07921' 8 019 08 '2/2' 21' 219'
.'04 60'=1' 0 60' 1'.S 'C'. 98 .210$ 3'
8 .4924 CC2 103

& =q ! ; J =' q ! '

T63'9 D/' / .' 8 .9 .6 ' .4229 '
298 801. 08'G079 9'4.7.2. 'C 2' . ,D$ 9'
0 986.67' 0 9 .' = - & 6' 0. 9'4 6 7 '
0# .4' 0". '"268' 2 8 /' . .9 6'0 1. 68'
2/2 6 . 9.1 .92 8 2/2' 8 1 /' . 91' 94'
2 610. / 2 / 921 63 / ' / B11$ 31 1/1' B 3' %3 +!'
+5 * "' ' 6- 3 ' 3 ' ' @
0fA D' X' " . '3=% ' .D61.0" 2 4.. .3'
8 .2 3' 0F 6 ' 892 6 3' 2 /2' 8 .9.6 ' 94'
(8 6016 20F608 ' T60 9' F60 .3' 49792.'
.29F6 /408 8 /4 /91 08 0D924 ' " 8193 ' "1'
9F 2'1 02 86.92. ' 94'19 . 68'F6 4'298 '
9'8 .68? . 802901$ / 8 2 68'2016 08'0 '
F 0 .2 3' 9. 2923' 4' 8 9 /298' 06198'
0 10' 62. ' 0 60 ' G68 40 F6 40 ' 1 .J B0 V'
F6 0' .9462.' 0. 63' 9F69' . . 63'1 02 890.$'
219 D.' "9 7' F6 402 /2 9210 2 /2' " 9/ '
0?' 2 /21.20. 0#"1 62104. 3 / 968 ' O/&)'
.2 8' /7' 921/ . 8'2 /2' 9291 021 '29.' 0. 9'
9 0 0216 ' =94'29F69' 8 .9216 'F6 /4' 02 '
16 8 0D 1'CF6 /4102.68' 01 .6 # .' 49F69'
4'F6 /4' /9921 63'0D 1 ' C'0 .9 68'F6 /4'2 '
8 3 01 .6 ' "1' 102268E. ' I 1'9 D/' 2 .'
4F6 /4.68' 0. 9' 4 6 4 ' F690. ' 0 668'
; 0.1 668 9 1' . /06198'
4 S ?"' &.+<' 0) * '% . !- & ! + % . %" +'
>97921'92 8 "2 C4/ . ' C . 8 6167'0 '
19"0 9.0F6E I' 8 .9216 ' 298 9' . 989210'
F6E I' / 9' 8 9 7 0' 621

@ *& '&! " "/' &' A&"& ! +"&'
) ' + . +"&

! M2 101'.0 1 763' "249. 8 '04'1 93' 0 '
193 9404 3' : 80 ' 9 1' 4.' 2016 0' . . '
892. / 68 ' =9.6240 49'9/ 68' F .6 . 1 0'
49' .. / .0'. / 68 498'D92. 01 /2.
! '# .%.

5 H < 192634. 8 1 /29 ' 101 16 ' 04 /2. '
b /29 D.2. 0. /29 ./ 6 1 /2. '0 '
9 01 /29' 62.' 49'498 921 3 29' F6 763 ".'
92 763'. / / 763 '0 ' 67 1021 0# 2016 '
0 .3' 8 1 I'2 /2' / 6216 2..' 2 9 .621 0'
1. 0 99 D/ 2. 68' / 8 2 68' D929 07 '
68'0 E' "268' . . . . ' "1' D298 ' "9 '09 98 '
". ' 894 68' F6 4#F6 /4'. / 63' 1' C' 9 0 0'
7 9# 0 E' 46/ ' "1' D298 '1 08$0 E'.68'G3'
0. 98 I 8 94/. .3'F6016 / '9 98 .210#: 01/'
(0' ' 69' 4'F6 /4' / 803' / 8293' . .
.C. / 8 941 .6 EF6 /'2 /8 29' 80.. 08'
21. 9 .' =94'9 021 ' F6 '. / 63' 894 68'
.E 2 92 7 9'07' / 8 2 ' . /21 0 .10.9' C' / 80'
498 9210 9 0 016 804 1 6621' T6 02 /0'
/19 1' 92 7 9'. 9'2 ' . /21 0 910198'G0 '
7.01 4'9 1 2 ' 1'.0 468 ". ' D 468 D 0 '
69 ".O.69' I 01C : 01/ F6 80.9 0 608

/7 96 9' 269 . 1' .08F6.' 9763' 67 9.9 1'
"106 68' 06 9 3/ 9 763# 10"1' 698048 / '
468' 49'06 .0 101604 . 16 ' 06 68 ' .A80 '
1 9 0 0' 4 .016 ' 49' 9' D92 10 # >92 F69' F6 '
8019 08' 6 9 . 98' 9 9' "/ 69 1' ' .68'
./ / 0' 9 / 6 '4 . .' 2' 6 . . 93' / 8 2 0'
0619 ' 2' 8019 08' " 1 87' 07.02.$' F6#9' / '
8 2 0 0 0 622' 0' D 16 ' 9 1' 8019 0' . '
68' 92 7 62 ' .0' . .91' F60B'2 /2'9 1'0< 16' '
. 0 010[[7' / 8 2 ' / 8'0 ' 98 9 ' "2 '. /2 '
1 0 / 8 2'. /2 6240 ' C' / 8 2 763'. /2 0 L'
" . 8' 67 . '0 10' C' 2. 68' 868'
/ 68' 498 921/ 6 ' T60 .' . 0 62.' "46 '
1' 2. 0' 2'498 921 34 0' 87' 8019 0'
F J' /1921 0'9 1' 92 7 9'. / 63' =..6247'
./21 0 .10 93' "1'.0 / ' 9 . 7' 0' -6
. 98 9210 ' F6 ' 7' 8 6 6/ 621' 2. 0$'
F6019263 2 9 91 02 8 6102.6 C. .2 6 ' 9. '%/'
167' / 62 6 ' .. 0802..' .91' I 8 94/4. '
F6 '.68' D92. 01 /298'1/ 01' 0P9 01 /2. 8'
.1 0 F6!'04' 0' / 4 2016 1/ 9 9'. /6 2. 16
' !#' &)%" %.

Z 5 2. 0'=)'4 9 921 0'. / / 3' 92 7 '
3' 4'9 1'498 921 ' <'=92 7 9'06198' G .'
68 16 / .04 ' 69'. / F6 /41046 92 '
6 2' 0. .b 621'F60 10193' 04 .3 F6S' . ...'
1046' 9 . 616 ' T6 0' 9 '10 / #F60 101.3 '
./ / 0' 92 7 0' 49 1.02D 7 0'
621' . /2 1 166216 '0.'4 9 621$' 249'. / '
/ 93 0 / 93' C' 8 93'F60 .0193' 498 9210'
2 /2' . /2 1 166216$' .91' " 7 .3' / 93' G0 '
7.0216 ' .04 763' "1' " 63' / '9 1'1046
/2'92 8' 62.'0 94 /293'. / / 3'102D 7 '
3' "1'10 9'9 1' F60 93'10 8 92' F63 8 63' " "' . :3'
=621' "9 7' F60 10.68' 104 68' / 4 293'
69' 0 0' 9 1/ 8 ' !0 468 D 468 $G68 '
468 ..68$D 06. 96.$'46 68 8 / 9' '
/? "X /?$ 0 E 9 !\E 11 ' U*M9' " 9/ 68 '
0 468 0 . 68 969$'. 0 68 '1.26. ' I '
46/7639 D/' 8 3' / 4 2 763' 91' 49792.'
4 9 921 0#4. 8 921/ 68 #F6 0' 9 ' .0 / 98 '
D63' G68 4 10.98' C' .. 10198 ' 0D62.' =7'
01 6216 ' E' 01F69' 26 .98' 1 02 8 610216 '
04 /2 763' . .91' C' 0 /2 763' 0 1. 0. 6 3'
H 2..2 89 . 646216 ' D 06 103' =)' 96 103$'
F6 0 .48 /1 .93 21' 2 /2' 621' 10 8 92'0 '
19 01 9.3' 9 ' F603' 2' .' 26 .98'0D0 1' 4. '
8 9210 F60# / 'G .F60# 6216
I 1G0 8 8 F6 4. 8'F6016 / ' 120 6' F60 '
.016 8' 46S' 04 601' 621 .0 / '=)' D63$46 '
0 6 EG 8 4 103' C' .. 103' ! 0 4 8'92 2 ' ^57' S'
9 1' F6 /4'. /2D 9D01'G / 8 / D9290#
F6 /4G91. / D9290' 69'.0F6 62.4 69 '
D929 3' H68 468 ' F6 /4' 0 .2 /'19 8 2/ '
2 /2' / / ' 4. 2 .6 '061'. .68 927 16 #

= . . 6 8 ' F6 / 4' / /' 19 8 2/' 79 9' 49 '
2 16 '0 .27'03D 9' ! 0 4 '2 0 8 F6.'C' D 4'
01 /' 9 '0J1 /2. 8' EG6 8 4 '"9 7'C' . . '20 '
6 0 9 0 /298. .016 ' 1F6.' F60 '
16/ G03F60 .01.3 '. 9 803' / 8 2 6 8' 0.'
"9 61' 2. .3 '9 '9/'. /2 101' F6/4' 070.' / '
8 29304' 03'7. O 89' 946.0 8 6 ' '".' 246 '
71 /2.'2/6 8'9 1' J D/' 2. 0'C' 4 N9 .'
1 '9 . 8 921/ 6 8 ' "1'. / / 0' 6 8' .2 7 0'
8 9'104 0 621'F6016/ ' 8 'F60 101.3

%N ' !# ' & %.

'i' . 9 8 .210' 621' F6016/ ' "1' 621' '. 62 .'
+\A029'F6016/ '. / 6 0 ' C .D 1 8 0'. /2 6 '
D 0 ' E/E#F 9$ ' 00 6 8' F60 1016 8 $
.'F 1 763' 2D6 3' 2D6 0'9 9129210'. / D02 '
16 ': 8 0'. /2 6D01 /'. 1'.0 4 ' . . $"24.'
D2 3 =9.6240'.0 4 G6 8 4 E"249'09 ' 9 '
1 0'G6 8 4 D 4 "24.'0F60 ' T 10 D Q
4 ' . . $"24.'19 0' 9F69'.2 8'. /2 0 0'
"2/' 6D/' 8 6 ' /1 621'.M2 / . 0 '".' D '
46 8 C'.0 46 8 G6 8 46 8'C' . . 6 ' H 9'
2/10'9 / 9 8'9 9' 2' "9 /29' 0. 24' D '
/ 041. 8 ' 7 .D 16 0 19 8 2F6 '
'.& ! + 76 40 8 . . 8 0 763' & 3& + : %/ ' /'
+.&6 ' 3& ')!- "/' H07916 '.2 8
2'19 16' - . /' '= '& ,7W %/ ' 0 ")' 94 9'
#1 k S 4 # 761 1 621 8 3'. / / 763'
8 0' F60 101.3 ' 102F60 8' 4 9 921 0$'
9.6240 8 F603'.1 0 8'. /2 191' F60.9 20 63'
. . 8 921/ 6$' : / /'0. 'C'0F60 8 . 0'2/'
- .&"% 21 94' 8 10# 4'9 1'2/' 6 0'=)' .9 0 '
"+/ 0 64'2/3 T 8 0'2 G '9 '9 . 8 92./'9 '
. . .2.9D D2 .6 ".'9 ' D29C'D 049' /.0'
0619 8' 0943' C' D2 3' 621' 61 6 8 E0F60# C'
19 '49/ 6 8 ' 94 0'9 . 8 92.0' 8 6 / 0'
621'9 1 9 8 3 ' =6 9 / 0' 0469 0216 ' 2 9 '
/ 763 '298 .' D2 3'0F6 '09 '19 "1 0 '
F69' F60 1019 ' T 4 791' 9 9 8 9216 8' "20'
F60 10119 .9 O1' 9 0'.2 8' 8 0D 3' . .0'
. 1 F60 8' D 40$' 0F60' 8 0D 3' D 40 'F60 8'
76 8 40$' 04 8 0D 3G6 8 463 ' F60 8 .0 463$'
D2 3') ! - !/' 8 0D 3 F60 8' . . 63

' !# '2%! %. '

L%+='O' : ' . 29210' / 8 2 0' 2' 9' 8 6167' / 62 '
0' .& !"' O1 02 8 610 ' ' C' F6/46 39F6/6 3' 9 '
0' ' <' 3
9 T6 0'/ 8 2 0' 621'. /1 0 0 ". 01 /2.' "1 6 '
F69 ". ' 01 /29"2 63F60 101 3 ' H 29 0. '
/ 'C' . . . / '0 / 6 8' 2' .' 26 .9 8'8 D 0'
1 /E0 / 68 10 4 / ' T6 92 8' 87/ 6 8'
G07921 ' 4'9 1 'F6 ' "20'F60 1019'. /2292 6. '
0. C0F60 0. 3. / 8 8 6 .0216 $' F60 8'
F6 ' 87/ 6 8'2/2'G 92. ".' D2 3'C'0F60 '
N0. 63'F6 99 1' "21 " 2. . . ' F60 8'46/

I26/763". 7K0 87/O3 '0 0' 46/' / 1 81'
D929 0 ' "19 D2. C0F60 ' 04C1. 0$C#'
. 0. 9; .'19 0' D2 3C'0F60 ' 4/'. 2 8'
& D2 3'.0 / 9 ; .'G6 8'/ 9'0F6 8 0297 1' . . '
103C D63 'F6 ' 621' 19 'F60 101.3 ' ='
. /21 0 04' 19 8'9 '0. 9'C'19 0' D2 3'/ 16 '
" /'19 ' D/ 9 0. 3G6 8 / 9' I ' 4'F6 '
4. 8 2 0 8 8 0 F6 8 0 8 HD2 39 1 . /2 'S
. 16 $G .'92 8'9 1' 6 8 63' 0 4923 '21 /3 e A'
Z 411 E@ 68 63'0619 8' '9 '09 9' C'19 0' =94'
9 87/ . 319 1 6 8 2/2' D929 016 ' 0 19 0'
F60 1019'07' "1 / F69'07.621. ' 0 8'F6 ' 9 '
8 02. .1 . 91'.0498 ". '. /2. 0 0# '90498'
2' "1 / F69 ' 'G6 8 / 20. 9C' 0F60 '2/2'
/4 7 .'19 1 8 #F6 0'. ' "20'F60 1019 '2/2'
19 9 8 9216 8' #29F69" 9 9 8 .21/'G6 8 / '
F60 8'0. 'C'0F6 ' 29 1$ '. /2. 0 0' ".' .0 '
/ 0 . 3C D630F6 '2/2'9 6 D91' 91 0 8'
19 1 6 8 9 9 8 9216 8 ' F6 0AG0#.' . / 6 0' 2/2'
67 1 1' I D/' 46 8' 8 D 021' 07/ .0 '
"26 046210 01' 219 1E46 8' "9 7' 46/' 6 '
D2021'0 87/ 0 10"1'19 1 6 8'/ 0.6 0 87/'
2/ 62.6

' !# '2. " %.

I 9 8 .210' 2/2' 621' 8 019 0' 2016 0 6 8' 9. "%
. / / 6 8 ' 49 1 2. . 6 26 . . 1 '2. . e p
8 P1/ 6 8 # "9 '92 8'. / 6 8' "26 8'9 9.'1073'
8 019 0 ".'04'0F6 ' G/.'2/2 'F6 0'/ 8 2 0'
9 921' "26 8 C'.6 8'9 '0 E .' 9 91'0F60 '
. .1'D.2. 01 /' 94'0 .9 01 /' 9 '.2 8' 9 8 0'
2. 91'. 1921 0 .9 '09 ' "1' 63E01'.6 8' 8 02.9'
67 9 76 8' 49 8'0716'C'9 .21 0 . . 'C 8 6 '
.01 /' 1' 2'F60 1019 '0 .9 01 /'9 1'2/2' D929 b'
01 /# . '. . .9'9/ 6 8' 6 0 'C'G/.'24E.6 8'
/790 8 49 8 01 /29 8 ' 16 2' F6 0' 46/'. /2 '
1 0 0' 2' 9/49 8'. 921# 9 . 8 92.0' .2 8' / '
8 2 0' 621'. /F1 0 0' =94' 29F69' 8 94 6 8'
. / 63' 219 '9 . 8 92.0' 0 / 6 8' 8 019 0'9 .'
/.9 1' '20 8' .6 8'. ' ./' D929 0 '497. .2.'
/ 8 2 0 '. /2. 0 6 8' 9 9.' / 8 2 763 ' 01F6.'
049/' 2. /49 8' 8 6 '9 1921'. /2. 0 0' I 1'
9 D/ 8 019 0F6 40 8 . / 8 8 62 3 ' 9' F60' / ' (
8 2 0' 1 2 ' =94' C' 9 . 8 92.0' 2' .' 8 6167'
. / 8 8 610216 ' / 8 2 0' # 9 D/' "26 8'2/2' 9 1'
0 / 6 8' 24 6 8' 8 0D 3'F60 8'0 64 ! 6 8'
0619 8'46 ' 29' 2' 9E9 8 921 3'. /21 0 . .0193 '
.0 / ' C# D63$ G6 8 / 'C' . . .03' "20F69'
67 1' 8 019 0'. / 8 8 62 3' 0 6 8'.0 0 9 6.'
F6016/ '. 9 8 .210 2/2' 6 0'2/2' 06. / 0#
9 . 8 .6 8' 29'F6016/ '.02 6 8' 0 6 8'
. /2 6D01 /2.3 ' /2 8 19 D/. 9 8 .2.0 2 @'
2 10 .6 8'92 8'/ 8 2 0' 29'. /2. 0 0'/ / 'A
1. 91 3' 2 2 03' 29 9' F60 101.3 ' 9 'F603'
. /2. 0 0'9 921

,N ˁ ! ˁ&6 %. ˁ ˁ [
% . ˁ ˁ 92. 1ˁ I 8 94/. 93ˁ 4.ˁ 9 .12.2 / ˁ
E 680 19 20.42 6 0 /2. ˁH02.92 8ˁ
.68ˁ1/ 0. ˁ 0ˁ.0892ˁ 219 ˁ .ˁ ./8 0 0 $ˁ
0. .E.E6ˁ ˁ .ˁ<E63ˁ"/...ˁSF60 0 2ˁF6021 .0 ˁ
1.$ˁ 69 2F60 .0.9 ˁ E8 0#0. ../886 ˁ
2. 8ˁ./ 68ˁ80ˁ19 08ˁ0D2/ . ! 1ˁ ˁ9 ˁ0F6Aˁ
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.16 ˁ /F6 48F6/./8 0 01 /ˁ 9 .9ˁ
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8 68ˁ0 / . /29ˁ9 .01

0 9ˁ49ˁD.2. 0. /29ˁ ..62468ˁ2016 08 ˁ
F608ˁ.0 6.692 .0 . ˁ 08ˁF60$ˁ ..62468ˁ
2016 08ˁ 621ˁ9/498ˁ 98 9ˁ 62. 621F6.ˁ
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0 94.8/16 ˁC1.26 1. #ˁF6 0ˁ 198ˁCˁ
08 .108ˁ8/6/ 9ˁ4 1ˁ 29.ˁ8/468ˁ9 ˁ
/ 6 .

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"/ 6 . ˁ0619 9 9892. 38 108 ˁ"1 68F69ˁ
92 8ˁ 0 68 ˁ =ˁ92 8ˁ. ... 98.2168Aˁ"ˁDˁ
D2 3 ˁ 963ˁ0 9 /293ˁ. .21ˁ . .8.210 .3#ˁ
F60 .3ˁ ˁDˁD2ˁ./8 9.621ˁE 94ˁ10 .3ˁ2/2ˁ
68ˁ02 83ˁ0`.4 /293"ˁ 9 921 ˁ 298/ ˁ
0ˁ =1979 3ˁ8 0ˁ9 91ˁ9 63ˁ0 9J1 /293ˁ
. .2.ˁ 6 68. 98.21/ 68 ˁ0 F69049/ˁ
./ / 9 E01G0 68ˁ0218 0 94 /268ˁ 9 ˁ
.91 ˁ26 0./ / 90. 1ˁ= .ˁ92 8ˁ 219 9ˁ
1/ 9 ˁ 9 .ˁ- 3. ˁ./21. 163#F6.8ˁ2/2ˁ01 3ˁ
!/ 4 D9219ˁ. 924. 621ˁ !/2 87 .92 93ˁ
^E KF6 F6/4490 N9<W# /2 763ˁ4 . .ˁ 1/1. 93ˁ
04/2 808. 046.621ˁ 08ˁ ˁCSM1 .E104
0ˁ R 4979 9 9 9 - 08 801 .0 04/ ˁ
.9. Cˁ 9ˁ /7 ˁ./216 1/23

!#

1 /2 3ˁ8/463 F6/ˁ" 49 .91ˁ9 .11 .2ˁ
10./2.6 82.C . 8 .9216 ˁ04ˁD9 ˁ
. 01 /298ˁ8 9 ˁ 80 9ˁ.108ˁ07ˁ I 8 94/ ˁ
. 9ˁ9 .0.6 ˁEF6 ˁ8 10ˁ 6106 .ˁ 9
ˁ E0"ˁ MA # !! ˁ 0191 763ˁ
Cˁ 0 4 763ˁ 1ˁ 0 93ˁ= .ˁ92 8ˁ 8 1 /ˁ9 91ˁ
))+Wk" ˁ./8 / 1 /ˁ./0.. 601 ˁE29.ˁ / ˁ
92ˁ.ˁF60 79.ˁ 0 19ˁ8 XO "1ˁ.0 2 3 . . 8 .2Aˁ
10ˁ/820ˁ /4 9ˁE"1299ˁ9F6063ˁ 0 19ˁ 86 ˁ
ˁ946.62.6 ˁ 0 493 C 01.193ˁH/.ˁ06198ˁ
0 68 ˁ >9791ˁ 9 D/ˁ 8 1 /ˁ 9ˁ. .0 ˁ
!68ˁ.0 468ˁ=)ˁ D 468ˁ0 E1F6. ˁ 8E9ˁ
F60 .01.3ˁ 80D 3ˁ=)ˁ 8 263ˁ 6 9 ˁ ˁ / ˁ
21F69ˁ 21924 ˁ=)ˁ 98 11 # 198F69ˁ.0 468ˁ
Cˁ D 468ˁ4 .0216 ˁ1 763ˁ 8/43 84ˁ
8 . 19 0 16ˁ 4ˁ9 1ˁ 2D 046 088/Cˁ
. .9 .21 2/ B SE ˁ =..6244
/192. 0ˁ=3 %ˁ 9 1 4ˁ894 /ˁF6/408

8/49 4ˁ9 1ˁ 2ˁ0 F2/ˁD 046 ˁ04./ˁ"1ˁ0 F8ˁ
19263ˁ "1 68F69ˁ ./21 0 68ˁ 1ˁ 2ˁ./49ˁ
67 . ' / 01F69ˁ"1ˁ .G/ ˁ /F66216 2ˁD 3ˁ
4 763ˁ .8 231 I .8921 ˁ 10ˁ8 99216 ˁˁˁ
29F69 / 68 /1921 0 ˁ29F69ˁ9. 08ˁ 8 ˁ ˁ&!&+
. .9 046 ˁ 49 1 2ˁ 6880ˁ 60ˁ 9 . ' ; /29. 6A ˁ
9/ 68./2. 0 ˁF60 0..3 2ˁ8 ./ˁ 980ˁ %.ˁ
9021 94ˁ 894 /ˁF6/408ˁ8/4/EC . 0 ˁ
4 3ˁ 916 E6.ˁ90 68ˁG 9 /.G 3ˁ .6. 6 . ˁ
021 3 C 21.8 . . 20 F608ˁ@ˁ + " ˁ
9404 3$ˁ9ˁF60F6 498ˁ894 /. .0..ˁ ./2 ˁ
198 9 01 /2.ˁ / 6216 ˁ 8 0ˁ /ˁ "0 0ˁ
198 9 08921ˁ / / 1 /2.ˁ 0ˁ 9ˁ 26 .9 2ˁ
4 9 9210 ˁ J.ˁ .61ˁ 9 ˁ 498921 3ˁ 8 10ˁ
./8 /26216 $ .Cˁ 2ˁ 0ˁ. / 66216 049/ˁ
".ˁ.ˁ8 93ˁ . . 8 . 80ˁ946. ˁ0.ˁ /4 9ˁ4 ˁ
.02.6 ˁCF6/408 8/4/ˁD D2 ˁ 9 ˁ 9 / 6 ˁ
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./8 / 1 /2.8 D.29 0 A

,N ˁ !#ˁ+= ![%.

168ˁ/829 ˁ. .0ˁ 894 68ˁ 8624ˁ
./ /.0168ˁˁ. ˁ/82 763ˁ..892. 3ˁ
./2 101ˁ I ˁ19 0ˁF6 498ˁ#F6 0"268F6/4ˁ
F69ˁ2016 08ˁ9 63ˁ 9 ˁ 2ˁ.6 63ˁ /./ˁ20168ˁ
. 1 / 1 16 ˁ 0 . 01ˁ I ˁ0F60"9 4 F6 0ˁ
2... 68. ˁ8 168ˁ./2. 4.. . 0DD6. ./A ˁA<?ˁ
20 1. 8 20. ˁF6/4ˁ79 8 9ˁ 0.ˁG6ˁ
8/ 0F6963#F6/ . !911. .0801. 93 F6 SLˁ/.ˁV
0 /F6ˁ4 0 .10 ˁ D. ˁ0.ˁ./21 2.16 ˁ
T644 ˁ19 0C0F60ˁ./.021ˁ 2ˁ8 1 /2.8 ˁ
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8 1621 1ˁ4ˁ./21 0 / 68ˁ1.8 . 08.21/#ˁ
09 ˁ06198ˁ19 ˁ D2 3ˁ0F6 ˁ./21 0 0ˁ 21ˁ
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" 92 68F608ˁ" 10ˁ.0 921 68ˁ 01 / ˁF6/Q
04ˁ8 1M298ˁ9 ˁ9 98.21 3 0.ˁ" 692. 0ˁ./2 ˁ
1021ˁ498921 3ˁ/82 763ˁ H 3ˁ92 8ˁ 86ˁ
9 8 1 3ˁ26. 6216 ˁ".ˁ 021 ˁ0F6019 ˁ
8 10 C 12/ˁM82 006.98261 6216 ˁE3ˁ
F6 763ˁ./2 1021ˁ=/ 63ˁ D2 3ˁ 219 ˁ498 9210ˁ
261 16 <26. . /2.ˁ8 / 0ˁCˁ 9ˁ6 10ˁ
/ 1.? .8ˁ2/2ˁ / 0ˁC" 10 9 2163ˁ
6!.. 1/2.8 jˁF6 0ˁ261 1ˁ./ 68ˁ. 1F6 ˁ
80 2Dˁ 621ˁ9 .0. 0E / 80 0ˁ0%1 60$"24.ˁ
(0 8.2168. 1ˁ". 6. ˁ8 019 0$F6/4ˁ
0 16 "1ˁ / 80ˁ0.ˁ .. 93# 1ˁ"9 /ˁD2 3ˁ / ˁ
3 80 89ˁ 219 ˁ4989210ˁ / 80#9 1ˁ".ˁ
F6 480 89 / 80. ˁ 4ˁ9 1 "19D/ 219 ˁ
9./ ˁ. .0. 868ˁH 9ˁ.108ˁ29D D.2 ˁ
193ˁ 69 .ˁ !/2 87 .92 93ˁ 2ˁ. 08 2024. A SK!9ˁ
9 16ˁ- .9./ˁCˁ./ˁ 1 7ˁ"9 .924/ ˁF6 ˁD9 ˁ. '" ˁ
2. 668ˁ - S.68 ..9 . 0. 268S ˁV
"+. "T "%. ˁ + .!ˁˁ ./21 0ˁ 92 68ˁ Cˁ
892198ˁ 1/19 3ˁ=)ˁ4/ 1 20.ˁ"9 101920

> M ! 5 I ' : I 5 8 I ! p $' /E

/2'92 8' D2 3' / 8 0'9 1' 94' / 8 0#. .0'
. 2Z' 0 1 . . 3$F6 0' 6 68'0419 8 268'
"2 09 602016 0 9 16 "7 . 1' / 7 3'. /3'
. 1 3$F6 "1C ' . / 8 8 .26216 80 89'
/ 00 3'9 1' 4'9 1'0 1 663 ';9'04'F6. 8' 67'
620 0' 9 9'G07921 "1' 8019 0'04' / 808'
D #' . . .
& 6-.' C' 2. 0' . / 8 862 0' . / 68'
FV8'F6Z' / 6210 'C' Z. 96 1'< 1'021. 8'
D92.101 /' 80 89' . .0' 894 68' 8624 \'
63'. E .0 '497.21'F604 '49' 3' 0 196'
01 8'4 .08 ' =621'06198'1 0 '"1' 2' . . 2 3'
8 F69' . / / 763 4 . 1' . /0 = 2.8 9'
.SS' 8019 0 / 809 . 923' 019 0'9 1' / '
. . '#'V'1921 0049 9'C 2/2'9 9' . F608' 93'9 9'
E29210 .=/1 6216 C 219 9621' : /180 69'
\! . .3X04F/08'1.6/.01`1' 2 3' F0019203'
/ 8 0'D 01 0'9 . 923'0D 1E9 1 01 /' 67 102'
1 0#' !69' 9 921 E9'.0 6 F69' 9 ' I . 923'9'
921921 0'F6 49 E =/. 01 3' 2' : G34/2. '9 1'
490' 8 0191 A'03 9 3'C'0'119 20$F60' 2' 8'
9 /29 2801. 08 X 4S@0? [S .06'
0. 1D929 0 1MM 33' /'0S 8 '1 .S 6'C'07A'
94 /29 ' , '= 2 / 4 .0 0.@ 6 11/'
2 3#. 0 /161' `"917' / 2 /29 9 . 923'9 1'
0' 8 019 0' 0'F6 ' . .91'7929' 4 / 10'
8 /1F3! 1 , V/ 0808 / ! 901 / '=942.6'
1 1.1 194 .621' /11=/. 0 93E 11 04979 9!'
. /2 204'C' - 2 .1' 490D.1E. 019 . 1' 98'
9 '!1 "1' /19S191?0C' 8 8 6107 ` S# 19SFX'
'2?8019 0 0 1/' 1' .8 9 '=9.61144 2'0
' !%' '# > ' ' , ' 9 & '
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P $A (L F L :- ' '
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'4 ' ' ') '
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$' ' ' ' 6 #) '

9' E3'4 ' 2'89/' .4 . 20#. /8 924 '
+' - ' F6/4' 7. 68' 01 / /D .68' 2/8

' !#' /) .%.
M163' ! ' .06 0'9 1' 9 .160#' 9 9'
D929101 /268#2/2' 102168' F6 03'
19 2639 1'C . /21 2663'C' / 22' 8 6101 /29'
0.D929 01 /29 / ' 9480 84'F6 0'04'
8 /691' 0 08 /6.1F69' 4' F6/4' " 8'G0791D '
D2.24 '/8 2 0'298 9'=/ .8 0 BF69'= 49'
0'F60' 6/'0..9 6'C' 9.9 'D92. 01 /268'
.06 0' 621 1'. / / . /268 '04'F60G 8' 10'
892'" 9 164 293' 2919 0 0' 621' 6 68'
9 7 68' 01 /293 90F69' "0 A' ! 68' 92 8'
4.8 .8 9 802901 `263' / 7 0'9 0 F69'
. /269 /' 1'80 89'"20' 02 9 F69' 6' '
=9> ' "2 .63' 95?2 5;@8 / .63' "263' 0.'
8 9 . . 179 .1'1021 8' !06 0'D92. 0. /9'
2 3' . '102168' . / 6 1 /2 3# .68' 498'
002923 498 9 / 9 0 168 1 0. . 9' 498#'
0 9 10218 11101 /293' 6 9763' 4 69 80'
298 9D929101 /0.3=' . / 16 1 /293'9 D/' %9 +'
2 . Y .240 62 2/204' 8 / 1 8' 8 ' / 7 3'
"2 7 898 9404968 'F6 1' K6B ' _ . . --'
@<0 ? f 1.62468'/7 6E68 . .6 08 298 ' S'S]
9_/4 0.68 ' H 1' 92 8' 8 /163'. /21 2663 B"C70'
9 1'7 ' &8 ' 2$. . 1' 'C'4 &&(. "'24$' 2 ' W= '42' & &>
2,& ($3, . , # = ' ' ($2 &(' 3. ' 2 ' C'
%($$1 7'6. -3(/ / -3-' &- , $ (.1' ' -%2'
; . , 2' -2.$244 &. /' 4& &&$: - & /' (0 / -'
,2$(03(&$%&%& 4 1' (.4$ / /' , '5(' &- '
, . $$' , . , &' - '&'3. /' : - 2/'(3', -1' 23.'
&$%3 4.1:&'$&,$ 0,2 /'< : & 2, /' (&&24 .'
: - 1'4 ($ 5-2 ($ - ,&1' 2 2' 4$($5 $2'
&$ ((.$2 / ' &- . '$ - ,&1' .$. / , - '=)
KW&A5< K ,&' &' &. .46.2 %B(' 7'$2 / ' .1'
&2$4 ' / /2 - '3&4 , $. 4$($ 6.&'& -3 1
`M2' 1 892' 498' / 8 2 68' F6 9' / 4/')M9=&
9 1' T6E2F608 . /21 2D 1193 619 468 60#'
.1 /4 89 08'2/2' 01 2D.1. C' 2/4' 014'
02194E. 8 / . . 6879 . / 0.06 0 68'. M 6'
'0?' .A /0.2 E'C'2 019 9' "6
F00 10198' =94'=1 9 9160#' /21' - 92.10'
1 /2.3'C' ! / 6 1 /2.3 'F7' 7 29' 80 89'
.06 08 'F6/4' 0.6 0' 09 107 63' 8 9 6 '& #% '
F69' 98 9 '1FE .101$' 89 63'06198'9 1' 9 9'
F60122/2'9 9#'C4.8 9'9 9'F608'0 F602 '#. E' '
4 /#01' "91/'2/2' / 8 2 0' 1 91'. 9' / 621' #
X 2' 114 6 46/' . \' F6 0'1/2D9' 07' /'
<4C24E /21.C 2. /' 298 9' >9/ 8'
2 / 10 '4 1021#9/' D 16 'F6' 9 10701' 8 / '
4/' = 9' . . !T
3 "'$B /@ . / 8 96 . "2 O9 68' >963' 9'
9160 11. /21 2608 F09' 1. 923' D969 01 / '
098' 1'2 8 68'M82 0'9108'.0 6 1'
' ' E

),ʾ =q M:= = q ! ʾ

7 G ʾ . 9160ʾ4 921$ ʾ2/2ʾ 2ʾX 011 . Hʾ 01.8ʾ 2ʾ ...ʾT6/4ʾ./8 8629ʾ 68ʾ 2ʾ F6920.6 0#7.29 . 68 2/22 ʾ-.2. 01 4ʾ 2 3./2426 67 4 / 9 ʾ /1. 0.ʾ .F6.ʾ ʾ6)ʾ F6 4.8ʾ . .16 03ʾ 2/2ʾ 102168ʾ0" Aʾ 6.2. /63ʾ0 94016 ʾ 94ʾCʾ07ʾ. 98.21 31F63ʾ . .6 0 .8ʾ 0.ʾ 98 .9 268ʾ ./3 ʾ 8/168ʾ 8 .02.6 86160 68ʾ D929 02/268ʾ 249ʾ !2921ʾ0.ʾ .. /. ʾ " . 164 2.ʾ0.ʾ "9 "1ʾ / SO. .6 0 $468 . .9107./4904ʾ 4.ʾ 9D 9ʾ &(V K4 6216 2.F69..$ 021"2F608ʾ ..68ʾ. 0F60G10. 9 ʾ0. 9ʾ D2 3ʾCʾ 6263ʾ9 ʾ D2ʾ 09 . 09 .ʾ0F60ʾ=)ʾ 10ʾ49 2.9 3ʾ 29ʾ 29ʾ 249F6 0 .ʾ. 02 26Z02.6ʾ9 98 9210 ./Q 68ʾ26 68ʾG0J1. 83< ..62468ʾ 9ʾ./16 ʾ 0 198ʾ\ʾ C# 0ʾ 198 / 9ʾ 2 2 ./ʾ<862468ʾ .2 8ʾ07ʾ .9 2/ʾ / 6 1ʾ /.9 93\" / 2ʾ .9 1/ʾ 101/F69ʾ /./ʾ802 .ʾ 94ʾ/8 2 0ʾ 6 ʾ F69ʾ 49F69ʾ /7. 02.ʾCʾ 68 80ʾ 8 3ʾ 80ʾ 68 8 3ʾ 9 8 .92.6 ʾ I 1ʾ .68ʾ8/163ʾ 9 Q 91663ʾ 1ʾ 9 1ʾ.. 08ʾ 8/6923ʾ 9 91668ʾ " 2 6 8 0 / E . C ʾ Q .91ʾ.2 8ʾ 6 93ʾ 29ʾ8/163ʾ0.F69ʾ04./ʾ 6ʾ .3ʾ/ 793ʾ=)ʾ 6 0ʾ 8/69220#/8 2 0ʾ108.2ʾ 70K.ʾF6/408 8/4/ʾ 67ʾ "2/ʾ /ʾ 2. /ʾ . .2... 68ʾ9 1

(ʾ !#ʾ3" &) .%.

AB ʾ921 68ʾ0 0ʾ29.9 0 /ʾ 18. Cʾ 18ʾ 41. ʾ 6ʾ.6 0#0 0ʾ2/2ʾ29.9 027ʾF6ʾ6ʾ / O2.ʾ4 9ʾ C2/2ʾ . 9# .ʾD929 0. /26 0ʾ F60#408 2.ʾ29.9 0 / F6019263ʾ " 49 .91ʾ / 4 20216ʾ04ʾ 9. 9 68ʾ ./2 9 601 /298ʾ F6/ʾ 04ʾ "2 6. ʾ / 4 298ʾ 29.9 0 /ʾ 62 # F6/408ʾ2/2ʾ29.9 0 /ʾ 94ʾ ./21 2D92193ʾ F6/ʾ . ..1ʾ04ʾG/.ʾ". ʾ 64ʾ 2D6 0 .ʾ.9 8 ʾ 20216 ʾF6/4ʾ /.9 1ʾ4 9ʾC2/2ʾ . .ʾ2..ʾ 9ʾ .ʾ 68 168ʾ04ʾ "2 69 ʾ 9 94 /298ʾ2. ʾ .9 0 7ʾ 9 10 ʾ I 1ʾ.2 8ʾ29.4 .ʾ. 9ʾG/8 ʾ 2. 8 ʾ2/2ʾ=/. 0198ʾʾ9F668ʾ2/2ʾ 76.9 G0ʾ 62

=ʾ9 D/ʾ / 19 639 9ʾ 2... ..1ʾ"0 97 .ʾ @ ./2 9F6921 0ʾ 0ʾ / ʾ/ ʾ 64$ 10"1ʾ 1 63ʾ)+"ʾ 1ʾ 1ʾ 9. 08ʾ / 19 63ʾ=)ʾ162.ʾ9 1ʾ 9. / ʾ .01 / ʾ 1ʾ ʾ2... 9ʾ9 1ʾ4/868ʾ 9 9ʾ2/2ʾ 102168 29.9 9ʾ. 1ʾ4 9ʾ 62408 92.68

& ʾ Cʾ ʾ 62408 92168ʾ9 1ʾ. 9ʾ..08ʾ 4/868 ʾ0 /F6ʾ2/2ʾ 91 /0D 16

=.4 /D . 63D!2. 01 /268ʾ". ʾ9 1# 9ʾ 463ʾ.68ʾ . ..1ʾ / 8/ʾ 7ʾ 6..94.21.3ʾ ..9ʾ4 9 621ʾ 98 9 #". ʾ. .6 0 3ʾ.68ʾ 04ʾ.0 498 9. 9 .ʾ 9D 9 63ʾ : / 9ʾ8/4/ʾ D929 0 /293ʾ 9 916 ʾ2/2ʾ 621$"9ʾ.2 8ʾ 9 921ʾ 2 1 ʾCʾ .ʾ2/2ʾ9 921ʾ 9 996 ʾE". ʾ 2 2 1 C# . 99 .3ʾ2/2ʾ 9 60 9216 $ Cʾ 26 0ʾ / 24.D929 01 /ʾ9 91ʾ 8 . 19ʾ2.ʾ

94 0 0ʾ = ...68ʾ.2 8ʾD 01 0ʾD929 01 /2ʾ 293ʾ 621ʾ29.9 0 /ʾ :/ 19 / 1$ D 16 ʾ 0/4 ʾ 9 916/ʾ 621ʾD929 01 / .3ʾF6 763ʾ 94901ʾ 498ʾ 9. 9ʾ 9 922ʾ. .6 /2.ʾ".ʾ9 ʾ0F60ʾ 09 ʾ. ʾ0. 9ʾD2 3ʾ9 ʾ D29ʾ09 ʾ9 ʾ0. 90F60ʾ 2ʾ 2 2 168 ʾ T6ʾD.2. 01 /268ʾ. .1 63ʾ 1ʾ ..62468ʾ..9 8/168ʾ. .6 0 .8 # 8/Q 168ʾ=/ 3ʾ 249ʾ0E 2ʾ.98 / 0ʾ 2ʾ. .6 68ʾ ..08ʾH621ʾ .4.621F6. ʾ:/ /ʾF6/ʾ 98 ʾ 19 20ʾ 621ʾ.0498ʾ2689 /ʾ 9ʾ. .6 .68ʾ19ʾ 4962. ʾ"1=/ .0 110ʾ T6/ʾ"9 7ʾ./ 6 13ʾ 7 0ʾ2/2ʾ268. /$ 94ʾ 9. 9ʾ .4.6.ʾ.04.2 ʾ 0.ʾ 9 D929 01 /268" .93ʾ 9 0 02.6 ʾ 2ʾ 49ʾ .91ʾ9"0 / 9ʾ 6 0ʾ 01 Cʾ9ʾ 66 0ʾ "0Q 9 "# / ʾ2/2ʾ.0892ʾ 498ʾ2689 /ʾ 94 1ʾ"0 / # "1ʾ 29F6!ʾ 2ʾ02 80 763ʾ ʾF6/ 68ʾ26 68ʾ 498ʾ268. /ʾ 9F0 9 16ʾ 0 /F6ʾ . 6 .ʾ 1 /ʾ 8/ .6/ 68ʾ2/2ʾ. ..ʾ8 0.6 / 0

=% . . !ʾ- * + . . ʾ2%! "+ ʾ / &+ ʾ

+-+:)+ %"

> Iʾ./ / .ʾ 8 . ..9 /ʾ. ..1ʾCʾ9. ʾ 8.2./ʾ ʾ49F69ʾ 86.60ʾ 9 98 921/ 68ʾ ./8 86101 /2.ʾ/ .6ʾ0.ʾ 21. .6ʾ./8 862 ʾ ;# 8 1 /2.ʾG0< 1.263ʾ 59 10.ʾ"1ʾ4.ʾ8 9 3ʾ 4 .016 ʾ =94ʾ8 168ʾ".ʾ9 1ʾ 8 9 9 168ʾ F6/4ʾ2016 08ʾ / 808F6.ʾ9 .8921ʾ 91 ʾ ʾ291 94ʾ0 19 0.08$"1ʾ26>.3 F6 ʾ2016 08ʾ 998 910F6/ʾ.ʾF60 2ʾ"0 / 98ʾ 67 0.0 Cʾ .6 / . % 0 / . ʾ 67.0 40 07 0/ 10ʾ9 1ʾ I 1ʾ .2 8ʾ 26793ʾ . .2. 0 19ʾ 0F60ʾ <G 2.ʾ .2 8ʾ 0. 1ʾ2ʾ 66 0 0ʾ / 6 16 \ʾ 94ʾ0F60ʾ9 ʾ .94923 603ʾ20. 603ʾF60 .01.3 67.0 40ʾ<. ʾ .91ʾ 96 / ʾ 0 / ʾF608ʾ 6 0ʾ. 63ʾ2016 0ʾ / 16 .1ʾ .ʾ 9 94168ʾF6/4ʾ9 ʾ. .892. 3ʾ 9 9 9ʾ8 9 3ʾ./2 101ʾ 7 2008 F69ʾ07ʾ 3ʾ @ ʾ4 69 08 / 1 16 ʾ I 1ʾG/.ʾF6 498ʾ"9ʾ 02 80168. 1E 6.ʾ" 6923ʾ".ʾG9 70ʾG/8 /$ "9ʾ 202 80168 "1ʾ0 3 8.10 68ʾ>.ʾ8 ʾ 1 3ʾ9 D/ʾ 8 9 9 3ʾF6/ʾ 6 D7ʾ 4 .62.6ʾ 4ʾ9 1ʾ<67 0 0ʾF6/4ʾ./ 68ʾ8 0D20ʾ 0 3 0ʾ 2ʾ 67 8 ʾ 4ʾ9 1 2ʾ0. 9 ʾ0D 16ʾ1 ʾ 763ʾ 8 3 7 3ʾ 919/ / 68 $4.ʾ .1.ʾ 1 3ʾ 061. 8 202 801 3# ". ʾ /1 63ʾ4.ʾ9/ 68ʾ0 ʾ 94 /2 763 F6Bʾ 3ʾ0.. 4621 . ʾ 80 68ʾ F60 .0168ʾ4 69 30ʾ 0.91/29ʾ=)ʾ 0 /2. ʾ".ʾ 21ʾD.2. 01 /ʾ 61 . 0< 1 /ʾ..@ 1 /ʾ. 64 ʾ 103ʾ/6 1 .3ʾ8/ 1 .3ʾ F607 .03ʾ 0D ʾ 103 7 /F60 1/ʾ T6 .08.2ʾ.68ʾ 919/ 0ʾ 2/2ʾ. 0ʾ 191 . 62D116ʾ0ʾ2/226 3ʾ0ʾ . .Eʾ . ./ / /D ./ 68# Jʾ 7 3ʾ49/ .60229ʾ 7 .6 ʾM7 9 168ʾ .0F69ʾ1 68 / 68ʾ9 1ʾ 8 168ʾ 8 9 9.168ʾ$F60 . 9 .ʾ 168

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8 26 F6. 7ʼ./2 1021J2ʼ F608ʼ 1.ʼ..9 .ʼ
1 6 8 . / / 8 8ʼ / 4/ʼ ʼN 621ʼ .0892ʼ 6 10ʼ
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5) &&.&ʼ). 6& ".ʼ-06 0. 99 . 13 80 "24.
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W 16 F6 ʼ 49/.0 40. 1ʼF1074"0 / .390ʼ
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3 G0 01 .3ʼ.01 403 1..03ʼF6 ʼ 621ʼ /192ʼ
00ʼ D6P 94 01 F0.ʼ 969 79 0 ʼ68 ʼ
3ʼ 04 /3ʼ191 0.ʼ /O4 101. . . /3 04.4F6.ʼ
7 1 7 .3. 9 Z6.ʼ 192 8 0. 3..D /2.3ʼ
93ʼ=6 .80 00*-?8 D2 Iʼ./01922

20[ʼ 627 F69ʼ9 19 3ʼ98 9ʼ.019 ʼ 83ʼ
F6C /7 4 403ʼ.06 03ʼ.0 40.1 089 1#
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19 0880 / I.ʼ.0 / ʼ070 1 3ʼF608ʼ 2ʼ89Q
4 /ʼ0. 9ʼ"7ʼ 621ʼ26793# T6 0ʼ"0 / ʼ8019Q
0ʼ21 7 3 2ʼ 8 .4G 8ʼ 208 9DE/298 D ʼ
4 6 .6 08ʼ0 .92492=E 7 492 0.6 ʼ I 1.2 2ʼ
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2/2 621ʼ26793ʼ$F6 0ʼ 0$29ʼ D290ʼ9 1 \C 8 /Aʼ
16ʼ. .6 0 ʼ0D 1010ʼ./2. .1 /298ʼ /G ʼ
79219ʼ# 2.F69ʼ91 02ʼ "921 ʼF6ʼ01 8/3ʼ
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/ 8 /16ʼ/ / 19 .68. ..9P 98 8 9.ʼ07ʼ
. .ʼ /.6 ʼ T /4ʼ./2692 1ʼ 01 /2ʼ"2 63ʼ
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.0 9 04. , 0ʼ0 1 0ʼ8 263E2/2ʼ.089 4./ʼ
S0ʼ90 40 /1 0' 16ʼ. O..1ʼCʼ / 80 1. $ʼ29.ʼ
D2 10 1 62.ʼ^ ;\?/ '; . -6 /293 19 0ʼ
16 8 "0D0 68 F2 49/ 2.09 /2/2ʼ 62 ʼ ʼ
F 84ʼ 21 D2 ʼ=62192 8ʼ 91 / 0ʼ D .0
T 4ʼ =/ ʼ0 16.0 463ʼ. .1 2/2ʼ0 0. $S Sʼ
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463ʼ0 0 91ʼ=62ʼ D 0ʼ=/ 49 0ʼ..91 .0ʼ
74[ʼ" O19ʼ.8 8 .2 9 2/20 6 29.ʼ / 80ʼ
.4 "1ʼ D2 3# Cʼ.0 9 09 621ʼF6 4. 8 2/2ʼ10ʼ
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16 2ʼ946.P$F6 .0 463ʼC 9.63. 1 4 . 6ʼ
9 0 0 1/ʼ ʼ.0 463ʼG08 463ʼ"0 / ʼ=94 ʼ
)'ʼ"19 F6970 163ʼ 86 4-.2401ʼ1 02 192ʼA$
4 1ʼ1089/ʼ9 G0 91 /ʼ"0 / 98ʼ ʼF6 0ʼ .0 /ʼ
9 1ʼ !689 D/ E 1 E 9808ʼ 1.8 9D /2. 2ʼ
. 6.2 . 7ʼ0.. 4,.6 1A818 / / 20 ʼ
49J. . ". 96 / 9688 1 630D 3ʼF6ʼ D2ʼ
" 9863ʼ9 1ʼ ʼ 8 / 8ʼ I 1ʼ92 8ʼ 108 80ʼ 9.ʼ
163 0 4/ ʼ I 1G F0 498ʼ 088 86 ʼ
1 8 4 29ʼ 06. 1010ʼ 16Aʼ D6 0ʼ4 982ʼ
H 29 1 E Iʼ01492193 @ 93 .0 $I 19 \ Iʼ
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2989 C9 1 6492 9ʼ 1D69ʼ"1ʼ 6 / -163ʼ
6.9 23ʼ 6 9 / ʼ01492/ʼ 2 1163ʼC. 7ʼ 2ʼ
08 807 O3ʼ 2 91 / 3ʼ 6.9 201ʼZ .923ʼ/.. 11ʼ
413 1/103" 4916 ʼ 67 170.9924 912ʼ 0.Q
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2/49ʻ 9 920ʻ 0 7ʻ 2.9 4 6ʻ# C# 67ʻD 7/ʻ
620#ʻ" ʻ19 10. ʻ./ 68ʻ.9 . 103ʻ / ..1/ʻ
68ʻ.1 8/ʻ8/16ʻ 8 3# .0ʻ".ʻ" 4.0216ʻ
8/6. ʻ.. 9 GE3ʻ 1. 3ʻCʻ=/ .EʻF6/4ʻ0.. 4 9ʻ
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ʻ ! ʻ),%"%.ʻ 9
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ʻ. G0G /29 .ʻ68 2 3ʻ 9 04 /298ʻ"0 3ʻ
4 7240ʻ./ / 7 3 62../ʻ80 89ʻ8)ʻ 6ʻ
6 9/ F6 . D2./=..024 4/ʻ 8 1ʻ/ 62ʻ
6 ʻ=94ʻ. 0 / .3 62. F6 2ʻ9 G0 0. /29 0ʻ
/ $ʻ/7 .6 / 93 F6 2. 0 / ʻ:G0 80ʻ
10ʻ 0 68ʻ46 021 /7ʻ 8019 08ʻ9602 408#
299" 49216ʻ 1 880ʻ4 9ʻ /7ʻ4 6 2ʻ 68 2 3ʻ
" 8ʻCʻ./ 08E29.ʻ 6880ʻ 2/49ʻ/7ʻ2 ʻ
8 08ʻ/7 .6 10198ʻ H 0163ʻ 1ʻ 68 29ʻ0ʻ
1 68ʻ087 9219ʻ"249ʻ 894 0ʻ0 0 .1ʻ /ʻ
624 103
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! M 89102/29 1ʻ 6.ʻ./0 0
1/ʻ 02.10 612ʻ 7ʻ" . 2/ 68 04ʻ 9ʻ
668ʻ 6892ʻ0 1. 20. 8ʻ 9 624921 68ʻʻ".ʻ
"/ 6. .ʻ 20 0D/ 03ʻ Cʻ >98/. 163ʻ T6 0ʻ
4 7 1/ʻ./8910ʻ 98 9ʻ0 0 .192.ʻ 1. ʻ
22 GSʻF6/4ʻ2/2ʻ 1ʻ =9.6207ʻ./2 01ʻ .ʻ
9ʻ 62Dʻ8)ʻ./ 9ʻ 029.03ʻ91 08ʻ.6ʻ0G 3E2.ʻ
F69ʻ.0892ʻ 4./ʻ20 9ʻ ! / 0.10 2ʻ /2ʻ9 1ʻ
..012ʻ ! /8910ʻ"263.ʻ 0291 3ʻF6 01.01ʻ 7ʻ
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" 49016 E".ʻ: 1G0D/ 03ʻ Cʻ 10 ʻ4 . 9 ".ʻ
F6ʻ./808ʻ.0 01ʻ0ʻ /./ʻ=/ 9ʻG68/ 9804ʻ
68ʻ. .60219ʻ061ʻ0 /ʻF6/6 3ʻ 8/4/ʻ ".ʻ
H /. 0193ʻ;.ʻ 1 .G 63ʻ"/ 6 . F6 0ʻ 0Q
2913ʻ/8293ʻ 67ʻ_/4 0./ʻ499 021ʻ 98 9#
01ʻ" ʻ 629ʻ! /89 3ʻ9 1 0ʻ_/4 00 8
ʻ !# &# .0.
| . 923ʻ .06 0ʻ ! /8.10. 1ʻ=/ʻCʻ0 1 0
01. 0 3ʻ9 G0 0. /ʻ.0 40ʻ ..0ʻ P ʻ
80 492 0E! /8 040ʻ .F69ʻ 2 08 807Oʻ
3ʻ"1299ʻ86 168ʻ9 6 016 ʻ2... 17ʻ9 1 2ʻ
D6016 ʻ 94ʻ./21 2 7ʻ4 F6.ʻ 9 46 91E01ʻ
F69ʻ049/ʻ04ʻ. 63ʻ 98.ʻ 2 08 801 9ʻ 076Aʻ
680 ..2401 67"/ 91F6.ʻ./2 8 3ʻ9 G0ʻ
04/ʻ > . 16ʻ9 D/ʻ! /89193ʻ 69ʻ 1. 0. 1ʻ
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68ʻ8/4/ʻ 2ʻ". . ..ʻ7 40$ /D 2 03
(.68ʻ/7 /2D0 2 10ʻ70 73ʻ ! /8.108! 9ʻ
D . ʻ./2 1 16. /2 3ʻ 019.#F6 00 8ʻ0 0ʻ
91ʻ"921ʻ9 6 D18.ʻ ...0193ʻ F60 / 93ʻ
0 .1ʻ06192ʻ0 7ʻ F6. 9 9ʻ"2 .63 ʻ9 Q
1 0ʻ / ./ ʻF6 0ʻ. 63ʻ8019 0ʻ4 1 016 07ʻ
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9 1ʻ /.63 6.ʻ 0 3ʻ ..9 ʻ" 1 /2.ʻ 040ʻ
.024 4 / ʻ0ʻ..9 ʻ:70.1/21.0ʻ./2 0D 0 /ʻ
29ʻ 76 /30ʻ = 8 92ʻ.2 8ʻ/7ʻ.06 08ʻ_/ʻ
4 0.6=Eʻ 67F6/ʻ 98 9ʻ=/ʻ4..6 1C 0ʻ
29 . 084 6ʻ49K 0D 0 .1ʻ Cʻ 2.0246 ..Aʻ
/2ʻ9 1ʻ91 08ʻ 6892ʻ0 1 / 68ʻ / 1 68ʻ
F6/49/ 68./2D 9D01 /29 Cʻ=/ 907 92ʻV
19 19 6.ʻ 219 / 10ʻ " 49016ʻʻ"ʻ4 1ʻ
20 0D/ 03ʻ T 8 0ʻ 0.ʻ 2ʻ9 498ʻ0 1 3ʻ9 1ʻ
98 9 $ʻ01ʻ10 9ʻ 6892ʻ 29ʻ=/ 9ʻ 2ʻ4 69 3ʻ
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19 0ʻ 219 /2016 ʻ2 2 0 94 110 8 92ʻ9 63ʻ
"87 00 9468=/ 3ʻ /10ʻ19 0ʻ /2D9ʻ80ʻ
/ 3$ 4. 1F6/8 263ʻ=/ 0 1 0ʻ0ʻ19 0ʻ 8 0Q
89ʻ4 102. 0ʻ 6 1 91# F6 0ʻ./263ʻ"87 01ʻ
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1 / 68ʻ 6 8/ 68 F6L# 2ʻ" 0ʻ H A 6...ʻ@
. 1ʻ. .6 /ʻ 049/ʻ4 4/ 40 1 89ʻ 6 D921ʻ
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892ʻ0 1 / 68ʻ .ʻ. 1921 68ʻCʻ 63 0 ʻ
1 3ʻ..9 #"249ʻ0 0E91ʻ. .6 63ʻ 8 0D263ʻ;.ʻ0ʻ
4./ʻ.024/ 9ʻ./2 .663ʻ ".ʻ 67ʻ0 11ʻ /ʻ
1624 1019ʻʻG0 /ʻ".ʻ./ /20ʻ =ʻ.2 8ʻ "268ʻ
0 1 68ʻ 8019 08ʻ ! /8 913ʻ /19 1ʻ . .60 .ʻ
126 17 8 0D 3 19 08 6 10 2ʻ 0ʻ..9 ʻ 0490ʻ
0 19ʻ 924493ʻCʻ?`J Yd4 4 8019 08ʻ
049ʻ. .6 1ʻ 6 1/ 921ʻd.4ʻ;.ʻ 1ʻ04.63ʻ. Q
.6 63ʻ9 1 0ʻ / ./3ʻ"1ʻ! / ! Z10$F6/4ʻ0 ʻ
D6 .ʻ 8ʻ7ʻ 61.0ʻ 70 01 /29ʻ 9 ʻ 7ʻ
.2 8ʻ "7ʻ9 1ʻ;.ʻ -M 0ʻ9 G 0. /268ʻ /2D9ʻ
80 / F6012ʻ 21 0 / ./3 /107 3ʻ 9Q
2.9ʻ .4M ʻ86P 3 6 28 F69" 3ʻ2/2ʻ /ʻ
70 ʻ702.ʻ49 049/ʻ. .6 /ʻ .2.921 08#F6ʻ
1016181ʻ 0492ʻ. .6 68ʻ2/2ʻ9 .ʻ $
061ʻF6 407ʻ9 70101 /29ʻ20.68 94ʻ "9 08ʻ
.997ʻ /406 ʻF6/4ʻ 4 .P6ʻ 808 92168ʻ
0 1.2 9_/208 f ʻ-98 2/3ʻ;.ʻ=0D 1ʻ
0 * 2 1 02P6 .98$.ʻ 60492 .01. "9ʻ
191 0 6 2ʻ 8 2 80 68ʻ 8 0D20ʻ 9F6921 0ʻ
2492.98 ʻ T 3ʻF6 498ʻ 19 03ʻ" 4. ʻ
I 62.4 / . . 3 2 1 62 92. 3ʻ0 62.ʻ 69ʻ /ʻ
!1 763ʻ 01G98 01 . 3ʻ26 9 29ʻ 2692
43
D!#ʻ"+"%.
-92468ʻ4. 3F601ʻ H621ʻ 2ʻ8 94 / ʻ;.ʻA
G/0` .#".4. 66 0ʻ267.ʻ.0 D 2.ʻ&
/ .ʻ 6 20ʻ ! 0 40. . .23 66 . . 1=/ʻ
80 89#80.9 E0 3ʻ"0 / $ʻF6ʻG0 163ʻ9 1ʻ0ʻ
5#6ʻ ! 68ʻ.2 8ʻ=/ ʻ01 6.ʻ0 1 0ʻ9 . 1021

"0 / . 8 9 '=F29 3 ; 'G68921 7 3 / . 3E 6 A'
68F69'4.60 .' 2' 8 94 08' 0. 3 .D /298 '
7 '4 2 6 .2 63'4.2 016 ' / . ' D/ . 'C' 0'
?F6'9D6..03 / 6 16 $F609 ' 8 26101 8'4. '
6021' 1 09 4 .6210 E ' 8 0 / .3
21' E 66 0' =94'"0 / ' .'. 0 / 'F6
2'0. 9 6 .2 63'" 4916 C'. '0D 9 20F608'
8 610 / 9. 9 1267.3 S R ' !0 D/06 98'
' A?' % \ "5' ' 8 9 2976 0 '9 1'267 3 2' F608'. /2Q
. 919' 6 9 I 8103 (!69 26793 2 /9.6240'
' D26 2 . 92 .01 3
W ' !#' &) .%.' (
' / '.0 / 9 D6/' 219 4 6'9 .60163
' 2/2' /2D9'0 19 0'E468'4.2< / ' 04 Sd
49 9924 1'./2.9 1/' 9 '2/ 198' D/ . /3
\ 0S1' "9' 6 20' : 2 F6E498'
"' R$$?$AA.62'"0 / '0219'./2D. 0 1 1'F608' 7 6K016'
20F608 "24.'G 989 497 980 763' 4'
9 1' D 4 / 7.`' / .3 6 20'D D2 16 ' - 0 '
.9 . !/ +/'06198 '.68'"0 / ' 2'0F608'
.' ! /2. .6 1E" ' .0 / ' 1. 923 S1 ' '2/2'
/16. P.68'4 7 0 906.'. ..0 .'?2..' '
D63./2D 040 9 'A5 /3C' 6 20 621' 2/419'
. .2P'C'0'"921 3 .21. ' 2' / .G'4. 9 / '
763 / 9'.9 08 'H /2'988'.. 68' 80Q
0 0')+" ' &)'#+ &' 2' 8 8 3 8 /2. 68'
"7 ' 021'"92. 'E 8 /21F69'10 2'0 . 9 '
D 18 /7490 110198EC.0 / 3 0/ 08 ' A
(' !#' 3" &&.%.
!1- '$E '9 1'26793'./2D. 010A' 1 D 49'
198 9 101 3 ' 9D /2 3 249 ' : 66 0'
C' /3 6 20' C' 2 ' / 0 9.. . 101.' C'
86 . 164 29'4 19 621
(, ' !# ' %+ &) .%.
!&($#' Z024/' .' -10
"E. .3 '2/2' 1'10892' 1 D/ 9' G 980 '
.68' . 0 44 .89$ 9 63 10. ! j' '
8.' "9 .' >' 06168 /' ./21 2D01' .12 .'
F6"0 024/' 1' 9 08 9 4 01 2' 29'./2'
1 0 / 68'. .68 /7 1.21 012' 610'.0R G'
C' D/ 3 .68' 8 793 .0 /' 198 / 9' 2'
. & ! .' &: +") .' 629'#&' 021 9 10 2'
1 4 / 98' 7 0 0' ' 7 ' . 14' 9 D9 016 '
4.2 016 'C' 2'D6.10d' 80 / .3 ./2. . . E
F6 '80 / .'.1 0 8 8 916'49. 4.2 .3 "7 ' 2'
42 808'0. 3' 9D /29 'F6 '162.'.0 4'
. 1 . 6. @ . V 7 S 02 . 4 0 2'./2D. '
4.62.'C' 246 0216 '" D92.9' . .91'.0 / '
99 19 2/' 2 8 ' 9D1/2 3 'C 0.6.619 8 9
268 D03D6110 62 '4.. 4.21 68 F6 ' .'(
./2D 0.E.' D 024 293 621$ .7' 80 / .3'
F6/ * 7Z ./8 2 .3 F67 /2D 4=W'191'
0D D 501` ' F 1011' "1'. 1 63' . D9 921'
8 "24C . .19 .9 9 178 18d 0. 021 90 1'
=/ '9 / 681' 1.: /21 "0../ I.' 6 0'D 0'

. .8' 4/862.6 03' 9 9890193' 04.0 16 08'
. 68' ' 0F608'.0 408' 0 624 8763'. '
.68 62462! E !'. 1 63'46 .16 ' 2'D9 6#"162'
16 92 8 D 049 '"1 6 8 7 / ' =9H "1 2' 0Q
7 0'C' J.2 / 0' 621' 00 / 93' 8 7 93' 3 10 '
19 C 4 9'9/448' 9F692 / 93'F608'2/49#' ")0) "'
4 .F6 498 / 8 2 0 "1D 024E2CD92. 0'
1 / "208' /7'.06 08' 162.'F6 '. 702 9 ' /!%.'
10 3
' & ' !#' &) .%" & . .
> 1992468
4.' "9243 01 763'
66 3' C' 80 1' 92168'4 9 621' F6 408'
4 9'0. 98'. /8 8 /168 C 6 021984 ." '
0. 4.2 3' ./2. 91 3'9 1'26793 0F60#'
10"1' "924' /8 293' 49/' 21' "263' "92163'
F6 00. /8 2 3 2/168' 67 9 13' 9 1' "7 j6.'
498# .91'4 9 892' .' 01 /29' / . ' =94'
F6 4C"249".2.63EC02F60 0' "0 9' F6/ '
408' 601 061'.02F6089 '"1 763$'0111 "1' '
4/ .3'49 2D62.'9' 9 3 2 . 68 10163'. '
82! 021'4 D2689 1'./2 49 01 /2. ' .'4.'
66 / 68' F6 498' / 1#6 G064'.. 08' 0 .9'
.92 69 .1H. '2 8 68'9 0F6 66 0./ '
/ 180G' 9 29 219 ./2.. 10.6 3./ '
.4 'F6 ' '. '0 6913' 6 3 02.0'"79 10.9'. '
168 ". 2/2' 0219'./2 680 6 C9 0 9 .0.'
F60 2'0 66 ' 1F6924'7 98.' 94 9 2 '
9 92 193' 02.' 66 E' 1.63 2/2' 9 92.3 '=94'
2498'. ..4P'G .' / 2 / ' F6 '92 8' '9'
F6 763'./21 267' 8 020 921' 80 / /3' 06 E'
.. 08' 2' 02098 /21' 70 / .319 0#F6/ '
8 / /' 9 D/' / 192.' 2'.9 . 3 .9 ' ./2.. '
10.6 3./21 29 B' I 1/44' 20.' 2' 0F6 3' '
6.' 166 / 3'4. 1. .2 763' 1'9 D/'0.1' 6 0'
!9 08'492 0163 1' "0 M #C' " / ' 9' '
D63' 1' 0F60EK .' >) ' 19 1 ' ./2.9 .0.6 3'
.069 2 F6.' D 4 / 763' 498'./2. 2D '
". 6 OE .C18 .01 629'./2 26 0j 94' Q
89'H621' 1 '9 D6 F6 ./9621.3 62.'
D611 80 / 93' H 2. /2 .3C' .016 D 1 93'
#& ' 2. 0' 166 / 68 '.68' . ..1' 2'
"208' & 0 1.8.' ; /39'./2 662. H8.' \K 1A'
9' 8 /21 763' 80 8 3' C# .069 2/ 3' 8 0D2'
68 20' * ' ? ' $ 10D20%. /21.3
/ 99 2 863
' !#' &) .%. %! %.
102.6 ' / .0' 9 ' ' 62.F 9' 262.'
'68 40' C' 0 6/ E' 262.' ..0' $ /7'
66 /168 2/6/K' / .63' 0.' 49 .4 /2.3$' ".'
80 30..9 68C 9 ! . 168E 9.62468'.9 '
14 / 4 2.30. . /4/3' H0792192 899 ' & K .'
0 193' 608' "9 "1' 6692. 19 0' 29' " D/'
98C 9868E0E1 0 @9B A#' "1 02 ' % " . F'
02 8 0 #' 4F69' 0' .0 / .' C' ./26. 1/2.

& 'C' ' ' '>' '>

=/ 3# 10"1' 8 2401 / /./ 68' 1F60 6'
6. .63$9 ..01 / 92.4#63A " 0F69' "9 /' 1'
9'" .93' C#. .6 63 2 21/3' H 2.' 49 9'
-9N 1' 621' . D /2.3# G 2.' 4 9 621' F6 408'
8624 8' 9' .2/60. # F602F608' G/.'
0 68' I 1'92 8 0 60048/468' 0'19 0'
19D / 168' 86 01 /' 9 946' 8624 #.B 2'
19 0# 8/ 93'2 G ' 9'.68'./ ./' ... /'./8 0'
0.0#' 0 39 D/' 8 .01 /2 3' .06 0'9 1' 80'
D20'0 F60'G 023' 9 /4 .0' K
%3 0 Z S 0; ?S/; . .9X 63 87 68' "9 4'
66 68'.9 3'198 / 6 0' 01 3' 04692 923#
299' .8 9' 498' /. 3' 68 268' 9 92'
2 8'.0 .' 621' /.0'01 80'492 0' D'
40'D D2924 3' . 6024 F69'0F6 3' 4/290#4.'(
+" ' . 921 68' 68 / 0' 69' 8/21 68' M+'
) % ' /46
/2.3' 6 ' 62D/ 9' 0 4/ '0 D /'
'0F6 3'D.2. 024 3 48 "9./21 2924 3' 2A'
9 90#' T602F608' 66 E' / 9' 9 9.6'
26 21$'. 8 /8293' 603' G07.02.' 6924'
9 /4/3E' 299' 98 9' /.0' 9049 0' 1.'
602. ".29. 6880.' T /4' 4/..9'
D 1630O F6. 9D /2.3' T F69'.68 98'
63C# 2 69 8 .. 20' 2. 63C 0'
20 3'2/2 98 9' 6 9 621$C' 90' "249' '
2 4' /4 9 62.' /.0'/ 8'0 40' 69 9' '92'
63'.2 8' 9 86 01' /820

@ '& '=&)%" .'(& &+ + . .

M2 101'.0 1763'2/698 0 1 703'F60
9 1' 49' 80 ' ' 4.' "9243
' 491. 8/.6' '49 /21 6 W.' 6A'
D6 9

!#'# .%.

I1. 93' '
80 9' 4 9 621' 0 /2. 7 3' / 16 2' 9 9'
39 WS' 0 9'F6 0'567 68'80 9 H .02 .68 !0'
/21 763' 26Z 3' / 62.6' E' 4'
' . 6 19 0 2' 2. /'0F83'/ 9 108'6'
9'E 94'9 '"20' 0 19' 6' 9'9 ..0108' 96/ 9'
' =/ 3'9 6 F69' 0.' 62 './269 /2 763 C'
F6/4<6 9 9 1'. 9 20 .$ 6.6 68 F69' 02A'
+& @ 498 "1./.0 . 0 20 . .0' E492 F694'
& +' . 621'80 .'9 9' 64/ 9 2' 91 0'=/ 9'.0'
0< 1 #CG 2.9 9' 0 68 F6 0' 64/' 0 63'
1'#".92 80F60' 9'. 29 93./0.0' 0 09 1$'
. 20 9'1. 048 161E' /6916 6 .F69'
20 9' 'F6 0' 2' 91 3'02D6 1 / 763'./04168' (
G 2. 9 16< 1601 808 68' 1 9' 4 624.63#
=94' C' 6 1'0'=9 192. /29'04' 6 1 68$F 1 0'
19 0'=. 1.8 /20 3'0. /'. 1EG68 / 06'
1 0 3 C 66 E' 86 1'0'=9 192. /29' 4..6'
621 2809

q !'

m' !# &). %.

' 9'9 19'./ 63' 22. 8'/823'
0F6 ' 61 62.' ".19 .3 0' F6/ 6021'
C 2F6/4 9 6021' 08 293 F6' 4./' 46. 3'
621 U ' /16 .21 'F6/4' 0F60' 80 20' 9'
./ 010 '9' F60' H621' 46 .9 10.' 1' F6/1 1/4/' '
0F60 0' 80 20 0 0C. 0 / ' /19 14'
. 2. 68'0 0 680F60 68 671 / 68'
C' 8 ./ 68' C# /107 68' 0 9'1.'
08'0 6 .'C'. .62401' 2F6 62.'0 E' "1' 10'
9 09 $09 98 D2 3' =/ 0619 0' 9' 80 '46'
./ .3'C' 671 / 93' 0F603' 96/.01 2' "0 / 93'
8610' F6 7630 16 ' =9 'G' 64 D2' 621'A
F6 0' "0 / 93' 9/2. 91' 94.6.' 2'19 08#2.F$
=/'0 26 29F6 49' ! D2 3EF6./ 11269 1 E AA AK' K
2/6 3044 1/ 076 /' =/ .2 8 2/2' 4926/'
061'./21 269'D.29 0.6 > 1'=/. 0193' 0 A'
0 68 2D.2.9 2'19 ' / 08'9 .'/2D'
2.8'80 3'C'0F60 68'/8 2 68#468'F 03'
.6/86 .'0F 03' 492. 498' 9 / 79.#0F603'
"9 7'. / / 93' C' 0 / .3' "0 93'./2 0G9 9' 0'
"0 3/. 3' =.4 0 37 F6 0' 2/2' .8 9' 9'
6621'0F6 '04'968' /.6 2' .'F6/' . & %"
.F69'9 1' 01 /'.6'0F60' 2 / 624/' 0'
0 9' / 10'4./ 68'E' 2.'9 6 D0.' 6 68'
C 4/ 79016 ' /.63' 9 D/' 0F6 . 1./ "'
.066809 3$ .4G62.' /.68 F6'0F6 '9 1'
2016 0 3 80 .'19 08'08 7 923 262.' /.'
.6 01; F6 046 . ;C' 67 / '0F60' 6 68'
.0 / 9' =/ 13'9 .6016 0 0'06198'. 0 B / > -'
19 90'F6 '4 . .6'80 9' 67 491$ C' G .'
.06 '9 1 .6 '0F6 '/829Y 6021' 2' 80 .E K
F6/4' . .9.'0F6 ' /.68'/..6 9 '.68 F69' $$ "'
80 8 9'./2.0668' 1' 1' 0F6 ' 16 F69'
/8293' 98 9021' 2' 8E .''.6 ' 2F6 93'80 .'
2/2 .' 0 63B' 504/9 1 F6 0' F60216 8' 0'
F6 '46 . 3' 2' 80 .'4.6/ 6 16 '102.68'0'=/Q
9'./2 68 16 'C# 9 / 6 16 'E 468' 0F60' 0')% +)&& '
2' 80 9' 4948 10 9 #0 4 /=.'02D6 1/'9 624'
16 ' 2' "0 108'08 O 64898# .'92 8' 2' 0' &"&+' K
16 2'. 00'. ./' 9 ..016'C' 9 / 6 .6 $"1' 1'
. 0.G68 0F6 ' 2892 08'08 1 808'. '
62403 1 89'92 8'0F60' .'9 02 0'4 1'
07 .6

' !#' & ".

T '80 9' 49 F[16 680 621 I / 0 1'
76 03' 20 021$9 1'.2 8 '"1' 862463'
98 .9 268' >9 0 94 2.'0 E' 0 04 .62.'
9292468 '80 9'. 9' 0 68'0 F6/' .9 9'
1 ' 046 1/' 048 ./' ' . ..1'9 G0 01 /2.' S'
F6 '80 '048 ..016 ' 08'0' 688/80 eKK '
'46 .5' "0 / '9 .6016 ' '0' 624/'06198 '=+'
3' 9 6/ 9'046 1/' f 0 0 1/' 'F6 ' 9'80 9'
1 02 923' .68' "0 / .' .. 08'0 9924 3'
01F69' 2'80 9' 9 07.23$ 24' 1.

9 298#

0 6D 2. 8#2/2' 9.63' 01F69' . 9 .3 .0 '
F60 2 B 63 02 .62..3 .08 0 0 0. 68 '
=0 .4 2. 8'". /'9 9'07'046 1/'1.119 11 ' 91 '
& 31/ ' 24 .021' 66 ' 06 110 93 C' 8p'
06.6820 .3 F6 ' /7'8 103. G0 01 /2.= 07'
' 621 ' =94C0F6080 3 /1 8 1031.1 S '
1 93C" 1039 G0 0. /2.3 . 4 / . 1 .10 / '
C'D 06 / '0 3' ' 4./F$' 80D2 3'202 763' / '
1024 3'0 .0 2/2'4 16 01 E' I 084.2 ' /7' .02A'
0 0' "03' . . .62 '7929'. 06 08' > '. 1.681 '
' D0168' 2'80 '4. 8 . 68 ' 70 '46 .98'0'
F60 2'048 11 1' 9 1 3' 0 13 02 763'. 0 3'
C1. . 3" 1 3EF603' /7 6 28 ' / / 68' 19'
26 101. 8 2/2' /19 1' 1! .11' I . 2' :0 1 '
-6' F6/408' 0. 2' /7' 0F6p' 0 C'. 0 1 90\'
O /1' 2. . G/ 8 /' .91'" 24163 '2. .' 8292. 28' 8. '
1?60 SA'D 8F .4' 6 . 20101#C' /6091 08 .00 0F6 '
$- ' +' 0 p' 22010. . ' I01' ! R /2 p' /2 3
, ' 0 /' 1' 0'2 6963' 1. Z0/ . '.1. . / 11/21' C'
-! '.60 / 01 /29. 0< 1/ ." 1/F $4H2.21M' I '
A1' ! 2 8'=0' 046 1p' 19 3' . . . F69' 1 D 4/'C'
G68 4/' / ? .6 .0114/ C 9./'./29 . . 1=.'
2461012 H 2.' / 7 9 '0 1 64 20'C' 6./ '
68'. 29 7'./. 3' 0 9972 9 61' T @1F6/1'
06198' 26 E /21 F3' 9 -'<11 '9/30 F/04/'
!-%^ +#2) ' 4. 249 D2 3 2. 68 '
9 1 8 161 ' 6 .E 0 0892' "1'19 0 0 S'
/@ 3 E 9' F 1= 102 8 './ 016 "' .2R2901'
'ASSO' ':X3'E' 1'. 2 9 '.0 =94=1' 0 ` '
612 10[2 .3 ' /2 91F '"0 ?0 94 ' 1 / 7 '
C'. / / 763'07'# 290'" 1019' 1 1 . 3 . '
& 19 03' 63' 8 263 ' D2. 8'. . 103
:' ` 0 `208 C.0P 3'C ! 8 0C .61 '
101 7K63' .203 ' H 0.' 9/Z=' F2 408' 0. 4 '
F6/ 68' 0F60 ' F6p' 4 S2S ' '?9A40
8 0 102F 0' 0. . @'"1 `1 1V 2 #/ p 11= . '
' 0#F1 40080 'TFp'M` 2 007' D29/'.0 / '
.'19 0' 1'04@19219' '1 9? 101 '91 00F
1. 8 " 10/ 8 2 1' 01/ ` 1 '.0 ` ,09 1$"104 1 '
10'/022 0'F6/4' 01 3' /70R' I0 .8 . 93 = '
.4 892100 1 8 0E 68#F2p 49/' ! 0 40' 6 1E' &
0 98' '/19 11 ' (F6/ '1L 298 0 U' 21

=' I 1/ 8 0'C `016162'906 '.p. .23'=/
' C0 1 0 8019 0 3 70 01 M I0 0 9K
A ' 92 8 0 S S H0 3 126 ? .92A
4923'46 . 0 S PSY4 6.'72 / 423'C'"0 / '
/ 63 "263$.'F6/' 66 A$/M A4 4@9 68??'
4630 19 C' 9.63$"249'"92 0 2F0/ 6 '
.39 .=W216 9 70 01 /293 9/a.21 .1. \11M'
E $ $ 93 0211C"921S3'/9 0 .' 049' ?0 /$4 '
?%/< 9' ./21 0 0 . ` . . 1 7 $469 0\ .61E' 1F69'
8 6 60S\ X<9/S1S61,1 ' ' > .2 FF9"7 '. 9?'
602'1'6 ' 8 6<1F'9E9G' S/1193 "1' 2'=9 1921' 3'
2.'C$, .1@ 9 U?'? H "901 #'3 I ' 06.p '"1

k1 0 / ./3 C 2'M 16' C#' M. .0 6' 06.
=/ '92 8' G03' 1 8 9023'" 03' 130 . 04 01'
C'./2 68' 11 ' T 02F608 'C' "9G92@23' 1 D 3'
6 / ! 01'9 G0 0 / 93 921/ 612' .F0921 '
! G F6 /693)? 91< ' ? < C0 1 GF6 0'
=/ 'GA9' / .02/04 9 1 '/7 F618 /6.2 '
161 2 1 /' 0 / 4/2D "9'1/' 0 7961. 8 01 2 #
1' 122 20 O.91'92 8' 6 68' 91 00 992401'
9 G0 ,1 / .3 3' 10 8 92' / 7013' 221' 22793 ' 1]='
10.4 69' /7 101' 0. 3' 9D /E 6 03' D/ .'
9 9 62161 C 04 0163 01F69 2' / 9 F668'
8 .0 9. /D0 661 8 0D2019 1.@ 0'191 0 8 'C
2' 84' 9D /2 091 3'1S4?3'91. 1'02193
' ! 0 ' F0 SS\?
] ' I 2 /3' .4W1 9 ,9 101F69'=/ I' =940 '928'
q' 8 019 08 41 7 2 1 1920 2F04' 0 . .0 '
0019F6'016' 8 6P6'9 7406.1 11'9 9 10F' 2 ' 4/'
./2110 / I 621' N'?3? E 4S 1"191 00F6 G.0 '
193' 8 8 /' D/ .'49 92 8 /01 ' ! E6 2F$
021 2'1. 1 _/20 :1 8 0 .20 40C' EG07 '
3 F008 =0 ' 4990 1 1 ' =996240 ' 198 . 010 ? ' ?'
219' 2! ' .0'C'9 .6\60 J<196 ' 9 1 0 0 '
4 .0 1 DT .2 01 /' 2G07 107 B T6$ #0 .9 '
9 010'= @7 107 1 3 ' 219 ' 8 0'C' / '02 '
101 1P .E196 012 ' T 2 ! 0 02 014 90 1 D 4 '
8 0 2G07 107 3 q 9 0 07 107 31 0 0 '
" ' D6 08' 9 9 #F0 0' 8 0 / '9 1. 1 3' /2D '
164/ F00#9 10 S/ 0 22 31j 9 . 6 334' 19 0 2'
24 . 8 'F002 ' 0 164/1'F63'9 1'07'E I 1G /
'G07 107 I 04' 91 ` ' C=1 1 08'91 08'
7 1#, \ 92?' 11 D/ "921/3 '19 0'2/ 1 0'
07 10R 0D1Z 4H 63' . . /2 0 93' 2' / '
/ 10' / / 91' / /29 9 ' =94' 9069' ' 9 '
, / '0720.' 4/.9 .0'191 A'G0C 107 3' C'
0707 10 3' 91.1 1 /29' $F 08' 4 9' I4 '
012' 9.9 1 /168' 200 D01 11' 2/0 8 p'
19 1020 Z' ' F-7' 6 .
' ' 'G@ 1 D0@ '<2E3=1. / 10 9103'"921/ 'SA' 'S '
6 / 63' .11F00407 /D 0 G. .04. '
9 1 /29 = '9 D/'. / /2 '. 1.0 03' 9' F6 '
01198 9R '" 0 11 I 69G02 GE 62/ 60'
0 19'2/2'" 0' 49 1'07'0 19 /' .8 G /'
4 S 4 1' ' 2' F6/' 119 p'=9 624 09'4 0891 /'
c / 102/1.2 2 ' = 2D6 0 62110' 2D6 /3'
. /3'9/168F '26896 / 1 /29'C'. /2 '
1 '0 91019' 24 .0/68 ' E' ! 8./2. 0 E' "921 '
6111 F 94 0<2.11/ 9 /21' 1 D/. 1' k '
9 M 8 6=E 1M. . 49219' p F6 2/J1 0 '
163 ' ` . 1S2 '?2Z =67 3 21[3 0' T 9219'
F0 2 / 4 01 13 4 9 = @ ' F6 /'C'
=. 1. ` / 11 1 1/'+/. 30 B AA 6 1. ' 2'
9 4 . E. S< ' -0 . 03 2'M 921.'p 1 6/'
"' [' 1 963' 2'M. . 4919'7 79 2/ ' I 4 1'
I1 63 0 1" 263 8M 9.9G 7. / / " . 263'
1 .1Z "2491111/2M1 S \'1'<$ D9 .3 ". '

=q M:= ='   q !

=. /'!/ 63 2'/..06 16/'4
219'!/8' 29 D9 198' =9 921 929'
.' 6 . ' 9 93 219'!0 408'C=. .921 /'
298'=94G3'46/763'26 ./210 E2O' / Q
19:G..2 . 0= G 0 4 H8.'0 621'9 9F6 '
4.846/4.. 8'"92 /3 .91'"249. 12'102'
168' 9/ 80 .6$ 94F6016/'9 9 E '
. .3'=67 / 0268'N06/2 6' 82'`/'
.08#;.' 6 #0 93 .0 4/= `/ 90 .3N D 4/3E
M 910 93'8 263 .0 4/3 6 1 0 763E M.. '
4.210 .3 8 263 D 4/3`/ 90 763 I ' 0 '
9 06998'7/ .0 ' X6 930 6 D. .#F6 0 O.'
'07624021'0F6 'C'2 6.3'F6 ' / 61 'X .0'
=P -'8 268 801. 08 1021' . 1 9 47 2.'
E "'??S // / .'2/2 / 62.' 22' 0 9 .''
' /1.8 / . # 60 91CX 0.$F6 .7 '
/ '.9 01' :/ 621'"9 4'0 E F6 .62F69 '
8 ' 0 9M /< / 13 02.1.8 . 0'
763#C' 2.9 468' 498 '2.9 468'/ / '
168' 0. 21' E . 4 .4 G68 .1 9 9 '
D 024 2/ 2 6/ ' > 416 ! . 03'1 0 1. .'
267.3 F644' 2 9 9 94016 ' H 2.' /6. '
'. . !' !5 &'.!-%. !)9/"/ '&.)" '
'F6 '267 763. .6 ' 96 62. 4 962'16 '/.''
! 3#& ' /.9 'H621F69'.68'0G 3'H021 76C '
0 E 2D 66 1! 9 .1 61682M' I 9 R `0163
680; 91 E? ?4679 11 0'C. 1. ? /29
X 6.0 1/ 11. .21.3CE72D907962193A' M '
62.6'.68'.02 .6 0 / 1'=/ 116 1GE68'
./ F6043 /./2 8'=9 1921 . 20 68 "249
/4.62. 2 6 763#. '. 0 "1'0 4/ 98'
668' 98 . 92.'0 .2' 2F6 2089813 . '
6 D921' 9 3 98 20 0 . 02 'H 2.'X9/'
0 \'. J F644'"9 . 2 ./ 0 68 020/468'
"9 02.
I '8 163'2/2' .07 1G. . 26.' D29'
0 .'0. 9'9 '0P . /'G98 7 /'19 0 2'
' 2 9 / 98 67.6219 ' 6 . / .8 . .63
D 024'F601P219$".' 6.1 19 . .4 4P' 20'
0D/ 03# / 9 198 8'E S 31. F1108' 2
.'4 8O 0[1f 0/ / 4 6 9 / 9F6. '
D8d 061'0=' 7 0 .1'F608' .8 8 98 '
/2' 191 08'.9 '8 /16d'07' 0F64'. 79'
021.' 2'1! './2.. 096H3 1'4E 1'>98 /'
.016=EF6 0 /. 63'0! 2.6 /29 / 7916'
19 0 9F69 8 /'0F6 /E1 4. .' /2'4.'
2 F694 804/ .191 .06 9. .019 1'1 1 S'
8 /S 3 "1 `102 .' 20 89293$F6 0. .7. '
8 ' .21'G0< 4926319 .1' 2/163#.612' 9'
9 6 3 8 04901 9 .' ..P01 1 63 F60 '
.0. 44 F 44 6.1. '8/ O3 . 3'2./'
2''8 68'8049. 76EC'G68 4 3'1 ..'2 8 48'
99 3
0 9' = ?,!? R;\ !M5!O"
/83'%'8 /16319 A' P 8 F 8 440

d/ 0 1 0'X 2 3'19 0 246 63'F6' 60'1.'
26 1019'. . . P0 .'"9798 921 4'" 8'G0791'
80 89'20/6924 # 0.. 0 34 0'1. 0$F603
9 G0 0. U2 76d ./! . 13 07624023 8 8 /K'
162' !68'.2 8'19 0'2016 0 19 ' $..0 94'0'
F603./21 2.2=E=/ C . 6/ .4D24 F6.'F6 '
763 .01..-/ / 763 2.0 6 . 8 103. G0 . +'
01 /293' 162 "9./ / 68' 0. 9./2. r'
1#F6' .68' 671 3'X 1'".G98 91`E .6 3'0.'
/2D9'.49 211 3'7" .' 6.' 9 '19 '"91 98'
C. 9. .0.6 08. 6 63"0D016 'C'4 96 ' ?
. . 168'F1 923'C'O7. 10198 F608'.02''
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19 '" .4 28 F001 92 'C'4 68 923
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8 0' 2'0. 9'1 02FO 103'9 1' 2. 6 3 9 0'C'
0 9 601 3. 70 01 /2 763' 4F69'2/ 6'4X 6'
.6 C'8. 4 .E F6024/'4 9 01#
(. 31$0S9 2/ E;. 204 763 F6 '8 0 9" D91 '
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9 9 1021 763' >610.'19 '8 /.63 21. /68'
9 '" '4 93'"0S4 08 8 18 . / .3C' /'
2 /"0 ..01.' /./ 68'< 6. ' 6D 1';.'
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9 . 923' =94' /2 1 61 8' 1 .68'. 70 0'
1 /'1 0 0'267.'94' 2' 68 8 0' 0 19 '492 /''
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6 .4S68$.68'X E 163'9/2 12' / 3' 2'
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.924 0 0 1 /' @'9 1'0.'./ 6 101 /'I 0 'A#A$
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9 1ˢ 80D/ˢ=/ 3ˢ 2ˢ267 80 8 9ˢ0#F 07 ˢ
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, D/? .. 8'./2 101'.0 1 763 2'F6016/ ' 0293' 9404 3' ' 9 1' 49' F60 .01 763' 0<163'.0 68F69'9 943'./2./4 /29' 1' ./2./4 / 9' '49 0H6 3' '49' 0!' /2 763' 8 1/ 612' . .' 1/88'.' 8 3' F60 101 763' / 13' ' 4.'G/8.9/89 3' 89' 8 0 763

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98921/ 68'.06 4'. 1 F60 .01.3' ' 8 "9' 621'0 60# ".'.0 / 'C' D63E"9' L %' 0 6 E ! ..103' >)G68 4 103' H0 6 2'/ ' %/' "'Eq 268'D929 01 / 2016 0 3'9 1'9 N.< 163#C'D ' (-+' -'D2629F6 498'.0 / ' D1 3 .68'8019 08' :%' " 2/ 21 H0 /F6 .' N7%+5"' 4. 1 2F8201 / C 2./2./< 1 / =8 .'D929 0' '%. -' 1 /2'046. 016' 61 . 0U7 /' 268 F6/4F69'.2 8 '2 1'"'./ 68 016 ' 6. .' 1. H 2.'F6 ' 61 921' 287'0 0 921'G6' 8 40 49 24.' ..0' !0 /'.2 8'9 19 263'G6' 8/ 98' 219 668F69'.0 / 98' 86' / 03' . . 07 68 1F69'10 4.8#"243'120 ./ 'C' ' .&' ...03'H 2.'/820' 1.' D298' 61 921' ".!'&6'E3 0 ' 61 . 14 / . '# +# ,'"! . &# ')! + /' "' '!. +'&6 :&" '/'!<'&6 & "+')!' /')+ '

#/ + /'%" /!+"' . # 94' 0 89 0' 66=E10"1'09 E0F 0'.. 004' 02 21' ! 8014 ' .'04'90 "1' / 80'=94'C' 660.' 6' 1 . 0' 1/2.8' / 0' D 4 103' 'F6 '.0 / 3' 219 2' 926 08'8/2 1 01' C'9 19 2 " ' / 08' 0. / 9 807962..'06998' 898/ ' 26'G68/ 0. 603'. !/ ! % '960 / 01' H 2.'F6 ' 61 92 102498' 1..0 62. "1'.9 ' 0;. 863E B1BJ;;' 2 D/ .'108.2'8863' 93' 6. 911 ".'8)' 2'8/8' 8)'. 6/' 93'.0O4 / ' 3' 18'2016 'C80 / .3'./ 263' 6.9' 962 ' . 9.02468 01. 08'46 08#

E#%-' J 61 9 0

V & ' 7 3'"9 /'D D262.61'0 88 60F674'.0 / F6' "&N. .,'2016 Q 3'9 1'4 08' 9 0 016 ' 0 01'F602168 . ' / 9 '" F6 4 66 0 62.'=)' &.D 9D0 0' 9' ./ 6 1 /298 ./90X 1'=)'19 8' 2'9216 ' 9.62' 468'F60 408' 01.603 F6 .8/ '" .08'0' 2 008F69'=/ 9' 98' /8/691.' 6 4 6 ' H .'92 8'"9 893' .0 07. '.6 .93'0Z0F69' 4'D9263' 02 8'0 .0 0'9'8019 0' 61 '/ '4 ' .6016 ' '.0 / .'9 D0C 1D/ .. 119' 08'19 8 201 /'=)'./2 1921 0' 07' G08 101.'C' ..1019'1. 81107 103#F6 0' 'b 09 0=16. .0 H00# 621#19 2 2019'.2 8' 0 W# 6811S 11. 8 8 ' 0 668

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016 01 / 2 E123$'. 01 / ' 0 101 ME' / ' SBB/1S' H0#.'91 08'1 9 ! 64 10=E6KZE # 2' ' !%+ & F6 201 / 14 S ' d$. .0 401 / ! / 2 ' ./1 1 /'9 1V 9 9< 1 /' 0' 2016 0 '.0 / 9' 040' 9 / / 13' 0 6 3'F6E9' 60' .6 F69' 8 ./'S 8019 0' 621' T6/4'92 8'./3 / !16891' 9 9 168'9 1C' D92 .68 ' 9'.68'0G892A' 1 8'./ 16'9 1'4 . 161' . .4#6'U)'. 07/ 0 6$' F6 . 9S 1 /. 10201 6/.00 . '".'0' 2' . .'.0630'E0.91 1'07'0 3".'0'70 2. 3 102F60' 07'9 19 2 3'048 2 .6 E3'./4 F2.8' 66021 ' 7631 '21. OD9' 9 '/ / 10' 0 60 G6'8 468' U)' ..68EF6Z' ,./'8019 0'8 1'4 .62 6 ' F6/4' 29' 0 60 "1' 8019 0'N 23'././4 / ' 2 3' 2'0 39 1' / Z!'8)'. .2. '8610. / '".' .68'. 763 6 0' 023 ". . 8 ' 2' 02D6 2.8' 7 .'E2'.0 2.2 .0 /'.2 20'9 92 08' 07..'4 ' 6. 080 02.S20 3'8801 / 9.6246F60' 10198' 9'F602. .0198' "1' 2' 64 763'. 6' 4 3 468 8016 9 .62.$.0 763E' 468'./ ' F66216 $86 1/ F6/4'4 . .6 ' E@S 468' 4. 9 7 1'1679 .6O3' ?6 6 0. 3'0' . 8 3 2' .803' / 49 F6.'./0. 913'T89' .2 8'./F66216 . 0 / 0'H621'C'.0 4 / 0' 2./2./4 /'9 1' 8 9 94 /' 2' / / 13' 0 63'0'.0 / 3 .26 0 6.' D 4 .0 .A

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160 /' 9 1' ./4 /' 24668'#FS0E' 3 '1629 9 940'9 1'.68' 98 20' 3' 2' .600 10' 621' 8 9D.2. 09'> . 16 '80' 1601 /'4.'0 3'86 . 3 "1'49 16Z. .6 3 1'6 ' 10 948.10 G/ .9' I1'G...' 80.6 01 /' 9 1' ./0198 '76 18 3'./2./4 /'0'201 6/'.0 /Q .'M /2 16 '8016 01 /2 '. 64 03 2./2' ./4 / 646680' 926 0' .0 / 3G68/ 9' 49 2 9'0.'" 299 .'2.F6968 3 > . .6'. 6' 4 103'91 08'49.01G0 3 C. . .898 3'F6 ' .0 / '209863'2/'" 2. .'29.'./F6 1'C'49'19 Q 0'H 20'C' 049 .68' / 81'.0 / .' 9' 868 '2/2' 619216 '10892' 94802902.' 2019 010' 6 68768 46 9' .' 29'0 4/' 8016 . . '! 64/8 6..63'1926 3' D 463' 01 /. 1249 2 1' 2' 6' 8/ 9'. 1913'./2./4 / '07' 68 4/'.0 / .' =)'9 .0 / '> 19 61'. 0'0' 3'F6/4'G .'0' .0 / .' ../' 021'G68 46'9 . 63' 0 .21.' 0'0'.0 / 9'G68 4/'9 19 2/ 'G68 468' 2' 1. 63'1 0G91. 'H 2.'. 0 .. / 0'0 3'H 2.' / 9' / 0'G68 40 2/2' ..0 2/24.2 0' / 621'. 0 ' 023 9 .6 '1089'. 01 /'04' 06 68 D268$0.'"9 /'. 0 '4 . 16 .68' . .68 1021.' D29' 0 / 3' 9. 9'86101 N 23' . 01 /239 0. / / 71 / E;. 2. #. 0216' G0 80.0 2/2'/968 6 8 F6 0'2/2' 1' . 0 63 8 213D 06 63 80 63 67. 63 9'

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P.68 ' 0 E01. 0 3' 63'19 'F608' 0F6#I' G07921#F6 0' D29'./2. 9 .62.' 2/2' 2. 0 02.6 '".'F6J' 63'G07921'0F699' 99'92 8' D29' 0216 8' 10216 ' 0'./2' MZ=' @ . 9 .62 ' M 9 '2016 0'087 D60' /2'92 8' K D/ 9 2...0 / 9./2. 9 . I $F6 009 .<.0 19.' H 2.0F6 6 9 2010.' ! 0O9 9 1'10 092' C' D/ 9' 09 903' . 63' 0 193' 1. 0 021.' 2' 0F608' E C'.0 / 9' / /' 80 .. .921. 162.' 92 8' 09' 1' $ F60' F690' C' 1.2 ! 0 0 '8 ' 1 /29' ' ! /0D6 0G12 ' " . 8' C' F602[1 ? ' 0D 3' 0F690'. 02.6 ' 2.10 0216 '"1'86' 168 'N D6=-MD 1'4. ..01' 2. 0 0.' T8/' D019 /2 2. 0 02.6 ' 94' ./2- . .22.B' .60 / 021 0F84. 071D2.' 90' 621' 80D 3' 0F6.0 1'" 268 " 20 0-.16 0 O 068 .' 8%(' 68' T6S' "9 7' D29' 200 0216 '2/2'960' / 02@0A' "9 99 90' 1 21' "189 #". ' 0 1 8' 09190 0 . 8' 0FF90 '".'/ 96 2' " A."9 7' ' 02D. 30F6.0C'19 90' .46 0D 31. 90' .' 768 / 93"249 0 C' 2 . 6 8' 09.2 8' 9 /' ./2 1010F694 'C'.0 9/' 6E?0.9 I 'F69 2' .1 08' 2D9 1/'./0D6 /' 49 021' '" 3 ' 94 .'./0D6 0193 ' =0 D6 3' " /' D/ 9' ..0163'.D2. 9 . 1' 1. 8 F69' 960 / 0219'.0' 4/ '"209'19 963' 4 416 $F6' '2/2' 01 2' S/2. . .01 ".'.9 6 8 '0F696=' 4 ',.'"0 49' D 463'29/69 7 03' G07923 96 0' 7 E.'19 ' 6)/D' 29' C' 67 10 3'.06 'd.42..8 / ' .+ %K 7 463' 02D6 3./0. 9 .6#' F6 0' 9 / 63 .6 / 113?0F6963 2./<* C' . ../A' 68' 0 0' / 6 O0 1'21 08 0'2/ '"1' 0' @ 6@@ 8/ .07 0'"1' ! / 28 - ! "+" 36-!)& ' 9X.0C 9 90' 621' D20A' 0 !)'2/2' F60216 '29.' 7/ 9 .62.$' 94' " 8.6 C0F6S 6 9 201021 I 9 '97.' AA' 268'2 D 0 F60' 6319 E9' F60 09 3G079 (K /2' / 6 1' 0F60' 019 9'19 968' 29. D2 3' ! ' +G! ! .K

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T6.0ʻ 621ʻ D 40E2 ʻ0 9 /ʻ.0 / .0 ʻ
940 2 ! E 1 668ʻ 9 90"1 6ʻ
868.0 40ʻ"1.0
ʻ&) . !. >ʻ D2 1 /298?/8 2 0ʻ.2 8ʻ
D2 .0ʻ 69 D298ʻ. 9 .0E .0 40ʻ . 202.21#ʻ
0 /F6 ʻ19 90ʻ"1ʻCʻ0F6.0ʻ . .6`468ʻ 1 ʻ
D 40 621ʻ =.4ʻ0. . 4 9ʻ 0ʻ/ . .6 0 ʻ0 92/ʻ
.0 / 9ʻ 10ʻ 61 9 19 . ʻ"1ʻ 02.02 80 .6 0ʻ
9 0F690ʻ 94/ 98ʻG07.21 ". 01 66[2ʻ; .ʻ.S . ʻ "Sʻ
4ED. 92. .8 ʻF6/ ./2 1621ʻʻ".E0 .268 "1ʻ
61 40ʻ H H. 02D6▯3 . 8 . 2 E C 0 0 4 D . ʻ
263ʻF 0848 608ʻ 9 6021ʻ 0.6 08 ʻ.0 40ʻ
62.#468ʻ9/268 O216 ʻ D 40#F6 0ʻ . ʻ ʻ
802.1ʻ ./ 68ʻ 8 019 0ʻ19 0 ; ʻ0F60ʻ 9ʻ .ʻ
D 4 ʻ H 2.ʻ 02D6 3ʻCʻ 98 92 ʻ07ʻ0 3ʻ.0Q
40ʻ4 .6216 ʻ20.6 08ʻ 9 . 924763ʻ# 07ʻ
0 3ʻ D 40 ./2. . . /292 ʻCʻ8 01. 08ʻ 9ʻ
4 02. 763 =.4 93E.0E4 "1ʻ49 2 .0ʻ. 1 H 2.ʻ /9ʻ
0F690 ED 40 F674ʻ0F60ʻ D2 ʻ/8 2 2/ʻ 4 peA? "ʻ
69 916 # ʻ9 .0ʻ06198 ʻ". 09 -0ʻ.0 4 MZAʻ&_ _ʻ
.". 7". 4 .8ʻ 219 468ʻ D 4 868ʻ
7 .0 4 868. 1. 2/ʻ.0 / 9 08ʻ / 4 ʻ
868ʻ./ 63ʻ "1ʻ8 0 2 .ʻ D 4/2ʻ . ʻ
6/ 69.6 ʻ.0 / .$ʻ 10ʻ ʻ D2.ʻ 2.0249 .0. ʻ
.0 0 868ʻ9604S# " . .F6.ʻ"9G. 8 .2. . ʻ
= .ʻ0F60 9 . 69 .9 38 0D 3"1 1 .E6 ʻ 6ʻ
8 9E3$ʻ 8)ʻ D2 163ʻ 0 3ʻ 8 0 ʻ ʻF608ʻ0F60
501 /ʻ9 1ʻ ʻF6 0ʻ / 14 / 0ʻ ./ / 0ʻ
8)ʻ D/ 3ʻ 8 . /298ʻ 0 1 87ʻ 048 1ʻ +. &.4ʻ
16 2#ʻ=)ʻ 8 9 08ʻF20 10. .8ʻ / 1 .ʻ
2.21

> M ! 5 I ' : I $B6 ' " < ' < B + ' '

! ' %+ &) .%.

8 0 0' ./2 1021'9 9892 3' '9 ' 8 0 '
\ 763 "1'9 '8019 0 '/8 2 0'20.6 E.'/ 9 0'
3 1061989 . .21 0E 01 /29 ' 49 1 / 80'
), . 'F6 '9 1' 01 /'9 .21 0#'T60# / 19 / 0/ 4 '
E 0 R 29D.29 02/2 =E! 036.2/7 32/1 / 0'= ./ '
D020' 0 19 . 69' 4 8 0 93'./D2/ 96218A'
120D 3 F608' 8 0 .3E 610.0 61E- 08. 3'
F6 0' F6/4' 0..94P' / 63' 04' 22.8' '
/ 808 49 2/16 3'F608F6/40480 1. '
-'.%@ 08 7'92 8'86 168 8019 0#'7 088'
7 80#J2 "9'./2 10.' 7'06.98' / 2 '
"? / 8 263' 8 263'9 1'./D2 1 /2 3' =621'92 8'
8019 0C / 80".46/. 1980 F60 9'".'
8019 0"7 F6.'90498 2 G 14.. 0 0.4 1 '
8 2 3# .' / 80' 9'F608'/28 0' 62.'49 '
2 0'/8293' 968'0 9 .2. 03' 24 .07.
"9 7'8 94 0' 621 2.9' / 80 2' [)' 8 '
19 0 0'90'".' / / 0'. 621'"1 7.1$.'C'
/ .@ 9'2/1 / 0"9 D2/1 / 0'9 21' 249'.68' 1'
V 80.. 0# 81' / / 0 D2/1 / 0'91 0'
#% + ' f 68' 4 860 763' C' / D02 43 F00 /1'
. 6' 62.' / 2F6 / 0'C'F6/ 68' D 01 0'
0 62 ' =94' C' 90' 2/1 / 0' 62. 'F6/ 68'
04 /293' C' / C. 0' 80D 3 621' 49 2G0' I0'
92 8'"9 9' 2.'F6 '/ 9 0' 1 0' 0.9 .' / '
62 2/F69'.%"+)) !": '" /.1 63'"9 9'
9 1 T'" 4..$"1'./21 0 F6 2/2' / 62 08'
/ B? ' 8/ .663C 0 4963/.6 63' 2/2' 9E# /.6 63'
&'2 F6 2/.9$F6 0'0J7 /2. 1' 0089 9 .9 .'
" ."&' EE9F6 1' 1F6 04 /2-=C/ Z. 0' / 1. / '
S?SL' 4 8 0 68'"1/.6 '8083
80D 3' 62.' F2 8' ' / 8' 610' 1'A
8 0 68'"1'.0 2 3 .61 3 / 1 3'#497/ 68'0, '
76.'80D 3F1 08' D2 30 1'0F6 '".' 2' 8 '
1 3' 21#9 D/' / 19 / 0'2/1 / 0' 4' ' 6)'
0210 68 0 93 8..0b 0' 202 80 0E0D9 '
4 '06.' 01 924 'F60408' 0.6 10..' 4 10'
B3 /V 6 'T!3
01 /2.3' 4. 1J/18 S'. 19 "1 0 .3'2/ 62.'
9 049' ! /D2 . #F6 0' 801. p' 6 Z'80D 3'04'
4 4 ' 0 68F6. 18 0 .0 .'F60 1 9 6 '
. /' 7 .6 010A' > 19 621'9 D/' 1 6 0 0'
D! .' D/ 9'./ 68F6.'8 /. /2 763'./2'
91 /29' F 01 /29'46 1 0'8/ .9 6 0'
. / 1. 3' 1F6.'".'. '06 /'". '0 D92./ F6 9'
D/ .'06 .0 / 9' 162.'./2 102110F608'. '
8019 0'9 0' G 0 0'0 0F6.'0 19' 1 4#0'E2. '
F69'"9 /'04'G/ 68'. .21 08 '0"68 0# ".'
6 . 68' # 94' 9F6 16' .9 .0'01 3' 169'
$? T 800 1<. 0 3. 0"9' G 0 0## 1/9# 1'
'"1'9 '8019 0' 1 81'4 !'
,. 9!' E8 3 93 F60C108.288 0' 06.0 0'F6 '
408'.06C' 02 808 219 1 D/ 07 10 0'
< 0 4'9 1'0' / 80' 6 9'2016 0 '"1'9 1 /

80D2 3' 4 1 02 \'D929 019' 9 41'%.'
./8 '91' H0.19263' . D/497/12. I /89 3'
. 101"14902/8 . I /8 . 3'4 .0863 16.'4 '
18 0 763' 0.'492 F69' 49' 3F6 G 3./2'
1021 "149G/8 29' 0210'0 F69 4D9'
'263 H I .Z079.6 7'F60 1/' 919/ / 68

@ ' ' &'.%" +'! ' -&6!" . .

H 29' 1788'. 94 1' 6 1 263' 0 1 '
/ 01' 0 291 04D921939 9' 1/1. '
3'2/2'9 1'10892' #"1'49. 0 09'4/4 20# 0'
01 / ' 1 ' 0 103'4 1 4F69' 79 0 / '=.'
:/=. . 3' / 763' / 01/ F69'. 208 . 6 3'
0 12' 6 1 0.0' : "G91 98CH 1/ .68'
/4923 /12E3 F608' :G / / 768' I 1'10Q
892'4 /4 6' 2 D2'C'./ /30' 9263'.0'
F292/2 G 1.0.0868' 94'C' 79/ /D '
.0' 9 .98/8 2 2/'4 6 0'.0 1 71 3' T6 '
99 ' / 0' 9 9' 94 /29C'8 .F /. '04G 7 .0'
011921 /2.' / 2' 1 19 02' 2 9 D $4 D 0'
10 8 90 621'<"1'"2 63' 1/1. 3'.6 63'2/Q
8 29'4 .08 9 6216 .06 0\F6 ' 6880. 8'
0 1. 8 0.'"97 1' 9'7 96 0 0 0' 9 1 2D016
: F612'.0 61' 01 /'9 1'04' 8 9 01/ '
98' 9 .02 T8 :7 1. '4 D2 10198'./8'
89240 2'..968'" F6.$ 2'F6/4'.68'7/ '
8 2 H/2 ..01' 9.62468'./ 63' 0 99249'
9 ".'/ 18'49892.93' /0499'C'D D02193'./ '
201' 621#02 863'.0892 " J46.98'20463'
=Z9 9 1 8' .' 9' 1 4 9'9 ./ 0.' C' .46 0'
./2198 P. /29 164 /F69'2/2' 8 /4/'0 '
68 ' 94' 8624 18'"2 69 68'./2 9F608
!F Z'./D211 / '"1'=#80 80 68'F60 68'
.68F69' 9 6 11' 8 9 01/ 98' 80 89' 4.'
!.0!E / F69' / 1 801.3 2D.26/3 79 0 .3
!0 61' 9.62468' 8624' / 9 1' 4. 2 E #
1E/2.3'4603 : 80'91 jS SS' 4' ' '6& K+<'
SS' ' ;' ' ,
" 6246 9 1'./8 0D.39./9 / 9 0F69'./ '
0D8 010 F6920 6 3'F6 ' 219' 0'./2'
29216 '=9.6240' 62463'9 1' +C.
' :1 314/
* "'/ 4/'C'4 D9 1 /' 9 68'/8 2 68'0'>9/'
C .1' >968'./2 9 60.0"' 94 68' 8624'
9 1'19 0' 88/ 0' ' 8019 ' =9' 8 . '02 80'
68 ':0`' 6880'.0468 '>9' .4.3' ' 9 '
76304/ 20.0' 9 916/' 8 /7 3' X G .0'
.6 63'46/' / $0 2 .03 0210 " 1 .63$F6 ' 2'
192 D628 '102F608' 293' 2. '4 89292'
1 3' F6 0 34 . .6' ' 1. S"2 .4P 8' ..023'
= 49 0"9 1 0 02. 'F6 '.68' 1 80898/'
8/ .2.6 %.'.68498'198 9' 219' 1' 68'
9 602.' 2' G/8 8' 894 /' 9 1' _/4 0.63

' ' 46/4. . 8' 0 93' 4 6 63' 9'
1 / . /3' 1 02 6. 63# "9' . 0. .0' F6 . 0 '
.68' 3'.9 9 10 I .'2/2' 8 /69216 2. . .08 '
4912' 98 9' 219 ' .' / . /2. 8' 9 6021$'
621F .' 9 1. 8 0 0'1/1 498' . .9 3< 1G. '
' 6.' .0 /' . /2 2 3' 9 1' 2016 0' 01 7 O3' C'
9 . 8 9210 3' D290 ' 0. 90 2F60 62. 8 9 '
1. / 0' D2.0 0F690 "921

!0 6.' .9 1 68' 8 8' 19 0.' C' 80 3' 9 '
/2 1' F609' 46/' 621' 8 624 ' 2 9 20' "2 69 '
103' = . "9 /4 / .639 18 62463' "18 '
2/ 9D /080 / 9./9 .90.6 ' 2 6 09' 0 p'
80 . 93' ;# 898/ 07 .3' "1' = . 0' =0 4 2 0
937/3#0 !' 8 2/ .3' " ! . 0493 02086'
10#M. .0263 F6' 9' . / 68 203' H9 .6 E3' 9 '
168 " .' -04 .0268 9' 0 + "' &'<, PR !- ! '02?'
D6 1 3' 06. 763' 1 02 923' . 901' 80 9' 219 '
263' 9 .91' 94 19 02.68' H 2.' =0 4/ '
2' -0 .68' H04 01 .68' = .6 68' ! 9'
1 .68 C#.

!0 61' F60 168' 4 1 2D6 1' 9 G0 0 /293'
69G0 .63 2' . . /3' F6' 0' 1920E=$' G68 '
4/3' F6' 07' 0F60' 0 . .2462.' T6' 46/' G0'
163' .0" 0E' 621' 8 919/ .0 68' 20 9 /'
26 2 10 8 0F690 68 C G68 40 68' F608'
. .0 68 C D290 68' >9' F6 763 4 68'
9 1' 7 3' .19/ / 68 =94' 4/4 20' 4.' "92'
1/ ' F6. 8 G6 63/ 92306. 1/ 4. 2 .09 .8'
86 .68 6J1602198 C' . /04168' 9 6D201'
&' $' 1/19 ' .' ". ' G 2.' . /2 19.' 7 68' G62.'
'E' &' 'E/29 .' 1/19 3# .91' 0 /F6 ' 86 1 3 (
+' 4/492208' : . 019. .08' 94/ 901

!0 61' F6 2.68' 4/. .1' 8 66468' .' . /2 '
1 0 3' 1.' . /2 10 . ' "1' 9' .0'0 99' 4 / 110' C'
. /2198 . 010 9 6916 0. . 46 .1E' 1 /2' 9'
.63' 0 F69' . 6 103' . /21 0 3' D.21 763' 4 6. '
1 F69' G/8 26 2' / 4 2 763' 101 763' 8 / '
76 F69' . /2 1023' 2. / 68 3' . 969 01#C'
1 16 0. / / 68' "0 9101.' 924.1$' C' 6'
E.0' " / .68' . /2. / 4' 4 . . 08 0' . /2 1 .'
. /2. 2168F .' 944 1' 048 07 98' T6/4'
D 6 2/2' 4 / 60 6' 8 62463 976 04. /'
7 ' 0469 02. 763' . /2 1023# .06 0' 9 1' '5#'
) `')-&.&" + .).)+ ' UA. /2
92 63' . /21 0 / 68 H6 63' "9149729/ 4 09'
.06 0' 9 1' . = && %! - !/' H07. 8' 92 8'
D 06 0 9 0' .0 40 K D40 Z '1? S@' .'
:! 3' 4' 9 1' 09F6 7 68

! 8' !0 61' 9 168' .06 08' 498 /2 1 01' 9 68'
/8 2 68' . /2 9 601 .98 298 .' >968 F6'
/8 2 68 9 68 064 / ' 9 1' C' / 9 ' H 49'
.2 2' 4 9 9' "91. .3' / 8 2 0' 920. 9> . / '
68' =94' "1' / 8 2 0' 4 6 209' " 16. ' F603' 6 2 '
F608' 01 D016 67 0.921 ' 90 8 F69' 921 621$'
9' 80 89' . / 63' 64' 6 98 68' F6/4

63>9 94.3' 9 1' 9 6 4.8' 0.' 261292
9 9 6 ' I / .2 8 / 4 2.192916 ' 8 62463'
"1' F63' . / / 0' >9/ ' . 6 "9' 4/8 . /' 621'
" . 2 / 0' .4' 21' 9 94 / 0$' C' F6%9' 98 / '
1 / 0$.4' . . 08' 8 . 94 / 0' T 0 9' " 9. '
6 2' 68 86 0' 9 1' C' . 94 868' . / / '
68' ' 9' 19 0' 19 920F69' / 8 2 0' 2 80' 621'
C 8 . .< 1 / 0$' 04' F6E9.08 .2' .91' . /AA'
1 80' >9' " .63' . 692 0.' 0.' . /9' 2 6 6'
1 023 840.6 ' 9F69' .2 2' 49. .1' >968'
3 7]' ? . ' 68' 9' 9' 93' .9 9203'
048 2 1 0 9' "1' 299' 5 9D98 ' " 93' / 9 03'
/7 .$ 94' .68 90' 80 9 1019' 39 49 9 ". 9'
9 94 808' /7 923' 04 /29 0' F6 ' 9 1'
68 8' . / ' 0 9160 8 . ' F607 3' =)'
0 4 808 /1 / ' 9 G02.' " 08' 93' / '
8 293' 26O/' 29D/1 /' D6' 7. 2. .' =)' 07 / 601' 0'
68 8 304 80 9 8 94 /3' D 0463' 8 07 '
19' 9229024/ ' H 2.' 8 624' / 20.63' C' D 0 '
1 0 C' F60 ' .G/ 63' 6 .63' .6 63 8 0D . '
. / 2 63' 0. .92. / > .639 1' T6/4'
' >9' " 8 . 193' # + ! ' 2/8 .2' . ' 1 ' P",-'
7693] ' 6 .G 164 2.8' ,$7]"54 "# 1' " '
10 2' # ' " 16998' 0.' /196. 08' " K ' ' 'A
T6 F602F608' 9' 1' 1' C' (
204 94107 3' ' 2' / 9 763' 10 8 .2' " 4. '
0. 9' /19 1' T6/4' 9 D/' 9 1' 2' 206' D679 '
201/ 2' .6 6' 0D 101/ 2' . / /' 9921/ '
9 ' 2' . 6 101.' 2' 9 . . 16' G/ .' 2' 8 62
4/' >96C9 1$' 2 ' F6/4' /3' 07/ ' C' .6 ' 0'
1 D021' 6 .' "9 4' 04' 2616 8' /7.4 02.A 6. .9'
402 F69' / 8 2 0' 29' " 0' 2 8 10. .' 06.A'
8 / . 1 =

!0 61' 9 1 868' >9' 816 08' "2024' 0 '
9 1 2/8 20 6 0' >968' 92 8' " / .021' @
F6 0' 9' .68' " 6 8 63' > . .6 E '
C' 0 1 1/2023 6 D6 01/ 1G9 63 6 8 20 BA"' @@
19 ' 66 63E' 6D / .923' " 7 68' .6 1/3'
. 60. / G/ 10 3 . .9 . 1 3' 19 9263' C.'
9.9 10=E5 168 989 3' 4 0 1 0' H69'
9 1 2921' F6 ' 4.' :0 . 3' 4 .6216 ' M8 0'
92 8' G . F6 1' : 01/ . 3 621#.68' >.63'
2. S8 8 94 68 2.8 F69' 192909' 9Q
16 2' / 8 2 68$' 94 6.' 2.0' 2.94923'
.62468' 2016 08' 0D0 A' . / 8 198' C' 04 9'
1 .98' G07923' > .92' 6 1 1 ' 4.8 ' 3 !'
F6 ' 4 1 2 ' 9D 3' " 7 0. ' " 1 ' 9 1' 0.' " 2 '
49 ' $ .6 63' 49/' 6 H. ' 4 3' 0 1 .9 3'
=)' .6 1/ ' /7 9 6021 8 63' 9 .' 49791'
.1 08' 0' 2. / ' F6 F6 3' 6.6'
63' 9 1' 0 ' .' 7908 3
H .' 9 7 /4.'
624/

2 ' (' ' ' ' '

= . . ! ' - * + . . ' = 3 ' '

& " . %

9 G# ' # ' & ' ' '

F 9 $ ') ' ') ' L /

' ' , ' $ ') ' # '

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U 1 $ 1 + 1 V ? 1 3 ' B ? 1 G 1 5 ? Q Q ? C 1 '

+ ') 1 C "

93 6/1'7 71 4.00 80 12 E@ 2@ 4 / '

? ' 1E 1/ . 93 21921 03"2. 11 2E4. 1016 '

0'0 80# '90 FF9' 9 9OP ' 9.604/'0D 1'9 '

V ' V ' ? ' + ' 1 ? 5 1 + Q] ; ' 1 + 1 1 U Q C '

"V $ 5 'N ? $1 $1 ' ' E V + 1 5 ' ' C '

F6 3 11 111121' 04' % N 1 5 + 5 3 ' C 5 ?) '

3F6 1'04' ? E ? + 5 '000 8p' ' .2 7M3'

! 1. / 3' ? ' U C G 1 U ; '

29219 2. 0 . ` . 16 1 .0 / 111C 49. A '

190 60101 3' (K

86P 3'0 3' ' C' 0 19 .0' . '9 1' . O 1H '

60 . .91' 3'02 80# 'b6 '

0.9 3 ' C' 04 63'4 2 2 10 ' 3 9 :' 21@ '

E20S' 9 1' 2619. 0240' ' 80 80' .6 11' 04' M '

2@. 1 / 9 01' "91 101920 4'9 1'04' . ! @ 03'] '

F203X 1 9 C' /1 8 6 20 ' : G 1.08 ' 1= `' ^S A '

1'0 100' @9 612' / 8 0 9' 04 80 6 1'

F1 A' 21 3' /21' G\ < ' > .91146 8 ' Z W ' 49'

9 63' 20164'= 9 9@0# 1C2F/9' 3' 1 1

W. . 46 11' ' 2/ 61"1' FS0 4011 9 ' / 1 . ' . /2 '

6. 19 49210 "1' H..O 9 19'E @9408'02 I'

8 0 91' 0 8 "1 10 9 ' .44 1 . 3. 1 0. . ' '

4 F6 0/ ' I 1.2 8 49 2 924 ' E / ! 69.0'

"20 1' 10. 8 6 9 14 .0 0 9F69 0. 4#

9 1'0 D20 9D9263021/ R =#02'< /1921 '

02'04103 02 9 3 '291 9'E02'"20 '419/@ '

8 /2 99 63 01 / ' "1'021120 = 0`' P D 40 / '

12D6 0# "19 ' 2 ' G/12 07 'J\. '<' > . 41 1'

9 98 ' D10 0 C 2 10 12192 0@. /2 1 "

) ' ' ' 1' 9'

' ' # 4 ' ! '

4$ ($ " $ # '

; ' ' L & ' '

; , & 4 '

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) L ## L '-

6 ' ' # ' " $

4 4 ' ! '

A # L L) ' ' '

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= ' ' ' $

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' 1# 4 $, ' & ' # ' 5 >

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' [<' # $' E ' + 3 $, $' 7<:< G

, ' ' # ' ' # ' A ' ' , 3RGR 'Z '

' 7 ' $# ' '

' # ' > ' 9 ' '

' &')

9 $ 9 < # : ') ;) # ' : ' ! ') ' ' ' ' # ' /

BB9 9 # ' &# ') ! ") '

' ' ' # ^' 1 ' ' # ' F 2 OP $# GM'

1921 011@11' 9 /002W 9A8 8 4. ?1 W12 qE 9 ?

' m' @ ?8@@S ' . S ' R ' ? S4 'BS$ H9 k M=

((1 # $ L $ <0 A _) . & " ! . %

W 9 : ' ' ' .0' ' , ' & 9 ' (%/ ' ; - + &! ' ! ' = 9) ' !

_') ' < & O $' ') ' ; ' 1108 0/ . 101 > 0P0E. 113' 9110 8 ' 49 2 . '

" L ' ' ; $ i ' 9 / 8 293' .01 03' 94' 19F690 13' 9 ' /1 '

9 1 "# ' é< ') ' ' ' 808 . ` /1 / .111 ' M9' . 0107 7 = 01 /H9'

N ^ 4 $ &818 $) ' ' '0D 1' 8 01G9 8 01 .63 '07 1 0794/ 8 919'

A (9 ' E ' V' & (' 120D 164 2.3' C' 26 8 91/30' 8 0 . 0$' 4. 9

'8ˢ =q M : = =

E0 1 3ˢ061. 8ˢ . 30ˢ G / /ˢiEG .63ˢ 4ˢ9 1ˢ89ˢ
10 G\ˢ 963ˢF6 49ˢ>9/ˢ< . 2. . D92 34 9ˢ
/0 Kˢ 20. .20 .0 9ˢ 9 0 01 3ˢ =6 6 D 0 0ˢ
O(ˢ N) %/! " . 6Tˢ 0.6 0ˢ 8019 0ˢ00
,'ˢ . 0 07 93 2.F69ˢ 0ˢU.ˢ8 / 83ˢ 1 9ˢ
06.ˢ / 62.ˢ . 0 0 "1ˢ 2.0ˢ .!ˢ(6 ˢ
8019 0ˢ21. Dˢ =8 8 .#
2/2ˢ / 62

! ˢ))%" %.

5 / /29240ˢ"919 68ˢ 0. 104.ˢ02 8ˢ
ˢ 20.6 0ˢ"1ˢF6 ˢ 949ˢ4 U10ˢ6 . 0. . 0ˢ
16 EF6 ˢ80 . . E. 02.6 ˢM 8 2939 D/02ˢ
0 8 8 / .6E". 92 649 2 9 2ˢT 6602ˢ
80.6 2ˢ07ˢ 202 801/ˢG 3ˢ 40/763ˢ 4 9.ˢ
H 2.ˢ>98 /. 163ˢ D298ˢ. .ˢ02 808ˢ 610ˢ
ˢK b$V6 . . /1624 301/8 3ˢ8 / 6 0 1 8 3 :ˢ
$ S @@1G0D/ . " 0 .98ˢ0. /2 / 68ˢ8 /. .98
20 0D/ 03 2. 6 8 8 /163ˢ I G F6ˢ
), +"ˢ 498ˢ02 80.ˢ8 / .68ˢ 9 . . .ˢ T 8ˢ"9 7ˢ
, % %ˢ . /D2 1 /2980.ˢ .2 6 8 /7 9 6082. ˢ
. 0 9 68ˢ02 00 0ˢ.< 9ˢ4 . 62. 01F6.".ˢ
4.ˢ 2. =E I .ˢ49ˢ02 80 9 .ˢ.92 69 6 2.ˢ
ˢI 8 .4/. 93C : 01/02 808. ˢ. 98 .2ˢ
1 3ˢ. /2 10 .ˢ4 / .69162.ˢ>)02 808ˢ
E2.2. / 68ˢF6/46 3#ˢ#6 008 80. /D2/ 4.#ˢ
/ ."9ˢ+ˢ E8 9061. 8ˢ 8 . /D2/G# .6 D2 3ˢ D29ˢ
19 019 0ˢ / 6 14ˢ: 01/ˢ9ˢ2689 3ˢ02ˢ
808 /8 /2 F6/3 916 2ˢ / 8039 9 6ˢ
106 .ˢ E"1 /F6.ˢ .2 62 8 68 C 8 /16ˢ
.08ˢ4.H2 9 621 26 0. 8 8ˢ.08ˢ4 9ˢ0 9 92ˢ
193ˢ 9 / 68ˢ8 / .2.98 =94ˢ>) 294 / 968ˢ
F6 4ˢ9 b908498ˢ9 9ˢ4Z.68.ˢ ! .4$4 1ˢ
G0 93ˢ4 98 /1 668 F6 4ˢ 49/.2 8ˢRˢ
E/ ˢ80D2.19 2ˢ. 9ˢ02 80168ˢF6/4 ME @ˢ
> /D9293ˢ 09 . 8ˢH9 0. 163 . Aˢ
G0 01E/298ˢ192698 2. / / .08ˢ 9 9ˢ
167ˢ: 6921. 0ˢ .8 /2ˢ 67 10 02ˢ8ˢ
8 / 10 98 !ˢ0 1 62ˢH /2 0F608ˢG69ˢ
9892ˢ! 403E 02D6 292 "7 7 19 0469ˢ
193ˢ02 808ˢ0ˢ698 09ˢ4 408ˢ9 9ˢ19 08ˢ
0 198 9/ 8ˢ070H 3ˢ9 . 898 3 F6 01. 0ˢ
8 8 /7 39 1ˢM26 93ˢ9 D/ˢ02 808ˢ8 /.ˢ
92 6 C# 2. / / . /ˢ49 2 621#ˢ 9ˢ 1 . /ˢ
/ 968ˢ"9 7ˢ 214OD6E6ˢ. / 63ˢ. . E 69ˢ
7. 9ˢ

!#ˢ& %.

2 80ˢ2/2ˢ8 /69.ˢ9 08ˢ".ˢ4 1ˢ>.ˢ
/. 1 3ˢ T 6 0ˢ2 G ˢ9 68ˢ8 /691$ˢ
P5%ˢ +ˢFE .F6 4ˢ98 8ˢ8 /6.16 070 /ˢ8 /0.16ˢ
=9.6247"9ˢ 9.ˢ9ˢ8 /6. 916 $ˢ"9ˢ 9ˢ4 64#ˢ
2/ˢ 9ˢ9#9 9.ˢ92 8ˢ 9ˢ9ˢ2ˢ / . / ˢ86.0 9.ˢ
/.68 !ˢ. / / 0$ / 9 F69ˢ 0ˢ. / / 0ˢ
. 8F6. .EC1ˢ04ˢ90 .4 .Eˢ .F$ˢ8 / .60ˢ. / Q
/ 0ˢ 9 6 D9 922ˢ ! 6 8 .2 8ˢ. /2 191ˢ02ˢ
808 8 /69 9ˢ. / 63 . /2 92.02968ˢ" 49

q ! ,ˢ

9.6 ˢ. /ˢ 08ˢ8 / .6ˢ. 9 F 4. / 63 F6/4ˢ
1 /2.ˢ 8 /6. ˢ2U1 8 6 8ˢ9 1ˢC# / .68ˢ
8610 9 .ˢ0 64ˢ9 D/ˢ 69ˢ 9ˢ0. . 49232/2ˢ
9 . /697 16ˢ02 80 0 /29 . . .1.FE ˢ
/ 3ˢF6/4ˢ 9ˢ. 8 /6.16 ˢ8ˢ. /ˢ98 8ˢ8 /ˢ
6. .6 02 80ˢ"120610 2 66 ˢ=94.0G38 /ˢ
.63ˢ 9ˢ0 64ˢ2/2ˢ9 1ˢ 2ˢ 9763 6 ˢ .ˢ8 /6.ˢ
ˢ4 .6216 ˢ: 9 249ˢ9 D/ˢ4 . .ˢ>.26 . .63
ˢ01F69ˢ: G 63ˢ. / 8 . 3 F6 >0$40 680 .V ˢ
D2908ˢ 909 98ˢ. /2 9. 9ˢF6 1ˢ8 /16ˢ0ˢ
D921 " 6 2ˢ.08ˢ 2 6G 8 /6.70.6 $ˢ468 S /\\S/
"6 .02 808 8 /69 9. / 63ˢ9 / 8 / 4 / F6/ˢ
08 /6916 ˢT /4ˢC 8 0E[3ˢ: 0. /2 .3 3ˢ
4 .ˢ" 4. .6 ˢ02 808ˢ. 0 68ˢ"/ .023ˢ
G0 8 /2 .68 $C . 63ˢ8 /1 /2.3 .09 ˢ0. /ˢ
293ˢ 10"10218 0ˢ.09 68ˢ1/ 1E6901ˢ2ˢD 68ˢ
F6/4 0 .ˢ. .6 63ˢ=94ˢ80 9ˢ"/ .06 .ˢ02Oˢ
808ˢ8 624 ˢ49ˢ.098 8ˢ /F6 16 ˢ80D2 .6ˢ
4 2. 8 # .68ˢ90 2ˢ". 1ˢ 9 9ˢ 21. D.2 .8ˢ
2/2=92 60806. ! /2.6 . .2 98ˢ 08ˢ
219 9463ˢ"263ˢ. 1ˢF6 4. 8ˢ . / 8663ˢ".ˢ
219 P4 /#F6 ˢS 1ˢ 63ˢ. /2.9 .63 94ˢ2/ˢ".ˢ
80D2 04/E 0.0198 8 0 1 7ˢ06.ˢ2/ˢ9 1ˢ".ˢ
80D2 6 4/ ˢ. /21 2663ˢ 9. . .0. /26. /ˢ
"9ˢ. ˢ0#ˢ/ˢ . 9.60. 1#0. 219O94 /
ˢ ˢ. / 68ˢF6 ˢ 62.ˢ8)
7ˢ04 /2. 8ˢ.0462. 6.2ˢG07. . ˢ.68ˢ 9ˢ
0 .6 63D 0 0ˢ 98 2. . .4 /ˢ G9/ .1 .0ˢ
Cˢ. /2.9 2 01 0ˢ.9 1 3ˢ 2 7639 1ˢ. .68ˢ
9 90ˢ49 2 1 /29ˢ 9 G991ˢ8ˢ 498 /2 1 0ˢ
11/29 F6 ˢ. /2. 6G/2.ˢ 2 .6 CF602F608ˢ
2/2ˢ9 191ˢ19 8 2010ˢ2/2ˢ 10892ˢ 94 1ˢ04ˢ
2. 68 "1ˢ. .6 01 /ˢ(94ˢ 940ˢ / .94 .ˢ
894 68ˢ98 91ˢ. 2. 8 6 8 F6.ˢ68923ˢ 4ˢ
7 9ˢ219O94 /ˢF6 9.ˢ 8 /ˢ9 1 F608ˢ8 /ˢ
16 2/2ˢ9 D/ˢ 2 . 94 /ˢ. .6 0. /29ˢ4. ˢ
2 9240ˢ)ˢ% /ˢ& ! .ˢ&G ")--&)ˢ"ˢ"+"ˢ&,,&ˢ)% .ˢ
./$ / ˢ"10 62 126P ˢ 07/ / 68ˢ92 8 07ˢ
9/ˢ07 / 6ˢ2/2ˢ / 9ˢ 0 9ˢ9 D/ˢ 21. .463ˢ
./9 /ˢ0 D0.6ˢ. .6 8 0D.24/ "1 / ˢ0Aˢ
4 /2 ˢO. 8 F6.ˢ2/2ˢ 949ˢ.D .ˢ 8 63 F6ˢ
02 808 .7 / 9ˢ04 62D. .ˢ4 68ˢ
F698 /6939ˢˢ2/2ˢ1089 .ˢ. / / 9 ˢ"1ˢ 0ˢ
V9 01 F6 .F608ˢ49 2 6 .#F60 9ˢ. . .1 7ˢ
9ˢ4.7.0.ˢF6/4ˢ02 808ˢ9 1ˢ9.9 16 8 $0.ˢ
ˢF6 6 3ˢ02 80ˢ. / 63ˢF6/46 3ˢ 2469 9 hˢ
M .!ˢˢ .Eˢ 268
ˢF6/4F69ˢ92 8ˢ. / 63ˢ / 08ˢG07. .ˢ 9 S @@sˢ
. 98ˢ / 808 F69ˢF6 ˢ /ˢ"1 16 ".ˢ
3 2 1 68 .2. 3ˢ /F6ˢ 94/2 .9ˢ 69 , RA?ˢ
0 3ˢ 07 3ˢ 1 7 3ˢ CˢG 16 3ˢ3F69ˢ7929ˢ0.ˢ
80 9/ˢ061ˢ 9 0ˢ".9 . .6 EˢF6/4ˢ9 1ˢ07 6 46ˢ

, ˢ !#ˢ2% . %.

80ˢ2/2ˢ9 1ˢ91 6/4 ˢG69ˢ. / 11 02/ˢ
68ˢ198 9 010ˢ. / 8 / 1 /ˢ / /ˢ

1 /' "9' 1E11 0' 80' 8 /6 .1'G0 8 /2 0' 8 2 '
89' I 1' .91'49' " 164763' . / / 3 ' 02 101. '
= 1 6 .G 164 0.'4 4' / 1'G0 0/2 0' '2/2'10'(
. H ' 4.' 02 80' . 6 F69' 0 9<0# 763#C' . .119'
2'70 20/2 0' 46/' 90021 1$' . /8 / 1 /'
20D2 164 268 'C' / / /' .0 684.2 ' 1'
.61 8'49' 02 80' " 0'4 . 6 .' /1. 1' /2'
9 1' .2 8' 8 . 1.463' 29' 02 80' 81. D923'
1M8 / 1 /'10 3$'2. .' .21 923' ! 6 63' .2 8'
'b6 /' 061' 1E`M 0 1/ 9. 9' .1 08' ! /8 '
/ 1/ 011' / / 1 / '061' 2 1 /2 3' 01 / '
! 8' .2 8' "01 A' 81' 8 1 / 3' 01 /293'
/ / 1 /2. F6.' . . 8 .21/ 68' ' 2' "0 3'
. / / 3' 0 1 703$01 0F6. 1/ 3 0 0' .0 '
88 - B '2 3' / .44' 6 93' .1 08' 9 1.21' 2' "2/'
. . ' 02 80$ 'F6 /4' 0 8' TF02F60 2
"91/' 0 80' 4/ .01 . /2 4 1'1 89 01 10 10 '
16 121 1' 01 / . 2.1/ 2/2' 4. /' 102 .2'
.08'1 /6. ' ' 6102468'9 1' =S1 1' .2 8' 73.9'
0702 80' 2/69219 ' 2. / / . G/1/ : /?
K16 2' "9 4' F6040 2' 7621' 9 ' 8 /1 /2. / .0 '
/ D01 /1 12' $ F6 .4 8' ! /8 8' 0P. 01 /2/ '
1E3 '?$??(jE. .19' " .17' 02 808 1 0 9 '1 8 . . ' 498' 9 1'
01'4 9. 9'90 2'19 I919 '0941 90 91'89 63'98 12'
- . ' 9 1'4 9. 9'7/8 29208 9191 '4 .11 . '101 M '
! ' 9 10 ' 9 0 1 2 08 ' 04 /093' F84.2 ' 6/1
0 / 1/ 68 691/1 63 . . \1\/0' F6 '
498'F6/4' 2'0 E 84' 1'111/16 19 'F6 4' 2 '
1. 468 4 2 18 "XF69 81. 468 07' 0' '
1' 9. / 40 /'F 1 498'07' '=9 1'04' .03' . 7'
291' 8 .1 /2.3' " . 26 .1. 9 F6.' F1' 12' 92 '
M D02 =$' S ' ?S' C S?

"1=&G% '

490 ' -%' = ' .0
. ,/- '=-) ,'EO1FE 9'))> .# ' ! 93 108 919161' 92 20'
] ' 929 1/1. '11'F96 23 'C' M D020' . / /1 3$01'
`= . /8 8 112 ' 0 0 909 707. 11' / '
.6 68' 2292 3' " 4/ 91' "1' 11292 3' 2 80'
92 12 9 9E E2 929 91 19F2.'0.9 4 1' d9 '
2.C63 '9 ' !MF274' 02=120' .9 012' 0=0'
'E 1' ' 94'F0 014' 2'F6 /9 1' . P91' . / 63 '0 '
9 1' "1 1971 9101 7/3C 2/ '
7 3 E 4. 9 ' 2 9 . 1 /12 10' = ' . /211 1 '
E 01 /' 41 1/ . . 1' 0 /F0/408' 1`163' 4/ '
. 921 . '298 9' . 02 /' . /1 M 3' 80 .9 1'
. . `19' =94' ! 1' 9'E01 0 7 199 1 ' H 2 .6 '
1.H9 103' ' '69'02 80'101 /20 3' / 19' F6 1'
084 0 2 63' 9 1 ' = '0' 0 / /3F60 7911 8 '
0/ ! `62 3' T60 1'2/2' 8 /6 .7 1'299'07'0 8 '
21. 1319F699 126 8 9 63' X9 8 8 2/ `93 '
= / 2 6 8 S03' 98 8' 8 8 /7 3' 9 1' ' . /@3' 3
=6K .' 0 193 ' 11 19.1' "2 10193' ' 21' 24 0O '
&[E .3 '1/ 2S 4912' 24 0 7 9' 8 8 / '
$ ' =94' , .' ' 0 /3' 4

6 4' / 1\' ' 8 2 9 68' 1/O03 ' " . ' "2 101' '
1. /' "1' .' F6 20 /' ' 7120 6 2' ' . 802. '
7 1' 23' . . .'26 2. 63 ' 610'19 20 63#01'
0 3 2' 9 1' 02 80 ' F6d' .049 0' . . 9' 9 '
8 0/91 ' 021 3'4 .4 3' = ' 08 3'0 2 6'
101 3' T6 /4' .1 08' .9 2 16 ' 2' 02 80 763'
86 1 3 F63.' " 691.' 2/2' 49 2621 ' .91' . / '
68' 0 193'F699408' 01' 07 1 0 ' F69'
91/' 6 10' 9/2 1 166 `1' 02 80 ' G/' %" !'
F6 . / . 10' /8 2 0 ' 2' F6 763' 621' 62 K pp '
40 ' 02 808' G079 92. F6 /4' 0 68 ' : 10# '
1. 90' 6240' 2/2' 9 010216 '0' .0$ G69'
.2 8' 2/2' 19 /16 12 ' 2' 6240' 9/1 8' . / '
70 .21 0$. /2 101' "9 / ' " . ' /' 9 / . 0 '
?9' : 01/2 . /' . /2 1 1 .1"1. ' 02 003' 9 010 '
0' . / / 763' A ` 0 B2
* %'9 R /2. /2 10. D6 1 11
1 >76 =7

044' ! 0 ' " . .

/0' 2/2' 1 1' F6 4' 29/1 / 968 ' . /'
8 /4/' F6/' P:' 4 .6 `1 ' 8 . /1 / 968'
/' 1926 '0.'6 1 ' . / /19' 68 92993 ! 68 ' /8.'
911 2' 02 80' 1' 2' 1/ /' . /1 / 9' ' ' 02 80 V ' SS'
9 91' . / 63 ' 40/' . / /1 ' 9 121' 8 6]]'
F6/4' 9 '2.F6P
51' ,5345' 5 : 62;7 51?05;76 =759? ; ?6'
; 5' '*5 '?7' 5;' : =65>' 2 : E6 : 2 7?2' 34> 2FG2 '
52;' : * 6; :' =*51 : 1 >' 2 4;?1 ?5 : ; ;>' 2 '
7 2; ' ;H : 2; ;6465' IG =' =49;7 79 7 70' 5 '
?=56; >' 1 45 @ ' 347' 5 : E632? ;' 76 =7'
A5;' * : ;?2; '? : 56 :)2??;?'A;' ?; ; '2; : ;6 : :>
7 : '3475'A? '6 : 9' 2; = ;5J = ?6;7 A?95H >'
6 : 6' ? : 62;76; 65345 9 ? ; >? : 62;?6; ' 7'
:65>' ;7 =56' @' 5 : ;6* : 2 : 6?>K7054; *5 '
54K7 ?> 0' 5256;5 = ;>' 1 45 >> 34(' 15 : A;'
5 : E6 : 2?5;? 6 ' 1505 >6;' ?2?5' 6' 76 67
249' / 3 'G/8 / ' > .63 0 3' C' / 8 2 0' 9 '
/11 2' 1/ / 0 F ` /4' 07 6 46 2 ' = . .6244 '
02 80' . / / 10 91 3' F60$! / D2/ 1 1 '061' 9 ' '
/ /21 ' 498 0243' 0.' 2. 3' "9' .0' / '
E2 8 7113' 8 6 ' ! 019D4 3' 9/2 10 . . $ "9' . '
90 162' 29 O3' $ "4' . ' / 63' 67 1021 3'
2. 3' /2' 9 ' / 22 7 0'E .' .2 8' 2/2'
9 1' 11 61D92. 3' 49S 1' 06198' 4 9' 67 '
1021 0 ' /2' . ' / 8 2 68' 2. 3# 62.'
.2 8' 4 69 0' 4 / . 0 68' .0 9D/ 0 62 '
2. 0' ' C' 4 0' 67 1021 A ' " .' 8019 0'
C' / 8 0$ 0 0' F002 101 3 ' "1' 62116 8'
0D2 164 2 3 1 8 103' 268 91 ' : 01' 9 D/' / '
' 2. /1H 8 /46 11' 0. . 49 1$ 2/2' . ' 2. '
63' 7 83' 7 101 1 4 .' .G '8' / 03' 7 102 '
019/D2/ . . 91 2/2' 0. . 492110E ' "9 68'
9 1 1` . 0O . M . ' 1 1 4 =92. .

T' = q M : = = q ! '

219 D9 9 ' . /D2/ .9 . ' 9 1' F6/440 12' 01 '
C' 8 /69 ' =94' 2 G ' 01 ' %141' 0' 12 '
. ' .2 8' F608 .8 9 0 M./8 1 I E
9 18 . '4 8 0 9 D/' 12 .' 2/2 . 01 .1'
1 0 . ' T 14 ' = ' 8 9' 18 ' ./DE 2/ 9 '
16 4.79 92D2 3 D2. 19 0.9 0 /' 2 4#'
01' 0 .93' 02 2 0 68'1. ., "1' /40 2. 6 A'
O 2G ' 9 . 621' 29468' 9 08 'H 00469 A'
19 /F2 1/19 98 4929 6 3' 9 ' /Q
3 ' / 8 2 F29' 16A4. 1 .61 3' . 2 8 2 / 2'
921 621 ' G/F6 ' . 0 ?#' 2' G. 6 3' .2 8'
80 89' "3' .2 .0 2. 1' "1' .4 .80. 1 '
. .39D .D .' 4.8 2 1 021 ' T6 213E>.63
.2 8
./2 19 ! E 1' "6 1' 5 6 94/. .3 ' F60.6M 9 9 '
8921 3' C' 8 . 1 0' 8 .' / './2./1 =E / '
944' / 63' "26 '9 .8.21 8 . ...'41 ./ A'
4 08 '2/2' ./D "/ .! .1$' .68' 108. .08' 0 '
2 80 0' C' 8/ 0G0' /8 2 0' ./D2/ .021$' !'
o' ' / 9. 9 ./8 / 110 ' =9 J . 89210 189'
" %""' 2 0 9 0 .6 63' 9 1' ./21 29 ' !' 9D '02 80'
@S E' "91/' 9 1' ./218923 ' .42 >/ 20 9 9 '
' $' 8' .2 3' /8268 . F6 80 ' =)' 9 '20'
%' E 1 06 /8268 9 118' >/8 2D' /29 19 A'
D/'02 80'. .8 .2108' 06 '. '498921 3A' A/ '
/".1. .32/00..6 01.29..T /=9' 09E3' 4.'
D2 80' 4 1. 6928 ' T '92 8' 8 /16' 90 2
49 2 .N621 2/2' " 492.6 0113 . ! =. ' T@p'
F6 408' 08 808' G07. 8 ' "81 .' .21 81E'
.68' 108 .2' 2/2' 8 /6.029@ ' 1'
02102 80 0' / D '/ 1 9A ' 8 S ./2A'
.G 0' F6 'G..1' 2' //2.G 3' 63' /. '".' F8 '
763' 0420# .8 '. .24021"2.' 04' 9 768' 6 '
892468 C' ./21 0702 6 .' /./' 108 .2'
04' /.68' 1/10' 2/2' . 02 9621 ' T6 '"9 /' 92' '
02 808' ./2 1 .69 6 6 8 263' C43 ... '
2 8 1$' 1 93' .2 8' 02 808' G07921' 29' . 1 '
2' $.' F6 ' 01 >. 20.E/ .' 4 02/30 ' /A'
82 / 28 2 89' T80

. . M'&" ' 7 /7 .E60 .2 6 ' / /8' >0A'
2008 . . G02.' D2 .0 0 /2.8 2 '
1. .463 ' =94' M G963' E296 8463 ' F6 '
02 808' 0. 98' 2 / 0.6120' "929E3' 4969A'
468' 9 9' 4< 1' 372.262/82 00> 808'
G07 21 0 9 02 ' =94299' 04G6.' 0 / '
1.' 4 . 021' F808 808'. '498921 3' ./8A'
/2621 '90 2' ./2 O .'/8 4 2 =6 . .701'
9 18' 0 19 0' 0 3//21 . 0 3 6
468". .0 E68 2/2"1 626E69 ' F6 0//2
110 68' "208' C' $' 8021 9 101' 0 19 08'
M: / 168 ' 59 09262C E8 1.0/8 01'
M9 F668..8 /. 86B' &# 9 + % 6'
M+ " ' ; # ' ' . '(01' /7 F/62E'
@' S0/ @ =?? 2.. 6 /.9 90 9D6 09 1' >A'

9 621' "9 4' F6 408' 02 808 Y .1/ 862 '
4/' 9 8 108 ' H 2.' G0 93' "/ 6 1' /82 0'
> E3' B .' 920 ' G/.' 0 68 ' ! 6 92 1'
2/2/8 808 10 0.P02 80 0 ' "7 F '
9 1B' 8 /C/6 . .2 1. 110E 0' /2' 8902 '
80 0B 08' '02 20' "20C' 904.89 1 ./ '
498' 8 /4/0 .1'./ 1 1/9.F69' ./ / 0 2'
.0498 ..9d' 8483' 9 .41 F6.89 / '
0# '"1 4'4ES. 11 .9 19' 89 / '. 1' 02 80'. '
.892./ 08 68' F6 0' 89O/ 68' 9 './ / '
6 '"1' 0 6210469 0 E '16 2' F6 0' 9 1 2 8 / '
10 / 'U '42.07 / '38 2 ' F60$' 2' 02 80 '
763f 1 17S. 0 0 9F6..2 8 D2 3C 0. ' &- .!"K
02 80 0 0210 4 0240 ! 6 2' 2' 9 3' 26 0'
.2 6d/ 9 0. /. 16 D90.#C' ./21 0 '9 '2/2'
/.0 .08 80H0 2. 30 180' 9 1 921 923 '
07 6 468 ' M ..468' 9 D/' /. 63' 26 08 2'
308 808' 9 9' ' =94P 102.# / 68' >)' 0 Q
193' 621' . 6 4.8' .. . ' 8 G/8 /D.2. 3 "1'
18 .4. 89210 01' 0 93' 498921/ 68' 62.'
02 8010. "1' 8 10' 028 010 5. /4./ :0 .93'
498921/ '08' 2/2'. .' 2 80.43' 2' 8 9 3' 0 '
2 8013 "1' 621' .3. .8 0 .3 F6/4 /70 '
4 791494' !' 07' 0218 ' 8 1 2 13 80 16 '
T644 . 1M1F6748' 02 80 763' ./2.9 A'
1WJ498921/ 68 02.3' 81' 0 8010$' //G '
.16408' ./10' 9P8 9 60' 9 .' 91 08' 02 80 '
.0#F 1 0904989 12 16 01T. 63')' 0 .68 A
:0 '6 /9/2 4 /19 1 994 F6924/' 0 D6 '
.2.68$' . 2 498' .. 9 '02 808' 2' ./ /'
=)' 0 1 7631' 4' 9 1' 0' 02 80 763 'C' 1/ ./'. '
98921/'. .' B80 18.' '07' 0' 9 98921' ' 1/' '
63 0 19 F6S' E' 2D61 C 6 - .6 G06 '
1 621' 02 808' 02 8060' T6/4' './2.. '
402.E' .6 '. 98 .8 / 68' "2 69 10193' 2 /0'
/.0863' 02 80 0' ".' 8 10B ' ! 68' 1' .0 '
498' 2' /8 2 763' 02 80 ' = .92 8' / 9 1/'
4979 92.' /8293' " 6921 68' 02 8 'F6 0A'
/F2 '4 69 8A' 18.' ' 2' 498921 3' . '
9 ''. 91F69' 02 80' 7/8 / /8. .3' 8O'
68' 02 62 149892.0' 4' 9 . 6 498'
9. 9 '"7 F69' T 4' 8. 03' .0. /2 3' 9D 9 '
8 6 ' ...A.. F6/4' "9 68. 1 ./2 1.2 '
46 2' 9 P '0 808' 2/2' 9 9' 9 '1/162 ' 06 B

!68 '"91/' 4 69 - ' 21' 02 80' 008 0' C
1 /293 ' "1' ./D2/<.9 S' ' / 20 ' 921 9'
.`9 .6 9' 9' ' /./' E` /69 '. 9 .. 9#=' 621 '
E 94 69 9.1 08' 02 8 ' 0 193' E02' "91/' "20'
1M10' 02 8 0 0' F60' G0 9' /8 2 0' 21 '> .621'
G1/2 . '02 808' 0 1 7 .8' 9 9' E C' "20'
XZ 19 F6018' 90 199 1 . 20 .9 ' 219 0 E '
D9 9' $' 0 1. ' F609' 2' ./ 49 ' 0 9'
1 0 F60#' 2' ../19 './2./ .. 9'
9' = ' .2 8' 6 90' /21' 02 8A' 0 193

S > + < $ B T ' ' R' ' $B R' " < ' < B + 4' '

./ / .E / B/B197 1.03 "2 ' C' ./8 2. '
".' 01' " 68# 01'2/2' / 68' ./8 2. ' 0'
./ / .'F6/4 68 . `21 29 '4979 #9 D/'
01\'02 8 0' "2 #F60'079621.' 49/'./ 63' 6 '
1 9 9 1' : 19 90' 26 08' ./ / 3' 01.9 02'
!/21 2.!' 8 923'(298 . F6 0./ / 90'2/2
. 1 29.' / D02 .0 94' 8 2019 0 3' C# 8 '
8 / 10 3' =94' C' 0210 68' = 2 94/ 68'
0G 8 0 68' 0 93' "2 .0198' 02 8 3' 24 Q
.021' ' F609'4 6 9' .08 498' 0 F6/' 198 / 9'
"91 2921' 08 8 08 F608' ./2 6243' G079 '
702 ' : 2. 68' "9 7' 0210 68' 02 80'
9 1 " .D910. ' . ... 'F608' / 08' ./8 '
262. 8 G079210 8 8 0 0C' 02109#C' 9'
F6 498' 0 921 9219' 9 0 0161 '2/2' 921 923'
07' 0#F6 .F6 4' 92 8' 92 68' G0791 02 '
"/991 08' " .D9101 . 3' 9 1' 011 .9 3' H09.'
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5 '+ ,& '& ,

! M2 109' .0 1 743' 46/4. . 8 ' 2' 0 193'
F6016/ ' 9404 3' ' I 1' 4.' 02 8 ' . '
.2. 0' C' 4. 12 . /29' O ' >9' ./8 8 62 4 '
6 /29 0.6 1016 8 02 8 ' ' >9 0.6 A'
0 7 3' 02 8 ' "9D. 0 . 3$ K' >9' 0L'
.6 101 7 3' 02 8 ' 12 92 3' 0.' 1 . 8'
4.'=92 763'. . 2 =E' ./ 68 F69/1=.4 3

/ !K D9263' "26 8' 9 1' 67 1021 0' H .?
! "9 8 01 . 0$' F6 2/29 1 91 . M - '0 '
K F6 4 4' 9 1' 93' 4922 10' .9 1/' 9 98 0I' D 0 '
?@ ; 46#"9' / 8 0 9 F608' 9 1' G/. 0 F6 4' A
.9 1' . . .1' 0.' 491 2 939'. 98 .'E "9' ./8 '
/ 162 . G 3 I .' 8019 0' F6 498' /998
1 0' 9 1$' / 8 0' 06198 '0463' 9 94 / '& " '
463' 46 . ' 8 63' F6 . 1 '
. 0' 8' / 9 024 ' "1' 921 0 'F6 '9 1' 2Q
. 68' !/21.8 024' .9 17 '40 9' 9' .06'
=&)%F [< ' 08 ' =..62463' 'F6 '9 1' 0' / 9 01 .' ' !
9/2192 0 0460 1. ' =621' 9 7' ./ / 0'
0 89' 6 102. p' =)' 8 0D 3' F60 28 01. '
0C' / 8 0 'F6p' 2 / 68' 0 193$ F6 0'
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/ 0' 9 ' 3' ./8 / 10' :0 193' 92 8' 2/2'
3. 162.' 9/ 8 0' 1/./' ./8 / 1/# C' 219 '
/ / 0 F6p' "9' 2016 0 0' 621 19 '0 .9 '
40 .0F6p' 2016 0 0' 621 '8 0D 3' ./ / '
0 621$' F6 9' F6p' 29' 0 /8 8?' 4' 9 1'
19 04/ 68 2. 0' # "1' 92 8' 016 0'
\. 02 1.' 3' 201 1108 ". 6240 /.616 8'
6 E[P j' C' ./ / 0' F6 498' : .0' "9'
Z08 07.2! 9 5/2' 10' 06198' 261 '
9 1 0. . 91 / ,9.@1 / $ 1 ' ./' F6/4' "

P' T 0 9' ./ 63' :G .68' /8 2.' C' " '
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' '9 1' ./ 63' " .08 F69' G07.0. '2/2' 9 1'
4' 02 8 0# .612' ./ 63' 2/2' 1' 2' 67 94/ '
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D 16 A 2 8 0
= ; 7' +3 3' / ' ' "' '
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1 763" 10.6 '02 8 0 '102F60' / D02 3' 69 2 '
1 6 92. 3 04' 04 /2.3' " 1 ' / =162403 ' "1 '
1/ 92 12' 02 8 0' / .6 / $" ' D' 04' " 492468 '
01 904' 064 .24612 497F69/ .6 63' C' 06 '
3' / D020' 621' 02 8 3' k9 0 1.3' 1/ / 3 '
F6/44 . / .9 1' 1/10 9' E668 ' 2 1 6 8 .2 '
16 8 #C' .91 0 . 68 / D02 .0 68' 4 1 2 '
4 / . 0 639 6 .90. 2' 02 8 0 C63 ' 621.0A'
8 92' 91 08' 2' 02. 3 F602 6 3' /7 96 63'
./2 .6%' 504 .93' 92 8' F6 763' . 0G 81 S' C"S/2
0 8 9216 8 . /24.2./ ' =621' 91 08' / \ A S'
0 6463 '0 3F69' 0 193' / I . 3' 4 1 2 '
4 'F6 ' 49/' / D02 . p' 621' :0 3' 92 '8' / '
D02 .09 1 F6p' 04' . . 1 8 " 6 / V . 612
&01 1 /2. 8 " .9 1' 49 18 010 "249' F6 0' 02 '
2 04 /293' 8)' / J. 0' 621' 6 0 4 69 '
!' "))) . '9' 6. 9' / D020' 6 0' C' 4 '
69 0' ! / 63' 9 D/' / D02 .68' 9 1 ' F 174' @'
0 1 763' ./2 101' .9 14' 01 /23' 198 9 01 3 '
4 ./2 / 8 0230402 8 39' " 63' "02/3' =)' / '
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9 30' 1' " 8 8 ' .' . ' ./ M 9' C' 02 8 0
.F69"9' 9G079. " 6304/.6 68 A 1.' 02 '
8 0' 04' ./ 63' 24.' " .' " 6' 49 . 9219 '2/2'
8029.' / .6 '2 ' F6 6/ '? .' 02 8 0' 1/ '
16 02 8 0' 67 010' /2' 9 1' 9 D/' 02 8 0'
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/ . .24006. . 8 " 6 .232/2' 9 1 4F6 /4' 072 ?A?' ?$
941' 02 8 08' " ' .04069 ' 94' F6/4' .08' G0 '
791' 046 ' 249' 29.' 026 0' 98 2 3' 0463'
9 1' F6 0' 046' 02 8 08' 2/2' 0791' 98 92' Q
94' / .' G079 9' H 2.' 0.9' 02 8 08' 2/2'
. 9' 9 0 07 92E 0' ./ / .' ' .68' 1' 0463'
./ / 3 9 6 F6.' 9 94 / C' / 8 0 = .98'
9.62462' 0 193' 0 F603' '.0' 0 1 7 3' 9 1'
! 0 68' 92 8' 9 1' 0 1 68' 02 8 p' F60 408 A'
"1' 0.6 10193' .2 . 603' . 90463' 0 . 68'
0 F60 68' ./ / 3' 610' " 68' / .6 14'
G ' /G 79.' F60 408' 0 1 68' 02 12p'
. 9 . 0 07 .30' ./ / .' " .' 2 . .463F6 0'
26 O63' ./ / 3' 6E .' 0.163' =94' 2/246. /2 S
01 20 E 8 0' 9' ./ / 3' 0 1/3 .@1 `06 '
10' 206 3# 41 1' 02' 02 8 0' 219 D.23' . 1' 1'
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1' E

O,ʹ =q M:= =

/ 110892ʹ ./ 8ʹ=)ʹ 2Bʹ./ 79ʹ61 ʹ
.19ʹʹ01F6.ʹ07ʹ./ʹ . 00 ʹʹ"ʹ20 0ʹ0ʹ
206 ʹF608ʹ .91ʹ 0/6.0.ʹ 9D0.F 9ʹʹ0 ʹ.0ʹ
10892ʹ 9 0 0 ʹ /19 1ʹ H/.ʹ12 2ʹSA92 ʹ
=)ʹ 8/4/ʹ020 /D 0ʹ 9 1ʹ 219ʹ42 8ʹ ʹ 0ʹ
1 /20 .8ʹ Cʹ 206108ʹ$2/2ʹ 10892ʹ F6 4ʹʹ
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F619ʹ / 80 3ʹ. 1 01F69ʹ91 08ʹ 801. 0 3Eʹ
0 19 08ʹF6J0ʹ.06 0ʹ. . 989ʹ . ...ʹ 910ʹ
16 ʹ 101691.ʹG .ʹ/ / 191 "1ʹ 9ʹG02.ʹ 0ʹ
4. 8 /2 1 916 01F69ʹ9ʹ0p /2 763ʹ02 80#
49. 0 01 3ʹ.0 612ʹ 2. 68ʹC!060ʹ./8 ʹ
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102F608ʹ .9 16 2ʹʹ 02 808 8ʹ07ʹ 202 8ʹ
4 91 9ʹ" 1=ʹ 1006198ʹ. 1"26 0G/8 8Eʹ
219 .7163ʹ=92 63ʹ /@3ʹT2 9 "9ʹ /.0ʹ
3 61 1 /ʹ .9191 /ʹ>99 .1 /ʹ H 29" ʹ
6621ʹ 02. F6 0ʹ. 9 9621ʹCʹ261 62162 .ʹ
F6024 6ʹ26118 2 6 1024 6ʹ" 6621#Cʹ" 3ʹ
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C. . . .24 070G 3ʹ"1ʹ .2 6 8 /16ʹ 219 ʹ
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?ʹ "D/ʹ .6 83ʹ ./2692 1ʹ 91ʹ 7/.ʹ "9D91024ʹ
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168#"1ʹ F6911ʹ9ʹ_// G . 3ʹ=ʹ!/297 3ʹ
F4Jʹ02 8 4 0ʹ 021ʹ29.ʹ10892ʹ8/0.2.6 ʹ
ʹ =92 60 20619 `ʹ 863 ʹ10 639 1$F6 o"1ʹ
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86 10ʹ"1 68ʹ2/2ʹG079111ʹ ʹ29.ʹ 064 .68ʹ
29.ʹ/ 0 1 8 ʹF60ʹ10892ʹ10 108ʹ 67ʹF6/ʹ
!J ʹ, ʹD2 163ʹ./21 2916 ʹG07921ʹ 2 80ʹ9 D/ʹ
.!ʹ 2. 68ʹ9 1ʹ"9D 024 921 924 219Oʹ
D924 ʹ /./ʹ 2/6924 ʹ =94ʹX 41 4 D268ʹ
02ʹG/8 8ʹF6/4F69ʹ"1ʹ 2M 68ʹ"9D9Q
1024ʹʹ .0 1 608ʹ02 80ʹ 1ʹE02ʹ9 03ʹ 0 3ʹ
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!9119ʹ8 021 3ʹCʹ 2 9 3 3ʹ1. .91ʹ
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q !

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1 0F69 0 3 $ ʹ/2?ʹʹ= .40ʹ 921 .C 8 /p ʹ
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2 80 921 923ʹ 10 64 64 . 689 14 ʹ 2ʹʹ
19 .06ʹ 69ʹ02 80ʹ 219 D921.ʹF6 9ʹ. Eʹ
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1 924 ʹ T6/4ʹ ʹ 21ʹ 69 0#ʹ0 1 /2.3ʹ
. 621ʹC4 6. 0 2. 0ʹ !6 ". 746/ʹ
76ʹ2ʹ/4 3ʹ4 .016ʹ 4ʹF6/ʹ" 62223"9ʹ92ʹ
1 8 3\ʹ 2/ʹ .!62468ʹ 2. 28 ʹCʹ0ʹ
4 12ʹ07 / 619ʹ 868ʹ# 1. / ..624621ʹ
"02ʹ ʹ 0.6 10.98 ʹ0 / ".ʹ 9.62401 68ʹ
< 9ʹ92 8ʹ 9 9ʹ4 . 86ʹ46/763ʹ91 08ʹ8 / ʹ
4 3$ʹ"9ʹ 91ʹ02 808ʹ"1ʹ 9.ʹ 2. E68ʹ
07 / 619ʹ 868ʹʹ208ʹ02 80ʹ 6268ʹ
9 1ʹ 1 9 GAʹCʹ./D2 1 /2 3.68 7918 2ʹ
. 68 ʹF60ʹ 1 71010ʹ/8 2 3ʹ91 08ʹ1/ 16ʹ
219 D924ʹ 01 /ʹ$ʹ"9ʹ 91ʹ 0 2ʹ . 92ʹ
1 08ʹ"1ʹ 9ʹ 2. 68ʹ 9.6240 68ʹ 4ʹ
9 ʹ2/2ʹ07 / 619ʹ 1 8 6 F ʹ)Gʹ
.+ʹ# .+ʹ.% . .ʹ &7%. /ʹ
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2/2ʹ !261. .3ʹ061ʹ I 1ʹ92 8ʹ3
02 80ʹ./ /1 3ʹ /2ʹ.6 6 7.1 .Sʹ
/ D02 . ʹ0.ʹ[34 / . #0 123ʹ92
6/ 68ʹ 2ʹ 01 92.9ʹ ʹ 1ʹ 0B'E T /<./#
ʹ . .2. 0ʹ 2ʹ0 1 80ʹ 4 1 23ʹ .0 0.ʹ
M82 F6.ʹ0 163ʹ / 80ʹ ./ 1012ʹ 9ʹ
F6 Pʹ 8018021ʹ /2ʹ9 1ʹ DP6ʹ02 80ʹ
./ 63ʹ 94. 63@ S1 9 1' 11/X 9ʹ
8 / 063ʹ `0 70 03ʹ "9 1 .ʹ 0 / 11 9ʹ
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1ʹ 9 "/ʹG07 1 /0' . 4/ . A A]
. 11/2 3#.68ʹ92 8ʹ [)ʹ F6024 6ʹ./ 63ʹ
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1 1ʹ . . 108ʹ9 1ʹ(0.ʹ 86 0.F6.ʹ. 8ʹ
. 4 4 . 61 ..ʹ>)ʹ4 / 6 .6 /2. 1"9ʹ
4ʹ064 92463ʹ ʹ 6 63ʹF6ʹ 2?^?I
"9 1 .ʹ8/ /298ʹ986860 08ʹCʹ 9 92ʹ
298ʹ /2ʹ92 8ʹ"0 1 R 1. .3ʹ02 808ʹ
9 9 8 /11/ʹ298ʹ 9 1ʹ0 63ʹ ..42,63#
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> M ! 5 : I 5 : I !

<E1 /P 1 068\ "2 3/2 9 1 29 . / /9 94 07?.9 /2 2 3 49 9 14911 F6/04 /Z. 68 2 / 8024 B. 9 1.EE4 1012 1 2016 0 .2E A &
c !0 %. K
8 <I 0.6 10 #93 F6 2F69 = N 7
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7/3 4 D. . 483 =4 / 06192 04 1 . 9 1 7.1 02 AA? 02 9, 1 91 11/ 90 E41 . 3 S. 3 c1 [S 1 3 1621 4 D 4 E76 3= j? A 08 "? 7 " 0921 763 = 191 2611 1 M 98 $ 0 6 8 < 9 ?0D 11 01 89 .0 8 / 190V 29 1 " 3 / . / 2 /S00 @# . 11/ 07 20 A 763 SE/5 9 1763E != 4/2EF6. 2. 6 0 9 .A 8 3 ?1 9 Z
03 107H 6 9 1 < " ` ` ! .5 p 4A8<Z 293 9 49 1 1 =: 0 `M ` 9 9 0/ 1.9 9 . : #)% > ! 6 ! -!G<N &[
E / 1 0 07 103 I E. . 2@ S@@14? EC C SC [\ M Z 0 I 1 9 02 EG4 Y 6A S 1 `S / 90 03 0 1/ ' 96118 +2 3U2\0C D11 3 S 1 +4 4 11dE Z 1XA$ 1F69"1 @3?
' ($#3(21 4 (1 & $&A$#G2 # #$$$\
D 0 .1 1 04 02 H91 ` .SS 3$ 067 0 9 1 `77 , = [* 00 10 13?. S 0 47
(G 3(,1.$ 4$($22 <AAL ##A$0(# B6

IH$ (3#(1 '4($-,42 3 ($. , 1.$(,3$$1 24$< $%2 3 ' - 2G] #4&" - (2 -4 ,1&-$$ $ 1' /1 3$,1 / 4$ 6.(3 ($- - 2,$F&: ; 3,& 4&'$$14 (, . (M , ^T ' -4$# $-4 0$$$ %$ #2 2#,1 $$ 4$+ ' 2(21 A A#= $(, 6.4$4,V. ,A9] 44 ($ / .12 4 $ (, . (' (, I024$ 2 N, (, - 1< Q2 , / ($-7/&,1 4$2(,$((0- (1 0 ' - 1 4 # 42&. =21 ,2$-1 *, 42 = (; AA< "(32- , 4$ 2$$2 ($-$ (24& $-$2W ; # . . 7 ' - 4$2 = &- , ,2$2/ -2($ < (, 44 '3- 2 &2?24$& -$2 "$&,$/ 44 (, (

1 /29 90 92. < 9 90 . O..1 C 9 F6 10 F @ .10 0792. .0 F6S .9 97 6 8 7079 . 1! ' 1 / 2016 8 CW 19 4 / 16 8 F60# &40@ 8 0G0 FS 9 49/ " 0 62. C$ 2/A 109499@/ 3 "1 2 .0 ?$F6 402 "9 7 9A
!4%$22'+(,& &(,21 &6. 3& '2 42(& 21 (, /(-$21 6.($ 32- #'!" =% 22 3 . $. 6.33 2 &(/ $(, 6. ($, '2 `&. $($. ,F 6/0.1 ' 3 4 , $ ' (4$(/ 4B. / 7 , / , , , " '2- $& 2- / %,$= ; 6. -36.2 2, / '2$ 3 %$$2 2 a &$$A$ 6. (3 , &- 24$ ' & 42(4 44 ? , : - (2= @' (, (, / (,$0.1 , - , 24$ ($ - 6.V ' - :$ 2(. / %$(. 02 , ($ 423 0 (, (-($ -< 1 2A / , - / ,21 ($ - 5 $ 4 2 ((.$(4 ((, / (, 1< W 3 $ 4$($2 2 □32$('+< 5< < &(2$2 ((4 44 3 ,## (
34@3Y21)2AI -1U ; $, (,($-/0.1% -2 2 :2/2, - - 1 0. (, . / 3 2, .1 ($2 4& ($ -&4 ($ (0(1

49 1D6 . Z.6G01 76= %
E3 4 .92468 E. 9016 110 /2 703#
F6 0 R 3 0 93 2@ $5 " 0 1 /29 49 1 . /D27 /2. =J 49 21 8 . "1 AAA U1 /7 94 0 0 1@ @ 3 249 9 8 2 4/ ! * & # . 0D9246 23F6 0 046 8 40
2 8 .11 21 /Z9 10 `# 07 # 9 E 99 98 4 161621 1 190 10193 A7 0 1 /2 763 ! 60 S 49 92 112/ 9 0 / 9 1 1 024 49 S2
7 F6/4 9 1/7 9 12 .2 46 4 ..2 468 9 1 =9.6240 49 0' 1X/29 .21 .2 Kc 1 S 49 .6 1019 3= 1 262. 9 8 / V. 149 /01 11 / 0949 02 8 "9D910 19 /1226 2 8 0 S .6 63 j ?0 0' 11 9 1 261 /6 I D/ .261 8 /2 =/7 9 1/ ! 1 .91 0 8921/ 1 .92468 T D02F60 8 D9 9 04/ 120 4 91 /19 1 / 4 29 4 D2 100 1 3 : 9 702. 9210 "1 19 /9 20 6 0 .8 " 6921 0 40 S9 0L <?
. C4 0 F0 861 0
10 @ C62 9 ?, 9 1 7 31194 29 D92 10 @ .21/9.9021 7..F6.E/64/ ./2 1 1 96 98 4 6 10@ 8 7 2 8 1 C 8 8 / 10 1 10190 . /2CF11 8 26 2/2 2 24 6 463 1 ! " 2 .09 4F69 0.@ 94 / 98 119 I 1 3 ! 2 80 . / / 3 " 6921 3 .06 I C A 2. 16 2 11 763 1 1/ 3 : 8 4 "1 B .06C S1E2 3 /S / 8 0 E7110 0Z3 F 0 4019 ` 7 .1@. / " 6921 4 9 1 " 29 9 1 G/ . 92 12 S " 692 3 9 9 =996044 r "1 2 1 F6 0 . / 63 9 1 02 8 01 D 09E

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W S !

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3 : 8 6 3 . 6 6 3 D 0 1 0 6 S F 6 / 1 . 2 ' 1 0
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3 = . . 6 2 4 6 3 . 6 $ 4 9 1 2 . 6 6 3 / F 6
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D 9 2 . 0 1 / 2 3 7 9 2 . . / 2 8 / 1 1 0 G 1 6 0 3 F 6 Z
4 0 8 . . 9 3 . / 8 0 0 1 6 9 2 4 " 1 . 0 6 0 9
. 9 2 3 . . 4 6 / 2 . 0 . / 2 6 1 2 " 1 0 6 8 2 6
0 " 9 @ X 1 1 E / 2 3 0 1 . 0 1 / 2 3 < 9 . . 2 8 . 2 6 3 F 6 0 B (
S ; E 2 0 1 9 0 1 / \ 8 / 1 6 3 / . 0 3 0 . . 9 1 M 2 3
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0 7 9 0 1 # C F 6 0 8 4 6 . 0 7 6 6 8 6 . 1 1 0 2
4 6 0 D 0 9 4 0 2 8 0 F 6 2 . 9 1 / 8 0 D 2 1 6 4
2 3 D 0 4 6 2 9 . / 2 1 1 0 4 6 1 0 1 0 8 9 2 D 2 9
) (6 9 . 0 / 9 " 1 2 1 6 1 2 . 2 1 / 0 . 4 1 9 1 / H
8 9 2 1 6 8 . / 2 1 0 1 6 1 2 " 6 . 6 2 6 1 1 / 9 9 4 9 Q
7 9 1 0 1 0 8 9 " 1 9 9 / 2 / 8 / 4 9 D 9 2 9 1 0 /
1 . / 2 1 0 6 1 " . 4 = 4 9 8 / 1 2 . 9 8 9 2
` S 9 6 8 6 9 9 1 9 N 6 2 . . 2 0 . / 2 . 0 0 P 0
F 6 . 9 . 2 6 . . 8 9 4 " 2 6 8 0 . 9 / 2 / 2 0 .
. 1 9 9 1 " 1 D / 1 6 0 0 2 6 8 = 9 4 C 0
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1 M . G 3' F6 / 4' 9 1' / 1 . 2 '0 9 . / / 4' 9 1'
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0 1 . N 1 / 2 . 68' 04 9J1 / ' 9 . 60 ' T /'
8 / 4 /' 9 923'0P9 0 '4 . 16 '0P9101 / 119' . '
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.2 7 P ' =121 9'@ 4 '0 16 ' 11 9' 9 1' . / 11 '
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10 68' 2 / 6921'<9 19 68' 6 .\4601' / 7 '
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19 0# ' 8 A' .6 'F6U40? 8 / 4 /' 29' 2'
)' . 68 7 . 2 . O D . 9' F / 3' 4 / 19 1$

1 0' / 7 9 ' 92C I 3' 029'9 1'29.9 Z 0' 1

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2 .01 F20 'F 1.0' 8D40 0' 12 7 1 0' ' ..11'
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MK&65 ; ' '?# $' 43 !' ' $' 7 '
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44 # 3 '6 S6 HH' & / 2 ' N 4 H6 '2'
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+' =q M:= = S W ('

. 6 . . 8' /2' ' 9 98 9 ' <9.' 2/2' . 2 . '
. . 0 6 E"1'C168 2 3' 98 9'.2 8' H1'
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2 E3' / 8 2 763 / . 3' F6S2/2' 9 . 11 .4.'
=/ . / / "9 6. 4/' / / 10 F' 61= '
08 ' =/26 0' 0. 9' 4'F6/4' 0. .2 2 6.1 !'
0D 10.'. /21 269' "268' 04064668 " FO.E 2'
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! /220.S 0 3 02 80.03 8 8/7 ;#T6 'F6 '
'4.8 1. 263'0 2'079 19 2c' 8 /6 3 064 1 / '
] ' ' 298' 101' 9 ' .2 8' 09' H.' F6 ' 061 EE/3'
.42. 6 639 1 064 .24 / D0268 ' H 2.06 '
4 863' 2' 0F60 ' F6 0' 0S. 8' O1M' 2001O 5'
0F60'2/2' 67 1' # + 6& ' !%
!" !)' " T6/4' '06 93' /7.01' F/0'2/2'
064 8 63$ ".' 29F$ 468' 90 9 1' 8987 020'
09 .2' 22016 8'. /21 2923' $ F60' ' ' 8 0'
" A ./2 / 801 /2. . 0 ` / . $C#4.S 1/ .0S 3'
9 1 2 02/7 3' 6 4 1023 ' > . 16 ' G0.' 8 . H'
7 020' "6 D/ 8 0268' . F'.'B.E #; '4!2'
0 E. .0 . 6. 4# S=.3. 63. F6 1 ' 9 3'
F6 498'<c7 1. '4 . /\"1. 1.?8 8 09 9E '
/2/3' 0. 19'9 . 01' > .2 0' ". '9 19 2' 31. '
101' 2 61 3' 'd . "1' 2.E 1 B' . /2.1' F 1/4'
.2 8' 9. 1' 8 8 '. 1 8 0 8 ' 9 /2 # ' "1'0P'
N / . J9d 4E' .'9 D/' 2/ 1 Q
49' 6d'468' 0 0'9 1'162 .0' ' 6' 4
PS? 19D923 C0 10 62 '782/ . 8'86/ '
"S' R' "923 F8" ;' 9 1' / D02/O ' 06B' 91 08'16 '
.0. /12.0' $.'2/2'024 863' ? /
E2 XD1` . 1 02/ 09 . 81 201612 F6 / '
D02 8 2' 9 1' 0 E4 163' . / 8 .4 . 8 . ' =/201'
1 68F/.' . / 63' "9 79 023' "! 9 0 6 E'
2/2' /201' 0.63 0.68' 9 923' F6 0' =/202S'
4979.' . 1.' 71 18' C' ".' 9 X21 .7
16 F$. /2.61 016 ' =/263'0 63'098 63 '0 83'
D 0 3' H9' .4. . ' (G' 120 89' 064O68'
E2/69 j7 .10 4B$C# 0 68 ' = .4. 6 .408'
=/2' 4 "/ ' 4/ 8 2 39 1'0702 120 1'
/$ 9 '2/2F1 / 2 .4' 02D2 2. / C11 '
102. . : .93'9 D/' "/ .98' 11/2'. 621 1BP '
.921' .G'7 0297 3' 9G91/ ' 1793'F6 02/2'
. 02 ! $ 29.' 46 ! 68' 9 ! 0 29'F6/'MM2'
1' : /263$ 1' "9 7' E D60Bp =9684 !W= '
D6 10 . 04' " E.'29.4 .0 .1 # /F2 14. / 8 '
2 /4 01.2 #= .'=30. 3' 9 01 /2.'011 0 1 '
19 1 . 0 . .0 9 912' 219 16 8 F2/4 01 263'
9 1'29. . 1 .0.P# " /4' E9 10 9' 2@9. 0' F6/4'
. 1" 10 ! ` M D0 11H 06. . 2'
E F' !0)& #%- . +' 2'70. 4 8' 0 19'
09.1 c E3' [9 13' 3' 9 D 9 1'
R6='09 3'19 101 /29011 0 'C01 D D6 '
? . ?' 6.' " / ' 0 S 20 1S, 8 0 10702 '
S '16' 0G / /2 E3S 19211 .6 1 F2040 2'
1903 00ZM0 9' ' 4' `1921 M29 E2 .0

144' 7. 68' 49' "/. . . / 0F6/ 408 9 '
4 .93 ' F6 ' :G / / G 3. 2493 ' 29.' 01 3 0'
' H / .01 3' c.' -0 9 ' 0 . `1 ". 01 "/ '
E. .2 ' " 109' 4 .989 90.D0701Z
B , 'L 7' "+. . ' B)' +%.
<.91.' 0 9' / /? 9B 0 '4. /4/1016

.74/107 2/2' 9 1049/ 09 9 ' 0949'
0'C'004 1"#FO 0'/4/ 0 4 ' / 63' 2' 97 3'
9 1'79 1 / '291' 89 63' 0! 8 87/ ?893 AS8/$<
F6 R ' " 49EE1' 02180 0' 'S Z9 [0A 4S SE '
)% +/' ' & . . 4' GE9 '92 2 2/2[. B. 61. /A'
/ .3' 1 '92 8' ! H 9061'. /2 14'.01 0' 4'9 1'
' . /19@93' 04. /' . '0 9 01@' "1' E3' "1 31 '
8 9021' 021' G11921 @' T 0 4'2/2' 3 102.' 1'
7 9 10 '6 ' 2' D1 40' .EI .9 121 0 ' 11 D/'
02 80 0' 1 @.1' 5/2' 9 1 621'. / / 93 '
9 . .H. 8 / . ; /7' / D02 '49 . 168 ' " = .74 '
12 093' 2/2' 9 921 9021' / 4/S3 2 '90 2'
4/ /14'=B' / 0 01.1' 4'. 1 2 ' 21'04. /' / Q
193' ' 1' ". ' " / 6 1011 8' 9 91 98' . 8 8046 '
. .c 29C' 11D 21 0' ". '4/ / 98' ! 6. 8 / . '
1 08 2 .26 1' 60DE06. / . 8 ' T0/4. /2 '
1 D 1' " 1 / / D 8 '0 041/ E 2' 2/7 310 4 / '
23' M / M 3.0D/9 1D0 / ' F6 2/1 /19 1'
9/D2/ 19 463' , .' /4/ .3' . ' 0 /2703'
! 8@ ! /18 2/7 3' D6 163 06 09 110 163'
F6 E0 8 ' 0 103' 0 1.8' 2' '9 10. .2 '
ES 3 F0/' / 8 2 0' " 11. 183' 03 8 0 0' , .07
19 0' 90.1.1 3 9 17 3 /2D9' 9 0@ 1' I 1'
F6 0'104 6' " D9.' 10 .1 FE7/ 8 / ' 4 . / 16 ' A?S
4.8 86 11'9 1'0S111 09 692 0 10 . 0 8' 0
1 .2 E7/2 .03"9 7"79164 ' 64 9016 ' 7 08 @@@ '
/8 293SR , =AA 2/ S.4? 4 . `JS
' - . ' " " J' . " ' M& 3' ?
" . ' / 1$ E0 '3& = . > . ' ' "&'
`0 : /@/ 7 8 1019'10 16 ' 2D92 E' 01 102 '
1 0'. / ZD 161$F 0'7/2 .03'10 163 ' F0 ' 2' 1 '
8 3' F60 10 7 3'9/2 1 1 ' 1 1019 2' 921 '
` . 08 91 1' 24 .01# . 8 9 00 9 1 ' 061912'
1/ 610A' 94292 1 1' 04' D.3 1' 3. 10 120 0'
01192\' 8 01." 0 1.1' C' 4 / . 69' > / . 6 1 oo $'
1 1 2' - 0 . 01 ' 8 / 93' 00 8 '4.F0 190 [9 0'
019219 8' . /9 /23' = .4"71' 4 1 12 90O\ 3] '
10/4 1 93' 7/11 ' 2D92 E' 249 '09 .0' < E1 5 '
D. 140S 1$F030 01 + .' 0 407 0 D2 29'
13=F 271 /199 1 1E 1/2' 0F690' 061' G . '
D 8 01 0' ' F014139 ' 2619 68C G/8 18 8 '
16 1 / 68 ' I D "1 0 / ' . ' /4/ '0 63'
46 . 3 '0 03' 08 0163 0.9 '0.9 763 '0.6163 '
2D6 3 ' M4/ 01639 1'C'19 /4/107 3'C'2/'
/4/ 07 3' ' "O 3' " 3' 1' A2 7 3#]K[E '
F6 0' .1 63' 1 I .21 0O 'c.'07 916 02\' 6 'M7 '
9 1' 9 . 1O01 `' 9' . '702.' 009 4923 '
2/4/ 07 .'4 ! 81 ' 8 4' F6/426 1 = . 1'
/4/ 3$ 1 3O14/' F6/4' 9 1D6 '1M 1 4' M ` /4'

191 6' /18 /4 3' < *? 2D6 107 .' 9Q
4 68' /4/ 08 309 C' 0F60' : ..3.2 8 / '
04621 H 2.'2/2./498 8 /4/.62 1002 '
= .' / 0. 621# F609'92 8' . 021'/ 0'
! S21' 2 0 4/' 4'9 1' 09 98' 011 0G.24/#
.0#19 0 2/2' 19 8 '/7'4 69 08'/ D02'/ 0'
K< 1/ E 01 /2.8 24.' 9F6 6'.0'F603'19 '
021'2/2'/ 0.9 9' 2'0F60' ! /22 1'/4/'
K8 0 8 9 2 ../ "1 0 / 2G6 8 4/' H 2.'
S ('6'/4/ 010' ..\/ ? S21 C' 9 9'.0 4 / 0 =0 / '
93'06.98'D6116 /'2/20 46 1' 29'G6 8 / '
9$' C' F60 / 40' 621 2/2D6 108 6 '2 '
EF69<'021'G 2.'./24 89210' I 1'"9 7'/ D0'
?68' 90 163' 10 9' /191 1E0' F60 9'9 '01 6'
/4/ 0/ 9

,' @

'('D6 10 .'9 1' F6/44032' 102D. 9' .'&?
<0' 0-' ' -6 107 P' 9 1' F6/4'
10= 9# 490'2/2' 921 1 'D6 107'2.' 9'
894 689 19 2012 " . / / /263 /4/ .4'
9' 219 268' '"1' 104 63' =94' "1" ! 7 9'9 1'
. / / ' .'D6 107 9 S$<) 'S' 0 / 'M 8 29'06'
19 8'D6 107' . G6 8 4S? 9'0C6 "9' /192'
1 0' : .14 1' 01' 2D6 07 P
"1'" 63 192.7 0= '064 163 921 68' '88'
#+! * -& 'F6/4'7 7 16 '0'10 16' C'D6 16' 9'
. 16 07' HM!'". G 0Z 27 7..' 7 / ".'
7 VA 768 468 S 1' 40 2D202/2D6 101 F6 9'
] D001 8' D6 163' 10 9' '4 I9791' /.921='
+ ' F601.'9 1'D6 107 90 1H 01 2976 2/ .'2/2'
921 16 'D6 107 P' 2D60'91 08' 1 8 3'G 1'
8 402/2 0 1E 1' W9@1/162" F6 7630 80 0'
" 492161' / 8 2 0 F610./ 62' 2D600 801/'
C'7 G/ /'G6 8 / 9' 91 1EC'9 1' = 9. 93' 0 /'
6H '46 .P '0 /0 63 4' 46 ..8' 9 9 1
$ # ; %$< ^:8H8 $(60 A $ '
$' $' ' I 1' '
') ' ' ', 1 ' 0 ' '
. 'F/0 3'9 1' /'@21 0
0L4!0 O 499 < `
P .92468 3 90 @C 1 A '4910 1OC
4916 '10 @' 8 8' 6260 94
6 1 . '9 3' T/E0" 63 &" '/'" 1 3. 1'
S2 0 9101 3' "1" 1 3'0 7'C' 8 D2 D6 16'
"' 46 . 3'C080 #0110 18. . 6 93'./21 0'
](29 0.93"9 08 ! 01 468= D 46 ` G68'
468' ..68$'29/ 9412 `" = '.A1'T6/4' '
4 .03' 8 P3'./21 0 .101 F O0 3' 92$#76='
9 9 j' "/.93' .2 2 F60.'04' 064 .68'1 9'
4 021 9 .0. 103 CD 0693$' 8 0D603' 0 603$'
9293'0 9 03'./K/ 93' 198' 6/8 /4/' 6. '&2/
/3E4 /91 './11 01 /='. .'59 /20 0 0 .8'
/2'9 . 01 /`98'./21 0 910.68'0 / 68'
92 2E8' C10463# 1A9 H ` 8 "208 ./8 '
1 0. 2' 0T/281! R O90 0/FG 8 2 89

M D0268'06198'10 163' " 49 / 9.'.0 /'
F6 0'.68 868'102D 16 1 .2 63' =94'
G F 01 M2/2./26 2. . 'T6 0' 9'8 9 8 7 0'
26 = 6 .1. .2 0'.0 2 4 . / .1' / D026'
0 63 /68' 92 63' 01' 6 0 / 30' 0'8912 ' '
7 026 0'I 1'9 D/'.0 /'894 68'10' 163# 219 '
268'10 8 92 ' /2 62468 V C 104 < / SS r 1$'
16 2'"1' .' 219' 93'10 1 93'C' / D0268' '
6810 163' ! 61206Z' 2D60' 9384 .34'
0 / 93' 90498' 0 19'0.' 219 2/'894 /' 92 '
1 01'. 621' 2' 6 .3'10463' T6 0' 04 63'
2D 0$' 4 . 1'010J 6' 9 9/ 634 6 7 16'
& 9'10468' 2D63' 82'91 08'<0 / .3' 9 '
. 0863 91'10468 "917' . F6 ./ / 3'
/ 03'F60 10193'104 P3': 3'% 4'7 3' D .01'
1/1. 93'D/ 16 0'9 P'10 8'F698408 '
"1' 08 6 .3'4 2=92 63 9 4'M 8 293/7 9'
0' 60' . 4 6 1' 9' 8946 89 1. 1 68'
91 08'D6 1 =C104 63' 9F ..2 R'D6 10 9' 88'
'061'102D9 9 / 61263'./ / 0' /1 40' 0 19 8
C'46 0' 2'0. 9' = '0F60' E6 '09 'C'0F60' 2''
19 940' 29'=94'G/.'4 9 621' . F6' 92 63'
0'D6 16' C'1046 'F6/4' '. 0 203' /7 940'
9 . 021 G'./8 263' C'104 0F6 498'
4 91O`1' '</2 3'C'./ / 763'F6 4'G '89'
4 6 0' 8 /69021' 84' 'C'49 249' 894 68'
68'8 /690F' . 01FE' .2 68 200 ?98'
286 894 08' = C2 62 4 /690 `1' T6/4'
9'/7'104 9 3'./2 624K/2.8 '=. .O 101910'
2 9 60 ' 1 1.68'F6 3 9 . EF3.68' 9 '
.61 16 ' /218 24 . 823 684. .68'
0G?70 0' 0.11 '=.' 49 249' 8 198'0'. '
9/'F6/'862 16 ' ' .6 '< 94'8 P9 0'"2'
.68'. ./ 0D08'0.. 9 9'!0 /'C' 2D60'
046=' 894 68' 62. '"10D C0F60' 63'
64 163'=. 463' 22' 96 7 9' 1E
.2 1. 68'4'9 1' 6 10'/ D0268' / 168'
2/2' 98 16 $'0.'104 P' 2 0! E 298 / ' RS$0S"$
68 98 161' /2'9 1' D 16 /0 / /1D0268 '
104F3' 94' 894 O=1' /7'F6/'". /'/ D0211 0'
019 ' 04 0' 6198' 6.'/7 940'1046B' 621'
4 9 921 0# 9/ / 1 2' 8 / 8 2 '.0 468'
D 4OA'G G 8' ..68 49'F6 763' 7'
49' - 92.81'C ! 7 6 1 M D0268'104 3'9 1'
90 3 F6 p 9 1 /1921 0 4' F6/4104 P'9 1 D '
046'F6 0' F6/4' 9E6 1' 01 16 '07'/7 94/#
01'F6/4' 0 8 '9 1 /1921 41 0 .'F60 9' 4'0'&
F6/' 31 6 ' /2 01 12106198 K 8 90 '
8 ' T60 /'2/2' 921 863 8 1. '.0 40'
1' D 40'46 0'2 / 0' 'F60# . ..1' 0468'
68' '. 6 F6F' 8 /468'0.' 19 / 9 .8'
F63'6... 7' / 1 8 0 68'F60 10168'89'%_ %'
4 /. 1019'./2 1 2/ 19 ..462 .47 +? "6'
9 7/ 03 ! 69'9 F. 63' >'9 / 9 01 /2.=F60'
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W)ˢ =q M : = =

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/ 80 "9ˢ 9. .ˢ 29ˢ 8 019 0#".ˢ.9 0ˢU ˢ
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N. MEˢ"9ˢ06 / =92 63ˢ 01 16 ˢ07ˢ/7 94/ˢ10Q
ˢC "1ˢ0 62. 7ˢ / / 1 /2019ˢM D026 2ˢ
9 1ˢ 4ˢ 2ˢF6/ˢ10E 3ˢ 0.6 103. 1ˢ 8 9ˢ298 9ˢ
92 63ˢ M D026 8ˢCˢ 92 63ˢ 498ˢ 67 94/$ˢ
01 /29ˢ4 69 0ˢ 62.ˢ 9G9 8 923ˢ .2 7 .ˢ K
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WP %"ˢ S T 8 0ˢ.68

/7 9ˢ 168ˢ .2 7 9ˢ / D02cˢ 6/ˢ 9ˢ /2D9ˢ
/;183 07. 0< 101ˢ Cˢ4 / 6 1ˢ9 63 4 / ˢ
1 /2. 8 ˢ0.ˢ198 9 98 ˢ 2ˢF60ˢ./2 1 .ˢ 92 ˢ
63ˢ 1ˢ./21 2D 1ˢ 2ˢ 8 G/2 0ˢ ./2. .2. ˢ
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198ˢ0 F608ˢ ˋ0. 8 ".ˢ G079021ˢ298 ˢ
"9D.10 .8$ˢF6 0ˢ/ D02ˢ 92 / E 8 .4 /. ˢ
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/ˢ . /2 1021 02 80ˢ . . . .2. .21.?F6/ˢ
/7 94#/ 68ˢ 92 7 6 1ˢ / 803ˢ .04 .ˢ
6 . 021 29ˢ 101. ˢN2D9 9621ˢ.0 8 .0ˢ
. 621ˢ[Dˢ 0 6216ˢ.68ˢ8 019 0ˢCˢ 9763ˢ
3ˢ=/ 1ˢ 92 63ˢ0ˢ 92 7 763ˢ 0 0216 ˢCˢ
92 7 0 621#ˢ.0ˢ . H. .1"1ˢ.0 0ˢ 9 . 921ˢ
4/ˢ =/ 63ˢ 92 8ˢ /4/ 0163ˢ /4/ .3ˢ "1ˢ10 93ˢ
62.ˢ 9 91 1ˢ =/ 63ˢ" 3ˢ 6 8 Cˢ./ / .3Aˢ
I 1/ˢ09ˢ . . 01ˢ/4/ .3ˢGˢ892ˢ /2/3ˢ 1/ ˢ
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2/7 3ˢ : G / /2 G. 8 1 ˢ> G/8 Dˢ
0 / 68ˢ 219 916 8ˢ4 6 /2. 8ˢ .F6921 ˢ
763ˢ A. 1ˢF60 16 8ˢ# "7 ˢ 2. 1ˢ 1 1/19 93ˢ
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4 ˢ2/ 1 /ˢ 9 4 62161$ˢ9 D/ˢ /8 0.3ˢ" 7 ˢ
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T 4 ˢ 109 1ˢ2/2ˢ. 1/ 63ˢ 62763ˢ 92 ˢ
763ˢ =94ˢ / .8ˢ9D/ˢ 1/ . ˢ/ /2. 9ˢ
2/7 3ˢ 499 9ˢ 92 68ˢF6/ˢ . . 08 63ˢ" 9ˢ
G9 70 68ˢ 6 80 68ˢ 0 46 8 ˢ".ˢ?0ˢ
D291 3ˢ 9 68ˢ. 0G.2 3ECE"1ˢ 68 80. 8ˢ4 ˢ
.08 /8 293ˢ903ˢF6 .0.93ˢF6Sˢ/9.6 . ˢ /21ˢ
4 .6216 FEˢ / 2@ .3ˢ ˢ 9. .Aˢ 62ˢ
.1 02/226 E .2 68ˢ"429 939ˢ"U 6 101 3 0 bˢ
0 ˢE3ˢ4 1 9 9ˢ9 9F$ˢ 9 16ˢ .2 68 89.ˢ8 263ˢˢ
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4 9 . 0 68F$ˢ .2 68ˢ. /2 10 1#ˢ . 1 ˢ
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26 8ˢ ˢ9 D/ˢ 29F$ˢ 92 63ˢ" 63ˢ499 1ˢ . . 4ˢ
/7 3ˢ 94 68ˢ /1229ˢ04 98 9246 8ˢ2. ˢ
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19 2612#707Sˢ 9 7ˢ/1 02O8ˢ/8 29ˢ9/D20ˢ
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H 2." 03 6.ˢ 6 0 064 1O3 69463/ ˢ
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3ˢ061.120111 00 1 3ˢ9 02 ˢ / 63ˢ
4 1 06.ˢ./8 8 62 3ˢ/8 2 68$ˢF6 0ˢ 29ˢ.0 / .ˢ
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8 293 92 63ˢ 9 . 10/1 021 9 ˢ 9 "1ˢ 6ˢ
4. 2 16 8 6 1 0 4.ˢ 2 . Eˢ 76 . 0ˢ
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' N9 ' > ' $ #) , " ' ' ' ' # # W ' $)
c $ 1 $, > a ' < ' ' ' ' $ 4 GGG k B :
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JLc/' ' 9 ' ' ' ' , ' A ' ' $: ' '
L ' ! ' ' ' # ' < 6 ' L ' ' F - ' ' ' # ') "
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; ' ' * # ' $ ' '
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4 ' + ' K 5 ' 9' ' ' ' H : 9 9 / ' ; '
+99L (< \ , + 9 *7 < ' ' ' # #) ' E# ' . ' I '
' @N ; ' 9 ' ' ' # 7 ; , ' G ' ' #+L '
' LO ' ' ' $ ' ' ' ' ' # # : ' 1 $ ' B
?? (, ' 9 A ' K9 ' # E '
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282 ' 0//29' /7P 1 / / / / 246/ $) ' ' O * 8
K G 4 4 ' % $% ' 3 ' U ' A ' $ # $ # L ' '
0 13.0 468 <CED 40 ?#C' 2D 4' ' 9) G) B
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' T / Z91" 71 . . 2 6@ F09 ` " /9 Z' 5 6 L F L) ''I999'
. / <R 66612\F8' W9 19E / % 4 ' ' ' ' ' ' & '
6SC2 S22P07=/2 ' S4O. S S01 S1/S F 1 ' # ' E ' ' ' $ - < * M
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8 93ʻ F6 ʻ 16 08ʻ 6cʻ 4ʻ 6 6ʻ ʻ 69ʻ
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.ʻ 8 0D 601 /ʻ 9 ʻ .2 63# F6 0ʻ .6 63". ʻ
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07ʻ G/.ʻ 06198 ʻ F6 0ʻ2/2ʻ9 ʻ 299ʻ 9 ʻ.68ʻ
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/ 6 8 \ʻ 0ʻ 03 .ʻ 0 0ʻ /2ʻ4 ʻ4.2 F ʻ/ Q
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. 60 /ʻ . 60 /2. 8ʻE0. /ʻ1 G0210 08ʻ
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108 .2ʻ07ʻ./498ʻG/8 8 9ʻ19 0ʻ /2D9ʻ8 0 / ʻ
8 0D 201 /ʻ /ʻ / 0 16ʻ 0.6 .0. 3ʻ 8 0D ʻ
N 201 . 3ʻ 8 0ʻ9 1ʻ8 /2/ʻ 2ʻ02 80 76310ʻ
W 0ʻ 92 6 2046 F60ʻ"0 90 .8 2 6 ʻCʻ
262.ʻ "9 0ʻ262.ʻN0 0ʻ0 9G924 81ʻ I /ʻ
06198ʻ 8 0D 201 /2 3ʻ07ʻ. / .ʻ 92 6 8ʻ/ Q
16 ʻF6ʻ 0 6 .6ʻ 2ʻ .2 7 ʻ./8 8 62 ʻ !
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0ʻ / 9 016 ʻ 9 8 0291#ʻ 9 ʻF608 4./ʻ
79 pʻ G/8 293ʻ 86 10ʻ 0D 2.ʻ p F6 0ʻ
892...0 . 1ʻ 2..ʻ. .. 1.21 / 98ʻ G0210 0ʻ
N0.6 10.98ʻ/71 2921$ʻH F6 0ʻ8 923ʻ /8 2Mʻ
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ʻK& >X6 ʻʻ ʻ+7 % ! !ʻ& -8)ʻF60 ʻ 26/
A ʻ > 610 921.ʻ92 8ʻN9 021.ʻ". ʻF6/ 791ʻ0 1.ʻ
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2N4 . 1. 07 9219ʻ . .91ʻ06.ʻ/7

96 01/ʻ /1 63ʻ =/E9ʻ 01 /2 3ʻ > .. 92ʻG 9ʻ
86 10ʻC# p. 0 0ʻ4.ʻ" G02. 0 p F6pʻ8 0ʻ
. 1 2 /2 2 08 763ʻ 22/46 2 3ʻ4. 0 076ʻ
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1. .4 8ʻ :9ʻ 0 198ʻ92 2 02 8 p F60./ʻ
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21. 9463"263ʻ9 10D923 F6 93ʻ /1. 101.' 'S ʻ ʻ
2.4GD 7 9=EN0. .ʻ046ʻ 219 D $ʻ 07 .024/ʻ
. ...ʻ .. 93ʻ 2.9 .4 .3ʻ 29ʻN 0 .3ʻ 9ʻ
68ʻ 8 0D 293 04ʻ 21.[.4 / . 8ʻ29.. 0 03#
0 19ʻ 0. 923ʻ 01 7 3ʻ / 1 7 3ʻF 0ʻ 9. 93ʻ
219O94 93ʻ 07ʻ 0D9219ʻ. 90903ʻ .. .23Aʻ !3
/8 293ʻ 2.4 D 1ʻ I 0. 923ʻF6 498ʻ 2.4 . ʻ
463ʻ./2 49 0 6 "1ʻ 2ʻ 6 .21$0$"ʻ 2ʻG07 ʻ
16Eʻ"1ʻ 2ʻ046ʻ> 40 ʻ" 9 / 2 / .240ʻ) .ʻ
2/2468ʻ K. . ʻ ʻ299ʻ "O08ʻ . 68ʻ 9ʻ
.98ʻ 2 .648. 8 ".ʻ 6 9. 1$ .42/1 / ʻ
268ʻ41ʻ9 9 3ʻC1076 pʻ 0 pʻX 16 3 2ʻF60ʻ
2 G ʻ9 1ʻ . 46 8 ʻ"ʻ9 1ʻ 2.. .463ʻ 6. / ʻ
68 ʻ0219ʻ" 68ʻ 01 /2 3ʻ 07 16 .68ʻ 02ʻ
2 1 6463ʻ4 ʻ . .2 E3ʻ8)ʻ G07 . 7 3$ʻS... ʻ
.FEʻ 916 2ʻ 9493ʻ Cʻ2/1 /293 9410 8 92ʻ
(0462/2 2 . D . .91ʻ 10 163ʻ 04 2.. Oʻ
D.2428 1ʻ9 1ʻ 2.. .463ʻ:G /N/ G/ 68
2ʻ046ʻ.68ʻ046ʻ./21. 8 016 ʻ06ʻ 2 9 ʻ
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2ʻ046
219 .463 0. .23ʻ 01 16ʻ0ʻ 9ʻ 2.. D 7Pʻ
ʻ ! .2 E3ʻ0ʻ9 7 ʻ:0 1 /29ʻ . .91ʻ 9 ʻ
.4 60 C .. 924/ʻ 9. 98ʻ/7 .4 F 08ʻ
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19 9463ʻ/8 2 0 219 3 1449/ʻ 8 S 9 1 \KB \A?ʻ
2/28 > 3ʻ 2/2 ./8 / b163 . 3 . 6.9.ʻ
F6 763.0$.. 09/2 102 ! # ʻ92 8 G 3./2 10ʻ
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F6/4408ʻ4/8 20 \"1ʻ92 8ʻ10463ʻ2/2ʻ 9 ʻ
4 1ʻ 916 2ʻF60 10.93ʻ E3ʻ F603046ʻ G079 ʻ
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./ 68 6pʻ 62. 0219F608ʻ.0ʻ 219 D01 / ʻʻ ʻ
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7 8 . 1"116 8 F6 . 2D403 C . 9 2D9
\ 6 8 0900 1?1<[6 4 9 8 699/ / / 10S?
0D6 019 . /D2/ .5 12 O\ 9 92.1011 "S4E
00 8 D1110 1019 07 1 0G 1 9 1F6. "2 6.
d 21. 9C0 / "1 0 8 2 . 9 9 ` .4
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19$ 91 92 0 / 9 .91 F6 / 112
8 8 2 18 R9/19 149 8 9 D/ 024 906B .
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8 / 10 3 9 1 C 0 1. 263 F601.263 . .91
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29 10 ./D2/ 9924 8 /4/ F60 9 2 9/1 /
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1. D 1 9 G0210 8 010$< .1 0 ./ 63 "9 7
? =A 2. 13 H 2. 9 1 F6/4 2/2 ../ 498 9

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2.G/. 21. . 1/ 0<b 6/ 49 1 29 10 1
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> G 029 19 D01 94 F6/4 2 9/ 1 016 0A
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10 201 3 I 01E 9 D/ ".7. `.21. F0 9 S
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9 / .0 1.0 16. 1 I 68.2 8 4 1 , &
1/ 9 .39 1 . J9 010G 98 228 168 8 2 9
8 9 M D02 .6 8 C 8 01 7 .8 0 /29 9/
6 1 2= 24. / 2 8 621 8 .8 /19 9
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29. "9 68 2.. I 1 /12 . /6111 0161 19 A
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0 2 ./2.9 103 C 019 1 103 ./8 /2 863
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4/ 29 9 M / /29 8 100 /8 619A
9 08 91 01D6 8 92101 /119 8 C /D
68 08 27 7=9 0 .9 0 21929 163 0 1@0A
2. F6? 4 9 16 9/ P9 668 9/ 0 / ! / /
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94 1 93 1M . .0S3 0 0393 9 0 1 4 16

D6.240 H . D 10 ! /8 / 1 / "9 68 <.8A
9 ". I /8 4 . 1 1 ` ` F69 06198 0
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0 16 4 6 /12 "249 89 4 3 ,9.1S16 8 6
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20 C $ 24 8 0 "2c > 04 0 30 21. `9 1 /A
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198 O=# 1 8 0 68 9 7/2012 19297 0# 9
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4 4 0 F601.223 / .9 11 1/2 F6 498 0 /1
8 024/ "9 68 "4 R 012 96 "919 9 .
924/ . 9 92 1 E 2 "191 , @1 2 90 0 9
2 24924= 0/A 499 10@ = . 92 8 92 /3
"9 634P661.6 2 9 . ./7 9428 "1 9 1
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191 ./0 F1 1 2 / 004 F$ 916 2 .0D 1 9 /29
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89ʿ 9 0 0.63ʿ 4ʿ9 1ʿ468ʿ 2ʿ. / / .ʿ9 1ʿ 67ʿ
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9 3 ʿ /2ʿ.2 B2ʿ 0 3ʿ 2ʿ02 8 Iʿ9 1ʿ 94ʿ 9ʿ
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/ . 638911"A 1A20 83 F6pʿ. 1ʿ \\ S@01B'E ʿ
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29.ʿ9 1 9 3 9/ 68 F6 4F60 F639 21. D . ʿ
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. /2.9 163ʿ061ʿ2/1 /2.3ʿ 0 64ʿ10892ʿ07ʿG 3ʿ
9 1ʿ G02.0 0 01F6.ʿ04. /ʿ07 219 E. 16
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6$ʿ02 80 29ʿ. / .0ʿ 8 8 .4 01 02ʿ 0 3ʿ9 63ʿ Q
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. .3ʿ /2ʿ.2 8ʿ F69. 49ʿ 92 6 20210 0ʿ
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4 69 9E4.7901 2904ʿ 03 0 ʿ04ʿG03ʿ 96/ .0
3ʿ9 D/ʿ8 /1 ʿ02 80 3ʿ2/ʿ9 1ʿ 0.6 .03ʿ"9ʿ
D9.01 ʿ"9 ʿ261 93$F6 0ʿ02 80 2/ʿ8 /6.16 K B AAʿ
/ . / ʿ2 ʿ/7ʿ 29ʿ 80D 201 /29ʿ0 9G9 68
C .68ʿ 0 91 16ʿ$0.ʿ 0.6 103ʿ "9D910. ʿ. ʿ
9 3ʿ9 1ʿ 80D 201 /2 3ʿCʿ0 91 163ʿ >9 249ʿ
8 /69 9216 ʿ 0213ʿ8 / .6 /D 9 6/ 7079ʿ
9.F ʿ 0 .93G6 - 8 /16 4/2.03ʿ 98 9ʿ . ʿ
.3 0 03E01ʿG/ . 0 68 = .429F$ .2 A3ʿ 22 ʿ
4 6ʿ9 1ʿ8 /8 3ʿ /D 9 6 ʿ 2 80 0ʿ92 21ʿ
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16 / . /$ 1_/ / G 10$F6 G 49/2016 0ʿ / ʿ
D 9 >2 3 2 18 89.04 .29D06G 60#0 /F6ʿ
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9 1ʿ9. 0 19 9463 2. 6ʿ8 /8 3ʿ /D 9 ʿ
6 2/ʿ1G9/ 91 .63ʿF6 0ʿ2 G 49ʿ0ʿ 1 /2.ʿ. / ʿ
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2 D 9246 . 9F6.246 / 6306.9 /D 9 ʿ
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7 /26ʿ 9 9F691 3#2 /2ʿ 0 .O3 F6 0ʿ9 63ʿ 6ʿ
4 . 68ʿ2/ʿ 98 9ʿ 9F6 .6 04 /ʿG69ʿ8 /163ʿ
! 68 8 . 0. 01 /2 G/ 2/2/ 98 . ʿ /7 ʿ
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. 61ʿ+- 6 . ʿ " +" "&" &/ʿ >92 F 0 9 .63ʿ
2/ʿ9 1.06 0ʿ E2.9 3ʿ /D 9 6ʿ8 /163ʿ 69ʿ
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1 3 07 1 2.2 /2 41 D .6 0 .1 163 2..
219 .463 04P63 064 / /D 9 /2 3 0
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0 19 6.9 / 3 08 "19 F69 86 8 / 0
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4 D621 8 . 62 F69 " 8 8 /1 .98 04 0(
G& . U168 69 8 /1 /298 219 .< 63 F 498 "9
% # . G0210 0 4 D924/ 4. / /2.24/ F6 4
K". . 1 6D 92468 F6 4 08 .492468 .
1 .63 "9 7E 6D 924/ ". 08 .. .24/ H 9
92 8 12/6.. 0 .6 63 2 3 D 01 0 8) 7/2 08
0$./D2 1 0 G0210 0$"9 219 94 6 04
./ . 1.2 8 2 3 19 9.61 / . "P 863
. .08.2 ./D2 1 /29 8) 2.924/29 863#
"+ " -9)%# + =94 24 6 3. 668
41 92163 H 9 92 8 29 219 .44 8 /
6. . /1. "1 2 7 043 8) 09 9 2 G/8 2
763 F6 . 2=1/ 0. /2 3 64 . / 8 0D 20. /
.8 .6 4 101. 8 F69 .F66216 #0. 21.H9
4$63 202F608 8 /6.1 29 0 94.6 4 9 1 Q
29 "/ 62101. F 0$ 4 . 6 c/ 2d ". 0 9.
163 .6 4 103 4 M82 3 9. 08
2/1 /2 3 22. 8 89 10 91 .63 10 2 9
Y 6 8) G/29 1 F608 " 4/1P#"249 .1 08 4
416 0 91663 "1 C G02.0 0 262. . !G 3
+ % " 4629 2/2 .463 0. 01 / 29 2.9 9? 163 0
4 .63 / 3 9 1 8 /163 G /2. 1 F6. 0. /
, &# /8 2 3 92 8 2.. 94163
9463 9 1 2 8 3 80 89 C "2 6. 0 763
8 /8 8 2. 3 2 F6 763 202F608 0 A
6 8) F602168 9 . 9 1 2/24 D 1 0/64
F69 2 04 9468 G/29 168 "9 68 F$ 7/Q
08 .1 163 06198 2/2 0 / 2. 20. 49
94 1F69 0 68 16 9 0 0 .2 F6. 7/
2 8 : / / 2 2/7 3 F6 ..8 / 34 9 .2
1G3 9 . 863 0 .4. 3 9 1 46 . "/ 62Q
103 <. .. F6B .F6 16 64 . 68 01 /2 3 4
. 16 F69 0 .1 163 04/20 3$C .1 163
921 93 08 0 . 7 3 F608 ./2.6 O. 7 3
F6 92 68 C G0210 08 9F6 16 .9 F69
@ 2689 / 102168 4 9 1 X.4 949 4 9 1
3" D.2. .1"1 6 F69.2 8 ./2. 0 621 0 9
,.%&"/ ! 6 63 9 04/ 9 1 F6/4 ./D2 4/
298 G07.0863 3 921 3 198 / 3 8) 1 1
08 F6 9 .2168 69 8 0D 201 /2.8 6
4 .01 0 F6 4 4 . 7/268 262. 610 " 2 /
(16 2 7 .7 921 E" 268 262. 0 ... 92
. 9 0 9416 G0210 64 . 68 1.6163$

q ! E

01 01 / 616 01 . 0 .68 64 ..1 / 9 "1
268 2 / .901$8) 10 9 64 . 6 9F6H 16 " / 62
103 / 9 9 6106 0 .1 1O 69 04. / "/Q
62103 " 2 " 68 /G 791 1 "9 7 0 .1 163
46 9 E . 0 .1 7 . 92 7 . . ..1 C 0Q
1 /20 9 2 69 2 061. 9. 7 9 8 /O92
468 9 1 86 T 8 0 08 /19240 0 9
1.24 E102F608 /7 .46 8 /6..$C 219 946
04 .68 "9 G02.0 08 F6J 8 /6921 0
621 202 80 3 92 8 8 /.6 . 0 21 F6/4
8 /6.1# C G/. 46 9 $ "26 F6/4 8 /6.1 8
2 /.6 9 1F$ 947 . F6/4 ". 2 3 8 /6.1
0 94168 > /2 "19 . .23$0 1. 6 F6/4 8 /
69. 0 8 /16 9 1F$ 0 .1 163 9 07 9. 7
8 /#63 C 8 /69302 80 F6/8 /6.4C$
G/. 0 39 102 00 3 298 9./ F6/ ". 2
1 6891/ 0 91 7 9 8 7691 02 80 ! / 2
F60 ". 0 0 0 3 "9 / . / 4 9 /24923 F6S.
2. E 2 F 01 /29 G07.01 "1 .0 4/
$+/ 1F6. 8 8 /.0 ". .921 0 2. .6 /
/163 92 8 1 6 9 0 F6/ U C F6 9 99
1. ! / "9 7 .91 . ..67 8 /6.0.6 9 =
1/ 9C > 0 1/ 9 8 ..0. / .089802. 9 6I
.0.6 8 8 /16#F6 0 2 894 / 1G/ 0.9 F6/Q
04 70 8 168<894 6 92 8 ./ / 3 1. .1
"87 .63\. 498 0 1 C /./ ./$E0/ 3 1 0
. 04G .. C026 /0 / / D02/ 8 /.68
0.. !E 94 68 0 3 . 0 19 0 68 .020 93
8) ".G .6 0 F60210 / .9 1 8 . 1 16 .0 / .
" 0 9 FE .63 2 /8 2 0 897 0 4 1 7692 (
4/ F6/48 /6.16 C#G/.W2 80 9 1
64F; 9 9468 !# 3" &) .%.
^)C "9 893 2 940F69 /8 2 0 /./
8 /692.6 "1 9 94002 26 0# F60 9
07 49 2. 3 0 91 16 9 ..9 8) 02
10 0 8 /697616 =94 F6 0 8 . .49 24.
2 19 C "0D /F6/408 c../2 6 029/ 8 /16 .#&
. 6216 W4 / 0 W I 9240C 0 8 /..6
$92. 0449/ 8 9 .4010 168 G0210 0 C
9 ./.68 ./ 63 4 6 08 G079 I 9 "9 7
2 30 .1 16./2 1019 ./ F674 4/ / 9=. "9
"/6 .0.9 0 .02 6 J 1 D .6 G02 0 0 2 #'!,%
7 643/ 22 763 94 .2 . 60 .02168 F6 .
2 8)" ! ' S4 .16 6. ./2 6 0. > . 8) 49
7. 0 60 / 3 29 1 01 /2. 4 43 >9 7.
0 9 F6 4. 9 1 8 6 10 219 . ./2 9 . 04 0
F698 298 0#./D2 .68 F6 0D924/ 6 9
9 1 C 89 6 0 C9 3 86 1 3. D. 9 89 63
8) 0../8 8 /40463 2 # G/. 06198 / 63 0
1 /2 3 9 1 2. . 219 46 2 2 2/7 3 921 923
0 .1 163 04/20 98 6. "/ 6210.9 94 20
16 0 3 / 4/ / 16 0. ". 6 . / C# 2.9 3
F6 I "/ 62103 9 148 9 9 ! E 2/690.F$ .8E.2
198 ". G * 0 1 92/ 2 9 / .$C 162. . 93 " "& '
8 /163 62 / 62101 3 8 9 02 3 91
1 3 92 46 . 1.243 ! / / 3/719 . 02

2 (S 9' ! I 5' : I ! 0 I ' WB

' ' ' $: & '

4 $ ' ' ' $

' # ' ' E '# ' '

' '' ' $, ' ' '

' ' ' $ # ' '

3 M R RM ' ' ' ' , '

(. 6 / F60 8 8 0 / "2 69 0 ; $F6 0 1/ / '
1 /2.3' 0 1 .6 0 93' 9@'/ 9 '" . 2 /193
' ' %+ &) . .

AB' ' (' '# ' ' .
') $ >

E 0'. . 9 1 ./2 1 1'4.. . . 1'F6B' 29'26'
+.%('1 /2.'2/2' 221' =.4' 2/2' / 8 29' " 69 13'
92 63'9 '. / 8 /3 d1 .3.2 8' 92 6'.0 92 '
0 / 8KF6 0'. /1 / 9'9/2 1021' 8 .0' 4'9 1'19 0'
8 0b 8 . F61. 29 307624010.' 014/ 8 20 '
16 ''0 0'92 8 . . 8 9 10' 2' 021 391 0' 8 10'
621\# 49/F1'9 9 193' 89'198 9 . 'C' / '
/11 /2 3'F6010/ ' 20 O8' 0 110.2 'F61.'
04'10 612'9 1'29. .+02 0#C'F6 0'2/' .1E 621'
/ 8 01' 29' 8 019 0 'E4'. 1 . . .3 2141 /H0 '
e E 1 93 . 'F60= '1' 91 01 /4 229'0619 1'02 2O '
EE ; ! "'<92 ! 2 11G0791' 0 8 4F0/4 /D114 161 4 '
. ./'9` 8 8 /1O 11A'20 6 04981'".'0 89?
16 8 F6= I 1.191 ! 6 03 9 1 6 8 2M 1' 707. .1'
8 / 9 916 C' 8 1 0' 8 /1 .9' 0.6 1019 / D0 '
2 E0'9' /D 9 ` /2 3' %0)' 2 1 '8=6 2011'
4F2 / /'2/2' /D 94 11 '"1')++ * 'F6S'
&!'2/2'12/?S2.21 F6 40 1 29211''9/2 0 '
4 6 2' G079021' /2' . 1' 9 /
' 201 924 '0.6 .01 '08 1 1 9i19' ` 4?2 6
6 8'. / 13' 02 8 06 8' 8 921 3'. / / /3'9 1'
F6 2' 1'C' .2 1 3= 8 8 9 ` 39 19962. .2 '
1 ".4 4 27/661202 8 01. .49111 "9E'9/ '
/ 3 2/2'02 80 ' 6 0 .2' 2' 8 0D 32 9 8 '
"9 8 1H D 91# 0\/'F601E4 2'1/'1 /1 /11'9 1'
10 11 60 92 6 .2491 2' 1219 D924/# 2/2'
. / / 3 F2 0 99/ 11 1 .3' C' 07 .0' 97 '
K / 3 1H /1` /2 91E2@41/12 2 / 'M1/2
01119 8'0 1 8 0O'192 9 2'1/9 .' / /119191 0 2'
8 .1 90 2/ 'F0 02@H6 8 229'10 I 10'" '
. 9 =' 0'69 9'C'.72 1 60 /Z 1' ='92 8' 0IP0=' 1'
] : e ; ? ` / 9 @ 2 / 0 'F00 13Z=4 1. '
2.F/9' 03' 919 ' 030 2 '
A' . 1 #01F$04. / 00 9". D/9/. 1/?.'./2 A
08 .2 ".1'D. 4E0F609 1 2D631@' .2
.'D2 12 F6 '10. `9 1'0 F11 3 121 924; F6)'
- 0 @'02 8 0 ' 1/2261296 2' O19262D6 '
1234.2 10 8 92 5 .O1 ' 92 01' 8 8 2 '
10S9. . p @ \J/ /1'92 8 / 1O; C/4/ 2/ `'
261 62. TS02T1108' ' D 04 .8 02 8 0 '
2. . . 1 /61 2/2/ ` 2 ' 9. . 2 8 921/ '
9 04'<0 @9?L[1 4 9 ` 03S ?019' 1'2/' 8 /'(
44. / 0 1/@ 911 01 F / /4'102@.24/ 1 1

.91'C' " 4.24/4 10230 8 .216 8 04' F6/4'
0. . 6 0.$' C064 924/ .1G . '1/2 1 6 ' 6 '
8 2 Y' 8 916 8'C' 0D/ .3'0 0F$2/ 0 ".'
1 D 01' =92 7 092 0' 0' 9 '9 19 26' 8 9Q
4 6 8' 921 6216 ' 'F6/4' 0 9416 8' C' "9 "1'
./2 D2016 8' < 9. 97113' >' 8 664 2 763'
F60 ' D Z3'/7 9 I / 8 2' .2 ! 7 2' 8 8 /691'
9 . 101F 92 62 ' = .' ! 262' 0 8 3'9 'C'. / 8 ' - - '
8 /4 63'" ! /298' 9 ' 91' 9.9 1 / 98' . KK ' '
. 916 8 - 69 8 0D 26 8 0. / / . 763C /6 3 0E $ '
2' / . /1 9 '8 94 6 8'0=198'1 01 ! 2 .6'8 '
F60 0' 9 ' 04 / 6'. / .6 3'98 /2. 8 'F6 I r r'
F6 49 2104 E07/7 . 1 1 02D021610.' 9 9'
10216 '"1: 01/2 . M 1 . F69'. / 8 16 .3'
"/ 62 ' ' !#' &% 0 .& '
I H> 6d02 8 0 32/2 /19 19 9 8 9 '
" 0 4. 1 ED'296 2 ". 0F6.6 8 0C9612 J ?' &
19 96 8 ' ! 0'/ 8 29'0 8 8 0'10 16 8' G019 '
F6 '8 1 /298 9F6 1'.9 10 8 F69' / / '
@/2.8'F6010/ ' 1 8 0 6 8' F 0 01 8 ' =94'
23.' 0 163'19 963' 4 .E' /19 1# F6 0' = 8 /44'
19 0A'F60 101.3' 9 . 1 94'.0 / ' 8 ' 1 D63'
0 0 F29' / 72.36 8 /'F 90#190S0 621 "1' 0 '
1A / 0 1 2/2 .21 621' = 2916 160619 8'
261163'9 1' 921/=EO119' P' 2.0 3'9 9' / '
11' 2 8 0 F6 1P 8 29' " 1@' 491 8 921/ 0 '
3 .2 763 /0 /1. 1 27 @ ' ! 6 8'
92200 8 8 0 104 11"610 =#' 91' 96 8' * * . '
10 / 0.49 0 / ! 1 / 06916 C' " 10'
91 0 8 1/07 10 ' HC .9 9. F3C'9 6 9 0 '
1 / R9'30 E/@8'. 7 1/ 8 ' Z.c1' / 0'/ Q
D020'4 9 1 1E0/9'. '21/ 0'P A'/ .0 /3E2 210 '
8 92' 02 8 0' 2'. /112@ 221' 9 8 1 2 '
F09E 1100 01` . .9 I] '=' ! 6'/4! //263' 1/ ' =6
2 111 " 'D '06c 16 ` 49 121123 " 49016 'C'0 ' "% & '
2 8 0 2191 .9 9' 4 . 0.9 4923 1 C 2/0'
?0S))S 92 94 0D31/'9/2.2 1 /2 309 3'
"979 8921 2Z ! '01F1E9'049/'F6019263' /263'
(.6 8'10 6 ` D 161' I 1'. D/10 12 ' 0 1/'0 '= @ K'
(2 @0 1 999 C 163' " 1' " 49 .91' 02 8 0' 0 '
E4 . 1. ' '.0919 '"9 7' 12 3' '".1929 . C'
.M 8 8 /4 / 9121 .H9 / . 8 F69" 10 8' 49D01
=1'# 'E 1 ' ' $) , '
91 ; # # 3'
$: $: < ' A # ' $ '
: + $,)) ? ' ' ' '
0 4 $# N: i ' ' L # U ' '
/1 . 0 8 9 1 1/2D6 10 910` 10 8 94 /F6 =.'
' 1 '- 5 ') ' $ '
F $: : 9 $' 4 ' " '
8 0: ', '

A' B '= "' '= "
S ' $,:'* # L(# ' >'
"7 49C2 6/ 02 3 /7 90 F 0D 16
8' E

2 6 .892 68 7 / 28 H.02 80 =62.
.2 8 '='#G.C .F6921.3 7. 4.898 / 0
4. /82/ 2 /82 3E 669216.. " 10 .
01 /29 0 924 .93 F60#408 04 7 /3 4. 0
%! 2 8 0$ 4 .6216 F69 "6 D4 0 60 2016 0 0
% -N 2 .27 16 G 9 863
4. 92 6 C 92 7 763 " "1 0E E. 9
4621 '^ S . ; 89 S 49 &", % / D0
&2 3 92 668 (
: 5 8 / D 16 .0 1.0 9 1 1 16168 C#
/ 4 2 .8 .6 0 0 8 1 0.10 /268 . 9
1 . ..1 4 .92468 4. 3 F6 ./8 8 2 0 621
C F6 / 0 02 80 6 2 = " 692. 68
>. 249 4/..1 90F60$02 80 68./8 8 62 0
621C / 0 04./ 63 C02 808 < 86
9 1 2. . ". 621 92 63 8.8/ 0 0 .6
4 .03$G . 92 8 29 ./ / 0 2/2 81
I 9 91 08 0 0 F6 " 6.2. 7= /82 763
./26.2621 0 0 F6 02 2 0 763 F6 76
408 I / 68 "9 7 F60. / 8 1 ./2 6D0 1/
293 . .9. 0 ?U ;
V3 !3% "+: ,F 7 #B /?
D_@ S + . "%/ %%&". S K&"& %/ & # ! +
! &6 ! ; 3 % . + / 4. F1 723 4 ..0
468 D 01 8 :G ./ "1 C 4. 8 3 02
101 3C 8 7 .06 3E 2 F2 763 :2 .63 F2
./2 1 1 94 94 .63 07 3 06 P0121
"). `. 60B 0 3 2/ 4 0 429 9 . 7 0 A
80 M82 92 63 46/3 9 9 2...X 0 / ` ?10
7 68 CD6 168 0 /38 2 8. T2 10 292
2 D298 0 9 021 ". .01.8 G/8P 763
80 89 04 4 . 203 C 9 98 03$" 68
F6 498 9 .E F6 0 /82 0 ./ / 0 9 9 E8$
064 168 . 0.. 4. 23 F6 0 2/8 20 9 68
9 8 /292E69 F8763 /82 0 D2 .0216
"/. 76300 6271/3064E. 9 .9E 6#/ . 2/2
F6 `2/8 20 62.C D20 .4 F60 "/.93 C
72 49/ .68 0.4 63 1064E .C4E .. .
07 0 / F608 / / 0 1. 0 19F69 F6 4
E60 2 2612 .$ 8 043 ./2 9 104 6490
1 0 8 C . .21 0 8 060 163 FF08 " 63 H 2.
./ 68 F6 07 / 8 60G16 "1 /F69 92 6
9 9 621 8 61 3 =) 6 4E3 64.2. / .3$F6 0
G 4 99 .8) 2 1 82/ / 8 H / 21
I .0. . 9. E247 92 668 / D020
F60 9 2/226 6 .0 9 .892.0 F6016/
4 1 2D6621 94 29 9 62. .6 F6 2168 / .
0../8 8 /4 ./8 .3 " 68 D2968 0
. 621 F6 09 /.6 / ./8 . /7. ./8 2/1/
D2963 4D/ 0 0 9. =94 2/2 49M /.6 63
" 16 F6. D0.639 1$ D/ .2 8 H99 1 0 S
6 0..C / 1 . 6 "9 16G . ./89
<F6 G .4 . .6 /.6 0 3 2 D 0 894 F6 .\
.. 9E 1. 2 929R 3 ./2 .0109 6 0 .2 12
8 / 10 2 ..2.7 7 6 21E 1.0 10 F6/

2 840G 968
! ! .&.%. M.6 63 9 D/ .0 0 9 6 3
/ 163 468.. . . 7 2 .9297 3 ./2 AeAA
.016 .24/ .8 98 11 C F6/408 1.I
0 1 /2 3 8 /4/ 9 6 2 " 49. F60 0463
46/ " 4923 C " 68 T6/4 /.6 63 D0963
9 9. 8) " / 9 .1 9 . . =2.12 F60
@.62..9 0.980 8 29$.6 2 19G91 3
2/2 9 91" / 4. .. .2 8 6892 6
. 923 9. 4 . /1911 6892 04 7 " /RA
/ 68. 1 2D6 2 19297 3 /2 .2 8
892 . 1 2D6 .6 F6 0 . 187H/ . .0 4E
.. "1 08 8 .0 7/2 3 D2 . 0 D 4/
G68 4/ 01 6892299 J0 468 R P.68
9 1 M.6 63 9 D/ 0F6963 9 1 4. 1 02 6..231 A
1 02 6.923F1 4.8C . P6 E 1.6 2
9 ./8 8 /2P91? 0F6963 0619 2 "1 8.G63 S
.. .3 9. 0. 8 6 F69 0. 4 61 3 . / 1 EA
. 6.1#09 .2 8 0. 8.4 6 .0.4 O 0 S?AL ? '
16 1 9 D/ / 026 " 63 0F6968 AH9 064
163 09 908 / 8 '$ D2968 <208 /4/ 6 9
0 40 9 1 9 G0 01 / C D 00J 101 163
16319 .6 1
5 I 91 . .? P9 1.1. / F6P401249J.0 6 A< 4 A
6262. . / / . . .6/ 4 U 0 G7 3 4. W
02 1 0 :. .668 9 1 F6 4 ./ 8629 0 I
0F6p 0 4 ..T / H?3 R 8 263 6A
8 2 3 2016 9 2 9 1 .2/ 9 1 249 2 ./
F6/4 9 .9. 9 </1/ 6892 .. 10. 2 2
1 8 3 0 . 763 " 6 92.1 0 6 ! / / 9 1
! 1 98 .03 6. 19 8 263 "9 6 . 4.3
9 .6 2 ./ / . 19 8 2019 > . 169
./ / 6 . 4.3 2/2 F6/4 "9 7 1 / .
. .3 94 F6 0 2 .0 9 1 8) .9 2 16 V ! / Q
/ 92 8 219 263 8) ./1 / 68 19 8 201/
68 2/2 " 4..6 F60 10 Z .4 "1 /4 1 . 11
9 . . # ./ 63 "9 7 19 8 201620 9 1
F6/4 " 68 1G C 1.228 01 0 1 6 9
.E.410". 68 " 63 2/2 9291 91 "1 0 1 0 C
! / / 0 ./ / 010 4 416 F69 9 P668
8 / 9 `1.68 0446/1. 8 2016 0 08
.1 . 88 / 9 219 8 20168 69 2
49 2 168 4P 16 `J ../ / 9. . 6892
"10. 0F6W "J"9 7 T09 9 262. 6892 262.
19297 P $. 2 ./ / 763 0 768 C 2
\D 62 I F6/ 68 "0 0 8 1 /2.j "1 9 0
/ . /2. F608 27 621 1/ .3 "0 E /
& 6216 ./ / 93
T 0 ./ .0 19 /4/ 98 C 0 / .8./ 4 A ?
D201/3 0. 1 .4 76 6380 89 .06 03
9. . F6. .20 0 =0 / 9 1 0 .1 1 / 69
F60 .03 2 G68 4/ 0F6./ 0J100 ../ .9 9 S
.0 / .< ../F6921. D6 11 89 /6243
04 0 168 9 .. 01 /298 4946.! `3 I 63
"9 7 .. 0 / 0 9 / 9 1 ". 60. /

'E6/ 261 .24 '" 8'G07.1#C 46 . 3' 64A! 2
0 / 0 !E 0 63'"9 7'C'0/Z63' 62.' ./24 '
892.0' 1F6.' "." ./ / .3' 9 ' 0 7/' C' 2 D /'
./8 8 1 ' ?.' . .. ' 0 / .3' . ' 46 . ' C' 0'
80 /' / 6216 ' '/1' 0 / 6 8' F6/1'. / / 6 8'
.4.3 298 9' ' : 2D6 3' .. 9' 46 . 3' 9 1E'
0 63'C'080 63 9 9' 498 ' 94 E0. . 06 19 '
63 0.9 763 0. 463 ' ! / / 93' 621' G ' 0'
663 ' 62 .963 ' 6 6 903 ' " 4 3 '. 6 963'
0 763 2 D. ' =67' 2 D /' .2 8 6 963' . 21 '
2.6 ' ! .0./8 862 0 .2 0 0O60Z 92 '
63$ /2'. .0' / 0 ' >.' 0 / 6 8' 0 E94 / '
2 7634 . .16 ' 2 : G / /D 0 02.0 6 8 '
21/.0 .. 49 /4/ 9' .0' 9 9' 1 04 1'
F6 '49' 0 / .' 4 110' 621' M4/ 98'
.2 8' 9 '"1' 0 .8 ".'92 8' 19 90' P. .03'
2G68 4/0F6./' 8 10' C' 4 6.0 0 / 98'
. 90 .0 / 0...40.04./F6.24684 .G6 '
26468 F6/4 08' 0 468' 9 1 '.68' ../'
9 8 168' 2' 09 .' ". 0F6= /4/ 98 0. 1'
T 9' /4/ ' 9 ' 0.6 0' F6 408' 0 / / '
.. 101 3' 2'G68 4/'4 6 $0' 0 / f'.2 8'9 '
' /4/11H 2.'F609' 0 / .'.0 921 .0 .8' /4/ 9'
f'. 98 .210 P 493 '2 'F6 40 .8 2 ..'A'
8 168' 1$ 80 9'.2 8' /4/ 98' G07.1 F6 0'
0 / 98' G079.' 0 68' 0' ../1. I . 1 " 1/'
9 8 /$ /8 2 0' "9 7' /4/ 0 0 ' 0 40A' '
F6.0 6.98' 8 263' # F6 0' /4/ 0.0' P9 / 0'
.'.2 8' 2' 0 / .'"P . .'G68 468 .' 2' / '
4/ . ..68 '=62602E92' 8 '0 2.3' 0 / '
71B3/4/ .3#F6/2 8 .. .3 498' 2/.02 '
R /@9 16 "/.076 3A 1.2 8@ / .3 .' G& 4 93'
0. 93' 62.'40P.3"06 1. G0.. 7 CD293# '
61 4 /4/ .308 01 3 0 / 7 3' 9 /249 11'
1F6.'"1' D63' './2. 91 /'P / 93' / .162 '
462.$ 10/4/ .347F 921 .0 / 9 0' 92. 602A'
4/ ' H S# G . 0.' " '/4/ .K' 9 6216 '
M4/ 93' 0 E' 9 ' 0.. 498' 6.624 "9 8 / 9'
! ' 'F6 ' / /8 10216 ' 0 / 93'. P/ 68 '
=621' 92 8' .019203'D 01 F6019263' 04 8 2 '
8 . 4 3' 0 4 3' .EO R3' 2O1 186 'H 29'
9 6 921 76 ' 60/93' 6E .' 0 0 3' "9 7 2D 0'
1 ' 9,' . 62.' 60693&"J / 6 8 $F6/Q
68' 2 3. 7 '0 192. 08' 2/2 /6/ .0 '
"1'E / 68 8 /'1/ 1' / . 63' 9 68 .0 2'
. 1F6/44 # d1 01 ; ' < SA\/j
')% 7 -&"/D+ .% ' +F +#+ D'
3": &" %. 'F6/4' . .91' 606 19 ' / 90.'
F602F608' "/ 6 10 1E' G/ 8 293' / .6 3' / '
98 0' 8 998 ' >9 9 00216 ' "9 /'G/ 8 293'
.0 =G3' /4/ 763 'F6/4' G 3' .1 97 68' 71D '
4010' Z68 .GB/ ' 9. ./ 6 F6 763' 9 . P2 '
4 3 080 9 01 /2.' 076. 6 96 63' 0 /A'
F6 ' / 63" E 9 1E E I ./ 4P' 9 16 FH.'
. D9 0 . 'M 00 229 68' / 0 3' 9 1' 2

.0 .9 ' 04' F6/4' .68' 163' 0 ..24 06 9 .'
4' F6/4' 2 10 ' 4 9 .6 ' 6 9 /G96 8' 9 1#
<2/2. .01' .G 9' / D0268' / 0< 163' '
1 .. .3 F6/4' "6 1' - 0 9263' g 9' 49' " 6' 0 '
.0 ' '9 9' 0 !. / .3' .9 97 ' "92.2.6 /=EE'
69 /9=' ! / 9. 1 '.0 '20 68' 898 '
7 0208 "9 ' 29 668' 9 ' 20 93' 9 02 62 ?'
6 ..220E N.2 'W .02 ' ' 7. 163' 0D263 '
?' 0 1 '=688 49' G/ 2 ' 2' . 0401 ' 4.' / 0A'
71 E =#0 E' 86 1 .0 62.6 03' 808 8 0 93' 6'
0' /3' /2D / 68 9 G8 / 4.3' "9'. 7 / '
89' 4 46 8 'G103 'F/ ' 92 921 0' /707 E/ '
. 1\ . 1/ 0' 1# / ' H 2.' 2 G ' / 10. 86 Y'
21 E' 9 9863' G1. ' "9 7' / 0. 621F6 '
2/0 9 021E 1' P93' R07921' 92 / "1' / '
.6 /3 ./ D0268 / 01 1/ 68' <.2 9' 0'
016 8' 04' F69 G6 3' /4/ 98 ' 249' 8 H 62'
.91D 069 / 92.98 6D 60 2 ' / .9' < .P A'
1G 9 'C' 9 2 . / 63' ".' 0. $\, @
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.2 8' 191 /' /4/ 9' .29.028 ' ".' G/8 293' " '
!0 70268' G& 6208 8' G0 6' 0 9' : .G0 '
D/ . ' /4/ 93' 26. .' 4 9 621# F6 0' F6/4 ??SSS' A
269 P' / 889 1' C. / 619.S8 $' 10".' / '
261 1 /2. 8' 4.7.0.' F6 440' 9D9 '.02F608'
261 9'. . .8 .28 8 #01' /4/ '2/2' 9 1' . 6! '
8 /4 ! 68' 1' 091.63' ' "9 ' 0F6963 ' 449'
F6/4' M.63/4/ 68 ' / D02620F6. 2' 90 .. pAA A'
9 1 / .63'. 7/ 1 8' 0G7 2' "9 1 9' . ...A
G '9 D/' 9 904261 .04/2.8'. /2 9 .'
/4/ 1' G.9.'. /2 9 0104 8 10198 A
= I 1M' .0 .M D6 1 /2. 8' 8 /691' 49' 4 '
F 1 1 1019 92 7 68' F1 0.62 00.0#
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22c F ` 1\63 2G 921'A > 9 2 ' P 610 1 9 '
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6 0' 62 9 1 912 3' '@6 ? S X69' .S ` S0 '
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10 /01/E ! 39 ! M111 R M16
P3 'E6` 01S3' 6 4 ' 91' 0! 44903 01 R 6 '
29@./21 8 1$' 69' 2 @Z3' 8BD2 8 ' '
E1S'01F60 93' 2 103' 1 9' 2AF60 SC 1' / / '
/20 93 /19 1019' E 603 ?01' 4 6 / ' .'
69' 3 ' "' ! T111 00/'01 049 10=0 '0 64' / '
921 0 9 2' .2! 763' 0 61' 4 ' 019240'
12 ! P '"1' 0 3 /2@24 0141 30 8 1006 '"1'
68' 1/16 8' ' "4 0134' 1/1/' 9 0 010' F00#
100 91 2 2020. 1 < L S0U71 0/2' 9243 '
16 9 0 010 'F7' 4. 9.18 68 0D2 .04 2 3' 9 '
' A<10 1 .91 . <S /19240 .'c .2 3' - 08'
.2 12' 1/1 ' "8 10' 69 1 9 ` 1 .16 'T60 1U =/ '
2F3C' /4/ 93 / . . . 07' 2' 8 .4 F' D92. 01
&0.' 92 8' 4940. ' 0' / D020$ 61010' ". 4' 2'
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49 .9 =) 2 9 C H 9 0 "920 68 2.
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5 0' G0791' .0 10' : 868' 1016 A' =. R@=/8268E2/2' . . ' 92 ' . .. 2/ 29.04/ 2 /2988.2198' "9' 9' 9 ' .9. /82 024/ 0#1. " 0' 8923' 0' 0' 89 D0.' .F69'92 8'F6 . 'b6 4' 2' /8' 2/' " 49863' 061./D .0863 /8268'91' =92 / D .6 ' 013'04.<1 /f 1' /8268' <E601.263 80D 201 60. 1 .2 63' .2 8' ./8Q 862 3'C' 80D 20. /' "20'268. /' " 3'91' 0' /29'9 1921 0F69' 4 9 923' # /8268' 06' 19 2' < 9 1 68'F6/4408'91' =' G02.0 80' "9'" 68' 2' /82/'0 0 923

),# I.62468' /2 1' H /1G9 93' 9 .01' F69$!4/.901' / 1' 62 =1 /2.3' 92 668' 9 19 2/ 68' .802. 9' 2' / D02 3'0 94 /' 2.3'07'/7 9 3' 246403' 4'9 1'8 /1 /293 ' 030. 1 2 O1/4 2.3' = .' .680' / .' /.668' 0746. 863 2' / 0.68' 2 G '.. 2 863 F6 0' 162.' 68 2 3 9. .3C8/ /' /.668'04 6.' +< ' / 491 . ' ' 4<' / .'./228.086C' 84' %0. /' (S 6 4980 0 ..' 6892' 'F60 9' 9 1' $ 4984.' ' ")/' & F6 4 O2 ..68' 16 2' 6 6 .68' 4/299' 01 68'0 0 901 =99 / . .01 1.8' 1" /08' . . & 2.'.. 9 19' 8/./'0.' 692.9' /.6 /3'1 023 .' 0863'04'0 7/ 93' "9'0 0'F ' 1021' . '8/' 6. ' " 4976216 ' /7' 8 /163' 8 9 /298' 980292.98

)! ' V I 168H /1G9 .3 . 403' 0../8' [' ' 8/40104 2 /820' 4/.91F69' 8/.P ' 2.3' 07' . .98 3' 92 1763' 219 ' " D 02468' 0..9 103' 802. .' 2 /82/ C.68'/..6 ' 82. 21. 4/ 8 92468 0.992 /820 ' 99.'2/2'F6/63 /82'.98 / . ' 2..'F606 3' .01.' /2'.2 8' 9' / 9 621' 80D 293 2 ' 9 949 2.' C'F6 969 2.'G68/ .3'H 2.' 101 8'0. 7/2/2 . /8268 29. 101 80' 201 6 1019#' F6 0' 162.' 6 8 09 1' ./88/1 /' / 19'0 89G10 68'.0 / 98' .' 9 D/' 2' 0F60' "97989219 '0D 1010'26 0'0 0 91' 80Q D/' ' ". ' 80 89' 4 1/ 0' # 2' 90498' 9 7' F6 . ..2.. 6 0C'9 9 10 944 .6 $' ..68' G68/ 68'.686O63. 1C0D .01 / ". ' 26 ' 9446216 80D 293' "9 G/ 7 93$' "2' 4.' 2D 010' /820' "1' 9 02.G/ ./ 68'=)' 0 D /1 M1 68# 1'.68' 9 94 1 02D6 3'C'G6' , . "%' 8/ 93' F .6. 9' 610' D 0.0F69' 9446 116' /820 I 1' D 16' /8268' G02.0 80'H69' A 0 0 1/F6 08/692 7 6808 .26 . .9 1/ 68'/ 10' 02 80 7 3' 219 ' 4/' 2 92468/f.6 . '= 'F6019263' 4/ 8 621

' /2' 98 9' . /8268 T8. 08'98 .1/ 1 " 102/2' /820 61 =94G/' 0 6 2' .06 P' .0498' .68'.0' 'E639 E /8268' 8 94 1' 10' 1 80'. 7/ 'C' 2' 6. 3

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408 ' &' M 1 0.90' 8 9 / 0 94' & 8 / 691 ' '
2 10 F604 6 946 8 ' F6@6 8 ' . 6 0' 8 1'
4.96 10103"1 621' " 16 ' 8 0 2 EC 9C9 '
1 / 293 ' 2. / .' F6E0' / 1 0.90' ` 9 903'
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2/2' 0 68 0 63' 69 1' 2' 20/8 . ' "1' 2'
2. /' "920 68 29 6/ 68?8/.63 X92 63'
F6/4' 0 / 6106 1. .'./ 198' 2' 0' 4. '
. 1 /29' ./ 4 3' ' F6/4' .2763' ".21 '
6 3' . .4 4 .' . .' 4 1 24 68 ' ! 6 63 9'
.06 089 9' 610863' F6/4' 9 63198 / '
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' , 'G/ 0 E'./8 0 93' C' 07 .0' 219 '
9 0J19' 29F6 . ' 2 ' 9 63' 9 93' 62 .6 '
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4 4 2. 9' / /202 6 ' /.6 3' # 9'./ /Q
3' G 802' 6 6 0./D2/ . '2/2' /.9 1'
29 0 1684 7 61 /2.'d 4 D.2. '01F6.'
0..6 010' .0 68' 4 H.71 /29' F60#0' - 9913'
2/8 2016 ' 69' .0' 1' "2P 9 0
E 3?' "1F603' 1' 2' 1/. ' ./ / .$' 6.' 0 1 3'
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1' "1 0F69' 46 9 A' : 0<H# .0' F60' 8026'
048 2 016 ' 0' ! 7 6 D/' # F6 0' 2/2' 49'
. . . 8 .4 .08' ..0 . ' 94' 9 /2 763' 0 '
9 9#=)' G9/ .1 .0' F6S' 9 ' 0 1 3' .6 6 F6.'
0..6 010' 0.' . 921 .0' ./8 .8 0 /' F60#
" 49 .91' 0 1 68' 2D6 0 68' 24 0'
./8 / 1 /298 ' 198 . 98 ' ./2E . 4'
298 .68E0JP /298 " 68F6. 9 F6 1' C'
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1 0F69' 020./89' ./8 9G.24 .6'
A F6 970791' 20 / E .
9 1' G6802' ./ / 3' 2' 0 193' H2 1 .93' =)'
./8 / 103' 4 . 1 / '0..6 019' 0 .2.9 F69'
048 2 1 010 '04 9 97108' /82 68' 0 1 6'
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10F69' ./ 63' G680268' /7P4 68'
9 1' 0201/ 093A' b6. .S 1 .. 1C' 4 6 4668'
2' 0 193' ./.68' 92 12' ./ 63' / /2 16'
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L , ' ' ₣ ! / 63' G680268' 9 1' 0 3' G/8 2 3'
0 19 0' 9' G07923' "1' 80.. 0' "0 E3' ./2 1023'
/ D083044 69 002 80 / 1 . 0' ./ 1 0 0'
1 3' ./ 63' .2 8' G680268' 06 93G0791' 04'
064 92468 /.6 /304' " 492468 ' 9493' 04'
02 76 02468
:0 3' ./ /3 39 1' F60# .680 E3' 1/16 11'
./8 91E 219D 68F6.' 0' 1' =94' F6 0' 04' 0'
1 /298 0 1 3'. 0 81' 2..9 0 0# : 87 "1

q !

./ 0 901' 6/' 1/1 EE0 3' .2 8' 066 0' 01/1/ 9'
2 1929' 0 3' / /81 6. 0 1' 2/ 1192 9 '
1 291' ' .' .2 8' .3' 08 610163E /2' 9 1' 08' '
63' ./ / 3' 0 3' 2 ' 01F0 /. ' S @# / '
F66/16 ' :G / / 9 ' =9.024/ ' " ' ./886'
2.8' .68' 1/1/' " .08' G01E9012012' C ' " '
6921 3' " 69 949791 0 /F6 ' " 0.23C' 02 '
M0168' ./2 10 .1' 0 1 763' 202 6201 3# "24.'
.' !8987 68' 98 / 1668' C' 0 428 ' 102'
F608' 261 9' C' 2/ 68' /2463' 497901' 9'
9.0 110863' ..0163' 07' 0 7/ 9' .11 7'
"1" 8G07.01061' 6 1 /2.8' F602408#
2 G '.2 8' 9 1' 2' 9/ M19' /1 / 68' C' 2E'
1 0' 94' 011 96 '91 08' " /193' 298' 1/ '
62 'G07921# .6 / 2FO0 2 1H0' G0.9' 98 '
021 1 '04' 01 /2.8' 0 1 3 ! 1 N9 29 63'
0 198' 49 2 81' .0 19' 4 7 0 :G / /D 0$
+ #%/' + ')+' ! "=, + . .%"%# &' +! !')+" %" '
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(' :0 193' G68026 2' ./ 63' ./G 1 16921.3'
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94' F11 400 0' ./ / 0' ./8 292193' E" 1' 62.' (
/ 0 D08 9210' "9239 0 19 0## ./2192103 '
F.8 9' 76 / / .3?F2 ' "92 3C0 19 E3' ./21 ' ' A A'
E.2 6 ' "1' E21' U D` '3 8 .0' 7 3# +.' 8'
.O9219d 69 2 ' I 68 0. .2193 . ..1 ' 8'
163' 1093' 0 26 .3' 2016 0 93' F6' . '
21091 E 0.192 ` 93' C' 9 6 4 ' 0. .4. '
.6 621 91' "2 9136' ./ 6= 1 64F69' 2. '
1021' 8 9 621' '9 0D .021' >. . 921 766'
F6 9' . 763' 8 /163' / 3' 92 6 F69'
49 . 1' " 93' ./2. 4621E 14FO9' 102498 '
09 1 2D6 161
19 ' 4 6 4 1/1' 0 0' 2' 2/7 .8' '
69' 1 2. 98 98 8 110 0 6. D2/7 98'
. 1F60104' " 108' 1/1 6 F6.' 24 6 46'
./2 91601 /29807 / 619C' 28 . 19 ' 9 1'
29.9 0 0# "9 F6 ' ./88 2.8' F602408'
2 0.9 08' 6.0' 1612' "9' 02D6 298'
1 1 '1/ E ' 0 D 1@' =' 4 1 7 E 1 # 9.61'
./.' .9 97 68 F6/ 68 GO0 6' 4=. / '
0.' " 1 0113' " 10' 67 1 1' 10"1' =. ..219'
10 68' 0 168' / .94' " 10' 4 . 01' H0#.'
. 1.1' D2/7 3' 9 1' 90' F609' 2. ' 1'
H6 016 ' O. . . /8 86298' 8019 0 '1/1 '4.'
6/ 0 D 16 "1' "920 F60$' G9 01 2' 49 9'
924/ 02D6 2.$0 19 0' FO0#./ 4 ' 2' 46'
.924/' 1P6' " 10 2. 663' F6' .. 97 / '
2' 496.G9/4/' 02 80 ' . 16' 8 2 1 02
> D 1 '91 08' C' 492193' 621' 0 193' D 637 93'
F6 0' 2/2' 621' 8 . 19' 04" 1010' 69.9 '
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[illegible]

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j 1 Q + Q 1 1 + E U $? G ? + d$1 ? ? 3
^ ? 1 1 Q + $V C ? 5 1 +) T 5 ?
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V . - 2 3 , U N 1 " ? C 2 C] Q $. V $ $
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1 4 U $ 1 C V $? V * ? $) ? U
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+ Q Q 5] + 5 5 5 Q Q 9 5) 3
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6FE 1 CF2 09A@@ FSA40 21@ 1S21 2
0 29210 =02DS 3 .2 3. 1 c 8 S 10 1/1 63
./1 1 30 311 011 C .9 =1 10 12.T IO12
6 ! /1 6 .3 11A H1 9 OJ "1 .Z [1 93
0 .93/ D011 ! 9. /1 1301 1249 8 94060 .9 6 26$
97 p1 /1 1.8 1 0HA/1S3 M14/ @2 p
2/ E4621 02@3 ? 0 93 P, 1 4 840 11111 2
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1 $ + C 1 ?] 1 5 V $? + $ V) C T + ? U Q C
G + M M 7] Q 1 ? 5 V 1 ? V $ 1 C #
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V 1 4 $ 1 ? + N ? 3 ? + ? $
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.G \ /3 9 0/ =E4 .P1ZF21 M0M 3 /
A679 02d F6A4 .P1 R /@Z C 042010
0E 694 . 1O1 =RM@/3
9/ 7 3 1 1 932= 98 0 / 3$ F6p
9 1 1 9 08 U /18 40 9 1 4 . 16

.0 61$ 0.68 2010 ./ 26' 29 ?'
9' D0. ' 01 08 / '.96
!0 61". '9 1 80D268'=) / 62468 ".'
98/ 3 # "9' 4. 268' F6/4' "/.021'
,7=3R M ! / /29' F 04 6 9
' , M ! ' . 'F604 6
.' D 0' '02./ ' / 1 ' ./ 6 ' b.'
80 280 68
I G 39 1/3 0420168' / '9 F69'
0 924 # .6 63 " 63 4 "1' 2' / 7638.'
46 / 3 1' / 9 .6 68 '2.' 8946O0 9 601$
1.8 F69' "1' 0 1 'B6 01 /' 1' 8 / $ 198 "9'
D08.2.0' . ' / 763 / 0216 $ b! 0416'
0/ 68' F6 /76.2 01' 1016 '2.' " '
1 0 9 D09' ' .' . G 3 9 1' 2' / 9 68'
2' .67 1/' ' 04 / 'C0 E3# .91"7 F6.'2/2'
9 9 016' ". ' 2' 80 0' 2 9 /
M / 1 10 1.8' / 10'. 9 O 80 2G6'
802/' ./ / .' 04' 8 /1668' "0 .10..8#
".' . O.9.' 4 6 268' 02 80 'F60 ' 10.60'
2' 8 8 /1 8' 2/2' 10 .1' 29F69' . .2.68'
8/ . . . .
=94' 62D6216' / 10' 46/763 8 /4 3'
: 8 / 9' 29 0 2.6 01 /298 '=9
.624/ .' 29. /22016 01 /298
". /F66216' 201/8 .
1.6 01 /' 9 1' 2016 0 3' / 1 68' 18'
' 16 0' 9 'F608' / 1 68' 9 1 980 9 9./2'
2D621#. 1F69' 46 9 ' ' 'F2
/ (6' b 9 1' 0 1 .6 01 /' 7 0' .68' 8 /8' 802 9'
&M 1/' # C' ' 9 1' 0 1 .6 01 /
(1 40' 29 8 /8' ' "9' ./' /7 . 8/'
.9 19
> 0 1G / 3' 1 9 ' # I20 .G / 3' .68'
.06 103'. . .23 / 6240'. 1 C .0 618'
.68' /7 /2D68' ' "1' 9 1' 0 1 .6 01 /' 9Q
8/ 3' .68' 97 /' ' 1G /4 0 '.68' .06 '
6 103' 9 . 923 9 1' 6 . . 0 0 'C'.0 61'
. . 9 16 8' $ " ' 0 4.6 01 /' 80 0# 2 9'
/ 3 .68 / 19198 / 68 ' - 2D 8 /3' 0'
.6 01 /' 8' F60' 498' /3. . . 1C'. . 16 E'
6."7 ' 8 61663' 9 1' 4 68' 2D 9 63' ".' '
4 D 1/3 8616 3' 2 9 1 /2 763' .M8 8 1103'
H .'0 1 .6 0 / 0 1 8" 16 2 92. 1 3C'
4 E3' 2' F 7 3 9 0892168' "9 8 2F69'
861668' G0791' 2D 9 168 ' = .' 0 1 .6 0.6'
986 '.68' 170
= 40 .G / 3' F63I' 0 1 .6 01 /' 29
2/.6 9 1' .1 08' 1 9 ' :1 804 .16 p'
6.' 6.6 0' F60# 9 1' F 68'. /8 / 1 /'
V/2 6 3' "9 1 763' 8 3' $ b 1' F .'46 9 '
9 010' "1 2/ 1 763'. 00 E C04' "2D6.8'
"' 2' / 1 763' 198 / 68 '=9.6240' 20 '
#G / 3' 4 9 6 ' . @.1' F6A' 9 1' 0 1 .6 01 /

9' 8 ..8 2.08 .4$0 8 "9' / F 30 1' '"
"9'. .6 0 98 .'28 9' 1 . E 3' ' 0'
./8 8 11 1216' 92 0' '?' 6 '6
0 1 .6 01 /' F60' /3' / 2 . 8 2 !G' F6'
2 10 ' 40 ' .' 492193' 2 62.' 0 6./ 3'
80 0 68' (' ' '
= 8 G 3' 9 1' 2016 0 3' / 1 68' "2 / ' 9'
F608' / 0F6 '46/'. 029' E! /21 260216 'C' S
2621"268' A
N.' 8 G 3' "9' 29 894 / '"1'. 8' / 10'
8 / .6 0C 62D/ 0./0 . .621' 610' 9 '
G 93' 'F69' 8 / .3' 621' C' .0 1 0D 2. # "9'
.68' 8 94 / ' "1'.68' / 0' 46 / 0'./ D0216'
9 ' 298 /3' 96' /1 63' D08 .210# 198' 9'
.0 . 0D 2.3 C . .0 298# G 2.' 8 G 3'
.68' 894 /' 1 9 ' ' 3 (J#!5"' E' F60#
9 1' "2 /' 9' .0 1 0D 2.3' "1' 2' ./ 19' C'
19 2/' $ .3>, %.' ' F6 ' 9 1' "2 / . '
D0 8 9210' "1' 2/ 8 2 '> 0 1G / $ SR ?60'
5"' ' F6 '9 1' "2 /' 9' 8 6 .6 /3C .0 2.8'
"1 2/ 9G / 49
= 8 G 8'.68' 8 94 /' ' "/.021' 2/2'
26 24. 8 'F6 ' 9 1' ./8 8 16" ' / 1 Q
68' 9' .0 2.8' ' D0 8 92168 ' .011 '
2.12' C' 04' ". 08 8 G 8 'F6 ' 29 89Q
4 /' 9 1' 0.' 29 8 /@' . 9 62.50 G92 H0 A'
8 /2 08 - /8 G/ 8 C I G 8 $ 0'
621F69' > 0 1G / 973=9' = 20 .G / ./= F6%
802 9 1/' b.' /7 96 /8 M16' 10 E. '4 ' '
62 4 990 4.84 . 9O 03'
' 68. 63' C' 8 6 1 164/' / 1 68' 4940'
0.6' 49 9 1 /29' =.9 .. ' ' 9 1' 92 1'
+M ' ' ./8 0D93' C 29 O3' / 1 68' 29
G/8 / / 1963
> 8 4 .0 . . .63 2.0 61' 1 62.68 E'
b.08 3
!0 61'.1E2 101'. 02 / ' . 9
2'. 02 /' 621' / /' / 10# 9' F 40 ' /3'
/2 3' "268' / .. 1 3' "26 8' 8 . 1 3'
46/ '198 / 68' 46/' 21 0F6 1 0/ .G'
0' 04' 064 92468' ./8 0 010' ./21 292.6'
10 93' 2.63' 80 9/ 63# 46/' ! /12 8 62 B'
298 9' / 319D 1 ' 4'. 1 .629 1 8 /4'
.1 08' 4 . .6 '70 0 . 'F6 0' .68' 9 1' 270 '
.0 6 '9F6098 116216' /.9 163'..' 6.' E'
hBS?" $ X 070 0 68' F6040' 8 164 ' '
"/ .01 # C' /3 /?; E ;U' 6. EZ 2D / 6# 6'
"9 ' Se 1?3 . 7 / 8 9' 2' 12/468'. '
.91'. 7 ' 9 / 0168 b #04' 68 808' 20 '
04 998' .68
N0. 93' 4603' G0791' 80 03' '=6 9 / '
./2 101' / 1 763' "24 .. 8' ? 2 9 / '06198'
46/763
9 F69' 04 624' /21' 9 494 8' 492193

$ o [' 6 76 < c 0' 621' / /49. 8 \' F6/ 68 '
$ ' F6016/ ' 6 1 2. /193 46/' .02 2 49. ' 2'
8 / 0 .3
2' 62. /' 621' 20 . / 10#' C' /3'02/2 '
868 '
' ' = 1G0' F6016/ ' 0791' 0 193 ' .. 1 .98 '
4/ 98 ' 6 27/3 ' /3' 0.168
' ! 9 21 ' . /21101' "9 197 3' 9 198$4/ 68'
46/49. 8' E 6 /7 ' F6 2F69$' /3' 0. 68' F60 '
16/ $F6/ 68' " 1 8 6 11' 49D929 01' 2' 67 '
108 08' .0 0 0D 2.08 F6 76 408' 0 66 '
/ / 763' . / 0 1164 08 ' F609' "M.016 '
-0H .. ' 9' & +0# +"
! / 1. ' "9 2F69' 621' 46/49. 8 ' 9 198'
"9 ' 9 198' 6 0##F 1 763' /3' 19 2 ' 02 9 '
/ . ' 0 19 ' . 06 .6 0$' 6 9 / .$' C' .0 6 '
')' 69' / 8 / 010# ' / 19 / .0229 6216
M3'02/2 868' G0791' . 93' 011.3 /3' 68 '
/3' 9G 68 ' C' /3' 67 3
.63'46/' 621 ' 80263' C' 93
02634 2 4 16 ' 2' 7 097 68 ' .67 168 '
C' . .1 9808' 80818
` 09 0 E "2 .68 . `' /3$' .67 1 46/ 04 63'
. 7.9 C' .67 163
I S. 8 0' 8021 3' 4 6 4 16 ' 2' .0 68 ' 89 '
10 ! 0 68' =941D 1/3
! 0 63' / 0' G0791' / c# /' $ 8910.0 62E '
F6016/ ' E4 D 1 F6 249. 8 # F6 763' / .6 0'
9 0 2/ 490' 802 68' C' 9468' 219 244 3' V'
"11 .6 ' D0 2921 3' 8 .0216
: .3'4 6 4 16 ' 2' 986 ' 1 7 0 8 ' =1' 9 1 9Q
868' 9498 ' ?
M3 98 / 3' "2 .68' 9 1' 7 0# 46/ ! '
29 . ..1C' 1 7 0 ' .68' /16 0' 2D92F
: .3' 9 1 98 63' 4 6 4 6 ' 2' 1701 68' ! 69'
94 68' ' 8910 G0 68' 6.12.10 94 6 2E C'
4 D 1/3 ' M 101G0 ' 62 C 1. 8 ' 8 .101 01 '
F6 6F69' 4 D 1/ H 8 F6016M14 .. 8
H P' / 8 2 763' 022689 02408' '41' /3'
5 / 4.3' 0' D6 0' ?' 4 168 ' 04 12D60 ' 1041 '
.98' ! 68 ' 8921/' 19 / .0 6 3' 9 '
0 . / 2' 69' 86 .6 /3' 0 D 168 C' 2F6 O '
F69' 1.2 0' 4 11 76168
(. . ' M 10/ 8 2 0" 6621=1 26 6216 ' 8946 '
O' 94' 92 68 /2' G07.21EF6 0' 26 j' 29 6 0'
F6 763' 9 1' 92 63' 2' . / 4' <67 1021 0' 4 9 '
D6216 ' T6/4 ' / 0' .21 .21 ' 02 80' 9 91'
E2? 30B?A 9 . SS4 ' 4S 9 F6 0' / 0' 98 9 '
6 1 2924 ' / . /' 62D6216 ' /11021F69'
/2463' . / / 3#' 249' 4/ /1' 9F69 .16 ' 1'
92. 921
' -%#=/' $! "V' . 9 ' . ' ! 0 '%
I .62/68' / .68' "2 9' 8 0193' 0 193'
70792 ! E ! 0 1 0D 2.3' ! .094' $ E ? ' F6 '
E 193 8 0 13 / 763' 8 / /

93' .089' 46 / 93' C' / 4 / 93' 9 93'
92 63' . 9 19=E ! .8 29' 19 929' C' " 9 '
4/D92 1 ' "1 0 193' 8 /16 49 1 20103' .6 1/ '
4 021' /4 68' . /21 E1 /298 8 .4 021 8 / '
168' 9/ 68' 04 66.2 0M 01 1F694 616 2 / '
.2 ' 492 F69' "1' 4 E3 8 / 19 . 1P24/' 9 6 '
4021
! 0 1 0D9' 0 .. 94 1' 04' 2016 0 E ' 4 3 G 2. '
07 68 10' G68 4 1019 ' .0 1 0D 893 621' / 0'
/D19 ' 198 / 3 ' "1' " 4919' 9 1' 2' 192. 3'
/ 763 2 021 68 ' ' (
! 0 1 10D 293' 9 9' 4 6 46>1R ' "1/40=1' ?'
D08921 0' D08 92168 69" 2.6 6849 '
816 ' 0 3' 8 0 3 / 40 / 7638 /H / A '
46 0' 10892 / 1 3' C' "0 40' 92 63' 9 9 3' 9 '
9 2 29' 1920. ' C' 921/' / 20 ' "1' 01193' 62D01'
./ D.1F69
' 987 020' 9 1' 0 3' 8 0 3 010' C' 020 '
. ' .8 2. ' " . 4/' C' 0F6/ /' / .19010 "1 A'
0 193' "9 1 924/' 169016
N 7 0' 9 1' 0 3' 8 0 3' 671 1/1 9 ' 8 '
29' " . 4/' C# 921/' D92 10 ' "1' .01293' 169016 '
C2 /16 8 04 669.
/ .02 6 ' 7 ' 10 2 70 ' 0E29 20 ' " $=. '
& 621F6. ' 192693' C0 79 @.3' 2.98639 '
0 921' 86 96 3 ' 4' 9 1 ' .0 2/ 3' 0 6763 0 '
9 0#
: 7 ' 0 ' . 1 ' 621' =)' /2D $F60 68'
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.6 0 .3 ' F60 8' 862639' 1' . 9 9 9$0 ' / '
7 F6 F60 68' / . 68' 9 1' .. 2. .
59 6 0119 ' ". ' "6 D4' 1 8 0216 '
0 193' 8 0 93 = ' 04' 64 . 62 ' 12 63 94' 9 '
0 19' /F6.24/' 2/2' 621' 8 . .3 ' 29. ' . ' '
94 9' 8 0 938 80' . /2 1021' 7 3' C' 8 . 8 '
7 02 3' =94' C' R 6 61 8 3' 8 / .3' 621' 0. ' 8 . '
4 1/ ' ' 2' 1 . . 9' 219 2' P9 / 93' =)' 46 '
6 .61
' 5 2. . . 1 ' 4. 8 16891O = 0 3' 92 63' 2'
64E9 / ' 24 . .419' 8 c1 3 9 ' 98 29' D 6 '
1 2/ /' C D 4/' D92 10 0' .9 97 /' " . ' 8 9Q
46 0' 20 ' / 10 ' 2163' 8 / 3' 0. ' 8 .46 / 0'
. 11 2 9.63' 89816 02/ 0' =)' 46 6 .6P ' 04'
0.6 101 3' ! 69' 163' 02 80 3' 4 1 76 / '
2. 8 49 1 04' 92C11 ' = ' 8 /168 "2 69 /'
./ / ' 4 1 7692408 ' 49 1 2010 ' 98 '
2/ 0.2 219 468 68 6 /' 08921/' 1'
1924 29 691924/291 94' 18 / ' 02 '
1924/293' . /2 1021' 7 3' 1926 723' / 612'
29 O/ 68' C' D08 916/ 68' 86' 219 1 3
C' 2' "208' 9 "1' .7/14 0' . /1/ 11 763 04 '
26 4/3' 29 6/3 ' "1' 8 /[68' 9 . 021
494' 1924/293' / 1 8 1' 9 1 98 10193'
6. 293? 91' /1 13' 193 ' C' F60 ' .064 '
86 .6 /168 ' F63' 2' 01193' 8 /692403 2 9 '

4 ʼ &=ʼ ʼB ʼ :ʼ=ʼ ʼ=

& 6216 ʼCʼ4 .6 16ʼ 119 0ʼ9 1
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19119Rʼ ʼ. /01723 ʼP4 Z 0 4/ʼ 02D6 E ʼ ʼ
10 /C 07. Z ʼ1 99ʼ2 /2ʼ192 91024Mʼ
Z .P247 C9$F E D0 ?4/ 4 D6 S212ʼ 0 ʼ
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Nʼ / ʼ S20 . 1ʼ 013ʼ .0 3ʼ 0 4 0/ʼ 8 0 3ʼ9
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. . 68 4 41111ʼ j6. "S D ʼ \ 0d1\`$ $SV060 1ʼ ʼ
% +ʼ! - - . %&ʼ"1ʼ9 1ʼ.0 /ʼ. / 4 ʼ19Cʼ 19 01 3ʼ
:6106 1ʼ 0 1 0163ʼG683ʼ " / .07 ʼ 1/9 1ʼ
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"& &ʼ"92 3ʼ 1ʼ I 0 6 F/. 011 3 1. E=0ʼ
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7 1021 0 1 10 3. 1ʼ ʼ 921 .0 / 1 ?9 1 ʼ
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.98ʼ /7 1021 08ʼ - 01.263ʼ0D2 @ 1ʼ000 8ʼ
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D69 8ʼ$0 19 08ʼ" /3ʼ1. .2198 ʼF/ 4 . 1 ʼ
/ E0ʼ.01/ʼ. / 6 F09ʼ 0 1 3ʼ ʼ I 1.01/ʼ
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"921 9 ʼ49F6/ / 190 ʼ ʼ
4ʼ0 "$ T 01 46 08ʼ 49 2 9 62 ʼ "91. . ʼ E6 408ʼ
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0ʼ 8 . ʼ1 07 3ʼ =.ʼ /2D10# 8 /4p ʼ8 / ʼ
Z3ʼ? / 684 6 42 763 20 14 3 PS\` /1 1ʼ
7?ʼ .1 /13ʼ.7 7924 3 C#F6 76 408 ʼ01 ʼ
7 @ʼ111 D024 34. 1 11010
"9 ! 61134. 2EF6. . 1 0 3 1 00 3 . 01 D6E ʼ
2.C 92\`2. O118 . 3D.1 0ʼ04ʼ/8 2 8ʼ
0 1 6 8 96 1/41012ʼCʼ"9 1 8 921611ʼ>976 1ʼ
.2 8 .6 39/1E 1019ʼ 0MD6 29ʼ>=b 8 R<F610ʼ
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4 .0 9ʼ ! 94 1/ ʼS 16ʼ. 1 3ʼ9 191 1ʼ 0 1113ʼ
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q ! ʼ
.61 3ʼ. / . . .21 0ʼ 8 80ʼ . .6 . ʼ
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=94ʼ 7 .ʼ F6 49 011 763 8 0 763 ʼ0ʼAʼ
7. /ʼ 4 10ʼ /21ʼ08 G03 6 1107 1ʼ / 1. ʼ
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3 8 001/ 9 1G9 0 ʼ (
ʼ 419 F66/ R9/1 / B / .021 0Aʼ ʼ
1M\` ! 19 1 9 1190 R 11Z49F11 763ʼ /116E ʼ
P13ʼ7 90 1ʼ. ʼCʼ.) ?[4? ʼ 3 ʼ41.9863ʼ
09 8 ʼ 1CM1O=ʼ2/ 14 D1C01 3 9F\`016 EʼEʼ 2 ʼ
1 68 " 497. 4/9924/ 1ʼ 2 8=ʼ 9D /29ʼ
29ʼE \` /ʼ "921 9ʼEʼF69 8ʼ/61ʼ9040 1.10ʼ . .021ʼ
8 40 . 1121E9/F6/4 A 193 21/ʼ "921 9ʼ
./2198 3 0. 9ʼ 6.19 1001ʼ 2ʼ.04069 763

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/ 3ʼF60Bʼ.011 0D 29ʼ G/ 49449 1 92 1ʼ
7 8 29 1 . 8 / 19 2/ / 10 Cʼ"1 8 F2.ʼ ʼ
. / 1 3ʼ0.ʼ/ 763ʼ 67 3ʼ. .68 9 7 10
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> M ! 5 I ' : I' $ B R " < % + H' B6`

2. C' 2'DS19 /29' .9163 "9219 '4 01016 '
E' #6 " > 6 4 16 '@P / . /241 0 'F60# 0 3'9 1'
@??' 9 23 6 . /1 /" 8 7 .6 8 F60#8 94 0 2'
G /D0 1 08 'F6 ' 2 8 0
! /2 101' E 9 8 763' . /21 29014763' C' . /2

.' ' (A ! /21 292193' 0 0.' 621'1 / 8 8 6293 'F60#
&.8 / <= . ..1' 2' 0 3' F6 2 ' 2' 921 9 / .O' . . '
26216 621F69F6 2F29 ' .61 .6 0' ' .61 3
&A 2D6.4/' ! 6 8 10' 2 9 27 020 ' 022 . 63'
.0 2/ 63 C 0987 020' . / 8 8 62 3' 8 6 .6 / '
3"# ' 6 8 019' / '"1' 8 6 .6 '074/8 2 3' C'
.&' 9 1/2 68
! /21921 0 ' 2 . 6 62.'261 1 / 1 '"1'
. 0 ' ".21 .6 63$0H 'D92. 01 /2 '"1' "0 '
0' .1801 .0 ' Z1O=' 92 3 '1. 1 .6 49'F6 '
763 D 01 8' C' 7 .0 19 '4 .92468

B &')+" "&" ' . ') . . % . * ! / '

9 b ' ! 111 .6 0 F1 '9 1' 8 6 8 '0.'1926 '
- ('8 6 8' . / / 3'1.D 8 .2 ` 'F6 '2010'9 1'
. . 0 /13' ! 023' 9 . 9 8 92 / '4 0 ' 74 /'
(' 1 /19 1.1 0 8 4..619C' 2D094 29 59 '
101' 022 .6163' 012 / 61 ' .O8' 8 9 8 7 02 '
. / 8 8 F2 ' 8 6 .6 /168 '
I 1 D 16 022 .6 63.0 8 / 13 ` .8 7 020'
.61 ' C' 2D694 2 17 . 10 '"2 1 9 68'
7 923. / 63 8 .0 /' ! 8 3' .6 63' " 3'9 1'
' "0 ' .61 3 1 P 19 26 .0 / 8 .0 2 8 9D9 9
' C c 'c?93' 02D6 29/3' 60' ! 10 =1 .' . / 11
0. 9 'c9' 2'04 98' . /HO 191.
<0. ' ' 9 8 7 020' . / 8 8 62 3' 8 6 9/1/16 8' 90'
=' 9 1 1P 26 .6O3'011/9 1' 16 ' 91'10@ 0' 0'(
R ' 8 9210 "1. /3 269 1 01 C0 b 26 . . 01.1

(J& . . * " ' +# 1 '

/2 0=11 26 ` 011910/21 1 .019=E' C'
074/ 08 3' 1/ 1 0 <62180 .6< EX' . /'
1 6 @8' 1/D194 . 66 ' " 1. 6? 4.'
.6 /'11/226 0'D92910162' 70240 ' /21
6 .6 63 - . 3 S ` 3 0 ` ?99 '
<?$A' 163 /F6/4 0.9 12' . * 1 # & & . . / ! ' '
. . . 01/ 49 1 \ 16 0Z 8'&6' 0 0 [0 '
1 09 2 . /
: / 9 8 /4/ 0 12 D02 ! 0' C
V' 7 ' . /0 1023' .0 2. '" 3'2.10 3 '\S A Y'"9 '
V' 2 3 C' / 0' '62 .
: / 1. / 9' 0 3' 4 @ 01 =E /21029 '
29' "/ 6 `10 E' 8 /163 'F6 '"6 D7'4 . 1614/ '
0Z4 d 8 8 94 0168 68S2H H
59 9192468'9 ' : ' .0'04' 8M16 ` M.0A'
E9 8'02 80 680... 0 0' . 9 /7 9 168'0 '
91 7 9' . /DE1 @22' 0.6 101. >0 ! 1.2198$'
" 02@2 S0@?14\ ` 0 S =' 02 80 93

29 6/3' P63' 09 9 92193$492 F69' 8 6 96 '
/3' 1 3' 9 ' 29 6/3' . . 921.3
=94' 2' 8 6 .6 /' 1 93 0 1934 1 2D6216 '
.0 61 9219 .0640 ' ! 0 61' 8 6 .6 9 1' 9 63')F.
1. 6 8 F1 /4' 2'0 3' .0 2 6 8'9 1 20 '
3' 29 / / 6 ' 2'0 3' 8 9 8 7 00/ 6 8 $C' 2'
F2/ ' 0 8 '9 ' 0 19' 2. 663' 2 1 16
H 2.' ! 0 1' 8 6 .6 ' . 16 '9 .' 9 663
9219 '9 1' 0 3' 8 94 0' 8 6 .6 'F63' .0 8 9' %% '
21689 . 1 49/F6.' 9219 ' 8 6 .6 '" / .016 '
.0 /
! 0640'9 1' 2 3' 8 6 .6 '"9 ' /1 63' 62 3 ')" ('
'9 7 3H916/ 6 8' C' D1/ .21/ 8' 219 '
19 1 3' . / . 220163 '" / .01@ F2.'0' 101 2 3'192' '
4/ 0' - 9 3' ! " > + ' 8 6 .6 '"9'9 1'
80 0' / 8 9' . /2110 1 /' 63' ".1 63'
2. 6 2 668 C' / 1 ' 8 6 .6 ' 9 0A'
01 /' # "9 . .6240 0 ' 911F69' . 0 01 /' '
63 C' . / 11104 /' / / 1
6 .6 'P1' . / / 9' "2 691 7' E01 1 '
F60 8 F604 2D.21 ' >64' .2 8' 621' /2 '
1 3' ' 9 ' 0 7 0 6 ` 'E' / .6 1 6 8' 46/4. . $'
061 6 8 . E20 6 8' F01R / E 07 M 08' 2/ '
698 $' 81 ' 2 9 /1 349.9 2' E/ 3' 7 / '
4 3' /C /' 2D " '4. . 98 06. 6 8 C 0 2D13'
F6016/ 4. . 8 ' .0 1 3' F6016/149 ! 8 $' . / '
/ 1/E ' 10 6 0 6 8 ! /' . 0. . / 6 8' P49 '
. 0' ' .67 1 ' /4 /' E' 04 \' / ' 1/$' .0 'F/016M $'
8 02668' F6 2F60D 210F/0 8 / 9 01/ '
E' /0D 210F6 2F69' $' 298 9' 1 D 2 046/'
1 192492193' C' 1/1 49 8' . /61 0G. 1.3 'F6 '
763' . / 8 292161' 3SS@ c4SS . .' 219 . / '
019 $' G 3' /10D 210' F6016/ ' 044 16 ' 4 0 '
G10D 8 0 FO0 8 F60 0 / 6210 E' . 9' /J1/ '
D 210' 2069111' 8 6 .6 /3' 19 / 1014 /3 ' 8 '
0 11 3'4. .98' 21' 8 6 .6 ' 'A '49.98E02 '
F6016/ $' 19 . ' "263E1. 1 6 8' 46/' $' 92 3'
F6016/ $.Z 168' " 0 2. /4 /'<1 7 0 6 8'" '
D 21 ' 464' ' 94 3' 44/499 1 1' E' 4 D 1/ 6 8'
F60410D 210' 46M'
1F D/' 04' 0 193' . / M 92 93' 4 03'
9 2 81 .6 /3' C .1 1/0?< S' "92 0 8 63E'
86 .6 '074/8 2 3' 62149.98 2. 8 9' F60 '
6F /7ZF6 44/ 9< 1 46) 0 8 'E0 93 C' %%-'
46/'1 02 69 .0' 710 6 8 46 ' 16C' D6 4 .'
0 9O01 1/162A' " 63' 9 1074/8 92. / 8 '
8 ! 9 '"249' 9F6016 '4916 701 /' 9 . 9 8 92 '
1/1612 ' "01 40' . E 01 / ' 91901 /' 163'
/91639 .6 / ' '
: 91 . /2 6 8 9 1' 8 9 8 0 020' "241F 0F6.' . '
46 9 '0 0290 6 0' 19 3' 9 02 3 ' =. 01 / '
763 8 4 8 0?1926 3' F6 49 8 ' 94' 8 0 ' C'
0 763G2 ' "9211 3' . 9 8 2192C "1' 903' 2
O/ 6 C .6 1/4 01' ' ' &

' Z *' . ' * 2

(_' 621'9 /68E 2 9 1 20' 2 21. '
S8 ' 02. 903'".211 .6 " 3' 0 '"9 '
S6 0' 9 3' X 92' .2.3'" 9 11.3'". .0 ' 0A'
193'D90P019 'R 0'" .3'F602 '86 .7193

0 16 8/04 9'8 `/10 .2. P6O' 62A'
4A'C' 019 1 213' 2.68 7923'=.' "9 61 ' 200 A'
1023 249'2/8 .1'G07. ' 0 '1=9 @ F11/4'
)> " "% &'"1./ 6 2'.0 2 9 2' 72 1 49.6 '
92193' 0 .9 03' >' "9203' 6 2901' 7 198 F09'
08/3' "9209' / 1 ' F6 4 121\? '497921' 2'
91@ .140 ` ' G.291 1' ' 21. 1 1@8' 46/49 '
208 'C'./P8' 6 6 401A' /9016 '0' 01 2E3'
&/2?92@` c' - 0 13

A,

= 013'41 8 0 3'./2.060 27 /2D0'
J '/10240 2Z '".8 .6 /'040208 C'
9 1 91228 24 .9'" E69' / .2 0 ! /1 2911'
&4 3' C' 0 19 024 39 7 3'4 1272924/'<2 9'
0'.G /'4.2P 69' 93 /11024 3' . 8 D0 1'
4 F69' 9. 703' 0' 2016 0' 2 21c 9E16/ ?='
D 3' C' 02 0 763'.P92/ 6/ 6 0' 9' 0 ?'
892168'./2 . 1 8'4 07933 D2 09'=.Z 012'
1074 '074/8 2 '2/3' 67@D0 .1
I 1'".14 219 1 12 8 '"1 'D10. .'"91'. 0 A'
8
- 0.H91 '= 40/49 R ' 18D612'46/'
49412'4 D /3 'P 61 68 'C' 196 0'0 4'?=m'
R 'F6/4'9 1'3& & '"91')& .)'! '41C62E'
! 0 61291 08'1 93'.09.6 `E' 169 0. ! 113='
0 .24 3' 1926E13'1 19' 29'C#./ ' 2. /'
/ 168'G07.23' 9/1/20 1"'@ ` S=S< 'bO/4
9 1' &),%& '<E1 0' 1'1/9' 211 1 6/'1/ 8 20'
.9 .0' 2 Z'494/ / .3' 0.917 8 $C'19Q
468 6/4 9<c 0[/1.24 16 0 026E' ! 023'
2 .2/1 0 3 1 2 16 86 .` 3' /11092 0 '
763'F0/3'"/.021 7 241. 93 0 4' B '
=. 'F6/49 1' . : . ,")' 11919 "/ 6 .0ZR'
2/ 1 02 . . . 89210'492. 0 116

3 ,

I =1 0 3'4 8 0 3 29 17102/ ' 2P'
1 /0'S '4Z[0 `= 4 631/2 . 3'"92 39'
108' S18 P 3C'0S.1 ` 04 9'C'D 024/ 3'
1/219 10

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I =1' 0 3'4 8 0 3'D 0S409/ 0. 1 1<23'
".1 3 0291 3 C2A 6 3 9 j'"9211 .6I

'

624/ '46/4.2/ '8:".2 \M1 0064"'. ''
F69' 10'108/3"0 / 68' 6 . 923' 9#"9211'
.6 / 2 10'8/ P !14' 6 6 20 3' 67 940'L

4 #

I =1' 0 3'4 1 2 0 3'C' 2 D15"9/ /23'
/ 26 2 '!066 ' /16206121M/P\ '
? 892 7102/ ` 8 460763'162 . 3 /'
1 3'./2 101 3'C'"20'./8 862'0' 91 1/'
EI $'M82'" / 68'D929 .' 219 19 168'
. 7 3. . 1.24\3 gJ9G / 'F2d' 80./'
1 /'9 1'./2 . 924 4 .0168' 67'4 0 7 0'
D801.' 219 'G9 0'C' `9298
' 93 2./2/102 0 0 11 'N62468' 69'
.06 1039 1 923. 7/3 C'4S/'/ . 0' '
9 63'F6/4' 4 . 161' 1/80 G63'021 F 3'
.7 0793F6 1/'</2 6'C' 8 01G 0' 2 D2'
928'./ 4.' / 1'4 4 /# 2 9 63'FO/4'4 '
9 .6 A?1?D '.6' D0168'9 1'42/49262 E'
2'F6/4' 94 .99' 9' / 68'F60 ' 9'.'
168' ?9 7 1012 4986116'.G /3 01 0'
".21 P /'9 07/ 0 03' ?"1'9 03' 013' @ /'
9'"9203'89 92191 '49 2 0161'04'G9 0 $01'
F69' 2 7 91101R 2I2 D6 2N8

& !

1 =1' 013' 29D 3'90 40'782 40'./2'
1063 @2.7 0 0I9' 02D2 2'./ 0914
8 ' 9162 9@I'198 8 0 269 111 JD1 BA
1 9 1 2 9923' 96 p#D 770 21 2 ..63'.0'
S '"1'"922 96 68'./8 P1 0 6 ' 6/F69'
90 /19 /2901'C'0 9 0' / 19' . .6 0' 9Q
3' 168'"920 28' 04 ' 02D6 2 3'/ I9 20'
67'4 0 G 0D 019'C.' 3>/17 3' 2'49 /'
7 /97/24 /' 10 1 763' D08921 3'./2A'
29 0' / 8 "2S8'"/9012'6 . /1 62'
9 FO 79 0'0 D016'4 0 7 0D801E.'
.112468 9 F6/49/ 1 3C' 687 3 19 168'
9 1' "920'"8@ .0 3' F60'074/8 2'0229'
4 16

& &, & 9'&-1

I =1' 3496168'F6/4408' 69' / .67 3'S(S' 6
89127 02/ 63 D6 0' 0 6' C'
D 6<.6Z 9 9 923 "2 .0./2 1023162 .01 ' '
. D921 9' 7 0 68 21. 10E.68".26 3'
0 1. / 3'2. 661 3'=946/763'464 763'.G/'
74/.G 3'F6/ 68' / 9' 2'G9 0'9 / 9'
/'011 0G 1'.G/ 9108' 080 08' C' 0608$'
/ 191 / 9 F6'49 1' 2'46/49268'.08' 9'
E 31D0 'C'9 . 64 12 24.' 06 1 .3' 2' 01.E763'
C 0.6 101 3. 6 1 . 39 1 86 01 /04'49 .A' (
4 /'29 0'4 9 6'.2 8'! G/ 9 0'9 9'201S''
0 3

2 (K 9 !

!

= 1. / / 3 0 D E1 2D R 7S
/ 6E11 " .63 0 . O/12 M `
: 01/ 62D/ / / S/ 11
10 /2D / 6E / 3 8 2 11/ G / .G/
/ 1/H 29 66= 3 C R 3 F6 76 4012
94 0119 3 . 08 F 0 E 1 6 8 C 9
80 0 02D6 2 3 21 8 0. 616 92101/ 6
6 .8 9.9"2903 .F09 . .6 9 6 D023
26 8987 02A 0 1/23/ M 10 26. 1
16 2 0 1. .060 ".M.1 .6 / 011. D 7704 0
G10 801 C .0 1 1 / 8087 020 68
. 17 I R 2Z16. ` 16 0 D01 18

&! ! ?

9F $ 4 $ >
9 $ L < "
L 9 > ># $:
L K#) , <
K$#: i : :

& &

F Y F 9 $ $
+ G $ $ Q) 1 # 9
9 5
96 <1 <:L & $, : :
` HE1 @2 4946. @ 9 "9 .083 H .0=26 $
) 9

4

MMF G(# " - '
GZ '9<G;' ; ? 0 $; - $9 9
5 9 ; 9E K ; ; G
#K $ 0 L: 9 - # < K " L $; ;
00934600 24/8 C . .16 A 624/8 . / 1
G i < 7 : <9
;B, U8" 8 7 $:

Y , ; 5 & ;
T e$ #] 9 40: :
&/ " : =1J "NK3 "/ . Q
D69 GA.201@ A/\1 H3 2 3 16 9 1 " 1 D9 .?
#9L % L , , - : #
@ E11R ` ! 4 / C 8 8 9 F6/4 9000 .7.0
R 92 99 1 1/ 9 .3 9 A 01923 .
84 I 1 06198 S03 D6 2 D929 01A
0A ` 8 20 D60# 2 . I 1 0 193 D6P 921D9@ 0 A
AAK A1 /2 4 .0.$I 4 .6216 0 193 '[?9. R D6 0
./2 . 6 ` 1 04 9. 9 / 0D04/29@ 10@
2A 1/ D608 286 . 9 K
! L * 5
: $! N$ F -F
$! ; @$!
F U; # ; F: #:
V S\JA C 1/ 4 4 S ? c Z S \ ! 20401 04 91$

I O : 1 ! I (4 =P
801 90 / 16 128 .4 01 # 0 1 62. / "923 .0
60# 49 . 4921 3$ 1 1 0 08M.1116 D.219#
49/ C2D2 3 920# 49 0 6 / . 1 Z. 0
7/ 0 0 " 1 /1S /79 . /4GE3E H1 1 90
D0/ / C . /8 2 1/4411 ` = H / .0 /@
01S9A 948 3 / 8 Bc3?E 2 1 3 CS
2 3D929101 # 8 0 93 92 1/ 198 2 3 . 3
4 / 93
I G 3 "0 3 2 07 E 011 9 / 8 .0 3
621 0 0 10@ 69 9 4 4 8 493 . / 6
.6 0 /7 /2D0 "0 . /19 ! 024 40 19 1 .6 3
04 102 0 .E / 9 2 ! ` RS 0 ` 8 .4 = 01
1. 2/22 7 49G 9. 8 0 .0 2 .0DM924/
0. 4.017024/ 49 1 010
1.3 "9 7 ". 191 ! 9 4 1 29
Y) D1 E0 7 2\ 601 0 . 20 D329101 / $
2 3 2 1 6 8 9/10 @/ 0 .02912/ 0 D 024SA
/10 . P0 9 C . 8 01/ BgS ' 4 S 98
20O 4 0 O 1A //0 3 4607/ 3 11 2 1 3
. / 8 8 62 7@319710 2921 9 1 /1/ ". 1/ A
1/ 29 76 30 E = 1OD/3= 9219 C . 21P6E4
.21? 10219?C40 A/7 0 2/ \ 022 .6 / /
1 024C C1/1 498 / 1 3 9 19 / 9 "2=
1 =3 4C11 "0D120 .4 . 6 E 210 890
1.14 0# /G ' /1. 1AC 27 13S1 0@19 16 8
120 4 019 10/12
Y 0 9 0.6 01/ 0 S94.C 921 0< - L.4
S S2E E19 3R 4 / 421 "1 2DS9"2?8
0 0 101 3/ 10 " 1 18 92 0 19 1 763 04 /
10349 12 09 . /21 800 ` 5 19/= ` "010 r
40 M11p "0 140.1401/ E0 ` 703
/ "0 02 183 / . / 21 8 20 8 / /18
111 C7 001 0 3= 0 2S/2U 1S ! 1 0 [) .0
1EE1019 / 9 11 12 9 / 010 ' 608 0. 19
9 2P9A 271 19 4104 .110 /@.0 09 1 @
91168
1/ 1010 / 7 2L D 0242P 04 92 3 .6
/DL / 10 04 .98 / 11A 1 1? " ! .0
G 2419 98492 / 9898 7102004 1@1 2 3
.0 1/4 0 0 . ' ? 1 8/
<"24. . / .23"2G 103 014 0# !098 9 1
8 .2 9 07/ 0160 . /20 /0 19 6 /1 . 04
1.8 03 / 6 3
:92 34 9 Z /4/4 0/YS " D0 / 3
D69 ` E.3271 ` ` " .04 04 998 . = 3 67 3
168 . 1 0 . / @ 3 9249 3 /7 /2D62 /
11 24 62 8 11 16 3D00 /2 S/2 1023 46/763
L9 329 9 3 02? "11 2D69 "2M\C .0
20 794 / /9890 6 18 2 C" 0# . /8
220 R ?S 04P?16 ?CS 16 0 R 001 0
994 12"9 ! . A # + ! > . + .
I 11980 0 3 92 34 . . / 100A@ c23 0SS S
.0 61 8 91116 .9 0 3 .012/<0 8 / 0 0 2 0
96 68 ". D9 ` 3 92 690D2 < 1/ 0#4 .0 D 0I
468 02D2 23=1 1 8 10 D . 1 6791 0.

=ˢ o = 2 A M : = = q ! ˢ

1.24 16 S1 /FOSˢ19 6DP 61ˢ. / 6D 6 ˢ = ˢ
0H9Eˢ =0 H@ 8ˢ1 D 1ˢ 92 3ˢ 1/46 ˢ
M F63ˢ 4@1ˢ 3 91 E 0 3ˢ 4 3ˢ</ ˢ
10ˢ. .68 . 4 \ˢ90 ˢ . H.91ˢ 1ˢ61 /ˢ 0ˢ.61 3ˢ
14 D0S 12 9 /3$.ˢ= R 0 ` ! . . / ! .6 63ˢ
707144 . 111 /1/20

ˢ = 011611 ˢ ES ˢ !69 ˢCˢ02@ ˢ 9.016
ˢ . 8 .2 0@ˢ 891 98 29621

501193ˢD.H 10 93ˢ 8 0 ˢ 97 93 ˢ 62?ˢ"0 0ˢF60 ˢ
1O/1ˢ 310@1 90 98 .2ˢ 1@ 0 08 0 ˢ460.ˢ"9 ˢ
009C46 Iˢ011. 0$$F60# 1 " 3ˢ1D1 ˢ 9 62 ˢ
O ˢ04ˢ19 930ˢCˢ9 E4 ˢ ˢ ˢ8 140 ˢ .SAˢ 686 9ˢ
0 1.1 81. Z

A O.2 12;90 1. 01 1 0 1 1/ 246216 ˢ
O .120 / /1 /ˢ0 R 3@0 01ˢ 29 4 4"2H ˢ
404919 1. ` ` / 04 6 46 11ˢ "19 ˢ46.0 ˢ
16 ˢ I .F6 498ˢ 1 / ˢ 0ˢ "02 3ˢ0 3 10 763ˢ
8 E.0101ˢ 04ˢ .8 2 3ˢc . 0901 /H.8 102 ˢ
498F69. 2D 1ˢ 9 4 4 8 40 ./N 63 "0 ˢ
./ 1ˢ 0/ .CD 024/6E2

I ˢR3ˢ 0 0 021 763ˢ"0 3ˢ46/ˢ0 0ˢ/ /0 ˢ
1 1 4. .112. 0 "0 ˢ9 0.6 0 ˢ?1 0 ` 0D 3ˢ . 61Eˢ
<0ˢF6 8ˢ 0ˢ" 1 3ˢ. .0ˢ<9 193ˢ 010#.08ˢ 9..! ˢ
9 621ˢ 0ˢ1. 1 763 ˢ02D6 1 / 0ˢ,ˢ10/498F11. ˢ
000 / 0ˢ 9 6216 ˢ04ˢ "19 6 10 2 0492?ˢ
./ 60 ˢF608ˢ 9 ˢ. 6 4. 8ˢ 01. 0

H07.21ˢ Cˢ 26 . 93ˢ 9/3ˢ1. .6 /3ˢ
./24 1/3 .8 8 3ˢ 80 P7 3 .@ ˢ ?@1ˢ
019 763ˢ0..62 792.93 ˢ "11 6F6.ˢ< 2D61/3ˢ
O87/ 6 Mˢ86 16C 2 ! 4.2193 1 763ˢ20 ˢ
2/ .3ˢ8 / /1.4 ˢ D 4 93 ˢCˢ86 1 3ˢ"9 ˢ
.6Z3 7 8 616/ˢ0420.E3 9 9 1/3? $4ˢ .0 921ˢ
/ 101 3

:0 3ˢ"9 / 1E.4 60ˢ184 F I @ F60 6E2 9ˢ
9 1ˢE 8 01 911 29". . ˢ KD 9ˢ2 16 ˢ
"11 61F69 01.F 3 . 8 9 ˢ9 .< 9 ?ˢ04ˢ / ˢ
3D.29101 / /S21 019 ˢ 9 .08ˢ 163ˢC 9ˢ
8 2ˢ 21. 1 2 M\ D6 0# S6 4Xˢ/7 / /9 /ˢ
3 2 9 ˢ S0 6 / <17 1021 0$ .8 / 0 ˢ
E c 0# "14 0101 C. 064 .68 / / 1.1 0. ˢ
. 1 H0791ˢ 19 6311 EP03ˢ4603 ˢ" ` /3 ˢ
/. 7 03 9<003 97 F60d 1 02 - . 03, "92A3ˢ
0119 03 ?S 6/3 D38. 10 102F608ˢ 01193ˢ
/2 0S3#U44 0 7 0 ! . /@ 0 91 43 Fˢ
2ˢ 0 193F60 0/ ˢ4 - 8 =0 93

:. 2 0ˢ "/.0161ˢ 6646 2 ˢF6/4ˢ. ˢ 1/ ˢ
0 2ˢ"19 ˢ.0 03 . 8 3ˢO199493ˢ /.9 63ˢ
". . 0 ` 2 9/ S00

=. .62404 . 161/ ˢ 69/ . 62 ˢ"19 ˢ2 ˢ
19 2 FO/4ˢ. 090 630>D6 ? F6Mˢ"99 63ˢ
91992" 9 / 9 ! 71Aˢ 1 07 1 F Z ./1E ˢ
.1 1/049/9 F6 19. 0114 @ "1ˢ29ˢ09 . 0ˢ
F/ˢ 498ˢW.63 301ˢ 9. H N071 P10

& 9 1 0ˢ9 1ˢ. /=68ˢ " 0 F6/4ˢ M. 21ˢ ˢ
268 64/ 3E. F6.ˢ 8 90163ˢ". .024 377

/2D63 1 #0 00 20$ "1 ! 1G0 13ˢ 4ˢ" ˢ3ˢ
" 3ˢ 9.9 10 ! 6 0F # 2ˢ .6 63ˢ 2 4 / ˢ0 [
0 621 0 Eˢ29D0219 98 D 2 763ˢ[9 p 7 0 ˢ
27 08ˢ 2ˢ 8 94 /ˢ 9 /1010 6 ˢF6Aˢ 8 /ˢ
./0. /7 16ˢ / 6 /ˢ M 2D6 `.ˢ 6 / ˢ / ˢ
901 C4 . 161"6 D7ˢH /. / "4="19 Y6Ei ˢ
" D 20 . ˢ A ˢ ˢ

L ˢ9 1ˢ 649 468 E"0 60E 69/ ˢ
. 681/ ! O `3F6 498ˢ 0 193ˢ9 19 23ˢC
/76 0#ˢ H51 F7.3 ˢ8 /21 .6 63 7 0ˢ46/ ˢ
00D20ˢ 120# 11912Aˢ0619 ˢ0 39ˢ 8 / 93ˢC
M2D / 9 9 ˢF003ˢ 1 2c 4946. 16 "249ˢ
2 8 GLˢ"/.01 9 621 ˢ198ˢF6@6/ .0 62 ˢ
.6 3ˢ F6Aˢ /1 23ˢ2 8 GAˢ "/.0 ˢ 497921ˢ
F6083 3 8987 022 ` 8 172 408ˢ 219 ˢ 9ˢ
./ 2193 ˢF6Aˢ 6Mˢ 116ˢ / 98ˢ " D 2 101 3ˢ
(- 0 / G ` /2/246 0 3299 .01/ 49 1ˢ
/.9O/ ˢ 8 . 8 . 1 2 8 21ˢH13ˢ92 8ˢ011 ˢ
1 3 .1Z /3 1D `963

024912ˢ0 191ˢ ! 1/ 3ˢ"E DAˢ" ˢ"1 ˢ * B ˢ
/68F 9 2 13ˢ40/763ˢ D08 92113ˢf0/?3 ˢ
103 / 3. 0 7F6.ˢO2D1 29ˢ 983ˢ=)ˢ
F/ 2 /1ˢ9 D6 3ˢ86 .6 3ˢ./2 1023EF60ˢ 0 Q
19ˢF60 1 8 97 G0 10 091468 0@216 ˢ
8ˢ19 0ˢ/11./92010 10ˢ86O9 .3ˢ 9 904ˢ3& ˢ
9 908ˢ"/ 6 101. 8ˢ./2 012193 ˢ R CE69ˢ
1 70493 /. 2.01 .930 9=0 A ˢ I 1ˢ92 8 ˢ
=RS ; ? /7 SI 6 ?3"917= =.4Gp9ˢ49ˢD.A ˢ
2 10 76382 9 6?C" / 012 F09 .'? E
4 79O / 19 / 346 10 01 3 01

ˢ < < + %) ! ˢ & . .

B &ˢ & !ˢ ": +"&ˢ '%" ! " ˢ)+ + ˢ %& ˢ
'+ !)&

H/10 ˢ 4ˢ ˢ F6 4ˢ9 1ˢ - ! &
F6 0 7 ˢ. /1ˢ 91 9164ˢ8 /6.16 CF1E0 ˢ
- P 101 E/ 8 92G?7S23 ˢ I 1ˢ90ˢG6 8 02 ˢ. / Q
/ 3ˢ 0 3 F6Aˢ ˢ0D6 3ˢ04ˢD0 1 0D 2. 8ˢ ˢ
G/ 4989 924 161 ˢCˢ 6 9 63ˢ. 06 .6 3ˢ
2 91 634 0 7 0D12019ˢE02 9 63ˢ< 912 /$ /Aˢ
19 63ˢ"911/7 3ˢ4/1 ˢ ˢ49 1 / 68ˢ./ G3ˢ 9 1ˢ
. .68 9 10ˢ K F

0 7/ 0.94 1 2D6216 ˢ 0 193ˢ. /01 ˢ
0.2193 "9 ./8 862.3 4.F6 763ˢ 021.0ˢ 9ˢ
M A .ˢ86 .2 ˢ/ 0ˢ. / 1A ˢ.0 1 0D ˢ ˢ
093 2 c 8 8 A 4 0 G 0D 8 0\ˢ 96 0 ˢ8 94 0 ˢ
1 26 0ˢ ˢ Cˢ. /2192139 " ˢ. / ˢ 9 .0 4 68 ˢ
6 20ME 92 ˢ.06 ˢ 0863ˢ 6 3 0.191 0ˢ8 0 ˢ ˢ
D20 ˢ091/ 0 9 Aˢ011. 0ˢ 013ˢ. I / G0D ˢ 94ˢ
F6 049/ 723C. / 1 3 F00912ˢ.0 1 0D 293ˢ
4 262 ! EC49.011EOD 29 G/ 49 2ˢ 29ˢ
198 ˢ / =ˢ04ˢ 1/ 8 097 ˢ=94 0 G 0D 8 01 3ˢ
161. 08 I 7. ` / 0 94 803 040 W= 01Aˢ
.93ˢ7 96 .9 ˢ. 1. 0 922468 '

> M ! 5 I =

* ' - # 6# 7 8 -

+ "

' ' (^ %) %-

2 H / 0. ' 2.6 /7.21.3ÏF6 ' ". '021.1 4 '
)/' 68 "1 8F/.' 1.3$ "9' / 19 / '
.3 "11 8F .'49.9 2# "9 ' . / 1 3' 219 1. $
F6 ' "/9 HlO ' ' 9 . / 10 93 ' C
2' " . . . ` ' 9 19 0/3' 1MH 9 2F6.' 219 8 /3'
62 4 6

' .' 21' " / 6 8 F63' /10'.619 4 1'
E 1 ` 0 3. /2 1021#02 ' c / 9310 92' + '
4. .9 / .3 "1'F60# 0. 1019' 04<J'/0F60` '
00032C@8 "' - 0. " / .021 '49 1 1602161 '
2' 94/ 9' ! 19 '049.71 1' " .9 @2 ' . / 2192 ' '
1/168E .'. / / 3'/ 20 1.2162\
09'11 11 9 62 ' F6 7/3' " '=.' "1. 4'4 '
9 10' " 1/ 8 6 9 ' 8026 =92198 6O9 / 8'
8 1 14 /193 @ 10246 9C 0 0 . 1'
4 .cI 61 7 3' "0 16 3' S 1 3 04' 1 0G10 '
Z' 221 11/0. 8 ' I .09F6 4.11 'D9 42A' 621E'
F 0EE/ 62 26 . 9 9491999260/3' 9163 '
272' OZ3 ' ! ' @ 9' 4./2/ 80 0 / '
. .0 F0B 6 .3S4S21 9 103 .0792 '1 0E0'
0193'8 0 8 8 03\' "1 93 < 0 ` 93' 9 2 Z
E1 .93' 80 6 0 ` ' " / .0 0' 0 9#
90 M Z4 1E 8' " 1D 2 763' 6791 / 8 91'
F69 2 91 9D A' 010 21E763' 99'26 1 . '
763 0S$ 2 ".16 =' 92 / 17632 D 9F1
1.M 0'00198'4 9 01' ! ! 6 O.'FR' ? '
X 1 ` 3 127 1

' : .

" ' '=1' 1E99 6612 /?M R H' 0444#=. S'&
' (' ! 01. 101 /2 =E400763. /2 1 @ E29E11
7102 3 4 0763"9 1 3 ,10703 191 3 46FA'
003'29 6 =P R 7F01 191 93 H9171. 2 710 1F '
+ '0 19 0'.0 8 / 1\ U[61 '5 9 L' 3' 9'(
1923 0' 9 1/ 3'/ # 9 . / 9 6 8' 6 02 2'
9 1 9 '04 1 17/ 6p' 9D /2.1H'@02 6. '
/ =U R / 9119A +11 9 2? "1' 12 ' "9 1 3'
" 9 0' / '4 /E` O ' 0 193'201@0 .3E 9 0'
E91 0 6763 G/ 019.0 8 921 =) 14 . '
' .@C# 6 11/ 876c F 1=I 10 93 .HA216 $'
9F119 8 94 01 29' . / 191 3K 0 @ 1 3'9 '
G0/' 91 29'0 192498 763' F 411R ' 29'
.2 120/ 8 92'G076 1' g'
9 1' 9 010 9' :9 / 01H '06198' 460710' / '
1021 `1763 "2 ' 49 1 Y04' 92B'.0OE0 99 '
28' '0 19 3'0' `1 1 3 04' 49 ..2 6 2'.9 / '
7 ' /09R ! 9/ 9F ` 0' 0 016 ' 2'
[01 S Z C ' cZ?19S 99 `01 /? .$

: I 5 : ' I ! '

F6 ' 8 /1632/210216 8 9 1' 2' " 6 8 9 0'
1 /2 3' 94' 01 0 8' 04' ".21 01 /298' / '
.G/241 / 6 8 ' C' 79 / 98' 0..68'4. 9'
1 20.@

: / 0

B =1' 1=98 7 020' . / 1 3' 671.2 \' 0 193' " '
10 93'1G/ 0.9'. /2192103'.F 1 2.23 .S 6E'
2 082 01 p' 4 . 16 ' : .1 1 3 ' 8 / 763'0.6 '
1 863'=" 91P61/ 63

:' & ! - . .

I =1' .7 03' 8.87 0 E/ 6 ' 0' 46 .010'
90 /1168 0' 2D6 3' 04' 4 0 G 0D8 0'
9 196 / 8' 9.624 E8' /2D 164 298 ' C' 9'
&! 8468' 01 104 2. 8'0' 198 /04' "9 197 03'
4.01 0 2'1G2 0. 3' 011912'0 9 1 0'4 8923'
" . . 0 2 92 0192923 C 30 " =' 0 19' 0 Q
19 0 8'. /0 9 60 ` =

)* ' - # '#

:'0 I 921 '1G 863 9 .0 4 6 8'. / '96! '
I F6 9' "0 0 672/ '0 9 0'0 19 0 ' /9 / '
G0D1 013

. %

B =1'. /? S3D 0246 / 62 81 5 '4. 0'
182E' E F2DE/ 6 8 ? ' 910 8 0'1G/ 0. 3'
0 198 10 6D2 6 8 198 / 97 9 16 8 ' ". '
20E?'.0608 924921. 8' 2 . 923' 0 0'. /2 '
9@023E ! =0 .9

- .

I =18 9 8 G@20'9/ ' 22/ 0923 '079/' 10 '
8 .24 103F/ 8 122 04' 4 0101 /29'. / Q
4 3'/ 1`'9 1'4904'768 /198' . / 68'. /21
292408 I 192 8' :9 .0 4 6 8' 0F60' 8 2 '
&1'091 27 8 04'19 1 D9 8 8'. / 4 3 F6/4'
0 / ' '@9/ 8 =18 /'8 S 0'141 91'. 6

!0 ' ' ' &

: =1 0 3 24. 3' / 82 "18' .0 44=80'
" 0' 1 9 68 104 '01191 016 8 '49230'
. 4 F69'.0129'. / 1 100 '04 9'.1 0 8 ' "92 3'
0 99 13 29 6 ` 7 3 1 ` 4F2.' / 0' '
p ' 0 012 40 3 ` ! 29 I' 8 3' 2' 8 9Q
4 /'1G/ 0.9 10 9 [91 1/' 8 0@' 0D 1010 '04
= E6 8 " 10O6 8 / . .0 /29 0

! 'K+!)%! (%.'.& %. '%.)%- &-'
K' 3 . - & . .

M 4 3'F6/4'. '70 '08 / .' 9 / '
/ 98'19.6 8'1929 9' 2' 7 2016 8' 8 6 '
.1/2. 8'49 2 1 F6012/ 9 1' "010' 9'4 1 2'
T0 2' 6 70 ' 14 1M 21' 2' "2/F6/F6.'
18 ?298 .' "920' 90110 .' "920' 0 1.G/ 0' 2'
49 1 /#0 91 0' "9 / 0' C' 01 . 0 8 0D20' 2'
2 12/' =621' 92 8' 42210 01' 46/' . / Q
4 3' "921 .2 ' .9 '1193' 9 .' 6 10' 9 9'
1 1' 1/1. 93' '% 3'.01 0 6 18 6 163' ?

$!

02D6 3 2 4. . 68 "921 .6 612A "1 9 94
9 9 .68 894 68 ./ 4 3 9 / 01/ 2
2 1 6 0 "921 .6 68 02. 963 " 10 93$= #
0 .9 .0 9/4.2 02D6 29 6 8 /2.3 26
1 0216 ! / D 8 0 49 1 / 60 O26 / 62
624 1 <02D6 298 04 0 924/3 6 8 /293 9
"9208 0 9 / 0 G)4 08 b644./2 1..
162 .0 . 0 < / 9 " .0 .9 0 .91/ . / "920
1 .68 02D6 298 "9 @1
1. 0 06198 ".2/ 0 2 / .. 4 3 ".
1 .6 / 2 .68 298 0 D010 9H "1 0 9 0 0.
04 68 c 2 6 8 /2 763 0# 0 0168 i 2
.E6 68 671102108 0 6 93 108 /39
624 1 49 9 0104 ./ . D9 0241 8 C B9
/ " .)" !M 02. .63 " .0 93 N 1 / 8 " .0 B
E ! ' 1 163 . 02D6 29 C 09 9 7929 ./ 1 3 C
A e 3 0 01 3 19 "1.04 0 19 0 " .2/ 0 68
4/3 "0 / .3 . ./ 49 9 962193. 4 01 C / A
! /29 163 "P0 = 494 .0. 2 6 8 /2.3
> . 16 06 98 "92/ 0 F8 0 ./2 101 16 4.0
8 O. "1 920 .91 . M 1 0 .9 0
19 0 8 0DO0 ' 63 0/ 10 4P .6 C 80
19 0 1. 0 68 / 16 .1 080 2 1 / ./ 4 3
26 9 F6/ " 10 .12 68 G06 P23 9611
9 08 /3 0 0 6816#19 02R ` 8 "26. 8
./ 63 4 761
6 .6 0# ./ 4 3 621 46S 0 924 .93
8987 02/ 9 8/ 93 !06. 2/ 0# 0 D6 0
. 4 U 04 ". 68FO. .21 .6 / 68 0
163 9 2P02..3# F60 68 49 1 0 /E 1 / 3& 6
.063 0..1 2 P 0 0 .9 E9 "92/ 9 #F60
68 " 63 9 1 "1 9 . 021 # <02D6 298 C
09 98 . 9 11. 2 .M 6.1 I 93 2. 2 7
10 ./2. 04 /29 9 9 9 1 /2.8 6 /..
16 ; C 2. "920 .060 0119 0"92/ 0 68
026 2" / 921 38 M1 763./ 4 3 / 92 8
8 0D20 " 02D6 298 C0R 981 0G 1
0 66 ./ 4 3 62. / 1 / 0 F6 408
8987 02/ 0A 2D6 3 "0 /"6 / P 04Q
2010 2. F6/4 2 ./ 21 /8 68 9
60. . .04.8 0 0EC29 F6/4. 6 1 .
? ?J . 901 621F6. "249 ! G2 1 93 . .91 "0 66
A 0#1 .6 493 2 / 1. / 92 .0603E 460B
"%! %9 1 .6 4.3 2 / . / 0 19 39 ".2/ E1 .3
.8 . .6 0 .3 2 / 4/ 0 19 0# 8 0D $
1/1 498 2 / . / "920#0 1. / 9 A
/.63 ./ 4 3 2 F6/ " 10 ./2 1140
A 1/ 9 C 1/ 9 4 1 2D6 16 # 10 9 1 41 0
10. / ./ 4 3 F60 02D6 3 9 "920 .0
608 j 09 9 0 1. 08 "92/ 08 0.. 0G
6 P_ 9 1 9/2. 04 / ./ 4 3 F60 A
R: R 163 " .0 .3./2 9 . 8 C ./ /39 9 / .08
986 686 68 4 F09 "0 / 93 . .6462
<6 9 0 .9 08 92/ 08 86 / 1 /

q !

163 " 10 3 9 902498 0 1. 08 1
8 /293 4946496

%- . +") G A

T 2. / D020 .0 2/ 0 0 0
MD 0 /7 6 / . ` 04 10 @ ' \EH 0E76
76 I 8 0E1926 9 .6 0 U740 10 .
763 2 1 6 10 "0 3 0 9 0 0 . 0 ".2001
19 /30 01.9 0 "92/30 2 F6016/ 9 F6 2
F69 /7/3 ! 69 0 193 4 6 0 2 .06 101.
1G/ 0. 3 F60 2 0/4/ / .21 10 8 /
168 1G/ 0. 3 .F6921.3 "1 ./ "921 024/
F60 079 0 9 D91921 C 19 01 /G "/
4F . 2 9 6 021

2 E 0 ? D

= 21 1193 ./ T6/4 .68 2 D101 08 S\, S$
6 8 /268 C 1G/ 0. 3 9 1 6 68 1
<208 F6Z .0 921 6 8 /29 C .98 .
9 1 8 0 1 .6 0108 2/2 94621 ./ F .1 011
.0 921J 499/ . ` 4 992468

I =1 0 34 8 0 3 219 .0 61 C 17/ 1 E;
10.912 894 0 "/. 3 8 /46 02439 c1 6
2/268 D 01 0 /. 9010
I 63 #!) [&6 & "/ ! 3)- 9) "
11. 20 1 8 "20 0219 / F6A "/.01.
D6116 "9 6D6 63 .6 63 68 8 103 4 416 ?
/86 0 402 #0 0 / 19 / F6?S. 6 =:?
2/8 2016 $0 ' I ! 6 01. 0b.3 F6A 4 .F2161
0 /1 493
21. 20 68 F619 .619 C 2D694 2919
D62161 0 0# 91 08 621 / 1 .0# "1 .
198 9 197 0# 8941 0 20 3 8 6 96
/ 19 7 93 E6 498 "249. 2$ 0219
/ .3 9 #0 021 .3 "1 "923 6D6 0 93
02. . !0 /1 4.3 2. 6 0 2 C 9 63
4# # FO016/ 49. 12 0 9 0 0 19 0 /9 /
G0D63 F6 763 12 D40 39 69 118 9 02
268. 0216
9 0 D 61 0 19 0 - 3. 3 9
.020 3 69 16 0 9 0 /2 3 /E .8 =
G0 168 1 02 2 11.23 G68 / .3 0.0 3 94
0 /3 ". 2 6 8 /2 76 ./ 941/ E ! 6 -
061 .1.016 . . .23 162 . 3 460763 ./2
1023 ".26 3 91 08 0 19 / 3 2986 3
. 1 0D 2 763 / 1 3 F603"/.021 D8 /
4.3 69 <.8 . .6 01.3 2 0 1 763021. /
763 C 01. 0 763./2 .603 01F69 898
7 02/ 3 . .6 3 ./229 03$ 0 3 92 8 /
1. / 1 0.G90# F609 102D 1 .9 / G0D62
0987 02/ 0 . 1 C 8 / / 29 09401 13 /
G0D63 468 . 7/3 49D 61

> M ! 5 : I

1 61'0 9 0'0 1. 0# 4 . 16 ' 0 2 ' 9 '
F66 0'. / 1'7 / 2 . G / 3

0 2 '9 1' / D0268 ' . / 2 1023' 1E608 / '
4 . . 2186 . 6 3 C ' 1 763 . "1' 0 3' 0Q
.91 '<E6016 / 011 OD 8 763 '04' " / . 3' 8 / 46 '
01 . 0 9R ' . 6 63' 01. 0' 4601 621D 0246 '
\0# / 2D / 0 . 08 D40 0' 4 4 0 F60' 0 2 '
D98' 2D608 C / . - G0D68 'G68 / . ' 6/'
D021

2' 894 / '06198 ' 0 2D 3' . D60' 80'
0 0191 ' C% / '4 0' 04' 2D19 68 ' 09 3'
. / 8 0 010#F608 ' F6 498 ' 8 6 08 ' 2 . ' / '
16 '. 76 6 . ' 67901 ' / . . O 4 1' ` G 0 \ ' . / '
6 . 6 68 ' . 0 1 0D 2968 ' ' 0 60# 2D60#E'
"9 ' / 1 63' / E' G94 . 0 . . ' D6 021' 9 . '
1923

1"9 7' 1 0 . G90' 9 1' . 020 3' 09 3 ' . ' / 9 '
/ G0D63' . 7 ' C' / 1 3 ' 249' 4 . 16 ' 16 '
0' . 70 0' / 192 0' 07' / 9' 04' "921 . 6 68 '
460763' . / 2 1023' 8 98 7 02 3 ' "92 3 29 '
6 3 0 19 3 C46 / 7 ` 8 ? . 6 3' 49D 61 1 / '
2 ' 9 6 921 763 ' H019' 49' 8 94 0' 9D / 29'
01 3

% ' # ' # ' 0

' ' - ' # ' ! '

' 0

1M 0' 0' 013' . / / 3 ' F60# '94 1 '
' 8 / 1 / 9 / 10' ' C'0 62E8 / ' 9 . 9'04'
808 ' ! / 3 197 0 29 192C E19 1 D92 '
1 39' C' 01 / 2 3' 94 ! 3 ' 8 / 163 12 6 69' 2 '
. 68 . 0 61' / 8 2016 ! ' T G / 4' 497' / '
62461E '9 1 ' F6 / 4' 1' . 0 0 . 63' =9 63 ' G0'
10 8 92' "1' 0 F60191 8 3' / 7 / 2D62 ' 04' 0
0' . 1 08 ' 10 2F69
D98 0 3' 9 16 '
/ 7P 8 D68 ' @'
. 9 97 68 C ! 9 97 . P 1 ' F609' D6 021' / 7 '
/ 2D00 ' / ' 16' 944221 ' . . 8 / 4 63' 9
1 09 ' 198' / 1679223 ' 021. / ' F6 '
4 . ' 0 19 ' / 19 ' . 0162 . 6 03' 808 8 0' '
91 ' F / 03' 0 1' / D0 0' / 4 / 0@3$' / 19 / '
&06198' ' , / 19 ' 9 / 168 ' 12946 0# '
G7L> (

1 V Q ' Q 1 C ' V 1 C ' U 1 U ') 1 1 1 5 ' % 3 '
? 1 - ' + Q $ ' + 1 Q 1 $ 1 V C ' 1 ' 1 ' Q " '
N 1] C ' + + + 5 ? C ' $ $ 1 ' 3 + ' ? C ' 1 1 3 '
1 E C b $ 1 + C ' #$ N $) 1 ? & " 4) Q 2 ' b 1 3 '
U $ 1 ? ' 09' V ? ' 1 $ 1 5 '] Q - ' + Q $ ' ! '
+ C b $ 1 G + 4 + 1 _ 1 ; '] Q 5 ' 1 5 3 '
" / . 016 . / 1 / 00 013

5' : ' I ! 0 I ' EB
0219 / ' 2 . 6 $' / 1 . / / . . 6 894 0'
"9 19 ' ' 0 . 0 0 '198 / 0

I 1' 0 0' 4 6 / ' . 0 60 0# 2' 0 193' . / 21 '
292193' =)' . / 2192103 ' > 9' . / 21 2921 763' . / 8 '
862 763' G 9' 10216 8 ' 2 / 1019' / / 11 . 1 2 / 2' . '
9' 7 '04 98 0 ' . . 0' / . . 61

! / 21 2 . 0193' / 0# 621' / 1 / ' / 0' . 10 '
2 E# 7 621' 616 0# 1 ! = ! / / 20 0 ' F60# / 3'
/ 21 3' 4 1 2DG 1' 0' ! 2 . 1 . ' 0874 / 4 . 3 '
F6 ' 2 . 61' 8 ' / . . 19' 94' 0874 / 4 . 3' '
F6024 / ' . . 1 11 @' 46 9 $' ! 68 ' . . 91' / 6 '
. 6 68 ' 1 F6 . 1168 11 02D 4019' F6 76 408A'
4 4168 ' 2 E294 7' . 98 1 29 j' F6 / 4' / . 6 '
6 2' . / 21 0' I 49 08 ' ' 67 ` 16 93' . / 8 '
8 . G4016 ' # C' D 110 3oF6010' 087484 . '
04 . / / 20 08' 4600 4 6 4G' / 0 2 . 3

63' 616 0 68 ' 9 1' ' "1' 21 0 . 6 0' . 9Q
97 ' '04' 9 ! 19 . / 298' "0 / 1 191' 8 4 / '
68

: 0 193' 9608 ' ! / 1 . 2 . 2193' 1 3 ' 621'
: 9 . 02 68 ' C'4609' 8 . 2 2D9=04610' . . . . '
> '1926 3$' F609' 11' 4611 . 9 @ ' 8 . D6 ` 92 '
10 / 0 . 1130' 1 G64 29' 0 9 1010

: ' ` 1' 898 710E6' 492 0' = ' 1 R ' S '910 '
! 892 2D9' 7 10 ' "1' 1' ! 62 409' 26 / 11 '
. 118A' ?6' 861 892 0 / ' Z . G2 . / 8 26
/ 0 . 1 9' R 942 / 0108 M 1 '

" "6',0 !

I =1 29 ?7 0 ` 0 ' 7SP4 S0 ` 0@ 0 01'
& 0119' 46 9 . 9 97 68 ' 01' Y 20P 8 ' 89 '
46 228 Z 1 / 91 ' 8 619' 9 6 0' 012 '
/ 63 ' 04' "0 / 1 `' 803=G =1998 ' 59 '
46 O . 016 ' 04' "911 . 912 ' ! 0 1 3$' "1' . 0 9 . '
. . 1972 8' 2' 49 08 A' C' 0 = 0 8 $' F639'
946 . 00 / ' 9016 ' 9G . ' 4 Y 1 ' ' 2' / '
191 / ' 06198' 0 19' A "7 '9 . 1971O 8 ' 0' . 9 '
979 2' 4 1 ? 6 1 F60416 . 0111 ' =94' 2Q
19 ' H03 46 90 =H 03' / 21' 8 3F6012 / 1' "0 '
/ 12 8 ' " . 0 E' F 8 0' 02D6 098 ' C' Y G 168 '
9 62462 ' 2' . 9 97 ' 67 G 01 08 '

)]h ' : 9 1 / G0168 ' E2' 1G / "921 9 '
: 96 0' 2' 1G / 10 . 9' 3G / . ' 1 . 0 G9' 39 101' 46 '
0 90 2 $' F1108' 10793' " / . 0 / 1' 41 08' / 0 '
9@ ' / 7' PP0198 ' C' . 0 1 9 0

&* "6

=)' 89871020' 1 / 9' 8 / H / 1' 0 . ' 91 . 9 ' 7SN ' SA(
2613 ' . 9 97 68 ' 8 894 019' 8 / 6923 A'
3GE11 . 46 p' 892 2D ' 6 / 10 0' 8 0191

I# ' + I ' "2

J : = =' ' q ! '

) &' .

2 '=1' 0 3'. / / 3' 3 1021 8 0 C '
. 6 8 ' 2. . 3E' D 40 'G6 8 40 . 0 I'
E E' .06 101.' . /29 6 0 ' D6 E.' .29' / 7 .6Q
0 3' ' 2. 6/ 68 ' / D/' ' 67 1021 0' . /2 '
1023' 8 / ' 0 7 .089' ' 8946 0 ' 8 2 '
8 .' 2D6 ' .2 63' 8 /16 F6.' /2 02. ' 2 '
. 6 8 E 0' 10 8 .2' 92 63' 9 . 3 ' 4 0 1/ .'
C' < 1/ 9' . /2. 29219 0D 1010 04 1030 '
2' 80 3' 9 07/ 01 /2. 8
/1 3' .9 97 ' / 1 3' 2 /2' 9 1" / '
6210 63 ' 94'201 0 3' C2. . .20 63 "1' 8 /A'
. / 4 3' ! 9 97 6 8' 92 8' 4 0 1/ 98 608'
/ 98'. /G 79 9' 29F6 1 2' 4 0 1/ .'00 '
19 2' 46 8' 4 1924 16 E. 8 F6.' ".21 .6 C'
263' 4 0.0216 '1 0G .'9 ' . 6' 8 07 ' '
16 8 " 10 . 8' C 9' 20 763' 09 98 E' "1 6 8 '
/ 'N F69' ' 8019 08' 163' 02 80 3' F6 D.2.' '
F' &" "'? 016 ' 2' 6 9 /2763' . . .7 ' ". 2. .6 3' 1'
" -"' R-/W' 2' 1/ . ' F6024/' 9/21 07 16 ' 18 6 F6.'
'. 63"921 .6 9 1 8' 021. / .3 ' . /0 '
0216 1$' 16 8' 02 80 . 8' 9' 6 9 / 763'
". 21 .6X 3 2' 19 . 68' C' F60 16 8' 2 9 / '
93' E 1. 8 F69' 2' / D020' 92 66 8' 0.' 29 6/3'
/ 624 .E". ' 01' 92 63' C 8 /16302 8 0 3'
,V " "K %. ' . > 8' G6 8 / 9' 2 8 /' /7 1 116216 / '
. . .7 " 20 / . 0 .A'
@@ ' ' 1 1' 92 63' C' 8 / 63' / 8 2 3'
') - ' / 8 92' . . .7 ' 46/763' 8 /4 3' 8 16 '
E: 0 8 4 0 9$' C' 9' . / 8 .7.24 1' . .79 '
' 4 6 4 . F6.' 2' 021. M 8' 0 . . 0'
F6E I' 08 O 1 8 09 1' +.' / 19 / 98 F6 '
/2D9' 8 2/ '4 . 4 F69' 1 . .7.O212' =. '
.62' 4 / ' 1 49 ' /' / 0' 0219 / ' 0 1. F6c.'
' /7' 08 .64 2. 8' 91 26 1' 2 / 8 92' 1/1 63'
H6 63' 9 D/' 0 92.G 8 0' 9 1' 67 1021 0' 89 '
46 / 0' 2' 9 19 / ' 6 . . .' 67. 29 . 0
+.' 29 0 00 46/' 8 / .6 68 02.6 / 7 .6 '
0 763' 02 04 763' 26010 A
! 0 298' G029.9 97 0 98 10411 6 8'. '
. .9 ' 4 D 1/ 68' .10 1 . 8' 9.6. 3' 10. 0'
0 0 97 1 0 3' 46 / g .024 4 / @c.')+ Q
#%/')!- + %. ' ')_6!' @ @ 9' - S9. 3' 4 46 8 '
.6 63' / 1 /294. 040 '0 0 921' 463' .06 '
.9 ' / ?.0193 169' "921 .6 46/' 6 9 / 9 49 19 ' '
1 19 F6/3 8 . 8 7 020' 1926 3' C' . 6 '
")' . 404 1 2D6 1 2494 40 9 .68' 6. 46 8'
H/ 6 0' ". 21 .6 / 6 2' " 63 9 1' 297/01 /'
166 8' 02 20 68' E. / 68 F6. 09 0 0'
1 /$' 198' 2 0. /' C' 9 01 /' .9 97 ' / '
4/0 8 F69' 6 .9 1 '
4' F6/4' .1 08'. /2 . 621 . 63' .G/ / '
@E' 9 493' 1. . .1 .6 0 .3 2' 3' "98 .6O3 1#
F 6' 2 G '0 64 621 F60 8'". 26 0 2 2' +.' 0

19 / 0 68' 19 163' 07 21G9 ' 9 ' 62 3'
8 .2 7 020#' 6 68' 0 99249 11 3' / 1 62 '
.6 0 8' . .6 .21. 3$ 8' F6 763' .1 ' Q
163' 02 80 3' . . /F6 16 ' 01F E.' 0 0 $

: / . . 63' 06198' 80 8 8 =0 .3T 7 0 '
80' 0 19' 6 9 / 68' "98 .6 416 8' 46.6 '
16 ' 04' /3' 91G 8 / 493' 69' . 7 / H.' 20 '
68#+. 9 G02." 08 . 628 ' /4/ .3.162'
0. 9' 04' .9 97 68$' 6 .F69' 9 ' 9/498' / 9'
26. . / 0' . 66 93 220 93' 3 .F69' .9 97 68'
9 6 D016
: / 146/3 6 9 / 93". 21 .6 /3' .9 2 16 '
' 1263' 46 9 ' 7/ 87 . 3' "9 8 .6 '9 D98'
944923$ F6 ' " 4916 ' 9 9' / 1 /' F609408'
6 9 / 68' "921 .6 / 68#+.' 101 8' 0 0 '
.1' 19 1 63' ". 2 .6 63' .9 97 ' 67' / 2 . .' (.'
169' . / / 9' .08 . 01/' F6/4' 4 . .6 ' - '^ B '
. 3' , '1 $ $; F8' F6 49 /' ". 2 .6 63' . '
. /2. 6E i63' C' .06 103' . 2221 3' 46/ 8 8' 6 '
9 / 68
H 2.'9 9621' c 6463' 46/ ' F6/ 68' "263'
04' . . .7 '70 808 / 68 49 9924 1' 9 '
/ 1 62. 6 01 ' . . 8 3' 8 98 7 02 9' F63' '
8 4 01 / 16 8' 02D6 1 / ' 2 624 76G D6 '
08' 9 9 1' 4 . 16 F69' - . 3' ' D' A'
F60 8' " 08' . 02 1/ 0.6 ' 16 10' 2' . . .71/'
(D92 0$' F60 8 D 023' .6 10 0. . 1' C' 9'
/ 3 G92/ 4 3 6. .629' / 08 20 2' 0' '
016 8' 9491921 8 2 1 P1
4' 0.9 0' 9'
1.' - 0 .2 8 07 . .9.' 200 21' 0 E' 9 68 AeA'
.G/ / 4. 8 F6 ' 2' ". 2 .6 3 6 9 / 763'
. /2 . 16 '59.9' 8 07 .' 0 . 0 .
19 '46E 63' 9 1' " 0' 0' .9 1 /' ". 21 .6 /' 0 '
F60 16 8 ' 7 "0 ' " 49216 0 1 .6 . ".'
D 0246 0' 16 7 1010' 2. '26. ' 18 3' F60 8'
" / .02 ' - 9' E @3 RE!6' "1 2F69' . /21 '
D60' 621' . / 6 .6 0' /16240' +.' 46 6 .6 0'
/ !' 4@ 10 49 1 20193 67F6 763'
4' 9 1' 19 1 .6 0 0 921' F6/ 68' " 63' 9 1'
8 8' 02 80 98' 2' F60 16 8' "921 .6 68'
. . .7 '161/4.6.G. 9' "
T60 963' 102498' / . .6 ["921 . 8' . . '
' E.79 /' C' 20 ' 8946 0B' . / 8 8 62 3' / '
8 2 68' 8 2 8 63' 94' / 4 1 863' F6 'F6/ A'
2 08' . '08 / 9' 1' 1 1 / ' 2 10' .0 0Q
8 ' 9 1/ ' 2/ 8 20 63' 6 .' * 0&6+# ' '
/' .0 0 8 63

) &' - - "%

| =1' 0 66 8' .9 97 68' 4. .6 /' 8 263'
/' .9 97 /' ' .6' 2 9 / 9' 0 19' . /2 '
1 266 8' 9 1' ". 10F6.' 8 92 2D.' . . G62'

/.' 1 /' 168 67 1021 0'. /6 1023'46 @ 9'
. 0 / 9'. / / 3' F7. 8 9 1 E' D/ 0# DN/ '
7 01 / =E! 6 1 3 94 0# 0 193'" / .02161' , "
A'
D6 0' F6 / '0 19 '061. / 8 901 8' S 1 '
1 / 0 17@@1` 921 .6 62' .1 E 91'0 . 1H11 '
0 19' 1. / ' 0 1' 20 3' 2 .46 0' 2'
.087 C11 1.c 161' 9 63'F60116 8'"92 '
.6 6S F6. .1601W 9 168
!9 .79 " 3. 1E 9 8 019' 1610'0 1'
49/' . . Z 7 /'8 8 =9 120 '8946E 19'
040 10 .

& ! !%,-/

U P' <& 5 4'

[R / 9)110'"924 3A61/' 9 2198 3'
.H6C '@20 ' 03# c 61=' 8SS ?D. 1<0$ # cF b'
81 4 0S F639'c' D0890 C'0219 / 6 0'
.119710` 0'E0 9 .61'.EZO R 900'461 / '
8 8 2. 0/1111 1 F6 '2 E10' 4cZO `06/ cS
D/'E'C'9 C12 119'4 [1 101 3C'1 010 A'U ?1?'
. . .7 /' 2 'E6/c \c3p001 ./2 0'4@ / '
9 'C' / .1 0 'H @ 91"1/ @E01011914A'
71@11/7 /2D016 3 '
`9 9 6`' / 1.0

A' ',#! -

' ' 19260' ! 0 60 A' 0 93 '10S' &
'292193'F6191. / 0192103'49 9 699'
00.37233 0200 @090 1 3 013/9.11 E1 11'
. 924' 0 901C 'F2 R' 4 'G/S 1?'
"9 0 09 93'1/ 1'M2A' 49/'02 2' 8 0D/'C'
992 6 8 0 9191 8 10 ''E61 9 + 6'
YS$ ' .11 E 3D106 103' 0'D.S 3' / 4/ 1S92 '
J)' 80 9 103' 1?' 9 8 8'U SS 0' '[S' /SS1 3'
< .24/' @ 111' / .7 11141 S<
I /119 103' 9 =2 ?79`1"' 20' 0. 9A' / 9
(/121" 62E'. / 8 8 /O 1'C'0 1 . 10' .0@' 1180'
" 6 ' . 99`11 1 8 0' N0.91'70.' / 9 2 '
.93' 02]3 7 RS??
0640.90' 8 /49 1 #Gp !'492 F69' 9 0 1 9'
10@ 8 '19 9 9 2 E2/' 002 8 E'CD.2198

I ' 0 193' /21'41 ' 9 9 M 'C' 2 9Q
/ ' 0' - 01 34 111 < @00 '10 2 E'
& 3' / / 3' 96 113' 9 119 2 10193' 7 1 21 '=6 9 '
10 0 "/ .021@'H39"0 03'G07 0 011 . ` 03'
@0" ' 0 97 03 /96 /3 '0019A 06Z#d D9'
S0?E07 0 /A'129216 8
M@ 111' 0 191' 0. 93 2' 0 193'9/21 '
092193' . / 8 8 6293'"4' / 1 03 "1'6 11
/ H492@ /4 C'. /2191603' F6A' 021'F60'
10/ '/ 2 0' 90 00p' . .91').6 10 .3

' .
= 21'/ D020' " C3' 8 /' 20161 '0 1 . / $
07 . 0 70EM / 19 0 ! D 9=. /168' " 63' (
98 9'" ' 6 . 1WC'@ = 0' 91 9F60 1 2/' '
0' 4. ` 19 223' ' R OA, 1 9 1164898'
9/21. 8 9 `
M. 6 /32W10 0 A119 ' 4 ?M 021 F6.'
/ 1 3. / [/ 90 > P " 711C S 4. . +1 C 102'
F6 2' ,' 9.11 0 '01F 9' 1' 9 .01' . . 6 / .3$'
2 / "11/ 0119 ` E@ = F !' / 6D20'
(.M 0. 91 EA' I `9`E1`16 0' / 6 1'M=
/ 01 0C' 1/ .= 01' 2 0 / 3' 6 . / 3'
8 0 H %EKDE 8 0'C' 0Z= 011@/1 6 8' "9 7'
0 97 03 'F6P'16 R' 0293'0 1029 '.0 1 O'
D 29 9 . . 00 /' / 1A' 8 6 /4P'1 763'
./2 01Z93' 1 1@340 140114 8 1' 1. 163'
0[0 .' 1' S9 /' 0 97 0'1/ 91 / ' 8 8 / '
7 3# `30' 1 .' 9 / '@ / /06 $' I0 68'
9 1 9 8 0'4P@216'. 0 F2 PE3 8 6216 ' '
I D924' ?" E 0 92E 9 193' A&
'4' / 91A?' / 90 / 6 8'46 /' 21'02D6 $' r $'
8 2/ ' MH3' 04'19 8 / 0'"9 D 1'C' 9
S P 1. ` X 3 2?S 0 8 =00 / '0 19 F6'
A0'PA93 '4 9 111 F?9' .021G63' 219 263' 2'
/ .' .012/96 0'9 19#a120 34 40 G6 8 / '
9 8'9/21 29 `3 /9S /' 671 .024+' (('&6 8
: '4- (/ 2,' - ' (4' - - '3' '4 .1' - '
&('2 2$2 =;$(' , ' , .$(Q ; (/ - '2 '
. ! /' '
H &$- , ' '424$$' - - B /$(32'1'4, ,
'K '< & ' '5#34 !
32'$ -'4&2'4'($ (' $(, (' / , &. - . ('
: ,24.-$; <,2' =3 2 8&22&$A 7' $4(& 2'
($-.2($ / <
=(4 / 0'4(,$42 '6. (' -&, 'Z ' / -$ 'Ab@O'
HO(124&$$$(' ' , A # 4$ 1 7'3.-0.1'& b8T b'
2. ($0. <!4;A-VJ-&($('4 '2 0.1'4 .2(&'
$- 2, 1'<6((&.? /'2&.($' , '4. '2 - '
'($2'4-.1<' :2 .-3.1<+. / 1'K.2' 32' '
/2 1$' (3 $ / 1-2 $$$, , ''($2' ,42'
$ -24. < 2$ .1<(3725,14 .& 0 0 &- '
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6.- . /' -$2 6.2' -&.0. , ' . . ! ' (3' ($2 ('
:26. 32 /'(3 / (- 2 /'&(- /'(33.&&, '
3- '%$ 4 $' $ 2' 0 02, 3. ('H+2' (Q(&2,3-
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&; $ 3-&-, $&('$. < D. ,$.1 : 4 $.1 -0K'
6. '& ((421' (/ ($- '6.03 4$$ 3?$, '
(K -$23.221<
> .4(<7 ,$I ## ' -&(-1, .$$ & / 21' -$12'
(42 . (0. : '($24 '(&(-$30.1 K / , '
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& / ' :2' ,2 / 0 (,(1* 32, 6.2' ,2$, ' % 0 6'
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/ 6 . -ˢ 62 .0#/ .6 / 68ˢ 61 1ˢ<. : 80ˢ0ˢ 9 ˢ
<-) %ˢ - E. 3ˢ =" . # 6!/,@!) " /ˢ
(! !ˢ >ˢ)+" %" %ˢ ; "6 D/ˢ 0 768ˢ / .6 / ˢ
68ˢ ˢ.6 63ˢ/ 9ˢ. /21 69216 ˢ/ .6 ˢCˢ" . 2 3ˢ
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=9.6240 1X . 16 ˢ - 09. 3ˢ 0 6
S;= ; 01 39>890ˢ"9 ˢ408 ˢ0ˢ. 0 30ˢ8 92 2D.ˢ
3 10 ˢ 2 10 ˢ. / 26ˢ.6 6 408ˢ49 0 ˢ / P0ˢCˢ
91 6440ˢEˢ 1ˢ 9. 93ˢ " 7 93ˢ07ˢ / 7P4 3ˢ9 ˢ
H 4 Aˢ. / 8 8 /49ˢ 9. 02162ˢ I 1ˢ "9 7ˢ46 ˢ
/ E 1ˢ. 10 268G68 / . 8ˢ= 1926 / 93ˢ
102P03ˢ49 90401ˢ07ˢ9 19 3ˢ 2 6 3

.11 0ˢ 4 . 16 ˢ - P43 E36 3 ˢ 01 2 =ˢ
R 074ˢ 843ˢ 1"6Aˢ0. 2/ 69 / ˢ ˢ
(9111/0ˢF6 /ˢ0O6 63ˢ9 1ˢ 9462 ! 6P= HP9019 ˢ
261ˢ 89870 0 0ˢ / 10ˢ1/160 ˢ / .0 18ˢ. 2D 1ˢ
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. 68ˢ 946 .010 ˢ9 / 801ˢ 6 08 ˢF60$

4 . 16 ˢ - 9 3ˢ 9 1F69 22/ 8 8 7 `3 /ˢ
1 @40 ˢF6 76 408ˢ0 80 763ˢ /7 / `D0ˢ
4. /ˢ 9 / 0 0 "1ˢ 1ˢ0..9 1 3ˢ 86 0.. 31 01Zˢ
163 9 1ˢ "9 7ˢ 2 D 0ˢ04 642 4 01/ ˢ
68ˢ. / 9 1 /298ˢ 219 63ˢ 861 . / / ˢ"1ˢ
G68 / ˢ. 10 263ˢG0. ˢ162 .0ˢF60 ˢ 9.6 /ˢ

?Sˢ " 6ˢ4 . . . .16 ˢ H 9ˢ92 8ˢ. 98 16 ˢ/ .6 / 68ˢ 3ˢ
69ˢ. .6 63E 0 /ˢ. / / 9ˢ4 1 J 63 80P 89ˢ
2ˢG/ 8 29 .6ˢ / ˢ"0 06 ˢ/ .6

T60 10ˢ 4 . 16 ˢ =%&ˢ ! . !
F6/4ˢ0 0290 68ˢ19 0 8 60ˢ1926 101. . ! 01ˢ
3 1F6.1.26 3Cˢ 6. 40ˢ "1ˢ. 10 26 6G11Aˢ
2 / . 8ˢ19D01ˢ 107 O01F699/ 8 2/4 6= ˢ"7 ˢ
9 1ˢ D0892168ˢ. 0 .ˢ4 #68 F M H2D 16 ˢ
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1. / 3ˢCˢ"926 3 . 9 @ 0ˢ 943ˢ DO10ˢ! . ˢ4 ˢ
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01010ˢ989 D923ˢ8 / 3 ˢ0 70 ˢCˢ0 F6019263ˢ
679 .92=\ .3ˢ 163ˢ 9 ˢ 2 64 68ˢ / ˢ
.6 62 4 C24923ˢCˢ 9 68" 1P68ˢ .41 0ˢ
49 9 9/ ˢ04ˢ.9 97 68$ˢ" 1 968F69ˢG82/ ˢ
. 8 E2 10 ˢ 9. .6 ˢ087 923ˢC2611 . `=

=9 1? ˢS 39 3ˢ 69ˢ @ 9ˢ0 F674ˢG O11/ ˢ
911"ˢ" 1 968ˢ/ 8 2ˢ. ˢ 0 19ˢ087 01ˢ3 2ˢ.6 63ˢ
894 /ˢ9 1ˢ 219 1 168ˢ. C 9ˢ4 < 168 F674 ˢ
. Eˢ D6 08ˢ19 9 01

+)%ˢ9 9 ˢ H68 / 93ˢ/ .6 / 68ˢ 621ˢ 19= [1 I34 ˢ
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410 2 G68 / 3ˢ 0 198ˢC#. / 2908ˢ "1ˢ7P.ˢ
`9 91674 19240161 ! 0ˢ9G ˢ. /1 6D010ˢ" ˢ
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! 1" 10 G 111266. 0ˢ4641 9ˢ1/98[E 020 68$

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) !-9ˢ 69ˢ.1 10 263 ˢF6/4ˢ . 9 0 0. 98ˢ
. /2. 9 0 2 ˢCˢ. 10 ˢ8 /4/ ˢ 1ˢ . 6. 463
H 9ˢG68 / ˢ 163ˢ9 1ˢ .91 /ˢ/ . = G/ˢ 0ˢ
63ˢ .24.23ˢ 9 . 16 F69ˢ "1ˢ9 63ˢD 01 0ˢ
/ .O 63ˢ . /2 1 64 63ˢ " 490 611 49 F69ˢ4 . ˢ
/ 901ˢ/ .6 ˢ/ .9 63298 .ˢF 0ˢ 2ˢ. / ˢ"1ˢ 2ˢ

2. 9ˢ / D02/ ˢ 9 491ˢ " 63$ˢ I 1ˢ 06192 ˢ
492 63ˢCˢ 894 / . 191ˢ46 63 "1ˢ 2ˢ. /ˢ *6 ˢ
9021ˢ 9. .3ˢ" .3$ˢ . ˢ"1ˢ" / 621ˢM 1 . 0ˢ
4 Eˢ" <60 93 >9 . 63ˢ9 1ˢ 0 19ˢ0219 / F60ˢ
6 08ˢ 9C1E / 9 / ˢF60ˢ" 1 9/ˢ26ˢ
12/ ˢ 220101 M162463

9 1 63 ˢ4 . 16 ˢ"S 39 69ˢ3 . ˢ. 0 ˢ
1 9ˢ=)ˢ. /2 1.21 0 " 1 /ˢ 6 /E. / / 9ˢC 9 ˢ
6. 4 1019ˢ " 1 /ˢ492 0 /ˢCˢ 9 D9 01/ˢ 8 ˢ
3$ˢ 2 / 19 / ˢ 0 19ˢ 163 ˢ"1ˢ. 10 268ˢ
. . 01 261 01 . /2 9 6.1 16 - E69ˢ" / ˢ
/39721 2901 ˢ2. ˢ. 17ˢ9 602 ˢF6 763ˢ. ˢ
. .1. 10 263 68 2016 ˢ = . ˢ70791ˢ / .6 ˢ
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% .

23. 19W 263 F6 . /2 1011 763/ ˢ ?
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6P0 3 ˢ"926G3ˢCˢ29.66\ 3 8 . 8 > 02 Cˢ
.619 ˢ 929 1 3ˢ < 69ˢ /108 2 763ˢ46/763 ˢ
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21. 223ˢ0 19 ˢF6 ˢ. /2 101ˢ/ 9ˢ.1G8 /1 9ˢ
2 10 ˢ. 7 ˢ 9 / 01/ ˢ 1. 8F69ˢ 1ˢ/ .9 763ˢ
69ˢ.0162.6 3ˢ808 0 2 3ˢ 2ˢF6 763ˢ 9 Q
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0 ˢ" 63ˢ9 1ˢ/4/ 0 ˢ . 9 19M4/ 93C09 ˢ
98ˢ04ˢ.9 97 68 ˢCˢ 6G2/293 ˢCˢ 9 6 D0 ˢ
3.ˢ86. . / 0 2ˢ. 66 98ˢ7.9 97 /ˢ 1 02198

+ 21ˢ / D0200 `4 .63 294 1 / . / . / / ˢ
10ˢ04ˢ"1 68F69ˢ.0 1 3ˢ 0163 C 2ˢ.0498ˢ
290ˢ.68ˢ/ .6 3EˢF6 0ˢ298 9ˢ9 . 621ˢ / ˢ
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O .3ˢ"9ˢ9 19 2 ˢ4 .6216 ˢF6 ˢ 1/ .ˢ
62106 .6 % "9 219 23 F6 1ˢ M 9ˢ06 ˢ
93ˢ I 1. 20 68 67 1021 0.0 1 0D 1 `0. 1ˢ
D6 0ˢ 2.ˢ 98 . .6 0. 3ˢ. 68ˢ ! &"+ ˢ
.0 G1019ˢ ˢ86 96 ˢ1 93 ˢ ! 06 103"917ˢ04 8 90 3ˢ
16 2ˢ064 1/ 68ˢ4 . 16 ˢ016.0 68ˢ:0 3 6 ˢ
9 /106 .6 4 . 16 0 0 69ˢ 220 2 9 ˢA]Rˢ
/ " / .016 ˢ /763 898/ pˢ .9 ˢ Rˢ `ˢ
0 =@ ˢ7ˢ.0 924/ˢ ˢF6/4ˢ0 9G9240 ˢ
863ˢG02. 0 1 .6 0806 .3"9 .024/ ˢ - P ˢ
.684641 /ˢ02 .6 pˢ" / .016 ˢ1ˢ = 69ˢ 2 ˢ
&01 / 0 3ˢ/ / 10ˢ =1ˢ ! /2.0668ˢ 219 ˢ
1 63ˢ4 . 16 ˢ. /2.G67E ˢ". ˢ $

' 1/19 2 ' !6' 62 ' / .' .11/ /' 219 '
1/.. 381 1/ . 9=EC0 / G - 8% D/80 '
1 3 . /2 1 166216 F6.' 9 ' 1 6016/ ' 8 901 763$'
F6/ 6 ' `63'4 . 16 '24 ''/ (? /-' . . . '
0R @ 8 98 9 ' # '') ' . E . '
! =1 @6 q1.069086= 1/@2463' 02D6 '
' /7 F67' 6 6 ' @249/33 @' .2 63C19'
9 1' 9 968' 898710H/ 68' ' F6/4' "/.021'
1 8 0268 ' F6 0' 9 1' 8 .FE7 020' 1 8 0/ '
8 /4/' .92<0 0' 46 0 8 .2 2D9' / 10 $F619' '
' . 0 /' . 1C492 ! / 6 4E103' ./2. 2D 1' 2 0 '
9900' 237 6' :' 804.01'G68 / . ' 1O645 1D106 3'
C101463
' ' 1 ' $' '
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' ' # # ($W6 ' <
' '0 L 4 '
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, ' ' ' '>' @ L ' G ' '
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98' ". 792 1
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1 ' # 6 ' : : : $' ' # 9'
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E ' , ' ' < 0<' ' , 4

5 : I ! 0 I ' ES;
7 /49 92 1' C 92 ' N9 621619 D/' /21'
9 G62.2. 66 8 04' .9 97 68' C' 92 68'
./8 8 6298
/29'06 93' /21' D 0246 0#' 0 /1 493'4 '
139' . 8 62 = /20' .9 97 ' F6 0' 2' .03' 0 193'
9 9.9197 /8 9 M `9 01' @G9 01 2' 2D6 '
10 . / 1 0L +03
. !6 -9
= 2D2 D9234603 0 0921' 0 193' / 9'
1 / 98' F/ 14 .11O 3\ ' 4' 9 1' + '
EMM R 40 2 101 /8 07.1' /16240F69'
9 1' 3 ' / 9' 64/ 0C'91 79 ..21 0#' /4.3#'
2 91 / 9 0 F 9 0 ` M '9 1 4 . 16 F69 ' ! ^'
01 2 3 00/
/.63' 7' S)27@ "7 86 68' 1929 0'
1/ D@' 9 ?8 1 "/ !0@ E 111 ' 249' 2/ '
892 0 ! O 8' 0"
4' 9 10 8 09. /201 68 ' . G029 0 . 8' 4 '
14 0019
=6P6 03'90O9/0 1' 8 3'4 . 16 ' '
F 0 `4 .0='08 /1 3 9..7 03
07 0 /LA' 8 0 . / / 9/ 39 1 . 8 101.3'
/12/3. 06492193' C' 0 9 92193'
M! `1- 01. = 40= 0E 4'9 1' %!) 5# !
0 `08' 924/21' ' 08 /2.3
9 `168 # S?' - 039 3 . 1' 0 3' 2 9 / '
3E 1E 2' 0.61M849 2923' 2' F60' 70 7 0'
q / 08'20 . 16 '9 ' / D 2/ /' " / 9' .61 3'
0.6 0' R 89021. ' 7 F69' 492 01/' ' 04'
2/7 / 3 9 63' c 20 0.2968 T2 4' ' F6 '
408 8 0 9='70 7013.' 621 91. ' . /8 8 6 '
29 8 E 0161A' 9DF2 ' 9191F69' 8 6 97 3' 9 '
`=. /24 . M298 ' G/ .' . /2112D 1#' "249" / '
.0210173911@ Z193 q 0D 293' F6 0" 1/3' 0 '
19 'A c921S1?=.S: R 8' "1' 70 708' .' 8 /Q
7 191' 8 1017
0 346A' 8 $ 1 . / ' 2' /82 '
7 /3' 00 80 723' 8 8 /7 13 . 99 1/' ! / . / '
&4 /' C' : 1 0 . / ' 1 91191' 8 /7 3' / 68'
49/ /8 ' = ' 04' 01@0' / 19 ' 80 1 .01 / '
2921 149 /1 7/=@6 .6 3' 2 1 6 109 1
>9' / 7031/0 1 0 @2'4 ' ' M 19/ /D 0
)?
| =J 1 80' 69' /101/92' 2' 0. 9. /2 '
.668 07 / /8' 4 6 /2.'9 / 8 0168 ' @'
F6/93. 12 9 8 4' 01F6.' 8 1 9016 ' 0 '
89 2168 ' / 9 0' 4.21 H8 ' 2 9 6 1' 91 08' /3'
. 01 /2 ' 9 1 8' 20 763' /716 01 3'
198' / . " /8 1 /8' 9E 8 / 1 /2
' " &
9 21/ 0' / D929 3' /82 684 / 80 8 .'
M ' C' / 4 ! 80' 80A \ 3' 460763' 9 ' '
BS ? 2 0 "124O3 C' 0 1. / 3' 9/ 68 .0 '
2 1019 1 ' 1179621 76=' 2 116 G' ' 02D6 29'
2611 10 ' 9 9@4' <F6/4 / 68' / 68'
/' E

! ,' / = - =

9 1E. 9 .921 0 ' F6 / 4F6 / 1 4 02001118 / 29'
8 260216 .2 6'9 F6 1/' / 729 66 / 39 '
E.3' C 0987 026 03' 1.26 / 93' / 68' .0 '
6 @1. 8' 2D .4 .2193' 10$4 10#' " / . 3' / '
20240 C .<\8 2 8 924 ' . 7 ' 2 1 6 E 9210
>9' : 921 68'2686 / '4 . 921 E3 C'0 1 '
.0E01 427 ' C H 2' M 19/ /D 0

? ') ' ? ' 0 8 S' 8 8 / 7 93 F6 763'432P3 6 3'
"E0 113/ 30 1 8 0216

| = ' 0 = . . / ' / 3 = 0#. .
&.131/ 2 ' / 9'46 /'0.'4.2 /' 0 0 411M'
G0793 7 02@20 ' F6 763' . . 97 68 1 R DL '
16 ' SA0 c' >' .0 2/ 0' 162 .0'0' 42 ' 2 9'
/1 F240' ! M 1023
L% : - +' (%&' , %- !
! ' =1 2D / 0' .01O ` ! 6 00' 0 01/' / 9H '
_'4 23' 0 / 3 ' 6 10'20 68' 8 90163 ' .6 23'
" 3' 9 1' 0. 9@' 9 . .619 9 " / .98' 660 ! E'
09 . 8 2 . 016 0' 198 9 019' 2F 6764 2 '
D 4Z ' 6 8 / / .3' 01401
!%) /
: 11. 8 / 1 3 / 1. / . 8' C' 1 .1 /1912 '
G2D6 F69' . / 8 8 6298' " / 9021' 'W A4'
F/ 640 01E2 ' !%)&/' .08'298 9' .0 0. 10 '
198 ' F6 G 021 ' / 9' 9 . 16 ' C'0 002D ` '
1 04 . .6 0= Z331"249' F6A
.02'10 '0 /'2 / 8 29'08 D40 ' 23' 1/2 9'
4.'F6 763' 6 0
A' @ " : %!
' =1/ D0268 - 16 C / .61 / 8 3E ! /2 '
_ 1023' .0 29' 8 / 6 0 0E0 0 / / D / '
0' " / 674 ' 91' 2.08' 894 08' 4 1 11 '
C' 96C E3' 8 /1/ E F ` 9' 2. 63' 2 1640 '
460763 92 3 F603" / .021' 02 203 , / 492 '
0 .9 E3 8 8 10 ' .68' 86 16 3'419. 8 C D0 '
8 921/' / 1 8 / ' .6 63'9 1 98 10 '0420S'
9 16 ' 62 .6 63 ' FO9 1' 2D60' 322 @2'
0 9 021 29' 2D6 /31 I F6/ 2 0F60. '
1019 8' X7 0016
% '% j 2D6S' 97 09.1/3' G / 493' 2D60
6 1.2S?.6 01?' :9 941 80 0' 2D608'
"263 219 ! 3@?002??0 9' H / 8 /'/71 26 1'
" . . " 61M 98 / 98' C' 0108 ' =9 9216 8' .2 8'
e/ ' ` 2D6019 3. 1 1 6 .0 ' " 7 023 ' /2 '
, . ' D0'E 0.911938 p '7 40' C' /' 0$" 1 ` / 6 E'
20 2/16@40 19 ' . 68' /10'04G 9 23E'
E9/06 8' C , 1@68' 8010E 4'9 1' 8 3 8 '
3 ' 5 01 3 F@ 0' / 63' G / 8 /' TFF 1< C'
/262 0 ' H M '0693' 0"/ &. % !&%' F6p'
. .91' 2D60 8 71 / 9 ` ' G07.22" 1' 110. '
/ . 6 ' 1 ` 20 10' /F69 0 2' "10 12F69'
8 102@
& /Z 2D 039 1E 911 9 . 0 / .3 ' 3.

' q ! ' '
9 1 8' 2'9 1 98 1019' 96' .6 4.' 60' E '
D921' .2 8' .2 63 2. 1 98 101 763 8 0 '
8 9'10 163' C' D6 163 ' 198' 4 1 8 19' C' 0 1 Q
.6 019' /F6 ' 0.' /2621 01.

'& A "
@ *&-- ' + & + /') ! #%'
B &' % ' .

5163' /21' 1290 7 0' 9' . / / . ' " 0 S #? $'
, 8 9' 1 19 ' . 021010
8 3' 0 E' /21' 6 111 .3 ' 29 8 9' 8 0Q
8 3'$0 E' 2 .1 / .3 298 9' 9493$' 49' F6 763'
0 1.0' G . 21' 9 .0240 . / F644' 11. '
603' 9 / 8 8' ` 0 193 298 9' / 0 198 F69' 0 '
1 .2 01 /293' 6 0'19.92 6. 8 63' 2' M 19.6'
/D 0
>9' . ' /' f%# + %/' %&
! " - /
263' 0 / / 9' Y 2 016 9 1' 0 3$
4 8 E0 34/ D0 / 1 3 ' " 0 40 1/10'
04' 0/16 2' 79 68' . / 8 0 010' ' 0 76 '
F69 49/' 86 90 3' C' .08 0D 0763' 2 1 6 '
0 ' C' 9 ' " 0 03' 4 E 17 / 93' 0 2.6 010
` 3' 1 93' 61 !' 0 193 ' ` 097 68 ' ! 67 '
163 ' / ' 04 63' 0 12689 016 ' ' C' 9 1 98 0'
8 0263
` 097 68 ' .6 63' .0 61' 08 63 01/'
.0 6 / 69 / 8 / 01 ' 2 91 16 ' 4 .P4
FO9 1 ,6 ' $8 /6.16 / /2 ' F6 498' 91
86 .6 /3 49 1/ 4. 8 C 6 2016 8 349/1'
68 . ' 01 068' C' 1/162468' 8 0 / 98$'
021 /1 68 ' 9' 9 1/ 0 98' .1 / 68 ' 9'
2 0' 2016 8 ' /162468 ' 8 2/ 98 ' /7 '
.0 6 0198' $' . .6 01 1. 07' / 22 763' 1 '
206
=.0 6 0' 8 / 69161 ' 6 / 8' F6 498' / 9 0' '3? '
08 .2 . 1.6 0 3 ' =. 9601/ 3' / 1 E$ 4. '
/ 612 1 0 9 EC' 01 8 / 1 /2 763$' 0 1'
1/ 6 2 9 01 ' 8 2/ 3$' 191 / 68 7/ 0 '
7/ 4 2 ! 06 103' /7' G 68 9 ' 0 .6' /' " / .0. '
0 0' ! 69' 0 0$ F6 0 7 20 .6216 ' ' F60 '
9220 '
! 67 163' 9 1' 9.6240' 0 3' 8 026= 11. 7 0'
.7 6 1C9 1 . 8 08 8 026' 8 .4 0 .6 / ' ('
1 609 1' 04 63 ' ! 67 08' 9 1621' 86 96O'
4 / 7 .9 3' C' 7 097 963 ' 9 1924621' 1/1 49 '
6 3' C71.6 3$504 E' 061.' / 63' 8 / 8 3' 9 1' '
/20 9' 8 0268 C .08 6 20 . H 2.F60 '
162 ' 9 63' 86 .6 1' 46/' / 201/ .3 '46/' 1/ '
101/ 93
0263' 9 1 98 0' 9 1' M D0268' 0 1.7911 ' cS '
668 ' F6/'/ 8 2 0' .0 8 63' C' 1979248 6 3'
9 639 11920 .019 ! 1 621" 1D6/304 0. 3' '

> M ! 5 I ' R ' $ B R % < B + 4` ' !

. .2468 ' 8 3' ./2. 292468 4 D ./3'
862 .24/3' (
I 1 9 8 0' 8 G63' 4 6 4 .6 ' 2' .0 68' 29'
5/ 9.08". 7 0.G 0 1 F6 0 3' ./2 10.' / '
I .6 3/4/ '46 4/ 4 29' 4 24 3' ' !0 '
40/' 86 .6 ' 2 . 2 '
. ..24621' 46/' 9 .9 2
' 2 8 910.0 68' F6016/ / .6 13' ./8 '
' / 10 8 ' .6 63' 0 3' 219 20' .6 29 / '
D 16 ' 0 80"/.016 ' .68' .6 60.6 ?"/ 0'
80263E 2' 'E60.9126216 ' 293'= /8 892A'
1 / .3 69' .08/ / 93' 0 ..=' <' 8/21 .61/3'
"/.0 .' ! G /8 021 . \' 9 ' F60 08' 0 91 11'
8 0' / .92.6 .4' 29' 8 40891/' I .. '
, !' 0 ..8' 0 3' 8..0.0 E' "/.010 ' 80263'
069 0 2 01 E38 ..0.0 01.21 9 86 .6 '
.6 '1 93' 219 2 'C' 1 93' 9 19 2 '4 D ./3' 07 '
46.92193
>92 F69' 2' 4 D ./3 ' 8 8 . /F6 F6. 4J'
' 10 F60 .3' "1' . ..0 .G.2Z/' 9 9 1/ '
C' D6 3' /8 293' 4 D 1 3./ 9G92 9 9216
' : 863' 4 . 16 ' / 9 #F644' /7/ . /O.0 '
9 192 8' 4 ./ 624 /8 =863$' 249' /H9 '
182. -0O?.9 K91S 8' F60C /O ..' 1 6T '
.0. E4 .62.2 ' D206 C 6< 02 8 .3 H079.'
1 4' #+--)6' 46/10 16 8' 219 /4 0 .4D6 0'
E 9.6 0 9' F6 '4 08' ' !*&' 2' 8 /16' ' ')+'
..6 0 93' 7079.86 96 /3' $9 1' .2 2 ' "2 3'
'9'` 923' '9 '192492193' 46/ V0446.9 93' 1 93E'
0746.92193' ./ 4.8
' =.96246=' 4 . 16 ' 249 ' F6 0' 9 ' 68'
93' d. 9 /203 4 .0863
I 9 1 63894 1dAF1@' C' 2 08 3"/.016 #'
/ .9' F 0' G/.' 9 192 /' 492.' 0 ' 0 /3 ". '
2 08 02/ 021'
T 0 163' 894 .63' F6 0' 9/' "919 93' G0 '
80.08 .9702. > . 16 ' C' 0226 0 3' F6/4'
!MD9 928 '0226
8 63' 4 . 61' 2 263' 1 8 F69' 06 '
.6 0 3' F6/2 0' 0" 68' ! / 49=' . ' 6 D0 " '
.6
T@16/ G/3' 4 D 1/3 . 6 .1 .3' 86 .6 '
0 80 3 67 8 3 / ! 62463$9 1! 114 .' 192 '
/ 263' F604 0 1 163' E0446.621' F60.6/ '
0 6 ' " ! 8 .6' 0 93' ,' 0746.629 9 ' 2.. /2 '
698 910.0 E 942 2 0 '4 D 9/' 7662 '
16 .6 0 .3' 86 .6 ' 93 ' ". 6016/ 4'
0 / 68' 4 1 2 1 /2.
0 0' 8 0263 2. 6/3' . ..1' 0 19 03' =)' .'
203 / 90' 9.92 97/
("(. %/' %' %= () -1&'
& *%
I 3' 9 1' 013' 4 2 0 3' / 763' 86 . 3'
' GD02E321 3E 0 1 763' 8987 02 3'
26 .F 1E' "92 3' =329 6 3' ./2 1023 07' .G \

C' ./3.24 . 3' 0 1 .6 / 04' "2D693' " F69' / '
192 0' ". 102. 3' ./ / 3' 048 8.6 68 '
C0876 024 ' 2 1 68.2.68
> 6 4 .6 ' 2' 986 C' 1 7 012 ' C' 9 1 90
868' 9498 '
N986 ' 9' 4 468' F6 0' ./ 9 @6 '
4629' 46/' 86 .6 : /03 0.63B. ' 92462.'
1 .3 80/ 8 .4 63' C' 8 2 863$' F6 ' 20193'
9/ /261' 446.621' 21 /' 1 93 ' " 4' "2 .63' 94'
1 .9 3 !1 .6 "D6.' / 03' . 298 .' F6016/ '
F604 1D98 8 ' C' 46/' /716 01/ 93' 7 08'
94621' F608/ '86 96 I' / ' 4 . 192462.'
F6016/ 594O3"263 q0 1' 46/ C' "263' 0 6 0
963' 0440.62. 21 /' 46/' /2D63' . / '
.63 074 . 1" P6C ' 0 . 0 .0"/.0.63
:9418' 94621' 46/ ' 27 963' 02. .63'
9 /2963' E . .924621' F/0 6/ ' . ..1' 46/'
-.8. G=/ 963' =)' 021' 01' 3
T60.6/ '4 D ./3' 94621' 86 .6 '46/ '
80/ C8 2/ 9 192462.1/1 4.8 $0446 '
1621F6016/ ". 8 .6 0 .33074/.621' /4/'
89 / 19' G 9' 8910 94O /O 998' 492 F69'
194 .80 .6 63"263 9 1924 .419 0446. .'
1. 1 63' F60263 074641$' =94 '8 2 863' 4A'
D .T3' 9.6 0 98' 86 .6 612' G0791' 0' S0 99'
. / .08 .68F6.' 64 1/3 ' 4916 92 '
19 2
M 0' 9468' 9.92 6' 2M 19/ /D 0
=. 9' GP' / / ..1' 2 0 ..' 6 9 / 9' / '
3' 98/1 3' 29' . 6 3' 1993' . 9' 0 / G 93'
298 9.0 61 . 2/ 3' 1F6/4 2' / 62408'
9G '.06 101f 9 16 $C ' / .G' 0.9 93' 46/3'
F6 '9 2 / / 9.9 6 . 0 1. ' 92/4 ' ' : 100
76 0' .46.62.6 ' 3' 0' % &" +
F6/4' 8 /163' 98/ 3' f6 @ F69' 9 '86 96 '
/3G 30 / 7 763 2 3 ./3 9 . 00.6 #0. '
F69' 9/ 68' F6 498' 0 .9' . 9 263' .1 26 '
D263' /101/ '4 4 63E0 1. '8 2' /
302.. / 0 1 040 /2 3' 98/ 3' .68 '
1 7 I '4 . 16 D926E / 19 / / 93' F6 0'
/ 1 .0.6 ' ! 9 2 .6 '04' D. 6' L" 3'
69 / ! 6 08 7' 66023' 0 1 .6 0. /298' . '
8/ 3.68' 1 7 0' : 0 3' 021P0' 1 7 3' 4 . 16.'
021.1 7 0 . ' . 1F69' 9 .0 2 3$' / '
.0' F609' 6 / 0' 9 1 "/.0.6 ' 27bMa +3' S
' ! 69' 6 0]9 19 / ' 0 3' $' 219 /
0' 0619 8' 1 7 0' REO B' 924 '
/8 2923' =)' D 77 ' F6=' .9 2 16 ' 2' . '
1 98/2 . / 3. 7694 . .6 '2 ' 4' 9 1'
80 9/ 63' 2.. 263808 /.9 63' 2 9 / 3'
69 9 /2.3E/ 3. 7 3' " . 2 ' 9 1' 80 ./ '
639 19 263
:93' 9 . 98 63' ' "9 68 'D 04 924 ' 2 1 0 '
8.2.28. .3' G07..' 0 .93 94 HM ' 8 910 9'
4 68 ' C' 4 D ./3

' = ' 'M' :' = ' = ,' - ' ,' ' J' ' * ' ,'

:0 3 94 E' /16240' C' / 1 . 8' 4 . 16' .0 2 8 0 F60' 19 108 .0 .08 63' M 1 .0 .00968

.10 .4 E' 0 3' 2 9 / '4 . 16' 010' 94 3' < 6&1' ' 6 . / 4 `? ' 94 63

>92 F69' 4 D 1' 621'F11 2F69' 9 'D 2D ' 8 6 8' 0 1 .6 01 / 13' 2/1142 763' .0 92' 193 C / .6 0' 9 0 8 / 490' 6 3' 219 2/4 3'04' 6241 0' 0791 193 '04' 8 / 91 '0 1 .6 01 / ' 2 9 8' &

2' 07 .0' 0 1668' 8 07 P' . 1 F674 ' 16 0' .0 8 9' 8 6 10' 9 1 9 8 0 8' 8 02/8 9E1119 ' 8 6 8 F69' 94902/2' 29 00. 1' 94 9403' J 8 069 1'19247 723' "0 4 3' M / 1@01. ' 2 8 .693. 9C. 94 103 1.=E 103' 0 ' 8 /1689 .21 /8 1 /090E9 P11.0 / 11 ' 8 0' 049 F69' . / / 63 11' 1 H 1F Y 69' 0. O90198'0.'.9P 10198' 6 .4 01

, <" 6N 9 ' % . '# & &" '

G' !'

B&3! % . '% " . &" (# 1 '

/168' 96802' . / / 3' 0 3 9 1 /A' 29 0' " / .001' 001/8 .' 19?

K '.2 8 - 1X. 0D .H 014 '1 p?? =@?c111 '

0' 6 8 D929 60 " .1 9 0 19 0# 09 R .4 ' 410F674. 310 F60 1 1 1 =E49 E0 ` 1 0' / ' 0293' . / / 3' 0 193 - ` D1S3 .0 /1 Y W` ?3' " 10 '2 2 1 / 8 /163gC 9g 3' ?4/'"11 93' 621' 291 93' 0 193 G9 c1' . / .9 971S2 ' 9' "0 0' 1/1 498' 920.2 00779 019/ ' 16 2'G0791 '9 F69' 49 91 E 1' 04' 02D/@911 ' C'

168' 201610 98' 49 9 924611 # 011. 0' 0' . / 4.'98 91D 1 '9 F6.' 086 010.' 04' 1O0' " 10 3'4 1 761 /2.11 #1 91663' 0' . . 1.7 M' S' 4 1 91F6.' 8 2 1 01' ".'02 80 98' 111 11 11' "2 69 68' . / 63'110 12 11015. O19 R ' 2/ 1 09' 21G / /D19' 219D 10. .12 'R'@ p A' 8 2 76=' 1 3' "0 3'. 68F/. 9 ! ! A ' D 2 703./8 .24 /394 .0 11S ` 3C97' 0SS ' 63 F674 1/19 93 G0. "047 02 /4 7' 20' 91 06 .1 1$ F6 9' F <"9' 9 ' / 9 3 / 0' /7 9 601 3'. /2 101\' "9202 8 '0 19 @ ` 3 ' 2J 60 6 8 "2 .@S 9 ! 91 1 E2. 0?S >9 1 A' 9' . / ' T6. 11' 9 M 9D' " '. .11M 9F2 ' F608' /19 1' .=1 'SY [$39 4' 9 1' 1 0 8' . / / 3' 2 94O/ '96 1203 . 3 . 6191

\BR D " A A9' ?3. .

' ,' - 43 % $%#. $#% KO '

(' ."&&(9104 '0 ` C =/ D 43 061 $50 .0

1 /2 3' 69' 4 92 01 /2 3' 0 1. 6 8' : 4 9' ' 2/4/'=98 92' 9 1' 1 2. 684/2' 8 /4/". ' 20 8 2' 94' 2. 6/162 011 0 6 8' / 68 C' 0 6 8' / 8 2 6 8 918 01 .0 6 8' ' "1' 02D6 3' / 8 2 6 8' .012/ 0 O1E / 1. / 9' G9 0 '4 . 16' 2. 6 8 "920168 . / ,1 ' 1. 0 6 8 '.9 97 6 8' 2916/ 6 8 # F6 0' "0Y' 7019' / 8 2 0' .' 49 924921' 0' 2. 763' : 3' 011 763' "1'G 9' /168' " 4.0216 '9 9'10' 4 9.= 9 /1 63'F6 0' 04 .93' "0 / 68' 2 ' E99 621' 0 1 763' 2. 763 F60 6 8' 8 9' &?(S' /' 0' "0 0' D6791 1022

M 8 293' D 16 '"9209' /03G07921' 2'G9 0' 9' 04 .93' 9 460380 803".203 / 08' E= .0608 "/496 '=6? 69 62 . / 63048 ' &?S' 104 Z . 01 /294 . D6216 $

: /2092 8' F6/4' 91 .08'F60 ' . / /11102 E .7 7304 Z 0 49 9 0.6 ' 0 D 0' 4. `E 18 0928' / 1924.23 < '.060' 96' 80' G 3 0 19 /4 1' 101 8 F6.4. 9' 8 11 1' F6016/ '80 9/ /E 6 .6 /3

U 1 .001 'F6 2' . .6 0 8' . 3 'F6#9' . 1 3 "M.0161' . 96 1

-0 .68 F6 @' .21 .6 6 8' C' / ' 06 9 16

' 0 1. . E4/ . ` 2'F6 2' /24 8' < . 1 '

2'9 8 /68

'1/1. 14 9@ F 9146/412 R D 104 ' `M249 M016

M. 249' 9 . /4981/ /'1@ `97989 D 9' 46/' 08 2 D293 916.63'C' 8S 9@SS.63' HP 0 92.8 1 16 'E " .' 38 9 122 C' 219 20' m

= .2 ! ` 91/2468 7.0 ' '4 8 ' 2016 P01D0 .63 'F6 P .63' 49 19 ' ' ./1/20 63 // .7 .63' / .63' / 9' S/A T6/4 10F S ' 6364'MF 29' 2' 92 3' 17 10 ` 1 0 2 01D 1@ ' 6218 /'1089' / ' ? ?90919 10 ` / ' 6 @ 63' 8' " .211 .6 0163' C 12 8 111 $' F6p4' "03' 7196.' 061' "92/ ' 6 0" / .021$F6/8 . .6 ' O9 02.G/ .63' 0. ' 463' 2' "9F 2.61' 024/8'=.' /3 . 624 16 ".' 9 . 19 '0 919 11 0 8'

508 /3' 89 .219 .63' 1 93' G0791' A7 E' EE /3 6 96 /3

:1 1O1 3' G0 I 8 /1 G/ 40 3' 9 1 04' 0116 8' C' 44 9921" F2.' /1. .23' 9' . / '9 1 9Q 8 0 C 9J 6 8 219 1 2 6 8' H62. 6 .6 6 8' 016 0. .06 1' "1' 01 D6 2.12' 89 02.G= ' (6 8' 9 .9 2. 91 9' 2 '91203'C' / . .6 103'G0# ' 8 7 G/ 403'$ F601 4/2/ ' M19 1'/7' P2 3' :G112 /298' 9 61D0 ' I 1' .2 12' 0 /3' F6 8 ' 0 8 63' "9 1p' .060 49 . .1 492 3 6 /D0 11 .634 1113 F6 312/ 17/ 40395' 191203' 0. 1

& = .62463 9 1 .0$.0 3 F6 9116 04 . .6 8
K 2 . 1 2 6 8

9 1 63 .1 29. 2 / 8 .2 1/1 63 4 . 16 F69
8 . .21. .63 2 2 103 ".26 03 4 624.23
04 162 .03 219 1 2/16 8 91 " . 92191 68
"1 . 6D3 1 G 6 0$C 86 02 6 298 0
. . / . 9P7 / 016 04 / 68 261 1 2. 0
8 107 1. .6.G021

1 0 198 "920# / 13 04 .93 9 G9 0 3
.060 6 763 6 .6 3 4 198 0216 .
1 10#D 024\3 2 63 "920 F608 H / . 0
. % 193G7 1 I 4.8 9./10 08 "/.01 C 2O]
SSS& 1/ 8 410602 8 01 98 F69 / 8 2 6189 9
)
10"87 .0 C /110\ 04 . . 3 . . 6 1 .2
(E/ 9 01 3..26. 0 C D 770 80D 3 9 6 462A
161 E F60 M1 29= 2 "268 .004 .F 8 49 12 P
F6 923 8 0 / 3 ". .023 162/63 /P10 A
. 01 (

62. 3 D 16 ` . 07 119 019 /4 923
4 6 4 1/ 2 0 198 <6 9 / 98 F 3. 4 .
161 "120.060 0 9924923E C 2 9 / 98 F 3
9 1 "920 .0H049 .M24923E M 0 19 P 2 0
D23 168 20 01 1 2 # 62D 16 0.982

% : 8 4 "9208 04 / 912 1 8 F69 20
04 !&*# . >9 19 / 9 0 9262E 89 `
7 0202 9 16
=9.624/ . ? 21D92.92? 99 920 98 "0E8A
F69 2012
9 4 . 2R !c8 "1 0F 9"1 00 10
1 49 1 0 1102. / "9209 906A 116794P19
/ 016 2 11007986 D9219 24.49 1168
.0 4 1 3C$ 99.624 S1 2 12 8 9"/
63 C D 4 63 H 1.0 621 010193 1 49 1 9
+. 24. 1 = 1/. 901 919E003 Z2 + 3 9
2 2 11 3 / .02161 11910 S S c1Pj9 F1 0
8 0191 08 98 2 "A 278 / 92D0 0.8 X1 9(
79. /46 8 49 9118 1 0419 193 4/3 F6 492
G 20 7633 2 1?1 2 30111. 8 04 19 934
01 4612"1.1
T60117 6870190 F2A (91 08 @11 1
9 . 1 04 62 7M S2 91S711= C # "!1 !
8946 08 261 92403
214 126 92 / 02 +4 126 2 /3 62
7/168 C ".211 3
:9 249 24 1 1901 0 "020 49 .924.2 3 2
46/3 020/3 F6/3 "/.01/ 0./ 19 F69 0
863 1/4641 F6016/1 0 93 ". `
=0. 08 F60#048900 `02 M 3 091 46
. 101
4E /=A 11 /08 E F63 G /D0 11 E 0293
01 1
I D0199@11 E0B. . .M 6#68 C 86 A
.<1/3 67 2
4 Z 176 - / 9 c D26. /7 ! # 6016 I

D,0 . #192693 .6 /3 9 1 98 3 808 80
16 2 F6 808 8020# "/.0216 /..6 . 9 0
H 2.808 80 68 C "19 ./2 .2 63 +
:6492408 E F6 9 16 04 " 0 C 06
97 0
508 0. 9 1 0 2 868 "921 98 "1 2
9 49 01 C 2 2 2D6 20 . 6 0F69 49 .92492
93 "/.02161. 610 .3 F6 21 6 93 6 .6A
/3 91 . ` 6 1 7 02 C 9 1 9868 9498
26129 / 0 08 /128 . . 1/ 0D016 H 2.
9H 2 9 2 D293".2?/ 6296 G98 .=0
X G920 F6S P1 2 1R12 [./ 611 . 03
8 2/1 6 96 0E:/ 190 =6 0 3 E C .7 03
210 / ;F60 6 1 021E049 1 98 /3" F6. 9
1 93 1111216
420.060 0 .924923 9 161 04 6D6 68
K 24 6 /1 629214 26/ /2016/1 "92 4. &2 $SA
1@02@
:G 92 .0 > 0 G 0D8 01 90 96
923 9 ` 0 7 0D200C:9 .0 4 68 A
! 41/20 0 F6p 9 2D 1 70 8 ./ 4 3
8 6P4 F@ 086 92 /3 0 8 0 D 1 <67
72. 08 ! / 413 H ..912 16 .06 p 1 62.63
1 / 023 N. .014 00 4. 114F69 ./14 3
921 !0 / 9 904 611D923
0 D/= < 9 414 F6/4 /9 08
M ?07901 C 8 / / 01. 949 1 /19 9 0
:/0/ E .6 3 01 9012 2 49 1 0 2 C
2 012 0 198 079621 763 F2 763 2 9
" / 4=/4/ f / 103 C .0 62 41 0 261 62
1R 111M M 10 3 F6 p 201 1 6 9 / 93 ./
103
/ 1.0 1 /041 3 "920 .02L 4 6 4 16 0
4?03 0 1R ` 67. 03 /3 . 4 3 1/3$ F6 0 62.
2 11@406 .6 03 C 6D2 68
C7. 06 E 2 4603 0 193 9 0 02 6 #
/ 9./24 10. 1906 90.9 1G/ 0. 3 9 F64
! 9621F6 /F6. ".0L 2 12 168
G40 8 80 0 F609 9 .1 41 91 198620
219 O=E=9 82 .6 /38 C 8 80 68 " F>. 04
" 1 71 ./8 $"7 9 ! " . 0 .68 I
D0 1 90
8 .0 F6A 9 1G 8 2 8 49.61 .
!0 6 0 3 F6 9 :91 .014 6 ` 69.0
6 08 ./ 4 3
! . 6 .0 3 F6A 9 .9 6 998 2 .9 9 b
7 68
6 .6 0 F6 9 86 .6 /3 2 4/ 0 3
.9 6 . 3 C 68 8 1G/ 0. 3
:/ 19 /1 0 3 08 67. 06 E 4 . 16
0 R0 3 $F6 0 9 16 04 0 03 . F60 9 Q
9621
G/ 0. .0 "1 2F6. D92 20$F60 68 "20
2 8 0 6803 021. / 93 86 .6 /3 1G/10. 3$
0 9 08 / 19 / 93 4346. 16

`0 .0 F63.1 08 "/.016 G9 01 .0 . '
1 F6.' 9 ' 219 / .12' 7 0.G E' 0 198
!9 G0 .0FO0#' 9 '9 19 / 98
`0 O.0'061. 0'"20' / E40'9 1' ' 2'7 0 '
.G / '0 1 63'4 .8 2010$ 0P9 0' 67.6102.0'
9 '.6998'. .61 .23$ F0 9' 2' 46/3' 24 16 '
08 /3 F6/ 68'01 '04' 01. / 98'.67 168'
4. 0163 .68'!9 G01 9E9'1010/'" 16 '"249'
1'"920' 94 020'F608' 10793'2 D 0 ' M'
.021#0 1. 9 ' 219 26 27 0.G E' 0163' 49 '
9924 1' 1 06 F69' 66 /3' 0 D 1' 2'" . 202'
.6198 '
!. G0 .0' "9 7' !94 09 1'F6/4 2.00'
30 941 763' ...16 ' 94'07'0 E3'4 9 16N'
G689 0 3 F6 0' 9 161 9 'G2209 68 ' / '
46. 1F69'46/3' 086 3' F6/ 011'0 .1 2 2 A'
1. / 98'.67 168'/7 F674. 0163'.68'70 '
.A' 108 /'./8H @ 1'g jc 9808#01191'49 '
9924 ' 91' 04 68 'C' 2.'/7 F69'. .6 ?'
9 1304.0 68 @10' . .9 19120 /8026 0'
DW1 F60$".20' 107 7639 1' =0 60 9H0A
50863'06198' E7.O@ 63'"7 ' 1 0'. ? '
6.3989 . 86101' 2/89/' '4 . 14 F69']'
. . 06 63#0'F2'/'42 '/ 6216 '"9209' /D6' '
0 93#F60 68'"20'9 1'9 1! '/0' ' 28 '.6198'
C'8987 0208'.0 2/ 08' 9' 9 9364923' M
" 98/3'86 .6 /3' 0 2D 3'/ 1 3'G / 4 3 /'
D6 07 / 68 20 68 ' /2 N D920 68 '
06 6 2$' 0 . 0 21. 20'F63 . 01910.91 '
6 . 3 9 .6 '04'.9 97 68' ' 8 23F69' 086A'
.6 3' 2'" . 203' 0 193 1024" 2' 9 '. 02 E' '(
08 20 246 3' 892 2D 3' - 263' 01.924 0 '
F6 763' / 16 ' "926 088' / 0D/' 8/ 1 ?'
9 04' 261 1 /298'8.87 060! 8 '4994A'
.7

=6 . /E' "/.01 ' 2 0D20' 0 1.1 0'0 .9 r
4923 ' F60$04 OD6 68'.69 10' ' 4 6 1 16 '
E' 08 /3'=67. 02 /3 C 20#F60 93 4. R68 ' '
08 / .8 UJ 2 168 8 2/ 9 2' ['
50863'49 19 ' 67. 06 '9M4. 0' 9 9'
12/4/4 6 4 16 F6/' "920 Y42. 1F69'
21919/ 10 98' 6 9 /8 8 '04' 6D. / .3'
9/ 103
' j" 0880 012 04' 19 268'C' 808 803$
!6 630 191 0 1 66GF6 40 0' / . .611621' 1/ '
14.8 66 3'9 D0 1 .09' 0 9924921 3 ' 06
4' 6 P'"87 .68
6 .6 0 0' 04. .16 . 3' / 1 . /3' 86 '
.6 /3
!9 6P0 98 '6.(* 91' / 08 20'1 02 6. '
<7 68'. .1 . 3' /.9 66 2'0 9924923 ' 9 '
/ 01'46 08'8.2 2D98 'F609' 20 .8'89A'
46C 8 11D . = .0 60 09.06 10 98'8D . 0'
62D 10 .08' /0' ./2 0D9' / / 1 ' 0.9 3' '
20F1 9 0 10 67'8 94 ' .9 97 ' 70 ' 9 1'
4729.04'<9 08'/ 3' G.2/ 4 ' .'16929' 1$
7 7 [11 1+ 07 [' 49 20'C' 8 108 =.4'
Z1 0F69' 04G6 !' "01 9' 4 11 72 16 ' 91'
8 .162D.3.9 .71 C924 1F6904 / . /1.3
'"7 .19'8 10 49'./019 F. ` 8'
/11E/2 703'8NM9 4/8
!0 /1 498'<F60#./8'H D0 0 ' 219 20'J '
.904 2.987@8 ' /F6/4 1 E608' 2 '
D 94 01/ ' 111.6 /3E2 11 .'04' 0 2D 3'C' 7 '
/ 4 3126 94/ " . 203#D 024.3 ' 092168 '
01H0 A98 / 0 49MX93'20 93E49 249 .02 '
4 1 0.P"7 6 2 ' 9 ' F 68' / 0892'
F6/4 19 /3' G92/ 40C/31.8 / 3 ' ('
08A 1E"7 ' 2 / 103'. 9 F69' / 0D 293'
E2H1/408 91 39@ 1 1' 24.' 9 63' 8 0 '
7 E12/ '01 3'./2 9924923'8 1. 1'0 1'. / '
0?04/.S /3C 82 .O /3'198 / 68'# 02 '
21 F69 2' / 192/ 0 ' 6 9 / 0 ' 0 9 0 0'
.9197 M 19 10 ' / .016 ' 2' 6 91 / '
763 9214.6O3 'C' .681086 3' . . 6 .0 3'
. / 801 9 08'07" 21G96 /

++. .% ' M29 06 1' 1/ 9P3 =/ 1001191 0 '
' 02@F603 . .919 "2/./14.491 60A'
K' ' / D 198F694O991 9' / 1191111 ' .69 E1'
'&$ .2 8'0110 090'1/ 49'/1 D 298'.0E0181'"J'
/8293./2 192 6 'C C4/.91 2 90 /'
96'41 .4 /
T2 9. 0 117./ 4 3 9.0' 1/49 @ '
/ 10') ' 2 D233' 0 1. .9' '"92/ 0' C'0/ 10'49'
"92/ 0'46 1' 0 11M.'8 101'4 192462 '49'
?S'N '0/ 1 FM399 180. . /91. .0168
6??' "7 9 D/ 1E8680/ 09./ 49' ' -4 &'
E 80876 8<`2970 8./ 41='4940. 10 116'
? B 012./ /20 108 C8/ R62.630/1C.07 .'
846/30 193 C 9 /198C' 2 9 / 98 '

50863' 2 191' 17. 06 63'./498'8 /4/'
4 1 76 1618 F644.0 /1 4.8'2/2'.8 1 '
!E' FO '012 2./'/ 16 ' '
=.4"7 ' 0863' 67. 06 63' 9 692 1'04'0 L'
0=E4 . 1O '0 0 3 0' F6/'
G/ 0. .0 F63' 2' 86 .6 /3' 021. / .3'
49 / 191 / 3'1G/ 0. 3'< 0 D 16 $C
`0 .0$F609'". ' / 6240'9 1'"9 ' 67.6 ' '
102.0 86 1/3'9 624923' 66 /3$F6/168'"
23' 2'.0 /'4 1'! /2 ./63'"7 ' 6 68'9 '
E\ / 02.894 . 0 D /386 921.3'
&A =1 93' 2 9 / '0/ 10' /.081' 1S R'
0 8 0D20' 49 9924923' 1/46. F69'# '
84' ' S'

' R ' 5' ' :' ' ' I 1' ' ! ' I' ' ' D#

' 11. 08' 219 .0 10 .8' 0 9 /@> ' 6S'
".23'! ! 6) E'4. .06 0' E .1'
=..62 / G 92 .08
:/ .0' 91 / 0.'4 0 G10D 8 0 8 143 E' 1 19'
0 19 03'0' S#<; 2/8 20 03' 29 9' ! 0. 1'9'
F60' 6 =' 0126 .6O' 0 D > O' 1' "921 .6'
6 2 / 68 /89\.68 G. 0 ! 1 1`, 929$'
(9 .219 .08 . / 98$' 5920 98 'F1 0#2='
'10216 8' 46. 1' .F\'04' .293 .4' 1 6'
? 01110 61' 2' 011. 3'(./01. 8 0 2' 8 0 019'.7 '
"' 2' "92 3' "1' 9 '@ 1F3' 9 1 D91H $= 91
801 .08'. 3' 911@'04Z< S3# .C2 91 .08'
2 . 0 . 0 'SE63' 04' 0 9 163' 2E9 9 19 11 8#
6 8 70 98 'F60#04' F87/ ` ' "9 197 0L' '
6 .6 08 04 6"07M 61 R .11 pL
:/ 1'G03' / 0D 11 ! = 5"2E @' RCH!R= 2 0 '
2/3' 0./3'C'. 6 0 93' .61'"F 0106049 1 A'
H' . ' . 1Z1003' .L 2 R=L I9 S2+2
. ' .' 0 1. 0 "920L'. 8 10 101' 0H9
0 09'./2 6D/'".20 H.91F60 408' MH 1'
29' 0119 '.E6 0' 0HD6P'. 0 0 8 S[[R'
0 193C4 1 I 003' .89/ 1 1290 E' 2941P'
4 76 3"9208 8 02D6 0". 70 19 / 3'
09 63 C".2 198 /10. 61 1 \ / 01E.011c '
8 38 0 7 6 '0 19 0 62 '4910 1= 9 .39.03'
<?.96S j '" 03')' 90'4 9@ 0 1 0 '
40961 Z 91 0<@90 Z = ! Z 1` F6 90S9'
0 S ' 9 10=1 61 05
?' D6 2.0= 11C @ R 11`=./2 11 9

9&. ' ' ' :/ 9 / 9 S197 '?9 0 01 S c Hc?c1 '
A' 6 '/ 269 2 @ 0/)'?'<9/ .' 2919 '
46.6219 9 `92E 1 /.4/.91

@? ' 0010 " ' 0 92F` B 6A ?0[91 [02 S'
^ ' 9 9 R.// 1 01?H ,) 0@ \6@ S S 9'
7 22' 212 '8 139 1'0.'?94S 101 3'39 1 / 9A'
.6306198' E@87 009? 03$4 FS .'E6 ' '70 0.1'
01 1.7 M 1011:0 10791 0895 2D 7`=
1 2 2.1F '19@. 9 / 0 110 2'/0E R3'
2 /3 6D30 '?99'@ @' @92 01@
494' 01 2 =? 19 S'?d c ! ` ?1L0$C\9'./S'
`D01 /293 `9 3 S0S 9 14 c68'
8946 0'04G69 5'R0M :'1 1 /48 11R '
1 210 "7' /0 9' 1 ! ! 9#),!& & '
0'1'71028 1\108 104. . 11@c < 9 8 '
8S'?'11D01 /2934.! D1102H19?' C03#

' . '92 8 `11 D021 '9 1' 19 0/ '
! 1 .M16 .'" 17 /1 ''10' 91'90 /0 0.' / 0A'
09 24191 .9M1 8 1 9 1.1 1.024/ 49

2 8 E = '< 16L'" / /3' 9 621'04 /.6 6 '
- '92 0'.7 12 3' . .' " /' :/ /'.68'
F 1 ./ /2A' 292 / 6 8' 67 1021 0' 8 / 3' 0.'
11 946 C 7'04' 1 10 2` 8'G6 8 / 98' 9 69'
2 7 ' 401011 '. .01F69'162 .08' 91 .6 0''
1.1 1E4 'E6 6 0 7 49'/.6 3
=9.61 409 129 6/0 8' 8 /6921 6 2'/.6 /3'
&F6 .E ..1' 2/1619 '81 .6 /3'4 . ' 62 '
9 01. 76370 399 97 /4.62.93
7Z 09 D6 101M ' /1a ? 770 .9 97 '04'
>D20 2 90?1 6<`' 9 624921 6 8' 2
F6/ . 0 0790 /@81 R 90 F3' /8 3'.1 08'
. 9 19 0 / `1`
T601.076 1 2 0 48 2 / / /29'
0408' 2' 0 0 02 F/0' 0 2 2'1 8 .0' 2D6 '
E6719C1049.6 CD6 1 1 49C 6 1 "119 1 0
' ' 0 10' 9 61 206 .3=1' 8 9016 8 064 1/ '
E66` "7 080 /3 0 D 1 E2/ 68"2O3' 9 '
.6 11 04' 86 8 /L' 0 1D 3' '/ 37 2 4 3A' (
& 249 0 1 '8 10' 0' 8 017. 0'061 6 8' 2

.117S =99 ? ! 6R'92 8 .0 60 08'9D 9 0'
&1910A ! H71 41S 0 D60 0..9 104' 6D6 68'
16 0F 51 90 1 .6 1\L' : 863' 9 1'46 9 '
/92 4901 9 = C2 19 '>9 1. 0 0 .8'0 '
191E0 ?0 1jE4' 110 p .0 2 9 9 3 2 1 '
4H410 E ? L F `9111M.7 .0 08 / 7 .6 /3'
1 0 9 1O5' 9 E0"C 14 1' 626 .6 /3' 0 2 '
D 34E2 19 '"9 7'2 $ E`90 I 1 S S'1 '66.68 'F60'
01` ` ' / S ?491/ DS/ R '9 .68 .09'
H/0298 /3' @ 0 ' 20@0E9E'19.6 92193'C'
/ ! 0 93' 'F6E0'7E 07 . 30 1 8 0 /78 61. . 1
=9.62403 1 . 0 4 . IM '1/ 10 3 "1' '
8 @3 9./ 923$F6 0' 9.024/39 .61 1' 9' 0'
1910'./ 10 F ` ' 9 1 63'4 . 16 ' 1/Z09 1 .63'
(9 0 9 16 34 1/1209G612'C'".21 .6 68
=. 1G`+S<?` 0?D011/ 98S'07' 9 1 /' 2'
1` 0 8 1 2 =9 0 2D 3
:.9191G0C . 1981/2 6D01 /2.3 0 0 621'
1 0 '12.411M 1 ' /4.629.3' ! .F6.'
4 0 9E 1.1 / . 3 ! 21'<9 14' '46/49. 8$
087 =F11 2FO ! M 13' 09 7 9 .91'0 E'F60 '
16 / '2 6?S9292/2' 9 3'9 0 C4 6 4.2193
! 2 0D01 2.3'.. 8 . 3' 0 79' 9 62@' 2'
236C0 /3 .9 1 3'"9 1.7 0 6? '3 / G0D '
./ 0 01 2.6198' 0. 9 ' 2'.. 6 . 086 .6'
/3 7 0.[0 #0 O 03 4 0 G 0D8W
/1016'4 D26'9 1 -'F60 1 $ F6 210 '<9 ='=)'
. 1 12 './216D01 /29.9 0 . 3' 9 '29 6/3'04'
4 0 HA0D8 0#@ \499 1` 0 1 0' 4 0 0D8 01 3' ' '
C'$9 . 9 ' E11 01G9 0' 2 201/ 2 4 0 G 0 '
D 0013 11 7 .2 1 3 140'FO 210 9 10 C . 1 ?'
8 0'9 F 1 '29 6/L'7 0.G / 6 'F6 '04' 9 ' 0 0' A A'
1.46.621 . '1/ 0' 8 026'9D 9D .'4 =6 0

9hB' + J - / " + * + q ! '

(! /2 6D01 /2.3'1 / 0. 3' / 6216 07' 63'
"9 197 3' : 80'C' ..6240 9 16 ' 0 0/'0219 '
/ . 2'7 0.G 6 e 191 / 9 04'8" .6 /31G/ '
09 3' 59 .E6^ I ..<S\$ 01 'E6 49 ?0 1S / '
J. 04' 2D6 0 921 E2 0. 0'9/ 10168 / '
19 / 9'061912 04' 16 96 D3'17/ 0. 3'C E 209
. /0- .&-, .W ($ - I21'4$&.$?'$(/ :' ' - '
4$2 -$0(1' , ' $ &.$214'$,($&1'(,$#*L- 0'
@*4$21 7 / .4&, -1'(1V- ((1(&42 1<
! /2 D01 M R=4 '[3' 09 011 11 6 SS 61'
E 1 8 228 @ /3" S 2/3'C' .6198 011 8'
3 % %456 72 $ 0
&211/4 9 S1@?
9 : :% * 0 % 0
('$ $ #) & 5#' 4 4 5#' 4 6
#7 " " % $)
" <= %=> " %)5
"? %
& . /2 RC93.1198 01 1 94.898P@21'
H#9.'9 1'83 E/ S12'@22 118 01F 'Θ6!MacA?
@ 1/1 63' ./ / 3' = 11 761 /041 07=P'
S&'? ' 4.'F60 1= 4."2 6.13'./ / 3'76` 00'./ '
E 0D9 01 3 /' 01 /1 9' `1 / /D1Z'0401 8 '
- . ' 9')6'=)' 2 111613'= 2/ 9?; 6`S 9 D0SR3' 2'
1/19 3' 7 3 . 01 2 . 1 `D924 3
=' 219 '9 191/3' 7 08' >9'= 0 2 19'
1'('01 680863'F6 O7 68 9 0.. 170 @110 @0
& S '2/6 ! 89,967@8 /14 29./2 9F 8

'=ES 1/

1 / 1 2.111/3' 1 1. 93 0M 1/ `M '
E '698 E0 .' K
96 2'F6 49 0 E?c9 0`0R 2 Y'4/ 11 2 '
I7 ' :9 0191 .p'4 1 '061'D 00 1019'= 470011'
e) ' 023' '" 0 /8 07 9 'F0 ' 1 /14 /0129 9'
0640 =9 `9D4 O 12/1 4FE04./ 1 G/ '
/ 4/' 1/19 B'0 .7/ .0 ' 1' "1 1 ME/21M 1'
9 A' 2' /' 8 29'F6 1 /49' 9 802 1/2. 2 9'
163 9 6 F69 2. .2 - 1 / < .S992 2'
.68'C' / 1 / 18' 0 '.= 10 9.101 38119 / '
&E ' W'1 . C. / =< 0 G9 =101011 c S 0 /2912'
C0` 1 /298 1 163X2';9 24.. 3' D.29S'
"1 ' 01 /2. . 8B . 1 ' 19129 .07 2 1 /E 90c C'
e_ ' 02 8= /1 S `? 10c1 /3p / '
1' 4/3 9 .1 / S , /298 C ./J1 /2.8'
0 8 .211 0'70?.'F6 42/#:01'9/ ?' 01 /'9 1'
1 63 01 /@S11/U V7A9"9 /S6216
06D96 FE'c' 11 91 // / 9 . D/A'R9 9E6
S1 0'./ 63'9 1 9@C71 =C 0- ' 02
9E/01 ' 7S0 Cc !1 4d' 1 163'F6 '02 2 '
0 ./0 2 I CS6? 11119 C '4 M 16 / '07'
c 8971/ $ 90S 1E1 E296 D'D ' 111 D18 3'
44.'F6/4'0 6 ' 1 163'1/E49 9 / 9 1'9 '
..98Sh AppAu':Apc 2/8 2 0 ?b1/19 9 16 '
4' . 101 /23 8'"9 7#F6 0' 6106 1' 1 1/

D9293' 1 16 8'46 0 9'C'06D9 '. '0. 9' 2'ic '
8 /29'./2./4 / / 03' 6 3'4 83'9 91989. 3 '
=94 49'9 .94 1' 0 .'/ 2 / 'F6 ' 2. 94<74.'
./ 1 /2 3.. 9 101. 2' 269G 1' 2 01 /0. 8'
92 8'F60' 9 '. 94 1' 1 168 10?p .F \ 161'
9 101 / 19 8'2/' '1' 2 101 /'0 7 'F602 ' 2'
E6 21/29 1 1 163' 2 163' 7 F'9 1' 9F69'
9 ' /19 1 "1107 96 '19 / 9' ' 6 8 /29'. '
01 1H= 07901F 803 0 193 8 7"1V / /'
R0 16' 01'1073'./ 1 / '=94'"1' 2'2/' 108 7'
/ 103'07'0 1291/'9 1 F6 42 'C' 2'< 01 763B'
D 16 ' / 1.A'4.' 9 01 /2. 6 6'C'0 891'
9 '0 19 E 019 1 /29 '=1016 16 ' 9 01 /29'
/ 1. / .'. .' / /01 /2.' /9163'261 1 /29 '
c .Sa1 /29 6 6 5. 0 9'92 8'16 2' 86'
24 02 80 .6' 2' 6.98'.4 168 . 1#01 /1 '
8 0 R 122 '.19 9 1' 2' "19 / ' 8 /C 9 '
? 1 A.` 1 161 /2 3./14 3 6 63'0 0 .1 =92'
1 9'01 I. 0'/702 8 p[?/1.21 0' 2 .0' 08'
/ 0 2 168 . 9 9 2/21 . 668 'H62.'
[94 / 9 X08'@ 2 84=.4' 101 12' 68 1' "1'
"9 30 0 ! 0190 ./ 10 .'"920 F6 0 02' 10' 02' .S?' /?$
DO . 98'12 11 1#098 p F6 01= 1' /11 1#0 1. 0 ı r '
F6 0 . X 1$4 / 9 < S 707. >.'198 ' . -E
09F6 62 E'49261 1 /092.10/8'=)+ '
9 H' F` .S 4.0' 9 9'. + & ! '2@./'
04 03 .219/9 6/3261 ' 30 649 9' 0"'
2921 $'.49 < 8D6 299 9. 19 0 "0 3 . '
9918 /4 30 19101/ 9 8 8 610 / 'M 09 1. / A'
`/2 ` "9 04 0.24118 ". '04./219D92 '
4 R1' 1 0'02 80 763' 9 .'12/16 3 29 6/3'
"9 /302 1/ /2 /00 931276 .' 4'8 /8'
.6 6 F 1/ 1 6 / 0/ D020'9 07/ 0 9 '"1'
7929' 11.94=1C `' 9493'Z2M3$ 9 '19 0'D10 '
4 .1 1 76 61.=E / 021 763 0 3 ! 0 / 98' 2'
02 80E 7' . 1 U '9 99 9' /"1'07'00 8 0'1. '
D 16 1' "1' D298'0 1 .6 H' /"1'04'4 6.1 /3'
293'" = 4 D 96 ' 1. 8'.0 / 9'"1 '"1' 2 '
1 6 8@ 1/4016108 '"1' 2 11612921/'C'2E019 '
0 'H98 9F6 0 20 19' D2 3' 0 3'2/'9 1/ 9'
3422021 03 9 74 6 639 1 9 118' / 6 '
C' "2 '.08'.0$1.1 3' 67 1021 08 9 63'. .1
! ' ' ' ' $ $ ' '
9 ' G1 $) ' 9 '
(' ' $ '
' , '# $' ') ' ' $' G'
' , ' $' ') ' '

> 9 ' '
A$ (' ' ' '
,) ^ 2 : " $ L ' $
' 2) " # # '
= # $; '
$) &' '" ' '9 ;

./1 26010'1 040. / I1'8 0 89' / 1 380'". '
70 7 ' 9 1 1 %09 E E' <3S @S$K 6p 62.'
& 80 71'4.. 8 >92 F 9 1 8 7 8 07 . '
6 23' F63' 2/0 1. F60 4.. 0 0... 6 6 '
.4 /19 1' 2G/3 D 16 71/3.6 E.29'1/1'
G 1/ . ! 21E 1' 0' k@2 3S9 S9 D 0 09'
492/101'2/'9 1'F6/4'0 D6/ .210'2/10 ' / '
/ 93' 8 .4 .986 #F6'0. /0801 .73' 0 '
V89' >'c.1 / /D ./3 ! 6. "1' .G/ 3I'0 621 . 91 ?'
./3 C'4 ` . / 93'./2 .< 10 '01F$' 2'.4 92 '
4 / 08' 40 08F$' 2/ 8'1.46.91.' 2 1 .11 '
863 . . 1 8' E 8' 2' ./ 498' 7 /3'. 1.1'
G./4/ ' - 0%3' 2191 . 3E.6 63108 .2".1'
T ".'4 .08'/7 19 0 68' 40 01F<! 1 0 '10"'
19 468' 060'4. .2.24 161\'49D03'C 407/ '
10 0 C. / F 0E 2 // 91 3"9 1 70 / '
0 6 1/ 3' 2 1 16168 C$ 7 /16SB0?R 9'
C'"1 1019' 8 8 0'7 96 1019 . 1 /D 1'=01 3'
9 D/' . 29'2 G '4 9' " 49086 / 4 1 '
1/1. 912' / O3G/.' 9= 8 6C /2D708 /92 1'
868'0'.. 97 '4 6 /2.' 0 1 68' 2'12./ /A'
103' 19' 0 0 93 F6?' . ..1' 2' 8 93'4 6 '
I I' 40216 "1'. 1.01/' 0.'.2 8' 2'.0 29' 98 91'
G$$ ' 48 4 16 \I1.U /2103 6.4 ?O0.93 F6 2'
^ #'4 8 93' "19 18 0263 0192/2 2 20263 94'
E A ' 2/ 0 .6198 2. 0 3 .0 294 6 4 8 >9 249'
A' 3 140696 921 08'C'4 . 8 2002 80 'S ?'
.019 0@93 / 030./ 2862 0'4 1 2D29 '
ME(' &'C 1/98 803 80 7S3 F6U4G '<92 92' 2'01 '
19 68 ?24021 HS 2C 2 2 0 6 F0 0 9 '
' 9062E02 80 D92. 0 9 0 04S0 0 0 "9 8 .3 '
0 2D6 2.0 09 0 1/ 0 :0 1.302 120 ='
. N9"0 03'=/ 7/8 2 0. . 8 ./692 . A ' '
2 10 0 86 / 3'0 19 'G07919 'F1?8'" ' 2 '
120 0'F63408' 2'F6 76 40'. /2092FC4 9 '
9'8 0\ 3 1/'0 .49 107S3 0' . 744 9 19 '
C 2191 14P91. /6.2 0 ` 0 F6 72S ' 592.3= '
"9 .0'G0 9939/28 0'FS0 # :A YF6#`'02 201'
D92.10@1S? 0 0 Sc693E 0. . F$L` 707. 9#
). ' '19 1 4 2.E212021C9 99 91=' .1 03'C'2.<'
O?=' 6/3'C 0111 030./ 4. /1 10Z1 .3?0 .6 /3'
G079 9' 2 8 0 62E9302911 22 F6016/ '9 9'
929 0H0G0'9 .'8/ 0'9 8MC.63E' 2163' /E
40 "1 03 G0' 2163'8/ 0 9 2 9- O3 7 A'
40'C .16 10.90$"19009 M3' 0 1 163'.@/98'
G079 9 . 1 2 9.63#1. 08 .90 / 4 F F69'
r ' S E3 @S "1/ 1 903 9/.G03 04 9 2 9 c#0'
4 1 24012 S193 04931d2 '
'46 01' 2 80 00 0 M..=E 0 0 0)= 0 0'
61126 0949 ! 0 0 /F6 ' : . 0F 3919 G/ '
2.8' /2C 0 .'> 9191 /298' 9 63' 2d'9 .'
F8 1 D9`919'02 8 01 08 ' 0 3' 8/4 3'./ 'A'
9 ' 13' 9 09' 2'02// 0 0' 6 93' 0 . 9'
940 ". 9 '08 80 76340 49'D929 3'. 90'
"4 /19$"9 '9 '1/ 9' 7149'"9 3'C'0 7

8 0C 86 0 - 929 01 /298'9 '/6/ / 82O'
76306 763'.4692 9'9/498' 8 /4/ ' 94' 98 '
919'4 69 / ' : 2. 28' 6 '. .'0 7689$*)';<;'
. 76 ` 61. ` 8' ! / 212703'7 20A"9 '04' 6 2 '
268' @@0' /60 019 9' 6 16 93' 2' 688 3'
8 4 0 0' ?, 9'0 130@ 763' 'F6 3 02 9 '
703 ` <?3 9@S 34#2.6G3 06/2 763' 198'
49 1310 4 ' ' 0j ' 0 0D 2. 621'02 '
E24DS29 01 9 2 2 21 3 /60 ' ! / 8 8 629' / '
122 6 [02 /0 7 8 ". >9 .211 0 Jj604 6
94931 2030 0 19 0 / . 9 8 0 93' 2'. / '
16 'M293 'S0 #0=\S011' = 13 9F6 3'0 2/3'
8 6 /3 .084/3 7C /3 6/3 "1 /3' 9/ '
F93 1 993E 00 03 9 7 93 "6 9346' '/3'
9 .3 . 0911>) 93 1 S 93'1 /'9/498' 8 /4/'
9/ 9' 2/29F ' 19S'198 /19 0 9 '.' 4 69 03'
A10193G079?9 ' H /12 29 9 4 D.2. 01 / '
299 1 1 . MO= 10 ` F608 . I 8 '
=0 2 6702 `649. 12 62FO01 6' 98 .2'X L "(, 0'
/G .62@429 ' j1 S `79 .9 9 "/.9' 8 61019'
2'D10 ` /1S FS/44?41111'@ * $' ')) ' . -' r A'
` 03 /2 2 39 167@019 8 9 1 668' 02D6 '
29 ?/.S 01@2/ 30 / 8 9' 6.1.'49 '
. 9 9' 624 49/F3C 1 8 /98 2968'
623'P 19 F 0' 4C 91'49. 9 ..19 86 9 A]eV VK
49 .01 6A 2 D91S. F1?S30. .91. 8 / '19 .0 '
16 = D1 R 1=' ! M`99 4/2 3'. 596 /.F3 4'9 1'
"6 60 ' '] S SS?8 1..63'9 1$=$' 1'
.8 .2'H1 1 ROMA'4 98' 863' 91 /02 9 1
/69 'E 0193 ! 11.0'F604 0D9 864 98' 2'
4. 117" 91 13H9 9 j9 203'9 .0'2/20D9 '
8 6243' 9 M 1 2110'4 98' 9 1 868'
' ?=) ` ! 3<7p 630.9 4 ;1 "/.01'&,, !6
? FOA< 901110 4? R `S ' - 0 99' (&,&' ! :&P'
[S[SA11= S` 3 M1 0 6 4 4D9 868 ' c9
: / ` '80 .6 6'F604 0D9'
8 /4 993 0136 0 01.01' 80 6 .6 19 F6/04'
8WD@1?4 1?9` 9 9L '[60 98 0987 0F '4 '
. 9107079 9 . 0HOM.08'04G6.' .9 1 /'8 9 9'
24 C 2?[@S /92 8 /98 20'10 4 63'
F0002 1/1 9 R R 01109 91 . #' I 1 0'"9911 '
./1 0 6O.1 7 09/2.. 16'. / 63'1/16'D10 '
[OZ M0 614/ 9 . /.11 /=' .0 D0 . 206 .0 . '
"/ 8 9E 01 0=D6 0 69' " 8B' 1 . 4 6'
168 C1.3910 M /01 /298". '49 06010'
0 9198 1B' Zb c 1 4 B 9 1 8'.6' 1 16 '
.0 I 63 220 . 16 92E 63' 0 924 '"268' R '
. .. 3'0 80 7 . 9./6 1 1616 2 'G/ 8 2 r e '
861 . 01.1U ?4. 8 / 8 .2 .'/406/ '
2/0/ 112B 49.12 / c . 26 /'3249. 0 ' 219'
9 1 1` M 14C 391O 10 98 ' =9 1 8 9 1 9'
9 9' 8 /'C'/=S`?9p191 1' 2' I D 1/ 2/2' 2'
- 39. 0' 2 8 0 0M=Z910 2D0 /3' 1 63 ". '
6 .=9 . D9/S3'G10 8 0268'98"1 09 ! A'
86 . 93' 0 '

1 = q M : = =

. 9 2D6 3 .9 0 9 8 .2 1 0 . .0 02268
F604 0D9 8 6 "9 F6 2F60D9 106 T6 / 9
0J1/ 2 / 9 D.29 01 /29 0 93 2 6 1/3D.
2. 0 9 022/ 9 0D9 8 / 1 / 160D. 8 /
. . 49 9 " ZC 2E6 . 763 "1 F0 . / 6 24
D929 019 2 / /169 21 4 7. 01 [0 3 62
HD929 .21 T6 / 408 " /3 / 03 .98. 03
.#190 . F60 40 86 9 9= / /3 00 .6 /3 H91
.6 . 80 93 9 160D 210 C "H68 08. 0
"0 .0D909 ! 064/3D929 0 9 . 064/33
10#.)=E!0#!)= =1 D8010 20#6U3 8 PB 4 29=
06/ 0 4168 2 3 C 29 /1 71 8029
/D91 /9163 2 "19 / 9 127 .6 6 0
07.021 H62. " 6 19 0.910711 3
/.02 7A 9 = 168 99121 86 19 / [0
4 6 9468 F6 498 .e. 9 1 08#26 946
699 94 /7 E668 968#7 946
E2 . 68./1 0J 6S F69 " 0 H8 H/8 24
2 .8 91./2D 70168 D9 10 E 120 62
219 D9260 /.6 /3 91 D92 60 06 93 9 1 0
D9260 G07. :0 .6H9198 8 2 9 98 1/
8 2 7 . 6. .16 p $6 21@0 R/? 9? .9
. 19 0 919 ! 319 302 200 723 0 1 Z. 9
/.21 /193 =9.0 9 =149 D0 9 7 .68 2
021 =E 4 9 64921E0 /7 191 43 1 02198
F608 /.92 94. 9 0 119F110 `A /4 9 1
2 4. 9 29S 9 9 " D 02198 8 3, T
4 97 38 / 6 C 9 F6 9Z8 1 49 9C .9
0 . .6821/O 6 .6 / 29 19 F6 /4 10 44
246 981 002 80 0 0 9 .68 491 763
=/ /3 O9 /3491 9 8. 9 9 . & 9 1 8 /
.4 F 808 3 F6 /168 261 .93 098 7921
.0 4 63 : / 1 0 168 0. 9 . 10 :6. 03
S / 7/ 01 9794 08088 3 00B120
10219 6 D01 / `93 1 1 6 828 :69 /3
./1 6 91 / 93 0=1 "79 1/ U=. 0 ` /1 1 6
1 1/3 0 2611 . 763 . .6 91 37.29F$.012/
E 3 C " 2/ 2 D1/0. 2 / 34 61/ " .21 763
./66 /2 703./ 1 C06194 98 . 11 M2
61 8 /3 2191 19 1F$ 49/E/69 3 9 0 0/
4 92/8 20 8 / ! 2O 93 .1 .11 /
/ 93 92 62 / C 948 .0 / 3 / M`16 A
4G6G9 / .68 19 91 4979 9 7 68 49.
8 6 0 9 19 01 3 /4 .0 9M `1 26010 2 9 / 49
7/8 2 3 D929 01 /09 110 01 / H 9 108 92
/2 .6 /410663 79 42 F6 / 49 "01 3 0 1 /
2 763 2D.2 / 2E/ 703 46021 `0 6 0
F6 763"1C 08 3/ 4/ F6 43 9 . 1 /2 3
0 20161= 9 60163 9 1 =10 6 16 91D / 1 8 0
0 198 " 109 02 80 68 2 / . .04 / . /
./2 191. 0 19 08 2 01929 / ! 7/3 4 911/
01 /2. 801.1 0; 9ZF60 90 F609 0160 6 E./2
1021 49/02 80 0 0 0 9 9 1 0 F6E / 1910
3 4.D 1 0 0 0F601 .0 FO 2 0F6 3 0 0 89
08 " 0924 101 /298 2P9 9 F 0 1 `

q !

1. . 1 0 0 1 8 0F690 % / % " "
DS ! ")&/*!*&" & &=" /8293
2 6/ 03 3 .9 9 6D93 496/ 0 . .1 0 24
103 =9 92193 0.9 1/3 C0 0
"< ! . 65# ! 9 9 +. .%+ " .0 298 . . 1 C
G9 73 949 9 T604 6 .4002 80 D9 9 0=1 0
69 1 0 ; . ! / 20
9 9A !<# 6 /3 02 91 .9 08 949 9 0
F608 . 8 9 6 621 9. G9 703 102D91. 2 < "
0D /1021.3 ` 791. 0G 80 0 F609408 0 279
4/ " . 86 93 C E9 ES ? 0 0 0 / 7924/ "1JA
.F6/3 ` /6.3 4S / 2Z ./21 G6/3491Fj70 oE
792 0 0 8 / 494/ "1 "1 /3 693 "9 7 /
7924/ ! / 2 D9 0 02 80 0 . 0 " 7020 C 2/
91 01/3 492193 707.21 0 6D.". . CG9 70
6.3 9 7 04 . 7 80 8 9 0 02 80 0 0 3
"9 9 0 8921 3 0O/ 0 / 2 2416 04 04 /
293 7 03 29 10 00 349 940 4 69 3
.1 0 0 8 / 7 3 ./ 40 : 993 0 /3 0 3 198
/ 763 89 / 93 . 7UF$0 1 /193 /2/ 7 /
. .0216 0 . . /293C 8 / 93 0 80 68 ?(?
64.21 0 16 1P 0 / 1 164/ D206 0 9 989
0 0.9 7 103 4/. 10342 8 . 1 3 I 08 . 1 E. 0
161 0 .9110129 2 4 .01 / 0 163 59 67
.0 0 6 048 07 3 0D0. 103 9 9 G02 .08.
.0 1P03 80 69124/ 49 7 2 #. 6 F 2 69 /3
/ 92 / C 08 / $ 3.1 08 10 1 01 /2 3 63 p
9 . /2 3 1. 1 .6 / 6 F60 =1 / 80 C 8 / 93
02 80 6 8 861016 >98F 68 201 / F6B 9DP
9 1 F60 1. 010 . 7 0... C0 F6M . / 4 ?SeeS
601 . /806 / F 6 F6 4. 02 8070
. "!" NX 7/693 /6.3 .0 0E 6 9 / 49
168 /14 29 .0 9 1 0 4. 4 10 ` .6 2/ 8 263
F008 .49 .2. 568 2021 q917G 98 948 /
8 9< 763 C168 204F 0..21)9. 8/[7 /3?? @
4. "1. 01 . 76 " 9 0D 16 T6 763 9 9 2/
1D929 01 / =1016 16 101 99 7929 707. .
46 O 3/ . 3 /79 49 62D 161 > 29 8 / . ? (
0146 ZE/2016 0 / . / . /G 1P C 94/ 4/
29/ $ 16#46 ` M 9 1 60 101/ 198 / 9 .2 PA
1 5468 /11 2 0 F/ 163 . G 791 H079 9 0011 AA$
.98 "E81 07.24FC12 83 9 6 . 93 2
! MP6 219 48 2 .6 . .91
99 / .@1 .8 9 2. . .7. =1 4 1F01 . .
.4661 /29 0 4 191 /294D29 3 .0 / 763 G6
0 =69 ./01 16 ./2 1 < 1 /2. /1 . E 6 F
93 ` 0D20 9 0 19 1014 63 989 F60 " /3 9
64 19 >.79 . 04D9 ` . 0 /29 98 20 ./.6
. 9 46.2 91. ./ 11 31. / . 1 8 203 80 93
2 .40 "1 -0 203 -0 /3 0 F$. G 3 67
. . . -0 203 -0 63 07. 1 2110K 9 / .9 9
E989 P0F "1 C . .0403 9 0D20193 649
/O0/R9 60 80 pC .98 20 31299 6 11 313
7 29 "1 /F69 D911. 0 N.98 208 F6 0
2 "19168 9892 668 . 5 24 1 91 9 1/

>M ! 5 I' :Y' 5' :' I ' ' !'] W

E =' D92S 0 9 "1 .3/60.0[0 2' .' X0892' 2/2'
L' 02 880 $W6//42B '?[U' . "1 E6 F$. '
& r V]] S7.1 .4./ 302 80 ' 8 9'
% . ' = . 0 8 8 6 9 380 08.0 2 3' 2 /2 E['
= A e' 4P 16 / 1'19 1 ' "1'43'F6=408
030@1 1 F 0111 8 "90226 1 " / 0 8 9 ` 9'
02 0 0 #1 0. E1 0 8 7/7 `2/9 1 98 2 763 A'
' 9 . .1' 09 119/' ! 7 2 8 9 ' : /' . p'
V91 0 6'F 8 F 1E/' 'F6 0'G070P' 08S
8021 3' 2DS , ' ' . S S @0 12'8 / '
D1 9 /29D `D 408 . 3M 1 9894P/3 '10 2'
8 4D DH \1S46816S/198 . G 6 8 0 1 '
02' 0. / 86H97193' .4F 1E9 8 70 ' 7 F$' .47A'
0 /7' 94 ` Z2UR [@7/ 9' 14 '
.01 '9 /1040 09 98 G 0@1/11 '
NE Z0311 6 9193F1101 9 49 ' "/' E0E 1.9D ! 9'
O101@ F0F ' ' . / 8' 9!3'S' ' 1'"1 /0' 94
; 31,%` 9' 2, 4 '3 '18 2' ?17' 2-$$& ' (,$$
93 1 011 /2..0 98 2 3 1/ 11 Z'9p?
' -42 # 5' -78 6$$1=3' 2, ($--24$4 (
2 ($□$6' ,24$44 $,'& 21&$- / 44' 6.-3' -<
:24$ '42/2(' ; ('$2 $ (0($. <4 ; /' (/ / (<
F 6(3($$' $$- $.' CS/ 1[$19 1 '?8'?P/',
42 , 1,2 ('7' &; .3' , -'&-B.< 1/'
#$#c$. <K(&'&'=$4$$ 1 ' (.2(I #4$ $ (, '?'
< Q $' NR 32&2 , ' (/ '4$ / / 1'4$, 26. &' 0<
<3(((1 0 41' 3 2 4$ - (4 (/ 'W 2<
D0?19Z$S 0 01. 6' 10 1A

EP/ H 1 1F0 /1 :1P =S FF6f/0 1 763'
./1 1023 1/143 8 ./0 118 16 /.
.024047.904 102/ 19=91291H/4/E '
' 1 1 8' =13092 0193' 2 1' 1016 16 ' ' 2'
/ 4/ 114 0 ./X98 E< / /9 H@G04/'
' 46/3. 1707 1 /38 / 1` 11 "01 1'
6 3+ ' -0_0 1/3 1R 8=E `E46/37 4 2 3 0/
4/ .6819 ! R1'c A!O3 9G 7.01 4X@ Zs6!'
& K
= c A 2 19c c : S SP6 0 11 10SA =11 '
(: 9 1 ' . 1"103=. 91 12 'G961$0X '
. c = X@ 14 . 8 4 F0 4 ! 9M '0@'2/2'
19 1 9/ /4/ 1 040 0 M. 9 1Z 1M 20 '
16 L 93F6/ 19?1?/ 1 11\ F0 7/39 '
.04 01 /' 8 .1G/4 EF ` . . / `1 119016 ' 10. '
6 & ' = . ' ' R00 6 90219 0 1 .6 0 0A'
D8 9100219' < ! .P=E 17 1021 03 69 019='
00Z 0 1 .0 0 .3 V@9 J/1 0 I 11 04F11 4S2'
0[1 63" 49 2 ! 06 0 O 0' [=. H. . ' . 9'
.Sj <X8. . 19. 08 / `0' 262 .218 C'
4.10 /12"0C 2 3 8 /C. . 92='9=9' / '
1. 1 4 2.1 1'19 . ' f49' 02 800 9 1'
E 1/ 9O3 049 2 ! F' 0. . 09202. ` 9'
1/ 1. . / 1 0 2'$(C / 19 'G02.E' 89 8 7 0'
0 19 M14 `94 /21 ' =94 2 8 019, 0 63'

3D 6 / " . 1/39 . "9.9 93' / 80 0F '1911 3 '
.29D 9 ! . F 9' 10 8 92' /1 63' 20.6 09 1
F608' 8019 0' " ' > 9/ 8 2 0 8 8 0' 4 9 9 9
:11 . '8 0263' 2/2' . 9#F 0' 2/78 2 3'02 '
8 0'201/10'9 1298 9' 219 . ` 60$29F J8'0'
8019 0'07 0408 ' "1. 1 2 .O.063 ' 016
E0 13 .E921 0' . /219 016 'T6/4' ' 219 .46'
9/ 119 91' : 7 10 '9/ 498' 9' =)'1219 D '&
9 0' .MD0/ 9 .1 0'F8 0'39 1 0' .1/92/ . '
1' 90 763'0D 1 T60 9' : 7 = .0' "20' A'
8 3'/8 33' ./1 / 903 . .91' C' 10 93' 9 '
7 13' C' 21. D 7 P3' . /D2/ . . .1 ' F6/4'
0 22 K=94 19 ` D92 134 G .' / .63' 49' B'
1. .4 0 '0 8 0 S 9 161' 9. 39 '
9 @44 .'07 11?004 19\ / 9 'C' F60 .26 3'
108 " 6 1' 8910 G 90 C' PP0 98 '2/' ".'
1112 E' 9 1' ! / / 3' 24' : G 'V
D S S' 92 /9J " ! 06 03' 3. (124$2&. .1' D 01 '
1 011 17SE$O C . 8 0. `1 0911 '10P9 '9
29.9 10@ . ! 91 1 01. 8 8 11 031089'
.9 .039A' 2. - 1'0# 1 8 000 J 1' ! 8 8' 9.6 3'
46 0 F6 0'< . . 0 . 791 " > .' 110 4 . .F46'
94' 91' 298'4/8 .8 110401 ' . 7' 29. . 10 ' K
1= F6E' 0H0307 /11@0. 1 0 03' .0 /3 ` 01 C#A'
93'G '/1G 1F4302.'. 9' 29.H/' 01 /29'
1 1 . `92=0 / .5.'29.9 1G/ 'F6/ 791 '
19263 "1 /DG 0 9 ` '4/01 R 9/P 0341 ' 0Q
2 . / "110'4 91'/1/1 13` j' : 0M` ='T E .=2 '
4' 046 . <P 01 /?. ' . 'PA`1'"1' S 8 9'
40168 8 92201 $ /41 `b .91 7 F60# '
40' /D 0'1 0462.61'4.'4 6 124 81 /2.'=)'
49'D929 .'0!'X 9.19 "2 010"0 93 17 1 3 03
'F 03' 2D.2 .03`X ./ 6 1 7 9 9 9 S9/'
j/=E 0 03 2/8 9; C.046 ! 03 "1 1 1 .=C

"1168 F '10 292' 164 689 9 G1.624 M#
0 68 /79 .9 921 00 . 68 ./D2 08 8
c . S' 0 /F6 96P9 ' 903' 011 2D08 3' D 3
92 ' 9 8' 6 9 /168' C./$ 9 1 6 8' 8 @ ?S0
2 00./D1 /29 F6 8'" / 68'C' 2 9 D
E612' "731 8 0. / 8 9G9 /29' 49 9 0196 # ?'?@$
" . ' 202 0X 3 0X 3 F60F 8 8 2 8 0 .M
/ 3 0 .9'9/2 9 10' 63' 0 . 8 2 'F608 /8 r
0 1 2 7 C 8 0A 8 3 H0 68 "9 4 /7./
08 . 921 = H . 0 6 49 39 1' "9 / - 0 oo?
A06 9 04 0 / .1) G 2201610. - '
' 90 1/ 1F0/4 0 F8 4 0=8 02468' 2/2
G4090.' 1/ !' H9= . I 16 0' D2 .0 9 F6
2.0U 20 0>. /391 0 8 9 9 26 92. 76?
08 P `0 1 F02P 016 0 8 0D. .' 2 3'7/2
1/119 EF6.D ! 01 /04.79 .F6. 2F608
9.279 ! .9 9 11. / 898 1 / 90 1/8 0' 02
, "12. . ,2. MD,2 1 /2,. , . / / ,3 , 0 '

9hC' =q M : = =' L q !'

1 8"9'F6 763'./2 101' I03'./2 4. 0 ' 0'
1 /29' / 839$"1' 019' 93' 61 i D20 01 /29'
4/863 96' / 80$34 68 '=6 /29246' D '
16 ' 86 10' 8 13'02 00 763'9 9'./ 262 0'
0 18' 1 . 191'"1 .4.S '0 03' F60120=$
0 9M 3' 86I1/3 0 . 8'020 /D .9 C' M'
/ 1 /29 "1F0 4 M./' 6 8/2 3' 'F6 4' /./'
02D6 2 3' I 01193'./ / B'. 9' 2 1 6120210'
0 1 /26 0 02 8A' /168' !/ 63'02 80#
&(' !/862 0' 87'9. /2940 49 249' / 0'
/. ' 0'=..62463' 79' .0 763'./2 101' R '
16 16' .3'9 9'./8 / /293' I 92 92'
(U12 8 8 0" [E8 31 0':0 1 11 0'
10 68 9.6240/ ;F6 763' A2 2 073' 2010 0'
./2 101$"1/ 3.0 2 3' . 10 8' 4 8 0'
68 '"1' 0. 9 80263' 1' 01 E0 8 CD929'
101 /2. 8' / 80=1'. 9`1 0 1/ .8'9 9'19'
D 9'E / 80'".NM 1/ 9 7'1@ /29'C' 4 D2 '
101.'C'G016 : 1262E' !11 8'201/ S D929 0'
1/ .'9 1'" 1 868' 01. 089.8.0./'
168 '4 . 8 0 E6 0 1 11M D 01 0' 8 0A'
.3'E 91/' 01193 D 0 C 4 =[01 68 =!/ D 1'
2' .0 68#F60 8' / 70= M .3' 21'2/'
3 08 8 '"1/.6 1'" 49 .' " K100 /293 -.'
0 193'. .'" 1/11763'4 6.1 0 0 12/ .3 A'
.0 231H '0 03' " 1'/ 0' '0 10 M2103 SDO'
403E /'"01 /' /9 'M D00 .03'"9 4 0 7`='
" !61 711=9 9 1E.4 103 R'3 0 /9408' '
29 H 2.7039A 3./2 019'G/2'./21 0'"'
=.2 62 . 9' /2 0 703E = 9' 8 0193 '
.-8 .9='F610 911 /'04@6'D9263' 911 '
291' H 2.9 98 91 3' 2D6 1 2D610' 92 068'
/ D020' 1 76 #10 - 68 10 8 92' F61" 4916 '
6 0D929 0 . c 9 9 2 0 19'8 243' 8'
..<. "1.01`9 9 cHF 0' / / 1 /20 '
./ 6 .21 = 2/' 1'=.2 122 8 P 1@3'
. 9' 1 /292 'C'8 /168'07'/ D02 . 3 69
E?B`1<4< 0 0 763'"2 '!/ 0 1 8' 8 . 1C'
]?' P 9'9 9'F0 0/ 02 0 92 7 0'9 . 1'(
C' ' 0 193' 8 93'4 6 4 16 "1'0 0" . 0'
. ' 0 84 2 0 9 F6 08/69 0D 1 C.1 10.'
9E D6 9 .9 0/8 2 09 9 02D10211'
F6 0'04' 8 90163'"920 68' 0 10' '= 8 P E6'
0 038/ .=E=9GF71 403' S 'C 2D6 8 92 <0'
2 98 04 .843OM111ER946`08' 9892' 0!'
.0 2. 8#0 03'46 03'C' / 403 ?1'/3' 208'
29 68 "9200 '!0 48 2 1 D 468F'4 '
.'8613'8/ 3 q1!.9/2?C `12 4/Sp1' '
N 7 3 69' " =F60#02E8 0 I 0 4110' 2/2'
1 F6 ' 9208 =#04 G 7079W 1C 9'
46 08$ H 49!. .71/ .01 0 3 .0 29 "9'
$/ 71`' .c / 0 9' /29 9!9197 21 '&
+1Q 15 V$? V ` ?' V 5? ? +'
F' F030//C]Q 5 "+C $ 5 2 "9 ?)5 1 '$3
49 M D0203. `O8 P 3 .4 / 10 /!6 /3'

06193' "' 6.3 F6042 .40 /8 2.=' /' '
/3' G079 9' 0 .7 19 1/3 .3' 2/2 1. G
': /3' / 9 8 .21 'D 01 0'401/3$ 6 0 . 0
C'. 0 04 68921'/.6 / 68' " ' 0 !3'4 9'
/ 0. .24 / D0268 2F604 6 .4 63" 6 '
0. 3 .' 9 9'9/4912' 8 /E/'9 9'4 / 10 2 0'
2'9 . G021/#F6 0'. 9 G03'20 9'. 768' .. '
^'7612 4 18'.0 E.0F69'0 7/193'". 1$102'
1E 012'2 026' 07 020 7 3'02 80 68492 A'
10 / 6 0' C' 02D6 29/ 69 9 67 9 004 0'
619 8' +'1619 08' 4921 68$ 94E /8 2 'eG'
./8 8 /40' 04'. 8/2. 11' " ' 2D60 8' 1'
0O 9'9 9'4 8 9 2'G/8 2 763'"9 7' 0108'
8/ 9 2 07 / 61 80 2/2'04' 0 / 93'10216'
. . 94/3' 94'04' 9 8 /293'9 1 8924/3
* $]) U + $')"+ 1 V 1 '^1 U '4 U ' $ ' '
+ V 1 ? 1 U' ? U Q C '' $ ' 1 + '+' $? U Q C ' AA
+' ' N Q d 1 + $ 9 + ' $ 4 ? C V Q C ? ' + 3'
+ ' $ " ? '4 + 1 '$? U Q C ' V ' ' 1 ? + $ ' '
5 5 U $ 1 ? C 4 ? $? + ?' + ' 1 N Q ' "
T00 63', .0 1 763'9 . 1'F6/8 /4/'
" .90'C'"9 11 93' & '' -),!' 2'4 69 3'02'
801 763 .6 '<9 9F6 40 0 .02. F0/4' 1'
89 9219 E 0 7.3' 01 2 '"/.01 \'-0 ' ' " '
0. C # / </892168' 01 2 '2/8 202Y'
A) & &J+> . + !/ 'H 3.0 9 9'
/11 0'02 80 0' 0 940 '19 1010'. 6 10../$'
94'020 /D0 1079 9' M 691 3'G .'02 80 0'
011 763./2 1019' I 19 2'03'02 80 68'" 6 '
0 / = 02D6 29/ 68 019.3 '07' 7/8 2='
0 1 7639 19 2 = 4 2 . =0D6 290M6 0 0'
0 1 02'F604 6 940' 0 1 1226 940'9/16'
0 193' 02016 0 0 9219 4 D9 103' 9 9'' %&/'
/8 293'9 9' 1 220103'4 9 19'.08 92'94.9 6'
=<4. 9 16' 0 18 8 00D11 164 29'C' 016 10'
1. : .93' 0 9 .7 / 9'9 9'06 763'F6/04'
0.1 68'4119 /8 2 07 .08' 693'F60 4
0 1 2 02.3 08 8F6048 9493 9 9 9 "1'
(161G /298' 1928 F6'7 .3'9 1 "1 06 3E'
7 61.63 "9 /'=X"2D6 08 7 011 108' 70793 '
"1F604 6 93 !6 H38 0D2 164G 2 '3F601'
$ 4'V 3' 4 '"/01 7 8 3' 299 92203'
D91 1' M 016' 4/2903 .4 3' 8 93'

(' / %

21' F6 2F' : 863'.0 10'G0791'E[==10 3S??S'
+16 16 '0219' /8 2 0'9 9', ' D929 0'.06C' '
168 2.8 /'180 2019 02 9 9 923'T6/'
68 96 8'4G/' / 0' 2 3'C' / 8 0 F63' 621'
49 8 '49'02 801 763'9/16 0F69' 0 1 ' 69' '
1 21'. / .0E 8/'C'8019 0' 2'0/ 1 2 0' 49
0 1 703' 16 0 763' '4G 8 0 763' 0 '6ZF' "
19 2'F6/04' 0 193' 9' C' 24 42/'29.9 '
0 03$ 9 101' "1' 49'9 . 219' 96' 8 /29019
49F' 0 1 7' 0 3D929101 /2 4 .0 10D016

;S2. 0 '9 D/'02 80 0'4/. . . . 'E@C 0'
9 '. / .68?80 3'C' 9 0 20#' .0' . .9.'
E6 3' 9 `'4 1 2D66216 621F ` !' 02D6 290$
Z .00 6'2/226 0 F609' ! 2 . / .19E 1 '
0'92 8' / .99021 .4E /2' 1 P'E'?1'F`p'
9 '19 0' 61 'C'. . 92 .1 3 021 HEE1992H "'
D9263'4 69 62 ` /4/. . 203 9 1 9F V` '
80 D929 021' 6 1 ` 0"9 4'2/'D13 0'
1' 2 6 9=6)' 02 3! 2 0'80 .'C .98 9
202/24 991 "1299 02103E2 F6040 0'
8 164 2. #W20 /D 0' : 0. 0'D.03 0 '
1 00 3. 9 ' , 3 '
. `' 68'FE 4.8'102F6012 2. ' 2410B'C'
D929 01 /2 3'G07. 69 2E'G02. "1'2/@ 39 '
' 030 .92 8C$' .9 0 0 1/4 .'D92 10 3' 9 23
E10"11203'F6 49 8' 2'0 / / 8 20 2 9D3/9 '
.1 '> 6.1 0 8 49/. 9"11 6 F$'" 8' 0
1931 /9 0 239' F6 4. 2' 1396 8 E 8 0 R 19 1.3 '
. / .3 9 ' 2. /3' ' ' 02D6 2. /D32999# 8 /'C'
9 02D6 76 96'4 . .1 3' S1 0 / 8 2 763'
02D6 29 3 0 193D92 1 '9/43' 8M4/' 4 ! '
TC0# 2/2 2. ' /2'G07.2 '92 8' 993'
09 9 .2193J9 1 .6 /3 942 30163 /10 "9 '
D 6 2/3' 9 3 01 . 3 Hc 9 90 019 1 . /=1'
. 1216304 19 0 . .3 6 07 3041.2 10 ` 93'
1F604 6 .40' 6 0 W 9 P0J 0 T2A'02 3'
2 0 821 / 8 8 0'19 93'7079 '0 ' cS
+ 1 9 90/ 2' 469 7' .40 0'04'9 1 980'
E 921198' 163'.024 1/3 '"1'4. 203'8 9.'
/ 03 9' 298 1/68 68'G079 9'"1'7/Q
293' 0' / 3D9 . 9 9 9246 /3'q1G/8 '
292"9 0229 /3 4 "1' /93' 1919306130 '
6 E.39 9'7 0 1 1/3 "1'19 193'D9E2 /3E .4'
8'01 3' 9912 2 3'0 191 1F '"1' 2' 01 /29. 7 '
A'"/ 0. /10' / /1 'F60' 94 60 'G07921' 219 '
268 . 1/. 6 / 03 4' "929 . ' 7 C. /E19'
. 9 . 63 FO0# 9 8 9016= ?16 2M2 1.E .6 '
4 3'G07901 "9 '19 1 .6 /B /163J0 1 T100@3' '
8 90163'02 .0 16/ 93 079 9'$ "9X 9593 'F0 '
2 168'D9 01019'9 9 9 292@ 0.=9 ' R\
' 9 8 ' 2'" 0 3 '"1'9F6 F 0/2318763' T60 '
9 1 .6 /3'9 1 0' / 3' 0 99212/2'#/ .' '
8 92'.8 .. 9'F60 8' ./3' 9 0 . 2'1$01F6.

92193$F6 0'9/'2 2'.D 921 .1 ` ' !9 9 9G23'
./9021' 191/3/ 8 293' R ' 216304.6 1/4 0'
9163' 90163'. . . 8 95 '< . . 'C'G68 4
' 9 9.H 3' . .91'C'" 23 9 '4 69 /3' 2 Q
80 0' . 6 10.90 '8 / 0'.9 10.90'C' 2 . 10'
'&' ' D92. 01 S8 .4 9 9 C0 . C0 00D` 2. 3' '
=98 92'2/2'4. . 4. 9 9 ' / 8 2 763' . / / E3'
'"'+)' 0 1 763 9 9 . 98 .16 8 'H 2.'02 80 0'
A $$ $80 / 0 8 2H3 9.6240 0160 /9.64 80'
F0 07A.'07624021'9 919/ 921 3' 92 180

9 M0'.1 02E'9 . 98 9210' .0F$'98 11 '0' 02D6 '
2. 3'02 80 763 'C' 6 94 10 '0' 99 0 20 '"1'
8 01. 0 8 D929 0 /2 3 'N.98 208 989'"9 ' 0 A '
' 68 2/2'98 . . . ' 94' 3@%%% .'
8.2 1 6/ 08' ./2 161 /2 .8 4610 0 'H0'
79 9.2 2 /' 98 208 2 0 ' 01 921 3 '8 0 '
19 8 2 10 '0D921 3'C 8 /6.21 3#01F69' 04./'
2 01 3' .8 92 0D9 . '8 /69 . N/ 80 9' '01' /9'
8 208 ./2 .1 9 / 08 '8 019 08'2/2'D92 '
1O 08'3 494FB '80 98 oF6/4' 60 8'9 1' 2' 1 '
8 208 9 6249 9 C' 2'90' 99.68' / 80 '
F6 0 2909 18 01.1 0 'UZ'F60F6/4 1/. 90 '
16 .U 1B1' 0 .8'C 998 202 4 1 2D6 ' 2'
/ 8 2 763'D . 7634942/0'4 9 9' 9. 9
2' 021 3' 80 98'0' / 8 20'2/2' 9 0 0 '-!'#-. '
49/F' 9 03 /D.29 01. . 0@ 7 98 3
=9 .62463/ '=1/ .T2 10S9 F21 763 '=1016 '
&161' ' 2 80 68' D929 01 /23'3 9/7 .8 '
19 2 .0.98 2/2' 24 6 40/'16 2' 94' 9. 9 e VA'
68 ' 0 98'C' .9 8 20 2'9 9 2'D 01 08'
D92. 0. /2 3'6 ' 0 98 0 098 20' . 0 01 $'
F6 0'8 9 63'9 1 4'F6/4' 9 9 1 639 1'0' 4. '
1U / 3 62DOa 2 8 0O6 ?0 6'949 9'02
'80 ' 91 9'0?8 1'G/8 29330 0' / 91 94 6#
C'G/10 8 1 0 /66 8' /2.1p' '02D6 G90'
0 0'". 892 'C'9 02D 0'&"4K C.3'/60' : &. '
0 9 6102 2 346 / 3 "1=F1` 9 ". .9 .19 '
8 9216 8'. 0 /8 '0 768 G68 428 .0 46'=
68 / 68 0.1 68 ' 2./2D9 07 C 4./'89'
9 ' !19 108' ! ` 4 68 0 .` . .8'9 021 ' 9
(8 92' . .68'46 68'F69'9 . "1'9 9 168'N 69
/. . 8 8 ' I.'H. /4/ 68 4 .9219 8'<. 8 92'
9.7 / 689 .2 D 68 'M 8 2992 8' 989'
0 768'9 1 F/ 0 68 / / 6 '= 680.2 8'0 '
709 1 "1' 2'/ 9/'C'0F60'8 1 3' #0D 101 3' " '
49 9' .91 '" 2 2' 981/ 703'C ' /299 1 7'2/'
9 0 01 3<9 /1G 99 10"19 12 - 03. /$208'
1/9 6'$ 0' 9 /292468' ' 02 80
"9D910 .8'9 /' /1921 ' 1'. / 9 163' / 02'93'
1 8 4'" 69 9' " 10 8 '0/139 "8 M 82.3'02 Q
8 63'9 '.0 6 ' R 9 /1.21 0F60'0 6 '
H 2. ./ D .6 . 97 9' 1/19 3' 4E 1/8 '
G/ 8 1298' " 69 9 8 / " 10' 0210 '49 249'
02 120 =E4.2 F69'G/ 8 2 3 ' 9219 8' /
&! 1 2 9. 63'09/94/ 9' 49 1 '4/ / / 9' 2/2'
94 6. 908F' / 08'9 9'4 6 208' F6 0'2 G 1'
.68'9 63'0 1 / 9'F/ 0 86 1 .01'0 /'. / / '
0 13' ' 1' 02 /03' 9' c' . / / 0'2/7 101.'
4 91 9 1' 2 98 12. . 19.0 71912 /OC. / '
.68 F12/2' D29 '5 /210 .8 0 F2089 9 0 '
.6 1019 94' 16E.6 63'201/ 0'
9 /491'9 .8 91/' 19 016 ' 4'9 pAA4/'H 2.'(S " 0'
XD 9'26 68'02 80 'D92. 0 .4'.01/ 9 / 3' ' '
.'02 80 62 ' A ' N.98 208'9 /' 80 98' $$
(M B 0 1 861 68'C/7 A 68# 86 97 9

:

S = q M : = = & %

29 1 668 . .F6 4.2 .8.2 X.42/2 6 6 #) # :
: 2. 68" 0#9 90 2c .# ` .F$.b.. " & & D $
8 9 2 0 9 0 903 .1 / F0/4 1 16 . " $, # $ Z
3. . 9892168 Z.9 9 1$F E .68 9.62 G) 9
468 68 403 C03 E/ 1021 03 C ./ 6 . A 9 ;
1 03 1 .0 /9 2 1 . ` 1 I = /74 . 16 D9 $
2 16 0 8 31029 11 . 9 1D. 01 I C . O ## =)
#6 /7 0U A $ 2 8070 8 . 9 0 / 0 & 9) $) "
9 . 168 F8 498 ./2.. 1 8 "1 /66O 2/ + *) $ G #
02 80 1K/103 1.9 9 =/ 0 9 8 0N. / 0 # K $ I $
1 G08 2.3 . 9 168 02 1 0 0 ! 19 1 29 L &W #G #
"9 /9 1 9 9 168 02 8 0 .08 ! /2.. 113 # $ (# <#<
"1. / 406 63 08 0= 9 "9 E9 0 20 6 $, 9 I 9 5 G + ` //9
. Z 'A! / 3. /9/ 2 . 9 011 208 1 319 9 4 #) L & < ; :
R 9D ./2 1 9 F6/4 00E8 0 10EF209A ' 8 10 # ;
$_$ 80 3 =9 /98 11 9. 9 4=9 R 01 0 0A "1 A # +L)
3C.02 3 . 4 9 3CD01 j 110. p? D.291 111 L 9 #
.91 04 8 164 098 1 1 F6. 0 92A <& D* ; ; O7 $9, :G 8
1 3 9 9 021 /D 4C 11 8 911.9 11 M 3 9
8 23 / 80 246021 C9 / / = ./7 0 ; ; '& P& ' 3
90 02 8 0 0 F60# .68 2120 6.034 01 = C<2 91 ZF842M ` 49/4 . F6744 69 0i V WA
8 0D2 164 29 10 090 C 39. ! ! /. 1100 A 4 9. 96? @, 017 ./ ' 001 46804 0F60 2S '?
498 C 04 "19 D9 101 0292 01F6. <1/1960 ` /3 [4 7 90 9 r 6. /1024 D 01 0
9/498 198 / 9 6 `1 01010 H .11Z R . 1 1/ 9/0690 60 &&O 61/ 68 D.063 2 9.
19 16 - . / F6 019 1.G9 0. 64 10 B !] :604 O01 9 103. 11.06 03 19 101 3
! . 040 92 8 " / . & 19 /119 4/ 6/ 0 1 911 13 7 1"249. 327079 .0 10 =10
F6/4 24 9$ 1EC 92 ` = C `4 /0 p ?=1S 1 00?0 0M0 0 0 ./P6 80 13 9 8 . 1
4. 0/1 /2 763 . 21/0 1 C4K49" ! ` 1D9 10A 0 1@ 00890 119 ` 1 3D92910 . "1 0693 AK
1 /2. C ./2.9 4/0 76=# F0=F 0829. ". A .3 J10?93 F6 498 /6O8949 9 9 9 =68
/ 0.9 ZSRA1 ?` ' 0S & && + 40 0116 ` 3194 E8 0 8M 7/ 6i2 1 =94
?S(D2 .01 F648 " . 4 0 / 10 =9 06G 8 /60 /8 2 0 7 ./ / 0 : 9 68 8/ 0
1 2/ 04 0 0 / 8 2= 8016 021 9 $ C Sa89/ / 0 M 1 /D 0 8 a. 2. 68
./ S?R. ' G0.1. 1011 ' j S.@ .) 0 9 D9 1Z0 980 3 0 .9F60/668 "19 T 04
9D 120 <.F602 I R 9 09 PE41 /2 I. 1 . 6. 43/ 9 0 8 .= ./ /
1. 0F00 E '#90B80 80%0 02 9 'W HA 1?..1 0e #9 /.62468 ! 940 19 0 0 19 0 ! 6
8 2 763 10 ! E . 63 ` J .0 0 .9 46 639E608 2 9 / . : 2
8 20#S - .# 23T216 =1 2 1d1 . ' 0 111P08 . 146 9 /9 9 20.61 B .9 : 993 .0
3D92 16 = 9 "1 0+#H 9/0D 108 ' 1 SS 1 4 2./3 2. 0 . 6 8 . . 68 0.9 9$
I 1 92 8 ./0D6 68 99 ./ 11 0@3 .07 92 94 1 049 "27 "99 /4/ 2 0 68 1 023 3
) % & " .0 98 F6/ 8 0 / 08 4 ` .02 8 =1 . U. 5 0 9 9 02 80 020 . .9 .0
./D628 I 1 0. 892 1 2/ ` F69 ! 1 4900 ! . . . /O 0 . 68 / 03 "1 0 012 G6
2016 9 ! 81 "6 N 91 49 049 2 987 0S03 8 / 9 $ 0 19 4 .9 / 40 G68 .
.9.68 /18 .4690 93 c c @A Jc E?A 99219 C 611 4 U ` 0219U. 0 99219 "
! # K ! / 8 8 7 801 F6 0 2. 68 : .9 . . 1 ! 624 8 /3 . 6 0 80 2 311/
8 01 6. 1C 4 ` 00e 0 68 C07 /0111 E616 : 9 08 D9 83 1/168 /@ 0 2
1 / 02D6 91 .91C !0 F6/11 0 ! 1 /1 . . 2/2 M5 93 10 0929 . N.92 8 # ' / BG
S9. 8 H 2. 07 G 68 9 9H. /4/. R
EC 0 9019 1 ..3 2 9 4. O71/ 9 801. C /6 3
768 4/299 9 9 19 8 1 C D19 7 7 29 6/ 0O689 . !)2 10 9 #"6 60/6 3 .
"87 162 2ZM 10 2 F/0 F6/4 496/ 0.6 9 1 2.F6 1# ./
19 "126Z3 2"1 60"[/46 F/ 16 .2 F6/4 ".2. .6 68 67 1 , =
4 3 0 460763 "90 3 7 /1 1 E 4/A@ 7S? 8 92 9 / .89 99/ O8 F6 61E21./
/ 168 / 8 04 26@ 1 /0 4016 8 9 19 I 63 11/3=! 7 2/ ../ 9$ 86 1. 08 / 9F 0 9 9
92 8 "9203 FF0 04 .93 "1 ! 6111./01 2D. G 39208 46 9 D92 10 9 80 30 # 198 201
07919 1/.G08 . 08 = 9 8 0 19

>M! 5 "1' :I'5 : I !4I '

E ' M6 3' 06 68' C' . 61' 1201. 8' 0 C 9'
. 94 /2.8 ' " $' 5 9 9' 8.? 0
0 "1 9 03 C. S<710 . .U O` ' P M11 '
2 . 0' >0 11/. /P2 [0 = 2'<[\/21S A' '
62D92@ 1 /29129 C0 21 D600E C' 4 '
. 98 :610 9'0 /3'0 93'1 p ' 10199 ' 6. /3 . '
84 03 0 /3'. / 11 0$
9 03 ' 0 293 D9?'?0 "10 = ' 94' 2' A'
3' "1' 20 O `1 33@9 '11 G '4 61@0 8' 9 9A
' T 1 0. / 19220' S 1 1' S3 1=3' G0792 0 '
9 01 ' 0S ?'@ '01? 8 C' 2$ 911P 29 '[? 1 '
1 2 2/S'S1' 0 1129 . p# 0' 1021 9' @O04B '
00"0 0 E0 4E63'.9311 .102@ 3'02 120 .723'A '
.6` 1021 3' - S2 90S00 @ 11 /0 ' 8 2'
C04H$ 9 2L?PR 0S`S189 '?. p A
' .9Z=. D1 9 1919 .1C093 8 1"4/3 / 1 903'
/%.. ' D$$($$ 1 3 4##'&('$('@A($$d$' :$(4'
&.$'$$$$ A(42/'`$-(1 -(A`$A# , ''
1'% ,& ' & $$ 3 6($'24$4 ;1,(,<&. $
,&$;$' .,&9 11` 2 D? S I M 18 6S?'
5',$ A .A(;V, $:#4$42 / ,(< :('
-(3-<42 $-'N$2(' .! 0'(1($2(&42'
,24&2,2'$$?F<$- A2 -#2/',--3. '
4 A□4(24N2<'#42($4& $ $2&'3&4&2$2<$2/'"-$, '
4/3 C 9 ?5 @1S 3R 8S?R L9 S 0 8 5 A'
S$? ?$ 0= 2 . R9p' 3= 4 23'C' ! Z192 ! 1' !)]
' (/ ' =(21'(11$2/'`$-2$2($' '-$ .1'4 (/2
A< 4 (4' 2$$2 ($-
2921 001 3'C p@ S0 [8 2S1 0 2'C'. /12 '
'2Z 901 /2912 ' R 29' .2 21' 0 /30c1 3 2 0?'
/ED92910 9 '@4 /2'D9 19 0 .' 'E0R'. / 1''
921 0/ '8 19 ' 9 '"9 4 .21 021 ']: 91 / '901'
4921 1\ ! 06U01109739 A$ 0 S21 903 "9 '0 P'
8 .3061'4 8 19 '8 0 93' 011 101 '
9G2 203' 0 / .3$'0 /3' 8 O' '?2 0?D0 '
29/ .4 1/12 2 M 93E0 1/3'29G / 8 R E6 ''
4.8 94' 11/2 1 / ' I 9'J/3' /4 6 2 8 /4/'
8 /2 1 0' ' ' 0 9 8 3763' 2 /2' 8' 8 . '
F2/ '90' 1/ /' 0@' 49 9 9 21'
, $ / , ' 2K,V 2 / $#$ -, # 2&424(1 / '
98 2 ' E/. 901@0' `9.9 11 0' .'
?E1 r 0 0 80 02' 9 1 , 9S R ?8' . C1110'
1 /298 = 8 11 4 939 3 9.30141 1A' " 0 /3'
9 2 2 32 /1`3'C 9 90 /0.= 10a1' E' 49 9'
E 0 01921 763 1 1 01 90111Z 1 13 2' 06/3'
. 249' 07' 7 3' 2' 9` 7 / 8 R = '0Y` '=1'
[\ 2 2 3 2D926 1Z ! 9102 S01 CS112. . '
0/2 1 0' 8 D3521 9 ?029S I '1' /40?0 '
879 1"0 691 0 . '= 1' 691611 E20 . .0 19'
01 .1 3 1 ''". '7/6 3#" 1` 28'.0 . 9'
E/69/1 .0 19'7/2 3'T 02F60D1' C32/1 '
1 091 0 8 4 . 216 F6A' 2' 6,' 19. 9' . /'
8 02. `1 0 1 23108 .2 .D923' " / R '%$' '
(?R S0e=3?? ?0R .68'"268
0 01'G079 =443908' 9493'46/3' T60

'/ '8 /2 1 / 6 2 '.06 0 /' 9 69'. '8 019 9AA $r $
' 9 .1. 408' C' ./2.9 1 /2 763' H 2. B '
91 H ' 2' 3' F6 2D6 /3' /9163' 0 62 0 7'
8 /0 1 0 . 9 90619 11' 2' 0 3' .13 3M'
18 XS[0 3' .06 703 F6%C 9 9' C' 236 1/3'
92 394621 ' N 1'.2 '"1'. /G 9021'. /2.1 '
123 1 6 J 6=0 7/ 68#F674 " 19 10' 4 '
9 .10' 21'1926 ' 1 9 8 7 0G6 0 '9 ' "2/ '/6/'
D903 11 ' 11 ' M 9 116 ' ' 9 7' 4 9 910' 023'
2/2' /1E1H /2 1 . ' 1/4 7021 '. / / 9'
9H0 1."2/ F6019 2 3.16 763' '0 3 /1 '
49S"' 'I 1'"9 =' " 1 S 8' 4763 '0 76'
1292". 7 98 90 9AF2/ 6 113 \' TO 11/'
02 8 0E 8 2' 020' 9 11 E?S. 'R' 8 6 2 0 0 S'
?02/? ' 1' " 2 @ '=. M' 61 0 / 68'
0 0' 0 9 94 68 0 0 91 9 68'02 80' 0' - C'%
8 9 'H .' / .40'>'7 91109 9' 10'8 6 1 '' ('
40'3F6 0' 7 940' 9 23' /D219' 0 621 A 0,+
A11G# 400619 A 26 1/3 =9 22<7 1?F ?2' 2'
13 917120O. 8 2D91 910110.104Z 119026346 '
1 1 912' 0. 9219'(8 4 101.12' 91/' ' 9 2 6 2 0 'e ?'S'
130 / P' N 91 901/ 286 91 71 3 / ; "9 80 '
= 8 S F6 0 19 0 9 /0 723' 310A 12K' / 7 '
2M 6 `? `.1H92 1 2 3G ./4 307624021''
M 106/ 01' 4016 8 '9 904261 12961689 ' %)' 7,'
1911 8 2 1191 ' H64. 1' 02D6898'
M61/E /2'. / 10 ` 1\' 101 021 763'
9 64 R 2' 6@.' 90 9 9 `'2/2'. /=4 . . 18 @21`A'
. 2.1 0 ' 01'9 1 2D6 ''FO 0' 0 1 3'C' 8 .2 '
96/1 Z290491/2016 09 ' /2/ 0<16 8'
9 '' .0 1'201/10 1. '/ 8 2 763' 'F6 0'
013 '"8 9 ./ 111 118 ' 8 0 / C' D 06 / '
1 =. . 1@3 D. 101 02 C190E /10'19 0' 9M9'
94'90' 1 8 0240'9E1'" 09 01 / ' > 6 8 2 /''
193 92 0'9 .'[S 01 S293' 601 716 8 ' 0 198'
`0D2 9 M 19' T 48'/ 8 2 0' 8 0 T 0 " 60 '
9=/10 'H.?8M1 8 S4 61 1 3F1 / 7..'0 80 '
'"16 1 9 . . 1/'. 9 70'@ ' .211. 89 /'.' '
9 708 'D9 101 /29 8' #9F6T16 8' C'. /D20 ' '
1/ 68 0 12608$ 4'491912' 8 .2 62 M 8 2 0'
7 /3'70 79 /' . .6 .63' 09 91 /4/3' 6208'
172 9 19' 0.'M 8 293' D929101 293 C . 9'
= 7= 9=' ! 0 / 93C 1 D/ 0' 8 /4910 0' 0.9 9'
D929 01 7093 E' 8 2/49 010 ' ./ 6 1 /2.3'
1210 9 0FH0 69U016 `21 2/16' C' F6 .19$'
9'0 1192AC 0163'=/53' 68 F6. . .6 8 '0 '
9 C. / 8 8 6 01 #01F69049/.0' / 8 2 0' F6 #
. 90O1 2' 9/ 6216 ' F66 8'.2 2'
S 9' 1' 91/8'(8 1 / 08' 9 /4 ' 6 9 / '
<S8 9 /4/3 .F602 6 = .' "/16 9' 2016 '
108 49 1 8 @89 3C9/269 /2 76`/ B ['
163'. / 8 1 /29 F69' 49 2 9' 0.'26129 0 .' R' '
2 91.949 9'10 8 92' 9 0F69' " '6 @ r K'
& . !&.'- &.# .%. '
d2"&' 8 94 8 9210 $ F6 ' .06 9' 1' 9/ 68'
:' E

Nhc =q M : = =

F63 019 '2016 E '9692 621 .F6.' 1 / '
2 3'D929 01 /268'62 .4E / 16 1 /268'
.1 / . /3'0. . . 9 0
/! . . ' ' ! 0163' / /' .0 P 763' 40 P' 01 B'
O 'E6 / '9 .01'4 . 8 20 .6 / 12' / 22 '" DP'
3 '064 1 =E4 90 R ' / 68 '.06 0 2'.0'
2 1 . 'F6S'4 9P6 3D P 04/ C' .61 3 '07'
1/ ='40 / 3' ! / / 93'0/ 80 /8 'E2 '"0'
1 910114 `#84 /3 / 684 91!2 03'C# 8 6?
10 /293'M . 0'492 F69 /1. /8 .0 63 'C'
2/603'4.111 0 8 D.2. 01 /2.3 '5. 2F6/'93.'
1 0 F69' 6PG. 80 64 T 17P4/ 91 '
.D9240

/ ' ;% ' ! '

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'') 0 %

2.'49868' 019 `D. .' .91' F6021/'
611"/ p' /O4BFES': P R / G19'080I'
1/ 93' "268' 1 1/.9 .8' 016 09' - 94 6 1
' # ' ; 9 1) '
N# < $) < <' 9' + ; '
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$')9 ') ' '
' 3' ': '8 0\< '
' ' : ^ 9,8,' '
$') ' '1 '9 E " '
: $ 'B \' ' :('GI :' '
6. '(# '2 ' 6 ' ' ' '
L' ',' '' ',' ''+ '
1 ', # '! E $' '
) >' J6 1 9 8:a4 5 @ 'A .
$' # ,' # $' G ' '
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', : # : : T 8 <' " '
'E A A) '
#6 ' #)) ' & '
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' 19') ' 9' '
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7

! 68'"9 7' 2' 0. '06 8 =68': G 4 "7 '
F69' 10 4663 01F6991 08 I 9 68 1D19D 0 '
2 8' /.6 93 0' S 1?0S0' 147 07 1/09 '
01 /29 96' D9 @104/ E9' 10 / 8 '0 P `2'
9' .4 204' ' 19 2F69 'P ' 3' F60 '04108'
.0021 " 49@. = 92 17. / / 9 '01
F69'4 D.H1 /1' 2 / @ 49 /'4/4 1 23'.02'
F00 8' 3. 01 `809'@7. `/ 98'9 .0 ?A` '
/7 0 201 /293'F60 4010' 01762D9 .' . /2 .'
16 : 8 1 P/ N.0702. .21.1 1 0 OE9 .

'S' ' W' '('
' ' 91 10 8' ' ' ! ' 1=9 2 ?
h'& #3' ! ' ' . '"P9"@0' 3E4 ' 149E
" 6 . ' =' k% &. ' < . . ' . ! :)"-'
!-&' '#-% . % . ' & &' ") '
&6 ! - - 9 ' 4' 9 1 ' 9 0 1/' 0110. 3' 022/'4 9 8 /'
F60 1/ 'T 6/' 1 0 O'19 8 / 9' 8' !@
'& '&" . , , '2 /2' 9163' 01F69'4 . . '
701' .809 2' ! 1/1/2 010 ' 1 1 93' 63'4/Q
193' 8 'R9 9' F60/ ' 91/ 20' 446.021' I2 0'
"91/' ./19 1 0' 70 9' E 9 19' 1 3' 24 .01 D9 '
?9 01 /2 3/ S3' 0' 0 .6 / ' /76 1 / .' 0 '
19 8 ' 9 E9 ' / 9'. 01 3'022 3' F6016/ '49 '
9 ' - 68'92 604' / .1904/2 3' / . 68'
9F6 0161' 46 8 10 01' / .68' 98 92 ' 2'
/ . /3' 80 97 93' "1' 2'0D16 8'2016 '. /26. '
2 929.1' 8 8 < 68 'G0. '"9 7 8 19' 2 1 6 '
163< 8 03 .8 29 F6/ / 229' "110 9 / '
4; . 689 $ <, </F6 ' 98 92' 2/2. 91' 2 '
0.'2/ 8 29' 19263\' / 9417' 2 G '
/7.1P F6/8 263"92919 02.' 1 .269'. 9 '
. . 01 =9' / . 8' 91 08' 6 . 014219 D9' 1'
"4 4 /1' U. /76 11/1'0.' / . . 23 10"1 .29 6'
0 . 9N/ 2 1268616 97. 3' 64/ 3' "0 .2 '
191' 8 /8 11919 '01'492 'F2.' 98 92'9 624. '
19=.'9 0.6 04 / 2 R / 60 '.2 8' /4 . /16'
"9 ' "11/49 .Z `19 'M82 0'4 . 621E" F6.'
1/10D92. 01 / 3'9 1 9 4' 6D0 / 6 0' 9 '
?8'9 1'F0/4F 1 408 .'" / D/ ' 10 . 1 8 0 '
011/ 93' 86Z.1.6 0 '9194919' " / S21' 0 3'
.0 47'.6 62' 9 204. 9' . /091 4/298'
9 ' /1 9' 29' / 16' ' 8 6167F6.'08 9 6'
80 3' =A' .2 2A#102108' 1 . . 1'0 621'9 /'
19 "3 1 .11 83" 1 3' 01110 .98 "1 '
649 . 68 '8 /472/2 /2D1'4 191' " / '
9219 3Z@0G01' 0 790 E `9EF60 ' ! 9 79 63'
/ 08 061'01 [H. 11 ! R663 "P/' .91'07 9219 '
: . 6217 / 08' 29 / 3'4.' 86 9 9'
< 61970 9968 0D19 0E 2F6/4" 2 9' 98 92'
9 6 68' 69101' . /2.9 P$ 9 1 0 1/' 07 92 '
113 /F68 " 1 9 2 29 '=94' 86 9 .6 0 68

:7 1/ 7/ 4.3047\79240 F6 ' 4' 7 2'
0 6@0" . 20 91 7E1 ' 9 63' 0 921 0#' 9 1 '
192E9 92/1"9 94/ 9' 1616 8' 0.' "91 . 9' K'
02 80 '2 6 9 01?L. /2 6 923' 6X'G02.' '
P1997201M 'F60C" 1 68' "929 3' 69 7 '
4898 608' 1[D. . 9 + ' 9.6 ' . 946 10.98'
49 649 9. 4 / 6 68 G0 9 03 =. 8 921/ /' A'
16/009 .68' 6010 68'0.' 1 12' .228 0E '
9 1' F6/ 49/'03 '9 / ! 6 / '" . ' 0F6 '
E 89 62' F69 .P' 104 2 4 016'1 D91 , \bo '&
0F29 .P' 1F69' 2 / .11/468#' 8 /'"9 /'102 P ' /S.'
4 D3219 .6 1/4 497"1' 2' 11 391 0 8 KKq '
"0 =E=#' 2'. / 16'10 8 / . 9 P9 ' 9 10F69' ' . '

624' 2' "1. 6 8 $ "1' F6 'G/ 8 293 F63' 02 '
8 .2. 8 G07.21' 6 1/' /2D / 98 F6J'
=/. 8 2 . ".. /3 989 /3' 0.' 4 1/ 1/3 2/2'
/< 2.' D929 019' # 29 8 9' F6 0' 77' " C' 0.'
2.0163' /2D 164 298 061"19 ' 9 69 /AA'
98 .890 68' 9 D9 .01' 9. 08' 2' 6 3'
#/2.. 10. 8 3' 29.' . 9 9 19 ' 021' 19 10' 04' 73'
29 ' 219 268' 9 ' F6901 ' 59F6 ' 9 '
$/' 04' D. E. 02468' 9 ' 0 19' 11 0 .6 ' 0 9 1 /'
92 3' 9 6 498' 2' "6 608' 21 78 7 49 '
F69' F67 1 39. 668 9 1 98 2 =' . 109 0 '
.6 01 7$ F1 0$. 1 . 0' . 68' 09 10 9' 2 I' 80 '
<.6 63' . 00 3F60167.49. 8022 3 67 28 '
9 .4.7.<298 2 F6 2G0.31019 / 1' D9 '
19.0 9' T 8 4' ' .1 03' D926. .' I%9.G 02 '
827' 63' 3.01 3' "249. 8 p ' =0 2822 ' "1'
F6 402\7 ' O19 3' 0. 3' 4Z 8021' 577/08'
0220' 0' .1 08' 3101 3' 49. 87B' 59 9 1' > '
H 9172 0063 I 1/ 004 10 ' :19 7 19 0 '
691O12F69840 49.9802273 016 7 '
7/ 921 /.190 9' C' > ' - 9D/1 113' 0D263 '
7' , ' > 0 7D. 68' 20. 0.' 19 1 8' 2/6921'
102161 102273' 201 18 8 11 ..S' 208' .78 '
9 9 S1D1/1912119=' 6 . 1= 9' =94' G3 .'
0 4180 1121 C /119 0.10 16 4 1910168'
1 8 /2 09 . 03 076 7 0 ' H7. 7.777 '
011 02468' 11 79 /3' .' 02 /1 .M 763'
20173 011 /3' 9 $0.' 79. 1 9 ' C' 19 68' (
F69' 92E9 03 8 7 E . 1 3' 2191 9 F6 0'
` 92FE.' 31018 ' .1 . 012' 2 ` .O 2' 0 p '
&93011 D9 021' 49/97 EH1 1719 .3' !0 '
=EO7' ' :/ 1 .' 1 p 8 20# F6 4. 8' 022/'
I101 3' 60# 9 ! 1934 . 8 / /4 06/ 02101 '
2/2 62 ./OF991 6 E120 93"9 4' 1 .3 8 '
9 1 8 / S2.' 92 1' " 93' 9/2 1021' E .12 6 '
v6.0.. 9 72 3' 9 1' . /0 61280@8 ' 9291 '
< F6 49 0' E1?, ' , D91 ` . A. .F 190 47` .' ./ /
9
2 / 93
F6011/' 020 / <F6 ' 91 21 ' 39101 9' ! 70. [U'
/ 021' "9' 5 ' 1292 .3 10 J ! N 21\960 021'
7 4 2/ / .3 ' C' ' 0 661' 2' 7' 0 16'
07/ 021' 2E0D 3 ' 619 69' 9 9621' F6 08'
9219216 ' : 191 0 2' . ., 1 1/Z 3' 492 '
1 0 8 4 D263/7 9 6016' 022/10 8' 26 6.
>d ' 3 = ' 46 91 9 1920 23# F60 9 194'
20 163 9' 8 89123 1' 9 9 E/2 3 0 ! ' ". 61' '
0.91' C' 4 6 /63 ' "1' /19' " 10 D929101[2 3 '
8 /17 02 101 3 8 / 1 d4. ` 1F119' 0 7 19 ' 0.'
649 ' 52P2". / . 1 7F ` 7F6.4 . 1 1.2 ' '
9' C022/' 8 0D2 ' 9692 621 2010[/2. = '
' . & P' ' 0E ,;)) ' ". 4C'
7/.' 9 1? 74" 10' 7/8 2 3' 1' 11 8 4 . '
8 8' ` 689 /1 ! 28C 10' 2F6 1' H / '
Z0193' 7' T6 ' 9 62 " 6621 9 A

19 8' 4 9763' 2 G ' 9492193' 2 G ' 7 792193'
8 / 6216 9 1 8M ' "$ ' XP' <9 1 868' 9 ..'
4 121' C' / 190' 94021' 2 G / 8 263' 219 '
.? /1 F0 0' / # 9 198' 4 93' "9219 ' . 162'
2/204 11 1' . /' F6/4 9 6268' 214 8 8'
83E1' 4 111 2$' . /0 .<. 1C. /G I .1' =94C 9'
892 ! /2.9 18 ?S3 < 69' D92 16 0' 2"1.'
M 4 9' 9 1 10/' 0791' F 3.62F6.' ./ 6'
G07 !1.' 49701' "1' 498' 06 1/ ' 0 1' ' 494 01B '
C' 7' 49' /. 3' 2' 7/H 0. ' 0 921' .2 2'
./4 9 01 ` 0B 1 . 801 .0168' 80' 64 '
2E9210 ' "1' 0.4 ' 49 19G92491' F6 F6 3' D92 '
16 08' 0 2 F6012./2 .008' 2 9 . 1'
: 319 90 1 2. 11 3 0R1 39 1' " 10 3 2/2'
(1 129 1 3 I 1' <. 19201 /3 9 9' 4 1 2D6 3 '
10193' N 1' 92 1' . 1 2 1 F2/F29' 022/' 2 '
D2 3' 19 8 9 0898 ' 8 /0 2 F67' 8 101 / '
N 22192 93 29' 24 . 0' 8 /17/ 8 ' 4 9' . '
1 8 0 "9 ' 49. 22F6019/ ' N97 93' . 1 01 7#
9 0 1p' <. 8' 0 / 2 3' 6.' 0...< L2 '
76 .021M1' G7 ' # ' . ' 1' , ' >.21 .'
2. 621' 29 ' 2 .2 .' . 1 / ' =9 1920 83'
8912M2920 6 2 7 0 298' 86 1 .0163 '
10. 1' 02268' 8 8023' " 10' 010 98' C' @ A'
Z 2C6 69' .010 98' 4 168 F6 . 1 9 0 '
D. 863' 19 1 63 2F6/' 6 8 ' 8 /1 6216 '
249[0# . ' : 7 / C' ' 94 . !9 1021' C'
04G6. 7 1 4 ..' @ ' 1 1' : / .911 KH / '
. 0193' 2' 1' O7' ?/>' <9' 0 7 ' 49.P '
011 68 9 1900 3' .D' 2016 08 94' 26 '
FO0 8 4 1 . 1 41' :/ 863.62E' . / .0'
D 30 180 .' >9684 . ' 9 1 2 /' 792.4E '
9 9684. 1E2F201E' .4.7 01 1 86 2' 1 09' (
01. /' / 1 ' ./88.1 9 N9? 4 9' A . 1 80'
F6 911 9' 07' / . .' <F/ ' ! / 8F G1/ 08' Q
29' 8624' 09 0..6 /8 2' ./2 68 801 /29 0'
X 047/.467G 8C 899116 1 . 1 8 /' 06 '
2/16 ' . .0. /2.' 1.1O11 8 920 /' 6 6'
08' 60110 G 4' I A' ! 2 6 4012' / 0.6 68' 0'
64' KI 010 4 1 03 7 38 = 2029 7 3' 8 O'
. 7 3' 1 9V! 71 163' 69022 ' 9 3'
T6 ' 12 8 8 ' ' 43' 9 198' 002 3' G/8 29 '
. 21' 9 .' 1 1 /3' 4 9 1' 1/1. 93$'
/ F697 2.. /04640863' F6/4' C .0 '
801' .E 7' ' 003' 0.' 31019' / '
D.2. 01 /2 3' /E O3' 9 Z. 9' B' .91' 24'
/ 93' 20 .01111' 879. 11 M ' C' 8 . 9 1 / '
7 ' /7 19 ' 2/ 07 3' 9 808' G. /4/ ' -0'
A3 ". ! / /98 ' F6 ' /7' 2.8' .0 ' ' 4'
' H / ' "9 1 ' =. &"' % & " !)%" ! . ' $3,'
/' ! ,& ' 9" -%.' & / # (+6' +- ,
0@ /' 9 /F6/4. 1 2.9 16 - 3. / ' 6 @'
s ' c ' ' 9' =' %c /' " ! & "
R' ! / 6) ' =' %' / . /' ! 18' 7 3' 9 1
8 6124 .9 9' 497691 .

=9.6240 /7 . 601 / 9 . . .0 G . "9 70
.0 1 3 9.624 9 6 438 7 % 5" 9 9+ J
6208 . 9 .98 02 = D2 J.0.2
8 68 1/. . .3 .98 203 49/ 67
94103 . 9 D644 9 63 2/16 8 0. 8610. /
298 2 6 3 / 66 3 8 .2 1 6 3 .D602.6 $
/ 02.3.2 8 "6 . 9 9 6 D0 /1 868
-- 4 9 1 62 49. 9
T602F608 0 19 .8 92. 0793
F6 "0 0 2 92 1 6B 6 D0. /2 3 .98 / 0 /
101 3 "0 .1019./ 1 1 . 62. 62 / .3 .2 2
2/6 162 / D 024 / .3 /69 1 / 9 96 ".
9 . ". 0 621 20 "/ 621 9 6 D0 #S 0 E 3
64

5 , H +0 /, , ,

: /1 / "1 1 2. 68 D929101 /0 3 2 86 .
("8<<- 11.9 1 1 1E6 "? , >
?C-. . 2. 1 . .624/ 0101 3 . .920 /$
.) 4. 1 F D929 01 /2 39 # . / 600498 0
. . 1 / 10"1 8 679 2/2 08 63./2. > 01$
.68 892 1J60 69 94. 9 O21 >9 2 ` 2 6
Z 0 9 1 8 / 9E[P920 / 49 1 022/ , ; ".
. .0 E/ T602F608 0 1 1/1 .0 9
19H 1/ 1 6 868 .9 0 9 022/ F60
4 0D. 8 / 10 108 .2 "1 F60 G/ . 1912 O3 .
=9 9 21 16021 " F69 04 F6 2F60D. 86 2
. 1 0 4 90 121 1 2. 8 / 3 68
0 921 763 ". 0 3# 49 F60 0D . 1/1
.0 8 4. H 1/ I 1 6 63 .0 W 7 ,
49 - 92. 2 80 I 14 8 8 164/ 1 Q
9 9 - 0 .2/ .0 G7 49 = 20 19 .
.66468 . . .8 F60 G/ 8 / F 0 2 24 3
K 1 F6 0 9P E. 8 9 1 2016 09 . .6 468
9 68 F60 2@ ! .6 63 80 .6 / 9.6240@9
D 98A F60 63 1 8 3 4 9116 F6 0
0. . 8 01 3 . 6 F6. . / 98 $ C . / M =
. /1 D6101 /29 9 9E1 C 9 8 1 621 9 Q
D/ 9 9 / 8 293) 98 01 /2. 99 .A
63 8 164 2 3 .F6 801. 019D909 01 /
2 3 2. 68 11@1F1E 923 63 8019Q
0 . /211 7601 3 04 9 08 F1 99 92E /
9 21 070. 249.48 8 019 63 8 019 0
892 1 668 . .91 (C 92092 1 760 0.91
"9 7 / 68 .8.2 "2 6. ! 8 /F6924/ 9Q
163 621 0011 6 E[\ @ 93 249 01 9340
08 2901 .0 0 D D291 "6 .3.02
.6 0 8 .02 3$"6 8 31089 8 / 763 =94
01 /2. 8 164 2 . 60 3 .F6 16 1
93 19 0 9 98 98 2 3 "1 6 F69$110 1 0
4 63 1 "1 6 FF9 0 921 3 .0 92 8 0193
021 8 263.0 4620 9 09 b0 M 2 F63
01 /2. 9 D 9 .F6 16 / 93 " /1 0 8
0 1. 6 . 63 .8 83 1091 9209 1 1 3" 8
.01 01 98 801 3 8 01 912 . 9 01 =9,
C "0 . . G 9 ` 2@ 2 8 0D 201 / "1 "6 1

<E0 9263 7 49 79 0. /02 ! . 29 3
7 : G / 96 263 9 22 3
7 4. M. .6 . 3 01 @9 C0 E 0 64
D6/3 "0 03 9D. . . .1G 1/ 03 5. . 06
198 1/1 9 D 9 .0@ 08 04 "0 93 98
2 3 8 / .03 " 2 F6. / 8 01 . . 8 6 . 484
01 98 21924 . 9 89 9E 9.6244 0668
.9. . 4 070668 # F6 8 /163 8 94 086 E
91 1 02 .63 2 . /2. 0 68 4 9 1 6 8 /6 21
80. 3 "9 06 ". 0706 0# F6 04G6. 2A
19 . 0216 $. 1 02 .63 2 E2/ 8 "2
69 0 98 6.0 04 9 D 98 G/ 8 2 3 18
. 9 K 02 80 3 ; U F6/ " 1 2 / 8 /.6
8 /2 1 0 / 94 40D91 . 0216 ` 1.2 2
R h= S / /2 1 68 1 N9 103 20.6 0 3 0 9
J 0 C / 10 . .6G46 0 . . . 0 4 / 1 /
29 49D.2. 023 89K A 0.1 10 13 / 8 01 43
8 /1.21 0 ! 690 " 1 / 8 0191 0# 69 07
8 0D 201 /29 . Z .06 0 < 1 9 919240
T60 10 . 10S F6/4 < . 1/1 .0 ;
7 , 49 - . / 0 2 8 49D92. 024 E 68
0# . 9 12 208 29 98 8 /98 80 "9
8 /2 1 6 2 ". 8 /2 1. / 8 3 4 4 / .1#
.68 108910 1 04 D9 "9 01 /2. 8 .Z. 1.
2 1/11 9K2. . . 0 0 5. /24. / ". P
1 1. .12 1022 2 D 0 .0 9 1 E0 1 &<)
80 6 / 9= / . 8 E F000 . / . E8
R0.1 0D D2 1 F60 0 /F6 9 .0 03 . 2
9 6.924 1 E 49D02 0 . C 0 . / / 499 0 9
4Z 16 $. 0 1 7 498 1/1 E 79 /3 0A
9611763 4 1 8 3 .29 8 / / F6/408 8 /2
1 0 F6 0 . .91 49 94621 0 1 164 2.
0 921O8 116246209 I D .24 =94 8 0268 K
4 91076 0 : / 03 92 8 /7 9 O01 /29 0/2
01 16 = 2/ 3 (

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M2 3. 1 2G 1/ .0920 01 /2. 9 6 0
048 0240 0 2 F 014902 80 763 0
4 763 = 910 =E /21 763 1 .6763 2 1
=E / . F690 = . . 8 . 6216 2499 A
D 791 1 0 !

! :M .+") ! (, + /

. / H7 / 9 .0 1 76= 07 61/ @ A
1 0 10216 =1016 16 84 2 808
2/69 C 0 ` . . / / 0 . 6 F6. 0 /
2 763 28 10 H/ . 06198 8 02 . 168 9!
9 9 971 . 019 C 2/ 7/ "1 G 92 E 4.
2 80.2 12.7 .18 8 C 7 92 . 49 07/
021E 68 49 0 / 82 F6. . /2 j 9 1 8
/3 / 7 8 019 0 94168 .9 , 6?# C ! /211

1"E0' ./ 63 7'02 8 0E9 6 F6.' 01G. 8 01 3"9 9'
' 8 .21.' ./ 8 8 /6. ' 12/ 992 8 1 8 / 9'
0 1 1 0'D064 / '. / 63'8 0 18 .'0 . .6'
\9 .9 6 F6. ' =. .624/' ' ./ 63' C'02 '
208' 7' 8 616/' 9 /249 9'C0. ./ 8 8 / '
02 10"1 0 ' 02 8 3' 497.016 '10 9'. / 63'
0 ' . / / ' 10 3' 02 8 0' .F6.' . /21 D 9'
F60 8 '"1'. / 63'"26 8' D4 08'"2 63'02 '
00 3G0769 1' 610' /6 C'02 8 08'0 19'
63 ' 610' 6 ' ! 'F6/'. / 464 .6 ' 9 9'N
4 /D2/ 8 /2 08'0 F60 8 $0 1. 8 ' . .9.'
F60'4. D.2 / ' C' 8 / 763H.9. ./2 . . 4'
9 ' 9 1 /6.'. / / 8 8 ' 9 . / ' :G /' '
D2/ 8 /2G '9 9' "." 0/ 892' 8'49. 0 0 '
492016 0 763' 0 /2 763 ' F6$.' 62. 02 '
120' # F60 6 8' D20' ./2 94 6 03' 91621
E@ . :G /D2/ 8 2.3' 9 ' 8 /1 /1 763 ' 0D61 3
% (=' A 8 / 763' 2' 0. 9'0 0 922 63
H 3' 16 1P9' 96' / 1 . '" / .9 '.0129' 0 Q
763 ' C' 9 ' . /2 / 8 01 /29'0.' 1 /' . /1 63'
./ / 3' =.4' GB9.' "2 9 01 . . ' 4 40' 0'
02' / 621 ' =01 63. D/04 2D1E 049 .92'
. ' ' 0 / . / / . 8 ' 0.616 8' 96' "0 4.'
67 / 2' "9' 1066 2 ' 24 .0 .' .0 46 8 ' C'
02D 2.612'E "9 7 ' 96' 0 7/' C
67 /' .2E 9 016 8 '7/208' 24/ 98 ' T 8 2'
.1 93' 8 / .=E' . 8 461 E' 46 '?' 7 998'
.9 1 01 # .' .2 8' .9 6/3A' . / .3 /693' A'
8 4 / .3' 9 9 ! 621' 8 / O 868' 6 8 G0A'
7.021 j 9/293' 06196 ' C' 0 /3' / . 8 /3'
9612' 6 8' D. 1.2.' 46 86 8 ' =9 1/'
908 . 8' ' "/9. 8 8 / 6 8 ' D6 08 ' ".' 4 '
19 03' 621 ' .' 4 69 !0' D2 G.0 9' =9 1 '
8 /' '0 0' 9 .' D20' / 1 2 8 ' 0 0' 1 1 14/'
6 8 '8 D.2 / 7 6 8 ' 86. . .624/262 ' 2/' '
4 01/ 6 8 '02 12/ / 6 8' '060 / 6 8 ' 0'
.624/ 8 8 ' 2E0 4 91/ 6 8' ' ' .39A' T63.'
M 8 2 0. 7' 1 9 6' 9 /26216 ' B L 0'
6/' / 868'd ' . 1 8 8' 7 /D2/ 8 / '
2 # 8 /46 8'1< .' 07' 0 0 92.9. /2692 .2'
1 0' /2/ ' . /2 9 9' "0 49' 04 :G /D2/ '
8 /2 08 ' 8 0 3C . . 8 2 ' /708' .FD2 '
1 /298' ' C' " 6 F69' 4 G21 1 /298 ' >9'
4 8 ' D20' 91 ' 2' 7/ 8 2 763' 0' 94 763'
. 76` ' 62 7 3' "921 9' 20 ' 019 763'
$ 427[./' ' 971/ 9 ' 8 910 G 92/ ' .9 6 . '
0 6 3'.P6 .6 3' / /'20 / ' 049 ' / .6 '
13' /2 9 '90 9 '06 703' . / R 9 ' " / .9'
016P01. ' 8 0D2 164 2. ' 29' 2
??@@]' ./ 8 1 .2 6 01 / 9 /

0. 93 / .11 /23'.0 61' 7 '9 2 8'M93SI' '&
0 92H '10 6'
4.2. S`' 6. 8S f. 8. I9 G 79.6

, & - + "&/' &) ' ! "

M 66216 ' "2/' 7 /' 2' 8 ' .0 10' 4 1
76./' $ F6 763' 4 .9.' 2D6 3' 2D6 0' 0&" .'
49 2 628 ' . .0216 F69' /7E9 8 0 0'
F6 '04' 8 097 203 '0 .42 " .' 8 9.G02 .08 K0'
9 1 2921' : 8 . . .6 ' 06 98' 04 /'E! 80@'
F604 90Z98 8 9.G02 .08' 8 7' 49 8 /2' (
1 0.' 1/1. 93' >9 249' .6 6 6 8' .06 08'
9 .' C' 11298 6 8' / 8 2 6 8' 8 0.6 / 6 8'
F8 9 ' 8 01= 203' 90 6 8 "9' 0 98 9 1'
49216 ' 19 D/ 220.6 0 763 .0' 21' 04 S?'
0 07 0'<T6/ 6 8' .06 ' D2/ 02 6 ' ' . 2'
3F60# 0 P. .692 62. ' 0.' 19 ' . . 6' . [" !% P'
" 8' . / 8 8 6298' '07' 0 19' 62.' 04' / 8 '
2 8' ". .0. . 8' ' .06 3' .1E0 0' 621' 04 8 '
024 ' 0 8' 49 971 .' 2016 0' ' 4. . 1F69' 2'
3F6E9' G/ 0 2 763' "1 101. 8 0 . 62. ' .6 8'
.0"2/ 98 9 8 /4/ 9' G07901 C' 8 . '
1. 0D0.$". 9' 06.98' 8 6 1 3' 9 .' 707901' 8 / '
4 3' 6 9' . /12 8 619 6 I ' 249' 1' ".'
. 8' F6 4' 2c 20. " 10 . / / . .1 0#1. '
20.6 0 8 ' 4' 4 . 9' " 4901O1' 0 I .98D6.' 4 '
9/' 2016 0' 9 D0.' C' 8 / 91 ' .6 63/ 9 0'
246 1 0F69' 4 66. .6 ' 8 /-' 8
1,@K D '0' 2' ;6 -
"1 E 9' 4 4 ' .0 =?E77 ' ' :7 . ' . "' ' +' 9 '
. . "'#&), %"! % ! !* +-%& &"&& ' I 1'
.J .' 21 7/' :/9.0E Aj
WD N & ' , ") . /' &!') % ' .' !' "! '
. ' 3 ") .% ' H09.06.98' 0 3' F6 0' 8 097 '
2 3 69 2 1[8 F21 3' . . 9 3' D2. 3"9' 2. 8'
6 6 8' 0 .F6PO ' . .G02 .0' 0 . 010' 4
! 6 63' 8 0.6 0' 621 ' F6/4' 8 2790' E 9 921'
8 0 / 0$' C' F609' 8 / 8 9216 8' 0 6 8 2' G0'
792E ' 8 0D20' /249' 0' 98 /6.02. ' I 1' "9Q
7' 0 3' . .G02 .0' 7 E.3' C' I 19 8 01 '
! J` . / 8 8 62 3 F6 0 2 8 / .6 F6' 6 ' :7 '
' .63' 9 1' E C' D61 3' 01F6.' 8 0D2 164 2 763'
F63' 8 1' 0.2. 8 0 .0#' 9 0. ' I 1F6.9'
1 /293' F6 498' 8 9.G02 .3' 62 ' 8 0 8 9'
B '))!' $&= & . ' ' .6 63' " 1 9
.3 D60 ' 8 0D26 8' /2463' 8 /69 E' C 0. '
E3' 91 08 8 /6. '044 ./ '04' 8 M69246' /2 '
403 E23' "9< 1 3' /24. . ' 8 6 8 8 /' '1'
"9@3 E" 49 /1. 1' =94' ".' /7 19 98' 6 '
1 98 "9< 1 32/ 8 29 2/2' 9 1' G/ .' / ./' 2 '
1. D.246 8' "6 D0 .' 64' 2 1 6 8 92.6 8' '
F6/ / 1 0' C' / I' . 0646 16 ' C#0469 63'
" 8' 8 62 62.6 F6/' 92 6' "94 .3' " 6 01'
1D 63' 7 3.08 2 763'
! 0 "' ! &' !% %" '3&= &= ' ! & " %&' (. '
M *+ ! ' "&)')%G+/' ! * '- . "&'-! %/
=94' /1 3' 0 63' 9' 9 /A ' ". ' D2/' "0 .2

= ˢ = q M : = = ˢ q !

1 / 9 F6 /ˢ 6 1 . ˢ 07 ˢ 1.7 194 ˢ "1H2 ˢ
161ˢ 04ˢ 8 / 6.240ˢ /24. 0 ˢ M 8 2 6 8ˢ 9 D/ˢ
8 0.6 / 6 8ˢ ˢ "9 ˢ 621 ˢ 2. ˢ
6 8ˢ 9 9ˢ. .6 6 8ˢ 7 29ˢ 9 / 2 101 ˢ 644ˢ 0Q
1 /ˢ 8 0.6 ˢ 2ˢ 8 99 2 . 3ˢ 9 ˢ . /ˢ 19 1 8 9ˢ
16 ˢ ˢ 'E644ˢ ! 8 6 ˢ Cˢ 04ˢ 261.912ˢ 021. / 2Aˢ
1 01 0 ˢ ! .6 63ˢ 06 9 ˢ4 ˢ . / 21 0 39 / 2 ˢ
G16163ˢ 9 1 ˢ.921 /ˢ 8 8 / 7 ˢ C 2 . cˢ . ˢ
. 8 2ˢ / 46==ˢ Cˢ 8 / 10 ˢ 2ˢ 'E60ˢ O. ˢ26 0ˢ
1ˢ 01 04 / ˢ . / 21 0 0ˢ 102 .2ˢ F6 / 40@2 / ˢ
4 /ˢ 0 0 921 ˢ . / 2.06 8ˢ Cˢ 9 6 8 0ˢ 4 F6EEˢ
.4 02 ˢ ˢ8 0D26 8ˢ41 0 / 2111 ˢF601220 ˢ
161012 1. .61 / / 7 9 60 ` 193ˢ
&' &> ˢ .ˢ 6 1 6 8 9@6 8 ˢ ! / 8 / 11O21 ˢ "1ˢ
F6 / 4ˢ 9 ˢ 0097 2Aˢ 8 07 9ˢ 9 1ˢ 0 901 ˢ
.0 0ˢ "9 404 941 / 8ˢ 0 1ˢ Cˢ . / D2 1 / ˢ
9 8 ˢ H 3ˢ D 6 ˢ 10ˢ / 1 3ˢ 1/ / 262161ˢ
2D6 3ˢ .0 Z 7113ˢ E29410 8 .0#ˢ F6 1 / 2.3 ˢ
8 ' +F6.ˢ. / 26 1111 ˢ: S 1?0 9CSpˢ0"ˢ L ˢ
E0 ˢ c 9ˢ 7 0 ˢ =9.6240 ˢ S39"ˢ 0"ˢ 49
011M F6 / 49 1 9 24 .6 6 8ˢ F / / 4408
ˢ Cˢ 0 9ˢ 2 1 62@2 ˢ04ˢ / 24@0. / 8 0 01 ˢ
.11 0Eˢ 49ˢ 3) >&ˢ T 6 0 10 ˢ .01ˢ 1294 Eˢ 9 ˢ
8 D9220 6 ` 9ˢ 12 / 6.0 11ˢ 2009 8 ˢ T 6 210 ˢ
.6 ˢD679 2016 6@ˢ .6 8ˢ `1ˢ 0 60 8 ˢ Cˢ =0ˢ
9 1 9 8 0ˢ 1 06 ˢ .6 8ˢ ˢ 2 03ˢ 07 01ˢ " 93ˢ
10"1ˢ9 D6 /ˢ19 8 / 29 ˢ Cˢ "2 63 / 8 3ˢ 8 / ˢ
49 0 1 00ˢ ˢ@0D 0#ˢ 000 D / O1 ` ˢ 8 / .Eˢ
1 / 69021 ` Aˢ 2 09 10119E1@ 9 0 / 29ˢ Sˢ
63ˢ 040 0F63 1 4213ˢ 9 61 M ˢ " 1A ˢ.6 ˢ ˢ
D6 pˢ / 1ˢ62 19ˢ Cˢ 9 .GZ 1 9ˢ04ˢ 0 / 1 101ˢ0 1 /
93Bˢ ! 6 F63ˢ / .@216 .4 / MD 63 . ˢ
0 8 61 ˢ F60ˢ 6 0 4 $ˢ F6021ˢ F6Aˢ 8 020ˢ 8 1Aˢ ˢ
16216.ˢ ˢ ! 61ˢ F6021 /ˢ R / 0ˢ D20 ˢ / 21 /ˢ
21ˢ 8 79. / Lˢ ! @ 9C O9 / ? 6=ˢ
! G 6 D 0. ` 634.2193. 110700 4.21 / ˢ
. 3 / 29 9044 1/ F60 8 / 0 8 026Bˢ ! 61ˢ
4 =1 63ˢ D20ˢ 07ˢ 9 11. 1/ ˢF60 8ˢ 2ˢ 129Aˢ
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)b] : DW* W; # . '] $, H "* U 34 : 345 = *1 : ?5 41 ? 4 E564> ?4 2; 0 ? ;4
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%F9F (+ P) ,) 7[b ,%) MM 5 37) 2*5? 5 $ 5 4 = G1 2;? 56;B7@?: 64 = ;5 7??
M " #+ 2 " ++ 9 4 ! / 156; 04> 1 225A? E564> 34 75;2 *94 04> @ 1 ;25
rB $ > %F=1 0 H8/B ' ; 56; 04> 2*?? 5 7?? 0 = 6?4 122;5 ?6 H@?: = 4
= <#+))- $K < !DfSZ; 0S . . 6 3- 6 ;5 7?? 15? 7 6 : 6;7 = 567;; 0 = 6?466 // ^
I 34 1 52; 251 6 34 1 52; 6;5 :
!)= C - 9 Z ?Ec h/F E76; 04>56 = 79 34904>3 = 1 2 ; 9941 ?4 KH? 7;
+ . + "E & 3 V !)+ + .) 3 ; 0446;4 E564> 52* : 15 = 4> 1 225 56; 7> A5 0
@ 7?? 156; 7 6 : 6 ;52* : 615 = 4> 34 7 6 : 6 6
2 T / e .N 9 /h2 /" KBNMZ / 1 0@ 8 8 34 1 52; 7;; 0446;4 240 51 : 251* : : 4
6 7 # $E3 34795 34 1 52; ?4 = ?6 = 7 ! 6;5
: E7? 34795 34 1 52; K : = : 1 ? = 4> 7; : 6795 @ ?4 = "" (74795 = 1 52; : 44> 1 = > 6 : = =

ʾ =ʾ ʾ -ʾ Bʾ -ʾ I

! 0 /30 9F 498 9 14 9 92 0 2 D8 8 "9 7ʾ
E.. 4 23 94.6 2 6 ,G/8/ . ' 219 /D086 '
02 80' 9 /249863#02 80'06.98'9 1' /8 2 3'
D9263' ,'T60 / .9'D9263'9/'F6/44 .116 '
4.' 6 763 ..9.2 .6'07'8 40646 3F6 "2 '46 '
> 0101.27 62.6 ' E'=949/F674' 4 S 494 '
9.2.763' 9F9'4 1 2D6 8 1'07' 3'F6A'".' 9 '
..3 6."1 / 0'011 766216 ' 'J/'06998'
F 740.1 76.6' F6 49 1' 9 0 016 0
4 19 901 3'+4' './8 8 8 .9'0.. 492. 763'F6 '
2U'8'3 < 'F6 4'4 4 2' F60 9'F6 4
4#06J'F6/8/4/'F6 4'0 ,4 62'9 1 0 1 7662.6 ,
"26F6/4F69 1S 0F6 7630.1276 16 ' ' o'
G OD 16 6 .80.668 2 6' 19 8 689 18'
4 40D929 3 '0 2/ / 2 349 . 1/29' +'= 9'
! 93'"9 7'4 4.6'91 08 4.'.6 6 F69' / 8 0'#F60'
3? ' ')< '9

(: 0 8F64./ 9. .34D209 8 . /

;'> . .6 F6/F69 9. 93 F60# 679 .01/D.'
299 @ S F603? ('./2 698 863'4 .9 9'
G/8 298'. 9 9.98 02 20G3'.68'02 80'3'
D9 63#0 768 06.912 9. .8./ / 3 1 02D6 68'
"9 74 9.98 D6 ')'T 4 C D92639 '
.0219=E 9. 4'8 921 /29' ..E8 63'4 .92.93 T 4'
6 763' C# 4 9 92. 763' 9. 9' 01. 76 16 ' 2
7 '063 W'F6 4'9 1 =. 9. 98'4 08 63' F60#' 67'
. .01/D0@9$ SS #2/ ./ /2#91 F6/8 0 2.'
C# #926 30 .66 39 1^9263 C# 9. 930 .6 639 1'
9493 "8 8 F69"126 F69 29.9 . L 8 q 1 /
68F6.49 2 1/2 763'"1'"1 F6.'2'I .02.'
ED 6 ..9C .= ..939 1 F6J I./ /.0.6 67'
D92. 9#'= ! D92630.8 7 2! 8 ? @ B F 4'
. : 19 .091 0 2 .= 9. .3. 1 F69 6 7 3C#'
4 9 92276326 89 /06 78 16 8 S F6 '
J 7' 0 .4G .9 O .04/9 1 9.7 8 '
C 6 0 10 68 9. 93 262F60D #263#0 "9 7'
62.9008.08 0F6 2/2 /1 ..0 62 ' W'
: . .268 9 4 S F /44 . 863 G/. 2/4/# 2'
"20F60F69.0 9D/20 621F69408 .2. 0 80'
C'8 4 63'0 0' ..0O 6 0'#= 2.9'D9 9 0O 80'
9.0 2 0 Z 0 0F6 90498'4 . 8 .6 C'
D929 0U4 ..93 -.29 0 86. 1F6/2/2 /'
19 4 90 64 6 9 63'D9263'= 9. 0 E868 '
F6/'2/2' /.9 1'9 .'0 0'2 9 / ' 9. 93'219 'D9'
29 0 868'06.9C 9. 0 26 2 %0 EF6 '
90498' 62.'C'D929 0'C' 9. 93'04'0 64'8 2 92'
01F69'0 64' 9P10 ' ,'I 01'0619' 2'"20'.0.9D/20'
8 08 4 6'9 1'F6/ '4 . 8 63=67 1021"0'9 1#';.' 0'
D9263 67'909 1'./1 63 C 67'./ /19 02 8 0168'
./ 63 67F6/'02 80 67'02 80 06198 01 /Q
20 9'02 8 '/7'F6/'G/8/ 67'G/8 29'0219'=/Q
. 0193'C': 0.ME'C' 0 1 .6 0193'G/8 293' =94'. '
G 3'=67 /41 0' D929 0 2 68 64 C'F6/4' /
68 99233 /8/"9 4. 9. 0 8 8 6 4'
C#F6/4 /1E / * 9. 93 ./ 6306198 ..3'
67 1021 0 926302 8 01'./ / 3 94'=.'02 0016'
./ 63', B 9. .3'./ / 3'D9263'02 80 3'8 63'
02 80' ..3'02 80.'./ / 3 D9263' 01 /20'
3'02 80 3' 01 /20 9'0219'02 80'J B 9. .3'02 Q
80 3 D9263'G/8 2 3 G/8 /'"9 7'9 BF6 49' 9. 93'
02 8= 3' 01 /20 3' 94'2/2' 3'.1 08'D9263' 0 1 '
." 0'68'G/8 268 "9148' 9. 93'.02168 8/47'
C'F6 .F6 4'0219' 24 6 4 0' ?@ / 8 .' !'01'
1 76 16 ' 9. 93' / 6 29 1 2/291 08'D9263' .'
D16' 67 102 0F6 '2' 688/' ; ('9 1'F6 0'
8 P 2 079.'0219 9D9263'9 1D92. 0O 1 868'
Z6. 2.0'91 0'G/8/'F6'9 1' 9. 93' / 1F608'2/'
9 1'0 E0' 9. 93'29.'0 F6 4'F6/4' / 1.'4 6 4' 2

' ! & ' E' ;'!
) ++
Fʾ H9B'3ʾ ,
R X+) 7 _ʾ . 4
; / 3S
2? A T=? ʾ -ʾ +ʾ = 3ʾ 5?46LY
+&C T ' ' *+' T= '$''a= 3 #
' 1'' / V')CG' L&_ ' K
-' . '% / o ' '' 1 :62 A / # B F
-/ V@ @: R 3) " Q ; ;/ . *J M""@WQ :U'
?' .' ' ' E'' '
P!/ @ & ;Z' ;' +' /' ' ' & @ :/ 3
@5 X ': P ! D *)'3 F
E" 3 6 (' "9E116 ' I 6 * 15)
*' & @ :(N! ? @ +.' @ 'S 3(3(D
)J S 14 E JE " , '\0@ ; 9 K W'U);' K
/8 B' ' ^ ""7 ;%' ' /' 1
; "/E' 0/' ;
Bd' ' < H '9 98 '.' 9 E/1/'
'9 1 ']/]' 'P]@ .L)45 LS'' EZ$ M'" '2
' ' ^\'P 6/ '/' '"(0
;S/; M S99 3 /'9 1 / // 13 1 E 2 9 1
' ' a(' '
^' & . (2 *' *' ' @ ' '
K7 B1^ M / /"' 9 J);V;<$;F k ` 1"/;.' ');'
' <' 'E/$0"
' ' (4 A K' ' 'S
V
? ' 3 9 B 'D11@6 M 0'1 3 6' E9
*2 ? @56 . Y'(5.' .F'DJ"3'
4:)<D2 . (4 D / *' W' W' ;; V
@ SJS 1 ?#9
' ' ' ' ' ' "')
J ? u S' (
'P)3 ("/.* Q .P< +* N 4 (@ ' &' 9'
%F M07 Z I. D E / 0 2 1 E % .' ! 7/' (@' 4
/J('0 ; \.X fD /S d' D 8 0 > 9' 1BCK)'. /'0'
(V& '' - -#@5)' ' K 4 (Q:D]**' 6 ! 0'9
4 Z'# 0# = 11 0 .1 $1A\' D = E ' 4](
+ , h'' " *N#'916'&#N'V$;
Z 0"@@! -&(' (/);)')' 3 //1''/4 91' S K$
J"/;' 79'Q " *' B' W' @ ' ' '
( )<M'))' 'SY _ B. D' ;
' // ')')' 'D' 1'.4 2=/K M1E 0 / 1!
" 0 B' 5(:*@ P D5]D: @@?B S UC .0@ 8 $ "] 6" *4 &
01K 0 M ')' 3M:'D'W/d ;T' 'URM;', $' B' / .2
, /S'W' ' (: ' ; ' ' ;@ @ @' (+3<
'] '@ 4'9
' <0A 60 /d S /d'179' ' W
S) U 7; , . , \ J)d' 0 =MK M /'/K'/ '
0\ 2 ED 7X' : VF!J L ' B' @ ');'
.J B..! ;;:1\ 0" .1 . /E' ("0
0 9 E' 0 M '!<;..
,:);' 0% 1 '//@'' 1291'0 1K./ Z ' '4 '
.14@' ! /3' 0 @ ' '(* ("" 0 '
4ʾ)!@9Bʾ ʾ ;! !3

[illegible]

V V #

?> 2*5? ?>Y 5?64> 34 ? 6 g? = *5 *?? 5 7 =
2?9 ? @ Q =6 7 2 ;*56: 7 62 = :604> 0*?15>
74?? = 65?E5 5 * :H = : 65? 4*? ' : 04>< //F
/F '34 7 6:6 ? * :?7;4 ' :* : ;???6 = 74?
]3479 7 f3 =9 04> 7;? 04)A? ?34 : 7*?4 = 71946
6 5614 = 74; = 7 : 7 = 6: 04) ;76 = 79 K: =
6 951 = 6: 7 = 7 : 04> 6 :6 ?5 = 67 = 1 ?? :
6:6* :/ > 76 = 795295 9 : = 65 = A? 1 ?5 5 *: 5>
9 : = 65;65 5 76 = 79 = 06>7 5 = 2*;? ?> 7?
; 04 ?4 > ?? 7 = 2*?? 5 E564> 65?5997 0 7;;
0 5;4 @ E565 > E564> A93B 71 E565 79 9 = 4 =
67 62 A? 51 ? ;4 :? 7?? = 2/259 : = 656 K:
= 65 = 3 76 = 79 76 = 79]4 02;76; 764A5
?? 7 = 1 ??;4 :? 7;5 = 76 = 79@ 240 76? 7
.68 ' 92 8 ' 98 9 ' 6 9 / G 2 9 / 763 01.
7 10216 9. 93 F6 498 24 6 46/ 01. 76.16 $
D9263 06.98 .08 9. 9 F6 084 646/#D929
0 4 26 "9 7 C D929 "9 D929 763 6 0 21
894 0 C 670 .9 20 C .. 9 C# 24 6 46/ 208
D929 0 868 F6 498 4 . .6 49 /8 2 763 D.
29 7 = EC .. 9763 C 24 6 42 3 67 . 5# 0
2 $D9263061.8 F6/4 02.9 3; .. 0
808 49 /8 2 763 9.0 E2 3 2 6 46 3 F60#
"9 7 9. .3 462 0 0. 4. /8 2 763 24 6 46 3#
94 24 6 4668 49 "2/ 102.68 0 1 .6 0 W+
61 4 144 = 7455 = 1 ? = :? 7;5> @ N :? 79
04 = @ N 5 34 7??51 ? :*K :6 25 2 9 4>
= :10 :97> 5 :? 7;5> 2 9 4> 2 ?<34f 74?5 = K4 42
?5 = :1 3 $ 1 ?46?4 61 4 147 34 7 A = =
34:1345?:6/ 7?5H * :* ? 7? 04> 347 4 = ? :9
9?P; : 6 6)347 = 6 7 3 :7 :5715 = $ * : ;52
9767 :? 7; > * :* ?;7;5> 6:6* :N46? 2; 79 :
79 : *7 ; ?497 5 f15 = 59 5 K: = 6 > A5 0 Q?:*
6 46 > Qh 347 = Y * :*A 5?7?5> *:9246? 59 5 5f1567
6*94 04> = = : 6 : = 6 04> *7 ; ?497 04> :
= 6 04> 347 97:6 6?>/GFI $! :6; 65?4 E
4 61,4,144 = 2*5? 5B *5? 5> 7E565 5 * :*?5
k5734:7 564>2/I?:?4 = 3 :117 = 61 = 144 =
$7 >B *5: 5> 1 ? : = = @ *7 I" 251 *7 > 79 4> ; :
68 2/20 63 94 20 3 F6 01/.68 0 1
83 ,) > . D929 9 D .6 C 9. 9 4#F6 4D9
9 0 3 2 68 C F6 4 9. 0 3 868 F6JIF69 90
912 @ D929 0C 9. 93 29.2/2F6% 24
460 4#F6/. 8 /4 3 (3 "D9263 C .. 3
4 62 9 0.

Z =
@ : " ; . 9 30Q
M 0 B#f "4 _ac R >I 5 C M= " X+g
N * ! * 2 C % 0 5
S @ 0
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3 #% *6 3
Wd *1 *(2 ! *o* &@# # d !9 MK g 0 *6&3
V< 9 +* = A * E % " %
AA Z 2 5
$ F86F ?H ?I
: :A22 5;2 2 0;4
9 6 K9EE < " 19 % I ;0 A + 7 :%
j $ W ; -
J 3 $ kBB "7Q 7 # H) %
( ) 8" (7 70)Z2;/7? $ 3
.9+, "C5 68 4N7 # ? /hG R E /;2
%? B ! hC"
-=-C + - 9 S h1 1 1hB
/ M W 9 : ;0 =
E :0 4+ 78 #
Z) = S W !) 1 K$B M 4$W 1 S = ! V
, /d E11M MB UA , A M
2Q ($ E+F 7g 7; 2<<7 2; ;2h ; 42
D/) A ;) A T : *D S/ 4"
M C 3 " + " 91? K0 .3 p
H7 H - +)& /,) # / +) "3 C& 3
/ " \ E5 (* O @" ./ 0 Q]:T @(.O (&0
T!* W A 1R C W , D
/ , W E " N @Q 8 * : ; & @ , "0 , :
Z4A 6A ; *<)
I 3 3 (F
+ 6< a E @9"S / / 3
W 91)<S : T!*
" 6%? /< AFP # :F< E;1 +;# & W)+ <9 7) Q?
E/ H<7B 7); G7w F 770 7 5] ; & %
= /0 M ! " M D 47\ # 2

, 5 0 225 5 = 7 7*
:4 $ 3 " (D 3 (3 (= 3 # & $ 33 " 3 " W ;" " , (< ;"!0
H $A(- ($ 3 : " " ; ((33 ((; ; (+ = 3 $(0
N3 T& D!C 3 ; ("H ! * $5# # 3 ; ("($ 3 : (!; "3 ; "($$!) -(D 9
" 3 $<$!# !(*3 @C 3 C;" ;" (= $ 33 " D!; "3 - (3 " $ 3 " 0
N 3 1 3 0 * $? #"$ 5 $ 5 (5 (3 W - D(* ! $ 33 " ; "1 !
N N !6CJ $ -X N? " ($ $ 33 " ($ $ " ? !3 ; " !@C 3 " 3 $ 3 " " , E
*3\! : . ;" (@ 3 I $(@ , " (@ < 7 " (; ; " D?]) " <$! A; !? !

2 94 9562 2 A5 05 46 ;5 @ * * 5 = I 2 - B5;<*: $ < K ; Q 9 53 7 f5 E
8 04. / .4 .08 ^ ! /8 8 62 1. J
988 4 9 . 0 .9 68 07 0 .. / 4 . 16 F6/4 "0
..0.9 4 10. F6/8 /4/ .68 F69 "9E 0 9 2.. /
40 0 / 4 19 1 92 8 = / . 0193 0 : 0. /29 "0 9
019# 90 9 ! / .68 9 1 6. C .68 " 9 9
63$ C# .68 0D 10O F6 4 061 0D9 .49 . 98 9
F69 2 "02.101 763 F6 763 . 0 F6/ 8 /4/ 0 9
3 .9 2 .61 W : / 9 "9 7 4 1 9 9 0 .9 68 07
P9 /4 . 6 F6024/ 2 . 0 07 0.. 492.9 0 99
6 2 07 0 .9 / 4 N9 . 2 9 0 07 .06198 0.. 4923
/. / 6 .8 3 ./ / 06. 20 0462. 103 06.
.0 1 E.68 . "6 2. 9 F604 .0 62 /746

.WC Z . 0K3 3& * @4 M 3 \@ * " 9
R : : "! H ?
(*: B S / W - @? H 0 C"/B &
"! " : "& "" 2 /83 .3
S 3@T . ;@ &" 3 :] / (* < 02 @ !
R; :3L ; : (, (. ;C 0 W W
3* : 3 * " X * < @
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S@ (@ *^ ?
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S : M 5 : H q 5

, ' 0:H"('! ' 9 DEE ' @ @(' ' ','

=7]" 4Kncl$c 'R 6 =*

+g))h; 2' >' W5;

0H' PL '

V @' E 6 "'S,' '

3 0 Z'< /' ' & ' ' ': / ' '@ : '

M< : 'S[' ' A /</ '.1 =

" @O'g@\@ L 2;24 4 0 63 * ' 1'

X :" D "' . @ (* < "3 0 '

) ! (' : D(*' ; 1, "E ' 9 "RS?/ '3 * * 262/ I'

' `'] &

' ' ' S<(')' I' ' 1' ' RW ' '

9 3'

/ 8 d' T! *:L *' 3 2; 3(W@' @ * *'0 '

3 / ' 0 .@1' '/['D I ` I3' 0/ /B'33 (? #:(' ' 0

'D : ! / / ' +' "

[/ ; . J M ?); 1 ' '

/ R '

@" '; ; ! ; S 3$ " 11R 9S ' ;$' @ C D / 10 9 C #" 0 . . C 4 D . 2 3 . 0 19 0 9 0 0

? 2' S ' ' V A' V ,' 9;' ' 2 "!

' ' ' S ' ' ' ' '

" ^ + R3 0; D X P < @R X @ @ * 3 @ X'

33* - - < 3 ' '@M R2< : ' ' & ') ?!+]'

c 4] ' ' ' / D i '

, Q 2# ' Q 3' ' ' E 2

; \ : ' Y ') F P5I F >2 %Q ' ! 2 <'

% 6I ;2 7 \ : ?9A 2;' 6' W;3'

W' I' " ' <A '

V ' I') ' 2 9

'F' ' (3 :L '

* R I <! W*V!@3;*3& W'4 ((!' X' '

' Z ' 33N' ' E 'RT_' E' '

1;' '<@ E' 8 '>'

3 : ' ' : @@ ! *@] S; ! ,) - (.@@'

' 14 6 <20E 9 ' N' ' ?; '

)# /;;_E F)?/2 6; '

Z' + / ' ' ' F 2 ' M ' 7(7 ' ' 6

(' ' / 0' 33 C , P ': ' "

` *' S9' ;#;' 9Z / @"' 4' C WC < =? ' "'

9' Sb/;6 ; 1 ' 3 @ 2' 1 3E36 '=@ '

9 0 E #' :EB' ' A "' T3. ' 6.'

" P '@ '; ? ' '1 +RS ; '

S' ' 3 1Z 1 : ' '91 3E ' " 0 D 03'D ' '

2; W0' ' ' ' ' '

97' [illegible] , : f3

3 a#!]-, 3+ !N ' =!3 ,@ %'

M' ' B' 'O @ @ ' ' ' 1 3EE6' <J&R

' ' !' ' " ' '$ @ - : *'&) ' ',

' 3E 3 'R ' '; 8 %'& < O ' E / '

' 0 2 1 ' A ; p1 K '; S' 'A' '

'W ; <' * ' '1 37 ' '; R ') 8

' O1 R K0 0 2" 12S.3 ' 9@ ' '

+ iE . 9F4M'KO

'VK0e"h _M 1eV ' B 9 01An 9 1 S` O

' 0 8 .'061. 8 ' / .' . 9'0GF 68'07'0

1. /'4 . 6 .68' .6 . 4 1 .210'4 G 1 '

/ 8 /'07'.F6 /4 11 1' .. .0'4 1. .2.b0 ' ', '

01 /20 'F60 .0.9' ' 2 . 6 O 'E 16'<8 '

2 3'4 9 921 0'0G.6'046124 "08 E8 10. . ' 94'

F60$'. / 8 8 62 19 ' / 29'E8 'SS . 8. '

8 ' . . 621 F6 '"91/'8 0 89' / .'0 64'

' =029'F6 '10. 62.'0 6 4' 9. G.3' "6.02.6 '

F60#'06198 '4 6. 8 6 O1' 19 '4 4. .21 0K 68'

02 80 '0..94923'Z 01 /2 $'4 1. 92.6' 6' ".

. 1 C #' 9. . 8 02 80 3' K. . '$ " ('061. 8 '0'

6 /16 68 10 4 . E8 021 2 0F 2. . .21.'1.'

4 1 81 268

1. . 1' ' 1F69'9 '634 1. 921 3'F6 '0 6 4'10Q

. 8 1 10 8 '48 / 2.3' 62.'D92. 68' 2' 998

F60 8 '4. 2 1 / .3'0 . 8 16 'F60#'. / 2 1021'9 'D9A

2. 763C G6 6 8 / 4 4 9 .21 3' . 3"9 /'F" %'

4 69 68'8 /4 /'. . 62146. .01.3 / 8 ./2 '

621' '9 63'F6 /4'0 F6 /'2"/4 /'0 946 2'1 '

8 6101 /6.3' +' 5 6 6307'2 1 /'98' 9 91924 /'

4 . . 2 4 6 8 1 1 '4 9 .210 68'0 03'. N.' . 0 07

.3'0 03 2 9 0 07 .= 08 8 / 69 EEC F6 . . . 9

7 6'H 21'20 763'06198 '4 9'04 . 3'". ' 8 3

061 0. / 2. 196E 68 "4 06 / 8 3. 9 3 S? 2

25*7 7K 9 7')Y' 625*7 70 94 =74;5= 79 H7;; '

0446;4 '*5 '25 79 H?H7?? 156?5 '67=' 7; :6795'

*5 ' 5 652;'K: = 6 @= : ?79? @'1 2? *9 6H'?7*7H

5225 67 04>74;?6 52257146? >74;944 > ?H7??

156;? 6 :6*5 9?' [illegible] ' 4H' E ;='*5 9?77 46;

7?2 6 ; :65'B 19 0?6 = '@@?)46;' 94 1'3 4

A5 0 @G'5H7?11?6;5 ??' 6' 1?N6 ; F6?'719

7.28 29. 04 8 10 64 944 6.1 68 ' ' I1'

F609' 91' 1' . / 8 8 6 / 218 'C' 98 /20 '

` / 2048 E11021 F6 "91/ 1@ '9 0. . 4. . 6 08

'8 . 0 07 93'. / 2192. / 2.8 ' 98 5 /

2980. . 2. 9192 8 29F69D92638 0D 3C 8

263011 76 6 9 '. "EE639 1D9263 '29F69'D92. $

7 225 56; 5'34 0 ; 4 1 ;4 ' K '67=345'2:6;'

34H'?4 =93 5'756 , ? :65 6'?: = *956;' ? 956; B

,'AX%'?4 42345 = 1 "20'@ ?715 = '7?65345'?: ;

;?6? :6?='71 = ?? ?653B ?= 299:65 = '7146?46'

A5 0'74;'2 =46'6724 ='K705 5'74;'7 3 :'=:1

?:9: 7?4 = 59 5 @'?:6;561 ;4 '@ 5 = ?; = ' [illegible]

4 = 22 ;4 ; 5>2*?? 5>1 225 56; H?:69* ? 76;4

. 18 F690 8 1 . 0 07 93 0 2 9 0 07 .3$;'

2 . 0 07 O 6 8 0 21 . . 0 '9 0. . 49219'

6 634 . 921 0 68 9 . 0 621 'F6 763'4

D929 0'2' 9. 93''0G 'F6 763'4 6 0'9

2 / 2 01 /20 .'C' 0. / 20 9 '198 '8 / 10 9C 8

8 / 8 9#'02 8 0168 'C#' 92 1 6 8 '9 1'4 9 921

J' . / 2 1 .6923'9 921 08 '02 8 0 3#'02 2E0 '208 F6'

7 1022002 8 010 .2 . 60 8 / 10 06198 C

= = : ;795 '65?6 :6' 7; :6795'@' 7? :6795' 46

1 2;5 56? H'1 4 9 4H'76 =79 >B'34 7'*5 ?7>'1 4 1'

64>' E565 7' 6'2*?? ?>' [illegible]$' 51' KH' 1 2;? 56; 7'

1 4 9 4H' E565 4 = '?: = *95? 4H'246;'%P ?:62; ;4'

? 4H'2*5? ? 4 = ' 76 =79 5: ='1 4 1 ;4 'K '1 '

25 56; >' ' 7; :679'+.' 7; :679 ' ;5 ='= : ;79'

@' = 6: ;79 '251' 1 2;5 5 ; H' ' 7; :6795' @'

= : ;79? '?:62; ; 46 'K: = 65 = $' 7; :6795'+.' 6'

6: ;79) , 54 = "' = : ;795'+.' 7; :6795 0 4;7'76'

=76; 7' ?' ?? 7 = '?4 = '24* 5 = 7 = '2402;76; 7 '

1 4 176;' '$ 33R " ' '76 = 7;4 =' ? 676 =7'

;4 6 '65?6 :6'2562 ? 44 =' @'25694'?7 56>'76 =7'

;4 6'@'2569 744 = '71 46P972402;76; H *5 2 < 44

[illegible]

[illegible]

[illegible]

:ˁ Mˁ 5ˁ :ˁ Hˁ qˁ 5ˁ ˁ

ˁ K /1 7ˁ (>ˁ < ^ˁ Z3lb) ▪ 5 / 6 8 0 6 . . 4 6 4 6 2 . F 6 0 4 0 1 ' T 0# '

@ ˁ 1ˁ J< ˁ 5,%L "6< ˁDˁ .S] ˁSd0%K = # ▪ ;" ; ˁ V C 6 7 $'31 (' . . 9 0 . . 4 1 A'

ˁ 6 ++53ˁ ˁ /ˁ W Z@ . @!D 2 3 9. '2/2'/8 2 #'"1' U8 2 '8 .49 '06.'D9/8 E0 :'

Tˁ. ` ˁ P 6.10ˁ! T()%= 5 ˁ = "= / . / 62D ' W I .F6/40. . 4 . /8 2 9 . 9 91 '

,ˁ Z0E) 6E 0"3 ˁ R h3 1E0 ` 'R=./h 0ˁ /ˁ (2/2 / 2 " .G/8 8 . 97 .498 ' , ' I .'F6/4' / '

\? # /# W0 ˁ ˁ (( ] + ') ' 8 ˁ C 'M 8 2 'C# 0 F6024/ '"1'/2 2 'G/8 G '(($ '8'

EOSSˁ 9 (7(G('R ' 'R ' . ; ## ' .29 1619' .02. .9 9 ' ;' I 1'F60 1/'D ' 2'F6/' -'

((" 4 ' ' $ˁ(ˁ 1KDˁ \ˁ 9 ./2.6 2 21' / '>-'/8 2 'C' 98 9 '"1'G/'8 2'

ˁ $ # ';S .0ˁ > ')ˁ "9ˁ (` K D"0Eˁ % ' ' 0 . 8'9 9'04' 492468 '20 2'.. '2/2' .8 . ' '

913ˁ 0 ˁ ! ˁ 9 49!E108 92'4 . .6 0 168'04'1 492468 2/G'F 44'

4 B % ' ' .1/ `ˁ 3ˁ $ #ˁ ' 4^4 ' H ' ')ˁ ' 98 9 4901 94F6/42016 00 163 .'($' $ 0]'

9R XB,ˁ 0- ˁ- B , 46ˁ ˁ - $ 'G/.'061.8'9' 98 9 '20.6 0 2 .68'9 1'#"1'

(2 4 " 9 2 .F6/'0 168' 33'04'G 22 92468 ' ' .F69'G .'

/ .' / 0' '2F6 62.#F6 0' 9. /.0216 '

'F6 492 8' 9F663'FB0 168'04'G8 2 92468 '

C# 1'F6 4' '0 168'04G 22 9468 '9F663

> 9 ' . . 4 9 2 1 9 ' ! : ' A

ˁ]= '# .!ˁ %ˁ = ' W :@ 3 3 $(' ,ˁ = " ('

1 ./ 7ˁ M ˁ , ˁ ˁ ˁ ˁ F ˁ !,4.H3 ". /' . 1ˁ F6/4'049 1ˁ U)ˁ079 1ˁ 29

.0 ', %ˁ 6,# ;=ˁ 9ˁ + ˁ = E 6(9 1 (219 8 ' , ' > 6 4 16 06198 246M'

@6 / ˁ M 9ˁ # E. :&"& !ˁ 208'0 4'9 1' 9 0 07 9'0 64' 2 9 0 0'

E 'ˁ 5,V & a=ˁ C!,ˁ & ˁ 7 9' 86.0' 4/ 8 9'9 1' 0. . 4923' 9 0 07 9#'

ˁ 5ˁ <P :/5] ˁ(D- - TP ˁS (F 2 D 62 61.8'9 9E 100. . 4 1./ 6/'C# 1G / '

+0 C B1B E ˁ"4eh C ˁ 6C% ˁ ' !' 9 0 0 '29F6901' 94' /19 1' 2.9 D' ./ '

W L !& @" < ' ' ' " @ 663'0 763 'C'EI .G / 3'07 9 1/' ./ / 9' 29' 2Q

19 8' 679. ' W = .'.108' 49 2 8.' ' . '

4923'9 1' 'F6/4' ./21 2D .'9 498' 29 9'C# 2/2

+ / & - !' 13 @ @ ˁ $@ ˁ 5$ J' ' ("<3 @ ˁ !'3< ˁ 65295 ˁ "ˁ ;ˁ 34 :1' 65345ˁ52;ˁE5 = >ˁ 65345ˁ1 2(

, ' P (' : X @ 2; @ F' 25 56; 7 65?ˁ9*5? 5> 65?ˁ* :* 4 = 2 *5 7 =

=/ /ˁ$+' ˁ0.ˁA! /\.9 .,9Y1 E 6 7 . 1 / 2 G 9

> Iˁ ! M ` =ˁ I ˁ > NN I 5 I =ˁ T T I

/9 ˁ 5 ! =ˁ :M= I 5 M 1

! / 01 /ˁF6 2F69"/.68 ˁ !0 ˁ ˁ

ˁ =)+#%/ ˁ"&6%/ˁ % +."%. !/ˁ ; &&. !

K/Jc. hB1 ˁ ˁ) 3 ˁ ! w6 *:9 ; >ˁ 25*7 7; =ˁ : = 6 04>ˁ 347"

* :*:2 ?7245 = ?ˁ6 = 4 = E?6? 5ˁ

Z/.E /E 2 /" 4h ˁ M, ˁ 'u4 2*?? 5 1 225 56; 7 * :* :ˁ7?? 156I

?5ˁ#1 ??614 =ˁ #347567=ˁ 2 65ˁ 5 >ˁ

?: = = 46 7 @ˁ34Hˁ* :* 7ˁ fˁ : = I

C / '/ .S""/) 7)c 'D H /1\ˁ W " (9ˁ f = 465ˁ E?4ˁ: = 6 4 =ˁ ˁ*94 04>ˁ7?? 04 ˁA51 ˁ

$E /d ˁ >, ' * (>ˁ $ ˁ >> $2ˁ Sˁ> ˁ 04 = 24 ;ˁ $ˁ 51ˁE564>ˁ 2*5? 504>ˁ ;?

(* $+ 2ˁ M > P '(# , >ˁ . '>>")'> ' <$)' ˁ 61 4 14 >ˁ34Hˁ240ˁ 2?ˁ5 ˁ ? 15 = 345ˁ 1 225 56I

#"' .$ ' ' (, ' ' (H49 >' M: ' > ! 2' ' ' ; 7ˁ2*?? 5>ˁ74;? =ˁ 61 4 14 >ˁ240ˁ25ˁ V # !'* : ˁ

2# # ' ' ' 4 ' >) 47 2ˁ ; * 4 6ˁ A5 0ˁ(" "ˁ2*5? 5ˁ?4 4>ˁ52;ˁ* :*64 =ˁ

k6 :9Y Nˁ %GB T ˁ @ K1 4 14 >34H2405"ˁ 2*5? 5 ;25 156>ˁ74ˁ

Z ˁ ˁ ˁ ˁ ˁ ˁ ˁ Z 2Zˁ; 2*?? ;04>ˁ ˁ = 1 = 14 > =ˁ 6 = 7ˁ7;

' ' ') 09 ' 2ˁ 8 ' ,)' $ˁ 04 ;4 534: @ '0: 49 34Hˁ946;9*5? 5>ˁ65?6 :6

J ˁ#+ " 5 ' (" ' #" ˁ ">ˁ& ˁ +% ˁ + /%ˁ"ˁ K X?534: @K4 ?0: 4 34H246; = 1 4 147 7? :

' - " ? ; ?' '< ' &% "("4" " 9% f + 'A+"4% 2 3'06.98'9 9 3'011 76 .6 9F6/J.7/6 0 .1'

' ;' ˁK ˁH"%ˁ1+ % 'R ' p + '& " +" ' '<)) '<' !'(' ! '01' . . .3 "1'G/8 / /Q

ˁ p S ;1 / W! ˁ ˁ ˁ h 73' 0 1 .6 0 763'01. 721.6 ' / 68'"9 = '(0'

) S 31 ' ;' U) ,' % " 3 4 "ˁ ; '#L" * "%ˁC'3; ' .6 63'9 1' / E68 'U)ˁ8 4 6 '

@' &"96 ' '(" ?' 900' ' # 46 3' 67'90' 9. 9' 5# !$" .'0 168'04' 492 '

"ˁ 9 '0 /"' ' >2 (M > 468' ;.' /8 2 ' ' 0 1 .6 0 7632 '

ˁ6 * ,3 = ,C ˁLˁR(# ˁ2EF) & ˁ D 68 "9 7'(3 1# "'3; ' ./ 6/ 68 C . '

Tˁ-!ˁ4M. 1 .6 0 763' " ! ' ." 8' 1'0. . 4923' 2 9 0 7 9'

198'8 /69 G/8 2 C'.F6/ .68' 1'0. . 4.23' 9Q

0 07 9'#'94' 8 8' ?$? 2 4 6 4 6 3 .' 62'

4/'06.98' /./'9. 08 3'F6 './21 2921' 246 46

' ' ' V' ' V'

' :927E:E565 >@1 P25 56; ' 7*'

9 a 3 (!3" ((* $ J N!' /' ((1' 7 !("1 "? " *$$ 33 " ' ;' : " '
N < 2 $ 1(!5 1 " 3 " "(' ,' ' = 33 " !' " ((" " 7 1 "
' $(' (' * $ ' U' : " ((';" 3 " " ' ' (" (6'7 (' 3 1D $ 3 ")" J 6 '
' ' ,' D'&"('("1 $ ' ;' < ' ' " ')' (' ' ;("(' & " '3*" R
'N(0

ć = = 4 W' 'E565 >'751 2556; ('K705 5' ' 8F' -;'^:;<'8' IGPIF'w'> >7 9\ ' 2D'$0'
?:6;=561 '2*5?5>'67='@'1 225 56; 7' -Z ' &
?:6; 65;'2*?? 5>)5?9 7:6:7=5>3 4>'E564>'U7' X' / ' : ' ' ' + ' M ' c# ' ')'
; :6795'5 = ='?;99'6:6'?:6; 65?57< 47"246;' 7; : ' + ' 'U G] F'
8 3'9 9 1 0 '"1'02 8 0 '01' " './21 29.'02D9 68'
U'G/8 298 F6' 62. 9. 93' ' I 1F6 .68 F69'
0.1 766216 'D9292'".'D9263' 0'9. 08' 9. 9763'' m;]' 22; ' -I'? '* ; 80' 'O
9'67. E0.. 76628 C#'F6 .68F69, ?S A'
Y "4 9 921 '".'4 1 9 921 0'9 1'91 08' 9. 9'9'
/33<3<'0.. 7 .216 '!68'92 8'02 80' 9'D9263#' ' '<0/ ' ;) ,'E<;! HE3 0\S. $.1' ;
'10 8 F6 'D92. '0.. 76 16 ' 67 02 0'C'02 ' W' (5 ""<5K ' .1 .; ' V(A
8 0.68 C' .2 6' 1 4 68 ' 94'4.'/8 2 763' 9Q ' :O :T5 ' ! @; ' ; B 0 ' R ' (@TM'
. 9763'02 210 ' 3$'G .'0..27662.6 " F69'
04' 24 6 460'!68 F69' 01 /20 9' 9'4 19 92. 0#9
?7=347=' 1 225 565)5' 7?? 04 ; ' U7; :65'A? ' O' ' ' 0' R
6??2: 4= 7 :679) 515; 76 /))5? ?04>' 7? :H 79' AY7W/' ' E/ 7
240/?f /0'7?? 045?4'U71:65'A? ' # ?1@'K:?' '#' W:/=')'?;WF*; =0' ' 8
?:==465'5/I'24097;:'E56? 5'74?'1 29A 56; 7 :99' ^&;! += ' 0)@ '$6, '@h2' /8d <@/1
5? 7='34H2405 >) /GI A??6 = 6 9'K?76 =79)'6:' 0?' U; 7/ :I 2, ' -M X0: 0' LL8:+5 Q W;' #+< -;
529'534; >'655'K:=:'2?'=9'2;' 7; :6795'64994=' E 2: ?/ M P;+ , A:S' , ' 0 $$;01,
5 ?'76 =79' 3; :65'A;56>B' " :* 4='74;5='E5I
65 >' 3 '* 4 04>'7;5604 '347='1 22?;56? 7=B'@' ']6P\M* $*'Y <@ X(' f)' &_ '
2*5? 5= '@'* :* 4=@'7?? 156> 67=7==791?' &' (&; <4 E N-?: ') 'g 7?A' P7]
K:= 65 @'5343 @ '74?'@76E45'$ $ H '3471 4
*5>74;5 (15 8'2:9>'347 347?4: *515>K7056?' < *0/G?+ ::/'@ :" '< ; *'@ R -"(' &
:=:'A5 0'152:9>' 61 14>'@72 4='71'0 6' @4 '$O :""(']$2 $' $@" 3 (0
6 5614 = 15'2:-7534: @'*7 ; 4 7 04>' 7 !&- 0' Y $N@ 4@' *K !@ : ' '
15) 34 ?? 15>'1?*74? : 04>' *: ;5;'74;5= cccc! Z cZ' < M ' (';' ' ' ' '
1 2;5 56) >7?? *5 5)34 04>1 4 1 ;4 E564> 6:6' 'K' 3
?:=*9?147>56566f E565 >2511 4 2 47>')' H ' :- ;;/E >;/ :'*%
;5 57'E564>'1 225 56; 7='?:6? 65;*:?52;7??'67='),'/' . , B0 SE$ ' 3' *(-' ' S //,'
76 =79)7 ; =' 7? :6 >'*7 ;255*> *7 ? ='5H*5 >B' $(3; :< ' ' ; G+, :;' '-+7<*)Q1L Q :A
1 225 565 H A 0' 6:6'?:6; 656;'E565 7' %' H ' ++YG F ' /F + + WA)'w <;B ;BY ' 7' $&
;5 57'E565 7/FF/M* : 7'1 9 5 56; >'240'2?'; 3 !'
' &/ ' > E(" '57>A67;:9946;'25170 99>' ' ' 'R '@T*' .@@''< A)
A67'6:6' ?:N:6?4 '24097 :'?6 ='76 779 '9 =49' . E0 3Z M. / 01' ' /. @0? J ' # '
;:99 ;4' 7; :6795 ' 7; :679? 1 22? 56; 7276?5=)" (9(34\/ '# T5 "'$: $(;5 " ' %' E."'
2/2 8 6'1/O62.'D9263 208' .91'/8 293'1/ 02 ' (/ 3(3; :&' ' !@/ @'10' ' " 4 ' 0 / /4' /.= '
16 ,B? ? 67 021 002 8 010 92292. 0.6 .019' ' ' I' '
F4 10 21. ODP6 F60I#1 R<<B?E9 102 8 0 '+': A' ' '
1. 90'D9263011 76"18 1 1'7 3 " 'F6 4'9 1 4 9' @:3< '1$ @ :/ D1')' - *' +' J)
92. 0 2 ? WS F 0 9F8 4 9 1 "1 ,@4 46 6 ' @ *' <.' $ @ &); @Sb < : *0")O'
;? : 19 90' 2'F60F69' 9. 9'"268' 3'D9263'"1' ' !4 ' ''@ * &*'@'P!0; R *'4
G/8 8 3'D9263'1 0 8 8 0 4 1 910 1 0 061.8 8 6
'"1' 01 /20 9'8 / .0 9' 2.9O 921 '0.'9 92' M+3'` $hB ' +=6 ' P] &* ' 1>&4' !
1 '.0 0 'F6 763'07'0 3'02 8 0 763@@ \'4 9 1' ' P ') &@'&@ 0' P@ ' 3);4'<;''&<F
)' .D92-3F6 4.8 0 8 016 8 019 '4 9Q
921 0'". U' / 2 ' ' !62 06.9 2'0 0F6/F69' O! 9 ' , " % "%' = ' " (%'%:% "%' '(' 9
29'./8 8 62 0' ' / 0'D929 3'C'4 9 .2. #' 3X`9Fh ' ' 66'C/.+T)
1/1' <3 3 3 ' 6 .E0.

!/ 01 /D.29 =EC ..9 ' ' !0 '
'
' - D !'B (" ; "1 ' ' $(B3 ;" ' : " B5 ' "' '= 33 " 'O" 0'
(` 5^4 ! "(' ' $(` M !;(" 7 $;; !' ': "N ` "(3 ;" "(5; F'
$1 !' '5; 2"(` !3\1M # W ;; V "(' +' ((1(" 0' ' < ((33 1! 0!);' $ 30'
3 " !' ' ; (('? "(X 5; (5R

3 64>' '2*5? ?>'?:==465/ :?K7056;'* 4 I ?$ ' (*' !'$% B'" 4$ ') * ' * ')' ' " . 0"'
04>' '<"94 468'9 1\0i. 76 ' .. 016 06' ' i' 11A;'3 H .F' \' &"- , ' K1' ' 9

:' M' 5' :' H q' 5'

-9' 1 3' b7 ' K' /$' KKA
J <)B' ' $R ' %' Z / . AZ' R' ='
1 EZS u; 11\' W Z 0E/'. 1K' ,' S1
< 9 ' ') ' / ' : " ' + ' " / '
" 9 ' AK ^$ E ' ; ' g 3E ' /
6\' 5 ' H < "" 0 (' ? ' ' <;' ed
/ 0H 0 #,;' 9 `h#<.$$
' Z11\WA' / E' '1 /p B' B' K E' ' ' h
. 1 0 0 #6 Z ' (4 "-% M
+ M#F' <6C<] F ; '@ ') B) ' " 2
< ' 3' Z. b' <0' 1 ' +T%%7- ' < EA: 0'
1 0 1 1 E 2 ' % ' "' ! 0 9 ' *
' ' E* J.$ <[$ % K 0 %9
/+%'0 " % 224 " 2 " "' (' /' ' ;
7 ' / ' 3 9E / K.6' % "> " 9

?? = '2*?? 5>'A? *5? ?>' ?' 6 4 = '6 : 6' Q 97 = A? ' '
6 4 > ' [illegible] 2: ?5')15 = ' 2 ;' ?G = ' 2*?75> 3 4 = 'E564>'
' : = = 465'?; 7 = 'K >' ' * : 7529 5' 8 '
7?? 0446?4 ' # ?' A; = 34?' 5295' ; : ;C = 34 = '
17 = ' "' , 925 = = ' 74; ? = ;34 7' E564>' ? : 6? 65?'
9 5? ?> B '9*5? 5>? : 6? 6?6; . 6 : 6' ? \ ? 6?6 'E5I
65 7')' V,564>?6 = *94 04>7;?60 ?4 ' 347 7'
2*?5 ?>' 8 H55 57' : *4>'52; 'A?' * 4>'240 ? 76'
4 'E565 7 @' ?22: = 7?7' *5? 2 ? >' 1 220 56; >' *5 '
2 ? 76?2*?? 5>' A615'?; 7 = 67?4 7' * : 7' 98 /0
65 7' ' ?A67?: [46? 6 : 6A67?: 9 6;4 674 L'
*5? 5>' ? : = 6 6 :'52;'517 = 'E564>'3401'2'E564>'
9 ; 6 : 6' : = 6 :'52;'2*?5 ?>' & ?'E565 7'34 156'
2 6 : 6 = : >' 7?? 0446?4 ' 2*5? 504>' 9 0 '240 / '
6 : 6' ;5 = '2*5? ?>' E565 06>' !' 7 ?5 57' E565 7'
24*5 76?'2*5? ? 4 = 2 0 ' - 1 5 " '?: 6* 5K56'
2 : 6?B2*?? 5>' 7 45 = '2; *5 76?' E565 7' * : *6 >' 1 2'
2? 56; >' [illegible] ' 7?5 57' 655' *?? ?>* : ??2;' 56E? '
65 79 29 = 4 = ' 655' E564>' 2*5? 79 2; = 4 =

! / 0 /'D929 3' C' / E' !0 '

' g - 33 " & !' "" 3 ((; $! ' p' ($ & 7 ' (" ' W : " (@ @ 4!' (" 1 ' , ' " ' = 3 0'
] 2' : " @' - ' 31' ; " !' 3" ; " ' ' !$(' (" '); $ " 7 !(3" 1 P" ' ' : " (' (;" (('
' Q Z &@ 0" ; "D 5 P(5; $; " 1H ' +' M ? " " ; " ; @ Z&b

I " / Z' 3' .EF' 3 / 'ZE2
D ' Q ?>A' J) ' :
" ' ; : ; ; ' $; *' : . -4 ' = 4' ' ?8 ; ; '
0@ ;0 0' &3* : + @5 T : L ' @ '! * * ' $' W: - '
T 0: /3'(/)!(R* (. <! - : @g .\ c / ' ?' @@ : 0R P (3'
' $>' : ' E !* ' ' 2 99' " ' : ' & ' ;
*2 : I' ! : '@ ' - ' ! 3' EhY' @' R]
2 . M ; ' ' WF?2' ; ' E&5'@ * !
& : T *(* ' * !' 3 N +2 '
9 / ; '&S 'C W ' ' ' W ' ' 4' = ' 0 ' > '
! L' @ L ' ' - ') - 0] P) @O; ! / S' " @ : ' ' 8Z@
S : ' : ' '@ : ? * * ' : '
R 9 6 %1 J< E 31B KS ' ; f ; K 2KB ' ' ' - ;
97 3"' &(" 3% . . '
Z & ! ' ,) ; 'E' ' / ' 9 / E ' Bi$ ' OD
' = ' F 6
; M3 3 '@ 0' ' 0 ' (33 " '1
R ' ' R ' R ') B < ' ' EF' / 7 A
/ !(

9 1' ! ' w I 2 9 . 6 8 / / . / 8 8 6 2 9 ' . F 6 ' 9
! !; ' 2 0 'F 6 4' BG / 8 / B B' 0 2 8 0 'C 'F 6 4'
'G / 8 / B B0 . 6 8 0 4 4 9 2 4 6 8 ' %' . 9 8 0KF69'
0 . . 7 6 'D 9 2 6 3' 9 . 9 7 6 3 'C ' / 6 8 ' 2 4 6 4 6 3'
F 6 9 9 6 8 ' 0 1 . 0 2 1 'G / 8 / ' 9 2 2 C #' 1 !' 0KF0.'
'0 2 8 0 '#C 2 8 3 0 1 F 6 9 9 . 6 3' 3 ' 9 3'
0 . 0 0 4 ' 4 . 6 4 6 8 ' W ! / 8 8 6 2 9 ' 9 1 0 8 ' 9 1 2 / '
2 2 " 3' 0 . . 7 6 'D 9 2 6 3' / 3' 9 . 9 7 6 3 ' C# / Q
6 8 E F 6 / 6 8 ' 6 9 1 / 4 6 8 ' , ' E N . 6 6 . '
0 6 1 9 8 F 6 0'D 9 2 6 3' 6 3 / 6 2 / 1 9 3 '
; " ' . 2 8 ' / . 9 . 9 1 9 0 2 8 0 ' / 1 . 0' 4 6 4 '
4 9 . 2 1 3 C / 1 3 ' ' . 'D 9 2 6 3 'F 6 4 9 8 6
0 1 8 7 6 1 6 # / 6 8 '" 9 7' " 2 ' 0
. 6 ' 9 . . ' . 6 6 3' . 1 / 6 8 ' , 4 : 0 , . . . 0 /
8 8 9 . / . 0 1 6 ' . 6 8 ' . / ' . 6 6 3' 9 1' / 6 8 #'
D 9 2 6 3' 0 2 1 9' . 6 8 ' 2 6 / ' . . / . 0 . 6 ' 2 9 F 6 9 ' 9 8 8 '
F 6 4' B' 6 ' * - ' $ 5 ' ' ' # 2 9 . ' F 6 4 '
0 2 8 0) ' 0 1 6 ' 0 4 ' 4 9 2 4 6 8 ' 0 1' 1' F 6 4' 3 1'
/ 8 / B0 1 6 ' 0 4 4 . 2 4 6 8 # " . 3 8 F 6 . ' ' 3K' 0 6'
0 4 4 9 2 4 6 ' G / 8 / ' ' : 2 . . . . 0 ' / 6 8 ' 2 9 1'
2' . / . 0' 9 . ' . 6 6 3' 9 1' / 1 6 'C.' / 0 'U9' 9 8 1 #'
D 9 2 6 3' " 9 7' 'F 6 4 . 2 6 / . 0 9 . 9 . 6 6 3 9 1D 9 '
2 6 3 U9' 9 8 9 2U' 1 0 8 9 2 / 0 ' + ' : 0 . 9 9 0' / 0'
6 7 0 . 0 U' 8 6 '1/ 6 2 . 'D 9 2 9 0 9 4'D 9 2 9 0' 6 7 0 '
@3 * ' . / 6 2 . ' 9 . . 3 F 6 0 2 6 2' 6 2 9 / 0#
F 6 0 9' 3 'F 6 / 6 8 ' 6 2 1' / 0 ' 6 7 0 1 3 ' 0'F 6 / F 6 9 ; Z ; " (' 8 6 '1/ 6 2 . 6

! / 0. /'D929 3' >)0 . . 4921 3 !0 '

' g - D!* (@: (" !(" W' / ' : 3 " D ' O" @; (? !' ! 0; " !'3; $!' 6($$ @; ! 0 F'
" ! ' W ! $ ' (1' (" 7 (@ <7 (' , ' : " ((1 $ $! ' ' ; "D(1(" 1# ' 7 ! '
7 3 $' @' * '7 ' !

! 0 0 1 ' C' J@ , ' EK / ' = ' '\ ((@' [' I ' I 2 9 3'C# 0 . . 4 9 2 1 3' . / 8 8 6 2 9' V' G @ 7 6 3
. 0 / ' U ' 3 1 ' ' E; S %F\' 9@' . ' ' .@K 3' A' 1H 1 6 8 ' 9 1\' 0 1 . 7 6 4 6 . ' 1' 9 ' ($ '1 !
'& ' ' ! ' $ 6 ' ' + B 4 ' A ' ' 9 0 0 7 7 6 3 ' 8 9 9 2 9 0 0 7 7 6 3 9 . 9 2 8 = .
' ' ' ' ' 8 / 6 . ' 6 7 6 3' ("H "' # ' 2 0$ 6 8 ' . / 2 6 3
%' / 1 ' ` . G / 7 4 F 6 9 0 . 2 / 2 2 6 O 3 0 8 8 0' . 0 9 2 6 7 6 3'
' : 9 <[U / d J E 6 ! U! E.; W; / M 1, "' / ' > 9 . ' 0 6 9 9 8 ' D 9 2 6 3' 0 7' 0 . . 4 9 2 . 9' # F 6 D 9
/ + " (35 0 < R" (@ + / 0 ' 6 3 / 3 9 . 9 7 6 3 0 . . 4 9 2 8 ' " 9 7
M 0 , A$? R [?? AC C Z E; ; " K D ! * $ ' ' S . 7 6 3' / 1 9 2 / 6 ' 2 0 8 ' Z 0 8 '0 . . E0
. 6 '0 . . 4 9 2 3' 8 9 0 0 7 9$ 1 0 8 9 2' 8 3' . 6' 6 ' 0 2

0.. 1F6080..4.23' W' .D9263F6 498F6 '
0 1 0 02 A'
1F .F6/2 08 ./2 921 /2980. 98 /298 9 '
(2 49. 68 0 1 . 01 / D.69 68 2/2' 198 '
,' G10.. 49210 2 68 621'8 24 6 46 3$D92. '
0'"9 /+. 9. 9320.6 0 / 0 S@ ' 24 6 46 3' 67?'
102. 3' ' I.'D929 0' 3'F6 67 9 SB 011 7662A'
1'6 ' 2'32 3 3 'F6 4'9 1$0.. 492'1 0'"9 7' 2'7($3# 0'
$ 'F6 .'F6 4'9 1 '061'F6/8 4/'3 '$079.'"26,8
A' F6.K4F6 219 /D0163 2 F6 3 1E / 3E4 ..9
.# 92 D 8 2$06.F6/8 / / 0U..=/. 01934 .93'
D /10 .'061'"0 . 9'

W' Z 0b B [1, "(S"/S
(*3& @ ! /
5", M^ 7' @' + ". &LF ,]_
' T 9 ' , ' Z0E
5"5$3<_4 73 35-7g 5# ' . '=& J PW
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@ 4' D 16 'D9263'070 3'F6016/ '4 9101' `' ' ' 9 2
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F69'O/8' F6016/ '4 90. F60' ' L (
..6F6 2F69G2.'.! "268 F6/4F6907 SEF60' ' ? E\' ' I'
.6/ '4 9 0.#'F6 01. 'F6 2F69,. 9 2.'" D G1' M 1@ 1' 2
4 N. 921 '/8 93' 0' . 8 2/2 10 9 G0791' ' B./S / ;J E K'.91
94'. 8 98 9 'F6 '49 2.9 3' 621 ./2268. 9
16 +#'8 ' 9.624/'"20'4 1 120'4. . 01'F 4'08' I' 4
68 109 1 669 . /46 E8 F60 1/1 93$ 2F68 1/' ' @ ' ' ' !' ' I' ' I
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9 01'0' 9. 9'F6/8 /4/'0 .8'4 9 01' 9. .3' DK 9 E' 3']: ' 2< ;\4\' ' 3 1 9 3 D 3' " '
D92. 94 . #62 6 ..48'4 .97016 'F6/20/4/'4 ' -S ' ' M' ' d K' 11 \ ' ' 1U!D' R O\ `
9 0.'D9263' ' 9. 9'F6/4' D 11 @ 9 101'F0/8 /4/' " T '= (%3 '! ,'+,' =-C<#+ ' /' =' = / ' '
9. .34 1. 0. 1 / / C 070.. 492.. 4 ..16 ' M 3 '"@'(* - -0 @5*. ' ' ;7' ' 0
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8 /4/'07'0.. 4.21.'$ & ($ ' <; $ '9
6F69.6 208 F6/8 /4/0 9. 94 1. .210 C# p K!V' S S / B' J- X \ *K ^ W;33\' " " . *
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.98 98 21/2 1293' +E@?S #. F8 763'F6016/ ' "*3$ X +*<!' @ ' (" ' ' / 0 E.F
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; ?*5>946;*7 ; ?497 5>K: = 65>' 65?6:6' 7; : '
61 >122; \56; 7'' ' : = =465'?; 7=5/256 *5 ' '& ; @;' @3' M 3 /4
71195' >347 *7 ; ? *76?'25=*5 '56 =' :? 7;5>' P ** '@ <N 'N' $ ' 0* ' &(;<6 ' >;;'
7; :679J ;?25=*5 ' :? 7;5>' K: = : ' $: ' O!@<! 0' $$' ! " ' 7 >I' w
* 6=74;5='5/1 22; = ; 7'' 3=15= ' 7;=04 ' 6' ?0 ; 3&'3& 'Y ' $ ' '&.) ' 5 ' W# & '
"F 5)IF8347953=152; 2*5? 5 A5 0' 6' (' Z ' I' ' + '
34 15 9 67=@2 0: A;347953 43) .1* 7 ' 2 3 '' D
;4 '6:6'2 =*9 ? ?5 52;'347-5 251'347E565 7?? ' V 3$ 40"(@@ -4 - '5=' && '' ?; '
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F60$'"91. 93'2/' " ' ' ' ʿ ' 1' I' (' '

.2/ 0 212 ʿ 2 J ' $ &# W ;F a')(/ H ' /E. \. ES J B E ! !

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1. .0'4 9 9210' 2'8 6P 3 9. 9763' 0 9'. . 2 ʿ
16 ' "1' F 048 93' 2' 6 8 302 8 0 763 9. $'
4 1. 921763 9. .3'061B8'9 1' 2'7 3'2 4 6 4 ʿ
7 67 9 4 3 ʿ ;ʿ : E.19 904 1. 92. 0 E E E ʿ
. . F608'. / 2 1 16 1 ' 01 / 20 9'92E8 67 01#68 1'
(' "20G/8 2. 8 1/ 1 G/8 / '06.S2 11R 0 63'
2/2'. / 9' 0. /20 !E!68'02D9 63' 1' ʿ : J9 9 90'
4 9 9210'. / 2 62D .6 '.68'0 0'4 9 .2. 0#<20 ʿ
01 / 20 9'C#8 / 10 9' 8 6 ' 6240' 62.'04'G/8 ʿ
2. 8 . / 2 1 169241 8 \ 9. 93". 7'.68 9. . 2/2'
./ 2D .6 ".' 249'D D20.6 '0 'F6 9408 9. .3'
F6 408 .2 8 '9F60'.68'F6 / 408'0 2/'. / 1'04'
8 6 6 8 'D D292468'# 94'.F663' 8 . 1. 0 20'
. / 2 62463 '29F60F608'8 6 6 8 '9 . . .

! / 0. /ʿ4 9 921 0ʿC / E !0 ʿ

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T @31? ʿ P @ $P ʿ)' * 'E. :' 'K ' $W@ ; >*ʿ <&'

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3 5< ʿ@ʿ <&ʿ : 23; 2; "' a' -K' 5 ; " < "3 3 : L ʿ $@' D9

6ʿ = ʿ M -) .

> 225 56; 7'@* :* 4 =ʿ ?: = = 465'E ʿ
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;4 ʿP?345'56 =ʿ 7; :679 7 ^B ; 7; :67 7'@ʿ 7*;7'
71' 1514 = @F/ <] // ʿ7*5771' 15614 = ʿ ʿ : = I
= 465'5? 7 =ʿ A? 2345' 3ʿ ʿ 5 = *5 ʿC ʿ : = 6 ʿ 715225'
347 = 4 >ʿ 56 = ʿ 0 *5> = 4; 97;4 = 2 ; ;7 = 56' 71' 1'
34:167?.4 7'?: = *7 7;4 = ʿ?2; 9941' 5 = *5 525 ʿ
;4 67 = ʿ@ ʿ7*? 46'71' 15614 = ʿ 5:ʿ34 :1'67;4 7'
?: = *7 7;4 = ʿ52; ʿ9 70??' 9941' 5 = *5 ʿ6:6'34 :1'
5 = *5 157; ʿ # :* = = 74?56 /1 225 5? H'
34:1 *27'34 15 = ʿ15*94 04>' *5? 504>'27;*5'1 ʿ
? ;4 B' ʿ 7; :6795'15'76E? : @'' 15'K : = 6? 7?'* :ʿ
* 4 = ʿ 15A672*?? 5 ʿ?4 4>'52; * :* 4 = ʿ "ʿ ?'
1 225 56; 7'34 15 = ʿ >'?: 6253A 56>'52;'34 : 4 = ʿ52'
1 225 56; 7 ʿ6 :6';7 = 56' 5? * :?7;4 '* 1)) 775

" . 8 ' 011 706216 ' D3' F6 / 68 ' 621' / 0 ' F6 0' 9. / .0216

! / 04 / '4 9 9210#' '0. . 49213' !0 ʿ

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! C 3 1 ! ' ,' $($) D a C" ʿ ;ʿ : ($ < ʿ ʿ ʿ B ? !

K # != ʿ P (); ʿQ ʿ< ʿ " - - * &" ' . " ." 7E / " / ! ' 9ʿ

- 2 +7ʿ &ʿ('=&2ʿ % 2 4ʿ M+ 3ʿ J 6 ʿ <= _(E

); J& @'* ʿ ʿ :;E] : : $ʿ > ;= 7 ʿ &\ 3 ʿ ; 9 :

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!' "91. 93'. / ' 5 I \ʿ &V4!4@<J*ʿ $*ʿ ' (

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8 4 "& @ : @ʿ # * + " 7 &03 $'

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& @ * ' ,' Z 31\') 3&@' <2; ʿ < & F

;P I' W ʿ *+ ,*) - . /ʿ ʿ T ʿZ @($:L R

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$ R <3 -@& "(ʿ -ʿ : : D: &* $ @R:

ʿ 3c"" ʿ 22$ ( ); ʿ ʿ $ @0

9 9 2 . 30. . 4921 . / 8 8 629 2 1
ʿ 7634 . ' ' .98 . / 8 8 62. K_.680. .
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4.2. 763'8 9 0 07 763 ' 98 . C / 8 2 049 .
208 C 7 93' 98 9 '049 1'G / 8 2 21 498 F692 ʿ
D / 1' / 8 2 763'. / 6 3' ;ʿ > . 62.'06198 #F6 0'
4 9 9210'. / 21 29. 9. 93 2.F69 KS . / 2 29'
16 # 01 / 20 9'92 8 ' . / 21 29.G/8 298 C .02D! ʿ
6 8 $'0. . 49. 0'"9 7'0 F6 / '2 / 4 / '. / 24292. F6 0'
21' 2' F 763K'0 F6 / '8 / 4 / '. / 2. 29216 'F6 E'
67 9 10'2/2' "2 63'0. . 49213' 94' 6 6 8 ' 1 21'
6 .9 . 60' ,' .'4 9 9210'F 64. 8 2 / 2 / 19 1'
. / 21.24 'C# 9 1 #0. . 49210'"9 7'. / 8 921 / '
298 C 98 / 298 9. 62. ' ' I .'4 9 921%'
. / 21 0 '8 99 '29F6962.#0. . 49210'06198'
. / 21 0 0'8 .9 '21. 468 / 62. ' U' / 1'3 ʿ
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&R R . F0 8 F6; 4 0.0'
*8:@7+7?? 15 655+G/ BI 1?5?4 ' 2 *5? 5L?4 ='
/ 2/ ./ 221123 2 61 @ 1Z71 / / ' 'F6 4
56 =* : = : / ;;G71 <J 1;:'2?2 < 4c 1'
2/7*; =71615,Q146; </ - : = :A 2?4=A5 :71
61=;:=7??*'15;55'25? G1GF;29\ [F95=' '
9 1?61):??2;7;5= 27'E? W F ' ' N:?'5; 7='
?:==465'52;'34%1'- Q)72;_' A BA'F3A= ;5'
92 8 9. 9304 S8 8 ' A 08
* 7 4>34:;46 946;: 27' 1 , 2;5 ;742?='
2*57F)a :*6:'3F- ;5*8 1;568 7- : ='
E564>'?295'* :* K =A5 %79 ;;=' 'hG :2 ;;7'
29F6 1' # . ' .. 9B
& 11S' 1/ 168 ' " ' U' T E... '04 4 @ .#'F.4 .'
7 / .91'G/8 298 '9 C ' ' P'0 16 2 4'2492408 '
8': %.9.90' 9. .3' .8 9 '046'049 1' 67 14/#'
/ 68 '"91/'219 8 ' /.9 1019 =/. 01.3'9 48'
98 9'9 1'0 6' /8 M 012/2' 92.9 ' 491F606 3'
98 9'2016 0 1' 18 0414.24F8 ' ': 0 19 90'
F6/ 6'49 21//9='@ 4 11.1C ' 0F6/F69' 81'
469 0 9 1'06198'S ' / 11 909 =S7'D./. .'4 9'
C': 6 76d'0.'4S 90 76d'268 . '0.. 76' 2'
206 .'F6 4.Y + 'FS0#E= .@ 2/4 # - \'"9Q
7 '=/ C#/ 2 C$. 91044 9

R $ 3 8 "
' ' ' *&-X: P>] '33 : :L ' ' G
'\/6 ;' pA ?AA /EKE 1 @E A
'@ @ "' 52 '@4 (
' X' ' ' A G Q 4 ' A M
G k ' F'2(' <$I' T' (n n'
;* $I I :2 +\;2Y[# $ P * * ' P ' *4 X(("
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G ');A ?A 2' '+ZA' :' ' Z ' +G
k D/FB(#1 F G \ ? (QFFF k' T' W' < b 'G '
+Q H(3*')' :2 ,' \5'_1?0
3' ' 'C' P " " % , '
711'?' `f$c1`h e" ' 8' : " .=*' >Y' 8K ,6 !]K KK
' M=&= ' "' = % ,9
3' & '$ 3@ M'S+ T3 ' '@ &'
&*&S9?\ ] 7#36('%3+,' R7> M= ' ' '%F' K
'M= 3,E3 % +3'& +'). ' K BA
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! / 01 F' .. 9 'U.'0.9 498 3 !0 '

' Z .%. != F 'S '.7' ' ' & " M ". , 7 1 8"&" F +"&2% &(73&- %!-&2% &,"'
S #3 :3f "' & 9 . , !&/ !)) "&' %! !..!.&Z +"& ,&0' ! 1#! +"&

!: A!. S'C '0.. 49213'./8 8 629'; ' 61763'01 '! '
60 ' U7 75 745?=)2 7 ('?:==46 ?7;5>"
34 7* =4= 6;5 951 2;7 '7?? 156;>' ?' 1?4'
7?? 1 5' Q' :* 7'A5 0'A;* Vh75 @ ? PBG/' *5? 5'
34 15=' 6' 3& '34 1'52;'7 ? 04' >'34: 4='
52;'2*?? ?>' 7511 '74;56 ' ; 53 '2' ('
34 1'52;'74; ::1: K105;'$' ?347=345'
02;76? 7='A7 4> 5? 1'* ? 5 *5=5295' >?5 '
156; 4='A5 0'*9 ';7=25*7?702; 46' 347='
625*7 70 9 4= ' "' ?2*?? 5><h4 7* W59'
9 E46;4 347=7 ? 1?7; 7' J5?' 5*4;70 9 7' 6;'
g:*: ;5?'57 ='1 5' 0 51K86' 'A?'5'(; $'75? '
17;Y7?? 1?6;0A5 0I67 7 7 =?*: :27'@67'
4 7 ; K70?)(?2;F: ?_=2;)?4?7= A;'9402;775 ' 6'
Kf 576;' # ;% 6;*??;5 * ; ? *7; :< I H3479 >'
0.. 49213'"9 T F608 P = 7 9' 12/2'39F60''
3'9192 2 I1G 3 .G / 9[?/19 1'G079 9'./ '
/198 S 98 0R Z 8 / C / 9.62468'
E[6D / .8 '

-=' N' . '13 ! 24 / '6/ /-F
1' ' ! ' >";7^' &' /F' M.- =
' 3 1Z 6 h'" , ;/' '6/0
7')' 9 3 ' ' = '0' ,9Z
M iE ' '
6(/]b')7 6 . +3 3 " + ' W' Z/E
' +3!,!' ' !F)' 63
=E 7 .' ' '#! '&3' $;S@9B@
,' ZSA' S"D ' 1I D /@IB
5. 1' I I hB $%K \.9 $S S4 b6
h < [?f ?E\hZ 'EO'/f /\9c!'R' AS' R O
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' & KZ' % K "N2 9 ! !#! +"&'

['B] 'A;'49' / /'C '0.. 49219'4 .016 #' '
208 'F6 / 08 9. 'C 04 9 928 '
@ 7E565 ?1 225 7;) \ 81 14 6?2;' 7' :==4I
65' 5 ?4;' 2' * :* :' ?'7?? 156;' ;62?*7 70 9 '
2 65' 6 >' 57' 6:6' ?:62;2;5 5' 6' 34 0:>' 2*5 [6;4 '
A;56 =2 657*; =1 4?71' 156 '6:6'?:6V2; ;'
K:=:'2 2' =56 E : ?N:6?:62 2;5;5; < ;K :*>

<>-' , '/
. D @/ I 2' ' M+ 9 . ((&6 T(
#)' !3#) - / ' ' 1,'&97 '<
5K 'W!#< ZN'%[' T ' 3 ' I D=Z1'&3 '3#: +
SR=Sh``E0h1 `! ' Y3E '
' ' O

5 = M I =

?ʹ 2P-ģ4 ʹ , ʹ ʹ 1KDʹ 5 ʹ "-= ʹ /9ʹ G0? ʹ " !9!S /; ʹ , ʹ J1`S / ʹ Dʹ Bhʹ /ʹ 6 Jʹ @EM` f$e e 0'X1 c h h/ W A$) H .# !J/ EH++3 ʹ EO1 0Lʹ ʹ !< ʹ "1 h1" ʹ E " ʹ , ʹ < =01 ʹ L 3 , ʹ 2 ʹ Ih 00E / 1 \<`h h1[ ʹ 91ʹ E$ʹ 1 !3ʹ * '1 9 ec" <", J ʹ ʹ !3 ʹ 3 ,@ M 7 E"X " Z0E <ʹ . 0ʹ 5#/3 %&" ʹ 1 O !9 R 1 $A S' 6' ' 60 / ' '< JS / ' ' IE ' O' // ' @ 3L : "! I W 8de` 3< J #S ʹ "K' 0 !`. "SSHB[D d1

.;' .'F698 048 /468 C'M82'C' 98 9'0.. .' / 62 E 10.108 2 9 07 9'0.. 4.23',> 1 ' 9 62.06198 #F6 0' / 68 "2 '.02.621 DD9 044 "1G/8 2 0 16804' 4924 8 # 2 9 ARL 6 ' "9 7'0.. 4.23 "1'2 D 68 2/2' / 68'E I . E E 91' ' .108./ 6/'049 1'C .0 7/2 'C .7. / ' 2/226 3' ' : I1. 90 / 68 9. /.0.6 . ' ' !/'.2 63'9 ' / 268 ;.'0 F69'D ' 019.02 9 0 0 ' 7 9'06198 0.. 4923'2/2' .. /.016 ' U' I 1 / ' ' / 68'F6 49 2'0#F60 3' J' 0 . . 01 /#0p . 492' 168'"9 7'0 0'80 / '0 28 / ' ' =6217 0 1 ' ./8 862 .0..3'0.' / 9.0.93'4 J / 68' (? "0' ($'G0$'076249' 6 . 62.'04'90'4 .9 2940' ./8 862 10.98 ? ,'./2 .692408

'

Z ʹ ʹ Hʹ /ʹ : ʹ ʹ ʹ " ' "

, ' * + / * +

, * B b [" '

Z [* < B [' 9 B ;

: 5 ! :

R ʹ B

!9 2 4/293 , Z " '

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'2 ' ' ' ' '& @ " ' 9@ '=V' p' ʹ)! " @' '# ' R' ' 'Q , "P ' ' B C= ʹ ʹ f J1O 1 9 he Oʹ MB' && 0 ' 'W.B< / ' 9 , V! .3 ' / 1204d 9 I J d 90 ' DE . 2 10 &% K

9' 10G62.' /Q .68' : / G Q 23' 9D .' .' (E .G63' C' * 'W' & " 3D 3 ʹ (@' M? ' '@ ' ' @3 ; & ; $' (' 3 0 1. O @R ' ' D: >' ' @@ - : A' 3 : ' (J' & ' 0 .9 ' 0 @'<! *(' * ' *R @ ' 4 . $" 1' 2 ' = 0 !##d' ", "%7 "+ % F' 4B E ! *'O! @*' 6 , %' ' T $

O @4@ , ' @' ' ;' $(' '@ ' H @ O ! @@ ' W' 9 ' / R .) + V< ʹ " ; +, <T& !, ʹ S ʹ = 0 @ ' %K 0:(((R H'S ʹ " : " < SJ$ '(" " ' / " ' /

M ʹ ' / ʹ ' q ʹ ' ' 1 ?46?4 ʹ 34 : 4 = ʹ 6 : = ?6 ʹ 2:94 = ʹ ; ʹ ? : = = 465 71 ʹ 9941 ʹ A5 0 ʹ 6 : I = 56 ʹ 7?? : = = : 17?7 ʹ 1?2 6 ʹ ; : ʹ &O 1 45 27B ʹ 345 = 71 = : ʹ 14 = @ ʹ K : = : ʹ @ ʹ 34 : 1* ʹ 1946 ʹ 52; ʹ 76 = 79 ʹ </ //// ʹ K : ʹ 4 = 67 = 345 ʹ 6 : = 56 ʹ 0946 ʹ # ʹ ? : = = 465 71 ʹ 9-41A5 0 ʹ 6 : = 56 ʹ 7?? : 6 = : (ʹ 1) 57 152 6 ? : ʹ ʹ 1 45 97 ʹ 2; ʹ 34 > ʹ 56 = ʹ 5H*9 ?5? ʹ 34 12 ? ʹ A; 43455 : 4 = ʹ 347 ʹ 76 = 79 ʹ 52;GB* : * 769 ʹ A? 42345152 6 ; : 65 = ; 715? ʹ ʹ 6 : 6 = 774 (ʹ ;5 6 ʹ 1 ?464 34 : 4 = ʹ @ ʹ 6 : = 56 ʹ 3 ' ? : = = 465 @B ʹ 71 ʹ 9941 ʹ 6 : = 567?? : = : 17 7152;6 ? : 5715 = " 3 5 = 71 = : 14 ʹ C ' K : = : 0 : > ʹ $ "' 76 = 79 ʹ K : ʹ 4 = ʹ 56 7A; 4345? : = = 46 ʹ 6 : = 65 ʹ 7**5 [7;4 ʹ 76 = 7K7? ʹ 152;6 ; : ʹ 34 : 345 ʹ ʹ 571? = 9 34 > ʹ ?6 6; ʹ ; 717?A? 493 5 ʹ 152;6 ; : 65 = 34 1 ʹ 52; ʹ A = = 345 ʹ 347 ʹ 52; ʹ 76 = 79" ?7K15 = ʹ ; 715 ʹ 152;6 ; : 75 = ʹ # , 56 : = 67;7 ʹ A5 0 ʹ 1 ?46;4 ʹ 34 ?4 = 345 ʹ 70 ʹ 79 ʹ 34 : ʹ ?7 ʹ A? 1 225 76; ʹ ?724 ʹ 6 : = 6 > ʹ 7**5997; : 6? = ʹ K7056; A;7E 7 = = 7? ?71/F/8 E 7 6 = 7? ?4> ʹ @'7 ʹ 2: ? ?41 65 ʹ 2: ; >

!ʾ ʾ ʾ Iʾ -ʾ B ʾ 5ʾ

)E / f3 !0 ʾ 99

ʾ # ʾ# .ʾ& . . ʾ S'S) . !% B %, +ʾ!- & !ʾ&+ %. 2%Nʾ(%"

) 2 2 F6A Z O 8 01 0 0 0 !) ` 1 0 0 9 1 . 0 2

8 1 0 R 29. / 8 621/29 . / 00# 1 G/ ʾ [

26.6 1G/8/89Z 8 9./8"1/Rf0 !$"1G/ʾ " ʾ ?S I

8 / 7 / ; . 6 8 1 " 2 . 1 ʾ 1 ʾ I / 1 0 8 6 0 . 0 0 ʾ 4 9

6 7 . 4 / ʾ 0 F6 / ʾ 4 . 6 2 1 6 ʾ 2 6 / ʾ ʾ C "ʾ /? ?

'. R ʾU 4 ʾ 2ʾ(OM $ ʾ> * *ʾ6*ʾ.!ʾJO ʾ

U 0 $ʾ($ ʾ ʾ(OM $ %ʾ4V 6M.K.ʾ ʾ(M $ ʾ S / /ʾ ʾ 63Eʾʾ@

.!JO 0 $(OM $ .0 .,(ʾ 0,R" ʾ

(OM $ (' (2 ʾJ V8 04 ʾ.!JO ʾ ʾJO.!ʾ

%.,ʾ! ʾ% (($ $ʾ% ʾ ʾJO ʾ$( )RF ʾJOB< Sʾ J - ʾ< K 4h ʾ

.4ʾ((,.4 4 . 2.2((!! (ʾ. . .ʾ$ ʾ 6& =-!ʾ,ʾ & ʾ "!ʾ O. E ʾ0 R.1 2

$! ʾ(OM < ʾ 2 2O,# RU 2.!MO <$(ʾ ʾ(OM< "5 7=$ -+ ! M X < 0-K!] 7" 7 /P $C<H

M ' '6' 2 ,% 2$ʾ" ,. .! 2 ! W, N 44 7S$=5 & +6N ʾ ʾ E "/3 1

. / / . " . 62 4922 / 117 94/ 416 ʾ. (;ʾ ʾ 3ʾ 1 / ; 4

40 0C49ʾ 67 94/4 962161 C # 8 67 907 7116

F,ʾ(2!$.ʾ$(ʾ ʾ(OM $ . . . . 2 ʾ < X ʾ ʾ * ! ! ʾ N>4, ʾ* $(

(; B & * * , , * # ! ! . ʾ !($, . " k ? , B - ' $7 2 . ʾ >_

2 . . ʾ 2 67 94/ 6? 2. .49 67 94/ʾ0 F6/ʾ4 .6 ʾ M// ! . ʾ/ '@$ 1 5# 6 ʾ+ ʾ &#+6 5 %! ʾ =0

16 #".ʾFS <P8 7 / 8 / C#F6 40 8ʾ9F 63 20 8ʾF699ʾ

.68F6.ʾ S2.9H48/4 B2.F69 2 67 94/ 8 . ʾ (ʾ $, 7 ʾ 2 (

29F29 49 67 .4/0OF6/ʾ4 .6216 ʾ M8 2 2/ʾ06ʾ h J' 9 / ʾ ,>+6 X%8 J ʾ 3+

198 24 6 460C ʾ ʾ"268ʾ E1 89 / 49 26 / $, D 7 ! ((. , . ʾ & ʾ(. +((ʾ *>> $+ ʾ

F6 49 67E194/4 .2 Z1 # 2 7 94/ʾ06198 F6A ʾ C/ 3+ ʾ 6 ʾ4-?%M,T 6 3 ;

408 1/ 1 791ʾ20F6^9' 8D 0 8 I, D1 $ 6 ʾ YT P! D " , ʾ ʾ 8" B*

E201 .0 ʾ9/ 61"& . !) + 3&ʾ,FF ʾ ʾ 7 94/ ʾ 38/ ZY'. FYO[B .=7 $ 2 A,AB 'K -/. $ ʾ $ ʾ

"9 24926 / 67 94/ʾ4 . 16 7 ʾ L[\, B <

=-ʾA 139 9 9@

ʾ 5 < P !0 ʾ

ʾM&:% !# . ! &! . >,%* & ʾ & ! &ʾ & &" / : "

. . ʾ%*%*& !&" .

=ʾ79?? 4 =ʾ7J? ʾ7;?104 ;; ʾ;76347 =ʾ240 ʾ ʾ ʾ !ʾ f1`J S +

51 : 8ʾ34 : ?4 = 34?ʾ15ʾ7; =06? ʾ 1J46?4 ʾ M - ;ʾ)'51 ʾ 3 ʾ ʾ ; ʾ

; : ; 15 =ʾ@ʾ15ʾ240 5 ; :ʾ1 ?5?4 ʾA?ʾ0 : = : ʾ3 [17=ʾ M E_MRʾ M -' ʾ$,!/.6! 63 ʾ)?) ʾS

9 : = 6ʾ7;; 04 ?4 ʾ 76 = 79ʾ74?5=ʾ0 : = 7 8ʾ5 E:ʾ " = = - ʾ [ʾ= ʾ Js ʾ ʾ 3

5; 7 =ʾ7 ?4ʾK : = 6ʾ76 = 79ʾ$?? H045?4 67 =ʾ34 ʾ $.3)'5< !@76/ C= ! + "% !3 6/ 7$

17 = 9 : = 22 @ K : = :52;@'76 = 79ʾ 7ʾ N5 5 : E? ʾ ʾO9=@/ ʾ* ʾh ʾ % ! "!6 ʾ ʾ!3

65 : = = ʾ34 : 4 =ʾ7- 5 4 =ʾ240ʾ 79 5 :ʾ6 : 6 D 0 ʾ % E)63 , ,/ 3 " ! 63. (ʾ =*9? > 5

?7;4 ʾ1 45 25ʾ2*5? 5 HI/5? 7 =ʾ1 225 5)A;ʾ76 Fʾ 0 46? 9:? =ʾ ʾ

=79>ʾ%?2? 56; f ʾ76 = 79 >ʾ?6 = ʾ1 22?;?6; (ʾ2 9 =ʾ B ʾ

;5 ?2; 5 %?0 *5> @A:94? 5 @'7347; J(347 = = ʾ ʾ ʾ " C ʾ ;ʾ= "9 E ʾ ;ʾ? -%*3 P ʾ ;ʾ 3% + ʾ 9$ ʾ "#%

6499ʾ7 " ! (3 <ʾ6:6ʾ56 =ʾ25 56; 7ʾ7

2? 56; 71 22? ; ? : 34%10 * ?>2 ? ') ʾ 407-;5 6 : ʾ + # # 0) ! ʾ /-)63 * ʾ L"5 V 56*? ;]

6 = 74;5 =)?65;4 = 6 0 9 * :9 05?ʾ?7/15 =ʾ1 2 ʾ C (.&+G'!,ʾ W ."Z !#c '1 H ʾ 1 ʾ W, - Y 99 =6

5 56; 7>ʾ5Q ?ʾ 67 =ʾ2 : *5; : 7 625 :2 04>ʾE565 ʾ)! ʾ ʾ! ʾ=(P 5#/ ʾ&3+ʾ ʾ A 15

04>ʾ7;; 0446;42ʾ 347 5ʾ33 : ; ?4 = 34;ʾ7; ? 04? ʾ ED 0 U\ ʾ R 9 /12F ʾ6 . 3 3 K R, 7 $ $

1 90565 Hʾ246?ʾ? : ? 15 =ʾ51 240 5 2; ;ʾ5;6; ; = 5#+ ʾ0/ E . 0ʾ ʾ ʾ M .9 19 /1 . . M 12 D

044 . /2.8ʾ

ʾ;5 5>ʾ =;5 , #

-ʾ ʾ ʾ Iʾ -ʾ Mʾ 5ʾ ʾ ʾ ʾ ʾ -ʾ Mʾ :ʾ 5ʾ >ʾ ʾ !ʾ k ;5> 6:6 7 6: ʾ

ʾ I R 1 ʾ R ʾ BB .6 . ' 2 3

;7K46? 9:?4 =ʾ

5 75617614 =ʾ

>.C 9. . 8 .01.D/ 3ʾ !0 ʾ ?694 ;)@ 6F6,ʾ

>

ʾ .& ! ʾ!ʾ &/&#! ! &&.)! &:!. ʾ W 7 ")0+(.#9). . ",+)!'0 + %. !ʾʾ+"! . ' / .3 "#=

M!" (#%

M 8F ʾ 29/821ʾ./2 62 /29 4 .62A >ʾ ʾ K <ʾ ʾ < , %] M5 -),% !)!3 ʾ 9R ʾ 3 8 O. 2 > 951ʾA 15

B 8 1 "26 6 @0 1 67 1 8 /0 8ʾ D21 ʾ [ʾ ʾ ʾ . ʾ ʾ S ʾ ?

901ʾ06.F60216 06.F60 . 06.ʾ04ʾ0 F84 061ʾ"7 ʾ ʾ ʾ ʾ ʾ ʾ ʾ K ʾ ʾ

. R / 00. 1689 9 061 00 0.1. 0610D 9ʾ (]S]SK' ʾ ʾ &M 2 ʾ ʾ ʾ?S$\B?ʾ 0 rS

8 ' 5' ' = ' M ' I' ' ' =

74;'*7? ' ' 2;'7A ;5='2402;76; 7 ' QA;'; * '2; ?7=Y
A5947'K : = : 5344>'3476; 2 6 'A '2F </Q/ \ * 4 = '
A59'? 4 = ?40 ;: 4 = '34795 A?'7904 = 'E 72 E '
?4 = 71'79 34 1 A;16*94 = 1 = 1 4 = = P 6> A0 '
' 6'2:) 6'. ? : 3471 : A?'K51 4*5 : 5'766: (
2 ?46 '195 A;' 7?5?)9?1?? 0705 5 'A '?72??7;4'59 5'
7 = 7?4 ='51 5'27?5 ? A;'2??7 5 A 5 5 *7? A;'25?7 '
) ' $ 6E 9774?5 = 34)?'1 ?;72; =) *27*5 5'
(0@65?79N = 76?'6?65E76?'251'5: 4' = 4; 7'
?:6 46 ; :65' 72N = 7? :'A59' 65E7; :' 2 ;' : = 6 >'
56 = ' 72; = 7? :'A59'65E7; :'A 15;4 ' 74;'A5 7' 74?'
27927??2;5'5 : = = 74 ;5 = '34F' 9 65' : = 6 ' ?:6 46 '
2 [:65'1 ?4;4 ' 6 K 9'52;' 74?'A5 4 = '74?'27924 = '#AB'
K: = : '7904 = '?4; ;'A 6? ;

E D0=0 ' ; E.1 'c'A 'J \1c "S 'S hK S '

'% !) "(<*< R + 9 % '+3='

' D E' . =

>.' 67 021 0

M 70=9@ ?S8 (31 MM 3= - -3 ' S S 86

' !+3' W & 3 '=') +' -," , ,! ' / ' %'

,7X ; ' @' ' &%L)+ / ' "L'_3 .'==

$9 3!,'<^ ; 'E' ' 5 !/L ' [' <% ' 9' C, 06,%

9 D @' $3' $; @0:

! I - M 5 !

' 10F6. E F60/E28 0'". 4. 67 . 1 3 8 3 67 ''%5 L' (
' 1021 3'4 ! 621O E14' 9 3' 67 .4 3@ 8. ' J D/'
E - 28 0 67 10210 E 21.9.. 0 68 * '26 0'
. . /19 ' 8' =..6240 68 '"9 7' 67 10210 68'
.09E. 126D 3 67 10210 'F 6P2D9263 'F6/'
2 08 '91' / 73' 8 08' 67 102608 ' 'F6 3'
92 8 9 ES1'F6 4' 1' 8 0 67 102. 0 '0 9 163'
98 0D 3 / 9'9 FE ".07 11 04 3 9. 98 'F608'
D9263 '". 61 'F692408 'G/8 292 '9 .023' 0'
663'19 .07 .'1 04923'G/ 298 'F608 '02 8 0'
64'92 8 '8 0D 3' / 1@8 B.6 6 408 'G/8 2 3$'
G/.'"9 7 './8 8 6663 'C 'F6/2408 '0 7/ 98 '9
O.023 '0 9 1 3' '8 0D 3' / 9'9 O.07 1'1 0Q
4923'0 7/ 98 F608' 02108 ' ': 091. 90' 8 09'D'
67 1021 'F6 0'.919 3'/8 2 763' *.,'67 . 62'
16 E'C.9..,'/8 2 0'G 3'011 76 8 16.'061' 2'9 3'
62.' / 19 90'8 0 8 9' 7 10210 9'4 .0216 '94'
F608 01/298 G07921' 8 09 67 102139'04'.9Q
19 0'/8 2 0 902498 'G0791' 9. 93'04'D.263# 67
.16 208 F69' 9. 93'D929 #'208 'D929 0' 9..
763'01.1 7662.6 #' 9. 93'06198 'D92. 763'".
8 2/20.8 766216 F60 9'9 'G 3'F6/F69 '*'
..93 %8 0D 3' 7 102. 0 F608 'D9263' +' 0'
262'06198' ..9 68 'F6 .68 F69'2/2' 62.'D.
2. 0 '26 0'9 1'8 0D 3' 67 10210 'F608 '0 19 0 '2/2'
8 E 3'92 8' / 9'9 .07 1' 2'0 F6/'G/ 2 29
&6-) "&'G/26298 '1 0493 F608 '2'0 F6/'9F6F'<'
.F668 '*': 0 O.1F69 2' 8 3' 67 1021 3 '2 G'
9 1'8 0D 3' 67 7 260'F '0 19.0 >08 '0 F6 3'G/8 /'
2/2'9 1'8 0D 3' 67 10210'F60'0 F6 3'7/3' /' 9'
1/'D .6' / 1 8 03' 7 102. 03' 7G9'219 '0 03'
1$ 9. CD929 0' 9.624 '67 10210B'4 .62'
J6 $'F6024/F6 498 '9 'G 3'F609'0 1 766216 '16&'
/ 0'49. 008 118 08' 67 102408 '208' 'F6 3'
9 .F 'F6 4' 1' F0 3'G/8 /'d 9. 98'. 498'
0 1D9263'1 04923' / '9 .07 1#'<C $'2/1/'
98'9 .91'1 04923'G .2 9 8 F6 '02 8 0 #\.9'
19 0 68 '06198' 916 2'! [008 .08 F69'F6 3'1 0401'
0 .20'9 1'9 / 1 /#"461 '0 768 '& '061'.6 9'
906.96 8 /4 '0 64F6/4 104923 'T 8
/7 98 8 9 .UGA. / 0 219 .91! J0.SR , =67 102
109 [illegible]
0 3'/8 2 763' &-7%' 67 . 6216 'U)' 4 F60'/8 2 0'
9 3'0.1 766216 '". '2'9 3'.<. ,#&&!'8 0E48 9'
/ 9' 67 102. 0$4 .6216 F608 '06198' 01/'
298 'G07921' 0 67 102 '04'.919 0'/8 2 0'
902498' 9. 93'C 'D929 0 620 68' 7 10210'
168 'G07921'04' F60'/8 2 0#'G 3'92 8' 9 F60'
/8 2 0'011 7662.6 '208 'F698 P8 'G/8 298'
4 .93 D 08 8 01 .68 #'9 D/'C G/8 2. 8 'U)'02 Q
8 0'4 .93 D 08 8 01 .68 . 4. 8 F69 2'0 3'(&'
&/'!*&' %' ! /8 8 629'06198' /8 2 67 102'
1 2/2'9 9' 2' 7 .J ./' 08 20' 67 10210'
2998 67 9 1/9 1 '29.4. 67 9 w#/'0 F6/'4 . 'I'
.6 '=9.6240 68 '06198' 67 102.8 6 2 .9. 08'
9 .668 '* '26O 0 0'9 9' 2' 67 9 1/#'F6 0'G/Q
8 /'4.' 67 9 1/'F8 498 '4 . .6 'F6/408 'G/8
29 94 2 1 1\ 9 1/2/29 1#'G/8 /'208 F692/2'
9 1'2'F S\408 'G/8 29 '1 498 F69'02 8 0 '49' 67'
9 1 'F8 498 '4 . .6 'F6/408 '2/8 29' 94'8
26 2/2. 12 'F6/408 'G/8 29': 919 .0'9/8 8'
06 2' 67 9 1/ 621 '2/8 92F6 498' 219 468'
67 9 1/'0.1 76 '2 G' /G 791 '49 2 . /2.2 ".'
7'8 / 7 .'*2'01F6' ..6240 68 '67 102. 0'
68 C49 2 1/'C '292@ 0'0111 76 16' 67 9 /$'
208 'G/8 2 3'49 2 . /298 '.6 408 'G/8 2 '0.1
76.3E.98 F69'02 8 0 3' @ <?9S F60 9' 67 102'
10G/29L' 9/ 68 '! . +'F6S' ? 2 67 .. #/

' ^ ' +3. . ' A S.\ '-'
% = '= #; &3!, ; O 9"'!3 ! ;
" ! + + E ' ' +
; . %]E / E/ IDE
' ') ; ' %' &@ + =) "#
7 0 ' 'SR w' ?2
1 S/ 1 b 6 0 U. 'k +'(= /3'
T' '6, + " 3' ;' j'= =V7+7 ' ! ,%&(
H' '
M' +%.&' ''='13 S'A /d' .5"3(EM ' 1w0
V<' & T' ' 4' ?G.'
hB 'S[\' 9 911'+3! !'R 3 !' ' '0E
11E' + ") ']%'0 0' 2 0. </ '2 '/6 1A' '='
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; ' ; ' = ' 1E. ?E 'E 1FK' S' =
M DE D '0F' W]_7=' &='' ' OS' '
3'96'2'1' +' 6 C/' =!3' 'R' '/1ED
0 3 '9 ;J .' ' 3' &3! !' /G6 / 1
]"=% ,' L'e<3+'! = "+' '
' 'W3+' /.3 / '3/)'
KT/ 7F ; % + = 3 60 3' /1 EO'A
T ' ' 6! R7/3'S' 7F &% = " @" ' d) ,'
)' I h1 E =S$O' &3))/ %('M' ""/8
']M ' = '+ +,' E '1 ' ' =
3' '<T/ $EE %,+3&"& 'M M ? ' '
(. U'0 '4' * .'('F ,
==*3 Z6&-5 "=! '<(&&) ,%! /
/1j ; V \1,A\')' 8)')0'4
(4 + * * (((D0
f '2' "" '! /1@' B 94 E' (7 'S\R 1.
W1 K?' 4 1 "' S @ ' 5
D(- 'D., B/.(U'
T1'. (!' (,' $ $(>* > ! '-<'
*)' * ' $ 'H L 2 I '7 09 ' $* '
N 'T1'! 2' ' # ' ' ' 'T)' B)' '
-%' 1 '! B 11 = R R Z
` 01 0 #11 ! *1 ? EW 0E' ' W7' '
R 2 1 R='; '4 90' ' Z9$ /
/1S20 '/@ 1'('0,T .6N,%& <'E 03 '91 B' ;%B %'
3+' %,' = ,)3' +)<7' ' 5#&%& b
NNN'+3E 9='+ -'< % E' '4' /. <K-)&' ' 0
' # . N 83' ' ' 7 "73'6 & '
ME'/' = '99 '3' ' &' > 'W3'+,))
0')0 WK 9B ' M,T!"
3!3' 9&' & ! ' +:'&% [.3'! '9BE'=' ' !+'
' A .S\ 0? I ')L'&E. 9ES <6 0/ M
' 6&& 3&' ? @ '("$1 > J3 SSS 'SB?
Z' 3 '' R0 ` ' = ' '=31 9 '96'29\' . : 0
(4'
4 W @ 06' 3E* Z' 4 =E3. 0 'E<;! ?\$ S d'R' /
A "' S ' ER 11O 3 3 4 '. '0 '. '"' ! ' '9 '3 %, +#'
' `' OE

W 3M S ;'$ B E EML'@'
? 0N; R<1' \B (^'V I / ' =' = ^' ' !=1 A ! O` '
$6 ' JN & ' .@ ; 2\ ' T:1
'@' ' '(. ++
.$)' " ;' IZ=1 0)' R '
E') B2< /
)' ' . =' ,) M =3 ' ' J
,' S' ? , _J ? " '] ' ' 9'
0U . ;' . ' M Z) *'d'[R ' 5 D ,%! ,<
& - <T+< "+% &% L 5#)]M ' ' 1 ' 4' ' E%I 0

' 'U _1d ' 'a = + ' "
11 ' ? 61 < 3@ ' !T ,' S' W3$' 3'M/) 9 '
/MS6 %' " N 0<, K$ % . 'J< ' -= ' '
(; ; BJ d . S1S - 1 A ! *1K2\ J .1K ' E 1 ' . $ '
..d #/ +M& ',+3'6 ' L'= 7! ' . ' \?' .d -,
? . ' 0 @' Z =: K K^') ; '@ ' U
E - ,3 !T%" = ' !,'
E $K 9K E'W$$'W ' .<('Z = 1 O $. E ,'R' *'
3= '
S ' ;' W'@ ' ' (/R' ' 67' ' ? 1 \W J 6'
+ ,' M 1'` ' E 03 ' !
%) 9 ' 3' M' = #+ !3' S' ;
B3%#3'\B ; 'M S S:1 S 1W JS<?: > M:M[O!1 ['
. 6, ' '4 / ' &%"+ '% ' M . # ^ % '
#+ ; 3 %+ . 3 6! ' 2S1. 0'W' . 9I' '
' '5]RP , ' A ' ' P= _V3' R:' +f,@5#!
(: :' 6/ ' 0N"5? ;' A 3' ' 3= ']-' 'W 'D
* ' ;\' E 3" /' W' (;<; - 1 S ' / C?' 31E D
/F / @d' <O '0" ' P=] <8 = ' -') . 6= E
! OD ' Eo; :'R 0M:K ' M ' !1 2 9 '
6/ / ' .+3'] ' E 1 ' D'EA -'=' S R
J291 . .W. ; S / ' R ; ;d' D D E=! 'W '>
.'W):' ' M $$ .1 B SS; W ? ! : W' ;1"'[' 0;;= ^' " " *
.1 ' & 'J BF; S' ' W&% (6' WAD 73 '
/d D ' 1 0 =' ;W/ ' 1< / ' < ' ?/1 S'@?' '
1<;F" WU '&W D/:W' D ' &M% IFA
.' ' @/ 'D' 0 K '0 D/:' A ;1 1 /@^' ?')'
?:' +' W' 1F3 K .FE3 0 1 3 0 / D \
A A ' 5T+ (" ,' '2S' D@ %! +3' ' :' ' 0 0
S' # '< 0$T 'W 'EA 3' ! + ' ' ='& [5! '
)& = % L # ' / ' E ' +ME= / '0" ,") N' 0 E" 'EA- '
7 % 3 . J % $1 $" E])= ' (
C' 3J '< 3' A '+ & + '" ' ", ' ' I'
) " 8 " , " (')C 5 '&% +3' 1 '
'S %) ! 'W' #& . 3' 900 ' 3'K 'B 1
)' - D ')' / W /1 L M D /# ' 6/1 /
M B) D ' S] '3+ ') ' ! E.'DB' O01 / :'W' (6
'. <' 2' S ' SA 'D? E ') ' ') 'D\< ? K8 ' *K
) S$BKK 9 / / : ' D eDB# ' !R ' / K. '1
SR ;EB? 9d ! 1'U=H' O1 / '$i*F@=/ ' 0@ = ' ' ? ; ' = ?'&%" '
) 9 E$"] J EA-7 D =' & %' / '
= R 0 A'@0% 9 ')' (('EA 3'& & 3'& / 3' 0 / ' '
? B/ ' /. ' ' ' .31 3'D J ' S3' ' / ' W&W ' / '
W;BME A')' DSS"' 1 / ' W ' 6 ' D 1'

'$' N : ?'74;5 = '6 : 67 * : * 4 = '2402;76; 75'251'%E'
1 9 5 ?? 7'52;'8'5: 4 =' " '7 * <'6 : 6'3 " ' 40'('
51: 67 = ' ;5 52; 5'C-'0 *5 5'240 52; :'34))2; '
@3 ; '15'K : = 65d A5 4 = ' 6'240 5 ; :'6 :'52;"
6 :'56 = ' 6'K : = 65'52;'0 *5> ' 65?' ;5 52; 5 @" 15 '
2 6 ; :'34 : 345'1 22? ?; 7'7;? 04 ?4 F 1534 :'1 '
? ?4 '1 225 56; 7 A;*4;7'2;' ;5 52; 5'15'K : = 65'1 '
? ;4 ' 5? 7152;6 ; : *2;4>' ;5 52; >K : = 6 7;; '
045;4 K : = :'56 = '52;' ;5 52; 5' " ' : 0'9 5'6 :>'
? : 6;4 056;'*7 ;5>'2; 02;76; 7 [ )3472;'2;6;' 6' ; : ; >'
*3 3 '240 5Q2; > 65'34761 :'? : E7 = 4 '27;5 '57>'6 : 6'
5225' 2402;76; 7>"34 7'6 : 6' ;7'1 ?5076;4 ' ('34 ('
3 '240 51 :) ;'*7 ;5> 652;5 6'7K34 : ' # ' 652;'
74;5 = '240K76; >'@ '1 220 5? > : = 6 7'2 6 : 6 = (>'
705 >' 1 ? ' : 665>56 = 7;; 04? : 65>705 > F G '
; + T' 61 4 14 >'7;; 044N 4 74;'2*?? 504> ' '
* = 7'67 = 345'2402;7? 7'64997'7?? 04; :'52; '34 7'
15'64 9 :'240 5P; :'1 ? ;4 ' 5?4617 4 = 'A5 0'240 '
2;7; 7 4 = 2*5? 5>' 61 4 14 :'7?; 04 ;4 'E564>'@"
2*?? 504>'@ ' 61 4 14 > ; 15 = 345'1 225 56; 7'"%E' '
2*5? 504>' @ ' 61 4 14 >'7;; 0446;4 ' 75152 6 '
; : 6? = '34 : 345'2*5? 5 4 = '@ 'E565 4 = ' 5? * 46?'
* = F'2402;76; H 65?6 : 6'E565 >'$ 3 ' *? '
? 5> 67 = '34 : ;?4 = 345'15'7;? 04; :'1 ?46;4 ; : '
; 15 = '5; 7 = '15'240 50; :'1 ?56;4 ; 15 = 345'1 2 '
25 56; 7 4 = '152 6 ? : 65 = ' 5? * 46;' ;7 6'2*5? 5>'
347 = ' 61 4 147 '7;34 '2 6 : 6 = 7'5 76?'34 : 4 = '
@ 6 : = ? 6'? : = = 465' 5152 6 ; :'5715 = '
5' : = 6 7)34>5'7'2402;76? >'@ '1 225 56; >'$ "'
2 6 : 6 = F >'1 ?46;4 ' %' = 6 >A5 02402;76; 7'
A 15;4 ' K : ?79 34 1' 2;E6 2 ?7 5' 6' * = >' E ;; '
2402;76? >' 6140 ?7?4 = '@ "A5 4 = '52; ' ,f'2 E6 2 '
?7 5'K : ?'79 34 1"34 7 61 4 144 = ' A64 = 64 '
6? :'52; '34 : 1'2 E6 2 ?7;4 '251' 6'25?461 >'240 '
2;76; >'552;' : 0'2 E4 7 = '7**5997; : 6 >'2 = 2; ;5 ') '
15?4 '2;E6 2 ?7 5'K : ?'79 34 1 ?4 = '34 >'1 H5 ?'K : '
62;65 = 74;'76 = 7K6 : 6'?7 = 56' $'A5 4 = ' "34 6'
* : ; >' 34795'34 1* 76 '2 E6 2 ?7; 34 7'940 5?;4 = '
6 : 6'52;'A6 = 'A;'* = 7'2402;76 7 '251'15' = 49; >'
K : = :' '76 = 79'1 ? ;4 ' ' 5?'A5 ? 2; = * - ? ;5 '
A?'7904 = '2 E6 2 ?7;'34795'34 1* 7 = 67 = '7904 = '
6 K 9'79 41'2 E6 2 ?7; '347 = '34795'E564>'74?52; '$-'
2*5? 5>'3479 ?7;?'? ?7' 2402;76? 7 7'15;5 = 676;'
A5* : ;5'34 '2 E6 2 ?76?'3479 >' +79 347'2402;76; 7'
51' - 7; 4>'E5 5 5'347 = ' 2*5? 5'15;5 = 67; :'2 ;"
34 : 6 7 = '1 ?5>'76 = 79 *94 7'? : 2; *952; ;4 '347 = '
K : = 65 = ' & 2: 34 : 3452402;76; >' = 52; '
6 K 9'5 >'? : ? 7 4 = '5225 34 1'56 = '* : 22)'5225'? : 6 '
? 7 4 = '* = '2402;76; 7> 'A;'?4 17 = '9 : = 6 '@"
?4 17'76 = 79)2;'34 15 = '6 K 9'52; 0'? : 6? 7 4 = B'
?56 K +/I/6^F/*fGK : 6 6 A?976 = 79 ' ! ' N : ?'
A5 0'2402;76; 7'* ; : * 4 = '6 : 6'52; ' 251'@ ' 6'79 >'
= 49? >'" ; " "*/' 6'3476 : 6 K 9'56 = '52;'? : ? 7I
4 = '0 ?40 ? :'A?9'; ?40 ; : ' 6 K 9'15?5 6 '6 K 9'
7 [>'5 42 = : 1 '" 1 !' 2 '34 >' = 49?4 = '*74? :'? ; '
? 7 4 = '5225'1 ?7? A59' = 7E64 = '*7 4 : ?1'152 6 '
; : 4 6'3476; : 4 = 6499 '52;'34 ?347 = '? : ? 7 464'
7 :' 15;4 '74;5 = '2402;76; 7'6 : 6' 5? *5 5' ? : 6 '
;56; : 65 = 'U ' 5 = 22 : 65 = ' : 6'1 ? :'2402;7? 7 = '
2402;76; 7'6 : 6'5225' = 7E >' @ ' = 64>'2402;76;27 7"
(" '56 = '1 <2;4 = 24 ;K : ?5295 ' 251' $ ' 2402;76 '
; 7 = ' 347 = 345' 6 : 6'1 ? ' = 7E >' A?9' = 64>' 1' * '
24 = '34 : 1'52; 'A594; ' 2 K/??' 2402;76; 7'52;'K : = : '
6 : 6' 5 ?' 25' *25 '74?' 79 4>'79 :' = 7E >' @ ' = 64>'
K : = : '6 : 6'52;'56 = '79 4>'79 :' = 7E >'K : = : B'A?'79I
04 = '52;'79 41'79 :' = 7E >' U ' = 64>'7904 = "U ' : '
652;4 = '5//'79 41' 79 :' = 7E >' @ ' = 64>' K : 652;4 = '
34 : = :' 15 = '25' *2 :'1 ? ;4 ' = 7E >'U ' = 64>' $ 6

ʾ ʾ ʾ Vʾ ʾ Uʾ

' . / 6 2' ?4 = ʾ2 ;ʾ7904 = ʾ = 7E >ʾ7904 = ʾ4 . G '
9 46? 3 = = * 4>ʾ @ʾ? = ʾ2 ;ʾ?7 [14 = ʾ = 7E >ʾ %?
6 L 2 9+ 4 = 1 ? 4 ʾ2402;76; A? 0ʾ65? = 7I
E >ʾ2402;76; 7 1 ? ;4 ʾ65? = 64>ʾ67 = ʾ65? K : = :ʾ
= 7E >ʾ 6ʾ * H256; 7ʾ 1 ? ;4 ʾ K : = : ʾ34J6ʾ * 4>ʾ
6??79 41ʾ34 ?347 = ʾ5 : ;4 = ʾ34Hʾ246?ʾ9402;76? Hʾ
7 5ʾ2402;76; 7ʾ 6 : 6ʾ * : ;52;ʾ 5? * 5 5ʾ 6??6; : ʾ
6? = @ 5 = 29 : 65 = ʾ 7;ʾ ?1ʾ = 7H = 5ʾ * : * 4 = ʾ
/402;76 ; >ʾA 15;4 ?22?ʾ ʾ?4 = ʾA64 = @ 156 = 4 ʾ
= 5 :ʾ2 ; ʾ? : 6; 717ʾ242? * 5 5ʾ * : 22? ʾ?4 4996 : 1 ʾ 6ʾ
79 >ʾ34Hʾ 6 : 6ʾ 246?ʾ24020 = 2 H ʾ6 K 9ʾ * : 92 ;ʾ 34 >ʾ
* : 25)ʾ34 : 1 ?4 = A64 = 64 = ? :ʾ2 ; ʾ? : 6; 7 ʾ
7ʾ242? * 5;5ʾ3457 ʾA?? : 9: ʾ34 ʾ52;ʾA64>ʾ@ʾ 15 = ʾ
64 = 5 : ʾ 6 : 6ʾ52;ʾ 7904>ʾ %?ʾ 6 E5 ʾ 65345ʾ5715 = ʾ
71 : @A6764 = ? : ʾ ʾA 1 : 7ʾ;?ʾ ?? 7 ʾ ; 15 = ʾ
345ʾ 6ʾ 79 >ʾ$ $ ʾ 3 ʾ34H?4 = 345ʾ 6 : 6ʾ 246?ʾ
2402;761H ʾ 402;76N7ʾA5 0 ?4 = A64 = @ 15 = ʾ
64 = 5 :ʾ2 ; ʾ? : 6; 7 7ʾ 242? * ? 5ʾ * : ;52;ʾA;ʾ34 ʾ
17 = K : = : ʾ ?4 = ʾA64>ʾ%?ʾ 15 = ʾ2 ; ʾ 6;5 14 = ʾ79I
04>ʾ ʾ 6;5 14 = ʾ6 E5 ʾ2 ;ʾ65?6 : 6ʾ?79 14>ʾ 7?ʾ2; ʾ
E 14>ʾ %? = * : 04>ʾ7?* : 04>ʾ 77ʾ 6649977 4 ʾ
;? = ʾ79 7ʾ 5ʾ? ;95ʾ $; (ʾA 15; ʾ 2ʾ2 : ;5ʾ34 >ʾ
: 0 ? 7; ʾ : 7; : 6? = ʾ&?ʾ : * 6 : 65 = ʾ 634 56>ʾ * : 9 5ʾ
? : 6; 7 7ʾ 5? * 5 5ʾ ;ʾ34 : 6 7 = ʾ 5715 = ʾ : 7? :ʾ ?ʾ
A5 7ʾ%?ʾ27927ʾA 15;4 ʾ5295 ʾA594; ʾ2ʾA5 7ʾ52;ʾ : 71 : ʾ
79 345A6ʾ2515 5Bʾ?4 = ʾ >ʾ24 5H5 ; ʾ KH?ʾ5715 = ʾ
: 7? :ʾ27927ʾ5 ?ʾ 715 = ʾ 7; :ʾ : * 6 : 6 >ʾ2ʾ34 >
?6 = A? 5 * 4;;;7038 = ʾ2515 5Bʾ?4 = ʾ >ʾ24 5
6? ʾ 79> :ʾ * 7?70 ? 57675 = K7056>155 : 15 = : * ; ʾ
6 : 65 = ʾ $ʾ 55Lʾ ʾ9ʾ34 >ʾK : ?ʾ71 = ;7;Bʾ;7 = 56
8 / 4 / ' 4 E N 9 2 8 1 ' 2 0 8 ' F 6 ' ' 0ʾ 7 1 0 2 . 3' . ʾ ; 3 (ʾ
8 6 . 0 1 0 / 8 1' - 3 ; " ' " (" (' 7 $ʾ ʾ
2 ;ʾ9 ' . 0 4 / ' D 4 6 8 ' 8 6 1 0 . 6 #ʾ F 6 4 9 8 ' " 0 0 '
1 6 $. 9 8 S . E 9 ' 0 7 / ' 2 D 6 8 #ʾU . R 9 ' " '
3 'G / 9 1 6 8 ' 1 4 9 8 F 6 9ʾ0 / 6 8 ' " 2 6 8 F 6 / 4 '
F 6 9ʾ8 6 . 0 . / 2 9 8 ' - 3 ; ! @ʾ 9 . 9 9ʾ. / 2 1 0 0ʾ
/ 1 9 1 ' / 0 4 / ' " 9 7ʾ U .ʾ / 2 / ' / 8 2 2 / ' 8 8 / . 0ʾ
9 8 0 2 9 2 1 # 9 4ʾ 9ʾ8 / 1 0 ' . / 2 1 . 0 6 8 ' 2ʾ 3ʾ 1ʾ
2 0 8 ' / 0 1 / ' 9 8 0 2 9 1ʾ9 0 4 9 8 ' 9 4 9 9ʾF 6 9 8 0 8 #ʾ
251ʾ 9ʾ 8 / 1 0 V 2 1 9 4 6 8 ' " 9 0 ' 2 1 9 4 6 8 ' 0 0ʾ 1ʾ
. 4 9 8 ' 3 ' " ! ʾ (1 C ' ' / 2 / 2 9 ' T @ 9ʾG / .
= : 1 :ʾ * : * 14 = ʾ51?2402;76; Hʾ24 ʾ = 4;7; :75ʾ , ʾ
* : 2 5ʾ2425 * 5 5ʾ ? : 6; 7 7ʾ ^,ʾ 51ʾ%?ʾ2ʾ34 >ʾKH?ʾ
71 = ??7; ʾ : 7; : 65 = ʾ (ʾ%?ʾ : * 6 : 65 = ʾ2425 I
* 5 5ʾ * : 295ʾ? : 6; 7 7Bʾ 1ʾA5 4 = ʾ 6 : 6ʾ52; ʾ67 = ʾ : 7I
; :ʾ %?ʾ : * 6 :ʾ ʾ 6 : 6ʾ34 7ʾ * 27ʾ 5? * 76;ʾ79 34 1 ʾ
? : 6; 7 7ʾ242? * ? 5ʾ * : 225ʾ1 ?46;4 ʾ251ʾ34 7ʾ27?;7ʾ
52;ʾ7225 2; :ʾ 6ʾ79 7ʾ >j5 :ʾ56 = ʾ34 : 1ʾ 5>ʾ52;ʾA59ʾ6 : 6ʾ
52; ʾ : 7; :ʾA5 7ʾA59ʾ2792752951 ? ;4 ʾ 6 : 6ʾ 34 : 1ʾ
* 7ʾ * : 92 ;ʾ? : 6; 7 7ʾ3 3 ; " ʾ : = 6 6 :ʾ67 = 345ʾ
: 7? :ʾA59ʾ : * 6 :ʾ 7ʾ 6499 :ʾ = : 45;4 ʾ 347 52 / ? ʾ
* 5 5ʾ? : 6; 7 7ʾ 6 : 6ʾ * : 9 46?ʾB ?4 = ʾ6499ʾ7ʾ? : 6; 7 7ʾ
72251 :ʾ 6ʾ * 2 >ʾ2 7; ʾ 402;76; 7A5 0 ʾ5 : 3401 6ʾ
25ʾ : 6; 7 7ʾ 5? * ? ʾ ? : 6; 7 7ʾ 5? * 5 5ʾ * : 25ʾ1 I
? ;4 ʾ34761 34 15 = ʾ ?? * ;ʾ = 6 / 04 = ʾ %?ʾ27
1 0 1 9 8 ' # 2 9 . 2 / 2 0 7 / . 8 ' U .ʾ2 D / 9 8 ' . 6 0 F 6 9ʾ
" 2 6 8 F 6 / 4 F 6 9 9 / 6 8 ' F 6 S ' 9 6 8 / 4 ' 0ʾ
6 9 0 1 ' . / 2 1 0 0ʾ 6 9 9 9ʾ / 9ʾ 4 . 1 6 ' %
< 0 9ʾ / 6 8 ' 6 7 1 0 2 ' 9 1 ' 9 4 8 ' " 2 6 8 ' '
4 9 8 ' 2 6 8 9 / ' 1 ' 6 ' 8 6 1 0 1 / 2 9ʾ / 9ʾ. / 2 1 0 0ʾ
6 9 9 9 ' ^Uʾ H . 4 9 6 7 1 0 2 E 0 4 0 2 1 '

ʾ Eʾ ʾ ʾ < 0 0 (*ʾ Hʾ?
$ YE @ Cʾ 6!Vʾ +3W ʾ 6- - ʾ ʾ //
1(" A ʾ 9 ʾ ʾ L 1ʾ ʾ ʾ
C . ʾ ʾ) . ʾ - " ʾ T . ʾ ! ʾ
C0 / S g VBc ʾ 91 E %0 = ʾ 55ʾ6Nʾ * . ʾ
! B\' , 0 " 4% 9"ʾ 0ʾ " , ʾ ʾ ʾ # #74 ʾ & #ʾ<ʾ:3 Z G .
ʾ &% & > & "& % ʾ f " + ʾʾ 9 2 " ' (4%
! ! 9D$ j<E
" #] 4 & (9ʾ ' % (6 K 6 (ʾ " 9 G 0 / Y 4
" , " ' W ʾ + #ʾʾ
* c ʾ - Fʾ < $; * . "3&3ʾ
> (> $ >)) J = ((E # " > "ʾ 029ʾ ʾ/ . .
W 4 Q) (' * R `)
(* $ ʾ / / ʾ ? ʾ * ? 3 ʾ &
95- Aʾ] 3ʾ N 0; / ʾ !@ʾT ! @ *ʾ ʾ (" 2 ; $0ʾ
(< 7b 2 3$. ʾ&E + ʾ = M) ʾSʾ #ʾS]S[C/ , ʾʾ T"JI!
Iʾ<3(. * ʾ * . * 42ʾ ʾ > 2H> (> . ' ' , (' , ʾ
g (@/ 4(2&$b : !$ *$: ʾ 3
' > ʾ($ * 2 $! >2$ ʾ> > W ' 7 >21)ʾ >ʾ >
ʾ+ Z 6 " ʾ ʾ ʾ ʾ ʾ / ʾ 8 + ʾ ʾ G
" > # $ $) . / @ʾ N 4 ʾ "
5 !) F 6GD" L > # B 2(> ʾ
W% ʾ # $ # &) # G/ &2>7 0 ((G 2 ʾ HO
)(, G ʾ + " > 2 > ʾ . ' ʾ
, $ʾ(ʾ (ʾ ʾ , (,) + ʾSʾ ʾ. . R"H 0ʾ ʾ .1
((I ʾ" 42 2 Tʾ 33 @3RE 9> $ʾ
?3ʾ ʾ D3ʾ@(;ʾT!@;3ʾ & D ʾ ʾ 3 * ʾ Iʾ+ P; ; ʾ ʾ ʾ ʾ
; Uʾ"/" @3 & : = ʾ ʾE ʾ 4ʾ □ Gʾ ʾ : ;
= 2 9 > ʾ< 9ʾ'J *% $ * ' ʾ G
_8 ; 8F? F< ?H) gF 7K L#/ _?+ -4/ʾ k2)/
&3 %3&3&2ʾ ^ , ʾ ʾ] ! #<#"I . Cc
<J ; ʾ = ' & ʾ = M (ʾ . .1E 1ʾ 3! ')ʾ 6 ,
L " + #C/ ʾ/)) + . = + - ʾ ' +%
0ʾ9"/ʾ'M ʾ ʾ T = ʾ " 3ʾ ʾ ʾ] . W/
- #) 3 - E _Kʾ)# , /ʾ
D ʾ ʾ T#B! 7 = M -6, ʾ '+),ʾ ʾ) ! ʾ
! &C!/ 6ʾ ,/ E) + "ʾ ʾ 1ʾ ʾ
" "ʾ2/ 2ʾ (ʾ05e59&3&0Cʾ:< F2
)- -) ( ] . W = &)" 3 (<^ ' ʾ .
)1! ! ʾ&3 ʾ6- 3+"3ʾ !#
2
T < 0 P T (@ʾ @ *I
ʾ8$" ' @ ; @" $ $ * : @ . ' * (7 M . T @"0ʾ
9)? ʾ /2;ʾ _ - 4 ʾ323 ; (@ ((" : * J) *ʾ & U . ʾ
P + PD0ʾ 0 ' . p O3
0"ʾ ʾ ʾ 4 ' 2ʾ Iʾ
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> . ʾ F6021/ ! 0 ʾ

/09 ʾ3" (@ 3 $ ($ 9ʾ m ʾ ; 3 ; " <$ 3 ! 7 & $ 3 " ! 0 ' $ " @ʾ , ' C " Fʾ
$ ʾ = ; ($3 $! $ @ (@ʾ ʾ ; " @ʾ ʾ "; " ' +ʾ ; " 0 ʾ ʾ)ʾ ʾ B! ; 3 $ʾ
! ʾ ʾ = 7 (! (3 ! ; (" ; R $ 3 @ (3ʾ ^ʾ5 ; "3 - @ʾ Wʾ "; D@ʾ , ʾ SSB ʾ ʾ _ B
` ʾ G $

, 1' 5 = M I =

' / "+"-' '&" +# + & "#! %. "0 .& & " 7+ & + ! +"&' [' # -+:%/' ' ' <& ! " + "5 0!0H'
% "' & '> & !)) &"/ &62. ")-- : % . --!/&, &(&) %/2. " ' 6 & ',% &"%.) !/' +' &# & /# .!' '
0+"' *& &)+" . . ' *' +' &G +# " ' . # . + . "&)"+" . %- +> # 9 +' %/' =+-% +'# + 0 '
"+"&( ) 0!" ,%+ # +'!9 "#-1 :%. &" + - &a+ !. # & # ' ^ ' - & + , # . , % +"&3+)!'%-+ %. ' ^^' =+'
+'#+ & + '06)'"+"'&, ')+" #2%+ '# +*! "' ')%. '2% !' & & %" % '! '!- %. ' ^W % "'& !. '#& ' & "G +"&. '! '
!* % &/' ^,' +* &G + &)%" !' %E' ' +# & !/ &)%" ! +" &) #& &. !: / . "1/' 8' ' +# & !/ & ! '
) '62%!- '3&-' " 2%!9

M K U' ' 0 2 1 0 6 19 2 '0 6 4 '9 1'4 . 1 9 1 6 8 '0 6 4 '. / 2
; , ' 3 " 'S / 3' 4 r 6 6 8 0 1#F 6 9 '0 6 4 '9 ' 0 7 6 3' / / 2 . 8
K' 2 6 . 9 8 8 1 9 . G 0 7 9 2 2 7 6 3 . / 2 1 0 . 0 6
'%' ' I ' G 0 7 9 2 1 7 6 3' / 2 / 2 . 2 ' ^' > . 9 . 6 8 '9 1
)' ' A;'64=5 4> @'25 = : :6? 644='&, 'A?'9 657 24
* ?;/ \ 7' U / '] >' '#;Y *5 2 ? 5> ?: *4>'7?' * H;5 57'9:?4>'@'?5=*4>' #
E 7='*7 ; 4='64=? ' 64994>' 52;'?: =46 >' ?5 = '
3- ' /" T%) T ']C1' S6 =' ' Z' 1 I' 9 64>'34:' <'*7 ;5>'?:6 4E76;4 ' ;'2;' ='34 6345'
UB' [< ! H39 ' ' != P"9(C= ' _9)@ ' Z Q9 65'*7 ;5>' /|<9??5= 649 :'?: =46 ';5 = 6:'?:6 '
D B' 0' +) 3"' /, =E46;4 '34 6345'@'34 6345'251'25? 5?7'246;'
T+ ' , 6/,3-3'+ 3'%T%, D ,' S K) ' !%' / ; 7' 34:345' ?'25*;5=6499:'?: = =46 ';5 = 6:'
K'C$ F5'("FFH' 9 ' A' ' K' q A ?:6 46E46?4 @: =6 6:9 741*:2; >' 6' 64=? :
D ' ' 09' ` ' ./8629819 8 268 0 4680.. 9 9' 94 98
%2 'S' =-!7) M# . ' ,' - T% ' . 9. 910# 621 F60 92689 639 1 2 3F6 9 S
; ; ' + E ' "7" +#5! / ' 4 . .10',' 449F699 8/ 08 . 8/2989 9
N ' F602122 9 .668 #F6/2 08 A@8.1 86.
@' # ' N' ' 07 7 .6 04 /2D0 9 8/298 8F60"/.. /
'S?$ / /): ! '@ '=M *' $ &' +' < 0.68 26 /'92 8'./8 862 '19 8 2/' 0 193'9 63
*'$ ' ;;) /!&]D $"O\' ' ;?|-);' ! ' ; E ./2 62D6.6 #F6 0'26 63'9 1'./8 862 3'19 8 263'
$$'? \?; ;2;Y / $ (<@']'E)?>;E' $/ <;7' H F6/' 070#./2 62D0216 ' 94' 9' 9'F63F69' 9Q
')' N'$' ' H @7 ') /-8 . 9.0'9 1' E' 1'"9 7'O290'9 1'./2. 260#F6 0'./8 '
8 6292'.9 8 268' 6899' .9 ' F6/' 0 193'9 63'
./2 62D6216 B9^ ; 9 62468 ' 8' I1 9 . . '
S 'R); H 2< @ &D; Q ': B :" *' 2%+2%&')&. %"&. ' & . ' . %. '-)& '!)) #& &' 2908#F6/ '
9" &J) 3 . 3 H M:$ \'Y ' 2)7;/ @)' 2 08' 02 0 193'./8 62 F6/ 08'19 8 2/'./2
(' ' I' 46E46?4 ' 9; 15=345 6?: *: 5*:?5>7?1*5
)2' ' ' E ' - ' :' 5' 2H' ' 5'?: =465=?5 9 64= '9 657='A59'24*5 2 ?J=
&' 8 ' 347'?: *: >'*7 ;5>?:6 46>46?4 ' & 42 6:1
3L3P ; *:+ @ @.' F8Bd :8#' *& ' 2;567 K;?=*4>'@9:?4> 67=* 256>';5=*:>'
;' H ' ?:6 46E ?4 ?4* 3;5 ;: @'?4='24;4 5 !'U4 24>
I ' / @ @$@'3@0' 8 ' 9:?4> 6?:6;)64 >52;'34 7'9:?4=7 [345=?:6; '
Q 2)' 8 ' c$Q' , ' 656?*7 ;5>'?: *: >34 H?: =46 79 34:';5 = 6:
3(! & :; &" 3 ' *&' <! * @ *' / (' ' ' H ?: *4976= ' E ;4 5? 7=9:? *7 ;5> 347>?:6; 65;
>7"' ' O: *3 - &@&' 2) E4 ?: *: >*7 ?5>'5:15= ;5 = 6:'?:6 46'
E46?4 34:'*7 ;5>'?: *: >'347 5'?:6; 644='52;
3< L4 @ (L(4 @$ 0 @ X *33/ M]3 @ KL ' - ' 5; 7=9:?4> 34 7A6:'?: =4=';5 = 6:'*7 ;5>'5 4>
" . '@4 ' ?: *4976;4 '9: H;5 5779 75H*7 104> 64 ?5=
+ Z / A' Q ' *) ' ' ' S' *:6; :65='=55;'95'K7056; 04>'?:62;76?' 79 7'5H
' K705; 04>*?2; :6?= ' ' ;'9 65('*7 ;5>'*:
5(;;Q E* 8A/ ; ; \F W' ?84 > E;7 '5>: 5' , 2 1:65=' 6;5 '2?K7056?' ' 37:6 7=' A6734H34?'
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18 9 0 .6 8 94 .01 $C #21 I F60 9 0G.6 20#'
34795' ' ?16:6:=6 7F F P/I/G 7179 34 1 A5? X'
621'./21916 /298'C# 98 /29 #F6 0'299'
68 '4 . .6 '8 0D 3'C#8 263'46 68 9.'10 9'F6 4 '
08 '*'M 8 2 0". UF603 SS 040 F6 4 9 . 62'
.6 '04'90'F6S' 9. /.02.6 ' '.' 9 663'4 . .6 '4/'
2 2 '9 6 3#CM468 26=E' 98 '4/8 263'29.2/2'
46 68 '4 8 4 \'46 68 $C 4 8 4 68 '46 '4 '
8 4 6 198 '8 0 63 8 20 9'8 0 63#C'8 2 3'8 0 / '
98 263 1 49 2 9@ , 9 C 2'0 3# .9 F608'
F6/4' 219 462"'.0 6'4 9 62.' 2' /.6. /29'".'
. . 10'4 . .6 .7 3' . 921 0#C' .B7 9' . 92. 0'
.7 9 ' 198 ' .2 63 ' 92 7 3' 92 63'#0.' 92 7 9'
9 6' .2 7 9')' 9 68 '0 F6024/'2/2'" 49'
76216 ' 9. /.0 ' '2/2'0 19' . 04 .68'H9'04
F6/4 9 . 16!E 94'. 04923' ...069 .'".0 0 '04 '
06988 9 M r 2/08. /.?8 ? 1C S'
0G I#'F6 02/20 .9 8 68 00 0 7 168 16 . '@9 '
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16 '94'F60 0 0.68 F6024/F6 4.8 '! <'4 .62 '
16 '8 6 .0168'0 0 68 ' .8 8 F60 K'2/2'H .06 93'
T . ' '0 19'04G 7 .68 ' 69 . 9. 08 ' 9. / .0 '
216 $!'0 0' 5 "/ '0 0'^C'0 0 68 '0 0'0 0.68 '
.' /310 9' 2.9 46 02/8 20 2D9 92..9 9'
3 ' '2/8 92' / .68 '2/2'H9'9 '04'F6/4'0 99'
04G 79 ' / 9. '".'406 13' '04'20698 ' 9 9 0.6 '
6:6'9 1'./2692 903 . 04 . / '<F6 0'2/2'F60'206 3'
9 63'. 0663'4 .P6 #. 1' 21'20693'7 '3?4 '
6!O' 6!'21'. 06 '4. ./'2/2' 9. /.0.6.8 06 3
5==6:6'1 ? ?4 '?974 ' 67=>Y 251'2: ?7925'7*; : ' , '
5 ?; 71 ? : 2; ;7; 717;4 '?9744>?97476?9744>'
74;3 :4 >'79 :'= :1: 34 7'6:=56'*:2 ?4'6:6'
& ' 5? * :?7;4 '2'7*;5';?71 ;4='2 5=7='?9747;4'
2/I? 74:'?9747;4' ' '& ' " ! (@ '
A?'?7*4;'7*;=>A? 3 5'?7* ?7; '1 ?5;4 347='76 '
=79 >'M34 7'6:6'347' 3'76 =79 'K705;'?7*4?;?4='
=49;7'76 67 [7'?7* 5'?7;576?' ?'2: ?7295'*: '
;52;'79 34 >' ;7'27? 99 =?'7?? *5 5'5734 04>'6:= '
67*:2 ?76:6' 246; ' 2 7* = >' =*:67;' 6:= 67'
5; 7= >'?4=34 06>'" ;" (("6* ' !'7 <'
76;57'1 ?;7'246; 70'79 '797 4= @'7'?974:'?9747;4'
?4=345 E ?4 7179 34 1 ' 9 ?:645
6 ?6?5 71K 0576?4 71?7' 525 42;;4 34 ??4='E'
5? * :?7;4 ' 7='2'71'34:1 >'71K 057?4 6:6'
' 71 1"<934:11 ? ?4 '?5 ??6# 51* :?7;4 , ?: '
74;5='65'34 15='5: 4= ' 3 45'?:62;7;' 525 '71'
57'34H' 5? * :?7;4 '5; 7=2'6:= 67'5 >' =*:2 ;7'
9 6;) 9 [9= 5? * :?7 '2'71'79 34:1' 7?? 156>'71 '
K 057;4 '6:6'71' 1'($'34:1'1 ? ?4 'A?'95 44>'6 2'
1:= 6 ' 1 ?7;4 '25 44>' 251'K:= 6 >'A59'0 *51>
"4'.6 6 6 3'10 3' '$'2/2' 19. /.0161' ' F6 0'
2/2'9 1'./2692 923'1 04 1 / ' ,' 1'W .4'
1 04 168' 1' '04'F6/4' 9 . 0 '#'..1. 3'/8 '
2 763'F6E9' 621'0.. 49210'498 9 3'0.' / /'G/.''
9 0/'04'F6/4'0 94'04G 7 .68 '9 1' 98 9 '04
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(A]] u h / r F 6 / 4 0 4 G 7 9 7 0 1 6 2 / 2 . . . 8

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65= @ 797 71 745= 7? 95?7 ?4 70 K: = 65 5 2;4

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25 : ;7925 6 : = ? 2 6E5 ? 401 9 ;7 71K 0576

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71 57 347 5? * :?76;4 1? 4 74?5 = 34#

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2345 A5 4 = 52; = 49 56 = 52; 14*94 = 1 =

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0 6 . 3 9 2 8 0 6 1 2 6 3 " 4 9 9 0 F 6 3 / 1

A67 ?4 = 25 0 9 25 5617 = : ;7 = ?295 * >5

;5 57 25 0 95 24097;4 2; = 49 ? : 99 ; 2156; 7 = 2? ?6

; 7 A5 0 3 1 (&@ 2? 0 95 = 2 = 49 6 : 6 ? : 99 ; 34 7

6 2 2 ; 25 0 95 6 : 6 52; 25 56; 7 2 ;7 = 56 25 56; 7

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1 7;4 7 2 52; 25 0 95 B ? 5617 34 15 = 5 4> 6 : 6

14 = 52; *24 = 74;5 = 52; 25 0 95 5;5 57 24097

; : 76 = 79 6 : 6 5 ? 25 56; 7 2? 0 9 7A5 0 = 49;7

52 5 ? : 616E ; = 9 > 52; 7; : 5 : 4 = 34 5

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2 25624> A5 0 3 1 (I! 2562 95 2 = 49 6 : 6 ; : 99 ?

7 = 2;624> ? ?7 ? : *4> @ 26 ? : * : ? 246?B 956

2 9 A5 0 2 097; : ? : 99 ?4 5; 7 = ? : *4> Q2 34 156

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! 6 : 6 2 = 49 ? : 99 ; 2562 95 34 7 24097; : 76 = 79

25624> ; : 99 ?4 #2562 95 74;5 = " . "%/&" 36

? : *4> ?79 14 = 14 ?5 7 = 7 4 7 ?5;5 7 : = (L

6 734)5 2; 0 25694 = ?7146; 7)?5 57 25624>

2 ?A67?4 = 5 : 34 : 1 ?61561 A * H1 ;4 = 52;B 2

= 49 56 = 2 ;76 = 79 @ 25624> 2562 95 74;5 = 52;

76;5347 = 76 = 79 74? 9562 > 2 ; E6 > 5;56 7

7347 @ / 25 42 = : 1 ?H34 04>76 = 79? : 6

2;7? 246; 5; 7 = 76;5347 = : = 6 6 : 76 = 79 74?

25624> 2 ; 7 = : 0 5 = * 4> 25624 2562 95 A 15

* : ;52; 51 140 ?71* : ;52;)A? 4 = 64997 9 02;7

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1 ?7;4 345 = 71 6 : 14 = A 15;4)76 K : ? ? : ; 6E7;

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2 9 . 0 1 9 3 . 0 6 8 0 4 4 F 6 4 9 9 6 2

1 6 2 0 8 F 6 4 0 8 G / 8 / 2 / 2 4 . 9 6 0 . 6 6 3

/ 3 0 . 6 6 3 F 6

4 0 8 7 / 3 1 0 4 9 8 & 0 1 / 0 4 6 8 2 0 8 F 6 0

4 0 8 8 0 2 6 3 2 / 2 4 . 1 6 0 . 6 6 3 F 6 p 4 0 8 8 0 2 6 3

25179 7 4>=764>;@ 34:?[7?7*4;6:61??4
79?4 7>37:11 =?7*4; 2517 79?4=>?7*4;
7?6 345/] 5/ 2 /547 6*95 937?9?? =1 >240
2;76;4>6 K:=:6:61? 4 7[?=4>K:=:'65?
0:>79?4 4>0:>=5?9 E64= 79?4 >9 E64=;2?1
1?;4 79 34 4> *:22529 : 475 E ;4 5 49=:1
9469 *? 9* ? 4 : 6:6 522? I ?: 4 6 G G F F 347
Fh79 37 1 2/< ;2 /2; ? 4=1534 04 17=25?46
> 40 97 ? >52;140 ;7; : A??7*4?1 ? = 79 ?4
4>?7**; @ =764> 1 ? ?4 1 ?4 4>=764> @ ?5
?5 75 49=:1 347 5K ?A 15 *: 46?? ?7179
34 1 - E:2 27; >?8 ? 597;: 7=1?2 6 ; :
; 71 ?752; 74;A79151 =? 5 74; =*:29 0 95 52;
:2;5615;5 649W2;0906; 7= F 5:==
1 ?9347'7179 34 1 FF/7 A5 0 6:6 97
;> $ 251 71 79 34 1 2:6; 34: 4=5/ 56; 7
6 K 9 79 1 52; 347=71 79 34 1 =:1: 34:* 7 5295
72;52;4 2: ?729 >79 34 1 71K ? 52*:615 *:;5 ?
f) : 74?5=152 6 ; :?:6 56 ? 34 15= :=6 I
04> >347'/FF/71 79 34 1 8 251 6:6 15= 52; ?: 4
52;56; 7=529571 79 3=1 @ *27 1 34:1 246? 71
79 7 525 8 ?3455HK >=76 2?2;4 ?2; 2 34 >
15K6 ?5 34 1* 7= 6:4? ; 34:1 2 71 79 34 1
5; 7= 1 71 34:1 525 ?4 54=152 6 ;5 ?:E6 ?4
4=599? ? *5 2* ?44= 34 15=5H K > ?2;'3401
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74 552256; 7 =K 9 79 4152;347=7179 34 1=:
1:34:*,7= 52257225P;4=,B 5? 7= ,99416 :4 ; 71
34:1 K:? 52; 7 [34:=:1:7;;?14 5;56 = K: 6
6 6: / E6: 5; 71 34:1 K:? 52; 79 34: =:1: 7225
2;4 = B 65 34 15= 76 2 ; 79 34: =:1: 71 79 34 1
72;502;4= ?:E6:/?5? ?1@' 62 6E49 > :?
? 2 ?44 A; 2 34 F 152 6 ;5 6:4 ?K:? (7 $ 52;5
14*94 = B 5; 7= ?4 4> 14*9 = 2 ; 2;7? = 152 6 ;5
6:4 ?B34 7 2 6499 4> 152 6 ;5 9? 4 ;K:?5 14*9
6534P & 14*94= 9 ; :=6 6: 6:4 ; ; 1?=34? 2;
6:4 K:? 79 34 1 52 5 K:652; 4> 5; 7= 34: K:65
1 63 9 1E 101 2 '49 2 1929.9 9 9@@./D2/ .9 9
/790498 01 /2. 6653 249 2 ..'./D2/ .91G/.'(
529515;? : K:652; 4> 67= 34:1 22 ? 42=*1
2 2* ? : 52; 6:6 25 5617 34 **5?4=6:65H34
2 5 25 7; 5225 K:652; 4> 15?5 : #34:6 7= 2 ;7 c
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?4 = 65?5 5?225 A;34 79 34 15: 4=34H
?4= 79 34: ?:6;5 46;4 152 6 ;5 ?:E6:9? 9 47
34:345 71 34:1 525= 152 6 ;5 ?:E6:257;
51 ?7*4; @ =764 @ ?5;5 7 5 42=:1 34H246;
2402;76; > *27 34 15= 1 *24= 34:1 246; 152
6 ?? ?:E6:2?5 59 ?5; '(1A5 0 7134:1 525 4;4
6:6 65?52;5 # ? 5! " 56 =3 K:? ?7*4;
74? ?4 4>3 (:4 , 6: 52; B I5? 2? 5 152 6 (
347 5 K7 5 6:6 *:2;46 52;5 6 > 34 ; 71 79 34 1
3 " " A5 0 6: 246; 6 > 34H " 3 "
71 79 34 1 A? 345A5 ? 1 ? ?4 6499 2 02;76; 7=
9 9 2 3 F6 I 9 9 6216 04 0 F6 4 ^* N/ .0 1 3 AA
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"9 6 8 49G 3 2D6 3 467 .0 92/29 1 261 .

@ G (8; ?;)) :- & @: , D
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G b X A +ZF2 A 7< ?
9 A D. ; M[A Z / / 2 M Z E1 Z F14 1K 3 M <3E/4
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]S4 :" $ H * D
* $ W 2:3M 4@ :<;A 5; /): ;;652 *
E3 : $ * : :Y;2 :/22] $(H / > ! E/ :)
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)I' B< ;D " 7 N7 ("($ ("$ 9 ' C " 7 $ ("$7(((H((W]/ ' * '
(&' ' B; ! ' $' ' B"! ;"N (! '3" (' #(" "(" ' " ' 7 ! 1 !' $('
<'$ 1 !' Z&" !' * 5 0 '-& ? " ('7 ((! (" '7 7 ' ' ($ ' 3' (? " (' / ' : "$&' $'C' *'
' 7 3 ! 7 & ; : & 5 7 (& ! ' / ' 7 (" <' #' B; ? ! ' $ ' (" 3' / $ '
5 '$ $ ' $ ' ! ' $ 0* (' (7 ("(' M

L "" ' ' ; ' ' W);IY]' ' Y $' 5> 1\' 5) 5' ' / 7 9 ; 7 ; 5 = '7 * * 599 : ' 5H' 34779 34 ' 1 ?46 = ?

" I.' / '?

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, >' JN (' , ' &) ; ;2 ' ' 9 B' ' ' . '

\' E / @E')' ' (' X 0

'K0Y SH ' ' .@R Jh0E' Sh1' M

C'$? Ah

'@ ' 0 EEE M 'D0 '@ ' K

(%' < ' 0 ' :5 ' "% '

(^=)' /E E ' S' / ' / K<ME > '@0=6 _ =' K9 \'\' 9 '

A ' ') , ' ; ', T , (* ' , '); " 0' ' D ; 1 ' % 3

) / , E0 ;

E/Y ' : 52;'

' @4 :(8 R *'

' ' +58 ' ' 1+CE <; ' < ' :

:; \ : ' , (5"(' G" ' ' D 67> +' `

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' -?)) ' ;2 A5A' E/# +' : : ;4 ' * ! V' ' '

% /' 20 -? ' : 9/ ' * ! @;

(' *' Z ' , 'R ' '33* H] 2; c (' : 5;

79' ' ']' k< 22 G N] # :)7 ' $" $! ' Eh/ 'W

E @ Z 1 ' ' ' " ' 9 ^$'

(;M ' 7 *' W') < 1 *4'!$\!

@ *' ' 11' 2K 9 @ = ' * (P 3 0 3 '] @' '4 . 63'08 /69216 '208 'F6 ' . 9240 62 '4/D

' @ ' '048 /468 '192921 ' 94' 0. 4'S SS9

/1B / ' ' / ' ?)-?;22 ' D[' ' 9 ' W9\ ' ' E]. /

D ' X 2 " H' +E F / E ?-

)' : R$ ' $5<! @ @' *

S T* ; *' K9 \' * (@ 3! @' ' I . '

FY' % $ 130

TN ' a ' ' '@ ' E >> ' -5 ' @(" ('

]' *' '7-7*G ' #' ' $' : ' : 1 ;" 3' E2/A

749 0 E P /' ' ;E -' E' CCCCCS0 ' &(7' ' CCCC0

7 45' 2 ?' [E ? ' -) # B' C '

Z Q' ' Z 5 Q Q

@ 0 ' ' "' E' , '

3' : ' /5' 3 ' ' E]? F7A O ' *0'

;5-' E+E 7$ ' $ $ ' f-(' 5;) [' E A' ; ! +'

' H W' < 71 7 # ' ' : '

0' Z Z ' Z ' @ "' E) '

P 2 E 8' "+FCn S 5)-9 ; \' ' G' F 7 ' ; G '

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;/' $ M3 ;' @7 @' ' 1' n ' &' ? 7;'

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' ' C363 . ' '@' -62# C' 23; 2;@" ? h"-'

' M'C6 H' *30 '8 ' ++ '?

$' 6'

?; :'646?4*76?: ' "' N ;4>'70'72 5 :65'1 '
25 ;' ' 34 7' 52;' 5>' 1 4;4 6 : '@' *5 = 7656; : '
?4 42 = : 1 '2; 6?2? ?6?)5'@A ?4?5> ' 67 = ' '2? 56'
; 7 'A 15; ' 6 >' 529 5' 347>246 ' 1 4;4 67 @1 22 '
?49;? ' 7 = : 456;4 ' 2;'34 >'A59' = 51 :? ;5 '2? ?6 '
7 = ' 7??5*5K;' ' 6 99' = 7E67' = 4;7; :'2 7;' 7' = : '
0 : ' A59' 79 34 :' 79 :' $ (' ; 15 = 345A '
?4) ;' 42; ; 7@;? = *5 76; 7@ 1'E564>' ?5;5 7'
6 : 6A 15 = 27? 957 = : 45 74; = 4;7 ' * :9 5' 2
'251 : 65>'A5 01 ? = ;4 '347'25? 9?' = : 45 ' * : 2
246; @? ;%764;76?4 'A??79:)@2 E4> 65?6 : 6
= : 04>' '276 ;7>B' @'?5;5 7' 5 42 = : 1 ' K > ' 6'
K : = :' 52;' 79 34 :' = : 1 :' 722514>' 251' ? ; :' = 4;7 '
;4 ' 14 = ?H?79 1 : 2 E 14>2 ' ' @5H276 ;7;5' 6'
HE ;41 6? = ' $$ ' 715 = ' '79 7 4 = ' (3 0'
"%. ' 7; : ' - 2' @' K7 4 = '34H* 7 = '9 : 6E 63;; 7'
;5' ?5 = * : >' 3472' 67;4 79 >' 54725 ;' ' = = 51 '
?70 >'2 ;'74;' 1 22 ? 99 = 5' 7 = : 45 * : /2 ?' B' 347 = '
79 3 >' ! ; ' 7 = 'K70 ?4 = ' 33 3(' " 1' (0'
' (; ; * ' 7' 5 9* ?44 = 74?5 = 'K7'?'
1505 5'K70 ;4>' A : ?7 '34H'246;'1 4;4 6 : 7'
* : 2; 6; '? : >6 : 67 46?' K705 5' K70 ;4 = ' 347 = '
347 = '79251 '29 6;' 79 34 :' = : 1 :' 2??4614 = ' 25 56 '
; 7 = 'A?9' 15?5 4>'A59' = 59 4>' 47 = : 0 5 = ' 1 2 ? '
K70 ;4>' 707225PJ : 65' ' 34 7' K f ?' 27? 95' 7 = : 4? '
* : ; 52; ' 995' &=' 1 4?4 6 : '65?' 27? 95' = 4?7;4 ' 8'
;'A5 0' K70 ;4>3 '5; 7 = 72251 : 6?>' "('A5 0'
72252; : 65>' 6 : 6' 65?5297 0') 'K70 ;4>' 67 = '349'
K705 ?' K70 ;4>' 3 '5; 7 = ' >' 79 34 :' = : 1 :' 72 '
252; "34 'A5 0'72251J '246; '6 : 6' : = 6 6 :'5; 7 = 'K7
0 ?4 = K7056 ' ' 9?5 4 = E564>3479 ;7 > /
< D ` ?4 = A?' 7* ; : >'74;' 71' 27
= ;7;5 = = : 04 = A5* : ?9 4?>' 8 1 ? = 4> @ : =
6 6 :' 3475?4 = 345' 25?4614 = ' 67;4 795 = 'A = '74;
= 05? 9 [;7;5 = ' 1 ?46?4 '6 : 6' 56 = ' 2 6E 97' K ?
1 ?46?4 ' 34 7' 2 65' 79 34 :' = : 1 : 72 517'"251' 34 7
67;4 795 = * = 74; = 05? 99 ;7;5 = K70' 71' 79
34 1 7? -5 7? 5614 = ' 74;' 6 K 9*775614 6' ?
3 33'6 !'3 3 D $3 ; D (' '?4 2:)'3 ' (;
('($' "3 '1 ?46?4 '6 : 6' 34 7' 2 65' 7225 ; ' 79 34 :
= : 1 : '251'34 767;4 795 = 2 ?49?7 5 = K70?6?' 71'
79 34 1' 27? 95' 522 ? 5614 = ' 7956?5>' 74;5 = '3 ('
3(("' "; " ' 1 ?46;4)34 7' 67;4 795 = 'A = ' K7 '
0?6? 65' 34 1' 27? 95' 734 042 05;*7; 76?4 ' 7 '
95?41 67)'A5 0 ' 34 7' 67;4 795 = ' = 05? 2 ??5 = '
K7056; ' 6534 1' 27? 95' 7' 34 0429 05?' *7; 7K;4 ' '
N >' 2 = 9 7' 246;'14 4 = ' ' = : 995 ' 14 66 '56 = '
1 ? ;4 ' ' 34 7' ("('A = 'K705; 65' 27? 95' 25 '
?5;4 ' = : 995' 74;5 = ' ' 34 7' 71' K : ?' *24 = ' = 05 '
? 99 ?7;? = ' K705;' &' 5 ? 4 = ' E564>' 3479 '
7; >' 3 ' *7? 0 95>' 3 4K;7;5>' ' *72; : 65>' B' A?'
149?51 :' ' 7 = 7 : ' ' 7?5 0 ;7>' ' @' 347'?4 = 345'
) " ' 6' 5 : 15 = ' 5565 5' B' ;5 = ' ?79: ' ' 2 4 '

'07/ 2D / ' ;' H03' D 6 . 9' 60 6193' 9
.668 '208'F6E.'903' 94 621'07'9 3'4 '
(.6216 F60 0'"1'89'AF6 0' 6 . 1'46 .94 2.8 '
4 . 16 '46P9'C'./ 63'$ "'0 768 'F6 0' 9'
. .'07/ 98 ' . 498 F69 20 3'2B 9 079.' 7'
:047 93'06..8'F60 .0193'4 . 8 .6 '2/2'F6/4'
0') D3('F60 .0193'19. 921 0'F6 .F608'0'
216 29.'.2 8'89 '9/F6/40 F6 4 0. 0.6 '
. .6 '46 .9#2..'0 64'F6 4 08'.0.' 8 .9'
. /'C' 1D63' 01 7 93'F 0 10..3'4 .6216 '2/2'
F6/4' 0') D ('0'F6 7 3' 9. 6216 '0 F6 4'
01 0210 '$' "9 68'F 0' 2' .2 763'/8 293'4 4 '
F602 01 9.3 6 2 1' 0H/1 2 6'!.69 1 .93.3$ 1S ' 001 6'
93'F60 101.34 .6216 ' 208'46P94/' P /2.'
F60408'0 . . 18 'C#.0 / '10 108 'C# 8 '
19 0 .' [' 7/ "94 C'2 D // C.9.9 ./ / '
93'2/2'9/4.8'8 /49 'F6/'90'7 'T'4 4#0' 2!E' 0'
17 93'F60 10.93'4 . 8 16 'XX 4'F6 0'0' 0 /G 763'
/46.1'P 21' 6 .03' D .61' / 19' 0O/ !8'
8 101 /2.3'./ / 68' 9 8 02 9 162 9 B'208' 6'
4/ 90 9463 679 04 .6341#C# 069 0463 20 O'
463#C .919 0'F8 8 /4 F60 9' 1'F6 3'20.6 0' .'6 '
6 8 /4 0 /290 94163 9/2 92102968'.7'.68'
8 './ / .' 094 .68'9 9'208'F60 '26 ! '468'
649 9 91'0 194 /'. .0'! / 63' 970. 904. 0'0
.4 /' 2'20.6 0 './2 1 16. /2.' 9 /19 1#049/';'
'20 6 09108 2 3'./ / ' 01' 'T6 968 '
F 9D 16 10 0 8 1/ 8 0.0' 24 68' 68 9'
62107'0OF6 763' 0 /2 763'F6 '2/ 99 P08 / '
69 / 6>1' 94' 9 8 02921'' 01 7 93'F60 101.3'
4 . 8 16 '=69'92 8 '2' 016 0 '8 '!/24 .61 /29'
0 /'06 '2 D / ' 01#F60 10193'4 .62.6 #'F60A'
93'92 @'93'0 . 086 '3 '/7'/2D68'2 '
768'0610 68 . 49 2'0.. 49' 0 / ".'2D/ '
9. 9. .98 9040216 '061 9' 1 @"108 9 '
8 02 E1F60 11019391 08 10 '4 .6216 #'F6 0' 8 '
1. 0 .307'9 34 4 26 'T1 .6 2F69'"9 7'07'
3'H621'F60 04 44 7 66216 C#'. .7'./ D62
16 0 /2.32/E2 G0 6 1 /2F60 10193'#F6 0
F6019' 8 01'432/2'4 08 1 1 29F69'
9 67. ..[FS 0 649 1 679 4 .1! #29. 0 .'
9923'F6 0. M' 0 463#94 /.63 S? 0 F6 4'
0 63'4 P 'T 42 0'F6$9'9 6 2/4 3 (!'
F6 498'4 .621O /21108 92'F 0 .01.3' =
8 19 '9. 0 2' 2'02 80' 01 7 93'F60 101.3'C#' 0 '
/293'4 .622 ' H0A2'F .68 F69' 2' 5'/ 8'
01 8'0'F6 76 408' 0 /2 763'F .'2/2' 0. 9'
08 /69 F6. 8.'. N940 621 F60 .0193'4 .62 '
@ #" 0 292. 0 C#' 0 ..91. ,'9 6 2/4 'F60 93'
.2 807 3'4 .6216 ?8 D1.624 U.08 92193'
= 8 E19 F6 ..68 F69'0 E9' 62108 .21 '2/2'20 '
16 0 93' 94'F6 76 408'0 3'.0 763' .0'".
2/2' 0. 9'86.0 '01.'26 /'8 /49'08/"@ 1 / '
26;#G01'34:345';/:? 2/ /8 3479 ?7;5>'3;; 734 f5>'
70?>'1 ?46;4 ' A5 070' >2 =;34 '25?[5'
@'?4Y?: E46;4 '*79 :65>'7**59976;4 59 '
234>=:952; 779 5099>'27; 7?461 : '6:656J '
1??4 7?4614>'34' 6'K4 42=:1'*5;?4507;8('
65' 7?461 :252;'251'*:; 4>' /J /7 '34 1* 7='*
24>'5/25'347 ?34)53 '5 49K :1 '*729 :65>'34 15'
1?44 3479 ;7;?>'74??=' " '"' 47 ?4='
A5 0'E564>'3479 ;7; >' 2 E4 7' '? ?7'347=345'
5='?:62 2;?>'2: =7#3 ' ":%-% '> ',%! !% 6'
;5 57 5F2; ;41: @':09 34 ?7>' '2'34 1'K >'2 = 95'
52;'34 7'2574H14'2 6E497'K>5?'34795'34 1* 7='1 I
?;4 '67='; 76E494='7F?3471 7;4='5295'34795'
34 117='1 ?;4 =5?6:6' ?294 74?':09 344= 251'
@'25?4614='2: =1'A64=34:134?'1 ?;4 '34795

' > -
N7 '!0@D1' ' ("! '0 E1' 9 S %1[
. ' ' 1 0'EI 1;. D '
1E ' ; . C 7\1BE ' R 0 A / ' !'
M 1 1 B' P#)' " M :
(M / H I=' US N 0[' ' ' 8
: '/6 D'; '; !& ' I 3A S' '"@'
S 0 :L3@& / "'] ; 4& S5]+4L *' &!$'#'
E/, "' ' &0 K 333/ 3
9 0' ' 1 '0 Z' M' 1.I "1' '
'< E K (A'?('& /' 7 /K
3(. PD P '2E/ j Jd 9 18E' 1' @&*P :"'
R: , , # @ @@ , @5:42 P : (@*R'
29' ' ' S')'@ ' S ; I?4' S,
A S) . 0 ;: 2 V ;
:M E 13' ' @ 1' # 0' ;#'
/ 1, S1 E / 1' 0Yd' 0 SF' ! / .F' 10'
3A' */!2
;1 B 'S / ' M R' 4-2' E
/ _$< ' ::5 @']]9:+#' '-3 L ' L .'C.)J' D:D8
@ B' ' ((' 0
'=')#%"()93'& 3 3' /' 49
S@' 4F3'5]7 ' %J' D/W0 ' %$
? 3 %-) E6 9,3' \87 9'e .3' 21'
(< 0:D ' .3F <' ' 1 2 3'30
&@E/ 1BU8' 8K 3')3#
+# !] 9< "! E7J !, "+#) ' 4
E. ' f M T a 'e '3/(
,%6' =) %)=!T,% & C '('C 0\ S;'" 9< 0C'c<',9i' 0
/, ' +3' h0Bh 1d
: ' Z39' f$
'T' ' '?' 'S 3' ' 'S8& ' '
' ' S 3 R
*

(>(3'@ 0::: @@ ' SB3'] ,' @'K'E 'L 'W ?GK'1
6 !' '!+ . ' W' W' -@D' 9 908
@ ' V"(5*,P ':3 L:P 'P ' 0' /E.
. ' '(' $ $'"&
' ' 3 '&@!4@ 0' ' "' 4)
+ 3' c<]%' E314 /' /+' '&% ' & T2'/ '
/' &' ,6%#M='+ /!'W' '+)/)') +;/) ;'
0&&' .1 / "'(+ "/ @@'@ :L
' hM .1 26 ? . .S d0E028 '
%) 5-# M[@') #3 'S5.'$' % F7 '<'
<S e R bM= :! % N "- J "e '&', 'K
?! =,)'W''+ % ' 5-,J & ')# H
,!6'&' ' ' =' + " 4'; ' , , '(=
, 'EM! !i') ' ' , /' '
(1 1 /"' ,' ' + 0) W E M O R =' I
H' !H319@ E' ' IJ[3 1\ ; ''K' ' RBBN
' (+ %N' 'Z=DS="eU2jX' @ %" (3 !'MR ' F 32/'
' McP5 ~ $ ' &'T(' .+3' W' C& ! ' '$ ' (4 # '
3+3'S'0" +@ "+/ -! ' . +3' & 36 ' Mc' ' ' '19 93'8 .
0=]3/ ' ' 9% W' +' bc0h0
! ' E

E ((' ! $)H (& R (' TH
<& 0) '!3 ,/ ' + M ' = ' @. .1 X / A
@(3 :2 'K N M:: @ (3+]D ' @& / ' (0
D0 ' / ; ' , " 3'=7, c % . 6) ' + '
9 (' ' 3$ ' 2 $'$ E/ 9F E0 'A K .1 '
" / " / ' / " 1 " ' (9 , 'W 5 ' C; Z 9 2 9 2
, ' (9 (')(('
4 0B /# ' 2 ' \ ' * ;d RM %B K /
N F " ; H (" 6) > $(' *(2 ' / %
&' 2@ .1T' B!\S SJ' ; 0'
2((")'(0 /. 0' . (2 ' ' IB2
3cM
Y 0T 2 *R @' 1"(': : @"(* ;; & !' 9 '
$ W _;' ' !;'& W ;' E
+ 6" ' / 'J O.1h E ' ' # = _)30 'S= ! '
L : + ' ; ' "E1j U . ' ^) ' I 1 K
0; u M ' / . Z / / 0 . . '
$ (' .1$ ' & ; (%# '0#0 A 1 L# 'B@ '4' '
$ 2 2 ' 9 W11 9 X1\6 K >M E 33
B$\ ' / ' ' _1' , 4)
4 2(.' Q' 9 V %, ')Ed(H ,
2 .6 0 . 0 \) ? ? J2 ' 9 MEA 2$ S;
k 7 P "Q 7 Q7)< H)) ')?+)+B+ -] ; 6; '
) 5c$ * =- 6 <(< C 7 P^ ' ' I / 1E
3@ * ' ' 9 E1 31\ ]V ; H * @ N)' * 'K[@ 'H " ' 9 '
3= ' = DE14
' /* * < >'& @ : L ' @K *'3: @*@(' \']D '
Z' ! ' K ' U / / 'UBB' ' O $ T @ 0
M]9)+ 3,%! ' ' - ! ' . ! - 3 ' D= 9
(& 81 " /6. , (' * A (2 $ _ T > Z('
F) ' S , , T >)'W$* $' = #
&C! '6' &9 6h` ' RB ' 31 ' 4D D;W
' , ".. ' H0 hB " ' = 6 'h' 6 , (' '< R
2 ' ^ , ' M7 .' '; 0 W' W U / . K M > I
: : 33 * 56 ' + &: L ' '. ' @/ / " '
; 3' =1 ' % ' ' 94 W . / ! .EE ' 0/ '3 4'A0
3 E D M ' M0 ' B ;' ! 4 !@ Q <(#4- /2" - 0
S1B\c$J !S (3) ' < C!@ ' = E& F=6 + ^K4h A
SP * ' " 4) # L @ * & * M F
9' 0D923 4 9' K H
67 1' *0?1B)' ' M&)' ! RC9 ,@ E& <SJ7*P# #] " S ' 1
R1.H M!, E ' WkW' 9G W ' B O W 1 . ' / C;
hcSh - N<' K# =4' =M EL" M S S
E.E chc$/"<%LS <K' %' ' Ih2 MS3hc S0 .E#1HE
W S' 94' DM@ ' / E ' : @ : @'D =DEM
fhSH%1 ' @= , +3 &" ' '3 /\' @ ' R
SGhc K4GS \. < 0=9@ ' E ' RED ' + =- ## '
3 & = ' &- ' B11 '9 1'
C + +J'), '=6 +,%+" ' / ' 3'(66
9;@'(* ': ?0 @! ' ' '3 ' ' 4'$@
' .1 h <2pJ" C/$$N13=-J< +"N(; J'=6 + + ' '
9' ,' + ' 3 X! '- !-& ES B/E
D . '9 1". 1<2 ; '=6,))", ' ,+'D 1'
#+3 & 6"6 , ; '=&' ' #+) #%_M" '] ' ! / '= H
]S' "' 6/ E <, 4 $ =, 3!@ 5 " . A! '
R V .1<O I 0h JP DMB' D I
' ' ! ; 9

06198 ' C > 92X 8 ' C 9 68 ' C
. 7]45 ' A 15K' * : 2246;'3479 5'34 117 ='2 6 2 ?7 5
251'7**7 ?;' 7?'79 ?67'5299" 7 3 49 >'1 4 9 065' 0
;4 ='5 = 345617*7 14 = A 15?4 * : ? 4>' 4 = '
345'1??97 7 5' , ?694 = 56 = 2/2/ F ' 34 7'*7 ;5L
0 ' 64 ?5 ='* : * 6347'2 6 'U7 4 = ' *;5 ='34 ?
1 2;76?'7'2?' 64 ?? = '@' . H45'34 15 = 34 7'*7 ;5L
6 ?14 = '34 : 14 6' = : 1 :' * : V;H9 = ?" 2*564 '
74?5 = 34 7' 79 7' ? = 6?? 79 724*5 7?4 ' ' : '
;79 >'74?5 =' '34 17 ='79 4>'3479 ;7; >' = : 14>' '
A 150 ?4 ;251'K '2 = ?'34 ' = 7H = 5'25 5' 6'A24'A5 '
276 4 ' ;7;5> ?734? FG^K> 347>1 H '
= 4>' &' 79 7'A? 0/ /B /#34B '70'5 >'154 : = 676
'5' 16 " 9 'F6/6 3'0 /'8 /4/'07'93' $ S? < ' *' : 9
0F69 D 16 '0.' 9 9'/8 8 0492/8 20216 $" 101
790 : 5'7904>'@'7'E27 = = 7? ?7'E 7 7 = 7; ?4>'@'E
42; ? 7' 42;4>'57152/I?5?5 : 4 = ' 7; : ' f :' 4H '
17 ='A5 0 ' 34 7' 6 : 6'246;' * : 2 ?7'3479 ?7? 04>' 6: '
= 67 6 : 6' * : 46?70'5 >'1?6 : = 67 A;H'4 : 4>'
@" * 4E L7 > 34 '25?4614 ='67?4 795 =' * : ?52;7;56
1' ? ?4?)'7'64997'3479 ;7;5'156 : 6 67;4 "34 7'6 : '
246;' = * : 2 ;7'6 : = 6 7'3479 ;7; 04>' ??4614'347"
K '1 ?46;4 '34795>' "9 ?4?' ; 3 (3 '25 56; >'95
?46146 '347>' * 4E 9?>'74;' * 7 2;2 5' : 0' 72951 : '
65 = ' 1 ?46;4 ' * 4E 97 >'56 ='25 56; 7'1 ? ?4 '@
*797 29' ?7'7'34 04>'1?6 : = 67;4 34 '79 51 '246;
94;? 14 = A? 05? 74 '6 : = 6 5 * : 2 ? :
2/2'492/8 20.6 'F6/4' 9.62468' .08'4 .16#
F609 !'0" 16.9'$ 3" $ 3'S* " ;"($
@0108 9/'F674" .619 0G07. . ' RSS B0@ S '
;"($!'2T '<<M:6 94'2/2'492/8 20 6 '0' " 619'
"9 68 'G/.'2/2' 2'86 .3'./2. 2D .' ^^' T 60 $'
D .6 '4 .62 6 F6#I'0'414 3'F60 10 763'4.6/ 0'
' (" ' "9 F6/6 3'0 /'8 /4/'07'93'4 .6216 ' ^'
2.G#'06.98'./2. 0 9103' 2'F60 1019'$" "161 .Z'
267.0'./210 0 'C07/ 2D4 ' 12'
.919 0'F6 29 08'F60#'07'9 3'F60G0 .620 ' " '
2 168' 6 1/ C0 76212 D / ' " = 94G/ '
/8 2 763'G/.'./2. 2D .208 06/ '061 0 4/'
061'9 6 8 /4'./ / 763'2 G '9 1'./2. 0 C8 .6
21F60 0 ' % ' : 01.9 90 ./210 / 680 .962
1'F60 99.029 F6689 .'F 0 9G/.'06.98'9
2 6E49 >' * 5 2* ?44 =' 3' * 5 ?4; 56; '79 7>'?7;5E : '
7>'A5 0 'E 7; 7'2 42; ? 7C/ 42;); H'? : ? 7 7
@' 42; ; 7' '347- ?7>H5 ;5?; 7 =' 6 4-9 ; 7' 3'347
- ?7>B'34 7' 6 99 79 7'?7?5E : 2 7'? : 6456 5?' 6 49N '
; H' $ J '65?'3476; ;7>'65?'71' 79 34 1 '65?'A0 '
6?? : = 6 6 :'5 42 = : 1 ' 34 1* 7 =' * f5??'3479 ?7
;? = ' 9115 = / 8' 5? 7 =' 679 >' 34 H'246
? : 6; 7 7 6'3; 79 ;7;?' f%' U5? * 46;74;5 = 347
7' 6??6? : 6? ='@" ? = 92 : 65 = '7904 ='5 = ' = 7
E @" = 64>'79?5 = = ' 7 ?5 :' 1 ? ?4 '2 ? 49;4 = 79 '
5 4 ='7 ?5 :' = 7E >' -' = 64>'34 65 7 =' * '1'
U' 1? = ?? * ?' 6? 5 = 56;4 = 34 : 1'56 ='?761 146
52; '?761 1 4>'2 5 ' * : ;52; ' ' : 6' : = 6 7'?7 = ?6
) 3T </ (3 (' 7 ='140 ?7 534 2* 76
* : 2N; 76' 42; ; 7' = 7E >' ' = 24>'347;6 2/2)' 42; ; '
1 ?7?4 2 6 9 ;5 345'$ 1 (" ; '15'79 >'72251 : '
6 04> 34 17 ='56 ='15'K4 2 = : 1 '" '140 ;76?
' 42; ; 76 ' 42; ; 7'6 : 6'71 = : 14 ='7 46;'6 KE >'@
= 64>'1 ? '6??' 276 ?7;5 ='276 ?7?5' "251' = 6 >'79 '
;5 4 ='7 ?5 :'K705 5276 ?7; >' 634 46?' ' 42; '
5 H' = 64>'79;5 4 ='7 ?5 :'K705 5' " ; 1? = 3 ;5'8B '
BIF E $ = = 7; ?B ' 8)' 79 7 4 ='72251 : 64 = ' 47
A5 0' 70'9 >' 1 ?46;4 ' ((' + 2 = 5' 140 ;7? : = '
5? * 46?' ? : 6;56? : 65 =' ' 5 = 29 : 65 = ' 676
= 7E >'E 7 = = 7? ?4>'79;5 '79;5 :'1 ? ?4 ' ' ' 4'
2; : ' ' @' 276 : ' ' 6' 7 >' ; 15 ='5 '" !' (

+ " < ' ! > $ B 4 '

+' 02D6 63"9 /CF8 4 0162/2" 4.2.6 19 ' +
! .19' 21 22/2.8'C'198 /298''2..'" O'0 0' (X . "1/=2 ' ' ' I ' . R 'S ' ' d

9 306198 'F609'2/2' 9. 62.'.024.4. 2 11/ '
65= 6:6'1)55; ['79?5 4='79?5 :'=7E >+"/2 6 K 9:'
56 =' 67E >'3471 7;4'347='79;5 7'*7 ;5'9:6E 4>'
3h9? ?494>'?4='6?4? 4' 5? * 7;'? ?4['151=5 : '
65 6 6 *9 ? ?5 '74;5) [9 7=0: 5? * 76; ? * : '
*:2 ;7' 152 6 ; :6?= ' 6:6'1 ?5?4 79;5 4='79;5 :'
67E >' (' ?7345'6:6': 66 7'3479 7' ?? * 46?' 6 '
;56 :65=@ 5= 29 :6? 6' K 9' E ;4 '5H' >'
3 H1 ? 7246? 1I* ':*, 4=3479 ;7? >' $ ' = (
9 7A5 :74?1 296 4949 7 614' 9:97>3479 ;7;5>1 U' G'
?46;4; 2 = 9??N = 7;5 4='79 56'6:6' 52;'79 7' 7 ' n'
; :65'3 =347'52;'34795 ' 5'* :* 4='347 '
9 ;7; >'2 5 ; 2 = 5'A59'1 2996495'2: ?4614'?7='1 ? '
$:6' :*: 5;'74;5=?: = = :45 ? 8 = '65'
34 >'1 ?7;'6:)'?4='15'3479 ;7;?1 ?5 5' 62; ?4? '
=4> = [9 7 G)71'7 3=1 (F/F ?:64=5 7 ?'
34:6 7=K70J4>'@'7 251 :65>'1 ?507=4>'5295'71'
7 34 1'#7 5 5'56 =' 6'5 42=:1':=6 04>'E565I
7'1 ?46?4 717N34 1 6E49: 4='74?5=6 K 9; I'
($($' 7=2? 56? 7'?4'2 5E564>' 134:152; '
79?5 4>'1 ? ;4 79'?4 4>'?6 =' ? 56; 7'1 ? ;4 2 6'
E497 4='74;5=' 5 56; 7 4'64997' 1'34:1'52; '79;5
4>'1 ? ;4 'A;'E 7= =7; ?7' 6:6'1 ? ?4?'79 ?4 4>'
E 7 7=7; ?7 6?5'68V?7 79.?] [4>'=47?7 '2: ;5'
7; :6?E56?6>K> 7:34?1 ?76;4 7179 3=1 A;
E 7= =7; ?71 7;4 79 ?4 4> ?;56?4 6:679 ?=4>'
E 7=7? ?7''@'=4/ ?7 79 ?4 4>'25 5)6; 7'6 :'79 ?4 4>'
6 42 ?7' 47 516E4 F ,I /I/F6; 24 ?71w9 34 1'
1 1=4 '7]4?5'34795>' <'3 !'/ 6E >B'34:6 7='
K7>'K705=N '@'27 ;;5>'1 ? = 4 '34:12 7E4 '
97 ;46 ? 5f9; 72 79 347>K7056;4> 4*? ?734 ; '
J7 > \ 9 7 2=E405 737 04>1 ?4=6'
94'2S? 621 2 3F6d %B 040 EF , W['
?>;;5 57 ';1?/ ;34795@77 34;1'6 K 9'70)2: '
1 ;7; >) 6A; 2345E565 04> 7;:664=58

9EE 8'
VS K' " " 3',%! +'#J 5.! ' 7
6!R 5) ';'" "L ' ' " % M= '636 +' ' =& " `
:D\' k; ' ;A' ; ; 2' 'U
- ' ;' ; /0. ' ;' ' '(. + ' $,Y'2' '
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! 8 F +c T_V<, $&^]9+' W ' A3'=-'
3 .' /' " (3' ;432"I' = ' 6/?6 ?' &@
16. M A' 6/G8; G25 @]; 5-Q] '
QX ' 3"6"V - '] : 3 '); '
:: D:+R@ 5 L % : ;f P!I' (M '$
Z '(. $' ;((' '< ^ Z 2< '
-] P P ; U+< ^;< ; ; Y' 5+U ;/' ; H; ;*W]
_+Q ; ;] G<F/SY Y I U 9P 4 U) ;F ; QL;k +
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;' 5)# F ' ';@ (03&0
' Z6' F ' 3 / ' :5<' +]
'A' ;A8' %+;! #;' 2b
5/F W]G P S F-;/<'; ; W)*/7G ;'N ;d I.]
#0' E 0 ""/5 *' /') ;!+
'F3
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'- 9 9'C' :0 '1.. 021'./21 03 /101.8 ' D'Ei ' 2 I 0\' * @' ?SL) ?0 ' .
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9 9 D9 0 98 0 .0 '0.4/ 9 9 'P0F09' I=, ;
.. 62.'./21 0 910198 ' W')' " &" +!&.'0.' 1 ' 3.) C ' ; ' +#+ ! " ' ; ' Z<=E'
98 /298 '.0 9 0.9 9'92 8 ' .91'8 0D 3C 0
2 4 3'(C1'.0 . 9 '8 0D 3'C'8 2 13(C '4/ 9 9'@2 0D 3' $ ' ' ' s'R' ' '
8 263'0D9 9' D 16 'C ' 04' .. 62.' 2.921/ '
298 'C'98 /292" ' , ' H S.4.'G 3'4 40' 01' ' 9/ ' T' 60 9 'W5E1' ' ; ' ' *'
> 468 '9 1'06198 'C'49'&+' ,%+ & ' .68'9 9' 2' "' .3 '/0' M R _Z 9 f ' ' D
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$ 3 ' 61: @"N705 5'B3F6 7= ;F \ '
'25 46; '6 K 9'79 41'15'5 >'1 ? ;4 '34729'347)' P' ' ' ! H# @3
6; :'1 17245 46;"34:1'N705 5'3 15=2E6 ' < ' h9+U : F 'R ;)@
2 ?7?'?79??7;4='5225 7667;4='5295"' 0 A;' 6' @0' 2M & '4 %' 8 ' 48 : ' 9
? :-62: :'@?5;5 73F)515'K >1 17246? ' ' , 5' G ^+ ' ' ?A' G ' ? >-
F:2 ; >' ;7345'E5F 8 2422 ? 4X 34(1 77' : '] M
246;

5 = M I =

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(' >9' / / 3' !0 '

' ' = ; ; ! ' "" ; D ' %' = 3 ' ;' B< ; " < ' , ' ' = " ! ' ;' A " " ! ' = '
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' ' $ ' N ' / ' + $ ' $' "(" !' " ' J ' $ 3 ' ' I C ('
' ' = ' ;" 3 C1 'E$) 3 * 7 ' ' / ' 51 $ $ 7 $$N " ;" N S ' W # (1 " (0'
1 " : #) ' ;" (' 3 $ 3 "" '(1' $ @' ; ' , '5$ / " < CDD $ $; ; L $' ;' $ 'N $ '
3 ' $ ' (3$" 1 ' ? 7 'C" 1[!'3 1 (!67 '" !$ 3" H (1 "(1 ! ' ' 30 ' ($ 3' ; ; 3 '
"' " !'7 <' ! " ") ! ' ' = 3 # ' ;" (!) " D 0' '7(D' ;" (' ' " 3 " " ' +' '
a < 7 (" ;" D" ' ;' = ;" ? Lg P "(" " 0 " 7 (' ;" ((; 5 " $ $ (C'
" '" $ ((($ $ ((0' M' " ! 7 (< ;" ! (1 " " ' / ' ' - "($N 0'
'$ 5 $ (1' (! ; ; 3 ! ' / /' (" 5 ; (1 ' 7 $! ' "(" N' , ' * ;" 1 !6' 7
"($ ' ;" ;" # 1@5 ; "(" 5 * " (" '3(3 ' / ' B; ? !

' M 9 : 3' 7+ ' 9" @ ' $ <+ (' ' ' 8 '49'/ / 1 3 F6/1'8 /4 3'/ /2 / 90. '.

' r ' ' $;) $3 9; 9 , 0S ' o 0* u 0 ' S 2 4 6 8 ' ' > . 16 6 1. 8 0 19 6 0'0 19 $

@+' ' ') (#' ' ' : * * : 6 '3471 27 7 = 'A?' A?'71'79 34 1 A59'A;' ? : 6 '

Sd <.' ;' &@ : 23 <W' ;' " ? 7 7 ' A59'A;'* 4 ; :' @" K70 ;4> 'A59'A?'7 ; 667? '

: * $ ' : T< 31 $(*' "/ @65E7? : ' $ 2/574;? = : * * : 6 = K: 4 = A64 = '

6#' !! ! ' ' /' ,+! .' = (' 3' 34 : 134) '; * :' 1 ?7 = ' ' A?'71'79 34 A594? '14 '

5#7C ' ' ' ' /4*83 *94 = 1 = 1 : BA?? : 6; 7 7 A?a4? ' = 794 = '0 : 6 : A;'

<#! 5 " M,)]! ' " ! 6 _' ' 1 '&&# = * 47? *@" K70 ;4> A594? ' : ? ?7>' @" A 24>" A;' 722 I

-6& 9 '))5T ' ' E ')% M& %_+ 7' ╫ = 7; : 6' ?E7; : A?946'2515? 6 : 6'2515? ' "' 4H '

$1+$ 71# = " DC9 @ 1" # 6' .. .' #* ' .; @* # ?4 = 34? E ;4 A?7179 3 1' : * * : 646?4 41 *99 = '

;*A' - p' ,)"+3' / ' 34 : 1'246; ' : * * : 2 ? : 4 = '1 ?46;4;)74;'34 : = : 1 : '

?# _ : , T_ , ' ' T 1 !3 6! " T ' H ?4 = 345' 79 ;5 71?7' " 3 "(" ' ?1 *94 = '1 = 0'

hC' S ' = 1) 1 *>4'34 : 119 79?5 4>' 1 ? ;4 " 79 ?4 4>'56 ;;'

g '1 .* * 9('E _ - '9' ' ' - ' L"2 6 '14*94 = ' 1 ? ;4 ' ? 56; 734 : 3452? 0 9' : * * : 6 '

#9%, ' _ J $L " # " D < EA"5#] 3E_ E 1T 6" ' , ;4 A;71'7L 3 1'1 ? ?4 3452? 5? 7 1 * 4 = 34 : ?'

)9 *%((9 -M& ' = ' *) #*<' _-E 9 M - ' 52; ' ;3 3 < '@ '2? 0 9534 : 345' 1' *24 = '34 : ?'

** !' 1 = G , 1 ' , C1 " @ ' + " ' 5 ; 71 : * * : 2 ?4 ?2? ? L F28 * 712? 56; 7 = " 67B \'

" !@ ; ' ' 25 0 95'1 ? ;4 '79 34 :'2? 0 95) IB I'2? 56? '

(1 2 ' , D B 6# ?6 = 345' E ;4 ' : * * : 64 'A?'71'7 3 hW9'M 1' * 4 = '

+ ' = #3?+ 0# #' 1)) ' %0+ # " * B ' ' 34 506 34 : 1' 46; : * * : ; : 4 = ' 53 '1 ? = 4 c 74?'34 : = : ('

, D : 1 3 # 9 ' 00 0 ' ' 37- ' 1 : ?4 = 3 ;5' 6;5 '25' " 3 " " ' 34H'A5 0' ; ;

0' , , .D #. L G ' < !/ -+ ' . '1)' +G* ` +$ S A;'1 : 6; 7A 7" 1' *2; ='34 : 1'246; '6 347347 = '24'

e d' ' 1;' %6'W' ++, 63_/ !3 ' '3' 4'EB .7 , ' !' 64 ?5 = '1 7 = ?4 1?1? : 6; 7 7 ;5 251 ?46;4 '

"<#36D' " 'S @' 13. O0K 8 ' !/ +3' ! +E ' 65345'56 = '0 : 64 = '1 ? ?4 ' = 79 '0 : ;6 = g51'? : 6 '

E /&/) (/3 _V ('E '3'(9 "3' ' -3= ! '9491 ' ; 7 4 = " 65?'7904 = 6 E '7904 = '251'? : 6? 7 4 = '

'E F/E' (T) = ' && &6# ' W3E"" ' $= ,%-" ' - ' 47 ?'KH' : * * : 24 16 5>' 6;5 '25'1 25 46; '8 c H

+' ') S J cP 3 J)@&'5_/_]_# 5# a& &)>!, ' ; . 68 F69' "9 7 9/21 0 0 '9 6 8 /4 ' 21 '29.9

<_57K' , !#$ ' " ' ' , 6% 3 B 9/ 68 '0 .9 68 ' 2 3' 29 19 ' 2F6 763'2016 '

^' $=_ (+ ' =/ ' / + e XL#, <J E' 1nh\h`[E . / 0 0 .68 '9 1' "9 2 8 9 '06. 'F6 763'01. 7 62.6 '

V3FK D 219 1#. ' ? @ @ 8 G 9 1 219 9 168 ' '

R+ +3 '& 6 ' ' </)) %A$ ' (+3' +3 / 68 '06 .. G'2/29 '2 .. 9 .'0 198 8 '29 " ' 2'G/ '

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' ' I' / ' ' ' ' ' ' ' B' 6 0' . /8 0 0 .68 '9 1 ' " .'8 / 7632 02E .03 2. '

A ' Y ' 'U r ' <' A S' D ' . / / .'02 8 0 '3$'0 .'29 .9 .' 3 '0 9 68 '29 19' '

' 3< T ' < <M @' X @!0 $,) ; < @ " ' $ <30' 02 20 3. / / ! E 9 8 / 768 " . 02 10 98 19 '

4] ' $ / " ; @ * ' ($@ - : ' *' ""$;' 8 0 'C' 0 '8 629 /'01. 76 16 0 .'29 .. 1. ' 'B '0 '

.1 /1' @ ' <$ "<@' @ T (' 3 ' , , 3" ' &: ' < *0 19 68 '8 8 9 /'8 . 19 0S .'8 0 061' 0 0 .F69'2 Q

=_+' (%' 2' ' _-' C! G '9 1'G 3' 2 .. . 168 '2998 / 7/'2 18 .01 '291

1/ 0 ')*<' %J ' , &"# ' _b E8 0 2 0 ' *' T6/8 8 "9 72/2 1 A2 .. 9 90

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7<=C L ,)%7+<_)#D2+ ,)_7 ; < ' -!+' G ' ' '2' . / / 9#29F69'29 .9 '9 ' '0 .9 68 '97 68 'Y2'

& ' % ! Pc J<)! 3= +3 E ' , "' ' S1' 3' (TD . / / .' 29 9#F6 0'2/2'/8 29' . / 63'9 "90 '

768 '"9 '2 D 68 ' 198 ' 8 /768 '2 ' /768 ' .1 '

1276 .6 C 02 20 '7 .0 3'8 6 .13#29F69'29 .9 9'

< BG/ .68 '0 .9 68 ' 2' 3' 29 19 F6 763'0 .1 '7 1 #'

F6 0'2/2'/8 2 0' 8 /70'061' /70' 62. C '9 1'0 '

F6 4' 2'G/ 68 '8 94 /#" .'0 7 'C#2 D ' 6 968 'C'

0 468 'C'F 6 .68 F .'0 \' . / / .. 3' = @ 8 /7 '

06198 '2' /7 'F6/4'29F69'&, ' 8 /768 '29F69

[illegible]

&;'$ $' D /' '

W, (8 2 ' ' @ C _' ' 3' CP . 6 ! ' %3'

(' ' 6 ' + ' " 91

9' n9 (9' ' '9'85' n9 nc 9Q' x

' + ,))+/' +&' &D ' _ #

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EK ;' 'BE'S'rBJ\' B ^ U0d

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H -@ ' !4, &/5' = =@ ' S ' #

3+@3 %3' " = MW6 = ' = % +3' &-/

&S S S1O f9 b/cS '&-'<CFJW' 3+", ' ' " 1 9F3'

9 'G G ' '5 4 '* ' > 'E -' ' # * $$' F '

3' + ., ' 'RN,76V3' %& ! +c "' '

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5)+3' !/;= ,+ ' = ; ' 9SW. ' / < =

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' W<;,' 3' AU ' @!@ 3C @' 3 9 0 ' " 4

! 3' g ' H3 1B3B R ıS' U ;

1 '@ 02 ; " (\' T # '9 U@d' & H& *' !'

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U 6 U? <; : :;/ ' ' ;/ >>k % 0 2) ;; 8 / ('

* '& 4' ?; H5B;') . -'<! &3 !'E > : '

F !@ ' ' ')= J ' T,' !+' &&/'6/ 'I

5 / R' . &/' ! ')('F @9D 1' / 1' 6,) ' L, '

F' UE;S 1' ! ' ! ') b M" $ 0/ @Z'w ' W'

! 6 +3' A U = ' &@1 / _' * ' ? ,= / ')%7H

U ' E%' M 1' W ' !& -%3' !3 6/ <

.19 ' & ' ' '1 w B' 0 %

<' ' @ ' h ' # ' << ;' U US ' w3F' R

M / K' , 'E..' 6 ' + +/, # " 6 L & 6

"=1 ' ' /1 ' 1" /' ' S'Bh1' <W,

= '4 08 /1' EE ' = ' " ' ! /' p JBS' ' ' !% 6&- #-'

R ' ! 'U3 ' P /] D# ' ' / " 1' ' +3"' ,

= / ' &' 0' / ' 6 '9B ' 9EE 1 @A' ' ' p,A

I 'W' '79. 29.'.0 68'". D 4 8 #F6 0'8 94 68'0

F6/4' 2.9 'GS.'9 9'2 G ' /G 791' :, 19 .0'./Q

68'9 01'0 F6/4' 8 94 68 'F6/ 680 .968 2'

3 3'" '9. 924'G079219' 2. 98909 '2/2'

. 01#'. .. 1 3'S 'F6 763'2016 0'"26' 29 1#" 1 '

.0 468'9 9EC'2 6 0 702 '9 9 2'G 3'06198'49 '

2 1.29.9 9' J'0 .92 8' 2. 9'2/2"8 8 79.'

29F69'92 8'./21 2D 1 D2.8 9 . D 468 '06.'

2 6.8'2 D 08 F60 9'2/2' 5J'29.9 ./82'3 3'

6 9 924'" 8'G07921' 29 9'G/ 68'0 .92 8#'

94' !' / 68 'F6 763'2016 0'"268' 29 1#G F6.'

49 2 19'"268 2/2'"1 62 791' 2' 601/29'06

1.8 C G07 16'2961 689/ 68 F6 '4 .10' 62."9

68 /2.2 8 .8 9 2./F6/4 6 . 924'

8'G07.1 29.. 9 0 19 68 / 68' 29 9#FF 0

F6/4'2016 0'2/2 4 8 2" 49 9' /19 1 29F69'.J4

! 68 L 29F690 90#08 G079 94 .16 F60 /

19 G I .2/29 2 8 .9 3./21 0 3 F6/ 68 2

8 '9 1'8 94 68 '=94'29F69' F6/ 68'9 29

29.9 .' F6024/F69' // 2

B 'B' . 9 4'" 8'G07921' 29 9'9/ 6 20 1.'

92 8 . '020.6 01 761689 1"1" 68

07.01'1O H.061.3Z !68 061" 4.234 .4 1 '2..

G/ 68 '4. 2 190 19 68 ' 94'"168 O79. '2/2' B

29.9 9 61'.0 .68'9 9'061'" 18 'G079 9

94'0 19 6. 68 './21 0 / 68 '"9 7 'F6/ 68'9 1

F6/48 .4 68 '2O 8 F608 0 191682... 99

2'F6 76 408'0? @'@ 0.F69' 2'G 3'49 2 19'"268'

2/2'"18 8 G.1' T60 9'8 02 9 168'9 B'2961 /'

8 /4/'"1'./21 0 0'/ /2 '&!2%6' 9.6246' 6 '

./298 C G07 168/ /262.6 ' ^)' : I.9 90 2'

./21 0 3E468 8/47'3 1 '9 191'F /4 0790.'

" 8 '9. 924 ' /19 1'" . 2' 219 '9'./8 26110D6'

1/' 9 #2 ' '.6 '2016 0'"268 2 1S D2'.0 Q

468 '9 9' 08 'C#F6/4'9 1026 2 T1S A1 $DL/.0'

9#;.'F6/4'9 1'0 768 '2 D 68' . C /4 E"'

D 468 '.09 . #C'F6/4 .0O468 .9 D9G '

9 ' /7/'F6/F69' 0 /763' 9 ' /19 1'C#9 '2 '

/7/' /763'208' 8 /763'04'89 / .3'9 9 .

'101/2.3' 7?' 9 8/ 93' 4946J1O3' ' 1/D 94 .16

347 24 >?7A2 = ' 71K: 6A; ' & 39 : 2? 3401? 95'

= ?9'A5 '*7;44= ' 6 5=56;4= '7??5*5 ; ' *5 2* '

?4. = ' $ ' ($ '54= '74?'*5 2515' =4?7;4' '74;'

5664 ;4 6' 6? 5 =?6; ' 7??5;4 4 '25= *5 '56 = '

71'A ;4;5= ' * :?9 4 : 2 ; 2'A?9' = :1 57= ' * : E 5;'

2 :65= ' 6 ; :'25?5 ; '347 5'A5 2 = 95' 3 ' 54= ' '

$!= 7 4>' 6? 5 =56;4= '7?? *5 5'34 :1'2 '25= *5 '

27? ' *5 252;?' 6'? :6; 7 4= ' K70 ;4= /) 8 H88'

?2; ?4?; ' 6 2 ' ;5= * : 5'5H?9417;4 ' 6'* 47; :65

A5 0'@'K70 ;4= 4?7; :' 6;5 ')25 A ? 92 = '25 '65

342; :7 6' 5?2 70940 471* 47; :65= = 4;7? :'

' * 47; :65'71'K70 ;4'2 5W' 6 :6' * :;52;

3n 'n ['272;4>52; ' 4 = 72*5H ;B

G!F69'.0 O63'./8 08 '9.9 .89.'949216 63'492 A'

19398 1' %' T "9 7/ /26216 "10 8 0 '

1/' >' 29D01 / ' 9 .66' '&!'26 /'9 '4 J1 3'8 / '

4 3'/ /2 #F6/2 08 '2'G 3' / 3'29.9 9' 98 '

9 '0 19 68 '9/2 8 '9 19 "98 8 '0 19 68' 1 02'

%%' 9.'92 8 ' 2'./21 0 3'29.9 .' 3@' 92 S'07'

1. 68 '9 9'"9 68 0 19 68 ' 0 68 $'29.' 223F60.'

S? 040 F6 4 29.' 2'G07 16'C' 601/29' 1 6 '

10' 02 103C 8/ 763 ? ./21 0 0#01F6.9/ 68'

2961 8 2' "9 68 '"9' 0 68 ' .49846 68'C#

4 8 468 / /262.6 "1.0F60$'3 '04'0 F6 4#'

9/ 68 F6.'2961 68 '9 1' "9 68 '06.' 0 68 ' =94'

29F69'90' F6 '4 .6216 ' 9.6246 2' 601/298'

C G07 168 '$' "1'0 163' C '.S. 103' J1/ 8 2 2/

! I - M 5 !

9/ F ^ 29/8 2 ./2 621H/2I4 .62.6 26 ' "' ?.7(' /?

68'9 1'"98 8061' 0 8 '# 04 40"9 7/8 8 0'

9;)??:=462; :651 ?46?4 ' 5A4='56 =45'

U'= :7Y5A 1? '*:29;';795'34 1* 7='?:616E5+'

?6 >?:6; 7 >'37H'?:6 46 ;7'1 ?46;4 ' 7='

:? 7?5='A795 5@' ? 7;5='HE :;7 51 46?'?:6'

'; 7 7'=94'65345' 6'0=>'6???225' 33' '25=*5'7955'

;4 6'A5 4=' 79;5 4='27994 6'1 5'?4='56 =' : '

? 7;5>'52;' 79;5 4='52;'A5 4=' 79?? 4='2792; ='

?4=74? (=6:652;) ? 734?/(F 2 KS']36 765?'

A5 4='52;' :;) 7?5='HE :;7 5'65?'A79? 5B'?4='

:=6 6:' *25' :? 7;5>'6:6'-;' [illegible] 6* 67; :65'

294?5=@K70 ;4'?4=:6= :'3 A '6:6'52;'

654? 46' 3'A5 4='?4='A5 0'3 1 A '52;'6:6'

25=*5'79;5 4='Q A5 4=' 79;5 4='27924='67=

:? 7;5=A 24* H1 ;4=?295w@ :? 7?5=?3?4='

?29?':**:646; ' '* 47? :'@'K70 ;4>' ?4=345'

52; 6:65/ ?22579;5 7=5225A5 4=74?'

97994 7' 34761:?6 =6:614='95?4614=' 67;4('

7=K705 ?1?05? A? 7345279 / B / ?4=A5 U :'

. 0.93/8 2 2/'2/2'9 1' .'F6/F69'"9 0F69#&"'

0 0# " '968'" ' 4 168'4 9'C#!68' <0'

.68'4 ' E' 9 68'2'0 8 01/29'U.'29D01/ '

29'3 "\ "(3 !' . 69'2/2' 1E0 .9 68'9 .'

"9 68 '0 19 68' 0 68 208'=/. 0.98' D /10 9'&

C-'2/2' D /.0 9 .68' 9' *& !'9 1' 9 .668'

0 19 68 'G/ 68'9 9"9 68 0 19 68'0 68 ' '

8 1. F6.'.68'2/2'52;' "(!' "'92 8' D / '

10 . F6024/'2/2' 0 68' 3#'2/2' D1/10 9'06'

.98 9 "9 68 ' DT 9'G 3' / 3 F6 / /262 ''

.6 "9'0 Z 8 0.E/S;'#29D01/' / 68'9 1'98 9'

0 19 68'9/ 68'"9 68'". ' 3

' 0B'' 6B R'9 E 19' R R'2' 11

/' ' 'A' 7-

' e"' ''

/HF 2I7'7* 5' *' ' 2]"'

FmF' $ 0 (*' 0'@4'*@ 'T M4< "D*

" < :\ *$ 2<3: 4 *R - W@ !* :+ @ <30

M 03 ;1 I 9! S;YB IJ ' &

R `;' % ' ," H0A' DB/ '11 S $;

% ;;' .1 ' M ; ' U "'M1 ' p' =.9\ J

) '/@ B' /4\,0E 'E ?91 S ;' [O@'% ;d' '/ @d' ' '"" b

C;6 ' _C' JBBB''@' \X<?9 23

/0 ' '/ 41E' && ,"'0 E; K/" /d' 11J' "> "'

'/;, A ?; G 0;>; 2<IU , S 22 ;k# ("n'

I')7/ A *-I 7HP;? < 2

& 3 3 3Y 'h1B

'6 1' < ' G ' ' ' [illegible] ' Z

5 B '

;;'W') J.d '=.4 E4 21' :+N'

Y>"% = ' " '0S" "<4J Z 3 [% $' 'I8 E E'

" (" J' " , 0 0' ' ' , ' ,"

2; \'0E& 3 @L' 9 IJ 0 dW' /06'

$ %& ' 4 ("; ' ' '* " ")' (>'(

./ ' &@3 '$'WD ; ' 0(0'@;' % F

@ '* : "'35 I * 3' [U7 K2 W <J'32] '*''1 E'

#' ;$ ' ' '+(< ' ' *' ;

' ' @ ' ' '# BJ" J ,' ' ,

)%'66 !,' K

> 9'./21 0 3' !0 '

T' 3 b b "(" " ; ('0' (5 $ "(" O ((!' ((!' ('W O '* ' "(" 3'

3 '("(';' ;I' "("(; ;N(',';' '(';' ' "(" " '(3'$ 'O '('? "

a'- "("('* ;' ' $? "'* ' "(" !'? "1 ' ' "("('? "(

M#'S; 9' KEF' -. ' ,

E '(

M2/-/210 68 29.4 0 79 18 0 68 01F69!'

LYK;?'=76 25;4=' 3'26E497 4='25 4=' 614'

? :65'A;276 ;7;' 5)I'=: 04>'@' 42; 5 H

6 42; ; 7'@'2: ; ;41 6' E67=7'%5'?5;5 7'2 = 9'

;5 ' f' \ 79:'74?5=' 6?5 14=' 0:64='52;' ?:6'

; 7 4=' 6;5 14='=794^ '67='1?252;4 '34 '52;'

'6494=)5H24*5 76; 7'52;'?:6; 7 7'34 '52;'=794='

=51 :? ;7>'A5 0' '34H2 = ;5 'A?63 5'52;'?:6I

; 7 7' '0:64='52;' 6'*74? >'74;36 'K:?A 15 5'9 I

?5;'"251' 6'*94 = >'25=*5 '=793'0:64='52;'?:6'

; 7 4=' # H;5 576:6'6??1 ??2; 9?:6? 7 7'

4='79;5 4='2 '5 7 6' 5 E44='5295 '67 6':=6 I

04>'0565' A79 ? 04>' /76 ?7>'5 ?' 6:6'=: 04>'

??=345'3':6=5>'790' 963790: '? '6:6'6 E :

, ' : .9 90 = /. 198 "0 9 9 C #=/. 0.9 D / '>'

.0 9'./21 0 0' 21#'29.' 8 6 ./2 2D 1'"9 0F69'

./? , '. 498 '29 9#' 9 '2/2' /19 1'"1'.68'0'

19 68'./21 0 6 2' 1'..02' 9 F668' 1.68'

.8 8 8 S9 1=/. 0198 "0 9 9#2/2 /19 19 9'

;F. '=/. 0198 D /10 .' ;' 08 .162 "9 7'

& '201E0 6./8 0 0.6 2'9 9'"1'./210 0' 29'

/1T5)'"9' 9. 9"9'D929 9'20.6 092 8'./8'

$ T&M@')?8' @3 ' &(' L3 <' 5

q'K p9.'m' % ''%' ; $

' @M<3'?' $3 ')'P-T-K 2'+ &[illegible]L

$" " *' "')!(' 08<'*' 1"((@! 0

";(' /'M@ 5*R * 0/!"' &@&4" 7' &30(& 'Z' 2>]

) <(' '$@ "' D(3"!R' 1 "'

[' ' ' &3 ". ') , 6#'E '&+' ' & '*6

P R '&! :!@ $ 3'*R "@:- ' $@" :D "'*@ &'\&'

7/ '* (*' *' 3 3 !' 'P-E&$ @ ' * /3*' :" ;R:+R <

'&5#6 , !KC &+3' , '] ,]T#C)&

(!-3 67' ' '=% - 3 ++; ' R ',%"' 9"

=5@(8% !- X ')')' 7

' ' '?S' ' V ' ' '

R

+ # X !7<)"'3)%3X3)C) "<VP] 7+.)+) '

9)' ' E' D'Bh' '9%c '9B '/

*' 3!)] V' '3)

*: 5B 499 ; 7A5 0%? 6 42; 7 676 =7K:== >'

8' 5?52 5' 3'74;5':=6 7'?:6; 7 7'A59' 6'?:15='

E565 5'5 ?'A59' 6'?:6; 7 >'E56? 04>'A?9' *27'

E565 719 904='5=='?6 E== G665:1?='

E565 5"3=7?:9: 2/ '5: 4=' E564>94=? 7A5 0'

<5 8' ' *'

;) :')E' 'E* 3' ' ' 5' ($'@-2$"('8PG

+ 0> >B' #$$)&6 @<: (3&1 @5@' 0] V

' U 4

' $ D' +

5 = M I =

cC ;)@=, ' ' ', I' ' E D? ' &' C, 2 6 1 1W0 $S 8 ./21 0 E ^929 763$ 02
' ' ' ')Y' ' V 6 3D.263 " 8 3#G6 63 " 1 68 '@ 2680619 8
"' '@ <$' ; ')34' '8068'2/2'62.' 2'D 929 9 94' 0 62.D929 0
B9hc 0 F6/ 68

> .' / : 1

' ' 5K!G" !$ 2W ! 3 "' ^' D $ 3" ' W $!' ,' " ' ;' U
' '&$ (7 3 $ '+' B3 ? !0'

D '$' 5 630 640 /4 . . F604 9 08 ' ' :
A .0 *K^ =' Z ;(* '1, /'< 'PM O5 LE]:M:D ; ' ' SK 868'0.'80 89' / 29'0./29'.98 / 39'
6 63'. 9 F6/'0 64'0 /'"9.6 1 3'C 024F6 63'4 .16 '208'
3'T,0 !C)@, "3 / %' 021 F 63C "916 1634 . 8 'F6 0.98 63' /2'
!' Y::T '+ '<& A / !;,' D D 63'. ' W =9.624/'F6/4'2/2' 9. /.016 9'
W' .6 4689 1924'./2 9.64/298 .'"268'46/'
'.=!u:;1^ ' :' '=qM J* V):S ';') ; 763' " ' 63 A208 46/' 62.'# 101 8' 9F6 6A'
1Zu e`` ' '9 D[\V R/d3'+.< '/ .1 /"' /' "268'. . F674' '"268'9 1#2/2' 29.9 9'46/'
4 '! !' ;' '9!;'S 'fX\' ' 3 9 9F60 .2/2 .. /.016 ".E "268 . 9F60'
#$F' 0 99n09#' + & ' ' '*$*42' (6' 1 9 F6689 9': 6306.98" 4916 49 9'0'
F (4 *.(, ' 4/ $5 4T 2')$' %' ' 4" &1 ($ ' "' F6/'2/2' 9. /.016 '9 1924'./2 ..64/' ,'
. ? ' A' ' 9 4/'04/29'/ 4 2 3' 63'4 . .6 $".' 2' . .2'
1 3 C / 04/2 763'208 / 4 29 463C=./ 1. 63
8 9 1 2' .924 3'498 /2 1 046 3'. 98 .210'208 '
*: ': ' M0 9FB '='&p\S/' F69'3 " ' 4/ 049 .4 4/2 763= 2'D 02
@ '*7 *' 2 01.0 9E98 .2 #0 ? / 0 07 3 8 19 F6.
:/ 1G029"/ ' $' & ' ' + '(!''F 2"42 2 ' & 2'/ 01/2 763 F6/2 08 /.98 68'/ 4 29' B
..2' 2 . 21' ' .?0' S I' ' #'' 2" F (52;67 7; :65' # 7 ?5 57' 347?1 17 . 6; 34:1'
F6 1 28' 0B\=' 1 ; BJ;B . ' / 11 !'j '7 2 1 R' 3 ' =59 4>' C' * H2;76 4>' $'A 15= ' '67;4 7'
E " = ' ' E$' ? ' 'K * 4>' \ 49; '5; 7='1 ?5 5' 09 ?'246;'*6: 5>'7*41'
.0e ' ' 9 91' 1E 25'5295'34:>'=7E >' :6: 76; ' 7E 2345'1 9 E46; '
9 1'98 8'D / 0' , 7 "+" ' "& ' Q0 ' '% ' ' J ' > 51'K 5'=:14>'599' :=6 4='25 5' 67H I' 79 564>'
6 6 1J B1' W # / ,J1$ 1 / 1 J M 9E K = "0% " " R 8' 4 ' E)?4 '=:1' : >' A24 *76?4 '25 5'?:;'
Y ? Y E Z \' M ' E F 246; ' ' 51' * H55 ' =:1:>' ?: = =5 = : 7?58 (
";3' H ' ; '$P 3' P#1 2;' ' ' 3 : @4 76>' 7F '*:?52;'5; 7='79 4>'5225' : ; :14 ' G;4 =
; 22; ' 8' 56 =347;' 2??4611'5H 2;561 '?: 2?1;2 ;- 6';5
?" % = J' ! .=3 . ' ' -9&' 9 S p '13 ')2 > '? * :?76;4 '34:1' 3 : = :1:?4 6345'; ;'?7427'
6 ' ' ' ccc' ' ' (d' ?4 '79;5 6='2 ;'=5 ?:' * 4>' 67?4 7 1 >;' *:;52;
); " *' " ' ' R 3'(# * ""@'='$0" 3'E H' 9 9'06.98'F6 9408'10 0'802 9668' '208'
: ;(' '9 /)+ *' 0$0" '0"'F / ' U : '(&'/ 1' 9 9'G/8 298'.68'"9 0'49'9/'/ 01/29' 9. / '
:@' /0 Z' 3"= .0.6 '9.62468'9 1924'./2 ..6./298 'F602 '
$ 8*($< VcS, @ "K ! K MP" & 2 ' '" 4 4/F6 498 'G/8/'9 1". 0 / 0. /'F60'4 . 863'
/' + $' $' ' ' ' 6' ('B> G/8 298'. 9C'9. /.016 $F6 0' '"9 0' 3'/ 0'
R ' Q ' '@ '.1 S S')' *);',' DE 1 /'F60'4 . 863'G/8 298'9 . G/8/'9 1"9 0'06Q
5''= + .98'/ 01/'29F00F602 . 1.06 0.6 ' 93' 1'$' 94'
, +4 'D 0'/' ` A ./2 10. 98'F6/408 8/4/.06 089 9'.6 "98'
./ 04/ 208'F6 0' 93'9 1'"9 2/2'9 1'/ 0. /'4 . '
16 "9 0"9 0 0 0' +' T60 9F6 6F69 8/4 30 64'
0 /' 63'4 .' /.9 1
@3<!M' ; * : 7 '$:\ *"X ' 8# .!@V5@!@ (' " 5R'
:*&'W' Ej ' * ')' * :3 '0' *b DE I ' +' HBB' 6': * ' 0 ?*'9 1 1
; "'!4

8/4 3' = 06 ' !0 '

' $!';" !' /' $!' W : !# ,' 7 #3'Y: "&C'3; !' 'B; ? !

' :' ' '

M r 9 F / 68 / 1639 29U1 912[/ 9
&& ' ' " "%0' &"+"%' 5 y ; ' . / ' D 2.61 68'92 8'G/ 68'9 1' 63 061' 'E198 " 3 . '
@ (' ^' V1 R' A @. '/E 0']& ' 06.98'4 .62.6' 86'.92 / .'O' 01@0'"9 7'
*(3' $!V $.P(<*'3 V @$ K' (; (@' 1J$ ' 86E S?S F6,.68F69' 9. /.0216 F6 498'
@(' R "' ' ' @<3' M *' ' " & 9.62468'9 1924'./2 ..62/298 ' 94'26 /'
' hc' 1 h 0'2/' ') ;; ,3' ' 8/4/'0 19 68'9 1'.06 0'.6 '0 .. 68' 1#".' 2'46'
HEM I/3' . 0E'+ , ' ' && ,"%'+ && " " /'C'$$ $<'; "; ; 3J' < '92 8 9. /.02'
16 F6 0'.68'46 68'9 1 4 8 4'68'7(7 '9 1#C'
.68'4 8 4 68'.1'46 68'9 1K'2961 68'"9 7'9 1

?7427?4 7-?5 4 = 2 ? ' $ 734 : 345' 34H' 5H' 5
()?=' E?65 ; '2 0 ' 64 ?57+' 6' 1 4 9; : 6? : * * : 646 '
;7 ' 9 = 7967;4 7: ?46? ' 0 64 ?? = 61 4 '
2 :65' : * * : 6 ' 1 ?46;4 '34f?' A;' A : 94? 5' ; ; ("
?;?52; @'7347; 9 KH?' 56 = ' N0 ' 64 ?? = ' '$ 0
//;2F2 : * * : 646?7 '?4' [* ;' 5H' 5 : ?J = ' E?65 5' 34 * '
* ??46 ' 769 \ 79 6KH?1 4 17;4 /@FI / 6A : 94 I
? 5'@;5 52; 5 '@'7347; 95 '7;365' K: 4 = ' 64994 = '
52;' * 4> A59' * : 2;5 4> ' " 51' A 1;6?4 ' KH?' 9 = 69'
?99567;4 7 ' U4 24>' K: 4 = ' A64 = 34 : 1345' 6'2 * 5 '
? 5>' 1 4 1 ' * : ;52;' A?9 ; ' A: 4? ? '?5 599 5 '7347 '
; 95 '5 4 , ;' E ;4 ' 9 7' 34 : 34?'2 4 = 9' 67?4 7 ' 34H
246?5H? : 15 = E565 5 = ?715 = 1 4 2 : 6? ' 7V5 '
65 7A5 %2 * 57504>25 = * 5 * : 7+F '34 76 : 6'
5? * ? : ?76?4 ' 25?4614 = ' 5H 2;561 ' ? : 25?4; : '
65 = ' 594 ?4 = 52;7347; 95 '52;76 = 7K?4 = 74 '
;5 = ' 52;'76 = 79 6 : 6' < I65?5 573471 559 5 ' '
6 4 E ?4 '67?4 71 ?46;4 '34H?4 = 345' 5? * : '
?76;4 ' 25?4614 = ' 5H 2;561 ' ? : 625?4? : 65 = ' 251'
654; 347 = ' 79;5 4 = ' 52;' ?7427?4 ' 79;? 4 = 2 ;' @'
34H' 5H' 5 : 15 = ' E565 5' 6' 1 4 2 : 65' 2 0 ' 64 ?5 = '
: * * : 646;4 '2 = * 9 ? ;5 '74;5 = ' 2 = 495 (' 34 : I
4 = ' : ?;;>' 52;' 5 : 15 = ' ;5 = * : 5

: # Z 1E h0' '
' & @ 0 0
B' 9 ' R' A'G 4 9 e9` ' hZ hI G Z /G ^ 1 8' / 9JE' M
3 H * ' ; /(G' ! 1$ 0 h0\ "H ` 'B!CX
' & " % * ' + ' <
V ! A' D' h9' <_ -%+' ' W' MZ' ' = ' J1 ' jeBN
U " > ' 13 E EM EE ?J 0 ' * 1' ' '
\' 5E' < M=O' (_
B .' 9P' b ` ' M ' %
Xb// DB 9 S0 .1S<"0 E1 1h \ 'B1 . /0 1C1' ' 1
Z B' + 6 '2
" ' : (3@4 ' (
' :5) 2;\' □ & R @$
' +Z3)<,) +) ' /263 '99' C. ' I / R9' !3 .' + 6) V
3&,+) ' &')@' (' ' 7%6' //6 ' ' 1<h ' 5) ;2' /.0I
#*5I<H V<]93 <1% 5-7% / $ "3 (=1#% '
3 $ # &, + & !,E < .))%) ' 9@ '
=3# =,!' /. 3 @' 94K
.< 9

>9' 8 /16 !0 '

' =#&) & "+ %/' ^' G "G +)0 . !9 + % . " + . . ; & (& % . & ! . 3! . + ! * ! - . + ' " = % . % / &" . '
%' !)' ' !)'$')'9D7 D' #+, & 6' "' ! . &" > 3 ! + &#& ' "%") ! ! * ! - / . + '% ' ' > ! - ' . + . ! 3 . ! % + " &
8' $; ; (" ? "$' "& ; L@7 N '3 ? D! ; ! 3 N & ! ' '3 $ (* (" (

A M 63 9. .3' 62.' 25H ' / 63 ' 2 . . 163 '06 ! ' " RL @a@ 2 @ , 4) D (0' : G . 3 0 1
0 / 4 8 261 / ' " 0 01 / C 9 . 62 6 2 / ' ' 0'
.6 8 8 6 . 0 . / ' ,' /3' D . 6 8 /163' 219 ' 9' 4 '
9 .9' 9 . 8 8 ' 3' ' F6 / 2 0 8 ' / . 632 / 2'9 1' 2 . . '
.6=E 1=F 1'064 / ' &,-' 4 8 26 . / ' 29F69' 9 . 62 '
46 2' . 162'8 6101 / '90498 ' 0 / 62 0 / ' $ 6'
"0 0. /29'06198 '467 10. / 'F6 408 '9 1 29'F602 '
4/'G9.9 9' 9' 4'F6 / 4' "0 0161 ' 9 . 6246'0 F698 '
9 F6/ 68 '8 /1668 ' "0 0 ' , ' H / . '06198 "9 '
68 '2 / 2'9 1'19 9'92 8 ' 9 . 62468 ' / 8 293'061' 6 '
& 8 03' 0 /293' . / 2 . 2D . ' 2 / 3' "0 0 '26 0'0 0'
8 /1 /29' 2' / . 9 . 0 . 98 ' 04 6240 '9 . 92 2'29 ' [69'
06D9 '29.9 9' F6 / 4' 9 . 6246' 0 /298 '8 /6 .
16 29F694 8 26 904 . 8 0 / 6 2' 01 / 'T @ '
9'4 69 0'9 1'07'0 3' 8 / . / 2 763' "0 0 . / ' 08 ' '> '
9 . 190498 ' / /119191 4F6 / 4 "0 016 ' . / 2 9 '
1 8 91"08 0OD. "9 '8 26 ' "9 0 080 F608 '
8 / . / 298 ' 9F6 $ '@ 4108 922721 B29 . 9 10" 612 '
' . 498 '91 08 'F6 / 4'06D926 061'0 / '8 / 4 / '8 / '
6916 ' "0 0 '49 7 9 9 . ' 01F6 ' 2 / 226 006D92 . 6 '
F6 ' & '2 / 2 ' "0 0216 "1 6 . 0F604 0 . 68 'D2 / '
8 / 29' . . 68 / . / 06468 F6 498 9 1 ' 2 / 2' . 0 '
8 92"0 0168 ' 498 1'91 08 ' 2' . 919 3' 9 6 2/ '
4 ' T 9' <' 8 / . / 293' 4 69 ' 621' 219 ' 9
U 08 ' "9 7' 8 . 19 ' 8 /1 /2 ' . / 21 0 68 ' A'
F6 93 ' 2D6 3'06198 ' 2D6 #' / . 6 'F6 498 '8 '
19 . 63# 064 72 ' 4 8 26 . / ' #' / . ' 6101 / 2
6 93E / . / '80 89'06198' " 4916 ' / /2 '86 'D'
104F 2 / . 68' . / 21 0 68 ' 1' 49 . . 6' 0 . 92 '
@ '72? : 24 '15255624>' ' U 59 34H' A5 0' 5H'
= : ? : 6 04>' 5H * [?7? >' 6 : 6' 27? 95' A' 5H * : 65 5'
34 1' ? : 6; 7 4 = '2 ;' 251'6 K 9'5 'A 15;4 '5925' ? : 6 '
; ; 7 4 = ' 6 2 34 >?47 = ' 4 ? : * * : 67;' 34 ?75 = ' 6'
3479 ;7;5 ' A59' = 4?7? : 65 = 6' ? : 6; 7 7 = '3 7- ?7 '
;5 = '345 = 71 = : 14 = '5; 7 = '9 : ? ' = 4;7; : 6 ' ; ; R'
8 8)34 5;?' 6'9 : ? : ' A59' = 4;7; : 65 = ' 6' ? : ; 7 4 = '
9 : ?4 = 7 7; : '67 = 345'52;' = 4;7; : ' 6'3479 ;7;5

DR +,'M '<#! = ' ' +,' 8 . '
E ' ' '5#W $ - 'S % . - ' L 'F
" _T 9N] ! + ! ,% 7% L ! ! ' ;' I T 0 '
W) ' !) - + ' ' = ' 4 * *
& + J<,&]]) #] . J% <" ! + +(+g , ' : ' < / 8
T /)' '] T-(F S M2'
!36 / -6 ' ' L &)N' .1 0' '
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" '0" & ! +J' 6) + 'S= 2\ '3 3, ! ' 'A '
+T ' 1'L 3' "T% !% . ' [' %'0 A?
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U' = +@ - 9 "' 'C / $#T 6-) ' ' 9 ' ?
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h I E 1 _ ' ? S ' 11S&% 9 "= -'&@) W3? e#h1 ' ' ' E 4 ' *
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;7;5 = 34 5>2??461 = 3479 ?7?5 = , 74;6 4H7 :
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H 05 5 = 49 > = :1 > 1 ? = 6 7 ?9 56 = A?
K70 ;4 = @ 72;51 :65 = 74; 79 3476 79 76A
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A ?4?5 = $?9A; 3476;4 = A 347 = 34 > = 7
E6 ;41 656 K705;B1 ? ?4 56 = K705 5 = 7E6J4
7 6? = ? 4 = 347;4: A5?40 ; : = = " 5 A?57
343 246; ? ?7 ?: *4>'A? A?2; = 56;4 = 74? ;42 ?7
59A; 6 * 7 ?5'A? 6 = 764766494 = < 5 ;7
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A725'A? = :1 4> ; ?4 = 74?7 = * K: 7A 64 = '(1
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05 5 1 : = 4 = A17E 4 = ; , ? ?4 5? 7 = A = 4
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45=71= :14=74?5' 6'76 =7' 6?5 14='52;' 6' 6(ˢ%&. '_N 3) ,9)) 3 %"' I
;?99 E56? 7A5 A?92792'5H*5 >' 6?5 14='A5;:'?4' 4 ! 1/=0'MDTHP C 3 J "T ' W &
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A:?5 67='6'?:=*: 7:6?'@'14 :65'52;'A5? ?7> 8ˢ !* 9 3)) . % '
74;279 ;7>' %' * 7 E ;4 6:= 67@A? 07729 = (' +MZ)")+2
76;4' 6;599 E?6? 7 34 ' 9965?:=*:2? :65'@
4 8 /29$"1G/8/ 0610 768 F6024/2/2. 10O ' ' ˢ4 'E= ' 7S?
F6 404 9068#F6 02/2069 B"9 68 06.10 68' o' ' ' I ' 7 ' "' ? K ' "
988'.'Y2 89 1#F8 0H ./.9 663 D2 .01' (S& .1 9 M
F6 49'0 F 4'2/2468.08.2"9 68 F6 4 08' h' ' ' ' +3 .' ' '2
06. 0 68'2 1' ' '06.'T ' ' '04 .0' ==*
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0. 8'T' 08'2' ZSS M '2G ' E 9 9' R $;O Y' ' ' 2 2R
D2 .01E 12 0./ 0./29' $ '"1 ^' J B Z 1 \ 0W; \ ŒE ! /
2'2/8 2 763' 8 .763 G9 B'G0791' 2'./62' A;' 90 3' ('(' 2$I' :+N3' : 3' RA
JG3 2 3'92 8 0 3'26 /'8/4/' D2 2.01# 2' 3' J(N,'+,(J')6+ 3'</& C+ '+3+) ']^<
* "1'"6 498'(7 $3? 3 (" ' 94'2 3? 0' T ' ' * < '3 T*' .&F
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8S 1D2 .01 9 9' F^ 0%B ' ;' J ' 21.6./'06' 'D' 2 '9 M D SD' ' D @3'
198'$ < #F6 0'26 68'2/8.2'9 1'20.6 0 .4'.68' : ' W' / ' '3.E$/%S ') '
J12/10' D .021'.2 8'0 F6 4'9.08'/2' .9' / / 60 11 '. ' / ' 0!/
0.E 9 61'79 60 68;'F6/ 68'26 63'9 1'2/8 92
./2 1 08 8'2/8.2' F6/ / / 1901 40 9 019#
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2 2 168#F6 0' 8 .9'2'F6/6 3 29 1E10 8'9219' < - < V]/7@ @ 3]' : /7 /K/@ ='
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'.919 0'. 6 8/4 2/23 '2/8 20 94'.0 63'2/' D '/ M>/6 1 SF; ' / ;;' 1;!(E ') =;' ' /
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/$ $ 3 ! ' 94'F6 0' D ' 1E B0 ;d' @MEM01 M ' 3 $ d' $2"< "$ 3&@ M4 &'
.68 ' ' BI 1"9'J 0. "9'I 12/2' D2 .0.'"9' : L: D' @ ' ' ?H ' .. E1 1 H' i 779P /1 A'
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6=74;5=52; 34:1712 E6 2 ?7;';5=*4>' ' ZN/ : ff :)+B : cB : : ' (* .
.06'3'64997'*7'2 E6 2 ?7?' 5*7 7; = '@'52;' ' H' ' ' 3' 7 .'&.
98 9KK'2/10'9/ 68'F6 9'49'0 19 /'4 .62.6 ' '
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9 1'2/8.2#"0 .. ". 768$'04 D2 .0.'92 8 262.' ' + + C + 3 ! 3X+"(' ' /' "1@ K @;' ,'0E
29 9';'I.'9 1' 98 9'2/109/ 6'F609'49'0 19 /'4' ,/ @# ' W ' a - JX E 3 7 6 ; $>3' %
.6.6 ".9/ 6'F6 '49' 67 9 1/ ". 2 67 9< 1/'621' !T*E ' 3,T/ /6 % +3'') H #. M@/1 E.6
,' /'"0 9106.98 C' /2'07/ 01 2U'"/./'"9 76$ % ' ,' /')'7 $$!35' +' ' + 6!' 6 "49' 88/2
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??2 712 E6 2 ?7?;5 = * . >' %D 5 = *5 '1579 346' ?+'
K4 ?' A? :1 2;5 ?6 H' 6:6' ?296 : = ?6' h26*:9 ?4
251' ?99: = 2 6 ?4 = A? 04' '34 72 = 9 ?5 ' 6'34:46'
65 ; ;7 6'?4;5 347' :6?6 .(' # = 9 ;? 794 ?'
@' 9?0 ; 6: /Q 2;2A? 04 2?1?724>A5 0 7'A5 0:'
74?5 =' 2 ' 1 225 46? 34:6 7 =' 9941' (1Q E6 1?7?
;5 = * :>' * 256>' 7'?'A5 0'($? (@' " ; !'3 ?1'
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2 = ?'6 : = 67 '@ '2 E6 2 ?76?'79 36 1' ' Q67 = '34 '59 I
?; / f/ /6 / '1 76?576 '9L ; ? @'34 '74Q 4 ; 7?34 ? '
4 ?Y251A; 4 = 99? 76' 6:6/// 6:614 = 9 E6B1?7? 65'
345?6 = ' ' ' 74?' & N' 3 ' 5 ;' E64 6'
? '6534 15 = ' 2' *27 = ' 6>' 1 H? >' 6414 = B' 4'
56 = 6 K 9'52;B'251' ?: = * :2 ; :6?6 '3476?97 = ' 71'
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'$ 2;(*2 0 ;H $3 (W: PW ' `' 5 0 1 / '9 1"/ 1D2 .0 39 2 1 .E 1/ ' .6 03
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S' PD Z ! /3103' $ '@3]P ;(\"J ' ' S] :/ ; ' @ ($ 7 (; /'4 .1 / 2/2" .0 1 8 0. "9 '29D01 / '
! > .9'06198 #" .G / 8 /' D2 1.0.'F6 4.2 '0 F66 '
') =]c'<. c ' 6' ' / 'E'K?S. 2/2' / H3? 3 '9 N.E .'2/2'9 9 94'9 '0 I '
D / 4'" 49'
8 0/2 7' ' 2;@' @ :/ 2;S S N' 03' 'D1 ' $4 20. /E . 29D01 / 1F6 404 621 168 69" 1' W 1'
[' " (' *; 'H ' / = 06' / .1! '6 0 ' ! 3 A\ "9 7'G / 8 2 3' 070'"20' ? (/ < '9222'
. 3< ' /' N 33*@< @*' , (2; $ QW(' 3' ' 2'" / .076 /'= / 9 ' 9 ' D2 1.01' 7 $0& $'8 8 .'
6/ Z = '%!/ '& 9 1'102 6 2'" / ' 2'46 . 763'06198 ' ! " @;(" '
1D2 1.01'F6 498 0 F6 4E .4'2/2' 9 ' 9'(; (; '
,' IB' ' S! 0' V @4 ' (%' 2"*3< B$@ '? D 4 4 68 '91 ' ,' 08 '"9 7'/8 2 3/ 01 /' D2 1.01'
.+3 X))!""' '3% M93' ' 0 2/2'"1' 2 1 68 92168 ' 94'<F69048 /4'68 '4 < 168'
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2;(4$@ 4')' ' .L' 1' = '0 E "' S' ! '2 3' 94'9, .6 "98 8 "9 0 68 '4 .9 .'./2692 1
' - '$ * '7' ' (; ; 0 *'4' ' @3 ' 2/2'/8 2 763'06198 './2692 ".' 9.01 /' 3'F6
49/ 01 / 94 .."9 0 29. 0 0' U' ! 919 0A' D 16 '
' 09 R = ' ' SS ??S8 < 9 0 #F6/2 = G.1/ . "9< / = . . .
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?'W' #@ BS R '8 ' 0 1 8 ' E .21 3'9 1' 2 .0 /2 3

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' :4 5 ' (!' * ' ' _ $ '$ 3 '$ 3 ? (Z(1 ('* (' ;' "3 * ("(0 '
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h ' Ej' f?;' > ' W5 K 6 / 01 /9262. 01 60 9 10 H
(K ' ' ' K "' 3' ' <"' ' ' '2 01 /$' . . 249'29D01 /' # . F60'"9 7'/8 293
fE 0' 2N" (' '$^ .1) ' 1 ' 2 <* b'9 ;
E' ' &(. /28 2.1 /29' ' 7.4/2 29/ 01 /298
' 9? ' 9262. 02198 '29.9 .' 3'9 '"9 7/'9 9'"4' . '.0 6
3 P'$3 2 (.' / EA' = < ' '4 '.@ ; 96' @3 ' ". 7 .192 'G/8 2 3'49 1 / 2 'I 1'061'I 0 '
'- ' 'D ' 1(:* !" '$ ' / ' 06.'I . 061'9 6 8 /4 'F6 4 08 'W44016 [0482
W' 2 3 Z ' ^" & ?Z ?, ' S, / 01 / . 26240260' W' ! 6 16 0 2 1
M!MZ I!/' 4 0R#<' 1/ '? 1 '%_SD 1BD '/!1/ 'D= 9' 1 .7 93 9 1'"26'F6 40 /28' 1108'29F69'928 K ? (A
A' 9.0 G ' '@' '@' 2^+" ;' '6) ' +' ! ' , 49/'9 .'"20'/ ' \'F6 0'./2 29219 ' 0262. 9
7 . 6 = 9466 63 . 9 '.01 / . 12..040 08 . 0
9 ' 3E: M 'SR d S4D 'B= 01 H4. %U' ;. . D d B M ' 10. /298 ' ,' I 1'06198 '"20'/ 04/'9262401 60'
3')) ' & /' * ' 9" '>')' 0 R 1 ' ' /' ' "268' D2 1.01 "4'F60'./2 6297 /29' 3
?' ' ?0 ' I' ' I' "20 8 6 100619 F60 8 P0C 2/2"26 4
,# TT S' / '3* ' '203- 5' , ' ; , ' , ' / ' D 8 ' ! ,? "9 ./2 62 1 /29' .0 921' ' I D/'2 /8 92'C#
"9 76 0'9 1/'4 . 1 /' .02168 F6/2 08 4 . '2.F '6.

. ' f'0 F6 4'4.'0 1F6 4 '06.'0 F6 407'0 F6 / '

0 09 'G 3./2 1023 '"1/ 04/F609408 08./8 ' , * ""4 * *)3 @ V0!@4 3' ' I F

/ 10' UA' . 8 9 '4262. 0. /9 1"/ D2 ' & < 0L.0d F\0 S' % ' EE

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>9'0 80H/2.'C29D0. /2.'=)'./21 04 .1 /2. ' .0 N '

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N 801 /9 19262. 01 /' 0 .6 63'490 1F6/' ' 1 0L<2d' R '?<;1 0/ 1@B

' 9D0. /91/8 401 /0 .6 6307'0 F6/' & 3 ' R ' :0? 3 ==B @ < '?S S S;S E' I 8

W T 6 0'"91/'F6/4' 29 1 9262. 0 9' .91 'F60 '2/'

J' F6/4'2/2' 29 1 F60 ' 2 .#'C 'F6/4' 29 1'

F60 2 C $F6/42/2 29 1 F60 2/2' G 1'# . '

498 F69 2'198 / 763 'F60#'3 3' </"/' 9 923#'

44 /F6/492 0F69'0 F6 3'0 8 0692. '29D0 #'

C'F /T!68 F69 F6 3'2.D069 . '0 80 ' /19 1'

F60 9'8 02 9 168 /8 2 0 8 01 /2 9 1929 '

D0. /298/ / 108 'C#M 8 2 '29D01 /2 '0 80 '

. /298 ' W' 1F69G/.9 1/./2. 04 41 /0 80 '

1/C R D04// / . ' ;' > ./'06198 '. /2 '

.0G F6 ' 9 6 498 '49'9/498 '2/2'G/8 /2 '

2 ?3 C'.919 0'9 6 8 24 'F6 S'49.9 8 66 2 63'0WA'

69 3 / 1 .03' 8 / 9 1 03

C _7'E/- P/ & 3 <#) ,)M! ,'. ') -' >) '13F'

^' 4' =0 =&T 7 '@3 #^% F

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E 1 0 9112 ' , ' Z9F9' K/ <BA/1 '2B .S 0' 2S E ; '

S '29SF.R S , .1j' ;' jS 1S / 1F ' 94#

2 Z ' + &33 ')' ' A 'A' / 11

> I ' I ' ' !' ' M ' ' ' `' ' =' = I ' 'M' > 'M '

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D.'92" 2.01 / ` 763'"2 6. 0 763' 0 . .6 0 763' 249 2 1 3'C'!2D6 0 763

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' ' W! 3 3 !' "(" 2* "(3(' 0" " ' ^' A 0* "3(4 !'L P 3(" 'E' A 3 '

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0' ' 54 ;3 ?D" &')' = $! ' ' 'G (?(* ?(! "($3 " ' ^' 'B $? !

[&/2 080619 ? 982 0 0 =? "2 69 0 93' !'

R 0 # ' !2D 0 93$' <"2 69 9'0 9 /'F6/4'

$k ,!#)&. %' 26 1 3'01. 76 6 ' 2D6 0'

.F6/42/2'! *! % 36G/8/'&,-' 93'"2 69 0 3'

!0 0=EPD6 0 3'(29.9 19 '". F69'92C. 0 9'0 '

F6 4' 2. 906.'2 / 2 ? ' 2.914 6 8' 9'"2 691 0 '

819 46 11 9 2D6 0 ' ' = F6 3' D .6 "2 69 0'

1&'492'"2 /.1 0 ') . "))3! 2 "))'06.'2/'

L? #9 62. c99262. 01 /293'. /21 0 > ./'06Q

198 4.' 9'"2 09 0 '"2 69'0 .9'92'62'. 0 9$'"9'

61E/ 223G/8/' B0 763'26 63'G/8/'9 = 0 763'

W 1.4 24.' &' /'"2 6. 0 763'2/2'"2 69 0 19'

SG.! '62/2' 1 1'./21 0 #F639"9 7' D2 '

902163 / 162.0 F6024/'9 9'.4G. 8 0 > ./'06Q

198'2/2'"2 69 0 19'9262. 019'4. 3 2 6.

0 78@.61 9 1'0 763'G/8 / '2/'9 1'0 763'G/8/ ' '# $ 3'

9G8' G/8/' 1' &/'"2 69'0 3'2/2'F60 '"2

E R 2 ' ' ' 2 2 ' 'Q?' 2' 'M' (' '3'

98'"2 69 0 98' D2 .01' 94'"2 69 0 '

) '= . 'N '& &" ' ,' 1 76.68'06Q

198'"2 69 ` .' 6'"2 6.1 0 9'09 76016 '2/2'

9 1'"9 68' +."&!%.' 26 0' 92 8' 0 1 80. /'

! . 1' 2'F 0 !6801. 76.68' 1'"2 69 0'

9'"2 69 0 1. 01 12616 '". ' / 2 3'G/8/'9 1'

/229 02 80' E' > ./' D16'0 80. /298

&& . L'

; ')' A '] '5X ,V

]X5 3M& <1 B c'0 1FK 4 @' ' +%%' =

T'&`h? 9S b0= F' ' '8 =

E 1 K9?1! ` ' ' I ' S 81 ! `.`. ` '

< !, .N' ' '3' %N' _ 9

&+ '+ +') 9 /'

)# , + -' ""6+6'Y" %' #

"" ;' c' E' # L ' <#ec 3

/ 31. % ' M& ,' + 6 ' , ' +' <5" "G'

F @E 1-N' M' &9 +@' _7,9 '),

9 1' ./B'$@" 0"" '

O /d Z=M' 36 R1/B ') & . ')+

E.C. 36 B' c' K 0B '"c' ! M'

e1 'm1'eF ' K/ !E1 / MO' , ' I 2 ' 1W! '

6 " 1B / /6 'E!31T/ /'6/$ T3 X 'M 1' !C"0

X "$N3&&@4. M]$/;& eV$ C 0](' ' K (

"J6 <=1e '@ K! .=/ /6 .2 3 K2E' (#

+ ' W' " B DS AA' //4 ,)]%<#)

. A'

' 5' ' =' ' M' ' ı' ' '

FP ' ' +>' '7 5 E(4 ')0 ' ! '
8/ 63' 'h2 dS1 `/uh`d 7 '$< <c0 E0Md" B47+ bB#)%
"0. ' * ; ;;" ; ' . 0@ ! \ \9 0\ .; Y *1' 0< 01 @ '
' K!; B V*' 8B0 U < Wd $Z;;' ';1
m' E 'S\ M'0 ' B(#)+ ' / ' 0d/?)EW<\ %d=-M= + ' - SA;'0A) .S\
= 9.
1.' $$B $' E B( ) +' 8' "4' ^1 ; ,' <1,A' 1, !' 0 SY
A1\ ' ' .. ' VC 0 ;' `
' ' /" 0d.@* S 2\;' M .E ' E1\ UB
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'20' 1
; '362' 0 Y '9 \'2' D'
;' P-# 1 ' ` (
(''/G1' =02. E 8 E B ')' M. 31
0 S =BBd' 1 '
0" /' 'A jB1d ''+'U* '
Sd Z; , M G13B A) 'A 2 ;' E d ' 9B S0U W9' 4 " '
/7.' .* "'0) \ 2 ;'E 1 3= '9" 'S @
' . ! ' ED' ',K P ! ". - J'
= ' ! \0 U/; S ? 'B K ; + '^\ ! G.DF A") S ` ;' \ ! ;;
S S' ' #& ' >(6 '^\ \ 1` 2E' 5" (=
'/ 'A S1' +@ -7)" ' ' Bnh 6 ! .
5 !@+')@' ,@]%<#6! ! E _ ' / M=]'
4 2'
?' J?!; ;0' <WS ' jE 0/ W '); ' AJ);
; SJ) ; <R Z* + * D M 99' ^ [1J E1 S;' R '
D9 ^J \\ ! ; ;' ; ; ^.1' 'K= 3 SR ' E
/ /" ;0 MK+3 'HA h 1J K? KJ;)'
D I ' ?E 0 U M; 7E ; ' /1'] !/K-3 <]&b
4E E; 2' B 11 T 30 ' 42. 'S ' - ;' ' =? & '
4M .B;' =EDD 'AE) J? 0B 7 ; Z / ' 3'1 .'
7 , , ' 6' %6 , !5#6) & .5 7 ! '
(' / '6 4' 6 M " #&@ C (,' 3=R &] @ -#V , .' !R
4 1/H6 R4.' R' 9 Sh1jA@' hS
2 8/2' 0. 1 .1 ? ;' - 6" ' R
;'\' &,V<YA

98 '"2 69 0 9' D2 .01' ' 37 '<'902'
$ V? ('2/2') '' ''36< <' - $ $ #".$'
/8 2 3'G/8 / 0 76=E> /2'/8 2 3'G/8 / 0 763#'
8 63'G/8 /' 0 763 '. 1F6 408 'G/8 /'0 763'
! /21 0 9'06198 '" '"2 69 '0 801/29'4.8'
"2 69 9'29D0. /2.8$" 1'/8 2 3'G/8 /' 3'0 763'
26 63'G/8 /' ! '0 763#/8 2 3'G/8 /' 6 63 '8 '
63'G/8 / 6 163 'U' 4. . ./G092/2' / 62.9 .'
86 "9 ' 'H 306. .8 / / 103'./2. 2D .0 '
F6024/'2'./498' 8 '"9 03'929$". 21 2/2'/8 Q
2 3'G/8 /' 0 763 'C '9 1'0 F6 3'G/8 /'0 763' =
T6 .68 F6. 1 16 1@"2 69 0 28./21 0
"20 9 0G1. ' 29.9 7' 3'0 19 0
. 9"9 08". 0 08 ' *' I 1F6%. 8 F29 62149'
9 @ 2D0 0 763#" 9 1'=/. 0193'0 763 '2/'9 1'=/ '
. 01.30 763')' & ' "'7 <'3 $ " 3'* "0'
0 763 2/2'10 8 92'"2 69 0 19 '2/' 98 9'0 19 0'
9 1". 0 0 9 0 0 0' 0 86 "9 .'4 . 16 '9 'G/Q
8 /'0 763' '2/2'4 1'G/8 /'0 763' 98 'G/8 /'9 1'
6 .G9 ; . 2/24 G/8 /' 6 .G9 9192 8 '12 3'
2/2'9 1' 6 .G9 $C#' 'F6 4 ! $2/2 @' . 1 101 8'
061.'" 49 ' /19 1'07 468 '9 9 / 19 90'F6/4'
" 49.6 '498' D2 G.0 9'G/.' 3('2/'9 1' /8 /'
0 763# 86 F$'G/. 26 63'G/8 // 0 763' 94'29.'
498 D2 .01 29. 86 29.920 U B '2':9 '
! 68'06198'; B "208'29D01 /298'"2 63'0 80'
1/8 3'4 9' 498'92 8 // 19122 9D01 /29'29D019
F6/40 801/0 I 8 1#C 07./498 ".
('0 F6/' 0 1 .6 0 '"9 '0 F6/'"2 69 0G' 29'
"2 69 0G19 ' 8 9'2/2'"2 69 0 19 '(34 6"9 7'
D 01 0 '9 1'=/. 0193'0 763 '2/2'9 1'=/. 0E9 3'0 763'
F6/4' '0 64'F6 407'9/498 ". '07'0 /' 498 2/2'
9 .'/ / 10' 0 94'07'90'4 69 0 'H6 .'"9 7' #0'
(M` " !'G/8 /' '0 7 6 3 2 / 2 '
/8 2 3'G/8 /' 0 763 ' 94'G6 . 'F6 40 1 /8 /' !3'
0 763G . '26 63'G/8 /'. B'0 763 'G6 .'06198 '9 1'
G/8 /0 763G . '2/2'9 1'G/8 /'0 763' ' 208'
D .6 '0 801/29"2 '29D01 /2 './G1 04 1/ .'
/ /2 C'F6 208' 21'G 4 468 '9 1# 198'.<;2 '
1 0 03 '0 03'=.'F6 208' 2.G '9 6 1/8'9 1#0.'
2/2/8 29 2'./2. 04 < 1 / 98' ". 08 "9 ' 0 '
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>9'9262. 01 /2.'"20'". 6 763 !0 '

' . "&"%")' .& 3" ' 3-.%-(' E & 9'&"0"&9 "%.'.%'!' :")!" %"

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)3# 3+3 T ' +E ! / 36'E+ . '%' 131 36' ' ' ('
7 <,7 +])+N01)E*JS\ M;' 03'E ' ' 4E
! '9* S)E*<0 ; ;' '; E<E' 9B ' * ' ? B; ;' " 4(996'
[# 0 ') \ %\;' 4 E@3' ' 2 3"D =
7 ; D' %' I W' J D ' <\ S U _1 0 ' .@
K 3 ' ' 6-66,) . 5#)" R) #)@ ' &"-: "'
+ + 6!'- -+ ' ! 0' ' 6! +3C =(
&%, "' ' . 1'E.E. 0 .1.23' ' PC< ' T 0 "' \'= H
<% '<%&] " S 'E % L,c! . N' . ' " 4 ; %?
. ' ' -3! '& '<- , ! . ' ' 9;
(K #E!# ;7 .;= US0 6 / Z ' ^JV 5)" 5 7+%" <=, &' 2B S'
3') ' S = F S*' 9 .1' B
;' W*; ' W)' .' / K)K' 5% X 6
S 1c@A \E B' -%7 D20': <#55

>' ' 006190 H 80. /C 29D0. /. 1F6 "268'
' 49'"2/' 1.0 F69' 269 0 '"2 '
69 0 .9 '('0.'2/2'" 69 0 19 #"1'/8 2 3'
G/8 /'0 763'9 1 2/2'/8 2 3'G/8 /'0 763'9 1#9 1'G/Q
8 /'0 763 '2/2'9 1'G/8 /'0 76386 63'G/8 /'0 763'
9 19 1'0 F6 3'G/8 /'0 763#' '3$ '0 768 '"20' 98'
D2 .01' ' = F '06198'460763' "268 '2/Q
8 92' / 168' 1'9 'F6 763'2/2' 1'" 8 8 '#2/2' '
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" '"20'0 80. / '"9 1 8 92.6'9 1'0 768 '(D 20'
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16 '9 1' /8 /'0 763 '=.9 1'9F663'0 763 'I D/' GS'
hS@S 11 $E 86 .0 D21 .02.'=. 62.86 . # . '
.668' 3 '9108 808 "9 8 6 10'". '2 G ' '
D2 .0 9 F6 0'2 ; '9 1'0 F6 3'G/8 /'9F663' WT '
.'29.' 2'G 3'29.9 9' 3'0 19 08'./2. 04 4 /29 2'
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4 , "&" " (, ", ' "&, & 2 , 0

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,+ /' /' & % ! + & 9 +# " +" / ' ' & "&% ! . '#! &. ')+" ! +" /'&, &'3& ! . ' ! +# . !' %)&"/'! ' ")+ ". + '
0 . <, . !3 . 2%&# /'&, & ! - ! ' U ! +'! - & !' %)&"/'! - & % . ' ;)+ . . + % . '2 0 ! " ' - '&, & 2%+ ' , +% /' . & +')+" '
;) & ' ' ' +" % ! + &)%" +# " +"9 #& &)*+!& . ! ")+ . . + % . ,! ! ' !)+# " + +-- ')+ "#&" ! 3 + '
- 1 . + # + ; & & ' "!"&/')+" ! + &/ ! +"&/"+(- 0 #+ '& / ' + + ! +')&",&)% +" / ' ; !) %' +-% '
" / & %&! + +-7& %D &)+" &2%&" / ' V& %D +!" &)& &"9 / ' =+-% +' ! +"% . ! %) . '# +'f&)%" !
X . . & !)# . % . +-% + ! &" /! % "#!) 6 ! ' W =+-% + ! + . / ! -9% . !) 2% " ' N ' ! " ! '
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63 D 16 ' E6W9 2. C D6A 0 0 2 1 2 . . 9 9 ' ! ; 1 0 ' +
B'0 8 0 / 98 ' ". '29D0. / 298 ' "9 0 8 ' 061 '
10 18 ' . C 2 ' "2 8 . 0 7 = 3'F 8 4 . 8 ' "8 6 . 0 '
19 . 98 9 0 19 089 9"9 08 0P9 08 0 ' '@+ *R U\3?1* Y ; 1 0 U , 6 ' . @ : E ! 1 H 6 1'
08 $29. 2 / 2 2 8 D6 0 763 ". '4 468 ' 6 . 8 ' "2 ' A) ' 9 ! * 1 ; 0 S R [\'D E?20 j / 'W
69 0 763'06198 2 / 2 ' "28 . 0 . 9 / 262. 0 . 3 ' # ' C # " M'91 . 1R '9$<\S 0 'W
2 / 2 2 . . . 9$0. 4 . G 3'F0 / F6 . 4 068 8 ' 0'
22D6 0 7630619 2 6162 F09 / 268 E. 9 ' ^ ' 0 ' ' 1' /8
'/8 2 3'0 ' 8 0 . / ' " . '29D0. / '9 1' "9 0'06 . ' 0 0 ' 1 0 . ? < ; ! 0 < < d' '4 / ! 1 ' S , U 4Sd ' 1; F0 _ O
/2 0'29. 9 9'9 1'9 9 061'2 / ' . 19 'F6 3'92 8 '0 ')-MV , / ! # 3 6"' 5 -,T/) 7 3 <P# ')
F6 4 / 9'4 . 0 . 0 19 ' 4 6 8 2 / '4 . 0 . ' ')'T O ' ![\ < ' M0 u M' \ ' . 1' M
29. 9 9' 0 19 6 8 '9 / 68 ' "9 9'41. 9 ! E ' . & +'/ L ')%, -] . . '6! < 5#< 5"/2^ 9! 2 /K@ "'S >,
2 30 . 8 0 E/ "9 2990 , 99 1" . 0 "9 ' 0 0 ' "9 0F#' / "
98 8 8 6 2 / . 622 2G8 662 / 4 @ S F6 / 8 08 ' / ' = N + -65 % ; a] b <6% + "
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. 9 9 BE. 90 768 06 . '2 / 2 '0 768 = . '9 1'0 768 ' 6,3 ' +3 , 6* ' 6 W ' _ '5#)6)@ 3
06 '2 / 2 '0 768 '#' "9 . '0 6 8 16 "9 '29D0161 ' ! ' ' 9' 6
2 / 295 07u4 . 16 C 0 3u 4 . 8 2 / ' 0 0 ? R Z ? 0 S
T / 0 929. 9 9 ' "9 08 8 01 / 298 "9 29D01 / ' 0' ' E' @' ?' 7 ? ' 7
2 . 8 '9 919 08 061' 0 08 '8 G 'D 8 '9 1'29. ' 1' 3'
/ . 6 17 29. "@ / 7918 / 4 / '#2 . F699 . 06 . 2 / 2 ' " 9R MD1 M ; UB0 EM f ; 0 E " ' $ ' !&! 6 "'
. . #' 94'/ 8 2 0 SS . 29. 9 019 2 / ' "9 / 6 3'8 / ' 0 $ ' 8 S 9 ' '5'C
4 / 208 E 1" . 44P 1F8 0 8 0 #061F6 29D01 ' R r K' 3
0 / F6 2 F6929 9 '0692 / 2 'G9 9 . 'F6 / 49262 ' I' ' ('
" . / 6 3'8 / 49'0 . . 4 9 '2 / 2 8 0D 3G / . F6 8 / '
8 / 4 / G079. 061 G0797 . ' , ' : 1 . 90 262 . ' I 11 ' " S*Y E^@ D' S1 M M J H ' " " K* '@1 '
. 768 "9 94 . 02190 / . 9 01 / 90 76 F60 9VT '0D1. 1 ` 19 'D' M?M <)ZSB 1@ C ?'3 ' 2'9 / 9
98 9144 . " . 9 / 1 1F6 / F6 4 19 . 061 / . ' =59<9C" J - 7e-P] . + -E> 7 . ' M 2
F6 / 4'- 98 9'4 4' "9 9' / 16 . '9 9 '061' / 98 / 2 ' :(' +, ' ' 9 6 S' ' 3
/ 19 1G / . 2 / 2 '9 9 06 '2 / ' / 9 'F6 / 4'06998 '2 / 2 ' 3
/ . 9 1'2 / 2 ' 9 ' 8 / 7 9'& "+" ' 9 'C#F6 / 4 ' " " 5 C + = 7 'A] " X"0 S/ % '
62 / 1 7 9'*B'2 / 2 ' 9 29. 9 19 K 9 616 0 D ' & " 7 ' + ' "^M $>2 & ' %5 / 0
16 '/ 8 2 0'29. 9 9' 9 '9 D / '2 G ' " . / . 3'8 / ' - " '% ' '0) " & ">'&' "<EL' (' , " '
4 / 2 6 ' / . 6 168 '9 1#F6 0' ' ; '3 "/' / ' ' 8 ' ' 8 (& && ' &
' 29. 9 0 U' ' 9F69' "9 7'4 . ' / 19 1'2 . 61 6' T ' 1 . / 'S 1'S 3 M ') '
"9 69 91"9 69 2E9F69'17 . '29F69'2 / 2 ' / 9 ' : '
26 8 2 . 68 . '0 8 0 . / ' 0 0 $ 0 1 8 02 / '2 / 2 ' < R'AR' #+" "& ' R
"9 0#C'. 6'GA. ' 1' 0 0 ' . / 21 2D '1'0 8 0 . / 298 ' -<4J " 2%9: 2 $"' ' J"< " Y4'
2 / 29 9"9 08 ' ' : E9. 9 90' ' "9 . '4 . 6 0 76' ' ' , # BSJ 2" "' N %B"_ ` &' ', %' 7 ' : W S ; A'
8 6 C 8 0DG6 / / 191" . 0F69. 9 ' 2061. 2 ' 9 U ; ' 4 >
"$ ("3 " ' . 103 / / 19. ' / 9' . 03 0 . '3 " $ 0' I
1 29F69' / 9'29F69'2 / 2 ' / 9' . 03 2 / '9 . 'F6 / 4 ' = >)@# 3 - ') , ' 0' ' SS
" . / 77 ! 2 / 4 / '0 . . 4 1 "1'79 6 '2060 9#/ / 197 1' & +3 M % +E. " " 3
. 2 029F69' 9 '2060 9'79 6 '29F69'2 / 2 ' 9 ' ' <6 " 4 & T2 %N N & #) "'
. . 4621' D 8 'G0 9' 2 . / 8 / 40 '01F69'9 6 8 / 4 '
0 0 ' 9 / 8 8 '0 8 0 . / 29'0 . '29D0. / 29'F6p ' * ' = 6 ! + 9)@" " -9(G C= C+ = !
H '0@ / DZ 8 6216 ' 69', . '49' &*%/ "2 69 0 763 ' .) . ' 6 ' 1 D
8 94 ! . 0 . 1R EE 6 . ') &* /' 2D6 0 763 29 '
0 19 0'9 9' "9108 0 . . 0'0 08 @ '2 G '
. 9 1 3'F6F' 6 1F6 / 4' " . / 791'8 / 4 / '9692 01' M8 3 @%6G 7J % ! , - E > = = ' -@ '
94'/ 8 2 0'9 9'0 . ' 91'9 '29. 9 10 . 9 'F608 / 7 98 ' #'E 3# 3 -# ! 5 X7 < + RC) < R< ! , '
29F69'9 / 6 10 9'/ / 1 . 7 . o'29F69' 164 / 39'0D9 9#' X(' ' ; ; ' TC5 (' '
F6@ 7 / . C . 08 63 G / . 616 6 . #' 2'8 2632 ; ' "3&& ! '%7' (33' "4" "' 3S' 6 ' ' "9# &'= '
. '116 6 '+' G '92 8 ' / G 7 . ! 9 '04'49. 9'8 ' `S1' /1 ' = M. P ' @9G 11 /
[0'022 / 6'0060 8 0 9'G / . ' 616 6 0 6 029D0 9$ ' ' ' ' ! "' # ' $' &$'

[illegible]

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\5$" 3# 33 ʿ 3 ʿ ;ʿ- D ʿ (ʿ " ʿ($D 3ʿ<3 3 3 ʿC ʿ @ ʿ"ʿ3 ʿ H 0ʿ
H 1 3 ! !* Z&Z#!ʿ ,ʿ & *((ʿ 3 ʿ(?(ʿ3 $ 33" <Y "1 ʿ
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& ʿ * "1!ʿ 3 !

T :6 (=74;5=ʿ?2N =7?:ʿ2E6 2?7;7 3 1ʿ ʿ h
(ʿ79 34:ʿ7;34?ʿK:?ʿ52;ʿA?9ʿ6:=56ʿA59 6ʿ
K2/8 20168 "26806.. 8ʿ9 9ʿ/ /...C.ʿ
ʿ49"0/ F /4 20 80./29#ʿ<F6 406.98ʿ5 ʿ
2/892 ʿCʿF6 4ʿ22/8 20 68 ʿ4<168ʿ9 1ʿ021.0#
1192 8ʿ /2ʿG/8/ʿ2/2ʿ"/./ʿ2/892 ʿ94ʿ 2 2 Q
168ʿ2/892808ʿ"208ʿ98ʿF6/4028 /4/ʿ D2 ʿ
.0.ʿ2/8 .2ʿ 2 G . 8#F698048 /4 8ʿ /2ʿ* 0ʿ
9.2/24 E!ʿ 1ʿ"97 8 94ʿ2 2 168ʿ". 7 8\92.ʿ
D16 /8 2 30 B 002/Cʿ29D0. /ʿ". ʿ9 ʿ2/8 29ʿ
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29ʿ"97/ʿ8 0ʿ B0 12201/ʿ2..ʿ2.D0. /208ʿ
I "9ʿI 1ʿ". ʿI 01ʿA?9N 1ʿC ʿ.919 0ʿ9 6 8/4 ʿ
6 "970ʿ* <H! !(<ʿ? ? , / 10 69
46;34:6 7=712 E6 2?76?;5=*7>ʿ $ 4:? ?7ʿ
? ?* =7722 =7; :ʿ@65E7; :52;ʿK:=:6:6ʿ52;ʿ
K:=:ʿ15=15 52;ʿ6:6ʿK:=: 6:6ʿ52;ʿ6:6ʿK:=:ʿ
=2 >ʿ52;:=6>ʿK:=:ʿ6:6ʿ52;ʿ:=6>ʿK:=:ʿ52;ʿ
:=6>6:6ʿK:=:ʿ6:6ʿ52;ʿ:=6>ʿ6:6ʿK:=:ʿ;ʿ 6ʿ
?H? 625?>?56*: 04>?715)6ʿ52;ʿ 7; :ʿ "ʿ 4=ʿ
74;5=ʿ*"1 ʿ >ʿ ʿ?5 ;4= 6 4*5 7?=0 ;4 ʿ
)7=ʿ14*9?;5ʿ1?46?4ʿ:**:2; :65>ʿ)ʿ 5 0ʿ
E 7; 7 52;942;4>K:=:ʿB 9941ʿ >ʿ ʿ1?:;5 ;==ʿ
?:=*:6ʿ[3 (ʿ :=56ʿ254ʿA5 04=ʿ(3; ". 6ʿ9 7?ʿ
72; 767? :6? 1? ?:ʿ347 4:;K(5?ʿ5 4<?ʿ34:;4=ʿ
14:717 2 =7; :6?=ʿ ʿ65E7; :65=ʿ)ʿK7056?
25?4614 ?:62??41:6>ʿ: 1 65=ʿA;ʿ* 471:6?>
14:8 K= ==5 N ?1 ?:ʿ3=7 FFP>)4 ʿ
W6 1/\04 0916 061ʿ2/2ʿ6 1/#F60 9ʿ9108ʿ29D0 ʿ
4/ ʿF601 / ʿD16 ʿ98 21 219 D 8 63ʿ0219ʿF6/4ʿ
4 16 2ʿ9 1 ʿ2 0ʿ. 1 3$J 1ʿ6 163ʿG/8/42 63ʿ
29D0 /E /2ʿ9 16 163ʿG/8/ʿ9 1ʿ /2 6 163ʿG/8/#
8 63ʿ29D04/ʿ2/2ʿ9 1ʿ2/2ʿ6 163ʿG/8/ ʿ208ʿ E.ʿ
S(ʿʿ <4 c ʿ ʿ 6 1/ʿCʿ2/2ʿ 6 1/ʿ
04 .626 ʿH .D16 ʿ"92 20 1.34 4 6 2ʿ
4 ʿ10ʿ4 / 10ʿ62.ʿ Uʿ =8 3ʿ. 1ʿ01/ʿ1ʿ2/ ʿ
8 2 3ʿ"2 69 0 19ʿ0..9 1ʿ 1ʿ0 8 01/ "1ʿ/8 2 3ʿ
9 1ʿG/8/ʿ6 163 G6 63ʿ29D01 / 2/ʿ/8 2 3ʿ9 1ʿG/8/ʿ
6 163ʿ/8 2 3ʿ9 1ʿG/8/ʿ2/2ʿ6 163ʿ2/2ʿ/8 2 3ʿ9 1#
G/8/2/ 6 1 3 19 F60 2ʿF 74ʿ2/2 12 1.ʿ
./21 2D 9"903ʿ 86 ʿ919ʿF68ʿ9 ʿ4089. /
3ʿ251ʿ?:616E ;79 34761:ʿ ʿ L 3 E ;4 ʿ
7 2 219 ./ /26216 ʿ+ʿ 01061.8 ? 1 Sʿ
"7 29ʿ "3 ;; "ʿ ;" ʿ04ʿ2/2ʿG/Q
8/ʿ108F608ʿ $ʿ 67 94 68 F6/4408 044 168
!ʿ?2; 42;4>ʿ6:6ʿK:=:ʿ6:6ʿ52;ʿ 42;4>ʿ6:6ʿK:=:Bʿ
52;ʿ6:6ʿ 42;4>ʿ6:6ʿK:=:ʿ6:6ʿ52;ʿ6:6ʿ 42;4>ʿ6:6ʿ
K:=:ʿ 4 9 >74 5=6:6246;*94 5>:**:21:ʿ
65> ʿ 51K>25: 24=70 99 >5 46? *2;?*5 2?ʿ
A5*:;5347ʿA;46; ʿ6:= 65ʿ :6ʿK:=:ʿ 6ʿ 6(ʿ
34 04>74;5=8 7 8ʿ I 3 ʿ6:67??:==:17;4
12@G3% cʿ ` 51#2G3 498ʿ
9 .110 / 168ʿ0.ʿ1"9 768ʿʿ ʿ04 62468ʿ
9 9.#" 6.ʿ"0 91ʿ/823G/8/ʿ2/2ʿ"0 91ʿ/823K
G/81 $ .1ʿ/8232/2ʿG/8/ʿ2/2ʿ"0 91ʿ/823 J
M<98K:=:ʿ fʿ :652;56 =ʿ1 ?5614=ʿ :6ʿ
:=7>K:=:ʿ251ʿ 9 765E7; :ʿN&N%K:= 6ʿ71ʿʿ
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" '@ 9 #" 1 2 / 2' / 8 29'9 1' 02 8 0 ' 6 168 'C# '9 1'
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26 O 39 1' G / 8 / ' 6 163 # G02 . "9 7 ' I 12 / 2 / 8 '
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,' : 94 .668 06 .98 ' 2 2D6 02763 621. '
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6 123'E' F 0 '29D0. / 293' 07 F .'2 / 8 29' ; .'"9 7 / '
" 4 . / 62. '2 / 2' 621' .08 92$' F6 0' 98 9 '29 '
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W' = 94' 498 ' " 4916 ' / 9'9 9' '2 / 94 . 'F6 / 4'
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7 99 9 29D0 . / 9 1G . / 7 92 / 29 9 ' , ' I'
G 3'92 8 ' ; '$!'3 ' 9F6 16 '06 .' 498 '49'9 /'
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7 9 'G / .' 029' . 19 D . 2468 ' I 1 D 8 '29D01 .'
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3' * "1 ' I 9' ' / 2'9 9' ' H68 3' 06192 '
/ 7 9'2 / 2'9 9 '29D01 / ' 3 '2 / 2'G I ! A2 / 2' / '
7 99 9'E 94G . '2 / 2' / 1 7 9'2 / 2'9 9' 'G6'
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G . '2 / 2' / 7 .'9 9' ! / . . 0'G '8 6 . 67 '
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6:7199 (P;K4 = > = * : 0)?5225 6 : 6 K ??
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& * 1(D 5 : 6 1 5 * : 6 150?6? ?7 = E
9 0 52;7AKH? A5; : 722 = ; : 65 = 65E7
: 65 = 5299? 5 : ? 7 71 3 *! D 295 @ : 6 5/95
1 46E56179 = ; 7;3A ?K7; K70561 246; * : : *
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k?; 7; A' ?f ;/V%/YF : ' >' N'0<+ H<0 3' @"6:6'*:2990 9 1 7 ?'5'?:6? 7 :' 3 7 ; "0
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F6/42..9 7. 9 . F6/4. 07 6 46\' 1F6 S
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' /H<:!@'< < (T 0] ' ' p' .1 M /"' 7'@C F6/2 08' '0.. 49 9087/' / 162.#G/ 68'0619'
2*V * *"/5 HT: ' , ' M' < <;' ' "/*Bd'\<;'j<' ". 68"3'".8' 12/2'9 6108 63' 0'"98 ' 86'
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c<' M C# 6_' (* _''cB'U)' ' --J /2'9 9'F 0 68"1 0F69' 0 0' 49'9/' /4' $'
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9 ' 9_ ' ' ' / ' - & < P ' \ C#2/2' 9.0 $C#9 9 C#2/'9 19 10F6/F6/4'29..! $'
U)''' = U$'' 9 ' D T:+ 9 R' ' ; 9' 3'9 19 './242D91'2/2'9 19'#G/.'06.9' 0 6'8' O'
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. 19 '29 .9 D /'4 . 16 #0 19 6 8 ' 219 2 '"9 .'$ 0'))- M P + .]! B! !+c! +3 " '
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0 9 . /2 9F6923 .#9 F6 / 4'2 . .9 10 7'9 1 . /2 9' H
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' . 6 8 '"249' / 8 8 0' 6210 .'2 /2 62 .'# 9 F60 ! '
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') ' `' >' /A' ' ?' ' ' ' / ' 5 ' >' /
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; ! ' 3 "(" 0')' (" (((;" ;!" ' '#@; " ($;4 ! 3' N ! 0'
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' =' 74;5 = ?: 6 767' 52;' 722 = 7; :65E7 ' ' a' , L ' ; " ' Rj 4 ! " 2; (23 3 : "2DN W
' @ @ 6020 8 01 / 0 8 01 /2 BC 70 . / 0 ' ' 5M' 4)!M 6 ' & 0 ' .)!) 2 ;< G ']:/' V!0J '
; ?' : = 6 >K: = :' 42;4>' ' 99 ' : 7; : '6; 2J >' !3' _'] D' 'G@p' ; 'A '1
K: = :' ' 42;4>' 76K7)? ' : = 6 >K: = :' 42;4> ') d K M WI,' 3 3'$ @: :<']" \& 3 0 (& 0
99 ' : = 6 >K: = :' &/' K 42;4>' f A?9 ; ' 52;' 79I Mg' ' UB'Z0 ? !S +)' M) (&&N
94>' 42;4> ' 6:6' 52;' 799 7>' 42;4> ' 799 7>' 6 4 ' &Z0 6L' =M '$ ' 3- -! : %3' ' I' ,#
2;4>52;'A; 7 E ?4 K7 4 = 5//?: 6; 72 7' f ' 7 = ' ' ' ' 5%73M M$ ++W' </_& 3' &3/)&' . E1[0'
2' 5733H' . ' 6' A: ?5' ' ?: 6253446;4 ' >' 347'
246? = ' 1 76:57' ' 99 ?' 74;5 = ' ('52;'?: 6; 7 7 : * '
' 6 : 34f ?: 6; 7) A;' 07>5' : = 65 = K: = 6? = 9"3 1 ' ' +' * : *' Ne ' ') ' ' , ;

' . ' :@' ;H &'9 .3 6 168 / 8 2 . 8 G / 8 298 . 9' 2 2 8#
@ ' 'D a' 0?$' ' ' (.1 0 8 2'926. 06/2 763'! / <; 3! '6'
;EE. 0 .1 ' 9 / 3 ' 8 1. ' '3 'G079 9B '"F 7' / 91' 9' 2K'
W' O 111 19.' 9 0 / 2 /'. / 6 0 0 F60#'9 1'. / 21 0 E 8 9F 8 0 '
) ' ' (3: M'(&' , ' H 1 / 0 2 8 0. / 2 '9 1'. /21. .6 0' 94'4 0'2.D01 / '
H ` ' . \0L .<'D '< . /1 0 ' ,' D I 0K ;(B' ;' W' T 6 0 9. / 2 14. 024 62 B'F60 208' 2 E / ' 0 '
$A . 0 $' ' 1$' 0$ B / ' ' 2'W ') ' ! =B1 0 . / 21 0 0'"9 ' / 2 / 8 #'2.D01 / 2 G9 02'
D N ' ' ! E 1 . ' M N '1 K C ' ! D1 E!1' :@ F 6 9. / 2. 0 6 8 4 9/ 2016 ' ,' = .'06.98'4 Q
K') ' - $ ' 'D 0 K.1$' ' / ?1 .9$'I 1'F 408'4.'7/ /"9 0/ 2 / 4 9'7/268 '
\['V (/ D0;0 ' (@ - 'E/ $" '@ :/5' : ' 0 0 0'"9 7' 0 0 2/2'. .'7/2 8# 198'0 0 F[9'8 0'
*'s, & 0 &'(6 ' s 0$W0B> / 's s %'4 s <'cs 6 2 '"1 0' D 16 'G0 6 8' J'. / 2 020'"9 'B'C' '9 1'
"20' 9. 8 462 'F602 '. / 21 020'B' ;' = F6 3' D '
16 ' 6. .1$ / .'4.22 '. / 21 0 03'/ 8 /29 'F6/4'
166202/E 8 6'1$ 636' $ 08'6'9'7/2/'1@A
ZE1 . S' 2 E E ' D8' D' 7/262\$4#'49' 8 / ' . 49'8068 '.049
9 01 D' W ' KS % D 0 1 0"' @ \'DR EK A' .1 ' / 10H 3 C 69S8 1 ' 6.'"20 '"9 09 101F6 '
% '@ " (' ' I ' ?'D3' , S' ' .1 0 . / 4' .' 621'. / 21 0 0 ' 94'2 / 2'. /' 'E6U' '92. . / 21 0
: ! ' .MK / '. ' ' R ' \'W' / 68 . / 26 0' / .001. ' .4 /1 .' 0/4'. /2
' ' ? ' K oK ' ' $' ' g' (' (' (H ' U' I E / 497/2// 8 /
@ @ U U 3 ' @ ' D $('9 1 . 9'7/212 '0 0'". / 2/E' 3'7/
3', *'16 '(3'?"E3 S ' '3 5' 4 . .' 268 '9 1'06.9 2'0 124 . 4 0 HE' $ '2.F6.
/1 E? S 1/ E0 ' : 0 '<16<B/ ' 2 . 129F6. 29 9 /19 1FB / 9. U 1p 080 0 8
/' * '(S'' / .9246 2. '2 = .F 0' / 202.6
' 3-%% '$ 3'3 ,".- 3 2419 'F6/42/2 2. 1'299F6 K /2' 29 .'F6/4'
' /' ' ' ' 2. 1 11 2. '. 2 EE 62."1 F6. C F6 2. .
8@ '"@3 (' / 202.6 FO/4 /2 2. 1 C F69'2/6 29 .F6/4
W [< 2" R ' +' $@ $;* ' $@ 0' 29 1' A' =94 2'F1 7O 39 14. .9 . /# '"91/ 62.

;' E' ' 34';' /' & ' ' 1' 621*$9 . 0Z /293#. .#/. ! 0 H J . . . 2/293' +' =
9 S <? . ! 9 o 0 / / ' @ 9 \\ S > 11 ' 7/ 68 . 10.7 2 8 C 2/1 2068 C
2 *'$<$. K' :Pc ,
<.' :' '$ @2@ @' /' ' < K0J' S' 3 ;@ *" 64F6 498 9 940/ .06198 9 0. . 4.219#<F6/ '
, 'W' 'Bh')&5 ,6 08'. '0. . 4 "1'2/2'8068 1E2 0DE3'06.98'49'
;'g '"(' 4' "' / '/' F60F69' 9'"9 0' ; 'F60' 9 ' 9# = .' (? !
" 3' 1 & ' ' 0 0' $ ') 2' 3'; "1 F6 498' &?$'"9 0' 10'0. '
. 6 G0. 'D .6 1 %$ 2/2'7/268'4 9'7/268 '
: ; *((3 R ;$A" & : ' 1% D _P A 0' 49'. /'F6/4' 9 9' 29 1$G0. 6198 '9 19'
: '.4 ;' ; : & ()!*R: @ D D ' @ (: 0' 8 0P 2 EE 'X B'49'9c'F6/4' 9 '0. . 492. . #F60 9'
' Q ! L : (*"*'(' J' (": & '"'W 8 0D 3'10 09 1'4.'7/2/'/ 2 /'29D02/2 3 'F608'
@ :)P> 4)5@: &@< C @3(&]/ ()V 3J5\)W 0' /7. . / 21 0 E 8 0 8 .'06 92' 2'F60F60' 910 .6 F6'
;' ' B' > ' . / 2. 0 08 67. . / 2 /298#. / 21 0 0202 F69'
3 'F6 '2'9/498 0 ' 6 868 9 621'
D 16 'G0 68'0 19 0'. '. / 21 0 0 94'F60A' 29D0'
a'@ ' & K ' 1' @\@' ' (@' 1 ' . / 21 0 0#.72 101'G 2.'9 19'R
F' '"' (' ' ' ' ' ? K " . / 2. 0 08 'H .". 7/ @@E7/ 6 29 .E20 68
K 3%' & . /+%N E ! K '< 3 9,3 ' ' ' 9 1. / 229 0# / 0 79286 .k 9024.91 0 2'
; $&* , '7 /HP//;" F' ' ' d'(3 : @' *3 10'S ' 9 1 8 0 . @SB?2/2. 97/ 8 0' A*' : 01. 901
U')+)2)2 _'] N' `0@ ' 2'0 3 8 . .'; 8'@'G079 9'/ / 199 G .'F6/F69'
K /['hKBd' .! `J$' NC' ' B' ') 9 19'4 .168'" 49 ' /19@. '06.'.0 2'"7 F69' '
Bh9AhAeB) ') ')' ' "(""(' 3 3 '2.D0 /2 3 '0 11' T Y W 0'01'F6 743
%: '8 '" L ' . & 4'% ' '$@3J ' ,' $0@ *' F 2/2' 62.'. /21 0 0#4.' !30< - $N ; @7 <'"9 0'
'Q ;;2H@$ ' ,'&@& @'M8' !&& '35 I'&@< *3$ ' / G .6 #".'F6 'G48 298' 6.0.'2/2' 3'G/8 '
292 '9 O. 1 ' 'ED 26'G '29D0 /2.3' ; ("(0'
0'9.6210 0 E9D01 /2 3' ; ' "("D') '
)A' : S. 1. 90 8 O 1/ 'G079F1' (O ; ! H
$ ' (D' &3 ! @.'T' '! '5 -5 -1 : #'$' ' 5 ?0:666N # 9:60: = =2* '522?01 4 = ' ' 7?
Q' 3'$&4 , : @ (0' ; *'$@ * &(& #%' * 7 5 57' 6 = ='6:B'1 5'0:6 6 ('@'6:6'0:64='
<' D '0 &E &; (&&I ,"!' : 5 & "' ' *'W?-?/A' 125'0:6A 6- E 92;4?A5 70* 6 :6 6:60:64=
9/A ,' ' ' ' 2 ' [(&]-& ') ' O & ')/' , ' 3cccc', ;:6 ;5'0: 446 V47695 ??:6? 7 7'-6:6'56 =
' '(' &@ ' :' &;&,*' 3 :&'3' '4]] 4 $ 'V ?7'347'72;1 5'=797'B:4 37 61:34?9 = 4 'A5 7
M ' ' ' 6 $ 9 19 9J. 1262FS006198". 09 1'"9 0. / 0 020$
&0 EF U4' G22/2A7F 1;'. 1'8068 F60 9. / 212
@& , S]\'&@&, @' , ; ' 94E ' 4' D 1U ' S ? 8 6 ". 039 9 6 63' "3 0
:' '&. , @'3 S'0 j'8" 3 N(' ' M' / ; '/ -9 9 ' =e' 4; I'H" 'N (@ '9 9'8 0 U$F6/2 8

, U3' N '<!] 2;& ' 0: = 6) 5 6; 7 7 I K3? 6: **64) ? 50: = ='
2(' \' ') 'A)[' ' ' K7?56 = '52;'27927' ' *; : *;? ? 7 = K7 ? 0:64
2: '$@&D3' $ @ $ ' - $ @' $@ ; '$@ 3 "' 6:6'5225'0:64'5; ;'?:? 7 7' [0:64'125'0:64=

> I I 5 : 5 I M I ' A Z

' :9 .66806 98B 6 G 8 / 94 . 892' '2

.108 '8 6. 0P8 /208 630 80. /298 1"1 '
6.1 0 3 2 '29D01 /K.1 1'. /2110 0 '"1 610/ '
2 /2 F 9 X 98 016 'F6 .F6 4'9 7/268 '4 .'
7/ 6 0?$1 ?B@S @ 2 G '9/ 6'F60$'7/20' 21'
. .'7/8F 208 A' 7/16 8'. .'7/268 ' '
"26. 0 19 7/26 2, . BA ' 498 '"0 .1'1E6 / 4'
..F6c 6.011 F6/4I9 1P /268 7/2 8 G`.
06198 '2 G ',?1 . 107' 0 'F6 .F6 4'9 1'7/8 8 "'
. . .H 68'= 8 O.9 C8'2 27/ /' B' &/*!' '
6 ' 0 80A
1 /293'29D01 /2 69 ' /.!' './ 6 11' F A'
8 9219' 2/. ! /2 71'0 8 01 /

&3 6/ &))&3' S ') !/ !' 5
B 'h' ' '. ' - 'S !-'K' ' &- +
'2+ '! ' '- ! 3 ' +/1
+6' ! ;'< 0 / S"1p)) -3' '!3 ' ' ' ' #' \
& ! >-3 'C0V . ' "' +'0' / 1p'
9 EE =A ' '&- &=)' L'
.1 . ' 0
' 10 1 91R ' R' 5.< +#' '+
' ,"" ' /B M' R' ,%&' / /@ 01' S '`e

.8#". Y ! 82. B/ 6 12< 7/2:8E?1 /82.8' ! >8 '+)
G/8 298 ^\ 7/21S8 0$. 6 62 < LS??". ' ' 'N1 '=< " + $ +3 . ' ; &% '
". !)) <'. 7 L". Y) * &. * ' '

./810 @ 1S/ Z 0 08F11. S ? F6c. . C ' ' ' 0 0' '. $ 1E M HA ?
/110 R . S0F SfO2498"- ..\M E20 10.c A' > ' !:p' ') ' 0' + &% '3 3
..1.'. / R MD 1A`S 26198'. / 9D 0'44912' 0' ! '
9 92/2. / 40D 1' ' ' A (

m m

H 1 ZM '2 : M 19 8 ' / ' : M

#' ' ' ' /' ' ' ' *' +

' I q 9 ! M 5 ' I 5 M .

' 5' A' (

V2 ' I' 5' ' ' 'M' ' I' ! 'M' 'N' ' !' ' I' 'B 'M' 5' '

- ! ! . / 0 1

< " ' B

=6R .0S8 C '/ 63 7 M S 2' 1 Y 1 . /16 8'15 80. 2P /293 F11/1'09'4 6 /293'

! / ' ' V

' ;' ". #!) . . . + %.' ' ' % " 6 -'
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#'>'2! , & %/ '6/'3&'
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L 5'' ' ' '4 ..N!'33(" C ? ' @' '!'
- D ') ' < ' 1$ " 1 @'
9 19.0 .0498 /2 1 04/298 'C . 92 I S'
2& 3 ! 456 4/7' '82 !9 '2 :'
'!3 "3 1';9 2 !<!#<# ! # '=>'; 5 2'! ? 35 /#
F84 /D 263" . 3 91 9063$=)F 63' 2'
91 ' ' : / G . FES4 E # F6/'1/./'
F6 4 `89< 9 0612/2. 7$S.FS 4C ! ?8? /8'
2 ". /68S276 ' ' : / / 10/ D 6 41@0;

: K M 'b 86' f I E 1`< `?` `A
`]
M . '
Y E 1` LB`I B\"RdS MR` I 9B` '
"8/' ' &T)', '$] ' '
' '

> , A 7 , !! *B!& =# 2 %2C.D& E# F ' ' CG -'-

01119 ` S, ! ES"` 09 3 0618 01E9 08 A A' '. & (=-/ > M ' E?'W' '6 ' '
80 L . 90 . / /82 6126+ 23 . 11' &K'c' 'S' S' ' C

07< 6."2P. 0 0 1 0 .6 0 S1 C#"9". . / ' ('15 A. S /@ E M B R?'9 ' 0
1 02/ 6 2 9024989 9C . 8 08'$061 '"/6 .0A'
1.80/5. 9E/ 68' "108 / 7 / / 1 /4.' 0' ']
<#! H

U .

0 3 0 ((& 1 79?22 ?)74;5 = 52; 6;5 5*; :?:6; 71 7 :6 >
/ ? + H ?1 / 71A? 4 34? A9a: 6 = ?: K? 56 J =
: D D 67N 7/ P 1 922; 67 = &5
9 5A - 7f/ ?+) 5 f3 2 2;A7 @ 34 7;5 :E7 9 99:E 9 64 = ?B ;5)?I?426
7;/ :+2I I?+K 79 hA 1 79 ?4 65295 7 = 6:6 4-9 : 94 = *2? ;
[/ 6 7?- > 7 <(+# A) 7 7 ? g0 k . # 06 B :# 14 47 ?9 99:E 2; ?7 * :*49 ; : 46*9)? >5
2 :+ &(:"* : P3 ((F 80. \A59 29D01 / 0 .6 63 49 0 EF6 / . / F6 / 4Eo
; 6; G I?8 MA > : :)I 5Y +/ \ , A+ 8 63 8 /49 >.8 / 1 01 6006..8 4B < R @ 1
e5 & P] T5 @ L 3 @&0 "9 0 1 > 9 2 1 / G / 1 G 9 93 6 0 #
<"D !T (% % J ' 1 " C V = 'H > 0 .4 .0 "9 / F6 / 4 04 .68 9401 F6" 9 .7
R@P !30 J]DPV E<YN f 10.6NE 44 1. /D0. / . /2. 04 4. /2 3# F6/40
- ; 8 2 < w H 28 + 9 2 04 .68 F6 0. / . 20. 9 # 68 1 / .6B
3 P 6*^ $0 - -) $3 , " 3 ? ;" (/ E F6 / 4 49. C# /707 . . < "1 2 / . 3 4 4
"/(- $5 I=P)- f(c (?@ * - 94 T E44 D16 / / . / E F6 / /D 1 .0
H X kFG 7U \ Y) 78> 1? = :6gK4; 47 7? 1 79?? ?7? 22? 76 ?H3 2 ;?
2 q q Q 29 ?3456? 04>// I / 2 1 ??;4 '2?13 :171* 7' 56?56
;77 8 6 7 \ 5GG 2422 ? 76;34H6 = ?76 :0>>1?2 6 ;7
L & ;/ 94 ; 5 = 64 = A5 :7**1 : 6 345 = 7 9
] @) , 0! . 0@ (R : '" . : * :*:2= : BA; 7;;60J4 = @ 1 ? = 7;;
- $3 , !3 04 ; 2 6571 ? 7?4 K4595*$. ;6 7 //F# 225
S H 7 3Y : ?@FP;) <hI & e5 F A59 :65 ? > 99:E 26 .> 74 ? 5 : 7; :
* - (** > 3&9 ? *)/ ! (34734 04217 = * :10 [79 41 34 117 = 5 "0
+ (" ! 3 : & (@ F8) 8 *&0 3 70 K > 3455 *: ?7 246? 6???997 0 7?? 1 5
% & 2)QI I ; ?; >8 ; j?2 5? \ L : 5: 34:1 KH? 246; , ?: 7 4?6 5: 34:1 K7]?
=) + % _7) ! , 3 / " " 246? * :*;5 - 7'? 54?6 ? 7? * :*;5 K7 ? 545
1 $ 6 5 H 3 6499: H;56 : 5 = = 4 :*4> 1 5
h9@ 23+=f2" + @ o ! C ($ Q "1G. 9.9 02 @$ BB$ B :9 .468 D46
B (E^_ : 9 B ;(@ 7 E 3 1 .F /D 86 0 . / .68 F6 . . .0F A0# 0 ..9 1L
3L"- :(:(@ : & ; 6 2 1 2 6 0 0 0 9 24 D.. ! 2 ..4 03
c 7 4 Q > 0 $) . (2 ! *0 7**7 57? 9 a *?. 54 7 6 8 .68 F8 "20 9
M ?' F / 6 76 9 24 D91 F6 F6 498 9 6 / ./3
4 U ,) B Z;1 KA ;%! J= 3 E 1 %FK 19 8 2 / 3 H 2129.9 I 0 2 / 2 ;0 2.6 8 10 89
; @? (:D (. 9 / / ./293 E 2 1 / 1 / 0619 2 0 .. / 0 19
68 . 9 C#0P9 680 .9 /82 01. 76 498
914 . 863 06198 /82 0.. 76 F6024 /8
67 .P0.. 99 ... 49F6/0 .. 682/24 .0
16 #0. 26 A 0.. .6 ./4988 /4/

>9./269 /2. / / 1 /268 8 .68 !0

G"> " ! % ? D$ 3< ; "5 @ " ? (" < ; (% ? ;" &$ 3" 3 * "0
3 ?0 E $($ * " ((33 " " &$;(" (" (3 ((" ($;" D " ?(
O" (" ? D;" < 3 $!@ " 7 ("

+ EE -L " ! 7/ +] 6)"g L]"#2N 5)
6#4 9`3 %-:)3 = X 3]"6# Cb W S[
W[<#)@ < TE3 / .1 .3\ M= E 6,-# 5!)+, 7 . 0
3W E . #) 6 E) J% & 9& (+ / S jA
) %,7) = = / : :/ C- ; 3) .=3, #
%2 2E EM3) 6" </ :+ : 5f 7 5#) 9 6 =)@
= '3" 6W - 5 J 3$: J* W 4 Zc!1
M93)%] #& X #& = ,!=6/ " , 9+ \ 3RA
b $ = '
, 1 B / N7 . # ; C , f 5#)@ M9 (=N 5: #53
1 \ :

- (2 >7) *$ 4 2 *$
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> 2 U ? * !"! c9 +; 6 25 ! L%
a)@ =,) ! . : b K ,9 =)@ 3 #G -
(4 L 3- " 1[>1 C .1 #B
&5#6 = ,, = T=Ec ` 1 3 % M %' Sc
E ' I Z M1 (n) T=J
" , ( ) > ! ! 2 - # 9

7455 = : = 6 > / / 1 / H D2 H ..1 74?
29 . 74; 6??5 99761 65295 7 ;?:6; = E5 5
65995 K7 46 345 7- ?2965 722 = B 4 ?'79 ;65E7
; 4) 6 3 44 > 7?; 04?61 7; ?65)7? 4 99 > 79N
67; 47 4 = ?63E7? 47 4 = 79 7'A6 45 2795 >
79 5 6*7 ?5 7 615296 ; A 7 O" ;&
?:34:1 652;)A6 45 97956 = 4 = 7 K 65?5295
;56 > (@" (!?:645 ; A; 9 64997 A: *77>
a 0:64 = 517 = 64994 = 0:64 = 5 ?A:94*?7>
$?; 04; = 7 = 7]: ;5 = ?:64? ? 34 1?6 655195
6 : 6 ;7 = 5 A6 45 79 ?5 951 6 *7 ?5BA 2L : =
6 > A:94*?7> . B 0:64 = 3V 30 ?? 7 = 34:117 =
0:64 = 59 5 A:94* 7?5 = " H*7 ; ?497 04>
79 = 7; = 7 = 65??29 ? 6 *7 ;5 ?:645 ; '
67 = 4 34H17 = A:94* 7> 3 0:64 = ?? 7 = 34:1I
17 = 0:64 = 5 A:94*?7> 47; 47 = 74 5 =
?:645 ; 6:6 D65?5295 6:656 6 2 K: :6:6
6529" ?4 17 = 7 = 79 /G+ # +/2 2 ?; 7 = 76 = 79 6 : 6
652;?4 17 = K: = 6 = 4 = E 4 *; :*:2
; :72 V? *647147A6 45 9 > 2 E ?4 6499 22](('
6529 5? 7 = 6499 (k 64 = 5 ? 67 6 29 79 ?4 / /<
5H5 = *9 ?7 97 S& 6:6 5 ? A5?4 = 7 $ $ &3
0 @ 6 ;99 7 6125 34 7 = 599 79 34 1
?9 GF ! : = 6 5? 7 = p 65 ; ?4 I
17 = 7 67 6 9 6499 @ ?? 7 = GF'64 9 6?6?B

! ' ' : '5 ' 'M '5 ' ' =

94' 6 /297016 '/82'29 9' ' = 8 19 '3 ' '
H" 0'/ / / . /' 1' 0 1 . / 0 3 208' ' ']' 3'
V0 .6' 5 T / ''= B 29 .0 .6 '0#F6 0' '
8 O $$ '? 108 =VS 26 29 1' ;' = "9 41= 00 '
.6 !2/289 1'#2/29 B'29.. 7'"1'9108' 0 .6'
0'2/2'2 1 ".' ';' '9 1'02 80 0.' S' /8 /#F6/ '
208'G/8/'F 498'2/2'/82'0880 '02 80'
A 9U'/82'G/8 2'29 1

30 H.] 3 3] ' g
<J
> ' ' ' ! ' # ' ' ' =!
#' ' = $0 -=$C73 < H
! 5 = $P+5' $A6 ' ' ' B ! +"' 1
7M = 203 +

> 9'./611.. 42.' / / . /262 '8 /4 .0.0 6 !0 '

T' ' = ;" 4 I3 3(" ! ' <' = ? * "3(' ' = (33" & R* :3(3 " "D' ' >L'
? 3("N ' ' '; 3" 3 3 & D ? 1 ! '& " (1H '?' = ' ?& !'7 $ ' ' '
Q* (3 #@' ' $3 $

| 1?='74??=' = :1:' 5>'3' K70?0 ;'5; 7=' 6' '
6??57J7>* :*:240 = 04>' A=45 27 [>56 ='
*=4447 A=45 979 ?5 :: =5 =4 722 =75 47'
4=74;5= 2W 345; <IFG5 /// F 6*7 ;5' 7' 7='
2 65?1 5I/I;< F5g95646 6??5 5 5; 7= 5'
659 5= [7;3 [7 79 ?6 7?? 79;)5; 7= 7?? '
1??7 ?4 2')' 12 65?5 97 ; F 62 ;:=6 '
74?79 7 2') ???295' 3' '5; 7=' I' 6529579 ?4 F'
34 76 2' '3 3 '65345' 65?5227 :' 6
? 79 ?: 2' "' < *1A5 0*7 ;5*2 47? 44'
:0 ?7=')*2 46 3:7=' * 1>' 1 H =4>' ?7 2 =' 6:6'
?:645 ; ;4 ' 2' 1'7;? 65;'71' ?:6; 6E?6; 7

n(' ' 0 ' ' k 7'5 FH X&' H (*' * '
) ' ;: G+S W#<#BZ>F'
? * 9' #-F ' <k' ' M ' 6(
' & 2 <3 @ $3P "3+' '
>7 * E 5/+>;) ' ,*' $* @ :/ W39' 0' ('
W 9 5 ! (MN,// EW0
/ S'+ '6 ;/' %' %N
! CNP5 &E S 7 KP3^)-' ,' /
]-' T.D 9' 5 J M= ' ' C ' = 'B %' ! "')
I(' E' '5 .'9

F 'TMD 29 9 1 68 2 'C F6/4 '<B / / 7 9 '2'
0 = 801O 3/ E10 71 3 66 39 P' 9/269 ".24' 0Q
1/' 08 R 0.. 4 1'/82 '06.'0 .6 '$'9108 '
0.. 491'0 .6 A' F6 0 11 6 ' $" <</* 90< 0'
. 49 9.261 CF6024/F/ 498'G/.'02.90'498 /2'
1016891' '1<E / ' "!" - 3a (00
6' 94'F6A'4 .621O './212D9 9 " 9 'F6 0'2..9 '
7'2/2'2 181". 'F6 0'2/2'29.9 0 M' 2 62! '
8 1.'" " "*"3 ? " "(*' 'F613'./212D.A'
94"901'G/8 298 2/2'9 99F668 '06926O "9'
1 8921/'0768'29 9#G/ 68 '92 8'0P. 6829'
.9 0 72M 1' 29 1' 4.968'2/2'29.9 0 7' 29 1'
C' 8 .9'./2119 2 ' / / 1 /' '92 8'26
/8 2 09.R 9F4689 9#P 08 'G/8 2.8'
0.. 0P26219F6/ C 0 > 68'0.. 4 9'26 6"9 1 '
8921ME'9108'"9 1 89216'0.. 4 9'26 '0 7/#F6 0'
* @ * 3 '29.9 0 7' $DB 94 08'0 Q
768'.0140'"9C 8 .2./'29.9 0 7' ?9 1#F6/2 08'
G/.'02.90'49 2/2 1 068 61' = 8 19' & &/' '
3" 33 ' 011 .60 '29D0160' 'T '"9 7'
9/'F /4' 92 8F6.' (> '3'('20 6 0' 62 ./ '
0 './8 2D91.'4 .6216 '<F6/8/4/'49 2 '
8 63.021 2D923\'2/2 8 19 'G0797621' 2' '
6^> './269 /8763# 94' / / /'"269 0 3'
6 0'2/2'./269 1 8 #F6A'"9 7' #' 2 0 19'
./269 /16 'G/.'0619 0' . . 88 '9 G 'D68 '4.
./21 D1204 .9863 2' 98 0'G/.'.0`16 2'I'
1. '90F 0S4 <10' 621'802 91R 8'9 1/ 'F6/4'
..212 9 9'T60 @ '061'0 .6 '2/2'29 19'0 '
68 24 6 2,54 7=K70?; 67= / ;65 6E ?'
93 &'#A.. & ! &6& 3& .. 3& O" '
- ?= 2;'F6 G6 .68 F6.'0.1 768'04O 4016 '
1'2 .'>)1 22 2/'0 8 0. /298' 9. 1#". '9 1'8 \?'
7/268# 9 9 12/2'0 768'1".! " 8 . 19 '
* * " $.'9 12/2G/.'=94. 9F6921763'
9108'G/.'./2 807116 'F6/4'"9 7' 04'
./269 /293' 2 19 B' 079768'".'0 E.'

! S' 'S ' / '@ '2' ' /
T @I3 'Y$3
/ $3 ' L3'$ ' @ : (' ' *' 9 A
'$3 @ 0 (' : 5A' @('0"'4
/]F,' ' '3T J @' : ' L3 @ :(30' *
" ! ?@ 0' ' ' 5']$:T! & P ' - ' / 3: (
:22f2? $ '$3 @ $ ' EY 63'8 ' 3
3 : ' _ , ' ' 3) "+ ' ' '%' &
5#& E. = "3 *) ! CN K 'bVR p @' ;' '-, , '
<6 =3' ,)& "- ' 'W' /7 0 E/ 3
+ . /L /6(! 6 3 "6 ')6 9 3'
; '
E' %,' ' . 2 ! ; 2 * ' (S', ? ' @ ' Y '
* 3&# 0 0:" &' 9'
E< *D3 :3 @T 3 T: *' < @
: $@ 3 '@ P & <@3< "32&' : ' 3 (3'
&3$" T& ": 3-: 33!" 0 @' L &' '@3.
Z'$ @ & 3 ' L (/ @'"(' ' X&' 2' '
1\'@ ' ' S '. 7 ?<' + 'K'/' 21?
3 4 @&3 $3 *.2 *0 \ - ' E E ?0' 3I' <)+ ;n'
)c] ;(R' "((' ,/' " "3 'W '_ !B 0#'2B3
:742; 0'8 50/8E/5<'@$;(' ' F' _??3<*7
W B' 3R @
3 '9"1 '" ! 3' ' '" ' @ /
=' ' M4
' P' '
: G[F '5 $' 3 0 E'J cE6c0F\' ' + q)' 08' (' ' ')' & ' ' ' N
$ / 6
F c ' ?J\& ' 5"7
)*)' 3 S ' R3' ?W.B ?' U '3 &: 3 '
& . %' ' % ' ' P' Ac' 3 2+ !-
)>)3>
V' A' 3' E
A

> . /D 8 39 6 3 / / 1 /2 763 2 4 8 0 D6 0' (' ! 0

E' ' - : ; !$ $ 3 $ 5@ ?3 7 ($ $ 3"(' ' 'E4 $! ;" !3 "!* C "5 # D ! = 5'
\ 3 ? " ' W = 5 $W@ C < " " ' , ' * "(7 ; " ; 3 * " !&33 " (! ' E' F (*";"'
; ' ? ' @ @ . ' (33 " ' ' ' & "'(33" ' C ' "' ? ' ' ' * "((' ; " ; 3 ' N ' Y' ; ? "
>' ' = $! ; " ($(" 1 ' '("(' ;" ; '3 * "3(! $ "(' ;(" ($(" ! * $ (')' $ (I '
! < " : ' ' (" ; " ; 5 5 * "3(! $@ " ;(" D" !(3 " (!' ' (="5 * # "33'
D!' ?(! 'C' "' ; " D" !' (33 " (!0' W' ' ("5 * "3(!' ?(! 'C' "' $ 3 (' (33 " (!' , ' '
("553 ; " (" ! * $ 3 (' !' ("3 ; (" N $(" ! " * "3$ D !(35 " & !' ; ' * ?(!9' A'
("3 $ $ (' +' "5 ; (" (" ! ?(! $ Q ("* "5(!' (3 " (!' /X' ?(! ' ' ^ S'
3 " (' " '7 ! ; " < $ ('3 " ; 6 " $ (3((@'$ (('C'* ? 5 & ' //' * "(7 ; " ; 3'
5 ; (" D" !' * $ 3 (6R*$("(' ;(" (" ! ("($ 3 (' ^;' FB; ? !' ^ , ' ' - " ('$ ' * .'
@ ? 3 !' ; " !'3? "! ' G&' ' ; "3 ' ^ E' G&' ; " N (!' 7 (' ' (' ? "('$ "(' / ' e " '
!'5 ? "(

' 32" *'C' B *9' *'R ' ' ' 3'49 2 . 3' 0 8 '4 .08 63 9 'F6 723 'C 'F6
1/ 8 2 3' /D 8 8

"'' ') . ' F' E' ' 1. 8 3' 06 .912'4 . . 06 8 4 .4 9 8 / 2 G 01 / 29 2
92 8 4 . /D 8 /4 .924S8 F 0494 .8 / '
' < (@ ! X ' : "' P @ 0' 1 01 / 29 # F6 0' /D 8 63'9 1'8 D 3' "2 69 4
S @@ S ' ' P @ 333 ! N' e @ (N' ' ' 9192 8 '4 .8 / 2 1 01 / ' B /D 8 3'F6 408 '$ 9
/' "("$ ' 2/ 2' / 8 2 3' /D 8 63 4 .8 / 2 1 0 @' ^' !
D .6 1 93'19 8 2 '10' 219 ' 9'0 194 ' 21' " .' 9B'
$9' & (3 ' ") 2" '$0' : * ' 1 .8 63' 1' 2'1 / 1 / '8 94 / EC #'8 94 63' 2'1 / . / ' 8'
* & (/ ?@" ' S . - 3 - @]* 'F 1' "9 '2 / 2' 1# 29 .9 9' '9 1 98 / 68 '9 9' P'
@P : TN@ ' W D 8 6 9 .468 ' W / . / 06998 '8 94 68 F69'
$. ' $! $ ' !W " B$ " ' < .' $ * C ' 8 '9 1' 2'0 / ' .68 '0 64' 2' /' 1$'C# / '
R ($ R : $!$ JW'2 $ $ $$ e' $ * ' , ' I ' ' = ' . .' 1 / 29'F6 / F69' 1'8 94 68 ' I 1 98 0'06198 '(; ; '
C#S F6 / 4 . 1 20 / 'U 2F6 / '9 1'0 64 ' , 'G'
^ W ; ' ' / '[W' Z 3 " AB' : (@0 $$@ .' = ' . .' 3 0 (' (1 "' / 8 2 ' $' ' / 8 2 '@ # 29 .9 9'9 1
(/B ' ' p' 0 .1 76 ' / 8 2 #0219'92 8 '9 / 168 '9 1 F6 / 8 '
>; 9 3 1@ ' .' L ^ P2 L 4 &PPD 33 13' @ : ' X' 3' $; 4 / ' ,49' M 8 2 '4 , . 8 63' B' = 8 , 19 '; 9 . 08 E3 .3
3' ' ' a(' K 0 ' 4' 4 + !' " ("' ? ' / 0& ' L 0 ' Y ' '! @'
; ' - ' .E$' ' $ * / " : / L @' ' = ' "91/ ' 8 68 ' / 8 2 8 94 / ' 1' . / 2 9F692
I 'W' = ' + H $; $' "53 " ' = 'W' 8 94 68 '06198 '26 '9 1 98 9' 2 1 2 / 2'9 1'
3 5 ! ' : 5' "@$0" ' *N @ ; $ '$; @' D 63' . . 98 / 68 $'F6 0'2 G '29 .9 10 / '96 .
2 'Y >' Y 5 0 3 .0' ' F6 / 4G .' 8 1 0 . . 4 1'92 8 ' " . 2 8 8 2'C#F
' ' ' "R' I' K S ' ' & ' 8 'C 26 '9 . 9 2 / 8 . ' "249'29 .' 0 . ! 02
"2 6 . 0O 3' N3 (C" ' . / D 16 ' .
^ ' VS' 3 X? '@ : ' (J(3<@ @'3 . @ ' 'E"" ' 06198 '2 G '29 . . 0 7 . / D0 .6 '9 'G 3'2 / 2'9
D / '(*4 @ : W N' / E' ' : $3 ' /D G263 ' 9 8 2 ' $!' / 8 2 ' 29 9 '
S0 00 "'3 5 44$ 02 8 0 'G / 8 / '9F663# 3 !'26 ' 8 94'
&' ! ' ' I' ' 02 8 0 G / 8 / 0 3' ' 9F6 9 1 = 9 1 /D
<) E' 9d M ; ' ' M I M D = 1 ! 8 63' .68 'C' (8 6'26 ((('8 94 (/ 'EN' 8 94 '68 '26 M'
3& "(3L : ' = '[RJ ; ' ' ; #' . 9@ 3 9 1 98 F'29 1' 9 8 2 ' $!'0 1 2 02 33'
/ / / $6S ') ^' 'E9 . E . 9210 8 90 '8 .4 . 20 # 29D0213 ' . 9210 ' '
S9F I * W ; W @ @ 3 7 3 3@? (5M\5 N@C (N0 +' Z 91 / ' 290 "2 103 ' +' ! 68 D 16 19 8 2 ' 62 "2 6 . '
/' (*" *'$; @ O @ $. , * : / @ W$"$ 2 93 # 8 02 4 68 ' @' 2'G0 .' D6 0'F6024 / ' . 1'
?' ' 'S $ WL ' M ' 2K* ' (*3 @ (; N' ' / "/ 8 E' (* @ G3(! 3 F6024 / '2 / 2'9 .' /D 8 63' ' 1' /D 26'
(! M"4)2 ; *N : V@ 4@D) : ; ; '$ $; ; @' 29 .9 9' 3' " .'19 8 2 '9 / 'F6 / '4 8 63'8 / 4 / '3 'G'
/ 'R2 ; / '(*@N @ 5ML ' ' B ')' 1, @ 79022 . / 2 10 .'9 . 08 ' ' 10 ' 07902 . / .' /DE'
! < \ ? ')' '6 ; ; ' '3+ ' ; 'J IJ ') '<I, S' W 8 68 ' ; \' . 19 8 2 / 68 0 63 "8 69 0 P9'
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$*' ; ; ' = '9 31 B/" 'E 1 E 9 "E" ' $" < 'E / 9'04 62D 16 '8 0 / '9 1 98 / ' 29'0 . . 729 662'
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3'$ D R @')' & @ ' ; ' '3 @' ?$' E0 . . 761 668 $O . . 9 9 ; B /D G2689 9 9
. . 16 2 ' .68 '06198 ' * "$ ' ($? "' 8 2 /
. ' 3LP : *'RX " V?3 @'W W'S" E W' W' (* . " ' ' ""VO ; 0' 2 = 8 ; 2)74?34 : 4 >' 79 : ' = : 1 : ' ; 5 = 6 ' 3 ' 7056'
3 * , @ : / ' @' D ' = * : 2 ; 0 95' ' ')@ ? 3 ' ' / ' \ 7 6^'5H ; 5'
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&' @'' / @ ; ' *0' </' P ' $' W' ; @' 91' ; @^' 'W' 34 : 1' 52 ; ' 240' = 51 : ' ' 62 ? 56 = ' 0((0 : = 6 '
(! 0 ! hc' / ' ! - 3)(M"M['"T(#%V 7?'6' 79 ?4 +' E ; 4 2 : = 6 '7?? 04 '52 ; ' 1345'
%) ' #' ' ,6" = + ' & ++' R3&#/7 ' 2 6 ; : ' 1 14 = '24 ? ' 65?? ?2 / I 67'7K?4 # 652 ;]
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8 779 ?4 6 : 6 = 592? ' 67 = '@34 : = : 1 : ' 499 B
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2/ / /8 2 ?=152 6 ?7) =2;?7 ; 04147 67= @ *4 J "3 ? 0F
157956?) [:E =4> / ? 6152 =?7 45 6 *7 ;5
94=7;4 4%1 = 6: 5H; 5=5A6 45 9795
71 ?746 597;?604? 44= A?9 * 475 44=66:6 > # %, ""Qa" I E SJ5 "2 (b%0"I 9B E ! "0' 9Bp
; 52 -:E 2=4>2=? 61?N ?7*7 ; ?497 >A? * : $ 4 _ (J0 9 ! ; 4% > , K #D
/ 1 /0 12.1 8. 9D91 ; . S0 .6 2 $ (Q " $ 6 %" &)U 87"> [H<(;(: #(*
2/2 29 1 0. ? /82 W 29 1 9 8 2 W)+# '1\/91= H"2
-% +" '0 18021 3 ,%! > 7/ 8 G07 163 2 D #034]3
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1?2 =; 46 , $?345/>-W 5 ?2 :E =2> OH7) / w-:) h)<4- $#?F5/ 727 _5? E
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; 04; = =A5;*=7;=4= = 6:67F;H=F<F8 T
*647 44= 5?4614= *7 ;5= Q=5;6:56=54= S / j3 G G
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3 615 6W[= :<606 65995 (@Q 45 56;6 F 2 <
= 99) 2 F5 \ : 8 2 ;A5 51 : =279WB4 8 8 (
652959 A46*=74?5= 4 4 =:1 ;? = 6 > ?7 AF 2 / G
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4=2 N;B7**w;55HE ; 7 ?7*52 ; > 5 = 6 > <82)

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9 1/3#F6/808/8293 9 4616 9 90 F60A 07 Z 1 $& " 4 >%" GD \! M 2 I d #67 > < 1
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[illegible]

. U U

2Z99:G264>' 5 = 6' 3 !'72N;=76;>7= '?85 7Y' @ 'S H @ ' '>:
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1 60 [C 0 . 61' 9 8 26 / @ S j ? E0Xa 1' ;' E' ' '1K E! 1
8 8 ; 02 26 < 17 10 1 0 ; 0 3#2 $D021 3 02 8 0 ' ?Y ' 'RH '< Z= E7.2.1'9 . A ' *' A
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E 2 / .68'"2 69 0 '4 4 6 8 '. 7 'F6024/'.2 ' J \ Eh9' 9
F 24/2/2. . / / 8 63 ' 1/' ! 6 8 ' 0 ' 0. S' S E# 'B'!
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904 626 016 '8 0 /2'9 . 6 /#"1'R A'2 ' 'H 3 ' O O= K H/I ' C ' : + D ' - 03# : / 7' I
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2 02 8 0 ' 9 8 2 061.8' $!'/8 2 2' (%) !) ! ()' (2' * ' #&' + ' . ' ' B
q 9 0. . '2.F296 . ' .8 40 2';'2 9 7 .6 408 . 1; D M)] ,E W 1 .1 J B 1=T 0?' J '
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8 E 29 . '"9 6 8 '<6 /2.70.6 '.6 408 ' 1 .F#['E' @ K &C- 9 ! 8' _J# '!MR' 6'
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02 20 '9 D8 3' ^;' : . 1 .6 / 8 D 16 'F601 ' F) :1< :; F4# 1E I =1E :^ >+ < ; ' - ' < V@' (3 ' , '
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M 69 10 3 0 19 0' 0 1 .6 0 3$'26 / 8 / 4/' 9 '
/D 868' ' R# <`'< ' " P ? ! -
A 7E4579 7 ' 62 ?' A?9' 6:6' 62 ;B'A?9' *7 ; ='?4 ' , '/? @' 7 /
-7= *7= =6: 'A?965= : = 6 A?9 6152 ' 5> 74';G
=?? ? = 6 ?: 4 465>: = 6 4= '7904= '76 ' ' ' ' 42 ;' +' A ' '
80O /8/#'0 768 '02 8 0 '202 8 0168 ' ^ ' 'H' U OSA0\ I S11 I)' C ;'^' $ @.<')J# ; ?);' " 3
4 4 3' D 61' 9 .668 ' ' #19 8 2 '10' 219 '.' D T J : + #)" TV0 @ b@S $/$* P9. '0? I ' ;1' 3'
0 .4 8 1"14 8 63'2. . . 10 / 1 ' 1 /D 126#' ' !1 !1 E 1#CJ #& ' f' ' &' 1 3 I !' M '
C ' 1 /D 8 63'29.9 99 "1'19 8 2 '10'0 ' I /B ;,' /@ " ' E)-[' ' E3T * /&.0 @' TT @ : D!
1' 29' ^+' 02 . 689 '91 0 8 '/ 8 293'1 ' W) 3
/D 2/3 F6' 621'8 'G0.' D 0 9 1.' [9 9 1/3#'
/8293'98 8' . .6 .6 '0468 9 3 F6 76 408 ' EH: $; 0' E ;'
F"Z."4819 8 2 3'29.9 02 / 2 8 '"9 / 28 ' $ *' !' P("'*' @ $
;4 ;7=3 7='K *:;05 5>'A;'?4='15= : 2; 7=4>' c Q#% F*7 7:#) *&& @" ' E!*0 *' I' Q[:;)' A'('
5 =:220[?')' ;5='6:6'2 5 90E =4=' " H b " ' * R W D * F5 $ '
7= 67?=4= =K7?2 E4 7 251: =6?>B2= * =7 ' ' ('
; 4:>'1=A6 45 2795>'347='*7 ; ?497 5>

>. /D 8 3'9 3' / / 1 /2 763' 2'19 1 0' D6 0 !0 '

' ' - " D A ? 5 ! "D ? " = 0 3 ! :? " '3 ; ((!0* I " WC 33!' /9= 3I ' 3 0'
< " " ' # $ ' " ' R= ' "3$3 # '@# ? @" ' ' '= 3 '3 3 !'*" 0"0'
3(!C3(" &: !' U ' 4 ') 3 ! <(1&1 33" 3 5 D! * (#! ' (N 3 " ' ' (" 09'
? "(33" ' +' " (" 33" " ? ' ' (1< ? ')' #3 D? ! ' 2 ' ' = 3 *? ! N(6" '
3" * "3 3$ "(3(" D"3 * "((3;" 6' ^' ("3 '; (" (" ! ' "/ "3$!$ W * '
H$ "* "3$ "3 " D" ! ' ' - 3 " 7 '3" < !; !' D3 ' ' " 0'
? ! 3" "&33 " * "3 "' '> & (33 " * "5N " " ? 32 " ' ' "* " '
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? ! ' ^W' ' - " D" (; "3 ' " @ ? 3 " : 0' , ' # (' A' ' '

V @' U E'= -'
C = . '+' # ! 8' XE/.
/ "3 ' e' +@& , C '
> 2 '$ D' '.B
EO' (- ' 9)"3 E 3' , - ' ' 'e
W' [' W' ' ,4 , ' .
1<> & h06M ' 1 G' >
; R.1 M9 KDB # ' `e' U#Y e
)#%3 +7_$' ' M& ,+ /3' 7)3
o‾ -' ' ! 'S] '$Mc ' ' 6/' ' ' E
' < ' ' ' 3/ ' ' 4@' K '
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! 1'W ' "⊐ -' MP&@a @ P L@' ' " (' ' . ' -,3' : / 53'
4 '] ' -< & * 7^' ' W '3' @ '^ ' ' ' $ <*'
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;< ' ' J ' ' '$ D (' \' _ < 'T + : ;
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'a h ' $$ PP 0'E' ! ; ;' 5\;'JB 1' BS' =
g' I. '
1 ' / ' ' ' ? ' ' ' ' K K' ?'
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/1 / ') ; ') ' ' 0 ;d'
' , W ' '3 Q @3 * ' ;I' ;YF3]
' 33< @6. : UW -1 R7(' T @ (3< '
' ' < 3Q0 *53(*3W U 0' 3K)@*0' $!R&3@ @
. ' </ ",' % 6@ ']"7"&5# ' . /' ! @' " '
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&)' . J;E'@. '\< \?WE D !* ' 9 S3 0/;') ' "E1% .F '
& ' / '0 /$' : "3' M 3(' - : ' ' 3 : @5 ' ' - L ' 2 ' : ;' 3')
35 3' '< 3 : @5') W '* 3); : @)5 0D ;' : 'E'
; 1 'R ' 9 ; $' / ' ' 0 '2"*W 048 D '_2'= A'> '
W (! % ' . . '^ '$<3 @'R: $< ; ('D *'0O3' ' .1 0 E ? 1'D / '
E' ' H 04'0MK)' '@ , V *' ^ ' * 'SFK ' @D 3
) : @!. R2 ,' @:+ @'F] ' ($ '@@ C \' .@ /
@ @ : 35* * .) V !I Q 3 00' : '
',' ,T +# ' = C 'W8'
-<< @;@ @ : : ' M@:) ;R; ; :
' "+*E"(: : ' < A'D" ^' '3 @;@" ;0 ' 1 ;' -<' ' '=@ * '
' : '3' : *^'] ']:' V 1' A' ' ' W
2S1 < ' '9 ' ;' D'O' : 3' ; '< ;' 1' : : O: ' : .1 ' O
4S1 $ M 1 1 . . W &/ (' J /$' 93 ' B2
N : ' ' Y ' .F']" ' 1 R S1 ; 1$' I' / 763'
BK$! # ' 1* " ' (" : ; (@' ' I 0 ')
L)U '\E@ : @;!&P ' ')')' ' B1 S' R1Y ; ' ' ' ! : ; - 0'
@ 'L : - @ 'D? (;'*' : - < ' V@ @ @)'9A'
S ' C ' ' W' : 33 : @ 3< $ <! (;@) @(3. *' ' '
: @3' :LO' ; D*' * T 3@ @ @ . ; Q : ;0$0 (0' '
: '0 (0 : "5; : ' " ('2"*Q "' @ * : : @@ '& < L'P #
*=' =' 67. 3 ! 'C35#(F" ' 4' ;' ' ' &#

' 8 061. 8 '9 0. 8' 29 1'0 64F 4. 8' / 82
' 0 64' "9 / 26O ' "9 0 8 7 / ' / 2 ? ' " . R '
8 $' 2 6 .98 / 4 D6 B 2 0 9O / SZ 0 ' 1'
2'F60'8 94 68 ' " / . / ' S .6 '0 8 7 / '0. . 7 863 . '
1 9 8 0" . U F6^9011 766S161 8 0 6306 .98 . . 9 '
8 6 8 'F6 / 4' / 2D 63 _0 8 .4 / # 8 2@1 F' 1 4'
* , $ ' W' .'8 94 68 ' / 2 .61'F6 4 .8'
9 1 09 . .8 0 ' " . 8 6 8 '06998' / . = 29' &%8 '
,' : 9 9! 63' D 16 ' / D 8 63'29F698 G 9 '
D6 0' 1' ' I 1 9'06198 ' / 19 119 8
2 3'10 1 " 1 69 0 .9 F608 '2 / 2'"2 6 . 0 19 8 9 '
4 / 6 3' ' 9 8 1 3 D 16 ' "2 69 0 19 /
13 .68 C R C@ 8 . 1/ 8 21 E / D 2639 H
D' 2 . . 9 0 US Y S '? 2 . .'0 .6' .68 E
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0 .6 ' 0'F601 .948 '& ' 6 9 2 ' 0 .6 '
29.9 .'9 1 '0$*' 29 9'0 .6 '3' 1'92 8 ' I / D 2 6'
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9 ' 8 / 7 9 ' C' 9 '9 ; F / 1 / 298 ' 0 8 . 2'
"1 0F69' 2 21/ 8 2 ' 6 8 016 '0 F6 4 W "9'
61 '2'46' 6 .'C#' @'@ C' ' ' 29 1'F60 9'0 .6 ' ' Y'
2 . 1' ' I 1 A'B / 212 L 262 2 1#. . '
/ D 8 6=E @E'2 . . 9 0 7' ? "'S'? .6 4 0 8 '3'2 / '
29 9' 49 '92 8 ' . 1'498 / 2 1 03 / 2 3' 8 / 46#'
. / 2 910' / 1 / 19' . 70 '91 08 ' / 19 '
9 ' 8 / 8 7 19 '" 1' 2' / = E63' - - & " /' ! %"'
3 ' ' = '"9 7 '2,6, , S'@ / 8 21L' 2 .#'2 / 2'9
q / ^6 @ 3 9 8 8 '@S 3@ '? B 0 2 8021 =E08
- ' 8 0 '.F66=E / H 9#'29D061 3 '02G8 J 02 8 6 8
G / 8 / '0 ' 9F69/3 @9 1 2 / D 8 6=E!6 087 .
4 .9216 '49GO / 'S(' 9 8 2 ' @ 3 !'0 8 02 '
13 '02 0 '3FO 3'8 02 2 6 8 #29D0@1 3 ' G / 8 / '
UF66= 200 8 68 894 S8 Z 0GE 868 ')' : 91'
.668 'D 16 B 9108 'G0.' D6 0'F6024 / '9 .'
C$'F6024 / '2 / 2 1' / D 11 63 '19 8 2 '" 69 '
0 . . 1 21' 08968 I F69'19 8 2 ' '8'
011 7618 9 1' P D P 6= '7 P ? "$</*$(] '
198 / '9 19868 ' 29 0' .68 '061.'3 ' 601 6 '
2 / 2'9 .'3@ ? 3 ' .48 '0 19 '9 1' 601 66 0X
1. 0 8 01 663' F6 498 '8 0 / ?S S' 1 '
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3 L3' 3(3@ " ' ? ! ' ' T674!'
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29.9 9' ! ' 9 ' O / D 8 6 8 '"19 " 3'19 8 2 / 68'
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5 #91P 8 KKp '0 .6 'E29 1#" 49'9 . 08 S'8 " '
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I 2 . . 9 9 ER 0 0 - 61 '29 94498 92 8 49A'
8 / 2 1 024 '8 / 463A' ,' I .9!06196 C B 4 .8 / 2 '
1 0 9'9108 . ?O[7 9 'C \9 1 / 29 '" . S
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Z' &, '0.' R?' .6 408'2/2' 2. 1#29. - .' S&0
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L /J: U@ "4 @! 2 0:@ K: 202 9 168 ' 3" (' 24. 2.68 "/0.'

: @ YH 433 ' -' (#F 1 76.6/' 0 ..60 '0..9 168 '. . 0E664.8'

) ' I ' '< _ / . 1 ' .$,A ' 33 O/D 268 2/8 2 7632D6 3' ' .929 $'

' 1' @Z3P-M: ' 'AL' 'G' 1' $:+* .668 ' /8 293' 8 9 9 1/3'X /D 1@ 9 '

/ 3 : ' M3 "; 0'H' @@ :L3' 9 808 ' D 08 '061'92 8 '498 // 01/2.'

= :@ K' V \ R 4@' ' :' 2 33' : ;; 3" A061 9 '22 / 7 9' .H. 62161/809 $! FV0'

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. 7', 9M '):1@@' : K@' M (& & ' ' ' ' ' & h 26 0.V=c /82' # 10 2 '26 j 94E? / ./F69 4 0 689 ' /D 863'./2H. 6 '2

<W,'@ ' % & ' ' IB1' -<'')33'H 0@ @(*' ,! 80 D60' 12 / 92 0HD60 00. 0@

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+' / F '3 3 '. 01'/82' '= 8 1! 'E ..08'2'4 3'

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& M B*E 1M&/; %N! 1 M :M9 0' DN4 6D 2/ '"269 0 .3' 380$' HD6 "' +' 8'

: (0" 4 '$" @ 3@ ' *' F '3 <<'9.6240' D60 2.'467 /' 9' /3 ..'

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' . C .8E 9 4621O 'F6 4.2 . ' 9 /3'3 $' .91'9.0 '

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3' T=) 9)'+ / ' 1 /E1E1@'4& %F' ! " ! '0' D6 9'1946.0 16 '04' /D 12/3'" 069 09C '

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F6/874/I / 2 ' 29 .0612/2' 29 9/ P9 '

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* , ') 'J)' ' A 5 'p[])+ ? =1+ p' &/ '(* +2 : /

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0' 2'2... 0 3'D 6 E'! 8 '9".'8 /. /' &/' &'G 0 ' '
7 9 1 0 . F 6 9 2 ' 3F63.' 2 0 2 1 ' . / 4 9 ' . 2 8 ' 8 / 2 / ' / '
A' 1 3'.9 2 0 8 3' 2'9 / 'F 6 4 ' 2 9 1 ' 2'9 / 'F 6 / 4 ' 2 9 '
.9 0 7 24 "9 '2/2' 29 1'9 1 'C '2/2'9 1'X\'O / '
D 8 6 3 G / .'.0 2 1 6 8 '4 9 8 2 . F 6 U 4 '. 9 8 2 3' 6 4'
04 . 16 , 9 . . 0 U' 2. .E 9 '2/2 2. .'
@ 6016 112 / ESSS4 ^9/498 8 /4/'./263 .6 #'
1/1/'. !EM82 FA'! *% ' 8 1. '1 0498 63
20 3 D16'./498'8.4/ #< 9'./269 /2.'
/19 4.16'./2.6-/2.8'9 12.. 0 08 F6!8'
042 /468' 29/'F6/4 29 ' 2'894 0'06998' D6'
0.68 2 ' "B"269 0H39 1'0 H 801 60'=)' 0 '
6. 0 3' 60 40$ 2 1 F$' 2'19 1 0'.68'"2 69 '
0 3 ,-'011 761 60' 'C 0 1 .6 0 3' 601 60'2/2' ('
.1' 8 G@ 498 /2 1 06/# .4'29.. 9'< ".'9 /A'
291 Z30 F6 4.6 18 8F6.'2/2' 2. 1 4.'G/.' '
/DE 868' 0. 08113 49'G/.'92G2')")#.' '2.'
.9< 0 0F6%4 49S2 ? @'9 / 1 9 M 2 9. '
0 0'. . 101'.1 08'49' 1/0ZF6/' & 9
2 $208'F6/4 / '< 16 24 63' 0 3'9 1'J.'02
198 0. F119c 1 /D1"=0B3' 2' / PY1 @

I B2' 1, /' % '
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E ' ' ' 3' .@B ?' M$W 3' ehB?
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3 M@< 3' '& H !;1 1J S\
M'B / '. ' R' '4B0 WS b'
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>9 9\ 8E39 0 19 ? 1/)C?29E8 0'C0P9 0'29.9 0 0 2 80 D6 0
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-' B = ' - 1% M 9 ' '= . + # . . 3N . #! !' ' = . . # #%" . .
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#* . %#! . . / ' ,' '= . M# -% ! #. ". (!% > ,9+: (. 0/ "! . . /
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J /D 1 /' 1'29/9 0 0 S# 263'
.9 P 63'#2/ 1"[92 1 0" 3' & '90'DS$9'./21 291'
80 239 1 9808' 1' 1 9 1 2 168-12.!.!A'
&0 /E29 9 . 2/2 29 . 0.';' ' E 29 9'10 1'
16T$.'.2 G'0... 03 4 / . /2 763'29.9 02G'
(1 2921'"9 2/2 2921' `7'.68'92 8'/8 8 B29?'
.9 0 /E2 1106 12/2' 2 ;.?SS SE 06198 1'0 F6 4'
(A<'# 9 .8 ' 91 08'S'"29.. 0 G' / 9'G/
2 80 .982 ' E= "9 4 2 ?SL2b29 1 2b.. '
P 0 94 9 1 7.9 0 0$2/2'9 P'4/29 6 /'29A'
S. 10X 0 /08 '6; % 2"&)&,,! !'. 11 0.. 491'"1' ;
0H 9S'? '29.9 S ' 8 ' > '
8 0F008 '8 '19 1 0 D@ 0 'G/.'06192 0 1 8 9 E'
. 0 /042 1' >'9 .'9 6 8 /4 '".'S S' / .'9 '
20 ' 29 9': 1919'91 08'. '.9 8 2 30 0 9 '
./6.O /29E22/2 / 9'29.9 0 08'"1' 'S'S 1'
8/ 03 A?SL02 80'#+ "7 'G/ 8 /#F6/2 08'G/Q
8 /'39. PXi . 102 2 0 # 94'29.02P20G0 /.G/?
2 /09.9 = 8 /2.16 ' ,' = 8 19 '91 0 8 B@'
C< ?SSC1 601 668'#F6/2 08 /0498 9 B49 '
2P/2 60 /' ' 2 /D 2 3061. 8 0 11.6P '
7113 '&/ / /6 2.") M.'"2 6. 0 .'9 1'29.9 0'
/8 .102 .'H. / /9 1'29.9 P B#01' ' 0 1 .6'
0 9 ?S` C.B@ /? /2/28 29.. 10 0# 69'
601 110 6.011 761 60 1' / / 1 /"2 69 0A'
3' 8' /48'9 D/'"2 09 0 .' 1'2994 01 28#'
0-BP/2 6 8 129.9 027 S 1061 fS 0 0 2'
1021 8' 1 9.9 9' D 16 '&R S0 .6' ' 29 19' B.'
.9 0G/ 1 1M` 08"A' '9 1' 67') 01F"@/81 ?J ?S6'
9 0. 9.9 P1 B' ' = 8 19 B8ECc 80A'
1 66 /D -263 F6/2 08'9049 8'921498 /2'
0T/S +' = ' "9 7' 0 . .6 0 9'9 1' 29.9 10 68'
2//91 11/2. 6 /29.9 0 0'2 G 'S2 8'07 4'
0.44 1 F698048 4C'29. 2' H/D 8 3'"2 69 '
04C= ' >3< 1& . & N'&&. J& b7 /N '
)% . *% # 3 . . / C&. " '8 /1 3'02 80 '
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C * ' ' 5 ' ' T: ' ,%& '06 +3'
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= ,"/'9[' 1 -'
K 6 X M= ') &% MKJ<)+@ "/' ,'
%' b S '1[c C C \S72\ h ['
' I@'W A< ' ' N N' !37 + !
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'6/ 3 3 ,'9 R
(8' 1 3' 0 J`h0G2. `' '
'J0 B.`1XA" (' , ' '. ' 5'jc'3 %')- M'
: ' ' "4 9 "4 % ' > 277'R ' ' ' ' 5'
- <)@ &- M <E ' PK <' <O' ' * 7
2 '3 3C' 9 M=' e' #K' '$'#/ "'
M [W VN& $" +' IA
G ' > ! '$' (&' ' !

@` JBEKS R `` / 4 j!B
N

> 9' /D 12 3'. '0 .. 0' / / . /29' 6 0 '$ '0 19 0'29.9 0 0' 2' ..6240' D6 0 '

7* S'

' ' = 3@ 3 !* "3 !' ' ' & "' +#+, +' 3(" (? '. "+ '#% !'(33 ' W = ## '
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0 #& &+-% +"&. "# . . : "' &' & =-)"&! ")+. . + %. ' 8' > & . "+ %. &6#+ +"&']'
D';&" N D" !' +' 5(" (5 ";" ; 5 * "3(! ?(!' %' !"'. ! +-* "3(!'(33 " (' !%' ' '
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> 4 3' ' ' ' ' 9.6240'06.98' D6 0 ' 6016 0' / / . /'
2 ' '/'33* < 33@ '=?.?'9@9!E / "'9$' 1'2 : : : 0'20'9. 08'. /246 /'8 9'29.9 " 0'
-'% 7, 7(C L*'! "<+ (3 ((3(" (0" ' ' " D("
/' : 8 6'92 8' 6016 0' 1'29.9 0 0 '0.'Y'I'S'26O '
= ' './2. D0!E 94 j& . / 68 'F6/1260 D .:6 #+ '
]"- 5 -: J P#X *$#F ' # +# %!"/)+.)" %" =4%--&A./2. 2D $01
R 2 @X'Y C S& R ' 0 K- '] 1')]] '@'Y V]] ' &] 222D

' ' ' 1 ' ' ' ')' ' ' 3 ' 29D01 /04600.6 ' W 0 8 2@S26 b E ./216 D 1
7' ' ' 0' ; @"" 5'@ ' (9. 08 "26 0 29 9 / .9 1'"9 68' r S 29 /2
' ' >@ ' .1' D' [W' ' F60 .'26O 9 /' ./. 2D 1# 1'96 8 .. 6' 8 0
S-!//"2<3@ 0(?0'X 5 - *'" ' Y 6 0 '9 D/'29.'" 3 ; " 0 @#F6 0' 8 .9

, '#'. S$1;U ;W91j $ 2 01 B'U= 'UR0E<; 1 ! !DE% M , '= 'A5 0' \ ; 04; 47'* :*:; 6:' 1'
A TE T ')%%= +3' ' '0' R' = 65?5- 767+ :656 ?:?946:65??9767 =9 56 =
&% M0 ('6"="' " %', . S/82 29.. 0 UW0.26 '2 1' 7 6 ./269 0'
D 16 ? ' 2602.9E J O 0 D6 0 / 9236#'
06198 '9 1 ' 2 280 0 .68 2/29 129.. 0 0'
B '<Ol@.1 3 ' ' ; "=%&- "'C S cd` 3' '+ / / 1 /'8 0 / ' 6016 0 '29F69'. /2. 6 /2.8'
@ K"' K +3 %-' 2&)(/ 9'2..9 0 02 F60 .'29.' 2);'9 1' 29 '
.9 10 0 ' E' : 9 90' 1'. /2. 6 E/' 1'69.9 B0 0 0.Q
3$3< ' ;' $R ' ' "*3< :(@&'3 *' 5"! * "* &0' . 4 9' !' M@'0 . '0'2..9 10 4'2/2'2 1.' 08 ' ' B'
f9F S[p' ' T'6 ' &% 6" ' ' + 0A 29.9 0 /26 '@'29 1 '9. 08' 3E 9.9 9 /'26 '
; 3 *' ((3< ''L"$' ' ' 93 = 2. .'0.F6 '2994 9' '2. 19'0 .6 0 'F6 4.'
! 6 "' ' ' C i' " ' h M('/8 2 ' /'29.9 0 7' 29 01 'F60 9'2994 9' ='@'
*" 3 : H $ <Z :"*3@ @ 2M@@ '0:' 'S:/ (X' 0 .6 '('2/2' 29 19 94'2 G ' /G 791';)S'9 6 2/ '
<6"32## ' / % M JX' #5' 4 '0.. E !'/8 2 ' '29 9' / 1 ' A: 0 9 .0'9. 02"
;' ' -' I E 0"' X@ '.7. *",A / ' ' .9 8 2/ 689 / 1/29' .91' / 19249 9 /2. 6 '
(-:'979' !' 3&: ; "&-M' 91 E<E. /"'$ P 1/298 '2/'9 9' 8 . .9 '29.9 0 08 ':94 G 3 '
0)! :+.3 6 * J&"P M * R K(: (@: X 3] / . 3'29.9 0 08 'I 1/ 9 9 '.0630 SS 02 8 0#'
B'W' " & *$ '(' 3L $(' !); , \ 3 ' @ :(3 & 0 G/8/$/'" 0 768 $0. / / 1 [29 2O .9 ' '
' ' ' ' 9' ' (S . Z ' K ' ' ' 8 02'.6 0.. 4 .'92 8 E .02 8 0 '26 '0 7/'2 119 '
) D/'9. 08'G/8 /' 29 .26 '0 7/ .4'2/2'2..9 0 '
: * X ! ' J B 7 ./212D .'92 8 G/8 2.8 ' 9 '0 768 2/2'.0'
33 (&&4P : ' ' * '3 3 * ' 8 92'F60 4 602 8 0 '262 0 7/ /29 1 F60 9'G 3' / '
7 ' DBS ' ' ' 132 .]'o' o ./24 ' / 02 O ' .9 06.92/2
' ' ' & I' ' ' ' ' ' ^' ' 29.. 0 0 ' ' = 8 .. @ 1G0797 .=. 2
! ' S . ' ' /D 8 3 0 1 .6 0 763 !68 .2 8 6016 0 /
` : -N 3 (*NP*@ 3 ' @4 2 3 : < 'K]K E> 9 1'"869 0 3'C '29.9 0 0 9108'. /4 /
8; +30 ; ' 1' ' .11 / 0E. ! ' '(* &R " & 7(3$@ (@0' 9 .'2... 020'.68 '06198 '011 6260'9 '"26.
$*@*: 'L 3 - & ' ' ' $@ "P (S' '2..4 0 0 0160'08 .' 0 .6 0 3'C
' ' ' ' ' ? ' 1' ' ' ' ' 2/229-. 10 08 /29 1. /46 /29.9 G 1 =:
.@ ' r' 868 'D .6 ' 60. 60' 1.' " 66. 0 3'=.2..9 010#'
S < ^M ' +' I*0 '== pD \\, # B .; \ *6' H' S //26 ! 29 9' / 1 .6 408 "9 7' 2 1'.68
$@ @<0(<' * ': ' A3'!' ' f " ' .6 60. 668 ./69 1016 91E08 S 26 S 2
*7 ; :+ : *$@: ; ; ' F6 40 /"@. 1' 0 .'29.9
* 'S1' "$@'*:6$; @] X2 e@ "W; @* ;0' 0 7.6 40 2/2 29 1 f ';'56 1E3'011 761 0'
" 4 R$ &* @ ^:5* V 3" *: ;):I' ! ';' N 176 ;" ; 3 ' 1'"269 0 3'C '29.. 0 0#C '0 80 /
f* 'Z'E 1 ? J B 1;1*/ * ' 1' 1' 9W .K 04 /0 .6 ' ED 2Z K S/8 8 2... 0 1 '29 1
)'Z#! K%." DX =E M0' W9 //91 '6 32F/ .6 408'06.98 2/2' 29 1# 9 .6O89 = !.0 '
W ' A#K'4 8 1[W U / ' '*: *M ':*- @ ; 408' '2/2' 29 19# 94'2/2'2... 0 7 418'92'8'
D E " ' $*$"< @$;'5 ' 3 " V ': 3D 19 8 2' 3'. 62104' '4912/28 01 462'AF 9' 2'
/D 123"26. 0 763' <B C?' 7' .29'
16 2'F2 498'9 .'./46 /'29.9 10 P . 12 # +" "'
& @0@ 601 668' 9 129.9 10 68' 2' 0 190..9'
168$ 9.'./ 4.8'9E68'1. 02/3'498/210. /'
& '# &

)' VD ' "' S' (' @"A' V' A' @

" T ' "' ' "' R $ B > $ ' "

>9' O/D 03'. '0 . . 0 / / 1 /2. 6 0 'C'0 19 0'29.9 0 0 ' 8'.9 1 0' D610

! 0 '

' ' & + # , % + " ' / 3 " " - ' % / ' ' = 3 " !) & + # + + ! . & . ! + , " &) & ! . " + ' W ! ' ' " - . ! + % " . ")) & (! ' , ' = . ! + " & & & (% . . . % ! ! # a . ' ; ' = " ! + % ! " : & . ! 5 (# 5 , . Y) .) -% + " & . % ! . & 2 0 S * % 0 & , + - " 9 & " & F . . # : % " ' 8 ' > & 6 # + + " & . . " + % . ' , 1 9 ' +' ' B &', 0 + : (. & 6' ! -% ! ' + + ' " & 3 " % & ! - - & ! ') % - ! ' = 3 ! 2 % &' ! # + + ' , . & ' . & G / ' .) & ! + ' L' 3 & - . + " ') ' + % ' ! 9 ! / ' (' " &) , ! ! ' 2 ' . . ' ; 3 & - . + ' , ' = ' & ! . & - & ! " & K (S, + % " % & ! - / (" & : N " / F &) & , ! ' ; ! O ! . ! " / ' X " & & , , . ! ' ! % ' ") ! " / ' % " - ! / ' B

K 19 1 0 "9 Y 6 0'. 6 8 '19 8 2 ' 62 ' "2 69
0 19 8 9 4 / 6 2 = ' C " . 0 #F 6 9 T / 8 / 2 9 3 '
#6 761 6J I "12X 3 29.9X 0 0 9408 ./246 /'
.'29.9 J 6F6 4' ' CTL 91# :#+(+' P' 6046 '
.9 00 1 76. 60' $ .6 8 ' 60. / 0'9 1' 29.9 @
$ 0 8 ' . / 2 . 6 / '9 1'2 9 . 9 0 0 #' . 6 8 '0 6 1 9 8 ' 0 1 .
0 1 6 0 '<(-' (" (') + ") - " +' 2 / 2 ' 9 1 1'2 9 . 9 0 ' '
2 8 6 8 9 2 1 2 8 F 6 9 ' / / . / 2 9 3 2 1 0 1 1 7 6 '
O Z $!K' =) M 8 2 ' 2 1 'C ' 2 . . 9 0 0 '
1 A ' F / 8 0 8 ' D . 6 ' 2 9 1 '7 8 2 '
4 0 '8 ; V ' . 1'0 . 6 ' ' . / 2 6 . . 1 6 '9 8 V 8 '# &# , . '
2 6 . 0 3 2 ' 0 . . 6 0 . 8 F 6 0 9 / 8 ' (A' 2 9
. 0 / ' 2 9 1 0 . '&?' 0 . 6 ' ; $ 9 1 6 ' ; S ' 0 . 6 ' 2 9 . . 1 $
< 2 . 9 F 6 0 @ ' . 1 6 7 . . D / ' 1 9 0 0 ' 8 0 '
$6 0 ' ; ' = P 2 H 9 / 1 9 2 4 9 . 6 EX ; $ S f U . 2 9 ' `
9 0 0 $ 2 0 2 S 9 . 1 / . 0 1 6 . 6 2 , O F 6 / S F 6 0 9 '
1 / 8 2 ? , 9 . 9 0 7 ' 2 9 1E 0 9 @ ' 0 O . 6 A ' @'
1 0 0 'S X 0 . 6 S 2 9 . 9 0 U '8 9 1 ' , ' 5 @ 6 3 @ '
7 1 4 0 1 6 0 'C # :#+ +' ']' 0 4 8 6 0 #'
6 0 1 6 ? 1 9 8 2 9 ! . 0 0 F 6 2 0 8 Y I 6 '
8 0 1 6 0 ' . / O ! I O 6 ' ' 2 . . ' . 2 4 0 8 ' 0 . ' S S'
. . 9 = 0 7 0 4 O 1 9 8 ! 6 4 0 8 ' ' 2 9 . 9 0 0 2 / 2 '
I9 !OS$F E 0 ?4bC 67 ' [' .[/ 1 011 '
6 . 6 0 E< 2 C $. 0 0 5 / 2 . 1' . / 2 4 6 4 / '2 9 . 9 0 0 '
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8 0 1 6 0 . 2 6 9 1 0 1 6 9 1 0 8 / V " ' 2 9 . 9 0 / ' 2 '
1' . 6 4 0 8 'E F 6 0 . ' ' 'S '2 6 ' 0 . '(?' ; ' . 6 4 0 8 'Y 2

7 / 1 9 2 6 8 '9 2 8 6 1 2 ' 8 0 ' D 6 0) . 0 ' / A'
M 1 7 9' 6 0 . 6 0 '2 / 2 '2 9 . 9 0 4 ' . / 2 . 6 / 2 9 8 '
/ / . 2 9 . 9 0 0 8 ' ' : $J 1 9 9 0 9 . 0 8 . . 9 8 '
3' BS?' 9 D . 6 6 8 '9 9 ' ; < 'R'S 7 / 2 6 8 #'
f '0 2 E2 0 6 ' E E . F 6 3 . / 2 2 D 9 9 ' D . 6 ' / . 1 " . '
T 6 8 '2 6 '9 F 6 / ' 2 1 $ 2 9 . 9 . ' 0 6 . 9 8 '9 0 2 8 0 '
8 2 2 4 . K ! . 4 2 / '2 9 . 9 9 '9 B 0 F 6 / 4 '0 2 8 0 '
/ 2 '9 9 7 / 8 1 8 ' F 6 4 . 8 ' . / 2 4 2 D 9 9 ' / 1 9 1 ' " . '
8 9 Z R 1 7 / 2 = ' 6 1 ' 'G / . ' 9 '2 . F 6 ! E 8 E '
9 E 2 2 6 3 / 2 @ . 7 9 1 @ " D \ 0 9 " . 4 / 8 9 $F 6 / '
0 8 / 8 2 . 0 0 P 0 . 1 9 . 9 . / 1 9 1 ' ' = D '
(<' ! 9 8 2 ' 2 6 . 0 1 9 . '8 9 4 6 6 1 ' 6 2 '1 4 ? 1 6 8
1 8 4 / ' . / . 6 / '9 1 '2 9 . 9 0 0 ' +' = " 9 4 E '
$1. "069 0 19 0P9 8 >0 194 .8J4$4 0 S 0'
. '0 2 7 / ' 8 . 0 . 1 1 7 6 4 6 ' . 6 8 '# :#+ . '" 2 6 9 0 3 '
E . '2 . . 0 . 1 0 8 ' . / 2 . 6 / '9 1 '2 . . . 0 0 ' > 9 '
2 / 2 1 1 0 1 / 0 6 1 9 8 '9 0 4 9 8 ' F 6 S '0 2 . 9 0 Z E6 0 . / 2 A'
. 1 1 6 I '9 4 0 8 ' ; +#+ +' 0 1 1 7 6 6 0 ' 0 . . 6 0 3 '
1 0 F 6 9 ' '2 9 . 9 9 ' & '?(' 2 9 9 ' / 8 2 ' '0 . ' 8 / '9 1 '
7' 9 . 9 ! 1 ' ?! ' 2 9 9 '0 H . 6 'S 'F 6 7 4 ' ' ='
"&= ' 0 . 6 'S ' 9 1 0 8 ' ='S ' 0 . 6 ' ' 2 9 9 ' 2 9 . 9 '
9 ' & ' #' F / 7 2 0 0 ' '6)' # +#+, . ' . / 2 6 9 1 . 6 ' b'
i 4 S 2 . 1 # [#+(Z(' 1'2 9 . 9 0 0 ' =)' " 2 6 9 0 '
3 F 6 0 1 ! 9 1 6 7 ')' ; *# +#: +# 6) ; '
0 2 3 1 2 9 9 4 0 0 ' 2 / 2 '9 1' . / 2 . 6 / '2 9 . 9 0 0 '
' = 1 . 2 8 / / ! 4 / ' ' 0 4 . 6 0 3 = . 2 9 . 9 0 $

' ' ')' + ' 4
=' 9J& , $ I &:(" " =
, " = '%'&% % J " 0' '
='Dd@ ' 1@ /h9/1 'W'=' < 3, ' W
3 ' ' " > , Q M_ '# /9 09$ P ' 4 & " ('
)E 'W 3 '0 3 6 , 3 ') 6 ' 5#6

" 0% " , J " > , 2% L " < %'
9< 7' 'a ' . ' : 74' & S\ / Y' K ' '_3 ' >

-9; 9%, " '& %(' ' " ' " % ' '2m $9

S ((S 3$ D u p : 0S 6 ' W M . ' 1SW E' $) # S /'
' ' : ' / ' ! 'W" ')) '5< =
#' ' M! ' =6 ' ' 11 ' '7D' _ ' ! ' 3J ' ! '%
, ' "N "5 S % 5 5 4 #] $
==& "5 # M, ' % 3) 3

& 3 1 0 : ' ! ,M ' & ?; ' &')
(c& %0/ / ' 'G 0 + ' , < 7 < ( )) # ! 6 + E))'
') 3 ,] 5 6! '0 916 / ' B 'J' ' . 1 6 9 /
' '1: 1bb / 3' + # 6 / 'E16 '/1 .1 11.F/ 9K . ' ' '
'E 1 < S E1/ ' A' ' 1 ' 'f' '5 3
9 R'= 0 & W O E< 6#a - 7 F
'W - Y <& - Y = '
<% X 7 ' 6 3
6 "@J - ' G'2 4&&]) "3& ('5 7 '5;*7))?7)>* ' %' 6'H

S/ p' ' . / / '9 / ' ' & # &% ' " ' KJ' E
" ' -# @4 4 1EE 2 M EE 0 D 7 K
-3= "!,X' I ' . .
: H'D [S ? h> R0 9 R".1 9'D D . '2' '
e11 ` p eS &V BHB / < JSM: ` . ' ! 9 " ' ' G # & '
M D R 9 @ : ED EKH / F 0 I 'B
g

-3 ! P V 5#+ "# . ' #' ' 1E1 / 9 '
S^\' p' " L 3 & : 3 5 (' ' @ < 3 (@
['4' 4] * & ' 2 ! 3 " @ & @] V 3) ' ` @ 3 & ' < ! M . 3 0 '
f K@ I L & N J : - M & ; @ H ' ' / b'
Ap 'K : ' . :9 TA 1/fı : ' 3 !- . ' K'O ! ' '4I
C ' '1 1 ' ! ' # # 3' -) & 3' a# 5#8 ' ' S'
M + Jg< b 38 L '3 '
(M' # > E K ! L 7) &) 4 ! ' 4 1#

N' E

5 = M I =

@' : ' ($3@ J 2 F' '0.)S 2 ./8 2 2/2108 9229..X 0 U ./26. '

3 (R 3' = %" ')*5' !V56-)6

C I(J'+3) &3! '<" $ g 69e "'<^ 9 " +%!

! ,%+ ' c ' JF

)+;' ! 3& ' c < ' _'L'

e 'T'$' ' '% ' ' : '2 '%' G@ $;+ '/ KK$#+(V 3'

9#g + 3**) #$# %'+ * 3$1 I# $#+% j ; 4 '9' '

c' '! ! 6 '(.%3 ' ?S -J FJ/7H

7 D,' W M6 R`E

'+'%').'+ @'+Q+ ')# ' "' B / 'G

' ' 1 #J ' ; '?9'& `, # CV3

*0"'# !'G 'C ++ C' '9' "4 # 'N %' 2 $2 H

SC'0 0 '0" 3@ (3 ' 0 3'@' R ']'

2;' "')(0'5 7 \'#@K'3 % # 3')' 9 #'= ' &' , <: 5#! '

E '&) 6 %+' +) %# '4B ' 1 9"

fS' 'R' BJ$ '5'- BhY

' K' h' H1B` 3" Bh E D . R 1@/ 9 Z`` <2d< 0/ E

o' & o' V' &

L " $ ' @ ' 7H '

; J \. ' 2 3@ * " ; ;3 @' 0 A' (' '

3P3.' : ;0 "' : L '; 0'

,' @ P T ' 9 ?@? '

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) ' :-L ' < 2 @ "'

3TD:j\ ' . 9 '

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/ / 1 /'2/ 2..9 I " 0 94' 1.6 3' 2. '

.. 0 E0 .68'06198 ' .0'G07921 / / 1 /29=E2/2'

9 01'./2. 6 /29.9 0 0 'F6/. .029.' 2 3 A'

!'7 !' '; 3 ! ' " ' $ ' " ' '

: 19 909 '1. 8 2 3'G/. . . 6 = .2 2 '

" D 0'#W'7 93 "7 E'02 8 0 29.. . 16 '

0 .6 ' '29 . ./2 2D 1F69'".' /'/8 2 '@' ' - 3'

B]S ;'2/2'29.9 0 7' 30'F6 0'E /2'

0 F6/4'7 93'4/ 8 0. '06.'" D 91' ;' = 8 19 '

06.98 C' 9 './ 49 219 8 2/3' / 1.24916 ' C#<'

;" ; (0'@' 1' 0 4. 0 3'= 29.9 0 0 ' ,'T 4'

3" 9 8 2/8'0 19 ' 1'01. 76166=E0 .9 ' 601663'

.68' "269 0 3'9 1 0160'C 29.9 0

0 .108'./2. 6 /'9 1'29.9 10 0 08' 'R 0'26

AB'94212D 1#0. '.6 408'E 29 18 ..4 .

.6 408 =2/2 29 9' ' !68061.8 < \0 '

8 0.8 0'2... 0 0 69 1E 6.'"2 9 0 3'!69'2'

0 19 061' 601 60' 0 1'.6 0 3#2/2'9 1'./. 6 /'

2..9 10 0' !919 '208 F69'90498'4 .98 63'F6 '

2 / 763'$ < ! ' 9 8 2'0 198 '.68 ;" ; 0'

" '"2 9 0 3'0 8023' 29.9 10 0 B? '" D 0'

02 8 0 /8 /029468 /8 / '!68 '06198 1

0 190 8023 29.9 0 0# 8 $E8

" D 0 02 8 0 0 76'2... 9 92 8 '02 8 0'.6

0 7/' 29 910.. 4 106198'".'" D 026H '(

?? 1#29.'29.. .1 .6 408'? 8 0O'2/2'29 9'"

D 08 ' !68 06198 '"2E?/ BB / 260238 0 19 9 1

' 7 93'8 /163'02 8 0 $'8 9

4 68 '02 8 0

!/ 01 /29.9 0 E C9 63' F6/4' 29 # !0 '

' = 3" ' ,' $ ' W' A; ? !

I < ' 9 ''BS) ' " * "$3; * 2 2 ' *I @ "3 @! '

);D & '+H' @ ' 5* P M @ "'

9 I; ' ' "0 V' I' ' u'

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" P @ @ $E5"< $H $ *3-+ : L M ' *'

9:/ ')O : 5 <(" T @ ')'/ S .1LVf 1 1\'- /3 * -0 ;0

@ 0' '$ '& @@ @'$*(0"< ' <;6' % f-; " ' ') '

E

& 2; , *! P N ! @"'*" *334 !' 36/ (' W' : 9D '

//6' 'S1" '1 EF/1$ /;' 7D 'E 1\' B '

1 !d')' / * D ? R ' R 0 '

\I .668'D 16 B @2'9 9' /D 8 6'913'

' F6/4 2. 1 8 '"1 F6. / / 1 /293' D2

.92129 , 9 . / 9 108 9229.9 0 0 ./2. 6 /

298 9408 '0 19 0'102168 '; ; '29.9 0 0' 1'

%' 2"8 F6906.98 6908 8016 ' 69 6016E'

! 21' /D 8 '2..9 19' 3'0 19 08' / / . /29 '

9 19' 8 98'./2. 6 /2 ' K.06198' 8 98 .7K./$'

= ' $ $(" ' D '("(';" ; N'3? 3 '

E29 9 2...9 00 668 ' ('("(';" ; $ ' ' 0

.9 0 0 F60 9./2 1012/2./246 8 ...JT 8 '

". F6/4 29 1 2 0P9 0 / / 1 /0.. 0.6 29'

.9 0 0 "9' D2 .0232. 9' ;' > 9'2..9 0 /

D 16 'F6/'8 /49'./H D116 'C F60'4 1. 01

0 I'9/'F6/4' 2. 1 .3' 9 .4 8 '9 1

>.'./21 2D921 'C' / / . /2 763' [4.'0..9 . 3 h' (#' Q

' ; !'$"' < ! ' %' - ? !'$ 3 6' W' $"'$!' 3" (' ,'E4 ' ('(3 $" ('$"' ?('

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I 9 ' ' < @< @ : 'W ' I' [W ' 4.'! /21 2D9 '4 .08 3'F6024/ 'C

R $A 0? 2) j 0 3' ' F@ 8 /4/ 'C'9 'F8 763'.'@ /D 6 ' 0

24 ! ; * ! * 2H 3 ; :'& H M* " ;'$4 (J) 3&L 00'

* ; !'$3 @<;$ ' W' " D 1')'E* ; * '

5#%K - 8MW' : " #+-" ; '7 <#) ^ W)+'

Y0' 0' 0'

.48 2/2 .29.9 0 68 /2016 9 9 2 G O2 '

49 9F6 6 ' 8 / 7 9 'F6/4'92 8 29.9 0 8 2'

73@'G/8 /2 8 1 3'./21 2D9 M'4 . 16 ' W' H /.'06

./2. 2D923' 2F& '$ < @ "- ;('

9 ' 29D01 /2 763' C ' 0 2@6/8 763' / / . B

!.28 E2/2./2.8D. 29 9 C 8 / 7 .
2. . C29S . 2/2 29 9 06.9049 621 061
.9 8 16/'./2 .F6621 'F60 9'9. 08' 3'/ / '
;10 S B ./8 2D 129 9 C2/2 8 / 7 9 2'
.'C#2/2'2... 9' 2/2'29 9'06.'9 62.'9049'
1' 9 .'2 16/'./2 9F6.616 208'49'/8 2 2K"9'
801/"9'29D01/@ ,9 1' D/'./ 2D923'9 '
/B ...4 0 68#C#2/2'29.. P 68 ./2.8 D923'
E' <=26 .306198 49./2. 2D921 / / /293 2'
9' 26 98'./2698 / 621#S?S 2F608 '2/2'
801 603' 2'29D01 603'' 94'F6 .T F69'0 80'
602 D6 08'G0792. S!1 2468'/ / 1 /2.8 #
.G0#. ./21 20Z 2. ??S .? S 2G02. ./2. 2 E1'o' '
/2' 24:9#C . SS1 2D 1'/8 2 8' 28.' - p
D18 E 42/2/8 2 =.G .0 .6 @ Dq '
2G02. '2/ /231 '#1 SS?D './49'8 /4/'8) 2'0 3'
"3"(3 './21 2D923'2/2' 1'29.9 0'
8 0.2/2 29.. 0 28 / 12/2'29 9 9 '
68 ' BE' /2. 2D 1' S' = 2. 9'./21 2D9 .'
1082/T'89 9' '/8 2 './2. 2D 1'29 9'910'
M82'./21 /D4 92/2' 24 . = 8 3'9 ' 01 /'0 '
201 /28 2111 0 19$F6/2 08'90498'& '498 /2'
10 M 'I 0 244'"9 /' / / . /293' 621'01. 76'
1601E2/0 6016 '20 2 2 @@'! /21 2D .' 8 '
191 /81/' "; ('*<;J "1 'J #' .61' 63'
4 W 6 1' E' H 3'4. 2 1=E!6 63'4 .08 63 ! /2'
12D9 94 . #'42/763'8 /4 3#"2/ F6/4' . 68 F6.'X'
10.'49 .11 2.99 0 /# ".'G/8 298'.029 .. 9'
"9'06D. E .O079 .9 9'C'/828/'F6/4'2016 0'
9 .' / 91 G/.'9 0202/2'G079.'./21 608'29.9 '
10.92 'F6 02@' 7 0 .1'G/8/'9 $ 94' 'G/8/'
>!E06.' ... A'06.' .2 8F69')<-J'!-+'8/4/'
F6/4 249 2 162q'F6/4 4 ' 104 9.63'; '
/19 1 "1'02 10'0 760. '06 "00676 02196B '
&"/'8///8 .')2662/'F6/4' 1'0' /11620#'+" .'
.2 8'2 G 80 .0209 849/2q 0 016 89 1'F60'
)+" ! +'.+ +' 8' ! /26. 1 .6 9 D/ 9.6246'
/ / 103[1 / U . /293'"9 6F69 ./2. 2D9 38/2'
10 092./49 28/4/' 94'F6/4'208 0'./ 0 016 2
9 1" I I 8 40`?! ? F6/42/ 29.9 0 U 29 #
9988 . 2D 1' /2'.029 99 9G/8 29'F6/4'>
06.98';B 4. 2C 2)+.& [% 5 + '2/2'80'
D3 G/.'F60 2' O/11 74/'9 9' /19 ' ' =. 921 0'
"9 7C' 7D 863'49 0/ 04663'2/2'9 1'9/ 68
= $ 62.' 209 2 .0 F6 0S<\946 8'9 2/ 4 20 6#
./8 8F6 '2016 ./8 0 0.68'9 1'".' 29'0.'
.1 4 .. 01 /293' ./ 49101 /29 F6.'49'G 3'H69'
F6J'7/98/4/'./21 2D621' &' /'06198',%6 /'
.+'+&. :%" ' 9 'F6 498' 7.9 1' /D 863'
(94F 11 1/2'./2 696 .' +' 06) : % '2 0D 3'
49 2 9266# 2 9F6921 763'262.' "9 /4 .0863'
F60 14/' 8 /4/' 'U)'F6 3'. 1' H/D 263'.'
42D98 7S / / 1 /2 763' ' T 8 0"9 7' ;,'
*+) '9/2. 3 G/.G6 .' 29 N9'7 0 08'0.. ' '
<06192G2'< :") ' .6'G/. 29 1'061'.6'A]
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omnium *ſint hi*: *Concluſionis*, neceſſariò ineſſe, ani- A mal, album, homo. *Concluſionis*, non poſſe ineſſe, animal, album, veſtimentum. Perſpicuum igitur *eſt*, cùm termini hoc modo *ſe* habent, nullum fieri ſyllogiſmum. nam omnis ſyllogiſmus colligit aut ineſſe, aut neceſſariò *ineſſe*, aut contingere *ineſſe*. quòd autem *hic ſyllogiſmus* nec ineſſe nec neceſſariò *ineſſe* colligat, *ex eo* apparet, quòd affirmatiuam *concluſionem* tollit priuatiua, & priuatiuam affirmatiua: reſtat igitur, *vt colligat* contingere ineſſe. ſed hoc *eſt* impoſſibile: quippe oſtenſum eſt, cùm termini ita *ſe* habent, & omni poſtremo primum neceſſariò *ineſſe* & nulli contingere ineſſe. quare non poteſt eſſe ſyllogiſmus, *quo colligatur* contingere: B quia quod *eſt* neceſſarium, non eſt contingens. 11 Perſpicuum igitur *eſt*, cùm termini vniuerſaliter accipiuntur in propoſitionibus contingentibus, ſemper fieri ſyllogiſmum in prima figura, ſiue ſint attributiui ſiue priuatiui: verùm ſi attributiui ſint, *ſyllogiſmum eſſe* perfectum: ſi priuatiui, imperfectũ. 12 Sed opus eſt vt contingere accipiatur, non in *propoſitionibus* neceſſariis, ſed ſecundum dictam definitionem. hoc autem interdum latet.

πάντων, τοῦ μὲν ὑπάρχειν ἐξ ἀνάγκης, ζῷον, λευκόν, ἄνθρωπος· τοῦ δὲ μὴ ἐνδέχεσθαι, ζῷον, λευκόν, ἱμάτιον. Φανερὸν οὖν, ὅτι τοῦτον τὸν τρόπον ἐχόντων τῶν ὅρων, οὐδεὶς γίνεται συλλογισμός. ἢ γὰρ τοῦ ὑπάρχειν, ἢ τοῦ ἐξ ἀνάγκης, ἢ τοῦ ἐνδέχεσθαι, πᾶς ἐστὶ συλλογισμός. τοῦ μὲν οὖν ὑπάρχειν, καὶ τοῦ ἀναγκαίου, φανερὸν ὅτι οὐκ ἔστιν· ὁ μὲν γὰρ καταφατικὸς ἀναιρεῖται τῷ στερητικῷ· ὁ δὲ στερητικὸς τῷ καταφατικῷ. λείπεται δή, τοῦ ἐνδέχεσθαι εἶναι· τοῦτο δὲ ἀδύνατον. δέδεικται γάρ, ὅτι οὕτως ἐχόντων τῶν ὅρων, καὶ παντὶ τῷ ἐσχάτῳ τὸ πρῶτον ἀνάγκη καὶ οὐδενὶ ἐνδέχεσθαι ὑπάρχειν. ὥστ᾽ οὐκ ἂν εἴη τοῦ ἐνδέχεσθαι συλλογισμός. τὸ γὰρ ἀναγκαῖον οὐκ ἦν ἐνδεχόμενον. 11 Φανερὸν οὖν, ὅτι καθόλου τῶν ὅρων ὄντων ἐν ταῖς ἐνδεχομέναις προτάσεσιν, ἀεὶ γίνεται συλλογισμὸς ἐν τῷ πρώτῳ σχήματι, καὶ κατηγορικῶν, καὶ στερητικῶν ὄντων, πλὴν κατηγορικῶν μὲν ὄντων, τέλειος· στερητικῶν δέ, ἀτελής. 12 Δεῖ δὲ τὸ ἐνδέχεσθαι λαμβάνειν, μὴ ἐν τοῖς ἀναγκαίοις, ἀλλὰ κατὰ τὸν εἰρημένον διορισμόν. ἐνίοτε δὲ λανθάνει τὸ τοιοῦτον.

De ſyllogiſmis ex altera propoſitione pura & altera contingente, in prima figura.

Cap. XV.

1 ¶ De ſyllogiſmis vniuerſalibus. 2 Si minor propoſitio pura affirmet, & maior contingens affirmet, 3 vel neget: 4 ſyllogiſmos eſſe perfectos. 5 Si minor propoſitio contingens affirmet, ſyllogiſmos eſſe imperfectos. 6 Protheoria prima, ſi antecedens eſt poſsibile, etiam conſequens eſſe poſsibile. 7 Expoſitio, quomodo accipi debeat poſsibile & impoſsibile: 8 necnon antecedens & conſequens. 9 Protheoria altera, Ex falſa non impoſsibili hypotheſi ſequi falſam concluſionem, non impoſsibilem. 10 Si minor propoſitio contingens affirmet, & maior purè affirmet 11 abſolutè & ſimpliciter, non ratione certi temporis, 12 vel neget: 13 colligi contingens impropriè ſumptum pro non neceſſario, vt probatur cùm ex confirmatione huius ſyllogiſmi facta per deductionem ad impoſsibile, 14 tum etiam terminorum expoſitione, ex quibus ſequitur modò concluſio neceſſaria, 15 modò non neceſſaria. 16 Si minor propoſitio contingens neget, & maior pura affirmet, 17 vel neget. 18 Si minor propoſitio pura neget, & maior contingens affirmet vel neget. 19 Epilogus. 20 De ſyllogiſmis particularibus. Si minor ſit vniuerſalis contingens, & minor particularis pura affirmet. 21 Si maior ſit vniuerſalis pura, & minor contingens. 22 Si maior contingens affirmet vel neget, & minor pura neget. 23 Si maior ſit particularis. 24 Epilogus.

SI verò altera propoſitio pura, altera cõtingens C accipiatur: cùm ea quæ continet maius extremum, contingere ſignificat: omnes ſyllogiſmi erunt perfecti, & de contingenti ſecundũ dictam definitionem *accepto*. cùm autem propoſitio in qua eſt minus extremum, *contingere ſignificat*: omnes *erunt* imperfecti: & priuatiui ſyllogiſmi non erunt de contingenti ſecundum definitionem illam *accepto*, ſed de eo quòd nulli, aut non omni neceſſariò ineſt. nam ſi nulli aut non omni neceſſariò *ineſt*, contingere dicimus vt nulli aut non omni inſit. 2 Contingat enim α omni β, ac β ponatur ineſſe omni γ. quoniam igitur γ eſt ſub β, omni autem β contingit α: perſpicuum *eſt*, etiam omni γ contingere α. fit igitur perfectus ſyllogiſ- D mus. 3 Similiter etiam, ſi propoſitio αβ, ſit priuatiua, *propoſitio* autem βγ affirmatiua, ſumatúrque *propoſitio* αβ *ſignificans* contingere; *propoſitio* verò βγ, *ſignificans* ineſſe: perfectus erit ſyllogiſmus, *quo colligetur* contingere vt α nulli γ inſit. 4 Cùm igitur minor propoſitio ineſſe *maior contingere* ſignificat, ſyllogiſmos fieri perfectos, perſpicuum *eſt*. 5 Cùm autẽ contrario modo *res* habet, ſyllogiſmos fore; oſtendendum *eſt* per *deductionem ad* impoſſibile: ſimulque cõſtabit, *eſſe ſyllogiſmos* imperfectos, quia demonſtratio *non fit* ex propoſitionibus *initio* acceptis. 6 Primùm autem explicandum *eſt*,

Ἐὰν δὲ ἡ μέν, ὑπάρχειν, ἡ δὲ ἐνδέχεσθαι λαμβάνηται, τῶν προτάσεων ὅταν μὲν ἡ πρὸς τὸ μεῖζον ἄκρον, ἐνδέχεσθαι σημαίνῃ, τέλειοί τε πάντες ἔσονται οἱ συλλογισμοί, καὶ τοῦ ἐνδέχεσθαι κατὰ τὸν εἰρημένον διορισμόν· ὅταν δ᾽ ἡ πρὸς τὸ ἔλαττον, ἀτελεῖς τε πάντες, καὶ οἱ στερητικοὶ τῶν συλλογισμῶν, οὐ τοῦ κατὰ τὸν διορισμὸν ἐνδεχομένου, ἀλλὰ τοῦ μηδενί, ἢ μὴ παντὶ ἐξ ἀνάγκης ὑπάρχειν· εἰ γὰρ μηδενὶ ἢ μὴ παντὶ ἐξ ἀνάγκης, ἐνδέχεσθαί φαμεν καὶ μηδενὶ καὶ μὴ παντὶ ὑπάρχειν. 2 Ἐνδεχέσθω γὰρ τὸ α παντὶ τῷ β, τὸ δὲ β παντὶ τῷ γ κείσθω ὑπάρχειν. ἐπεὶ οὖν ὑπὸ τὸ β ἐστὶ τὸ γ, τῷ δὲ β παντὶ ἐνδέχεται τὸ α· φανερὸν ὅτι καὶ τῷ γ παντὶ ἐνδέχεται τὸ α· γίνεται δὴ τέλειος συλλογισμός. 3 Ὁμοίως δὲ καὶ στερητικῆς οὔσης τῆς α β προτάσεως, τῆς δὲ β γ, καταφατικῆς· καὶ τῆς μὲν α β, ἐνδέχεσθαι, τῆς δὲ β γ, ὑπάρχειν λαμβανομένης· τέλειος ἔσται συλλογισμός, ὅτι τὸ α ἐνδέχεται μηδενὶ τῷ γ ὑπάρχειν. 4 Ὅτι μὲν οὖν τοῦ ὑπάρχειν τιθεμένου πρὸς τὸ ἔλαττον ἄκρον, τέλειοι γίνονται οἱ συλλογισμοί, φανερόν. 5 Ὅτι δὲ ἐναντίως ἔχοντος, ἔσονται συλλογισμοί, διὰ τοῦ ἀδυνάτου δεικτέον· ἅμα δὲ ἔσται δῆλον, καὶ ὅτι ἀτελεῖς· ἡ γὰρ δεῖξις, οὐκ ἐκ τῶν εἰλημμένων προτάσεων. 6 Πρῶτον δὲ λεκτέον, CAP. XIV.

ὅτι εἰ τοῦ α ὄντος, ἀνάγκη τὸ β εἶναι· καὶ δυνατοῦ ὄντος τοῦ α, δυνατὸν ἔσται τὸ β ἐξ ἀνάγκης. ἔστω γὰρ, οὕτως ἐχόντων, τὸ μὲν ἐφ' ᾧ τὸ α, δυνατόν· τὸ δὲ ἐφ' ᾧ τὸ β, ἀδύνατον. Εἰ οὖν τὸ μὲν δυνατὸν, ὅτε δυνατὸν εἶναι, γένοιτο ἄν· τὸ δὲ ἀδύνατον, ὅτι ἀδύνατον, οὐκ ἂν γένοιτο. ἅμα δὲ εἰ τὸ α δυνατὸν, καὶ τὸ β ἀδύνατον, ἐνδέχοιτο ἂν τὸ α γενέσθαι ἄνευ τοῦ β, εἰ δὲ γενέσθαι, καὶ εἶναι· τὸ γὰρ γεγονὸς, ὅτε γέγονεν, ἔστι. 7 Δεῖ δὲ λαμβάνειν μὴ μόνον ἐν τῇ γενέσει τὸ δυνατὸν καὶ ἀδύνατον, ἀλλὰ καὶ ἐν τῷ ἀληθεύεσθαι, καὶ ἐν τῷ ὑπάρχειν, καὶ ὁσαχῶς ἄλλως λέγεται τὸ δυνατόν· ἐν ἅπασι γὰρ ὁμοίως ἕξει. 8 Ἔτι, ὄντος τοῦ α β εἶναι, οὐχ ὡς ἑνός τινος ὄντος τοῦ α τὸ β ἔσται, δεῖ ὑπολαμβάνειν· οὐ γάρ ἐστιν οὐδὲν ἐξ ἀνάγκης ἑνός τινος ὄντος, ἀλλὰ δυοῖν ἐλαχίστοιν· οἷον, ὅταν αἱ προτάσεις οὕτως ἔχωσιν, ὡς ἐλέχθη, κατὰ τὸν συλλογισμόν. εἰ γὰρ τὸ γ κατὰ τοῦ δ, τὸ δὲ δ κατὰ τοῦ ζ, καὶ τὸ γ κατὰ τοῦ ζ ἐξ ἀνάγκης. καὶ εἰ δυνατὸν δὲ ἑκάτερον, καὶ τὸ συμπέρασμα ἔσται δυνατόν. ὥσπερ οὖν εἴ τις θείη, τὸ μὲν α, τὰς προτάσεις, τὸ δὲ β, τὸ συμπέρασμα· συμβαίνοι ἂν οὐ μόνον ἀναγκαίου τοῦ α ὄντος, ἅμα καὶ τὸ β εἶναι ἀναγκαῖον· ἀλλὰ καὶ δυνατοῦ, δυνατόν. 9 Τούτου δὲ δειχθέντος, φανερὸν ὅτι ψεύδους ὑποτεθέντος καὶ μὴ ἀδυνάτου, καὶ τὸ συμβαῖνον διὰ τὴν ὑπόθεσιν, ψεῦδος ἔσται, καὶ οὐκ ἀδύνατον. οἷον, εἰ τὸ α, ψεῦδος μέν ἐστι, μὴ μέντοι ἀδύνατον· ὄντος δὲ τοῦ α, τὸ β ἐστί· καὶ τὸ β ἔσται ψεῦδος μὲν, οὐ μέντοι γε ἀδύνατον. ἐπεὶ γὰρ δέδεικται ὅτι εἰ τοῦ α ὄντος, ἔστι τὸ β· καὶ δυνατοῦ ὄντος τοῦ α, ἔσται τὸ β δυνατόν· ὑπόκειται δὲ τὸ α δυνατὸν εἶναι· καὶ τὸ β ἄρα ἔσται δυνατόν· εἰ γὰρ ἀδύνατον, ἅμα δυνατὸν ἔσται τὸ αὐτὸ καὶ ἀδύνατον. 10 Διωρισμένων δὲ τούτων, ὑπαρχέτω τὸ α παντὶ τῷ β, τὸ δὲ β παντὶ τῷ γ ἐνδεχέσθω. ἀνάγκη οὖν παντὶ τῷ γ τὸ α ἐνδέχεσθαι ὑπάρχειν. Μὴ γὰρ ἐνδεχέσθω· τὸ δὲ β παντὶ τῷ γ κείσθω ὑπάρχον· τοῦτο δὲ ψεῦδος μὲν, οὐ μέντοι ἀδύνατον. εἰ οὖν τὸ μὲν α μὴ ἐνδέχεται τῷ γ, τὸ δὲ β παντὶ ὑπάρχει τῷ γ, τὸ α οὐ παντὶ τῷ β ἐνδέχεται· γίνεται γὰρ συλλογισμὸς διὰ τοῦ τρίτου σχήματος. ἀλλ' ὑπέκειτο παντὶ ἐνδέχεσθαι ὑπάρχειν. ἀνάγκη ἄρα τὸ α παντὶ τῷ γ ἐνδέχεσθαι· ψεύδους γὰρ ὑποτεθέντος καὶ οὐκ ἀδυνάτου, τὸ συμβαῖνόν ἐστιν ἀδύνατον. Ἐγχωρεῖ δὲ καὶ διὰ τοῦ πρώτου σχήματος ποιῆσαι τὸ ἀδύνατον, θέντας τῷ γ τὸ β ὑπάρχειν. εἰ γὰρ τὸ β παντὶ τῷ γ ὑπάρχει, τὸ δὲ α παντὶ τῷ β ἐνδέχεται, καὶ τῷ γ παντὶ ἂν ἐνδέχοιτο τὸ α. ἀλλ' ὑπέκειτο μὴ παντὶ ἐγχωρεῖν. 11 Δεῖ δὲ λαμβάνειν τὸ παντὶ ὑπάρχειν, μὴ κατὰ χρόνον ὁρίσαντας, οἷον νῦν, ἢ ἐν τῷδε τῷ χρόνῳ, ἀλλ' ἁπλῶς· διὰ τοιούτων γὰρ προτάσεων καὶ τοὺς συλλογισμοὺς ποιοῦμεν. ἐπεὶ κατά γε τὸ νῦν λαμβανομένης τῆς προτάσεως, οὐκ ἔσται συλλογισμός· οὐδὲν γὰρ ἴσως κωλύει, ποτὲ παντὶ κινουμένῳ ἄνθρωπον ὑπάρχειν· οἷον, εἰ μηδὲν ἄλλο κινοῖτο· τὸ δὲ κινούμενον ἐνδέχεται παντὶ τῷ ἵππῳ· ἀλλ' ἄνθρωπος οὐδενὶ ἵππῳ ἐνδέχεται. ἔτι, ἔστω τὸ μὲν πρῶτον, ζῷον· τὸ δὲ μέσον, κινούμενον· τὸ δὲ ἔσχατον, ἄνθρωπος· αἱ μὲν οὖν προτάσεις ὁμοίως ἕξουσι· τὸ δὲ συμπέρασμα, ἀναγκαῖον, οὐκ ἐνδεχόμενον· ἐξ ἀνάγκης γὰρ ὁ ἄνθρωπος, ζῷον. Φανερὸν οὖν, ὅτι τὸ καθόλου ληπτέον ἁπλῶς, καὶ οὐ χρόνῳ διορίζοντας. 12 Πάλιν, ἔστω στερητικὴ πρότασις καθόλου ἡ α β, καὶ εἰλήφθω τὸ μὲν α μηδενὶ τῷ β ὑπάρχειν, τὸ δὲ β παντὶ ἐνδεχέσθω ὑπάρχειν τῷ γ. τούτων οὖν τεθέντων, ἀνάγκη τὸ α ἐνδέχεσθαι μηδενὶ τῷ γ ὑπάρχειν. Μὴ γὰρ ἐνδεχέσθω· τὸ δὲ β τῷ γ κείσθω ὑπάρχειν,

A ſi cùm eſt τὸ α, neceſſe *eſt* eſſe τὸ β, *pariter* etiam, cùm τὸ α eſt poſſibile, τὸ β fore poſſibile: *idque* neceſſariò. Sit enim, *rebus* ita *ſe* habentibus, vbi τὸ α, poſſibile: vbi τὸ β, impoſſibile. Si igitur poſſibile, quando poſſibile eſt, factum fuerit: at *certè* impoſſibile, quia eſt impoſſibile, factum non erit. Quòd ſi ſimul τὸ α eſt poſſibile, & τὸ β impoſſibile: continget τὸ α factum eſſe ſine β. & ſi factum eſſe, etiam eſſe: quod enim eſt factum, quando eſt factum, eſt. 7 Poſſibile autem & impoſſibile accipere oportet, non ſolùm quod fieri poteſt, ſed etiam quod verè dicitur, & quod *actu* eſt, & quotcumque aliis modis dicitur poſſibile: omnium enim ſimilis ratio eſt. 8 Prætere a *quod dicimus*, cùm eſt τὸ α, eſſe τὸ β: non *ita* accipere oportet, quaſi cùm vnum quiddam ſit, *nempe* τὸ α, τὸ β futurum ſit: quia nihil neceſſariò colligitur *ex eo* quòd vnum quiddam ſit, ſed *quòd* duo minimùm *ſint*: vt cùm propoſitiones eo quo diximus modo *ſe* habent in ſyllogiſmo. nam ſi τὸ γ *dicitur* de δ, ac τὸ δ de ζ, etiam τὸ γ de ζ *dicetur* neceſſariò. & ſi vtraque *propoſitio eſt* poſſibilis, etiam concluſio erit poſſibilis. tamquàm igitur ſi quis poſuerit τὸ α, propoſitiones, τὸ β, concluſionem: non ſolùm fit, vt cùm τὸ α ſit neceſſarium, ſimul etiam τὸ β ſit neceſſarium, ſed etiam, cùm *illud ſit* poſſibile, *hoc quoque ſit* poſſibile. 9 Hoc autem oſtenſo, conſtat, ſi falſa nec impoſſibilis ſit hypotheſis, etiam id falſum nec impoſſibile fore, quod propter hypotheſim accidit. C vt ſi τὸ α eſt falſum, non tamen impoſſibile, cùm autem τὸ α eſt, etiam τὸ β eſt: certè etiam τὸ β erit falſum, non tamen impoſſibile. Nam quia oſtenſum eſt, ſi cùm eſt τὸ α, eſt τὸ β, etiam cùm poſſibile eſt τὸ α, poſſibile fore τὸ β: ſupponitur autem, τὸ α eſſe poſſibile: ergo etiam τὸ β erit poſſibile: quia ſi *ſit* impoſſibile, idem ſimul erit poſſibile & impoſſibile. 10 His definitis, τὸ α inſit omni β, ac τὸ β contingat omni γ. neceſſe igitur *eſt*, vt omni γ τὸ α ineſſe contingat. Fac enim non contingere: ac τὸ β omni γ ponatur ineſſe: hoc autem falſum quidem *eſt*, non tamen impoſſibile. ſi igitur τὸ α non contingit τῷ γ, ac τὸ β ineſt omni γ: D τὸ α non omni β contingit: fit enim ſyllogiſmus in tertia figura. atqui ſupponebatur omni ineſſe contingere. neceſſe igitur *eſt*, vt τὸ α omni γ contingat: ſuppoſito enim eo quod falſum, non impoſſibile eſt: quod *inde* accidit, eſt impoſſibile. Licet etiam in prima figura deducere ad impoſſibile, ſi ponamus τὸ β ineſſe τῷ γ. nã ſi τὸ β ineſt omni γ, ac τὸ α contingit omni β, etiam omni γ continget τὸ α. verùm ſupponebatur non omni ineſſe poſſe. 11 Omni autem ineſſe, accipiendum eſt, non tempore definitum, vt nunc, aut hoc tempore, ſed ſimpliciter: quoniam ex huiuſcemodi propoſitionibus ſyllogiſmos conficimus. ceteroqui propoſitione ſecun- E dum *tempus* præſens acceptâ, non erit ſyllogiſmus. nihil enim fortaſſe prohibet, aliquãdo omni moto hominem ineſſe, nempe ſi nihil aliud moueatur: motum autem contingit omni equo: ſed homo nulli equo contingit. Præterea primus *terminus* ſit animal: medius, motum: poſtremus, homo: propoſitiones igitur ſimiliter habebunt: concluſio autẽ *erit* neceſſaria, non contingens: neceſſariò namque homo *eſt* animal. Apparet igitur, *pronunciatum* vniuerſale accipiendum *eſſe* ſimpliciter, non tempore definitum. 12 Rurſus propoſitio α β ſit priuatiua vniuerſalis: ac ſumatur τὸ α nulli β ineſſe, τὸ β autem contingat omni γ ineſſe. his igitur poſitis, neceſſe *eſt* vt contingat τὸ α nulli γ ineſſe. Fac enim non contingere; ac τὸ β ponatur ineſſe τῷ γ,

quemadmodum antea *factum fuit*. neceſſe igitur *eſt* τὸ α alicui β ineſſe: fit enim ſyllogiſmus in tertia figura. hoc autẽ *eſt* impoſſibile. Quapropter continget vtique τὸ α nulli γ: quia falſo *principio* nec impoſſibili ſuppoſito, impoſſibile accidit. 13 Hic igitur ſyllogiſmus non eſt contingentis ſecundũ definitionem illam, *quam ſuprà tradidimus*, accepti, ſed eius quod nulli neceſſario *ineſt*. hæc enim eſt contradictio poſitæ hypotheſeos: quia ſuppoſitum fuerat, neceſſario τὸ α alicui γ ineſſe: ſyllogiſmus autẽ deducens ad impoſſibile, colligit contradictionem oppoſitam. 14 Præterea ex terminis quoque perſpicuum *eſt*, non eſſe concluſionem contingentem. ſit enim vbi α, coruus: vbi β, intelligens: vbi γ, homo. nulli igitur β τὸ α ineſt: nulla enim res intelligens *eſt* coruus. τὸ β autem contingit omni γ: omni enim homini contingit vt intelligat. ſed τὸ α neceſſario *ineſt* nulli γ. ergo concluſio non eſt contingens. 15 Non tamen ſemper *eſt* neceſſaria. ſit n. τὸ α, motum: τὸ β, ſcientia: vbi γ, homo. igitur τὸ α nulli β inerit: ac τὸ β contingit omni γ: nec erit concluſio neceſſaria: quia non *eſt* neceſſe nullum hominem moueri, ſed non *eſt* neceſſe aliquem *moueri*. Conſtat igitur concluſionem eſſe de eo quod non neceſſariò ineſt. Termini autem meliùs *ſunt* accipiendi. 16 Quòd ſi priuatio iungatur minori extremo, & ſignificet contingere: ex ipſis propoſitionibus acceptis nullus erit ſyllogiſmus: ſed conuerſâ propoſitione contingente, erit *ſyllogiſmus*, quemadmodum in prioribus. Inſit enim τὸ α omni β, & τὸ β contingat nulli γ. ſic igitur terminis conſtitutis, nihil neceſſariò colligetur. ſi verò conuertatur *propoſitio* β γ, & accipiatur τὸ β omni γ contingere, fit ſyllogiſmus vt antea: ſimilẽ enim ſitum termini habent. 17 Eodem modo *fiet*, cũ ambo interualla ſunt priuatiua; ſi *interuallum* α β, non ineſſe, *interuallum* β γ, nulli contingere ſignificet. nam ex *propoſitionibus* acceptis nihil neceſſariò colligitur: conuerſâ autem propoſitione contingente, erit ſyllogiſmus. accipiatur enim τὸ α nulli β ineſſe, ac τὸ β contingat nulli γ. ex his ergo nihil neceſſariò *colligitur*. ſi verò ſumatur τὸ β omni γ cõtingere, quod quidem verum eſt: propoſitio autem α β ſimiliter habeat: rurſus erit idem ſyllogiſmus. 18 Quòd ſi ſumptum ſit, τὸ β non ineſſe τῷ γ, non autem, contingere non ineſſe: nullo modo erit ſyllogiſmus, ſiue propoſitio α β ſit negatiua, ſiue affirmatiua. Termini communes, *Concluſionis* neceſſariò ineſſe, album, animal, nix: *Concluſionis* non contingere, album, animal, pix. 19 Perſpicuum igitur *eſt*, cùm termini ſunt vniuerſales, & altera propoſitio accipitur pura, altera contingẽs, ſi propoſitio, in qua eſt minus extremum, accipiatur contingens, ſemper fieri ſyllogiſmum: ſed interdum ex ipſis *propoſitionibus*, interdum conuerſâ propoſitione. quando autem horum vtrũque fiat, & quam ob cauſam, *ſuprà* diximus. 20 Sin autem alterum interuallum ſumatur vniuerſale, alterum in parte: cùm maiori extremo vniuerſale contingens iungitur, ſiue affirmatiuum, ſiue negatiuum: particulare autem *interuallum eſt* affirmatiuum & purum: erit ſyllogiſmus perfectus, quemadmodum & cùm termini ſunt vniuerſales. demonſtratio autem *eſt* eadem, quæ antea. 21 Cùm autem *interuallum* quo continetur maius extremũ, eſt purum, non contingens: alterũ autem, in parte contingens: ſiue affirmatiuæ ſiue negatiuæ poſitæ ſint ambæ *propoſitiones*; ſiue altera affirmatiua,

A καθάπερ πρότερον. ἀνάγκη δὴ τὸ α τινὶ τῷ β ὑπάρχειν· γίνεται γὰρ συλλογισμὸς διὰ τοῦ τρίτου σχήματος. τοῦτο δὲ, ἀδύνατον. Ὥστ' ἐνδέχοιτο ἂν τὸ α μηδενὶ τῷ γ. ψεύδους γὰρ ὑποτεθέντος καὶ οὐκ ἀδυνάτου, ἀδύνατον συμβαίνει. 13 Οὗτος οὖν ὁ συλλογισμὸς, οὐκ ἔστι τοῦ κατὰ τὸν ὁρισμὸν ἐνδεχομένου, ἀλλὰ τοῦ μηδενὶ ἐξ ἀνάγκης. αὕτη γάρ ἐστιν ἡ ἀντίφασις τῆς γενομένης ὑποθέσεως· ὑπετέθη γὰρ, ἐξ ἀνάγκης τὸ α τινὶ τῷ γ ὑπάρχειν. ὁ δὲ διὰ τοῦ ἀδυνάτου συλλογισμὸς, τῆς ἀντικειμένης ἐστὶν ἀντιφάσεως. 14 Ἔτι δὲ καὶ ἐκ τῶν ὅρων φανερὸν, ὅτι οὐκ ἔστι τὸ συμπέρασμα ἐνδεχόμενον. ἔστω γὰρ τὸ μὲν ἐφ' ᾧ τὸ α, κόραξ· τὸ δὲ ἐφ' ᾧ τὸ β, διανοούμενον· ἐφ' ᾧ δὲ γ, ἄνθρωπος. οὐδενὶ δὴ τῷ β B τὸ α ὑπάρχει· οὐδὲν γὰρ διανοούμενον, κόραξ. τὸ δὲ β παντὶ ἐνδέχεται τῷ γ· παντὶ γὰρ ἀνθρώπῳ ἐνδέχεται τὸ διανοεῖσθαι. ἀλλὰ τὸ α ἐξ ἀνάγκης οὐδενὶ τῷ γ. οὐκ ἄρα τὸ συμπέρασμα ἐνδεχόμενον. 15 Ἀλλ' οὐδ' ἀναγκαῖον ἀεί. ἔστω γὰρ τὸ μὲν α, κινούμενον· τὸ δὲ β, ἐπιστήμη· τὸ δὲ ἐφ' ᾧ γ, ἄνθρωπος. τὸ μὲν οὖν α οὐδενὶ τῷ β ὑπάρξει· τὸ δὲ β παντὶ τῷ γ ἐνδέχεται. καὶ οὐκ ἔσται τὸ συμπέρασμα ἀναγκαῖον· οὐ γὰρ ἀνάγκη μηδένα κινεῖσθαι ἄνθρωπον, ἀλλ' οὐκ ἀνάγκη τινά. δῆλον οὖν, ὅτι τὸ συμπέρασμά ἐστι τοῦ μηδενὶ ἐξ ἀνάγκης ὑπάρχειν. ληπτέον δὲ βέλτιον τοὺς ὅρους. 16 Ἐὰν δὲ τὸ στερητικὸν τεθῇ πρὸς τὸ ἔλαττον ἄκρον, ἐνδέχεσθαι σημαῖνον, ἐξ αὐτῶν μὲν τῶν εἰλημμένων προτάσεων, οὐδεὶς ἔσται συλλογισμός· ἀντι- C στραφείσης δὲ τῆς κατὰ τὸ ἐνδέχεσθαι προτάσεως, ἔσται, καθάπερ ἐν τοῖς πρότερον. ὑπαρχέτω γὰρ τὸ α παντὶ τῷ β, τὸ δὲ β ἐνδεχέσθω μηδενὶ τῷ γ. οὕτω μὲν οὖν ἐχόντων τῶν ὅρων, οὐδὲν ἔσται ἀναγκαῖον. ἐὰν δὲ ἀντιστραφῇ τὸ βγ, καὶ ληφθῇ τὸ β παντὶ τῷ γ ἐνδέχεσθαι, γίνεται συλλογισμὸς ὥσπερ πρότερον· ὁμοίως γὰρ ἔχουσιν οἱ ὅροι τῇ θέσει. 17 Τὸν αὐτὸν δὲ τρόπον, καὶ στερητικῶν ὄντων ἀμφοτέρων τῶν διαστημάτων, ἐὰν τὸ μὲν αβ, μὴ ὑπάρχειν, τὸ δὲ βγ, μηδενὶ ἐνδέχεσθαι σημαίνῃ. δι' αὐτῶν μὲν γὰρ τῶν εἰλημμένων οὐ γίνεται τὸ ἀναγκαῖον. ἀντιστραφείσης δὲ τῆς κατὰ τὸ ἐνδέχεσθαι προτάσεως, ἔσται συλλογισμός. εἰλήφθω γὰρ τὸ μὲν α μηδενὶ τῷ β ὑπάρχειν, τὸ δὲ β ἐνδεχέ- D σθω μηδενὶ τῷ γ. διὰ μὲν οὖν τούτων οὐδὲν ἀναγκαῖον. ἐὰν δὲ ληφθῇ τὸ β παντὶ τῷ γ ἐνδέχεσθαι, ὅπερ ἐστὶν ἀληθές· ἡ δὲ αβ πρότασις ὁμοίως ἔχῃ, πάλιν ὁ αὐτὸς ἔσται συλλογισμός. 18 Ἐὰν δὲ μὴ ὑπάρχειν τεθῇ τὸ β τῷ γ, καὶ μὴ, ἐνδέχεσθαι μὴ ὑπάρχειν, οὐκ ἔσται συλλογισμὸς οὐδαμῶς, οὔτε στερητικῆς οὔσης, οὔτε καταφατικῆς τῆς αβ προτάσεως. ὅροι δὲ κοινοὶ, τοῦ μὲν ἐξ ἀνάγκης ὑπάρχειν, λευκὸν, ζῷον, χιών· τοῦ δὲ μὴ ἐνδέχεσθαι, λευκὸν, ζῷον, πίττα. 19 Φανερὸν οὖν, ὅτι καθόλου τῶν ὅρων ὄντων, καὶ τῆς μὲν ὑπάρχειν, τῆς δὲ ἐνδέχεσθαι λαμβανομένης τῶν προτάσεων, ὅταν ἡ πρὸς τὸ ἔλαττον ἄκρον ἐνδέχεσθαι λαμβάνηται πρότασις, ἀεὶ γίνεται συλλογισμός· πλὴν ὁτὲ μὲν ἐξ αὐ- E τῶν, ὁτὲ δὲ ἀντιστραφείσης τῆς προτάσεως. πότε δὲ τούτων ἑκάτερον, καὶ διὰ τίνα αἰτίαν, εἰρήκαμεν. 20 Ἐὰν δὲ τὸ μὲν, καθόλου, τὸ δ', ἐν μέρει ληφθῇ τῶν διαστημάτων· ὅταν μὲν τὸ πρὸς τὸ μεῖζον ἄκρον καθόλου τεθῇ καὶ ἐνδεχόμενον, εἴτε ἀποφατικὸν, εἴτε καταφατικόν· τὸ δ' ἐν μέρει, καταφατικὸν καὶ ὑπάρχον, ἔσται συλλογισμὸς τέλειος, καθάπερ καὶ καθόλου τῶν ὅρων ὄντων. ἀπόδειξις δὲ ἡ αὐτὴ ἥπερ καὶ πρότερον. 21 Ὅταν δὲ καθόλου μὲν ᾖ τὸ πρὸς μεῖζον ἄκρον, ὑπάρχον δὲ, καὶ μὴ ἐνδεχόμενον, θάτερον δ', ἐν μέρει καὶ ἐνδεχόμενον· ἐάν τε ἀποφατικαὶ, ἐάν τε καταφατικαὶ τεθῶσιν ἀμφότεραι· ἐάν τε ἡ μὲν, ἀποφατική, ἡ

δὲ, κατηγορικὴ· πάντως ἔσται συλλογισμὸς ἀτελής. πλὴν A οἱ μὲν, διὰ τοῦ ἀδυνάτου δειχθήσονται· οἱ δὲ, καὶ διὰ τῆς ἀντιστροφῆς τοῦ ἐνδέχεσθαι, καθάπερ ἐν τοῖς πρότερον. ἔσται δὲ συλλογισμὸς διὰ τῆς ἀντιστροφῆς, καὶ ὅταν ἡ μὲν καθόλου τεθεῖσα πρὸς τὸ ἄκρον μεῖζον, σημαίνῃ τὸ ὑπάρχειν, ἢ μὴ ὑπάρχειν· ἡ δ' ἐν μέρει, στερητικὴ οὖσα, τὸ ἐνδέχεσθαι λαμβάνῃ· οἷον, εἰ τὸ μὲν α παντὶ τῷ β ὑπάρχει, ἢ μὴ ὑπάρχει, τὸ δὲ β τινὶ τῷ γ ἐνδέχεται μὴ ὑπάρχειν· ἀντιστραφέντος γὰρ τοῦ β γ κατὰ τὸ ἐνδέχεσθαι, γίνεται συλλογισμός. 22 Ὅταν δὲ τὸ μὴ ὑπάρχον λαμβάνῃ ἡ κατὰ μέρος τεθεῖσα πρότασις, οὐκ ἔσται συλλογισμός. ὅροι τοῦ μὲν ὑπάρχειν, λευκόν, ζῷον, χιών· τοῦ δὲ μὴ ὑπάρχειν, λευκόν, ζῷον, πίττα. διὰ γὰρ τοῦ ἀδιορίστου ληπτέον τὴν ἀπόδειξιν. 23 Ἐὰν δὲ τὸ μὲν καθόλου, τε- B θῇ πρὸς τὸ ἔλαττον ἄκρον, τὸ δ' ἐν μέρει, πρὸς τὸ μεῖζον· ἐάν τε στερητικὸν, ἐάν τε κατηγορικόν· ἐάν τε ἐνδεχόμενον, ἐάν τε ὑπάρχον ὁποτερονοῦν· οὐδαμῶς ἔσται συλλογισμός. οὐδ' ὅταν ἐν μέρει, ἢ ἀδιόριστοι τεθῶσιν αἱ προτάσεις, εἴτ' ἐνδέχεσθαι λαμβάνουσαι, εἴτε ὑπάρχειν, εἴτε ἐναλλάξ, οὐδ' οὕτως ἔσται συλλογισμός. ἀπόδειξις δ' ἡ αὐτή, ἣ καὶ ἐπὶ τῶν πρότερον. ὅροι δὲ κοινοί, τοῦ μὲν ὑπάρχειν ἐξ ἀνάγκης, ζῷον, λευκόν, ἄνθρωπος. τοῦ δὲ μὴ ἐνδέχεσθαι, ζῷον, λευκόν, ἱμάτιον. 24 Φανερὸν οὖν, ὅτι τοῦ μὲν πρὸς τὸ μεῖζον ἄκρον, καθόλου τεθέντος, ἀεὶ γίνεται συλλογισμός· τοῦ δὲ πρὸς τὸ ἔλαττον, οὐδέποτε οὐδαμῶς.

A altera negatiua: omnino erit ſyllogiſmus imperfectus. ſed alij confirmabuntur per impoſſibile, alij etiam per conuerſionem *propoſitionū* contingentis, ſicut in prioribus *ſyllogiſmis factum eſt*. Erit autē ſyllogiſmus per conuerſionem, cùm vniuerſalis *propoſitio* iuncta maiori extremo, ſignificat ineſſe, aut non ineſſe, particularis autem, cùm ſit priuatiua, contingere accipit. vt ſi τὸ α omni β inſit, aut non inſit: ac τὸ β alicui γ contingit non ineſſe: nam conuerſâ pro ratione contingentis *propoſitione* β γ, fit ſyllogiſmus. 22 Cùm autem propoſitio particularis accipit non ineſſe, non erit ſyllogiſmus. Termini *concluſionis* affirmantis, album, animal, nix. negantis, album animal, pix. nam ab indefinito ſumenda *eſt* demonſtratio. 23 Quòd B ſi vniuerſale iunctum ſit minori extremo, particulare maiori: ſiue priuatiuum, ſiue affirmatiuum: ſiue contingens, ſiue purum vtrumvis *ſit acceptum*: nullo modo erit ſyllogiſmus. Neque tunc erit ſyllogiſmus, cùm in parte, vel indefinitæ poſitæ fuerint propoſitiones: ſiue contingere *ambæ* accipiant, ſiue *ambæ* ineſſe, ſiue altera contingere, altera ineſſe. Eſt autem demonſtratio eadem, quæ in ſuperioribus. Termini autem communes, in *quibus* neceſſariò ineſt, animal, album, homo. in *quibus* non contingit, animal, album, veſtimentum. 24 Perſpicuum igitur *eſt*, ſi maior *propoſitio* poſita ſit vniuerſalis, ſemper fieri ſyllogiſmum. ſi minor, nihil vnquàm *inde colligi poſſe*.

De ſyllogiſmis ex altera propoſitione neceſſaria & altera contingente, in prima figura.

Cap. XVI.

1 ¶ Summa rei. 2 ¶ De modis vniuerſalibus. Si vtraque propoſitio affirmet, & maior ſit neceſſaria, 3 vel contingens. 4 Si maior ſit negatiua neceſſaria, 5 vel contingens. 6 Si maior affirmet, ac minor contingens, 7 vel neceſſaria neget. Si ambæ propoſitiones negent. 8 ¶ De modis particularibus. Si maior ſit vniuerſalis negans neceſſaria, 9 vel contingens. 10 Si maior ſit particularis neceſſaria, 11 vel contingens: & minor ſit neceſſaria negans, 12 vel affirmans. 13 Si ambæ propoſitiones ſint indefinitæ, vel particulares. 14 ¶ Collatio ſyllogiſmorum mixtorum in prima figura. De modis vtilibus, vel inutilibus. 15 De imperfectione modorum vtilium, & de ratione eos perficiendi.

CAP. XV.

Ὅταν δ' ἡ μὲν, ἐξ ἀνάγκης ὑπάρχειν, ἢ μὴ ὑπάρ- C χειν, ἡ δ', ἐνδέχεσθαι σημαίνῃ, τῶν προτάσεων· ὁ μὲν συλλογισμὸς ἔσται, τὸν αὐτὸν τρόπον ἐχόντων τῶν ὅρων· καὶ τέλειος, ὅταν πρὸς τῷ ἐλάττονι ἄκρῳ τεθῇ τὸ ἀναγκαῖον. τὸ δὲ συμπέρασμα, κατηγορικῶν μὲν ὄντων τῶν ὅρων, τοῦ ἐνδέχεσθαι καὶ οὐ τοῦ ὑπάρχειν ἔσται, καὶ καθόλου, καὶ μὴ καθόλου τιθεμένων. ἐὰν δ' ᾖ, τὸ μὲν, κατηγορικὸν, τὸ δὲ, στερητικὸν· ὅταν μὲν ᾖ τὸ κατηγορικὸν, ἀναγκαῖον, τοῦ ἐνδέχεσθαι, καὶ οὐ τοῦ μὴ ὑπάρχειν· ὅταν δ' ᾖ τὸ στερητικὸν, ἀναγκαῖον, καὶ τοῦ ἐνδέχεσθαι μὴ ὑπάρχειν, καὶ τοῦ μὴ ὑπάρχειν· καὶ καθόλου, καὶ μὴ καθόλου τῶν ὅρων ὄντων. τὸ δ' ἐνδέχεσθαι, ἐν τῷ συμπεράσματι τὸν αὐτὸν τρόπον ληπτέον, ὅνπερ καὶ ἐν τοῖς πρότερον. D τοῦ δ' ἐξ ἀνάγκης μὴ ὑπάρχειν, οὐκ ἔσται συλλογισμός· ἕτερον γὰρ τὸ μὴ ἐξ ἀνάγκης ὑπάρχειν, καὶ τὸ ἐξ ἀνάγκης μὴ ὑπάρχειν. 2 Ὅτι μὲν οὖν, κατηγορικῶν ὄντων τῶν ὅρων, οὐ γίνεται συμπέρασμα ἀναγκαῖον, φανερόν. ὑπαρχέτω γὰρ τὸ μὲν α παντὶ τῷ β ἐξ ἀνάγκης, τὸ δὲ β ἐνδεχέσθω παντὶ τῷ γ. ἔσται δὴ συλλογισμὸς ἀτελής, ὅτι ἐνδέχεται τὸ α παντὶ τῷ γ ὑπάρχειν. Ὅτι δὲ ἀτελής, ἐκ τῆς ἀποδείξεως δῆλον· τὸν αὐτὸν γὰρ τρόπον δειχθήσεται, ὅνπερ καὶ ἐπὶ τῶν πρότερον. 3 Πάλιν, τὸ μὲν α ἐνδεχέσθω παντὶ τῷ β,

C CVm autem altera propoſitio neceſſariò ineſſe aut non ineſſe, altera contingere ſignificat: ſyllogiſmus quidem erit, terminis eodem modo habentibus: *iſque* perfectus, cùm minori extremo iungetur neceſſarium. concluſio verò; ſi termini ſint attributiui, ſiue vniuerſaliter ſiue non vniuerſaliter poſiti, ſignificabit contingere: non, ineſſe. ſin alterum *interuallum* ſit affirmatiuum, alterum priuatiuum: cùm affirmatiuum eſt neceſſarium, *concluſio ſimiliter ſignificabit* contingere, non autem non ineſſe. cùm verò priuatiuum eſt neceſſarium, *concludetur* contingere ineſſe, & non ineſſe: ſiue termini ſint vniuerſales, ſiue non vniuerſales. Contingere autem in concluſione eodem D modo accipi debet, quo in ſuperioribus. Nullus autem ſyllogiſmus erit *quo colligatur* neceſſariò non ineſſe. nam aliud eſt, non neceſſariò ineſſe; aliud, neceſſariò non ineſſe. 2 Cùm igitur termini ſunt affirmatiui, non effici concluſionem neceſſariam, perſpicuum *eſt*. Inſit n. τῷ α omni β neceſſariò, ac τὸ β accidat omni γ. erit igitur ſyllogiſmus imperfectus, *quo colligetur* τὸ α contingere omni γ. Imperfectum autem eſſe, ex demonſtratione manifeſtum *eſt*: demonſtrabitur enim eodem modo, quo in ſuperioribus *vſi ſumus*. 3 Rurſus τὸ α contingat omni β,

ac τὸ β, neceſſariò inſit omni γ. erit igitur ſyllogiſmus, *quo colligetur* τὸ α contingere omni γ, ſed non *colligetur* ineſſe. atque *hic ſyllogiſmus eſt* perfectus, non imperfectus: quia ſtatim perficitur ex propoſitionibus initio ſumptis. 4 Quòd ſi propoſitiones figurâ differant: primùm propoſitio priuatiua ſit neceſſaria, ac τὸ α neceſſario nulli β contingat, ſed τὸ β contingat omni γ: neceſſe igitur *eſt*, τὸ α nulli γ ineſſe. Ponatur enim ineſſe aut omni, aut alicui. ſupponebatur autem nulli β contingere. cùm igitur *propoſitio* priuans conuertatur, etiam τὸ β nulli α cõtingit. atqui τὸ α omni aut alicui γ ponitur ineſſe. quare nulli aut non omni γ τὸ β contingit ineſſe. verùm initio ſupponebatur omni *contingere*. Perſpicuum autem *eſt* colligi etiam contingere non ineſſe, quandoquidem *colligitur* non ineſſe. 5 Rurſus affirmatiua propoſitio ſit neceſſaria: & cõtingat nulli β τὸ α ineſſe, omni autem γ τὸ β inſit neceſſariò. ſyllogiſmus igitur erit perfectus: *quo* tamen non *colligetur* non ineſſe: ſed, contingere non ineſſe. ſic enim accepta fuit maior propoſitio. nec licet deducere ad impoſſibile: quia ſi ſupponatur τὸ α alicui γ ineſſe, & ponatur etiam contingere τὸ α nulli β ineſſe, nihil inde colligitur impoſſibile. 6 Si verò minori extremo iuncta ſit priuatio, cùm ſignificat contingere, ſyllogiſmus erit per conuerſionem, quemadmodum in prioribus *factum fuit*. 7 Cùm autem *ſignificat* non contingere, non erit *ſyllogiſmus*. Neque *tunc erit ſyllogiſmus*, cùm ambo *interualla* poſita erunt priuatiua, niſi contingens iungatur minori *extremo*. Termini autem iidem ſunt, *quibus poſitis colligitur* ineſſe, album, animal, nix: non ineſſe, album, animal, pix. 8 Eodem modo *res* habebit etiam in particularibus ſyllogiſmis. Cùm enim priuatiuum *interuallum* eſt neceſſarium, colligetur non ineſſe. vt ſi τὸ α nulli β contingit ineſſe, ac τὸ β alicui γ contingit ineſſe: neceſſe *eſt*, τὸ α alicui γ non ineſſe. nam ſi omni ineſt, ac nulli β contingit, etiam τὸ β nulli α ineſſe contingit. quare ſi τὸ α omni γ ineſt, τὸ β nulli γ contingit. ſed ſupponebatur alicui contingere. 9 Cùm autem *pronunciatum* in parte affirmans, eſt neceſſarium quod *ponitur* in ſyllogiſmo priuatiuo, vt *pronunciatum* β γ, aut *pronunciatum* vniuerſale *affirmans*, quod *eſt* in ſyllogiſmo attributiuo, vt *pronunciatum* α β: non erit ſyllogiſmus *concludens* ineſſe. demonſtratio verò eadem *eſt*, quæ in prioribus. 10 Si verò vniuerſale iungatur minori extremo, vel affirmatiuum vel priuatiuum, & contingens, particulare autem neceſſarium minori extremo: non erit ſyllogiſmus. Termini *concluſionis* neceſſario ineſſe, animal, album, homo. *Concluſionis* non contingere, animal, album, veſtimentum. 11 Quod ſi *pronunciatum* vniuerſale ſit neceſſarium; particulare verò, contingens: cùm vniuerſale eſt priuatiuum: termini, in quibus ineſt, *ſint hi*, animal, album, coruus: in quibus non ineſt, animal, album, pix. 12 Cùm autem *pronunciatum vniuerſale* affirmat: *termini concluſionis* ineſſe, *ſint hi*, animal, album, cygnus: *concluſionis* non ineſſe, animal, album, nix. 13 Neque tum erit ſyllogiſmus, cùm propoſitiones indefinitæ, vel ambæ in parte ſumptæ fuerint. Termini communes, in quibus ineſt, animal, album, homo: in quibus non ineſt, animal, album, inanimatum. etenim animal cuidam albo, & album cuidam inanimato & neceſſariò ineſt, & non contingit ineſſe. & in contingenti ſimiliter *res habet*.

A τὸ δὲ β παντὶ τῷ γ ὑπαρχέτω ἐξ ἀνάγκης. ἔσται δὲ συλλογισμός, ὅτι τὸ α παντὶ τῷ γ ἐνδέχεται ὑπάρχειν, ἀλλ' οὐχ ὅτι ὑπάρχει· καὶ τέλειος, ἀλλ' οὐκ ἀτελής· εὐθὺς γὰρ ἐπιτελεῖται διὰ τῶν ἐξ ἀρχῆς προτάσεων. 4 Εἰ δὲ μὴ ὁμοιοσχήμονες αἱ προτάσεις, ἔστω πρῶτον ἡ στερητική, ἀναγκαία· καὶ τὸ μὲν α μηδενὶ ἐνδεχέσθω τῷ β ἐξ ἀνάγκης, τὸ δὲ β παντὶ τῷ γ ἐνδεχέσθω. ἀνάγκη δὴ τὸ α μηδενὶ τῷ γ ὑπάρχειν. Κείσθω γὰρ ὑπάρχειν ἢ παντὶ, ἢ τινὶ· τῷ δὲ β ὑπέκειτο μηδενὶ ἐνδέχεσθαι. ἐπεὶ οὖν ἀντιστρέφει τὸ στερητικόν, οὐδὲ τὸ β τῷ α οὐδενὶ ἐνδέχεται. τὸ δὲ α τῷ γ παντὶ, ἢ τινὶ κεῖται ὑπάρχειν· ὥστε οὐδενὶ, ἢ οὐ παντὶ τῷ γ τὸ β ἐνδέχοιτο ἂν ὑπάρχειν·
B ὑπέκειτο δὲ παντὶ ἐξ ἀρχῆς. Φανερὸν δ', ὅτι καὶ τοῦ ἐνδέχεσθαι μὴ ὑπάρχειν γίνεται συλλογισμός, εἴπερ καὶ τοῦ μὴ ὑπάρχειν. 5 Πάλιν, ἔστω ἡ καταφατικὴ πρότασις, ἀναγκαία· καὶ τὸ μὲν α ἐνδεχέσθω μηδενὶ τῷ β ὑπάρχειν, τὸ δὲ β παντὶ τῷ γ ὑπαρχέτω ἐξ ἀνάγκης. ὁ μὲν οὖν συλλογισμὸς ἔσται τέλειος, ἀλλ' οὐ τοῦ μὴ ὑπάρχειν, ἀλλὰ τοῦ ἐνδέχεσθαι μὴ ὑπάρχειν. ἥ τε γὰρ πρότασις οὕτως ἐλήφθη ἀπὸ τοῦ μείζονος ἄκρου· καὶ εἰς τὸ ἀδύνατον οὐκ ἔστιν ἀπαγαγεῖν. εἰ γὰρ ὑποτεθείη τὸ α * τῷ γ τινὶ ὑπάρχειν, κεῖται δὲ καὶ τὸ α τῷ β ἐνδέχεσθαι μηδενὶ ὑπάρχειν, οὐδὲν συμβαίνει διὰ τούτων ἀδύνατον. 6 Ἐὰν δὲ πρὸς τῷ ἐλάττονι ἄκρῳ τεθῇ τὸ στερητι-
C κόν, ὅταν μὲν ἐνδέχεσθαι σημαίνῃ, συλλογισμὸς ἔσται διὰ τῆς ἀντιστροφῆς, καθάπερ ἐν τοῖς πρότερον. 7 Ὅταν δὲ μὴ ἐνδέχεσθαι, οὐκ ἔσται. Οὐδ' ὅταν ἄμφω μὲν τεθῇ στερητικά, μὴ ᾖ δὲ ἐνδεχόμενον τὸ πρὸς τὸ ἔλαττον. ὅροι δὲ οἱ αὐτοί, τοῦ μὲν ὑπάρχειν, λευκόν, ζῷον, χιών· τοῦ δὲ μὴ ὑπάρχειν, λευκόν, ζῷον, πίττα. 8 Τὸν αὐτὸν δὲ τρόπον ἕξει καὶ ἐπὶ τῶν ἐν μέρει συλλογισμῶν. ὅταν μὲν γὰρ ᾖ τὸ στερητικὸν ἀναγκαῖον, καὶ τὸ συμπέρασμα ἔσται τοῦ μὴ ὑπάρχειν. οἷον, εἰ τὸ μὲν α μηδενὶ τῷ β ἐνδέχεται ὑπάρχειν, τὸ δὲ β τινὶ τῷ γ ἐνδέχεται ὑπάρχειν, ἀνάγκη τὸ α τινὶ τῷ γ μὴ ὑπάρχειν. εἰ γὰρ παντὶ ὑπάρχει, τῷ δὲ β μηδενὶ ἐνδέχεται, οὐδὲ τὸ β τῷ α
D οὐδενὶ ἐνδέχεται ὑπάρχειν. ὥστ' εἰ τὸ α παντὶ τῷ γ ὑπάρχει, τὸ β οὐδενὶ τῷ γ ἐνδέχεται. ἀλλ' ὑπέκειτο τινὶ ἐνδέχεσθαι. 9 Ὅταν δὲ τὸ ἐν μέρει καταφατικὸν ἀναγκαῖον ᾖ, τὸ ἐν τῷ στερητικῷ συλλογισμῷ, οἷον τὸ β γ· ἢ τὸ καθόλου, τὸ ἐν τῷ κατηγορικῷ, οἷον τὸ α β· οὐκ ἔσται τοῦ ὑπάρχειν συλλογισμός· ἀπόδειξις δ' ἡ αὐτή, ἣ καὶ ἐπὶ τῶν προτέρων. 10 Ἐὰν δὲ τὸ μὲν καθόλου τεθῇ πρὸς τῷ ἐλάττονι ἄκρῳ, ἢ καταφατικὸν ἢ στερητικόν, * καὶ ἐνδεχόμενον, τὸ δ' ἐν μέρει ἀναγκαῖον, πρὸς τῷ μείζονι ἄκρῳ· οὐκ ἔσται συλλογισμός. ὅροι δέ, τοῦ μὲν ὑπάρχειν ἐξ ἀνάγκης, ζῷον, λευκόν, ἄνθρωπος· τοῦ δὲ μὴ ἐνδέχεσθαι, ζῷον, λευκόν, ἱμάτιον.
E 11 Ὅταν δὲ ἀναγκαῖον ᾖ τὸ καθόλου, τὸ δ' ἐν μέρει, ἐνδεχόμενον. στερητικοῦ μὲν ὄντος τοῦ καθόλου, τοῦ μὲν ὑπάρχειν ὅροι, ζῷον, λευκόν, κόραξ· τοῦ δὲ μὴ ὑπάρχειν, ζῷον, λευκόν, πίττα. 12 Καταφατικοῦ δέ, τοῦ μὲν ὑπάρχειν, ζῷον, λευκόν, κύκνος· τοῦ δὲ μὴ ἐνδέχεσθαι, ζῷον, λευκόν, χιών. 13 Οὐδ' ὅταν ἀδιόριστοι ληφθῶσιν αἱ προτάσεις, ἢ ἀμφότεραι κατὰ μέρος, οὐδ' οὕτως ἔσται συλλογισμός. ὅροι δὲ κοινοί, τοῦ μὲν ὑπάρχειν, ζῷον, λευκόν, ἄνθρωπος· τοῦ δὲ μὴ ὑπάρχειν, ζῷον, λευκόν, ἄψυχον. καὶ γὰρ τὸ ζῷον τινὶ λευκῷ, καὶ τὸ λευκὸν ἀψύχῳ τινί, καὶ ἀναγκαῖον ὑπάρχειν, καὶ οὐκ ἐνδέχεται ὑπάρχειν. καὶ ἐπὶ τοῦ ἐνδέχεσθαι ὁμοίως.

* κ. τῷ γ μηδενί.

* κ. ἢ οὐ.

ὥστε πρὸς ἅπαντα χρήσιμοι οἱ ὅροι. 14 Φανερὸν οὖν ἐκ τῶν A εἰρημένων, ὅτι ὁμοίως ἐχόντων τῶν ὅρων, ἔν τε τῷ ὑπάρχειν, καὶ ἐν ταῖς ἀναγκαίαις, γίνεται καὶ οὐ γίνεται συλλογισμός. πλὴν κατὰ μὲν τὸ ὑπάρχειν τιθεμένης τῆς στερητικῆς προτάσεως, τοῦ ἐνδέχεσθαι ἦν ὁ συλλογισμός· κατὰ δὲ τὸ ἀναγκαῖον τῆς στερητικῆς, καὶ τοῦ ἐνδέχεσθαι, καὶ τοῦ μὴ ὑπάρχειν. 15 Δῆλον δὲ καὶ, ὅτι πάντες οἱ συλλογισμοὶ, ἀτελεῖς· καὶ ὅτι τελειοῦνται διὰ τῶν προειρημένων σχημάτων.

quare omnibus *modis* hi termini conueniunt. 14 Ex dictis igitur perſpicuum *eſt*, ſimiliter *ſe* habentibus terminis in eo quod ineſt, & in neceſſariis *propoſitionibus*, fieri, & non fieri ſyllogiſmum. præterquàm quòd ſi priuatiua propoſitio ponatur pura, colligitur contingere *non ineſſe*. ſi verò priuatiua *ſit* neceſſaria, *colligitur* & contingere non ineſſe, & non ineſſe. 15 Conſtat etiam, omnes ſyllogiſmos *eſſe* imperfectos, & perfici per figuras ſupra dictas.

De ſyllogiſmis ex ambabus propoſitionibus contingentibus in ſecunda figura.

Cap. XVII.

1 ¶ Summa huius & duorum ſequentium capitum. 2 ¶ Protheoria, Propoſitionem vniuerſalem contingentem negantem non reciprocari: vt probatur primò ab abſurdo: 3 ſecundò ab exemplis: 4 tertiò, quia ſi negetur reciprocatio, nihil abſurdi inde colligitur. 5 Epilogus. 6 ¶ De modis vniuerſalibus. Si maior neget, minor affirmet. 7 De aliis modis. 8 ¶ De modis particularibus. 9 ¶ Epilogus.

ΕΝ δὲ τῷ δευτέρῳ σχήματι, ὅταν μὲν ἐνδεχόμεναι λαμβάνωνται ἀμφότεραι αἱ προτάσεις, οὐδεὶς ἔσται συλλογισμός, οὔτε κατηγορικῶν οὔτε στερητικῶν τιθεμένων, οὔτε καθόλου, οὔτε κατὰ μέρος. ὅταν δὲ ἡ μὲν, ὑπάρχειν, ἡ δὲ, ἐνδέχεσθαι* σημαίνῃ· τῆς μὲν καταφατικῆς ὑπάρχειν σημαινούσης, οὐδέποτε ἔσται· τῆς δὲ στερητικῆς τῆς καθόλου, ἀεί. τὸν αὐτὸν δὲ τρόπον, καὶ ὅταν ἡ μὲν, ἐξ ἀνάγκης, ἡ δὲ, ἐνδέχεσθαι λαμβάνηται, τῶν προτάσεων. Δεῖ δὲ καὶ ἐν τούτοις λαμβάνειν τὸ ἐν τοῖς συμπεράσμασιν ἐνδεχόμενον, ὥσπερ καὶ ἐν τοῖς πρότερον. 2 Πρῶτον οὖν δεικτέον, ὅτι οὐκ ἀντιστρέφει τὸ ἐν τῷ ἐνδέχεσθαι στερητικόν· οἷον, εἰ τὸ α ἐνδέχεται μηδενὶ τῷ β, οὐκ ἀνάγκη καὶ τὸ β μηδενὶ τῷ α ἐνδέχεσθαι. κείσθω γὰρ τοῦτο, καὶ ἐνδεχέσθω τὸ β μηδενὶ τῷ α C ὑπάρχειν. οὐκοῦν ἐπεὶ ἀντιστρέφουσιν αἱ ἐν τῷ ἐνδέχεσθαι καταφάσεις ταῖς ἀποφάσεσι, καὶ αἱ ἐναντίαι, καὶ αἱ ἀντικείμεναι· τὸ δὲ β τῷ α ἐνδέχεται μηδενὶ ὑπάρχειν· φανερὸν ὅτι καὶ παντὶ ἐνδέχοιτο ἂν τὸ β τῷ α ὑπάρχειν· τοῦτο δὲ, ψεῦδος. οὐ γὰρ εἰ τόδε τῷδε παντὶ ἐνδέχεται, καὶ τόδε τῷδε ἀναγκαῖον· ὥστ' οὐκ ἀντιστρέφει τὸ στερητικόν. 3 Ἔτι δὲ, οὐδὲν κωλύει, τὸ μὲν α τῷ ϛ ἐνδέχεσθαι μηδενὶ, τὸ δὲ β* τινὶ τῷ α ἐξ ἀνάγκης μὴ ὑπάρχειν. οἷον, τὸ μὲν λευκὸν παντὶ ἀνθρώπῳ ἐνδέχεται μὴ ὑπάρχειν· καὶ γὰρ ὑπάρχειν. ἄνθρωπον δ' οὐκ ἀληθὲς εἰπεῖν, ὡς ἐνδέχεται μηδενὶ λευκῷ. πολλοῖς γὰρ ἐξ ἀνάγκης οὐχ ὑπάρχει· τὸ δ' ἀναγκαῖον, οὐκ ἦν ἐνδεχόμενον. 4 Ἀλλὰ μὴν οὐδ' ἐκ τοῦ ἀδυνάτου D δειχθήσεται ἀντιστρέφον. οἷον, εἴ τις ἀξιώσειεν, ἐπεὶ ψεῦδος τὸ ἐνδέχεσθαι μηδενὶ τῷ α τὸ β ὑπάρχειν, ἀληθὲς τὸ μὴ ἐνδέχεσθαι μηδενί· (* φάσις γὰρ καὶ ἀπόφασις) εἰ δὲ τοῦτο, ἀληθὲς, ἐξ ἀνάγκης τινὶ τῷ α * ὑπάρχειν τὸ β· ὥστε καὶ τὸ α * τινὶ τῷ β. τοῦτο δ' ἀδύνατον. οὐ γὰρ, εἰ μὴ ἐνδέχεται μηδενὶ τῷ α τὸ β, ἀνάγκη τινὶ ὑπάρχειν. τὸ γὰρ μὴ ἐνδέχεσθαι μηδενὶ, διχῶς λέγεται· τὸ μὲν, εἰ ἐξ ἀνάγκης τινὶ ὑπάρχει· τὸ δὲ, εἰ ἐξ ἀνάγκης τινὶ μὴ ὑπάρχει. τὸ γὰρ ἐξ ἀνάγκης τινὶ τῷ α μὴ ὑπάρχον, οὐκ ἀληθὲς εἰπεῖν, ὡς παντὶ ἐνδέχεται μὴ ὑπάρχειν· ὥσπερ οὐδὲ τὸ τινὶ ὑπάρχον ἐξ ἀνάγκης, ὅτι παντὶ ἐνδέχεται ὑπάρχειν. εἰ οὖν τις ἀξιοίη, ἐπεὶ οὐκ ἐνδέχεται τὸ ϛ παντὶ τῷ δ ὑπάρχειν, ἐξ ἀνάγκης τινὶ μὴ ὑπάρχειν αὐτὸ, ψεῦδος ἂν λαμβάνοι. παντὶ γὰρ ὑπάρχει, εἰ τύχοι· ἀλλ' ὅτι ἐνίοις ἐξ ἀνάγκης ὑπάρχει, διὰ τοῦτό φαμεν, οὐ παντὶ ἐνδέχεσθαι. ὥστε τῷ ἐνδέχεσθαι παντὶ

* κ. λαμβάνωνται.
* κ. τινὶ τῶν.
* κ. κατάφασις.
* κ. ὑπάρχει.
* κ. τινὶ τῶν.
* κ. ἀνάγκη ὑπάρχειν τινὶ μόνον, ἀλλὰ καὶ ἐξ ἀνάγκης οὐ παντί τι γὰρ μὴ.

B IN ſecunda autem figura, cùm ambæ propoſitiones contingentes accipiuntur, nullus erit ſyllogiſmus, ſiue attributiuæ ſiue priuatiuæ ponantur, ſiue vniuerſales ſiue in parte. cùm autem altera ineſſe, altera contingere ſignificat: ſi affirmatiua ſignificet ineſſe, numquàm erit *ſyllogiſmus*. ſi verò priuatiua vniuerſalis *ſignificet ineſſe*, ſemper erit *ſyllogiſmus*. Eodem modo *res ſe habebit*, etiam cùm altera propoſitio accipietur neceſſaria, altera contingens. Oportet autem in his quoque *ſyllogiſmis ita* accipere contingens quod in concluſionibus *ponitur*, vt in ſuperioribus *acceptum fuit*. 2 Primùm igitur oſtendendum *eſt*, contingens priuatiuum non conuerti. vt ſi τὸ α contingit nulli ϛ, non *eſt* neceſſe etiam τὸ β contingere nulli α. hoc enim ponatur, & contingat τὸ ϛ nulli α ineſſe. cùm igitur contingentes affirmationes mutentur in negationes, tam contrariæ quàm oppoſitæ, & contingat τὸ ϛ nulli α ineſſe: perſpicuum *eſt*, contingere etiam vt τὸ β omni α inſit. hoc autem falſum *eſt*. non enim ſi hoc illi omni contingit, neceſſe *eſt* etiam illud huic contingere. quare contingens priuatiuum non conuertitur. 3 Præterea nihil prohibet quo minùs τὸ α contingat nulli ϛ, verùm τὸ β cuidam α neceſſariò non inſit. verbi gratiâ, contingit vt omni homini album non inſit, quia *contingit* etiam vt inſit. ſed non verè dicetur contingere vt homo nulli albo inſit: quia multis neceſſariò non ineſt: quod autem *eſt* neceſſarium, non erat contingens. 4 Sed neque D ab impoſſibili probabitur conuerti. vt putà ſi quis *ſibi* concedi poſtulet, quia falſum eſt, contingere nulli α τὸ β, verum eſſe, non contingere nulli, (quoniam *hæc ſunt* affirmatio & negatio) & ſi hoc verum *ſit*, neceſſariò alicui α ineſſe τὸ ϛ: proinde etiam τὸ α *neceſſario ineſſe* alicui ϛ: quod eſt impoſſibile. non enim, ſi τὸ β non contingit nulli α, neceſſe *eſt propterea* vt alicui inſit. quia nõ contingere nulli, duobus modis dicitur: vno, ſi alicui neceſſariò inſit: altero, ſi alicui neceſſariò non inſit. quod enim neceſſariò cuidam α non ineſt, dici verè nõ poteſt omni cõtingere non ineſſe: quẽadmodũ nec quod alicui neceſſariò ineſt, *verè dicetur* omni cõtingere ineſſe. Si quis igitur ſibi concedi poſtulet, quia nõ cõtingit τὸ γ omni δ ineſſe, neceſſariò id alicui non ineſſe: falſum ſumit: quia fortaſſe omni ineſt: ſed quia nonnullis neceſſariò ineſt, ideo dicimus non omni cõtingere. Quare *illi orationi*, cõtingere omni ineſſe,

ineſſe, *hæ duæ* opponuntur, neceſſariò alicui ineſſe, & neceſſariò alicui non ineſſe. Similiterque *illi orationi*, contingere nulli. Conſtat igitur, cùm ita contingens & non contingens accipitur, vt initio definiuimus, non ſolùm neceſſariò alicui ineſſe; ſed etiam neceſſariò alicui non ineſſe, ſumi debere hoc autem ſumpto, nihil colligitur impoſſibile: proinde non fit ſyllogiſmus. 5 Ex dictis igitur apparet *contingens* priuatiuum non conuerti. 6 Hoc autem probato, ponatur τὸ α contingere nulli β, & omni γ. ſyllogiſmus igitur non erit per conuerſionem: quia dictum eſt huiuſmodi propoſitionem non conuerti. neque per *deductionem ad* impoſſibile: quia ſi ponatur contingere vt τὸ β inſit omni γ, nihil falſi *inde* colligitur: quia contingere poteſt vt τὸ α & omni & nulli γ inſit. Omnino autem, ſi eſt ſyllogiſmus, conſtat eſſe eius quod contingit, (quia neutra propoſitio ſumpta eſt de eo quod ineſt) iſque aut affirmatiuus, aut priuatiuus. at neutro modo *fieri* poteſt. nam ſi ponatur affirmatiuus, per terminos oſtendetur non contingere ineſſe. ſi *ponatur* negatiuus, *oſtendetur* concluſionem non eſſe contingentem, ſed neceſſariam. ſit enim τὸ α, album: τὸ β, homo: vbi γ, equus. ergo τὸ α, id eſt album, alteri omni, alteri nulli ineſſe contingit. ſed neque contingit τὸ β τῷ γ ineſſe, neque non ineſſe. ſanè quòd non contingat ineſſe, *ex eo* apparet, quòd nullus equus *eſt* homo. ſed ne quidem contingit non ineſſe: quia neceſſe *eſt* nullũ equum eſſe hominem: quod verò eſt neceſſarium, nõ erat contingens. non fit igitur ſyllogiſmus. 7 Similiter etiam oſtendetur, ſi inuerſo ordine priuatio ponatur, vel ambæ *propoſitiones* ſumptæ ſint affirmatiuæ, vel *ambæ* priuatiuæ: quoniam per eoſdem terminos erit demonſtratio. 8 Et quando altera *propoſitio eſt* vniuerſalis, altera in parte, vel ambæ particulares, vel indefinitæ, vel quouis alio modo mutare propoſitiones licet. ſemper enim erit demonſtratio per eoſdem terminos. 9 Perſpicuum igitur *eſt*, ſi ambæ propoſitiones ponantur contingentes, nullam fieri ſyllogiſmum.

A τό τ' ἐξ ἀνάγκης τινὶ ὑπάρχειν, ἀντίκειται, καὶ τὸ ἐξ ἀνάγκης τινὶ μὴ ὑπάρχειν· ὁμοίως δὲ καὶ τῷ ἐνδέχεσθαι μηδενί. Δῆλον οὖν, ὅτι πρὸς τὸ οὕτως ἐνδεχόμενον, καὶ μὴ ἐνδεχόμενον, ὡς ἐν ἀρχῇ διωρισάμεθα, οὐ μόνον τὸ ἐξ ἀνάγκης τινὶ ὑπάρχειν, ἀλλὰ καὶ τὸ ἐξ ἀνάγκης τινὶ μὴ ὑπάρχειν, ληπτέον. τούτου δὲ ληφθέντος, οὐδὲν συμβαίνει ἀδύνατον· ὥστ' οὐ γίνεται συλλογισμός. 5 Φανερὸν οὖν ἐκ τῶν εἰρημένων, ὅτι οὐκ ἀντιστρέφει τὸ στερητικόν. 6 Τούτου δὲ δειχθέντος, κείσθω τὸ α τῷ μὲν β ἐνδέχεσθαι μηδενί, τῷ δὲ γ παντί. διὰ μὲν οὖν τῆς ἀντιστροφῆς* οὐκ ἔσται συλλογισμός, εἴρηται γάρ, ὅτι οὐκ ἀντιστρέφει ἡ τοιαύτη πρότασις. ἀλλ' οὐδὲ διὰ τοῦ ἀδυνάτου. τεθέντος γὰρ τοῦ β παντὶ τῷ γ * ἐνδέχεσθαι ὑπάρχειν, οὐδὲν συμβαίνει ψεῦδος· ἐνδέχοιτο γὰρ
B ἂν τὸ α τῷ γ καὶ παντὶ καὶ μηδενὶ ὑπάρχειν. Ὅλως δέ, εἰ ἔστι συλλογισμός, δῆλον ὅτι τοῦ* ἐνδέχεσθαι ἂν εἴη, (διὰ τὸ μηδετέραν τῶν προτάσεων εἰλῆφθαι ἐν τῷ ὑπάρχειν) καὶ οὗτος ἢ καταφατικός, ἢ στερητικός· οὐδετέρως δ' ἐγχωρεῖ. καταφατικοῦ μὲν γὰρ τεθέντος, δειχθήσεται διὰ τῶν ὅρων, ὅτι οὐκ ἐνδέχεται ὑπάρχειν· στερητικοῦ δέ, ὅτι τὸ συμπέρασμα, οὐκ ἐνδεχόμενον, ἀλλ' ἀναγκαῖόν ἐστιν. ἔστω γὰρ τὸ μὲν α, λευκόν· τὸ δὲ β, ἄνθρωπος· ἐφ' ᾧ δὲ γ, ἵππος. τὸ δὴ α, τὸ λευκόν, ἐνδέχεται τῷ μέν, παντί· τῷ δέ, μηδενὶ ὑπάρχειν. ἀλλὰ τὸ β τῷ γ οὔτε ὑπάρχειν ἐνδέχεται, οὔτε μὴ ὑπάρχειν. ὅτι μὲν οὖν ὑπάρχειν
C οὐκ ἐγχωρεῖ, φανερόν· οὐδεὶς γὰρ ἵππος, ἄνθρωπος. ἀλλ' οὐδὲ ἐνδέχεσθαι μὴ ὑπάρχειν. ἀνάγκη γὰρ μηδένα ἵππον ἄνθρωπον εἶναι· τὸ δ' ἀναγκαῖον, οὐκ ἦν ἐνδεχόμενον. οὐκ ἄρα γίνεται συλλογισμός. 7 Ὁμοίως δὲ δειχθήσεται, κἂν ἀνάπαλιν τεθῇ τὸ στερητικόν, κἂν ἀμφότεραι καταφατικαὶ ληφθῶσιν, ἢ στερητικαί· διὰ γὰρ τῶν αὐτῶν ὅρων ἔσται ἡ ἀπόδειξις. 8 Καὶ ὅταν ἡ μέν, καθόλου, ἡ δ', ἐν μέρει· ἢ ἀμφότεραι, κατὰ μέρος, ἢ ἀδιόριστοι· ἢ ὁσαχῶς ἄλλως ἐνδέχεται μεταλαβεῖν τὰς προτάσεις. ἀεὶ γὰρ ἔσται διὰ τῶν αὐτῶν ὅρων ἡ ἀπόδειξις. 9 Φανερὸν οὖν, ὅτι ἀμφοτέρων τῶν προτάσεων κατὰ τὸ ἐνδέχεσθαι τιθεμένων, οὐδεὶς γίνεται συλλογισμός.

* γρ. ὑπάρχει.

* γρ. ἐνδέχεσθαι μὴ ὑπάρχ. de qua lectione in comm. Alexandri vide.

De ſyllogiſmis ex altera propoſitione pura & altera contingente, in ſecunda figura. Cap. XVIII.

1 ¶ *De modis vniuerſalibus.* 2 *Si maior propoſitio pura neget, minor contingens affirmet:* 3 *vel contrà, maior contingens affirmet, minor pura neget.* 4 *Si ambæ propoſitiones negent,* 5 *vel ambæ affirment.* 6 ¶ *De modis conſtantibus ex altera propoſitione vniuerſali & altera particulari. Si propoſitio negans ſit contingens:* 7 *aut pura vniuerſalis coniuncta cum minore particulari affirmante,* 8 *vel negante:* 9 *aut pura particularis.* 10 *Si ambæ propoſitiones ſint particulares, vel indefinitæ.*

QVòd ſi altera *propoſitio* ineſſe, altera contingere ſignificet: cùm attributiua ſignificat ineſſe, & priuatiua, contingere: numquàm erit ſyllogiſmus, ſiue vniuerſaliter ſiue in parte termini accipiantur. demonſtratio autem eſt eadem, & per eoſdem terminos. Cùm autem affirmatiua *ſignificat* contingere, priuatiua ineſſe: erit ſyllogiſmus. 2 Nam ſumptum eſto τὸ α nulli β ineſſe, & omni γ contingere: conuerſo igitur *interuallo* priuatiuo, τὸ β inerit nulli α: atqui τὸ α contingebat omni γ: fit igitur ſyllogiſmus, *quo colligitur* contingere τὸ β nulli γ, in prima figura. 3 Similiter etiam *fit ſyllogiſmus*, ſi adiiciatur priuatio τῷ γ. 4 Si verò ambæ *propoſitiones* ſint priuatiuæ, & altera ſignificet non ineſſe, altera cõtingere non ineſſe: ſanè ex his *propoſitionibus* acceptis nihil efficitur neceſſariò

D Εἰ δ' ἡ μέν, ὑπάρχειν, ἡ δ', ἐνδέχεσθαι σημαίνει· τῆς μὲν* κατηγορικῆς, ὑπάρχειν* σημαινούσης, τῆς δὲ στερητικῆς, ἐνδέχεσθαι, οὐδέποτε ἔσται συλλογισμός, οὔτε καθόλου* τῶν ὅρων, οὔτ' ἐν μέρει λαμβανομένων. ἀπόδειξις δ' ἡ αὐτή, καὶ διὰ τῶν αὐτῶν ὅρων. Ὅταν δ' ἡ μὲν καταφατική, ἐνδέχεσθαι· ἡ δὲ στερητική, ὑπάρχειν, ἔσται συλλογισμός. 2 Εἰλήφθω γὰρ τὸ α τῷ μὲν β μηδενὶ ὑπάρχειν, τῷ δὲ γ παντὶ ἐνδέχεσθαι. ἀντιστρέφοντος οὖν τοῦ στερητικοῦ, τὸ β τῷ α οὐδενὶ ὑπάρξει· τὸ δὲ α παντὶ τῷ γ ἐνεδέχετο· γίνεται δὴ συλλογισμός, ὅτι ἐνδέχεται τὸ β μηδενὶ τῷ γ, διὰ τοῦ πρώτου σχήματος. 3 Ὁμοίως δέ, καὶ εἰ πρὸς τῷ γ τεθείη τὸ στερητικόν. 4 Ἐὰν δὲ ἀμφότεραι μὲν ὦσι στερητικαί, σημαίνῃ δὲ ἡ μέν, μὴ ὑπάρχειν, ἡ δέ, ἐνδέχεσθαι μὴ ὑπάρχειν· δι' αὐτῶν μὲν τῶν εἰλημμένων, οὐδὲν συμβαίνει ἀναγκαῖον·

CAP. XXVII.

* γρ. καταφατικῆς.

* γρ. τιθεμένης.

* γρ. τῶν ὅρων ὄντων.

ἀντιστραφείσης δὲ τῆς κατὰ τὸ ἐνδέχεσθαι προτάσεως, γίνεται συλλογισμὸς, ὅτι τὸ β τῷ γ ἐνδέχεται μηδενὶ ὑπάρχειν, καθάπερ ἐν τοῖς πρότερον· ἔσται γὰρ πάλιν τὸ πρῶτον σχῆμα. 5 Ἐὰν δὲ ἀμφότεραι τεθῶσι κατηγορικαὶ, οὐκ ἔσται συλλογισμός. ὅροι τοῦ μὲν ὑπάρχειν, ὑγίεια, ζῷον, ἄνθρωπος· τοῦ δὲ μὴ ὑπάρχειν, ὑγίεια, ἵππος, ἄνθρωπος. 6 Τὸν αὐτὸν δὲ τρόπον ἕξει κἀπὶ τῶν ἐν μέρει συλλογισμῶν. ὅταν μὲν γὰρ ᾖ τὸ καταφατικὸν, ὑπάρχον, εἴτε καθόλου, εἴτ᾽ ἐν μέρει ληφθὲν, οὐδεὶς ἔσται συλλογισμός. τοῦτο δὲ ὁμοίως καὶ διὰ τῶν αὐτῶν ὅρων δείκνυται τοῖς πρότερον. 7 Ὅταν δὲ τὸ στερητικὸν, ἔσται διὰ τῆς ἀντιστροφῆς,* καθάπερ ἐν τοῖς πρότερον. 8 Πάλιν, ἐὰν ἄμφω μὲν τὰ διαστήματα, στερητικὰ* ληφθῇ, καθόλου δὲ τὸ μὴ ὑπάρχειν· ἐξ αὐτῶν μὲν τῶν προτάσεων οὐκ ἔσται τὸ ἀναγκαῖον· ἀντιστραφέντος δὲ τοῦ ἐνδέχεσθαι,* καθάπερ ἐν τοῖς πρότερον, ἔσται συλλογισμός. 9 Ἐὰν δὲ ὑπάρχον μὲν ᾖ τὸ στερητικὸν, ἐν μέρει δὲ ληφθῇ· οὐκ ἔσται συλλογισμὸς, οὔτε καταφατικῆς, οὔτε στερητικῆς οὔσης τῆς ἑτέρας προτάσεως. 10 Οὐδ᾽, ὅταν ἀμφότεραι ληφθῶσιν ἀδιόριστοι ἢ καταφατικαὶ ἢ ἀποφατικαὶ, ἢ κατὰ μέρος. ἀπόδειξις δὲ ἡ αὐτὴ, καὶ διὰ τῶν αὐτῶν ὅρων.

* γ. ὥσπερ.
* γ. τεθῇ.
* γ. ὥσπερ.

A ſed conuerſâ propoſitione contingente fit ſyllogiſmus, *quo colligitur* contingere vt τὸ β nulli γ inſit, vt in prioribus *ſyllogiſmis*: erit enim iterum prima figura. 5 Quòd ſi ambæ *propoſitiones* poſitæ ſint attributiuæ, non erit ſyllogiſmus. Termini in quibus ineſt, ſanitas, animal, homo. in quibus non ineſt, ſanitas, equus, homo. 6 Eodem modo *res* habebit etiam in ſyllogiſmis particularibus. Cùm enim *propoſitum* affirmatiuum eſt purum, ſiue vniuerſaliter ſiue in parte acceptum: nullus erit ſyllogiſmus. hoc autem ſimiliter, & per eoſdem terminos probatur, quibus ſuprà *vſi ſumus.* 7 Cùm autem priuatiuum *eſt purum*, erit *ſyllogiſmus* per B conuerſionem, vt in prioribus *ſyllogiſmis factum eſt.* 8 Rurſus ſi ambo interualla priuatiua ſumpta ſint: & *quod ſignificat* non ineſſe, *ſit* vniuerſale: ſanè ex his propoſitionibus nihil colligitur neceſſariò: ſed per contingentis conuerſionem, vt in ſuperioribus, erit ſyllogiſmus. 9 Quòd ſi priuatiuum *interuallũ* ſit quidem purum, ſed in parte acceptum: non erit ſyllogiſmus, ſiue affirmatiua ſiue priuatiua ſit altera propoſitio. 10 Neque *tunc erit ſyllogiſmus*, cùm ambæ propoſitiones ſumptæ ſunt indefinitæ ſiue negantes ſiue affirmantes, aut in parte. demonſtratio verò eadem *eſt*, & per eoſdem terminos.

De ſyllogiſmis ex altera propoſitione neceſſaria & altera contingente, in ſecunda figura.

Cap. XIX.

1 ¶ Summa rei. 2 ¶ De ſyllogiſmis vniuerſalibus. Si altera propoſitio affirmet, altera neget: & negans propoſitio ſit neceſſaria maior, 3 vel neceſſaria minor, 4 vel contingens maior, 5 vel contingens minor. 6 Si ambæ propoſitiones negent: 7 & neceſſaria ſit maior, 8 vel minor. 9 Si ambæ affirment. 10 ¶ De ſyllogiſmis conſtantibus ex altera propoſitione vniuerſali, & altera particulari. Si altera affirmet, altera neget: ita vt neceſſaria vniuerſalis neget, 11 vel neceſſaria affirmet. 12 Si ambæ propoſitiones affirment, 13 vel negent. 14 ¶ Si ambæ propoſitiones ſint particulares. 15 ¶ Epilogus. 16 ¶ Collatio ſyllogiſmorum mixtorum in ſecunda figura. De modis vtilibus, vel inutilibus. 17 De imperfectione modorum vtilium, & de ratione eos perficiendi.

CAP. XVIII.

Ἐὰν δὲ ἡ μὲν, ἐξ ἀνάγκης, ἡ δὲ, ἐνδέχεσθαι σημαίνῃ, τῶν προτάσεων· τῆς μὲν στερητικῆς ἀναγκαίας οὔσης, ἔσται συλλογισμὸς, οὐ μόνον ὅτι ἐνδέχεται μὴ ὑπάρχειν, ἀλλὰ καὶ ὅτι οὐχ ὑπάρχει· τῆς δὲ καταφατικῆς, οὐκ ἔσται. 2 Κείσθω γὰρ τὸ α τῷ μὲν β μηδενὶ ἐξ ἀνάγκης ὑπάρχειν, τῷ δὲ γ παντὶ ἐνδέχεσθαι. ἀντιστραφείσης οὖν τῆς στερητικῆς, οὐδὲ τὸ β τῷ α μηδενὶ ὑπάρξει, τὸ δὲ α παντὶ τῷ γ* ἐνεδέχετο. γίνεται δὴ πάλιν διὰ τοῦ πρώτου σχήματος* ὁ συλλογισμὸς, ὅτι τὸ β τῷ γ ἐνδέχεται μηδενὶ ὑπάρχειν. Ἅμα δὲ δῆλον, ὅτι οὐδ᾽* ὑπάρχει τὸ β οὐδενὶ τῷ γ. κείσθω γὰρ ὑπάρχειν. οὐκοῦν, εἰ τὸ α τῷ β μηδενὶ ἐνδέχεται, τὸ δὲ β ὑπάρχει τινὶ* τῷ γ, τὸ α τινὶ τῷ γ οὐκ ἐνδέχεται. ἀλλὰ παντὶ ὑπέκειτο ἐνδέχεσθαι. 3 Τὸν αὐτὸν δὲ τρόπον δειχθήσεται, καὶ εἰ πρὸς τῷ γ τεθείη τὸ στερητικόν. 4 Πάλιν ἔστω τὸ μὲν κατηγορικὸν, ἀναγκαῖον· θάτερον δὲ, στερητικὸν, καὶ ἐνδεχόμενον· καὶ τὸ α τῷ μὲν β ἐνδεχέσθω μηδενὶ, τῷ δὲ γ παντὶ ὑπαρχέτω ἐξ ἀνάγκης. οὕτως οὖν ἐχόντων τῶν ὅρων, οὐδεὶς* ἔσται συλλογισμός· συμβαίνει γὰρ τὸ β τῷ γ ἐξ ἀνάγκης μὴ ὑπάρχειν. ἔστω γὰρ τὸ μὲν α λευκὸν, ἐφ᾽ ᾧ δὲ τὸ β, ἄνθρωπος, ἐφ᾽ ᾧ δὲ τὸ γ, κύκνος. τὸ δὴ λευκὸν κύκνῳ μὲν ἐξ ἀνάγκης ὑπάρχει, ἀνθρώπῳ δὲ ἐνδέχεται οὐδενί· καὶ ἄνθρωπος οὐδενὶ κύκνῳ ἐξ ἀνάγκης. Ὅτι μὲν οὖν ἐνδέχεσθαι οὐκ ἔσται συλλογισμὸς, φανερόν· τὸ γὰρ ἐξ ἀνάγκης, οὐκ ἦν ἐνδεχόμενον. Ἀλλὰ μὴν οὐδὲ τοῦ ἀναγκαίου· τὸ γὰρ ἀναγκαῖον, ἢ ἐξ ἀμφοτέρων ἀναγκαίων, ἢ ἐκ τῆς στερητικῆς συνέβαινεν. Ἔτι δὲ, καὶ ἐγχωρεῖ, τούτων κειμένων, τὸ β τῷ γ

* γ. ἐνδέχεται.
* γ. τὸ συμπέρασμα ἔστι.
* γ. ὑπάρχει.
* γ. τῷ γ. bis.
* γ. [illegible]

C Si verò altera propoſitio, neceſſariò *ineſſe vel non ineſſe*, altera contingere ſignificet: cùm priuatiua eſt neceſſaria, erit ſyllogiſmus, *quo colligetur* non ſolùm contingere non ineſſe, ſed etiam non ineſſe. cùm autem affirmatiua *eſt neceſſaria*, non erit *ſyllogiſmus*. 2 Ponatur enim τὸ α neceſſariò nulli β ineſſe, & omni γ contingere. conuerſâ igitur *propoſitione* priuatiua, τὸ β neceſſariò nulli α inerit. atqui τὸ α omni γ contingebat. fit igitur iterum in prima figura ſyllogiſmus, *quo colligitur* contingere vt τὸ β nulli γ inſit. Simúlque perſpicuum *ſit*, τὸ β nulli γ ineſſe. ponatur enim ineſſe. ergo ſi τὸ α nulli β contingit, ac τὸ β ineſt alicui γ: *certè* τὸ α cuidam γ non contingit. verùm ſupponebatur omni contingere. 3 Eodem modo demonſtrabitur, ſi τῷ γ iungatur priuatio. 4 Rurſus attributiuum D *interuallum* ſit neceſſarium, alterum verò priuatiuum contingens: ac τὸ α contingat nulli β, & omni γ neceſſariò inſit. ſic igitur habentibus terminis, nullus erit ſyllogiſmus: quia fieri poteſt, vt τὸ β τῷ γ neceſſariò non inſit. ſit enim α, album: vbi β, homo: vbi γ, cygnus. album igitur cygno ex neceſſitate ineſt, & contingit nulli homini: homóque ex neceſſitate nulli cygno *ineſt*. Ergo contingentis non fore ſyllogiſmum, patet: quia quod *eſt* ex neceſſitate, non eſt contingens. Neque verò *eſt ſyllogiſmus concluſionis* neceſſariæ: quia *concluſio* neceſſaria colligebatur vel ex ambabus *propoſitionibus* neceſſariis, vel ex priuatiua. Præterea, his poſitis fieri poteſt vt τὸ β inſit τῷ γ. nihil enim vetat, τὸ γ eſſe ſub β, ac τὸ α accidere omni β, & τῷ γ

nihil enim vetat, τὸ γ eſſe ſub β, ac τὸ α accidere omni β, & τῷ γ neceſſariò ineſſe. vt ſi τὸ γ ſit vigilans: τὸ β, animal: vbi α, motus. nam omni vigilanti, neceſſariò motus ineſt: omnique animali contingit: & omne vigilans *eſt* animal. Perſpicuum igitur *eſt*, neque *colligi* non ineſſe; quandoquidem *terminis* ita habentibus, neceſſe *eſt* ineſſe: neque oppoſitas affirmationes. itaque nullum fore ſyllogiſmum. 5 Similis erit probatio, ſi vice verſa *propoſitio* affirmatiua poſita ſit. 6 Quod ſi propoſitiones ſint figurâ ſimiles, cùm ſunt priuatiuæ, ſemper fit ſyllogiſmus conuerſâ propoſitione contingente, vt in ſuperioribus *factum fuit*. 7 Nam ſumptum eſto τὸ α τῷ β neceſſariò non ineſſe, ac τῷ γ contingere non ineſſe. conuerſis igitur propoſitionibus, τὸ β ineſt nulli α, ac τὸ α contingit omni γ. quare fit prima figura. 8 Idem *fiet*, ſi priuatio iuncta ſit τῷ γ. 9 Si verò attributiuæ poſitæ ſint *ambæ propoſitiones*, non erit ſyllogiſmus. Conſtat enim neque colligi non ineſſe, neque neceſſariò non ineſſe: quia non eſt accepta *vlla* propoſitio priuatiua: *id eſt* neque de eo quod ineſt, neque de eo quod neceſſe eſt ineſſe. Quin ne *colligetur* quidem contingere non ineſſe. ex neceſſitate enim, ita *terminis* poſitis, τὸ β τῷ γ non inerit: verbi causâ, ſi τὸ α ponatur album: vbi β, cygnus: τὸ γ, homo: Nec item *colligentur* oppoſitæ affirmationes: quia oſtenſum eſt τὸ β τῷ γ neceſſariò nõ ineſſe. omnino igitur non fit ſyllogiſmus. 10 Similiter *res* habebit in particularibus ſyllogiſmis. cũ enim *propoſitum* priuatiuum erit vniuerſale neceſſariũ, ſemper erit ſyllogiſmus, quo colligetur contingere, & non ineſſe. demonſtratio autem fiet per conuerſionem. 11 Cùm autem affirmatiuum *erit neceſſarium*, numquàm *erit ſyllogiſmus*. eodem namque modo *hoc* oſtendetur quo in *modis* vniuerſalibus *vſi ſumus*, & per eoſdem terminos. 12 Neque *tunc erit ſyllogiſmus*, cùm ambæ *propoſitiones* accipiuntur affirmatiuæ. cuius rei eadem *eſt* demonſtratio, quæ priùs. 13 Cùm auté ambæ *propoſitiones accipiuntur* priuatiuæ; & ea quæ ſignificat non ineſſe, *eſt* vniuerſalis & neceſſaria: ſanè ex his *propoſitionibus* quæ acceptæ ſunt, non erit *concludendi* neceſſitas: ſed conuerſâ propoſitione contingente, erit ſyllogiſmus, vt in ſuperioribus. 14 Sin ambæ *propoſitiones* poſitæ ſint indefinitæ vel in parte, non erit ſyllogiſmus. demonſtratio autem *erit* eadem, & per eoſdem terminos. 15 Ex dictis igitur perſpicuum *eſt*, cùm priuatiua *propoſitio* ponitur vniuerſalis & neceſſaria, ſemper fieri ſyllogiſmum, *quo colligitur* non ſolùm contingere non ineſſe, ſed etiam non ineſſe. cùm autem affirmatiua *ponitur neceſſaria*, numquàm fieri ſyllogiſmum. 16 *Conſtat* etiam, *terminis* eodem modo *ſe* habentibus in neceſſariis & in puris *propoſitionibus*, fieri & non fieri ſyllogiſmum. 17 Denique manifeſtum *eſt*, omnes hos ſyllogiſmos eſſe imperfectos, & perfici per dictas figuras.

A ὑπάρχειν· οὐδὲν γὰρ κωλύει, τὸ μὲν γ ὑπὸ τὸ β εἶναι, τὸ δὲ α τῷ μὲν β παντὶ ἐνδέχεσθαι, τῷ δὲ γ ἐξ ἀνάγκης ὑπάρχειν· οἷον εἰ τὸ μὲν γ εἴη* ἐγρηγορὸς, τὸ δὲ β, ζῷον, τὸ δ' ἐφ' ᾧ τὸ α, κίνησις. τῷ μὲν γὰρ ἐγρηγορότι παντὶ ἐξ ἀνάγκης κίνησις ἐστί· ζῴῳ δὲ παντὶ ἐνδέχεται· καὶ πᾶν τὸ ἐγρηγορὸς,* ζῷον. φανερὸν οὖν, ὅτι οὐδὲ τὸ μὴ ὑπάρχειν ἐστὶν, οὕτως ἐχόντων, ἀνάγκη ὑπάρχειν. οὐδὲ δὴ τῶν ἀντικειμένων* φάσεων· ὥστε οὐδεὶς ἔσται συλλογισμός. 5 Ὁμοίως δὲ δειχθήσεται, καὶ ἀνάπαλιν τεθείσης τῆς καταφατικῆς. 6 Ἐὰν δὲ ὁμοιοσχήμονες ὦσιν αἱ προτάσεις, στερητικῶν μὲν οὐσῶν, ἀεὶ γίνεται συλλογισμός, ἀντιστραφείσης τῆς κατὰ τὸ ἐνδέχεσθαι προτάσεως, καθάπερ ἐν τοῖς πρότερον. B 7 Εἰλήφθω γὰρ τὸ α τῷ μὲν β ἐξ ἀνάγκης μὴ ὑπάρχειν, τῷ δὲ γ ἐνδέχεσθαι μὴ ὑπάρχειν, ἀντιστραφεισῶν οὖν τῶν προτάσεων, τὸ μὲν β τῷ α οὐδενὶ ὑπάρχει, τὸ δὲ α παντὶ τῷ γ ἐνδέχεται· γίνεται δὴ τὸ πρῶτον σχῆμα. 8 Κἂν εἰ πρὸς τῷ γ τεθείη τὸ στερητικὸν, ὡσαύτως. 9 Ἐὰν δὲ κατηγορικαὶ τεθῶσιν, οὐκ ἔσται συλλογισμός. τοῦ μὲν γὰρ μὴ ὑπάρχειν, ἢ τοῦ ἐξ ἀνάγκης μὴ ὑπάρχειν, φανερὸν ὅτι οὐκ ἔσται, διὰ τὸ μὴ εἰλῆφθαι στερητικὴν πρότασιν, μήτε ἐν τῷ ὑπάρχειν, μήτε ἐν τῷ ἐξ ἀνάγκης ὑπάρχειν. ἀλλὰ μὴν οὐδὲ τοῦ ἐνδέχεσθαι μὴ ὑπάρχειν· ἐξ ἀνάγκης γὰρ, οὕτως ἐχόντων, τὸ β τῷ γ οὐχ ὑπάρξει· οἷον εἰ τὸ μὲν α τεθείη λευκὸν, ἐφ' ᾧ δὲ τὸ β, κύκνος· τὸ δὲ γ, ἄνθρωπος. οὐδέ γε τῶν ἀντικειμένων* φάσεων· ἐπεὶ δέδεικται C τὸ β τῷ γ ἐξ ἀνάγκης οὐχ ὑπάρχειν. οὐκ ἄρα γίνεται συλλογισμὸς ὅλως. 10 Ὁμοίως δ' ἕξει καὶ ἐπὶ τῶν ἐν μέρει συλλογισμῶν. ὅταν μὲν γὰρ ἡ τὸ στερητικὸν, καθόλου τε καὶ ἀναγκαῖον, ἀεὶ συλλογισμὸς ἔσται καὶ τοῦ ἐνδέχεσθαι, καὶ τοῦ μὴ ὑπάρχειν. ἀπόδειξις δὲ διὰ τῆς ἀντιστροφῆς. 11 Ὅταν δὲ τὸ καταφατικὸν, οὐδέποτε. τὸν αὐτὸν γὰρ τρόπον δειχθήσεται, ὃν καὶ ἐν τοῖς καθόλου, καὶ διὰ τῶν αὐτῶν ὅρων. 12 Οὐδ' ὅταν ἀμφότεραι ληφθῶσι καταφατικαί· καὶ γὰρ τούτου ἡ αὐτὴ ἀπόδειξις, ἣ καὶ πρότερον. 13 Ὅταν δὲ ἀμφότεραι μὲν στερητικαὶ, καθόλου δὲ καὶ ἀναγκαία ἡ τὸ μὴ ὑπάρχειν σημαίνουσα· δι' αὐτῶν D μὲν τῶν εἰλημμένων, οὐκ ἔσται τὸ ἀναγκαῖον· ἀντιστραφείσης δὲ τῆς κατὰ τὸ ἐνδέχεσθαι προτάσεως, ἔσται συλλογισμός,* καθάπερ ἐν τοῖς πρότερον. 14 Ἐὰν δὲ ἀμφότεραι, ἀδιόριστοι ἢ ἐν μέρει τεθῶσιν, οὐκ ἔσται συλλογισμός· ἀπόδειξις δὲ ἡ αὐτὴ, καὶ διὰ τῶν αὐτῶν ὅρων. 15 Φανερὸν οὖν ἐκ τῶν εἰρημένων, ὅτι τῆς μὲν στερητικῆς καθόλου τιθεμένης καὶ ἀναγκαίας, ἀεὶ γίνεται συλλογισμὸς, οὐ μόνον τοῦ ἐνδέχεσθαι μὴ ὑπάρχειν, ἀλλὰ καὶ τοῦ μὴ ὑπάρχειν· τῆς δὲ καταφατικῆς, οὐδέποτε. 16 Καὶ ὅτι τὸν αὐτὸν τρόπον ἐχόντων ἔν τε τοῖς ἀναγκαίοις καὶ ἐν τοῖς ὑπάρχουσι, γίνεται καὶ οὐ γίνεται συλλογισμός. 17 Δῆλον δὲ καὶ ὅτι πάντες ἀτελεῖς οἱ συλλογισμοὶ, καὶ ὅτι τελειοῦνται διὰ τῶν εἰρημένων σχημάτων.

* γρ. ἐγείρεσθαι.
* γρ. ζῷον ἀνάγκη.
* γρ. καταφάσεων.
* γρ. καταφάσεων ἢ ἀποφάσεων.
* γρ. καὶ ἐξ αὐτῶν.

De ſyllogiſmis ex vtriſque propoſitionibus contingentibus in tertia figura.

Cap. XX.

1 ¶ *Summa huius, & duorum ſequentium capitum.* 2 ¶ *Si propoſitiones ſint vniuerſales affirmantes:* 3 *vel negans & affirmans:* 4 *vel negantes.* 5 ¶ *Si altera ſit vniuerſalis, altera particularis:* 6 *ita vt maior ſit vniuerſalis, & minor particularis, affirmantes:* 7 *vel maior particularis, & minor vniuerſalis, affirmantes:* 8 *vel maior negans, & minor affirmans:* 9 *vel ambæ negantes.* 10 ¶ *Si ambæ ſint particulares, vel indefinitæ, vel altera particularis & altera indefinita.*

CAP. XIX.

A Ἐν δὲ τῷ τελευταίῳ σχήματι, καὶ ἀμφοτέρων ἐνδεχομένων, καὶ τῆς ἑτέρας, ἔσται συλλογισμός. ὅταν μὲν οὖν ἐνδέχεσθαι σημαίνωσιν αἱ προτάσεις, καὶ τὸ συμπέρασμα ἔσται ἐνδεχόμενον· καὶ ὅταν ἡ μὲν, ἐνδέχεσθαι, ἡ δὲ, ὑπάρχειν. ὅταν δὲ ἡ ἑτέρα τεθῇ ἀναγκαία· ἂν μὲν ᾖ καταφατική, οὐκ ἔσται τὸ συμπέρασμα, οὔτε ἀναγκαῖον, οὔτε ὑπάρχον· ἐὰν δὲ ᾖ στερητική, τοῦ μὴ ὑπάρχειν ἔσται συλλογισμός, καθάπερ καὶ ἐν τοῖς πρότερον. ληπτέον δὲ καὶ ἐν τούτοις ὁμοίως τὸ ἐν τοῖς συμπεράσμασιν ἐνδεχόμενον. 2 Ἔστωσαν δὴ πρῶτον ἐνδεχόμεναι, καὶ τὸ α καὶ τὸ β παντὶ τῷ γ ἐνδεχέσθω ὑπάρχειν. ἐπεὶ οὖν ἀντιστρέφει τὸ καταφατικὸν ἐπὶ μέρους, τὸ δὲ β παντὶ τῷ γ ἐνδέχεται· καὶ τὸ γ τινὶ τῷ β ἐνδέχοιτο ἄν. ὥστε εἰ τὸ μὲν α παντὶ τῷ γ ἐνδέχεται, B τὸ δὲ γ τινὶ τῷ β, ἀνάγκη καὶ τὸ α τινὶ τῷ β ἐνδέχεσθαι· γίνεται γὰρ τὸ πρῶτον σχῆμα. 3 Καὶ εἰ τὸ μὲν α ἐνδέχεται μηδενὶ τῷ γ ὑπάρχειν, τὸ δὲ β παντὶ τῷ γ, ἀνάγκη καὶ τὸ α τινὶ τῷ β ἐνδέχεσθαι μὴ ὑπάρχειν· ἔσται γὰρ πάλιν τὸ πρῶτον σχῆμα διὰ ἀντιστροφῆς. 4 Ἐὰν δὲ ἀμφότεραι στερητικαὶ τεθῶσιν, ἐξ αὐτῶν μὲν τῶν εἰλημμένων, οὐκ ἔσται τὸ ἀναγκαῖον· ἀντιστραφεισῶν δὲ τῶν προτάσεων, ἔσται συλλογισμός, καθάπερ ἐν τοῖς πρότερον· εἰ γὰρ τὸ α καὶ τὸ β ἐνδέχεται τῷ γ μὴ ὑπάρχειν, ἐὰν μεταληφθῇ τὸ ἐνδέχεσθαι μὴ ὑπάρχειν, πάλιν ἔσται τὸ πρῶτον σχῆμα διὰ τῆς ἀντιστροφῆς. 5 Εἰ δὲ ὁ μέν ἐστι καθόλου τῶν ὅρων, ὁ δὲ, ἐν μέρει· τὸν αὐτὸν τρόπον ἐχόντων τῶν ὅρων, ὅνπερ C ἐπὶ τοῦ ὑπάρχειν, ἔσται τε καὶ οὐκ ἔσται συλλογισμός. 6 Ἐνδεχέσθω γὰρ τὸ μὲν α παντὶ τῷ γ, τὸ δὲ β τινὶ τῷ γ ὑπάρχειν. ἔσται δὴ πάλιν τὸ πρῶτον σχῆμα, τῆς ἐν μέρει προτάσεως ἀντιστραφείσης. εἰ γὰρ τὸ α παντὶ τῷ γ, τὸ δὲ γ τινὶ τῷ β, καὶ τὸ α τινὶ τῷ β ἐνδέχεται. 7 Καὶ εἰ πρὸς τὸ β γ τεθείη τὸ καθόλου, ὡσαύτως. 8 Ὁμοίως δὲ, καὶ εἰ τὸ μὲν α γ, στερητικὸν εἴη, τὸ δὲ β γ, καταφατικόν· ἔσται γὰρ πάλιν τὸ πρῶτον σχῆμα διὰ τῆς ἀντιστροφῆς. 9 Εἰ δὲ ἀμφότεραι στερητικαὶ τεθῶσιν· ἡ μὲν, καθόλου, ἡ δὲ, ἐν μέρει· δι᾽ αὐτῶν μὲν τῶν εἰλημμένων, οὐκ ἔσται συλλογισμός· ἀντιστραφεισῶν δὲ, ἔσται καθάπερ ἐν τοῖς πρότερον. 10 Ὅταν δὲ ἀμφότεραι, ἀδιόριστοι, ἢ ἐν μέρει ληφθῶσιν, οὐκ ἔσται συλλογισμός. καὶ γὰρ παντὶ ἀνάγκη τὸ α τῷ β, καὶ μηδενὶ ὑπάρχειν. ὅροι τοῦ ὑπάρχειν, ζῷον, ἄνθρωπος, λευκόν· τοῦ μὴ ὑπάρχειν, ἵππος, ἄνθρωπος, λευκόν· μέσον, λευκόν.

A In poſtrema verò figura, & cùm ambæ *propoſitiones ſunt* contingentes, & cùm altera *tantum*, erit ſyllogiſmus. Cùm igitur propoſitiones contingere ſignificant, etiam cõcluſio erit contingens: & cùm altera *ſignificat* contingere, altera ineſſe. Cùm autem altera poſita ſit neceſſaria, ſi quidem ſit affirmatiua, non erit *vlla* concluſio, nec neceſſaria, nec pura. ſin autem ſit priuatiua, colligetur non ineſſe: quemadmodum etiam in ſuperioribus. Sed & in his ſimiliter accipiendum *eſt* contingens in concluſionibus *poſitum*. 2 Primùm igitur ſint *ambæ propoſitiones* contingentes, & τὸ α, & τὸ β contingat omni γ ineſſe. quoniam igitur *propoſitum* affirmatiuum cõuertitur in parte, & τὸ β contingit omni γ, B etiam τὸ γ continget omni β. quare ſi τὸ α contingit omni γ, ac τὸ γ alicui β: neceſſe *eſt* etiam τὸ α contingere alicui β. fit enim prima figura. 3 Et ſi contingit τὸ α nulli γ ineſſe, τὸ β autem omni γ: neceſſe *eſt* etiam contingere vt τὸ α alicui β non inſit. rurſus enim erit prima figura per conuerſionẽ. 4 Quòd ſi ambæ *propoſitiones* poſitæ ſint priuatiuæ, ſane ex ipſis *propoſitionibus* quæ acceptæ ſunt, non erit *concludendi* neceſſitas: ſed conuerſis propoſitionibus erit ſyllogiſmus, vt in ſuperioribus *factum fuit*. Nã ſi contingit τὸ α & τὸ β nulli γ ineſſe, ſi commutetur cõtingere non ineſſe, iterum erit prima figura per conuerſionem. 5 Si verò terminorum alter ſit vniuerſalis, alter in parte, cùm eodem modo ha- C bent, quo in eo quod ineſt, erit & non erit ſyllogiſmus. 6 Contingat enim τὸ α omni γ, ac τὸ β, alicui γ ineſſe. erit igitur iterũ prima figura, conuerſâ propoſitione particulari. nam ſi τὸ α omni γ, ac τὸ γ alicui β, etiam τὸ α alicui β contingit. 7 Idem *fit*, ſi *nota* vniuerſalis iuncta ſit *propoſitioni* β γ. 8 Similiterque, ſi *propoſitio* α γ ſit priuatiua, & β γ affirmatiua. iterum enim erit prima figura per conuerſionem. 9 Si verò ambæ priuatiuæ poſitæ ſint, altera vniuerſalis, altera in parte: ex his quidem quę ſumptæ ſunt, non erit ſyllogiſmus, ſed eis conuerſis erit *ſyllogiſmus*, quemadmodum in ſuperioribus. 10 Cùm autem ambæ ſumptæ ſunt indefinitæ, vel in parte, non erit *ſyllogiſmus*. etenim neceſſe *eſt* τὸ α & omni & nulli β ineſſe. Termini in quibus ineſt, *hi ſint*, animal, homo, album. in quibus non ineſt, equus, homo, album. medium *ſit* album,

De ſyllogiſmis ex altera propoſitione pura & altera contingente, in tertia figura.

Cap. XXI.

1 ¶ Summa. 2 ¶ De ſyllogiſmis ex ambabus propoſitionibus vniuerſalibus. Si maior propoſitio ſit pura, & minor contingens, affirmantes. 3 Si maior ſit contingens, minor pura, affirmantes. Si maior neget, minor affirmet. 4 Si maior affirmet, minor neget. 5 ¶ De ſyllogiſmis ex altera propoſitione vniuerſali & altera particulari. Si ambæ propoſitiones affirment. Si vniuerſalis neget, particularis affirmet. 6 Si vniuerſalis affirmet, particularis neget. 7 De modis inutilibus ex ambabus propoſitionibus particularibus.

Ἐὰν δὲ ἡ μὲν ὑπάρχειν, ἡ δὲ, ἐνδέχεσθαι σημαίνῃ, D τὸ μὲν συμπέρασμα ἔσται, ὅτι ἐνδέχεται, οὐχ ὅτι ὑπάρχει. συλλογισμὸς δὲ ἔσται, τὸν αὐτὸν ἐχόντων τρόπον τῶν ὅρων, ὃν καὶ ἐν τοῖς πρότερον. 2 Ἔστωσαν γὰρ πρῶτον κατηγορικοί. καὶ τὸ μὲν α παντὶ τῷ γ ὑπαρχέτω, τὸ δὲ β παντὶ τῷ γ ἐνδεχέσθω ὑπάρχειν. ἀντιστραφέντος οὖν τοῦ β γ, τὸ πρῶτον ἔσται σχῆμα· καὶ τὸ συμπέρασμα, ὅτι ἐνδέχεται τὸ α τινὶ τῷ β ὑπάρχειν. ὅτε γὰρ ἡ ἑτέρα τῶν προτάσεων ἐν τῷ πρώτῳ σχήματι σημαίνειν ἐνδέχεσθαι, καὶ τὸ συμπέρασμα, ἦν ἐνδεχόμενον. 3 Ὁμοίως δὲ καὶ εἰ τὸ μὲν β γ, ὑπάρχειν, τὸ δὲ α γ, ἐνδέχεσθαι

Si verò altera propoſitio ſignificet ineſſe, altera contingere: concludetur contingere: non, ineſſe. ſyllogiſmus autem erit terminis eodem, quo in prioribus, modo habentibus. 2 Primùm enim ſint attributiui, ac τὸ α omni γ inſit, verùm τὸ β omni γ ineſſe contingat. conuerſa igitur propoſitione β γ, erit prima figura, & concludetur contingere vt τὸ α inſit alicui β. Nam cùm propoſitionum altera in prima figura ſignificat contingere, etiam concluſio erat contingens. 3 Similiter ſi propoſitio β γ *ſignificet* ineſſe, *propoſitio* verò α γ cõtingere:

item ſi α γ ſit priuatiua, β γ attributiua, & vtrauis ſit A pura: vtroque modo erit concluſio contingẽs. iterum enim fit prima figura: oſtenſum autem eſt, cũ altera propoſitio in ea *figura* contingere ſignificat, etiam concluſionem fore cõtingentem. 4 Quòd ſi contingens priuatiuum iunctum ſit minori extremo, aut ambo *interualla* ſumpta ſint priuatiua: ſanè ex iis quæ poſita ſunt, non erit ſyllogiſmus: *iis* verò conuerſis, erit *ſyllogiſmus*, vt in ſuperioribus. 5 Si verò altera propoſitio *ſit* vniuerſalis, altera particularis: cum ambæ ſunt attributiuæ; aut vniuerſalis *eſt* priuatiua, particularis affirmatiua: idem erit modus ſyllogiſmorum. omnes B enim perficiuntur per primam figuram. vnde conſtat fore ſyllogiſmum *quo colligatur* contingere: non ineſſe. 6 Si verò affirmatiua *propoſitio ſit* vniuerſalis, priuatiua in parte: demonſtratio fiet per impoſſibile. Inſit enim τὸ β omni γ, & contingat τὸ α cuidam γ, non ineſſe. neceſſe igitur *eſt* contingere vt τὸ α alicui β non inſit. nam ſi omni β τὸ α neceſſariò inſit, ac τὸ β omni γ ponatur ineſſe, τὸ α omni γ neceſſariò inerit: hoc enim antea demonſtratum eſt. verùm ſupponebatur contingere vt cuidam non ineſſet. 7 Cùm autem indefinitæ vel in parte acceptæ ſunt ambæ *propoſitiones*, non erit ſyllogiſmus. demonſtratio autem *eſt* eadem, quæ *fuit* etiam in vniuerſalibus, & per eoſdem terminos.

καὶ εἰ τὸ μὲν α γ, στερητικὸν, τὸ δὲ β γ, κατηγορικὸν, ὑπάρχον δ' ὁποτερονοῦν· ἀμφοτέρως ἐνδεχόμενον ἔσται τὸ συμπέρασμα· γίνεται γὰρ πάλιν τὸ πρῶτον σχῆμα. δέδεικται δ', ὅτι τῆς ἑτέρας προτάσεως ἐνδέχεσθαι σημαινούσης ἐν αὐτῷ, καὶ τὸ συμπέρασμα ἔσται ἐνδεχόμενον. 4 Εἰ δὲ τὸ ἐνδεχόμενον, τὸ στερητικὸν, τεθείη πρὸς τὸ ἔλαττον ἄκρον, ἢ καὶ ἄμφω ληφθείη στερητικὰ· δι' αὐτῶν μὲν τῶν κειμένων οὐκ ἔσται συλλογισμός· ἀντιστραφέντων δ', ἔσται, καθάπερ ἐν τοῖς πρότερον. 5 Εἰ δὲ ἡ μὲν, καθόλου τῶν προτάσεων, ἡ δ', ἐν μέρει· κατηγορικῶν μὲν οὐσῶν ἀμφοτέρων· ἢ τῆς μὲν καθόλου, στερητικῆς, τῆς δ' ἐν μέρει, καταφατικῆς· ὁ αὐτὸς τρόπος ἔσται τῶν B συλλογισμῶν· πάντες γὰρ περαίνονται διὰ τοῦ πρώτου σχήματος. ὥστε φανερὸν, ὅτι τοῦ ἐνδέχεσθαι, καὶ οὐ τοῦ ὑπάρχειν, ἔσται ὁ συλλογισμός. 6 Εἰ δὲ ἡ μὲν καταφατικὴ καθόλου, ἡ δὲ στερητικὴ, ἐν μέρει, διὰ τοῦ ἀδυνάτου ἔσται ἡ ἀπόδειξις. ὑπαρχέτω γὰρ τὸ μὲν β παντὶ τῷ γ, τὸ δὲ α ἐνδεχέσθω τινὶ τῷ γ μὴ ὑπάρχειν· ἀνάγκη δὴ τὸ α ἐνδέχεσθαι τινὶ τῷ β μὴ ὑπάρχειν. εἰ γὰρ παντὶ τῷ β τὸ α ὑπάρχει ἐξ ἀνάγκης, τὸ δὲ β παντὶ τῷ γ κεῖται ὑπάρχειν, τὸ α παντὶ τῷ γ ἐξ ἀνάγκης ὑπάρξει· τοῦτο γὰρ δέδεικται πρότερον. ἀλλ' ὑπέκειτο τινὶ ἐνδέχεσθαι μὴ ὑπάρχειν. 7 Ὅταν δ' ἀδιόριστοι, ἢ ἐν μέρει ληφθῶσιν ἀμφότεραι, οὐκ ἔσται συλλογισμός. ἀπόδειξις δ' ἡ αὐτή, ἣ καὶ ἐν τοῖς καθόλου, καὶ διὰ τῶν αὐτῶν ὅρων.

De ſyllogiſmis ex altera propoſitione neceſſaria, & altera contingente in tertia figura. Cap. XXII.

1 ¶ De ſyllogiſmis ex vtriſque propoſitionibus vniuerſalibus. 2 Si ambæ propoſitiones affirment: & neceſſaria ſit maior, 3 vel minor. 4 Si altera affirmet, altera neget: ita vt maior propoſitio ſit contingens negans, 5 vel neceſſaria negans, 6 vel neceſſaria affirmans, 7 vel contingens affirmans. 8 ¶ De ſyllogiſmis ex altera propoſitione vniuerſali & altera particulari. Si ambæ propoſitiones affirment. Si maior neget, minor affirmet. 9 Si maior particularis affirmet, & minor vniuerſalis neget: ita vt maior ſit neceſſaria, minor contingens: 10 vel contrà maior contingens, minor neceſſaria. 11 ¶ Communia de ſyllogiſmis in tertia figura ex vtraque, vel ex altera propoſitione contingente. De modis vtilibus, vel inutilibus. De concluſione. 12 De imperfectione horum ſyllogiſmorum, & de ratione eos perficiendi.

SI verò altera propoſitio ſit neceſſaria, alte- C ra contingens, & termini ſint attributiui: ſemper erit ſyllogiſmus, *quo colligetur* contingere. cùm autem alterum *interuallum* eſt attributiuum, alterum priuatiuum: ſi affirmatiuum ſit neceſſarium, *colligetur* contingere non ineſſe. ſin priuatiuum *id fuerit: concludetur* & contingere non ineſſe, &, non ineſſe. non colligetur autem, neceſſariò non ineſſe, quemadmodum nec in aliis figuris. 2 Primùm igitur termini ſint attributiui, ac τὸ α neceſſariò inſit omni γ, ſed τὸ β omni γ ineſſe contingat. quoniam igitur τὸ α omni γ *ineſt* neceſſariò, & τὸ γ alicui β contingit: etiam τὸ α alicui β continget, non, inerit: ſic enim eueniebat in prima figura. 3 Si- D militer etiam demonſtrabitur, ſi *propoſitio* β γ poſita ſit neceſſaria, & *propoſitio* α γ contingens. 4 Rurſus altera *propoſitio* ſit attributiua, altera priuatiua, & attributiua *ſit* neceſſaria: contingátque τὸ α nulli γ ineſſe, ſed τὸ β omni γ neceſſariò inſit. erit igitur rurſus prima figura: & concluſio contingens, non pura: quia priuatiua propoſitio ſignificat contingere: vnde perſpicuum *eſt* concluſionem fore contingentem: cùm enim ita *ſe* habent propoſitiones in prima figura, concluſio erat contingens. 5 Si verò priuatiua propoſitio *ſit* neceſſaria: concluſio erit, & contingere vt alicui non inſit, & nõ ineſſe. Ponatur enim τὸ α τῷ γ

Εἰ δὲ ἐστὶν ἡ μὲν, ἀναγκαία, τῶν προτάσεων, ἡ δὲ, ἐνδεχομένη, κατηγορικῶν μὲν ὄντων τῶν ὅρων ἀεὶ τοῦ ἐνδέχεσθαι ἔσται συλλογισμός. ὅταν δ' ᾖ τὸ μὲν, κατηγορικὸν, τὸ δὲ, στερητικὸν· ἐὰν μὲν ᾖ τὸ καταφατικὸν, ἀναγκαῖον, τοῦ ἐνδέχεσθαι μὴ ὑπάρχειν· ἐὰν δὲ τὸ στερητικὸν, καὶ τοῦ ἐνδέχεσθαι μὴ ὑπάρχειν, καὶ τοῦ μὴ ὑπάρχειν· τοῦ δὲ ἐξ ἀνάγκης μὴ ὑπάρχειν, οὐκ ἔσται συλλογισμός, ὥσπερ οὐδ' ἐν τοῖς ἑτέροις σχήμασιν. 2 Ἔστωσαν δὴ κατηγορικοὶ πρῶτον οἱ ὅροι, καὶ τὸ μὲν α παντὶ τῷ γ ὑπαρχέτω ἐξ ἀνάγκης, τὸ δὲ β παντὶ τῷ γ ἐνδεχέσθω ὑπάρχειν. ἐπεὶ οὖν τὸ μὲν α παντὶ τῷ γ ἐξ ἀνάγκης, τὸ δὲ γ τινὶ τῷ β ἐνδέχεται· καὶ τὸ α τινὶ τῷ β ἐνδεχόμενον ἔσται, καὶ οὐχ ὑπάρχον· οὕτως γὰρ συνέπιπτεν D ἐπὶ τοῦ πρώτου σχήματος. 3 Ὁμοίως δὲ δειχθήσεται, καὶ εἰ τὸ μὲν β γ τεθείη ἀναγκαῖον, τὸ δὲ α γ, ἐνδεχόμενον. 4 Πάλιν ἔστω τὸ μὲν, κατηγορικὸν, τὸ δὲ στερητικὸν, ἀναγκαῖον δὲ, τὸ κατηγορικόν· καὶ τὸ μὲν α ἐνδεχέσθω μηδενὶ τῷ γ ὑπάρχειν, τὸ δὲ β παντὶ ὑπαρχέτω ἐξ ἀνάγκης. ἔσται δὴ πάλιν τὸ πρῶτον σχῆμα· καὶ τὸ συμπέρασμα, ἐνδεχόμενον, ἀλλ' οὐχ ὑπάρχον· καὶ γὰρ ἡ στερητικὴ πρότασις ἐνδέχεσθαι σημαίνει. φανερὸν οὖν, ὅτι τὸ συμπέρασμα ἔσται ἐνδεχόμενον· ὅτε γὰρ οὕτως ἔχοιεν αἱ προτάσεις ἐν τῷ πρώτῳ σχήματι, καὶ τὸ συμπέρασμα ἦν ἐνδεχόμενον. 5 Εἰ δ' ἡ στερητικὴ πρότασις, ἀναγκαία· καὶ τὸ συμπέρασμα ἔσται, καὶ ὅτι ἐνδέχεται τινὶ μὴ ὑπάρχειν, καὶ ὅτι οὐχ ὑπάρχει. κείσθω γὰρ τὸ α τῷ γ CAP. XXI.

μὴ ὑπάρχειν ἐξ ἀνάγκης, τὸ δὲ β παντὶ ἐνδέχεσθαι. ἀντιστραφέντος μὲν τοῦ β γ καταφατικοῦ, τὸ πρῶτον ἔσται σχῆμα, καὶ ἀναγκαία ἡ στερητικὴ πρότασις. ὅτε δὴ οὕτως εἶχον αἱ προτάσεις, συνέβαινε τὸ α τῷ γ καὶ ἐνδέχεσθαι τινὶ μὴ ὑπάρχειν, καὶ μὴ ὑπάρχειν. ὥστε καὶ τὸ α τῷ β ἀνάγκη τινὶ μὴ ὑπάρχειν. 6 Ὅταν δὲ τὸ στερητικὸν τεθῇ πρὸς τὸ ἔλαττον ἄκρον, ἐὰν μὲν ἐνδεχόμενον, ἔσται συλλογισμὸς, μεταληφθείσης τῆς προτάσεως, καθάπερ ἐν τοῖς πρότερον. 7 Ἐὰν δὲ ἀναγκαῖον, οὐκ ἔσται· καὶ γὰρ παντὶ ἀνάγκη, καὶ οὐδενὶ ἐνδέχεται ὑπάρχειν. ὅροι τοῦ παντὶ ὑπάρχειν, ὕπνος, ἵππος καθεύδων, ἄνθρωπος. τοῦ δὲ μηδενὶ, ὕπνος, ἵππος, ἐγρηγορὼς, ἄνθρωπος. 8 Ὁμοίως δὲ ἕξει. καὶ εἰ ὁ μὲν καθόλου, τῶν ὅρων, ὁ δ', ἐν μέρει, πρὸς τὸ μέσον· κατηγορικῶν μὲν γὰρ ὄντων ἀμφοτέρων, τοῦ ἐνδέχεσθαι, καὶ οὐ τοῦ ὑπάρχειν, ἔσται συλλογισμός. καὶ ὅταν τὸ μὲν, στερητικὸν ληφθῇ· τὸ δὲ, καταφατικὸν· ἀναγκαῖον δὲ, τὸ καταφατικόν. ὅταν δὲ τὸ στερητικὸν, ἀναγκαῖον, καὶ τὸ συμπέρασμα ἔσται τοῦ μὴ ὑπάρχειν. ὁ γὰρ αὐτὸς τρόπος ἔσται τῆς ἀποδείξεως, καὶ καθόλου καὶ μὴ καθόλου τῶν ὅρων ὄντων. ἀνάγκη γὰρ διὰ τοῦ πρώτου σχήματος τελειοῦσθαι τοὺς συλλογισμούς. ὥστε καθάπερ ἐν ἐκείνοις, καὶ ἐπὶ τούτων ἀναγκαῖον συμπίπτειν. 9 Ὅταν δὲ τὸ στερητικὸν, καθόλου ληφθὲν, τεθῇ πρὸς τὸ ἔλαττον ἄκρον, ἐὰν μὲν ἐνδεχόμενον, ἔσται συλλογισμὸς διὰ τῆς ἀντιστροφῆς. 10 Ἐὰν δὲ ἀναγκαῖον, οὐκ ἔσται. δειχθήσεται δὲ τὸν αὐτὸν τρόπον, ὃν καὶ ἐν τοῖς καθόλου, καὶ διὰ τῶν αὐτῶν ὅρων. 11 Φανερὸν οὖν, καὶ ἐν τούτῳ τῷ σχήματι πότε καὶ πῶς ἔσται συλλογισμός· καὶ πότε τοῦ ἐνδέχεσθαι, καὶ πότε τοῦ ὑπάρχειν. 12 Δῆλον δὲ καὶ, ὅτι πάντες ἀτελεῖς, καὶ ὅτι τελειοῦνται διὰ τοῦ πρώτου σχήματος.

A necesſariò non ineſſe, ac β a omni contingere. conuersâ igitur *propoſitione* β γ affirmatiuâ, erit prima figura, & neceſſaria *erit* propoſitio priuatiua. cùm autem ita propoſitiones habent, concludebatur tum contingere vt γ a cuidam γ non inſit, tum non ineſſe. quare neceſſe etiam *eſt*, vt γ a alicui β non inſit. 6 Cùm autem priuatiuum iunctum eſt minori extremo, ſi *id ſit* contingens, erit ſyllogiſmus conuerſa propoſitione, quemadmodum in ſuperioribus. 7 Si verò *ſit* neceſſarium, non erit *ſyllogiſmus*: quia & neceſſe *eſt* omni ineſſe; & nulli contingit ineſſe. Termini *concluſionis* omni ineſſe, *ſint hi*, ſomnus, equus dormiens, homo: *concluſionis* nulli *ineſſe* ſomnus, equus vigilans, homo. 8 Si-
B militer quoque *res* habebit, ſi alter terminus vniuerſaliter, alter in parte *iungatur* medio. cùm enim ambo ſunt attributiui: colligetur contingere: non, ineſſe. item cùm alterum *interuallum* acceptum erit priuatiuum, alterū affirmatiuum, ita vt affirmatiuum *ſit* neceſſarium. cùm autem priuatiuum *eſt* neceſſarium, etiam concludetur non ineſſe. idem enim erit demonſtrandi modus, ſiue termini ſint vniuerſales, ſiue non vniuerſales. neceſſe *eſt* enim hos ſyllogiſmos perfici per primam figuram. proinde vt in illis, ſic in his neceſſe *eſt* euenire. 9 Cùm autē priuatiuum vniuerſaliter acceptum iungitur minori extremo, ſi quidem contingens, erit ſyllogiſmus per conuerſionem. 10 Si verò
C neceſſarium, non erit *ſyllogiſmus*. *id*que demonſtrabitur eodem modo, quo in vniuerſalibus, & per eoſdem terminos. 11 Perſpicuum igitur *eſt*, etiam in hac figura quando & quomodo erit ſyllogiſmus: & quando *colligatur* contingere, quando ineſſe. 12 Conſtat etiam omnes *ſyllogiſmos* eſſe imperfectos, & perfici per primam figuram.

Omnem ſyllogiſmum exſtrui in aliqua ex tribus figuris, & perfici per primam figuram, & reduci ad modum vniuerſalem primæ figuræ.

Cap. XXIII.

1 ¶ Tranſitio. 2 ¶ Protheoria. Diuiſio ſyllogiſmorum. 3 Ordo eorum quæ dicenda ſunt. 4 ¶ De ſyllogiſmis oſtenſiuis. Opus eſſe vt ſumatur propoſitio 5 diuerſa à concluſione. 6 Non ſufficere vnam propoſitionem, ſed duabus opus eſſe. 7 In propoſitionibus medium terminum eſſe debere, qui coniungatur cum vtroque extremo. 8 Hanc coniunctionem fieri tribus modis, vnde oriuntur tres figuræ. 9 Eandem eſſe rationem ſyllogiſmorum compoſitorum. 10 Epilogus. 11 ¶ De ſyllogiſmis ducentibus ad impoſſibile. 12 ¶ De reliquis ſyllogiſmis hypotheticis. 13 ¶ Concluſio.

CAP. XXII. Ὅτι μὲν οὖν οἱ ἐν τούτοις τοῖς σχήμασι συλλογισμοὶ, τελειοῦνται διὰ τῶν ἐν τῷ πρώτῳ σχήματι καθόλου συλλογισμῶν, καὶ εἰς τούτους ἀνάγονται, δῆλον ἐκ τῶν εἰρημένων. ὅτι δὲ ἁπλῶς πᾶς συλλογισμὸς οὕτως ἕξει, νῦν ἔσται φανερὸν, ὅταν δειχθῇ πᾶς γινόμενος διὰ τούτων τινὸς τῶν σχημάτων. 2 Ἀνάγκη δὴ, πᾶσαν ἀπόδειξιν καὶ πάντα συλλογισμὸν, ἢ ὑπάρχον τι, ἢ μὴ ὑπάρχον δεικνύναι· καὶ τοῦτο, ἢ καθόλου, ἢ κατὰ μέρος, ἢ ἐξ ὑποθέσεως. τοῦ δὲ ἐξ ὑποθέσεως, μέρος, τὸ διὰ τοῦ ἀδυνάτου. 3 Πρῶτον οὖν εἴπωμεν περὶ τῶν δεικτικῶν· τούτων γὰρ δειχθέντων, φανερὸν ἔσται καὶ ἐπὶ τῶν εἰς τὸ ἀδύνατον, καὶ ὅλως ἐπὶ τῶν ἐξ ὑποθέσεως. 4 Εἰ δὴ δέοι τὸ α κατὰ τοῦ β συλλογίσασθαι, * ἢ ὑπάρχον, ἢ μὴ ὑπάρχον, ἀνάγκη λαβεῖν τι κατά τινος. 5 Εἰ μὲν οὖν τὸ α κατὰ τοῦ β ληφθείη, τὸ ἐξ ἀρχῆς ἔσται εἰλημμένον. 6 Εἰ δὲ κατὰ τοῦ γ, τὸ δὲ

*ἢ ὡς ὑπάρχον.

D Ex dictis, ſyllogiſmos qui in his figuris *ſunt*, per ſyllogiſmos vniuerſales primæ figuræ perfici, & ad hos reduci conſtat: ſimpliciter autem eandem eſſe rationem omnium ſyllogiſmorum, nunc erit perſpicuum, cùm omnem ſyllogiſmum in aliqua ex his figuris confici, oſtenſum fuerit. 2 Neceſſe igitur *eſt*, omnem demonſtrationem & omnem ſyllogiſmum oſtendere vel quidpiam ineſſe, vel non ineſſe: idque aut vniuerſaliter, aut in parte: præterea aut oſtenſiuè, aut ex hypotheſi. eius autem qui *fit* ex hypotheſi, pars eſt qui *fit* per impoſſibile. 3 Primùm igitur dicamus de *ſyllogiſmis* oſtenſiuis: de quibus cùm hoc explicatum fuerit, perſpicuum erit etiam in *ſyllogiſmis ducentibus* ad impoſſibile, & omnino in hypotheticis. 4 Si igitur oporteat ſyllogiſmo colligere a de β, *id eſt*, ineſſe, aut non ineſſe: neceſſe *eſt* ſumpſiſſe aliquid de aliquo. 5 Ergo ſi ſumptum fuerit a de β: id ſumptum erit, quod ab initio *propoſitum fuerat vt probaretur*. 6 Si verò *ſumptum ſit* de γ: verùm nec

γ de vllo alio, nec aliud de eo, nec de α aliud: nullus erit ſyllogiſmus: quoniam ex eo quòd vnum de vno acceptum ſit: nihil colligitur neceſſariò. itaque aſſumenda eſt altera propoſitio. 7 Si igitur ſumptum ſit α de alio, vel aliud de α, vel aliud de γ: eſſe quidem ſyllogiſmum, nihil vetat: ſed ex iis quæ ſumpta ſunt, non pertinebit ad β. Neque tum erit ſyllogiſmus τῶ α *relati* ad β, cùm τῶ γ *attribuetur* alij, idque alij, & hoc *aliud* alij, ſi *nullum horum* coniungatur cum β. Omnino enim diximus, nullum vnquàm fore ſyllogiſmum alterius de altero, niſi ſumptum ſit aliquod medium, quod ad vtrunque *extremum* attributione quadam referatur. Nam ſyllogiſmus ſimpliciter ex propoſitionibus conſtat. ſyllogiſmus autem *qui* ad hoc *pertinet*, *conficitur* ex propoſitionibus ad hoc *pertinentibus*. at ſyllogiſmus huius ad illud *relati*, *exſtruitur* ex propoſitionibus, *in quibus* hoc ad illud *refertur*. fieri autem nequit, vt accipiatur propoſitio *pertinens* ad β, ſi nec attribuatur ei quidpiam, nec negetur: aut rurſus *vt accipiatur propoſitio* τῶ α de β, ſi nihil cōmune ſumatur, ſed vtrique propria quædam attribuantur, vel negentur. Quare ſumendum *eſt* aliquod amborum medium, quod attributiones cōiunget: ſi quidem erit ſyllogiſmus huius ad hoc *relati*. 8 Si igitur neceſſe *eſt* aliquid ſumpſiſſe ambobus commune: atque hoc trifariam accidit: vel enim τῶ α τῶ γ, & β τῶ β attribuimus, vel τῶ γ de ambobus vel ambo de γ: hæ verò ſunt figuræ illæ quas diximus: certè patet neceſſe *eſſe* vt omnis ſyllogiſmus fiat per aliquam ex his figuris. 9 Eadem namque ratio *eſt*, & ſi per plura *media* coniungatur cum β. nam in multis quoque *mediis* eadem erit figura, *quæ in vno*. 10 Omnes igitur oſtenſiuos *ſyllogiſmos* perfici per ſuprà dictas figuras, perſpicuum *eſt*. 11 *Per eaſdem* verò *perfici* etiam eos qui *ducunt* ad impoſſibile, ex his manifeſtum erit. Nam quicumque per impoſſibile concludunt: falſum colligunt: ſed quod ab initio *propoſitum fuit*, ex hypotheſi oſtēdunt, cùm impoſſibile quidpiam accidit poſita contradictione. verbi gratiâ, *probant* non eſſe communem menſuram dimetiendi *& lateri*: quia poſitâ communi menſurâ, fit vt imparia paribus ſint æqualia. ergo imparia fieri paribus æqualia, ſyllogiſmo colligunt: dimetientem verò non habere communem menſuram, ex hypotheſi oſtendunt: quia falſum *quidpiam* euenit ex contradictione. hoc enim eſt ratiocinari per impoſſibile, oſtendere aliquid impoſſibile per hypotheſim ab initio *conceſſam*. Quocirca cum iis *ratiocinationibus*, quæ ad impoſſibile ducunt, falſum probetur ſyllogiſmo oſtēſiuo: quod verò ab initio *propoſitum fuit*, ex hypotheſi probetur: cúmque antea dixerimus *ſyllogiſmos* oſtenſiuos perfici per has figuras: perſpicuum *eſt*, etiam ſyllogiſmos qui *fiunt* per impoſſibile, per eaſdem figuras *conficiendos* fore. 12 Itidémque fient omnes alij qui arguunt ex hypotheſi. in omnibus enim ſyllogiſmus quidem fit de eo quod tranſſumptum eſt: ſed quod ab initio *propoſitum fuit*, probatur per confeſſionem, aut aliquam aliam hypotheſim. 13 Quod ſi verum *eſt*: neceſſe *eſt* omnem demonſtrationem & omnem ſyllogiſmũ fieri per tres ſuprà dictas figuras. cúmque hoc ſit probatũ: conſtat omnem ſyllogiſmum perfici per primam figuram, & reduci ad ſyllogiſmos vniuerſales eius figuræ.

A γ κατὰ μηδενός, μηδὲ ἄλλο κατ᾽ ἐκείνου, μηδὲ κατὰ τοῦ α ἕτερον· οὐδεὶς ἔσται συλλογισμός· τὸ γὰρ ἓν καθ᾽ ἑνὸς λαμβάνεσθαι, οὐδὲν συμβαίνει ἐξ ἀνάγκης. ὥστε προσληπτέον καὶ ἑτέραν πρότασιν. 7 Ἐὰν μὲν οὖν ληφθῇ τὸ α κατ᾽ ἄλλου, ἢ ἄλλο κατὰ τοῦ α, ἢ κατὰ τοῦ γ ἕτερον εἶναι μὲν συλλογισμόν, οὐδὲν κωλύει· πρὸς μέντοι τὸ β οὐκ ἔσται διὰ τῶν εἰλημμένων. Οὐδ᾽ ὅταν τὸ γ ἑτέρῳ, κἀκεῖνο ἄλλῳ, καὶ τοῦτο ἑτέρῳ, μὴ συνάπτῃ δὲ πρὸς τὸ β, οὐδ᾽ οὕτως ἔσται πρὸς τὸ β συλλογισμὸς τοῦ α. Ὅλως γὰρ εἴπομεν, ὅτι οὐδεὶς οὐδέποτε ἔσται συλλογισμὸς ἄλλου κατ᾽ ἄλλου, μὴ ληφθέντος τινὸς μέσου, B ὃ πρὸς ἑκάτερον ἔχει πως ταῖς κατηγορίαις· ὁ μὲν γὰρ συλλογισμὸς ἁπλῶς ἐκ προτάσεών ἐστιν· ὁ δὲ πρὸς τόδε συλλογισμός, ἐκ τῶν πρὸς τόδε προτάσεων. ὁ δὲ τοῦδε πρὸς τόδε, διὰ τῶν τοῦδε πρὸς τόδε προτάσεων. ἀδύνατον δέ, πρὸς τὸ β λαβεῖν πρότασιν, μηδὲν μήτε κατηγοροῦντας αὐτοῦ, μήτε ἀπαρνουμένους· ἢ πάλιν, τοῦ α πρὸς τὸ β, μηδὲν κοινὸν λαμβάνοντας, ἀλλ᾽ ἑκατέρου ἴδια ἄττα κατηγοροῦντας, ἢ ἀπαρνουμένους. ὥστε ληπτέον τι μέσον ἀμφοῖν, ὃ συνάψει τὰς κατηγορίας, εἴπερ ἔσται τοῦδε πρὸς τόδε συλλογισμός. 8 Εἰ οὖν ἀνάγκη μέν τι λαβεῖν πρὸς ἄμφω κοινόν. τοῦτο δὲ ἐνδέχεται τριχῶς· ἢ γὰρ τὸ α τοῦ γ, καὶ τὸ γ τοῦ β κατηγορήσαντας, ἢ τὸ γ κατ᾽ ἀμφοῖν, ἢ ἄμφω κατὰ τοῦ γ· ταῦτα δ᾽ ἐστὶ τὰ εἰρημένα C σχήματα· φανερὸν οὖν ὅτι πάντα συλλογισμὸν ἀνάγκη γίνεσθαι διὰ τούτων τινὸς τῶν σχημάτων. 9 Ὁ γὰρ αὐτὸς λόγος, καὶ εἰ διὰ πλειόνων συνάπτοι πρὸς τὸ β· τὸ αὐτὸ γὰρ ἔσται σχῆμα καὶ ἐπὶ τῶν πολλῶν. 10 Ὅτι μὲν οὖν οἱ δεικτικοὶ πάντες περαίνονται διὰ τῶν προειρημένων σχημάτων, φανερόν. 11 Ὅτι δὲ καὶ οἱ εἰς τὸ ἀδύνατον, δῆλον ἔσται διὰ τούτων. πάντες γὰρ οἱ διὰ τοῦ ἀδυνάτου περαίνοντες, τὸ μὲν ψεῦδος συλλογίζονται· τὸ δ᾽ ἐξ ἀρχῆς, ἐξ ὑποθέσεως δεικνύουσιν, ὅταν ἀδύνατόν τι συμβαίνῃ τῆς ἀντιφάσεως τεθείσης· οἷον, ὅτι ἀσύμμετρος ἡ διάμετρος, διὰ τὸ γίνεσθαι τὰ D περιττὰ ἴσα τοῖς ἀρτίοις συμμέτρου τεθείσης. τὸ μὲν οὖν ἴσα γίνεσθαι τὰ περιττὰ τοῖς ἀρτίοις, * συλλογίζονται· τὸ δ᾽ ἀσύμμετρον εἶναι τὴν διάμετρον, ἐξ ὑποθέσεως δεικνύουσιν, ἐπεὶ ψεῦδος συμβαίνει διὰ τὴν ἀντίφασιν. τοῦτο γὰρ ἦν τὸ διὰ τοῦ ἀδυνάτου συλλογίσασθαι, τὸ δεῖξαί τι ἀδύνατον διὰ τὴν ἐξ ἀρχῆς ὑπόθεσιν. ὥστε ἐπεὶ τοῦ ψεύδους γίνεται συλλογισμὸς δεικτικὸς ἐν τοῖς εἰς τὸ ἀδύνατον ἀπαγομένοις· τὸ δ᾽ ἐξ ἀρχῆς, ἐξ ὑποθέσεως δείκνυται· τοὺς δὲ δεικτικοὺς πρότερον εἴπομεν, ὅτι διὰ τούτων περαίνονται τῶν σχημάτων· φανερὸν οὖν, ὅτι καὶ οἱ διὰ τοῦ ἀδυνάτου συλλογισμοί, διὰ τούτων ἔσονται τῶν σχημάτων. 12 Ὡσαύτως δὲ καὶ οἱ ἄλλοι πάντες οἱ ἐξ ὑποθέσεως· ἐν ἅπασι γὰρ ὁ μὲν συλ- E λογισμὸς γίνεται πρὸς τὸ μεταλαμβανόμενον· τὸ δ᾽ ἐξ ἀρχῆς, περαίνεται δι᾽ ὁμολογίας, ἤ τινος ἄλλης ὑποθέσεως. 13 Εἰ δὲ τοῦτ᾽ ἀληθές, πᾶσαν ἀπόδειξιν καὶ πάντα συλλογισμὸν ἀνάγκη γίνεσθαι διὰ * τριῶν τῶν προειρημένων σχημάτων. τούτου δὲ δειχθέντος, δῆλον ὡς ἅπας τε συλλογισμὸς ἐπιτελεῖται διὰ τοῦ πρώτου σχήματος, καὶ ἀνάγεται εἰς τοὺς ἐν τούτῳ καθόλου συλλογισμούς.

* γρ. συνάγεται.

* γρ. διὰ τῶν πρώτων τῶν εἰρημ. σχημ.

De qualitate, & quantitate terminorum ſyllogiſmi. Cap. XXIV.

1 ¶ In omni ſyllogiſmo reperiri aliquid affirmatiuum, & aliquid vniuerſale. 2 ¶ Collatio propoſitionum & concluſionis: quatenus ſimiles, vel diſſimiles ſunt. De vniuerſali, & particulari. 3 De affirmatione, & negatione: & de modis. 4 ¶ Epilogus.

Cap. xxiv. * χ. ἅπαντι.

Ἔτι δὲ, ἐν *ἅπασι δεῖ κατηγορικόν τινα τῶν ὅρων εἶναι, καὶ A τὸ καθόλου ὑπάρχειν· ἄνευ γὰρ τοῦ καθόλου, ἢ οὐκ ἔσται συλλογισμός, ἢ οὐ πρὸς τὸ προκείμενον, ἢ τὸ ἐξ ἀρχῆς αἰτήσεται. κείσθω γὰρ, τὴν μουσικὴν ἡδονὴν εἶναι σπουδαίαν, εἰ μὲν οὖν ἀξιώσειεν ἡδονὴν εἶναι σπουδαίαν, μὴ προσθεὶς τὸ πᾶσαν· οὐκ ἔσται συλλογισμός. εἰ δὲ τινὰ ἡδονήν· εἰ μὲν ἄλλην, οὐδὲν πρὸς τὸ προκείμενον· εἰ δ' αὐτὴν ταύτην, τὸ ἐξ ἀρχῆς λαμβάνει. μᾶλλον δὲ γίνεται φανερὸν ἐν τοῖς διαγράμμασιν· οἷον, ὅτι τοῦ ἰσοσκελοῦς, ἴσαι αἱ πρὸς τῇ βάσει. ἔστωσαν εἰς τὸ κέντρον ἠγμέναι αἱ α β. Εἰ οὖν ἴσην λαμβάνει τὴν α γ γωνίαν τῇ β δ, μὴ ὅλως ἀξιώσας γωνίας τὰς τῶν ἡμικυκλίων· καὶ πάλιν τὴν γ τῇ δ, μὴ πᾶσαν προσλαβὼν B τὴν τοῦ τμήματος· ἔτι δ', ἀπ' ἴσων οὐσῶν τῶν ὅλων γωνιῶν, καὶ ἴσων ἀφῃρημένων, ἴσας εἶναι τὰς λοιπὰς τὰς ε ζ· τὸ ἐξ ἀρχῆς αἰτήσεται· ἐὰν μὴ λάβῃ, ἀπὸ τῶν ἴσων ἴσα ἀφαιρουμένων, ἴσα λείπεσθαι. Φανερὸν οὖν ὅτι ἐν *ἅπασι δεῖ τὸ καθόλου ὑπάρχειν. 2 Καὶ ὅτι τὸ μὲν καθόλου, ἐξ ἁπάντων τῶν ὅρων καθόλου δείκνυται· τὸ δ' ἐν μέρει, καὶ οὕτως, κἀκείνως. ὥστε ἐὰν μὲν ᾖ τὸ συμπέρασμα, καθόλου, καὶ τοὺς ὅρους ἀνάγκη καθόλου εἶναι. ἐὰν δὲ οἱ ὅροι, καθόλου, ἐνδέχεται τὸ συμπέρασμα μὴ εἶναι καθόλου. 3 Δῆλον δὲ, καὶ ὅτι ἐν ἅπαντι συλλογισμῷ, ἢ ἀμφοτέρας, ἢ τὴν ἑτέραν πρότασιν, ὁμοίαν ἀνάγκη γίνεσθαι τῷ συμπεράσματι. λέγω δ', οὐ μόνον τῷ C καταφατικὴν εἶναι, ἢ στερητικήν· ἀλλὰ καὶ τῷ ἀναγκαίαν, ἢ ὑπάρχουσαν, ἢ ἐνδεχομένην. ἐπισκέψασθαι δὲ δεῖ καὶ τὰς ἄλλας κατηγορίας. 4 Φανερὸν δὲ καὶ ἁπλῶς πότε ἔσται, καὶ πότε οὐκ ἔσται συλλογισμός· καὶ πότε δυνατὸς, καὶ πότε τέλειος· καὶ ὅτι συλλογισμοῦ ὄντος, ἀναγκαῖον ἔχειν τοὺς ὅρους κατά τινα τῶν εἰρημένων τρόπων.

* χ. ἅπαντι.

A Iam verò in omnibus *ſyllogiſmis* oportet eſſe aliquem terminum attributiuum, & *aliquem* vniuerſalem: quia ſine vniuerſali vel non erit ſyllogiſmus, vel non *pertinebit* ad rem propoſitam, vel petetur quod ab initio *quæſitum eſt*. Ponatur enim *eſſe demonſtrandum*, muſicam voluptatem eſſe honeſtam. ſi *quis* igitur *ſibi* concedi poſtulet voluptatem eſſe honeſtam, non adiiciens Omnem: non erit ſyllogiſmus. ſin autem quandam voluptatem *eſſe honeſtam*: ſi quidem aliam, nihil *pertinebit* ad rem propoſitã. ſi verò hanc ipſam, accipit *id* quod ab initio *quærebat*. *Hoc* magis perſpicuum fit in deſcriptionibus *mathematicis*. verbi gratiâ *probandum ſit angulos* æquicruris *qui ſunt* iuxta baſim, *eſſe* æqua- B les. ſint ad centrum ductæ *lineæ* α β. Si igitur accipiat angulum α γ *eſſe* æqualem angulo β δ, non omnino poſtulans angulos ſemicirculorum *eſſe æquales*, rurſuſque *accipiat angulum* γ *eſſe æqualem angulo* δ, non aſſumẽs *generaliter angulum* ſectionis *eſſe æqualem alteri angulo eiuſdem ſectionis*, præterea *accipiat*, demptis *partibus* æqualibus à totis angulis æqualibus, reliquos *angulos* ε ζ eſſe æquales: poſtulabit quod ab initio *quærendum propoſuit*, niſi accipiat, ab æqualibus ſi æqualia demantur, æqualia relinqui. Apparet igitur, opus eſſe vt in omnibus *ſyllogiſmis* ſit vniuerſale. 2 *Conſtat* etiam, vniuerſale probari ex omnibus terminis vniuerſalibus: particulare verò, tum hoc, tum illo modo. Quare ſi con- C cluſio ſit vniuerſalis, neceſſe *eſt* etiam terminos eſſe vniuerſales. ſi verò termini *ſint* vniuerſales, fieri poteſt vt concluſio non ſit vniuerſalis. 3 Manifeſtum quoque *eſt*, in omni ſyllogiſmo vel ambas vel alteram propoſitionem neceſſariò ſimilem eſſe concluſioni. *ſimilem* inquam, non ſolùm quòd ſit affirmatiua, aut priuatiua; ſed etiam quòd *ſit* neceſſaria, vel pura, vel contingens. conſiderare autem oportet alias quoque attribuendi rationes.

4 Quinetiam perſpicuum *eſt* ſimpliciter quando erit, & quando non erit ſyllogiſmus; & quando poſſibilis, & quando perfectus: & vbi ſyllogiſmus ſit, neceſſe *eſſe* vt termini aliquo ex dictis modis affecti ſint.

De numero terminorum, propoſitionum, & concluſionum. Cap. XXV.

1 ¶ De numero terminorum, Regula. 2 Exceptio prima, niſi probetur eadem concluſio per diuerſa media. 3 Exceptio ſecunda, niſi ſyllogiſmo principali adiungantur proſyllogiſmi. 4 Exceptio tertia, niſi ſit ſyllogiſmus compoſitus. 5 Regulæ probatio. 6 ¶ De numero propoſitionum. 7 Corollarium. 8 ¶ Collatio terminorum, propoſitionum, & concluſionum, in ſyllogiſmo ſimplici, 9 vel compoſito.

Cap. xxv. * χ. διὰ τῶν γ.

Δῆλον δὲ καὶ ὅτι πᾶσα ἀπόδειξις ἔσται διὰ τριῶν ὅρων, D καὶ οὐ πλειόνων. 2 Ἐὰν μὴ δι' ἄλλων καὶ ἄλλων τὸ αὐτὸ συμπέρασμα γίνηται· οἷον, τὸ ε, διά τε τῶν α β, καὶ διὰ τῶν γ δ, ἢ διὰ τῶν α β, καὶ α γ, *καὶ β γ· πλείω γὰρ μέσα τῶν αὐτῶν οὐδὲν εἶναι κωλύει. τούτων δὲ ὄντων, οὐχ εἷς, ἀλλὰ πλείους εἰσὶν οἱ συλλογισμοί. 3 Ἢ πάλιν, ὅταν ἑκάτερον τῶν α β διὰ συλλογισμοῦ ληφθῇ· οἷον, τὸ α, διὰ τῶν δ ε· καὶ πάλιν τὸ β διὰ τῶν ζ θ. Ἢ τὸ μὲν, ἐπαγωγῇ· τὸ δὲ, συλλογισμῷ. Ἀλλὰ καὶ οὕτως πλείους οἱ συλλογισμοί· πλείω γὰρ τὰ συμπεράσματά ἐστιν. οἷον, τό, τε α καὶ τὸ β, καὶ τὸ γ. 4 Εἰ δὲ μὴ πλείους, ἀλλ' εἷς· οὕτως μὲν ἐνδέχεται γίνεσθαι διὰ

D Manifeſtum quoque *eſt*, omnem demonſtrationem fore per tres terminos, nec plures. 2 Niſi per alia atque alia *argumenta* efficiatur eadem concluſio: vt τὸ ε per α β, & per γ δ: vel per α β, & α γ, & β γ. nam plura eſſe media earundem *concluſionum*, nihil vetat. Cùm autem hæc ſunt *multa*, non vnus ſed multi ſunt ſyllogiſmi. 3 Rurſus *demonſtratio non eſt per tres, ſed per plures terminos*, cùm vtrumque *propoſitum*, id eſt & τὸ α & τὸ β, per ſyllogiſmum accipitur: veluti τὸ α, per δ ε, ac τὸ β per ζ θ. Vel alterũ inductione, alterum ſyllogiſmo. Verũ ſic quoque *ſunt* plures ſyllogiſmi: quia ſunt plures concluſiones: veluti τὸ α, & τὸ β, & τὸ γ. 4 Quòd ſi nõ plures, ſed vnus *ſit ſyllogiſmus*: ſic quidẽ

per plura effici poteſt eadem concluſio. 5 Vt autem γ probatur per α ϐ, impoſſibile *eſt eſſe plures quã tres terminos*. Sit enim *concluſio* ε, quæ colligatur ex α ϐ γ δ. ergo neceſſe *eſt* horum aliquid ſumi tamquàm totum, aliud tanquàm partem. hoc enim antea demonſtratum fuit, cùm eſt ſyllogiſmus, neceſſe *eſſe* vt quidam termini ita ſint affecti. Ergo ſic affectum ſit α ad ϐ. eſt igitur aliqua ex his cõcluſio, quæ aut eſt ε, aut γ, aut δ, aut alia quæpiam ab his *diuerſa*. Et ſi quidem ε *concludatur*: ex ſolis α ϐ erit ſyllogiſmus. γ autem & δ ſi ita *ſe* habent, vt alterum habeat rationem totius, alterum partis: colligetur ex eis aliquid, nempe aut ε, aut alterum ex α ϐ, aut aliud quidpiam ab his *diuerſum*: ſi *colligatur* ε, alterúmve ex α ϐ: aut plures erunt ſyllogiſmi: aut eo modo quo fieri poſſe diximus, idẽ per multos terminos concludi accidit. ſi aliud quidpiam ab his *diuerſum colligitur* plures erunt atque à ſe inuicem diſcreti ſyllogiſmi. ſi verò γ non ſit ita affectum ad δ, vt ſyllogiſmum efficiant, fruſtrà ſumpta erunt: niſi inductionis, aut occultationis, aut eiuſmodi alius rei causâ *ſumpta fuerint*. Quòd ſi ex α ϐ nõ colligatur cõcluſio ε, ſed alia quæpiam: ex γ δ verò *colligatur* vel horũ alterum, vel aliud ab his *diuerſum*: ſyllogiſmi plures fiunt, nec de re propoſita: ſupponebatur enim eſſe ſyllogiſmum τοῦ ε. ſi verò nõ colligitur ex γ δ aliqua concluſio: accidit vt fruſtrà ſumantur, & ſyllogiſmus non ſit eius quod ab initio *quæſitum fuit*. Quare perſpicuum *eſt*, omnẽ demonſtrationem & omnem ſyllogiſmum cõſtare ex tribus terminis ſolis. 6 Cùm autẽ hoc perſpicuum ſit: planum *eſt* etiam, *ſyllogiſmum conſtare* ex duabus propoſitionibus, non pluribus. nam tres termini *ſunt* duæ propoſitiones, niſi quid aſſumatur, vt initio dictum eſt, ad perficiendos ſyllogiſmos. 7 Perſpicuum igitur *eſt*, in qua oratione ſyllogiſtica pares non ſunt propoſitiones ex quibus efficitur cõcluſio principalis, (quaſdam enim ex ſuperioribus concluſionibus neceſſe *eſt* eſſe propoſitiones) hãc orationem aut nihil colligere, aut plura interrogare *quàm quæ* ad theſim *neceſſaria ſint*. 8 Itaque ſi ſecũdum principales propoſitiones ſyllogiſmi accipiantur: omnis ſyllogiſmus ex propoſitionibus paribus, terminis verò imparibus conſtabit. vno enim plures *ſunt* termini, quàm propoſitiones. cõcluſiones autem erunt dimidia pars propoſitionũ. 9 Cùm autem per proſyllogiſmos concluditur, vel per plura media continua: (vt α ϐ per γ *& per* δ) multitudo terminorum itidem vno ſuperabit propoſitiones: aut enim extrà, aut in medio terminus inſeretur: vtroque autem modo fit, vt vno pauciora ſint interualla quã termini. Propoſitiones verò æquales *ſunt* interuallis. nõ tamen hæ ſemper erũt pares: illi, impares. ſed vicibus commutatis, cùm propoſitiones pares *fuerint*, termini *erunt* impares: & cùm termini pares, propoſitiones impares. nam vnà cum termino vna propoſitio adiicitur, vndecũque terminus adiiciatur. quocirca cùm propoſitiones eſſent pares, termini impares: neceſſe *eſt rationem* cõmutari factâ vtriſque eadem acceſſione. Cõcluſiones verò non habent amplius eãdem rationem, nec ad terminos, nec ad propoſitiones. vno enim termino adiecto concluſiones adiiciuntur vnâ pauciores terminis antea poſitis: quia duntaxat ad vltimum terminum non fit concluſio, ad reliquos verò omnes *fit*. Vt ſi τῷ α ϐ γ adiiciatur τὸ δ, ſtatim adiiciuntur duæ concluſiones, altera ad α, altera ad ϐ. Similiter *fit* & in aliis. Et ſi medio *loco*

A πλειόνων τὸ αὐτὸ συμπέρασμα. 5 Ὡς δὲ τὸ γ διὰ τῶν α β ἀδύνατον. ἔστω γὰρ τὸ ε συμπεραινόμενον ἐκ τῶν α β γ δ. οὐκοῦν ἀνάγκη τι αὐτῶν ἄλλο πρὸς ἄλλο εἰλῆφθαι, τὸ μὲν, ὡς ὅλον, τὸ δ᾽, ὡς μέρος. τοῦτο γὰρ δέδεικται πρότερον, ὅτι ὄντος συλλογισμοῦ, ἀναγκαῖον οὕτως τινὰς ἔχειν τῶν ὅρων. ἐχέτω οὖν τὸ α οὕτως πρὸς τὸ β. ἔστιν ἄρα τι ἐξ αὐτῶν συμπέρασμα. οὐκοῦν ἤτοι τὸ ε, ἢ τῶν γ δ θάτερον, ἢ ἄλλο τι παρὰ ταῦτα. καὶ εἰ μὲν τὸ ε ἐκ τῶν α β * μόνων ἂν εἴη ὁ συλλογισμός. τὰ δὲ γ δ εἰ μὲν ἔχει οὕτως, ὥστ᾽ εἶναι, τὸ μὲν, ὡς ὅλον, τὸ δ᾽, ὡς μέρος· ἔσται τι καὶ ἐξ ἐκείνων· καὶ ἤτοι τὸ ε, ἢ τῶν α β θάτερον, ἢ ἄλλο τι παρὰ ταῦτα. καὶ εἰ τὸ μὲν ε, ἢ B τῶν α β θάτερον· ἢ πλείους ἔσονται οἱ συλλογισμοὶ, ἢ, ὡς ἐνεδέχετο ταὐτὸ διὰ πλειόνων ὅρων περαίνεσθαι συμβαίνει. εἰ δ᾽ ἄλλο τι παρὰ ταῦτα· πλείους ἔσονται, καὶ ἀσύναπτοι οἱ συλλογισμοὶ πρὸς ἀλλήλους. εἰ δὲ μὴ οὕτως ἔχοι τὸ γ πρὸς τὸ δ, ὥστε ποιεῖν συλλογισμόν· μάτην ἔσται εἰλημμένα, εἰ μὴ ἐπαγωγῆς, ἢ κρύψεως, ἤ τινος ἄλλου τῶν τοιούτων χάριν. εἰ δὲ ἐκ τῶν α β μὴ τὸ ε, ἀλλ᾽ ἄλλο τι γίνεται συμπέρασμα· ἐκ δὲ τῶν γ δ ἢ τούτων θάτερον, ἢ ἄλλο παρὰ ταῦτα, πλείους τε οἱ συλλογισμοὶ γίνονται, καὶ οὐ τοῦ ὑποκειμένου· ὑπέκειτο γὰρ εἶναι τοῦ ε τὸν συλλογισμόν. εἰ δὲ μὴ γίνεται * ἐκ τῶν γ δ μηδὲν συμπέρασμα, μάτην τε αὐτὰ C εἰλῆφθαι συμβαίνει, καὶ μὴ τοῦ ἐξ ἀρχῆς εἶναι τὸν συλλογισμόν. ὥστε φανερὸν, ὅτι πᾶσα ἀπόδειξις καὶ πᾶς συλλογισμὸς ἔσται διὰ τριῶν ὅρων μόνον. 6 Τούτου δ᾽ ὄντος φανεροῦ, δῆλον ὡς καὶ ἐκ δύο προτάσεων καὶ οὐ πλειόνων· οἱ γὰρ τρεῖς ὅροι, δύο προτάσεις, εἰ μὴ προσλαμβάνοιτό τι, καθάπερ ἐν τοῖς ἐξ ἀρχῆς ἐλέχθη, πρὸς τὴν τελείωσιν τῶν συλλογισμῶν. 7 Φανερὸν οὖν, ὅτι ὡς ἐν ᾧ λόγῳ συλλογιστικῷ μὴ ἄρτιαί εἰσιν αἱ προτάσεις, δι᾽ ὧν γίνεται τὸ συμπέρασμα τὸ κύριον, (ἔνια γὰρ τῶν ἄνωθεν συμπερασμάτων ἀναγκαῖον εἶναι προτάσεις) οὗτος ὁ λόγος ἢ οὐ συλλελόγισται, ἢ πλείω τῶν ἀναγκαίων ἠρώτηκε πρὸς τὴν θέσιν. 8 Κα- D τὰ μὲν οὖν τὰς κυρίας προτάσεις λαμβανομένων τῶν συλλογισμῶν, ἅπας ἔσται συλλογισμὸς ἐκ προτάσεων μὲν ἀρτίων, ἐξ ὅρων δὲ περιττῶν· ἑνὶ γὰρ πλείους οἱ ὅροι, τῶν προτάσεων. ἔσται δὲ καὶ τὰ συμπεράσματα, ἡμίση τῶν προτάσεων. 9 Ὅταν δὲ διὰ προσυλλογισμῶν περαίνηται, ἢ διὰ πλειόνων μέσων συνεχῶν (οἷον τὸ α β διὰ τῶν γ δ) τὸ μὲν πλῆθος τῶν ὅρων ὡσαύτως ἑνὶ ὑπερέξει τὰς προτάσεις· ἢ γὰρ ἔξωθεν, ἢ εἰς τὸ μέσον τεθήσεται ὁ παρεμπίπτων ὅρος· ἀμφοτέρως δὲ συμβαίνει ἑνὶ ἐλάττω εἶναι τὰ διαστήματα, τῶν ὅρων· αἱ δὲ προτάσεις ἴσαι τοῖς διαστήμασιν· οὐ μέν τοι αἱ μὲν, ἀεὶ ἄρτιαι ἔσονται· οἱ δὲ, περιττοί· ἀλλ᾽ ἐναλλὰξ, ὅταν μὲν αἱ προ- E τάσεις ἄρτιαι, περιττοὶ οἱ ὅροι· ὅταν δ᾽ οἱ ὅροι ἄρτιοι, περιτταὶ αἱ προτάσεις. ἅμα γὰρ τῷ ὅρῳ μία προστίθεται πρότασις, ἂν ὁποθενοῦν προστεθῇ ὁ ὅρος. ὥστ᾽ ἐπεὶ αἱ μὲν, ἄρτιαι, οἱ δὲ, περιττοὶ ἦσαν· ἀνάγκη παραλλάττειν τῆς αὐτῆς προσθέσεως γινομένης. τὰ δὲ συμπεράσματα οὐκέτι τὴν αὐτὴν ἕξει τάξιν, οὔτε πρὸς τοὺς ὅρους, οὔτε πρὸς τὰς προτάσεις· ἑνὸς γὰρ ὅρου προστιθεμένου, συμπεράσματα προστεθήσεται ἑνὶ ἐλάττω τῶν προϋπαρχόντων ὅρων· πρὸς μόνον γὰρ τὸν ἔσχατον ὅρον οὐ ποιεῖ συμπέρασμα, πρὸς δὲ τοὺς ἄλλους πάντας. οἷον, εἰ τῷ α β γ πρόσκειται τὸ δ, εὐθὺς καὶ συμπεράσματα δύο πρόσκειται, τό, τε πρὸς τὸ α, καὶ τὸ πρὸς τὸ β. ὁμοίως δὲ κἀπὶ τῶν ἄλλων. Κἂν εἰς τὸ μέσον δὲ

* κ. μόνων

Alexander & Philoponus corruptum locum putant, leguntque ἐκ τῶν α β.

CAP. XXVI.

περιπέσῃ, τὸν αὐτὸν τρόπον· πρὸς ἕνα γὰρ μόνον οὐ ποιήσει A συλλογισμόν. ὥστε πολὺ πλείω τὰ συμπεράσματα καὶ τῶν ὅρων ἔσται, καὶ τῶν προτάσεων.

terminus inferatur, eadem erit ratio: quia ad vnum tantùm *terminum* non faciet ſyllogiſmum. quare multo plures erunt concluſiones terminis & propoſitionibus.

De problematis in quaque figura adſtruendis, vel euertendis. Cap. XXVI.

1 ¶ Quæ problemata faciliùs vel difficiliùs confirmentur aut refellantur. Faciliùs probari, quæ in pluribus figuris & modis probantur: difficiliùs, quæ in paucioribus. 2 Vniuerſalia probari in paucioribus, particularia in pluribus. ¶ Ideóque vniuerſalia difficiliùs confirmari, & faciliùs refelli, quàm particularia. contrà autem particularia difficiliùs confirmari, faciliùs euerti. 4 An vniuerſale & particulare ſe inuicem euertant, 5 vel confirment. 6 ¶ Quædam faciliùs refutari, quàm confirmari. 7 ¶ Epilogus primi tractatus.

CAP. XXVII. Ἐπεὶ δ' ἔχομεν περὶ ὧν οἱ συλλογισμοί, καὶ ποῖον ἐν B ἑκάστῳ σχήματι, καὶ ποσαχῶς δείκνυται· φανερὸν ἡμῖν ἐστι, καὶ ποῖον πρόβλημα χαλεπὸν, καὶ ποῖον εὐεπιχείρητον. τὸ μὲν γὰρ ἐν πλείοσι σχήμασι, καὶ διὰ πλειόνων πτώσεων περαινόμενον, ῥᾷον· τὸ δ' ἐν ἐλάττοσι, καὶ δι' ἐλαττόνων, δυσεπιχειρητότερον. 2 Τὸ μὲν οὖν καταφατικὸν τὸ καθόλου, διὰ τοῦ πρώτου σχήματος δείκνυται μόνου, καὶ διὰ τούτου μοναχῶς. τὸ δὲ στερητικὸν, διὰ τοῦ πρώτου, καὶ διὰ τοῦ μέσου· καὶ διὰ μὲν τοῦ πρώτου, μοναχῶς, διὰ δὲ τοῦ μέσου, διχῶς. τὸ δ' ἐν μέρει * καταφατικὸν, διὰ τοῦ πρώτου, καὶ διὰ τοῦ ἐσχάτου· μοναχῶς μὲν διὰ τοῦ πρώτου, τριχῶς δὲ διὰ τοῦ ἐσχάτου. τὸ δὲ στερητικὸν τὸ κατὰ μέρος, ἐν ἅπασι τοῖς σχήμασι δείκνυται· C πλὴν ἐν μὲν τῷ πρώτῳ, ἅπαξ· ἐν δὲ τῷ μέσῳ, καὶ τῷ ἐσχάτῳ· ἐν τῷ μὲν, διχῶς· ἐν τῷ δὲ, τριχῶς. 3 Φανερὸν οὖν, ὅτι τὸ καθόλου κατηγορικὸν κατασκευάσαι μὲν χαλεπώτατον, ἀνασκευάσαι δὲ * ῥᾷστον· ὅλως δ' ἐστὶν ἀναιροῦντι μὲν τὰ καθόλου τῶν ἐν μέρει ῥᾷον· καὶ γὰρ ἂν μηδενὶ, καὶ ἂν τινὶ μὴ ὑπάρχῃ, ἀνῄρηται· τούτων δὲ, τὸ μὲν τινὶ μὴ, ἐν ἅπασι τοῖς σχήμασι δείκνυται· τὸ δὲ μηδενὶ, ἐν τοῖς δυσί. τὸν αὐτὸν δὲ τρόπον κἀπὶ τῶν στερητικῶν· καὶ γὰρ εἰ παντὶ, καὶ εἴ τινι, ἀνῄρηται τὸ ἐξ ἀρχῆς· τοῦτο δ' ἦν ἐν δύο σχήμασιν. ἐπὶ δὲ τῶν ἐν μέρει, μοναχῶς, ἢ παντὶ, ἢ μηδενὶ δείξαντα ὑπάρχειν. κατασκευάζοντι δὲ ῥᾴω τὰ ἐν μέρει· καὶ γὰρ ἐν πλείοσι σχήμασι, καὶ D διὰ πλειόνων * τρόπων. 4 Ὅλως τε οὐ δεῖ λανθάνειν, ὅτι ἀνασκευάσαι μὲν δι' ἀλλήλων ἐστὶ καὶ τὰ καθόλου διὰ τῶν ἐν μέρει, καὶ ταῦτα διὰ τῶν καθόλου. κατασκευάσαι δ' οὐκ ἔστι διὰ τῶν κατὰ μέρος τὰ καθόλου, δι' ἐκείνων δὲ ταῦτα ἐστιν. 5 Ἅμα δὲ δῆλον, ὅτι καὶ τὸ ἀνασκευάζειν ἐστὶ τοῦ κατασκευάζειν ῥᾷον. 6 Πῶς μὲν οὖν γίνεται πᾶς συλλογισμὸς, καὶ διὰ πόσων ὅρων καὶ προτάσεων, καὶ πῶς ἐχουσῶν πρὸς ἀλλήλας· ἔτι δὲ, ποῖον πρόβλημα ἐν ἑκάστῳ σχήματι, καὶ ποῖον ἐν πλείοσι, καὶ ποῖον ἐν ἐλάττοσι δείκνυται, δῆλον ἐκ τῶν εἰρημένων.

* γρ. καταφατικῶν.
* γρ. ῥᾷον.
* γρ. πτώσεων.

QVia verò habemus de quibus ſyllogiſmi *extruuntur*, & qualia in quaque figura, quótque modis probantur: perſpicuum quoque nobis *eſt*, cuiuſmodi problema *ſit* difficile aut facile ad probandum. nam quod in pluribus figuris & per plures caſus concluditur, faciliùs *eſt*. quod verò in paucioribus *figuris* & per pauciores *caſus*, difficiliùs probari poteſt. 2 *Problema* igitur affirmatiuum vniuerſale per ſolam primam figuram probatur, vnóque per eam modo. Priuatiuum autem, per primam, & per mediam: & per primam quidē vno modo, per mediam verò duobus modis. Sed particulare affirmatiuum, per primam, & per vltimam: vno modo per primam, tribus modis per vltimam. Denique priuatiuum particulare in omnibus figuris probatur: ſed in prima vno modo: in ſecunda & tertia *pluribus modis, id eſt*, in illa duobus, in hac tribus. 3 Perſpicuum igitur *eſt*, vniuerſale attributiuū difficillimè adſtrui, facillimè euerti poſſe: & omnino ad euertendum faciliora eſſe vniuerſalia, quàm particularia: quia *vniuerſalia* tolluntur, ſiue nulli *inſit*, ſiue alicui non inſit: quorum hoc, *id eſt* alicui non *ineſſe*, in omnibus figuris probatur: illud, *id eſt*, nulli *ineſſe*, in duabus. Eadem eſt ratio priuatiuorum. ſiue enim omni, ſiue alicui *inſit*: tollitur quod ab initio *propoſitum fuit*. hoc verò erat in duabus figuris. In particularibus autem vno modo *fit refutatio: nempe ſi* vel omni, vel nulli probetur ineſſe. Ad confirmandum autem faciliora ſunt *problemata* particularia: quia & in pluribus figuris, & per plures modos *confirmantur, quàm vniuerſalia*. 4 Et omnino nō oportet latere, inuicem refelli vniuerſale per particularia, & hæc per vniuerſalia. Confirmare autem non licet vniuerſalia per particularia, ſed hæc per illa licet. 5 Item planum *eſt*, refutationem eſſe faciliorem confirmatione. 6 Quomodo igitur fiat omnis ſyllogiſmus, & per quot terminos, ac propoſitiones, & quomodo inter ſe affectas: prȩterea quale problema in quaque figura, & quale in pluribus, quale in paucioribus probetur, manifeſtum *eſt* ex his quæ dicta ſunt.

DE INVENTIONE.

TRACTATVS II.

De inuentione præcepta generalia Cap. XXVII.

1 ¶ Propoſitio. 2 ¶ Protheoria. Rerum diuiſio: 3 & diuiſionis confirmatio. 4 Quibus de rebus ſyllogiſmi ſiunt. 5 ¶ Regulæ ſeu præcepta de inuentione. Primum præceptum de ſumendis terminis problematis, & eorum definitionibus, proprietatibus, conſequentibus, antecedentibus, repugnantibus. 6 Secundum de diſtinguendis eſſentialibus, propriis, & accidentibus: item veris, & probabilibus. 7 Tertium, vt eligantur conſequentia vniuerſaliter. 8 Quartum, vt eligantur antecedentia, quibus res vniuerſaliter conſequens eſt. 9 Quintum de nota vniuerſali non iungenda conſequenti, ſed antecedenti. 10 Sextum de conſequentibus proximis accipiendis, non remotis. 11 Septimum de antecedentibus proximis ſumendis, non remotis. 12 Octauum de his quæ plerumque conſequuntur, aut antecedunt. 13 Nonum de his quæ omnibus conſequentia ſunt.

QVo autem modo ſyllogiſmorum copia nobis ſemper ſuppetet ad *quæſtionem* propoſitam, quáque via ſumemus principia ad quodque *problema* pertinentia, nunc dicendum *eſt*: quia fortaſſe non ſolùm oportet ſyllogiſmorum exſtructionem intelligere, ſed etiam *eorum* conficiendorum facultatem habere. 2 Eorum igitur omnium quæ ſunt, quædã ſunt eiuſmodi, vt nulli alij verè vniuerſaliter attribuantur: (vt Cleon, & Callias, & quod ſingulare eſt, quódque ſub ſenſum cadit) his autem alia *attribuantur*: (horũ enim vtrumque eſt & homo & animal) nonnulla aliis attribuuntur, ſed ipſis alia priùs non attribuuntur: reliqua *ſunt eiuſmodi vt* & ipſa aliis, & ipſis alia *attribuantur*; vt homo Calliæ *attribuitur*, & homini animal. 3 Conſtat igitur quaſdam res ſuapte naturâ eſſe tales, quæ de nullo dicantur. nam eorum quæ ſub ſenſum cadunt, vnumquodque ferè eſt eiuſmodi vt nulli attribuatur niſi ex accidente. dicimus n. aliquando album illud eſſe Socratem: & quod accedit, *eſſe* Calliam. ſurſum quoque verſus procedendo ſiſti aliquãdo, iterum dicemus: nunc verò hoc poſitum *& conceſſum* eſto. 4 De his igitur non poſſumus demonſtrare aliud attributum, niſi ſecundum opinionem: ſed hæc de aliis. Nec ſingularia de aliis, ſed de his alia. Quæ verò *his intermedia ſunt*, cõſtat vtroque modo *ſub demonſtrationem cadere* poſſe: quoniam & ipſa de aliis, & alia de ipſis dicentur. ac ferè diſceptationes & conſiderationes de his maximè ſunt. 5 Oportet autem propoſitiones ad quamque rem *pertinentes* ita accipere: vt principio ſupponatur ipſa res *de qua agitur*, necnon definitiones, & quæcũque ſunt *eius* rei propria: deinde quę rei conſequentia ſunt, & ea quibus *ipſa* res conſequens eſt, & quæ non poſſunt illi ineſſe. quibus autem res *ineſſe* non poteſt, *ea* non *ſunt* ſumenda, quia *pronunciatum* priuatiuum conuertitur. 6 Diſtinguenda ſunt etiam conſequentia, *vt intelligatur* quænam in *quæſtione* quid eſt, & quæ vt propria, & quæ vt accidentia attribuantur: & horum quænam ſecundum opinionem, quæ re vera *tribuantur*. nam quò maior horum copia alicui ſuppetit, *eò* expeditiùs propoſitum concludet: & quò veriora fuerint, *eò* magis demonſtrabit. 7 Oportet autem eligere, non quæ alicui, ſed quæ vniuerſæ rei conſequentia ſunt. verbi gratiâ, non quod alicui homini, ſed quod omni homini cõſequens eſt: quoniã ex propoſitionibus vniuerſalibus ſyllogiſmus *conſtat*. cũ igitur propoſitio eſt indefinita, non conſtat an ſit vniuerſalis. cùm autem eſt definita, *id* apparet. 8 Similiter eligenda *ſunt ea*, quibus ipſa *res* vniuerſis conſequitur: *idque* ob dictã cauſam. 9 Ipſum verò conſequens non *eſt* ſumendum totum ſequi: verbi gratiâ, *non eſt ſumendum* homini *conſequens eſſe* omne animal, aut muſicæ omnem ſciẽtiam: ſed ſimpliciter conſequens eſſe dumtaxat: quemadmodum etiam proponimus: quoniam alterum & inutile *eſt*, & impoſſibile, vtputa omnem hominem eſſe omne animal, aut iuſtitiã *eſſe* omne bonum. Sed cui *aliud* conſequens eſt, ei adiicitur *nota* OMNI, *cùm dicitur ei omni aliquid conſequens eſſe*. 10 Cùm autem ab aliquo continetur ſubiectum, cui conſequentia oportet accipere: ea quidem, quæ vniuerſale ſequuntur, vel nõ ſequuntur, non ſunt in his eligenda: quia in illis ſumpta ſunt. quæcumque enim animal, *eadem* etiam hominem ſequuntur. eadem eſt ratio eorum quæ non inſunt. quæ verò cuiuſque rei propria ſunt, accipi debent: ſunt enim quædã ſpeciei propria, non cõmunia generi: quandoquidem neceſſe *eſt* ſpeciebus diuerſis propria quædam ineſſe.

A Πῶς δ' εὐπορήσομεν αὐτοὶ πρὸς τὸ τιθέμενον ἀεὶ συλλογισμῶν, καὶ διὰ ποίας ὁδοῦ ληψόμεθα τὰς περὶ ἕκαστον ἀρχάς, νῦν ἤδη λεκτέον· οὐ μόνον γὰρ ἴσως δεῖ θεωρεῖν τὴν γένεσιν τῶν συλλογισμῶν, ἀλλὰ καὶ τὴν δύναμιν ἔχειν τοῦ ποιεῖν. CAP. XXVIII. 2 Ἁπάντων δὴ τῶν ὄντων, τὰ μέν ἐστι τοιαῦτα, ὥστε κατὰ μηδενὸς ἄλλου κατηγορεῖσθαι ἀληθῶς καθόλου (οἷον Κλέων, καὶ Καλλίας, καὶ τὸ καθ' ἕκαστον, καὶ αἰσθητόν) κατὰ δὲ τούτων, ἄλλα (καὶ γὰρ ἄνθρωπος καὶ ζῷον, ἑκάτερος τούτων ἐστί.) τὰ δ', αὐτὰ μὲν κατ' ἄλλων κατηγορεῖται, κατὰ δὲ τούτων ἄλλα πρότερον οὐ κατηγορεῖται· τὰ δὲ καὶ αὐτὰ ἄλλων, καὶ αὐτῶν ἕτερα, οἷον ἄνθρωπος Καλλίου, καὶ ἀνθρώπου B ζῷον. 3 Ὅτι μὲν οὖν ἔνια τῶν ὄντων κατ' οὐδενὸς πέφυκε λέγεσθαι, δῆλον· τῶν γὰρ αἰσθητῶν σχεδὸν ἕκαστόν ἐστι τοιοῦτον, ὥστε μὴ κατηγορεῖσθαι κατὰ μηδενός, πλὴν ὡς κατὰ συμβεβηκός· φαμὲν γάρ ποτε τὸ λευκὸν ἐκεῖνο, Σωκράτην εἶναι· καὶ τὸ προσιόν, Καλλίαν. ὅτι δὲ καὶ ἐπὶ τὸ ἄνω πορευομένοις ἵσταταί ποτε, * πάλιν ἐροῦμεν· νῦν δ' ἔστω τοῦτο κείμενον. 4 Κατὰ μὲν οὖν τούτων οὐκ ἔστιν ἀποδεῖξαι κατηγορούμενον ἕτερον, πλὴν εἰ μὴ κατὰ δόξαν· ἀλλὰ ταῦτα κατ' ἄλλων. οὐδὲ τὰ καθ' ἕκαστα κατ' ἄλλων· ἀλλ' ἕτερα κατ' ἐκείνων. τὰ δὲ μεταξύ, δῆλον ὡς * ἀμφοτέρως ἐνδέχεται· καὶ γὰρ καὶ αὐτὰ κατ' ἄλλων, καὶ ἄλλα κατὰ τούτων λεχθήσεται. καὶ σχε-C δὸν οἱ λόγοι καὶ αἱ σκέψεις εἰσὶ μάλιστα περὶ τούτων. 5 Δεῖ δὲ τὰς προτάσεις περὶ ἕκαστον, οὕτως ἐκλαμβάνειν * ὑποθέμενον αὐτὸ πρῶτον, καὶ τοὺς ὁρισμούς τε, καὶ ὅσα ἴδια τοῦ πράγματός ἐστιν· εἶτα μετὰ τοῦτο, ὅσα ἕπεται τῷ πράγματι, καὶ πάλιν οἷς τὸ πρᾶγμα ἀκολουθεῖ, καὶ ὅσα μὴ ἐνδέχεται αὐτῷ ὑπάρχειν. οἷς δ' αὐτὸ μὴ ἐνδέχεται, οὐκ ἐκληπτέον, διὰ τὸ ἀντιστρέφειν τὸ στερητικόν. 6 Διαιρετέον δὲ καὶ τῶν ἑπομένων, ὅσα τε ἐν τῷ τί ἐστι, καὶ ὅσα ὡς ἴδια, καὶ ὅσα ὡς συμβεβηκότα κατηγορεῖται· καὶ τούτων ποῖα δοξαστικῶς, καὶ ποῖα κατ' ἀλήθειαν. ὅσῳ μὲν γὰρ ἂν πλειόνων τοιούτων εὐπορῇ τις, θᾶττον ἐντεύξεται συμπεράσματι· ὅσῳ δ' ἂν D ἀληθεστέρων, μᾶλλον ἀποδείξει. 7 Δεῖ δ' ἐκλέγειν, μὴ τὰ τινὶ ἑπόμενα, ἀλλ' ὅσα ὅλῳ τῷ πράγματι ἕπεται· οἷον μὴ τί τινι ἀνθρώπῳ, ἀλλὰ τί παντὶ ἀνθρώπῳ ἕπεται· διὰ γὰρ τῶν καθόλου προτάσεων ὁ συλλογισμός. ἀδιορίστου μὲν οὖν ὄντος, ἄδηλον εἰ καθόλου ἡ πρότασις· διωρισμένου δ', φανερόν. 8 Ὁμοίως δ' ἐκλεκτέον καὶ οἷς αὐτὸ ἕπεται ὅλοις, διὰ τὴν εἰρημένην αἰτίαν. 9 Αὐτὸ δὲ τὸ ἑπόμενον οὐ ληπτέον ὅλον ἕπεσθαι· λέγω δ', οἷον ἀνθρώπῳ πᾶν ζῷον, ἢ μουσικῇ πᾶσαν ἐπιστήμην· ἀλλ' ἁπλῶς μόνον ἀκολουθεῖν, καθάπερ καὶ προτεινόμεθα· καὶ γὰρ ἄχρηστον θάτερον, καὶ ἀδύνατον, οἷον πάντα ἄνθρωπον εἶναι πᾶν ζῷον ἢ δικαιοσύνην, E ἅπαν ἀγαθόν. ἀλλ' ᾧ ἕπεται, ἐπ' ἐκείνου τὸ παντὶ λέγεται. 10 Ὅταν δ' ὑπό τινος περιέχηται τὸ ὑποκείμενον ᾧ τὰ ἑπόμενα δεῖ λαβεῖν, τὰ μὲν τῷ καθόλου ἑπόμενα, ἢ μὴ ἑπόμενα, οὐκ ἐκλεκτέον ἐν τούτοις· εἴληπται γὰρ ἐν ἐκείνοις. ὅσα γὰρ ζῴῳ, καὶ ἀνθρώπῳ ἕπεται· καὶ ὅσα μὴ ὑπάρχει, ὡσαύτως. τὰ δὲ περὶ ἕκαστον ἴδια ληπτέον· ἔστι γὰρ ἄττα τῷ εἴδει ἴδια παρὰ τὸ γένος· ἀνάγκη γὰρ τοῖς ἑτέροις εἴδεσιν ἴδια ἄττα ὑπάρχειν.

* Poſterior. lib. pr.

* γ. ἀμφότερα.

* γ. ὑποθέμενον.

11 Οὐδὲ δὴ τῷ καθόλου ἐκλεκτέον, οἷς ἕπεται τὸ περιεχόμενον, οἷον τῷ ζῴῳ, οἷς ἕπεται ἄνθρωπος. ἀνάγκη μὲν γάρ, εἰ ἀνθρώπῳ ἀκολουθεῖ τὸ ζῷον, καὶ τούτοις ἅπασιν ἀκολουθεῖν. οἰκειότερα δὲ ταῦτα τῆς τοῦ ἀνθρώπου ἐκλογῆς. 12 Ληπτέον δὲ καὶ τὰ ὡς ἐπὶ τὸ πολὺ ἑπόμενα, καὶ οἷς ἕπεται· τῶν γὰρ ὡς ἐπὶ τὸ πολὺ προβλημάτων, καὶ ὁ συλλογισμὸς ἐκ τῶν ὡς ἐπὶ τὸ πολὺ προτάσεων, ἢ πασῶν, ἢ τινῶν· ὅμοιον γὰρ ἑκάστου τὸ συμπέρασμα ταῖς ἀρχαῖς. 13 Ἔτι, τὰ πᾶσιν ἑπόμενα, οὐκ ἐκλεκτέον. οὐ γὰρ ἔσται συλλογισμὸς ἐξ αὐτῶν. δι' ἣν δὲ αἰτίαν, ἐν τοῖς ἑπομένοις ἔσται δῆλον.

A 11 Neque verò *quaſi* vniuerſalis *antecedentia*, eligenda *ſunt ea* quibus conſequens eſt quod *ſub eo* continetur. exempli cauſa, *non debent quaſi* animalis *antecedentia*, ſumi ea quibus homo eſt conſequens. nam ſi hominē ſequitur animal: hæc quoque omnia neceſſario ſequitur. ſed hæc ad hominis *antecedentium* delectum magis pertinent. 12 Sumenda *ſunt* etiam, quæ plerumque conſequuntur, aut antecedunt. nam problematum quæ plerumque *eueniunt*, etiam ſyllogiſmus *conſtat* ex propoſitionibus quarum aut omnes aut quædam plerumque *ſunt vera*. cuiuſuis enim *ſyllogiſmi* concluſio ſimilis *eſt* principiis. 13 Præterea quæ omnibus conſequentia ſunt, non debent eligi: quoniam ex eis non erit ſyllogiſmus. ob quam verò cauſam, in ſequentibus manifeſtum erit.

Specialia, & ſingulorum problematum propria præcepta. Cap. XXVIII.

1 *De inueniendo medio termino problematis vniuerſalis affirmantis*, 2 *aut particularis affirmantis*, 3 *aut vniuerſalis negantis*, 4 *aut particularis negantis*. 5 *Exſtructio typi*. 6 *Quæ concluſio colligatur ex coniugatione γ ζ*, 7 *vel γ η*, 8 *vel δ ζ*, 9 *vel β θ*, 10 *vel δ η*, 11 *vel ζ η*. 12 *Epilogus*. 13 *Reſpiciendum eſſe ad prima & maximè vniuerſalia*, 14 *Expoſitam rationem inueniendi medij termini, in tribus terminis ac duabus propoſitionibus poſitam eſſe*. 15 *Omnes ſyllogiſmos hac ratione inuentos, exſtrui in aliqua ex tribus illis figuris iam expoſitis*. 16 *De his quæ omnibus conſequentia ſunt*. 17 *De coniugationibus inutilibus, β ζ, γ θ, δ θ*. 18 *In hac inſpectione accipi debere eadem, non diuerſa, aut contraria. quod probatur primùm à natura medij termini*. 19 *deinde quia aliæ methodi ad hanc reducuntur*: 20 *vt repugnantia τῶν β ζ ad identitatem τῶν ζ θ*, 21 *& repugnantia τῶν ζ η ad identitatem τῶν ζ θ*, 22 *licet hoc interdum lateat*.

CAP. XXIX.

Κατασκευάζειν μὲν οὖν βουλομένοις κατά τινος ὅλου, τοῦ μὲν κατασκευαζομένου βλεπτέον εἰς τὰ ὑποκείμενα, καθ' ὧν αὐτὸ τυγχάνει λεγόμενον· οὗ δὲ δεῖ κατηγορεῖσθαι, ὅσα τούτῳ ἕπεται. ἂν γάρ τι τούτων ᾖ ταὐτόν, ἀνάγκη θάτερον θατέρῳ ὑπάρχειν. 2 Ἢν δὲ μὴ ὅτι παντί, ἀλλ' ὅτι τινί· οἷς ἕπεται ἑκάτερον. εἰ γάρ τι τούτων ταὐτὸν εἴη, ἀνάγκη τινὶ ὑπάρχειν. 3 * Ὅταν δὲ μηδενὶ δέῃ ὑπάρχειν· ᾧ μὲν οὐ δεῖ ὑπάρχειν, εἰς τὰ ἑπόμενα· ὃ δὲ δεῖ μὴ ὑπάρχειν, εἰς ἃ μὴ ἐνδέχεται αὐτῷ παρεῖναι. ἢ ἀνάπαλιν, ᾧ μὲν δεῖ μὴ ὑπάρχειν, ἃ μὴ ἐνδέχεται αὐτῷ παρεῖναι· ὃ δὲ μὴ ὑπάρχειν, εἰς τὰ ἑπόμενα. τούτων γὰρ ὄντων τῶν αὐτῶν ὁποτερωνοῦν, οὐδενὶ ἐνδέχεται θατέρῳ θάτερον ὑπάρχειν· γίνεται γὰρ ὁτὲ μὲν ὁ ἐν τῷ πρώτῳ C σχήματι συλλογισμός, ὁτὲ δὲ ὁ ἐν τῷ μέσῳ. 4 Ἐὰν δὲ τινὶ μὴ ὑπάρχειν· ᾧ μὲν δεῖ μὴ ὑπάρχειν, οἷς ἕπεται· ὃ δὲ μὴ ὑπάρχειν, ἃ μὴ δυνατὸν αὐτῷ ὑπάρχειν. εἰ γάρ τι τούτων εἴη ταὐτόν, ἀνάγκη τινὶ μὴ ὑπάρχειν. 5 Μᾶλλον δ' ἴσως ὧδ' ἔσται τῶν λεγομένων ἕκαστον φανερόν. ἔστω γὰρ τὰ μὲν ἑπόμενα τῷ α, ἐφ' ὧν β· οἷς δὲ αὐτὸ ἕπεται, ἐφ' ὧν γ· ἃ δὲ μὴ ἐνδέχεται αὐτῷ ὑπάρχειν, ἐφ' ὧν δ. πάλιν δὲ, τῷ ε τὰ μὲν ὑπάρχοντα, ἐφ' οἷς ζ· οἷς δ' αὐτὸ ἕπεται, ἐφ' οἷς η· ἃ δὲ μὴ ἐνδέχεται αὐτῷ ὑπάρχειν, ἐφ' οἷς θ. 6 Εἰ μὲν οὖν ταὐτό τι ἔσται τῷ γ τινὶ τῶν ζ, ἀνάγκη τὸ α παντὶ τῷ ε ὑπάρχειν· τὸ μὲν γὰρ ζ παντὶ τῷ ε, τῷ δὲ γ παντὶ τὸ α· ὥστε παντὶ τῷ ε τὸ α. 7 Εἰ δὲ τὸ γ, D καὶ τὸ η, ταὐτόν, ἀνάγκη τινὶ τῶν ε τὸ α ὑπάρχειν. τῷ μὲν γὰρ γ τὸ α, τῷ δὲ η τὸ ε παντὶ ἀκολουθεῖ. 8 Εἰ δὲ τὸ ζ, καὶ τὸ δ, ταὐτόν, οὐδενὶ τῷ ε τὸ α ὑπάρξει ἐκ προσυλλογισμοῦ. ἐπεὶ γὰρ ἀντιστρέφει τὸ στερητικόν, καὶ τὸ ζ τῷ δ ταὐτόν, οὐδενὶ τῷ ζ ὑπάρξει τὸ α, τὸ δὲ ζ παντὶ τῷ ε. 9 Πάλιν, εἰ τὸ β, καὶ τὸ θ, ταὐτόν, οὐδενὶ τῷ ε τὸ α ὑπάρξει. τὸ γὰρ β τῷ μὲν α παντί, τῷ δ' ἐφ' ᾧ τὸ ε, οὐδενὶ ὑπάρξει· ταὐτὸ γὰρ ἦν τὸ θ τῷ β, τὸ δὲ θ οὐδενὶ τῷ ε ὑπῆρχεν.

* In Alexandri codicibus hic locus aliter legebatur vt ex eius com. apparet.

B Volentibus igitur aliquid confirmare de aliquo toto, reſpiciendum *eſt* ad eius quod confirmatur, ſubiecta, de quibus illud dicitur: & ad *eius* cui oportet attribui, *conſequentia*, quæcumque hoc ſequuntur. nam ſi horum aliquid ſit idem, neceſſe *eſt* alterum alteri ineſſe. 2 Si verò non *ſit probandum* omni, ſed alicui *ineſſe*: *ſpectanda ſunt* ea quæ vtrumque ſequitur. nam ſi horum quidpiam ſit idem, neceſſe *eſt* alicui ineſſe. 3 Cùm autem nulli ineſſe oportet: *quod attinet ad id* cui non oportet ineſſe, *reſpiciendum eſt* ad conſequentia: *quod* verò *ad id* quod *oportet* non ineſſe, ad ea quæ illi adeſſe nequeunt. vel è cõtrario *ex parte eius* cui oportet non ineſſe, *reſpiciendum eſt ad repugnantia*, quæ C non poſſunt illi adeſſe: *ex parte* autem *eius* quod *oportet* non ineſſe, ad conſequentia. horum.n. vtriuis ſint eadem, accidit vt alterum alteri nulli inſit: quia fit ſyllogiſmus modò in prima figura, modò in media. 4 Quòd ſi *probandum ſit*, alicui non ineſſe: *eius* cui oportet non ineſſe, *ſpectanda ſunt antecedentia* quibus eſt conſequens: *eius* verò quod *oportet* non ineſſe, *ſpectanda ſunt repugnantia*, quæ non poſſunt ei ineſſe. nam ſi horum quidpiam ſit idem, neceſſe *eſt* alicui non ineſſe. 5 Sic autem fortaſſe quæcumque dicta ſunt, magis erunt perſpicua. Conſequentia τῷ α, ſint *ea* in quibus *eſt* β. quæ verò ipſum ſequitur, *ſint ea* in quibus *eſt* γ. quæ autem ei non poſſunt ineſſe, *ſint ea* in quibus *eſt* δ. D rurſus quæ τῷ ε inſunt, *ſint ea* in quibus *eſt* ζ. quæ ipſum ſequitur, *ſint ea* in quibus *eſt* η. quæ non poſſunt ei ineſſe, *ſint ea* in quibus *eſt* θ. 6 Si igitur aliquod γ & aliquod ζ ſint idem: neceſſe *eſt*, τὸ α ineſſe omni ε: quoniam τὸ ζ *ineſt* omni ε, ac τὸ α omni γ: quare τὸ α ineſt omni ε. 7 Si verò γ & η *ſint* idem: neceſſe *eſt*, τὸ α ineſſe cuidam ε: quia τὸ α eſt conſequens omni γ, ac τὸ ε omni η. 8 Quòd ſi ζ & δ *ſint* idem, τὸ α nulli ε inerit: *idque* per proſyllogiſmum. cùm enim *effatum* priuatiuum reciprocetur, & ζ ſit idem quod δ: nulli ζ inerit τὸ α: omni autē ε *ineſt* τὸ ζ. 9 Rurſus ſi β & θ *ſint* idē, τὸ α nulli ε inerit. nã τὸ β inerit omni α, & nulli ε: idem enim erãt θ & β, ac τὸ θ nulli ε inerat.

10 Si

10 Si verò τὸ δ & τὸ η *ſint* idem, τὸ α cuidam τῷ ε non inerit. nam τὸ α non inerit τῷ η, cùm non inſit τῷ δ. atqui τὸ η eſt ſub ε, itaque cuidam ε non inerit. 11 Sin η & β idem *ſint*, ſyllogiſmus inuerſus erit. nam τὸ η inerit omni α, (ſi quidem τὸ β *ineſt* τῷ α) ac τὸ ε inerit τῷ β (idem enim erat, quod β & η) neceſſe autem non *eſt* τὸ α ineſſe omni ε: ſed neceſſe *eſt* alicui *ineſſe*: quia vniuerſalis attributio conuertitur in particularem. 12 Perſpicuum igitur *eſt*, ab vtraque cuiuſvis problematis parte reſpiciendum *eſſe* ad ea quæ diximus: quoniam ex his *conficiuntur* omnes ſyllogiſmi. 13 *Cùm* autem conſequentium aut quamque rem antecedentium *ratio habetur*, ad prima & maximè vniuerſalia reſpicere oportet. vtputà *ex parte* τοῦ ε, magis *reſpicere* ad κζ, quàm ad ζ tantùm. *ex parte* verò τοῦ α, *magis* ad κγ, quàm ad γ tantùm. nam ſi τὸ α ineſt τῷ κζ, ineſt etiam τῷ ζ & τῷ ε. ſed & ſi huic non eſt conſequens, tamen poteſt eſſe conſequens τῷ ζ. ſimilis ratio *ſeruanda eſt* in iis quibus ipſa *res* eſt conſequens: nam ſi *ſequitur* prima, etiam ſequitur illa quæ ſub his *collocantur*. quòd ſi non *ſequitur* hæc, tamen poteſt ea *ſequi* quæ ſub his *ponuntur*. 14 Conſtat etiam, in tribus terminis ac duabus propoſitionibus *hanc* conſiderationem *conſiſtere*. 15 Et in prædictis figuris omnes ſyllogiſmos *extrui*. Oſtenditur enim τὸ α ineſſe omni ε, cùm ex γ & *ex* ζ quidpiam idem *eſſe* accipitur: hoc autem erit medium: extrema verò, τὸ α & ε: fit igitur prima figura. Alicui verò *ineſſe oſtenditur*, cùm γ & η idem *eſſe* accipitur. hæc autem eſt poſtrema figura: nam τὸ η fit medium. Nulli autem *ineſſe probatur*, cùm δ & ζ idem *ſunt*. ſic autem *fit* & prima figura, & media. prima quidem: quia nulli ζ ineſt τὸ α, (ſiquidem priuatiuum *effatum* conuertitur) omni autem ε, *ineſt* τὸ ζ. media verò: quia τὸ δ nulli α, & omni ε ineſt. Alicui non ineſſe *probatur*, cùm δ & η ſunt idem. hæc autem eſt vltima figura: nam τὸ α nulli η inerit, ac τὸ ε omni η. Perſpicuum igitur *eſt*, in prædictis figuris *fieri* omnes ſyllogiſmos. 16 Item non *eſſe* eligenda, quæ omnibus conſequentia ſunt: quia nullus ſyllogiſmus ex his fit. omnino enim adſtruere non licebat ex conſequentibus. priuatio verò probari nequit per ea quæ omnibus conſequentia ſunt: quoniam oportet alteri ineſſe, alteri non ineſſe. 17 Perſpicuum quoque *eſt*, alias delectus habendi rationes *eſſe* inutiles ad conficiendum ſyllogiſmum. veluti ſi vtrique conſequentia, eadem ſunt: aut *ea* quibus conſequens eſt τὸ α, & *ea* quæ non poſſunt ineſſe τῷ ε: aut rurſus quæ neutri poſſunt ineſſe: quia non fit ex his ſyllogiſmus. Nam ſi conſequentia ſint eadem, vt β & ζ: fit media figura attributiuas habens ambas propoſitiones. Sin *eadem ſint ea*, quibus conſequens eſt τὸ α, & quæ non poſſunt ineſſe τῷ ε, vt τὸ γ & τὸ θ: *fit* prima figura priuatiuam habens minorem propoſitionem. Si verò *eadem ſint*, quæ neutri ineſſe poſſunt, vt τὸ δ & τὸ θ: ambæ propoſitiones erunt priuatiuæ vel in prima, vel in media figura: ſic autem nullo modo erit ſyllogiſmus. 18 Liquet etiam, certa quædam ſumenda eſſe eadem in hac inſpectione, non certa quædã diuerſa, aut contraria. Primũ quia medij causâ *eſt* hæc inſpectio: mediũ autem nõ diuerſum, ſed idẽ accipere oportet. 19 Deinde in quibus contingit fieri ſyllogiſmum eo quòd cõtraria ſumpta ſint, aut quę non poſſunt eidẽ ineſſe: omnia reducẽtur ad prædictos modos.

A 10 Εἰ δὲ τὸ δ, καὶ τὸ η, ταὐτὸν, τὸ α τινὶ τῷ ε οὐχ ὑπάρξει. τῷ γὰρ η οὐχ ὑπάρξει τὸ α, ἐπεὶ οὐδὲ τῷ δ. τὸ δὲ η ἐστὶν ὑπὸ τὸ ε· ὥστε τινὶ τῷ ε οὐχ ὑπάρξει. 11 Εἰ δὲ τὸ η, καὶ τὸ β, ταὐτὸν, ἀντεστραμμένος ἔσται ὁ συλλογισμός. τὸ μὲν γὰρ η τῷ α ὑπάρξει παντί, (τὸ γὰρ β τῷ α (τὸ δὲ ε τῷ β·) ταὐτὸ γὰρ ἦν τῷ η) τὸ δὲ α τῷ ε παντὶ μὲν οὐκ ἀνάγκη ὑπάρχειν, τινὶ δ' ἀνάγκη, διὰ τὸ ἀντιστρέφειν τὴν καθόλου κατηγορίαν τῇ κατὰ μέρος. 12 Φανερὸν οὖν, ὅτι εἰς τὰ προειρημένα βλεπτέον ἑκατέρου καθ' ἕκαστον πρόβλημα· διὰ τούτων γὰρ ἅπαντες οἱ συλλογισμοί. 13 Δεῖ δὲ καὶ τῶν ἑπομένων, καὶ οἷς ἕπεται B ἕκαστον, εἰς τὰ πρῶτα καὶ τὰ καθόλου μάλιστα *ἐπιβλέπειν. οἷον, τοῦ μὲν ε, μᾶλλον εἰς τὸ κ ζ, ἢ εἰς τὸ ζ μόνον. τοῦ δὲ α, εἰς τὸ κ γ, ἢ εἰς τὸ γ μόνον. εἰ μὲν γὰρ τῷ κ ζ ὑπάρχει τὸ α, καὶ τῷ ζ καὶ τῷ ε ὑπάρχει· εἰ δὲ τούτῳ μὴ ἕπεται, ἐγχωρεῖ τῷ ζ ἕπεσθαι. ὁμοίως δὲ καὶ ἐφ' ὧν αὐτὸ ἀκολουθεῖ, σκεπτέον· εἰ μὲν γὰρ τοῖς πρώτοις, καὶ τοῖς ὑπ' ἐκεῖνα ἕπεται· εἰ δὲ μὴ τούτοις, ἀλλὰ τοῖς ὑπὸ ταῦτα ἐγχωρεῖ. 14 Δῆλον δὲ καὶ, ὅτι διὰ τῶν τριῶν ὅρων καὶ τῶν δύο προτάσεων ἡ σκέψις. 15 Καὶ διὰ τῶν προειρημένων σχημάτων οἱ συλλογισμοὶ πάντες. δείκνυται γὰρ ὑπάρχειν μὲν παντὶ τῷ ε τὸ α, ὅταν τῶν γ C καὶ τῶν ζ ταὐτόν τι ληφθῇ. τοῦτο δ' ἔσται μέσον· ἄκρα δὲ, τὸ α καὶ ε. γίνεται οὖν τὸ πρῶτον σχῆμα. τινὶ δὲ, ὅταν τὸ γ καὶ τὸ η ληφθῇ ταὐτόν. τοῦτο δὲ τὸ ἔσχατον σχῆμα· μέσον γὰρ τὸ η γίνεται. μηδενὶ δὲ, ὅταν τὸ δ, καὶ τὸ ζ, ταὐτόν. οὕτως δὲ καὶ τὸ πρῶτον σχῆμα, καὶ τὸ μέσον· τὸ μὲν πρῶτον, ὅτι οὐδενὶ τῷ ζ ὑπάρχει τὸ α, (εἴπερ ἀντιστρέφει τὸ στερητικόν) τὸ δὲ ζ παντὶ τῷ ε· τὸ δὲ μέσον, ὅτι τὸ δ τῷ μὲν α οὐδενὶ, τῷ ε παντὶ ὑπάρχει. τινὶ δὲ μὴ ὑπάρχειν, ὅταν τὸ δ καὶ τὸ η ταὐτὸν ᾖ. τοῦτο δὲ τὸ ἔσχατον σχῆμα. τὸ μὲν γὰρ α, οὐδενὶ τῷ η ὑπάρξει, τὸ δὲ ε παντὶ τῷ η. Φανερὸν οὖν ὅτι διὰ τῶν προειρημένων σχημάτων οἱ συλλογισμοὶ πάντες. 16 Καὶ ὅτι οὐκ D ἐκλεκτέον ὅσα πᾶσιν ἕπεται, διὰ τὸ μηδένα γίνεσθαι συλλογισμὸν ἐξ αὐτῶν. κατασκευάζειν μὲν γὰρ, ὅλως οὐκ ἦν ἐκ τῶν ἑπομένων· ἀποστερεῖν δ' οὐκ ἐνδέχεται διὰ τῶν πᾶσιν ἑπομένων. δεῖ γὰρ τῷ μὲν, ὑπάρχειν, τῷ δὲ, μὴ ὑπάρχειν. 17 Φανερὸν δὲ, ὅτι καὶ αἱ ἄλλαι σκέψεις τῶν κατὰ τὰς ἐκλογὰς, ἀχρεῖοι πρὸς τὸ ποιεῖν συλλογισμόν· οἷον, εἰ τὰ ἑπόμενα ἑκατέρῳ, ταὐτά ἐστιν, ἢ εἰ οἷς ἕπεται τὸ α, καὶ ἃ μὴ ἐνδέχεται τῷ ε· ἢ ὅσα πάλιν μὴ ἐγχωρεῖ ἑκατέρῳ ὑπάρχειν· οὐ γὰρ γίνεται συλλογισμὸς διὰ τούτων. εἰ μὲν γὰρ τὰ ἑπόμενα, ταὐτὰ, οἷον τὸ β καὶ τὸ ζ, τὸ μέσον γίνεται σχῆμα, κατηγορικὰς ἔχον ἀμφοτέρας τὰς προτάσεις. εἰ δ' οἷς ἕπεται E τὸ α, καὶ ἃ μὴ ἐνδέχεται τῷ ε, οἷον τὸ γ καὶ τὸ θ, τὸ πρῶτον σχῆμα στερητικὴν ἔχον τὴν πρὸς τὸ ἔλαττον ἄκρον πρότασιν. εἰ δ' ὅσα μὴ ἐνδέχεται ἑκατέρῳ, οἷον τὸ δ καὶ τὸ θ, στερητικαὶ ἀμφότεραι αἱ προτάσεις, ἢ ἐν τῷ πρώτῳ, ἢ ἐν τῷ μέσῳ σχήματι· οὕτως δ' οὐδαμῶς ἔσται συλλογισμός. 18 Δῆλον δὲ καὶ, ὅτι ὁποῖα ταὐτὰ ληπτέον τὰ κατὰ τὴν ἐπίσκεψιν, καὶ οὐχ ὁποῖα ἕτερα, ἢ ἐναντία. πρῶτον μὲν, ὅτι τοῦ μέσου χάριν ἡ *ἐπίβλεψις· τὸ δὲ μέσον, οὐχ ἕτερον, ἀλλὰ ταὐτὸν δεῖ λαβεῖν. 19 Εἶτα ἐν ὅσοις συμβαίνει γίνεσθαι συλλογισμὸν τῷ ληφθῆναι ἐναντία, ἢ μὴ ἐνδεχόμενα τῷ αὐτῷ ὑπάρχειν, εἰς τοὺς προειρημένους ἅπαντα *ἀναχθήσεται τρόπους.

* γρ. ἐπισκοπεῖν.
* γρ. ἐπίσκεψις.
* ἀναχθήσονται

A ἔσται μὲν γὰρ, τούτων ληφθέντων, συλλογισμὸς, ὅτι οὐδενὶ τῷ ε τὸ α ὑπάρχει· ἀλλ' οὐκ ἐξ αὐτῶν, ἀλλ' ἐκ τοῦ προειρημένου τρόπου. τὸ γὰρ β τῷ μὲν α παντὶ, τῷ δὲ ε οὐδενὶ ὑπάρξει· ὥστ' ἀνάγκη ταὐτὸ εἶναι τὸ β τινὶ τῶν θ. 21 Πάλιν, εἰ τὸ ζ* καὶ η μὴ ἐνδέχεται τῷ αὐτῷ ὑπάρχειν, ὅτι τινὶ* τῷ ε, οὐχ ὑπάρξει τὸ α· καὶ γὰρ οὕτως τὸ μέσον ἔσται σχῆμα.* τὸ γὰρ ζ τῷ μὲν α παντὶ, τῷ δὲ η οὐδενὶ ὑπάρξει· ὥστ' ἀνάγκη τὸ ζ ταὐτόν τινι εἶναι τῶν θ. τὸ γὰρ μὴ ἐνδέχεσθαι τὸ ζ καὶ τὸ η τῷ αὐτῷ ὑπάρχειν, οὐδὲν διαφέρει,* ἢ τὸ β τῶν θ τινὶ ταὐτὸν εἶναι· πάντα γὰρ εἴληπται ἐν* τῷ θ, τὰ μὴ ἐνδεχόμενα τῷ* ε ὑπάρχειν. 22 Φανερὸν μὲν οὖν, B ὅτι ἐξ αὐτῶν μὲν τούτων τῶν ἐπιβλέψεων οὐδεὶς γίνεται συλλογισμός. εἰ δὲ τὸ β, καὶ τὸ ζ, ἐναντία· ἀνάγκη ταὐτόν τινι εἶναι τὸ β τῶν θ· καὶ τὸν συλλογισμὸν γίνεσθαι διὰ τούτων. συμβαίνει δὴ τοῖς οὕτως ἐπισκοποῦσι, προσεπιβλέπειν ἄλλην ὁδὸν τῆς ἀναγκαίας, διὰ τὸ λανθάνειν ποτὲ τὴν ταὐτότητα τῶν β καὶ τῶν θ.

* γρ. ζ τὸ η.
* γρ. τῶν.
* γρ. τὸ ε.
* γρ. ἢ τὸ η.
* γρ. τῷ θ.
* γρ. τῷ α.

A 20 Vt ſi τὸ β & τὸ ζ *ſunt* contraria, vel non poſſunt eidem ineſſe. erit enim his acceptis ſyllogiſmus, *quo colligetur* nulli ε ineſſe τὸ α. ſed hoc ex his *ſumptionibus* non *efficitur*, verùm ex ſuprà dicto modo: quia τὸ β omni α & nulli ε ineſt. quare neceſſe *eſt*, τὸ β idem eſſe atque aliquod θ. 21 Rurſus ſi τὸ ζ & η non poſſunt eidem ineſſe: *concludetur*, cuidam ε non ineſſe τὸ α. nam & ſic quoque erit media figura: quia τὸ ζ omni α, & nulli η ineſt. quare neceſſe eſt, τὸ ζ idem eſſe atque aliquod θ: quia hæc nihil inter ſe differunt, non poſſe η ac ζ eidem ineſſe, & τὸ ζ eſſe idem atque aliquod θ: quippe cùm in θ ſumpta ſint, quæcunque τῷ ε ineſſe B nequeunt. 22 Perſpicuum igitur *eſt*, ex his inſpectionibus nullum fieri ſyllogiſmum. quòd ſi τὸ β ac ζ contraria *ſint*: neceſſe *eſt*, τὸ ζ eſſe idem atque aliquod θ, ſyllogiſmúmque ex his confici. iis igitur qui ita inſpiciunt, accidit vt ad viam à neceſſaria diuerſam reſpiciant, quia quandoque latet τὸ ζ ac τὸ θ idem eſſe.

De ſyllogiſmis ducentibus ad incommodum, & de reliquis hypotheticis: necnon de coniugationibus vtilibus ex hypotheſi: & de attributionibus modificatis.

Cap. XXIX.

1 ¶ De ſyllogiſmis ducentibus ad incommodum. Collatio cum oſtenſiuis: 2 quia eadem eſt in vtriſque inſpectio: 3 & per eoſdem terminos vtrique fiunt: differunt autem, quia propoſitio falſa ponitur in ſyllogiſmo ducente ad impoſſibile, non item in oſtenſiuo. 4 Excuſatio. 5 ¶ De reliquis ſyllogiſmis hypotheticis. Quomodo inueniuntur. 6 Quot modis fiunt. 7 ¶ De coniugationibus vtilibus ex hypotheſi. 8 ¶ De ſyllogiſmis modificatis. 9 Contingens quomodo accipi debet. 10 De aliis modis attribuendi.

CAP. XXX.

C Τὸν αὐτὸν δὲ τρόπον ἔχουσι καὶ οἱ εἰς τὸ ἀδύνατον* ἀπάγοντες συλλογισμοὶ, τοῖς δεικτικοῖς· καὶ γὰρ οὗτοι γίνονται διὰ τῶν ἑπομένων, καὶ οἷς ἕπεται ἑκάτερον. καὶ ἡ αὐτὴ* ἐπίσκεψις ἐν ἀμφοῖν· ὃ γὰρ δείκνυται δεικτικῶς, καὶ διὰ τοῦ ἀδυνάτου ἔστι συλλογίσασθαι, καὶ διὰ τῶν αὐτῶν ὅρων· καὶ ὃ διὰ τοῦ ἀδυνάτου, καὶ δεικτικῶς. 2 Οἷον, ὅτι τὸ α οὐδενὶ* τῷ ε ὑπάρχει. κείσθω γὰρ τινὶ ὑπάρχειν· οὐκοῦν, ἐπεὶ τὸ β παντὶ τῷ α, τὸ δὲ α τινὶ τῷ ε, τὸ β τινὶ τῷ ε ὑπάρξει· ἀλλ' οὐδενὶ ὑπῆρχε. Πάλιν, ὅτι τινὶ ὑπάρχει· εἰ γὰρ μηδενὶ τῷ ε τὸ α, τὸ δὲ ε παντὶ τῷ η, οὐδενὶ* τῷ η ὑπάρξει τὸ α· ἀλλὰ παντὶ ὑπῆρχεν. Ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων προβλημάτων· ἀεὶ γὰρ ἔσται καὶ ἐν ἅπασιν ἡ διὰ τοῦ ἀδυνάτου δεῖξις, ἐκ τῶν ἑπομένων, καὶ οἷς ἕπεται ἑκάτερον. 3 Καὶ D καθ' ἕκαστον πρόβλημα ἡ αὐτὴ σκέψις, δεικτικῶς τε* βουλομένῳ συλλογίσασθαι, καὶ εἰς τὸ ἀδύνατον ἀπαγαγεῖν· ἐκ γὰρ τῶν αὐτῶν ὅρων ἀμφότεραι αἱ ἀποδείξεις. οἷον, εἰ δέδεικται μηδενὶ ὑπάρχειν τῷ ε τὸ α, ὅτι συμβαίνει καὶ τὸ β τινὶ τῷ ε ὑπάρχειν, ὅπερ ἀδύνατον· ἐὰν ληφθῇ, τῷ μὲν ε μηδενὶ, τῷ δὲ α παντὶ ὑπάρχειν τὸ β· φανερὸν ὅτι οὐδενὶ τῷ ε τὸ α ὑπάρξει. πάλιν, εἰ δεικτικῶς συλλελόγισται τὸ α τῷ ε μηδενὶ ὑπάρχειν, ὑποθεμένοις ὑπάρχειν τινὶ, διὰ τοῦ ἀδυνάτου δειχθήσεται οὐδενὶ* ὑπάρχον. Ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων· ἐν ἅπασι γὰρ ἀνάγκη κοινόν τινα λαβεῖν ὅρον ἄλλον τῶν ὑποκειμένων, πρὸς ὃν ἔσται τοῦ ψεύδους ὁ συλλογισμός. ὥστε ἀντιστραφείσης ταύτης τῆς προτάσεως, τῆς δ' ἑτέρας, ὁμοίως ἐχούσης, δεικτικὸς ἔσται ὁ συλλογισμὸς, διὰ τῶν αὐτῶν ὅρων.

* γρ. ἄγοντες.
* γρ. ἐπίβλεψις. ἴσα.
* γρ. τῶν.
* γρ. τῶν η ὑπάρχει τὸ α.
* γρ. βουλομένοις.
* γρ. ὑπάρχειν.

C Eodem autem modo habent ſyllogiſmi ad impoſſibile ducentes, quo oſtenſiui. nam hi quoque fiunt per conſequentia, & *ea* quæ vtrumque ſequitur. eadémque *eſt* in vtriſque inſpectio. quod enim demonſtratur oſtenſiuè, etiam per impoſſibile probari poteſt: & *quidem* per eoſdem terminos: item quod *probatur* per impoſſibile, etiam oſtenſiuè *confirmari poteſt*. 2 Verbi causâ *probatur* τὸ α nulli ε ineſſe. ponatur enim cuidam ineſſe. cùm igitur τὸ β *inſit* omni α, ac τὸ α cuidam ε: τὸ β inerit cuidam ε. ſed nulli inerat. Rurſus *probatur* alicui ineſſe: quia ſi nulli ε *inſit* τὸ α, omni autem η τὸ ε: *certè* nulli η inerit τὸ α. ſed omni inerat. Similiter *fit* etiam in aliis problematis. ſemper enim & in omnibus demonſtratio quæ *fit* per impoſſibile, D conficitur ex conſequentibus, & iis quæ vtrumque ſequitur. 3 Ac *ſanè* in quoque problemate eadem *eſt* inſpectio, ſiue quis oſtenſiuè ratiocinari velit, ſiue ducere ad impoſſibile: quoniam ex iiſdem terminis ambæ demonſtrationes *conſtant*. Exempli gratiâ oſtenſum ſit nulli ε ineſſe τὸ α, quia contingit vt τὸ β inſit cuidam ε, quod *eſt* impoſſibile. ſi accipiatur nulli ε & omni α ineſſe τὸ β: perſpicuum *eſt*, nulli ε τὸ α ineſſe. Rurſus oſtenſiuè concluſum ſit τὸ α nulli ε ineſſe. ſi cui ſupponatur ineſſe, per impoſſibile oſtendetur nulli ineſſe. Similiter *fit* etiam in aliis: in omnibus enim neceſſe *eſt* accipere communem aliquem terminum diuerſum à *terminis* ſubiectis, ad quem referetur ſyllogiſmus falſum concludens. quare conuerſâ hac propoſitione, alterâ verò eâdem manente, ſyllogiſmus erit oſtenſiuus ex iiſdem terminis.

4 Differt autem oſtenſiuus ab eo qui *ducit* ad im- A poſſibile: quia in oſtenſiuo ſecundum veritatem ponuntur ambæ propoſitiones: in eo verò qui *ducit* ad impoſſibile, vna falsò *ponitur*. 5 Hæc igitur erunt magis perſpicua ex ſequentibus, vbi de impoſſibili dicemus: nunc id tantùm nobis conſtet, ad hæc reſpiciendum *eſſe*, ſiue quis oſtenſiuè ratiocinari velit, ſiue ducere ad impoſſibile. 6 Quod attinet ad alios ſyllogiſmos qui *fiunt* ex hypotheſi, veluti ſecundum tranſſumptionem, aut ſecundum qualitatem, conſideratio *poſita* eſt in *terminis* ſubiectis; *id eſt*, non in *ſumptis* ab initio, ſed in tranſſumptis: modus autem inſpectionis eſt idem. 7 Conſiderare autem oportet, ac diuiſione explicare quot modis *fiunt* ſyllogiſmi ex B hypotheſi. 8 *Sic* igitur quodvis problema probatur. Sed & alio modo licet horum nonnulla concludere: vt vniuerſalia per inſpectionem particularem: idque ex hypotheſi. nam ſi γ & η ſint eadem, accipiatúrque ſolis η τὸ ε ineſſe: *profectò* omni ε τὸ α inerit. Rurſus ſi δ & η *ſint* eadem, ac ſolis η τὸ ε attribuatur: *concludetur* nulli ε τὸ α ineſſe. Apparet igitur, hoc etiam modo eſſe inſpiciendum. 9 Eodem modo *fit* & in neceſſariis & contingentibus: *eſt* enim eadem conſideratio: & per terminos eodem ordine diſpoſitos fit ſyllogiſmus de eo quod ineſt, & de contingenti. 10 In contingentibus autem accipienda *ſunt* etiam quæ non C inſunt, ſed poſſunt ineſſe: quippe cùm oſtenſum fuerit, etiam ex his fieri ſyllogiſmum de contingenti. 11 Similis ratio eſt aliarum attributionum. 12 Ex dictis non ſolùm conſtat, hac via poſſe confici omnes *ſyllogiſmos*, ſed etiam aliâ viâ non poſſe. Oſtenſum namque eſt, omnem ſyllogiſmum fieri in aliqua ex ſuprà dictis figuris: hæ verò ex aliis conſtitui nequeunt, quàm ex conſequentibus, & cuiuſque rei antecedentibus: quandoquidem ex his propoſitiones *efficiuntur*, & medius terminus accipitur. quare ſyllogiſmus per alia fieri non poteſt.

4 Διαφέρει δὲ ὁ δεικτικὸς τοῦ εἰς τὸ ἀδύνατον, ὅτι ἐν μὲν τῷ δεικτικῷ, κατ' ἀλήθειαν ἀμφότεραι τίθενται αἱ προτάσεις· ἐν δὲ τῷ εἰς τὸ ἀδύνατον ψευδῶς ἡ μία. 5 Ταῦτα μὲν οὖν ἔσται * μᾶλλον φανερὰ διὰ τῶν ἑπομένων, ὅταν περὶ τοῦ ἀδυνάτου λέγωμεν· νῦν δὲ τοσοῦτον ἡμῖν ἔστω δῆλον, ὅτι εἰς ταῦτα βλεπτέον, δεικτικῶς τε βουλομένοις συλλογίζεσθαι, καὶ εἰς τὸ ἀδύνατον ἀγαγεῖν. 6 Ἐν δὲ τοῖς ἄλλοις συλλογισμοῖς τοῖς ἐξ ὑποθέσεως, οἷον ὅσοι κατὰ μετάληψιν, ἢ καὶ κατὰ ποιότητα, ἐν τοῖς ὑποκειμένοις, οὐκ ἐν τοῖς ἐξ ἀρχῆς, ἀλλ' ἐν τοῖς μεταλαμβανομένοις ἔσται ἡ σκέψις· ὁ δὲ τρόπος ὁ αὐτὸς τῆς * ἐπιβλέψεως. 7 Ἐπισκέψασθαι δὲ δεῖ καὶ διελεῖν, ποσαχῶς οἱ ἐξ ὑποθέσεως. 8 Δείκνυται μὲν οὖν ἕκαστον τῶν προβλημάτων οὕτω. ἔστι δὲ καὶ ἄλλον τρόπον ἔνια συλλογίσασθαι τούτων· οἷον τὰ καθόλου, διὰ τῆς κατὰ μέρος * ἐπιβλέψεως, ἐξ ὑποθέσεως. Εἰ γὰρ τὰ γ καὶ τὰ η ταὐτὰ εἴη, μόνοις δὲ ληφθείη τοῖς η τὸ ε ὑπάρχειν, παντὶ ἂν τῷ ε τὸ α ὑπάρχοι. καὶ πάλιν, εἰ τὰ δ καὶ τὰ η ταὐτά, μόνον δὲ τῶν η τὸ ε κατηγοροῖτο, ὅτι οὐδενὶ τῷ ε τὸ α ὑπάρξει. Φανερὸν οὖν, ὅτι καὶ οὕτως ἐπιβλεπτέον. 9 Τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἀναγκαίων, καὶ τῶν ἐνδεχομένων· ἡ γὰρ αὐτὴ σκέψις, καὶ διὰ τῶν αὐτῶν ὅρων ἔσται τῇ τάξει, τοῦ τε ἐνδέχεσθαι, καὶ τοῦ ὑπάρχειν ὁ συλλογισμός. 10 Ληπτέον δὲ ἐπὶ τῶν ἐνδεχομένων καὶ τὰ μὴ ὑπάρχοντα, δυνατὰ δὲ ὑπάρχειν· δέδεικται γάρ, ὅτι καὶ διὰ τούτων γίνεται ὁ τοῦ ἐνδέχεσθαι συλλογισμός. 11 Ὁμοίως δὴ ἕξει καὶ ἐπὶ τῶν ἄλλων κατηγοριῶν. 12 Φανερὸν οὖν ἐκ τῶν εἰρημένων, ὅτι οὐ μόνον ἐγχωρεῖ διὰ ταύτης τῆς ὁδοῦ γίνεσθαι πάντας τοὺς συλλογισμούς, ἀλλὰ καὶ ὅτι δι' ἄλλης ἀδύνατον. ἅπας μὲν γὰρ συλλογισμὸς δέδεικται διά τινος τῶν προειρημένων σχημάτων γινόμενος· ταῦτα δὲ οὐκ ἐγχωρεῖ δι' ἄλλων συσταθῆναι, πλὴν διὰ τῶν ἑπομένων, καὶ οἷς ἕπεται ἕκαστον. ἐκ τούτων γὰρ αἱ προτάσεις καὶ ἡ τοῦ μέσου λῆψις. ὥστ' οὐδὲ συλλογισμὸν ἐγχωρεῖ γίνεσθαι δι' ἄλλων.

* χ. φανερώτερα

* χ. ἐπισκέψεως.

* χ. ἐπισκέψεως.

De ſyllogiſmis in philoſophia, vel in quavis arte, ſeu diſciplina, & de quacumque re exſtruendis. Cap. XXX.

1 ¶ *Expoſitam inuentionis methodum pertinere ad omnes artes & ſcientias:* 2 *& eſſe generalem.* 3 ¶ *De methodo ſpeciali, id eſt analytica,* 4 *vel dialectica.*

OMnium itaque via *eſt* eadem tum in philo- D ſophia, tum in arte qualibet atque diſciplina. oportet enim, quovis *problemate* propoſito, *ea* colligere quæ inſunt, & quæ ſubiiciuntur: horúmque copiam quàm maximam habere: atque hæc per tres terminos conſiderare, hoc modo, ſi euertatur: illo, ſi adſtruatur. & veritatis quidem causâ ex iis *ratiocinari*, quæ verè ineſſe deſcribuntur. ob dialecticos autem ſyllogiſmos, ex propoſitionibus probabilibus. 2 Principia ſyllogiſmorum vniuerſalia, dictum eſt, quomodo *ſe* habent, & quomodo ea venari oporteat: ne reſpiciamus ad *ea* omnia quæ dicuntur: neque ad eadem, confirmantes, & euertentes: neque confirmantes de omni vel de aliquo, & euertentes in totum vel ex parte: ſed *reſpiciamus* ad pauciora & definita.

Ἡ μὲν οὖν ὁδὸς, κατὰ πάντων ἡ αὐτὴ καὶ περὶ φιλοσοφίαν καὶ περὶ τέχνην ὁποιανοῦν, καὶ μάθημα. δεῖ γὰρ τὰ ὑπάρχοντα, καὶ οἷς ὑπάρχει, περὶ ἑκάτερον ἀθρεῖν· καὶ τούτων ὡς πλείστων εὐπορεῖν· καὶ ταῦτα διὰ τῶν τριῶν ὅρων σκοπεῖν, ἀνασκευάζοντα μὲν ὡδί· κατασκευάζοντα δὲ, ὡδί· καὶ κατὰ μὲν ἀλήθειαν, ἐκ τῶν κατ' ἀλήθειαν διαγεγραμμένων ὑπάρχειν· εἰς δὲ τοὺς διαλεκτικοὺς συλλογισμοὺς, ἐκ τῶν κατὰ δόξαν προτάσεων. 2 *Αἱ δ' ἀρχαὶ τῶν συλλογισμῶν, καθόλου μὲν εἴρηνται, ὅν τρόπον τε ἔχουσι, καὶ ὅν τρόπον δεῖ θηρεύειν αὐτάς· ὅπως μὴ βλέπωμεν εἰς ἅπαντα τὰ λεγόμενα, μηδὲ εἰς ταὐτὰ κατασκευάζοντες καὶ ἀνασκευάζοντες, μηδὲ κατασκευάζοντές τε κατὰ παντὸς ἢ τινος, καὶ ἀνασκευάζοντες ἀπὸ πάντων ἢ τινων, ἀλλ' εἰς ἐλάττω καὶ ὡρισμένα.

CAP. XXXI.

3 Καθ' ἕκαστον δὲ δεῖ ἐκλέγειν τῶν ὄντων, οἷον περὶ ἀγαθοῦ, ἢ ἐπιστήμης. Ἴδιαι δὲ καθ' ἑκάστην εἰσὶν αἱ πλεῖσται. διὸ τὰς μὲν ἀρχὰς τὰς περὶ ἕκαστον, ἐμπειρίας ἐστὶ παραδοῦναι. λέγω δ', οἷον τὴν ἀστρολογικὴν μὲν ἐμπειρίαν, τῆς ἀστρολογικῆς ἐπιστήμης· ληφθέντων γὰρ ἱκανῶς τῶν φαινομένων, οὕτως εὑρέθησαν αἱ ἀστρολογικαὶ ἀποδείξεις. ὁμοίως δὲ καὶ περὶ ἄλλην ὁποιανοῦν ἔχει τέχνην τε καὶ ἐπιστήμην. ὥστ' ἐὰν ληφθῇ τὰ ὑπάρχοντα περὶ ἕκαστον, ἡμέτερον ἤδη τὰς ἀποδείξεις ἑτοίμως ἐμφανίζειν. εἰ γὰρ μηδὲν κατὰ τὴν ἱστορίαν παραλειφθείη τῶν ἀληθῶς ὑπαρχόντων τοῖς πράγμασιν, ἕξομεν περὶ παντὸς οὗ μὲν ἔστιν ἀπόδειξις, ταύτην εὑρεῖν καὶ ἀποδεικνύναι· οὗ δὲ μὴ πέφυκεν ἀπόδειξις, τοῦτο ποιεῖν φανερόν. 4 Καθόλου μὲν οὖν, ὃν δεῖ τρόπον τὰς προτάσεις ἐκλέγειν, εἴρηται σχεδόν· δι' ἀκριβείας δὲ διεληλύθαμεν ἐν τῇ πραγματείᾳ τῇ περὶ τὴν διαλεκτικήν.

A 3 Circa ſingulas autem res oportet eligere, vt de bono, vel ſcientia. Propria verò *principia* in quaque *ſcientia* permulta ſunt. Idcirco experientiæ *proprium* eſt, cuiuſque rei principia tradere. verbi gratiâ, aſtrologica experientia *ſuppeditat principia* aſtrologicæ ſcientiæ. ſufficienter enim acceptis iis quæ apparent, ita inuentæ ſunt aſtrologicæ demonſtrationes. Similiter *res* habet in quavis alia arte & ſcientia. Quocirca ſi accepta fuerint, quæ inſunt circa quamque rem: noſtrum iam *erit*, promptè demonſtrationes edere. nam ſi nihil, quod ad hiſtoriam attinet, prætermiſſum fuerit ex iis quæ verè inſunt rebus: poterimus de omni re, cuius eſt demonſtratio, eam inuenire ac demonſtrare. Si quid autem natura ita ſit comparatum vt demonſtrari nequeat, id ipſum palam facere. 4 Ergo vniuerſaliter, quomodo propoſitiones eligere oporteat, ferè dictum eſt: exquiſitè autem *hac de re* egimus in eo tractatu qui ad dialecticam *pertinet*.

De diuiſione. Cap. XXXI.

1 Expoſitam methodum pertinere etiam ad diuiſiones. 2 Veterum ignorantia. 3 Reductio diuiſionis ad ſyllogiſmum, & diſtinctio à demonſtratione. 4 De his quæ per diuiſionem probari nequeunt. 5 Epilogus huius capitis. 6 Epilogus huius ſecundi tractatus de inuentione.

CAP. XXXII. Ὅτι δ' ἡ διὰ τῶν γενῶν διαίρεσις, μικρόν τι μόριόν ἐστι τῆς εἰρημένης μεθόδου, ῥᾴδιον ἰδεῖν· ἔστι γὰρ ἡ διαίρεσις, οἷον ἀσθενὴς συλλογισμός· ὃ μὲν γὰρ δεῖ δεῖξαι αἰτεῖται· συλλογίζεται δ' ἀεί τι τῶν ἄνωθεν. 2 Πρῶτον δ' αὐτὸ τοῦτο ἐλελήθει τοὺς χρωμένους αὐτῇ πάντας· καὶ πείθειν ἐπεχείρουν, ὡς ὄντος δυνατοῦ περὶ οὐσίας ἀπόδειξιν γίνεσθαι, καὶ τοῦ τί ἐστιν. ὥστε οὔτε, *ὅτι ἐνδέχεται συλλογίσασθαι τοῖς* διαιρουμένοις, ξυνίεσαν· οὔτε, ὅτι οὕτως ἐνεδέχετο, ὥσπερ εἰρήκαμεν. 3 Ἐν μὲν οὖν ταῖς ἀποδείξεσιν, ὅταν δέῃ τι συλλογίσασθαι ὑπάρχειν, δεῖ τὸ μέσον, δι' οὗ γίνεται ὁ συλλογισμός, ἧττον ἀεὶ εἶναι, καὶ μὴ καθόλου τοῦ πρώτου τῶν ἄκρων· ἡ δὲ διαίρεσις τοὐναντίον βούλεται· τὸ γὰρ καθόλου λαμβάνει μέσον. ἔστω γὰρ ζῷον μὲν, ἐφ' οὗ α· τὸ δὲ θνητὸν, ἐφ' οὗ β· καὶ ἀθάνατον, ἐφ' οὗ γ· ὁ δὲ ἄνθρωπος, οὗ τὸν *ὅρον δεῖ λαβεῖν, ἐφ' οὗ τὸ δ. ἅπαν δὴ ζῷον λαμβάνει, ἢ θνητὸν ἢ ἀθάνατον· τοῦτο δέ ἐστιν, ὃ ἂν ᾖ α, ἅπαν εἶναι ἢ β ἢ γ. πάλιν τὸν ἄνθρωπον ἀεὶ διαιρούμενος τίθεται ζῷον εἶναι· ὥστε κατὰ τοῦ δ τὸ α λαμβάνει ὑπάρχειν. ὁ μὲν οὖν συλλογισμός ἐστιν, ὅτι τὸ δ, ἢ β ἢ γ, ἅπαν ἔσται· ὥστε τὸν ἄνθρωπον, ἢ θνητὸν ἢ ἀθάνατον δεῖ λαμβάνειν· θνητὸν μὲν γὰρ ἢ ἀθάνατον, ἀναγκαῖον εἶναι ζῷον. θνητὸν δὲ, οὐκ ἀναγκαῖον εἶναι, ἀλλ' αἰτεῖται· τοῦτο δὲ ἦν, ὃ ἔδει συλλογίσασθαι. Καὶ πάλιν θέμενος τὸ μὲν α, ζῷον θνητόν· ἐφ' οὗ δὲ τὸ β, ὑπόπουν· ἐφ' οὗ δὲ τὸ γ, ἄπουν· τὸν δὲ ἄνθρωπον, τὸ δ· ὡσαύτως λαμβάνει, τὸ μὲν α, ἤτοι ἐν τῷ β, ἢ ἐν τῷ γ εἶναι (ἅπαν γὰρ ζῷον θνητὸν, ἢ ὑπόπουν ἢ ἄπουν ἐστί) κατὰ δὲ τοῦ δ, τὸ α· (τὸν γὰρ ἄνθρωπον, ζῷον θνητὸν εἶναι ἔλαβεν) ὥσθ' ὑπόπουν μὲν ἢ ἄπουν εἶναι ζῷον ἀνάγκη τὸν ἄνθρωπον· ὑπόπουν δ', οὐκ ἀνάγκη, ἀλλὰ λαμβάνει· τοῦτο δ' ἦν, ὃ ἔδει πάλιν δεῖξαι. Καὶ τοῦτον δὴ τὸν τρόπον ἀεὶ διαιρουμένοις, τὸ μὲν καθόλου συμβαίνει αὐτοῖς μέσον λαμβάνειν· καθ' οὗ δὲ ἔδει δεῖξαι καὶ τὰς διαφοράς.

* γρ. ἔστι.
* γρ. τῶν διαιρουμένων.
* γρ. λόγον.

B Diuiſionem autem, quæ per genera *fit*, eſſe paruam particulam huius methodi, facile *eſt* videre. diuiſio namque eſt velut imbecillus ſyllogiſmus: petit enim, quod oſtendere oportet: ſemper autem concludit aliquid ex ſuperioribus. 2 Primùm autem hoc ipſum latuit omnes eâ vtentes: conatique ſunt perſuadere demonſtrationem de ſubſtantia fieri poſſe, & quid res quæpiam ſit. Quare neque intellexerunt, quid ij, qui diuidunt, concludant: neque *intellexerunt* id eo quo diximus modo fieri. 3 In demonſtrationibus igitur, cùm concludendum eſt, aliquid ineſſe, opus eſt vt medium, per quod fit ſyllogiſmus, ſemper minus ſit primo extremo, non de *eo* vniuerſaliter *dicatur*. E C contrario diuiſio ſumit vniuerſale pro medio termino. ſit enim animal, vbi α: mortale, vbi β: immortale, vbi γ: homo cuius definitionem accipere oportet, vbi δ. ſumit igitur, omne animal *eſſe* aut mortale aut immortale: hoc autem eſt, quodcunque eſt α, *id* omne eſſe aut β aut γ. rurſusqui diuidit, ſemper ponit hominem eſſe animal: vnde accipit τὸ α dici de δ. Ergo ſyllogiſmo concluditur, omne δ eſſe aut β aut γ. proinde ſumere oportet hominẽ aut *eſſe* mortalem aut immortalem: ſiquidem neceſſe *eſt* animal eſſe aut mortale aut immortale. mortalem autem eſſe, non eſt neceſſarium, ſed petitur: hoc verò eſt, quod concludere oportebat. Rurſus ponẽs τὸ α, animal mortale: vbi β, pedeſtre: D vbi γ, expes: hominem autem, τὸ δ: itidem accipit. *nam ſumit* α aut eſſe in β aut in γ: (omne enim animal mortale, aut eſt pedeſtre aut expes) de δ autem *dici* τὸ α: (ſumpſit enim hominem eſſe animal mortale) quare neceſſe *eſt*, hominem eſſe animal pedeſtre aut bipes: pedeſtre autem *eſſe*, non *eſt* neceſſariũ, ſed ſumitur: hoc verò erat, quod oportebat rurſus probare. Atque hoc modo ſemper accidit, vt diuidẽtes, vniuerſale quidẽ conſtituant mediũ: *id* verò de quo oportet oſtẽdere, ac differẽtias,

extrema. 3 poſtremum, nihil planè dicunt, cur A neceſſe ſit hoc eſſe hominem, aut quodvis aliud de quo quæritur: etenim quamvis aliam viam perſequuntur, ne ſuſpicantes quidem eſſe eas copias, quæ re vera parari poſſunt. 4 Perſpicuum autem *eſt*, nec euerti hac methodo poſſe, neque de accidente aut proprio quidpiam concludi, neque de genere, neque de his quæ ignoramus vtrùm hoc an illo modo *ſe* habeant: veluti vtrùm diameter communem menſuram habeat, an non habeat. nam ſi accipiat omnem longitudinem aut habere aut non habere communem menſuram, dimetientem verò eſſe longitudinem: colliget dimetientem habere aut non habere communem menſuram. quòd ſi accipiat habere communem menſuram; *id* accipiet, quod ſyllogiſmo probare oportebat. non poteſt igitur probari, *quod erat probandum.* nam via *eſt* hæc, qua probari nequit. Habens aut non habens communem menſuram, *ſit* vbi α: longitudo, vbi β: dimetiens, vbi γ. 5 Perſpicuum igitur *eſt*, nec ad omnē inſpectionem aptari hunc inquirendi modum, nec in iis eſſe vtilem, quibus maximè videtur conuenire. 6 Ex quibus igitur demonſtrationes fiant. & quomodo, & ad quæ reſpiciendum *ſit* in quoque problemate, perſpicuum *eſt* ex iis quæ dicta ſunt.

A ἄκρα. τέλος δὲ, ὅτι τοῦτ' ἐστὶν ἄνθρωπος, ἢ ὅ,τι ποτ' ἂν ᾖ τὸ ζητούμενον, οὐδὲν λέγουσι σαφὲς, ὥστε ἀναγκαῖον εἶναι· καὶ γὰρ τὴν ἄλλην ὁδὸν ποιοῦνται πᾶσαν, οὐδὲ τὰς ἐνδεχομένας εὐπορίας ὑπολαμβάνοντες ὑπάρχειν. 4 Φανερὸν δ', ὅτι οὔτ' ἀνασκευάσαι ταύτῃ τῇ μεθόδῳ ἔστιν, οὔτε περὶ συμβεβηκότος τι, ἢ ἰδίου συλλογίσασθαι, οὔτε περὶ γένους, οὔτε ἐν οἷς ἀγνοεῖται τὸ πότερον ὡδὶ ἢ ὡδὶ ἔχει· οἷον, ἆρ' ἡ διάμετρος, σύμμετρος, ἢ ἀσύμμετρος. ἐὰν γὰρ λάβῃ, ὅτι πᾶν μῆκος, ἢ σύμμετρον ἢ ἀσύμμετρον, ἡ δὲ διάμετρος, μῆκος· συλλελόγισται ὅτι ἢ ἀσύμμετρος ἢ σύμμετρος ἡ διάμετρος. B εἰ δὲ λήψεται* ἀσύμμετρον· ὃ ἔδει συλλογίσασθαι, λήψεται. οὐκ ἄρα ἔστι δεῖξαι· ἡ μὲν γὰρ ὁδὸς, αὕτη, διὰ ταύτης δ' οὐκ ἔστι* δεῖξαι. τὸ ἀσύμμετρον ἢ σύμμετρον, ἐφ' οὗ α· μῆκος, ἐφ' οὗ β· διάμετρος, ἐφ' οὗ γ. 5 Φανερὸν οὖν, ὅτι οὔτε πρὸς πᾶσαν σκέψιν ἁρμόζει τῆς ζητήσεως ὁ τρόπος, οὔτ' ἐν οἷς μάλιστα δοκεῖ πρέπειν, ἐν τούτοις ἐστὶ χρήσιμος. 6 Ἐκ τίνων μὲν οὖν αἱ ἀποδείξεις γίνονται, καὶ πῶς, καὶ εἰς ποῖα βλεπτέον καθ' ἕκαστον πρόβλημα, φανερὸν ἐκ τῶν εἰρημένων.

* γρ. ὅτι ἀσύμμετρος.

* γρ. δεῖξαι τὸ ἀσύμμετρον, ἢ σύμμετρον, ἐφ' οὗ τὸ α· μῆκος τὸ β· ἢ σύμμετρος ἢ ἀσύμμετρος διάμετρος.

DE RESOLVTIONE SYLLOGISMORVM IN FIGVRAS ET MODOS.

TRACTATVS III.

De accipiendis propoſitionibus, terminis, medio termino, & figura.

Cap. XXXII.

1 ¶ Proponit hunc tractatum, & eius vtilitatem. 2 ¶ De propoſitionibus. Vt prius accipiantur, quam termini. 3 De vniuerſalibus, & particularibus. 4 De iis quæ deſunt, aut ſuperfluunt. 5 Si videatur eſſe, nec tamen ſit ſyllogiſmus. 6 ¶ De terminis. 7 ¶ De medio termino, & figura. De ratione cognoſcendi medium terminum. 8 Ex medio cognoſci figuram. 9 Quomodo deprehendatur nullum eſſe medium terminum. 10 De figura ex problemate & ex medio termino cognoſcenda.

POſt hæc dicendum *eſt*, quomodo reducemus C ſyllogiſmos ad ſupra dictas figuras. hoc enim reliquum adhuc *eſt* ex tractatione propoſita. nam ſi ſtructuram ſyllogiſmorum intelligamus, & inueniendi facultatem habeamus, præterea ſyllogiſmos confectos reſoluamus in prædictas figuras: perductum ad finem erit, quod *explicare* ab initio inſtituimus. Simul autem eueniet, vt antea dicta confirmentur, & magis perſpicuè conſtet ea ſic *ſe* habere, ex iis quæ nunc dicenda ſunt. quicquid enim *eſt* verum, opus eſt vt ipſum ſecum omni ex parte conſentiat. 2 Primùm igitur niti oportet, vt duæ ſyllogiſmi propoſitiones excipiantur: facilius *eſt* enim in maiora diuidere D quàm in minora: maiora autem ſunt compoſita, quàm ea ex quibus componuntur. 3 Deinde oportet inſpicere, vtra ſit in toto, vtra in parte. 4 Et ſi ambæ propoſitiones ſumptæ non ſint, altera ſupplenda eſt. nam qui ſcribunt, aut interrogant, interdum vniuerſalem proponentes, alteram, quæ in ea continetur, non accipiunt: aut has quidem proponunt, ſed eas omittunt per quas hæ concluduntur, & alia fruſtra interrogant. videndum igitur *eſt*, an quid ſuperuacuum acceptum ſit, vel neceſſarium prætermiſſum. & hoc quidem adiici debet, illud verò adimi, donec ad duas propoſitiones perueniatur. etenim ſine his

Πῶς δὲ ἀνάξομεν τοὺς συλλογισμοὺς εἰς τὰ προειρημένα σχήματα, λεκτέον ἂν εἴη μετὰ ταῦτα· λοιπὸν γὰρ ἔτι τοῦτο τῆς σκέψεως. εἰ γὰρ τήν τε γένεσιν τῶν συλλογισμῶν θεωροῖμεν, καὶ τοῦ εὑρίσκειν ἔχοιμεν δύναμιν, ἔτι δὲ τοὺς γεγενημένους ἀναλύοιμεν εἰς τὰ προειρημένα σχήματα· τέλος ἂν ἔχοι ἡ ἐξ ἀρχῆς* πρόθεσις. συμβήσεται δ' ἅμα καὶ τὰ πρότερον εἰρημένα ἐπιβεβαιοῦσθαι, καὶ φανερώτερα εἶναι, ὅτι οὕτως ἔχει, διὰ τῶν νῦν λεχθησομένων· δεῖ γὰρ πᾶν τὸ ἀληθὲς αὐτὸ ἑαυτῷ ὁμολογούμενον εἶναι πάντῃ. CAP. XXXIII.
2 Πρῶτον μὲν οὖν δεῖ πειρᾶσθαι τὰς δύο προτάσεις ἐκλαμβάνειν τοῦ συλλογισμοῦ· ῥᾷον γὰρ εἰς τὰ μείζω διελεῖν, ἢ τὰ ἐλάττω· μείζω δὲ τὰ συγκείμενα, ἢ τὰ ἐξ ὧν σύγκειται. 3 Εἶτα σκοπεῖν, ποτέρα ἐν ὅλῳ, καὶ ποτέρα ἐν μέρει. 4 Καὶ εἰ μὴ ἄμφω εἰλημμέναι εἶεν, αὐτὸν τιθέντα τὴν ἑτέραν. ἐνίοτε γὰρ τὴν καθόλου προτείναντες, τὴν* ἐν ταύτῃ οὐ λαμβάνουσιν, οὔτε γράφοντες, οὔτ' ἐρωτῶντες. ἢ ταύτας μὲν προτείνουσι, δι' ὧν δ' αὗται περαίνονται, παραλείπουσιν, ἄλλα δὲ μάτην ἐρωτῶσι. σκεπτέον οὖν, εἴ τι περίεργον εἴληπται, καὶ εἴ τι τῶν ἀναγκαίων παραλέλειπται· καὶ τὸ μὲν, θετέον· τὸ δ', ἀφαιρετέον, ἕως ἂν ἔλθῃ τις εἰς τὰς δύο προτάσεις· ἄνευ γὰρ τούτων,

* γρ. προθέσεως. al. ἐπιθέσεως.

* γρ. ἐν αὐτῇ.

οὐκ ἔστιν ἀναγαγεῖν τοὺς οὕτως ἠρωτημένους λόγους. 5 Ἐνίων A μὲν οὖν ῥᾴδιον ἰδεῖν τὸ ἐνδεές. ἔνιοι δὲ λανθάνουσι καὶ δοκοῦσι συλλογίζεσθαι, διὰ τὸ ἀναγκαῖόν τι συμβαίνειν ἐκ τῶν κειμένων. οἷον, εἰ ληφθείη, μὴ οὐσίας ἀναιρουμένης, μὴ ἀναιρεῖσθαι οὐσίαν· ἐξ ὧν δ' ἐστὶν ἀναιρουμένων, καὶ τὸ ἐκ τούτων φθείρεσθαι· τούτων γὰρ τεθέντων, ἀναγκαῖον μὲν τὸ οὐσίας μέρος εἶναι οὐσίαν· οὐ μὴν συλλελόγισται διὰ τῶν εἰλημμένων, ἀλλ' ἐλλείπουσιν αἱ προτάσεις. πάλιν, εἰ ἀνθρώπου ὄντος, ἀνάγκη ζῷον εἶναι· καὶ ζῴου οὐσίαν· ἀνθρώπου ὄντος, ἀνάγκη οὐσίαν εἶναι· ἀλλ' οὔπω συλλελόγισται· οὐ γὰρ ἔχουσιν αἱ προτάσεις, ὡς εἴπομεν. ἀπατώμεθα δ' ἐν τοῖς τοιούτοις, διὰ τὸ ἀναγκαῖόν τι συμβαίνειν ἐκ τῶν κειμένων, ὅτι καὶ ὁ συλλογισμὸς ἀναγκαῖόν B ἐστιν. ἐπὶ πλέον δὲ τὸ ἀναγκαῖον, ἢ συλλογισμός. ὁ μὲν γὰρ συλλογισμὸς πᾶς, ἀναγκαῖον· τὸ δ' ἀναγκαῖον οὐ πᾶν, συλλογισμός. ὥστ' οὐκ εἴ τι συμβαίνει τεθέντων τινῶν, πειρατέον ἀνάγειν εὐθύς, ἀλλὰ πρῶτον ληπτέον τὰς δύο προτάσεις. 6 Εἶθ' οὕτω διαιρετέον εἰς τοὺς ὅρους. 7 Μέσον δὲ θετέον τῶν ὅρων, τὸν ἐν ἀμφοτέραις ταῖς προτάσεσι λεγόμενον· ἀνάγκη γὰρ τὸ μέσον ἐν ἀμφοτέραις ὑπάρχειν ἐν ἅπασι τοῖς σχήμασιν. 8 Ἐὰν μὲν οὖν κατηγορῇ, καὶ κατηγορῆται τὸ μέσον· ἢ αὐτὸ μὲν κατηγορῇ, ἄλλο δ' ἐκείνου ἀπαρνῆται· τὸ πρῶτον ἔσται σχῆμα. ἐὰν δὲ καὶ * κατηγορῇ, καὶ ἀπαρνῆται ἀπό τινος· τὸ μέσον. ἐὰν δὲ ἄλλα ἐκείνου κατηγορῆται· ἢ τὸ μὲν C ἀπαρνῆται, τὸ δὲ κατηγορῆται· τὸ ἔσχατον. οὕτω γὰρ εἶχεν ἐν ἑκάστῳ σχήματι τὸ μέσον. ὁμοίως δέ, καὶ ἐὰν μὴ καθόλου ὦσιν αἱ προτάσεις· ὁ γὰρ αὐτὸς διορισμὸς τοῦ μέσου. 9 Φανερὸν οὖν, ὡς ἐν ᾧ λόγῳ μὴ λέγεται τὸ αὐτὸ πλεονάκις, οὐ γίνεται συλλογισμός· οὐ γὰρ εἴληπται μέσον. 10 Ἐπεὶ δ' ἔχομεν ποῖον ἐν ἑκάστῳ σχήματι περαίνεται τῶν προβλημάτων, καὶ ἐν τίνι τὸ καθόλου, καὶ ἐν ποίῳ τὸ ἐν μέρει· φανερόν, ὅτι οὐκ εἰς ἅπαντα τὰ σχήματα βλεπτέον, ἀλλ' ἑκάστου προβλήματος εἰς τὸ οἰκεῖον. ὅσα δὲ ἐν πλείοσι περαίνεται, τῇ τοῦ μέσου θέσει γνωριοῦμεν τὸ σχῆμα.

* γ. κατηγορῆται.

haud reduci poſſunt orationes ita rogatæ. 5 In quibuſdã igitur facile *eſt* videre quod deeſt. nonnullæ autem obſcuræ ſunt, ac videntur eſſe ſyllogiſmi, quia neceſſariò aliquid accidit ex iis quæ poſita ſunt. Vt ſi ſumptum ſit, nõ ſublatã ſubſtantiã non tolli ſubſtantiam: iis autem, ex quibus res eſt, ſublatis, interimi quod ex his *conſtat*. his enim poſitis, ſanè *eſt* neceſſe partem ſubſtantiæ eſſe ſubſtantiam: non tamen ſyllogiſmo concluſum eſt ex iis quę ſumpta ſunt. ſed propoſitiones deſunt. Rurſus ſi cùm eſt homo, neceſſe *eſt* animal eſſe; & *cùm eſt* animal, *eſſe* ſubſtantiam: *certè* cùm eſt homo, neceſſe *eſt* eſſe ſubſtantiam. ſed nondum ſyllogiſmus exſtructus eſt: quia propoſitiones non *ita ſe* habẽt, vt diximus. In his autem *ideo* decipimur, quia neceſſariũ quidpiam accidit ex his quæ poſita ſunt, cùm ſyllogiſmus quoque ſit res neceſſaria. ſed latiùs patet res neceſſaria, quàm ſyllogiſmus: quoniam omnis ſyllogiſmus *eſt* res neceſſaria: non omnis autem res neceſſaria *eſt* ſyllogiſmus. Quamobrem non continuò, ſi quid poſitis quibuſdam accidit, tentanda eſt reductio: ſed primùm accipiendæ *ſunt* duæ propoſitiones. 6 Ita deinde facienda *eſt* diuiſio in terminos. 7 Ex terminis autem, is, qui in ambabus propoſitionibus dicitur, pro medio haberi debet: quandoquidem neceſſe *eſt*, medium in ambabus propoſitionibus ineſſe: *idque* in omnibus figuris. 8 Si igitur medium alij, & aliud medio attribuatur; aut ipſum *alij* attribuatur, aliud verò de eo negetur: erit prima figura. ſi verò & attribuatur & negetur ab aliquo: *erit* media *figura*. quòd ſi alia ei attribuantur; aut aliud negetur, aliud attribuatur: *erit* vltima *figura*. ſic enim diſponebatur medium in ſingulis figuris. Similiter autem *fit*, etiam ſi propoſitiones non ſint vniuerſales: eadem namque *eſt* definitio medij. 9 Perſpicuum igitur *eſt*, cùm in oratione idem ſępius non dicitur, non fieri ſyllogiſmum: quia non eſt ſumptum medium. 10 Cùm autem habeamus quale problema in quaque figura concludatur; & in qua *concludatur* vniuerſale, in qua particulare: conſtat, non eſſe ad omnes figuras reſpiciendum, ſed ad cuiuſque problematis propriam. cùm autem in pluribus *figuris* concluditur: ex medij collocatione figuram cognoſcemus.

De terminorum quantitate ſpectanda. Cap. XXXIII.

1 De deceptione ob concludendi neceſſitatem. 2 De deceptione ob ſimilitudinem collocationis extremorum: 3 quæ vno, 4 & altero exemplo explicatur: 5 & conſiſtit in exiguo diſcrimine, quod eſt inter propoſitionem vniuerſalem & indefinitam.

CAP. XXXV. Πολλάκις μὲν οὖν ἀπατᾶσθαι συμβαίνει περὶ τοὺς D συλλογισμοὺς διὰ τὸ ἀναγκαῖον, ὥσπερ εἴρηται πρότερον. ἐνίοτε δὲ παρὰ τὴν ὁμοιότητα τῆς τῶν ὅρων θέσεως· ὅπερ οὐ χρὴ λανθάνειν ἡμᾶς. 2 Οἷον, εἰ τὸ α κατὰ τοῦ β λέγεται, καὶ τὸ β κατὰ τοῦ γ· δόξειε γὰρ ἄν, οὕτως ἐχόντων τῶν ὅρων, εἶναι συλλογισμός· οὐ γίνεται δέ, οὔτ' ἀναγκαῖον οὐδέν, οὔτε συλλογισμός. 3 Ἔστω γὰρ ἐφ' ᾧ τὸ α, τὸ ἀεὶ εἶναι· ἐφ' ᾧ δὲ β, διανοητὸς Ἀριστομένης· τὸ δ' ἐφ' ᾧ γ, Ἀριστομένης. Ἀληθὲς δὴ τὸ α τῷ β ὑπάρχειν· ἀεὶ γάρ ἐστι, διανοητὸς Ἀριστομένης. ἀλλὰ καὶ τὸ β τῷ γ· ὁ γὰρ Ἀριστομένης, διανοητὸς Ἀριστομένης ἐστί. τὸ δὲ α τῷ γ οὐχ ὑπάρχει· φθαρτὸς γάρ ἐστιν ὁ Ἀριστομένης. οὐ γὰρ ἐγένετο συλλογισμός, οὕτως ἐχόντων τῶν ὅρων. ἀλλ' ἔδει καθόλου τὴν α β ληφθῆναι πρότασιν. τοῦτο δὲ ψεῦδος, τὸ ἀξιοῦν πάντα τὸν διανοητὸν Ἀριστομένην ἀεὶ εἶναι,

SÆpe igitur accidit vt in ſyllogiſmis decipiamur ob *concludendi* neceſſitatem, vt antea dictum eſt. Interdum verò propter ſimilitudinem collocationis terminorum: quod non oportet nos latere. 2 Vt ſi τὸ α dicitur de β, ac τὸ β de γ: vtique enim videbitur terminis ita poſitis eſſe ſyllogiſmus: ſed neque neceſſarium quidpiam fit, neque ſyllogiſmus. 3 Sit enim vbi α, ſemper eſſe: vbi β, intelligibilis Ariſtomenes: vbi γ, Ariſtomenes. Verum igitur *eſt*, τὸ α τῷ β ineſſe: ſemper enim eſt, intelligibilis Ariſtomenes. item *verũ eſt*, τὸ β τῷ γ *ineſſe*: quoniam Ariſtomenes *eſt* intelligibilis Ariſtomenes. ſed τὸ α τῷ γ non ineſt: quoniam Ariſtomenes eſt interitui obnoxius. Etenim ſyllogiſmus non fiebat, ita poſitis terminis: ſed opus erat vt ſumeretur propoſitio α β, vniuerſalis. hoc verò falſum *eſt*, ſi quis ſibi concedi poſtulet omnem in-

[illegible]bilem Ariſtomenem ſemper eſſe, cum Ariſtomenes interitui ſit obnoxius. 4 Rurſus eſto, vbi γ, Miccalus: vbi ϐ, muſicus Miccalus: vbi α, interire cras. Verè igitur τὸ β τῷ γ attribuitur: (quia Miccalus eſt muſicus Miccalus) item τὸ α τῷ β: (interierit n. cras muſicus Miccalus) ſed α de γ falſò dicitur. Hoc itaque *exemplum* à ſuperiori non differt: quia non *eſt* verum vniuerſaliter, Miccalum muſicum cras interiturum: quo non accepto, non erat ſyllogiſmus. 5 Atque hæc deceptio fit ob exiguum *diſcrimen*. nam *ita* concedimus, quaſi nihil differat, vtrum dicatur hoc huic ineſſe, an hoc huic omni ineſſe.

A φθαρτοῦ ὄντος τοῦ Ἀριστομένους. 4 Πάλιν ἔστω, τὸ μὲν ἐφ' ᾧ γ, Μίκκαλος· τὸ δὲ ἐφ' ᾧ ϐ, μουσικὸς Μίκκαλος· ἐφ' ᾧ δὲ τὸ α, τὸ φθείρεσθαι αὔριον. Ἀληθὲς δὴ, τὸ β τοῦ γ κατηγορεῖν· (ὁ γὰρ Μίκκαλος, ἐστὶ μουσικὸς Μίκκαλος) ἀλλὰ καὶ τὸ α τοῦ ϐ· (φθείροιτο γὰρ αὔριον μουσικὸς Μίκκαλος) τὸ δέ γε α τοῦ γ, ψεῦδος. τοῦτο δὴ ταὐτόν ἐστι τῷ πρότερον· οὐ γὰρ ἀληθὲς καθόλου, Μίκκαλος μουσικὸς ὅτι φθείρεται αὔριον· τούτου δὲ μὴ ληφθέντος, οὐκ ἦν συλλογισμός. 5 Αὕτη μὲν οὖν ἡ ἀπάτη γίνεται ἐν τῷ παρὰ μικρόν· ὡς γὰρ οὐδὲν διαφέρον εἰπεῖν τόδε τῷδε ὑπάρχειν, ἢ τόδε τῷδε παντὶ ὑπάρχειν, συγχωροῦμεν.

De nominibus concretis, & abſtractis. Cap. XXXIV.

1 De errore contingente in prima, 2 vel ſecunda, 3 vel tertia figura. 4 Quæ in re hic error conſiſtat, & quomodo vitari debeat.

SÆpe etiam accidit vt decipiamur, quia termini qui in propoſitione *collocantur*, non rectè exponuntur. Vt ſi τὸ α ſit ſanitas: vbi ϐ, morbus: vbi γ, homo. Nam verè dicitur τὸ α nulli ϐ ineſſe poſſe: (nulli enim morbo ſanitas ineſt) rurſus *verum eſt* τὸ ϐ omni γ ineſſe: (quoniam omnis homo *eſt* ſuſceptiuus morbi) vnde videtur conſequi, vt nulli homini ſanitas ineſſe poſſit. Cuius rei cauſa *eſt*, quia non rectè expoſiti ſunt termini in dictione. tranſmutatis enim *vocabulis* quibus habitus ſignificantur, non erit ſyllogiſmus. vt pro ſanitate ſi ponatur ſanum: pro morbo, morbidum, *ſeu ægrotum*. non enim verè dixeris, non contingere vt ægroto inſit ſanum eſſe. quo non accepto, non fit ſyllogiſmus: niſi contingentis: quod *ſanè* non *eſt* impoſſibile: contingit enim, nulli homini ſanitatem ineſſe. 2 Rurſus in media figura ſimiliter erit falſitas. nam ſanitatem nulli morbo, & omni homini contingit ineſſe: proinde nulli homini morbum. 3 In tertia verò figura falſum colligitur ratione contingentis. nam & ſanitatem & morbum, necnon ſcientiam & ignorantiam, atque omnino contraria eidem omni contingit ineſſe: ſibi autem mutuò *ineſſe*, impoſſibile *eſt*. Hoc autem cum iis quæ ſuprà dicta fuerunt, non conſentit. cùm enim contingit eidem plura ineſſe, contingebat etiam ſibi inuicem *ineſſe*. 4 Perſpicuum igitur *eſt*, in his omnibus deceptionem oriri ex terminorum expoſitione. tranſmutatis enim *vocabulis* quibus habitus ſignificantur, nihil falſi colligitur. vnde liquet in huiuſmodi propoſitionibus loco habitus ſumendum eſſe ac pro termino ponendum id quod eſt habitu præditum.

B ΠΟλλάκις δὲ διαψεύδεσθαι συμπεσεῖται παρὰ τὸ μὴ καλῶς ἐκτίθεσθαι τοὺς κατὰ τὴν πρότασιν ὅρους. CAP. XXXVI. οἷον, εἰ τὸ μὲν α, εἴη ὑγίεια· τὸ δὲ ἐφ' ᾧ ϐ, νόσος· ἐφ' ᾧ δὲ γ, ἄνθρωπος. Ἀληθὲς γὰρ εἰπεῖν, ὅτι τὸ α οὐδενὶ τῷ ϐ ἐνδέχεται ὑπάρχειν (οὐδεμιᾷ γὰρ νόσῳ ὑγίεια ὑπάρχει) καὶ πάλιν, ὅτι τὸ ϐ παντὶ τῷ γ ὑπάρχει (πᾶς γὰρ ἄνθρωπος, δεκτικὸς νόσου) δόξειεν ἂν οὖν συμβαίνειν, μηδενὶ ἀνθρώπῳ ἐνδέχεσθαι ὑγίειαν ὑπάρχειν. τούτου δ' αἴτιον, τὸ μὴ καλῶς ἐκκεῖσθαι τοὺς ὅρους κατὰ τὴν λέξιν. ἐπεὶ μεταληφθέντων τῶν κατὰ τὰς ἕξεις, οὐκ ἔσται συλλογισμός· οἷον, ἀντὶ C μὲν τῆς ὑγιείας, εἰ τεθείη τὸ ὑγιαῖνον· ἀντὶ δὲ τῆς νόσου, τὸ νοσοῦν. οὐ γὰρ ἀληθὲς εἰπεῖν ὡς οὐκ ἐνδέχεται τῷ νοσοῦντι τὸ ὑγιαίνειν ὑπάρξαι. τούτου δὲ μὴ ληφθέντος, οὐ γίνεται συλλογισμὸς, εἰ μὴ τοῦ ἐνδέχεσθαι· τοῦτο δὲ, οὐκ ἀδύνατον· ἐνδέχεται γὰρ μηδενὶ ὑπάρχειν ἀνθρώπῳ ὑγίειαν. 2 Πάλιν ἐπὶ τοῦ μέσου σχήματος ὁμοίως ἔσται τὸ ψεῦδος. τὴν γὰρ ὑγίειαν νόσῳ μὲν οὐδεμιᾷ, ἀνθρώπῳ δὲ παντὶ ἐνδέχεται ὑπάρχειν· ὥστ' οὐδενὶ ἀνθρώπῳ νόσον. 3 Ἐν δὲ τῷ τρίτῳ σχήματι, κατὰ τὸ ἐνδέχεσθαι συμβαίνει τὸ ψεῦδος. καὶ γὰρ D ὑγίειαν καὶ νόσον, καὶ ἐπιστήμην καὶ ἄγνοιαν, καὶ ὅλως τὰ ἐναντία παντὶ τῷ αὐτῷ ἐνδέχεται ὑπάρχειν· ἀλλήλοις δ', ἀδύνατον. Τοῦτο δὲ ἀνομολογούμενον τοῖς προειρημένοις. ὅτε γὰρ τῷ αὐτῷ πλείω ἐνδέχοιτο ὑπάρχειν, ἐνεδέχετο καὶ ἀλλήλοις. 4 Φανερὸν οὖν, ὅτι ἐν ἅπασι τούτοις ἡ ἀπάτη γίνεται παρὰ τὴν τῶν ὅρων ἔκθεσιν· μεταληφθέντων γὰρ τῶν κατὰ τὰς ἕξεις, οὐδὲν γίνεται ψεῦδος. δῆλον οὖν, ὅτι κατὰ τὰς τοιαύτας προτάσεις, ἀεὶ τὸ κατὰ τὴν ἕξιν, ἀντὶ τῆς ἕξεως μεταληπτέον, καὶ θετέον ὅρον.

De iis quæ nomine carent. Cap. XXXV.

NEc verò ſemper nomen quærere oportet quo termini exponantur: ſæpe enim erunt orationes, quibus non eſt poſitum nomen. ideóque difficile *eſt* reducere huiuſcemodi ſyllogiſmos: & quandoque accidit vt fallamur ob huiuſmodi inquiſitionem: vtputà quoniam immediatorum eſt ſyllogiſmus. Sit enim τὸ α, duo recti: vbi β, triangulus: vbi γ, æquicrurus. τῷ γ igitur ineſt τὸ α per ϐ: *ineſt* autem τῷ ϐ, non per aliud: quia per ſe triangulus habet duos rectos. quare non erit medium *propoſi-*

E ΟΥ δεῖ δὲ τοὺς ὅρους ἀεὶ ζητεῖν ὀνόματι ἐκτίθεσθαι· CAP. XXXVII. πολλάκις γὰρ ἔσονται λόγοι, οἷς οὐ κεῖται ὀνόματα. διὸ καὶ χαλεπὸν ἀνάγειν τοὺς τοιούτους συλλογισμούς. ἐνίοτε δὲ καὶ ἀπατᾶσθαι συμβήσεται διὰ τὴν τοιαύτην ζήτησιν· οἷον, ὅτι τῶν ἀμέσων ἐστὶ συλλογισμός. ἔστω γὰρ τὸ α, δύο ὀρθαί· τὸ ἐφ' ᾧ ϐ, τρίγωνον· ἐφ' ᾧ δὲ γ, ἰσοσκελές. τῷ μὲν οὖν γ ὑπάρχει τὸ α διὰ τὸ β. τῷ δὲ β, οὐκέτι δι' ἄλλο· καθ' αὑτὸ γὰρ τὸ τρίγωνον ἔχει δύο ὀρθάς. ὥστ' οὐκ ἔσται μέσον τοῦ

αβ* ἀποδεικτοῦ ὄντος. Φανερὸν οὖν, ὅτι τὸ μέσον οὐχ οὕτως ἀεὶ ληπτέον, ὡς τόδε τι, ἀλλ' ἐνίοτε λόγον, ὅπερ συμβαίνει κἀπὶ τοῦ λεχθέντος.

* χ. καθὸ ἀποδεικτοῦ.

A *tionis* αβ, quæ eſt demonſtrabilis. Per[illegible] igitur, medium non ita ſemper accipiendum eſt, quaſi *ſit* hoc aliquid: ſed interdum *accipiendum eſt* orationem: quod quidem euenit etiam in dicto *exemplo*.

De nomine recto, & obliquis caſibus. Cap. XXXVI.

1 *Variè terminos efferri.* 2 *Exemplum affirmationis in caſu obliquo conceptæ.* 3 *De ſyllogiſmis affirmatiuis in prima figura: in quibus maior propoſitio eſt recta, minor, & concluſio obliquæ:* 4 *vel minor recta, maior, & concluſio obliquæ.* 5 *vel ambæ propoſitiones obliquæ, & concluſio ſimiliter obliqua: vel ambæ propoſitiones obliquæ, & concluſio recta.* 6 *De ſyllogiſmis negantibus* 7 *in prima,* 8 *vel ſecunda,* 9 *vel tertia figura.* 10 *Communia de omnium ſyllogiſmis.*

Τὸ δὲ ὑπάρχειν τὸ πρῶτον τῷ μέσῳ, καὶ τοῦτο τῷ ἄκρῳ, οὐ δεῖ λαμβάνειν, ὡς ἀεὶ κατηγορηθησομένων ἀλλήλων ὁμοίως, τό, τε πρῶτον τοῦ μέσου, καὶ τοῦτο τοῦ ἐσχάτου. καὶ ἐπὶ τοῦ μὴ ὑπάρχειν δέ, ὡσαύτως. ἀλλ' ὁσαχῶς τὸ εἶναι λέγεται, καὶ τὸ ἀληθὲς εἰπεῖν αὐτὸ τοῦτο, τοσαυταχῶς οἴεσθαι χρὴ σημαίνειν τὸ ὑπάρχειν, καὶ τὸ μὴ ὑπάρχειν. 2 Οἷον, ὅτι τῶν ἐναντίων ἐστὶ μία ἐπιστήμη. ἔστω γὰρ τὸ α, τὸ μίαν εἶναι ἐπιστήμην· τὰ δ' ἐναντία ἀλλήλοις, ἐφ' οὗ β. τὸ δὴ α τῷ β ὑπάρχει· οὐχ ὡς τὰ ἐναντία, * τὸ μίαν εἶναι αὐτῶν ἐπιστήμην· ἀλλὰ ὅτι ἀληθὲς εἰπεῖν κατ' αὐτῶν, μίαν εἶναι αὐτῶν ἐπιστήμην. 3 Συμβαίνει δ', ὁτὲ μὲν ἐπὶ τοῦ μέσου τὸ πρῶτον λέγεσθαι, τὸ δὲ μέσον ἐπὶ τοῦ τρίτου μὴ λέγεσθαι· οἷον, εἰ ἡ σοφία ἐστὶν ἐπιστήμη, τοῦ δ' ἀγαθοῦ ἐστιν ἡ σοφία, συμπέρασμα ὅτι τοῦ ἀγαθοῦ ἐπιστήμη ἐστί. τὸ μὲν δὴ ἀγαθὸν οὐκ ἔστιν ἐπιστήμη· ἡ δὲ σοφία ἐστὶν ἐπιστήμη. 4 Ὁτὲ δέ, τὸ μὲν μέσον ἐπὶ τοῦ τρίτου λέγεται· τὸ δὲ πρῶτον, ἐπὶ τοῦ μέσου οὐ λέγεται. οἷον, εἰ τοῦ ποιοῦ παντὸς ἐστὶν ἐπιστήμη, ἢ ἐναντίου· τὸ δ' ἀγαθόν, καὶ ἐναντίον, καὶ ποιόν· συμπέρασμα μέν, ὅτι τοῦ ἀγαθοῦ ἐστὶν ἐπιστήμη· οὐκ ἔστι δὲ τὸ ἀγαθὸν ἐπιστήμη, οὐδὲ τὸ ποιόν, οὐδὲ τὸ ἐναντίον· ἀλλὰ τὸ ἀγαθόν, ταῦτα. 5 Ἔστι δὲ ὅτε μήτε τὸ πρῶτον κατὰ τοῦ μέσου, μήτε τοῦτο κατὰ τοῦ τρίτου· τοῦ πρώτου κατὰ τοῦ τρίτου, ὁτὲ μὲν λεγομένου, ὁτὲ δὲ μὴ λεγομένου. οἷον, εἰ οὗ ἐπιστήμη ἐστίν, ἔστι τούτου γένος· τοῦ δ' ἀγαθοῦ ἐστὶν ἐπιστήμη· συμπέρασμα, ὅτι τοῦ ἀγαθοῦ ἐστὶ γένος. κατηγορεῖται δὲ οὐδὲν κατ' οὐδενός. Εἰ δέ, οὗ ἐστὶν ἐπιστήμη, γένος ἐστὶ τοῦτο· τοῦ δ' ἀγαθοῦ ἐστὶν ἐπιστήμη· συμπέρασμα, ὅτι τὸ ἀγαθόν ἐστι γένος. κατὰ μὲν δὴ τοῦ ἄκρου κατηγορεῖται τὸ πρῶτον, κατ' ἀλλήλων δὲ οὐ λέγεται. 6 Τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τοῦ μὴ ὑπάρχειν ληπτέον. οὐ γὰρ ἀεὶ σημαίνει τὸ μὴ ὑπάρχειν τόδε τῷδε, μὴ εἶναι τόδε τῷδε· ἀλλ' ἐνίοτε μὴ εἶναι τόδε τοῦδε, ἢ τόδε τῷδε. 7 Οἷον, ὅτι οὐκ ἔστι κινήσεως κίνησις, ἢ γενέσεως γένεσις· ἡδονῆς δέ ἐστιν· οὐκ ἄρα ἡ ἡδονή, γένεσις, ἢ κίνησις. πάλιν, ὅτι γέλωτος μὲν ἐστὶ σημεῖον· σημείου δὲ οὐκ ἔστι σημεῖον, ὥστ' οὐ σημεῖον ὁ γέλως. 8 Ὁμοίως δὲ κἂν τοῖς ἄλλοις, ἐν ὅσοις ἀναιρεῖται τὸ πρόβλημα τῷ λέγεσθαί πως πρὸς αὐτό, * τὸ γένος. 9 Πάλιν, ὅτι ὁ καιρὸς οὐκ ἔστι χρόνος δέων· θεῷ γὰρ καιρὸς μὲν ἐστί, χρόνος δ' οὐκ ἔστι δέων, διὰ τὸ μηδὲν εἶναι θεῷ ὠφέλιμον. ὅρους μὲν γὰρ θετέον, καιρόν, καὶ χρόνον δέοντα, καὶ θεόν· τὴν δὲ πρότασιν ληπτέον κατὰ τὴν τοῦ ὀνόματος πτῶσιν. 10 Ἁπλῶς γὰρ τοῦτο λέγομεν κατὰ πάντων, ὅτι τοὺς μὲν ὅρους ἀεὶ θετέον κατὰ τὰς κλήσεις τῶν ὀνομάτων· οἷον ἄνθρωπος, ἢ ἀγαθόν, ἢ τἀναντία· οὐκ, ἀνθρώπου, ἢ ἀγαθοῦ, ἢ ἐναντίων· τὰς δὲ προ[illegible] ληπτέον κατὰ τὰς ἑκάστου πτώσεις· ἢ γὰρ ὅτι τούτῳ, οἷον τὸ[illegible] ὅτι τούτου,

* χ. τὴν μίαν. medoſè, vt ex Gr. interpret. liquet.

* Alexander ſuſpicatur mendum eſſe ac legendum ἢ μίαν.

B Primum autem ineſſe medio, & hoc extremo, non debet accipi, quaſi ſemper ſibi attribuantur ſimiliter primum medio & hoc extremo. eadémque eſt ratio *eius quod dicitur* non ineſſe. ſed quot modis *verbum* Eſſe accipitur, & aliquid v[illegible] dicitur: totidem exiſtimandum eſt ſignificatio[illegible] eſſe *verbi* Ineſſe, & Non ineſſe. 2 Veluti q[illegible] contrariorum eſt vna ſcientia. ſit enim τὸ α, v[illegible] eſſe ſcientiam: inuicem autem contraria, vbi [illegible] eſt igitur τὸ α τῷ β, non quaſi cõtraria ſint vna ſcientia, ſed quia verè de eis dicitur, vnam eſſe eorum ſcientiam. 3 Accidit autem interdum vt de medio primum dicatur, medium autem de tertio C non dicatur. vt ſi ſapientia eſt ſcientia, boni autem eſt ſapientia: concluditur, boni eſſe ſcientiam. bonum igitur non eſt ſapientia: ſapientia verò eſt ſcientia. 4 Interdum verò medium de tertio dicitur, primum autem de medio non dicitur. vt ſi omnis qualis, aut contrarij eſt ſcientia: bonum autem *eſt* & contrarium, & quale: concluditur, boni eſſe ſcientiam: bonum autem, aut quale, aut contrarium non eſt ſcientia: ſed bonum *eſt* hæc *ipſa*: 5 Quandoque nec primum *dicitur* de medio, neque hoc de tertio: vbi primum de tertio aliquando dicitur, aliquando non dicitur. verbi causâ, ſi cuius eſt ſcientia, eius eſt genus: boni autem eſt ſcientia: concluditur, boni eſſe genus. D *ex his* autem nullum alij attribuitur. Si verò cuius eſt ſcientia, illud eſt genus: boni autem eſt ſcientia: concluditur, bonum eſſe genus. Extremo igitur attribuitur primum: de ſe autem non dicuntur. 6 Eodem modo accipiendum *eſt* in eo quod non ineſt: quoniam hoc non ineſſe huic, non ſemper ſignificat, hoc non eſſe hoc, ſed aliquando non eſſe hoc huius, aut hoc huic. 7 Vtputà non eſt motionis motio, vel generationis generatio: voluptatis autem eſt *motio, & generatio*: voluptas igitur non *eſt* generatio, aut motio. Rurſus, *ipſi*[illegible] ſus eſt ſignum: ſigni autem non eſt ſignum: itaque *ipſe* riſus non *eſt* ſignum. 8 Similiter *fit* in aliis, in quibus euertitur problema ex eo quòd genus aliquo modo ad id refertur. E 9 Rurſus occaſio non eſt tempus oportunum: quoniam Deo eſt occaſio: non eſt autem *ei* tempus opportunum, quia nihil eſt Deo vtile. terminos enim ponere oportet, occaſionem, & tempus oportunum, & Deum: propoſitio verò accipi debet ſecundum nominis caſum. 10 Simpliciter enim hoc de omnibus dicimus, terminos ſemper ponendos *eſſe* ſecundum nominum appellationes: vt Homo, aut Bonum, aut Contraria: non, Hominis, aut Boni, aut Contrariorum. propoſitiones autem accipi debent ſecundum cuiuſque *vocabuli* caſus. aut enim huic vt æquale: aut huius,

vt duplum: aut hoc, vt verberans, vel videns: aut hic, vt homo, animal: aut ſi quovis alio modo nomen cadit in propoſitionem. A

δεῖ τὸ διπλάσιον· ἢ ὅτι τοῦτο, δεῖ τὸ τύπτον, ἢ τὸ ὁρῶν· ἢ ὅτι ἐστί, δεῖ ἄνθρωπος, ζῷον· ἢ εἴ πως ἄλλως πίπτει τοὔνομα κατὰ τὴν πρότασιν.

De variis attributionum generibus. Cap. XXXVII.

IAm verò hoc huic ineſſe, &, hoc de hoc verè dici, tot modis accipere debemus quot ſunt modi attributionum: atque has *accipe* aut quadamtenus, aut ſimpliciter: item aut ſimplices, aut coniunctas. Similiterque *accipi debet* Non ineſſe. Hæc autem meliùs conſideranda *ſunt* ac definienda. B

ΤΟ δὲ ὑπάρχειν τόδε τῷδε, καὶ τὸ ἀληθεύεσθαι τόδε κατὰ τοῦδε, τοσαυταχῶς ληπτέον, ὁσαχῶς αἱ κατηγορίαι διῄρηνται· καὶ ταύτας ἢ πῇ, ἢ ἁπλῶς· ἔτι δὲ ἢ ἁπλᾶς, ἢ συμπεπλεγμένας. ὁμοίως δὲ καὶ τὸ μὴ ὑπάρχειν. ἐπισκεπτέον δὲ ταῦτα καὶ διοριστέον βέλτιον.

De iteratione, ſeu repetitione eiuſdem termini. Cap. XXXVIII.

1 Vbi collocari debeat quod iteratur. 2 Exemplum primum datæ regulæ. 3 Alia tota exempla. 4 Differentia ſyllogiſmorum, qui iteratione carent, vel iterationem habent medij termini ad minoris extremi eſſentiam pertinentis aut non pertinentis. 5 Exemplum ſyllogiſmi iteratione carentis. 6 Exemplum ſyllogiſmi iterantis medium terminum ad minoris extremi eſſentiam pertinentis. 7 Exemplum ſyllogiſmi iterantis medium terminum ad minoris extremi eſſentiam non pertinentis. 8 Epilogus.

QVod autem iteratur in propoſitionibus, primo extremo iungi debet, non medio *termino*. 2 Verbi causâ, ſi fiat ſyllogiſmus *quo colligatur* iuſtitiæ eſſe ſcientiam quòd *ſit* bonum: illud, quòd *ſit* bonum, vel, quà bonum, primo extremo iungi debet. Sit enim τὸ α, ſcientia quòd *ſit* bonum: vbi β, bonum. vbi γ, iuſtitia. verè igitur τὸ α τῷ β attribuitur: nam boni eſt ſcientia quòd *ſit* bonum. ſed & τὸ β *verè attribuitur* τῷ γ: quia iuſtitia eſt id quod bonum. Sic igitur fit reſolutio. Si verò τῷ β adiiciatur illud: quod ſit bonum: non erit *verum*. Sanè enim τὸ α *attribui* τῷ β, verum erit. ſed τὸ β *attribui* τῷ γ, minimè verum erit. nam bonũ, quòd *ſit* bonum, attribui iuſtitiæ, falſum *eſt*, nec intelligi poteſt. D 3 Idem *dicendum eſt*, ſi ſalubre oſtendatur eſſe ſcibile quà bonũ, aut hircoceruus opinabilis quà nõ ens: aut homo res interitui obnoxia quà ſenſibilis. in iis enim omnibus quæ attributo adiiciuntur, *hoc tenendum eſt*, iterationem *maiori* extremo iungendam *eſſe*. 4 Non *eſt* autem eadem terminorum poſitio, cùm ſimpliciter quidpiam in ſyllogiſmum deducitur, & cùm hoc aliquid, aut quadamtenus, aut quodam modo. 5 Verbi causâ, cùm bonum oſtenditur eſſe ſcibile, & cùm *oſtenditur* eſſe ſcibile quoddam, *exempli causâ* quòd bonum verùm ſi ſimpliciter ſcibile oſtendatur, medius terminus conſtituetur Ens. 6 Quod ſi *probetur ſcibile eſſe* quòd bonum: *pro medio termino accipitur* aliquod ens. E Sit enim τὸ α, ſcientia quòd ens quodpiam: vbi β, quodpiam ens: vbi γ, bonũ. verè igitur τὸ α τῷ β attribuitur: nam ſcientia eſt cuiuſdã entis quòd *ſit* quoddam ens. ſed & τὸ β τῷ γ: quia vbi γ, *eſt* ens quoddam. quapropter etiam τὸ α *attribuetur* τῷ γ: erit igitur ſcientia boni quòd bonum: nam illud quoddam ens, propriæ eſſentiæ ſignum erat. 7 Sin ens ponatur eſſe medius terminus, & extremo adiiciatur ens ſimpliciter, non quoddam ens: non concluditur, ſcientiam eſſe boni quòd bonum, ſed quòd ens. ſit vbi α, ſcientia quòd ens: vbi β, ens: vbi γ, bonum. 8 Perſpicuum igitur *eſt*, in iis ſyllogiſmis qui ex parte *concludunt* ita *eſſe* terminos accipiendos.

C ΤΟ δ' ἐπαναδιπλούμενον ἐν ταῖς προτάσεσι, πρὸς τῷ πρώτῳ ἄκρῳ θετέον, οὐ πρὸς τῷ μέσῳ. 2 Λέγω δέ, οἷον, εἰ γένοιτο συλλογισμὸς ὅτι τῆς δικαιοσύνης ἐστὶν ἐπιστήμη ὅτι ἀγαθόν, τὸ ὅτι ἀγαθόν, ἢ ᾗ ἀγαθόν, πρὸς τῷ πρώτῳ ἄκρῳ θετέον. ἔστω γὰρ τὸ α, ἐπιστήμη ὅτι ἀγαθόν· ἐφ' ᾧ δὲ τὸ β, τὸ ἀγαθόν. ἐφ' ᾧ δὲ τὸ γ, δικαιοσύνη. τὸ δὴ α, ἀληθὲς τοῦ β κατηγορῆσαι· τοῦ γὰρ ἀγαθοῦ ἐστὶν ἐπιστήμη ὅτι ἀγαθόν. ἀλλὰ καὶ τὸ β τοῦ γ· ἡ γὰρ δικαιοσύνη, ὅπερ ἀγαθόν. οὕτω μὲν οὖν γίνεται ἀνάλυσις. Εἰ δὲ πρὸς τῷ β τεθείη τὸ ὅτι ἀγαθόν, οὐκ ἔσται· τὸ μὲν γὰρ α κατὰ τοῦ β, ἀληθὲς ἔσται· τὸ δὲ β κατὰ τοῦ γ, οὐκ ἀληθὲς ἔσται· τὸ γὰρ ἀγαθὸν ὅτι ἀγαθόν, κατηγορεῖν τῆς δικαιοσύνης, ψεῦδος, καὶ οὐ συνετόν. D 3 Ὁμοίως δὲ καί, εἰ τὸ ὑγιεινὸν δειχθείη ὅτι ἐπιστητόν ἐστιν ᾗ ἀγαθόν· ἢ τραγέλαφος, δοξαστὸν ᾗ μὴ ὄν· ἢ ὁ ἄνθρωπος, φθαρτὸν ᾗ αἰσθητόν· ἐν ἅπασι γὰρ τοῖς ἐπικατηγορουμένοις, πρὸς τῷ ἄκρῳ τὴν ἐπαναδίπλωσιν θετέον. 4 Οὐχ ἡ αὐτὴ δὲ θέσις τῶν ὅρων, ὅταν ἁπλῶς τι συλλογισθῇ, καὶ ὅταν τόδε τι, ἢ πῇ, ἢ πώς. 5 λέγω δ', οἷον ὅταν τὸ ἀγαθόν, ἐπιστητὸν δειχθῇ, καὶ ὅταν ἐπιστητόν τι, ὅτι ἀγαθόν. Ἀλλ' εἰ μὲν ἁπλῶς ἐπιστητὸν δέδεικται, μέσον θετέον τὸ ὄν. 6 Εἰ δ' ὅτι ἀγαθόν, τὸ τὶ ὄν. ἔστω γὰρ τὸ μὲν α, ἐπιστήμη ὅτι τὶ ὄν· ἐφ' ᾧ δὲ β, ὄν τι· τὸ δὲ ἐφ' ᾧ γ, ἀγαθόν. E ἀληθὲς δή, τὸ α τοῦ β κατηγορεῖν· ἦν γὰρ ἐπιστήμη τοῦ τινος ὄντος, ὅτι τὶ ὄν. ἀλλὰ καὶ τὸ β τοῦ γ· τὸ γὰρ ἐφ' ᾧ γ, ὄν τι. ὥστε καὶ τὸ α τοῦ γ· ἔσται ἄρα ἐπιστήμη τοῦ ἀγαθοῦ ὅτι ἀγαθόν· ἦν γὰρ τὸ τὶ ὄν, τῆς ἰδίας οὐσίας σημεῖον. 7 Εἰ δὲ τὸ ὄν, μέσον ἐτέθη, καὶ πρὸς τῷ ἄκρῳ τὸ ὂν ἁπλῶς, καὶ μὴ τὸ τὶ ὂν ἐλέχθη. οὐκ ἂν ἦν συλλογισμὸς ὅτι ἐστὶν ἐπιστήμη τοῦ ἀγαθοῦ ὅτι ἀγαθόν, ἀλλ' ὅτι ὄν. οἷον, ἐφ' ᾧ α, ἐπιστήμη, ὅτι ὄν. ἐφ' ᾧ τὸ β, ὄν· ἐφ' ᾧ γ, ἀγαθόν. 8 Φανερὸν οὖν, ὅτι ἐν τοῖς ἐν μέρει συλλογισμοῖς, οὕτω ληπτέον τοὺς ὅρους. CAP. XXXVIII.

De commutatione orationum & nominum. Cap. XXXIX.

1 Præceptum. 2 Exemplum.

CAP. XXXIX. Δεῖ δὲ καὶ μεταλαμβάνειν ἃ τὸ αὐτὸ δύναται, ὀνόματα ἀντ' ὀνομάτων, καὶ λόγους ἀντὶ λόγων, καὶ ὄνομα καὶ λόγον, καὶ ἀεὶ ἀντὶ τοῦ λόγου τοὔνομα λαμβάνειν· ῥᾴων γὰρ ἡ τῶν ὅρων ἔκθεσις. 2 Οἷον, εἰ μηδὲν διαφέρει εἰπεῖν, τὸ ὑποληπτὸν τοῦ δοξαστοῦ μὴ εἶναι γένος, ἢ μὴ εἶναι ὅπερ ὑποληπτόν τι τὸ δοξαστόν. ταὐτὸν γὰρ τὸ σημαινόμενον ἀντὶ τοῦ λόγου τοῦ λεχθέντος, τὸ ὑποληπτὸν καὶ τὸ δοξαστὸν ὅρους θετέον.

A Oportet etiam commutare, & accipere quæ idem valent, nimirum nomina pro nominibus, & orationes pro orationibus: item commutare nomen & & orationem, ſempérque pro oratione nomen ſumere: ſic enim facilior erit terminorum expoſitio. 2 Verbi gratiâ, ſi nihil refert, vtrum dicatur ſuſpicabile opinabilis non eſſe genus, an opinabile non eſſe id quod ſuſpicabile quoddam: idem enim eſt, quod *vtraque ratione* ſignificatur loco dictæ rationis, ponendi ſunt termini, ſuſpicabile & opinabile.

De articulis. Cap. XL.

Ἐπεὶ δὲ οὐ ταὐτόν ἐστι τὸ εἶναι τὴν ἡδονὴν ἀγαθὸν, καὶ τὸ εἶναι τὴν ἡδονὴν τὸ ἀγαθὸν, οὐχ ὁμοίως θετέον τοὺς ὅρους, ἀλλ' εἰ μέν ἐστιν ὁ συλλογισμὸς ὅτι ἡδονὴ τὸ ἀγαθὸν, ὅρον θετέον τὸ ἀγαθόν· εἰ δ' ὅτι ἀγαθὸν, ἀγαθόν. οὕτως δὲ καὶ ἐπὶ τῶν ἄλλων.

B Qvia verò non idẽ eſt, voluptatem eſſe ἀγαθὸν *id eſt bonum*, &, voluptatem eſſe τὸ ἀγαθὸν *id eſt ipſum bonũ*: non ſimiliter poni terminũ debent. verùm ſi ſyllogiſmo probetur voluptatẽ eſſe τὸ ἀγαθόν: terminus conſtituendus *eſt* τὸ ἀγαθόν: ſin *probetur* eſſe ἀγαθὸν *terminus conſtitui debet* ἀγαθόν. Sic & in aliis *faciendum eſt*.

Interpretatio quarundam orationum. Cap. XLI.

1 ¶ Interpretatio ſequentium orationum: Cui τὸ β ineſt, ei omni τὸ α ineſt: Cui omni τὸ β ineſt, etiam τὸ α omni ineſt. 2 Τὸ α ineſt, τῷ β non ei omni de quo dicitur τὸ β. 3 De quo τὸ β verè dicitur, huic omni τὸ α ineſt. 4 Τὸ α de eo dicitur, de quo omni dicitur τὸ β. 5 De quo dicitur τὸ β, de omni eo dicitur τὸ α. 6 ¶ Hypothecaria.

Οὐκ ἔστι δὲ ταὐτὸν, οὔτ' εἶναι, οὔτ' εἰπεῖν, ὅτι ᾧ τὸ β ὑπάρχει, τούτῳ παντὶ τὸ α ὑπάρχει· καὶ τὸ εἰπεῖν τὸ, ᾧ παντὶ τὸ β ὑπάρχει, καὶ τὸ α ὑπάρχει παντί· οὐδὲν γὰρ κωλύει, τὸ β τῷ γ ὑπάρχειν, μὴ παντὶ δέ. οἷον, ἔστω τὸ μὲν β, καλόν τι· τὸ δὲ γ, λευκόν. εἰ δὴ τινὶ λευκῷ ὑπάρχει καλόν τι, ἀληθὲς εἰπεῖν, ὅτι τῷ λευκῷ ὑπάρχει καλόν· ἀλλ' οὐ παντὶ ἴσως. 2 Εἰ μὲν οὖν τὸ α τῷ β ὑπάρχει, μὴ παντὶ δὲ καθ' οὗ τὸ β· οὔτ' εἰ παντὶ τῷ γ τὸ β, οὔτ' εἰ μόνον τινὶ ὑπάρχει, ἀνάγκη τὸ α οὐχ ὅτι οὐ παντὶ, ἀλλ' οὐδ' ὑπάρχειν τῷ γ. 3 Εἰ δὲ καθ' ὅτου ἂν τὸ β λέγηται ἀληθῶς, τούτῳ παντὶ τὸ α ὑπάρχει· συμβήσεται τὸ α, καθ' οὗ παντὸς τὸ β λέγεται, κατὰ τούτου παντὸς λέγεσθαι. 4 Εἰ μέντοι τὸ α λέγεται, καθ' οὗ ἂν τὸ β λέγηται, κατὰ παντός· οὐδὲν κωλύει, τῷ γ ὑπάρχειν τὸ β, μὴ παντὶ δὲ τὸ α, ἢ ὅλως μὴ ὑπάρχειν. 5 Ἐν δὴ τοῖς τρισὶν ὅροις δῆλον, ὅτι τὸ καθ' οὗ τὸ β, παντὸς τὸ α λέγεσθαι, τοῦτ' ἔστι, καθ' ὅσων τὸ β λέγεται, κατὰ πάντων λέγεσθαι καὶ τὸ α. καὶ εἰ μὲν κατὰ παντὸς τὸ β, καὶ τὸ α οὕτως. εἰ δὲ μὴ κατὰ παντὸς, οὐκ ἀνάγκη τὸ α κατὰ παντός. 6 Οὐ δεῖ δὲ οἴεσθαι, παρὰ τὸ ἐκτίθεσθαι συμβαίνειν τι ἄτοπον· οὐδὲν γὰρ προσχρώμεθα τῷ τόδε τι εἶναι· ἀλλ' ὥσπερ ὁ γεωμέτρης τὴν ποδιαίαν καὶ εὐθεῖαν τήνδε εἶναι καὶ ἀπλατῆ λέγει, οὐκ* οὔσας. ἀλλ' οὐχ οὕτως χρῆται, ὡς ἐκ τούτων συλλογιζόμενος. ὅλως γὰρ ὃ μή ἐστιν, ὡς ὅλον πρὸς μέρος, καὶ ἄλλο πρὸς τοῦτο, ὡς μέρος πρὸς ὅλον, ἐξ οὐδενὸς τῶν τοιούτων δείκνυσιν ὁ δεικνύων· οὐδὲ γὰρ γίνεται ὁ συλλογισμός. τῷ δ' ἐκτίθεσθαι, οὕτω χρώμεθα, ὥσπερ καὶ τῷ αἰσθάνεσθαι, πρὸς τὸν μανθάνοντα λέγοντες [illegible] οὕτως,

* κ. οὔσαν.

C HÆc autem nec in re nec in oratione idem ſunt: Cui τὸ β ineſt, ei omni τὸ α ineſt: &, Cui τὸ β omni ineſt, etiam τὸ α omni ineſt. nihil enim vetat, τὸ β τῷ γ ineſſe, non tamen omni. Vtputà τὸ β ſit pulchrum quoddam: τὸ γ, album. Si igitur cuidam albo ineſt pulchrum quoddam, verè dicetur albo ineſſe pulchrum, ſed fortaſſe non omni. 2 Itaque ſi τὸ α τῷ β ineſt, ſed non omni *ei* de quo *dicitur* τὸ β: ſiue omni γ τὸ β inſit, ſiue alicui tantùm; non ſolùm non *eſt* neceſſe τὸ α ineſſe omni, ſed ne quidem *alicui* γ. 3 Si verò, de quo τὸ β verè dicitur, huic omni τὸ α ineſt: eueniet vt τὸ α de eo omni dicatur, de quo omni τὸ β dicitur. D 4 Quòd ſi τὸ α *de eo* dicitur de quo omni dicitur τὸ β: nihil prohibet, quo minùs τὸ β inſit τῷ γ, *cui* non omni aut omnino nulli τὸ α inſit. 5 In tribus ergo terminis manifeſtum *eſt*, *hanc orationem*, de quo dicitur τὸ β, *de eo* omni dici τὸ α, hoc ſignificare, de quibuſcumque τὸ β dicitur, de *iis* omnibus dici etiam τὸ α, & ſi τὸ β *dicitur* de omni, etiam τὸ α ita *dicetur*. ſi verò non de omni, non *eſt* neceſſe τὸ α *dici* de omni. 6 Non oportet autem exiſtimare, propter *terminorum* expoſitionem euenire aliquid abſurdi. neque enim *ad probandum* eo etiam vtimur, quòd hoc aliquid E ſit: ſed ita *illud adhibemus*, vt geometra pedalem & rectam & ſine latitudine ait eſſe hanc *lineam* quæ non eſt *eiuſmodi*. non ita verò *geometra his* vtitur quaſi ex his ratiocinetur. omnino enim niſi quid referatur tamquàm totum ad partem, & aliud ad hoc tamquam pars ad totum, ex iis non demonſtrat, qui demonſtrat: quia nec ſyllogiſmus *ex his* fit. expoſitione autem ſic vtimur, vt & ſenſu, dum eum, qui diſcit, inſtituimus: non enim ita *vtimur*

quum his demonſtrari nequeat, quomodo uti-A mur propoſitionibus, ex quibus ſyllogiſmus *conſtat.*

ὡς αὐτῶν τούτων οὐχ οἷόν τε ἀποδειχθῆναι, ὥσπερ ἐξ ὧν ὁ συλλογισμός.

De reſolutione ſyllogiſmorum compoſitorum. Cap. XLII.

1 Reſolutionem fieri in plures figuras. 2 In qua figura quæri debet.

Illud nos non lateat, in eodem ſyllogiſmo non B omnes concluſiones per vnam figuram effici, ſed alias per hanc, alias per aliam. Conſtat igitur, etiam reſolutiones ita faciendas *eſſe*. 2 Quia verò non omne problema in omni figura, ſed certa in ſingulis probantur: ex concluſione perſpicuum *eſt*, in qua figura quærendum *ſit*.

ΜΗ λανθανέτω δ' ἡμᾶς, ὅτι ἐν τῷ αὐτῷ συλλογισμῷ οὐχ ἅπαντα τὰ συμπεράσματα δι' ἑνὸς σχήματός ἐστιν, ἀλλὰ τὸ μὲν διὰ τούτου, τὸ δὲ δι' ἄλλου. δῆλον οὖν, ὅτι καὶ τὰς ἀναλύσεις οὕτω ποιητέον. 2 Ἐπεὶ δ' οὐ πᾶν πρόβλημα ἐν ἅπαντι σχήματι, ἀλλ' ἐν ἑκάστῳ τεταγμένα, φανερὸν ἐκ τοῦ συμπεράσματος, ἐν ᾧ σχήματι ζητητέον.

De reprehendenda definitione. Cap. XLIII.

Qvod attinet ad rationes quibus aduerſus defi-C nitiones *diſſeritur, id eſt,* quibus vnum quidpiam ex iis quæ in definitione *poſita ſunt,* reprehenditur: terminus poni debet *id* quod reprehenditur, non tota definitio: minùs enim accidet, vt turbemur ob prolixitatem. vtputà ſi aquam oſtendit eſſe humidū potabile: potabile, & aquam, terminos ponemus.

ΤΟύς τε πρὸς ὁρισμοὺς τῶν λόγων, ὅσοι πρὸς ἕν τι τυγχάνουσι διειλεγμένοι τῶν ἐν τῷ ὅρῳ, πρὸς ὃ διείλεκται, θετέον ὅρον, καὶ οὐ τὸν ἅπαντα λόγον· ἧττον γὰρ συμβήσεται ταράττεσθαι διὰ τὸ μῆκος. οἷον, εἰ τὸ ὕδωρ ἔδειξεν ὅτι ὑγρὸν ποτόν· τὸ ποτὸν, καὶ τὸ ὕδωρ, ὅρους θετέον.

De reſolutione ſyllogiſmorum ducentium ad incommodum, & ceterorum qui fiunt ex hypotheſi. Cap. XLIV.

1 De ſyllogiſmis hypotheticis. 2 De ſyllogiſmis ducentibus ad incommodum. 3 Horum & illorum diſcrimen. 4 Excuſatio.

IAm verò conari non debemus, vt ſyllogiſmos, D *qui ſunt* ex hypotheſi, reducamus: quoniam ex iis quæ poſita ſunt, reduci nequeunt: quippe qui non per ſyllogiſmum probant, ſed ex conuentione & conſenſu. Exempli causâ ſi *quis* ſupponens, niſi vna ſit facultas contrariorū, neque ſcientiam vnam eſſe, deinde diſſerat *& probet* non eſſe contrariorum vnam facultatem, vt ſalubris & inſalubris, quia idē ſimul eſſet ſalubre & inſalubre: certè non eſſe vnam omnium cōtrariorum facultatem, demōſtratum eſt: non eſſe autem *contrariorum vnā* ſcientiam, non eſt demōſtratum: atqui neceſſe *eſt, hoc* fateri: ſed non ex ſyllogiſmo, verùm ex hypotheſi. Hunc igitur *ſyllogiſmum* non licet reducere. eum verò *quo probatur* contrariorum non eſſe vnam facultatem, *reducere* licet. fortaſſis enim hic eſt ſyllogiſmus: *illud* verò, hypotheſis. 2 Similis eſt ratio eorū qui per impoſſibile concludunt: quia nec hos reſoluere licet: ſed deductionē quidem ad impoſ-E ſibile *reſoluere* licet, quia ſyllogiſmo probatur. alterum verò *ideo reſoluere* non licet, quia concluditur ex hypotheſi. 3 Differunt autē à prædictis *ſyllogiſmis ex hypotheſi:* quoniā in illis antea fateri oportet, vt poſtea conueniat: vtputà ſi oſtendatur vnā eſſe facultatē contrariorum, etiam ſcientiam eſſe eandem: hic verò etiam qui antea faſſi non ſunt, *poſt probationem* admittunt, quia falſitas eſt euidens: vtputà ſi diameter dicatur habere cōmunem menſuram, imparia eſſe paribus æqualia. 4 Multi quoque alij cōcluduntur ex hypotheſi, quos conſiderare oportet, ac dilucidè explanare. Quænā igitur *ſint* horū differentiæ, & quot modis fiant *ſyllogiſmi* ex hypotheſi, poſteriùs dicemus: nunc id tantùm nobis manifeſtum eſto, huiuſmodi ſyllogiſmos nō poſſe in figuras reſolui: *cuius rei* cauſam diximus.

ΕΤι δὲ τοὺς ἐξ ὑποθέσεως συλλογισμοὺς, οὐ πειρατέον CAP. XL. ἀνάγειν. οὐ γὰρ ἔστιν ἐκ τῶν κειμένων ἀνάγειν. οὐ γὰρ διὰ συλλογισμοῦ δεδειγμένοι εἰσὶν, ἀλλὰ διὰ συνθήκης ὡμολογημένοι πάντες. οἷον, εἰ ὑποθέμενος, εἰ μία τις δύναμις μὴ εἴη τῶν ἐναντίων, μηδ' ἐπιστήμην εἶναι μίαν, εἶτα διαλεχθείη, ὅτι οὐκ ἔστι μία δύναμις τῶν ἐναντίων· οἷον τοῦ ὑγιεινοῦ καὶ τοῦ νοσώδους· ἅμα γὰρ ἔσται τὸ αὐτὸ ὑγιεινὸν καὶ νοσῶδες. ὅτι μὲν οὐκ ἔστι μία πάντων τῶν ἐναντίων δύναμις, *ἀποδέδεικται· ὅτι δὲ ἐπιστήμη οὐκ ἔστιν, οὐ δέδεικται. καίτοι γε ὁμολογεῖν ἀναγκαῖον. ἀλλ' οὐκ ἐκ συλλογισμοῦ, ἀλλ' ἐξ ὑποθέσεως. τοῦτον μὲν οὖν οὐκ ἔστιν ἀναγαγεῖν· ὅτι δὲ οὐ μία δύναμις, ἔστιν· οὗτος γὰρ ἴσως συλλογισμὸς ἐκεῖνος, *ὑπόθεσις. 2 Ὁμοίως δὲ καὶ ἐπὶ τῶν διὰ τοῦ ἀδυνάτου περαινομένων· οὐδὲ γὰρ τούτους ἔστιν ἀναλύειν· ἀλλὰ τὴν μὲν εἰς τὸ ἀδύνατον ἀπαγωγὴν, ἔστι, συλλογισμῷ γὰρ δείκνυται. θάτερον δ', οὐκ ἔστιν· ἐξ ὑποθέσεως γὰρ περαίνεται. 3 Διαφέρουσι δὲ τῶν προειρημένων· ὅτι ἐν ἐκείνοις μὲν δεῖ προδιομολογήσασθαι, εἰ μέλλει συμφήσειν· οἷον, ἐὰν δειχθῇ μία δύναμις τῶν ἐναντίων, καὶ ἐπιστήμην εἶναι τὴν αὐτήν· ἐνταῦθα δὲ καὶ μὴ προδιομολογησάμενοι συγχωροῦσι, διὰ τὸ φανερὸν εἶναι τὸ ψεῦδος· οἷον, τεθείσης τῆς διαμέτρου συμμέτρου, *τὸ τὰ περιττὰ ἴσα εἶναι τοῖς ἀρτίοις. 4 Πολλοὶ δὲ καὶ ἕτεροι περαίνονται ἐξ ὑποθέσεως, οὓς ἐπισκέψασθαι δεῖ, καὶ διασημῆναι καθαρῶς. τίνες μὲν οὖν αἱ διαφοραὶ τούτων, καὶ ποσαχῶς *γίνονται οἱ ἐξ ὑποθέσεως, ὕστερον ἐροῦμεν· νῦν δὲ τοσοῦτον ἡμῖν ἔστω φανερὸν, ὅτι οὐκ ἔστιν ἀναλύειν εἰς τὰ σχήματα τοὺς τοιούτους συλλογισμούς. καὶ δι' ἣν αἰτίαν, εἴρηται.

* γρ. ἐπιδέδεικται.
* γρ. ὁ δ' ὑπόθεσις
* γρ. τὰ περιττά.
* γρ. γίνεται τὸ ἐξ.

De reſolutione ſyllogiſmorum vnius figuræ in aliam. Cap. XLV.

1 ¶ An reſolutio fieri poſſit. 2 ¶ De reſolutione ſyllogiſmorum primæ figuræ in ſecundam: & primùm τοῦ Celarent in Ceſare. 3 Ferio in Feſtino. 4 ¶ De reſolutione ſyllogiſmorum ſecundæ figuræ in primam. 5 Ceſare in Celarent. 6 Cameſtres in Celarent. 7 Feſtino in Ferio. 8 Baroco reſolui non poſſe. 9 ¶ De prima & tertia figura. 10 ¶ De reſolutione ſyllogiſmorum primæ figuræ in tertiam: ac primùm τοῦ Darij in Datiſi. 11 Ferio in Feriſon. 12 ¶ De reſolutione tertiæ figuræ in primam. 13 Darapti in Darij. 14 Datiſi in Darij. 15 Diſamis in Darij. 16 Felapton in Ferio. 17 Feriſon in Ferio. 18 De Brocardo. 19 ¶ De minore propoſitione conuertenda in mutua reſolutione primæ & tertiæ figuræ. 20 ¶ De reſolutione ſecundæ figuræ in tertiam. 21 Feſtino in Ferio. 22 De Baroco. 23 ¶ De reſolutione tertiæ figuræ in ſecundam: & primùm τοῦ Felapton & τοῦ Feriſon in Feſtino. 24 De Brocardo. 25 ¶ Qui ſyllogiſmi non reſoluantur. 26 ¶ Epilogus.

CAP. XLI.

A Ὅσα δὲ ἐν πλείοσι σχήμασι δείκνυται τῶν προβλημάτων, ἂν ἐν θατέρῳ συλλογισθῇ, ἔστιν* ἀναγαγεῖν τὸν συλλογισμὸν εἰς θάτερον· οἷον, τὸν ἐν τῷ πρώτῳ στερητικὸν εἰς τὸ δεύτερον· καὶ τὸν ἐν τῷ μέσῳ, εἰς τὸ πρῶτον. οὐχ ἅπαντας δὲ, ἀλλ' ἐνίους. ἔσται δὲ φανερὸν ἐν τοῖς ἑπομένοις. 2 Εἰ γὰρ τὸ α μηδενὶ τῷ β, τὸ δὲ β παντὶ τῷ γ, τὸ α οὐδενὶ τῷ γ. οὕτω μὲν οὖν τὸ πρῶτον σχῆμα. ἐὰν δὲ ἀντιστραφῇ τὸ στερητικὸν, τὸ μέσον ἔσται· τὸ γὰρ β τῷ μὲν α οὐδενὶ, τῷ δὲ γ παντὶ *ὑπάρξει. 3 Ὁμοίως δὲ καὶ εἰ μὴ καθόλου, ἀλλ' ἐν μέρει ὁ συλλογισμός· οἷον, εἰ τὸ μὲν α μηδενὶ τῷ β, τὸ δὲ β τινὶ τῷ γ. ἀντιστραφέντος γὰρ τοῦ στερητικοῦ, τὸ μέσον ἔσται σχῆμα. 4 Τῶν δὲ ἐν τῷ δευτέρῳ σχήματι συλλογισμῶν, οἱ μὲν καθόλου, ἀναχθήσονται εἰς τὸ πρῶτον σχῆμα. τῶν δ' ἐν μέρει, ἅτερος* μόνον. 5 Ἔστω γὰρ τὸ α τῷ μὲν β μηδενὶ, τῷ δὲ γ παντὶ ὑπάρχον. ἀντιστραφέντος οὖν τοῦ στερητικοῦ, τὸ πρῶτον ἔσται σχῆμα· τὸ μὲν γὰρ β, οὐδενὶ τῷ α· τὸ δὲ α παντὶ τῷ γ ὑπάρξει. 6 Ἐὰν δὲ τὸ κατηγορικὸν μὲν ᾖ πρὸς τῷ β, τὸ δὲ στερητικὸν πρὸς τῷ γ, πρῶτον ὅρον θετέον τὸ γ· τοῦτο γὰρ οὐδενὶ τῷ α· τὸ δὲ α, παντὶ τῷ β· ὥστ' οὐδενὶ τῷ β τὸ γ. οὐδ' ἄρα τὸ β τῷ γ οὐδενί· ἀντιστρέφει γὰρ τὸ στερητικόν. 7 Ἐὰν δὲ ἐν μέρει ᾖ ὁ συλλογισμός· ὅταν μὲν ᾖ τὸ στερητικὸν πρὸς τῷ μείζονι ἄκρῳ,* ἀναλυθήσεται εἰς τὸ πρῶτον σχῆμα. οἷον, εἰ τὸ α μηδενὶ τῷ β, τῷ δὲ γ τινί· ἀντιστραφέντος γὰρ τοῦ στερητικοῦ, τὸ πρῶτον ἔσται σχῆμα. τὸ μὲν γὰρ β, οὐδενὶ τῷ α· τὸ δὲ α, τινὶ τῷ γ. 8 Ὅταν δὲ τὸ κατηγορικὸν, οὐκ ἀναλυθήσεται· οἷον, εἰ τὸ α τῷ μὲν β παντὶ, τῷ δὲ γ οὐ παντί· οὔτε γὰρ δέχεται ἀντιστροφὴν τὸ α β, οὔτε γενομένης, ἔσται συλλογισμός. 9 Πάλιν, οἱ μὲν ἐν τῷ τρίτῳ σχήματι οὐκ ἀναλυθήσονται πάντες εἰς τὸ πρῶτον· οἱ δ' ἐν τῷ πρώτῳ πάντες, εἰς τὸ τρίτον. 10 Ὑπαρχέτω γὰρ τὸ μὲν α παντὶ τῷ β, τὸ δὲ β τινὶ τῷ γ. οὐκοῦν, ἐπεὶ ἀντιστρέφει τὸ ἐν μέρει κατηγορικὸν, ὑπάρξει καὶ τὸ γ τινὶ τῷ β· τὸ δὲ α παντὶ ὑπῆρχε τῷ β· ὥστε γίνεται τὸ τρίτον σχῆμα. 11 Καὶ εἰ στερητικὸς ὁ συλλογισμὸς, ὡσαύτως· ἀντιστρέφει γὰρ τὸ ἐν μέρει κατηγορικόν. ὥστε τὸ μὲν α οὐδενὶ τῷ β, τὸ δὲ γ τινὶ ὑπάρξει. 12 Τῶν δ' ἐν τῷ τελευταίῳ σχήματι συλλογισμῶν, εἷς μόνος οὐκ ἀναλύεται εἰς τὸ πρῶτον, ὅταν μὴ καθόλου τεθῇ τὸ στερητικόν· οἱ δ' ἄλλοι πάντες ἀναλύονται. 13 Κατηγορείσθω γὰρ παντὸς τοῦ γ τὸ α, καὶ τὸ β. οὐκοῦν ἀντιστρέψει τὸ γ πρὸς ἑκάτερον ἐπὶ μέρους. ὑπάρξει ἄρα τινὶ τῷ β. ὥστ' ἔσται τὸ πρῶτον σχῆμα, εἰ τὸ μὲν α παντὶ τῷ γ, τὸ δὲ γ τινὶ τῷ β. 14 Καὶ εἰ τὸ μὲν α παντὶ τῷ γ, τὸ δὲ β τινὶ τῷ γ, ὁ αὐτὸς λόγος· ἀντιστρέφει γὰρ * πρὸς τὸ γ τὸ β. 15 Ἐὰν δὲ τὸ μὲν β παντὶ τῷ γ, τὸ δὲ α τινὶ τῷ γ, πρῶτον ὅρον θετέον τὸ β· τὸ γὰρ β παντὶ τῷ γ, τὸ δὲ γ

* γρ. ἀνάγειν. * καὶ ὑπάρχει. * γρ. μόνος. * γρ. ἀναχθήσεται. * γρ. πρὸς τὸ β τὸ γ.

A QVæcumque autem problemata in pluribus figuris probantur, ſi in vna, ſyllogiſmo probata ſint, licet ſyllogiſmũ referre in aliam: vt *ſyllogiſmum* priuatiuum in prima figura *extructum referre* in ſecundam: & eum qui in media *extructus eſt*, *referre* in primam. non omnes autem, ſed quoſdam *ita reſoluere licet*. quod in ſequentibus perſpicuum erit. 2 Nam ſi τὸ α inſit nulli β, ac β omni γ: β α inerit nulli γ. ſic igitur *fit* prima figura. quòd ſi *pronunciatum* priuatiuum conuertatur, erit media *figura*: quia β α nulli α, & omni γ, inerit. 3 Similiterque *fit*, ſi ſyllogiſmus non *ſit* vniuerſalis, ſed in parte: vt ſi τὸ α *inſit* nulli β, ac τὸ β alicui γ: quia conuerſâ *propoſitione* priuatiuâ, erit B media figura. 4 Ex ſyllogiſmis autem qui *extruuntur* in ſecunda figura, vniuerſales referentur in primam figuram, ex particularibus verò alter tantùm. 5 Inſit enim β α nulli β, & omni γ. conuerſo igitur *pronunciato* priuatiuo, erit prima figura: quia τὸ β nulli α, ac τὸ α omni γ inerit. 6 Quod ſi affirmatio iungatur τῷ β, priuatio τῷ γ: primus terminus poni debet τὸ γ. hoc enim nulli α *ineſt*, ac τὸ α omni β. quare nulli β τὸ γ *inerit*. ergo etiam τὸ β nulli γ: quia *concluſio* priuatiua conuertitur. 7 Si verò ſyllogiſmus ſit in parte: cùm priuatio iungitur maiori extremo, reſoluetur in primam figuram: vt ſi τὸ α *ineſt* nulli β, & alicui γ. conuerſo C enim *pronunciato* priuatiuo, erit prima figura. nam τὸ β *ineſt* nulli α, & τὸ α alicui γ. 8 Cùm autem affirmatio *iungitur maiori extremo*, non reſoluetur: vt ſi τὸ α *inſit* omni β, & non omni γ: quia neque conuerſionem admittit *propoſitio* α β: neque *conuerſione* factâ erit ſyllogiſmus. 9 Rurſus *ſyllogiſmi* qui *ſunt* in tertia figura, non reſoluentur omnes in primam. ſed qui ſunt in prima, *reſoluentur* omnes in tertiam. 10 Inſit enim τὸ α omni β, ac τὸ β cuidam γ. cùm igitur conuertatur *pronunciatum* in parte attributiuum, inerit etiam τὸ γ cuidam β. verùm τὸ α inerat omni β. quare fit tertia figura. 11 Itidémque, ſi priuatiuus ſit ſyllogiſmus. conuertitur enim *propoſitum* in parte attributiuum. D quare nulli β τὸ α, cuidam verò τὸ γ inerit. 12 Ex ſyllogiſmis autem qui *ſunt* in tertia figura, vnus tantùm non reſoluitur in primam, cùm priuatiuum *pronunciatum* non vniuerſale poſitum fuerit: reliqui autem omnes reſoluuntur. 13 Attribuatur enim omni γ τὸ α & τὸ β. ergo τὸ γ conuertitur in parte ad vtrumque *extremum*. inerit igitur alicui β. quocirca erit prima figura, ſi τὸ α *inſit* omni γ, ac τὸ γ alicui β. 14 Et ſi τὸ α *inſit* omni γ, ac τὸ β alicui γ: eadem *eſt* ratio: quia reciprocatur τὸ β cum γ. 15 Quod ſi τὸ β *inſit* omni γ, ac τὸ α cuidam γ: primus terminus poni debet τὸ β. nã τὸ β *ineſt* omni γ, ac τὸ γ cuidam

cuidam γ. ergo τὸ β cuidam α. & quia reciprocatur A quod eſt in parte, etiam τὸ α inerit cuidam β. 16 Et ſi priuatiuus ſit ſyllogiſmus, cùm termini ſunt vniuerſales, ſimiliter accipi debet. Inſit enim τὸ β omni γ, ac τὸ α nulli. ergo cuidam β ineſt τὸ γ, ac τὸ α nulli γ. itaque medium erit γ. 17 Similiter fiet, ſi priuatiuum pronunciatũ ſit vniuerſale, & attributiuum ſit in parte. nam τὸ α nulli γ, ac τὸ γ cuidã β inerit. 18 Si vero in parte accipiatur pronunciatum priuatiuum, non fiet reſolutio. vt ſi τὸ β omni γ, & τὸ α cuidam non ineſt. nam conuerſa propoſitione β γ, ambæ propoſitiones erunt in parte. 19 Perſpicuum autem eſt, vt hæ figuræ in ſe inuicem reſoluantur, eam B propoſitionem, in qua eſt minus extremum, conuertendam eſſe in vtraque figura. hac enim tranſpoſitã tranſitus fit. 20 Ex ſyllogiſmis autem qui ſunt in media figura, alter reſoluitur, alter non reſoluitur in tertiam. 21 Cùm enim propoſitio vniuerſalis eſt priuatiua, reſoluitur. Nam ſi τὸ α nulli β, & cuidam γ ineſt: ambo extrema ſimiliter reciprocantur cum α. quapropter τὸ β nulli α, ac τὸ γ cuidam ineſt. medium igitur eſt τὸ α. 22 Cùm autem τὸ α omni β ineſt, cuidam verò γ non ineſt: non fit reſolutio. neutra enim propoſitio, cùm fuerit conuerſa, erit vniuerſalis. 23 Ex tertia quoque figura ſyllogiſmi reſoluuntur in ſecundam, cùm priuatiuum C pronunciatum eſt vniuerſale. vt ſi τὸ α ineſt nulli γ, & τὸ β ineſt alicui vel omni. etiam τὸ γ nulli α, & cuidam β inerit. 24 Si vero propoſitum priuatiuum ſit in parte, non reſoluetur: quia negatiuum in parte, non admittit conuerſionem. 25 Perſpicuum igitur eſt, eoſdem ſyllogiſmos non reſolui in his figuris, qui nec in primam reſoluebantur: & cùm in primam figuram ſyllogiſmi referantur, hos ſolùm confirmari per reductionem ad impoſſibile. 26 Quomodo igitur ſyllogiſmos reducere oporteat, & figuras in ſe inuicem reſolui, perſpicuum eſt ex his quæ dicta ſunt.

A τινὶ τῷ α. ὥστε τὸ β τινὶ τῷ α. ἐπεὶ δ' ἀντιστρέφει τὸ ἐν μέρει, καὶ τὸ α τινὶ τῷ β ὑπάρξει. 16 Καὶ εἰ στερητικὸς ὁ συλλογισμὸς, καθόλου τῶν ὅρων ὄντων, ὁμοίως ληπτέον. ὑπαρχέτω γὰρ τὸ β παντὶ τῷ γ, τὸ δὲ α μηδενί. οὐκοῦν τινὶ τῷ β ὑπάρχει τὸ γ· τὸ δὲ α οὐδενὶ τῷ γ. ὥστε ἔσται μέσον τὸ γ. 17 Ὁμοίως δὲ καὶ, εἰ τὸ μὲν, στερητικὸν, καθόλου· τὸ δὲ κατηγορικὸν, ἐν μέρει. τὸ μὲν γὰρ α οὐδενὶ τῷ γ· τὸ δὲ γ τινὶ τῷ β ὑπάρξει. 18 Ἐὰν δὲ ἐν μέρει ληφθῇ τὸ στερητικὸν, οὐκ ἔσται ἀνάλυσις· οἷον, εἰ τὸ μὲν β παντὶ τῷ γ, τὸ δὲ α τινὶ μὴ ὑπάρχει· ἀντιστραφέντος γὰρ τοῦ βγ, ἀμφότεραι αἱ προτάσεις ἔσονται B κατὰ μέρος. 19 Φανερὸν δὲ, ὅτι καὶ πρὸς τὸ ἀναλύειν εἰς ἄλληλα τὰ σχήματα, ἡ πρὸς ἐλάττονι ἄκρῳ πρότασις, ἀντιστρεπτέα ἐν ἀμφοτέροις τοῖς σχήμασι· ταύτης γὰρ μετατιθεμένης, ἡ μετάβασις* γίνεται. 20 Τῶν δὲ ἐν τῷ μέσῳ σχήματι, ἅτερος δὲ οὐκ ἀναλύεται εἰς τὸ τρίτον. 21 Ὅταν μὲν γὰρ ᾖ τὸ καθόλου στερητικὸν, ἀναλύεται. εἰ γὰρ τὸ α μηδενὶ μὲν τῷ β, τῷ δὲ γ τινὶ, ἀμφότερα ὁμοίως ἀντιστρέφει πρὸς τὸ α. ὥστε τὸ μὲν β, οὐδενὶ τῷ α· τὸ δὲ γ, τινί. μέσον ἄρα τὸ α. 22 Ὅταν δὲ τὸ α παντὶ τῷ β, τῷ δὲ γ τινὶ μὴ ὑπάρχῃ,* οὐ γίνεται ἀνάλυσις· οὐδετέρα γὰρ τῶν προτάσεων ἐκ τῆς ἀντιστροφῆς, καθόλου. 23 Καὶ οἱ ἐκ τοῦ τρίτου δὲ σχήματος, C ἀναλυθήσονται εἰς τὸ μέσον, ὅταν ᾖ καθόλου τὸ στερητικόν. οἷον, εἰ τὸ α μηδενὶ τῷ γ, τὸ δὲ β, τινὶ, ἢ παντί. καὶ γὰρ τὸ γ τῷ μὲν α οὐδενὶ, τῷ δὲ β τινὶ ὑπάρξει. 24 Ἐὰν δὲ ἐπὶ μέρους ᾖ τὸ στερητικὸν, οὐκ ἀναλυθήσονται· οὐ γὰρ δέχεται ἀντιστροφὴν τὸ ἐν μέρει ἀποφατικόν. 25 Φανερὸν οὖν, ὅτι οἱ αὐτοὶ συλλογισμοὶ οὐκ ἀναλύονται ἐν τούτοις τοῖς σχήμασιν, οἵπερ οὐδ' εἰς τὸ πρῶτον ἀνελύοντο· καὶ ὅτι εἰς τὸ πρῶτον σχῆμα τῶν συλλογισμῶν ἀναγομένων, οὗτοι* μόνοι διὰ τοῦ ἀδυνάτου περαίνονται. 26 Πῶς μὲν οὖν δεῖ τοὺς συλλογισμοὺς ἀνάγειν, καὶ ὅτι ἀναλύεται τὰ σχήματα εἰς ἄλληλα, φανερὸν ἐκ τῶν εἰρημένων.

* γρ. ἐγίνετο. * γρ. οὐκ ἔσται. * γρ. μόνον.

De attributis finitis, vel infinitis: & de habitibus, vel priuationibus. Cap. XLVI.

1 ¶ De collatione attributi negantis, & attributi infiniti. Quæſtionem an hæc attributa differant, pertinere ad reſolutionem ſyllogiſmorum. 2 Duplex inter ea diſcrimen: 3 quod tribus argumentis probatur: primum quia alterum poteſt eſſe verum vna cum affirmatione, alterum minimè: 4 deinde quia alteri ſubiicitur aliquid, alteri nihil: 5 poſtremo quia fieri poteſt, vt alterum ſit verum, alterum falſum. 6 ¶ Collatio attributionis & negationis attributi infiniti de eodem ſubiecto. 7 ¶ Collatio ſeu diſpoſitio quatuor attributionum, finitæ affirmantis, finitæ negantis, infinitæ affirmantis, & infinitæ negantis. 8 Eadem diſpoſitio attributionum & priuationum. 9 ¶ De pronunciatis definitis. 10 ¶ Expoſitio reſolutionis. 11 ¶ Hypotheoriæ. Generalis confirmatio diſpoſitionis ſuprà explicatæ. 12 Dubitatio. 13 Solutio.

Refert autem, in problemate confirmando vel D euertendo, vtrùm quis hæc exiſtimet eandẽ, an diuerſam rem ſignificare, non eſſe hoc, &, eſſe non hoc: vt, non eſſe album, &, eſſe non album. 2 Neque enim idem ſignificant. nec eius dicti, eſſe album, negatio eſt hoc, eſſe non album, ſed hoc, non eſſe album. 3 Cuius rei ratio hæc eſt: quia ſimiliter ſe habet hoc, poteſt ambulare, ad illud, poteſt non ambulare: vt hoc, eſt album, ad illud, eſt non album. ſed & hoc, ſcit bonum, ſimiliter ſe habet ad illud, ſcit non bonum. (quoniam hæc nihil differunt, ſcit bonum, aut, eſt ſciens bonum. neque item hæc, poteſt ambulare, &, eſt potens ambulare. quapropter etiam oppoſita nihil differunt, nempe, non poteſt ambulare, &, non eſt potens ambulare) ſi igitur hoc, non eſt potens ambulare, idem ſignificat quod, eſt potens non ambulare: hæc ſimul inerunt in eodem,

Διαφέρει δέ τι ἐν τῷ κατασκευάζειν, ἢ ἀνασκευάζειν, τὸ ὑπολαμβάνειν, ἢ ταὐτὸν, ἢ ἕτερον σημαίνειν, τὸ μὴ εἶναι τόδε, καὶ εἶναι μὴ τόδε· οἷον, τὸ μὴ εἶναι λευκὸν, τῷ εἶναι μὴ λευκόν. 2 Οὐ γὰρ ταὐτὸν σημαίνει· οὐδέ ἐστιν ἀπόφασις τοῦ εἶναι λευκὸν, τὸ εἶναι μὴ λευκὸν, ἀλλὰ τὸ, μὴ εἶναι λευκόν. 3 Λόγος δὲ τούτου, ὅδε. ὁμοίως γὰρ ἔχει τὸ δύναται βαδίζειν, πρὸς τὸ, δύναται οὐ βαδίζειν, τῷ, ἐστι λευκὸν, πρὸς τὸ, ἐστιν οὐ λευκόν· καὶ τὸ, ἐπίσταται τἀγαθὸν πρὸς τὸ ἐπίσταται τὸ οὐκ ἀγαθόν. (τὸ γὰρ ἐπίσταται τὸ ἀγαθὸν, ἢ, ἐστιν ἐπιστάμενος τὸ ἀγαθὸν, οὐδὲν διαφέρει· οὐδὲ τὸ δύναται βαδίζειν, ἢ, ἐστι δυνάμενος βαδίζειν· ὥστε καὶ τὰ ἀντικείμενα, οὐ δύναται βαδίζειν, οὐκ ἐστι* δυνάμενος βαδίζειν) εἰ οὖν τὸ, οὐκ ἐστι* δυνάμενος βαδίζειν, ταὐτὸ σημαίνει, καὶ ἐστι δυνάμενος οὐ βαδίζειν, ἢ μὴ βαδίζειν· ταῦτα γε ἅμα ὑπάρξει τῷ αὐτῷ·

CAP. XIII.

* γρ. δυνάμενοι. * γρ. δυνάμενοι.

* γρ. ἐπιστάμενον, τ. ἀγαθοῦ ἔχει.

(ὁ γὰρ αὐτὸς δύναται καὶ βαδίζειν καὶ μὴ βαδίζειν· καὶ * ἐπιστήμων τοῦ ἀγαθοῦ καὶ τοῦ μὴ ἀγαθοῦ ἐστι) φάσις δὲ ἀπόφασις οὐχ ὑπάρχουσιν αἱ ἀντικείμεναι ἅμα τῷ αὐτῷ, ὥσπερ οὖν οὐ ταὐτόν ἐστι τὸ μὴ ἐπίστασθαι τὸ ἀγαθὸν, καὶ ἐπίστασθαι τὸ μὴ ἀγαθόν· οὐδὲ εἶναι μὴ ἀγαθὸν, καὶ μὴ εἶναι ἀγαθὸν, ταὐτόν. τῶν γὰρ ἀνάλογον, ἐὰν θάτερα ἢ ἕτερα, καὶ θάτερα. 4 Οὐδὲ τὸ εἶναι μὴ ἴσον, καὶ τὸ μὴ εἶναι ἴσον· τῷ μὲν γὰρ ὑπόκειταί τι, τῷ ὄντι μὴ ἴσῳ, καὶ τοῦτ' ἔστι τὸ ἄνισον· τῷ δὲ, οὐδέν. διόπερ ἴσον μὲν ἢ ἄνισον, οὐ παντὶ ὑπάρχει· ἴσον δὲ ἢ οὐκ ἴσον, παντί. 5 Ἔτι, τὸ, ἔστιν οὐ λευκὸν ξύλον, καὶ τὸ, οὐκ ἔστι λευκὸν ξύλον, οὐχ ἅμα ὑπάρχει. εἰ γάρ ἐστι ξύλον οὐ λευκὸν, ἔσται ξύλον· τὸ δὲ μὴ ὂν λευκὸν ξύλον, οὐκ ἀνάγκη εἶναι ξύλον. 6 Ὥστε φανερὸν, ὅτι οὐκ ἔστι τοῦ, ἔστιν ἀγαθὸν, τὸ, ἔστιν οὐκ ἀγαθὸν, ἀπόφασις. Εἰ οὖν κατὰ παντὸς ἑνὸς, ἡ ἡ φάσις ἢ ἡ ἀπόφασις ἀληθής· εἰ μὴ ἔστιν ἀπόφασις, δῆλον ὡς κατάφασις ἄν πως εἴη. καταφάσεως δὲ πάσης ἀπόφασίς ἐστι· καὶ ταύτης ἄρα, τὸ, οὐκ ἔστιν οὐκ ἀγαθόν. 7 Ἔχει δὲ τάξιν τήνδε πρὸς ἄλληλα. ἔστω τὸ μὲν εἶναι ἀγαθὸν, ἐφ' οὗ α· τὸ δὲ μὴ εἶναι ἀγαθὸν, ἐφ' οὗ τὸ β· τὸ δὲ εἶναι μὴ ἀγαθὸν, ἐφ' οὗ γ, ὑπὸ τὸ β· τὸ δὲ μὴ εἶναι μὴ ἀγαθὸν, ἐφ' οὗ δ, ὑπὸ τὸ α. Παντὶ δὴ ὑπάρξει ἢ τὸ α ἢ τὸ β καὶ οὐδενὶ τῷ αὐτῷ· καὶ ἢ τὸ γ ἢ τὸ δ, καὶ οὐδενὶ τῷ αὐτῷ. καὶ ᾧ τὸ γ, ἀνάγκη τὸ β παντὶ ὑπάρχειν. εἰ γὰρ ἀληθὲς εἰπεῖν ὅτι ἐστὶν οὐ λευκὸν, καὶ ὅτι οὐκ ἔστι λευκὸν, ἀληθές. ἀδύνατον γὰρ, ἅμα εἶναι λευκὸν καὶ εἶναι μὴ λευκόν· ἢ εἶναι ξύλον οὐ λευκὸν, καὶ εἶναι ξύλον λευκόν. ὥστ' εἰ μὴ ἡ κατάφασις, ἡ ἀπόφασις ὑπάρξει. τῷ δὲ β τὸ γ οὐκ ἀεί. ὃ γὰρ ὅλως μὴ ξύλον ἐστὶν, οὐδὲ ξύλον ἔσται οὐ λευκόν. ἀνάπαλιν τοίνυν ᾧ τὸ α, τὸ δ παντί. ἢ γὰρ τὸ γ, ἢ τὸ δ. ἐπεὶ δ' οὐχ οἷόν τε ἅμα εἶναι μὴ λευκὸν καὶ εἶναι λευκὸν, τὸ δ ὑπάρξει. κατὰ γὰρ τοῦ ὄντος λευκοῦ, ἀληθὲς εἰπεῖν, ὅτι οὐκ ἔστιν οὐ λευκόν· κατὰ δὲ τοῦ δ, οὐ παντὸς τὸ α· κατὰ γὰρ τοῦ ὅλως μὴ ὄντος ξύλου, οὐκ ἀληθὲς τὸ α εἰπεῖν, ὡς ἔστι ξύλον λευκόν. ὥστε τὸ δ, ἀληθές· τὸ α, οὐκ ἀληθὲς, ὅτι ξύλον λευκόν. δῆλον δ' ὅτι καὶ τὸ α γ οὐδενὶ τῷ αὐτῷ ὑπάρχει, εἰ καὶ τὸ β καὶ τὸ δ ἐνδέχεταί τινι τῷ αὐτῷ ὑπάρξαι. 8 Ὁμοίως δ' ἔχουσιν αἱ στερήσεις πρὸς τὰς κατηγορίας ταύτῃ τῇ θέσει. ἔστω γὰρ ἴσον, ἐφ' οὗ τὸ α· οὐκ ἴσον ἐφ' οὗ τὸ β· ἄνισον, ἐφ' οὗ τὸ γ· οὐκ ἄνισον, ἐφ' οὗ τὸ δ. 9 Καὶ ἐπὶ πολλῶν δὲ, ὧν τοῖς μὲν ὑπάρχει, τοῖς δὲ οὐχ ὑπάρχει τὸ αὐτὸ, ἡ μὲν ἀπόφασις ὁμοίως ἀληθεύοιτ' ἂν, ὅτι οὐκ ἔστι λευκὰ πάντα, ἢ ὅτι οὐκ ἔστι λευκὸν ἕκαστον· ὅτι δὲ ἐστὶν οὐ λευκὸν ἕκαστον, ἢ ὅτι πάντα ἐστὶν οὐ λευκὰ, ψεῦδος. ὁμοίως δὲ καὶ τοῦ, ἔστι πᾶν ζῷον λευκὸν, οὐ τὸ, ἔστιν οὐ λευκὸν ἅπαν ζῷον, ἀπόφασις· ἄμφω γὰρ ψευδεῖς· ἀλλὰ τὸ, οὐκ ἔστι πᾶν ζῷον λευκόν. 10 Ἐπεὶ δὲ δῆλον, ὅτι ἕτερον σημαίνει τὸ, ἔστιν οὐ λευκὸν, καὶ τὸ, οὐκ ἔστι λευκόν· καὶ τὸ μὲν, κατάφασις, τὸ δὲ ἀπόφασις· φανερὸν ὡς οὐχ ὁ αὐτὸς τρόπος τοῦ δεικνύναι ἑκάτερον. οἷον ὅτι ὃ ἂν ᾖ ζῷον, οὐκ ἔστι λευκὸν, ἢ ἐνδέχεται μὴ εἶναι λευκόν· καὶ ὅτι ἀληθὲς εἰπεῖν μὴ λευκόν· τοῦτο γάρ ἐστιν εἶναι μὴ λευκόν. ἀλλὰ τοῦ μὲν, ἀληθὲς εἰπεῖν, ἔστι λευκὸν, εἴτε μὴ λευκὸν, ὁ αὐτὸς τρόπος· κατασκευαστικῶς γὰρ ἄμφω διὰ τοῦ πρώτου δείκνυται σχήματος. τὸ γὰρ ἀληθὲς, τῷ ἔστιν ὁμοίως τάττεται. τοῦ γὰρ ἀληθὲς εἰπεῖν λευκὸν, οὐ τὸ ἀληθὲς εἰπεῖν μὴ λευκὸν, ἀπόφασις, ἀλλὰ τὸ μὴ ἀληθὲς εἰπεῖν λευκόν.

A (quoniam idem poteſt & ambulare, & non ambulare: necnon ſcire bonum, & non bonum) affirmatio verò & negatio oppoſitæ, non ſunt ſimul in eodem. Quemadmodum igitur non idem eſt, non noſſe bonum, & noſſe non bonum: ita non idem *eſt*, eſſe non bonum, & non eſſe bonum. nam ſi ex analogis altera ſint diuerſa, etiam altera *ita ſe habent*. 4 Neque idem eſt eſſe non æquale, & non eſſe æquale. alteri namque, *id eſt* ei quod eſt non æquale, ſubiicitur aliquid, *nempe* quod eſt inæquale: alteri verò nihil *ſubiicitur*. Idcirco non omne eſt æquale aut inæquale: omne autem *eſt* æquale aut non æquale. 5 Præterea hæc, eſt non B album lignum, &, non eſt album lignum, non ſimul ſunt. nã ſi eſt lignum non album, erit lignum: quod autem non eſt album lignum, non neceſſe *eſt* eſſe lignum. 6 Quare perſpicuum *eſt*, *huius dicti*, eſt bonum, non eſſe negationem hoc, eſt non bonum. Si igitur de vnoquoque aut affirmatio aut negatio vera *eſt*, cùm negatio non ſit, conſtat affirmationem quodammodo eſſe. Omnis autem affirmationis eſt negatio, ergo huius quoque *negatio eſt*, non eſt non bonum. 7 Habent autem hunc ordinem inter ſe. Eſto, eſſe bonum vbi α: non eſſe bonum, vbi β: eſſe non bonum, vbi γ, ſub β: non eſſe non bonum, vbi δ, ſub α. Cuivis igitur inerit aut τὸ α, aut τὸ β, & nulli eidem *vtrumque*. itẽm C aut τὸ γ, aut τὸ δ, & nulli eidem *vtrumque*. & cuicumque τὸ γ *ineſt*, neceſſe *eſt etiam* τὸ β ineſſe. nam ſi verè dicitur eſſe non album, etiam verè *dicetur* non eſſe album. impoſſibile n. *eſt*, ſimul eſſe album, & non eſſe album: aut eſſe lignum non album, & eſſe lignum album. quare niſi affirmatio *inſit*, negatio inerit. Verum τῷ β τὸ γ non ſemper *conſequens eſt*. quod n. omnino nõ lignum eſt, ne lignum *quidem* erit non album. Contra, cuicumque *ineſt* τὸ α, *ineſt* etiam τὸ δ. aut enim *ineſt* τὸ γ aut τὸ δ. ſed quia nõ poteſt ſimul eſſe non album & eſſe album, τὸ δ inerit. nam de eo quod eſt album, verè dicitur non eſſe non albũ. Non tamen de omni δ *dicitur* τὸ α: quia de D eo quod omnino non eſt lignum, non verè dicitur τὸ α, nempe eſſe lignum album. quare τὸ δ erit verũ: τὸ α, non verum, *id eſt* eſſe lignum album. Manifeſtum quoque *eſt*, τὸ α γ nulli eidem ineſſe, etſi τὸ β & τὸ δ poſſint eidem alicui ſimul ineſſe. 8 Huic collocationi ſimilis eſt collocatio priuationum *relatarum* ad attributiones. Sit n. æquale, vbi α: non æquale, vbi β: inæquale, vbi γ: non inæquale, vbi δ. 9 Quinetiam in multis, quorum aliis ineſt, aliis non ineſt eadem res, negatio ſimiliter vera eſſe poteſt, *veluti*, non ſunt alba omnia, aut, non eſt album vnumquodque: cùm falſa *ſit affirmatio*, eſt non album vnumquodque, vel, omnia ſunt non alba. Similiter huius *affirmationis*, eſt omne animal albũ, E non *eſt* negatio hæc, eſt non album omne animal, (ambæ enim ſunt falſæ) ſed hęc, non eſt omne animal album. 10 Cùm autem conſtet diuerſam eſſe *horum pronunciatorum* ſignificationem, eſt non albũ, &, non eſt album: & alterum eſſe affirmationem, alterum negationem: perſpicuum *eſt*, non eodem modo vtrumque probari. Exempli causâ, *nõ eodem modo hæc probantur*. Quodcumque eſt animal, non eſt album, aut, contingit non eſſe album: &, verè dicitur non album, hoc enim eſt eſſe non album. Sed hæc, verè dicitur eſſe album, ſiue non album, *probandi* modus idem *eſt*. ambo enim adſtruendo probantur per primam figuram. nam *articulus ille*, Verè *dicitur*, ſimiliter collocatur vt *verbum* Eſt. huius enim *pronunciati*, verè dicitur album, non eſt negatio, verè dicitur non album. ſed, non verè dicitur album.

Quod ſi hoc probandum ſit, verè dicitur, quodcumque eſt homo, eſſe muſicum aut eſſe non muſicum: accipiendum eſt, quodcumque eſt animal, eſſe muſicum, aut eſſe non muſicum: ac demonſtratum erit. At verò quodcumque eſt homo, non eſſe muſicum, refutando probatur in dictis tribus modis. 11 Simpliciter autem cùm ita ſe habent τὸ α ac τὸ β, vt ſimul eidem ineſſe nequeant, cuivis autem neceſſariò alterum inſit, itidemque rurſus ſe habent τὸ γ & τὸ δ, conſequens autem eſt τῷ γ τὸ α, nec reciprocatur: tunc etiam τῷ β τὸ δ conſequens erit, nec reciprocabitur: & τὸ α ac τὸ δ poterunt eidem ineſſe, τὸ β autem & τὸ γ non poterunt. Primum igitur τῷ β conſequens eſſe τὸ δ, hinc apparet. Cùm enim cuivis ex neceſſitate inſit alterum τῶν γ δ, ei verò cui τὸ β ineſt, non poſſit ineſſe τὸ γ, quia ſecum infert α, τὸ α verò & τὸ β non poſſunt eidem ineſſe: perſpicuum eſt, conſequens eſſe τὸ δ. Rurſus quia τὸ γ non reciprocatur cum α: cuivis autem ineſt aut τὸ γ, aut τὸ δ: accidit vt τὸ α & τὸ δ eidem inſint. Verùm τὸ β & τὸ γ non poſſunt eidem ineſſe: quia ſtatim ad γ conſequitur τὸ α, atque ita euenit quiddam impoſſibile. perſpicuum igitur eſt τὸ β cum δ non reciprocari: quia vnà cum δ contingit etiam τὸ α ineſſe. 12 Interdum verò etiam in huiuſcemodi terminorum diſpoſitione falli contingit; quia non rectè accipiuntur oppoſita, quorum alterum cuivis ineſſe neceſſe eſt. Vt ſi τὸ α & τὸ β non accidant ſimul eidem, neceſſe autem ſit, cui alterum non ineſt, alterum ineſſe: rurſus eodem modo ſe habeant τὸ γ & τὸ δ: omni autem γ, conſequens ſit τὸ α. concludetur enim, cui τὸ δ ineſt, ei τὸ β neceſſariò ineſſe: quod quidem eſt falſum. Sumatur enim negatio τῶν α β, quæ ſit vbi ζ: rurſúſque negatio τῶν γ δ, quæ ſit vbi θ. neceſſe igitur eſt, cuivis ineſſe aut τὸ α aut τὸ ζ, nimirum aut affirmationem aut negationem: rurſus aut τὸ γ aut τὸ θ quia ſunt affirmatio & negatio: & cuicumque τὸ γ ineſt, etiam τὸ α ineſſe ſuppoſitum fuit. itaque cuicumque τὸ ζ ineſt, etiam τὸ θ inerit. Rurſus quia τῶν ζ β alterū cuivis ineſt, & τῶν θ δ itidem alterum, conſequens autem eſt τῷ ζ τὸ θ: etiam τῷ δ conſequens erit τὸ β: hoc enim ſcimus. Si igitur τῷ γ conſequens eſt τὸ α, etiam τῷ δ conſequens erit τὸ β. quod tamen falſum eſt: quia vice verſa erat conſecutio in iis quæ ita ſe habent. 13 Non enim fortaſſe neceſſe eſt, cuivis ineſſe aut τὸ α aut τὸ ζ, nec aut τὸ ζ aut τὸ β: quia τὸ α non eſt negatio τὸ ζ. nam boni negatio eſt non bonum: hæc autem non idem valent, non eſt bonum, &, neque eſt bonum, neque non bonum. Similis eſt ratio τῶν γ δ: quoniam negationes, quæ ſumptæ fuerunt, duæ ſunt.

A Εἰ δή ἐστιν ἀληθὲς εἰπεῖν, ὃ μὲν ἂν ᾖ ἄνθρωπος, μουσικὸν εἶναι, ἢ μὴ μουσικὸν εἶναι· ὃ δ' ἂν ᾖ ζῷον, ληπτέον ἢ εἶναι μουσικὸν, ἢ μὴ μουσικὸν εἶναι, καὶ δέδεικται. τὸ δὲ μὴ εἶναι μουσικὸν ὃ ἂν ᾖ ἄνθρωπος, ἀνασκευαστικῶς δείκνυται κατὰ τοὺς εἰρημένους τρεῖς τρόπους. 11 Ἁπλῶς δὲ, ὅταν οὕτως ἔχῃ τὸ α καὶ τὸ β, ὥστε ἅμα μὲν τῷ αὐτῷ μὴ ἐνδέχεσθαι, παντὶ δὲ ἐξ ἀνάγκης θάτερον· καὶ πάλιν τὸ γ καὶ τὸ δ ὡσαύτως· ἕπηται δὲ τῷ γ τὸ α, καὶ μὴ ἀντιστρέφῃ· καὶ τῷ β τὸ δ ἀκολουθήσει, καὶ οὐκ ἀντιστρέψει· καὶ τὸ μὲν α καὶ τὸ δ ἐνδέχεται τῷ αὐτῷ, τὸ δὲ β καὶ τὸ γ οὐκ ἐνδέχεται. B Πρῶτον μὲν οὖν, ὅτι τῷ β ἕπεται τὸ δ, ἐνθένδε φανερόν. ἐπεὶ γὰρ παντὶ τῶν γ δ θάτερον ἐξ ἀνάγκης· ᾧ δὲ τὸ β, οὐκ ἐνδέχεται τὸ γ, διὰ τὸ συνεπιφέρειν τὸ α, τὸ δὲ α καὶ β μὴ ἐνδέχεσθαι τῷ αὐτῷ· φανερὸν, ὅτι τὸ δ ἀκολουθήσει. πάλιν, ἐπεὶ τῷ α τὸ γ οὐκ ἀντιστρέφει, παντὶ δὲ ἢ τὸ γ ἢ τὸ δ, ἐνδέχεται τὸ α καὶ τὸ δ τῷ αὐτῷ ὑπάρχειν. τὸ δέ γε β καὶ τὸ γ οὐκ ἐνδέχεται, διὰ τὸ συνακολουθεῖν τῷ γ τὸ α· συμβαίνει γάρ τι ἀδύνατον. φανερὸν οὖν, ὅτι οὐδὲ τὸ β τῷ δ ἀντιστρέφει· ἐπείπερ ἐγχωρεῖ, ἅμα τῷ δ καὶ τὸ α ὑπάρχειν. 12 C Συμβαίνει δὲ ἐνίοτε καὶ ἐν τῇ τοιαύτῃ τάξει τῶν ὅρων ἀπατᾶσθαι, διὰ τὸ μὴ τὰ ἀντικείμενα λαμβάνειν ὀρθῶς, ὧν ἀνάγκη παντὶ θάτερον ὑπάρχειν. οἷον, εἰ τὸ α καὶ τὸ β μὴ ἐνδέχεται ἅμα τῷ αὐτῷ, ἀνάγκη δὲ ὑπάρχειν, ᾧ μὴ θάτερον, θάτερον· καὶ πάλιν τὸ γ καὶ τὸ δ, ὡσαύτως· ᾧ δὲ τὸ γ, παντὶ ἕπεται τὸ α· συμβήσεται γὰρ ᾧ τὸ δ, τὸ β ὑπάρχειν ἐξ ἀνάγκης, ὅπερ ἐστὶ ψεῦδος. Εἰλήφθω γὰρ ἡ ἀπόφασις τῶν α β, ἡ ἐφ' ὧν ζ· καὶ πάλιν τῶν γ δ, ἡ ἐφ' ὧν θ. ἀνάγκη δὴ παντὶ ἢ τὸ α ἢ τὸ ζ· ἢ γὰρ τὴν φάσιν, ἢ τὴν ἀπόφασιν. καὶ πάλιν, ἢ τὸ γ, ἢ τὸ θ· D φάσις γὰρ καὶ ἀπόφασις. καὶ ᾧ τὸ γ, παντὶ τὸ α ὑπόκειται. ὥστε ᾧ τὸ ζ, παντὶ τὸ θ. πάλιν, ἐπεὶ τῶν ζ β, παντὶ θάτερον· καὶ τῶν θ δ ὡσαύτως· ἀκολουθεῖ δὲ τῷ ζ τὸ θ· καὶ τῷ δ ἀκολουθήσει τὸ β· τοῦτο γὰρ ἴσμεν. εἰ ἄρα τῷ γ τὸ α· καὶ τῷ δ τὸ β. τοῦτο δὲ ψεῦδος· ἀνάπαλιν γὰρ ἦν ἐν τοῖς οὕτως ἔχουσιν ἡ ἀκολούθησις. 13 Οὐ γὰρ ἴσως ἀνάγκη παντὶ τὸ α ἢ τὸ ζ, οὐδὲ τὸ ζ ἢ τὸ β· οὐ γάρ ἐστιν ἀπόφασις τοῦ α τὸ ζ. τοῦ γὰρ ἀγαθοῦ, τὸ οὐκ ἀγαθὸν, ἀπόφασις· οὐ ταὐτὸ δέ ἐστι τὸ οὐκ ἔστιν ἀγαθὸν, τῷ οὔτε ἀγαθὸν, οὔτε οὐκ ἀγαθόν. ὁμοίως δὲ καὶ ἐπὶ τῶν γ δ. αἱ γὰρ ἀποφάσεις αἱ εἰλημμέναι, δύο εἰσίν.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΑΝΑΛΥΤΙΚΩΝ ΠΡΟΤΕΡΩΝ
τὸ δεύτερον.

ARISTOTELIS ANALYTICORVM PRIORVM.

LIBER II.

DE POTESTATIBVS SYLLOGISMORVM.

TRACTATVS I.

De poteſtate plura concludendi — Cap. I.

1 Anacephalæoſis. 2 De conuerſione concluſionis. 3 De iis quæ continentur ſub medio termino, aut ſub minori extremo. 4 De ſyllogiſmis vniuerſalibus in prima figura affirmantibus, 5 vel negantibus. 6 De ſyllogiſmis vniuerſalibus in ſecunda figura. 7 De particularibus in prima figura, 8 & in aliis figuris.

CAP. I. Librum hunc interpretes alij in tres partes ſcindunt, alij in duas, qui priorem hunc inſcribunt De ratione iudicandi.

Ἐν πόσοις μὲν οὖν σχήμασι, καὶ διὰ ποίων καὶ πόσων προτάσεων, καὶ πότε, καὶ πῶς γίνεται συλλογισμός· ἔτι δὲ, εἰς ποῖα βλεπτέον ἀνασκευάζοντι, καὶ κατασκευάζοντι, καὶ πῶς δεῖ ζητεῖν περὶ τοῦ προκειμένου καθ' ὁποιανοῦν μέθοδον· ἔτι δὲ καὶ διὰ ποίας ὁδοῦ ληψόμεθα τὰς περὶ ἕκαστον ἀρχὰς, ἤδη διεληλύθαμεν. 2 Ἐπεὶ δὲ οἱ μὲν, καθόλου, τῶν συλλογισμῶν εἰσιν, οἱ δὲ, * ἐπὶ μέρους· οἱ μὲν καθόλου πάντες, ἀεὶ πλείω συλλογίζονται· τῶν δὲ ἐν μέρει, οἱ μὲν κατηγορικοὶ, πλείω· οἱ δὲ ἀποφατικοὶ, τὸ συμπέρασμα μόνον. αἱ μὲν γὰρ ἄλλαι προτάσεις ἀντιστρέφουσιν· ἡ δὲ ἐν μέρει στερητικὴ, οὐκ ἀντιστρέφει· τὸ δὲ συμπέρασμα, τὶ κατά τινός ἐστιν. ὥσθ' οἱ μὲν ἄλλοι συλλογισμοὶ πλείω συλλογίζονται. οἷον, εἰ τὸ α δέδεικται παντὶ τῷ β, ἢ τινὶ, καὶ τὸ β τινὶ τῷ α, ἀναγκαῖον ὑπάρχειν· καὶ εἰ μηδενὶ τῷ β τὸ α, οὐδὲ τὸ β οὐδενὶ τῷ α. τοῦτο δὲ ἕτερον τοῦ ἔμπροσθεν. εἰ δὲ τὸ α τινὶ μὴ ὑπάρχει τῷ β, οὐκ ἀνάγκη καὶ τὸ β τινὶ τῷ α μὴ ὑπάρχειν· ἐνδέχεται γὰρ παντὶ ὑπάρχειν. Αὕτη μὲν οὖν κοινὴ πάντων αἰτία, τῶν τε καθόλου, καὶ τῶν κατὰ μέρος. 3 Ἔστι δὲ περὶ τῶν καθόλου καὶ ἄλλως εἰπεῖν. ὅσα γὰρ ἢ ὑπὸ τὸ μέσον, ἢ ὑπὸ τὸ συμπέρασμά ἐστιν, ἁπάντων ἔσται ὁ αὐτὸς συλλογισμὸς, ἐὰν τὰ μὲν, ἐν τῷ μέσῳ τὰ δὲ, ἐν τῷ συμπεράσματι τεθῇ. 4 Οἷον, εἰ τὸ αβ συμπέρασμα διὰ τοῦ γ, ὅσα ὑπὸ τὸ β ἢ τὸ γ ἐστὶν, ἀνάγκη κατὰ πάντων λέγεσθαι τὸ α. εἰ γὰρ τὸ δ ἐν ὅλῳ τῷ β, τὸ δὲ β ἐν ὅλῳ τῷ α, καὶ τὸ δ ἔσται ἐν ὅλῳ τῷ α. πάλιν, εἰ τὸ ε ἐν ὅλῳ τῷ γ, τὸ δὲ γ ἐν τῷ α, καὶ τὸ ε ἐν ὅλῳ τῷ α ἔσται. 5 Ὁμοίως δὲ, καὶ εἰ στερητικὸς εἴη ὁ συλλογισμός. 6 Ἐπὶ δὲ τοῦ δευτέρου σχήματος, * τὸ ὑπὸ τὸ συμπέρασμα, μόνον ἔσται συλλογίσασθαι. οἷον, εἰ τὸ α τῷ β μηδενὶ, τῷ δὲ γ παντί· συμπέρασμα, ὅτι οὐδενὶ τῷ γ τὸ β. εἰ δὴ τὸ δ ὑπὸ τὸ γ ἐστὶ, φανερὸν ὅτι οὐχ ὑπάρχει αὐτῷ τὸ β. τοῖς δὲ ὑπὸ τὸ α, ὅτι οὐχ ὑπάρχει, οὐ δῆλον διὰ τοῦ συλλογισμοῦ. καίτοι οὐχ ὑπάρχει τῷ ε, εἰ ἔστιν ὑπὸ τὸ α. ἀλλὰ τὸ μὲν, τῷ γ μηδενὶ ὑπάρχειν τὸ β, διὰ τοῦ συλλογισμοῦ δέδεικται. τὸ δὲ, τῷ α μὴ ὑπάρχειν, ἀναπόδεικτον εἴληπται· ὥστε οὐ διὰ τὸν συλλογισμὸν συμβαίνει, τὸ β τῷ ε μὴ ὑπάρχειν. 7 Ἐπὶ δὲ τῶν ἐν μέρει, τῶν μὲν ὑπὸ τὸ συμπέρασμα, οὐκ ἔσται τὸ ἀναγκαῖον. οὐ γὰρ γίνεται συλλογισμὸς, ὅταν αὕτη ληφθῇ ἐν μέρει. τῶν δὲ ὑπὸ τὸ μέσον, ἔσται πάντων, πλὴν οὐ διὰ τὸν συλλογισμόν.

* κ. κατὰ μέρος.

* γ. τὸ ὑ. τ. σ. μ. ἔ. συλλογισμός.

In quot igitur figuris, & per quales ac quot propoſitiones, & quando, & quomodo fiat ſyllogiſmus: amplius, ad quæ reſpiciendum *ſit* euertenti vel adſtruenti, & quomodo quæri debeat de re propoſita ſecundum quamvis methodum: preterea qua via ſumemus cuiuſque *quæſtionis* principia, iam expoſuimus. 2 Cum autem ſyllogiſmorum alij ſint vniuerſales, alij particulares: vniuerſales omnes ſemper plura concludunt: ex particularibus, attributiui plura *concludunt*: negatiui vnam concluſionem *colligunt*. nam aliæ propoſitiones conuertuntur. particularis autem priuatiua non conuertitur. concluſio verò eſt *oratio ſignificans* aliquid de aliquo. quapropter alij ſyllogiſmi plura concludunt. Vt ſi oſtenſum fuerit τὸ α *ineſſe* omni aut alicui β: neceſſe *eſt*, etiam τὸ β ineſſe alicui α. quòd ſi *oſtenſum ſit* nulli β *ineſſe* τὸ α, etiam nulli α *inerit* τὸ β. hæc autem *concluſio* eſt diuerſa à ſuperiori. At ſi α cuidam β non inſit: non *eſt* neceſſe, etiam τὸ β cuidam α non ineſſe. poteſt enim omni ineſſe. Hæc igitur *eſt* cauſa omnium *ſyllogiſmorum* communis, tam vniuerſalium, quàm particularium. 3 Licet autem de vniuerſalibus etiam aliter dicere. nam quæ ſub medio aut ſub concluſione ſunt, *eorum* omnium erit idem ſyllogiſmus, ſi illa in medio, hæc in concluſione ponantur. 4 Vtputa ſi τὸ αβ concludatur per γ: neceſſe *eſt*, τὸ α dici de *iis* omnibus, quæ ſunt ſub β aut *ſub* γ. nam ſi τὸ δ eſt in toto β, ac τὸ β in toto α: etiam τὸ δ erit in toto α. Rurſus ſi τὸ ε *eſt* in toto γ, ac τὸ γ in *ipſo* α: etiam τὸ ε erit in toto α. 5 Similis ratio *eſt*, ſi priuatiuus ſit ſyllogiſmus. 6 In ſecunda autem figura ſyllogiſmus erit eius dumtaxat quod *eſt* ſub concluſione: Vt ſi τὸ α *inſit* nulli β, & omni γ: concludetur, nulli γ *ineſſe* τὸ β. Si igitur τὸ δ eſt ſub γ: perſpicuũ *eſt*, ei non ineſſe τὸ β. Iis verò quæ *ſunt* ſub α, non ineſſe, nõ *eſt* manifeſtum per ſyllogiſmum. atqui non inerit τῷ ε, ſi eſt ſub α. ſed nulli quidẽ γ ineſſe τὸ β, ſyllogiſmo probatum fuit: τῷ α verò nõ ineſſe, ſine demonſtratione acceptum fuit. quare nõ colligitur eo ſyllogiſmo, τὸ β τῷ ε nõ ineſſe. 7 In particularibus autẽ *ſyllogiſmis*, eorũ quæ *ſunt* ſub concluſione *concludendorũ* non erit *vlla* neceſſitas: quia non fit ſyllogiſmus, cùm hæc *propoſitio* accipitur in parte. eorum autem omnium quæ *ſunt* ſub medio erit quidem, non tamen per *eum* ſyllogiſmum.

ὑπάρχει τὸ α ineſt omni β, ac τὸ β cuidam γ. quod enim A poſitum eſt ſub γ, non concludetur. quod verò eſt ſub β, concludetur, non tamen per ſyllogiſmum antecedentem. 9 Similis eſt ratio aliarum figurarum. quod enim eſt ſub concluſione, non cõcludetur: alterum concludetur, non tamen per eum ſyllogiſmum: quã etiam in ſyllogiſmis vniuerſalibus ex non demonſtrata propoſitione probabantur, quæ ſunt ſub medio. quare aut ibi quoque non concludetur, aut concludetur etiam in his.

8 Οἷον, εἰ τὸ α παντὶ τῷ β, τὸ δὲ β τινὶ τῷ γ· τοῦ μὲν γὰρ ὑπὸ τὸ γ τεθέντος οὐκ ἔσται συλλογισμός· τοῦ δὲ ὑπὸ τὸ β, ἔσται· ἀλλ᾽ οὐ διὰ τὸν προγεγενημένον συλλογισμόν. 9 Ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων σχημάτων· τοῦ μὲν γὰρ ὑπὸ τὸ συμπέρασμα, οὐκ ἔσται· θατέρου δὲ ἔσται· πλὴν οὐ διὰ τὸν συλλογισμόν,* ᾗ καὶ ἐν τοῖς καθόλου ἐξ ἀναποδείκτου τῆς προτάσεως τὰ ὑπὸ τὸ μέσον ἐδείκνυτο· ὥστε ἢ οὐδὲ ἐκεῖ ἔσται, ἢ καὶ ἐπὶ τούτων.

De concluſione falſa ex veris propoſitionibus non colligenda, & vera ex falſis colligenda, in prima figura. Cap. II.

1 ¶ Protheoria. 2 ¶ Summa huius tractatus. 3 ¶ Non concludi falſum ex veris. 4 ¶ Concludi verum ex falſis in prima figura. 5 De ſyllogiſmis vniuerſalibus. ſi ambæ propoſitiones ſint omnino falſæ, in Barbara, 6 vel Celarent. 7 ſi ambæ ſint falſæ ex parte. 8 ſi altera ſit falſa, altera vera. 9 ſi maior ſit tota falſa, & minor vera, in Barbara, 10 vel Celarent. 11 Epilogus. 12 ſi maior ſit falſa ex parte, & minor vera, in Barbara, 13 vel Celarent. 14 ſi maior ſit vera, & minor tota falſa, in Babara, 15 vel Celarent. 16 ſi maior ſit vera, & minor falſa ex parte, in Barbara, 17 vel Celarent. 18 De ſyllogiſmis particularibus. 19 ſi maior ſit tota falſa, & minor vera, in Dary, 20 vel Ferio. 21 ſi maior ſit falſa ex parte, & minor vera, in Darii, 22 vel Ferio. 23 ſi maior ſit vera, & minor tota falſa, in Darii, 24 vel Ferio. 25 ſi maior ſit falſa ex parte & minor tota falſa, in Darii, 26 vel Ferio. 27 ſi ambæ propoſitiones ſint in totum falſæ, in Darii, 28 vel Ferio.

POteſt igitur fieri, vt veræ ſint propoſitiones, B ex quibus conſtat ſyllogiſmus: poteſt etiam fieri, vt ſint falſæ: & vt altera ſit vera altera falſa. Concluſio autem neceſſariò eſt aut vera aut falſa. 2 Ex veris igitur non poteſt falſum concludi. ex falſis verum poteſt: non ita tamen vt probetur cur ſit, ſed tantùm quod ſit: nam cur res ſit, non poteſt ſyllogiſmo ex falſis probari: cuius rei cauſa in ſequentibus dicetur. 3 Primùm igitur ex veris non poſſe falſum colligi, hinc manifeſtum eſt. Nam ſi cùm τὸ α eſt, neceſſe eſt τὸ β eſſe: certè cùm τὸ β non eſt, neceſſe eſt τὸ α non eſſe. Si igitur verum eſt τὸ α, neceſſe eſt etiam τὸ β verum eſſe: alioqui accidet vt idem ſimul ſit & non ſit: quod eſt impoſſibile. Neque verò quia poſitũ eſt τὸ α vnus terminus, ſuſpi- C cetur aliquis accidere, vt, cùm vnum quidpiam ſit, neceſſariò aliquid colligatur. hoc enim fieri nequit. quod enim neceſſariò colligitur, eſt concluſio. ex quibus autẽ pauciſſimis hæc colligitur, ſunt tres termini, duo autem interualla & propoſitiones. Ergo ſi verum eſt, cuicumque τὸ β ineſt, etiam τὸ α ineſſe: & cuicumque ineſt τὸ γ, ineſſe etiam τὸ β: profectò cui τὸ γ ineſt, neceſſe eſt τὸ α ineſſe, neque poteſt hoc eſſe falſum: quia ſimul idem ineſſet & nõ ineſſet. Itaque τὸ α quaſi vnum poſitum eſt, cum eo ſignificentur duæ propoſitiones ſimul acceptæ. In priuatiuis quoque res ſimiliter ſe habet. non licet enim ex veris falſum oſtendere. 4 Ex falſis autem verum colligi poteſt, & cùm ambæ propoſi- D tiones ſunt falſæ, & cùm vna. hæc autẽ non vtrauis: ſed ſecunda, ſi totam falſam accipiamus. quòd ſi nõ tota falſa accipiatur, verum colligi poteſt, vtrauis falſa ſumpta fuerit. 5 Inſit enim τὸ α toti γ, & nulli β: neque τὸ β τῷ γ inſit. accidit autem hoc: vt nulli lapidi animal, & lapis nulli homini. Si igitur accipiatur τὸ α ineſſe omni β, ac τὸ β omni γ: τὸ α omni γ inerit. quare ex ambabus falſis vera erit concluſio: omnis enim homo eſt animal. 6 Eadem eſt ratio concluſionis priuatiuæ. Pone enim nec τὸ α nec τὸ β ineſſe vlli γ, verùm τὸ α ineſſe omni β. vt ſi iiſdem terminis acceptis, homo conſtituatur medius terminus. nulli enim lapidi animal, vel homo ineſt, omni autem homini animal.

Ἔστι μὲν οὖν οὕτως ἔχειν, ὥστ᾽ ἀληθεῖς εἶναι τὰς προτάσεις δι᾽ ὧν ὁ συλλογισμός· ἔστι δ᾽, ὥστε ψευδεῖς· ἔστι δ᾽, ὥστε τὴν μὲν, ἀληθῆ, τὴν δὲ, ψευδῆ. τὸ δὲ συμπέρασμα, ἢ ἀληθὲς ἢ ψεῦδος ἐξ ἀνάγκης. 2 Ἐξ ἀληθῶν μὲν οὖν οὐκ ἔστι ψεῦδος συλλογίσασθαι· ἐκ ψευδῶν δὲ ἔστιν ἀληθές, πλὴν οὐ διότι, ἀλλ᾽ ὅτι· τοῦ γὰρ διότι, οὐκ ἔστιν ἐκ ψευδῶν συλλογισμός· δι᾽ ἣν δὲ αἰτίαν, ἐν τοῖς ἑπομένοις λεχθήσεται. CAP. II.

3 Πρῶτον μὲν οὖν, ὅτι ἐξ ἀληθῶν οὐχ οἷόν τε ψεῦδος συλλογίσασθαι, ἐντεῦθεν δῆλον. εἰ γὰρ τοῦ α ὄντος, ἀνάγκη τὸ β εἶναι· τοῦ β μὴ ὄντος, ἀνάγκη τὸ α μὴ εἶναι. εἰ οὖν ἀληθές ἐστι τὸ α, ἀνάγκη καὶ τὸ β ἀληθὲς εἶναι· ἢ συμβήσεται τὸ αὐτὸ ἅμα εἶναί τε καὶ οὐκ εἶναι· τοῦτο δὲ ἀδύνατον. μὴ ὅτι δὲ κεῖται τὸ α εἷς ὅρος, ὑπολαμβανέσθω ἐνδέχεσθαι, ὡς ἑνός τινος ὄντος, ἐξ ἀνάγκης τι συμβαίνειν· οὐ γὰρ οἷόν τε· τὸ μὲν γὰρ συμβαῖνον ἐξ ἀνάγκης, τὸ συμπέρασμά ἐστι· δι᾽ ὧν δὲ τοῦτο γίνεται ἐλαχίστων, τρεῖς ὅροι, δύο δὲ διαστήματα καὶ προτάσεις. εἰ οὖν ἀληθὲς, ᾧ τὸ β ὑπάρχει, καὶ τὸ α παντί· ᾧ δὲ τὸ γ, τὸ β· ᾧ τὸ γ, ἀνάγκη τὸ α ὑπάρχειν· καὶ οὐχ οἷόν τε, τοῦτο ψεῦδος εἶναι· ἅμα γὰρ ὑπάρξει ταὐτὸ, καὶ οὐχ ὑπάρξει. τὸ οὖν α, ὥσπερ ἓν κεῖται, δύο προτάσεις συλληφθεῖσαι. ὁμοίως δὲ καὶ ἐπὶ τῶν στερητικῶν ἔχει· οὐ γάρ ἐστιν ἐξ ἀληθῶν δεῖξαι ψεῦδος. 4 Ἐκ ψευδῶν δὲ ἔστιν ἀληθὲς συλλογίσασθαι, καὶ ἀμφοτέρων τῶν προτάσεων ψευδῶν οὐσῶν, καὶ τῆς μιᾶς· ταύτης δὲ οὐχ ὁποτέρας ἔτυχεν, ἀλλὰ τῆς δευτέρας, ἐὰν περ ὅλην* λαμβάνωμεν ψευδῆ· μὴ ὅλης δὲ λαμβανομένης, ἔστιν ὁποτερασοῦν. * κ. λαμβάνῃ

5 Ἔστω γὰρ τὸ α ὅλῳ τῷ γ ὑπάρχον, τῶν δὲ β μηδενὶ, μηδὲ τὸ β* τῷ γ. ἐνδέχεται δὲ τοῦτο οἷον, λίθῳ οὐδενὶ ζῷον, οὐδὲ λίθος οὐδενὶ ἀνθρώπῳ. ἐὰν οὖν ληφθῇ τὸ α παντὶ τῷ β, καὶ τὸ β παντὶ τῷ γ· τὸ α παντὶ τῷ γ ὑπάρξει, ὥστ᾽ ἐξ ἀμφοῖν ψευδῶν, ἀληθὲς τὸ συμπέρασμα· πᾶς γὰρ ἄνθρωπος, ζῷον. 6 Ὡσαύτως δὲ καὶ τὸ στερητικόν. ἔστω γὰρ τῷ γ μήτε τὸ α ὑπάρχειν μηδενὶ, μήτε τὸ β, τὸ μέντοι α τῷ β παντί. οἷον, ἐὰν τῶν αὐτῶν ὅρων ληφθέντων, μέσον τεθῇ ὁ ἄνθρωπος· λίθῳ γὰρ οὔτε ζῷον, οὔτε ἄνθρωπος οὐδενὶ ὑπάρχει, ἀνθρώπῳ δὲ παντὶ ζῷον. * κ. τῷ γ ὑπάρχειν

A ὥστε ἐὰν, ᾧ μὲν ὑπάρχει παντὶ, λαμβάνωμεν μηδενὶ ὑπάρχειν, ᾧ δὲ μὴ ὑπάρχει, παντὶ ὑπάρχειν· ἐκ ψευδῶν ἀμφοῖν, ἀληθὲς ἔσται τὸ συμπέρασμα. 7 Ὁμοίως δὲ δειχθήσεται, καὶ ἐὰν ἐπί τι ψευδὴς ἑκατέρα ληφθῇ. 8 Ἐὰν δ' ἡ ἑτέρα τεθῇ ψευδής· τῆς μὲν πρώτης, ὅλης ψευδοῦς οὔσης, οἷον τῆς αβ, οὐκ ἔσται τὸ συμπέρασμα ἀληθές· τῆς δὲ βγ, ἔσται. λέγω δὲ ὅλην ψευδῆ, τὴν ἐναντίαν· οἷον, εἰ μηδενὶ ὑπάρχον, παντὶ εἴληπται· ἢ εἰ παντὶ, μηδενὶ ὑπάρχειν. 9 Ἔστω γὰρ τὸ α τῷ β μηδενὶ ὑπάρχον, τὸ δὲ β τῷ γ παντί. ἐὰν δὴ τὴν μὲν βγ πρότασιν,* λάβωμεν ἀληθῆ, τὴν δὲ αβ, ψευδῆ ὅλην, καὶ παντὶ ὑπάρχειν τῷ β τὸ α· ἀδύνατον, τὸ συμπέρασμα ἀληθὲς B εἶναι· οὐδενὶ γὰρ ὑπῆρχε τῶν γ, εἴπερ ᾧ τὸ β, μηδενὶ τὸ α· τὸ δὲ β παντὶ τῷ γ. 10 Ὁμοίως δὲ, οὐδ' εἰ τὸ α τῷ β παντὶ ὑπάρχει, καὶ τὸ β τῷ γ παντί· ληφθείη δὲ ἡ μὲν βγ, ἀληθὴς πρότασις· ἡ δὲ αβ, ψευδὴς ὅλη, καὶ μηδενὶ ᾧ τὸ β, τὸ α· τὸ συμπέρασμα, ψεῦδος ἔσται· παντὶ γὰρ ὑπάρξει τῷ γ τὸ α, εἴπερ ᾧ τὸ β, παντὶ τὸ α, τὸ δὲ β παντὶ τῷ γ. 11 Φανερὸν οὖν, ὅτι τῆς πρώτης, ὅλης λαμβανομένης ψευδοῦς, ἄν τε καταφατικῆς, ἄν τε στερητικῆς, τῆς δ' ἑτέρας ἀληθοῦς, οὐ γίνεται ἀληθὲς τὸ συμπέρασμα. 12 Μὴ ὅλης δὲ λαμβανομένης ψευδοῦς, ἔσται. εἰ γὰρ τὸ α τῷ μὲν γ παντὶ ὑπάρχει, τῷ δὲ β τινὶ, τὸ δὲ β παντὶ τῷ γ· οἷον, ζῷον κύκνῳ μὲν παντὶ, λευκῷ δὲ τινὶ, τὸ δὲ λευκὸν παντὶ κύκνῳ· ἐὰν C ληφθῇ τὸ α παντὶ τῷ β, καὶ τὸ β παντὶ τῷ γ, τὸ α παντὶ τῷ γ ὑπάρξει ἀληθῶς· πᾶς γὰρ κύκνος, ζῷον. 13 Ὁμοίως δὲ καὶ, εἰ στερητικὸν εἴη τὸ αβ· ἐνδέχεται γὰρ, τὸ α τῷ μὲν β τινὶ ὑπάρχειν, τῷ δὲ γ μηδενί· τὸ δὲ β, παντὶ τῷ γ· οἷον, τὸ ζῷον, τινὶ μὲν λευκῷ, χιόνι δὲ οὐδεμιᾷ· λευκὸν δὲ πάσῃ χιόνι. εἰ οὖν ληφθείη, τὸ μὲν α μηδενὶ τῷ β, τὸ δὲ β παντὶ τῷ γ· τὸ α οὐδενὶ τῷ γ ὑπάρξει. 14 Ἐὰν δὲ ἡ μὲν αβ πρότασις, ὅλη ληφθῇ ἀληθής· ἡ δὲ βγ, ὅλη ψευδής· ἔσται συλλογισμὸς ἀληθής· οὐδὲν γὰρ κωλύει, τὸ α καὶ τῷ β καὶ τῷ γ παντὶ ὑπάρχειν, τὸ μέντοι β μηδενὶ τῷ γ· οἷον ὅσα τοῦ αὐτοῦ γένους εἴδη μὴ ὑπ' ἄλληλα· τὸ γὰρ ζῷον καὶ ἵππῳ καὶ ἀνθρώπῳ ὑπάρχει· ἵππος δὲ οὐδενὶ ἀνθρώπῳ. ἐὰν μὲν οὖν ληφθῇ τὸ α παντὶ τῷ β, καὶ τὸ β παντὶ τῷ γ· ἀληθὲς ἔσται τὸ συμπέ- D ρασμα, ψευδοῦς οὔσης ὅλης τῆς βγ προτάσεως. 15 Ὁμοίως δὲ καὶ στερητικῆς οὔσης τῆς αβ προτάσεως. ἐνδέχεται γὰρ τὸ α μήτε τῷ β, μήτε τῷ γ μηδενὶ ὑπάρχειν, μήτε τὸ β μηδενὶ τῷ γ· οἷον, τοῖς ἐξ ἄλλου γένους εἴδεσι, τὸ ἕτερον γένος· τὸ γὰρ ζῷον οὔτε μουσικῇ, οὔτε ἰατρικῇ ὑπάρχει, οὐδ' ἡ μουσικὴ ἰατρικῇ. ληφθέντος οὖν τοῦ μὲν α μηδενὶ τῷ β, τοῦ δὲ β παντὶ τῷ γ, ἀληθὲς ἔσται τὸ συμπέρασμα. 16 Καὶ εἰ μὴ ὅλη ψευδὴς ἡ βγ, ἀλλ' ἐπί τι, καὶ οὕτως ἔσται τὸ συμπέρασμα ἀληθές. οὐδὲν γὰρ κωλύει, τὸ α καὶ τῷ β, καὶ τῷ γ ὅλῳ ὑπάρχειν· τὸ μέντοι β τινὶ τῷ γ· οἷον, τὸ γένος τῷ εἴδει, καὶ τῇ διαφορᾷ· τὸ γὰρ ζῷον παντὶ ἀνθρώπῳ, καὶ παντὶ πεζῷ· ὁ δὲ ἄνθρωπος, τινὶ πεζῷ, καὶ οὐ παντί. εἰ οὖν τὸ α παντὶ E τῷ β, καὶ τὸ β παντὶ τῷ γ ληφθείη· τὸ α παντὶ τῷ γ ὑπάρξει· ὅπερ ἦν ἀληθές. 17 Ὁμοίως δὲ καὶ στερητικῆς οὔσης τῆς αβ προτάσεως. ἐνδέχεται γὰρ τὸ α μήτε τῷ β, μήτε τῷ γ μηδενὶ ὑπάρχειν, τὸ μέντοι β τινὶ τῷ γ· οἷον, τὸ γένος τοῖς ἐξ ἄλλου γένους εἴδεσι, καὶ διαφορᾷ· τὸ γὰρ ζῷον οὔτε φρονήσει οὐδεμιᾷ ὑπάρχει, οὔτε θεωρητικῇ· ἡ δὲ φρόνησις, τινὶ θεωρητικῇ. εἰ οὖν ληφθείη, τὸ μὲν α μηδενὶ τῷ β, τὸ δὲ β παντὶ τῷ γ· οὐδενὶ τῷ γ τὸ α ὑπάρξει· τοῦτο δ' ἦν ἀληθές. 18 Ἐπὶ δὲ τῶν ἐν μέρει συλλογισμῶν ἐνδέχεται καὶ τῆς πρώτης προτάσεως ὅλης ψευδοῦς οὔσης, τῆς δ' ἑτέρας ἀληθοῦς, ἀληθὲς εἶναι τὸ συμπέρασμα· καὶ ἐπί τι ψευδοῦς οὔσης* τῆς αβ, τῆς δὲ βγ,

* γρ. λάβω.

* γρ. τῆς πρώτης τῆς δ' ἑτέρας ἀληθοῦς, * καὶ τῆς μὲν μείζονος ἀληθοῦς.

A Quare ſi cui omni ineſt, acceperimus nulli ineſſe: cui verò non ineſt, omni ineſſe: ex ambabus falſis erit concluſio vera. 7 Similiter oſtendetur, ſi vtraque *propoſitio ſit* falſa ex parte. 8 Cùm autem altera *tantùm propoſitio* falſa poſita eſt: ſi prima ſit tota falſa, vt α β, non erit, concluſio vera: ſin *tota falſa ſit propoſitio* β γ, erit, *vera concluſio*. Totam falſam voco eam quæ eſt contraria veræ. vt ſi ſumptum fuerit omni *ineſſe*, quod nulli ineſt: aut ſi *quod* omni *ineſt*, nulli *acceptum fuerit* ineſſe. 9 Inſit enim τὸ α, nulli β, ac τὸ β omni γ. Si igitur propoſitionem β γ accipiamus veram, *propoſitionem* autem α β totam falſam, & omni β ineſſe τὸ α: fieri nequit, vt concluſio vera ſit: quia nulli γ B inerat: ſiquidem cui τὸ β, *ei* nulli τὸ α *inerat*, & τὸ β *inerat* omni γ. 10 Similiter autem non *erit vera concluſio*, ſi τὸ α inſit omni β, & τὸ β omni γ: & propoſitio β γ ſumatur vera: propoſitio autem α β, tota falſa; & nulli, cui τὸ β *inſit*, τὸ α ineſſe: concluſio, *inquam*, falſa erit. omni enim γ inerit τὸ α: ſiquidem cuicumque τὸ β, *etiam* τὸ α *inerat*, τὸ β verò *inerat* omni Γ. 11 Perſpicuum igitur *eſt*, cùm prima *propoſitio* tota falſa accipitur, ſiue affirmet ſiue neget, altera autem vera, non effici veram concluſionem. 12 Quòd ſi non tota ſumatur falſa, erit *vera concluſio*. Nam ſi τὸ α ineſt omni γ, & alicui β, ac τὸ β omni γ: vt animal omni cygno, & cuidam C albo, albúmque omni cygno; ſi ſumptum ſit τὸ α *ineſſe* omni β, & τὸ β omni γ, τὸ α omni γ verè inerit: omnis enim cygnus eſt animal. 13 Similitérque *concluſio vera erit*, ſi *pronunciatum* α β ſit priuatiuum: poteſt enim τὸ α cuidam β ineſſe, & nulli γ: τὸ β autem omni γ: vt animal cuidam albo, & nulli niui, album autem omni niui. Si igitur ſumptum fuerit, τὸ α *ineſſe* nulli β, ac τὸ β omni γ: τὸ α nulli γ inerit. 14 Quòd ſi propoſitio α β ſumpta fuerit tota vera, & *propoſitio* β γ tota falſa: erit ſyllogiſmus verus. nihil enim prohibet quo minùs τὸ α & omni β & *omni* γ: τὸ β autem nulli γ inſit: vt quæ *ſunt* eiuſdem generis ſpecies non ſubalternæ. nam animal & equo, & homini ineſt: equus autem nulli D homini. Si igitur ſumptum ſit, τὸ α *ineſſe* omni β, & τὸ β omni γ: vera erit concluſio, cùm propoſitio β γ ſit tota falſa. 15 Similiter *res habet*, ſi propoſitio α β ſit priuatiua. accidit enim, vt τὸ α, inſit nulli β, & nulli γ, ac τὸ β nulli γ: vt ſpeciebus quæ *ſunt* ex alio genere, aliud genus. animal namque nec muſicæ, nec medicinæ ineſt, nec muſica medicinæ. Si igitur ſumptum fuerit, τὸ α, *ineſſe* nulli β, & τὸ β omni γ: vera erit concluſio. 16 Et ſi non tota falſa *ſit propoſitio* β γ, ſed ex parte: ſic quoque erit concluſio vera. Nihil enim vetat, τὸ α & τὸ β & τὸ γ toti ineſſe, τὸ β autem alicui γ: vt genus ſpeciei, & differentiæ. nam animal *ineſt* omni homini, & om- E ni pedeſtri: homo autem alicui pedeſtri, & non omni. Si igitur τὸ α omni β, & τὸ β omni γ *ineſſe* ſumptum fuerit: τὸ α omni γ inerit: quod quidem erat verũ. 17 Similis ratio *eſt*, ſi propoſitio α β ſit priuatiua. accidit enim, vt τὸ α nulli β & nulli γ, inſit, τὸ β autem *inſit* alicui γ vt genus ſpeciei & differentiæ, quæ *ſunt* ex alio genere. nã animal neque vlli prudentiæ ineſt, neque cõtẽplatiuæ: prudentia verò *ineſt* cuidam contemplatiuæ. Si igitur ſumptũ fuerit, τὸ α nulli β, & τὸ β omni γ *ineſſe*: nulli γ τὸ α inerit. hoc autẽ verũ erat. 18 In particularibus autẽ ſyllogiſmis, & cũ prima propoſitio eſt tota falſa, altera autẽ vera, cõtingit concluſionẽ eſſe verã: & cũ falſa eſt ex parte *propoſitio* α β, *propoſitio* autẽ β γ tota vera:

& cùm propoſitio α β eſt vera, particularis autem eſt falſa: & cùm ambæ ſunt falſæ. 19 Nihil enim vetat, quo minùs τὸ α inſit nulli β, & cuidam γ, & τὸ β cuidam γ: vt animal nulli niui, & cuidam albo ineſt, & nix cuidam albo. Si igitur nix ponatur medium, & animal, *conſtituatur* primum: ſumaturque τὸ α toti β ineſſe, ac τὸ β cuidam γ: *propoſitio* α β, erit tota falſa: *propoſitio* β γ, *erit* vera: & concluſio, vera. 20 Similiter *dicendum eſt*, & ſi priuatiua ſit propoſitio α β. poteſt n. τὸ α toti β ineſſe, cuidam verò γ non ineſſe: τὸ β autem cuidam γ ineſſe. vt animal omni homini ineſt, & cuidam albo non eſt conſequens: homo autem cuidam albo ineſt. Itaque ſi homo ponatur medius *terminus*, & ſumatur τὸ α nulli β ineſſe, τὸ β autem cuidam γ ineſſe: vera erit concluſio, cùm propoſitio α β tota ſit falſa. 21 Et *ſi* propoſitio α β ſit falſa ex parte, cùm *propoſitio* β γ ſit vera: erit concluſio vera. nihil enim vetat, τὸ α & τὸ β & τὸ γ alicui ineſſe, & τὸ β alicui γ ineſſe: vt animal alicui pulchro, & alicui magno, & pulchrum alicui magno ineſſe. Si igitur ſumptum fuerit, τὸ α *ineſſe* omni β, & τὸ β alicui γ: propoſitio α β erit falſa ex parte, *propoſitio* autem β γ vera, & concluſio vera. 22 Similitérque ſi priuatiua ſit propoſitio α β. iidem enim erunt termini, & eodem modo poſiti, ad demonſtrationem *conficiendam*. 23 Rurſus ſi *propoſitio* α β *ſit* vera, & *propoſitio* β γ falſa: vera erit concluſio. nihil enim prohibet, quominùs τὸ α inſit toti β, & alicui γ, & τὸ β inſit nulli γ: vt animal omni cygno, & cuidam nigro, cygnus autem nulli nigro. Quare ſi ſumptum fuerit, *ineſſe* omni β τὸ α, & alicui γ τὸ β: vera erit concluſio, cùm falſum ſit *proloquium* β γ. 24 Similis *eſt* ratio, ſi priuatiua accipiatur propoſitio α β. poteſt enim τὸ α nulli β *ineſſe*, & cuidam γ non ineſſe, τὸ β autem nulli γ: vt genus ſpeciei quæ *eſt* ex alio genere, & ei quod accidit ſuis ſpeciebus. animal enim ineſt nulli numero, & cuidam albo, numerus autem nulli albo. Si igitur numerus ponatur medius *terminus*: & accipiatur τὸ α *ineſſe* nulli β, ac τὸ β cuidam γ: τὸ α cuidam γ non inerit, quod quidem erat verum: & propoſitio α β *eſt* vera: *propoſitio* β γ, falſa. 25 Et ſi falſa *ſit* ex parte *propoſitio* α β, falſa autem ſit etiam *propoſitio* β γ: erit concluſio vera. nihil enim prohibet, quo minùs τὸ α cuidã β, & cuidam γ inſit, τὸ β autem nulli γ: vt ſi ſit contrarium τὸ β τῷ γ, ambo autẽ accidant eidẽ generi. animal enim cuidam albo, & cuidam nigro ineſt, album autem nulli nigro. Ergo ſi ſumptum fuerit, τὸ α *ineſſe* omni β, & τὸ β alicui γ: vera erit concluſio. 26 Itidémque ſi propoſitio α β accipiatur priuatiua: iidem enim termini *accipientur*, & eodem modo ponentur ad demonſtrationem *efficiendam*. 27 *Sed* & ſi ambæ *propoſitiones* ſint falſæ, erit concluſio vera. poteſt enim τὸ α nulli β, & alicui γ ineſſe, τὸ β autem nulli γ: vt genus ſpeciei quæ *eſt* ex alio genere, & ei quod accidit ſuis ſpeciebus. animal enim nulli numero, & cuidam albo ineſt, & numerus nulli albo. Si igitur ſumptum fuerit, τὸ α ineſſe omni β, & τὸ β alicui γ: concluſio *erit* vera: propoſitiones verò ambæ falſæ. 28 Similitérque ſi priuatiua ſit *propoſitio* α β. nihil enim prohibet, quo minùs τὸ α toti β inſit, cuidam verò γ non inſit, & τὸ β nulli γ: vt animal nulli cygno *ineſt*, & cuidam nigro non ineſt, cygnus autem nulli nigro. Quocirca ſi ſumptum fuerit, τὸ α *ineſſe* nulli β, ac τὸ β cuidam γ: τὸ α non inerit cuidam γ. *erit* igitur concluſio vera, propoſitiones autem falſæ.

A ὅλης ἀληθοῦς καὶ τῆς μὲν α β, ἀληθοῦς, τῆς δὲ ἐν μέρει ψευδοῦς. καὶ ἀμφοτέρων οὐσῶν ψευδῶν. 19 Οὐδὲν γὰρ κωλύει, τὸ α τῷ μὲν β μηδενὶ ὑπάρχειν, τῷ δὲ γ τινὶ, καὶ τὸ β τινὶ τῷ γ. οἷον, ζῶον οὐδεμιᾷ χιόνι, λευκῷ δέ τινι ὑπάρχει, καὶ ἡ χιὼν λευκῷ τινι. εἰ οὖν μέσον τεθείη ἡ χιὼν, πρῶτον δὲ τὸ ζῶον καὶ ληφθείη τὸ μὲν α ὅλῳ τῷ β ὑπάρχειν, τὸ δὲ β τινὶ τῷ γ ἡ μὲν α β, ὅλη ψευδής· ἡ δὲ β γ, ἀληθής· καὶ τὸ συμπέρασμα, ἀληθές. 20 Ὁμοίως δὲ καὶ στερητικῆς οὔσης τῆς α β προτάσεως· ἐνδέχεται γὰρ, τὸ α τῷ μὲν β ὅλῳ ὑπάρχειν, τῷ δὲ γ τινὶ μὴ ὑπάρχειν, τὸ μέντοι β τινὶ ὑπάρχειν τῷ γ. οἷον, τὸ ζῶον ἀνθρώπῳ μὲν παντὶ ὑπάρχει, λευκῷ δέ τινι οὐχ ἕπεται· ὁ δὲ ἄνθρωπος, τινὶ λευκῷ ὑπάρχει. ὥστε εἰ μέ- B σου τεθέντος τοῦ ἀνθρώπου, ληφθείη τὸ α μηδενὶ τῷ β ὑπάρχειν, τὸ δὲ β τινὶ τῷ γ ὑπάρχειν· ἀληθὲς ἔσται τὸ συμπέρασμα, ψευδοῦς οὔσης ὅλης τῆς α β προτάσεως. 21 Καὶ εἰ ἐπί τι ψευδὴς ἡ α β πρότασις, τῆς β γ ἀληθοῦς οὔσης, ἔσται τὸ συμπέρασμα ἀληθές. οὐδὲν γὰρ κωλύει, τὸ α καὶ τῷ β καὶ τῷ γ τινὶ ὑπάρχειν, καὶ τὸ β τῷ γ τινὶ ὑπάρχειν. οἷον, τὸ ζῶον τινὶ καλῷ, καὶ τινὶ μεγάλῳ, καὶ τὸ καλὸν, τινὶ μεγάλῳ ὑπάρχειν. ἐὰν οὖν ληφθῇ τὸ α παντὶ τῷ β, καὶ τὸ β τινὶ τῷ γ· ἡ μὲν α β πρότασις, ἐπί τι ψευδὴς ἔσται· ἡ δὲ β γ, ἀληθής· καὶ τὸ συμπέρασμα, ἀληθές. 22 Ὁμοίως δὲ καὶ στερητικῆς οὔσης τῆς α β προτάσεως. οἱ γὰρ αὐτοὶ ὅροι ἔσονται, καὶ ὡσαύτως κείμενοι, πρὸς τὴν ἀπόδειξιν. 23 Πάλιν C εἰ ἡ μὲν α β, ἀληθὴς· ἡ δὲ β γ ψευδής· ἀληθὲς ἔσται τὸ συμπέρασμα. οὐδὲν γὰρ κωλύει, τὸ α τῷ μὲν β ὅλῳ ὑπάρχειν, τῷ δὲ γ τινὶ, καὶ τὸ β τῷ γ μηδενὶ ὑπάρχειν. οἷον, ζῶον, κύκνῳ μὲν παντὶ, μέλανι δέ τινι, κύκνος δὲ οὐδενὶ μέλανι. ὥστ' εἰ ληφθείη παντὶ τῷ β τὸ α, καὶ τὸ β τῷ γ τινὶ· ἀληθὲς ἔσται τὸ συμπέρασμα, ψευδοῦς ὄντος τοῦ β γ. 24 Ὁμοίως δὲ καὶ στερητικῆς λαμβανομένης τῆς α β προτάσεως. ἐνδέχεται γάρ, τὸ α τῷ μὲν β μηδενὶ, τῷ δὲ γ τινὶ μὴ ὑπάρχειν, τὸ μέντοι β μηδενὶ τῷ γ. οἷον, τὸ γένος τῷ ἐξ ἄλλου γένους εἴδει, καὶ τῷ συμβεβηκότι τοῖς αὑτοῦ εἴδεσι· τὸ γὰρ ζῶον ἀριθμῷ μὲν οὐδενὶ ὑπάρχει, λευκῷ δέ τινι, ὁ δὲ ἀριθμὸς οὐδενὶ λευκῷ. ἐὰν οὖν μέσον τεθῇ ὁ ἀριθμὸς, καὶ ληφθῇ τὸ μὲν α μηδενὶ D τῷ β, τὸ δὲ β τινὶ τῷ γ. τὸ α τινὶ τῷ γ οὐχ ὑπάρξει, ὅπερ ἦν ἀληθές· καὶ ἡ μὲν α β πρότασις, ἀληθής. ἡ δὲ β γ, ψευδής. 25 Καὶ εἰ ἐπί τι ψευδὴς ἡ α β, ψευδὴς δὲ καὶ ἡ β γ· ἔσται τὸ συμπέρασμα ἀληθές. οὐδὲν γὰρ κωλύει, τὸ α τῷ β τινὶ καὶ τῷ γ τινὶ ὑπάρχειν ἑκατέρῳ, τὸ δὲ β μηδενὶ τῷ γ. οἷον, εἰ εἴη ἐναντίον τὸ β τῷ γ, ἄμφω δὲ συμβεβηκότα τῷ αὐτῷ γένει· τὸ γὰρ ζῶον, τινὶ λευκῷ, καὶ τινὶ μέλανι ὑπάρχει, λευκὸν δὲ οὐδενὶ μέλανι. ἐὰν οὖν ληφθῇ τὸ α παντὶ τῷ β, καὶ τὸ β τινὶ τῷ γ· ἀληθὲς ἔσται τὸ συμπέρασμα. 26 Καὶ στερητικῆς δὲ λαμβανομένης τῆς α β, ὡσαύτως· οἱ γὰρ αὐτοὶ ὅροι, καὶ ὡσαύτως, τεθήσονται πρὸς τὴν ἀπόδειξιν. 27 Καὶ ἀμφοτέρων δὲ ψευδῶν οὐσῶν, ἔσται τὸ συμ- E πέρασμα ἀληθές· ἐνδέχεται γὰρ τὸ α τῷ μὲν β μηδενὶ, τῷ δὲ γ τινὶ ὑπάρχειν, τὸ μέντοι β μηδενὶ τῷ γ. οἷον, τὸ γένος τῷ ἐξ ἄλλου γένους εἴδει, καὶ τῷ συμβεβηκότι τοῖς* εἴδεσιν αὐτοῦ· ζῶον γὰρ ἀριθμῷ μὲν οὐδενὶ, λευκῷ δέ τινι ὑπάρχει, καὶ ὁ ἀριθμὸς οὐδενὶ λευκῷ. ἐὰν οὖν ληφθῇ τὸ α παντὶ τῷ β, καὶ τὸ β τινὶ τῷ γ, τὸ μὲν συμπέρασμα, ἀληθές· αἱ δὲ προτάσεις ἄμφω, ψευδεῖς. 28 Ὁμοίως καὶ στερητικῆς οὔσης τῆς α β. οὐδὲν γὰρ κωλύει, τὸ α τῷ μὲν β ὅλῳ ὑπάρχειν, τῷ δὲ γ τινὶ μὴ ὑπάρχειν, μηδὲ τὸ β μηδενὶ τῷ γ. οἷον, ζῶον κύκνῳ μὲν παντὶ, μέλανι δέ τινι οὐχ ὑπάρχει· κύκνος δὲ οὐδενὶ μέλανι. ὥστ' εἰ ληφθείη τὸ α μηδενὶ τῷ β, τὸ δὲ β τινὶ τῷ γ· τὸ α τινὶ τῷ γ οὐχ ὑπάρξει. τὸ μὲν οὖν συμπέρασμα, ἀληθές· αἱ δὲ προτάσεις, ψευδεῖς.

* γρ. ἰδίοις τοῦ αὐτοῦ.

De poteſtate concludendi verum ex falſis in ſecunda figura. Cap. III.

1 ¶ Summaria expoſitio. 2 ¶ De ſyllogiſmis vniuerſalibus. Si ambæ propoſitiones ſint omnino falſæ in Cameſtres, 3 vel Ceſare. 4 Si altera ſit vera, altera omnino falſa. 5 Si propoſitio vera affirmet, & falſa neget, in Ceſare. 6 vel Cameſtres. 7 Si propoſitio vera neget, & falſa ex parte affirmet. 8 Si ambæ propoſitiones ſint ex parte falſæ in Cameſtres, 9 vel Ceſare. 10 ¶ De ſyllogiſmis particularibus. Si maior propoſitio ſit falſa, & minor vera, in Feſtino, 11 vel Baroco. 12 Si maior ſit vera, minor falſa in Feſtino, 13 vel Baroco. 14 Si ambæ propoſitiones ſint falſæ in Feſtino, 15 vel Baroco.

CAP. III.

ἘΝ δὲ τῷ μέσῳ σχήματι πάντως ἐνδέχεται διὰ ψευδῶν A ἀληθὲς συλλογίσασθαι, καὶ ἀμφοτέρων τῶν προτάσεων ὅλων ψευδῶν λαμβανομένων· καὶ ἐπί τι ἑκατέρας· καὶ τῆς μὲν ἀληθοῦς, τῆς δὲ ψευδοῦς οὔσης ὅλης, ὁποτερασοῦν ψευδοῦς τιθεμένης· καὶ εἰ ἀμφότεραι, ἐπί τι ψευδεῖς· καὶ εἰ ἡ μὲν, ἁπλῶς ἀληθής, ἡ δέ, ἐπί τι ψευδής· καὶ εἰ ἡ μέν, ὅλη ψευδής, ἡ δέ, ἐπί τι ἀληθής· καὶ* ἐπὶ τῶν καθόλου, καὶ ἐπὶ τῶν ἐν μέρει συλλογισμῶν. 2 Εἰ γὰρ τὸ α τῷ μὲν β μηδενὶ ὑπάρχει, τῷ δὲ γ παντί· οἷον ζῷον λίθῳ μὲν οὐδενί, ἵππῳ δὲ παντί· ἐὰν ἐναντίως τεθῶσιν αἱ προτάσεις· καὶ ληφθῇ τὸ α τῷ μὲν β παντί, τῷ δὲ γ μηδενί, ἐκ ψευδῶν ὅλων τῶν προτάσεων, B ἀληθὲς ἔσται τὸ συμπέρασμα. 3 Ὁμοίως δὲ καί, εἰ τῷ μὲν β παντί, τῷ δὲ γ μηδενὶ ὑπάρχει τὸ α· ὁ γὰρ αὐτὸς ἔσται συλλογισμός. 4 Πάλιν, εἰ ἡ μὲν ἑτέρα, ὅλη ψευδής· ἡ δὲ ἑτέρα, ὅλη ἀληθής· οὐδὲν γὰρ κωλύει, τὸ α καὶ τῷ β, καὶ τῷ γ παντὶ ὑπάρχειν, τὸ μέντοι β μηδενὶ τῷ γ· οἷον, τὸ γένος τοῖς μὴ ὑπ' ἄλληλα εἴδεσι. τὸ γὰρ ζῷον καὶ ἵππῳ παντί, καὶ ἀνθρώπῳ· καὶ οὐδεὶς ἄνθρωπος, ἵππος. ἐὰν οὖν ληφθῇ τὸ ζῷον, τῷ μέν, παντί, τῷ δέ, μηδενὶ ὑπάρχειν· ἡ μέν, ὅλη ψευδὴς ἔσται· ἡ δέ, ὅλη ἀληθής· καὶ τὸ συμπέρασμα, ἀληθές· πρὸς ὁποτερονοῦν τεθέντος τοῦ στερητικοῦ. 5 Καὶ εἰ ἡ ἑτέρα, ἐπί τι ψευδής· ἡ δὲ ἑτέρα, ὅλη ἀληθής. C ἐνδέχεται γὰρ τὸ α τῷ μὲν β τινὶ ὑπάρχειν, τῷ δὲ γ παντί, τὸ μέντοι β μηδενὶ τῷ γ· οἷον, ζῷον λευκῷ μὲν τινί, κόρακι δὲ παντί, καὶ τὸ λευκὸν οὐδενὶ κόρακι. ἐὰν οὖν ληφθῇ τὸ α τῷ μὲν β μηδενί, τῷ δὲ γ ὅλῳ ὑπάρχειν· ἡ μὲν α β πρότασις, ἐπί τι ψευδής· ἡ δὲ α γ, ὅλη ἀληθής· καὶ τὸ συμπέρασμα, ἀληθές. 6 Καὶ μετατιθεμένου δὲ τοῦ στερητικοῦ, ὡσαύτως· διὰ γὰρ τῶν αὐτῶν ὅρων ἡ ἀπόδειξις. 7 Καὶ εἰ ἡ καταφατικὴ πρότασις, ἐπί τι ψευδής· ἡ δὲ στερητική, ὅλη ἀληθής. οὐδὲν γὰρ κωλύει, τὸ α τῷ μὲν β τινὶ ὑπάρχειν, τῷ δὲ γ ὅλῳ μὴ ὑπάρχειν, καὶ τὸ β μηδενὶ τῷ γ· οἷον, τὸ D ζῷον λευκῷ μέν τινι, πίττῃ δὲ οὐδεμιᾷ, καὶ τὸ λευκὸν οὐδεμιᾷ πίττῃ. ὥστε ἐὰν ληφθῇ τὸ α ὅλῳ τῷ β ὑπάρχειν, τῷ δὲ γ μηδενί· ἡ μὲν α β, ἐπί τι ψευδής· ἡ δὲ α γ, ὅλη ἀληθής· καὶ τὸ συμπέρασμα, ἀληθές. 8 Καὶ εἰ ἀμφότεραι αἱ προτάσεις ἐπί τι ψευδεῖς, ἔσται τὸ συμπέρασμα ἀληθές. ἐνδέχεται γάρ, τὸ α καὶ τῷ β, καὶ τῷ γ τινὶ ὑπάρχειν, τὸ δὲ β μηδενὶ τῷ γ· οἷον, ζῷον καὶ λευκῷ τινί, καὶ μέλανι τινί· τὸ δὲ λευκόν, οὐδενὶ μέλανι. ἐὰν οὖν ληφθῇ τὸ α τῷ μὲν β παντί, τῷ δὲ γ μηδενί· ἄμφω μὲν αἱ προτάσεις, ἐπί τι ψευδεῖς· τὸ δὲ συμπέρασμα, ἀληθές. 9 Ὁμοίως δὲ καὶ μετατεθείσης τῆς στερητικῆς, διὰ E τῶν αὐτῶν ὅρων. 10 Φανερὸν δὲ καὶ ἐπὶ τῶν ἐν μέρει συλλογισμῶν· οὐδὲν γὰρ κωλύει, τὸ α τῷ μὲν β παντί, τῷ δὲ γ τινὶ ὑπάρχειν, καὶ τὸ β τῷ γ τινὶ μὴ ὑπάρχειν· οἷον, ζῷον παντὶ μὲν ἀνθρώπῳ, λευκῷ δέ τινι, ἄνθρωπος δέ τινι λευκῷ οὐχ ὑπάρχει. ἐὰν οὖν τεθῇ τὸ α τῷ μὲν β μηδενὶ ὑπάρχειν, τῷ δὲ γ τινὶ ὑπάρχειν· ἡ μὲν καθόλου πρότασις, ὅλη ψευδής· ἡ δὲ ἐν μέρει, ἀληθής· καὶ τὸ συμπέρασμα, ἀληθές. 11 Ὡσαύτως δὲ καὶ καταφατικῆς λαμβανομένης τῆς α β·

* γρ. ἐν τοῖς καθ.

IN media verò figura omnino licet ex falſis verum concludere: ſiue ambæ propoſitiones totæ falſæ accipiantur: ſiue altervtra *falſa* ex parte: ſiue altera ſit vera, altera tota falſa, vtravis falſa ponatur: ſiue ambæ *ſint* ex parte falſæ: ſiue altera *ſit* vera ſimpliciter, altera falſa ex parte: ſiue altera *ſit* tota falſa, altera vera ex parte, *idque* tum in vniuerſalibus tum in particularibus ſyllogiſmis. 2 Nam ſi τὸ α inſit nulli β, & omni γ: vt animal nulli lapidi, & omni equo: propoſitiones autem contrario modo ponantur, & accipiatur τὸ α *ineſſe* omni β, ac nulli γ: ex propoſitionibus in totum falſis vera erit concluſio. 3 Similitérque, ſi omni β, & nulli γ inſit τὸ α, quoniam erit idem ſyllogiſmus. 4 Rurſus, ſi altera *propoſitio ſit* tota falſa, altera tota vera. nihil enim prohibet, quo minùs τὸ α inſit omni β, & *omni* γ, τὸ β autem nulli γ: vt genus ſpeciebus non ſubalternis. animal enim & omni equo, & *omni* homini *ineſt*: & nullus homo *eſt* equus. Si igitur ſumptum fuerit, animal alteri omni, alteri nulli ineſſe: altera *propoſitio* tota falſa erit, altera tota vera, & concluſio vera, vtrivis adiuncta ſit negatio. 5 Item ſi altera *ſit* falſa ex parte, altera tota vera. poteſt enim τὸ α cuidam β ineſſe, & omni γ: τὸ β autem nulli γ: vt animal cuidam albo, & omni coruo, & album nulli coruo. Si igitur ſumptum fuerit, τὸ α nulli β, & toti γ ineſſe: propoſitio α β erit falſa ex parte, *propoſitio* autem α γ tota vera, & concluſio vera. 6 Itidémque priuatione tranſpoſitâ; quia per eoſdem terminos *fiet* demonſtratio. 7 Idem ſi affirmatiua propoſitio ſit falſa ex parte, priuatiua autem tota vera. nihil enim vetat, τὸ α cuidam β ineſſe, & toti γ non ineſſe, ac τὸ β nulli γ: vt animal cuidam albo, & nulli pici, & album nulli pici. Quare ſi ſumptum fuerit τὸ α toti β ineſſe, & nulli γ: propoſitio α β *erit* falſa ex parte, *propoſitio* autem α γ tota vera, & concluſio vera. 8 *Sed* & ſi ambæ propoſitiones *ſint* ex parte falſæ, erit concluſio vera. poteſt enim τὸ α alicui β & *alicui* γ ineſſe, τὸ β autem nulli γ: vt animal *alicui* albo, & alicui nigro, album autem alicui nigro. Ergo ſi acceptum fuerit τὸ α *ineſſe* omni β, & nulli γ: ambæ propoſitiones *erunt* falſæ ex parte, concluſio autem vera. 9 Similiter, ſi tranſponatur *propoſitio* priuatiua, *demonſtrabitur* per eoſdem terminos. 10 Perſpicuum autem *eſt*, *hoc fieri* etiam in particularibus ſyllogiſmis, nihil enim prohibet. τὸ α omni β, & cuidam γ ineſſe, & τὸ β cuidam γ non ineſſe: vt animal omni homini, & cuidá albo *ineſt*, homo autem cuidam albo non ineſt. Si igitur poſitum fuerit τὸ α nulli β ineſſe, & alicui γ ineſſe: propoſitio vniuerſalis *erit* tota falſa: particularis, vera: & concluſio, vera. 11 Eadem *eſt* ratio, ſi *propoſitio* α β

A accipiatur affirmatiua. poteſt enim τὸ α nulli β ineſſe, & cuidam γ non ineſſe, & τὸ β cuidam γ non ineſſe: vt animal nulli inanimo, & cuidam albo non ineſt: inanimum verò cuidam albo non ineſt. Si igitur poſitum fuerit, τὸ α omni β ineſſe, & cuidam γ non ineſſe: propoſitio illa vniuerſalis α β, erit tota falſa: propoſitio autem α γ, vera: & concluſio, vera. 12 Item ſi vniuerſalis poſita fuerit vera, & particularis falſa. nihil enim prohibet, τὸ α nulli β & nulli γ eſſe conſequens, τὸ β autem cuidam γ non ineſſe: vt animal nulli numero, & nulli inanimo conſequens eſt, & numerus cuidam inanimo non eſt conſequens. B Si igitur poſitum fuerit, τὸ α nulli β, & cuidam γ ineſſe: concluſio quidem erit vera: & vniuerſalis propoſitio vera: particularis autem, falſa. 13 Idem eſt, ſi vniuerſalis propoſitio ponatur affirmatiua. poteſt enim τὸ α ineſſe toti β, & toti γ, τὸ β autem cuidam γ non eſſe conſequens: vt genus ſpeciei, & differentiæ. animal enim omni homini, & omni pedeſtri conſequens eſt: homo autem non omni pedeſtri. Quare ſi ſumptum fuerit, τὸ α toti β ineſſe, & cuidam γ non ineſſe: propoſitio vniuerſalis erit vera: & particularis, falſa: concluſio autem, vera. 14 Perſpicuum autem eſt, etiam ex ambabus falſis veram fore concluſionem. C ſiquidem accidit vt τὸ α toti β, & nulli γ inſit, τὸ β autem cuidam γ non ſit conſequēs. nam ſi ſumptum fuerit, τὸ α nulli β, & cuidam γ ineſſe: ambæ propoſitiones erunt falſæ: concluſio autem, vera. 15 Item ſi vniuerſalis propoſitio ſit attributiua: & particularis, priuatiua. poteſt enim τὸ α nulli β & omni γ eſſe cōſequens, τὸ β verò cuidam γ non ineſſe. vt animal nulli ſcientiæ, omni autem homini eſt conſequens: ſcientia verò non omni homini. Si igitur ſumptum fuerit, τὸ α toti β ineſſe, & cuidam γ non eſſe conſequens: propoſitiones erunt falſæ: concluſio autem vera.

A ἐνδέχεται γὰρ τὸ α τῷ μὲν β μηδενί, τῷ δὲ γ τινὶ μὴ ὑπάρχειν, καὶ τὸ β τῷ γ τινὶ μὴ ὑπάρχειν. οἷον, τὸ ζῷον οὐδενὶ ἀψύχῳ, λευκῷ δέ τινι οὐχ ὑπάρχει, καὶ τὸ ἄψυχον τινὶ λευκῷ οὐχ ὑπάρχει. ἐὰν οὖν τεθῇ τὸ α τῷ μὲν β παντί, τῷ δὲ γ τινὶ μὴ ὑπάρχειν, ἡ μὲν αβ πρότασις, ἡ καθόλου, ὅλη ψευδής· ἡ δὲ αγ, ἀληθής, καὶ τὸ συμπέρασμα, ἀληθές. 12 Καὶ τῆς μὲν καθόλου, ἀληθοῦς τεθείσης· τῆς δὲ ἐν μέρει, ψευδοῦς. οὐδὲν γὰρ κωλύει, τὸ α μήτε τῷ β, μήτε τῷ γ οὐδενὶ ἕπεσθαι, τὸ μέντοι β τινὶ τῷ γ μὴ ὑπάρχειν· οἷον, ζῷον οὐδενὶ ἀριθμῷ, οὐδὲ ἀψύχῳ, καὶ ὁ ἀριθμὸς τινὶ ἀψύχῳ οὐχ ἕπεται. B ἐὰν οὖν τεθῇ τὸ α τῷ μὲν β μηδενί, τῷ δὲ γ τινί· τὸ μὲν συμπέρασμα ἔσται ἀληθές, καὶ ἡ καθόλου πρότασις, ἀληθής· ἡ δὲ ἐν μέρει, ψευδής. 13 Καὶ καταφατικῆς δὲ τῆς καθόλου τιθεμένης, ὡσαύτως. ἐνδέχεται γὰρ τὸ α καὶ τῷ β καὶ τῷ γ ὅλῳ ὑπάρχειν, τὸ μέντοι β τινὶ τῷ γ μὴ ἕπεσθαι· οἷον, τὸ γένος τῷ εἴδει καὶ τῇ διαφορᾷ. τὸ γὰρ ζῷον παντὶ ἀνθρώπῳ, καὶ ὅλῳ πεζῷ ἕπεται· ὁ δὲ ἄνθρωπος, οὐ παντὶ πεζῷ. ὥστε ἐὰν ληφθῇ τὸ α τῷ μὲν β ὅλῳ ὑπάρχειν, τῷ δὲ γ τινὶ μὴ ὑπάρχειν· ἡ μὲν καθόλου πρότασις, ἀληθής· ἡ δὲ ἐν μέρει, ψευδής· τὸ δὲ συμπέρασμα, ἀληθές. 14 Φανερὸν δὲ, ὅτι καὶ ἐξ ἀμφοτέρων ψευδῶν ἀληθὲς C ἔσται τὸ συμπέρασμα· εἴπερ ἐνδέχεται τὸ α καὶ * τῷ β καὶ τῷ γ ὅλῳ ὑπάρχειν, τὸ μέντοι β τινὶ τῷ γ μὴ ἕπεσθαι. ληφθέντος γὰρ τοῦ α τῷ μὲν β μηδενί, τῷ δὲ γ τινὶ ὑπάρχειν· αἱ μὲν προτάσεις ἀμφότεραι, ψευδεῖς· τὸ δὲ συμπέρασμα, ἀληθές. 15 Ὁμοίως δὲ καὶ κατηγορικῆς οὔσης τῆς καθόλου προτάσεως· τῆς δὲ ἐν μέρει, στερητικῆς. ἐνδέχεται γὰρ, τὸ α τῷ μὲν β μηδενί, τῷ δὲ γ παντὶ ἕπεσθαι, καὶ τὸ β τινὶ τῷ γ μὴ ὑπάρχειν· οἷον, ζῷον ἐπιστήμῃ μὲν οὐδεμιᾷ, ἀνθρώπῳ δὲ παντὶ ἕπεται· ἡ δὲ ἐπιστήμη, οὐ παντὶ ἀνθρώπῳ. ἐὰν οὖν ληφθῇ τὸ μὲν α τῷ β ὅλῳ ὑπάρχειν, τῷ δὲ γ τινὶ μὴ ἕπεσθαι· αἱ μὲν προτάσεις, ψευδεῖς· τὸ δὲ συμπέρασμα, ἀληθές.

* γρ. τῷ β & τῷ γ, τῷ μὲν ὅλῳ, τῷ δὲ μηδενὶ ὑπάρχειν. & ita Boëthus legit, qui ſic vertit, ſiquidē contingit a & b & c, huic quidem omni, illi verò nulli ineſſe. Philoponus quid legerit obſcurum.

De poteſtate concludendi verum ex falſis in tertia figura. Cap. IV.

1 ¶ Summaria expoſitio. 2 ¶ De ſyllogiſmis ex ambabus propoſitionibus vniuerſalibus. Si ambæ propoſitiones ſint omnino falſæ in Darapti. 3 vel Felapton. 4 Si ambæ ſint falſæ ex parte in Darapti, 5 vel Felapton. 6 Si in Felapton maior ſit tota falſa, & minor vera: 7 vel maior vera, & minor tota falſa. 8 Si in Darapti maior ſit tota falſa, & minor vera: 9 vel maior vera, & minor tota falſa. 10 Si in Darapti maior ſit falſa ex parte, & minor vera: 11 vel maior vera, & minor falſa ex parte. 12 Si in Felapton minor ſit falſa ex parte, & minor vera: 13 vel maior vera, & minor falſa ex parte. 14 ¶ De ſyllogiſmis ex ambabus propoſitionibus particularibus. 15 ¶ Corollaria communia tribus figuris. 16 Cur non valeat argumentum à falſitate concluſionis ad falſitatem propoſitionum. 17 nec à falſitate propoſitionum ad veritatem concluſionis.

D IN poſtremâ quoque figurâ concludetur verum ex falſis; cùm ambæ propoſitiones ſunt totæ falſæ, vel vtraque ex parte, vel altera tota vera, altera falſa, vel altera falſa ex parte, altera tota vera: vel contra: denique quotcumque aliis modis licet commutare propoſitiones. 2 Nihil enim prohibet, quo minùs neque τὸ α neque τὸ β vlli γ inſit, τὸ α autem alicui β inſit: vtputà nec homo nec pedeſtre vlli inanimo conſequens eſt: homo autem alicui pedeſtri ineſt. Si igitur ſumptum fuerit, τὸ α & τὸ β omni γ ineſſe: propoſitiones quidem erunt totæ falſæ: concluſio autem vera. 3 Idem eſt, ſi altera propoſitio ſit priuatiua, altera, affirmatiua. poteſt enim τὸ β nulli γ ineſſe, τὸ α autem omni, & τὸ α cuidam β non ineſſe: vt nigrum nulli cygno, animal verò omni cygno, & animal nō omni nigro. Quare ſi ſumptum fuerit,

CAP. IV.

Ἔσται δὲ καὶ ἐν τῷ ἐσχάτῳ σχήματι διὰ ψευδῶν ἀληθὲς, καὶ ἀμφοτέρων ψευδῶν οὐσῶν ὅλων· καὶ ἐπί τι ἑκατέρας, καὶ τῆς μὲν ἑτέρας, ὅλης ἀληθοῦς οὔσης, τῆς δὲ ἑτέρας, ψευδοῦς· καὶ τῆς μὲν, ἐπί τι ψευδοῦς, τῆς δὲ, ὅλης ἀληθοῦς· καὶ ἀνάπαλιν· καὶ ὁσαχῶς ἄλλως ἐνδέχεται * μεταβάλλειν τὰς προτάσεις. 2 Οὐδὲν γὰρ κωλύει, μήτε τὸ α, μήτε τὸ β μηδενὶ τῷ γ ὑπάρχειν, τὸ μέντοι α τινὶ τῷ β ὑπάρχειν· οἷον, οὔτε ἄνθρωπος, οὔτε πεζὸν οὐδενὶ ἀψύχῳ ἕπεται, ἄνθρωπος μέντοι τινὶ πεζῷ ὑπάρχει. ἐὰν οὖν ληφθῇ τὸ α καὶ τὸ β παντὶ τῷ γ ὑπάρχειν· αἱ μὲν προτάσεις, ὅλαι ψευδεῖς· τὸ δὲ συμπέρασμα, ἀληθές. 3 Ὡσαύτως δὲ καὶ τῆς μὲν, στερητικῆς· τῆς δὲ, καταφατικῆς οὔσης. ἐνδέχεται γὰρ, τὸ μὲν β μηδενὶ τῷ γ ὑπάρχειν, τὸ δὲ α παντί, καὶ τὸ α τινὶ τῷ β μὴ ὑπάρχειν· οἷον, τὸ μέλαν οὐδενὶ κύκνῳ, ζῷον δὲ παντί, καὶ τὸ ζῷον οὐ παντὶ μέλανι. ὥστ' ἐὰν ληφθῇ

* γρ. μεταβαλεῖν.

τὸ μὲν β παντὶ τῷ γ, τὸ δὲ α μηδενί· τὸ α τινὶ τῷ β οὐχ ὑπάρ- A
ξει· καὶ τὸ συμπέρασμα, ἀληθές· αἱ δὲ προτάσεις ψευδεῖς.
4 Καὶ εἰ ἐπί τι ἑκατέρα ψευδής, ἔσται τὸ συμπέρασμα ἀληθές. οὐδὲν γὰρ κωλύει, καὶ τὸ α καὶ τὸ β τινὶ τῷ γ ὑπάρχειν, καὶ τὸ α τινὶ τῷ β. οἷον, τὸ λευκὸν, καὶ τὸ καλὸν, τινὶ ζῴῳ ὑπάρχει, καὶ τὸ λευκὸν, τινὶ καλῷ. ἐὰν οὖν τεθῇ τὸ α καὶ τὸ β παντὶ τῷ γ ὑπάρχειν· αἱ μὲν προτάσεις, ἐπί τι ψευδεῖς· τὸ δὲ συμπέρασμα ἀληθές.
5 Καὶ στερητικῆς δὲ τῆς α γ τιθεμένης, ὁμοίως. οὐδὲν γὰρ κωλύει, τὸ μὲν α τινὶ τῷ γ μὴ ὑπάρχειν, τὸ δὲ β τινὶ ὑπάρχειν, καὶ τὸ α τῷ β μὴ παντὶ ὑπάρχειν. οἷον, τὸ λευκὸν, τινὶ ζῴῳ οὐχ ὑπάρχει, τὸ δὲ καλὸν, τινὶ ὑπάρχει, καὶ τὸ λευκὸν οὐ παντὶ καλῷ. ὥστ' ἐὰν ληφθῇ τὸ μὲν α μηδενὶ τῷ B
γ, τὸ δὲ β παντί· ἀμφότεραι μὲν αἱ προτάσεις, ἐπί τι ψευδεῖς· τὸ δὲ συμπέρασμα, ἀληθές.
6 Ὡσαύτως δὲ καὶ τῆς μὲν, ὅλης ψευδοῦς, τῆς δὲ, ὅλης ἀληθοῦς λαμβανομένης. ἐγχωρεῖ γὰρ, καὶ τὸ α καὶ τὸ β παντὶ τῷ γ ἕπεσθαι, τὸ μέντοι α τινὶ τῷ β μὴ ὑπάρχειν. οἷον, ζῷον καὶ λευκὸν παντὶ κύκνῳ ἕπεται· τὸ μέντοι ζῷον οὐ παντὶ ὑπάρχει λευκῷ. τεθέντων οὖν ὅρων τούτων, ἐὰν ληφθῇ τὸ μὲν β ὅλῳ τῷ γ ὑπάρχειν, τὸ δὲ α ὅλῳ μὴ ὑπάρχειν· ἡ μὲν β γ ἔσται ἀληθὴς ὅλη· ἡ δὲ α γ, ὅλη ψευδής· καὶ τὸ συμπέρασμα ἀληθές.
7 Ὁμοίως δὲ καὶ, εἰ τὸ μὲν β γ,* ψεῦδος, τὸ δὲ α γ, ἀληθές· οἱ γὰρ αὐτοὶ ὅροι πρὸς τὴν ἀπόδειξιν, μέλαν, κύκνος, ἄψυχον.
8 Ἀλλὰ καὶ εἰ ἀμφότεραι λαμβάνοιντο καταφατικαί. οὐδὲν γὰρ κωλύει, τὸ μὲν β παντὶ τῷ γ C
ἕπεσθαι, τὸ δὲ α ὅλῳ μὴ ὑπάρχειν, καὶ τὸ α τινὶ τῷ β ὑπάρχειν· οἷον, κύκνῳ μὲν παντὶ ζῷον, μέλαν δὲ οὐδενὶ κύκνῳ, καὶ τὸ μέλαν ὑπάρχει τινὶ ζῴῳ. ὥστ' ἐὰν ληφθῇ τὸ α καὶ τὸ β παντὶ τῷ γ ὑπάρχειν· ἡ μὲν β γ, ὅλη ἀληθής· ἡ δὲ α γ, ὅλη ψευδής· καὶ τὸ συμπέρασμα, ἀληθές.
9 Ὁμοίως δὲ καὶ τῆς α γ ληφθείσης ἀληθοῦς· διὰ γὰρ τῶν αὐτῶν ὅρων ἡ ἀπόδειξις.
10 Πάλιν τῆς μὲν, ὅλης ἀληθοῦς οὔσης· τῆς δὲ, ἐπί τι ψευδοῦς. ἐγχωρεῖ γὰρ, τὸ μὲν β παντὶ τῷ γ ὑπάρχειν, τὸ δὲ α τινὶ τῷ γ, καὶ τὸ α τινὶ τῷ β· οἷον, δίπουν μὲν παντὶ ἀνθρώπῳ, καλὸν δὲ οὐ παντὶ, καὶ τὸ καλὸν, τινὶ δίποδι ὑπάρχει. ἐὰν οὖν ληφθῇ καὶ τὸ α καὶ τὸ β ὅλῳ τῷ D
γ ὑπάρχειν· ἡ μὲν β γ, ἀληθὴς ὅλη· ἡ δὲ α γ, ἐπί τι ψευδής· τὸ δὲ συμπέρασμα, ἀληθές.
11 Ὁμοίως δὲ καὶ τῆς μὲν α γ, ἀληθοῦς οὔσης· τῆς δὲ, β γ, ψευδοῦς ἐπί τι λαμβανομένης. μετατεθέντων γὰρ τῶν αὐτῶν ὅρων, ἔσται ἡ ἀπόδειξις.
12 Καὶ τῆς μὲν, στερητικῆς· τῆς δὲ, καταφατικῆς οὔσης. ἐπεὶ γὰρ ἐγχωρεῖ, τὸ μὲν β ὅλῳ τῷ γ ὑπάρχειν,* τὸ δὲ α τινί· ὅταν οὕτως ἔχωσιν, οὐ παντὶ τῷ β τὸ α. ἐὰν οὖν ληφθῇ τὸ μὲν β ὅλῳ τῷ γ ὑπάρχειν, τὸ δὲ α μηδενί· ἡ μὲν στερητική, ἐπί τι ψευδής· ἡ δ' ἑτέρα, ὅλη ἀληθής· καὶ τὸ συμπέρασμα ἔσται ἀληθές.
13 Πάλιν ἐπεὶ δέδεικται, ὅτι τοῦ μὲν α μηδενὶ ὑπάρχοντος τῷ γ, τοῦ δὲ β τινί, ἐγχωρεῖ τὸ α τῷ β τινὶ μὴ ὑπάρχειν· φανερὸν οὖν ὅτι καὶ τῆς μὲν α γ, E
ὅλης ἀληθοῦς οὔσης, τῆς δὲ β γ, ἐπί τι ψευδοῦς, ἐγχωρεῖ τὸ συμπέρασμα εἶναι ἀληθές. ἐὰν γὰρ ληφθῇ τὸ μὲν α μηδενὶ τῷ γ, τὸ δὲ β παντί· ἡ μὲν α γ, ὅλη ἀληθής· ἡ δὲ β γ, ἐπί τι ψευδής.
14 Φανερὸν δὲ καὶ ἐπὶ τῶν ἐν μέρει συλλογισμῶν, ὅτι πάντως ἔσται διὰ ψευδῶν ἀληθές. οἱ γὰρ αὐτοὶ ὅροι ληπτέοι, οἱ καὶ ὅταν καθόλου ὦσιν αἱ προτάσεις· οἱ μὲν ἐν τοῖς κατηγορικοῖς, κατηγορικοί· οἱ δὲ ἐν τοῖς στερητικοῖς, στερητικοί. οὐδὲν γὰρ διαφέρει, μηδενὸς ὑπάρχοντος, παντὶ λαβεῖν ὑπάρχειν· καὶ τινὶ ὑπάρχοντος λαβεῖν καθόλου, πρὸς τὴν τῶν ὅρων ἔκθεσιν. ὁμοίως δὲ καὶ ἐπὶ τῶν στερητικῶν.
15 Φανερὸν οὖν, ὅταν μὲν ᾖ τὸ συμ-

* γ. ψεῦδος.

* γρ. τὸ δὲ α τινί. al. τὸ δὲ α τινὶ μὴ ὑπάρχειν. ὅταν οὕτω ἔχ.

A τὸ β omni γ, & τὸ α nulli ineſſe: τὸ α cuidam β non inerit: & concluſio erit vera: propoſitiones autem, falſæ.
4 *Sed* & ſi vtraque *propoſitio ſit* falſa ex parte, erit concluſio vera. nihil enim vetat, quo minùs & τὸ α & τὸ β cuidam γ inſit, & τὸ α cuidam β: vt album, & pulchrum cuidam animali ineſt, & album cuidam pulchro. Si igitur poſitum fuerit, τὸ α & τὸ β omni γ ineſſe: propoſitiones quidem *erunt* ex parte falſæ: concluſio autem, vera.
5 Item ſi priuatiua ponatur propoſitio α γ, nihil enim prohibet, τὸ α cuidam γ non ineſſe, τὸ β autem cuidam ineſſe, ac τὸ α non omni β ineſſe: vt album cuidam animali non ineſt, pulchrum autem cuidam ineſt, & album non omni pulchro. Quare ſi ſumptum
B fuerit, τὸ α nulli γ, τὸ β autem omni *ineſſe*: ambæ propoſitiones *erunt* ex parte falſæ: concluſio autem, vera.
6 Item ſi altera *propoſitio* tota falſa, altera tota vera accipiatur. poteſt enim & τὸ α & τὸ β omni γ conſequens eſſe, τὸ α verò cuidam γ non ineſſe: vt animal & album omni cygno eſt conſequens, animal autem non omni albo ineſt. Poſitis igitur his terminis, ſi ſumptum fuerit τὸ β toti γ ineſſe, τὸ α autem toti non ineſſe: *propoſitio* β γ erit tota vera: *propoſitio* autem α γ, tota falſa: & concluſio, vera.
7 Item ſi τὸ β γ *ſit* falſum: τὸ α γ, verum. hi namque termini *ſumentur* ad demonſtrationem *cōficiendam*, nigrum, cygnus, inanimum.
8 Sed & ſi ambæ
C *propoſitiones* accipiantur affirmatiuæ. nihil enim prohibet τὸ β omni γ conſequens eſſe, τὸ α autem toti non ineſſe, ac τὸ α cuidam β ineſſe: vt omni cygno animal, nigrum autem nulli cygno, & nigrum alicui animali ineſt. Quare ſi ſumptum fuerit, τὸ α & τὸ β omni γ ineſſe: *propoſitio* β γ *erit* tota vera: *propoſitio* autem α γ, tota falſa: & concluſio, vera.
9 Item ſi vera ſumpta fuerit propoſitio α γ. *fiet* enim demonſtratio per eoſdem terminos.
10 Rurſus ſi altera ſit tota vera: altera falſa ex parte. poteſt enim τὸ β omni γ ineſſe, τὸ α autem alicui γ, & τὸ α alicui β: vt bipes omni homini, pulchrum autem non omni, & pulchrum alicui bipedi ineſt. Si igitur ſumptum fuerit,
D & τὸ α & τὸ β toti γ ineſſe: *propoſitio* β γ *erit* tota vera: propoſitio autem α γ, falſa ex parte: concluſio autem, vera.
11 Item ſi *propoſitio* α γ ſit vera, & *propoſitio* β γ accipiatur falſa ex parte. tranſpoſitis enim iiſdem terminis, erit demonſtratio.
12 Et ſi altera ſit priuatiua, altera affirmatiua. nam quia fieri poteſt, vt τὸ β toti γ inſit, τὸ α autem alicui *tantùm*; cùm *termini* ita *ſe* habent, non omni β *ineſt* τὸ α. Si igitur ſumptum fuerit, τὸ β toti γ ineſſe, τὸ α autem nulli: *propoſitio* priuatiua, falſa ex parte: altera, tota vera: & concluſio vera erit.
13 Rurſus quia oſtenſum eſt, cùm τὸ α ineſt nulli γ, τὸ β verò *ineſt* alicui, fieri vt τὸ α cuidam β non inſit:
E perſpicuum igitur *eſt*, etiam cùm *propoſitio* α γ eſt tota vera, & *propoſitio* β γ falſa ex parte, poſſe concluſionem eſſe veram. Nam ſi ſumptum fuerit, τὸ α *ineſſe* nulli γ, τὸ β autem *ineſſe* omni: *propoſitio* α γ *erit* tota vera: *propoſitio* autem β γ, falſa ex parte.
14 Perſpicuum autem *eſt*, etiam in ſyllogiſmis particularibus omnino concludi verum ex falſis. iidem enim termini ſumendi ſunt, qui *ſumebantur* cùm propoſitiones erant vniuerſales: *nempe* in attributiuis attributiui, in priuatiuis priuatiui. nihil enim refert, vtrùm, cùm nulli inſit, accipiatur omni ineſſe, an, cū inſit alicui, ſumatur vniuerſaliter: *quod attinet* ad terminorum expoſitionē. Similis *eſt* ratio priuatiuorum.
15 Apparet igitur, cùm falſa eſt

conclusio, necesse *esse* vt ea, ex quibus ratio *constat*, A falsa sint aut omnia, aut aliqua. cùm autem *conclusio est* vera, non necesse *esse* vt aliquid, aut omnia vera sint: sed fieri posse, vt, cùm nihil veri sit in syllogismo, conclusio similiter vera sit, non tamen necessariò. 16 Causa autem *est*: quia cùm duo ita inter se affecta sunt, vt si vnum sit, necessariò sit alterum: nisi hoc sit, neque illud erit: sed si sit, non necesse *est* illud esse. 17 At verò, si idem sit, & nisi sit, eandem rem necessario esse, *est* impossibile. vtputà, si τὸ α sit album, τὸ β esse magnum necessariò: & si τὸ α non sit album, τὸ β esse magnum necessariò. Cùm enim si hoc est album, vt τὸ α, necesse *est* hoc esse magnum, vt τὸ β: & si τὸ β sit magnum, τὸ γ non esse album: necesse *est*, si τὸ α *sit* album, τὸ γ non esse album. Et cùm duobus propositis, si vnum sit, necesse *est* alterum esse: *certè* si, hoc non sit, necesse *est* primum non esse. Ergo cùm τὸ β non est magnũ, τὸ α non potest esse album. Quòd si cùm τὸ α non est album, necesse *est* τὸ β esse magnum: necessariò euenit, vt si τὸ β non sit magnum, ipsum β sit magnum. (hoc autem est impossibile) nam si τὸ β non est magnum, τὸ α necessario non erit album. si igitur, cùm τὸ α non est album, τὸ β erit magnum: efficitur quasi per tres *terminos*, vt, si τὸ β non sit magnum, *illud ipsum* sit magnum.

B

περασμα* ψεῦδες, ἀνάγκη, ἐξ ὧν ὁ λόγος, ψευδῆ εἶναι ἢ πάντα, ἢ ἔνια. ὅταν δὲ ἀληθὲς, οὐκ ἀνάγκη ἀληθές εἶναι, οὔτε τὶ, οὔτε πάντα· ἀλλ' ἔστι μηδενὸς ὄντος ἀληθοῦς τῶν ἐν τῷ συλλογισμῷ, τὸ συμπέρασμα ὁμοίως εἶναι ἀληθὲς, οὐ μὴν ἐξ ἀνάγκης. 16 Αἴτιον δὲ, ὅτι ὅταν δύο ἔχῃ οὕτω πρὸς ἄλληλα, ὥστε θατέρου ὄντος ἐξ ἀνάγκης θάτερον εἶναι· τούτου μὴ ὄντος, μὲν οὐδὲ θάτερον ἔσται· ὄντος δὲ, οὐκ ἀνάγκη εἶναι θάτερον. 17 Τοῦ δ' αὐτοῦ ὄντος, καὶ μὴ ὄντος, ἀδύνατον ἐξ ἀνάγκης εἶναι τὸ αὐτό. λέγω δ', οἷον, τοῦ α ὄντος λευκοῦ, τὸ β εἶναι μέγα ἐξ ἀνάγκης· καὶ μὴ ὄντος λευκοῦ τοῦ α, τὸ β εἶναι μέγα ἐξ ἀνάγκης. ὅταν γὰρ τουδὶ ὄντος λευκοῦ, οἷον τοῦ α, τοδὶ ἀνάγκη εἶναι μέγα, οἷον τὸ β· τοῦ δὲ β ὄντος μεγάλου, τὸ γ μὴ εἶναι λευκόν· ἀνάγκη, εἰ τὸ α λευκὸν, τὸ γ μὴ εἶναι λευκόν. Καὶ ὅταν δυοῖν ὄντοιν θατέρου ὄντος, ἀνάγκη θάτερον εἶναι· τούτου μὴ ὄντος, ἀνάγκη τὸ α μὴ εἶναι. τοῦ δὴ β μὴ ὄντος μεγάλου, τὸ α οὐχ οἷόν τε λευκὸν εἶναι. τοῦ δὲ α μὴ ὄντος λευκοῦ, εἰ ἀνάγκη τὸ β μέγα εἶναι· συμβαίνει ἐξ ἀνάγκης, τοῦ β μὴ ὄντος μεγάλου, αὐτὸ τὸ β μέγα εἶναι (τοῦτο δὲ, ἀδύνατον) εἰ γὰρ τὸ β μὴ ἔστι μέγα, τὸ α οὐκ ἔσται λευκὸν ἐξ ἀνάγκης· εἰ οὖν μὴ ὄντος τοῦ λευκοῦ, τὸ β ἔσται μέγα· συμβαίνει, εἰ τὸ β μὴ ἔστι μέγα, εἶναι μέγα, ὡς διὰ τριῶν.

* χ. ψευδές.

De probatione circulari seu reciproca in prima figura. Cap. V.

1 ¶ Expositio generalis. Quid sit probatio circularis, & quomodo fiat. 2 Exemplum. 3 Non posse aliter fieri, quàm dictum sit. 4 In quibus terminis locum habeat. 5 ¶ Expositio specialis Barbara, 8 Celarent, 12 Dary, 15 Ferio.

Circulo autem & ex se inuicem probari, *nihil* C *aliud* est, *quàm* per conclusionem & alteram propositionem attributione inuersam, concludi reliquam *propositionem* quæ accepta fuerat in altero syllogismo. 2 Vt si probare oportebat τὸ α omni γ inesse: probauit autem per β: rursus si probet τὸ α τῷ β inesse, accipiens τὸ α inesse τῷ γ, τὸ γ autem τῷ β: *ita fiet vt* etiam τὸ α *insit* τῷ β: prius autem contra acceperat, τὸ β inesse τῷ γ. Vel si ostendere oporteat τὸ β inesse τῷ γ: & sumat τὸ α *inesse* τῷ γ, quæ erat conclusio: & τὸ β inesse τῷ α: prius autem sumptum è contrario fuerat τὸ α inesse τῷ β. 3 Aliter vero non licet mutuò probare. siue enim aliud medium sumetur, non *probabitur* circulo: nihil enim idem accipietur. siue quid horum accipiatur: necesse *est* alterum solum *accipi*: quia si ambo sumantur, erit eadem conclusio, cùm diuersam *esse* oporteat. 4 In iis igitur *terminis*, qui non conuertuntur, ex altera propositione non demonstrata fit syllogismus: quia non licet per hos terminos demonstrare tertium inesse medio, aut medium primo. In iis verò qui reciprocantur, licet omnia inuicem probare. veluti si τὸ α, & τὸ β, & τὸ γ, inuicem conuertuntur. 5 Ostensum enim sit τὸ α γ per medium β: & rursus τὸ α β per conclusionem, & propositionem β γ conuersam: item τὸ β γ per conclusionem, & propositionem α β inuersam. Oportet autem [illegible] propositionem γ β, & propositionem β α: [illegible] non demonstratis vsi sumus. Si igitur sumptum fuerit, τὸ β inesse omni γ, & τὸ γ omni α, syllogismus erit τὸ β de α. Rursus si sumptum [illegible] τὸ γ *inesse* omni α, & τὸ α omni β: necesse *est* [illegible] omni β inesse. In ambobus igitur his syllogis[illegible] propositio α γ sumpta est sine demonstratio-

D

E

Τὸ δὲ κύκλῳ καὶ ἐξ ἀλλήλων δείκνυσθαί ἐστι, τὸ διὰ τοῦ συμπεράσματος, καὶ τοῦ ἀνάπαλιν τῇ κατηγορίᾳ τὴν ἑτέραν λαβόντα πρότασιν, συμπεράνασθαι τὴν λοιπὴν, ἣν ἐλάμβανεν* ἐν ἑτέρῳ συλλογισμῷ. 2 Οἷον, εἰ ἔδει δεῖξαι ὅτι τὸ α τῷ γ παντὶ ὑπάρχει· ἔδειξε δὲ διὰ τοῦ β· πάλιν εἰ δεικνύοι ὅτι τὸ α τῷ β ὑπάρχει, λαβὼν τὸ μὲν α τῷ γ ὑπάρχειν, τὸ δὲ γ τῷ β, καὶ τὸ α τῷ β· πρότερον δὲ ἀνάπαλιν* ἔλαβε τὸ β τῷ γ* ὑπάρχειν. ἢ εἰ ὅτι τὸ β τῷ γ δέοι δεῖξαι ὑπάρχον, εἰ λάβοι τὸ α κατὰ τοῦ γ, ὃ ἦν συμπέρασμα, τὸ δὲ β κατὰ τοῦ α ὑπάρχειν· πρότερον δὲ ἐλήφθη ἀνάπαλιν τὸ α κατὰ τοῦ β. 3 Ἄλλως δ' οὐκ ἔστι δι' ἀλλήλων δεῖξαι. εἴτε γὰρ ἄλλο μέσον λήψεται, οὐ κύκλῳ· οὐδὲν γὰρ λαμβάνεται τῶν αὐτῶν. εἴτε τούτων τι. ἀνάγκη θάτερον μόνον· εἰ γὰρ ἄμφω, τὸ αὐτὸ ἔσται συμπέρασμα· δεῖ δ' ἕτερον. 4 Ἐν μὲν οὖν τοῖς μὴ ἀντιστρέφουσιν, ἐξ ἀναποδείκτου τῆς ἑτέρας προτάσεως γίνεται ὁ συλλογισμός. οὐ γὰρ ἔστιν ἀποδεῖξαι διὰ τούτων τῶν ὅρων, ὅτι τῷ μέσῳ τὸ τρίτον ὑπάρχει, ἢ τῷ πρώτῳ τὸ μέσον. ἐν δὲ τοῖς ἀντιστρέφουσιν ἔστι πάντα δεικνύναι δι' ἀλλήλων· οἷον, εἰ τὸ α καὶ τὸ β καὶ τὸ γ ἀντιστρέφουσιν ἀλλήλοις. 5 Δεδείχθω γὰρ τὸ α γ διὰ μέσου τοῦ β· καὶ πάλιν τὸ α β διά τε τοῦ συμπεράσματος, καὶ τῆς β γ προτάσεως ἀντιστραφείσης· ὡσαύτως δὲ καὶ τὸ β γ, διά τε τοῦ συμπεράσματος, καὶ τῆς α β προτάσεως ἀντεστραμμένης. δεῖ δὲ τήν τε γ β, καὶ τὴν β α πρότασιν ἀποδεῖξαι· ταύταις γὰρ ἀναποδείκτοις κεχρήμεθα μόναις. Ἐὰν οὖν ληφθῇ τὸ β παντὶ τῷ γ ὑπάρχειν, καὶ τὸ γ παντὶ τῷ α· συλλογισμὸς ἔσται τοῦ β πρὸς τὸ α. πάλιν ἐὰν ληφθῇ τὸ μὲν γ παντὶ τῷ α, τὸ δὲ α παντὶ τῷ β, ἀνάγ-

CAP. V.

* χ. ἐν τῷ πρώτῳ συλλογισμῷ.

* χ. ἔλαβε.

* χ. ὑπάρχειν.

[illegible] τῷ β ὑπάρχειν. Ἐν ἀμφοτέροις δὴ τούτοις τοῖς συλλογισμοῖς ἡ γ α πρότασις, ἀναπόδεικτος εἴληπται.

A αἱ γὰρ ἕτεραι δεδειγμέναι ἦσαν· ὥστε ἂν ταύτην ἀποδείξωμεν, ἅπασαι ἔσονται δεδειγμέναι δι' ἀλλήλων. ἐὰν οὖν ληφθῇ τὸ γ παντὶ τῷ β, καὶ τὸ β παντὶ τῷ α ὑπάρχειν· ἀμφότεραί τε αἱ προτάσεις ἀποδεδειγμέναι λαμβάνονται, καὶ τὸ γ τῷ α ἀνάγκη ὑπάρχειν. Φανερὸν οὖν, ὅτι ἐν μόνοις τοῖς ἀντιστρέφουσι, κύκλῳ καὶ δι' ἀλλήλων ἐνδέχεται γίνεσθαι τὰς ἀποδείξεις· ἐν δὲ τοῖς ἄλλοις, ὥσπερ πρότερον εἴπομεν. 6 Συμβαίνει δὲ καὶ ἐν τούτοις, αὐτῷ τῷ δεικνυμένῳ χρῆσθαι πρὸς τὴν ἀπόδειξιν. τὸ μὲν γὰρ γ κατὰ τοῦ β, καὶ τὸ β κατὰ τοῦ α δείκνυται, ληφθέντος τοῦ γ κατὰ τοῦ α λέγεσθαι· τὸ δὲ γ κατὰ τοῦ α, διὰ τούτων δείκνυται τῶν προτάσεων. ὥστε τῷ συμπεράσματι χρώμεθα πρὸς τὴν ἀπόδειξιν. 7 Ἐπὶ δὲ τῶν στερητικῶν B συλλογισμῶν ὧδε δείκνυται δι' ἀλλήλων. ἔστω τὸ μὲν β παντὶ τῷ γ ὑπάρχον, τὸ δὲ α μηδενὶ τῷ β· συμπέρασμα, ὅτι τὸ α οὐδενὶ τῷ γ. εἰ δὴ πάλιν δεῖ συμπεράνασθαι, ὅτι τὸ α οὐδενὶ τῷ β, ὃ πάλαι ἔλαβεν· ἔσται τὸ μὲν α μηδενὶ τῷ γ, τὸ δὲ γ παντὶ τῷ β. οὕτω γὰρ ἀνάπαλιν ἡ πρότασις. 8 Εἰ δ' ὅτι τὸ β τῷ γ, δεῖ συμπεράνασθαι, οὐκέτι ὁμοίως ἀντιστρεπτέον τὴν α β· ἡ γὰρ αὐτὴ πρότασις, τὸ β μηδενὶ τῷ α, καὶ τὸ α μηδενὶ τῷ β ὑπάρχειν. 9 Ἀλλὰ ληπτέον, ᾧ τὸ α μηδενὶ ὑπάρχει, τὸ β παντὶ ὑπάρχειν· ἔστω τὸ α μηδενὶ τῷ γ ὑπάρχειν, ὅπερ ἦν τὸ συμπέρασμα· ᾧ δὲ τὸ α μηδενί, τὸ β εἰλήφθω παντὶ ὑπάρχειν· ἀνάγκη οὖν τὸ β παντὶ τῷ γ ὑπάρχειν. 10 Ὥστε τριῶν ὄντων, ἕκαστον, συμπέρασμα γέγονε. καὶ τὸ C κύκλῳ ἀποδείκνυσθαι, τοῦτ' ἐστι, τὸ συμπέρασμα λαμβάνοντα, καὶ ἀνάπαλιν τὴν ἑτέραν πρότασιν, τὴν λοιπὴν συλλογίζεσθαι. 11 Ἐπὶ δὲ τῶν ἐν μέρει συλλογισμῶν, τὴν μὲν καθόλου πρότασιν οὐκ ἔστιν ἀποδεῖξαι διὰ τῶν ἑτέρων, τὴν δὲ κατὰ μέρος ἔστιν. 12 Ὅτι μὲν οὖν οὐκ ἔστιν ἀποδεῖξαι τὴν καθόλου, φανερόν· τὸ μὲν γὰρ καθόλου δείκνυται διὰ τῶν καθόλου· τὸ δὲ συμπέρασμα οὐκ ἔστι καθόλου· δεῖ δ' ἐκ τοῦ συμπεράσματος δεῖξαι καὶ ἐκ τῆς ἑτέρας προτάσεως. ἔτι, ὅλως οὐδὲ γίνεται συλλογισμός, ἀντιστραφείσης τῆς προτάσεως· ἐν μέρει γὰρ ἀμφότεραι γίνονται αἱ προτάσεις. 13 Τὴν D δὲ ἐπὶ μέρους ἔστι. δεδείχθω γὰρ τὸ α κατά τινος τοῦ γ, διὰ τοῦ β. ἐὰν οὖν ληφθῇ τὸ β παντὶ τῷ α, καὶ τὸ συμπέρασμα μένῃ· τὸ β τινὶ τῷ γ ὑπάρξει· γίνεται γὰρ τὸ πρῶτον σχῆμα· καὶ τὸ α, μέσον. 14 Εἰ δὲ στερητικὸς ὁ συλλογισμός, τὴν μὲν καθόλου πρότασιν οὐκ ἔστι δεῖξαι, δι' ὃ καὶ πρότερον ἐλέχθη. 15 Τὴν δ' ἐν μέρει, ἐὰν μὲν ὁμοίως ἀντιστραφῇ τὸ α β, ὥσπερ καὶ ἐπὶ τῶν καθόλου, οὐκ ἔστι. διὰ προσλήψεως δὲ ἔστιν· οἷον, ᾧ τὸ α τινὶ μὴ ὑπάρχει, τὸ β τινὶ ὑπάρχειν. ἄλλως γὰρ ἐχόντων, οὐ γίνεται συλλογισμός, διὰ τὸ ἀποφατικὴν εἶναι τὴν ἐν μέρει πρότασιν.

A ne: aliæ namque probatæ fuerant. quare ſi hanc demonſtremus, omnes erunt ex ſe inuicem probatæ. ſi igitur ſumptum fuerit, τὸ γ omni β, & τὸ β omni α ineſſe: ambæ propoſitiones demonſtratæ accipiuntur, & neceſſe *eſt* τὸ γ ineſſe τῷ α. Perſpicuum igitur *eſt*, in iis ſolis quæ conuertuntur, circulo & ex ſe inuicem fieri poſſe demonſtrationes: in aliis autem, quemadmodum antea diximus. 7 Sed & in his accidit, vt eo quod probatum eſt vtamur ad demonſtrationem *conficiendam*. nam γ de β, & τὸ β de α probatur, ſumpto γ dici de α: τὸ γ autem de α probatur per has propoſitiones. itaque vtimur cõcluſione *ad exſtruendã* demonſtrationẽ. 8 In priuatiuis autem ſyllogiſmis ita fit mutua B probatio. Inſit quidem τὸ β omni γ, τὸ α autem nulli β: concluſio *eſt*, τὸ α *ineſſe* nulli γ. Si igitur oportet rurſus concludere τὸ α *ineſſe* nulli β, quod pridem acceperat: τὸ α inerit nulli γ, τὸ γ autem omni β. ſic enim inuerſa *eſt* propoſitio. 9 Quod ſi, τὸ β τῷ γ *ineſſe* concludendum ſit, non eſt amplius ſimiliter conuertenda *propoſitio* α β. *eſt* enim eadem propoſitio, τὸ β nulli α, & τὸ α nulli β ineſſe. 10 Sed accipiendum *eſt*, cui τὸ α nulli ineſt, τὸ β omni ineſſe. Inſit τὸ α nulli γ: quæ quidem erat concluſio. cui verò τὸ α nulli *ineſt*, τὸ β accipiatur omni ineſſe. neceſſe igitur *eſt*, τὸ β ineſſe omni γ. 11 Quare cum tria ſint, vnumquodque effectum eſt concluſio, & circulo demonſtrare, hoc eſt, ſumptis concluſione & altera propoſitione inuerſa, reliquam con- C cludere. 12 In particularibus autem ſyllogiſmis vniuerſalem propoſitionem non licet ex aliis demonſtrare, particularem verò licet. 13 Vniuerſalem igitur non poſſe demonſtrari, perſpicuum *eſt*: quia vniuerſale probatur ex vniuerſalibus, concluſio autem non eſt vniuerſalis: & probatio effici debet ex concluſione & ex altera propoſitione. Præterea, omnino non fit ſyllogiſmus conuersâ propoſitione: quoniam in parte efficiuntur ambæ propoſitiones. 14 Particularem autem *propoſitionem demonſtrare* licet. probatum enim ſit τὸ α de aliquo γ per β. Si igitur ſumatur, τὸ β *ineſſe* D omni α, & concluſio maneat: τὸ β inerit alicui γ. fit enim prima figura: & τὸ α, medium. 15 Quod ſi ſyllogiſmus *ſit* priuatiuus, vniuerſalem propoſitionem non licet probare ob id quod antea dictum eſt. 16 Particularem autem, ſi ſimiliter conuertatur *pronunciatum* α β, quemadmodum in vniuerſalibus, *probare* non licet: verùm per aſſumptionem licet: vt, cui τὸ α cuidam non ineſt, τὸ β cuidam ineſſe. Quòd ſi *termini* aliter habeant, non fit ſyllogiſmus, quia propoſitio particularis eſt negatiua.

De probatione circulari in ſecunda figura. Cap. VI.

1 ¶ De ſyllogiſmis vniuerſalibus. 2 De propoſitione affirmante. 3 De propoſitione negante, in Cameſtres, 4 vel in Ceſare. 5 ¶ De ſyllogiſmis particularibus. De propoſitione vniuerſali. 6 De propoſitione particulari negante, 7 vel affirmante.

CAP. VI.

A Ἐν δὲ τῷ δευτέρῳ σχήματι τὸ μὲν καταφατικὸν οὐκ ἔστι δεῖξαι διὰ τούτου τοῦ τρόπου· τὸ δὲ στερητικόν, ἔστι. 2 Τὸ μὲν οὖν κατηγορικὸν οὐ δείκνυται, διὰ τὸ μὴ ἀμφοτέρας εἶναι τὰς προτάσεις καταφατικάς. τὸ γὰρ συμ-

In ſecunda autẽ figura *pronunciatũ* affirmatiuum non poteſt hoc modo probari, priuatiuũ poteſt. 2 Affirmatiuum non probatur, quia non ſunt ambæ propoſitiones affirmatiuæ: concluſio namque eſt

que eſt priuatiua: affirmatio autem ex ambabus A *propoſitionibus* affirmantibus probatur. 3 *Pronunciatum* autem priuatiuum ſic probatur. Inſit τὸ α omni β, ac nulli γ. concludetur τὸ β *ineſſe* nulli γ. Si igitur ſumptum fuerit, τὸ β ineſſe omni α, & nulli γ: neceſſe *eſt*, τὸ α nulli γ ineſſe. fit enim media figura. medium *eſt* τὸ β. 4 Quòd ſi *pronunciatum* α β ſumptum fuerit priuatiuum, alterum autem attributiuum: erit prima figura. nam τὸ γ *ineſt* omni α, & τὸ β nulli γ. quare nulli α *ineſt* τὸ β. proinde nec τὸ α ineſt ulli β. medium *eſt* τὸ γ. Per concluſionem igitur & vnam propoſitionẽ non fit ſyllogiſmus: aſſumptâ autem alterâ propoſitione, erit *ſyllogiſmus*. 5 Si verò non vniuerſalis ſit ſyllogiſmus, propoſitio, B quæ *eſt* in toto, non probatur ob eam ipſam cauſam, quam & priùs diximus. 6 Particularis autem probatur, quando *pronunciatum* vniuerſale *eſt* attributiuum. Inſit enim τὸ α omni β, & non omni γ, concludetur, cuidam γ τὸ β non ineſſe. Si igitur ſumptum fuerit, τὸ β omni α, & non omni γ: τὸ α cuidam γ non ineſt. medium *eſt* τὸ β. 7 Si verò *propoſitio* vniuerſalis ſit priuatiua, non probabitur propoſitio α γ, conuerſo *pronunciato* α β. accidit enim, vt vel ambæ, vel altera propoſitio ſit negatiua. quare non erit ſyllogiſmus. Sed ſimiliter probabitur, vt in ſyllogiſmis vniuerſalibus, ſi ſumptum fuerit, cui τὸ β in parte non ineſt, *ei* τὸ α in parte ineſſe.

A πέρασμα, στερητικόν ἐστι· τὸ δὲ κατηγορικὸν, ἐξ ἀμφοτέρων ἐδείκνυτο καταφατικῶν. 3 Τὸ δὲ στερητικὸν ὧδε δείκνυται. ὑπαρχέτω τὸ α παντὶ τῷ β, τῷ δὲ γ μηδενί· συμπέρασμα, τὸ β τῷ γ οὐδενί. ἐὰν οὖν ληφθῇ τὸ β παντὶ τῷ α ὑπάρχειν, τῷ δὲ γ μηδενί· ἀνάγκη τὸ α μηδενὶ τῷ γ ὑπάρχειν. γίνεται γὰρ τὸ δεύτερον σχῆμα. μέσον, τὸ β. 4 Εἰ δὲ τὸ α β, στερητικὸν ληφθῇ· θάτερον δὲ, κατηγορικόν· τὸ πρῶτον ἔσται σχῆμα. τὸ μὲν γὰρ γ παντὶ τῷ α· τὸ δὲ β οὐδενὶ τῷ γ· ὥστ' οὐδενὶ τῷ α τὸ β· οὐδ' ἄρα τῷ β τὸ α. μέσον τὸ γ. διὰ μὲν οὖν τοῦ συμπεράσματος, καὶ τῆς μιᾶς προτάσεως, οὐ γίνεται B συλλογισμός. προσληφθείσης δὲ ἑτέρας, ἔσται. 5 Ἢν δὲ μὴ καθόλου ὁ συλλογισμὸς ᾖ, ἡ μὲν ἐν ὅλῳ πρότασις οὐ δείκνυται διὰ τὴν αὐτὴν αἰτίαν, ἣν καὶ εἴπομεν καὶ πρότερον. 6 Ἡ δ' ἐν μέρει δείκνυται, ὅταν ᾖ τὸ καθόλου κατηγορικόν. ὑπαρχέτω γὰρ τὸ μὲν α παντὶ τῷ β, τῷ δὲ γ μὴ παντί· συμπέρασμα, τινὶ τῷ γ τὸ β οὐχ ὑπάρχειν. ἐὰν οὖν ληφθῇ τὸ β παντὶ τῷ α, τῷ δὲ γ μὴ παντί· τὸ α τινὶ τῷ γ οὐχ ὑπάρξει. μέσον, τὸ β. 7 Εἰ δ' ἐστὶν ἡ καθόλου, στερητικὴ, οὐ δειχθήσεται ἡ α γ πρότασις, ἀντιστραφέντος τοῦ α β. συμβαίνει γὰρ, ἢ ἀμφοτέρας, ἢ τὴν ἑτέραν πρότασιν γίνεσθαι ἀποφατικήν· ὥστ' οὐκ ἔσται συλλογισμός. Ἀλλ' ὁμοίως δειχθήσεται, ὡς καὶ ἐπὶ τῶν καθόλου, ἐὰν ληφθῇ, ᾧ τὸ β τινὶ μὴ ὑπάρχει, τὸ α τινὶ ὑπάρχειν.

De probatione circulari in prima figura. Cap. VII.

1 ¶ De ſyllogiſmis ex ambabus propoſitionibus vniuerſalibus. 2 ¶ De ſyllogiſmis ex altera propoſitione vniuerſali & altera particulari. 3 Datiſi: 4 Diſamis: 5 Brocardo: 6 Feriſon. 8 ¶ Communia de tribus figuris. Quando mutua confirmatio efficiatur in eadem vel in diuerſis figuris. 9 An ſit verus circulus in diuerſis figuris.

IN tertia verò figurâ, quando ambæ propoſitio- C nes vniuerſaliter ſumptæ ſunt, mutua & reciproca probatio locum non habet. vniuerſale enim probatur ex vniuerſalibus: concluſio autem quæ *eſt* in hac figura, ſemper *eſt* particularis. vnde perſpicuum *eſt*, omnino in hac figura propoſitionem vniuerſalem probari non poſſe. 2 Sin altera *propoſitio* ſit vniuerſalis, altera particularis: interdum licebit *mutuò confirmare*, interdum non licebit. Sanè cùm ambæ *propoſitiones* attributiuæ ſumptæ fuerint, & vniuerſale iunctum ſit minori extremo: licebit. cùm autem alteri extremo, non licebit. 3 Inſit enim τὸ α omni γ, τὸ β autem alicui: concluſio *erit* α β. Si igitur ſumptum fuerit, τὸ γ ineſſe omni α, conuerſâ propoſitione vniuerſali; & D τὸ α ineſſe alicui β, quæ erat concluſio: τὸ γ quidem probatum eſt τῷ β ineſſe: τὸ β autem alicui γ *ineſſe*, probatum non eſt. Atqui neceſſe *eſt*, ſi τὸ γ *ineſſet* alicui β, etiam τὸ β ineſſe alicui γ. Sed non idem eſt, hoc illi ineſſe, & illud huic. verùm aſſumi debet, ſi hoc illi in parte *ineſt*, etiam illud huic in parte ineſſe. Hoc autem ſumpto, non efficitur ampliùs ſyllogiſmus ex concluſione & altera propoſitione. 4 Si verò τὸ β *ineſt* omni γ, & τὸ α alicui γ: licebit propoſitionem α γ, cùm ſumptum fuerit, τὸ γ omni β ineſſe, & τὸ α alicui β. nã ſi τὸ γ ineſt omni β, & τὸ α cuidam β: neceſſe *eſt* τὸ α cuidã γ ineſſe. medium *eſt* τὸ β.

CAP. VII. ΕΠὶ δὲ τοῦ τρίτου σχήματος, ὅταν μὲν ἀμφότεραι αἱ προτάσεις καθόλου ληφθῶσιν, οὐκ ἐνδέχεται δεῖξαι δι' ἀλλήλων. τὸ μὲν γὰρ καθόλου δείκνυται διὰ τῶν καθόλου· τὸ δὲ ἐν τούτῳ συμπέρασμα, ἀεὶ κατὰ μέρος. ὥστε φανερὸν ὅτι οὐκ ἐνδέχεται ὅλως δεῖξαι διὰ τούτου τοῦ σχήματος τὴν καθόλου πρότασιν. 2 Ἐὰν δ' ἡ μὲν ᾖ καθόλου, ἡ δ', ἐν μέρει· ποτὲ μὲν ἔσται, ποτὲ δὲ οὐκ ἔσται. ὅταν μὲν οὖν ἀμφότεραι κατηγορικαὶ ληφθῶσι, καὶ τὸ καθόλου γένηται πρὸς τῷ ἐλάττονι ἄκρῳ, ἔσται. ὅταν δὲ πρὸς θατέρῳ, οὐκ ἔσται. 3 Ὑπαρχέτω γὰρ τὸ α παντὶ τῷ γ, τὸ δὲ β τινί· συμπέρασμα, τὸ α β. ἐὰν D οὖν ληφθῇ τὸ γ παντὶ τῷ α ὑπάρχειν, ἀντιστραφείσης τῆς καθόλου· καὶ τὸ α τινὶ τῷ β, ὃ ἦν συμπέρασμα· τὸ μὲν γ δέδεικται τινὶ τῷ β ὑπάρχειν· τὸ δὲ β τινὶ τῷ γ οὐ δέδεικται. καίτοι ἀνάγκη, εἰ τὸ γ τινὶ τῷ β, καὶ τὸ β τινὶ τῷ γ ὑπάρχειν. ἀλλ' οὐ ταὐτόν ἐστι, τόδε τῷδε ὑπάρχειν, καὶ τόδε τῷδε· ἀλλὰ προσληπτέον, ὅτι, εἰ τόδε τινὶ τῷδε, καὶ θάτερον τινὶ τῷδε. τούτου δὲ ληφθέντος, οὐκέτι γίνεται ἐκ τοῦ συμπεράσματος, καὶ τῆς ἑτέρας προτάσεως, ὁ συλλογισμός. 4 Εἰ δὲ τὸ μὲν β παντὶ τῷ γ, τὸ δὲ α τινὶ τῷ γ, ἔσται δεῖξαι τὸ α γ, ὅταν ληφθῇ τὸ μὲν γ παντὶ τῷ β ὑπάρχειν, τὸ δὲ α τινὶ τῷ β. εἰ γὰρ τὸ γ παντὶ τῷ β ὑπάρχει, τὸ δὲ α τινὶ τῷ β, ἀνάγκη τὸ α τινὶ τῷ γ ὑπάρχειν. μέσον, τὸ β.

5 Καὶ ὅταν ἡ ἡ μὲν, κατηγορικὴ, ἡ δὲ, στερητικὴ, καθόλου δὲ ἡ κατηγορικὴ δειχθήσεται ἡ ἑτέρα. ὑπαρχέτω γὰρ τὸ β παντὶ τῷ γ, τὸ δὲ α τινὶ μὴ ὑπαρχέτω· συμπέρασμα, ὅτι τὸ α τινὶ τῷ β οὐχ ὑπάρχει. ἐὰν οὖν * προσληφθῇ τὸ γ παντὶ τῷ β ὑπάρχειν, ἐὰν δὲ καὶ τὸ α οὐ παντὶ τῷ β, ἀνάγκη τὸ α τινὶ τῷ γ μὴ ὑπάρχειν. μέσον, τὸ β. 6 Ὅταν δὲ ἡ στερητικὴ καθόλου γένηται οὐ δείκνυται ἡ ἑτέρα, εἰ μὴ ὥσπερ ἐπὶ τῶν πρότερον ἐλήφθη, ἐὰν ληφθῇ, ᾧ τοῦτο τινὶ μὴ ὑπάρχει, θάτερον τινὶ ὑπάρχειν οἷον, εἰ τὸ μὲν α μηδενὶ ὑπάρχει τῷ γ, τὸ δὲ β τινί· συμπέρασμα, ὅτι τινὶ τῷ β τὸ α οὐχ ὑπάρχει. ἐὰν οὖν ληφθῇ, ᾧ τὸ α τινὶ μὴ ὑπάρχει, τούτῳ τὸ γ τινὶ ὑπάρχειν, ἀνάγκη τὸ γ τινὶ τῷ β ὑπάρχειν. 7 Ἄλλως δ' οὐκ ἔστιν ἀντιστρέφοντα τὴν καθόλου πρότασιν, δεῖξαι τὴν ἑτέραν· οὐδαμῶς γὰρ ἔσται συλλογισμός. 8 Φανερὸν οὖν, ὅτι ἐν μὲν τῷ πρώτῳ σχήματι ἡ δι' ἀλλήλων δεῖξις, διά τε τοῦ πρώτου καὶ τοῦ τρίτου γίνεται σχήματος. κατηγορικοῦ μὲν γὰρ ὄντος τοῦ συμπεράσματος, διὰ τοῦ πρώτου· στερητικοῦ δὲ, διὰ τοῦ ἐσχάτου· λαμβάνεται γὰρ, ᾧ τοῦτο μηδενὶ, θάτερον παντὶ ὑπάρχειν. ἐν δὲ τῷ μέσῳ, καθόλου μὲν ὄντος τοῦ συλλογισμοῦ, δι' αὐτοῦ τε καὶ διὰ τοῦ πρώτου σχήματος· ὅταν δ' ἐν μέρει, δι' αὐτοῦ τε καὶ διὰ τοῦ ἐσχάτου. ἐν δὲ τῷ τρίτῳ, δι' αὐτοῦ πάντες. 9 Φανερὸν δὲ καὶ, ὅτι ἐν τῷ μέσῳ, καὶ ἐν τῷ τρίτῳ, οἱ μὴ δι' αὐτῶν γινόμενοι συλλογισμοὶ, ἢ οὐκ εἰσὶ κατὰ τὴν κύκλῳ δεῖξιν, ἢ ἀτελεῖς.

* γρ. ληφθ.

A 5 Et cùm altera *propoſitio* eſt attributiua, altera priuatiua, attributiua autem eſt vniuerſalis: probabitur altera. Inſit enim τὸ β omni γ: τὸ α autem cuidam non inſit: concludetur τὸ α cuidam β non ineſſe. Si igitur aſſumptum fuerit, τὸ γ omni β ineſſe: inerat autem τὸ α non omni β: *certè* neceſſe *eſt* τὸ α cuidam γ non ineſſe, medium eſt τὸ β. 6 Cùm autem priuatiua eſt vniuerſalis, non probatur altera: niſi, vt in prioribus ſumebatur, ſi ſumptum fuerit, cui hoc non omni ineſt, alterum alicui ineſſe. vtputà ſi τὸ α ineſt nulli γ, τὸ β autem alicui: concludetur, cuidam β τὸ α non ineſſe. Si igitur ſumptum fuerit, cui τὸ α non omni ineſt, τὸ γ alicui ineſſe: neceſſe *eſt*, τὸ γ ineſſe alicui β. 7

B Alio modo non licet conuerſâ vniuerſali propoſitione alteram confirmare: neutiquam enim erit ſyllogiſmus. 8 Perſpicuum igitur *eſt*, in prima figura probationem reciprocam fieri per primam & *per* tertiam figuram: nempe cùm attributiua eſt concluſio, per primam: cùm priuatiua, per vltimam: ſumitur enim, cui hoc nulli *ineſt*, alterum omni ineſſe. in media verò figura, cùm ſyllogiſmus eſt vniuerſalis, *probationem fieri* per *eam* ipſam, & per primam figuram: cùm particularis, per *eam* ipſam, & per vltimam. in tertia autem figura, omnes *probationes* per *eam* ipſam *fieri*. 9 Perſpicuum *eſt* etiam, in media & tertia figura ſyllogiſmos qui per eas ipſas non efficiuntur, aut non eſſe ſecundum circularem probationem, aut *eſſe* imperfectos.

De conuerſione ſyllogiſmorum in prima figura. Cap. VIII.

1 ¶ *Definitio.* 2 ¶ *Diuiſio.* 3 ¶ *De ſyllogiſmis vniuerſalibus. De contraria conuerſione τοῦ Barbara,* 4 *vel Celarent.* 5 *De contradictoria conuerſione* 6 *τοῦ Barbara,* 7 *vel Celarent.* 8 ¶ *De ſyllogiſmis particularibus.* 9 *De conuerſione τοῦ Dary contradictoria,* 10 *vel contraria.* 11 *De conuerſione τοῦ Ferio.*

CAP. VIII.

C Τὸ δ' ἀντιστρέφειν ἐστὶ, τὸ μετατιθέντα τὸ συμπέρασμα, ποιεῖν τὸν συλλογισμὸν, ὅτι ἢ τὸ ἄκρον τῷ μέσῳ οὐχ ὑπάρξει, ἢ τοῦτο τῷ τελευταίῳ. ἀνάγκη γὰρ, τοῦ συμπεράσματος ἀντιστραφέντος, καὶ τῆς ἑτέρας προτάσεως μενούσης, ἀναιρεῖσθαι τὴν λοιπήν. εἰ γὰρ ἔσται, καὶ τὸ συμπέρασμα ἔσται. 2 Διαφέρει δὲ τὸ ἀντικειμένως ἢ ἐναντίως ἀντιστρέφειν τὸ συμπέρασμα. οὐ γὰρ ὁ αὐτὸς γίνεται συλλογισμὸς, ἑκατέρως ἀντιστραφέντος. δῆλον δὲ τοῦτο ἔσται διὰ τῶν ἑπομένων. λέγω δ' ἀντικεῖσθαι μὲν, τὸ παντὶ τῷ οὐ παντὶ καὶ τὸ τινὶ, τῷ οὐδενί. ἐναντίως δὲ, τὸ παντὶ, τῷ οὐδενί· καὶ τὸ τινὶ, τῷ οὐ τινὶ ὑπάρχειν. 3 Ἔστω γὰρ δεδειγμένον τὸ α κατὰ τοῦ γ, διὰ μέσου τοῦ β. εἰ δὴ τὸ α μηδενὶ ληφθείη τῷ γ ὑπάρχειν, τῷ δὲ β παντὶ, οὐδενὶ τῷ γ ὑπάρξει τὸ β. καὶ εἰ τὸ μὲν α μηδενὶ τῷ γ, τὸ δὲ β παντὶ τῷ γ· τὸ α οὐ παντὶ τῷ β, καὶ οὐχ ὅλως οὐδενί· οὐ γὰρ ἐδείκνυτο τὸ καθόλου διὰ τοῦ τρίτου σχήματος. ὅλως δὲ τὴν πρὸς τῷ μείζονι ἄκρῳ πρότασιν οὐκ ἔστιν ἀνασκευάσαι καθόλου δι' ἀντιστροφῆς. ἀεὶ γὰρ ἀναιρεῖται διὰ τοῦ τρίτου σχήματος· ἀνάγκη γὰρ πρὸς τὸ ἔσχατον ἄκρον ἀμφοτέρας λαβεῖν τὰς προτάσεις. 4 Καὶ εἰ στερητικὸς ὁ συλλογισμὸς, ὡσαύτως. δεδείχθω γὰρ τὸ α μηδενὶ τῷ γ ὑπάρχειν, διὰ τοῦ β. οὐκοῦν ἐὰν ληφθῇ τὸ α τῷ γ παντὶ ὑπάρχειν, τῷ δὲ β μηδενί· οὐδενὶ τῷ γ τὸ β ὑπάρξει. καὶ εἰ τὸ α, καὶ τὸ β παντὶ τῷ γ· τὸ α τινὶ τῷ β· ἀλλ' οὐδενὶ ὑπῆρχεν.

C Conuertere autem eſt, tranſpoſitâ concluſione efficere ſyllogiſmum *quo colligatur* aut *maius* extremum medio non ineſſe, aut hoc *medium* poſtremo. neceſſe enim *eſt* concluſione conuerſâ, & altera propoſitione manente, reliquam tolli: nam ſi *illa quoque propoſitio* erit, etiam concluſio erit. 2 Intereſt autem, vtrùm oppoſitè an contrariè conuertatur concluſio: quia non fit idem ſyllogiſmus eâ vtrovis modo conuerſâ. hoc autem planum fiet ex ſequentibus. Dico opponi, Omni, &, Non omni: item, Alicui, &, Nulli. contraria *vero*, Omni, &, Nulli: item, Alicui, &, Non alicui ineſſe. 3 Sit enim probatum τὸ α de

D γ per medium β. Si igitur ſumptum fuerit, τὸ α ineſſe nulli γ, & omni β: *certè* nulli γ inerit τὸ β. Et ſi ſumptum ſit, τὸ α *ineſſe* nulli γ, τὸ β autem omni γ: *concludetur* τὸ α non omni β *ineſſe*, non omnino nulli; quia non probabatur vniuerſale per tertiam figuram. Et omnino propoſitionem quæ maiori extremo iuncta eſt, non licet euertere vniuerſaliter per conuerſionem: quia ſemper euertitur per tertiam figuram. neceſſe *eſt* enim, ad minus extremum ambæ propoſitiones ſumantur. 4 Itidem *fiet*, ſi ſyllogiſmus ſit priuatiuus. Oſtenſum enim ſit τὸ α nulli γ ineſſe, per β. Ergo ſi ſumptum fuerit, τὸ α omni γ, & nulli β ineſſe: nulli γ τὸ β inerit. Quòd ſi τὸ α & τὸ β inſint omni γ, τὸ α *inerit* alicui β. atqui nulli inerat.

A 5 Si verò oppoſitè conuertatur concluſio: etiam alij ſyllogiſmi, oppoſiti, non vniuerſales erunt: quoniam altera propoſitio fit particularis: proinde etiam concluſio erit particularis. 6 Sit enim ſyllogiſmus attributiuus, atque ita conuertatur. Ergo ſi τὸ α non omni γ, & omni β *ineſt*: τὸ β non omni γ *inerit*. Et ſi τὸ α non omni γ, τὸ β autem omni *ineſt*: τὸ α non omni β *inerit*. 7 Similiter *fiet*, ſi ſyllogiſmus ſit priuatiuus. Nam ſi τὸ α inſit alicui γ & nulli τῷ β: alicui γ non inerit: non ſimpliciter nulli. Et ſi τὸ α alicui γ, τὸ β autem omni *inſit*, vt initio ſumptum fuit: τὸ α inerit alicui β. 8 In ſyllogiſmis autem particularibus, vbi oppoſitè conuertitur concluſio, tolluntur ambæ propoſitiones. vbi contrariè, neutra. non enim ampliùs fit, quemadmodum in vniuerſalibus, vt euertatur, deficiente concluſione, dum conuertitur: imo omnino euerti non poteſt. 9 Oſtenſum enim ſit τὸ α de aliquo γ. Ergo ſi ſumptum fuerit τὸ α ineſſe nulli γ, τὸ β autem alicui γ: τὸ α cuidam β non inerit. Et ſi τὸ α nulli γ, omni autem β *inſit*, nulli γ τὸ β *inerit*. Quare euertuntur ambæ *propoſitiones*. 10 Si verò contrariè conuertatur *concluſio*, neutra *propoſitio euertitur*. Nam ſi τὸ α cuidam γ non ineſt, omni autem β *ineſt*: τὸ β cuidam γ non inerit. ſed nondum euerſum eſt, quod ab initio *fuit propoſitum*: quia poteſt alicui ineſſe, & alicui non ineſſe. Vniuerſalis autem propoſitionis α β omnino non fit ſyllogiſmus. nam ſi τὸ α alicui γ non ineſt, & τὸ β alicui ineſt: neutra propoſitio *eſt* vniuerſalis. 11 Similiter *fiet*, ſi ſyllogiſmus ſit priuatiuus. nam ſi ſumptum fuerit τὸ α omni γ ineſſe, tolluntur ambæ *propoſitiones*. ſi alicui, neutra. demonſtratio verò *eſt* eadem.

5 Ἐὰν δὲ ἀντικειμένως ἀντιστραφῇ τὸ συμπέρασμα, καὶ οἱ ἄλλοι συλλογισμοὶ ἀντικείμενοι, καὶ οὐ καθόλου ἔσονται. γίνεται γὰρ ἡ ἑτέρα πρότασις, ἐν μέρει· ὥστε καὶ τὸ συμπέρασμα ἔσται κατὰ μέρος. 6 Ἔστω γὰρ κατηγορικὸς ὁ συλλογισμός, καὶ ἀντιστραφήτω οὕτως. οὐκοῦν εἰ τὸ α μὴ παντὶ τῷ γ, τῷ δὲ β παντί, τὸ β οὐ παντὶ τῷ γ. καὶ εἰ τὸ μὲν α οὐ παντὶ τῷ γ, τὸ δὲ β παντί, τὸ α οὐ παντὶ τῷ β. 7 Ὁμοίως δὲ καί, εἰ στερητικὸς εἴη ὁ συλλογισμός. εἰ γὰρ τὸ α τινὶ τῷ γ ὑπάρχει, τῷ δὲ β μηδενί, τὸ β τινὶ τῷ γ οὐχ ὑπάρξει, καὶ οὐχ ἁπλῶς οὐδενί. καὶ εἰ τὸ μὲν α τῷ γ τινί, τὸ δὲ β παντί, ὥσπερ ἐν ἀρχῇ ἐλήφθη· τὸ α τῷ β τινὶ ὑπάρξει. 8 Ἐπὶ δὲ τῶν ἐν μέρει συλλογισμῶν, B ὅταν μὲν ἀντικειμένως ἀντιστρέφηται τὸ συμπέρασμα, ἀναιροῦνται ἀμφότεραι αἱ προτάσεις. ὅταν δὲ ἐναντίως, οὐδετέρα. οὐ γὰρ ἔτι συμβαίνει, καθάπερ ἐν τοῖς καθόλου, ἀναιρεῖν, ἐλλείποντος τοῦ συμπεράσματος κατὰ τὴν ἀντιστροφήν· ἀλλ' οὐδ' ὅλως ἀναιρεῖν. 9 Δεδείχθω γὰρ τὸ α κατά τινος τοῦ γ. οὐκοῦν ἐὰν ληφθῇ τὸ α μηδενὶ τῷ γ ὑπάρχειν, τὸ δὲ β τινὶ τῷ γ· τὸ α τῷ β τινὶ οὐχ ὑπάρξει. καὶ εἰ τὸ α μηδενὶ τῷ γ, τῷ δὲ β παντί· οὐδενὶ τῷ γ τὸ β. ὥστε ἀναιροῦνται ἀμφότεραι. 10 Ἐὰν δὲ ἐναντίως ἀντιστραφῇ, οὐδετέρα. εἰ γὰρ τὸ α τινὶ τῷ γ μὴ ὑπάρχει, τῷ δὲ β παντί, τὸ β τινὶ τῷ γ οὐχ C ὑπάρξει. ἀλλ' οὔπω ἀνῄρηται τὸ ἐξ ἀρχῆς· ἐνδέχεται γὰρ τινὶ ὑπάρχειν, καὶ τινὶ μὴ ὑπάρχειν. τῆς δὲ καθόλου, τῆς α β, ὅλως οὐ γίνεται συλλογισμός. εἰ γὰρ τὸ μὲν α τινὶ τῷ γ μὴ ὑπάρχει, τὸ δὲ β τινὶ ὑπάρχει· οὐδετέρα καθόλου τῶν προτάσεων. 11 Ὁμοίως δὲ καί, εἰ στερητικὸς εἴη ὁ συλλογισμός. εἰ μὲν γὰρ * ληφθείη τὸ α παντὶ τῷ γ ὑπάρχειν, * γρ. ληφθείνται ἀναιροῦνται ἀμφότεραι. εἰ δὲ τινί, οὐδετέρα. ἀπόδειξις δ', ἡ αὐτή.

De conuerſione ſyllogiſmorum in ſecunda figura. Cap. IX.

1 ¶ De ſyllogiſmis vniuerſalibus. 2 Conuerſio τοῦ Cameſtres contrariè, 3 vel contradictoriè. 4 Conuerſio τοῦ Ceſare. 5 ¶ De ſyllogiſmis particularibus. 6 Conuerſio τοῦ Feſtino contrariè, 7 vel contradictoriè. 8 Conuerſio τοῦ Baroco.

D IN ſecundâ autem figurâ propoſitionem maiori extremo iunctam non licet euertere contrariè, vtrouis modo conuerſio fiat. ſemper enim erit concluſio in tertia figura, in qua non erat ſyllogiſmus vniuerſalis. alteram verò propoſitionem euertemus eo modo, quo conuerſio facta fuerit: nempe, ſi contrariè facta ſit conuerſio, *euertetur* contrario modo: ſi oppoſitè, oppoſito. 2 Inſit enim τὸ α omni β, nulli autem γ: concluſio *eſt* β γ. Si igitur ſumptum fuerit, τὸ β omni γ ineſſe, & *pronunciatum* α β maneat: τὸ α omni γ inerit. fit enim prima figura. Quod ſi τὸ β *inſit* omni γ, τὸ α verò nulli γ: τὸ α non omni β *inerit*. figura *eſt* vltima. 3 Si E verò oppoſitè conuertatur *concluſio* β γ: *propoſitio* α β ſimili modo oſtendetur: *propoſitio* autem α γ, oppoſitè. Nam ſi τὸ β *inſit* cuidam γ, τὸ α autem nulli γ: τὸ α cuidam β non inerit. Rurſus ſi τὸ β *inſit* alicui γ, τὸ α autem omni β: τὸ α *inerit* alicui γ. itaque oppoſito modo fit ſyllogiſmus. 4 Similiter etiam probabitur, ſi vice verſa *ſe* habeant propoſitiones. 5 Si verò ſyllogiſmus ſit in parte: contrariè conuerſâ concluſione, neutra propoſitio euertitur, quemadmodum nec in prima figura *euertebatur*: oppoſitè *conuerſâ*, ambæ *euertuntur*.

ΕΝ δὲ τῷ δευτέρῳ σχήματι τὴν μὲν πρὸς τῷ μείζονι ἄκρῳ πρότασιν οὐκ ἔστιν ἀνελεῖν ἐναντίως, ὁποτερωσοῦν τῆς ἀντιστροφῆς γινομένης. ἀεὶ γὰρ ἔσται τὸ συμπέρασμα ἐν τῷ τρίτῳ σχήματι· καθόλου δὲ οὐκ ἦν ἐν τούτῳ συλλογισμός. τὴν δ' ἑτέραν ὁμοίως ἀναιρήσομεν τῇ ἀντιστροφῇ. λέγω δὲ τὸ ὁμοίως, εἰ μὲν ἐναντίως ἀντιστρέφεται, ἐναντίως· εἰ δὲ ἀντικειμένως, ἀντικειμένως. 2 Ὑπαρχέτω γὰρ τὸ α παντὶ τῷ β, τῷ δὲ γ μηδενί· συμπέρασμα, τὸ β γ. ἐὰν οὖν ληφθῇ τὸ β παντὶ τῷ γ ὑπάρχειν, καὶ τὸ α β μένῃ· τὸ α παντὶ τῷ γ ὑπάρξει. γίνεται γὰρ τὸ πρῶτον σχῆμα. εἰ δὲ τὸ β παντὶ τῷ γ, τὸ δὲ α οὐ- E δενὶ τῷ γ· τὸ α οὐ παντὶ τῷ β· σχῆμα, τὸ ἔσχατον. 3 Ἐὰν δ' ἀντικειμένως ἀντιστραφῇ τὸ β γ· ἡ μὲν α β, ὁμοίως δειχθήσεται· ἡ δὲ α γ, ἀντικειμένως. εἰ γὰρ τὸ β τινὶ τῷ γ, τὸ δὲ α μηδενὶ τῷ γ· τὸ α τινὶ τῷ β οὐχ ὑπάρξει. πάλιν, εἰ τὸ β τινὶ τῷ γ, τὸ δὲ α παντὶ τῷ β· τὸ α τινὶ τῷ γ. ὥστ' ἀντικειμένως γίνεται ὁ συλλογισμός. 4 Ὁμοίως δὲ δειχθήσεται, καὶ εἰ ἀνάπαλιν ἔχοιεν αἱ προτάσεις. 5 Εἰ δ' ἐστὶν ἐπὶ μέρους ὁ συλλογισμός· ἐναντίως μὲν ἀντιστρεφομένου τοῦ συμπεράσματος, οὐδετέρα τῶν προτάσεων ἀναιρεῖται, καθάπερ οὐδ' ἐν τῷ πρώτῳ σχήματι· ἀντικειμένως δέ, ἀμφότεραι. CAP. IX.

6 Κείσθω γὰρ τὸ α τῷ μὲν β μηδενὶ ὑπάρχειν, τῷ δὲ γ τινί· συμπέρασμα, τὸ β γ. ἐὰν οὖν τεθῇ τὸ β τινὶ τῷ γ ὑπάρχειν, καὶ τὸ α β μένῃ· συμπέρασμα ἔσται, ὅτι τὸ α τινὶ τῷ γ οὐχ ὑπάρχει. ἀλλ' οὐκ ἀνῄρηται τὸ ἐξ ἀρχῆς. ἐνδέχεται γὰρ τινὶ ὑπάρχειν, καὶ μὴ ὑπάρχειν. πάλιν, εἰ τὸ β τινὶ τῷ γ, καὶ τὸ α τινὶ τῷ γ, οὐκ ἔσται συλλογισμός· οὐδέτερον γὰρ καθόλου τῶν εἰλημμένων. ὥστ' οὐκ ἀναιρεῖται τὸ α β. 7 Ἐὰν δ' ἀντικειμένως ἀντιστρέφηται, ἀναιροῦνται ἀμφότεραι. εἰ γὰρ τὸ β παντὶ τῷ γ, τὸ δὲ α μηδενὶ τῷ β· οὐδενὶ τῷ γ τὸ α· ἦν δὲ τινί. πάλιν, εἰ τὸ β παντὶ τῷ γ, τὸ δὲ α τινὶ τῷ γ· ἔσται τινὶ τῷ β τὸ α. 8 Ἡ αὐτὴ δ' ἀπόδειξις, καὶ εἰ τὸ καθόλου κατηγορικὸν εἴη.

A 6 Ponatur enim τὸ α ineſſe nulli β, & alicui γ: concluſio eſt β γ. Si igitur poſitum fuerit τὸ β cuidã γ ineſſe, & pronunciatum α β maneat: concluſio erit, τὸ α cuidam γ non ineſſe. ſed non euertitur, quod ab initio propoſitum fuit: quia poteſt alicui ineſſe, & nõ ineſſe. Rurſus ſi τὸ β inſit alicui γ, & τὸ α alicui γ: non erit ſyllogiſmus: quia neutrum ex pronunciatis acceptis eſt vniuerſale. quare non euertitur pronunciatum α β. 7 Quòd ſi oppoſite conuertatur, tolluntur ambæ propoſitiones. Nam ſi τὸ β ineſt omni γ, τὸ α autem nulli β: nulli γ inerit τὸ α. alicui tamen inerat. Rurſus ſi τὸ β ineſt omni γ, τὸ α autem alicui γ: inerit alicui β τὸ α. 8 Eadem erit demonſtratio, & ſi pronunciatum vniuerſale ſit attributiuum.

De conuerſione ſyllogiſmorum in tertia figura. Cap. X.

1 ¶ *Summaria expoſitio.* 2 ¶ *De ſyllogiſmis affirmatiuis. De contraria conuerſione τοῦ Darapti, vel Diſamis, vel Datiſi.* 4 *De contradictoria conuerſione* 5 *τοῦ Darapti,* 6 *vel Datiſi* 7 ¶ *De ſyllogiſmis negatiuis. De conuerſione τοῦ Felapton contraria,* 8 *vel contradictoria.* 9 *De conuerſione τοῦ Feriſon contradictoria,* 10 *vel contraria.* 11 ¶ *Communia de tribus figuris. Quomodo fiat conuerſio.* 12 *Quid inde colligatur.* 13 *In quibus figuris fiant ſyllogiſmi euertentes.* 14 *Epilogus.*

CAP. X. Ἐν δὲ τῷ τρίτῳ σχήματι, ὅταν μὲν ἐναντίως ἀντιστρέφηται τὸ συμπέρασμα, οὐδετέρα τῶν προτάσεων ἀναιρεῖται, κατ' οὐδένα τῶν συλλογισμῶν. ὅταν δὲ ἀντικειμένως, ἀμφότεραι, καὶ ἐν ἅπασι. 2 Δεδείχθω γὰρ τὸ α τινὶ τῷ β *ὑπάρχειν· μέσον δὲ εἰλήφθω τὸ γ· ἔστωσαν δὲ καθόλου αἱ προτάσεις. οὐκοῦν ἐὰν ληφθῇ τὸ α τινὶ τῷ β μὴ ὑπάρχειν, τὸ δὲ β παντὶ τῷ γ· οὐ γίνεται συλλογισμὸς τοῦ α καὶ τοῦ γ. οὐδ' εἰ τὸ α τῷ μὲν β τινὶ μὴ ὑπάρχει, τῷ δὲ γ παντί, οὐκ ἔσται τοῦ β καὶ τοῦ γ συλλογισμός. 3 Ὁμοίως δὲ δειχθήσεται, καὶ εἰ μὴ καθόλου αἱ προτάσεις. ἢ γὰρ ἀμφοτέρας ἀνάγκη κατὰ μέρος εἶναι διὰ τῆς ἀντιστροφῆς, ἢ τὸ καθόλου πρὸς τῷ ἐλάττονι ἄκρῳ γίνεσθαι· οὕτω δὲ οὐκ ἦν συλλογισμός, οὔτ' ἐν τῷ πρώτῳ σχήματι, οὔτ' ἐν τῷ μέσῳ. 4 Ἐὰν δὲ ἀντικειμένως ἀντιστρέφωνται αἱ προτάσεις, ἀναιροῦνται ἀμφότεραι. 5 Εἰ γὰρ τὸ α μηδενὶ τῷ β, τὸ δὲ β παντὶ τῷ γ· τὸ α οὐδενὶ τῷ γ. πάλιν, εἰ τὸ α τῷ μὲν β οὐδενί, τῷ δὲ γ παντί· τὸ β οὐδενὶ τῷ γ. 6 Καὶ εἰ ἡ ἑτέρα μὴ καθόλου, ὡσαύτως. εἰ γὰρ τὸ α μηδενὶ τῷ β, τὸ δὲ β τινὶ τῷ γ· τὸ α τινὶ τῷ γ οὐχ ὑπάρξει. εἰ δὲ τὸ α τῷ μὲν β μηδενί, τῷ δὲ γ παντί· οὐδενὶ τῷ γ τὸ β. 7 Ὁμοίως δὲ καί, εἰ στερητικὸς ὁ συλλογισμός. δεδείχθω γὰρ τὸ α τινὶ τῷ β μὴ ὑπάρχον· ἔστω δὲ κατηγορικὸν μὲν τὸ β γ, ἀποφατικὸν δὲ τὸ α γ. οὕτω γὰρ ἐγίνετο ὁ συλλογισμός. ὅταν μὲν οὖν τὸ ἐναντίον ληφθῇ τῷ συμπεράσματι, οὐκ ἔσται συλλογισμός. εἰ γὰρ τὸ α τινὶ τῷ β, τὸ δὲ β παντὶ τῷ γ, οὐκ ἦν συλλογισμὸς τοῦ α καὶ τοῦ γ. οὐδ' εἰ τὸ α τινὶ τῷ β, τῷ δὲ γ μηδενί, οὐκ ἦν τοῦ β καὶ τοῦ γ συλλογισμός. ὥστε οὐκ ἀναιροῦνται αἱ προτάσεις. 8 Ὅταν δὲ τὸ ἀντικείμενον, ἀναιροῦνται. εἰ γὰρ τὸ α παντὶ τῷ β, καὶ τὸ β παντὶ τῷ γ· τὸ α τῷ γ παντί. ἀλλ' οὐδενὶ ὑπῆρχε. πάλιν, εἰ τὸ α παντὶ τῷ β, τῷ δὲ γ μηδενί· τὸ β οὐδενὶ τῷ γ· ἀλλὰ παντὶ ὑπῆρχεν. 9 Ὁμοίως δὲ δείκνυται, καὶ εἰ μὴ καθόλου *εἰσὶν αἱ προτάσεις. γίνεται γὰρ τὸ α γ, καθόλου τε καὶ στερητικόν· θάτερον δέ, ἐπὶ μέρους καὶ κατηγορικόν. εἰ μὲν οὖν τὸ α παντὶ τῷ β, τὸ δὲ β τινὶ τῷ γ· τὸ α τινὶ τῷ γ συμβαίνει. ἀλλ' οὐδενὶ ὑπῆρχε. πάλιν, εἰ τὸ α παντὶ τῷ β, τῷ δὲ γ μηδενί· τὸ β οὐδενὶ τῷ γ. ἔκειτο δὲ τινί. 10 Εἰ δὲ τὸ α τινὶ τῷ β, καὶ τὸ β τινὶ τῷ γ· οὐ γίνεται συλλογισμός· οὐδ' εἰ τὸ α τινὶ τῷ β, τῷ δὲ γ μηδενί· οὐδ' οὕτως. ὥστε ἐκείνως μὲν ἀναιροῦνται

* γ. ὑπάρχον.

* γ. ὦσιν.

B In tertia verò figura, quando contrariè conuertitur concluſio, neutra cuiuſvis ſyllogiſmi propoſitio euertitur. quando oppoſitè, ambæ *euertuntur*, & in omnibus *ſyllogiſmis*. 2 Oſtenſum enim ſit τὸ α cuidam β ineſſe: & medium ſumptum ſit τὸ γ: ſintque propoſitiones vniuerſales. Ergo ſi ſumptũ fuerit, τὸ α cuidam β non ineſſe, τὸ β autẽ omni γ *ineſſe*: non fit ſyllogiſmus τοῦ α de γ. Item ſi τὸ α cuidam β non inſit, omni autem γ inſit: non erit ſyllogiſmus τοῦ β de γ. 3 Similiter oſtendetur, & ſi propoſitiones non vniuerſales *ſint*. aut enim neceſſe *eſt* ambas eſſe particulares per conuerſionem, aut vniuerſale iungi minori extremo: ſic verò nõ erat ſyllogiſmus, nec in prima figura, nec in media. 4 C Quòd ſi oppoſitè conuertantur propoſitiones, euertuntur ambæ. 5 Nam ſi τὸ α *inſit* nulli β, & τὸ β omni γ: τὸ α *inerit* nulli γ. Rurſus ſi τὸ α *inſit* nulli β, & omni γ: τὸ β *inerit* nulli γ. 6 Itidem *fit*, & ſi altera propoſitio non vniuerſalis *ſit*. Nam ſi τὸ α nulli β, & τὸ β cuidam γ *inſit*: τὸ α cuidam γ non inerit. Si verò τὸ α nulli β, & omni γ *inſit*: nulli γ τὸ β *inerit*. 7 Similiter fiet, ſi ſyllogiſmus ſit priuatiuus. Oſtenſum enim ſit τὸ α cuidam β non ineſſe: ſitque attributiuum *pronunciatum* β γ: negatiuum, α γ. ſic enim efficiebatur ſyllogiſmus. cùm igitur *pronunciatum* concluſioni contrarium ſumptum fuerit, non erit ſyllogiſmus. Nam ſi τὸ α *inſit* alicui β, τὸ β autem omni γ: non erat ſyllogiſmus τοῦ α de γ. Item ſi τὸ α *inſit* D alicui β, nulli autem γ: non erat ſyllogiſmus τοῦ β de γ. Quare non euertuntur propoſitiones. 8 Cùm autem oppoſitum *ſumptum fuerit, propoſitiones* euertuntur. Nam ſi τὸ α omni β, & τὸ β omni γ *inſit*: τὸ α omni γ *inerit*. ſed nulli inerat. Rurſus ſi τὸ α omni β, nulli autem γ *inſit*: τὸ β nulli γ *inerit*. ſed omni inerat. 9 Similiter oſtenditur, & ſi non vniuerſales ſint propoſitiones: quia τὸ α γ fit vniuerſale, & priuatiuum: alterum verò *pronunciatum*, in parte, & attributiuum. Si igitur τὸ α omni β, τὸ β autem alicui γ: τὸ α alicui γ accidit. ſed nulli inerat. Rurſus ſi τὸ α omni β, nulli autem γ *inſit*: τὸ β nulli γ *inerit*. poſitum autem fuerat *ineſſe* alicui. 10 Si verò τὸ α *inſit* alicui β, & τὸ β alicui γ: non fit ſyllogiſmus. Quòd ſi τὸ α *inſit* alicui β, nulli autem γ: ne ſic quidem *erit ſyllogiſmus*. Quocirca illo modo euertuntur

tur, hoc non euertuntur propoſitiones. 11 Ex A dictis igitur conſtat, quomodo conuerſa concluſione in ſingulis figuris fiat ſyllogiſmus. 12 Et quando *probetur* contrarium propoſitioni, quando oppoſitum. 13 *Apparet* etiam, in prima figura per mediam & *per* poſtremam effici ſyllogiſmos. & *propoſitionem* quidẽ minori extremo iunctam, ſemper euerti per mediam *figuram*: eam verò, quæ maiori *extremo* iuncta eſt, per poſtremam. In ſecunda autem figura, per primam & *per* poſtremam. & *propoſitionem* quidem iunctam minori extremo, ſemper *euerti* per primam figuram: iunctam verò maiori extremo, per vltimam. In tertia verò *figura*, per B primam & *per* mediam. & iunctam quidem maiori extremo, ſemper *euerti* per primam: iunctam autem minori, ſemper per mediam. 14 Quid igitur ſit conuertere, & quomodo in ſingulis figuris, & quis efficiatur ſyllogiſmus, perſpicuum *eſt*.

A οὕτω δ' οὐκ ἀναιροῦνται αἱ προτάσεις. 11 Φανερὸν οὖν διὰ τῶν εἰρημένων, πῶς ἀντιστρεφομένου τοῦ συμπεράσματος, ἐν ἑκάστῳ σχήματι γίνεται συλλογισμός. 12 Καὶ πότε ἐναντίως τῇ προτάσει, καὶ πότε ἀντικειμένως. 13 Καὶ ὅτι ἐν μὲν τῷ πρώτῳ σχήματι, διὰ τοῦ μέσου, καὶ τοῦ ἐσχάτου, γίνονται οἱ συλλογισμοί· καὶ ἡ μὲν πρὸς τῷ ἐλάττονι ἄκρῳ, ἀεὶ διὰ τοῦ μέσου ἀναιρεῖται· ἡ δὲ πρὸς τῷ μείζονι, διὰ τοῦ ἐσχάτου. ἐν δὲ τῷ δευτέρῳ σχήματι, διὰ τοῦ πρώτου, καὶ τοῦ ἐσχάτου. καὶ ἡ μὲν πρὸς τῷ ἐλάττονι ἄκρῳ, ἀεὶ διὰ τοῦ πρώτου σχήματος· ἡ δὲ πρὸς τῷ μείζονι, διὰ τοῦ ἐσχάτου. ἐν δὲ τῷ τρίτῳ, διὰ τοῦ πρώτου, καὶ τοῦ μέσου. καὶ ἡ μὲν πρὸς τῷ μείζονι, ἀεὶ διὰ τοῦ πρώτου· ἡ δὲ πρὸς τῷ ἐλάττονι, ἀεὶ διὰ τοῦ μέσου. 14 Τί μὲν οὖν ἐστι τὸ ἀντιστρέφειν, καὶ πῶς ἐν ἑκάστῳ σχήματι, καὶ τίς γίνεται συλλογισμός, φανερόν.

De deductione ad impoſſibile in prima figura. Cap. XI.

1 ¶ *Quomodo probetur per impoſſibile.* 2 ¶ *Quæ problemata ita probentur in ſingulis figuris.* 3 ¶ *De prima figura: & primum De problemate vniuerſali affirmante, ſi eius contradictio ſupponatur.* 4 *ſi ei contraria ſit maior,* 5 *vel minor propoſitio.* 6 *Concluſio.* 7 *De reliquis problematis:* 8 *& primum De problemate particulari affirmante. ſi ei contradicat maior,* 9 *vel minor propoſitio,* 10 *ſi ei contraria ſit minor, vel maior propoſitio* 11 *De problemate vniuerſali negante ſi ei contradicat minor propoſitio in Dary,* 12 *vel Ferio.* 13 *ſi ei contradicat maior.* 14 *ſi ei contraria ſit* 15 *minor,* 16 *vel maior* 17 *De problemate particulari negante, Non omni ineſſe. ſi ei contradicat minor in Barbara.* 18 *vel maior in Barbara,* 19 *vel minor in Celarent,* 20 *vel maior in modo negatiuo inutili.* 21 *ſi ei contraria ſit minor* 22 *De problemate particulari negante, Alicui non ineſſe.* 23 ¶ *Communia de ſyllogiſmis primæ figuræ. De hypotheſi.* 24 *De problemate.*

PEr impoſſibile autem fit ſyllogiſmus, cùm C ponitur contradictio concluſionis, & aſſumitur alia propoſitio. Fit autem in omnibus figuris. ſimilis enim eſt conuerſioni: ſed eo differt: quòd conuertitur facto ſyllogiſmo, & ſumptis ambabus propoſitionibus: deducitur autem ad impoſſibile, cùm oppoſitum eſſe verum, non antè conceſſum, ſed *ex ſe* manifeſtum eſt. Termini autem ſimiliter habẽt in ambobus, eademq; eſt amborũ ſumptio. Vtputà cùm τὸ α omni β ineſt, medium autẽ *eſt* τὸ γ: ſi ſuppoſitũ fuerit τὸ α aut non omni, aut nulli β ineſſe, omni autẽ γ *ineſſe*, quod quidẽ erat verum: neceſſe *eſt* τὸ γ aut nulli, aut nõ omni β ineſſe. hoc verò *eſt* impoſſibile, quare falſum eſt, quod ſuppoſitũ D fuit. oppoſitum igitur *eſt* verum. Similiter *fit* etiam in aliis figuris. quæcumque enim conuerſionem recipiunt, etiam ſyllogiſmum qui per impoſſibilẽ *extruitur, recipiunt.* 2 Omnia igitur alia problemata probantur per impoſſibile in omnibus figuris. vniuerſale autem attributiuum in media quidem & *in* tertia *figura* probatur: in prima verò non probatur. 3 Supponatur enim τὸ α non omni aut nulli β ineſſe, & ab vtrauis parte aſſumatur altera propoſitio: *id eſt*, ſiue omni α ineſſe τὸ γ, ſiue τὸ β omni δ: ſic enim fuerit prima figura. Si igitur ſupponatur non omni β ineſſe τὸ α: non fit ſyllogiſmus, ab vtrauis parte accipiatur propoſitio. 4 Sin E nulli: tunc cùm *propoſitio* β δ aſſumpta fuerit, concludetur falſum, non tamen probabitur propoſitum. Nam ſi τὸ α nulli β, τὸ β autem omni δ *inſit*: α nulli δ *inerit*. hoc autem ſit impoſſibile. falſum igitur *eſt* aliud, nulli β τὸ α ineſſe. Sed ſi, nulli *ineſſe, eſt* falſum: non *continuò*, omni *ineſſe, eſt* verum. 5 Si verò aſſumatur *propoſitio* γ α, non fit ſyllogiſmus. neque tunc, cùm ſuppoſitum fuerit, non omni β ineſſe τὸ α. 6 Quare perſpicuum *eſt*, omni ineſſe, non probari in prima figura per impoſſibile. 7 Alicui verò, & nulli, & nõ omni *ineſſe* probatur. 8 Supponatur enim τὸ α nulli β *ineſſe*: τὸ β

Ὁ Δὲ διὰ τοῦ ἀδυνάτου συλλογισμός, δείκνυται μὲν ὅταν ἡ ἀντίφασις τεθῇ τοῦ συμπεράσματος, καὶ προσληφθῇ ἄλλη πρότασις. γίνεται δ' ἐν ἅπασι τοῖς σχήμασιν. ὅμοιον γάρ ἐστι τῇ ἀντιστροφῇ· πλὴν διαφέρει τοσοῦτον ὅτι ἀντιστρέφεται μὲν γεγενημένου τοῦ συλλογισμοῦ, καὶ εἰλημμένων ἀμφοῖν τῶν προτάσεων· ἀπάγεται δ' εἰς τὸ ἀδύνατον, οὐ προομολογηθέντος τοῦ ἀντικειμένου πρότερον, ἀλλὰ φανεροῦ ὄντος ὅτι ἀληθές. οἱ δὲ ὅροι ὁμοίως ἔχουσιν ἐν ἀμφοῖν, καὶ ἡ αὐτὴ λῆψις ἀμφοτέρων. οἷον, εἰ τὸ α παντὶ τῷ β ὑπάρχει, μέσον δὲ τὸ γ· ἐὰν ὑποτεθῇ τὸ α ἢ μὴ παντί, ἢ μηδενὶ τῷ β ὑπάρχειν, τῷ δὲ γ παντί, ὅπερ ἦν ἀληθές· ἀνάγκη τὸ γ τῷ β ἢ μηδενί, ἢ μὴ παντὶ ὑπάρχειν. τοῦτο δὲ ἀδύνατον. ὥστε ψεῦδος τὸ ὑποτεθέν. ἀληθὲς ἄρα τὸ ἀντικείμενον. Ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων σχημάτων· ὅσα γὰρ ἀντιστροφὴν δέχεται, καὶ τὸν διὰ τοῦ ἀδυνάτου συλλογισμόν. 2 Τὰ μὲν οὖν ἄλλα προβλήματα πάντα δείκνυται διὰ τοῦ ἀδυνάτου ἐν πᾶσι τοῖς σχήμασι. τὸ δὲ καθόλου κατηγορικόν, ἐν μὲν τῷ μέσῳ, καὶ τῷ τρίτῳ δείκνυται· ἐν δὲ τῷ πρώτῳ οὐ δείκνυται. 3 Ὑποκείσθω γὰρ τὸ α τῷ β μὴ παντὶ ἢ μηδενὶ ὑπάρχειν, καὶ προσειλήφθω ἄλλη πρότασις ὁποτερωθενοῦν, εἴτε τῷ α παντὶ ὑπάρχειν τὸ γ, εἴτε τὸ β παντὶ τῷ δ· οὕτω γὰρ ἂν εἴη τὸ πρῶτον σχῆμα. εἰ μὲν οὖν ὑπόκειται μὴ παντὶ ὑπάρχειν τὸ α τῷ β, οὐ γίνεται συλλογισμός, ὁποτερωθενοῦν τῆς προτάσεως λαμβανομένης. 4 Εἰ δὲ μηδενὶ ὅταν μὲν ἡ βδ προσληφθῇ, συλλογισμὸς μὲν ἔσται τοῦ ψεύδους, οὐ δείκνυται δὲ τὸ προκείμενον. εἰ γὰρ τὸ α μηδενὶ τῷ β, τὸ δὲ β παντὶ τῷ δ, τὸ α οὐδενὶ τῷ δ. τοῦτο δ' ἔστω ἀδύνατον. ψεῦδος ἄρα τὸ μηδενὶ τῷ β τὸ α ὑπάρχειν. ἀλλ' οὐκ εἰ τὸ μηδενί, ψεῦδος, τὸ παντὶ ἀληθές. 5 Ἐὰν δ' ἡ γα προσληφθῇ, οὐ γίνεται συλλογισμός. Οὐδ' ὅταν ὑποτεθῇ μὴ παντὶ τῷ β ὑπάρχειν τὸ α. 6 Ὥστε φανερόν, ὅτι τὸ παντὶ ὑπάρχειν, οὐ δείκνυται ἐν τῷ πρώτῳ σχήματι διὰ τοῦ ἀδυνάτου. 7 Τὸ δέ τινι, καὶ τὸ μηδενί, καὶ τὸ μὴ παντί, δείκνυται. 8 Ὑποκείσθω γὰρ τὸ α μηδενὶ τῷ β CAP. XI.

ὑπάρχειν· τὸ δὲ β εἰλήφθω παντί, ἢ τινὶ τῷ γ ὑπάρχειν. οὐκοῦν ἀνάγκη τὸ α μὴ παντί, ἢ μηδενὶ τῷ γ ὑπάρχειν. τοῦτο δ' ἀδύνατον· ἔστω γὰρ τοῦτο ἀληθές, καὶ φανερόν, ὅτι παντὶ ὑπάρχει τὸ α τῷ γ. ὥστ' εἰ τοῦτο, ψεῦδος· ἀνάγκη τὸ α τινὶ τῷ β ὑπάρχειν. 9 Ἐὰν δὲ πρὸς τὸ α ληφθῇ ἡ ἑτέρα πρότασις, οὐκ ἔσται συλλογισμός. 10 Οὐδ' ὅταν τὸ ἐναντίον τῷ συμπεράσματι ὑποτεθῇ, οἷον τὸ τινὶ μὴ ὑπάρχειν. φανερὸν οὖν, ὅτι τὸ ἀντικείμενον ὑποθετέον. 11 Πάλιν ὑποκείσθω τὸ α τινὶ τῷ β ὑπάρχειν· εἰλήφθω δὲ τὸ γ παντὶ τῷ α. ἀνάγκη οὖν τὸ γ τινὶ τῷ β ὑπάρχειν. τοῦτο δὲ ἔστω ἀδύνατον. ὥστε ψεῦδος, τὸ ὑποτεθέν. εἰ δ' οὕτως ἀληθές, τὸ μηδενὶ ὑπάρχειν. 12 Ὁμοίως δὲ καί, εἰ στερητικὸν * ληφθῇ * τὸ γ α. 13 Εἰ δ' ἡ πρὸς τὸ β εἰλήφθη πρότασις, οὐκ ἔσται συλλογισμός. 14 Ἐὰν δὲ τὸ ἐναντίον ὑποτεθῇ, συλλογισμὸς μὲν ἔσται, καὶ τὸ ἀδύνατον· οὐ δείκνυται δὲ τὸ προτεθέν. 15 Ὑποκείσθω γὰρ παντὶ τῷ β τὸ α ὑπάρχειν· καὶ τὸ γ τῷ α εἰλήφθω παντί. οὐκοῦν ἀνάγκη τὸ γ παντὶ τῷ β ὑπάρχειν. τοῦτο δὲ ἀδύνατον. ὥστε ψεῦδος, τὸ παντὶ τῷ β τὸ α ὑπάρχειν. ἀλλ' οὔπω γε ἀναγκαῖον, εἰ μὴ παντί, μηδενὶ ὑπάρχειν. 16 Ὁμοίως δὲ καὶ εἰ πρὸς τὸ β ληφθείη ἡ ἑτέρα πρότασις. συλλογισμὸς μὲν γὰρ ἔσται, καὶ τὸ ἀδύνατον· οὐκ ἀναιρεῖται δ' ἡ ὑπόθεσις. ὥστε τὸ ἀντικείμενον ὑποθετέον. 17 Πρὸς δὲ τὸ μὴ παντὶ δεῖξαι ὑπάρχον τῷ β τὸ α, ὑποθετέον παντὶ ὑπάρχειν. εἰ γὰρ τὸ α παντὶ τῷ β, καὶ τὸ γ παντὶ τῷ α· τὸ γ παντὶ τῷ β. ὥστ' εἰ τοῦτο ἀδύνατον, ψεῦδος, τὸ ὑποτεθέν. 18 Ὁμοίως δὲ καί, εἰ πρὸς τὸ β ληφθῇ ἡ ἑτέρα πρότασις. 19 Καὶ εἰ στερητικὸν ἦν τὸ γ α, ὡσαύτως· καὶ γὰρ οὕτω γίνεται συλλογισμός. 20 Ἐὰν δὲ πρὸς τὸ β ᾖ τὸ στερητικόν, οὐδὲν δείκνυται. 21 Ἐὰν δὲ μὴ τὸ παντί, ἀλλὰ τὸ τινὶ ὑπάρχειν ὑποτεθῇ, οὐ δείκνυται ὅτι οὐ παντί, ἀλλ' ὅτι οὐδενί. εἰ γὰρ τὸ α τῷ β τινί, τὸ δὲ γ παντὶ τῷ α· τινὶ τῷ β τὸ γ ὑπάρξει. εἰ οὖν τοῦτο, ἀδύνατον· ψεῦδος, τὸ τινὶ ὑπάρχειν τῷ β τὸ α. ὥστ' ἀληθές, τὸ μηδενί. τούτου δὲ δειχθέντος, προσαναιρεῖται τὸ ἀληθές· τὸ γὰρ α τῷ β τινὶ μὲν ὑπῆρχε, τινὶ δ' οὐχ ὑπῆρχεν. ἔτι δὲ οὐ παρὰ τὴν ὑπόθεσιν συμβαίνει τὸ ἀδύνατον· * ψευδὴς γὰρ ἂν εἴη· εἴπερ ἐξ ἀληθῶν μὴ ἔστι ψεῦδος συλλογίσασθαι· νῦν δὲ ἔστιν * ἀληθής· ὑπάρχει γὰρ τὸ α τινὶ τῷ β. ὥστ' οὐχ ὑποθετέον, τὸ τινὶ ὑπάρχειν, ἀλλὰ τὸ παντί. 22 Ὁμοίως δὲ καί, εἰ τινὶ μὴ ὑπάρχον τῷ β τὸ α δεικνύοιμεν. εἰ γὰρ ταὐτὸ τὸ τινὶ μὴ ὑπάρχειν, καὶ μὴ παντὶ ὑπάρχειν, ἡ αὐτὴ ἀμφοῖν ἀπόδειξις. 23 Φανερὸν οὖν, ὅτι οὐ τὸ ἐναντίον, ἀλλὰ τὸ ἀντικείμενον, ὑποθετέον ἐν ἅπασι τοῖς συλλογισμοῖς. οὕτω γὰρ τό, τε ἀναγκαῖον ἔσται, καὶ τὸ ἀξίωμα ἔνδοξον. εἰ γὰρ κατὰ παντὸς ἡ κατάφασις, ἢ ἡ ἀπόφασις· δειχθέντος ὅτι οὐχ ἡ ἀπόφασις, ἀνάγκη τὴν κατάφασιν ἀληθεύεσθαι. πάλιν, εἰ μὴ τίθησιν ἀληθεύεσθαι τὴν κατάφασιν, ἔνδοξον τὸ ἀξιῶσαι τὴν ἀπόφασιν. τὸ δ' ἐναντίον οὐδετέρως ἁρμόττει * ἀξιῶσαι. οὔτε γὰρ ἀναγκαῖον, εἰ τὸ μηδενὶ ψεῦδος, τὸ παντὶ ἀληθές· οὔτε ἔνδοξον, ὥστ' εἰ θάτερον, ψεῦδος, ὅτι θάτερον ἀληθές. 24 Φανερὸν οὖν, ὅτι ἐν τῷ πρώτῳ σχήματι τὰ μὲν ἄλλα προβλήματα πάντα δείκνυται διὰ τοῦ ἀδυνάτου, τὸ δὲ καθόλου καταφατικὸν οὐ δείκνυται.

* γρ. [illegible]
* γρ. [illegible]
* γρ. ψεῦδος.
* γρ. ἀληθές.
* γρ. ἀξιοῦν.

autem ſumatur omni, aut alicui, ineſſe: ergo neceſſe eſt τῷ α non omni aut nulli γ ineſſe. hoc autem eſt impoſſibile, ſit enim hoc verum & manifeſtum, omni γ ineſſe τὸ α. quare ſi hoc eſt falſum; neceſſe eſt, τὸ α alicui β ineſſe. 9 Quòd ſi iuxta α ſumpta fuerit altera propoſitio, non erit ſyllogiſmus. 10 Neque cùm ſuppoſitum fuerit contrarium concluſioni, vt, alicui non ineſſe. Apparet igitur, oppoſitum ſupponendum eſſe. 11 Rurſus ſupponatur τὸ α cuidam β ineſſe: ſumatur autem, τὸ γ ineſſe omni α. neceſſe igitur eſt, τὸ γ cuidam β ineſſe. hoc autem eſto impoſſibile. quare falſum eſt, quod ſuppoſitum fuit: atque ita verum eſt, nulli ineſſe. 12 Similiter fiet, ſi priuatiuum ſumptum fuerit pronunciatum γ α. 13 Quòd ſi propoſitio ſumpta ſit iuxta β, non erit ſyllogiſmus. 14 Sin contrarium ſuppoſitum fuerit: ſyllogiſmus quidem erit, & probabitur impoſſibile: non tamen probatur, quod propoſitum fuit. 15 Supponatur enim, omni β τὸ α ineſſe: & τὸ γ ſumptum ſit ineſſe omni α. neceſſe igitur eſt, τὸ γ omni β ineſſe. hoc autem eſt impoſſibile. itaque falſum eſt, omni β τὸ α ineſſe. at non continuò neceſſe eſt, ſi non omni inſit, nulli ineſſe. 16 Similiter fiet, & ſi ad β ſumpta fuerit altera propoſitio. erit enim ſyllogiſmus, & probabitur impoſſibile: non tamen tollitur hypotheſis. quocirca oppoſitum ſupponendum eſt. 17 Vt autem probetur non omni β ineſſe τὸ α, ſupponendum eſt omni ineſſe. Nam ſi τὸ α ineſt omni β, & τὸ γ omni α: τὸ γ inerit omni β. quare ſi hoc eſt impoſſibile: falſum eſt, quod ſuppoſitū fuit. 18 Similiter fiet, & ſi ad β ſumpta fuerit altera propoſitio. 19 Itidémque, ſi pronunciatum α γ ſit priuatiuum. nam ſic quoque fit ſyllogiſmus. 20 Quòd ſi τῷ β iungatur pronunciatum priuatiuum, nihil oſtenditur. 21 Si verò non fuerit ſuppoſitum omni ineſſe, ſed alicui: non probatur non omni ineſſe, ſed nulli. Nam ſi τὸ α inſit alicui β, τὸ γ verò omni α: τὸ γ inerit alicui β. ſi igitur hoc eſt impoſſibile: falſum eſt, alicui β ineſſe τὸ α. itaque verum eſt, nulli ineſſe. hoc autem probato ſimul tollitur, quod verum eſt: quia τὸ α cuidam β inerat, cuidam non inerat. Præterea non propter hypotheſim accidit impoſſibile. falſa enim eſſet: ſiquidem ex veris non poteſt falſum concludi. ſed modò eſt vera: ineſt enim τὸ α cuidam β. Quare non eſt ſupponendum ineſſe alicui, ſed Omni. 22 Similiter fit, & ſi τὸ α cuidam β non ineſſe probemus. nam ſi idem eſt, cuidam non ineſſe, & non omni ineſſe: eadem eſt amborum demonſtratio. 23 Apparet igitur, non contrarium, ſed oppoſitum ſupponendum eſſe in omnibus ſyllogiſmis. ſic enim erit concludendi neceſſitas, & locum habebit axioma illud probabile. quia ſi de quovis affirmatio aut negatio vera eſt: cùm probatum ſit non eſſe veram negationem, neceſſe eſt affirmationem veram eſſe. rurſus niſi ponat veram eſſe affirmationem, probabile eſt admittendam eſſe negationem. contrarium autem neutro modo ſub axioma cadit. neque enim, ſi falſum eſt nulli ineſſe, neceſſe eſt vt verum ſit omni ineſſe: nec etiam probabile, ſi alterum ſit falſum alterum eſſe verum. 24 Perſpicuum igitur eſt, alia omnia problemata per impoſſibile probari in prima figura, vniuerſale autem affirmatiuum non probari.

De deductione ad impoſſibile in ſecunda figura. Cap. XII.

1 ¶ De problemate vniuerſali affirmante. Si hypotheſis problemati contradicat, 2 vel contraria ſit. 3 ¶ De problemate particulari affirmante. Si hypotheſis problemati contradicat, 4 vel contraria ſit. 5 ¶ De problemate vniuerſali negante. 6 ¶ De problemate particulari negante. 7 ¶ Corollarium, quod omnia problemata probentur in ſecunda figura.

IN media verò, & *in* vltima *figura* hoc quoque A probatur. Supponatur enim, τὸ α non omni β ineſſe: & ſumatur omni γ ineſſe τὸ α. ergo ſi non omni β, & omni γ ineſt τὸ α: non omni β *ineſt* τὸ γ. hoc autem *eſt* impoſſibile. ſit enim manifeſtum, omni β ineſſe τὸ γ. quare falſum *eſt*, *quod* ſuppoſitum *fuit*. verum *eſt* igitur, omni ineſſe. 2 Quòd ſi contrarium ſuppoſitum fuerit: ſyllogiſmus quidem erit, & impoſſibile *probabitur*: non tamen confirmatur propoſitum. Nam ſi τὸ α nulli β, omni autem γ *inſit*: nulli β *inerit* τὸ γ. hoc autem *eſt* impoſſibile. quare falſum *eſt*, nulli ineſſe. ſed non, ſi hoc *eſt* falſum, omni *ineſſe eſt* verum. 3 Quando autem alicui β ineſt τὸ α: ſupponatur τὸ α nulli β ineſſe: B omni autem γ inſit. neceſſe igitur *eſt* τὸ γ nulli β *ineſſe*. quare, ſi hoc *eſt* impoſſibile, neceſſe *eſt* τὸ α alicui β ineſſe. 4 *Si* verò ſuppoſitum fuerit, alicui non ineſſe: eadem erunt, quæ in prima figura. 5 Iterum ſupponatur, τὸ α cuidam β ineſſe, τὸ γ autem nulli inſit. neceſſe *eſt* igitur τὸ γ cuidam β non ineſſe. ſed omni inerat. quare falſum *eſt*, *quod* ſuppoſitum *fuit*. nulli igitur β τὸ α inerit. 6 Cùm verò non omni β *ineſt* τὸ α: ſupponatur omni ineſſe, nulli autem γ. neceſſe *eſt* igitur τὸ γ nulli β ineſſe. hoc autem *eſt* impoſſibile. quare verum *eſt*, non omni ineſſe. 7 Apparet igitur, omnes ſyllogiſmos fieri per mediam figuram.

ΕΝ δὲ τῷ μέσῳ καὶ τῷ ἐσχάτῳ καὶ τοῦτο δείκνυται.* ὑποκείσθω γὰρ τὸ α μὴ παντὶ τῷ β ὑπάρχειν· εἰλήφθω δὲ τῷ γ παντὶ ὑπάρχειν τὸ α. οὐκοῦν εἰ τῷ μὲν β ὑπάρχει τὸ α μὴ παντί, τῷ δὲ γ παντί, οὐ παντὶ τῷ β τὸ γ. τοῦτο δέ, ἀδύνατον. ἔστω γὰρ φανερόν, ὅτι τῷ β παντὶ ὑπάρχει τὸ γ. ὥστε ψεῦδος, τὸ ὑποκείμενον. ἀληθὲς ἄρα, τὸ παντὶ ὑπάρχειν. 2 Ἐὰν δὲ τὸ ἐναντίον ὑποτεθῇ· συλλογισμὸς μὲν ἔσται, καὶ τὸ ἀδύνατον· οὐ μὴν δείκνυται τὸ προτεθέν. εἰ γὰρ τὸ α μηδενὶ τῷ β, τῷ δὲ γ παντί, οὐδενὶ τῷ β τὸ γ. τοῦτο δέ, ἀδύνατον. ὥστε ψεῦδος, τὸ μηδενὶ ὑπάρχειν. ἀλλ' οὐκ, εἰ τοῦτο ψεῦδος, τὸ παντί, ἀληθές. 3 Ὅτε δὲ τινὶ τῷ β ὑπάρχει τὸ α, ὑποκείσθω τὸ α μηδενὶ τῷ β ὑπάρχειν· τῷ δὲ γ παντὶ ὑπαρχέτω. ἀνάγκη οὖν τὸ γ μηδενὶ τῷ β. ὥστ' εἰ τοῦτο, ἀδύνατον, ἀνάγκη τὸ α τινὶ τῷ β ὑπάρχειν. 4 Ἐὰν δὲ ὑποτεθῇ, τινὶ μὴ ὑπάρχειν· ταὐτὰ ἔσται, ἅπερ καὶ ἐπὶ τοῦ προτέρου σχήματος. 5 Πάλιν ὑποκείσθω τὸ α τινὶ τῷ β ὑπάρχειν· τῷ δὲ γ μηδενὶ ὑπαρχέτω. ἀνάγκη οὖν τὸ γ τῷ β τινὶ μὴ ὑπάρχειν. ἀλλὰ παντὶ ὑπῆρχεν. ὥστε ψεῦδος, τὸ ὑποτεθέν. οὐδενὶ ἄρα τῷ β τὸ α ὑπάρξει. 6 Ὅτε δὲ οὐ παντὶ τῷ β τὸ α, ὑποκείσθω παντὶ ὑπάρχειν, τῷ δὲ γ μηδενί· ἀνάγκη οὖν τὸ γ μηδενὶ τῷ β ὑπάρχειν. τοῦτο δέ, ἀδύνατον. ὥστ' ἀληθές, τὸ μὴ παντὶ ὑπάρχειν. 7 Φανερὸν οὖν, ὅτι πάντες οἱ συλλογισμοὶ γίνονται διὰ τοῦ μέσου σχήματος.

* CAP. XII.

De deductione ad impoſſibile in tertia figura. Cap. XIII.

1 ¶ De problemate vniuerſali affirmante. Si hypotheſis problemati contradicat, 2 vel contraria ſit. 3 ¶ De problemate particulari affirmante. 4 ¶ De problemate vniuerſali negante. Si hypotheſis problemati contradicat, 5 vel contraria ſit. 6 ¶ De problemate particulari negante. Si hypotheſis problemati contradicat, 7 vel ſit contraria. 8 ¶ Communia de tribus figuris. Accipiendam eſſe hypotheſim, quæ contradicat problemati. 9 Quæ problemata probentur in ſecunda figura.

SImiliter *concludetur* etiam per tertiam *figuram*. C Ponatur enim τὸ α cuidam β non ineſſe, τὸ γ autem omni *ineſſe*: ergo τὸ α cuidam γ non inerit. ſi igitur hoc *eſt* impoſſibile: falſum *eſt*, alicui non ineſſe. itaque verum *eſt*, omni *ineſſe*. 2 Si verò ſupponatur, nulli ineſſe: ſyllogiſmus quidem erit, & impoſſibile [illegible]: ſed non confirmatur propoſitum. [illegible] contrarium ſupponatur, eadem erunt [illegible]. 3 Sed ad *concludendum* alicui ineſſe, hæc hypotheſis ſumenda *eſt*. nam ſi τὸ α nulli [illegible] *inſit*: τὸ α non omni γ *inerit*. ſi igitur hoc eſt falſum: verum *eſt*, τὸ α alicui β ineſſe. [illegible] autem nulli β ineſt τὸ α: ſupponatur alicui [illegible] omni β ineſſe accipiatur. neceſſe [illegible] alicui γ ineſſe. at nulli inerat. quare falſum *eſt*, alicui β τὸ α ineſſe. 5 Quòd ſi ſupponatur omni β ineſſe τὸ α, non probatur propoſitum. 6 Sed ad *concludendum* non omni ineſſe, hæc hypotheſis ſumenda *eſt*. nam ſi τὸ α *ineſt* omni β, & τὸ γ cuidam β: τὸ α ineſt cuidam γ. hoc autem non erat. quare falſum *eſt*, omni ineſſe. proinde verum *eſt*,

ΟΜοίως δὲ καὶ διὰ τοῦ ἐσχάτου. κείσθω γὰρ τὸ α τινὶ τῷ β μὴ ὑπάρχειν, τὸ δὲ γ παντί· τὸ ἄρα α τινὶ τῷ γ οὐχ ὑπάρξει. εἰ οὖν τοῦτο, ἀδύνατον· ψεῦδος, τὸ τινὶ μὴ ὑπάρχειν. ὥστε ἀληθές, τὸ παντί. 2 Ἐὰν δὲ ὑποτεθῇ μηδενὶ ὑπάρχειν· συλλογισμὸς μὲν ἔσται, καὶ τὸ ἀδύνατον· οὐ δείκνυται δὲ τὸ προτεθέν. ἐὰν γὰρ τὸ ἐναντίον ὑποτεθῇ· ταὐτὰ ἔσται, ἅπερ καὶ ἐπὶ τῶν προτέρων. 3 Ἀλλὰ πρὸς τὸ τινὶ ὑπάρχειν, αὕτη ληπτέα ἡ ὑπόθεσις. εἰ γὰρ τὸ α μηδενὶ τῷ β, τὸ δὲ γ τινὶ τῷ β· τὸ α οὐ παντὶ τῷ γ. εἰ οὖν τοῦτο, ψεῦδος· ἀληθές, τὸ α τινὶ τῷ β ὑπάρχειν. 4 Ὅτε δὲ οὐδενὶ τῷ β ὑπάρχει τὸ α· ὑποκείσθω τινὶ ὑπάρχειν· εἰλήφθω δὲ καὶ τὸ γ παντὶ τῷ β ὑπάρχον. οὐκοῦν ἀνάγκη τὸ α τινὶ τῷ γ ὑπάρχειν. ἀλλ' οὐδενὶ ὑπῆρχεν. ὥστε ψεῦδος, τὸ τινὶ τῷ β τὸ α ὑπάρχειν. 5 Ἐὰν δὲ ὑποτεθῇ παντὶ τῷ β ὑπάρχειν τὸ α, οὐ δείκνυται τὸ προτεθέν. 6 Ἀλλὰ πρὸς τὸ μὴ παντὶ ὑπάρχειν, αὕτη ληπτέα ἡ ὑπόθεσις. εἰ γὰρ τὸ α παντὶ τῷ β, καὶ τὸ γ [illegible] β· τὸ α ὑπάρχει τινὶ τῷ γ· τοῦτο δὲ οὐκ ἦν. ὥστε ψεῦδος, τὸ παντὶ ὑπάρχειν. εἰ δ' οὕτως, ἀληθές,

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τὸ μὴ παντί. 7 Ἐὰν δὲ ὑποτεθῇ τινὶ ὑπάρχειν ταὐτὰ ἔσται, ἃ καὶ ἐπὶ τῶν προειρημένων. 8 Φανερὸν οὖν, ὅτι ἐν ἅπασι τοῖς διὰ τοῦ ἀδυνάτου συλλογισμοῖς τὸ ἀντικείμενον ὑποθετέον. 9 Δῆλον δὲ καὶ, ὅτι ἐν τῷ μέσῳ σχήματι δείκνυταί πως τὸ καταφατικὸν, καὶ ἐν τῷ ἐσχάτῳ τὸ καθόλου.

A non omni *ineſſe*. 7 Quòd ſi ſupponatur cuidam ineſſe: eadem erunt, quæ in prædictis. 8 Perſpicuum igitur *eſt*, in omnibus ſyllogiſmis, qui per impoſſibile *exſtruuntur*, ſupponendum eſſe *quod eſt* oppoſitum. 9 Conſtat etiam, in media figura probari aliquo modo *problema* affirmatiuum, & in poſtrema vniuerſale.

Collatio probationis ducentis ad incommodum, & oſtenſiuæ. Cap. XIV.

1 ¶¶ De propoſitionibus. 2 ¶¶ De concluſione. 3 ¶¶ De terminis, & figura, & mutua reſolutione. 4 ¶¶ De reſolutione ſyllogiſmorum qui fiunt per impoſſibile, in oſtenſiuos. 5 ¶ De prima figura. De problemate negante & reductione τοῦ Dary ad Cameſtres: 6 τοῦ Barbara ad Baroco: 7 τοῦ Ferio ad Ceſare: τοῦ Celarent ad Feſtino. 8 De problemate particulari affirmante, & reductione τοῦ Celarent ad Darapti, 9 vel Diſamis: τοῦ Ferio ad Datiſi. 10 ¶ De ſecunda figura. De problemate vniuerſali affirmante, & reductione τοῦ Baroco ad Barbara. 11 De problemate particulari affirmante, & reductione τοῦ Cameſtres ad Dary. 12 De problemate vniuerſali negante, & reductione τοῦ Feſtino ad Celarent. 13 De problemate particulari negante, & reductione τοῦ Ceſare ad Ferio. 14 ¶ De tertia figura. De problemate vniuerſali affirmante, & reductione τοῦ Brocardo ad Barbara. 15 De problemate particulari affirmante, & reductione τοῦ Feriſon ad Dary. 16 De problemate vniuerſali negante, & reductione τοῦ Diſamis ad Ceſare. 17 De problemate particulari negante, & reductione τοῦ Datiſi ad Feſtino. 18 ¶ Corollarium de terminis, ex quibus problema vtroque modo probatur. 19 ¶¶ De reſolutione ſyllogiſmorum oſtenſiuorum in eos qui ducent ad incommodum. 20 ¶¶ Corollarium de coniunctione vtriuſque probationis.

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* γ. τῆς ἀποδεικτικῆς.

Διαφέρει δὲ ἡ εἰς τὸ ἀδύνατον ἀπόδειξις,* τῆς δεικτικῆς, τῷ τιθέναι ὃ βούλεται ἀναιρεῖν, ἀπάγουσα εἰς ὁμολογούμενον ψεῦδος· ἡ δὲ δεικτικὴ ἄρχεται ἐξ ὁμολογουμένων θέσεων. λαμβάνουσι μὲν οὖν ἀμφότεραι δύο προτάσεις ὁμολογουμένας· ἀλλ' ἡ μὲν, ἐξ ὧν ὁ συλλογισμός· ἡ δὲ, μίαν μὲν τούτων, μίαν δὲ, τὴν ἀντίφασιν τοῦ συμπεράσματος. 2 Καὶ ἔνθα μὲν οὐκ ἀνάγκη γνώριμον εἶναι τὸ συμπέρασμα, οὐδὲ προϋπολαμβάνειν ὡς ἔστιν, ἢ οὔ. ἔνθα δὲ ἀνάγκη, ὡς οὐκ ἔστι. διαφέρει δὲ οὐδὲν,* φάσιν ἢ ἀπόφασιν εἶναι τὸ συμπέρασμα· ἀλλ' ὁμοίως ἔχει περὶ ἀμφοῖν. 3 Ἅπαν δὲ τὸ δεικτικῶς συμπεραινόμενον, καὶ διὰ τοῦ ἀδυνάτου δειχθήσεται· καὶ τὸ διὰ τοῦ ἀδυνάτου, δεικτικῶς καὶ διὰ τῶν αὐτῶν ὅρων, οὐκ ἐν τοῖς αὐτοῖς δὲ σχήμασιν. 4 Ὅταν μὲν γὰρ ὁ συλλογισμὸς ἐν τῷ πρώτῳ σχήματι γένηται, τὸ ἀληθὲς ἔσται ἢ ἐν τῷ μέσῳ, ἢ ἐν τῷ ἐσχάτῳ· τὸ μὲν στερητικὸν, ἐν τῷ μέσῳ· τὸ δὲ κατηγορικὸν, ἐν τῷ ἐσχάτῳ. ὅταν δὲ ἐν τῷ μέσῳ ᾖ ὁ συλλογισμὸς, τὸ ἀληθὲς, ἐν τῷ πρώτῳ, ἐπὶ πάντων τῶν προβλημάτων. ὅταν δὴ ἐν τῷ ἐσχάτῳ ὁ συλλογισμὸς, τὸ ἀληθὲς, ἐν τῷ πρώτῳ, καὶ τῷ μέσῳ· τὰ μὲν καταφατικὰ, ἐν τῷ πρώτῳ· τὰ δὲ στερητικὰ, ἐν τῷ μέσῳ. 5 Ἔστω γὰρ δεδειγμένον τὸ α μηδενὶ, ἢ μὴ παντὶ τῷ β, διὰ τοῦ πρώτου σχήματος. οὐκοῦν ἡ μὲν ὑπόθεσις ἦν, τινὶ τῷ β ὑπάρχειν τὸ α· τὸ δὲ γ ἐλαμβάνετο τῷ μὲν α παντὶ ὑπάρχειν, τῷ δὲ β οὐδενί. οὕτω γὰρ ἐγίνετο συλλογισμὸς, καὶ τὸ ἀδύνατον. τοῦτο δὲ, τὸ μέσον σχῆμα, εἰ τὸ γ τῷ μὲν α παντὶ, τῷ δὲ β μηδενὶ ὑπάρχει. καὶ φανερὸν ἐκ τούτων, ὅτι οὐδενὶ τῷ β ὑπάρχει τὸ α. 6 Ὁμοίως δὲ καὶ, εἰ μὴ παντὶ δέδεικται* ὑπάρχειν. ἡ μὲν γὰρ ὑπόθεσίς ἐστι, παντὶ ὑπάρχειν· τὸ δὲ γ ἐλαμβάνετο τῷ μὲν α παντὶ, τῷ δὲ β οὐ παντί. 7 Καὶ εἰ στερητικὸν λαμβάνοιτο τὸ γ α, ὡσαύτως. καὶ γὰρ οὕτω γίνεται τὸ μέσον σχῆμα. 8 Πάλιν δεδείχθω τινὶ ὑπάρχον τῷ β τὸ α· ἡ μὲν οὖν ὑπόθεσις, μηδενὶ ὑπάρχειν· τὸ δὲ β ἐλαμβάνετο παντὶ τῷ γ ὑπάρχειν, καὶ τὸ α ἢ παντὶ, ἢ τινὶ τῷ γ. οὕτω γὰρ ἔσται τὸ ἀδύνατον. τοῦτο δὲ, τὸ ἔσχατον σχῆμα, εἰ τὸ α καὶ τὸ β παντὶ τῷ γ. καὶ φανερὸν ἐκ τούτων, ὅτι ἀνάγκη τὸ α τινὶ τῷ β ὑπάρχειν. 9 Ὁμοίως δὲ καὶ, εἰ τινὶ τῷ γ ληφθείη ὑπάρχον τὸ β, ἢ τὸ α. 10 Πάλιν καὶ ἐν τῷ μέσῳ σχήματι δεδείχθω τὸ α παντὶ τῷ β ὑπάρχον, οὐκοῦν ἡ μὲν

* γ. καταφάναι.

* γ. ὑπάρχον.

B Iam verò demonſtratio *ducens* ad impoſſibile, differt ab oſtenſiua: quia ponit quod vult euertere, ducens ad confeſſum mendacium: oſtenſiua autem initium ſumit à conceſſis poſitionibus. Accipiunt igitur ambæ duas propoſitiones conceſſas: ſed altera *ſumit eas* ex quibus *fit* ſyllogiſmus: altera verò vnam harum, & contradictionem concluſionis. 2 Item in altera non *eſt* neceſſe notam eſſe concluſionem, neque priùs ſumi *eam* eſſe, vel non *eſſe*: in altera verò neceſſe *eſt*, *priùs ſumi eam* non eſſe. Nihil autem refert, *vtrum* concluſio ſit affirmatio, an negatio: ſed ſimiliter res *ſe* habebit in ambabus. 3 Quicquid autem oſtenſiuè concluditur, etiam per impoſſibile C probabitur: & quod per impoſſibile, oſtenſiuè: & per eoſdem terminos, non tamen in iiſdem figuris. 4 Cùm enim ſyllogiſmus fit in prima figura: verum erit aut in media, aut in vltima: priuatiuum in media, attributiuum in vltima. cùm autē ſyllogiſmus eſt in media figura: verum *erit* in prima *figura, idque* in omnibus problematis. cùm autem in poſtrema *eſt* ſyllogiſmus: verum *erit* in prima, & media: nēpe affirmantia in prima, negantia in media. 5 Probatum enim ſit τὸ α nulli aut non omni β *ineſſe*, per primam figuram. Ergo hypotheſis erat, alicui β ineſſe τὸ α: τὸ γ autem ſumebatur omni quidem α ineſſe, nulli autem β. ſic enim efficiebatur ſyllogiſ-D mus, & impoſſibile. hæc autem *eſt* media figura, ſi τὸ γ omni α, & nulli β ineſt. & ex his apparet, nulli β ineſſe τὸ α. 6 Similiter *fiet*, ſi probatum fuerit non omni ineſſe. nam hypotheſis eſt, omni ineſſe: τὸ γ verò ſumebatur *ineſſe* omni α, & non omni β. 7 Itidemque ſi priuatiuum accipiatur *pronunciatum* γ α. nam ſic quoque fit media figura. 8 Rurſus probatum ſit alicui β ineſſe τὸ α, ergo hypotheſis nulli ineſſe. τὸ β autem ſumebatur omni γ ineſſe, τὸ α vel omni, vel alicui γ. ſic enim *concluſum* [illegible] poſſibile. hæc autē *eſt* vltima figura, ſi τὸ α & τὸ β [illegible] *ſint* omni γ atque ex his perſpicuum *fit*, neceſſe *eſſe*, vt τὸ α cuidam β inſit. 9 Similiter *fiet*, & ſi alicui γ ſumptum fuerit ineſſe τὸ β, aut τὸ α. 10 Rurſus in media figura probatum ſit τὸ α omni β ineſſe. ergo

hypotheſis erat, non omni β τὸ α ineſſe: ſumptum autem fuit, τὸ α ineſſe omni γ, & τὸ γ omni β. ſic enim efficietur impoſſibile. atque hæc eſt prima figura, ſi τὸ α inſit omni γ, & τὸ γ omni β. 11 Similiter fiet, & ſi alicui probatum ſit ineſſe. nam hypotheſis erat, nulli β τὸ α ineſſe: ſumptum autem fuit, τὸ α ineſſe omni γ, & τὸ γ cuidam β. 12 Si verò ſyllogiſmus ſit priuatiuus: hypotheſis erat, τὸ α cuidam β ineſſe: ſumptum autẽ fuit & τὸ α nulli γ, & τὸ γ omni β ineſſe. itaque fit prima figura. 13 Eadem eſt ratio, ſi non vniuerſalis ſit ſyllogiſmus, ſed τὸ α cuidã β probatum ſit non ineſſe. nã hypotheſis erat, omni β τὸ α ineſſe: ſumptum autem fuit, τὸ α ineſſe nulli γ, & τὸ γ alicui β. ſic enim efficitur prima figura. 14 Rurſus in tertia figura probatum ſit τὸ α omni β ineſſe. ergo hypotheſis erat, non omni β τὸ α ineſſe: ſumptum autẽ fuerat τὸ γ ineſſe omni β, & τὸ α omni γ. ſic enim concluſum erit impoſſibile. hæc autem eſt prima figura. 15 Eadem eſt ratio, ſi in aliquo fuerit demonſtratio. nam hypotheſis erit, nulli β τὸ α ineſſe: ſumptum autẽ eſt, τὸ γ ineſſe alicui β, & τὸ α omni γ. 16 Quòd ſi priuatiuus ſit ſyllogiſmus: hypotheſis eſt, τὸ α cuidam β ineſſe: ſumptum autem eſt, τὸ γ ineſſe nulli α, & omni β. hæc autem eſt media figura. 17 Similiter fiet, & ſi non vniuerſalis ſit demõſtratio. hypotheſis enim erit, omni β τὸ α ineſſe: ſumptum eſt autem, τὸ γ ineſſe nulli α, & alicui β. hæc autem eſt media figura. 18 Perſpicuum igitur eſt, per eoſdem terminos & oſtenſiuè poſſe probari ſingula problemata, & per impoſſibile. 19 Similiter autem licebit, cùm ſyllogiſmi ſint oſtenſiui, ad impoſſibile ducere in iis terminis qui ſumpti fuerint, ſi propoſitio ſumpta fuerit concluſioni oppoſita. efficiuntur enim iidem ſyllogiſmi, atque ſunt qui per conuerſionem ſiunt. quamobrem continuò habemus etiã figuras, per quas concluduntur ſingula problemata. 20 Conſtat igitur, omne problema probari vtroque modo, id eſt, & per impoſſibile, & oſtenſiuè; nec poſſe alterum modum ab altero ſeparari.

A ὑπόθεσις ἦν, μὴ παντὶ τῷ β τὸ α ὑπάρχειν· εἴληπται δὲ τὸ α παντὶ τῷ γ, καὶ τὸ γ παντὶ τῷ β· οὕτω γὰρ ἔσται τὸ ἀδύνατον. τοῦτο δὲ, τὸ πρῶτον σχῆμα, εἰ τὸ α παντὶ τῷ γ, καὶ τὸ γ παντὶ τῷ β. 11 Ὁμοίως δὲ καὶ, εἴ τινι δέδεικται ὑπάρχον. ἡ μὲν γὰρ ὑπόθεσις ἦν, μηδενὶ τῷ β τὸ α ὑπάρχειν· εἴληπται δὲ τὸ α παντὶ τῷ γ, καὶ τὸ γ τινὶ τῷ β. 12 Εἰ δὲ στερητικὸς ὁ συλλογισμός· ἡ μὲν ὑπόθεσις, τὸ α τινὶ τῷ β ὑπάρχειν· εἴληπται δὲ καὶ τὸ α μηδενὶ τῷ γ, καὶ τὸ γ παντὶ τῷ β. ὥστε γίνεται τὸ πρῶτον σχῆμα. 13 Καὶ εἰ μὴ καθόλου ὁ συλλογισμὸς, ἀλλὰ τὸ α τινὶ τῷ β δέδεικται μὴ ὑπάρχειν, ὡσαύτως. B ὑπόθεσις μὲν γὰρ, παντὶ τῷ β τὸ α ὑπάρχειν. εἴληπται δὲ τὸ α μηδενὶ τῷ γ, καὶ τὸ γ τινὶ τῷ β. οὕτω γὰρ τὸ πρῶτον σχῆμα. 14 Πάλιν ἐν τῷ τρίτῳ σχήματι δεδείχθω τὸ α παντὶ τῷ β ὑπάρχειν. οὐκοῦν ἡ μὲν ὑπόθεσις ἦν, μὴ παντὶ τῷ β τὸ α ὑπάρχειν· εἴληπται δὲ τὸ γ παντὶ τῷ β, καὶ τὸ α παντὶ τῷ γ· οὕτω γὰρ ἔσται τὸ ἀδύνατον. τοῦτο δὲ, τὸ πρῶτον σχῆμα. 15 Ὡσαύτως δὲ καὶ εἰ ἐπί τινος ἡ ἀπόδειξις. ἡ μὲν γὰρ ὑπόθεσις ἔσται, μηδενὶ τῷ β τὸ α ὑπάρχειν· εἴληπται δὲ τὸ γ τινὶ τῷ β, καὶ τὸ α παντὶ τῷ γ. 16 Εἰ δὲ στερητικὸς ὁ συλλογισμός· ὑπόθεσις μὲν, τὸ α τινὶ τῷ β ὑπάρχειν· εἴληπται δὲ τὸ γ τῷ μὲν α μηδενὶ, τῷ δὲ β παντί. C τοῦτο δὲ, τὸ μέσον σχῆμα. 17 Ὁμοίως δὲ καὶ, εἰ μὴ καθόλου ἡ ἀπόδειξις. ὑπόθεσις μὲν γὰρ ἔσται, παντὶ τῷ β τὸ α ὑπάρχειν· εἴληπται δὲ τὸ γ τῷ μὲν α μηδενὶ, τῷ δὲ β τινί. τοῦτο δὲ, τὸ μέσον σχῆμα. 18 Φανερὸν οὖν, ὅτι διὰ τῶν αὐτῶν ὅρων καὶ δεικτικῶς ἔστι δεικνύναι τῶν προβλημάτων ἕκαστον, καὶ διὰ τοῦ ἀδυνάτου. 19 Ὁμοίως δ᾽ ἔσται, καὶ δεικτικῶν ὄντων τῶν συλλογισμῶν, εἰς ἀδύνατον ἀπάγειν ἐν τοῖς εἰλημμένοις ὅροις, ὅταν ἡ ἀντικειμένη πρότασις τῷ συμπεράσματι ληφθῇ. γίνονται γὰρ οἱ αὐτοὶ συλλογισμοὶ τοῖς διὰ τῆς ἀντιστροφῆς. ὥστε εὐθὺς ἔχομεν καὶ τὰ σχήματα, δι᾽ ὧν ἔσται ἕκαστον. 20 Δῆλον οὖν, ὅτι πᾶν πρόβλημα δείκνυται κατ᾽ ἀμφοτέρους τοὺς τρόπους, διά τε τοῦ ἀδυνάτου, καὶ δεικτικῶς· καὶ οὐκ ἐνδέχεται χωρίζεσθαι τὸν ἕτερον τοῦ ἑτέρου.

De ratione concludendi ex oppoſitis. Cap. XV.

1 ¶ Protheſis. 2 ¶ Quæ ſint propoſitiones ſecundum dictionem vel re vera oppoſitæ: & ex his quænam vocentur contrariæ, quænam contradictoriè oppoſitæ. 3 ¶ De prima figura. 4 ¶ De ſecunda figura. 5 ¶ De Cameſtres ex contrariis, 6 vel contradicentibus. 7 De Ceſare. 8 De Feſtino, & Baroco. 9 Qualia debent eſſe extrema. 10 ¶ De tertia figura. 11 ¶ De Felapton. 12 De Brocardo. 13 Diſcrimen τοῦ Felapton & τοῦ Brocardo. 14 ¶ Oppoſitio propoſitionum quæ & appareat, aut lateat. 15 ¶ Quot modis accipi poſſint propoſitiones oppoſitæ. 16 ¶ De falſitate concluſionis. 17 ¶ De ſyllogiſmis hypotheticis. 18 ¶ De concluſione affirmante, vel negante.

IN qua autem figura liceat ex oppoſitis propoſi- D tionibus ratiocinari, in qua non liceat, ſic erit manifeſtum. 2 Dico autem oppoſitas propoſitiones eſſe ſecundum dictionem quatuor: nempe, omni, nulli: & omni, non omni: & alicui, nulli: & alicui, non alicui: re vera tres. quoniam alicui, & non alicui, ſecundum dictionem tantùm opponuntur. Ex his autem contrarias voco eas quæ ſunt vniuerſales, id eſt, omni, & nulli ineſſe: vt, omnem ſcientiam eſſe honeſtam, nullam ſcientiam eſſe honeſtam. alias verò appello oppoſitas. 3 In prima igitur figura non eſt ex oppoſitis propoſitionibus ſyllogiſmus, neque affirmatiuus neque negatiuus. affirmatiuus quidem: quia propoſitiones ambas oportet eſſe affirmatiuas, oppoſitæ autem ſunt affirmatio & negatio. priuatiuus autem: quia

ἘΝ ποίῳ δὲ σχήματι ἔστιν ἐξ ἀντικειμένων προτάσεων συλλογίσασθαι, καὶ ἐν ποίῳ οὐκ ἔστιν, ὧδ᾽ ἔσται φανερόν. 2 Λέγω δὲ ἀντικειμένας προτάσεις εἶναι, κατὰ μὲν τὴν λέξιν, τέτταρας εἶναι, οἷον τὸ παντὶ, τῷ οὐδενί, καὶ τὸ παντὶ, τῷ οὐ παντὶ, καὶ τὸ τινὶ, τῷ οὐδενί, καὶ τὸ τινὶ, τῷ οὐ τινί. κατ᾽ ἀλήθειαν δὲ τρεῖς· τὸ γὰρ τινὶ, τῷ οὐ τινὶ, κατὰ τὴν λέξιν ἀντίκειται μόνον. Τούτων δ᾽ ἐναντίας μὲν, τὰς καθόλου, τὸ παντὶ, τῷ μηδενὶ ὑπάρχειν, οἷον πᾶσαν ἐπιστήμην εἶναι σπουδαίαν, τῷ μηδεμίαν εἶναι σπουδαίαν. τὰς δ᾽ ἄλλας, ἀντικειμένας. 3 Ἐν μὲν οὖν τῷ πρώτῳ σχήματι οὐκ ἔστιν ἐξ ἀντικειμένων προτάσεων συλλογισμὸς, οὔτε καταφατικὸς, οὔτε ἀποφατικός. καταφατικὸς μὲν ὅτι ἀμφοτέρας καταφατικὰς δεῖ εἶναι τὰς προτάσεις· αἱ δ᾽ ἀντικείμεναι, φάσις καὶ ἀπόφασις. στερητικὸς δὲ ὅτι

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αἱ μὲν ἀντικείμεναι, τὸ αὐτὸ τοῦ αὐτοῦ κατηγοροῦσι καὶ ἀποφάσκουσι· τὸ δ' ἐν τῷ πρώτῳ σχήματι μέσον, οὐ λέγεται κατ' ἀμφοῖν· ἀλλ' ἐκείνου μὲν ἄλλο ἀπαρνεῖται, αὐτὸ δὲ ἄλλου κατηγορεῖται· αὗται δ' οὐκ ἀντίκεινται. 4 Ἐν δὲ τῷ μέσῳ σχήματι, καὶ ἐκ τῶν ἀντικειμένων, καὶ ἐκ τῶν ἐναντίων ἐνδέχεται γίνεσθαι συλλογισμόν. 5 Ἔστω γὰρ ἀγαθὸν μέν, ἐφ' οὗ α· ἐπιστήμη δέ, ἐφ' οὗ β, καὶ γ. εἰ δὴ πᾶσαν ἐπιστήμην σπουδαίαν ἔλαβε, καὶ μηδεμίαν· τὸ α τῷ β παντὶ ὑπάρχει, καὶ τῷ γ οὐδενί· ὥστε τὸ β τῷ γ οὐδενί· οὐδεμία ἄρα ἐπιστήμη, ἐπιστήμη ἐστίν. 6 Ὁμοίως δὲ καί, εἰ πᾶσαν λαβὼν σπουδαίαν, τὴν ἰατρικὴν μὴ σπουδαίαν ἔλαβε. τῷ μὲν γὰρ β παντὶ τὸ α, τῷ δὲ γ οὐδενί. ὥστε ἡ τὶς ἐπιστήμη, οὐκ ἔσται ἐπιστήμη. 7 Καὶ εἰ τῷ μὲν γ παντὶ τὸ α, τῷ δὲ β μηδενί· ἔστι δὲ τὸ μὲν β, ἐπιστήμη· τὸ δὲ γ, ἰατρική· τὸ δὲ α, ὑπόληψις. οὐδεμίαν γὰρ ἐπιστήμην, ὑπόληψιν λαβών, εἴληφε τινὰ ἐπιστήμην εἶναι ὑπόληψιν. Διαφέρει δὲ τοῦ πάλαι, τῷ ἐπὶ τῶν ὅρων ἀντιστρέφεσθαι· πρότερον μὲν γὰρ πρὸς τῷ β, νῦν δὲ πρὸς τῷ γ, τὸ καταφατικόν. 8 Καὶ ἐὰν ἡ μὴ καθόλου ἡ ἑτέρα πρότασις, ὡσαύτως. ἀεὶ γὰρ τὸ μέσον ἐστίν, ὃ ἀπὸ θατέρου μὲν ἀποφατικῶς λέγεται, κατὰ θατέρου δὲ καταφατικῶς. 9 Ὥστ' ἐνδέχεται τὰ ἀντικείμενα περαίνεσθαι· πλὴν οὐκ ἀεί, οὐδὲ πάντως· ἀλλ' ἐὰν οὕτως ἔχῃ τὰ ὑπὸ τὸ μέσον, ὥστ' ἢ ταὐτὰ εἶναι, ἢ ὅλον πρὸς μέρος. ἄλλως δέ, ἀδύνατον· οὐ γὰρ ἔσονται οὐδαμῶς αἱ προτάσεις, οὔτε ἐναντίαι, οὔτ' ἀντικείμεναι. 10 Ἐν δὲ τῷ τρίτῳ σχήματι καταφατικὸς μὲν συλλογισμὸς οὐδέποτ' ἔσται ἐξ ἀντικειμένων προτάσεων, διὰ τὴν προειρημένην αἰτίαν καὶ ἐπὶ τοῦ πρώτου σχήματος. Ἀποφατικὸς δ' ἔσται, καὶ καθόλου, καὶ μὴ καθόλου τῶν ὅρων ὄντων. 11 Ἔστω γὰρ ἐπιστήμη, ἐφ' οὗ β καὶ γ· ἰατρικὴ δέ, ἐφ' οὗ α. εἰ οὖν λάβοι πᾶσαν ἰατρικὴν ἐπιστήμην καὶ μηδεμίαν ἰατρικὴν ἐπιστήμην, τὸ β παντὶ τῷ α εἴληφε, καὶ τὸ γ οὐδενί· ὥστ' ἔσται τὶς ἐπιστήμη, οὐκ ἐπιστήμη. 12 Ὁμοίως δὲ καὶ ἐὰν μὴ καθόλου ληφθῇ ἡ α β πρότασις. εἰ γάρ ἐστί τις ἰατρική, ἐπιστήμη, καὶ πάλιν μηδεμία ἰατρική, ἐπιστήμη· συμβαίνει ἐπιστήμην τινὰ μὴ εἶναι ἐπιστήμην. 13 Εἰσὶ δέ, καθόλου μὲν τῶν ὅρων λαμβανομένων, ἐναντίαι αἱ προτάσεις· εἰ δὲ ἐν μέρει ἕτερος, ἀντικείμεναι. 14 Δεῖ δὲ κατανοεῖν, ὅτι ἐνδέχεται μὲν οὕτω τὰ ἀντικείμενα λαμβάνειν, ὥσπερ εἴπομεν, πᾶσαν ἐπιστήμην σπουδαίαν εἶναι, καὶ πάλιν οὐδεμίαν, ἢ τινὰ μὴ σπουδαίαν· ὅπερ οὐκ εἴωθε λανθάνειν. ἔστι δὲ καὶ δι' ἄλλων ἐρωτημάτων συλλογίσασθαι θάτερον· ἢ καί, ὡς ἐν Τοπικοῖς ἐλέχθη, λαβεῖν. 15 Ἐπεὶ δὲ τῶν καταφάσεων αἱ ἀντιθέσεις, τρεῖς· ἑξαχῶς συμβαίνει τὰ ἀντικείμενα λαμβάνειν, ἢ παντὶ καὶ μηδενί, ἢ παντὶ καὶ μὴ παντί, ἢ τινὶ καὶ μηδενί· καὶ τοῦτο ἀντιστρέψαι ἐπὶ τῶν ὅρων. οἷον, τὸ α παντὶ τῷ β, τῷ δὲ γ μηδενί· ἢ τῷ γ παντί, τῷ δὲ β μηδενί· ἢ τῷ μέν, παντί, τῷ δέ, μὴ παντί. καὶ πάλιν τοῦτο ἀντιστρέψαι κατὰ τοὺς ὅρους. ὁμοίως δὲ καὶ ἐπὶ τοῦ τρίτου σχήματος. ὥστε φανερόν, ὁσαχῶς τε, καὶ ἐν ποίοις σχήμασιν ἐνδέχεται διὰ τῶν ἀντικειμένων προτάσεων * γίνεσθαι συλλογισμόν. 16 Φανερὸν δ', ὅτι καὶ ἐκ ψευδῶν μὲν ἔστιν ἀληθὲς συλλογίσασθαι, καθάπερ εἴρηται πρότερον· ἐκ δὲ τῶν ἀντικειμένων οὐκ ἔστιν. ἀεὶ γὰρ ἐναντίος ὁ συλλογισμὸς γίνεται τῷ πράγματι· οἷον, εἰ ἔστιν ἀγαθόν, μὴ εἶναι ἀγαθόν· ἢ εἰ ζῷον, μὴ ζῷον· διὰ τὸ ἐξ ἀντιφάσεως εἶναι τὸν συλλογισμόν, καὶ τοὺς ὑποκειμένους ὅρους, ἢ τοὺς αὐτοὺς εἶναι, ἢ τὸν μέν, ὅλον, τὸν δέ, μέρος.

* γ. γίνεσθαι.

A oppoſitæ idem de eodẽ affirmant & negant: quod verò *eſt* in prima figura medium, non dicitur de ambobus *extremis*: ſed aliud de eo negatur, ipſum autem alij attribuitur: hæ verò *propoſitiones* non opponuntur. 4 At in media figura & ex oppoſitis & ex contrariis poteſt fieri ſyllogiſmus. 5 Sit enim bonum, vbi α: ſcientia, vbi β & γ. Si igitur omnem ſcientiam honeſtam *eſſe* ſumpſerit, & nullam *quoque*: τὸ α ineſt omni β, & nulli γ. quare τὸ β *in erit* nulli γ; nulla igitur ſcientia eſt ſcientia. 6 Similiter *fiet*, & ſi, cùm acceperit omnem *eſſe* honeſtam, *poſtea* medicinam non *eſſe* honeſtam ſumpſerit. nam τὸ α *ineſt* omni β, & nulli γ. quare quædam ſcientia non erit ſcientia. 7 Item ſi τὸ α *ineſt* omni γ, & nulli β: eſt autem τὸ β, ſcientia: τὸ γ, medicina: τὸ α, exiſtimatio: Cùm enim acceperit nullam ſcientiam *eſſe* exiſtimationem, ſumpſit aliquam ſcientiam eſſe exiſtimationem. Differt autem *hic modus* à ſuperiori ob conuerſionem in terminis factam: quoniam antea τῷ β, nunc verò τῷ γ iungitur affirmatio. 8 Itidem *fiet*, ſi non vniuerſalis *ſit* altera propoſitio. ſemper enim medium eſt, quod de altero dicitur negatiuè, de altero affirmatiuè. 9 Quapropter accidit vt oppoſita concludantur: non tamen ſemper, nec omnino: ſed ſi ita *ſe* habeant quæ *ſunt* ſub medio, vt vel eadem ſint, vel *vnum ad alterum referatur vt* totum ad partem. alioquin *id* fieri nequit: nullo enim modo erunt propoſitiones contrariæ, nec oppoſitæ. 10 In tertia verò figura affirmatiuus ſyllogiſmus numquam erit ex oppoſitis propoſitionibus, ob cauſam in prima figura expoſitam. Negatiuus autem erit, ſiue termini ſint vniuerſaliter, ſiue non vniuerſaliter *accepti*. 11 Sit enim ſcientia, vbi β & γ: medicina, vbi α. Si igitur acceperit omnem medicinam *eſſe* ſcientiam, &, nullam medicinam *eſſe* ſcientiam: τὸ β omni, ac τὸ γ nulli *ineſſe* ſumpſit. quare quædam ſcientia non erit ſcientia. 12 Similiter *fiet*, & ſi non vniuerſalis ſumpta fuerit propoſitio α β. nam ſi quædam medicina *eſt* ſcientia, rurſúſque nulla medicina *eſt* ſcientia: accidit vt quædam ſcientia non ſit ſcientia. 13 Sunt autem propoſitiones, terminis vniuerſaliter acceptis, contrariæ: ſi verò alter *ſit* in parte, oppoſitæ. 14 Iam verò intelligendum eſt, ſic poſſe oppoſita ſumi, vt diximus, omnem ſcientiam eſſe honeſtam, & rurſus nullam *eſſe*, aut aliquam non *eſſe* honeſtam: quod quidem latêre non ſolet. poſſe etiam per alias interrogationes alterum concludi, vel, vt in Topicis dictum eſt, ſumi. 15 Cùm autem affirmationum tres *ſint* oppoſitiones: ſex modis accidit accipi oppoſita: vel omni & nulli, vel omni & non omni, vel alicui & nulli. idque in terminis conuertere *licet*. verbi gratiâ, τὸ α *poteſt ineſſe* omni β, & nulli γ: vel omni γ, & nulli β: vel alteri omni, alteri non omni. & hoc rurſus ſecundum terminos conuertere *licet*. Similiter *fit* etiam in tertia figura. Quare perſpicuum *eſt*, quot modis, & in quibus figuris accidit per oppoſitas propoſitiones fieri ſyllogiſmum. 16 Perſpicuum autem *eſt*, etiam ex falſis verum concludi poſſe, quemadmodum antea dictum fuit: ex oppoſitis autem non poſſe. ſemper enim fit ſyllogiſmus rei contrarius. vt, ſi eſt bonum, *concluditur* non eſſe bonum: aut, ſi *eſt* animal, non *eſſe* animal: quoniam ex contradictione ſyllogiſmus conſtat: & ſubiecti termini aut ſunt iidem; aut alter *eſt* totum, alter *eſt* pars.

17 Conſtat etiam, in vitioſis ratiocinationibus nihil prohibere quò minùs efficiatur ſuppoſitionis contradictio: vt, ſi eſt impar, non eſſe impar: quoniã ex oppoſitis propoſitionibus ſyllogiſmus erat contrarius. ſi igitur tales ſumpſerit, erit contradictio ſuppoſitionis. 18 Iam intelligi debet, ita non poſſe contraria concludi ex vno ſyllogiſmo, vt concluſio ſit, quod non eſt bonum, *eſſe* bonum, aut aliud quippiam eiuſmodi, niſi ſtatim talis propoſitiò ſumpta fuerit, veluti, Omne animal eſſe album & non album, hominem autem *eſſe* animal. ſed vel oportet præſumere contradictionem, (vt omnem ſcientiam *eſſe* exiſtimationem; &, non *eſſe* exiſtimationem, poſtea ſumere *ex eo*, quod *omnis* medicina eſt ſcientia, nulla autem *eſt* exiſtimatio: quo modo elenchi fiunt) vel *concludendum eſt* ex duobus ſyllogiſmis. Vt autem ſecundum veritatem contraria ſint quæ ſumpta fuerunt, alio modo quã hoc fieri non poteſt, quemadmodum antea dictum fuit.

A 17 Δῆλον δὲ καὶ, ὅτι ἐν τοῖς παραλογισμοῖς οὐδὲν κωλύει γίνεσθαι τῆς ὑποθέσεως ἀντίφασιν· οἷον, εἰ ἔστι περιττὸν, μὴ εἶναι περιττόν. ἐκ γὰρ τῶν ἀντικειμένων προτάσεων ἐναντίος ἦν ὁ συλλογισμός. ἐὰν οὖν λάβῃ τοιαύτας, ἔσται τῆς ὑποθέσεως ἀντίφασις. 18 Δεῖ δὲ κατανοεῖν, ὅτι οὕτω μὲν οὐκ ἔστιν ἐναντία συμπεραίνεσθαι ἐξ ἑνὸς συλλογισμοῦ, ὥστε εἶναι τὸ συμπέρασμα, τὸ μὴ ὂν ἀγαθὸν, ἀγαθὸν, ἢ ἄλλο τι τοιοῦτον, ἐὰν μὴ εὐθὺς ἡ πρότασις τοιαύτη ληφθῇ· οἷον, πᾶν ζῷον εἶναι λευκὸν καὶ μὴ λευκὸν, τὸν δὲ ἄνθρωπον, ζῷον. ἀλλ' ἢ B προσλαβεῖν δεῖ τὴν ἀντίφασιν (οἷον, ὅτι πᾶσα ἐπιστήμη, ὑπόληψις, καὶ οὐχ ὑπόληψις· εἶτα λαβεῖν, ὅτι ἡ ἰατρικὴ, ἐπιστήμη μέν ἐστιν, οὐδεμία δὲ, ὑπόληψις· ὥσπερ οἱ ἔλεγχοι γίνονται) ἢ ἐκ δύο συλλογισμῶν. ὥστε δὲ εἶναι ἐναντία κατ' ἀλήθειαν τὰ εἰλημμένα, οὐκ ἔστιν ἄλλον τρόπον ἢ τοῦτον, καθάπερ εἴρηται πρότερον.

DE VITIIS ET IMBECILLITATIBVS SYLLOGISMORVM.

TRACTATVS II.

De petitione quæſiti. Cap. XVI.

1 ¶ Definitio. 2 ¶ Diuiſio prima in eam quæ fit ſtatim & eam quæ fit per tranſitionem ad alia. 3 ¶ Diuiſio ſecunda. De ſyllogiſmis affirmatiuis primæ figuræ, qui propoſitum petunt in maiore, 4 vel minore propoſitione. 5 De reliquis ſyllogiſmis. 6 ¶ Diuiſio tertia ſumpta à demonſtrationibus & ſyllogiſmis dialecticis.

PEtere & ſumere quod ab initio *quæſitum fuit*, C vt eius genus accipiam, *in eo poſitum* eſt, quod *vocatur* non demonſtrare propoſitum. 2 Hoc autem accidit multis modis: nempe ſiue omnino non concludatur, ſiue per ignotiora vel æquè ignota, ſiue prius per poſteriora. demonſtratio namque ex credibilioribus & prioribus conſtat. Horum igitur *modorum* nullus eſt petitio *quæſiti* ab initio *propoſiti*. Sed quia naturâ comparatum eſt, vt quædam per ſe, nonnulla per alia cognoſcantur: (nam principia, per ſe: quæ verò ſub principiis *continentur*, per alia *cognoſcuntur*) cùm id quod per ſe cognoſci non poteſt, conatur quis per ſe demonſtrare: tunc petit quod ab initio *propoſitum* D *fuit*. 3 Hoc autem ita fieri poteſt, vt ſtatim poſtuletur propoſitum: accidit etiam, vt tranſeuntes ad alia quædam, quæ per illud probari comparata ſunt natura, per hæc demonſtremus quod ab initio *fuit quæſitum*. Vt ſi τὸ α demonſtretur per β, ac τὸ β per γ, τὸ γ vero naturâ comparatum ſit probari per α: accidit enim, vt ipſum α per ſe ipſum probetur ab iis qui ita ratiocinantur. quod quidem faciunt, qui *lineas* parallelas *ſe* deſcribere putant. non enim intelligunt ſe talia ſumere quæ demonſtrari nequeunt, niſi ſint parallelæ. Quare qui ita ratiocinantur, accidit vt dicant ſingula eſſe, ſi ea ipſa ſint. ſic autem omnia per ſe cognoſci poterunt: quod *eſt* impoſſibile. 4 Si quis E igitur, cùm ignotum ſit τὸ α ineſſe τῷ γ, ſimiliterque τὸ α ineſſe τῷ β, petat *ſibi concedi*, τῷ β ineſſe τὸ α: nondum conſtat, an petat quod ab initio *quæſitum fuit*: ſed conſtat eum non demonſtrare: quia quod *eſt* æquè ignotum, non eſt principium demonſtrationis. Si verò τὸ β ita *ſe* habet ad γ, vt idem ſint,

CAP. XVIII.

ΤΟ δὲ ἐν ἀρχῇ αἰτεῖσθαι καὶ λαμβάνειν, ἔστι μὲν, ὡς ἐν γένει λαβεῖν, ἐν τῷ μὴ ἀποδεικνύναι τὸ προκείμενον. 2 Τοῦτο δὲ ἐνδέχεται πολλαχῶς. καὶ γὰρ εἰ ὅλως μὴ συλλογίζεται, καὶ εἰ δι' ἀγνωστοτέρων, ἢ ὁμοίως ἀγνώστων, καὶ εἰ διὰ τῶν ὑστέρων τὸ πρότερον· ἡ γὰρ ἀπόδειξις, ἐκ πιστοτέρων τε καὶ προτέρων ἐστί. τούτων μὲν οὖν οὐδέν ἐστι τὸ αἰτεῖσθαι τὸ ἐξ ἀρχῆς. ἀλλ' ἐπεὶ τὰ μὲν, δι' αὐτῶν πέφυκε γνωρίζεσθαι, τὰ δὲ, δι' ἄλλων (αἱ μὲν γὰρ ἀρχαὶ, δι' ἑαυτῶν· τὰ δὲ ὑπὸ τὰς ἀρχὰς, δι' ἄλλων) ὅταν τὸ μὴ δι' αὑτοῦ γνωστὸν, δι' αὑτοῦ τις ἐπιχειρῇ δεικνύναι, τότε αἰτεῖται τὸ ἐξ ἀρχῆς. 3 Τοῦτο δὲ ἔστι μὲν οὕτω ποιεῖν, ὥστ' εὐθὺς ἀξιῶσαι τὸ προκείμενον. ἐνδέχεται δὲ καὶ μεταβάντας ἐπ' ἄλλα ἄττα τῶν πεφυκότων δι' * ἐκείνου δείκνυσθαι, διὰ τούτων ἀποδεικνύναι τὸ ἐξ ἀρχῆς. οἷον, εἰ τὸ α δεικνύοιτο διὰ τοῦ β, τὸ δὲ β διὰ τοῦ γ, τὸ δὲ γ πεφυκὸς εἴη δείκνυσθαι διὰ τοῦ α· συμβαίνει γὰρ, αὐτὸ δι' ἑαυτοῦ τὸ α δεικνύναι τοὺς οὕτω συλλογιζομένους. ὅπερ ποιοῦσιν οἱ τὰς παραλλήλους οἰόμενοι γράφειν. λανθάνουσι γὰρ αὐτοὶ ἑαυτοὺς, τοιαῦτα λαμβάνοντες, ἃ οὐχ οἷόν τε ἀποδεῖξαι, μὴ οὐσῶν τῶν παραλλήλων. ὥστε τοῖς οὕτω συλλογιζομένοις συμβαίνει, ἕκαστον λέγειν εἶναι, εἰ ἔστιν ἕκαστον. οὕτω δὲ ἅπαν ἔσται δι' αὑτοῦ γνωστόν· ὅπερ ἀδύνατον. 4 Εἰ οὖν τις, ἀδήλου ὄντος * ὅτι τὸ α ὑπάρχει τῷ γ, ὁμοίως δὲ καὶ ὅτι τῷ β, αἰτοῖτο τῷ β ὑπάρχειν τὸ α· οὔπω δῆλον, εἰ τὸ ἐν ἀρχῇ αἰτεῖται· ἀλλ' ὅτι οὐκ ἀποδείκνυσι, δῆλον· οὐ γάρ ἐστιν ἀρχὴ ἀποδείξεως, τὸ ὁμοίως ἄδηλον. Εἰ μέντοι τὸ β πρὸς τὸ γ οὕτως ἔχει, ὥστε ταὐτὸν εἶναι,

* γρ. ἐκείνου.

* γρ. ὅτι τὸ β ὑπάρχει τῷ γ, ὁμοίως δὲ καὶ ὅτι τὸ α τῷ β, αἰτοῖτο τῷ γ ὑπάρχειν τὸ α.

ἢ δῆλον ὅτι ἀντιστρέφουσιν, ἢ ὑπάρχει θάτερον θατέρῳ· τὸ ἐν ἀρχῇ αἰτεῖται. καὶ γὰρ ἄν, ὅτι τῷ β τὸ α ὑπάρχει, δι' ἐκείνων δεικνύοι, εἰ ἀντιστρέφοι. νῦν δὲ τοῦτο κωλύει, ἀλλ' οὐχ ὁ τρόπος. εἰ δὲ τοῦτο ποιοῖ, τὸ εἰρημένον ἂν ποιοῖ, καὶ ἀντιστρέφοι ὡς διὰ τριῶν. 5 Ὡσαύτως δὲ κἂν εἰ τὸ β τῷ γ λαμβάνοι ὑπάρχειν, ὁμοίως ἄδηλον ὂν καὶ εἰ τὸ α τῷ γ, οὔπω τὸ ἐξ ἀρχῆς αἰτεῖται, ἀλλ' οὐκ ἀποδείκνυσιν. ἐὰν δὲ ταὐτὸν ᾖ τὸ α καὶ τὸ β, ἢ τὸ* ἀντιστρέφειν, ἢ *τὸ ἕπεσθαι τὸ α τῷ β· τὸ ἐξ ἀρχῆς αἰτεῖται, διὰ τὴν αὐτὴν αἰτίαν. τὸ γὰρ ἐξ ἀρχῆς τί δύναται, πρότερον εἴρηται ἡμῖν, ὅτι τὸ δι' ἑαυτοῦ δεικνύναι τὸ μὴ δι' αὑτοῦ δῆλον. 6 Εἰ οὖν ἐστι τὸ ἐν ἀρχῇ αἰτεῖσθαι, τὸ δι' αὑτοῦ δεικνύναι τὸ μὴ δι' αὑτοῦ δῆλον· τοῦτο δέ ἐστι, τὸ μὴ δεικνύναι, ὅταν ὁμοίως ἀδήλων ὄντων τοῦ δεικνυμένου καὶ δι' οὗ δείκνυται, ἢ τῷ ταὐτὰ τῷ αὐτῷ, ἢ τῷ ταὐτὸν τοῖς αὐτοῖς ὑπάρχειν· ἐν μὲν τῷ μέσῳ σχήματι καὶ τρίτῳ, ἀμφοτέρως ἂν ἐνδέχοιτο ὁμοίως τὸ ἐν ἀρχῇ αἰτεῖσθαι. 7 Ἐν δὲ κατηγορικῷ συλλογισμῷ, ἔν τε τῷ τρίτῳ καὶ τῷ πρώτῳ. ἀποφατικῶς δ', ὅταν τὰ αὐτὰ ἀπὸ τοῦ αὐτοῦ, καὶ οὐχ ὁμοίως ἀμφότεραι αἱ προτάσεις, (ὡσαύτως δὲ καὶ ἐν τῷ μέσῳ) διὰ τὸ μὴ ἀντιστρέφειν τοὺς ὅρους κατὰ τοὺς ἀποφατικοὺς συλλογισμούς. 8 Ἔστι δὲ τὸ ἐν ἀρχῇ αἰτεῖσθαι, ἐν μὲν ταῖς ἀποδείξεσι, τὰ κατ' ἀλήθειαν οὕτως ἔχοντα· ἐν δὲ τοῖς διαλεκτικοῖς τὰ κατὰ δόξαν.

* γρ. τῷ ἀντ.
* γρ. τῷ ἑπ.

vel conſtat *hæc* conuerti, aut ineſt alterum alteri: petit, quod *quæſitum eſt* in principio. nam & τὸ β τῷ γ ineſſe per ea probare poterit, ſi conuertuntur. nunc verò hoc prohibet: non modus. ſin hoc faciat: quod dictum eſt, fecerit, ac quaſi per tres *terminos* fit conuerſio. 5 Itidem ſi accipiat τὸ β ineſſe τῷ γ, cùm ſit æquè ignotum, ac ſi *acciperet* τὸ α *ineſſe* τῷ γ: nondum petit quod ab initio *quæſiuit*, ſed non demonſtrat. Quòd ſi idem ſit τὸ α & τὸ β, vel conuertantur, vel τὸ α conſequens ſit τὸ β: petit quod initio *quæſiuit*, ob eandẽ cauſam. quid enim valeat *petere* quod ab initio *quæſitum fuit*, antea dictum eſt à nobis: nempe, demonſtrare per ſe, quod non *eſt* per ſe manifeſtum. 6 Si igitur *nihil aliud eſt* petere quod ab initio *fuit quæſitum*, quàm per ſe probare quod non *eſt* per ſe manifeſtum; hoc autem eſt non probare, cùm ita probatur, vt æquè ignota ſint quod monſtratur, aut quia eadem eidem, aut quia idem eiſdem ineſſe *accipitur*: in media figura & *in* tertia vtroque modo poteſt ſimiliter peti quod ab initio *fuit quæſitum*. 7 Verùm in attributiuo ſyllogiſmo *quæſitum petitur* in tertia & prima *figura duntaxat*. Negatiuè autem *petitur*, cùm eadem *abſunt* ab eodem, neque *eſt* eadem ratio ambarum propoſitionum, (itidem *ſe res habet* & in media figura) quia termini non conuertuntur in negatiuis. 8 Iam verò quod *eſt* in principio, petitur in demonſtrationibus, *cùm petuntur quæ* re vera ita *ſe* habent: in *ſyllogiſmis* autem dialecticis, *cùm ea petuntur* quæ ſecundum *hominum* opinionem *ita ſe habere videntur*.

De reprehenſione ſyllogiſmi, qua dicitur, falſum propter hoc non accidere.

Cap. XVII.

1 In quibus ſyllogiſmis hoc locum habeat, & quid ſit. 2 Modus primus. 3 Modus alter, 4 terminis deorſum, 5 vel ſurſum verſus acceptis. 6 Quando propter hypotheſim accidat falſum, 7 terminis deorſum, 8 vel ſurſum verſus acceptis. 9 De ſyllogiſmis negatiuis. 10 Epilogus. 11 Obiectio. 12 Solutio.

CAP. XIX.

Τὸ δὲ μὴ παρὰ τοῦτο συμβαίνειν τὸ ψεῦδος, (ὃ πολλάκις ἐν τοῖς λόγοις εἰώθαμεν λέγειν) πρῶτον μέν ἐστιν ἐν τοῖς εἰς τὸ ἀδύνατον συλλογισμοῖς, ὅταν πρὸς ἀντίφασιν ᾖ τούτου, ὃ ἐδείκνυτο τῇ εἰς τὸ ἀδύνατον. οὔτε γὰρ μὴ ἀντιφήσας τις, ἐρεῖ τὸ οὐ παρὰ τοῦτο, ἀλλ' ὅτι ψεῦδός τι ἐτέθη τῶν πρότερον· οὔτ' ἐν τῇ δεικνυούσῃ· οὐ γὰρ τίθησι* τὴν ἀντίφασιν. Ἔτι δὲ, ὅταν ἀναιρεθῇ τι δεικτικῶς διὰ τῶν α β γ, οὐκ ἔστιν εἰπεῖν ὡς οὐ παρὰ τὸ κείμενον γεγένηται ὁ συλλογισμός. τὸ γὰρ μὴ παρὰ τοῦτο γίνεσθαι, τότε λέγομεν, ὅταν ἀναιρεθέντος τούτου, μηδὲν ἧττον περαίνηται ὁ συλλογισμός. ὅπερ οὐκ ἔστιν ἐν τοῖς δεικτικοῖς· ἀναιρεθείσης γὰρ τῆς θέσεως, οὐδ' ὁ πρὸς ταύτην ἔσται συλλογισμός. φανερὸν οὖν ὅτι ἐν τοῖς εἰς τὸ ἀδύνατον λέγεται τὸ μὴ παρὰ τοῦτο· καὶ ὅταν οὕτως ἔχῃ πρὸς τὸ ἀδύνατον ἡ ἐξ ἀρχῆς ὑπόθεσις, ὥστε καὶ οὔσης καὶ μὴ οὔσης ταύτης, οὐδὲν ἧττον συμβαίνειν τὸ ἀδύνατον. 2 Ὁ μὲν οὖν* φανερώτατος τρόπος ἐστὶ τοῦ μὴ παρὰ τὴν ὑπόθεσιν εἶναι τὸ ψεῦδος, ὅταν ἀπὸ τῆς ὑποθέσεως ἀσύναπτος ᾖ, ἀπὸ τῶν μέσων πρὸς τὸ ἀδύνατον ὁ συλλογισμός, ὥσπερ εἴρηται καὶ ἐν τοῖς Τοπικοῖς. τὸ γὰρ τὸ ἀναίτιον, ὡς αἴτιον τιθέναι, *τοῦτό ἐστιν. οἷον εἰ βουλόμενος δεῖξαι ὅτι ἀσύμμετρος ἡ διάμετρος, ἐπιχειροίη τὸν Ζήνωνος λόγον δεικνύναι, ὡς οὐκ ἔστι κινεῖσθαι, καὶ εἰς τοῦτο ἀπάγοι τὸ ἀδύνατον· οὐδαμῶς γὰρ οὐδαμῆ συνεχές ἐστι τὸ ψεῦδος τῇ φάσει τῇ ἐξ ἀρχῆς. 3 Ἄλλος δὲ τρόπος, εἰ συνεχὲς μὲν εἴη τὸ ἀδύνατον τῇ ὑποθέσει,

* γρ. ὃ ἀντίφησιν, al. ὃ ἀντίθησι.
* γρ. φανερώτερος.
* γρ. τοῦτό ἐστιν ὁ μὴ παρὰ τοῦτο.

At non propter hoc accidere falſum, (quod ſæpe in diſputationibus dicere ſoliti ſumus) primùm reperitur in ſyllogiſmis *ducentibus* ad impoſſibile, cùm *quis* contradicit ei quod *alius* probauit *deductione* ad impoſſibile. neque enim qui non contradixit, dicet illud, Non propter hoc, ſed falſum quidpiam eſſe *contendet* ex iis quæ priùs poſita ſunt: neque in *probatione* oſtenſiua; quia non ponit contradictionem. Præterea cùm euerſum quippiã fuerit oſtenſiuè per α β γ: dici non poteſt, non propter hoc quod poſitũ eſt, factum eſſe ſyllogiſmum. nam illud, non propter hoc fieri, tunc dicimus, cùm hoc ſublato nihilo minùs perficitur ſyllogiſmus. quod quidem non eſt in oſtenſiuis: quia poſitione ſublatâ, non erit ampliùs ſyllogiſmus *ille* qui ad eam *pertinebat*. Perſpicuum igitur *eſt*, in *ducentibus* ad impoſſibile dici illud, non propter hoc: cũ ſcilicet hypotheſis ab initio ſumpta, ita *ſe* habet ad impoſſibile; vt ſiue ea ſit, ſiue nõ ſit, nihilo minùs accidat impoſſibile. 2 Eſt igitur maximè conſpicuus modus, quo non propter hypotheſim eſt falſum, cùm ſyllogiſmus ex mediis ad impoſſibile *ducentibus effectus*, ab hypotheſi eſt ſeparatus, queãdmodum & in Topicis dictum eſt: hoc enim eſt, non cauſam pro cauſã ponere. Vt ſi volens probare dimetientẽ non habere cõmunem menſuram, conetur Zenonis orationẽ probare, id eſt, non eſſe motum, ducátque ad hoc impoſſibile. falſum enim *quod cõcluſum eſt*, nullo prorſus modo cohæret ei quod ab initio *dictũ fuit*. 3 Alius modus *eſt*, ſi cohæreat quidem impoſſibile hypotheſi,

non

non tamen propter illam accidat. hoc enim fieri A poteſt, ſiue ſurſum, ſiue deorſum verſùs cohærentia accipiatur. 4 Vt ſi τὸ α τῷ ϐ ponatur ineſſe, & τὸ β τῷ γ, & τὸ γ τῷ δ: hoc autem falſum ſit, τὸ ϐ τῷ δ ineſſe. nam ſi dempto α, nihilo minùs ineſt τὸ β τῷ γ, & τὸ γ τῷ δ: non colligetur falſum ex hypotheſi initio ſumpta. 5 Aut rurſus ſi quis ſurſum verſùs accipiat cohærentiam. Vt ſi τὸ α *inſit* τῷ ϐ, & τῷ α τὸ ε, & τῷ ε τὸ ζ: falſum autem ſit ineſſe τῷ α τὸ ζ. nam ſic quoque nihilo minùs efficietur impoſſibile ablata hypotheſi initio *accepta*. 6 Sed oportet impoſſibile coniungere cū terminis ab initio *ſumptis*. ſic enim erit propter hypotheſim. 7 Vt deorſum verſùs B acceptā cohærentiā, *coniungi debet* cum termino attributo. nam ſi impoſſibile *eſt* τὸ α τῷ δ ineſſe: ablato α, non erit ampliùs falſum illud. 8 Surſum autem verſùs *acceptā cohærentiā, coniungi debet cum termino* ſubiecto. Nam ſi τῷ ϐ non poteſt τὸ ζ ineſſe: dempto ϐ, nō erit ampliùs illud impoſſibile. 9 Similis *eſt* ratio ſyllogiſmorum priuantium. 10 Perſpicuum igitur *eſt*, niſi impoſſibile coniungatur cum terminis ab initio *acceptis*, non propter poſitionem falſum accidere. 11 An ne ſic quidem ſemper propter hypotheſim erit falſum? Nam ſi τὸ α ponatur ineſſe, non τῷ ϐ, ſed τῷ κ, & τὸ κ τῷ γ, atque hoc τῷ δ: ſic quoque manet *ipſum* impoſſibile. Similiterque ſurſum verſus acceptis terminis. Cùm C igitur impoſſibile accidat, ſiue hoc ſit, ſiue non ſit: non erit propter poſitionem. 12 Aut ſi hoc non ſit, nihilominùs effici falſum, non ita accipi debet, quaſi alio poſito accidat impoſſibile: ſed, cùm hoc ablato, per reliquas propoſitiones concluditur idē impoſſibile: quandoquidem nihil fortaſſe abſurdi *eſt*, ſi falſum concludatur per multas hypotheſes: veluti lineas parallelas concurrere, ſiue maior ſit *angulus* internus externo, ſiue triangulus plures duobus rectis *angulos* habeat.

A μὴ μέντοι δι' ἐκείνην συμβαίνοι· τοῦτο γὰρ ἐνδέχεται γίνεσθαι, καὶ ἐπὶ τὸ ἄνω, καὶ ἐπὶ τὸ κάτω λαμβάνοντι τὸ συνεχές. 4 Οἷον, εἰ τὸ α τῷ ϐ κεῖται ὑπάρχον, τὸ δὲ ϐ τῷ γ, τὸ δὲ γ τῷ δ· τοῦτο δὲ εἴη ψεῦδος, τὸ ϐ τῷ δ ὑπάρχειν. εἰ γὰρ ἀφαιρεθέντος τοῦ α, μηδὲν ἧττον ὑπάρχοι τὸ ϐ τῷ γ, καὶ τὸ γ τῷ δ, οὐκ ἂν εἴη τὸ ψεῦδος διὰ τὴν ἐξ ἀρχῆς ὑπόθεσιν. 5 Ἢ πάλιν, εἴ τις ἐπὶ τὸ ἄνω λαμβάνοι τὸ συνεχές. οἷον, εἰ τὸ μὲν α τῷ ϐ, τῷ δὲ α τὸ ε, καὶ τῷ ε τὸ ζ· ψεῦδος δὲ εἴη τὸ ὑπάρχειν τῷ α τὸ ζ· καὶ γὰρ οὕτως οὐδὲν ἂν ἧττον εἴη τὸ ἀδύνατον, ἀναιρεθείσης τῆς ἐξ ἀρχῆς ὑποθέσεως. 6 Ἀλλὰ δεῖ πρὸς τοὺς ἐξ ἀρχῆς ὅρους B συνάπτειν τὸ ἀδύνατον· οὕτω γὰρ ἔσται διὰ τὴν ὑπόθεσιν. 7 Οἷον, ἐπὶ μὲν τὸ κάτω λαμβάνοντι τὸ συνεχές, πρὸς τὸν κατηγορούμενον τῶν ὅρων. εἰ γὰρ ἀδύνατον, τὸ α τῷ δ ὑπάρχειν, ἀφαιρεθέντος τοῦ α, οὐκ ἔτι ἔσται τὸ ψεῦδος. 8 Ἐπὶ δὲ τὸ ἄνω, καθ' οὗ κατηγορεῖται. εἰ γὰρ τῷ ϐ μὴ ἐνδέχεται τὸ ζ ὑπάρχειν, ἀφαιρεθέντος τοῦ ϐ, οὐκ ἔτι ἔσται τὸ ἀδύνατον. 9 Ὁμοίως δὲ καὶ στερητικῶν τῶν συλλογισμῶν ὄντων. 10 Φανερὸν οὖν, ὅτι τοῦ ἀδυνάτου μὴ πρὸς τοὺς ἐξ ἀρχῆς ὅρους ὄντος, οὐ παρὰ τὴν θέσιν συμβαίνει τὸ ψεῦδος. 11 Ἢ οὐδ' οὕτως ἀεὶ διὰ τὴν ὑπόθεσιν ἔσται τὸ ψεῦδος; καὶ γὰρ εἰ μὴ τῷ ϐ, ἀλλὰ τῷ κ ἐτέθη τὸ α ὑπάρχειν, τὸ δὲ κ τῷ γ, καὶ τοῦτο τῷ δ, καὶ οὕτω μένει τὸ ἀδύνατον. C Ὁμοίως δὲ καὶ ἐπὶ τὸ ἄνω λαμβάνοντι τοὺς ὅρους. Ὥστ' ἐπεὶ καὶ ὄντος καὶ μὴ ὄντος τούτου, συμβαίνει τὸ ἀδύνατον· οὐκ ἂν εἴη παρὰ τὴν θέσιν. 12 Ἢ τὸ μὴ ὄντος τούτου, μηδὲν ἧττον γίνεσθαι τὸ ψεῦδος, οὐχ οὕτω ληπτέον, ὥστ' ἄλλου τεθέντος, συμβαίνειν τὸ ἀδύνατον· ἀλλ' ὅταν, ἀφαιρεθέντος τούτου, διὰ τῶν λοιπῶν προτάσεων τὸ αὐτὸ περαίνηται ἀδύνατον. ἐπεὶ τὸ αὐτό γε ψεῦδος συμβαίνειν διὰ πλειόνων ὑποθέσεων, οὐδὲν ἴσως ἄτοπον· οἷον, τὰς παραλλήλους * συμπίπτειν, καὶ εἰ μείζων ἐστὶν ἡ ἐντὸς τῆς ἐκτός, καὶ εἰ τὸ τρίγωνον ἔχει πλείους ὀρθὰς δυοῖν. * γ. συνάπτειν.

De falſa ratione. Cap. XVIII.

Falſa autem ratio efficitur ob *id quod* primum D falſum *eſt*. aut enim ex duabus propoſitionibus, aut pluribus cōſtat omnis ſyllogiſmus. Si igitur ex duabus *conſtet*: harum alteram, vel ambas neceſſe *eſt* falſas eſſe: ex veris namque non erat falſus ſyllogiſmus. ſin ex pluribus *conſtet*, velut τὸ γ *probetur* per α ϐ, hæc autē per δ ε ζ η: horum ſuperiorum quippiam falſum *eſt*: & propter hoc ratio *eſt falſa*. nam τὸ α & τὸ ϐ per ea concluditur. itaque propter eorū quippiam efficitur concluſio & falſum.

Ὁ δὲ ψευδὴς λόγος γίνεται παρὰ τὸ πρῶτον ψεῦδος. ἢ CAP. XX. γὰρ ἐκ τῶν δύο προτάσεων, ἢ ἐκ πλειόνων πᾶς ἐστι συλλογισμός. εἰ μὲν οὖν ἐκ τῶν δύο τούτων ἀνάγκη τὴν ἑτέραν, ἢ καὶ ἀμφοτέρας εἶναι ψευδεῖς· ἐξ ἀληθῶν γὰρ οὐκ ἦν ψευδὴς συλλογισμός. εἰ δ' ἐκ πλειόνων οἷον, τὸ μὲν γ, διὰ τῶν α β· ταῦτα δὲ, διὰ τῶν δ ε ζ η· τούτων τι ἔσται τῶν ἐπάνω ψεῦδος, καὶ παρὰ τοῦτο ὁ λόγος· τὸ γὰρ α καὶ τὸ ϐ δι' ἐκείνων περαίνεται. ὥστε παρ' ἐκείνων τι συμβαίνει τὸ συμπέρασμα καὶ τὸ ψεῦδος.

De impediendo cataſyllogiſmo id eſt, ne contra nos ſyllogiſmo concludatur.

Cap. XIX.

1 ¶ Præcepta pro reſpondente, contra eum qui argumentatur. Cautio, ne fiat vllus ſyllogiſmus. 2 Cautio, ne probetur certa concluſio. 3 ¶ Præceptum generale pro eo qui argumentatur, contra reſpondentem. 4 ¶ Præcepta ſpecialia pro qui argumentatur, contra reſpondentem. De proſyllogiſmis. 5 De ſyllogiſmis compoſitis. 6 De vno & ſimplici ſyllogiſmo.

Vt autem contra nos ſyllogiſmo non conclu- E datur, obſeruare debemus, cùm ſine concluſionibus rationem *aduerſarius* rogat, ne bis concedatur idem in propoſitionibus: quoniam ſcimus ſine medio nō effici ſyllogiſmū; medium verò eſt,

Πρὸς δὲ τὸ μὴ κατασυλλογίζεσθαι, παρατηρητέον, ὅταν ἄνευ τῶν συμπερασμάτων ἐρωτᾷ τὸν λόγον, ὅπως μὴ δοθῇ δὶς τὸ αὐτὸ ἐν ταῖς προτάσεσιν· ἐπειδήπερ ἴσμεν, ὅτι ἄνευ μέσου συλλογισμὸς οὐ γίνεται, μέσον δὲ ἐστι

τὸ πλεονάκις λεγόμενον. 2 Πῶς δὲ δεῖ πρὸς ἕκαστον συμπέρασμα τηρεῖν τὸ μέσον, φανερὸν ἐκ τοῦ εἰδέναι ποῖον ἐν ἑκάστῳ σχήματι δείκνυται. τοῦτο δὲ ἡμᾶς οὐ λήσεται, διὰ τὸ εἰδέναι πῶς ὑπέχομεν τὸν λόγον. 3 Χρὴ δὲ, ὅπερ φυλάττεσθαι παραγγέλλομεν ἀποκρινομένους, αὐτοὺς ἐπιχειροῦντας πειρᾶσθαι λανθάνειν. 4 Τοῦτο δὲ ἔσται πρῶτον μὲν, ἐὰν τὰ συμπεράσματα μὴ προσυλλογίζωνται· ἀλλ' εἰλημμένων τῶν ἀναγκαίων, ἄδηλα ᾖ. 5 Ἐπὶ δὲ, ἐὰν μὴ τὰ σύνεγγυς ἐρωτᾷ, ἀλλ' ὅτι μάλιστα τὰ μέσα. οἷον, ἔστω δέον συμπεραίνεσθαι τὸ α κατὰ τοῦ ζ· μέσα δὲ, τὰ β γ δ ε. δεῖ οὖν ἐρωτᾶν, εἰ τὸ α τῷ β· καὶ πάλιν, μὴ εἰ τὸ β τῷ γ, ἀλλ' εἰ τῷ δ τὸ ε· καὶ ἔπειτα, εἰ τὸ β τῷ γ· καὶ οὕτω τὰ λοιπά. 6 Κἂν δι' ἑνὸς μέσου γίνηται ὁ συλλογισμὸς, ἀπὸ τοῦ μέσου ἄρχεσθαι· μάλιστα γὰρ ἂν οὕτω λανθάνοι τὸν ἀποκρινόμενον.

A quod ſæpius dicitur. 2 Quomodo autem in quãque concluſionem medium obſeruare oporteat, perſpicuum *eſt* ex eo quòd ſcimus quænam in quaque figura probetur. hæc autem nos non latebit: quia ſcimus, quomodo ſuſtineamus diſputationẽ. 3 Quod verò iuſſimus reſpondentes cauere: *id* vt lateat, conentur efficere qui argumentantur. 4 Quod fiet, primum, ſi proſyllogiſmis non concludant, ſed ſumptis *propoſitionibus* neceſſariis *concluſiones proſyllogiſmorum* lateant. 5 Præterea ſi quis non proxima roget, ſed quã plurima media. Vtputà concludendũ ſit τὸ α de ζ: media verò ſint τὸ β γ δ ε. oportet igitur rogare, an τὸ α *inſit* τῷ β: & rurſus, non an β *inſit* τῷ γ, ſed an τὸ δ τῷ ε: deinde an τὸ β τῷ γ: atque ita reliqua. 6 Et ſi per vnum medium fiat ſyllogiſmus, à medio incipere *oportet*: ſic enim maximè poterit latêre reſpondentem.

De impediendo Elencho. Cap. XX,

1 Propoſitio. 2 Expoſitio quando ſit Elenchus, & quid ſit: 3 & quando non ſit. quia propoſitiones negent, 4 vel ſint particulares.

Ἐπεὶ δὲ ἔχομεν, πότε, καὶ πῶς ἐχόντων τῶν ὅρων γίνεται ὁ συλλογισμός· φανερὸν καὶ πότε ἔσται, καὶ πότε οὐκ ἔσται ἔλεγχος. 2 Πάντων μὲν γὰρ συγχωρουμένων, ἢ ἐναλλὰξ τιθεμένων τῶν ἀποκρίσεων, (οἷον τῆς μὲν, ἀποφατικῆς· τῆς δὲ * καταφατικῆς) ἐγχωρεῖ γίνεσθαι ἔλεγχον. ἦν γὰρ συλλογισμὸς, καὶ οὕτω καὶ ἐκείνως ἐχόντων τῶν ὅρων. ὥστε, εἰ τὸ κείμενον εἴη ἐναντίον τῷ συμπεράσματι, ἀνάγκη γίνεσθαι ἔλεγχον· ὁ γὰρ ἔλεγχος, ἀντιφάσεως συλλογισμός. 3 Εἰ δὲ μηδὲν συγχωροῖτο, ἀδύνατον γίνεσθαι ἔλεγχον. οὐ γὰρ ἦν συλλογισμὸς, ἁπάντων τῶν ὅρων στερητικῶν ὄντων. ὥστε οὐδ' ἔλεγχος. εἰ μὲν γὰρ ἔλεγχος, ἀνάγκη συλλογισμὸν εἶναι· συλλογισμοῦ δὲ ὄντος, οὐκ ἀνάγκη ἔλεγχον. 4 Ὡσαύτως δὲ, καὶ εἰ μηδὲν τεθείη κατὰ τὴν ἀπόκρισιν ἐν ὅλῳ· ὁ γὰρ αὐτὸς ἔσται διορισμὸς ἐλέγχου καὶ συλλογισμοῦ.

* γρ. κατηγορικῆς.

B Qvia verò habemus, quando, & quomodo *ſe* habentibus terminis ſit ſyllogiſmus: perſpicuũ etiam *eſt*, quando erit, & quando non erit Elenchus. 2 Omnibus enim conceſſis, aut reſponſionibus vice verſa poſitis, (vtputà altera affirmante, altera negante) poteſt fieri elenchus. erat enim ſyllogiſmus tam hoc quàm illo modo *ſe* habentibus terminis. quare ſi quod poſitum eſt, ſit contrarium concluſioni: neceſſe *eſt* fieri elenchũ: quoniam elenchus *eſt* ſyllogiſmus cõtradictionis. 3 Quòd ſi nihil concedatur, impoſſibile *eſt* fieri elenchum. non enim erat ſyllogiſmus, cùm omnes termini ſunt priuatiui. quare nec elenchus. etenim ſi *ſit* elenchus, neceſſe *eſt* eſſe ſyllogiſmum. ſi verò ſit ſyllogiſmus, nõ neceſſe *eſt* eſſe elenchũ. 4 Idem *dicendum eſt*, ſi nihil per reſponſionem poſitum fuerit *quod ſit* in toto: quoniãm elenchi & ſyllogiſmi eadem eſt ratio.

De deceptione. Cap. XXI.

1 Prima deceptio propter maiorem propoſitionem vniuerſalem falſam, cùm ſunt duo media non ſubalterna. 2 Secunda deceptio, cùm media ſunt ſubalterna. 3 Quomodo non fiat ſecunda, 4 vel prima deceptio. 5 Quomodo vtraque fiat. 6 Tertia deceptio propter minorem particularem ignoratam. 7 ¶ De ratione Platonis in Menone, quòd ſcientia ſit reminiſcentia. 8 An deceptio ſit contraria ſcientiæ. 9 Quarta deceptio ex eo quod non exercetur actu & coniunctim cognitio vtriuſque propoſitionis. 10 vnde confirmatur deceptio tertia. 11 Quartam deceptionem non eſſe contrariam ſcientiæ. 12 Obiectio. 13 Solutio.

CAP. XXI.

Συμβαίνει δ' ἐνίοτε, καθάπερ ἐν τῇ θέσει τῶν ὅρων ἀπατώμεθα, καὶ κατὰ τὴν ὑπόληψιν γίνεσθαι τὴν ἀπάτην. οἷον, εἰ ἐνδέχεται τὸ αὐτὸ πλείοσι πρώτοις ὑπάρχειν, τὸ δὲ μὴ, λεληθέναι τινὰ, καὶ οἴεσθαι μηδενὶ ὑπάρχειν, τὸ δὲ, εἰδέναι. ἔστω γὰρ τὸ α τῷ β καὶ τῷ γ καθ' αὑτὸ ὑπάρχειν, καὶ ταῦτα παντὶ τῷ δ ὡσαύτως. εἰ δὴ τῷ μὲν β τὸ α παντὶ οἴεται ὑπάρχειν, καὶ τοῦτο τῷ δ παντὶ· τῷ δὲ γ τὸ α μηδενὶ, καὶ τοῦτο τῷ δ παντὶ· τοῦ αὐτοῦ κατὰ ταὐτὸν ἕξει ἐπιστήμην καὶ ἄγνοιαν. 2 Πάλιν, εἴ τις ἀπατηθείη περὶ τὰ ἐκ τῆς αὐτῆς συστοιχίας. οἷον, εἰ τὸ α ὑπάρχει τῷ β, τοῦτο δὲ τῷ γ, καὶ τὸ γ τῷ δ· ὑπολαμβάνοι δὲ τὸ α παντὶ τῷ β ὑπάρχειν, καὶ πάλιν μηδενὶ τῷ γ. ἅμα γὰρ εἴσεταί τε, καὶ οὐχ ὑπολήψεται ὑπάρχειν. 3 Ἆρ' οὖν οὐδὲν ἄλλο ἀξιοῖ ἐκ τούτων, ἢ ὃ ἐπίσταται, τοῦτο μὴ ὑπολαμβάνειν;

C Interdum accidit, vt, quemadmodum in terminorum poſitione decipimur, *ita* etiam in exiſtimatione fiat deceptio. Vt ſi contingat idem pluribus primùm ineſſe, & alterum quis ignoret, putétque nulli ineſſe, alterum ſciat. Inſit α per ſe τῷ β, & τῷ γ: itidémque hæc omni δ. ſi *quis* igitur putet τὸ α ineſſe omni β, & hoc omni δ, τὸ α autem nulli γ, & hoc omni δ: eiuſdem ſecundum idem habebit ſcientiam & ignorantiam. 2 Rurſus ſi quis decipiatur circa ea quæ *ſunt* ex eadem ſerie. vt ſi τὸ α ineſt τῷ β, hoc autem τῷ γ, & τὸ γ τῷ δ: exiſtimat autem τὸ α omni β ineſſe, & rurſus nulli γ. ſimul enim ſciet, & non exiſtimabit ineſſe. 3 An igitur ex his nihil aliud cenſet, quam, quod ſcit, id *ſe* non exiſtimare?

A nam τὸ α τῷ γ ineſſe, quodammodo ſcit per δ, ſicut particulare noſcitur cognitione vniuerſali. Quocirca quod quodammodò ſcit, hoc omnino cenſet ſe non exiſtimare. quod quidem eſt impoſſibile. 4 In eo verò quod antea dictum eſt, ſi medium non ſit ex eadem ſerie, ſecundum vtrumque medium ambas propoſitiones non accidit quempiam exiſtimare. veluti, ſi τὸ α inſit omni β, & nulli γ, ambo autem hæc omni δ. ſic enim contingit, vt prima propoſitio accipiatur contraria vel ſimpliciter, vel ex parte. nam ſi cuicumque τὸ β ineſt, exiſtimat τὸ α ineſſe; nouit autem τὸ β τῷ δ ineſſe: etiam nouit τὸ α τῷ δ ineſſe. ſi igitur rurſus, cui τὸ γ ineſt, nulli putat τὸ α ineſſe: alicui ſanè, cui τὸ β ineſt, non putat τὸ α B ineſſe. qui autem omni ineſſe putat cui τὸ β ineſt, eum rurſus putare alicui non ineſſe cui τὸ β ineſt, aut ſimpliciter aut ex parte contrarium eſt. Sic igitur non contingit exiſtimare. 5 At ſecundum vtrumque medium vnam propoſitionem, aut ſecundum alterum ambas exiſtimare, nihil vetat: veluti τὸ α ineſſe omni β, & τὸ β τῷ δ: rurſuſque τὸ α nulli γ. 6 Hæc enim deceptio ſimilis eſt ei, qua decipimur circa particularia. vtputà ſi omni β τὸ α ineſt, ac τὸ β omni γ, τὸ α omni γ inerit. Si quis igitur nouit τὸ α illi omni ineſſe cui τὸ β ineſt, nouit etiam ineſſe τῷ γ. ſed nihil prohibet, quo minùs ignoret τὸ γ eſſe. Veluti ſi τὸ α ſint duo anguli recti: vbi β, triangulus: vbi γ, ſenſibilis triangulus. Poteſt C enim quiſpiam exiſtimare non eſſe τὸ γ, ſciens omnem triangulum habere duos rectos. quare ſimul cognoſcet & ignorabit eandem rem. Noſſe enim omnem triangulum habere duos rectos, non eſt quid ſimplex: ſed ita dicitur, vel quia ſcientia vniuerſalis habetur, vel quia particularis. Sic igitur cognitione vniuerſali nouit τὸ γ habere duos rectos: particulari autem non nouit. Quare non habebit ſcientiam & deceptionem contrarias. 7 Similiter ſe habet ratio ſcripta in Menone, quòd ſcientia ſit reminiſcentia. numquam enim accidit vt ſingulare præſciatur: ſed dum inductio fit, ſimul accipimus particularium ſcientiam, quaſi agnoſcentes. quæ- D dam enim vbi vidimus, ſtatim cognoſcimus: vtputà habere tres angulos æquales duobus rectis, ſi modo ſciamus eſſe triangulum. Similis eſt aliorum ratio. 8 Vniuerſali igitur cognitione intelligimus particularia, propriâ cognitione non nouimus. Quare contingit etiam in his falli: non tamen modo contrario. ſed quia habemus cognitionem vniuerſalem, & decipimur particulari. Itaque ſimiliter fit & in iis quæ antea diximus. non enim contraria eſt deceptio ex medio orta, ſcientiæ per ſyllogiſmum acquiſitæ, nec exiſtimatio ſecundum ambo media. 9 Nihil autẽ vetat, quo minùs ſciens τὸ α toti β ineſſe, ac rurſus hoc ineſſe τῷ γ, putet non ineſſe τὸ α τῷ γ. verbi gratiâ, ſciens omnem mulam eſſe ſterilem, & E hanc eſſe mulam, putet hanc ferre in vtero: non enim ſcit τὸ α ineſſe τῷ γ, niſi ſimul conſideret vtrumque pronunciatum. 10 Quocirca perſpicuum eſt, & ſi alterum nouerit, alterum non nouerit, eum deceptũ iri. quomodo ſe habent vniuerſales ſcientiæ ad particulares. ex iis enim quæ ſub ſenſum cadunt, nihil à ſenſu abſens cognoſcimus, ne quidem ſi id antea ſenſerimus, niſi hac ratione quia vniuerſalem & propriam ſcientiam habemus, non quòd actu ea ſcientia vtamur. Scire enim dicitur tribus modis: id eſt, vel vt cognitione vniuerſali, vel vt propriâ, vel vt actu & operatione quare etiam decipi dicitur tot modis. 11 Nihil igitur prohibet,

ἐπίσταται γάρ πως, ὅτι τὸ α τῷ γ ὑπάρχει, διὰ τοῦ β, ὡς ἐν τῇ καθόλου τὸ κατὰ μέρος. ὥστε ὅ, πως ἐπίσταται, τοῦτο ὅλως ἀξιοῖ μὴ ὑπολαμβάνειν· ὅπερ ἀδύνατον. 4 Ἐπὶ δὲ τοῦ προτέρου λεχθέντος, εἰ μὴ ἐκ τῆς αὐτῆς συστοιχίας τὸ μέσον, καθ' ἑκάτερον μὲν τῶν μέσων ἀμφοτέρας τὰς προτάσεις οὐκ ἐνδέχεται ὑπολαμβάνειν. οἷον, εἰ τὸ α τῷ μὲν β παντί, τῷ δὲ γ μηδενί, ταῦτα δὲ ἀμφότερα παντὶ τῷ δ. συμβαίνει γὰρ ἢ ἁπλῶς ἢ ἐπί τι λαμβάνεσθαι ἐναντίαν τὴν πρώτην πρότασιν. εἰ γὰρ ᾧ τὸ β ὑπάρχει, παντὶ τὸ α ὑπολαμβάνει ὑπάρχειν, τὸ δὲ β τῷ δ οἶδε· καὶ ὅτι τῷ δ τὸ α, οἶδεν. ὥστ', εἰ πάλιν, ᾧ τὸ γ, μηδενὶ οἴεται τὸ α ὑπάρχειν ᾧ τὸ β τινὶ ὑπάρχει, τούτῳ οὐκ οἴεται τὸ α ὑπάρχειν. τὸ δὲ παντὶ οἰόμενον ᾧ τὸ β, πάλιν τινὶ μὴ οἴεσθαι ᾧ τὸ β, ἢ ἁπλῶς ἢ ἐπί τι ἐναντίον ἐστίν. οὕτω μὲν οὖν οὐκ ἐνδέχεται ὑπολαβεῖν. 5 Καθ' ἑκάτερον δὲ τὴν μίαν, ἢ κατὰ τὸ ἕτερον ἀμφοτέρας, οὐδὲν κωλύει. οἷον, τὸ α παντὶ τῷ β, καὶ τὸ β τῷ δ· καὶ πάλιν, τὸ α μηδενὶ τῷ γ. 6 Ὁμοία γὰρ ἡ τοιαύτη ἀπάτη, καὶ ὡς ἀπατώμεθα περὶ τὰ ἐν μέρει. οἷον, εἰ ᾧ τὸ β παντὶ τὸ α ὑπάρχει, τὸ δὲ β τῷ γ παντί, τὸ α παντὶ τῷ γ ὑπάρξει. εἰ οὖν τις οἶδεν, ὅτι τὸ α, ᾧ τὸ β, ὑπάρχει παντί· οἶδε καὶ ὅτι τῷ γ. ἀλλ' οὐδὲν κωλύει ἀγνοεῖν τὸ γ ὅτι ἔστιν. οἷον, εἰ τὸ μὲν α, δύο ὀρθαί· τὸ δ' ἐφ' ᾧ β, τρίγωνον· τὸ δ' ἐφ' ᾧ γ, αἰσθητὸν τρίγωνον. Ὑπολάβοι γὰρ ἄν τις μὴ εἶναι τὸ γ, εἰδὼς ὅτι πᾶν τρίγωνον ἔχει δύο ὀρθάς. ὥστ' ἅμα εἴσεται, καὶ ἀγνοήσει ταὐτόν. τὸ γὰρ εἰδέναι ὅτι* πᾶν τρίγωνον ἔχει δύο ὀρθάς, οὐχ ἁπλοῦν ἐστιν· ἀλλὰ τὸ μέν, τῷ τὴν καθόλου ἔχειν ἐπιστήμην· τὸ δέ, τῷ τὴν καθ' ἕκαστον. οὕτω μὲν οὖν ὡς ἐν τῇ καθόλου, οἶδε τὸ γ ὅτι δύο ὀρθαί· ὡς δὲ τῇ καθ' ἕκαστον, οὐκ οἶδεν. ὥστ' οὐχ ἕξει τὰς ἐναντίας. 7 Ὁμοίως δὲ καὶ ὁ ἐν τῷ Μένωνι λόγος, ὅτι ἡ μάθησις, ἀνάμνησις. οὐδαμοῦ γὰρ συμβαίνει προεπίστασθαι τὸ καθ' ἕκαστον· ἀλλ' ἅμα τῇ ἐπαγωγῇ λαμβάνειν τὴν τῶν κατὰ μέρος ἐπιστήμην, ὥσπερ ἀναγνωρίζοντας. ἔνια γὰρ εὐθὺς ἴσμεν· οἷον ὅτι δύο ὀρθαῖς, ἐὰν εἰδῶμεν ὅτι τρίγωνον. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. 8 Τῇ μὲν οὖν καθόλου θεωροῦμεν τὰ ἐν μέρει, τῇ δὲ οἰκείᾳ οὐκ ἴσμεν. ὥστ' ἐνδέχεται καὶ ἀπατᾶσθαι περὶ αὐτά, πλὴν οὐκ ἐναντίως, ἀλλ' ἔχειν μὲν τὴν καθόλου, ἀπατᾶσθαι δὲ τῇ κατὰ μέρος. ὁμοίως οὖν καὶ ἐπὶ τῶν προειρημένων. οὐ γὰρ ἐναντία ἡ κατὰ τὸ μέσον ἀπάτη, τῇ κατὰ τὸν συλλογισμὸν ἐπιστήμῃ· οὐδ' ἡ καθ' ἑκάτερον τῶν μέσων ὑπόληψις. 9 Οὐδὲν δὲ κωλύει, εἰδότα καὶ ὅτι τὸ α ὅλῳ τῷ β ὑπάρχει, καὶ πάλιν τοῦτο τῷ γ, οἰηθῆναι μὴ ὑπάρχειν τὸ α τῷ γ. οἷον, ὅτι πᾶσα ἡμίονος, ἄτοκος· καὶ αὕτη ἡμίονος, οἴεσθαι κύειν ταύτην· οὐ γὰρ ἐπίσταται ὅτι τὸ α τῷ γ, μὴ συνθεωρῶν τὸ καθ' ἑκάτερον. 10 Ὥστε δῆλον ὅτι καὶ εἰ τὸ μὲν, οἶδε, τὸ δέ, μὴ οἶδεν, ἀπατηθήσεται· ὅπερ ἔχουσιν αἱ καθόλου πρὸς τὰς κατὰ μέρος ἐπιστήμας. οὐδὲν γὰρ τῶν αἰσθητῶν ἔξω τῆς αἰσθήσεως γινόμενον ἴσμεν, οὐδ' ἂν ᾐσθημένοι τυγχάνωμεν, εἰ μὴ ὡς τῷ καθόλου, καὶ τῷ ἔχειν τὴν οἰκείαν ἐπιστήμην, ἀλλ' οὐχ ὡς τῷ ἐνεργεῖν. τὸ γὰρ ἐπίστασθαι λέγεται τριχῶς· ἢ ὡς τῇ καθόλου, ἢ ὡς τῇ οἰκείᾳ, ἢ ὡς τῷ ἐνεργεῖν. ὥστε καὶ τὸ ἠπατῆσθαι τοσαυταχῶς. 11 Οὐδὲν οὖν κωλύει,

* χ. εἰδέναι τὸ τρίγωνον, ὅτι δύο ὀρθαῖς οὐχ ἁπλοῦν ἐστι, ἀλλὰ τὸ μὲν, τῷ τὴν καθόλου ἔχειν ἐπιστήμην· τὸ δὲ τῷ καθ' ἕκαστον.

καὶ εἰδέναι, καὶ ἠπατῆσθαι περὶ τὸ αὐτό, πλὴν οὐκ ἐναντίως. ὅπερ συμβαίνει καὶ τῷ καθ' ἑκατέραν εἰδότι τὴν πρότασιν, καὶ μὴ ἐπεσκεμμένῳ πρότερον. ὑπολαμβάνων γὰρ κύειν τὴν ἡμίονον, οὐκ ἔχει τὴν κατὰ τὸ ἐνεργεῖν ἐπιστήμην· οὐδ' αὖ διὰ τὴν ὑπόληψιν, ἐναντίαν ἀπάτην τῇ ἐπιστήμῃ. συλλογισμὸς γὰρ ἐστὶν ἡ ἐναντία ἀπάτη τῇ καθόλου. 12 Ὁ δ' ὑπολαμβάνων τὸ ἀγαθῷ εἶναι, κακῷ εἶναι, τὸ αὐτὸ ὑπολήψεται ἀγαθῷ εἶναι καὶ κακῷ. ἔστω γὰρ τὸ μὲν ἀγαθῷ εἶναι, ἐφ' ὧ τὸ α· τὸ δὲ κακῷ εἶναι, ἐφ' οὗ τὸ β· πάλιν δὲ τὸ ἀγαθῷ εἶναι, ἐφ' ὧ τὸ γ. ἐπεὶ οὖν ταὐτὸν ὑπολαμβάνει τὸ β καὶ τὸ γ, καὶ εἶναι τὸ γ τὸ β ὑπολήψεται· καὶ πάλιν τὸ β τὸ α εἶναι ὡσαύτως. ὥστε καὶ τὸ γ τὸ α. Ὥσπερ γὰρ εἰ ἦν ἀληθές, καθ' οὗ τὸ γ, τὸ β· καὶ καθ' οὗ τὸ β, τὸ α· καὶ κατὰ τοῦ γ τὸ α, ἀληθὲς ἦν· οὕτω καὶ ἐπὶ τοῦ ὑπολαμβάνειν. ὁμοίως δὲ καὶ ἐπὶ τοῦ εἶναι. τοῦ αὐτοῦ γὰρ ὄντος τοῦ γ καὶ τοῦ β, καὶ πάλιν τοῦ β καὶ τοῦ α, καὶ τὸ γ τῷ α ταὐτὸν ἦν. ὥστε καὶ ἐπὶ τοῦ δοξάζειν ὁμοίως. 13 Ἆρ' οὖν τοῦτο μὲν ἀναγκαῖον, εἴ τις δώσει τὸ πρῶτον, ἀλλ' ἴσως ἐκεῖνο, ψεῦδος, τὸ ὑπολαμβάνειν τινὰ, κακῷ εἶναι τὸ ἀγαθῷ εἶναι, εἰ μὴ κατὰ συμβεβηκός. πολλαχῶς γὰρ ἐνδέχεται τοῦτο ὑπολαμβάνειν. ἐπισκεπτέον δὲ τοῦτο βέλτιον.

A quempiam cognoſcere ac decipi in eadem re, non tamen modo contrario. quod ei quoque accidit, qui ſecundum vtrãque propoſitionem nouit, nec priùs conſiderauit. exiſtimans enim mulã vterum ferre, non habet actu ſcientiã: nec rurſus propter exiſtimationem, *habet* errorem ſcientiæ contrarium. nam *ſcientiæ* vniuerſali contrarius error eſt ſyllogiſmus. 12 Qui verò exiſtimat boni eſſentiã *eſſe* mali eſſentiam, idem *eſſe* exiſtimabit eſſentiam boni & mali. ſit enim boni eſſentia, vbi τὸ α: mali autem eſſentia, vbi τὸ β: rurſus boni eſſentia, vbi τὸ γ. Quoniam igitur idẽ *eſſe* exiſtimat τὸ β & τὸ γ, etiam exiſtimabit τὸ γ eſſe τὸ β. rurſuſque itidem *exiſtimabit* τὸ β eſſe τὸ α: proinde τὸ γ *eſſe* τὸ α. Quemadmodũ B enim ſi verũ erat, de quo *dicitur* τὸ γ, *de eo dici* τὸ β; & de quo *dicitur* τὸ β, *de eo dici* τὸ α: etiam de γ *dici* τὸ α, verũ erat: ita etiam *ſe res habet* in *verbo* Exiſtimare. Similitérque in *verbo* Eſſe. nam ſi idẽ *ſit* τὸ γ & τὸ β, rurſúſque τὸ β & τὸ α: etiam τὸ γ idem erat quod τὸ α. itaque etiam iñ *verbo* Opinari, ſimiliter *ſe res habet*. 13 An hoc *eſt* quidem neceſſarium, ſi quis primũ conceſſerit? ſed fortaſſe illud *eſt* falſum, quẽpiam exiſtimare eſſentiam boni eſſe eſſentiam mali, niſi ex accidente. multis enim modis licet hoc exiſtimare. Sed hoc diligentiùs conſiderandum *eſt*.

DE VARIIS ARGVMENTANDI SEV RATIOCINANDI GENERIBVS, QVÆ AD SYLLOGISMOS REDVCVNTVR.

TRACTATVS III.

De conſecutionum regulis, quæ ad terminorum conuerſionem, & eligendorum fugiendorúmque comparationem pertinent.

Cap. XXII.

1 ¶ Theorema primum. Conuerſio propoſitionum τοῦ Barbara, ob conuerſionem concluſionis. 2 Conuerſio concluſionis τοῦ Celarent ob conuerſionem maioris, 3 vel minoris propoſitionis. 4 Conuerſio maioris propoſitionis τοῦ Celarent ob conuerſionem concluſionis, & minoris propoſitionis. 5 ¶ Secundum. 6 ¶ Tertium. 7 ¶ Quartum. 8 ¶ Quintum. 9 ¶ Sextum, de eligendis & fugiendis.

CAP. XXII.

Ὅταν δὲ ἀντιστρέφηται τὰ ἄκρα, ἀνάγκη καὶ τὸ μέσον ἀντιστρέφειν πρὸς ἄμφω. εἰ γὰρ τὸ α κατὰ τοῦ γ διὰ τοῦ β ὑπάρχει, εἰ ἀντιστρέφει, καὶ ὑπάρχει, ᾧ τὸ α, παντὶ τὸ γ· καὶ τὸ β τῷ α ἀντιστρέφει, καὶ ὑπάρχει, ᾧ τὸ α, παντὶ τὸ β, διὰ μέσου τοῦ γ· καὶ τὸ γ τῷ β ἀντιστρέφει, διὰ μέσου τοῦ α. 2 Καὶ ἐπὶ τοῦ μὴ ὑπάρχειν ὡσαύτως. οἷον, εἰ τὸ β τῷ γ ὑπάρχει, τῷ δὲ β τὸ α μὴ ὑπάρχει· οὐδὲ τὸ α τῷ γ οὐχ ὑπάρξει. εἰ δὴ τὸ β τῷ α ἀντιστρέφει, καὶ τὸ γ τῷ α ἀντιστρέψει. ἔστω γὰρ τὸ β μὴ ὑπάρχον * τῷ α· οὐδ' ἄρα τὸ γ· παντὶ γὰρ τῷ γ * τὸ β ὑπῆρχε. 3 Καὶ εἰ τῷ β τὸ γ ἀντιστρέφει * καὶ τῷ α τὸ β ἀντιστρέψει. καθ' οὗ γὰρ ἂν παντὸς τὸ β, καὶ τὸ γ. 4 Καὶ εἰ τὸ γ πρὸς τὸ α ἀντιστρέφει· καὶ τὸ β ἀντιστρέψει πρὸς τὸ α. ᾧ γὰρ τὸ β, καὶ τὸ γ· ᾧ δὲ τὸ α, τὸ γ οὐχ ὑπάρχει. καὶ μόνον τοῦτο ἀπὸ τοῦ συμπεράσματος ἄρχεται, (τὰ δ' ἄλλα, οὐχ ὁμοίως) ὡς καὶ ἐπὶ τοῦ κατηγορικοῦ συλλογισμοῦ. 5 Πάλιν, εἰ τὸ α καὶ τὸ β ἀντιστρέφει, καὶ τὸ γ καὶ τὸ δ ὡσαύτως, ἅπαντι δὲ ἀνάγκη τὸ α ἢ τὸ γ ὑπάρχειν· καὶ τὸ β καὶ τὸ δ οὕτως ἕξει, ὥστε παντὶ θάτερον ὑπάρχειν.

* κ. ᾧ τὸ α.
* κ. τὸ β τῷ γ.
* κ. καὶ τὸ β ᾧ τὸ γ, ἀντιστρέψει. al. καὶ τῷ α τὸ β ἀντιστρέψει. docti viri legunt, ᾧ ἢ τὸ α τὸ γ οὐχ ὑπάρχει.
Poſt hæc verba οὐχ ἅμα, ſequuntur in quibuſdam codicibus quæ mox ſunt his notis [] incluſa.

C IAm verò quando extrema conuertuntur, neceſſe *eſt* etiam medium conuerti cũ ambobus. Nã ſi τὸ α τῷ γ ineſt per β: ſi conuertitur, & cuicumque ineſt τὸ α, *ineſt* etiam τὸ γ: *certè* etiam τὸ β cum α conuertitur: & cuicumque τὸ α ineſt, etiam τὸ β ineſt per medium γ: item τὸ γ cum β conuertitur per medium α. 2 Itidémque *ſe res habet* in eo quod non ineſt. Vt ſi τὸ β τῷ γ ineſt, τῷ β autẽ τὸ α non ineſt, neque τὸ α τῷ γ inerit. ſi igitur τὸ β cum α conuertitur, etiam τὸ γ cum α conuertetur. ponamus enim τὸ β non ineſſe τῷ α: ergo neque τὸ γ *inerit*: quoniam omni γ τὸ β inerat. 3 Et ſi cum β τὸ γ conuertitur, etiam cum α τὸ β conuertetur. nam de quocumque *dicitur* τὸ β, *dicitur* etiam τὸ γ. 4 Et ſi τὸ γ cum α conuertitur, etiam τὸ β conuertetur cum α. nam cui τὸ β *ineſt*, *eidem ineſt* etiã τὸ γ: cui verò *ineſt* τὸ α, non ineſt τὸ γ. atque hoc ſolũ à concluſione incipit, (alia verò non ſimiliter) vt etiam in attributiuo ſyllogiſmo. 5 Rurſus ſi τὸ α & τὸ β conuertuntur: itẽ τὸ γ & τὸ δ, cuivis autẽ neceſſe *eſt* aut τὸ α aut τὸ γ ineſſe: etiam τὸ β & τὸ δ ita *ſe* habebunt, & cuivis alterum inſit.

Cùm enim cui τὸ α ineſt, etiam τὸ ε inſit: & cui τὸ γ, etiam τὸ δ: cuivis autem inſit τὸ α vel τὸ γ, non vtrumque ſimul: perſpicuum eſt, etiam τὸ ε vel τὸ δ cuivis ineſſe, nec ambo ſimul. duo namque ſyllogiſmi componuntur. 6 Rurſus ſi cuivis inſit τὸ α aut τὸ β, & τὸ γ aut τὸ δ, ſimul autem non inſint: ſi conuertuntur τὸ α ac τὸ γ, etiam τὸ ε & τὸ δ conuertuntur. nam ſi alicui non ineſt τὸ β, cui ineſt τὸ δ: conſtat τὸ α ineſſe. quòd ſi τὸ α inſit, etiam τὸ γ inerit: quandoquidem conuertuntur. quare ſimul erunt τὸ γ & τὸ δ. hoc autem eſt impoſſibile. Vtputa ſi ingenitum eſt incorruptibile, & incorruptibile eſt ingenitum: neceſſe eſt, genitum eſſe corruptibile, & corruptibile eſſe genitum. 7 Cùm autem τὸ α toti β, & toti γ ineſt, & nulli alij attribuitur, ineſt autem etiam τὸ ε omni γ: neceſſe eſt τὸ α & τὸ ε conuerti. Cùm enim de ſolis ε γ dicatur τὸ α, attribuatur autem τὸ ε, & ipſum ſibi, & τὸ γ: apparet, de quibus dicitur τὸ α, de iis omnibus τὸ ε dictum iri: quin & de ipſo α. 8 Rurſus cùm τὸ α & τὸ ε toti γ inſunt, conuertitur autem τὸ γ cum ε: neceſſe eſt, τὸ α ineſſe omni ε. Cùm enim inſit omni γ τὸ α: & omni ε τὸ γ, proptereà quòd reciprocantur: etiam τὸ α omni ε inerit. 9 Cùm autem ex duabus rebus oppoſitis, putà α & β, τὸ α eſt optabilius quàm τὸ ε, & τὸ δ itidem optabilius quàm τὸ γ: ſi optabiliora ſunt τὸ α γ, quàm τὸ ε δ, τὸ α eſt optabilius quàm ε δ. æquè enim expetendum eſt τὸ α, & fugiendum τὸ β, quippe cùm ſint oppoſita. item æquè fugiendum eſt τὸ γ, atque expetendum τὸ δ: quoniã hæc quoque opponuntur. ſi igitur τὸ α eſt æquè eligendum, ac τὸ δ: etiam τὸ β eſt æquè fugiendum ac τὸ γ. vtrũque enim vtrique ſimiliter opponitur, fugiendum expetendo. quare etiam ambo erunt æquè fugienda vel eligenda, nempe τὸ α γ æquè ac τὸ ε δ. quia verò illa ſunt his magis eligenda, non poſſunt eſſe æquè eligẽda: alioquin τὸ β δ eſſent æquè eligenda. Quòd ſi τὸ δ ſit optabilius quàm τὸ α, etiam τὸ ε erit minus fugiendum quã τὸ γ: quia minus minori opponitur. Optabilius autẽ eſt maius bonum & minus malum, quàm minus bonum & maius malum. ergo etiam totum τὸ ε δ eſt optabilius quàm τὸ α γ. ſed non ita eſt. τὸ α igitur eſt optabilius quàm τὸ δ. proinde etiam τὸ γ minùs fugiendum quàm τὸ ε. Si igitur omnis amans, ſecundum amorem eligit τὸ α, nempe ita ſe habere vt gratificetur, & non gratificari quod eſt vbi γ potiùs quã gratificari quod eſt vbi δ, & non talem eſſe vt gratificetur quod eſt vbi ε: manifeſtũ eſt, τὸ α, id eſt eſſe talem, optabilius eſſe quã gratificari. itaque diligi eſt congreſſu optabilius ſecundum amorem. amor igitur eſt potiùs dilectionis quàm congreſſus cauſa. quòd ſi huius cauſa eſt maximè: finis hoc eſt. Ergo congreſſus aut non eſt omnino, aut eſt dilectionis cauſa. nam aliæ quoque cupiditates & artes ita fiunt. 10 Quomodo igitur termini ſe habeant ſecundum conuerſionem, & eligendorum aut fugiendorum comparationem, perſpicuum eſt.

ἐπεὶ γὰρ ᾧ τὸ α, τὸ β· καὶ ᾧ τὸ γ, τὸ δ· παντὶ δὲ τὸ α ἢ τὸ γ, καὶ οὐχ ἅμα· φανερὸν ὅτι καὶ τὸ β ἢ τὸ δ παντί, καὶ οὐχ ἅμα· δύο γὰρ συλλογισμοὶ σύγκεινται. 6 Πάλιν, εἰ παντὶ μὲν τὸ α ἢ τὸ β, καὶ τὸ γ ἢ τὸ δ, ἅμα δὲ μὴ ὑπάρχει· εἰ ἀντιστρέφει τὸ α καὶ τὸ γ, καὶ τὸ β καὶ τὸ δ ἀντιστρέφει. εἰ γὰρ τινὶ μὴ ὑπάρχει τὸ β, ᾧ τὸ δ· δῆλον ὅτι τὸ α ὑπάρχει. εἰ δὲ τὸ α, καὶ τὸ γ· ἀντιστρέφει γάρ. ὥστε ἅμα τὸ γ καὶ τὸ δ. τοῦτο δὲ, ἀδύνατον. οἷον, εἰ τὸ * ἀγένητον, ἄφθαρτον· καὶ τὸ ἄφθαρτον, ἀγένητον· ἀνάγκη τὸ γενόμενον, φθαρτόν· καὶ τὸ φθαρτὸν γεγενῆσθαι. 7 Ὅταν δὲ τὸ α ὅλῳ τῷ β, καὶ τῷ γ ὑπάρχῃ, καὶ μηδενὸς ἄλλου κατηγορῆται, ὑπάρχῃ δὲ καὶ τὸ β παντὶ τῷ γ· ἀνάγκη τὸ α καὶ τὸ β ἀντιστρέφειν. ἐπεὶ γὰρ κατὰ μόνων τῶν β γ λέγεται τὸ α, κατηγορεῖται δὲ τὸ β καὶ αὐτὸ ἑαυτοῦ καὶ τοῦ γ· φανερὸν ὅτι καθ' ὧν τὸ α, καὶ τὸ β λεχθήσεται πάντων, πλὴν αὐτοῦ τοῦ α. 8 Πάλιν, ὅταν τὸ α καὶ τὸ β ὅλῳ τῷ γ ὑπάρχῃ, ἀντιστρέφῃ δὲ τὸ γ τῷ β· ἀνάγκη τὸ α παντὶ τῷ β ὑπάρχειν. ἐπεὶ γὰρ παντὶ τῷ γ τὸ α, τὸ δὲ γ τῷ β, διὰ τὸ ἀντιστρέφειν· καὶ τὸ α παντὶ τῷ β ὑπάρξει. 9 Ὅταν δὲ, δυοῖν ὄντοιν, ᾖ τοῦ α καὶ τοῦ β, τὸ α τοῦ β αἱρετώτερον ᾖ, ὄντων ἀντικειμένων, καὶ τὸ δ τοῦ γ ὡσαύτως· εἰ αἱρετώτερα τὰ α γ τῶν β δ, τὸ α τοῦ δ αἱρετώτερον. ὁμοίως γὰρ διωκτὸν τὸ α, καὶ φευκτὸν τὸ β· ἀντικείμενα γάρ. καὶ τὸ γ τῷ δ· καὶ γὰρ καὶ ταῦτα ἀντίκειται. εἰ οὖν τὸ α τῷ δ ὁμοίως αἱρετόν· καὶ τὸ β τῷ γ φευκτόν. ἑκάτερον γὰρ ἑκατέρῳ ὁμοίως, φευκτὸν διωκτῷ. ὥστε καὶ τὰ ἄμφω τὰ α γ τοῖς β δ. ἐπεὶ δὲ μᾶλλον, οὐχ οἷόν τε ὁμοίως· καὶ γὰρ ἂν τὰ β δ ὁμοίως ἦσαν. εἰ δὲ τὸ δ τοῦ α αἱρετώτερον, καὶ τὸ β τοῦ γ ἧττον φευκτόν. τὸ γὰρ ἔλαττον τῷ ἐλάττονι ἀντίκειται. αἱρετώτερον δὲ τὸ μεῖζον ἀγαθὸν καὶ ἔλαττον κακὸν, ἢ τὸ ἔλαττον ἀγαθὸν καὶ τὸ μεῖζον κακόν· καὶ τὸ ἅπαν ἄρα τὸ β δ, αἱρετώτερον τοῦ α γ. νῦν δὲ οὐκ ἔστι. τὸ α ἄρα, αἱρετώτερον τοῦ δ. καὶ τὸ γ ἄρα, τοῦ β ἧττον φευκτόν. εἰ δὴ ἕλοιτο πᾶς ὁ ἐρῶν κατὰ τὸν ἔρωτα τὸ α, τὸ οὕτως ἔχειν ὥστε χαρίζεσθαι, καὶ τὸ μὴ χαρίζεσθαι τὸ ἐφ' οὗ γ, ἢ τὸ χαρίζεσθαι τὸ ἐφ' οὗ δ, καὶ τὸ μὴ τοιοῦτον εἶναι οἷον χαρίζεσθαι τὸ ἐφ' οὗ β· δῆλον ὅτι τὸ α τὸ τοιοῦτον εἶναι, αἱρετώτερόν ἐστιν ἢ τὸ χαρίζεσθαι. τὸ ἄρα φιλεῖσθαι, τῆς συνουσίας αἱρετώτερον κατὰ τὸν ἔρωτα. μᾶλλον ἄρα ὁ ἔρως ἐστὶ τῆς φιλίας, ἢ τοῦ συνεῖναι. εἰ δὲ μάλιστα τούτου, καὶ τὸ τέλος τοῦτο. τὸ ἄρα συνεῖναι, ἢ οὐκ ἔστιν ὅλως, ἢ τοῦ φιλεῖσθαι ἕνεκα. καὶ γὰρ αἱ ἄλλαι ἐπιθυμίαι καὶ τέχναι οὕτω γίνονται. 10 Πῶς μὲν οὖν ἔχουσιν οἱ ὅροι κατὰ τὰς ἀντιστροφάς, καὶ τὸ * αἱρετώτεροι ἢ φευκτότεροι εἶναι, φανερόν.

* γρ. ἀγένητον.

* γρ. αἱρετώτεροι ἢ φευκτότεροι εἶναι.

De inductione. Cap. XXIII.

1 Vtilitas huius tractatus. 2 Quid ſit inductio. 3 Exemplum alphabeticum. 4 Exemplum in terminis realibus. 5 Quænam potiſſimùm inductione probentur. 6 Collatio inductionis cum ſyllogiſmo prima, 7 ſecunda, & tertia.

NVnc verò exponendum eſt, non ſolùm dialecticos & demonſtratiuos ſyllogiſmos in ſuprà dictis figuris exſtrui, ſed etiam oratorios, & omnino quamcumque fidem, & ſecundum

ΟΤι δὲ οὐ μόνον οἱ διαλεκτικοὶ καὶ ἀποδεικτικοὶ συλλογισμοὶ διὰ τῶν προειρημένων γίνονται σχημάτων, ἀλλὰ καὶ οἱ ῥητορικοὶ, καὶ ἁπλῶς ἡτισοῦν πίστις, καὶ ἡ καθ'

CAP. XXIII. Hic incipit ſecundum quoſdam interpre-

res altera libri huius pars: quā inſcribunt, De reuocandis ratiocinationibus omnibus ad artificium ſyllogiſticum.

* γ. πιστεύομ.
* γ. ὑπάρχει.
* γ. τὸ καθέκαστον.
* γ. ἔχειν.

ὁποιανοῦν μέθοδον, νῦν ἂν εἴη λεκτέον. ἅπαντα γὰρ* πιστεύομεν ἢ διὰ συλλογισμοῦ, ἢ ἐξ ἐπαγωγῆς. A 2 Ἐπαγωγὴ μὲν οὖν ἐστι, καὶ ὁ ἐξ ἐπαγωγῆς συλλογισμός, τὸ διὰ τοῦ ἑτέρου θάτερον ἄκρον τῷ μέσῳ συλλογίσασθαι. 3 Οἷον, εἰ τῶν α γ μέσον τὸ β, διὰ τοῦ γ δεῖξαι τὸ α τῷ β* ὑπάρχειν· οὕτω γὰρ ποιούμεθα τὰς ἐπαγωγάς. 4 Οἷον, ἔστω τὸ α, μακρόβιον· τὸ δὲ ἐφ' ᾧ β, τὸ χολὴν μὴ ἔχον· ἐφ' ᾧ δὲ γ, τὸ καθέκαστον μακρόβιον, οἷον ἄνθρωπος, καὶ ἵππος, καὶ ἡμίονος.* τῷ δὴ γ ὅλῳ ὑπάρχει τὸ α· πᾶν γὰρ τὸ γ, μακρόβιον. ἀλλὰ καὶ τὸ β τὸ μὴ* ἔχον χολήν, παντὶ ὑπάρχει τῷ γ. εἰ οὖν ἀντιστρέφει τὸ γ τῷ β, καὶ μὴ ὑπερτείνει τὸ μέσον, ἀνάγκη τὸ α τῷ β ὑπάρχειν. δέδεικται γὰρ πρότερον, ὅτι ἂν δύο ἄττα τῷ αὐτῷ ὑπάρχῃ, καὶ πρὸς θάτερον αὐτῶν ἀντιστρέφῃ τὸ B ἄκρον, ὅτι τῷ ἀντιστρέφοντι καὶ θάτερον ὑπάρξει τῶν κατηγορουμένων. δεῖ δὲ νοεῖν τὸ γ, τὸ ἐξ ἁπάντων τῶν καθέκαστον συγκείμενον· ἡ γὰρ ἐπαγωγή, διὰ πάντων. 5 Ἔστι δὲ ὁ τοιοῦτος συλλογισμός τῆς πρώτης καὶ ἀμέσου προτάσεως. 6 Ὧν μὲν γὰρ ἔστι μέσον, διὰ τοῦ μέσου ὁ συλλογισμός· ὧν δὲ μὴ ἔστι, δι' ἐπαγωγῆς. 7 Καὶ τρόπον τινὰ ἀντίκειται ἡ ἐπαγωγὴ τῷ συλλογισμῷ, ὁ μὲν γάρ, διὰ τοῦ μέσου τὸ ἄκρον τῷ τρίτῳ δείκνυσιν· ἡ δέ, διὰ τοῦ τρίτου τὸ ἄκρον τῷ μέσῳ. 8 Φύσει μὲν οὖν πρότερος καὶ γνωριμώτερος, ὁ διὰ τοῦ μέσου συλλογισμός· ἡμῖν δὲ ἐναργέστερος, ὁ διὰ τῆς ἐπαγωγῆς.

A qualemcumque methodum. *rerum* enim omnium fidem facimus aut ſyllogiſmo, aut inductione. 2 Eſt igitur inductio, & ſyllogiſmus ex inductione, cùm alterum extremum per alterum de medio concluditur. 3 Veluti ſi τῶν α γ, medium ſit τὸ β, & per γ probetur τὸ α τῷ β ineſſe. ſic enim facimus inductiones. 4 Vtputà, eſto τὸ α, longæuum: vbi β, vacans bile: vbi γ, vnumquodque longæuum, vt homo, & equus, & mulus. Ergo toti γ ineſt τὸ α: omne enim vacans bile *eſt* longæuum. ſed & τὸ β, *id eſt* vacans bile, ineſt omni γ. ſi igitur conuertatur τὸ γ cum β, nec medium excedat: neceſſe *eſt* τὸ α τῷ β ineſſe: quandoquidem antea oſtenſum eſt; cùm duo aliqua eidem inſint, & cum altero eorum conuertitur extremum, ei quod conuertitur, etiam B alterum attributum ineſſe. Intelligere autē oportet τὸ γ, *quaſi* ex omnibus ſingularibus cōpoſitum: nam inductio *fit* ex omnibus *ſingularibus*. 5 Eſt autem huiuſcemodi ſyllogiſmus primæ & medio carentis propoſitionis. 6 Quorum enim eſt medium, ſyllogiſmus *fit* per medium: quorum autem non eſt *medium*, per inductionem. 7 Et quodammodo opponitur inductio ſyllogiſmo: hic enim per medium probat extremum de tertio: illa verò per tertium *probat* extremum de medio. 8 Naturâ igitur prior & notior *eſt* ſyllogiſmus qui *fit* per medium: nobis verò *eſt* euidentior, qui *fit* per inductionem.

De exemplo. Cap. XXIV.

1 Definitio exempli. 2 Quibus in terminis ſit huic argumentationi locus. 3 Exemplum eiuſdem argumentationis. 4 Proprietas. 5 Diſcrimen exempli & inductionis.

CAP. XXIV.

* γ. γνωριμώτερον.

ΠΑράδειγμα δέ ἐστιν, ὅταν τῷ μέσῳ τὸ ἄκρον ὑπάρχον δειχθῇ διὰ τοῦ ὁμοίου τῷ τρίτῳ. C 2 Δεῖ δὲ καὶ τὸ μέσον τῷ τρίτῳ, καὶ τὸ πρῶτον τῷ ὁμοίῳ* γνώριμον εἶναι ὑπάρχον. 3 Οἷον, ἔστω τὸ α, κακόν· τὸ δὲ β, πρὸς ὁμόρους ἀναιρεῖσθαι πόλεμον· ἐφ' ᾧ δὲ γ, τὸ Ἀθηναίους πρὸς Θηβαίους· τὸ δ' ἐφ' ᾧ δ, Θηβαίους πρὸς Φωκεῖς. ἐὰν οὖν βουλώμεθα δεῖξαι, ὅτι τὸ Θηβαίοις πολεμεῖν, κακόν ἐστι· ληπτέον, ὅτι τὸ πρὸς τοὺς ὁμόρους πολεμεῖν, κακόν. τούτου δὲ πίστις ἐκ τῶν ὁμοίων· οἷον, ὅτι Θηβαίοις ὁ πρὸς Φωκεῖς. ἐπεὶ οὖν τὸ πρὸς τοὺς ὁμόρους, κακόν· τὸ δὲ πρὸς Θηβαίους, πρὸς τοὺς ὁμόρους ἐστί· φανερόν, ὅτι τὸ πρὸς Θηβαίους πολεμεῖν, κακόν. D ὅτι μὲν οὖν τὸ β τῷ γ, καὶ τῷ δ ὑπάρχει, φανερόν· ἄμφω γάρ ἐστι πρὸς τοὺς ὁμόρους ἀναιρεῖσθαι πόλεμον. καὶ ὅτι τὸ α τῷ δ· Θηβαίοις γὰρ οὐ συνήνεγκεν ὁ πρὸς Φωκεῖς πόλεμος. ὅτι δὲ τὸ α τῷ β ὑπάρχει, διὰ τοῦ δ δειχθήσεται. Τὸν αὐτὸν δὲ τρόπον, κἂν εἰ διὰ πλειόνων τῶν ὁμοίων ἡ πίστις γίνοιτο τοῦ μέσου πρὸς τὸ ἄκρον. 4 Φανερὸν οὖν, ὅτι τὸ παράδειγμά ἐστιν, οὔτε ὡς ὅλον πρὸς μέρος, οὔτε ὡς μέρος πρὸς ὅλον, ἀλλ' ὡς μέρος πρὸς μέρος, ὅταν ἄμφω μὲν ᾖ ὑπὸ τὸ αὐτό, γνώριμον δὲ θάτερον. 5 Καὶ διαφέρει τῆς ἐπαγωγῆς, ὅτι ἡ μέν, ἐξ ἁπάντων τῶν ἀτόμων τὸ ἄκρον ἐδείκνυεν ὑπάρχειν τῷ μέσῳ, καὶ πρὸς τὸ ἄκρον οὐ συνῆπτε τὸν συλλογισμόν· τὸ δέ, καὶ συνάπτει, καὶ οὐκ ἐξ ἁπάντων δείκνυσι.

C EXemplum verò eſt, cùm medio extremum ineſſe oſtenditur per ſimile tertio. 2 Oportet autem, vt medium tertio, & primum ſimili ineſſe, notum *ſit*. 3 Verbi cauſa, eſto τὸ α, malum: τὸ β, contra finitimos bellum ſuſcipere: vbi γ, Athenienſes contra Thebanos: vbi δ, Thebanos contra Phocenſes. Ergo ſi velimus probare, cum Thebanis bellum gerere, malum eſſe: accipiendum *eſt*, aduerſus finitimos bellum gerere, *eſſe* malum. huius autem *rei* fides *eſt* ex ſimilibus, veluti quia Thebanis *pernicioſum fuit bellum* contra Phocenſes. Quoniam igitur *bellum* aduerſus finitimos malum *eſt*: *bellum* autem contra Thebanos, D eſt contra finitimos: perſpicuum *eſt*, aduerſus Thebanos bellum gerere, malum *eſſe*. Itaque τὸ β τῷ γ & τῷ δ ineſſe, perſpicuum *eſt*: vtrumque enim eſt, finitimis bellum inferre. item τὸ α *ineſſe* τῷ δ: quia Thebanis non profuit bellum contra Phocenſes. verùm τὸ α τῷ β ineſſe, per δ probabitur. Eodem modo *fiet*, & ſi ex pluribus ſimilibus fides fiat, medium eſſe in extremo. 4 Perſpicuum igitur *eſt*, exemplum non habere rationem totius ad partem, nec partis ad totum, ſed partis ad partem cùm ambo ſunt ſub eodem *contenta*, alterum autem *altero* notius *eſt*. 5 Ac differt ab inductione: quoniam illa ex omnibus indiuiduis probabat extremum ineſſe medio, neque connectebat ſyllogiſmum ad extremum: hoc verò & connectit, & non ex omnibus probat.

De abductione. Cap. XXV.

1 Duas ſpecies abductionis. 2 Exemplum primæ ſpeciei. 3 Exemplum ſecundæ. 4 Aſſinia.

A Bductio verò eſt, cùm primum medio ineſſe A conſtat: medium autem poſtremo ineſſe, *eſt* quidẽ ignotum, æquè tamen credibile, aut etiam magis quàm concluſio. Præterea, ſi pauca ſint media poſtremi & medij. Omnino enim accidit, vt propiùs accedamus ad ſcientiam. 2 Verbi cauſâ, eſto τὸ α, quod doceri poteſt: vbi β, ſcientia: τὸ γ, iuſtitia. ſcientiam igitur poſſe doceri perſpicuum *eſt*: ſed, an iuſtitia ſit ſcientia, ignotũ *eſt*. quare ſi æquè aut magis credibile ſit β γ, quam α γ: eſt abductio: propius enim *accedimus* ad ſcientiam: quoniam adiunximus *concluſioni* α γ, *propoſitionem* β γ, cùm ſcientiam antea non haberemus. 3 Rurſus *abductio eſt*, ſi pauca ſint media *terminorum* β γ: nam ſic quoque propius *acceditur* ad cognitionem. Veluti ſi τὸ δ ſit quadrari: vbi ε, *figura* rectilinea: vbi ζ, circulus: *tum ſi pronunciati* ε ζ, vnum tantum ſit medium, per lunulas circulũ rectilineæ *figuræ* æqualem fieri, prope cognitionem *res* eſt. 4 Cùm autem neque credibilior eſt *propoſitio* β γ quàm *concluſio* α γ, neque pauciora ſunt media, non voco abductionem. neque cùm *pronunciatum* β γ medio caret: hoc enim *eſt* ſcientia.

Ἀπαγωγὴ δέ ἐστιν, ὅταν τῷ μὲν μέσῳ τὸ πρῶτον δῆλον ᾖ ὑπάρχον· τῷ δὲ ἐσχάτῳ τὸ μέσον, ἄδηλον μὲν, ὁμοίως δὲ πιστὸν, ἢ μᾶλλον τοῦ συμπεράσματος. Ἔτι, ἐὰν ὀλίγα ᾖ τὰ μέσα τοῦ ἐσχάτου καὶ τοῦ μέσου. Πάντως γὰρ ἐγγύτερον εἶναι συμβαίνει τῆς ἐπιστήμης. 2 Οἷον, ἔστω τὸ α, τὸ διδακτόν· ἐφ' οὗ β, ἐπιστήμη· τὸ δὲ γ, δικαιοσύνη. ἡ μὲν οὖν ἐπιστήμη ὅτι διδακτὸν, φανερόν· * ἡ δὲ δικαιοσύνη εἰ ἐπιστήμη, ἄδηλον. εἰ οὖν ὁμοίως, ἢ μᾶλλον πιστὸν τὸ β γ τοῦ α γ, ἀπαγωγή ἐστιν· ἐγγύτερον γὰρ τοῦ ἐπίστασθαι, διὰ τὸ προσειληφέναι * τὴν α γ τὴν β γ, ἐπιστήμην πρότερον οὐκ ἔχοντας. CAP. XXV. B 3 Πάλιν, ἐὰν ὀλίγα τὰ μέσα τῶν β γ· καὶ γὰρ οὕτως ἐγγύτερον τοῦ εἰδέναι. οἷον, εἰ τὸ δ εἴη τετραγωνίζεσθαι· τὸ δ' ἐφ' ᾧ ε, εὐθύγραμμον· τὸ δὲ ἐφ' ᾧ ζ, κύκλος· εἰ τοῦ ε ζ, ἓν μόνον εἴη μέσον, τὸ μετὰ μηνίσκων ἴσον γίνεσθαι εὐθυγράμμῳ τὸν κύκλον, ἐγγὺς ἂν εἴη τοῦ εἰδέναι. 4 Ὅταν δὲ μήτε πιστότερον ᾖ τὸ β γ τοῦ α γ, μήτε ὀλίγα τὰ μέσα, οὐ λέγω ἀπαγωγήν· οὐδ' ὅταν ἄμεσον ᾖ τὸ β γ· ἐπιστήμη γὰρ τὸ τοιοῦτον.

* γ. ἡ δ' ἀρετὴ, εἰ.

* γ. τὴν α γ, ἐπι.

De obiectione, quæ vulgò inſtantia vocatur. Cap. XXVI.

1 ¶ Quid ſit. 2 ¶ Quid differat à propoſitione. 3 ¶ Quot modis fiat, & in quibus figuris: 4 ſi obiiciatur aduerſus propoſitionem affirmantem, 5 vel negantem. 6 Cur non fiat obiectio in ſecunda figura: ratio prima, à diſpoſitione medij accepti in obiectione. 7 ratio ſecunda, quia in ſecunda figura non concluditur negatio. 8 ratio tertia, ab euidentia vel obſcuritate. 9 Corollarium. 10 ¶ Prætermiſſa.

O Biectio autem eſt propoſitio propoſitioni C contraria. 2 Differt autem à propoſitione: quoniam obiectio poteſt eſſe etiam in parte: propoſitio vero aut omnino non poteſt, aut ſaltem non in vniuerſalibus ſyllogiſmis. 3 Obiicitur autem bifariam, & in duabus figuris. bifariam quidem: quia omnis obiectio vel *eſt* vniuerſalis, vel in parte: in duabus autem figuris: quoniam afferuntur *obiectiones* oppoſitæ propoſitioni: oppoſita verò in prima & tertia tantùm figura concluduntur. 4 Nam cùm *quis*, omni ineſſe, ſibi concedi poſtulauerit: obiicimus, vel quòd nulli *ineſt*, vel quod cuidam non ineſt. ex his autem illud, nulli *ineſſe*, ex prima figura *ducitur*: hoc, cuidam non *ineſſe*, ex D poſtrema. vtputa eſto τὸ α, vnam eſſe ſcientiam: vbi β, contraria. Ergo cùm *quis* propoſuerit vnam eſſe contrariorum ſcientiam: obiicitur, vel quòd omnino non *eſt* eadem ſcientia oppoſitorum, contraria vero ſunt oppoſita, adeo vt fiat prima figura. Vel quòd noti & ignoti non *eſt* vna *ſcientia*. atque hæc eſt tertia *figura*. nã de γ, *id eſt de* noto & ignoto, verè *dicitur ea* eſſe contraria: ſed vnam eſſe eorum ſcientiã, falſum *eſt*. 5 Rurſus itidem *fit* in priuatiua propoſitione. poſtulante enim *aliquo* ſibi concedi, non eſſe vnam ſcientiam contrariorum, vel dicimus oppoſitorum eſſe eandem, vel quorum- E dam contrariorũ, vt ſalubris & morbidi. omnium igitur *eſſe vnam obiicitur* ex prima figura: quorumdam, ex tertia. 6 Simpliciter enim in omnibus *diſputationibus* neceſſe *eſt* vt qui vniuerſaliter obiicit ad *id quod* vniuerſale *eſt*, propoſitorum contradictionẽ iungat. vtputa poſtulante *aliquo* ſibi concedi, non eandem eſſe *ſcientiam* contrariorum omnium, dicat oppoſitorum *eſſe* vnam *ſcientiam*. ſic autem neceſſe *eſt* eſſe primam figurã: medium enim fit, *quod eſt* vniuerſale ad *id quod propoſitum fuit* ab initio. *Qui* autem in parte *obiicit, neceſſe eſt vt contradictionem ei iungat*, ad quod ſubiectũ propoſitionis ſit vniuer-

Ἔνστασις δέ ἐστι πρότασις προτάσει ἐναντία. 2 Διαφέρει δὲ τῆς προτάσεως, ὅτι τὴν μὲν ἔνστασιν ἐνδέχεται εἶναι καὶ ἐπὶ μέρους· τὴν δὲ πρότασιν, ἢ ὅλως οὐκ ἐνδέχεται, ἢ οὐκ ἐν τοῖς καθόλου συλλογισμοῖς. 3 Φέρεται δὲ ἡ ἔνστασις διχῶς τε, καὶ διὰ δύο σχημάτων. διχῶς μὲν ὅτι ἢ καθόλου, ἢ ἐν μέρει, πᾶσα ἔνστασις. * διὰ δύο δὲ σχημάτων ὅτι ἀντικείμεναι φέρονται τῇ προτάσει· τὰ δὲ ἀντικείμενα, ἐν τῷ πρώτῳ καὶ ἐν τῷ τρίτῳ σχήματι περαίνονται μόνοις. 4 Ὅταν γὰρ ἀξιώσῃ παντί τι ὑπάρχειν, ἐνιστάμεθα, ἢ ὅτι οὐδενὶ, ἢ ὅτι τινὶ οὐχ ὑπάρχει. τούτων δὲ, τὸ μὲν μηδενὶ, ἐκ τοῦ πρώτου σχήματος· τὸ δὲ τινὶ μὴ, ἐκ τοῦ ἐσχάτου. οἷον, ἔστω τὸ α, μίαν εἶναι ἐπιστήμην· ἐφ' ᾧ τὸ β, ἐναντία. προτείναντος δὴ μίαν εἶναι τῶν ἐναντίων ἐπιστήμην· ἢ ὅτι ὅλως ἡ αὐτὴ τῶν ἀντικειμένων, ἐνίσταται· τὰ δὲ ἐναντία, ἀντικείμενα· ὥστε * γίνεσθαι τὸ πρῶτον σχῆμα. Ἢ ὅτι τοῦ γνωστοῦ καὶ ἀγνώστου οὐ μία· τοῦτο δὲ τὸ τρίτον. κατὰ γὰρ τοῦ γ, τοῦ γνωστοῦ καὶ ἀγνώστου, τὸ μὲν ἐναντία εἶναι, ἀληθές· τὸ δὲ μίαν αὐτῶν ἐπιστήμην εἶναι, ψεῦδος. 5 Πάλιν ἐπὶ τῆς στερητικῆς προτάσεως ὡσαύτως. ἀξιοῦντος γὰρ τὸ μὴ εἶναι μίαν ἐπιστήμην τῶν ἐναντίων, ἢ ὅτι πάντων τῶν ἀντικειμένων, ἢ ὅτι τινῶν τῶν ἐναντίων ἡ αὐτὴ, λέγομεν, οἷον ὑγιεινοῦ καὶ νοσώδους. τὸ μὲν οὖν πάντων, ἐκ τοῦ πρώτου· τὸ δὲ τινῶν, ἐκ τοῦ τρίτου σχήματος. 6 Ἁπλῶς γὰρ ἐν πᾶσι καθόλου μὲν ἐνιστάμενον, ἀνάγκη πρὸς τὸ καθόλου τῶν προτεινομένων τὴν ἀντίφασιν εἰπεῖν. οἷον, εἰ μὴ τὴν αὐτὴν ἀξιοῖ τῶν ἐναντίων πάντων, εἰπόντα τῶν ἀντικειμένων μίαν. οὕτω δ' ἀνάγκη τὸ πρῶτον εἶναι σχῆμα· μέσον γὰρ γίνεται τὸ καθόλου πρὸς τὸ ἐξ ἀρχῆς. ἐν μέρει δὲ, πρὸς ὅ ἐστι καθόλου, καθ' οὗ λέγεται ἡ προτα- CAP. XXVI.

* γ. ὡς διὰ δύο δὲ σχ.

* γ. γίνεται.

σις, οἷον γνωστοῦ καὶ ἀγνώστου μὴ τὴν αὐτήν· τὰ γὰρ ἐναντία, καθόλου πρὸς ταῦτα· καὶ γίνεται τὸ τρίτον σχῆμα· μέσον γὰρ τὸ ἐν μέρει λαμβανόμενον, οἷον τὸ γνωστὸν καὶ τὸ ἄγνωστον. 7 Ἐξ ὧν γὰρ ἔστι συλλογίσασθαι τοὐναντίον, ἐκ τούτων καὶ τὰς ἐνστάσεις ἐπιχειροῦμεν λέγειν. διὸ καὶ ἐκ μόνων τῶν σχημάτων τούτων φέρομεν. ἐν μόνοις γὰρ τούτοις οἱ ἀντικείμενοι συλλογισμοί· διὰ γὰρ τοῦ μέσου οὐκ ἦν καταφατικῶς. 8 Ἔτι δέ, κἂν εἴη, λόγου δέοιτο πλείονος ἢ διὰ τοῦ μέσου σχήματος· οἷον, εἰ μὴ δοίη τὸ α τῷ β ὑπάρχειν, διὰ τὸ μὴ ἀκολουθεῖν αὐτῷ τὸ γ. Τοῦτο γὰρ δι' ἄλλων προτάσεων δῆλον. οὐ δεῖ δὲ εἰς ἄλλα * ἐκτρέπεσθαι τὴν ἔνστασιν, ἀλλ' εὐθὺς φανερὰν ἔχειν τὴν ἑτέραν πρότασιν. 9 Διὸ καὶ τὸ σημεῖον ἐκ μόνου τούτου τοῦ σχήματος οὐκ ἔστιν. 10 Ἐπισκεπτέον δὲ καὶ περὶ τῶν ἄλλων ἐνστάσεων, οἷον, περὶ τῶν ἐκ τοῦ ἐναντίου, καὶ τοῦ ὁμοίου, καὶ τοῦ κατὰ δόξαν· καὶ εἰ τὴν ἐν μέρει ἐκ τοῦ πρώτου, ἢ τὴν στερητικὴν ἐκ τοῦ μέσου δυνατὸν λαβεῖν.

* γρ. τρέπεσθαι.

A fale: veluti, noti & ignoti non eandē *eſſe ſcientiam*: contraria namque ſunt vniuerſalia ad hæc, fitque tertia figura: quippe cū medium *ſit*, quod in parte accipitur; veluti notum & ignotum. 7 Ex quibus enim licet concludere contrarium, ex his etiam obiectiones dicere conamur. idcirco ex his ſolis figuris afferimus *obiectiones*: in his enim ſolis oppoſiti ſyllogiſmi *exſtruuntur*: quandoquidem in ſecunda non licebat *concludere* affirmatiue. 8 Præterea etiamſi eſſet, *tamen* prolixiori oratione indigeret *obiectio allata* in ſecunda figura: vtputà ſi *quis* non concedat τὸ α τῷ β ineſſe: quia τὸ γ non ſit ei conſequens. Hoc enim per alias propoſitiones manifeſtum *eſt*. non oportet autem obiectionem ad alia B conuerti, ſed continuò perſpicuam habere alterā propoſitionem. 9 Ideoque ſignum ex hac ſola figura non eſt. 10 Conſiderandæ autē ſunt etiam aliæ obiectiones: veluti quæ ſumuntur ex contrario, & ſimili, & *eo quod eſt* ſecundum opinionem. itē *conſiderandum eſt*, an *obiectio* particularis ex prima *figura*, vel negatiua ex media poſſit accipi.

De enthymemate. Cap. XXVII.

1 ¶ *Protheoria. De veriſimili.* 2 *De ſigno.* 3 ¶ *Definitio enthymematis.* 4 ¶ *De figura*, 5 *prima*, 6 *tertia*, 7 *ſecunda.* 8 ¶ *Differentia ſigni & ſyllogiſmi:* 9 ¶ *De vi ſyllogiſmi, ad quem reducitur enthymema.* 10 *Concluſio.* 11 ¶ *Hypotheoria prima de differentia ſigni, & tecmerij.* 12 ¶ *Hypotheoria ſecunda de phyſiognomia & ſyllogiſmo phyſiognomico, ſeu de natura coniectanda. An ſit*, 13 *ſi in vno animalium genere ſit affectio vna*, 14 *vel plures.* 15 *Quomodo natura coniiciatur.*

CAP. XXVII. Εἰκὸς δὲ καὶ σημεῖον, οὐ ταὐτόν ἐστιν. ἀλλὰ τὸ μὲν εἰκός ἐστι C πρότασις ἔνδοξος. ὃ γὰρ ὡς ἐπὶ τὸ πολὺ ἴσασιν οὕτω γινόμενον, ἢ μὴ γινόμενον, ἢ ὄν, ἢ μὴ ὄν· τοῦτό ἐστιν εἰκός· οἷον, τὸ μισεῖν τοὺς φθονοῦντας, ἢ τὸ φιλεῖν τοὺς ἐρωμένους. 2 Σημεῖον δὲ βούλεται εἶναι πρότασις ἀποδεικτικὴ ἢ ἀναγκαία, ἢ ἔνδοξος. οὗ γὰρ ὄντος ἔστιν, ἢ οὗ γενομένου, πρότερον ἢ ὕστερον γέγονε τὸ πρᾶγμα· τοῦτο σημεῖόν ἐστι τοῦ γεγονέναι, ἢ εἶναι. 3 Ἐνθύμημα μὲν οὖν ἐστι συλλογισμὸς ἐξ εἰκότων, ἢ σημείων. 4 λαμβάνεται δὲ τὸ σημεῖον τριχῶς, ὁσαχῶς καὶ τὸ μέσον ἐν τοῖς σχήμασιν. ἢ γὰρ ὡς ἐν τῷ πρώτῳ, ἢ ὡς ἐν τῷ μέσῳ, ἢ ὡς ἐν τῷ τρίτῳ. 5 Οἷον, τὸ μὲν δεῖξαι κύουσαν, διὰ τὸ γάλα ἔχειν, D ἐκ τοῦ πρώτου σχήματος· μέσον γὰρ, τὸ γάλα ἔχειν. ἐφ' ᾧ τὸ α, τὸ κύειν· τὸ β, τὸ γάλα ἔχειν· γυνὴ δέ, ἐφ' ᾧ τὸ γ. 6 Τὸ δ', ὅτι οἱ σοφοί, σπουδαῖοι· Πιττακὸς γὰρ, σπουδαῖος· διὰ τοῦ ἐσχάτου. ἐφ' ᾧ τὸ α, σπουδαῖον· ἐφ' ᾧ τὸ β, οἱ σοφοί. ἐφ' ᾧ τὸ γ, Πιττακός. ἀληθὲς δὴ καὶ τὸ α καὶ τὸ β τοῦ γ κατηγορῆσαι. πλὴν τὸ μὲν, οὐ λέγουσι, διὰ τὸ εἰδέναι· τὸ δέ, λαμβάνουσι. 7 Τὸ δὲ κύειν, ὅτι ὠχρά, διὰ τοῦ μέσου σχήματος βούλεται εἶναι. ἐπεὶ γὰρ ἕπεται ταῖς κυούσαις τὸ ὠχρόν, ἀκολουθεῖ δὲ καὶ ταύτῃ, δεδεῖχθαι οἴονται ὅτι κύει. ὠχρόν, ἐφ' οὗ τὸ α· ἐφ' οὗ τὸ β, κύειν· γυνή, ἐφ' οὗ τὸ γ. 8 Ἐὰν μὲν οὖν ἡ μία λεχθῇ πρότασις, σημεῖον γίνεται μόνον. ἐὰν δὲ καὶ ἡ ἑτέρα E προσληφθῇ, συλλογισμός. οἷον, ὅτι ὁ Πιττακὸς, ἐλευθέριος· οἱ γὰρ φιλότιμοι, ἐλευθέριοι· Πιττακὸς δέ, φιλότιμος. ἢ πάλιν ὅτι οἱ σοφοί, ἀγαθοί· Πιττακὸς γὰρ, ἀγαθός, ἀλλὰ καὶ σοφός. οὕτω μὲν οὖν γίνονται οἱ συλλογισμοί. 9 Πλὴν ὁ μὲν διὰ τοῦ πρώτου σχήματος, ἄλυτος, ἂν ἀληθὴς ᾖ· καθόλου γάρ ἐστιν. Ὁ δὲ διὰ τοῦ ἐσχάτου, λύσιμος, κἂν ἀληθὲς ᾖ τὸ συμπέρασμα, διὰ τὸ μὴ εἶναι καθόλου, μηδὲ πρὸς τὸ πρᾶγμα, τὸν συλλογισμόν. οὐ γάρ, εἰ Πιττακὸς σπουδαῖος, ἀνάγκη

Veriſimile autem & ſignum non ſunt idem. ſed veriſimile eſt propoſitio probabilis. quod enim plerumque ſciunt ita fieri, vel non fieri, aut eſſe, aut non eſſe: hoc eſt veriſimile; vt inuidentes odiſſe, aut amantes diligere. 2 Signum autem nihil aliud eſſe videtur, quàm propoſitio demonſtratiua, aut neceſſaria, aut probabilis. nam quo exſtante *res* exſtat, vel quo facto, priùs aut poſteriùs res facta eſt: hoc eſt ſignum *indicans rem* factam eſſe aut exſtare. 3 Enthymema igitur eſt ſyllogiſmus ex veriſimilibus, vel ſignis. 4 Accipitur autem ſignum tribus modis, quot & medium in figuris. vel enim vt in prima *figura*, vel vt in ſecunda, vel vt in tertia. 5 Vtputà probare *mulierem* vterum ferre quia lac habet, ex prima figura *eſt*: medium enim *eſt*, habere lac. *eſto*, vbi α, vterum ferre: τὸ β, habere lac: mulier autem, vbi γ. 6 At ſapientes eſſe *viros* probos, quia Pittacus *ſit* probus, per vltimam *figuram concluditur. ſit*, vbi α, probum: vbi β, ſapientes: vbi γ, Pittacus. verum *eſt* igitur, & τὸ α & τὸ β τῷ γ attribuere: ſed alterum non dicunt, quia norunt: alterum accipiunt. 7 *Mulierem* autē vterum geſtare quia *ſit* pallida, ad mediam figuram referri debet. Cùm enim vterum geſtantibus conſequens ſit pallor, & huic quoque conſequens ſit: probatum eſſe putant *eam* vterum geſtare. eſto pallidum, vbi α: geſtare vterum, vbi β: mulier, vbi γ. 8 Si igitur vna propoſitio dicta fuerit, fit tantùm ſignū. quòd ſi & altera ſit aſſumpta, *fit* ſyllogiſmus. Vtputà, Pittacū *eſſe* liberalem: quoniam ambitioſi *ſunt* liberales, Pittacus autem *eſt* ambitioſus. Rurſus, ſapientes *eſſe viros* bonos: quia Pittacus *eſt vir* bonus, ſed & ſapiens. Sic igitur fiunt ſyllogiſmi. 9 Verùm qui *fit* in prima figura, *eſt* inſolubilis, ſi verus ſit: vniuerſalis enim eſt. Qui verò *fit* in poſtrema, ſolui poteſt, etiamſi concluſio vera ſit: quia ſyllogiſmus non eſt vniuerſalis, nec ad rem. non enim ſi Pittacus *eſt vir* probus, neceſſe

eſt propterea etiam alios ſapientes *eſſe probos*. Qui A verò *fit* in media figura, ſemper & omnino ſolui poteſt: numquam enim fit ſyllogiſmus, cùm termini ita *ſe* habent. non enim, ſi vterum ferens *eſt* pallida, atque hæc *eſt* pallida, *continuò* neceſſe *eſt* hanc vterum ferre. 10 Verum igitur inerit in omnibus figuris: ſed habent *eas* differentias quæ dictæ ſunt. 11 Aut igitur ſic diuidendum *eſt* ſignum: ex his autem tecmerium, *ſiue indicium*, accipi debet, *quod eſt* medium: indicium enim aiunt eſſe, quod ſcire facit: medium verò maximè tale eſt. aut quæ ex extremis *ſumuntur*, ſigna vocari debent: quòd verò ex medio, indicium: nam maximè probabile & maximè verum *eſt*, quod per primam figuram *probat*. 12 Natura autem conijci poteſt, B ſi quis concedat naturales affectiones ſimul immutare corpus & animam: (fortaſſe enim qui muſicam didicit, mutatus eſt animo: at ex iis quæ naturâ nobis *inſunt*, non eſt hæc affectio: ſed *aliæ potiùs*, vt iræ, & cupiditates, *quæ* in naturalibus motionibus numerantur) ſi igitur hoc cōceſſum fuerit, & vnum vnius *affectionis* ſignum eſſe, & accipere poſſimus propriam cuiuſque generis affectionem & ſignum: *certè* poterimus naturā conijcere. Nam ſi alicui generi indiuiduo ineſt propria affectio, vt leonibus fortitudo: neceſſe *eſt* eſſe etiā aliquod ſignum: (inuicē enim compati, ſuppoſitum eſt) atque hoc eſto magnas extremitates habere: quod contingit aliis quoque generibus non totis C ineſſe. ſignum enim ita proprium eſt, quoniam affectio eſt propria totius generis, nō propria ſolius, quemadmodum loqui ſoliti ſumus. Idem igitur inerit etiam in alio genere: & homo erit fortis, & aliud quodpiam animal. habebit igitur illud ſignum, quoniam vnum erat vnius *affectionis ſignum*. 13 Si igitur hæc ſunt, & poterimus huiuſmodi ſigna colligere in his animalibus, quæ vnam tantū affectionē propriam habent, (vnaquæque autem *affectio ſuum* habet ſignum, quandoquidem vnum *ſignum* habere neceſſe *eſt*) poterimus naturam coniectare. 14 Sin totū genus duas habeat proprietates, vt leo fortitudinem & liberalitatem: quomodo cognoſcemus, vtrum ex ſignis illis pro- D priè conſequentibus ſit vtrius *affectionis* ſignum? An ſi cuidam alij non toti ambo *inſint*, & in quibus non totis vtrumque *ineſt*, cùm vnum habet, alterum non *item*? nam ſi eſt fortis non liberalis, habet autem hoc ex duobus *ſignis*: apparet, etiam in leone hoc *eſſe* ſignum fortitudinis. 15 Eſt autem naturæ coniectio in prima figura, eò quòd medium reciprocatur cum primo extremo, & ſuperat tertium, neque *cum eo* reciprocatur: Vtpută *eſto* fortitudo, τὸ α: magnæ extremitates, vbi τὸ β: τὸ γ autem, leo. Igitur cui τὸ γ *ineſt*, ei τὸ β omni, ſed & aliis *ineſt*. cui autem *ineſt* τὸ β, *ei τὸ α ineſt* omni, nec pluribus, ſed conuertitur: alioquin non erit vnum vnius *affectionis* ſignum.

A διὰ τοῦτο καὶ τοὺς ἄλλους σοφούς. Ὁ δὲ διὰ τοῦ μέσου σχήματος, ἀεὶ καὶ πάντως λύσιμος. οὐδέποτε γὰρ γίνεται συλλογισμὸς, οὕτως ἐχόντων τῶν ὅρων. οὐ γὰρ, εἰ ἡ κύουσα, ὠχρά, ὠχρὰ δὲ καὶ ἥδε, κύειν ἀνάγκη ταύτην. 10 Ἀληθὲς μὲν οὖν ἐν ἅπασιν ὑπάρξει τοῖς σχήμασι· διαφορὰς δὲ ἔχουσι τὰς εἰρημένας. 11 Ἢ δὴ οὕτω διαιρετέον τὸ σημεῖον· τούτων δὲ, τὸ μέσον, τεκμήριον ληπτέον· τὸ γὰρ τεκμήριον, τὸ εἰδέναι ποιοῦν φασιν εἶναι· τοιοῦτον δὲ μάλιστα, τὸ μέσον, ἢ τὰ μὲν ἐκ τῶν ἄκρων, * σημεῖα λεκτέον· τὸ δὲ ἐκ τοῦ μέσου, * γρ. σημεῖον. τεκμήριον· ἐνδοξότατον γὰρ, καὶ μάλιστα ἀληθὲς, τὸ διὰ τοῦ πρώτου σχήματος. 12 Τὸ δὲ φυσιογνωμονεῖν, δυνα- CAP. XXVIII. B τόν ἐστιν, εἴ τις δίδωσιν, ἅμα μεταβάλλειν τὸ σῶμα καὶ τὴν ψυχὴν, ὅσα ἐστὶ φυσικὰ παθήματα (μαθὼν γὰρ ἴσως τις μουσικὴν, μεταβέβληκέ τι τὴν ψυχήν. ἀλλ' οὐ τῶν φύσει ἡμῖν ἐστι τοῦτο τὸ πάθος· ἀλλ' οἷον ὀργαὶ, καὶ ἐπιθυμίαι, τῶν φύσει κινήσεων) εἰ δὴ τοῦτό τε δοθείη, καὶ ἓν ἑνὸς σημεῖον εἶναι, καὶ λαμβάνειν δυναίμεθα τὸ ἴδιον ἑκάστου γένους πάθος καὶ σημεῖον, δυνησόμεθα φυσιογνωμονεῖν. εἰ γάρ ἐστιν ἰδίᾳ τινὶ γένει ὑπάρχον ἀτόμῳ πάθος, οἷον τοῖς λέουσιν ἀνδρεία, ἀνάγκη καὶ σημεῖον εἶναί τι. (συμπάσχειν γὰρ ἀλλήλοις ὑπόκειται) καὶ ἔστω τοῦτο, τὸ μεγάλα τὰ ἀκρωτήρια ἔχειν· ὃ καὶ ἄλλοις ὑπάρχει γένεσι μὴ ὅλοις ἐνδέχεται. τὸ γὰρ σημεῖον, οὕτως ἴδιόν ἐστιν, ὅτι ὅλου γένους ἴδιόν ἐστι τὸ πά- C θος, καὶ οὐ μόνου ἴδιον, ὥσπερ εἰώθαμεν λέγειν. ὑπάρξει δὴ καὶ ἐν ἄλλῳ γένει * ταυτό· καὶ ἔσται ἀνδρεῖος ὁ ἄν- * γρ. ταῦτ. θρωπος, καὶ ἄλλο τι ζῶον. ἕξει ἄρα τὸ σημεῖον· ἓν γὰρ ἑνὸς ἦν. 13 Εἰ τοίνυν ταῦτά ἐστι, καὶ δυνησόμεθα τοιαῦτα σημεῖα συλλέξαι ἐπὶ τούτων τῶν ζῴων, ἃ μόνον ἓν πάθος ἔχει τι ἴδιον (ἕκαστον δὲ ἔχει σημεῖον· ἐπείπερ ἓν ἔχειν ἀνάγκη) δυνησόμεθα φυσιογνωμονεῖν. 14 Εἰ δὲ δύο ἔχει ἴδια ὅλον τὸ γένος, οἷον, ὁ λέων, ἀνδρεῖον, καὶ μεταδοτικὸν· πῶς γνωσόμεθα πότερον ποτέρου σημεῖον, τῶν ἰδίᾳ ἀκολουθούντων σημείων; ἢ εἰ ἄλλῳ τινὶ μὴ ὅλῳ ἄμφω, καὶ ἐν οἷς μὴ ὅλοις ἑκάτερον, ὅταν τὸ μὲν, ἔχῃ, τὸ δὲ, μή; εἰ D γὰρ ἀνδρεῖος μὲν, ἐλευθέριος δὲ μή, ἔχει δὲ τῶν δύο τοδί· δῆλον ὅτι καὶ ἐπὶ τοῦ λέοντος τοῦτο σημεῖον τῆς ἀνδρείας. 15 * Ἔστι δὲ τὸ φυσιογνωμονεῖν, ἐν τῷ πρώτῳ σχήματι * γρ. ἐπὶ δὲ. τῷ τὸ μέσον τῷ μὲν πρώτῳ ἄκρῳ ἀντιστρέφειν, τοῦ δὲ τρίτου ὑπερτείνειν, καὶ μὴ ἀντιστρέφειν. οἷον, ἀνδρεία, τὸ α· τὰ ἀκρωτήρια μεγάλα, ἐφ' οὗ β· τὸ δὲ γ, λέων. ᾧ δὴ τὸ γ, * τὸ β παντὶ, ἀλλὰ καὶ ἄλλοις. ᾧ δὲ τὸ β, τὸ α παν- * γρ. τῷ β παντί. τὶ, καὶ οὐ πλείοσιν, ἀλλ' ἀντιστρέφει. εἰ δὲ μὴ, οὐκ ἔσται perperam. ἓν ἑνὸς σημεῖον.

* γρ. ὁ δεύτερος ἀποδεικτικῆς ᾗ περὶ.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΑΝΑΛΥΤΙΚΩΝ ΥΣΤΕΡΩΝ* τὸ πρῶτον.

ARISTOTELIS ANALYTICORVM POSTERIORVM.

LIBER I.

AN SIT SCIENTIA DEMONSTRATIVA.

TRACTATVS I.

Cap. I.

1 Axioma. 2 Probatio prima per inductionem. 3 Probatio altera à ſimili. 4 Interpretatio prima, antecedentis cognitionis, id eſt, de prænotionibus quòd ſit, & quid ſignificet. 5 Interpretatio altera id eſt, de prænotione acquiſita per antecedentem cognitionem, vel ſine antecedente cognitione. 6 An concluſio cognoſcatur ante quàm probetur. 7 Solutio dubitationis quæ eſt apud Platonem in Menone. 8 Altera dubitatio, & praua eius ſolutio, atque eius ſolutionis refutatio. 9 Vera ſolutio.

CAP. I.

ΠΑΣΑ διδασκαλία καὶ πᾶσα μάθησις διανοητικὴ, ἐκ προϋπαρχούσης γίνεται γνώσεως. 2 Φανερὸν δὲ τοῦτο θεωροῦσιν ἐπὶ πασῶν. αἵ τε γὰρ μαθηματικαὶ τῶν ἐπιστημῶν, διὰ τούτου τοῦ τρόπου* παραγίνονται, καὶ τῶν ἄλλων ἑκάστη τεχνῶν. 3 Ὁμοίως δὲ καὶ περὶ τοὺς λόγους, οἵ τε διὰ συλλογισμῶν, καὶ οἱ δι' ἐπαγωγῆς· ἀμφότεροι γὰρ διὰ προγινωσκομένων ποιοῦνται τὴν διδασκαλίαν· οἱ μὲν, λαμβάνοντες ὡς παρὰ ξυνιέντων· οἱ δὲ, δεικνύντες τὸ καθόλου, διὰ τοῦ δῆλον εἶναι τὸ καθ' ἕκαστον. Ὡσαύτως καὶ οἱ ῥητορικοὶ συμπείθουσιν· ἢ γὰρ διὰ παραδειγμάτων, ὅ ἐστιν ἐπαγωγὴ· ἢ δι' ἐνθυμημάτων, ὅπερ ἐστὶ συλλογισμός. 4 Διχῶς δ' ἀναγκαῖον προγινώσκειν· τὰ μὲν γὰρ, ὅτι ἐστὶ, προϋπολαμβάνειν ἀναγκαῖον· τὰ δὲ, τί τὸ λεγόμενόν ἐστι, ξυνιέναι δεῖ· τὰ δ', ἄμφω. οἷον, ὅτι μὲν ἅπαν ἢ φῆσαι ἢ ἀποφῆσαι ἀληθὲς, ὅτι ἐστί· τὸ δὲ τρίγωνον, ὅτι τοδὶ σημαίνει· τὴν δὲ μονάδα, ἄμφω, καὶ τί σημαίνει, καὶ ὅτι ἔστιν. οὐ γὰρ ὁμοίως τούτων ἕκαστον δῆλον ἡμῖν. 5 Ἔστι δὲ γνωρίζειν, τὰ μὲν πρότερον γνωρίζοντα, τῶν δὲ καὶ ἅμα λαμβάνοντα τὴν γνῶσιν, οἷον ὅσα τυγχάνει ὄντα* ὑπὸ τὸ καθόλου, ὧν ἔχει τὴν γνῶσιν. ὅτι μὲν γὰρ πᾶν τρίγωνον ἔχει δυσὶν ὀρθαῖς ἴσας, προῄδει. ὅτι δὲ τόδε τὸ ἐν τῷ ἡμικυκλίῳ, τρίγωνόν ἐστιν, ἅμα ἐπαγόμενος ἐγνώρισεν. ἐνίων γὰρ τοῦτον τὸν τρόπον ἡ μάθησίς ἐστι, καὶ οὐ διὰ τοῦ μέσου τὸ ἔσχατον γνωρίζεται,* ὅσα ἤδη τῶν καθ' ἕκαστα τυγχάνει ὄντα, καὶ μὴ καθ' ὑποκειμένου τινός. 6 Πρὶν δ' ἐπαχθῆναι ἢ λαβεῖν συλλογισμὸν, τρόπον μέν τινα ἴσως φατέον ἐπίστασθαι· τρόπον δ' ἄλλον, οὔ. ὃ γὰρ μὴ ᾔδει εἰ ἔστιν ἁπλῶς, τοῦτο πῶς εἰδείη,* ὅτι δυσὶν ὀρθαῖς ἴσας ἔχει, ἁπλῶς; ἀλλὰ δῆλον ὡς ὡδὶ μὲν ἐπίσταται, ὅτι καθόλου ἐπίσταται, ἁπλῶς δ' οὐκ ἐπίσταται. 7 Εἰ δὲ μὴ, τὸ ἐν τῷ Μένωνι ἀπόρημα συμβήσεται· ἢ γὰρ οὐδὲν μαθήσεται, ἢ ἃ οἶδεν. 8 Οὐ γὰρ δὴ, ὥς γέ τινες ἐγχειροῦσι λύειν, λεκτέον. Ἆρ' οἶδας ἅπασαν δυάδα ὅτι ἀρτία, ἢ οὔ; φήσαντος δὲ,* προήνεγκάν τινα δυάδα ἣν οὐκ ᾤετο εἶναι, ὥστ' οὐδ' ἀρτίαν. λύουσι γὰρ, οὐ φάσκοντες

* γρ. περαίνονται sic Philoponus leg. videtur, quod interpretatur περαίνονται & καθορθοῦνται. Themiſtius περαίνονται, qui explicat περαιτοῦνται. Quidam legunt ἃ οἱ περὶ τ.

* Scrib. ὑπὸ τὸ καθόλου ὧν ἔ. ſic legit Boëthus, & vt videtur, Philoponus: vel lege, ὑπὸ τὸ καθόλου, οὗ ἔχει τὴν γνῶσιν. aut ὑπὸ τ. vt apud Themiſtium.

* γρ. ὅσα ἤδη τῶν καθ'.

* γρ. ὅτι δύο ὀρθαῖς ἴσας.

* γρ. προτείνουσι.

A OMNIS doctrina & omnis diſciplina dianoëtica fit ex antecedente cognitione. 2 Hoc autē perſpicuum *erit*, ſi omnes conſiderentur. nam & mathematicæ ſcientiæ hoc modo comparantur, & ceterarum artium vnaquæque. 3 Similiter autem *ſe res habet* & in rationibus, tam quæ ſyllogiſmis *fiunt*, quàm quæ inductione: ambæ námque ex præcognitis docent, illæ quidem accipientes quaſi ab intelligentibus, hæ verò probantes vniuerſale ex eo quòd particulare eſt manifeſtum. Eodem modo etiam oratoriæ *rationes* perſuadent. aut enim *perſuadent* B exemplis, quæ ſunt inductiones: aut enthymematibus, quæ ſunt ſyllogiſmi. 4 Dupliciter autem neceſſe *eſt* prænoſcere. nam aliàs quòd ſit, præſumere neceſſe *eſt*: aliàs quid ſit quod dicitur, intelligere oportet: aliàs vtrumque. Vtputà *illud*, verè quodvis aut affirmari aut negari, quòd ſit, *præſumi debet*: trianguli verò hanc eſſe ſignificationē: vnitatem autem vtroque modo *prænoſcere oportet, id eſt*, & quid ſignificet, & quòd ſit: quia non ſimiliter horum vnumquodque *eſt* nobis manifeſtum? 5 Licet autem vt *quis* notum faciat, quædam priùs notificans, quorūdam autem ſimul accipiens cognitionem, *vt eorum* quæ continentur ſub vniuerſalibus, quorū habet cognitionem. Nam omnem C triangulum habere *angulos* æquales duobus rectis, prænouit: hunc verò qui *eſt* in ſemicirculo, eſſe triangulum, ſimul ac induxit, notum fecit. quædam enim hoc modo diſcuntur, neque extremum per medium notificatur, *nempe* quæcumque ſingularia ſunt, nec de vllo ſubiecto *dicuntur*. 6 At priùs quàm induxerit aut acceperit ſyllogiſmum, aliquo modo fortaſſe fatendum eſt *eum* ſcire, alio modo non *item*. quod enim ſimpliciter neſciebat an eſſet, quomodo *illud* habere *tres angulos* æquales duobus rectis, ſimpliciter ſciret? Sed manifeſtum *eſt, eum* ita ſcire *quia* vniuerſale ſcit, ſimpliciter autem neſcire. 7 Sin minùs, ea dubitatio accidet, quæ *eſt in* Menone: quoniam aut nihil diſcet, aut quæ nouit. 8 Non enim *ita* dicendum *eſt*, vt quidā ſoluere conantur. Sciſne omnē *numerum* binarium eſſe parē, an neſcis? *illo* autem *ſe ſcire* dicente, proferebant binarium quēdam, quem *ille* non putabat eſſe, proinde nec *putabat eſſe* parē. ſoluunt enim dicētes

non omnem binarium *ſe* ſcire parem eſſe, ſed *eum* A quem ſciunt eſſe binarium. Atqui ſciunt *id* cuius demonſtrationem habent, & cuius *demonſtrationem* acceperunt: acceperunt autem, non omnis quem ſcirent eſſe triangulum, aut numerum; ſed ſimpliciter de omni numero, aut triangulo. nulla enim propoſitio accipitur talis, Quem tu ſcis eſſe numerum: aut, Quod tu ſcis eſſe rectilineum: ſed de omni. 9 Verùm nihil (puto) prohibet, quod quis diſcit, *eum* aliquo modo ignorare: non enim abſurdum *eſt*, ſi quodammodo nouit quod diſcit: ſed ſi ita *nouit*, veluti qui diſcit, & quomodo *diſcit*.

πᾶσαν εἰδέναι δυάδα ἀρτίαν * οὖσαν, ἀλλ' ἣν ἴσασιν ὅτι δυάς. καίτοι ἴσασι μὲν, οὗ περ τὴν ἀπόδειξιν ἔχουσι, καὶ οὗ ἔλαβον· ἔλαβον δ' οὐχὶ παντὸς οὗ ἂν εἰδῶσιν ὅτι τρίγωνον, ἢ ὅτι ἀριθμός· ἀλλ' ἁπλῶς κατὰ παντὸς ἀριθμοῦ, καὶ τριγώνου. οὐδεμία γὰρ πρότασις λαμβάνεται τοιαύτη, ὅτι ὃν σὺ οἶδας ἀριθμόν, ἢ ὃ σὺ οἶδας εὐθύγραμμον, ἀλλὰ κατὰ παντός. 9 Ἀλλ' οὐδὲν (οἶμαι) κωλύει, ὃ μανθάνει τις, ἔστιν ὡς ἐπίστασθαι, ἔστι δ' ὡς ἀγνοεῖν. * οὐκ ἄτοπον γὰρ, εἰ οἶδέ πως ὃ μανθάνει· ἀλλ' εἰ ὡδὶ, οἷον ᾗ μανθάνει, καὶ ὥς. * χ. ὄν. * χ. ἀγνοεῖν. ἄτοπον γὰρ, οὐκ εἰ οἶδέ πως ὃ μανθάνει.

DE HIS QVÆ PERTINENT AD ESSENTIAM DEMONSTRATIONIS.

TRACTATVS II.

Quid ſit ſcire, item quid ſit demonſtratio, & ex quibus conſtet. Cap. II.

1 ¶ De ſcientia ſeu Scire. Definitio. 2 Definitionis confirmatio. 3 Corollarium. 4 An ſit alius ſciendi modus, & quomodo in præſentia Scire accipiatur. 5 ¶ De demonſtratione. Definitio. 6 Cuiuſmodi ſint principia demonſtrationis, 7 per quæ diſtinguitur ab aliis ſyllogiſmis. 8 Quòd principia demonſtratiua ſint vera. 9 Quòd ſint prima indemonſtrabilia. 10 Quòd ſint cauſæ, & priora concluſione. 11 Priora & notiora quot modis dicantur. 12 Quæ ſint priora. 13 Quid ſit principium demonſtrationis. 14 Principij diuiſio in theſim & axioma. 15 Theſis ſubdiuiſio in hypotheſim & definitionem. 16 Quòd principia demonſtrationis ſint notiora concluſione. 17 Corollarium. 18 De cognitione eorum quæ principiis demonſtrationis opponuntur.

SCire autem putamus vnamquamque rem ſimpliciter, B non ſophiſtico modo, id eſt ex accidenti, cùm putamus cauſam cognoſcere, propter quam res eſt, eius rei cauſam eſſe, nec poſſe eam aliter *ſe* habere. 2 Conſtat igitur tale quidpiam eſſe ipſum Scire. nã & qui neſciunt & qui ſciunt: illi quidem putãt *ſe* ita habere: hi verò qui ſciunt, etiam habent. 3 Quapropter id cuius ſimpliciter eſt ſcientia, non poteſt aliter *ſe* habere. 4 An igitur ſit etiam alius ſciendi modus, poſtea dicemus: ſed *ſcire* dicimus etiam, per demõſtrationem cognoſcere. 5 Demonſtrationem autem voco ſyllogiſmum ſcientialem. ſcientialem appello, ſecundum quem, eò quòd ipſum habemus, ſcimus. C 6 Si igitur ſcire eſt, vt poſuimus: neceſſe *eſt*, etiam demonſtratiuam ſcientiam ex veris eſſe, & primis & immediatis, & notioribus, & prioribus, & cauſis concluſionis. Sic enim erunt etiam principia propria eius quod demonſtratur. 7 Nam ſyllogiſmus quidẽ erit etiam ſine his: demonſtratio verò non erit, quia non efficiet ſcientiam. 8 Vera igitur eſſe oportet: quia quod non eſt, ſciri nequit: veluti diametrum habere communem *cum latere* menſuram. 9 Ex primis autem indemonſtrabilibus: nam *alioqui* neſciret, non habens eorum demonſtrationem: quia ſcire *ea* quorum eſt demonſtratio, non ex accidente, *nihil aliud* eſt *quàm* habe- D re demonſtrationem. 10 Cauſas verò, & notiora eſſe oportet, & priora. Cauſas quidẽ: quia tunc ſcimus, cùm cauſam cognoſcimus. & priora, quia *ſunt* cauſæ. & præcognita non ſolùm altero modo, quia intelligatur *quid ſignificent*, ſed etiam quia cognoſcatur *ea vera* eſſe. 11 Priora autem & notiora ſunt duobus modis. non enim idẽ eſt prius natura & prius quod ad nos, neque notius *natura* & notius nobis. Quod ad nos priora & notiora appello *ea*, quæ *ſunt* propinquiora ſenſui: ſimpliciter autem priora & notiora, quæ longiùs *abſunt*. ac longiùs quidẽ *abſunt*, *quæ ſunt* maximè vniuerſalia:

CAP. II.

ΕΠίστασθαι δὲ οἰόμεθα ἕκαστον ἁπλῶς, ἀλλὰ μὴ τὸν σοφιστικὸν τρόπον, τὸν κατὰ συμβεβηκός, ὅταν τήν τ' αἰτίαν οἰώμεθα γινώσκειν, δι' ἣν τὸ πρᾶγμά ἐστιν, ὅτι ἐκείνου αἰτία ἐστὶ, καὶ μὴ * ἐνδέχεται τοῦτ' ἄλλως ἔχειν. 2 Δῆλον τοίνυν ὅτι τοιοῦτόν τι τὸ ἐπίστασθαί ἐστι. καὶ γὰρ καὶ οἱ μὴ ἐπιστάμενοι, καὶ οἱ ἐπιστάμενοι· οἱ μὲν, οἴονται * αὐτὸ οὕτως ἔχειν· οἱ δὲ ἐπιστάμενοι, καὶ ἔχουσιν. 3 Ὥστε οὗ ἁπλῶς ἐστὶν ἐπιστήμη, τοῦτ' ἀδύνατον ἄλλως ἔχειν. 4 Εἰ μὲν οὖν καὶ ἕτερος ἐστι τοῦ ἐπίστασθαι τρόπος, ὕστερον ἐροῦμεν· φαμὲν δὲ καὶ δι' ἀποδείξεως εἰδέναι. 5 Ἀπόδειξιν δὲ λέγω συλλογισμὸν ἐπιστημονικόν. ἐπιστημονικὸν δὲ λέγω, καθ' ὃν, τῷ ἔχειν αὐτὸν, ἐπιστάμεθα. 6 Εἰ τοίνυν ἐστὶ τὸ ἐπίστασθαι, οἷον ἔθεμεν· ἀνάγκη καὶ τὴν ἀποδεικτικὴν ἐπιστήμην, ἐξ ἀληθῶν τ' εἶναι, καὶ πρώτων καὶ ἀμέσων, καὶ γνωριμωτέρων, καὶ προτέρων, καὶ αἰτίων τοῦ συμπεράσματος. οὕτως γὰρ ἔσονται καὶ αἱ ἀρχαὶ οἰκεῖαι τοῦ δεικνυμένου. 7 Συλλογισμὸς μὲν γὰρ ἔσται καὶ ἄνευ τούτων· ἀπόδειξις δὲ οὐκ ἔσται· οὐ γὰρ ποιήσει ἐπιστήμην. 8 Ἀληθῆ μὲν οὖν δεῖ εἶναι, ὅτι * οὐκ ἔστι τὸ μὴ ὂν ἐπίστασθαι· οἷον, ὅτι ἡ διάμετρος, σύμμετρος. 9 Ἐκ πρώτων δ' ἀναποδείκτων, ὅτι οὐκ * ἐπιστήσεται μὴ ἔχων ἀπόδειξιν αὐτῶν. τὸ γὰρ ἐπίστασθαι ὧν ἀπόδειξίς ἐστι, μὴ κατὰ συμβεβηκός, τὸ ἔχειν ἀπόδειξίν ἐστιν. 10 Αἴτιά τε, καὶ γνωριμώτερα δεῖ εἶναι, καὶ πρότερα. αἴτια μὲν, ὅτι τότε ἐπιστάμεθα, ὅταν τὴν αἰτίαν εἰδῶμεν. καὶ πρότερα, εἴπερ αἴτια. καὶ προγινωσκόμενα οὐ μόνον τὸν ἕτερον τρόπον τῷ ξυνιέναι, ἀλλὰ καὶ τῷ εἰδέναι ὅτι ἐστί. 11 Πρότερα δ' ἐστὶ καὶ γνωριμώτερα διχῶς. οὐ γὰρ ταὐτὸν, πρότερον τῇ φύσει, καὶ πρὸς ἡμᾶς πρότερον· οὐδὲ γνωριμώτερον, καὶ ἡμῖν γνωριμώτερον. λέγω δὲ πρὸς ἡμᾶς μὲν πρότερα καὶ γνωριμώτερα, τὰ ἐγγύτερον τῆς αἰσθήσεως· ἁπλῶς δὲ πρότερα καὶ γνωριμώτερα, τὰ πορρώτερον. ἔστι δὲ πορρωτάτω μὲν, τὰ καθόλου μάλιστα·

* χ. ἐνδέχεσθαι.
* χ. αὐτοί.
* χ. ἐκεῖ ἔσται.
* χ. ἐπίσταται.

ἐγγυτέρω δὲ, τὰ καθ' ἕκαστα· καὶ ἀντίκειται ταῦτ' ἀλλήλοις. 12 Ἐκ πρώτων δ' ἐστὶ τὸ ἐξ ἀρχῶν οἰκείων. ταὐτὸ γὰρ λέγω πρῶτον καὶ ἀρχήν. 13 Ἀρχὴ δ' ἐστὶν ἀποδείξεως, πρότασις ἄμεσος· ἄμεσος δὲ, ἧς μὴ ἔστιν ἄλλη προτέρα. Πρότασις δ' ἐστὶν, ἀποφάνσεως τὸ ἕτερον μόριον, ἓν καθ' ἑνός· διαλεκτικὴ μὲν, ἡ ὁμοίως λαμβάνουσα ὁποτερονοῦν· ἀποδεικτικὴ δὲ, ἡ ὡρισμένως θάτερον, ὅτι ἀληθές. Ἀπόφανσις δὲ, ἀντιφάσεως ὁποτερονοῦν μόριον. Ἀντίφασις δὲ, ἀντίθεσις, ἧς οὐκ ἔστι μεταξὺ καθ' αὑτήν. μόριον δ' ἀντιφάσεως, τὸ μὲν τὶ κατὰ τινὸς, ἐστὶ κατάφασις· τὸ δὲ τὶ ἀπὸ τινὸς, ἀπόφασις. 14 Ἀμέσου δ' ἀρχῆς συλλογιστικῆς, θέσιν μὲν λέγω, ἣν μὴ ἔστι δεῖξαι, μηδ' ἀνάγκη ἔχειν τὸν μαθησόμενόν τι. ἣν δ' ἀνάγκη ἔχειν τὸν ὁτιοῦν μαθησόμενον, ἀξίωμα. ἔστι γὰρ ἔνια τοιαῦτα· * τοῦτο γὰρ μάλιστ' ἐπὶ τοῖς τοιούτοις εἰώθαμεν λέγειν ὄνομα. 15 Θέσεως δ', ἡ μὲν ὁποτερονοῦν τῶν μορίων τῆς ἀποφάνσεως λαμβάνουσα, (οἷον λέγω, τὸ εἶναί τι ἢ μὴ εἶναί τι) ὑπόθεσις· ἡ δ' ἄνευ τούτου, ὁρισμός. ὁ γὰρ ὁρισμὸς, θέσις μὲν ἐστί· τίθεται γὰρ ὁ ἀριθμητικὸς μονάδα τὸ ἀδιαίρετον εἶναι κατὰ τὸ ποσόν· ὑπόθεσις δ' οὐκ ἔστι· τὸ γὰρ τί ἐστι μονὰς, καὶ τὸ εἶναι μονάδα, οὐ ταὐτόν. 16 Ἐπεὶ δὲ δεῖ πιστεύειν τε καὶ εἰδέναι τὸ πρᾶγμα, τῷ τοιοῦτον ἔχειν συλλογισμὸν, ὃν καλοῦμεν ἀπόδειξιν, ἔστι δ' οὗτος τῷ ταδὶ εἶναι ἐξ ὧν ὁ συλλογισμός· ἀνάγκη μὴ μόνον προγινώσκειν τὰ πρῶτα, ἢ πάντα, ἢ ἔνια, ἀλλὰ καὶ μᾶλλον. ἀεὶ γὰρ δι' ὃ ὑπάρχει ἕκαστον, ἐκεῖνο μᾶλλον ὑπάρχει. οἷον, δι' ὃ φιλοῦμεν, ἐκεῖνο μᾶλλον φίλον. ὥστ' εἴπερ ἴσμεν διὰ τὰ πρῶτα καὶ πιστεύομεν, κἀκεῖνα ἴσμεν τε καὶ πιστεύομεν μᾶλλον, ὅτι δι' ἐκεῖνα καὶ τὰ ὕστερα. 17 Οὐχ οἷόν τε δὲ πιστεύειν μᾶλλον ὧν οἶδεν, ἃ μὴ τυγχάνει μήτε εἰδὼς, μήτε βέλτιον διακείμενος, ἢ εἰ ἐτύγχανεν εἰδώς. συμβήσεται δὲ τοῦτο, εἰ μή τις προγνώσεται τῶν δι' ἀπόδειξιν πιστευόντων· μᾶλλον γὰρ ἀνάγκη πιστεύειν ταῖς ἀρχαῖς ἢ πάσαις, ἢ τισὶ, τοῦ συμπεράσματος. 18 Τὸν δὲ μέλλοντα ἕξειν τὴν ἐπιστήμην τὴν δι' ἀποδείξεως, οὐ μόνον δεῖ τὰς ἀρχὰς μᾶλλον γνωρίζειν, καὶ μᾶλλον αὐταῖς πιστεύειν, ἢ τῷ δεικνυμένῳ· ἀλλὰ μηδ' ἄλλο αὐτῷ πιστότερον εἶναι, μηδὲ γνωριμώτερον τῶν ἀντικειμένων ταῖς ἀρχαῖς, ἐξ ὧν ἔσται συλλογισμὸς ὁ τῆς ἐναντίας ἀπάτης· εἴπερ δεῖ τὸν ἐπιστάμενον ἁπλῶς, * ἀμετάπειστον εἶναι.

* Alij addunt ἃ εἰώθει ὁ μανθάνων προσλαμβάνειν καθ' ἑκάστην ἐπιστήμην. quæ Boëthus & alij non agnoſcunt: & gloſſam ſapiunt: etſi extant apud Themiſtium & Philoponum.

* γ. ἀμετάπειστον.

A proxima verò *ſunt* ſingularia. atque hæc ſibi inuicem opponuntur. 12 Ex primis autem eſt, quod *eſt* ex principiis propriis. idem enim voco primum & principium. 13 Principium autem demonſtrationis eſt propoſitio immediata. Immediata verò *eſt*, qua non eſt alia prior. Propoſitio autem eſt enunciationis altera pars, vnum de vno: dialectica quidem, quæ vtrumvis æquè ſumit: demonſtratiua verò, quæ definite *ſumit* alterum eſſe verum. Enunciatio *eſt* contradictionis vtravis pars. Contradictio eſt oppoſitio, medio carens per ſe. Partium contradictionis *ea quæ ſignificat* aliquid de aliquo, eſt affirmatio: *ſua* aliquid ab aliquo, negatio. 14 Ex immediatis autem principiis B ſyllogiſticis, theſim *ſeu poſitionem* appello *eam*, quam non licet demonſtrare, nec neceſſe *eſt* eum habere qui diſcere aliquid velit. *eam* verò, quam neceſſe *eſt* eum habere qui diſcere quidvis debeat, *voco* axioma. ſunt enim quædam eiuſmodi: & potiſſimùm in his *appellandis* ſoliti ſumus hoc nomine vti. 15 Ex poſitionibus verò, *ea*, quæ vtramvis contradictionis partem accipit, (veluti eſſe aliquid, aut non eſſe aliquid) *eſt* hypotheſis *ſiue ſuppoſitio*: at quæ hoc vacat, definitio *appellatur*. definitio namque eſt quidem theſis: ponit enim arithmeticus vnitatem *id* eſſe quod eſt indiuiduum ſecundum quantitatem: non tamen eſt hypotheſis. nam C quid ſit vnitas, & eſſe vnitatem, non idem *eſt*. 16 Quia verò *ob id* credere & ſcire rē oportet, quòd talis habetur ſyllogiſmus, quem vocamus demonſtrationem, hic autē eſt, eo quòd hæc ſunt ex quibus ſyllogiſmus *conſtat: propterea* neceſſe *eſt* non ſolùm prænoſcere prima aut omnia, aut quædā, ſed etiā magis. ſemper enim id magis *tale* eſt, propter quod vnumquodque eſt *tale*: vtputà id magis dilectū *eſt*, propter quod diligimus. quocirca ſi propter prima ſcimus & credimus, illa quoq; ſcimus & credimus magis, quia per illa *ſcimus & credimus* etiam poſteriora. 17 Fieri autem nequit, vt magis quàm *ea* quæ nouit, credat *aliquis* quæ neque ſcit, neque meliùs affectus *eſt* quā ſi ſciret. hoc tamen accidet, niſi per demonſtrationem credens prænouerit: quia neceſſe *eſt* maiorē fidem habere principiis aut omnibus, aut quibuſdam, quā concluſioni. 18 Non ſolùm autem oportet, eum qui habiturus eſt ſcientiam per demonſtrationē, magis principia cognoſcere, & magis eis credere, quā rei demōſtratę: ſed neque aliud ei credibilius eſſe, neque notius, quàm principiis oppoſita, ex quibus erit ſyllogiſmus contrariæ deceptionis: ſiquidem opus eſt, vt qui ſimpliciter ſcit, labi & errare nequeat.

Refutatio errorum, in quos nonnulli inciderunt, eò quòd principia demonſtrationis ſciri debent. Cap. III.

1 ¶ Opiniones aliorum, 2 qui ſcientiam demonſtratiuam eſſe negabant, 3 aut omnia circulo demonſtrari aſſerebant. 4 Sententia Ariſtotelis. 5 Contra circularem demonſtrationem, Ratio prima ducens ad abſurditatem, quia idem eodem eſſet prius & poſterius. 6 Ratio altera, quia demonſtratio circularis probat idem per idem. 7 Ratio tertia, quia non in quibuſvis terminis circulus locum habere poteſt.

CAP. III.

* γ. ἀπόδειξιν.

ΕΝίοις μὲν οὖν διὰ τὸ δεῖν τὰ πρῶτα ἐπίστασθαι, οὐ δοκεῖ D ἐπιστήμη εἶναι· τοῖς δ', εἶναι μὲν, πάντων μέντοι * ἀποδείξεις εἶναι. ὧν οὐδέτερον, οὔτ' ἀληθὲς, οὔτ' ἀναγκαῖον. 2 Οἱ μὲν γὰρ ὑποθέμενοι μὴ εἶναι ὅλως ἐπίστασθαι, οὗτοι εἰς ἄπειρον ἀξιοῦσιν ἀνάγεσθαι, ὡς οὐκ ἂν ἐπιστάμενος τὰ ὕστερα διὰ τὰ πρότερα, ὧν μή ἐστι πρῶτα, ὀρθῶς λέγοντες· ἀδύνατον γὰρ

QVibuſdam igitur, quoniam oportet prima ſcire, non videtur ſcientia eſſe: aliis *videtur* quidē eſſe, ſed omnium eſſe demonſtrationes. quorum neutrum *eſt* verum, aut neceſſarium. 2 Nam qui ſupponunt non eſſe omnino ſcire, hi cenſent in infinitum deduci: vtpote cùm non cognoſcantur poſteriora per priora, quorum non ſunt prima: rectè dicentes, quoniam impoſſibile

bile *eſt* infinita percurrere. Si verò ſtatur, & ſunt principia: hæc eſſe ignota, cùm demonſtratio eorum non ſit: quod quidem ſolum aiunt eſſe ſcire. quòd ſi non licet prima cognoſcere: ne illa quidẽ, quæ ex his *efficiuntur*, ſciri poſſe ſimpliciter & propriè, ſed ſub conditione ſi illa ſunt. 3 Alij verò, quod ad ipſum ſcire, conſentiunt: tantùm enim per demonſtrationem eſſe: verùm, quo minùs omnium ſit demõſtratio, nihil vetare: poſſe enim circulo fieri demõſtrationem, & *omnia* ex ſe inuicem *probari*. 4 Nos verò dicimus nec omnem ſcientiam eſſe demonſtratiuam: ſed ea quæ medio vacant, ſciri ſine demonſtratione: (atque hoc neceſſarium eſſe conſtat. nam ſi neceſſe *eſt* vt ſciantur priora *& ea* ex quibus demonſtratio *conſtat*, & conſiſtitur tandem in iis quæ medio carent: *certè* neceſſe *eſt* hæc eſſe indemonſtrabilia) hæc igitur ita dicimus: nec ſolùm eſſe ſcientiam, ſed etiam principium quoddam ſcientiæ, quo terminos cognoſcimus. 5 Circulo autem non poſſe demonſtrari ſimpliciter, manifeſtum *eſt*: ſiquidem ex prioribus oportet demonſtrationem conſtare, ac notioribus. fieri enim nequit, vt eadem iiſdẽ ſimul priora & poſteriora ſint, niſi diuerſo modo: veluti alia *quod* ad nos; alia ſimpliciter, quo modo inductio notum facit. Quod ſi ita *eſt*: non eſt rectè definitum ſcire ſimpliciter, ſed *eſt* duplex: aut non ſimpliciter *eſt* altera demonſtratio, quæ *ſcilicet* fit ex notioribus nobis. 6 Accidit autem iis qui aſſerunt circulo demonſtrationem eſſe, non ſolùm quod nunc dictum eſt: ſed etiam vt nihil aliud dicant, quàm hoc eſſe ſi hoc ſit: ſic autem facile *eſt* omnia demonſtrare. conſtat autem hoc accidere, tribus terminis poſitis. (nihil enim refert, vtrum quis per multos, an per paucos *demonſtrationem* reflecti dicat: *nec vtrùm* per paucos, an per duos) quotieſcumque enim, cùm eſt τὸ α, neceſſariò *eſt* τὸ β; & cùm *eſt* hoc, *neceſſariò eſt* τὸ γ: cùm ſit τὸ α, *erit* τὸ γ. Si igitur cùm τὸ α eſt, neceſſe *eſt* τὸ β eſſe; cùm autem hoc ſit, τὸ α *eſſe*: (hoc enim erat, circulo *demonſtrari*) ponatur τὸ α, vbi *erat* τὸ γ. illa igitur oratio, cùm ſit τὸ β, eſſe τὸ α, perinde valet, ac ſi dicatur eſſe τὸ γ. hæc autem *probat*, cùm τὸ α ſit, τὸ γ eſſe: τὸ γ autẽ *eſt* idem quod τὸ α. Quare accidit, vt qui circulo aiunt eſſe demonſtrationem, nihil aliud *dicant*, quàm, ſi τὸ α eſt, τὸ α eſſe. ſic autem omnia demonſtrari facilè poſſunt. 7 Immo ne quidem fieri hoc poteſt, niſi in iis, quæ ſeſe mutuò conſequuntur, vt propria. Vno igitur poſito, oſtenſum eſt, numquàm aliud quicquam neceſſariò effici. vno inquam termino, aut vna theſi poſita. minimùm autem ex duobus theſibus primis poteſt *aliquid colligi*, ſiquidẽ etiam ratiocinari *licet*. Si igitur τὸ α τὸ β & τὸ γ conſequens ſit, & hæc ſibi inuicem, ac τὸ α: ſic ſanè ex ſe inuicem probari poſſunt omnia poſtulata in prima figura, vt demonſtratum eſt in *libris* de ſyllogiſmo. ſed & *illud ibi* oſtenſum fuit, in aliis figuris aut non fieri ſyllogiſmum, aut non de acceptis. quæ verò non reciprocantur, neutiquàm poſſe demonſtrari circulo. Quocirca cùm pauca talia ſint in demonſtrationibus: apparet, vanum *quiddam* eſſe & impoſſibile, ſi quis mutuam & reciprocam demonſtrationem eſſe, ideóque omnia demonſtrari poſſe dicat.

A τὰ ἄπειρα διελθεῖν. εἰ δὲ ἵστανται, καὶ εἰσὶν ἀρχαὶ, ταύτας ἀγνώστους εἶναι, ἀποδείξεώς γε μὴ οὔσης αὐτῶν· ὅπερ φασὶν εἶναι τὸ ἐπίστασθαι μόνον· εἰ δὲ μὴ ἔστι τὰ πρῶτα εἰδέναι, οὐδὲ τὰ ἐκ τούτων εἶναι ἐπίστασθαι, οὐδὲ ἁπλῶς, οὐδὲ κυρίως, ἀλλ' ἐξ ὑποθέσεως· εἰ ἐκεῖνά ἐστιν. 3 Οἱ δὲ, περὶ μὲν τοῦ ἐπίστασθαι ὁμολογοῦσι· δι' ἀποδείξεως γὰρ εἶναι μόνον. ἀλλὰ πάντων εἶναι ἀπόδειξιν, οὐδὲν κωλύειν· ἐνδέχεσθαι γὰρ κύκλῳ* γίνεσθαι τὴν ἀπόδειξιν, καὶ ἐξ ἀλλήλων. 4 Ἡμεῖς δέ φαμεν, οὔτε πᾶσαν ἐπιστήμην ἀποδεικτικὴν εἶναι, ἀλλὰ τὴν τῶν ἀμέσων, ἀναπόδεικτον) καὶ τοῦθ' ὅτι ἀναγκαῖον, φανερόν. εἰ γὰρ ἀνάγκη μὲν ἐπίστασθαι τὰ πρότερα, καὶ ἐξ
B ὧν ἡ ἀπόδειξις, ἵσταται δέ ποτε τὰ ἄμεσα· ταῦτ' ἀναπόδεικτα ἀνάγκη εἶναι) ταῦτ' οὖν οὕτω λέγομεν· καὶ οὐ μόνον ἐπιστήμην, ἀλλὰ καὶ ἀρχὴν ἐπιστήμης εἶναί τινά φαμεν, ᾗ τοὺς ὅρους γνωρίζομεν. 5 Κύκλῳ δ' ὅτι ἀδύνατον ἀποδείκνυσθαι ἁπλῶς, δῆλον, εἴπερ ἐκ προτέρων δεῖ τὴν ἀπόδειξιν εἶναι, καὶ γνωριμωτέρων· ἀδύνατον γάρ ἐστι τὰ αὐτὰ τῶν αὐτῶν ἅμα πρότερα καὶ ὕστερα εἶναι, εἰ μὴ τὸν ἕτερον τρόπον οἷ, τὰ μὲν, πρὸς ἡμᾶς· τὰ δ', ἁπλῶς, ὅνπερ τρόπον ἡ ἐπαγωγὴ ποιεῖ γνώριμον. εἰ δ' οὕτως, οὐκ ἂν εἴη τὸ ἁπλῶς εἰδέναι, καλῶς ὡρισμένον, ἀλλὰ διττόν· ἢ οὐχ ἁπλῶς, ἡ ἑτέρα ἀπόδειξις, ἡ γινομένη ἐκ τῶν ἡμῖν γνωριμωτέρων.
C 6 Συμβαίνει δὲ τοῖς λέγουσι κύκλῳ τὴν ἀπόδειξιν εἶναι, οὐ μόνον τὸ νῦν εἰρημένον, ἀλλ' οὐδὲν ἄλλο λέγειν, ἢ ὅτι τοῦτ' ἔστιν εἰ τοῦτ' ἔστιν· οὕτω δὲ πάντα ῥᾴδιον δεῖξαι· δῆλον δ' ὅτι τοῦτο συμβαίνει, τριῶν ὅρων τεθέντων. (τὸ μὲν γὰρ διὰ πολλῶν, ἢ δι' ὀλίγων ἀνακάμπτειν φάναι, οὐδὲν διαφέρει· δι' ὀλίγων δ', ἢ δυοῖν) ὅταν γὰρ τοῦ α ὄντος, ἐξ ἀνάγκης ᾖ τὸ β· τούτου δὲ, τὸ γ· τοῦ α ὄντος, ἔσται τὸ γ. Εἰ δὴ τοῦ α ὄντος, ἀνάγκη τὸ β εἶναι· τούτου δ' ὄντος, τὸ α· (τοῦτο γὰρ ἦν τὸ κύκλῳ) κείσθω τὸ α, ἐφ' οὗ τὸ γ. τὸ οὖν, τοῦ β ὄντος, τὸ α εἶναι λέγειν, ἐστὶ τὸ γ εἶναι λέγειν. τοῦτο δ' ὅτι τοῦ α ὄντος, τὸ γ ἐστί· τὸ δὲ γ, ταὐτὰ τὸ α ὕ. ὥστε συμβαίνει λέγειν τοὺς κύκλῳ φά-
D σκοντας εἶναι τὴν ἀπόδειξιν, οὐδὲν ἕτερον, πλὴν ὅτι τοῦ α ὄντος, τὸ α ἐστίν. οὕτω δὲ πάντα δεῖξαι ῥᾴδιον. 7 Οὐ μὴν ἀλλ' οὐδὲ τοῦτο δυνατὸν, πλὴν ἐπὶ τούτων ὅσα ἀλλήλοις ἕπεται, ὥσπερ τὰ ἴδια. ἑνὸς μὲν οὖν κειμένου, δέδεικται ὅτι οὐδέποτ' ἀνάγκη τι εἶναι ἕτερον. λέγω δ' ἑνὸς, ὅτι οὔτε ὅρου ἑνὸς, οὔτε θέσεως μιᾶς τεθείσης. ἐκ δύο δὲ θέσεων πρώτων καὶ ἐλαχίστων ἐνδέχεται, εἴπερ καὶ συλλογίσασθαι. ἐὰν μὲν οὖν τὸ α τῷ β καὶ τῷ γ ἕπηται, καὶ ταῦτ' ἀλλήλοις, καὶ τῷ α· οὕτω μὲν ἐνδέχεται ἐξ ἀλλήλων δεικνύναι πάντα τὰ αἰτηθέντα ἐν πρώτῳ σχήματι, ὡς δέδεικται ἐν τοῖς περὶ συλλογισμοῦ. δέδεικται δὲ καὶ, ὅτι ἐν τοῖς ἄλλοις σχή-
E μασιν ἢ οὐ γίνεται συλλογισμὸς, ἢ οὐ περὶ τῶν ληφθέντων. τὰ δὲ μὴ ἀντικατηγορούμενα, οὐδαμῶς ἔστι δεῖξαι κύκλῳ. ὥστ' ἐπειδὴ ὀλίγα τοιαῦτα ἐν ταῖς ἀποδείξεσι· φανερὸν ὅτι κενόν τε καὶ ἀδύνατον, τὸ λέγειν ἐξ ἀλλήλων εἶναι τὴν ἀπόδειξιν, καὶ διὰ τοῦτο ἐνδέχεσθαι πάντων εἶναι ἀπόδειξιν.

* γρ. κύκλον ἀδέχεται.

Quid ſit De omni, Per ſe, & Vniuerſale. Cap. IV.

1 ¶ Demonſtrationem eſſe ex neceſſariis. 2 ¶ Propoſitio. 3 ¶ Quæ dicantur de omni. 4 ¶ Quæ & quot modis dicantur per ſe, vel per accidens. Modus primus, & ſecundus. 5 Tertius. 6 Quartus. 7 Quæ primo aut ſecundo modo ſunt per ſe, eadem eſſe propter ſe, & neceſſaria. 8 Epilogus. 9 ¶ De vniuerſali. Definitio, 10 Corollarium, quod vniuerſale ſit neceſſarium. 11 Expoſitio definitionis. 12 Quodnam ſit ſubiectum, de quo vniuerſaliter demonſtratur.

Cap. VI.

Ἐπεὶ δ' ἀδύνατον ἄλλως ἔχειν οὗ ἐστιν ἐπιστήμη ἁπλῶς, A ἀναγκαῖον ἂν εἴη τὸ ἐπιστητὸν τὸ κατὰ τὴν ἀποδεικτικὴν ἐπιστήμην. ἀποδεικτικὴ δ' ἐστὶν, ἣν ἔχομεν τῷ ἔχειν ἀπόδειξιν· ἐξ ἀναγκαίων ἄρα συλλογισμός ἐστιν ἡ ἀπόδειξις. 2 Ληπτέον ἄρα ἐκ τίνων καὶ ποίων αἱ ἀποδείξεις εἰσί. πρῶτον δὲ διορίσωμεν τί λέγομεν τὸ κατὰ παντὸς, καὶ τί τὸ καθ' αὑτὸ, καὶ τί τὸ καθόλου. 3 Κατὰ παντὸς μὲν οὖν τοῦτο λέγω, ὃ ἂν ᾖ μὴ ἐπὶ τινὸς μὲν, τινὸς δὲ μή· μηδὲ, ποτὲ μὲν, ποτὲ δὲ μή. οἷον, εἰ κατὰ παντὸς ἀνθρώπου ζῷον· εἰ ἀληθὲς τόνδ' εἰπεῖν ἄνθρωπον, ἀληθὲς καὶ ζῷον· καὶ εἰ νῦν θάτερον, καὶ θάτερον. καὶ εἰ ἐν πάσῃ γραμμῇ στιγμὴ, ὡσαύτως. B σημεῖον δέ· καὶ γὰρ τὰς ἐνστάσεις οὕτω φέρομεν, ὡς κατὰ παντὸς ἐρωτώμενοι, ἢ εἰ * ἐπί τινι μὴ, ἢ εἴποτε μή. 4 Καθ' αὑτὰ δ', ὅσα ὑπάρχει ἐν τῷ τί ἐστιν· οἷον τριγώνῳ γραμμὴ καὶ γραμμῇ στιγμή· ἡ γὰρ οὐσία αὐτῶν ἐκ τούτων ἐστὶ, καὶ ἐν τῷ λόγῳ τῷ λέγοντι τί ἐστιν ἐνυπάρχει. καὶ ὅσοις τῶν ἐνυπαρχόντων αὐτοῖς, αὐτὰ ἐν τῷ λόγῳ ἐνυπάρχουσι, τῷ τί ἐστι δηλοῦντι. οἷον, τὸ εὐθὺ ὑπάρχει γραμμῇ, καὶ τὸ περιφερὲς, καὶ τὸ περιττὸν καὶ ἄρτιον ἀριθμῷ, καὶ τὸ πρῶτον, καὶ σύνθετον, καὶ ἰσόπλευρον, καὶ ἑτερόμηκες. καὶ πᾶσι τούτοις ἐνυπάρχουσιν ἐν τῷ λόγῳ τῷ τί ἐστι λέγοντι, ἔνθα C μὲν γραμμὴ, ἔνθα δ' ἀριθμός. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων, τὰ τοιαῦθ' ἑκάστοις καθ' αὑτὰ λέγω. ὅσα δὲ μηδετέρως ὑπάρχει, συμβεβηκότα· οἷον, τὸ μουσικὸν, ἢ λευκὸν τῷ ζῴῳ. 5 Ἔτι ὃ μὴ καθ' ὑποκειμένου λέγεται ἄλλου τινός. οἷον, τὸ βαδίζον, ἕτερόν τι ὂν, βαδίζον ἐστὶ, καὶ λευκόν· ἡ δ' οὐσία, καὶ ὅσα τόδε τι σημαίνει, οὐχ ἕτερόν τι ὄντα ἐστὶν, ὅπερ ἐστί. τὰ μὲν δὴ μὴ καθ' ὑποκειμένου, καθ' αὑτὰ λέγω. τὰ δὲ καθ' ὑποκειμένου, συμβεβηκότα. 6 Ἔτι δ' ἄλλον τρόπον, τὸ μὲν δι' αὐτὸ ὑπάρχον ἑκάστῳ, καθ' αὑτό. τὸ δὲ μὴ δι' αὑτὸ, συμβεβηκός. οἷον, εἰ βαδίζοντος ἤστραψε, συμβεβηκός· οὐ γὰρ διὰ τὸ βαδίζειν ἤστραψεν, ἀλλὰ συνέβη, φαμὲν, τοῦτο. εἰ δὲ δι' αὑτὸ, D καθ' αὑτό. οἷον εἴ τις σφαττόμενος ἀπέθανε, καὶ κατὰ τὴν σφαγὴν, ὅτι διὰ τὸ σφάττεσθαι, ἀλλ' οὐ συνέβη σφαττόμενον ἀποθανεῖν. 7 Τὰ ἄρα λεγόμενα ἐπὶ τῶν ἁπλῶς ἐπιστητῶν καθ' αὑτὰ, οὕτως ὡς ἐνυπάρχειν τοῖς κατηγορουμένοις, ἢ ἐνυπάρχεσθαι, δι' αὑτά τέ ἐστι, καὶ ἐξ ἀνάγκης. οὐ γὰρ ἐνδέχεται μὴ ὑπάρχειν ἢ ἁπλῶς, ἢ τὰ ἀντικείμενα· οἷον, γραμμῇ τὸ εὐθὺ ἢ τὸ καμπύλον, καὶ ἀριθμῷ τὸ περιττὸν ἢ τὸ ἄρτιον. ἔστι γὰρ τὸ ἐναντίον, ἢ στέρησις, ἢ ἀντίφασις ἐν τῷ αὐτῷ γένει· οἷον, ἄρτιον τὸ μὴ περιττὸν, ἐν ἀριθμοῖς ᾗ ἕπεται. ὥστ' εἰ ἀνάγκη φάναι ἢ ἀποφάναι· ἀνάγκη καὶ τὰ καθ' αὑτὰ, ὑπάρχειν. 8 Τὸ μὲν οὖν κατὰ παντὸς, καὶ καθ' αὑτὸ, διωρίσθω τὸν τρόπον τοῦτον. 9 Καθόλου δὲ λέγω, ὃ ἂν κατὰ παντός τε ὑπάρχῃ, καὶ καθ' αὑτὸ, καὶ ᾗ αὐτό. 10 Φανερὸν ἄρα

* γ. ὅτι τινὶ μὲν, ἢ ἐπί τινι μή.

Qvia verò non poteſt aliter ſe habere id cuius eſt ſcientia ſimpliciter, neceſſarium vtique erit, quod cadit ſub ſcientiam demõſtratiuam: demonſtratiua autem eſt, quam ideo habemus, quia habemus demonſtrationem: demõſtratio igitur eſt ſyllogiſmus ex neceſſariis. 2 Accipiendum igitur *eſt*, ex quibus & qualibus *propoſitionibus* demonſtrationes conſtent. ſed primùm definiamus, quid vocemus De omni, & quid Per ſe, & quid Vniuerſale. 3 De omni igitur id apello, quod non in aliquo eſt, in aliquo non *eſt*, nec interdum *eſt*, interdum non *eſt*. Vtputa ſi de omni homine *dicitur* animal: ſi verè dicitur hunc *eſſe* hominem, verè *dicetur* etiam *eſſe* animal. & ſi nunc alterum *eſt verum*, alterum quoque *ſimiliter eſt verum*. Et ſi in omni linea *eſt* punctum, eadem *eſt* ratio. *Huius* autem *rei* ſignum *eſt*: quoniã ita obiicimus, cùm velut de omni interrogamur, vel quòd alicui non *ineſt*, vel quòd interdum non *ineſt*. 4 Per ſe autem *voco*, quæcumque inſunt in *attributione declarante* quid eſt: vt triangulo *ineſt* linea, & lineæ punctum: eſſentia namque ipſorum ex his eſt, atque *hæc* inſunt in oratione dicẽte quid ſit. Item ea quæ attributis ſuis inſunt in oratione declarante quid ſit; vt rectum & curuum ineſt lineæ, & impar ac par numero, necnon primum & compoſitum, item æquilaterum & altera parte longius. atque his omnibus ineſt in oratione quid ſit dicẽte, illic quidem linea, hic verò numerus. Similiter & in aliis, ea quæ *ſunt* eiuſmodi, ſingulis per ſe *ineſſe* dico. Quæ verò neutro modo inſunt, *voco* accidentia: vt muſicum, aut album *ineſt* animali. 5 Præterea *per ſe appello*, quod non dicitur de vllo alio ſubiecto: vt ambulans, cùm aliud quiddam ſit, ambulans eſt & albũ. ſubſtantia verò & quæcumque hoc aliquid ſignificant, non aliud quiddam ſunt, quàm id quod ſunt. Quæ igitur de ſubiecto non *dicuntur*, per ſe: quæ verò de ſubiecto *dicuntur*, accidentia voco. 6 Alio pręterea modo, quod propter ſe ineſt vnicuique, per ſe *eſt*: quod non propter ſe, accidẽs. vt ſi ambulante *aliquo* fulgurauit, accidẽs *eſt*: non enim propter ambulationem fulgurauit: ſed dicimus, hoc accidit. Si verò propter ſe, per ſe *ineſt*. vt ſi quis iugulatus interiit, & per iugulationem: quoniam *ideo periit* quia iugulatus eſt, nõ autem accidit iugulatum interire. 7 Quæ igitur in iis quæ ſimpliciter cadunt ſub ſcientiam, dicuntur per ſe, ita vt *ipſa* inſint attributis, aut ipſis attributa, cùm propter ſe ſunt, tum ex neceſſitate. non enim accidit nõ ineſſe aut ſimpliciter, aut oppoſita, vt lineæ rectum vel inflexum, & numero impar vel par. nam contrarium eſt aut priuatio aut contradictio in eodem genere: vt par *eſt* quod non *eſt* impar, in numeris quâ conſequitur. quare ſi neceſſe *eſt* affirmare vel negare; neceſſe *eſt* etiam *ea* quæ *ſunt* per ſe ineſſe. 8 Ergo de omni, & Per ſe, definita ſint hoc modo. 9 Vniuerſale autem voco, quod & omni ineſt, & per ſe, & quâ *id* ipſum *eſt*. 10 Apparet igitur,

quæcumque *ſunt* vniuerſalia, neceſſariò ineſſe rebus. 11 Per ſe autem & quà ipſum, idem *ſunt*. vtputà per ſe lineæ ineſt punctum, & rectum: quia *ineſt*, quà linea *eſt*, item triangulo quà *eſt* triangulum, *inſunt* duo recti: quia per ſe triangulum *eſt* æquale duobus rectis. 12 Iam verò vniuerſale tunc ineſt, cùm de quovis & primò demonſtratur. exẽpli causâ, duos rectos habere, nec figuræ ineſt vniuerſaliter: (quamquam licet de figura demonſtrare quòd duos rectos habet, ſed non de quavis figura: nec vtitur quavis figura is qui demonſtrat) nam quadratum *eſt* quidem figura, non tamen habet *angulos* æquales duobus rectis. quodlibet verò B iſoſceles habet *angulos* æquales duobus rectis, ſed non primum, cũ triangulum priùs *id habeat*. Quod igitur omne *&* primum oſtenditur duos *angulos* rectos aut quodvis aliud habere, huic primo ineſt vniuerſaliter: ac demonſtratio per ſe eſt huius vniuerſalis: aliorum autem modo quodam, non per ſe: neque iſoſcelis eſt vniuerſaliter, ſed latiùs *patet quàm iſoſceles*.

A ὅτι ὅσα καθόλου, ἐξ ἀνάγκης ὑπάρχει τοῖς πράγμασι. 11 Τὸ καθ' αὑτὸ δὲ, καὶ ᾗ αὐτὸ, ταὐτόν. οἷον, καθ' αὑτὸ τῇ γραμμῇ ὑπάρχει στιγμὴ, καὶ τὸ εὐθύ. καὶ γὰρ ᾗ γραμμή. καὶ τῷ τριγώνῳ ᾗ τρίγωνον, δύο ὀρθαί· καὶ γὰρ καθ' αὑτὸ, τὸ τρίγωνον δύο ὀρθαῖς ἴσον. 12 Τὸ καθόλου δὲ ὑπάρχει τότε, ὅταν ἐπὶ τοῦ τυχόντος καὶ πρώτου * δεικνύηται. οἷον, τὸ δύο ὀρθὰς ἔχειν, οὔτε τῷ σχήματί ἐστι καθόλου (καίτοι ἔστι δεῖξαι κατὰ σχήματος, ὅτι δύο ὀρθὰς ἔχει, ἀλλ' οὐ τοῦ τυχόντος σχήματος· οὐδὲ χρῆται τῷ τυχόντι σχήματι ὁ δεικνύς) τὸ γὰρ τετράγωνον, σχῆμα μὲν, οὐκ ἔχει δὲ δύο ὀρθαῖς ἴσας. τὸ δὲ B ἰσοσκελὲς ἔχει μὲν τὸ τυχὸν δύο ὀρθαῖς ἴσας, ἀλλ' οὐ πρῶτον. ἀλλὰ τὸ τρίγωνον πρότερον. ὃ τοίνυν τὸ τυχὸν πρῶτον δείκνυται δύο ὀρθὰς ἔχον, ἢ ὁτιοῦν ἄλλο· τούτῳ πρώτῳ ὑπάρχει καθόλου· καὶ ἡ ἀπόδειξις καθ' αὑτὸ τούτου καθόλου ἐστί. τῶν δ' ἄλλων τρόπον τινὰ, οὐ καθ' αὑτό· οὐδὲ τοῦ ἰσοσκελοῦς οὐκ ἔστι καθόλου, ἀλλ' ἐπὶ πλέον.

* γ. δείκνυται.

Quibus ex cauſis peccetur in vniuerſali accipiendo, & qua ratione error vitetur. Cap. V.

1 ¶ *De cauſis errandi. Enumeratio.* 2 *Exemplum quartæ*, 3 *primæ*, 4 *tertiæ*, 5 *& ſecundæ cauſæ.* 6 ¶ *De errore vitando. Differentia homonymorum & ſynonymorum.* 7 *Ratio inueniendi proprij ſubiecti ſynonymi, de quo affectio demonſtretur.*

NOn eſt autem ignorandum, ſæpe accidere vt C peccetur, nec ſit, quod demonſtratur, primum vniuerſale, quà videtur demonſtrari vniuerſale primum. ſic autem fallimur, cùm aut nihil licet accipere ſuperius præter ſingulare, vel ſingularia: aut licet quidem, ſed *id* nomine caret in rebus ſpecie differentibus: aut eſt vt in parte totum in quo demonſtratur: particularibus enim inerit demonſtratio, & erit de omni, non tamen erit demonſtratio huius primi vniuerſalis. Dico autem demonſtrationem *eſſe* huius primi qua *eſt* hoc, quando eſt *huius* primi vniuerſalis. 2 Si quis igitur oſtenderit rectas non concurrere: videri poſſit huius eſſe demonſtratio propriè, quoniam *hæc af-* D *fectio* eſt in omnibus rectis. non eſt autem *propriè demõſtratio*: ſiquidem id fit, non quia *ſunt* ita æquales, ſed quà *ſunt* quomodocumque æquales. 3 Et ſi aliud triangulum non eſſet, quàm iſoſceles, quà iſoſceles, videretur ineſſe. 4 Et proportio commutata *videbatur ineſſe* quà *ſunt* numeri, & quà lineæ, & quà ſolida, & quà tempora, ſicut oſtendebatur aliquando ſeparatim: cùm de omnibus vnâ demonſtratione probari poſſit. ſed quoniam hæc omnia, numeri, longitudines, tempora, ſolida, *ita ſunt* vnum *vt* nominatum quidpiam non ſint, ac ſpecie differunt inter ſe: *idcirco* ſeparatim accipie- E bantur. nunc verò vniuerſaliter demõſtratur. non enim *hæc affectio* ineſt *lineis* quà *ſunt* lineæ, & *numeris* quà *ſunt* numeri, ſed quà *ſunt* hoc quod ſupponunt eſſe vniuerſale. 5 Proindè & ſi quis ſingillatim oſtenderit vnâ aut alterâ demonſtratione vnumquodque triangulum habere duos rectos, æqui laterum *inquam* ſeparatim, & ſcalenum, & iſoſceles: *is* nondum nouit *ipſum* triangulum eſſe æquale duobus rectis, niſi ſophiſtico modo: nec vniuerſaliter triangulum, licèt nullum præter hæc ſit aliud triangulum. non enim quà triangulum, nouit: nec omne triangulum, niſi ſecundum numerum: ſecundum formam verò non omne, etſi nullum eſt quod non cognoſcat.

ΔΕῖ δὲ μὴ λανθάνειν, ὅτι πολλάκις συμβαίνει διαψεύδεσθαι, καὶ μὴ ὑπάρχειν τὸ δεικνύμενον, πρῶτον καθόλου, ᾗ δοκεῖ δείκνυσθαι καθόλου πρῶτον. ἀπατώμεθα δὲ ταύτην τὴν ἀπάτην, ὅταν ἢ μηδὲν ᾖ λαβεῖν ἀνώτερον παρὰ τὸ καθέκαστον, ἢ τὰ καθέκαστα· ἢ ᾖ μὲν, ἀλλ' ἀνώνυμον ᾖ ἐπὶ διαφόροις εἴδει πράγμασιν· ἢ τυγχάνῃ ὂν ὡς ἐν μέρει ὅλον ἐφ' ᾧ δείκνυται· τοῖς γὰρ ἐν μέρει ὑπάρξει μὲν ἡ ἀπόδειξις, καὶ ἔσται κατὰ παντός, ἀλλ' ὅμως οὐκ ἔσται τούτου πρώτου καθόλου ἡ ἀπόδειξις. λέγω δὲ τούτου πρώτου, ᾗ τοιοῦτο, ἀπόδειξιν, ὅταν ᾖ πρώτου καθόλου. 2 Εἰ οὖν τις δείξειεν ὅτι αἱ ὀρθαὶ οὐ συμπίπτουσι, δόξειεν ἂν τούτου εἶναι ἡ ἀπόδειξις κυρίως, διὰ τὸ ἐπὶ πασῶν εἶναι τῶν ὀρθῶν. οὐκ ἔστι δέ· εἴπερ μὴ ὅτι ὡδὶ ἴσαι, γίνεται τοῦτο· ἀλλ' ᾗ ὁπωσοῦν ἴσαι. 3 Καὶ εἰ τρίγωνον μὴ ἦν ἄλλο, ἢ ἰσοσκελὲς, ᾗ ἂν ἐδόκει ὑπάρχειν. 4 Καὶ τὸ ἀνάλογον ὅτι ἐναλλὰξ, ᾗ ἀριθμοὶ, καὶ ᾗ γραμμαὶ, καὶ ᾗ στερεὰ, καὶ ᾗ χρόνοι, ὥσπερ ἐδείκνυτό ποτε χωρὶς, ἐνδεχόμενόν γε κατὰ πάντων μιᾷ ἀποδείξει δειχθῆναι· ἀλλὰ διὰ τὸ μὴ εἶναι ὠνομασμένον τι πάντα ταῦτα ἕν, ἀριθμοὶ, μήκη, χρόνοι, στερεὰ, καὶ εἴδει διαφέρειν ἀλλήλων, χωρὶς ἐλαμβάνετο. νῦν δὲ καθόλου δείκνυται· οὐ γὰρ ᾗ γραμμαὶ, ἢ ᾗ ἀριθμοὶ, ὑπῆρχεν· ἀλλ' ᾗ τοδί, ὃ καθόλου ὑποτίθενται ὑπάρχειν. 5 Διὰ τοῦτο οὐδ' ἄν τις δείξῃ καθ' ἕκαστον τὸ τρίγωνον ἀποδείξει ἢ μιᾷ ἢ ἑτέρᾳ, ὅτι δύο ὀρθὰς ἔχει ἕκαστον, τὸ ἰσόπλευρον χωρὶς, καὶ τὸ σκαληνὸν, καὶ τὸ ἰσοσκελές· οὔπω οἶδε τὸ τρίγωνον ὅτι δύο ὀρθαῖς ἴσον, εἰ μὴ τὸν σοφιστικὸν τρόπον· οὐδὲ καθόλου τρίγωνον, οὐδ' εἰ μηδέν ἐστι παρὰ ταῦτα τρίγωνον ἕτερον. οὐ γὰρ, ᾗ τρίγωνον, οἶδεν· οὐδὲ πᾶν τρίγωνον, * ἀλλ' ἢ κατ' ἀριθμόν· κατ' εἶδος δ', οὐ πᾶν, καὶ εἰ μηδέν ἐστιν ὃ οὐκ οἶδε.

CAP. VII.

* γ. ἀλλ' ἤ.

6 Πότ' οὖν οὐκ οἶδε καθόλου, καὶ πότ' οἶδεν ἁπλῶς; δῆλον δή, ὅτι εἰ ταὐτὸν ἦν τριγώνῳ εἶναι καὶ ἰσοπλεύρῳ ἢ ἑκάστῳ ἢ πᾶσιν. εἰ δὲ μὴ ταὐτόν, ἀλλ' ἕτερον, ὑπάρχει δ' ᾗ τρίγωνον οὐκ οἶδε. 7 Πότερον δ' ᾗ τρίγωνον ἢ ᾗ ἰσοσκελές, ὑπάρχει; καὶ πότε κατὰ τοῦθ' ὑπάρχει πρῶτον; καὶ καθόλου τίνος ἡ ἀπόδειξις; δῆλον ὅτι ὅταν ἀφαιρουμένων ὑπάρχῃ πρώτῳ. οἷον τῷ ἰσοσκελεῖ χαλκῷ τριγώνῳ ὑπάρξουσι δύο ὀρθαί. ἀλλὰ καὶ τοῦ χαλκοῦν εἶναι ἀφαιρεθέντος, καὶ τοῦ ἰσοσκελές. ἀλλ' οὐ τοῦ σχήματος, ἢ πέρατος. ἀλλ' οὐ πρώτων. τίνος οὖν πρώτου; εἰ δὴ τριγώνου, κατὰ τοῦτο * ὑπάρχει καὶ τοῖς ἄλλοις, καὶ τούτου καθόλου ἐστὶν ἡ ἀπόδειξις.

* κ. ὑπάρξει.

A 6 Quando igitur non nouit vniuerſaliter, & quãdo nouit ſimpliciter? Manifeſtum *eſt*, quòd ſi eadẽ ſit eſſentia trianguli & æquilateri aut cuiuſvis aut omnium, *vniuerſaliter nouit*. ſi verò non idem *ſint*, ſed diuerſa, & inſit *illa affectio triãgulo* quâ *eſt* triangulum: non nouit. 7 Vtrũ autem ineſt quâ triangulum, an quâ iſoſceles? & quando ratione huius primi ineſt *aliis*? & vniuerſaliter cuiuſnam *eſt* demonſtratio? *Tunc* ſanè, cùm *aliis* ablatis, *nihilominus* inerit *huic* primo *de quo demonſtratum eſt*. Vt iſoſceli æneo triangulo inerũt duo recti: ſed & *his* ablatis, æneum eſſe, & iſoſceles eſſe, *nihilominus inerit eadẽ affectio*. atqui non *inerit ſublatâ* figurâ, vel termino. ſed non *his* primis *ſublatis tollitur*. Quo igitur primo *ſublato affectio tollitur*? Si quidem triangulo, ratione huius ineſt etiam aliis, & huius vniuerſaliter eſt demonſtratio.

Demonſtrationem conſtare ex principiis neceſſariis, & per ſe. Cap. VI.

1 ¶¶ *Breuis & ſummaria probatio.* 2 ¶ *Diffuſa & prolixa probatio.* ¶ *Quòd propoſitiones demonſtratiuæ ſint neceſſariæ. Ratio prima, quia concluſio eſt neceſſaria.* 3 *Ratio ſecunda à diſtinctione demonſtrationis & aliorum ſyllogiſmorum.* 4 *Ratio tertia ab obiectione contra demonſtrationes.* 5 *Corollarium contra ſophiſtas.* 6 *Ratio quarta, quia propoſitiones non neceſſariæ non poſſunt eſſe cauſæ concluſionis neceſſariæ.* 7 *Ratio quinta ab interitu medij termini.* 8 *Obiectio prima, quia concluſio neceſſaria colligi poteſt ex propoſitionibus contingentibus.* 9 *Solutio.* 10 *Corollarium.* 11 *Obiectio ſecunda, quia interrogationes fiunt etiam de accidentibus.* 12 *Solutio.* 13 ¶ *Quòd demonſtrationis principia & concluſio ſint per ſe. Ratio prima communis propoſitionibus & concluſioni, quia ſunt neceſſariæ.* 14 *Ratio altera propoſitionum propria, ab earum effectu ſumpta, quia ſcientiam pariunt.* 15 *Corollarium, Non haberi veram ſcientiam per ea quæ non ſunt per ſe, licèt ſint de omni, veluti per ſignum.* 16 *Ambas propoſitiones per ſe eſſe debere.*

CAP. VI.

Εἰ οὖν ἐστὶν ἡ ἀποδεικτικὴ ἐπιστήμη ἐξ ἀναγκαίων ἀρχῶν (ὃ γὰρ ἐπίσταται, οὐ δυνατὸν ἄλλως ἔχειν) τὰ δὲ καθ' αὑτὰ ὑπάρχοντα, ἀναγκαῖα τοῖς πράγμασιν (τὰ μὲν γάρ, ἐν τῷ τί ἐστιν ὑπάρχει· τοῖς δ', αὐτὰ ἐν τῷ τί ἐστιν ὑπάρχει κατηγορουμένοις αὐτῶν, ὧν θάτερον τῶν ἀντικειμένων ἀνάγκη ὑπάρχειν) φανερὸν ὅτι ἐκ τοιούτων τινῶν ἂν εἴη ὁ ἀποδεικτικὸς συλλογισμός. ἅπαν γὰρ ἢ οὕτως ὑπάρχει, ἢ κατὰ συμβεβηκός. τὰ δὲ συμβεβηκότα, οὐκ ἀναγκαῖα. 2 Ἢ δὴ οὕτω λεκτέον, ἢ ἀρχὴν * θεμένοις, ὅτι ἡ ἀπόδειξις ἀναγκαῖόν ἐστι· καί, εἰ ἀποδέδεικται, οὐχ οἷόν τ' ἄλλως ἔχειν. ἐξ ἀναγκαίων ἄρα δεῖ εἶναι τὸν συλλογισμόν. 3 Ἐξ ἀληθῶν μὲν γὰρ ἔστι καὶ μὴ ἀποδεικνύντα συλλογίσασθαι. ἐξ ἀναγκαίων δ' οὐκ ἔστιν, ἀλλ' ἢ ἀποδεικνύντα. τοῦτο γὰρ ἤδη ἀποδείξεώς ἐστι. 4 Σημεῖον δ' ὅτι ἡ ἀπόδειξις ἐξ ἀναγκαίων, ὅτι καὶ τὰς ἐνστάσεις οὕτω φέρομεν πρὸς τοὺς οἰομένους ἀποδεικνύναι, ὅτι οὐκ * ἀνάγκη, ἂν οἰώμεθα ἢ ὅλως ἐνδέχεσθαι ἄλλως ἔχειν, ἢ ἕνεκά γε τοῦ λόγου. 5 Δῆλον δ' ἐκ τούτων, καὶ ὅτι εὐήθεις οἱ λαμβάνειν οἰόμενοι καλῶς τὰς ἀρχάς, ἐὰν ἔνδοξος ᾖ ἡ πρότασις καὶ ἀληθής· οἷον, οἱ σοφισταί, ὅτι τὸ ἐπίστασθαι, τὸ ἐπιστήμην ἔχειν. οὐ γὰρ τὸ ἔνδοξον, ἢ μὴ ἀρχή ἐστιν, ἀλλὰ τὸ πρῶτον τοῦ γένους περὶ ὃ δείκνυται· καὶ τἀληθὲς οὐ πᾶν, οἰκεῖον. 6 Ὅτι δ' ἐξ ἀναγκαίων εἶναι δεῖ τὸν συλλογισμόν, φανερὸν καὶ ἐκ τῶνδε. εἰ γὰρ ὁ μὴ ἔχων λόγον τοῦ διὰ τί, οὔσης ἀποδείξεως, οὐκ ἐπιστήμων. εἴη δ' ἂν ὥστε τὸ α κατὰ τοῦ γ ἐξ ἀνάγκης ὑπάρχειν· τὸ δὲ β, μέσον, δι' οὗ ἀπεδείχθη, μὴ ἐξ ἀνάγκης· οὐκ οἶδε διότι. οὐ γάρ ἐστι τοῦτο διὰ τὸ μέσον· τὸ μὲν γάρ, ἐνδέχεται μὴ εἶναι· τὸ δὲ συμπέρασμα, ἀναγκαῖον.

* γρ. θεμένου.

* γρ. ἀναγκαῖον εἶναι οἰόμεθα.

B SI igitur eſt demonſtratiua ſcientia ex neceſſariis principiis: (quod enim ſcitur, non poteſt aliter *ſe* habere) quæ autem per ſe rebus inſunt, neceſſaria *ſunt*: alia namque inſunt in *attributione*, quid eſt: alia verò ſunt, in quorum quidditate inſunt ſubiecta; quibus *ita* attribuuntur, *vt* neceſſe *ſit* alterum oppoſitorum ineſſe) perſpicuum *eſt* demonſtratiuum ſyllogiſmũ ex huiuſcemodi propoſitionibus conſtare. quiduis enim vel ita ineſt, vel ex accidenti: accidentia verò non *ſunt* neceſſaria. 2 Aut igitur ita dicendum eſt: aut *hoc* principio poſito, demonſtrationem eſſe rem neceſſariam, &, ſi demonſtratum eſt, non poſſe rẽ aliter *ſe* habere: ex neceſſariis igitur oportet eſſe C ſyllogiſmum illum. 3 Nam ex veris fieri poteſt vt etiam non demonſtrans ratiocinetur: ex neceſſariis autem nõ poteſt *quiſpiam ratiocinari* præter eum qui demonſtrat. hoc enim iam demonſtrationis eſt *proprium*. 4 *Hoc* autem ſignum *oſtendit* demonſtrationẽ *conſtare* ex *propoſitionibus* neceſſariis: quoniam aduerſus eos qui *ſe* demonſtrare putant, ita obiicimus, quòd non neceſſe *eſt*: ſiue exiſtimemus fieri poſſe vt *res* aliter *ſe* habeat, ſiue diſputationis causâ. 5 Ex his cõſtat, ſtultos eſſe eos qui putãt *ſe* rectè accipere principia, ſi propoſitio ſit probabilis & vera: vt ſophiſtæ *hanc propoſitionem accipiunt*, Scire D *eſt* ſcientiam habere. non enim *id* eſt principium, quod eſt probabile aut non *probabile*: ſed quod eſt primum ex eo genere, de quo demonſtratur: nec proprium *eſt* quicquid verum *eſt*. 6 Quod autem ſyllogiſmum illũ oporteat eſſe ex neceſſariis, hinc etiam apparet. Nam ſi ignorans rationem cur *res ſit*, cum ſit *eius rei* demonſtratio, non *eſt* ſciens: fac τὸ α de γ neceſſariò dici: τὸ β autem, medium per quod demonſtratum fuit, non *eſſe* ex neceſſitate: *certè* non nouit cur *res ſit*: quoniam hoc non eſt propter illud medium: quandoquidem accidit illud non eſſe, concluſio verò *eſt* neceſſaria.

Prǽterea ſi quis nunc non nouit, cùm rationem A habeat, ſitque ſaluus, re ſaluâ, ne ſit oblitus: *is* ne antea quidem cognoſcebat: ſed interire medium poteſt, ſi neceſſarium non *ſit*. quare habebit rationem, & *erit* ſaluus re ſaluâ, nec tamen nouit. ergo ne antea quidem cognoſcebat. Quòd ſi *medium* non interiit, ſed fieri poteſt vt intereat: id quod accidit, erit poſſibile & contingens. ſed fieri nequit, vt qui ita affectus eſt, cognoſcat. 8 Cùm igitur concluſio eſt neceſſaria, nihil prohibet quominùs non neceſſarium ſit medium per quod demonſtratum eſt: quia neceſſarium poteſt etiam ex non neceſſariis concludi, quemadmodum & verũ ex non veris. Cùm autem medium *eſt* neceſſarium, etiam concluſio *eſt* neceſſaria, ſicut ex veris verũ B ſemper *colligitur*. Dicatur enim neceſſariò τὸ α de ϛ, atque hoc de γ: neceſſe *eſt* igitur etiam τὸ α τῷ γ ineſſe. Cùm autem nõ neceſſaria eſt concluſio, fieri nequit vt medium ſit neceſſarium. finge enim τὸ α τῷ γ non ex neceſſitate ineſſe, verùm τῷ ϛ, atque hoc τῷ γ *ineſſe* ex neceſſitate: ergo etiam τὸ α τῷ γ ex neceſſitate inerit: ſed non, *ita eſſe* ſupponebatur. 9 Quoniam igitur quod per demonſtrationem *quiſpiam* ſcit, neceſſariò ineſſe oportet: per medium quoq; neceſſarium demonſtrationẽ haberi oportere cõſtat. alioquin neque ſciet cur, nec quòd neceſſe *ſit* illud eſſe: ſed vel putabit *ſe ſcire*, cũ neſciat, *nempe* ſi acceperit quaſi neceſſarium, quod non *eſt* C neceſſarium: aut ne putabit quidem *ſcire*, ſiue per media ſciat quòd *eſt*, ſiue per immediata *ſciat* quãobrem ſit. 10 Accidentium verò *quæ* non *ſunt* per ſe quo modo definita fuerunt ea quæ ſunt per ſe, non eſt ſcientia demonſtratiua: quia non poteſt neceſſariò probari concluſio: quandoquidem accidens poteſt non ineſſe; de tali enim accidente loquor. 11 Atqui dubitabit fortaſſe quiſpiam, quare hæc interrogare de his oportet, niſi neceſſe *ſit* cõcluſionem eſſe? nihil enim refert, ſi quis, cùm quęvis interrogauerit, poſtea dicat concluſionem. 12 Sed oportet interrogare, non quare *hoc quod concluditur*, neceſſarium ſit propter ea quæ interro- D gata fuerunt: ſed quia neceſſe *eſt*, vt *hoc quoque* dicat, qui illa dicit: & verè dicat, ſi *ea* vera ſint. 13 Quia verò neceſſariò inſunt in vnoquoque genere; quæcũque inſunt per ſe, & quà *eſt* vnumquodque, apparet, de his quę per ſe inſunt, atque ex his eſſe demonſtrationes quæ ſcientiam pariunt. accidentia namque non ſunt neceſſaria. 14 Quocirca non neceſſe *eſt* ſcire cur ſit res quæ concluditur. ne quidem ſi *illa* ſemper ſint, non autem per ſe, cuiuſmodi *ſunt* ſyllogiſmi à ſignis *ducti*. nam quod eſt per ſe, non per ſe ſciet. nec quamobrem *ſit*. ſcire autem quamobrem *res ſit, nihil aliud* eſt *quàm* per cauſam ſcire. Per ſe igitur oportet & medium tertio, & primum medio ineſſe.

A 7 Ἔτι εἴ τις μὴ οἶδε νῦν ἔχων τὸν λόγον, καὶ σωζόμενος,* σωζομένου τοῦ πράγματος, μὴ ἐπιλελησμένος· οὐδὲ ἄρα πρότερον ᾔδει. φθαρείη δ' ἂν τὸ μέσον, εἰ μὴ ἀναγκαῖον· ὥστε ἕξει μὲν τὸν λόγον,* σωζόμενος, σωζομένου τοῦ πράγματος· οὐκ οἶδε δέ. οὐδ' ἄρα πρότερον ᾔδει. εἰ δὲ μὴ ἔφθαρται, ἐνδέχεται δὲ φθαρῆναι, τὸ συμβαῖνον ἂν εἴη δυνατὸν καὶ ἐνδεχόμενον. ἀλλ' ἔστιν ἀδύνατον, τὸν οὕτως ἔχοντα εἰδέναι. 8 Ὅταν μὲν οὖν τὸ συμπέρασμα ἐξ ἀνάγκης ᾖ, οὐδὲν κωλύει τὸ μέσον μὴ ἀναγκαῖον εἶναι, δι' οὗ ἐδείχθη· ἔστι γὰρ τὸ ἀναγκαῖον καὶ μὴ ἐξ ἀναγκαίων συλλογίσασθαι, ὥσπερ καὶ ἀληθὲς* ἐκ μὴ ἀληθῶν. ὅταν δὲ τὸ μέσον, ἐξ ἀνάγκης καὶ B τὸ συμπέρασμα, ἐξ ἀνάγκης· ὥσπερ καὶ ἐξ ἀληθῶν ἀληθὲς ἀεί. Ἔστω γὰρ τὸ α κατὰ τοῦ β, ἐξ ἀνάγκης, καὶ τοῦτο κατὰ τοῦ γ· ἀναγκαῖον τοίνυν καὶ τὸ α τῷ γ ὑπάρχειν. Ὅταν δὲ μὴ ἀναγκαῖον ᾖ τὸ συμπέρασμα, οὐδὲ τὸ μέσον, ἀναγκαῖον, οἷόν τ' εἶναι. ἔστω γὰρ τὸ α τῷ γ μὴ ἐξ ἀνάγκης ὑπάρχειν, τῷ δὲ β, καὶ τοῦτο τῷ γ ἐξ ἀνάγκης· καὶ τὸ α ἄρα τῷ γ ἐξ ἀνάγκης ὑπάρξει. ἀλλ' οὐχ, ὑπέκειτο. 9 Ἐπεὶ τοίνυν* ὁ ἐπίσταται ἀποδεικτικῶς, δεῖ ἐξ ἀνάγκης ὑπάρχειν, δῆλον ὅτι καὶ διὰ μέσου ἀναγκαίου δεῖ ἔχειν τὴν ἀπόδειξιν. ἢ οὐκ ἐπιστήσεται, οὔτε διότι, οὔτε ὅτι ἀνάγκη ἐκεῖνο εἶναι. ἀλλ' ἢ* οἰήσεται οὐκ εἰδώς, ἐὰν ὑπολάβῃ ὡς ἀναγ- C καῖον, τὸ μὴ ἀναγκαῖον. ἢ οὐδ' οἰήσεται ὁμοίως, ἐάν τε τὸ ὅτι εἰδῇ διὰ μέσων, ἐάν τε τὸ διότι καὶ δι' ἀμέσων. 10 Τῶν δὲ συμβεβηκότων μὴ καθ' αὑτά, ὃν τρόπον διωρίσθη τὰ καθ' αὑτά, οὐκ ἔστιν ἐπιστήμη ἀποδεικτική. οὐ γάρ ἐστιν ἐξ ἀνάγκης δεῖξαι τὸ συμπέρασμα· τὸ συμβεβηκὸς γὰρ ἐνδέχεται μὴ ὑπάρχειν· περὶ τοιούτου γὰρ λέγω συμβεβηκότος. 11 Καίτοι ἀπορήσειεν ἄν τις ἴσως, τίνος ἕνεκα ταῦτα δεῖ ἐρωτᾶν περὶ τούτων, εἰ μὴ ἀνάγκη τὸ συμπέρασμα εἶναι; οὐδὲν γὰρ διαφέρει, εἴ τις ἐρωτώμενος τὰ τυχόντα, εἶτα εἴποι τὸ συμπέρασμα. 12 Δεῖ δὴ ἐρωτᾶν, οὐχ ὡς D ἀναγκαῖον εἶναι διὰ τὰ ἠρωτημένα, ἀλλ' ὅτι λέγειν ἀνάγκη τῷ ἐκεῖνα λέγοντι, καὶ ἀληθῶς λέγειν, ἐὰν ἀληθῶς ᾖ ὑπάρχοντα. 13 Ἐπεὶ δ' ἐξ ἀνάγκης ὑπάρχει περὶ ἕκαστον γένος, ὅσα καθ' αὑτὰ ὑπάρχει, καὶ ᾗ ἕκαστον· φανερὸν ὅτι περὶ τῶν καθ' αὑτὰ ὑπαρχόντων αἱ ἐπιστημονικαὶ ἀποδείξεις, καὶ ἐκ τῶν τοιούτων εἰσί. τὰ μὲν γὰρ συμβεβηκότα, οὐκ ἀναγκαῖα. 14 Ὥστ' οὐκ ἀνάγκη τὸ συμπέρασμα εἰδέναι διότι ὑπάρχει, οὐδ' εἰ ἀεὶ εἴη, μὴ καθ' αὑτὸ δέ, οἷον οἱ διὰ σημείων συλλογισμοί. τὸ γὰρ καθ' αὑτὸ οὐ καθ' αὑτὸ ἐπιστήσεται, οὐδὲ διότι. τὸ δὲ διότι ἐπίστασθαι, ἐστὶ τὸ διὰ τοῦ αἰτίου ἐπίστασθαι. Δι' αὐτὸ ἄρα δεῖ καὶ τὸ μέσον τῷ τρίτῳ, καὶ τὸ πρῶτον τῷ μέσῳ ὑπάρχειν.

* κ. τοῦ σωζομένου πράγματος.
* κ. σωζόμενος.
* κ. καὶ ἐξ ἀληθῶν.
* κ. ὁ ἐπιστ.
* γρ. οἰηθήσεται.

Cap. II.

Principia & concluſionem demonſtrationis non eſſe heterogenea, ſed ſyngenea.

Cap. VII.

1 ¶ *Principia demonſtrationis non eſſe heterogenea. Propoſitio.* 2 *Protheoria.* 3 *Expoſitio.* 4 *Probatio.* 5 *Exempla, in quibus medius terminus,* 6 *vel affectio ſumitur ex alia ſcientia.*

NOn licet igitur ex alio genere in aliud mi- E grantem demonſtrare: vtputà *non licet* arithmeticæ *probare problema* geometricum. 2 Tria nãque ſunt, quæ in demonſtrationibus *ſpectantur*. Primum, concluſio quæ demõſtratur, id eſt, quod alicui generi per ſe ineſt. alterum, axiomata;

Οὐκ ἄρα ἔστιν ἐξ ἄλλου γένους μεταβάντα δεῖξαι· οἷον, τὸ γεωμετρικὸν ἀριθμητικῇ. 2 Τρία γάρ ἐστι τὰ ἐν ταῖς ἀποδείξεσιν· ἓν μέν, τὸ ἀποδεικνύμενον συμπέρασμα· τοῦτο δ' ἐστὶ τὸ ὑπάρχον γένει τινὶ καθ' αὑτό. ἓν δέ, τὰ ἀξιώματα·

ἀξιώματα δ' ἐστὶν, ἐξ ὧν. τρίτον, τὸ γένος τὸ ὑποκείμενον, οὗ A τὰ πάθη καὶ τὰ καθ' αὑτὰ συμβεβηκότα δηλοῖ ἡ ἀπόδειξις. 3 Ἐξ ὧν μὲν οὖν ἡ ἀπόδειξις, ἐνδέχεται τὰ αὐτὰ εἶναι. ὧν δὲ τὸ γένος ἕτερον, ὥσπερ ἀριθμητικῆς καὶ γεωμετρίας, οὐκ ἔστι τὴν ἀριθμητικὴν ἀπόδειξιν ἐφαρμόσαι ἐπὶ τὰ τοῖς μεγέθεσι συμβεβηκότα· εἰ μὴ τὰ μεγέθη ἀριθμοί εἰσι. τοῦτο δ' ὡς ἐνδέχεται ἐπί τινων, ὕστερον λεχθήσεται. 4 Ἡ δ' ἀριθμητικὴ ἀπόδειξις ἀεὶ ἔχει τὸ γένος, περὶ ὃ ἡ ἀπόδειξις. καὶ αἱ ἄλλαι ὁμοίως. ὥστε ἢ ἁπλῶς ἀνάγκη τὸ αὐτὸ εἶναι γένος, ἢ πῇ, εἰ μέλλει ἡ ἀπόδειξις μεταβαίνειν. ἄλλως δ' ὅτι ἀδύνατον, δῆλον. ἐκ γὰρ τοῦ αὐτοῦ γένους ἀνάγκη τὰ ἄκρα καὶ τὰ μέσα εἶναι. εἰ γὰρ μὴ καθ' αὑτά, συμβεβηκότα ἔσται. 5 Διὰ τοῦτο B τῇ γεωμετρίᾳ οὐκ ἔστι δεῖξαι ὅτι τῶν ἐναντίων μία* ἐπιστήμη, ἀλλ' οὐδ' ὅτι οἱ κύβοι κύβος· οὐδ' ἄλλη ἐπιστήμη τὸ ἑτέρας. ἀλλ' ἢ ὅσα οὕτως ἔχει πρὸς ἄλληλα, ὥστ' εἶναι θάτερον ὑπὸ θάτερον· οἷον τὰ ὀπτικὰ πρὸς γεωμετρίαν, καὶ τὰ ἁρμονικὰ πρὸς ἀριθμητικήν. 6 Οὐδ' εἴ τι ὑπάρχει ταῖς γραμμαῖς, μὴ ᾗ γραμμαὶ, καὶ ᾗ ἐκ τῶν ἀρχῶν τῶν ἰδίων· οἷον, εἰ καλλίστη τῶν γραμμῶν ἡ εὐθεῖα, ἢ εἰ ἐναντίως ἔχει τῇ περιφερείᾳ. οὐ γὰρ ᾗ τὸ ἴδιον γένος αὐτῶν, ὑπάρχει, ἀλλ' ᾗ κοινόν τι.

axiomata autem ſunt, ex quibus *demonſtratio conſ-citur*. tertium *eſt* genus ſubiectum, cuius affectiones & per ſe accidentia demonſtratio declarat. 3 Ex quibus igitur demõſtratio *conſtat*, *ea* poſſunt eadem eſſe. quarum autem *ſcientiarum* genus *eſt* diuerſum, vt arithmeticæ & geometriæ, *in his* non licet arithmeticam demonſtrationem accommodare ad ea quæ magnitudinibus accidunt, niſi magnitudines numeri ſint. hoc autem quomodo accidat in quibuſdam, poſtea dicetur. 4 Sed arithmetica demonſtratio ſemper habet genus circa quod demonſtratio *verſatur*: & aliæ ſimiliter. quare aut ſimpliciter neceſſe *eſt* idem eſſe genus, aut quodam modo, ſi futurum eſt vt demonſtratio transferatur. alioquin *id* fieri non poſſe conſtat: quoniam ex eodem genere neceſſe *eſt* & extrema & media eſſe; quandoquidem, niſi *ſint* per ſe, accidentia erunt. 5 Idcirco geometriæ non licet demonſtrare contrariorum vnam eſſe ſcientiam, ſed nec duos cubos cubum *facere*. nec *vlli* alij ſcientiæ *licet demonſtrare problema* alterius ſcientiæ, iis exceptis quæ ita ſunt affecta inter ſe, vt alterum ſub altero contineatur: quomodo optica *problemata* ad geometriam, & harmonica ad arithmeticam *referuntur*. 6 Ne *id* quidem *ad geometriam pertinet*, ſi quid ineſt lineis, non quâ lineæ *ſunt*, & quâ ex propriis principiis *conſtant*. veluti ſi *linea* recta ſit linearum pulcherrima, aut circumductæ contraria. non enim proprij generis, ſed communis cuiuſdam ratione, *lineis hæc inſunt*.

Demonſtrationem eſſe tantùm rerum æternarum. Cap. VIII.

1 *De demonſtratione.* 2 *De definitione.* 3 *De his quæ ſæpe fiunt.*

Themiſtius in paraphraſi alio loco iſta habet: prorſuſque loco ſuo eſſe mota cenſent quidam vide Zabarellæ comm.

* γρ. αὐτό ἐστιν.

Philoponus annotat legi hunc locum in pleriſque codicibus ita, ὅτι τὸ καθόλου αὐτό ἐστιν, quam lectionem explicat, ſed negationẽ ſequentem ἀλλὰ retinendam dictat.

* γρ. ὃ μὲν & ὃ δὲ mox.

Φανερὸν δὲ καὶ, ἐὰν ὦσιν αἱ προτάσεις καθόλου ἐξ ὧν ὁ C συλλογισμὸς, ὅτι ἀνάγκη καὶ τὸ συμπέρασμα ἀΐδιον εἶναι, τῆς τοιαύτης ἀποδείξεως, καὶ τῆς (ἁπλῶς εἰπεῖν) ἀποδείξεως. οὐκ ἔστιν ἄρα ἀπόδειξις τῶν φθαρτῶν, οὐδ' ἐπιστήμη ἁπλῶς, ἀλλ' οὕτως, ὥσπερ κατὰ συμβεβηκός· ὅτι οὐ καθόλου* αὐτοῦ ἐστιν, ἀλλὰ ποτὲ καὶ πώς. ὅταν δ' ᾖ τοιαύτη, ἀνάγκη τὴν ἑτέραν μὴ καθόλου εἶναι πρότασιν, καὶ φθαρτήν. φθαρτὴν μὲν, ὅτι ἔσται καὶ τὸ συμπέρασμα, οὔσης τῆς προτάσεως. μὴ καθόλου δὲ, ὅτι* ὁ μὲν, ἔσται, ὁ δὲ, οὐκ ἔσται, ἐφ' ὧν. ὥστε οὐκ ἔστι συλλογίσασθαι καθόλου, ἀλλ' ὅτι νῦν. 2 Ὁμοίως δ' ἔχει καὶ περὶ ὁρισμούς· ἐπείπερ ἐστὶν ὁ ὁρισμὸς, ἢ ἀρχὴ ἀποδείξεως, ἢ ἀπόδειξις, θέσει διαφέρουσα, ἢ συμπέρασμά τι ἀποδείξεως. 3 Αἱ δὲ τῶν πολλάκις γινομένων ἀποδείξεις καὶ ἐπιστῆμαι, οἷον σελήνης ἐκλείψεως, δῆλον ὅτι, ᾗ μὲν τοιαίδε εἰσὶν, ἀεί εἰσιν. ᾗ δ' οὐκ ἀεὶ, κατὰ μέρος εἰσίν. ὥσπερ δ' ἡ ἔκλειψις, ὡσαύτως τοῖς ἄλλοις.

Perſpicuum quoque *eſt*, ſi propoſitiones ſunt vniuerſales ex quibus ſyllogiſmus ille *conſtat*, neceſſe *eſſe* vt æterna ſit etiam concluſio huiuſcemodi demonſtrationis, & (vt ſimpliciter dicam) ipſius demonſtrationis. non eſt igitur demonſtratio rerum caducarum, nec ſcientia abſolutè, ſed tamquàm per accidens: quia non eſt ipſius vniuerſalis, ſed interdum & quodam modo. cùm autem talis ſit, neceſſe *eſt ſaltem* alteram propoſitionem non vniuerſalem eſſe & caducam. caducam quidem: quia concluſio quoque erit, ſi ſit *vtraque* propoſitio. non vniuerſalem autem: quoniam aliud erit, aliud non erit, *ex iis de quibus dicitur*. quare non licet cõcludere vniuerſaliter, ſed quòd nunc *ita res ſe habeat*. 2 Similiter *ſe res* habet in definitionibus: quia definitio vel eſt principium demõſtrationis, vel demonſtratio poſitione *terminorum* differens, vel concluſio quędam demonſtrationis. 3 Eorum autem quæ ſæpe fiunt, demonſtrationes & ſcientias, vt Lunæ defectionis, perſpicuum *eſt*, quà tales ſunt, ſemper eſſe: quâ verò non ſemper *ſunt*, in parte eſſe. Quod autẽ de *Lunæ* defectione *dixi* idem *in* ceteris *ſimilibus rebus intelligi debet*.

Demonſtrationem non eſſe ex communibus: ſed ex propriis, proinde ex indemonſtrabilibus principiis: ex quibus an quis ſciat, non facile cognitu eſt. Cap. IX.

1 ¶ *Quia concluſio eſt per ſe, propoſitiones quoque eſſe per ſe, proinde non communes.* 2 *Probatio ſecundæ conſequentiæ.* 3 *Probatio primæ conſequentiæ à concluſione demonſtrationis ad propoſitiones.* 4 *Exceptio ſcientiarum ſubalternarum, quibus principia communia ſunt.* 5 ¶ *Principia eſſe indemonſtrabilia. Probatio.* 6 *Prolepſis.* 7 *Corollarium.*

Ἐπεὶ δὲ φανερὸν ὅτι ἕκαστον ἀποδεῖξαι οὐκ ἔστιν, ἀλλ' ἢ ἐκ τῶν ἑκάστου ἀρχῶν, ἂν τὸ δεικνύμενον ὑπάρχῃ ᾗ

Cum autem perſpicuum *ſit*, fieri non poſſe vt vnũquodque demonſtretur, niſi ex ſuis prin-

ciplis, ſi res quę probatur, *ſubiecto* inſit, quâ *ſubiectũ* A *eſt* illud *ipſum quod eſt*: certè eam rẽ ſcire, non eſt hoc, ſi ex veris & indemonſtrabilibus atque immediatis probatum fuerit. fieri enim poteſt, vt ita probetur, quemadmodum Bryſo tetragoniſmum. 2 Etenim huiuſcemodi rationes probant per commune *quidpiã*, quod & alteri *rei* inerit. idcirco aliis quoque non eiuſdem generis *rebus* hæ rationes aptantur. itaque non quâ *eſt* illud, ſcit, ſed ex accidenti: alioqui demonſtratio non aptaretur etiam alij generi. 3 Vnumquodque autem ſcimus non ex accidente, cùm ſecundùm illud cognoſcimus, ſecundùm quod ineſt, ex principiis, quæ illius, quâ illud *ipſum eſt*, *principia ſunt*. exempli causâ, duobus rectis æquales *angulos* habere *tunc ſcimus*, *quando*, B cui per ſe ineſt quod dictũ eſt, *cognoſcimus* ex principiis huius. quare ſi & illud per ſe ineſt *ei* cui ineſt, neceſſe *eſt* medium in eadem ſyngenia eſſe. 4 Sin minùs, *at certè ita erit*, vt *cùm probãtur problemata* harmonica per *principium* arithmeticum. quæ autem *ſunt* eiuſmodi, etſi itidem demonſtrantur, tamen differunt. quòd enim *ſit*, *eſt* alterius ſcientiæ: quia ſubiectum genus, *eſt* diuerſum. cur autem *ſit*, *eſt ſcientiæ* ſuperioris cuius per ſe affectiones ſunt. quare ex his etiam perſpicuum *eſt*, non poſſe demonſtrari vnumquodque ſimpliciter, niſi ex propriis principiis. ſed harum principia habent *aliquid* commune. 5 Quòd ſi perſpicuum hoc *eſt*: perſpicuum quoque *eſt*, nõ poſſe cuiuſque propria principia demonſtrari: C quoniam illa erunt omnium principia & eorum ſcientia *erit* omnium domina. etenim magis ſcit, qui ex ſuperioribus cauſis nouit: ex prioribus enim nouit, cùm ex iis nouit, quæ non *ſunt* effecta, ſed tantùm cauſæ. quare ſi magis nouit, etiam maximè, & ſi ſcientia illa ſit, & magis & maximè *ſcientia eſt*. 6 Demonſtratio verò non aptatur ad aliud genus, niſi (vt dictum eſt) geometricæ ad opticas vel mechanicas, & arithmeticæ ad harmonicas. 7 Difficile autẽ eſt cognoſcere, an *quiſpiam* nouit nécne: difficile enim *eſt* cognoſcere, vtrùm ex cuiuſque *rei* principiis ſciamus, an non: putamus autem ſcire, ſi *modo* ex veris & primis quibuſdam *propoſitionibus* habeamus ſyllogiſmum. ſed non *ita* eſt: verùm ſyngenea primis eſſe oportet.

A ἐκεῖνο· οὐκ ἔστι τὸ ἐπίστασθαι, τοῦτο, ἂν ἐξ ἀληθῶν καὶ ἀναποδείκτων δειχθῇ καὶ ἀμέσων. ἔστι γὰρ οὕτω δεῖξαι, ὥσπερ Βρύσων τὸν τετραγωνισμόν. 2 Κατὰ* κοινόν τε γὰρ δεικνύουσιν οἱ τοιοῦτοι λόγοι, ὃ καὶ ἑτέρῳ ὑπάρξει· διὸ καὶ ἐπ᾽ ἄλλων ἐφαρμόττουσιν οἱ λόγοι οὐ συγγενῶν. οὐκοῦν οὐχ, ᾗ ἐκεῖνο, ἐπίσταται, ἀλλὰ κατὰ συμβεβηκός· οὐ γὰρ ἂν ἐφήρμοττεν ἡ ἀπόδειξις καὶ ἐπ᾽ ἄλλο γένος. 3 Ἕκαστον δ᾽ ἐπιστάμεθα μὴ κατὰ συμβεβηκός, ὅταν καθ᾽ ὃ ἐκεῖνο γινώσκωμεν, καθ᾽ ὃ ὑπάρχει, ἐκ τῶν ἀρχῶν τῶν ἐκείνου ᾗ ἐκεῖνο· οἷον, τὸ δυσὶν ὀρθαῖς ἴσας ἔχειν, ᾧ ὑπάρχει καθ᾽ αὑτὸ τὸ εἰρημένον, ἐκ τῶν ἀρχῶν τῶν τούτου. ὥστ᾽ εἰ καθ᾽ αὑτὸ* ἐκεῖνο ὑπάρχει, ᾧ B ὑπάρχει· ἀνάγκη τὸ μέσον ἐν τῇ αὐτῇ συγγενείᾳ εἶναι. 4 Εἰ δὲ μή, ἀλλ᾽ ὡς τὰ ἁρμονικὰ δι᾽ ἀριθμητικῆς. τὰ δὲ τοιαῦτα δείκνυται μὲν ὡσαύτως, διαφέρει δέ. τὸ μὲν γὰρ ὅτι, ἑτέρας ἐπιστήμης· τὸ γὰρ ὑποκείμενον γένος, ἕτερον. τὸ δὲ διότι, τῆς ἄνω, ἧς καθ᾽ αὑτὰ τὰ πάθη ἐστίν. ὥστε καὶ ἐκ τούτων φανερόν, ὅτι οὐκ ἔστιν ἀποδεῖξαι ἕκαστον ἁπλῶς, ἀλλ᾽ ἢ ἐκ τῶν ἰδίων ἀρχῶν. ἀλλὰ τούτων αἱ ἀρχαὶ* ἔχουσι τὸ κοινόν. 5 Εἰ δὲ φανερὸν τοῦτο, φανερὸν καὶ ὅτι οὐκ ἔστι τὰς ἑκάστου ἰδίας ἀρχὰς ἀποδεῖξαι· ἔσονται γὰρ ἐκεῖναι ἁπάντων ἀρχαί, καὶ ἐπιστήμη ἡ ἐκείνων, κυρία πάντων. καὶ γὰρ ἐπίσταται μᾶλλον ὁ ἐκ τῶν* ἀνωτέρων αἰτίων εἰδώς· ἐκ τῶν προτέρων γὰρ οἶδεν, ὅταν μὴ ἐξ αἰτιατῶν εἰδῇ, ἀλλ᾽ αἰτίων. ὥστ᾽ εἰ C μᾶλλον οἶδε, καὶ μάλιστα. κἂν ἐπιστήμη ἐκείνη εἴη καὶ μᾶλλον καὶ μάλιστα. 6 Ἡ δ᾽ ἀπόδειξις οὐκ ἐφαρμόττει ἐπ᾽ ἄλλο γένος, ἀλλ᾽ ἢ (ὡς εἴρηται) αἱ γεωμετρικαὶ ἐπὶ τὰς ὀπτικάς, ἢ μηχανικάς, καὶ αἱ ἀριθμητικαὶ ἐπὶ τὰς ἁρμονικάς. 7 Χαλεπὸν δ᾽ ἐστὶ τὸ γνῶναι, εἰ οἶδεν, ἢ μή. χαλεπὸν γὰρ τὸ γνῶναι, εἰ ἐκ τῶν ἑκάστου ἀρχῶν ἴσμεν, ἢ μή· ὅπερ ἐστὶ τὸ εἰδέναι. οἰόμεθα δ᾽, ἂν ἔχωμεν ἐξ ἀληθῶν τινων συλλογισμὸν καὶ πρώτων, ἐπίστασθαι, τὸ δ᾽ οὐκ ἔστιν· ἀλλὰ συγγενῆ δεῖ εἶναι τοῖς πρώτοις.

* Scrib. κοινόν τε γ. vel κοινὸν tantùm vt Boëthus legit.

* γ. κἀκεῖνο.

* Quidam ἔχουσι τὸ κ. Philoponus τὸ καί.

* γ. τῶν αἰτιωτέρων.

Definitio & diuiſio principiorum. Cap. X.

1 ¶ Definitio: 2 & definitionis expoſitio. 3 ¶ Diuiſio in principia communia & propria. 4 ¶ Subdiuiſio propriorum principiorum. 5 Expoſitio dictæ ſubdiuiſionis. 6 Prolepſis. 7 ¶ Diſtinctio axiomatis ab hypotheſi & poſtulato. 8 ¶ Diſtinctio hypotheſeos, & poſtulati. 9 ¶ Diſtinctio definitionis & hypotheſeos. Differentia prima, à ſignificatione τῦ eſſe vel non eſſe. 10 Prolepſis, de ſuppoſitionibus geometricis. 1 Secunda differentia, à ſignificatione vniuerſi vel partis.

PRincipia verò in quoque genere appello ea, D quæ quòd ſint, probari nequit. 2 Quid igitur ſignificant & prima, & quæ ex his *concluduntur*, ſumitur. quòd autẽ principia ſint, ſumere: *quod* alia *ſint*, probare neceſſe *eſt*. veluti, quid *ſit* vnitas, aut quid rectũ & triangulum. ſed *etiam* vnitatẽ, & magnitudinem eſſe, *ſumere oportet*: reliqua vero probare. 3 Ex *iis* autẽ quibus vtuntur in demõſtratiuis ſcientiis, alia ſunt propria cuiuſque ſcientiæ, alia communia. communia *inquam*, ſecundum proportionem: quoniam *vnumquodque* vtile *eſt*, in quantum *eſt* in genere ſub ſcientiam *ſubiecto*. Propria *ſunt*, vt, lineam eſſe eiuſmodi, &, rectum *eſſe eiuſmodi*. communia, vt, ab æqualibus æqualia ſi auferas, quæ relinquuntur, *eſſe* æqualia. Sufficit autem horum vnumquodque, *in* quantũ *eſt* in genere *ſcientiæ ſubiecto*. idem enim faciet, etiãſi non de omnibus *geometra*

Λέγω δ᾽ ἀρχὰς ἐν ἑκάστῳ γένει ταύτας, ἃς, ὅτι ἔστι, μὴ ἐνδέχεται δεῖξαι. 2 Τί μὲν οὖν σημαίνει καὶ τὰ πρῶτα, καὶ τὰ ἐκ τούτων, λαμβάνεται. ὅτι δ᾽ ἔστι, τὰς μὲν ἀρχάς, ἀνάγκη λαμβάνειν· τὰ δ᾽ ἄλλα, δεικνύναι. οἷον, τί μονάς, ἢ τί τὸ εὐθύ, καὶ τρίγωνον. εἶναι δὲ τὴν μὲν μονάδα, λαβεῖν, καὶ τὸ μέγεθος· τὰ δ᾽ ἕτερα, δεικνύναι. 3 Ἔστι δ᾽ οἷς χρῶνται ἐν ταῖς ἀποδεικτικαῖς ἐπιστήμαις, τὰ μὲν, ἴδια ἑκάστης ἐπιστήμης· τὰ δέ, κοινά· κοινὰ δὲ κατ᾽ ἀναλογίαν· ἐπεὶ χρήσιμόν γε, ὅσον ἐν τῷ ὑπὸ τὴν ἐπιστήμην γένει. ἴδια μέν, οἷον, γραμμὴν εἶναι τοιανδί, καὶ τὸ εὐθύ. κοινὰ δέ, οἷον, τό, ἴσα ἀπὸ ἴσων ἂν ἀφέλῃ, ὅτι ἴσα τὰ λοιπά. ἱκανὸν δ᾽ ἕκαστον τούτων, ὅσον ἐν τῷ γένει. ταὐτὸν γὰρ ποιήσει, κἂν μὴ κατὰ πάντων

Cap. VIII.

λάβῃ, ἀλλ' ἐπὶ μεγεθῶν* μόνων· τῷ δ' ἀριθμητικῷ, ἐπ' ἀριθμῶν. 4 Ἔστι δ' ἴδια μὲν, καὶ ἃ λαμβάνεται εἶναι, περὶ ἃ ἡ ἐπιστήμη θεωρεῖ τὰ ὑπάρχοντα καθ' αὑτά. οἷον, μονάδας ἡ ἀριθμητική· ἡ δὲ γεωμετρία σημεῖα, καὶ γραμμάς. ταῦτα γὰρ λαμβάνουσι τὸ εἶναι, καὶ τοδὶ εἶναι. τὰ δὲ τούτων πάθη καθ' αὑτά, τί μὲν σημαίνει ἕκαστον, λαμβάνουσιν· οἷον, ἡ μὲν ἀριθμητική, τί περιττὸν, ἢ ἄρτιον, ἢ τετράγωνον, ἢ κύβος. ἡ δὲ γεωμετρία, τί τὸ ἄλογον, ἢ τί τὸ κεκλάσθαι, ἢ νεύειν. ὅτι δ' ἔστι, δεικνύουσι διά τε τῶν κοινῶν καὶ ἐκ τῶν ἀποδεδειγμένων. καὶ ἡ ἀστρολογία ὡσαύτως. 5 Πᾶσα γὰρ ἀποδεικτικὴ ἐπιστήμη, περὶ τρία ἐστὶν, ὅσα τε εἶναι τίθεται· ταῦτα δ' ἐστὶ τὸ γένος, οὗ τῶν καθ' αὑτὰ παθημάτων ἐστὶ θεωρητική· καὶ τὰ κοινὰ, ἃ λέγομεν ἀξιώματα, ἐξ ὧν πρώτων ἀποδεικνύουσι· καὶ τρίτον, τὰ πάθη, ὧν τί σημαίνει ἕκαστον, λαμβάνει. 6 Ἐνίας μέν τοι ἐπιστήμας οὐδὲν κωλύει ἔνια τούτων παρορᾷν· οἷον, τὸ γένος μὴ ὑποτίθεσθαι εἶναι, ἂν ᾖ φανερὸν ὅτι ἐστίν· (οὐ γὰρ ὁμοίως δῆλον, ὅτι ὁ ἀριθμός ἐστι, καὶ ὅτι θερμὸν καὶ ψυχρόν) καὶ τὰ πάθη μὴ λαμβάνειν τί σημαίνει, ἂν ᾖ δῆλα· ὥσπερ οὐδὲ τὰ κοινὰ οὐ λαμβάνει* τί σημαίνει τὸ ἴσα ἀπὸ ἴσων ἀφελεῖν, ὅτι γνώριμον. ἀλλ' οὐδὲν ἧττον τῇ γε φύσει τρία ταῦτά ἐστι, περὶ ὅ, τε δείκνυσι, καὶ ἃ δείκνυσι, καὶ ἐξ ὧν. 7 Οὐκ ἔστι δ' ὑπόθεσις, οὐδ' αἴτημα, ὃ ἀνάγκη εἶναι δι' αὑτὸ, καὶ δοκεῖν ἀνάγκη. οὐ γὰρ πρὸς τὸν ἔξω λόγον ἡ ἀπόδειξις, ἀλλὰ πρὸς τὸν ἐν τῇ ψυχῇ· ἐπεὶ οὐδὲ συλλογισμός. ἀεὶ γάρ ἐστιν ἐνστῆναι πρὸς τὸν ἔξω λόγον· ἀλλὰ πρὸς τὸν ἔσω λόγον,* οὐκ ἀεί. 8 Ὅσα μὲν οὖν δεικτὰ ὄντα λαμβάνει αὐτὸς μὴ δείξας· ταῦτα, ἐὰν μὲν δοκοῦντα λαμβάνῃ τῷ μανθάνοντι, ὑποτίθεται· καὶ ἔστιν οὐχ ἁπλῶς ὑπόθεσις, ἀλλὰ πρὸς ἐκεῖνον μόνον. ἐὰν δὲ ἢ μηδεμιᾶς ἐνούσης δόξης, ἢ καὶ ἐναντίας ἐνούσης, λαμβάνῃ τὸ αὐτὸ αἰτεῖται. καὶ τούτῳ διαφέρει ὑπόθεσις καὶ αἴτημα· ἔστι γὰρ αἴτημα, τὸ ὑπεναντίον τοῦ μανθάνοντος τῇ δόξῃ· ἢ ὃ ἄν τις ἀποδεικτὸν ὂν λαμβάνῃ, καὶ χρῆται μὴ δείξας. 9 Οἱ μὲν οὖν ὅροι οὐκ εἰσὶν ὑποθέσεις· οὐδὲ γὰρ εἶναι, ἢ μὴ εἶναι λέγονται. Ἀλλ' ἐν ταῖς προτάσεσιν αἱ ὑποθέσεις. Τοὺς δ' ὅρους μόνον ξυνίεσθαι δεῖ. τοῦτο δ', οὐχ ὑπόθεσις· εἰ μὴ καὶ τὸ ἀκούειν, ὑπόθεσίν τις φήσειεν εἶναι. Ἀλλ' ὅσων ὄντων, τῷ ἐκεῖνα εἶναι, γίνεται τὸ συμπέρασμα. 10 Οὐδ' ὁ γεωμέτρης ψευδῆ ὑποτίθεται, ὥσπερ τινὲς ἔφασαν λέγοντες, ὡς οὐ δεῖ τῷ ψεύδει* χρῆσθαι, τὸν δὲ γεωμέτρην ψεύδεσθαι λέγοντα ποδιαίαν τὴν οὐ ποδιαίαν, ἢ εὐθεῖαν τὴν γεγραμμένην, οὐκ εὐθεῖαν οὖσαν. ὁ δὲ γεωμέτρης οὐδὲν συμπεραίνεται τῷ τήνδε εἶναι γραμμὴν, ἣν αὐτὸς ἔφθεγκται, ἀλλὰ τὰ διὰ τούτων δηλούμενα. 11 Ἔτι τὸ αἴτημα καὶ ὑπόθεσις πᾶσα, ἢ ὡς ὅλον, ἢ ὡς ἐν μέρει· οἱ δ' ὅροι, οὐδέτερον τούτων.

* γ. μόνον.

* γ. τί σημαίνει τὸ τὰ ἴσα.

Post hæc verba ſequũtur apud Themiſtium quæ toto decimo textu continentur. vide Zabar. Comm.

* γ. χρῆσθαι τὸν γεωμέτρην. τὸν δὲ γ.

A ſumpſerit, ſed in magnitudinibus ſolis. arithmetico verò *ſufficiet, ſi accipiatur* in *ſolis* numeris. 4 Sunt autem propria, & quæ ſumuntur eſſe, circa quæ ſcientia conſiderat *ea* quæ inſunt per ſe. verbi causâ, vnitates *eſſe* arithmetica *ſumit*. geometria verò puncta, & lineas. nam hæc ſumunt eſſe, & eſſe hoc. quæ verò *ſunt* horum affectiones per ſe, quid *earum* vnaquæque ſignificet, accipiunt: vt arithmetica, quid impar vel par, vel quadratum, vel cubus. geometria, quid irrationale, aut quid inflecti, aut concurrere. quòd autem ſit, demonſtrant per communia, & per ea quæ demonſtrata fuerunt. itidémque *facit* aſtrologia. 5 Omnis enim B demõſtratiua ſcientia circa tria eſt. *horum duo ſunt*, quæ ponuntur eſſe: nempe genus, cuius per ſe affectiones *ſcientia* contemplatur: & communia illa, quæ vocamus axiomata, ex quibus primis demonſtrant. tertium *eſt*, affectiones: quarum quid quæque ſignificet, *demonſtrator* accipit. 6 Sanè ſcientiæ nonnullæ quominùs ex his quædã deſpiciant, nihil vetat. vtputà *aliqua ſcientia* non ſupponat genus eſſe, ſi liquidò conſtet *illud* eſſe: (non enim æquè manifeſtum *eſt* numerum eſſe, atque calidum & frigidum) neque accipiat, quid affectiones ſignificent, ſi ſint manifeſtæ: quemadmodum ne communia quidem accipit quid ſignificent, *veluti quid ſignificet* æqualia ab æqualibus auferre, quia C notum *eſt*. Sed nihilominùs naturâ tria hæc ſunt *id eſt*, circa quod demonſtrat, & quæ demonſtrat, & ex quibus. 7 Non eſt autem ſuppoſitio, nec poſtulatum, *id* quod neceſſe *eſt* eſſe per ſe, & videri neceſſe *eſt*. non enim ad externum ſermonem demõſtratio *pertinet*, ſed ad eum qui eſt in anima: quia nec ſyllogiſmus *ad illum, ſed ad hunc pertinet*. ſemper enim licet obiicere aduerſus ſermonẽ extremum, ſed aduerſus internum ſermonem non ſemper *licet*. 8 Quæcumque igitur, cùm probari poſſint, ſumit ipſe *demõſtrator* ſine probatione, hæc ſi accipiat probabilia diſcenti, ſupponit: & eſt non ſimpliciter ſuppoſitio, ſed ad illum ſolum. ſi verò cũ nulla inſit opinio, aut etiam *cùm* contraria inD ſit: *demonſtrator* ſumat, idem poſtulat. eóque differunt, ſuppoſitio, *quæ Græco vocabulo hypotheſis appellatur*, & poſtulatum. eſt enim poſtulatum, quod eſt ſubcontrarium diſcentis opinioni, quod cùm ſit demonſtrabile, aliquis ſumit, *eó*que vtitur nõ probato. 9 Definitiones igitur non ſunt ſuppoſitiones, quia non dicunt eſſe aut non eſſe. Verùm in propoſitionibus ſuppoſitiones *continentur*. Definitiones verò tantùm intelligi oportet. hoc autem non *eſt* ſuppoſitio: niſi quis & *verbum* AVDIRE, ſuppoſitionem eſſe dixerit. Sed *illæ ſunt ſuppoſitiones*, quibus poſitis, quia illæ ſunt, efficitur concluſio. 10 Neque geometra falſa ſupponit, vt nonnulli aſſerunt, qui non oportere inquiunt falſo *principio* vti, geometram verò mentiri, dum pedalem ait *eſſe lineam*, quæ non eſt pedalis; aut rectam *eam*, quam deſcripſit, quæ non eſt recta. at geometra nihil concludit *ex eo* quòd ſit hæc linea, quam ipſe protulit, ſed *quod ſunt ea* quæ hiſce *notis* declarantur. 11 Præterea poſtulatum ſuppoſitióque omnis vel *eſt* vt totum, vel vt in parte. definitiones autem neutrum horum *ſunt*.

De principiis quibuſdam omnium ſcientiarum communibus. Cap. XI.

1 ¶ De ideis. 2 ¶ De axiomatis contradictionis. Affirmationem & negationem ſimul veras eſſe non poſſe. 3 Aut affirmationem eſſe veram, aut negationem. 4 Vſus horum axiomatum. 5 ¶ Scientiis communia eſſe axiomata, 6 & dialecticam, 7 & metaphyſicam. 8 ¶ Diſcrimen dialecticæ & metaphyſicæ.

SPecies igitur eſſe aut vnum quidpiam præter A multa, non neceſſe *eſt*, ſi demonſtratio fuerit. ſed neceſſe *eſt*, vt verè dicatur eſſe vnum de multis: quia non erit vniuerſale, niſi hoc ſit: quòd ſi, vniuerſale non ſit, medium non erit: proinde nec demonſtratio. Oportet igitur aliquid vnum & idẽ in pluribus eſſe non homonymum. 2 Fieri autem nõ poſſe vt *idem* ſimul affirmetur & negetur, nulla ſumit demonſtratio, niſi oporteat etiam cõcluſionem ſic probare. probatur autem, cùm ſumptum fuerit primum de medio verè *affirmari*, non verè negari. medium autem ſumere eſſe & non eſſe, nihil refert: itidémque tertium. nam ſi conceſſum fuerit, de quo homo verè dicitur, quamvis non B homo verè dicatur, ſi modò tamen homo *verè dicitur* eſſe animal, non autem non animal: profectò verè dicetur Calliam, etiamſi non *ſit* Callias, tamẽ eſſe animal, non autem non animal. *Huius* autem *rei* cauſa *eſt*: quia primum non ſolùm de medio dicitur: ſed etiam de alio: quippe quod eſt in multis, quòcirca ſi medium, & idipſum eſt & nõ idipſum, ad concluſionem nihil attinet. 3 De quavis autẽ re affirmationem aut negationem *veram eſſe*, ea demonſtratio ſumit, quę *ducit* ad impoſſibile. 4 Atque hæc *axiomata* non *ſumuntur* ſemper vniuerſaliter, ſed in quantum ſufficit. ſufficit autem, *quod ſumitur* in genere *ſubiecto*. dico autem in genere ſub- C iecto, vt circa quod genus demõſtrationes *affert*, quemadmodum anteà quoq; dictum fuit. 5 Cõmunicant autem inter ſe omnes ſcientiæ ſecundũ communia. communia verò appello *ea*, quibus vtuntur tanquã ex his demonſtrantes, non *ea* de quibus *de*monſtrãt, nec quod *de*monſtrant. 6 Ac dialectica omnibus *ſcientiis communis eſt*. 7 Et ſi qua *ſciẽtia* vniuerſaliter conatur probare communia *principia*: veluti, de quacumque re *veram eſſe* affirmationem vel negationem: aut, *eſſe* æqualia, *quæ relinquũtur, cùm* ab æqualibus *æqualia dempta fuerint*: aut alia eiuſmodi. 8 Dialectica verò non eſt ita definitorum quorumdam, neque vnius cuiuſdam generis. alioqui non interrogaret. demonſtranti namque non licet interrogare: quia ex oppoſitis non probatur idem, vt probatum fuit in *libris* de ſyllogiſmo.

Εἴδη μὲν οὖν εἶναι, ἢ ἕν τι παρὰ τὰ πολλά, οὐκ ἀνάγκη, εἰ ἀπόδειξις ἔσται. εἶναι μέντοι ἓν κατὰ πολλῶν ἀληθὲς εἰπεῖν, ἀνάγκη· οὐ γὰρ ἔσται τὸ καθόλου, ἂν μὴ τοῦτο ᾖ· ἐὰν δὲ τὸ καθόλου μὴ ᾖ, τὸ μέσον οὐκ ἔσται· ὥστ᾽ οὐδ᾽ ἀπόδειξις. δεῖ ἄρα * τι ἓν καὶ τὸ αὐτὸ ἐπὶ πλειόνων εἶναι μὴ ὁμώνυμον. 2 Τὸ δὲ μὴ ἐνδέχεσθαι ἅμα φάναι καὶ ἀποφάναι, οὐδεμία λαμβάνει ἀπόδειξις, ἀλλ᾽ ἢ ἐὰν δέῃ δεῖξαι καὶ τὸ συμπέρασμα οὕτως. δείκνυται δὲ λαβοῦσι τὸ πρῶτον κατὰ τοῦ μέσου, ὅτι ἀληθές· ἀποφάναι δ᾽, οὐκ ἀληθές. τὸ δὲ μέσον οὐδὲν διαφέρει εἶναι καὶ μὴ εἶναι λαβεῖν. ὡσαύτως καὶ τὸ τρίτον. εἰ γὰρ ἐδόθη, καθ᾽ οὗ ἄνθρωπον ἀληθὲς εἰπεῖν, εἰ καὶ μὴ ἄνθρωπον ἀληθές, ἀλλ᾽ εἰ μόνον ἄνθρωπον, ζῷον εἶναι, μὴ ζῷον δὲ μή· ἔσται γὰρ ἀληθὲς εἰπεῖν Καλλίαν, εἰ καὶ μὴ Καλλίαν, ὅμως ζῷον, μὴ ζῷον δ᾽ οὔ. αἴτιον δέ, ὅτι τὸ πρῶτον οὐ μόνον κατὰ τοῦ μέσου λέγεται, ἀλλὰ καὶ κατ᾽ ἄλλου, διὰ τὸ εἶναι ἐπὶ πλειόνων. ὥστ᾽ οὐδ᾽ εἰ τὸ μέσον, καὶ αὐτό ἐστι καὶ μὴ αὐτό, πρὸς τὸ συμπέρασμα, οὐδὲν διαφέρει. 3 Τὸ δ᾽ ἅπαν φάναι ἢ ἀποφάναι, ἡ εἰς τὸ ἀδύνατον ἀπόδειξις λαμβάνει. 4 Καὶ ταῦτα οὐδ᾽ ἀεὶ καθόλου, ἀλλ᾽ ὅσον ἱκανόν. ἱκανὸν δ᾽ ἐπὶ τοῦ γένους. λέγω δὲ τοῦ ἐπὶ τοῦ γένους, οἷον περὶ ὃ γένος τὰς ἀποδείξεις φέρει, ὥσπερ εἴρηται καὶ πρότερον. 5 Ἐπικοινωνοῦσι δὲ πᾶσαι αἱ ἐπιστῆμαι ἀλλήλαις κατὰ τὰ κοινά. κοινὰ δὲ λέγω, οἷς χρῶνται ὡς ἐκ τούτων ἀποδεικνύντες· ἀλλ᾽ οὐ περὶ ὧν δεικνύουσιν, οὐδ᾽ ὃ δεικνύουσι. 6 Καὶ ἡ διαλεκτικὴ πάσαις. 7 Καὶ εἴ τις καθόλου πειρῷτο δεικνύναι τὰ κοινά· οἷον, ὅτι ἅπαν φάναι καὶ ἀποφάναι, ἢ ὅτι ἴσα ἀπὸ ἴσων, ἢ τῶν τοιούτων ἄττα. 8 Ἡ δὲ διαλεκτικὴ οὐκ ἔστιν οὕτως ὡρισμένων τινῶν, οὐδὲ γένους ἑνός τινος. οὐ γὰρ ἂν ἠρώτα. ἀποδεικνύντα γὰρ οὐκ ἔστιν ἐρωτᾶν, διὰ τὸ τῶν * ἀντικειμένων ὄντων, μὴ δείκνυσθαι τὸ αὐτό. δέδεικται δὲ τοῦτο ἐν τοῖς περὶ συλλογισμοῦ.

De interrogationibus, & obiter de ſcientiarum incremento. Cap. XII.

1 ¶ De interrogationibus ſcientialibus. An ſint. 2 Quænam ſint. 3 De quibus ſit diſceptandum. 4 Quænam interrogare, & ad quæ reſpondere oporteat. 5 Quomodo & ex quibus diſputari, probari, 6 redargui debeat. 7 Apud quos diſceptandum ſit. 8 ¶ De interrogationibus à ſcientia alienis. An ſint, & quænam ſint: & quomodo fiant praui ſyllogiſmi in ſcientiis. 9 De interrogationibus ad aliam artem pertinentibus: & de falſis. 10 De paralogiſmo propter homonymiam. 11 De obiectione aduerſus mathematicos, quaſi committant paralogiſmos arguentes ex particularibus. 12 De paralogiſmo ex duabus propoſitionibus affirmantibus in ſecunda figura. 13 De paralogiſmo ex propoſitionibus falſis. 14 De incremento ſcientiarum per aſſumptionem, 15 & per tranſuerſum.

SI verò idẽ eſt interrogatio ſyllogiſtica, & pro- D poſitio *quæ eſt altera pars* cõtradictionis: propoſitiones autem *ſunt* in quaque ſcientia, ex quibus *cõſtat* ſyllogiſmus ille qui in quaque ſcientia *efficitur*: ſit vtique interrogatio quædam ſcientialis, *de his* ex quibus fit ſyllogiſmus in quaque *ſciẽtia* proprius. 2 Conſtat igitur nõ omnem interrogationem eſſe geometricã, aut medicam. ſimiliter autem *ſe res habet* etiam in aliis. ſed *ea demũ ſunt interrogationes geometricæ*, ex quibus vel probatur *eorum* quidpiã, de quibus eſt geometria, vel quæ ex eiſdem principiis probantur, ex quibus geometria, cuiuſmodi *ſunt* optica *problemata*. ſimiliterque *res ſe habet* in aliis. 3 Ac de his quidem etiam diſceptatio ſubeunda *eſt* ex geometricis principiis & concluſionibus. de principiis autem diſceptatio ſubeun-

Εἰ δὲ τὸ αὐτό ἐστιν ἐρώτημα συλλογιστικὸν, καὶ πρότασις ἀντιφάσεως· προτάσεις δὲ καθ᾽ ἑκάστην ἐπιστήμην, ἐξ ὧν ὁ συλλογισμὸς ὁ καθ᾽ ἑκάστην· εἴη ἄν τι ἐρώτημα ἐπιστημονικὸν, ἐξ ὧν ὁ καθ᾽ ἑκάστην οἰκεῖος γίνεται συλλογισμός. 2 Δῆλον ἄρα, ὅτι οὐ πᾶν ἐρώτημα γεωμετρικὸν ἂν εἴη, οὐδ᾽ ἰατρικόν. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. ἀλλ᾽ ἐξ ὧν ἢ δείκνυταί τι, περὶ ὧν ἡ γεωμετρία ἐστίν, ἢ ἃ ἐκ τῶν αὐτῶν δείκνυται τῇ γεωμετρίᾳ, ὥσπερ τὰ ὀπτικά. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. 3 Καὶ περὶ μὲν τούτων καὶ λόγον ὑφεκτέον ἐκ τῶν γεωμετρικῶν ἀρχῶν καὶ συμπερασμάτων. περὶ δὲ τῶν ἀρχῶν λόγον οὐχ

ὑφεκτέον τῷ γεωμέτρῃ ᾗ γεωμέτρης. ὁμοίως δὲ καὶ ἐπὶ ἄλλων ἐπιστημῶν. 4 Οὔτε πᾶν ἄρα ἕκαστον ἐπιστήμονα ἐρώτημα ἐρωτητέον, οὔτε ἅπαν τὸ ἐρωτώμενον ἀποκριτέον περὶ ἑκάστου· ἀλλὰ τὰ κατὰ τὴν ἐπιστήμην διωρισθέντα. 5 Εἰ δὲ διαλέξεται γεωμέτρῃ ᾗ γεωμέτρης. οὕτως φανερὸν ὅτι καὶ καλῶς, ἐὰν ἐκ τούτων τι δεικνύῃ. εἰ δὲ μή, οὐ καλῶς. 6 Δῆλον δὲ ὅτι οὐδ᾽ ἐλέγχει γεωμέτρην, ἀλλ᾽ ἢ κατὰ συμβεβηκός. 7 Ὥστ᾽ οὐκ ἂν εἴη ἐν ἀγεωμετρήτοις περὶ γεωμετρίας διαλεκτέον. λήσει γὰρ ὁ φαύλως διαλεγόμενος. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων ἐπιστημῶν. 8 Ἐπεὶ δ᾽ ἔστι γεωμετρικὰ ἐρωτήματα, * ἆρ᾽ ἔστι καὶ ἀγεωμέτρητα; καὶ παρ᾽ ἑκάστην ἐπιστήμην τὰ κατὰ τὴν ἄγνοιαν τὴν ποίαν γεωμετρικά ἐστιν ἢ ἀγεωμέτρητα; καὶ πότερον ὁ κατὰ τὴν ἄγνοιαν συλλογισμός, ὁ ἐκ τῶν ἀντικειμένων συλλογισμός, ἢ παραλογισμός, κατὰ γεωμετρίαν δέ. 9 Ἢ ἐξ ἄλλης τέχνης, οἷον τὸ μουσικόν, ἐστὶν ἐρώτημα ἀγεωμέτρητον * περὶ γεωμετρίας· τὸ δὲ τὰς παραλλήλους συμπίπτειν οἴεσθαι, γεωμετρικόν πως· καὶ ἀγεωμέτρητον, ἄλλον τρόπον; διττὸν γὰρ τοῦτο, ὥσπερ τὸ ἄρρυθμον· καὶ τὸ μὲν ἕτερον, ἀγεωμέτρητον τῷ μὴ ἔχειν, ὥσπερ τὸ ἄρρυθμον· τὸ δὲ ἕτερον τῷ φαύλως ἔχειν· καὶ ἡ ἄγνοια αὕτη, ἡ ἐκ τῶν τοιούτων ἀρχῶν, ἐναντία. 10 Ἐν δὲ τοῖς μαθήμασιν οὐκ ἔστιν ὁμοίως ὁ παραλογισμός, ὅτι τὸ μέσον ἐστὶν ἀεὶ διττόν· κατά τε γὰρ τούτου παντός, καὶ τοῦτο πάλιν κατ᾽ ἄλλου λέγεται παντός. τὸ δὲ κατηγορούμενον οὐ λέγεται πᾶν. ταῦτα δ᾽ ἔστιν οἷον ὁρᾶν τῇ νοήσει. ἐν δὲ τοῖς λόγοις λανθάνει, ἆρα πᾶς κύκλος σχῆμα; ἂν δὲ γράψῃ, δῆλον. τί δέ; τὰ ἔπη κύκλος; φανερὸν ὅτι οὐκ ἔστιν. 11 Οὐ δεῖ δ᾽ ἔνστασιν εἰς αὐτὸ φέρειν, ἂν ᾖ ἡ πρότασις ἐπακτική. ὥσπερ γὰρ οὐδὲ πρότασίς ἐστιν, ἣ μὴ ἐστὶν ἐπὶ πλειόνων (οὐ γὰρ ἔσται ἐπὶ πάντων· ἐκ τῶν καθόλου δ᾽, ὁ συλλογισμός) δῆλον ὅτι οὐδ᾽ ἔνστασις. αἱ αὐταὶ γὰρ, προτάσεις καὶ ἐνστάσεις· ἣν γὰρ φέρει ἔνστασιν, αὕτη γένοιτ᾽ ἂν πρότασις ἢ ἀποδεικτική, ἢ διαλεκτική. 12 Συμβαίνει δ᾽ ἐνίοις ἀσυλλογίστως λέγειν, διὰ τὸ λαμβάνειν ἀμφοτέροις τὰ ἑπόμενα. οἷον καὶ ὁ Καινεὺς ποιεῖ, ὅτι τὸ πῦρ ἐν τῇ * πολλαπλασίῳ ἀναλογίᾳ· καὶ γὰρ τὸ πῦρ ταχὺ γεννᾶται, (ὥς φησι) καὶ αὕτη ἡ ἀναλογία· οὕτω δ᾽ οὐκ ἔστι συλλογισμός· ἀλλ᾽ εἰ τῇ ταχίστῃ ἀναλογίᾳ ἕπεται ἡ * πολλαπλάσιος, καὶ τῷ πυρὶ ἡ ταχίστη ἐν τῇ κινήσει ἀναλογία. ἐνίοτε μὲν οὖν οὐκ ἐνδέχεται συλλογίσασθαι ἐκ τῶν εἰλημμένων. ὁτὲ δὲ ἐνδέχεται, ἀλλ᾽ οὐχ ὁρᾶται. 13 Εἰ δ᾽ ἦν ἀδύνατον * ἐκ ψευδῶν ἀληθὲς δεῖξαι, ῥᾴδιον ἂν ἦν τὸ ἀναλύειν· * ἀντέστρεφε γὰρ ἂν ἐξ ἀνάγκης. ἔστω γὰρ τὸ α, ὄν· τούτου δ᾽ ὄντος, ταδὶ ἔστιν, ἃ οἶδα ὅτι ἐστίν, οἷον τὸ β. ἐκ τούτων ἄρα δείξω ὅτι ἔστιν ἐκεῖνο. Ἀντιστρέφει δὲ μᾶλλον τὰ ἐν τοῖς μαθήμασιν, ὅτι * οὐδὲν συμβεβηκὸς λαμβάνουσιν, (ἀλλὰ καὶ τούτῳ διαφέρουσι τῶν ἐν τοῖς διαλόγοις) ἀλλ᾽ ὁρισμούς. 14 Αὔξεται δ᾽ οὐ διὰ τῶν μέσων, ἀλλὰ τῷ προσλαμβάνειν. οἷον, τὸ α τοῦ β, τοῦτο δὲ τοῦ γ, πάλιν τοῦτο τοῦ δ, καὶ τοῦτ᾽ εἰς ἄπειρον. 15 Καὶ εἰς τὸ πλάγιον· οἷον, τὸ α καὶ κατὰ * τοῦ γ, καὶ κατὰ τοῦ ε. οἷον, ἔστιν ἀριθμὸς ποσὸς ἢ καὶ ἄπειρος, τοῦτο ἐφ᾽ ᾧ α· ὁ περιττὸς ἀριθμὸς ποσός, ἐφ᾽ οὗ β· ἀριθμὸς περιττός, ἐφ᾽ οὗ γ. ἔστιν ἄρα τὸ α κατὰ τοῦ γ. καὶ ἔστιν ὁ ἄρτιος ποσὸς ἀριθμός, ἐφ᾽ οὗ δ· ὁ ἄρτιος ἀριθμός, ἐφ᾽ οὗ ε· ἔστιν ἄρα τὸ α κατὰ τοῦ ε.

Philoponus annotat legi etiã ἄρα, & mox ποίαν ſublatis interrog. notis eãmque lectionem magis probat.

* γρ. περὶ γεωμετρίαν, al. περὶ γεωμέτρας vel γεωμετρίᾳ.

* γρ. πολλαπλασίᾳ.

* γρ. πολλαπλάσιος.

* γρ. ἐκ ψευδοῦς.

* γρ. ἀντιστρέφει.

* γρ. οὐ τῶν λαμ. ὁρισμούς. ἀλλὰ καὶ τούτῳ διαφέρουσι τῶν ἐν τοῖς διαλόγοις. αὐξ. Philopon. vulgatam lect. agnoſcit.

* γρ. τοῦ β.

A da non *eſt* geometræ quâ *eſt* geometra: ſimiliterq; *ſe res habet* in aliis ſcientiis. 4 Neque igitur omni interrogatione quiſque ſciens *eſt* interrogandus, nec ad omnem interrogationem reſpõdere oportet de quauis re, ſed *ad* ea quæ illius ſcientiæ, *quam quiſque tenet*, finibus continentur. 5 *Si quis* verò ſic diſputet cum geometra quâ geometra *eſt*, apparet eum rectè *diſputare*, ſi ex his quidpiam probet. ſin minùs, non rectè. 6 Sed & manifeſtũ *eſt*, eum non redarguere geometriam, niſi per accidens. 7 Quocirca apud geometriæ imperitos non eſt de geometria diſſerendum. latebit enim vitioſè diſſerens. ſimiliter autem *res ſe habet* B etiã in aliis ſcientiis. 8 Quia verò ſunt *quædam* geometricæ interrogationes, ſuntne etiam non geometricæ? & in quaque ſcientia, quæ ſunt ſecundũ ignorantiam, *ſecundum* qualem ſunt geometricæ, vel non geometricæ? & vtrùm ſyllogiſmus ſecundũ ignorantiam *eſt* ſyllogiſmus *conſtans* ex oppoſitis, an paralogiſmus, ſecundum geometriam tamen? 9 An ex alia arte, vt interrogatio muſica, *eſt* non geometrica de geometria: putare autem æquidiſtantes concurrere, geometricum *eſt* quodammodo, & non geometricum alio modo? duplex enim hec *eſt*, quemadmodum arrythmum: & alterum quidem *eſt* non geometricum, quia non habet ſicut arrythmum: alterũ C verò, quia praue habet. atque hæc ignorantia quæ *eſt* ex huiuſmodi principiis, *eſt* cõtraria *ſcientiæ*. 10 In mathematicis autem non æquè *atque in diſputationibus, eſt* paralogiſmus: quia medium ſemper eſt duplex. etenim *aliud* de hoc omni, & hoc de alio omni dicitur. attributiuum verò non dicitur omne. hæc autem licet quaſi videre intelligentiâ. in diſputationibus verò latet, an omnis circulus *ſit* figura. quòd ſi deſcripſerit, manifeſtum *eſt*. quid autem? carmina ſunt circulus? apparet non eſſe. 11 Non oportet autem aduerſus id obiicere, ſi ſit propoſitio inductiua: nam quemadmodum nõ eſt propoſitio, quæ non eſt in pluribus: (quia non D erit in omnibus: ex vniuerſalibus autem *propoſitionibus* ſyllogiſmus ille *conſtat*) ita nec obiectionem *eſſe* conſtat. eædem enim ſunt propoſitiones & obiectiones. quam enim obiectionem *quiſpiam* affert, hęc poteſt fieri propoſitio vel demonſtratiua, vel dialectica. 12 Accidit autem vt nonnulli vitioſè concludãt: quoniam accipiunt *ea quæ* ambobus *extremis* conſequentia *ſunt*, vt & Cæneus facit *concludẽs* ignem *gigni* multiplici proportione: quia & ignis celeriter gignitur, vt *ipſe* ait, & hæc proportio. ſic autem non eſt ſyllogiſmus: ſed ſi celerrimæ proportioni conſequens ſit multiplex, ignique celerrima in motione proportio. Interdum igitur non accidit vt concludatur ex iis quæ ſum- E pta fuerunt: interdum verò contingit, ſed non videtur. 13 Quòd ſi non poſſet ex falſis verum probari, facilis eſſet reſolutio: quia neceſſario conuerteretur. ponatur enim eſſe τὸ α: cùm autem hoc ſit, hęc *quoque* ſunt quę eſſe noui, veluti τὸ β. ex his igitur oſtendam illud eſſe. Magis autem conuertuntur, quæ *traduntur* in mathematicis: quia nullum accidens accipiunt, (immo hoc differunt ab iis de quibus diſſeritur) ſed definitiones. 14 Augentur autem non per media, ſed quia aſſumunt *alia*, vt τὸ α de β, & hoc de γ, rurſus hoc de δ, & hoc in infinitum. 15 Et in tranſuerſum: veluti τὸ α & de γ, & de ε. vtputà eſt numerus tantus vel infinitus: hoc, vbi α: impar numerus tantus, vbi β: numerus impar, vbi γ: eſt igitur τὸ α de γ. atque eſt par tantus numerus, vbi δ: par numerus, vbi ε: eſt igitur τὸ α de ε.

Differentiæ demonſtrationis ac ſcientiæ quòd ſit, & cur ſit. Cap. XIII.

1 ¶ Duobus modis in eadem ſcientia differre Quòd ſit & Cur ſit. 2 ¶ De primo modo. Exemplum demonſtrationis per effectum 3 collata cum demonſtratione per cauſam. 4 Alterum exemplum demonſtrationis per effectum 5 collata cum demonſtratione per cauſam. 6 Quando per effectum demonſtretur quod ſit: non per cauſam cur ſit. 7 ¶ De ſecundo modo, id eſt, de demonſtratione per cauſam remotam. Cùm hac cauſa vtimur, ſolùm demonſtrari quòd ſit, non cur ſit. 8 Exemplum primum. 9 De figura huiuſcemodi ſyllogiſmorum. 10 Comparatio. 11 Exemplum alterum. 12 ¶ Epilogus. 13 ¶ Quomodo in diuerſis ſcientiis differant Quòd ſit & Cur ſit. De ſcientiis omnino ſubalternis. 14 De nexu & ordine plurium ſcientiarum ſubalternarum. 15 De ſcientiis non omnino ſubalternis, ſed ratione quorumdam problematum.

A SCire autem quòd *ſit*, & cur *ſit*, differunt primū quidem in eâdem ſcientia: atque in hac bifariam. vno modo, ſi non ex immediatis efficiatur ſyllogiſmus: quia non accipitur prima cauſa: ſcientia verò cur *res ſit*, per primā cauſam *habetur*. alio modo, ſi *fiat* quidem ex immediatis at non ex cauſa, ſed ex eo, quod inter ea, quæ reciprocātur, notius eſt. nihil enim prohibet quo minus inter ea quæ ſibi inuicē attribuuntur, notius ſit interdum *id* quod non *eſt* cauſa. itaque ex hoc erit demonſtratio. 2 Veluti quòd planetæ propè *ſunt*, ex eo *demonſtratur* quòd non ſcintillant. eſto, vbi γ, planetæ: vbi β, non ſcintillare: vbi α, propè eſſe. verè igitur τὸ β dicitur de γ: quia planetæ non ſcintillāt. ſed & τὸ α de β: quia quod non ſcintillat propè eſt. B hoc autem ſumptum ſit per inductionem, aut per ſenſum. neceſſe *eſt* igitur τὸ α τῷ γ ineſſe. quare demonſtratum eſt, quòd planetæ propè ſunt. Hic igitur ſyllogiſmus non oſtēdit cur *res ſit*, ſed quòd *ſit*. non enim quia ſcintillant, ſunt propè: ſed quia propè ſunt, non ſcintillant. 3 Accidit etiam, vt alterum per alterum probetur: & erit demonſtratio *docens* cur *res ſit*. Vtputà eſto τὸ γ, planetæ: vbi β, propè eſſe: τὸ α, non ſcintillare. Ineſt igitur & τὸ β τῷ γ & τὸ α, *id eſt* non ſcintillare, τῷ β: quare etiam τὸ α *ineſt* τῷ γ. Et eſt ſyllogiſmus *oſtendens* cur *res ſit*: quia ſumpta fuit prima cauſa. 4 Rurſus vt oſtendunt Lunā eſſe globoſam per accretiones. etenim ſi quod ita augetur, *eſt* globoſum: augetur autem C Luna: perſpicuum *eſt*, quòd *eſt* globoſa. Sic igitur factus eſt ſyllogiſmus *oſtendens* quòd *res ſit*. 5 At ſi è contrario ponatur medium, *erit ſyllogiſmus oſtēdens* cur *ſit*: quia non propter accretiones *Luna* eſt globoſa: ſed quia eſt globoſa, *idcirco* ſuſcipit accretiones huiuſmodi. *Sit* Luna, vbi γ: globoſum, vbi β: accretio, vbi α. 6 In quibus autem media non reciprocantur, idque eſt notius quod non *eſt* cauſa: oſtenditur quòd *ſit*, non cur *ſit*. 7 Item in quibus medium extrinſecùs ponitur. In his enim demonſtratur quod *ſit*, non cur *ſit*, quia non dicitur cauſa. 8 Veluti cur non reſpirat paries? quia non *eſt* animal. etenim ſi hæc *eſſet* cauſa nō reſpirandi, oporteret animal eſſe cauſam reſpirandi: vt ſi negatio E *eſt* cauſa cur non inſit, affirmatio *eſt* cauſa cur inſit. veluti ſi intemperies calidorum & frigidorū *eſt* cauſa non bene valendi, *eorumdem* temperies *eſt* cauſa bene valendi. ſimiliterque ſi affirmatio *eſt* cauſa cur inſit, negatio *eſt cauſa* cur non inſit. in iis verò quæ ſic explicata ſunt, non accidit quod dictum eſt: non enim omne animal reſpirat. 9 Fit autem ſyllogiſmus huiuſmodi cauſæ in media figura. vt eſto τὸ α, animal: vbi β, reſpirare: vbi γ, paries. omni igitur β ineſt τὸ α: quicquid enim reſpirat, *eſt* animal: nulli autem γ: quare etiam τὸ β *ineſt* nulli γ, non igitur reſpirat paries. 10 Aſſimilantur autem huiuſcemodi cauſæ iis quæ dicuntur per

A ΤΟ δὴ ὅτι, διαφέρει, καὶ τὸ διότι ἐπίστασθαι, πρῶτον μὲν ἐν τῇ αὐτῇ ἐπιστήμῃ, καὶ ἐν ταύτῃ διχῶς. ἕνα μὲν τρόπον, ἐὰν μὴ δι᾽ ἀμέσων γίνηται ὁ συλλογισμός. οὐ γὰρ λαμβάνεται τὸ πρῶτον αἴτιον· ἡ δὲ τοῦ διότι ἐπιστήμη, κατὰ τὸ πρῶτον αἴτιον. ἄλλον δὲ, εἰ δι᾽ ἀμέσων μὲν, ἀλλὰ μὴ διὰ τοῦ αἰτίου, ἀλλὰ τῶν ἀντιστρεφόντων διὰ τοῦ γνωριμωτέρου. κωλύει γὰρ οὐδὲν, τῶν ἀντικατηγορουμένων, γνωριμώτερον εἶναι ἐνίοτε τὸ μὴ αἴτιον. ὥστ᾽ ἔσται διὰ τούτου ἡ ἀπόδειξις. 2 Οἷον, ὅτι ἐγγὺς οἱ πλάνητες, διὰ τοῦ μὴ στίλβειν. ἔστω, ἐφ᾽ ᾧ γ, πλάνητες· ἐφ᾽ ᾧ β, τὸ μὴ στίλβειν· ἐφ᾽ ᾧ α, τὸ ἐγγὺς εἶναι. ἀληθὲς δὴ τὸ β κατὰ τοῦ γ εἰπεῖν· οἱ γὰρ πλάνητες οὐ στίλβουσιν. ἀλλὰ καὶ τὸ α κατὰ τοῦ β· τὸ γὰρ μὴ στίλβον, ἐγγύς ἐστι. B τοῦτο δ᾽ εἰλήφθω δι᾽ ἐπαγωγῆς, ἢ δι᾽ αἰσθήσεως. ἀνάγκη οὖν τὸ α τῷ γ ὑπάρχειν. ὥστ᾽ ἀποδέδεικται, ὅτι οἱ πλάνητες, ἐγγύς εἰσιν. Οὗτος οὖν ὁ συλλογισμὸς, οὐ τοῦ διότι, ἀλλὰ τοῦ ὅτι, ἐστίν· οὐ γὰρ διὰ τὸ μὴ στίλβειν, ἐγγύς εἰσιν· ἀλλὰ διὰ τὸ ἐγγὺς εἶναι, οὐ στίλβουσιν. 3 Ἐγχωρεῖ δὲ καὶ διὰ θατέρου θάτερον δειχθῆναι, καὶ ἔσται τοῦ διότι ἡ ἀπόδειξις. οἷον, ἔστω τὸ γ, πλάνητες· ἐφ᾽ ᾧ β, τὸ ἐγγὺς εἶναι· τὸ α, τὸ μὴ στίλβειν. ὑπάρχει δὴ καὶ τὸ β τῷ γ, καὶ τὸ α τῷ β τὸ μὴ στίλβειν· ὥστε καὶ τὸ α τῷ γ. Καὶ ἔστι τοῦ διότι ὁ συλλογισμός· εἴληπται γὰρ τὸ πρῶτον αἴτιον. 4 Πάλιν ὡς τὴν σελήνην δεικνύουσιν, ὅτι σφαιροειδὴς, διὰ τῶν αὐξήσεων. εἰ γὰρ τὸ αὐξανόμενον οὕ- C τω, σφαιροειδές· αὐξάνει δ᾽ ἡ σελήνη· φανερὸν, ὅτι σφαιροειδής. Οὕτω μὲν οὖν τοῦ ὅτι γέγονεν ὁ συλλογισμός. 5 Ἀνάπαλιν δὲ τεθέντος τοῦ μέσου, τοῦ διότι. οὐ γὰρ διὰ τὰς αὐξήσεις σφαιροειδής ἐστιν· ἀλλὰ διὰ τὸ σφαιροειδὴς εἶναι, λαμβάνει τὰς αὐξήσεις τοιαύτας. σελήνη, ἐφ᾽ ᾧ γ· σφαιροειδὴς, ἐφ᾽ ᾧ β· αὔξησις, ἐφ᾽ ᾧ α. 6 Ἐφ᾽ ὧν δὲ τὰ μέσα μὴ ἀντιστρέφει, καὶ ἔστι γνωριμώτερον τὸ ἀναίτιον· τὸ ὅτι μὲν, δείκνυται· τὸ διότι δ᾽, οὔ. 7 Ἔτι, ἐφ᾽ ὧν τὸ μέσον, ἔξω τίθεται. καὶ γὰρ ἐν τούτοις, τοῦ ὅτι, καὶ οὐ τοῦ διότι, ἡ ἀπόδειξις· οὐ γὰρ λέγεται τὸ αἴτιον. 8 Οἷον, διὰ τί οὐκ ἀναπνεῖ ὁ τοῖχος, ὅτι οὐ ζῶον. εἰ γὰρ τοῦτο τοῦ μὴ ἀναπνεῖν αἴτιον, ἔδει τὸ ζῶον εἶναι αἴτιον τοῦ ἀναπνεῖν. οἷον, εἰ ἡ ἀπόφασις, αἰτία τοῦ μὴ ὑπάρ- E χειν· ἡ κατάφασις, αἰτία τοῦ ὑπάρχειν. ὥσπερ εἰ τὸ ἀσύμμετρα εἶναι τὰ θερμὰ καὶ ψυχρὰ, τοῦ μὴ ὑγιαίνειν· τὸ σύμμετρα εἶναι, τοῦ ὑγιαίνειν. ὁμοίως δὲ καὶ, εἰ ἡ κατάφασις τοῦ ὑπάρχειν, ἡ ἀπόφασις, τοῦ μὴ ὑπάρχειν. ἐπὶ δὲ τῶν οὕτως ἀποδεδομένων οὐ συμβαίνει τὸ λεχθέν· οὐ γὰρ ἅπαν ἀναπνεῖ ζῶον. 9 Ὁ δὲ συλλογισμὸς γίνεται τῆς τοιαύτης αἰτίας ἐν τῷ μέσῳ σχήματι. οἷον, ἔστω τὸ α, ζῶον· ἐφ᾽ ᾧ τὸ β, τὸ ἀναπνεῖν· ἐφ᾽ ᾧ γ, τοῖχος. τῷ μὲν οὖν β παντὶ ὑπάρχει τὸ α. πᾶν γὰρ τὸ ἀναπνέον, ζῶον· τῷ δὲ γ οὐδενί· ὥστε οὐδὲ τὸ β τῷ γ οὐδενί, οὐκ ἄρα ἀναπνεῖ ὁ τοῖχος. 10 Ἐοίκασι δ᾽ αἱ τοιαῦται τῶν αἰτιῶν, τοῖς καθ᾽

ὑπερβολὴν εἰρημένοις. τοῦτο δ᾽ ἐστὶ τὸ πλέον, ἀποστήσαντα, τὸ μέσον εἰπεῖν. 11 Οἷον, τὸ τοῦ Ἀναχάρσιδος, ὅτι ἐν Σκύθαις οὐκ εἰσὶν αὐλητρίδες, οὐδὲ γὰρ ἄμπελοι. 12 Κατὰ μὲν δὴ τὴν αὐτὴν ἐπιστήμην, καὶ κατὰ τὴν τῶν μέσων θέσιν, αὗται διαφοραί εἰσι τοῦ ὅτι πρὸς τὸν τοῦ διότι συλλογισμόν. 13 Ἄλλον δὲ τρόπον διαφέρει τὸ διότι τοῦ ὅτι, * τῷ δι᾽ ἄλλης ἐπιστήμης ἑκάτερον θεωρεῖν. τοιαῦτα δ᾽ ἐστὶν, ὅσα οὕτως ἔχει πρὸς ἄλληλα, ὥστ᾽ εἶναι θάτερον ὑπὸ θάτερον· οἷον, τὰ ὀπτικὰ πρὸς γεωμετρίαν, καὶ τὰ μηχανικὰ πρὸς στερεομετρίαν, καὶ τὰ ἁρμονικὰ πρὸς ἀριθμητικὴν, καὶ τὰ φαινόμενα πρὸς ἀστρολογικήν. 14 Σχεδὸν δὲ συνώνυμοί εἰσι τούτων τῶν ἐπιστημῶν ἔνιαι· οἷον, ἀστρολογία, ἥτε μαθηματικὴ, καὶ ἡ ναυτική· καὶ ἁρμονικὴ, ἥτε μαθηματικὴ, καὶ ἡ κατὰ τὴν ἀκοήν. 15 Ἐνταῦθα γὰρ τὸ μὲν ὅτι, τῶν αἰσθητικῶν εἰδέναι· τὸ δὲ διότι, τῶν μαθηματικῶν· οὗτοι γὰρ ἔχουσι τῶν αἰτίων τὰς ἀποδείξεις, καὶ πολλάκις οὐκ ἴσασι τὸ ὅτι· καθάπερ οἱ τὸ καθόλου θεωροῦντες, πολλάκις ἔνια τῶν καθ᾽ ἕκαστον οὐκ ἴσασι δι᾽ ἀνεπισκεψίαν. Ἔστι δὲ ταῦτα, ὅσα ἕτερόν τι ὄντα τὴν οὐσίαν, κέχρηται τοῖς εἴδεσι. τὰ γὰρ μαθήματα, περὶ εἴδη ἐστίν· οὐ γὰρ καθ᾽ ὑποκειμένου τινός. εἰ γὰρ καὶ καθ᾽ ὑποκειμένου τινὸς τὰ γεωμετρικά ἐστιν, ἀλλ᾽ οὐχ ᾗ γεωμετρικά, καθ᾽ ὑποκειμένου. 16 Ἔχει δὲ καὶ πρὸς τὴν ὀπτικὴν, ὡς αὕτη πρὸς τὴν γεωμετρίαν, ἄλλη πρὸς ταύτην· οἷον, τὸ περὶ τῆς ἴριδος. τὸ μὲν γὰρ ὅτι, φυσικοῦ εἰδέναι· τὸ δὲ διότι, ὀπτικοῦ, ἢ ἁπλῶς, ἢ κατὰ τὸ μάθημα. 17 Πολλαὶ δὲ καὶ τῶν μὴ ὑπ᾽ ἀλλήλας ἐπιστημῶν ἔχουσιν οὕτως· οἷον, ἰατρικὴ πρὸς γεωμετρίαν. ὅτι μὲν γὰρ τὰ ἕλκη τὰ περιφερῆ βραδύτερον ὑγιάζεται, τοῦ ἰατροῦ εἰδέναι· διότι δὲ τοῦ γεωμέτρου.

* γ. καί.

A hyperbolen, *id eſt ſuperlationem*. hoc autem eſt, abſcedēdo, medium illud dicere, quod latius patet quàm cauſa. 11 Quale *eſt* illud Anacharſidis, apud Scythas non eſſe tibicines, quia nec vites *illic ſunt*. 12 Ergo in eadem ſcientia, & ſecundum mediorum poſitionem, hæ differentiæ ſunt *ſyllogiſmi docentis* quòd *ſit*, & ſyllogiſmi *docentis* cur *ſit*. 13 Alio autem modo differunt cur *ſit* & quòd *ſit*, quia in diuerſis ſcientiis ſpectantur. eiuſmodi verò ſunt, quæ ita ſunt inter ſe affecta, vt alterum ſit ſub altero. quemadmodum optica *problemata affecta ſunt* ad geometriam, & mechanica ad ſtereometriam, & muſica ad arithmeticam, & phænomena, *id eſt* B *apparentia*, ad aſtrologiam. 14 Ferè autem ſynonymę ſunt harum ſcientiarum nonnullæ. vt aſtrologia *dicitur* & mathematica & nautica, item muſica *vocatur* tam mathematica, quàm ea quæ *ſpectatur* ſecundum auditum. 15 Hic enim ſcire quod *ſit, proprium eſt* eorum qui ſenſus rationem habēt: *ſcire* autem cur *ſit*, mathematicorum. hi namque habent cauſarum demonſtratiónes, ac ſæpe ignorant quòd *res ſit*: quemadmodum qui vniuerſale contemplantur, ſæpe quædam particularia ignorant, quia non animaduertunt. hæc autem ſunt, quæcumque cùm aliud ſint *ſecundum* eſſentiam, vtuntur formis. etenim *ſcientiæ* mathematicę circa C formas verſantur: quia *res mathematicæ* non *ſunt* in vllo ſubiecto. quamvis n. res geometricæ in quopiam ſubiecto ſint: non tamen quà geometricæ, in ſubiecto *ſunt*. 16 Vt autē opticæ ad geometriam, ſic ad opticem affecta eſt alia *ſcientia*: veluti quod *tractatur* de iride. ſcire enim quòd *ſit*, *proprium eſt* phyſici: cur *ſit*, optici aut ſimpliciter, aut ratione *ſcientiæ* mathematicæ. 17 Ex iis quoque ſcientiis, quarum vna non collocatur ſub altera, multæ ſic *ſe* habent. veluti medicina *ſic affecta eſt* ad geometriã. ſcire enim quòd vulnera orbicularia tardiùs ſanantur, *proprium eſt* medici: cur verò *tardius ſanentur*, geometræ.

De figura ſyllogiſmi demonſtratiui. Cap. XIV.

1 *Problema.* 2 *Confirmatio prima à ſcientiis & cognitione* τοῦ διότι. 3 *Secunda à cognitione* τοῦ τί ἐστι. 4 *Tertia à natura figurarum.* 5 *Concluſio.*

CAP. XI.

Τῶν δὲ σχημάτων ἐπιστημονικὸν μάλιστα τὸ πρῶτόν ἐστι. 2 Αἵ τε γὰρ μαθηματικαὶ τῶν ἐπιστημῶν διὰ τούτου φέρουσι τὰς ἀποδείξεις· οἷον, ἀριθμητικὴ, καὶ γεωμετρία, καὶ ὀπτικὴ, καὶ σχεδὸν (ὡς εἰπεῖν) ὅσαι τοῦ διότι ποιοῦνται τὴν * σκέψιν. ἢ γὰρ ὅλως, ἢ ὡς ἐπὶ τὸ πολὺ, καὶ ἐν τοῖς πλείστοις, διὰ τούτου τοῦ σχήματος ὁ τοῦ διότι γίνεται συλλογισμός. 3 Ὥστε κἂν διὰ τοῦτ᾽ εἴη μάλιστα ἐπιστημονικόν. κυριώτατον γὰρ * τοῦ εἰδέναι, τὸ διότι θεωρεῖν. 4 Εἶτα τὴν τοῦ τί ἐστιν ἐπιστήμην, διὰ τούτου μόνου θηρεῦσαι δυνατόν. ἐν μὲν γὰρ τῷ μέσῳ σχήματι οὐ γίνεται κατηγορικὸς συλλογισμός· ἡ δὲ τοῦ τί ἐστιν ἐπιστήμη, καταφάσεως. ἐν δὲ τῷ ἐσχάτῳ γίνεται μὲν, ἀλλ᾽ οὐ καθόλου· τὸ δὲ τί ἐστι, τῶν καθόλου ἐστίν· οὐ γὰρ πῇ ἐστι ζῷον δίπουν ὁ ἄνθρωπος. 5 Ἔτι, τοῦτο μὲν ἐκείνων οὐδὲν προσδεῖται· ἐκεῖνα δὲ διὰ τούτου καταπυκνοῦται, καὶ αὔξεται, ἕως ἂν εἰς τὰ ἄμεσα ἔλθῃ. 6 Φανερὸν οὖν, ὅτι κυριώτατον τοῦ ἐπίστασθαι τὸ πρῶτόν ἐστι σχῆμα.

* γ. ἐπίσκεψιν.

* Quidam τὸ εἰδέναι cum Argyrop. & Themiſtio qui habet pro his, ὥστε κυριώτατος ἴσως. Sed & τὸ legi poteſt cũ Philop. qui interpretatur κυριώτατον, & μάλιστα οἰκεῖον πρὸς ἐπιστήμην.

D EX figuris autem prima eſt ad ſcientiam *gignendam* aptiſſima. 2 Nam mathematicæ ſcientiæ per hanc *figuram* demonſtrationes afferunt: vt arithmetica, & geometria, & optice, & (penè dixerim) quæcumque conſiderant cur *res ſit*. nam aut omnino, aut plerumque & in pleriſque *ſciētiis* per hanc figuram efficitur ſyllogiſmus *docēs* cur *res ſit*. 3 Ideóque ob hoc etiam eſt ad ſcientiam *gignendam hæc figura* accommodatiſſima: maximè enim ipſius ſcire proprium *eſt*, *cauſam* cur *res ſit* contemplari. 4 Deinde ſcientia, *qua* quid *res* ſit *cognoſcitur*, per hãc ſolam figuram poteſt inueſtigari. quo- E niam in media figura non fit attributiuus ſyllogiſmus: ſcientia verò, *qua* quid *res* ſit *cognoſcitur*, eſt *ſcientia* affirmationis. in vltima autem *figura* fit quidem *ſyllogiſmus attributiuus*, at nõ vniuerſalis: ipſum verò quid eſt, *in* rerum vniuerſalium eſt *numero*: non enim homo eſt quadamtenus animal bipes. 5 Inſuper hæc *figura* illis non indiget: illæ autem per hanc denſantur, & augentur donec ad immediata ventum ſit. 6 Perſpicuum igitur *eſt*, primam figuram eſſe maximè propriam & *accommodatam* ſcientiæ.

DE IGNORANTIA OPPOSITA SCIENTIÆ DEMONSTRATIVÆ.

TRACTATVS III.

De oppoſitionibus immediatis negantibus. Cap. XV.

1 An ſint. 2 Quid ſint. 3 Quomodo non ſint immediatæ: 4 quia attributum, 5 vel ſubiectum, 6 vel ambo ſint in aliquo toto. 7 Hypothetaris. Quod fieri poßit, vt in aliquo toto ſit ſolum attributum, non etiam ſubiectum: vel ſolum ſubiectum, non attributum. 8 Quando ſint immediatæ. 9 Epilogus.

VT autem contingebat τὸ α τῷ β ineſſe indiuiduè, ſic etiam accidit non ineſſe. 2 Dico autem indiuiduè ineſſe, aut non ineſſe; quia non eſt inter ipſa *vllum* medium. ſic enim non continget vt ſecundum aliud inſit, vel non inſit. 3 Cùm igitur vel τὸ α, vel τὸ β in toto aliquo eſt, vel etiam ambo: fieri non poteſt, vt τὸ α τῷ β primùm non inſit. 4 Sit enim τὸ α in toto γ. ergo ſi τὸ β non eſt in toto γ (fieri enim poteſt, vt τὸ α ſit in aliquo toto, τὸ β autem in eo non ſit) ſyllogiſmus erit, *quo concludetur* non ineſſe τὸ α τῷ β. nam ſi omni α *ineſt* τὸ γ, ac nulli β: *conſequens eſt, vt* nulli β *inſit* τὸ α. 5 Similis ratio *eſt*, ſi τὸ β ſit in toto aliquo, velut in δ. etenim τὸ δ omni β, nulli autem β α ineſt. quare τὸ α nulli β inerit, *vt* per ſyllogiſmum *concluditur*. 6 Eodem modo probatur, ſi ambo in toto aliquo ſint. 7 Quòd autem fieri poſſit, vt in quo toto eſt τὸ α, non ſit τὸ β: & rurſus, in quo *toto eſt* τὸ β, *non ſit* τὸ α: perſpicuum *eſt* ex rerum claſſibus, quæ inter ſe non permiſcentur. Nam ſi nihil eorum quæ *ſunt* in claſſe α γ δ, attribuitur vlli eorum quæ *ſunt* in claſſe β ε ζ: τὸ α autem eſt in toto θ eiuſdem claſſis: perſpicuum *eſt*, τὸ β non eſſe in θ: alioquin permiſcerentur claſſes. Similis *eſt* ratio, ſi τὸ β in toto aliquo ſit. 8 Quod ſi neutrum ſit in vllo toto, ac τὸ α non inſit τῷ β: neceſſe *eſt*, vt indiuiduè non inſit. Nam ſi quid medium ſit: neceſſe *erit*, alterum eorum in toto aliquo eſſe. aut enim in prima figura, aut in media erit ſyllogiſmus. Si igitur *ſit* in prima, τὸ β erit in toto aliquo: quoniam affirmatiuam effici oportet propoſitionem in qua ipſum *continetur*. Si verò *ſyllogiſmus ſit* in media figura, vtrumvis *poterit eſſe in toto*: quoniam vtrivis iungatur priuatio, fit ſyllogiſmus. at ſi vtræque *propoſitiones* ſint negatiuæ, non erit *ſyllogiſmus*. 9 Perſpicuum igitur *eſt*, fieri poſſe vt indiuiduè aliud alij non inſit: & quando quomodóque *id* fieri poſſit, *iam* diximus.

A Ὥσπερ δὲ ὑπάρχειν τὸ α τῷ β ἐνεδέχετο ἀτόμως, οὕτω καὶ μὴ ὑπάρχειν ἐγχωρεῖ. 2 Λέγω δὲ τὸ ἀτόμως ὑπάρχειν, ἢ μὴ ὑπάρχειν, τῷ μὴ εἶναι αὐτῶν μέσον. οὕτω γὰρ οὐκ ἔσται κατ' ἄλλο, τὸ ὑπάρχειν, ἢ μὴ ὑπάρχειν. 3 Ὅταν μὲν οὖν ἢ τὸ α ἢ τὸ β ἐν ὅλῳ τινὶ ᾖ, ἢ καὶ ἄμφω, οὐκ ἐνδέχεται τὸ α τῷ β πρώτως μὴ ὑπάρχειν. 4 Ἔστω γὰρ τὸ α ἐν ὅλῳ τῷ γ. οὐκοῦν, εἰ τὸ β μή ἐστιν ἐν ὅλῳ τῷ γ, (ἐγχωρεῖ γὰρ τὸ μὲν α εἶναι ἔν τινι ὅλῳ, τὸ δὲ β μὴ εἶναι ἐν τούτῳ) συλλογισμὸς ἔσται τοῦ μὴ ὑπάρχειν τὸ α τῷ β. εἰ γὰρ τῷ μὲν α παντὶ τὸ γ, τῷ δὲ β μηδενί, οὐδενὶ τῷ β τὸ α. 5 B Ὁμοίως δὲ καὶ, εἰ τὸ μὲν β ἐν ὅλῳ τινί ἐστιν, οἷον ἐν τῷ δ. τὸ μὲν γὰρ δ παντὶ τῷ β ὑπάρχει, τῷ δὲ α οὐδενί. ὥστε τὸ α οὐδενὶ τῷ β ὑπάρξει, διὰ συλλογισμοῦ. 6 Τὸν αὐτὸν δὲ τρόπον δειχθήσεται, καὶ εἰ ἄμφω ἐν ὅλῳ τινί ἐστιν. 7 Ὅτι δὲ ἐνδέχεται τὸ β μὴ εἶναι, ἐν ᾧ ὅλῳ ἐστὶ τὸ α· ἢ πάλιν τὸ α, ἐν ᾧ τὸ β: φανερὸν ἐκ τῶν συστοιχιῶν, ὅσαι μὴ ἐπαλλάττουσιν ἀλλήλαις. Εἰ γὰρ μηδὲν τῶν ἐν τῇ α γ δ συστοιχίᾳ, κατὰ μηδενὸς κατηγορεῖται τῶν ἐν τῇ β ε ζ· τὸ δ' α ἐν ὅλῳ ἐστὶ τῷ θ, συστοίχῳ ὄντι· φανερὸν ὅτι τὸ β οὐκ ἔσται ἐν τῷ θ· ἐπαλ- C λάξουσι γὰρ αἱ συστοιχίαι. Ὁμοίως δὲ καὶ, εἰ τὸ β ἐν ὅλῳ τινί ἐστιν. 8 Ἐὰν δὲ μηδέτερον ᾖ ἐν ὅλῳ μηδενί, μὴ ὑπάρχῃ δὲ τὸ α τῷ β, ἀνάγκη, ἀτόμως μὴ ὑπάρχειν. Εἰ γὰρ ἔσται τι μέσον, ἀνάγκη θάτερον αὐτῶν ἐν ὅλῳ τινὶ εἶναι. ἢ γὰρ ἐν τῷ πρώτῳ σχήματι, ἢ ἐν τῷ μέσῳ ἔσται ὁ συλλογισμός. εἰ μὲν οὖν ἐν τῷ πρώτῳ, τὸ β ἔσται ἐν ὅλῳ τινί· καταφατικὴν γὰρ δεῖ τὴν πρὸς τοῦτο * γίνεσθαι πρότασιν. εἰ δ' ἐν τῷ μέσῳ, ὁπότερον ἔτυχε. πρὸς ἀμφοτέροις γὰρ ληφθέντος τοῦ στερητικοῦ, γίνεται συλλογισμός· ἀμφοτέρων δ' ἀποφατικῶν οὐσῶν, οὐκ ἔσται. 9 Φανερὸν οὖν, ὅτι ἐνδέχεταί τε ἄλλο ἄλλῳ μὴ ὑπάρχειν ἀτόμως· καὶ πότ' ἐνδέχεται, καὶ πῶς, εἰρήκαμεν.

* λαμβάνεσθαι

De ignorantia ſecundum prauam diſpoſitionem in iis quæ medio vacant.

Cap. XVI.

1 ¶¶ Definitio. 2 ¶¶ Diuiſio. 3 ¶¶ Specierum diſcrimen. 4 ¶¶ Eius diſcriminis expoſitio. ¶ Si falſo exiſtimetur omni ineſſe, 5 per vnam, vel vtramque propoſitionem falſam. 6 De ſyllogiſmo extructo in prima figura, id eſt, in Barbara, ex ambabus propoſitionibus falſis, 7 vel ex altera vera & altera falſa, cùm maior propoſitio ſit immediata, 8 vel mediata. 9 Epilogus. 10 ¶ Si falſo exiſtimetur non ineſſe. 11 De ſyllogiſmo extructo in prima figura, id eſt, in Celarent, ex ambabus propoſitionibus falſis, 12 vel ex vna falſa, 13 nempe minore, 14 vel maiore. 15 Epilogus. 16 De ſecunda figura: cùm ambæ propoſitiones ſunt falſæ in totum. 17 aut ambæ falſæ ex parte in Cameſtres, 18 vel in Ceſare: 19 cùm altera tantùm eſt falſa, id eſt, cùm in Cameſtres eſt falſa minor 20 vel maior: 21 aut in Ceſare eſt falſa minor, 22 vel maior. 23 Epilogus.

IGnorantia verò, quæ non ſecundum negationem, ſed ſecundum diſpoſitionem dicitur, eſt deceptio quæ per logiſmum efficitur. 2 Hæc autem in iis quæ primùm inſunt, vel non inſunt,

A Ἄγνοια δ' ἡ μὴ κατ' ἀπόφασιν, ἀλλὰ κατὰ διάθεσιν λέγομένη, ἐστὶ μὲν, ἡ διὰ * λογισμοῦ γινομένη ἀπάτη. 2 Αὕτη δ' ἐν μὲν τοῖς πρώτως ὑπάρχουσιν, ἢ μὴ ὑπάρχουσι,

CAP. XII.
* γρ. συλλογισμοῦ al. συλλογισμῶν.

A συμβαίνει διχῶς. ἢ γὰρ ὅταν ἁπλῶς ὑπολάβῃ ὑπάρχειν, ἢ μὴ ὑπάρχειν· ἢ ὅταν διὰ συλλογισμοῦ λαβὼν τὴν ὑπόληψιν. 3 Τῆς μὲν οὖν ἁπλῆς ὑπολήψεως, ἁπλῆ ἡ ἀπάτη· τῆς δὲ διὰ συλλογισμοῦ πλείους. 4 Μὴ ὑπαρχέτω γὰρ τὸ α μηδενὶ τῷ β ἀτόμως. οὐκοῦν ἐὰν συλλογίζηται ὑπάρχειν τὸ α τῷ β, μέσον λαβὼν τὸ γ, ἠπατημένος ἔσται διὰ συλλογισμοῦ. 5 Ἐνδέχεται μὲν οὖν ἀμφοτέρας τὰς προτάσεις εἶναι ψευδεῖς· ἐνδέχεται δὲ τὴν ἑτέραν* μόνον. 6 Εἰ γὰρ μήτε τὸ α μηδενὶ τῷ γ ὑπάρχει, μήτε τὸ γ μηδενὶ τῷ β, εἴληπται δ' ἑκατέρα ἀνάπαλιν, ἀμφότεραι ψευδεῖς ἔσονται. ἐγχωρεῖ δ' οὕτως ἔχειν τὸ γ πρὸς τὸ α, καὶ τὸ β, ὥστε μήτε ὑπὸ τὸ α εἶναι, μήτε καθόλου* τῷ β. τὸ μὲν γὰρ β, ἀδύνατον εἶναι ἐν ὅλῳ τινί· πρώτως γὰρ ἐλέγετο αὐτῷ τὸ α μὴ ὑπάρχειν. τὸ δὲ α οὐκ ἀνάγκη πᾶσι τοῖς οὖσιν εἶναι B καθόλου. ὥστε ἀμφότεραι ψευδεῖς. 7 Ἀλλὰ καὶ τὴν ἑτέραν ἐνδέχεται ἀληθῆ λαμβάνειν, οὐ μέντοι ὁποτέραν ἔτυχεν, ἀλλὰ τὴν α γ. ἡ γὰρ γ β πρότασις, ἀεὶ ψευδὴς ἔσται, διὰ τὸ ἐν μηδενὶ εἶναι τὸ β. τὴν δὲ α γ, ἐγχωρεῖ. οἷον, εἰ τὸ α καὶ τῷ γ καὶ τῷ β ὑπάρχει ἀτόμως. ὅταν γὰρ* πρώτως τὸ αὐτὸ πλειόνων κατηγορῆται, οὐδέτερον ἐν οὐδετέρῳ ἔσται. 8 Διαφέρει δ' οὐδέν, οὐδ' εἰ μὴ ἀτόμως ὑπάρχει. 9 Ἡ μὲν οὖν τοῦ ὑπάρχειν ἀπάτη, διὰ τούτων τε καὶ οὕτω γίνεται μόνως. οὐ γὰρ ἦν ἐν ἄλλῳ σχήματι τοῦ ὑπάρχειν συλλογι- C σμός. 10 Ἡ δὲ τοῦ μὴ ὑπάρχειν, ἔν τε τῷ πρώτῳ, καὶ ἐν τῷ μέσῳ σχήματι. πρῶτον οὖν εἴπωμεν, ποσαχῶς ἐν τῷ πρώτῳ γίνεται, καὶ πῶς ἐχουσῶν τῶν προτάσεων. 11 Ἐνδέχεται μὲν οὖν, ἀμφοτέρων ψευδῶν οὐσῶν εἶναι, εἰ τὸ α καὶ τῷ γ καὶ τῷ β ὑπάρχει ἀτόμως· ἐὰν γὰρ ληφθῇ τὸ μὲν α τῷ γ μηδενί, τὸ δὲ γ παντὶ τῷ β, ψευδεῖς αἱ προτάσεις. 12 Ἐνδέχεται δὲ καὶ τῆς ἑτέρας ψευδοῦς οὔσης, καὶ ταύτης ὁποτέρας ἔτυχεν. 13 Ἐγχωρεῖ γὰρ τὴν μὲν α γ, ἀληθῆ εἶναι, τὴν δὲ β γ, ψευδῆ. τὴν μὲν α γ, ἀληθῆ, ὅτι οὐ πᾶσι τοῖς οὖσιν ὑπάρχει τὸ α. τὴν δὲ γ β, ψευδῆ, ὅτι ἀδύνατον ὑπάρχειν τῷ β τὸ γ, ᾧ μηδενὶ ὑπάρχει τὸ α. οὐ γὰρ ἔτι ἀληθὴς ἔσται ἡ α γ πρό- D τασις. ἅμα δ', εἰ καὶ εἰσιν ἀμφότεραι ἀληθεῖς, καὶ τὸ συμπέρασμα ἔσται ἀληθές. 14 Ἀλλὰ καὶ τὴν γ β ἐνδέχεται ἀληθῆ εἶναι, τῆς ἑτέρας οὔσης ψευδοῦς. οἷον, εἰ τὸ β καὶ ἐν τῷ γ, καὶ ἐν τῷ α ἐστίν. ἀνάγκη γὰρ θάτερον ὑπὸ θάτερον εἶναι. ὥστ' ἂν λάβῃ τὸ α μηδενὶ τῷ γ ὑπάρχειν, ψευδὴς ἔσται ἡ πρότασις. 15 Φανερὸν οὖν, ὅτι καὶ τῆς ἑτέρας ψευδοῦς οὔσης, καὶ* ἀμφοῖν, ἔσται ψευδὴς ὁ συλλογισμός. 16 Ἐν δὲ τῷ μέσῳ σχήματι ὅλας μὲν εἶναι ἀμφοτέρας τὰς προτάσεις ψευδεῖς, οὐκ ἐνδέχεται. ὅταν γὰρ τὸ α παντὶ τῷ β ὑπάρχῃ, οὐδὲν ἔσται λαβεῖν, ὃ τῷ μὲν ἑτέρῳ παντί, θατέρῳ δ' οὐδενὶ ὑπάρξει. δεῖ δ' οὕτω λαμ- E βάνειν τὰς προτάσεις, ὥστε τῷ μὲν ὑπάρχειν, τῷ δέ, μὴ ὑπάρχειν, εἴπερ ἔσται συλλογισμός. εἰ οὖν οὕτω λαμβανόμεναι ψευδεῖς, δῆλον ὡς ἐναντίως, ἀνάπαλιν ἕξουσι, τοῦτο δ', ἀδύνατον. 17 Ἐπί τι δ' ἑκατέραν οὐδὲν κωλύει ψευδῆ εἶναι. οἷον, εἰ τὸ γ καὶ τῷ α, καὶ τῷ β τινὶ ὑπάρχοι. ἂν γὰρ τῷ μὲν α ληφθῇ παντὶ ὑπάρχον, τῷ δὲ β μηδενί, ψευδεῖς μέν, ἀμφότεραι αἱ προτάσεις· οὐ μέντοι ὅλαι, ἀλλ' ἐπί τι. 18 Καὶ ἀνάπαλιν δὲ τεθέντος τοῦ στερητικοῦ, ὡσαύτως. 19 Τὴν δ' ἑτέραν εἶναι ψευδῆ καὶ ὁποτερανοῦν, ἐνδέχεται. ὃ γὰρ ὑπάρχει τῷ α παντί, καὶ τῷ β * ὑπάρξει. ἐὰν οὖν ληφθῇ τῷ μὲν α ὅλῳ ὑπάρχειν τὸ γ, τῷ δὲ β ὅλῳ μὴ ὑπάρχειν, ἡ μὲν γ α, ἀληθὴς ἔσται, ἡ δὲ γ β, ψευδής.

* γ. μόνην.
* γ. τῷ.
* γ. πρότερον.
* γ. ἀμφοτέρων.
* γ. ὑπάρχει.

A bifariam accidit: nempe aut cùm ſimpliciter exiſtimauerit quippiam ineſſe, vel non ineſſe; aut cùm per ſyllogiſmum ad exiſtimandum adductus fuerit. 3 Simplicis igitur exiſtimationis ſimplex eſt deceptio, eius autem quæ fit per ſyllogiſmum, plures. 4 Non inſit enim τὸ α τῷ β indiuiduè. ergo ſi cõcludat ineſſe τὸ α τῷ β, medium accipiens τὸ γ: deceptus erit per ſyllogiſmũ. 5 Fieri igitur poteſt, vt ambæ propoſitiones ſint falſæ: fieri etiam poteſt, vt altera tantùm ſit falſa. 6 Nam ſi neque τὸ α vlli γ ineſt, neque τὸ γ vlli β, ſumpta autẽ fuit vtraque propoſitio è contrario: ambæ falſæ erunt. fieri autem poteſt, vt ita affectum ſit τὸ γ ad α, & ad β, vt neque ſit ſub α, neque vniuerſaliter attribuatur τῷ β: B quia τὸ β non poteſt eſſe in toto aliquo: dicebatur enim, ei primùm τὸ α non ineſſe. non eſt autem neceſſe, vt τὸ α omnibus rebus attribuatur vniuerſaliter. quare ambæ propoſitiones falſæ erunt. 7 Accidit etiam, vt altera propoſitio vera accipiatur, non tamen vtrauis, ſed propoſitio α γ. nam propoſitio γ β ſemper falſa erit: quia in nullo eſt τὸ β. at propoſitio α γ, vera eſſe poteſt. veluti, ſi τὸ α & τῷ γ & τῷ β ineſt indiuiduè. quando enim idem pluribus primùm attribuitur, neutrum alteri attribuetur. 8 Nec quicquam refert, ſi inſit non indiuiduè. 9 Deceptio igitur, qua exiſtimatur ineſſe, per hæc atque hoc modo ſolùm fit: quia non erat in alia fi- C gura ſyllogiſmus, quo concluderetur ineſſe. 10 Ea verò, qua exiſtimatur non ineſſe, fit & in prima, & in media figura. primùm itaque dicamus, quot modis in prima figura fiat, & quomodo habentibus propoſitionibus. 11 Fieri igitur poteſt, cùm ambæ propoſitiones ſint falſæ: veluti ſi τὸ α & τῷ γ & τῷ β ineſt indiuiduè. nam ſi ſumptum fuerit τὸ α nulli γ, τὸ γ vero omni β ineſſe: falſæ erunt propoſitiones. 12 Fieri etiam poteſt, cùm altera propoſitio ſit falſa, & quidem vtrauis. 13 Fieri enim poteſt, vt propoſitio α γ ſit vera, ſed γ β, falſa. α γ veri: quia non omnibus rebus ineſt τὸ α. γ β, falſa: quia non poteſt ineſſe τῷ β τὸ γ, cui nulli ineſt τὸ α; alioqui non erit amplius vera propoſitio α γ. item ſi ſint D ambæ veræ, etiam concluſio erit vera. 14 Accidit etiam, vt propoſitio γ β ſit vera, cùm altera ſit falſa: veluti ſi τὸ β eſt & in γ, & in α: neceſſe eſt enim alterum ſub altero eſſe. quare ſi acceperit τὸ α nulli γ ineſſe, falſa erit propoſitio. 15 Perſpicuum igitur eſt, & cùm altera propoſitio ſit falſa, & cùm ambæ, falſum ſyllogiſmum fore. 16 In media verò figura fieri non poteſt vt ambæ propoſitiones ſint in totum falſæ. cùm enim τὸ α omni β ineſt: nihil licebit accipere, quod alteri omni, alteri nulli inſit. oportet autem ita ſumere propoſitiones, vt medius terminus alteri extremo inſit, alteri non inſit: ſiquidem futurus eſt ſyllogiſ- E mus. ſi igitur ita acceptæ, ſunt falſæ: manifeſtum eſt, quod contrario modo acceptæ, vice verſa ſe habebunt. hoc autem eſt impoſſibile. 17 At ex parte vtramque falſam eſſe, nihil vetat. veluti ſi τὸ γ & τῷ α, & τῷ β cuidam ineſt. nam ſi ſumptum fuerit omni α, nulli autem β ineſſe: falſæ erunt ambæ propoſitiones: non quidem totæ, ſed ex parte. 18 Itidémque fiet, ſi commutato ordine pronunciatum priuatiuum poſitum fuerit. 19 Fieri autẽ poteſt, vt altera & quidem vtrauis falſa ſit. quod enim ineſt omni α, etiam τῷ β ineſt. ſi igitur ſumptum fuerit, toti α ineſſe τὸ γ, toti autẽ β non ineſſe: certè propoſitio γ α, vera erit: γ β, falſa.

20 Rurſus quod nulli β ineſt, omni α non inerit. A nam ſi τῷ α, etiam τῷ β ineſſet: atqui non inerat. ſi igitur ſumptum fuerit τὸ γ toti α ineſſe, & nulli β, propoſitio γβ, vera erit: altera verò, falſa. 21 Similiter fiet tranſpoſito pronunciato priuatiuo. quod enim ineſt nulli α, etiam nulli β inerit. ſi igitur ſumptum fuerit τὸ γ toti α non ineſſe, toti autem β ineſſe: certè propoſitio αγ, vera erit: altera verò, falſa. 22 Ac rurſus quod omni β ineſt, falsò accipitur nulli α ineſſe: quia neceſſe eſt, ſi omni β ineſt, vt etiam cuidam α inſit. ſi igitur ſumptum fuerit, omni β ineſſe τὸ γ, nulli autem α: propoſitio quidem γβ, vera erit: ſed γα, falſa. 23 Perſpicuum igitur eſt, & cùm ambæ propoſitiones ſint falſæ, & cùm altera tantùm, fore ſyllogiſmum deceptiuum in iis quæ ſunt indiuidua.

20 Πάλιν ὃ τῷ β μηδενὶ ὑπάρχει, οὐδὲ τῷ α παντὶ ὑπάρξει. εἰ γὰρ τῷ α, καὶ τῷ β· ἀλλ' οὐχ ὑπῆρχεν. ἐὰν οὖν ληφθῇ τὸ γ τῷ μὲν α ὅλῳ ὑπάρχειν, τῷ δὲ β μηδενί· ἡ μὲν γβ πρότασις, ἀληθής· ἡ δ' ἑτέρα, ψευδής. 21 Ὁμοίως δὲ καὶ μετατεθέντος τοῦ στερητικοῦ. ὃ γὰρ μηδενὶ ὑπάρχει τῷ α, οὐδὲ τῷ β οὐδενὶ ὑπάρξει. ἐὰν οὖν ληφθῇ τὸ γ τῷ μὲν α ὅλῳ μὴ ὑπάρχειν, τῷ δὲ β ὅλῳ ὑπάρχειν· ἡ μὲν αγ πρότασις, ἀληθὴς ἔσται· ἡ δ' ἑτέρα, ψευδής. 22 Καὶ πάλιν, ὃ παντὶ τῷ β ὑπάρχει, μηδενὶ λαβεῖν τῷ α ὑπάρχειν, ψεῦδος· ἀνάγκη γὰρ, εἰ τῷ β παντί, καὶ τῷ α τινὶ ὑπάρχειν. ἐὰν οὖν ληφθῇ τῷ μὲν β παντὶ ὑπάρχειν τὸ γ, τῷ δὲ α μηδενί· ἡ μὲν γβ, ἀληθὴς ἔσται· ἡ δὲ γα, ψευδής. 23 Φανερὸν οὖν, ὅτι καὶ ἀμφοτέρων οὐσῶν ψευδῶν, καὶ τῆς ἑτέρας μόνον, ἔσται συλλογισμὸς ἀπατητικὸς ἐν τοῖς ἀτόμοις.

De ignorantia ſecundum prauam diſpoſitionem in iis quibus medium aliquod eſt interiectum. Cap. XVII.

1 ¶ Regula de ſyllogiſmis ex proprio medio. 2 ¶ Quod ſit proprium medium. 3 ¶ De ſyllogiſmis negantibus in prima figura ex medio proprio, 4 vel quaſi proprio. 5 vel non proprio, quod eſt, 6 vel non eſt ſub primo. 7 ¶ De ſyllogiſmis negantibus in ſecunda figura. De ambabus propoſitionibus in totum falſis. 8 Si alterutra falſa ſit. 9 id eſt, ſola minor, 10 vel ſola maior. 11 ¶ Epilogus. 12 ¶ De ſyllogiſmis affirmantibus in prima figura. De proprio medio. 13 De quaſi proprio, 14 De non proprio, quod eſt, 15 vel non eſt ſub primo. 16 ¶ Epilogus.

IN iis autem quæ non indiuiduè inſunt, aut non B inſunt, cùm per proprium medium fit ſyllogiſmus falſi, non poſſunt ambæ propoſitiones falſæ eſſe, ſed ea tantum, in qua continetur maius extremum. 2 Proprium medium id appello, per quod fit ſyllogiſmus contradictionis. 3 Inſit enim τὸ α τῷ β per medium γ. cùm igitur neceſſe ſit, vt propoſitio γβ ſumatur affirmatiua, ſi ſit ſyllogiſmus: manifeſtum eſt, hanc propoſitionem ſemper fore veram, quia non conuertitur. propoſitionem autem αγ falſam: quoniam hac conuerſâ ſyllogiſmus contrarius efficitur. 4 Similiter fiet, & ſi ex alia claſſe medium ſumptum fuerit: vt τὸ δ, ſi & in toto α eſt, & omni β attribuitur. neceſſe enim eſt vt propoſitio δβ maneat, altera verò conuertatur. quapro- C pter altera ſemper vera erit, altera ſemper falſa. ac ferè huiuſmodi deceptio eadem eſt, atque ea quæ fit per proprium medium. 5 Quòd ſi non per proprium medium fiat ſyllogiſmus: ſanè cùm ſub α eſt medium, nulli autem β ineſt, neceſſe eſt falſas eſſe ambas propoſitiones. ſumendæ enim ſunt propoſitiones contrario modo, quàm re vera habeant, ſi futurus eſt ſyllogiſmus. cùm autem ita ſumantur, ambæ efficiuntur falſæ. veluti ſi τὸ α toti δ ineſt, τὸ δ autem nulli β. his enim conuerſis, erit ſyllogiſmus, & propoſitiones ambæ falſæ. 6 Cùm verò ſub α non eſt medium, veluti τὸ δ: propoſitio quidem αδ, vera erit: propoſitio autem δβ, D falſa. erit enim αδ, vera: quia non erat in α τὸ δ. at δβ, falſa: quia ſi vera eſſet, etiam concluſio eſſet vera: ſed erat falſa. 7 Quando autem per mediam figuram fit deceptio, fieri nequit vt ambæ propoſitiones ſint totæ falſæ. cùm enim τὸ β eſt ſub α: nihil eſt, quod poſſit alteri omni, alteri nulli ineſſe, vt antea quoque dictum fuit. 8 Poteſt autem eſſe altera falſa, & quidem vtrauis. 9 Nam ſi τὸ γ & τῷ α & τῷ β inſit: ſi ſumptum fuerit τῷ α ineſſe, ſed τῷ β non ineſſe: propoſitio αγ, vera erit: altera verò, falſa.

ΕΝ δὲ τοῖς μὴ ἀτόμως ὑπάρχουσιν, ἢ μὴ ὑπάρχουσιν, ὅταν CAP. VIII. μὲν διὰ τοῦ οἰκείου μέσου γίνηται τοῦ ψεύδους ὁ συλλογισμός, οὐχ οἷόν τε ἀμφοτέρας ψευδεῖς εἶναι τὰς προτάσεις, ἀλλὰ μόνον τὴν πρὸς τῷ μείζονι ἄκρῳ. 2 Λέγω δ' οἰκεῖον μέσον, δι' οὗ γίνεται τῆς ἀντιφάσεως ὁ συλλογισμός. 3 Ὑπαρχέτω γὰρ τὸ α τῷ β διὰ μέσου τοῦ γ. ἐπεὶ οὖν ἀνάγκη τὴν γβ καταφατικὴν λαμβάνεσθαι, συλλογισμοῦ γινομένου· δῆλον ὅτι ἀεὶ αὕτη ἀληθής· οὐ γὰρ ἀντιστρέφεται. ἡ δ' αγ, ψευδής· ταύτης γὰρ ἀντιστρεφομένης, ἐναντίος γίνεται ὁ συλλογισμός. 4 Ὁμοίως δὲ καὶ, εἰ ἐξ ἄλλης συστοιχίας ληφθείη τὸ μέσον· οἷον, τὸ δ, εἰ καὶ ἐν τῷ α ὅλῳ ἐστί, καὶ κατὰ τοῦ β κατηγορεῖται παντός. ἀνάγκη γὰρ τὴν μὲν δβ πρότασιν μένειν, τὴν δ' ἑτέραν ἀντιστρέφεσθαι. ὥσθ' ἡ μὲν, ἀεὶ ἀληθής· ἡ δ', ἀεὶ ψευδής. καὶ σχεδόν γε τοιαύτη ἀπάτη, ἡ αὐτή ἐστι τῇ διὰ τοῦ οἰκείου μέσου. 5 Ἐὰν δὲ μὴ διὰ τοῦ οἰκείου μέσου γίνηται ὁ συλλογισμός· ὅταν μὲν ὑπὸ τὸ α ᾖ τὸ μέσον, τῷ δὲ β μηδενὶ ὑπάρχῃ· ἀνάγκη ψευδεῖς εἶναι ἀμφοτέρας. ληπτέαι γὰρ ἐναντίως, ἢ ὡς ἔχουσιν, αἱ προτάσεις, εἰ μέλλοι συλλογισμὸς ἔσεσθαι. οὕτω δὲ λαμβανομένων, ἀμφότεραι γίνονται ψευδεῖς. οἷον, εἰ τὸ μὲν α ὅλῳ τῷ δ ὑπάρχει, τὸ δὲ δ μηδενὶ τῷ β. ἀντιστραφέντων γὰρ τούτων, συλλογισμὸς ἔσται· καὶ αἱ προτάσεις ἀμφότεραι, ψευδεῖς. 6 Ὅταν δὲ μὴ ᾖ ὑπὸ τὸ α τὸ μέσον, οἷον τὸ δ. ἡ μὲν αδ, ἀληθὴς ἔσται· ἡ δὲ δβ, ψευδής. ἡ μὲν γὰρ αδ, D ἀληθής, ὅτι οὐκ ἦν ἐν τῷ α τὸ δ· ἡ δὲ δβ, ψευδής· ὅτι, εἰ ἦν ἀληθής, καὶ τὸ συμπέρασμα ἦν ἀληθές· ἀλλ' ἦν * ψεῦδος. * γρ. ψευδές. 7 Διὰ δὲ τοῦ μέσου σχήματος γινομένης τῆς ἀπάτης, ἀμφοτέρας μὲν οὐκ ἐνδέχεται ψευδεῖς εἶναι τὰς προτάσεις ὅλας. ὅταν γὰρ ᾖ τὸ β ὑπὸ τὸ α, οὐδὲν ἐνδέχεται τῷ μὲν, παντί, τῷ δὲ, μηδενὶ ὑπάρχειν, καθάπερ ἐλέχθη καὶ πρότερον. 8 Τὴν ἑτέραν δ' ἐνδέχεται, καὶ ὁποτέραν ἔτυχεν. 9 Εἰ γὰρ τὸ γ καὶ τῷ α καὶ τῷ β ὑπάρχει, ἐὰν ληφθῇ τῷ μὲν α ὑπάρχειν, τῷ δὲ β μὴ ὑπάρχειν· ἡ μὲν αγ, ἀληθὴς ἔσται· ἡ δ' ἑτέρα, ψευδής.

10 Πάλιν, εἰ τῷ μὲν β ληφθείη τὸ γ ὑπάρχειν, τῷ δὲ α μηδενί· ἡ μὲν γ β, ἀληθὴς ἔσται· ἡ δ' ἑτέρα, ψευδής. 11 Ἐὰν μὲν οὖν στερητικὸς ᾖ τῆς ἀπάτης ὁ συλλογισμός, εἴρηται, πότε, καὶ διὰ τίνων ἔσται ἡ ἀπάτη. 12 Ἐὰν δὲ καταφατικός, ὅταν μὲν διὰ τοῦ οἰκείου μέσου, ἀδύνατον ἀμφοτέρας εἶναι ψευδεῖς· ἀνάγκη γὰρ τὴν γ β μένειν, εἴπερ ἔσται συλλογισμός, καθάπερ ἐλέχθη καὶ πρότερον. ὥστε ἡ γ α, ἀεὶ ἔσται ψευδής· αὕτη γάρ ἐστιν ἡ ἀντιστρεφομένη. 13 Ὁμοίως δὲ καί, εἰ ἐξ ἄλλης συστοιχίας λαμβάνοιτο τὸ μέσον, ὥσπερ ἐλέχθη καὶ ἐπὶ τῆς στερητικῆς ἀπάτης. ἀνάγκη γὰρ τὴν μὲν δ β μένειν, τὴν δὲ α δ ἀντιστρέφεσθαι. καὶ ἡ ἀπάτη, ἡ αὐτὴ τῇ πρότερον. 14 Ὅταν δὲ μὴ διὰ τοῦ οἰκείου, ἐὰν μὲν ᾖ τὸ δ ὑπὸ τὸ α, αὕτη μὲν ἔσται ἀληθής, ἡ ἑτέρα δέ, ψευδής. ἐγχωρεῖ γὰρ τὸ α πλείοσιν ὑπάρχειν, ἃ οὐκ ἔστιν ὑπ' ἄλληλα. 15 Ἐὰν δὲ μὴ ᾖ τὸ δ ὑπὸ τὸ α· αὕτη μὲν ἀεὶ δῆλον ὅτι ἔσται ψευδής· καταφατικὴ γὰρ λαμβάνεται.* τὴν δὲ β δ ἐνδέχεται καὶ ἀληθῆ εἶναι, καὶ ψευδῆ· οὐδὲν γὰρ κωλύει, τὸ μὲν α τῷ δ μηδενὶ ὑπάρχειν· τὸ δὲ δ τῷ β παντί. οἷον, ζῷον ἐπιστήμῃ, ἐπιστήμη δὲ μουσικῇ. Οὐδ' αὖ μήτε τὸ α μηδενὶ τῷ δ, μήτε τὸ δ μηδενὶ τῷ β. Φανερὸν οὖν ὅτι μὴ ὄντος τοῦ μέσου ὑπὸ τὸ α, καὶ ἀμφοτέρας ἐγχωρεῖ ψευδεῖς εἶναι, καὶ ὁποτέραν ἔτυχε. 16 Ποσαχῶς μὲν οὖν, καὶ διὰ τίνων ἐγχωρεῖ γίνεσθαι τὰς κατὰ συλλογισμὸν ἀπάτας ἔν τε τοῖς ἀμέσοις, καὶ ἐν τοῖς δι' ἀποδείξεως, φανερόν.

* γρ. τὴν δὲ δ β.

10 Rurſus ſi ſumptum fuerit τὸ γ ineſſe τῷ β, nulli autem α: *propoſitio* quidem γ β, vera erit: altera autē falſa. 11 Si igitur priuatiuus ſit ſyllogiſmus deceptionis, dictum eſt, quando, & per quæ erit deceptio. 12 Si verò *ſit* affirmatiuus: cū *eſt* per proprium medium, impoſſibile *eſt* ambas *propoſitiones* eſſe falſas: neceſſe *eſt* enim *propoſitionem* γ β manere, ſi futurus eſt ſyllogiſmus, vt antea quoque dictum fuit. quare *propoſitio* γ α ſemper erit falſa: hæc enim eſt, quæ conuertitur. 13 Similis ratio *eſt*, ſi ex alia claſſe ſumatur medium, vt dictū fuit etiam in priuatiua deceptione: quia neceſſe *eſt*, vt propoſitio δ β maneat, α δ verò conuertatur. ac deceptio eadem *eſt* cum priore. 14 Cùm autem non per proprium *medium exſtruitur ſyllogiſmus*: ſi quidem ſit τὸ δ ſub α: hæc erit vera: altera, falſa. poteſt enim τὸ α pluribus ineſſe, quorum alia ſub aliis non ſint *collocata*. 15 Quòd ſi τὸ δ non ſit ſub α: hāc quidem conſtat eſſe falſam, quia ſumitur affirmatiua: ſed δ β tam vera, quam falſa eſſe poteſt. nihil enim prohibet, quominùs τὸ α nulli δ inſit, τὸ δ autem omni β: vt animal *ineſt nulli* ſcientię: ſcientia *omni* muſicæ. Rurſus *nihil prohibet, quominùs* τὸ α nulli δ, ac τὸ δ nulli β *inſit*. Perſpicuum igitur *eſt*, cùm mediū non eſt ſub α, & ambas *propoſitiones* falſas eſſe poſſe, & alterutram. 16 Quotupliciter igitur, & per quæ poſſint effici deceptiones ſyllogiſticæ, tam in immediatis, quàm in iis quæ per demonſtrationem *probantur*, perſpicuum *eſt*.

De ignorantia ſecundum negationem. Cap. XIII.

CAP. XIX.

Φανερὸν δὲ καί, ὅτι, εἴ τις αἴσθησις ἐκλέλοιπεν, ἀνάγκη καὶ ἐπιστήμην τινὰ ἐκλελοιπέναι, ἣν ἀδύνατον λαβεῖν. εἴπερ μανθάνομεν ἢ ἐπαγωγῇ, ἢ ἀποδείξει. ἔστι δ' ἡ μὲν ἀπόδειξις, ἐκ τῶν καθόλου· ἡ δ' ἐπαγωγή, ἐκ τῶν κατὰ μέρος· ἀδύνατον δὲ τὰ καθόλου θεωρῆσαι, εἰ μὴ δι' ἐπαγωγῆς· (ἐπεὶ καὶ τὰ ἐξ ἀφαιρέσεως λεγόμενα, ἔσται δι' ἐπαγωγῆς γνώριμα, ἐάν τις βούληται γνώριμα ποιεῖν, ὅτι ὑπάρχει ἑκάστῳ γένει ἔνια, καὶ εἰ μὴ χωριστά ἐστιν, ᾗ τοιονδὶ ἕκαστον) ἐπαχθῆναι δέ, μὴ ἔχοντας αἴσθησιν, ἀδύνατον. τῶν γὰρ καθ' ἕκαστον ἡ αἴσθησις· οὐ γὰρ ἐνδέχεται λαβεῖν αὐτῶν τὴν ἐπιστήμην· οὔτε γὰρ ἐκ τῶν καθόλου ἄνευ ἐπαγωγῆς, οὔτε διὰ τῆς ἐπαγωγῆς ἄνευ τῆς αἰσθήσεως.

Perſpicuū etiam *eſt*, ſi quis ſenſus deſit, neceſſe eſſe vt aliqua ſcientia deſit, quam impoſſibile *eſt* percipere. ſiquidem diſcimus aut inductione, aut demonſtratione. eſt autem demonſtratio ex vniuerſalibus: inductio verò ex particularibus: impoſſibile verò *eſt* vniuerſalia contemplari, niſi per inductionem: (quoniam & ea quæ abſtracta dicūtur, erunt per inductionem nota, ſi quis declarare velit quædam cuique generi ineſſe, quamvis non ſeparabilia ſint, quatenus vnumquodque *eſt* hoc tale) vt autem inducant qui ſenſu carent, fieri nequit: quia ſingularium *eſt* ſenſus. non enim poteſt accipi ipſorum ſcientia: quia nec ex vniuerſalibus *accipi poteſt* ſine inductione, nec per inductionem ſine ſenſu.

VARIARVM QVÆSTIONVM SOLVTIO, EX QVA DEMONSTRATIONIS ET SCIENTIÆ DEMONSTRAtiuæ proprietates manifeſtæ fiunt.

TRACTATVS IV.

Vtrùm principia demonſtrationis ſint finita, an infinita. Cap. XIX.

1 Hypotheſis prima, 2 ſecunda, 3 tertia, 4 quarta, 5 quinta, 6 Quæſtio prima, 7 ſecunda. 8 D[illegible] primæ & ſecundæ quæſtionis. 9 Quæſtio tertia. 10 Summa harum quæſtionum. 11 De ſyllogiſmis & propoſ[illegible] negantibus. 12 De iis quæ reciprocantur.

CAP. XX.

Ἔστι δὲ πᾶς συλλογισμὸς διὰ τριῶν ὅρων. 2 Καὶ ὁ μέν, δεικνύναι δυνάμενος, ὅτι ὑπάρχει τὸ α τῷ γ, διὰ τὸ ὑπάρχειν τῷ β, καὶ τοῦτο τῷ γ· ὁ δὲ στερητικός, τὴν μὲν ἑτέραν

Omnis autem ſyllogiſmus ex tribus terminis conſtat. 2 Et alius quidem vim habet probandi ineſſe τὸ α τῷ γ, quia ineſt τῷ β, atque hoc τῷ γ: alius verò *eſt* priuatiuus, alterā propoſitionē habēs

qua ſignificatur ineſſe quidpiam aliud alij; alteram, *qua ſignificatur* non ineſſe. 3 Perſpicuum igitur *eſt*, hæc eſſe principia, & quæ vocantur ſuppoſitiones: his n. ita acceptis, neceſſe *eſt* probare: veluti τὸ α τῷ γ ineſſe, per τὸ β: rurſus τὸ α τῷ β, per aliud mediũ: itidémque τὸ β τῷ γ. 4 Conſtat igitur, eos, qui probabiliter tantùm ac dialecticè argumentãtur, hoc ſolum reſpicere debere, an ex *propoſitionibus*, quò ad eius fieri poteſt, quam maximè probabilibus efficiatur ſyllogiſmus. quocirca etſi re vera eſt *aliquid* medium inter α & β, ſed videtur non eſſe: qui per hoc argumentatur, dialecticè argumentatur. *Cum* autem ad veritatem *probationes diriguntur*: ex iis quæ inſunt, conſiderare oportet. 5 *Ideo* autem *quædam* ſic *ſe* habent: quia *in vnoquoque genere* reperitur, quod alij attribuitur non ex accidenti. Dico autem, ex accidenti: veluti album illud interdum dicimus eſſe hominem, cùm nõ ſimiliter dicamus etiam hominem *eſſe* album. hic enim, cùm non ſit aliud quiddam, eſt albus. albũ autem *dicitur homo*: quia accidit homini vt ſit albus. ſunt igitur nonnulla eiuſmodi, vt per ſe attribuantur. 6 Eſto igitur τὸ γ eiuſmodi, quod alij non inſit, huic verò primo *inſit* τὸ β, nec ſit aliud interiectum, itidémque rurſus τὸ ε *inſit* τῷ ζ; atque hoc τῷ β. vtrùm igitur neceſſe *eſt* hoc conſiſtere, an poteſt in infinitum progredi? 7 Ac rurſus ſi τῷ α nihil attribuitur per ſe: τὸ α verò τῷ θ ineſt primo, interiecto autem nulli priori: item τὸ θ ineſt τῷ η atque hoc τῷ β: vtrùm hoc quoque neceſſe *eſt* conſiſtere, an & hoc poteſt in infinitum progredi? 8 Differt autem hoc *quæſitũ* à priori: quoniam illo modo quæritur incipiendo ab eo quod nulli alij ineſt cùm aliud ipſi inſit, vtrùm liceat ſurſum versùs in infinitum progredi: hoc autem modo quæritur, ſumpto initio ab eo, quod alij attribuitur, & nulli ſubijcitur, vtrùm deorſum versùs liceat in infinitum progredi. 9 Præterea terminatis extremis, poſſúntne media eſſe infinita? verbi gratiâ, ſi τὸ α ineſt τῷ γ, medium autem eorum *eſt* τὸ β, τῷ β verò & τῷ α *ſunt* alia *media*, atque horum alia: vtrùm hæc quoque in infinitum poſſunt progredi, an non poſſunt? 10 Hoc autem conſiderare, nihil aliud eſt, quàm *quærere* vtrùm demonſtrationes in infinitum progrediantur, & vtrùm omnium ſit demonſtratio, an *extrema* ſe inuicem terminent. 11 Similiter dico *quærendum eſſe* de priuatiuis ſyllogiſmis, & propoſitionibus: veluti an τὸ α nulli β inſit primo, an ſit aliquid medium cui priori non inſit: veluti an *medium* ſit τὸ η, quod inſit omni β: & rurſus *an* hoc alij priori τὸ α *non inſit*, veluti an *medium ſit* τὸ θ, quod omni η inſit. etenim in his quoque aut infinita *ſunt ea*, quibus prioribus non ineſt, aut conſiſtunt. 12 In iis verò quæ reciprocantur non ſimiliter *ſe res* habet: quoniam in iis quæ ſibi inuicem attribuuntur, nihil eſt cui primo, vel poſtremo attribuatur. omnia namque ad omnia, quantùm ad hoc, ſimiliter affecta ſunt; ſiue ſint infinita, quæ eidem attribuuntur, ſiue ambo *illa*, de quibus dubitatur, ſint infinita: præterquàm ſi non ſimiliter fiat reciprocatio; ſed alterum *ſit* vt accidens; alterum verò, vt attributio.

A προτάσεων ἔχων, ὅτι ὑπάρχει τι ἄλλο ἄλλῳ· τὴν δ' ἑτέραν, ὅτι οὐχ ὑπάρχει. 3 Φανερὸν οὖν, ὅτι αἱ μὲν ἀρχαί, καὶ αἱ λεγόμεναι ὑποθέσεις, αὗταί εἰσι. λαβόντα γὰρ ταῦτα οὕτως, ἀνάγκη δεικνύναι· οἷον, ὅτι τὸ α τῷ γ ὑπάρχει, διὰ τοῦ β· πάλιν δ', ὅτι τὸ α τῷ β, δι' ἄλλου μέσου· καὶ ὅτι τὸ β τῷ γ, ὡσαύτως. 4 Κατὰ μὲν οὖν δόξαν συλλογιζομένοις, καὶ μόνον διαλεκτικῶς, δῆλον ὅτι τοῦτο μόνον σκεπτέον, εἰ ἐξ ὧν ἐνδέχεται ἐνδοξοτάτων γίνεται ὁ συλλογισμός. ὥστ' εἰ καὶ ἔστι τι τῇ ἀληθείᾳ τῶν α β μέσον, δοκεῖ δὲ μὴ εἶναι, ὁ διὰ τούτου συλλογιζόμενος, συλλελόγισται διαλεκτικῶς. πρὸς δ' ἀλήθειαν, ἐκ τῶν ὑπαρχόντων δεῖ σκοπεῖν.

B 5 Ἔχει δ' οὕτως· ἐπειδὴ ἔστιν ὃ αὐτὸ μὲν κατ' ἄλλου κατηγορεῖται μὴ κατὰ συμβεβηκός. λέγω δὲ τὸ κατὰ συμβεβηκός, οἷον, τὸ λευκόν ποτ' ἐκεῖνό φαμεν εἶναι ἄνθρωπον, οὐχ ὁμοίως λέγοντες καὶ τὸν ἄνθρωπον λευκόν. ὁ μὲν γὰρ, οὐχ ἕτερόν τι ὤν, λευκός ἐστι· τὸ δὲ λευκόν, ὅτι συμβέβηκε τῷ ἀνθρώπῳ εἶναι* λευκῷ. ἔστιν οὖν ἔνια τοιαῦτα, ὥστε καθ' αὑτὰ κατηγορεῖσθαι. * χ. λευκόν. 6 Ἔστω δὴ τὸ γ τοιοῦτον, ὃ αὐτὸ μὲν μηκέτι ὑπάρχει ἄλλῳ, τούτῳ δὲ τὸ β πρώτῳ καὶ οὐκ ἔστιν ἄλλο μεταξύ. καὶ πάλιν, τὸ ε τῷ ζ, ὡσαύτως, καὶ τοῦτο τῷ β. ἆρ' οὖν τοῦτο ἀνάγκη στῆναι, ἢ ἐνδέχεται εἰς ἄπειρον ἰέναι; 7 Καὶ πάλιν, εἰ τοῦ α μηδὲν κατηγορεῖται καθ' αὑτό,

C τὸ δὲ α* τῷ θ ὑπάρχει πρώτῳ, μεταξὺ δὲ μηδενὶ προτέρῳ, καὶ τὸ θ τῷ η, καὶ τοῦτο τῷ β· ἆρα καὶ τοῦτο ἵστασθαι ἀνάγκη, ἢ καὶ τοῦτ' ἐνδέχεται εἰς ἄπειρον ἰέναι; * χ. τῷ ζ. 8 Διαφέρει δὲ τοῦτο τοῦ* προτέρου, τοσοῦτον, ὅτι τὸ μέν ἐστιν, ἆρα ἐνδέχεται ἀρξαμένῳ ἀπὸ τοιούτου, ὃ μηδενὶ ὑπάρχει ἑτέρῳ, ἀλλ' ἄλλο ἐκείνῳ, ἐπὶ τὸ ἄνω εἰς ἄπειρον ἰέναι· θάτερον δέ, ἀρξαμένους ἀπὸ τοιούτου, ὃ αὐτὸ μὲν ἄλλου, ἐκείνου δὲ μηδὲν κατηγορεῖται, ἐπὶ τὸ κάτω σκοπεῖν εἰ ἐνδέχεται εἰς ἄπειρον ἰέναι; * χ. πρότερον. 9 Ἔτι, τὰ μεταξύ, ἆρα ἐνδέχεται ἄπειρα εἶναι, ὡρισμένων τῶν ἄκρων; λέγω δ', οἷον,

D εἰ τὸ α τῷ γ ὑπάρχει, μέσον δ' αὐτῶν τὸ β, τοῦ δὲ β καὶ τοῦ α ἕτερα, τούτων δ' ἄλλα· ἆρα καὶ ταῦτα εἰς ἄπειρον ἐνδέχεται ἰέναι, ἢ ἀδύνατον; 10 Ἔστι δὲ τοῦτο σκοπεῖν, ταὐτὸ, καὶ εἰ αἱ ἀποδείξεις εἰς ἄπειρον ἔρχονται, καὶ εἰ ἔστιν ἀπόδειξις ἁπάντων, ἢ πρὸς ἄλληλα περαίνεται. 11 Ὁμοίως δὲ λέγω καὶ ἐπὶ τῶν στερητικῶν συλλογισμῶν, καὶ προτάσεων. οἷον, εἰ τὸ α μὴ ὑπάρχει τῷ β μηδενί, ἤτοι πρώτῳ, ἢ ἔσται τι μεταξύ, ᾧ προτέρῳ οὐχ ὑπάρχει· οἷον, εἰ τῷ η, ὃ τῷ β ὑπάρχει παντί· καὶ πάλιν τούτου ἔτι ἄλλῳ προτέρῳ, οἷον εἰ τῷ θ, ὃ τῷ η παντὶ ὑπάρχει. καὶ γὰρ ἐπὶ τούτων ἢ ἄπειρα οἷς οὐχ ὑπάρχει προτέροις, ἢ ἵσταται. 12 Ἐπὶ δὲ τῶν ἀντιστρεφόντων οὐχ ὁμοίως ἔχει. οὐ γάρ

E ἐστιν ἐν τοῖς ἀντικατηγορουμένοις οὗ πρώτου κατηγορεῖται, ἢ τελευταίου· πάντα γὰρ πρὸς πάντα ταύτῃ γε ὁμοίως ἔχει, εἴτ' ἐστὶν ἄπειρα τὰ κατ' αὐτοῦ κατηγορούμενα, εἴτ' ἀμφότερά ἐστι τὰ ἀπορηθέντα ἄπειρα· πλὴν εἰ μὴ ὁμοίως ἐνδέχεται ἀντιστρέφειν, ἀλλὰ τὸ μέν, ὡς συμβεβηκός, τὸ δ', ὡς κατηγορία.

Media non eſſe infinita. Cap. XX.

1 Veræ ſententiæ confirmatio. 2 Prauæ ſolutionis refutatio.

CAP. XVI.

Ὅτι μὲν οὖν τὰ μεταξὺ οὐκ ἐνδέχεται ἄπειρα εἶναι, εἰ ἐπὶ τὸ κάτω καὶ τὸ ἄνω ἵστανται αἱ κατηγορίαι, δῆλον. (λέγω δ' ἄνω μὲν, τὴν ἐπὶ τὸ καθόλου μᾶλλον· κάτω δὲ, τὴν ἐπὶ * τὸ κατὰ μέρος) εἰ γὰρ, τοῦ α κατηγορουμένου κατὰ τοῦ ζ, ἄπειρα τὰ μεταξὺ, ἐφ' ὧν τὸ β, δῆλον ὅτι ἐνδέχοιτ' ἂν, ὥστε καὶ ἀπὸ τοῦ α ἐπὶ τὸ κάτω, ἕτερον ἑτέρου κατηγορεῖσθαι εἰς ἄπειρον (πρὶν γὰρ ἐπὶ τὸ ζ ἐλθεῖν, ἄπειρα τὰ μεταξύ) καὶ ἀπὸ τοῦ ζ ἐπὶ τὸ ἄνω, ἄπειρα, πρὶν ἐπὶ τὸ α ἐλθεῖν. ὥστ' εἰ ταῦτα, ἀδύνατα· καὶ τοῦ α καὶ τοῦ ζ, ἀδύνατον ἄπειρα εἶναι τὰ μεταξύ. 2. Οὐδὲ γὰρ εἴ τις λέγοι, ὅτι τὰ μὲν, ἔστι τῶν * αβζ ἐχόμενα ἀλλήλων, ὥστε μὴ εἶναι μεταξὺ, τὰ δ' οὐκ ἔστι λαβεῖν· οὐδὲν διαφέρει. ὃ γὰρ ἂν λάβω τῶν β, ἔσται πρὸς τὸ α, ἢ πρὸς τὸ ζ, ἢ ἄπειρα τὰ μεταξὺ, ἢ οὔ. ἀφ' οὗ δὲ πρῶτον ἄπειρα, εἴτ' εὐθὺς, εἴτε μὴ εὐθὺς, οὐδὲν διαφέρει. τὰ γὰρ μετὰ ταῦτα, ἄπειρά ἐστι.

*γρ. τὸ κάτω.

*γ. αζγ.

A Qvòd autem media non poſſint eſſe infinita, ſi tam deorſum quàm ſurſum versùs attributiones conſiſtant, manifeſtum *eſt*. (voco autem *attributionem* ſurſum *verſus, eam* quæ *progreditur* ad magis vniuerſale: deorſum *verſus eam* quæ *progreditur* ad particulare) nam ſi, cùm τὸ α attribuatur τῷ ζ, infinita ſunt media, vbi β: conſtat accidere poſſe, vt ab α deorſum versùs alterum alteri attribuatur in infinitum: (quia priuſquàm perueniatur ad ζ, infinita *ſunt* media) & à ζ ſursũ versùs *ſint* infinita *attributa*, priuſquàm perueniatur ad α. quare ſi hæc *ſunt* impoſſibilia, etiam τοῦ α & τοῦ ζ impoſſi[bi]le B *eſt* infinita eſſe media. 2 Nec enim quicquam refert, ſi quis dicat quædam τῶν αβζ inuicem hærere, adeo vt nihil ſit interiectum: alia verò non poſſe accipi. quod*cumque* enim ſumpſero τῶν β: media vel *relatione habita* ad α vel ad ζ, aut erunt infinita, aut non, à quo autem primùm *incipiant eſſe* infinita, ſiue ſtatim, ſiue non ſtatim, nihil refert. nam quæ *ſunt* poſt hæc, infinita ſunt.

In negationibus eſſe quoddam ſupremum, & quoddam vltimum, in quibus eſt conſiſtendum. Cap. XXI.

1 ¶ *Protheſis.* 2 ¶ *Probatio. De prima figura.* 3 *De ſecunda figura.* 4 *De tertia figura.* 5 *De coniunctione figurarum.* 6 ¶ *Epilogus.*

CAP. XVII.

Φανερὸν δὲ καὶ ἐπὶ τῆς στερητικῆς ἀποδείξεως ὅτι στήσεται, εἴπερ ἐπὶ τῆς κατηγορικῆς ἵσταται ἐπ' ἀμφότερα. ἔστω γὰρ μὴ ἐνδεχόμενον, μήτε ἐπὶ τὸ ἄνω ἀπὸ τοῦ ὑστάτου εἰς ἄπειρον ἰέναι, (λέγω δ' ὕστατον, ὃ, αὐτὸ μὲν ἄλλῳ μηδενὶ ὑπάρχει, ἐκείνῳ δὲ ἄλλο, οἷον τὸ ζ) μήτε ἀπὸ τοῦ πρώτου ἐπὶ τὸ ὕστατον (λέγω δὲ πρῶτον, ὃ, αὐτὸ μὲν κατ' ἄλλου, κατ' ἐκείνου δὲ μηδὲν ἄλλο) εἰ δὴ ταῦτ' ἔστι, δῆλον ὡς καὶ ἐπὶ τῆς ἀποφάσεως στήσεται. 2. Τριχῶς * γὰρ δείκνυται μὴ ὑπάρχον. ἢ γὰρ ᾧ μὲν τὸ γ, τὸ β ὑπάρχει παντί· ᾧ δὲ τὸ β, οὐδενὶ τὸ α. Τοῦ μὲν τοίνυν βγ, καὶ ἀεὶ τοῦ ἑτέρου διαστήματος, ἀνάγκη βαδίζειν εἰς ἄμεσα· κατηγορικὸν γὰρ τοῦτο τὸ διάστημα. τὸ δ' ἕτερον, δῆλον ὅτι εἰ ἄλλῳ οὐχ ὑπάρχει προτέρῳ, οἷον τῷ δ, τοῦτο δεήσει τῷ β παντὶ ὑπάρχειν. Καὶ εἰ πάλιν ἄλλῳ προτέρῳ τοῦ δ οὐχ ὑπάρχει, ἐκεῖνο δεήσει τῷ δ παντὶ ὑπάρχειν. Ὥστ' ἐπεὶ * ἡ ἐπὶ τὸ κάτω ἵσταται ὁδὸς, καὶ ἡ ἐπὶ τὸ ἄνω στήσεται, καὶ ἔσται τι πρῶτον, ᾧ οὐχ ὑπάρχει. 3 Πάλιν, εἰ τὸ μὲν β παντὶ τῷ α, τῷ δὲ γ μηδενὶ, τὸ α τῷ γ οὐδενὶ ὑπάρχει. Πάλιν τοῦτο εἰ δεῖ δεῖξαι, δῆλον ὅτι ἢ διὰ τοῦ ἄνω τρόπου δειχθήσεται, ἢ διὰ τούτου, ἢ διὰ τοῦ τρίτου. ὁ μὲν οὖν πρῶτος εἴρηται· ὁ δὲ δεύτερος δειχθήσεται. οὕτω δ' ἂν δεικνύοι, οἷον, ὅτι τὸ δ τῷ μὲν β παντὶ ὑπάρχει, τῷ δὲ γ οὐδενὶ, εἰ ἀνάγκη ὑπάρχειν τι τῷ β. Καὶ πάλιν εἰ τοῦτο τῷ γ μὴ ὑπάρξει, ἄλλο τῷ δ ὑπάρχει, ὃ τῷ γ οὐχ ὑπάρχει. Οὐκοῦν ἐπεὶ τὸ ὑπάρχειν ἀεὶ τῷ ἀνωτέρῳ ἵσταται, στήσεται καὶ τὸ μὴ * ὑπάρχειν. 4 Ὁ δὲ τρίτος τρόπος ἦν· εἰ τὸ μὲν α τῷ β παντὶ ὑπάρχει, τὸ δὲ γ * μὴ ὑπάρχει· οὐ παντὶ ὑπάρχει τὸ γ ᾧ τὸ α. Πάλιν δὲ τοῦτο ἢ διὰ τῶν ἄνω εἰρημένων, ἢ ὁμοίως δειχθήσεται.

*γ. δι.

*γρ. ἡ ἐπὶ τὸ ἄνω & mox ἡ ἐπὶ τὸ κάτω.

*γρ. ὑπάρχειν.

*γρ. μηδενὶ ὑπ.

C PErſpicuum autem *eſt*, etiam in priuatiua demonſtratione *fore terminum in quo* conſiſtetur, ſiquidem in attributiua cõſiſtitur ex vtraque parte. ponatur enim fieri non poſſe, vt progreſſus ſit infinitus tam ab vltimo ſurſum versùs, (vltimum appello, quod nulli alij ineſt, cùm ipſi aliud *inſit* vt τὸ ζ) quàm à primo ad vltimum: (voco autem primum, quod de alio *dicitur*, cùm de eo nihil aliud dicatur) ſi igitur hæc ſunt, conſtat etiam in negatione *fore terminum in quo* conſiſtetur. 2 Tripliciter enim probatur non ineſſe. Aut enim cui *ineſt* τὸ γ, ei omni ineſt τὸ β: cui verò *ineſt* τὸ β, nulli *ineſt* τὸ α. Ergo *in pronunciato* β γ, atque *adeo* ſemper alte-D rius interualli *probatione* neceſſe *eſt* progredi ad *principia* medio vacantia: quoniam hoc interuallum *eſt* attributiuum. Alterum autem ſi alij priori non ineſt, veluti τῷ δ: opus erit, vt hoc omni β inſit. Et ſi rurſus alij priori ipſo δ non inſit, opus erit vt illud omni δ inſit. Quocirca cùm progreſſus deorſum versùs conſiſtat, etiam ſurſum versùs cõſiſtet, atque erit aliquid primum, cui non inſit. 3 Rurſus ſi τὸ β omni α, nulli autem γ: τὸ α nulli γ ineſt. [illegible] rurſus hoc probare oportet: manifeſtum [illegible] ſuperiori modo probatum iri, vel hoc, vel tertio. De primo igitur dictum eſt. ſecundus autem o[ſtende]-E tur: ſic verò probaret, veluti quia τὸ δ omni β in[eſt], nulli autem γ, ſi neceſſe *eſt* ineſſe quidpiam [τῷ β]. Ac rurſus ſi hoc τῷ γ nõ inerit: aliud τῷ δ ineſt, qu[od] τῷ γ non ineſt. Itaque cùm ineſſe ſemper ſup[erius con]ſiſtatur: ſiſtetur etiam non ineſſe. 4 Ter[tius au]tem modus erat: ſi τὸ α omni β ineſt, τὸ γ autem [non] ineſt: non omni α ineſt τὸ γ. Rurſus autem hoc vel per ſuprà dictos *modos*, vel ſimiliter probabitur. il-

Iis igitur modis conſiſtitur. ſi verò ſic *probetur*: rurſus accipietur τὸ β τῷ ε ineſſe, cui τὸ γ non omni ineſt. Et hoc rurſus ſimiliter *probabitur*. Cùm autem ſupponatur deorſum verſus ſtari: manifeſtum *eſt*, fore vt cōſiſtat etiam τὸ γ negatum. 5 Perſpicuum autem *eſt*, & ſi non vnâ viâ probetur, ſed omnibus, id eſt, modò ex prima figura, modò ex ſecunda, vel tertia, hoc etiam pacto *fore terminum in quo* conſiſtetur. finitæ namque ſunt viæ: ac neceſſe *eſt* vt finita finities *accepta*, ſint finita vniuerſa. 6 Quòd igitur in negatione, ſi quidem & in affirmatione, ſtatur, manifeſtum *eſt*.

A ἐκείνως μὲν δὴ ἵσταται. εἰ δ' οὕτω, πάλιν ληφθήσεται τὸ β τῷ ε ὑπάρχειν, ᾧ τὸ γ μὴ παντὶ ὑπάρχει. Καὶ τοῦτο πάλιν ὁμοίως. Ἐπεὶ δ' ὑπόκειται ἵστασθαι καὶ ἐπὶ τὸ κάτω, δῆλον ὅτι στήσεται καὶ τὸ γ οὐχ ὑπάρχον. 5 Φανερὸν δ' ὅτι καὶ, ἐὰν μὴ μιᾷ ὁδῷ δεικνύηται, ἀλλὰ πάσαις, ὁτὲ μὲν ἐκ τοῦ πρώτου σχήματος, ὁτὲ δὲ ἐκ τοῦ δευτέρου, ἢ τρίτου, ὅτι καὶ οὕτω στήσεται. πεπερασμέναι γάρ εἰσιν αἱ ὁδοί· τὰ δὲ πεπερασμένα πεπερασμενάκις, ἀνάγκη πεπεράνθαι πάντα. 6 Ὅτι μὲν οὖν ἐπὶ τῆς στερήσεως, εἴπερ καὶ ἐπὶ τοῦ ὑπάρχειν, ἵσταται, δῆλον.

In affirmationibus reperiri ſupremum, & infimum, in quibus conſiſtitur. Cap. XXII.

1 ❡ Rationes logicæ. Protheſis. 2 Ratio propria eorum quæ attribuuntur in quæſtione quid eſt. 3 Protheoria. 7 Ratio generaliter pertinens ad omnes attributiones, quia ſubſtantiarum & accidentium numerus eſt finitus. 18 Protheoria. 21 Altera ratio generalis, quia infinitarum rerum non poteſt eſſe ſcientia. 22 Epilogus. 23 ❡ Ratio analytica, quia quæ per ſe dicuntur, finita ſunt. Protheoria. 27 Demonſtratio. 28 Corollarium vnum, 29 atque alterum.

QVod autem in illis *ſtetur*, logicè conſiderantibus ita perſpicuum *erit*. 2 Sanè in iis quæ attribuuntur in *quæſtione* quid eſt, *hoc eſt* manifeſtum. nã ſi licet definire, vel ſi cognoſci poteſt quid res ſit, infinita verò percurrere non licet: neceſſe *eſt ea* eſſe finita, quæ attribuuntur in *quæſtione* quid eſt. 3 Vniuerſaliter autem ſi dicamus. Poteſt enim verè dici, album ambulare, & magnũ illud eſſe lignum: & rurſus lignum eſſe magnum, & hominem ambulare. differunt igitur, hoc modo dicere, & illo modo. cùm enim dico album eſſe lignum: tunc dico *id* cui accidit vt ſit album, eſſe lignum. ſed album non eſt tamquàm ſubiectum ligno: quia neque cùm eſſet album, neque cùm *eſſet* ſpecies albi, factum eſt lignum: proinde non eſt *lignum*, niſi per accidẽs. Cùm autem lignum, album eſſe dico, non dico aliud quiddam eſſe album, C eique accidere, vt ſit lignum: (quemadmodum cũ dico muſicum eſſe album: tunc enim *dico* hominẽ eſſe album, cui accidit vt ſit muſicus) ſed lignum eſt ſubiectum, quod factum eſt *album*, cùm aliud quid non eſſet quàm ipſum lignum, aut lignum quoddam. 4 Quòd ſi nomina ponere licet: hoc modo dicere, eſto attribuere: illo autẽ modo, aut nullo modo attribuere, aut attribuere quidẽ, non *tamẽ* ſimpliciter, ſed per accidens attribuere. Eſto autem attributum, vt album: *id* verò cui attribui- D tur, vt lignum. 5 Supponatur igitur attributum attribui ſemper ei cui attribuitur, ſimpliciter, non per accidens. ſic enim demonſtrationes demonſtrant. 6 Itaque *attribuitur* vel in *quæſtione* quid eſt, vel quia *eſt* quale, aut quantum, aut *relatum* ad aliquid, aut faciens, aut patiens, aut vbi, aut quando: *vtrum* cùm vnum vni attributum fuerit. 7 Præterea quæ ſignificant eſſentiam, ſignificant *id* cui attribuitur, nihil aliud eſſe quàm illud ipſum quod attribuitur, aut partem eius. Quæ verò non eſſentiam ſignificãt, ſed dicuntur de alio ſubiecto, quod nec eſt illud ipſum attributũ, nec pars eius: E *ſunt* accidentia. vt homini *attribuitur* album. homo namque nec eſt ipſum albũ, nec ipſum quiddam albi, ſed fortaſſe animal: homo n. eſt ipſum quiddam animal. 8 Quæ verò non eſſentiam ſignificant, oportet alicui ſubiecto attribui: nec eſſe album quoddam, quod, cùm nõ ſit aliud quidpiam, album ſit. valeant enim ideæ: quia ſunt teretiſmata: & ſi *re vera* ſint, nihil *tamen* ad *hunc* ſermonem

B ΟΤι δ' ἐπ' ἐκείνων, λογικῶς μὲν θεωροῦσιν, ὧδε φανερόν. 2 Ἐπὶ μὲν οὖν τῶν ἐν τῷ τί ἐστι κατηγορουμένων, δῆλον. εἰ γάρ ἐστιν ὁρίσασθαι, ἢ εἰ γνωστὸν τὸ τί ἦν εἶναι, τὰ δ' ἄπειρα μὴ ἔστι διελθεῖν, ἀνάγκη πεπεράνθαι τὰ ἐν τῷ τί ἐστι κατηγορούμενα. 3 Καθόλου δὲ ὧδε λέγομεν. ἔστι γὰρ εἰπεῖν ἀληθῶς, τὸ λευκὸν βαδίζειν, καὶ τὸ μέγα ἐκεῖνο εἶναι ξύλον· καὶ πάλιν, τὸ ξύλον μέγα εἶναι, καὶ τὸν ἄνθρωπον βαδίζειν. ἕτερον δή ἐστι τὸ οὕτως εἰπεῖν, καὶ τὸ ἐκείνως. ὅταν μὲν γὰρ τὸ λευκὸν εἶναι φῶ ξύλον· τότε λέγω, ὅτι ᾧ συμβέβηκε λευκῷ εἶναι, ξύλον ἐστίν. ἀλλ' οὐχ ὡς τὸ ὑποκείμενον τῷ ξύλῳ τὸ λευκόν ἐστι. καὶ γὰρ οὔτε λευκὸν ὂν, οὔθ' ὅπερ λευκόν τι, ἐγένετο ξύλον· ὥστ' οὐκ ἔστιν, ἀλλ' ἢ κατὰ συμβεβηκός. ὅταν δὲ τὸ ξύλον, λευκὸν εἶναι φῶ· οὐχ ὅτι ἕτερόν τί ἐστι λευκόν, ἐκείνῳ δὲ συμβέβηκε ξύλῳ εἶναι, (οἷον ὅταν τὸν μουσικὸν, λευκὸν εἶναι φῶ· τότε γὰρ, ὅτι ὁ ἄνθρωπος λευκός ἐστιν, ᾧ συμβέβηκεν εἶναι μουσικῷ) λέγω· ἀλλὰ τὸ ξύλον ἐστὶ τὸ ὑποκείμενον, ὅπερ καὶ ἐγένετο, οὐχ ἕτερόν τι ὂν, ἢ ὅπερ ξύλον, ἢ ξύλον τι. 4 Εἰ δὴ δεῖ * ὀνοματοθετῆσαι· ἔστω τὸ οὕτω λέγειν, κατηγορεῖν· τὸ δ' ἐκείνως, ἤτοι μηδαμῶς κατηγορεῖν, ἢ κατηγορεῖν μὲν μὴ ἁπλῶς, κατὰ συμβεβηκὸς δὲ κατηγορεῖν. ἔστω δ' ὡς μὲν τὸ λευκόν, τὸ κατηγορούμενον· ὡς δὲ τὸ ξύλον, τὸ οὗ κατηγορεῖται. 5 Ὑποκείσθω δὴ τὸ κατηγορούμενον κατηγορεῖσθαι ἀεὶ, οὗ κατηγορεῖται, ἁπλῶς, ἀλλὰ μὴ κατὰ συμβεβηκός· οὕτω γὰρ αἱ ἀποδείξεις ἀποδεικνύουσιν. 6 Ὥστε ἢ ἐν τῷ τί ἐστιν, ἢ ὅτι ποιὸν, ἢ ποσὸν, ἢ πρός τι, ἢ ποιοῦν, ἢ πάσχον, ἢ πού, ἢ ποτέ, ὅταν ἓν καθ' ἑνὸς κατηγορηθῇ. 7 Ἔτι, τὰ μὲν οὐσίαν σημαίνοντα, ὅπερ ἐκεῖνο, ἢ ὅπερ ἐκεῖνό τι σημαίνει, καθ' οὗ κατηγορεῖται. ὅσα δὲ μὴ οὐσίαν σημαίνει, ἀλλὰ κατ' ἄλλου ὑποκειμένου λέγεται, ὃ μή ἐστι μήτε ὅπερ ἐκεῖνο, μήτε ὅπερ ἐκεῖνό τι, συμβεβηκότα εἶναι, κατὰ τοῦ ἀνθρώπου τὸ λευκόν. οὐ γάρ ἐστιν ὁ ἄνθρωπος, οὔτε ὅπερ λευκὸν, οὔτε ὅπερ λευκόν τι· ἀλλὰ ζῷον ἴσως· ὅπερ γὰρ ζῷόν τί ἐστιν ὁ ἄνθρωπος. 8 Ὅσα δὲ μὴ οὐσίαν σημαίνει, δεῖ κατά τινος ὑποκειμένου κατηγορεῖσθαι, καὶ μὴ εἶναί τι λευκὸν, ὃ οὐχ ἕτερόν τι ὂν, λευκόν ἐστι. τὰ γὰρ εἴδη χαιρέτω. τερετίσματα γάρ ἐστι· καὶ εἰ ἔστιν, οὐδὲν πρὸς τὸν λόγον

CAP. XVIII.

* γρ. quidam νομοθετῆσαι. prorſus malè neque ita veteres.

ἐστίν. * οὐ γὰρ ἀποδείξεις περὶ τῶν τοιούτων εἰσίν. 9 Ἔτι, εἰ μὴ ἔστι τοῦτο τοῦδε ποιότης, κἀκεῖνο * τούτου, μηδὲ ποιότητος ποιότης· ἀδύνατον ἀντικατηγορεῖσθαι ἀλλήλων οὕτως. ἀλλ' ἀληθὲς μὲν εἰπεῖν ἐνδέχεται, ἀντικατηγορῆσαι δὲ ἀληθῶς οὐκ ἐνδέχεται. 10 Ἢ γὰρ ὡς οὐσία κατηγορηθήσεται, οἷον, εἰ γένος ὂν, ἢ διαφορὰ τοῦ κατηγορουμένου. 11 Ταῦτα δὲ δέδεικται ὅτι οὐκ ἔσται ἄπειρα, οὔτ' ἐπὶ τὸ κάτω, οὔτ' ἐπὶ τὸ ἄνω. οἷον, ἄνθρωπος, δίπουν τοῦτο, ζῷον τοῦτο δ', ἕτερον· οὐδὲ τὸ ζῷον κατ' ἀνθρώπου, τοῦτο δὲ κατὰ Καλλίου, τοῦτο δὲ κατ' ἄλλου, ἐν τῷ τί ἐστι. τὴν μὲν γὰρ οὐσίαν ἅπασαν ἔστιν ὁρίσασθαι τὴν τοιαύτην· τὰ δ' ἄπειρα οὐκ ἔστι διεξελθεῖν νοοῦντα. ὥστ' οὔτ' ἐπὶ τὸ ἄνω, οὔτ' ἐπὶ τὸ κάτω ἄπειρα· ἐκείνην γὰρ οὐκ ἔστιν ὁρίσασθαι, ἧς τὰ ἄπειρα κατηγορεῖται. 12 Ὡς μὲν δὴ γένη, ἀλλήλων οὐκ ἀντικατηγορηθήσονται· ἔσται γὰρ αὐτὸ, ὅπερ αὐτό τι. 13 Οὐδὲ μὴν τοῦ ποιοῦ, ἢ τῶν ἄλλων οὐδὲν, ἂν μὴ κατὰ συμβεβηκὸς, κατηγορηθῇ· πάντα γὰρ ταῦτα συμβέβηκε, καὶ κατὰ τῶν οὐσιῶν κατηγορεῖται. 14 Ἀλλὰ δὴ ὅτι οὐδ' εἰς τὸ ἄνω, ἄπειρα ἔσται. ἑκάστου γὰρ κατηγορεῖται, ὃ ἂν σημαίνῃ ἢ ποιόν τι, ἢ ποσόν τι, ἢ τι τῶν τοιούτων, ἢ τὰ ἐν τῇ οὐσίᾳ· ταῦτα δὲ πεπέρανται, καὶ τὰ γένη τῶν κατηγοριῶν πεπέρανται· ἢ γὰρ ποιὸν, ἢ ποσὸν, ἢ πρός τι, ἢ ποιοῦν, ἢ πάσχον, ἢ ποῦ, ἢ ποτέ. 15 Ὑπόκειται δὲ ἓν καθ' ἑνὸς κατηγορεῖσθαι. 16 Αὐτὰ δὲ αὑτῶν, ὅσα μὴ τί ἐστι, μὴ κατηγορεῖσθαι. συμβεβηκότα γάρ ἐστι πάντα· ἀλλὰ τὰ μὲν, καθ' αὑτὰ· τὰ δὲ, καθ' ἕτερον τρόπον. ταῦτα δὲ πάντα καθ' ὑποκειμένου τινὸς κατηγορεῖσθαί φαμεν. τὸ δὲ συμβεβηκὸς οὐκ εἶναι ὑποκείμενόν τι· οὐδὲν γὰρ τῶν τοιούτων τίθεμεν εἶναι, ὃ, οὐχ ἕτερόν τι ὂν, λέγεται ὃ λέγεται· ἀλλ' αὐτὸ ἄλλου, καὶ ἄλλ' ἄττα καθ' ἑτέρου. 17 Οὔτ' εἰς τὸ ἄνω ἄρα ἓν καθ' ἑνὸς, οὔτ' εἰς τὸ κάτω ὑπάρχειν, λεχθήσεται. καθ' ὧν μὲν γὰρ λέγεται τὰ συμβεβηκότα, ὅσα ἐν τῇ οὐσίᾳ ἑκάστου· ταῦτα δὲ, οὐκ ἄπειρα. ἄνω δὲ ταῦτά τε, καὶ τὰ συμβεβηκότα, ἀμφότερα οὐκ ἄπειρα. ἀνάγκη ἄρα εἶναί τι, οὗ πρῶτόν τι κατηγορεῖται, καὶ τούτου ἄλλο· καὶ τοῦτο ἵστασθαι, καὶ εἶναί τι, ὃ οὐκέτι οὔτε κατ' ἄλλου προτέρου, οὔτε κατ' ἐκείνου ἄλλο πρότερον κατηγορεῖται. Εἷς μὲν οὖν τρόπος λέγεται ἀποδείξεως οὗτος. 18 Ἔτι δὲ ἄλλος, εἰ ὧν * πρότερα ἄττα κατηγορεῖται, ἔστι τούτων ἀπόδειξις. 19 Ὧν δ' ἔστιν ἀπόδειξις, οὔτε βέλτιον ἔχειν ἐγχωρεῖ πρὸς αὐτὰ τοῦ εἰδέναι, οὔτ' εἰδέναι ἄνευ ἀποδείξεως. 20 Εἰ δὲ τόδε διὰ τῶνδε γνώριμον, τάδε δὲ μὴ ἴσμεν, μηδὲ βέλτιον ἔχομεν πρὸς αὐτὰ τοῦ εἰδέναι, οὐδὲ τὸ διὰ τούτων γνώριμον ἐπιστησόμεθα. 21 Εἰ οὖν ἔστι τι εἰδέναι δι' ἀποδείξεως ἁπλῶς, καὶ μὴ ἐκ τινῶν, μηδ' ἐξ ὑποθέσεως, ἀνάγκη ἵστασθαι τὰς κατηγορίας τὰς μεταξύ. εἰ γὰρ μὴ ἵστανται, ἀλλ' ἔστιν ἀεὶ τοῦ ληφθέντος ἐπάνω, ἁπάντων ἔσται ἀπόδειξις· ὥστ' εἰ τὰ ἄπειρα μὴ ἐγχωρεῖ διελθεῖν, ὧν ἐστιν ἀπόδειξις, ταῦτ' οὐκ εἰσόμεθα δι' ἀποδείξεως. εἰ οὖν μηδὲ βέλτιον ἔχομεν πρὸς αὐτὰ τοῦ εἰδέναι, * οὐκ ἔστιν οὐδὲν ἐπίστασθαι δι' ἀποδείξεως ἁπλῶς, ἀλλ' ἐξ ὑποθέσεως. 22 Λογικῶς μὲν οὖν ἐκ τούτων ἄν τις πιστεύσειε περὶ τοῦ λεχθέντος. 23 Ἀναλυτικῶς δὲ διὰ τῶνδε συντομώτερον, ὅτι οὔτ' ἐπὶ τὸ ἄνω, οὔτ' ἐπὶ τὸ κάτω ἄπειρα τὰ κατηγορούμενα ἐνδέχεται εἶναι ἐν ταῖς

* γρ. αὐτά.
* γρ. τοῦδε.
* γρ. ὕστερα.
* γρ. ὡς ἔστιν.

A pertinent: non enim demõſtrationes de talibus ſunt huiuſmodi. 9 Præterea ſi non eſt hoc huius qualitas, & illud huius, nec qualitatis qualitas: fieri non poteſt, vt ita inuicem attribuatur: ſed verè quidem dici poteſt, inuicem autem attribui verè non poteſt. 10 Quid enim? attribuetur ne vt ſubſtantia? veluti ſi ſit genus, aut differentia *generis* attributi. 11 Atqui oſtenſum eſt, hæc non fore infinita, nec deorſum, nec ſurſum verſùs. veluti, homo *eſt* bipes: hoc *eſt* animal: hoc autem *eſt* aliud. nec *progreſſu infinito* animal *dicetur* de homine; hoc de Callia, hoc de alio, in *quæſtione* quid eſt. omnem n. huiuſmodi ſubſtantiam licet definire: infinita B verò non poſſunt intelligentiâ percurri. quocirca nec ſurſum nec deorſum verſùs *ſunt* infinita: quandoquidem eam definire non licet, cui infinita attribuuntur. 12 Sanè vt genera, non ſibi mutuò ac reciprocè attribuentur: alioquin genus erit pars ſuiipſius. 13 Sed nec quale, nec aliquod aliud *accidens inuicem* attribuitur, niſi per accidens: hæc enim omnia accidunt, & ſubſtantiis attribuuntur. 14 At verò nec ſurſum verſùs infinita erunt. nam vnicuique *rei* attribuitur, quod ſignificat vel quale quiddam, vel quantum quiddam, vel tale quidpiam, vel quæ *ſunt* in *rei* eſſentia. hæc autem finita ſunt, ac genera categoriarum finita ſunt: aut enim eſt quale, aut quantum, aut ad aliquid, aut faciens, C aut patiens, aut vbi, aut quandò. 15 Supponitur autem, vnum vni attribui. 16 Quæ autem non *ſignificant* quid eſt, ipſa ſibi non attribui: quoniam omnia ſunt accidentia. ſed alia per ſe, *alia* ſecundum alium modum. hæc verò omnia dicimus alicui ſubiecto attribui: accidẽs autem non eſſe ſubiectum quoddam. nullam enim eiuſmodi rem ponimus eſſe, quæ, cùm non ſit aliud quidpiam, dicatur id quod dicitur: ſed ipſum alij *dicimus attribui*, & alia quædam alij. 17 Itaque nec ſurſum nec deorſum verſùs vnum vni ineſſe dicetur. de quibus enim dicuntur accidentia, *ſunt ea* quæ *cõtinentur* in cuiuſque *rei* eſſentia: atque hæc non *ſunt* infinita. ſurſum verò *ſunt* & hæc, & accidẽtia: ambo D autem non infinita *ſunt*. Neceſſe *eſt* igitur eſſe aliquid, cui primùm quidpiam attribuatur, & huic aliud: atque hoc conſiſtere: & eſſe aliquid, quod nec alij priori attribuatur, nec alij priori ſubijciatur. Expoſitus igitur eſt hic demonſtrationis modus. 18 Præterea verò *eſt* alius *modus*, ſi eorum eſt demonſtratio, quibus aliqua priùs attribuuntur. 19 Ad ea verò, quorum eſt demonſtratio, non poteſt quiſpiam meliùs affectus eſſe, quàm ſi *ea* cognoſcat: nec *poteſt ea* cognoſcere ſine demonſtratione. 20 Quòd ſi hoc per hæc notum *ſit*, hęc autem non nouimus, nec ad ea melius affecti ſumus quàm ſi cognoſceremus: ne *id* quidem ſciemus, E quod per hæc notum *fieri debet*. 21 Si igitur licet aliquid ſcire per demonſtrationẽ ſimpliciter, non ex quibuſdam, nec ſub conditione: neceſſe *attributiones* interiectas conſiſtere: quia ſi non conſiſtant, ſed ſit ſemper *aliquid* ſupra *id quod* ſumptum *fuit*: omnium erit demonſtratio. quare ſi infinita percurri nequeunt: quorum eſt demonſtratio, ea non cognoſcemus per demonſtrationem. ſi igitur nec meliùs ad ea ſumus affecti, quam ſi cognoſceremus: non licet quidpiam per demonſtrationem ſcire ſimpliciter, ſed ſub conditione. 22 Logicè igitur ex his fides fieri poteſt de eo quod dictum fuit. 23 Analyticè verò per hæc breuiùs probabitur, nec ſurſum, nec deorſum verſùs infinita

eſſe poſſe attributa in demonſtratiuis ſcientiis, de A quibus conſideratio *inſtituta* eſt. 24 Nam demonſtratio eſt eorum quæ per ſe inſunt rebus. 25 Per ſe autem dicuntur bifariam: nempe quæ illis inſunt in *attributione declarante* quid eſt: & quibus ſubiecta inſunt in *attributione declarante* quid eſt. vt numero *attribuitur* impar, quod quidem numero ineſt, ſed ipſe numerus ineſt in eius definitione. rurſuſque multitudo aut diuiſibile in definitione numeri ineſt. 26 Horum autem neutra poſſunt eſſe infinita: nec vt impar *attribuitur* numero: (ſurſus enim in impari aliud eſſet, cui, cùm eſſet *in impari, impar* ineſſet. quod ſi eſt, primùm numerus inerit iis quæ ipſi inſunt. Si igitur infinita eiuſmodi non poſſunt vni ineſſe: certè nec ſurſum versùs B erunt infinita. at verò neceſſe *eſt* omnia ineſſe primo, vt numero, & illis numerum. proinde reciprocabuntur nec latiùs patebunt) ſed *nec ea* ſunt infinita, quæ inſunt in *attributione declarante* quid eſt: alioqui nihil poſſet definiri. 27 Quare ſi omnia attributa dicuntur per ſe, hæc autem non *ſunt* infinita: vtique conſiſtent, quæ *ſunt* ſurſum versùs: proinde & deorſum. 28 Quòd ſi ita *eſt*: ea quoque finita erunt, quæ ſunt duobus terminis interiecta. 29 Si autem hoc *verum eſt*, iam patet neceſſe eſſe, vt ſint demonſtrationum principia, neque ſit omnium *rerum* demonſtratio, quod initio diximus quoſdam aſſerere. etenim ſi ſint principia: nec omnia *ſunt* demonſtrabilia, nec in infinitum C iri poteſt. eſſe enim horum vtrumlibet, nihil aliud eſt, quàm nullum eſſe interuallum immediatum & indiuiduum, ſed omnia *eſſe* diuidua: quoniam ob terminum intrinſecùs immiſſum, nō *extrinſecùs* aſſumptum, demonſtratur id quod demonſtratur. quare ſi hoc in infinitum abire poteſt, fieri *etiam* poteſt vt infinita ſint media duobus terminis interiecta. ſed hoc *eſt* impoſſibile, ſi attributiones conſiſtunt ſurſum & deorſum versùs. quòd autem conſiſtant, antea logicè, nunc verò analyticè oſtenſum fuit.

ἀποδεικτικαῖς ἐπιστήμαις, περὶ ὧν ἡ σκέψις ἐστίν. 24 Ἡ μὲν γὰρ ἀπόδειξίς ἐστι τῶν ὅσα ὑπάρχει καθ' αὑτὰ τοῖς πράγμασι. 25 Καθ' αὑτὰ δὲ* διχῶς· ὅσα τε γὰρ ἐν ἐκείνοις ἐνυπάρχει ἐν τῷ τί ἐστι, καὶ οἷς αὐτὰ ἐν τῷ τί ἐστιν ὑπάρχουσιν αὐτοῖς εἶναι, τῷ ἀριθμῷ τὸ περιττόν, ὃ ὑπάρχει μὲν ἀριθμῷ, ἐνυπάρχει δ' αὐτὸς ὁ ἀριθμὸς ἐν τῷ λόγῳ αὐτοῦ. καὶ πάλιν πλῆθος ἢ τὸ διαιρετὸν, ἐν τῷ λόγῳ τοῦ ἀριθμοῦ ἐνυπάρχει. 26 Τούτων δ' οὐδέτερα ἐνδέχεται ἄπειρα εἶναι, οὔτε ὡς τὸ περιττὸν τοῦ ἀριθμοῦ (πάλιν γὰρ ἂν ἐν τῷ περιττῷ ἄλλο εἴη, ᾧ ἐνυπῆρχεν ὑπάρχοντι· τοῦτο δ' εἰ ἔστι, πρῶτον ὁ ἀριθμὸς ἐνυπάρξει ὑπάρχουσιν αὐτῷ. εἰ μὲν οὖν μὴ ἐνδέχεται ἄπειρα τοιαῦτα ὑπάρχειν τῷ ἑνὶ, οὐδ' ἐπὶ τὸ ἄνω ἔσται ἄπειρα. ἀλλὰ μὴν ἀνάγκη γε πάντα ὑπάρχειν τῷ πρώτῳ, εἶναι τῷ ἀριθμῷ, κἀκείνοις τὸν ἀριθμὸν· ὥστ' ἀντιστρέφοντα ἔσται, ἀλλ' οὐχ ὑπερτείνοντα) οὐδὲ μὴν ὅσα ἐν τῷ τί ἐστιν ἐνυπάρχει, οὐδὲ ταῦτα ἄπειρα. οὐδὲ γὰρ ἂν εἴη ὁρίσασθαι. 27 Ὥστ' εἰ τὰ μὲν κατηγορούμενα, καθ' αὑτὰ πάντα λέγεται· ταῦτα δέ, μὴ ἄπειρα· ἵσταιτο ἂν τὰ ἐπὶ τὸ ἄνω· ὥστε καὶ ἐπὶ τὸ κάτω. 28 Εἰ δ' οὕτω, καὶ τὰ ἐν τῷ μεταξὺ δύο ὅρων, ἀεὶ* εἴη πεπερασμένα. 29 Εἰ δὲ τοῦτο, δῆλον ἤδη καὶ τῶν ἀποδείξεων ὅτι ἀνάγκη ἀρχάς τε εἶναι, καὶ μὴ πάντων εἶναι ἀπόδειξιν,* ὅπερ ἔφαμέν τινας λέγειν κατ' ἀρχάς. εἰ γάρ εἰσιν ἀρχαί· οὔτε πάντα, ἀποδεικτὰ οὔτ' εἰς ἄπειρον οἷόν τε βαδίζειν. τὸ γὰρ εἶναι τούτων ὁποτερονοῦν, οὐδὲν ἄλλο ἐστὶν ἢ τὸ εἶναι μηδὲν διάστημα ἄμεσον καὶ ἀδιαίρετον, ἀλλὰ πάντα διαιρετά. τῷ γὰρ ἐντὸς ἐμβάλλεσθαι ὅρον, ἀλλ' οὐ τῷ προσλαμβάνεσθαι, ἀποδείκνυται τὸ ἀποδεικνύμενον. ὥστ' εἰ τοῦτ' εἰς ἄπειρον ἐνδέχεται ἰέναι, ἐνδέχετ' ἂν δύο ὅρων ἄπειρα μεταξὺ εἶναι μέσα. ἀλλὰ τοῦτ' ἀδύνατον, εἰ ἵστανται αἱ κατηγορίαι ἐπὶ τὸ ἄνω, καὶ τὸ κάτω. ὅτι δὲ ἵστανται, δέδεικται λογικῶς μὲν πρότερον, ἀναλυτικῶς δὲ νῦν.

* γρ. διττῶς. ſic Themiſt.

* γρ. ἀεὶ ἄν.

* γρ. ὥσπερ ἐφαμέν.

Corollaria. Cap. XXIII.

1 ¶ *De eo quod duobus ineſt immediatè. Propoſitio.* 2 *Expoſitio.* 3 *Probatio per deductionem ad impoßibile.* 4 *Limitatio.* 5 ¶ *Quando demonſtrari poßit affirmatio,* 6 *vel negatio:* 7 *& quæ ſint principia demonſtrationis ſimplicis,* 8 *vel coniunctæ.* 9 *Quomodo progrediamur ad prima & immediata principia in ſyllogiſmis affirmantibus primæ figuræ,* 10 *aut negantibus primæ,* 11 *vel ſecundæ,* 12 *vel tertiæ figuræ.*

His autem probatis perſpicuum *eſt*, ſi vnum D quidpiam duobus inſit, veluti τὸ α τῷ γ & τῷ δ, cùm alterū alteri aut nullo modo, aut non omni attribuatur, non ſemper ſecundum aliquid commune ineſſe. 2 Vtputà iſoſceli & ſcaleno *hæc affectio*, duobus rectis æquales *angulos* habere, ſecundum commune quiddam ineſt. ineſt enim quà *eſt* figura quædam, non quà *eſt* aliud. hoc verò non ſemper ita *ſe* habet. 3 Eſto namque τὸ β ſecūdum quod τὸ α τῷ γ δ ineſt. conſtat igitur, etiam τὸ β τῷ γ & τῷ δ *ineſſe* ſecundum aliud commune, & illud ſecūdum aliud. quare inter duos terminos infiniti eſſe termini poterunt. quod *tamen eſt* impoſſibile. Non E *eſt* igitur neceſſe, vt ſemper idem multis inſit ſecundum commune quidpiam: quandoquidem erunt immediata interualla. 4 Porrò neceſſe *eſt*, terminos eſſe in eodem genere & ex eiſdem tomis, ſiquidem commune illud eſt ex iis quæ per ſe inſunt. non enim licebat ex vno genere in aliud genus transferre ea quæ *de*monſtrātur. 5 Perſpi-

Δεδειγμένων δὲ τούτων, φανερὸν ὅτι, ἐάν τι τὸ αὐτὸ δυσὶν ὑπάρχῃ εἶναι, τὸ α τῷ τε γ, καὶ τῷ δ, μὴ κατηγορουμένου θατέρου κατὰ θατέρου, ἢ μηδαμῶς, ἢ μὴ κατὰ παντός· ὅτι οὐκ ἀεὶ κατὰ κοινόν τι ὑπάρξει. 2 Οἷον τῷ ἰσοσκελεῖ, καὶ τῷ σκαληνῷ, τὸ δυσὶν ὀρθαῖς ἴσας ἔχειν, κατὰ κοινόν τι ὑπάρχει· ᾗ γὰρ σχῆμά τι ὑπάρχει, καὶ οὐχ ᾗ ἕτερον. τοῦτο δ' οὐκ ἀεὶ οὕτως ἔχει. 3 Ἔστω γὰρ τὸ β, καθ' ὃ τὸ α τῷ γ δ* ὑπάρχει. δῆλον τοίνυν, ὅτι καὶ τὸ β τῷ γ, καὶ τῷ δ κατ' ἄλλο κοινόν, κἀκεῖνο καθ' ἕτερον. ὥστε δύο ὅρων μεταξὺ, ἄπειροι ἂν ἐμπίπτοιεν ὅροι. ἀλλ' ἀδύνατον. κατὰ μὲν τοίνυν κοινόν τι ὑπάρχειν, οὐκ ἀνάγκη ἀεὶ τὸ αὐτὸ πλείοσιν, ἐπείπερ ἔσται* ἄμεσα διαστήματα. 4 Ἐν μέντοι τῷ αὐτῷ γένει, καὶ* ἐκ τῶν αὐτῶν ἀτόμων ἀνάγκη τοὺς ὅρους εἶναι, εἴπερ τῶν καθ' αὑτὰ ὑπαρχόντων ἔσται τὸ κοινόν. οὐ γὰρ ἦν ἐξ ἄλλου γένους εἰς ἄλλο γένος* διαβῆναι τὰ δεικνύμενα. 5 Φανερὸν δὲ καὶ,

CAP. XIX.

* γρ. τὸ ὑπάρξει.

* γρ. & ἄπειρα. al. μέσα.

Veteres interpretes. ἐκ τῶν αὐτῶν ἀτόμων.

* γρ. μεταβῆναι.

ὅτι, ὅταν δὲ τὸ α τῷ β ὑπάρχῃ, εἰ μὲν ἔστι τι μέσον, ἔστι δεῖξαι ὅτι τὸ α τῷ β ὑπάρχει, καὶ στοιχεῖα τούτου ἐστὶ ταῦτα, καὶ τοσαῦθ' ὅσα μέσα ἐστίν. αἱ γὰρ ἄμεσοι προτάσεις, στοιχεῖα, ἢ πᾶσαι, ἢ αἱ καθόλου. εἰ δὲ μὴ ἔστιν, οὐκέτι ἐστὶν ἀπόδειξις, ἀλλ' ἡ ἐπὶ τὰς ἀρχὰς ὁδὸς αὕτη ἐστίν. 6 Ὁμοίως δὲ καὶ, εἰ τὸ α τῷ β μὴ ὑπάρχῃ, εἰ μὲν ἔστι τι ἢ μέσον, ἢ πρότερον ᾧ οὐχ ὑπάρχει, ἔστιν ἀπόδειξις· εἰ δὲ μὴ, οὐκ ἔστιν. 7 Ἀλλ' ἀρχαὶ καὶ στοιχεῖα τοσαῦτ' ἐστὶν, ὅσοι ὅροι. αἱ γὰρ τούτων προτάσεις, ἀρχαὶ τῆς ἀποδείξεώς εἰσι. 8 Καὶ ὥσπερ ἔνιαι ἀρχαί εἰσιν ἀναπόδεικτοι, ὅτι ἐστὶ τόδε τοδὶ, καὶ ὑπάρχει τόδε τῳδί· οὕτω καὶ ὅτι οὐκ ἔστι τόδε τοδὶ, οὐδ' ὑπάρχει τόδε τῳδί. ὥστε αἱ μὲν, εἶναί τι, αἱ δὲ, μὴ εἶναί τι, ἔσονται ἀρχαί. 9 Ὅταν δὲ δέῃ τι δεῖξαι, ληπτέον, ὃ τοῦ β πρῶτον κατηγορεῖται. ἔστω δὲ γ· καὶ τούτου ὁμοίως τὸ α. καὶ οὕτως ἀεὶ βαδίζοντι, οὐδέποτε ἐξωτέρω πρότασις, οὐδ' ὑπάρχον λαμβάνεται τοῦ α ἐν τῷ δεικνύναι· ἀλλ' ἀεὶ τὸ μέσον πυκνοῦται, ἕως ἀδιαίρετα γένηται, καὶ ἕν. Ἔστι δ' ἕν, ὅταν [* χ. ἄμεσα.] ἄμεσον γένηται, καὶ μία πρότασις ἁπλῶς ἡ ἄμεσος. καὶ ὥσπερ ἐν τοῖς ἄλλοις, ἡ ἀρχὴ ἁπλοῦν. τοῦτο δ' οὐ πανταχοῦ τὸ αὐτὸ, ἀλλ' ἐν βάρει μὲν μνᾶ, ἐν δὲ μέλει δίεσις, ἄλλο δ' ἐν ἄλλῳ. οὕτως ἐν συλλογισμῷ τὸ ἕν, πρότασις ἄμεσος· ἐν δ' ἀποδείξει καὶ ἐπιστήμῃ, ὁ νοῦς. ἐν μὲν οὖν τοῖς δεικτικοῖς συλλογισμοῖς τοῦ ὑπάρχοντος, οὐδὲν ἔξω πίπτει. 10 Ἐν δὲ τοῖς στερητικοῖς, ἔνθα μὲν, ὃ δεῖ ὑπάρχειν, οὐδὲν τούτου ἔξω πίπτει. οἷον, εἰ τὸ α τῷ β, διὰ τοῦ γ, μή. εἰ γὰρ τῷ μὲν β παντὶ τὸ γ, *τῷ δὲ γ μηδενὶ τὸ α. πάλιν ἂν δέῃ ὅτι τῷ γ τὸ α οὐδενὶ ὑπάρχει, μέσον ληπτέον τοῦ α καὶ γ· καὶ οὕτως ἀεὶ *προβαδιεῖται. 11 Ἐὰν δὲ δέῃ δεῖξαι ὅτι τὸ δ τῷ ε οὐχ ὑπάρχει, τῷ, τὸ γ τῷ μὲν δ παντὶ, τῷ δὲ ε μηδενὶ, ἢ μὴ παντί· τοῦ ε* οὐδέποτ' ἔξω πεσεῖται. τοῦτο δ' ἐστὶν, ᾧ δεῖ ὑπάρχειν. 12 Ἐπὶ δὲ τοῦ τρίτου τρόπου, οὔτε ἀφ' οὗ δεῖ, οὔτε ὃ δεῖ στερῆσαι, οὐδέποτ' ἔξω βαδιεῖται.

* χ. ἄμεσα.
* χ. τὸ δὲ γ μηδενὶ τὸ α.
* χ. προβαδιεῖται.
* Sic Philop. & Boëth. vulgò ὑπὸ τ' male.

A cuium quoque *eſt*, quando τὸ α τῷ β ineſt, ſi eſt quoddam mediũ, demonſtrari poſſe quòd τὸ α τῷ β ineſt. atque huius elementa ſunt hæc, & quæcumque ſunt media. nam immediatæ propoſitiones *ſunt* elementa, vel omnes, vel *ex quæ ſunt* vniuerſales. at ſi non eſt *vllum medium*, non eſt ampliùs demonſtratio, ſed ad principia via hæc eſt. 6 Similiter ſi τὸ α τῷ β non inſit, ſiquidem eſt quoddam vel medium, vel prius cui non inſit, eſt demonſtratio. ſin minùs, non eſt. 7 Sed principia & elementa tot ſunt, quot *ſunt* termini. ex iis n. *conſtitutæ* propoſitiones, ſunt principia demonſtrationis. 8 Et B quemadmodũ quædam principia ſunt indemonſtrabilia, *quibus affirmatur* hoc eſſe hoc, & hoc ineſſe huic: ita etiam *ſunt quædam indemõſtrabilia, quibus pronũciatur* hoc non eſt hoc, aut hoc non ineſſe huic. Quapropter alia erunt principia, *quæ ſignificabunt* eſſe quidpiam: alia, *quæ ſignificabunt* non eſſe quidpiam. 9 Cùm autem aliquid probare oportet, ſumendũ *eſt id* quod τῷ β primùm attribuitur. ſit τὸ γ: & huic ſimiliter *attribuatur* τὸ α. atque ita ſemper progrediendo, numquàm extrinſecùs *accipitur* propoſitio, nec ſumitur quod ineſt τῷ α, in probatione *faciẽda*: ſed ſemper medium denſatur, donec indiuiſibilia facta ſint, & vnum. Eſt autem C vnum, cùm factum eſt immediatum, & vna propoſitio ſimpliciter, *nimirũ* immediata. & vt in aliis *rebus, ita in demonſtrationibus* principium *eſt res* ſimplex. hoc autem non vbique eſt idem: ſed in pondere mina, in concentu dieſis, aliud vero in alia re. ſic in ſyllogiſmo vnum illud *eſt* propoſitio immediata. in demonſtratione autem & ſcientia *eſt* intelligẽtia. In ſyllogiſmis igitur quibus ineſſe oſtẽditur, nullũ *medium* extra cadit. 10 In priuatiuis autem, hic quidem nihil cadit extra id quod ineſſe non oportet. veluti ſi τὸ α τῷ β per γ non *ineſt*: nam ſi omni β *ineſt* τὸ γ, nulli autem γ τὸ α: rurſus ſi oporteat *probare* τὸ α nulli γ ineſſe, medium ſumendum eſt τῶν α & γ. atque ita ſemper progredietur. 11 Quod ſi oporteat probare τὸ δ τῷ ε non ineſſe, quia τὸ γ ineſt omni δ & nulli aut non omni ε: numquàm *medium* cadet extra ε: hoc autem eſt *id* cui non oportet ineſſe. 12 In tertio autem modo numquàm progredietur extra *id* à quo vel quod priuare oportet.

Vtrùm vniuerſalis an particularis demonſtratio ſit præſtantior.

Cap. XXIV.

1 ¶ Quæſtio. 2 ¶ Quòd particularis demonſtratio videatur eſſe præferenda vniuerſali. Ratio prima, quia videtur magis ſcientiam gignere quàm vniuerſalis. 3 Ratio ſecunda, & tertia, quia vniuerſalis videtur eſſe de eo quod non eſt, & inducere in errorem, vt credatur eſſe quod non eſt. 4 ¶ Solutio rationis. primæ, 5 ſecundæ, 6 & tertiæ. 7 ¶ Quod demonſtratio vniuerſalis ſit melior, quàm particularis. Ratio prima, quia vniuerſale eſt magis cauſa. 8 Ratio ſecunda, quia quò magis demonſtratio eſt vniuerſalis, eò magis eſt de eo quod eſt propter ſe. 9 Ratio tertia, quia particularia declinant ad infinita, vniuerſalia verò ad finitum & vnum. 10 Ratio quarta, quia demonſtratio vniuerſalis plura ſcire facit, quàm particularis. 11 Ratio quinta, quia medium quò magis vniuerſale eſt, eò eſt principium prius. 12 Ratio ſexta, quia demonſtratio vniuerſalis magis eſt ex principio. 13 Multas ex ſuprà allatis rationibus eſſe logicas. 14 Rationes præcipuæ ſunt, quia cognitio vniuerſalis poteſtate continet particularem, non contrà: 15 & quia vniuerſalia intelliguntur, particularia ad ſenſum referuntur. 16 ¶ Epilogus.

CAP. XX.

Οὔσης δ' ἀποδείξεως, τῆς μὲν, καθόλου, τῆς δὲ, κατὰ μέρος· καὶ τῆς μὲν, κατηγορικῆς, τῆς δὲ, στερητικῆς· ἀμφισβητεῖται, ποτέρα βελτίων. ὡς δ' αὕτως καὶ περὶ τῆς ἀποδεικνύναι λεγομένης, καὶ τῆς εἰς τὸ ἀδύνατον ἀγούσης ἀποδείξεως. πρῶτον μὲν οὖν ἐπισκεψώμεθα περὶ τῆς καθόλου, καὶ τῆς κατὰ μέρος· δηλώσαντες δὲ τοῦτο, καὶ περὶ τῆς δεικνύναι λεγομένης, καὶ τῆς εἰς τὸ ἀδύνατον, εἴπωμεν.

D Cvm autem alia ſit demonſtratio vniuerſalis, alia particularis, & alia attributiua, alia priuatiua: ambigitur, vtra *ſit* melior. idem *quæritur* de ea demonſtratione, quæ dicitur *directè* demonſtrare, & de ea quæ ducit ad impoſſibile. Primùm igitur tractemus de vniuerſali & particulari: atque hoc expoſito, de ea quoque dicamus, quæ *directò* probare dicitur, & de ea quæ *ducit* ad impoſſibile.

2 Videri igitur fortaſſe poſſit quibuſdam ita conſiderantibus, particularis eſſe melior. nam ſi *ea* demonſtratio melior *eſt*, ſecundum quam demonſtrationem magis ſcimus, (hæc enim *eſt* virtus demonſtrationis) magis autem ſcimus vnumquodque, cùm id cognoſcimus per ſe, quàm cùm per aliud, (vt Coriſcum *eſſe* muſicum *magis ſcimus*, cùm Coriſcum eſſe muſicum *cognoſcimus*, quàm cùm *cognoſcimus* hominem eſſe muſicum. ſimiliter *dicendum eſt* etiam in aliis) vniuerſalis autem *demonſtratio* quòd aliud, non quod ipſum ſit, demonſtrat, (veluti quòd iſoſceles, non quia *eſt* iſoſceles, ſed quia *eſt* triangulum, *habeat tres angulos æquales duobus rectis*) particularis verò *demonſtratio*, quod ipſum *ſit*: ſi igitur melior *demonſtratio eſt* quæ *demonſtrat* per ſe, talis autem eſt particularis potiùs quàm vniuerſalis: etiam melior eſt particularis demonſtratio. 3 Præterea ſi vniuerſale non eſt quidpiam præter ſingularia: demonſtratio verò *eam* opinionem inducit, vt aliquid eſſe *putemus* id ſecũdum quod demonſtrat, & eiuſmodi quandam naturam in rebus extare: (veluti trianguli præter particularia *triangula*, & figuræ præter particulares *figuras*, & numeri præter particulares numeros) melior autem *eſt demonſtratio* de eo quod eſt, quàm de eo quod non eſt: & *ea* per quam non decipietur, quàm *ea* per quam *decipietur*: vniuerſalis autem eſt eiuſmodi. (procedentes enim demonſtrãt, quemadmodum de *eo quod eſt* analogum: veluti quod eſt eiuſmodi, vt neque *ſit* linea, neque numerus, neque ſolidũ, neque planum, ſed aliquid præter hæc, id fore analogum.) Si igitur hæc *eſt* magis vniuerſalis: minùs autẽ verſatur in eo quod eſt, vniuerſalis *demonſtratio* quàm particularis, & falſam opinionem gignit: deterior vtique eſt vniuerſalis particulari. 4 An primum quidem altera ratio non magis in vniuerſali, quàm in particulari locum habet? Nam ſi hæc *affectio*, *habere tres angulos æquales* duobus rectis, ineſt non quà iſoſceles, ſed quà triangulum: qui nouit iſoſceles *affectione illa præditum eſſe*, minùs nouit per ſe, quã qui nouit triangulũ *eam affectionem habere*. & omnino, ſi non ſit quà triangulum, & id oſtendat, non erit demonſtratio, at ſi ſit: *profectò* qui quãque rẽ, quà res quæque *eſt*, nouit, magis nouit. Si igitur triangulum latiùs patet *quàm iſoſceles*, & eſt eadem definitio, nec ſecundum homonymiam *dicitur* triangulum: atque ineſt omni triangulo *affectio illa, habere tres angulos æquales* duobus *rectis*: *certè* nõ triangulum quà iſoſceles, ſed iſoſceles quà triangulũ, habet huiuſcemodi angulos. Quocirca qui vniuerſale nouit, magis nouit quà ineſt, quàm qui particulare. Melior igitur eſt *demonſtratio* vniuerſalis, quàm particularis. 5 Præterea ſi ſit vna quædam definitio, nec ſit homonymia: vniuerſale nihilo minùs erit. quã nonnulla particularia: immo magis, quatenus incorruptibilia in illis ſunt, particularia verò ſunt magis corruptibilia. 6 Præterea nulla neceſſitas *nos cogit* vt exiſtimemus hoc eſſe aliquid præter hæc *ſingularia*, quia vnam rem ſignificat, non magis quàm in aliis, quæ non ſignificant quid, ſed vel quale, vel ad aliquid, vel facere. ſi *quis* verò *id exiſtimet*, non demonſtratio eſt *huius erroris* cauſa, ſed is qui audit. 7 Præterea ſi demonſtratio eſt ſyllogiſmus oſtendens cauſam, & cur *res ſit*: vniuerſale *autem eſt* magis cauſa: id enim cui quidpiam per ſe ineſt, ipſum ſibi *eſt* cauſa: vniuerſale autem *eſt* primum: vniuerſale igitur *eſt* cauſa. quare demonſtratio quoque *eſt* melior: quoniam magis oſtendit cauſam, & cur *res ſit*. 8 Præterea eouſque quærimus cur *res ſit*, ac tunc putamus cognoſcere, quando non *ideo* quod

2 Δόξειε μὲν οὖν τάχ' ἄν τισιν ὧδε σκοποῦσιν, ἡ κατὰ μέρος εἶναι βελτίων. εἰ γὰρ καθ' ἣν μᾶλλον ἐπιστάμεθα ἀπόδειξιν, βελτίων ἀπόδειξις (αὕτη γὰρ ἀρετὴ ἀποδείξεως) μᾶλλον δ' ἐπιστάμεθα ἕκαστον, ὅταν αὐτὸ εἰδῶμεν καθ' αὑτό, ἢ ὅταν κατ' ἄλλο (οἷον τὸν μουσικὸν Κορίσκον, ὅταν ὅτι ὁ Κορίσκος μουσικός, ἢ ὅταν ὅτι ὁ ἄνθρωπος μουσικός. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων) ἡ δὲ καθόλου, ὅτι ἄλλο, οὐχ ὅτι αὐτὸ τυγχάνει, ἐπιδείκνυσιν (οἷον ὅτι ἰσοσκελές, οὐχ ὅτι ἰσοσκελές, ἀλλ' ὅτι τρίγωνον) ἡ δὲ κατὰ μέρος, ὅτι αὐτό. εἰ δὴ βελτίων μὲν ἡ καθ' αὑτό, τοιαύτη δ' ἡ κατὰ μέρος τῆς καθόλου μᾶλλον, καὶ βελτίων ἂν ἡ κατὰ μέρος ἀπόδειξις εἴη. 3 Ἔτι, εἰ τὸ μὲν καθόλου μή ἐστί τι παρὰ τὰ καθ' ἕκαστα· ἡ δ' ἀπόδειξις δόξαν ἐμποιεῖ εἶναί τι τοῦτο καθ' ὃ ἀποδείκνυσι, καί τινα φύσιν ὑπάρχειν ἐν τοῖς οὖσι ταύτην (οἷον τριγώνου παρὰ * τὰ ἴσα, καὶ σχήματος παρὰ τὰ ἴσα, καὶ ἀριθμοῦ παρὰ τοὺς ἴσους ἀριθμούς) βελτίων δ' ἡ περὶ ὄντος, ἢ μὴ ὄντος· καὶ δι' ἣν μὴ ἀπατηθήσεται, ἢ δι' ἣν· ἔστι δ' ἡ μὲν καθόλου, τοιάδε (προϊόντες γὰρ δεικνύουσιν, ὥσπερ περὶ τοῦ ἀνάλογον οἷον, ὅτι ὃ ἂν ᾖ τοιοῦτον, ἔσται ἀνάλογον, ὃ οὔτε γραμμή, οὔτε ἀριθμός, οὔτε στερεόν, οὔτ' ἐπίπεδον, ἀλλὰ παρὰ ταῦτά τι) εἰ οὖν καθόλου μὲν μᾶλλον αὕτη, περὶ ὄντος δ' ἧττον ἡ καθόλου τῆς κατὰ μέρος, καὶ ἐμποιεῖ δόξαν ψευδῆ· χείρων ἂν εἴη ἡ καθόλου τῆς κατὰ μέρος. 4 * Ἢ πρῶτον μὲν οὐδὲν μᾶλλον ἐπὶ τοῦ καθόλου, ἢ τοῦ κατὰ μέρος, ἅτερος λόγος ἐστίν; εἰ γὰρ τὸ δυσὶν ὀρθαῖς * ὑπάρχει, μὴ ᾗ ἰσοσκελές, ἀλλ' ᾗ τρίγωνον· ὁ εἰδὼς ὅτι ἰσοσκελές, ἧττον οἶδεν ᾗ αὐτό, ἢ ὁ εἰδὼς ὅτι τρίγωνον. Ὅλως τε, εἰ μὲν μὴ ὄντος ᾗ τρίγωνον, εἶτα δείκνυσιν, οὐκ ἂν εἴη ἀπόδειξις. εἰ δὲ ὄντος, ὁ εἰδὼς ἕκαστον ᾗ ἕκαστον ὑπάρχει, μᾶλλον οἶδεν. εἰ δὴ τὸ τρίγωνον ἐπὶ πλέον ἐστί, καὶ ὁ αὐτὸς λόγος, καὶ μὴ καθ' ὁμωνυμίαν τὸ τρίγωνον, καὶ ὑπάρχει παντὶ τριγώνῳ τὸ δύο· οὐκ ἂν τὸ τρίγωνον ᾗ ἰσοσκελές, ἀλλὰ τὸ ἰσοσκελὲς ᾗ τρίγωνον, ἔχει τοιαύτας τὰς γωνίας. ὥστε ὁ καθόλου εἰδώς, μᾶλλον οἶδεν ᾗ ὑπάρχει, ἢ ὁ τὸ κατὰ μέρος. βελτίων ἄρα ἡ καθόλου τῆς κατὰ μέρος. 5 Ἔτι, εἰ μὲν εἴη τις λόγος εἷς, καὶ μὴ ὁμωνυμία τὸ καθόλου, εἴη ἂν οὐδὲν ἧττον ἐνίων τῶν κατὰ μέρος, ἀλλὰ καὶ μᾶλλον, ὅσῳ τὰ ἄφθαρτα ἐν ἐκείνοις ἐστί· τὰ δὲ κατὰ μέρος, φθαρτὰ μᾶλλον. 6 Ἔτι τε οὐδεμία ἀνάγκη ὑπολαμβάνειν τι εἶναι τοῦτο παρὰ ταῦτα, ὅτι ἓν δηλοῖ, οὐδὲν μᾶλλον ἢ ἐπὶ τῶν ἄλλων, ὅσα μὴ τὶ σημαίνει, ἀλλ' ἢ ποιόν, ἢ πρός τι, ἢ ποιεῖν. εἰ δὲ ἄρα, οὐχ ἡ ἀπόδειξις αἰτία, ἀλλ' ὁ ἀκούων. 7 Ἔτι, εἰ ἡ ἀπόδειξις μέν ἐστι συλλογισμὸς τῆς αἰτίας καὶ τοῦ διὰ τί, τὸ καθόλου δ' αἰτιώτερον· ᾧ γὰρ καθ' αὑτὸ ὑπάρχει τι, τοῦτο αὐτὸ αὑτῷ αἴτιον· τὸ δὲ καθόλου, πρῶτον· αἴτιον ἄρα τὸ καθόλου. ὥστε καὶ ἡ ἀπόδειξις, βελτίων· μᾶλλον γὰρ τοῦ αἰτίου καὶ τοῦ διὰ τί ἐστιν. 8 Ἔτι, μέχρι τούτου ζητοῦμεν τὸ διὰ τί, καὶ τότε οἰόμεθα εἰδέναι, ὅταν μὴ ᾖ ὅτι

* χ. τὰ τινά.

* χ. ἕτερος ὅτι.

* χ. ὑπάρχει. minus rectè. Philoponus & Boëthius ὑπάρχειν.

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. 60' / / 2 8 99# ' 4989 B'8 /463'.1 08 ' 2'
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2 6 0 ' F 6 / 7 9 2 6 3' 4 9 . * $ 6 8 ' 9 9 6 2 . 6 2 1 9 ' BB ; <;1;1 *". / 0 ' U 4 ' S 3 ' " 3N 1 5'
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8 6 3 ' 9 4' 1 0 F 6 7 8 ' 0 7 9 2 . 9 3' " 2 6 = 0 9' 9 '9 / ' F 6 / 4 ' ' 7' ' < 0 'b (
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6&'!' . "+3 . *6/ ' $

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[illegible]

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, A?; : 34 : 1240 2? 56; 7229?71 ;@2? ?;01 2
25 4 \' 70' : * 670 9'@" : * = : 65' "34 7'27?6 7'
2+2A6 = 5 <79 >' &P5H65?529 96 >'65?? 9764 = 74?5'
6:6' * :?52;' 79 ?5 / 'K705 5'34H17 = 74;5 = 246;'
A5 7 '@B' 46?'251' * : 29 2-9;' ?; 7 = ' 79 ;5 '3 ' Y7705 5'
. / 2 101' D 16Z 4X ' 'G0 9'2 / 2 '9 9' 9 9 2 1 0 8 '<0 / '
F 6 2 '2 / E ' / . 2 1 0 1. B'G 0 7 9 9 F 6 0 #' / 8 1'0 '
A 1 9 B G 0 7 9 . \ 9 4 . F S' 2 1. D. . 0 8 '<" / . /' 9 2 8 '
2 . 9 D. . 0 8 G . 6 2 ' . 9 2 1 $9 \ 2 9 . ' . 9 2 . 0 8 '
2 4 9 8 / 1 0 7 . 2 F G 3 9 . 0 6 1 . 8 9 9 1 8 0 1 P \' / '
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9 2 . 0 2 . 6 8 ' 3F 6 0'0 0 9 2 1 2 0 8 / 2 / ' A'" *' 2 Q
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F 6 / '8 2 6 3'/ 8 9 1 6 'F 6 0 '1 0 3' " ' . / 8 / '2 9 '
. . 0 E 9 " . / ' 7 9 2 . 0 ' , ' T @ 8 / 4 / ' D 1 6 2 / 2 '
G . 9 9 E 9 1 1 ' / 2 0 ' 3 " 'B' I . '. 6 '/ 2 / '2 / 2 '9 1'
' . 9 2 1 0 'F 6 1 3' / 1 9 . 'F 6 / 4 . 6 8 F 6 . ' / 8 9 '4 9'
! M' / [2 / 2 9 2 'G 0 7 9 ' / 9' B' 9 9 F 6 . . 6 ' . 2 8 '
8 9 4 0 'C 'F 6 ' 9 1 'C 'F 1 1 '/ 2 0 . 6 '4 / 2 9 9 '0 4' 8 '
E 2 . 4 0 2 1 . 1 G 9 1 F 1 9 1 2 9 '2 / 6 . # 9 0 8 F '
/ 2 0 . 6 '2 / 6 " 9 2 8 ' . 9 1'/ 2 0 'F 6 / 4 V ' '
. 0 8 ' <0* 3 ' / . 0 6 9 8 A'8 9 4 6 8 ' ' 2' ' 1 0
9 1 8 0 7 1F 6 0 2 / 2 / 6 2 . '0 1 9 ') 'G 0 7 9 9 '" 1
3< A '3 ' \ 0 7 . . '4 9 2 1 / 2 9 3' 9 F 6 0 3'4 9 8 / 2 '
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* 99> = ?29525?4 6 1 4 = 5290 6 7 7 = @2??4 6 1 4 = 2:
= 7 = "A? ? : * 670 =)9 : 2;'7 ; ;5 = 2? 5; @'3 4 0 1'
I / '%?'? 4 '3 '2; * 5 ' 6? ;51 7;7: * *6?7?4>'2 5 ;' I' 2;'
kA5 O' ,/ 2' * 5;' 8 2 . 4 0 @ ' / 2 0 7 . 6 '2;+ 4 ='F 6 7 4'
3 ' 8 4 1?7674 5 = ' ?' : * 6 :%?25 ?6; 7: '
/ 8 2 2 / 8 1' 1 4'1 9 8 0 4 2 / 4 @ 1' D.' (, '
: * 6 :'5 ' 1 34 :' = : 1 :' ? A1 [? = ' 5; 76'
? 56;)7E5' : * 6 : / G 5 4915 = 2B' 3 ($ '
)('U ?' : * 6 :65 = 'A5 7 6 ?'279/7 = 'A;' ?/9 ?5;'6 : 6 '
6699 7 56 = ?'5 4915 = '" 6'7?? 1 5'A570/ ; 17
`/79..680 0JS8G/. 2/2/ 802 L N@ @ ?
5 F 6 / 4 / 2 0 1 6 ' 0 3 'T 6 0' 9 ' 0 . 8 '4 . 1 6 '
8 6 1 3'8 / 4 3$'0 / 8 / 4 / ' / 8 9' &, &'& " &. ') '
2 / = 1T . 7' "+!#+ FF '" 9 9 '9 2 8 / 8 0 '4 8 9 '
/ 9 2 1 4 C . / @ @ 0 0 2 8 ' 3?? 'R '0 G '
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E / ' ! 3'3& ! . '&,-' "!' > '9 0 4 9 2' 9 3' #
s * M=' . '! 8 9 8 ' 9 1 '". 6 F 6 9 '" 9 1 / '4 9 1 0'
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' F : F L'
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)& '& J] #$ ' ! 3 6 ++ ' A) !-%,' &' "' 8 '
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fBN'B L# "' S' = 3'. 9 0;S
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: *%/' 9' M' % T@ L ' ,1' ."'
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% W 7 ' 3 , ' %'6 ' < ,F '" '&%
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' ' I 'G 3'06198' . .668' % !"2/2' .''
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#'2/'0G.9'3'3 R " ;) 67 $'% ' .<61'80 '
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9 "1'4 .168' 61' 29/498'"9 7'2/2' 3'10' / -'
7 .0 /F2 2' 2"2'. 18071998 G'.0630 GA'
8898'9 94' 8 1F6/402 80 #'<G/.'92 29'
2/2' / 9'9 9'2/2'02 0 2/2'4' 68'F6/'
02 80#G/.92 8 1 / 9S ,H@' ' + 59'
F6 " ' B 6/8/4/'4 12D291. / /Z.01A4 02/ #'
C'E2.. D92168 'C' 992108 '30198 'C' 6'
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01S

D0. 103'0O198'. 1'7/20'F6 408'894E'./ '
9!10 /'G 96 61/ / .' %' 96.' 'F1'
" 49/3' 6G=' 98 9'=/98'"9363' 9249#../ '
918'2.9 D01'.6'G/. 1' 3'F60' G 101"'
0'=/ 9#06 @ @E ! / 1/F6921.8'.68'4 899'..'
D2/ .01' $ @'F60' D '86.606E'
0 '.'3) &' 'T N 24(7 3" ' @26 3#N ' '.6#'
49 2' 28 . '/8293'2 894 03.06 03' 9 91'
9 198 3'./D2/" .' j' =/98'"9363' 91#'
49 ."1 S$1. 10 0'=/. f 620 / '291D.1'
"80 ' ' &?3' $' 3V' 610.'0'=/9' !'06198 /'&
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<',S' - /'8]' (C- ' =)E '
. 38 'S 1' ?, 1 EE %4S N*-' 4'
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9 ;? ; M 9Ej',%K'' 6 !' 56' T 90K

F6"F609 411 './ '26897' 62'
F6T!'53 'F6.' 9863'F60# '
S/306198 F4010/ #F6U4' '.6'
B 0 '19C'F6 4'1' %' -6892 2'
".2 2 .G/.02G/. 'F60# 863'
6 0. ` . .21.3#'<"96. "1'
=/ '49 . 0102'2/?E' 0 @ F60 863'F6/4'-.'HS'
63A'0 198'" '-D=812' 3'#'F60'.68' 2692 81'
F6/4'=1B 49 .1' '4. 2263 99 1'#' '0'
21/'./D2/ .9 9863'F6/4'49 .1 '2/2'F60'
..8 3'02'$3 (' !68'0 198'./D2 .283'
F 84'3 '@162.' F6 863'.6'3 '"9611'+ '
6/6 863'F6/4' '49 .1'C#F6/4'19 10' 2/69'
16 #' 'F6 863'.6'4. .0'0'"9.6' G/690'
16 'H0 9'F6 498' 1 0 W'< E9408"9.
'8/49'F89 863". 6102' :2..29' !.2.06 63'"9'>.63'> ./'061.06' '29.2. 8 .1. /2'02'

q ! : M= I 5 V

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4 9 0 . . 2 .' 6 2 0' ' " 9 0 0 D 9 6 8 9 B' 9 . . 2 8' 3 8 9' 0 '
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. . . 0 1 6 . A 2 @ 0 0 1 2 9 . 2 9 6 2 0 " 9 / $'
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7 = '? 7 4 7 2 / / = 5 1 4 = ' 6' : = 6 0 4 > ' 7 4 ; 5 = ' K
3 4 H ; 4 ' ; ' 1 ? K ? ? 6 5 1 5 6 6 ? ? 7 4 9 7 7 K 3 4 7 7 6'
6 : 6' + : 9 9' 9 W ? ? 4' ? : E 6 : 4 = 6 > ' 5 2 2 5' 7 3 4 = ' ? = '
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2 7 6 3 9 . 6 6 8 9 1 4 9 2' . . F 6 4 . 1 C F 0 8 '
/ 7 9 8 9 1 ' T 6 4 9 0 9 . 3 B 6 0 1 / ' 6 0
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. 6 ' 4 9 . 1' 8 0 B / . 9 9 0' F 6 / 4' 6 8 9 2' 4 9 '
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Z O M' 0' B' , ' T 6 / 4 0 6 1 9 8 8 9 . E' 9' / @ % 'F 6 '
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F 6 E 9 2 6 3' . 2 8 2 / 2' 0 9 . 9 1 0' 9 ' 9 2 6 8 ' < 9 9 8 '
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- " / " 3 @ 0 " : " S
, Y ' * $; . / / ' 4 ' S 9 B / 1 ' 9 6'

G / . ' 0 6 1 9 8 ' " 4' 8 . 1 9 \ ' 2 / 2' . / 6 8' F 6 4 0 8 ' F 6 9' 2 / 2 1' # " 9 ' . / 8 8 'F 6 4 0 8' ' . 6 6 8 / 4 ' 3 '
G 0 7 @ $' 4 6 / 3' (; !' 9 1 / 3' ' 0 6 1' 9 9' 8 0 6 3' " . ' 8 2 6 3' T 4 ' D . 6 ' 2' / 8 2 7 1 3' F 6 0 1 3' 9 1' F 6 1 / '
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7 $ ' Y Y '3 " '0* '3D " 0 ' 2'$2 6 J ' ,' "(' " ('7 D'$ 3 $ '7 $')'$ "(* " 0'
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[illegible]

-" ; :3' 0 M0" @]++N< "!$ Y ' ' _O O R/ '
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% ' 3 'SP)7- ' ,)A+ +E ') + '
@ ' & '+' ' =
, ' , " 0' F;$$' # 00
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@, ' ,= 3 ,E&E ' PZ 73e07
#$ ' !3 1' ! '.K"
Oh'h! T;' %' E ' 3+) 52 +7) ') 3'E)%
& !' R ,' 8
2 M = S]/3C3 S' 0) ;(T 5' 'M> 9
S3 $' ($ ' $: " @ " U(< & - -4 6< : 6 '
N 'fK) /J / X / / 11 ' :D@ &+P "< R$@3!' T! /'2; F
85"!')]V 6 9 =
2 0 ' =' < 4' /, K ' 2"; !'
$ "= - ' 4 *'H' '$I ' '&;
JM 3 1"' ' %@9!R2 O 'C*]%' '=' *) '
- 3' ' 'R '/': $' "'(*@ -@ : R('#
-% ! 3 ' ' ' 6' - !5#-"
A' T6 408 ' ' Y"(')' 'B ' "0 : (: ;)!3'$ 3 :
1'0E(2 =2' : 6 / ' 1 ' : L 3' 9 . IF 2W /A J]' R *""H ' 7
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"/' "' #E!' ! ' ' I : D 'E : :M3' (@ : / 3 "*P' 2
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)" K<$ $ 2 Q ' E 3'
J 3 J'22 7> :& ' % X' ' V' 7RS;V 6
& , " ' " %X 5 ("'-1G &$ 0' J"' 316 !'1'
9 '=' ' '" ' ',% & 54 ($' ' 63 ' '0.'\A1 '
9 #BV 'E=' '] /E' #)M' %"' I E R@0' 3=% /' '
ZE/ 0 B$.;'4 '<3 90 ' & "0 ' ' ' '+ "'
) 3= " ' 0, " E, "2'$\' * '
+ ''M ' PM ; ' & '%"' '
=
,' I ' f $?' = ' ;' ' ' / E' ! ' SS
) #)' 'E '' ' ' '+ '=
S'T' 8 == %' 9 X $]"J' [' ! ' ![' # &) ' "'
3; '9 ?$;' ' 9V '1 / '$ 8I]U' ":T T '$* '. \16 *A'
8' ' = S '=- M 9',9 & ' !1 ' ;' f '/ =?' Z '

;'/ 4 /4/' 12$ '8' /7 16 'F6 4' @ C'F =[; '
4 0 ',24 S4' /2 3 '=9F6 4'0.F6/ 68' f$ '
2(R 4 .0 26=E!68' 6349G 3467 '
106. 8 3 ' ^' 16806 .8 616 269 1/ F6/4'
9 1'8 0 89' / 68' .F6.2. 2' 22/228 40'
7 0 .'98 8'0 F163 4 1'02' 468 3" $ $('
49H 21 18 . .6 / 6 4$4 .8 /2 0. / 1. ' B' 6'
K 8 / 7 . 208'4 61 6'" 4 66'. .'
F6 4 ' X.$20 .F6 40 1.8 $ @ F 'E@' '
"2 . 4.'\6-'0 1 7 2 8 2#' / 1/ 621'"9 0'
F6 4 8' 8. 601 O K'F 408'2/6"669 .3#'
"96.'F6' < " " '9.640'1 0$6 0'/8# 9= SS=
* =,7?4 "3,4'A? : 6';?,? '6%4'A6 4?= 95>
> 9 249'20'/2 2 68 # 8 01 / QQQQQ 0QQQ 702
16 2'# * $ 9 : $
102D6 684 1/G23' .4 3 F60 9\8 L BG079 9
4 E) 9
' $(' $# #
/ 9' 0 /F62'
. 9.3q /089108' 49 62/2,3,2/'G0 '
= 29 - # $)
8663'2/2' 206' 07.0.' " %-' 6% . ' ' "40. 3
.1 8 ' ZX6<7' $6 6 .2 8'
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2 6 . "90..4. 10 8 ' ' : 00.0 4.G2@
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22 ',$'2 2 '2 2 . <%.222 - 20,' '
4 4',$,04'$($' $U $, J0.,04' ! 2<'
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2H '$!M,$' T 0 $4 (,. 6' W' '
I . $'F .,.2 '$ .4'. 'U 2 %$, 2,'
; 0 '$ 4 J0.F 4(/ F . '2$.'J0.%, <'
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.4,20$ 2 .! J U ' 4% (! M !2'R J0 .' 2U <'
$4U.M2 42 $,* R 8 2!2 $2#' bZ' > B<'
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W/2'9 19' 4.8 /2 1 0. /2.3
0 6 90 1/70168 6. 061'93 @' 8. E0'9"62949A
8 /2 1 07 G0 '29.2/2' 12 2 8 68 2.E 0'
G/.' 2' 2G2 16' "/..49.#06. 26 S S. 62.'
&49 2 2/293 2498 /H 107 .3' ' 8 F6 4'D '
11 \M '/28 2S \[0 192 'F60 6 1408 . 68' '
8 6 '9 1' 49 49 /' 498 /2 1 01 /'B' ' 2' G9P#'
F2!F69'9 1' 8 / 7 9 F6 0'2/2'9 1'4.12/ 1 01 '
R S 1 96 S30 49 21.)#F6004/F6 4.8'49G6 '
3 - "<; 7 $" !. 921 08 1498 /2 1 0 / '
293'06.98'<8 2.3"14. .6 ' 6 /2. .'C'< 26 .E'
F6 4' 1#"9O .'8 0 .2E0B . F2 4'"2 103 'C'F6 4'
8 0 # C#01 ' 8 19"' : 0. 9 90'/8 2 3'49'
8 /2 1"0 /' "9 701'0 F6 4'4.'0 F6/'' ". 6. '9 17'
0 1'2/2'9 9'3' 2'49 2 . /2.'"9 7'0 .9 6E2'0 1. '
2/206170 1 $"1 6.0'2.F2902 0 S 4.'
7 .4.E69F6.'G/.'49'02 8 0 '# 94'2.F69'4"A' 0Q
2/'GD6N0$F6 029. 668' ' D6 0 29.4D6#

*97=66' "' >F?? ?77KF12/ * :07 ?'3 J92 5 ? G>>9 F223471'2;;'1?K6;; :' *54 '155-7 7;'34 1'2 ;B'15 '
= :62; 7; :'A5 0'34:1'K:?'1?'K:?'52;'74;'6:6'52;' 5' 74;5='1 4? ?' 1 4? 97' 3' 1? 6:6 ; ? :B' 6 2;' K5' A?'
*7 >'34H17=';:? 4>' K:?'7 4 ; 5 = 1 ? : '7 34 7' *>:07?8 = 24 ? :2??95>' ' "' &/' 52& 9' % " /
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N . C 7' U ' . '

;7' 6;5 '3 '7229 ?97 'F674'2;' F6 '2;' ' -"2' *" ' ' ' /' B' 0.

) 76:65 ;79??=79;? 4>'*7 >' 2' ? 2* 74 =' 4 S' "'S 1S'

ED18' 653 '?9 4>' 1'&-'152 6 ; :'?4>':=6 :' 9 F6/d1EE]6 64' \ " = 'W8 .+

#8 1?=:62 ? :6?6 '6534??4 4>' 3'15=:62; 7')J9E6/ ' ' 2 '8))' '&%")5 +

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3 . / 9'A5 7345K705 ' %' 47 5'?:62;7?'

;952 =; 765='@B' 15=:6 ; 7; :65=' 6?345' 15=' S4 *'R'D S'?' N° '1R' M

5 5 ??79;? 4='2 0'79';? :' "B'67 '79 :34' A 6 U1' ML=M']' <=0hS 1c@ M

5)7=240]517' 2 =) ?? 3 'K705 56?' , 5K >'

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4 1' .3 . 2/2 /70 /D 2/' !0 ' '

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406..E !E .689 .016 /D 8/`' . ' :R ' *' : @ ! & ' +

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n* H ?6>'1 9*4?7? 4'24**:6?07? I9 99:E 2' : @ (; ' <! :(' "D L' H 33' '3 2 *'^' '

=4>' 56 =7 34 1157K34: *?:07;*?' =51 4=B' 'R' 3)cM ;W] O;\]/ 'Q : / ' / 0 E

34 1 ;7>'74;5'52;'* :* 7) ?7;? 04 ;4' (=6 , ' &% -5 X' =-/' ' '9?, R<

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'0' 52;'* :* 4='@'@$?: 2;7; 3 ;" ;" '5; 7=' B'a ,T/)-##'<". 7 ' E. e ='! '%

I37'345K:? #+'* : 615'1=6 7A? 9 = 52 <G' R 19 ' 9 'n F S . ' ' ' 9

7 B 7?34 '2' &F 652;' :=6 ')'6 0" '34 1'52; @' !<0 .J f $/1 1 o jEH Yn0 ' nB 0R ' '($@<

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91' 'F6 3'"9 /' 29'G0.'D9"2 201/29' 68 9 1' (M&;(4 7L3'/ '@ '3'!'EX ' ' ' W' ')2 *

* F / /. '6:66??52955; ;A?' #7 62 ;; 047;4 7 ' (' ' L 'B '00" /' U-'$'!) 2 ' E9n9n' B'

5# & -+"&'34 1'52;'F/ 282'67'15' ')! %' 6'2% +"&' ' ^' L & " $

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J'; " / '34 1'52;'5 E:'34 1'8 2 ; '7=0:' : $ (' "'A /' ' ' () '(*V @ \(($ '

KH?'2 E6 2 ?7046; ;734?'5; 7 :'2'2 E=2;?70 ;34 1' ("f M ; S) E<; ; '[/W1F)1 EFK 3 ;

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2 ?76; 6'=51 :';566 6:' 6;5' % +"&.'?:6; 65' 9 I a W ' $' 2'F3]

07;4 34 1 5>'2;' f' ;:=6 6:'2'9 ?5 * *07;?' MZ / 0. 1' /J . E DK

(34 1'2 ?9 :6 : 52;:' K:=:'((34 1'2 ; 2 65'76 I ( ]D(Y' =@- 'E

=79'0 *5>)2 4579 4134 1* 7=' ' E ;4 ?:?9 ;1?' @ 'B f': ? "$S 1; , "' ;'$? 2 6>'8?? '

24 B65?52 55/I A; G;;7;; 047;6?: *6 /$'K4 4>'76I ,-'&" >

;5'? ;'7K7' 152 6 ; :'=51 7'347* :*;5')5?'34:' 5 , K' J ' !# -&%7 M -+ < ' M

3 5'2 E6 2 ?70 '34 1'2 ;'K:=: 46 ;' E ;4 34:w 6! '&%. ' '%.K' , . ; . ') 6 i' !, . 'E%7' 9 # '

8:07)2?*: ;5 B' 34:=7= +'2 E6 2 ?7;' 34 1' & '>)94 -',%3+%]_& _ ' , ' '& , ' / '

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'9 04>' @'/h ? = > 7?34?' ==51 7; >' ,)@ ; < E R J/&-]"]3 ! #%)bJ' +3 - 9'

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1? =4> =' E ;4 '* :*;? 5? * :?7; :75' : 2;56' A' ?f 6' >F' I' 3'

146;'3A 1'2 ;'76 =7 74;'34 1 9?'K:=: 74;'34 A >'

79 7'?5>' *:2;4976;' 134:1'70 6 ; :'6 (

A594?'2' 34 >'2 0'?:6?51 '*:2;495;'76 =7='5295' 1'

M34:1'2 0'52;'?7427 A 4?61 K1?'74;5='5295'= =?'

=6 5 *2; \ ' =:45=56 ' A * :

16 .102 808'919 1868'2689 68' 9' 8' ' ' ' ' ' 2 4 ' ' '

096.219 049/'"1498'2 65' "' /292 8 1./2 'B' .''P! "*@; ": 3' 3 ;]" ('

9F @239 1"D' 0'01F69T " 3 " ' . .' E3. 5(' 3.) (

F 6 0 3 '<94'102168' 997 1'4'.9 9' 9 19' ' ' \ ' ' ' '

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16 ' /8 298. 9G/.< 8 S?B"9168 B' ; * /33 : * $ 2; ? R/5@ 3 X :*' W

F6 .F6 4 EB'G/8 298'9)99 '08 2 0 L#XF6904 ' Q 1 P 3'3 $"' !3 2; @0' '

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h1F' E ! &) * ";' B' _ ']!' ! !]T
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. B' V'
4 $ 9E ' D$; ' SD , S . $ ' & X " 4 ?- '
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(J ' " 64 , ' < < < > ' 1 E
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"@ * ' / ' @ 3' ' ? : 35& L T' T ! '
<09'EC' h dX4 , ' +h' hB' ' 0'O'
; : 33/ 3 p ' * : . ' ' & ; : :3' S b' @&
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293' . 6 2 9 / 6 4 / . 0 4' D6 3
@ D 3 3 " ' 4 4 6 8 ' 6 1 ' 2 6 F 6 0 8 ' . 2 8 '
2 . . . 7 9 1E" ' ! 6 8 ' G . 2 . ' 93' 0' 9' F 6 9 8 0 4
8 M 4 6 2 . . ' 8 4 6 . . 3 4 9 8 / 2 1 0 6 / 2 4 . 7 9 . 9 2 8 '
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0 . 9 0 . 6 F 6 , 9 / , 2 4 . ' H / 8 / 9 6 9 ' 0 2 8 0 ' 0 2
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F 6 4 4 . 0 1 9 8 ' B' W : 1 9 1 0 ' F 6 4 " 9 0 1 " 4 ' 0 4 . . 9 '
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0 F 6 6 1 0 8 9 2 ' 4 9 . 0 0 ' ' : 9 ' E / D 8 6 8 ' 0 6 '
1 9 8 ' 2 / ' . / D F F O ' 9 4 6 / 2 F ' 9 D . ' 4 9 1 2 / '
2 9 8 " . 9 2 8 ' 2 ' . 2 . 6 1 / 2 7 6 3 ' F 6 1 2 . E 2 . 4 3 '
3 " " ' 1' F 6 3 ' 4 . 0 . ' G 3 ' / 3' 2 . . . N 9' * ' G / . '
1 ' / . 9 1' 2 . 9 / D 0 ' C ' F 6 ' F 0 8 / 7 . 8 ' $' 9 '
< U 3 " @ 0' 2 ' 4 . H 2 P / 2 7 6 3 ' F 6 0# ' 9 ' 4 6 P \ '
G 9 8 ' / 7 0 2 2 ' F 6 4 ' 9 1' G / 8 / ' B' 0 8 0 ' 8 / 1 0 9 '
9 4 9 3 ' G 0 7 9 2 3 E 7 ' 9 2 2 3 ' . 0 9 3 F 6 4 ' H . . 6 2 '
4 6 8 ' F 6 0 8 F 6 9 ' 0 4 9 . / 2 9 8 4 . 9 ' 9 2 8 = ' / 1 9 2
4 9 1' 4 6 / 2 9 ' < " . 6 1 0 1 \ F 6 0 / 8 2 9 ? S B , ' N * ' '

/ 1 0 . " 9 8 8 / 1 0 9 1 / 1 0 0 6 1 9 j 2 G J ! ! / W . ' ; 2 / 2 f 1 4 . 2 4 / F 6 0 9 K, $ 4 . 8 / H 1 . . 6 4 6 2 9 . 0 8 . ^'
2 1 / ' 2 / 2 ' . 1 . 1 6 ' / D 8 /

T 8 4' 9 3' 1' 2 / 2' / 7 0 ' 9 ' 4 9 2 1 / 2 9 8' ! 6 3' F 6 4 . 1$ " . ' 9 ' . / 2 1 0 3
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9 1' '" ' @" 3" # G S 9 . ' " 9 7' 2' 7 < 3 ' F 6 ' 4
9 1 ' / E' & " ' C ' . / 8 8 ' 3' " ' / 6 8 ') 2 0$ 1 '
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F 6 9 ' + * ! + " & 6 1 1' F 6 4 4 6 1 9 8 ' ' 2 9 . 9 1 9 '
Y 3 ' 9 2 8 ' 9 ' 8 9 4 6 8 ' / 7 0 9 ' W' : 0 1 4 0 '
F 6 9 8 0 4 8 / 4 6 8 ' 2 ' 0 . / . 2 0 1 / G 9 ' 2 / ' 8 . 6 '
F 6 4 ' 1' 0 . / . 2 0 ' # F 6 0 ' 9 8 9 ' / / 1 / '

" 9 ' . ' H 6 E 2 ' " 9 ' 0 3 ' S ' 8 7 6 3 ' 0 . / . 2 0 4 / ' # 1 0 ' . . O 8 ' F 6 4 ' " ! - (' 2 / 2 ' 4 9 7 9 1' 9 1 9 '

EH4/D 1 / ' 94 9/ 118 07 3F60#' / 10' 621' I 1'
6. 63'467 10198 '"1 6 8 'G/.'./2. 6 68 ' 1'02'
/2 /..6 92468' , '9 7 F6 0'G/.'. 01'
" /D 863 C#0469 63'$ ('2/2' 6 ../2. 6 '
8'F6 4' 1'(" $ ' 3' $'6 9' #F6 0'
G/.'0'2/7 3 / .68 /. 0.'. 9'F6 4' 1'E' . T 9'
9.9 9'. 1"1'./2. 6 68'F6 4 08' 1' 29'4. 2 '
1/29 /D 8 E 9 63'F6 4'9 1' ,' $ @ '
'93 !'9 'G ' /1G.G'/ 1.2401". 61' '9 .210'8 0 '
<B. 94 A 4668$./210 E"9 U< B. 9240'./ 0 '
0' "("@' ('F6 7 .68 F6.'9 1'0 F6 4'.U '
1 0 6 017/268'06198'8 0 9' './6 0 68 EC#'2 '
4 8 466 08 G .F6/F69 /G0. .68 68 . .'
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#X i.!) &.<(&") & ")2)) . /& &! $'
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63'". / F6! E 4'9 1?C'($ " '9 62'F6' 9 '4 6 / '
29' /701'C'04 9 6 3' /D 26 8'.0'9 1 64 6'
90498. 467 101 / '.6 'G/8 /'921'02 80'7 .3'
949 1 98 /2'02 8 0 E'C# 949 1 . 9 ' 3'92 8'F60#'
68 10' 69 6G1 26 0' ..9 1 .03'./D 1"1'F6/4'0.
1 76 16 E 01'"268 943 (; " $ ' " @ '498'G/8 /'9 1'C#'8 6 .63 C'D 08 8 01 .63

> 9OBEM\ >JS$ 0' ' K ;' '!1 M:
' " "E 9 _',37'+ < + ' o ('Y< _7' <' W
'B ;' 3!,' M&"3' ,9 +' ' J'
)#* ' , ' >, ' '7Q K & ' 1 ' +3 H
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+. + ! -+ =' +J!,B)(7<7@ ' &% +3' '
/'<=-!# 7')(=&,,= T&
%' ' F W R !3E' ;'&')%=.)3 %'
4 ' 8 ' ' ' I' ')
U' J ' ' $2' -" ' '#
;F; ' F ' B'6 hB`'")% 2 ' <' - '7 '
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33*&& @ " M'@0 ' : 9 ' D ' 9] ' ;@'
L7' , 3 ' ' ')K 5 7
S 5]< '< 6" 33 .) ,E / 3'
;!!lb ;&' ' S% ('-34$ S F &

/" /2/4/ /7..6 'F6 4' 93' 1' !0 '

' ! +' . 2< #&" @ %a"+" 7<(& +! %, "/' & " % 0+']' ! +&)%" ! 2% ' & "&"/! &"'
& & 2 & !" +9 " & & 2. *+' 9 &.(.-+, &" ." + &- 2 /+ +' &3" ! && .2%+ & '
" +3&- &; ! '!'' & 9 ! ' ' / =0+" "& &.&((&> &&,(&"9 " , *' +'2%! ,) . %' ! %" ' ' C'
.+ / & "&"! 2% %" 03%' 8' 9! & ! 2% ! & . "(.() & 2%+ "+.&" '&) % . N-<0 . , & h' +'
*! 2% *+) + +)# &% & !-F"+"%* !" Y Z+ D0/ '=' <C+." /+ ! +"&/&, &" & . +"&/ ' ' &.2%'
"%-9 !)" # +*! ( ) . . & *& . ' ' #1: /

/8 /4/ D . .4. 2 923 /707 .9 9210 !'
'9 4'F6 4'< 1'$'2/2'92 8 'E 0228'0. 91'"1'49 '
8 /2 1 023'9 ' 3' F6 9 19'./2..462.6 E'
F6 0'2..9 .' 3@'.68' 0' 29'0 64'F6 4408'9 9'
4/8 /2 1 0. '208 F6.'G/.'9 2..'"1' 046.923'9 '
2D6 027632/. 3' F674/8 29' .0'5 ' F6 0'
26 68'0 .9 9$X B ?' S 'E208 F69'2/2' /701'
F6 4' 1' 94'F6/4' 1E .'2/2' 1'! 3' D .6 '0 63'
8 /463' . F6O 3'& ''2/2'92 8 ' 029'/ 1949.' 92 6 '
"9 4 D ./ ' %' :1319 90'F6/8 /4// 1. 49.F0 4'
1'G/8 /#29.9 19'92 8' '"1'F6 './D2/ 9 1'F6 4'
1'G/8 / 061'F6 4" 30O64 ./D2/ #0.'91 08 'F6/4
1'F6/4'92 8'2/29 1 298 /'2/6 1F6 4' , 1# 9 4'
F6 4' D2 2 1..1'< 101 /1'". '2/ 2'9'* '.68'H 8'2 1'
./.9 663 F6 4'0619' .7 1./.. 663 ./D2/ . 2/2'
/1. 1 1'"9 7' '/ 1949.'F6 4 $ C F6U4 .$F6/ '
O/4/' .0498'/ 0. /2.'"1 68 F6.'/ I 92491'B208'
49 2 1/'"268 F6 44940 01'2../2/ '4.8 / 0 '
1/ F6 4'06198' 1'G/8 / 'C#9 9'G/8 292 '4 N9'
62.' ;'>. 249'2... 0 68'4 9'4 . 863'".' 9 '
4.8 /2 1 . / 192'F6 4" 3' /7916 '9 9 '2 ' 1'
. 9210'. 9'06198 26 E 63' 9'9 92. 0'&(- F602 '
4/F8 402 I 032/ . D.263 498 /2 1 0. /29 D '
16 9/707 1O 9' 6'6 /,0'F68 04 9 F6 0 4 6'9.1 08 "9 '92
1 A26. 0.@8 8 S4.2 8 1 02D6 68 D2 ..1'
D9/8 ..10 G 11 7406.98 1E /70. T 8 4'
D .6 ' /70R 4. F 923'F6 4' 1B02'1 02D6 68 B
, 9D2/ .923' D .6 'F8 08'49 2 1/29'F6 4' 1'
D2/ 07 1'02'@1 .4 ; B? " / 7 9' ' :9 E2 '
.668'06198' @'91 08' ..62468'E2/4/3'49 2 '
16 68'F6 '262.' 1 (H 3$ C !'G9 2' /Q
7019'F674' 1208 .1 '9 1'0#F60 10d ? S 9 8 i! '

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-; !3 ' 7 D7]'E 3 ' '+'& 9' R/' 3
%' I E'
+C E 3 = . 5 6N -,J] '& = %' ;' B'
'-' ' R 3' +%3' - 35 ' "-'U;' W
@\ .B' U' / 'E =' '2'9B'' 'R J 'S ' .D9 4
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' ' 9 3 '-! 3' - ']S')))= ' 7R
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4 / 3 , q 10892'./ '9 1' 6 2'49 8 1" 1B=4'96 'G 99 1'. .6 63G 0'4 . '91 08' /19 .'/ . 0 9'9 9'.04920

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.9 9 'F 6 0 8 / 7 9 8 'B ' = ' D .6 '4 9 2 9 2 3' '/ 7 0.'
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8 / 4 / ' D2 . . 1F6 4' " !' 9 4 9 2 1 0'. 1/ 0 /'
4 9 8 ' D2 .0 3EF6 / 4'2 / 8 .2 '0 .F6 '$;K' B 0 7 6 4 6 6'
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6 6'C '2 / 2'9 2 .6 6 2 F6 / 2 1 0 8 ' . . 0 8 '2 / '9 1 0' 2 '
6 2 1 0 F6 4 D2 .0 9 ' +' : 0#1 9 9 0 / 2 2 .3' / 0 '
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*' : 9 9 9 0'2 6 0' 9 9 2 1 0'4 9 2 / 2 1 0 1'G / .'2 / 8 9'
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/'Bh9' * '+3]97b C 'M#0 h'33 2

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- 3 ' 3' 2 .9 1'
0 6 1G / 3' .D '
1 6 ' ! / 2 1 0 2 1
SS' ='

5 6 3 0 6 .9 8'. / 2 4 . 0 2 4 8 B F 4G / 6 2 '
4 .0 1 6 ' .< 1 . F6 4'2 / 2' .J .E ;9'F6 4' 1'4 9 '
2 1 / $C #'F6 4 4 1 0 . 3' "1 6 '0 F6 / ' 8 / 4 / ' .'4 9 8 / 2 '
1 0 1 / C 4 9 J 2 1 / 0 L 2 6 / 8 / 4 / ' 0' T 2 0 8 '
D .6 4 9 2 9 1' \' 3" $'4 8 6 3\'2 / 9F6 4'
2 / 1 9 .0 6 ! 8 E 6 3 F6 4' 1# 0 . /'0 6 .9 2' 6 6 3'3 5'
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FS0 8 F6 / 4 B ^ 1 0' 0 2 9'F6 4' 2 / 2
2 9'S ? ?BF0 7 4' 1' 9 '.2 8 '2 .F6 1 ' "7'F6
D2 / 0 2 1'0 2' 1 . / D2 / .0 2 .'F6 4' 1' UA 2 0 6 . . 8
2 . . 4 6 8 ' 9 '0 . . 4 9 3'. / D2 / 9 8 6 3 '2 .9 4 6 8 '
. / D2 / 9 9 2 1 9 3'0 F6 4' 6 3' 9 ' " . 6 1 ' 3 '1 / 2 '
. 6 6 8 'F6 0 / 2 6 3'F6 4 0 8 '2 6 7 6 8 = .' 3 '9 4 '
2 FS 0' 3' 1 6 0 1 / ' 8 2 3'0 3 ' 3 'G / 8 2 . F 1 0'
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4 9 2 3 2 / 6 8 6 3'F6 / 4 8 1 '0 4' ? W) $ 2V 3'& <'
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F6 0'2 .'F6 4 9 8 '2 .8 8 6 3'F6 U4' 2 9$'F6 9 9'0 6

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7 (<G '7 $$' " 'T ? / . .0' "1'. / D2 / . 8 6 3F6 7 4 . 1 0 6 8 6 3 0 1 0 Z 2D?* ` S ?9 .2 2F6 4 .
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q ! : M = I 5 US

79 34 1 ? : E6 : 2? = 4> *5 665> & N D (0 E)

71?29?6? 7;6 * = 4 = 52; : K : ? < + ; !
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E ?4 A;A4 = m FG 21? ? 7? 76 6 : 6 ($52;
\ 834H 5 576(2;;45?6? 34 : 1*5 61552;
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34 : 345 1 ?; = 4> ?Q 5 59 \ (" ! ; ; " 0
3 (Y <" A; 4> ? : 6; 71 : > 7; : K
A; 4 = W70561 14 : > 76E49 : > 51 : > 76 6 : 6 K7
5 1 # 4 = 76;5 6456 = 4 2 = ; 9 ? : E6 : 25
= > 34 : 15 C ?4 V; 2; *5 = 51 7 $ "(
2 ; = = 4> F2/ <! /2//A/// /G/FBG3 %1// 676

. 6 6 8 # . . " 2 2 . 2 6 2 / " 8 1 9 2
2 2 2 /2 . 1 0 . L 9 . 6 G 2 G 6 2 1 9 8 7 3 2 1 . V2 9 4 6 8
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" 8 7 0 8 0 . . . . 6 8 2 G 1 2 / 7 3 2 1 9 9 4 6 8
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F 6 $ . . F 6 4 . ? 3 " . 6 8 / / 1 / S ? 2 . / 2
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F 6 / 2 0 8 2 9 0 9 6 2 = O G 3 2 3 G 6 . 0 6 . 9 2 9 1 #
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8 % < F 4 6 @ 3 P G 8 6 3 6 4 8 9 4 6 8
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6 3 F 6 1 2 / G 1 F 6 4 8 / D 8 S 6 1 4 9
8 / 2 1 0 1 / 1 8 0 2 9 1 6 8 . 0 8 . 2 9 / D 8 6
C 9 4 9 8 T 8 / 2 4 M 1 ^ F 6 9 2 9 - 2 9 9 2 / 2
0 . / 2 9 S # . f 2 D / . U . F 6 , 4 1 0 9 9 8 9 1 6 3 9 1
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:J S : < ; 3! : D *
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]) &D* * P (H& $;
! : U" ! : @ A E1 : 9F =) M
V 1 S$ \ P E" ?
= 1 4 D E K 1 . 1 / . D 1 " " / A
U 1$ . . 1 1 , J < 3[* : U 120
?B" = / $K . 0 E . W & : + 5 @ ;
= ; / 1 " K U
< 1 * . 1 14E B @g @ - S X) H" 3 (p ?BB
X $ 0$ <3" 4L " UF
* E% 0 ED + ; K
= h9B 0E 0 1=3 3 $%Ec+ "9
#3I . !b 2e K$! R R " =
!A & @E=1@ 0 . . 0 R = 4 -
D @ <
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" ? #
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, R " @ (@ *5 *O& @ 0
97 @ 7
S S
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T F0 8 F6 4 .0193 /79216 061 2 / 2 /79216 !0
O N Z & 6 / = ; " (3 ! . !2 D ; " (H4

8 " 9 7 F6 / 8 8 E0 8 9 1$ 0 0 . 0 6 0 F6 / 2 8 4 > ^ " 93E .
2 / 2 9 1 1 T 0 9 E 0191 . . 0 8 F6 4 4 1 0 1 6 8
F6 0 0 9 I 9 8 8 7 4 0103 C # 1 2 . 0 # F 0 3 9 .
F6 4 2 1 6 / 2 . . / / 1 9 . 0 6 1 0 / 2 / 4 /
8 0G #X 0 3 0 . F . F6 F , F6 4 9 8 0 " 1G 8 9 1 . 6 3 0 Q
. P 2 0 8 C # F6 = 4 1 " 8 B0 W o 1 / 2 1 E + J F 7 4
W " 9 7 7 $$! F6 9 8 9 4 6 8 G0 7 9 E . C
F6 0 6 8 9 1 0 F6 0 4 1 1 9 0 . 0 0 9 9 2 . 9 1 9
4 9 8 / 2 1 0 1 / E . 8 " 1 , 8 6 3 4 9 4 0 0 9 2 / 4 9
8 / 2 1 0 4 / F6 4

= 3 U <W, R
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TF [9 2 I / CF6 / 6 9 !0
, 2 B > $) d 6 ! ; ! $ 3 !0 O" ($ 3 !Y / "S E =&)% ! & 6!" /)% JF
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@ - ? (" "D? ("&$ 5 "& (5 B ; !

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f #C+ 8 2%6 T3< &><c T + & V (V A
7 $ H/89 29 / 011/ 0 . 0 /
8 24 3#"9 61EF11 4 1 .01E @F6 4 / 1F60B 0 3E K= V . %%6 W/ S S)V B
D11G 8V B ?2F?/4 U 10A263 4P F6 8 1 .1 ! +) #-# / _
144E Z. .06.92E 9 1 .0 9 . F R 2/2 2/6
Z@3 9 9# 0. 4 1 0 .01 = @/ 0 6 1 02199 / 10#

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. 1 2' " .163'
. 0. 9' 2 010" '
222; $7,9$1 : G

: @ + ' # ,'S

)(&- D3 S ' 3 2

G 9 8 1 ' 10 8 9'
? [?; :) ' 27 '
61;'6 : 76 K 9

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)' 9S' ;d' 3E K3' 0 / ' = ' 1 DK 0 ' Ei;

; '+$:':8 P C P ' <' 3e' D B ' ` ' R ' C '

* "3 M' ' M '4I' @ 'S1 09 1 "' / J ' / ' U ' ' "

R * $ 0 P cR ' ' I ' / 9 / $); D X 1, " ;

0<' é C9 !V7 ! .)" ' 3' 3A 83cn F' F' é nnC+ 9

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'$ L ' 3 = ' 3%3

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0 . . 4923 ' W 20 D .6 49 2 1 / 2 49 1` . / 9 1E'
F60 2'4 ' 0"9 / '49 2 . '9 1' / 0 / '4 . . O 023'
.6 ' 1' , ' T 4 .0' / ' D2 .01F6 4 .8 '2 / 2'
10 8 92' / 701 #' / 19 / 98 ' 0 19 8 ' 0 0 91'9 .'
F60 '492 / 2 1 04 / 298 ;"! ('F6 4 1 98 R '
. '4 9 92198 ' 0F98 / 2 1 01 / 29 '4 9 92 '
4 . . 19 .6 ' ./ 01'B' C 'F6 4'9 1'1/ 2 1 63'B ! - ! . '2 '
7 \# ' . ' 9 / 24 .7 . #' F6 0'9 1 2D6 6 ' D2 3'
0'267 763 F6 4'0 1 . 8 '9 1'1 / 2 1 63 / 263'9 1 2 '
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. / 22260'' G / . '061 / 8 ' 8 / 4 / ' & ' 4 . 6 1 /
: 0#19 .09 149 2 8 / 1 / 2 . 6 ' / 2638 " 7
763 G . '06198 '9 1' . / 2 . 6 / '498 / 2 1 01 / 2 3' " 0'
0S F6 4 . ' U' 08 94 0 . / 68 06198 49 2 . / '
9 1'1G9 3' 24 .8 46 1 07 3A ' K? $? . ? 'F6 4' . ' '
> 9 2 . / 268 D 16 ' 0 0' / 01 / . . 42@E F6 4 '
24 .8 / G 1 07 3'#0 0'"9 7' . ' / D 86 =E BK '
1(! $' . . 0 6'4 9 923'0'498 / 2 1 0 . / 2 . # . . '
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F6 4 . ' +' I '4 1 3 D ! 6 . T . 6 8 F6 / '
8 / 4 / '9 1'C 'F6 / 8 / 4 / '2 / 2'9 1'4 . 8 / 1 01 / 63
F6 4' . $' 9 . 2 / 2'F6 / 68 '9 1 'C 'F6 / 68 '2 / 2'9 1
19 . 0F6 / 18 / 4 3'4 . 2 1 / '4 . . 6 CF6 / 8 / '
4 / ' / 70 . 'F6 4' 1'C#F6 / 8 / 4 / ' 2 / 2' ; 3* (0
F6 / 68 '9 1'C 'F6 / 6'2 / 2 1 ' 9 9 . 0'F6 / 8 / 4 / '

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" (;" g4 SB' 3' '4 ' 2 * F
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$(- '& ; : -! : ' ? ' * V@' ' % f
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Y 2 ' XV* ;J$ * 3' # ' 0 $(6 DPLT&) 3', 2; R &SB' ' %
_3' P@ X' ' R' 2 ' ' 2 '
1' ' ' 3 ' " p . . EV ' @ ' B'
: +'S '(: ' Y* '(R(* * : !@ " ; ' S . '
; . * ' ' *' >' 2 >' ' 3 @' ' 0 / '
S !!"(3@ 0 ' %, ' I' $*' D P <;5 (' (;$ $' '
W' # 5 3 & ' ' . [\ ' : / 3"X ' @ ;33 *'
` ' 3 '(, +' -+ '==-M '
RD1E ' , ' / ' 3 ' C' & 5" * ' "34] ' @H X
/ 31E@ ' K' 3 ' : (' <'RT ! ; X ^' D 3 * ' $'
#! ' # '@C7.1 3 ' '
=4,# E Y -5'$'9 (=\p) =

06198 619863 . 9 F6024 / ' .02
<08 ' . / D2 / 9 8 63# .06 9'"9 7'F6016 / '3 '
"20 '7 (<; ('F6 4'8 ' 1$'0 19 0 'F608 ' 'F6 '
408 'X 21 2 . . . . ' 3 9 9'E'1 . 1 0 F6 ' 8 68 '8 / '
6 1#F60 10' 4' .6 63'D 01 0E / 8 2 .3' ' 9 '8 94 68 '
/ 19246216 ' I 192 8 ' < '("? (' .68 ' 641'
1'29 .9 9' 3'G / . ' . . '"20' / / . / 69' 1 8 .0'
26 0'9 1$'01'46 / 763'8 2 868 ') ; ! *('29 .'
$ (' (' ;" ; 3 ! ' ' "8 94 68 ' G07921'
H / . ' D 16 '"2 / 6 8 . / '29 .9 . ' 3' . / 2 . 6 / 2 . 8 '
. 9' 0' =94' U6' G / 98 / 4 / %S 2 2 1 . 168 91'
! 6 ' 9 .163' 3 ('F6 ' 3'49 9 163' 2' . 8 '.
.6b / B06 . F6 / / 1/S<B1" 9' K 9 . #63 BI 1/ ^
0 .063' " G #4 8 0 68 46 / = 90 / 8 '"7 E#
(? $ '7 ' 2 . 2 . . 6 / K7 ' ! 6 ' D 16 'S'0
$ '" $! 3 < 3$ $' 3 (? '27 ' 2 98 .
.6 / .06 0 . 2' G . . 2 8 , ?E SL $ F60 3K S#'
02D6 63'06 . . E' ' 3'(7 (! $ 'F6 0 . 4 8 4 6 2 '
46 / 68 ' ? ? ' S?? . . 7 / "68 D 16 ' . ,) N '
4 8 4 68 '46 / 68 ' .9? 1/ 68 , ? S SS? 'S&A ' 2 '
9 1#'G / . '06198 '9 01 '02D6 68 '4 . . 1 1 H1 23 0'
' 8 B 9J168'9 9' ;' H / . '06198 '9 1' 498 'F6 / 4'
F6 44 .03 'F6 0'G02 . ' D2 .0 '49 2 . / ' 94'C#
F6 44 10 .98 ' / 1924 8 63'9 9' .0 08 '8 94 08 '
, ' ! 6 '06198 ' 94 '79 68 'D9 9 61S'0469 63

!" #
$ ' 3' " ,
A \

1G92 90 93'B BS 'F6 '9 1' .06 0'79 'D9 924 ' . / 21 0' . G92 92 .3BF6 / 2 08 '& 1 3 !'4 8 'I 91 3' 2'=0

? Q F h '

S R 1G . 8 9 2 7 6 3 ' . 4 ' S W $F 6 0'
0?994 = ' 625 46;' >'34L' * 64>' 6 49 7' 72;5?5 = 6;'
= 52;' E ; 4 D 7 / 0 5994 = ' 425 6' >34 97 '
??22 45 4? : ?74?5 = ' :5 '2 4?' ?K57 569 04>'
34 7* : ?>97?59 4? 46;' E:'K ?34 : 3 ?774 '
0 ?,< @ 8 8 2,8 / 6 . 2 3, 8 9 4 6 8 ' ' J " S'
" 9 7 F6 / 6 8 ' . 0 6 0' B' 4' . 6 6 3'D 0 1 0 # " 9 6 1 ' . 6 '
4 . 0 8 7 6 0 1 "1'7 9 2 9 '" 0 . 0 . # . 6 '4 / 8 6 3'9 1'B " 1' 9 '
6 9 2 . 6 ' 6 . O . 1 0 # 6 4'F 6 4 9' 3'7 9 2 9 '" 0 9 2 4 '
D 0 1 0 4 / . ' " 9 7' 9 6 0 4 'D 0 1 0 ' E " (!0C* 0'
R @ E ? . E . 6 ' / 1 . . 9 2 0 8 4 . 0 8 7 6 0 9 / / . . 1B
C . 6 6 3'D 0 1 0' / / 1 9 1 8 G 2 1 9 9 1 ' 8' B ! <0'
1 . 8 0 9 0 8 7 6 0 1 / 0 1 . . 9 $0 # 2 / 2 6 1 0 9 . 7 / 3 '
7 S$" 0 . . " 7 ' A I 1 / D 6 4 9 0 8 7 6 0 1 / 2 9 / 1'
. . . 2 0 8 '9 . . K 2 9 . 7 ' 6 1 9 2 1' 0 4' / 3' " . 2 8 . 6 #'
0 1F 6 9'G / . _ E 0 6 7 9 " 4 . . 6 '9 2 8 2 9 9' 4 . 0 8 '
7 6 0 1 / 2 ' 7 3 'R$ 3 ' . 7 / 3'2 / 2' 6 1 0 9 #'
G 6 . 0 6 . 9 8 R 0 $B B 0 6 7 9 F 6 ' D 1 6 '9 1'. 0 6 0'
. 6 ' R E / 0 2 1 'F 6 / 4 . 6 6 3 '0 << T 3 ! 3'
1 !'2 / 2' 6 1 0 9 ' H / . '0 6 . 9 8 '9 1' " 9 6 1 '9 6 3'4 9 '
2 . / # 2 0 8 ' 0 . . . 0 7 1 6 ' ! 6 0 6 1 . KK? 2 9 1'
@4'F 6 0' " 0 . 9'9 1 1 0'0 N . 4 6 8 '9 9 'M / 1 9 . 0 6 '
1 9 2' / 0 1 / 2 9 3' . / 8 8 6 1 0 . # 0 1F $' . 0' 1 2D 6 0' 8 0D 3'
0 0 9 7 6 2 1' 'M 1 6 3'0 6 1 9 8 '" . 9'" . 0) ' (1
7 . 'C' 2' . 0 6 3'F 6 . . 6 2 . 9 ' 2 / 1 6 8 7 '2 0
F 6 9' / 6 3'9 1 " 1'8 9 4 6 6 3' 0 1 G . '" 9 7
"G 8 6 8 2 S E $ 4 " 9 7' . 6 6 3'D 0 1 0 / 1 9 8 6'
+' . . 4 1 0 6 1 9 " 1 4 9 8 1C 0 . " 6 3 . 0 6 3 0
C# 9 '2 9 . 9 1 0 9 '" 9 6 1 ' . 6 ' 9 2 0 . 0 1' B %0 ; @$
S G \ 8 9 2' 9 ' 0 9 2 0'B 9 1 9 2 8 '9 '2 . . . 1 1 0 . 9'1 . 0 2 '
1 F 6 / 4'9 ' 6 7 1 / 2 7 6 3 0 1 7 6 3' . / 2 1 0 9 '8 0 '
/ 9 3 8 9 0 1 6 3 F 6 4 . 8 ' 6 8 9 2' 1 F 6 0' 9 8 9 0 9 '
" (3 " # 1 9 8 '0 . 6 6 3' . 0 6 3 0 '" 4 9 . 9 1'2 9' /
. 4 0 8 6 3 ' 1 0F 6 9' '0 . . 4 9'" 1' 1 0 . . 4 1' . 1 0 2 '" . '
0 1 " . 6 1' ' . / 2 0 1'9 1 2 4 1 / ' D 2 . 2 9 . 9 9' 3' 1 4 / A'
9 8 'C'1 / 2 6 8 ' 9 C < " . ' : 0D / 9 '4 . 6 2 \ 8 '
2 0 1 / 2 3 . 0 6 3 0 '" 9 1 9 9 0 2 1 6) 6 %" ' 2 0 1 0 /
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F 6 0 E 9 . 8 4 F 8 2 0 1 6 0 . / 2 1 1 6 6 2 1 6 C . / 2 1 0 2 1'
0 0'2 0 8 F $2 0 1 6 0 0 . 6 6 3D 0 1 0 0 . 0 0 9 2 9
. 9 . 0 1 9 ')' 9 . 9 1 0 3'0 6 1 9 8 '4 6 9 0 1 9 0'
2 0 8 F 6 . ' & ' 9 . 6 2 4 6 8 '2 0 1 6 0 8 ' =)' 0 9 1 1 / 2 9 8 #'
0 1 9 0'" 9 7'" / 9 2 1 0 F 6 ' 1 9 0 . 1 1 / 6 . 2 '
"1' 0 3'9 '2 . . 9 1 0 1 9' U . ' 6 6 8 'C# 4 9 / 6 8 ' 9 '
1 6 9 4'2 / 2 / 7 9 0 2 4 9 8 2 9 . 9 1 0 . 9 8 ' ' I 3'
0 2 1 9'F 6 ' 6 2 1'0' 0 1 / 2 9 0 0'2 6 8 F 6 0 8 ' 6 2 1' . 0 6 '
" 1'4 / 8 6 = E 9 ' 1 0 1 6 0 2 9 . '9 '2 . . 9 1 0 1 9 ' 9 4'0 .
6 3'D 0 1 0 $0 0'" 9 7 5 '9 1 0 8 '0' / 2 0 " 1' 0 2 1 0 3'
" 9 0 6 3 ' ' 0 8 9 0 2 1 9' 2' 3'F 6 / 2 . 1 0'
'<9 . 6 3' 9'G 0 7 9 9 ' . 6 8 '0' 4 1 6 2 0'2 / 2'D D 2 6 2 1 6
F 6 / 6 8 ' 2 3'7 / 2 6 3' 0 . 6 6 3'D 0 0' 1 C " 9 '
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? '
) !"- "3 & < : &
'W' 52R !5% F. I P F :#7/
' R' 7_ (@ 'dd ?' %2
3< ' H'
M = R ' ' O C ! M ;'9\ 9 ! ' / 3K)$'
' WC' O I '$M MB' ' ' S T (8 3'K'S] 3' 2 6 @.]/
]]-'3T *:'Y ;' U T M' '6 0 [' ' ' ;' ! ' ' / = S
1' ' = " *' 1%= 0 '$'), ' 'BBB
- " < 9 <[' <' 2 f U 1 0 ;d] : : ' & (
' (' ' '
@ ' ' 26E ')& ' 0
] %)] % % g + -'G '4 , C# ' ; ; 3'
4' #" '#' 1$+ V NQ# 2 (% ' %' # 6"'
!')+ 'E/+ = E)@ 3+3 ' W + ! %' +, + '
" (E S& + ' 7 & ,)]S'] S 6F' 1 " '
- +(' E'-7'9 B #'TL# + # ,39 J - 2 (!'
! ', # R''2 ' !'* *(N!C' ' D
0 6 '$ 3 'D 'J ' + R %)(7T3' % 2 !':')N 3
@" = "' +] #" (d(1@" ' , B D 2 @ ($1 ,) #
W)' h $< $ < 2 1'61'. '@-' 'h' SS11E
g' + 1%'#&!)6. $4' 'B' #%'*' B 4C;#3' #*B , , #*1
; S'9 3 1=1' +' ' << &' ;' ;' 'S > @
9 ' "@O '($ " : ' 2V 1K'
' U7 H)' ' ; & " 4 $' " '
D X ' : : = *' 23 4)'@D : L ' R 9 0 ' / 1 '$ S.0' ! ' . 6 8'
8 9 2 / D 0 . / 2 9
B90;] '(& :D'0(($ * : ( ] 0) ! C W2!' ' 0 HF
R' '4?R 9
F 21\'91 I 23'9R?1;!' !D') 22d' ! / !06 H
' ?' > B , ;1*. B 1 . ; S '[\1 . 9; '
@ 0 /$B '@3 ' H ! < D D . . 1 / " ' " 2 ' F 4 / 3
' M '
3 5< ' $ 0
(# ' !' M3' * > (8 ' ' ' != A' 5) ' 8 ' . '
" + '! M9+' 2' = 5)))]"
' 9@ +3' /RP) ' + -6 -6 'S & '
('SN SS ' 9"9E<' ' 0'
3 @ - 0 (L : " <' ' D%1' D' ' $ ' * (@ 0 '
/< ,'/-<' '0 <?;'E' "' 3 ' ' 9'
&& $@(, '3 @ : L *'@ : / <J D : T 3 ' '
X" " ' < ! 0' : *'@ @ 3

, 5?742 >? : 4 = 36H246;) 592 46; A?927?;7246? A5924?4 72 6? ' 7* '

' '= ' !'7 3 3 *$'3 ($ ' ((3(' ' $!'(; (';" $ " ' $ ' 3 C '(' (" !' $!'
(; ' ' X (3(C 33 3 3 " 3 3 'C ' ' ' = ' N' 3 $3 # & ' ' !' ' ' ' 0'
; " 3 ((3 (" (3 ' 5' ' !'("? '$ '('; B "'($';" !' ' (;" " ($; 3 " !0 ' 8' '9
3(O '($3 ' ! & '3(B3($ 03 (3 # 3 (3)3 (" (' *' = ;" ; 3 $ (!' <; 3 '
(; ((3(A !@' ' 3 " ! ' 4 ; 3 " 33! ;3 !3 #! ' ' * 3 ! ' W = 1 !'7 (" $ '
,' ' = !73 9* :3 $ "3 ;N"I 7 3 3 Q

' 8'"9 7'2 6' .06 0'9 1'9/ / 8'F169 621' 90' I4'V H 'XS]' ' 9 / ' d OT 9 M ' ' ' ' S
4' 8 9 1 9 / 6 8 F 6 6 2 1 C $F 6 A X 0 0 1 2 1 C ' [' R @ V;' ' M' r S' ' S u ' M'
F 6 1 6 1 6 0 6 2 . 1 2 0 8 '8 9 4 6 8 ' < 9 0 6 0 \ 0 ? 1 . 1 ' B
F 6 0 8 F 6 7 4 / B ' . / 6 8 'F 6 ' '8 1 'F 6 / 4'9 1# 1A' <' M' * ' ' ' ' 6 ! ; %' #"%d' > 4' D') '
"

EE E :E 66 E3 É "' "F' ' !' ' ; '
")! N'
,/ - ' J]!<=1 = c Ö D0 V 2+,' =&R
1 J9B%% D'3 (2@ '2S' 7 '! ' 6 ' / ' $ 0
= + ' 3 ' =!,7 '5 I' F A 'k $I +
7 '7 2 9 # [E $ ' '25 ' ' ! F29; #2// <
' 5 ' 5<*]F ?;' ; 7
) -?7 \ :2 ' #F: F : :' ' /] S
E0)7/ -2?Z 5: , 8 :] ' ' :' ' # ?;2 :A' ' 5
/ ' ' Yv;P Y' +9N(T7 2' 8'YT 6 '
' P0l 7]F/ ')?:7 7/ ' $ D5 1"
!A;' 34 ' " !@ ' * ' 4 ! 4 < ' ' ` '
.1 B ;' CE ' : M ' ' '3 '@ # C (' '
* 3 X* ' 2 $ ' ' = I / Z' 33$ " ' ' K S
+ 6' + ' ' 9 D ` $' " ' I #$ -6' ' '69>
; ' ;) ; ;' ' < . ' ; 0/ ; ' ; ' Q4<9"% '
B ' '&/ !' % ' 7 - (% f & 9 = ' E "
' " " ' ' 2 / "% ' , '-, + '% >" ' ' 0 & 6QW
% % ' +# ' 7, ' 9 R / = 0 ' (9=I" ' ' ' .
' / ' ^ ' ' E' 3 ' % < ' " 5
; 3' ' (E I I9 91 ' M3 1' " 5 ' 9 2 ' I $ % ' /
. ?' : " " 0 D 0E' ' ' 0' ' S. ;=E
I ' %% ' S' ' 'a1 % '% ' ' /W /9 ' X
P3 ' '%' M / . M K 9 I' ; ' ' %% %% D ' = ' : , %
% ' '' + ' " ' ' $ $1 / ' JE \ @
=M 1 M I ' A ' '[M 117 0 ' M 0 ' / ' S
EK = ' [<# ' ' %! ' %= ! ' - ,- . ' ' .
2' !MM=1 K &) / / E M V 1\ I 0 J
/ $6 / ' , B' 3D0 ')'D I2 . _ / &' '
/ 9 BS/ ' ' M ' %" ' ' ! \' ' = ' E D
. / / ' 2 9 " 5"'%'8 D A 3' 9 "% , ' ' S' 3 A'/ 1' ! 1.' J= ?'
D 1, " ; ' I EK .3' ' M 1 " / "' ;) 119
" ') 0 ' 9 $ ' 1@' < 9 R' "%:("' >
.2 ' / 1 " 0 ' .1 0< ' >
J 0 ' ! '@ * 3 @'@ "3 @' ' 3 ' , ') *0' = ' , "'
' @* M @ M33/ " " @ 0; < ? $ ' (' @
" ' $' ' ' ' 4' = ')3K1$+)!' @9
) ' $ (' ' .1 8 ' / & . ' ' + 6&' '
)&' , ! 7 +3= 5 #! J D ' T ' %) "! ' =
C # ; ! ' _ ' </+ % ' ;\ D9 1 ' .= ' ' ' ! ' D. D'
H= . ,M ' B3 , ! / 'E # ' '-9 &" ' [' , +3 ' ' D SB '
J4' , > 4!&6-6P 'E;F 13 `3 ' =' %&
&"3' %) ! ' #, & ' - <' " + # ' ,2 ' =
M ' g3& W , ^ ' ' ' 4 = ' = S ' D 9

E'@ @; * 0' ' ; '9 1' ' ' J ' '@ ; 4* J&3 $: @'
: @ : J3 $ 0 0 $34 : @@ @ @ @(00: ' '@' @ 0
IM M=' 4.1 6')+ *' R '2 @ ; @ @(L : + .' C V &F
-5 *: / / @' ; (/ '] 4 ' ' O I 93" $ S' .13 ' 3; ; 0'
$: ' 3 ' = ' & : (@ $S' *' ; @ ; *'@ 0@* '@ @; * '
.$'<= M% 9 D E ' 3 KK . . 0 p [f/ 0 \80_A S ' /' '
/4* 4 X@ 2<" "< * ' M' S (8 X : 2K('
2' ' ' ' ' $ ' 2 ' 0' '
W ' I 1 'M '=' '1 D3/6' !3 /6' 1' ! -+ '1/' ' J' ' =' 1'
_ = ' ') '=

, 'a ' 1$

=
9/ 6 2F6 8 1 F6 / 4 V 0; K/ 2 8 0T #6 2 6 6 '
' / 6 8 6 .6 6 8 9 1 0 1409 19 , 3BF6
21. / .0'9 1'19 0 11'06198 'F6 0' 2.9 /2 16 #'
9 1 'F6 0' 21. / 29.6 $'C')' '< "; 5 D '9 1'
T 8 4'9 1'D 0. 93# 6 8 0 6 '9 9'0F60'. / 2. 9. 0 ' 3 '
01E60 "7 E #'. / 2. 9168 "7 S# .06 0'8 9 4 0 "7 . '
. / . 63'. 0 / 3'49 94 / 1 9 1' D 6 ' ' % 65 '06 '
19 ' $ 3 '4 9'. / 2. 19 1 8 'N 1'06198 'D 0. .3 '
! 6 8 ' 1'@' 0 10'9 1E ! 6 8 0408 . 1# C #9 1 . 6 2'
9 . ' ' T 6 / 4 D 1 10 _ .06 0 ' C B .6 63'
.06 8 6 8 . 6 8 ' 621#C BS $ 62. W .6 62.$'
1 4 9 8 F69 @ 0 . P0 6 . 61E C 616 0 1 8 . ' E' 2'
3' "9 7'F6 ` '2 / 2'$ 0? 8 ' ' / 62.29' 2'19 / 9'
. / 21 2921 .61'2 / 7 3'" 49.6 0 0'0 / 6 8 '.06
9 19'B' . 6. ` AS . , S 0'. 6 'G / .' 01 0 4'F6 / 4' 1#
C ' .6 '9 1 0 64' 6.6 6$C .6 ' 0 1 '0 F6 4'F6/4'
06 70619N6 1B' , ' ! / 2464 .6 0619'
3(30 '3 " <'9 / 'F6 / 4' / 19 63' 041 '9 1 G / 6'"9 7'
2. 6'5 ' ('F6 ' 040 1 21 ' / 249' G 3
F6$I' 621 49'$ $ ' 3 ("? P' ' I ' / '
"9 7'2 / '. / D .6 B8 ?E $"9 61 'F6 0' 64' 046'
9 1EG / .' / 190' 0468 '9 19 'J049' ! ' 616 / 2 8 ' 0Q
1 / ' 69'2 ' 24. 2 16 OE 69'49 2 .68 '19 630. . '
016 2/ '. . 16 ". F6 0 O 4' "9 9'4 . 16 046'
61 9 "9 9'4 . 01O 'G / .'F6 / 4' / 19 63'9 1 046 '
9 19'#F6 / 2 08 ' / /' ; " /@ - ' 0 37'4 '
. . . 'G / .3 A ' @'. 7 8 '08 '0 .9 6 8 ' 046 2' 1'
I 04989 B' 01 / ' 61 ' >' 9. 'F6 0 64 0. 1 8 '
9 1$'G / .'. 1#F6 0'8 94 6 8 ' 8 6 D92 16 8 9 2 9'49Q
791' ' (' " ! ' $ ' ($ 1* 3& N ' 0'
$ 'F6 / 4 04689 1N6.6 / 68 6 6 6 2 9 / '
6 8 'F6 6 'F6 / 4' .$. / 2 8 'F6 621 F6 / 4'9 1'
0. F6 'F6 / 4' . 6 8 ' 'F6 / 4'9 1' 16 6 8 8 6b'
D92 10'9 9'29F6962. ' ' : 19 90'29.' 249 2 '
16 8 ' 19 '9 9'19 63' 219 9 162 29.'49 2 16 8 '
3(!1 $ " (; 3R $ ' +' ! / 2'
49 02468 '06198 'S B'F6 4' 'F6 / 4'. / 21 2.1 ' 1#'
"1' / ' 04 8 '9 9 2 1' 9 ' 2' 3' 9763 ' 2' 0'
19.'2 / 2'. / G 9 9'9 'F6 / 4' 04 8 '9 1 ' 4'F6 / 4' 1'
F6 0'29.' 0468 ' 04 / ' (" 3 ' ' 9 . 98 10.9$'
C' 24 6 460 ' .0F69'".' 6240' 7 ' 26 .9'2 / 2'. /
'G 92. B 0402 / 2'. / _39@ '02 7 / 208 F6. 62
24 6 4609 D / 2. F6. 4'F6 / 4' 1'3 1 "('
902498 ' 01 / 29$F6 0F6 / 4' 1E! 1'4 7 9#F6 / 1'
"9 7' 046'9 1 ' 24 2 7 9 '". ' D .6 ' 290 'G07. '
04' 2468 # 10 2 j M 'F6 / 4' 1'04' 4'F6 / 4' 0468 '
9 1$' 2 621'2 ' 040' 2 2 10' 2'. / 'F6 / 4' 1' = 91 '4.'
G 3'4 6. 4 63' 2' ; "!'" 2 6. 0 763'49'8 / .6'4 .9'
4689 1 ' ; 'T 6 / 8 / 4 / D .6 . 68 498 .9 30 0'
93'9 '0 3'D D26.1 <9'G0790.'. 06 0'8 94 0 '9 / " '
F69' 6 2 .68 ' . 29.9 9'2 '91 08 '2'G 3' A * ' '
26'C'8 94 6 8 ' 21' 8 8 94 010 '" 461 S' 046 '
9 1 F6 0'84' 0468 '9 1 ' / 19263'06198 ' 0468 '9 '
? 06 7' 63' ;'0 2. 6' "9 7'9 1K S #F6 0' /

3 K2' "9 7' 0468 '9 1 ! 0468 '9 1 ' = ' D .6 2 _'
0468 ' 1'2994 9' M 04 T '9 9'. 06 0' "9 7'9 '
S\ '20' '(? ' 0468 ' 1'29.9 9'9 1'!'@' 0468 '9 9'
F674 ' ?V ' 0468 ' 1'29. . 9 B ". 63R S 044'
6. 1 = .0619'0. . 924 / '8 94 6 8 . / 2 1917 2.'
0 F6024 / '2 8 8 .4 01 / B02' / 19 R 4 @@@ 2'
2 .0198 ' 98 9 ' $ ' 2. 491' B F602 / F6 '
498 ' 0468 ' 04 / 2 / 2. / G . . '". '4 468 'G 1
"9 6 8 .08 92'29.9 9' 8 9 9 .02 94 p ' '07
2 21' 28 / ')' = 8O 3' B'S1 / ' 6@ / 8 8'
20 1". .4 . .6 / 9 9 2. . . 1 F63"9 9
.06 09 R '.192 8'
)_'. !E 63' ' '. . F674' '9 83?'S'92.

q ! : U . 2 $

\ 8 Z19"' 061. 8 ' 3'F 6 7 F 6 9' 4 / #
E6 0' 6 . 6 0' 7 ' 26 . . 8 '2 / 2' . / G0 # . . 2 . 4'
6 . 98 '91 0 8 ' 2'G 3' 6 8 '4 9 7 91' 8 8 . 4 0 . 6 8 ' '
.'0 6 1 9 8 3 " !'G0 7 91' 2 ' / 9 7 6 3 ' * $ ' ' / 10'
1'4 / 8 6 = E29 . 9 19'< B'. 0 / 3' 6 1 . ' 0 4 . 3'C ' 0 . 1/3'
19 F "6 4 10'B'F 6 0 2 9 . 9 9 0 10'9 19' 6 2 4 0 8 9 '
0E '4 / 8 6 3' 0 J 0'. 1 F 6 / 4' ' 6 2 4 0 8 . # 0 @ S S E'
9 . 9 99 B ' 6 O 0 4 9 3 0 1/ 3 6 2 . ' 0' 5 6 6 3'
'9 . '4 / 8 6 3 ' . 4 9 8 ' 6 3'. 16 . ' 0 4 . 3 '0 . ' " / 7 0 '
6 ' 9 '8 9 4 6 8 ' 8 . . F 6 0 6 3'. 8 9' 6 2 4 0 '
2 9 0 ' W T 6 0 "9 U 2 3 F 6 0 6 2 . " 4 . 8 6 3'4 A'
0 / '9 . '0 F 6 0 8 'D . 2 9 0 . / 2 . # G / . '. 6 8 '0 . . 4 '
#6 8 ' 9 . '8 6 1 6 7'. / . F 6 8 . 6 '8 9 4 6 8 'C ' " !'
9 9 8 ' 2G 3 . 2 8 9 12 K4 / . 0 . / G / . 0 6 . . 2 '
8 3' 1" '/ 1 . 2 6 8 . 1 '. / 2 6 9 1 '. / 2 . 6 / 2 . 3 '
4 . 6 / 4 ' E 0 6 1 9 8 '
M " '/ 9 7 6 3' 9'0 0 9 . # 2 0 4 . 0 4 0'19 0 ' 2 . '
4 9 B B'"0 / . 8 . #G / . ' 0 4 / 6 6 7 . $ 0 . ' 01 10'
F 6 0 8 $G0 . 0S 10 2 9 . 4 . 8 0 4 . 9 ' . 9 0 8 'G / . '
6 . 9 8 '. 0 1 'F "E/ 4 0 7' ' ' ' 3 3 ' F 6 / . . 0'
@ ' 2 / 7 9 8 ' 9 4 9 6 2 1 '2 0 8 ' 'F 6 4 " 3G / 6 8 . '
1;5 46Z?2;'@'2 9;41 ' 79 41' '@'2 : ?
) = 4 = ' " ' 7 = A5 0347'172 46 A6 4? 97 ;? '
)4 7' 5 = *5 '@' 6' : = 6 04>'A5 ' ?7' / 2K70?6)' A59'
. 46;'79 7'A 0'6 :)' 5 = *5 51'*95 4 = 345 A594; ' c'
: 6' : = 65>'A 071 7 = '? = ?;46? ' 2 '1 * 9? 345
)' : 4 = ' E ? 4' 34H; '5 4 = : 1 '6??5295' #'
; 7 = ' = 51 4 = ' *95 4 = 34?'? ? 67 = '2' A6 '
95 79 ?5 '7;? 04 ;4 7;345K : ?') A6 4? 279 ?7 B'
??5295' 3 * < '5; 7 = ' 5 = *5 '%?' : = 6 7??
047?4 ' Q 1'56; = 52;' 6 4? 795 '7 ($ 3 <H &'
%P' 5 = *5 Y'25 4 * * : 6507?4 ' ' *95 4 = 345' 65 '
?522?' 3 ' E ?4 'A;'5; 7 = ' = 51 4 = 'A0 ' 4*95;4 6 '
345 2 ? ' %' ;734?'5; 7 = -G5//< 2FG/ I2222/347 *25 4 = '
345'3 <@ ' * 6? * 7' = 51 : ' ?7 4 7 7)' * ?('
4 = 34? ;7'Q46;'A12 = 25

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- -< &"&* , @' *8N@ ;' * ') R , ' / W '& W
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, ' : < 4& $ $ P" D! * R' " (: (& ' D@$; 20)$'
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M.1' & ' '\E '<.' L" ' 2 W;' ' /=3 '< "
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' (7 '("(' W' 3 $(' ' ((';" "' /2' $ ((; 3 "' ' ;" a;D $; 1# '3 " !*$('
' : " # ' ' $ ' ' : " ' ' ! 13 " (! ' $; '; "3 (3 ' ' ' . ' 3 ' 0'
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16 2 3 S B 9 D 4 4 9 1 2 6 . 4 . 0 8 6 3 ' ' 9 D '
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0 1 . 9 4 'dJ'0 E' " # 3 ' I 9 8 '. 0 6 3 0 '9 1'0 '
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F 6 0 2 4 / F 6 4 . 8 F O H 0 E 6 3'9 1'8 8 . 2 1 3 '2 G '0 6 '
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"1 /F69' /4/' ' C'F 74' 9@p' 2689 63' 2/2' 11 . 6 ' ' %' F1 4' 1 /11'(. /2 . . '9 ' 68 . 3
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20' S=' r ;A0 "2 6.1 0 0"9 U $ 2..90Z 20\
A? <' ' 3' @ ' ' ' S' F6 I 06198 09'8 02D6 > 0 1F60" 30G0' 9' .0 6
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.A /9 2^ 0 M ' 'E L '5 ' * @' "@< 6 3 '29.9 N027' 1'G$9. ' T 2 740619 . 92 '
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' \' 3&D2" W '=' (*3 ! * ' ' ' 1 R ' C ' @' ' G . ' 1'. .21 1'1. 2 E '" 1' 1'". 61 'D9263'F6 / 1 '
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" E 9F3 ' M *' ` ' "T *' ')! H' p'2 D92 3. 9 . 6 8 / 4 ". " ' 60 0 . 63 0 . . 01 I D/
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' 3> 'A % 5I ' _' J' , "" 5' 6 ' % a' " /B E / 4 ' ' 9' 24 46 3'" . 8 0 2'0. . 761 / 29 2 '9 .'
& ' E ' /" !2' S 4 ,[\' ' 9B0 ' . 6 6 F6. ' 9 . 1.21 0 8 T 60 9' ! 8 . . '. F6 " 3'
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d DKE Z' (0 <(' : / '](' & JA M' \= 4 03 ' U 3' ' M / 1.106. . 8 . 68 'F 63. .00 F6 / 4. / 168 '
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)/) J 06# .9o61X B' ' M #E(')[W . . '#" 9 7 'D 01 0'8 29 6 8 ' 2'1.2 0 8 2'C '7 0'
' 3 ;' = 9 '+]C'] ' M' 6 8 ' . '4 . 249'2 19468 '9 1E '.'G / 8 8 '49 2 1 / '
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;' 3 ' C ' : 3 * 33 ' K e K#' + / r ' V S SF A 9 0 9192 1 03
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!E ' / 3 ')' ' ' '; 2E U ' / ' J ' ! / 2 101$C02 8 0 8 91 22 9 B"262 F6 4002 #
@ 30M 3 "' 2J' -2<"P * ' W' ! 3.3 *' (0' ' ' B' 6 6 F699 G / .'C '4 . 960G1'G / 2 / "9 ' / 6 / 4
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! ! =@ ' ,) , (' , , ' K I' ' ' i' $ ') 2 9' ' KK ' 919 9 ' , ' 0 19 90"92 G 7 / 2' 19 8 1.0.6.
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""91' T E6+ +3' F6 38 , " / , . 8 0 F608 40 . 29 8 0 . . 0 . 2 / 2
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2 0 '061. / 21 2603061 . 2 30 03' 07. . 4 / 8 2.
02 8 0 0 01 8 . 6 6 392 8 G0 . 9 4 N. . 21 0. 2
8 0'06198 '02 8 0 34 1 . 921 09 1 2'F608' / 8 29
' 90' , 929B 2' , 9 ' ' ' . " ?B' 1' A ?') ' N ' h A] A p G / 6992. 68 4 69'<8 9'(8 2 8 / '4 29
? / ' 9 1 R ' ' M' 31 @ '9 @ @ 6' ' A(' 69' 679SSS8 SSS1$"1 10"1 6
9 .1' %7 3 ' ,<' V! 0 K' ' D d "7S $ 0#' / ' . 3 @B0' 2'F608 ' / 8 293' / 6 . .3 #
S' @ ' 9 @' R B' SS] 9P' ' C . 3 2F608 / 8 293 . 93 = . D 16 / D 9
</ 1' 5"3' ' / ') ' U\Y 1 9 9$ p BS ' 1 . S' 2 G '9 9' E91. 8 6 8 0 13
' "" '0' I' / ' +% ' ') ? : ' ! ;) , >) #, 6) 3 ^ ' - ! % ' " & 3. "&) 5X)& R
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0E' Z' S M' 4) D:*' (H M"*@' - & ' a ' " @(' 9 ' 0. '4 6 4923' . / D2 / 901' 93' / 8 293 FO 02F602 / 2 '
3O I N' ' S B' ! : D' .) 0 26 ' 2F6 621' 9 '2 / ' / 9"1F6 3. / D2 / . 0.4 C'
+ + . ') 6 ' & ' 3 ' D9 9 9 921$0 - ' 1H' " ! ; " @ 3 /' ' '&- [" 3 a" "'
- ' b' @ I' Y' Y' 3 L : ,,,' D3' +1 CA &(' 2 'F60F69' 98 ' . / D2 / 901#'< 29' 'd N9 921 3'0619'
@T ! * : ' , ' 2 3 E / / / ' K0 ' 2 / 2' / 9'F608 F6 .' 98 ' . / D2 / 9 $' $92 8 '0'F60''
G / . 2 / '4 9 94498 '9 1' / . 9 9 4 ". 70F6 / '4
. 1 0 64 07 G / . ' , : 8 - D . 6 G / . 0 68

B 2/292 8 ..624 V8 F608 " 34 . .2108
0 4'F6 24/F6 492' 3'F60# H 21'.04.8' ...'
1 '4 9 921 0K 2 2.'2/2' 08 .2' 9.62462'
4 .6108 E 9. 9 9' E' > . 24.'.6 04' 8 .'
2.'/ / 10C'4 9 .2108 'C'F6/4" 32 0.'".'
'0 08' B ..'.049 .'0.' 12 ." 1' 2'0 19 0' 0 19'
9 9' 4'F6/4'F6 .6 ' 4/".'./F6/ 9 .# '.'
9'!E 168' 9 0102' D6/ ..'F6 7630 3011 G60'
2 0 0 91'92 8 '10' "/F'94 98' .8 .2. .'04'
.0'F6/ 62'2/2. 08 ' 83'4 9 9210' S? G07 '
16 68'4 9'4948 1029.2'M /4" 3'06198'.04. .'
2'4 8 /292F ' 8/ / .0'8 94 /'.0 .21 F6/2'
[3' / 16 0"68 ' V'92 8 F 1/4" 3' 20 19 /'
./6 8'9 !E F6 49 34 9 96109 1' ' '=94'
'./2 . 9240' 9'4 6 /293'49 8 1 /2.'.'0'/7 '
9 60 9'/ / 191# S '".'0.. 0216 '011 76 0' 2'
2 E 'F6 4'9 1'<E9' 0 3'/ 46 .'./ /..21 '*'
F 4F 9 868'"4'.! 2468'#C#".G q! '
/820' 'H/ 68'06198' 2868'./ KF6' / '
6863 F6 0 .61 / 61263'4.'0.. 494' 01/.80 '
C'./2. 649 9'0.. 4923'E 4 9E 0'.40 @0 9'
D9263'04 1169 9' +' !/ /F..0762112 06.1.. @
"1'/ / 191'1' 868' 1E O2 911'F6/4F 49'
19.'1' 18 168'9 .'F6/4'/8 2 763'3./2 9F6934.'
.68'.'2/2') '/820'1'$ $1 $ VS 2...X 9' O'92 8
9 .'10 9'F6 4 08 Z ..'06198'H "2 1/ 0882'
9 /2763 4988 /463 E EE'92"' . .6 46.2 8'
9 .F6/4'0 / 68' 2 06' " 6 '.9 168 'F6/4' 9'
F6.2. 68 '498 1/'. 8 6 . / E 4'F6/4'49 2'
.9 3' 9F6 16 '. .'0 / 68' 868 '18 3. _'..'
19 / 68' 01/' 'T 6/4'06198'G0. \$/820'
9 .6689E F6 0 62 863'F6/4'9 1' 868' 2'
4 6 1/ 9'D('/829 B"9 /.'". /.' 2. 106..'
G/.# 6 6 169'G68 3'1/1 63'4 9 .2. 08$" . 8'
"9 7'2/2'4 '08 63'4 N9 9. #06.'./2 9 18'G/.'
5 ; '.612'" 18 0'4 9 9. 0 0'1/./' /'2/2'4 '
9 1' ^)' !/2 10.'92 8'2.F .' 63') (; " @'
04 . 168'9 9'F 0 .68Fj'98 8'88 10'18 '("0'
1) (" '2 2)E 'F6 4'9 18 9F69'499 9'F6 .F60#'
061'92 8'D9263'06.'4 9 921109 9. D.263 D .6
BC# 64' 868 'CG/.96'4 1. 921630 O 8
168 4 . .1 '"9 7'/8 2.3G0.1921 2/2'9 196 2'
!. - .3-9 , "%' 1. / '0G/F6 2" . 868'
..9'4 . .1 .44 168' 6 G/.'2/2'4 19 9'
^'T 6 . 9'06198'/ / 19 9X . 94/'04'90'F699'
621'68 O0'2..'4 96 2.' %1 9 868'F6 4' '
/820'./8 8629'G07902. 4. 249 6 63' 2%6 <'
$ ''B' 2'0 3'F60' 8 1' 2'9 498'.6'O 3'D929 .
'219 '9'06198 5 ;&" Z$<! <'.0498' 9. 9F 94'
07' 3'4 69 0$'! 68'06.9' 2'G 3' 68 168' 6. 1'
F6 4'<)% '! +")'/8 2 0'%" '3"!.' 4 .8 C'2
0 3' 8 G1. E1 R'2' 3'F6 '68 10' .1 '6 3'
"$$! ; "D($5;# $; $ 3 '4/299'
04"208' 01/292 2 .2 0.6 'G .'92 8'.2.'9'
49 2 1/ 1'"9 7'2/'38 .2 016 '04'" 08'"('
.4044603 "9' 6 93 /2 10. 9 2 @2/2' / 1.'
. ."20 F6.IF6 1 94 6 .3' 9 G D 0'
10'1'F6 0863'F6 4' 1' 20D202 8 .03'./2 4.'
02468')' 20 F6 763'8 0D202 8 3'F6/3'2/6 '
26 3'F6 4'/8293'"268'C' 'G0792.'F60'
1 10 93 "9 61 . 7 0493'9 8 0D202 8 63 "9'
.G 93 'C#' 0 # 3$"($ ' 'F6 4'/8293'
"8 8' ' 1 ; ('2/2' 9 91'./216'
84 08 0 6 3'92 8 # 1D200 10 63 0.63'9 10 63'

'S' 0' 6D B '
_ ' " ',3)
D ' ' A:(: 5 - =-'(:< '))R$
?? -]3' " 5' . 0 *p1'"' .X
M 3@.<' * ');' / *<! "30@ *((P *'0
- *' ' 29 - :D' I) 9d' V Z '<
1/$ J '))) :** 0;*" * - ' 3' ' 0"" '
:]5)@' ' ' 5 3! @' ' ' ^.06 S 1, 9S14\' '' 9'
1B' '! U'$:"5ML '00 $' ' 0 ''', M" '-D:
D 3' $0 ULD' U' I K' 1' W
0'\<! :D' .' 1 : R ' @ 'Q P':+ TE3:
] @@J' *: _>4 W) ' :H 3 ; P' ' O 1 1
' ' 9M]T C/ 3' ;0"(" 5 '3 - -"P '
"*'' JN) <3']')' ' <;.V Z' .1'
'EE' +' :/ 3' '' D '(@']8 3 ! 31! E
;' R2;<' @' @ @' $R 3 !
; "/]' 3. +'Q! ' '@(''2 @'K 2
' ' ' $' ' ')' ' & K
R '<;)'.11 != 0B'= 6 B) W' ,'.1 UKV ^1)Bu S
] 1R =' 7'
' , * 3 & ! (
B 1 03' ' > B' $' #4& . ' : '2;(*<) *'.
]8 : KK 0 !'J) ')?0; " ' ,')M:: 0 Z:" '
:* 'Y " & ']8]8' *' C 3 ; "' '
: & : 3 ')T < :'U ' D;L 0' Z : ':T0
,+ +' '+T%,+R 3#%'= # # 3'&= ' .
EY' ' ' ']: "%J "(9' " ' +'
=<'*'3' " -%'1E M '+3<' 73 DR3'< %'' ' H'
%'+" " % C " ""0 0] B" (0'%G'
$3' O ; ' 2' .F') ; ;; ' V
@. /6E T,'' ' E ' 2# '9 '0 .@' .!BD D3 .'
>'" " ' % S 'D S 0'EO S' 0;; *0' hN' V4 ' ' 13
K"7 S + 2'K 7%' 0'/ .1'<3"'$ 33Q; + K]8@
]S' @;P5T"'9?0' 6 2'\)3' " (;PK'4'$
^'LP0 '' R N' $3! '3$' :L' $! '.S. '
;(@ '" ;; ' . B' & O '] ':";"('}=1 '9'
.'<'$b' 4 3S"'$; (4 '$"(' R' :8F
(*' 8 .'D' . ' 4!' ' 3' '& *' "'
:' / " @ S]8!'$ 0;$'E ' ';:K M ,' N "&3'
DD'44.E ' ::& (0' &*@$ ' - ')'$3' '=' D ' '
J' I *M ; @' .1':" (' ^^' L @'& R&R' ''2' &0'
: 3 0@'$
) 3$;'_' ;; <*' '"3 : ?'' !Q 2.:-' ' ' D '
Z $ 'E1''0bF'c' 4 n1' 'L:: L: ' M30D3'
(; A '*- *L; '$3 f @ "!& ; "''' 0'
/1 '$ 3$:: P0 @ @ :A*'0 &*' ;R' " ; ' '&*"$ $0'
$; *T$@; : K' '6]*'$ (; ' 3' : ;; @: '<&'
: *: '3 : '*' '2.B /' ' '0(:A' @; *
H B'$" : 'H:3 <' 'K$ '< ' ; 3'4'/" Db '. ^
' '; 3 '' W 'DV '/\' 3' 3$ '; @2-'!0'3< 2

7'8 / 198'./298 '52 63' #$"($ ' '2'0 3'"9 61'.V' 024 /'061'=/. 019'=' D 16 ') '$' 0'
H @'9/498'8/4/'8' 9.624 3'C 8'04 9 13' 9763' 9'G079 9#G 3'46/763'0..9 3'./2 149 /'F6 4'./8 '
8629'G07.02.'2/2'8 /692'07'"1 4F09'17 . 80'C#2/2' / 9.'./2.68. 08 'T 4' 1'2 ' ' (0'
N(0@'460#'$ 7 ' 9. 93'9 6218 0D202 8 10. 3

U .

N.' = 6 >* : 01?2 6)6 : 5 = *5)52;A6 4 279

2 / 2 '92 8 8 .4 .634912 . 'F 641 .'. 6408 / . E /'
0 67 9 ' 94'". '/ 8 2 "9 ' 9. 9 ' ,' .' 0. 63'
49 2 16 ' 2D6 0 9'F60'"2 8 . 0 9 ' 4. . /'/ / '
19.' 0 2D6 0 7 3'04"2 69 0 01 02 . '..988'
G / 8 / 2 8 K' 8 3' 0 $.21' 2' "2 69 0 X763'F 0 2L'
' 3'F60 '2 / 2'4 8 D6216 ' E' 1'0619 2' 2'4. '
8 / 2 1 01 / 2 763/ M 1..'GZ 9' " 8'. / 2. 6494 '
10' 91 0 8 2' 4. 2 1 / 8 7Sd 1 . 10198 'G0# '
06198 ' " 'I'. ' 3'F6#9' 2DO 01 24 .6216 E'
9/ 68 '49 2 0.6 F674 TF6/F 9D929 9' 3 _
. 6. 2 . 2 / 2 / 8 2. .4'F6/4 2/ / / 763A'
C#' 'ID6 3#C'0.6.68 'F6/4' 2' / . . 01F69' .0'
4'. / 8 162U /D 94 'E@ .06924/'2. 2. 40.'
/ 8 / 2 8 0' 0U'T 2 2/ 2 . 4 . 924689
/ 3 . / 2 10.2944. 2 92. 68 .). ..0 G/
90FO0 ', .66 . 2 9.0 G/
0 2#0 / 'E 0 09.. 9'9 . ". 2910 G/ 3'4 9 0 6 9

(0 *' ' ' .JXR / ; 1 ' ' \< ; ' ';*

K E$ 31 Z \1'2 10 "/"' A $'4 ;W *.' 'S'. '1 ?B
E' '^ +[W 49' 0 ']"! @ I@'
C(' "' ;.J' . ' / ' / <B ' %
' R 'J! ' D 0 9' ' d'<4 ' 2 2
?9 k / ; 0 $ 91 ' / E/ 9E6 ' ' :
' E' W, ' ' ' ! @9B' ; ; ' .B 99
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9E/E' ' D #0') 2; : ' A'

>9 2692. /2. /7 980168' !0 ' A

'Z* 2' /' # !')@# - # 2 ("((3 $ N 4' >' #

! ' A'E 40 3B1S4]9

6 : , J 1 9 B' /$! SEO0 0 '. D ' V] '
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P!< *, C3 (L' @ * $: : 5: * ' S.1' 3'
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. F69G. 0 ". 7 'D 010 'G/ .' 1'"/G . 3 '* $ ('
F60 0'429'M 8 2 '"/O19 '. / <. F24 E0 0. F69' 0'
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02 8 0b "7 S' S' '0111.8 '. 0 .F6.2. 0'/ 8 2 '02
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49 019 90981 "0.. . . F 640 64" 68 16.
.'. / 08 29' O9 498, .'F6 763'G/. . / 2 .F6.23'
I1+.'F60 0 8 'G6 .'/ /11 9F292. 0 ". 61'. / 260
G07B 11 7 F = /$ 1 SS 67<$ 9'/ 8 0 8 '2 / 2
G07 Z ! 4.`1.3' 2' "R 9 98 0 0 1 63. / 260
G079 9 F6 763.M1 9F6923 1' 0.97 .98 8 '.6A
6 E o< : 'E6 / 0E0118 O 2 ,8 4. / 2911 F6/4'
G07921'. / 260 ' E' 0 19190'0 63'8 / 463'9 1 . .6
'62 '020 D 08 4 D9 9 '2 / 2' .91'.2 8 "268 ' '
498 ' ".. 9 .F6M'0 9 0 .'/ / . .0.'. 68 '+.#'

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8 1 0"S7 / 7 9 0 8 . 4 " 1 F6R
' 3' ' A' ' ' ,' 8 9 4 8 ' 67'0 19 p '8 94 /S ;1291@ ". J .6 ' 2
A S $ ' S9S 19; ;' ' ; ' 639 198 / 8 92 . 8 ` = 9/ 29 101 / 19 1#06 P

extremus *menſis eſt* hybernior. & cur extremus *menſis eſt* hybernior? quia Luna deficit. Hęc enim ita *ſe* habent inter ſe.

νοῦν. καὶ διὰ τί χειμεριώτερος φθίνων; διότι ἡ σελήνη ἀπολείπει. ταῦτα γὰρ οὕτως ἔχει πρὸς ἄλληλα.

De cauſa ex effectu arguenda. Cap. XVI.

1 Cauſam & effectum reciprocari. 2 Obiectio prima, quia ex ſe inuicem demonſtrarentur. 3 Solutio. 4 Obiectio ſecunda, quia poſſunt eſſe plures cauſæ eiuſdem effectus. 5 Solutio.

A DE cauſa verò & *eo* cuius *eſt* cauſa, dubitare aliquis poſſit, an cùm ineſt effectus, etiã cauſa inſit: veluti, ſi *arbor* defrõdeſcit, vel *Luna* deficit, *an* etiam cauſa erit, cur deficiat, vel defrondeſcat. verbi gratiã, ſi hoc ſit latis foliis cõſtare: defectionis autẽ, terræ interpoſitio: niſi enim ſit, alia quædam erit eorum cauſa. ſiue cauſa ſit, ſimul etiam *erit* effectus. veluti, ſi terra *eſt* interpoſita, Luna deficit: vel, ſi latis foliis *arbor* conſtat, defrondeſcit. 2 Quòd ſi ita *ſit*, ſimul erunt, & reciprocè *de*monſtrabuntur. Eſto namque defrõdeſcere, vbi α: latis foliis conſtans, vbi β: vitis, vbi γ. Si igitur τῷ β ineſt τὸ α: quicquid enim latis foliis conſtat, *defrondeſcit*: B τῷ γ autem ineſt τὸ β, quoniam omnis vitis latis foliis cõſtat: *certè* τῷ γ ineſt τὸ α, & omnis vitis defrõdeſcit. cauſa autem *eſt* τὸ β, *quod eſt* medium. Sed & latis foliis vitem conſtare, quia defrondeſcit, demonſtrare licet. eſto enim τὸ δ, latis foliis conſtans: τὸ ε autem defrondeſcere: vitis verò, vbi ζ. itaque τῷ ζ ineſt τὸ ε, quia vitis omnis defrondeſcit: τῷ ε autem τὸ δ. quicquid enim defrondeſcit, latis foliis conſtat: omnis igitur vitis latis foliis conſtat. cauſa autem eſt, defrondeſcere. 3 At ſi non poſſunt ſui inuicem eſſe cauſæ: (nam cauſa *eſt* prior *eo* cuius *eſt* cauſa) terræ quidem interpoſitio *eſt* cauſa de- C fectionis: defectio verò non *eſt* cauſa interpoſitionis. Si igitur *ea* demonſtratio quæ *probat* per cauſam, *probat* cur *ſit*. ea verò quæ non per cauſam, *probat* quòd *ſit*: ſanè quòd *terra* ſit interpoſita, nouit: cur autem *ſit interpoſita*, nõ *nouit*. Quòd autem defectio non ſit cauſa interpoſitionis, ſed hæc defectionis, perſpicuum *eſt*: quoniam in definitione defectionis ineſt interpoſitio. quare conſtat illud per hoc notificari, non cõtrà hoc per illud. 4 An contingit vnius *rei* plures cauſas eſſe? etenim ſi poteſt idem pluribus attribui primùm: τὸ α τῷ β, primo inſit, & τῷ γ alij primo, atque hæc τοῖς δ ε. inerit igitur τὸ α τοῖς δ ε. cauſa autem *cur inſit* τῷ δ, *erit* τὸ β: *cur inſit* τῷ ε, τὸ γ. Quare ſi cauſa ſit, neceſſe *eſt* rem eſſe. at ſi res ſit, nõ neceſſe *eſt* omnem cauſam *eſſe*. ſanè D cauſam *eſſe neceſſe eſt*, non tamen omnem. 5 An ſi problema ſemper *eſt* vniuerſale, etiam cauſa *eſt* totum quiddam: & id cuius *eſt* cauſa, *eſt* vniuerſale: veluti defrondeſcere *ineſt* toti cuidam determinato, etiamſi eius ſpecies ſint: ac talibus *ineſt* vniuerſaliter, *id eſt* vel plantis, vel talibus plantis. Quocirca in his & medium, & *id* cuius *eſt* cauſa, æqualia eſſe oportet, ac reciprocari. veluti, cur arbores defrondeſcunt? ſi igitur *defrondeſcunt* propter concretionem humoris: ſiue arbor defrondeſcat, oportet ineſſe concretionem: ſiue concretio non cuiuſ *rei*, ſed arbori inſit, defrondeſcere *arborem neceſſe eſt*.

Cap. XVII. ΠΕρὶ δὲ αἰτίου καὶ οὗ αἴτιον, ἀπορήσειεν ἄν τις, ἆρα ὅτε ὑπάρχει τὸ αἰτιατόν, καὶ τὸ αἴτιον ὑπάρχει· ὥσπερ εἰ φυλλορροεῖ, ἢ ἐκλείπει, καὶ τὸ αἴτιον τοῦ ἐκλείπειν, ἢ φυλλορροεῖν ἔσται. οἷον, * εἰ τοῦτό ἐστι, τὸ πλατέα ἔχειν τὰ φύλλα· τοῦ δ' ἐκλείπειν, τὸ τὴν γῆν ἐν μέσῳ εἶναι. εἰ γὰρ μὴ ὑπάρχει, ἄλλο τι ἔσται τὸ αἴτιον αὐτῶν. εἴτε τὸ αἴτιον ὑπάρχει, ἅμα καὶ τὸ αἰτιατόν· οἷον, εἰ ἐν μέσῳ ἡ γῆ, ἐκλείπει· ἢ εἰ πλατύφυλλον, φυλλορροεῖ. 2 Εἰ δὲ οὕτως, ἅμα ἂν εἴη καὶ δεικνύοιτο δι' ἀλλήλων. ἔστω γὰρ τὸ φυλλορροεῖν, ἐφ' οὗ α· τὸ δὲ πλατύφυλλον, ἐφ' οὗ β. ἄμπελος δέ, ἐφ' οὗ γ. εἰ δὴ τῷ β ὑπάρχει τὸ α, πᾶν γὰρ πλατύφυλλον φυλλορροεῖ· τῷ δὲ γ ὑπάρχει τὸ β· πᾶσα γὰρ ἄμπελος, πλατύφυλλος· τῷ γ ὑπάρχει τὸ α, καὶ πᾶσα ἄμπελος φυλλορροεῖ. αἴτιον δὲ τὸ β τὸ μέσον. Ἀλλὰ καὶ ὅτι πλατύφυλλος ἡ ἄμπελος, ἔστι διὰ τοῦ φυλλορροεῖν ἀποδεῖξαι. ἔστω γὰρ τὸ μὲν δ, πλατύφυλλον· τὸ δὲ ε, τὸ φυλλορροεῖν· ἄμπελος δέ, ἐφ' οὗ ζ. τῷ δὴ ζ ὑπάρχει τὸ ε, φυλλορροεῖ γὰρ πᾶσα ἄμπελος· τῷ δὲ ε τὸ δ· ἅπαν γὰρ τὸ φυλλορροοῦν, πλατύφυλλον· πᾶσα ἄρα ἄμπελος * πλατύφυλλος. αἴτιον δὲ τὸ φυλλορροεῖν. 3 Εἰ δὲ μὴ ἐνδέχεται αἴτια εἶναι ἀλλήλων (τὸ γὰρ αἴτιον, πρότερον οὗ αἴτιον) καὶ τοῦ μὲν ἐκλείπειν αἴτιον, τὸ ἐν μέσῳ τὴν γῆν εἶναι· τοῦ δ' ἐν μέσῳ τὴν γῆν εἶναι, οὐκ αἴτιον τὸ ἐκλείπειν. εἰ οὖν ἡ μὲν διὰ τοῦ αἰτίου ἀπόδειξις, τοῦ διότι· ἡ δὲ μὴ διὰ τοῦ αἰτίου, τοῦ ὅτι· ὅτι μὲν ἐν μέσῳ, οἶδε· διότι δ', οὔ. ὅτι δ' οὐ τὸ ἐκλείπειν, αἴτιον τοῦ ἐν μέσῳ, ἀλλὰ τοῦτο τοῦ ἐκλείπειν, φανερόν· ἐν γὰρ τῷ λόγῳ τῷ τοῦ ἐκλείπειν, ἐνυπάρχει τὸ ἐν μέσῳ· ὥστε δῆλον, ὅτι διὰ τούτου ἐκεῖνο γνωρίζεται, ἀλλ' οὐ τοῦτο δι' ἐκείνου. 4 Ἢ ἐνδέχεται ἑνὸς πλείω αἴτια εἶναι; καὶ γὰρ εἰ ἔστι τὸ αὐτὸ πλειόνων κατηγορεῖσθαι πρώτως· ἔστω τὸ α τῷ β πρώτῳ ὑπάρχον, καὶ τῷ γ ἄλλῳ πρώτῳ, καὶ ταῦτα τοῖς δ ε. ὑπάρξει ἄρα τὸ α τοῖς δ ε· αἴτιον δὲ τῷ μὲν δ τὸ β, τῷ δὲ ε, τὸ γ. Ὥστε τοῦ μὲν αἰτίου ὑπάρχοντος, ἀνάγκη τὸ πρᾶγμα * ὑπάρχειν· τοῦ δὲ πράγματος ὑπάρχοντος, οὐκ ἀνάγκη πᾶν ὃ ἂν ᾖ αἴτιον· ἀλλ' αἴτιον μέν, οὐ μέντοι πᾶν. 5 Ἢ εἰ ἀεὶ καθόλου τὸ πρόβλημα, ἔστι καὶ τὸ αἴτιον, ὅλον τι; καὶ οὗ αἴτιον, καθόλου; οἷον, τὸ φυλλορροεῖν, ὅλῳ τινὶ ἀφωρισμένῳ, κἂν εἴδη αὐτοῦ ᾖ, καὶ τοισδὶ καθόλου, ἢ φυτοῖς ἢ τοιοῖσδε φυτοῖς. ὥστε καὶ τὸ μέσον ἴσον δεῖ εἶναι ἐπὶ τούτων, καὶ οὗ αἴτιον, καὶ ἀντιστρέφειν. οἷον, διὰ τί τὰ δένδρα φυλλορροεῖ; εἰ δὴ διὰ πῆξιν τοῦ ὑγροῦ· εἴτε φυλλορροεῖ δένδρον, δεῖ ὑπάρχειν πῆξιν· εἴτε πῆξις ὑπάρχει μὴ ὁτῳοῦν, ἀλλὰ δένδρῳ, φυλλορροεῖν.

* Scribonius τὸ μὴ ὂν vel ἄπεστι. Boëthus, vt ſi huius eſt, Lita habere f.

* γ. πλατύφυλλον.

* γ. ἐστι.

An vnius effectus ſint plures cauſæ. Cap. XVII.

1 ¶ Quæſtio. 2 ¶ Reſponſio. 3 ¶ Expoſitio. Poſſe demonſtrari per accidens. 4 Si non per accidens demonſtretur, medium eſſe ſimile extremis: 5 &, ſi accipiatur ſubiectum proprium, non ſpecialia ſubiecta, cum eo reciprocari: 6 atque eſſe definitionem maioris extremi: 7 vt figuris quoque explicatur.

Πότερον δ' ἐνδέχεται μὴ τὸ αὐτὸ αἴτιον εἶναι τοῦ αὐτοῦ πᾶσιν, ἀλλ' ἕτερον, ἢ οὔ; 2 Ἢ εἰ μὲν καθ' αὑτὸ ἀποδέδεικται, καὶ μὴ κατὰ σημεῖον ἢ κατὰ συμβεβηκός, οὐχ οἷόν τε· ὁ γὰρ λόγος τοῦ ἄκρου, τὸ μέσον ἐστίν· εἰ δὲ μὴ οὕτως, ἐνδέχεται; 3 Ἔστι δὲ καὶ οὗ αἴτιον, καὶ ᾧ, σκοπεῖν κατὰ συμβεβηκός· οὐ μὴν δοκεῖ προβλήματα εἶναι. 4 Εἰ δὲ μή, ὁμοίως ἕξει τὸ μέσον· εἰ μὲν ὁμώνυμα, ὁμώνυμον τὸ μέσον· εἰ δ' ὡς ἐν γένει, ὁμοίως ἕξει. οἷον, διὰ τί ἐναλλὰξ ἀνάλογον; ἄλλο γὰρ αἴτιον ἐν γραμμαῖς, καὶ ἀριθμοῖς· καὶ τὸ αὐτό γε, ᾗ μὲν γραμμαί, ἄλλο· ᾗ δ' ἔχει αὔξησιν τοιανδί, τὸ αὐτό. οὕτως ἐπὶ πάντων. τοῦ δ' ὅμοιον εἶναι χρῶμα χρώματι, καὶ σχῆμα σχήματι, ἄλλο ἄλλῳ. ὁμώνυμον γὰρ τὸ ὅμοιον ἐπὶ τούτων· ἔνθα μὲν γὰρ ἴσως τὸ ἀνάλογον ἔχειν τὰς πλευράς, καὶ ἴσας τὰς γωνίας· ἐπὶ δὲ χρωμάτων, τὸ τὴν αἴσθησιν μίαν εἶναι, ἤτοι ἄλλο τι τοιοῦτον. τὰ δὲ κατὰ ἀναλογίαν τὰ αὐτά, καὶ τὸ μέσον ἕξει κατὰ ἀναλογίαν. 5 Ἔχει δ' οὕτω, διὰ τὸ παρακολουθεῖν, τὸ αἴτιον ἀλλήλοις, καὶ οὗ αἴτιον, καὶ ᾧ αἴτιον. καθ' ἕκαστον μέντοι λαμβάνοντι, τὸ οὗ αἴτιον, ἐπὶ πλέον. οἷον, τὸ τέτταρσιν ἴσας τὰς ἔξω, ἐπὶ πλέον, ἢ τρίγωνον, ἢ τετράγωνον· ἅπασι δὲ ἐπὶ ἴσης. ὅσα γὰρ τέτταρσιν ὀρθαῖς ἴσας τὰς ἔξω, καὶ τὸ μέσον ὁμοίως. 6 Ἔστι δὲ τὸ μέσον λόγος τοῦ πρώτου ἄκρου. διὸ πᾶσαι αἱ ἐπιστῆμαι δι' ὁρισμοῦ γίνονται. οἷον, τὸ φυλλορροεῖν ἅμα ἀκολουθεῖ τῇ ἀμπέλῳ, καὶ ὑπερέχει· καὶ συκῇ, καὶ ὑπερέχει· ἀλλ' οὐ πάντων, * ἀλλ' ἴσον. εἰ δὴ λάβοις τὸ πρῶτον μέσον, λόγος τοῦ φυλλορροεῖν ἐστίν. ἔσται γὰρ πρῶτον μὲν * ἐπὶ θάτερον μέσον, ὅτι τοιαδὶ ἅπαντα· εἶτα τούτου μέσον, ὅτι ὁ ὀπὸς πήγνυται, ἤ τι ἄλλο τοιοῦτον. τί δ' ἐστὶ τὸ φυλλορροεῖν; τὸ πήγνυσθαι τὸν ἐν τῇ συνάψει τοῦ σπέρματος ὀπόν. 7 Ἐπὶ δὲ τῶν σχημάτων ὧδε ἀποδώσει ζητοῦσι τὴν παρακολούθησιν τοῦ αἰτίου, καὶ οὗ αἴτιον. ἔστω τὸ α τῷ β ὑπάρχειν παντί· τὸ δὲ β ἑκάστῳ τῶν δ, ἐπὶ πλέον δέ. τὸ μὲν δὴ β, καθόλου ἂν εἴη τοῖς δ. τοῦτο γὰρ λέγω καθόλου, ὃ μὴ ἀντιστρέφει. πρῶτον δὲ καθόλου, ᾧ ἕκαστον μὲν μὴ ἀντιστρέφει, ἅπαντα δὲ ἀντιστρέφει, καὶ μὴ παρεκτείνει. τοῖς δὴ δ αἴτιον τοῦ α, τὸ β. δεῖ ἄρα τὸ α ἐπὶ πλέον τοῦ β παρεκτείνειν· εἰ δὲ μή, τί μᾶλλον ἔσται αἴτιον τοῦτο ἐκείνου; εἰ δὴ πᾶσιν ὑπάρχει τοῖς ε τὸ α, ἔσται τι ἐκεῖνα ἓν ἅπαντα ἄλλο τοῦ β. εἰ καὶ μή· πῶς ἔσται εἰπεῖν, ὅτι ᾧ τὸ ε, τὸ α παντί· ᾧ δὲ τὸ α, οὐ παντὶ τὸ ε; διὰ τί γὰρ οὐκ ἔσται τι αἴτιον, οἷον * τὸ α ὑπάρχει πᾶσι τοῖς δ; ἀλλ' ἄρα καὶ τὰ ε ἔσται τι ἕν. ἐπισκέψασθαι δεῖ τοῦτο. καὶ ἔστω τὸ γ. ἐνδέχεται δὴ τοῦ αὐτοῦ πλείω αἴτια εἶναι, ἀλλ' οὐ τοῖς αὐτοῖς τῷ εἴδει. οἷον τοῦ μακρόβια εἶναι, τὰ μὲν τετράποδα, τὸ μὴ ἔχειν χολήν· τὰ δὲ πτηνά, τὸ ξηρὰ εἶναι, ἢ ἕτερόν τι. Εἰ δὲ εἰς τὸ ἄτομον μὴ εὐθὺς ἔρχονται, καὶ μὴ μόνον ἓν τὸ μέσον, ἀλλὰ πλείω· καὶ τὰ αἴτια, πλείω.

* γρ. ἀλλ' ἴσον.

* γρ. ἐπὶ θάτερα.

* Quidam τῷ τὸ α ὑπάρχειν πᾶσι τοῖς δ. & Boëthius vt a ſit in omnibus d.

A Vtrùm autem poteſt eiuſdẽ non eadem cauſa eſſe omnibus, ſed diuerſa, an non? 2 An ſi per ſe demonſtratum eſt, non per ſignum vel per accidẽs, *id* fieri nequit? nam medium eſt definitio extremi. ſi verò non ita *demõſtratum ſit*, fieri poteſt? 3 Licet autẽ & *id* cuius eſt cauſa & *id* cui *eſt* cauſa, conſiderare per accidens: ſed non videntur eſſe problemata. 4 Sin minùs, ſimiliter *ſe* habebit medium. *id eſt*, ſi *extrema ſint* homonyma, *etiã* medium *erit* homonymũ. ſi verò *illa ſint* vt in genere, ſimile erit *medium*: veluti quamobrem *quibuſdã inſit* proportio cõmutata: quoniam alia cauſa *eſt* in lineis, B & *alia in* numeris. atque idem *medium*, quà lineæ *ſunt in quibus ſpectatur*, *eſt* diuerſum: quà verò habet eiuſmodi incrementum *eſt* idem. ita *ſe res habet* in omnibus. Cur autem color colori & figura figuræ ſimilis ſit, alia *eſt* alij *ſubiecto cauſa*. nam ſimile in his eſt homonymum. hîc enim fortaſſe *nihil aliud eſt quàm* latera habere proportionem, & angulos *eſſe* æquales. in coloribus autẽ, vnum eſſe ſenſum, aut eiuſmodi aliud. Quæ verò ſecundum analogiam *ſunt* eadem, etiam medium habebunt *idem* ſecundum analogiam. 5 Sic autem *ſe res* habet: quia ſe mutuò conſequuntur, cauſa, & *id* cuius *eſt* cauſa, & *id* cui *eſt* cauſa. ſingulatim autem accipiendo, *id* cuius *eſt* cauſa, latiùs *patet*. veluti, quatuor *angulis* C æquales *eſſe angulos* externos, latiùs *patet*, quã triangulum, vel quadratum: omnibus autẽ *eſt* par. quæcumque enim quatuor *angulis* rectis æquales *habẽt angulos* externos, & mediũ ſimiliter *habent*. 6 Medium autem eſt definitio primi extremi. idcirco omnes ſcientiæ per definitionem comparantur. Veluti defrondeſcere ſimul conſequens eſt viti, & *vitem* excedit, necnon ficui, & *ficum* excedit: ſed non omnes *excedit*, immo *eſt* æquale. Si igitur ſumpſeris primum: medium eſt definitio *huius verbi* Defrondeſcere. primum enim eſt alterutrius medium, quod omnia *ſunt* talia: deinde huius mediũ *eſt*, quòd ſuccus concreſcit, vel eiuſmodi aliud. Quid autem eſt defrondeſcere? concreſcere ſuc- D cum ſeminis qui *eſt in ea parte* vbi *folium cum ramo* coniungitur. 7 In figuris autem ita *quiſpiam* declarabit quærentibus cõſecutionem cauſæ & *eius* cuius *eſt* cauſa. Inſit τὸ α omni β: τὸ β autem vnicuique τῶν δ, ſed latiùs pateat. τὸ β igitur eſt vniuerſale τοῖς δ. id enim voco vniuerſale, quod non reciprocatur. primum autẽ vniuerſale *appello id* cum quo ſingula nõ reciprocãtur, omnia verò *ſimul ſumpta* reciprocãtur, nec latiùs patet. Itaque cur τοῖς δ *inſit* τὸ α, cauſa eſt τὸ β. Opus eſt igitur vt τὸ α latiùs pateat quàm τὸ β, alioquin cur potiùs hoc erit cauſa quàm illud? Si igitur omnibus ε ineſt τὸ α: erit aliquid diuerſum à β, *cuius ratione* ea omnia *ſint* vnum. ſin minùs, cur dicere licebit, omni ε ineſſe τὸ α, non omni autem α τὸ ε? cur enim non erit aliqua cauſa, ſicut *eſt aliqua cauſa cur* τὸ α inſit omnibus δ? Ergo etiam τὰ ε erunt vnum quid. Conſiderare hoc oportet. atque eſto τὸ γ. Poſſunt igitur eiuſdem eſſe plures cauſæ, non tamen iiſdem ſpecie. veluti cur longæuæ ſint quadrupedes, *cauſa eſt*, vacare bile. *cur* volucres, *cauſa eſt*, ſiccas eſſe, vel aliud quidpiam. At ſi ad indiuiduum non ſtatim perueniunt, nec vnum tantùm eſt medium, ſed plura: etiam cauſæ *ſunt* plures.

Vtra cauſa prior ſit, propiorne, an magis vniuerſalis. Cap. XVIII.

1 *Quæſtio.* 2 *Reſponſio.* 3 *Epilogus.*

Πότερον δ' αἴτιον τῶν μέσων, τὸ πρὸς τὸ καθόλου πρῶτον, ἢ τὸ πρὸς τὰ καθ' ἕκαστον, τοῖς καθ'-

Vtrùm autem medium eſt cauſa ſingulis? *idne* quod ad primum vniuerſale, an quod ad ſin-

gula magis accedit? 2 Conſtat igitur *eã media eſſe cauſas, quæ ſunt* proxima cuique rei, cui cauſæ ſunt. cur enim primum ſub vniuerſali contẽtum inſit, hoc *eſt* cauſa: veluti cur τῷ δ inſit τὸ β, cauſa *eſt* τὸ γ. Itaque cur τῷ δ inſit τὸ α, cauſa *eſt* τὸ γ. *cur* autem *inſit* τῷ γ, *cauſa eſt* τὸ β. huic verò ipſummet. 3 De ſyllogiſmo igitur ac demonſtratione, & quid vtrumque ſit, & quomodo fiat, perſpicuum *eſt*: ſimúlque de ſcientia demonſtratiua, quoniam idem eſt.

χιστον; 2 Δῆλον δή, ὅτι τὰ ἐγγύτατα ἑκάστῳ αἴτιον. τοῦ γὰρ τὸ πρῶτον ὑπὸ τὸ καθόλου ὑπάρχειν, τοῦτο αἴτιον. οἷον, τῷ δ τὸ γ τοῦ τὸ β ὑπάρχειν αἴτιον. τῷ μὲν οὖν δ τὸ γ αἴτιον τοῦ α, *τῷ δὲ γ τὸ β, τούτῳ δὲ αὐτό. 3 Περὶ μὲν οὖν συλλογισμοῦ καὶ ἀποδείξεως, τί τε ἑκάτερόν ἐστι, καὶ πῶς γίνεται, φανερὸν ἅμα δὲ καὶ περὶ ἐπιστήμης ἀποδεικτικῆς, ταὐτὸν γάρ ἐστι. * κ. τῷ β, τὸ α.

DE COGNITIONE PRIMORVM PRINCIPIORVM.

TRACTATVS IV.

Cap. XIX.

1 *Quæſtiones duæ.* 2 *Fundamentum propoſitarum quæſtionum.* 3 *Expoſitio earumdem quæſtionum.* 4 *Dubitatio.* 5 *Reſponſio ad priorem quæſitionem.* 6 *Solutio dubitationis.* 7 *Interpretatio dictæ reſponſionis.* 8 *Reſponſio ad poſteriorem quæſtionem.*

QVomodo autem principia nota fiant, & quis *ſit ea* notificans habitus, hinc manifeſtũ erit, cùm priùs dubitatũ fuerit. 2 Non poſſe igitur *quempiam* ſcire per demonſtrationem niſi cognoſcat prima principia immediata, dictũ antea fuit. 3 Vtrùm autem immediatorum eadem an diuerſa ſit cognitio, dubitare aliquis poſſit. & ſitne vtriuſque ſcientia: an neutrius: an alterius ſcientia, alterius diuerſum quoddam *cognitionis* genus. & vtrùm habitus, cùm non inſint, ingenerentur: an cùm ineſſent, laterent. 4 *Si* igitur eos habemus, abſurdum *eſt*, accidit enim vt eos qui habent cognitiones exquiſitiores demonſtratione, lateat. *Si* verò *eos* accipimus, cùm antea nõ haberemus, quomodo notũ faceremus & diſceremus ex non antecedente cognitione? *hoc* enim *eſt* impoſſibile, vt etiã de demõſtratione dicebamus. Perſpicuum igitur *eſt* neq; haberi, nec in ignorantibus ac nullo habitu præditis gigni poſſe. 5 Quare neceſſe *eſt* facultatem quandam haberi, non tamen talem, quæ his præſtantior ſit quaſi exquiſitior. Videtur autem hoc ineſſe omnibus animalibus. habent n. vim cõgenitam iudicatiuam, quam appellant ſenſum. Cùm autem ſenſus inſit: *in* aliis animalibus res ſenſu percepta manet, *in* aliis non manet. *In* quibus igitur non manet: hæc aut omnino, aut eorum quæ non manent, cognitionem non habent extra quam cùm ſentiunt. alia verò cùm ſentiunt, vnum quid in anima retinent. Cùm autem multa *animalia* huiuſmodi ſint, iam eſt diſcrimen quoddam: adeò vt *in* aliis ratio fiat ex huiuſcemodi *rerũ* memoriã, *in* aliis nõ *fiat*. Ex ſenſu igitur fit memoria, quẽadmodum dicimus. ex memoria verò ſæpe eiuſdem *rei* factâ, *fit* experientia. multæ enim memoriæ numero, *ſunt* vna experientia. at verò ex experientiâ ſiue ex omni & vniuerſali quieſcente in anima: *nimirum* vno præter multa, quod in omnibus illis ineſt vnum & idem, *fit* principium artis & ſcientiæ: artis, ſi *pertineat* ad generationem: ſcientiæ, ſi *pertineat* ad id quod eſt. 6 Itaq; nec inſunt definiti habitus, nec fiunt ex aliis habitibus notioribus, ſed ex ſenſu. Vt in bello, poſtquàm *acies* in fugam conuerſa eſt, vno ſtante alius ſtetit, deinde alius, donec ad principium peruẽnit. anima verò talis eſt, vt poſſit hoc pati. 7 Quod autem antea dictum eſt, non tamen apertè dictum fuit, iterum

Περὶ δὲ τῶν ἀρχῶν, πῶς τε γίνονται γνώριμοι, καὶ τίς ἡ γνωρίζουσα ἕξις, ἐντεῦθέν ἐστι δῆλον προαπορήσασι πρῶτον. 2 Ὅτι μὲν οὖν οὐκ ἐνδέχεται ἐπίστασθαι δι' ἀποδείξεως, μὴ γινώσκοντι τὰς πρώτας ἀρχὰς τὰς ἀμέσους, εἴρηται πρότερον. 3 Τῶν δ' ἀμέσων τὴν γνῶσιν, καὶ πότερον ἡ αὐτή ἐστιν, ἢ οὐχ ἡ αὐτή, διαπορήσειεν ἄν τις, καὶ πότερον ἐπιστήμη ἑκατέρου ἢ οὔ· ἢ τοῦ μὲν ἐπιστήμη, τοῦ δὲ ἕτερόν τι γένος. καὶ πότερον οὐκ ἐνοῦσαι αἱ ἕξεις ἐγγίνονται, ἢ ἐνοῦσαι λελήθασιν. 4 Εἰ μὲν δὴ ἔχομεν αὐτάς, ἄτοπον. συμβαίνει γὰρ ἀκριβεστέρας ἔχοντας γνώσεις ἀποδείξεως λανθάνειν. εἰ δὲ λαμβάνομεν μὴ ἔχοντες πρότερον, πῶς ἂν γνωρίζοιμεν καὶ μανθάνοιμεν ἐκ μὴ προϋπαρχούσης γνώσεως; ἀδύνατον γάρ, ὥσπερ καὶ ἐπὶ τῆς ἀποδείξεως ἐλέγομεν. Φανερὸν τοίνυν, ὅτι οὔτε ἔχειν οἷόν τε, οὔτ' ἀγνοοῦσι καὶ μηδεμίαν ἔχουσιν ἕξιν ἐγγίνεσθαι. 5 Ἀνάγκη ἄρα ἔχειν μέν τινα δύναμιν, μὴ τοιαύτην δ' ἔχειν, ἣ ἔσται τούτων τιμιωτέρα κατ' ἀκρίβειαν. Φαίνεται δὲ τοῦτο ὑπάρχον πᾶσι τοῖς ζώοις. ἔχει γὰρ δύναμιν σύμφυτον κριτικήν, ἣν καλοῦσιν αἴσθησιν. ἐνούσης δ' αἰσθήσεως· τοῖς μὲν τῶν ζώων, ἐγγίνεται μονὴ τοῦ αἰσθήματος· τοῖς δ', οὐκ ἐγγίνεται. ὅσοις μὲν οὖν μὴ ἐγγίνεται, ἢ ὅλως, ἢ περὶ ἃ μὴ ἐγγίνεται, οὐκ ἔστι τούτοις γνῶσις, ἔξω τοῦ αἰσθάνεσθαι. ἐν οἷς δέ, ἔνεστιν αἰσθανομένοις ἔχειν ἔτι ἐν τῇ ψυχῇ. πολλῶν δὲ τοιούτων γινομένων, ἤδη διαφορά τις γίνεται· ὥστε τοῖς μέν, γίνεσθαι λόγον ἐκ τῆς τῶν τοιούτων *μνήμης· τοῖς δέ, μή. ἐκ μὲν οὖν αἰσθήσεως γίνεται μνήμη, ὥσπερ λέγομεν. ἐκ δὲ μνήμης πολλάκις τοῦ αὐτοῦ γινομένης, ἐμπειρία. αἱ γὰρ πολλαὶ μνῆμαι τῷ ἀριθμῷ, ἐμπειρία μία ἐστίν. ἐκ δ' ἐμπειρίας ἢ ἐκ παντὸς ἠρεμήσαντος τοῦ καθόλου ἐν τῇ ψυχῇ, τοῦ ἑνὸς παρὰ τὰ πολλά, ὃ ἂν ἐν ἅπασιν ἓν ἐνῇ ἐκείνοις τὸ αὐτό, τέχνης ἀρχὴ καὶ ἐπιστήμης· ἐὰν μὲν περὶ γένεσιν, τέχνης· ἐὰν δὲ περὶ τὸ ὄν, ἐπιστήμης. 6 Οὔτε δὴ ἐνυπάρχουσιν ἀφωρισμέναι αἱ ἕξεις, οὔτ' ἀπ' ἄλλων ἕξεων γίνονται γνωριμωτέρων, ἀλλ' ἀπὸ αἰσθήσεως. *οἷον ἐν μάχῃ τροπῆς γενομένης, ἑνὸς στάντος, ἕτερος ἔστη, εἶθ' ἕτερος, ἕως ἐπὶ τὴν ἀρχὴν ἦλθεν. ἡ δὲ ψυχὴ ὑπάρχει τοιαύτη οὖσα, οἵα δύνασθαι πάσχειν τοῦτο. 7 Ὃ δὲ ἐλέχθη μὲν πάλαι, οὐ σαφῶς δὲ ἐλέχθη, πάλιν

CAP. XVIII.

* καὶ μονῆς.

* Sic Problem. ſect. 18. 7. & ſect. 16. 8.

εἴπωμεν. στάντος γὰρ τῶν ἀδιαφόρων ἑνὸς, πρῶτον μὲν ἐν τῇ ψυχῇ καθόλου. καὶ γὰρ αἰσθάνεται μὲν τὸ καθ' ἕκαστον· ἡ δ' αἴσθησις, τοῦ καθόλου ἐστὶν, οἷον ἀνθρώπου, ἀλλ' οὐ Καλλίου ἀνθρώπου. πάλιν ἐν τούτοις ἵσταται, ἕως ἂν τὰ ἀμερῆ στῇ, καὶ τὰ καθόλου· οἷον, τοιονδὶ ζῷον, ἕως ζῷον· καὶ ἐν τούτῳ ὡσαύτως. δῆλον δὴ ὅτι ἡμῖν τὰ πρῶτα ἐπαγωγῇ γνωρίζειν ἀναγκαῖον· καὶ γὰρ καὶ ἡ αἴσθησις οὕτω τὸ καθόλου ἐμποιεῖ. 8 Ἐπεὶ δὲ τῶν περὶ τὴν διάνοιαν ἕξεων αἷς ἀληθεύομεν, αἱ μὲν, ἀεὶ ἀληθεῖς εἰσιν· αἱ δὲ, ἐπιδέχονται τὸ ψεῦδος, οἷον δόξα καὶ λογισμός· ἀληθῆ δ' ἀεὶ ἐπιστήμη καὶ νοῦς· καὶ οὐδὲν ἐπιστήμης ἀκριβέστερον ἄλλο γένος ἢ νοῦς· αἱ δ' ἀρχαὶ τῶν ἀποδείξεων γνωριμώτεραι· ἐπιστήμη δ' ἅπασα μετὰ λόγου ἐστί. τῶν ἀρχῶν ἐπιστήμη μὲν οὐκ ἂν εἴη. ἐπεὶ δ' οὐδὲν ἀληθέστερον ἐνδέχεται εἶναι ἐπιστήμης ἢ νοῦν, νοῦς ἂν εἴη τῶν ἀρχῶν· ἔκ τε τούτων σκοποῦσι, καὶ ὅτι ἀποδείξεως ἀρχὴ, οὐκ ἀπόδειξις· ὥστ' οὐδ' ἐπιστήμης ἐπιστήμη. εἰ οὖν μηδὲν ἄλλο παρὰ ἐπιστήμην ἔχομεν γένος ἀληθὲς, νοῦς ἂν εἴη ἐπιστήμης ἀρχή. καὶ ἡ μὲν ἀρχὴ τῆς ἀρχῆς εἴη ἂν, ἡ δὲ πᾶσα ὁμοίως ἔχει πρὸς τὸ ἅπαν πρᾶγμα.

A explicemus. Stante enim vno indifferente, *tūc* primùm in anima *eſt* vniuerſale. etenim ſentitur quidem ſingulare: ſed ſenſus eſt *rei* vniuerſalis, veluti hominis, non Calliæ hominis. rurſus in his cōſiſtitur, donec impartibilia ſtent & vniuerſalia: veluti huiuſmodi animal *eſt id in quo ſtatur*, donec animal *in anima ſtet*. & in hoc itidē *ſtatur, donec aliud magis vniuerſale ſtet in anima*. Patet igitur, neceſſe *eſſe* vt prima nobis inductione nota fiant. nam & ſenſus ita efficit *in anima* vniuerſale. 8 Quoniam autem habituū qui in dianœa *ſpectantur*, & veritatis ſunt participes, alij ſemper veri ſunt, alij verò falſitatē B quoque ſuſcipiunt, vt opinio, & logiſmus; ſemper autem veri *ſunt* ſcientia & intelligētia; ac nullum aliud *cognitionis* genus præter intelligētiam, *eſt* exquiſitius quàm ſcientia; principia verò demōſtrationum ſunt notiora, omnis autem ſcientia cū ratione eſt: profectò principiorum ſcientia eſſe nequit. quia verò nihil ſciētia verius eſſe poteſt præter intelligētiam: intelligentia vtique erit principiorum. *quod* non ſolùm ex his *quæ dixi, probatur, ſed* etiam quia demonſtrationis principium non eſt demonſtratio: quapropter nec ſcientiæ *principium eſt* ſcientia. ſi igitur nullum aliud preter ſcientiam habemus verum *habitus* genus: ſanè intelligentia erit ſcientiæ principium: & principium quidem *ſcientiæ*, erit *cognitio* principij: omnis autem *ſcientia ſeu cognitio* ſimiliter *ſe* habebit ad omnem rem.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΤΟΠΙΚΩΝ ΤΟ ΠΡΩΤΟΝ

ARISTOTELIS TOPICORVM,

LIBER I.

De ſyllogiſmo, & eius ſpeciebus. Cap. I.

1 Finis dialecticæ. 2 De principiis hoc capite explicandis. 3 De ſyllogiſmo. 4 De demonſtratione. 5 De ſyllogiſmo dialectico. 6 Hypotheoriæ. quæ ſint vera & prima. 7 quæ ſint probabilia. 8 De ſyllogiſmo contentioſo. 9 De paralogiſmo ſcientiarum proprio. 10 Excuſatio.

CAP. I. ΗΜΕΝ πρόθεσις τῆς πραγματείας, μέθοδον εὑρεῖν, ἀφ' ἧς δυνησόμεθα συλλογίζεσθαι περὶ παντὸς τοῦ προτεθέντος προβλήματος ἐξ ἐνδόξων· καὶ αὐτοὶ λόγον ὑπέχοντες, μηθὲν ἐροῦμεν ὑπεναντίον. 2 Πρῶτον οὖν ῥητέον, τί ἐστι συλλογισμὸς, καὶ τίνες αὐτοῦ διαφοραὶ, ὅπως ληφθῇ ὁ διαλεκτικὸς συλλογισμός. τοῦτον γὰρ ζητοῦμεν κατὰ τὴν προκειμένην πραγματείαν. 3 * Ἔστι δὴ συλλογισμὸς, λόγος, ἐν ᾧ τεθέντων τινῶν, ἕτερόν τι τῶν κειμένων ἐξ ἀνάγκης συμβαίνει διὰ τῶν κειμένων. 4 * Ἀπόδειξις δὲ ἐστιν, ὅταν ἐξ ἀληθῶν καὶ πρώτων ὁ συλλογισμὸς ᾖ, D ἢ ἐκ τοιούτων, ἃ διά τινων πρώτων καὶ ἀληθῶν τῆς περὶ αὐτὰ γνώσεως τὴν ἀρχὴν εἴληφε. 5 Διαλεκτικὸς δὲ συλλογισμὸς, ὁ ἐξ ἐνδόξων συλλογιζόμενος. 6 Ἔστι δὲ ἀληθῆ μὲν καὶ πρῶτα, τὰ μὴ δι' ἑτέρων, ἀλλὰ δι' αὑτῶν ἔχοντα τὴν πίστιν. οὐ δεῖ γὰρ ἐν ταῖς ἐπιστημονικαῖς ἀρχαῖς ἐπιζητεῖσθαι τὸ διὰ τί· ἀλλ' ἑκάστην τῶν ἀρχῶν, αὐτὴν καθ' ἑαυτὴν εἶναι πιστήν. 7 Ἔνδοξα δὲ, τὰ δοκοῦντα πᾶσιν, ἢ τοῖς πλείστοις, ἢ τοῖς σοφοῖς· καὶ τούτοις, ἢ τοῖς πᾶσιν, ἢ τοῖς πλείστοις, ἢ τοῖς μάλιστα γνωρίμοις, καὶ ἐνδόξοις. 8 Ἐριστικὸς δέ ἐστι συλλογισμὸς, ὁ ἐκ

* Priorum lib. 1. cap. 1.

* γρ. ἀπόδειξις μὲν οὖν melius.

C PROPOSITVM huius tractationis *eſt* inuenire methodum, per quam poterimus argumentari de omni propoſito problemate ex probabilibus: & ipſi diſputationē ſuſtinentes, nihil dicemus repugnans. 2 Primùm igitur dicendū *eſt*, quid ſit ſyllogiſmus, & quæ ſint eius differentiæ, vt ſumatur ſyllogiſmus dialecticus: hunc enim quærimus ſecūdùm propoſitam tractationem. 3 Syllogiſmus igitur eſt oratio, in qua poſitis quibuſdam, aliud quiddam *diuerſum* ab iis quæ poſita fuere, neceſſariò accidit ob ea quæ poſita ſunt. 4 Demonſtratio eſt, cùm ex veris & primis ſyllogiſmus conſtat: vel ex eiuſmodi, quæ à quibuſdam veris & primis ſui cognitionis principium ſumpſerunt. 5 Dialecticus ſyllogiſmus *eſt*, qui ex probabilibus cōcludit. 6 Sunt autem vera & prima, ea quæ non ab aliis ſed à ſe ipſis fidem habent, non debet enim de ſcientiarum principiis quæri quamobrem *ſint*: ſed vnumquodque principium per ſe ipſum debet eſſe fide dignum. 7 Probabilia autem ſunt, quæ videntur omnibus, vel pleriſque, vel ſapientibus: atque his vel omnibus, vel pleriſque, vel maximè notis & claris. 8 Syllogiſmus contentioſus *eſt*, qui *exſtruitur* ex iis, quæ videntur

videtur probabilia, nec tamen ſunt:& qui ex probabilibus, vel iis quæ videntur probabilia videtur *eſſe, nec eſt*. Non enim quicquid videtur probabile, etiam eſt probabile. nihil enim eorum quę dicuntur eſſe probabilia, ſuperficie tenus habet *probabilitatis* imaginem: quemadmodum in principiis rationum contentioſarum accidit. confeſtim enim & plerumque iis qui etiam parua contueri poſſunt, perſpicua *eſt* falſi natura *quæ* in ipſis *reperitur*. Prior igitur ex dictis contentioſis ſyllogiſmis, etiã ſyllogiſmus appellator. alter vero *vocator* quidem contentioſus ſyllogiſmus, non tamen *ſimpliciter* ſyllogiſmus: quia etſi videtur concludere, *re vera* tamen non concludit. 9 Inſuper *ſunt* præter dictos omnes ſyllogiſmos, paralogiſmi qui ex iis *conſtant*, quæ *ſunt* aliquarum ſcientiarum propria: quemadmodum in geometria, & aliis id genus *ſcientiis* accidit. Videtur enim hic modus differre à dictis ſyllogiſmis: quoniam qui falſis deſcriptionibus vtitur, nec ex veris & primis concludit, nec ex probabilibus. quandoquidem in definitionem non cadit: quia nec ea ſumit quæ omnibus videntur; nec quæ pleriſque, nec quę ſapientibus: & his, neque omnibus, neque pleriſque, neque clariſſimis: ſed ex propriis ſcientię ſumptionibus, non tamen veris, ſyllogiſmum efficit. nam quia vel ſemicirculos deſcribit non vt oportet, vel lineas quaſdam ducit non quo modo duci debent, paralogiſmum facit. 10 Species igitur ſyllogiſmorum, vt *eas* typo complectar, eæ ſunto quas dixi. vniuerſaliter autem loquendo de omnibus tam dictis quã poſt hæc dicendis, eatenus nobis definitum eſto: propterea quòd de harum rerũ nulla exquiſitam rationem afferendi, conſilium cepimus, ſed quatenus typo hæc percurrere volumus, omnino ſufficere putantes ſecundùm propoſitam methodum, ſi horum vnumquodque poſſit quomodocumque notum fieri.

A φαινομένων ἐνδόξων, μὴ ὄντων δέ· καὶ ὁ ἐξ ἐνδόξων δὲ, ἢ φαινομένων ἐνδόξων, φαινόμενος. οὐ γὰρ πᾶν τὸ φαινόμενον ἔνδοξον, καὶ ἔστιν ἔνδοξον. οὐδὲν γὰρ τῶν λεγομένων ἐνδόξων, ἐπιπόλαιον ἔχει παντελῶς τὴν φαντασίαν, καθάπερ περὶ τὰς τῶν ἐριστικῶν λόγων ἀρχὰς συμβέβηκεν ἔχειν. παραχρῆμα γὰρ καὶ ὡς ἐπὶ τὸ πολὺ, τοῖς καὶ μικρὰ συνορᾶν δυναμένοις κατάδηλος ἐν αὐτοῖς ἡ τοῦ ψεύδους ἐστὶ φύσις. ὁ μὲν οὖν πρότερος τῶν ῥηθέντων ἐριστικῶν συλλογισμῶν, καὶ συλλογισμὸς λεγέσθω. ὁ δὲ λοιπὸς, ἐριστικὸς μὲν συλλογισμὸς, συλλογισμὸς δ' οὔ· ἐπειδὴ φαίνεται μὲν συλλογίζεσθαι, συλλογίζεται δ' οὔ. 9 Ἔτι δὲ παρὰ τοὺς εἰρημένους ἅπαντας συλλογισμοὺς, B οἱ ἐκ τῶν περί τινας ἐπιστήμας οἰκείων γινόμενοι παραλογισμοὶ, καθάπερ ἐπὶ τῆς γεωμετρίας, καὶ τῶν * ταύτης συγγενῶν συμβέβηκεν * ἔχειν. ἔοικε γὰρ ὁ τρόπος οὗτος διαφέρειν τῶν εἰρημένων συλλογισμῶν. οὔτε γὰρ ἐξ ἀληθῶν καὶ πρώτων συλλογίζεται ὁ ψευδογραφῶν, οὔτε ἐξ ἐνδόξων. εἰς γὰρ τὸν ὅρον οὐκ ἐμπίπτει. οὔτε γὰρ τὰ πᾶσι δοκοῦντα λαμβάνει, οὔτε τὰ τοῖς πλείστοις, οὔτε τὰ τοῖς σοφοῖς καὶ τούτοις, οὔτε τοῖς πλείστοις, οὔτε τοῖς ἐνδοξοτάτοις· ἀλλ' ἐκ τῶν οἰκείων μὲν τῇ ἐπιστήμῃ λημμάτων, οὐκ ἀληθῶν δὲ, τὸν συλλογισμὸν ποιεῖται. τῷ γὰρ ἢ τὰ ἡμικύκλια περιγράφειν μὴ ὡς δεῖ, ἢ γραμμάς τινας ἄγειν μὴ ὡς ἂν ἀχθείησαν, τὸν C παραλογισμὸν ποιεῖται. 10 Εἴδη μὲν οὖν τῶν συλλογισμῶν, ὡς τύπῳ περιλαβεῖν, ἔστω τὰ εἰρημένα. καθόλου δ' εἰπεῖν περὶ πάντων τῶν εἰρημένων, καὶ τῶν μετὰ ταῦτα ῥηθησομένων, ἐπὶ τοσοῦτον ἡμῖν διωρίσθω· διότι περὶ οὐδενὸς αὐτῶν τὸν ἀκριβῆ λόγον ἀποδοῦναι προαιρούμεθα, ἀλλ' ὅσον τύπῳ περὶ αὐτῶν βουλόμεθα διελθεῖν, παντελῶς ἡγούμενοι ἱκανὸν κατὰ τὴν προκειμένην μέθοδον, τὸ δύνασθαι γνωρίζειν ὁπωσοῦν ἕκαστον αὐτῶν.

* γρ. ταύτης
* γρ. ὑπάρχειν

De vtilitate huius tractationis. Cap. II.

1 ¶ *Scopus & nexus.* 2 ¶ *Enumeratio eorum ad quæ hæc tractatio conducit.* 3 ¶ *Expoſitio & confirmatio. De exercitatione.* 4 *De congreſſu.* 5 *De philoſophicis ſcientiis,* 6 *& earum principiis.*

His quæ dicta ſunt, cõſequens eſt vt dicamus, ad quot & quæ *ſit* vtilis hæc tractatio. 2 Eſt igitur *vtilis* ad tria, ad exercitationem, ad cõgreſſus, ad philoſophicas ſcientias. 3 Quòd igitur ad exercitationem *ſit* vtilis, ex his perſpicuum eſt: quoniam *hanc* methodum habentes, facilè de omni re propoſita poterimus argumentari. 4 Ad congreſſus autem: quia multorum opinionibus enumeratis, non ex alienis, ſed ex propriis *ſingulorum* ſententiis poterimus cum eis agere, refellentes quod non rectè dicere nobis videbuntur. 5 Ad philoſophicas autem ſcientias: quia cùm poterimus in vtramque partem dubitare, facilè in ſingulis perſpiciemus verum & falſum. 6 Præterea ad prima cuiuſque ſcientiæ principia. de his enim ex propriis propoſitæ ſcientiæ principiis nihil dici poteſt, quia ſunt prima omnium principia: ſed ex iis quæ in ſingulis probabilia ſunt, neceſſe *eſt* de iis dicere. hoc autem *vel* eſt proprium vel maximè peculiare dialecticæ. cùm enim ſit indagatrix, ad omnium ſcientiarum principia viam continet.

D Ἑπόμενον δ' ἂν εἴη τοῖς εἰρημένοις εἰπεῖν, πρὸς πόσα τε καὶ τίνα χρήσιμος ἡ πραγματεία. 2 Ἔστι δὴ πρὸς τρία, πρὸς γυμνασίαν, πρὸς τὰς ἐντεύξεις, πρὸς τὰς κατὰ φιλοσοφίαν ἐπιστήμας. 3 Ὅτι μὲν οὖν πρὸς γυμνασίαν χρήσιμος, ἐξ αὐτῶν καταφανές ἐστι. μέθοδον γὰρ ἔχοντες, ῥᾷον περὶ παντὸς τοῦ προτεθέντος ἐπιχειρεῖν δυνησόμεθα. 4 Πρὸς δὲ τὰς ἐντεύξεις, διότι τὰς τῶν πολλῶν κατηριθμημένοι δόξας, οὐκ ἐκ τῶν ἀλλοτρίων, ἀλλ' ἐκ τῶν οἰκείων δογμάτων ὁμιλήσομεν πρὸς αὐτοὺς, μεταβιβάζοντες ὅ,τι ἂν μὴ καλῶς φαίνωνται λέγειν ἡμῖν. 5 Πρὸς δὲ E τὰς κατὰ φιλοσοφίαν ἐπιστήμας, ὅτι δυνάμενοι πρὸς ἀμφότερα διαπορῆσαι, ῥᾷον ἐν ἑκάστοις κατοψόμεθα τἀληθές τε καὶ τὸ ψεῦδος. 6 Ἔτι δὲ πρὸς τὰ πρῶτα τῶν περὶ ἑκάστην ἐπιστήμην ἀρχῶν. ἐκ μὲν γὰρ τῶν οἰκείων τῶν κατὰ τὴν προτεθεῖσαν ἐπιστήμην ἀρχῶν, ἀδύνατον εἰπεῖν τι περὶ αὐτῶν, ἐπειδὴ πρῶται αἱ ἀρχαὶ ἁπάντων εἰσί. διὰ δὲ τῶν περὶ ἕκαστα ἐνδόξων, ἀνάγκη περὶ αὐτῶν διελθεῖν. τοῦτο δ' ἴδιον, ἢ μάλιστα οἰκεῖον τῆς διαλεκτικῆς ἐστιν. ἐξεταστικὴ γὰρ οὖσα, πρὸς τὰς ἁπασῶν τῶν μεθόδων ἀρχὰς ὁδὸν ἔχει. CAP. II.

De perfecta dialecticæ cognitione. Cap. III.

Ἕξομεν δὲ τελέως τὴν μέθοδον, ὅταν ὁμοίως ἔχωμεν, A ὥσπερ ἐπὶ ῥητορικῆς, καὶ ἰατρικῆς, καὶ τῶν τοιούτων δυνάμεων. τοῦτο δ᾽ ἐστί, τὸ ἐκ τῶν ἐνδεχομένων ποιεῖν, ἃ προαιρούμεθα. οὔτε γὰρ ὁ ῥητορικὸς ἐκ παντὸς τρόπου πείσει, οὔθ᾽* ὁ ἰατρικὸς ὑγιάσει. ἀλλ᾽ ἐὰν τῶν ἐνδεχομένων μηδὲν* παραλείπῃ, ἱκανῶς αὐτὸν ἔχειν τὴν ἐπιστήμην φήσομεν.

* γρ. οὐδ᾽ ὁ ἰατρ.
* γρ. παραλείποντες.

Habebimus autem perfectè *hanc* methodum, cùm ita habebimus, vt in rhetorica, & medicina, & huiuſmodi facultatibus *accidit*. hoc autẽ eſt, ex poſſibilibus efficere quæ præeligimus. neque enim orator omni modo perſuadebit, neque medicus ſanabit. ſed ſi nihil eorum quæ adhiberi poſſunt, prætermittat: ſufficienter eum habere ſcientiam dicemus.

De quibus, & ex quibus diſſeratur. Cap. IV.

1 Protheſis. 2 Enumeratio. 3 Expoſitio. 4 Collatio propoſitionis & problematis, ex qua confirmatur quod dictum fuit in ſecunda particula, paria numero eſſe problemata & propoſitiones.

CAP. III.

Πρῶτον οὖν θεωρητέον, ἐκ τίνων ἡ μέθοδος. εἰ δὴ λάβοιμεν B πρὸς πόσα, καὶ ποῖα, καὶ ἐκ τίνων οἱ λόγοι, καὶ πῶς τούτων εὐπορήσομεν, ἔχοιμεν ἂν ἱκανῶς τὸ προκείμενον. 2 Ἔστι δὲ ἀριθμῷ ἴσα καὶ τὰ αὐτά, ἐξ ὧν τε οἱ λόγοι,* καὶ περὶ ὧν οἱ συλλογισμοί. γίνονται μὲν γὰρ οἱ λόγοι ἐκ τῶν προτάσεων· περὶ ὧν δὲ γίνονται οἱ συλλογισμοί, τὰ προβλήματά ἐστι. πᾶσα δὲ πρότασις, καὶ πᾶν πρόβλημα, ἢ γένος, ἢ ἴδιον, ἢ συμβεβηκὸς δηλοῖ. καὶ γὰρ τὴν διαφορὰν ὡς οὖσαν γενικὴν, ὁμοῦ τῷ γένει τακτέον. ἐπεὶ δὲ τοῦ ἰδίου, τὸ μὲν, τὸ τί ἦν εἶναι σημαίνει, τὸ δὲ, οὐ σημαίνει· διῃρήσθω τὸ ἴδιον εἰς ἄμφω τὰ προειρημένα μέρη· καὶ καλείσθω, τὸ μὲν τὸ τί ἦν εἶναι σημαῖνον, ὅρος· τὸ δὲ λοιπὸν, κατὰ τὴν κοινὴν περὶ αὐτῶν ἀποδοθεῖσαν ὀνομασίαν προσαγορευέσθω ἴδιον. δῆλον C οὖν ἐκ τῶν εἰρημένων, ὅτι κατὰ τὴν νῦν διαίρεσιν, τέτταρα τὰ πάντα συμβαίνει γίνεσθαι, ἢ ἴδιον, ἢ ὅρον, ἢ γένος, ἢ συμβεβηκός. 3 Μηδεὶς δὲ ἡμᾶς* ὑπολάβῃ λέγειν, ὅτι ἕκαστον τούτων καθ᾽ αὑτὸ λεγόμενον, πρότασις, ἢ πρόβλημά ἐστιν, ἀλλ᾽ ὅτι ἀπὸ τούτων καὶ τὰ προβλήματα, καὶ αἱ προτάσεις γίνονται. 4 Διαφέρει δὲ τὸ πρόβλημα καὶ ἡ πρότασις τῷ τρόπῳ. οὕτω μὲν γὰρ ῥηθέντος, ἆρά γε τὸ ζῷον πεζὸν δίπουν, ὁρισμός ἐστιν ἀνθρώπου; καὶ, ἆρά γε τὸ ζῷον, γένος ἐστὶ τοῦ ἀνθρώπου; πρότασις γίνεται. ἐὰν δὲ, πότερον τὸ ζῷον πεζὸν δίπουν, ὁρισμός ἐστιν ἀνθρώπου* ἢ οὔ; καὶ πότερον τὸ ζῷον γένος ἐστὶν ἀνθρώπου ἢ οὔ; πρόβλημα γίνεται. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. ὥστ᾽ εἰκότως ἴσα τῷ ἀριθμῷ τὰ προβλήματα, καὶ αἱ προτάσεις εἰσίν. ἀπὸ πάσης γὰρ προτάσεως πρόβλημα ποιήσεις, μεταβάλλων* τῷ τρόπῳ.

* Muretus ita hunc locum corrigit, & ἀεὶ ὧν· γίνονται μὲν γὰρ ἐκ τῶν προτάσεων· περὶ ὧν δὲ τὰ προβλήματά ἐστι. Variar. lib. 6. cap. 8.
* γρ. ὑπολαμβανέτω.
* γρ. ἢ οὐ, πρόβλημα γ.
* γρ. τὸν τρόπον.

Primùm igitur videndũ *eſt*, ex quibus *hæc* methodus *conſtet*. Si igitur ſumpſerimus ad quot, & quæ, & ex quibus rationes *exſtruātur*, & quomodo his abundabimus: ſatis id quod propoſuimus, conſequemur. 2 Sunt autẽ numero paria & eadem, *ea* ex quibus rationes *conſtant*, & *ea* de quibus ſyllogiſmi *conficiuntur*. fiunt enim rationes ex propoſitionibus: *ea* verò de quibus fiunt ſyllogiſmi, ſunt problemata. omnis autẽ propoſitio, & omne problema, aut genus aut propriũ, aut accĩens declarat. etenim differentia, cùm ſit generalis, vnâ cum genere *eſt* collocanda. Quia verò proprium aliud *eſt quod* ſignificat quid *res* ſit, aliud *quod* non ſignificat: diuidatur proprium in h*a*s duas partes: voceturque id quod ſignificat quid *res* ſit, Definitio: alterum verò ſecundùm appellationem communiter his attributam, appelletur Proprium. Ex dictis igitur patet, ſecundũ præſentem diuiſionem accidere vt quatuor omnia fiant: *id eſt*, vel propriũ, vel definitio, vel genus, vel accidens. 3 Nemo autem nos dicere exiſtimet, horũ vnumquodque per ſe dictum, eſſe propoſitionem, aut problema, ſed ex his problemata & propoſitiones fieri. 4 Iã verò propoſitio & problema differunt modo, nam ſi ita dicatur, Nónne animal pedeſtre bipes, eſt hominis definitio? &, Nónne animal eſt genus hominis? propoſitio efficitur. ſi verò *dicatur*, vtrùm animal pedeſtre bipes, eſt hominis definitio, an non? &, vtrùm animal eſt genus hominis, an non? problema efficitur. ſimiliterque *dicendum eſt* de aliis. Merito igitur paria numero ſunt problemata & propoſitiones: quoniam ex omni propoſitione problema facies, ſi modum commutaueris.

Quid ſit definitio, genus, proprium, & accidens. Cap. V.

1 Protheſis. 2 De definitione: 3 & de expoſitione verbi obſcurioris per verbum notius: 4 & de quæſtione, vtrùm ſit idem an diuerſum. 5 De proprio. 6 De genere, 7 & de quæſtione an aliqua ſint in eodem genere. 8 De accidente, 10 & rerum comparatione ab accidentibus ſumpta. 13 An accidens poſſit effici proprium.

CAP. IV.

Λεκτέον δὲ, τί ὅρος, τί γένος, τί ἴδιον, τί συμβεβηκός. D 2 Ἔστι δὲ ὅρος μὲν, λόγος ὁ τὸ τί ἦν εἶναι σημαίνων. ἀποδίδοται δὲ ἢ λόγος ἀντ᾽ ὀνόματος, ἢ λόγος ἀντὶ λόγου. δυνατὸν γὰρ καὶ τῶν ὑπὸ λόγου τινὰ σημαινομένων ὁρίσασθαι. 3 Ὅσοι δ᾽ ὁπωσοῦν* ὀνόματι τὴν ἀπόδοσιν ποιοῦνται, δῆλον ὡς οὐκ ἀποδιδόασιν οὗτοι τὸν τοῦ πράγματος ὁρισμόν· ἐπειδὴ πᾶς ὁρισμὸς, λόγος τίς ἐστιν. ὁρικὸν μέντοι καὶ τὸ

* γρ. ὁπωσοῦν ἂν.

Dicendum autem *eſt* quid ſit definitio, quid genus, quid proprium, quid accidens. 2 Eſt autem definitio, oratio quæ ſignificat quid res ſit. Adhibetur autem aut oratio pro nomine, aut oratio pro oratione. poſſunt enim etiam nonnulla, quæ oratione ſignificantur, definiri. 3 Eos verò qui nomen adhibent, conſtat non adhibere rei definitionem: quoniam omnis definitio eſt oratio quædam. attamen hoc quoque ad definitionem

referri debet: veluti, honeſtum eſſe quod decet. 4 Itémque hoc, vtrùm idem ſit ſenſus & ſcientia, an aliud. cũ enim circa definitiones *verſamur*, plurimum ſtudij in eo ponimus, vtrùm ſit idem an diuerſum. Et, *vt* abſolutè *loquar*, definitiua omnia vocentur, quæ ſunt ſub eadem methodo, ſub qua *eſt* definitio. Quòd autem omnia quæ nunc dixi, ſint eiuſmodi, ex his patet. cùm enim poterimus quod idem *ſit* & quòd diuerſum, diſſerendo probare, eodem modo abundabimus argumentis ad definitiones *pertinentibus*. oſtendentes enim non idem eſſe, euertemus definitionem. Sed non conuertitur, quod nunc dixi. nõ enim ſufficit ad confirmandam definitionem, ſi oſtendatur idem eſſe: ſed ad euertendam ſufficit, ſi oſtẽdatur non idem eſſe. 5 Proprium verò eſt, quod non declarat quidditatem, ſed ſoli ineſt, & cum re reciprocatur. Vt proprium hominis *eſt*, grammaticæ ſuſceptiuum eſſe: quia ſi homo eſt, grammaticæ ſuſceptiuus eſt: & *retrò* ſi grammaticæ ſuſceptiuus eſt, homo eſt. Nemo enim proprium appellat id quod poteſt alij ineſſe, vt dormire homini, ne quidem ſi accidat aliquo tempore vt ſoli inſit. Si quis itaque etiã tale quidpiam vocauerit proprium: non ſimpliciter, ſed aliquando, aut *per relationem* ad aliquid, appellabitur proprium. Nam eſſe a dextra, aliquando proprium eſt. bipes autem *per relationem* ad aliquid, vocatur proprium: vt homini *per relationem* ad equum & canem. Quòd autem nihil eorum quæ & alij poſſunt ineſſe, reciprocè attribuatur, manifeſtum *eſt*. non enim neceſſe *eſt*, ſi quid dormit, *id* hominem eſſe. 6 Genus autem eſt, quod pluribus & differentibus ſpecie attribuitur in *quæſtione* quid eſt. In *quæſtione* quid eſt, ea dicuntur attribui, quæ aptè reſpondentur, cùm rogatur quid ſit res propoſita. vt ad interrogationem quid ſit homo, aptè reſpondetur eſſe animal. 7 Generale *eſt* hoc quoque vtrùm aliquid in eodem in quo aliud genere *ſit*, an in diuerſo. hoc enim ſub eandem methodum cadit, ſub quàm genus. cum enim diſſerendo probauerimus animal eſſe genus hominis, & ſimiliter bouis: hæc in eodem genere *collocari* probauerimus. at ſi alterius eſſe genus, alterius non eſſe oſtenderimus: non eſſe hæc in eodem genere probauerimus. 8 Accidens autem eſt, quod nihil horum eſt, *id eſt*, nec definitio, nec proprium, nec genus: ineſt autem rei, &, quod cuiuis *rei* vni & eidem poteſt ineſſe, & nõ ineſſe. Vt ſedere poteſt eidem alicui ineſſe, & non ineſſe. ſimiliterque album. nihil enim prohibet quo minùs idẽ modò ſit album, modò non album. 9 Harum autem accidentis definitionum ſecunda eſt melior. nam prima *definitione* allata, neceſſe *eſt*, ſi quis eſt *eam* intellecturus, vt priùs cognoſcat, quidnam ſit definitio, & genus, & proprium. ſecunda verò per ſe perfecta eſt & ſufficiens ad notificandum quidnam ſit id quod dicitur. 10 Adiungantur autem accidenti etiam mutuæ *rerum* collationes, quomodocumque ab accidente ductæ. veluti, vtrùm bonum an vtile ſit magis eligendum: &, vtrùm iucundior *ſit* vita quæ *eſt* ſecundùm virtutem, an *quæ* ſecundùm fruitionem: & ſi quid aliud conſimiliter dicitur. in his enim omnibus quæritur, vtri magis attributum accidit. 11 Ex his autem patet, nihil prohibere quo minùs accidẽs interdum & *per relationem* ad aliquid, proprium fiat. veluti ſedere, quod eſt accidens,

τοιοῦτον ῥητέον ἐστὶν, ὅτι καλόν ἐστι τὸ πρέπον. 4 Ὁμοίως δὲ καὶ τὸ, πότερον ταὐτὸν αἴσθησις καὶ ἐπιστήμη, ἢ ἕτερον. καὶ γὰρ περὶ τοὺς ὁρισμοὺς, πότερον ταὐτὸν, ἢ ἕτερον, ἡ πλείστη γίνεται διατριβή. ἁπλῶς δὲ ὁρικὰ πάντα λεγέσθω, τὰ ὑπὸ τὴν αὐτὴν ὄντα μέθοδον τοῖς ὁρισμοῖς. ὅτι δὲ πάντα τὰ νῦν ῥηθέντα, τοιαῦτά ἐστι, δῆλον * ἐξ αὐτῶν. δυνάμενοι γὰρ ὅτι ταὐτὸν, καὶ ὅτι ἕτερον, διαλέγεσθαι, τῷ αὐτῷ τρόπῳ καὶ πρὸς τοὺς ὁρισμοὺς ἐπιχειρεῖν εὐπορήσομεν. δείξαντες γὰρ ὅτι οὐ ταὐτόν ἐστιν, ἀνῃρηκότες ἐσόμεθα τὸν ὁρισμόν. οὐ μὴν ἀντιστρέφει τὸ νῦν ῥηθέν. οὐ γὰρ ἱκανὸν πρὸς τὸ κατασκευάσαι τὸν ὁρισμὸν, τὸ δεῖξαι ταὐτὸν ὄν. πρὸς μέντοι τὸ ἀνασκευάσαι, αὔταρκες τὸ δεῖξαι ὅτι οὐ ταὐτόν. 5 Ἴδιον δέ ἐστιν, ὃ μὴ δηλοῖ μὲν τὸ τί ἦν εἶναι, μόνῳ δ' ὑπάρχει, καὶ ἀντικατηγορεῖται τοῦ πράγματος. οἷον, ἴδιον ἀνθρώπου, τὸ γραμματικῆς εἶναι δεκτικόν. εἰ γὰρ ἄνθρωπός ἐστι, γραμματικῆς δεκτικός ἐστι· καὶ εἰ γραμματικῆς δεκτικός ἐστιν, ἄνθρωπός ἐστιν. * οὐδεὶς γὰρ ἴδιον λέγει τὸ ἐνδεχόμενον ἄλλῳ ὑπάρχειν, οἷον τὸ καθεύδειν ἀνθρώπῳ, οὐδ' ἂν τύχῃ κατά τινα χρόνον μόνῳ ὑπάρχον. * εἰ δ' ἄρα τι καὶ λέγοιτο τῶν τοιούτων ἴδιον, οὐχ ἁπλῶς ἀλλά ποτε, ἢ πρός τι ἴδιον ῥηθήσεται. τὸ μὲν γὰρ ἐκ * δεξιῶν εἶναι, ποτὲ ἴδιόν ἐστι. τὸ δὲ δίπουν, πρός τι ἴδιον τυγχάνει λεγόμενον, οἷον, τῷ ἀνθρώπῳ πρὸς ἵππον καὶ κύνα. ὅτι δὲ τῶν ἐνδεχομένων καὶ ἄλλῳ ὑπάρχειν, οὐδὲν ἀντικατηγορεῖται, δῆλον. οὐ γὰρ ἀναγκαῖον, εἴ τι καθεύδει, ἄνθρωπον εἶναι. 6 Γένος δέ ἐστι, τὸ κατὰ πλειόνων καὶ διαφερόντων τῷ εἴδει ἐν τῷ τί ἐστι κατηγορούμενον. ἐν τῷ τί ἐστι δὲ κατηγορεῖσθαι τοιαῦτα λεγέσθω, ὅσα ἁρμόττει * ἐρωτηθέντας ἀποδοῦναι τί ἐστι τὸ προκείμενον. καθάπερ ἐπὶ τοῦ ἀνθρώπου ἁρμόττει, ἐρωτηθέντας τί ἐστι τὸ προκείμενον, εἰπεῖν, ὅτι ζῷον. 7 Γενικὸν δὲ καὶ τὸ, πότερον ἐν τῷ αὐτῷ γένει ἄλλο ἄλλῳ, ἢ ἐν ἑτέρῳ. καὶ γὰρ τὸ τοιοῦτον ὑπὸ τὴν αὐτὴν μέθοδον πίπτει τῷ γένει. διαλεχθέντες γὰρ ὅτι τὸ ζῷον γένος τοῦ ἀνθρώπου, ὁμοίως δὲ καὶ τοῦ βοὸς, διειλεγμένοι ἐσόμεθα ὅτι ταῦτα ἐν τῷ αὐτῷ γένει. ἐὰν δὲ τοῦ μὲν ἑτέρου δείξωμεν ὅτι γένος ἐστὶ, * τοῦ δὲ ἑτέρου ὅτι οὐκ ἔστι, διειλεγμένοι ἐσόμεθα ὅτι οὐκ ἐν τῷ αὐτῷ γένει ταῦτά ἐστι. 8 Συμβεβηκὸς δέ ἐστιν, ὃ μηδὲν μὲν τούτων ἐστὶ, μήτε ὅρος, μήτε ἴδιον, μήτε γένος, ὑπάρχει δὲ τῷ πράγματι. * καὶ ὃ ἐνδέχεται ὑπάρχειν ὁτῳοῦν ἑνὶ καὶ τῷ αὐτῷ καὶ μὴ ὑπάρχειν. οἷον, τὸ καθῆσθαι ἐνδέχεται ὑπάρχειν τινὶ τῷ αὐτῷ, καὶ μὴ ὑπάρχειν. ὁμοίως δὲ καὶ τὸ λευκόν. τὸ γὰρ αὐτὸ, οὐδὲν κωλύει ὁτὲ μὲν λευκὸν, ὁτὲ δὲ μὴ λευκὸν εἶναι. 9 Ἔστι δὲ τῶν τοῦ συμβεβηκότος ὁρισμῶν ὁ δεύτερος, βελτίων. τοῦ μὲν γὰρ πρώτου ῥηθέντος, ἀναγκαῖον, εἰ μέλλει τις συνήσειν, προειδέναι, τί ποτέ ἐστιν ὅρος, καὶ γένος, καὶ ἴδιον. ὁ δὲ δεύτερος, αὐτοτελής ἐστι πρὸς τὸ γνωρίζειν τί ποτέ ἐστι τὸ λεγόμενον, καθ' αὑτό. 10 Προσκείσθωσαν δὲ τῷ συμβεβηκότι, καὶ αἱ πρὸς ἄλληλα συγκρίσεις, ὁπωσοῦν ἀπὸ τοῦ συμβεβηκότος λεγόμεναι. οἷον, πότερον τὸ καλὸν, ἢ τὸ συμφέρον, αἱρετώτερον· καὶ πότερος ὁ κατ' ἀρετὴν, ἢ κατ' ἀπόλαυσιν, ἡδίων βίος, καὶ εἴ τι ἄλλο παραπλησίως τυγχάνει τούτοις λεγόμενον. ἐπὶ πάντων γὰρ τῶν τοιούτων, ποτέρῳ μᾶλλον τὸ κατηγορούμενον συμβέβηκεν, ἡ ζήτησις γίνεται. 11 Δῆλον δ' ἐξ αὐτῶν, ὅτι τὸ συμβεβηκὸς οὐδὲν κωλύει ποτὲ καὶ πρός τι ἴδιον γίνεσθαι. οἷον, τὸ καθῆσθαι, συμβεβηκὸς ὂν,

* γρ. αὐτῶν.

* γρ. οὐδεὶς γ.

* γρ. ἢ πρός τι.

* γρ. δεξιᾷ.

Metaph. lib. 5. cap. 28.

* γρ. ἁρμόττει.

* γρ. τ. δ. ἑτ. δείξωμεν ὅτι

* γρ. ὃ, ὃ.

ὅταν τις μόνος κάθηται, τότε ποτὲ ἴδιον ἔσται. μόνου δὲ καθημένου, πρὸς τοὺς μὴ καθημένους ἴδιον. ὥστε καὶ πρός τι, καὶ ποτὲ, οὐδὲν κωλύει τὸ συμβεβηκὸς ἴδιον γίνεσθαι. ἁπλῶς δ' ἴδιον οὐκ ἔσται.

A cùm quis ſolus ſedet, tunc temporis proprium *eius* erit. cùm autem ſolus ſedet, *relatione habita* ad non ſedentes, proprium *eſt*. Quocirca nihil vetat, quo minùs accidens per relationem ad aliquid & interdum efficiatur proprium. ſimpliciter autem non erit proprium.

Obiectionis ſolutio. Cap. VI.

1 *Obiectio.* 2 *Solutio.*

CAP. V. Μὴ λανθανέτω δ' ἡμᾶς, ὅτι τὰ πρὸς τὸ ἴδιον, καὶ τὸ γένος, καὶ τὸ συμβεβηκὸς λεγόμενα, πάντα καὶ πρὸς τοὺς ὁρισμοὺς ἁρμόσει λέγεσθαι. δείξαντες γὰρ ὅτι οὐ μόνῳ ὑπάρχει τῷ ὑπὸ τὸν ὁρισμὸν, ὥσπερ καὶ ἐπὶ τοῦ ἰδίου, ἢ ὅτι οὐ γένος τὸ ἀποδοθὲν ἐν τῷ ὁρισμῷ, ἢ ὅτι οὐχ ὑπάρχει τι τῶν ἐν τῷ λόγῳ ῥηθέντων, ὅπερ καὶ ἐπὶ τοῦ συμβεβηκότος ἂν ῥηθείη, ἀνῃρηκότες ἐσόμεθα τὸν ὁρισμόν. ὥστε κατὰ τὸν ἔμπροσθεν ἀποδοθέντα λόγον, ἅπαντ' ἂν εἴη τρόπον τινὰ ὁρικὰ τὰ κατηριθμημένα. 2 Ἀλλ' οὐ διὰ τοῦτο μίαν ἐπὶ πάντων καθόλου μέθοδον ζητητέον. οὔτε γὰρ ῥᾴδιον εὑρεῖν τοῦτό ἐστιν. εἴθ' εὑρεθείη, παντελῶς ἀσαφὴς καὶ δύσχρηστος ἂν εἴη πρὸς τὴν προκειμένην πραγματείαν. ἰδίας δὲ καθ' ἕκαστον τῶν διορισθέντων* γενῶν ἀποδοθείσης μεθόδου, ῥᾷον ἐκ τῶν περὶ ἕκαστον οἰκείων ἡ διέξοδος τοῦ προκειμένου γένοιτ' ἄν. 3 Ὥστε καθόλου τύπῳ μὲν, καθάπερ εἴρηται πρότερον, διαιρετέον. τῶν δὲ λοιπῶν, τὰ μάλιστ' ἑκάστοις οἰκεῖα προσαπτέον, ὁρικά τε καὶ γενικὰ προσαγορεύοντας* αὐτά. σχεδὸν δὲ προσῆπται τὰ ῥηθέντα πρὸς ἑκάστοις.

* γρ. τῶν προειρημένων.

* γρ. ταὐτά. al. ταῦτα.

B Nos autem *hoc* non lateat, *ea* omnia quæ ad proprium, & *quæ ad* genus, & *quæ ad* accidens referuntur, etiam definitionibus aptari poſſe. nam ſi oſtenderimus non *ei* ſoli ineſſe, quod *eſt* ſub definitione, vt & in proprio *fit*: vel *id* quod in definitione aſſignatum eſt, non eſſe genus: vel eorum quidpiam quę in definitione continentur, non ineſſe, quemadmodum etiam in accidente dici poſſet: definitionem euerterimus. Quare ſecundum rationem paulò antè adductam, *ea* omnia quæ numerauimus, aliquo modo erũt definitiua. 2 Sed nõ propterea vna in omnibus vniuerſalis methodus quærenda *eſt*. neque enim hoc facile eſt inuẽ- C tu. & ſi fuerit inuentum, *talis methodus* eſſet omnino obſcura, & inutilis ad propoſitã tractationem. at ſi propria ſingulorum definitorum generũ methodus explicabitur: facile erit, ex iis quæ cuiuſque rei propria ſunt, de re propoſita diſſerere. 3 Quocirca vniuerſaliter *ac* typo (vt antea dictum fuit) diuidendum *eſt*: cęterorum autem, quę maximè ſingulis propria *ſunt*, eis adiungi, & definitiua, aut generalia appellari debent. Ferè autem hæc quæ *nunc* dixi, ſingulis adiuncta fuerunt.

Idem quot modis dicatur. Cap. VII.

1 *Protheſis.* 2 *Diſtinctio.* 3 *Obiectio.* 4 *Solutio.* 5 *Membrorum inter ſe collatio.* 6 *Eiuſdem numero ſubdiſtinctio in ſignificationem primam,* 7 *ſecundam,* 8 *tertiam.* 9 *Epilogus.*

CAP. VI. Metaphyſ. lib. 4 cap. 6.

Πρῶτον δὲ πάντων περὶ ταὐτοῦ διοριστέον, ποσαχῶς λέγεται. 2 Δόξειε δ' ἂν ὁ ταὐτὸν, (ὡς τύπῳ λαβεῖν,) τριχῇ διαιρεῖσθαι. ἢ γὰρ ἀριθμῷ, ἢ εἴδει, ἢ γένει, τὸ ταὐτὸν εἰώθαμεν* προσαγορεύειν. ἀριθμῷ μὲν, ὧν ὀνόματα πλείω, τὸ δὲ πρᾶγμα, ἕν, οἷον, λώπιον καὶ ἱμάτιον. εἴδει δὲ, ὅσα πλείω ὄντα, ἀδιάφορα κατὰ τὸ εἶδός ἐστι, καθάπερ ἄνθρωπος ἀνθρώπῳ, καὶ ἵππος ἵππῳ. τὰ γὰρ τοιαῦτα τῷ εἴδει λέγεται ταὐτά, ὅσα ὑπὸ τὸ αὐτὸ εἶδός ἐστιν. ὁμοίως δὲ καὶ γένει ταὐτά, ὅσα ὑπὸ τὸ αὐτὸ γένος ἐστὶν, οἷον, ἵππος ἀνθρώπῳ. 3 Δόξειε δ' ἂν τὸ ἀπὸ τῆς αὐτῆς κρήνης ὕδωρ, ταὐτὸν λεγόμενον, ἔχειν τινὰ διαφορὰν παρὰ τοὺς εἰρημένους τρόπους. 4 Οὐ μὴν ἀλλὰ καὶ τὸ τοιοῦτόν γε ἐν τῷ αὐτῷ τετάχθω τοῖς καθ' ἓν εἶδος ὁπωσοῦν λεγομένοις. ἅπαντα γὰρ τὰ τοιαῦτα, συγγενῆ καὶ παραπλήσια ἀλλήλοις ἔοικεν εἶναι. πᾶν μὲν γὰρ ὕδωρ παντὶ ταὐτὸν τῷ εἴδει λέγεται, διὰ τὸ ἔχειν τινὰ ὁμοιότητα. τὸ δ' ἀπὸ τῆς αὐτῆς κρήνης ὕδωρ, οὐδενὶ ἄλλῳ διαφέρει, ἀλλ' ἢ τῷ σφοδροτέραν εἶναι τὴν ὁμοιότητα. διὸ οὐ χωρίζομεν αὐτὸ ἀπὸ τῶν καθ' ἓν εἶδος ὁπωσοῦν λεγομένων. 5 Μάλιστα δ' ὁμολογουμένως τὸ ἓν ἀριθμῷ ταὐτὸν παρὰ πᾶσι δοκεῖ λέγεσθαι. 6 Εἴωθε δὲ καὶ τοῦτο ἀποδίδοσθαι πλεοναχῶς. καὶ κυριώτατα μὲν καὶ πρώτως, ὅταν ὀνόματι, ἢ ὅρῳ τὸ ταὐτὸν ἀποδοθῇ, καθάπερ ἱμάτιον λωπίῳ.

* γρ. τῷ [illegible] διαφορᾷ.

D Primùm autem omnium, definiẽdum *eſt* quot modis idem dicatur. 2 Videri autem poſſit idem (vt typo explicem) tripertitò diſtributũ eſſe. aut enim numero, aut ſpecie, aut genere idem ſoliti ſumus appellare. numero quidem, cùm nomina ſunt plura, res autem vna: vt indumentum, & veſtimentum. ſpecie verò *eadem dicimus*, quæ, cùm pluta ſint, ſpecie non differunt: vt duos homines, & duos equos. ea namque ſpecie dicũtur eadem, quæ ſub eadem ſpecie ſunt. ſimiliterque genere eadem, quæ ſub eodem genere ſunt, vt homo & equus. 3 Videri autem poſſit, aquam quæ ex eodem fonte *manat*, alio modo dici eandem, quã ſuperiora. 4 Verumtamen in iis numerãda eſt, quæ E ſub eadem ſpecie quoquo modo *eſſe* dicũtur. hæc enim omnia ſyngenea & conſimilia inter ſe videtur eſſe. Omnis enim aqua dicitur ſpecie eadem cum omni *aqua*, quoniam habent *inter ſe* ſimilitudinem quãdam. aqua autem ex eodem fonte *manãs*, nulla alia *ratione* differt *ab aliis aquis quæ eadem dicuntur*, niſi quòd vehementior eſt ſimilitudo. Proinde non ſeiungimus ab iis quæ quoquo modo ſecundum vnam ſpeciem dicuntur. 5 Maximè autem (*vt* in confeſſo *eſt*) *quod eſt* vnum numero, videtur ab omnibus idem dici. 6 Solet autem & hoc dici multis modis, ſed maximè propriè & primùm, quando nomine, aut definitione eadem dicuntur: vt indumentum, & veſtimẽtum:

nec non animal pedeſtre bipes, & homo. 7 Secundo *loco* cùm proprio *eadem dicuntur*: vt ſcientia ſuſceptiuum, & homo: item quod naturâ ſurſum fertur, & ignis. 8 Tertio *loco* cũ ratione accidentium: vt ſedens, vel muſicũ, & Socrates. hæc enim omnia vnum numero ſignificãt. Quod nunc dixi, verum eſſe, ex iis qui appellationes commutant, maximè poteſt aliquis diſcere. ſæpe enim iubẽtes nominatim vocari ſedentium aliquem, commutamus *appellationem*, cùm non intelligit is cui iubemus, quaſi faciliùs ex accidente ſit intellecturus: ac iubemus ſedẽtem, aut diſputantem ad nos vocari, perſpicuè pro eodem accipientes, ſiue nomine, ſiue accidente ſignificetur. 9 Idem igitur, vt dictum fuit, tripertitò diuiſum eſto.

A καὶ ζῷον πεζὸν δίπουν, ἀνθρώπῳ. 7 Δεύτερον δ', ὅταν τῷ ἰδίῳ, καθάπερ τὸ ἐπιστήμης δεκτικόν, ἀνθρώπῳ· καὶ τὸ τῇ φύσει ἄνω φερόμενον, πυρί. 8 Τρίτον δ', ὅταν ἀπὸ * τῶν συμβεβηκότων ᾖ, τὸ καθήμενον, ἢ τὸ μουσικόν, Σωκράτει. πάντα γὰρ ταῦτα τὸ ἓν ἀριθμῷ βούλεται σημαίνειν. Ὅτι δ' ἀληθὲς τὸ νῦν ῥηθέν ἐστι, ἐκ τῶν μεταβαλλόντων τὰς προσηγορίας μάλιστ' ἄν τις καταμάθοι. πολλάκις γὰρ ἐπιτάττοντες ὀνόματι καλέσαι τινὰ τῶν καθημένων, μεταβάλλομεν, ὅταν τύχῃ μὴ συνιείς, ᾧ τὴν πρόσταξιν * ποιούμεθα, ὡς ἀπὸ τοῦ συμβεβηκότος, αὐτοῦ μᾶλλον συνήσοντος· καὶ κελεύομεν, τὸν καθήμενον, ἢ τὸν διαλεγόμενον καλέσαι πρὸς ἡμᾶς· δῆλον ὡς ταὐτὸ ὑπολαμβάνοντες κατά τε τοὔνομα, καὶ κατὰ τὸ συμβεβηκὸς σημαίνειν. 9 Τὸ μὲν οὖν ταὐτόν, καθάπερ εἴρηται, τριχῇ διῃρήσθω.

* γ. τοῦ συμβεβηκότος.

* γ. ποιούμεθα.

Nec plura, nec pauciora eſſe attributa, quàm quatuor ſuprà expoſita. Cap. VIII.

1 Inductio. 2 Syllogiſmus.

B QVòd autem ex ſuprà dictis & per ea diſputationes *conficiantur* & ad ea *pertineant*, prima fides eſt per inductionẽ. ſi quis enim conſideret ſingulas propoſitiones & problemata: videbuntur vtique aut ex definitione, aut ex proprio, aut ex genere, aut ex accidente ſumpta eſſe. 2 Altera fides *eſt* per ſyllogiſmum. neceſſe *eſt* enim, vt quicquid alicui attribuitur, vel reciprocetur cum re, vel non *reciprocetur*. & ſiquidem reciprocetur, erit definitio, aut proprium. nam ſi ſignificet quidditatem, definitio: ſi verò id non ſignificet, propriũ *erit*. id enim erat proprium, quod reciprocatur quidem, non tamen ſignificat quidditatem. quòd ſi non reciprocetur cum re: aut eſt C aliquid ex iis quæ dicũtur in definitione ſubiecti, aut non. & ſi *quid eſt* ex iis quæ dicuntur in definitione: aut erit genus, aut differentia: quoniam definitio ex genere & differẽtiis conſtat. ſi verò non eſt ex iis quę dicuntur in definitione, profectò erit accidens. nam accidens vocabatur, quod neque definitio, neque genus, neque proprium eſt, ineſt autem rei.

Cap. VII. Ὅτι δὲ ἐκ τῶν προειρημένων οἱ λόγοι, καὶ διὰ τούτων, καὶ πρὸς ταῦτα, μία μὲν πίστις ἡ διὰ τῆς ἐπαγωγῆς. εἰ γάρ τις ἐπισκοποίη ἑκάστην τῶν προτάσεων καὶ τῶν προβλημάτων, φαίνοιτ' ἂν ἢ ἀπὸ τοῦ ὅρου, ἢ ἀπὸ τοῦ ἰδίου, ἢ ἀπὸ τοῦ γένους, ἢ ἀπὸ τοῦ συμβεβηκότος γεγενημένη. 2 Ἄλλη δὲ πίστις, ἡ διὰ συλλογισμοῦ. ἀνάγκη γάρ, πᾶν τὸ περί τινος κατηγορούμενον, ἤτοι ἀντικατηγορεῖσθαι τοῦ πράγματος, ἢ μή. καὶ εἰ μὲν ἀντικατηγορεῖται, ὅρος ἂν εἴη, ἢ ἴδιον. εἰ μὲν γὰρ σημαίνει τὸ τί ἦν εἶναι, ὅρος· εἰ δὲ μὴ σημαίνει, ἴδιον. τοῦτο γὰρ ἦν ἴδιον, τὸ ἀντικατηγορούμενον μέν, μὴ σημαῖνον δὲ τὸ τί ἦν εἶναι. εἰ δὲ μὴ ἀντικατηγορεῖται τοῦ πράγματος, ἤτοι τῶν ἐν τῷ ὁρισμῷ τοῦ ὑποκειμένου λεγομένων ἐστίν, ἢ οὔ. καὶ εἰ μὲν τῶν ἐν τῷ ὁρισμῷ λεγομένων, ἢ γένος, ἢ διαφορὰ ἂν εἴη, ἐπειδὴ ὁ ὁρισμὸς ἐκ γένους καὶ διαφορῶν ἐστιν. εἰ δὲ μὴ τῶν ἐν τῷ ὁρισμῷ λεγομένων ἐστί, δῆλον ὅτι συμβεβηκὸς ἂν εἴη. τὸ γὰρ συμβεβηκὸς ἐλέγετο, ὃ μήτε ὅρος, μήτε γένος, μήτε ἴδιόν ἐστιν, ὑπάρχει δὲ τῷ πράγματι.

De categoriis. Cap. IX.

1 Protheſis. 2 Expoſitio decem categoriarum. 3 Interpretatio attributionis quid eſt. 4 Tranſitio.

D POſt hæc igitur oportet definire genera categoriarum, in quibus inſunt dictæ quatuor differentiæ. 2 Hæc autem ſunt numero decẽ, quid eſt, quantum, quale, ad aliquid, vbi, quando, ſitum eſſe, habere, facere, pati. ſemper enim accidens, & genus, & proprium, & definitio in vna harum categoriarum reperientur. omnes enim propoſitiones ab his *ſumptæ*, vel quid eſt, vel quale, vel quantum, vel aliquam aliam categoriam ſignificant. 3 Ex his autem conſtat eum qui ſignificat quid eſt, modò ſignificare ſubſtantiam, modò quale, modò aliquã aliam categoriam. cùm enim homine propoſito, ait id quod eſt propoſitum, eſſe hominẽ, aut animal: dicit quid eſt, & ſignificat ſubſtantiam. cũ autem colore albo propoſito, ait id quod eſt propoſitum, eſſe album, vel colorem: & dicit quid eſt, & ſignificat quale. ſimiliterque ſi propria magnitudine vnius cubiti, dicat id quod propoſitum eſt, eſſe magnitudinem vnius cubiti: & dicit quid eſt,

Μετὰ τοίνυν ταῦτα, δεῖ διορίσασθαι τὰ γένη τῶν κατηγοριῶν, ἐν οἷς ὑπάρχουσιν αἱ ῥηθεῖσαι τέτταρες * διαφοραί. 2 Ἔστι δὲ ταῦτα τὸν ἀριθμὸν δέκα, τί ἐστι, ποσόν, ποιόν, πρός τι, ποῦ, ποτέ, κεῖσθαι, ἔχειν, ποιεῖν, πάσχειν. ἀεὶ γὰρ τὸ συμβεβηκός, καὶ τὸ γένος, καὶ τὸ ἴδιον, καὶ ὁ ὁρισμός, ἐν μιᾷ τούτων τῶν κατηγοριῶν ἔσται· πᾶσαι γὰρ αἱ * ἀπὸ τούτων προτάσεις, ἢ τί ἐστιν, ἢ ποιόν, ἢ ποσόν, ἢ τινὰ τῶν ἄλλων κατηγοριῶν σημαίνουσι. 3 Δῆλον δὲ ἐξ αὐτῶν, ὅτι ὁ τὸ τί ἐστι σημαίνων, ὁτὲ μὲν οὐσίαν σημαίνει, ὁτὲ δὲ ποιόν, ὁτὲ δὲ τῶν ἄλλων τινὰ κατηγοριῶν. ὅταν μὲν γὰρ ἐκκειμένου ἀνθρώπου, φῇ τὸ ἐκκείμενον ἄνθρωπον εἶναι, ἢ ζῷον, τί ἐστι λέγει, καὶ οὐσίαν σημαίνει. ὅταν δὲ χρώματος λευκοῦ ἐκκειμένου, φῇ τὸ ἐκκείμενον λευκὸν εἶναι, ἢ χρῶμα, τί ἐστι * λέγει καὶ ποιὸν σημαίνει. ὁμοίως δὲ καὶ ἐὰν πηχυαίου μεγέθους ἐκκειμένου, φῇ τὸ ἐκκείμενον πηχυαῖον εἶναι μέγεθος, τί ἐστι * λέγει,

* Vide Victorij Var. lect. lib. 18. cap. 8.

* ἡ ἐπὶ.

* γρ. ἐρεῖ.

* γρ. ἐρεῖ.

καὶ ποσὸν σημαίνει. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων· ἕκαστον γὰρ τῶν τοιούτων, ἐάν τε αὐτὸ περὶ ἑαυτοῦ λέγηται, ἐάν τε τὸ γένος * περὶ τούτου, τί ἐστι σημαίνει· ὅταν δὲ περὶ ἑτέρου, οὐ τί ἐστι σημαίνει, ἀλλ' ἢ ποσὸν, ἢ ποιὸν, ἤ τινα τῶν ἄλλων κατηγοριῶν. 4 Ὥστε περὶ ὧν μὲν οἱ λόγοι, καὶ ἐξ ὧν, ταῦτα καὶ τοσαῦτά ἐστι. Πῶς δὲ ληψόμεθα, καὶ δι' ὧν εὐπορήσομεν, μετὰ ταῦτα λεκτέον.

* γρ. περὶ αὐτοῦ.

A & ſignificat quantum. Similiter autem *dicendum eſt* etiam in aliis. horum enim vnumquodque, ſiue ipſum de ſeipſo dicatur, ſiue de eo genus *dicatur*, ſignificat quid eſt. cùm autem de alio *dicitur*, non ſignificat quid eſt; ſed vel quantum, vel quale, vel aliquam aliam categoriam. 4 Quæ de quibus rationes, & ex quibus *conſtant*, hæc & tot ſunt. Quomodo autem *hæc* ſumemus, & per quæ nobis copia ſuppetet, poſt hæc dicendum *eſt*.

De propoſitione dialectica. Cap. X.

1 Protheſis. 2 De propoſitione quæ videtur omnibus, vel pleriſque, vel ſapientibus. 3 De ceteris propoſitionibus dialecticis: 4 quæ ſunt ſimiles probabilibus: 5 vel contrarium per contradictionem enunciant: 6 vel contrarium de contrario enunciant: 7 vel ex aliqua arte ſumptæ ſunt.

CAP. VIII.

Πρῶτον τοίνυν διωρίσθω, τί ἐστι πρότασις διαλεκτικὴ, καὶ τί πρόβλημα διαλεκτικόν· οὐ γὰρ πᾶσαν πρότασιν, οὐδὲ πᾶν πρόβλημα, διαλεκτικὸν θετέον. οὐδεὶς γὰρ ἂν προτείνειε, νοῦν ἔχων, τὸ μηδενὶ δοκοῦν· οὐδὲ προβάλοι τὸ πᾶσι φανερὸν, ἢ τοῖς πλείστοις. τὰ μὲν γὰρ, οὐκ ἔχει ἀπορίαν· τὰ δ', οὐδεὶς ἂν θείη. 2 Ἔστι δὲ πρότασις μὲν διαλεκτικὴ, ἐρώτησις ἔνδοξος ἢ πᾶσιν, ἢ τοῖς πλείστοις, ἢ τοῖς σοφοῖς· καὶ τούτοις, ἢ πᾶσιν, ἢ τοῖς πλείστοις, ἢ τοῖς μάλιστα γνωρίμοις, μὴ παράδοξος. θείη γὰρ ἄν τις τὸ δοκοῦν τοῖς σοφοῖς, ἐὰν μὴ ἐναντίον τοῖς τῶν πολλῶν δόξαις ᾖ. 3 Εἰσὶ δὲ προτάσεις διαλεκτικαὶ, καὶ τὰ τοῖς ἐνδόξοις ὅμοια, καὶ τὰ ἐναντία κατ' ἀντίφασιν τοῖς δοκοῦσιν ἐνδόξοις εἶναι προτεινόμενα, καὶ ὅσαι δόξαι κατὰ τέχνας εἰσὶ τὰς εὑρημένας. 4 Εἰ γὰρ ἔνδοξον εἴη, τὸ τὴν αὐτὴν εἶναι τῶν ἐναντίων ἐπιστήμην· καὶ τὸ αἴσθησιν τὴν αὐτὴν εἶναι τῶν ἐναντίων, ἔνδοξον ἂν φανείη. καὶ εἰ μίαν ἀριθμῷ γραμματικὴν εἶναι, καὶ αὐλητικὴν μίαν· εἰ δὲ πλείους γραμματικὰς, καὶ αὐλητικὰς πλείους. πάντα γὰρ ὅμοια καὶ συγγενῆ ταῦτα ἔοικεν εἶναι. 5 Ὁμοίως δὲ καὶ τὰ τοῖς ἐνδόξοις ἐναντία, κατ' ἀντίφασιν προτεινόμενα, ἔνδοξα * φανεῖται εἶναι· εἰ γὰρ ἔνδοξον, ὅτι δεῖ τοὺς φίλους εὖ ποιεῖν, καὶ ὅτι οὐ δεῖ κακῶς ποιεῖν, ἔνδοξον. ἔστι δὲ ἐναντίον μὲν, ὅτι δεῖ κακῶς ποιεῖν τοὺς φίλους· κατ' ἀντίφασιν δὲ, ὅτι οὐ κακῶς ποιεῖν. ὁμοίως δὲ, καὶ εἰ δεῖ τοὺς φίλους εὖ ποιεῖν, τοὺς ἐχθροὺς οὐ δεῖ. ἔστι δὲ καὶ τοῦτο κατ' ἀντίφασιν τῶν ἐναντίων. τὸ γὰρ ἐναντίον ἐστὶν, ὅτι δεῖ τοὺς ἐχθροὺς εὖ ποιεῖν. ὡσαύτως δὲ καὶ ἐπὶ τῶν ἄλλων. 6 Ἔνδοξον δὲ καὶ ἐν παραβολῇ φανεῖται καὶ τὸ ἐναντίον περὶ τοῦ ἐναντίου εἶναι, εἰ τοὺς φίλους δεῖ εὖ ποιεῖν, καὶ τοὺς ἐχθροὺς δεῖ κακῶς. φανείη δ' ἂν καὶ ἐναντίον τὸ τοὺς φίλους εὖ ποιεῖν, τῷ τοὺς ἐχθροὺς κακῶς. πότερον δὲ καὶ κατ' ἀλήθειαν οὕτως ἔχει, ἢ οὔ, ἐν τοῖς περὶ τῶν ἐναντίων λεγομένοις ῥηθήσεται. 7 Δῆλον δ' ὅτι καὶ ὅσαι δόξαι κατὰ τέχνας εἰσὶ, διαλεκτικαὶ προτάσεις εἰσί. θείη γὰρ ἄν τις τὰ δοκοῦντα τοῖς περὶ τούτων ἐπεσκεμμένοις εἶναι, οἷον περὶ μὲν τῶν ἐν ἰατρικῇ, ὡς ὁ ἰατρὸς· περὶ δὲ τῶν ἐν γεωμετρίᾳ, ὡς ὁ γεωμέτρης· ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων.

* γρ. φαίνεται.

B PRimùm igitur definiatur quid ſit propoſitio dialectica, & quid *ſit* problema dialecticum. nec enim omnis propoſitio, nec omne problema haberi debet pro dialectico. nemo enim mentis cõpos pro principio ſumet, quòd nemini videtur: nec pro quæſtione ponet, quod videtur omnibus, aut pleriſque: quoniam hæc dubitatione carent, illa verò nemo conceſſerit. 2 Eſt autem propoſitio dialectica, interrogatio probabilis aut omnibus, aut pleriſque, aut ſapientibus: atque his vel omnibus, vel plurimis, vel nobiliſſimis, à communi opinione non abhorrens: conceſſerit enim quiſquam, quod videtur ſapientibus, niſi contrarium C ſit opinionibus multorum. 3 Sunt autẽ propoſitiones dialecticæ etiam *ea quæ ſunt* probabilibus ſimilia: necnon contraria iis quæ probabilia videntur, per contradictionem propoſita: & quæcumq; opiniones ſunt ſecũdùm artes inuentas. 4 Nam ſi probabile ſit, eandem eſſe contrariorum ſcientiam: hoc quoque videbitur probabile, ſenſum eundem eſſe contrariorum. & ſi vnam numero grammaticam eſſe, tibiarum quoque artem vnam *eſſe, probabile erit*, ſin plures grammaticas, etiam tibiarum artes plures. hæc enim omnia, ſimilia & eiuſdem generis videntur eſſe. 5 Similiter etiam quæ probabilibus ſunt cõtraria, per contradictionem propoſita, videbuntur probabilia. nam ſi pro- D babile *eſt*, oportere de amicis bene mereri: probabile etiam *erit*, non oportere malè mereri. eſt autẽ contrarium, oportere malè mereri de amicis: per cõtradictionem verò, non oportere malè mereri. Similitérque ſi oportet de amicis bene mereri, de inimicis non oportet. eſt autem hoc quoque per contradictionem contrariorum. contrariorum n. eſt, oportere de inimicis bene mereri. Itidem *dicendum eſt* etiam in aliis. 6 Probabile autem in comparatione videbitur etiam contrarium de cõtrario. veluti, ſi de amicis oportet bene mereri, etiam inimicis oportet malè mereri. Videri autẽ poſſit hoc, de amicis bene mereri, *eſſe* illi contrarium, de inimicis malè *mereri*. vtrùm autẽ re vera ita habeat, nécne, in iis, quæ de contrariis dicentur, explicabitur. 7 Cõſtat autem, & opiniones, quæcumque ſunt ſecundùm artes, eſſe dialecticas propoſitiones. conceſſerit enim quiſpiam, quæ iis videntur, qui in hiſce *rebus, de quibus agitur* verſati ſunt: veluti de rebus medicis *ita ſentiendum eſſe admittet*, vt medicus *docet*: de geometricis, vt geometra. ſimilis *eſt* aliorum ratio.

De problemate dialectico, & theſi. Cap. XI.

1 ¶ *De problemate. Definitio.* 2 *Definitionis expoſitio.* 3 *Diuiſio.* 4 *Epilogus.* 5 ¶ *De theſi. Species vna.* 6 *Species altera.* 7 ¶ *Collatio theſeos & problematis. Diſtinctio.* 8 *Sumptio pro eodem.* 9 ¶ *De quibus problematibus, ſeu theſibus ſit diſputandum.*

PRoblema verò dialecticum, eſt contemplatio A pertinens vel ad electionem & fugam, vel ad veritatem & cognitionem: idque vel per ſe, vel quia adiumentum affert ad aliud quidpiam eiuſmodi: de quo aut neutram in partem ſentiunt, aut multi contrà ac ſapientes, aut ſapientes contrà ac multi, aut vtriq; diſſentiunt ipſi inter ſe. 2 Quorumdam enim problematum cognitio vtilis *eſt* ad eligẽdum, aut fugiendum: veluti, vtrùm voluptas *ſit* bonum, néc ne. Quorũdam verò ad cognoſcendum duntaxat: veluti, vtrum mundus *ſit* æternus, an non. Quædam autem per ſe ad neutrum horũ *valent*, ad eorum tamen aliqua conferunt. multa B enim *ſunt, quæ* nolumus ſui ipſorum cauſa nota facere, ſed aliorũ cauſâ, vt per hæc aliud quidpiam notum faciamus. 3 Sunt autem problemata, & *ea* quorum ſunt ſyllogiſmi cõtrarij, (quia dubitationem continẽt, vtrùm ſic *ſe* habeat, an ſecus, propterea quòd in vtrãque partem ſunt rationes probabiles) & *ea* de quibus rationem non habemus, cum magna ſint & *ardua*, putantes difficile eſſe, vt afferatur *ratio* quamobrem *ita ſit*: veluti, vtrũ mundus ſit æternus, an nõ: nam & quæ eiuſmodi ſunt, quærere aliquis poteſt. 4 Problemata igitur, & propoſitiones, ita vt dictum eſt, diuiſa ſunto. 5 Theſis autem eſt præter *omniũ* opinionem ſententia alicuius nobilis philoſophi: veluti, non poſſe C cõtradici, vt dicebat Antiſthenes: aut omnia moueri ſecundùm Heraclitum: aut quod*cumque* eſt, *eſſe* vnum, vt ait Meliſſus. nam cuiuſvis contraria opinionibus pronũciatis rationem habere, amentia eſt. 6 Vel *theſis eſt ſentẽtia de his* quorum rationem habemus, cùm ſint opinionibus cõtraria: veluti non omne quod eſt, aut eſſe factum aut æternum, ſicut ſophiſtæ inquiũt: nam qui eſt muſicus, eſt grammaticus, cùm nec factus, nec æternus ſit. hoc n. etſi alicui non videtur, *tamen* videri poſſit, quia rationem habet ad perſuadendum idoneam. 7 Ergo & theſis eſt problema: non omne autem problema *eſt* theſis. nam quædam problemata ſunt eiuſmodi, vt de eis in neutram partem ſentiamus. D Quod autem theſis quoque ſit problema, manifeſtum *eſt*. neceſſe n. *eſt* ex iis quæ dicta fuerunt, aut multos cum ſapientibus de theſi contendere, aut vtroſvis inter ſe: quoniam theſis eſt ſentẽtia quædam præter opinionem. 8 Sed ferè nunc omnia dialectica problemata, vocantur theſes. Concedatur autem, nihil referre quocũque modo dicatur. non enim quia velimus nomina condere *ideo* hæc ita diuiſimus: ſed ne nos lateat, quæ ſint horũ differẽtiæ. 9 Nec verò oportet omne problema aut omnem theſim in quæſtionem reuocare: ſed eã de qua dubitare quiſpiam poſſit egens rationis, non pœnæ, aut sẽſus. nam qui ambigunt, vtrũ oporteat Deos colere, & parẽtes diligere, nécne, pœnã: qui verò *dubitant*, vtrùm nix ſit alba, nécne: ſenſu indigent. 10 Nec igitur *de his diſceptare oportet*, quorum in promptu eſt demonſtratio, nec quorum *eſt* nimis remota: quoniam illa non habent dubitationem: hæc verò maiorem habent, quàm gymnaſticæ conueniat.

ΠΡόβλημα δ' ἐστὶ διαλεκτικὸν, θεώρημα τὸ συντεῖνον ἢ πρὸς αἵρεσιν καὶ φυγὴν, ἢ πρὸς ἀλήθειαν καὶ γνῶσιν, ἢ αὐτὸ, ἢ ὡς συνεργὸν πρός τι ἕτερον τῶν τοιούτων· περὶ οὗ, ἢ οὐδετέρως δοξάζουσιν, ἢ ἐναντίως οἱ πολλοὶ τοῖς σοφοῖς, ἢ οἱ σοφοὶ τοῖς πολλοῖς, ἢ ἑκάτεροι αὐτοὶ ἑαυτοῖς. 2 Ἔνια μὲν γὰρ τῶν προβλημάτων χρήσιμον εἰδέναι πρὸς τὸ ἑλέσθαι, ἢ φυγεῖν. οἷον, πότερον ἡ ἡδονὴ * ἀγαθὸν, ἢ οὔ. ἔνια δὲ πρὸς τὸ εἰδέναι μόνον. οἷον, πότερον ὁ κόσμος ἀΐδιος, ἢ οὔ. ἔνια δὲ αὐτὰ μὲν καθ' αὑτὰ, πρὸς οὐδέτερον τούτων· συνεργὰ δέ ἐστι πρός τινα τῶν τοιούτων. πολλὰ μὲν γὰρ αὐτὰ καθ' αὑτὰ οὐ βουλόμεθα γνωρίζειν, ἑτέρων δ' ἕνεκα, ὅπως διὰ τούτων ἄλλο τι γνωρίσωμεν. 3 Ἔστι δὲ προβλήματα, * καὶ ὧν ἐναντίοι εἰσὶν οἱ συλλογισμοὶ, (ἀπορίαν γὰρ ἔχει, πότερον οὕτως ἔχει, ἢ οὐχ οὕτως, διὰ τὸ περὶ ἀμφοτέρων εἶναι λόγους πιθανοὺς) καὶ περὶ ὧν λόγον μὴ ἔχομεν, ὄντων μεγάλων, χαλεπὸν νομίζοντες εἶναι τὸ διὰ τί ἀποδοῦναι· οἷον, πότερον ὁ κόσμος ἀΐδιος, ἢ οὔ. καὶ γὰρ τὰ τοιαῦτα, ζητήσειεν ἄν τις. 4 Τὰ μὲν οὖν προβλήματα, καὶ αἱ προτάσεις, καθάπερ εἴρηται, διῃρήσθω. 5 Θέσις δέ ἐστιν ὑπόληψις παράδοξος τῶν γνωρίμων τινὸς κατὰ φιλοσοφίαν· οἷον, ὅτι οὐκ ἔστιν ἀντιλέγειν, καθάπερ ἔφη Ἀντισθένης· ἢ ὅτι πάντα κινεῖται, καθ' Ἡράκλειτον· ἢ ὅτι ἓν τὸ ὂν, καθάπερ Μέλισσός φησι. τὸ γὰρ τοῦ τυχόντος ἐναντία ταῖς δόξαις ἀποφηναμένου φροντίζειν, εὔηθές ἐστιν. 6 Ἢ περὶ ὧν λόγον ἔχομεν * ἐναντίον ταῖς δόξαις· οἷον, ὅτι οὐ πᾶν τὸ ὂν, ἤτοι γενόμενόν ἐστιν, ἢ ἀΐδιον, καθάπερ οἱ σοφισταί φασι· μουσικὸν γὰρ ὄντα, γραμματικὸν εἶναι, οὔτε γενόμενον, οὔτε ἀΐδιον ὄντα. τοῦτο γὰρ, εἰ καί τινι μὴ δοκεῖ, δόξειεν ἂν διὰ τὸ λόγον ἔχειν πιθανόν. 7 Ἔστι μὲν οὖν καὶ ἡ θέσις, πρόβλημα· οὐ πᾶν δὲ πρόβλημα, θέσις· ἐπειδὴ ἔνια τῶν προβλημάτων τοιαῦτ' ἐστὶ, περὶ ὧν οὐδετέρως δοξάζομεν. * ὅτι δ' ἐστὶ καὶ ἡ θέσις πρόβλημα, δῆλον. ἀνάγκη γὰρ ἐκ τῶν εἰρημένων, ἢ τοὺς πολλοὺς τοῖς σοφοῖς περὶ τὴν θέσιν ἀμφισβητεῖν, ἢ ὁποτερουσοῦν ἑαυτοῖς, ἐπειδὴ ὑπόληψίς τις παράδοξος ἡ θέσις ἐστί. 8 Σχεδὸν δὲ νῦν πάντα τὰ * διαλεκτικὰ προβλήματα θέσεις καλοῦνται. διαφερέτω δὲ μηδὲν, ὁποτέρως λεγόμενον. οὐ γὰρ ὀνοματοποιῆσαι βουλόμενοι, διείλομεν οὕτως αὐτά· ἀλλ' ἵνα μὴ λανθάνωσιν ἡμᾶς, τίνες αὐτῶν τυγχάνουσιν οὖσαι αἱ διαφοραί. 9 Οὐ δεῖ δὲ πᾶν πρόβλημα, οὐδὲ πᾶσαν θέσιν ἐπισκοπεῖν, ἀλλ' ἣν ἀπορήσειεν ἄν τις τῶν λόγου δεομένων, καὶ μὴ κολάσεως, ἢ αἰσθήσεως. οἱ μὲν γὰρ ἀποροῦντες, πότερον δεῖ τοὺς θεοὺς τιμᾶν, καὶ τοὺς γονεῖς ἀγαπᾶν, ἢ οὔ, κολάσεως δέονται· οἱ δὲ, πότερον ἡ χιὼν λευκὴ, ἢ οὔ, αἰσθήσεως. 10 Οὐδὲ δὴ ὧν σύνεγγυς ἡ ἀπόδειξις, οὐδὲ ὧν λίαν πόρρω. τὰ μὲν γὰρ, οὐκ ἔχει ἀπορίαν· τὰ δὲ, πλείω ἢ κατὰ γυμναστικήν.

CAP. IX.

* γ. αἱρετόν.

* γ. ἃ ἂν εἶναι | ἐναντίοι ... ψεις.

* γ. ἐναντίαν.

* γ. ὅτι δέ ἐστι ... πρόβλημα ... δῆλον.

* γ. πάντες ...

De ſpeciebus ratiocinationum. Cap. XII.

1 Scopus & nexus. 2 Diuiſio in ſyllogiſmum & inductionem. 3 Quid ſit ſyllogiſmus. 4 Quid ſit inductio. 5 Collatio ſyllogiſmi & inductionis.

CAP. X. Διωρισμένων δὲ τούτων, χρὴ διελέσθαι πόσα τῶν λόγων εἴδη τῶν διαλεκτικῶν. 2 Ἔστι δὲ τὸ μὲν, ἐπαγωγή· τὸ δὲ, συλλογισμός. 3 Καὶ συλλογισμὸς μὲν τί ἐστιν, εἴρηται πρότερον. 4 Ἐπαγωγὴ δὲ ἡ ἀπὸ τῶν καθ' ἕκαστα ἐπὶ τὰ καθόλου ἔφοδος· οἷον, εἰ ἔστι κυβερνήτης ὁ ἐπιστάμενος κράτιστος, καὶ ἡνίοχος· καὶ ὅλως ἐστὶν ὁ ἐπιστάμενος περὶ ἕκαστον ἄριστος. 5 Ἔστι δὲ ἡ μὲν ἐπαγωγὴ, * πιθανώτερον καὶ τοῖς πολλοῖς κοινόν· ὁ δὲ συλλογισμὸς, * βιαστικώτερον, καὶ πρὸς τοὺς ἀντιλογικοὺς ἐνεργέστερον.

* χ. πιθανώτερα, σαφέστερα, & γνωριμώτερα.
* χ. ἐνεργέστερος.

A His autem definitis, diſtinguere oportet *& explicare* quot ſint rationum dialecticarum ſpecies. 2 Eſt autem vnum, inductio: alterum, ſyllogiſmus. 3 Ac ſyllogiſmus quidem quid ſit, dictū antea fuit. 4 Inductio verò *eſt* progreſſio à ſingularibus ad vniuerſale. veluti ſi ſciens gubernator, eſt optimus, necnon auriga: omnino etiam *& vniuerſaliter* ſciens in quaque re eſt optimus. 5 Eſt autem inductio *inſtrumentum* aptius ad perſuadendum, & apertius, & ſecundùm ſenſum notius, & multis commune. ſyllogiſmus verò *inſtrumentum* maiori vi vrgens, & aduerſus eos, qui ſunt ad contradicendum apti efficacius.

De inſtrumentis inuentionis. Cap. XIII.

1 Enumeratio. 2 Omnia quodammodo reduci ad vnum membrum.

CAP. XI. Τὰ μὲν οὖν γένη, περὶ ὧν τε οἱ λόγοι, καὶ ἐξ ὧν, καθάπερ ἔμπροσθεν εἴρηται, διωρίσθω. Τὰ δὲ ὄργανα, δι' ὧν εὐπορήσομεν τῶν συλλογισμῶν, καὶ τῶν ἐπαγωγῶν, ἐστὶ τέτταρα. ἓν μὲν, τὸ τὰς προτάσεις λαβεῖν. δεύτερον δὲ, τὸ ποσαχῶς ἕκαστον λέγεται, δύνασθαι διελεῖν. τρίτον, τὸ τὰς διαφορὰς εὑρεῖν. τέταρτον δὲ, ἡ τοῦ ὁμοίου σκέψις. 2 Ἔστι δὲ τρόπον τινὰ καὶ τὰ τρία τούτων, προτάσεις. ἔστι γὰρ καθ' ἕκαστον αὐτῶν ποιήσασθαι πρότασιν. οἷον ὅτι αἱρετόν ἐστι τὸ καλὸν, ἢ τὸ ἡδὺ, ἢ τὸ συμφέρον. καὶ ὅτι διαφέρει αἴσθησις ἐπιστήμης· τῷ τὴν μὲν * ἀποβαλόντι, δυνατὸν εἶναι πάλιν λαβεῖν· τὴν δὲ, ἀδύνατον. καὶ ὅτι ὁμοίως ἔχει τὸ ὑγιεινὸν πρὸς ὑγίειαν, καὶ τὸ εὐεκτικὸν πρὸς εὐεξίαν. ἔστι δὲ ἡ μὲν πρώτη πρότασις, ἀπὸ * τῶν πολλαχῶς λεγομένων· ἡ δὲ δευτέρα, ἀπὸ τῶν διαφορῶν· ἡ δὲ τρίτη, ἀπὸ τῶν ὁμοίων.

* χ. ἀποβαλόντι.
* χ. τῶν πολ. λεγομένων.

B Genera igitur de quibus & ex quibus rationes fiunt, vt paulò antè dictū fuit, definita ſunto. Inſtrumenta verò, per quæ nobis copia ſuppetet ſyllogiſmorum & inductionum, quattuor ſunt. vnū *eſt*, propoſitiones ſumere. ſecundum quot modis quidque dicatur, poſſe diſtinguere. tertium, differentias inuenire. quartum, ſimilitudinis cōſideratio. 2 Sed & horum tria ſunt quodammodo, propoſitiones. licet enim ſecundum vnum quodque eorum facere propoſitionem. veluti, eligendum eſſe, quod *eſt* honeſtum, vel quod *eſt* iucūdum, vel quod *eſt* vtile. &, differre ſenſum à ſcientia: quod qui hāc amiſit, poteſt iterum accipere: illum verò non poteſt. item, quam rationem habet ſalubre ad ſanitatem, eandem habere quod firmam corporis conſtitutionem efficit, ad firmam cōſtitutionem. eſt autem prima propoſitio, *ducta* ab iis quæ multis modis dicuntur: ſecunda à differentiis: tertia à ſimilibus.

De propoſitionibus ſumendis. Cap. XIV.

1 De probabilibus, & iis quæ ſunt contraria probabilibus, & iis quæ præceptis alicuius artis congruunt. 2 De his quæ ſunt ſimilia probabilibus. 3 De iis quæ in omnibus aut pleriſque vera ſunt. 4 De ſermonibus ſcriptis. 5 De promptuario conſcribendo. 6 Diuiſio in propoſitiones ethicas, phyſicas, & logicas. 7 & quomodo circa has verſetur philoſophus, vel dialecticus. 8 De vniuerſalibus, & particularibus. 9 Epilogus.

CAP. XII. Τὰς μὲν οὖν προτάσεις ἐκλεκτέον, ὁσαχῶς διωρίσθη περὶ * προτάσεως, ἢ τὰς πάντων δόξας προχειριζόμενον, ἢ τὰς τῶν πλείστων, ἢ τὰς τῶν σοφῶν· καὶ τούτων, ἢ πάντων, ἢ τῶν πλείστων, ἢ τῶν γνωριμωτάτων· ἢ καὶ τὰς ἐναντίας ταῖς φαινομέναις· καὶ ὅσαι δόξαι κατὰ τὴν τέχνην εἰσί. δεῖ δὲ προτείνειν τὰς ἐναντίας ταῖς φαινομέναις, κατ' ἀντίφασιν, καθάπερ εἴρηται πρότερον. 2 Χρήσιμον δὲ, καὶ τὸ ποιεῖν * αὐτὰς ἐν τῷ ἐκλέγειν μὴ μόνον τὰς οὔσας ἐνδόξους, ἀλλὰ καὶ τὰς ὁμοίας ταύταις· οἷον, ὅτι τῶν ἐναντίων ἡ αὐτὴ αἴσθησις, καὶ γὰρ ἡ ἐπιστήμη· καὶ ὅτι ὁρῶμεν, εἰσδεχόμενοί τι καὶ οὐκ ἐκπέμποντες· καὶ γὰρ ἐπὶ τῶν ἄλλων αἰσθήσεων ὡσαύτως. ἀκούομεν τε γὰρ εἰσδεχόμενοί τι καὶ οὐκ ἐκπέμποντες, καὶ γευόμεθα, καὶ

* χ. προτάσεων.
* χ. πῶς.

C Propoſitiones igitur *tot modis ſunt* eligendæ, quot modi poſiti ſunt in definitione propoſitionis: *adeò vt* vel omniū opiniones ſeligamus vel plurimorum, vel ſapientum: atque horum vel omnium, vel plurimorū, vel nobiliſſimorum: vel etiā contrarias his quæ videntur: & opiniones *illas* quę ſecundùm artem *quampiam* ſunt. Oportet autem contrarias his quæ videntur, proponere ſecundū contradictionem, vt ſuprà dictum fuit. 2 Vtile etiam *eſt* eas efficere eligendo non ſolùm eas quæ ſunt probabiles, ſed etiam eas quæ *ſunt* his ſimiles: veluti contrariorum eundem eſſe ſenſum, quia *eſt* eadem ſcientia: & nos videre recipientes quidpiam, non emittentes: quia in aliis quoque ſenſibus itidem *ſe res habet*. audimus enim recipientes quidpiam, non emittentes: atque eodem modo

guſtamus, & olfacimus. Similis eſt aliorum ratio. 3 Præterea quæcumque in omnibus aut plurimis apparent, ſumenda *ſunt* quaſi principia, & probabiles theſes. *hæc* enim concedunt, qui non vident aliqua in re non ita habere. 4 Eligere etiã oportet ex ſermonibus ſcriptis. 5 Deſcriptiones autẽ faciendæ ſunt de quoque genere ſeparatim ſuppoſito, veluti de bono, vel de animali: de bono (*inquam*) omni, incipiendo à *quæſtione* quid eſt. Annotandæ autem *ſunt* & ſingulorum opiniones, veluti Empedoclem dicere quatuor eſſe corporum elementa. *facilè* n. quiſpiam conceſſerit, quod à claro aliquo *philoſopho* dictum eſt. 6 Sunt autẽ (vt typo complectar) propoſitionum & problematum partes tres. nam aliæ propoſitiones ſunt ethicæ, aliæ phyſicæ, aliæ logicæ. Ethicæ *ſunt* eiuſmodi, veluti, vtrùm oporteat parẽtibus parêre potius quàm legibus, ſi diſcrepent. Logicæ autem, veluti, vtrùm contrariorum *ſit* eadem ſcientia, an non. Phyſicæ verò, veluti, *ſitne* mundus æternus, necne. Similis *eſt* ratio problematum. Quales autem *ſint* ſingulæ quas dixi, definitione explicare non facile *eſt*: ſed eã quæ *eſt* per inductionem conſuetudine nitendum *eſt*, vt earum quæque notæ fiant, ad prædicta exempla reſpiciendo. 7 *Quod* igitur ad philoſophiam *attinet*, ſecundùm veritatem de his tractandum *eſt*: dialecticè verò ad opinionem *& probabilitatem omnis diſputatio dirigi debet*. 8 Omnes porrò propoſitiones ſumẽdæ *ſunt* quàm maximè vniuerſales: & ex vna multæ fieri debent. veluti, oppoſitorum eandem eſſe ſcientiam: deinde eſſe *eandem* contrariorum, & *eandem* relatorum. Eodem modo & hæ rurſus diuidi debẽt, quamdiu poſſunt diuidi: veluti *eandem eſſe ſcientiam* boni & mali, necnon albi & nigri, item frigidi & calidi. Similiter *fieri debet* etiam in aliis. 9 De propoſitionibus igitur ſufficiant quæ iam dicta ſunt.

A ὀσφραινόμεθα ὡσαύτως, ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. 3 Ἔτι ὅσα ἐπὶ πάντων ἢ τῶν πλείστων φαίνεται, ληπτέον ὡς ἀρχὴν, καὶ δοκοῦσαν θέσιν. τιθέασι γὰρ οἱ μὴ συνορῶντες, ἐπί τινος οὐχ οὕτως ἔχει. 4 Ἐκλέγειν δὲ χρὴ καὶ ἐκ τῶν γεγραμμένων λόγων. 5 Τὰς δὲ διαγραφὰς ποιεῖσθαι * περὶ ἑκάστου γένους ὑποτιθέντας χωρίς, οἷον περὶ ἀγαθοῦ, ἢ περὶ ζῴου· καὶ περὶ ἀγαθοῦ παντός, ἀρξαμένους ἀπὸ τοῦ τί ἐστι. Παρασημαίνεσθαι δὲ καὶ τὰς ἑκάστων δόξας, οἷον ὅτι Ἐμπεδοκλῆς τέτταρά φησι τῶν σωμάτων στοιχεῖα εἶναι. θείη γὰρ ἄν τις τὸ ὑπό τινος εἰρημένον ἔνδοξον. 6 Ἔστι δὲ (ὡς τύπῳ B περιλαβεῖν) τῶν προτάσεων καὶ τῶν προβλημάτων μέρη τρία. αἱ μὲν γὰρ, ἠθικαὶ προτάσεις εἰσὶν· αἱ δὲ, φυσικαί· αἱ δὲ, λογικαί. ἠθικαὶ μὲν οὖν αἱ τοιαῦται, οἷον, πότερον δεῖ τοῖς γονεῦσι μᾶλλον * πειθαρχεῖν, ἢ τοῖς νόμοις, ἐὰν διαφωνῶσι. λογικαὶ δὲ, οἷον, πότερον τῶν ἐναντίων * ἡ αὐτὴ ἐπιστήμη, ἢ οὔ. φυσικαὶ δὲ, οἷον, πότερον ὁ κόσμος ἀΐδιος, ἢ οὔ. ὁμοίως δὲ καὶ τὰ προβλήματα. ὁποῖαι δ' ἕκασται τῶν προειρημένων, ὁρισμῷ μὲν οὐκ εὐπετὲς ἀποδοῦναι περὶ αὐτῶν· τῇ δὲ διὰ τῆς ἐπαγωγῆς συνηθείᾳ πειρατέον γνωρίζειν ἑκάστην αὐτῶν, κατὰ τὰ προειρημένα παραδείγματα ἐπισκοποῦντας. 7 Πρὸς C μὲν οὖν φιλοσοφίαν, κατ' ἀλήθειαν περὶ αὐτῶν πραγματευτέον· διαλεκτικῶς δὲ, πρὸς δόξαν. 8 Ληπτέον δὲ ὅτι μάλιστα καθόλου πάσας τὰς προτάσεις· καὶ τὴν μίαν, πολλὰς ποιητέον. οἷον, ὅτι τῶν ἀντικειμένων ἡ αὐτὴ ἐπιστήμη· εἶθ', ὅτι τῶν ἐναντίων, καὶ ὅτι τῶν πρός τι. τὸν αὐτὸν δὲ τρόπον καὶ ταύτας πάλιν διαιρετέον, ἕως ἂν ἐνδέχηται διαιρεῖν· οἷον, ὅτι ἀγαθοῦ καὶ κακοῦ, καὶ λευκοῦ, καὶ μέλανος, καὶ ψυχροῦ καὶ θερμοῦ. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. 9 Περὶ μὲν οὖν * προτάσεως ἱκανὰ * τὰ προειρημένα.

* γ. ἐπὶ. * γ. πείθεσθαι. * γ. μία ἐστίν. * γρ. προτάσεων. * γρ. τὰ εἰρημένα.

De iis, quæ multifariam dicuntur, diſtinguendis. Cap. XV.

1 ¶ Quomodo explicanda ſit homonymia. 2 ¶ Quibus ex locis cognoſcitur an ſit verbum homonymum. 3 Ab homonymia contrarij, quod etiam nomine diſtinguitur, 4 vel non diſtinguitur. 5 A contrario & defectu contrarij. 6 A medio & defectu medij. A diuerſitate mediorum. 7 A numero mediorum. 8 A contradicentibus. 9 A priuatione & habitu. 10 A caſibus. 11 A genere remoto. 12 A genere proximo. 13 A generibus contrariorum. 14 A definitione compoſiti: 15 quæ expendenda eſt, vt intelligatur an ſit homonyma. 16 A comparatione. 17 A diuerſitate generum, quorum ſunt differentiæ. 18 A differentiis. 19 A differentia & ſpecie. 20 ¶ Epilogus.

QVot modis autem *quidque dicatur, ita* tractandum *eſt, vt* non ſolũ quę alio *atque alio* modo dicuntur, ſed etiam rationes eorũ explicare conemur. exempli gratiâ non ſolùm *explicari debet*, alio modo bonum dici iuſtitiam, & fortitudinem: alio modo, quod ad firmam corporis cõſtitutionem, & quod ad ſanitatem efficiendam valet: ſed *etiam* eã *dici bona*, quia cuiuſdammodi ſunt: hæc vero, quia ſunt alicuius effectiua, nõ quod ipſa cuiuſdãmodi ſint. Itidemq; in aliis *intelligi debet*. 2 Vtrũ autem ſpecie multis modis, an vno modo quidpiã dicatur, ex his videndum *eſt*. 3 Primùm conſiderare *oportet*, an contrariũ multis modis dicatur, ſiue ſpecie, ſiue etiam nomine diſtinguatur. quædã enim illico etiam nominibus differunt. Veluti acuto, in voce contrarium *eſt* graue, in magnitudine obtuſum. conſtat igitur cõtrarium acuto multis modis dici. quòd ſi hoc, etiam acutũ *dicetur multis modis*: cõtrarium enim horum vtrique *oppoſitum*, aliud *atque aliud* erit: quia nõ idem acutum, erit obtuſo & graui contrarium: atqui vtrique acutum *eſt* contrarium. Ruſum graui, in voce contrarium *eſt* acutum, in

D ΤΟ δὲ ποσαχῶς, πραγματευτέον μὴ μόνον ὅσα λέγεται καθ' ἕτερον τρόπον, ἀλλὰ καὶ τοὺς λόγους αὐτῶν πειρατέον ἀποδιδόναι. οἷον, μὴ μόνον ὅτι ἀγαθὸν καθ' ἕτερον μὲν τρόπον λέγεται δικαιοσύνη καὶ ἀνδρεία, εὐεκτικὸν δὲ καὶ ὑγιεινὸν καθ' ἕτερον· ἀλλ' ὅτι καὶ τὰ μὲν, τῷ αὐτὰ ποιά τινα εἶναι· τὰ δὲ, τῷ ποιητικά τινος, καὶ οὐ τῷ ποιὰ αὐτά τινα εἶναι. ὡσαύτως δὲ καὶ ἐπὶ τῶν ἄλλων. 2 Πότερον δὲ πολλαχῶς, ἢ μοναχῶς τῷ εἴδει λέγεται, διὰ τῶνδε θεωρητέον. 3 Πρῶτον μὲν ἐπὶ τοῦ ἐναντίου σκοπεῖν, εἰ πολλαχῶς λέγεται, E ἐάν τε τῷ εἴδει, ἐάν τε τῷ ὀνόματι διαφωνῇ. ἔνια γὰρ εὐθὺς καὶ τοῖς ὀνόμασιν ἕτερά ἐστιν. οἷον τῷ ὀξεῖ, ἐν φωνῇ μὲν ἐναντίον, τὸ βαρύ· ἐν ὄγκῳ δὲ, τὸ ἀμβλύ. δῆλον οὖν ὅτι τὸ ἐναντίον τῷ ὀξεῖ, πολλαχῶς λέγεται. εἰ δὲ τοῦτο, καὶ τὸ ὀξύ. καθ' ἑκάτερον γὰρ * τούτων ἕτερον ἔσται τὸ ἐναντίον. οὐ γὰρ τὸ αὐτὸ ὀξὺ ἔσται τῷ ἀμβλεῖ καὶ βαρεῖ ἐναντίον, ἑκατέρῳ δὲ τὸ ὀξὺ ἐναντίον. πάλιν τῷ βαρεῖ, ἐν φωνῇ μὲν ἐναντίον τὸ ὀξύ· ἐν

CAP. XIIII.

* γρ. ἐκείνων.

ἐν ὄγκῳ δὲ, τὸ κοῦφον. ὥστε πολλαχῶς τὸ βαρὺ λέγεται, ἐπεὶ καὶ τὸ ἐναντίον. ὁμοίως δὲ καὶ τῷ καλῷ, τῷ μὲν ἐπὶ τοῦ ζώου, τὸ αἰσχρόν· τῷ δὲ ἐπὶ τῆς οἰκίας, τὸ μοχθηρόν. ὥστε ὁμώνυμον τὸ καλόν. 4 Ἐπ' ἐνίων δὲ τοῖς μὲν ὀνόμασιν οὐδαμῶς διαφωνεῖ, τῷ δὲ εἴδει κατάδηλος ἐν αὐτοῖς εὐθέως ἡ διαφορά ἐστιν· οἷον ἐπὶ τοῦ λευκοῦ καὶ τοῦ μέλανος. φωνὴ γὰρ λευκὴ καὶ μέλαινα *λέγεται· ὁμοίως δὲ καὶ τὸ χρῶμα. τοῖς μὲν οὖν ὀνόμασιν οὐδὲν διαφωνεῖ· τῷ δὲ εἴδει κατάδηλος ἐν αὐτοῖς εὐθέως ἡ διαφορά· οὐ γὰρ ὁμοίως τό τε χρῶμα λευκὸν λέγεται, καὶ ἡ φωνή. δῆλον δὲ τοῦτο καὶ διὰ τῆς αἰσθήσεως· τῶν γὰρ αὐτῶν τῷ εἴδει, ἡ αὐτὴ αἴσθησις. τὸ δὲ λευκὸν τὸ ἐπὶ τῆς φωνῆς, καὶ ἐπὶ τοῦ χρώματος, οὐ τῇ αὐτῇ αἰσθήσει κρίνομεν· ἀλλὰ τὸ μὲν, ὄψει· τὸ δὲ, ἀκοῇ. ὁμοίως δὲ καὶ τὸ ὀξὺ καὶ τὸ ἀμβλὺ, ἐν χυμοῖς καὶ ἐν ὄγκοις· ἀλλὰ τὸ μὲν, ἁφῇ· τὸ δὲ, γεύσει. οὐδὲ γὰρ ταῦτα διαφωνεῖ τοῖς ὀνόμασιν, οὔτ' *ἐπ' αὐτῶν, οὔτ' ἐπὶ τῶν ἐναντίων· ἀμβλὺ γὰρ καὶ τὸ ἐναντίον ἑκατέρῳ. 5 Ἔτι, εἰ τῷ μὲν ἔστι τι ἐναντίον, τῷ δ' ἁπλῶς μηδέν ἐστι, τῇ μὲν ἀπὸ τοῦ πίνειν ἡδονῇ, ἡ ἀπὸ τοῦ διψῆν λύπη, ἐναντίον· τῇ δ' ἀπὸ τοῦ θεωρεῖν ὅτι ἡ διάμετρος τῇ πλευρᾷ ἀσύμμετρος, οὐδέν. ὥστε *πλεοναχῶς ἡ ἡδονὴ λέγεται. καὶ τῷ μὲν κατὰ τὴν διάνοιαν φιλεῖν, τὸ μισεῖν, ἐναντίον· τῷ δὲ κατὰ τὴν σωματικὴν ἐνέργειαν, οὐδέν. δῆλον οὖν ὅτι τὸ φιλεῖν ὁμώνυμον. 6 Ἔτι καὶ ἐπὶ τῶν ἀνὰ μέσον, εἰ *τῶν μὲν ἔστι τι ἀνὰ μέσον, τῶν δὲ, μηδέν. ἢ εἰ ἀμφοῖν μὲν ἔστι, μὴ ταὐτὸν δὲ ἐστι, λευκοῦ, καὶ μέλανος, ἐν *χρώμασι μὲν τὸ φαιὸν, ἐν φωνῇ δὲ οὐδέν. ἢ εἰ ἄρα τὸ σομφὸν, καθάπερ τινές φασι, σομφὴν φωνὴν ἀνὰ μέσον εἶναι, ὥσθ' ὁμώνυμον τὸ λευκὸν ὁμοίως δὲ καὶ τὸ μέλαν. 7 Ἔτι, εἰ τῶν μὲν, πλείω τὰ ἀνὰ μέσον· τῶν δὲ, ἓν· καθάπερ ἐπὶ τοῦ λευκοῦ, καὶ μέλανος. ἐπὶ μὲν γὰρ τῶν χρωμάτων, πολλὰ τὰ ἀνὰ μέσον· ἐπὶ δὲ τῆς φωνῆς, ἓν τὸ σομφόν. 8 Πάλιν ἐπὶ τοῦ κατ' ἀντίφασιν ἀντικειμένου σκοπεῖν, εἰ πλεοναχῶς λέγεται. εἰ γὰρ τοῦτο πλεοναχῶς λέγεται, καὶ τὸ τούτῳ ἀντικείμενον πλεοναχῶς ῥηθήσεται. οἷον, τὸ μὴ βλέπειν, πλεοναχῶς λέγεται· ἓν μὲν, τὸ μὴ ἔχειν ὄψιν· ἕτερον δὲ, τὸ μὴ ἐνεργεῖν τῇ ὄψει. εἰ δὲ τοῦτο πλεοναχῶς λέγεται, ἀναγκαῖον καὶ τὸ βλέπειν, πλεοναχῶς λέγεσθαι. ἑκατέρῳ γὰρ *τῷ μὴ βλέπειν, ἀντίκειταί τι· οἷον, τῷ μὲν μὴ ἔχειν ὄψιν, τὸ ἔχειν· τῷ δὲ μὴ ἐνεργεῖν τῇ ὄψει, τὸ ἐνεργεῖν. 9 Ἔτι, ἐπὶ τῶν κατὰ στέρησιν καὶ ἕξιν λεγομένων, ἐπισκοπεῖν. εἰ γὰρ θάτερον πλεοναχῶς λέγεται, καὶ τὸ λοιπόν ἐστιν, εἰ τὸ αἰσθάνεσθαι πλεοναχῶς λέγεται, κατά τε τὴν ψυχὴν, καὶ τὸ σῶμα· καὶ τὸ ἀναίσθητον εἶναι, πλεοναχῶς ῥηθήσεται, κατά τε τὴν ψυχὴν, καὶ κατὰ τὸ σῶμα. ὅτι δὲ κατὰ στέρησιν καὶ ἕξιν ἀντίκειται τὰ νῦν λεγόμενα, δῆλον· ἐπειδὴ πέφυκεν ἑκατέραν τῶν αἰσθήσεων ἔχειν τὰ ζῶα, καὶ κατὰ τὴν ψυχὴν, καὶ κατὰ τὸ σῶμα. 10 Ἔτι δ' ἐπὶ τῶν πτώσεων ἐπισκεπτέον. εἰ γὰρ τὸ δικαίως, πλεοναχῶς λέγεται· καὶ τὸ δίκαιον, πλεοναχῶς ῥηθήσεται. καθ' ἑκάτερον γὰρ *τῶν δικαίως ἔστι δίκαιον. οἷον, εἰ τὸ δικαίως λέγεται, τό, τε κρῖναι κατὰ τὴν ἑαυτοῦ γνώμην, καὶ τὸ ὡς δεῖ· ὁμοίως καὶ τὸ δίκαιον. ὡσαύτως δὲ καὶ εἰ τὸ ὑγιεινὸν πλεοναχῶς λέγεται, καὶ τὸ ὑγιεινῶς πλεοναχῶς ῥηθήσεται. οἷον, εἰ ὑγιεινὸν

* γ. ἐφ' αὐτῶν.
* γ. πλεοναχῶς.
* γ. τῶν μὲν & mox τῶν δέ.
* γ. χρώματι.
* γ. τὸ μὴ ἔχειν.
* γ. τῶν δικαίως.

A magnitudine leue. quocirca graue multis modis dicitur, quandoquidem etiam cõtrarium. Similiter pulchro quod *eſt* in animali, *contrariũ eſt* turpe: ei verò quod *eſt* in domo, vitioſum. quare pulchrũ *eſt verbũ* homonymum. 4 In quibuſdam autem *cõtrariis* nulla eſt nominum differentia, ſed ſpecie ſtatim apparet in eis differentia: vt in candido, & fuſco. vox enim candida & fuſca dicitur: ſimiliter & color. nominibus igitur nõ differunt, ſed ſpecie ſtatim apparet in eis differentia. non n. ſimili ratione color candidus dicitur, & vox *candida*. hoc autem patet etiam ex ſenſu. eorum n. quæ *ſunt* eadem ſpecie, idem *eſt* ſenſus. candidum verò, quod
B in voce, & *quod* in colore eſt, non eodem ſenſu iudicamus, ſed alterum viſu, alterum auditu. Similiter autẽ & acutum & obtuſum in ſaporibus & in magnitudinibus, *non eodem ſenſu iudicãtur*: ſed alterum tactu, alterum guſtu. hæc enim nominibus non diſcrepant: *quia* nec in ipſis *eſt hæc differentia*, nec in contrariis. obtuſum enim *dicitur*, quod *eſt* contrarium vtrique. 5 Præterea *videndũ eſt*, ſitne alteri aliquid contrarium, alteri nihil omnino. Veluti voluptati quæ ex potu *percipitur*, contrarius *eſt* dolor qui ex ſiti *oritur*: ei verò *voluptati, quam* ex eo *capimus* quod intelligimus non eſſe communem menſuram dimetientis & lateris, nihil *eſt contrarium*: quare multis modis voluptas dicitur. Item
C *verbo* Amare, ſecundũ animum *accepto*, contrariũ *eſt* Odiſſe: at ſecundum corporalem actionem *accepto*, nihil *eſt cõtrarium*. vnde conſtat, *verbum* Amare eſſe homonymum. 6 Præterea *ſpectari debent etiam* media: *nempe* an quorũdam ſit aliquod medium, aliorum verò nihil. vel, an ſit quidem amborum medium, non tamen idem: vt inter cãdidum & fuſcum, in coloribus pallidũ, in voce verò nihil *eſt interiectum*: niſi forte raucum *ſit interiectum*, ſicut quidam aiunt raucam vocem mediam eſſe. quare homonyma ſunt candidũm & fuſcum. 7 Præterea *videndum eſt*, an aliorũ plura media *ſint*, aliorum vnum: vt in candido & fuſco *intelligere licet*. in coloribus enim multa ſunt media: in voce verò
D vnum, *nempe* raucum. 8 Item in eo quod ſecundùm contradictionem opponitur, conſiderãdum eſt an multis modis dicatur. etenim ſi hoc multis modis dicatur, etiam ei oppoſitum multis modis dicetur. veluti non cernere, multis modis dicitur: vno, non habere facultatem videndi: altero, non vti facultate vidẽdi. quòd ſi hoc multis modis dicitur: neceſſe *eſt* vt etiã cernere, multis modis dicatur: vtrique enim *ſignificationi verbi* non cernere opponitur aliquid: veluti illi, non habere facultatem videndi, *opponitur* habere: huic verò, non vti facultate videndi, *opponitur* vti. 9 Præterea in his quæ ſecundum priuationem & habitum dicũtur,
E cõſiderare *oportet*. nam ſi vnum multis modis dicitur, etiam alterum. veluti ſi ſentire multis modis dicitur, *id eſt* ſecundùm animam, & ſecundũ corpus: etiã ſenſu carere, dicetur multis modis, *id eſt* & ſecundum animã & ſecundum corpus. Secundùm priuationẽ autem & habitum opponi ea quę nunc dixi, manifeſtum *eſt*: quia naturâ comparatũ eſt, vt animalia vtrumque ſenſum habeant *id eſt* & ſecundùm animã, & ſecundùm corpus. 10 Præterea in caſibus *hoc* conſiderandũ *eſt*. Nam ſi iuſtè multis modis dicitur, etiam iuſtum multis modis dicetur: quia ſecundum vtrumque *eorum quæ* iuſtè *fiunt*, iuſtum eſt. veluti ſi iuſtè dicitur & ex ſententia ſua iudicare, & vt oportet: ſimiliter etiam iuſtũ *his duobus modis dicetur*. Itidéque ſi ſalubre multis modis dicitur, etiam ſalubriter multis modis dicetur. veluti ſi ſalubre

dicitur quod ſanitatis efficiendæ, quod conſeruādæ, quod indicandæ vim habet: etiā ſalubriter dicetur vel accommodatè ad efficiendā, vel ad conſeruandam, vel ad indicandam ſanitatē. Ac ſimiliter in ceteris, quando ipſum *nomen* multis modis dicitur, etiā caſus ab eo *ductus* multis modis dicetur: & *retro* ſi caſus *multis modis dicatur*, etiam ipſum *nomen multis modis dicetur*. 11 Spectare etiā oportet genera categoriarum quæ nomini conueniunt, an eadem ſint in omnibus. niſi enim *ſint* eadē: patet, homonymum eſſe id quod dicitur. Veluti bonum in cibis *eſt*, quod eſt effectiuum voluptatis: in medicina, quod eſt effectiuū ſanitatis: in anima, qualem eſſe, vt temperantem, vel fortem, vel iuſtam: ſimiliterque in homine. interdū verò Quando, vt bonum quod *poſitum eſt* in occaſione: bonum n. dicitur, quod in tēpore fit. ſæpe autem *bonum dicitur*, *quod eſt* quantū, vt moderatum: nā & *quod* moderatum *eſt* bonum dicitur. quocirca bonum eſt *verbum* homonymū. Itidem candidum in corpore *eſt* color: in voce, quod facile exaudiri poteſt. Eadē *eſt* ratio acuti: quia non eodē modo in omnibus idē dicitur. vox n. *dicitur* acuta, quæ *eſt* cita, vt aiunt muſici qui circa numeros verſantur: angulus verò acutus, qui *eſt* minor recto: machęra autē, quę acutum angulum habet. 12 Conſiderare etiā oportet genera eorum quæ ſub eodē nomine *continentur*, an ſint diuerſa nec ſubalterna. vt *ὄνος* dicitur & animal & vas: diuerſa enim *eſt* horum definitio ad illud nomen *accommodata*. alterum n. tale quoddam animal dicetur: alterum, tale quoddā vas. Quòd ſi genera ſint ſubalterna, nō *eſt* neceſſe diuerſas definitiones eſſe. vt corui & animal & auis genus eſt. cùm igitur dicimus coruum eſſe auem, dicimus quoque eum eſſe tale quoddā animal: quapropter ambo genera ei attribuuntur. ſimiliter etiam cū dicimus coruum *eſſe* animal alatum bipes, dicimus eum eſſe auē: ergo ſic quoq; ambo genera coruo attribuuntur, necnon eorū definitio. in generibus autē non ſubalternis hoc non contingit. neque n. cùm vas dicimus, animal dicimus: neque cū animal, vas. 13 Conſiderare autem *oportet* non ſolū an eius quod propoſitū eſt, diuerſa nec ſubalterna genera ſint, ſed etiam in contrario. nam ſi contrarium multis modis dicitur: manifeſtum *eſt*, etiā *id quod* propoſitum *fuit*, *multis modis dici*.* 14 Vtile eſt etiam ad compoſiti definitionem reſpicere: veluti candidi corporis, & candidæ vocis. ſublato n. eo quod eſt proprium, oportet eandem definitionem manere. hoc vero nō accidit in homonymis, vt in iis quæ nunc dixi. illud n. *ſi definiatur*, erit corpus talem colorem habens: hoc autem, vox quę facilè exauditur. ſublato igitur corpore & voce, non idē *eſt* in vtraque *definitione* quod relinquitur. atqui oportebat, ſi candidum erat verbum ſynonymū, idē eſſe quod in vtraq; *definitione* dicitur. 15 Sæpe etiam in ipſis definitionibus latet conſequens homonymia. idcirco definitiones quoque cōſiderandæ ſunt. veluti ſi quis ſignificatiuum & effectiuum ſanitatis, eſſe dicat quod ſymmetros affectū eſt ad ſanitatem, non *eſt* deſiſtendum, ſed conſiderandū, quid in vtroque vocauerit ſymmetros: veluti ſi alterum *ita vocauerit*, quia tale eſt, vt efficiat ſanitatē: alterū verò, quia tale eſt vt indicet qualis ſit habitus. 16 Præterea *videndū eſt*, an conferri nequeant ex maiori, vel ſimilitudine: vt vox candida, & candidum veſtimētum: itē acutus ſapor, & acuta vox. hæc n. nec ſimiliter dicuntur candida vel acuta,

A λέγεται, ὃ μὲν, ὑγιείας ποιητικὸν, ὃ δὲ, φυλακτικὸν, τὸ δὲ, σημαντικὸν· καὶ ὃ ὑγιεινῶς, ἢ ποιητικῶς, ἢ φυλακτικῶς, ἢ σημαντικῶς, ῥηθήσεται. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων, ὅταν αὐτὸ πλεοναχῶς λέγηται, καὶ ἡ πτῶσις ἡ ἀπ᾽ αὐτοῦ πλεοναχῶς ῥηθήσεται· καὶ εἰ ἡ πτῶσις, καὶ αὐτό. 11 Σκοπεῖν δὲ δεῖ καὶ τὰ γένη τῶν κατὰ τοὔνομα* κατηγοριῶν, εἰ ταὐτά ἐστιν ἐπὶ πάντων. εἰ γὰρ μὴ ταὐτά, δῆλον ὅτι ὁμώνυμον τὸ λεγόμενον. οἷον, τὸ ἀγαθὸν, ἐν* ἐδέσματι μὲν, τὸ ποιητικὸν ἡδονῆς· ἐν ἰατρικῇ δὲ, τὸ ποιητικὸν ὑγιείας· ἐπὶ δὲ ψυχῆς, τὸ ποιὰν εἶναι, οἷον, σώφρονα, ἢ ἀνδρείαν, ἢ δικαίαν· ὁμοίως δὲ καὶ ἐπὶ ἀνθρώπου. ἐνιαχοῦ δὲ τὸ ποτὲ, οἷον, τὸ ἐν τῷ
B καιρῷ ἀγαθὸν· ἀγαθὸν γὰρ λέγεται τὸ ἐν τῷ καιρῷ. πολλάκις δὲ τὸ ποσὸν, οἷον, τὸ ἐπὶ τοῦ μετρίου· λέγεται γὰρ καὶ τὸ μέτριον, ἀγαθόν. ὥστε ὁμώνυμον τὸ ἀγαθόν. ὡσαύτως δὲ καὶ τὸ λευκὸν, ἐπὶ σώματος μὲν, χρῶμα· ἐπὶ δὲ φωνῆς, τὸ εὐήκοον. παραπλησίως δὲ καὶ τὸ ὀξύ. οὐ γὰρ ὡσαύτως ἐπὶ πάντων τὸ αὐτὸ λέγεται.* φωνὴ μὲν γὰρ ὀξεῖα, ἡ ταχεῖα, καθάπερ φασὶν οἱ κατ᾽ ἀριθμοὺς ἁρμονικοί· γωνία δὲ ὀξεῖα, ἡ ἐλάττων ὀρθῆς· μάχαιρα δὲ, ἡ ὀξυγώνιος. 12 Σκοπεῖν δὲ χρὴ καὶ τὰ γένη τῶν ὑπὸ τὸ αὐτὸ ὄνομα, εἰ ἕτερα καὶ μὴ ὑπ᾽ ἄλληλα. οἷον, ὄνος, τό, τε ζῶον, καὶ τὸ σκεῦος. ἕτερος γὰρ ὁ κατὰ τοὔνομα λό-
C γος αὐτῶν. τὸ μὲν γὰρ, ζῶον ποιόν τι ῥηθήσεται· τὸ δὲ, σκεῦος* ποιόν τι. ἐὰν δὲ ὑπ᾽ ἄλληλα τὰ γένη ᾖ, οὐκ ἀναγκαῖον ἑτέρους τοὺς λόγους εἶναι. οἷον, τοῦ κόρακος, τὸ ζῶον, καὶ τὸ ὄρνεον, γένος ἐστίν. ὅταν οὖν λέγωμεν τὸν κόρακα ὄρνεον εἶναι, καὶ ζῶόν ποιόν τι φαμὲν εἶναι αὐτόν· ὥστε ἀμφότερα τὰ γένη περὶ αὐτοῦ κατηγορεῖται. ὁμοίως δὲ καὶ ὅταν ζῶον πτηνὸν δίπουν τὸν κόρακα λέγωμεν, ὄρνεον αὐτὸν φαμὲν εἶναι· καὶ οὕτως οὖν ἀμφότερα τὰ γένη κατηγορεῖται κατὰ τοῦ κόρακος, καὶ ὁ λόγος αὐτῶν. ἐπὶ δὲ τῶν μὴ ὑπ᾽ ἄλληλα γενῶν, οὐ συμβαίνει τοῦτο. οὔτε γὰρ ὅταν σκεῦος λέγωμεν, ζῶον λέγομεν· οὔθ᾽ ὅταν ζῶον, σκεῦος.
D 13 Σκοπεῖν δὲ μὴ μόνον εἰ τοῦ προκειμένου ἕτερα τὰ γένη, καὶ μὴ ὑπ᾽ ἄλληλα, ἀλλὰ καὶ ἐπὶ τοῦ ἐναντίου. εἰ γὰρ τὸ ἐναντίον πολλαχῶς λέγεται, δῆλον ὅτι καὶ τὸ προκείμενον. 14 Χρήσιμον δὲ καὶ τὸ ἐπὶ τὸν ὁρισμὸν ἐπιβλέπειν, τὸν ἐκ τοῦ συντιθεμένου γινόμενον. οἷον, λευκοῦ σώματος, καὶ λευκῆς φωνῆς· ἀφαιρουμένου γὰρ τοῦ ἰδίου, τὸν αὐτὸν δεῖ λόγον λείπεσθαι. τοῦτο δὲ οὐ συμβαίνει ἐπὶ τῶν ὁμωνύμων· οἷον, ἐπὶ τῶν νῦν εἰρημένων. τὸ μὲν γὰρ, ἔσται σῶμα τοιόνδε χρῶμα ἔχον· τὸ δὲ, φωνὴ εὐήκοος. ἀφαιρεθέντος οὖν τοῦ σώματος, καὶ τῆς φωνῆς, οὐ ταὐτὸν ἐν ἑκατέρῳ τὸ λειπόμενον. ἔδει δέ γε, εἴπερ συνώνυμον ἦν τὸ
E λευκὸν, τὸ ἐφ᾽ ἑκατέρου λεγόμενον εἶναι ταὐτόν. 15 Πολλάκις δὲ καὶ ἐν αὐτοῖς τοῖς λόγοις λανθάνει παρακολουθοῦν τὸ ὁμώνυμον. διὸ δὲ καὶ ἐπὶ* τὸν λόγον σκεπτέον. οἷον, ἐάν τις τὸ σημαντικὸν, καὶ τὸ ποιητικὸν ὑγιείας, τὸ συμμέτρως ἔχον πρὸς ὑγίειαν φῇ εἶναι· οὐκ ἀποστατέον ἀλλ᾽ ἐπισκεπτέον τί τὸ συμμέτρως καθ᾽ ἑκάτερον εἴρηκεν· οἷον, εἰ τὸ μὲν, τῷ* τοσοῦτον εἶναι, ὥστε ποιεῖν ὑγίειαν· τὸ δὲ, τῷ τοιοῦτον εἶναι, οἷον σημαίνειν ποία τις ἡ ἕξις. 16 Ἔτι, εἰ μὴ συμβλητὰ κατὰ τὸ μᾶλλον, ἢ ὁμοίως· οἷον, λευκὴ φωνὴ, καὶ λευκὸν ἱμάτιον· καὶ ὀξὺς χυμὸς, καὶ ὀξεῖα φωνή. ταῦτα γὰρ οὔθ᾽ ὁμοίως λευκὰ λέγεται, ἢ ὀξέα,

* γρ. προσηγοριῶν.
* γρ. ἐδέσμασι.
* γρ. ἐπὶ δὲ φωνῆς μὲν ὀξεῖα.
* γρ. σκεῦος ποιόν τι.
* γρ. τῶν λόγων.
* γρ. τοιόνδε.

U .

G 6_34579?5 4 = = 7E > // + <- 347* :*;52 7?4;4
@"?761 14 = 2 F8'K: = :6 = 4 = := 6?'6 Y
6:6 = 4 = 'P/I?: = *7 70 9?'34 7'A59'2 = 9 ;? '1 ?<
;4 A?97J? 4 = 7E >79;5 : ' 4)7A5 %(1 4?a
2: 4 = 'E?6? 46 '34: 4 = '79?5 4 = '240'7J5 :'6:
?: 9:?7? -)'1 45 2H'2*5? 5'1 225 ?K? () G6QA?9
76 = 79)@ ?56?) "1 45 J5'?6 = '2 6;'9 : 4'11
25 56; ;Y'?: 62 1? 7 ?' ; 3 '57'340'240'5:17
6: = 65F'<I //G2G2F 1 45 : 4 = E56?6466:2J
7J5 = 024'1 225 56; 7'2 65'A;7?4;4 = '
A:? >@ = 7E6 ?41 6 > 1 22? ?6 'A:H7A15? 34%
7?4;7'2 ;'"7?2 'A S 5 Sn ESn DS F' 7' = 7E6 ;41 6?
347 57?4?4 = '2/I8/ (K: = :6A = 4 = '34 7246
14W;2: 4 = SE?6? 4'6:6' 24079;5
6:24 = ' &' P' ') >* $ $ 3 2 XL<'' 2'' '<)'''
5:15 = '6: = 65') I" $$'TX<)<5 '1 225 5; H
70 =)' = F '(' ?K : = 7; >'34:1'52;' 6'?: *: 04>' M@'34:1'?9
6 8 59:1 >' 5 4>56 = 3; :1?/ = ?: *: A
/2 < G ;'^ FB /95E 5E7? 44 = @?:E ?E7; = = '79*5
1;4>G5 4>'A5 0'34:1'52;' 99'6 59:7 > 6:6c/GG25H1'
1 225 56; 7' 347 ??K : = 75/ ;2 2;+80: = :K 64
34:6 7 = '57 415 = ' 524 = '5B?15 = / G/1 2;? 56; 7
;5 57'33 7'2*5? 5>'6499 '52;'1 225 56 = BQK:
6 :5 = @ :>4:N?2;1 225 ?6? 7 9?1A [34
2*?? ?> Y?: 62 1? 7 5:*5 ;5; 765: 4 = 34 2
5:15 = '6: = 65'< -G//8F/F 7 ;5 4 = '2 ;' *515> 79'
;5 4 = 1 2;5 56; 7 A;' 761 17'34:1' '6'?? *: 5

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2 3 (b ' ' B " *(W'#' 52 ' Q #'
9' 2@0'' A'S /G 2' ' * ' ' N']' 2A 1' '
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3'2*5? 5>'?:9: >'34:1'A5 0' 0 "A:??')'1 225 56; 7"1 225 ;'56 = 'A:H'7'A:1? '34:1' 761 17'2 ;' 7:' 47'
< '?H'K >' ;79 0 >'?: 62 15 7617'246

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' / G /! ' 6;5 ' 42; ; 7 = @2: ? ;41 6? = '@' 6;5 '* 4156
2 S(H ' ;; W'8 ' ' ' '+<' " ';? = *5 76; 7 = 'K ??' :6 = ' : = 6 7' 2 = ;'7
* N 2 * + '' T' 5:15 = E565 5)G 8 +;2A ? ;5' ' 5 6 61 45 9 L
I6+ ' 7 'FKE2)Y8] = /A' ' /4' $ $ 333 ' ' E?65 04>' 6;5 '34)?'6:6'52;'*5667E67'1 2;7 = 7
$' P " Y # 'k) * 58 6; H>? > '2 : ' ?94; 34 1 = 5 2 ?' 6;5 '25624 = @ ? 56; 6' '
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; , & '* ' 2? -6' $('@ O$ * '$*' 7 :BA594; 'A;'A 24>' /)2 6':?49: F"' = 56>' 6'76 = 7'
* * &)TEW <) "'K ;b @ '( ]*@ < ' $' \F8)4 Ig; @A;; 734 99;7> 6 = 7 Y E 8 5 56 4;7> 67? 5BA 4
P A'V' ' Sq ' F 6 9 9 2 6 2 F 6 9 3 ' W' 0 2.0 6 1 9 8 8 ' 3F60#
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Z * 5(M:$;3 & 6 . ' , ' ' 6' 59 34 >'*:;? = 4>'2; 6 9 ;41 6?>'*5 2* ?5 5' "'
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. 020 . 68 ' 6 . 2 . F / ' 8 / 4 3' 4 . 0 6 C #' F6 / ' 9 '
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339 ' 2 . ' 0 0 / D 8 / ' . 0 086 C ' " . @ 00 /
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. 916 ' 3' F6 ' 2 . 9 / D0 . ' " 9 / ' 21 . / D02 . . 3' / '
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763' 98 9 ' E 19 ' / 19 1#' 94' F6024 / ' . / 68 ' F6 '
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9 88 / 09249 863' 2 / 2' 498 ' 4 9 ' =' 4 . /
D2 / . . 246806 . 98F64 . F60 / 08 . 66 '
F699 ' 49 2 1 / 298 / 3' . 6 F69' . ' 4 N9'
91 3' - " " ' 79863' ' d 2 . 64 2 3' 061 . 8 '
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C 04 / D 8 / 3G / . G91 . / 3 ' C ' 04 0 1 . 92403'
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108 98 ' F608 ' 49 29863' 9 9 9' 497908 63'
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8 . ' 2' 7 3 H ' F6 4' 9 1' 011276 16 ' D9263' " . F69'
9 1#' ;' = 8 G . 9 06198 C 2 3F6 72D9 ? '
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&0'7/268 :0 . . 6 0 0" 9 7' '
T6 408' " / 6 103'9 1'7 262 '
T609408 " / 6 1032/29 17/268 ' W=62.06'
"1 F69' /7 980.68'D929 ' . / 8 8 8 0 '90'F '
"2 69 0 19 '0E 1 6.24 ' "9 '969 1924 ' " 8'7079'
.68'2' /7069 863'/82' 69 9'9.08'.840'
29 1.' /7069 863' 1 6 .9 F6 '26 ' 3'
/ 19249863'9 082/2'/82 29 19'/ 19249863'
$' : 868'D .6'49'G 3'F60B" 69 0 . . '91 9 1.'
4 '" 8'G0792 '4 .92468 #'.68'F 0F1 .'6'
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'P 5 +)Y?# ; ' ' ' ' >3 :E ' - ' ' 67=7* :* :+@'7'1?2 6 ; :65 @7E56? ?</F<2I"
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/ n 2;' 2)' ' +A ?-' RE)' F ' ?29576 = 79*5152; 50 *?>)?:645 2 :6?270;. A5
' 6 '(!' 1 ?5;4 52;76 = 79*51I2;6?0 *5> ; = 9 >5/= ;
; (1 ? ((3 I43 ''67='2'?4 ' 652; ' 5 '
.'@ * 0' 'F2;] ^?B ' ' <KA' % ' # ' 76 = 7K52;'76 = 79' 715=5; 7= 6* :* :/292F'
2 (3& V ' Y M3 & 0: ' 2:GF 5;5= =2'?4 ' 652; '5225272?5*; 44='E 76
0 & ' 7' , ' =7; ?7? 5 ;'Q4255*; 74='E;7= =7; ?7 6 K 9'6'K
)' ' ' ' G]' G ? ' ' ' / Z F 50 4='* :;52;'5H'*7 ;5' 65995 4?6: 46?295 \ 51 =
'+ 7 8'F D ' *9 ? ;5 'A59' 652; A59'6 :6' 652; ?? 156; 7'A5 0'Q
* ` ' 22A ? 5 \ / '; ' < "(' 29' *7 ;5' 65 5 6 K 'A??7;'"A594; '7 0: 5= 74;' 42;
1) \ U= 9' * ' ? H; ' < 5 '6:6'27; >'52;'* :07;5 61 ?790: 5
U & ' 2 ; 42;); 7= A?* :0?;4 '5 ?7L04>A59 42;4>' K'
' -) ' ' A]' + Q 0556 '140 ?7; :65="34 7/A) 5H*7 ;?7904
' /A?9 72;4>52; = * :*;? 6 :6//65?52 7 7 67<'
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I'"/ (T# M @'D ' $' $4 '@ & '7 ; ('34 7'=56;
' Z ;' 2' ;' W ' ' 'F 0 ' ' ' ' ' ' B / ;7 A59' 34 7' 1 ?51 ?'7' * : 4;7o S B/ // 21 7 :6
/ + 56156??>'6 '@'34 :1'6 :6' 652; ' 652;?'7K54 '1'
#@T '3< 'P !" *' - ' ?56?5> ' *5??76; ' ;5='34 79 ?6 >'6 := 6 04>6
$ R * < ! K' @ :!E ' * 3<(' :@5N" @ M&R ' 7**59976; 'A594; 34 *97;764= : 6 6?= 72 /+2'
"D $: H 6 : 6 : = 6 0 4 > 1 ? ? 1 4 6 ;

' M' :' ' !' p 5' ' ` ' ?=

K (0 E /. /7 9 8 016 8 49'0.. 492.9' V !0 '

' =0+"&! "'% + %. ' ' (( ) &*"/%* &) ' V' &, " '"&' ,' *+* & . &' /' *,<=+ !&7

64D 16 / .63' & ' "1" 490 8 63 ' 02F6 / 4 ' O' '

0O/ F6/ 012' 8 /4/' 4 416 ' /' 0..E402 9' 0$:

0... 921 0 8 9061. 8'G/. 9..0162 048 .. ' ' ' ' ' ' ' /' ' H' ('

16 . .0 D929 0 "9 61 F6 34 9 10 7/0..E49 ') '9'

."1' 1'..// // '2/2' 92 8'0.. 4 9'0 7/ ".' 1'. / /2 ')3 6 6' "=

94'. / / '9 1'9 63'D9263 ' .. 4 9' D 16 ' "1 3F6 ' M ' ' W O O S ' I E

179 8'. /2 1 16 1 '2/8 201 8'4. 2 0.' '& &' !)) H)CC' '4< 'M C' . ,@+@))%

9$? "9 61' 6 1 1 0.. 4. .'"9 1'" 163 94 0 . '

268 . /' 29' '!)'4. 2 . /2.' 802 9 168' &<*' D9Q / ')1 ') '¶ !9J\ C'

263' /'0.. 4.219' 68 8 8'. 9 "9 61' 'F6 3'0 '

7/ 98'9 19'. / / 016 8'4 9 .'061' 2.9 68' 8 / ' !D! ?.*'; / /\' ' T' ' >4 4 ' * 7

6 9 F6/2 08 026 /' D92. 9' 492/8 204690.' = ,' ';?.29' E' ' c< '1@63) + ' /' + .

1 764/'4. . . . 4 . 6 ' 94 2/2 8S3/8 2 0'

D929 0' 9. 9763' 011 7662.6 '9192 8' 9. .3'C' S' E612B; ;9 ' ' 9$ S2 '] '

2/8 92's) 4'9 2 1 /29 $'D92. 68' 6 9 621' T(8' D' 'B2 @' "% .3 ' . '

D 6 '4 **1'0 768'**&D&'**. / / 0168 89.'"**.'D92&630.' ' /@/ /1' ;B 3 $ Z

X 1 F6 04.2/8 201894 1$29."1 / 6 2' ?' J$1 / 01

"9 "14.2 8 1 /29 8 ' F6 0' 49 8. /' C' / 68' "2S0 ' ' ' ' ' ' ? ' ' ' ' S S

8 0 E' 8 2 621' 8 6 1 061980 E 62.. / ' = 3 !7' / 6

010 ! E 1 D268 0 3 G/8 / 9F663 0..1 D 6 ' ' ;' & ' 7C<

0..9 168 . 9".0..14.23' "' 63' /.631 B' 9 ' M & ! ' ' 0 .1' + +7 $+(+3

.9 9 $SF6 763/8 2 763"48 6O 3 8 9 .4 ')=

0#6 8 9 1#. /2 4.10 .06 . 8 62 6 03 9093 2/2' ' ' ' ']' ' ' 5 "

2 2 10# 98 8 8 0D 3' " = S 9 . O 2 06' S

. / 763 ? ./2 49 01 / M . .9 061. 8 . / ' * . '& "3 ' " 3' 3' 1 1' 6"' 3' * P

4 0 9' # 2. . 9 8 3 / 19049 2.9 3 1 ' ;' . ' ' %! ' + ' F# J85" " / J[E

R A" F$04 4 6 460 A 6. / / 1/ 68902 ' / / '] ' ' +& 3

4.2 . 921 089 94 92.#. /2 0. 02468 'A '02 ! '= ' S' (' ' ' ' & ' ' S' A' ' ' (??

19 01/ 68 C. /21 0 / 68 C 9/ 68 F63 9.62

468 60 /298 C G07 16 2 'C9/ 68 F60B 9' ' '&-' ! '

.62468. /2. 04 1 /298 'E S4 .6216 W C90

498 . .21 0 C 2G 32/24680 0 901 6 63' 9 S S0 DS K0 \.0 1 @"6 '

G . ?? 4 6 49240" F6904 24 6 460#"9 1 02' ^ s ' A ' ' 3777 7]' K' ?" "' 5 9

6 1/ 68 C 2 6 1/ 02 "9 46 OS94 8 4 E .

!Z! 1013 U' " 63' ". 639 9C2/2. 9' @ /

() & ! B_ 0 .6 632/2.024989 9 /701 ' $ / , @ S " [\@<1@ 9/ 3+

O9 1 . /2 6.0168'9 1' /7 980 8 O3' 01 /'& ' ' ' 1 S B 4' ' 1

C 26 8 1 H .06..8 / .63. /269 1 16 49 ' ' M "3' ? " 'S A' ' ' /B ' 9"?

04. /2 802468=.04 9 6102468 41 98 8'

/ 0104 6 / 9 2/8 2 763" 090. 6#061 2 . '

F69# / 16 02462" '". ', S SSEV"2 6. 0 ' ' ' /E[;9E?' P' " '

19 . /2.940. "4/7 . 01. ' / , 2F6/2/2 10' _.) + 6 6 R % W3!,X @bC<"35 & & ' "'

208 2961 68 G/168 . 01 2. .63" 4.7 ' 9/ /=R =4' '

.6 'F8' 2/2'. /2.9401' W' 8 3 4 9 2 1 6 9' ' L '

0.. 0923C 4 .6 0.1 . ". "1 6 8 F69 9 ' 9 "9' '& ' M9N

30 19 68 ,$B L ?# 49 24.. /2 49 0 .0G 68 .68' / !D!2 3 ' + ! 3' & ,," 3

F6 4 08' 1'F60 '"9 6 8 ' R 2'49 2 4/ 2 763' S ' '9 0' +6 . &- ', ' 3 W. '

p2 8 cS "9 6 8 ". ' / Se 'D R " ' / 'D 1

> .680 . 2 6 0 F6 0> . /2/.. 2/2 / .9 1#' J' $ 3' s &) ' &

E). +"! % 3 '+. = "% %/ 3 & .& ') ' g;)9 /RA' JK) e

F6 3 D 86 463' CF6 0 26 4 0 208 86 4 09 # 5#W+' 3 "' . ' ^ ' A "&

26 468 F6/8089 9. 8 /763' ` . 3F6 04' ' AA b<RA N =\h eA=J= R b<1 2JB3S ' + . # / '

24 D2024F8' 1/ 92 63'9 1' + % ! '&,&' 26 4 3# ' $) % 9 ' 6 9' ' 01193' E# E, " ')) ' ,'F E/

& . +"& 6 - %" % . & ' F6 3' 1'9/ 08 "19 F69 A$'& 'O' 91 c ?S =J"' . /' F' + 0 /

.'92 2' 9 .668 . . ' "1 68' "9 8A'02' 07' E' (?' ' ' (' E ' 0.' P

68 1' F6/ 4 0689 1 $9 01 26 4639 F6 ' ' ' S 9 / 9' / . . /'

4/ .1' 9763' 7/2/ 68'@S 9?' 9.624 3$ 04' 2 ' A B B ' c , 8 - " 'S '. S' '\ SJS' /

4 D202468' 06.98' / 92 63' 4B ' F6 '4/ .1' 9 ' ' ' ('

763' 8 0 / 68' !9.624 3# 0Z1'. 68' F6 1/ .1 F3 1'04' 84 D1 0 4 8' ' 2/ B' 9 B' 26 468

' & 8

' 5' ' M' : I ' @ =

/ ' ,7'!-] ' ')9R/] R 7 :')`P < @ 3# ÈL7 7 ' 916 689 .49 2 4/293 /2/8 2 7 3 '
249 2 4/2 763# 9.49 19 9 4/29.042/1
9 692 0.61' S 92 1/.049 28/29. 04 .0 2/
F6/4'F6 8 ' 94' /'0E F6/'2/8 2
/ - +/ T(' #1 0 ' (2494 . /29 49 2 . /4 10 69 . 6
#S= '' '' ' ' / 40 ' # M M'`?V9S M' .66 1' '' : 0#1. 909 /7 98019 / /1#' '
'/7 . 92468'. 1EF6/2 08'/% 9 /'!
1' ' < 1' S' ' ' 0 D68 9216./2. 0.G9 8H .06.98 87463 9
; ;M 93 A) M $E; T ' ' 'S 1; R ' ;GJ 9 r ? E 4E 01Fo9 9 . .9 9R F6 76# 82 72
/ M3 K.1 E 6 '' S &A "9 '26 3' 2.4 94 689 1 .48 /4/4 401
e ' # I '4 1 DT 1 ' 0B0S 1 .A R# /'@ / ' E.B\ : 19 90'4. 2 9' F60 0"/.02. 0' 2."
] &8 6 1 4S F60 02/2 S061.
7 @ I 3 > ,/2 8 02468 C04' 9 9 92468 ' B.B<a. 4
3' 2/ 2 2 763' "93 ? 0 9 0240# F6 763' 86 '
<! J - ' ' : $V 3 " 1 ')! . ") ' ,% & % &/ '421'9 4'
@ ! : G '' (:P' \' ' ' - : 8/4 '"9'2/2'9 6 8/4 '2/2' 08 63' 9F694'
. 3' 1 ' ' R H @ ' 1 'D' R ' UA;')B 86 . 164/ '9 98 'D 020' 0 67 9'"/.02468'&/'
/ ' 0 ' ' H ' ' 0 E E F6/4' "0 91' 04' 02 10198'9 H. 92408 ' ".' 86 1'
A'@;' M' ' ' / " ! ^ 1' = 3 ' ' DZ R 0 ;') "/.021 '0206198' F6/4 / / 168'9 1 '04 02 '
K ' 4$ ' " ' (3X 10198'9 =. 9 408'"0 901 '29.29$'2/2 08 4'
$ 4 .92468 '"1'8 6 1 ?? ' 94'"18.4 !63

> 9 / . 3 9 22.21 7630490 F6 8 6 1 38 /4 34 .6216 ' ' ! 0 '

' ' 7&'S] .", " ! <, -! & ' 6 3 . !" & !&,= ' ', & ,[2 Y. %' '=&%M % .' '8. F, .F/ d

) 3' 3 .1 ' 6 2 6& =,+3' = ' ' ! $ 5J919190 ER< 86P 38 /4 34 .016 / 162
'+E J E +3 ' M,) # 3' = C, %+& ' 06.9 1' 1' 29 .' ". '2/2' 2. 9 1/70 9

)A3 ' G 1@' 01 1 /E 3$$' ' ' 33 A 'E @ ' ' F6$9 0 92 'F6 0 $' 06 38 /4 3 1 '2/2 0 ..0
& # & . ! '+ '+3' = & 6 % ' !-77 ' /7 . .1'2/2' 49'. /'F6/4' 9' 2'46
=' 0 D ' @'W- 3' ' = ' ' 7 6 8 "/ .06 1 .4490 19 / H .06198 /463./2

% . .) !) T . * "+ ! + ! . ! / " "
,' <%5#F =-%, %& ' 0 M .4. 1 I' 1 '! ' 19 /707 863' 0 192 8'2/2' 19 9E '087/'2/
W &J ' '- + %= ' ' P' ! # !' / 0 0', " : .'(/ K863' 9 48' 2 8021 '2/2' / 63'9 1'9 './2

+3 ' &' ' ; ' &' = ' 91' 9 610168 . . 1 1@ 90E M 68 2= 9 '0. !
A'E1 @ = + ' ' '+=# MT 5 # = _+ ^ Cf -5 %' 8 19 ' "2 / 19249863' 09 9 .1 9 19863 S\ '
W "'] ' ,>)@ # 3' +) ' =) ' . ' = +-= , ' ' 1 E21 2. 9 ! /2 802.9306198E
'S//2 9 /0..
$A @ ' 5 ' I' ' &' ' ' ,V 8 9 9 "96 2 961G/. . / 16 0168 2/22 01
kZ2' 1'! = (; ') @ 5 7 %' /702468'482 ' 29 9 ' 4. "2/'4 919
`6 M3E . ' '' ++' "9 61 G/8 2 302 6 B 88/ !0 3 \829F6'
$A + ' 3 ' p <#E ' 1' 02 808' &,& 6/ 10P8 'F6/. . ' 63'.
?A KS(' M' S $9 8 /' ./2 9 / 689 9'4 / 191 F62620880 2

V&31"A ##' 0.5/6@! ; b "7 ' ' /1f' '. 1'2/7 3 .8 1030 N 9 4 './2 862. 8'"2012' Z'
, ,' E $?/ ' D 0' 1 /2.49/26 763 F6. 8048 F464 D./891 0 "$
'T . ' W T ' / %7] J' ' f) a% +3' ? , 4% <+. . !" ' ! & &'# +'!'11 02D 68'7079 9'1 93'0'
% 3 ! N' ' I ' D6 / ;SF60 93' 46/763 .4 3' %' ='"9 7' 86 1'
8 /4 4'2/2 01901 .6 4 1 2 168 9 1F6.'
: < M .1$ B' U; ;S)Z ' D ; 1, "p1 r ' D , @ 8/4 3'4 .016 'C'19 9 9 9'C'./2 180 9' &#+ &
9 * R' + [? '9 61' 'F6/4'4. . S '9 1' "1 9' "9 'G/29 162 #' . .'
'@ B .3 3' ' " -+ ' 0 % #)' 2 2064612 B'087/'. /2 180 9' "9 9 9 9 9 P'.'
' 1_ JB fX / '(@ /1 ' 0 "* < F6/4 / / 169 11". 6 '% 9 G/29 16C"1 1'
K' ? + ' =E . 3$')3 N75# 3' $&& 06.29.7/29 1682. .'"1 9 T 4 '2.F696'
T. *+# +*! '0 1. 8 8' /702468 '.6'0219' 2
=) -+ ' ' (! '(? 4 .0168 9 .0 .9 08 C9 0 . 18 8 2 8'
- ! ! 'N 'S7 $' 3R'Z ' ; P' ?' 0 ' I0498 81 / B 6 0 21 8FHA@ S??S '
1 21 ' ' S4 8 4016 ' ' 5 6 63S? R 0 S' F6$
V 0] 3' ' ? , ' ?) D(' @ @ ' , +;' 3$1 G = 1 3 861 0 08'4 .6216 2/2'" 7/872 80 94'0
Q! ' K 'N: K '4 6Q7' @ U ! !QW % 6+ 8 11 1')I 2 ' 3 8 2 8' (

. "1ˢ 2 3'C . 63'F6/4'04' 2.8'" 3 "ˢ
'' 'U 3̄3 ; ('. 1 . .24 ' 02 .01. C 0 714 '
1 7298 '" 63#". '".'46 / 6 2 '" 1'. / . 6 / '
68 90498 ' . .2. 04 . .6 0 1. 6'2 0 . /'2/'4 '
00D 3' 2 31". '"19 63'F6/4 ' ' . ' . C . 63'F6/4'
'B 9 0. E493#"1' . . . @ E1 02D6 68 46/ H 3'
94 3' F60 .BG07. 9'. .302D6 /3# 9 '0.. 4.23'
619'0#F"6 0.. 68 '20'F6 0'8 02D6 /'0F6 0.. /'
J. 4 1'"1'1. 02D6 6' 1' 9.62468'G/.'./D2/ . '
63'F6 4'46/763 ..1 3'0#F 0 .3'G07.1 B S 2 '
. 2/3 D .6 '26 /'8 /4/'./2. 2D01.024.. .'
P0 68 . 6 2 . .2. 02D8 02 . Z /8 > G/'
#/2'S 21 2D. 9 1' #'#8 1 'F6/' /4/./21 2D 1' '
008 9 168 ' ./22D. . > 6649 9061.8 .@ '&'
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/ . .240 ^? F6 ./0. 2D . , L <[S, , '
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"2G0 04./2 8 024G 0 I . 610 9R '
!- 5 O' / . .240EF60#'2/2'./21 2D 1 'E ,' 3'
9 F60'"9 7' .9 2 .1.240 'I.'2'G 3'F /F6.'
'0. 92468 '' B'. 8 'O 1..F6/.8 /4 3' .016 '
8 29. 08 'G/.'G6 63'9 9". '2/2'. 1. 4P' 4.8 '
/. 3'./2 8 02468 ' 3 '"9 . . 92. 0G02.'G6 '
< 55 * T'". ' 2 3 ". '"1'. / 6'F6 ; " S $' 29 '
. ' !'9/ 18 ' ') "' 9 '0.. 4923#'06.'./9 0
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01 /' C ! .6 4 0 3' ..19 / 68 '/8 2 68 'F603' ' ' E/ 1 E ;' 4 ' ' : 2 3 < *)T 0' E
.62 6 " B'8 6P08 8 .8 '.P'2 6 4 103'G6 63' ' S'. / /\$'/
9 "9'2 2 3E"9 61 ' 02 .01 3#"9 '"../8 8 F60# .K ' ' ' '? " 'K S ' /A' ' I' (' (
S S 04' 2 . 8 '". 8 ' 68 .24 ' G0 8 04'#". 1' ' . ' 9/B
63'7 $' @ "(O "'; "'0.. 4923 'F698 04 2/46' '(3 J* D ' ' 3 *'@ 'C $O '/#!S\./ ' '3 @ ' K' '
E'F6 '46 ..4 9'44.1100 " 2 ' " '2/2'F6E0' (0 "'' " , 3 ['.)3' "*3&X - < '5 .' X J* D ' 2 \ '
268 ' 94'F6 0'46 .1'9 1'46 .94 2. '92 0' 9 '9' ' 'E' ' @' '
#/2.6 . 1 268 '06.. 0 . 0.. 4.3#'F 0 06 ' ' ' S' ' &
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B, L .2 .668 C# /.62/G10.9Eˢ .68 .6ˢ ˢ (?(' ˢ ˢ ˢ
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. 63./2. 01G9 8 0D68.6.0 / 6263 I 1ˢ 5&& 3 ˢ 3+ =,+3ˢ
v.98G 9<[6/F69 /.63./82 8 3ˢ 04087/ˢ V <"< = J< +ˢ $ # @1 ˢR
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9 19 9408 2 .2 6'9 .' 9 # 1< 4/C # 9..0168
8. DS619 .92. 9ˢ498/ 4 01 /E .B, 4.ˢ Iˢ " ˢ /$ˢ . ˢ " & ˢ ?ˢ ˢ "ˢ
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A R # / 1.2/ ˢ06198ˢ3Sˢ 9 03 6/2ˢ92 8ˢ29 ˢAˢ ˢEˢ R E R

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* K U 3 .

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+ j $ "] 7A?;2 : Z # k #) 7A? 6???9 .
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O BB 0 < %K#B : 8 6 *A#5 F 5 2# - 2 A597- 34779 79? ?7
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9. 0 @ . 5"! 0 F608 9. 98 8/163 0. . 4010 1 8088 /29 #
& 3 < . +) S ") /R &"9 61 AB 06D9 ". 8 6 $". ./ 68
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\ r JE < 1 YR ? = V SS;9E; S 782 /6.16 C . .0/47826 62 9. 988
? SA V 2 A 6. .6 /.6 467 42/28 4691 , ! 6 ". /
I .A D2 6 9 .0 D68 .2./ 8. 004. 9 2
] (? 8 H < * E ; * ? @ ! -) <C< 2 (" I N033 " 9
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9 E (3 ; 6 / < / S A B / 2 + 2 k(34 ;2/G1?2 = 5 6; 2;? 4>5 ;7 224 = 5;7 34 *
Q 7 8 51 = 7145 24> 15 4 : 65> 27? 997 2 ;7 E4 = ;
@P@ < 3 I N#!) (I VP S 0 ;7; : * *2 15 7 574 5 = /f 6?:34:1E :
@(@ , ?9 * <?13 < 3 @A 5 * 2;< 2 (3)06 3J * : 2 ;4 = ?2;)?4 5 ?2 : 62534?6> 2 ? 34 : 1?2; *) :
8 7>) 0- "(O ;> w F 5 # F G 5);; , ;4 = A52 36 165?5227 0 2 ; 2 ; 1 34 : 1 52; * 1
N 7) @>) N) *$ ((4 N N " + 2 D<6 : 62 667 5 E ;4 A : 96 ; (
C ; C PaJ ! .6 . 29. . 027. /2 9F6.2$. F6/49 1 /
%, /" / $ / .68 208 4 /70.S8 1 9 .9 B.# 4F6TF69
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&] *] 4* 2; @ "M @- 3 $ "D ? +34 12 ; 2 34 : 152; * : * :

2 3)(? @ 3@ 3 $: 3<* + * : 2 ;4 = 8 ;5 57 71 ;5*4> 52* ?? 5 ; "\ )@0<
^ /;.) < B # N ;-b 0 : 28] h + * 7 ?40 1 2? ? *5; 594?L2 8 1 H? ; 134 : 179
;F \ : = # >>85 ; ;4 65?5P 7 0 74E = 67 = 76 = 79 7 25 = * ? 7946
/ 8 B / Q 2 ;4 6 : 6;7 = ?625 = *5 74E56;4 ?? = 34?2 34 >

U: A + ;U +d#< E N ; # K 52; * H;? ? ?5 = * : > 9941A5 0?; 7 = * H25 ;)>
" ?4 L34761 : 3. 156 2 51 ? = 4 * ?H9P; 7
@ 24;4 7 A594 19 > 152? 9 : 65 = 2* 5 = 5 = 6 2 F 74;5 6 6 : 6 * : 4 = > * 99 34 : 1* H;5 ?; = 52;

A 9 01 02 01 /294 6.01 /2 3B (# F

B& ", (! . & ! & , + ' - . !) + " . ! % e93) %& % 3 3& 2%& & + &, %. &h
2"&"/ - &&

1F 4 2 @M E& & b S . E; E ; 8 ; / G 9 19 10 / G 1 .63 . + 6/) L! ! 8
46. 81 3 04 4 49 F6/ 0 D68 901/8 8 ./ 0
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@ I E 1 I ($; * 9 1 2.91468 " 4. .6 29.9 0 68 219 468 29.
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G9D021. 9/ F6 9 /24.1 F6 49/ 8 F6 04
1G9 8 9 1 2921 04 4 0 7 .34 D6216 #0. .
09. B 4 1 06192 " 1 4 # . 6 0/4 04 F6 /40 D68921/S
$ 68 22 0 /2>9.0. = 6 . . 91 08 .68 "%

ˢ Mˢ :ˢ 1ˢ !ˢ B $ˢ %ˢ]ˢ # ˢ BB ˢ .

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0. 0 969 19 9196.0. ! M'208 F69'96. /E.. 02'
/ / 168'.6. 116 ' 4..6 '0619'2. . 0 68'
.62 04.G. 18 . .8 9 K9'" 4..6 '2..'108 .2' . '
1 29. 041E6/4 01 /293' . 98 216 4 692.D02..'
9/F6 '4 6.01 /2. 2' 6 1 2.1 ' 6.'07464 /2.'
/707K 01 . 04' 4'0 0'4'.6. .9 9./29'
AA16 '5 9,3F 68' # '.68' $'04'F6/4' 0. /2.3'4 '
D62.6 E ..'9 129.9 10" 68 '2..'. 1.'" 4..6 ' 94'
0 19 '0.. 4 9'"1' 0 . .2.G/' . /24923' 940 D60'
&8 '# " ''< !'4 '8/4/ 8'" .868'" .0.'
/ / .91#F6/ 08'/ 22 2/' 98/.63'C#0 9263'" '
4916 . .'04 0 .. .0' T /. .0'49791'9108'3'
(F6 ' . /249 2/2'4E 1 0 . 2'C#8 / / 68'9' '
(79 . ' 94'.=.949 9'F603'2/2' . . 292.'04'.G9 8'
D2 .023'FM .20 '2/2'" 4902.6 ' .91' ('./2'
.940.' . 6F0.'.2 8'0.. 4 9'".'80D 3'0 D28 92'
1/ 68'2/ 0' 07/ .1E'F6 '2.. /D02. .62E'/8 '
'2 0'9 3'./..462.6 ' 3 '9 0 8/4 '2/2'./2'
.A 6402.' %' : 1. 90'F6 .62 F69'F6/4" 3'4 1'
F6/408 8 /47'8 6 .0'4 1#F6 0'8 6 10'.6 F69'"$'
'29.9 0 7'. 2 9F6921 0' 621$"9 6. 'F6 '4 1'P/ '
8 09 2'9 .9108'02 8 0 '9 1.'4 ? 1 C '02 8 016 2'
C'7 9498 ' 21. D921 . 92. .F69'.0 0.9'
T 60 9'F6/" 3'./ 8 F69'./2 .F66216 67 0./'
1/ .6 '.. 08';" ('07' 2 1 /' +#+, %. ˢ =94'
.069 9'/ / .9. 2.'04' 4'F6/4' 9'4 8 0 6 1 0 0'
. /' 014219 46'92 8'0. O63' './2 9F6923'.691 '
1 9# 2.9 468 "9 U 68 / R , / / 168

, . ' ';'
' ; .
/EK S / d' ' IJ.\d' ' p' @ @* " 3' ' V50.!"'
"(" ' SP 2 ' ' ; *
<;" ' ' 0))) + '7/' 6- "
' + ,+'S' =
* & - ('* '" 3' ' $ .1' / ; S ' " @
R)"@<]/@ ' ( ]" "@ @
'E : - X 'R : *'E3.'"" !' @
"D 33 *@X" (* !0@24 @' 2!() 6 < * ' ' 9
U '7 2 ' 4 4"() 3
:$30 ; : 3 @(*')3 *: * ' (*' ' : @ 09
-E ' _' I 21d/D 2 '^d/ 9S ? ? .1 W ;!' ' (
< @3
" ' ' $"zT/ + 3' 3 '&a#%M ' zT2
" * 3 : : @ 5 * ' 0 E1'
' : : @ 3 * K$ (; * '@ P3
L' 31! 0=11' U' N' ' @ & " ' :-+ 0
/WOE' : P&(3 @' $ R '& *' ' O *' ' P 3@, @' 0 K3
R' ' ' ' ' (

! ' ! ' /3' 3' 1 V"' ' "
' ' + /. !& 9%/' ' *&#"+-+ ' ' . ,+"& !)) &" /' #)- +"" . /

68 29 ."9 2/289 9'".G/8 8' N79' ' ' ' ' ' ' ' '?
SLR 8 / 728 "9 02 10 .8 'G 3
0 19 /076249 8 630 D68.2. 3 S S @ @? 23
. 19 ". '2/2' 29 19 9. 08'490 19 /'076 407 8113'
/.06 98./269 . 16'.86 0490127/69 .A162208 1' K 29$" \" !X 3& 2; 4$ (A 3&0 * E @ '4$
/706. 8 3'0.. 6 2' 29 9 /70.62'9 . ' . '
'F668'2/2' 9 9' 1"9 7 7707 1 03'2/2' 29 19#' 3 " ' P /!: $M; 'D
/70168' 9 1 . F668' 29 9 0..1' D 16 '04'
087/"1 98 C0?7 4.68 ' %' 2 6 9 1 0 ') 6& ' 3R/ ' '5 / : I' %#)77
D6 ..0 E1 02 01/2/8 2404 /10. /298EF60 1'
80D 3'./ 92.0296 1 #0.. 4 . F608 "1 / 16'
9 12/892" .861' SE Z < 9CB ' 0 "&c? "&c'S?8242/0' ? A 4
&(& %.' / .921'F6904 /468 / 16 '. 1 94
#'6'F6' '%%,1: S'G079 E '&6' .'# &O!" '.+!' &-%/'
.6.' J 2'X &O '+%') #-&. . &66+ 6'7/20'9 '
9 0.# 8 . F69' X & '&! %J .6 63
M 2/2' 9 1# 7/263' #F698 048 /468' 92/. 0 93'
9 19 .6 6302 863' 1.7/2 3468..G 8'
.6 F699 194 98/ 98 ' ' T 2 0806.98 9 K'
623'0 0$'29.9 10 7' 6210 0#' 6F 9 0 S'"1 /A' R' / 0 EpK 90Lh`
$? 7.1'8/4/ ' 4'F6/4'29.9 0 B\' E . 6F69'! '
& & /106 E"9' 4F6/4 9 623F49'& '. "9./2'
1 0 22 'RcB0 @9.9 0 b# 912 9' /.68' S
*&'0 D68 901/ 208' '29.. 0 62 1' . 08F69' /' ; ' ' !)96 :''0 ;EA7 / <
((/ P91 1E 9 .668 @@4 .9 9

/ 22 2 89 901 . 11 + 2 10 22 ' 8 9 F69' " 18 = @' ?
./21 0 089 F6/4 9 6F6. R 1 2..9 0 E/') 6 /' - !) -+3 . ' 'K"7 !7M3'
L 4 9 . 98 9 2 2 06. / 76341016 B@' S

293' 9 68 F6.'%" ' 8 /7 ' 017 @ 9/ 'F60 '
1/ .9'04 6.'80D 3' 9..06 I '7/0/3 0* V!3 @' = 1 /' : 3 :3 D* ' '$@ '
E5' $b

ἀνάγκης εἰρηκέναι. ὡσαύτως δὲ καὶ, εἰ τὸ ὁπότερ' ἔτυχεν, ἐξ ἀνάγκης ἔφησεν, ἢ ὡς ἐπιτοπολύ. οὔτε γὰρ ἐξ ἀνάγκης τὸ ὁπότερ' ἔτυχεν, οὔθ' ὡς ἐπιτοπολύ. ἐνδέχεται δὲ, κἂν μὴ διορίσας εἴπῃ, πότερον ὡς ἐπιτοπολὺ, ἢ ὡς ἐξ ἀνάγκης εἴρηκεν, ᾖ δὲ τὸ πρᾶγμα ὡς ἐπιτοπολὺ, διαλέγεσθαι ὡς ἐξ ἀνάγκης εἰρηκότος αὐτοῦ. οἷον, εἰ φαύλους τοὺς * ἀποκληρονόμους ἔφησεν εἶναι, μὴ διορίσας· ὡς ἐξ ἀνάγκης εἰρηκότος αὐτοῦ, διαλέγεσθαι. 4 Ἔτι, εἰ καὶ αὐτὸ ἑαυτῷ συμβεβηκὸς ἔθηκεν ὡς ἕτερον, διὰ τὸ ἕτερον εἶναι ὄνομα. καθάπερ Πρόδικος διῃρεῖτο τὰς ἡδονὰς εἰς χαρὰν, καὶ τέρψιν, καὶ εὐφροσύνην. ταῦτα γὰρ πάντα τοῦ αὐτοῦ τῆς ἡδονῆς * ὀνόματός ἐστιν. εἰ οὖν τις τὸ χαίρειν τῷ εὐφραίνεσθαι φήσει συμβεβηκέναι, αὐτὸ ἂν αὐτῷ φαίη συμβεβηκέναι.

* γρ. ἀποκηρύκτους.

* Quidam [illegible], vt Boethius.

esse dixerit. Itidem & ſi id quod vtrolibet modo accidit, neceſſariò, vel plerumque *eſſe* dixerit: quod n. vtrolibet modo accidit, nec neceſſariò, nec plerumque. Sed & ſi *quis* nō definierit, vtrum plerumque an neceſſariò *eſſe* dicat, res autem plerumque ſit: diſputari poteſt, quaſi ille ex neceſſitate *eſſe* dixerit. vt ſi exhæredes dixerit prauos eſſe, nec definierit: diſputari *contra eum poteſt*, quaſi dixerit neceſſariò prauos eſſe. 4 Præterea *videndum*, an eandem rem ſibi accidere poſuerit, quaſi diuerſam, propterea quod nomen diuerſum ſit. quemadmodum Prodicus diuiſit voluptates in gaudium & iucunditatem, & lætitiam. hæc enim omnia eiuſdem *rei*, *id eſt* voluptatis nomina ſunt. Si quis igitur gaudium lætitiæ dicat accidere, idem ſibi accidere dicet.

Loci à contrariis. Cap. VII.

1 A coniunctione contrariorum. 2 A poſitione contrary. 3 A conſecutione contrary. 4 A ſubiecto contrary.

CAP. VII.

Ἐπεὶ δὲ τὰ ἐναντία συμπλέκεται μὲν ἀλλήλοις ἑξαχῶς, ἐναντίωσιν δὲ ποιεῖ τετραχῶς συμπλεκόμενα· δεῖ λαμβάνειν τὰ ἐναντία, ὅπως ἂν χρήσιμον ᾖ, καὶ ἀναιροῦντι καὶ κατασκευάζοντι. ὅτι μὲν οὖν ἑξαχῶς συμπλέκεται, δῆλον· ἢ γὰρ ἑκάτερον ἑκατέρῳ τῶν ἐναντίων συμπλακήσεται· τοῦτο δὲ διχῶς, οἷον, τὸ τοὺς φίλους εὖ ποιεῖν καὶ τὸ τοὺς ἐχθροὺς κακῶς, ἢ ἀνάπαλιν τὸ τοὺς φίλους κακῶς καὶ τοὺς ἐχθροὺς εὖ. ἢ ἀμφότερα περὶ τοῦ ἑνός· διχῶς δὲ καὶ τοῦτο, οἷον, τὸ τοὺς φίλους εὖ ποιεῖν καὶ τὸ τοὺς φίλους κακῶς, ἢ τὸ τοὺς ἐχθροὺς εὖ ποιεῖν καὶ τὸ τοὺς ἐχθροὺς κακῶς. ἢ τὸ ἓν περὶ ἀμφοτέρων· διχῶς δὲ καὶ τοῦτο, οἷον, τὸ τοὺς φίλους εὖ καὶ τοὺς ἐχθροὺς εὖ, ἢ τοὺς φίλους κακῶς καὶ τοὺς ἐχθροὺς κακῶς. Αἱ μὲν οὖν πρῶται δύο ῥηθεῖσαι συμπλοκαὶ, οὐ ποιοῦσιν ἐναντίωσιν, τὸ γὰρ τοὺς φίλους εὖ ποιεῖν τῷ τοὺς ἐχθροὺς κακῶς, οὐκ ἔστιν ἐναντίον· ἀμφότερα γὰρ, αἱρετὰ, καὶ τοῦ αὐτοῦ ἤθους. οὐδὲ τὸ τοὺς φίλους κακῶς, τῷ τοὺς ἐχθροὺς εὖ· καὶ γὰρ ταῦτα ἀμφότερα φευκτὰ, καὶ τοῦ αὐτοῦ ἤθους. οὐ δοκεῖ δὲ φευκτὸν φευκτῷ ἐναντίον εἶναι, ἐὰν μὴ τὸ μὲν, καθ' * ὑπερβολὴν τὸ δὲ, κατ' ἔνδειαν λεγόμενον ᾖ. ἥτε γὰρ ὑπερβολὴ, φευκτῶν δοκεῖ εἶναι· ὁμοίως δὲ καὶ ἡ ἔνδεια. τὰ δὲ λοιπὰ τέτταρα πάντα ποιεῖ ἐναντίωσιν. τὸ γὰρ τοὺς φίλους εὖ ποιεῖν, τῷ τοὺς φίλους κακῶς, ἐναντίον. ἀπό τε γὰρ τοῦ ἐναντίου ἤθους ἐστί· καὶ τὸ μὲν, αἱρετὸν τὸ δὲ, φευκτόν. ὡσαύτως δὲ καὶ ἐπὶ τῶν ἄλλων. καθ' ἑκάστην γὰρ συζυγίαν, τὸ μὲν, αἱρετόν· τὸ δὲ, φευκτόν· καὶ τὸ μὲν, ἐπιεικοῦς ἤθους· τὸ δὲ, φαύλου. δῆλον οὖν ἐκ τῶν εἰρημένων, ὅτι τῷ αὐτῷ * πλείονα ἐναντία συμβαίνει γίνεσθαι. τῷ γὰρ τοὺς φίλους εὖ ποιεῖν, τὸ τοὺς ἐχθροὺς εὖ ποιεῖν, ἐναντίον· καὶ τὸ τοὺς φίλους κακῶς, ἐναντίον. ὁμοίως δὲ καὶ τῶν ἄλλων ἑκάστῳ, τὸν αὐτὸν τρόπον ἐπισκοποῦσι, δύο τὰ ἐναντία φανήσεται. λαμβάνειν οὖν τῶν ἐναντίων ὁπότερον ἂν ᾖ πρὸς τὴν θέσιν * χρήσιμον. 2 Ἔτι, εἰ ἔστιν ἐναντίον τι τῷ συμβεβηκότι, σκοπεῖν εἰ ὑπάρχει ᾧπερ τὸ συμβεβηκὸς εἴρηται ὑπάρχειν· εἰ γὰρ τοῦτο ὑπάρχει, ἐκεῖνο οὐκ ἂν ὑπάρχοι· ἀδύνατον γὰρ τἀναντία ἅμα τῷ αὐτῷ ὑπάρχειν. 3 Ἢ εἴ τι τοιοῦτον εἴρηται κατά τινος, οὗ ὄντος, ἀνάγκη τἀναντία ὑπάρχειν. οἷον, εἰ τὰς ἰδέας ἐν ἡμῖν ἔφησεν εἶναι· κινεῖσθαί τε γὰρ καὶ ἠρεμεῖν

* γρ. αὐτῷ ἐν.

* γρ. χρήσιμα.

Qvoniam autem contraria ſex modis inter ſe coniunguntur, contrarietatem autem efficiunt quatuor modis coniuncta: oportet accipere contraria, prout expedit euertenti & adſtruenti. Sex igitur modis *ea* cōiungi, manifeſtum *eſt*. aut enim vtrumque vtrique contrariorum iungitur: atque hoc bifariam, vt de amicis bene mereri & de inimicis male; vel contra de amicis malè & de inimicis benè. aut ambo de vno: & hoc quoque bifariam, vt de amicis bene mereri & de amicis malè, vel de inimicis bene mereri & de inimicis malè. aut vnum de ambobus: & hoc quoque bifariam, vt de amicis bene & de inimicis bene, vel de amicis malè & de inimicis malè. Primæ igitur duæ coniunctiones quas dixi, non faciunt contrarietatē: de amicis enim bene mereri, & de inimicis malè, non ſunt contraria, cū ambo *ſint* optabilia, & eorūdem morum *effectus*. neque item *contraria ſunt*, de amicis malè, & de inimicis bene *mereri*. nā & hæc *ſunt* ambo fugienda, & eorumdem morum *effectus*. nō videtur autem fugiendum fugiendo contrarium eſſe: niſi alterum exſuperātiæ, alterum defectus rationem habeat. nam & exſuperantia, *in* rerū fugiendarum *numero* eſſe videtur: & ſimiliter quod eſt defectus. *Reliqua autē quatuor omnia efficiunt contrarietatem. nam de amicis bene mereri, & de amicis malè mereri, contraria *ſunt*: quia ex contrariis moribus proficiſcuntur: & alterum *eſt* eligendum, alterum fugiendum. Itidem etiam in aliis *ſe res habet*: quoniam in ſingulis coniunctionibus alterum eſt eligendum, alterum fugiendum: & alterum ex bonis moribus *proficiſcitur*, alterū ex malis. Conſtat igitur ex iis quæ dicta ſunt, accidere vt eidem plura contraria ſint. huic enim, de amicis bene mereri, illud contrarium *eſt*, de inimicis bene mereri: nec non illud *eſt* contrarium, de amicis malè *mereri*. Similiter etiam aliorū cuique, ſi quis *ea* conſideret eodē modo, videbuntur duo contraria *eſſe*. Vtrumvis igitur contrariorū vtile ſit ad theſim, *illud* ſumi *debet*. 2 Præterea ſi quid contrarium ſit accidenti: conſiderandū eſt, an inſit *ei*, cui accidens ineſſe dictum eſt. ſi n. hoc inſit, illud non poteſt ineſſe: quoniam fieri nequit, vt contraria ſimul eidem *ſubiecto* inſint. 3 Aut an tale quidpiam dictum ſit de aliquo: quod ſi ſit, neceſſe ſit contraria *in eodem ſubiecto* ineſſe. vt ſi *quis* ideas in nobis eſſe dixerit: eas n. moueri & quie-

ſcere accidet, itemque ſenſibiles & intelligibiles A eſſe. videntur n. ideæ quieſcere, & immobiles, & intelligibiles eſſe, *vt placet* iis qui ideas eſſe ponũt. ſi verò in nobis ſint, immobiles eſſe nequeũt: quia cùm nos moueimur, neceſſe *eſt* vt & quæ in nobis *ſunt*, omnia ſimul moueantur. Conſtat etiã *eas* eſſe ſenſibiles, ſi quidem in nobis ſint: quia per oculorum ſenſum formam quæ in quaque re *eſt*, cognoſcimus. 4 Rurſus ſi poſitũ eſt accidens, cui ſit aliquid contrarium, conſiderare *oportet*. an contrarij quoque *ſit* ſuſceptiuum, quod *eſt* accidentis *ſuſceptiuum*. idẽ n. contrariorum *eſt* ſuſceptiuum. veluti ſi odium iræ conſequens eſſe dixerit: certè odium B erit in *parte animæ* iraſcibili, quoniã ibi eſt ira. videndum igitur *eſt*, an & contrarium ſit in iraſcibili, *nempe* amicitia. ſi n. amicitia non ſit *in iraſcibili*, ſed in concupiſcibili. non poteſt odiũ iræ conſequens eſſe. Similis ratio *eſt*, ſi *partem animæ* concupiſcibilẽ ignorare dixerit. nam erit apta ad ſuſcipiendam ſcientiam, ſiquidem *apta eſt* ad *ſuſcipiendã* ignorantiam. quod quidem non videtur *verum eſſe, nempe* concupiſcibilem *animæ partem* eſſe aptam ad ſuſcipiendã ſcientiam. Qui igitur refellit, *hoc loco*, quẽadmodum dictum eſt, vti debet. Confirmanti autem, *ad probandum* ineſſe accidẽs, non eſt vtilis hic C locus: ſed *ad probandum* poſſe ineſſe vtilis *eſt*. cùm enim probauerimus non eſſe ſuſceptiuum contrarij: probatum erit, neque ineſſe accidens, neque poſſe ineſſe. at ſi probabimus cõtrarium ineſſe, vel contrarij ſuſceptiuum eſſe: nondum probatũ erit etiam accidens ineſſe, ſed poſſe ineſſe tantummodò probatum erit.

αὐταῖς συμβήσεται· ἔτι δὲ αἰσθητὰς καὶ νοητάς. δοκοῦσι γὰρ αἱ ἰδέαι ἠρεμεῖν, καὶ ἀκίνητοι καὶ νοηταὶ εἶναι τοῖς τιθεμένοις ἰδέας εἶναι· ἐν ἡμῖν δὲ οὔσας, ἀδύνατον ἀκινήτους εἶναι· κινουμένων γὰρ ἡμῶν, ἀναγκαῖον καὶ τὰ ἐν ἡμῖν πάντα συγκινεῖσθαι. δῆλον δὲ ὅτι καὶ αἰσθηταί, εἴπερ ἐν ἡμῖν εἰσι· διὰ γὰρ τῆς περὶ τὴν ὄψιν αἰσθήσεως, τὴν ἐν ἑκάστῳ μορφὴν γνωρίζομεν. 4 Πάλιν, εἰ κεῖται συμβεβηκὸς ᾧ ἐστί τι ἐναντίον, σκοπεῖν, εἰ καὶ τοῦ ἐναντίου δεκτικὸν, ὅπερ καὶ τοῦ συμβεβηκότος· τὸ γὰρ αὐτὸ τῶν ἐναντίων δεκτικόν ἐστιν, οἷον εἰ τὸ μῖσος ἕπεσθαι τῇ ὀργῇ ἔφησεν, εἴη ἂν τὸ μῖσος ἐν τῷ θυμοειδεῖ· ἐκεῖ B γὰρ ἡ ὀργή. σκεπτέον οὖν, εἰ καὶ τὸ ἐναντίον ἐν τῷ θυμοειδεῖ, ἡ φιλία. εἰ γὰρ μὴ, ἀλλ' ἐν τῷ ἐπιθυμητικῷ ἐστὶν ἡ φιλία, οὐκ ἂν ἕποιτο τὸ μῖσος τῇ ὀργῇ. ὁμοίως δὲ καὶ εἰ τὸ ἐπιθυμητικὸν ἀγνοεῖν ἔφησεν. εἴη γὰρ ἂν ἐπιστήμης δεκτικὸν, εἴπερ καὶ ἀγνοίας· ὅπερ οὐ δοκεῖ, τὸ ἐπιθυμητικὸν δεκτικὸν εἶναι ἐπιστήμης. ἀνασκευάζοντι μὲν οὖν, καθάπερ εἴρηται χρηστέον. κατασκευάζοντι δὲ, ὅτι μὲν ὑπάρχει τὸ συμβεβηκὸς, οὐ χρήσιμος ὁ τόπος· ὅτι δὲ ἐνδέχεται ὑπάρξαι, χρήσιμος. δείξαντες μὲν γὰρ ὅτι οὐ δεκτικὸν τοῦ ἐναντίου, δεδειχότες ἐσόμεθα, ὅτι C οὔτε ὑπάρχει τὸ συμβεβηκὸς, οὔτε ἐνδέχεται ὑπάρξαι. ἐὰν δὲ δείξωμεν, ὅτι ὑπάρχει τὸ ἐναντίον, ἢ ὅτι δεκτικὸν τοῦ ἐναντίου ἐστὶν, οὔπω δεδειχότες ἐσόμεθα, ὅτι καὶ τὸ συμβεβηκὸς ὑπάρχει, ἀλλ' ὅτι ἐνδέχεται ὑπάρχειν, ἐπὶ τοσοῦτον μόνον δεδειγμένον ἔσται.

Loci ab oppoſitorum conſecutione. Cap. VIII.

1 *A contradicentibus*, 3 *A contrariis.* 3 *A priuatione & habitu.* 4 *A relatis.*

QVoniam autem oppoſitiones quatuor ſunt: D conſiderandum *eſt, an argumentum duci poſſit* ex contradictionibus inuerſa conſecutione, & in refellendo, & in confirmando. Accipere autẽ *hoc oportet* per inductionẽ, veluti ſi homo *eſt* animal: quod non eſt animal, non *eſt* homo. ſimiliterque in aliis *res ſe habet*. hic enim inuerſa *eſt* conſecutio: quoniam homini animal eſt conſequens: non homini autem non *eſt conſequens* nõ animal: ſed conuerſo ordine, non animali *conſequens eſt* nõ homo. In omnibus igitur, eiuſmodi axiomate vtendum eſt. veluti ſi honeſtum *eſt* iucundum, etiam non iucundum non *eſt* honeſtũ. quod ſi hoc non *eſt*, ne illud quidem erit. ſimiliterque ſi non iucundum non *eſt* honeſtum, honeſtum eſt iucundum. patet igitur ad ambo va- E lere conſecutionem quæ in contradictione fit ordine commutato. 2 In contrariis autem tam euertenti quàm adſtruenti conſiderandum *eſt*, an contrarium contrario ſit conſequens vel directò, vel ordine inuerſo. Accipere autẽ & hæc oportet per inductionẽ, quatenus vtile *eſt*. Directò *fit* conſecutio: vt fortitudini, & ignauiæ: illi n. virtus conſequens eſt, huic verò vitium: & illi quidem cõſequens eſt eligendũ, huic verò fugiendum. directa igitur eſt & horum cõſecutio: quoniam eligendũ, *eſt* cõtrarium fugiendo. Similiterque *fit* in ceteris. Inuerſo autem ordine *fit* conſecutio: vt bonæ corporis habitudini ſanitas conſequens eſt: malæ autẽ habitudini morbus non *eſt conſequens*, ſed morbo mala habitudo. patet igitur, mutato ordine in his fieri conſecutionem. Rarò autem hæc ordinis commutatio in contrariis accidit: ſed *in* plurimis directa *eſt*.

Ἐπεὶ δὲ εἰσιν αἱ ἀντιθέσεις τέτταρες, σκοπεῖν ἐκ μὲν τῶν ἀντιφάσεων, ἀνάπαλιν ἐκ τῆς ἀκολουθήσεως, * καὶ ἀναιροῦντι καὶ κατασκευάζοντι. λαμβάνειν δὲ ἐξ ἐπαγωγῆς ἐστὶν, εἰ ὁ ἄνθρωπος ζῷον, τὸ μὴ ζῷον οὐκ ἄνθρωπος. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. ἐνταῦθα γὰρ ἀνάπαλιν ἡ ἀκολούθησις. τῷ μὲν γὰρ ἀνθρώπῳ τὸ ζῷον ἕπεται· τῷ δὲ μὴ ἀνθρώπῳ τὸ μὴ ζῷον, οὔ. ἀλλ' ἀνάπαλιν τῷ μὴ ζῴῳ τὸ οὐκ ἄνθρωπος. ἐπὶ πάντων οὖν τὸ τοιοῦτον ἀξιωτέον ἐστὶν, εἰ τὸ καλὸν, ἡδύ· καὶ τὸ μὴ ἡδὺ, οὐ καλόν. εἰ δὲ μὴ τοῦτο, οὐδ' ἐκεῖνο. ὁμοίως δὲ καὶ, εἰ τὸ μὴ ἡδὺ, οὐ καλόν· τὸ καλὸν, ἡδύ. δῆλον οὖν, ὅτι πρὸς ἄμφω ἀντιστρέφει ἡ κατὰ τὴν ἀντίφασιν ἀκολούθησις ἀνάπαλιν γινομένη. 2 Ἐπὶ δὲ τῶν ἐναντίων E σκοπεῖν, εἰ τῷ ἐναντίῳ τὸ ἐναντίον ἕπεται, ἢ ἐπὶ ταὐτὰ, ἢ ἀνάπαλιν, καὶ ἀναιροῦντι, καὶ κατασκευάζοντι. λαμβάνειν δὲ καὶ τὰ τοιαῦτα ἐξ ἐπαγωγῆς, ἐφ' ὅσον χρήσιμον. ἐπὶ * ταὐτὸ μὲν οὖν ἡ ἀκολούθησίς ἐστι, τῇ ἀνδρείᾳ, καὶ τῇ δειλίᾳ· τῇ μὲν γὰρ, ἀρετὴ ἀκολουθεῖ· τῇ δὲ, κακία. καὶ τῇ μὲν, ἀκολουθεῖ τὸ αἱρετόν· τῇ δὲ, τὸ φευκτόν. ἐπὶ ταὐτὰ οὖν καὶ ἡ τούτων ἀκολούθησις· ἐναντίον γὰρ τὸ αἱρετὸν τῷ φευκτῷ. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. ἀνάπαλιν δὲ ἡ ἀκολούθησίς ἐστι, τῇ εὐεξίᾳ μὲν ἡ ὑγίεια ἀκολουθεῖ, καχεξίᾳ δὲ νόσος οὔ, ἀλλὰ νόσῳ καχεξία. δῆλον οὖν, ὅτι ἀνάπαλιν ἐπὶ τούτων ἡ ἀκολούθησις γίνεται. σπάνιον δὲ τὸ ἀνάπαλιν ἐπὶ τῶν ἐναντίων συμβαίνει, ἀλλὰ τοῖς πλείστοις ἐπὶ ταὐτὰ ἡ

* γρ. ἢ ἀναιροῦντι ἢ κατασκευάζοντι.

* γρ. ταὐτά.

ἀκολούθησις. εἰ οὖν μήτε ἐπὶ τὰ αὐτὰ τῷ ἐναντίῳ τὸ ἐναντίον ἀκολουθεῖ, μήτε ἀνάπαλιν, δῆλον ὅτι οὐδ᾽ ἐπὶ τῶν ῥηθέντων ἀκολουθεῖ τὸ ἕτερον τῷ ἑτέρῳ. εἰ δὲ ἐπὶ τῶν ἐναντίων, καὶ ἐπὶ τῶν ῥηθέντων, ἀναγκαῖον τὸ ἕτερον τῷ ἑτέρῳ ἀκολουθεῖν. 3 Ὁμοίως δὲ τοῖς ἐναντίοις, καὶ ἐπὶ τῶν στερήσεων καὶ ἕξεων σκεπτέον. πλὴν οὐκ ἔστιν ἐπὶ τῶν στερήσεων τὸ ἀνάπαλιν, ἀλλ᾽ ἐπὶ ταὐτὰ τὴν ἀκολούθησιν ἀναγκαῖον ἀεὶ γίνεσθαι· καθάπερ ὄψει μὲν αἴσθησιν, τυφλότητι δὲ ἀναισθησίαν. ἀντίκειται γὰρ ἡ αἴσθησις τῇ ἀναισθησίᾳ, ὡς ἕξις καὶ στέρησις. τὸ μὲν γὰρ, ἕξις, αὐτῶν· τὸ δὲ, στέρησίς ἐστιν. 4 Ὁμοίως δὲ τῇ ἕξει καὶ τῇ στερήσει, καὶ ἐπὶ τῶν πρός τι χρηστέον· ἐπὶ ταὐτὰ γὰρ καὶ τούτων ἡ ἀκολούθησις. οἷον, εἰ τὸ τριπλάσιον, πολλαπλάσιον. καὶ τὸ τριτημόριον, πολλοστημόριον. λέγεται γὰρ, τὸ μὲν τριπλάσιον, πρὸς τὸ τριτημόριον· τὸ δὲ πολλαπλάσιον, πρὸς τὸ πολλοστημόριον. πάλιν, εἰ ἡ ἐπιστήμη, ὑπόληψις· καὶ τὸ ἐπιστητὸν, ὑποληπτόν· καὶ εἰ ἡ* ὅρασις, αἴσθησις· καὶ τὸ ὁρατὸν, αἰσθητόν. ἔνστασις, ὅτι οὐκ ἀνάγκη ἐπὶ τῶν πρός τι τὴν ἀκολούθησιν γίνεσθαι, καθάπερ εἴρηται· τὸ γὰρ αἰσθητὸν, ἐπιστητόν ἐστιν· ἡ δὲ αἴσθησις, οὐκ ἐπιστήμη. οὐ μὴν ἀληθής γε ἡ ἔνστασις* δοκεῖ εἶναι· πολλοὶ γὰρ οὔ φασι τῶν αἰσθητῶν ἐπιστήμην εἶναι. ἔτι πρὸς τοὐναντίον, οὐχ ἧττον χρήσιμον τὸ ῥηθέν· οἷον, ὅτι τὸ αἰσθητὸν, οὐκ ἔστιν ἐπιστητόν. οὐδὲ γὰρ ἡ αἴσθησις, ἐπιστήμη.

* γρ. ὄψις.

* γρ. ἀληθὴς ἦ.

A confecutio. Quòd ſi nec directò contrarium contrario conſequens ſit, nec ordine inuerſo: manifeſtum *eſt*, ne quidem in iis quæ dicta ſunt, alterum alteri conſequens eſſe. Si verò in contrariis, etiam in iis quæ dicta ſunt, neceſſe *eſt* alterum alteri conſequens eſſe. 3 Vt autẽ in contrariis, ſic in priuationibus & habitibus conſiderandum *eſt*: præterquã quòd in priuationibus nõ eſt ordinis inuerſio, ſed neceſſe *eſt* vt directò ſemper conſecutio fiat, quemadmodum aſpectum ſenſus, cæcitatẽ priuatio ſenſus *ſequitur*. ſenſus enim opponitur priuationi ſenſus, vt habitus & priuatio: alterum enim eorum habitus, alterum priuatio eſt. 4 Vt autem habitu & priuatione, ſic etiam relatis vtẽdum *eſt*, B directa enim *eſt* etiam horum conſecutio. Veluti ſi triplum *eſt* multiplex, etiam ſubtriplum *eſt* ſubmultiplex: refertur enim triplum ad ſubtriplum, & multiplex ad ſubmultiplex. Rurſus ſi ſcientia *eſt* exiſtimatio etiam ſcibile *eſt* exiſtimabile. Et ſi viſio *eſt* ſenſus, etiam viſibile *eſt* ſenſibile. Obiectio *proponi poteſt*, non neceſſe *eſſe* vt in relatis conſecutio fiat, ſicut dictum eſt: quia sẽſile, eſt ſcibile, ſenſus autẽ non *eſt* ſcientia. Non tamen hæc obiectio videtur vera eſſe. multi enim negant ſenſibilium ſcientiam eſſe. Præterea ad contrarium *probandum* non minùs vtile *eſt* quod dixi: veluti ſenſibile non eſſe ſcibile, quia nec ſenſus *eſt* ſcientia.

Loci à coniugatis, & ab ortu, vel interitu, vel efficiente, vel interimente. Cap. IX.

1 *A coniugatis eius quod poſitum eſt in problemate*, 2 *vel contrarij*. 3 *Ab ortu, & interitu: necnon ab iis quæ efficiendi vel corrumpendi vim habent.*

C Πάλιν ἐπὶ τῶν συστοίχων καὶ ἐπὶ τῶν πτώσεων, καὶ ἀναιροῦντα, καὶ κατασκευάζοντα. λέγεται δὲ σύστοιχα μὲν τὰ τοιάδε· οἷον, τὰ δίκαια, καὶ ὁ δίκαιος, τῇ δικαιοσύνῃ· καὶ τὰ ἀνδρεῖα, καὶ ὁ ἀνδρεῖος, τῇ ἀνδρίᾳ. ὁμοίως δὲ καὶ τὰ ποιητικὰ, καὶ τὰ φυλακτικὰ, *σύστοιχα ἐκείνων ἐστὶν, ὧν ἐστι φυλακτικὰ, ἢ ποιητικά. οἷον, τὰ ὑγιεινὰ, ὑγιείας· καὶ τὰ εὐεκτικὰ, εὐεξίας. τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἄλλων. σύστοιχα μὲν οὖν τὰ τοιαῦτα εἴωθε λέγεσθαι. πτώσεις δὲ, οἷον, τὸ δικαίως, καὶ ἀνδρείως, καὶ ὑγιεινῶς, καὶ εὐεκτικῶς· καὶ ὅσα τοῦτον τὸν τρόπον λέγεται. δοκεῖ δὲ καὶ τὰ κατὰ τὰς πτώσεις, σύστοιχα εἶναι. οἷον, τὸ μὲν δικαίως τῇ δικαιοσύνῃ. τὸ δὲ ἀνδρείως, τῇ ἀνδρίᾳ. σύστοιχα δὲ λέγεται, τὰ κατὰ τὴν αὐτὴν συστοιχίαν ἅπαντα· οἷον, D δικαιοσύνη, δίκαιος, δίκαιον, δικαίως. δῆλον οὖν, ὅτι ἑνὸς ὁποιουοῦν δειχθέντος τῶν κατὰ τὴν αὐτὴν συστοιχίαν, ἀγαθοῦ, ἢ ἐπαινετοῦ, καὶ τὰ λοιπὰ πάντα δεδειγμένα *ἔσται. οἷον, εἰ ἡ δικαιοσύνη τῶν ἐπαινετῶν· καὶ ὁ δίκαιος, καὶ τὸ δίκαιον καὶ τὸ δικαίως, τῶν ἐπαινετῶν. ῥηθήσεται δὲ τὸ δικαίως, καὶ ἐπαινετῶς, κατὰ τὴν αὐτὴν πτῶσιν· ἀπὸ γὰρ τοῦ ἐπαινετοῦ καθάπερ τὸ δικαίως, ἀπὸ τῆς δικαιοσύνης. 2 Σκοπεῖν δὲ μὴ μόνον ἐπ᾽ αὐτοῦ τοῦ εἰρημένου, ἀλλὰ καὶ ἐπὶ τοῦ ἐναντίου τὸ ἐναντίον. οἷον, ὅτι τὸ ἀγαθὸν οὐκ ἐξ ἀνάγκης ἡδύ· οὐδὲ γὰρ τὸ κακὸν, λυπηρόν· ἢ εἰ τοῦτο, κἀκεῖνο. καὶ εἰ ἡ δικαιοσύνη, ἐπιστήμη· καὶ ἡ ἀδικία, ἄγνοια. καὶ εἰ τὸ δικαίως, ἐπιστημονικῶς καὶ ἐμπείρως· τὸ ἀδίκως, ἀγνοούντως καὶ ἀπείρως· εἰ δὲ ταῦτα μὴ, οὐδ᾽ ἐκεῖνα· καθάπερ ἐπὶ τοῦ νῦν ῥηθέντος.

* γρ. τοῖς ἐκείνων ἐστὶν ὧν ἐστι φ.

* γρ. γένηται.

C Item *conſiderãda ſunt* coniugata & caſus, & euertendo, & aſtruendo. Dicuntur autem cõiugata, quæ ſunt eiuſmodi: vt iuſta & iuſtus, cum iuſtitia: & fortia, & fortis, cum fortitudine. Similiter etiam quæ vim habent efficiendi vel conſeruãdi, coniugata eorum ſunt, quorum ſunt cõſeruantia vel efficientia: vt ſanitatis, ſalubria: & firmæ corporis conſtitutionis, ea quæ firmã corporis conſtitutionem efficiunt vel conſeruant. Eodemque modo in ceteris *ſe res habet*. Coniugata igitur dici ſolent, quæ eiuſmodi *ſunt*. Caſus autem, vt iuſtè, & fortiter, & ſalubriter, & aptè ad firmam corporis conſtitutionem, & quæcumque hoc modo dicuntur. Videntur autem & quæ ſecundum caſus *dicũ*- D *tur*, eſſe coniugata: vt iuſtè cum iuſtitia, & fortiter cum fortitudine. Coniugata autem dicuntur omnia, quæ *ſunt* in eadem coniugatione *ſeu claſſe*: vt iuſtitia, iuſtus, iuſtum, iuſtè patet igitur, ſi quid eorum quæ *ſunt* in eadem claſſe, probatum fuerit bonum *eſſe* aut laudabile, etiam reliqua omnia probata fore. veluti ſi iuſtitia *ſit in numero rerum* laudabilium: etiam iuſtus, & iuſtum, & iuſtè, *erit in eodem rerũ* laudabilium *numero*. Dicetur autem quod eſt iuſtè, eſſe etiam laudabiliter eodem caſu: *dicitur* n. *laudabiliter* à laudabili, vt iuſtè à iuſtitia. 2 Conſiderare autem *oportet* nõ ſolùm in eo quod dictum eſt, ſed etiam in contrario contrarium, veluti bonum non eſſe neceſſariò iucundum, quia nec malum *neceſſariò eſt* moleſtum: aut ſi hoc etiam illud. & ſi iuſtitia *ſit* ſcientia, etiam iniuſtitiam *eſſe* ignorantiam. & ſi quod *ſit* iuſtè, *ſit* ſcienter & peritè: id *quod ſit* iniuſtè, *fieri* inſcitè & imperitè: aut ſi hæc non *ita ſunt*, ne illa quidem, vt in eo quod modò dictum eſt.

potiùs enim videtur quod iniuſtè *ſit* peritè *fieri*, quàm imperitè. Hic autem locus antea dictus fuit in contrariorum conſecutionibus. nihil enim aliud in præſentia conſtituimus quàm contrario contrarium conſequens eſſe. 3 Præterea *ducenda ſunt argumenta* ab ortu, & interitu, & iis quæ faciendi, vel corrumpendi vim habent, ſiue quis refellat, ſiue confirmet. quorum enim ortus *ſunt in numero* bonorum, etiam ipſa *ſunt* bona. & ſi ipſa *ſunt* bona, etiã ortus *in bonis numerãtur*. at ſi ortus *in* malorum *numero ſunt*, ipſa quoque *ſunt in* malorum *numero*. In corruptionibus autem è contrario arguendum eſt. nam ſi corruptiones *ſunt in numero* bonorum, ipſa *ſunt in numero* malorum: ſi verò corruptiones *in numero* malorum, ipſa *ſunt in numero* bonorum. Eadem ratio *eſt* & in iis quæ efficiendi vel corrumpendi vim habent. quorum enim efficientia *ſunt* bona, etiam ipſa *ſunt* in bonis: & quorum corruptiua *ſunt* bona, ipſa *ſunt in* malorum *numero*.

A μᾶλλον γὰρ ἂν φανείη τὸ ἀδίκως, ἐμπείρως, ἢ ἀπείρως γίνεσθαι. οὗτος δ'* ὁ τόπος εἴρηται πρότερον ἐν ταῖς τῶν ἐναντίων ἀκολουθήσεσιν. οὐδὲν γὰρ ἄλλο νῦν ἀξιοῦμεν, ἢ τῷ ἐναντίῳ τὸ ἐναντίον ἀκολουθεῖν. 3 Ἔτι, ἐπὶ τῶν γενέσεων καὶ φθορῶν, καὶ ποιητικῶν καὶ φθαρτικῶν, καὶ ἀναιροῦντι καὶ κατασκευάζοντι. ὧν γὰρ αἱ γενέσεις, τῶν ἀγαθῶν, καὶ αὐτὰ ἀγαθά. καὶ εἰ αὐτὰ ἀγαθά, καὶ αἱ γενέσεις.* εἰ δὲ αἱ γενέσεις, τῶν κακῶν, καὶ αὐτὰ τῶν κακῶν. ἐπὶ δὲ τῶν φθορῶν, ἀνάπαλιν. εἰ γὰρ αἱ φθοραὶ τῶν ἀγαθῶν, αὐτὰ τῶν κακῶν. εἰ δὲ αἱ φθοραὶ τῶν κακῶν, αὐτὰ τῶν ἀγαθῶν. ὁ δὲ αὐτὸς λόγος καὶ ἐπὶ ποιητικῶν καὶ B φθαρτικῶν. ὧν μὲν γὰρ τὰ ποιητικὰ ἀγαθά, καὶ αὐτὰ τῶν ἀγαθῶν· ὧν δὲ τὰ φθαρτικὰ ἀγαθά, αὐτὰ τῶν κακῶν.

* γρ. ὕστερ.
* γρ. ἐὰν ᾖ.

Loci à proportione, & à comparatione. Cap. X.

1 ¶ *A ſimili.* 2 ¶ *A comparatione eius quod magis vel minus ineſſe videtur.* 3 *Ab inuentione ſubiecti & accidentis.* 4 *Ab altero ſubiecto cui accidens videtur magis vel minus ineſſe.* 5 *Ab altero accidente, quod magis vel minus videtur ineſſe in ſubiecto propoſito,* 6 *vel in altero ſubiecto.* 7 *A comparatione ſimilium ſeu parium.* 8 *Ab altero ſubiecto, cui æquè videtur ineſſe.* 9 *Ab altero accidente, quod æquè videtur ineſſe in ſubiecto propoſito,* 10 *vel in altero ſubiecto.* 11 ¶ *Epilogus.*

ITem in ſimilibus *videndum eſt*, an ſimiliter *ſe* habeant, veluti ſi ſcientia vna *eſt* multarum rerũ, etiam *vna eſt* opinio. & ſi viſum habere, *eſt* videre: etiam auditũ habere, *eſt* audire. Similis *eſt* & ceterorum ratio, tam quæ ſunt, quàm quæ *eſſe* videntur. C Vtilis autem *eſt* hic locus in vtramque partem. nã ſi in ſimili quopiã ita *res* habet, etiam in aliis ſimilibus *ita habet*. ſi verò in aliquo *ſimili* non *ita*: nec in ceteris ſimilibus. Conſiderare etiam *oportet* an in vno & in multis ſimiliter *res ſe* habeat: quoniã interdum diſcrepat. veluti ſi ſcire *eſt* cogitare: etiam multa ſcire, *eſt* multa cogitare. hoc autem non *eſt* verum: multa enim ſciri poſſunt, non item cogitari. ſi igitur hoc non *eſt*, ne illud quidem *eſt* quod in vno *dictum fuit, nempe* ſcire, eſſe cogitare. 2 Præterea D *ſumenda ſunt argumẽta* ex eo quod *eſt* magis vel minùs. ſunt autẽ eius quod magis vel minùs *eſt*, loci quatuor. 3 Vnus *eſt*, ſi quod magis *eſt*, conſequens eſt ei quod magis *eſt*. veluti ſi voluptas *eſt* bonum, etiam magis voluptas *eſt* magis bonum. & ſi iniuriam facere *eſt* malum: etiam magis iniuriã facere, *eſt* magis malum. Vtilis autem in vtramque partẽ *eſt* hic locus. nam ſi ſubiecti intentioni conſequẽs ſit accidentis intentio, ſicut dictum eſt: manifeſtũ *eſt* accidere. ſi verò conſequens non ſit, non accidere. Hoc autem inductione ſumendũ *eſt*. 4 Alius *locus*: Cùm vnum de duobus dicatur: ſi cui magis veriſimile *eſt* ineſſe, non ineſt: ne *illi* quidẽ cui mi- E nùs. & ſi cui minùs veriſimile *eſt* ineſſe, ineſt: etiam *ei*, cui magis. 5 Item cùm duo de vno dicuntur: ſi quod magis videtur ineſſe, nõ ineſt: ne *id* quidem quod minùs. ſin quod minùs videtur ineſſe, ineſt: etiã id, quod magis. 6 Præterea cùm duo de duobus dicantur: ſi quod alteri magis videtur ineſſe, non ineſt: ne reliquum quidẽ reliquo *inerit*. ſi verò quod minùs videtur alteri ineſſe, ineſt: etiam reliquum reliquo *inerit*. 7 Præterea *ducẽdum eſt argumentum* ex eo quod ſimiliter ineſt, aut videtur ineſſe, tribus modis, quẽadmodum dicebatur in eo quod magis *eſt*, *ſeu videtur eſſe*, in poſtremis *ſcilicet* tribus modis expoſitis. 8 Cùm enim vnum quidpiam duobus ſimiliter ineſt, aut videtur ineſſe; ſi alteri

Πάλιν ἐπὶ τῶν ὁμοίων, εἰ ὁμοίως ἔχει, οἷον, εἰ ἐπιστήμη μία πλειόνων, καὶ δόξα. καὶ εἰ τὸ ὄψιν ἔχειν, ὁρᾶν· καὶ τὸ ἀκοὴν ἔχειν, ἀκούειν. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων, καὶ ἐπὶ τῶν ὄντων, καὶ τῶν δοκούντων. χρήσιμος δὲ ὁ τόπος πρὸς ἄμφω. εἰ μὲν γὰρ ἐπί τινος τῶν ὁμοίων οὕτως ἔχει, καὶ ἐπὶ τῶν ἄλλων τῶν ὁμοίων· εἰ δὲ ἐπί τινος μή, οὐδὲ ἐπὶ τῶν ἄλλων τῶν ὁμοίων. Σκοπεῖν δὲ καὶ εἰ ἐφ' ἑνὸς, καὶ εἰ ἐπὶ πολλῶν ὁμοίως ἔχει· ἐνιαχοῦ γὰρ διαφωνεῖ. οἷον, εἰ τὸ ἐπίστασθαι, διανοεῖσθαι· καὶ τὸ πολλὰ ἐπίστασθαι, πολλὰ διανοεῖσθαι. τοῦτο δὲ οὐκ ἀληθές· ἐπίστασθαι μὲν γὰρ ἐνδέχεται πολλά, διανοεῖσθαι δ' οὔ. εἰ οὖν τοῦτο μή, οὐδ' ἐκεῖνο τὸ ἐφ' ἑνὸς, ὅτι τὸ D ἐπίστασθαι διανοεῖσθαί ἐστιν. 2 Ἔτι, ἐκ τοῦ μᾶλλον καὶ ἧττον. εἰσὶ δὲ τοῦ μᾶλλον, καὶ ἧττον τόποι τέσσαρες. 3 Εἷς μὲν, εἰ ἀκολουθεῖ τὸ μᾶλλον τῷ μᾶλλον. οἷον, εἰ ἡδονὴ, ἀγαθόν· καὶ ἡ μᾶλλον ἡδονὴ, μᾶλλον ἀγαθόν. καὶ εἰ τὸ ἀδικεῖν, κακόν· καὶ τὸ μᾶλλον ἀδικεῖν, μᾶλλον κακόν. χρήσιμος δὲ πρὸς ἄμφω ὁ τόπος. εἰ μὲν γὰρ ἀκολουθεῖ τῇ τοῦ ὑποκειμένου ἐπιδόσει, ἡ τοῦ συμβεβηκότος ἐπίδοσις, καθάπερ εἴρηται, δῆλον ὅτι συμβέβηκεν. εἰ δὲ μὴ ἀκολουθεῖ, οὐ συμβέβηκε. τοῦτο δὲ ἐπαγωγῇ ληπτέον. 4 Ἄλλος· ἑνὸς περὶ δυοῖν λεγομένου, εἰ ᾧ μᾶλλον εἰκὸς ὑπάρχειν, μὴ ὑπάρχει, οὐδ' ᾧ ἧττον. καὶ εἰ ᾧ ἧττον εἰκὸς ὑπάρχειν, ὑπάρχει, καὶ ᾧ μᾶλ- E λον. 5 Πάλιν δυοῖν περὶ ἑνὸς* λεγομένοιν, εἰ τὸ μᾶλλον ὑπάρχειν δοκοῦν, μὴ ὑπάρχει, οὐδὲ τὸ ἧττον.* εἰ δὲ τὸ ἧττον δοκοῦν ὑπάρχειν, ὑπάρχει, καὶ τὸ μᾶλλον. 6 Ἔτι, δυοῖν περὶ δυοῖν λεγομένοιν, εἰ τὸ θάτερον μᾶλλον ὑπάρχειν δοκοῦν, μὴ ὑπάρχει, οὐδὲ τὸ λοιπὸν τῷ λοιπῷ.* εἰ δὲ τὸ ἧττον δοκοῦν τῷ ἑτέρῳ ὑπάρχειν, ὑπάρχει, καὶ τὸ λοιπὸν τῷ λοιπῷ. 7 Ἔτι, ἐκ τοῦ ὁμοίως ὑπάρχειν, ἢ δοκεῖν ὑπάρχειν, τριχῶς, καθάπερ ἐπὶ τοῦ μᾶλλον, ἐπὶ τῶν ὕστερον ῥηθέντων τριῶν τόπων ἐλέγετο. 8 Εἴτε γὰρ ἑνὶ δυοῖν ὁμοίως ὑπάρχει, ἢ δοκεῖ ὑπάρχειν, εἰ τῷ

Cap. IX.
* γρ. λεγομένων.
* γρ. ἐάν τι.
* γρ. ἐὰν ᾖ.

Ἓν τι μὴ δυοῖν ὑπάρχει.

ἑτέρῳ * μὴ ὑπάρχῃ, οὐδὲ τῷ ἑτέρῳ· εἰ δὲ θατέρῳ ὑπάρχῃ, καὶ τῷ λοιπῷ. 9 Ἔτι δύο τῷ αὐτῷ ὁμοίως· εἰ τὸ ἕτερον μὴ ὑπάρχῃ, οὐδὲ τὸ λοιπόν· εἰ δὲ θάτερον, καὶ τὸ λοιπόν. 10 Τὸν αὐτὸν δὲ τρόπον, κἂν εἰ δύο δυσὶν ὁμοίως ὑπάρχῃ. εἰ γὰρ τὸ ἕτερον τῷ ἑτέρῳ μὴ ὑπάρχῃ, οὐδὲ τὸ λοιπὸν τῷ λοιπῷ. εἰ δὲ ὑπάρχῃ τὸ ἕτερον τῷ ἑτέρῳ, καὶ τὸ λοιπὸν τῷ λοιπῷ. 11 Ἐκ μὲν οὖν τοῦ μᾶλλον καὶ ἧττον, καὶ τοῦ ὁμοίως, τοσαυταχῶς ἐνδέχεται ἐπιχειρεῖν.

non inſit, ne alteri quidē *inerit*. quòd ſi alteri inſit, etiam reliquo *inerit*. 9 Cumque duo eidem ſimiliter *inſunt, aut videntur ineſſe*: ſi alterum non inſit, reliquum quidē *inerit*. at ſi alteri, etiam reliquo. 10 Eodem modo *arguendum eſt*, & ſi duo duobus ſimiliter inſint. ſi n. alterum alteri non inſit, ne reliquum quidem reliquo *inerit*. ſi verò inſit alterum alteri, *inerit* etiam reliquum reliquo. 11 Ex his igitur quod magis, vel minùs, vel ſimiliter *eſt aut eſſe videtur*, tot modis licet argumentari.

Loci ab adiectione, & ab eo quod eſt quoquo modo, ad id quod eſt ſimpliciter. Cap. XI.

1 ¶ Ab adiectione, quæ facit rem talem eſſe, qualis non erat, 2 aut magis talem eſſe, quàm antè erat. 3 ¶ Ab eo quod quoquo modo eſt, ad id quod ſimpliciter eſt. A comparatiuo ad poſitiuum. 4 A determinato ad ſimplex.

*. γρ. ποιεῖ.

Ἔτι δὲ ἐκ τῆς προσθέσεως· ἐὰν ἕτερον πρὸς ἕτερον προστεθὲν ποιῇ ἀγαθὸν ἢ λευκόν, μὴ ὂν πρότερον λευκὸν ἢ ἀγαθόν· τὸ προστεθὲν ἔσται λευκὸν ἢ ἀγαθόν, οἷόν περ καὶ τὸ ὅλον ποιεῖ. 2 Ἔτι, εἰ πρὸς τὸ ὑπάρχον, προστεθέν τι, μᾶλλον ποιεῖ τοιοῦτον, οἷον ὑπῆρχε· καὶ αὐτὸ ἔσται τοιοῦτον. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. χρήσιμος δὲ οὐκ ἐν ἅπασιν ὁ τόπος, ἀλλ' ἐν οἷς τὴν τοῦ μᾶλλον ὑπεροχὴν συμβαίνει γίνεσθαι. οὗτος δὲ ὁ τόπος οὐκ ἀντιστρέφει πρὸς τὸ ἀνασκευάζειν. εἰ γὰρ μὴ ποιεῖ τὸ προστιθέμενον, ἀγαθόν· οὔπω δῆλον, εἰ αὐτὸ μὴ ἀγαθόν. τὸ γὰρ ἀγαθὸν κακῷ προστιθέμενον, οὐκ ἐξ ἀνάγκης ἀγαθὸν τὸ ὅλον ποιεῖ. οὐδὲ λευκὸν μέλανι· οὐδὲ γλυκὺ πικρῷ. 3 Πάλιν, εἴ τι μᾶλλον καὶ ἧττον λέγεται, καὶ ἁπλῶς ὑπάρχει· τὸ γὰρ μὴ ὂν ἀγαθὸν ἢ λευκόν, οὐδὲ μᾶλλον ἢ ἧττον ἀγαθὸν ἢ λευκὸν ῥηθήσεται. τὸ γὰρ κακόν, οὐδενὸς μᾶλλον ἢ ἧττον ἀγαθόν, ἀλλὰ μᾶλλον κακὸν ἢ ἧττον ῥηθήσεται. οὐκ ἀντιστρέφει δ' οὐδ' οὗτος ὁ τόπος πρὸς τὸ ἀνασκευάσαι. πολλὰ γὰρ τῶν οὐ λεγομένων μᾶλλον, ἁπλῶς ὑπάρχει. ἄνθρωπος γὰρ οὐ λέγεται μᾶλλον καὶ ἧττον, ἀλλ' οὐ διὰ τοῦτο οὐκ ἔστιν ἄνθρωπος. 4 Τὸν αὐτὸν δὲ τρόπον σκεπτέον καὶ ἐπὶ τοῦ κατά τι, καὶ ποτέ, καὶ πού. εἰ γὰρ κατά τι ἐνδέχεται, καὶ ἁπλῶς ἐνδέχεται. ὁμοίως δὲ καὶ τὸ ποτέ, ἢ πού. τὸ γὰρ ἁπλῶς ἀδύνατον, οὔτε κατά τι, οὔτε πού, οὔτε ποτὲ ἐνδέχεται. ἔνστασις, ὅτι κατά τι μέν εἰσι φύσει σπουδαῖοι, οἷον, ἐλευθέριοι, ἢ σωφρονικοί· ἁπλῶς δὲ οὐκ εἰσὶ φύσει σπουδαῖοι· οὐδεὶς γάρ, φύσει φρόνιμος. ὁμοίως δὲ ποτὲ μὲν ἐνδέχεται τῶν φθαρτῶν τι μὴ φθαρῆναι· ἁπλῶς δὲ οὐκ ἐνδέχεται μὴ φθαρῆναι. τὸν αὐτὸν δὲ τρόπον καὶ πού μὲν συμφέρει τοιαύτῃ διαίτῃ χρῆσθαι, οἷον, ἐν τοῖς νοσώδεσι τόποις· ἁπλῶς δὲ οὐ συμφέρει. ἔτι δέ, πού μὲν ἕνα μόνον δυνατὸν εἶναι, ἁπλῶς δὲ οὐ δυνατόν, ἕνα μόνον εἶναι. τὸν αὐτὸν δὲ τρόπον καί, πού μὲν καλὸν τὸν πατέρα θύειν, οἷον, ἐν Τριβαλλοῖς· ἁπλῶς δὲ οὐ καλόν. ἢ τοῦτο μὲν οὐ πού σημαίνει, ἀλλὰ τισί; οὐδὲν γὰρ διαφέρει ὅπου ἂν ὦσι. πανταχοῦ γὰρ αὐτοῖς ἔσται καλόν, οὖσι Τριβαλλοῖς. πάλιν, ποτὲ μὲν συμφέρει φαρμακεύεσθαι, οἷον, ὅταν νοσῇ, ἁπλῶς δὲ οὔ. ἢ οὐδὲ τοῦτο ποτὲ σημαίνει, ἀλλὰ τῷ διακειμένῳ πως; οὐδὲν γὰρ διαφέρει, ὁποτεοῦν, ἐὰν οὕτω μόνον διακείμενος ᾖ. τὸ δ' ἁπλῶς ἐστίν, ὃ μηδενὸς προστεθέντος ἐρεῖς ὅτι καλόν ἐστιν, ἢ τὸ ἐναντίον, οἷον, τὸ τὸν πατέρα θύειν, οὐκ ἐρεῖς καλόν.

Prӕterea *ſumpto argumēto* ab adiectione: ſi alterum alteri adiectum, faciat bonum aut album *eſſe*, cū antea non eſſet album aut bonū: *certè* quod eſt adiectū, erit album aut bonum, quale etiam totū fecit. 2 Prӕterea ſi ad id quod tale eſt, aliquid adiectū, magis tale faciat quàm *antè* erat: id quoq; *quod eſt adiectum*, tale erit. ſimiliter etiam in ceteris *ſe res habet*. Non *eſt* autē in omnibus *rebus* vtilis hic locus, ſed in *iis tantū* quӕ intentionem ſuſcipiunt. Hic verò locus non conuertitur, *vt valeat etiam* ad refellendum. nam ſi quod eſt adiectum, non facit bonum, nōdum conſtat an ipſum non *ſit* bonum: quia bonum malo adiectum, non facit neceſſariò vt totum ſit bonum: nec album nigro *adiectum, neceſſariò facit vt totum ſit album*: nec dulce amaro *adiectum facit vt totum ſit dulce*. 3 Rurſus ſi quid magis & minùs dicitur, etiam ſimpliciter eſt. quod n. nō eſt bonum aut albū, non dicetur magis vel minùs bonū aut album. quod n. malum *eſt*, nulla re magis vel minùs bonum, ſed magis vel minùs malum dicetur. Sed neq; hic locus conuertitur, *vt valeat* ad refellendum. multa enim, quӕ nō dicuntur magis *eſſe*, ſimpliciter ſunt. nam homo non dicitur magis & minùs: non tamen propterea non eſt homo. 4 Eodem modo cōſiderandum *eſt* in *eo quod eſt* quadam ex parte, aut aliquando, aut alicubi: nā ſi quadamtenus accidit, etiam ſimpliciter accidit. Similiterq; quod aliquando aut alicubi *eſt*, *etiam ſimpliciter eſt. quod* n. ſimpliciter *eſt* impoſſibile, nec ex parte, nec alicubi, nec aliquādo accidit. Obiectio *eſt*: quia quadamtenus ſunt naturâ probi, vt liberales, aut temperati: ſimpliciter autem non ſunt naturâ probi: quippe cùm nemo *ſit* naturâ prudens. ſimiliter aliquando poteſt aliquid corruptibile nō corrumpi: ſimpliciter autem non poteſt non corrumpi. Eodem modo etiam alicubi prodeſt tali victus ratione vti, vt in locis inſalubribus: ſimpliciter autem non prodeſt. Inſuper vt alicubi vnus tantùm ſit, fieri poteſt: ſimpliciter autē fieri nequit vt vnus tantùm ſit. Eodem modo etiam alicubi honeſtum *eſt*, patrem immolare, vt apud Tribalos: ſimpliciter verò non *eſt* honeſtum. An hoc nō alicubi ſignificat, ſed quibuſdam? nihil n. refert, vbi ſint: quoniam vbique *id* eis erit honeſtum, cū ſint Tribali. Rurſum aliquādo prodeſt ſumptio pharmaci, vt cùm *quis* ӕgrotat, ſimpliciter autem non *prodeſt*. An nec hoc ſignificat aliquando, ſed ei qui certo modo affectus eſt? nihil enim refert, quando *id fiat*, ſi modò ita ſit affectus. Id autem ſimpliciter eſt, quod nullâ re adiectâ *rectè* dices eſſe honeſtum, vel contrarium. vt patrem immolare, nō dices honeſtum eſſe,

eſſe, ſed quibuſdam honeſtum eſſe: non *eſt* igitur ſimpliciter honeſtum. At Deos colere, dices honeſtum *eſſe*, nullâ re adiectâ: ſimpliciter n. honeſtum eſt. Quare quodcumque nullâ re adiectâ videtur eſſe honeſtum, vel turpe, vel aliud quidpiam tale, ſimpliciter dicetur *eſſe tale*.

A ἦ), ἀλλά τισι καλὸν ἦ· οὐκ ἄρα ἁπλῶς καλόν. ἀλλὰ τὸ τοὺς θεοὺς τιμᾷν, ἐρεῖς καλὸν μηδὲν προστιθείς· ἁπλῶς γὰρ καλόν ἐστιν. ὥστε ὃ ἂν μηδενὸς προστιθεμένου, δοκεῖ ἦ καλὸν, ἢ αἰσχρὸν, ἢ ἄλλό τι τῶν τοιούτων, ἁπλῶς ῥηθήσεται.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΤΟΠΙΚΩΝ ΤΟ ΤΡΙΤΟΝ.

ARISTOTELIS TOPICORVM

LIBER III.

DE QVÆSTIONE VTRVM SIT MELIVS VEL OPTABILIVS.

TRACTATVS I.

Loci, ex quibus probatur melius eſſe, vel optabilius. Cap. I.

1 Protheſis. 2 Protheoria. 3 Si alterum ſit diuturnius & permanentius altero. 4 A qualitate & numero eligentium. 5 A genere. 6 Si alterum ſit optabile propter ſe, alterum propter alterum. 7 Si alterum per ſe, alterum per accidens. 8 Si alterum ſit boni cauſa per ſe, alterum per accidens. 9 Si alterum ſit ſimpliciter bonum, alterum alicui. 10 Si alterum ſit naturale, alterum acquiſitum. 11 Si alterum inſit meliori & præſtantiori ſubiecto. 12 vel melioris proprium ſit, 13 vel in melioribus & prioribus & præſtantioribus reperiatur. 14 Si alterum ſit finis, alterum finis cauſâ. 15 Si alterum propiùs accedat ad finem. 16 Si alterum ad vitæ finem pertineat, alterum ad alium finem. 17 Si alterum ſit poſſibile, alterum impoſſibile. 18 Si alterius efficientis melior ſit finis. 19 A proportione quæ eſt inter efficientes & fines. 20 Si alterum ſit bonum & laudabile per ſe, alterum propter aliud.

DVORVM autem pluriúmve vtrũ B *ſeu quódnã ſit* optabilius & melius, ex his conſiderandum *eſt*. 2 *Sed illud* primùm definiatur, nos ſermonem inſtituere, non de iis quæ longè *inter ſe* diſtant, & magnam inter ſe differentiam habent (nemo enim dubitat, vtrùm beatitudo an diuitiæ *ſint* magis eligendæ) ſed de iis quę vicina *ſunt*, ac de quibus dubitamus, vtri oporteat adiungi *articulum* MAGIS: propterea quòd nihil videmus quo alterũ alteri antecellat. Patet igitur, in his probatâ præſtãtiâ vnâ vel pluribus, fore vt animus aſſentiatur & cõcedat hoc eſſe magis eligendũ, vtrumvis eorum ſit quod excellat. C 3 Primũ igitur quod *eſt* diuturnius & cõſtantius, magis *eſt* eligendum, quàm quod *eſt* minùs tale. 4 Et quod potiùs eligat vir prudens, aut bonus, aut lex recta, aut cuiuſq; rei ſtudioſi qui in eius lectione verſantur quà tales ſunt, aut ij qui in vnoquoq; genere ſcientes *ſunt*, aut quęcũque plures omnésve eligãt, vt in *arte* medica, aut fabrili, quæ plures medici, vel omnes *eligant*, aut quęcũque omnino plures vel omnes *eligant*, aut omnia, vt bonum: omnia namque bonum appetunt. Oportet autem quod dicturus erit, ad id ducere quod velle ſit. Eſt autem ſimpliciter melius & optabilius, quod *eſt* ſecundũ D meliorem ſcientiam. veluti ſi melior ſcientia *eſt* philoſophica quã *ars* fabrilis, etiam ſimpliciter *ea ſunt* optabiliora quæ *ſunt* ſecundùm philoſophiam, quàm quæ *ſunt* ſecundùm *artem* fabrilem: at vni alicui *optabilius eſt*, quod *eſt* ſecundùm propriam *ſcientiam*. 5 Præterea *optabilius eſt*, quod *eſt* in genere, eo quod non eſt in genere: vt iuſtitia *homine* iuſto. illa enim in genere, *nempe* bono: hic verò non *item*. Illa quidem eſt id quod bonum: hic verò minimè. Nihil enim quod in genere non ſit, dicitur eſſe id quod genus: vt albus homo non eſt id quod color. ſimilitérque *dicendum eſt* de aliis.

ΠΟΤΕΡΟΝ δὲ αἱρετώτερον ἢ βέλτιον δυοῖν ἢ πλειόνων, ἐκ τῶνδε σκεπτέον. CAP. I. 2 Πρῶτον δὲ διωρίσθω, ὅτι τὴν σκέψιν ποιούμεθα, οὐχ ὑπὲρ τῶν πολὺ διεστώτων, καὶ μεγάλην πρὸς ἄλληλα διαφορὰν ἐχόντων, (οὐδεὶς γὰρ ἀπορεῖ, πότερον ἡ εὐδαιμονία, ἢ ὁ πλοῦτος αἱρετώτερον) ἀλλ' ὑπὲρ τῶν συνεγγυς, καὶ περὶ ὧν* διαμφισβητοῦμεν ποτέρῳ δεῖ προσθέσθαι μᾶλλον, διὰ τὸ μηδεμίαν ὁρᾷν τοῦ ἑτέρου πρὸς τὸ ἕτερον ὑπεροχήν. δῆλον οὖν ἐπὶ τούτων, ὅτι δειχθείσης ὑπεροχῆς μιᾶς ἢ πλειόνων, συγκαταθήσεται ἡ διάνοια, ὅτι τοῦτό ἐστιν αἱρετώτερον,* ὁπότερον τυγχάνει αὐτῶν ὑπερέχον. 3 Πρῶτον μὲν οὖν τὸ πολυχρονιώτερον, ἢ βεβαιότερον, αἱρετώτερον τοῦ ἧττον τοιούτου. 4 Καὶ ὃ ἂν μᾶλλον ἕλοιτο ὁ φρόνιμος, ἢ ὁ ἀγαθὸς ἀνὴρ, ἢ ὁ* νόμος ὁ ὀρθὸς, ἢ οἱ σπουδαῖοι περὶ ἕκαστα αἱρούμενοι ἢ τοιοῦτοί εἰσιν, ἢ οἱ ἐν ἑκάστῳ γένει ἐπιστήμονες, ἢ ὅσα οἱ πλείους, ἢ οἱ πάντες, οἷον, ἐν ἰατρικῇ, ἢ τεκτονικῇ, ἃ οἱ πλείους τῶν ἰατρῶν, ἢ οἱ πάντες· ἢ ὅσα ὅλως οἱ πλείους, ἢ πάντες, ἢ πάντα, οἷον, τὸ ἀγαθόν· πάντα γὰρ τοῦ ἀγαθοῦ ἐφίεται· δεῖ δὲ ἄγειν πρὸς ὅ,τι ἂν ᾖ χρήσιμον τὸ ῥηθησόμενον. ἔστι δὲ ἁπλῶς μὲν βέλτιον καὶ αἱρετώτερον, τὸ κατὰ τὴν βελτίω ἐπιστήμην. οἷον, εἰ βελτίων ἐπιστήμη φιλοσοφία τεκτονικῆς· καὶ ἁπλῶς αἱρετώτερα τὰ κατὰ φιλοσοφίαν, τῶν κατὰ τεκτονικήν. τινὶ δὲ τὸ κατὰ τὴν οἰκείαν. 5 Ἔπειτα δὲ τὸ ὅπερ τόδε τι, τοῦ μὴ ἐν γένει· οἷον, ἡ δικαιοσύνη τοῦ δικαίου. τὸ μὲν γὰρ, ἐν γένει τῷ ἀγαθῷ· τὸ δὲ, οὔ. καὶ τὸ μὲν, ὅπερ ἀγαθὸν τὸ δὲ, οὔ. οὐδὲν γὰρ λέγεται ὅπερ τὸ γένος, ὃ μὴ τυγχάνει ἐν τῷ γένει ὄν. οἷον, ὁ λευκὸς ἄνθρωπος οὐκ ἔστιν ὅπερ χρῶμα. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων.

* γρ. ἀμφισ.

* γρ. [illegible]

* Quid. [illegible]

A 6 Καὶ τὸ δι' ἑαυτὸ αἱρετὸν, τοῦ δι' ἕτερον αἱρετοῦ αἱρετώτερον ἐστίν, οἷον ὑγιαίνειν τοῦ γυμνάζεσθαι. τὸ μὲν γὰρ, δι' ἑαυτὸ αἱρετὸν, τὸ δὲ, δι' ἕτερον. 7 Καὶ τὸ καθ' αὑτὸ, τοῦ κατὰ συμβεβηκός ἐστιν, οἷον τοὺς φίλους δικαίους εἶναι, τοῦ τοὺς ἐχθρούς. τὸ μὲν γὰρ, καθ' αὑτὸ αἱρετόν· τὸ δὲ, κατὰ συμβεβηκός. τοὺς γὰρ ἐχθροὺς δικαίους εἶναι, κατὰ συμβεβηκὸς αἱρούμεθα, ὅπως μηδὲν ἡμᾶς βλάπτωσιν. ἔστι δὲ τοῦτο ταὐτὸν τῷ πρὸ τούτου· διαφέρει δὲ τῷ τρόπῳ. τὸ μὲν γὰρ τοὺς φίλους δικαίους εἶναι, δι' αὐτὸ αἱρούμεθα, καὶ εἰ μηδὲν ἡμῖν μέλλει ἔσεσθαι, κἂν ἐν Ἰνδοῖς ὦσι· τὸ δὲ τοὺς ἐχθροὺς, δι' ἕτερον, ὅπως μηδὲν ἡμᾶς βλάπτωσι. 8 Καὶ τὸ αἴτιον ἀγαθοῦ καθ' αὑτὸ, τοῦ κατὰ συμβεβηκὸς αἰτίου. καθάπερ ἡ ἀρετὴ τῆς τύχης. ἡ μὲν γὰρ, καθ' αὑτήν· ἡ δὲ, κατὰ συμβεβηκὸς αἰτία τῶν ἀγαθῶν. καὶ εἴ τι ἄλλο τοιοῦτον. ὁμοίως δὲ καὶ ἐπὶ τοῦ ἐναντίου. τὸ γὰρ καθ' αὑτὸ κακοῦ αἴτιον, φευκτότερον τοῦ κατὰ συμβεβηκός ἐστιν, ἡ κακία, καὶ ἡ τύχη. τὸ μὲν γὰρ, καθ' αὑτὸ κακόν· ἡ δὲ τύχη, κατὰ συμβεβηκός. 9 Καὶ τὸ ἁπλῶς ἀγαθὸν τοῦ τινὶ αἱρετώτερόν ἐστιν, οἷον ὑγιάζεσθαι, τοῦ τέμνεσθαι. τὸ μὲν γὰρ, ἁπλῶς ἀγαθόν· τὸ δὲ, τινὶ τῷ δεομένῳ τομῆς. 10 Καὶ τὸ φύσει, τοῦ μὴ φύσει ἐστὶν, ἡ δικαιοσύνη τοῦ δικαίου. τὸ μὲν γὰρ, φύσει· τὸ δὲ, ἐπίκτητον. 11 Καὶ τὸ τῷ βελτίονι καὶ τιμιωτέρῳ ὑπάρχον, αἱρετώτερον. C ἐστιν, θεῷ, ἤπερ ἀνθρώπῳ· καὶ ψυχῇ, ἤπερ σώματι. 12 Καὶ τὸ τοῦ βελτίονος ἴδιον, βέλτιον, ἢ τὸ τοῦ χείρονος ἐστίν, τὸ τοῦ θεοῦ, ἤπερ τὸ τοῦ ἀνθρώπου. κατὰ μὲν γὰρ τὰ κοινὰ, ἐν ἀμφοτέροις, οὐδὲν διαφέρει ἀλλήλων, τοῖς δὲ ἰδίοις τὸ ἕτερον τοῦ ἑτέρου διαφέρον ὑπάρχει. 13 Καὶ τὸ ἐν βελτίοσιν, ἢ προτέροις, ἢ τιμιωτέροις, βέλτιόν ἐστιν, ὑγίεια ἰσχύος, καὶ κάλλους. ἡ μὲν γὰρ, ἐν ὑγροῖς καὶ ξηροῖς, καὶ θερμοῖς καὶ ψυχροῖς, ἁπλῶς δ' εἰπεῖν ἐξ ὧν πρώτων συνέστηκε τὸ ζῷον· τὰ δὲ, ἐν τοῖς ὑστέροις. ἡ μὲν γὰρ ἰσχὺς, ἐν τοῖς νεύροις καὶ ὀστοῖς· τὸ δὲ κάλλος, τῶν μελῶν τις συμμετρία δοκεῖ εἶναι. 14 Καὶ τὸ τέλος, τῶν πρὸς τὸ τέλος D αἱρετώτερον δοκεῖ εἶναι. 15 Καὶ δυοῖν, τὸ ἔγγιον τοῦ τέλους. 16 Καὶ ὅλως τὸ πρὸς τὸ τοῦ βίου τέλος, αἱρετώτερον μᾶλλον, ἤπερ τὸ πρὸς ἄλλο τι ἐστὶ, τὸ πρὸς εὐδαιμονίαν συντεῖνον, ἤπερ τὸ πρὸς φρόνησιν· τὸ γὰρ πρὸς εὐδαιμονίαν συντεῖνον, αἱρετώτερον. 17 Καὶ τὸ δυνατὸν, τοῦ ἀδυνάτου. 18 Ἔτι, δύο ποιητικῶν ὄντων, οὗ τὸ τέλος βέλτιον, καὶ αὐτὸ βέλτιον. 19 Ποιητικοῦ δὲ, καὶ τοῦ τέλους, ἐκ τοῦ ἀνάλογον, ὅταν πλείονι ὑπερέχῃ τὸ τέλος τοῦ τέλους, ἢ ἐκεῖνο τοῦ οἰκείου ποιητικοῦ ἐστὶν, εἰ ἡ εὐδαιμονία πλείονι ὑπερέχει ὑγιείας, ἤπερ ὑγίεια ὑγιεινοῦ· ὥστε E τὸ ποιητικὸν εὐδαιμονίας, βέλτιον ὑγιείας. ὅσῳ γὰρ ἡ εὐδαιμονία ὑγιείας ὑπερέχει, τοσούτῳ καὶ τὸ ποιητικὸν τὸ τῆς εὐδαιμονίας τοῦ ὑγιεινοῦ ὑπερέχει. ἡ δὲ ὑγίεια τοῦ ὑγιεινοῦ ἔλαττον ὑπερεῖχεν. ὥστε πλείονι ὑπερέχει τὸ ποιητικὸν εὐδαιμονίας, τοῦ ὑγιεινοῦ, ἤπερ ἡ ὑγίεια, τοῦ ὑγιεινοῦ. δῆλον οὖν, ὅτι αἱρετώτερον τὸ ποιητικὸν εὐδαιμονίας, τῆς ὑγιείας· τοῦ γὰρ αὐτοῦ πλείονι ὑπερέχει. 20 Ἔτι, τὸ κάλλιον καθ' αὑτὸ, καὶ τιμιώτερον καὶ ἐπαινετώτερόν ἐστι, φιλία πλούτου, καὶ δικαιοσύνη ὑγιείας καὶ ἰσχύος. τὰ μὲν γὰρ καθ' αὑτὰ τῶν τιμίων καὶ ἐπαινετῶν· τὰ δὲ, οὐ καθ' αὑτὰ, ἀλλὰ δι' ἕτερον.

A 6 Et quod propter ſe *eſt* optabile, optabilius *eſt* eo quod *eſt* optabile propter alterum: vt bene valere, *eſt optabilius* quã exercere. illud enim eſt optabile propter ſe, hoc verò propter alterum. 7 Et quod *eſt* per ſe, *potius eligendum eſt*, quàm quod *eſt* per accidens: vt amicos iuſtos eſſe, *potius* quam inimicos. illud n. per ſe *eſt* optabile, hoc verò per accidens. nam inimicos iuſtos eſſe, per accidens optamus, ne nobis noceãt. Hoc autem idem ferè, ac præcedens, ſed modo differt. amicos n. iuſtos eſſe, propter ſe optamus, & ſi nihil nobis futurum ſit, & ſi apud Indos ſint. inimicos autem *iuſtos eſſe optamus* propter aliud, *id eſt* ne nobis noceant. 8 Et quod B per ſe *eſt* cauſa boni, *optabilius eſt* eo quod *eſt* cauſa per accidens: vt virtus, fortunâ. illa n. per ſe, hæc verò per accidens *eſt* cauſa bonorũ. & ſi quid aliud *eſt* eiuſmodi. Similiter etiam in contrario *ſe res habet*. quod n. per ſe *eſt* mali cauſa, magis *eſt* fugiendum, quàm id quod *eſt cauſa* per accidens: vt vitiũ, quàm fortuna. illud n. per ſe *eſt* malum, fortuna verò per accidens. 9 Et *quod eſt* ſimpliciter bonum, optabilius *eſt* quàm alicui *bonum*: vt valere, quàm ſecari. illud n. *eſt* ſimpliciter bonum: hoc verò alicui, qui egeat ſectione. 10 Et quod naturâ *eſt bonum*, *melius eſt* nõ naturali: vt iuſtitia *viro* iuſto: illa n. *eſt* naturâ *bonum*, hic verò adſcititiè. 11 C Et quod rei meliori ac maiori honore dignę ineſt, magis *eſt* eligẽdum: vt *quod ineſt* Deo, *magis* quàm *quod ineſt* homini: & *quod ineſt* animo, *magis* quam *quod ineſt* corpori. 12 Et *quod eſt* melioris propriũ, *eſt* melius quã quod deterioris: vt Dei proprium, *melius eſt* quã proprium hominis. nã in ratione eorum quæ ſunt ambobus communia, nihil inter ſe differunt: iis verò quæ propria ſunt, alterum ab altero differt. 13 Et quod eſt in melioribus, vel prioribus, vel maiori honore dignis, melius *eſt*: vt ſanitas robore, & pulchritudine. illa n. *eſt* in humidis & ſiccis, & calidis & frigidis, & (vt ſimpliciter dicam) *in iis* ex quibus primis animal conſtat: hæc D verò in poſterioribus. nã robur in neruis & oſſibus conſiſtit: pulchritudo autem videtur eſſe mẽbrorum ſymmetria quædam. 14 Et finis iis quæ ad finem *diriguntur*, videtur eſſe optabilius. 15 Ex duobus autem id quod ad finem propiùs *accedit*. 16 Et omnino quod ad vitæ finem *refertur*, optabilius *eſt* eo quod ad alium quẽpiam *finem*, vt quod ad beatitatem confert, eo quod ad prudentiam: quod n. ad beatitatem confert, optabilius *eſt*. 17 Et poſſibile impoſſibili. 18 Præterea cũ ſint duo effectiua: cuius finis *eſt* melior, ipſum quoque melius *eſt*. 19 *Cùm* autem alterum *ſit* effectiuum, alterum finis: ex proportione *iudicãdum eſt*: cùm pluribus partibus finis finem ſuperat, quàm is cauſam E ſuam efficientem. veluti ſi beatitudo pluribus partibus ſuperat ſanitatem, quàm ſanitas ſalubre: *efficitur* vt quod habet vim efficiendi beatitudinem, *ſit* melius ſanitate. quanto enim beatitudo ſanitati præſtat, tanto etiam quod habet vim efficiendi beatitudinem, ſalubri præſtat. ſanitas autem ſalubri minùs præſtabat, quã beatitudo ſanitati. quocirca pluribus partibus ſalubri præſtat, quod habet vim efficiendi beatitudinem, quàm ſanitas ſalubri. Patet igitur ſanitate optabilius eſſe quod habet vim efficiendi beatitudinem: quippe eidem pluribus partibus præſtat. 20 Præterea *optabilius eſt*, quod eſt pulchrius per ſe, [illegible] honore ac laude dignum: vt amicitia *eſt anteponenda* diuitiis, & iuſtitia ſanitati ac viribus: illa enim *ſunt* per ſe in rebus honorabilibus & laudabilibus: hæc verò non per ſe, ſed pr[illegible]

nemo n. diuitias propter ſe honore dignas cenſet, A ſed propter aliud. amicitiam verò per ſe *colimus*, etiamſi nihil inde ad nos peruenturum ſit.

οὐδεὶς γὰρ τιμᾷ τὸν πλοῦτον δι' αὑτόν, ἀλλὰ δι' ἕτερον. τὴν δὲ φιλίαν καθ' αὑτό, καὶ εἰ μηδὲν μέλλοι ἡμῖν ἕτερον ἀπ' αὐτῆς ἔσεσθαι.

Alij loci. Cap. II.

1 A conſequentibus. 2 A numero. 3 A voluptate. 4 Ab indolentia. 5 Ab opportunitate. 6 Si alterum ſemper vel ſæpius vtile ſit. 7 Si cum alterum omnes habent, non indigemus altero. 8 A corruptione, abiectione, generatione, acceptione, & contrariis. 9 A propinquitate boni. 10 A ſimilitudine, ſi alterum ſit ſimilius bono, 11 vel meliori. 12 ſi alterum meliori, alterum deteriori ſimilius ſit. 13 Si alterum ſit magis, alterum minus inſigne. 14 A difficultate. 15 A proprietate. 16 A malorum abſentia. 17 A poſitiuis ad ſuperlatiua. 18 A ſuperlatiuis ad poſitiua. 19 Si alterum cum amicis communicare liceat, alterum minimè. 20 Si alterum malimus agere cum amicis, alterum cum quouis. 21 Si alterum ſit ex abundanti, alterum neceſſarium. 22 Si alterum ab aliis ſuppeditari poſſit, alterum non item. 23 Si alterum ſit per ſe eligendum, alterum non ſine altero. 24 A diſſimulatione. 25 Ab increpatione minori, 26 vel maiori.

PRæterea cũ duo quædam ſunt valde inter ſe B ſimilia, nec poſſumus vllam excellẽtiam perſpicere, qua alterũ alteri præſtet: videre *oportet an* ex conſequentibus *intelligi poſſit*. cui n. conſequens eſt maius bonum, id *eſt* magis eligendũ. at ſi conſequentia mala *ſint*: cui minus malũ eſt conſequẽs, id *eſt* magis eligendũ. cùm n. ambo ſint eligenda, nihil prohibet quo minùs aliquid moleſtũ conſequens ſit. bifariã autem ex conſecutione conſideratur. nam & priùs & poſteriùs conſequitur: vt diſcenti ignorantia priùs, ſcientia poſteriùs. Melius autem plerũque *eſt*, quod poſteriùs conſequitur. Conſequentiũ igitur vtrũuis vtile ſit, accipi *debet*. 2 Prçterea plura bona paucioribus *anteponẽda ſunt* C aut ſimpliciter, aut quãdo altera in alteris inſunt, nimirum pauciora in pluribus. Obiectio *eſt*, ſicubi alterum alterius gratia *ſit*: non *ſunt* n. ambo vno optabiliora: vt ſanari & ſanitas ſanitate: quia ſanari, ſanitatis causã eligimus. Nihil etiam vetat, quominùs non bona, *ſi vnà* cum bonis *accipiantur*, ſint *bonis* anteponenda: vt beatitudo & aliud quidpiã quod non ſit bonum, iuſtitiæ & fortitudini. 3 Et eadem cum voluptate magis *eligenda ſunt*, quàm ſine voluptate. 4 Et eadem cum indolentia, magis quàm cum dolore. 5 Et vnumquodque quo tempore magis valet, eo *tempore eſt* magis eligen- D dum: vt ſine moleſtia in ſenectute *viuere*, magis quàm in iuuentute: quia magis in ſenectute valet. ſecundũ hæc & prudentiã in ſenectute *eſt* magis eligenda. nemo n. adoleſcentes duces eligit, propterea quòd pro prudentibus non habentur. fortitudo verò contrà *habet*: quoniam in iuuentute magis neceſſaria *eſt* operatio ſecundum fortitudinem. ſimilis *eſt* ratio temperantiæ: magis n. adoleſcentes, quàm ſenes cupiditatibus afficiuntur. 6 Et, quod omni tẽpore, vel pleriſque *temporibus eſt vtile, id* vtilius *eſt*: vt iuſtitia & temperantia, quã fortitudo: illæ n. ſemper, hæc verò aliquãdo vtilis *eſt*. 7 Et *id* quod ſi omnes habeant, altero non E egemus, *magis eſt eligendum*, quàm *id*, quod ſi *omnes* habeant, indigemus reliquo: vt in iuſtitia & fortitudine *videre licet*. nam ſi iuſti omnes ſint, nihil prodeſt fortitudo: at ſi omnes ſint fortes, iuſtitia *eſt* vtilis. 8 Præterea *ducenda ſunt argumenta* ex corruptionibus, & abiectionibus, & generationibus, & acceptionibus, & contrariis. quorum enim corruptiones *ſunt* magis fugiendæ, ea *ſunt* magis eligenda. ſimiliter etiam in abiectionibus, & contrariis *accidit*. cuius enim abiectio vel contrarium *eſt* magis fugiendum, id *eſt* magis eligendum. Contrà *ſit* in generationibus & acceptionibus. quorum enim generationes & acceptiones *ſunt* magis eligendæ, ipſa *ſunt* magis eligenda.

ΕΤι, ὅταν δύο τινὰ ᾖ σφόδρα *ἀλλήλοις παραπλήσια, καὶ μὴ δυνώμεθα ὑπεροχὴν μηδεμίαν συνιδεῖν τοῦ ἑτέρου πρὸς ἕτερον, ὁρᾷν ἀπὸ τῶν παρεπομένων. ᾧ γὰρ ἕπεται μεῖζον ἀγαθόν, τοῦθ' αἱρετώτερον. ἂν δ' ᾖ τὰ ἑπόμενα κακά, ᾧ τὸ ἔλαττον ἀκολουθεῖ κακόν, τοῦθ' αἱρετώτερον. ὄντων γὰρ ἀμφοτέρων αἱρετῶν, οὐδὲν κωλύει δυσχερές τι παρέπεσθαι. διχῶς δ' ἀπὸ τοῦ ἕπεσθαι ἡ σκέψις. καὶ γὰρ πρότερον, καὶ ὕστερον ἕπεται ἐστί, τῷ μανθάνοντι, τὸ μὲν ἀγνοεῖν, πρότερον· τὸ δὲ ἐπίστασθαι, ὕστερον. βέλτιον δ' ὡς ἐπὶ τὸ πολὺ τὸ ὕστερον ἑπόμενον. λαμβάνειν οὖν τῶν ἑπομένων, ὁπότερον ἂν ᾖ χρήσιμον. 2 Ἔτι, τὰ πλείω ἀγαθὰ τῶν ἐλαττόνων, ἢ ἁπλῶς, ἢ ὅταν τὰ ἕτερα ἐν τοῖς ἑτέροις ὑπάρχῃ, τὰ ἐλάττω ἐν τοῖς πλείοσιν. ἔνστασις, εἴπου θάτερον θατέρου χάριν· οὐδὲν γὰρ αἱρετώτερα τὰ ἄμφω τοῦ ἑνός· οἷον τὸ ὑγιάζεσθαι καὶ ἡ ὑγίεια τῆς ὑγιείας· ἐπειδὴ τὸ ὑγιάζεσθαι τῆς ὑγιείας ἕνεκεν αἱρούμεθα. καὶ μὴ ἀγαθὰ δὲ μετ' ἀγαθῶν, οὐδὲν κωλύει εἶναι αἱρετώτερα· οἷον, εὐδαιμονίαν, καὶ ἄλλο τι ὃ μὴ ἔστιν ἀγαθόν, δικαιοσύνης καὶ ἀνδρίας. 3 Καὶ τὰ αὐτὰ μεθ' ἡδονῆς, μᾶλλον ἢ ἄνευ ἡδονῆς. 4 Καὶ τὰ αὐτὰ μετὰ ἀλυπίας, μᾶλλον ἢ μετὰ λύπης. 5 Καὶ ἕκαστον ἐν ᾧ καιρῷ μεῖζον δύναται, ἐν τούτῳ καὶ αἱρετώτερον εἶναι, τὸ ἀλύπως ἐν τῷ γήρᾳ, μᾶλλον ἢ ἐν τῇ νεότητι· μεῖζον γὰρ ἐν τῷ γήρᾳ δύναται. κατὰ ταῦτα δὲ καὶ ἡ φρόνησις ἐν τῷ γήρᾳ αἱρετώτερον· οὐδεὶς γὰρ τοὺς νέους αἱρεῖται ἡγεμόνας, διὰ τὸ μὴ ἀξιοῦν φρονίμους εἶναι. ἡ δ' ἀνδρία, ἀνάπαλιν· ἐν τῇ νεότητι γὰρ ἀναγκαιοτέρα ἡ κατὰ τὴν ἀνδρίαν ἐνέργεια. ὁμοίως δὲ καὶ ἡ σωφροσύνη· μᾶλλον γὰρ οἱ νέοι τῶν πρεσβυτέρων ὑπὸ τῶν ἐπιθυμιῶν ἐνοχλοῦνται. 6 Καὶ ὃ ἐν παντὶ καιρῷ, ἢ ἐν τοῖς πλείστοις, χρησιμώτερον· οἷον, δικαιοσύνη καὶ σωφροσύνη ἀνδρίας· αἱ μὲν γὰρ, ἀεί· ἡ δὲ, ποτὲ *χρησίμη. 7 Καὶ ὃ πάντων ἐχόντων, μηδὲν θατέρου δεόμεθα, ἢ ὃ ἐχόντων, προσδεόμεθα τοῦ λοιποῦ· καθάπερ ἐπὶ δικαιοσύνης, καὶ ἀνδρίας. δικαίων μὲν γὰρ πάντων ὄντων, οὐδὲν χρήσιμος ἡ ἀνδρία. ἀνδρείων δὲ πάντων ὄντων, χρήσιμος ἡ δικαιοσύνη. 8 Ἔτι, ἐκ τῶν φθορῶν καὶ τῶν ἀποβολῶν, καὶ τῶν γενέσεων, καὶ τῶν λήψεων, καὶ τῶν ἐναντίων. ὧν γὰρ αἱ φθοραὶ φευκτότεραι, αὐτὰ αἱρετώτερα. ὁμοίως δὲ καὶ ἐπὶ τῶν ἀποβολῶν, καὶ τῶν ἐναντίων. οὗ γὰρ ἡ ἀποβολὴ ἢ τὸ ἐναντίον φευκτότερον, αὐτὸ αἱρετώτερον. ἐπὶ δὲ τῶν γενέσεων καὶ τῶν λήψεων, ἀνάπαλιν. ὧν γὰρ αἱ λήψεις καὶ αἱ γενέσεις αἱρετώτεραι, καὶ αὐτὰ αἱρετώτερα.

CAP. II.
* γρ. ἰσάζει.
* γρ. χρήσιμος.

* γρ. [illegible]

9 Ἄλλος τόπος, τὸ ἐγγύτερον τἀγαθοῦ, βέλτιον* καὶ αἱρετώτερον. 10 Καὶ τὸ ὁμοιότερον τῷ ἀγαθῷ, οἷον ἡ δικαιοσύνη δικαίου. 11 Καὶ τὸ τῷ βελτίονι* αὐτοῦ, ὁμοιότερον, καθάπερ τὸν Αἴαντα τοῦ Ὀδυσσέως φασὶ βελτίω τινὲς εἶναι, διότι ὁμοιότερος μὲν τῷ Ἀχιλλεῖ. ἔνστασις τούτου ἐστὶν, ὅτι οὐκ ἀληθές. οὐδὲν γὰρ κωλύει, μὴ ᾗ βέλτιστος ὁ Ἀχιλλεύς, ταύτῃ ὁμοιότερον εἶναι τὸν Αἴαντα, τοῦ ἑτέρου ὄντος μὲν ἀγαθοῦ,* μὴ ὁμοίου δέ. σκοπεῖν δὲ καὶ εἰ ἐπὶ τὰ γελοιότερα εἴη* ὅμοιον, καθάπερ ὁ πίθηκος* τῷ ἀνθρώπῳ, τοῦ ἵππου μὴ ὄντος ὁμοίου. οὐ γὰρ κάλλιον ὁ πίθηκος, ὁμοιότερον δὲ τῷ ἀνθρώπῳ. 12 Πάλιν, ἐπὶ δυοῖν εἰ τὸ μὲν, τῷ βελτίονι τὸ δὲ, τῷ χείρονι ὁμοιότερον εἴη ἂν βέλτιον τὸ τῷ βελτίονι ὁμοιότερον. ἔχει δὲ καὶ τοῦτο ἔνστασιν. οὐδὲν γὰρ κωλύει, τὸ μὲν τῷ βελτίονι ἠρέμα ὅμοιον εἶναι τὸ δὲ, τῷ χείρονι σφόδρα. οἷον, εἰ ὁ μὲν Αἴας τῷ Ἀχιλλεῖ ἠρέμα, ὁ δὲ Ὀδυσσεὺς τῷ Νέστορι σφόδρα. καὶ εἰ τὸ μὲν, τῷ βελτίονι ὅμοιον, ἐπὶ τὰ χείρω ὅμοιον εἴη τὸ δὲ, τῷ χείρονι, ἐπὶ τὰ βελτίω καθάπερ ἵππος ὄνῳ, καὶ πίθηκος ἀνθρώπῳ. 13 Ἄλλος, τὸ ἐπιφανέστερον τοῦ ἧττον τοιούτου. 14 Καὶ, τὸ χαλεπώτερον. μᾶλλον γὰρ ἀγαπῶμεν ἔχοντες, ἃ μὴ ἔστι* ῥᾳδίως λαβεῖν. 15 Καὶ τὸ ἰδιαίτερον τοῦ κοινοτέρου. 16 Καὶ τὸ τοῖς κακοῖς ἀκοινωνητότερον. αἱρετώτερον γὰρ, ᾧ μηδεμία δυσχέρεια ἀκολουθεῖ, ἢ ᾧ ἀκολουθεῖ. 17 Ἔτι, εἰ τοῦτο ἁπλῶς τούτου βέλτιον καὶ ἁπλῶς τὸ βέλτιστον τῶν ἐν τούτῳ, βέλτιον τοῦ ἐν τῷ ἑτέρῳ βελτίστου οἷον, εἰ βελτίων ἄνθρωπος ἵππου, καὶ ὁ βέλτιστος ἄνθρωπος τοῦ βελτίστου ἵππου βελτίων. 18 Καὶ* εἰ τὸ βέλτιστον τοῦ βελτίστου βέλτιον, καὶ ἁπλῶς* τοῦτο βέλτιον οἷον, εἰ ὁ βέλτιστος ἄνθρωπος τοῦ βελτίστου ἵππου βελτίων, καὶ ὁ ἁπλῶς ἄνθρωπος τοῦ ἁπλῶς ἵππου βελτίων. 19 Ἔτι, ὧν ἔστι τοὺς φίλους μετασχεῖν, αἱρετώτερα, ἢ ὧν μή. 20 Καὶ ἃ πρὸς τὸν φίλον πράττειν μᾶλλον βουλόμεθα, ἢ ἃ πρὸς τὸν τυχόντα, ταῦτα αἱρετώτερα. οἷον, τὸ δικαιοπραγεῖν, καὶ εὖ ποιεῖν, μᾶλλον ἢ τὸ δοκεῖν. τοὺς γὰρ φίλους εὖ ποιεῖν βουλόμεθα μᾶλλον, ἢ δοκεῖν τοὺς δὲ τυχόντας, ἀνάπαλιν. 21 Καὶ τὰ ἐκ περιουσίας, τῶν ἀναγκαίων βελτίω, ἐνίοτε δὲ καὶ αἱρετώτερα. βέλτιον γὰρ τοῦ ζῆν, τὸ εὖ ζῆν. τὸ δὲ εὖ ζῆν, ἐστὶν ἐκ περιουσίας. αὐτὸ δὲ τὸ ζῆν, ἀναγκαῖον. ἐνίοτε δὲ τὰ βελτίω, οὐχὶ καὶ αἱρετώτερα. οὐ γὰρ εἰ βελτίω, ἀναγκαῖον καὶ αἱρετώτερα. τὸ γὰρ φιλοσοφεῖν, βέλτιον τοῦ χρηματίζεσθαι, ἀλλ' οὐχ αἱρετώτερον τῷ ἐνδεεῖ τῶν ἀναγκαίων. τὸ δὴ ἐκ περιουσίας ἐστὶν, ὅταν ὑπαρχόντων τῶν ἀναγκαίων, ἄλλα τινὰ προσκατασκευάζηται τῶν καλῶν. σχεδὸν δὲ ἴσως αἱρετώτερον τὸ ἀναγκαῖον ἐστί· βέλτιον δὲ, τὸ ἐκ περιουσίας. 22 Καὶ ὃ μὴ ἔστι παρ' ἄλλου πορίσασθαι, ἢ ὃ ἔστι καὶ παρ' ἄλλου· οἷον πέπονθεν ἡ δικαιοσύνη πρὸς τὴν ἀνδρείαν. 23 Καὶ εἰ τόδε μὲν ἄνευ τοῦδε αἱρετὸν, τόδε δὲ ἄνευ τοῦδε μή. οἷον, δύναμις ἄνευ φρονήσεως οὐχ αἱρετὸν, φρόνησις δὲ ἄνευ δυνάμεως αἱρετόν. 24 Καὶ δυοῖν εἰ θάτερον ἀρνούμεθα, ἵνα τὸ λοιπὸν δόξῃ ἡμῖν ὑπάρχειν, ἐκεῖνο αἱρετώτερον, ὃ βουλόμεθα δοκεῖν ὑπάρχειν. οἷον, φιλοπονίαν ἀρνούμεθα, ἵνα εὐφυεῖς δοκῶμεν εἶναι. 25 Ἔτι, οὗ τῇ ἀπουσίᾳ ἧττον ἐπιτιμητέον δυσφοροῦσι, τοῦτο αἱρετώτερον. 26 Καὶ οὗ τῇ ἀπουσίᾳ μὴ δυσφοροῦσι μᾶλλον ἐπιτιμητέον, τοῦτο αἱρετώτερον.

* γρ. [illegible]
* γρ. [illegible]
* γρ. [illegible]
* γρ. [illegible] quæ sequenti capite habentur.
* γρ. [illegible]
* γρ. [illegible]

A 9 Alius locus: Quod *est* propinquius bono, *est* melius & optabilius. 10 Et quod *est* similius bono: vt iustitia *similior est bono*, quã iustum. 11 Et quod vtroque meliori similius *est*: quemadmodum aiunt nonnulli Aiacem Vlysse meliorem esse, quod similior sit Achilli. Obiicitur, hoc non esse verũ: quia nihil prohibet Aiacẽ, non qua Achilles optimus *est*, ei similiorẽ esse: cum alter sit quidẽ bonus, non tamẽ similis. Considerare *etiam oportet*, an ea, quæ *sunt* magis ridicula, simile sit: quemadmodum simia *est* homini *similis*, cũ equus non sit similis: non n. simia *est* pulchrior, licet *sit* homini similior. 12 Rursus cùm duo sunt, si alterum meliori, alterum deteriori *sit* similius: melius erit, quod est meliori B similius. Sed & aduersùs hoc est obiectio. nihil n. prohibet, quominùs alterum meliori parũ simile sit, alterũ verò deteriori valde *simile*. veluti si Aiax Achilli parum, Vlysses autem Nestori valde *similis sit*. Et si quod est meliori simile, quantum ad deteriora similis sit: quod autem deteriori, quantũ ad meliora: quemadmodum equus asino, & simia homini. 13 Alius *locus: Quod est* magis insigne, *optabilius est* eo quod *est* minùs tale. 14 Et *quod est* difficilius. charior n. nobis est eorum possessio, quæ non facilè acquiri possunt. 15 Et magis propriũ *antepo-nitur* magis cõmuni. 16 Et *quod* magis à malis segregatũ *est*. magis n. eligendum *est id* cui nulla est C molestia consequens, quã *id*, cui est consequens. 17 Præterea si hoc simpliciter illo *est* melius, etiã simpliciter horũ optimũ *est* melius illorũ optimo. veluti si homo *est* melior equo, etiã optimus homo *est* melior optimo equo. 18 Et si optimum optimo *est* melius, etiam *simpliciter hoc est* melius. vt si optimus homo optimo equo est melior, etiã simpliciter homo *est* simpliciter equo melior. 19 Præterea quæ licèt communicare cum amicis, *sunt* magis eligenda, quã ea quæ non *licet*. 20 Et quæ erga amicũ agere malumus, hæc *sunt* magis eligenda, quã quę erga quẽvis. vt iustè agere, & benè facere, magis *eligenda sunt*, quã videri: amicis n. bene facere malumus quã videri: quibuslibet autẽ è contrario. 21 D Et quæ *sunt* ex abundanti, necessariis *sunt* meliora, interdum autẽ & magis eligenda. melius n. quàm viuere, *est* bene viuere. bene autem viuere est ex abundãti: at ipsum viuere *est* necessarium. Interdũ verò quæ sunt meliora, non *sunt* etiã magis eligenda: non n. si *sunt* meliora, *idcirco* necesse *est vt sint* magis eligenda. nã philosophari, melius *est* quàm quæstũ facere: sed ei non *est* magis eligendum, qui indiget *rebus* necessariis. Ex abundanti verò est, cũ res necessariæ suppetunt, & aliæ præterea quędã honestæ parantur. Ac ferè est fortasse magis eligendũ, quod est necessarium: melius autẽ, quod *est* ex abundanti. 22 Et quod ab alio suppeditari non E potest, *melius est* eo quod potest etiã ab alio *suppe-ditari*: quomodo affecta est iustitia ad fortitudinẽ. 23 Et si hoc sine illo *est* eligendũ, illud verò sine hoc non *ite*. vt vis sine prudentia non *est* eligenda, prudentia verò sine vi *est eligenda*. 24 Et si duorũ alterũ negamus, vt reliquũ videatur nobis inesse: illud *est* optabilius, quod videri volumus inesse. vtputà laboriosos *nos* esse negamus, vt valere ingenio videamur. 25 Præterea cuius absentiã qui molestè ferunt, minùs reprehendendi sunt, id *est* optabilius. 26 Et cuius absentiã qui non ægrè ferũt, magis reprehendendi sunt, id *ite est* optabilius.

Alij loci. Cap. III.

1 A propria virtute, quam alterum ſolum habet, 2 vel magis habet. 3 Si rem in qua eſt, bonam efficit alterum ſolum, 4 vel magis: vel alterum pertineat ad rem præſtantiorem, alterum ad deteriorem. 5 A caſibus, & vſu, & actionibus, & operibus, vel contrà. 6 Si cuius ſit alterum maius bonum, alterum minus. 7 Si alterum ſit rei maioris maius bonum. 8 Si eidem rei alterum ſit magis, alterum minus anteponendum. 9 Ab exſuperantia. 10 Si alterum malimus per nos acquirere, alterum per alios. 11 Ab adiectione ad quamuis rem, 12 vel ad minus bonum. 13 A detractione. 14 Si alterum per ſe, alterum gloriæ causâ: 15 vel alterum vno, alterum vtroque modo ſit eligendum. 16 Si alterum ſit propter ſe honorabile, alterum propter aliud. 17 Si alterum ad plura conferat, 18 vel magis conferat. 19 A fine. 20 Si alterum æquè probari poſſit eſſe eligendum & fugiendum, alterum verò tantummodo eligendum. 21 Epilogus.

PRæterea eorum quæ ſub eadē ſpecie *continentur*, quod habet propriam virtutem, eo quod non habet, optabilius *eſt*. 2 Cùm autē ambo habēt: *id eſt optabilius*, quod magis habet. 3 Præterea ſi alterum bonā efficit rem cui adeſt, alterum non efficit: id quod efficit, *eſt* optabilius: quēadmodum calidius *eſt* quod calefacit, eo quod nō *calefacit*. 4 Si verò ambo efficiant: *id eſt optabilius*, quod magis efficit: aut quod rē quæ melior & magis præcipua eſt, bonam facit: veluti ſi alterum animam *bonā efficiat*: alterū corpus. 5 Præterea *ſingula confirmanda ſunt* à caſibus, & vſibus, & actionibus, & operibus: atque hæc ab illis *à quibus orta ſunt*. nā ſeſe mutuò conſequuntur: veluti ſi iuſtè, *eſt* optabilius, quàm fortiter: etiam iuſtitia *eſt* optabilior fortitudine. & *verò* ſi iuſtitia *eſt* optabilior fortitudine: etiā iuſtè *eſt optabilius*, quā fortiter. Similis *eſt* aliorum ratio. 6 Præterea ſi eodem alterum ſit maius bonū, alterum minus: *id eſt* optabilius, quod *eſt* maius. 7 Aut ſi alterum ſit maiori maius. 8 Sed & ſi duo quædā ſint aliqua re optabiliora: quod magis eſt *ea re* optabilius, eo quod eſt minùs *eadem re* optabilius, optabilius *eſt*. 9 Præterea cuius exſuperantia *eſt* optabilior quàm *alterius* exſuperātia, id quoque *eſt* optabilius. vt amicitia, quàm diuitiæ: quoniā optabilior eſt exſuperātia amicitiæ, quàm diuitiarum. 10 Et quod ſibi quiſque mauult per ſe parare, quā quod per aliū: *illud eſt anteponēdum*, vt amici diuitiis. 11 Præterea ex adiunctione *arguendum eſt*, ſi eidem *rei* quidpiam adiunctum, faciat vt totum ſit optabilius. ſed cauere oportet, ne proponantur *ea*, in quibus altero eorum quæ adiunguntur, vtatur *id quod* commune *eſt*, aut aliquo alio modo *ab eo* adiuuetur: reliquo autem nec vtatur, nec *ab eo* adiuuetur. veluti *ſi coniungas* ſerram & falcem cum fabrica: optabilior *eſt* ſerra coniunctim accepta, ſimpliciter autem non eſt optabilior. 12 Præterea ſi minori adiunctum quidpiam, efficiat vt totum ſit maius. 13 Similiter etiam *arguendum erit* ex detractione. quo enim ab eadem re ablato, quod relinquitur, eſt minus: illud eſt maius: quandoquidem ablatum efficit, *vt* id quod relinquitur, minus *ſit*. 14 Et ſi alterum propter ſe, alterum propter gloriam ſit eligendum: vt ſanitas *eſt optabilior* pulchritudine. Definitio autem eius quod ad gloriam *dirigitur*, *hæc eſt*, Quod nemine conſcio non damus operam vt inſit. 15 Et ſi alterum propter ſe & propter gloriam *ſit* eligendum, alterum verò propter *eorum* alterutrum dumtaxat. 16 Et quod *eſt* magis propter ſe honorabile, hoc & melius & optabilius *eſt*. Honore autem dignius eſt per ſe, quod cùm futurum non ſit vt vlla alia res inſit, per ſe eligimus potiùs. 17 Præterea diſtinguere *oportet*, quot modis eligendum dicatur, & quorum gratiā: vt vtilitatis, vel honeſtatis, vel iucunditatis *causā*. quod enim ad omnia vel ad plura vtile eſt, eo *eſt* optabilius quod non ſimiliter *eſt vtile*.

CAP. III.

ΕΤι, τῶν ὑπὸ τὸ αὐτὸ εἶδος, τὸ ἔχει τὴν οἰκείαν ἀρετὴν, τοῦ μὴ ἔχοντος αἱρετώτερον. 2 Ἀμφοῖν δ' ἐχόντων, τὸ μᾶλλον ἔχον. 3 Ἔτι, εἰ τὸ μὲν, ποιεῖ ἀγαθὸν *ἐκεῖνο ᾧ ἂν παρῇ· τὸ δὲ, μὴ ποιεῖ, τὸ ποιοῦν, αἱρετώτερον· καθάπερ καὶ θερμότερον τὸ θερμαῖνον, τοῦ μή. 4 Εἰ δὲ ἄμφω ποιεῖ, τὸ μᾶλλον ποιοῦν· ἢ εἰ τὸ βέλτιον καὶ κυριώτερον ποιεῖ ἀγαθόν· οἷον, εἰ τὸ μὲν, τὴν ψυχήν· τὸ δὲ, τὸ σῶμα. 5 Ἔτι, ἀπὸ τῶν πτώσεων, καὶ τῶν χρήσεων, καὶ τῶν πράξεων, καὶ τῶν ἔργων, καὶ ταῦτα δὲ ἀπ' ἐκείνων. ἀκολουθεῖ γὰρ ἀλλήλοις. οἷον, εἰ τὸ δικαίως, αἱρετώτερον τοῦ ἀνδρείως· καὶ ἡ δικαιοσύνη τῆς ἀνδρείας αἱρετωτέρα. καὶ εἰ ἡ δικαιοσύνη τῆς ἀνδρείας αἱρετωτέρα, καὶ τὸ δικαίως τοῦ ἀνδρείως. παραπλησίως δὲ καὶ ἐπὶ τῶν ἄλλων. 6 Ἔτι, εἴ τινος τοῦ αὐτοῦ τὸ μὲν, μεῖζον ἀγαθόν ἐστι· τὸ δὲ, ἔλαττον· αἱρετώτερον τὸ μεῖζον. 7 Ἢ εἰ μείζονος μεῖζον εἴη θάτερον. 8 Ἀλλὰ καὶ εἰ δύο τινὰ, τινὸς εἴη αἱρετώτερα, τὸ μᾶλλον αἱρετώτερον, τοῦ ἧττον αἱρετωτέρου, αἱρετώτερον. 9 Ἔτι, οὗ ἡ ὑπερβολὴ τῆς ὑπερβολῆς αἱρετωτέρα, καὶ αὐτὸ αἱρετώτερον· οἷον, φιλία, χρημάτων. αἱρετωτέρα γὰρ ἡ τῆς φιλίας ὑπερβολὴ, τῆς τῶν χρημάτων. 10 Καὶ οὗ μᾶλλον ἂν ἕλοιτο αὐτὸς ἑαυτῷ αἴτιος εἶναι, ἢ οὗ ἕτερος· οἷον, φίλους τῶν χρημάτων. 11 Ἔτι, ἐκ τῆς προσθέσεως, εἰ τῷ αὐτῷ προστιθέμενόν τι, τὸ ὅλον αἱρετώτερον ποιεῖ. εὐλαβεῖσθαι δὲ δεῖ προτείνειν, ἐφ' ὧν τῷ μὲν ἑτέρῳ τῶν προστιθεμένων *χρῆται τὸ κοινὸν, ἢ ἄλλως πως συνεργόν ἐστι· τῷ δὲ λοιπῷ μὴ χρῆται, μηδὲ συνεργόν ἐστιν. οἷον, πρίονα καὶ δρέπανον μετὰ τεκτονικῆς, αἱρετώτερον ὁ πρίων συνδυαζόμενος, ἁπλῶς δὲ οὐχ αἱρετώτερον. 12 Πάλιν, εἰ ἐλάττονι προστεθέν τι, τὸ ὅλον μεῖζον ποιεῖ. 13 Ὁμοίως δὲ καὶ ἐκ τῆς ἀφαιρέσεως. οὗ γὰρ ἀφαιρεθέντος ἀπὸ τοῦ αὐτοῦ, τὸ λειπόμενον ἔλαττον ἦ· ἐκεῖνο μεῖζον ἂν εἴη· ὁπότε ἀφαιρεθὲν, τὸ λειπόμενον ἔλαττον ποιεῖ. 14 Καὶ εἰ τὸ μὲν, δι' ἑαυτό· τὸ δὲ, διὰ τὴν δόξαν αἱρετόν ἐστιν· οἷον, ὑγίεια κάλλους. ὅρος δὲ τοῦ πρὸς δόξαν, τὸ μηδενὸς *συνειδότος, μὴ ἂν σπουδάσαι ὑπάρχειν. 15 Καὶ εἰ τὸ μὲν, δι' ἑαυτὸ, καὶ διὰ τὴν δόξαν αἱρετόν· τὸ δὲ, διὰ θάτερον μόνον. 16 Καὶ ὁπότερον μᾶλλον δι' αὐτὸ τίμιον, τοῦτο καὶ βέλτιον καὶ αἱρετώτερον. τιμιώτερον δ' ἂν εἴη καθ' ἑαυτὸ, ὃ μηδενὸς ἄλλου μέλλοντος ὑπάρξειν, δι' ἑαυτὸ αἱρούμεθα μᾶλλον. 17 Ἔτι, διελέσθαι ποσαχῶς τὸ αἱρετὸν λέγεται, καὶ τίνων χάριν ἐστί· τοῦ συμφέροντος, ἢ τοῦ καλοῦ, ἢ τοῦ ἡδέος. τὸ γὰρ πρὸς ἅπαντα, ἢ πρὸς τὰ πλείω χρήσιμον, αἱρετώτερον ἂν εἴη τοῦ μὴ ὁμοίως.

* [illegible] al. [illegible] ἔχειν.
* ἢ συγχρῆται.
* ἂν μηδενὸς εἰδότος.

A 18 Τῶν δ' αὐτῶν ἀμφοτέροις ὑπαρχόντων, ὁποτέρῳ μᾶλλον ὑπάρχει σκεπτέον ἐστί, πότερον ἥδιον, ἢ κάλλιον, ἢ συμφορώτερον. 19 Πάλιν, τὸ τοῦ βελτίονος ἕνεκεν, αἱρετώτερον ἐστί, τὸ ἀρετῆς ἕνεκεν, ἢ ἡδονῆς. ὁμοίως δὲ καὶ ἐπὶ τῶν φευκτῶν. φευκτότερον γὰρ τὸ μᾶλλον ἐμποδιστικὸν τῶν* αἱρετῶν ἐστί, οἷον νόσος αἴσχους. καὶ γὰρ ἡδονῆς καὶ τοῦ σπουδαῖον εἶναι, κωλυτικώτερον ἡ νόσος. 20 Ἔτι, ἐκ τοῦ ὁμοίως δεικνύναι φευκτὸν καὶ αἱρετὸν τὸ προκείμενον. ἧττον γὰρ τὸ τοιοῦτον αἱρετόν, ὃ καὶ ἕλοιτ' ἄν τις ὁμοίως καὶ φύγοι, τοῦ ἑτέρου ὄντος αἱρετοῦ μόνον. 21 Τὰς μὲν οὖν πρὸς ἄλληλα συγκρίσεις, καθάπερ εἴρηται, ποιητέον.

* γρ. [illegible]

18 Cùm autē eadem ambobus inſunt, vtri magis inſint, videndū eſt: veluti vtrum ſit iucundius, aut honeſtius, aut vtilius. 19 Rurſus quod melioris causâ *eſt* optabilius: veluti quod *eſt* virtutis causâ, *eſt optabilius*, quàm *id* quod *eſt* voluptatis *causâ*. Similis *eſt* ratio fugiēdorum. magis n. fugiendum *eſt*, quod magis impedit res eligendas: vt morbus deformitate: quia magis & voluptati & probitati morbus obſtat. 20 Præterea *eſt* ex eo *argui*, quòd æquè probare *liceat id quod eſt* propoſitū, eſſe fugiendum & eligendum. quod n. eſt eiuſmodi, vt æquè aliquis eligat ac fugiat, minùs *eſt* eligendum, quàm alterum, quod eſt tantummodò eligendum. 21 *Rerum* igitur inter ſe comparationes, quemadmodum dictum eſt, fieri debent.

DE ABSOLVTE ELIGENDIS, AVT FVGIENDIS.

TRACTATVS II.

Cap. IV.

1 De excellentia, qua alterum alteri præſtat, detrahenda. 2 De iis quorum comparatione ſtatim apparet etiam vtrumque vel alterum eſſe eligendum.

CAP. IV.

B Οἱ αὐτοὶ δὲ τόποι χρήσιμοι καὶ πρὸς τὸ δεικνύναι ὁτιοῦν αἱρετὸν ἢ φευκτόν. ἀφαιρεῖν γὰρ μόνον δεῖ τὴν πρὸς ἕτερον ὑπεροχήν. εἰ γὰρ τὸ τιμιώτερον, αἱρετώτερον· καὶ τὸ τίμιον, αἱρετόν. καὶ εἰ τὸ χρησιμώτερον αἱρετώτερον, καὶ τὸ χρήσιμον, αἱρετόν. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων, ὅσα τοιαύτην ἔχει τὴν σύγκρισιν. 2 Ἐπ' ἐνίων δ' εὐθέως κατὰ τὴν πρὸς ἕτερον σύγκρισιν, καὶ ὅτι* αἱρετὸν ἑκάτερον, ἢ τὸ ἕτερον, λεγόμενον ἐστί, οἷον ὅταν τὸ μὲν φύσει ἀγαθόν, τὸ δὲ, μὴ φύσει, λέγωμεν. τὸ γὰρ φύσει ἀγαθόν, δῆλον ὅτι αἱρετόν ἐστι.

* γρ. [illegible]

IDem loci vtiles *ſunt* etiam ad probandum quamuis rem *eſſe* eligēdam aut fugiendam. detrahere n. ſolùm oportet excellentiam, qua alterum alteri præſtat. nam ſi *id quod eſt* honore dignius, *eſt* optabilius: etiam *quod* honore *dignum eſt*, *eſt* optabile. & ſi *id quod eſt* vtilius, *eſt* optabilius: etiā *id quod eſt* vtile, eſt optabile. Similis eſt ratio aliorum, quę ita comparantur. 2 In quorundam autem inter ſe comparatione ſtatim vtrumque aut alterum dicimus eſſe eligendum: veluti cùm dicimus alterum naturâ bonum eſſe, alterum nō naturâ. *quod* enim *eſt* naturâ bonum, proculdubio eſt eligendum.

DE QVORVMVIS ACCIDENTIVM COMPARATIONE, LOCI GENERALES.

TRACTATVS III.

Cap. V.

1 De locis maximè vniuerſaliter ſumendis. 2 ¶ Quomodo loci expoſiti fiant magis vniuerſales. 3 A natura. 4 Ab effectione: ſi alterum tantummodo efficiat, 5 vel magis efficiat. 6 Si eadem re alterum ſit magis, alterum minus tale. Si alterum re tali, alterum non tali ſit magis tale. 7 Ab adiunctione: ſi eidem rei, 8 aut minus tali adiectum efficiat vt totum ſit magis tale. 9 A detractione. 10 A non mixtione contrarij. 11 ¶ A definitione.

C Ληπτέον δ' ὅτι μάλιστα καθόλου τοὺς τόπους περὶ τοῦ μᾶλλον καὶ τοῦ μείζονος. ληφθέντες γὰρ οὕτως, πρὸς πλείω χρήσιμοι ἂν εἶεν. 2 Ἔστι δὲ αὐτῶν τῶν εἰρημένων ἐνίους καθόλου μᾶλλον ποιεῖν, μικρὸν* παραλλάσσοντα τῇ προσηγορίᾳ. 3 Οἷον, τὸ φύσει τοιοῦτον, τοῦ μὴ φύσει τοιούτου, μᾶλλον τοιοῦτον. 4 Καὶ εἰ τὸ μέν, ποιεῖ τὸ δὲ μὴ ποιεῖ τὸ ἔχον, τοιόνδε, ἢ ᾧ ἂν ὑπάρχοι, μᾶλλον* τοιοῦτον ὃ ποτὲ ποιεῖ, ἢ ὃ μὴ ποιεῖ. 5 Εἰ δ' ἄμφω ποιεῖ, τὸ μᾶλλον ποιοῦν τοιοῦτον. 6 Ἔτι, εἰ τοῦ αὐτοῦ τινος, τὸ μέν, μᾶλλον τὸ δέ, ἧττον τοιοῦτον· καὶ εἰ τὸ μέν, τοιούτου μᾶλλον τοιοῦτον, τὸ δέ, μὴ τοιούτου τοιοῦτον· δῆλον, ὅτι τὸ πρῶτον μᾶλλον τοιοῦτον. 7 Ἔτι,

* γρ. [illegible]

* γρ. [illegible]

SVmendi autem *ſunt* loci de eo quod magis, vel maius *eſt*, quā maximè vniuerſales. ſic n. ſumpti, ad plura *problemata* vtiles erūt. 2 Licet etiam nonnullos eorū quos diximus, efficere magis vniuerſales, paulū immutata appellatione. 3 Veluti *quod eſt* naturâ tale, eo quod non naturâ *eſt* tale, *eſt* magis tale. 4 Et ſi alterū efficit, alterum non efficit rem quæ *illud* habet, talem, ſeu cui *illud* ineſt: magis tale *eſt id* quod interdum efficit, quā quod non efficit. 5 Si verò ambo efficiunt: *id* quod magis efficit talem. 6 Præterea ſi eadem re alterum *ſit* magis, alterum minùs tale: & ſi alterum tali *re ſit* magis tale, alterum non *ſit* tali *re magis* tale: manifeſtum *eſt*, primum *eſſe* magis tale. 7 Præterea *du-*

Itidem eſt argumentum ab adiunctione, ſi quid eidē adiunctum, efficiat totum magis tale. 8 Aut ſi minus tali adiunctum, efficiat totum magis tale. 9 Similiter ex detractione. quo n. ablato reliquū *eſt* minus tale, id *eſt* magis tale. 10 Et quæ ſunt contrariis minùs mixta, *ſunt* magis talia; vt albius eſt, quod nigro eſt minùs mixtū. 11 Inſuper præter ſupradicta, quod magis ſuſcipit propriam rei propoſitæ definitionem: veluti ſi albi definitio eſt, color habens vim diſpertiendi viſum: *id eſt* albius, quod magis *eſt* color habens vim diſpertiendi viſum. A

ἐκ τῆς προσθέσεως, εἰ τινὶ αὐτὸ προστιθέμενόν τι, τὸ ὅλον μᾶλλον ποιεῖ τοιοῦτον. 8 Ἢ εἰ τινὶ ἧττον τοιούτῳ προστιθέμενον, τὸ ὅλον μᾶλλον ποιεῖ τοιοῦτον. 9 Ὁμοίως καὶ ἐκ τῆς ἀφαιρέσεως· οὗ γὰρ ἀφαιρεθέντος, τὸ λειπόμενον ἧττον τοιοῦτον, αὐτὸ μᾶλλον τοιοῦτον. 10 Καὶ τὰ τοῖς ἐναντίοις ἀμιγέστερα, μᾶλλον τοιαῦτα. οἷον, λευκότερον τὸ τῷ μέλανι ἀμιγέστερον. 11 Ἔτι παρὰ τὰ εἰρημένα πρότερον, τὸ μᾶλλον ἐπιδεχόμενον τὸν οἰκεῖον τοῦ προκειμένου λόγον. οἷον, εἰ τοῦ λευκοῦ ἐστὶ λόγος, χρῶμα διακριτικὸν ὄψεως· λευκότερον, ὅ ἐστι μᾶλλον χρῶμα διακριτικὸν ὄψεως.

DE PROBLEMATE ACCIDENTIS PARTICVLARI.

TRACTATVS IV.

Cap. VI.

1 De locis ſuprà expoſitis. 2 Ab oppoſitis. A coniugatis & caſibus. 3 A generatione, vel corruptione: & iis quæ generandi vel corrumpendi vim habent. 4 Ab eo quod magis, vel minus, vel ſimiliter eſt: ſiue ſit ex alio genere, 5 ſiue ex eodem genere, 6 ſiue ſumatur ex hypotheſi. 7 Quot modis confirmetur vel infirmetur problema indefinitum, 8 vel definitum, 9 vel magis definitum, 10 vel maximè definitum. 11 A particularibus ſub ſubiecto contentis. 12 A diuiſione ſubiecti. 13 A diuiſione attributi. 14 Epilogus.

SI verò problema non vniuerſale, ſed in parte B poſitum fuerit: primū loci omnes vniuerſales, quos diximus valere ad confirmandū vel refellendū, vtiles *ſunt*. cùm n. vniuerſaliter euertimus aut cōfirmamus, etiam in parte oſtēdimus. nā ſi omni inſit, etiam alicui *ineſt*: & ſi nulli *inſit*, ne alicui quidem *ineſt*. 2 Maximè autem apti & cōmunes *ſunt* loci, qui *ſumuntur* ab oppoſitis, & cōiugatis, & caſibus. æquè n. probabiliter poſtulatur, ſi omnis voluptas *eſt* in bonis, etiam omnem dolorem eſſe in malis: & ſi qua voluptas *eſt* in bonis, etiam dolorē quendam eſſe in malis. Præterea ſi quis ſenſus nō eſt vis & *facultas*, etiam ſenſus priuatio quædā non eſt imbecillitas. & ſi quid exiſtimabile *eſt* ſcibile, etiam exiſtimatio quædam *eſt* ſcientia. Rurſum ſi C quid iniuſtum *eſt* bonum, etiam iuſtum quidpiā *eſt* malum. & ſi quid iniuſtè *factum, eſt* malum: etiam aliquid iuſtè *factum, eſt* bonū. & ſi quid voluptuoſum *eſt* fugiendum, etiam voluptas quędam *eſt* fugienda. Secundum hæc & ſi quid voluptuoſum *ſit* vtile, etiam voluptas quædam *eſt* in bonis. 3 Et in iis quæ corrumpēdi vim habent, necnon in generationibus & corruptionibus itidem *ſe res habet*. nā ſi quid cùm vim habeat corrumpēdi voluptatem vel ſcientiam, eſt in bonis: certè quædam voluptas vel ſcientia erit in malis. Similiterque ſi corruptio quædam ſcientiæ *eſt* in bonis, aut generatio *quædā eſt* in malis: erit ſcientia quædam in malis. veluti ſi obliuio *eorum* quæ turpiter egit, *eſt* in bonis, aut re- D miniſcentia *eſt* in malis: certè ſcientia eorum quæ turpiter egit, erit in malis. Eadē *eſt* ratio aliorum. in omnibus n. ſimiliter *eſt* probabilitas. 4 Præterea ex eo quod magis, & minùs, & ſimiliter *ineſt*. nam ſi quid eorum quæ *ſunt* ex alio genere, *ſit* magis tale, nullum tamen eorum ſit *tale*: ne id quidem quod dictū eſt, erit tale. veluti ſi magis ſcientia quędam *eſt* in bonis quàm voluptas, nulla autē ſcientia *eſt* in bonis: ne voluptas quidē *in bonis* erit. Atque ex eo quod *eſt* ſimiliter, & *ex eo quod* minùs, itidem *arguitur*. licebit enim & infirmare & confirmare. Verùm ex eo quod *eſt* ſimiliter, ambo *fieri licet*:

Ἐὰν δ' ἐπὶ μέρους καὶ μὴ καθόλου τὸ πρόβλημα τεθῇ, πρῶτον μὲν οἱ εἰρημένοι καθόλου κατασκευαστικοὶ ἢ ἀνασκευαστικοὶ τόποι πάντες χρήσιμοι. καθόλου γὰρ ἀναιροῦντες ἢ κατασκευάζοντες, καὶ ἐπὶ μέρους δείκνυμεν. εἰ γὰρ παντὶ ὑπάρχει, καὶ τινί. καὶ εἰ μηδενί, οὐδὲ τινί. 2 Μάλιστα δ' ἐπίκαιροι, καὶ κοινοὶ τῶν τόπων, οἵ τε ἐκ τῶν ἀντικειμένων, καὶ τῶν συστοίχων, καὶ τῶν πτώσεων. ὁμοίως γὰρ ἔνδοξον τὸ ἀξιῶσαι, εἰ πᾶσα ἡδονὴ ἀγαθόν, καὶ λύπην πᾶσαν εἶναι κακόν, καὶ εἰ τὶς ἡδονὴ ἀγαθόν, καὶ λύπην εἶναι τινὰ κακόν. Ἔτι, εἰ τις αἴσθησις μὴ ἔστι δύναμις, καὶ ἀναισθησία οὐκ ἔστιν ἀδυναμία. καὶ εἰ τι ὑποληπτὸν ἐπιστητόν, καὶ ὑπόληψίς τις ἐπιστήμη. Πάλιν, εἰ τι τῶν ἀδίκων ἀγαθόν, καὶ τῶν δικαίων τι κακόν. καὶ εἰ τι τῶν ἀδίκως, κακόν, καὶ τῶν δικαίως τι ἀγαθόν. καὶ εἰ τι τῶν ἡδέων φευκτόν, καὶ ἡδονή τις φευκτόν. κατὰ ταὐτὰ δέ, καὶ εἰ τι τῶν ἡδέων ὠφέλιμον, καὶ ἡδονή τις, ἀγαθόν. 3 Καὶ ἐπὶ τῶν φθαρτικῶν δέ, καὶ τῶν γενέσεων, καὶ φθορῶν, ὡσαύτως. εἰ γάρ τι φθαρτικὸν ἡδονῆς ἢ ἐπιστήμης ὂν, ἀγαθόν ἐστιν· εἴη ἄν τις ἡδονή, ἢ ἐπιστήμη, τῶν κακῶν. ὁμοίως δὲ καὶ εἰ φθορά τις ἐπιστήμης, τῶν ἀγαθῶν ἢ ἡ γένεσις, τῶν κακῶν· ἔσται τις ἐπιστήμη τῶν κακῶν. οἷον, εἰ τὸ ἐπιλανθάνεσθαι ἅ τις αἰσχρὰ ἔπραξε τῶν ἀγαθῶν ἢ τὸ ἀναμιμνήσκεσθαι, τῶν κακῶν· εἴη ἂν τὸ ἐπίστασθαι ἅ τις * αἰσχρὰ ἔπραξε, τῶν κακῶν. ὡσαύτως δὲ καὶ ἐπὶ τῶν ἄλλων. ἐν ἅπασι γὰρ ὁμοίως τὸ ἔνδοξον. 4 Ἔτι, ἐκ τοῦ μᾶλλον, καὶ ἧττον, καὶ ὁμοίως. εἰ γὰρ μᾶλλον μὲν τῶν ἐξ ἄλλου γένους τι τοιοῦτον, ἐκείνων δὲ μηδέν ἐστιν, οὐδ' ἂν τὸ εἰρημένον εἴη τοιοῦτον. οἷον, εἰ μᾶλλον μὲν ἐπιστήμη τις ἀγαθὸν ἢ ἡδονή, μηδεμία δὲ ἐπιστήμη ἀγαθόν, οὐδ' ἂν ἡδονὴ εἴη. Καὶ ἐκ τοῦ ὁμοίως δέ, καὶ ἧττον, ὡσαύτως. ἔσται γὰρ καὶ ἀναιρεῖν, καὶ κατασκευάζειν· πλὴν ἐκ μὲν τοῦ ὁμοίως, ἀμφότερα.

* κακῶς ἔπραξε τῶν.

ἐκ δὲ τοῦ ἧττον, κατασκευάζειν μόνον, ἀνασκευάζειν δ' οὔ. εἰ γὰρ ὁμοίως δύναμίς τις ἀγαθόν, καὶ ἐπιστήμη, ἔστι δέ τις δύναμις ἀγαθὸν καὶ ἐπιστήμη ἐστίν· εἰ δὲ μηδεμία δύναμις, οὐδ' ἐπιστήμη. εἰ δὲ ἧττον δύναμίς τις ἀγαθὸν ἢ ἐπιστήμη, ἔστι δέ τις δύναμις ἀγαθὸν καὶ ἐπιστήμη.* εἰ δὲ μηδεμία δύναμις ἀγαθόν, οὐκ ἀνάγκη καὶ ἐπιστήμην μηδεμίαν εἶναι ἀγαθόν. δῆλον οὖν, ὅτι κατασκευάζειν μόνον ἐστὶν ἐκ τοῦ ἧττον. 5 Οὐ μόνον δ' ἐξ ἄλλου γένους ἔστιν ἀνασκευάζειν, ἀλλὰ καὶ ἐκ τοῦ αὐτοῦ,* λαμβάνοντα τὸ μάλιστα τοιοῦτον. οἷον, εἰ κεῖται ἐπιστήμη τις ἀγαθόν, δειχθείη δ' ὅτι φρόνησις οὐκ ἀγαθόν, οὐδ' ἄλλη οὐδεμία ἔσται, ἐπειδὴ οὐδ' ἡ μάλιστα δοκοῦσα. 6 Ἔτι ἐξ ὑποθέσεως, ὁμοίως ἀξιώσαντα, εἰ ἑνί, καὶ πᾶσιν ὑπάρχειν, ἢ μὴ ὑπάρχειν. οἷον, εἰ τοῦ ἀνθρώπου ἡ ψυχὴ ἀθάνατος, καὶ τὰς ἄλλας. εἰ δὲ αὕτη μή, μηδὲ τὰς ἄλλας. εἰ μὲν οὖν ὑπάρχειν τινὶ κεῖται, δεικτέον ὅτι οὐχ ὑπάρχει τινί. ἀκολουθήσει γὰρ διὰ τὴν ὑπόθεσιν τὸ μηδενὶ ὑπάρχειν. εἰ δὲ τινὶ μὴ* ὑπάρχοι κεῖται, δεικτέον ὅτι ὑπάρχει τινί. καὶ γὰρ οὕτως ἀκολουθήσει τὸ πᾶσιν ὑπάρχειν. δῆλον δ' ἐστίν, ὅτι ὁ* ὑποθέμενος ποιεῖ τὸ πρόβλημα καθόλου, ἐπὶ μέρους τεθέν. τὸν γὰρ ἐπὶ μέρους ὁμολογοῦντα, καθόλου ἀξιοῖ ὁμολογεῖν ἐπειδὴ εἰ ἑνί, καὶ πᾶσιν ὁμοίως ἀξιοῖ ὑπάρχειν. 7 Ἀδιορίστου μὲν οὖν ὄντος τοῦ προβλήματος, μοναχῶς ἀνασκευάζειν ἐνδέχεται. οἷον, εἰ ἔφησεν ἡδονὴν ἀγαθὸν εἶναι, ἢ μὴ ἀγαθόν, καὶ μηδὲν ἄλλο προσδιώρισεν. εἰ μὲν γὰρ τινὰ ἔφησεν ἡδονὴν ἀγαθὸν εἶναι, δεικτέον καθόλου ὅτι οὐδεμία, εἰ μέλλει ἀναιρεῖσθαι τὸ προκείμενον. ὁμοίως δὲ καὶ εἴ τινα ἡδονὴν ἔφησε μὴ εἶναι ἀγαθόν, δεικτέον καθόλου ὅτι πᾶσα· ἄλλως δ' οὐκ ἐνδέχεται. ἐὰν γὰρ δείξωμεν, ὅτι ἔστι τις ἡδονὴ οὐκ ἀγαθόν, ἢ ἀγαθόν, οὔπω ἀναιρεῖται τὸ προκείμενον. δῆλον οὖν, ὅτι ἀναιρεῖν μὲν μοναχῶς ἐνδέχεται, κατασκευάζειν δὲ διχῶς· ἄν τε γὰρ καθόλου δείξωμεν ὅτι πᾶσα ἡδονὴ ἀγαθόν, ἄν τε ὅτι ἔστι τις ἡδονὴ ἀγαθόν, δεδειγμένον ἔσται τὸ προκείμενον. ὁμοίως δὲ κἂν δέῃ διαλεχθῆναι ὅτι ἔστι τις ἡδονὴ οὐκ ἀγαθόν, ἐὰν δείξωμεν ὅτι οὐδεμία ἀγαθόν, ἢ ὅτι τις οὐκ ἀγαθόν, διειλεγμένοι ἐσόμεθα* ἀμφοτέρως, καὶ καθόλου, καὶ ἐπὶ μέρους, ὅτι ἔστι τις ἡδονὴ οὐκ ἀγαθόν. 8 Διωρισμένης δὲ τῆς θέσεως οὔσης, διχῶς ἀναιρεῖν ἔσται. οἷον, εἰ τεθείη τινὶ μὲν ὑπάρχειν ἡδονῇ *ἀγαθόν, τινὶ δ' οὐχ ὑπάρχειν. εἴτε γὰρ πᾶσα δειχθείη ἡδονὴ ἀγαθόν, εἴτε μηδεμία, ἀνῃρημένον ἔσται τὸ προκείμενον. 9 Εἰ δὲ μίαν μόνην ἔθηκεν ἡδονὴν ἀγαθὸν εἶναι, τριχῶς ἐνδέχεται ἀναιρεῖν. δείξαντες γάρ, ὅτι πᾶσα, ἢ ὅτι οὐδεμία, ἢ ὅτι πλείους μιᾶς ἀγαθόν, ἀνῃρηκότες ἐσόμεθα τὸ προκείμενον. 10 Ἐπὶ πλέον δὲ τῆς θέσεως διορισθείσης, οἷον, ὅτι ἡ φρόνησις μόνη τῶν ἀρετῶν ἐπιστήμη, τετραχῶς ἐστιν ἀναιρεῖν. δειχθέντος γὰρ ὅτι πᾶσα ἀρετὴ ἐπιστήμη, ἢ ὅτι οὐδεμία, ἢ ὅτι καὶ ἄλλη τις, οἷον, ἡ δικαιοσύνη, ἢ ὅτι* αὐτὴ ἡ φρόνησις οὐκ ἐπιστήμη, ἀνῃρημένον ἔσται τὸ προκείμενον. 11 Χρήσιμον δὲ καὶ τὸ ἐπιβλέπειν ἐπὶ τὰ καθ' ἕκαστα, ἐν οἷς ὑπάρχειν τι, ἢ μή, εἴρηται, καθάπερ ἐν τοῖς καθόλου προβλήμασιν. 12 Ἔτι δὲ ἐν τοῖς γένεσιν ἐπιβλεπτέον, διαιροῦντα κατ' εἴδη μέχρι τῶν ἀτόμων, καθάπερ πρότερον εἴρηται.

* Schegkius legit, εἰ δὲ μηδὲ ἧττον, οὐδὲ δύναμις.
* γρ. λαμβάνοντα.
* γρ. ὑπάρχειν.
* γρ. ὑποθέμενος.
* γρ. ἀμφοτέρως.
* γρ. ἀγαθὸν εἶναι.
* γρ. οὐδ' αὐτὴ ἡ φρόνησις ἐπιστήμη.

A ex eo autem quod minùs eſt, confirmare tantũ licet, non infirmare. Nam ſi ſimiliter facultas quædam eſt in bonis & ſcientia, eſt autem facultas quædam in bonis, etiam ſciẽtia eſt in bonis. at ſi nulla facultas, ne ſcientia quidẽ. ſi verò minùs facultas quædam eſt in bonis quam ſcientia, eſt autem quædam facultas in bonis, eſt etiam ſciẽtia. at ſi nulla facultas eſt in bonis, nõ neceſſe eſt etiam ſcientiam nullam eſſe in bonis. patet igitur, confirmari tantùm poſſe ex eo quod minùs eſt. 5 Non ſolùm autem ex alio genere licet infirmare, ſed etiam ex eodẽ, ſi ſumatur *quod eſt* maximè tale. veluti ſi poſitum ſit ſcientiam quandam eſſe in bonis, oſtendatur autẽ B prudẽtiam non eſſe in bonis: nec alia quidẽ ſcientia erit *in bonis*, cùm ea nõ *ſit*, quæ maximè videtur *eſſe*. 6 Præterea ex hypotheſi *idem efficitur*, cũ ſit poſtulatum, ſi vni *inſit vel non inſit*, etiam omnibus ſimiliter ineſſe vel nõ ineſſe. veluti ſi hominis anima *ſit* immortalis, etiã alias *eſſe immortales*. at ſi hæc nõ *ſit*, ne alias quidem *eſſe*. Si igitur cuidam ineſſe poſitum ſit: probandum *eſt* cuidam non ineſſe: cõſequetur n. propter hypotheſim, vt nulli inſit. At ſi cuidã non ineſſe poſitum ſit: probandum *eſt*, cuidam ineſſe: ſic n. conſequẽs erit, vt omnibus inſit. Manifeſtum autẽ *eſt*, eum qui *ita* ſupponit, efficere problema vniuerſale, quod poſitũ fuerat in parte. nam æquum cenſet, & poſtulat, vt qui in parte C concedit, vniuerſaliter concedat: quia ſi vni *inſit*, etiã omnibus ſimiliter ineſſe cenſet. 7 Cùm igitur problema eſt indefinitũ, vno modo infirmari poteſt. veluti ſi dixit voluptatem *eſſe* in bonis, aut non *eſſe* in bonis: nec aliud quicquam definiendi cauſâ adiecit. nam ſi quandam voluptatem dixit eſſe in bonis: probandum *eſt* vniuerſaliter nullam *eſſe in bonis*: ſi futurum eſt vt euertatur quod propoſitũ fuit. Similiter autẽ, & ſi quandam voluptatem dixerit nõ eſſe in bonis: probandũ *eſt* vniuerſaliter omnem *eſſe in bonis*. aliter autem euerti non poteſt. nam ſi oſtenderimus eſſe quandã voluptatem non in bonis, aut *eſſe* in bonis, nõdum euerti- D tur, quod propoſitum fuit. Patet igitur, vno quidẽ modo refelli poſſe, cõfirmari autem bifariam. ſiue n. vniuerſaliter oſtẽderimus omnem voluptatem *eſſe* in bonis, ſiue eſſe quandam voluptatem in bonis: probatum erit, quod fuit propoſitũ. Similiterque ſi differendo probare oporteat eſſe quandam voluptatem non in bonis: ſi oſtenderimus nullam *eſſe* in bonis, vel quandam non *eſſe* in bonis: probatum erit vtroque modo tam vniuerſaliter, quã in parte eſſe quandam voluptatem non in bonis. 8 Cùm autem theſis eſt definita, bifariam euertere licebit. veluti ſi poſitum fuerit cuidam voluptati bonum ineſſe, cuidam non ineſſe. ſiue enim probatum fuerit omnem voluptatem *eſſe* in E bonis, ſiue nullam: infirmatum erit, quod fuit propoſitum. 9 At ſi vnam tantùm voluptatem poſuit eſſe in bonis, tribus modis infirmari poteſt. nam ſi oſtenderimus omnem, vel nullam, vel plures vnâ *eſſe* in bonis: infirmatum erit, quod fuit propoſitum. 10 Cùm autem theſis *adhuc* magis definita eſt, veluti prudentiam ſolam ex virtutibus *eſſe* ſcientiam: quatuor modis licet infirmare. nam ſi oſtenderimus omnem virtutem, aut nullam, aut etiam aliam quandam, veluti iuſtitiam *eſſe* ſcientiam: aut hanc, *id eſt* prudentiam, non *eſſe* ſcientiam: infirmatum erit, quod propoſitum fuit. 11 Prodeſt etiam reſpicere ad ſingularia, quibus ineſſe quidpiam, vel non ineſſe dictum fuit, quemadmodum in vniuerſalibus problematis. 12 Præterea genera ſunt inſpicienda, ac diuidenda ſecundum ſpecies vſque ad indiuidua, quemadmodum antea dictum fuit.

ſiue n. omni viſum fuerit ineſſe, ſiue nulli, cũ multi prolati fuerint, poſtulãdum *eſt* vt vniuerſaliter concedatur, aut obijciatur qua in re non ita *ſit*. 13 Præterea in quibus licet vel ſpecie vel numero diſtribuere accidens, conſiderandum *eſt* an nullum horum inſit. veluti *ſi probare velimus* tempus non moueri: nec eſſe motum: enumeratione *dicendum* quot *ſint* ſpecies motionis. nam ſi harum nulla inſit tempori: manifeſtum *eſt*, *tempus* nec moueri, nec eſſe motum. Similiter etiam *probabimus* animã non *eſſe* numerum, facta diuiſione, omnem numerum *eſſe* aut imparem aut parem. ſi n. anima neque ſit impar, neque par: patet *eam* non *eſſe* numerum. 14 Ad *confirmandum* igitur *vel refellendum* accidẽs, ex huiuſmodi *locis*, & ita arguendum *eſt*.

A εἴτε γὰρ παντὶ φαίνεται ὑπάρχον, εἴτε μηδενί, πολλὰ προενεγκάμενοι ἀξιωτέον καθόλου ὁμολογεῖν, ἢ φέρειν ἔνστασιν ἐπὶ τίνος οὐχ οὕτως. 13 Ἔτι, ἐφ' ὧν ἐστιν ἢ εἴδει ἢ ἀριθμῷ διελεῖν τὸ συμβεβηκός, σκεπτέον εἰ μηδὲν τούτων ὑπάρχει, οἷον ὅτι ὁ χρόνος οὐ κινεῖται, οὐδὲ ἐστὶ κίνησις, καταριθμησάμενον πόσα εἴδη κινήσεώς ἐστιν. εἰ γὰρ μηδὲν τούτων ὑπάρχει τῷ χρόνῳ, δῆλον ὅτι οὐ κινεῖται, οὐδ' ἐστὶ κίνησις. ὁμοίως δὲ καὶ ὅτι ἡ ψυχὴ οὐκ ἀριθμός, διελόμενον ὅτι πᾶς ἀριθμὸς ἢ περιττὸς ἢ ἄρτιος. εἰ γὰρ ἡ ψυχὴ μήτε περιττὸν, μήτε ἄρτιον, δῆλον ὅτι οὐκ ἀριθμός. 14 Πρὸς μὲν οὖν τὸ συμβεβηκός, διὰ τῶν τοιούτων καὶ οὕτως ἐπιχειρητέον.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΤΟΠΙΚΩΝ ΤΟ ΤΕΤΑΡΤΟΝ.

ARISTOTELIS TOPICORVM

LIBER IV.

Loci pertinentes ad problema generis. Cap. I.

1 *Prolusio.* 2 *Si non dicatur de omnibus.* 3 *Si non attribuatur in quæstione quid eſt.* 4 *A definitione accidentis.* 5 *Si in altera categoria ſit genus, in altera ſpecies.* 6 *Si genus ſit ſpeciei particeps.* 7 *Si de aliquo dicatur ſpecies, de quo non dicatur genus.* 8 *Si nullius ſpeciei particeps ſit, id quod ponitur eſſe in genere.* 9 *Si latius pateat ſpecies, quàm genus.* 10 *Si de totidem rebus genus & ſpecies dicantur.* 11 *Ab indiuiduis ſpecie non differentibus.*

POST hæc de his quæ ad genus & B proprium *pertinent*, videndum *eſt*. Hæc autem ſunt elemẽta eorum quæ *pertinent* ad definitiones: de his autem ipſis rarò quærunt, qui diſputant. 2 Si igitur poſitũ fuerit *eſſe* alicuius rei genus, primũ reſpicere *oportet* ad omnia quæ ſunt eiuſdẽ generis, cuius ea res eſt: *& videamus*, an alicui nõ attribuatur: quemadmodum in accidente *ſit*. veluti ſi bonum ponatur *eſſe* genus voluptatis: *videndum eſt*, an aliqua voluptas non ſit in bonis. nam ſi hoc *dici poſſit*: manifeſtũ *eſt*, bonũ non eſſe genus voluptatis: quia genus omnibus ſpeciebus ſub ſe *contẽtis* attribuitur. 3 Deinde C *videndum eſt*, an non attribuatur in *quæſtione* quid eſt, ſed vt accidẽs: quemadmodum *attribuitur* niui album, vel animæ id quod à ſe mouetur. neque n. nix *eſt* id quod album, proinde albũ non *eſt* genus niuis: nec anima *eſt* id quod mouetur: ſed ei accidit vt moueatur, quemadmodum & animali ſæpe *accidit* vt ambulet, & ambulans ſit. Præterea *genus illud*. Quod mouetur, non quid eſt, ſed aliquid faciens vel patiẽs ſignificare videtur. ſimilis *eſt* ratio albi: nõ n. quid ſit nix, ſed qualis ſit, declarat. quare neutrũ eorum attribuitur in *quæſtione* quid eſt. 4 Maximè autem *oportet* ad accidentis definitionem D reſpicere, *ac videre* an aptetur ad id quod dictũ eſt *eſſe* genus: *vt aptatur ad* ea quæ nunc dixi. accidit n. vt aliquid ſeipſum moueat, & nõ *moueat*: ſimiliterque vt album *ſit*, & non *ſit*. quare neutrũ eorum *eſt* genus, ſed accidens: quoniã accidens vocabamus, quod poteſt ineſſe alicui, & non *ineſſe*. 5 Præterea *videndum eſt*, an non in eadem diuiſiõne *ſint* genus & ſpecies: ſed alterum *ſit* ſubſtantia: alterũ, quale: vel alterũ *ſit* ad aliquid: alterum, quale. Veluti nix, & cygnus, *eſt* ſubſtantia: albũ verò non *eſt* ſubſtantia, ſed quale. quapropter albũ nõ eſt genus niuis, nec cygni. Rurſus ſcientia *eſt in* eorũ *numero* quæ ad aliquid

B ΜΕΤΑ δὲ ταῦτα, περὶ τῶν πρὸς τὸ γένος CAP. 1. καὶ τὸ ἴδιον, ἐπισκεπτέον. ἔστι δὲ ταῦτα, στοιχεῖα τῶν πρὸς τοὺς ὅρους. περὶ αὐτῶν δὲ τούτων ὀλιγάκις αἱ σκέψεις γίνονται τοῖς διαλεγομένοις. 2 Ἂν δὴ τεθῇ γένος τινὸς τῶν ὄντων, πρῶτον μὲν ἐπιβλέπειν ἐπὶ πάντα τὰ συγγενῆ τῷ λεχθέντι, εἴ τινος μὴ κατηγορεῖται, καθάπερ ἐπὶ τοῦ συμβεβηκότος. οἷον, εἰ τῆς ἡδονῆς τὸ ἀγαθὸν, γένος κεῖται, εἴ τις ἡδονὴ μὴ ἀγαθόν. εἰ γὰρ τοῦτο, δῆλον ὅτι οὐ γένος τὸ ἀγαθὸν τῆς ἡδονῆς. τὸ γὰρ γένος κατὰ πάντων τῶν ὑπὸ τὸ αὐτὸ εἶδος κατηγορεῖται. 3 Εἶτα, εἰ μὴ ἐν τῷ τί ἐστι κατηγορεῖται, ἀλλ' ὡς C συμβεβηκὸς, καθάπερ τὸ λευκὸν τῆς χιόνος, ἢ ψυχῆς τὸ κινούμενον ὑφ' ἑαυτοῦ. οὔτε γὰρ ἡ χιὼν ὅπερ λευκόν. διόπερ οὐ γένος τὸ λευκὸν τῆς χιόνος. οὔτε ἡ ψυχὴ, ὅπερ κινούμενον. συμβέβηκε δὲ αὐτῇ κινεῖσθαι, καθάπερ καὶ τῷ ζῴῳ πολλάκις βαδίζειν τε, καὶ βαδίζοντι εἶναι. ἔτι, τὸ κινούμενον, οὐ τί ἐστιν, ἀλλά τι ποιοῦν ἢ πάσχον σημαίνειν ἔοικεν. ὁμοίως δὲ καὶ τὸ λευκόν. οὐ γὰρ τί ἐστιν ἡ χιὼν, ἀλλὰ ποιόν τι δηλοῖ. ὥστ' οὐδέτερον αὐτῶν ἐν τῷ τί ἐστι κατηγορεῖται. 4 Μάλιστα δὲ ἐπὶ τὸν τοῦ συμβεβηκότος ὁρισμὸν ἐπιβλέπειν, εἰ ἐφαρμόττει ἐπὶ τὸ ῥηθὲν γένος. οἷον, D καὶ τὰ νῦν εἰρημένα. ἐνδέχεται γάρ τι κινεῖν αὐτὸ ἑαυτὸ, καὶ μή. ὁμοίως δὲ καὶ λευκὸν εἶναι, καὶ μή. ὥστ' οὐδέτερον αὐτῶν, γένος, ἀλλὰ συμβεβηκὸς, ἐπεὶ συμβεβηκὸς ἐλέγομεν, ὃ ἐνδέχεται ὑπάρχειν τινὶ καὶ μή. 5 Ἔτι, εἰ μὴ ἐν τῇ αὐτῇ διαιρέσει τὸ γένος καὶ τὸ εἶδος, ἀλλὰ τὸ μὲν, οὐσία· τὸ δὲ, ποιόν. ἢ τὸ μὲν, πρός τι· τὸ δὲ, ποιόν. οἷον, ἡ μὲν χιὼν καὶ ὁ κύκνος, οὐσία· τὸ δὲ λευκὸν, οὐκ οὐσία, ἀλλὰ ποιόν. ὥστ' οὐ γένος τὸ λευκὸν τῆς χιόνος, οὐδὲ τοῦ κύκνου. πάλιν ἡ μὲν ἐπιστήμη, τῶν πρός τι·

τὸ δ' ἀγαθὸν καὶ τὸ καλὸν, ποιόν. ὥστ' οὐ γένος τὸ καλὸν ἢ τὸ ἀγαθὸν τῆς ἐπιστήμης. τὰ γὰρ τῶν πρός τι γένη, καὶ αὐτὰ τῶν πρός τι δεῖ εἶναι. καθάπερ ἐπὶ τοῦ διπλασίου· καὶ γὰρ τὸ πολλαπλάσιον, ὃ γένος τοῦ διπλασίου, καὶ αὐτὸ τῶν πρός τι ἐστί. καθόλου δὲ εἰπεῖν, ὑπὸ τὴν αὐτὴν διαίρεσιν δεῖ τὸ γένος τῷ εἴδει εἶναι· εἰ γὰρ τὸ εἶδος οὐσία, καὶ τὸ γένος. καὶ εἰ ποιόν τι τὸ εἶδος, καὶ τὸ γένος ποιόν τι. οἷον, εἰ τὸ λευκὸν ποιόν τι, καὶ τὸ χρῶμα. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. 6 Πάλιν, εἰ ἀναγκαῖον, ἢ εἰ ἐνδέχεται τοῦ τεθέντος ἐν τῷ γένει, μετέχειν τὸ γένος. ὅρος δὲ τοῦ μετέχειν, τὸ ἐπιδέχεσθαι τὸν τοῦ μετεχομένου λόγον. δῆλον οὖν, ὅτι τὰ μὲν εἴδη μετέχει τῶν γενῶν· τὰ δὲ γένη, τῶν εἰδῶν οὔ. τὸ μὲν γὰρ εἶδος ἐπιδέχεται τὸν τοῦ γένους λόγον· τὸ δὲ γένος, τὸν τοῦ εἴδους οὔ. σκεπτέον οὖν, εἰ μετέχει, ἢ ἐνδέχεται μετέχειν τοῦ εἴδους, τὸ ἀποδοθὲν γένος. οἷον, * εἴ τις τοῦ ὄντος, ἢ τοῦ ἑνὸς γένος τι ἀποδοίη· συμβήσεται γὰρ μετέχειν τὸ γένος τοῦ εἴδους· κατὰ πάντων γὰρ τῶν ὄντων, τὸ ὂν καὶ τὸ ἓν κατηγορεῖται· ὥστε καὶ ὁ λόγος αὐτῶν. 7 Ἔτι, εἰ κατά τινος τὸ ἀποδοθὲν εἶδος ἀληθεύεται, τὸ δὲ γένος μή. οἷον, εἰ τὸ ὂν, ἢ τὸ ἐπιστητὸν, τοῦ δοξαστοῦ γένος τεθείη. κατὰ γὰρ τοῦ μὴ ὄντος τὸ δοξαστὸν κατηγορηθήσεται· πολλὰ γὰρ τῶν μὴ ὄντων, δοξαστά. ὅτι δὲ τὸ ὂν ἢ τὸ ἐπιστητὸν οὐ κατηγορεῖται κατὰ τοῦ μὴ ὄντος, δῆλον. ὥστ' οὐ γένος τὸ ὂν, οὐδὲ τὸ ἐπιστητὸν, τοῦ δοξαστοῦ. καθ' ὧν γὰρ τὸ εἶδος κατηγορεῖται, καὶ τὸ γένος δεῖ κατηγορεῖσθαι. 8 Πάλιν, εἰ μηδενὸς τῶν εἰδῶν ἐνδέχεται μετέχειν τὸ τεθὲν ἐν τῷ γένει. ἀδύνατον γὰρ τοῦ γένους μετέχειν, μηδενὸς τῶν εἰδῶν μετέχον, πλὴν εἴ τι τῶν κατὰ τὴν πρώτην διαίρεσιν τῶν εἰδῶν ᾖ. ταῦτα δὲ τοῦ γένους μόνον μετέχει. ἂν οὖν ἡ κίνησις, γένος τῆς ἡδονῆς τεθῇ, σκεπτέον, εἰ μήτε φορὰ, μήτ' ἀλλοίωσις ἡ ἡδονή, μήτε τῶν λοιπῶν ἀποδοθεισῶν κινήσεων μηδεμία. δῆλον γὰρ, ὅτι οὐδενὸς τῶν εἰδῶν ἂν μετέχοι· ὥστε οὐδὲ τοῦ γένους, ἐπειδὴ ἀναγκαῖον ἐστὶ τὸ τοῦ γένους μετέχον, καὶ τῶν εἰδῶν τινος μετέχειν. ὥστ' οὐκ ἂν εἴη εἶδος ἡ ἡδονὴ τῆς κινήσεως, οὐδὲ τῶν ἀτόμων, οὐδὲ τῶν ὑπὸ τὸ εἶδος τῆς κινήσεως ὄντων. καὶ γὰρ τὰ ἄτομα μετέχει τοῦ γένους, καὶ τοῦ εἴδους. οἷον, ὁ τὶς ἄνθρωπος * καὶ ἀνθρώπου μετέχει καὶ ζῴου. 9 Ἔτι, εἰ ἐπὶ πλέον λέγεται τοῦ γένους τὸ ἐν τῷ γένει τεθέν. οἷον, τὸ δοξαστὸν τοῦ ὄντος. καὶ γὰρ τὸ ὂν, καὶ τὸ μὴ ὂν, δοξαστόν. ὥστ' οὐκ ἂν εἴη τὸ δοξαστὸν, εἶδος τοῦ ὄντος· ἐπὶ πλέον γὰρ ἀεὶ τὸ γένος, τοῦ εἴδους λέγεται. 10 Πάλιν, εἰ ἐπ' ἴσων τὸ γένος καὶ τὸ εἶδος λέγεται. οἷον, εἰ τῶν πᾶσιν ἑπομένων, τὸ μὲν, γένος· τὸ δὲ, εἶδος τεθείη. καθάπερ τὸ ὂν, καὶ τὸ ἕν. * παντὶ γὰρ τὸ ὂν, καὶ τὸ ἕν. ὥστ' οὐδέτερον οὐδετέρου γένος, ἐπειδὴ ἐπ' ἴσων λέγεται. ὁμοίως δὲ καὶ, εἰ τὸ πρῶτον, καὶ ἡ ἀρχὴ, ὑπ' ἄλληλα τεθείη. ἥ τε γὰρ ἀρχὴ, πρῶτον· καὶ τὸ πρῶτον, ἀρχή. ὥστ' ἢ ἀμφότερα τὰ εἰρημένα ταὐτόν ἐστιν, ἢ οὐδέτερον οὐδετέρου γένος. στοιχεῖον δὲ πρὸς ἅπαντα τὰ τοιαῦτα, τὸ ἐπὶ πλέον τὸ γένος ἢ τὸ εἶδος, καὶ τὴν διαφορὰν, λέγεσθαι· ἐπ' ἐλαττόνων γὰρ καὶ ἡ διαφορὰ τοῦ γένους λέγεται. 11 Ὁρᾶν δὲ καὶ, εἴ τινος τῶν ἀδιαφόρων τῷ εἴδει μὴ ἔστι γένος τὸ εἰρημένον, ἢ μὴ δόξειεν ἄν. κατασκευάζοντι δὲ, εἰ ἔστι τινός. ταὐτὸν γὰρ πάντων τῶν ἀδιαφόρων τῷ εἴδει τὸ γένος. ἂν οὖν ἑνὸς

* γρ. [illegible]

* γρ. [illegible]

* γρ. [illegible]

A *referuntur*: bonum autem & honeſtum *eſt* quale. quare honeſtum vel bonum non *eſt* [illegible] tiæ: quandoquidem relatorum genera [illegible] que relata eſſe oportet: quemadmodum in [illegible] *perſpicere licet*. etenim multiplum, cũ ſit genus dupli, ipſum quoque *in* relatorum *numero* eſt. [illegible] vniuerſaliter dicam, ſub eadem diuiſionem oportet & genus & ſpeciem cadere. ſi enim ſpecies *ſit* ſubſtantia, etiam genus *eſt ſubſtantia*: ſiue ſpecies *ſit* quale quidpiam, etiam genus *eſt* quale quidpiam, veluti ſi album *eſt* quale quidpiam, etiam color. Similis *eſt* aliorum ratio. 6 Item *conſiderãdum eſt*, an neceſſe ſit, vel an cõtingat, eius quod in genere B poſitum eſt, genus eſſe particeps. Definitio autem participandi *eſt*, recipere eius quod communicatur definitionem. Patet igitur, ſpecies eſſe generum participes, genera verò ſpecierum non *item*. ſpecies enim recipit generis definitionem: genus autem non *recipit definitionem* ſpeciei. Conſiderandũ igitur *eſt*, an ſpeciei particeps ſit, vel particeps eſſe poſſit, genus propoſitum. veluti ſi quis ſtatuat aliquid *eſſe* genus entis, aut vnius. accidit enim, vt genus ſit particeps ſpeciei: quoniam omnibus iis quæ ſunt, & ens & vnum attribuitur: proinde etiã eorum definitio. 7 Præterea *videndum eſt*, an de aliquo tradita ſpecies verè dicatur, genus autem minimè. veluti ſi poſitum fuerit ens aut ſcibile *eſſe* C opinabilis genus: quoniam ei quod non eſt, opinabile attribuitur: quandoquidem multa eorum quæ non ſunt, opinabilia *ſunt*. ens verò aut ſcibile non attribui ei quod non eſt, manifeſtum *eſt*. quapropter neque ens, neque ſcibile *eſt* genus opinabilis. quibus enim ſpecies attribuitur, *iis* genus quoque attribui oportet. 8 Item *videndum eſt*, an nullius ſpeciei particeps eſſe poſſit id quod poſitum eſt in genere. fieri enim nequit, vt generis ſit particeps, quod nullius ſpeciei eſt particeps: niſi *fortè* ſit aliqua *earum* ſpecierum, quæ in prima diuiſione generis *ponuntur*. hæc autem genus tantùm participant. Si igitur poſitum fuerit, motum D eſſe genus voluptatis: conſiderandum *eſt*, an voluptas nec *ſit* corruptio, nec variatio, nec vllus ex reliquis qui dicuntur eſſe motus. conſtat n. *eam* nullius ſpeciei participem eſſe, proinde nec generis: quia neceſſe *eſt*, vt *id* quod generis eſt particeps, etiam alicuius ſpeciei ſit particeps. Quocirca voluptas non eſt ſpecies motionis, nec *vnum* ex indiuiduis, nec ex iis quæ ſub ſpecie motionis sũt. nam indiuidua quoque genus & ſpeciem participant: vt quidam homo & hominis eſt particeps, & animalis. 9 Præterea *videndum eſt*, an latius quàm genus pateat id quod in genere poſitũ eſt. vt opinabile *latiùs patet* quã ens: quia & quod eſt, & quod non eſt, opinabile *eſt*. quare opinabile non poteſt E eſſe ſpecies entis: quia genus ſemper latiùs patet, quàm ſpecies. 10 Rurſus an de totidem [illegible] genus & ſpecies dicatur. veluti ſi eorum quæ omnibus conſequentia ſunt, alterum genus, alterũ ſpecies poſita fuerit: vtputà ens & vnũ. omni enim *rei* ens & vnum *cõſequentia ſunt*. quare neutrum *eſt* alterius genus: quia de totidem [illegible] dicũtur. Similiter *fit*, ſi primum & principium, alterum ſub altero poſitum fuerit. nã principium [illegible] primum: & primũ *eſt* principium. quare vel [illegible] idẽ ſunt, vel neutrum *eſt* alterius genus. Elementũ autem omnium eiuſmodi *locorũ eſt*, de pluribus dic[illegible] quàm ſpeciẽ, vel differentiam. nã differentia quoq; de paucioribus dicitur quã genus. [illegible] Videre etiã [illegible] an id quod dictũ eſt, non ſit aut nõ videatur eſſe genus alicuius eorũ quę ſpecie nõ differunt. ſed is [illegible] mat, *videbit* an alicuius *eorũ ſit genus*. idẽ n. *eſt* eorũ omniũ quę ſpecie nõ differũt, genus. [illegible] igitur [illegible]

probatum fuerit, conſtat *eſſe* omnium: & ſi vnius non *eſſe probatum fuerit*, conſtat *eſſe* nullius. vt ſi quis indiuiduas lineas ponens dixerit Inſecabile, eſſe earum genus. linearum enim quæ diuidi poſſunt, non eſt genus id quod dictum eſt, cùm ſpecie non differant: quandoquidem omnes rectæ lineæ ſpecie inter ſe non diſcrepant.

A δειχθείη, δῆλον ὅτι πάντων· κἂν ἑνὸς μή, δῆλον ὅτι οὐδενός· οἷον, εἴ τις ἀτόμους θέμενος γραμμάς, τὸ ἀδιαίρετον, γένος αὐτῶν φήσειεν εἶναι. τῶν γὰρ διαίρεσιν ἐχουσῶν γραμμῶν, οὐκ ἔστι τὸ εἰρημένον γένος, ἀδιαφόρων οὐσῶν κατὰ τὸ εἶδος· ἀδιάφοροι γὰρ κατὰ τὸ εἶδος ἀλλήλαις αἱ εὐθεῖαι γραμμαὶ πᾶσαι.

Alij loci. Cap. II.

1 Si ſpecies ſit in alio genere. 2 Si genus generis non attribuatur ſpeciei, vel ei non attribuatur in quæſtione quid eſt, vel ſit eius particeps. 3 Si genus, vel generis genus non attribuatur ſpeciebus ſpeciei in quæſtione quid eſt. 4 A definitione eius quod poſitum eſt eſſe genus. 5 Si differentia ponatur quaſi genus. 6 vel quaſi ſpecies. 7 Si genus ſpeciei ſubijciatur. 8 Si differentia ſubyciatur ſpeciei. 9. Si genus ſubyciatur differentiæ. 10. Si genus ponatur quaſi differentia. 11 Si nulla generis differentia dicatur de ſpecie. 12. Si ſpecies ſit prior genere, & ſublata ſpecie tollatur genus. 13 Si ſpecies ſeparetur à genere, vel à differentia.

A Conſiderare etiam *oportet*, an aliquid aliud genus ſit ſpeciei propoſitæ, quod neque contineat propoſitum genus, neque ſub illo ſit. veluti ſi quis poſuerit ſcientiam *eſſe* genus iuſtitiæ. nam & virtus eſt genus: & neutrum genus continet reliquum. quare ſcientia non poteſt eſſe genus iuſtitiæ. videtur enim, cùm vna ſpecies ſub duobus generibus eſt, alterum ſub altero contineri. Hoc autem in quibuſdam dubitationem habet. nonnullis enim videtur prudentia eſſe & virtus & iuſtitia, & neutrum genus ſub altero contineri. ſed non ab omnibus conceditur prudentiam eſſe ſcientiam. quod ſi quis concedat hoc verum eſſe: B at certè videtur neceſſe eſſe, vt quæ *ſunt* eiuſdem genera, vel *ſint* ſubalterna, vel ambo ſint ſub eodem genere: quemadmodum etiam in virtute & in ſcientia contingit: ambo enim ſunt ſub eodem genere, quia vtrumque eorum eſt habitus & affectio. Conſiderandum igitur *eſt*, an neutrum inſit propoſito generi. Nam ſi nec ſubalterna genera ſint, nec ſub codē *genere* ambo *collocentur*; id quod propoſitum eſt, non poteſt eſſe genus. 2 Conſiderare etiā *oportet* genus propoſiti generis, atque ita ſemper ſuperiora genera, *nempe* an omnia attribuantur ſpeciei, & an attribuantur in *quæſtione* quid eſt. opus enim eſt, vt omne ſuperius genus attribuatur C ſpeciei in *quæſtione* quid eſt. Sicubi igitur diſcrepat, conſtat id quod propoſitum eſt, non *eſſe* genus. Rurſus *videndum eſt*, an genus participet ſpeciem, ſiue ipſum, ſiue aliquod ſuperiorum generum. quod enim eſt ſuperius, nullius eorū quæ infra ſunt, particeps eſt. Qui igitur refellit, ita vt dixi, *hoc loco* vti debet. Ei verò qui confirmat, ſi cōcedatur genus propoſitum ineſſe ſpeciei, ac dubitetur an vt genus inſit, ſatis eſt probare aliquod ſuperiorum generum attribui ſpeciei in *quæſtione* quid eſt. nam ſi vnum attribuatur in *quæſtione* quid eſt, omnia quæ ſupra & quæ infra hoc ſunt, ſiquidem attribuantur ſpeciei, attribuētur in *quæſtione* quid eſt. quare etiam propoſitum genus attribui- D tur in *quæſtione* quid eſt. Quòd autem, ſi vnum attribuatur in *quæſtione* quid eſt, & reliqua omnia, ſi attribuantur, attribuentur in *quæſtione* quid eſt, per inductionem ſumi debet. At ſi ſimpliciter dubitetur, an propoſitum genus inſit, non ſufficit probare aliquod ſuperiorum generum attribui ſpeciei in *quæſtione* quid eſt. Veluti ſi quis tradiderit lationem eſſe genus inceſſus: non ſufficit probare inceſſum eſſe motionem, ad probandum eſſe lationem, quia ſunt & aliæ motiones. ſed ſimul

A Σκοπεῖν δὲ καὶ εἴ τι ἄλλο γένος ἐστὶ τοῦ ἀποδοθέντος εἴδους, ὃ μήτε περιέχει τὸ ἀποδοθὲν γένος, μήθ' ὑπ' ἐκεῖνό ἐστιν· οἷον, εἴ τις τῆς δικαιοσύνης τὴν ἐπιστήμην θείη γένος. * ἔστι γὰρ καὶ ἡ ἀρετὴ γένος· καὶ οὐδέτερον τῶν γενῶν, τὸ λοιπὸν περιέχει· ὥστ' οὐκ ἂν εἴη ἡ ἐπιστήμη γένος τῆς δικαιοσύνης. δοκεῖ γάρ, ὅταν ἓν εἶδος ὑπὸ δύο γένη ᾖ, τὸ ἕτερον ὑπὸ τοῦ ἑτέρου περιέχεσθαι. ἔχει δὲ ἀπορίαν ἐπ' ἐνίων τὸ τοιοῦτον. δοκεῖ γὰρ ἐνίοις ἡ φρόνησις, ἀρετή τε καὶ ἐπιστήμη εἶναι, καὶ οὐδέτερον τῶν γενῶν ὑπ' οὐδετέρου περιέχεσθαι. οὐ μὴν ὑπὸ πάντων γε συγχωρεῖται, B τὴν φρόνησιν, ἐπιστήμην εἶναι. εἰ δ' οὖν τις συγχωροίη τὸ λεγόμενον ἀληθὲς εἶναι· ἀλλὰ τό γε ὑπ' ἄλληλα, ἢ ὑπὸ τὸ αὐτὸ γένος ἄμφω γίνεσθαι τὰ τοῦ αὐτοῦ γένη, τῶν ἀναγκαίων ἂν δόξειεν εἶναι· καθάπερ καὶ ἐπὶ τῆς ἀρετῆς, καὶ ἐπὶ τῆς ἐπιστήμης συμβαίνει· ἄμφω γὰρ ὑπὸ τὸ αὐτὸ γένος ἐστίν· ἑκάτερον γὰρ αὐτῶν, ἕξις καὶ διάθεσίς ἐστι. σκεπτέον οὖν, εἰ μηδέτερον ὑπάρχει τῷ ἀποδοθέντι γένει. εἰ γὰρ μηδ' ὑπ' ἄλληλά ἐστι τὰ γένη, μηδὲ ὑπὸ ταὐτὸν ἄμφω· οὐκ ἂν εἴη τὸ ἀποδοθέν, γένος. 2 Σκοπεῖν δὲ καὶ τὸ γένος τοῦ ἀποδοθέντος γένους, καὶ οὕτως ἀεὶ τὸ ἐπάνω γένος, εἰ πάντα κατηγορεῖται τοῦ C εἴδους, καὶ εἰ ἐν τῷ τί ἐστι κατηγορεῖται. πᾶν γὰρ τὸ ἐπάνω γένος, κατηγορεῖσθαι δεῖ τοῦ εἴδους ἐν τῷ τί ἐστιν. εἰ οὖν που διαφωνεῖ, δῆλον ὅτι οὐ γένος τὸ ἀποδοθέν. Πάλιν, εἰ μετέχει τὸ γένος τοῦ εἴδους, ἢ αὐτό, ἢ τῶν ἐπάνω τι γενῶν· οὐδενὸς γὰρ τὸ ἐπάνω τῶν ὑποκάτω μετέχει. Ἀνασκευάζοντι μὲν οὖν, καθάπερ εἴρηται, χρηστέον. Κατασκευάζοντι δέ, ὁμολογουμένου μὲν ὑπάρχειν τῷ εἴδει τοῦ ῥηθέντος γένους, ὅτι δὲ ὡς γένος ὑπάρχει ἀμφισβητουμένου, ἀπόχρη τὸ δεῖξαί τι τῶν ἐπάνω γενῶν ἐν τῷ τί ἐστι τοῦ εἴδους κατηγορούμενον. ἑνὸς γὰρ ἐν τῷ τί ἐστι κατηγορουμένου, πάντα καὶ τὰ ἐπάνω τούτου, καὶ τὰ ὑποκάτω, ἄνπερ κατηγορῆται τοῦ εἴδους, ἐν τῷ τί ἐστι κατηγορηθήσεται· ὥστε καὶ τὸ ἀποδοθὲν γένος ἐν τῷ τί ἐστι D κατηγορεῖται. ὅτι δὲ ἑνὸς ἐν τῷ τί ἐστι κατηγορουμένου, καὶ πάντα τὰ λοιπά, ἄνπερ κατηγορεῖται, ἐν τῷ τί ἐστι κατηγορηθήσεται, δι' ἐπαγωγῆς ληπτέον. Εἰ δ' ἁπλῶς ὑπάρχειν ἀμφισβητεῖται τὸ ἀποδοθὲν γένος, οὐκ ἀπόχρη τὸ δεῖξαί τι τῶν ἐπάνω γενῶν ἐν τῷ τί ἐστι κατηγορούμενον τοῦ εἴδους. οἷον, εἴ τις βαδίσεως γένος ἀπέδωκε τὴν φοράν, οὐκ ἀπόχρη τὸ δεῖξαι * ὅτι κίνησίς ἐστιν ἡ βάδισις, πρὸς τὸ δεῖξαι ὅτι φορά ἐστιν, ἐπεὶ καὶ ἄλλαι κινήσεις εἰσίν· ἀλλὰ

CAP. II.

* [illegible]

* [illegible]

* γρ. προσαποδεικτέον.

* προσαποδεικτέον, ὅτι οὐδετέρας μετέχει ἡ βάδισις τῶν κατὰ τὴν αὐτὴν διαίρεσιν, εἰ μὴ τῆς φορᾶς. ἀνάγκη γὰρ τὸ τοῦ γένους μετέχον, καὶ τῶν εἰδῶν τινος μετέχειν τῶν κατὰ τὴν πρώτην διαίρεσιν. εἰ οὖν ἡ βάδισις μήτ' αὐξήσεως, μήτε μειώσεως, μήτε τῶν ἄλλων κινήσεων μετέχει, δῆλον ὅτι τῆς φορᾶς ἂν μετέχοι· ὥστε εἴη ἂν γένος ἡ φορὰ τῆς βαδίσεως. 3 Πάλιν, ἐφ' ὧν τὸ εἶδος τὸ τεθὲν, ὡς γένος κατηγορεῖται, σκοπεῖν εἰ καὶ τὸ ἀποδοθὲν γένος ἐν τῷ τί ἐστιν αὐτῶν τούτων κατηγορεῖται, ὧνπερ καὶ τὸ εἶδος. ὁμοίως δὲ καὶ εἰ τὰ ἐπάνω τοῦ γένους πάντα. εἰ γάρ που διαφωνεῖ, δῆλον ὅτι οὐ γένος τὸ ἀποδοθέν. εἰ γὰρ ἦν γένος, ἅπαντ' ἂν καὶ τὰ ἐπάνω τούτου, καὶ αὐτὸ τοῦτο, ἐν τῷ τί ἐστι κατηγορεῖτο, ὧνπερ καὶ τὸ εἶδος ἐν τῷ τί ἐστι κατηγορεῖται. ἀνασκευάζοντι μὲν οὖν χρήσιμον, εἰ μὴ * κατηγορεῖτο τὸ γένος ἐν τῷ τί ἐστιν, ὧνπερ καὶ τὸ εἶδος κατηγορεῖται. κατασκευάζοντι δὲ, εἰ κατηγορεῖται ἐν τῷ τί ἐστι, χρήσιμον. συμβήσεται γὰρ καὶ τὸ γένος, καὶ τὸ εἶδος, τοῦ αὐτοῦ ἐν τῷ τί ἐστι κατηγορεῖσθαι. ὥστε τὸ αὐτὸ ὑπὸ δύο γένη γίνεται. ἀναγκαῖον οὖν, ὑπ' ἄλληλα τὰ γένη εἶναι. ἂν οὖν δειχθῇ, ὃ βουλόμεθα γένος κατασκευάσαι, μὴ ὂν ὑπὸ τὸ εἶδος, δῆλον ὅτι τὸ εἶδος ὑπὸ τοῦτ' ἂν εἴη. ὥστε δεδειγμένον ἂν εἴη, ὅτι γένος τοῦτο. 4 Σκοπεῖν δὲ καὶ τοὺς λόγους τῶν γενῶν, εἰ ἐφαρμόττουσιν ἐπί τε τὸ ἀποδοθὲν εἶδος, καὶ ἐπὶ τὰ μετέχοντα τοῦ εἴδους. ἀνάγκη γὰρ τοὺς τῶν γενῶν λόγους κατηγορεῖσθαι τοῦ εἴδους, καὶ τῶν μετεχόντων τοῦ εἴδους. εἰ οὖν που διαφωνεῖ, δῆλον ὅτι οὐ γένος τὸ ἀποδοθέν. 5 Πάλιν, εἰ τὴν διαφορὰν ὡς γένος * ἀπέδωκεν. οἷον, εἰ τὸ ἀθάνατον, γένος Θεοῦ. διαφορὰ γάρ ἐστι ζώου τὸ ἀθάνατον· ἐπειδὴ τῶν ζώων, τὰ μὲν, θνητὰ· τὰ δὲ, ἀθάνατα. δῆλον οὖν, ὅτι διημάρτηται· οὐδενὸς γὰρ ἡ διαφορὰ γένος ἐστίν. ὅτι δὲ τοῦτ' ἀληθὲς, δῆλον· οὐδεμία γὰρ διαφορὰ σημαίνει τὸ τί ἐστιν, ἀλλὰ μᾶλλον ποιόν τι, καθάπερ τὸ πεζὸν, καὶ τὸ δίπουν. 6 Καὶ εἰ τὴν διαφορὰν εἰς τὸ γένος ἔθηκεν ὡς εἶδος. οἷον, τὸ περιττὸν, ὅπερ ἀριθμόν. διαφορὰ γὰρ ἀριθμοῦ τὸ περιττὸν, οὐκ εἶδός ἐστιν. οὐδὲ δοκεῖ μετέχειν ἡ διαφορὰ τοῦ γένους. πᾶν γὰρ τὸ μετέχον τοῦ γένους, ἢ εἶδος, ἢ * ἄτομόν ἐστιν· ἡ δὲ διαφορὰ, οὔτε εἶδος, οὔτε ἄτομόν ἐστι. δῆλον οὖν ὡς οὐ μετέχει τοῦ γένους ἡ διαφορά. ὥστ' οὐδὲ τὸ περιττὸν, εἶδος ἂν εἴη, ἀλλὰ διαφορά· ἐπειδὴ οὐ μετέχει τοῦ γένους. 7 Ἔτι, εἰ τὸ γένος εἰς τὸ εἶδος ἔθηκεν. οἷον, τὴν συναφὴν, ὅπερ συνοχὴν· ἢ τὴν μίξιν, ὅπερ κρᾶσιν· ἢ, ὡς Πλάτων ὁρίζεται, φορὰν τὴν κατὰ τόπον κίνησιν. οὐ γὰρ ἀναγκαῖον, τὴν συναφὴν, συνοχὴν εἶναι· ἀλλ' ἀνάπαλιν τὴν συνοχὴν, συναφήν. οὐ γὰρ πᾶν τὸ ἁπτόμενον συνέχεται· ἀλλὰ τὸ συνεχόμενον ἅπτεται. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. οὔτε γὰρ ἡ μίξις ἅπασα, κρᾶσις· ἡ γὰρ τῶν ξηρῶν μίξις, οὐκ ἔστι κρᾶσις· οὐδ' ἡ [illegible] τόπον μεταβολὴ πᾶσα, φορά. ἡ γὰρ βάδισις, οὐ δοκεῖ φορ[illegible]δὸν γὰρ ἡ φορὰ ἐπὶ τῶν ἀκουσίως τόπον ἐκ τόπου μ[illegible]λόντων λέγεται, καθάπερ ἐπὶ τῶν ἀψύχων συμβαίνει. δῆλον δ' ὅτι καὶ ἐπὶ πλέον λέγεται τὸ εἶδος, τοῦ γένους, ἐν τοῖς ἀποδοθεῖσι, δέον ἀνάπαλιν γίνεσθαι. 8 Πάλιν, εἰ τὴν διαφορὰν εἰς τὸ εἶδος ἔθηκεν. οἷον, τὸ ἀθάνατον ὅπερ θεόν. συμβήσεται γὰρ * ἐπ' ἴσων, ἢ ἐπὶ πλειόνων τὸ εἶδος λέγεσθαι. ἀεὶ γὰρ ἡ διαφορὰ ἐπ' ἴσης, ἢ ἐπὶ πλεῖον τοῦ εἴδους λέγεται.

* γρ. κατηγορῆται

* γρ. ἀπέδωκεν.

* γρ. ἄτομόν ἐστι.

* γρ. ἐπ' ἴσης, ἢ ἐπὶ πλεῖον

demonſtrandum *eſt* inceſſum nullius eorum quæ in eadem diuiſione *ponuntur*, eſſe participem, præterquàm lationis. neceſſe n. *eſt*, vt id quod genere eſt particeps, etiam alicuius earum ſpecierum, quæ in prima *generis* diuiſione *ponuntur*, particeps ſit. ſi igitur inceſſus neque accretionis, neque imminutionis, nec aliarum motionum particeps ſit: patet eũ lationis eſſe participem. Quocirca latio erit genus inceſſus. 3 Rurſus in quibus propoſita ſpecies vt genus dicitur, conſiderare *oportet*, an etiam propoſitum genus in quæſtione quid eſt, iis ipſis attribuatur, quibus & ſpecies *attribuitur*. ſimiliterq; an quæ *ſunt* ſupra genus, omnia. ſicubi n. diſcrepat: patet, id quod propoſitũ fuit, non eſſe genus: quia ſi eſſet genus, omnia quę ſupra illud ſunt, & ipſum illud in *quæſtione* quid eſt, attribueretur *iis*, quibus & ſpecies in *quæſtione* quid eſt, attribuitur. Euertẽti igitur vtile *eſt*, ſi genus *iis* non attribuatur in *quæſtione* quid eſt, quibus ſpecies attribuitur. Confirmanti autẽ vtile *eſt*, ſi attribuatur in *quæſtione* quid eſt. accidet n. vt & genus & ſpecies eidem in *quæſtione* quid eſt, attribuantur. quare idẽ ſub duobus generibus cõſtituitur. neceſſe *eſt* igitur, vt genera ſint ſubalterna. Si igitur probatum fuerit *id* quod volumus genus conſtituere, non eſſe ſub ſpecie, manifeſtum *eſt*, ſpeciem ſub ipſo eſſe. quare probatum erit hoc *eſſe* genus. 4 Conſiderare etiam oportet definitiones generum, an aptẽtur ſpeciei propoſitæ, & iis quæ ſpeciem participant. neceſſe n. *eſt*, vt generum definitiones attribuãtur ſpeciei, & iis quæ participant ſpeciem. ſicubi igitur diſcrepat, patet, id quod propoſitum fuit, non *eſſe* genus. 5 Rurſus *animaduertendum eſt*, an differentiam quaſi genus adhibuerit: veluti an immortale, *poſuerit* quaſi genus Dei. immortale n. eſt differentia animalis: quoniam animalium alia mortalia *ſunt*, alia immortalia. patet igitur eum peccaſſe: quia differentia, nullius *rei* genus eſt. hoc autem verum *eſſe*, conſtat: quia nulla differentia ſignificat quid eſt, ſed potiùs quale quid, quemadmodum terreſtre, & bipes. 6 *Sed & illud videndũ eſt*, an differentiam in genere poſuerit quaſi ſpeciem: veluti *ſi dixerit*, impar *eſſe* id quod numerum. impar n. eſt differentia, non ſpecies numeri. nec videtur differẽtia eſſe particeps generis. quicquid n. eſt generis particeps, aut eſt ſpecies, aut indiuiduum: differentia verò nec eſt ſpecies, nec indiuiduum: patet igitur, differentiam non eſſe generis participem. quamobrem impar nõ poteſt eſſe ſpecies, ſed differẽtia, quia nõ eſt particeps generis. 7 Præterea *videndũ eſt* an genus in ſpecie poſuerit: veluti *ſi* cõtiguitatem *eſſe* id quod continuationem *dixerit*: aut mixtionem *eſſe* id quod temperationem: aut, vt Plato definit, loci mutationem eſſe lationem. non n. neceſſe *eſt* contiguitatem *eſſe* continuationem, ſed contra continuationem *eſſe* contiguitatem: quia non quicquid aptatur, continuatur: ſed quod continuatur, aptatur. ſimiliter *fit* & in cęteris. neque n. omnis mixtio *eſt* tẽperatio, quia ſiccorum mixtio non eſt temperatio. neque omnis loci mutatio *eſt* latio: quoniam inceſſus non videtur eſſe latio. ferè n. latio dicitur de iis quæ non ſponte ſua locum mutant, vt in *rebus* inanimis accidit. Conſtat autẽ, latiùs patêre ſpeciem quàm genus, in iis quæ adducta fuerunt, cùm cõtra fieri debeat. 8 Rurſus *videndũ eſt*, an differẽtiam in ſpecie poſuerit: veluti immortale *eſſe* id quod Deum: accidet n. de totidem, vel de pluribus ſpeciem dici: ſemper n. differentia de totidem vel de pluribus dicitur, quàm ſpecies.

9 Præterea an genus in differẽtia poſuerit: velvti colorem *eſſe* id quod congregatiuum: aut numerũ *eſſe* id quod impatem. 10 Et an genus quaſi differẽtiam dixerit. fieri.n. poteſt, vt aliquis etiam eiuſmodi theſim afferat: velvti mixtionem *eſſe* differẽtiam tẽperationis: aut loci mutationem, lationis. Conſideranda autem *ſunt*, quæcumque ſunt eiuſmodi, ex iiſdem *locis ſeu fundamentis*: (quia communio *quædam* eſt inter locos) nam & de pluribus genus quàm differentia dici, nec differentiam participare debet. *Genere* autem ita *vt in ſuperioribus exẽplis* allato, neutrum eorum quæ dixi, contingere poteſt: quoniam & de paucioribus dicetur, & participabit genus differentiam. 11 Item ſi nulla ex generis differentiis attribuitur ſpeciei propoſitæ, ne genus quidem attribuetur: vt animę nec impar nec par attribuitur: proinde nec numerus. 12 Pręterea ſi ſpecies ſit naturâ prior, & ſecũ auferat genus: (quia cõtrarium videtur *verum eſſe*) non poteſt eſſe genus. 13 Præterea ſi accidit vt *ſpecies* relinquat propoſitum genus vel differentiam, vt animã motio, vel opinionem veritas & falſitas: neutrum eorum, quæ dixi, poteſt eſſe genus, aut differentia. videtur enim genus & differentia conſequens eſſe, quamdiu ſpecies eſt.

A 9 Ἔτι, εἰ τὸ γένος εἰς τὴν διαφορὰν ἔθηκεν· οἷον, τὸ χρῶμα, ὅπερ συγκριτικὸν· ἢ τὸν ἀριθμὸν, ὅπερ περιττόν. 10 Καὶ εἰ τὸ γένος, ὡς διαφορὰν εἶπεν. ἐγχωρεῖ γὰρ τινα καὶ τοιαύτην κομίσαι θέσιν· οἷον, κράσεως, τὴν μίξιν διαφορὰν· ἢ φορᾶς, τὴν κατὰ τόπον μεταβολήν. σκεπτέον δὲ πάντα τὰ τοιαῦτα διὰ τῶν αὐτῶν. (ἐπικοινωνοῦσι γὰρ οἱ τόποι) ἐπὶ πλέον τε γὰρ τὸ γένος τῆς διαφορᾶς δεῖ λέγεσθαι, καὶ μὴ μετέχειν τῆς διαφορᾶς. οὕτω δὲ ἀποδοθέντος, οὐδέτερον τῶν εἰρημένων δυνατὸν συμβαίνειν· ἐπ' ἔλαττόν τε γὰρ ῥηθήσεται, καὶ μεθέξει τὸ γένος τῆς διαφορᾶς. 11 Πάλιν, εἰ μηδεμία διαφορὰ κατηγορεῖται τῶν τοῦ γένους, κατὰ τοῦ ἀποδοθέντος εἴδους, B οὐδὲ τὸ γένος κατηγορηθήσεται· οἷον, ψυχῆς οὔτε τὸ περιττὸν, οὔτε τὸ ἄρτιον κατηγορεῖται· ὥστ' οὐδ' ὁ ἀριθμός. 12 Ἔτι, εἰ πρότερον φύσει τὸ εἶδος, καὶ συναναιρεῖ τὸ γένος· (δοκεῖ γὰρ τὸ ἐναντίον) οὐκ ἂν εἴη γένος. 13 Ἔτι, εἰ ἐνδέχεται ἀπολιπεῖν τὸ εἰρημένον γένος, ἢ τὴν διαφοράν· οἷον, ψυχὴν τὸ κινεῖσθαι, ἢ δόξαν τὸ ἀληθὲς καὶ ψεῦδος· οὐκ ἂν εἴη τῶν εἰρημένων οὐδέτερον, γένος, οὐδὲ διαφορά. δοκεῖ γὰρ τὸ γένος καὶ ἡ διαφορὰ παρακολουθεῖν, ἕως ἂν ᾖ τὸ εἶδος.

Alij loci. Cap. III.

1 ¶ Si ſpecies ſit, aut põſſit eſſe particeps eius quod eſt generi contrarium. 2 ¶ Si quid communicetur ſpeciei, quod nulli eorum quæ ſub genere ſunt, communicetur. 3 ¶ Ab homonymia. 4 ¶ Si non ſit alia ſpecies generis. 5 ¶ A metaphora. 6 ¶ A contrariis loci euertentes. 7 Si ſpecies ſit aliquid contrarium, quod non ſit in genere propoſito, vel in eo quod generi propoſito contrarium eſt, 8 vel non ſit in vllo genere. 9 Si & generi & ſpeciei ſint quædam contraria, quorum alia ſunt mediata, alia immediata: 10 vel aliis ſit interiectum medium per negationem, aliis vt ſubiectum. 11 Si medium non ſit in eodem genere, cùm generi nihil ſit contrarium. 12 Si generi ſit aliquid contrarium, ſpeciei nihil. 13 Epilogus. 14 ¶ A contrariis loci confirmantes. 15 Si contrarium ſpeciei ſit in eodem genere. 16 Si medium ſit in eodem genere. 17 Si contrarium ſit in contrario genere.

CONſiderare etiã *oportet*, an id quod in genere poſitũ eſt, alicuius generis cõtrarij particeps ſit, vel particeps eſſe poſſit. idem.n. contrariorum ſimul particeps erit: quia numquam *ſpecies* deſerit genus, & particeps quoq; eſt, vel particeps poteſt eſſe contrarij. 2 Præterea *vidẽdum eſt*, an aliquid communicetur cũ ſpecie, quod omnino ineſſe nequeat iis quę *ſunt* ſub genere. velvti ſi anima eſt vitæ particeps, numerorũ autẽ nullus viuere poteſt: certè anima non eſt ſpecies numeri. 3 Conſiderãdum etiã *eſt*, an ſpecies & genus ſint homonyma, vtendo elemẽtis quæ tradita ſunt ad homonymiã *inueſtigandam*, quoniam genus & ſpecies *ſunt* ſynonyma. 4 Cùm autẽ omnis generis *ſint* plures ſpecies: conſiderare *oportet*, an altera ſpecies eſſe nequeat generis propoſiti. nam ſi *altera ſpecies* non ſit, patet non poſſe omnino genus eſſe id quod dictũ eſt. 5 Cõſiderare etiã *oportet* an id quod per trãſlationem dicitur, quaſi genus propoſuerit: quale *eſt ſi quis dixerit* tẽperantiam *eſſe* concentum. omne.n. genus propriè ſpeciebus attribuitur: cõcentus verò temperantiæ non propriè, ſed per trãſlationem *attribuitur*: quandoquidem omnis concentus *eſt* in ſonis. 6 Præterea conſiderandum *eſt*, an contrarium quidpiam ſpeciei ſit. eſt autem multiplex *hæc* conſideratio. 7 Primùm *videndum eſt*, an in eodẽ genere *ſit* etiam contrarium, cùm nihil ſit generi contrarium. oportet enim contraria eſſe in eodem genere, ſi nihil contrarium generi ſit. At ſi ſit aliquid contrarium generi: conſiderare *oportet*, an contrarium *ſit* in contrario genere. neceſſe eſt enim, contrariũ in contrario eſſe, ſi quid ſit generi contrarium.

C ΣΚοπεῖν δὲ καὶ, εἰ τὸ ἐν γένει κείμενον, μετέχει τινὸς ἐναντίου τῷ γένει, ἢ ἐνδέχεται μετέχειν· τὸ γὰρ αὐτὸ τῶν ἐναντίων ἅμα μεθέξει, ἐπειδὴ τὸ μὲν γένος οὐδέποτε ἀπολείπει· μετέχει δὲ καὶ τοὐναντίου, ἢ ἐνδέχεται μετέχειν. 2 Ἔτι, εἴ τινος κοινωνεῖ τὸ εἶδος, ὃ ἀδύνατον ὅλως ὑπάρχειν τοῖς ὑπὸ τὸ γένος· οἷον, εἰ ἡ ψυχὴ τῆς ζωῆς κοινωνεῖ, τῶν δ' ἀριθμῶν μηδένα δυνατὸν ζῆν· οὐκ ἂν εἴη εἶδος ἀριθμοῦ, ἡ ψυχή. 3 Σκεπτέον δὲ καὶ, εἰ ὁμώνυμον τὸ εἶδος τῷ γένει, στοιχείοις χρώμενον τοῖς εἰρημένοις πρὸς* τὸ ὁμώνυμον· συνώνυμον γὰρ τὸ γένος καὶ τὸ εἶδος. 4 Ἐπεὶ δὲ γένους παντὸς εἴδη πλείω, σκοπεῖν, εἰ μὴ ἐνδέχεται ἕτερον εἶδος εἶναι τοῦ εἰρημένου γένους. εἰ γὰρ μὴ ἔστι, δῆλον ὅτι οὐκ ἂν εἴη γένος ὅλως τὸ εἰρημένον. D 5 Σκοπεῖν δὲ καὶ, εἰ τὸ κατὰ μεταφορὰν λεγόμενον, ὡς γένος *ἀπέδωκεν· οἷον, τὴν σωφροσύνην, συμφωνίαν. πᾶν γὰρ γένος κυρίως κατὰ τῶν εἰδῶν κατηγορεῖται· ἡ δὲ συμφωνία κατὰ τῆς σωφροσύνης οὐ κυρίως, ἀλλὰ κατὰ μεταφοράν· πᾶσα γὰρ συμφωνία, ἐν φθόγγοις. 6 Ἔτι, εἰ ἔστιν ἐναντίον* τι τῷ εἴδει, σκοπεῖν. ἔστι δὲ *πλεοναχῶς ἡ σκέψις. 7 Πρῶτον μὲν, εἰ ἐν τῷ αὐτῷ γένει καὶ τὸ ἐναντίον, μὴ ὄντος ἐναντίου* τῷ γένει. δεῖ γὰρ τὰ ἐναντία ἐν τῷ αὐτῷ γένει εἶναι, ἂν μηδὲν ἐναντίον τῷ γένει ᾖ. ὄντος δὲ ἐναντίου τῷ γένει, σκοπεῖν, εἰ τὸ ἐναντίον ἐν τῷ ἐναντίῳ γένει ἐστίν. ἀνάγκη γὰρ τὸ ἐναντίον ἐν τῷ ἐναντίῳ εἶναι, ἄνπερ ᾖ ἐναντίον τι* τῷ γένει.

CAP. III.

* γρ. τὴν ὁμωνυμίαν.
* γρ. ἀποδέδωκεν.
* γρ. καὶ τὸ εἶδος,
* γρ. πολλαχῶς
* γρ. τῷ γ. τινὸς, ὡς τῶν χρωμάτων.
* κ. τῷ γ. τι· γὰρ ἐναντία, ἐν τοῖς ἐναντίοις γένεσι [illegible] ἐναντία τοῖς ἐναντίοις γένεσιν, ἐὰν ᾖ ἐναντίον τῷ γένει.

φανερὸν δὲ τούτων ἕκαστον διὰ τῆς ἐπαγωγῆς. 8 Πάλιν, εἰ ὅλως ἐν μηδενὶ γένει τὸ τῷ εἴδει ἐναντίον, ἀλλ᾽ αὐτὸ γένος ἐστὶ, τὸ ἀγαθόν. εἰ γὰρ τοῦτο μὴ ἐν γένει, οὐδὲ τὸ ἐναντίον τούτου ἐν γένει ἔσται, ἀλλ᾽ αὐτὸ γένος· καθάπερ ἐπὶ τοῦ ἀγαθοῦ καὶ τοῦ κακοῦ συμβαίνει· οὐδέτερον γὰρ τούτων, ἐν γένει· ἀλλ᾽ ἑκάτερον αὐτῶν, γένος. 9 Ἔτι, εἰ εἴη ἐναντίον τινὶ καὶ τὸ γένος καὶ τὸ εἶδος· καὶ τῶν μὲν, ἐστί τι μεταξύ. τῶν δὲ, μή. εἰ γὰρ τῶν γενῶν ἐστί τι μεταξὺ, καὶ τῶν εἰδῶν· καὶ εἰ τῶν εἰδῶν, καὶ τῶν γενῶν καθάπερ ἐπὶ ἀρετῆς καὶ κακίας, καὶ δικαιοσύνης καὶ ἀδικίας· ἑκατέρων γὰρ ἐστί τι μεταξύ. ἔνστασις τούτου, ἐπὶ ὑγιείας καὶ νόσου οὐδὲν μεταξὺ, κακοῦ δὲ καὶ ἀγαθοῦ τι μεταξύ. 10 Ἔτι, εἰ ἔστι μέν τι ἀμφοῖν ἀνὰ μέσον, καὶ τῶν εἰδῶν, καὶ τῶν γενῶν· μὴ ὁμοίως δέ· ἀλλὰ τῶν μὲν, κατὰ ἀπόφασιν· τῶν δὲ, ὡς ὑποκείμενον. ἔνδοξον γὰρ, τὸ ὁμοίως ἀμφοῖν· καθάπερ ἐπὶ ἀρετῆς καὶ κακίας, καὶ δικαιοσύνης καὶ ἀδικίας· ἀμφοῖν γὰρ κατ᾽ ἀπόφασιν τὸ ἀνὰ μέσον. 11 Ἔτι, ὅταν μὴ ᾖ ἐναντίον τῷ γένει, σκοπεῖν μὴ μόνον εἰ τὸ ἐναντίον ἐν τῷ αὐτῷ γένει, ἀλλὰ καὶ εἰ τὸ ἀνὰ μέσον· ἐν ᾧ γὰρ τὰ ἄκρα, καὶ τὸ ἀνὰ μέσον ἐστὶ, ἐπὶ λευκοῦ, καὶ μέλανος. τὸ γὰρ χρῶμα, γένος τούτων τε καὶ τῶν ἀνὰ μέσον χρωμάτων ἁπάντων. ἔνστασις, ὅτι ἡ μὲν ἔνδεια καὶ ὑπερβολὴ, ἐν τῷ αὐτῷ γένει· ἐν τῷ κακῷ γὰρ ἄμφω· τὸ δὲ μέτριον, ἀνὰ μέσον ὂν τούτων, οὐκ ἐν* τῷ κακῷ, ἀλλ᾽ ἐν τῷ ἀγαθῷ.

* γρ. τῷ αὐτῷ,

12 Σκοπεῖν δὲ καὶ, εἰ τὸ μὲν γένος ἐναντίον τινὶ, τὸ δὲ εἶδος μηδενί. εἰ γὰρ τὸ γένος ἐναντίον τινὶ, καὶ τὸ εἶδος· καθάπερ ἀρετὴ καὶ κακία, καὶ δικαιοσύνη καὶ ἀδικία. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων σκοποῦντι, φανερὸν ἂν δόξειεν εἶναι τὸ τοιοῦτον. ἔνστασις ἐπὶ τῆς ὑγιείας καὶ νόσου· ἁπλῶς μὲν γὰρ ὑγίεια νόσῳ ἐναντία· ἡ δέ τις νόσος, εἶδος ὂν νόσου, οὐδενὶ ἐναντίον ἐστὶν, ὁ πυρετὸς, καὶ ἡ ὀφθαλμία, καὶ τῶν ἄλλων ἕκαστον. 13 Ἀναιροῦντι μὲν οὖν τοσαυταχῶς ἐπισκεπτέον. εἰ γὰρ μὴ ὑπάρχει τὰ εἰρημένα, δῆλον ὅτι οὐ γένος τὸ ἀποδοθέν. 14 Κατασκευάζοντι δὲ, τριχῶς. 15 Πρῶτον μὲν, εἰ τὸ ἐναντίον τῷ εἴδει, ἐν* τῷ εἰρημένῳ γένει, μὴ ὄντος ἐναντίου τῷ γένει. εἰ γὰρ τὸ ἐναντίον ἐν τούτῳ, δῆλον ὅτι καὶ τὸ προκείμενον. 16 Ἔτι, εἰ τὸ ἀνὰ μέσον, ἐν τῷ εἰρημένῳ γένει· ἐν ᾧ γὰρ τὰ ἀνὰ μέσον, καὶ τὰ ἄκρα. 17 Πάλιν, ἐὰν ᾖ ἐναντίον τι τῷ γένει, σκοπεῖν, εἰ καὶ τὸ ἐναντίον ἐν τῷ ἐναντίῳ. εἰ γὰρ ᾖ, δῆλον ὅτι καὶ τὸ προκείμενον, ἐν τῷ προκειμένῳ.

* γρ. τῷ αὐτῷ.

A Hoc autem vnumquodque manifeſtum *eſt* per inductionem. 8 Rurſus *videndum eſt*, an omnino in nullo genere *ſit* id quod eſt ſpeciei cōtrarium, ſed ipſum *ſit* genus: vt bonum. ſi enim hoc non *ſit* in genere, ne cōtrarium quidem eius in genere erit, ſed ipſum *erit* genus: quemadmodum in bono & malo accidit: neutrum .n. eorum *eſt* in genere, ſed vtrumq; eorum *eſt* genus. 9 Præterea *videndum eſt*, an alicui contrarium ſit tam genus quàm ſpecies, & aliis quidē ſit quidpiam interiectum, aliis verò minimè. nam ſi generibus eſt aliquid interiectum, etiam ſpeciebus: & ſi ſpeciebus, etiam generibus: quemadmodum in virtute & vitio, necnō iuſtitiā
B & iniuſtitia *contingit*. vtriſque .n. eſt aliquid interiectum. Huic obiicitur, quòd ſanitati & morbo nihil *eſt* interiectum, malo autem & bono *eſt* aliquid interiectum. 10 Præterea *videndum eſt*, an ſit quidem ambobus aliquid interiectum, *nēpe* & ſpeciebus & generibus: nō tamen ſimiliter: ſed aliorum ſecūdùm negationem, aliorum vt ſubiectum. probabile .n. *eſt*, ſimiliter *eſſe* ambobus *medium interiectum*: quemadmodum in virtute & vitio, necnon iuſtitia & iniuſtitia *perſpici poteſt*: vtriſque .n. per negationem medium *eſt* interiectum. 11 Præterea quādo non eſt contrarium generi, cōſiderare *opor-*
C *tet*, non ſolùm an contrarium, ſed etiam an mediū *ſit* in eodē genere. in quo .n. genere *ſunt* extrema, *in eo* & medium *eſt*: vt in albo & nigro *videre licet*. color .n. eſt genus & horum, & interiectorum colorum omnium. Obiectio *eſt*, quòd parum & nimium *ſunt* in eodem genere: ambo .n. *ſunt* in eo quod malum *eſt*: mediocre autem, quod eſt mediū his interiectum, non *eſt* in eo quod eſt malum, ſed in eo quod *eſt* bonum. 12 Conſiderare etiā *oportet*, an genus quidē *ſit* contrarium alicui, ſpecies vero nulli. nam ſi genus *eſt* alicui cōtrarium, etiam ſpecies: quemadmodum virtus & vitium, necnon iu-
D ſtitia & iniuſtitia. ſimiliterque ſi alia conſiderētur, hoc videri poſſit perſpicuum eſſe. Obiectio *eſt* in ſanitate & morbo. ſimpliciter .n. ſanitas *eſt* morbo contraria: quidam autem morbus, cùm ſit ſpecies morbi, nulli *eſt* contrarium: vt febris & oculorum dolor, & ſinguli alij. 13 Ac ei quidem qui refellit, *hæc* tot modis cōſideranda *ſunt*: quia niſi inſint *hæc* quæ dicta ſunt, patet id quod *eſt* propoſitū non *eſſe* genus. 14 Ei verò qui confirmat, tribus modis *cōſideranda ſunt*. 15 Primùm quidem, an id quod *eſt* ſpeciei cōtrarium, *ſit* in dicto genere, cùm nihil ſit contrariū generi. ſi .n. contrarium *ſit* in hoc *genere*, patet *in eodem genere eſſe* etiam id quod *eſt* propoſitum. 16 Præterea an medium *ſit* in dicto genere. in quo enim ſunt media, *in eo ſunt* etiam extrema. 17 Rurſus ſi quid ſit contrarium generi: conſiderare oportet, an etiam contrarium *ſit* in contrario. ſi enim ſit, patet etiam propoſitam *ſpeciem eſſe* in propoſito *genere*.

Alij loci. Cap. IV.

1 ¶ *A caſibus & coniugatis.* 2 ¶ *A proportione.* 3 ¶ *Ab ortu, & interitu:* 4 *necnon ab iis quæ gignendi, vel corrumpendi vim habent, & facultatibus, & vſibus, & quavis ſimilitudine.* 5 ¶ *A priuatione ſpeciei oppoſita.* 6 ¶ *A negatione generis.* 7 *A relatione. Si ſpecies vel genus referatur ad aliquid.* 8 *Si ſpecies non ad idem referatur ſecundùm ſe, & ratione generis:* 9 *vel non ad idem referatur ratione generis, & ratione generum generis.* 10 *Si genus & ſpecies non referantur in eiſdem caſibus.* 11 *Si generis relatio, & ſpeciei relatio non ſimiliter reciprocentur.* 12 *A numero eorum, ad quæ genus, vel ſpecies refertur.* 13 *A genere oppoſiti.* 14 *A ſubiecto in quo ſunt relata.*

ITem in caſibus & coniugatis, an ſimiliter conſequantur, *videndum eſt*, ſiue refellatur, ſiue confirmetur. ſimul enim vni & omnibus ineſt, vel non ineſt. velvti ſi iuſtitia *eſt* ſcientia quędã: etiam iuſtè *eſt* ſcienter, & iuſtus *eſt* ſciens. at ſi quid horum nõ *ita ſit*, nec aliorum vllum *eſt*. 2 Item *conſideranda ſunt*, quæ ſimiliter ſunt inter ſe affecta. velvti iucundum eandem rationem habet ad voluptatem, & vtile ad bonum: vtrumque enim vtriuſque *eſt* effectiuum. ſi igitur voluptas eſt id quod bonum, etiam iucũdum erit id quod vtile. patet enim eſſe boni efficiens, quandoquidem voluptas *eſt* bonũ. 3 Itidem *fit* etiam in generationibus & corruptionibus. vt ſi ædificare *eſt* agere, ædificaſſe *eſt* egiſſe. & ſi diſcere *eſt* recordari, didiciſſe *eſt* recordatum eſſe. & ſi diſſolui *eſt* corrumpi, etiam diſſolutum eſſe, *eſt* corruptum eſſe, & diſſolutio *eſt* corruptio quædam. 4 Itidem etiam in iis quæ gignendi aut corrumpendi vim habent, & in facultatibus, & vſibus, & omnino ſecundùm quamcumque ſimilitudinem, conſiderandum *eſt*, ſiue refellatur, ſiue confirmetur: quemadmodum in generatione & corruptione dicebamus. nam ſi corruptiuum *eſt* diſſolutiuum, etiam corrumpi *eſt* diſſolui. & ſi generatiuum *eſt* effectiuum, etiam gigni *eſt* effici, & generatio *eſt* effectio. ſimiliter *fit* in poteſtatibus & vſibus. & omnino ſi poteſtas *eſt* affectio, etiam poſſe *eſt* affectum eſſe: & ſi cuius *rei* vſus *eſt* actio, vti *eſt* agere, & vſum eſſe *eſt* egiſſe. 5 Si verò id quod ſpeciei opponitur, ſit priuatio, dupliciter licet refellere. Primùm quidem, ſi oppoſitum *ſit* in genere propoſito. vel enim ſimpliciter in nullo eodem genere *eſt* priuatio, vel non in *eodem* poſtremo *genere*. vtputà ſi aſpectus, *vt* in extremo genere, *eſt* in ſenſu: cæcitas non erit ſenſus. Deinde ſi & generi & ſpeciei opponatur priuatio, non ſit autem oppoſitum in oppoſito: ne quidem propoſitum erit in propoſito. Ac is quidem qui refellit, ita vt dictum eſt, vti debet. Qui vero confirmat, vno modo *argumentabitur*. ſi enim oppoſitum *ſit* in oppoſito, etiam propoſitum erit in propoſito. velvti ſi cæcitas *eſt* priuatio quædam ſenſus, etiam aſpectus *eſt* ſenſus. 6 Rurſus negationes conſiderandæ ſunt ordine commutato, quemadmodum in accidente dicebatur. vt ſi quod eſt iucundum, eſt id quod bonum: quod non eſt bonum, non *eſt* iucũdum. niſi enim ita *res* habeat, aliquod non bonum poterit eſſe iucundum: fieri autem nequit, ſi quidem bonum ſit genus iucundi, vt aliquid non bonum ſit iucundum. quibus enim genus non attribuitur, ne ſpecierum quidem vlla *attribuitur*. Et ſi quis confirmet, itidem conſiderare debet. ſi enim quod non eſt bonum, non *eſt* iucundum: quod eſt iucundum, *eſt* bonum: quare bonũ *eſt* genus iucũdi. 7 Quòd ſi ſpecies ſit ad aliquid, conſiderare *oportet*, an etiam genus *ſit* ad aliquid. nã ſi ſpecies *refertur* ad aliquid, etiam genus: vt in duplo & multiplo *videre licet*: vtrumque.n. *refertur* ad aliquid. ſi verò genus ad aliquid *referatur*, non neceſſe *eſt* etiam ſpeciem *referri*. nam ſcientia quidem *refertur* ad aliquid, grammatica verò non *ita*. An nec id quod priùs dictum eſt, verum *eſſe* videri poſſit? virtus enim *eſt* id quod bonum, & id quod honeſtum: & virtus quidem *refertur* ad aliquid: bonum autem & honeſtum non *ſunt* ad aliquid *relata*, ſed qualia. 8 Rurſus *videndum eſt*, an non ad idem referatur ſpecies per ſe, & ratione generis. velvti ſi duplum, dimidij dicitur duplum:

A Πάλιν ἐπὶ τῶν πτώσεων καὶ τῶν συστοίχων, εἰ ὁμοίως ἀκολουθοῦσι, καὶ ἀναιροῦντι, καὶ κατασκευάζοντι. ἅμα γὰρ ἑνὶ καὶ πᾶσιν ὑπάρχει, ἢ οὐχ ὑπάρχει. οἷον, εἰ ἡ δικαιοσύνη, ἐπιστήμη τις. καὶ τὸ δικαίως, ἐπιστημόνως· καὶ ὁ δίκαιος, ἐπιστήμων. ἐὰν δὲ τούτων τι μή, οὐδὲ τῶν λοιπῶν οὐδέν. 2 Πάλιν ἐπὶ τῶν ὁμοίως ἐχόντων πρὸς ἄλληλα. οἷον, τὸ ἡδὺ ὁμοίως ἔχει πρὸς τὴν ἡδονήν, καὶ τὸ ὠφέλιμον πρὸς τὸ ἀγαθόν. ἑκάτερον γὰρ ἑκατέρου ποιητικόν. εἰ οὖν ἐστὶν ἡ ἡδονὴ ὅπερ ἀγαθόν, καὶ τὸ ἡδὺ ὅπερ ὠφέλιμον ἔσται. δῆλον γὰρ ὅτι ἀγαθοῦ ἂν εἴη ποιητικόν, ἐπεὶ ἡ ἡδονὴ ἀγαθόν. 3 Ὡσαύτως δὲ καὶ ἐπὶ τῶν γενέσεων, καὶ B ἐπὶ τῶν φθορῶν. οἷον, εἰ τὸ οἰκοδομεῖν, ἐνεργεῖν· τὸ ᾠκοδομηκέναι, ἐνηργηκέναι. καὶ εἰ τὸ μανθάνειν, ἀναμιμνήσκεσθαι· τὸ μεμαθηκέναι, ἀναμεμνῆσθαι. καὶ εἰ διαλύεσθαι, φθείρεσθαι· καὶ τὸ διαλελύσθαι, ἐφθάρθαι· καὶ ἡ διάλυσις, φθορά τις. 4 Καὶ ἐπὶ τῶν* γεννητικῶν, καὶ φθαρτικῶν, ὡσαύτως καὶ ἐπὶ τῶν δυνάμεων, καὶ χρήσεων, καὶ ὅλως καθ' ὁποιανοῦν ὁμοιότητα, καὶ ἀναιροῦντι καὶ κατασκευάζοντι σκεπτέον, καθάπερ ἐπὶ τῆς γενέσεως καὶ φθορᾶς ἐλέγομεν. εἰ γὰρ τὸ φθαρτικὸν διαλυτικόν· καὶ τὸ φθείρεσθαι, διαλύεσθαι. καὶ εἰ τὸ γεννητικόν, ποιητικόν· καὶ τὸ γίνεσθαι, ποιεῖσθαι· καὶ ἡ* γένεσις, ποίησις. ὁμοίως δὲ καὶ ἐπὶ τῶν C δυνάμεων, καὶ χρήσεων. καὶ ὅλως εἰ ἡ δύναμις, διάθεσις· καὶ τὸ δύνασθαι, διακεῖσθαι, καὶ εἴ τινος ἡ χρῆσις, ἐνέργεια· τὸ χρῆσθαι, ἐνεργεῖν· καὶ τὸ κεχρῆσθαι, ἐνηργηκέναι. 5 Ἐὰν δὲ στέρησις ᾖ τὸ ἀντικείμενον τοῦ εἴδους, διχῶς ἐστὶν ἀνελεῖν. πρῶτον μέν, εἰ ἐν τῷ ἀποδοθέντι γένει τὸ ἀντικείμενον. ἢ γὰρ ἁπλῶς ἐν οὐδενὶ γένει τῷ αὐτῷ ἡ στέρησις, ἢ οὐκ ἐν τῷ ἐσχάτῳ. οἷον, εἰ ἡ ὄψις ἐν ἐσχάτῳ γένει τῇ αἰσθήσει, ἡ τυφλότης οὐκ ἔσται αἴσθησις. Δεύτερον δέ, εἰ καὶ τῷ γένει, καὶ τῷ εἴδει ἀντίκειται στέρησις, μὴ ἔστι δὲ τὸ ἀντικείμενον ἐν τῷ ἀντικειμένῳ, οὐδ' ἂν τὸ ἀποδοθὲν ἐν τῷ ἀποδοθέντι εἴη. Ἀναιροῦντι μὲν οὖν, καθά- D περ εἴρηται, χρηστέον· κατασκευάζοντι δέ, μοναχῶς. εἰ γὰρ τὸ ἀντικείμενον ἐν τῷ ἀντικειμένῳ, καὶ τὸ προκείμενον ἐν τῷ προκειμένῳ ἂν εἴη. οἷον, εἰ ἡ τυφλότης, ἀναισθησία τις· καὶ ἡ ὄψις, αἴσθησις. 6 Πάλιν ἐπὶ τῶν ἀποφάσεων σκοπεῖν ἀνάπαλιν, καθάπερ ἐπὶ τοῦ συμβεβηκότος ἐλέγετο. οἷον, εἰ τὸ ἡδύ, ὅπερ ἀγαθόν ἐστι· τὸ μὴ ἀγαθόν, οὐχ ἡδύ. εἰ γὰρ μὴ οὕτως ἔχει, εἴη ἄν τι οὐκ ἀγαθὸν ἡδύ. ἀδύνατον δέ, εἴπερ τὸ ἀγαθὸν γένος τοῦ ἡδέος, εἶναί τι μὴ ἀγαθὸν ἡδύ. ὧν γὰρ τὸ γένος μὴ κατηγορεῖται, οὐδὲ τῶν εἰδῶν οὐδέν. Καὶ κατασκευάζοντι δέ, ὡσαύτως σκεπτέον. εἰ γὰρ τὸ μὴ ἀγαθόν, οὐχ ἡδύ· τὸ ἡδύ, ἀγαθόν. E ὥστε γένος τὸ ἀγαθὸν τοῦ ἡδέος. 7 Ἐὰν δὲ ᾖ πρός τι τὸ εἶδος, σκοπεῖν, εἰ καὶ τὸ γένος, πρός τι. εἰ γὰρ τὸ εἶδος, τῶν πρός τι, καὶ τὸ γένος, καθάπερ ἐπὶ τοῦ διπλασίου καὶ πολλαπλασίου· ἑκάτερον γάρ, τῶν πρός τι. εἰ δὲ τὸ γένος, τῶν πρός τι, οὐκ ἀνάγκη καὶ τὸ εἶδος. ἡ μὲν γὰρ ἐπιστήμη, τῶν πρός τι· ἡ δὲ γραμματική, οὔ. ἢ οὐδὲ τὸ πρότερον ῥηθέν, ἀληθὲς ἂν δόξειεν; ἡ γὰρ ἀρετή, ὅπερ ἀγαθόν, καὶ ὅπερ καλόν· καὶ ἡ μὲν ἀρετή, τῶν πρός τι· τὸ δὲ ἀγαθόν, καὶ τὸ καλόν, οὐ τῶν πρός τι, ἀλλὰ ποιά. 8 Πάλιν, εἰ μὴ πρὸς τὸ αὐτὸ λέγεται τὸ εἶδος, καθ' αὑτό τε, καὶ κατὰ τὸ γένος. οἷον, εἰ τὸ διπλάσιον, * ἡμίσεος λέγεται διπλάσιον

* γ. φυτ.

* Melius φύσις vt monet Sylb.

* γ. ἡμίσεως

καὶ τὸ πολλαπλάσιον, ἡμίσεος δεῖ λέγεσθαι. εἰ δὲ μή, οὐκ ἂν εἴη τὸ πολλαπλάσιον, γένος τοῦ διπλασίου. 9 Ἔτι, εἰ μὴ πρὸς τὸ αὐτὸ κατά τε τὸ γένος λέγεται, καὶ κατὰ πάντα τὰ τοῦ γένους γένη. εἰ γὰρ τὸ διπλάσιον ἡμίσεος, καὶ τὸ πολλαπλάσιόν ἐστι, καὶ τὸ ὑπερέχον ἡμίσεος ῥηθήσεται· καὶ ἁπλῶς κατὰ πάντα τὰ ἐπάνω γένη, πρὸς τὸ ἥμισυ ῥηθήσεται. ἔνστασις, ὅτι οὐκ ἀναγκαῖον καθ' αὑτὸ καὶ κατὰ τὸ γένος πρὸς ταὐτὸ λέγεσθαι. ἡ γὰρ ἐπιστήμη, ἐπιστητοῦ λέγεται· ἕξις δὲ καὶ διάθεσις, οὐκ ἐπιστητοῦ, ἀλλὰ ψυχῆς. 10 Πάλιν, εἰ ὡσαύτως λέγεται τὸ γένος καὶ τὸ εἶδος κατὰ τὰς πτώσεις· οἷον, εἰ τινί, ἢ τινός, ἢ ὁσαχῶς ἄλλως λέγεται. ὡς γὰρ τὸ εἶδος, καὶ τὸ γένος· καθάπερ ἐπὶ τοῦ διπλασίου, καὶ τῶν ἐπάνω. τινὸς γὰρ καὶ τὸ διπλάσιον, καὶ τὸ πολλαπλάσιον. ὁμοίως δὲ καὶ ἐπὶ τῆς ἐπιστήμης· τινὸς γὰρ καὶ αὐτή, καὶ τὰ γένη· οἷον, ἥ τε διάθεσις, καὶ ἡ ἕξις. ἔνστασις, ὅτι ἐνιαχοῦ οὐχ οὕτω· τὸ μὲν γὰρ * διάφορον, καὶ τὸ ἐναντίον, τινί. τὸ δ' ἕτερον, γένος ὂν τούτων, οὐ τινί, ἀλλὰ τινός. ἕτερον γάρ τινος λέγεται. 11 Πάλιν, εἰ ὁμοίως τὰ πρός τι κατὰ τὰς πτώσεις λεγόμενα, μὴ ὁμοίως ἀντιστρέφει, καθάπερ ἐπὶ τοῦ διπλασίου καὶ τοῦ πολλαπλασίου. ἑκάτερον γὰρ τούτων, τινὸς καὶ αὐτό, καὶ κατὰ τὴν ἀντιστροφὴν λέγεται· τινὸς γὰρ καὶ τὸ ἥμισυ, καὶ τὸ πολλοστημόριον. ὡσαύτως δὲ καὶ ἐπὶ τῆς ἐπιστήμης, καὶ ἐπὶ τῆς ὑπολήψεως· αὗται γάρ τινος· καὶ ἀντιστρέφει ὁμοίως· τό, τε γὰρ ὑποληπτὸν καὶ τὸ ἐπιστητόν, τινί. εἰ οὖν ἐπί τινος μὴ ὁμοίως ἀντιστρέφει, δῆλον ὅτι οὐ γένος θάτερον θατέρου. 12 Πάλιν, εἰ μὴ πρὸς ἴσα τὸ γένος καὶ τὸ εἶδος λέγεται. ὁμοίως γὰρ καὶ ἰσαχῶς ἑκάτερον δοκεῖ λέγεσθαι· καθάπερ ἐπὶ τῆς δωρεᾶς, καὶ τῆς δόσεως. ἥ τε γὰρ δωρεά, καὶ τινὸς καὶ τινὶ λέγεται· καὶ ἡ δόσις, τινός, καὶ τινί. ἔστι δὲ ἡ δόσις γένος τῆς δωρεᾶς· ἡ γὰρ δωρεά, δόσις ἐστὶν ἀναπόδοτος. ἐπ' * ἐνίων δὲ οὐ συμβαίνει πρὸς ἴσα λέγεσθαι· τὸ μὲν γὰρ διπλάσιον, τινὸς διπλάσιον· τὸ δ' ὑπερέχον, καὶ τὸ μεῖζον, τινὸς καὶ τινί· πᾶν γὰρ τὸ ὑπερέχον, καὶ τὸ μεῖζον, τινὶ ὑπερέχει, καὶ τινὸς ὑπερέχει. ὥστ' οὐ γένη τὰ εἰρημένα τοῦ διπλασίου, ἐπεὶ οὐ πρὸς ἴσα τῷ εἴδει λέγεται. ἢ οὐ καθόλου ἀληθές, τὸ πρὸς ἴσα τὸ γένος καὶ τὸ εἶδος λέγεσθαι. 13 Ὁρᾶν δὲ καί, εἰ τοῦ ἀντικειμένου τὸ ἀντικείμενον, γένος ἐστίν· οἷον, εἰ τοῦ διπλασίου τὸ πολλαπλάσιον, καὶ τοῦ ἡμίσεος τὸ πολλοστημόριον. δεῖ γὰρ τὸ ἀντικείμενον τοῦ ἀντικειμένου γένος εἶναι. εἰ οὖν τις θείη τὴν ἐπιστήμην ὅπερ αἴσθησιν, δεήσει καὶ τὸ ἐπιστητὸν ὅπερ αἰσθητὸν εἶναι. οὐκ ἔστι δέ· οὐδὲ γὰρ πᾶν τὸ ἐπιστητόν, αἰσθητόν. καὶ γὰρ τῶν νοητῶν ἔνια, ἐπιστητά. ὥστ' οὐ γένος τὸ αἰσθητὸν τοῦ ἐπιστητοῦ. εἰ δὲ τοῦτο μή, οὐδ' ἡ αἴσθησις τῆς ἐπιστήμης. 14 Ἐπεὶ δὲ τῶν πρός τι λεγομένων, τὰ μέν, ἐξ ἀνάγκης ἐν ἐκείνοις ἢ περὶ ἐκεῖνά ἐστι πρὸς ἅ ποτε τυγχάνει λεγόμενα· (οἷον, ἡ διάθεσις καὶ ἡ ἕξις, καὶ ἡ συμμετρία· ἐν ἄλλῳ γὰρ οὐδενὶ δυνατὸν ὑπάρχειν τὰ εἰρημένα, ἢ ἐν ἐκείνοις πρὸς ἃ λέγεται) τὰ δ', οὐκ ἀνάγκη μὲν ἐν ἐκείνοις ὑπάρχειν πρὸς ἅ ποτε λέγεται, ἐνδέχεται δέ· (οἷον, εἰ ἐπιστητὸν * ἡ ψυχή· οὐδὲν γὰρ κωλύει τὴν αὑτῆς ἐπιστήμην ἔχειν τὴν ψυχήν. οὐκ ἀναγκαῖον δέ· δυνατὸν γὰρ καὶ ἐν ἄλλῳ ὑπάρχειν τὴν αὐτὴν ταύτην) τὰ δέ, ἁπλῶς οὐκ ἐνδέχεται ἐν ἐκείνοις ὑπάρχειν, πρὸς ἅ ποτε τυγχάνει λεγόμενα· (οἷον, τὸ ἐναντίον ἐν τῷ ἐναντίῳ· οὐδὲ τὴν ἐπιστήμην ἐν τῷ ἐπιστητῷ, ἐὰν μὴ τυγχάνῃ τὸ ἐπιστητόν, ψυχὴ ἢ ἄνθρωπος ὄν) σκοπεῖν οὖν χρή,

* γρ. διαφέρον,

* γρ. ἐπισ. al. ὡ ψυχῇ.

A etiam multiplum dimidij dici oportet. ſin minùs, multiplum non poteſt eſſe genus dupli. 9 Præterea an non ad idem referatur ratione generis, & ratione omnium generum generis. nam ſi duplum dimidij & multiplum eſt, etiam exſuperare dimidium dicetur, & omnino ſecundùm omnia ſuperiora genera ad dimidium referetur. Obijcitur, quòd non neceſſe *ſit*, per ſe & ratione generis ad idem referri: quia ſcientia dicitur *ſcientia rei* ſcibilis, habitus autem & affectio, non *rei* ſcibilis, ſed animæ. 10 Item an eodem modo dicantur genus & ſpecies, quod ad caſus *attinet*: veluti an alicui, vel alicuius, vel alio quovis modo dicantur. vt B enim ſpecies, *ita* etiam genus *dicitur*. vt *fit* in duplo & ſuperioribus *generibus*. alicuius enim *dicitur* & duplum, & multiplum. Similiter *fit* etiam in ſcientia, alicuius enim *dicitur* & ipſa *ſcientia*, & *eius* genera, vt affectio & habitus. Obijcitur, quòd interdum non ita *fiat*. nam præſtans, & contrarium alicui dicitur: diuerſum autem, cùm ſit horum genus, non dicitur alicui, ſed ab aliquo: diuerſum enim ab aliquo dicitur. 11 Item *videndum eſt* an ea, quæ ſimiliter, quantum ad caſus, dicuntur, non ſimiliter reciprocentur: vt *fit* in duplo & multiplo. horum enim vtrunque alicuius dicitur & ipſum, & ſecundùm reciprocationem. alicuius enim *dicitur* & dimidium, & ſubmultiplum. itiC demque *fit* in ſcientia & in exiſtimatione: hæ nãque *dicuntur eſſe* alicuius: & ſimiliter fit reciprocatio: quoniam aliquo exiſtimabile & ſcibile *eſſe dicitur*. Si igitur in aliquo non ſimiliter reciprocatur: patet, alterum non *eſſe* genus alterius. 12 Item *videndum eſt*, an non ad totidem genus & ſpecies referantur. ſimiliter. n. & ad totidem referri vtrumq; videtur: vt *fit* in donatione & datione. nam & donatio alicuius & alicui dicitur, & datio alicuius & alicui: datio autem eſt genus donationis: nam donatio eſt datio non reſtituenda. Quædam autem non contingit ad totidem referri. nam duplum *eſt* alicuius duplum. exſuperans autem & excellens, aliquod & aliquo. quicquid. n. exſuperat, & excelD lit, aliqua re exſuperat, & aliquam rem exſuperat. quocirca hæc quæ dixi, nõ ſunt genera dupli: quia non ad totidem ſpecie referuntur. aut nõ vniuerſaliter verum *eſt*, ad totidem genus & ſpeciem referri. 13 Videre etiam *oportet*, an oppoſitum *ſit* oppoſiti genus. vt ſi multiplum *eſt genus* dupli, etiam ſubmultiplum *eſt genus* dimidij. oportet. n. oppoſitum eſſe oppoſiti genus. Si quis igitur poſuerit ſcientiã *eſſe* id quod ſenſum, oportebit etiã ſcibile eſſe id quod ſenſibile. ſed *non ita* eſt. neque enim omne ſcibile *eſt* ſenſibile: quoniam in rerũ intelligibilium numero nõnulla ſcibilia *ſunt*. quare ſenſibile nõ *eſt* genus ſcibilis. quòd ſi hoc nõ *ſit genus*: E ne ſenſus quidem *eſt genus* ſciẽtiæ. 14 Quoniam autẽ eorum quæ ad aliquid referuntur, alia neceſſariò in illis aut circa illa ſunt ad quæ referuntur, (vt affectio & habitus, & ſymmetria: hęc. n. in nulla alia re eſſe poſſunt, quàm in iis ad quas referuntur) alia verò nõ neceſſe *eſt* in illis ineſſe ad quę referuntur, contingit tamen *ineſſe*, (vt ſi anima *ſit* res ſcibilis. nihil. n. vetat, quominus anima ſui ipſius ſcientiã habeat: non tamen neceſſe *eſt*, quia poteſt & in alio hæc ipſa *ſcientia* ineſſe) alia verò ſimpliciter non poſſunt in illis ineſſe ad quæ referuntur: (vt contrarium *non poteſt eſſe* in contrario: nec ſcientia in ſcibili: niſi accidat vt id quod eſt ſcibile, ſit anima vel homo) conſiderare igitur oportet,

an aliquis quod tale eſt, poſuerit in genere nõn tali. cuiuſmodi *eſt*, ſi quis dixerit memoriam eſſe manſionem ſcientiæ. omnis enim manſio in eo quod manet, & circa illud *eſt*. quapropter etiam ſcientiæ manſio *debet eſſe* in ſcientia. memoria igitur *eſt* in ſcientia, quia eſt manſio ſcientiæ. hoc autem nequit, quoniam omnis memoria *eſt* in anima. Hic autem locus etiam ad accidens pertinet. nihil enim refert, vtrùm manſio dicatur eſſe genus memoriæ, an dicatur ei accidere. nam ſi quomodo memoria eſt manſio ſcientiæ, hæc eadem de ea ratio conueniet.

A ἐάν τις εἰς γένος θῇ τὸ τοιοῦτον εἰς τὸ μὴ τοιοῦτον· οἷον, εἰ τὴν μνήμην, μονὴν ἐπιστήμης εἴποι. πᾶσα γὰρ μονή, ἐν τῷ μένοντι, καὶ περὶ ἐκεῖνο· ὥστε καὶ ἡ τῆς ἐπιστήμης μονή, ἐν τῇ ἐπιστήμῃ. ἡ μνήμη ἄρα ἐν τῇ ἐπιστήμῃ· ἐπείπερ μονὴ τῆς ἐπιστήμης ἐστί. τοῦτο δ' οὐκ ἐνδέχεται. μνήμη γὰρ πᾶσα, ἐν ψυχῇ. Ἔστι δ' ὁ εἰρημένος τόπος, καὶ πρὸς τὸ συμβεβηκὸς κοινός. οὐδὲν γὰρ διαφέρει, τῆς μνήμης γένος τὴν μονὴν εἰπεῖν, ἢ συμβεβηκέναι φάσκειν αὐτῇ τοῦτο. εἰ γὰρ ὁπωσοῦν ἐστὶν ἡ μνήμη μονὴ ἐπιστήμης, ὁ αὐτὸς ἁρμόσει περὶ αὐτῆς λόγος.

Alij loci. Cap. V.

1 Si habitus ad actum reducatur, vel actus ad habitum. 2 Si habitus ad facultatem referatur. 3 Si conſequens pro genere ponatur. 4 Si non in eodem ſubiecto ſint genus & ſpecies. 5 Si ſpecies ſit generis particeps ex parte. 6 Si genus ſit pars ſpeciei. 7 Si id quod vituperandum & fugiendum eſt, ad facultatem, ſiue ad id quod poteſt, referatur. 8 Si id quod eſt per ſe honorabile, ad facultatem, vel ad id quod poteſt, vel ad effectiuum referatur. 9 Si in vno genere ponatur, quod eſt in duobus. 10 Si genus pro differentia ſumatur, & differentia pro genere. 11 Si affectio dicatur eſſe ſpecies, 12 vel genus ſubiecti.

PRæterea ſi habitum ad actum retulerit, vel actum ad habitum: id non eſt genus. veluti ſi *dixerit* ſenſum *eſſe* motum per corpus. nam ſenſus *eſt* habitus: motus verò *eſt* actus. item ſi dixerit memoriam *eſſe* habitum retinendæ exiſtimationis. nulla enim memoria *eſt* habitus, ſed potiùs actus. 2 Peccant etiam, qui habitum ad conſequentem facultatem reducunt: vt *qui dicunt* clementiam *eſſe* continentiam iræ, & fortitudinem ac iuſtitiam *eſſe* continentiam metus & lucri. Fortis enim & clemens dicitur, qui eſt perturbatione vacuus: continens autem, qui à perturbatione, in qua eſt, non trahitur. Fortaſſe autem vtrique conſequens eſt talis facultas, vt, ſi in perturbatione eſſet, non traheretur, ſed *eam* vinceret. non tamen hæc eſt *viri* fortis vel clementis eſſentia, ſed omnino ab his perturbationibus non affici. 3 Interdum verò & quod quoquo modo conſequens eſt, quaſi genus ponunt: vt dolorem *genus* iræ, & exiſtimationem fidei. ambo enim illa conſequentia ſunt aliquo modo his ſpeciebus: ſed neutrum eorum eſt genus: nam qui iraſcitur, dolet, cùm in eo dolor præceſſerit. quandoquidem non ira doloris, ſed dolor iræ cauſa *eſt*: quare ſimpliciter ira non eſt dolor. Secundùm hæc nec fides *eſt* exiſtimatio: quia fieri poteſt, vt aliquis fidem non habens, eandem exiſtimationem habeat. quod fieri nequit, ſi fides *eſt* ſpecies exiſtimationis. non poteſt enim quidpiam idẽ permanere, ſi ex ſpecie omnino mutatum ſit: quemadmodum idem animal non *poteſt* interdum eſſe homo, interdum non *homo*. Quòd ſi quis dixerit neceſſariò eum qui exiſtimat, etiam credere: æqualiter exiſtimatio & opinio dicetur. quocirca ne ſic quidem poteſt eſſe genus: quoniam oportet genus de pluribus dici. 4 Videre etiam *oportet*, an naturâ comparatum ſit vt in eodem aliquo *ſubiecto* ambo inſint. in quo. n. ineſt genus, *ineſt* etiam ſpecies: vt in quo albor, etiam color: & in quo grammatica, etiam ſcientia. Si quis igitur dixerit verecũdiam *eſſe* metum, aut iram *eſſe* dolorem: non accidet, vt in eodem & genus & ſpecies inſint. nam verecundia *eſt* in *parte animæ* ratiocinatiua, metus autẽ in iraſcibili. ac dolor quidẽ in concupiſcibili, quoniã in hoc *eſt* etiã voluptas: ira autẽ in cõcupiſcibili. quare ea quæ allata fuerũt, nõ ſunt genera:

CAP. V.

A Πάλιν εἰ τὴν ἕξιν εἰς τὴν ἐνέργειαν ἔθηκεν, ἢ τὴν ἐνέργειαν εἰς τὴν ἕξιν, οὐκ ἔστι γένος τὸ τοιοῦτον. οἷον, εἰ τὴν αἴσθησιν, κίνησιν διὰ σώματος. ἡ μὲν γὰρ αἴσθησις, ἕξις· ἡ δὲ κίνησις, ἐνέργεια. ὁμοίως δὲ καὶ εἰ τὴν μνήμην, ἕξιν καθεκτικὴν ὑπολήψεως εἶπεν. οὐδεμία γὰρ μνήμη, ἕξις, ἀλλὰ μᾶλλον ἐνέργεια. 2 Διαμαρτάνουσι δὲ καὶ οἱ τὴν ἕξιν εἰς τὴν ἀκολουθοῦσαν δύναμιν τάττοντες· οἷον, τὴν πρᾳότητα, ἐγκράτειαν ὀργῆς· καὶ τὴν ἀνδρίαν καὶ τὴν δικαιοσύνην, φόβων καὶ κερδῶν ἐγκράτειαν. ἀνδρεῖος μὲν γὰρ καὶ πρᾶος ὁ ἀπαθὴς λέγεται· ἐγκρατὴς δέ, ὁ πάσχων καὶ μὴ ἀγόμενος. ἴσως μὲν οὖν B ἀκολουθεῖ δύναμις ἑκατέρῳ τοιαύτη, ὥστ', εἰ πάθοι, μὴ ἄγεσθαι, ἀλλὰ κρατεῖν. οὐ μὴν τοῦτό γε ἐστὶ τῷ μὲν ἀνδρείῳ, τῷ δὲ πρᾴῳ εἶναι, ἀλλὰ τὸ ὅλως μὴ πάσχειν ὑπὸ τῶν τοιούτων μηδέν. 3 Ἐνίοτε δὲ καὶ τὸ παρακολουθοῦν ὁπωσοῦν, ὡς γένος τιθέασιν· οἷον, τὴν λύπην τῆς ὀργῆς, καὶ τὴν ὑπόληψιν τῆς πίστεως. ἄμφω γὰρ τὰ εἰρημένα παρακολουθεῖ μὲν τρόπον τινὰ τοῖς ἀποδοθεῖσιν εἴδεσιν· οὐδέτερον δ' αὐτῶν γένος ἐστί. ὁ μὲν γὰρ ὀργιζόμενος λυπεῖται, προτέρας ἐν αὐτῷ τῆς λύπης γενομένης. οὐ γὰρ ἡ ὀργὴ τῆς λύπης, ἀλλ' ἡ λύπη τῆς ὀργῆς αἰτία. ὥσθ' ἁπλῶς ἡ ὀργὴ οὐκ ἔστι λύπη. κατὰ ταῦτα δὲ C οὐδ' ἡ πίστις ὑπόληψις. ἐνδέχεται γὰρ τὴν αὐτὴν ὑπόληψιν, καὶ μὴ πιστεύοντα ἔχειν. οὐκ ἐνδέχεται δ', εἴπερ ἡ πίστις εἶδος τῆς ὑπολήψεως. οὐ γὰρ ἐνδέχεταί τι τὸ αὐτὸ ἔτι διαμένειν, εἴπερ ἐκ τοῦ εἴδους ὅλως μεταβάλλει· καθάπερ οὐδὲ τὸ αὐτὸ ζῷον, ὁτὲ μὲν ἄνθρωπον εἶναι, ὁτὲ δὲ μή. ἐὰν δέ τις φῇ ἐξ ἀνάγκης τὸν ὑπολαμβάνοντα καὶ πιστεύειν, ἐπ' ἴσων ἡ ὑπόληψις καὶ ἡ πίστις ῥηθήσεται. ὥστ' οὐδ' ἂν οὕτως εἴη γένος· ἐπὶ πλέον γὰρ δεῖ λέγεσθαι τὸ γένος. 4 Ὁρᾶν δὲ καὶ εἰ ἔν τινι τῷ αὐτῷ πέφυκεν ἄμφω γίνεσθαι. ἐν ᾧ γὰρ * τὸ εἶδος, καὶ τὸ γένος· οἷον, ἐν ᾧ τὸ λευκόν, καὶ τὸ χρῶμα· καὶ ἐν D ᾧ γραμματική, καὶ ἐπιστήμη. ἐὰν οὖν τις τὴν αἰσχύνην φόβον εἴπῃ, ἢ τὴν ὀργὴν λύπην· οὐ συμβήσεται ἐν τῷ αὐτῷ τό, τε γένος καὶ τὸ εἶδος ὑπάρχειν. ἡ μὲν γὰρ αἰσχύνη, ἐν τῷ λογιστικῷ· ὁ δὲ φόβος, ἐν τῷ θυμοειδεῖ. καὶ ἡ μὲν λύπη, ἐν τῷ ἐπιθυμητικῷ. ἐν τούτῳ γὰρ καὶ ἡ ἡδονή· ἡ δὲ ὀργή, ἐν τῷ θυμοειδεῖ. ὥστ' οὐ γένη τὰ ἀποδοθέντα,

* γρ. τὸ ἴδιον. ἢ τὸ εἶδος.

ἐπεὶ οὐκ ἐν τῷ αὐτῷ τοῖς εἴδεσι πέφυκε γίνεσθαι. ὁμοίως δὲ καὶ εἰ ἡ φιλία ἐν τῷ ἐπιθυμητικῷ, οὐκ ἂν εἴη βούλησίς τις. πᾶσα γὰρ βούλησις ἐν τῷ λογιστικῷ. Χρήσιμος δὲ ὁ τόπος καὶ πρὸς τὸ συμβεβηκός. ἐν τῷ αὐτῷ γὰρ τὸ συμβεβηκὸς, καὶ ᾧ συμβέβηκεν. ὥστ' ἐὰν μὴ ἐν τῷ αὐτῷ φαίνηται, δῆλον ὅτι οὐ συμβέβηκεν. 5 Ἔτι, εἰ κατά τι τὸ εἶδος τοῦ εἰρημένου γένους μετέχει· οὐ δοκεῖ γὰρ κατά τι μετέχεσθαι τὸ γένος· οὐ γάρ ἐστιν ὁ ἄνθρωπος κατά τι ζῷον, οὐδὲ ἡ γραμματικὴ κατά τι ἐπιστήμη. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. σκοπεῖν οὖν, εἰ ἐπί τινων κατά τι μετέχεται τὸ γένος. οἷον, εἰ τὸ ζῷον ὅπερ αἰσθητὸν ἢ ὁρατὸν εἴρηται. κατά τι γὰρ αἰσθητὸν καὶ ὁρατὸν τὸ ζῷον. κατὰ τὸ σῶμα γὰρ, αἰσθητὸν καὶ ὁρατὸν, κατὰ δὲ τὴν ψυχὴν οὔ· ὥστε οὐκ ἂν εἴη * γένη τοῦ ζῴου, τὸ ὁρατὸν καὶ τὸ αἰσθητόν. 6 Λανθάνουσι δ' ἐνίοτε καὶ τὸ ὅλον εἰς τὸ μέρος τιθέντες. οἷον, τὸ ζῷον, σῶμα ἔμψυχον· οὐδαμῶς δὲ τὸ μέρος τοῦ ὅλου κατηγορεῖται. ὥστ' οὐκ ἂν εἴη τὸ σῶμα, γένος τοῦ ζῴου, ἐπεὶ μέρος ἐστίν. 7 Ὁρᾶν δὲ καὶ εἴ τι τῶν ψεκτῶν ἢ φευκτῶν εἰς δύναμιν ἢ τὸ δυνατὸν ἔθηκεν. οἷον, * τὸν σοφιστὴν, τὸν δυνάμενον ἀπὸ φαινομένης σοφίας χρηματίζεσθαι· ἢ διάβολον, τὸν δυνάμενον διαβάλλειν, καὶ ἐχθροὺς ποιεῖν τοὺς φίλους· ἢ κλέπτην, τὸν δυνάμενον τὰ ἀλλότρια λάθρα κλέπτειν. οὐδεὶς γὰρ τῶν εἰρημένων, τῷ δυνατὸς εἶναί τι τούτων, τοιοῦτος λέγεται * δύναται μὲν γὰρ καὶ ὁ Θεὸς, καὶ ὁ σπουδαῖος τὰ φαῦλα δρᾶν, ἀλλ' οὐκ εἰσὶ τοιοῦτοι. πάντες γὰρ οἱ φαῦλοι κατὰ προαίρεσιν λέγονται. Ἔτι πᾶσαι αἱ δυνάμεις τῶν αἱρετῶν. καὶ γὰρ αἱ τῶν φαύλων δυνάμεις αἱρεταί. διὸ καὶ τὸν Θεὸν καὶ τὸν σπουδαῖον ἔχειν φαμὲν αὐτάς. δυνατοὺς γὰρ φαμὲν εἶναι τὰ φαῦλα πράττειν. ὥστε οὐδενὸς ἂν εἴη ψεκτοῦ γένος ἡ δύναμις· εἰ δὲ μὴ, συμβήσεταί τι τῶν ψεκτῶν, αἱρετὸν εἶναι· ἔσται γάρ τις δύναμις ψεκτή. 8 Καὶ εἴ τι τῶν δι' αὑτὸ τιμίων ἢ αἱρετῶν, εἰς δύναμιν, ἢ τὸ δυνατὸν, ἢ τὸ ποιητικὸν ἔθηκε. πᾶσα γὰρ δύναμις, καὶ πᾶν τὸ δυνατὸν, ἢ τὸ ποιητικὸν, δι' ἄλλο αἱρετόν. 9 Ἢ εἴ τι τῶν ἐν δυσὶ γένεσιν ἢ πλείοσιν, εἰς θάτερον ἔθηκεν. ἔνια γὰρ οὐκ ἔστιν εἰς ἓν γένος θεῖναι· οἷον, τὸν φένακα, καὶ τὸν διάβολον· οὔτε γὰρ ὁ προαιρούμενος, ἀδυνατῶν δέ· οὔτε ὁ δυνάμενος μὲν, μὴ προαιρούμενος δὲ, διάβολος ἢ φέναξ· ἀλλ' ὁ ἄμφω ταῦτα ἔχων. * ὥστ' οὐ θετέον εἰς ἓν γένος, ἀλλ' εἰς ἀμφότερα, τὰ εἰρημένα. 10 Ἔτι, ἐνίοτε ἀνάπαλιν τὸ μὲν γένος, ὡς διαφορὰν ἀποδιδόασι· τὴν δὲ διαφορὰν, ὡς γένος. οἷον, τὴν ἔκπληξιν, ὑπερβολὴν θαυμασιότητος· καὶ τὴν πίστιν, σφοδρότητα ὑπολήψεως. οὔτε γὰρ ἡ ὑπερβολὴ, οὔτε ἡ σφοδρότης, γένος, ἀλλὰ διαφορά. δοκεῖ γὰρ ἡ ἔκπληξις, θαυμασιότης εἶναι ὑπερβάλλουσα· καὶ ἡ πίστις, ὑπόληψις σφοδρά. ὥστε γένος ἡ θαυμασιότης, καὶ ἡ ὑπόληψίς ἐστιν· ἡ δὲ ὑπερβολὴ καὶ ἡ σφοδρότης, διαφορά. Ἔτι, εἴ τις τὴν ὑπερβολὴν καὶ τὴν σφοδρότητα * ὡς γένος ἀποδώσει, τὰ ἄψυχα πιστεύσει καὶ ἐκπλαγήσεται. ἡ γὰρ ἑκάστου σφοδρότης καὶ ὑπερβολὴ πάρεστιν ἐκείνῳ, οὗ ἐστι σφοδρότης καὶ ὑπερβολή.

* γρ. γένος.

* γρ. τὸν σοφ. ἢ διάβολον ἢ κλέπτην τὸν λάθρα δυνάμενον τὰ ἀλλότρια ὑφαιρεῖσθαι, ἢ δυνάμενον διαβάλλειν ἢ σοφίζεσθαι.

* γρ. δυνατός.

* γρ. ὡς οὐδέτερον εἰς τὸ ἓν γ. ἀλλ' εἰς ἀμφ. τὰ εἰρημένα θετέον.

* γρ. γένη

A quia non eſt naturâ comparatum, vt inſint in eodem *ſubiecto*, in quo *inſunt* ſpecies. Similitérque ſi amicitia *eſt* in concupiſcibili, non poteſt eſſe voluntas quędam: omnis n. voluntas *eſt* in *parte* ratiocinatiua. Vtilis autem eſt hic locus etiam ad accidens *examinandum*: quoniam in eodem *ſunt* accidens & *id* cui accidit. quamobrem niſi in eodem *eſſe* videantur, conſtat non accidere. 5 Præterea *videndum eſt*, an ex parte ſpecies ſit eius particeps, quod dicitur eſſe genus: quia non videtur generis communicari ex parte. non n. homo eſt quadamtenus animal, neq; grammatica *eſt* quadamtenus ſcientia. ſimilis *eſt* ceterorum ratio. Conſiderare
B igitur *oportet*, an cum quibuſdam ex parte genus communicetur. quale *eſt*, ſi animal dictum ſit *eſſe* id quod ſenſibile, aut viſibile: quoniam animal *eſt* ex parte ſenſibile, & viſibile: quandoquidem ratione corporis *eſt* ſenſibile & viſibile, ratione autem animæ non *item*. quare viſibile & ſenſibile nō poſſunt eſſe genera animalis. 6 Interdum etiam non animaduertunt, ſe totum ad partem reducere: vt *qui dicunt* animal *eſſe* corpus animatum. atqui nullo modo pars toti attribuitur: quare corpus nō poteſt eſſe genus animalis, cùm ſit pars. 7 Videre etiam *oportet*, an aliquid vituperandum vel fugiendum, ad facultatem, vel ad id quod poteſt, retule-
C rit. quale *eſt*, *ſi dixerit* ſophiſtam eſſe eum qui poteſt ex ſapientia, qua videtur eſſe pręditus, lucrari: aut calumniatorem, eum qui poteſt calumniari, & ex amicis inimicos facere: aut furem, eum qui poteſt aliena clam furari. nullus enim eorum quos dixi, talis eſſe dicitur, quia poſſit aliquid horum facere. poteſt enim & Deus, & *vir* probus, quæ mala ſunt, efficere: non tamen tales ſunt: omnes enim improbi ex præelectione nominantur. Præterea omnes facultates ſunt *in* rerum eligendarum *numero*. nam & improborum facultates *ſunt* eligendæ. idcirco & Deum & *virum* bonum dicimus eas habere: dicimus enim eos poſſe quæ ma-
D la ſunt, agere. Quare facultas nullius rei vituperandæ genus eſſe poteſt. alioquin accidet, vt aliquid quod ſit vituperandum, ſit eligendum: erit enim aliqua facultas vituperanda. 8 *Videndum* etiam *eſt*, an aliquid eorum quæ ſunt per ſe honorabilia vel eligenda, ad facultatem, vel ad id quod poteſt, vel ad effectiuum retulerit. omnis enim facultas, & quicquid poteſt, aut efficiendi vim habet, propter aliud *eſt* eligendum. 9 Vel an aliquid eorum, quæ in duobus pluribúſve generibus *collocantur*, ad vnum reduxerit. quædam enim non licet ad vnum genus referre: vt impoſtorem, & calumniatorem. etenim nec qui conſi-
E lium capit, cùm *efficere* non poſſit, nec qui *efficere* poteſt, niſi conſilium capiat, calumniator, vel impoſtor: ſed qui ambo hæc habet: quamobrem ea quæ dicta ſunt, non in vno genere, ſed in vtroque poni debent. 10 Præterea interdum vice verſa genus ponunt pro differentia, & differentiam pro genere. *vt qui dicunt* ſtuporem *eſſe* exſuperantiam admirationis, & fidem *eſſe* vehementiam exiſtimationis. nam neque exſuperantia, neque vehementia *eſt* genus, ſed differentia. ſtupor enim videtur *eſſe* admiratio exſuperans: & fides, exiſtimatio vehemens. quare admiratio & exiſtimatio ſunt genera: exſuperantia verò & vehementia, differentiæ. Præterea, ſi quis exſuperantiam & magnitudinem pro genere acceperit, etiam res inanimæ fidem habebunt, & obſtupeſcent. cuiuſque enim rei vehementia & exſuperantia ineſt in ea re, cuius eſt vehementia & exſuperantia

ſi igitur ſtupor eſt exſuperātia admirationis, inerit A in admiratione ſtupor: quapropter admiratio obſtupeſcet. Similitérque fides inerit in exiſtimatione: ſiquidem eſt vehemētia exiſtimationis: quamobrem exiſtimatio fidē habebit. Præterea accidit ei qui ita *genus* accipit, vt vehementiam vehementem dicat, & exſuperantiam exſuperantem. nam quædam fides eſt vehemēs: ſi igitur fides ſit vehementia, certè vehementia erit vehemēs. Similiter etiam quidam ſtupor eſt exſuperās. ſi igitur ſtupor ſit exuperantia, certè exſuperantia erit exſuperās. Atqui horum neutrum *eſſe* videtur: quēadmodum nec ſcientia *eſt* res ſcibilis, nec motiō *eſt* id quod mouetur. 11 Interdum etiam errāt, affectionem, *quaſi* in genere, ponentes *in* eo quod affectum eſt: B vt quicumque aiunt immortalitatem eſſe vitam æternam: quoniam immortalitas videtur eſſe affectio quædam ſiue accidens vitæ. quod quidem verum *eſſe*, perſpicuum fieri poſſit, ſi quis cōceſſerit, aliquem ex mortali immortalem fieri poſſe. nemo enim dicet eum aliam vitam accipere, ſed accidens quoddam vel affectionem ei *vitæ quam degebat*, acceſſiſſe. quocirca vita non *eſt* genus immortalitatis. 12 *Errant* etiā, ſi id cuius eſt affectio, dicant eſſe affectionis genus: vt ventū, aërem motum. nam ventus *eſt* potiùs aëris motio: quandóquidem idem aër permanet, & cùm mouetur, & cùm ſtat: quare omnino ventus non eſt aër: alioquin & non moto aëre ventus eſſet: ſiquidem aër C idem permanet, qui erat ventus. Similiter *dicendū eſt* de huiuſmodi aliis *rebus*. Sed & ſi concedere oporteat ventum eſſe aërem motum; non tamen in omnibus hoc admitti debet, *id eſt non etiam in iis* de quibus nō verè dicitur genus propoſitum, ſed in iis *tātùm*, quibus verè attribuitur genus. nam in quibuſdam non videtur verè dici: vt in niue, & *in* luto. niuem enim aiunt eſſe aquam concretam: lutum autem, terram humore temperatam. ſed nec lutum eſt terra: nec nix, aqua. quare ex propoſitis generibus neutrum poteſt eſſe genus. oportet enim genus ſemper verè dici de ſpeciebus. Similiter nec vinum eſt aqua putrefacta, vt Empedocles ait *illo loco*,

—Putrefacta in ligno aqua.

ſimpliciter enim *vinum* non eſt aqua.

A εἰ οὖν ἡ ἔκπληξις, ὑπερβολή ἐστι θαυμασιότητος, ὑπάρξει τῇ θαυμασιότητι ἡ ἔκπληξις· ὥστε ἡ θαυμασιότης ἐκπλαγήσεται. ὁμοίως δὲ καὶ ἡ πίστις ὑπάρξει τῇ ὑπολήψει, εἴπερ σφοδρότης ὑπολήψεώς ἐστιν· ὥστε ἡ ὑπόληψις πιστεύσει. Ἔτι συμβήσεται τῷ οὕτως * ἀποδιδόντι, σφοδρότητα σφοδρὰν λέγειν, καὶ ὑπερβολὴν ὑπερβάλλουσαν. ἔστι γάρ τις πίστις σφοδρά. εἰ οὖν ἡ πίστις σφοδρότης ἐστὶ, σφοδρότης ἂν εἴη σφοδρά. ὁμοίως δὲ καὶ ἔκπληξίς τίς ἐστιν ὑπερβάλλουσα. εἰ οὖν ἡ ἔκπληξις, ὑπερβολή ἐστιν, ὑπερβολὴ ἂν εἴη ὑπερβάλλουσα. οὐ δοκεῖ δὲ οὐδέτερον τούτων· ὥσπερ οὐδὲ ἡ ἐπιστήμη * ἐπιστητὸν, οὐδὲ ἡ κίνησις κινούμενον. 11 Ἐνίοτε δὲ διαμαρτάνουσι, καὶ τὸ πάθος εἰς γένος τὸ πεπονθὸς τιθέντες· οἷον, B ὅσοι τὴν ἀθανασίαν, ζωὴν ἀΐδιόν φασιν εἶναι. πάθος γάρ τι ζωῆς, ἢ σύμπτωμα, ἡ ἀθανασία ἔοικεν εἶναι. ὅτι δ' ἀληθὲς τὸ λεγόμενον, δῆλον ἂν γένοιτο, εἴ τις * συγχωρήσειέ τινα ἐκ θνητοῦ ἀθάνατον γίνεσθαι. οὐδεὶς γὰρ φήσει ἑτέραν αὐτὸν ζωὴν λαμβάνειν. ἀλλὰ σύμπτωμά τι, ἢ πάθος * αὐτῇ παραγενέσθαι. ὥστ' οὐ γένος ἡ ζωὴ τῆς ἀθανασίας. 12 Ἔτι, * εἰ τοῦ πάθους, οὗ ἐστι πάθος, ἐκεῖνο γένος φασὶν εἶναι. οἷον, τὸ πνεῦμα, ἀέρα κινούμενον. μᾶλλον γὰρ κίνησις ἀέρος τὸ πνεῦμα. ὁ γὰρ αὐτὸς ἀὴρ διαμένει, ὅταν τε κινῆται, καὶ ὅταν μένῃ. ὥστ' οὐκ ἔστιν ὅλως ἀὴρ τὸ πνεῦμα· ἦν γὰρ ἂν καὶ μὴ κινουμένου τοῦ ἀέρος πνεῦμα, εἴπερ ὁ αὐτὸς ἀὴρ διαμένει, * ὅσπερ ἦν πνεῦμα. C ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων τῶν τοιούτων. εἰ δ' ἄρα καὶ ἐπὶ τούτου δεῖ συγχωρῆσαι, ὅτι ἐστὶν ἀὴρ κινούμενος τὸ πνεῦμα· ἀλλ' οὐκ ἐπί γε κατὰ πάντων * τὸ τοιοῦτον ἀποδεκτέον, καθ' ὧν μὴ ἀληθεύεται * τὸ τεθὲν γένος, ἀλλ' ἐφ' ὅσων ἀληθῶς κατηγορεῖται τὸ ἀποδοθὲν γένος. ἐπ' ἐνίων γὰρ οὐ δοκεῖ ἀληθεύεσθαι· οἷον, ἐπὶ τῆς χιόνος, καὶ τοῦ πηλοῦ. τὴν μὲν γὰρ χιόνα φασὶν ὕδωρ εἶναι πεπηγός· τὸν δὲ πηλὸν, γῆν ὑγρῷ πεφυραμένην· ἔστι δ' οὐδ' ὁ πηλὸς γῆ, οὐδ' ἡ χιὼν ὕδωρ. ὥστε οὐκ ἂν εἴη γένος, οὐδέτερον τῶν ἀποδοθέντων γενῶν. δεῖ γὰρ τὸ γένος ἀληθεύεσθαι ἀεὶ κατὰ τῶν εἰδῶν. ὁμοίως οὐδ' ὁ οἶνος, ὕδωρ ἐστὶ σεσηπὸς, καθάπερ Ἐμπεδοκλῆς φησι,

—Σαπὲν ἐν ξύλῳ ὕδωρ.

ἁπλῶς γὰρ οὐκ ἔστιν ὕδωρ.

* γρ. ἀποδιδόντι,

* γρ. ἐπιστητόν

* γρ. συγχωρήσειέ τις ἐκ θνητοῦ τι ἀθ. γ. δε mox αὐτῇ pro αὐτῇ.

* γρ. ταύτῃ.

* γρ. εἰ τὸ πάθος, ἢ τ. ἐκεῖνο ἔστι φ.

* γρ. ἦνπερ ἦν πν.

* γρ. τῶν τοιούτων.

* γρ. τὸ τεθέν τι γ.

Alij loci. Cap. VI.

1 Si dicatur alicuius rei genus eſſe id quod nullius rei eſt genus. 2 Si genus vel differentia omnibus rebus conſequens ſit. 3 Si genus ſit in ſpecie vt in ſubiecto. 4 Si non ſit ſynonymum. 5 Si melior ſpecies deteriori generi ſubiiciatur. 6 Si id quod ad duo eodem modo affectum eſt, ad deterius genus referatur. 7 Ab eo quod magis vel æquè vel minus eſt genus, aut ſpecies. 14 Si quid multis ſpecie differentibus attribuatur in quæſtione quid eſt. 15 Diſtinctio generis & differentiæ. 16 A denominatis. 17 Si quid ſit ſemper conſequens, nec reciprocetur. 19 Epilogus.

PRæterea *vidēdum eſt*, an omnino id quod pro- D poſitum eſt, nullius rei ſit genus. manifeſtum n. erit, ne ſpeciei quidem propoſitæ *genus eſſe*. vidēdum autem eſt ex eo, quòd ſpecie *inter ſe* nō differunt ea, quæ participāt propoſitum genus: vt alba: hæc n. ſpecie non differunt inter ſe: omnis autem generis ſpecies differunt. quare album nullius *rei* genus eſſe poteſt. 2 Rurſus *videndū eſt*, an id quod omnibus rebus eſt conſequēs, genus vel differentiam *eſſe* dixerit. multa n. *ſunt* omnibus rebus conſequentia, vt ens & vnum *in* eorum *numero* ſunt, quæ res omnes conſequuntur. ſi igitur ens pro genere poſuerit: procul dubio *rerum* omnium genus futurum eſt: quoniam eis attribuitur: nulli n. *rei* genus, præterquam ſpeciebus, attribuitur. quare etiam vnum

ΕΤι, εἰ ὅλως τὸ ἀποδοθὲν, μηδενός ἐστι γένος. δῆλον γάρ, ὡς οὐδὲ τοῦ λεχθέντος. σκοπεῖν δ' ἐκ τοῦ μηδὲν διαφέρειν εἴδει τὰ μετέχοντα τοῦ ἀποδοθέντος γένους· οἷον, τὰ λευκά· οὐδὲν γὰρ διαφέρει τῷ εἴδει ταῦτ' ἀλλήλων. παντὸς δὲ γένους ἐστὶν εἴδη διάφορα. ὥστ' οὐκ ἂν εἴη τὸ λευκὸν, γένος οὐδενός. 2 Πάλιν, εἰ τὸ πᾶσιν ἀκολουθοῦν, γένος ἢ διαφορὰν εἶπε. πλείω γὰρ τὰ πᾶσιν ἑπόμενα. οἷον, τὸ ὂν, καὶ τὸ ἓν, τῶν πᾶσιν ἑπομένων ἐστίν. εἰ οὖν τὸ ὂν, γένος ἀπέδωκε· δῆλον, ὅτι πάντων ἂν εἴη γένος, ἐπειδὴ κατηγορεῖται αὐτῶν. κατ' οὐδενὸς γὰρ τὸ γένος, ἀλλ' ἢ κατὰ τῶν εἰδῶν, κατηγορεῖται. ὥστε καὶ τὸ ἓν, CAP. VI.

εἶδος ἂν εἴη τοῦ ὄντος. συμβαίνει οὖν κατὰ πάντων, ὧν τὸ γένος κατηγορεῖται, καὶ τὸ εἶδος κατηγορεῖσθαι, (ἐπεὶ καὶ τὸ ὂν καὶ τὸ ἓν κατὰ πάντων ἁπλῶς κατηγορεῖται) * δέον ἐπ᾽ ἔλαττον τὸ εἶδος κατηγορεῖσθαι. εἰ δὲ τὸ πᾶσιν ἑπόμενον, διαφορὰν εἶπε, δῆλον, ὅτι ἐπ᾽ ἴσης, ἢ ἐπὶ πλέον ἡ διαφορὰ τοῦ γένους ῥηθήσεται. εἰ μὲν γὰρ καὶ τὸ γένος τῶν πᾶσιν ἑπομένων, ἐπ᾽ ἴσης. εἰ δὲ μὴ πᾶσιν ἕποιτο τὸ γένος, ἐπὶ πλέον ἡ διαφορὰ λέγοιτ᾽ ἂν αὐτοῦ. 3 Ἔτι, εἰ ἐν ὑποκειμένῳ τῷ εἴδει τὸ ἀποδοθὲν γένος λέγεται, καθάπερ τὸ λευκὸν ἐπὶ τῆς χιόνος· ὥστε δῆλον ὅτι οὐκ ἂν εἴη γένος· καθ᾽ ὑποκειμένου γὰρ τοῦ εἴδους μόνον τὸ γένος λέγεται. 4 Σκοπεῖν δὲ καὶ, εἰ μὴ συνώνυμον τὸ γένος τῷ εἴδει· κατὰ πάντων γὰρ τῶν εἰδῶν συνωνύμως τὸ γένος κατηγορεῖται. 5 Ἔτι, ὅταν ὄντος τῷ γένει καὶ τῷ εἴδει ἐναντίου, τὸ βέλτιον τῶν ἐναντίων εἰς τὸ χεῖρον γένος τεθῇ· συμβήσεται γὰρ τὸ λοιπὸν ἐν τῷ λοιπῷ εἶναι· ἐπεὶ τὰ ἐναντία, ἐν τοῖς ἐναντίοις γένεσιν. ὥστε τὸ βέλτιον ἐν τῷ * χείρονι ἔσται. δοκεῖ δὲ τοῦ βελτίονος καὶ τὸ γένος βέλτιον εἶναι. 6 Καὶ εἰ τοῦ αὐτοῦ ὁμοίως πρὸς ἄμφω ἔχοντος, εἰς τὸ χεῖρον, καὶ μὴ εἰς τὸ βέλτιον γένος ἔθηκεν· οἷον, τὴν ψυχὴν, ὅπερ κίνησιν, ἢ κινούμενον. ὁμοίως γὰρ ἡ αὐτὴ στατικὴ καὶ κινητικὴ δοκεῖ εἶναι. ὥστ᾽ εἰ βέλτιον, ἡ στάσις, εἰς τοῦτο ἔδει τὸ γένος θεῖναι. 7 Ἔτι ἐκ τοῦ μᾶλλον καὶ ἧττον, ἀνασκευάζοντι μὲν, εἰ τὸ γένος δέχεται τὸ μᾶλλον, τὸ δὲ εἶδος μὴ δέχεται, μήτ᾽ αὐτὸ, μήτε τὸ κατ᾽ ἐκεῖνο λεγόμενον. οἷον, εἰ ἡ ἀρετὴ δέχεται τὸ μᾶλλον· καὶ ἡ δικαιοσύνη, καὶ ὁ δίκαιος· λέγεται γὰρ δίκαιος μᾶλλον ἕτερος ἑτέρου. εἰ οὖν τὸ μὲν ἀποδοθὲν γένος δέχεται τὸ μᾶλλον, τὸ δ᾽ εἶδος μὴ δέχεται, μήτ᾽ αὐτὸ, μήτε τὸ κατ᾽ ἐκεῖνο λεγόμενον· οὐκ ἂν εἴη τὸ ἀποδοθὲν γένος. 8 Πάλιν, εἰ τὸ μᾶλλον δοκοῦν ἢ ὁμοίως, μή ἐστι γένος, δῆλον ὅτι οὐδὲ τὸ ἀποδοθέν. Χρήσιμος δ᾽ ὁ τόπος ἐστὶν ἐπὶ τῶν τοιούτων μάλιστα, * ἐφ᾽ ὅσων πλείω φαίνεται τοῦ εἴδους ἐν τῷ τί ἐστι κατηγορούμενα, καὶ μὴ διώρισται, μηδ᾽ ἔχομεν εἰπεῖν ποῖον αὐτῶν γένος· οἷον, τῆς ὀργῆς καὶ ἡ λύπη καὶ ἡ ὑπόληψις ὀλιγωρίας, ἐν τῷ τί ἐστι δοκεῖ κατηγορεῖσθαι. λυπεῖται γὰρ ὁ ὀργιζόμενος, καὶ ὑπολαμβάνει ὀλιγωρεῖσθαι. 9 Ἡ αὐτὴ δὲ σκέψις καὶ ἐπὶ τοῦ εἴδους πρὸς ἄλλο τι συγκρίνοντι. εἰ γὰρ τὸ μᾶλλον, ἢ τὸ ὁμοίως δοκοῦν εἶναι ἐν τῷ ἀποδοθέντι γένει, μή ἐστιν ἐν τῷ γένει· δῆλον ὅτι οὐδὲ τὸ ἀποδοθὲν ὅλως εἶδος, εἴη ἂν ἐν τῷ γένει. 10 Ἀναιροῦντι μὲν οὖν, καθάπερ εἴρηται, χρηστέον. 11 Κατασκευάζοντι δὲ, εἰ μὲν ἐπιδέχεται τὸ μᾶλλον τὸ ἀποδοθὲν γένος καὶ τὸ εἶδος, οὐ χρήσιμος ὁ τόπος· οὐδὲν γὰρ κωλύει, ἀμφοτέρων ἐπιδεχομένων, μὴ εἶναι θάτερον θατέρου γένος. τό,τε γὰρ λευκὸν καὶ τὸ καλὸν ἐπιδέχεται τὸ μᾶλλον, καὶ οὐδέτερον, ἑτέρου γένος. 12 Ἡ δὲ τῶν γενῶν καὶ τῶν εἰδῶν πρὸς ἄλληλα σύγκρισις χρήσιμος. οἷον, εἰ ὁμοίως τόδε καὶ τόδε γένος, εἰ θάτερον γένος, καὶ θάτερον. ὁμοίως δὲ καὶ εἰ τὸ ἧττον, καὶ τὸ μᾶλλον· οἷον, εἰ τῆς ἐγκρατείας μᾶλλον ἡ δύναμις ἢ ἡ ἀρετὴ γένος, * ἡ δ᾽ ἀρετὴ γένος, καὶ ἡ δύναμις. 13 Τὰ δ᾽ αὐτὰ καὶ ἐπὶ τοῦ εἴδους ἁρμόσει λέγεσθαι. εἰ γὰρ ὁμοίως τόδε καὶ τόδε τοῦ προκειμένου εἶδος· εἰ θάτερον, εἶδος, καὶ τὸ λοιπόν. καὶ εἰ τὸ ἧττον δοκοῦν, εἶδός ἐστι· καὶ τὸ μᾶλλον.

*γρ. δεῖ

*γρ. χ. ἴσως. ἐν τῷ χείρονι ἐν τῷ βελτίονι αἱ ἴσαι ταῦτα δὲ ἅπαντα.

*γρ. ἰσ᾽ ὧν

*γρ. ἡ δ᾽ ἡ ἀρετὴ γ.

A erit ſpecies entis. accidit igitur; vt *iis* omnibus, quibus genus attribuitur, etiã ſpecies attribuatur, (quãdoquidem & ens & vnum omnibus *rebus* ſimpliciter attribuuntur) cũ paucioribus ſpeciem attribui oporteat. Si verò id quod omnibus conſequens eſt, differentiam *eſſe* dixerit: patet, de totidẽ aut de pluribus differentiam quàm genus dictum iri. ſi.n.& genus *ſit in* eorum *numero* quæ omnibus conſequentia ſunt, de totidem *dicetur*. ſi verò *genus* non omnibus *rebus* conſequẽs ſit, de pluribus differentia dicetur, quàm ipſum *genus*. 3 Præterea *videndũ eſt*, an in ſubiecta ſpecie propoſitum genus *eſſe* dicatur, vt album in niue. itaq; perſpicuum *eſt* non eſſe genus. de ſubiecta.n. ſpecie tãtùm genus B dicitur. 4 Conſiderare etiam *oportet*, an genus & ſpecies non ſint ſynonyma. omnibus.n. ſpeciebus ſynonymus genus attribuitur. 5 Præterea *peccatur*, cùm eſt & generi & ſpeciei aliquid contrarium: *&* ex cõtrariis *ſpeciebus* ea quæ melior eſt, ad deterius genus refertur. accidet.n. vt reliqua in reliquo ſit: quoniam contraria *ſunt* in contrariis generibus. quare melior *ſpecies* erit in deteriori *genere*: videtur autem melioris melius genus eſſe. 6 *Peccat* etiam, ſi cùm eadem res ad vtrumque ſit eodem modo affecta, ad deterius, non ad melius genus retulerit: vt ſi *dixerit* animam eſſe id quod motionem, vel rem motam. eadem enim videtur æquè C habere vim ſiſtendi, ac mouendi. quare ſi ſtatus *eſt* melior, ad hoc genus referri oportebat. 7 Præterea ab eo quod eſt magis vel minùs, ei qui refellit, *arguere licet*, ſi genus recipiat intentionem, ſpecies autem non recipiat, neque ipſa, neque quod ab ea denominatur. vtputà ſi virtus intentionem capit, etiam iuſtitia & iuſtus *capiunt*: dicitur enim alter altero iuſtior. ſi igitur propoſitum genus intentionem recipit, ſpecies autem non recipit, nec ipſa, nec quod ab ea denominatur: id quod propoſitũ eſt, non poteſt eſſe genus. 8 Rurſus ſi id quod magis vel æquè *eſſe* videtur, non eſt genus: patet, ne id quidem quod propoſitum fuit, *eſſe genus*. D Vtilis autem *eſt* hic locus in iis maximè, in quibus plura *eſſe* videtur, quæ ſpeciei in *quæſtione* quid eſt, attribuãtur, nec definitum eſt, nec dicere poſſumus, quodnam eorum *ſit* genus: vtputà iræ & dolor & exiſtimatio contemptionis in *quæſtione* quid eſt, videtur attribui. nam qui iraſcitur, dolet, ſeque contemni exiſtimat. 9 Eadem conſideratio *eſt* in ſpecie, ſi cum alia quapiam conferatur. ſi enim quod magis, vel quod æquè videtur eſſe in genere propoſito, non eſt in genere: manifeſtum *eſt*, nec propoſitã omnino ſpeciem in genere eſſe. 10 Qui igitur refellit, ita vt dictum eſt, vti *hoc loco* debet. 11 Confirmanti autem non *eſt* vtilis locus, ſi & genus & ſpecies intentionem recipiant. nihil E enim vetat, cùm ambo recipiant, non eſſe alterum alterius genus. nam & album & honeſtum intentionem ſuſcipit, ac neutrum eſt alterius genus. 12 Generum autem & ſpecierum inter ſe collatio vtilis *eſt*. velvti ſi æquè hoc & illud *eſt* genus, alterum autem *eſt* genus, etiam alterum *erit*. Item ſi id quod minùs *eſt genus*, *eſt genus*, etiam quod magis: velvti ſi continentiæ potiùs genus *ſit* facultas quàm virtus, virtus autem *ſit* genus: etiam facultas *eſt genus*. 13 Eadem de ſpecie dici conueniet. nam ſi æquè hoc & illud *ſit* propoſiti *generis* ſpecies, alterum autem *ſit* ſpecies, etiam reliquum *erit*. & ſi quod minùs videtur, ſpecies eſt; etiam quod magis.

14 Præterea vt confirmetur, conſiderandum *eſt*, an *iis* quibus aſſignatũ eſt genus in *quæſtione* quid eſt, attribuatur, cùm non ſit vna data ſpecies, ſed plures ac differẽtes: quia proculdubio erit genus. At ſi vna ſit ſpecies data, conſiderare *oportet*, an etiã aliis ſpeciebus genus in *quæſtione* quid eſt, attribuatur. rurſus enim efficietur, vt idem pluribus ac differentibus attribuatur, & genus *eſſe* cõcedatur. 15 Quoniam autẽ quibuſdam videtur etiam differentia in *quæſtione* quid eſt, ſpeciebus attribui: ſeparandum *eſt* genus à differentia per dicta elementa. Primùm, quia genus de pluribus dicitur, quàm differentia. deinde quia in reſponſione ad *quæſtionem* quid eſt, aptiùs dicitur genus, quã differentia: nam qui dicit hominem *eſſe* animal, magis declarat quid ſit homo, quàm qui dicit *eſſe* pedeſtre. & quia differentia qualitatem generis ſemper ſignificat, genus autem differentiæ *qualitatem* non *ſignificat*. nam qui ait pedeſtre, quale quid animal dicit: qui verò inquit animal, non dicit quale quid pedeſtre. Ac differentia quidem à genere ita ſeparanda eſt. 16 Quia verò muſicum videtur, quà muſicũ eſt, ſciens eſſe; etiam muſica eſt ſcientia quædam: & ſi ambulãs propterea quòd ambulat, mouetur; ambulatio eſt motio quædam: hoc *igitur* modo conſiderandum eſt, in quo quis velit genere aliquid collocare. vt ſi *quis probare velit* ſciẽtiam *eſſe* id quod fidem: *videndum eſt*, an ſciens, quâ ſcit, credat: *ſic* n. manifeſtum *fiet*, ſcientiam eſſe fidem quãdam. Eodem modo *fieri debet* in aliis eiuſmodi. 17 Præterea, quoniam quod alicui ſemper conſequens eſt, nec reciprocatur, difficile *eſt* ſeparare *à genere, & oſtendere* non eſſe genus: ſi hoc illi omni conſequens ſit, illud autem huic non omni: (vt tranquillitati quies, & numero diuiduum: non cõtrà, quia non omne diuiduum *eſt* numerus, nec omnis quies *eſt* tranquillitas) *ipſe* quidem *diſputans* vti hoc *loco debet*, quaſi genus ſit id quod ſemper eſt conſequens, cùm alterum non reciprocetur. 18 Alio verò *hoc argumentum* proponente, non in omnibus admitti *debet*, ſed obiicere, id quod non eſt, ei omni quod fit, conſequens eſſe, (quod enim fit, non eſt) nec reciprocari, (non enim quicquid non eſt, fit) attamen non eſſe genus id quod non eſt, eius quod fit. ſimpliciter enim eius quod non eſt, non ſunt ſpecies. 19 De genere igitur expoſita methodo diſſerendum eſt.

A 14 Ἔτι, πρὸς τὸ κατασκευάζειν, σκεπτέον, εἰ καθ' ὧν ἀποδοθῇ τὸ γένος, ἐν τῷ τί ἐστι κατηγορεῖται, μὴ ὄντος * ἑνὸς τοῦ ἀποδοθέντος εἴδους, ἀλλὰ καὶ πλειόνων καὶ διαφόρων· δῆλον γάρ, ὅτι γένος ἔσται. εἰ δ' ἓν τὸ ἀποδοθὲν εἶδός ἐστι, σκοπεῖν, εἰ καὶ κατὰ τῶν ἄλλων εἰδῶν τὸ γένος ἐν τῷ τί ἐστι κατηγορεῖται. πάλιν γὰρ συμβήσεται κατὰ πλειόνων * αὐτὸ καὶ διαφέρων κατηγορεῖσθαι, καὶ γένος ὁμολογεῖσθαι. 15 Ἐπεὶ δὲ δοκεῖ τισι καὶ ἡ διαφορὰ ἐν τῷ τί ἐστι τῶν εἰδῶν κατηγορεῖσθαι, χωριστέον τὸ γένος ἀπὸ τῆς διαφορᾶς, χρώμενον τοῖς εἰρημένοις στοιχείοις. πρῶτον μέν, ὅτι τὸ γένος ἐπὶ πλέον λέγεται τῆς διαφορᾶς. B εἶθ' ὅτι κατὰ τὴν τοῦ τί ἐστιν ἀπόδοσιν μᾶλλον ἁρμόττει τὸ γένος, ἢ τὴν διαφορὰν εἰπεῖν· ὁ γὰρ ζῷον εἰπὼν τὸν ἄνθρωπον, μᾶλλον δηλοῖ τί ἐστιν ὁ ἄνθρωπος, ἢ ὁ πεζὸν εἰπών. καὶ ὅτι ἡ μὲν διαφορὰ ποιότητα τοῦ γένους ἀεὶ σημαίνει· τὸ δὲ γένος, τῆς διαφορᾶς οὔ· ὁ μὲν γὰρ εἰπὼν πεζόν, ποιόν τι λέγει ζῷον. ὁ δὲ ζῷον εἰπών, οὐ λέγει ποιόν τι πεζόν. τὴν μὲν οὖν διαφορὰν ἀπὸ τοῦ γένους οὕτω χωριστέον. 16 Ἐπεὶ δὲ δοκεῖ τὸ μουσικόν, ᾗ μουσικόν ἐστιν, ἐπιστῆμόν τι εἶναι· καὶ ἡ μουσικὴ ἐπιστήμη τίς ἐστι. καὶ εἰ τὸ βαδίζον, τῷ βαδίζειν κινεῖται· ἡ βάδισις, κίνησίς τίς ἐστι· σκοπεῖν, ἐν ᾧ ἂν βούληται γένει τι κατασκευάσαι, τὸν εἰρημένον C τρόπον. οἷον, εἰ τὴν ἐπιστήμην, ὅπερ πίστιν· εἰ ὁ ἐπιστάμενος, ᾗ ἐπίσταται, πιστεύει. δῆλον γάρ, ὅτι ἡ ἐπιστήμη, πίστις ἄν τις εἴη· τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἄλλων τῶν τοιούτων. 17 Ἔτι, ἐπεὶ τὸ παρεπόμενόν τινι ἀεί, καὶ μὴ ἀντιστρέφον, χαλεπὸν χωρίσαι τοῦ μὴ γένος εἶναι· ἂν τόδε μὲν τῷδε ἕπηται παντί, τόδε δὲ τῷδε μὴ παντί (οἷον, τῇ νηνεμίᾳ ἡ ἠρεμία, καὶ τῷ ἀριθμῷ τὸ διαιρετόν, ἀνάπαλιν δ' οὔ· τὸ γὰρ διαιρετὸν οὐ πᾶν ἀριθμός, οὐδ' ἡ ἠρεμία νηνεμία πᾶσα) αὐτῷ μὲν χρῆσθαι, ὡς γένους ὄντος τοῦ ἀεὶ ἀκολουθοῦντος, ὅταν μὴ ἀντιστρέφῃ θάτερον. 18 Ἄλλου δὲ προτείναντος, μὴ ἐπὶ πάντων ὑπακουστέον. ἔν-D στασις δὲ αὐτοῦ, ὅτι τὸ μὴ ὂν ἕπεται παντὶ τῷ γινομένῳ, (τὸ γὰρ γινόμενον οὐκ ἔστι) καὶ οὐκ ἀντιστρέφει. (οὐ γὰρ πᾶν τὸ μὴ ὂν γίνεται) ἀλλ' ὅμως οὐκ ἔστι γένος τὸ μὴ ὂν τοῦ γινομένου. ἁπλῶς γὰρ οὐκ ἔστι τοῦ μὴ ὄντος εἴδη. 19 Περὶ μὲν οὖν τοῦ γένους, καθάπερ εἴρηται, * μεθοδευτέον.

* γρ. [illegible]
* γρ. πάντη
* γρ. [illegible]

ΑΡΙΣΤΟΤΕΛΟΥΣ ΤΟΠΙΚΩΝ ΤΟ ΠΕΜΠΤΟΝ.

ARISTOTELIS TOPICORVM

LIBER V.

De proprio, & problemate proprij. Cap. I.

1 Protheſis. 2 Diuiſio proprij. 3 Quot efficiantur problemata, cùm proprium ponitur per collationem cum altero. 4 Definitiones ſingulorum propriorum. 5 Subdiuiſio. 6 Quæ ſint problemata maximè logica. 7 De locis pertinentibus ad proprium quod in collatione conſiſtit.

VTRVM autem proprium ſit, nécne, id quod eſt propoſitum, ex his *locis quos deinceps exponemus*, cõſiderandum *eſt*. 2 Proponitur autẽ proprium vel per ſe & ſemper, vel per comparationem cum altero, & interdum. Vt hominis *proprium eſt* per ſe, animal na-

E ΠΟΤΕΡΟΝ δ' ἴδιον ἢ οὐκ ἴδιόν ἐστι τὸ εἰρημένον, διὰ τῶνδε σκεπτέον. 2 Ἀποδίδοται δὲ τὸ ἴδιον ἢ καθ' αὑτὸ καὶ ἀεί, ἢ πρὸς ἕτερον, καὶ ποτέ. οἷον, καθ' αὑτὸ μὲν ἀνθρώπου, τὸ ζῷον ἥμερον φύ- CAP. I.

τί. πρὸς ἕτερον δὲ, οἷον, ψυχῆς πρὸς σῶμα· ὅτι τὸ μὲν, προστακτικὸν τὸ δ', ὑπηρετικόν ἐστιν. ἀεὶ δὲ, οἷον, Θεοῦ, τὸ ζῷον ἀθάνατον. ποτὲ δὲ, οἷον, τοῦ τινος ἀνθρώπου, τὸ περιπατεῖν ἐν τῷ γυμνασίῳ. 3 Ἔστι δὲ τὸ πρὸς ἕτερον ἴδιον ἀποδιδόμενον, ἢ δύο προβλήματα, ἢ τέτταρα. ἐὰν γὰρ τοῦ μὲν, ἀποδῷ· τοῦ δ', ἀρνήσηται ταὐτὸ τοῦτο· δύο μόνον προβλήματα γίνονται· καθάπερ, τὸ ἀνθρώπου πρὸς ἵππον ἴδιον, ὅτι δίπουν ἐστί.* καὶ γὰρ ὅτι ὁ ἄνθρωπος οὐ δίπουν ἐστίν, ἐπιχειρήσειέ τις ἄν, καὶ ὅτι ὁ ἵππος δίπουν· ἀμφοτέρως δ' ἂν κινοῖτο τὸ ἴδιον. ἐὰν δὲ ἑκατέρου ἑκάτερον ἀποδῷ, καὶ ἑκατέρου ἀπαρνηθῇ, τέτταρα προβλήματα ἔσται· καθάπερ τὸ ἀνθρώπου ἴδιον πρὸς ἵππον· ὅτι τὸ μὲν, δίπουν· τὸ δὲ, τετράπουν ἐστί. καὶ γὰρ ὅτι ἄνθρωπος * οὐ δίπουν ἐστὶ, καὶ ὅτι τετράπουν πέφυκεν, ἔστιν ἐπιχειρεῖν· καὶ διότι ὁ ἵππος δίπουν, καὶ διότι οὐ τετράπουν, οἷόν τε ἐπιχειρεῖν. ὅπως δ' οὖν δειχθέντος, ἀναιρεῖται τὸ προκείμενον. 4 Ἔστι δὲ τὸ μὲν καθ' αὑτὸ ἴδιον, ὃ πρὸς ἅπαντα ἀποδίδοται, καὶ παντὸς χωρίζει· καθάπερ ἀνθρώπου, τὸ * ζῷον θνητὸν καὶ ἐπιστήμης δεκτικόν. τὸ δὲ πρὸς ἕτερον, ὃ μὴ ἀπὸ παντὸς, ἀλλ' ἀπό τινος τακτοῦ διορίζει· καθάπερ ἀρετῆς τὸ πρὸς ἐπιστήμην· ὅτι τὸ μὲν, ἐν * πλείοσι· τὸ δ', ἐν λογιστικῷ μόνῳ, καὶ τοῖς ἔχουσι λογιστικὸν πέφυκε γίνεσθαι. τὸ δ' ἀεὶ, ὃ κατὰ πάντα χρόνον ἀληθεύεται, καὶ μηδέποτε ἀπολείπεται· καθάπερ τοῦ ζῴου τὸ ἐκ ψυχῆς καὶ σώματος συγκείμενον. τὸ δὲ, ποτὲ, ὃ κατά τινα χρόνον ἀληθεύεται, καὶ μὴ ἐξ ἀνάγκης ἀεὶ παρέπεται· καθάπερ τοῦ τινος ἀνθρώπου, τὸ περιπατεῖν ἐν ἀγορᾷ. 5 Ἔστι δὲ τὸ πρὸς ἄλλο ἴδιον ἀποδοῦναι, τὸ διαφορὰν εἰπεῖν ἢ ἐν ἅπασι καὶ ἀεὶ, ἢ ὡς ἐπιτοπολὺ καὶ ἐν τοῖς πλείστοις. οἷον, ἐν ἅπασι μὲν καὶ ἀεὶ, καθάπερ τὸ ἀνθρώπου ἴδιον πρὸς ἵππον, ὅτι δίπουν· ἄνθρωπος μὲν γὰρ καὶ πᾶς καὶ ἀεί ἐστι δίπους· ἵππος δ' οὐδείς ἐστι δίπους οὐδέποτε. ὡς ἐπιτοπολὺ δὲ καὶ ἐν τοῖς πλείστοις, καθάπερ τοῦ λογιστικοῦ ἴδιον, τὸ ἄρχειν, πρὸς ἐπιθυμητικὸν καὶ θυμικὸν τῷ, τὸ μὲν, προστάττειν* τὸ δ', ὑπηρετεῖν· οὔτε γὰρ τὸ λογιστικὸν πάντοτε προστάττει, ἀλλ' ἐνίοτε καὶ προστάττεται· οὔτε τὸ ἐπιθυμητικὸν καὶ θυμικὸν ἀεὶ προστάττεται, ἀλλὰ καὶ προστάττει ποτὲ, ὅταν ᾖ μοχθηρὰ ἡ ψυχὴ τοῦ ἀνθρώπου. 6 Τῶν δ' ἰδίων ἐστὶ λογικὰ μάλιστα, τά τε καθ' αὑτὰ καὶ ἀεὶ, καὶ τὰ πρὸς ἕτερον. τὸ μὲν γὰρ πρὸς ἕτερον ἴδιον, πλείω* προβλήματά ἐστι, καθάπερ εἴπομεν καὶ πρότερον· ἢ γὰρ δύο, ἢ τέτταρα ἐξ ἀνάγκης γίνονται τὰ προβλήματα· πλείους οὖν οἱ λόγοι γίνονται πρὸς ταῦτα. τὸ δὲ καθ' αὑτὸ καὶ ἀεὶ, πρὸς πολλά ἐστιν ἐπιχειρεῖν,* ἢ πρὸς πλείους χρόνους παρατηρεῖν. τὸ μὲν καθ' αὑτὸ, πρὸς πολλά· πρὸς ἕκαστον γὰρ τῶν ὄντων δεῖ ὑπάρχειν αὐτῷ τὸ ἴδιον· ὥστ' εἰ μὴ πρὸς ἅπαντα χωρίζεται, οὐκ ἂν εἴη καλῶς ἀποδεδομένον τὸ ἴδιον. τὸ δ' ἀεὶ, πρὸς * πλείους χρόνους * παρατηρεῖν· κἂν εἰ μὴ ὑπάρχῃ, κἂν εἰ μὴ ὑπῆρξε, κἂν εἰ μὴ ὑπάρξῃ, οὐκ ἔσται ἴδιον. τὸ δὲ ποτὲ, οὐκ ἐν ἄλλοις, ἢ πρὸς τὸν νῦν λεγόμενον χρόνον ἐπισκοποῦμεν· οὐκ οὖν εἰσι λόγοι πρὸς αὐτὸ πολλοί. λογικὸν δὲ τοῦτ' ἐστὶ πρόβλημα, πρὸς ὃ λόγοι γίνονται καὶ συχνοὶ, καὶ καλοί.

* γρ. οὐ γὰρ εἴ τι ὁ ἄνθρωπος οὐ δίπουν ἐστὶν, ἐπιχειρήσειέ τις ἄν, καὶ εἴ τι ὁ ἵππος δίπουν, ἀμφοτέρως ἂν κινοῖτο τὸ ἴδιον.

* γρ. οὐ δ. ἀλλὰ καὶ ὅτι τετρ.

* γρ. ζῷον λογικὸν, θνητὸν, νοῦ καὶ ἐπιστήμης δεκτ.

* γρ. ἐν πλείοσι δυνάμεσι τῆς ψυχῆς γίνεται. οὐ γὰρ ἐν τῷ ἐπιθυμητικῷ καὶ τῷ λογ. alij cod. ſic, ἐν πλείοσι δυνάμεσι τῆς ψυχῆς γίνεσθαι. οὐ γὰρ ἐν τοῖς πάθεσι, καὶ τῷ λογικῷ ἡ ἀρετή ἐστιν.

* γρ. τὸ δ'. ὑπ.

* γρ. γίνεται τὰ προβλ.

* γρ. οὐ πρ.

* γρ. πλείους

* γρ. τηρεῖν.

A turâ manſuetum. *Per cõparationem* verò cum altero, vt animæ cum corpore: quoniam illa iubendi, hoc parẽdi vim habet. Semper autem, vt Dei *proprium eſt* animal immortale. Interdum autem, vt cuiuſdã hominis, deambulare in gymnaſio. 3 Propriũ autem, quod comparatione alterius explicatur, vel efficit duo problemata, vel quatuor. Nã ſi de vno affirmauerit, de altero negauerit id ipſum, duo tãtùm problemata fiunt: vt hominis per collationẽ cum equo, proprium *eſt* eſſe bipedem. nam & hominem non bipedem eſſe, argumentando concludere quiſpiam poſſit, & equum *eſſe* bipedem: vtroque autem modo proprium tolli poteſt. Si verò B vtrumque de vtroque affirmauerit, & de vtroque negauerit: quatuor problemata erunt. vt hominis proprium *eſt* per collationem cum equo, quòd ille eſt bipes, hic quadrupes. nam & hominem non bipedem eſſe, & naturâ cõparatum eſſe vt quadrupes ſit, argumentando probare licebit. nec non equum *eſſe* bipedem, & non *eſſe* quadrupedem, argumentando concludi poterit, quovis autẽ modo probatum fuerit, propoſitum euertitur. 4 Eſt autem per ſe proprium, quod per comparationem cum omnibus affertur, & ab omni *re* ſeiungit: vt hominis, animal mortale & diſciplinæ capax. Alterius cõparatione *proprium eſt*, quod non ab omni C *re*, ſed à certa quadam diſtinguit, vt virtutis *propriũ eſt* per comparationem cum ſcientia, quòd naturâ comparatum ſit, vt illa gignatur in pluribus, hæc verò in ſola rationali *facultate*, & iis quæ rationali *facultate* prædita ſunt. Semper *propriũ eſt*, quod per omne tempus verè attribuitur, nec vnquã amittitur: vt animalis *proprium eſt*, ex anima & corpore cõpoſitum *eſſe*. Interdum *proprium eſt* quod ad aliquod tempus verè attribuitur, nec ex neceſſitate ſemper eſt conſequens: vt cuiuſdam hominis *proprium eſt*, in foro deambulare. 5 Iam verò alterius comparatione proprium explicare, *nihil aliud* eſt *quàm* differentiã dicere vel in omnibus & ſemper, D vel plerumque & in plurimis. Exempli gratiâ, in omnibus & ſemper: vt hominis cum equo comparati *proprium eſt eſſe* bipedẽ. homo namq; & omnis & ſemper eſt bipes: at equus nullus vnquam eſt bipes. Plerumq; autem & in plurimis: vt *facultatis* rationalis proprium *eſt* imperare, per comparationem cum concupiſcibili, & iraſcibili: quoniam altera imperat, altera verò obtẽperat. Neque enim rationalis ſemper imperat, ſed interdum etiam paret; neque concupiſcibilis & iraſcibilis ſemper parent, ſed & interdum imperant, *nempe* cùm anima hominis praua eſt. 6 Propriorum autem ea ſunt maximè logica, quæ ſunt per ſe & ſemper, & quæ E in collatione cum altero *cõſiſtunt*. Quod enim per comparationem cum altero proprium eſt, plura problemata efficit, vt & antea diximus. vel enim duo, vel quatuor problemata neceſſariò fiũt: multæ igitur rationes ad hæc *pertinentes* fiunt. Quod verò eſt per ſe & ſemper, ratione multarũ rerum in argumentationem venit, & in multis temporibus obſeruari poteſt, quod (*inquam*) eſt per ſe, ratione multarum rerum *in argumentationem venit*: quia per comparationem cum quibuſque rebus opus eſt vt proprium ipſi *ſubiecto* inſit: quare niſi ab omnibus ſeparet; non eſt ſcitè explicatum proprium. Quod verò ſemper *propriũ eſſe dicitur*, multis temporibus obſeruare *licet*: & ſiue non inſit, ſiue non inerat, ſiue non inerit, non erit proprium. Quod autem *eſt* aliquando *proprium*, non in aliis quàm in præſenti tempore ſpectamus. non ſunt igitur multæ rationes quæ ad ipſum pertineant. Illud autem eſt problema logicum, de quo crebræ & ſcitæ rationes efficiuntur.

7 Quod igitur alterius comparatione proprium A vocatur, ex locis accidentis conſiderandum eſt, *nempe* an alij quidem accidat, alij verò non *accidat*. De iis autē quæ *ſunt* ſemper & per ſe, ex his locis, *quos deinceps exponemus*, videndum *eſt*.

7 Τὸ μὲν οὖν πρὸς ἕτερον ἴδιον, ῥηθὲν ἐκ τῶν περὶ τὸ συμβεβηκὸς τόπων ἐπισκεπτέον ἐστὶν· εἰ τῷ μὲν συμβέβηκε τῷ δ᾽, οὔ. Περὶ δὲ τῶν ἀεί, καὶ τῶν καθ᾽ αὑτό, διὰ τῶνδε θεωρητέον.

DE LOCIS PERTINENTIBVS AD QVÆSTIONEM, BENE AN MALE PROPRIVM EXPOSITVM SIT.

TRACTATVS II.

Cap. II.

1 Prothesis. 2 De ignotioribus, vel notioribus. 3 De ambiguitate proprij: 4 vel eius cuius est proprium. 5 De tautologia. 6 De eo quod omnibus commune est. 7 De vno, vel pluribus propriis.

AC primùm *videndum eſt*, vtrùm rectè ſit explicatum proprium, an non rectè. 2 Huius autem *quæſtionis vtrùm ſit* rectè an non rectè *explicatū*, primus *locus* eſt, ſi non per notiora vel per notiora ponatur proprium: *& confirmatur* quidem *proprium*, ſi per notiora *poſitum eſſe oſtēdatur*: euertitur autem ſi per ignotiora. 3 *Sunt autem duo modi, quibus* non per notiora *poſitum eſſe dicitur*. Vnus *modus* eſt, ſi omnino propriū, quòd *aliquis* propoſuit, eo ſit ignotius, cuius proprium *eſſe* dixit. nō rectè.n. poſitum erit proprium: quandoquidem cognitionis causâ proprium facimus. nam diſcendi causâ & propriū & definitionē conficimus. Per notiora igitur explicandum *eſt proprium*. ſic.n. meliùs intelligere licebit. Exempli gratiâ, quoniam is qui poſuit ignis proprium eſſe ſimillimum animæ, vſus eſt anima quæ eſt ignotior igne: (magis. n. ſcimus quid ſit ignis, quam *quid ſit* anima) *idcirco* ſimillimū *eſſe* animæ, non rectè poſitum *eſt quaſi* proprium ignis. 4 Alius *modus eſt*, ſi non ſit notius hoc illi ineſſe: non ſolum.n. oportet *proprium* eſſe notius re, ſed etiam notius eſſe quòd illi inſit. nam qui neſcit, an nihil inſit, ne quidem an ei ſoli inſit, cognoſcet. quare vtrumvis horum contigerit, proprium ſit obſcurū. Velvti quoniam is qui proprium ignis poſuit, id in quo primo vt ſit anima, naturâ comparatum eſt, eo D vſus eſt quod *eſt* ignotius igne, *nempe* ſi in eo ineſt anima, & ſi in eo primo ineſt: *idcirco* in quo primo vt anima ſit, naturâ comparatum eſt, non rectè poſitum eſt *quaſi* ignis proprium. Confirmatur autē, ſi per notiora ponatur proprium, & quidē notiora vtroque modo. *ſic*.n. quod ad hoc, rectè poſitū erit proprium. (eorum. n. locorum qui ad confirmandum *aliquid* rectè *poſitū eſſe* valent, alij quod ad hoc tantùm, alij ſimpliciter oſtēdent rectè *poſitum eſſe*) velvti quoniam is qui dixit proprium *eſſe* animalis, habere ſenſum, ex notioribus, & notius vtroque modo proprium tradidit: rectè, quantum ad hoc, E traditum eſt proprium animalis, habere ſenſum. 3 Deinde refellitur, ſi nomen aliquod ex iis quæ in proprio poſita ſunt, multis modis dicatur, vel omnino oratio multa ſignificet. *ſic*.n. proprium nō rectè poſitum erit, velvti quia ſentire, multa ſignificat, id eſt, ſenſum habere: & ſenſu vti: certè naturâ aptum ad ſentiendum, non rectè ponetur *eſſe* animalis proprium. Idcirco nomine orationéve proprium ſignificante, quod quæve multis modis dicatur, non eſt vtēdum: quia quod multis modis dicitur, obſcurum dictum facit: cùm dubitet is qui argumentaturus eſt, vtrùm tandem *alter* dicat ex iis quæ multipliciter dicuntur. proprium enim

B Πρῶτον μέν, εἰ καλῶς ἀποδέδοται τὸ ἴδιον, ἢ μὴ καλῶς. CAP. II. 2 Τοῦ δὲ καλῶς ἢ μὴ καλῶς, ἕν ἐστι μέν, εἰ μὴ διὰ γνωριμωτέρων, ἢ διὰ γνωριμωτέρων κεῖται τὸ ἴδιον· ἀνασκευάζοντα μέν, εἰ μὴ διὰ γνωριμωτέρων, κατασκευάζοντα δέ, εἰ διὰ γνωριμωτέρων. 3 Τοῦ δὲ μὴ διὰ γνωριμωτέρων ἐστί, τὸ μέν, εἰ ὅλως ἀγνωστότερόν ἐστι τὸ ἴδιον ὃ ἀποδίδωσι, τούτου, οὗ τὸ ἴδιον εἴρηκεν· οὐ γὰρ ἔσται καλῶς κείμενον τὸ ἴδιον. γνώσεως γὰρ ἕνεκα τὸ ἴδιον ποιούμεθα. τοῦ γὰρ μανθάνειν ἕνεκεν, καὶ τὸ ἴδιον, καὶ τοὺς ὁρισμοὺς ποιούμεθα. διὰ γνωριμωτέρων οὖν * ἀποδοτέον· οὕτω γὰρ ἔσται κατανοεῖν * γ. χωρεῖν. C ἱκανῶς μᾶλλον. οἷον, ἐπεὶ ὁ θεὶς πυρὸς ἴδιον εἶναι τὸ ὁμοιότατον ψυχῇ, ἀγνωστοτέρῳ κέχρηται τοῦ πυρὸς τῇ ψυχῇ (μᾶλλον γὰρ ἴσμεν τί ἐστι πῦρ, ἢ ψυχή) οὐκ ἂν εἴη καλῶς κείμενον ἴδιον πυρὸς, τὸ ὁμοιότατον ψυχῇ. 4 Τὸ δέ, εἰ μὴ γνωριμώτερόν ἐστι τόδε τῷδε ὑπάρχον. δεῖ γὰρ μὴ μόνον εἶναι γνωριμώτερον τοῦ πράγματος· ἀλλὰ καὶ τῷδε ὑπάρχειν, γνωριμώτερον εἶναι. ὁ γὰρ μὴ εἰδὼς εἰ τῷδε ὑπάρχει, οὐδ᾽, εἰ τῷδε ὑπάρχει μόνῳ, γνωριεῖ ὥσθ᾽ ὁποτέρου τούτων συμβαίνοντος, ἀσαφὲς γίνεται τὸ ἴδιον. οἷον, ἐπεὶ ὁ θεὶς πυρὸς ἴδιον, τὸ ἐν ᾧ πρώτῳ ψυχὴ πέφυκεν εἶναι, ἀγνωστοτέ- D ρῳ κέχρηται τοῦ πυρὸς, τῷ εἰ ἐν τούτῳ ὑπάρχει ψυχή, καὶ εἰ ἐν αὐτῷ πρώτῳ ὑπάρχει· οὐκ ἂν εἴη καλῶς κείμενον ἴδιον πυρὸς, τὸ ἐν ᾧ πρώτῳ ψυχὴ πέφυκεν εἶναι. κατασκευάζοντα δέ, εἰ διὰ γνωριμωτέρων κεῖται τὸ ἴδιον, καὶ εἰ διὰ γνωριμωτέρων καθ᾽ ἑκάτερον τὸν τρόπον. ἔσται γάρ, κατὰ τοῦτο, καλῶς κείμενον τὸ ἴδιον. (τῶν γὰρ κατασκευαστικῶν τόπων τοῦ καλῶς, οἱ μέν, κατὰ τοῦτο μόνον· οἱ δ᾽ ἁπλῶς δείξουσιν, ὅτι καλῶς.) οἷον, ἐπεὶ ὁ εἰπὼν ζῴου ἴδιον τὸ αἴσθησιν ἔχειν, διὰ γνωριμωτέρων, καὶ γνωριμώτερον ἀπέδωκε τὸ ἴδιον καθ᾽ ἑκάτερον τὸν τρόπον· εἴη ἂν καλῶς * ἀποδεδομέ- * γ. ἀποδεδόσθαι. E νον κατὰ τοῦτο, ἴδιον τοῦ ζῴου, τὸ αἴσθησιν ἔχειν. 3 Ἔπειτα, ἀνασκευάζοντα μέν, εἴ τι τῶν ὀνομάτων τῶν ἐν τῷ ἰδίῳ ἀποδεδομένων, πλεοναχῶς λέγεται, ἢ καὶ ὅλως ὁ λόγος πλείω σημαίνει. οὐ γὰρ ἔσται καλῶς κείμενον τὸ ἴδιον. οἷον, ἐπεὶ τὸ αἰσθάνεσθαι, πλείω σημαίνει, ἓν μέν, τὸ αἴσθησιν ἔχειν * ἓν δέ, * γ. ἕτερον δὲ, τὸ αἰσθήσει χρῆσθαι· οὐκ ἂν εἴη τοῦ ζῴου ἴδιον καλῶς κείμενον, τὸ αἰσθάνεσθαι πεφυκός. διὰ τοῦτο οὐ χρηστέον ἐστίν, οὔτ᾽ ὀνόματι πλεοναχῶς λεγομένῳ, οὔτε λόγῳ, τῷ τὸ ἴδιον σημαίνοντι· διότι τὸ πλεοναχῶς λεγόμενον, ἀσαφὲς ποιεῖ τὸ ῥηθέν, ἀπορούντος τοῦ μέλλοντος ἐπιχειρεῖν, ὁπότερον ποτε λέγει τῶν πλεοναχῶς λεγομένων. τὸ γὰρ

ἴδιον, τοῦ μαθεῖν χάριν ἀποδίδοται. Ἔτι δὲ πρὸς τούτοις, ἀναγκαῖόν ἐστιν, ἔλεγχόν τινα γίνεσθαι τοῖς οὕτως ἀποδιδοῦσι τὸ ἴδιον, ὅταν ἐπὶ τοῦ διαφωνοῦντος ποιῇ τις τὸν συλλογισμὸν τοῦ πλεοναχῶς λεγομένου. κατασκευάζοντα δέ, εἰ μὴ πλείω σημαίνει, μήτε τῶν ὀνομάτων μηδέν, μήθ' ὅλος ὁ λόγος· ἔσται γάρ, κατὰ τοῦτο, καλῶς κείμενον τὸ ἴδιον. οἷον, ἐπεὶ οὔτε τὸ σῶμα πολλὰ δηλοῖ, οὔτε τὸ εὐκινητότατον εἰς τὸν ἄνω τόπον, οὔτε τὸ σύνολον τὸ ἐκ τούτων συντιθέμενον, εἴη ἂν καλῶς κείμενον, κατὰ τοῦτο, πυρὸς ἴδιον, σῶμα τὸ εὐκινητότατον εἰς τὸν ἄνω τόπον. 4 Ἔπειτα, ἀνασκευάζοντα μέν, εἰ πλεοναχῶς * λέγοιτο τοῦτο οὗ τὸ ἴδιον ἀποδίδωσι, μὴ διώρισται δὲ τὸ τίνος αὐτῶν ἴδιον τίθησιν· οὐ γὰρ ἔσται καλῶς ἀποδεδομένον τὸ ἴδιον. δι' ἃς δ' αἰτίας, οὐκ ἄδηλόν ἐστιν ἐκ τῶν πρότερον εἰρημένων· τὰ γὰρ αὐτὰ συμβαίνειν, ἀναγκαῖόν ἐστιν. οἷον, ἐπεὶ τὸ ἐπίστασθαι τοῦτο, πολλὰ σημαίνει· τὸ μὲν γάρ, ἐπιστήμην ἔχειν αὐτό· τὸ δ', ἐπιστήμῃ χρῆσθαι αὐτῷ· τὸ δ', ἐπιστήμην εἶναι αὐτοῦ· τὸ δ', ἐπιστήμῃ χρῆσθαι αὐτοῦ· οὐκ ἂν εἴη τοῦ ἐπίστασθαι τοῦτο, καλῶς ἴδιον ἀποδεδομένον οὐδέν, μὴ διορισθέντος τοῦ τίνος τίθησιν αὐτῶν τὸ ἴδιον. κατασκευάζοντα δέ, εἰ μὴ * λέγοιτο πολλαχῶς τοῦτο οὗ τὸ ἴδιον τίθησιν, ἀλλ' ἔστιν ἓν καὶ ἁπλοῦν· ἔσται γὰρ καλῶς, κατὰ τοῦτο, κείμενον τὸ ἴδιον. οἷον, ἐπεὶ ὁ ἄνθρωπος λέγεται ἁπλῶς, εἴη ἂν καλῶς κείμενον κατὰ τοῦ ἀνθρώπου, τὸ ζῷον ἥμερον φύσει. 5 Ἔπειτα, ἀνασκευάζοντα μέν, εἰ πλεονάκις εἴρηται τὸ αὐτὸ ἐν τῷ ἰδίῳ. πολλάκις γὰρ λανθάνουσι τοῦτο ποιοῦντες καὶ ἐν τοῖς ἰδίοις, καθάπερ καὶ ἐν τοῖς ὅροις. οὐκ ἔσται δὲ καλῶς κείμενον τὸ τοῦτο πεπονθὸς ἴδιον· ταράττει γὰρ τὸν ἀκούοντα τὸ πλεονάκις λεχθέν. ἀσαφὲς οὖν ἀναγκαῖόν ἐστι γίνεσθαι· καὶ πρὸς τούτοις, ἀδολεσχεῖν δοκοῦσιν. ἔσται δὲ συμπίπτον τὸ πλεονάκις εἰπεῖν τὸ αὐτό, κατὰ δύο τρόπους. καθ' ἕνα μέν, ὅταν ὀνομάσῃ πλεονάκις τὸ αὐτό· καθάπερ, εἴ τις ἀποδοίη ἴδιον πυρός, σῶμα τὸ λεπτότατον τῶν σωμάτων. οὗτος γὰρ πλεονάκις εἴρηκε τὸ σῶμα. δεύτερον δέ, ἐάν τις μεταλαμβάνῃ τοὺς λόγους ἀντὶ τῶν ὀνομάτων· καθάπερ εἴ τις ἀποδοίη γῆς ἴδιον, οὐσία ἡ μάλιστα κατὰ φύσιν φερομένη τῶν σωμάτων εἰς τὸν κάτω τόπον· ἔπειτα μεταλαμβάνοι ἀντὶ τῶν σωμάτων, τὸ οὐσιῶν τοιωνδί. ἓν γὰρ καὶ ταὐτόν ἐστι, σῶμα, καὶ οὐσία τοιαδί. ἔσται γὰρ οὗτος τὸ οὐσία πλεονάκις εἰρηκώς. ὥστ' οὐδέτερον καλῶς ἂν εἴη κείμενον τῶν ἰδίων. κατασκευάζοντα δέ, εἰ μηδενὶ χρῆται πλεονάκις ὀνόματι τῷ αὐτῷ· ἔσται γάρ, κατὰ τοῦτο, καλῶς ἀποδεδομένον τὸ ἴδιον. οἷον, ἐπεὶ ὁ εἴπας ἀνθρώπου ἴδιον, ζῷον ἐπιστήμης δεκτικόν, οὐ κέχρηται τῷ αὐτῷ πολλάκις ὀνόματι· εἴη ἄν, κατὰ τοῦτο, καλῶς ἀποδεδομένον τοῦ ἀνθρώπου τὸ ἴδιον. 6 Ἔπειτα, ἀνασκευάζοντα μέν, εἰ τοιοῦτόν τι ἀποδέδωκεν ἐν τῷ ἰδίῳ ὄνομα, ὃ πᾶσιν ὑπάρχει. ἀχρεῖον γὰρ ἔσται τὸ μὴ χωρίζον * ἀπό τινων. τὸ δ' ἐν τοῖς ἰδίοις λεγόμενον, χωρίζειν δεῖ, καθάπερ καὶ τὰ ἐν τοῖς ὅροις· οὐκ οὖν ἔσται καλῶς κείμενον τὸ ἴδιον. οἷον, ἐπεὶ ὁ θεὶς ἐπιστήμης ἴδιον, ὑπόληψιν ἀμετάπειστον ὑπὸ λόγου, ἓν ὄν, τοιούτῳ τινὶ κέχρηται ἐν τῷ ἰδίῳ, τῷ ἑνί, ὃ πᾶσιν ὑπάρχει· οὐκ ἂν εἴη καλῶς κείμενον τὸ τῆς ἐπιστήμης ἴδιον. κατασκευάζοντα δέ, εἰ μηδενὶ κέχρηται κοινῷ, ἀλλ' ἀπό τινος χωρίζοντι· ἔσται γὰρ καλῶς κείμενον, κατὰ τοῦτο, τὸ ἴδιον. οἷον, ἐπεὶ ὁ εἴπας ζῴου ἴδιον, τὸ * ψυχὴν ἔχειν, οὐδενὶ κέχρηται κοινῷ· εἴη ἄν, κατὰ τοῦτο, καλῶς κείμενον ζῴου ἴδιον, τὸ ψυχὴν ἔχειν. 7 Ἔπειτα, ἀνασκευάζοντα μέν, εἰ πλείω ἴδια ἀποδίδωσι τοῦ αὐτοῦ, μὴ διορίσας ὅτι πλείω τίθησιν·

* γρ. λέγεται

* γρ. λέγεται

* γρ. ἀπό τινος.

* αἰσθάνεσθαι legendum putat Aphrodiſius.

A diſcendi cauſâ proponitur. Præterea neceſſe eſt elenchum quendam fieri aduerſus eos qui ita proprium explicant, quando aliquis in ea *ſignificatione* in qua ſecus eſt, conficit ſyllogiſmum de eo quod dicitur multis modis. Confirmatur autem *propriũ*, ſi nec vllũ nomen, nec tota oratio plura ſignificet, proprium.n.quantum ad hoc, rectè poſitum erit. velvti quia neque corpus multa declarat, neque quod facillimè ſurſum fertur, neq; totum id quod ex his cõponitur: certè corpus quod facillimè ſurſum fertur, rectè, quantum ad hoc, poſitum erit ignis propriũ. 4 Præterea refellitur, ſi multis modis dicatur id, cuius proprium traditum eſt, neque B definitum ſit cuius eorũ ponatur proprium. *ſic*. n. proprium non erit rectè traditum. quas autem ob cauſas, non obſcurum eſt ex ſuprà dictis: quoniam eadem contingere neceſſe eſt: velvti, quoniã ſcire hoc, multa ſignificat, nempe id, ſcientiam habere, vel id, ſcientiã vti, vel eius ſcientiam eſſe, vel eius ſcientiã vti: non rectè vllum proprium tradetur, ſciendi hoc, niſi definitum fuerit cuius eorum ponatur proprium. Confirmatur autẽ, ſi non dicatur multis modis id cuius proprium ponitur, ſed ſit vnum & ſimplex. rectè.n.quantum ad hoc, poſitũ erit proprium. velvti, quoniam homo dicitur ſimpliciter: rectè hominis *propriũ eſſe* ponetur, animal naturâ manſuetũ. 5 Præterea refellitur, ſi ſæpius C idem in proprio dictum ſit. ſæpe n. hoc faciunt, nõ intelligentes ſe id facere, tam in propriis quàm in definitionibus. ſed eiuſmodi proprium non rectè poſitum erit. conturbat.n. auditorem quod ſæpe repetitum eſt. neceſſe eſt igitur vt obſcurum fiat: & præterea nugari videntur. Duobus autem modis accidit, vt idem ſæpe dicatur. vno modo, cùm *quis* ſæpe idem nominabit, velvti, ſi quis tradiderit proprium ignis, corpus tenuiſſimum corporum: hic enim ſæpius dixit corpus. altero, ſi quis accipiat definitiones pro nominibus: velvti, ſi quis tradiderit proprium terræ, *eſſe* ſubſtantiam quæ maximè inter corpora deorſum fertur: deinde pro *verbo* corpora, accipiat ſubſtantias tales. vnũ enim D & idem eſt, corpus, & ſubſtantia talis. itaque ſæpius vſus eſt *verbo* ſubſtantia. Quare neutrum proprium rectè poſitum eſt. Confirmatur autem, ſi nullo eodem nomine ſæpe vtatur: erit enim, quod ad hoc, proprium rectè traditum. Velvti, quoniam is qui dixit hominis proprium *eſſe* animal ſcientiæ capax, non eſt vſus eodem nomine ſæpius: erit, quod ad hoc, rectè traditum hominis proprium. 6 Præterea refellitur, ſi in proprio explicãdo tale quoddam nomen adhibuerit, quod omnibus inſit. inutile enim erit, quod à nullis *rebus* ſeparat. quod verò in propriis *explicandis* dicitur, ſeparare debet, vt & ea quæ *ſunt* in definitionibus. non rectè igi- E tur poſitum erit proprium. velvti, quoniam is qui ſcientiæ proprium poſuit exiſtimationem quæ ratione mutari nequit, cùm vna ſit, eiuſmodi aliquo quod omnibus ineſt, *nempe* vno, vſus eſt in proprio *explicando*: non rectè poſitum eſt ſcientiæ proprium. Confirmatur autem, ſi nullo communi *verbo* vſus ſit, ſed eo *tantùm* quod ab aliqua re ſeparet. erit enim proprium, quantum ad hoc, rectè poſitum. velvti, quoniam is qui dixit animalis proprium *eſſe*, animam habere, nullo communi *verbo* vſus eſt: erit, quantum ad hoc, rectè poſitum animalis proprium, animam habere. 7 Præterea refellitur, ſi *quis* plura propria eiuſdem rei tradiderit, non explicans ſe plura ponere:

non

non rectè.n. poſitum erit proprium. vt.n. in defi- A nitionibus non oportet præter ſermonem quo eſſentia declaratur, aliquid ampliùs addere: ſic in propriis, præter ſermonem quo efficitur proprium id quod dictum eſt, nihil adiungi debet. quod.n. *eſt* eiuſmodi, inutile eſt. velvti, quoniã is qui dixit proprium ignis *eſſe* corpus tenuiſſimum & leuiſſimum, plura propria tradidit: vtrumque.n. de ſolo igne verè dicitur: non rectè poſitum eſt ignis proprium *eſſe* corpus tenuiſſimum & leuiſſimum. Cõfirmatur autem, ſi non plura eiuſdem *rei* propria tradidit, ſed vnum. erit.n. quantum ad hoc, rectè poſitum proprium. velvti, quoniam is qui dixit humoris proprium *eſſe*, corpus quod in omnem formam ducitur, vnum proprium tradidit, non plura: erit, quod ad hoc, rectè poſitum humoris proprium.

οὐ γὰρ καλῶς ἔσται κείμενον τὸ ἴδιον. καθάπερ γὰρ οὐδ' ἐν τοῖς ὅροις δεῖ παρὰ τὸν δηλοῦντα λόγον τὴν οὐσίαν, προσκεῖσθαί τι πλέον· οὕτως οὐδ' ἐν τοῖς ἰδίοις, παρὰ τὸν ποιοῦντα λόγον ἴδιον τὸ ῥηθέν, οὐδὲν προσαποδοτέον· ἄχρηστον γὰρ γίνεται τὸ τοιοῦτον. οἷον, ἐπεὶ ὁ εἴπων ἴδιον πυρὸς, σῶμα τὸ λεπτότατον καὶ κουφότατον, πλείω ἀποδέδωκεν ἴδια. ἑκάτερον γὰρ κατὰ μόνου τοῦ πυρὸς ἀληθές ἐστιν εἰπεῖν· οὐκ ἂν εἴη καλῶς κείμενον ἴδιον πυρὸς, σῶμα τὸ λεπτότατον καὶ κουφότατον. κατασκευάζοντα δὲ, εἰ μὴ πλείω τοῦ αὐτοῦ ἴδια ἀποδέδωκεν, ἀλλ' ἕν· ἔσται γὰρ, κατὰ τοῦτο, καλῶς κείμενον τὸ ἴδιον. οἷον, ἐπεὶ ὁ εἴπων ὑγροῦ ἴδιον, σῶμα τὸ εἰς ἅπαν σχῆμα ἀγόμενον, ἓν ἀποδέδωκε τὸ ἴδιον, ἀλλ' οὐ πλείω· εἴη ἂν, κατὰ τοῦτο, καλῶς κείμενον τὸ τοῦ ὑγροῦ ἴδιον.

Varij loci. Cap. III.

1 Si in proprio explicando adhibeatur vel non adhibeatur ſubiectum, aut pars ſubiecti. 2 Si proprium em notiorem faciat, vel non. 3 Si proprium ſemper vel non ſemper inſit. 4 De eo quod non ſimpliciter, ſed nunc eſt proprium. 5 Si proprium ſenſu percipiatur, vel non. 6 Si proprium ſignificet vel non ſignificet quidditatem. 7 De genere, & differentiis. 8 Epilogus.

PRæterea reprehẽditur, ſi eo vtatur, cuius pro- B prium tradit, aut corũ aliquod quæ ei *ſubiecta ſunt*. non rectè.n. poſitum erit proprium: quia diſcendi cauſa proprium traditur. idem igitur æquè eſt ignotum atque ipſummet: quod verò *eſt* alicui *ſubiectum, eo eſt* poſterius: proinde non eſt notius. quare per hæc non fit vt aliquid magis diſcatur. Velvti, quoniam is qui dixit animalis propriũ *eſſe* ſubſtãtiam cuius ſpecies eſt homo, vſus eſt aliquo eorum quę animali *ſubiecta ſunt*: non rectè poſitum eſt proprium. Confirmatur autem, ſi nec eo *cuius proprium explicat*, nec aliquo eorum quæ ei *ſubiecta ſunt*, vtatur. erit.n. quantum ad hoc, rectè poſitum proprium. velvti, quoniam is qui C poſuit animalis proprium *eſſe*, ex anima & corpore conſtare, nec ipſo *animali* vſus eſt, nec aliquo eorum quæ ei *ſubiecta ſunt*: *idcirco* rectè quantum ad hoc, traditum erit animalis proprium. 2 Eodem modo cõſiderandum eſt in aliis quę non faciunt, vel *quæ* faciũt notius: ita vt reprehendatur, ſi quo vſus ſit vel oppoſito, vel omnino *quod eſt* ſimul naturâ, vel poſteriori aliquo. *ſic*.n. nõ rectè poſitum erit proprium. nam oppoſitum ſimul naturâ *eſt*: quod autem *eſt* ſimul naturâ, & quod *eſt* poſterius, non facit rem notiorem. velvti, quoniam is qui dixit boni pro- D prium *eſſe*, quod malo maximè opponitur, vſus eſt eo quod bono opponitur, non erit boni proprium rectè traditum. Confirmatur autem, ſi nulla re vſus ſit, neque oppoſita, nec omnino *quæ ſit* ſimul naturâ, nec poſteriori. erit.n. quod ad hoc, rectè traditum proprium. velvti, quoniam is qui ſciẽntiæ proprium poſuit exiſtimationẽ quæ maximè fidem facit, nulla re vſus eſt; nec oppoſita, nec omnino *quæ ſit* ſimul naturâ, nec poſteriori: erit, quod ad hoc, rectè poſitum ſcientiæ proprium. 3 Præterea refellitur, ſi quod non ſemper eſt conſequens, proprium tradidit, ſed id quod interdum non proprium. *ſic* enim proprium E non rectè expoſitum erit: quia neque in quo intelligimus ipſum ineſſe, de eo etiam nomen neceſſariò verè dicitur, nec in quo intelligitur non ineſſe, de eo nomen neceſſariò non dicetur. quare proprium non rectè poſitum erit.

Ἔπειτα, ἀνασκευάζοντα μὲν, εἰ αὐτῷ προσκέχρηται, οὗ τὸ ἴδιον ἀποδίδωσιν, ἢ τῶν αὐτοῦ τινι. οὐ γὰρ ἔσται καλῶς κείμενον τὸ ἴδιον. τοῦ γὰρ μαθεῖν χάριν* ἀποδίδοται τὸ ἴδιον. αὐτὸ μὲν οὖν αὑτῷ ὁμοίως ἄγνωστόν ἐστι· τὸ δὲ τῶν αὐτοῦ, ὕστερον· οὐκ οὖν ἐστι γνωριμώτερον. ὥστ' οὐ γίνεται διὰ τούτων* μᾶλλόν τι μαθεῖν. οἷον, ἐπεὶ ὁ εἴπων ζῴου ἴδιον, οὐσίαν ἧς ἐστιν εἶδος ἄνθρωπος, τινὶ προσκέχρηται τῶν τοῦ ζῴου· οὐκ ἂν εἴη καλῶς κείμενον τὸ ἴδιον. κατασκευάζοντα δὲ, εἰ μήτε αὐτῷ, μήτε τῶν αὐτοῦ μηδενὶ χρῆται. ἔσται γὰρ, κατὰ τοῦτο, καλῶς κείμενον τὸ ἴδιον. οἷον, ἐπεὶ ὁ θεὶς ζῴου C ἴδιον, τὸ ἐκ ψυχῆς καὶ σώματος συγκείμενον, οὔτε αὐτῷ, οὔτε τῶν αὐτοῦ οὐδενὶ* κέχρηται· εἴη ἂν καλῶς, κατὰ τοῦτο, ἀποδεδομένον τὸ τοῦ ζῴου ἴδιον. 2 Τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἄλλων σκεπτέον ἐστὶ τῶν μὴ ποιούντων ἢ ποιούντων γνωριμώτερον· ἀνασκευάζοντα μὲν, εἴ τινι προσκέχρηται ἢ ἀντικειμένῳ, ἢ ὅλως ἅμα τῇ φύσει, ἢ ὑστέρῳ τινί. οὐ γὰρ ἔσται καλῶς κείμενον τὸ ἴδιον. τὸ μὲν γὰρ ἀντικείμενον, ἅμα τῇ φύσει· τὸ δ' ἅμα τῇ φύσει, καὶ τὸ ὕστερον, οὐ ποιεῖ γνωριμώτερον. οἷον, ἐπεὶ ὁ εἴπας ἀγαθοῦ ἴδιον, ὃ κακῷ μάλιστα ἀντίκειται, τῷ ἀντικειμένῳ προσκέ- D χρηται τοῦ ἀγαθοῦ· οὐκ ἂν εἴη τοῦ ἀγαθοῦ καλῶς ἀποδεδομένον τὸ ἴδιον. κατασκευάζοντα δὲ, εἰ μηδενὶ προσκέχρηται, μήτ' ἀντικειμένῳ, μήτε ὅλως ἅμα τῇ φύσει, μήθ' ὑστέρῳ· ἔσται γὰρ, κατὰ τοῦτο, καλῶς ἀποδεδομένον τὸ ἴδιον. οἷον, ἐπεὶ ὁ θεὶς ἐπιστήμης ἴδιον, ὑπόληψιν τὴν πιστοτάτην, οὐδενὶ προσκέχρηται, οὔτε τῶν ἀντικειμένων, οὔτε ὅλως ἅμα τῇ φύσει, οὔθ' ὑστέρῳ· εἴη ἂν, κατὰ τοῦτο, καλῶς κείμενον τὸ τῆς ἐπιστήμης ἴδιον. 3 Ἔπειτα, ἀνασκευάζοντα μὲν, εἰ τὸ μὴ ἀεὶ παρεπόμενον, ἴδιον ἀποδέδωκεν, ἀλλά τινι, ὃ γίνεταί ποτε μὴ ἴδιον· οὐ γὰρ ἔσται καλῶς εἰρημένον τὸ ἴδιον. E οὔτε γὰρ ἐφ' ᾧ καταλαμβάνομεν ὑπάρχον αὐτὸ, κατὰ τούτου καὶ τοὔνομα ἐξ ἀνάγκης ἀληθεύεται· οὔτε ἐφ' ᾧ καταλαμβάνεται μὴ ὑπάρχον, κατὰ τούτου ἐξ ἀνάγκης οὐ ῥηθήσεται τοὔνομα. ἔστ' οὐκ ἂν εἴη καλῶς κείμενον τὸ ἴδιον.

* γρ. ἀποδίδοται
* γρ. μαθεῖν τι
* γρ. προσκέχρηται

* κ. ὅτ' ἂν

Ἔτι δὲ πρὸς τούτοις, * εἰ μὴ ὅτε ἀποδέδωκε τὸ ἴδιον, ἔσται φανερὸν εἰ ὑπάρχει· εἰ γὰρ τοιοῦτόν ἐστιν, οἷον ἀπολείπειν. οὐκ ἔσται σαφὲς τὸ ἴδιον. οἷον, ἐπεὶ ὁ θεὶς ζῴου ἴδιον, τὸ κινεῖσθαι ποτὲ ἢ ἑστάναι, τοιοῦτον ἀποδέδωκε τὸ ἴδιον, ὃ γίνεταί ποτε μὴ ἴδιον· οὐκ ἂν εἴη καλῶς κείμενον τὸ ἴδιον. κατασκευάζοντα δέ, εἰ τὸ ἐξ ἀνάγκης ἀεὶ ὄν, ἴδιον ἀποδέδωκεν· ἔσται γὰρ * καλῶς κείμενον τὸ ἴδιον, κατὰ τοῦτο. οἷον, ἐπεὶ ὁ θεὶς ἀρετῆς ἴδιον, ὃ τὸν ἔχοντα ποιεῖ σπουδαῖον, τὸ ἀεὶ παρεπόμενον ἴδιον ἀποδέδωκεν· εἴη ἄν, κατὰ τοῦτο, καλῶς ἀποδεδομένον τὸ τῆς ἀρετῆς ἴδιον.

* χ. τ. λ. τὸ κατὰ τοῦτο ἴδιον.

4 Ἔπειτα, ἀνασκευάζοντα μέν, εἰ τὸ νῦν ἴδιον ἀποδιδούς, μὴ διωρίσατο ὅτι τὸ νῦν ἴδιον ἀποδίδωσιν. οὐ γὰρ ἔσται καλῶς κείμενον τὸ ἴδιον. πρῶτον μὲν γὰρ τὸ παρὰ τὸ ἔθος γινόμενον ἅπαν, διορισμοῦ προσδεῖται· εἰώθασι δ' ὡς ἐπὶ τὸ πολὺ πάντες τὸ ἀεὶ παρακολουθοῦν, ἴδιον ἀποδιδόναι. δεύτερον δέ, ἄδηλός ἐστιν ὁ μὴ διορισάμενος, εἰ τὸ νῦν ἴδιον ἐβούλετο θεῖναι. οὐκ οὖν δοτέον ἐστὶν ἐπιτιμήσεως σκῆψιν. οἷον, ἐπεὶ ὁ θέμενος τοῦ τινὸς ἀνθρώπου ἴδιον, τὸ καθῆσθαι μετά τινος ἀνθρώπου, τὸ νῦν ἴδιον τίθησιν· οὐκ ἂν εἴη καλῶς τὸ ἴδιον ἀποδεδωκώς, εἴπερ μὴ διορισάμενος εἶπεν ὅτι νῦν. κατασκευάζοντα δέ, εἰ τὸ νῦν ἴδιον ἀποδιδούς, διορισάμενος ἔθηκεν, * ὅτι τὸ νῦν ἴδιον τίθησιν· ἔσται γὰρ καλῶς κείμενον κατὰ τοῦτο, τὸ ἴδιον. οἷον, ἐπεὶ ὁ εἴπας τινὸς ἀνθρώπου ἴδιον τὸ περιπατεῖν νῦν που, διαστειλάμενος ἔθηκε τοῦτο· καλῶς ἂν εἴη κείμενον τὸ ἴδιον.

* κ. διὸ

5 Ἔπειτα, ἀνασκευάζοντα μέν, εἰ τοιοῦτον ἀποδέδωκε τὸ ἴδιον, ὃ φανερὸν μή ἐστιν ἄλλως ὑπάρχον, ἢ αἰσθήσει. οὐ γὰρ ἔσται καλῶς κείμενον τὸ ἴδιον. ἅπαν γὰρ τὸ αἰσθητὸν ἔξω γινόμενον τῆς αἰσθήσεως, ἄδηλον γίνεται· ἀφανὲς γάρ ἐστιν, εἰ ἔτι ὑπάρχει, διὰ τὸ τῇ αἰσθήσει μόνον γνωρίζεσθαι. ἔσται δ' ἀληθὲς τοῦτο ἐπὶ τῶν μὴ ἐξ ἀνάγκης ἀεὶ παρακολουθούντων. οἷον, ἐπεὶ ὁ θέμενος ἡλίου ἴδιον, ἄστρον τὸ φερόμενον ὑπὲρ γῆς τὸ λαμπρότατον, τοιούτῳ κέχρηται ἐν τῷ ἰδίῳ, τῷ ὑπὲρ γῆς φέρεσθαι, ὃ τῇ αἰσθήσει γνωρίζεται· οὐκ ἂν εἴη καλῶς τὸ τοῦ ἡλίου ἀποδεδομένον ἴδιον· ἄδηλον γὰρ ἔσται, ὅταν δύῃ ὁ ἥλιος, εἰ φέρεται ὑπὲρ γῆς, διὰ τὸ τὴν αἴσθησιν τότε ἀπολείπειν ἡμᾶς. κατασκευάζοντα δέ, εἰ τοιοῦτον ἀποδέδωκε τὸ ἴδιον, ὃ μὴ τῇ αἰσθήσει φανερόν ἐστιν· ἢ ὅ, αἰσθητὸν ὄν, ἐξ ἀνάγκης ὑπάρχον δῆλόν ἐστιν· ἔσται γάρ, κατὰ τοῦτο, καλῶς κείμενον τὸ ἴδιον. οἷον, ἐπεὶ ὁ θέμενος ἐπιφανείας ἴδιον, ὃ πρῶτον κέχρωσται, αἰσθητῷ μέν τινι προσκέχρηται, τῷ κεχρῶσθαι· τοιούτῳ δέ, ὃ φανερόν ἐστιν ὑπάρχον ἀεί· εἴη ἄν, κατὰ τοῦτο, καλῶς ἀποδεδομένον τὸ τῆς ἐπιφανείας ἴδιον.

6 Ἔπειτα, ἀνασκευάζοντα, εἰ τὸν ὅρον ὡς ἴδιον ἀποδέδωκεν. οὐ γὰρ ἔσται καλῶς κείμενον τὸ ἴδιον· οὐ γὰρ δεῖ δηλοῦν τὸ τί ἦν εἶναι, τὸ ἴδιον. οἷον, ἐπεὶ ὁ εἴπας ἀνθρώπου ἴδιον, ζῷον πεζὸν δίπουν, τὸ τί ἦν εἶναι σημαῖνον, ἀποδέδωκε τοῦ ἀνθρώπου ἴδιον· οὐκ ἂν εἴη τὸ τοῦ ἀνθρώπου ἴδιον καλῶς ἀποδεδομένον. κατασκευάζοντα δέ, εἰ ἀντικατηγορούμενον μὲν ἀποδέδωκε τὸ ἴδιον, μὴ τὸ τί ἦν εἶναι δὲ δηλοῦν. ἔσται γάρ, κατὰ τοῦτο, καλῶς ἀποδεδομένον τὸ ἴδιον. οἷον, ἐπεὶ ὁ θεὶς ἀνθρώπου ἴδιον, τὸ ζῷον ἥμερον φύσει, ἀντικατηγορούμενον μὲν ἀποδέδωκε τὸ ἴδιον, οὐ τὸ τί ἦν εἶναι δὲ δηλοῦν· εἴη ἄν, κατὰ τοῦτο, καλῶς ἀποδεδομένον τὸ ἴδιον τοῦ ἀνθρώπου.

A Præterea nec quando proprium tradidit, perſpicuum erit an inſit: ſiquidē tale eſt, vt abeſſe poſſit. itaque proprium *hoc* non erit perſpicuum. Velvti, quoniam qui animalis propriū poſuit moueri interdū vel ſtare, eiuſmodi proprium tradidit, quod fit aliquando non proprium: non rectè erit poſitū proprium. Confirmatur autem, ſi quod neceſſariò ſemper eſt, proprium ſtatuit: erit.n. rectè poſitum proprium, quod ad hunc *locum attinet*. velvti, qui virtutis proprium poſuit, quod habentem efficit probū: quia quod ſemper conſequens eſt, propriū ſtatuit: erit, quantū ad hoc, rectè traditum virtutis proprium. 4 Præterea reprehenditur, ſi *quis* quod

B nūc proprium *eſt*, tradens, non declaret *ſe* id quod nunc proprium *eſt*, tradere: quia non erit rectè poſitum proprium. Primùm.n. quicquid præter morem fit, declaratione indiget: plerumque autem omnes cōſueuerunt, quod ſemper conſequēs eſt, proprium tradere. Preterea incertum eſt, an is qui non declarauit, quod nunc proprium eſt, ponere voluerit. nō igitur danda eſt reprehēſionis cauſa. Velvti, qui cuiuſdam hominis proprium ponit, ſedere cū quodam homine, quia quod nunc eſt proprium ponit, non rectè proprium tradidit, niſi declaret ſe quod nunc *eſt proprium, tradere*. Confirmatur autem, ſi *quis* quod nunc proprium eſt, tradēs, declarauerit ſe quod nunc eſt proprium, ponere.

C erit.n. proprium, quantum ad hoc, rectè poſitum. Velvti, quoniam is qui dixit alicuius hominis *eſſe* proprium, deambulare nūc aliquo in loco, diſtinctione adhibita hoc poſuit: rectè erit poſitum proprium. 5 Præterea rēfellitur, ſi eiuſmodi propriū tradidit, quod nō aliter cognoſcitur ineſſe, quàm ſenſu. non. n. erit rectè poſitum proprium. omne enim ſenſibile, ſi extra ſenſum conſtituatur, incertum fit: quoniam ignoratur, an adhuc inſit, propterea quòd ſenſu tantùm cognoſcitur. Hoc autem verum erit in iis quæ non neceſſariò ſemper conſequuntur. velvti, qui Solis proprium poſuit, aſtrum quod ſupra terram fertur, ſplēdidiſſimum; quoniam in proprio *explicādo* illud adhibuit, *id eſt*,

D ſupra terram ferri, quod ſenſu cognoſcitur: non rectè erit Solis proprium traditum. incertū enim erit, cùm Sol occiderit, an feratur ſupra terram: quia tunc ſenſus nos deficit. Confirmatur autem, ſi tale proprium tradidit, quod non ſenſu manifeſtum ſit: vel quod, cùm ſub ſenſum cadat, neceſſariò ineſſe cōſtet. erit enim, quod ad hoc, rectè poſitum proprium. velvti, quoniam is qui ſuperficiei proprium poſuit, quod primum coloratur: ſenſibile quiddam adhibuit, *nempe* colorari, ſed eiuſmodi, quod perſpicuum eſt ſemper ineſſe: erit, quod ad hoc, rectè traditum ſuperficiei proprium. 6 Preterea reprehenditur, ſi definitionem quaſi pro-

E prium tradiderit. non. n. rectè poſitum erit proprium: quia proprium, declarare quidditatem non debet. velvti, qui hominis proprium *eſſe* dixit animal pedeſtre bipes; quoniam id quod quidditatē ſignificat, hominis proprium *eſſe* ſtatuit: non erit hominis proprium rectè traditum. Confirmatur autem, ſi tradiderit proprium, quod reciprocatur, nec declarat quidditatem. erit.n. proprium, quantum ad hoc, rectè traditum. velvti, quoniam is qui proprium hominis *eſſe* poſuit animal naturā manſuetū, tradidit proprium, quod reciprocatur, nec declarat hominis quidditatem: erit, quantum ad hoc, rectè traditum proprium hominis.

7 Præterea reprehenditur, ſi in proprio explicando non poſuit quid *res* ſit. oportet enim, vt in definitionibus, ita in propriis primùm tradi genus, deinde reliqua adiungi, & *rem propoſitam ab aliis* ſeparari. quare proprium, quod hoc modo poſitum nõ eſt, nõ rectè eſt traditum. velvti, qui dixit animalis proprium *eſſe*, animã habere, quia non poſuit quid animal ſit: non rectè poſitum erit animalis proprium. Confirmatur autem, ſi quis, cùm poſuerit quid ſit *id* cuius proprium tradit, reliqua *deinde* adiungat. erit enim proprium, quod ad hoc, rectè traditum. velvti, qui poſuit hominis proprium, *eſſe* animal ſcientiæ capax, quoniam ponens quid ſit *homo, eius* proprium tradidit: erit, quod ad hoc, rectè poſitum proprium hominis. 8 Vtrùm igitur rectè an non rectè traditum *ſit* proprium, ex his conſiderandum *eſt*.

A 7 Ἔπειτα ἀνασκευάζοντα μὲν, εἰ μὴ εἰς τὸ τί ἐστι ὁ θεὶς ἀποδέδωκε τὸ ἴδιον. δεῖ γὰρ τῶν ἰδίων, καθάπερ καὶ τῶν ὅρων, τὸ πρῶτον ἀποδίδοσθαι γένος, ἔπειθ᾽ οὕτως ἤδη προσάπτεσθαι τὰ λοιπὰ, καὶ χωρίζειν. ὥστε τὸ μὴ τοῦτον τὸν τρόπον κείμενον ἴδιον, οὐκ ἂν εἴη καλῶς ἀποδεδομένον. οἷον, ἐπεὶ ὁ εἴπας τοῦ ζώου ἴδιον, τὸ ψυχὴν ἔχειν, οὐκ ἔθηκεν εἰς τὸ τί ἐστι τὸ ζῷον. οὐκ ἂν εἴη καλῶς κείμενον τὸ τοῦ ζώου ἴδιον. κατασκευάζοντα δὲ, εἴ τις εἰς τὸ τί ἐστι θεὶς οὗ τὸ ἴδιον ἀποδίδωσι, τὰ λοιπὰ προστίθησιν. ἔσται γὰρ, κατὰ τοῦτο, καλῶς ἀποδεδομένον τὸ ἴδιον. οἷον, ἐπεὶ ὁ θεὶς ἀνθρώπου ἴδιον ζῷον ἐπιστήμης δεκτικὸν, εἰς τὸ τί ἐστι θεὶς ἀπέδωκε τὸ ἴδιον, εἴη ἂν, κατὰ τοῦτο, καλῶς κείμενον τὸ ἴδιον τοῦ ἀνθρώπου. 8 Πότερον μὲν οὖν καλῶς, ἢ οὐ καλῶς, ἀποδίδοται τὸ ἴδιον, διὰ τῶνδε σκεπτέον.

DE LOCIS PERTINENTIBVS AD QVÆSTIONEM, AN SIT PROPRIVM NECNE.

TRACTATVS III.

Varij loci.

Cap. IV.

1 Protheſis. 2 Si omnibus inſit ratione communis ſubiecti, vel non. 3 Si nomen & oratio reciprocentur, vel non. 4 Si ſubiectum dicatur eſſe proprium eius quod eſt in ſubiecto, vel contrà. 5 A participatione. 6 A tempore. 7 Si earumdem rerum, quà ſunt eædem, non ſit, aut ſit idem proprium. 8 Si eorum quæ eodem genere continentur, non ſit, aut ſit proprium genere idem. 9 De ſubiecto ſolo vel cum accidente.

VTrum autem proprium ſit omnino *id* quod dictum eſt, an non proprium, ex his vidẽdum *eſt*. nam qui ſimpliciter cõfirmant proprium rectè poſitum eſſe, iidẽ loci erunt atque ij qui proprium omnino efficiunt: proinde in illis dicentur. 2 Primum igitur in confirmatione reſpicere *oportet* ad ſingula ſub eo cõtẽta cuius proprium *aliquis* tradidit: velvti, an nulli *eorum* inſit, vel non ratione huius verè dicatur, vel non ſit vniuſcuiuſque eorũ proprium, ratione eius, cuius proprium *ille* tradidit. *ſic* n. proprium non erit id quod poſitum eſt eſſe proprium. velvti, quia de geometra non verè dicitur, eum ratione falli non poſſe, quandoquidẽ fallitur geometra, dum falſam deſcriptionem adhibet: non poteſt hoc eſſe ſcientis proprium, non falli ratione. Confirmatur autem ſi de omni verè dicitur, & ratione huius verè dicitur. *quod* n. poſitum *eſt* non eſſe proprium, erit proprium. velvti, quoniam animal ſcientiæ capax, de omni homine verè dicitur, & quà homo *eſt*: certè hominis proprium eſt animal ſcientiæ capax. Eſt autem hic locus in refutatione, ſi de quo nomen, non etiam oratio verè dicitur: & ſi de quo oratio, non etiam nomen. in confirmatione autem, ſi de quo nomẽ, etiam oratio verè dicitur: & ſi *et* cui oratio, etiam nomẽ attribuitur. 3 Præterea refellitur, ſi de quo oratio, non etiam nomen verè dicitur: & ſi de quo nomen, non etiam oratio. quod enim poſitum eſt eſſe proprium, non erit proprium. velvti, quoniam animal ſcientiæ capax, verè dicitur de Deo, homo autem Deo non attribuitur: non poteſt eſſe hominis proprium, animal ſcientiæ capax.

B Πότερον δ᾽ ἴδιον ἐστὶν ὅλως τὸ εἰρημένον, ἢ οὐκ ἴδιον, ἐκ τῶνδε θεωρητέον. οἱ γὰρ ἁπλῶς κατασκευάζοντες τὸ ἴδιον ὅτι καλῶς κεῖται, τόποι οἱ αὐτοὶ ἔσονται τοῖς τὸ ἴδιον ὅλως ποιοῦσιν· ἐν ἐκείνοις οὖν ῥηθήσονται. 3 Πρῶτον μὲν οὖν ἀνασκευάζοντα ἐπιβλέπειν ἐφ᾽ ἕκαστον, οὗ τὸ ἴδιον ἀποδέδωκεν. οἷον, εἰ μηδενὶ ὑπάρχει, ἢ εἰ μὴ κατὰ τοῦτο ἀληθεύεται, ἢ εἰ μή ἐστιν ἴδιον ἑκάστου αὐτῶν κατ᾽ ἐκεῖνο, οὗ τὸ ἴδιον ἀποδέδωκεν· οὐ γὰρ ἔσται ἴδιον, τὸ κείμενον εἶναι ἴδιον. οἷον, ἐπεὶ κατὰ τοῦ * γεωμέτρου οὐκ ἀληθεύεται τὸ ἀνεξαπάτητον εἶναι ὑπὸ λόγου· ἀπατᾶται γὰρ ὁ * γεωμέτρης ἐν τῷ ψευδογραφεῖσθαι· οὐκ ἂν εἴη τοῦτο, ἐπιστήμονος ἴδιον, τὸ μὴ ἀπατᾶσθαι ὑπὸ λόγου. κατασκευάζοντα δὲ, εἰ κατὰ C παντὸς ἀληθεύεται, καὶ κατὰ τοῦτ᾽ ἀληθεύεται· ἔσται γὰρ ἴδιον, τὸ κείμενον μὴ εἶναι ἴδιον. οἷον, ἐπεὶ τὸ ζῷον ἐπιστήμης δεκτικὸν, κατὰ παντὸς ἀνθρώπου ἀληθεύεται, καὶ ᾗ ἄνθρωπος, εἴη ἂν ἀνθρώπου ἴδιον τὸ ζῷον ἐπιστήμης δεκτικόν. Ἔστι δὲ ὁ τόπος οὗτος ἀνασκευάζοντι μὲν, εἰ μὴ καθ᾽ οὗ τοὔνομα, καὶ ὁ λόγος ἀληθεύεται· καὶ εἰ μὴ καθ᾽ οὗ ὁ λόγος, καὶ τοὔνομα. κατασκευάζοντι δὲ, εἰ καθ᾽ οὗ τοὔνομα, καὶ ὁ λόγος ἀληθεύεται· καὶ εἰ καθ᾽ οὗ ὁ λόγος, καὶ τοὔνομα κατηγορεῖται. 3 Ἔπειτα, ἀνασκευάζοντα μὲν, εἰ μὴ καθ᾽ οὗ ὁ λόγος, καὶ τοὔνομα ἀληθεύεται· καὶ εἰ μὴ καθ᾽ οὗ τοὔνομα, καὶ ὁ λόγος. * οὐ γὰρ ἔσται ἴδιον, τὸ κείμενον ἴδιον εἶναι. οἷον, ἐπεὶ τὸ μὲν ζῷον ἐπιστήμης * δεκτικὸν ἀληθεύεται κατὰ τοῦ θεοῦ, ὁ δὲ ἄνθρωπος οὐ κατηγορεῖται, οὐκ ἂν εἴη * τοῦ ἀνθρώπου ἴδιον, τὸ ζῷον ἐπιστήμης * δεκτικόν.

CAP. III.

* γεωμετρικοῦ
* γεωμετρικός
* κεῖσθαι. al. ἀληθεύεται.
* [illegible]
* quidam τῷ θεῷ
* [illegible]

κατασκευάζοντα δὲ, εἰ καθ' οὗ ὁ λόγος, καὶ τοὔνομα κατηγορεῖται· καὶ καθ' οὗ τοὔνομα, καὶ ὁ λόγος κατηγορεῖται. ἔσται γὰρ ἴδιον, τὸ κείμενον μὴ εἶναι ἴδιον. οἷον, ἐπεὶ καθ' οὗ τὸ ψυχὴν ἔχειν, τὸ ζῷον ἀληθεύεται, καὶ καθ' οὗ τὸ ζῷον, τὸ ψυχὴν ἔχειν· εἴη ἂν τὸ ψυχὴν ἔχειν, τοῦ ζῴου ἴδιον. 4 Ἔπειτ' ἀνασκευάζοντα μὲν, εἰ τὸ ὑποκείμενον, ἴδιον ἀποδέδωκε τοῦ ἐν τῷ ὑποκειμένῳ λεγομένου. οὐ γὰρ ἔσται ἴδιον, τὸ κείμενον ἴδιον εἶναι. οἷον, ἐπεὶ ὁ ἀποδοὺς ἴδιον τοῦ λεπτομερεστάτου σώματος, τὸ πῦρ, τὸ ὑποκείμενον ἀποδέδωκε* τοῦ κατηγορουμένου ἴδιον· οὐκ ἂν εἴη τὸ πῦρ, σώματος τοῦ λεπτομερεστάτου ἴδιον. διὰ τοῦτο δ' οὐκ ἔσται τὸ ὑποκείμενον, τοῦ ἐν τῷ ὑποκειμένῳ λεγομένου ἴδιον, διότι τὸ αὐτὸ τῶν πλειόνων ἔσται καὶ διαφόρων τῷ εἴδει ἴδιον. τῷ γὰρ αὐτῷ πλείω τινὰ διάφορα τῷ εἴδει ὑπάρχει κατὰ μόνου λεγόμενα, ὧν ἔσται πάντων ἴδιον τὸ ὑποκείμενον, ἐάν τις οὕτω τιθῆται τὸ ἴδιον. κατασκευάζοντα δὲ, εἰ τὸ ἐν τῷ ὑποκειμένῳ* ἀπέδωκεν ἴδιον τοῦ ὑποκειμένου. ἔσται γὰρ ἴδιον τὸ κείμενον μὴ εἶναι ἴδιον, ἐὰν κατὰ μόνου κατηγορῆται, * οὗ εἴρηται τὸ ἴδιον. οἷον, ἐπεὶ ὁ εἴπας γῆς ἴδιον, σῶμα τὸ βαρύτατον τῷ εἴδει, τοῦ ὑποκειμένου ἀπέδωκε τὸ ἴδιον κατὰ μόνου λεγόμενον τοῦ πράγματος, καὶ ὡς τὸ ἴδιον κατηγορεῖται· εἴη ἂν τὸ τῆς γῆς ἴδιον, ὀρθῶς κείμενον. 4 Ἔπειτα, ἀνασκευάζοντα μὲν, εἰ κατὰ μέθεξιν ἀποδέδωκε τὸ ἴδιον· οὐ γὰρ ἔσται ἴδιον, τὸ κείμενον εἶναι ἴδιον. τὸ γὰρ κατὰ μέθεξιν ὑπάρχον, εἰς τὸ τί ἦν εἶναι συμβάλλεται· εἴη δ' ἂν τὸ τοιοῦτο, διαφορά τις κατά τινος εἴδους λεγομένη. οἷον, ἐπεὶ ὁ εἴπας ἀνθρώπου ἴδιον τὸ πεζὸν δίπουν, κατὰ μέθεξιν ἀπέδωκε τὸ ἴδιον· οὐκ ἂν εἴη ἀνθρώπου ἴδιον, τὸ πεζὸν δίπουν. κατασκευάζοντα δὲ εἰ μὴ κατὰ μέθεξιν ἀπέδωκε τὸ ἴδιον, μήτε τὸ τί ἦν εἶναι δηλοῦν, ἀντικατηγορουμένου τοῦ πράγματος· ἔσται γὰρ ἴδιον, τὸ κείμενον μὴ εἶναι ἴδιον. οἷον, ἐπεὶ ὁ θεὶς ζῴου ἴδιον, τὸ αἰσθάνεσθαι πεφυκὸς, οὔτε κατὰ μέθεξιν ἀπέδωκεν ἴδιον, οὔτε τὸ τί ἦν εἶναι δηλοῦν, ἀντικατηγορουμένου τοῦ πράγματος, εἴη ἂν ζῴου ἴδιον, τὸ αἰσθάνεσθαι πεφυκός. 6 Ἔπειτα ἀνασκευάζοντα μὲν, εἰ μὴ ἐνδέχεται* ἅμα ὑπάρχειν τὸ ἴδιον, ἀλλ' ἢ ὕστερον, ἢ πρότερον, ἢ οὗ τὸ ὄνομα. οὐ γὰρ ἔσται ἴδιον τὸ κείμενον εἶναι ἴδιον, ἢ οὐδέποτε, ἢ οὐκ ἀεί. οἷον, ἐπεὶ ἐνδέχεται * καὶ πρότερον καὶ ὕστερον ὑπάρξαι τινὶ, τὸ βαδίζειν διὰ τῆς ἀγορᾶς, ἢ τὸν ἄνθρωπον· οὐκ ἂν εἴη τὸ βαδίζειν διὰ τῆς ἀγορᾶς, ἴδιον ἀνθρώπου, ἢ οὐδέποτε, ἢ οὐκ ἀεί. κατασκευάζοντα δὲ, εἰ ἅμα ἐξ ἀνάγκης ἀεὶ ὑπάρχει, μήτε ὅρος ὢν, μήτε διαφορά. ἔσται γὰρ ἴδιον, τὸ κείμενον μὴ εἶναι ἴδιον. οἷον, ἐπεὶ τὸ ζῷον ἐπιστήμης δεκτικὸν, ἅμα ἐξ ἀνάγκης ἀεὶ ὑπάρχει καὶ ἄνθρωπος, οὔτε διαφορὰ ὂν, οὔθ' ὅρος· εἴη ἂν τὸ ζῷον ἐπιστήμης δεκτικὸν, τοῦ ἀνθρώπου ἴδιον. 7 Ἔπειτ' ἀνασκευάζοντα μὲν, εἰ τῶν αὐτῶν, ᾗ ταὐτά ἐστι, μή ἐστι τὸ αὐτὸ ἴδιον. οὐ γὰρ ἔσται ἴδιον τὸ κείμενον εἶναι ἴδιον. οἷον ἐπεὶ οὐκ ἔστι διωκτοῦ, τὸ φαίνεσθαί τισιν ἀγαθὸν, ἴδιον· οὐδ' ἂν αἱρετοῦ εἴη ἴδιον, τὸ φαίνεσθαί τισιν ἀγαθόν. ταὐτὸ γάρ ἐστι τὸ διωκτὸν καὶ τὸ αἱρετόν. κατασκευάζοντα δὲ, εἰ τοῦ αὐτοῦ, ᾗ ταὐτόν ἐστι, τὸ αὐτὸ ἴδιον. ἔσται γὰρ ἴδιον, τὸ κείμενον μὴ εἶναι ἴδιον.

* γρ. κατηγορουμένου
* γρ. ἀποδέδωκεν
* γρ. αὐτοῦ.
* γρ. ἅμα μὴ ὑπ.
* γρ. οὐδ' ὅλως ἀεί.
Legit Gruchius, καὶ πρ. τινὶ ὑπάρξαι τὸ ἀνθρώπῳ, ἢ ὕστερον τὸ βαδ. δ.

A Confirmatur autem, ſi de quo oratio, *de eo* nomen quoque dicitur: &, ſi de quo nomen, etiam oratio: quod. n. poſitum eſt non eſſe proprium, erit proprium. velvti, quia de quo animam habere, *de eo etiam* animal verè dicitur: & de quo animal, *de eo etiam* habere animam: certè habere animam, eſt animalis proprium. 4 Præterea reprehenditur, ſi ſubiectum *quaſi* proprium eius tradidit, quod dicitur *eſſe* in ſubiecto. quod.n. poſitum eſt proprium, non erit proprium. velvti, qui tradidit proprium corporis ſubtiliſſimis partibus conſtantis *eſſe* ignẽ, quia ſubiectum tradidit *quaſi* attributi proprium: certè ignis nõ erit proprium corporis ſubtiliſſimis B partibus cõſtantis. Idcirco autem ſubiectum non erit propriũ eius quod dicitur *eſſe* in ſubiecto: quia idem eſſet plurium & differentium ſpecie proprium: quandoquidem eidem *ſubiecto* plura quædã ſpecie differentia inſunt, quæ de *eo* ſolo dicuntur: quorum omnium proprium erit illud ſubiectum, ſi quis ita proprium ponat. Confirmatur autem, ſi id quod eſt in ſubiecto, ſtatuit *eſſe* proprium ſubiecti. quod.n. poſitum non eſſe proprium, erit proprium, dummodo *ei* ſoli attribuatur, cuius dictum eſt *eſſe* proprium. velvti, qui dixit terræ proprium *eſſe* corpus grauiſſimũ ſpecie, quia ſubiecti proprium tradidit, quod de ſola *ea* re dicitur, & vt proprium attribuitur: *ideo* terræ proprium rectè C poſitum eſt. 5 Præterea reprehẽditur, ſi per participationem tradidit proprium. quod.n. poſitum eſt eſſe proprium, non erit proprium. quod.n. per participationem ineſt, ad *rei* quidditatem pertinet: quod autem eſt eiuſmodi, differẽtia quædam eſt, quæ de ſpecie dicitur. velvti, quoniam is qui dixit hominis propriũ *eſſe* pedeſtre bipes, per participationem tradidit proprium: certè pedeſtre bipes, non erit hominis proprium. Confirmatur autem, ſi nõ per participationem tradidit proprium, nec quod *rei* quidditatem declarat, cùm res ei viciſſim attribuatur. erit.n. proprium, quod poſitum eſt non eſſe proprium. velvti, quoniam is qui poſuit animalis proprium, naturalẽ vim habere ſen- D tiẽdi, nec per participationem tradidit proprium, nec quod *rei* quidditatem declarat, cùm res de eo viciſſim dicatur: certè erit animalis proprium, naturalẽ vim habere ſentiendi. 6 Deinde refellitur, ſi non contingit ſimul ineſſe proprium, ſed vel poſterius, vel prius *eſt*, quã *id* cuius eſt nomẽ. quod.n. poſitum eſt eſſe proprium, aut numquam aut non ſemper erit proprium. velvti, quoniam accidit, vt cuipiam & prius & poſterius inſit deambulatio in foro, quàm homo *ſit*: certè deambulare in foro aut numquam aut nõ ſemper erit proprium hominis. Cõfirmatur autem, ſi ſimul neceſſariò ſemper eſt, cùm neque ſit definitio, neque differentia. quod E enim poſitum eſt non eſſe proprium, erit propriũ. velvti, quoniam animal ſcientiæ capax, neceſſariò ſemper eſt vnà cũ homine, cùm nec ſit differentia, nec definitio: certè animal ſcientiæ capax, erit hominis proprium. 7 Deinde refellitur, ſi earumdem rerum, quã ſunt eædem, non ſit idem proprium. quod.n. poſitum eſt eſſe proprium, non erit proprium. vt quia eius quod eſt perſequendũ, non eſt proprium, videri quibuſdam bonũ: ne eius quidem quod eſt eligẽdum, proprium erit videri quibuſdã bonum. quod.n. eſt perſequẽdum, & quod eligẽdum, idem ſunt. Confirmatur autem, ſi eiuſdem rei, quã eſt eadem, *eſt* idem proprium. quod enim poſitum eſt non eſſe proprium, erit propriũ.

A velvti, quoniam hominis quâ homo eſt, proprium dicitur, tripertitã animam habere: etiam mortalis quâ eſt mortalis, proprium erit, habere animã tripertitam. *Eſt* autem vtilis hic locus etiam in accidente. iiſdem.n. rebus, quâ eædem ſunt, eadem ineſſe oportet, aut non ineſſe. 8 Deinde refellitur, ſi eorum quæ *ſunt* eiuſdem ſpeciei, nõ ſemper ſpecie idẽ eſt proprium: quia nec rei propoſitæ *id* erit proprium, quod poſitum eſt eſſe proprium. velvti, quia eiuſdẽ ſpeciei ſunt homo & equus, non ſemper autẽ equi proprium eſt, à ſe ſtare: ne hominis quidem proprium ſemper erit, à ſe moueri. idem namque ſpecie ſunt, moueri & ſtare à ſemetipſo: quoniam vtrique eorum quâ eſt animal, accidunt. B Confirmatur autem, ſi eorum quæ ſunt eiuſdem ſpeciei, idem ſemper ſpecie proprium *eſt*. quod.n. poſitũ eſt non eſſe proprium, erit proprium. velvti, quia hominis eſt proprium, eſſe pedeſtre bipes: etiam auis proprium erit, eſſe alatum bipes. horũ enim vtrumque eſt idem ſpecie: quâ alia ſunt vt ſpecies ſub eodem genere, *nempe* ſub animali: alia, vt *eius* generis, *id eſt* animalis differentiæ. Hic autem locus falſus eſt, quando alterum eorum quæ dicta ſunt, vni tantùm ſpeciei ineſt: alterum verò multis, vt pedeſtre quadrupes. 9 Quoniam autẽ idem & diuerſum multis modis dicuntur: difficile eſt, ſi quis *hæc* ſophiſticè accipiat, vnius & ſolius alicuius *rei* proprium afferre. quod.n. ineſt alicui, cui quidpiam accidit, etiam accidenti illi inerit C *ſumpto vnà* cum eo cui accidit. velvti, quod ineſt homini, etiam albo homini inerit, ſi ſit albus homo: & quod albô homini ineſt, etiam homini inerit. Calumniari autem aliquis poteſt huiuſcemodi propria, ſi conſtituat aliud eſſe ſubiectum per ſe, aliud cum accidente: verbi gratiâ, ſi dicat aliud eſſe hominem, aliud eſſe album hominem. Præterea, ſi conſtituat aliud eſſe habitum, & id quod ex habitu nominatur. quod enim in habitu ineſt, in eo quoque inerit quod ex habitu nominatur. & quod in eo quod ex habitu nominatur, ineſt, etiam in habitu inerit. velvti, quia ſciens ſecundùm ſcientiam dicitur eſſe affectus: non erit ſcientiæ proprium, ratione mutari non poſſe, quia & D ſciens ratione mutari nequit. In confirmatione autem dicendum *eſt*, non eſſe aliud ſimpliciter, id cui accidit, & accidens ſumptum cum eo cui accidit: ſed *ob eam cauſam* aliud dici, quia diuerſa eſt eorum eſſentia. non enim idem eſt, hominem eſſe hominem, & album hominem eſſe hominem album. Præterea ſpectandi ſunt caſus; dicendúmque nec ſcientem eſſe quod ratione mutari non poteſt, ſed qui mutari non poteſt ratione: nec ſcientiam, quod ratione mutari nequit, ſed quæ mutari nequit ratione. Nam ei qui omni modo obijcit, omni modo occurrendum *eſt*.

A οἷον, ἐπεὶ ἀνθρώπου, ᾗ ἄνθρωπός ἐστι, λέγεται ἴδιον, τὸ τριμερῆ ψυχὴν ἔχειν· καὶ βροτοῦ ᾗ βροτός ἐστιν, εἴη ἂν ἴδιον, τὸ τριμερῆ ψυχὴν ἔχειν. Χρήσιμος δ' ὁ τόπος οὗτος καὶ ἐπὶ τοῦ συμβεβηκότος. οἷς γὰρ αὐτοῖς, ᾗ ταὐτά ἐστι, ταὐτὰ * δεῖ ὑπάρχειν, ἢ μὴ ὑπάρχειν. [* κ. δεῖν] 8 Ἔπειτα, ἀνασκευάζοντα μὲν, εἰ τῶν αὐτῶν τῷ εἴδει, μὴ ταὐτὸν ἀεὶ τῷ εἴδει τὸ ἴδιόν ἐστιν· οὐδὲ γὰρ τοῦ εἰρημένου ἔσται ἴδιον, τὸ κείμενον εἶναι ἴδιον. οἷον, ἐπεὶ ταὐτόν ἐστι τῷ εἴδει ἄνθρωπος καὶ ἵππος, οὐκ ἀεὶ δὲ τοῦ ἵππου ἐστὶν ἴδιον τὸ ἑστάναι ὑφ' ἑαυτοῦ· οὐδ' ἂν εἴη τοῦ ἀνθρώπου ἴδιον ἀεὶ, τὸ κινεῖσθαι ὑφ' ἑαυτοῦ. ταὐτὸν γάρ ἐστι τῷ εἴδει, τὸ κινεῖσθαι, καὶ τὸ ἑστάναι ὑφ' ἑαυτοῦ, ᾗ * ζῷόν ἐστιν ἑκατέρῳ αὐτῶν * τῷ συμβεβηκέναι. [* κ. ζῷον ἐστὶ] [* κ. τὸ συμβ.] B κατασκευάζοντα δὲ, εἰ τῶν αὐτῶν τῷ εἴδει ταὐτὸν ἀεὶ τῷ εἴδει τὸ ἴδιον· ἔσται γὰρ ἴδιον, τὸ κείμενον μὴ εἶναι ἴδιον. οἷον, ἐπεὶ ἀνθρώπου ἐστὶν ἴδιον, τὸ εἶναι πεζὸν δίπουν, καὶ ὄρνιθος ἂν εἴη ἴδιον, τὸ εἶναι πτηνὸν δίπουν. ἑκάτερον γὰρ τούτων ἐστὶ ταὐτὸν τῷ εἴδει, ᾗ τὰ μὲν, ὡς ὑπὸ τὸ αὐτὸ γένος ἐστὶν εἴδη, ὑπὸ τὸ ζῷον ὄντα· τὰ δὲ, ὡς γένους διαφοραὶ τοῦ ζῴου. οὗτος δὲ ὁ τόπος ψευδής ἐστιν, ὅταν τὸ μὲν ἕτερον τῶν λεχθέντων, ἑνί τινι μόνῳ ὑπάρχῃ εἴδει, τὸ δὲ ἕτερον, πολλοῖς, καθάπερ τὸ πεζὸν τετράπουν. 9 Ἐπεὶ δὲ τὸ ταὐτὸν καὶ τὸ ἕτερον, πολλαχῶς λέγεται, ἔργον ἐστὶ, σοφιστικῶς λαμβάνοντι, ἑνὸς ἀποδοῦναι καὶ μόνου τινὸς τὸ ἴδιον. τὸ γὰρ ὑπάρχον τινὶ ᾧ συμβέβηκέ τι, καὶ τῷ συμβεβηκότι ὑπάρξει, λαμβανομένῳ μετὰ C τοῦ ᾧ συμβέβηκεν. οἷον, τὸ ὑπάρχον ἀνθρώπῳ, καὶ λευκῷ ἀνθρώπῳ ὑπάρξει, ἂν ᾖ λευκὸς ἄνθρωπος. καὶ τὸ λευκῷ δὲ ἀνθρώπῳ ὑπάρχον, καὶ ἀνθρώπῳ ὑπάρξει. διαβάλλοι δ' ἄν τις * τὰ τοιαῦτα τῶν ἰδίων, τὸ ὑποκείμενον, ἄλλο μὲν καθ' αὑτὸ ποιῶν, ἄλλο δὲ μετὰ τοῦ συμβεβηκότος. [* κ. τὰ πολλὰ] οἷον, ἄλλο μὲν ἄνθρωπον εἶναι λέγων, ἄλλο δὲ, λευκὸν ἄνθρωπον. ἔτι δὲ ἕτερον ποιῶν τὴν ἕξιν, καὶ τὸ κατὰ τὴν ἕξιν λεγόμενον. τὸ γὰρ τῇ ἕξει ὑπάρχον, καὶ τῷ κατὰ τὴν ἕξιν λεγομένῳ ὑπάρξει· καὶ τὸ τῷ κατὰ τὴν ἕξιν λεγομένῳ ὑπάρχον, καὶ τῇ ἕξει ὑπάρξει. οἷον, ἐπεὶ ὁ ἐπιστήμων κατὰ τὴν ἐπιστήμην λέγεται διακεῖσθαι, οὐκ ἂν εἴη τῆς ἐπιστήμης ἴδιον, τὸ ἀμετάπειστον D ὑπὸ λόγου. καὶ γὰρ ὁ ἐπιστήμων ἔσται ἀμετάπειστος ὑπὸ λόγου. κατασκευάζοντα δὲ, ῥητέον, * ὅτι οὐκ ἔστιν ἕτερον ἁπλῶς, τὸ ᾧ συμβέβηκε, καὶ τὸ συμβεβηκὸς μετὰ τοῦ ᾧ συμβέβηκε, λαμβανόμενον· ἀλλ' ἄλλο λέγεται, τὸ ἕτερον εἶναι αὐτοῖς τὸ εἶναι. οὐ ταὐτὸν γάρ ἐστιν, ἀνθρώπῳ τε τὸ εἶναι ἀνθρώπῳ, καὶ λευκῷ ἀνθρώπῳ τὸ εἶναι ἀνθρώπῳ λευκῷ. [* κ. ὡς ἐν] Ἔτι δὲ θεωρητέον ἐστὶ παρὰ τὰς πτώσεις, λέγοντα διότι οὔτε ὁ ἐπιστήμων, * ἐστὶ τὸ ἀμετάπειστον ὑπὸ λόγου, ἀλλ' ὁ ἀμετάπειστος ὑπὸ λόγου· οὔτε ἡ ἐπιστήμη τὸ ἀμετάπειστον ὑπὸ λόγου, ἀλλ' ἡ ἀμετάπειστος ὑπὸ λόγου. πρὸς γὰρ τὸν πάντως ἐνιστάμενον, * πάντως ἀντιτακτέον ἐστίν. [* κ. ἴσως] [* κ. πάντα]

Alij loci. Cap. V.

1 De eo quod naturâ ineſt. 2 De eo quod eſt per ſe, vel per aliud. 3 ſi explicatum non fuerit quomodo proprium ponatur. 13 ſi quid dicatur eſſe ſui ipſius proprium, vel non ſui ipſius, ſed alterius rei cum qua reciprocatur. 14 De iis quæ ex ſimilibus partibus conſtant.

E Deinde refellitur, ſi volens id tradere quod naturâ ineſt, eiuſmodi oratione *id* ponat, vt ſignificet id quod ſemper ineſt. *ſic* enim videbitur tolli, quod poſitum eſt eſſe proprium. vt quoniam is qui dixit, bipes hominis eſſe proprium, vult quidem id tradere, quod naturâ ineſt,

E Ἔπειτα, ἀνασκευάζοντα μὲν, εἰ τὸ φύσει ὑπάρχον βουλόμενος ἀποδοῦναι, τοιοῦτον τὸν τρόπον τίθησι τῇ λέξει, ὥστε τὸ ἀεὶ ὑπάρχον σημαίνειν. δόξειε γὰρ ἂν κινεῖσθαι τὸ κείμενον εἶναι ἴδιον. οἷον, ἐπεὶ ὁ εἴπας ἀνθρώπου ἴδιον, τὸ δίπουν, βούλεται μὲν τὸ φύσει ὑπάρχον ἀποδιδόναι,

σημαίνει δὲ τῇ λέξει τὸ ἀεὶ ὑπάρχον· οὐκ ἂν εἴη ἀνθρώπου ἴδιον, τὸ δίπουν· οὐ γὰρ πᾶς ἄνθρωπός ἐστι δύο πόδας ἔχων. κατασκευάζοντα δὲ, εἰ βούλεται τὸ φύσει ὑπάρχον ἴδιον ἀποδιδόναι, καὶ τῇ λέξει τοῦτον τὸν τρόπον σημαίνει· οὐ γὰρ κινηθήσεται, κατὰ τοῦτο, τὸ ἴδιον. οἷον, ἐπεὶ ὁ ἀνθρώπου ἴδιον ἀποδιδοὺς, τὸ ζῷον ἐπιστήμης δεκτικὸν, καὶ βούλεται καὶ τῇ λέξει* σημαίνει τὸ φύσει ὑπάρχον ἴδιον· οὐκ ἂν* κινοῖτο κατὰ τοῦτο, ὡς οὐκ ἔστιν ἀνθρώπου ἴδιον, τὸ ζῷον ἐπιστήμης δεκτικόν. 2 Ἔπειτα λέγεται ὡς κατ' ἄλλο τι πρῶτον ἢ ὡς πρῶτον αὐτό, ἔργον ἐστὶν ἀποδοῦναι τῶν τοιούτων τὸ ἴδιον. ἐὰν μὲν γὰρ τοῦ κατ' ἄλλο τι ἴδιον ἀποδιδῷς, καὶ κατὰ τοῦ πρώτου ἀληθεύσεται· ἐὰν δὲ τοῦ πρώτου θῇς, καὶ τοῦ κατ' ἄλλο κατηγορηθήσεται. οἷον, ἐὰν μέν τις ἐπιφανείας ἴδιον ἀποδῷ τὸ κεχρῶσθαι, καὶ κατὰ τοῦ σώματος ἀληθεύσεται τὸ κεχρῶσθαι· ἐὰν δὲ σώματος, καὶ ἐπιφανείας κατηγορηθήσεται. ὥστε οὐ καθ' οὗ ὁ λόγος, καὶ τοὔνομα ἀληθεύσεται. 3 Συμβαίνει δ' ἐν ἐνίοις τῶν ἰδίων ὡς ἐπὶ τὸ πολὺ γίνεσθαί τινα ἁμαρτίαν παρὰ τὸ μὴ διορίζεσθαι, πῶς, καὶ τίνων τίθησι τὸ ἴδιον. 4 Ἅπαντες γὰρ ἐπιχειροῦσιν ἀποδιδόναι τὸ ἴδιον, ἢ τὸ φύσει ὑπάρχον, καθάπερ ἀνθρώπου τὸ δίπουν· ἢ τὸ ὑπάρχον, καθάπερ ἀνθρώπου τινὸς τὸ τέτταρας δακτύλους ἔχειν· ἢ εἴδει, καθάπερ πυρὸς, τὸ λεπτομερέστατον· ἢ ἁπλῶς, καθάπερ ζῴου, τὸ ζῆν· ἢ κατ' ἄλλο, καθάπερ ψυχῆς, τὸ φρόνιμον· ἢ ὡς τὸ πρῶτον, καθάπερ λογιστικοῦ, τὸ φρόνιμον· ἢ * ὡς τὸ ἔχειν, καθάπερ ἐπιστήμονος τὸ ἀμετάπειστον ὑπὸ λόγου (οὐδὲν γὰρ ἕτερον, ἢ * τὸ ἔχειν τι, ἔσται ἀμετάπειστον ὑπὸ λόγου) ἢ τῷ ἔχεσθαι, καθάπερ ἐπιστήμης τὸ ἀμετάπειστον ὑπὸ λόγου· ἢ τῷ μετέχεσθαι, καθάπερ ζῴου τὸ αἰσθάνεσθαι (αἰσθάνεται μὲν γὰρ καὶ ἄλλο τι, οἷον ἄνθρωπος· ἀλλὰ μετέχων ἤδη τούτου, αἰσθάνεται) ἢ τῷ μετέχειν, καθάπερ τοῦ τινὸς ζῴου τὸ ζῆν. 5 Μὴ προσθεὶς μὲν οὖν τὸ φύσει, ἁμαρτάνει· διότι ἐνδέχεται τὸ φύσει ὑπάρχον, μὴ ὑπάρχειν ἐκείνῳ ᾧ φύσει ὑπάρχει· καθάπερ ἀνθρώπῳ τὸ δύο πόδας ἔχειν. 6 Μὴ διείπας δ' ὅτι τὸ ὑπάρχον ἀποδίδωσιν· ὅτι οὐκ ἔσται τοιοῦτον, οἷον νῦν ὑπάρχει ἐκείνῳ· καθάπερ τὸ τέτταρας δακτύλους ἔχειν τὸν ἄνθρωπον. 7 Μὴ δηλώσας δὲ διότι ὡς πρῶτον, ἢ ὡς κατ' ἄλλο τίθησιν· ὅτι οὐ καθ' οὗ ὁ λόγος, καὶ τοὔνομα ἀληθεύσεται· καθάπερ τὸ κεχρῶσθαι, εἴτε τῆς ἐπιφανείας, εἴτε τοῦ σώματος * ἀποδοθείη ἴδιον. 8 Μὴ προειπὼν δὲ, διότι ἢ τῷ ἔχειν, ἢ τῷ ἔχεσθαι, τὸ ἴδιον ἀποδέδωκε· διότι οὐκ ἔσται ἴδιον τὸ ἀποδοθέν. ὑπάρξει γὰρ, ἐὰν μὲν τῷ ἐχομένῳ ἀποδιδῷ τὸ ἴδιον, καὶ τῷ ἔχοντι· ἐὰν δὲ τῷ ἔχοντι, καὶ τῷ ἐχομένῳ· καθάπερ τὸ ἀμετάπειστον ὑπὸ λόγου, τῆς ἐπιστήμης, ἢ τοῦ ἐπιστήμονος τεθὲν ἴδιον. 9 Μὴ * προσημήνας δὲ τῷ μετέχειν, ἢ τῷ μετέχεσθαι, ὅτι καὶ ἄλλοις τισὶν ὑπάρξει τὸ ἴδιον. ἐὰν μὲν γὰρ τῷ μετέχεσθαι, ἀποδῷ τοῖς μετέχουσιν· ἐὰν δὲ τῷ μετέχειν, τοῖς μετεχομένοις· καθάπερ εἰ τοῦ τινὸς ζῴου, ἢ τοῦ ζῴου τεθείη τὸ ζῆν, ἴδιον. 10 Μὴ διαστείλας δὲ τῷ εἴδει, ὅτι ἑνὶ μόνῳ ὑπάρξει τῶν ὑπὸ τοῦτο ὄντων, οὗ τὸ ἴδιον τίθησι. τὸ γὰρ καθ' ὑπερβολὴν, ἑνὶ μόνῳ ὑπάρχει· καθάπερ τοῦ πυρὸς τὸ κουφότατον. 11 Ἐνίοτε δὲ καὶ τὸ τῷ εἴδει προσθεὶς, [illegible] δεῖ γὰρ ἓν εἶδος εἶναι τῶν λεχθέντων, ὅταν τι τῷ εἴ[illegible]ῇ.

* γ. σημαίνοι
* γ. κινεῖτο
* γ. τῷ ἔχειν
* γ. τῷ ἔχ.
* γ. ἀποδοθῇ
* γ. προσημειώσας

A ſed oratione ſignificat quod ſemper ineſt: certè bipes nõ erit hominis proprium: ſiquidẽ non omnis homo habet duos pedes. Cõfirmatur autem, ſi velit propriũ quod naturâ ineſt, tradere, & oratione hunc modum ſignificet. non .n. per hũc *locum* tolletur proprium. velvti, quoniam is qui proprium hominis tradidit, animal ſcientiæ capax, & *tradere* vult, & oratione ſignificat proprium quod naturâ ineſt: non tolletur hac ratione, quaſi non ſit proprium hominis, animal ſciẽtiæ capax. 2 Propterea quæ dicuntur per aliud primum, vel vt ipſum primum, difficile eſt eorum proprium tradere. ſi .n. proprium tradas eius quod *eſt* per aliud, etiam de primo verè dicetur. at ſi primi *proprium* ponas, ei B quoque attribuetur, quod *eſt* per aliud. velvti, ſi quis ſuperficiei proprium ſtatuat coloratum eſſe, etiam de corpore verè dicetur eſſe coloratum. at ſi corporis, etiam ſuperficiei verè attribuetur. quocirca de quo oratio, non etiam nomen verè dicetur. 3 Accidit autem in quibuſdam propriis peccatum quoddam admitti, propterea quòd nõ definiunt, quomodo, & quorum proprium ponant. 4 Omnes .n. proprium tradere nituntur, vel quod naturâ ineſt, vt hominis, *eſſe* bipedem: vel quod ineſt, vt cuiuſdam hominis, habere quatuor digitos: vel ſpecie, vt ignis, tenuiſſimis partibus conſtare: vel ſimpliciter, vt animalis, viuere: vel per aliud, vt C animæ, prudẽtiâ eſſe præditum: vel vt primum, vt rationalis *facultatis*, prudẽtiâ eſſe præditum: vel quia habet, vt ſcientis, ratione diſſuaderi non poſſe: (nihil .n. aliud erit, ratione diſſuaderi non poſſe, quàm aliquid habere) vel quia habetur, vt ſcientiæ, ratione mutari nõ poſſe: vel quia communicatur, vt animalis, ſentire: (ſentit .n. & aliud quidpiam, vt homo: ſed cũ ſit huius particeps, ſentit) vel quia eſt particeps, vt cuiuſdã animalis, viuere. 5 Qui igitur nõ adiunxit *hoc verbum* NATVRA, peccat: quia contingit, vt quod naturâ ineſt, non inſit ei, cui naturâ ineſt: vt homini, duos pedes habere. 6 Qui verò nõ expoſuit ſe tradere quod ineſt, *ideo peccat*, quia res *quãdoque* non erit talis, qualis nunc eſt: vt D hominem habere quatuor digitos. 7 *Peccat etiã*, qui non declarat ſe ponere vt primum, vel vt per aliud: quia de quo oratio, non etiã nomen verè dicetur: vt coloratũ eſſe, ſiue ſuperficiei, ſiue corporis proprium *eſſe* ſtatuatur. 8 Qui verò non prædixit, ſe, vel quia *res* habet, vel quia habetur, proprium tradere: *ideo peccat*; quia quod traditum eſt, non erit proprium. nã ſi proprium tribuat ei quod habetur, inerit etiam habenti. ſin autem *tribuat* habenti, *inerit* etiam ei quod habetur: vt ratione immutabile eſſe, *ſiue* ſcientiæ, ſiue ſcientis proprium ponatur. 9 Qui verò antè non ſignificat *ſe propriũ dare*, quia *res* eſt particeps, vel quia cõmunicatur, E *ideo peccat*, quia & quibuſdã aliis proprium inerit. ſi enim *proprium* tradiderit, quia cõmunicatur, *inerit etiam* iis quæ participant. ſin quia eſt particeps, *inerit etiam* iis quæ communicantur: velvti, ſi viuere ponatur *eſſe* proprium cuiuſdam animalis, vel animalis. 10 *Peccat etiam*, qui non diſtinctè explicat *ſe dare proprium* ſpecie: quoniam inerit vni tantùm ex iis quæ ſub eo *collocantur*, cuius proprium ponit. quod enim in exſuperantia *conſiſtit*, vni tantùm ineſt. vt *ſi* ignis *proprium ſtatuatur eſſe* leuiſſimum. 11 Interdum autem & qui adiunxit *verbum* illud SPECIE, peccauit. oportebit enim vnam eſſe ſpeciem eorum quæ dicta ſunt *proprium recipere*, cùm *verbum* illud SPECIE adiunctum erit.

hoc autem in quibuſdam non contingit: quemadmodum nec in igne: quia nō eſt vna ſpecies ignis: quandoquidem ſpecie differunt pruna, & flāma, & lux, quorum vnumquodque eſt ignis. Idcirco autem non oportet, cùm *verbum illud* Specie adiúctum fuerit, aliam eſſe ſpeciem eius quod dictū eſt *ſuſcipere proprium*: quia dictū proprium aliis magis aliis minùs inerit. quale eſt ſubtiliſſimis partibus conſtare, *ſi proprium* ignis *ponatur*. ſubtilioribus enim partibus cōſtat lux, quàm pruna, & flamma. Quod fieri non oportet, niſi & nomen *ei* magis attribuatur, de quo oratio veriùs dicitur. alioquin non erit *verum*, de quo oratio magis *dicitur*, de eo etiam nomen magis *dici*. Præterea accidet idē eſſe propriū eius quod ſimpliciter *tale eſt*, & eius quod maximè eſt in ſimpliciter tali. quomodo, *ſi* in igne *ſpectatur, ſe* habet *hoc proprium*, tenuiſſimis conſtare partibus. nā hoc ipſum & lucis & ignis ſimpliciter proprium erit: tenuiſſimis .n. partibus lux conſtat. 12 Si igitur alius ita propriū tradiderit, argumentandum *eſt*. Is verò *qui proprium explicat*, non debet huic obiectioni *locum* dare, ſed ſtatim, dum ponit proprium, definire quomodo proprium ponat. 13 Deinde refellitur, ſi quid ſui ipſius propriū poſuit. non .n. erit *id* proprium, quod poſitum eſt eſſe proprium. quicquid .n. eſt idem atque res quæpiam, *eius* eſſentiam declarat: quod verò eſſentiam declarat, non eſt proprium, ſed definitio. velvti quoniam is qui dixit decorum eſſe honeſti proprium, idem ſui ipſius proprium ſtatuit; (idem .n. eſt honeſtum & decorum) certè decorum honeſti proprium non erit. Confirmatur autem, ſi non idē ſui ipſius proprium ſtatuit, id tamen poſuit, quod viciſſim attribuitur *& reciprocatur*. quod .n. poſitum eſt non eſſe proprium, erit proprium. velvti quoniam is qui poſuit animalis proprium *eſſe hoc*, Subſtantia animata, non idem ſui ipſius proprium *eſſe* poſuit, id tamē tradidit quod viciſſim attribuitur: certè ſubſtantia animata erit, proprium animalis. 14 Deinde, in iis quæ ex ſimilibus partibus conſtant, *hæc* ſunt conſideranda. Refellenti *videndum eſt*, an totius proprium, non verè dicatur de parte, vel an partis proprium non dicatur de toto. *ſic* .n. proprium non erit, quod poſitum eſt eſſe propriū. Hoc autem in quibuſdam fieri contingit: nam eorum quę ex ſimilibus partibus conſtant, proprium tradere aliquis poſſit, modò ad totum reſpiciens, modò eius quod in parte dicitur, rationem habēs. ſed neutrum rectè traditum erit. Exemplum totius *hoc eſto*: Quoniam is qui dixit maris proprium *eſſe hoc*, plurima aqua ſalſa, cuiuſdam *rei* ex ſimilibus partibus cōſtantis proprium poſuit: eiuſmodi autem tradidit*, quod non verè dicitur de parte: (quoddam .n. mare nō eſt plurima aqua ſalſa) certè non erit maris proprium plurima aqua ſalſa. *Exemplum* autem partis *hoc eſto*. velvti, quoniam is qui aëris proprium poſuit, *eſſe* reſpirabile, cuiuſdā *rei* ex ſimilibus partibus cōſtantis proprium dixit, ſed eiuſmodi, vt de quodam aëre verè dicatur, de toto non dicatur: (non .n. totus aër eſt reſpirabilis) certè non erit aëris proprium, *eſſe* reſpirabile. Confirmanti autem *videndum eſt*, an de vnoquoque eorum quæ ex ſimilibus partibus cōſtant, verè dicatur id quod eſt eorū proprium ratione totius. *ſic* .n. quod poſitum eſt non eſſe proprium, erit proprium. velvti, quia verè dicitur de vniuerſa terra, deorſum ferri naturâ, hócque eſt & alicuius terræ proprium ratione totius, nempe ratione terræ, & quia eſt terra: certè proprium erit terræ, deorſum ferri naturâ.

A τοῦτο δ' ἐπ' ἐνίων οὐ συμπίπτει, καθάπερ οὐδ' ἐπὶ τοῦ πυρός. οὐ γάρ ἐστιν ἓν εἶδος τοῦ πυρός. ἕτερον γάρ ἐστι τῷ εἴδει, ἄνθραξ, καὶ φλὸξ, καὶ φῶς, ἕκαστον αὐτῶν πῦρ ὄν. διὰ τοῦτο δ' οὐ δεῖ, ὅταν τῷ εἴδει προστεθῇ, ἕτερον εἶναι εἶδος τοῦ λεχθέντος· ὅτι τοῖς μὲν, μᾶλλον τοῖς δ', ἧττον ὑπάρξει τὸ λεχθὲν ἴδιον· καθάπερ ἐπὶ τοῦ πυρὸς τὸ λεπτομερέστατον· λεπτομερέστερον γάρ ἐστι τὸ φῶς τοῦ ἄνθρακος, καὶ τῆς φλογός. τοῦτο δ' οὐ δεῖ γίνεσθαι, ὅταν μὴ καὶ τὸ ὄνομα μᾶλλον κατηγορῆται, καθ' οὗ ὁ λόγος μᾶλλον ἀληθεύεται. εἰ δὲ μὴ, οὐκ ἔσται, καθ' οὗ ὁ λόγος μᾶλλον, καὶ τοὔνομα μᾶλλον. Ἔτι δὲ πρὸς τούτοις, B ταὐτὸν εἶναι συμβήσεται τὸ ἴδιον τοῦ τε ἁπλῶς καὶ τοῦ μάλιστα ὄντος ἐν τῷ ἁπλῶς τοιούτῳ· καθάπερ ἐπὶ τοῦ πυρὸς ἔχει τὸ λεπτομερέστατον. καὶ γὰρ τοῦ φωτὸς, καὶ τοῦ πυρὸς ἁπλῶς ἔσται ταὐτὸ τοῦτο ἴδιον· λεπτομερέστατον γάρ ἐστι τὸ φῶς. 12 Ἄλλου μὲν οὖν οὕτως ἀποδιδόντος τὸ ἴδιον, ἐπιχειρητέον. αὐτῷ δ' οὐ δοτέον ἐστὶ ταύτην τὴν ἔνστασιν· ἀλλ' εὐθὺς τιθέμενον τὸ ἴδιον, διοριστέον ὃν τρόπον τίθησι τὸ ἴδιον. 13 Ἔπειτα ἀνασκευάζοντα μὲν, εἰ αὐτὸ αὑτοῦ ἴδιον ἔθηκεν. οὐ γὰρ ἔσται ἴδιον, τὸ κείμενον εἶναι ἴδιον. αὐτὸ γὰρ αὑτῷ πᾶν, τὸ τί ἦν εἶναι δηλοῖ. τὸ δὲ τὸ τί ἦν εἶναι δηλοῦν, οὐκ ἴδιον, ἀλλ' ὅρος ἐστίν. οἷον, ἐπεὶ ὁ εἴπας τοῦ καλοῦ τὸ πρέπον ἴδιον εἶναι, αὐτὸ ἑαυτοῦ ἴδιον ἀπέδωκε· (ταὐτὸν γάρ ἐστι τὸ καλὸν καὶ τὸ πρέπον) οὐκ ἂν εἴη τὸ πρέπον τοῦ C καλοῦ ἴδιον. κατασκευάζοντα δὲ, εἰ μὴ αὐτὸ μὲν αὑτοῦ ἴδιον ἀπέδωκεν, ἀντικατηγορούμενον δ' ἔθηκεν. ἔσται γὰρ ἴδιον, τὸ κείμενον μὴ εἶναι ἴδιον. οἷον, ἐπεὶ ὁ θεὶς ζῴου ἴδιον τὸ, οὐσία ἔμψυχος, οὐκ αὐτὸ μὲν αὑτοῦ ἴδιον ἔθηκεν, ἀντικατηγορούμενον δ' ἀπέδωκεν, εἴη ἂν ἴδιον τοῦ ζῴου τὸ, οὐσία ἔμψυχος. 14 Ἔπειτα ἐπὶ τῶν ὁμοιομερῶν σκεπτέον ἐστὶν ἀνασκευάζοντα μὲν, εἰ τὸ τοῦ συνόλου ἴδιον μὴ ἀληθεύεται κατὰ τοῦ μέρους, ἢ εἰ τὸ τοῦ μέρους ἴδιον μὴ λέγεται κατὰ τοῦ σύμπαντος. οὐ γὰρ ἔσται ἴδιον, τὸ κείμενον ἴδιον εἶναι. συμβαίνει δ' ἐπ' ἐνίων τοῦτο γίνεσθαι. ἀποδοίη γὰρ ἄν τις ἐπὶ τῶν ὁμοιομερῶν ἴδιον, ἐνίοτε μὲν ἐπὶ τὸ σύμπαν βλέψας, ἐνίοτε δ' ἐπὶ τὸ κατὰ μέρος D λεγόμενον, αὐτὸς αὑτὸν ἐπιστήσας· ἔσται δ' οὐδέτερον ὀρθῶς ἀποδεδομένον. οἷον, ἐπὶ μὲν τοῦ σύμπαντος, ἐπεὶ ὁ εἴπας θαλάττης ἴδιον, τὸ πλεῖστον ὕδωρ ἁλμυρὸν, ὁμοιομεροῦς μέν τινος ἔθηκε τὸ ἴδιον * τοιοῦτον δ' ἀποδέδωκεν, ὃ οὐκ ἀληθεύεται κατὰ τοῦ μέρους (οὐ γάρ ἐστιν ἡ τὶς θάλαττα, τὸ πλεῖστον ὕδωρ ἁλμυρὸν) οὐκ ἂν εἴη τῆς θαλάττης ἴδιον, τὸ πλεῖστον ὕδωρ ἁλμυρόν. ἐπὶ δὲ τοῦ μέρους· οἷον, ἐπεὶ ὁ θεὶς ἀέρος ἴδιον, τὸ ἀναπνευστὸν, ὁμοιομεροῦς μέν τινος εἴρηκε τὸ ἴδιον, τοιοῦτον δ' ἀπέδωκεν, ὃ κατὰ τοῦ τινὸς ἀέρος ἀληθεύεται, κατὰ δὲ τοῦ σύμπαντος οὐ λέγεται (οὐ γάρ ἐστιν ὁ σύμπας ἀὴρ ἀναπνευστὸς) οὐκ ἂν εἴη τοῦ ἀέρος ἴδιον, τὸ ἀνα- E πνευστόν. κατασκευάζοντα δὲ, εἰ ἀληθεύεται μὲν καθ' ἑκάστου τῶν ὁμοιομερῶν, ὅ ἐστιν ἴδιον αὐτῶν κατὰ τὸ σύμπαν. ἔσται γὰρ ἴδιον τὸ κείμενον μὴ εἶναι ἴδιον. οἷον, ἐπεὶ ἀληθεύεται κατὰ πάσης τῆς γῆς τὸ κάτω φέρεσθαι κατὰ φύσιν. ἔστι δὲ ἴδιον τοῦτο καὶ τῆς τινὸς γῆς κατὰ τὸ σύμπαν (κατὰ γὰρ τὴν γῆν, καὶ τὸ γῆν εἶναι) εἴη ἂν τῆς γῆς ἴδιον, τὸ κάτω φέρεσθαι κατὰ φύσιν.

* χ. τ. δὲ ἀφ.

Loci ab oppoſitis. Cap. VI.

1 ¶ A contrariis. 3 ¶ A relatis. 5 A priuatione & habitu. 7 ¶ Ab affirmatione & negatione. Ab attributis. 8 Ab attributis & ſubiectis. 10 A ſubiectis. 12 Ab iis quæ ponuntur in eadem diuiſione.

CAP. VI. Ἔπειτα ἐκ τῶν ἀντικειμένων σκεπτέον ἐστί, πρῶτον μὲν, A ἐκ τῶν ἐναντίων· ἀνασκευάζοντα μὲν, εἰ τοῦ ἐναντίου μή ἐστι τὸ ἐναντίον, ἴδιον· οὐδὲ γὰρ τοῦ ἐναντίου ἔσται τὸ ἐναντίον, ἴδιον. οἷον, ἐπεὶ ἐναντίον ἐστὶ δικαιοσύνη μὲν ἀδικία, τῷ βελτίστῳ δὲ τὸ χείριστον, οὐκ ἔστι δὲ τῆς δικαιοσύνης τὸ βέλτιστον, ἴδιον· οὐκ ἂν εἴη τῆς ἀδικίας τὸ χείριστον, ἴδιον. 2 Κατασκευάζοντα δὲ, εἰ τοῦ ἐναντίου τὸ ἐναντίον ἐστὶν ἴδιον. * καὶ γὰρ τοῦ ἐναντίου τὸ ἐναντίον, ἴδιον ἔσται. οἷον, ἐπεὶ ἐναντίον ἐστὶν ἀγαθῷ μὲν κακὸν, αἱρετῷ δὲ φευκτὸν, ἔστι δὲ τοῦ ἀγαθοῦ ἴδιον τὸ αἱρετόν· εἴη ἂν κακοῦ ἴδιον τὸ φευκτόν. 3 Δεύτερον δ' ἐκ τῶν πρός τι· ἀνασκευάζοντα μὲν, εἰ τὸ πρός τι B τοῦ πρός τι μή ἐστιν ἴδιον· οὐδὲ τὸ πρός τι τοῦ πρός τι ἔσται ἴδιον. οἷον, ἐπεὶ λέγεται τὸ διπλάσιον μὲν πρὸς ἥμισυ, ὑπερέχον δὲ πρὸς τὸ ὑπερεχόμενον, οὐκ ἔστι δὲ τοῦ διπλασίου τὸ ὑπερέχον, ἴδιον· οὐκ ἂν εἴη τοῦ ἡμίσεος τὸ ὑπερεχόμενον, ἴδιον. 4 Κατασκευάζοντα δὲ, εἰ τοῦ πρός τι, τὸ πρός τι ἐστὶν ἴδιον. * καὶ τὸ πρός τι, τοῦ πρός τι ἔσται ἴδιον. οἷον, ἐπεὶ λέγεται τὸ μὲν διπλάσιον πρὸς τὸ ἥμισυ, * τὰ δὲ δύο πρὸς ἕν, ἔστι δὲ τοῦ διπλασίου ἴδιον τὸ ὡς δύο πρὸς ἕν· εἴη ἂν τοῦ ἡμίσεος ἴδιον τὸ ὡς ἓν πρὸς δύο. 5 Τρίτον δὲ ἀνασκευάζοντα μὲν, εἰ τῆς ἕξεως, τὸ καθ' ἕξιν λεγόμενον, μή ἐστιν ἴδιον· οὐδὲ γὰρ τῆς στερήσεως, τὸ κατὰ στέρησιν λεγόμενον, ἔσται ἴδιον. καὶ C εἰ τῆς στερήσεως, τὸ κατὰ στέρησιν λεγόμενον, μή ἐστιν ἴδιον· οὐδὲ τῆς ἕξεως, τὸ κατὰ τὴν ἕξιν λεγόμενον, ἔσται ἴδιον. οἷον, ἐπεὶ οὐ λέγεται τῆς κωφότητος ἴδιον, τὸ ἀναισθησίαν εἶναι· (καὶ γὰρ τῶν ἄλλων κοινόν) οὐδ' ἂν τῆς * ἀκοῆς εἴη ἴδιον τὸ αἴσθησιν εἶναι. 6 Κατασκευάζοντα δὲ, εἰ τὸ καθ' ἕξιν λεγόμενόν ἐστι τῆς ἕξεως ἴδιον· καὶ τῆς στερήσεως τὸ κατὰ στέρησιν λεγόμενον, ἔσται ἴδιον· καὶ εἰ τῆς στερήσεως, τὸ κατὰ στέρησιν λεγόμενον, ἐστὶν ἴδιον· καὶ τῆς ἕξεως, τὸ καθ' ἕξιν λεγόμενον, ἔσται ἴδιον. οἷον, ἐπεὶ τῆς ὄψεως ἐστὶν ἴδιον, τὸ βλέπειν, καθ' ὃ * ἔχομεν ὄψιν· εἴη ἂν τῆς τυφλότητος ἴδιον, τὸ μὴ βλέπειν, καθ' ὃ οὐκ ἔχομεν D ὄψιν, πεφυκότες ἔχειν. 7 Ἔπειτα ἐκ τῶν καταφάσεων, καὶ τῶν ἀποφάσεων, πρῶτον μὲν ἐξ αὐτῶν τῶν κατηγορουμένων. ἔστι δὲ ὁ τόπος οὗτος χρήσιμος ἀνασκευάζοντι μόνον. οἷον, εἰ ἡ φάσις, ἢ τὸ κατὰ τὴν φάσιν λεγόμενον αὐτοῦ ἴδιόν ἐστι· * οὐ γὰρ ἔσται αὐτοῦ ἡ ἀπόφασις, οὐδὲ τὸ κατὰ τὴν ἀπόφασιν λεγόμενον * ἴδιον. κἂν εἴη δὲ ἡ ἀπόφασις, ἢ τὸ κατὰ τὴν ἀπόφασιν λεγόμενον, ἴδιον αὐτοῦ· οὐκ ἔσται ἡ φάσις, οὐδὲ τὸ κατὰ τὴν φάσιν λεγόμενον, ἴδιον. οἷον, ἐπεὶ τοῦ ζῴου ἐστὶν ἴδιον * τὸ ἔμψυχον· οὐκ ἂν εἴη τοῦ ζῴου ἴδιον, τὸ οὐκ ἔμψυχον. 8 Δεύτερον δ' ἐκ τῶν κατηγορουμένων, ἢ μὴ κατηγορουμένων, καὶ E καθ' ὧν κατηγορεῖται, ἢ μὴ κατηγορεῖται· ἀνασκευάζοντα μὲν, εἰ ἡ φάσις τῆς φάσεως μή ἐστιν ἴδιον· οὐδὲ ἡ ἀπόφασις τῆς ἀποφάσεως ἔσται ἴδιον· καὶ εἰ ἡ ἀπόφασις τῆς ἀποφάσεως μή ἐστιν ἴδιον, οὐδ' ἡ φάσις τῆς φάσεως * ἔσται ἴδιον. οἷον, ἐπεὶ οὐκ ἔστι τοῦ ἀνθρώπου ἴδιον τὸ ζῷον, οὐδ' ἂν τοῦ μὴ ἀνθρώπου ἴδιον εἴη τὸ μὴ ζῷον. κἂν εἰ τοῦ μὴ ἀνθρώπου μὴ φαίνηται ἴδιον τὸ μὴ ζῷον,

(Margin notes: * γρ. [illegible] — * γρ. [illegible] — * γρ. [illegible] — * γρ. [illegible] — * γρ. [illegible] — * γρ. [illegible] — * γρ. [illegible] — * γρ. [illegible])

PRæterea ex oppoſitis conſiderandũ eſt, *ac* primùm ex contrariis. & reprehẽdenti quidem *videndum eſt*, an contrarium non ſit contrarij proprium: quia nec *alterius* contrarij erit proprium contrarium *alterum*. velvti, quia contrarium eſt iuſtitiæ iniuſtitia, & optimo deterrimum: quod autẽ eſt optimum, nõ eſt iuſtitiæ proprium: certè quod eſt deterrimum, non erit iniuſtitiæ proprium. 2 Confirmanti autem *videndum eſt*, an contrarij contrarium ſit proprium: nam & *alterius* contrarij *alterum* contrarium proprium erit. velvti, quia cõtrarium eſt bono malũ, & eligẽdo fugiendum: quod autem eſt eligẽdum, eſt boni propriũ: certè quod B eſt fugiendũ, erit mali proprium. 3 Secũdus *locus* eſt ex iis quæ ad aliquid *referuntur*. *ſic.n.* refellitur: Si *alterum* relatum *alterius* relati non eſt proprium, ne *hoc* quidem relatum *huius* relati erit proprium. velvti, quia refertur duplũ ad dimidium, & exſuperans ad exſuperatum: quod verò exſuperat, non eſt dupli propriũ: profectò quod exſuperatur, non erit dimidij proprium.* 4 *Sic* autem confirmatur: *Si alterius* relati *alterũ* relatum proprium ſit, etiam *huius* relati *hoc* relatum proprium erit. velvti, quia refertur duplũ ad dimidium, & duo ad vnum: eſt autem dupli proprium, *ita ſe habere* vt duo ad vnũ: profectò erit dimidij proprium, *ita ſe habere* vt vnũ C ad duo. 5 Tertius locus refutanti *eſt*, ſi id quod ſecundùm habitum dicitur, non ſit propriũ habitus: quia nec id quod ſecundùm priuationem dicitur, priuationis erit proprium. & ſi id quod dicitur ſecundùm priuationem, non ſit proprium priuationis: neque id quod dicitur ſecũdùm habitum, erit propriũ habitus. velvti, quia non dicitur ſurditatis proprium, vacuitatem eſſe ſenſus: (hoc.n.& aliorum commune eſt) ne auditus quidem proprium erit, ſenſum eſſe. 6 Confirmatur autem *hoc modo*: Si id quod dicitur ſecundùm habitum, eſt propriũ habitus: id quoque quod dicitur ſecundùm priuationẽ, erit proprium priuationis. velvti, quia pro- D prium aſpectus eſt cernere, quâ aſpectũ habemus: certè erit cæcitatis proprium, non cernere, quâ nõ habemus aſpectum, cùm naturâ apti ſimus ad habendum. 7 Deinde ex affirmationibus & negationibus *arguendum eſt*, ac primũ ex ipſis attributis. eſt autem hic locus vtilis refellenti dumtaxat. velvti, ſi affirmatio, aut quod ſecundùm affirmationẽ dicitur, ipſius *rei* proprium eſt: nõ enim proprium eius erit negatio, nec quod ſecũdùm negationẽ dicitur. & ſi negatio, vel quod ſecundùm negationem dicitur, eius proprium ſit: non erit affirmatio, nec quod ſecundùm affirmationem dicitur, *eius* proprium. velvti, quoniam animalis proprium eſt, E id quod *eſt* animatum: nõ erit animalis proprium, id quod non *eſt* animatum. 8 Secundus *locus eſt* ex iis quæ attribuuntur, vel non attribuũtur, & iis quibus attribuitur, vel non attribuitur. *& ſic* quidem refellitur: Si affirmatio affirmationis non eſt proprium, ne negatio quidem negationis erit proprium. & ſi negatio negationis non eſt proprium, ne affirmatio quidem affirmationis erit proprium. velvti, quoniam animal non eſt proprium hominis; ne eius quidem quod non *eſt* homo, proprium erit non animal. & ſi eius quod non eſt homo, non videatur proprium non animal;

ne hominis quidem proprium erit animal. 9 *Sic* autem confirmatur: Si affirmationis affirmatio ſit proprium, etiam negationis negatio erit propriũ. ſi verò negationis negatio ſit proprium, etiam affirmatio affirmationis erit proprium. velvti, quia non viuere, eſt proprium eius quod nõ *eſt* animal; etiã viuere, erit animalis proprium. quod ſi viuere videatur *eſſe* animalis proprium, etiam eius quod non *eſt* animal, videbitur proprium *eſſe* nõ viuere. 10 Tertius *locus eſt* ex ipſis ſubiectis. *Et* refellitur quidẽ *hoc modo*: Si datum proprium, affirmationis eſt proprium non erit idem etiam negationis proprium. ſin autem quod traditum eſt, negationis *ſit* proprium, non erit affirmationis proprium. velvti, quoniam animatum *eſt* proprium animalis; certè animatum non erit proprium nõ animalis. 11 *Sic* autem confirmatur: Si quod datum eſt, non ſit affirmationis proprium, erit vtique negationis. Sed hic locus eſt falſus. nam affirmatio negationis, & negatio affirmationis nõ eſt proprium. etenim affirmatio negationi ne quidẽ ineſt omnino: negatio verò affirmationi ineſt quidem; ſed nõ vt proprium, ineſt. 12 Deinde ex condiuidentibus, *id eſt ex iis quæ in eadem diuiſione ponũtur*, refellitur, ſi condiuidentium nullum ſit vllius reliquorum cõdiuidentium proprium. nam quod poſitum eſt, nõ erit huius proprium, cuius poſitum eſt *eſſe* proprium. velvti, quoniam animal ſenſibile, nullius aliorum mortalium animalium eſt proprium: certè animal intelligibile non erit Dei propriũ. 13 Confirmatur autem, ſi acceptum quodvis reliquorum condiuidentium ſit proprium, cùm vnicuique horum condiuidẽtium proprium ſit aliquod condiuidẽs. nam & reliquum erit reliqui proprium, cuius poſitum eſt non eſſe proprium. velvti, quia prudẽtiæ eſt proprium, per ſe & ſecundùm naturam ſuam rationalis *facultatis* virtutem eſſe, ſingulis quoque alis virtutibus ita acceptis, profectò erit temperantiæ proprium, per ſe & ſecundùm ſuam naturam, concupiſcibilis virtutem eſſe.

A οὐδὲ τοῦ ἀνθρώπου ἴδιον ἔσται τὸ ζῷον. 9 Κατασκευάζοντα δέ, εἰ τῆς φάσεως ἡ φάσις ἐστὶν ἴδιον, καὶ τῆς ἀποφάσεως * ἡ ἀπόφασις ἔσται ἴδιον. εἰ δὲ τῆς ἀποφάσεως ἡ ἀπόφασις ἐστὶν ἴδιον, καὶ ἡ φάσις τῆς φάσεως ἔσται ἴδιον. οἷον, ἐπεὶ τοῦ μὴ ζῴου ἐστὶν ἴδιον, τὸ μὴ ζῆν εἴη ἂν τοῦ ζῴου τὸ ζῆν ἴδιον. καὶ εἰ δὲ τοῦ ζῴου φαίνεται ἴδιον τὸ ζῆν, καὶ τοῦ μὴ ζῴου φανεῖται ἴδιον τὸ * μὴ ζῆν. 10 Τρίτον δέ, ἐξ αὐτῶν τῶν ὑποκειμένων ἀνασκευάζοντα μέν, εἰ τὸ ἀποδεδομένον ἴδιον, τῆς φάσεώς ἐστιν ἴδιον, οὐκ ἔσται τὸ αὐτὸ καὶ τῆς ἀποφάσεως ἴδιον. εἰ δὲ τῆς ἀποφάσεως ἴδιον τὸ ἀποδοθέν, οὐκ ἔσται τῆς B φάσεως ἴδιον. οἷον, ἐπεὶ τοῦ ζῴου ἴδιον τὸ ἔμψυχον, * οὐκ ἂν εἴη τοῦ μὴ ζῴου ἴδιον τὸ ἔμψυχον. 11 Κατασκευάζοντα δέ, εἰ τὸ ἀποδοθὲν μὴ τῆς φάσεως ἴδιον, εἴη ἂν τῆς ἀποφάσεως. ἔστι δ' ὁ τόπος οὗτος ψευδής. φάσις γὰρ ἀποφάσεως, καὶ ἀπόφασις φάσεως οὐκ ἔστιν ἴδιον. φάσις μὲν γὰρ ἀποφάσει * οὐδ' ὅλως ὑπάρχει. ἀπόφασις δὲ φάσει ὑπάρχει μέν, οὐχ ὡς ἴδιον δὲ ὑπάρχει. 12 Ἔπειτα δ' ἐκ τῶν ἀντιδιῃρημένων ἀνασκευάζοντα μέν, εἰ τῶν ἀντιδιῃρημένων μηδὲν μηδενὸς τῶν λοιπῶν ἀντιδιῃρημένων ἐστὶν ἴδιον. οὐδὲ γὰρ τὸ κείμενον, ἔσται ἴδιον τούτου οὗ κεῖται ἴδιον. οἷον, ἐπεὶ ζῷον αἰσθητόν, οὐδενὸς τῶν C ἄλλων θνητῶν ζῴων ἐστὶν ἴδιον· οὐκ ἂν εἴη τὸ ζῷον νοητόν, * τοῦ θεοῦ ἴδιον. 13 Κατασκευάζοντα δέ, εἰ τῶν λοιπῶν τῶν ἀντιδιῃρημένων * ὁποιονοῦν ἐστὶ τὸ ληφθὲν ἴδιον, τούτων ἑκάστου τῶν ἀντιδιῃρημένων ὄντων ἴδιον τούτους τῶν ἀντιδιῃρημένων. καὶ γὰρ τὸ λοιπὸν ἔσται * τοῦ λοιποῦ ἴδιον, οὗ κεῖται μὴ εἶναι ἴδιον. οἷον, ἐπεὶ φρονήσεώς ἐστιν ἴδιον, τὸ καθ' αὑτὸ πεφυκέναι λογιστικοῦ ἀρετὴν εἶναι, καὶ τῶν ἄλλων ἀρετῶν οὕτως ἑκάστης λαμβανομένης· εἴη ἂν σωφροσύνης ἴδιον, τὸ καθ' αὑτὸ πεφυκέναι τοῦ ἐπιθυμητικοῦ ἀρετὴν εἶναι.

* γρ. ἐπιέσω

quidam cod. poſt hæc verba habent, [Greek] & cætera quæ mox 11. text. habentur.

* γρ. τὸ μὴ ζῷον ... ἴδιον τὸ ἔμψυχον.

* [Greek]

* γρ. [Greek]

* γρ. ὁποιονοῦν τὸ ληφθὲν ᾖ.

quidam cod. ſic hunc locum legunt: εἰ τῶν λοιπῶν τῶν ἀντιδιῃρημένων ὁποιονοῦν ἐστὶν ἴδιον, τούτου ἑκάστου τῶν ἀντιδιῃρημένων ὄντος ἴδιον τινός. καὶ γὰρ τὸ λοιπὸν ἔσται τοῦ λοιποῦ ἴδιον, οὗ κεῖται μὴ εἶναι ἴδιον.

* γρ. τούτου

Alij loci. Cap. VII.

1 *A caſibus.* 3 *A caſibus oppoſitis.* 6 *A proportione.* 8 *Ab iis quæ eodem modo ſe habent.* 10 *Ab iis quæ ſiunt, vel corrumpuntur vel ſiunt.* 10 *Ab idea.*

DEinde ex caſibus refellitur, ſi *ille* caſus nõ eſt *illius* caſus proprium: quia neq; *hic* caſus erit *huius* caſus proprium. velvti, quoniã eius quod *eſt* iuſtè, nõ eſt proprium id quod *eſt* honeſtè, ne iuſti quidem proprium erit, quod *eſt* honeſtum. 2 Cõfirmatur autẽ, ſi *ille* caſus ſit *illius* caſus proprium: etenim *hic* caſus erit *huius* caſus proprium. velvti, quia hominis proprium eſt pedeſtre bipes, etiam homini proprium erit dici pedeſtri bipedi. 3 Nõ ſolùm autẽ in eo quod propoſitũ eſt, caſus ſpectari debent, ſed etiam in oppoſitis, vt in ſuperioribus quoq; locis dictum fuit. 4 Et refellitur quidem, ſi *illius* rei oppoſitæ caſus non eſt proprium *eius* rei oppoſitæ caſus: quia ne *huius* quidem oppoſitæ rei caſus erit propriũ *huius* oppoſitæ rei caſus. velvti, quia eius quod iuſtè *fit*, non eſt proprium id quod bene *fit*: ne eius quidem quod iniuſtè *fit*, proprium erit id quod malè *fit*. 5 Confirmatur autem, ſi *ille* oppoſitæ rei caſus eſt proprium *illius* oppoſitæ rei caſus. nam *hic* quoque oppoſitæ rei caſus erit proprium *huius* oppoſitæ rei caſus. velvti, quia boni proprium eſt id quod eſt optimũ, etiam mali proprium vtiq; eſt, quod eſt deterrimum. 6 Deinde, ex iis quæ ſimiliter *ſe* habent, refellitur quidem, ſi

D ΕΠειτα ἐκ τῶν πτώσεων, ἀνασκευάζοντα μέν, εἰ ἡ πτῶσις τῆς πτώσεως μὴ ἐστὶν ἴδιον· οὐδὲ γὰρ ἡ πτῶσις τῆς πτώσεως ἔσται ἴδιον. οἷον, ἐπεὶ οὐκ ἔστι τοῦ δικαίως ἴδιον τὸ καλῶς, οὐδ' ἂν τοῦ δικαίου ἴδιον εἴη τὸ καλόν. 2 Κατασκευάζοντα δέ, εἰ ἡ πτῶσις τῆς πτώσεως ἐστὶν ἴδιον· καὶ γὰρ ἡ πτῶσις τῆς πτώσεως ἔσται ἴδιον. οἷον, ἐπεὶ τοῦ ἀνθρώπου ἐστὶν ἴδιον τὸ πεζὸν δίπουν, καὶ τῷ ἀνθρώπῳ εἴη ἂν ἴδιον, τὸ πεζῷ δίποδι λέγεσθαι. 3 Οὐ μόνον δ' ἐπ' αὐτοῦ τοῦ εἰρημένου κατὰ τὰς πτώσεις ἐπιβλεπτέον, ἀλλὰ καὶ ἐπὶ τῶν ἀντικειμένων, καθάπερ καὶ ἐπὶ τῶν προτέρων τόπων εἴρηται. 4 Ἀνασκευάζοντα μέν, E εἰ ἡ τοῦ ἀντικειμένου πτῶσις μὴ ἐστὶν ἴδιον τῆς τοῦ ἀντικειμένου πτώσεως· οὐδὲ γὰρ ἡ τοῦ ἀντικειμένου πτῶσις ἔσται ἴδιον τῆς τοῦ ἀντικειμένου πτώσεως. οἷον, ἐπεὶ οὐκ ἔστι τοῦ δικαίως ἴδιον, τὸ ἀγαθῶς· οὐδ' ἂν τοῦ ἀδίκως εἴη ἴδιον τὸ κακῶς. 5 Κατασκευάζοντα δέ, εἰ ἡ τοῦ ἀντικειμένου πτῶσις ἐστὶν ἴδιον τῆς τοῦ ἀντικειμένου πτώσεως· καὶ γὰρ ἡ τοῦ ἀντικειμένου πτῶσις ἔσται ἴδιον τῆς τοῦ ἀντικειμένου πτώσεως. οἷον, ἐπεὶ τοῦ ἀγαθοῦ ἐστιν ἴδιον, τὸ βέλτιστον· καὶ τοῦ κακοῦ ἂν εἴη ἴδιον, τὸ χείριστον. 6 Ἔπειτα ἐκ τῶν ὁμοίως ἐχόντων, ἀνασκευάζοντα μέν, εἰ

ὃ ὁμοίως ἔχον τοῦ ὁμοίως ἔχοντος μή ἐστιν ἴδιον· οὐδὲ γὰρ τὸ ὁμοίως ἔχον, τοῦ ὁμοίως ἔχοντος ἔσται ἴδιον. οἷον, ἐπεὶ ὁμοίως ἔχει ὁ οἰκοδόμος πρὸς τὸ ποιεῖν οἰκίαν, καὶ ὁ ἰατρὸς πρὸς τὸ ποιεῖν ὑγίειαν· οὐκ ἔστι δὲ ἰατροῦ ἴδιον, τὸ ποιεῖν ὑγίειαν· οὐκ ἂν εἴη οἰκοδόμου ἴδιον, τὸ ποιεῖν οἰκίαν. 7 Κατασκευάζοντα δὲ, εἰ τὸ ὁμοίως ἔχον, τοῦ ὁμοίως ἔχοντος ἐστὶν ἴδιον· καὶ γὰρ τὸ ὁμοίως ἔχον, τοῦ ὁμοίως ἔχοντος ἔσται ἴδιον. οἷον, ἐπεὶ ὁμοίως ἔχει ἰατρός τε πρὸς τὸ ποιητικὸς ὑγιείας εἶναι, καὶ γυμναστὴς πρὸς τὸ ποιητικὸς εὐεξίας· ἔστι δ' ἴδιον γυμναστοῦ, τὸ ποιητικὸν εἶναι εὐεξίας· εἴη ἂν ἴδιον ἰατροῦ, τὸ ποιητικὸν ὑγιείας εἶναι. 8 Ἔπειτα, ἐκ τῶν ὡσαύτως ἐχόντων, ἀνασκευάζοντα μὲν, εἰ τὸ ὡσαύτως ἔχον τοῦ ὡσαύτως ἔχοντος μή ἐστιν ἴδιον· οὐδὲ γὰρ τὸ ὡσαύτως ἔχον, τοῦ ὡσαύτως ἔχοντος ἔσται ἴδιον. εἰ δ' ἔστι τοῦ ὡσαύτως ἔχοντος, τὸ ὡσαύτως ἔχον, ἴδιον· τούτου οὐκ ἔσται ἴδιον, οὗ κεῖται ἴδιον εἶναι. οἷον, ἐπεὶ ὡσαύτως ἔχει ἡ φρόνησις πρὸς τὸ καλὸν, καὶ τὸ αἰσχρὸν, τῷ ἐπιστήμην ἑκατέρου αὐτῶν εἶναι· οὐκ ἔστι δ' ἴδιον φρονήσεως, τὸ ἐπιστήμην εἶναι καλοῦ· οὐκ ἂν εἴη ἴδιον φρονήσεως, τὸ ἐπιστήμην εἶναι αἰσχροῦ. εἰ δ' ἔστιν ἴδιον φρονήσεως τὸ ἐπιστήμην εἶναι καλοῦ· οὐκ ἂν εἴη ἴδιον αὐτῆς τὸ ἐπιστήμην εἶναι αἰσχροῦ· ἀδύνατον γὰρ εἶναι τὸ αὐτὸ πλειόνων ἴδιον. 9 Κατασκευάζοντι δὲ οὐδέν ἐστιν ὁ τόπος οὗτος χρήσιμος· τὸ γὰρ ὡσαύτως ἔχον, ἓν πρὸς πλείω συγκρίνεται. 10 Ἔπειτα, ἀνασκευάζοντα μὲν, εἰ τὸ κατὰ τὸ εἶναι λεγόμενον, μή ἐστι τοῦ κατὰ τὸ εἶναι λεγομένου ἴδιον· οὐδὲ γὰρ τὸ φθείρεσθαι, τοῦ κατὰ τὸ φθείρεσθαι, οὐδὲ τὸ γίνεσθαι, τοῦ κατὰ τὸ γίνεσθαι λεγομένου, ἔσται ἴδιον. οἷον, ἐπεὶ οὐκ ἔστι τοῦ ἀνθρώπου ἴδιον, τὸ εἶναι ζῷον· οὐδ' ἂν τοῦ ἀνθρώπου γίνεσθαι, εἴη ἂν ἴδιον τὸ γίνεσθαι ζῷον· οὐδ' ἂν τοῦ ἀνθρώπου φθείρεσθαι, εἴη ἴδιον τὸ φθείρεσθαι ζῷον. τὸν αὐτὸν δὲ τρόπον ληπτέον ἐστὶ καὶ ἐκ τοῦ γίνεσθαι πρὸς τὸ εἶναι καὶ φθείρεσθαι, καὶ ἐκ τοῦ φθείρεσθαι πρὸς τὸ εἶναι καὶ πρὸς τὸ γίνεσθαι, καθάπερ εἴρηται νῦν ἐκ τοῦ εἶναι πρὸς τὸ γίνεσθαι καὶ φθείρεσθαι. 11 Κατασκευάζοντα δὲ, εἰ τοῦ κατὰ τὸ εἶναι τεταγμένου, ἐστὶ τὸ κατὰ τὸ εἶναι τεταγμένον, ἴδιον. καὶ γὰρ τοῦ κατὰ τὸ γίνεσθαι λεγομένου, ἔσται τὸ κατὰ τὸ γίνεσθαι λεγόμενον, ἴδιον· καὶ τοῦ κατὰ τὸ φθείρεσθαι, τὸ * κατὰ τὸ φθείρεσθαι ἀποδιδόμενον. οἷον, ἐπεὶ τοῦ ἀνθρώπου ἐστὶν ἴδιον, τὸ εἶναι βροτὸν· καὶ τοῦ γίνεσθαι ἄνθρωπον, εἴη ἂν ἴδιον, τὸ γίνεσθαι βροτόν· καὶ τοῦ φθείρεσθαι ἄνθρωπον, τὸ φθείρεσθαι βροτόν. τὸν αὐτὸν δὲ τρόπον ληπτέον ἐστὶ καὶ ἐκ τοῦ γίνεσθαι καὶ ἐκ τοῦ φθείρεσθαι, πρός τε τὸ εἶναι, καὶ πρὸς τὸ γίνεσθαι αὐτὰ ἐξ αὐτῶν, καθάπερ καὶ ἀνασκευάζοντι εἴρηται. 12 Ἔπειτα, ἐπιβλέπειν ἐπὶ τὴν ἰδέαν τοῦ κειμένου· ἀνασκευάζοντα μὲν, εἰ τῇ ἰδέᾳ μὴ ὑπάρχει, ἢ εἰ μὴ κατὰ τοῦτο, καθ' ὃ λέγεται τούτου, οὗ τὸ ἴδιον ἀποδέδοται· οὐ γὰρ ἔσται ἴδιον, τὸ κείμενον εἶναι ἴδιον. οἷον, ἐπεὶ αὐτοανθρώπῳ οὐχ ὑπάρχει τὸ ἠρεμεῖν, ᾗ ἄνθρωπός ἐστιν, ἀλλ' ᾗ ἰδέα· οὐκ ἂν εἴη τοῦ ἀνθρώπου ἴδιον, τὸ ἠρεμεῖν. 13 Κατασκευάζοντα δὲ, εἰ τῇ ἰδέᾳ ὑπάρχει, καὶ κατὰ τοῦτο ὑπάρχει, ᾗ λέγεται κατ' αὐτοῦ ἐκεῖνο, οὗ κεῖται μὴ εἶναι ἴδιον· ἔσται γὰρ ἴδιον, τὸ κείμενον μὴ εἶναι ἴδιον. οἷον, ἐπεὶ ὑπάρχει τῷ αὐτοζῴῳ τὸ ἐκ ψυχῆς καὶ σώματος συγκεῖσθαι, καὶ, ᾗ ζῷον αὐτῷ ὑπάρχει· τούτῳ εἴη ἂν ζῴου ἴδιον, τὸ ἐκ ψυχῆς καὶ σώματος συγκεῖσθαι.

* κ. κτ' ἁπλᾶ.

A illud ſimiliter ſe habens, illius ſimiliter ſe habentis nõ eſt proprium: quia ne hoc quidem quod ſimiliter ſe habet, erit huius quod ſimiliter ſe habet, proprium. velvti, quia ſimilem rationẽ habet ædificator ad efficiendam domum, & medicus ad efficiẽdam ſanitatem: non eſt autem medici proprium, efficere ſanitatem: ne ędificatoris quidem propriũ erit, efficere domum. 7 Confirmatur autem, ſi id quod ſimiliter ſe habet, proprium eſt eius quod ſimiliter ſe habet: quoniã hoc quoque quod ſimiliter ſe habet, propriũ erit huius quod ſimiliter ſe habet. veluti, quia ſimilem rationem habent medicus & effectiuus ſanitatis, necnõ gymnaſtes & effectiuus B bonæ corporis habitudinis: eſt autem proprium gymnaſtæ, effectiuum eſſe bonæ corporis habitudinis: vtique medici proprium erit, eſſe effectiuum ſanitatis. 8 Deinde ex iis quę eodẽ modo affecta ſunt, refellitur, ſi id quod eſt eodem modo affectum, illius eodem modo affecti non ſit proprium: quoniam id quod eſt eodem modo affectum, ne huius quidẽ hoc eodem modo affecti erit proprium. Si verò illius eodem modo affecti, id quod eſt eodem modo affectum, proprium ſit: huius non erit proprium, cuius poſitum eſt proprium eſſe. Velvti, quoniam eandẽ rationem habet prudentia ad honeſtum, & turpe, quia ſcientia eſt vtriuſque eorum: non eſt autem prudentiæ proprium, ſcientiam eſſe honeſti: pro- C fectò non erit prudentiæ proprium, ſcientiam eſſe turpis. Si verò eſt prudentiæ proprium, ſcientiam eſſe honeſti: certè non erit eius proprium, ſcientiam eſſe turpis. fieri.n. nequit, vt idem plurium rerum proprium ſit. 9 Confirmanti autẽ hic locus nullã vtilitatem affert. quod.n. eodem modo affectũ eſt, vnum cum pluribus cõparatur. 10 Deinde refellitur, ſi id quod eſſe dicitur, non eſt proprium eius quod eſſe dicitur: quia nec corrumpi quidem erit proprium eius quod corrũpi dicitur: nec fieri, eius quod fieri dicitur. velvti, quia nõ eſt hominis proprium, eſſe animal: vtique nec huius, hominẽ fieri, proprium erit, fieri animal: nec huius, animal corrumpi, proprium erit, corrumpi animal. Eodem D modo ſumendum eſt argumentum etiam ex ortu ad ſtatum, & interitum: & ex interitu ad ſtatum, & ad ortum: quẽadmodum modo dictum fuit ex ſtatu ad ortum, & interitum. 11 Confirmatur autem, ſi eius quod poſitum eſt eſſe, proprium eſt id quod poſitum eſt eſſe: quoniam eius quoque quod fieri dicitur, erit proprium id quod fieri dicitur: & eius quod dicitur corrumpi, propriũ erit id quod dicitur corrumpi. velvti, quia hominis proprium eſt, eſſe mortalem: certè huius, hominem gigni, proprium erit, mortalem gigni: & huius, interire hominem, proprium erit interire mortalem. Eodem modo ſumendũ eſt argumentũ etiam ex ortu, & ex interitu, E vt concludantur eſſe, & vt cõcludantur fieri eadem ex iiſdem: quemadmodum & refellenti preſcriptum fuit. 12 Deinde reſpicere oportet ad ideã rei propoſitæ. ac refellitur quidem, ſi ideæ non conuenit, vel non quatenus dicitur idea eſſe huius, cuius proprium traditum eſt. quod.n. poſitum eſt eſſe proprium, non erit proprium. vt quia ipſi homini non conuenit quies, quà homo eſt, ſed quà idea, certè non erit hominis proprium, quieſcere. 13 Confirmatur autem, ſi ideæ conuenit, & hac ratione conuenit, quà dicitur de hoc, cuius poſitum eſt non eſſe proprium. quod enim poſitum eſt non eſſe proprium, erit proprium. velvti, quia conuenit ipſi animali, ex anima & corpore conſtare, eique hoc conuenit, quà eſt animal: vtique animalis proprium erit, ex anima & corpore conſtare.

Loci à comparatione. Cap. VIII.

1 Ab eo quod eſt magis vel minùs, vel ſimpliciter, locus primus, 6 ſecundus, 8 tertius, 10 quartus. 12 Ab iis quæ æquè inſunt, locus primus, 14 ſecundus, 16 tertius. 18 Diſcrimen huius loci ab iis quæ æquè inſunt, & loci ab iis quæ ſimiliter affecta ſunt.

DEinde *arguendum eſt* ex *eo quod* magis vel minùs *eſt*. *At* primũ quidẽ refellitur, ſi id quod magis *eſt*, eius quod magis *eſt*, non eſt propriũ: quia nec id quod minùs *eſt*, eius quod minus *eſt*, propriũ erit: neque id quod minimè *eſt*, eius quod minimè *eſt*: neque id quod maximè *eſt*, eius quod maximè *eſt*: neque id quod ſimpliciter *eſt*, eius quod ſimpliciter eſt. velvti, quia magis coloratum eſſe, magis corporis non eſt proprium: nec minùs coloratum eſſe, minùs corporis proprium erit: neque coloratum eſſe, corporis omnino. 2 Confirmatur autẽ, ſi quod magis *eſt*, eius quod magis *eſt*, proprium ſit: nam & quod minùs *eſt*, eius quod minùs *eſt*, proprium erit: & quod minimè *eſt*, eius quod minimè *eſt*: & quod maximè *eſt*, eius quod maximè *eſt*: & quod ſimpliciter *eſt*, eius quod ſimpliciter *eſt*. velvti, quia magis viuẽtis magis ſentire eſt proprium: etiam minùs viuẽtis, minùs ſentire erit proprium: & maximè *viuẽtis*, maximè *ſentire*: & minimè *viuẽtis*, minimè *ſentire*: & ſimpliciter *viuẽtis*, ſimpliciter *ſentire*. 3 Ex eo quoque quod *eſt* ſimpliciter, *vt* ad *hæc arguatur*, conſiderandum eſt reprehendẽti, an id quod *eſt* ſimpliciter, eius quod *eſt* ſimpliciter, nõ ſit propriũ: quia nec id quod magis *eſt*, eius quod magis *eſt*: nec id quod minùs *eſt*, eius quod minùs *eſt*: nec id quod maximè *eſt*, eius quod maximè *eſt*: nec id quod minimè *eſt*, eius quod minimè *eſt*, proprium erit. velvti, quia hominis proprium non eſt, probũ *eſſe*: nec magis hominis proprium erit, magis probum. 4 Confirmanti autem *videndum eſt*, an id quod ſimpliciter *eſt*, eius propriũ ſit quod ſimpliciter *eſt*. nã & quod magis *eſt*, eius quod magis *eſt*: & quod minùs *eſt*, eius quod minùs *eſt*: & quod minimè *eſt*, eius quod minimè *eſt*: & quod maximè *eſt*, eius quod maximè *eſt*, propriũ erit. velvti, quia ignis propriũ eſt, ſurſum ferri naturâ: etiam magis ignis proprium erit, magis ſurſum ferri naturâ. 5 Eodem modo conſiderandum & *arguendum* eſt ex aliis ad hæc omnia. 6 Secundo *loco* refellitur, ſi id quod magis *eſt*, eius quod magis *eſt*, nõ eſt propriũ: quia nec id quod minùs *eſt*, eius quod minùs *eſt*, proprium erit. velvti, quia magis eſt proprium animalis ſentire, quàm hominis ſcire: non eſt autem animalis proprium, ſentire: profectò nõ erit hominis propriũ, ſcire. 7 Confirmatur autẽ, ſi id quod minus *eſt*, eius quod minus *eſt*, proprium ſit: nã id quoque quod magis *eſt*, eius quod magis *eſt*, proprium erit. velvti, quia minùs eſt propriũ hominis, naturâ manſuetum *eſſe*, quàm animalis, viuere: eſt autem hominis proprium, naturâ manſuetum *eſſe*: certè erit animalis propriũ viuere. 8 Tertio loco refellitur, ſi *quod eius* cuius magis eſt proprium, nõ ſit propriũ: quia nec huius cui minùs eſt propriũ, erit proprium. quòd ſi illius ſit proprium, non erit huius proprium. velvti, quia coloratum eſſe, magis ſuperficiei quã corporis eſt proprium: non eſt autẽ ſuperficiei proprium: certè nec corporis proprium erit coloratũ eſſe. ſi vero eſt ſuperficiei proprium, non erit corporis proprium. 9 Confirmanti autem hic locus non eſt vtilis: quia fieri nequit, vt idem multorũ propriũ ſit. 10 Quarto *loco* refellitur, ſi id quod magis ipſius *rei propoſitæ* proprium eſt, non eſt proprium: quia nec id quod minùs eſt eius proprium, erit proprium. velvti, quia magis eſt proprium animalis, ſenſibile, quàm

Ἔπειτα, ἐκ τοῦ μᾶλλον καὶ ἧττον· πρῶτον μὲν ἀνασκευάζοντα, εἰ τὸ μᾶλλον τοῦ μᾶλλον μή ἐστιν ἴδιον· οὐδὲ γὰρ τὸ ἧττον τοῦ ἧττον ἔσται ἴδιον, οὐδὲ τὸ ἥκιστα τοῦ ἥκιστα, οὐδὲ τὸ μάλιστα, τοῦ μάλιστα, οὐδὲ τὸ ἁπλῶς τοῦ ἁπλῶς· οἷον, ἐπεὶ οὐκ ἔστι τὸ μᾶλλον κεχρῶσθαι, τοῦ μᾶλλον σώματος ἴδιον· οὐδὲ τὸ ἧττον κεχρῶσθαι, τοῦ ἧττον σώματος ἂν εἴη ἴδιον· οὐδὲ τὸ κεχρῶσθαι σώματος ὅλως. 2 Κατασκευάζοντα δέ, εἰ τὸ μᾶλλον τοῦ μᾶλλόν ἐστιν ἴδιον. καὶ γὰρ καὶ τὸ ἧττον τοῦ ἧττον ἔσται ἴδιον, καὶ τὸ ἥκιστα τοῦ ἥκιστα, καὶ τὸ μάλιστα τοῦ μάλιστα, καὶ τὸ ἁπλῶς τοῦ ἁπλῶς. οἷον, ἐπεὶ τοῦ μᾶλλον ζῶντος, τὸ μᾶλλον αἰσθάνεσθαι, ἐστὶν ἴδιον· καὶ τοῦ ἧττον ζῶντος, τὸ ἧττον αἰσθάνεσθαι εἴη ἂν ἴδιον· καὶ τοῦ μάλιστα δὲ τὸ μάλιστα, καὶ τοῦ ἥκιστα τὸ ἥκιστα, καὶ τοῦ ἁπλῶς τὸ ἁπλῶς. 3 Καὶ ἐκ τοῦ ἁπλῶς δὲ πρὸς ταὐτὰ σκεπτέον ἐστὶν ἀνασκευάζοντα μέν, εἰ τὸ ἁπλῶς τοῦ ἁπλῶς μή ἐστιν ἴδιον· οὐδὲ γὰρ τὸ μᾶλλον τοῦ μᾶλλον, οὐδὲ τὸ ἧττον τοῦ ἧττον, οὐδὲ τὸ μάλιστα τοῦ μάλιστα, οὐδὲ τὸ ἥκιστα τοῦ ἥκιστα ἔσται ἴδιον. οἷον, ἐπεὶ οὐκ ἔστι τοῦ ἀνθρώπου τὸ σπουδαῖον ἴδιον, οὐδ᾽ ἂν τοῦ μᾶλλον ἀνθρώπου τὸ μᾶλλον σπουδαῖον ἴδιον εἴη. 4 Κατασκευάζοντα δέ, εἰ τὸ ἁπλῶς τοῦ ἁπλῶς ἐστὶν ἴδιον· καὶ γὰρ τὸ μᾶλλον τοῦ μᾶλλον, καὶ τὸ ἧττον τοῦ ἧττον, καὶ τὸ ἥκιστα τοῦ ἥκιστα, καὶ τὸ μάλιστα τοῦ μάλιστα ἔσται ἴδιον. οἷον, ἐπεὶ τοῦ πυρός ἐστιν ἴδιον, τὸ ἄνω φέρεσθαι κατὰ φύσιν· καὶ τοῦ μᾶλλον πυρὸς εἴη ἂν ἴδιον, τὸ μᾶλλον ἄνω φέρεσθαι κατὰ φύσιν. 5 Τὸν αὐτὸν δὲ τρόπον σκεπτέον ἐστὶ καὶ * ἐκ τῶν ἄλλων πρὸς ἅπαντα ταῦτα. 6 Δεύτερον δ᾽ ἀνασκευάζοντα μέν, εἰ τὸ μᾶλλον τοῦ μᾶλλον μή ἐστιν ἴδιον· οὐδὲ γὰρ τὸ ἧττον τοῦ ἧττον ἔσται ἴδιον. οἷον, ἐπεὶ μᾶλλόν ἐστιν ἴδιον ζῴου τὸ αἰσθάνεσθαι, ἢ ἀνθρώπου τὸ ἐπίστασθαι· οὐκ ἔστι δὲ ζῴου ἴδιον τὸ αἰσθάνεσθαι· οὐκ ἂν εἴη ἀνθρώπου ἴδιον τὸ ἐπίστασθαι. 7 Κατασκευάζοντα δ᾽, εἰ τὸ ἧττον τοῦ ἧττόν ἐστιν ἴδιον· καὶ γὰρ τὸ μᾶλλον τοῦ μᾶλλον ἔσται ἴδιον. οἷον, ἐπεὶ ἧττόν ἐστιν ἴδιον ἀνθρώπου τὸ ἥμερον φύσει, ἢ ζῴου τὸ ζῆν· ἔστι δ᾽ ἀνθρώπου ἴδιον, τὸ ἥμερον φύσει· εἴη δὴ ζῴου ἴδιον, τὸ ζῆν. 8 Τρίτον δέ, ἀνασκευάζοντα μέν, εἰ οὗ μᾶλλόν ἐστιν ἴδιον, μή ἐστιν ἴδιον. * οὐδὲ γὰρ οὗ ἧττόν ἐστιν ἴδιον, ἔσται τούτου ἴδιον. εἰ δ᾽ ἐκείνου ἐστὶν ἴδιον, οὐκ ἔσται τούτου ἴδιον. οἷον, ἐπεὶ τὸ κεχρῶσθαι, μᾶλλον τῆς ἐπιφανείας, ἢ τοῦ σώματός ἐστιν ἴδιον· οὐκ ἔστι δὲ τῆς ἐπιφανείας ἴδιον· οὐκ ἂν εἴη τοῦ σώματος ἴδιον τὸ κεχρῶσθαι. εἰ δὲ ἔστι τῆς ἐπιφανείας ἴδιον, οὐκ ἂν εἴη σώματος ἴδιον. 9 Κατασκευάζοντι δὲ ὁ τόπος οὗτος οὐκ ἔστι χρήσιμος. ἀδύνατον γάρ ἐστι τὸ αὐτὸ πλειόνων ἴδιον εἶναι. 10 Τέταρτον δέ, ἀνασκευάζοντα μέν, εἰ τὸ μᾶλλον αὐτοῦ ἴδιον ὄν, μή ἐστιν ἴδιον· οὐδὲ γὰρ τὸ ἧττον αὐτοῦ ἴδιον, ἔσται ἴδιον. οἷον, ἐπεὶ μᾶλλόν ἐστι τοῦ ζῴου ἴδιον τὸ αἰσθητόν, ἢ

CAT. V.

* κ. ἐπὶ τῶν

* κ. εἰ δ᾽

τὸ μεριστόν· οὐκ ἔστι δὲ τοῦ ζώου, τὸ αἰσθητὸν, ἴδιον· οὐκ ἂν εἴη τοῦ ζώου, τὸ μεριστὸν, ἴδιον. 11 Κατασκευάζοντα δὲ, εἰ τὸ ἧττον αὐτοῦ ὂν ἴδιον, ἔστιν ἴδιον· καὶ γὰρ τὸ μᾶλλον αὐτοῦ ὂν ἴδιον, ἔσται ἴδιον. οἷον, ἐπεὶ ἧττον ἐστὶν ἴδιον ζώου, τὸ αἰσθάνεσθαι, ἢ τὸ ζῆν· ἔστι δὲ τοῦ ζώου, τὸ αἰσθάνεσθαι, ἴδιον· εἴη ἂν τοῦ ζώου, τὸ ζῆν, ἴδιον. 12 Ἔπειτα, ἐκ τῶν ὁμοίως ὑπαρχόντων· πρῶτον μὲν ἀνασκευάζοντα, εἰ τὸ ὁμοίως ὑπάρχον ἴδιον, μὴ ἔστιν ἴδιον τούτου, οὗ ὁμοίως ἐστὶν ἴδιον· οὐδὲ γὰρ τὸ ὁμοίως ὂν ἴδιον, ἔσται ἴδιον τούτου, οὗ ὁμοίως ἐστὶν ἴδιον. οἷον, ἐπεὶ ὁμοίως ἐστὶν ἴδιον ἐπιθυμητικοῦ τὸ ἐπιθυμεῖν, καὶ λογιστικοῦ τὸ λογίζεσθαι· οὐκ ἔστι δ' ἴδιον τοῦ ἐπιθυμητικοῦ τὸ ἐπιθυμεῖν· οὐκ ἂν εἴη ἴδιον τοῦ λογιστικοῦ, τὸ λογίζεσθαι. 13 Κατασκευάζοντα δὲ, εἰ τὸ ὁμοίως ὂν ἴδιον, ἔστι τούτου ἴδιον, οὗ ὁμοίως ἐστὶν ἴδιον· ἔσται γὰρ καὶ τὸ ὁμοίως ὂν ἴδιον, τούτου ἴδιον, οὗ ὁμοίως ἐστὶν ἴδιον. οἷον, ἐπεὶ ὁμοίως ἐστὶν ἴδιον λογιστικοῦ τὸ πρῶτον φρόνιμον, καὶ ἐπιθυμητικοῦ τὸ πρῶτον σῶφρον· ἔστι δὲ τοῦ λογιστικοῦ ἴδιον, τὸ πρῶτον φρόνιμον· εἴη ἂν τοῦ ἐπιθυμητικοῦ ἴδιον, τὸ πρῶτον σῶφρον. 14 Δεύτερον δὲ, ἀνασκευάζοντα μὲν, εἰ τὸ ὁμοίως ὂν ἴδιον, μὴ ἔστιν ἴδιον αὐτοῦ· οὐδὲ γὰρ τὸ ὁμοίως ὂν ἴδιον, ἔσται ἴδιον αὐτοῦ. οἷον, ἐπεὶ ὁμοίως ἐστὶν ἴδιον ἀνθρώπου καὶ τὸ ὁρᾶν καὶ τὸ ἀκούειν· οὐκ ἔστι δὲ ἀνθρώπου ἴδιον, τὸ ὁρᾶν· οὐκ ἂν εἴη ἀνθρώπου ἴδιον, τὸ ἀκούειν. 15 Κατασκευάζοντα δὲ, εἰ τὸ ὁμοίως αὐτοῦ ὂν ἴδιον, ἔστιν ἴδιον· καὶ γὰρ τὸ ὁμοίως αὐτοῦ ὂν ἴδιον, ἔσται ἴδιον. οἷον, ἐπεὶ ὁμοίως ἐστὶν ἴδιον ψυχῆς, τὸ μέρος αὐτῆς ἐπιθυμητικὸν εἶναι, καὶ* λογιστικὸν πρώτως· ἔστι δὲ ψυχῆς ἴδιον, τὸ μέρος αὐτῆς εἶναι ἐπιθυμητικὸν* πρώτως· εἴη ἂν ἴδιον ψυχῆς, τὸ μέρος αὐτῆς εἶναι λογιστικὸν πρώτως. 16 Τρίτον δ' ἀνασκευάζοντα μὲν, εἰ οὗ ὁμοίως ἐστὶν ἴδιον, μὴ ἐστὶν ἴδιον· οὐδὲ γὰρ οὗ ὁμοίως ἐστὶν ἴδιον, ἔσται ἴδιον. εἰ δὲ ἐκείνου ἐστὶν ἴδιον, οὐκ ἔσται θατέρου ἴδιον. οἷον, ἐπεὶ ὁμοίως ἐστὶν ἴδιον τὸ καίειν φλογὸς καὶ ἄνθρακος· οὐκ ἔστι δ' ἴδιον φλογὸς, τὸ καίειν· οὐκ ἂν εἴη ἴδιον ἄνθρακος, τὸ καίειν. εἰ δὲ ἐστὶ φλογὸς ἴδιον, οὐκ ἂν εἴη ἄνθρακος ἴδιον. 17 Κατασκευάζοντι δὲ, οὐδὲν οὗτος ὁ τόπος ἐστὶ χρήσιμος. 18 Διαφέρει δὲ ὁ ἐκ τῶν ὁμοίως ἐχόντων, τοῦ ἐκ τῶν ὁμοίως ὑπαρχόντων· ὅτι ὁ μὲν, κατ' ἀναλογίαν λαμβάνεται, οὐκ ἐπὶ τοῦ ὑπάρχειν τι, θεωρούμενος· ὁ δ', ἐκ τοῦ* ὑπάρχειν τι, συγκρίνεται.

* γ. λογικὸν

* γ. πρῶτον

* γ. ὑπάρχει

A partibile: nõ eſt autem ſenſibile, animalis propriũ: certè nec partibile animalis propriũ erit. 11 Confirmatur autem, ſi id quod minùs eſt eius propriũ, ſit propriũ: nam & id quod magis eſt eius propriũ, erit proprium. velvti, quia minùs proprium eſt animalis ſentire, quàm viuere: eſt autem ſentire, animalis proprium: certè viuere animalis propriũ erit. 12 Deinde *arguendum eſt* ex iis quę æquè inſunt: & primùm quidẽ refellitur, ſi id quod æquè eſt proprium, non eſt proprium eius, cuius æquè eſt proprium: quia ne *hoc* quidem quod æquè eſt propriũ, erit propriũ huius cuius ęquè eſt proprium. velvti, quoniam æquè eſt proprium concupiſcibilis concupiſcere, & rationalis ratiocinari: non eſt autem

B proprium cõcupiſcibilis concupiſcere: certè non erit propriũ rationalis, ratiocinari. 13 Confirmatur autem, ſi id quod æquè eſt proprium, eius eſt proprium, cuius ęquè eſt proprium: erit.n. *hoc* quoque quod æquè eſt propriũ, huius proprium, cuius æquè eſt proprium. velvti, quia æquè proprium eſt rationalis *facultatis*, id quod primùm *eſt* prudẽs, & concupiſcibilis *id* quod primùm *eſt* temperans: eſt autẽ rationalis proprium *id* quod primùm *eſt* prudens: certè erit concupiſcibilis proprium *id* quod primùm eſt temperãs. 14 Secundo *loco* reprehenditur, ſi *id* quod æquè *eſt* huius proprium, non eſt eius proprium: quia ne *hoc* quidem quod æquè *eſt* proprium, erit eius proprium. velvti, quia æquè eſt

C proprium hominis & videre & audire: non eſt autem hominis proprium, videre: certè non erit hominis proprium, audire. 15 Confirmatur autem, ſi *id* quod æquè *eſt* huius proprium, eſt proprium. nam & *hoc* quod æquè *eſt* eius proprium, erit proprium. velvti, quia æquè eſt proprium animæ, partem eius eſſe concupiſcibilem, & rationalem primùm; eſt autem animæ proprium, partem eius eſſe concupiſcibilem primùm: erit etiam animæ proprium, partem eius eſſe rationalem primùm. 16 Tertio *loco* refellitur, ſi *eius*, cuius ęquè eſt propriũ, non eſt proprium: quia nec *huius*, cuius æquè eſt proprium, erit proprium. ſi verò illius eſt propriũ, non erit alterius proprium. velvti, quia incendere eſt æquè proprium flammæ, & prunæ: non eſt autem incendere, propriũ flammæ: certè incendere, non erit proprium prunæ. at ſi ſit flammæ propriũ, non erit prunæ proprium. 17 Confirmanti autem nullo modo hic locus eſt. 18 Differt autem *locus* ex iis quæ ſimiliter affecta ſunt, à *loco* ex iis quæ æquè inſunt: quòd ille ex proportione ſumitur, nec in eo ſpectatur, quòd aliquid inſit: hic verò ex eo quòd aliquid inſit, comparationem ſumit.

Loci à poteſtate, & hyperbole. Cap. IX.

1 *A poteſtate.* 3 *Ab hyperbole.*

D Ἔπειτα, ἀνασκευάζοντα μὲν, εἰ δυνάμει τὸ ἴδιον ἀποδίδωσι, καὶ πρὸς μὴ ὂν ἀποδέδωκε τὸ ἴδιον τῇ δυνάμει, μὴ ἐνδεχομένης τῆς δυνάμεως ὑπάρχειν τῷ μὴ ὄντι· οὐ γὰρ ἔσται ἴδιον, τὸ κείμενον ἴδιον εἶναι. οἷον, ἐπεὶ ὁ εἴπας ἀέρος ἴδιον, τὸ ἀναπνευστὸν, τῇ δυνάμει μὲν* ἀπέδωκε τὸ ἴδιον (τὸ γὰρ τοιοῦτον, οἷον ἀναπνεῖσθαι, ἀναπνευστόν ἐστιν) ἀποδέδωκε δὲ καὶ πρὸς τὸ μὴ ὂν, τὸ ἴδιον· καὶ γὰρ μὴ ὄντος ζώου, ὃ ἀναπνεῖν πέφυκε τὸν ἀέρα, ἐνδέχεται ἀέρα εἶναι· οὐ μέντοι μὴ ὄντος ζώου, δυνατόν ἐστιν ἀναπνεῖν· ὥστ'* οὐδὲ ἀέρος ἔσται ἴδιον τὸ τοιοῦτον, οἷον ἀναπνεῖσθαι,

* γ. ἀποδίδωσι

* γ. ἀναπνεῖσθαι.

* γρ. κὴ ἀνεῖναι πνεῖν, ὥς τὸ ἀναπνεῖσθαι τότε ἐστι ζ.

Deinde refellitur, ſi is qui poteſtate proprium tradidit, etiam ad id quod non eſt, retulit illud poteſtate proprium, cùm poteſtas rei quæ non eſt, ineſſe nequeat: quod enim poſitum eſt eſſe proprium, non erit proprium. velvti, quoniam is qui dixit aëris proprium *eſſe*, reſpirabile, poteſtate quidem proprium tradidit; (quod enim eſt eiuſmodi vt reſpirari *poſſit*, *id* reſpirabile eſt) accõmodauit autem proprium etiam ad id quod non eſt: nam etſi non ſit animal, quod naturâ aptum eſt ad reſpirandum aërem, contingit, aërem eſſe, non tamen, cũ animal nõ ſit, reſpirare licet: ideirco quod tale eſt vt reſpiretur, tum non erit aëris proprium,

cùm

cùm animal non erit tale vt reſpiret. non igitur eſt A aëris proprium *eſſe* reſpirabile. 2 Confirmatur autem, ſi is qui poteſtate proprium tradit, vel ad id quod eſt, accommodat proprium; vel ad id quod non eſt, cùm poteſtas poſſit ineſſe rei quæ non eſt. quod. n. poſitum eſt non eſſe proprium, erit proprium. velvti, quoniã is qui entis proprium ſtatuit, poſſe pati vel facere, cùm poteſtate proprium ſtatuat, ad id quod eſt, accommodauit illud propriũ: (nam quando ens eſt, etiam pati quidpiam vel efficere poteſt) idcirco erit proprium entis, poſſe facere vel pati. 3 Deinde reprehenditur, ſi ſuperlatione poſuit proprium. quod. n. poſitum eſt eſſe proprium, non erit proprium. accidit. n. iis qui ita proprium tradũt, vt de quo oratio, non etiam no- B men verè dicatur: quoniam re corrupta, nihilo minùs oratio manebit: quippe cùm alicui eorum quæ ſunt, maximè inſit. velvti, ſi quis propriũ ignis ſtatuat, corpus leuiſſimum: corrupto enim igne, erit aliquod corpus, quod leuiſſimum erit. quocirca non eſt proprium ignis, corpus leuiſſimum. 4 Confirmatur autem, ſi non ſuperlatione poſuit proprium. erit enim, quantum ad hoc, rectè poſitum proprium. velvti, quia is qui poſuit hominis proprium, animal naturâ manſuetum, non ſuperlatione tradidit proprium: erit, quantum ad hoc, proprium rectè poſitum.

A τότε ὅτε ζῶον οὐκ ἔσται τοιοῦτον, οἷον ἀναπνεῖν. οὐκ ἂν οὖν εἴη ἀέρος ἴδιον, τὸ ἀναπνευστόν. 2 Κατασκευάζοντα δὲ, εἰ τῇ δυνάμει ἀποδιδοὺς τὸ ἴδιον, ἢ πρὸς ὂν ἀποδίδωσι τὸ ἴδιον, ἢ πρὸς μὴ ὂν, ἐνδεχομένης τῆς δυνάμεως τῷ μὴ ὄντι ὑπάρχειν· ἔσται γὰρ ἴδιον, τὸ κείμενον μὴ εἶναι ἴδιον. οἷον, ἐπεὶ ὁ ἀποδιδοὺς ἴδιον τοῦ ὄντος, τὸ δυνατὸν παθεῖν, ἢ ποιῆσαι, δυνάμει ἀποδιδοὺς τὸ ἴδιον, πρὸς ὂν ἀπέδωκε τὸ ἴδιον· (ὅτε γὰρ ὂν ἔστι, καὶ δυνατὸν παθεῖν τι ἢ ποιῆσαι ἔσται·) ὥστε εἴη ἂν ἴδιον τοῦ ὄντος, τὸ δυνατὸν παθεῖν ἢ ποιῆσαι. 3 Ἔπειτα, ἀνασκευάζοντα μὲν, εἰ ὑπερβολῇ τέθεικε τὸ ἴδιον· οὐ γὰρ ἔσται ἴδιον, τὸ κείμενον εἶναι ἴδιον. συμβαίνει γὰρ τοῖς οὕτως ἀποδιδοῦσι τὸ ἴδιον, B οὐ καθ' οὗ τὸν λόγον, καὶ τοὔνομα ἀληθεύεσθαι· φθαρέντος γὰρ τοῦ πράγματος, οὐδὲν ἧττον ἔσται ὁ λόγος· τῶν γὰρ ὄντων τινὶ μάλιστα ὑπάρξει. οἷον, εἴ τις ἀποδοίη τοῦ πυρὸς ἴδιον, σῶμα τὸ κουφότατον. φθαρέντος γὰρ τοῦ πυρὸς, ἔσται τι τῶν σωμάτων, ὃ κουφότατον ἔσται. ὥστ' οὐκ ἂν εἴη τοῦ πυρὸς ἴδιον, σῶμα τὸ κουφότατον. 4 Κατασκευάζοντα δὲ, εἰ μὴ ὑπερβολῇ τέθεικε τὸ ἴδιον. ἔσται γὰρ κατὰ τοῦτο, καλῶς κείμενον τὸ ἴδιον. οἷον, ἐπεὶ ὁ θεὶς ἀνθρώπου ἴδιον, ζῶον ἥμερον φύσει, οὐχ ὑπερβολῇ ἀπέδωκε τὸ ἴδιον· εἴη ἂν, κατὰ τοῦτο, καλῶς κείμενον τὸ ἴδιον.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΤΟΠΙΚΩΝ ΤΟ ΕΚΤΟΝ.

ARISTOTELIS TOPICORVM

LIBER VI.

DE LOCIS GENERALIBVS,

TRACTATVS I.

Cap. I.

1 Quinque modis reprehendi definitionem. 2 Vnde petendi ſint loci ſpeciales, qui ad primum, 3 vel ſecundum, 4 vel tertium, vel quartum modum pertinent. 5 Collatio tertij & quarti modi. 6 Diuiſio quarti modi. 7 Subdiuiſio.

EIVS tractationis, quę ad definitio- C nes *pertinet*, quinq; ſunt partes. vel enim *definitio reprehenditur*, quia omnino non verè dicitur, de quo nomen, etiam oratio: (quãdoquidem oportet hominis definitionẽ de omni homine verè dici) vel quia cùm ſit *aliquod* genus, non collocauit *rem definitam* in genere, aut nõ collocauit in proprio genere: (quoniam debet is qui definit, cùm in genere definitum collocauerit, differẽtias adiungere: ſiquidem eorum quæ in definitione *ponũtur*, maximè genus videtur rei definitæ eſſentiam declarare) vel quia oratio non *eſt* D propria: (nam oportet definitionẽ propriam eſſe, quemadmodum & ſuprà dictum fuit) vel quia, cũ omnia quæ dixi perfecerit, *tamẽ* non definiuit, nec dixit quidditatem rei definitæ: reliquum *eſt* præterea *definitionis vitium*, ſi definiuit quidem, nõ tamen rectè definiuit. 2 An igitur de quo nomen *dicitur*, non etiã oratio verè dicatur, ex locis ad accidens *pertinentibus* conſiderandum *eſt*. nã ibi quoque omnis conſideratio in eo conſiſtit, *vt intelligatur* vtrùm *ſit* verum, an non verum. cùm enim differendo oſtendimus accidens ineſſe, dicimus *eſſe* verum: cùm autem *oſtendimus* non ineſſe, *dicimus* non *eſſe* verum.

C ΤΗΣ δὲ περὶ τοὺς ὅρους πραγματείας μέρη πέντε ἐστίν. ἢ γὰρ, ὅτι ὅλως οὐκ ἀληθὲς εἰπεῖν, καθ' οὗ τὸ ὄνομα, καὶ τὸν λόγον· (δεῖ γὰρ τὸν τοῦ ἀνθρώπου ὁρισμὸν, κατὰ παντὸς ἀνθρώπου ἀληθεύεσθαι) ἢ ὅτι ὄντος γένους, οὐκ ἔθηκεν εἰς γένος, ἢ οὐκ εἰς τὸ οἰκεῖον γένος ἔθηκε· (δεῖ γὰρ τὸν ὁριζόμενον, εἰς τὸ γένος θέντα, τὰς διαφορὰς προσάπτειν· μάλιστα γὰρ τῶν ἐν τῷ ὁρισμῷ, τὸ γένος δοκεῖ τὴν τοῦ ὁριζομένου οὐσίαν σημαίνειν) ἢ ὅτι οὐκ ἴδιος ὁ λόγος· (δεῖ γὰρ τὸν ὁρισμὸν, ἴδιον εἶναι, καθάπερ καὶ πρότερον εἴρηται) ἢ, εἰ πάντα τὰ D εἰρημένα πεποιηκὼς, μὴ ὥρισται, μηδὲ εἴρηκε τὸ τί ἦν εἶναι τῷ ὁριζομένῳ· λοιπὸν δὲ παρὰ τὰ εἰρημένα, εἰ ὥρισται μὲν, μὴ καλῶς δὲ ὥρισται. 2 Εἰ μὲν οὖν μὴ ἀληθεύεται, καθ' οὗ τοὔνομα, καὶ ὁ λόγος, ἐκ τῶν πρὸς τὸ συμβεβηκὸς τόπων ἐπισκεπτέον. καὶ γὰρ ἐκεῖ, πότερον ἀληθὲς ἢ οὐκ ἀληθὲς, πᾶσα ἡ σκέψις γίνεται. ὅταν μὲν γὰρ ὅτι ὑπάρχει τὸ συμβεβηκὸς, διαλεγόμεθα· ὅτι ἀληθὲς, λέγομεν· ὅταν δὲ, ὅτι οὐχ ὑπάρχει, ὅτι οὐκ ἀληθές. CAP. I.

3 Εἰ δὲ μὴ ἐν τῷ οἰκείῳ γένει ἔθηκεν, ἢ εἰ μὴ ἴδιος ὁ ἀποδοθεὶς λόγος· ἐκ τῶν περὶ τὸ γένος καὶ τὸ ἴδιον ῥηθέντων τόπων ἐπισκεπτέον. 4 Λοιπὸν δέ, εἰ μὴ ὥρισται, ἢ εἰ μὴ * καλῶς ὥρισται, πῶς μετιτέον, εἰπεῖν. 5 Πρῶτον μὲν οὖν ἐπισκεπτέον, εἰ μὴ καλῶς ὥρισται. ῥᾷον γὰρ ὁτιοῦν ποιῆσαι ἢ καλῶς ποιῆσαι. δῆλον οὖν, ὅτι ἡ ἁμαρτία περὶ τοῦτο πλείων, ἐπειδὴ ἐργωδέστερον. ὥστε ἡ ἐπιχείρησις ῥᾴων ἡ περὶ τοῦτο, ἢ ἡ περὶ ἐκεῖνο γίνεται. 6 Ἔστι δὲ τοῦ μὴ καλῶς, μέρη δύο· ἓν μέν, τὸ ἀσαφεῖ τῇ ἑρμηνείᾳ κεχρῆσθαι (δεῖ γὰρ τὸν ὁριζόμενον, ὡς ἐνδέχεται σαφεστάτῃ τῇ ἑρμηνείᾳ κεχρῆσθαι, ἐπειδὴ τοῦ γνωρίσαι χάριν ἀποδίδοται ὁ ὁρισμός) δεύτερον δέ, εἰ ἐπὶ πλέον εἴρηκε τὸν λόγον τοῦ δέοντος· πᾶν γὰρ τὸ προσκείμενον ἐν τῷ ὁρισμῷ, περίεργον. 7 Πάλιν δ' ἑκάτερον τῶν εἰρημένων, εἰς πλείω μέρη διείληπται. A

* γρ. κ. ὥρισται, πῶς μετιτέον

3 An autem non in proprio genere poſuit, vel nō propria *eſt* oratio tradita, ex dictis locis, qui ad genus, & ad proprium *pertinent*, conſiderandum *eſt*. 4 Reliquum *eſt* vt dicamus, quomodo diſquiri debeat, an non ſit definitum, vel an non rectè ſit definitum. 5 Primùm igitur videndum *eſt*, an non rectè definitum ſit. facilius. n. eſt quodvis facere, quā rectè facere. conſtat igitur, ſæpius in hoc peccari, quia *eſt* difficilius. vnde fit vt argumētatio facilius de hoc quàm de illo ſuppetat. 6 Huius autem *inquiſitionis*, an nōn rectè *ſit definitum*, duę ſunt partes. vna, ſi obſcura interpretatione vſus ſit: (oportet enim, eū qui definit, quoad eius fieri poteſt, clariſſima interpretatione vti: quiā cognoſcēdi causâ definitio traditur) altera, ſi plus dixit in definitione, quàm oportuit: quicquid enim adiicitur in definitione, ſuperuacuum *eſt*. 7 Rurſus vtrumque eorum quæ dicta ſunt, in plures partes eſt diſtributum.

DE LOCIS PERTINENTIBVS AD QVÆSTIONEM, AN RECTE DEFINITVM SIT NECNE

TRACTATVS II.

De obſcuritate definitionis. Cap. II.

1 Ab homonymia. 4 A tranſlatione. 5 A verbis inuſitatis. 6 Ab improprietate. 7 Si non appare[illegible] *definitio. 8 Si non appareat, cuius rei ſit definitio. 9 Epilogus.*

Εἷς μὲν οὖν τόπος τοῦ ἀσαφῶς, εἰ ὁμώνυμόν ἐστί τινι τὸ ῥηθέν. οἷον, ὅτι ἡ γένεσις, ἀγωγὴ εἰς οὐσίαν· ἢ ὅτι ἡ ὑγίεια, συμμετρία θερμῶν καὶ ψυχρῶν. ὁμώνυμος γὰρ ἡ ἀγωγή, καὶ ἡ συμμετρία. ἄδηλον οὖν, ὁπότερον βούλεται λέγειν τῶν δηλουμένων, ὑπὸ τοῦ πλεοναχῶς λεγομένου. B 2 Ὁμοίως δὲ καί, εἰ τοῦ ὁριζομένου πλεοναχῶς λεγομένου, μὴ διελὼν εἶπεν· ἄδηλον γάρ, ὁποτέρου τὸν ὅρον ἀποδέδωκεν. ἐνδέχεταί τε συκοφαντεῖν, ὡς οὐκ ἐφαρμόττοντος τοῦ λόγου ἐπὶ πάντων, ὧν τὸν ὁρισμὸν ἀπέδωκε. 3 Μάλιστα δ' ἐνδέχεται τὸ τοιοῦτον ποιεῖν, λανθανούσης τῆς ὁμωνυμίας. ἐνδέχεται δὲ καὶ διελόμενον αὐτόν, ποσαχῶς λέγεται τὸ ἐν τῷ C ὁρισμῷ ἀποδοθέν, συλλογισμὸν ποιήσασθαι. Εἰ γὰρ κατὰ μηδένα τῶν τρόπων ἱκανῶς εἴρηται, δῆλον ὅτι οὐκ ἂν ὡρισμένος εἴη κατὰ τρόπον. 4 Ἄλλος, εἰ κατὰ μεταφορὰν εἴρηκεν· οἷον, εἰ τὴν ἐπιστήμην, ἀμετάπτωτον· ἢ τὴν γῆν, τιθήνην· ἢ τὴν σωφροσύνην, συμφωνίαν. πᾶν γάρ, ἀσαφές, τὸ κατὰ μεταφορὰν λεγόμενον. ἐνδέχεται δὲ καὶ τὴν μεταφορὰν εἰπόντα συκοφαντεῖν, ὡς οὐ κυρίως εἰρηκότα. οὐ γὰρ ἐφαρμόσει ὁ λεχθεὶς ὅρος. οἷον, ἐπὶ τῆς σωφροσύνης. πᾶσα γὰρ συμφωνία ἐν φθόγγοις. ἔτι, εἰ γένος ἡ συμφωνία τῆς σωφροσύνης, ἐν δύο γένεσιν ἔσται ταὐτὸν οὐ περιέχουσιν ἄλληλα. οὔτε D γὰρ ἡ συμφωνία τὴν ἀρετήν, οὔθ' ἡ ἀρετὴ τὴν συμφωνίαν περιέχει. 5 Ἔτι, εἰ μὴ κειμένοις ὀνόμασι χρῆται. οἷον Πλάτων, ὀφρυόσκιον, τὸν ὀφθαλμόν· ἢ τὸ φαλάγγιον, σηψιδακές· ἢ τὸν μυελόν, ὀστεογενές. πᾶν γὰρ ἀσαφές, τὸ μὴ εἰωθός. 6 Ἔνια δ' οὔτε καθ' ὁμωνυμίαν, οὔτε κατὰ μεταφοράν, οὔτε κυρίως εἴρηται. οἷον, ὁ νόμος, μέτρον, ἢ εἰκὼν τῶν φύσει δικαίων.

PRimus igitur locus *probandæ* obſcuritatis *eſt*, ſi homonymum ſit aliquod *verbum* quod *in definitione* dictum eſt. vt *ſi quis* generationem *definiet* deductionem ad ſubſtantiam: aut ſanitatem, ſymmetriam calidorum & frigidorum. nam & deductio & ſymmetria *ſunt verba* homonyma. itaque dubium *eſt*, vtrum dicere velit eorum quæ declarātur eo *verbo*, quod multis modis dicitur. 2 Idem contingit, ſi, cùm definitum multis modis dicatur, non adhibita diſtinctione dixerit *definitionem*: quia dubium *eſt*, vtrius definitionē tradiderit: & cauillari licet, quaſi definitio non omnibus aptetur, quorum definitionem tradidit. 3 Maximè autem tale *quidpiam* euenit, cùm homonymia latet. Fieri etiam poteſt, vt *aliquis*, cùm ipſe diſtinxerit *& expoſuerit* quot modis dicatur id quod in definitione continetur, ſyllogiſmum conficiat. nam ſi in nulla ſignificatione ſufficienter dicta eſt *definitio*: patet, *eo* modo definitum non fuiſſe. 4 Alius *locus eſt*, ſi *definitionem* dixit per tranſlationem, vt ſi *dixerit* ſcientiam *eſſe*, quæ labi non poteſt: aut terram, altricem: aut temperantiam, concentum. quicquid enim per tranſlationem dicitur, obſcurum *eſt*. Licet etiam *aduerſus* eum qui tranſlatione vſus eſt, calūniari, quaſi non propriè locutus ſit: quia dicta definitio non accommodabitur *rei definitæ*: vt in temperantia *perſpicere poſſumus*: omnis enim cōcentus *eſt* in ſonis. Præterea ſi concentus *ſit* genus tēperantiæ, idem erit in duobus generibus, quorum neutrum continet alterum: quia neque concētus virtutem, nec virtus concentum continet. 5 Præterea *obſcurè definit*, qui non poſitis nominibus vtitur: vt Plato *fecit*, *qui* oculum *definiuit* ciliumbrem: aut araneam, putrimordacem: aut medullam, oſſigenam. omne enim *verbum* inuſitatum, obſcurum *eſt*. 6 Quædam autem nec per homonymiam, nec per translationem, nec propriè dicuntur. vt ſi lex *definiatur* menſura, vel imago eorum quæ naturâ iuſta ſunt.

ſed eiuſmodi *omnia* ſunt tranſlatione deteriora. nã tranſlatio facit quodãmodo notum id quod ſignificatur, propter ſimilitudinem. quicũque. n. *verba* transferunt, ratione alicuius ſimilitudinis transferunt. at *illud* tale non facit rem notam: quia nec ſimilitudo *vlla* eſt, cuius ratione lex ſit menſura vel imago: nec propriè dici ſolet. Quare ſi legẽ dicat propriè menſuram, vel imaginem eſſe, mentitur: quãdoquidem imago eſt, quæ per imitationem efficitur: quod in lege non reperitur. Quod ſi non propriè: patet, *eum* obſcurè locutũ eſſe, ac deteriùs quovis eorum quæ per tranſlationem dicuntur. 7 Præterea rectè *reprehenditur*, ſi ex data *definitione*, rei contrariæ definitio non *fiat* perſpicua. nã qui rectè *definitiones* tradunt, etiam contrarias adſignificant. 8 Aut ſi per ſe nõ appareat, cuius ſit definitio, *quæ data eſt*: ſed ſimilis ſit veterum pictorum operibus, quæ erant eiuſmodi, vt, niſi quis ſuperſcripſiſſet, cognoſci non poſſet, quid vnumquodque eſſet. 9 An igitur nõ dilucidè *aliquis definierit*, ex huiuſmodi locis videndum *eſt*.

A Ἔστι δὲ τὰ τοιαῦτα, χείρω τῆς μεταφορᾶς· ἡ γὰρ μεταφορὰ ποιεῖ πως γνώριμον τὸ σημαινόμενον, διὰ τὴν ὁμοιότητα· πάντες γὰρ οἱ μεταφέροντες, κατά τινα ὁμοιότητα μεταφέρουσι· τὸ δὲ τοιοῦτον οὐ ποιεῖ γνώριμον· οὔτε γὰρ ἡ ὁμοιότης ὑπάρχει, καθ' ἣν μέτρον ἢ εἰκὼν ὁ νόμος ἐστίν· οὔτε κυρίως εἴωθε λέγεσθαι. ὥστε εἰ μὲν κυρίως μέτρον, ἢ εἰκόνα τὸν νόμον φησὶν εἶναι, ψεύδεται· εἰκὼν γάρ ἐστιν, οὗ ἡ γένεσις διὰ μιμήσεως· τοῦτο δ' οὐχ ὑπάρχει τῷ νόμῳ. εἰ δὲ μὴ κυρίως, δῆλον ὅτι ἀσαφῶς εἴρηκε, καὶ χεῖρον* ὁποιουοῦν τῶν κατὰ μεταφορὰν λεγομένων. 7 Ἔτι, εἰ μὴ δῆλος ὁ τοῦ ἐναντίου λόγος ἐκ τοῦ λεχθέντος· οἱ γὰρ καλῶς* ἀποδεδομένοι, καὶ τοὺς ἐναντίους προσσημαίνουσιν. 8 Ἢ εἰ* καθ' αὑτὸν λεχθεὶς, μὴ φανερὸς εἴη τίνος ἐστὶν ὁρισμός· ἀλλὰ καθάπερ τὰ τῶν ἀρχαίων γραφέων, εἰ μή τις ἐπέγραψεν, οὐκ ἂν ἐγνωρίζετο τί ἐστιν ἕκαστον. 9 Εἰ μὲν οὖν μὴ σαφῶς, ἐκ τῶν τοιούτων ἐστὶν ἐπισκεπτέον.

* γρ. ὁποιονοῦν

* γρ. ἀποδεδομένοι

* γρ. καθ' αὐτὸ

De ſuperfluitate. Cap. III.

1 A verbo communi. Si parte detracta, reliqua ſit perfecta definitio. 3 Si pars definitionis non conueniat omnibus ſub definito contentis. 4 Si idem ſæpius dicatur, 5 aut vniuerſali particulare ſubiiciatur. 6 Epilogus.

Qvòd ſi plus dixerit in definitione, *quã debuerit*: primũ videre *oportet*, an aliquid adhibuerit, quod omnib. inſit: *id eſt*, vel ſimpliciter iis quæ ſunt, vel iis quæ *continentur* ſub eodem genere, ſub quo *ſunt* res definitę: quia neceſſe *eſt*, vt id ſuperuacuo dictum fuerit. quandoquidem opus eſt, vt genus ab aliis ſecernat, differentiam verò ab aliquo eorum quę *ſunt* in eodẽ genere. quod igitur omnibus ineſt, ſimpliciter a nulla re ſeiũgit. quod verò ineſt omnibus ſub eodem genere *contentis*, non ſeparat ab iis quæ *ſunt* in eodẽ genere. quare inane eſt eiuſmodi adiunctum. 2 Vel an ſit quidem proprium id quod adiunctum eſt: ſed eo detracto *nihilominus* reliqua definitio propria ſit, & eſſentiam declaret. vt in definitione hominis, ſi adiungatur ſciẽtiæ capax, ſuperuacaneum *eſt*. nam & eo dempto, reliqua definitio *eſt* propria, & eſſentiã declarat. Et vt vno verbo dicam, *id* omne ſuperuacuum *eſt*, quo ſublato, id quod reliquum eſt, perſpicuam facit rem definitam. Talis eſt etiam animæ definitio, ſi quidẽ eſt numerus ſeipſum mouens: etenim quod ſeipſum mouet, *eſt* anima, vt Plato definiuit. An *quod* dictum *eſt*, proprium quidem eſt, ſed non declarat eſſentiam numero ſublato? Vtro autem modo *res* habeat, difficile eſt explicare. Vtendum porrò eſt *hoc loco* in omnibus huiuſmodi *rebus*, quatenus expedit. *vt* cũ pituita definitur humor primus ex cibo incoctus. vnum. n. eſt *humor* primus, non multi. quare ſuperuacuum *eſt* illud adiunctũ, incoctus: cùm eo quoq; ſublato, reliqua futura ſit propria definitio: quia fieri nequit, vt ex cibo & hoc & aliud primũ ſit. An non ſimpliciter pituita eſt primũ ex cibo, ſed primũ eorum quæ ſunt incocta? quare adiiciendũ *eſt in definitione* illud *verbũ* incoctus. illo: n. modo ſi dicatur, non *erit* vera definitio: ſi quidem nõ omnium primũ eſt. 3 Præterea *videndum eſt*, an aliquid eorũ quæ *ſunt* in definitione, non omnibus iis conueniat, quæ *continẽtur* ſub eadem ſpecie. nã huiuſcemodi definitio deterior eſt iis, in quibus adhibetur quod omnibus rebus ineſt. illo enim modo *ſi definiatur, ſublato eo quod commune eſt*, reliqua oratio eſt propria, & tota eſt propria.

C Εἰ δ' ἐπὶ πλεῖον εἴρηκε τὸν ὅρον· πρῶτον μὲν σκοπεῖν, εἴ τινι κέχρηται ὃ πᾶσιν ὑπάρχει, ἢ* ἁπλῶς τοῖς οὖσιν, ἢ τοῖς ὑπὸ ταὐτὸ γένος τῷ ὁριζομένῳ· ἐπὶ πλεῖον γὰρ εἰρῆσθαι ἀναγκαῖον τοῦτο. δεῖ γὰρ, τὸ μὲν γένος, ἀπὸ τῶν ἄλλων χωρίζειν· τὴν δὲ διαφορὰν, ἀπό τινος τῶν ἐν τῷ αὐτῷ γένει. τὸ μὲν οὖν πᾶσιν ὑπάρχον, ἁπλῶς ἀπ' οὐδενὸς χωρίζει. τὸ δὲ τοῖς ὑπὸ ταὐτὸ γένος πᾶσιν ὑπάρχον οὐ χωρίζει ἀπὸ τῶν ἐν ταὐτῷ γένει. ὥστε μάταιον τὸ τοιοῦτον προσκείμενον. 2 Ἢ εἰ ἔστιν μὲν ἴδιον τὸ προσκείμενον· ἀφαιρεθέντος δὲ τούτου, καὶ ὁ λοιπὸς λόγος ἴδιός ἐστι, καὶ δηλοῖ τὴν D οὐσίαν. οἷον, ἐν τῷ τοῦ ἀνθρώπου λόγῳ, τὸ ἐπιστήμης δεκτικὸν προστεθὲν, περίεργον· καὶ γὰρ ἀφαιρεθέντος τούτου, καὶ ὁ λοιπὸς λόγος, ἴδιος, καὶ δηλοῖ τὴν οὐσίαν. ἁπλῶς δ' εἰπεῖν, ἅπαν περίεργον, οὗ ἀφαιρεθέντος, τὸ λοιπὸν, δῆλον ποιεῖ τὸ ὁριζόμενον. τοιοῦτος δὲ καὶ ὁ τῆς ψυχῆς ὅρος, εἴπερ ἀριθμὸς αὐτὸς αὑτὸν κινῶν ἐστι. καὶ γὰρ τὸ αὐτὸ ἑαυτὸ κινοῦν, ψυχή, καθάπερ Πλάτων ὥρισται. ἢ ἴδιον μὲν ἐστι τοῦτο τὸ εἰρημένον, οὐ δηλοῖ δὲ τὴν οὐσίαν, ἀφαιρεθέντος τοῦ ἀριθμοῦ; πότερως μὲν οὖν ἔχει, χαλεπὸν διασαφῆσαι. χρηστέον δ' ἐπὶ πάντων τῶν τοιούτων, πρὸς τὸ συμφέρον. οἷον, ὁ τοῦ φλέγματος ὅρος, ὑγρὸν πρῶτον ἀπὸ τροφῆς, ἄπε- E πτον. ἓν γὰρ τὸ πρῶτον, οὐ πολλά. ὥστε περίεργον, τὸ ἄπεπτον, προσκείμενον· καὶ γὰρ τούτου ἀφαιρεθέντος, ὁ λοιπὸς ἔσται ἴδιος λόγος· οὐ γὰρ ἐνδέχεται ἀπὸ τῆς τροφῆς, καὶ τοῦτό τι καὶ ἄλλο πρῶτον εἶναι. ἢ οὐχ ἁπλῶς πρῶτον ἀπὸ τροφῆς τὸ φλέγμα, ἀλλὰ τῶν ἀπέπτων πρῶτον, ὥστε προσθετέον τὸ ἄπεπτον. ἐκείνως μὲν γὰρ ῥηθέντος, οὐκ ἀληθὴς ὁ λόγος, εἴπερ μὴ πάντων πρῶτόν ἐστιν. 3 Ἔτι, εἴ τι τῶν ἐν τῷ λόγῳ, μὴ πᾶσιν ὑπάρχει τοῖς ὑπὸ ταὐτὸ εἶδος. ὁ γὰρ τοιοῦτος χεῖρον ὥρισται τῶν χρωμένων ὃ πᾶσιν ὑπάρχει τοῖς οὖσιν. ἐκείνως μὲν γὰρ ἂν ὁ λοιπὸς ἴδιος ᾖ λόγος, καὶ ὁ πᾶς ἴδιος ἔσται·

* γρ. ὅλως

ἁπλῶς γὰρ πρὸς τὸ ἴδιον ὁτιοῦν προστεθέντος ἀληθοῦς, ὅλος ὁ λόγος ἴδιος γίνεται. εἰ δέ τι τῶν ἐν τῷ λόγῳ μὴ πᾶσιν ὑπάρχει τοῖς ὑπὸ ταὐτὸ εἶδος, ἀδύνατον ὅλον τὸν λόγον ἴδιον εἶναι. οὐ γὰρ ἀντικατηγορηθήσεται τοῦ πράγματος. οἷον, τὸ ζῷον πεζόν, δίπουν, τετράπηχυ. ὁ γὰρ τοιοῦτος λόγος οὐκ ἀντικατηγορεῖται τοῦ πράγματος, διὰ τὸ μὴ πᾶσιν ὑπάρχειν τοῖς ὑπὸ ταὐτὸ εἶδος τὸ τετράπηχυ. 4 Πάλιν, εἰ ταὐτὸ πλεονάκις εἴρηκεν· οἷον, τὴν ἐπιθυμίαν, ὄρεξιν ἡδέος εἰπών. πᾶσα γὰρ ἐπιθυμία, ἡδέος ἐστίν. ὥστε καὶ τὸ ταὐτὸν τῇ ἐπιθυμίᾳ, ἡδέος ἔσται. γίνεται οὖν ὁ ὅρος τῆς ἐπιθυμίας, ὄρεξις ἡδέος ἡδέος (οὐδὲν γὰρ διαφέρει, ἐπιθυμίαν εἰπεῖν, ἢ ὄρεξιν ἡδέος) ὥστ' ἀμφότερα αὐτῶν ἡδέος ἔσται. ἢ τοῦτο μὲν οὐδὲν ἄτοπον; καὶ γὰρ ὁ ἄνθρωπος, δίπουν ἐστίν. ὥστε καὶ τὸ ταὐτὸν τῷ ἀνθρώπῳ, δίπουν ἔσται. ἔστι δὲ ταὐτὸν τῷ ἀνθρώπῳ, ζῷον πεζὸν δίπουν. ὥστε ζῷον πεζὸν δίπουν, δίπουν ἐστίν. ἀλλ' οὐ διὰ τοῦτο ἄτοπόν τι συμβαίνει. οὐ γὰρ κατὰ ζῴου πεζοῦ δὶς τὸ δίπουν κατηγορεῖται (οὕτω μὲν γὰρ ἂν δὶς περὶ τοῦ αὐτοῦ τὸ δίπουν κατηγοροῖτο) ἀλλὰ περὶ ζῴου πεζοῦ δίποδος, τὸ δίπουν λέγεται, ὥστε ἅπαξ μόνον τὸ δίπουν κατηγορεῖται. ὁμοίως δὲ καὶ ἐπὶ τῆς ἐπιθυμίας· οὐ γὰρ κατὰ τῆς ὀρέξεως, τὸ ἡδέος εἶναι κατηγορεῖται, ἀλλὰ κατὰ τοῦ συμπάντος· ὥστε ἅπαξ καὶ ἐνταῦθα ἡ κατηγορία γίνεται. οὐκ ἔστι δὲ τὸ δὶς φθέγξασθαι ταὐτὸν ὄνομα, τῶν ἀτόπων· ἀλλὰ τὸ πολλάκις* περί τινος τὸ αὐτὸ* κατηγορῆσαι· οἷον, ὁ Ξενοκράτης τὴν φρόνησιν, ὁριστικὴν καὶ θεωρητικὴν τῶν ὄντων φησὶν εἶναι. ἡ γὰρ ὁριστική, θεωρητική τίς ἐστιν· ὥστε δὶς τὸ αὐτὸ λέγει, προσθεὶς πάλιν καὶ θεωρητικήν. ὁμοίως δὲ καὶ ὅσοι τὴν κατάψυξιν, στέρησιν τοῦ κατὰ φύσιν θερμοῦ, φασὶν εἶναι· πᾶσα γὰρ στέρησις ἐστὶ τοῦ κατὰ φύσιν ὑπάρχοντος· ὥστε περίεργον τὸ προσθεῖναι τοῦ κατὰ φύσιν· ἀλλ' ἱκανὸν ἦν εἰπεῖν στέρησιν θερμοῦ· ἐπεὶ αὐτὴ ἡ στέρησις γνώριμον ποιεῖ, ὅτι τοῦ κατὰ φύσιν λέγεται. 5 Πάλιν εἰ τοῦ καθόλου εἰρημένου, προσθείη καὶ ἐπὶ μέρους· οἷον, εἰ τὴν ἐπιείκειαν ἐλάττωσιν τῶν συμφερόντων καὶ δικαίων· τὸ γὰρ δίκαιον, συμφέρον τι· ὥστε περιέχεται ἐν τῷ συμφέροντι. περιττὸν οὖν τὸ δίκαιον.* ὥστε καθόλου εἰπών, ἐπὶ μέρους προσέθηκε. καὶ εἰ τὴν ἰατρικήν, ἐπιστήμην τῶν ὑγιεινῶν ζῴῳ καὶ ἀνθρώπῳ· ἢ τὸν νόμον, εἰκόνα τῶν φύσει καλῶν καὶ δικαίων· τὸ γὰρ δίκαιον, καλόν τι· ὥστε πλεονάκις τὸ αὐτὸ λέγει. 6 Πότερον μὲν οὖν καλῶς, ἢ οὐ καλῶς, ὁρίζεται, διὰ τούτων καὶ τῶν τοιούτων ἐπισκεπτέον.

* γ. ἀεί τινι

* γ. κατηγορεῖσθαι

* γ. καθόλου γὰρ εἰπὼν ἐπὶ μ.

ſimpliciter. n. ſi ad propriũ addatur aliquid quod ſit verum, tota oratio fit propria. ſi quid autem eorum quę *ſunt* in definitione, nõ conuenit iis omnibus quæ *ſunt* ſub eadem ſpecie, fieri nequit vt tota oratio propria ſit: non. n. de re viciſſim dicetur: vt *hæc oratio*, animal pedeſtre bipes quatuor cubitorũ: neque. n. huiuſmodi oratio de re viciſſim dicitur: quia illud, quatuor cubitorum, non omnibus iis ineſt quæ *ſunt* ſub eadem ſpecie. 4 Rurſus *videndũ eſt*, an idem ſæpe dixerit: vt qui dixit cupiditatem *eſſe* appetitionẽ iucundi. omnis. n. cupiditas eſt rei iucundæ: quamobrem id quoque quod eſt idẽ atque cupiditas, erit rei iucundę. definitio igitur cupiditatis conſtituitur, appetitio iucundi: (nihil. n. refert, vtrum cupiditatem dicat, an appetitionem iucundi) quare horum vtrumque erit rei iucundę. An hoc non eſt abſurdũ? nam & homo eſt bipes, quare id quoque quod eſt idem atque homo, erit bipes. atqui idem quod homo, eſt animal pedeſtre bipes: itaque animal pedeſtre bipes, eſt bipes. Sed non ideo aliquid abſurdi accidit. non. n. animali pedeſtri bis bipes attribuitur, (ſic. n. bipes eidẽ bis attribueretur) ſed de animali pedeſtri bipede bipes dicitur. quapropter ſemel tantũ bipes attribuitur. Similiter *fit* etiam in cupiditate. non. n. appetitioni attribuitur eſſe rei iucundæ, ſed toti *orationi*. quocirca hic quoque ſemel attribuitur. non eſt autem res abſurda, ſi idem nomen bis pronuncietur, ſed ſi idẽ alicui ſæpius attribuatur. vt cum Xenocrates ait prudẽtiam eſſe definitiuam & contemplatiuam eorum quæ ſunt. nam *quæ* definitiua *eſt*, contemplatiua quędam eſt. quare bis eandem rẽ dicit, adiecto *verbo* Contemplatiua. Similiter *faciũt*, quicumque refrigerationem aiunt eſſe priuationem caloris naturalis. omnis. n. priuatio eſt rei naturâ inſitæ. quare ſuperuacaneum eſt addere *verbũ illud* Naturalis: ſed ſufficiebat dicere, priuationem caloris: quãdoquidem ex ipſo priuationis verbo apparet, rei naturalis *priuationem* dici. 5 Item *videndũ eſt*, an ad id quod vniuerſaliter dictum eſt, *aliquid* adiungatur *quod ſit* in parte. vt ſi quis æquitatem *definiat* imminutionem eorum quæ vtilia & iuſta ſunt. quod. n. iuſtum eſt, vtile quiddam *eſt*: proinde in eo quod eſt vtile, cõtinetur. ſuperuacaneum igitur eſt *illud verbum*, Iuſta. itaque cùm vniuerſale dixerit, particulare adiunxit. *Idem fit* etiam, ſi quis medicinam *definiat* ſcientiam eorum quæ ſalubria ſunt animali & homini: aut legem, ſimulachrum eorum quæ naturâ honeſta & iuſta ſunt. quod. n. iuſtum eſt, honeſtum quiddã eſt. quocirca ſæpius eandem rem dicit. 6 Vtrùm igitur rectè an non rectè definierit, ex his & eiuſmodi *aliis locis* videndum eſt.

DE LOCIS PERTINENTIBVS AD QVÆSTIONEM, AN DEFINITVM SIT,

TRACTATVS III.

Si definitum non ſit ex prioribus & notioribus. Cap. IV.

1 Quæſtio. 2 ¶ Expoſitio huius loci generaliter accepti. 3 ¶ Partes huius loci. De notioribus aut ignotioribus naturâ, vel ſecundum nos. 11 De quiete & motu: necnon de finito & infinito. 12 De iis quæ ſunt ſimul, 13 vt oppoſitis, 14 yſdem, 15 & ys quæ in eadem diuiſione ponuntur. 16 De ſuperioribus, vel inferioribus in categoria. 17 Nexus loci modo expoſiti cum loco ab eodem. 18 Epilogus.

Πότερον δ' εἴρηκε καὶ ὥρισται τὸ τί ἦν εἶναι ἢ οὐκ, ἐκ τῶνδε.

VTrùm autẽ dixerit ac definierit quid res ſit, necne, *videndum eſt* ex his *quæ deinceps exponã.*

2 *At* primùm ſi non ex prioribus & notioribus cō-fecit definitionem. cùm.n.definitio tradatur, eius quod dictum eſt, cognoſcēdi cauſâ: cognoſcamus autē, non ex quibuſvis, ſed ex prioribus & notioribus: (quemadmodum in demonſtrationibus *cōtingit*: ſic.n.omnis doctrina & diſciplina *ſe* habet) perſpicuum igitur *eſt*, eum qui non ex his definiuit, *re vera* non definiuiſſe. nam ſi definiuit, plures erunt eiuſdem *rei* definitiones. conſtat enim, eum qui ex prioribus & notioribus *definierit*, meliùs definiuiſſe. quare ambæ definitiones erunt eiuſdē *rei*. quod ita *eſſe* non videtur: quandoquidem vna eſt cuiuſque rei eſſentia, *qua eſt* id quod eſt. quocirca ſi plures erunt eiuſdem *rei* definitiones, eadem erit rei definitæ eſſentia, quæ vtrâque definitione declaratur. hæ verò *eſſentiæ* non ſunt eædem: quoniam & definitiones *ſunt* diuerſæ. Patet igitur, eum non definiuiſſe, qui non ex prioribus & notioribus definiuit. 3 Ergo non ex notioribus ſumptam eſſe definitionem, dupliciter accipi poteſt: nempe ſi ex ſimpliciter ignotioribus, vel *ex* iis quæ ſunt nobis ignotiora: quoniam vtroque modo *id fieri* accidit. Quod igitur prius *eſt*, id eo quod poſterius *eſt*, notius *eſt* ſimpliciter: vt punctum *eſt prius* linea, & linea plano, & planum ſolido: quemadmodum vnitas numero: quoniā prior *eſt* & principium omnis numeri. ſimiliterque elementum *eſt prius* ſyllaba. Nobis verò cōtra interdum accidit: quia ſolidum ſub ſenſum maximè cadit: planum autem, magis quàm linea: & linea magis quàm punctum. idcirco multi ea magis cognoſcunt, quæ *ſunt* eiuſmodi. hæc.n.cuiuſvis, illa verò exquiſitæ & excellentis cogitationis eſt diſcere. 4 Simpliciter igitur melius *eſt* conari vt ex prioribus poſteriora cognoſcantur: quoniam ad ſcientiam gignendam hoc magis eſt accommodatum. attamen apud eos qui ex talibus cognitionem adipiſci nequeunt, neceſſe *eſt* fortaſſe definitionem conficere ex iis quæ illis nota *ſunt*. Tales ſunt definitiones & puncti, & lineæ, & plani: omnes. n. ex poſterioribus priora declarant: illud. n. lineæ, illud plani, hoc ſolidi aiunt terminum eſſe. 5 Sed non eſt ignorādum, eos qui ita definiunt, non poſſe declarare quidditatem rei definitæ: niſi *fortè* idem ſit & nobis notius & ſimpliciter notius. ſiquidem oportet eum qui rectè definit, ex genere & differentiis definire: hæc autem ſunt *in* eorum *numero*, quæ ſunt notiora & priora, quàm ſpecies. ſecum enim aufert genus & differentia ſpeciem. quare hæc ſunt priora quàm ſpecies. Sunt etiam notiora: quia cognita ſpecie, neceſſe *eſt* & genus & differentiam cognoſci: etenim qui hominem cognoſcit, & animal & pedeſtre cognoſcit. cognito autē genere, vel differentiâ, non *eſt* neceſſe etiam ſpeciem cognoſci. itaque ſpecies ignotior *eſt*. 6 Prçterea qui re vera eiuſmodi definitiones eſſe aiunt, quæ ex vnicuique notis *conſtant*, iis accidit vt dicant eiuſdem *rei* multas eſſe definitiones. alia namque aliis, non eadem omnibus ſunt notiora. quare alia apud alium definitio tradenda erit: ſiquidem ex iis quæ cuique ſunt notiora, definitionem conficere oportet. Præterea iiſdem *hominibus* aliàs alia ſunt notiora. nam ab initio *notiora ſunt ea*, quæ ſub ſenſum cadunt. cùm autem tales effecti ſunt, vt exquiſitiùs res cognoſcere valeant, *tum* contrà *res habet*. quocirca ne apud eūdem quidem *hominē* ſemper eadē definitio tradenda *eſt ab* iis qui definitionem ex cuiq; notioribus tradendam eſſe aſſerunt.

A 2 Πρῶτον μὲν, εἰ μὴ διὰ προτέρων καὶ γνωριμωτέρων πεποίηται τὸν ὁρισμόν. ἐπεὶ γὰρ ὁ ὅρος ἀποδίδοται τοῦ γνωρίσαι χάριν τὸ λεχθὲν, γνωρίζομεν δ', οὐκ ἐκ τῶν τυχόντων, ἀλλ' ἐκ τῶν προτέρων καὶ γνωριμωτέρων (καθάπερ ἐν ταῖς ἀποδείξεσιν· οὕτω γὰρ πᾶσα διδασκαλία καὶ μάθησις ἔχει) φανερὸν οὖν, ὅτι ὁ μὴ διὰ τοιούτων ὁριζόμενος, οὐχ ὥρισται. εἰ γὰρ ὥρισται, πλείους ἔσονται τοῦ αὐτοῦ ὁρισμοί. δῆλον γὰρ, ὅτι καὶ ὁ διὰ προτέρων καὶ γνωριμωτέρων, βέλτιον ὥρισται. ὥστε ἀμφότεροι ἂν εἶησαν ὅροι τοῦ αὐτοῦ. τὸ δὲ τοιοῦτον οὐ δοκεῖ* ἑκάστῳ γὰρ τῶν ὄντων ἕν ἐστι τὸ εἶναι ὅπερ ἐστίν. ὥστε, εἰ πλείους ἔσονται τοῦ αὐτοῦ ὁρισμοὶ, ταὐτὸν ἔσται τῷ ὁριζομένῳ B τὸ εἶναι, ὅπερ καθ' ἑκάτερον τῶν ὁρισμῶν δηλοῦται. ταῦτα δ' οὐ ταὐτά ἐστιν ἐπεὶ καὶ οἱ ὁρισμοὶ, ἕτεροι. δῆλον οὖν, ὅτι οὐχ ὥρισται ὁ μὴ διὰ προτέρων καὶ γνωριμωτέρων ὁρισάμενος. 3 Τὸ μὲν οὖν μὴ διὰ γνωριμωτέρων εἰρῆσθαι τὸν ὅρον, διχῶς ἐστιν ἐκλαβεῖν. ἢ γὰρ, εἰ ἁπλῶς ἐξ ἀγνωστοτέρων, ἢ εἰ ἡμῖν ἀγνωστοτέρων. ἐνδέχεται γὰρ ἀμφοτέρως. ἁπλῶς* μὲν οὖν γνωριμώτερον, τὸ πρότερον τοῦ ὑστέρου· οἷον, στιγμὴ γραμμῆς, καὶ γραμμὴ ἐπιπέδου, καὶ ἐπίπεδον στερεοῦ· καθάπερ μονὰς ἀριθμοῦ· πρότερον γὰρ καὶ ἀρχὴ παντὸς ἀριθμοῦ. ὁμοίως δὲ καὶ στοιχεῖον συλλαβῆς. ἡμῖν δὲ ἀνάπαλιν ἐνίοτε συμβαίνει. μάλιστα γὰρ τὸ στερεὸν ὑπὸ C τὴν αἴσθησιν πίπτει. τὸ δ' ἐπίπεδον* μᾶλλον τῆς γραμμῆς,* γραμμὴ δὲ σημείου μᾶλλον.* διὸ μᾶλλον οἱ πολλοὶ τὰ τοιαῦτα γνωρίζουσι. τὰ μὲν γὰρ, τῆς τυχούσης· τὰ δ', ἀκριβοῦς καὶ περιττῆς διανοίας καταμαθεῖν ἐστιν. 4 Ἁπλῶς μὲν οὖν βέλτιον, τὸ διὰ προτέρων τὰ ὕστερα πειρᾶσθαι γνωρίζειν· ἐπιστημονικώτερον γὰρ τὸ τοιοῦτόν ἐστιν. οὐ μὴν ἀλλὰ πρὸς τοὺς ἀδυνατοῦντας γνωρίζειν διὰ τῶν τοιούτων, ἀναγκαῖον ἴσως διὰ τῶν ἐκείνοις γνωρίμων ποιεῖσθαι τὸν λόγον. εἰσὶ δὲ * τῶν τοιούτων ὁρισμῶν, ὅ,τε τῆς στιγμῆς, καὶ ὁ τῆς γραμμῆς, καὶ ὁ τοῦ ἐπιπέδου· πάντες γὰρ διὰ τῶν ὑστέρων D τὰ πρότερα δηλοῦσι. τὸ μὲν γὰρ, γραμμῆς· τὸ δ' ἐπιπέδου· τὸ δὲ, στερεοῦ φασι πέρας εἶναι. 5 Οὐ δεῖ δὲ λανθάνειν, ὅτι τοὺς οὕτως ὁριζομένους οὐκ ἐνδέχεται τὸ τί ἦν εἶναι τῷ ὁριζομένῳ δηλοῦν. ἐὰν μὴ τυγχάνῃ ταὐτὸν, ἡμῖν τε γνωριμώτερον ὂν, καὶ ἁπλῶς γνωριμώτερον· εἴπερ δεῖ μὲν διὰ τοῦ γένους καὶ τῶν διαφορῶν ὁρίζεσθαι τὸν καλῶς ὁριζόμενον· ταῦτα δὲ, τῶν ἁπλῶς γνωριμωτέρων καὶ προτέρων τοῦ εἴδους εἰσί. συναναιρεῖ γὰρ τὸ γένος καὶ ἡ διαφορὰ τὸ εἶδος· ὥστε πρότερα ταῦτα τοῦ εἴδους. ἔστι δὲ καὶ γνωριμώτερα· τοῦ μὲν γὰρ εἴδους γνωριζομένου, ἀνάγκη καὶ τὸ γένος καὶ τὴν διαφορὰν γνωρίζεσθαι· ὁ γὰρ ἄνθρωπον γνωρίζων, καὶ ζῷον καὶ πεζὸν γνωρίζει· τοῦ δὲ γένους ἢ τῆς διαφορᾶς γνω- E ριζομένης, οὐκ ἀνάγκη καὶ τὸ εἶδος γνωρίζεσθαι· ὥστε ἀγνωστότερον τὸ εἶδος. 6 Ἔτι, τοὺς κατ' ἀλήθειαν τοὺς τοιούτους ὁρισμοὺς φάσκοντας εἶναι, τοὺς ἐκ τῶν ἑκάστῳ γνωρίμων, πολλοὺς τοῦ αὐτοῦ συμβαίνει λέγειν ὁρισμοὺς εἶναι. ἕτερα γὰρ ἑτέροις, καὶ οὐ ταὐτὰ πᾶσι τυγχάνει γνωριμώτερα ὄντα. ὥστε πρὸς ἕκαστον ἕτερος ἂν εἴη ὁρισμὸς ἀποδοτέος, εἴπερ ἐκ τῶν ἑκάστοις γνωριμωτέρων τὸν ὁρισμὸν ποιεῖσθαι χρή. Ἔτι, τοῖς αὐτοῖς ἄλλοτε ἄλλα μᾶλλον γνώριμα· ἐξ ἀρχῆς μὲν γὰρ τὰ αἰσθητά· ἀκριβεστέροις δὲ γενομένοις, ἀνάπαλιν. ὥστ' οὐδὲ πρὸς τὸν αὐτὸν ἀεὶ ὁ αὐτὸς ὁρισμὸς ἀποδοτέος, τοῖς διὰ τῶν ἑκάστοις γνωριμωτέρων τὸν ὁρισμὸν φάσκουσιν ἀποδοτέον εἶναι.

* γρ. ἑκάστου γὰρ
* γρ. μὲν γὰρ
* γρ. μάλιστα
* γρ. ἡ δὲ γραμμὴ σημείου. magis Aristotelicè.
* γρ. διὸ οἱ πολλοὶ τ. προγνωρίζουσι. al. οἱ πολλοὶ γ. τ.
* γρ. τῶν τ. ὁρισμῶν

δῆλον ἐστιν, ὅτι οὐχ ὁριστέον διὰ τῶν τοιούτων, ἀλλὰ διὰ τῶν ἁπλῶς γνωριμωτέρων· μόνως γὰρ ἂν οὕτως εἷς καὶ ὁ αὐτὸς ὁρισμὸς ἀεὶ γίνοιτο. 7 Ἴσως δὲ καὶ τὸ ἁπλῶς γνώριμον, οὐ τὸ πᾶσι γνώριμόν ἐστιν, ἀλλὰ τὸ τοῖς εὖ διακειμένοις τὴν διάνοιαν· καθάπερ καὶ τὸ ἁπλῶς ὑγιεινόν, τὸ τοῖς εὖ ἔχουσι τὸ σῶμα. 8 Δεῖ μὲν οὖν * ἕκαστα τῶν τοιούτων ἐξακριβοῦν· χρῆσθαι δὲ διαλεγομένους, πρὸς τὸ συμφέρον. 9 Μάλιστα δ' ὁμολογουμένως ἀναιρεῖν ἐνδέχεται τὸν ὁρισμόν, ἐὰν μήτ' ἐκ τῶν ἁπλῶς γνωριμωτέρων, μήτ' ἐκ τῶν ἡμῖν τυγχάνῃ τὸν λόγον πεποιημένος. 10 Εἷς μὲν οὖν * τρόπος τοῦ μὴ διὰ γνωριμωτέρων, ἐστί, τὸ διὰ τῶν ὑστέρων τὰ πρότερα δηλοῦν, καθάπερ πρότερον εἴπομεν. 11 Ἄλλος δέ, εἰ τοῦ ἐν ἠρεμίᾳ, καὶ τοῦ ὡρισμένου, διὰ τοῦ ἀορίστου καὶ τοῦ ἐν κινήσει * ἀποδέδοται ὁ λόγος· πρότερον γὰρ καὶ γνωριμώτερον τὸ μένον, καὶ τὸ ὡρισμένον, τοῦ ἀορίστου, καὶ τοῦ ἐν κινήσει ὄντος. 12 Τοῦ δὲ μὴ ἐκ προτέρων, τρεῖς εἰσι * τρόποι. 13 Πρῶτος μέν, εἰ * διὰ τῶν ἀντικειμένων τὸ ἀντικείμενον ὥρισται, οἷον διὰ τοῦ κακοῦ τὸ ἀγαθόν· ἅμα γὰρ τῇ φύσει τὰ ἀντικείμενα. ἐνίοις δὲ καὶ ἡ αὐτὴ ἐπιστήμη ἀμφοτέρων δοκεῖ εἶναι· ὥστε οὐδὲ γνωριμώτερον τὸ ἕτερον τοῦ ἑτέρου. δεῖ δὲ μὴ λανθάνειν, ὅτι ἔνια ἴσως οὐκ ἔστιν ὁρίσασθαι ἄλλως, οἷον τὸ διπλάσιον ἄνευ τοῦ ἡμίσεος· καὶ * ὅσα καθ' αὑτὰ πρός τι λέγεται· πᾶσι γὰρ τοῖς τοιούτοις, ταὐτὸν τὸ εἶναι τῷ πρός τί πως ἔχειν· ὥστ' ἀδύνατον ἄνευ θατέρου θάτερον γνωρίζειν. διόπερ ἀναγκαῖον ἐν τῷ τοῦ ἑτέρου λόγῳ συμπεριειλῆφθαι καὶ θάτερον. γνωρίζειν μὲν οὖν δεῖ τὰ τοιαῦτα πάντα· χρῆσθαι δ' αὐτοῖς καὶ ἐπὶ τούτων, ὡς ἂν δοκῇ συμφέρειν. 14 Ἄλλος, εἰ αὐτῷ κέχρηται τῷ ὁριζομένῳ. λανθάνει δ', ὅταν μὴ αὐτῷ τῷ τοῦ ὁριζομένου ὀνόματι χρήσηται· οἷον, εἰ τὸν ἥλιον, ἄστρον ἡμεροφανὲς ὥρισται· ὁ γὰρ ἡμέρᾳ χρώμενος, καὶ ἡλίῳ χρῆται. δεῖ δὲ πρὸς τὸ * φωραθῆναι τὰ τοιαῦτα, μεταλαμβάνειν ἀντὶ τοῦ ὀνόματος τὸν λόγον· οἷον, ὅτι ἡ ἡμέρα, ἡλίου φορὰ ὑπὲρ γῆς ἐστί· δῆλον γάρ, ὅτι ὁ τὴν φορὰν ἡλίου ὑπὲρ γῆς εἰρηκώς, τὸν ἥλιον εἴρηκεν· ὥστε * κέχρηται τῷ ἡλίῳ, ὁ τῇ ἡμέρᾳ χρησάμενος. 15 Πάλιν, εἰ τῷ ἀντιδιῃρημένῳ τὸ ἀντιδιῃρημένον ὥρισται, οἷον περιττόν, τὸ μονάδι μεῖζον ἀρτίου. ἅμα γὰρ τῇ φύσει, τὰ ἐκ τοῦ αὐτοῦ γένους ἀντιδιῃρημένα. τὸ δὲ περιττὸν καὶ ἄρτιον * ἀντιδιῄρηνται· ἄμφω γάρ, ἀριθμοῦ διαφοραί. 16 Ὁμοίως δέ, καὶ εἰ διὰ τῶν ὑποκάτω * τὸ ἐπάνω ὥρισται, οἷον ἄρτιον ἀριθμόν, τὸν δίχα διαιρούμενον· ἢ ἀγαθόν, ἕξιν ἀρετῆς. τό, τε γὰρ δίχα, ἀπὸ τῶν δυοῖν εἴληπται, ἀρτίων ὄντων· καὶ ἡ ἀρετή, ἀγαθόν τί ἐστιν. ὥστε ὑποκάτω ταῦτα ἐκείνων ἐστίν. 17 Ἔστι δ' ἀνάγκη τὸν τῷ ὑποκάτω χρώμενον, καὶ αὐτῷ χρῆσθαι. ὅ, τε γὰρ τῇ ἀρετῇ χρώμενος, χρῆται τῷ ἀγαθῷ, ἐπεὶ ἀγαθόν τι ἡ ἀρετή. ὁμοίως δὲ καὶ ὁ τῷ δίχα χρώμενος, τῷ ἀρτίῳ χρῆται, ἐπεὶ εἰς δύο * διῃρῆσθαι σημαίνει τὸ δίχα· τὰ δὲ δύο, ἄρτια ἐστί. 18 Καθόλου μὲν οὖν εἰπεῖν, εἷς ἐστι * τόπος * τὸ μὴ διὰ προτέρων καὶ γνωριμωτέρων ποιήσασθαι τὸν λόγον· μέρη δ' αὐτοῦ, τὰ εἰρημένα.

* γρ. ἕκαστον τ.
* γρ. τόπος
* γρ. ἀποδίδοται
* γρ. τόποι.
* γρ. διὰ τοῦ ἀντικειμένου
* γρ. ὅσ' οὐ καθ' αὑτὰ ἀλλὰ πρ.
* γρ. φωρᾶσαι
* γρ. χρῆται
* γρ. ἀντιδιῄρηται
* γρ. τὰ ἐπ.
* γρ. διαιρεῖσθαι
* γρ. τρόπος
* γρ. τοῦ μὴ δ.

A Patet igitur non eſſe ex talibus definiendum, ſed ex ſimpliciter notioribus. nam hoc tantùm modo vna & eadem definitio ſemper fiet. 7 Fortaſſis autẽ quod ſimpliciter notum *eſt*, non id eſt quod omnibus notum *eſt*, ſed quod *notum eſt* iis qui ratione bene conſtituta præditi ſunt: quemadmodũ & ſimpliciter ſalubre dicitur id quod ſalubre eſt iis quorum corpus bene affectum eſt. 8 Oportet igitur ſingula quæ ſunt eiuſmodi, accuratè explicare. qui verò diſputãt, *iis vti debent*, quatenus expedit. 9 Maximè autem in cõfeſſo eſt, definitionem euerti, ſi neque ex ſimpliciter notioribus, neque ex iis quæ *ſunt* nobis *notiora*, oratio cõfecta ſit. B 10 Vnus igitur locus *probandi* definitionem non eſſe ex notioribus, is eſt quẽ antea diximus, nẽpe cùm priora per poſteriora declarantur. 11 Alius autem *eſt*, ſi eius quod in quiete *conſiſtit*, & definitum *eſt*, definitio tradita ſit per id quod eſt indefinitum, & in motione *conſiſtit*. quod .n. manet & definitum eſt, prius & notius *eſt* eo quod indefinitum & in motu *eſt*. 12 *Ad probandum* autem *definitionem* non *eſſe* ex prioribus, tres ſunt loci. 13 Primus *eſt*, ſi oppoſitum per oppoſita definiuit: vt bonum per malum: quoniam oppoſita ſimul ſunt naturâ. quibuſdam autem etiam eſſe eadem amborum ſcientia videtur. quapropter alterum altero notius non *eſt*. Sed non eſt ignorandum, quædam C fortaſſe non poſſe aliter definiri: vt duplum *non poteſt definiri* ſine dimidio: & quæcumque per ſe ad aliquid referuntur. *in* his .n. omnibus idem eſt eſſentia, & ad aliquid quodam modo ſe habere. quare fieri nequit, vt ſine altero alterius notitia comparetur. proinde neceſſe eſt, vt in alterius definitione alterum quoque comprehẽdatur. Oportet igitur *ea* omnia quæ *ſunt* eiuſmodi, cognoſcere: his autem *locis* in his *rebus* vti, prout videbitur vtile eſſe. 14 Alius *locus eſt*, ſi *in definitione* adhibuit ipſum definitum. *Hoc* autem latet, cùm non vtitur ipſo rei definitæ nomine. vt ſi quis Solem definiat, aſtrũ die perſpicuum. nam qui die vtitur, etiam Sole vtitur. Vt autẽ huiuſcemodi *vitia* D deprehendantur, ſumenda eſt pro nomine definitio: velut, diem eſſe Solis lationẽ ſupra terram. patet enim, eum qui Solis lationem ſupra terram dixit, Solem dixiſſe: quare Sole vſus eſt, qui die vſus eſt. 15 Rurſus, ſi definiuit id quod in diuiſione ponitur, per id quod in eadem diuiſione collocatur. vt ſi impar *definiuit*, quod vnitate maius eſt quàm par. ſimul .n. naturâ ſunt ea, quæ in eiuſdem generis diuiſione ponuntur: impar autem & par in eadem diuiſione ponuntur, cùm ambo ſint numeri differentiæ. 16 Similiter, ſi ſuperius per inferiora definiuit: vt *ſi* parem numerum *dixit eſſe* eum qui bifariàm diuiditur: aut bonum *eſſe* habitum virtutis. E nam & illud, bifariàm, ſumptum eſt à duobus, quę paria ſunt: & virtus eſt bonum quiddã. quare hæc ſub illis ſunt. 17 Neceſſe autem *eſt*, vt is qui inferiori vtitur, etiam ipſo *definito* vtatur. nam & qui vtitur virtute, vtitur bono: quia virtus *eſt* bonum quiddã. & ſimiliter qui vtitur *verbo* bifariàm, vtitur pari: quia verbum, bifariàm, ſignificat in duo diuidi: duo verò, paria ſunt. 18 Vt igitur vniuerſaliter dicam, vnus eſt locus, non ex prioribus & notioribus confectam eſſe definitionem: cuius *loci* partes *ſunt* eæ quæ dictæ ſunt.

Loci à genere, & ab ijs ad quæ definitum refertur. Cap. v.

1 Si genus omiſſum ſit. 2 Si cùm definitum ad multa pertineat, vel non ad omnia ſit aptatum, 3 vel non ad melius, ſed ad deterius. 4 A locis generis. 5 Si poſitum ſit genus remotum non proximum.

SEcundus *locus eſt*, ſi, cùm res ſit in genere, non ſit poſita in genere. in *iis* autē omnibus eſt huiuſmodi peccatum, in quibus orationi non præponitur quid ſit: cuiuſmodi *eſt hæc* corporis definitio, id quod habet tres dimenſiones: aut ſi quis hominem definiat, id quod ſcit numerare. quia dictum non fuit, quid ſit id quod habet tres dimenſiones, aut quid ſit quod ſcit numerare. genus autē debet ſignificare quid ſit: & eorū quæ in definitione dicūtur, primum ſupponitur. 2 Præterea *alius locus eſt*, ſi, cùm ad multa res definita pertineat, non ad omnia aptetur. vt ſi *quis* grāmaticam *definiat*, ſcientiam ſcribendi quod profertur. deeſt enim, & legendi, quandoquidem non magis qui ſcribendi, quàm qui legendi *ſcientiam eſſe* tradidit *grammaticā* definiuit. quare neuter *definiuit*, ſed is *demum* qui ambo hæc dixit: quippe cùm eiuſdē rei plures definitiones eſſe non poſſint. In nonnullis igitur reuera *ita res ſe* habet, vt dictum fuit. in quibuſdam verò non *ita*: vt in iis, quæ non per ſe ad ambo pertinent. quemadmodum medicina *eſt ſcientia* morbum & ſanitatem efficiendi. nam huius per ſe dicitur, illius verò per accidens. ſimpliciter .n. alienū *eſt à* medicina, morbum efficere. quare non magis definiuit, qui ad ambo retulit, quā qui ad alterum: ſed fortaſſe deterius: quia & quiuis alius poteſt morbum efficere. 3 Præterea ſi nō ad melius, ſed ad deterius accōmodauit, cùm plura ſint ad quæ pertinet res definita. omnis .n. ſciētia, & omnis facultas videtur eius eſſe quod optimū eſt. 4 Rurſus, an id quod dictū eſt, non ſit poſitum in proprio genere, conſiderare *oportet* ex elementis ad genera pertinētibus, quemadmodum antea dictum fuit. 5 Præterea *peccat*, qui trāſiliens dicit genera: vt *qui* iuſtitiam *definit*, habitū æquabilitatis effectiuum, aut æqui diſtributiuum. nam virtutem trāſilit, qui ita definit. cùm igitur omittat genus iuſtitiæ, non dicit quidditatem: quādoquidem cuiuſque *rei* eſſentia *eſt* cum genere *coniuncta*. Hoc autem idem *eſt* ac *ſi dicatur* non in proximo genere poſuiſſe. nam qui in proximo poſuit, omnia ſuperiora dixit: quippe cùm omnia ſuperiora genera inferioribus attribuātur. Quocirca vel in proximo genere ponendum eſt *id quod definitur*, vel omnes differentiæ ſuperiori generi adiungi debent, per quas proximum genus definitur. ſic .n. nihil prætermiſſum erit: ſed oratione, loco nominis, inferius genus dictum erit. Qui verò dicit ſolum genus ſuperius, non dicit etiam inferius genus. etenim qui dicit plantam, non dicit arborem.

Δεύτερος δὲ, εἰ ἐν γένει τοῦ πράγματος ὄντος, μὴ κεῖται ἐν γένει. ἐν ἅπασι δὲ τὸ τοιοῦτον ἁμάρτημά ἐστιν, ἐν οἷς οὐ προτίθεται τοῦ λόγου τὸ τί ἐστιν. οἷον, ὁ τοῦ σώματος ὁρισμὸς, τὸ ἔχον τρεῖς διαστάσεις. ἢ εἴ τις τὸν ἄνθρωπον ὁρίσαιτο, τὸ ἐπιστάμενον ἀριθμεῖν. οὐ γὰρ εἴρηται,* τί ὂν, τρεῖς ἔχει διαστάσεις· ἢ τί ὂν, ἐπίσταται ἀριθμεῖν. τὸ δὲ γένος βούλεται τὸ τί ἐστι σημαίνειν, καὶ πρῶτον ὑποτίθεται τῶν ἐν τῷ ὁρισμῷ λεγομένων. 2 Ἔτι, εἰ πρὸς πλείω λεγομένου τοῦ ὁριζομένου, μὴ πρὸς πάντα ἀπέδωκεν. οἷον, εἰ τὴν γραμματικὴν, ἐπιστήμην τοῦ γράψαι τὸ ὑπαγορευθέν. προσδεῖται γὰρ, ὅτι καὶ τοῦ ἀναγνῶναι· οὐδὲν γὰρ μᾶλλον τοῦ γράψαι, ἢ τοῦ ἀναγνῶναι, ὁ ἀποδοὺς ὥρισται. ὥστ' οὐδ' ἕτερος, ἀλλ' ὁ ἄμφω ταῦτ' εἰπών· ἐπεὶ πλείους οὐκ ἐνδέχεται τοῦ αὐτοῦ ὁρισμοὺς εἶναι. ἐπ' ἐνίων μὲν οὖν κατ' ἀλήθειαν ἔχει, καθάπερ εἴρηται. ἐπ' ἐνίων δ' οὔ. οἷον, ἐφ' ὅσων μὴ καθ' αὑτὸ πρὸς ἄμφω λέγεται. καθάπερ ἡ ἰατρικὴ, τοῦ νόσον καὶ ὑγίειαν ποιῆσαι· τοῦ μὲν γὰρ, καθ' αὑτὴν λέγεται· τοῦ δὲ, κατὰ συμβεβηκός· ἁπλῶς γὰρ ἀλλότριον τῆς ἰατρικῆς, τὸ νόσον ποιεῖν. ὥστ' οὐδὲν μᾶλλον ὥρισται, ὁ πρὸς ἄμφω ἀποδοὺς, τοῦ πρὸς θάτερον· ἀλλ' ἴσως καὶ χεῖρον. ἐπεὶ καὶ τῶν λοιπῶν ὁστισοῦν δυνατός ἐστι νόσον ποιῆσαι. 3 Ἔτι, εἰ μὴ πρὸς τὸ βέλτιον, ἀλλὰ πρὸς τὸ χεῖρον ἀπέδωκε, πλειόνων ὄντων, πρὸς ἃ λέγεται τὸ ὁριζόμενον. πᾶσα γὰρ ἐπιστήμη καὶ δύναμις, τοῦ βελτίστου δοκεῖ εἶναι. 4 Πάλιν, εἰ μὴ κεῖται ἐν τῷ οἰκείῳ αὐτοῦ γένει τὸ λεχθὲν, σκοπεῖν ἐκ τῶν* πρὸς τὰ γένη στοιχείων, καθάπερ πρότερον εἴρηται. 5 Ἔτι, εἰ ὑπερβαίνων λέγει τὰ γένη· οἷον, ὁ τὴν δικαιοσύνην, ἕξιν ἰσότητος ποιητικὴν, ἢ διανεμητικὴν τοῦ ἴσου. ὑπερβαίνει γὰρ ὁ οὕτως ὁριζόμενος τὴν ἀρετήν. ἀπολιπὼν οὖν τὸ τῆς δικαιοσύνης γένος, οὐ λέγει τὸ τί ἦν εἶναι. ἡ γὰρ οὐσία ἑκάστῳ, μετὰ τοῦ γένους. ἔστι δὲ τοῦτο ταὐτὸν τῷ μὴ εἰς τὸ ἐγγυτάτω γένος θεῖναι. ὁ γὰρ εἰς τὸ ἐγγυτάτω θεὶς, πάντα τὰ ἐπάνω εἴρηκεν· ἐπειδὴ πάντα τὰ ἐπάνω γένη τῶν ὑποκάτω* κατηγορεῖται. ὥστε ἢ εἰς τὸ ἐγγυτάτω γένος θετέον, ἢ πάσας τὰς διαφορὰς τῷ ἐπάνω γένει προσαπτέον, δι' ὧν ὁρίζεται τὸ ἐγγυτάτω γένος. οὕτω γὰρ οὐδὲν ἂν εἴη παραλελοιπὸς, ἀλλ' ἀντ' ὀνόματος λόγῳ εἰρηκὸς ἂν εἴη τὸ ὑποκάτω γένος. ὁ δ' αὐτὸ μόνον τὸ ἐπάνω γένος εἰπὼν, οὐ λέγει καὶ τὸ ὑποκάτω γένος. ὁ γὰρ φυτὸν εἰπὼν, οὐ λέγει δένδρον.

* γρ. τί ὄν, [illegible] τρεῖς ἔχει διαστάσεις· ἢ τί ὄν, [illegible] (ὅτι ἐπίσταται) ἀριθμεῖν.

* γρ. περὶ τὰ

* γρ. κατηγορεῖται.

Loci à differentiis. Cap. VI.

1 Si non ſint differentiæ generis. Si non ſint differentiæ. 2 Si nulla ſit differentia oppoſita. 3 Si differentia oppoſita non diuidat genus. 4 Si oppoſita differentia generi adiecta non conſtituat ſpeciem. 5 Si differentia exprimatur per negationem, 8 vel ei opponatur negatio. 9 Si ſpecies ponatur quaſi differentia. 10 Si genus ponatur quaſi differentia. 11 Si differentia non ſignificet quale quid. 12 Si per accidens inſit rei definitæ: 13 Si generi attribuatur differentia, vel ſpecies, vel ea quæ ſunt ſub ſpecie. 14 Si de differentia dicatur genus, 15 vel ſpecies, vel ea quæ ſunt ſub ſpecie. 16 Si differentia non ſit prior ſpecie. 17 Si ſit differentia alterius generis. 20 Si ſubſtantiæ differentia ſignificet eſſe in loco. 21 Si affectio pro differentiâ tradita fuerit. 23 Si relati differentia non referatur ad aliquid. 24 Si definiens non referat ad id, ad quod naturâ res refertur, 25 vel non ad primum ſubiectum. 26 A ſubiecto. 28 A tempore.

Πάλιν, ἐπὶ τῶν διαφορῶν ὁμοίως σκεπτέον, εἰ καὶ τὰς διαφορὰς εἶπε τὰς τοῦ γένους. εἰ γὰρ μὴ ταῖς* τοῦ πράγματος ἰδίαις ὥρισται διαφοραῖς, ἢ καὶ παντελῶς τοιοῦτον εἴρηκεν, ὃ μηδενὸς ἐνδέχεται διαφορὰν εἶναι, οἷον, τὸ ζῶον, ἢ τὴν οὐσίαν· δῆλον ὅτι οὐχ ὥρισται· οὐδενὸς γὰρ διαφοραὶ, τὰ εἰρημένα. 2 Ὁρᾶν δὲ καὶ, εἰ ἔστιν ἀντιδιῃρημένον τι τῇ εἰρημένῃ* διαφορᾷ. εἰ γὰρ μὴ ἔστι, δῆλον ὅτι οὐκ ἂν εἴη ἡ εἰρημένη, τοῦ γένους διαφορά· πᾶν γὰρ γένος ταῖς ἀντιδιῃρημέναις διαφοραῖς διαιρεῖται· καθάπερ τὸ ζῶον τῷ πεζῷ, καὶ τῷ πτηνῷ, καὶ τῷ ἐνύδρῳ, καὶ τῷ δίποδι. 3 Ἢ, εἰ ἔστι μὲν ἀντιδιῃρημένη διαφορὰ, μὴ ἀληθεύεται δὲ κατὰ τοῦ γένους. δῆλον γὰρ, ὅτι οὐδετέρα ἂν εἴη τοῦ γένους διαφορά· πᾶσαι γὰρ αἱ ἀντιδιῃρημέναι διαφοραὶ ἀληθεύονται κατὰ τοῦ οἰκείου γένους. 4 Ὁμοίως δὲ καὶ, εἰ ἀληθεύεται μὲν, μὴ ποιεῖ δὲ προστιθεμένη τῷ γένει εἶδος. δῆλον γὰρ, ὅτι οὐκ ἂν εἴη αὕτη εἰδοποιὸς διαφορὰ τοῦ γένους· πᾶσα γὰρ εἰδοποιὸς διαφορὰ, μετὰ τοῦ γένους, εἶδος ποιεῖ· εἰ δ' αὕτη μή ἐστι διαφορὰ, οὐδ' ἡ λεχθεῖσα, ἐπεὶ ταύτῃ ἀντιδιῄρηται. 5 Ἔτι, ἐὰν ἀποφάσει διαιρῇ τὸ γένος, καθάπερ οἱ τὴν γραμμὴν ὁριζόμενοι, μῆκος ἀπλατὲς εἶναι. οὐδὲν γὰρ ἄλλο σημαίνει, ἢ ὅτι οὐκ ἔχει πλάτος. συμβήσεται οὖν, τὸ γένος μετέχειν τοῦ εἴδους· πᾶν γὰρ μῆκος, ἢ ἀπλατὲς, ἢ πλάτος ἔχον ἐστίν· ἐπεὶ κατὰ παντὸς ἢ ἡ κατάφασις ἢ ἡ ἀπόφασις ἀληθεύεται. ὥστε καὶ τὸ γένος τῆς γραμμῆς, μῆκος ὂν, ἢ ἀπλατὲς, ἢ πλάτος ἔχον ἔσται. μῆκος δὲ ἀπλατὲς, εἴδους ἐστὶ λόγος· ὁμοίως δὲ καὶ μῆκος πλάτος ἔχον. τὸ γὰρ ἀπλατὲς, καὶ τὸ πλάτος ἔχον, διαφοραί εἰσιν· ἐκ δὲ τῆς διαφορᾶς, καὶ τοῦ γένους, ὁ τοῦ εἴδους ἐστὶ λόγος. ὥστε τὸ γένος ἐπιδέχοιτ' ἂν τὸν τοῦ εἴδους λόγον. ὁμοίως δὲ καὶ τὸν τῆς διαφορᾶς· ἐπείπερ ἡ ἑτέρα τῶν εἰρημένων διαφορῶν, ἐξ ἀνάγκης κατηγορεῖται τοῦ γένους. 6 Ἔστι δ' ὁ εἰρημένος τόπος χρήσιμος πρὸς τοὺς τιθεμένους ἰδέας εἶναι. εἰ γάρ ἐστιν αὐτομῆκος, πῶς κατηγορηθήσεται κατὰ τοῦ γένους, ὅτι πλάτος ἔχον ἐστὶν, ἢ ἀπλατές ἐστι; δεῖ γὰρ κατὰ παντὸς μήκους τὸ ἕτερον αὐτῶν ἀληθεύεσθαι, εἴπερ κατὰ τοῦ γένους ἀληθεύεσθαι μέλλει. τοῦτο δ' οὐ συμβαίνει. ἔστι γὰρ ἀπλατῆ, καὶ πλάτος ἔχοντα μήκη. ὥστε πρὸς ἐκείνους μόνους χρήσιμος ὁ τόπος, *οἳ τὸ γένος, ἓν ἀριθμῷ φασὶν εἶναι. τοῦτο δὲ ποιοῦσιν οἱ τὰς ἰδέας μόνον τιθέμενοι. αὐτομῆκος γὰρ, καὶ αὐτοζῶον, γένος φασὶν εἶναι. 7 Ἴσως δ' ἐπ' ἐνίων ἀναγκαῖον καὶ ἀποφάσει χρῆσθαι τὸν ὁριζόμενον. οἷον, ἐπὶ τῶν στερήσεων. τυφλὸν γάρ ἐστι, τὸ μὴ ἔχον ὄψιν, ὅτε πέφυκεν ἔχειν. 8 Διαφέρει δ' οὐδὲν, ἀποφάσει διελεῖν τὸ γένος, ἢ τοιαύτῃ καταφάσει, ᾗ ἀπόφασιν ἀναγκαῖον ἀντιδιῃρῆσθαι. οἷον, εἰ μῆκος πλάτος ἔχον* ὥρισται. τῷ γὰρ πλάτος ἔχοντι, τὸ μὴ ἔχον πλάτος ἀντιδιῄρηται, ἄλλο δ' οὐδέν· ὥστε ἀποφάσει πάλιν διαιρεῖται τὸ γένος. 9 Πάλιν, εἰ τὸ εἶδος ὡς διαφορὰν ἀπέδωκε. καθάπερ οἱ τὸν προπηλακισμὸν, ὕβριν μετὰ χλευασίας ὁριζόμενοι. ἡ γὰρ χλευασία, ὕβρις τις· ὥστ' οὐ διαφορὰ, ἀλλ' εἶδος, ἡ χλευασία. 10 Ἔτι, εἰ τὸ γένος ὡς διαφορὰν εἴρηκεν· οἷον, τὴν ἀρετὴν, ἕξιν ἀγαθὴν, ἢ σπουδαίαν. γένος γὰρ, τἀγαθὸν, τῆς ἀρετῆς ἐστιν. ἢ οὐ γένος τἀγαθὸν, ἀλλὰ διαφορά; εἴπερ ἀληθὲς, ὅτι οὐκ ἐνδέχεται

* γρ. τὸ γένος

* γρ. τὸ γένος διαφ.

* γρ. εἰ πῶς γ.

* γρ. ὡρίσατο.

A Rurſus in differentiis ſimiliter conſiderandum *eſt*, an generis differentias dixerit. niſi n. propriis rei differentiis definierit; aut *ſi* omnino tale *quidpiam* dixerit, quod nullius rei poſſit eſſe differentia, vt animal, aut ſubſtantiam: patet, eum non definiuiſſe: quoniã hæc nullius *rei* differẽtiæ ſunt. 2 Videre etiam *oportet*, an ſit aliquid in diuiſione oppoſitum dictæ differentiæ. niſi.n.ſit, patet, eam quæ dicta eſt, non eſſe generis differẽtiam. Omne enim genus iis differẽtiis diuiditur, quæ ſibi inuicem in diuiſione opponuntur: vt animal pedeſtri & volucri, & aquatili, & bipede. 3 Aut ſi ſit quidẽ oppoſita *aliqua* differẽtia, non tamen verè dicatur B de genere. patet.n. neutram eſſe *eius* generis differentiam. omnes.n. differentiæ, quæ ſibi inuicem in diuiſione opponuntur, de proprio genere verè dicuntur. 4 Item ſi verè quidem dicatur *de genere*, ſed generi adiuncta non efficiat ſpeciem. cõſtat n. hãc non eſſe ſpecificam differentiam generis: quãdoquidem omnis ſpecifica differẽtia cum genere *coniuncta* ſpeciem efficit. quòd ſi hæc non ſit differentia, ne ea quidem, quæ dicta fuit, *differentia erit*: quoniam huic in diuiſione opponitur. 5 Præterea *peccauit*, ſi negatione diuiſit genus; vt *ij* qui lineam definiunt eſſe longitudinem latitudine carẽtem. quod nihil aliud ſignificat, quã non habere latitudinẽ. accidit igitur, vt genus ſit particeps ſpeciei: C quoniam omnis lõgitudo vel latitudine caret, vel latitudinem habet: quippe cùm de omni *re* aut affirmatio, aut negatio verè dicatur. quare & genus lineæ, quod eſt longitudo, vel latitudine carebit, vel latitudinẽ habebit. atqui longitudo carens latitudine, ſpeciei eſt definitio: itémque longitudo habens latitudinem: quia latitudinis expers, & latitudinem habens, ſunt differentiæ: ex differentia verò & genere conſtat ſpeciei definitio. quare genus recipiet ſpeciei definitionem. ſimiliterq; differentiæ *definitionem*: quãdoquidem dictarum differentiarum altera neceſſariò attribuitur generi. 6 Eſt autẽ dictus locus vtilis aduerſus eos qui ponũt ideas eſſe. nam ſi ſit ipſa longitudo, quomodo D generi attribuetur latitudine carere, aut latitudine vacare? oportet.n. de omni lõgitudine alterum eorum verè dici, ſi futurum eſt, vt de genere verè dicatur. hoc autem non contingit: cùm ſint lõgitudines quæ latitudine carẽt, & quæ latitudinem habent. Quare aduerſus eos ſolos vtilis eſt *hic* locus, qui genus aiunt vnũ eſſe numero. quod quidẽ ij tantùm faciunt, qui ideas ponunt: quoniã ipſam longitudinẽ & ipſum animal, genus eſſe inquiunt. 7 Fortaſſe autem in nõnullis neceſſe *eſt* negatione vti eum qui definiuit, vt in priuationibus. nam cæcum eſt, quod non habet viſum, quando ſecundùm naturam habere debet. 8 Nihil autẽ refert, E vtrùm negatione diuidatur genus, an huiuſmodi affirmatione, cui neceſſe *ſit* negationẽ in diuiſione opponi. vt ſi *quis* longitudinem quæ latitudinẽ habet, definierit. nam ei quod latitudinem habet, nihil aliud in diuiſione opponitur, quàm id quod latitudinem non habet: proinde rurſus negatione genus diuiditur. 9 Rurſus *videndũ eſt*, an ſpeciem tradiderit quaſi differentiam: quemadmodum ij qui conuitium definiunt, contumeliam cum irriſione. nam irriſio *eſt* contumelia quædam. quamobrem irriſio non *eſt* differentia, ſed ſpecies. 10 Præterea *videndum eſt*, an genus quaſi differentiam dixerit: vt virtutem *eſſe* habitum bonum vel probum: quandoquidem bonum, virtutis eſt genus. An bonum non *eſt* genus, ſed differentia? ſiquidem fieri non poteſt, vt idem

ſit in duobus generibus, quorum neutrum alterū contineat: quia nec bonum cōtinet habitum, nec habitus bonū. etenim nec omnis habitus *eſt* in bonis, nec omne bonum eſt habitus. quare non erūt ambo *virtutis* genera. ſi igitur habitus *eſt* virtutis genus: patet, bonum, non *eſſe* genus, ſed potiùs differentiam. Præterea habitus ſignificat quid ſit virtus: bonum autem, non quid ſit, ſed quale: videtur autē differentia quale quid ſignificare. 11 Videre etiam *oportet*, an data differētia non ſignificet quale quid, ſed hoc aliquid. omnis.n. differentia videtur quale quid declarare. 12 Conſiderare etiā *oportet*, an differentia per accidens inſit rei definitæ. nulla.n. differētia eſt *in* eorum *numero* quæ per accidens inſunt, quemadmodū nec genus: quia fieri nequit, vt differentia eidem inſit, & non inſit. 13 Præterea, ſi generi attribuatur differentia, vel ſpecies, vel aliquid ſpeciei ſubiectum: vtique nō definiuit: quia nihil horum quæ dixi, generi attribui poteſt. quippe cùm genus latiùs, quam *hæc* omnia, pateat. 14 Rurſus, ſi attribuatur genus differētiæ: non.n. differentiæ, ſed *iis* de quibus differētia *dicitur*, genus attribui videtur: vt animal homini, & boui, & aliis pedeſtribus animalibus, non ipſi differentiæ, quæ de ſpecie dicitur. nam ſi ſingulis differētiis genus attribuetur, certè multa animalia ſpeciei attribuentur: quandoquidem differentiæ ſpeciei attribuuntur. Præterea omnes differentiæ vel erunt ſpecies, vel indiuidua: ſiquidē ſint animalia. vnūquodque.n. animal aut eſt ſpecies, aut indiuiduum. 15 Similiter etiam conſiderandum *eſt*, an ſpecies, vel aliquid eorum quæ *ſunt* ſub ſpecie, differētiæ attribuatur. *hoc*.n fieri nequit: quia de pluribus differētia dicitur, quam ſpecies. Præterea accidet, vt differentia ſit ſpecies, ſi quæ ſpecies de ea dicatur. nam ſi *differentiæ* attribuitur homo, manifeſtum *eſt*, differētiam eſſe hominem. 16 Rurſus *vidēdum eſt*, an differentia nō ſit prior ſpecie. oportet.n. differētiam eſſe genere poſteriorem, ſpecie verò priorem. 17 Conſiderare etiam *oportet*, an alterius generis *ſit ea* differentia, quæ dicta *fuit*, quod neque *ab ea* contineatur, neq; *eam* contineat: quia non videtur eadem differentia eſſe duorum generum, quorum neutrum ſub altero cōtineatur. alioquin accidet etiam ſpeciem cādem in duobus generibus eſſe, quorum neutrum alterū continebit. nam ex vnaquaque differentia concluditur proprium genus: vt ex pedeſtri & bipede concluditur animal. quare ſi *de eo dicitur* vtrūque genus, de quo *dicitur* differentia: patet ſpeciem *eſſe* in duobus generibus, quorum neutrum ſub altero continetur. 18 An non impoſſibile *eſt* eandem differētiam eſſe duorum generum, quorum neutrum contineatur ſub altero: ſed adiiciendum *eſt*, nec vtrumque ſub eodem cōtinetur? nam pedeſtre animal & alatum animal, ſunt genera, quorum neutrum ſub altero cōtinetur, & eorum vtriuſque, bipes, eſt differentia. quare adiungendū *eſt*, nec vtrumque ſub eodē continetur. hæc.n. ambo ſub animali ſunt. 19 Patet etiam, non neceſſariò ex omni differentia concludi proprium genus: cùm accidat eandem eſſe duorū generum, quorum neutrū ſub altero continetur: ſed alterum tantùm *genus* neceſſariò cōcludi, & omnia quæ ſupra illud *ſunt*: quemadmodum ex bipede alatum vel pedeſtre animal cōcluditur. 20 Videre etiam *oportet*, an *eſſe* in aliquo, quaſi ſubſtantiæ differentiam tradiderit: quia non videtur ſubſtantia à ſubſtantia differre eo quod ſit alicubi,

A ταὐτὸ ἐν δυσὶ γένεσιν εἶναι, μὴ περιέχουσιν ἄλληλα. οὔτε γὰρ τἀγαθὸν τὴν ἕξιν περιέχει, οὔθ' ἡ ἕξις τἀγαθόν· οὐ γὰρ πᾶσα ἕξις, ἀγαθόν· οὐδὲ πᾶν ἀγαθὸν, ἕξις. ὥστ' οὐκ ἂν εἴη γένη ἀμφότερα. * εἰ οὖν ἡ ἕξις, τῆς ἀρετῆς γένος, δῆλον ὅτι τἀγαθὸν, οὐ γένος, ἀλλὰ μᾶλλον διαφορά. ἔτι, ἡ μὲν ἕξις τί ἐστι σημαίνει ἡ ἀρετή· τὸ δ' ἀγαθὸν, οὐ τί ἐστιν, ἀλλὰ ποιόν· δοκεῖ δὲ ἡ διαφορὰ ποιόν τι σημαίνειν. 11 Ὁρᾶν δὲ καὶ, εἰ μὴ ποιόν τι, ἀλλὰ τόδε τι σημαίνει ἡ ἀποδοθεῖσα διαφορά. δοκεῖ γὰρ ποιόν τι πᾶσα διαφορὰ δηλοῦν. 12 Σκοπεῖν δὲ καὶ, εἰ κατὰ συμβεβηκὸς ὑπάρχει τῷ ὁριζομένῳ ἡ διαφορά. οὐδεμία γὰρ διαφορὰ, τῶν κατὰ συμβεβηκὸς ὑπαρχόντων ἐστὶ, καθάπερ οὐδὲ τὸ γένος· οὐ γὰρ ἐνδέχεται τὴν διαφορὰν ὑπάρχειν τινὶ, καὶ μὴ ὑπάρχειν. 13 Ἔτι, εἰ κατηγορεῖται τοῦ γένους ἡ διαφορὰ, ἢ τὸ εἶδος, ἢ τῶν κάτωθέν τι τοῦ εἴδους· οὐκ ἂν εἴη * ὡρισμένος. οὐδὲν γὰρ τῶν εἰρημένων, ἐνδέχεται τοῦ γένους κατηγορεῖσθαι· ἐπειδὴ τὸ γένος ἐπὶ * πλεῖον πάντων λέγεται. 14 Πάλιν, εἰ κατηγορεῖται τὸ γένος τῆς διαφορᾶς· οὐ γὰρ κατὰ τῆς διαφορᾶς, ἀλλὰ καθ' ὧν ἡ διαφορὰ, τὸ γένος δοκεῖ κατηγορεῖσθαι εἶναι, οἷον τὸ ζῷον κατὰ τοῦ ἀνθρώπου, καὶ τοῦ βοὸς, καὶ τῶν ἄλλων πεζῶν ζῴων, * οὐκ αὐτῆς τῆς διαφορᾶς, τῆς κατὰ τοῦ εἴδους λεγομένης. εἰ γὰρ καθ' ἑκάστης τῶν διαφορῶν τὸ ζῷον κατηγορηθήσεται, πολλὰ ζῷα τοῦ C εἴδους ἂν κατηγοροῖτο· αἱ γὰρ διαφοραὶ, τοῦ εἴδους κατηγοροῦνται. ἔτι, διαφοραὶ πᾶσαι ἢ εἴδη, ἢ ἄτομα ἔσται, εἴπερ εἴη ζῷα· ἕκαστον γὰρ τῶν ζῴων, ἢ εἶδός ἐστιν, ἢ ἄτομον. 15 Ὁμοίως δὲ σκεπτέον καὶ, εἰ τὸ εἶδος, ἢ τῶν ὑποκάτω τι τοῦ εἴδους, τῆς διαφορᾶς κατηγορεῖται· ἀδύνατον γὰρ, ἐπειδὴ ἐπὶ πλέον ἡ διαφορὰ, τῶν εἰδῶν λέγεται. ἔτι, συμβήσεται τὴν διαφορὰν εἶδος εἶναι, εἴπερ * κατηγορηθήσεταί τι αὐτῆς τῶν εἰδῶν. Εἰ γὰρ * κατηγορεῖται ὁ ἄνθρωπος, δῆλον ὅτι ἡ διαφορὰ ἄνθρωπός ἐστι. 16 Πάλιν, εἰ μὴ πρότερον ἡ διαφορὰ, τοῦ εἴδους. τοῦ μὲν γὰρ γένους ὕστερον, τοῦ δὲ εἴδους πρότερον τὴν διαφορὰν δεῖ εἶναι. 17 D Σκοπεῖν δὲ καὶ, εἰ ἑτέρου γένους ἡ ῥηθεῖσα διαφορὰ, μηδὲ περιεχομένου, μηδὲ περιέχοντος. οὐ δοκεῖ γὰρ ἡ αὐτὴ διαφορὰ δύο γενῶν εἶναι, μὴ περιεχόντων ἄλληλα. Εἰ δὲ μὴ, συμβήσεται καὶ εἶδος τὸ αὐτὸ, ἐν δυσὶ γένεσιν εἶναι μὴ περιέχουσιν ἄλληλα. ἐπιφέρει γὰρ ἑκάστη τῶν διαφορῶν τὸ οἰκεῖον γένος· καθάπερ τὸ πεζὸν καὶ τὸ δίπουν, τὸ ζῷον συνεπιφέρει. ὥστε, εἰ καθ' οὗ ἡ διαφορὰ, καὶ τῶν γενῶν ἑκάτερον. δῆλον οὖν, ὅτι τὸ εἶδος ἐν δυσὶ γένεσιν οὐ περιέχουσιν ἄλληλα. 18 Ἢ οὐκ ἀδύνατον τὴν αὐτὴν διαφορὰν δύο γενῶν εἶναι, μὴ περιεχόντων ἄλληλα· ἀλλὰ προσθετέον, μηδὲ ἄμφω ὑπὸ ταὐτὸ ὄντων; τὸ γὰρ πε-E ζὸν ζῷον, καὶ τὸ πτηνὸν ζῷον, γένη ἐστὶν οὐ περιέχοντα ἄλληλα. καὶ ἀμφοτέρων αὐτῶν τὸ δίπουν ἐστὶ διαφορά. ὥστε προσθετέον, ὅτι μηδὲ ὑπὸ τὸ αὐτὸ ὄντων ἄμφω. ταῦτα γὰρ ἄμφω ὑπὸ τὸ ζῷόν ἐστι. 19 Δῆλον δὲ καὶ, ὅτι οὐκ ἀνάγκη * τὴν διαφορὰν πᾶσαν, τὸ οἰκεῖον ἐπιφέρειν γένος· ἐπεὶ ἐνδέχεται τὴν αὐτὴν δύο γενῶν εἶναι, μὴ περιεχόντων ἄλληλα· ἀλλὰ τὸ ἕτερον μόνον ἀναγκη συνεπιφέρειν, καὶ τὰ ἐπάνω τούτου πάντα, καθάπερ τὸ δίπουν, ὃ πτηνὸν ἢ τὸ πεζὸν συνεπιφέρει ζῷον. 20 Ὁρᾶν δὲ καὶ, εἰ τὸ ἔν τινι, ὡς διαφορὰν ἀποδέδωκεν οὐσίας. οὐ δοκεῖ γὰρ διαφέρειν οὐσία οὐσίας τῷ ποῦ εἶναι.

* γρ. ἐπεὶ οὖν
* γρ. ὡρισμένη
* γρ. πλείω
* γρ. οὐ κατ' αὐτῆς
* γρ. κατηγορεῖται
* γρ. κατηγορηθήσεται
* γρ. τὴν διαφορὰν τὸ οἰκεῖον ἐπιφ.

διὸ καὶ τοὺς τὸ πεζὸν καὶ τὸ ἔνυδρον διαιροῦντας τὸ ζῷον, ἐπιτιμῶσιν, ὡς τὸ πεζὸν καὶ τὸ ἔνυδρον ποῦ σημαῖνον. ἢ ἐπὶ μὲν τούτων οὐκ ὀρθῶς ἐπιτιμῶσιν. οὐ γὰρ ἐν τινὶ, οὐδὲ ποῦ σημαίνει τὸ ἔνυδρον, καὶ τὸ χερσαῖον, ἀλλὰ ποιόν τι. * καὶ γὰρ ἂν ᾖ ἐν τῷ ξηρῷ, ὁμοίως ἔνυδρον. ὁμοίως δὲ τὸ χερσαῖον, κἂν ἐν ὑγρῷ, χερσαῖον, ἀλλ' οὐκ ἔνυδρον ἔσται. ἀλλ' ὅμως ἐάν ποτε σημαίνῃ τὸ ἔν τινι ἡ διαφορά, δῆλον ὅτι διημαρτηκὼς ἔσται. 21 Πάλιν, εἰ τὸ πάθος, διαφορὰν ἀποδέδωκε. πᾶν γὰρ πάθος μᾶλλον γινόμενον, ἐξίστησι τῆς οὐσίας· ἡ δὲ διαφορὰ, οὐ τοιοῦτον· μᾶλλον γὰρ σώζειν δοκεῖ ἡ διαφορὰ, οὗ ἐστι διαφορά. καὶ ἁπλῶς ἀδύνατον εἶναι ἄνευ τῆς οἰκείας διαφορᾶς ἕκαστον· πεζοῦ γὰρ μὴ ὄντος, οὐκ ἔσται ἄνθρωπος. 22 Ἁπλῶς δ' εἰπεῖν, καθ' ὅσα ἀλλοιοῦται τὸ ἔχον, οὐδὲν τούτων διαφορὰ ἐκείνου· ἅπαντα γὰρ τὰ τοιαῦτα μᾶλλον γινόμενα, ἐξίστησι τῆς οὐσίας. ὥστ' εἴ τινα τοιαύτην διαφορὰν ἀπέδωκεν, ἡμάρτηκεν· ἁπλῶς γὰρ οὐκ ἀλλοιούμεθα κατὰ τὰς διαφοράς. 23 Καὶ εἴ τινος τῶν πρός τι, μὴ πρὸς ἄλλο τι τὴν διαφορὰν ἀποδέδωκε. τῶν γὰρ πρός τι, καὶ αἱ διαφοραὶ πρός τι· καθάπερ καὶ ἐπὶ τῆς ἐπιστήμης· θεωρητικὴ γὰρ, καὶ πρακτικὴ, καὶ ποιητικὴ λέγεται· ἕκαστον δὲ τούτων πρός τι σημαίνει· θεωρητικὴ γάρ τινος, καὶ ποιητική τινος, καὶ πρακτική τινος. 24 Σκοπεῖν δὲ καὶ, εἰ πρὸς ὃ πέφυκεν ἕκαστον τῶν πρός τι, ἀποδίδωσιν ὁ ὁριζόμενος. ἐνίοις μὲν γὰρ, πρὸς ὃ πέφυκεν ἕκαστον τῶν πρός τι, μόνον ἐστὶ χρῆσθαι· πρὸς ἄλλο δ' οὐδέν, οἷον τῇ ὄψει, πρὸς τὸ ἰδεῖν μόνον, ἐνίοις δὲ καὶ πρὸς ἄλλο τι, οἷον τῇ στλεγγίδι κἂν ἀρύσαιτό τις· ἀλλ' ὅμως, εἴ τις ὁρίσαιτο τὴν στλεγγίδα, ὄργανον πρὸς τὸ ἀρύειν, ἡμάρτηκεν· οὐ γὰρ πρὸς τοῦτο πέφυκεν. ὅρος δὲ τοῦ πρὸς ὃ πέφυκεν, ἐφ' ὃ ἂν χρήσαιτο ὁ φρόνιμος ᾗ φρόνιμος, καὶ ἡ περὶ ἕκαστον οἰκεία ἐπιστήμη. 25 Ἔτι, εἰ μὴ τοῦ πρώτου ἀποδέδωκεν, ὅταν τυγχάνῃ πρὸς πλείω λεγόμενον, οἷον τὴν φρόνησιν, ἀρετὴν ἀνθρώπου, ἢ ψυχῆς, καὶ μὴ τοῦ λογιστικοῦ· πρώτου γὰρ τοῦ λογιστικοῦ ἀρετὴ, ἡ φρόνησις· κατὰ γὰρ τοῦτο, καὶ ἡ ψυχὴ, καὶ ὁ ἄνθρωπος φρονεῖν λέγεται. 26 Ἔτι, εἰ μὴ δεκτικόν ἐστιν, οὗ εἴρηται τὸ ὡρισμένον, πάθος, ἢ ἡ διάθεσις, ἢ ὁτιοῦν ἄλλο, ἡμάρτηκε. πᾶσα γὰρ διάθεσις, καὶ πᾶν πάθος, ἐν ἐκείνῳ πέφυκε γίνεσθαι, οὗ ἐστι διάθεσις, ἢ πάθος· καθάπερ καὶ ἡ ἐπιστήμη, ἐν ψυχῇ, διάθεσις οὖσα ψυχῆς. ἐνίοτε δὲ διαμαρτάνουσιν ἐν τοῖς τοιούτοις· οἷον ὅσοι λέγουσιν, ὅτι ὕπνος ἐστὶν ἀδυναμία * αἰσθήσεως· καὶ ἡ ἀπορία, ἰσότης ἐναντίων λογισμῶν· καὶ ἡ ἀλγηδὼν, διάστασις τῶν συμφύτων μερῶν μετὰ βίας· οὔτε γὰρ ὁ ὕπνος ὑπάρχει τῇ αἰσθήσει, ἔδει δ', εἴπερ ἀδυναμία αἰσθήσεώς ἐστιν. ὁμοίως δ' οὐδ' ἡ ἀπορία ὑπάρχει * τοῖς ἐναντίοις λογισμοῖς· οὐδ' ἡ ἀλγηδὼν τοῖς συμφύτοις μέρεσιν ὑπάρχει· * ἀλγήσει γὰρ τὰ ἄψυχα, εἴπερ ἀλγηδὼν αὐτοῖς παρέσται. τοιοῦτος δὲ καὶ ὁ τῆς ὑγιείας ὁρισμὸς, εἴπερ συμμετρία θερμῶν καὶ ψυχρῶν ἐστιν· ἀνάγκη γὰρ ὑγιαίνειν τὰ θερμὰ καὶ ψυχρά· ἡ γὰρ ἑκάστου συμμετρία, ἐν ἐκείνοις ὑπάρχει, ὧν ἐστι συμμετρία· ὥστε ἡ ὑγίεια ὑπάρχοι ἂν αὐτοῖς. 27 Ἔτι, τὸ ποιούμενον εἰς τὸ ποιητικὸν, ἢ ἀνάπαλιν συμβαίνει τιθέναι τοῖς οὕτως ὁριζομένοις. οὐ γάρ ἐστιν ἀλγηδὼν ἡ διάστασις τῶν συμφύτων

* γρ. καὶ γὰρ ἂν ἐν τῷ ὑγρῷ ᾖ τὸ χερσαῖον, ἔσται ὁμοίως χερσαῖον, ἀλλ' οὐκ ἔνυδρον.

* γρ. αἰσθήσεως· οὐ γὰρ αἰσθήσεως, ἀλλὰ ζῴου ὁμοίως δὲ ἡ ἀπορ.

* γρ. τοῖς ἴσοις.

* γρ. ἀλγήσει

A Idcirco & eos reprehẽdunt, qui pedeſtri & aquatili animal diuidunt: quaſi pedeſtre & aquatile ſignificent *eſſe* alicubi. An in his non rectè reprehẽdunt? quoniam aquatile & terrenum non ſignificant *eſſe* in aliquo, nec alicubi, ſed quale quid. nam etſi ſit in *loco* ſicco, æquè *erit* aquatile. ſimiliter ſi terrenum ſit in loco humido, terrenum erit, non aquatile. Verumtamen ſi quando differẽtia ſignificet eſſe in aliquo: manifeſtum erit, *eum* peccaſſe *qui definiuit*. 21 Item *videndum eſt*, an affectionẽ pro differẽtia tradiderit. omnis n. affectio, maior facta, eſſentiam *de ſtatu ſuo* dimouet: differentia verò nõ B *eſt* eiuſmodi: quin potiùs videtur differẽtia *id* ſeruare, cuius eſt differentia. & ſimpliciter fieri nequit, vt ſine propria differentia quidque ſit. niſi. n. ſit pedeſtre, non erit homo. 22 Et, vt ſimpliciter dicam, ſecundùm quæ variatur id quod habet, eorum nihil differẽtia illius *eſt*. nam omnia quæ ſunt eiuſmodi, ſi maiora fiant, eſſentiam *è ſtatu ſuo* dimouent. Quocirca qui talẽ aliquam differentiam tradidit, peccauit: quoniam omnino nõ variamur ſecundùm differentias. 23 *Peccauit* etiam, ſi cuius ad aliquid *relati* differentiam tradiderit, quæ ad aliud quidpiam non *referatur*. nam eorum quæ ad aliquid *referuntur*, etiam differentiæ *referuntur* ad C aliquid: quemadmodum & in ſcientia *perſpici poteſt*. dicitur enim contemplatiua, & actiua, & effectiua: quorum vnumquodq; ſignificat ad aliquid: eſt enim alicuius *rei* contemplatiua, & alicuius effectiua, & alicuius actiua. 24 Conſiderare etiam *oportet*, an is qui definit, *id* tradat, ad quod naturâ refertur vnumquodque eorum quæ *ſunt* ad aliquid. quibuſdam enim ad nihil aliud vti licet, quàm ad id, ad quod ſingula referuntur naturâ: vt aſpectu *vti* ſolùm *licet* ad cernendum, nonnullis verò & ad aliud quiddam *vti licet*: vt ſtrigili haurire aliquis poteſt. ſi quis tamẽ ſtrigilem definiuit, D inſtrumentum ad hauriendum, peccauit: quia non ad hoc eſt comparata. eius autem ad quod nata & comparata res eſt, definitio *hæc eſt*, *id* ad quod vtatur prudens quâ *eſt* prudens, & propria ſcientia quæ circa quamque rem *verſatur*. 25 Prꝗterea *videndum eſt*, an non ad primum accommodauerit, cùm ad plura pertineat: vt *ſi quis* prudentiam *definiat*, virtutem hominis, vel animæ: non, rationalis *facultatis*. nam prudentia primùm *eſt* virtus *facultatis* rationalis: etenim ſecundùm hanc & anima, & homo prudens eſſe dicitur. 26 Prætereà peccauit, niſi ſuſceptiuum ſit *id*, cuius res definita dicitur *eſſe* affectio, vel diſpoſitio, vel quiduis aliud. naturâ enim comparatum eſt, vt omnis E diſpoſitio & omnis affectio in eo gignatur, cuius eſt diſpoſitio vel affectio: quemadmodum & ſciẽtia *gignitur* in anima, cùm ſit diſpoſitio animæ. Interdum autem in huiuſmodi *rebus* peccant: vt qui dicunt ſomnum eſſe imbecillitatem ſenſus: & dubitationem, ęqualitatem contrariarum rationum: & dolorem, ſeparationem partium naturâ coniunctarum, vi *factam*. etenim nec ſomnus ineſt ſenſui, deberet autem *ineſſe*, ſi eſſet imbecillitas ſenſus: ſimiliter nec dubitatio ineſt contrariis rationibus: nec dolor ineſt partibus naturâ coniunctis: dolebunt enim res inanimæ, ſiquidem dolor eis aderit. Talis *eſt* etiam valetudinis definitio, ſi quidem eſt ſymmetria calidorum & frigidorum. neceſſe enim *eſt* valere res calidas & frigidas: quia ſingulorum ſymmetria in iis *rebus* ineſt, quorum eſt ſymmetria: itaque valetudo iis inerit. 27 Accidit prætereà, vt qui ſic definiunt, reducant id quod fit, ad effectiuum, vel contrà. non enim ſeparatio partium naturâ coniunctarum,

eſt dolor, ſed effectiuum doloris: nec imbecillitas ſenſus, eſt ſomnus: ſed alterum eſt effectiuum alterius: aut enim propter imbecillitatem ſomno opprimimur, aut propter ſomnum ſumus imbecilli. Similitérque cõtrariarum rationum æqualitas videri poteſt eſſe effectiuum dubitationis. cùm.n. in vtramque partem ratiocinamur, & ęquè videntur omnia vtroque modo fieri, tum dubitamus vtrum agamus. 28 Præterea ſecundùm omnia tempora inſpiciẽdum eſt, an alicubi diſcrepet, vt ſi *quis* immortale definierit, quod nũc eſt interitus expers. animal.n. quod nunc eſt interitus expers, nũc immortale erit. An in hoc nõ accidit? quoniam illud, nunc interitus expers eſſe, ambiguum *eſt*. aut.n. non interiiſſe nũc, ſignificat, aut non poſſe interire nunc, aut nunc eſſe eiuſmodi vt numquã intereat. Cùm igitur dicimus interitus expers nũc eſſe animal: non hoc dicimus, nunc tale eſſe animal, ſed quod numquam intereat. quod idem eſt atq; immortale. quare nõ accidit, vt nunc immortale ſit. Attamen ſi vbi accidat, vt id quod in definitione traditum eſt, nunc inſit, vel prius; id verò quod nomine *declaratur*, non inſit: certè non idem erit. Vtendum igitur eſt *hoc* loco, quemadmodum dictum eſt.

μερῶν, ἀλλὰ ποιητικὸν ἀλγηδόνος· οὐδ' ἡ ἀδυναμία τῆς αἰσθήσεως, ὁ ὕπνος, ἀλλὰ ποιητικὸν θάτερον θατέρου. ἤτοι γὰρ διὰ τὴν ἀδυναμίαν* ὑπνοῦμεν, ἢ διὰ τὸν ὕπνον ἀδυνατοῦμεν. ὁμοίως δὲ καὶ τῆς ἀπορίας δόξειεν ἂν ποιητικὸν εἶναι ἡ τῶν ἐναντίων ἰσότης λογισμῶν. ὅταν γὰρ ἐπ' ἀμφότερα λογιζομένοις ἡμῖν,* ὁμοίως ἅπαντα φαίνηται καθ' ἑκάτερον γίνεσθαι, ἀποροῦμεν ὁπότερον ἂν πράξωμεν. 28 Ἔτι, κατὰ τοὺς χρόνους πάντας ἐπισκοπεῖν, εἴ που διαφωνεῖ. οἷον, εἰ τὸ ἀθάνατον ὡρίσατο ζῷον ἄφθαρτον νῦν εἶναι. τὸ γὰρ νῦν ἄφθαρτον ζῷον, νῦν ἀθάνατον ἔσται. ἢ ἐπὶ μὲν τούτου οὐ συμβαίνει; ἀμφίβολον γὰρ τὸ νῦν ἄφθαρτον εἶναι. ἢ γὰρ ὅτι οὐκ ἔφθαρται νῦν,* σημαίνει, ἢ ὅτι οὐ δυνατὸν φθαρῆναι νῦν, ἢ ὅτι τοιοῦτόν ἐστι νῦν, οἷον μηδέποτε φθαρῆναι. ὅταν οὖν λέγωμεν, ὅτι ἄφθαρτον νῦν ἐστι ζῷον, οὐ τοῦτο λέγομεν, ὅτι νῦν τοιοῦτόν ἐστι ζῷον, ἀλλ' οἷον μηδέποτε φθαρῆναι. τοῦτο δὲ τῷ ἀθανάτῳ τὸ αὐτὸ ἦν. ὥστε οὐ συμβαίνει νῦν αὐτὸ ἀθάνατον εἶναι. ἀλλ' ὅμως ἐάν που συμβαίνῃ, τὸ μὲν κατὰ τὸν λόγον ἀποδοθὲν ὑπάρχειν νῦν, ἢ πρότερον· τὸ δὲ κατὰ τοὔνομα, μὴ ὑπάρχειν, οὐκ ἂν εἴη ταὐτόν. χρηστέον οὖν τῷ τόπῳ, καθάπερ εἴρηται.

* γρ. ὑπνώττομεν
* γρ. ὅμοια πάντα φ.
* γρ. συμβαίνει

Loci à comparatione, à diſiunctione, & à definitione. Cap. VII.

1 ¶ A comparatione. Si alia definitio magis conueniat. 2 Si acceſsionem recipiat res definita, non definitio: 3 vel ambo non ſimul recipiant. 4 Si duabus rebus propoſitis, alteri definitio, alteri definitum magis conueniat: 5 vel alterum æquè, vel alterum non æquè conueniat. 6 ¶ A diſiunctione. 7 ¶ A definitione partium definitionis.

Conſiderandum etiam *eſt*, an definitum alia oratione magis explicetur, quàm eâ quæ tradita ſunt. vt ſi iuſtitia *definiatur* facultas æqui diſtributiua. iuſtus.n. potiùs *eſt is* qui cõſultò vult æquũ diſtribuere, quàm qui poteſt. quare iuſtitia non eſt facultas ęqui diſtributiua. nam & iuſtus *is* maximè eſſet, qui poteſt æquum diſtribuere. 2 Præterea *videndum eſt*, an res ſuſcipiat intentionem; id verò quod in definitione traditum eſt, nõ ſuſcipiat: vel contrà quod in definitione traditum eſt, recipiat, res autem non *item*. oportet.n. vel ambo recipere, vel neutrum: ſiquidem idem eſt, quod in oratione traditur, atque res *definita*. 3 Præterea, an recipiãt quidem ambo intentionem, ſed non ambo ſimul acceſſionem recipiant. vt ſi amor ſit cupiditas cõcubitus. nam qui magis amat, non magis cupidus eſt concubitus. quare non ſimul ambo intentionẽ recipiunt. atqui opus eſſet, ſi idem eſſent. 4 Præterea, an duobus propoſitis, de quo res magis dicitur, *de eo* minùs dicatur id quod eſt in definitione. vt ſi ignis ſit corpus tenuiſſimis partibus conſtans. nam flãma eſt magis ignis, quàm lux: minùs verò flamma *eſt* corpus tenuiſſimis partibus conſtans, quàm lux. deberent autem ambo eidem magis ineſſe, ſi idem eſſent. 5 Rurſus, an alterum ęquè ambobus propoſitis conueniat; alterũ verò non ęquè ambobus, ſed alteri magis, *alteri minùs*. 6 Pręterea, an ad duo definitionem accommodauit ſecundũ vtrumque: vt *ſi* pulchrum *definiuit*, id quod viſu vel auditu iucundum eſt: & ens, id quod poteſt pati vel facere. idẽ.n. ſimul pulchrum & non pulchrũ erit: ſimilitérque ens & non ens. nam auditu iucũdum, idem erit quod pulchrum. quare quod non *eſt* auditu iucundum, idem *erit* quod non pulchrũ. nam & quæ iiſdem opponuntur, eadem ſunt: opponitur autem pulchro non pulchrum: & ei quod

Σκεπτέον δὲ καὶ, εἰ καθ' ἕτερόν τι μᾶλλον λέγεται τὸ ὁρισθὲν, ἢ κατὰ τὸν ἀποδοθέντα λόγον. οἷον, εἰ ἡ δικαιοσύνη, δύναμις τοῦ ἴσου* διανεμητική. δίκαιος γὰρ μᾶλλον, ὁ προαιρούμενος τὸ ἴσον διανέμειν, τοῦ δυναμένου. ὥστε οὐκ ἂν εἴη ἡ δικαιοσύνη, δύναμις τοῦ ἴσου διανεμητική· καὶ γὰρ δίκαιος εἴη ἂν μάλιστα,* ὁ δυνάμενος τὸ ἴσον διανέμειν. 2 Ἔτι, εἰ τὸ μὲν πρᾶγμα δέχεται τὸ μᾶλλον, τὸ δὲ κατὰ τὸν λόγον ἀποδοθὲν, μὴ δέχεται, ἢ ἀνάπαλιν, τὸ μὲν κατὰ τὸν λόγον ἀποδοθὲν, δέχεται, τὸ δὲ πρᾶγμα, μή. δεῖ γὰρ ἢ ἀμφότερα δέχεσθαι, ἢ μηδέτερον, εἴπερ δὴ ταὐτόν ἐστι τὸ κατὰ τὸν λόγον ἀποδοθὲν, τῷ πράγματι. 3 Ἔτι, εἰ δέχεται μὲν ἀμφότερα τὸ μᾶλλον, μὴ ἅμα δὲ τὴν ἐπίδοσιν ἀμφότερα λαμβάνει. οἷον, εἰ ὁ ἔρως, ἐπιθυμία συνουσίας ἐστίν. ὁ γὰρ μᾶλλον ἐρῶν, οὐ μᾶλλον ἐπιθυμεῖ τῆς συνουσίας. ὥστε οὐχ ἅμα ἀμφότερα τὸ μᾶλλον ἐπιδέχεται· ἔδει δέ γε, εἴπερ ταὐτὸν ἦν. 4 Ἔτι, εἰ δύο τινῶν προτεθέντων, καθ' οὗ τὸ πρᾶγμα μᾶλλον λέγεται, τὸ κατὰ τὸν λόγον ἧττον λέγεται. οἷον, εἰ τὸ πῦρ ἐστι σῶμα τὸ λεπτομερέστατον. πῦρ μὲν γὰρ μᾶλλον ἡ φλόξ ἐστι τοῦ φωτός· σῶμα δὲ τὸ λεπτομερέστατον, ἧττον ἡ φλὸξ τοῦ φωτός. ἔδει δ' ἀμφότερα μᾶλλον τῷ αὐτῷ ὑπάρχειν, εἴπερ ταὐτὰ ἦν. 5 Πάλιν, εἰ τὸ μὲν, ὁμοίως ἀμφοτέροις ὑπάρχει τοῖς προτεθεῖσι· τὸ δ' ἕτερον, μὴ ὁμοίως ἀμφοτέροις, ἀλλὰ τῷ ἑτέρῳ μᾶλλον. 6 Ἔτι, ἐὰν πρὸς δύο τὸν ὁρισμὸν ἀποδῷ καθ' ἑκάτερον. οἷον, τὸ καλὸν, τὸ δι' ὄψεως ἢ τὸ δι' ἀκοῆς ἡδύ· καὶ τὸ ὂν, τὸ δυνατὸν παθεῖν ἢ ποιῆσαι. ἅμα γὰρ ταὐτὸ, καλόν τε καὶ οὐ καλὸν ἔσται. ὁμοίως δὲ καὶ ὄν τε καὶ οὐκ ὄν. τὸ γὰρ δι' ἀκοῆς ἡδὺ, ταὐτὸν τῷ καλῷ ἔσται· ὥστε τὸ μὴ ἡδὺ δι' ἀκοῆς, ταὐτὸν τῷ οὐ καλῷ. τοῖς γὰρ αὐτοῖς καὶ τὰ ἀντικείμενα, ταὐτά. ἀντίκειται δὲ τῷ μὲν καλῷ, τὸ οὐ καλόν· τῷ δὲ δι'

* γρ. ἀπονεμητική.
* γρ. προαιρούμενος

ἀκοῆς ἡδὺ, τὸ οὐχ ἡδὺ δι' ἀκοῆς. δῆλον οὖν ὅτι ταὐτὸν, τὸ οὐχ A ἡδὺ δι' ἀκοῆς, τῷ οὐ καλῷ. εἰ οὖν τί ἐστι δι' ὄψεως μὲν ἡδὺ, δι' ἀκοῆς δὲ μὴ, καλόν τε καὶ οὐ καλὸν ἔσται. ὁμοίως δὲ δείξομεν, καὶ ὅτι ταὐτὸν, ὄν τε καὶ οὐκ ὄν ἐστιν. 7 Ἔτι, ἐκ τῶν γενῶν, καὶ τῶν διαφορῶν, καὶ τῶν ἄλλων ἁπάντων τῶν ἐν τοῖς ὁρισμοῖς ἀποδιδομένων, λόγους ἀντὶ τῶν ὀνομάτων * ποιοῦντα, σκοπεῖν εἴ τι διαφωνεῖ.

* γρ. ποιοῦντας,

auditu iucundum *eſt*, id quod non *eſt* iucundum auditu. patet igitur, idem eſſe *id quod* non *eſt* iucũdum auditu, & *quod* non *eſt* pulchrum. Si quid igitur ſit aſpectu iucundum, nõ auditu: *id* & pulchrũ & non pulchrũ erit. Similiter autem probabimus idem eſſe ens & non ens. 7 Præterea generum & differentiarum & ceterorum omnium quæ in definitionibus traduntur, definitiones loco nominum conficiantur, & videatur an aliquid eorum diſcrepet.

Loci ab omiſſione. Cap. VIII.

1 Si omiſſum ſit id ad quod refertur. 2 Si omiſſus ſit finis, quia non eſt expreſſum id quod poſtremum eſt: 3 vel quia generatio, actuſve pro fine ſumptus eſt. 4 A differentia omiſſa 5 in definitione appetitionum.

CAP. IV.

Ἔτι δ' εἰ πρός τι τὸ ὁριζόμενον, ἢ καθ' αὑτὸ, ἢ κατὰ τὸ B γένος, σκοπεῖν, εἰ μὴ εἴρηται ἐν τῷ ὁρισμῷ, πρὸς ὃ λέγεται, ἢ καθ' αὑτὸ, ἢ κατὰ τὸ γένος· οἷον, εἰ τὴν ἐπιστήμην ὡρίσατο ὑπόληψιν ἀμετάπειστον· ἢ τὴν βούλησιν, ὄρεξιν ἄλυπον. παντὸς γὰρ τοῦ πρός τι ἡ οὐσία, πρὸς ἕτερον· ἐπειδὴ ταὐτὸν ἦν ἑκάστῳ τῶν πρός τι τὸ εἶναι, ὅπερ τὸ πρός τί πως ἔχειν. ἔδει οὖν τὴν ἐπιστήμην εἰπεῖν ὑπόληψιν ἐπιστητοῦ· καὶ τὴν βούλησιν, ὄρεξιν ἀγαθοῦ. ὁμοίως δὲ καὶ, εἰ τὴν γραμματικὴν ὡρίσατο ἐπιστήμην γραμμάτων. ἔδει γὰρ ἢ πρὸς ὃ αὐτὸ λέγεται, ἢ πρὸς ὅ ποτε τὸ γένος, ἐν τῷ * ὁρισμῷ ἀποδίδοσθαι. 2 Ἢ, εἴ τινος πρός τι εἰρημένου, μὴ πρὸς C τὸ τέλος ἀποδίδοται. τέλος δ' ἐν ἑκάστῳ τὸ βέλτιστον, ἢ οὗ χάριν τἆλλα. ῥητέον οὖν ἢ τὸ βέλτιστον, ἢ τὸ ἔσχατον· οἷον, τὴν ἐπιθυμίαν, οὐχ ἡδέος, ἀλλ' ἡδονῆς· ταύτης γὰρ χάριν καὶ τὸ ἡδὺ αἱρούμεθα. 3 Σκοπεῖν δὲ καὶ, εἰ γένεσίς ἐστι πρὸς ὃ ἀποδέδωκεν, ἢ ἐνέργεια. οὐδὲν γὰρ τῶν τοιούτων, τέλος. μᾶλλον γὰρ τὸ ἐνηργηκέναι καὶ τὸ γεγενῆσθαι, τέλος, ἢ τὸ γίνεσθαι καὶ ἐνεργεῖν. ἢ οὐκ ἐπὶ πάντων ἀληθὲς τὸ τοιοῦτον; σχεδὸν γὰρ οἱ πλεῖστοι ἥδεσθαι μᾶλλον βούλονται, ἢ πεπαῦσθαι ἡδόμενοι. ὥστε τὸ ἐνεργεῖν, τέλος ἂν μᾶλλον ποιοῖντο, τοῦ ἐνηργηκέναι. 4 Πάλιν ἐπ' ἐνίων, εἰ μὴ διώρικε τοῦ πο- D σοῦ, ἢ τοῦ ποιοῦ, ἢ ποῦ, ἢ κατὰ τὰς ἄλλας διαφοράς· οἷον, φιλότιμος, ὁποίας καὶ ὁπόσης ὀρεγόμενος τιμῆς. πάντες γὰρ ὀρέγονται τιμῆς. ὥστ' οὐκ ἀπόχρη φιλότιμον εἰπεῖν, τὸν ὀρεγόμενον τιμῆς· ἀλλὰ προσθετέον τὰς εἰρημένας διαφοράς. ὁμοίως δὲ καὶ φιλοχρήματος, ὁπόσων ὀρεγόμενος χρημάτων· ἢ ἀκρατὴς, ὁ περὶ ποίας ἡδονάς. οὐ γὰρ ὁ ὑφ' * ὁποιασοῦν ἡδονῆς κρατούμενος, ἀκρατὴς λέγεται, ἀλλ' ὁ ὑπό τινος. ἢ πάλιν, ὡς ὁρίζονται τὴν νύκτα, * σκιὰν γῆς· ἢ τὸν σεισμὸν, κίνησιν γῆς· ἢ τὸ νέφος, πύκνωσιν ἀέρος· ἢ τὸ πνεῦμα, κίνησιν ἀέρος. προσθετέον γὰρ, πόσου, καὶ ποίου, καὶ ποῦ, καὶ ὑπὸ E τίνος. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων τῶν τοιούτων· ἀπολείπων γὰρ διαφορὰν ἡντινοῦν, οὐ λέγει τὸ τί ἦν εἶναι. δεῖ δ' ἀεὶ πρὸς τὸ ἐνδεὲς ἐπιχειρεῖν. οὐ γὰρ ὁπωσοῦν γῆς κινηθείσης, οὐδ' ὁποσησοῦν, σεισμὸς ἔσται. ὁμοίως δ' οὐδ' ἀέρος ὁπωσοῦν, οὐδ' ὁποσουοῦν κινηθέντος, πνεῦμα ἔσται. 5 Ἔτι, ἐπὶ τῶν ὀρέξεων, εἰ μὴ πρόσκειται τὸ φαινόμενον, καὶ ἐφ' ὅσων ἄλλων ἁρμόττει· οἷον, ὅτι ἡ βούλησις, ὄρεξις ἀγαθοῦ· ἡ δ' ἐπιθυμία, ὄρεξις ἡδέος· ἀλλὰ μὴ φαινομένου ἀγαθοῦ, ἢ ἡδέος. πολλάκις

* γρ. ὁρισμῷ

* γρ. οἱασποιοῦν

* γρ. σκ. γ. τοῦ ἡλίου ὑπὸ γῆς ὄντος.

SI verò id quod definitur, ad aliquid referatur, vel per ſe, vel ratione generis: conſiderare *oportet*, an non ſit in definitione expreſſum *id* ad quod refertur, vel per ſe, vel ratione generis. vt ſi *quis* ſcientiam definierit, exiſtimationem immutabilẽ: aut voluntatẽ, appetitionem dolore vacuã. omnis enim rei quæ ad aliquid *refertur*, eſſentia *conſiſtit in relatione* ad alterum: quãdoquidem vnicuique eorum, quæ ad aliquid *referuntur*, idem eſt eſſentia, & ad aliquid quodam modo affectum eſſe. oportebat igitur dicere, ſcientiam *eſſe* exiſtimationem *rei* ſcibilis: & volũtatem, appetitionem boni. Similis ratio eſt, ſi grammaticam definierit, ſcientiam literarũ. oportebat. n. in definitione id tradere, ad quod ipſa res *definita*, vel ad quod genus refertur. 2 *Videndũ eſt* etiam, an alicuius ad quidpiam relati *definitio*, non *per relationẽ* ad finem tradatur. Finis autem in quaque re eſt id, quod eſt optimum, vel id cuius gratiã reliqua *ſunt*. dicendum igitur *eſt*, vel quod *eſt* optimum, vel quod *eſt* poſtremum: velvti cupiditatem *eſſe*, nõ iucundi, ſed voluptatis: huius enim gratiã etiã iucundum eligimus. 3 Conſiderare etiã *oportet*, an id ad quod aptauit, ſit generatio vel actus: quia nihil eorum eſt finis, etenim potiùs egiſſe, & genitum eſſe, finis *eſt*, quàm gigni & agere. An non in omnibus hoc verum eſt? ferè. n. plurimi malunt voluptate affici, quàm affici deſiiſſe. quare conſtituent, agere potiùs eſſe finem, quàm egiſſe. 4 Item in quibuſdam *videndum eſt*, an non definierit, quanti, vel qualis, vel vbi *ſit*, vel ſecundũ alias differẽtias. vt ambitioſus, qualis & quanti honoris appetens ſit. omnes. n. honorem appetunt. quare non ſatis eſt ambitioſum dicere eũ, qui honoris eſt appetens: ſed adiiciendę ſunt dictæ differentiæ. ſimiliter *ſi* auarus *definiatur, dicendũ eſt*, quot pecuniarum appetens *ſit*: aut incontinens, circa quas voluptates *verſetur*. non enim, qui à qualicũque voluptate ſuperatur, incontinens dicitur, ſed qui à *certa* quadam. Idem *dicẽdum eſt de iis definitionibus, quibus* noctem definiunt, vmbram terræ: vel terræ motum, motionem terrę: vel nubem, denſationem aëris: vel ventum, motionem aëris. addendum. n. *eſt*, quanti, & qualis, & vbi, & à quo. Similis eſt ratio ceterorum, quæ ſunt eiuſmodi. nã qui differentiã quamvis prætermittit, non dicit quidditatem. oportet autem ſemper aduerſus id quod deeſt, dirigere argumenta. non. n. quandocumque terra mota ſit, nec quantavis *mota ſit*, terræmotus erit: ſimiliter nec quomodocumque, nec quantuſcumque aër motus ſit, ventus erit. 5 Item in appetitionibus *definiendis peccatur*, ſi adiectum non ſit id quod videtur: necnon in omnibus aliis, quibus *hoc* conuenit. vt *ſi* voluntas *definiatur* appetitio boni: cupiditas verò, appetitio iucundi: non autem, eius quod videtur bonum, vel iucundum. ſæpe enim

A enim qui appetunt, ignorant bonum aut iucundũ eſſe: quare non neceſſe *eſt*, vt bonum vel iucũdum ſit, ſed vt videatur dũtaxat. ſic igitur oportet etiã expoſitionem facere. 6 Quòd ſi id quoque quod dixi, tradiderit: ad ideas ducendus eſt, qui ponit ideas eſſe: quoniã idea nullius rei eſt quæ videtur: ſpecies verò ad ſpeciem videtur referri: vt ipſa cupiditas *eſt* ipſius iucundi, & ipſa voluntas, ipſius boni. eius autem quod videtur bonum, non erit ipſa voluntas: nec eius quod videtur iucundum, ipſa cupiditas. abſurdum *eſt* enim, eſſe ipſum apparens bonum, vel iucundum.

γὰρ λανθάνει τοὺς ὀρεγομένους, ὅτι ἀγαθὸν, ἢ ἡδύ ἐστιν. ὥστ' οὐκ ἀναγκαῖον, ἀγαθὸν ἢ ἡδὺ εἶναι, ἀλλὰ φαινόμενον μόνον. ἔδει οὖν οὕτω καὶ τὴν ἀπόδοσιν ποιήσασθαι. 6 Ἐὰν δὲ καὶ ἀποδῷ τὸ εἰρημένον, ἐπὶ τὰ εἴδη ἀκτέον τὸν τιθέμενον ἰδέας εἶναι. οὐ γάρ ἐστιν ἰδέα φαινομένου οὐδενός· τὸ δ' εἶδος, πρὸς τὸ εἶδος δοκεῖ λέγεσθαι· οἷον, αὐτοεπιθυμία, αὐτοηδέος· καὶ αὐτοβούλησις,* αὐταγαθοῦ. φαινομένου δὲ ἀγαθοῦ, οὐκ ἔσται αὐτοβούλησις· οὐδὲ φαινομένου ἡδέος, αὐτοεπιθυμία· ἄτοπον γὰρ τὸ εἶναι αὐτοφαινόμενον ἀγαθὸν, ἢ ἡδύ.

* γρ. αὐταγαθοῦ. ἢ ἴσως οὐ φαινομένου ἀγαθοῦ, αὐτοβούλησις· οὐδὲ φαινομένου ἡ. αἱ.

De abſtractis, vel concretis, & de oppoſitis. Cap. IX.

1 A contrariis, & à coniugatis. 2 Ab eo ad quod genus vel ſpecies refertur. 3 A definitione oppoſiti, vel relati, 4 vel contrary. 5 Si oppoſitum per oppoſitum definiatur vt habitus per priuationem, 7 vel contrarium per contrarium. 8 Si in definitione priuationis non explicetur, cuius ſit priuatio, & in quo ſubiecto: 9 Si definitione definiatur id quod non dicitur ſecundùm priuationem.

B PRæterea ſi habitus definitio *propoſita* ſit: ſpectandum eſt in eo quod habet. ſin autem eius quod habet, in habitu. Similis eſt ratio ceterorũ, quæ ſunt eiuſmodi, vt ſi iucundũ *eſt* id quod vtile, etiam qui voluptate afficitur, vtilitate afficitur. & vt vniuerſaliter dicã, in huiuſmodi definitionibus quodammodo accidit, vt qui definit, plura quàm vnum definiat. nam qui ſcientiam definit, quodãmodo etiã ignorantiam definit: ſimiliterque ſciẽs, & ignorans: necnon ſcire, & ignorare. cùm.n. primum manifeſtum ſit, quodãmodo etiam reliqua manifeſta fiunt. in iis igitur omnibus, ne quid diſcrepet, videndum *eſt* ex iis elementis, quæ *ſunt* ex contrariis, & coniugatis. 2 Præterea in iis, quæ ad aliquid *referuntur*, cõſiderare *oportet*, an ad quod accommodatum eſt genus, ad illud aliquid accommodetur etiã ſpecies. velvti ſi exiſtimatio *refertur* ad exiſtimabile, etiam quędam exiſtimatio *refertur* C ad quoddam exiſtimabile: & ſi multiplum ad ſubmultiplum, etiam quoddam multiplum ad quoddam ſubmultiplum. niſi.n. ita accommodetur, patet eſſe peccatum. 3 Videre etiam *oportet*, an oppoſiti *ſit* oppoſita definitio. velvti, an dimidij *definitio ſit* oppoſita definitioni dupli. ſi.n. duplum *eſt*, quod æquali ſuperat: dimidium *eſt*, quod æquali ſuperatur. 4 Eadem *eſt* ratio contrariorum. nam contrarij contraria definitio erit ſecundùm vnam quandam contrariorum connexionem. velvti, ſi vtile *eſt*, quod *eſt* effectiuum boni: damnoſum *eſt*, quod *eſt* effectiuum mali, vel quod *eſt* corruptiuũ boni. neceſſe *eſt*.n. horum alterum eſſe contrariũ ei quod ab initio dictum fuit. ſi igitur neutrum *ſit* D contrarium ei quod ab initio dictum fuit: patet, neutrã ex *definitionibus* poſteriùs traditis eſſe contrarij definitionem. quocirca ne ea quidem quæ initio data eſt, rectè tradita fuit. 5 Quoniã autem nõnulla contraria *ſunt* quæ priuatione alterius dicũtur: (vt inæqualitas videtur eſſe priuatio æqualitatis: etenim quæ non *ſunt* æqualia, dicuntur inæqualia) manifeſtum *eſt*, id quod ſecundùm priuationem dicitur contrarium, neceſſariò definiri per alterum: reliquum verò non item definiri debere per id quod ſecundùm priuationem dicitur: quoniam accideret, vt vtrumque ex vtroque notum fieret. Notandum igitur in contrariis *eſt* huiuſmodi peccatum. vt ſi quis definierit æqualitatem eſſe, quod *eſt* contrarium inæqualitati. *ſic* enim *æqualitas* definitur per id quod ſecundùm priuationem dicitur. 6 Præterea neceſſe *eſt*, vt qui ſic definit, ipſo definito vtatur *in definitione*. quod manifeſtũ *fiet*, ſi pro nomine accipiatur definitio,

Ἔτι, ἐὰν μὲν ᾖ τῆς ἕξεως ὁ ὁρισμὸς, σκοπεῖν ἐπὶ τοῦ ἔχοντος· ἐὰν δὲ τοῦ ἔχοντος, ἐπὶ τῆς ἕξεως. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων τῶν τοιούτων. οἷον, εἰ τὸ ἡδὺ, ὅπερ ὠφέλιμον· καὶ ὁ ἡδόμενος, ὠφελούμενος. καθόλου δὲ εἰπεῖν, ἐν τοῖς τοιούτοις ὁρισμοῖς τρόπον τινὰ πλείω ἑνὸς συμβαίνει τὸν ὁριζόμενον ὁρίζεσθαι· ὁ γὰρ τὴν ἐπιστήμην ὁριζόμενος, τρόπον τινὰ καὶ τὴν ἄγνοιαν ὁρίζεται· ὁμοίως δὲ καὶ τὸ ἐπιστῆμον, καὶ τὸ ἀνεπιστῆμον· καὶ τὸ ἐπίστασθαι, καὶ τὸ ἀγνοεῖν. τοῦ γὰρ πρώτου δήλου γενομένου, τρόπον τινὰ καὶ τὰ λοιπὰ δῆλα γίνεται. σκεπτέον οὖν ἐπὶ πάντων τῶν τοιούτων, μή τι διαφωνῇ, στοιχείοις χρώμενον τοῖς ἐκ τῶν ἐναντίων καὶ τῶν συστοίχων. 2 Ἔτι, ἐπὶ τῶν πρός τι σκοπεῖν, εἰ πρὸς ὃ τὸ γένος ἀποδίδοται, καὶ τὸ εἶδος πρὸς ἐκεῖνό τι ἀποδίδοται. οἷον, εἰ ἡ ὑπόληψις, πρὸς τὸ ὑποληπτόν· καὶ ἡ τὶς ὑπόληψις, πρὸς τι ὑποληπτόν· καὶ εἰ τὸ πολλαπλάσιον, πρὸς τὸ πολλοστημόριον· καὶ τὸ τὶ πολλαπλάσιον, πρὸς τὸ τὶ πολλοστημόριον. εἰ γὰρ μὴ οὕτως ἀποδίδοται, δῆλον ὅτι ἡμάρτηται. 3 Ὅρα δὲ καὶ, εἰ τοῦ ἀντικειμένου ὁ ἀντικείμενος λόγος· οἷον, εἰ τοῦ ἡμίσεος ὁ ἀντικείμενος τῷ τοῦ διπλασίου. εἰ γὰρ τὸ διπλάσιον, τὸ ἐν ἴσῳ ὑπερέχον· ἥμισυ, τὸ ἐν ἴσῳ ὑπερεχόμενον. 4 Καὶ ἐπὶ τῶν ἐναντίων δ' ὡσαύτως. ὁ γὰρ ἐναντίος, τοῦ ἐναντίου λόγος ἔσται, κατὰ μίαν τινὰ τῶν ἐναντίων συμπλοκήν. οἷον, εἰ ὠφέλιμον, τὸ ποιητικὸν ἀγαθοῦ· βλαβερὸν, τὸ ποιητικὸν κακοῦ, ἢ τὸ φθαρτικὸν ἀγαθοῦ. θάτερον γὰρ τούτων ἀναγκαῖον ἐναντίον εἶναι τῷ ἐξ ἀρχῆς ῥηθέντι. εἰ οὖν μηδέτερον, ἐναντίον τῷ ἐξ ἀρχῆς ῥηθέντι· δῆλον ὅτι οὐδέτερος ἂν εἴη τῶν ὕστερον ἀποδοθέντων, τοῦ ἐναντίου λόγος. ὥστ' οὐδ' ὁ ἐξ ἀρχῆς ἀποδοθεὶς, ὀρθῶς ἀποδέδοται. 5 Ἐπεὶ δ' ἔνια τῶν ἐναντίων στερήσει θατέρου λέγονται (οἷον, ἡ ἀνισότης, στέρησις ἰσότητος δοκεῖ εἶναι· ἄνισα γὰρ, τὰ μὴ ἴσα λέγεται) δῆλον ὅτι τὸ μὲν κατὰ στέρησιν λεγόμενον ἐναντίον, ἀναγκαῖον ὁρίζεσθαι διὰ θατέρου· τὸ δὲ λοιπὸν, οὐκέτι διὰ τοῦ κατὰ στέρησιν λεγομένου ὁρίζεσθαι·* συμβαίνοι γὰρ ἂν ἑκάτερον δι' ἑκατέρου γνωρίζεσθαι. ἐπισκεπτέον οὖν ἐν τοῖς ἐναντίοις τὴν τοιαύτην ἁμαρτίαν· οἷον, εἴ τις ὁρίσαιτο τὴν ἰσότητα εἶναι, τὸ ἐναντίον ἀνισότητι· διὰ γὰρ τοῦ κατὰ στέρησιν λεγομένου ὁρίζεται. 6 Ἔτι, τὸν οὕτως ὁριζόμενον, ἀναγκαῖον αὐτῷ τῷ ὁριζομένῳ χρῆσθαι. δῆλον δὲ τοῦτο, ἐὰν μεταληφθῇ ἀντὶ τοῦ ὀνόματος ὁ λόγος.

* γρ. ἐξ οὗ ὁρίζεται ἑκάτερον δι' ἑκατέρου γ.

* γρ. ἐπειδὴ γὰρ ἡ ἀνισότης οὐδὲν διαφέρει, ἢ ἡ στέρησις ἰσότητος·

A * ἐπεὶ γὰρ ἀνισότητα οὐδὲν διαφέρει εἰπεῖν, ἢ στέρησιν ἰσότητος· ἔσται ἡ ἰσότης, τὸ ἐναντίον στερήσει ἰσότητος. ὥστ' αὐτῷ ἂν εἴη κεχρημένος. 7 Ἐὰν δὲ μηδέτερον τῶν ἐναντίων κατὰ στέρησιν λέγηται, ἀποδοθῇ δὲ ὁ λόγος ὁμοίως· οἷον, ἀγαθὸν, τὸ ἐναντίον κακῷ· δῆλον ὅτι κακὸν, τὸ ἐναντίον ἀγαθῷ ἔσται· τῶν γὰρ οὕτως ἐναντίων, ὁμοίως ὁ λόγος ἀποδοτέος. ὥστε πάλιν αὐτῷ τῷ ὁριζομένῳ συμβαίνει χρῆσθαι. ἐνυπάρχει γὰρ ἐν τῷ τοῦ κακοῦ λόγῳ τὸ ἀγαθόν. ὥστ' εἰ ἀγαθόν ἐστι, τὸ τῷ κακῷ ἐναντίον· τὸ δὲ κακὸν, οὐδὲν διαφέρει, ἢ τὸ τῷ ἀγαθῷ ἐναντίον· ἔσται ἀγαθὸν τὸ ἐναντίον τῷ τοῦ ἀγαθοῦ ἐναντίῳ. δῆλον οὖν ὅτι αὐτῷ κέχρηται. B 8 Ἔτι, εἰ τὸ κατὰ στέρησιν λεγόμενον ἀποδιδοὺς, μὴ ἀπέδωκεν οὗ ἐστιν ἡ στέρησις· οἷον, τῆς ἕξεως, ἢ τοῦ ἐναντίου, ἢ ὁτουοῦν ἐστι στέρησις· καὶ εἰ μὴ ἐν ᾧ πέφυκε γίνεσθαι, προσέθηκεν, ἢ ἁπλῶς, ἢ ἐν ᾧ πρώτῳ πέφυκε γίνεσθαι. οἷον, εἰ τὴν ἄγνοιαν εἰπὼν στέρησιν, μὴ ἐπιστήμης στέρησιν εἶπεν· ἢ μὴ προσέθηκεν, ἐν ᾧ πέφυκε γίνεσθαι· ἢ προσθεὶς, μὴ ἐν ᾧ πρώτῳ ἀπέδωκεν· οἷον,* ὅτι οὐκ ἐν τῷ λογικῷ, ἀλλ' ἐν ἀνθρώπῳ, ἢ ψυχῇ. ἐὰν γὰρ ὁτιοῦν τούτων μὴ ποιήσῃ, ἡμάρτηκεν. ὁμοίως δὲ καὶ, εἰ τὴν τυφλότητα, μὴ ὄψεως στέρησιν ἐν ὀφθαλμῷ εἶπε. δεῖ γὰρ τὸν καλῶς ἀποδιδόντα τὸ τί ἐστι, καὶ τίνος ἐστὶν ἡ στέρησις ἀποδοῦναι, καὶ τί ἐστι τὸ ἐστερημένον. C 9 Ὁρᾷν δὲ καὶ, εἰ μὴ λεγόμενον κατὰ στέρησιν, στερήσει ὡρίσατο· οἷον, καὶ ἐπὶ τῆς ἀγνοίας δόξειεν ἂν ὑπάρχειν ἡ τοιαύτη ἁμαρτία, τοῖς μὴ κατ' ἀπόφασιν τὴν ἄγνοιαν λέγουσι. τὸ γὰρ μὴ ἔχον ἐπιστήμην, οὐ δοκεῖ ἀγνοεῖν, ἀλλὰ μᾶλλον τὸ διηπατημένον. διὸ οὔτε τὰ ἄψυχα, οὔτε τὰ παιδία* φαμὲν ἀγνοεῖν. ὥστ' οὐ κατὰ στέρησιν ἐπιστήμης ἡ ἄγνοια λέγεται.

* γρ. ὅτι ἐν τῷ λογιστικῷ, ἀλλ' οὐκ ἐν ἀνθρώπῳ,

* γρ. λέγομεν

A cùm.n.nihil interſit, *vtrùm* inæqualitas dicatur, an priuatio æqualitatis: æqualitas erit, quod *eſt* cõtrarium priuationi ęqualitatis. quare ipſo *definito* vſus eſt. 7 Quòd ſi neutrum contrariorum ſecundùm priuationem dicatur, ſimiliter autẽ definitio tradita fuerit: velvti bonum *eſſe*, quod *eſt* contrarium malo: profectò malũ erit, quod *eſt* contrariũ bono. nam eorũ quæ ita *ſunt* contraria, ſimiliter definitio tradi debet. itaque rurſus accidit, vt ipſo definito vtatur. ineſt.n. in mali definitione bonum. quare ſi bonum eſt, quod *eſt* malo cõtrarium: malũ autem *dicatur*, an quod *eſt* bono cõtrarium, nihil intereſt: B certè bonum erit, quod eſt boni contrario cõtrarium. patet igitur, *eũ qui definiuit*, ipſo *definito* vſum eſſe. 8 Præterea *videndum eſt*, an *id* explicans quod ſecundùm priuationem dicitur, non expoſuerit *id* cuius eſt priuatio: velvti habitúſ*ne*, an contrarij, an cuiuſvis priuatio ſit: & an nõ adiunxit *id*, in quo vt gignatur ſimpliciter, vel in quo primo vt gignatur, naturâ comparatum eſt: vt ſi *quis*, cùm dixerit ignorantiam *eſſe* priuationem, nõ dixerit *eſſe* priuationem ſcientiæ: aut non adiunxerit *id*, in quo vt gignatur, naturâ cõparatum eſt: aut cùm *id* adiunxerit, non expoſuerit *id* in quo primo: vtputà non *dixerit* in *facultate animæ* rationali, ſed in homine, C vel *in* anima: nam ſi quidvis horũ non fecerit, peccabit. Similitérque ſi cæcitatem non dixerit *eſſe* aſpectus priuationẽ in oculo. debet.n. *is* qui rectè explicat quid *priuatio* ſit, etiam cuius ſit priuatio, declarare, & quid ſit id quod priuatum eſt. 9 Videre etiam *oportet*, an priuatione definierit *id* quod non dicitur ſecundùm priuationem: quod quidem vitium & in ignorãtiæ *definitione* ineſſe videbitur iis qui non ponunt ignorantiam ſecundùm negationem. quod.n. non habet ſcientiam, non videtur ignorare, ſed potiùs quod decipitur. idcirco nec res inanimas, nec infantes ignorare dicimus. quapropter ignorantia non dicitur ſecundùm priuationem ſcientiæ.

Loci à caſibus, ab idea, & ab homonymia. Cap. X.

1 *A caſibus.* 2 *Ab idea.* 3 *Ab homonymia.*

D ἜΤι, εἰ τῶν ὁμοίων τοῦ ὀνόματος πτώσεων, αἱ ὅμοιαι τοῦ λόγου πτώσεις ἐφαρμόττουσιν. οἷον, εἰ ὠφέλιμον, τὸ ποιητικὸν ὑγιείας· ὠφελίμως, τὸ ποιητικῶς ὑγιείας· καὶ ὠφεληκὸς, τὸ πεποιηκὸς ὑγίειαν. 2 Σκοπεῖν δὲ καὶ ἐπὶ τὴν ἰδέαν, εἰ ἐφαρμόσει ὁ λεχθεὶς ὅρος. ἐπ' ἐνίων γὰρ οὐ συμβαίνει. οἷον, ὡς Πλάτων ὁρίζεται, τὸ θνητὸν προσάπτων ἐν τοῖς τῶν ζώων ὁρισμοῖς. ἡ γὰρ ἰδέα οὐκ ἔσται θνητή, οἷον, αὐτοάνθρωπος. ὥστε οὐκ ἐφαρμόσει ὁ λόγος ἐπὶ τὴν ἰδέαν. ἁπλῶς δὴ, οἷς προσκεῖται τὸ ποιητικὸν, ἢ παθητικὸν, ἀνάγκη διαφωνεῖν ἐπὶ τῆς ἰδέας τὸν ὅρον· ἀπαθεῖς γὰρ καὶ ἀκίνητοι δοκοῦσιν αἱ ἰδέαι τοῖς λέγουσιν ἰδέας εἶναι. E πρὸς δὲ τούτους καὶ οἱ τοιοῦτοι λόγοι χρήσιμοι. 3 Ἔτι,* ἐπὶ τῶν καθ' ὁμωνυμίαν λεγομένων, εἰ ἕνα λόγον κοινὸν ἁπάντων ἀπέδωκε. συνώνυμα γὰρ, ὧν εἷς ὁ κατὰ τοὔνομα λόγος. ὥστ' οὐδενὸς τῶν ὑπὸ τοὔνομα ἀποδοθεὶς* ὅρος ἐστὶν ὁμοίως ἐπὶ πάντων, τὸ ὁμώνυμον ἐφαρμόττει. 4 Πέπονθε δὲ τοῦτο καὶ ὁ Διονυσίου τῆς ζωῆς ὅρος, εἴπερ ἐστὶ κίνησις γένους θρεπτοῦ, σύμφυτος, παρακολουθοῦσα· οὐδὲν γὰρ μᾶλλον τοῦτο τοῖς ζώοις, ἢ τοῖς φυτοῖς ὑπάρχει· ἡ δὲ ζωὴ οὐ καθ' ἓν εἶδος δοκεῖ λέγεσθαι· ἀλλ' ἑτέρα μὲν τοῖς ζώοις, ἑτέρα δὲ τοῖς φυτοῖς ὑπάρχει.

* γρ. εἰ τῶν καθ' ὁμωνυμίαν λεγομένων, ἕνα λ. κ.

CAP. V.

* γρ. λόγος.

D PRæterea *vidẽdum eſt*, an ſimilibus nominis caſibus ſimiles orationis caſus cõueniant. velvti, ſi vtile *eſt*, quod *eſt* accommodatum ad ſanitatem efficiendam: vtiliter, *eſt* accõmodatè ad ſanitatem efficiendam: & vtilitatem attulit, quod effecit ſanitatem. 2 Conſiderare etiã *oportet*, an ideæ cõueniat definitio quæ dicta eſt, quoniam in nonnullis *hoc* nõ accidit. velvti *ſi quis ita definiat*, vt Plato definit, qui *verbum* mortale adiicit in animalium definitionibus: etenim idea non eſt mortalis, vt ipſe-homo. quare non aptabitur definitio ad ideã. ſimpliciter autem, quibus adiungitur effectiuum, aut E patibile, neceſſe eſt *eorũ* definitionem non conuenire ideæ: quoniam ideæ impatibiles & immobiles *eſſe* videntur iis qui dicunt ideas eſſe. & contra hos etiam huiuſmodi rationes valent. 3 Præterea in iis quæ ſecundùm homonymiam dicuntur, *videndum eſt*, an vnam communem omnium definitionem tradiderit. nam ea quorum vna eſt ad *commune* nomen accommodata definitio, ſynonyma ſunt. Quare tradita definitio, nullius eorum *propria eſt*, quę ſub nomine continentur: quippe cùm æquè ad omnia *ſignificata verbum* homonymum aptetur. 4 Hoc vitio laborat etiam vitæ definitio à Dionyſio tradita, ſi quidem eſt motus generis quod alitur, naturâ inſitus, conſequens: quoniam hoc non magis animalibus quàm plantis ineſt: vita autem non ſecundùm vnam ſpeciem dici videtur, ſed alia animalibus, alia plantis ineſt.

5 Accidit igitur etiam, vt cōſultò ſic tradatur definitio, quaſi omnis vita *ſit* ſynonyma, & dicatur ſecundùm vnam ſpeciem. ſed nihil etiam vetat, quominus *aliquis* perſpiciens homonymiā, ac volens alterius definitionē tradere, non animaduertat ſe non propriam ſed amborum communē definitionem tradere. ſed nihilominus, ſi *quis* vtrouis modo fecit, peccauit. 6 Quia verò quædā homonyma latent: is quidem qui interrogat, quaſi ſynonymis vti debet: quoniam alterius *ſignificati* definitio alteri non conueniet: proinde eo modo videbitur non definiuiſſe. quandoquidem opus eſt, vt ſynonymum omnibus conueniat. at is qui reſpondet, diſtinguere debet. 7 Quoniam autē nonnulli eorum qui reſpondent, quod ſynonymū eſt, aiunt eſſe homonymū, quando non omnibus conuenit tradita definitio: quod verò eſt homonymū, *aiunt eſſe* ſynonymum, ſi vtriſque *ſignificatis* conueniat: idcirco prius ex confeſſo conſtituendū eſt de his, aut proſyllogiſmis probandum, *eſſe* homonymum, vel ſynonymum, vel vtrumlibet. faciliùs.n. concedūt, qui non proſpiciunt quid euenturū ſit. Quod ſi *inter diſputantes* non conuenerit, ac dicat aliquis, id quod eſt ſynonymum, eſſe homonymum, propterea quòd non conuenit huic quoque definitio quæ data eſt: conſiderare *oportet*, an huius definitio conueniat etiam reliquis. patet.n. ſynonymum *id* cum reliquis fore. alioqui plures erūt reliquorum *ſignificatorum* definitiones. nam duę *ſunt* ad nomen *accōmodatæ* definitiones, *quæ* ipſis conueniunt: *nēpe* prior quæ data eſt, & poſterior. 8 Rurſus, ſi quis, cùm aliquid eorum definierit, quæ multis modis dicuntur, cùmq; definitio non omnibus *ſignificatis* conueniat, homonymum quidem *eſſe* non dicat, ſed neget nomen omnibus conuenire, quia nec definitio *conuenit*: aduerſus hunc dici debet, appellatione ea vtendum eſſe, quæ tradita eſt & recepta, nec moueri *debere* quæ ſunt eiuſmodi. Quædam tamen non ita dicenda ſunt, vt multi *dicunt*.

A 5 Ἐνδέχεται μὲν οὖν καὶ κατὰ προαίρεσιν οὕτως ἀποδοῦναι τὸν ὅρον, ὡς συνωνύμου καὶ καθ' ἓν εἶδος πάσης τῆς ζωῆς λεγομένης. οὐδὲν δὲ κωλύει καὶ συνορῶντα τὴν ὁμωνυμίαν, καὶ θατέρου βουλόμενον τὸν ὁρισμὸν ἀποδοῦναι, * λαθεῖν μὴ ἴδιον, ἀλλὰ κοινὸν ἀμφοῖν λόγον ἀποδόντα. ἀλλ' οὐδὲν ἧττον, εἰ ὁποτερωσοῦν πεποίηκεν, ἡμάρτηκεν. 6 Ἐπεὶ δ' ἔνια λανθάνει τῶν ὁμωνύμων, ἐρωτῶντι μὲν ὡς συνωνύμοις χρηστέον· οὐ γὰρ ἐφαρμόσει ὁ θατέρου ὅρος ἐπὶ θάτερον· ὥστε δόξει οὐχ ὡρίσθαι κατὰ τρόπον· δεῖ γὰρ ἐπὶ πᾶν τὸ συνώνυμον ἐφαρμόττειν· αὐτῷ δ' ἀποκρινομένῳ διαιρετέον. 7 Ἐπεὶ δ' ἔνιοι τῶν B ἀποκρινομένων, τὸ μὲν συνώνυμον, ὁμώνυμόν φασιν εἶναι, ὅταν μὴ ἐφαρμόττῃ ἐπὶ πᾶν ὁ ἀποδοθεὶς λόγος· τὸ δ' ὁμώνυμον, συνώνυμον, ἐὰν ἐπ' ἄμφω ἐφαρμόττῃ· προδιομολογητέον ὑπὲρ τῶν τοιούτων, ἢ προσυλλογιστέον, ὅτι ὁμώνυμον, ἢ συνώνυμον, ὁπότερον ἂν ᾖ. μᾶλλον γὰρ συγχωροῦσιν οὐ προορῶντες τὸ συμβησόμενον. ἂν δὲ μὴ γενομένης ὁμολογίας, φῇ τις τὸ συνώνυμον, ὁμώνυμον εἶναι, διὰ τὸ μὴ ἐφαρμόττειν καὶ ἐπὶ τοῦτο τὸν ἀποδοθέντα λόγον· σκοπεῖν, εἰ ὁ τούτου λόγος ἐφαρμόττει καὶ ἐπὶ τὰ λοιπά· δῆλον γὰρ, ὅτι συνώνυμον ἂν εἴη τοῖς λοιποῖς, εἰ δὲ μὴ, πλείους ἔσονται ὁρισμοὶ* τοῖς λοιποῖς· δύο C γὰρ οἱ κατὰ τοὔνομα λόγοι ἐφαρμόττουσιν ἐπ' αὐτά, ὅ, τε πρότερος ἀποδοθεὶς, καὶ ὁ ὕστερος. 8 Πάλιν, εἴ τις ὁρισάμενος τῶν πολλαχῶς τι λεγομένων, καὶ τοῦ λόγου μὴ ἐφαρμόττοντος ἐπὶ πάντα, ὅτι μὲν ὁμώνυμον μὴ λέγοι, τὸ δ' ὄνομα μὴ φαίη ἐφαρμόττειν ἐπὶ πάντα, ὅτι οὐδ' ὁ λόγος· ῥητέον πρὸς τὸν τοιοῦτον, ὅτι τῇ μὲν ὀνομασίᾳ δεῖ χρῆσθαι τῇ παραδεδομένῃ καὶ παρεπομένῃ, καὶ μὴ κινεῖν τὰ τοιαῦτα. ἔνια δ' οὐ λεκτέον ὁμοίως τοῖς πολλοῖς.

* γ. λαβεῖν

* γ. τῶν λοιπῶν

De verborum coniunctorum definitione. Cap. XI.

1 A detractione. 2 Si nomina cum nominibus commutentur: 3 & ignotiora pro notioribus accipiantur: 4 vel ſignificatio mutetur: 5 vel non differentiæ, ſed generis mutatio fiat.

SIn autem alicuius coniuncti definitio tradita fuerit, vidēdum eſt, detracta alterius partis definitione, an & reliqua ſit reliquæ *partis definitio*. ſi enim ſecus, manifeſtum *eſt*, ne totam quidem totius *definitionē eſſe*. vt ſi *quis* lineam finitam rectam definierit, extremum plani habētis extrema, cuius medium adiungitur extremis: ſi finitæ lineæ definitio eſt, extremum plani habentis extrema: recti eſſe oportet reliquam *definitionem, id eſt*, cuius medium adiungitur extremis. atqui *linea* infinita neque medium neque extrema habet, recta tamen eſt: quare non erit reliqua *oratio*, eius quod reliquum eſt, definitio. 2 Præterea *videndum eſt*, an, cùm compoſitum ſit id quod definitur, definitio tradita ſit totidem membris conſtans quot definitum. Totidem membris cōſtare dicitur definitio, quando quot ſunt compoſita, tot ſunt in definitione nomina & verba. neceſſe *eſt* enim in huiuſmodi *definitionibus* commutationem ipſorum nominum fieri, aut omnium, aut quorumdam: quandoquidem nihilo plura nomina nunc, quàm antea, dicta ſunt: oportet autem eum qui definit, orationem pro nominibus tradere maximè quidem omnium: ſin minùs, *ſaltem* plurimorum.

D Ἐὰν δὲ τῶν συμπεπλεγμένων τινὸς ἀποδοθῇ ὁ ὅρος, σκοπεῖν, ἀφαιροῦντα τὸν θατέρου τῶν συμπεπλεγμένων λόγον, εἰ καὶ ὁ λοιπὸς, τοῦ λοιποῦ· εἰ γὰρ μὴ, δῆλον ὅτι οὐδὲ ὁ ὅλος, τοῦ ὅλου. οἷον, εἰ ὡρίσατο γραμμὴν πεπερασμένην εὐθεῖαν, πέρας ἐπιπέδου ἔχοντος πέρατα, οὗ τὸ μέσον ἐπιπροσθεῖ τοῖς πέρασιν· εἰ τῆς πεπερασμένης γραμμῆς λόγος ἐστὶ πέρας ἐπιπέδου ἔχοντος πέρατα· τοῦ εὐθέος τὸ λοιπὸν δεῖ εἶναι, οὗ τὸ μέσον ἐπιπροσθεῖ τοῖς πέρασιν. ἀλλ' ἡ ἄπειρος οὔτε μέσον, οὔτε πέρατα ἔχει, εὐθεῖα δέ ἐστιν. ὥστε οὐκ ἔστιν ὁ λοιπὸς, τοῦ E λοιποῦ λόγος. 2 Ἔτι, εἰ συνθέτου ὄντος τοῦ ὁριζομένου, ἰσόκωλος ὁ λόγος ἀποδοθῇ τῷ ὁριζομένῳ. ἰσόκωλος δὲ λέγεται ὁ λόγος εἶναι, ὅτε ὅσαπερ ἂν ᾖ τὰ συγκείμενα, τοσαῦτα καὶ τὰ ἐν τῷ λόγῳ ὀνόματα καὶ ῥήματα ᾖ. ἀνάγκη γὰρ ἐν τοῖς τοιούτοις αὐτῶν τῶν ὀνομάτων μεταλλαγὴν* γίνεσθαι, ἢ πάντων, ἢ τινῶν· ἐπειδὴ οὐδὲν πλείω νῦν, ἢ πρότερον, ὀνόματα εἴρηται· δεῖ δὲ τὸν ὁριζόμενον, λόγον ἀντὶ τῶν ὀνομάτων ἀποδιδόναι, μάλιστα μὲν τῶν πάντων· εἰ δὲ μὴ, τῶν πλείστων.

* γ. [illegible]

οὕτω μὲν γὰρ καὶ ἐπὶ τῶν ἁπλῶν, ὁ τοὔνομα μεταλαβὼν, οὐχ ὁρισάμενος εἴη· οἷον, ἀντὶ λωπίου ἱμάτιον. 3 Ἔτι δὲ, μείζων ἡ ἁμαρτία, εἰ καὶ ἀγνωστοτέρων ὀνομάτων τὴν μετάληψιν ἐποιήσατο· οἷον, ἀντὶ τοῦ ἀνθρώπου λευκοῦ, βροτὸν δίαργον· οὔτε γὰρ ὥρισται ἧττόν τε σαφὲς, οὕτω ῥηθέν. 4 Σκοπεῖν δὲ καὶ ἐν τῇ μεταλλαγῇ τῶν ὀνομάτων, εἰ μὴ ταὐτὸν ἔτι σημαίνει· οἷον, ὁ τὴν θεωρητικὴν ἐπιστήμην, ὑπόληψιν θεωρητικὴν εἰπών. ἡ γὰρ ὑπόληψις τῇ ἐπιστήμῃ οὐ ταὐτόν. δεῖ δέ γε, εἴπερ μέλλει καὶ τὸ ὅλον ταὐτὸν εἶναι. τὸ μὲν γὰρ θεωρητικὸν, κοινὸν ἐν ἀμφοτέροις τοῖς λόγοις ἐστί· τὸ δὲ λοιπὸν, διάφορον. 5 Ἔτι, εἰ θατέρου τῶν ὀνομάτων μετάληψιν ποιούμενος, μὴ τῆς διαφορᾶς, ἀλλὰ τοῦ γένους τὴν μεταλλαγὴν ἐποιήσατο· καθάπερ ἐπὶ τοῦ ἀρτίως ῥηθέντος. ἀγνωστότερον γὰρ ἡ θεωρητικὴ, τῆς ἐπιστήμης· τὸ μὲν γὰρ, γένος· τὸ δὲ, διαφορά· πάντων δὲ γνωριμώτερον τὸ γένος· κοινότερον γάρ. ὥστε οὐ τοῦ γένους, ἀλλὰ τῆς διαφορᾶς ἔδει τὴν μετάληψιν ποιήσασθαι· ἐπειδὴ ἀγνωστότερόν ἐστι. 6 Ἢ τοῦτο μὲν γελοῖον τὸ ἐπιτίμημα· οὐδὲν γὰρ κωλύει, τὴν μὲν διαφορὰν, τῷ γνωριμωτάτῳ ὀνόματι εἰρῆσθαι· τὸ δὲ γένος, μή. οὕτω δὲ ἐχόντων, δῆλον ὅτι τοῦ γένους, καὶ οὐ τῆς διαφορᾶς, κατὰ τοὔνομα τὴν μετάληψιν ποιητέον. εἰ δὲ μὴ ὄνομα ἀντὶ ὀνόματος, ἀλλὰ λόγον ἀντ' ὀνόματος μεταλαμβάνει· δῆλον ὅτι τῆς διαφορᾶς μᾶλλον, ἢ τοῦ γένους, ὁρισμὸν ἀποδοτέον. ἐπειδὴ τοῦ γνωρίζειν χάριν ὁ ὁρισμὸς ἀποδίδοται· ἧττον γὰρ ἡ διαφορὰ τοῦ γένους* γνώριμος.

* ἢ γνώριμον.

A Sic.n. & in iis quæ ſimplicia ſunt, *res ſe habet: nam* qui nomen *cum nomine* cōmutabit, numquam definiet: vt *ſi* pro indumento *dicat* veſtimentum. 3 Præterea grauius peccatū *eſt*, ſi ignotiora nomina aſſumat: vt pro homine albo, mortalem cādidum: quia nec definiuit; & ita dictū minùs perſpicuum *eſt*. 4 Vidēdum eſt etiam in nominum commutatione, an non idē adhuc ſignificet: vt qui dixit contemplatiuam ſcientiam *eſſe* exiſtimationem contemplatiuam. nam exiſtimatio non *eſt* idem quod ſciētia. atqui *idem ſit*, oportet: ſi quidem & totum, idem futurum eſt. etenim *verbum illud*, cōtemplatiuum, commune eſt ambabus orationibus. quod autem reliquum *eſt*, diuerſum *eſt*. 5 Præterea *videndum eſt*, an alterius *tantùm* nominis commutatione B facta, non differentiam ſed genus mutauerit: vt in eo quod modò dixi, *videre licet*. ignotius.n. eſt *verbum* contemplatiua, quàm ſcientia: quoniam hoc *eſt* genus; illud, differentia. *cæteris* autem omnibus notius *eſt* genus, vtpote quod *eſt* cōmunius. vnde non generis, ſed differētiæ commutationem fieri oportebat; quia *hæc* eſt ignotior. 6 An hæc reprehenſio ridicula eſt. nihil.n. vetat, differentiam notiſſimo nomine ſignificari, genus nō *item*. cùm autem ita *ſe* habent, patet, generis, non differentiæ nomen *eſſe* mutandū. Si verò non nomen pro nomine, ſed orationem pro nomine aſſumat: patet, differētiæ potiùs quàm generis definitionem tradendam *eſſe*: quia notificādi gratiā definitio traditur: minùs enim differentia, quàm genus, nota *eſt*.

Varij loci. Cap. XII.

1 Si differentiæ definitio conueniat etiam alij rei. 2 Si res definita numeretur in iis quæ ſunt: definitione verò ſignificetur id quod non eſt. 3 Si definitio non ſpecialiter explicet id ad quos res definita refertur. 6 Si definitio non conueniat rei ſimpliciter, ſed rei perfectæ. 7 Si id quod per ſe eſt optabile, ſic definiatur quaſi propter aliud ſit optabile.

C Εἰ δὲ τῆς διαφορᾶς τὸν ὅρον ἀπέδωκε, σκοπεῖν, εἰ καὶ ἄλλου τινὸς κοινὸς ὁ ἀποδοθεὶς ὅρος. οἷον, ὅταν περιττὸν ἀριθμὸν, ἀριθμὸν μέσον ἔχοντα εἴπῃ, ἐπιδιοριστέον τὸ πῶς μέσον ἔχοντα. ὁ μὲν γὰρ ἀριθμὸς, κοινὸς ἐν ἀμφοτέροις τοῖς λόγοις ὑπάρχει· τοῦ δὲ περιττοῦ, μετείληπται ὁ λόγος. ἔχει δὲ καὶ γραμμὴ, καὶ σῶμα, μέσον, οὐ περιττὰ ὄντα. ὥστε οὐκ ἂν εἴη ὁ ὁρισμὸς οὗτος τοῦ περιττοῦ. εἰ δὲ πολλαχῶς λέγεται τὸ μέσον ἔχον, διοριστέον τὸ πῶς μέσον ἔχον. ὥστε ἡ ἐπιτίμησις ἔσται, ἢ συλλογισμὸς, ὅτι οὐχ ὥρισται. 2 Πάλιν, εἰ οὗ μὲν τὸν λόγον ἀποδίδωσι, τῶν ὄντων ἐστί· τὸ δ' ὑπὸ τὸν λόγον, D μὴ τῶν ὄντων. οἷον, εἰ τὸ λευκὸν ὡρίσατο, χρῶμα πυρὶ μεμιγμένον· ἀδύνατον γὰρ, τὸ ἀσώματον μεμῖχθαι σώματι. ὥστε οὐκ ἂν εἴη χρῶμα πυρὶ μεμιγμένον· λευκὸν δέ ἐστιν. 3 Ἔτι, ὅσοι μὴ διαιροῦσιν ἐν τοῖς πρός τι, πρὸς ὃ λέγεται, ἀλλ' ἐν πλείοσι περιλαβόντες εἶπον, ἢ ὅλως, ἢ ἐπί τι ψεύδονται· οἷον, εἴ τις τὴν ἰατρικὴν, ἐπιστήμην ὄντος εἶπεν. εἰ μὲν γὰρ μηδενὸς τῶν ὄντων, ἡ ἰατρικὴ ἐπιστήμη· δῆλον ὅτι ὅλως ὁ λόγος ἔψευσται. εἰ δὲ, τινὸς μὲν, τινὸς δὲ μὴ, ἐπί τι ἔψευσται. δεῖ γὰρ παντὸς, εἴπερ καθ' αὑτὸ, καὶ μὴ κατὰ συμβεβηκὸς ὄντος ἐπιστήμη εἶναι λέγεται· καθάπερ ἐπὶ τῶν ἄλλων ἔχει τῶν πρός τι· πᾶν γὰρ ἐπιστητὸν, πρὸς ἐπιστήμην λέγεται. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων· ἐπειδὴ ἀντιστρέφει πάντα τὰ πρός τι· πᾶν γὰρ ἐπιστητὸν, πρός τι.

Si verò differentiæ definitionem tradidit, cōſiderare *oportet* an alij cuipiam communis *ſit* definitio quæ data eſt. vt cùm imparem numerū dixit *eſſe* numerum qui medium habet, exponēdum *eſt*, quomodo medium habeat. nam *verbum*, numerus, commune eſt vtriſque orationibus: & pro imparis *vocabulo* ſumpta eſt oratio. ſed & linea & corpus habent medium, cùm non ſint imparia. quare non erit hæc definitio imparis. quòd ſi multis modis dicitur id quod medium habet: explicandū *eſt* quomodo medium habeat. Ergo reprehenſio locum habebit, ſeu ſyllogiſmus, *quo probabitur* non fuiſſe definitum. 2 Rurſus, ſi id, cuius definitionē tradidit, eſt *in numero* eorum quæ ſunt: quod verò definitioni ſubiicitur, non *eſt in numero* eorum quæ ſunt. vt ſi album definierit, colorem cum igne permixtum: quia fieri nequit, vt res incorporea cum corpore miſceatur: quare non poteſt eſſe color cū igne mixtus: album verò eſt. 3 Præterea quicumque in iis quæ ad aliquid *referuntur definiendis* non explicant diſtinctè *id* ad quod referūtur, ſed plura complectuntur: aut omnino, aut ex parte mentiuntur. vt ſi quis dixerit medicinam *eſſe* ſcientiam eius quod eſt: nam ſi medicina nullius eorū quæ ſunt, ſcientia *eſt*: patet orationē omnino falſam eſſe: at ſi alicuius *eſt*, alicuius non *eſt*, ex parte falſam eſſe. debet.n. *eſſe* omnium: ſiquidem per ſe nō per accidens dicitur *eſſe ſcientia* eius quod eſt, quemadmodum in aliis, quæ ad aliquid *referuntur*, *res ſe* habet: omne enim ſcibile ad ſcientiam refertur. ſimiliter autem & in aliis *ſit*: quoniam omnia relata reciprocantur. omne enim ſcibile ad aliquid *refertur*.

4 Prætereà ſi is qui non per ſe, ſed per accidẽs *rem* A explicat, rectè explicet: certè non ad vnum, ſed ad plura referetur vnumquodque eorum quæ *ſunt* ad aliquid. nihil.n. prohibet, quominus idem & ens, & album, & bonum ſit. quocirca quia ad quodvis horum referendo explicat, rectè explicat ſi modò is qui per accidens explicat, rectè explicat. 5 Prætereà. fieri nequit, vt huiuſcemodi definitio propria ſit rei quæ explicatur: non ſolùm.n. medicina, ſed multæ aliæ ſcientiæ referuntur ad id quod eſt. quapropter vnaquæq; erit ſcientia eius quod eſt. patet igitur, hãc nullius ſcientiæ definitionẽ eſſe: quia propriam, nõ communem definitionem eſſe B oportet. 6 Interdum verò definiunt, non rem *nudam*, ſed rem bene *ſe* habẽtem, ſeu perfectam. talis autem eſt & oratoris & furis definitio: ſi quidem orator eſt, qui quod in quaque re ad perſuadendũ valet, perſpicere poteſt, ac nihil omittit: fur autẽ, qui clam accipit. patet.n. vtrumque, cùm talis ſit, bonum *effectũ iri*, alterum, bonum oratorem; alterum, bonum furem. non.n. qui clam accipit, ſed qui vult clam accipere, fur eſt. 7 Item *peccauit*, ſi id quod propter ſe eligendũ eſt, quaſi actiuum, vel effectiuum, vel quomodocũque propter aliud eligẽdum explicuit: vt *ſi quis* dixerit iuſtitiam *eſſe* legum ſeruatricem, aut ſapiẽtiam *eſſe* effectiuam fe- C licitatis. quod.n. efficiendi, vel conſeruandi vim habet, in iis *numeratur*, quæ propter aliud *ſunt* eligenda. 8 An nihil vetat, quominus id quod propter ſe *eſt* eligendum, etiam propter aliud ſit eligẽdum? 9 Sed nihilo minùs peccauit, qui ita definiuit id, quod propter ſe *eſt* eligendum. cuiuſque enim rei quod optimũ eſt, in eſſentia maximè *continetur*: meliùs autem eſt, propter ſe eligendũ *eſſe*, quàm propter aliud. proinde hoc potiùs definitio ſignificare debebat.

4 Ἔτι, εἴπερ ὁ μὴ καθ' αὑτό, ἀλλὰ κατὰ συμβεβηκὸς τὴν ἀπόδοσιν ποιούμενος, ὀρθῶς ἀποδίδωσιν· οὐ πρὸς ἕν, ἀλλὰ πρὸς πλείω ἕκαστον ἂν αὐτῶν πρός τι λέγοιτο. οὐδὲν γὰρ κωλύει, τὸ αὐτό, καὶ ὄν, καὶ λευκόν, καὶ ἀγαθὸν εἶναι. ὥστε ὁ πρὸς ὁποιονοῦν τούτων ἀποδούς, ὀρθῶς ἂν εἴη ἀποδούς, εἴπερ ὁ κατὰ συμβεβηκὸς * ἀποδούς, ὀρθῶς ἀποδίδωσιν. 5 Ἔτι * γ. ἀποδιδῷ
δέ, ἀδύνατον, τὸν τοιοῦτον λόγον, ἴδιον τοῦ ἀποδοθέντος εἶναι· οὐ γὰρ μόνον ἡ ἰατρική, ἀλλὰ καὶ τῶν ἄλλων ἐπιστημῶν αἱ πολλαὶ πρὸς ὂν λέγονται. ὥστε ἑκάστη, ὄντος ἐπιστήμη ἔσται. δῆλον οὖν, ὅτι οὐδεμιᾶς ἐπιστήμης ἐστὶν ὁρισμός· ἴδιον γάρ, καὶ οὐ κοινὸν δεῖ τὸν ὁρισμὸν εἶναι. 6 Ἐνίοτε δὲ ὁρίζονται, οὐ τὸ πρᾶγμα, ἀλλὰ τὸ πρᾶγμα εὖ ἔχον, ἢ τετελεσμένον. τοιοῦτος δὲ καὶ ὁ τοῦ ῥήτορος καὶ τοῦ κλέπτου ὅρος· εἴπερ ἐστὶ ῥήτωρ μέν, ὁ δυνάμενος τὸ ἐν ἑκάστῳ πιθανὸν θεωρεῖν, καὶ μηδὲν * παραλείπειν. κλέπτης δέ, ὁ λάθρα λαμβάνων· δῆλον γάρ, * γ. παραλιπὼν
ὅτι * τοιοῦτος ὤν, ἀγαθὸς ἑκάτερος· ὁ μέν, ἀγαθὸς ῥήτωρ· ὁ * γ.τ. ἀγ. ἑκάτερος ὁ μὲν ἀγ.
δέ, ἀγαθὸς κλέπτης ἔσται. οὐ γὰρ ὁ λάθρα λαμβάνων, ἀλλ' ὁ βουλόμενος λάθρα * λαμβάνειν, κλέπτης ἐστί. 7 Πάλιν, * γ. λαβεῖν
εἰ τὸ δι' αὑτὸ αἱρετόν, ὡς πρακτικόν, ἢ ποιητικόν, ἢ ὁπωσοῦν δι' ἄλλο αἱρετὸν ἀποδέδωκεν· οἷον, τὴν δικαιοσύνην, νόμων σωστικὴν εἰπών· ἢ τὴν σοφίαν, ποιητικὴν εὐδαιμονίας. τὸ γὰρ ποιητικόν, ἢ σωστικόν, τῶν δι' ἄλλο αἱρετῶν. 8 Ἢ οὐδὲν μὲν κωλύει, τὸ δι' αὑτὸ αἱρετόν, καὶ δι' ἄλλο εἶναι αἱρετόν. 9 Οὐ μὴν ἀλλ' οὐδὲν ἧττον ἡμάρτηκεν ὁ οὕτω διορισάμενος τὸ δι' αὑτὸ αἱρετόν. * ἑκάστου γὰρ τὸ βέλτιστον, ἐν τῇ οὐσίᾳ μάλιστα· * γ. ἑκάστῳ
βέλτιον δὲ τὸ δι' αὑτὸ εἶναι αἱρετόν, τοῦ δι' ἕτερον· ὥστε τοῦτο καὶ τὸν ὁρισμὸν ἔδει μᾶλλον σημαίνειν.

Si quis in definitione dixerit eſſe hæc, vel ex his, vel hoc cum illo.

Cap. XIII.

1 ¶ Si dixerit eſſe hoc & illud. 6 ¶ Si dixerit ex his conſtare. Si natura comparatum non ſit, vt vnum ex his fiat. 7 Si totum in primo aliquo ſubiecto inſit, non item partes. 8 Si non in eodem primo ſubiecto inſint totum & partes. 9 Si toto interempto partes intereant. 10 Si totum ſit bonum vel malum, & partes neutrum: vel contra. 11 Si magis altera pars ſit bona quàm altera mala, totum verò non magis ſit bonum quàm malum. 13 Si altera pars ſit melior, altera deterior: totum autem non ſit meliori deterius, deteriori melius. 14 Si totum & pars ſint ſynonyma. 16 Si modus compoſitionis expoſitus non ſit. 17 ¶ Si dixerit eſſe hoc cum illo. De argumentis ducendis ex locis ſuperioribus. 18 A ſufficienti enumeratione. 19 A fine. 20 Obiectio.

CONſiderare etiam *oportet*, an alicuius *rei* defi- D nitionem tradens, *vel eſſe* hæc vel quod ex his *conſtat*, vel hoc cum illo, definierit. 2 Nam ſi *dixerit eſſe* hæc: accidet, vt ambobus, & neutri conueniat: vt ſi iuſtitiam definierit *eſſe* temperantiam & fortitudinem. etenim ſi duo ſint, quorum vterque habeat alterum *duntaxat*: ambo iuſti erũt, & neuter: quoniam ambo iuſtitiam habent: vterque autem non habet. 3 Quòd ſi hoc nõdum *ſit* valde abſurdum, quia in aliis quoque tale *quidpiam* accidit: (nihil.n. vetat ambos habere minam, cùm neuter habeat) at certè hoc, cõtraria iiſdem ineſſe, omnino abſurdum videbitur. hoc autem accidet, ſi al- E ter eorum temperantiâ & ignauiâ præditus ſit, alter fortitudine & intemperantiâ. nam ambo iuſtitiâ & iniuſtitiâ præditi erunt. etenim ſi iuſtitia eſt temperantia & fortitudo, iniuſtitia erit ignauia & intẽperantia. 4 Et omnino quæcũque argumenta adduci poſſunt *ad probandũ* non idem eſſe partem & totũ, omnia ad id quod dictũ eſt, *efficiendũ* valẽt.

Σκοπεῖν δὲ καί, εἴ τινος ὁρισμὸν ἀποδιδούς, τάδε, ἢ τὸ ἐκ τούτων, ἢ τόδε μετὰ τοῦδε ὡρίσατο. CAP. ΙΓ. 2 Εἰ μὲν γὰρ τάδε, συμβήσεται ἀμφοῖν καὶ μηδετέρῳ ὑπάρχειν. οἷον, εἰ τὴν δικαιοσύνην, σωφροσύνην καὶ ἀνδρίαν ὡρίσατο. δύο γὰρ ὄντων, εἰ ἑκάτερος θάτερον ἔχει, ἀμφότεροι δίκαιοι ἔσονται, καὶ οὐδέτερος· ἐπεὶ ἀμφότεροι μὲν ἔχουσι δικαιοσύνην, ἑκάτερος δὲ οὐκ ἔχει. 3 Εἰ δὲ μήπω τὸ εἰρημένον σφόδρα ἄτοπον, διὰ τὸ καὶ ἐπ' ἄλλων συμβαίνειν τὸ τοιοῦτον (οὐδὲν γὰρ κωλύει ἀμφοτέροις ἔχειν μνᾶν, μηδετέρου ἔχοντος) ἀλλ' οὖν τότε, τἀναντία ὑπάρχειν τοῖς αὐτοῖς, παντελῶς ἄτοπον δόξειεν ἂν εἶναι. συμβήσεται δὲ τοῦτο, ἐὰν ὁ μὲν αὐτῶν, σωφροσύνην καὶ δειλίαν ἔχῃ· ὁ δέ, ἀνδρίαν καὶ ἀκολασίαν· * ἀμφότεροι γὰρ δικαιοσύνην καὶ ἀδικίαν ἕξουσιν. εἰ γὰρ δικαιοσύνη, σωφροσύνη καὶ ἀνδρία ἐστίν, ἡ ἀδικία, δειλία καὶ ἀκολασία ἔσται. 4 Ὅλως τε ὅσα ἐστὶν ἐπιχειρεῖν, ὅτι οὐ ταὐτόν ἐστι τὰ μέρη τε καὶ τὸ ὅλον, πάντα χρήσιμα πρὸς τὸ νῦν εἰρημένον. * γ. ἀμφ.

ἔοικε γὰρ ὁ οὕτως ὁριζόμενος, τὰ μέρη τῷ ὅλῳ τὰ αὐτὰ φάσκειν εἶναι. 5 Μάλιστα δὲ οἰκεῖοι γίνονται οἱ λόγοι, ἐφ' ὧν κατάδηλος ἡ τῶν μερῶν ἐστι σύνθεσις, καθάπερ ἐπ' οἰκίας, καὶ τῶν ἄλλων τῶν τοιούτων. δῆλον γὰρ, ὅτι τῶν μερῶν ὄντων, οὐδὲν κωλύει τὸ ὅλον μὴ εἶναι. ὥστε οὐ ταὐτὸν τὰ μέρη τῷ ὅλῳ. 6 Εἰ δὲ μὴ ταῦτα, ἀλλὰ τὸ ἐκ τούτων ἔφησεν εἶναι τὸ ὁριζόμενον, πρῶτον μὲν ἐπισκεπτέον, εἰ μὴ πέφυκεν ἕν τι γίνεσθαι ἐκ τῶν εἰρημένων. ἔνια γὰρ οὕτως ἔχει πρὸς ἄλληλα, ὥστε μηδὲν ἐξ αὐτῶν γίνεσθαι, οἷον γραμμὴ καὶ ἀριθμός. 7 Ἔτι, εἰ τὸ μὲν ὁριζόμενον, ἔν τινι πρώτῳ πέφυκε γίνεσθαι, ἐξ ὧν δὲ ἔφησεν αὐτὸ εἶναι, μὴ ἐν ἑνί τινι πρώτῳ πέφυκε γίνεσθαι, ἀλλ' ἑκάτερον ἐν ἑκατέρῳ. δῆλον γὰρ, ὅτι οὐκ ἂν εἴη ἐκ τούτων ἐκεῖνο. ἐν οἷς γὰρ τὰ μέρη, καὶ τὸ ὅλον ἀνάγκη ὑπάρχειν. ὥστε οὐκ ἐν ἑνὶ τὸ ὅλον πρώτῳ, ἀλλ' ἐν πλείοσιν. 8 Εἰ δὲ καὶ τὰ μέρη καὶ τὸ ὅλον ἐν ἑνί τινι πρώτῳ, σκοπεῖν, εἰ μὴ ἐν τῷ αὐτῷ,* ἀλλ' ἐν ἑτέρῳ τὰ μέρη, καὶ ἐν ἑτέρῳ τὸ ὅλον. 9 Πάλιν, εἰ τῷ ὅλῳ συμφθείρεται τὰ μέρη. ἀνάπαλιν γὰρ δεῖ συμβαίνειν, τῶν μερῶν φθαρέντων, φθείρεσθαι τὸ ὅλον· τοῦ δ' ὅλου φθαρέντος, οὐκ ἀνάγκη καὶ τὰ μέρη ἐφθάρθαι. 10 Ἢ, εἰ τὸ μὲν ὅλον, ἀγαθὸν ἢ κακόν· τὰ δὲ μέρη, μηδέτερα· ἢ ἀνάπαλιν, τὰ μὲν μέρη, ἀγαθὰ ἢ κακά· τὸ δ' ὅλον, μηδέτερον. οὔτε γὰρ ἐκ μηδετέρων ἀγαθὸν ἢ κακὸν γίνεσθαι δυνατόν, οὔτε ἐκ κακῶν ἢ ἀγαθῶν μηδέτερον. 11 Ἢ εἰ μᾶλλον μὲν θάτερον ἀγαθόν, ἢ θάτερον κακόν· τὸ δ' ἐκ τούτων, μὴ μᾶλλον ἀγαθόν, ἢ κακόν. οἷον, εἰ ἡ ἀναίδεια ἐξ ἀνδρείας καὶ ψευδοῦς δόξης. μᾶλλον γὰρ ἀγαθὸν ἡ ἀνδρεία, ἢ κακὸν ἡ ψευδὴς δόξα. ἔδει οὖν καὶ τὸ ἐκ τούτων, ἀκολουθεῖν τῷ μᾶλλον, καὶ εἶναι ἢ ἁπλῶς ἀγαθόν, ἢ μᾶλλον ἀγαθὸν ἢ κακόν. 12 Ἢ τοῦτο μὲν οὐκ ἀναγκαῖον, ἐὰν μὴ ἑκάτερον ᾖ καθ' αὑτὸ ἀγαθὸν ἢ κακόν. πολλὰ γὰρ τῶν ποιητικῶν, καθ' αὑτὰ μὲν οὐκ ἔστιν ἀγαθά, μιχθέντα δέ τισιν, γίνεται ἀγαθά.* τὰ δὲ ἀνάπαλιν, ἑκάτερον μὲν ἀγαθόν, μιχθέντα δέ, κακόν, ἢ οὐδέτερον. μάλιστα δὲ καταφανὲς τὸ νῦν ῥηθέν, ἐπὶ τῶν ὑγιεινῶν καὶ νοσωδῶν. ἔνια γὰρ τῶν φαρμάκων οὕτως ἔχει, ὡς ἑκάτερον μὲν εἶναι ἀγαθόν, ἐὰν δὲ ἄμφω δοθῇ μιχθέντα,* κακά. 13 Πάλιν, εἰ ἐκ βελτίονος καὶ* χείρονος, ὃν μὴ ἔστι τὸ ὅλον τοῦ μὲν βελτίονος χεῖρον, τοῦ δὲ χείρονος βέλτιον. 14 Ἢ οὐδὲ τοῦτο ἀναγκαῖον, ἐὰν μὴ καθ' αὑτὰ ᾖ τὰ ἐξ ὧν σύγκειται, ἀγαθά, ἐπὶ γὰρ τῶν μὴ καθ' αὑτὰ ἀγαθῶν, οὐδὲν κωλύει τὸ ὅλον μὴ γίνεσθαι ἀγαθόν, καθάπερ ἐπὶ τῶν ἀρτίως ῥηθέντων. 15 Ἔτι, εἰ συνώνυμον τὸ ὅλον θατέρῳ. οὐ δεῖ γάρ· καθάπερ οὐδ' ἐπὶ τῶν συλλαβῶν. οὐδενὶ γὰρ τῶν στοιχείων, ἐξ ὧν σύγκειται, ἡ συλλαβὴ συνώνυμός ἐστιν. 16 Ἔτι, εἰ μὴ εἴρηκε τὸν τρόπον τῆς συνθέσεως. οὐ γὰρ αὐτάρκες πρὸς τὸ γνωρίσαι, τὸ εἰπεῖν ἐκ τούτων.* οὐ γὰρ τὸ ἐκ τούτων, ἀλλὰ καὶ τὸ οὕτως ἐκ τούτων, ἑκάστου τῶν συνθέτων ἡ οὐσία, καθάπερ ἐπὶ οἰκίας. οὐ γὰρ ἂν ὁπωσοῦν συντεθῇ ταῦτα, οἰκία ἐστίν. 17 Εἰ δὲ τόδε μετὰ τοῦδε ἀποδέδωκε· πρῶτον μὲν ῥητέον, ὅτι τόδε μετὰ τοῦδε,* ἤτοι τόδε καὶ τόδε λέγεται, ἢ τόδε ἐκ τοῦδε. ὁ γὰρ λέγων μέλι μεθ' ὕδατος, ἤτοι μέλι καὶ ὕδωρ λέγει, ἢ τὸ ἐκ μέλιτος καὶ ὕδατος. ὥστ' ἂν ὁποτερῳοῦν τῶν εἰρημένων ταὐτὸν ὁμολογήσῃ εἶναι τὸ τόδε μετὰ τοῦδε, τὰ αὐτὰ ἁρμόσει λέγειν, ἅπερ πρὸς ἑκάτερον τούτων ἔμπροσθεν εἴρηται.

* γρ. ἐν ἑτέρῳ τὸ ὅλον, καὶ ἐν ἑτέρῳ τὰ μέρη.

* γρ. ἢ ἀνάπαλιν, ἔχων.

* γρ. κακά.

* γρ. χείρονος ὄν, μὴ ἔστι τὸ ὅλον

* γρ. οὐδὲ γὰρ τὸ ἐκ τούτων, ἀλλὰ τὸ οὕτως ἐκ τούτων, ἑκάστου ἐστὶ τῶν συνθέτων ἡ οὐσία.

* γρ. ἢ τόδε καὶ τόδε, ἢ τόδε ἐκ τοῦδε

A nam qui ita definiuit, *is* dicere videtur idem eſſe partes ac totũ. 5 Maximè autem propriæ rationes *in iis* fiunt, in quibus perſpicua eſt partium cõpoſitio, vt in domo, & ceteris eiuſmodi *rebus*. patet n. nihil prohibere, quominus, cùm partes ſint, totum non ſit. itaque non idem *ſunt* partes, & totum. 6 Quòd ſi rem definitam dixerit eſſe, non has, ſed quod ex his *conſtat*: primùm conſiderare *oportet*, an naturâ comparatum nõ ſit, vt vnum fiat ex iis quæ dicta ſunt. quædam. n. ita ſunt affecta inter ſe, vt nihil ex eis fiat: velvti linea & numerus. 7 Deinde an naturâ comparatum ſit, vt id quod definitũ eſt, in vno aliquo primo *ſubiecto* inſit; neque naturâ B comparatum ſit, vt *ea* ex quibus ipſum *definitum* conſtare dixit, in vno primo ſubiecto inſint, ſed vtrumque in alio. patet enim, ex illis hoc non conſtare. in quibus. n. partes inſunt, neceſſe *eſt* etiam totum ineſſe. quocirca totum non erit in vno primo *ſubiecto*, ſed in pluribus. 8 Si verò & partes & totum in vno primo *ſubiecto inſint*: cõſiderare *oportet*, an nõ in eodem *inſint*: ſed in alio partes, in alio totum. 9 Rurſus, an ſimul cum toto intereant partes. nam contrà accidere oportet, vt partibus interẽptis, totum intereat. quod ſi totum interiit, non neceſſe *eſt* etiam partes interiiſſe. 10 Vel an totum *ſit* bonum aut malum; & partes, neutrum; vel cõtrà partes *ſint* bonæ vel malæ; totum autem, C neutrum etenim nec ex neutro bonum quidpiam aut malum fieri poteſt: neque ex bonis vel malis neutrum. 11 Vel an alterũ *ſit* magis bonum, quàm alterum malum: quod verò ex iis *conſtare dicitur*, non *ſit* magis bonum quàm malum: vt ſi impudentia *dicatur cõſtare* ex fortitudine & falſa opinione. nam fortitudo magis *eſt* bonum, quàm falſa opinio malum. ergo oportebat etiam id quod ex his *cõſtare dicitur*, ei quod magis *eſt*, conſequẽs eſſe, & vel ſimpliciter eſſe bonum, vel magis bonum quàm malum. 12 An hoc non *eſt* neceſſarium, niſi vtrumque ſit per ſe bonum, vel malum? multa. n. effectiua, *etſi* per ſe non ſunt bona, tamen ſi cum D quibuſdam coniungantur, fiunt bona, alia *ſunt* cõtrà, *quorũ* vtrumque eſt bonum: ſed ſi coniungantur, *quod efficitur*, *eſt* malum vel neutrum. Quod modò dixi, maximè perſpicuum *eſt* in iis quæ *ſunt* ſalubria vel inſalubria. quędam. n. pharmaca ita ſe habent, vt vtrumque ſit bonum: ſed ſi ambo mixta præbeantur, mala *ſint*. 13 Rurſus *videndum eſt*, an *aliquid videatur cõſtare* ex meliori & deteriori, quorum meliore totum non ſit deterius, deteriore autem melius. 14 An ne hoc quidẽ neceſſarium *eſt*, niſi eá ex quibus *totum* conſtat, ſint per ſe bona? in iis. n. quæ non *ſunt* per ſe bona, nihil vetat totum non effici bonum: quemadmodũ in iis quæ modò dixi, *perſpicere licet*. 15 Præterea *vidẽdum eſt*, an totũ E *ſit* alteri *parti* ſynonymũ. *id* n. *eſſe* non debet: quemadmodum ne in ſyllabis quidem. nam ſyllaba nulli elementorum ex quibus conſtat, ſynonyma eſt. 16 Præterea, an nõ expoſuerit modum cõpoſitionis. nõ ſatis. n rem explicat, qui dicit *rem* ex his *cõſtare*: quia non illud *ſolum*, ex his *conſtare*, ſed ita ex his *cõſtare*, *eſt* cuiuſq; rei compoſitæ eſſentia: vt in domo *perſpici poteſt*. neque. n. quocumque modo hæc cõponantur, domus eſt. 17 Sin autem *eſſe* hoc cũ illo tradiderit: primũ dicendum *eſt*, hoc cum illo dici, vel *quia eſt* hoc & illud, vel *quia eſt* hoc ex illis nam qui dicit mel cum aqua, *is* aut mel & aquam dicit, aut quod ex melle & aqua *conſtat*. Itaque vtrumvis horum fateatur idem eſſe atque hoc cum illo: eadem dici poterunt, quæ contra vtrumvis eorum paulo antè dicta ſunt.

18 Præterea diſtinguendũ eſt quot modis dicatur alterum cum altero, *&* conſiderandum, an nullo modo *ſit* hoc cum illo. Vtputà ſi dicatur alterum cũ altero, vel vt in aliquo eodem ſubiecto, quẽadmodum iuſtitia & fortitudo *ſunt* in anima, vel in eodem loco, vel in eodem tempore; nullo autem modo verũ ſit, quod in his dictum fuit: patet, nullius *rei* eſſe definitionẽ quæ tradita *eſt*: quia nullo modo hoc cum illo eſt. 19 Quòd ſi diſtinctione quot modis alterum cum altero dicatur, adhibita, verum ſit in eodẽ tempore vtrumque ineſſe: conſiderare *oportet*, an contingat non ad idem referri vtrumque: vt ſi *quis* fortitudinem definierit, audaciam cum recta cogitatione. cõtingit enim, vt *aliquis* audaciam habeat expoliandi, rectam autẽ cogitationem circa res ſalubres. ſed nondum fortis *eſt*, qui eodem tempore habet hoc cum illo. Præterea *non eſt fortis*, etiamſi ambo ad idem referãtur, velvti ad res medicas. nihil .n. prohibet quominus aliquis & audaciam & rectam cogitationẽ habeat circa res medicas. attamen ne hic quidẽ *eſt* fortis, qui hoc cum illo habet. Neque .n. ad diuerſa vtrũque eorum referri debet: neq; ad quamlibet eandem rẽ, ſed ad fortitudinis finem, velvti ad bellica pericula, aut ſi quid aliud, magis quã hoc, *eſt* finis. 20 Nonnullæ verò eorũ quę ita explicantur, nullo modo ſub dictam diuiſionem cadunt: velvti ira eſt dolor cum exiſtimatione contemptus. hoc .n. declarat, dolorẽ gigni ex huiuſmodi exiſtimatione. aliquid autem ex hoc gigni, non eſt idem atque eſſe hoc cum illo, ſecundùm vllum eorum modorum qui dicti fuerunt.

18 Ἔτι, διελόμενον ποσαχῶς λέγεται ἕτερον μεθ' ἑτέρου, σκοπεῖν, εἰ μηδαμῶς τόδε μετὰ τοῦδε. οἷον, εἰ λέγεται ἕτερον μεθ' ἑτέρου, ἢ ὡς ἔν τινι ταὐτῷ δεκτικῷ, καθάπερ ἡ δικαιοσύνη καὶ ἡ ἀνδρία ἐν ψυχῇ, ἢ ἐν τῷ τόπῳ τῷ αὐτῷ, ἢ ἐν τῷ χρόνῳ τῷ αὐτῷ· μηδαμῶς δ' ἀληθὲς ᾖ τὸ εἰρημένον ἐπὶ τούτων, δῆλον, ὅτι οὐδενὸς ἂν εἴη ὁ ἀποδοθεὶς ὁρισμός, ἐπεὶ οὐδαμῶς τόδε μετὰ τοῦδέ ἐστιν. 19. Εἰ δὲ τῶν διαιρεθέντων ποσαχῶς λέγεται ἕτερον μεθ' ἑτέρου, ἀληθὲς ᾖ τὸ ἐν τῷ αὐτῷ χρόνῳ ὑπάρχειν ἑκάτερον σκοπεῖν, εἰ ἐνδέχεται μὴ πρὸς τὸ αὐτὸ ἑκάτερον λέγεσθαι. οἷον, εἰ τὴν ἀνδρίαν ὡρίσατο, τόλμαν μετὰ διανοίας ὀρθῆς· ἐνδέχεται γὰρ τόλμαν μὲν ἔχειν τοῦ ἀποστερεῖν, ὀρθὴν δὲ διάνοιαν περὶ τὰ ὑγιεινά· ἀλλ' οὔπω ἀνδρεῖος, ὁ ἐν τῷ αὐτῷ χρόνῳ τόδε μετὰ τοῦδε ἔχων. ἔτι, εἰ καὶ πρὸς τὸ αὐτὸ ἄμφω λέγεται, οἷον πρὸς τὰ ἰατρικά· οὐδὲν γὰρ κωλύει καὶ τόλμαν τινὰ καὶ ὀρθὴν διάνοιαν ἔχειν πρὸς τὰ ἰατρικά· ἀλλ' ὅμως οὐδ' οὕτως ἀνδρεῖος, ὁ τόδε μετὰ τοῦδε ἔχων. οὔτε γὰρ πρὸς ἕτερον ἑκάτερον αὐτῶν δεῖ λέγεσθαι, οὔτε πρὸς ταὐτὸν τὸ τυχόν, ἀλλὰ πρὸς τὸ τῆς ἀνδρίας τέλος· οἷον, πρὸς τοὺς πολεμικοὺς κινδύνους, ἢ εἴ τι μᾶλλον τούτου τέλος. 20 Ἔνια δὲ τῶν οὕτως ἀποδεδομένων, οὐδαμῶς ὑπὸ τὴν εἰρημένην πίπτει διαίρεσιν. οἷον, εἰ ἡ ὀργή, λύπη ἐστὶ μεθ' ὑπολήψεως τοῦ ὀλιγωρεῖσθαι. ὅτι γὰρ διὰ τὴν ὑπόληψιν τὴν τοιαύτην ἡ λύπη γίνεται, τοῦτο βούλεται δηλοῦν. τὸ δὲ διὰ τοῦτο γίνεσθαί τι, οὐκ ἔστι ταὐτὸ τῷ μετὰ τούτου τόδε εἶναι, κατ' οὐδένα τῶν εἰρημένων τρόπων.

Reliqui loci. Cap. XIV.

1 Si dixerit eſſe compoſitionem, nec expoſuerit qualis ſit compoſitio. 2 Si ſubiectum, cui duo inter ſe contraria conueniunt, per alterum tantum definiatur. 3 De parte euertenda, ſi aduerſus totam definitionem argumenta non ſuppetant. 4 De obſcura definitione explicanda. 5 Ab alia definitione. 6 Epilogus.

Rvrſus, ſi totũ dixit *eſſe* horum compoſitionẽ, vt animal *eſſe* compoſitionẽ animæ & corporis: primũ conſiderare *oportet*, an non dixerit, qualis compoſitio *ſit*: vt ſi *quis* carnem definiens, aut os, dixerit *eſſe* compoſitionem ignis & terræ & aëris. non .n. ſatis eſt cõpoſitionem dicere: ſed & qualis *ea ſit*, explicari debet. quandoquidem nõ ſi quovis modo hæc componãtur, caro fit: ſed ſi hoc modo cõponantur, caro: ſi illo modo, os. Quamquã neutrum eorum quæ dixi, videtur eſſe omnino idem quod compoſitio: quoniam omni cõpoſitioni diſſolutio *eſt* cõtraria: neutri autem eorum quæ dixi, quicquam *eſt contrariũ*. Præterea ſi æquè probabile *eſt*, omne cõpoſitum eſſe compoſitionem, vel nullum; vnumquodque autem animal, cùm ſit cõpoſitum, non eſt compoſitio: ne aliud quidem vllum cõpoſitum erit compoſitio. 2 Præterea ſi naturâ comparatum ſit, vt æquè in aliquo cõtraria inſint, & *aliquis* definierit per alterum *tantùm*: patet, eum non definiuiſſe. alioquin accidet, vt eiuſdẽ *rei* ſint plures definitiones. quid .n. ampliùs dixit, qui per hoc, quàm qui per illud definiuit; cùm naturâ cõparatum ſit, vt ambo in eodem æquè gignantur? Talis autem *eſt* animæ definitio, ſi quidem eſt ſubſtãtia ſcientiæ capax. æquè .n. eſt ignorãtiæ capax. 3 Quòd ſi cui aduerſus totam definitionem argumenta non ſuppetant, propterea quòd totum cognitum non ſit: contra partẽ aliquam *oportet* argumentari, ſi *quæ* ſit nota, nec videatur rectè tradita: euerſâ enim parte, etiam tota definitio euertitur.

Πάλιν, εἰ τὴν τούτων σύνθεσιν, εἴρηκε τὸ ὅλον. οἷον, τῆς ψυχῆς καὶ σώματος σύνθεσιν, τὸ ζῷον· πρῶτον μὲν σκοπεῖν, εἰ μὴ εἴρηκε ποία σύνθεσις, καθάπερ εἰ σάρκα ὁριζόμενος, ἢ ὀστοῦν, τὴν πυρὸς καὶ γῆς καὶ ἀέρος σύνθεσιν εἶπεν. οὐ γὰρ ἀπόχρη τὸ σύνθεσιν εἰπεῖν· ἀλλὰ καὶ ποία τις, προσδιοριστέον. οὐ γὰρ ὁπωσοῦν συντεθέντων τούτων, σὰρξ γίνεται· ἀλλ' οὑτωσὶ μὲν συντεθέντων, σάρξ· οὑτωσὶ δέ, ὀστοῦν. ἔοικε δ' οὐδ' εἶναι τὸ παράπαν σύνθεσις ταὐτόν, οὐδέτερον τῶν εἰρημένων. συνθέσει μὲν γὰρ πάσῃ διάλυσις ἐναντίον· τῶν δ' εἰρημένων οὐδετέρῳ οὐδέν. ἔτι, εἰ ὁμοίως πιθανόν, πᾶν τὸ σύνθετον, σύνθεσιν εἶναι, ἢ μηδέν· τῶν δὲ ζῴων ἕκαστον, σύνθετον ὄν, μὴ ἔστι σύνθεσις· οὐδὲ τῶν ἄλλων οὐδὲν τῶν συνθέτων, σύνθεσις ἂν εἴη. 2 Πάλιν, εἰ ὁμοίως ἔν τινι πέφυκεν ὑπάρχειν τἀναντία, ὥρισται δὲ διὰ θατέρου· δῆλον γὰρ ὅτι οὐχ ὥρισται. εἰ δὲ μή, πλείους τοῦ αὐτοῦ συμβήσεται ὁρισμοὺς εἶναι. τί γὰρ μᾶλλον ὁ διὰ τούτου, ἢ ὁ διὰ τοῦ ἑτέρου ὁρισάμενος εἴρηκεν, ἐπειδὴ ὁμοίως ἀμφότερα πέφυκε γίνεσθαι ἐν αὐτῷ; τοιοῦτος δ' ὁ τῆς ψυχῆς ὅρος, εἴπερ ἐστὶν οὐσία ἐπιστήμης δεκτική. ὁμοίως γὰρ καὶ ἀγνοίας ἐστὶ δεκτική. 3 Δεῖ δὲ καὶ ἐὰν μὴ πρὸς ὅλον ἔχῃ τις ἐπιχειρεῖν τὸν ὁρισμόν, διὰ τὸ μὴ γνώριμον εἶναι τὸ ὅλον, πρὸς τῶν μερῶν τι ἐπιχειρεῖν, ἐὰν ᾖ γνώριμον, καὶ μὴ καλῶς ἀποδεδομένον φαίνηται. τοῦ γὰρ μέρους ἀναιρεθέντος, καὶ ὁ πᾶς ὁρισμὸς ἀναιρεῖται.

A 4 Ὅσοι τ' ἀσαφεῖς τῶν ὁρισμῶν, * συνδιορθώσαντα καὶ συσχηματίσαντα πρὸς τὸ δηλοῦν τι, καὶ ἔχειν ἐπιχείρημα, οὕτως ἐπισκεπτέον. ἀναγκαῖον γὰρ τῷ ἀποκρινομένῳ, ἢ δέχεσθαι τὸ ἐκλαμβανόμενον ὑπὸ τοῦ ἐρωτῶντος, ἢ αὐτὸν διασαφῆσαί τί ποτε τυγχάνει τὸ δηλούμενον ὑπὸ τοῦ λόγου. 5 Ἔτι, καθάπερ ἐν ταῖς ἐκκλησίαις νόμον εἰώθασιν ἐπεισφέρειν κἂν ᾖ βελτίων ὁ * ἐπεισφερόμενος, ἀναιροῦσι τὸν ἔμπροσθεν· οὕτω καὶ ἐπὶ τῶν ὁρισμῶν ποιητέον, καὶ * αὐτὸν ἐπεισφέρειν ὁρισμὸν ἕτερον· ἐὰν γὰρ φαίνηται βελτίων, καὶ μᾶλλον δηλῶν τὸ ὁριζόμενον, δῆλον ὅτι ἀνῃρημένος ἔσται ὁ κείμενος, ἐπειδὴ οὐκ εἰσὶ πλείους τοῦ αὐτοῦ ὁρισμοί. B 6 Πρὸς ἅπαντας δὲ τοὺς ὁρισμοὺς οὐκ ἐλάχιστον στοιχεῖον, τὸ πρὸς ἑαυτὸν εὐστόχως ὁρίσασθαι τὸ προκείμενον, ἢ καὶ καλῶς εἰρημένον ὅρον ἀναλαβεῖν. ἀνάγκη γάρ, ὥσπερ πρὸς * παράδειγμα θεώμενον, τό, τε ἐλλεῖπον ὧν προσήκει ἔχειν τὸν ὁρισμόν, καὶ τὸ προσκείμενον περιέργως, καθορᾶν· ὥστε μᾶλλον ἐπιχειρημάτων εὐπορεῖν. 7 Τὰ μὲν οὖν περὶ τοὺς ὁρισμοὺς ἐπὶ τοσοῦτον εἰρήσθω.

* γρ. συνδιορθώσαντα

* γρ. εἰσφερ.

* γρ. αὐτόν.

* γρ. παράδειγμα-τα

A 4 Et quæcũque *ſunt* obſcuræ definitiones, *eas* corrigendo & reformando, vt aliquid declarent, & *vt* argumenta ſuppetant, ita conſiderare *oportet*. neceſſe eſt enim, cum qui reſpondet, vel id quod ab interrogãte aſſumitur, admittere, vel ipſum patefacere, quid tãdem ſit quod definitione ſignificatur. 5 Præterea quemadmodum in concionibus legem ſoliti ſunt ferre: & ſi melior ſit ea quæ lata eſt, priorem abrogant: ita etiam in definitionibus faciendum *eſt*, aliáque adducenda *eſt* definitio. nã ſi *hæc* videatur melior *eſſe*, ac magis declarare rem definitam; profectò euerſa erit ea quæ poſita erat: quandoquidem non ſunt eiuſdem *rei* plures B definitiones. 6 Ad omnes autem definitiones *euertendas* non minimum elemẽtum *eſt*, ſi quis ſecum ipſe rem propoſitam ſcitè definiat, aut rectè traditam definitionem repetat. neceſſe *eſt* enim, vt quaſi ad exemplar confugientes perſpiciamus, & quid in definitione deſideretur, & quid ſuperuacuò ſit adiectum. itaque maior argumentorum copia ſuppetet. 7 *De iis* igitur, quæ ad definitiones *pertinent*, hactenus dictum eſto.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΤΟΠΙΚΩΝ ΤΟ ΕΒΔΟΜΟΝ.

ARISTOTELIS TOPICORVM

LIBER VII.

DE QVÆSTIONE VTRVM SIT IDEM, AN DIVERSVM,

TRACTATVS *I.*

Loci pertinentes ad quæſtionem, vtrum ſit idem an diuerſum.

Cap. I.

1 Protheſis. 2 A caſibus, & coniugatis, & oppoſitis. 3 Ab iis quæ efficiendi vel interimendi vim habent: & abortu, vel interitu: & omnino ab iis quæ erga vtramque rem propoſitam quoquo modo affecta ſunt. 4 Si alterum eorum quæ propoſita ſunt, dicatur maximè tale: 6 vel idem ſit quod tertium aliquid. 7 Ab accidentibus. A ſubiectis. 8 A categoria. 9 A genere. 10 A differentiis. 11 Ab eo quod eſt magis. 12 Ab adiectione. 13 A detractione. 14 Ab impoſſibili. 15 Ab attributis, vel ſubiectis. 16 A diſtinctione verbi Idem. 17 Si alterum ſine altero eſſe poſſit. 18 Epilogus.

CAP. I.

Lib. 1. cap. 6.

C ΠΟΤΕΡΟΝ δὲ ταὐτὸν ἢ ἕτερον, κατὰ τὸν κυριώτατον τῶν ῥηθέντων περὶ ταὐτοῦ τρόπων, νῦν ῥητέον. * ἐλέγετο δὲ κυριώτατα ταὐτό, τὸ τῷ ἀριθμῷ ἕν. 2 Σκοπεῖν δὲ ἔκ τε τῶν πτώσεων, καὶ τῶν συστοίχων, καὶ τῶν ἀντικειμένων. εἰ γὰρ ἡ δικαιοσύνη ταὐτὸν τῇ ἀνδρείᾳ, καὶ ὁ δίκαιος τῷ ἀνδρείῳ, καὶ τὸ δικαίως τῷ ἀνδρείως. ὁμοίως δὲ καὶ ἐπὶ τῶν ἀντικειμένων. εἰ γὰρ τάδε, ταὐτά, καὶ τὰ ἀντικείμενα τούτοις, ταὐτά, καθ' ὁποιανοῦν τῶν λεγομένων ἀντίθεσιν. οὐδὲν γὰρ διαφέρει τὸ τούτῳ ἢ τούτῳ ἀντικείμενον λαβεῖν ἐπειδὴ * ταὐτά ἐστι. D 3 Πάλιν, ἐκ τῶν ποιητικῶν, καὶ φθαρτικῶν, καὶ γενέσεων καὶ φθορῶν, καὶ ὅλως τῶν ὁμοίως ἐχόντων πρὸς * ἑκάτερον. ὅσα γὰρ ἁπλῶς ταὐτά, καὶ αἱ γενέσεις αὐτῶν, καὶ αἱ φθοραί, αἱ αὐταί, καὶ τὰ ποιητικά, καὶ τὰ φθαρτικά. 4 Σκοπεῖν δέ, καὶ ὧν θάτερον μάλιστα λέγεται ὁτιοῦν, εἰ καὶ θάτερον τῶν αὐτῶν τούτων, κατὰ

* γρ. ταὐτόν ἐστι.

* γρ. ἑκάτερα.

C VTRVM autẽ *id de quo agitur, ſit* idẽ an diuerſum, ſecundũ eum *modũ* qui inter modos *ſuprà* de eodẽ expoſitos, eſt maximè proprius, nũc dicendũ *eſt*. Dicebatur autẽ maximè propriè idem *eſſe*, quod *eſt* numero vnum. 2 Conſiderare autem *oportet atque argumenta ſumere* ex caſibus, & coniugatis, & oppoſitis. Nam ſi iuſtitia eſt idem quod fortitudo; etiam iuſtus *eſt idem* quod fortis: & iuſtè, *idem* quod fortiter. Similis ratio *eſt* oppoſitorum. nam ſi hæc *ſunt* eadem, etiam ea quæ his opponuntur, *ſunt* eadem, D quovis eorum quos dixi modorum opponantur. nihil enim intereſt, huic an illi contrarium ſumatur: quoniam eadem ſunt. 3 Rurſus ex iis quæ efficiendi & interimendi vim habent, necnon ex ortu & interitu, & omnino ex iis quæ æquè affecta ſunt ad vtrumque. quæcumque n. ſimpliciter eadem *ſunt*, eorũ quoque ortus & interitus *ſunt* iidẽ, necnon quæ efficiendi, & quæ corrumpendi vim habent. 4 Conſiderare etiam *oportet*, quorũ alterum maximè dicitur quidvis, an & alterum eorũ ſecundùm

idem maximè dicatur. quẽadmodum Xenocrates beatam vitam & probam demonſtrat eandem *eſſe*, quoniã inter omnes maximè eligẽda eſt vita proba, & *vita* beata. vnum.n. *eſt* quod eſt maximè eligendum & maximũ. Similiter *contingit* & in ceteris eiuſmodi *rebus*. 5 Oportet autem vtrunque *eorũ* quæ dicuntur maxima vel maximè eligenda, eſſe vnũ numero: alioqui non probabitur idem *eſſe*. neque.n. neceſſe *eſt*, ſi fortiſſimi Græcorũ ſunt Peloponneſij, & Lacedæmonij, eoſdẽ eſſe Peloponneſios & Lacedæmonios: quia non eſt vnus numero Peloponneſius & Lacedæmonius: ſed neceſſe *eſt* alterum ſub altero cõtineri, quemadmodũ Lacedæmonij ſub Peloponneſiis. alioquin cõtinget *eos* inuicem meliores eſſe, niſi alteri ſub alteris contineantur. neceſſe *eſt*.n. Pelopõneſios meliores eſſe Lacedæmoniis, ſi quidẽ non continẽtur alteri ſub alteris: quia ceteris omnibus ſunt meliores. ſimiliterq; neceſſe *eſt* Lacedæmonios meliores eſſe Peloponneſiis: nam & hi ſunt reliquis omnibus meliores. quare ſe inuicẽ meliores efficiuntur. Patet igitur vnũ numero eſſe debere, *id* quod optimũ & maximũ *eſſe* dicitur, ſi futurum eſt vt demõſtretur eſſe idem. Proinde ne Xenocrates quidẽ demonſtrat: quia vita beata, & *vita* proba, non *eſt* vna numero. Quocirca non *eſt* neceſſe eandem eſſe, eo quòd *ſint* ambæ maximè eligendæ: ſed altera *continetur* ſub altera. 6 Idẽ conſiderare *oportet*, ſi alterũ eorum *quæ ſunt propoſita*, ſit idẽ quod *tertium* quidpiam, an etiã alterum *ſit idẽ quod illud tertium*. niſi.n. ambo ſint eadẽ quod idẽ *quidpiam*: patet *ea* ne inter ſe quidẽ eſſe eadẽ. 7 Pręterea conſiderare *oportet* ex horum accidẽtibus, & *ex iis* quibus hæc accidunt. nã quæ alteri accidunt, etiã alteri accidere debẽt: & quibus alterũ eorum accidit, etiam alterũ debet accidere. Si quid autẽ horum diſcrepet, patet, non eſſe eadẽ. 8 Videre etiam *oportet*, an nõ in vno categorię genere ambo *ſint*, ſed alterũ qualitatem, alterum quantitatẽ, vel ad aliquid *relationẽ* declaret. 9 Rurſus, an genus vtriuſque non idẽ *ſit*: ſed alterũ *ſit* bonum, alterũ malum: vel alterum virtus, alterũ ſcientia. 10 Vel an idẽ quidẽ genus, non tamen eædẽ differentiæ vtrique attribuãtur: ſed alteri ſcientia contẽplatiua, alteri actiua. Similis *eſt* aliorũ ratio. 11 Præterea ex eo quod magis *eſt*, *argui poterit*, ſi alterũ recipiat intentionẽ, alterũ non *item*. vel ambo quidẽ recipiant, non tamẽ ſimul. quemadmodum qui magis amat, non magis cupit concũbere: itaque non idẽ *eſt* amor, atque cupiditas concũbendi. 12 Pręterea ex adiectione, ſi vtrũque eidẽ adiectum, non efficiat idem totũ. 13 Vel ſi eadẽ re ab vtroque detracta, quod reliquum *eſt*, diuerſũ *eſt*. vt ſi *quis* dixerit duplũ dimidij, & multiplũ ſimpli, idem eſſe. nã ſi ab vtroque detrahatur dimidiũ, ea quæ reliqua ſunt, idẽ declarare deberent: nec tamen declarãt: duplum.n. & multiplum non declarãt eandem rem. 14 Conſiderare autem *oportet*, non ſolũ an iam aliquid impoſſibile accidat propter theſim, ſed etiam an eſſe poſſit ex hypotheſi. vt iis *accidit*, qui inane & aëris plenum, idem eſſe aſſerũt: patet enim, ſi aër exeat, nihilo minùs, immo magis inane fore, plenũ verò aëris ampliùs non fore. Quocirca ſuppoſito aliquo, ſeu verò, ſeu falſo, (nihil.n. refert) alterum eorum tollitur, alterum non *item*. quare non idem *ſunt*. 15 Vt autem vniuerſaliter dicam, ex iis quæ quomodocumque vtrique attribuuntur, & quibus hęc attribuuntur, conſiderare *oportet*, an alicubi diſcrepent. nam quę

A τὸ αὐτὸ μάλιστα λέγεται· καθάπερ Ξενοκράτης τὸν εὐδαίμονα βίον, καὶ τὸν σπουδαῖον ἀποδείκνυσι τὸν αὐτὸν ἐπειδὴ πάντων τῶν βίων αἱρετώτατος ὁ σπουδαῖος, καὶ εὐδαίμων· ἓν γὰρ τὸ αἱρετώτατον, καὶ τὸ μέγιστον. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων τῶν τοιούτων. 5 Δεῖ δὴ ἑκάτερον, ἓν ἀριθμῷ εἶναι, τὸ λεγόμενον μέγιστον, ἢ καὶ αἱρετώτατον. εἰ δὲ μή, οὐκ ἔσται δεδειγμένον ὅτι ταὐτόν· οὐ γὰρ ἀναγκαῖον, εἰ ἀνδρειότατοι τῶν Ἑλλήνων Πελοποννήσιοι καὶ Λακεδαιμόνιοι, τοὺς αὐτοὺς εἶναι Πελοποννησίους τοῖς Λακεδαιμονίοις ἐπειδὴ οὐχ εἷς ἀριθμῷ Πελοποννήσιος καὶ Λακεδαιμόνιος· ἀλλὰ περιέχεσθαι μὲν τὸν ἕτερον ὑπὸ τοῦ ἑτέρου ἀναγκαῖον, καθάπερ οἱ Λακεδαιμόνιοι ὑπὸ B τῶν Πελοποννησίων. εἰ δὲ μή, συμβήσεται ἀλλήλων εἶναι βελτίους, ἐὰν μὴ περιέχωνται οἱ ἕτεροι ὑπὸ τῶν ἑτέρων. ἀναγκαῖον γὰρ τοὺς Πελοποννησίους, βελτίους εἶναι τῶν Λακεδαιμονίων, εἴπερ μὴ περιέχονται οἱ ἕτεροι ὑπὸ τῶν ἑτέρων· πάντων γὰρ τῶν λοιπῶν * εἰσὶ βελτίους· ὁμοίως δὲ καὶ τοὺς Λακεδαιμονίους ἀνάγκη βελτίους εἶναι τῶν Πελοποννησίων· καὶ γὰρ καὶ οὗτοι πάντων τῶν λοιπῶν εἰσὶ βελτίους· ὥστε ἀλλήλων βελτίους γίνονται. δῆλον οὖν, ὅτι ἓν ἀριθμῷ δεῖ εἶναι, τὸ βέλτιστον καὶ μέγιστον λεγόμενον, εἰ μέλλει ὅτι ταὐτὸν ἀποδείκνυσθαι. διὸ καὶ Ξενοκράτης οὐκ ἀποδείκνυσιν· οὐ γὰρ εἷς ἀριθμῷ ὁ εὐδαίμων, καὶ ὁ σπουδαῖος βίος. ὥστε οὐκ ἀναγ- C καῖον τὸν αὐτὸν εἶναι, διότι ἄμφω αἱρετώτατοι· ἀλλὰ τὸν ἕτερον ὑπὸ τὸν ἕτερον. 6 Πάλιν σκοπεῖν, εἰ ᾧ θάτερον ταὐτόν, καὶ θάτερον. εἰ γὰρ μὴ ἀμφότερα τῷ αὐτῷ ταὐτά, δῆλον ὅτι οὐδ' ἀλλήλοις. 7 Ἔτι, ἐκ τῶν τούτοις συμβεβηκότων, καὶ οἷς ταῦτα συμβέβηκεν, ἐπισκοπεῖν. ὅσα γὰρ θατέρῳ συμβέβηκε, καὶ θατέρῳ δεῖ συμβεβηκέναι· καὶ οἷς θάτερον αὐτῶν συμβέβηκε, καὶ θάτερον δεῖ συμβεβηκέναι. εἰ δέ τι τούτων διαφωνεῖ, δῆλον ὅτι οὐ ταὐτά. 8 Ὁρᾶν δὲ καί, εἰ μὴ ἐν ἑνὶ γένει κατηγορίας ἀμφότερα· ἀλλὰ τὸ μὲν, ποιόν * τὸ δέ, ποσόν, ἢ πρός τι δηλοῖ. 9 Πάλιν, εἰ τὸ γένος ἑκατέρου μὴ ταὐτόν· ἀλλὰ τὸ μὲν, ἀγαθὸν τὸ δὲ κακόν· ἢ τὸ μέν, ἀρετὴ τὸ D δ', ἐπιστήμη. 10 Ἢ εἰ τὸ μὲν γένος ταὐτόν, αἱ διαφοραὶ δὲ μὴ αἱ αὐταὶ ἑκατέρου κατηγοροῦνται· ἀλλὰ τοῦ μέν, ὅτι θεωρητικὴ ἐπιστήμη· τοῦ δὲ ὅτι πρακτική. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. 11 Ἔτι, ἐκ τοῦ μᾶλλον, εἰ τὸ μὲν, * δέχεται τὸ μᾶλλον· τὸ δέ, μή. ἢ εἰ ἄμφω μὲν * δέχεται, μὴ ἅμα δέ. καθάπερ ὁ μᾶλλον ἐρῶν, οὐ μᾶλλον ἐπιθυμεῖ τῆς συνουσίας· ὥστε οὐ ταὐτὸν ἔρως καὶ ἐπιθυμία συνουσίας. 12 Ἔτι, ἐκ τῆς προσθέσεως, εἰ τῷ αὐτῷ ἑκάτερον προστιθέμενον, μὴ ποιεῖ τὸ ὅλον ταὐτόν. 13 Ἢ εἰ τοῦ αὐτοῦ ἀφ' ἑκατέρου ἀφαιρεθέντος, τὸ λοιπόν, ἕτερον. οἷον, εἰ διπλάσιον ἡμίσεος, καὶ πολλαπλάσιον ἡμίσεος, ταὐτὸν ἔφησεν εἶναι. ἀφαιρεθέντος γὰρ ἀφ' ἑκατέρου, τοῦ E ἡμίσεος, τὰ λοιπὰ ταὐτὸν ἔδει δηλοῦν· οὐ δηλοῖ δέ. τὸ γὰρ διπλάσιον, καὶ πολλαπλάσιον, οὐ ταὐτὸν δηλοῖ. 14 Σκοπεῖν δέ, μὴ μόνον εἰ ἤδη τι συμβαίνει ἀδύνατον διὰ τῆς θέσεως, ἀλλὰ καὶ εἰ δυνατὸν ἐξ ὑποθέσεως ὑπάρξαι· καθάπερ τοῖς τὸ κενὸν καὶ τὸ πλῆρες ἀέρος, ταὐτὸν φάσκουσιν εἶναι. δῆλον γάρ, ὅτι ἐὰν ἐξέλθῃ ὁ ἀήρ, κενὸν μὲν οὐχ ἧττον, ἀλλὰ μᾶλλον ἔσται· πλῆρες δ' ἀέρος οὐκέτι ἔσται. ὥστε ὑποτεθέντος τινός, εἴτε ψευδοῦς, εἴτε ἀληθοῦς, (οὐδὲν γὰρ διαφέρει) τὸ μὲν ἕτερον ἀναιρεῖται αὐτῶν· τὸ δ' ἕτερον, οὔ· ὥστ' οὐ ταὐτόν. 15 Καθόλου δ' εἰπεῖν, ἐκ τῶν ὁπωσοῦν ἑκατέρου κατηγορουμένων, καὶ ὧν ταῦτα κατηγορεῖται, σκοπεῖν, εἴ που διαφωνεῖ. ὅσα γὰρ

* χ γίνονται
* χ ἢ δὲ ποσόν, ἢ δὲ πρός τι δηλοῖ.
* χ ἐπιδέχεται
* γρ. ἐπιδέχεται

θατέρου κατηγορεῖται, καὶ θατέρου κατηγορεῖσθαι δεῖ· καὶ ὧν θάτερον κατηγορεῖται, καὶ θάτερον κατηγορεῖσθαι δεῖ. 16 Ἔτι, ἐπεὶ πολλαχῶς ταὐτὸ λέγεται, σκοπεῖν, εἰ καθ' ἕτερόν τινα τρόπον ταὐτά ἐστι. τὰ γὰρ εἴδει, ἢ γένει ταὐτά, * οὐκ ἀνάγκη ἀριθμῷ ταὐτὰ εἶναι. ἐπισκοπούμεν δέ, πότερον οὕτω ταὐτά, ἢ οὐχ οὕτως. 17 Ἔτι, εἰ δυνατὸν θάτερον ἄνευ θατέρου εἶναι. οὐ γὰρ ἂν εἴη ταὐτόν. 18 Οἱ μὲν οὖν πρὸς τὸ ταὐτὸν τόποι, τοσοῦτοι λέγονται.

* γρ. οὐκ ἐνδέχεται ἀριθ. ταὐτὰ εἶναι.

A alteri attribuuntur, alteri quoque attribui debét: & quibus alterum attribuitur, etiam alterum attribui debet. 16 Præterea, quia multis modis idē dicitur, conſiderare *oportet*, an alio quodam modo eadem ſint. nā quæ genere vel ſpecie *ſunt* eadem, non neceſſe *eſt etiam* numero eadem eſſe. Conſiderabimus autem, vtrùm ita ſint eadem, an ſecus. 17 Præterea, an poſſit alterum ſine altero eſſe: ſic enim idem non erunt. 18 Loci igitur ad idem *pertinentes*, tot dicuntur.

An locis proximè expoſitis vti liceat, cùm de definitione diſſeritur.

Cap. II.

1 De locis qui vim habent refellendi. 2 De iis qui vim habent confirmandi. 3 Epilogus.

CAP. II.

Δῆλον δὲ ἐκ τῶν εἰρημένων, ὅτι ἅπαντες οἱ πρὸς τὸ ταὐτὸν ἀνασκευαστικοὶ τόποι, καὶ πρὸς ὅρον χρήσιμοι, καθάπερ ἔμπροσθεν εἴρηται. εἰ γὰρ μὴ ταὐτὸν δηλοῖ τό, τε ὄνομα καὶ ὁ λόγος, δῆλον ὅτι οὐκ ἂν εἴη ὁρισμὸς, ὁ ἀποδοθεὶς λόγος. 2 Τῶν δὲ κατασκευαστικῶν τόπων οὐδεὶς χρήσιμος πρὸς ὅρον· οὐ γὰρ ἀπόχρη τὸ δεῖξαι ταὐτόν, τὸ ὑπὸ τὸν λόγον, καὶ τοὔνομα, πρὸς τὸ κατασκευάσαι ὅτι ὁρισμός· ἀλλὰ καὶ τὰ ἄλλα πάντα δεῖ ἔχειν τὰ προηγγελμένα τὸν ὁρισμόν. 3 Ἀναιρεῖν μὲν οὖν ὅρον οὕτως, καὶ διὰ τούτων, ἀεὶ πειρατέον.

B Patet autē ex iis quæ dicta fuerunt, omnes locos ad idem *pertinentes*, qui vim habent euertendi, etiam ad definitionem *refutandam* vtiles *eſſe*, quemadmodum antea dictum fuit. niſi.n.& nomē & oratio idem declarent, conſtat eam orationem quæ tradita eſt, non eſſe definitionem. 2 *Eorum* autem locorum qui ad confirmādum valent, nullus vtilis *eſt* ad definitionem *confirmandam*: non.n. ſatis eſt probare idem *eſſe*, quod orationi & *quod* nomini ſubiectum *eſt*, ad definitionem confirmandam: ſed & cetera omnia quæ præcepta ſunt, definitionem habere oportet. 3 Refutare igitur definitionem hoc modo, & ex his ſemper tentandum *eſt*.

DE DEFINITIONE CONFIRMANDA,

Tractatus II.

Cap. III.

1 ¶ Protheoria. Neminem, aut paucos definitionem ſyllogiſmo concludere. 2 Definitionem ſyllogiſmō concludi poſſe. 3 ¶ Loci. 4 Ab oppoſitis, 5 id eſt, vel à tota definitione, 6 vel à partibus. 10 A caſibus & coniugatis. 11 A proportione. 12 Ab eo quod eſt magis. A ſimili.

C Ἐὰν δὲ κατασκευάζειν βουλώμεθα, πρῶτον μὲν εἰδέναι δεῖ, ὅτι οὐδεὶς, ἢ ὀλίγοι τῶν διαλεγομένων, ὅρον συλλογίζονται, ἀλλὰ πάντες ὡς ἀρχὴν τὸ τοιοῦτον λαμβάνουσιν· οἷον, οἵ τε περὶ γεωμετρίαν, καὶ ἀριθμούς, καὶ τὰς ἄλλας τὰς τοιαύτας μαθήσεις. 2 Εἶθ', ὅτι δι' ἀκριβείας μὲν, ἄλλης ἐστὶ πραγματείας ἀποδοῦναι, καὶ τί ἐστιν ὅρος, καὶ πῶς ὁρίζεσθαι δεῖ. νῦν δ', ὅσον ἱκανὸν πρὸς τὴν παροῦσαν χρείαν, τοσοῦτον μόνον λεκτέον, ὅτι δυνατὸν γενέσθαι ὁρισμοῦ, καὶ τοῦ τί ἦν εἶναι, συλλογισμόν. εἰ γάρ ἐστιν ὅρος, λόγος ὁ τὸ τί ἦν εἶναι τῷ πράγματι δηλῶν. καὶ δεῖ τὰ ἐν τῷ ὅρῳ κατηγορούμενα, καὶ ἐν τῷ τί ἐστι τοῦ πράγματος μόνα κατηγορεῖσθαι· (κατηγορεῖται δὲ ἐν τῷ τί ἐστι, τὰ γένη, καὶ αἱ διαφοραὶ) φανερόν, ὡς εἴ τις λάβοι ταῦτα, ἃ μόνα ἐν τῷ τί ἐστι τοῦ πράγματος κατηγορεῖται, ὅτι ὁ ταῦτα ἔχων λόγος, ὅρος ἐξ ἀνάγκης ἂν εἴη· οὐ γὰρ ἐνδέχεται ἕτερον εἶναι ὅρον τοῦ πράγματος· ἐπειδὴ οὐδὲν ἕτερον ἐν τῷ τί ἐστι, πράγματος κατηγορεῖται. ὅτι μὲν οὖν ἐγχωρεῖ συλλογισμὸν ὅρου γενέσθαι, φανερόν. 3 Ἐκ τίνων δὲ δεῖ κατασκευάζειν, διώρισται * μὲν ἐν ἑτέροις ἀκριβέστερον· πρὸς δὲ τὴν προκειμένην μέθοδον, οἱ αὐτοὶ τόποι χρήσιμοι. 4 Σκεπτέον γὰρ

* γρ. μὲν οὖν.

Qvod ſi confirmare velimus, primùm ſcire oportet, neminē aut paucos eorum qui diſputant, definitionem ſyllogiſmo concludere, ſed omnes eam pro principio ſumere: quemadmodū *faciunt* qui circa geometriam, & *qui circa* numeros, & *qui circa* alias eiuſmodi diſciplinas *verſantur*. 2 Deinde *ſciendum eſt*, alius eſſe tractationis exquiſitè exponere, & quid ſit definitio, & quomodo definire oporteat. nunc verò, quod in vſum præſentem ſufficit, hoc tantùm dicendum *eſt*, ſyllogiſmo concludi poſſe definitionem & quidditatem. nam ſi definitio eſt oratio quæ declarat rei quidditatem: & oportet ea quæ in definitione attribuuntur, etiam in *quæſtione* quid eſt, rei ſola attribui: (attribuuntur autem in *quæſtione* quid eſt, genera & D differentiæ) perſpicuū *eſt*, ſi quis ſumpſerit ea tantummodo quæ in *quæſtione* quid eſt, rei attribuuntur, orationem quæ hæc ipſa continet, neceſſariò eſſe definitionem, quia non poteſt eſſe alia rei definitio: cùm nihil aliud in *quæſtione* quid eſt, rei attribuatur. Definitionē igitur ſyllogiſmo concludi poſſe perſpicuum *eſt*. 3 Ex quibus autem oporteat eam conſtruere, definitum fuit in aliis *libris* exquiſitiùs. *quod* verò ad propoſitam methodum *attinet*, hi loci vtiles ſunt. 4 Conſiderandum enim

eſt in cõtrariis,& aliis oppoſitis,& totas orationes, & per partes inſpiciendo. 5 Nam ſi oppoſita *oratio eſt* oppoſitæ *rei definitio*, etiam *orationem* eam quæ dicta eſt, *rei* propoſitæ *definitionem* eſſe neceſſe *eſt*. Quoniam autem contrariorum plures ſunt connexiones, ſuméda *eſt* ex contrariis ea quæ maximè videri poſſit cõtraria definitio. Totæ igitur orationes, quemadmodũ dictum eſt, conſiderandæ *ſunt*. 6 Per partes autem ſic: Primùm *oſtenditur* genus quod traditũ fuit, rectè traditum eſſe. ſi.n. contrarium *eſt* in contrario *genere*: quod autem propoſitũ fuit, non eſt in eodem: proculdubio erit in cõtrario: quia neceſſe *eſt* cõtraria vel in eodem genere, vel in cõtrariis generibus eſſe. Ac differẽtias quoque contrarias attribui cõtrariis cenſemus: vt albo & nigro. nam illud diſſipandi, hoc colligẽdi aſpectum vim habet. quare ſi contrario contrariç *differentiæ* attribuuntur: certè ei quod propoſitum eſt, traditæ differentiæ attribuentur. Quocirca cũ & genus & differentiæ rectè traditæ ſint, patet, eam, quæ data eſt, definitionem eſſe. 7 An non neceſſe *eſt* contrariis contrarias differẽtias attribui, niſi in eodem genere cõtraria ſint? quorum autẽ genera contraria *ſunt*, nihil prohibet eãdem differentiam de ambobus dici; velvti de iuſtitia & iniuſtitia: etenim illa *eſt* virtus, hæc *eſt* vitium animæ. quapropter illud *verbum*, animæ, *quod eſt* differentia, de ambobus dicitur: quoniã corporis quoque eſt virtus & vitium. 8 At certè hoc verũ *eſt*, contrariorũ vel contrarias vel eaſdem differẽtias eſſe. Si igitur contrario contraria attribuitur, huic verò non *itẽ*, patet, eã quæ dicta fuit, huic attribui. 9 Et vt vniuerſaliter dicam, cùm definitio conſtet ex genere & differentiis, ſi rei contrariæ definitio perſpicua ſit, etiam rei propoſitæ definitio perſpicua erit. Cũ enim contrarium vel in eodem genere, vel in cõtrario *ſit*, ſimilitérque differentiæ vel contrariæ contrariis, vel eædem attribuãtur: manifeſtum *eſt*, rei propoſitæ aut idẽ genus attribui, quod & contrariæ attribuitur, differentias verò contrarias vel omnes, vel quaſdam *tãtùm*, cùm reliquæ *ſint* eædẽ: aut contrà differentias eaſdem, genera autẽ contraria: aut vtraque cõtraria, *nempe* & genera & differentias. vtraque.n. eadem eſſe non poſſunt: alioqui eadẽ erit definitio contrariorum. 10 Prçterea *ducenda ſunt argumenta* à caſibus & coniugatis. neceſſe *eſt*.n. conſequentia eſſe genera generibus, ac definitiones definitionibus. vtputà ſi obliuio eſt abiectio ſciẽtiæ: etiam obliuiſci erit abiicere ſciẽtiam: & oblitum eſſe, abieciſſe ſcientiã. vno igitur quovis eorum, quæ dixi, conceſſo, neceſſe eſt etiã reliqua cõcedere. Similitérque ſi interitus *eſt* diſſolutio eſſentiæ: etiã interire *erit* diſſolui eſſentiã: & quod habet vim interimendi, habebit vim diſſoluendi. item ſi id quod habet vim interimendi, habet vim diſſoluendi eſſentiam, etiam interitus *erit* diſſolutio eſſentiæ. Similis *eſt* aliorum ratio. Quare vno quovis ſumpto, etiam reliqua omnia conceduntur. 11 Ex iis quoque *argui poteſt*, quæ ſimiliter ſunt affecta inter ſe. nam ſi ſalubre habet vim efficiendi ſanitatẽ: id etiam quod valet ad firmã corporis conſtitutionẽ, habebit vim efficiendi firmam corporis cõſtitutionem: & quod vtile eſt, vim habebit efficiẽdi bonum. quoniam vnũquodque eorum quæ dixi, ſimiliter affectum eſt ad proprium finem. quare ſi vnius eorũ definitio eſt, habere vim efficiẽdi finem, etiam vniuſcuiuſque reliquorũ hæc erit definitio. 12 Præterea *ducenda ſunt argumenta* ex eo quod magis,& ex eo quod æquè *eſt*, quot

A ἐπὶ τῶν ἐναντίων, καὶ τῶν ἄλλων τῶν ἀντικειμένων, καὶ ὅλους τοὺς λόγους, καὶ κατὰ μέρος ἐπισκοποῦντα. 5 Εἰ γὰρ ὁ ἀντικείμενος, τοῦ ἀντικειμένου, καὶ τὸν εἰρημένον τοῦ προκειμένου ἀνάγκη εἶναι. ἐπεὶ δὲ τῶν ἐναντίων πλείους συμπλοκαὶ, ληπτέον ἐκ τῶν ἐναντίων, ὁποῖος ἂν μάλιστα φανείη ὁ ἐναντίος ὁρισμός. ὅλους μὲν οὖν τοὺς λόγους, καθάπερ εἴρηται, σκεπτέον. 6 Κατὰ μέρος δὲ ὧδε. Πρῶτον μὲν οὖν, ὅτι τὸ ἀποδοθὲν γένος, ὀρθῶς ἀποδέδοται. εἰ γὰρ τὸ ἐναντίον, ἐν τῷ ἐναντίῳ· τὸ δὲ προκείμενον μή ἐστιν ἐν τῷ αὐτῷ· δῆλον ὅτι ἐν τῷ ἐναντίῳ ἂν εἴη· ἐπειδὴ ἀνάγκη τὰ ἐναντία, ἢ ἐν τῷ αὐτῷ γένει, ἢ ἐν τοῖς ἐναντίοις γένεσιν εἶναι. καὶ τὰς διαφορὰς B δὲ τὰς ἐναντίας, τῶν ἐναντίων ἀξιοῦμεν κατηγορεῖσθαι, καθάπερ λευκοῦ καὶ μέλανος· τὸ μὲν γὰρ, διακριτικόν· τὸ δὲ, συγκριτικὸν ὄψεως. ὥστε, εἰ τοῦ ἐναντίου αἱ ἐναντίαι κατηγοροῦνται, τοῦ προκειμένου αἱ ἀποδοθεῖσαι κατηγοροῖντο ἄν. ὥστε, ἐπεὶ καὶ τὸ γένος καὶ αἱ διαφοραὶ ὀρθῶς ἀποδέδονται, δῆλον ὅτι ὁρισμὸς ἂν εἴη ὁ ἀποδοθείς. 7 Ἢ οὐκ ἀναγκαῖον, τῶν ἐναντίων τὰς ἐναντίας διαφορὰς κατηγορεῖσθαι, ἐὰν μὴ ἐν τῷ αὐτῷ γένει τὰ ἐναντία ᾖ; ὧν δὲ τὰ γένη ἐναντία, οὐδὲν κωλύει τὴν αὐτὴν διαφορὰν κατ᾽ ἀμφοῖν λέγεσθαι· οἷον, κατὰ δικαιοσύνης, καὶ ἀδικίας· τὸ μὲν γὰρ, ἀρετή· τὸ δὲ, κακία ψυχῆς. ὥστε τὸ ψυχῆς διαφορὰ, ἐπ᾽ ἀμφοῖν C λέγεται· ἐπεὶ καὶ σώματός ἐστιν ἀρετὴ, καὶ κακία. 8 Ἀλλ᾽ οὖν τοῦτό γε ἀληθὲς, ὅτι τῶν ἐναντίων, ἢ αἱ ἐναντίαι ἢ αἱ αὐταὶ διαφοραί εἰσιν. εἰ οὖν τοῦ ἐναντίου ἡ ἐναντία κατηγορεῖται, τούτου δὲ μή· δῆλον ὅτι ἡ εἰρημένη τούτου ἂν κατηγοροῖτο. 9 Καθόλου δὲ εἰπεῖν, ἐπεὶ ὁ ὁρισμός ἐστιν ἐκ γένους καὶ διαφορῶν, ἂν ᾖ τοῦ ἐναντίου ὁ ὁρισμὸς φανερὸς, καὶ ὁ τοῦ προκειμένου ὁρισμὸς φανερὸς ἔσται. ἐπεὶ γὰρ τὸ ἐναντίον, ἢ ἐν τῷ αὐτῷ γένει, ἢ ἐν τῷ ἐναντίῳ· ὁμοίως δὲ καὶ αἱ διαφοραὶ, ἢ αἱ ἐναντίαι τῶν ἐναντίων, ἢ αἱ αὐταὶ κατηγοροῦνται· δῆλον ὅτι τοῦ προκειμένου ἤτοι τὸ αὐτὸ γένος ἂν κατηγοροῖτο, ὅπερ καὶ τοῦ ἐναντίου· αἱ δὲ διαφοραὶ, ἐναντίαι, ἢ D πᾶσαι, ἢ τινὲς, αἱ δὲ λοιπαὶ αἱ αὐταί· ἢ ἀνάπαλιν, αἱ μὲν διαφοραὶ αἱ αὐταί· τὰ δὲ γένη, ἐναντία· ἢ ἄμφω, ἐναντία, καὶ τὰ γένη καὶ αἱ διαφοραί. ἀμφότερα μὲν γὰρ ταὐτὰ εἶναι οὐκ ἐνδέχεται. εἰ δὲ μὴ, ὁ αὐτὸς ὁρισμὸς τῶν ἐναντίων ἔσται. 10 Ἔτι, ἐκ τῶν πτώσεων, καὶ τῶν συστοίχων. ἀνάγκη γὰρ ἀκολουθεῖν τὰ γένη τοῖς γένεσι, καὶ τοὺς ὅρους τοῖς ὅροις. οἷον, εἰ ἡ λήθη ἐστὶν ἀποβολὴ ἐπιστήμης· καὶ τὸ ἐπιλανθάνεσθαι, ἀποβάλλειν ἐπιστήμην ἔσται· καὶ τὸ ἐπιλελῆσθαι, ἀποβεβληκέναι ἐπιστήμην. ἑνὸς οὖν ὁποιουοῦν τῶν εἰρημένων ὁμολογηθέντος, ἀνάγκη καὶ τὰ λοιπὰ ὁμολογεῖσθαι. ὁμοίως δὲ καὶ, εἰ ἡ φθορὰ, διάλυσις οὐσίας· καὶ τὸ φθείρεσθαι, διαλύεσθαι οὐ- E σίαν· καὶ * τὸ φθαρτικὸν, διαλυτικόν. εἴ γε τὸ φθαρτικὸν, διαλυτικὸν οὐσίας· καὶ ἡ φθορὰ, διάλυσις οὐσίας. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. ὥσθ᾽ ἑνὸς ὁποιουοῦν ληφθέντος, καὶ τὰ λοιπὰ πάντα ὁμολογεῖται. 11 Καὶ ἐκ τῶν ὁμοίως ἐχόντων πρὸς ἄλληλα. εἰ γὰρ τὸ ὑγιεινὸν, ποιητικὸν ὑγιείας· καὶ τὸ εὐεκτικὸν, ποιητικὸν εὐεξίας ἔσται· καὶ τὸ ὠφέλιμον, ποιητικὸν ἀγαθοῦ. ὁμοίως γὰρ ἕκαστον τῶν εἰρημένων πρὸς τὸ οἰκεῖον τέλος ἔχει. ὥστε εἰ ἑνὸς αὐτῶν ὁρισμός ἐστι, τὸ ποιητικὸν εἶναι τοῦ τέλους· καὶ τῶν λοιπῶν ἑκάστου * οὗτος ἂν εἴη ὁρισμός. 12 Ἔτι, ἐκ τοῦ μᾶλλον καὶ ἐκ τοῦ ὁμοίως, ὁσαχῶς ἐνδέ-

* γρ. φθαρτικῶς, διαλυτικῶς.

* γρ. οὕτως

* γρ. κατασκευά- σειν,

χεῖ)* κατασκευάζειν, δύο πρὸς δύο συγκρίνοντα ἐστι, εἰ μᾶλλον ὅδε τοῦδε, ἢ ὅδε τοῦδε ὁρισμός· ὁ δὲ ἧττον δοκῶν, ὁρισμός ἐστι καὶ ὁ μᾶλλον. καὶ εἰ ὁμοίως ὅδε τοῦδε, καὶ ὅδε τοῦδε· εἰ ὁ ἕτερος τοῦ ἑτέρου· καὶ ὁ λοιπὸς, τοῦ λοιποῦ. 13 Ἑνὸς δὲ ὁρισμοῦ πρὸς δύο συγκρινομένου, ἢ δύο ὁρισμῶν πρὸς ἕνα, οὐδὲν χρήσιμος ἡ ἐκ τοῦ μᾶλλον ἐπίσκεψις· οὔτε γὰρ ἕνα δυοῖν, οὔτε δύο τοῦ αὐτοῦ ὅρους δυνατὸν εἶναι.

A modis licet confirmare, duobus ad duo cōparatis. velvti ſi magis hæc huius, quā illa illius definitio *eſt*: quæ autem minùs *eſſe* videtur, definitio eſt etiā *ea* quæ magis *videtur, definitio erit*. Ite ſi æquè hæc huius, & illa illius *definitio eſt*: ſi altera alterius *eſt*, etiam reliqua reliqui *erit*. 13 Vna autē definitione cum duabus *rebus* comparata, aut duabus definitionibus cum vna *re*, non *eſt* vtilis *hæc* conſideratio ex eo quod magis *eſt*: quia nec vna duarum *rerum*, nec duæ eiuſdem *rei* definitiones eſſe poſſunt.

COMMVNIA DE OMNIBVS PROBLEMATIS.

TRACTATVS III.

De locis præcipuis, & maximè vtilibus. Cap. IV.

* γ. εἶδος ἐστι τοῖς εἴδεσι.

B Εἰσὶ δὲ ἐπικαιρότατοι τῶν τόπων, οἵ τε νῦν εἰρημένοι, καὶ οἱ ἐκ τῶν πτώσεων, καὶ τῶν συστοίχων. διὸ καὶ δεῖ μάλιστα κατέχειν καὶ προχείρους ἔχειν τούτους· (χρησιμώτατοι γὰρ πρὸς πλεῖστα) καὶ τῶν ἄλλων δὲ τοὺς μάλιστα κοινούς· οὗτοι γὰρ ἐνεργότατοι τῶν λοιπῶν εἰσι, τό, τ᾽ ἐπιβλέπειν ἐπὶ τὰ καθ᾽ ἕκαστα, καὶ ἐπὶ τῶν εἰδῶν σκοπεῖν, εἰ ἐφαρμόττει ὁ λόγος, ἐπειδὴ συνώνυμον* τὸ εἶδός ἐστιν· (ἔστι δὲ χρήσιμος ὁ τόπος πρὸς τοὺς τιθεμένους ἰδέας εἶναι), καθάπερ πρότερον εἴρηται) ἔτι, εἰ μεταφέρων εἴρηκε τοὔνομα· ἢ αὐτὸ αὑτοῦ κατηγόρησεν, ὡς ἕτερον. καὶ εἴ τις ἄλλος κοινὸς καὶ ἐνεργὸς τῶν τόπων ἐστί, τούτῳ χρηστέον.

Maximè autem locorum *omnium* apti ſunt ij, quos nunc dixi, necnon ex caſibus, & cōiugatis. ideóq; maximè *memoria* tenere, & in promptu habere oportet hos *locos*: (vtiliſſimi.n. *ſunt* ad plurima *problemata*) atque etiam ex ceteris eos qui *ſunt* maximè communes: quoniam inter reliquos *ſunt* efficaciſſimi. cuiuſmodi *eſt* reſpicere ad ſingularia: item in ſpeciebus cōſiderare, an *eis* conueniat definitio, quoniam ſpecies eſt ſynonyma: (eſt autem vtilis hic locus aduerſus eos qui ponūt ideas eſſe, quemadmodum antea dictum fuit) præterea *videre*, an nomen per trāſlationem dixit: aut idem ſibi ipſi attributum ſit quaſi diuerſum. & ſi quis alius locus eſt communis & efficax, eo vtendum *eſt*.

De facultate, vel difficultate argumentandi. Cap. V.

1 ¶ Vtrùm problema faciliùs confirmetur, an refellatur. De definitione quæ faciliùs euertitur quàm confirmatur: cùm quia difficile eſt ſumere propoſitiones, ex quibus confirmatur: 2 tum etiam quia plura probanda ſunt, cùm confirmatur, quàm cùm refellitur, ſi quidem omnes partes definitionis confirmari debent, vnam reprehendi ſufficit. 3. præterea ſyllogiſmo vniuerſali tantùm confirmatur definitio, & particulari quoque refutatur. item reciprocari debet cum definito. 4 & ſoli definito conuenire. 5 De proprio, & de genere. 6 Proprium faciliùs reprehendi, quàm confirmari: quia omnes partes confirmari debent, vnam reprehendi ſatis eſt: 7 item quia proprium omni, & ſoli conuenire debet. 8 Genus faciliùs refelli, quàm probari: quia confirmari debet ſyllogiſmo vniuerſali, refelli autem poteſt etiam ſyllogiſmo particulari: 9 item quia non confirmatur, niſi probetur ineſſe vt genus: refellitur autem etſi ſimpliciter probetur non ineſſe. 10 Eorum quæ dicta ſunt, confirmatio à ſimili. 11 De accidente. 12 ¶ Collatio diuerſorum problematum. Definitionem facillimè reprehendi, quia multæ conditiones in ea requiruntur, 13 & quia loci aliorum problematum ad definitionem transferri poſſunt. 14 difficillimè autem confirmari. 15 De proprio. 16 De accidente, quod facillimè confirmatur, 17 & difficillimè euertitur. 18 ¶ Epilogus.

CAP. III.

C Ὅτι δὲ χαλεπώτερον, κατασκευάζειν ἢ ἀνασκευάζειν ὅρον, ἐκ τῶν μετὰ ταῦτα ῥηθησομένων φανερόν. καὶ γὰρ ἰδεῖν αὐτόν, καὶ λαβεῖν παρὰ τῶν ἐρωτωμένων τὰς τοιαύτας προτάσεις, οὐκ εὐπετές ἐστιν, ὅτι τῶν ἐν τῷ ἀποδοθέντι λόγῳ, τὸ μὲν, γένος· τὸ δὲ, διαφορά· καὶ ὅτι ἐν τῷ τί ἐστι, τὸ γένος μόνον, καὶ αἱ διαφοραὶ κατηγοροῦνται. ἄνευ δὲ τούτων ἀδύνατον ὁρισμοῦ γενέσθαι συλλογισμόν. εἰ γάρ τινα καὶ ἄλλα ἐν τῷ τί ἐστι τοῦ πράγματος κατηγορεῖται, ἄδηλον πότερον ὁ ῥηθεὶς, ἢ ἕτερος αὐτοῦ ὁρισμός ἐστιν· ἐπειδὴ ὁρισμός ἐστι λόγος, ὁ τὸ τί ἦν εἶναι σημαίνων. 2 Δῆλον δὲ καὶ ἐκ τῶνδε. ῥᾷον γὰρ, ἓν συμπεραίνεσθαι, ἢ πολλά. ἀναιροῦντι μὲν οὖν, ἀπόχρη πρὸς ἓν διαλεχθῆναι· ἓν γὰρ ὁποιονοῦν ἀνασκευάσαντες, ἀνῃρηκότες ἐσόμεθα τὸν ὅρον. κατασκευάζοντι δὲ, πάντα ἀνάγκη συμβιβάζειν ὅτι ὑπάρχει τὰ ἐν τῷ ὅρῳ.

Difficiliùs autem confirmari quā euerti definitionem, ex iis, quæ deinceps dicētur, perſpicuum *erit*. nā & ipſum *interrogantē* videre, & ab iis qui interrogantur, ſumere huiuſmodi propoſitiones, nō facile *eſt*: vtputà eorū, quæ in tradita definitione *cōtinentur*, aliud *eſſe* genus, aliud differentiam: & in *quæſtione* quid eſt, attribui tātummodo genus & differentiā. ſine his autem *propoſitionibus* non poteſt definitio ſyllogiſmo cōcludi. nam ſi & quędam alia rei attribuuntur in *quæſtione* quid eſt: non cōſtat, eáne quæ dicta eſt, an altera ſit eius definitio: quādoquidem definitio eſt oratio quidditatem declarans. 2 Sed & ex his manifeſtum *eſt*. facilius *eſt* enim, vnum concludere, quā multa. ac refellenti quidem ſufficit contra vnam *definitionis partem* diſputare. nam ſi vnam qualemcumque refutauerimus, euerſa erit definitio. confirmanti autem neceſſe *eſt ea* omnia coagmentare & probare ineſſe, quæ in definitione *poſita ſunt*.

3 Præterea

3 Præterea qui confirmat, vniuerſalem ſyllogiſmũ afferre debet. nam quibus nomẽ, *iis* omnibus etiã definitionẽ attribui oportet: & præterea viciſſim quibus definitio, etiam nomẽ, ſi propria futura eſt definitio quæ tradita eſt. Ei verò qui refellit, nõ *eſt* neceſſe probare vniuerſale: ſufficit.n. ſi probet definitionẽ de aliquo eorum quę ſub nomine *cõtinentur*, nõ verè dici. Sed & ſi vniuerſaliter refellere oporteat, ne ſic quidem reciprocatio *eſt* neceſſaria in refutatione. ſatis.n.eſt, eum qui refutat vniuerſaliter, oſtendere cuidam *eorum* quibus nomen attribuitur, definitionem nõ attribui. cõtrà autem nõ neceſſe *eſt* oſtendere, quibus definitio non attribuitur, ne nomen quidem *attribui*. 4 Præterea etſi omni *ei* conueniat quod ſub nomine *cõtinetur*, non tamen ſoli, euerſa erit definitio. 5 Similis eſt & proprij & generis ratio. vtraque. n. refellere, quàm confirmare, facilius eſt. 6 *Quod* quidem de proprio perſpicuum *eſt* ex iis quæ dicta ſunt: quia plerumque *verborum* coniũctione proprium traditur. itaque refellere licet *vel* vno *verbo* reprehẽſo: cum verò qui confirmat, omnia ſyllogiſmo cõcludere neceſſe *eſt*. 7 Ferè autem reliqua omnia, quæ ad definitionẽ *pertinent*, etiam ad proprium aptari poſſunt. nam qui confirmat, oſtẽdere debet *orationem* iis omnibus conuenire, quæ ſub nomine *continentur*. refellenti autem ſatis eſt oſtendere vni non cõuenire. ſed etſi omni conueniat, non tamẽ ſoli, ſic quoq; euerſum erit, quemadmodum & in definitione dicebatur. 8 De genere autẽ *hinc apparet*: quia cõfirmatur vno modo: *id eſt*, ſi probetur omni ineſſe: refellitur autem duobus. ſiue.n. probetur nulli *ineſſe*, ſiue alicui nõ ineſſe, euerſum erit quod initio *poſitum fuit quaſi genus*. 9 Præterea confirmanti non ſatis eſt probare ineſſe: ſed etiam vt genus ineſſe, probandum *eſt*. refellenti autẽ ſufficit probare alicui non ineſſe, vel nulli *ineſſe*. 10 Videtur autem, vt & in aliis facilius *eſt* corrũpere quàm efficere, ſic & in iis refellere quàm confirmare. 11 Quod verò ad accidens attinet, vniuerſale facilius refellitur, quàm confirmatur: nã confirmanti probandum *eſt* omni *ineſſe*: refellenti autem ſatis eſt probare vni non ineſſe. contrà particulare faciliùs cõfirmatur, quàm refellitur: quia confirmanti ſatis eſt probare cuidam ineſſe: refellenti autem probandum *eſt* nulli ineſſe. 12 Perſpicuum quoque *eſt*, cur omnium facillimũ *ſit* definitionem euertere. cùm.n. multa dicta ſint, *quæ in definitione ſeruari debent*, plurima data ſunt ad eã *euertendam*. ex pluribus autẽ citiùs fit ſyllogiſmus: quia veriſimile *eſt*, in multis magis quàm in paucis peccari. 13 Præterea ad definitionem *euertendã*, ex aliis quoque argumenta ſumi poſſunt. ſiue.n. oratio non ſit propria: ſiue id quod traditum eſt, non ſit genus: ſiue aliquid corũ quę in definitione *poſita ſunt*, non inſit, euertitur definitio. Ad alia verò *refutanda*, nec quæ ex definitionibus *exiſtunt*, nec cetera omnia argumenta ſumi poſſunt. nã ea ſola quæ ad accidens pertinent, communia ſunt iis omnibus quæ dicta fuerunt: quoniam vnumquodque eorũ quæ dicta ſunt, ineſſe debet. Quòd ſi genus non inſit vt propriũ, non ideo genus euerſum eſt. Similiter non *eſt* neceſſe proprium *ineſſe* vt genus: nec accidens *ineſſe* vt genus, vel vt proprium, ſed ineſſe dumtaxat. Quare non poſſunt argumenta ex aliis ad alia transferri, niſi ad definitionem. Patet igitur, facillimè omnium infirmari definitionem. 14 Difficillimè autem confirmatur. nam & cetera omnia concludi oportet: (nimirum ineſſe et omnia quæ dicta fuerunt, & genus eſſe quod traditum fuit, & propriam *eſſe* orationem) & præterea *probandum eſt* orationem declarare quid *res* ſit: idque præclarè

A 3 Ἔτι, κατασκευάζοντι μὲν, καθόλου οἰστέον συλλογισμόν. δεῖ γὰρ κατὰ παντὸς οὗ τοὔνομα,* κατηγορεῖσθαι τὸν ὅρον· καὶ ἔτι πρὸς τούτοις, ἀντιστρέφειν, καθ' οὗ ὁ λόγος, καὶ τοὔνομα, εἰ μέλλει ἴδιος ἔσεσθαι ὁ ἀποδοθεὶς ὅρος. ἀνασκευάζοντι δ', οὐκ ἀνάγκη δεῖξαι τὸ καθόλου· ἀπόχρη γὰρ τὸ δεῖξαι, ὅτι οὐκ ἀληθεύεται περί τινος τῶν ὑπὸ τοὔνομα, ὁ λόγος. εἴτε καὶ καθόλου δέοι ἀνασκευάσαι, οὐδ' ὡς τὸ ἀντιστρέφειν ἀναγκαῖον ἐπὶ τοῦ ἀνασκευάζειν· ἀπόχρη γὰρ ἀνασκευάζοντι καθόλου, τὸ δεῖξαι, ὅτι κατά τινος ὧν τοὔνομα κατηγορεῖται, ὁ λόγος οὐ κατηγορεῖται. τὸ δ' ἀνάπαλιν, οὐκ ἀναγκαῖον πρὸς τὸ δεῖξαι, ὅτι καθ' ὧν ὁ λόγος μὴ κατηγορεῖται, οὐδὲ τοὔνομα. B 4 Ἔτι, εἰ καὶ παντὶ ὑπάρχει τῷ ὑπὸ τοὔνομα, μὴ μόνῳ δὲ, ἀνῃρημένος ὑπάρχει ὁ ὁρισμός. 5 Ὁμοίως δὲ καὶ περὶ τὸ ἴδιον καὶ τὸ γένος ἔχει. ἐν ἀμφοτέροις γὰρ ἀνασκευάζειν, ἢ κατασκευάζειν, ῥᾷον. 6 Περὶ μὲν οὖν τοῦ ἰδίου, φανερὸν ἐκ τῶν εἰρημένων. ὡς γὰρ ἐπὶ τὸ πολὺ, ἐν συμπλοκῇ τὸ ἴδιον ἀποδίδοται. ὥστε ἀνασκευάζειν μὲν ἔστιν, ἓν ἀνελόντα· κατασκευάζοντα δὲ, πάντα συλλογίζεσθαι ἀνάγκη. 7 Σχεδὸν δὲ πάντα τὰ λοιπὰ, ὅσα πρὸς τὸν ὁρισμὸν καὶ πρὸς τὸ ἴδιον ἁρμόσει λέγεσθαι. παντί τε γὰρ δεῖ τῷ ὑπὸ τοὔνομα, τὸν κατασκευάζοντα δεικνύναι ὅτι ὑπάρχει· ἀνασκευάζοντα δὲ, ἀπόχρη ἑνὶ δεῖξαι μὴ ὑπάρχον. εἰ δὲ καὶ παντὶ ὑπάρχει, μὴ μόνῳ δὲ, καὶ οὕτως ἀνασκευασμένον γίνεται, καθάπερ καὶ ἐπὶ τοῦ ὁρισμοῦ ἐλέγετο. 8 Περὶ δὲ τοῦ γένους, ὅτι* κατασκευάζοντα μὲν, C ἀνάγκη μοναχῶς παντὶ δείξαντα* ὑπάρχειν· ἀνασκευάζοντα δὲ, διχῶς· καὶ γὰρ εἰ μηδενὶ, καὶ εἰ τινὶ δέδεικται μὴ ὑπάρχον, ἀνῄρηται τὸ ἐν ἀρχῇ. 9 Ἔτι, κατασκευάζοντι μὲν, οὐκ ἀπόχρη ὅτι ὑπάρχει, δεῖξαι· ἀλλὰ καὶ ὅτι ὡς γένος ὑπάρχει, δεικτέον· ἀνασκευάζοντι δὲ, ἱκανὸν τὸ δεῖξαι μὴ ὑπάρχον, ἢ τινί,* ἢ μηδενί. 10 Ἔοικε δ', ὥσπερ καὶ ἐν τοῖς ἄλλοις τὸ διαφθεῖραι τοῦ ποιῆσαι ῥᾷον, οὕτω καὶ ἐπὶ τούτων τὸ ἀνασκευάσαι τοῦ κατασκευάσαι. 11 Ἐπὶ δὲ τοῦ συμβεβηκότος, τὸ μὲν καθόλου, ῥᾷον ἀνασκευάζειν, ἢ κατασκευάζειν· κατασκευάζοντα μὲν γὰρ, δεικτέον ὅτι παντί·* ἀνασκευάζοντα δὲ, ἀπόχρη ἑνὶ δεῖξαι μὴ ὑπάρχον. τὸ δ' ἐπὶ μέρους, ἀνάπαλιν· ῥᾷον γὰρ κατασκευάσαι, ἢ ἀνασκευάσαι· κατασκευάζοντι μὲν γὰρ, ἀπόχρη D τὸ δεῖξαι τινὶ ὑπάρχον· ἀνασκευάζοντι δὲ, δεικτέον ὅτι οὐδενὶ ὑπάρχει. 12 Φανερὸν δὲ καὶ διότι πάντων ῥᾷστον, ὅρον ἀνασκευάσαι. πλεῖστα μὲν γὰρ ἐν αὐτῷ τὰ δεδομένα, πολλῶν εἰρημένων· ἐκ δὲ τῶν πλειόνων, θᾶττον γίνεται συλλογισμός· εἰκὸς γὰρ ἐν τοῖς πολλοῖς μᾶλλον, ἢ ἐν τοῖς ὀλίγοις, ἁμάρτημα γίνεσθαι. 13 Ἔτι, πρὸς μὲν ὅρον ἐνδέχεται καὶ διὰ τῶν ἄλλων ἐπιχειρεῖν· εἴτε γὰρ μὴ ἴδιος ὁ λόγος, εἴτε μὴ γένος τὸ ἀποδοθὲν, εἴτε μὴ ὑπάρχει τι τῶν ἐν τῷ λόγῳ, ἀνῃρημένος γίνεται ὁ ὁρισμός· πρὸς δὲ τἄλλα, οὔτε* τὰ ἐκ τῶν ὅρων, οὔτε τἄλλα ἐνδέχεται πάντα ἐπιχειρεῖν· μόνα γὰρ τὰ πρὸς τὸ συμβεβηκὸς, κοινὰ πάντων τῶν εἰρημένων ἐστίν· ὑπάρχειν μὲν γὰρ δεῖ ἕκαστον τῶν εἰρημένων. εἰ δὲ μὴ ὡς ἴδιον ὑπάρχει τὸ γένος, οὐδέπω ἀνῄρηται E τὸ γένος. ὁμοίως δὲ καὶ τὸ ἴδιον, οὐκ ἀναγκαῖον, ὡς γένος. οὐδὲ τὸ συμβεβηκὸς, ὡς γένος ἢ ἴδιον, ἀλλ' ὑπάρχειν μόνον. ὥστε οὐ δυνατὸν ἐκ τῶν ἑτέρων πρὸς τὰ ἕτερα ἐπιχειρεῖν, ἀλλ' ἢ ἐπὶ τοῦ ὁρισμοῦ. δῆλον οὖν ὅτι ῥᾷστον πάντων, ὅρον ἀναιρεῖν. 14 Κατασκευάζειν δὲ, χαλεπώτατον. ἐκεῖνά τε γὰρ πάντα δεῖ συλλογίζεσθαι (καὶ γὰρ ὅτι ὑπάρχει τὰ εἰρημένα πάντα, καὶ ὅτι γένος τὸ ἀποδοθὲν, καὶ ὅτι ἴδιος ὁ λόγος) καὶ ἔτι παρὰ ταῦτα, ὅτι δηλοῖ τὸ τί ἦν εἶναι ὁ λόγος, καὶ τοῦτο καλῶς

* κ. κατηγορεῖται
* χ. κατασκευάζοντι & mox ἀνασκευάζοντι.
* χ. ὑπάρχειν.
* γρ. ἢ μὴ παντί.
* γρ. ἀνασκευάζοντι
* γρ. τὰ ἐ. τ. ὅ. ἐπιχειρητέα

δεῖ πεποιηκέναι. 15 Τῶν δ' ἄλλων, τὸ ἴδιον, μάλιστα τοιοῦτον. ἀναιρεῖν μὲν γὰρ ῥᾴδιον, διὰ τὸ ἐκ πολλῶν ὡς ἐπὶ τὸ πολὺ εἶναι. κατασκευάζειν δὲ, χαλεπώτατον· ὅτι τε πολλὰ δεῖ συμβιβάσαι· καὶ πρὸς τούτῳ, ὅτι μόνῳ ὑπάρχει, καὶ ἀντικατηγορεῖται τοῦ πράγματος. 16 Ῥᾷστον δὲ πάντων κατασκευάσαι τὸ συμβεβηκός. ἐν μὲν γὰρ τοῖς ἄλλοις οὐ μόνον ὑπάρχει, ἀλλὰ καὶ ὅτι οὕτως ὑπάρχει, δεικτέον· ἐπὶ δὲ τοῦ συμβεβηκότος, ὅτι ὑπάρχει μόνον, ἱκανὸν δεῖξαι. 17 Ἀνασκευάζειν δὲ χαλεπώτατον τὸ συμβεβηκός, ὅτι ἐλάχιστα ἐν αὐτῷ δέδοται· οὐ γὰρ προσσημαίνεται ἐν τῷ συμβεβηκότι, πῶς ὑπάρχει. ὥστε ἐπὶ μὲν τῶν ἄλλων διχῶς ἔστιν ἀναιρεῖν, ἢ δείξαντα ὅτι οὐχ ὑπάρχει, ἢ ὅτι οὐχ οὕτως ὑπάρχει· ἐπὶ δὲ τοῦ συμβεβηκότος οὐκ ἔστιν ἀνελεῖν, ἀλλ' ἢ δείξαντα, ὅτι οὐχ ὑπάρχει. 18 Οἱ μὲν οὖν τόποι, δι' ὧν εὐπορήσομεν πρὸς ἕκαστα τῶν προβλημάτων ἐπιχειρεῖν, σχεδὸν ἱκανῶς ἐξηρίθμηνται.

A factum eſſe oportet. 15 Inter cetera verò propriũ *eſt* maximè tale. faciliùs.n.euertitur: quia ex multis *verbis* plerumque conſtat. difficillime autē confirmatur: quia multa oportet coagmentare *atque coniungere*, & prӕterea probare ſoli ineſſe, & cum re reciprocari. 16 Facillimè autem omnium confirmatur accidens. cetera namque non ſolũ ineſſe, ſed etiam ita ineſſe, probandum *eſt*: accidens autē ineſſe tantùm probare ſufficit. 17 Difficillimum autem *eſt*, refellere accidēs: quia pauciſſima in eo data ſunt. neque. n. adſignificatur in accidente, quomodo inſit. Quare cetera duobus modis licet refellere, *id eſt*, vel probãdo non ineſſe, vel non ita ineſſe. accidēs autem non licet euertere, niſi probetur nõ ineſſe. 18 Loci igitur, ex quibus adverſus ſingula problemata argumentorum copia nobis ſuppetet, ferè ſufficienter enumerati ſunt.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΤΟΠΙΚΩΝ ΤΟ ΟΓΔΟΟΝ.

ARISTOTELIS TOPICORVM LIBER VIII.

DE INTERROGATIONE, TRACTATVS I.

De ſcopo ac nexu huius tractatus cum ſuperioribus, & de propoſitionibus neceſſariis, vel non neceſſariis. Cap. I.

1 ¶ *Scopus & nexus.* 2 ¶ *Quӕ ſint propoſitiones neceſſariӕ.* 3 *vel non neceſſariӕ.* 4 ¶ *Cur occultetur concluſio.* 5 ¶ *Prӕcepta de propoſitionibus neceſſariis.* 6 ¶ *Prӕcepta de non neceſſariis.* 7 *De inductione.* 8 *De occultatione. ſumendas eſſe propoſitiones proſyllogiſmorum.* 9. *reticendas eſſe concluſiones proſyllogiſmorum, quӕ ſunt propoſitiones neceſſariӕ.* 11 *propoſitiones non continenter accipiendas, ſed permiſcendas eſſe.* 12 *accipiendam eſſe definitionem coniugati.* 13 *cauendum, ne appareat, cuius gratiâ aliquid proponitur.* 14 *& vt incertum ſit, vtro oppoſitorum vti velit qui interrogat.* 15 *de ſimilitudinis collatione.* 16 *vt interrogans ſibi obiiciat.* 17 *vt dicat ſe id proponere, quod ab omnibus paſſim dici ſolet.* 18 *de ſtudio diſſimulando.* 19 *vt proponat quaſi conferens ad aliud, non per ſe. de eo proponendo, cui id quod ſumi debet, conſequens eſt.* 20 *quando interrogandum ſit, quod prӕcipuè ſumendum eſt.* 23 *de oratione producenda, & interuciendis iis quӕ nihil faciunt ad diſputationem.* 24 *Epilogus.* 25 *De ornatu.* 26 *De perſpicuitate.*

CAP. I.

ΜΕΤΑ δὲ ταῦτα περὶ τάξεως, καὶ πῶς δεῖ ἐρωτᾶν, λεκτέον. δεῖ δὲ πρῶτον μὲν ἐρωτᾶν μέλλοντα, τὸν τόπον εὑρεῖν, ὅθεν ἐπιχειρητέον· δεύτερον δὲ, ἐρωτηματίσαι καὶ τάξαι καθ' ἕκαστα πρὸς ἑαυτόν· τὸ δὲ λοιπὸν, καὶ τρίτον, εἰπεῖν ἤδη ταῦτα πρὸς ἕτερον. μέχρι μὲν οὖν τοῦ εὑρεῖν τὸν τόπον, ὁμοίως τοῦ φιλοσόφου καὶ τοῦ διαλεκτικοῦ ἡ σκέψις. τὸ δὲ ἤδη ταῦτα τάττειν καὶ ἐρωτηματίζειν, ἴδιον τοῦ διαλεκτικοῦ· πρὸς ἕτερον γὰρ πᾶν τὸ τοιοῦτον. τῷ δὲ φιλοσόφῳ, καὶ ζητοῦντι καθ' ἑαυτὸν, οὐδὲν μέλει, ἐὰν ἀληθῆ μὲν ᾖ καὶ γνώριμα, δι' ὧν ὁ συλλογισμὸς, μὴ θῇ δ' αὐτὰ ὁ ἀποκρινόμενος, διὰ τὸ σύνεγγυς εἶναι τοῦ ἐξ ἀρχῆς, καὶ προορᾶν τὸ συμβησόμενον· ἀλλ' ἴσως ἂν καὶ σπουδάσειεν, ὅτι μάλιστα γνώριμα καὶ σύνεγγυς εἶναι τὰ ἀξιώματα· ἐκ τούτων γὰρ οἱ ἐπιστημονικοὶ συλλογισμοί. Τοὺς μὲν οὖν τόπους ὅθεν δεῖ λαμβάνειν, εἴρηται πρότερον· περὶ τάξεως δὲ καὶ τοῦ ἐρωτηματίσαι λεκτέον, διελομένους τὰς προτάσεις, ὅσαι ληπτέαι παρὰ τὰς ἀναγκαίας. 2 Ἀναγκαῖαι δὲ λέγονται, δι' ὧν ὁ συλλογισμὸς γίνεται. 3 Αἱ δὲ παρὰ ταύτας λαμβανόμεναι, τέτταρές εἰσιν· ἢ γὰρ ἐπαγωγῆς χάριν, τοῦ δοθῆναι τὸ καθόλου, ἢ εἰς ὄγκον τοῦ λόγου, ἢ εἰς κρύψιν τοῦ συμπεράσματος,

B POST hęc de diſpoſitione, & quomodo interrogare oporteat, dicēdum *eſt*. Primùm autem debet is, qui interrogaturus eſt, locũ inuenire, ex quo argumētetur: deinde interrogare, & diſponere ſingula ipſe per ſe: tertiò & poſtremò hęc dicet cõtra alienum. Ac loci quidem inuentio ӕquè ad philoſophum & ad dialecticum pertinet. eorum autē, *quӕ inuenta fuerũt*, diſpoſitio & interrogatio, dialectici *eſt* propria: quoniam hoc totum adverſus alterum *eſt*: philoſopho autem & ei qui ipſe ſecum *veritatē* C inquirit, curӕ non eſt ſi vera ſint & nota *ea* ex quibus *efficitur* ſyllogiſmus, nec tamen ea ponat is qui reſpõdet, propterea quòd propinqua ſint *quӕſtioni* ab initio *propoſitӕ*, ac prouideat quod euenturũ *eſt*. Quinimmo fortaſſe dat operam, vt axiomata ſint maximè nota & *problemati* propinqua: quãdoquidem ex his conſtant ſyllogiſmi qui ſcientiam pariunt. Ac locos quidem, vnde *argumenta* ſumere oportet, ſuperiùs expoſuimus: *nunc* verò de diſpoſitione & interrogatione dicendum *eſt*, cùm antè diſtinctӕ fuerint propoſitiones, quę ſumendӕ *ſunt* prӕter neceſſarias. 2 Neceſſariӕ autem dicuntur *eӕ*, ex quibus ſyllogiſmus conficitur. 3 Quӕ verò prӕter has ſumuntur, quatuor ſunt. vel enim *ſumuntur* inductionis causâ, vt detur *quod eſt* vniuerſale: vel vt amplificetur oratio: vel vt celetur concluſio.

vel vt magis perſpicua ſit oratio. Præter has autem nulla propoſitio *eſt* ſumenda: ſed enitendum *eſt*, vt per has amplificetur *oratio*, vel interrogetur. 4 Quas autem celandæ *concluſionis* cauſâ *adhibemus*, *eas* certandi cauſâ adhibemus. ſed quia tota hæc tractatio eſt adverſus alterũ, neceſſe *eſt* etiam his *propoſitionibus* vti. 5 Neceſſariæ igitur ex quibus ſyllogiſmus *conficitur*, non ſtatim proponi debent: ſed recedendum quàm longiſſimè ſurſum verſus. vtputà non eſt poſtulandum, contrariorũ eandẽ *eſſe* ſcientiã, ſi *quis* hoc ſumere velit, ſed *generaliter* oppoſitorum: hoc.n. poſito, etiam contrariorum eandem ſcientiam *eſſe* concludet: quoniam cõtraria in oppoſitis *numerantur*. Quòd ſi *adverſarius id* non concedat: per inductionẽ ſumendum *eſt*, propoſitis ſingulis contrariis. vel.n. per ſyllogiſmum, vel per inductionẽ neceſſariæ propoſitiones ſumi debent, vel aliæ inductione, aliæ ſyllogiſmo. Quæ verò ſunt valde perſpicuæ, etiam ipſas proponere *debemus*. Obſcurius.n. ſemper *eſt* in receſſu & inductione, quod euenturum eſt. Simúlque eas quæ vtiles ſunt proponere, ſi *quis* illo modo ſumere nequeat, in promptu *eſt*. 6 Quæ verò præter has dictæ fuerunt, ſumendæ *ſunt* harum ipſarum cauſâ: ſingulis autem ita vtendum *eſt*. 7 Inducentẽ *oportet* à ſingularibus ad vniuerſalia, & *à* notis ad ignota *progredi*: notiora autẽ vel abſolutè, vel multis ſunt ea quæ ſub ſenſum *cadunt*. 8 Celantem autẽ *oportet* proſyllogiſmis *ea* probare, ex quibus concludẽdum eſt, quod ab initio *propoſitum fuit*: atque hæc quàm plurima. Quod quidem fiet, ſi quis non ſolum *propoſitiones* neceſſarias, ſed aliquam etiam ex iis quæ ad haſce vtiles ſunt, cõcludat. 9 Prætereà concluſiones dicere non *oportet*, ſed poſtea repẽtè concludere. ſic.n. maximè recedet à theſi initio *propoſita*. 10 Et, vt vniuerſaliter dicã, eum, qui celando percõtatur, ſic interrogare oportet, vt cùm totam orationem interrogauerit, & cõcluſionem dixerit, quæratur quid ita. hoc autem maximè fiet eo quẽ nunc diximus modo. Si.n. ſola vltima concluſio dicta fuerit, incertum erit quomodo efficiatur: propterea quòd is qui reſpondet, ex quibus colligatur, non prouiderit, cùm priores ſyllogiſmi in membra digeſti non fuerint. minimè autem in ſua membra digeritur ſyllogiſmus concluſionis, cùm non ponimus eius ſumptiones, ſed ea ex quibus *ſumptiones illæ* concluduntur. 11 Vtile etiam *erit*, non continentia ſumere axiomata, ex quibus ſyllogiſmi *conſtant*, ſed permiſcere, quæ ad hanc & quæ ad illam concluſionem pertinent. cùm enim propria *alicuius cõcluſionis* iuxta ſe ponuntur, magis apparet quid ex eis efficietur. 12 Oportet etiam, cùm fieri poteſt, definitione ſumere vniuerſalem propoſitionem, non in iis *de quibus agitur*, ſed in coniugatis. nam *qui reſpondẽt*, ſe ipſos paralogiſmo fallunt, cùm in coniugato ſumpta fuerit definitio, quaſi non concedant vniuerſale. vtputà ſi accipere oporteat, eum qui iraſcitur, appetere vindictam; & ſumatur ira eſſe appetitus vindictæ, quòd aliquis contempſiſſe videatur. patet enim, hoc ſumpto nos habituros eſſe vniuerſale, quod conſultò volumus. Cùm autẽ *definitio* proponitur in *iis* ipſis *de quibus agitur*, ſæpè accidit vt reſpondens abnuat: quia magis in eo, *de quo agitur*, obiectionem *paratam* habet: velvti, non omnem, qui iraſcitur, vindictam appetere: quia licèt parentibus iraſcamur, tamen vindictam non appetimus. Fortaſſe autem hæc obiectio vera non *eſt*: quoniam à quibuſdam ſatis vltionis *ſumimus*, ſi moleſtiâ tantùm *eos* afficiamus, & efficiamus vt *eos* pœniteat.

A ἢ πρὸς τὸ σαφέστερον εἶναι τὸν λόγον· παρὰ δὲ ταύτας οὐδεμίαν ληπτέον πρότασιν, ἀλλ' ἢ διὰ τούτων αὔξειν, * ἢ ἐρωτηματίζειν πειρατέον. (* κ. ἢ ἐρωτᾶν) 4 Εἰσὶ δὲ αἱ πρὸς κρύψιν, ἀγῶνος χάριν. ἀλλ' ἐπειδὴ πᾶσα ἡ τοιαύτη πραγματεία πρὸς ἕτερόν ἐστιν, ἀνάγκη καὶ ταύταις χρῆσθαι. 5 Τὰς μὲν οὖν ἀναγκαίας δι' ὧν ὁ συλλογισμός, οὐκ εὐθὺς προτατέον, ἀλλ' ἀποστατέον ὅτι ἀνωτάτω. οἷον, μὴ τὴν ἐναντίων ἀξιοῦντα τὴν αὐτὴν ἐπιστήμην, ἂν τοῦτο βούληται λαβεῖν, ἀλλὰ τὴν ἀντικειμένων· τεθέντος γὰρ τούτου, καὶ ὅτι τῶν ἐναντίων ἡ αὐτὴ ἐπιστήμη συλλογιεῖται, ἐπειδὴ τῶν ἀντικειμένων τὰ ἐναντία. ἐὰν δὲ μὴ τιθῇ, B δι' ἐπαγωγῆς ληπτέον, προτείνοντα ἐπὶ τῶν κατὰ μέρος ἐναντίων. ἢ γὰρ διὰ συλλογισμοῦ, ἢ δι' ἐπαγωγῆς τὰς ἀναγκαίας ληπτέον· ἢ τὰς μὲν, ἐπαγωγῇ· τὰς δὲ, συλλογισμῷ. ὅσαι δὲ λίαν προφανεῖς εἰσι, καὶ αὐτὰς προτείνοντα· ἀδηλότερον τε γὰρ ἀεὶ ἐν τῇ ἀποστάσει καὶ τῇ ἐπαγωγῇ τὸ συμβησόμενον· καὶ ἅμα τὸ αὐτὰς τὰς χρησίμους προτεῖναι, καὶ μὴ δυνάμενον ἐκείνως λαβεῖν, ἕτοιμον. 6 Τὰς δὲ παρὰ ταύτας εἰρημένας ληπτέον μὲν τούτων χάριν· ἑκάστῃ δὲ ὧδε χρηστέον. 7 Ἐπάγοντα μὲν, ἀπὸ τῶν καθ' ἕκαστα ἐπὶ τὰ καθόλου, καὶ τῶν γνωρίμων ἐπὶ τὰ ἄγνωστα. γνώριμα δὲ μᾶλλον τὰ κατὰ τὴν C αἴσθησιν, ἢ ἁπλῶς, ἢ τοῖς πολλοῖς. 8 Κρύπτοντα δὲ, προσυλλογίζεσθαι δι' ὧν ὁ συλλογισμὸς τοῦ ἐξ ἀρχῆς μέλλει γίνεσθαι, καὶ ταῦτα ὡς πλεῖστα. εἴη δ' ἂν τοῦτο, εἴ τις μὴ μόνον τὰς ἀναγκαίας, ἀλλὰ καὶ τῶν πρὸς ταύτας χρησίμων τινὰ συλλογίζοιτο. 9 Ἔτι, τὰ συμπεράσματα μὴ λέγειν, ἀλλ' ὕστερον συλλογίζεσθαι ἀθρόα· οὕτω γὰρ ἂν πορρωτάτω ἀποστήσειε τῆς ἐξ ἀρχῆς θέσεως. 10 Καθόλου δὲ εἰπεῖν, οὕτω δεῖ ἐρωτᾶν τὸν κρυπτικῶς πυνθανόμενον, ὥστε ἠρωτημένου παντὸς τοῦ λόγου, καὶ εἰπόντος τὸ συμπέρασμα, ζητεῖσθαι τὸ διὰ τί. τοῦτο δὲ ἔσται μάλιστα διὰ τοῦ λεχθέντος * ἔμπροσθεν τρόπου. (* κ. πρότερον) μόνου γὰρ τοῦ ἐσχάτου ῥηθέντος συμπεράσματος, ἄδηλον πῶς συμ- D βαίνει, διὰ τὸ μὴ προορᾶν τὸν ἀποκρινόμενον * ἐκ τίνος συμβαίνει, (* κ. ἐκ τίνων) μὴ διαρθρωθέντων τῶν προτέρων συλλογισμῶν. ἥκιστα δ' ἂν διαρθροῖτο ὁ συλλογισμὸς τοῦ συμπεράσματος, μὴ τὰ τούτου λήμματα ἡμῶν τιθέντων, ἀλλ' ἐκεῖνα ὑφ' ὧν ὁ συλλογισμὸς γίνεται. 11 Χρήσιμον δὲ καὶ τὸ μὴ συνεχῆ τὰ ἀξιώματα λαμβάνειν, ἐξ ὧν οἱ συλλογισμοὶ, ἀλλ' ἐναλλὰξ τὸ πρὸς ἕτερον καὶ ἕτερον συμπέρασμα. τιθεμένων γὰρ τῶν οἰκείων παρ' ἄλληλα, μᾶλλον τὸ συμβησόμενον ἐξ αὐτῶν προφανές. 12 Χρὴ δὲ καὶ * ὁρισμῷ λαμβάνειν, (* κ. ὁρισμὸν) ἐφ' ὧν ἐνδέχεται, τὴν καθόλου πρότασιν, μὴ ἐπ' αὐτῶν, ἀλλ' ἐπὶ τῶν συ- E στοίχων. παραλογίζονται γὰρ ἑαυτοὺς, ὅταν ἐπὶ συστοίχου ληφθῇ ὁ ὁρισμὸς, ὡς οὐ καθόλου συγχωροῦντες. οἷον, εἰ δέοι λαβεῖν, ὅτι ὁ ὀργιζόμενος ὀρέγεται τιμωρίας, ληφθείη δὲ ἡ ὀργὴ ὄρεξις εἶναι τιμωρίας διὰ φαινομένην ὀλιγωρίαν· δῆλον γὰρ, ὅτι τούτου ληφθέντος, ἔχοιμεν ἂν καθόλου, ὃ προαιρούμεθα. τοῖς δ' ἐπ' αὐτῶν προτείνουσι, πολλάκις ἀνανεύειν συμβαίνει τὸν ἀποκρινόμενον, διὰ τὸ μᾶλλον ἔχειν ἐπ' αὐτοῦ τὴν ἔνστασιν. οἷον, ὅτι οὐ πᾶς ὁ ὀργιζόμενος ὀρέγεται τιμωρίας· τοῖς γὰρ γονεῦσιν ὀργιζόμεθα μὲν, οὐκ ὀρεγόμεθα δὲ τιμωρίας. ἴσως μὲν οὖν ἀληθὴς ἡ ἔνστασις· παρ' ἐνίων γὰρ ἱκανὴ τιμωρία τὸ λυπῆσαι μόνον, καὶ ποιῆσαι μεταμέλεσθαι.

οὐ μὴν ἀλλ' ἔχει τι πιθανὸν πρὸς τὸ μὴ δοκεῖν ἀλόγως ἀρνεῖσθαι τὸ προτεινόμενον. ἐπὶ δὲ τοῦ τῆς ὀργῆς ὁρισμοῦ οὐχ ὁμοίως ῥάδιον εὑρεῖν ἔνστασιν. 13 Ἔτι, τὸ προτείνειν, ὡς οὐ δι' αὐτὸ, ἀλλ' ἄλλου χάριν προτείνοντα. εὐλαβοῦνται γὰρ τὰ πρὸς τὴν θέσιν χρήσιμα. 14 Ἁπλῶς δὲ εἰπεῖν, ὅτι μάλιστα ποιεῖν ἄδηλον, πότερον τὸ προτεινόμενον, ἢ τὸ ἀντικείμενον βούλεται λαβεῖν. ἀδήλου γὰρ ὄντος τοῦ πρὸς τὴν θέσιν χρησίμου, μᾶλλον τὸ δοκοῦν αὐτοῖς τιθέασιν. 15 Ἔτι, διὰ τῆς ὁμοιότητος πυνθάνεσθαι. καὶ γὰρ πιθανὸν, καὶ λανθάνει μᾶλλον τὸ καθόλου. οἷον, ὅτι ὥσπερ ἐπιστήμη καὶ ἄγνοια τῶν ἐναντίων ἡ αὐτή, οὕτω καὶ αἴσθησις τῶν ἐναντίων ἡ αὐτή. ἢ ἀνάπαλιν, ἐπεὶ ἡ αἴσθησις ἡ αὐτὴ τῶν ἐναντίων, καὶ ἐπιστήμη. τοῦτο δέ ἐστιν ὅμοιον ἐπαγωγῇ· οὐ μὴν ταὐτόν γε· ἐκεῖ μὲν γὰρ, ἀπὸ τῶν καθ' ἕκαστον τὸ καθόλου λαμβάνεται· ἐπὶ δὲ τῶν ὁμοίων, οὐκ ἔστι τὸ λαμβανόμενον τὸ καθόλου, ὑφ' ὃ ἅπαντα τὰ ὅμοιά ἐστι. 16 Δεῖ δὲ καὶ αὐτὸν ἑαυτῷ ποτε ἔνστασιν φέρειν· ἀνυπόπτως γὰρ ἔχουσιν οἱ ἀποκρινόμενοι πρὸς τοὺς δοκοῦντας δικαίως ἐπιχειρεῖν. 17 Χρήσιμον δὲ καὶ τὸ ἐπιλέγειν, ὅτι σύνηθες καὶ λεγόμενον τὸ τοιοῦτον· ὀκνοῦσι γὰρ κινεῖν τὸ εἰωθὸς, ἔνστασιν μὴ ἔχοντες· ἅμα δὲ καὶ διὰ τὸ χρῆσθαι καὶ αὐτοὶ τοῖς τοιούτοις, φυλάττονται κινεῖν αὐτά. 18 Ἔτι, τὸ μὴ σπουδάζειν, κἂν ὅλως χρήσιμον ᾖ· πρὸς γὰρ τοὺς σπουδάζοντας μᾶλλον ἀντιτείνουσι. 19 Καὶ τὸ ὡς ἐν παραβολῇ προτείνειν. τὸ γὰρ δι' ἄλλο τι προτεινόμενον, καὶ μὴ δι' αὐτὸ χρήσιμον, τιθέασι μᾶλλον. 20 Ἔτι, μὴ αὐτὸ προτείνειν, ὃ δεῖ ληφθῆναι, ἀλλ' ᾧ τοῦτο ἕπεται ἐξ ἀνάγκης· μᾶλλόν τε γὰρ συγχωροῦσι, διὰ τὸ μὴ ὁμοίως ἐκ τούτων φανερὸν εἶναι τὸ συμβησόμενον· καὶ ληφθέντος τούτου, εἴληπται κἀκεῖνο. 21 Καὶ τὸ ἐπ' ἐσχάτῳ ἐρωτᾶν, ὃ μάλιστα βούλεται λαβεῖν· μάλιστα γὰρ τὰ πρῶτα ἀναίνονται, διὰ τὸ τοὺς πλείστους τῶν ἐρωτώντων πρῶτα* λέγειν, περὶ ἃ μάλιστα σπουδάζουσι.

* κ. ἐρωτῶν,

22 Πρὸς ἐνίους δὲ πρῶτα τὰ τοιαῦτα προτείνειν. οἱ γὰρ δύσκολοι τὰ πρῶτα μάλιστα συγχωροῦσιν, ἐὰν μὴ παντελῶς φανερὸν ᾖ τὸ συμβησόμενον· ἐπὶ τελευτῆς δὲ δυσκολαίνουσιν· ὁμοίως δὲ καὶ ὅσοι οἴονται δριμεῖς εἶναι ἐν τῷ ἀποκρίνεσθαι· θέντες γὰρ * τὰ πλεῖστα, ἐπὶ τέλους τερθρεύονται, ὡς οὐ συμβαίνοντος ἐκ τῶν κειμένων· τιθέασι δὲ προχείρως, πιστεύοντες τῇ ἕξει, καὶ ὑπολαμβάνοντες οὐδὲν πείσεσθαι. 23 Ἔτι, τὸ μηκύνειν καὶ παρεμβάλλειν τὰ μηδὲν χρήσιμα πρὸς τὸν λόγον, καθάπερ οἱ ψευδογραφοῦντες. πολλῶν γὰρ ὄντων, ἄδηλον ἐν ὁποίῳ τὸ ψεῦδος. διὸ καὶ λανθάνουσιν ἐνίοτε οἱ ἐρωτῶντες, ἐν * παραβύστῳ προστιθέντες, ἃ καθ' αὑτὰ προτεινόμενα, οὐκ ἂν τεθείη. 24 Εἰς μὲν οὖν κρύψιν τοῖς εἰρημένοις χρηστέον.

* κ. τὰ πρῶτα,

* quidam παραβύστῳ, non recte.

25 Εἰς δὲ κόσμον, ἐπαγωγῇ καὶ διαιρέσει τῶν συγγενῶν. ἡ μὲν οὖν ἐπαγωγὴ ὁποῖόν τί ἐστι, δῆλον. τὸ δὲ διαιρεῖσθαι, τοιοῦτον οἷον, ὅτι ἐπιστήμη ἐπιστήμης βελτίων, ἢ τῷ ἀκριβεστέρα εἶναι, ἢ τῷ βελτιόνων· καὶ ὅτι τῶν ἐπιστημῶν, αἱ μὲν, θεωρητικαί· αἱ δὲ, πρακτικαί· αἱ δὲ, ποιητικαί. τῶν γὰρ τοιούτων ἕκαστον συνεπικοσμεῖ μὲν τὸν λόγον, οὐκ ἀναγκαῖον δὲ ῥηθῆναι πρὸς τὸ συμπέρασμα. 26 Εἰς δὲ σαφήνειαν, παραδείγματα καὶ παραβολὰς οἰστέον. παραδείγματα δὲ οἰκεῖα, καὶ ἐξ ὧν ἴσμεν, οἷα Ὅμηρος, μὴ οἷα * Χοιρίλος. οὕτω γὰρ ἂν σαφέστερον εἴη τὸ προτεινόμενον.

* κ. Χοίριλος.

A habet tamen neſcio quam vim perſuadendi, vt non iniuriâ propoſitio negata eſſe videatur. ſed aduerſus iræ definitionem non æquè facile *eſt* obiectionem inuenire. 13 Præterea *ſic* proponere *debemus*, quaſi non propter id *de quo agitur*, ſed alius causâ proponamus. nam *qui reſpondent*, ea declinant quæ ad theſim *impugnandam vtilia ſunt*. 14 Et vt ſimpliciter dicam, quàm maximè incertũ efficere *debet is qui interrogat*, vtrũ id quod proponit, an oppoſitum, ſumere velit. cùm.n. eſt obſcurum, quid ad theſim *impugnandam* vtile *ſit*, magis quod ſibi videtur, ponunt. 15 Præterea per ſimilitudinis *collationem* interrogare *oportet*: quoniã B & vim habet ad perſuadẽdum, & magis latet quã vniuerſale: velvti, vt ſcientia & ignorantia contrariorum *eſt* eadem, ita etiam ſenſum contrariorum eundem *eſſe*: vel contrà, quia contrariorum ſenſus *eſt* idem, etiam ſcientiam *eſſe eandem*. hoc autẽ eſt ſimile inductioni, non tamen idem: illic.n. ex ſingularibus ſumitur vniuerſale: in ſimilibus verò id quod ſumitur, non eſt vniuerſale, ſub quo ſimilia contineantur. 16 Oportet etiam ipſum ſibi aliquando obiicere: quoniam ij qui reſpondent, non habent eos ſuſpectos, qui iuſtè argumẽtari videntur. 17 Vtile etiam *eſt*, ſi quis inſuper dicat, ſe id quod paſſim dici ſolet, proponere: quia non audẽt quod ſolitum eſt, mutare, niſi obiectionẽ habeant. C item quia talibus ipſi quoque vtuntur, cauent ne ea mutent. 18 Præterea *vtile eſt* non magno ſtudio *in aliquid* incumbere, etſi omnino vtile ſit: quoniã iis qui magnum ſtudium adhibent, magis reſiſtũt. 19 Et quaſi in collatione proponere. quod.n. propter aliud quidpiã proponitur, nec per ſe vtile *eſt*, faciliùs cõcedunt. 20 Præterea non id proponere quod ſumi oportet, ſed *id* cui hoc conſequens eſt neceſſariò. nam & faciliùs concedunt, propterea quòd nõ æquè perſpicuum eſt, quid ex his efficietur: &, ſi hoc ſumptum fuerit, illud quoque ſumptum erit. 21 Ac poſtremo *loco* interrogare *aliquis debet*, quod præcipuè vult ſumere. maximè.n. prima negant: quia plurimi eorũ qui interrogant, pri- D mùm ea dicunt, in quibus maximum ſtudium ponunt. 22 Sed adverſus nonnullos primùm ea quæ ſunt eiuſmodi, proponere *oportet*. nã proterui prima maximè concedunt, niſi omnino ſit perſpicuũ, quid ſit euenturum: ad poſtremum verò difficiles ſunt & proterui. Similiter *faciunt*, quicũque putãt *ſe* acutos eſſe in reſpõdendo: plurimis.n. poſitis *&* *conceſſis*, in fine argutiolis & quaſi præſtigiis vtuntur, quaſi non colligatur ex iis quæ poſita ſunt: facilè autem cõcedunt, habitu freti, putantéſque *ſe* nihil paſſuros eſſe. 23 Præterea *vtile eſt* producere *orationẽ*, & interiicere ea quæ nihil ad diſputationem faciunt, quemadmodum *faciunt ij* qui falsò E *quidpiã* ſcribunt. cùm.n. multa ſunt, incertum *eſt*, in quo falſitas *conſiſtat*. Itaque interdum latent qui interrogant, obſcurè & occultè proponentes ea quæ per ſe propoſita non concederentur. 24 Ad occultãdum igitur, iis quæ dicta ſunt, vti oportet. 25 Ad ornatũ autem, inductione ac diuiſione eorũ quę eiuſdẽ generis ſunt. Et inductio quidem quid ſit, manifeſtum *eſt*. Diuiſio autem *eſt* talis: velvti, ſciẽtiam ſcientiâ meliorẽ *eſſe*, vel quia exquiſitior, vel quia *rerum* meliorũm *eſt*: & ſcientiarum alias *eſſe* contemplatiuas, alias actiuas, alias effectiuas. hæc.n. ſingula exornant orationem, neque neceſſe *eſt* vt dicantur ad concluſionem *efficiendã*. 2 Perſpicuitatis autẽ causâ exẽpla & *ſimilitudinũ* collationes afferri debent. Exempla verò propria *eſſe debent*, & ex quibus *rem* intelligamus; qualia Homerus, nõ qualia Chœril⁹ *propoſuit*. ſic.n. magis perſpicuũ erit id quod proponitur.

De argumentatione. Cap. II.

1 ¶¶ De argumentatione. 2 ¶¶ De inductione. ¶ Si nomen vniuerſale deſideretur. 3 ¶ De obiectione. Quando poſtulanda ſit. 4 In quibus dari debeat. De iis quæ ab interrogante propoſita ſunt. 5 De homonymis. 6 De ſynonymis, in quibus allata 7 vel non allata eſt obiectio. 8 ¶¶ De ſyllogiſmo. ¶ De probatione directa, aut per impoſſibile. 9 ¶ Quænam interrogari debeant. De iis in quibus facilè vel non facilè poteſt obiectio afferri. 10 De concluſione. 11 ¶ De forma 12 & breuitate interrogationis.

IAm verò in diſſerendo vtendum *eſt* ſyllogiſmo apud dialecticos potiùs quã apud multos: cõtrà inductione apud multos potiùs. ſed de his antea quoque dictum fuit. 2 In quibuſdã autem is qui inducit, poteſt interrogãdo ſumere vniuerſale: in nonnullis *id* non facile *eſt factu*, quia non eſt omnibus ſimilitudinibus poſitum nomẽ commune. ſed cùm vniuerſale ſumere oportet, ita *eſt*, inquiunt, in omnibus talibus *rebus*. hoc autem definire, difficillimum *eſt*, quænam eorum quæ afferuntur, *ſint* talia, quæ non *talia*. ideóque ſępe ſe inuicem in diſputationibus circumueniũt; dum alij ſimilia eſſe aiunt ea quæ ſimilia non ſunt, alij verò ambigunt *& ſuſpicantur* ea quæ ſimilia ſunt, non eſſe ſimilia. Idcirco in *iis* omnibus quæ talia ſunt, danda eſt opera vt nomina imponantur: vt nec reſpondenti liceat ambigere, quaſi nõ ſimiliter dicatur id quod affertur: nec ei qui interrogat, calumniari *liceat*, quaſi ſimiliter dicatur. multa. n. quæ non ſimiliter dicuntur, ſimiliter dici videntur. 3 Cùm autem inductione in multis adhibita, nõ dat *alter* vniuerſale, tũc iure optimo poſtulatur obiectio. qui verò non dixit in quibus ita *ſit*, nõ iuſtè poſtulat in quibus non ita *ſit*. oportet. n. priùs inducere, ſic *deinde* obiectionem poſtulare. 4 Ac poſtulandum *eſt*, vt obiectiones afferãtur, non in eo ipſo quod propoſitum eſt, niſi vnum tantummodo ſit tale, vt ſolus binarius *eſt* numerorum parium primus. debet. n. is qui obiicit, in alia re obiectionem afferre, aut dicere hoc ſolum tale *eſſe*. 5 *Quod* autem ad eos *attinet*, qui vniuerſali obiiciunt, nec in eodem *genere* obiectionem afferunt, ſed in homonymo: (velvti aliquem habere poſſe non ſuum colorem, aut pedem, aut manum: quia pictor habere poſſit non ſuum colorem, & coquus non ſuum pedem) in iis quæ ſunt eiuſmodi, adhibita diſtinctione interrogare debemus. nã ſi homonymia lateat, rectè obiicere propoſitioni videbitur. 6 Quòd ſi nõ in homonymo, ſed in eodem *genere* obiiciens, impediat interrogationem, oportet *eo* detracto, in quo obiectio *locum habet*, reliquum vniuerſaliter proponere, donec ſumptũ fuerit quod vtile eſt. vt in obliuione, & eo quod eſt, oblitum eſſe, *intelligi poteſt*. non. n. concedunt, eum qui amiſit ſcientiam, oblitum eſſe: quia cùm res intercidit, ſcientiam quidem amiſit, non tamen oblitus eſt. dempto igitur eo in quo *locum habet* obiectio, reliquum dicendum *eſt*: velvti, ſi re permanente amiſit ſcientiam, *eum* oblitum eſſe. Similiter *faciendum eſt* aduerſus eos qui obiiciunt *huic propoſitioni*, maiori bono maius malum opponi. proferunt enim *hanc obiectionẽ*, valetudini, quæ eſt minus bonum quàm firma *corporis* conſtitutio, maius malum opponi: morbum enim eſſe maius malum infirma *corporis* conſtitutione. detrahendum igitur in his quoque *eſt id* in quo *tenet* obiectio: (*eo* enim detracto, faciliùs concedet) velvti, maiori bono opponi maius malum, niſi vnà *ſecum* inferat alterum, vt firma *corporis* conſtitutio ſanitatem.

A Χρηστέον δὲ ἐν τῷ διαλέγεσθαι, τῷ μὲν συλλογισμῷ, πρὸς τοὺς διαλεκτικοὺς μᾶλλον, ἢ πρὸς τοὺς πολλούς· τῇ δὲ ἐπαγωγῇ, τοὐναντίον, πρὸς τοὺς πολλοὺς μᾶλλον. εἴρηται δὲ περὶ τούτων καὶ πρότερον. 2 Ἔστι δὲ ἐπ' ἐνίων μὲν, ἐπάγοντα δυνατὸν ἐρωτῆσαι τὸ καθόλου· ἐπ' ἐνίων δὲ, οὐ ῥᾴδιον, διὰ τὸ μὴ κεῖσθαι ταῖς ὁμοιότησιν ὄνομα πάσαις κοινόν· ἀλλ' ὅταν δέῃ τὸ καθόλου λαβεῖν, οὕτως ἐπὶ πάντων τῶν τοιούτων, φασί· τοῦτο δὲ διορίσαι, τῶν χαλεπωτάτων, ὁποῖα τῶν προφερομένων, τοιαῦτα, καὶ ὁποῖα οὔ. καὶ παρὰ τοῦτο πολλάκις ἀλλήλους παρακρούονται κατὰ τοὺς λόγους, B οἱ μὲν, φάσκοντες ὅμοια εἶναι τὰ μὴ ὄντα ὅμοια· οἱ δὲ, ἀμφισβητοῦντες τὰ ὅμοια μὴ εἶναι ὅμοια. διὸ πειρατέον ἐπὶ πάντων τῶν τοιούτων ὀνοματοποιεῖν αὐτόν· ὅπως μήτε τῷ ἀποκρινομένῳ ἐξῇ ἀμφισβητεῖν, ὡς οὐχ ὁμοίως τὸ ἐπιφερόμενον λέγεται· μήτε τῷ ἐρωτῶντι συκοφαντεῖν, ὡς ὁμοίως λεγομένου· ἐπειδὴ πολλὰ τῶν οὐχ ὁμοίως λεγομένων, ὁμοίως φαίνεται λέγεσθαι. 3 Ὅταν δὲ ἐπάγοντος ἐπὶ πολλῶν, μὴ διδῷ τὸ καθόλου, τότε δίκαιον ἀπαιτεῖν ἔνστασιν. μὴ εἰπόντα δ' αὐτὸν, ἐπὶ τίνων οὕτως, οὐ δίκαιον ἀπαιτεῖν ἐπὶ τίνων οὐχ οὕτως· δεῖ γὰρ ἐπάγοντα πρότερον, οὕτω τὴν ἔνστασιν C ἀπαιτεῖν. 4 Ἀξιωτέον τε, τὰς ἐνστάσεις μὴ ἐπ' αὐτοῦ τοῦ προτεινομένου φέρειν, ἂν μὴ ἓν μόνον ᾖ τὸ τοιοῦτον. καθάπερ ἡ δυὰς τῶν ἀρτίων ἀριθμῶν μόνος πρῶτος· δεῖ γὰρ τὸν ἐνιστάμενον, ἐφ' ἑτέρου τὴν ἔνστασιν φέρειν, ἢ λέγειν ὅτι τοῦτο μόνον τοιοῦτον. 5 Πρὸς δὲ τοὺς ἐνισταμένους τῷ καθόλου, μὴ ἐν αὐτῷ δὲ τὴν ἔνστασιν φέροντας, ἀλλ' ἐν τῷ ὁμωνύμῳ, (οἷον, ὅτι ἔχοι ἂν τις τὸ μὴ αὐτοῦ χρῶμα, ἢ πόδα, ἢ χεῖρα· ἔχοι γὰρ ἂν ὁ ζωγράφος τὸ μὴ αὐτοῦ χρῶμα, καὶ ὁ μάγειρος πόδα τὸν μὴ ἑαυτοῦ) διελόμενον οὖν ἐπὶ τῶν τοιούτων, D ἐρωτητέον· λανθανούσης γὰρ τῆς ὁμωνυμίας, εὖ δόξει ἐνστῆναι τῇ προτάσει. 6 Ἐὰν δὲ μὴ ἐν τῷ ὁμωνύμῳ, ἀλλ' ἐν αὐτῷ ἐνιστάμενος, κωλύῃ τὴν ἐρώτησιν· ἀφαιροῦντα δεῖ ἐν ᾧ ἡ ἔνστασις, προτείνειν τὸ λοιπὸν καθόλου ποιοῦντα, ἕως ἂν λάβῃ τὸ χρήσιμον· οἷον, ἐπὶ τῆς λήθης καὶ τοῦ ἐπιλελῆσθαι. οὐ γὰρ συγχωροῦσι τὸν ἀποβεβληκότα τὴν ἐπιστήμην, ἐπιλελῆσθαι· διότι μεταπεσόντος τοῦ πράγματος, ἀποβέβληκε μὲν τὴν ἐπιστήμην, ἐπιλέλησται δ' οὔ. ῥητέον οὖν, ἀφελόντα ἐν ᾧ ἡ ἔνστασις, τὸ λοιπόν. οἷον, εἰ διαμένοντος τοῦ πράγματος, ἀποβέβληκε τὴν ἐπιστήμην, διότι ἐπι- E λέλησται. ὁμοίως δὲ καὶ πρὸς τοὺς ἐνισταμένους, διότι τῷ μείζονι ἀγαθῷ μεῖζον ἀντίκειται κακόν· προφέρουσι γὰρ, ὅτι τῇ ὑγιείᾳ, ἐλάττονι ὄντι ἀγαθῷ τῆς εὐεξίας, μεῖζον κακὸν ἀντίκειται. τὴν γὰρ νόσον, μεῖζον εἶναι κακὸν τῆς καχεξίας· ἀφαιρετέον οὖν καὶ ἐπὶ * τούτων ἐν ᾧ ἡ ἔνστασις· (ἀφαιρεθέντος γὰρ, μᾶλλον ἂν θείη) οἷον, ὅτι τῷ μείζονι ἀγαθῷ μεῖζον κακὸν ἀντίκειται, ἐὰν μὴ συνεπιφέρῃ θάτερον, καθάπερ ἡ εὐεξία τὴν ὑγίειαν.

* χ. τούτου

A 7 Οὐ μόνον δὲ ἐνισταμένου τοῦτο ποιητέον, ἀλλὰ κἂν ἄνευ ἐνστάσεως ἀρνῆται, διὰ τὸ προορᾶν τι τῶν τοιούτων. ἀφαιρεθέντος γὰρ ἐν ᾧ ἡ ἔνστασις, ἀναγκασθήσεται τιθέναι, διὰ τὸ μὴ προορᾶν ἐν τῷ λοιπῷ, ἐπὶ τίνος οὐχ οὕτως· ἐὰν δὲ μὴ τιθῇ ἀπαιτούμενος ἔνστασιν, οὐχ ἕξει ἀποδοῦναι. εἰσὶ δὲ τοιαῦται τῶν προτάσεων, αἱ ἐπί τι μὲν ψευδεῖς, ἐπί τι δὲ ἀληθεῖς. ἐπὶ τούτων γάρ ἐστιν ἀφελόντα, τὸ λοιπὸν ἀληθὲς καταλιπεῖν. ἐὰν δὲ ἐπὶ πολλῶν* προτείνοντος, μὴ φέρῃ τὴν ἔνστασιν, ἀξιωτέον τιθέναι. διαλεκτικὴ γάρ ἐστι πρότασις, πρὸς ἣν οὕτως ἐπὶ πολλῶν ἐχουσῶν, μή ἐστιν ἔνστασις. 8 Ὅταν δὲ ἐνδέχηται τὸ αὐτὸ ἄνευ τοῦ ἀδυνάτου, καὶ διὰ τοῦ B ἀδυνάτου* συλλογίζεσθαι, ἀποδεικνύντι μὲν καὶ μὴ διαλεγομένῳ, οὐδὲν διαφέρει ἢ οὕτως ἢ ἐκείνως συλλογίσασθαι. διαλεγομένῳ δὲ οὐ χρηστέον τῷ διὰ τοῦ ἀδυνάτου συλλογισμῷ. ἄνευ μὲν γὰρ τοῦ ἀδυνάτου συλλογισαμένῳ, οὐκ ἔστιν ἀμφισβητεῖν· ὅταν δὲ τὸ ἀδύνατον συλλογίσωνται, ἂν μὴ λίαν ᾖ περιφανὲς ψεῦδος ὄν, οὐκ ἀδύνατόν φασιν εἶναι· ὥστε οὐ γίνεται τοῖς ἐρωτῶσιν ὃ βούλονται. 9 Δεῖ δὲ προτείνειν ὅσα ἐπὶ πολλῶν μὲν οὕτως ἔχει· ἔνστασις δὲ ἢ ὅλως μή ἐστιν, ἢ μὴ ἐπιπολῆς ἐστι τὸ συνιδεῖν. μὴ δυνάμενοι γὰρ συνορᾶν ἐφ' ὧν οὐχ οὕτως, ὡς ὂν ἀληθὲς τιθέασιν. 10 Οὐ δεῖ δὲ τὸ C συμπέρασμα, ἐρώτημα ποιεῖν· εἰ δὲ μή, ἀνανεύσαντος, οὐ δοκεῖ γεγονέναι συλλογισμός. πολλάκις γὰρ καὶ μὴ ἐρωτῶντος, ἀλλ' ὡς συμβαῖνον ἐπιφέροντος, ἀρνοῦνται· καὶ τοῦτο ποιοῦντες, οὐ δοκοῦσιν ἐλέγχεσθαι τοῖς μὴ συνορῶσιν, ὅ,τι συμβαίνει ἐκ τῶν τεθέντων. ὅταν οὖν μηδὲ φήσας συμβαίνειν, ἐρωτήσῃ· ὁ δέ, ἀρνηθῇ· παντελῶς οὐ δοκεῖ γεγονέναι συλλογισμός. 11 Οὐ δοκεῖ δὲ πᾶν τὸ καθόλου διαλεκτικὴ πρότασις εἶναι· οἷον, τί ἐστιν ἄνθρωπος; ἤ, ποσαχῶς λέγεται τὸ ἀγαθόν; ἔστι γὰρ πρότασις διαλεκτική, πρὸς ἣν ἔστιν ἀποκρίνεσθαι, ναί, ἢ οὔ· πρὸς δὲ τὰς εἰρημένας, οὐκ ἔστι. διὸ οὐδὲ διαλεκτικά ἐστι τὰ τοιαῦτα τῶν ἐρωτημάτων, ἐὰν μὴ αὐ- D τὸς διορίσας ἢ διελόμενος εἴπῃ· οἷον, ἆρά γε τἀγαθὸν οὕτως ἢ οὕτως λέγεται; πρὸς γὰρ τὰ τοιαῦτα, ῥᾳδία ἡ ἀπόκρισις, ἢ καταφήσαντι, ἢ ἀποφήσαντι. διὸ πειρατέον οὕτω προτείνειν τὰς τοιαύτας τῶν προτάσεων· ἅμα δὲ καὶ δίκαιον ἴσως παρ' ἐκείνου ζητεῖν, ποσαχῶς λέγεται τἀγαθόν, ὅταν αὐτοῦ διαιρουμένου, καὶ προτείνοντος, μηδαμῶς συγχωρήσῃ. 12 Ὅστις δ' ἕνα λόγον πολὺν χρόνον ἐρωτᾷ, κακῶς πυνθάνεται. εἰ μὲν γὰρ ἀποκρινομένου τοῦ ἐρωτωμένου τὸ ἠρωτημένον· δῆλον ὅτι πολλὰ ἐρωτήματα ἐρωτᾷ, ἢ πολλάκις ταὐτά· ὥστε ἢ ἀδολεσχεῖ, ἢ οὐκ ἔχει συλλογισμόν· ἐξ ὀλίγων γὰρ πᾶς συλλογισμός· εἰ δὲ μὴ ἀποκρινομένου ὅ,τι οὐκ ἐπιτιμᾷ, ἢ ἀφίσταται;

* γ. προτείνων,

* γ. συλλογίσασθαι

A 7 Non ſolùm autem cùm obiicitur, hoc faciendum *eſt*, ſed etiam ſi ſine obiectione *propoſitionem* neget, quia tale aliquid prouideat. dempto enim *eo* in quo obiectio *afferri poteſt*, cogetur concedere: quia in eo quod reliquum *erit*, non prouidebit, in quo non ita *ſit*. Si verò non concedat: cùm ab eo poſtulabitur obiectio, non poterit *eam* afferre. Sũt autem eiuſmodi propoſitiones, *ea* quæ *ſunt* ex parte falſæ, ex parte veræ. in iis enim licet, detractione facta, quod reliquum *eſt*, verum relinquere. Quòd ſi cùm *interrogans* in multis propoſuerit, *alter* non obiiciat: poſtulandum *eſt*, vt concedat. dialectica enim propoſitio eſt, aduerſus quam cùm in B multis ita habeat, non eſt obiectio. 8 Cùm autem idem poteſt ſine impoſſibili & per impoſſibile cõcludi: *quod attinet ad eum*, qui non diſputat, ſed demonſtrat, nihil refert, vtrùm hoc, an illo modo concludat. qui verò diſputat, non debet vti ſyllogiſmo ducente ad impoſſibile: quia ſi abſque impoſſibili concludat, ambigi non poteſt: cùm autem impoſſibile concludent, niſi valde perſpicuè falſum ſit, non impoſſibile aiũt eſſe. quocirca non conſequuntur quod volunt, ij qui interrogant. 9 Oportet autem proponere, quæcumque in multis ita *ſe* habent: obiectio autem aut omnino non C eſt, aut non facilè cerni poteſt. cùm enim perſpicere nequeunt, in quibus non ita ſit: *tum id quod propoſitum eſt*, quaſi verum ſit, concedunt. 10 Non oportet autem concluſionem interrogare. alioquin abnuente *eo qui reſpondet*, non videtur factus eſſe ſyllogiſmus. ſæpe enim negant, etiamſi *aduerſarius* non interroget, ſed vt conſequens inferat: idque facientes, redargui non vidẽtur iis qui non perſpiciunt quid ſequatur ex iis quæ poſita fuerunt. cùm igitur ne dicens quidem *concluſionem* ſequi, interrogabit, alter autem negabit: omnino non videbitur factus eſſe ſyllogiſmus. 11 Neque verò omne vniuerſale videtur eſſe propoſitio dialectica. velut, quid eſt homo? aut, quot modis di- D citur bonum? propoſitio enim dialectica eſt, ad quam reſpondere licet, etiam; aut, non: ad eas autem quæ dictæ ſunt, non licet. idcirco huiuſmodi interrogationes non ſunt dialecticæ, niſi is *qui interrogat*, determinatione aut diuiſione facta dixerit, exempli gratiâ, hócne modo an illo bonum dicitur? nam ad huiuſmodi *interrogata* facilis *eſt* reſponſio, vel affirmando, vel negando. Quapropter enitendum *eſt*, vt ita proponantur huiuſmodi propoſitiones. Quinimmo æquum *eſt* fortaſſe, ab illo quærere, quot modis dicatur bonum, cùm ipſe *interrogans* diuiſerit, & propoſuerit, *ille autem* nullo modo conceſſerit. 12 Qui verò vnam rationem diu interrogat, malè percontatur. nam ſi is qui interrogatur, *ad* interrogatum reſpondeat: patet, *eum qui interrogat, aut* multa, aut ſæpius eadem interrogare: proinde aut nugari, aut non habere ſyllogiſmum: ex paucis enim omnis ſyllogiſmus *conſtat*. quòd ſi *alter ad interrogatum* non reſpondeat, cur *eum* non reprehendit, aut diſcedit?

De facilitate aut difficultate argumentandi, vel defendendi.

Cap. III.

1 De primis, & vltimis. 2 De his quæ ſunt proxima principiis. 3 De definitionibus. 4 Summa. 5 De definitione omiſſa. 7 Epilogus. 8 Si propoſitio difficiliùs probari poſſit, quàm theſis. 9 Epilogus.

EAſdē porrò hypotheſes difficile eſt impugnare, ac facile *eſt* ſuſtinere. Eiuſmodi autē ſunt, & quæ *ſunt* prima naturâ, & quæ vltima. nā prima, definitione indigent: vltima verò multis concluduntur, ſi quis continentiam *argumētorum* ſumere à primis velit. alioqui captioſæ argumentationes videntur: quia fieri nequit, vt aliquid demonſtretur, niſi ſumpto à propriis principiis initio, continuata *argumentorum* ſerie perueniatur ad vltima. Qui igitur reſpondent, nec definiri poſtulāt, nec, ſi interrogans definiat, animum aduertunt. atqui niſi perſpicuum fiat, quid tādem ſit, quod eſt propoſitum, haud facile *eſt* argumētari. maximè verò hoc in principiis contingit. nā cetera per hæc probantur: ipſa verò per alia *probari* non poſſunt: ſed neceſſe *eſt*, vt eiuſmodi omnia definitione innoteſcant. 2 Ea quoque difficiles aggreſſiones habēt, quæ valde propinqua principio *ſunt*. non poſſunt. n. aduerſus ea multæ rationes ſuppetere, cū inter ea & principium ſint pauca media, per quæ neceſſe *eſt* poſteriora probari. 3 Omnium autem definitionum hæ difficillimè impugnātur, in quibus adhibita ſunt eiuſmodi nomina: vt primū incertum ſit, vno, an pluribus modis dicātur: deinde non conſtet, vtrùm propriè, an per tranſlationem à definiente ſumātur. nam, quia ſunt obſcura, non habent aggreſſiones. quia verò ignoratur, an eo quòd per tranſlationem dicantur, talia ſint, reprehenſione vacant. 4 Omnino autem quodcumq; problema difficulter impugnatur, exiſtimandū *eſt* aut definitione egere; aut ex iis eſſe, quæ multifariā, vel per tranſlationem dicuntur; aut non longè *abeſſe* à principiis; aut propterea *difficultatem habere*, quòd non eſt primo *intuitu* nobis perſpicuum, ad quem dictorum modorum referatur hoc ipſum, quod affert dubitationem. cùm. n. modus eſt perſpicuus, patet vel definiēdum eſſe, vel diuidendū, vel medias propoſitiones ſuggerēdas; quia per has vltima probantur. 5 In multis etiam theſibus non ſcitè definitione tradita, haud facile *eſt* diſſerere & argumentāri: velvti, vtrùm vnum vni contrariū *ſit*, an plura. contrariis autem commodè definitis, facile *erit* colligere, poſſintne plura eorūdem eſſe contraria, necne. Eodem modo *ſe res habet* in aliis definitione indigentibus. 6 Quin & in mathematis nonnulla ob definitionis defectū videntur non facilè deſcribi: vtputà eam lineam, quę planum ad latus ſecat, ſimiliter cū lineam tum ſpatium diuidere. definitione autem prolata, perſpicuum *eſt* quod dicitur. nam eandem ſubtractionem habēt loca & lineæ: hæc autem eſt eius orationis definitio. Omnino autem elementa, poſitis quidem definitionibus, (vt quid linea, quid circulus) facilè probātur: verùm haud multa aduerſus vnūquodque eorum argumēta ſuppetunt, quia non multa ſunt media. quòd ſi non ponantur principiorū definitiones, difficile *eſt*, aut fortaſſis omnino impoſſibile, *aduerſus ea diſſerere*. Similis eſt eorum ratio, quæ in diſputationibus ſpectātur. 7 Non oportet igitur latēre, cùm difficilem aggreſſionē theſis habet, eam aliquo dictorum *modorum* affectam eſſe. 8 Cùm autem de axiomate ac propoſitione difficilius *eſt* diſſerere, quàm de theſi, dubitare aliquis poſſit, vtrùm *ſint* ponēda, quæ ſunt huiuſmodi, an non. quia ſi nō ponat, ſed de eo quoque diſſeri poſtulet, maius *onus* iniūget, quàm quod à principio poſitum *fuit*. ſin autē ponat, credet ex iis quæ minus habent fidei. Si igitur non oportet difficilius

A Ἔστι δ᾽ ἐπιχειρεῖν τε χαλεπὸν, καὶ ὑπέχειν ῥᾴδιον τὰς αὐτὰς ὑποθέσεις. ἔστι δὲ τοιαῦτα τά τε φύσει πρῶτα, καὶ τὰ ἔσχατα. τὰ μὲν γὰρ πρῶτα, ὅρου δεῖται. τὰ δ᾽ ἔσχατα, διὰ πολλῶν περαίνεται, βουλομένῳ τὸ συνεχὲς λαμβάνειν ἀπὸ τῶν πρώτων· ἢ σοφισματώδη φαίνεται τὰ ἐπιχειρήματα. ἀδύνατον γὰρ ἀποδεῖξαί τι, μὴ ἀρξάμενον ἀπὸ τῶν οἰκείων ἀρχῶν, καὶ συνείροντα μέχρι τῶν ἐσχάτων. ὁρίζεσθαι μὲν οὖν οὔτ᾽ ἀξιοῦσιν οἱ ἀποκρινόμενοι, οὔτ᾽, ἂν ὁ ἐρωτῶν ὁρίζηται, προσέχουσι. μὴ γνωριμοῦ δὲ φανεροῦ τί ποτ᾽ ἐστὶ τὸ προκείμενον, οὐ ῥᾴδιον ἐπιχειρεῖν. μάλιστα δὲ τὸ τοιοῦτον περὶ τὰς ἀρχὰς συμβαίνει· τὰ μὲν γὰρ ἄλλα διὰ τούτων δείκνυται· B ταῦτα δ᾽ οὐκ ἐνδέχεται δι᾽ ἑτέρων, ἀλλ᾽ ἀναγκαῖον ὁρισμῷ τῶν τοιούτων ἕκαστον γνωρίζειν. 2 Ἔστι δὲ δυσεπιχείρητα καὶ τὰ λίαν ἐγγὺς τῆς ἀρχῆς. οὐ γὰρ ἐνδέχεται πολλοὺς πρὸς αὐτὰ λόγους πορίσασθαι, ὀλίγων ὄντων τῶν ἀνὰ μέσον αὐτῶν τε καὶ τῆς ἀρχῆς, δι᾽ ὧν ἀνάγκη δείκνυσθαι τὰ μετ᾽ αὐτά. 3 Τῶν δὲ ὅρων δυσεπιχειρητότατοι οὗτοι πάντων εἰσὶ μάλιστα, ὅσοι κέχρηνται τοιούτοις ὀνόμασιν, ἃ πρῶτον μὲν ἄδηλά ἐστιν, εἴτε ἁπλῶς, εἴτε πολλαχῶς λέγεται· πρὸς δὲ τούτοις, μηδὲ γνώριμα, πότερον κυρίως, ἢ κατὰ μεταφορὰν ὑπὸ τοῦ ὁρισαμένου λέγεται. διὰ μὲν γὰρ τὸ ἀσαφῆ εἶναι, οὐκ ἔχει ἐπιχειρήματα· διὰ δὲ τὸ ἀγνοεῖσθαι, C εἰ παρὰ τὸ κατὰ μεταφορὰν λέγεσθαι * τοιαῦτά ἐστιν, οὐκ ἔχει ἐπιτίμησιν. [* γρ. τοιοῦτόν ἐστιν] 4 Ὅλως δὲ πᾶν πρόβλημα, ὅταν ᾖ δυσεπιχείρητον, ἢ ὅρου δεῖσθαι ὑποληπτέον, ἢ τῶν πολλαχῶς, ἢ τῶν κατὰ μεταφορὰν εἶναι λεγομένων, ἢ οὐ πόρρω τῶν ἀρχῶν, ἢ διὰ τὸ μὴ φανερὸν εἶναι πρῶτον ἡμῖν, τοῦτ᾽ αὐτὸ κατὰ τίνα ποτὲ τῶν εἰρημένων τρόπων ἐστὶν, ὃ τὴν ἀπορίαν παρέχεται· φανεροῦ γὰρ ὄντος τοῦ τρόπου, δῆλον ὅτι ἢ ὁρίζεσθαι ἂν δέοι, ἢ διαιρεῖσθαι, ἢ τὰς ἀνὰ μέσον προτάσεις πορίζεσθαι· διὰ τούτων γὰρ δείκνυται τὰ ἔσχατα. 5 Ἐν πολλαῖς τε τῶν θέσεων μὴ καλῶς ἀποδιδομένου τοῦ ὁρισμοῦ, οὐ ῥᾴδιον διαλέγεσθαι καὶ ἐπιχειρεῖν. οἷον, πότερον ἓν ἑνὶ ἐναντίον, ἢ πλείω. D ὁρισθέντων δὲ * τῶν ἐναντίων κατὰ τρόπον, ῥᾴδιον συμβιβάσαι, πότερον ἐνδέχεται πλείω τῷ αὐτῷ εἶναι ἐναντία, ἢ οὔ. [* γρ. τῷ αὐτῷ ἓν] τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἄλλων τῶν ὁρισμοῦ δεομένων. 6 Ἔοικε δὲ καὶ ἐν τοῖς μαθήμασιν ἔνια δι᾽ ὁρισμοῦ ἔλλειψιν οὐ ῥᾳδίως γράφεσθαι. οἷον καὶ, ὅτι ἡ παρὰ τὴν πλευρὰν τέμνουσα τὸ ἐπίπεδον γραμμὴ, ὁμοίως * διαιρεῖ τήν τε γραμμὴν καὶ τὸ χωρίον. [* γρ. διαιρεῖται] τοῦ δὲ ὁρισμοῦ ῥηθέντος, φανερὸν τὸ λεγόμενον· τὴν γὰρ αὐτὴν ἀνταναίρεσιν ἔχει τὰ χωρία καὶ αἱ γραμμαί· ἔστι δ᾽ ὁρισμὸς τοῦ αὐτοῦ λόγου οὗτος. ἁπλῶς δὲ, τὰ πρῶτα τῶν στοιχείων, τιθεμένων μὲν ὁρισμῶν, (οἷον, τί γραμμὴ, καὶ τί κύκλος) ῥᾷστα δεῖξαι· πλὴν E οὐ πολλά γε πρὸς ἕκαστόν ἐστι τούτων ἐπιχειρεῖν, διὰ τὸ μὴ πολλὰ τὰ ἀνὰ μέσον εἶναι. ἐὰν δὲ μὴ τιθῶνται οἱ τῶν ἀρχῶν ὁρισμοὶ, χαλεπὸν, τάχα δ᾽ ὅλως ἀδύνατον. ὁμοίως δὲ τούτοις καὶ ἐπὶ τῶν κατὰ τοὺς λόγους ἔχει. 7 Οὐκ οὖν δεῖ λανθάνειν, ὅταν δυσεπιχείρητος ᾖ ἡ θέσις, ὅτι πέπονθέ τι τῶν εἰρημένων. 8 Ὅταν δὲ ᾖ πρὸς τὸ ἀξίωμα καὶ τὴν πρότασιν μεῖζον ἔργον διαλεχθῆναι, ἢ τὴν θέσιν, διαπορήσειεν ἄν τις πότερον θετέον τὰ τοιαῦτα, ἢ οὔ. Εἰ γὰρ μὴ θήσει, ἀλλ᾽ ἀξιώσει καὶ πρὸς τοῦτο διαλέγεσθαι, μεῖζον προστάξει τοῦ ἐν ἀρχῇ κειμένου. εἰ δὲ θήσει, πιστεύσει ἐξ ἧττον πιστῶν. εἰ μὲν οὖν δεῖ μὴ χαλεπώτερον

τὸ πρόβλημα ποιεῖν, θετέον· εἰ δὲ διὰ γνωριμωτέρων συλλογίζεσθαι, οὐ θετέον. ἢ τῷ μὲν μανθάνοντι οὐ θετέον, ἂν μὴ γνωριμώτερον ᾖ· τῷ δὲ γυμναζομένῳ θετέον, ἂν ἀληθὲς μόνον φαίνηται; ὥστε φανερόν, ὅτι οὐχ ὁμοίως ἐρωτῶντί τε καὶ διδάσκοντι ἀξιωτέον τιθέναι. 9 Πῶς μὲν οὖν ἐρωτηματίζειν καὶ τάττειν δεῖ, σχεδὸν ἱκανὰ τὰ εἰρημένα.

A problema facere, ponendum eſt *axioma illud*. quòd ſi ex notioribus concludere *oportet*, non *eſt illud* ponendum. An diſcenti quidem non ponendum, niſi notius ſit: *in diſputatione* autem ſe exercēti ponendum, ſi modò verum videatur? Quare perſpicuum *eſt*, interrogantem ac docentem non ſimiliter poſtulare debere, vt *aliquid* ponatur. 9 Quomodo igitur interrogare ac diſponere oporteat, iam ferè dictum eſt.

DE RESPONSIONE,

TRACTATVS II.

De officio interrogantis, & reſpondentis. Cap. IV.

1 Protheſis. 2 De officio interrogantis. 3 De officio reſpondentis.

CAP. III. Περὶ δὲ ἀποκρίσεως, πρῶτον μὲν διοριστέον, τί ἐστιν ἔργον τοῦ καλῶς ἀποκρινομένου, καθάπερ τοῦ καλῶς ἐρωτῶντος. 2 Ἔστι δὲ τοῦ μὲν ἐρωτῶντος, τὸ οὕτως μεταγαγεῖν τὸν λόγον, ὥστε ποιῆσαι τὸν ἀποκρινόμενον τὰ ἀδοξότατα λέγειν ἐκ τῶν διὰ τὴν θέσιν ἀναγκαίων. 3 Τοῦ δὲ ἀποκρινομένου, τὸ μὴ δι' αὐτὸν φαίνεσθαι συμβαίνειν τὸ ἀδύνατον, ἢ τὸ παράδοξον, ἀλλὰ διὰ τὴν θέσιν. ἑτέρα γὰρ ἴσως ἁμαρτία, τὸ θέσθαι πρῶτον ὃ μὴ δεῖ, καὶ τὸ θέμενον μὴ φυλάξαι κατὰ τρόπον.

B De reſponſione autem primùm determinandum *eſt*, quod eius ſit officium, qui rectè reſpōdet, quemadmodum eius qui rectè interrogat. 2 Eſt autem interrogantis, ita diſputationem deducere, vt reſpondentem cogat maximè incredibilia dicere, ex iis quę propter theſim *ſunt* neceſſaria. 3 Reſpondentis verò, ne ſuâ culpâ videatur euenire, quod abſurdum vel præter opinionem *eſt*, ſed propter theſim: aliud enim fortaſſe peccatum *eſt*, initio ponere quod non oportet, & poſitum non tueri commodè.

Si theſis ſit abſolutè vel cum adiunctione probabilis, aut improbabilis, aut neutra. Cap. V.

1 Protheſis. 2 Protheoria primă. 3 ſecunda. 4 tertia. 5 Si theſis ſit abſolutè improbabilis. 6 Si ſit abſolutè probabilis. 7 Si ſit neutra. 8 Epilogus. 9 Si ſit probabilis reſpondenti. 10 Si ſit probabilis alij. 11 Epilogus.

Ἐπεὶ δὲ ἐστὶν ἀδιόριστα τοῖς γυμνασίας καὶ πείρας ἕνεκα τοὺς λόγους ποιουμένοις· (οὐ γὰρ οἱ αὐτοὶ σκοποὶ τοῖς τε διδάσκουσιν ἢ μανθάνουσι, καὶ τοῖς ἀγωνιζομένοις· οὐδὲ τούτοις τε, καὶ διατρίβουσιν ἀεὶ μετ' ἀλλήλων σκέψεως χάριν. τῷ μὲν γὰρ μανθάνοντι θετέον ἀεὶ τὰ δοκοῦντα· καὶ γὰρ οὐδὲ ἐπιχειρεῖ ψεῦδος οὐδεὶς διδάσκειν. τῶν δὲ ἀγωνιζομένων, τὸν μὲν ἐρωτῶντα, φαίνεσθαί τι δεῖ ποιεῖν πάντως· τὸν δ' ἀποκρινόμενον, μηδὲν φαίνεσθαι πάσχειν. ἐν δὲ ταῖς διαλεκτικαῖς συνόδοις, τοῖς μὴ ἀγῶνος χάριν, ἀλλὰ πείρας καὶ σκέψεως τοὺς λόγους ποιουμένοις, οὐ διήρθρωταί πω, τίνος δεῖ στοχάζεσθαι τὸν ἀποκρινόμενον, καὶ ποῖα διδόναι, καὶ ποῖα μή, πρὸς τὸ καλῶς ἢ μὴ καλῶς φυλάττειν τὴν θέσιν) ἐπεὶ οὖν οὐδὲν ἔχομεν παραδεδομένον ὑπ' ἄλλων, αὐτοί τι πειραθῶμεν εἰπεῖν. 2 Ἀνάγκη δὴ τὸν ἀποκρινόμενον ὑπέχειν λόγον, θέμενον ἤτοι ἔνδοξον ἢ ἄδοξον θέσιν, ἢ μηδέτερον· καὶ ἤτοι ἁπλῶς ἔνδοξον, ἢ ἄδοξον, ἢ ὡρισμένως, οἷον τῷδέ τινι, ἢ αὐτῷ, ἢ ἄλλῳ. 3 Διαφέρει δ' οὐδέν, ὁπωσοῦν ἐνδόξου ἢ ἀδόξου οὔσης· ὁ γὰρ αὐτὸς τρόπος ἔσται τοῦ καλῶς ἀποκρίνεσθαι, καὶ δοῦναι ἢ μὴ δοῦναι τὸ ἐρωτηθέν. 4 Ἀδόξου μὲν οὖν οὔσης τῆς θέσεως, ἔνδοξον ἀνάγκη τὸ συμπέρασμα γίνεσθαι· ἐνδόξου δὲ ἄδοξον· τὸ γὰρ ἀντικείμενον ἀεὶ τῇ θέσει ὁ ἐρωτῶν συμπεραίνεται. εἰ δὲ * μήτ' ἄδοξον, μήτ' ἔνδοξον τὸ κείμε-

* γρ. μήτε ἔνδοξον, μήτ' ἄδοξον.

C Quia verò ſunt indefinita, quæ *obſeruanda ſunt ab* iis qui exercitationis & periculi *faciendi* cauſa diſputant: (non.n. iidem ſcopi *propoſiti ſunt* docentibus vel diſcentibus, & contēdentibus: neque his ipſis, & iis, qui ſe ſemper inter ſe exercent inquiſitionis gratiâ. nam diſcēti ponenda ſemper *ſunt*, quæ videntur: etenim falſum nemo docere aggreditur. ex iis verò qui contendunt, interrogantē oportet videri omnino aliquid facere: reſpondentem autē, nihil videri pati. In dialecticis autem cōgreſſibus, nondū *à quoquā* diſtinctè expoſitum eſt, *quid ſit obſeruandū* iis, qui non contentionis, ſed periculi & inquiſitionis gratiâ diſputāt, & quò oporteat reſpondentem collimare, & quæ concedere, D & quæ non *concedere*, vt pręclarè, aut ſecus tueatur theſim.) Quoniā igitur nihil habemus ab aliis traditum, ipſi nonnihil dicere conemur. 2 Neceſſe igitur *eſt*, eum qui reſpondet, ſuſtinere diſputationē, poſita vel probabili, vel improbabili theſi, vel neutra: probabili, inquam, vel improbabili, aut ſimpliciter, aut definitè, vt certo cuidam, nempe vel ipſi *reſpondenti*, vel alij. 3 Nihil autem intereſt, quocumque modo ſit probabilis, vel improbabilis: idem enim modus erit bene reſpondendi, & dandi, vel non dandi, quod interrogatum eſt. 4 Si igitur improbabilis ſit theſis, neceſſe *eſt* concluſionem probabilem fieri: ſi verò *illa* probabilis, *hanc* improbabilem, ſemper enim oppoſitum theſi concludit qui interrogat. Sed ſi id quod ponitur, neque improbabile *ſit*, neque probabile:

concluſio quoque talis erit. 5 Quoniam autem is qui ſcitè ratiocinatur, ex probabilioribus & notioribus id quod in quæſtione poſitū eſt, demonſtrat: *hinc* apparet, ſi improbabile ſit ſimpliciter, quod poſitum eſt, reſpondentem non debere cōcedere, nec quod non videtur ſimpliciter, nec quod videtur quidem, ſed minùs videtur, quàm concluſio. nam cū improbabilis eſt theſis, probabilis *eſt* concluſio. quare oportet, quæ ſumpta ſunt, probabilia omnia eſſe, & *quidem* magis quàm quod propoſitū eſt, probabilia, ſi futurum eſt vt per notiora minùs notum concludatur. Itaque niſi quid eiuſmodi ſit ex interrogatis, non *eſt* ponendum reſpondenti. 6 Sin autem ſimpliciter probabilis *ſit* theſis: patet concluſionem *eſſe* ſimpliciter improbabilem. Ponenda ſunt igitur & quæcūque videntur: & ex iis quæ non videntur, ea quæ minùs ſunt improbabilia, quàm cōcluſio. *ſic* enim videri poteſt ſatis *commode* diſputatum. 7 Similiter etiam *fiat*, ſi nec improbabilis nec probabilis ſit theſis. etenim ſic quoque danda ſunt, quæcumque videntur: & ex iis quæ non vidētur, *ea* quæ magis *ſunt* probabilia concluſione. ſic.n. fiet, vt probabiliores argumentationes efficiātur. 8 Ergo ſi ſimpliciter probabile aut improbabile ſit, quod poſitū *eſt*: ad ea *reſpiciēdo* quæ ſimpliciter vidētur, comparatio facienda *eſt*. 9 Sin autem non ſimpliciter probabile vel improbabile ſit, quod poſitum *eſt*, ſed reſpondenti: ad ſe ipſum *reſpiciendo, & ita* quod videatur, aut non videatur, dijudicando, ponēdum *eſt*, aut non ponendum. 10 Quòd ſi alterius opinionē tueatur is, qui reſpondet, procul dubio ad illius mentem & ſententiā reſpiciens, debet ſingula ponere, & negare. Idcirco & qui alienas opiniones inferunt, (vtputà bonum & malum eſſe idem, vt Heraclitus ait) *ij* non concedunt, eidem ſimul non adeſſe cōtraria, non quòd hoc ſibi non videatur, ſed quia ſecundū Heraclitum ſic *eſt* dicendum. Hoc etiam faciunt, qui *ita diſputant, vt* alteri ab alteris theſes accipiāt: coniiciunt enim, quid theſeos auctor diceret. 11 Perſpicuum igitur *eſt*, quò collimare debeat reſpondens, ſiue ſimpliciter, ſiue alicui probabile *ſit*, quod *eſt* poſitum.

A νον, καὶ τὸ συμπέρασμα ἔσται τοιοῦτον. 5 Ἐπεὶ δ' ὁ καλῶς συλλογιζόμενος, ἐξ ἐνδοξοτέρων καὶ γνωριμωτέρων τὸ προβληθὲν ἀποδείκνυσι· φανερὸν ὡς, ἀδόξου μὲν ὄντος ἁπλῶς τοῦ κειμένου, οὐ δοτέον τῷ ἀποκρινομένῳ, οὔθ' ὃ μὴ δοκεῖ ἁπλῶς, οὔθ' ὃ δοκεῖ μὲν, ἧττον δὲ τοῦ συμπεράσματος δοκεῖ. ἀδόξου γὰρ οὔσης τῆς θέσεως, ἔνδοξον τὸ συμπέρασμα· ὥστε δεῖ τὰ λαμβανόμενα, ἔνδοξα πάντ' εἶναι, καὶ μᾶλλον ἔνδοξα τοῦ προκειμένου, εἰ μέλλει διὰ τῶν γνωριμωτέρων τὸ ἧττον* γνώριμον περαίνεσθαι. ὥστ' εἰ μή τι τοιοῦτόν ἐστι τῶν ἐρωτωμένων, οὐ θετέον τῷ ἀποκρινομένῳ. 6 Εἰ δ' ἔνδοξος ἁπλῶς ἡ θέ- B σις, δῆλον ὅτι τὸ συμπέρασμα ἁπλῶς ἄδοξον. θετέον οὖν τά τε δοκοῦντα πάντα, καὶ τῶν μὴ δοκούντων ὅσα ἧττόν ἐστιν ἄδοξα τοῦ συμπεράσματος· ἱκανῶς γὰρ ἂν δόξειε διειλέχθαι. 7 Ὁμοίως δὲ καὶ, εἰ μήτ' ἄδοξος, μήτ' ἔνδοξός ἐστιν ἡ θέσις. καὶ γὰρ οὕτως τά τε φαινόμενα ἅπαντα δοτέον, καὶ τῶν μὴ δοκούντων ὅσα μᾶλλον ἔνδοξα τοῦ συμπεράσματος. οὕτω γὰρ ἂν ἐνδοξοτέρους συμβήσεται τοὺς λόγους γίνεσθαι. 8 Εἰ μὲν οὖν ἁπλῶς ἔνδοξον ἢ ἄδοξον τὸ κείμενον, πρὸς τὰ δοκοῦντα ἁπλῶς, τὴν σύγκρισιν ποιητέον. 9 Εἰ δὲ μὴ ἁπλῶς ἔνδοξον, ἢ ἄδοξον εἴη τὸ κείμενον, ἀλλὰ τῷ ἀποκρινομένῳ· πρὸς αὐτὸν τὸ δοκοῦν καὶ μὴ δοκοῦν κρίνοντα, θετέον, ἢ οὐ θετέον. 10 Ἐὰν δὲ ἑτέρου δόξαν διαφυλάττῃ ὁ ἀπο- C κρινόμενος, δῆλον ὅτι πρὸς τὴν ἐκείνου διάνοιαν ἀποβλέποντα, θετέον ἕκαστα, καὶ ἀρνητέον. διὸ καὶ οἱ κομίζοντες ἀλλοτρίας δόξας, (οἷον, ἀγαθὸν καὶ κακὸν εἶναι ταὐτὸν, καθάπερ Ἡράκλειτός φησιν) οὐ διδόασι μὴ παρεῖναι ἅμα τῷ αὐτῷ τἀναντία, οὐχ ὡς οὐ δοκοῦν αὐτοῖς τοῦτο, ἀλλ' ὅτι καθ' Ἡράκλειτον οὕτω λεκτέον. Ποιοῦσι δὲ τοῦτο καὶ οἱ παρ' ἀλλήλων δεχόμενοι τὰς θέσεις· στοχάζονται γὰρ, ὡς ἂν εἴποι ὁ θέμενος. 11 Φανερὸν οὖν, τίνων στοχαστέον τῷ ἀποκρινομένῳ, εἴτε ἁπλῶς ἔνδοξον, εἴτε τινὶ τὸ κείμενόν ἐστιν.

* κ ἐνδόξου

Si propoſitio ad rem propoſitam pertineat, vel non. Cap. VI.

1 Si propoſitio ſit probabilis, non ad rem. 2 Si nec probabilis ſit, nec ad rem. 3 Si ſit probabilis, & ad rem. 4 Si ſit valde improbabilis, & ad rem. 5 Si neutra, nec ad rem. 6 Si neutra, & ad rem.

CVm autē neceſſe *ſit*, quicquid interrogatur, aut probabile eſſe, aut improbabile, aut neutrum: & vel ad diſputationem *pertinere*, vel nō pertinere, quod interrogatur: ſiquidem *ſit* probabile, nec ad diſputationem *faciat*, dādum *eſt*, cùm *prius* dictum fuerit eſſe probabile: quoniam eo poſito non euertitur *problema*, quod ab initio poſitū fuit. 2 Si verò nec probabile *ſit*, nec ad diſputationem *pertineat*, dandum quidem *eſt*, ſed indicandum, *nobis* non probari, vitandæ fatuitatis causâ. 3 Quòd ſi ad diſputationem pertineat, & probabile ſit: dicendum, videri *id* quidem, ſed valde propinquum eſſe ei quod ab initio *propoſitum eſt*, & eo conceſſo euerti quod poſitum eſt. 4 Sin autem ad diſputationem pertineat, valde autem improbabile *ſit* axioma: dicendum, effici quidem, eo poſito, *concluſionem*, ſed valde fatuum eſſe quod proponitur. 5 At ſi neque improbabile, neque probabile *ſit*: ſiquidem nihil ad diſputationem *faciat*, dandum *eſt* nulla definitione adiecta. 6 Si verò ad diſputationem faciat: indicandum *eſt* euerti eo poſito *problema* ab initio *propoſitum*.

D ἘΠεὶ δ' ἀνάγκη πᾶν τὸ ἐρωτώμενον, ἢ ἔνδοξον εἶναι, ἢ ἄδοξον, ἢ μηδέτερον· καὶ ἢ πρὸς τὸν λόγον, ἢ μὴ πρὸς τὸν λόγον εἶναι τὸ ἐρωτώμενον· ἐὰν μὲν ᾖ δοκοῦν, καὶ μὴ πρὸς τὸν λόγον, δοτέον, φήσαντα δοκεῖν· * οὐ γὰρ ἀναιρεῖται τιθέντος τὸ ἐν ἀρχῇ. 2 Ἐάν τε μὴ δοκοῦν, καὶ μὴ πρὸς τὸν λόγον, δοτέον μὲν, ἐπισημαντέον δὲ τὸ μὴ δοκοῦν, πρὸς εὐλαβείαν εὐηθείας. 3 Ὄντος δὲ πρὸς τὸν λόγον, καὶ δοκοῦντος, λεκτέον ὅτι δοκεῖ μὲν, ἀλλὰ λίαν σύνεγγυς τοῦ ἐν ἀρχῇ ἐστὶ, καὶ ἀναιρεῖται τούτου τεθέντος τὸ κείμενον. 4 Εἰ δὲ πρὸς τὸν λόγον, λίαν δὲ ἄδοξον τὸ ἀξίωμα, συμβαίνειν μὲν φατέον, τούτου τεθέντος, ἀλλὰ λίαν εὔηθες εἶναι τὸ προτεινόμενον. 5 Εἰ δὲ μήτε ἄδοξον, μήτε ἔνδοξον· εἰ μὲν μηδὲν πρὸς τὸν λόγον, δοτέον, μηδὲν διορίσαντα. 6 Εἰ δὲ πρὸς τὸν λόγον, ἐπισημαντέον ὅτι ἀναιρεῖται τιθέντος τοῦ ἐν ἀρχῇ.

* Gruchius, ἐφ' οὗ [illegible] τιθέντος, τὸ ἐν ἀρχῇ.

* γρ. δι' αὐτὸν

7 Οὕτω γὰρ, ὅ,τι ἀποκρινόμενος οὐδὲν δόξει* δι' αὐτὸν πάσχειν, ἐὰν προορῶν ἕκαστα τιθῇ· ὅ,τε ἐρωτῶν τεύξεται συλλογισμοῦ, τιθεμένων αὐτῷ πάντων τῶν ἐνδοξοτέρων τοῦ συμπεράσματος. ὅσοι δὲ ἐξ ἀδοξοτέρων τοῦ συμπεράσματος ἐπιχειροῦσι συλλογίζεσθαι, δῆλον ὡς οὐ καλῶς συλλογίζονται. διὸ τοῖς ἐρωτῶσιν οὐ θετέον.

A 7 Sic.n.& reſpondẽs nihil ſuâ culpâ videbitur pati, ſi proſpiciens ſingula ponat:& interrogans non deſtituetur ſyllogiſmo, *iis* omnibus ſibi *à reſpondẽte* conceſſis, quę probabiliora *ſunt* concluſione. Quicumque autẽ ex iis quæ improbabiliora ſunt concluſione, argumentari aggrediuntur, propalàm non ſcitè argumentantur: proinde interrogantibus *hæc* non *ſunt* concedenda.

Si propoſitio ſit obſcura, vel multiplex, vel perſpicua & ſimplex. Cap. VII.

1 Si ſit obſcura. 2 Si ſit multiplex: & reſpondens ſciat eam eſſe omnino veram, vel omnino falſam: 3 vel ex parte veram, ex parte falſam: 4 vel homonymiam ab initio non cognouerit. 5 Si ſit ſimplex & perſpicua.

Ὁμοίως δὲ καὶ ἐπὶ τῶν ἀσαφῶς καὶ πλεοναχῶς λεγομένων ἀπαντητέον. ἐπεὶ γὰρ δέδοται τῷ ἀποκρινομένῳ μὴ μανθάνοντι, εἰπεῖν ὅτι οὐ μανθάνω· καὶ πλεοναχῶς λεγομένου, μὴ ἐξ ἀνάγκης ὁμολογῆσαι, ἢ ἀρνήσασθαι· δῆλον ὡς πρῶτον μὲν, ἂν μὴ σαφὲς ᾖ τὸ ῥηθὲν, οὐκ ἀποκνητέον τὸ φάναι μὴ συνιέναι· πολλάκις γὰρ ἐκ τοῦ μὴ σαφῶς ἐρωτηθέντας διδόναι, ἀπαντᾷ τι δυσχερές. 2 Ἐὰν δὲ γνώριμον μὲν ᾖ τὸ πλεοναχῶς λεγόμενον· ἐὰν μὲν ἐπὶ πάντων ἀληθὲς, ἢ ψεῦδος ᾖ τὸ λεγόμενον, δοτέον ἁπλῶς, ἢ ἀρνητέον. 3 Ἐὰν δὲ ἐπί τι μὲν, ψεῦδος ᾖ· ἐπί τι δὲ, ἀληθές· ἐπισημαντέον, ὅτι πλεοναχῶς λέγεται· καὶ ὅτι τὸ μὲν, ψεῦδος· τὸ δὲ, ἀληθές. ὕστερον δὲ διαιρουμένου, ἄδηλον εἰ καὶ ἐν ἀρχῇ συνεώρα τὸ ἀμφίβολον. 4 Ἐὰν δὲ μὴ προΐδῃ τὸ ἀμφίβολον, ἀλλ' εἰς θάτερον βλέψας θῇ, ῥητέον πρὸς τὸν ἐπὶ θάτερον ἄγοντα, ὅτι, οὐκ εἰς τοῦτο βλέπων* ἔθηκεν, ἀλλ' εἰς θάτερον αὐτῶν. πλειόνων γὰρ ὄντων τῶν ὑπὸ ταὐτὸ ὄνομα ἢ λόγον, ῥᾳδία ἡ ἀμφισβήτησις. 5 Ἐὰν δὲ καὶ σαφὲς ᾖ καὶ ἁπλοῦν τὸ ἐρωτώμενον, ἢ ναὶ, ἢ οὒ, ἀποκριτέον.

* γρ. ἔθηκε

B SImili etiam modo in iis quæ obſcurè & multifariàm dicuntur, occurrendũ *eſt*. nam quia datum eſt reſpondẽti, ſi non intelligat, vt dicat, Non intelligo:& ſi *propoſitum* multis modis dicatur, non neceſſariò fateatur aut neget, manifeſtum *eſt*, primùm quidem, ſi non dilucidum ſit quod dictum *eſt*, *reſpondenti* ſine cunctatione dicendum ſe non intelligere. ſæpe.n. ex eo quod non dilucidè interrogati concedunt, occurrit aliquid negotium faceſſens. 2 Si verò notum ſit id quod multis dicitur modis: ſi quidem quod dicitur, in omnibus verum aut falſum ſit, dandum *eſt* ſimpliciter, aut negandum. 3 Si verò ex parte *ſit* falſum, ex parte
C verum: indicãdum *eſt*, *id* dici multis modis, & cur partim *ſit* falſum, partim verũ. nam *ſi id* poſteriùs diſtinguat, dubium erit, an & initiò ambiguitatẽ perſpexerit. 4 Sin autem non proſpexerit ambiguitatem, ſed ad alterum *ſignificatũ* reſpiciens poſuerit, dicẽdum *eſt* adverſus eũm qui ad aliud ducit, ſe non ad hoc reſpicientem poſuiſſe, ſed ad alterum illorum *ſignificatorum*. cùm.n. multa eidem nomini vel orationi ſubiecta ſunt, facilè *exiſtit* dubitatio. 5 Sin rogatum & dilucidum ſit & ſimplex: aut Etiam, aut Non, reſpondendum.

De reſponſione ad inductionem. Cap. VIII.

* γρ. ἐπαγωγὴν καὶ ὁμοιότητα

ΕΠεὶ δὲ πᾶσα πρότασις συλλογιστικὴ, ἢ τούτων τίς ἐστιν ἐξ ὧν ὁ συλλογισμὸς, ἢ τινὸς τούτων ἕνεκα· δῆλον δ' ὅταν ἑτέρου χάριν λαμβάνηται, τῷ πλείω τὰ ὅμοια ἐρωτᾶν (ἢ γὰρ δι'* ἐπαγωγῆς, ἢ δι' ὁμοιότητος, ὡς ἐπὶ τὸ πολὺ τὸ καθόλου λαμβάνουσι) τὰ μὲν καθ' ἕκαστα πάντα θετέον, ἂν ᾖ ἀληθῆ καὶ ἔνδοξα· πρὸς δὲ τὸ καθόλου πειρατέον ἔνστασιν φέρειν. τὸ γὰρ ἄνευ ἐνστάσεως, ἢ οὔσης, ἢ δοκούσης, κωλύειν τὸν λόγον, δυσκολαίνειν ἐστίν. εἰ οὖν ἐπὶ πολλῶν φαινομένων, οὐ δίδωσι τὸ καθόλου, μὴ ἔχων ἔνστασιν, φανερὸν ὅτι δυσκολαίνει. ἔτι δὲ, εἰ μηδ' ἀντεπιχειρεῖν ἔχοι ὅτι οὐκ ἀληθὲς, μᾶλλον ἂν δόξειε δυσκολαίνειν. καίτοι οὐδὲ τοῦθ' ἱκανόν· πολλοὺς γὰρ λόγους ἐναντίους ἔχομεν ταῖς δόξαις, οὓς χαλεπὸν λύειν, καθάπερ τὸν Ζήνωνος, ὅτι οὐκ ἐνδέχεται κινεῖσθαι, οὐδὲ τὸ στάδιον διελθεῖν. ἀλλ' οὐ διὰ τοῦτο τὰ ἀντικείμενα τούτοις οὐ θετέον. εἰ οὖν μήτε ἀντεπιχειρεῖν ἔχων, μήτε ἐνίστασθαι, οὐ τίθησι, δῆλον ὅτι δυσκολαίνει. ἔστι γὰρ ἡ ἐν λόγοις δυσκολία, ἀπόκρισις παρὰ τοὺς εἰρημένους τρόπους, συλλογισμοῦ φθαρτική.

C QVoniam autẽ omnis propoſitio ſyllogiſtica, vel eſt earum aliqua, ex quibus ſyllogiſmus *cõficitur*, vel alicuius ex illis cauſâ *ſumitur*: patet autem, quando alterius gratiâ ſumatur, *nempe* quũ multa ſimilia interrogantur: (aut.n. per inductionem, aut per ſimilitudinem plerumque vniuerſale accipiunt) ſingularia quidem omnia ponẽda *ſunt*, ſi vera ſint & probabilia. adverſus vniuerſale autẽ enitẽdum *eſt* vt afferatur obiectio. nam ſine obiectione, quæ aut ſit, aut *falſè eſſe* videatur, argumentationem impedire, *hoc eſt* tergiuerſari. Si igitur, cũ multa videantur, non cõcedat vniuerſale, nec ha-
D beat obiectionẽ: perſpicuè tergiuerſatur. Inſuper, ſi ne quidem contrarium habeat argumẽtum, *quo oſtendat id* non eſſe verũ, magis videbitur tergiuerſari. Quamquam ne hoc quidẽ ſufficit: multas.n. rationes habemus opinionibus contrarias, quas difficile *eſt* ſoluere; velvti Zenonis *rationem*, quòd non poteſt *quidpiã* moueri, nẽc ſtadium peragrare: nec propterea tamen non *ſunt* ponenda, *quæ ſunt* his contraria. Si quis *igitur*, cùm neque argumentationem contrariam habeat, neque obiicere *poſſit*, non dat *quod rogatur*: perſpicuè tergiuerſatur. nam tergiuerſatio in diſputationibus *nihil aliud* eſt, quam reſponſio præter expoſitos modos, vim habens ſyllogiſmi perimendi.

De præexercitatione, & de theſi improbabili non defendenda.

Cap. IX.

1 *De præexercitatione.* 2 *De theſi improbabili.*

SVſtinere autem & theſim & definitionem *ſic* A oportet, vt ipſe *reſpondens* ſibi antè argumenta opponat. ex quibus.n. ij, qui percõtantur, *problema* poſitum euertunt, conſtat his *eſſe* occurrendum. 2 Cauendum verò eſt, ne improbabilis hypotheſis ſuſtineatur. Multis autẽ modis improbabilis eſſe poteſt. nam & *ea eſt improbabilis*, ex qua efficitur, vt abſurda dicantur; velvti ſi quis omnia moueri dicat, aut nihil: & ea quæ deterioribus moribus prędití eligunt, quæque *hominũ* voluntatibus contraria ſunt: velvti voluptatem *eſſe* rem bonam; & melius *eſſe*, iniuriam facere, quàm accipere. Non.n. quaſi diſputationis gratiâ defendentem, ſed quaſi *ea* quæ *ſibi vera* videntur, dicentem oderunt.

Ὑπέχειν δὲ καὶ θέσιν καὶ ὁρισμόν, αὐτὸν αὑτῷ δεῖ προεγχειρήσαντα. ἐξ ὧν γὰρ ἀναιροῦσιν οἱ πυνθανόμενοι τὸ κείμενον, δῆλον ὅτι τούτοις ἐναντιωτέον. 2 Ἄδοξον δὲ ὑπόθεσιν εὐλαβητέον ὑπέχειν. εἴη δ᾽ ἂν ἄδοξος *πλεοναχῶς. καὶ γὰρ ἐξ ἧς ἄτοπα συμβαίνει λέγειν. οἷον, εἰ πάντα φαίη τις κινεῖσθαι, ἢ μηδέν. καὶ ὅσα χείρονος ἤθους ἑλέσθαι, καὶ ὑπεναντία ταῖς βουλήσεσιν. οἷον, ὅτι ἡ ἡδονὴ ἀγαθόν· καὶ τὸ ἀδικεῖν, βέλτιον τοῦ ἀδικεῖσθαι. οὐ γὰρ ὡς λόγου χάριν *ὑπέχοντα, ἀλλ᾽ ὡς τὰ δοκοῦντα λέγοντα μισοῦσιν.

* γρ. ἐπιχειρεῖν.
* γρ. ἀδόξως.
* γρ. ὑπερέχοντα.

De ſolutione argumentorum, & de concluſione impedienda.

Cap. X.

1 *De ſolutione argumentorum.* 3 *De concluſione impedienda.* 4 *Communia.*

QVæcumque autem argumẽtationes falſum B colligunt, ſoluendæ *ſunt eo* ſublato ex quo falſum efficitur. non.n. quovis ſublato *ratio* ſoluitur, ne quidẽ ſi falſum ſit quod tollitur. multa.n. falſa continere ratio poteſt: velvti, ſi quis ſumpſerit, eum qui ſedet, ſcribere, ac Socratem ſedere: ex his.n. colligitur Socratẽ ſcribere: *hoc* igitur ſublato, Socratẽ ſcribere, nihilo magis ſoluta eſt argumentatio. atqui axioma eſt falſum. ſed non ob id ratio *eſt* falſa. ſi quis.n. ſedeat, neque ſcribat, huic non ampliùs eadem ſolutio conueniet. quare non hoc *eſt* tollendũ, ſed *illud*, eum, qui ſedet, ſcribere: non.n. quicumque ſedet, ſcribit. omnino igitur ſoluit, qui id ſuſtulit, ex quo falſum efficitur. 2 So- C lutionem autẽ nouit, qui nouit ex hoc rationem *pendere*: quemadmodum in falſis deſcriptionibus contingit: neque.n. ſatis eſt obiicere, ne quidem ſi falſum ſit quod tollitur: ſed cur *ſit* falſum, *eſt* demonſtrandum. ſic.n. apparebit, vtrùm aliquid proſpiciens, an non *proſpiciẽs*, proponat obiectionem. 3 Licet autem, quominus ratio concludatur, impedire quatuor modis. 4 Vel.n. *impeditur* ſublato eo ex quo efficitur falſum. 5 Vel adverſus eum, qui interrogat, obiectione allata. ſæpe.n. etſi *reſpõdens* non ſoluit, tamen qui percõtatur, non poteſt D vlteriùs progredi. 6 Tertiò adverſus ea quæ interrogantur, *obiectione allata*. poteſt.n. accidere, vt ex interrogatis non fiat quod volumus, quia malè interrogatum ſit: aliquo autem appoſito efficiatur concluſio. Si igitur ampliùs progredi non poteſt qui interrogat, adverſus interrogantem erit obiectio: ſin poteſt, adverſus interrogata. 7 Quarta ac deterrima obiectio *eſt*, quæ ad tempus *refertur*. quidam.n. talia obiiciunt, quæ ad differendum plus temporis requirunt, quàm præſens congreſſus *admittat*. 8 Obiectiones igitur, ſicut diximus, quatuor modis fiunt. ex his autem quas diximus, tantùm prima eſt ſolutio: reliquæ verò *ſunt* prohibitiones quædam & impedimenta concluſionum.

Ὅσοι δὲ τῶν λόγων ψεῦδος συλλογίζονται, λυτέον ἀναιροῦντα παρ᾽ ὃ γίνεται τὸ ψεῦδος. οὐ γὰρ ὁποιονοῦν ἀνελών, λέλυκεν, οὐδ᾽ εἰ ψεῦδός ἐστι τὸ ἀναιρούμενον. ἔχοι γὰρ ἂν πλείω ψευδῆ ὁ λόγος· οἷον, εἴ τις λάβοι τὸν καθήμενον γράφειν, *Σωκράτην δὲ καθῆσθαι· συμβαίνει γὰρ ἐκ τούτων, Σωκράτην γράφειν. ἀναιρεθέντος οὖν τοῦ Σωκράτην καθῆσθαι, οὐδὲν μᾶλλον λέλυται ὁ λόγος. καίτοι ψεῦδος τὸ ἀξίωμα. ἀλλ᾽ οὐ παρὰ τοῦτο ὁ λόγος ψευδής. ἐὰν γάρ τις τύχῃ καθήμενος μέν, μὴ γράφων δέ, οὐκέτι ἐπὶ τοῦ τοιούτου ἡ αὐτὴ λύσις ἁρμόσει. ὥστε οὐ τοῦτο ἀναιρετέον, ἀλλὰ τὸ τὸν καθήμενον γράφειν· οὐ γὰρ πᾶς ὁ καθήμενος γράφει. λέλυκε μὲν οὖν πάντως ὁ ἀνελὼν παρ᾽ ὃ γίνεται τὸ ψεῦδος. 2 Οἶδε δὲ τὴν λύσιν, ὁ εἰδὼς ὅτι παρὰ τοῦτο ὁ λόγος· καθάπερ ἐπὶ τῶν ψευδογραφουμένων· οὐ γὰρ ἀπόχρη τὸ ἐνστῆναι, οὐδ᾽ ἂν ψεῦδος ᾖ τὸ ἀναιρούμενον· ἀλλὰ καὶ διότι ψεῦδος, ἀποδεικτέον. οὕτω γὰρ ἂν εἴη φανερόν, πότερον *προορῶν τι, ἢ οὔ, ποιεῖται τὴν ἔνστασιν. 3 Ἔστι δὲ λόγον κωλῦσαι συμπεράνασθαι, τετραχῶς. Cap. IV. 4 Ἢ γὰρ ἀνελόντα παρ᾽ ὃ γίνεται τὸ ψεῦδος. 5 Ἢ πρὸς τὸν ἐρωτῶντα, ἔνστασιν εἰπόντα· πολλάκις μὲν γὰρ οὐ λέλυκε μέν, ὁ μέντοι πυνθανόμενος οὐ δύναται πορρωτέρω προάγειν. 6 Τρίτον δέ, πρὸς τὰ ἠρωτημένα· συμβαίνοι γὰρ ἄν, ἐκ μὲν τῶν ἠρωτημένων, μὴ γίνεσθαι *ὃ βουλόμεθα, διὰ τὸ κακῶς ἠρωτῆσθαι. προστεθέντος δέ τινος, γίνεσθαι τὸ συμπέρασμα. εἰ μὲν οὖν μηκέτι δύναται προάγειν ὁ ἐρωτῶν, εἰς τὸν ἐρωτῶντα εἴη ἂν ἡ ἔνστασις. εἰ δὲ δύναται, πρὸς τὰ ἠρωτημένα. 7 Τετάρτη δὲ καὶ χειρίστη τῶν ἐνστάσεων, ἡ πρὸς τὸν χρόνον. ἔνιοι γὰρ τοιαῦτα ἐνίστανται, πρὸς ἃ διαλεχθῆναι πλείονός ἐστι χρόνου, ἢ τῆς παρούσης διατριβῆς. 8 Αἱ μὲν οὖν ἐνστάσεις, καθάπερ εἴπομεν, τετραχῶς γίνονται. λύσις δὲ ἐστι τῶν εἰρημένων, ἡ πρώτη μόνον· αἱ δὲ λοιπαί, κωλύσεις τινὲς καὶ ἐμποδισμοὶ τῶν συμπερασμάτων.

* γρ. Σωκράτη.
* γρ. προσερωτᾷ.
* γρ. ὃ βούλεται.

De reprehendenda ratione, vel eo qui ratiocinatur. Cap. XI.

1 Diſtinctio: & eius probatio prima. 2 Probatio altera. 4 Quando vitium eſt in diſputante. 5 Quando vitium eſt in reſpondente. 6 Quando vitium eſt in argumentatione. 12 Diuiſio problematum. 13 Rationem quæ concludit eſſe interdam deteriorem ea quæ non concludit. 14 Si ex falſis verum probetur. 15 Per demonſtrationem vnius concluſionis non probari concluſionem heterogeneam. 16 Quid ſit φιλοσόφημα, ἐπιχείρημα, σόφισμα, ἀπόρημα. *17 De probabilitate propoſitionum & concluſionis. 18 Si pluribus probetur, quod paucioribus probari poteſt.*

Ἐπιτίμησις δὲ τοῦ λόγου, * καθ' αὑτόν τε λόγον, καὶ ὅταν ἐρωτᾶται, οὐχ ἡ αὐτή· πολλάκις γὰρ τοῦ μὴ καλῶς διειλέχθαι λόγον, ὁ ἐρωτώμενος αἴτιος, διὰ τὸ μὴ συγχωρεῖν ἐξ ὧν ἦν διαλεχθῆναι καλῶς πρὸς τὴν θέσιν· οὐ γάρ ἐστιν ἐπὶ θατέρῳ μόνῳ τὸ καλῶς ἐπιτελεσθῆναι τὸ κοινὸν ἔργον. ἀναγκαῖον οὖν ἐνίοτε πρὸς τὸν λέγοντα, καὶ μὴ πρὸς τὴν θέσιν ἐπιχειρεῖν, ὅταν ὁ ἀποκρινόμενος τἀναντία τῷ ἐρωτῶντι παρατηρῇ προσεπηρεάζων. δυσκολαίνοντες οὖν, ἀγωνιστικὰς καὶ οὐ διαλεκτικὰς ποιοῦνται τὰς διατριβάς. 2 Ἔτι δέ, ἐπεὶ γυμνασίας καὶ πείρας χάριν, ἀλλ' οὐ διδασκαλίας, οἱ τοιοῦτοι τῶν λόγων· δῆλον ὡς οὐ μόνον τἀληθῆ συλλογιστέον, ἀλλὰ καὶ ψεῦδος· οὐδὲ δι' ἀληθῶν, ἀεί, ἀλλ' ἐνίοτε καὶ ψευδῶν. πολλάκις γὰρ ἀληθοῦς τεθέντος, ἀναιρεῖν ἀνάγκη τὸν διαλεγόμενον· ὥστε προτατέον τὰ ψευδῆ. ἐνίοτε δὲ καὶ ψεύδους τεθέντος, ἀναιρετέον διὰ ψευδῶν· οὐδὲν γὰρ κωλύει, τινὶ δοκεῖν τὰ μὴ ὄντα, μᾶλλον τῶν ἀληθῶν· ὥστε ἐκ τῶν ἐκείνῳ δοκούντων τοῦ λόγου γινομένου, μᾶλλον ἔσται πεπεισμένος, ἢ ὠφελημένος. 3 Δεῖ δὲ τὸν καλῶς μεταβιβάζοντα, διαλεκτικῶς καὶ μὴ ἐριστικῶς μεταβιβάζειν, καθάπερ τὸν γεωμέτρην γεωμετρικῶς, ἄν τε ψεῦδος, ἄν τ' ἀληθὲς ᾖ τὸ συμπεραινόμενον. ὁποῖοι δὲ διαλεκτικοὶ συλλογισμοί, πρότερον εἴρηται. 4 Ἐπεὶ δὲ φαῦλος κοινωνὸς ὁ ἐμποδίζων τὸ κοινὸν ἔργον, δῆλον ὅτι καὶ ἐν λόγοις. κοινὸν γάρ τι προκείμενον καὶ ἐν τούτοις ἐστί, πλὴν τῶν ἀγωνιζομένων. τούτοις δὲ οὐκ ἔστιν ἀμφοτέροις τοῦ αὐτοῦ τέλους τυχεῖν· πλείους γὰρ ἑνὸς ἀδύνατον νικᾶν. διαφέρει δὲ οὐδέν, ἄν τε διὰ τοῦ ἀποκρίνεσθαι, ἄν τε διὰ τοῦ ἐρωτᾶν, ποιῇ αὐτό· ὅ,τε γὰρ ἐριστικῶς ἐρωτῶν, φαύλως διαλέγεται· ὅ,τε ἐν τῷ ἀποκρίνεσθαι μὴ διδοὺς τὸ φαινόμενον, μηδὲ ἐκδεχόμενος, ὅ, τί ποτε βούλεται ὁ ἐρωτῶν πυθέσθαι. δῆλον οὖν ἐκ τῶν εἰρημένων, ὅτι οὐχ ὁμοίως ἐπιτιμητέον καθ' αὑτόν τε τῷ λόγῳ, καὶ τῷ ἐρωτῶντι· οὐδὲν γὰρ κωλύει, τὸν μὲν λόγον, φαῦλον εἶναι· τὸν δὲ ἐρωτῶντα, ὡς ἐνδέχεται, βέλτιστα πρὸς τὸν ἀποκρινόμενον διειλέχθαι. πρὸς γὰρ τοὺς δυσκολαίνοντας, οὐ δυνατὸν ἴσως εὐθὺς οἵους τις βούλεται, ἀλλ' οἵους ἐνδέχεται, ποιήσασθαι τοὺς συλλογισμούς. 5 Ἐπεὶ δ' ἐστὶν ἀδιόριστον, πότε τἀναντία, καὶ πότε τὰ ἐν ἀρχῇ λαμβάνουσιν οἱ ἄνθρωποι (πολλάκις γὰρ καθ' αὑτοὺς λέγοντες, ἐναντία λέγουσι· καὶ ἀνανεύσαντες πρότερον, διδόασιν ὕστερον· διόπερ ἐρωτώμενοι, καὶ τὰ ἐναντία, καὶ τὰ ἐν ἀρχῇ πολλάκις ὑπακούουσιν) ἀνάγκη φαύλους γίνεσθαι τοὺς λόγους. αἴτιος δὲ ὁ ἀποκρινόμενος, τὰ μὲν οὐ διδούς, τὰ δὲ τοιαῦτα διδούς. φανερὸν οὖν, ὅτι οὐχ ὁμοίως ἐπιτιμητέον τοῖς ἐρωτῶσι καὶ τοῖς λόγοις. 6 * Καθ' αὑτὸν δὲ τῷ λόγῳ, πέντε εἰσὶν ἐπιτιμήσεις. 7 Πρώτη μέν, ὅταν ἐκ τῶν ἠρωτημένων μὴ συμπεραίνηται, μήτε πρὸς τὸ

* γρ. κατ' αὐτόν

* γρ. καθ' αὑτούς

A Reprehenſio autem argumentationis non eſt eadem, cùm ipſa argumẽtatio per ſe *ſpectatur*, & cùm in interrogatione ponitur. ſæpe enim, cur non ſcitè tractata fuerit argumentatio, interrogatus in cauſa *eſt*: quòd *ea* non concedat, ex quibus ſcitè diſſeri adverſus theſim poterat. non. n. *poſitũ* eſt in altero ſolo, vt ſcitè perficiatur commune opus. quapropter interdum neceſſe *eſt* cõtra eum qui dicit, non contra theſim argumentari: nempe cũ is qui reſpondet, contraria interroganti captat per calumniam. ſic igitur tergiuerſantes, contentioſos non dialecticos cõgreſſus efficiunt. 2 Præterea quoniam exercitationis & periculi *faciendi* gratiâ *ſunt* diſputationes huiuſmodi cõparatæ: pa- B tet, non ſolùm vera *eſſe* concludẽda, ſed etiam falſum: nec ex veris ſemper ſed interdum etiam ex falſis. ſæpe. n. *quod* verè poſitum *eſt*, euertere diſputantem oportet. quare proponẽda ſunt falſa *axiomata*. interdum & *quod* falsò poſitum *eſt*, euertendũ per falſa *axiomata*. nihil. n. prohibet, quominus alicui magis probentur ea quæ non ſunt, quã *quæ* vera *ſunt*. quocirca ſi ex his quæ illi probantur, argumentatio ſumatur, potiùs erit perſuaſus quàm adiutus. 3 Oportet autẽ eum qui ſcitè argumentationem traducere vult, dialecticè non contentioſè argumẽtari, quemadmodum geometrã geometricè, ſeu falſum ſeu verum ſit quod conclu- C ditur. Quales autem dialectici ſyllogiſmi *ſint*, antea dictum fuit. 4 Quia verò prauus ſocius *eſt*, qui impedit commune opus, patet *rem ita ſe habere* etiã in diſputationibus. commune. n. quiddam propoſitum etiã in his eſt, exceptis iis qui certãdi ſtudio diſputãt: quibus non licet ambobus eundem finẽ cõſequi, cùm plures vno vincere nequeant. Nihil autem refert vtrùm propter reſpõſionem an propter interrogationẽ id fiat. nam & qui contẽtioſè interrogat, malè diſputat, & qui reſpondẽdo non dat, quod *verum aut probabile* videtur, nec ſuſcipit quodcumque interrogãs percontari voluerit. Ex dictis igitur patet, non ſimiliter *eſſe* reprehendendam argumẽtationem per ſe, & eum qui interro- D gat. nihil. n. vetat, diſputationem quidem prauam eſſe; interrogantẽ autem, quàm optimè *fieri* poſſit, contra reſpondentẽ diſſeruiſſe: nam adverſus eos qui tergiuerſantur, non *eſt* fortaſſe integrũ ſtatim cuiuſmodi quis velit, ſed cuiuſmodi poſſit, efficere ſyllogiſmos. 5 Quoniam autem definitũ non eſt, quando contraria, & quando in principio *quæſita* homines ſumãt: ſæpe. n. per ſe dicentes, contraria dicunt; & cùm priùs abnuerint, poſtea concedũt: ideóque interrogati, & cõtraria, & quæ initio *quæſita fuerunt*, ſæpe admittunt, neceſſe *eſt* prauas fieri argumentationes. in cauſa verò *eſt* qui reſpondet, alia quidem non concedens, hæc autem, *cùm* talia ſint, concedẽs. Apparet igitur, non ſimiliter reprehendẽdos eſſe eos qui interrogant, & *eorum* argumentationes. 6 Per ſe autem argumentationis quinque ſunt reprehenſiones. 7 Prima *eſt*, quando ex rogatis non concluditur, neque aduerſus poſitum *problema*,

problema, neque omnino quicquam, cùm falſa vel improbabilia ſint aut omnia, aut plurima *eorum*, ex quibus *infertur* concluſio: & neque detractis quibuſdam, neque additis, neque aliis detractis, aliis additis efficitur concluſio. 8 Secunda, ſi adverſus theſim non valeat ſyllogiſmus ex talibus & ita *factus*, vt antea dictum fuit. 9 Tertia, ſi nonnullis additis fieret *adverſus theſim* ſyllogiſmus, hæc autem ſint deteriora quã *quæ* rogata *ſunt*, minúſque probabilia quàm concluſio. 10 Ruſus, ſi quibuſdam detractis *id eueniret*. interdum.n. plura ſumunt *interrogantes*, quàm neceſſe ſit. 11 Præterea ſi *ſumatur argumentatio* ex minùs probabilibus, & minùs credibilibus, quàm *ſit* cõcluſio: aut *ſi* ex veris, ſed quæ plus negotij requirunt vt demonſtrentur, quàm problema. 12 Non oportet autem poſtulare, vt omnium problematũ ſyllogiſmi æquè probabiles ſint, & ad perſuadẽdum apti. ſtatim.n. eorum, quæ quærũtur, alia *ſuapte* naturâ ſunt faciliora, alia difficiliora. quapropter ſi ex *propoſitionibus*, quoad eius fieri potuit, maximè probabilibus argumentatus fuerit, ſcitè diſſeruit. Perſpicuum igitur *eſt*, non eamdem eſſe argumentationis reprehenſionem, *cùm* ad id *refertur* quod in quæſtione eſt poſitũ, & *cùm* ad ipſam rationem. nihil.n. vetat, eſſe quidem per ſe argumẽtationem vituperabilem, ad problema verò *relatam eſſe* laudabilem: viciſſimque, per ſe laudabilem, ad problema autem relatã, vituperabilem: *nempe* cùm ex multis probabilibus & veris concludere eſt facilius. 13 Fieri etiam interdum poteſt vt argumentatio concludens, eâ quæ non concludit, ſit deterior: *nimirum* quando illa ex futilibus concludit, cùm problema tale non ſit; hæc autem eget aſſumptione talium *propoſitionum*, quæ ſunt probabilia & vera, nec in his aſſumptis *poſita* eſt argumentatio. 14 Qui verò ex falſis verũ concludunt, non poſſunt iure reprehendi: quoniam falſum quidẽ ſemper neceſſe *eſt* ex falſis concludi: ſed verũ licet interdum etiam ex falſis cõcludere: *hoc* autem *eſt* perſpicuum ex Analyticis. 15 Quãdo autem argumentatio quæ dicta eſt, alicuius *rei* eſt demonſtratio: ſi quid aliud ſit, quod nihil cũ concluſione *probanda* commune habeat: *profectò* non erit ex eo ſyllogiſmus: ſin autẽ videatur, ſophiſma erit, non demonſtratio. 16 Eſt autem philoſophema, ſyllogiſmus demõſtratiuus: epichirema verò, ſyllogiſmus dialecticus: ſophiſma, ſyllogiſmus cõtentioſus: aporema, ſyllogiſmus dialecticus cõtradictionis. 17 Si quid autem ex vtriſque *propoſitionibus* probabilibus oſtendatur, nec ſint *ambæ* æquè probabiles: nihil vetat, id quod oſtenſum eſt, vtraque *propoſitione* eſſe probabilius. At ſi vna probabilis ſit, altera neutro modo *ſe habeat*; vel altera ſit probabilis, altera non probabilis: ſiquidem ſimiliter, etiam *concluſio* ſimiliter erit, & non *erit*: ſin autem altera *propoſitio ſit* magis *talis*, *concluſio* conſequens erit ei *propoſitioni* quæ *eſt* magis *talis*. 18 Eſt & hoc peccatum in ſyllogiſmis, cùm *quis* per plura probarit, quod *probari* poterat per pauciora, quæ in argumentatione inſunt. velvti, ſi quis *probaturus* opinionem aliam aliâ magis eſſe, poſtulauerit ipſum quodque maximè eſſe: eſſe autem opinabile ipſum verè: eapropter quibuſdam magis ipſum *eſſe*: id autem quod magis dicitur, ad id quod *eſt* magis, referri: eſſe autem & ipſam opinionem verã, quæ erit magis *aliis* quibuſdã accurata: poſtulatum eſt autem & ipſam opinionem veram eſſe, & ipſum quodq;

A τεθὲν, μήτε ὅλως μηδὲν ὄντων ἢ ψευδῶν, ἢ ἀδόξων, ἢ πάντων, ἢ τῶν πλείστων, ἐν οἷς τὸ συμπέρασμα· καὶ μήτε ἀφαιρεθέντων τινῶν, μήτε προστεθέντων μηδὲ τῶν μὲν ἀφαιρεθέντων, τῶν δὲ, προστεθέντων, γίνεται τὸ συμπέρασμα. 8 Δευτέρα δὲ, εἰ πρὸς τὴν θέσιν μὴ γίνοιτο ὁ συλλογισμὸς ἐκ τοιούτων τε, καὶ οὕτως, ὡς εἴρηται πρότερον. 9 Τρίτη δὲ, εἰ προστεθέντων τινῶν, γίνοιτο συλλογισμὸς, ταῦτα δ' εἴη χείρω τῶν ἐρωτηθέντων, καὶ ἧττον ἔνδοξα τοῦ συμπεράσματος. 10 Πάλιν, εἰ ἀφαιρεθέντων τινῶν. ἐνίοτε γὰρ πλείονα λαμβάνουσι τῶν ἀναγκαίων. ὥστε οὐ τῷ ταῦτα εἶναι, λέγεται ὁ B συλλογισμός. 11 Ἔτι, εἰ ἐξ ἀδοξοτέρων καὶ ἧττον πιστῶν τοῦ συμπεράσματος· ἢ ἐξ ἀληθῶν, ἀλλὰ πλείονος ἔργου δεομένων ἀποδεῖξαι τοῦ προβλήματος. 12 Οὐ δεῖ δὲ πάντων τῶν προβλημάτων ὁμοίως ἀξιοῦν τοὺς συλλογισμοὺς ἐνδόξους εἶναι καὶ πιθανούς. φύσει γὰρ εὐθὺς ὑπάρχει, τὰ μὲν ῥᾴω· τὰ δὲ, χαλεπώτερα, τῶν ζητουμένων. ὥστε ἂν ἐξ ὧν ἐνδέχεται μάλιστα ἐνδόξων συμβιβάσῃ, διείλεκται καλῶς. φανερὸν οὖν, ὅτι οὐδὲ τῷ λόγῳ ἡ αὐτὴ ἐπιτίμησις, πρός τε τὸ πρόβλημα καὶ καθ' αὑτό. οὐδὲν γὰρ κωλύει, καθ' αὑτὸν μὲν εἶναι τὸν λόγον ψεκτόν· πρὸς δὲ τὸ πρόβλημα, ἐπαινετόν· C καὶ πάλιν ἀντεστραμμένως, καθ' αὑτὸν μὲν, ἐπαινετόν· πρὸς δὲ τὸ πρόβλημα, ψεκτόν, ὅταν ἐκ πολλῶν ἐνδόξων συμπεραίνεσθαι ῥᾴδιον ᾖ καὶ ἀληθῶν. 13 Εἴη δ' ἂν ποτε λόγος καὶ συμπεπερασμένος μὴ συμπεπερασμένου χείρων· ὅταν ὁ μὲν, ἐξ εὐηθῶν συμπεραίνηται, μὴ τοιούτου τοῦ προβλήματος ὄντος· ὁ δὲ, προσδέηται τοιούτων, ἅ ἐστιν ἔνδοξα καὶ ἀληθῆ, καὶ μὴ ἐν τοῖς προσλαμβανομένοις ᾖ ὁ λόγος. 14 Τοῖς δὲ διὰ ψευδῶν ἀληθὲς συμπεραινομένοις, οὐ δίκαιον ἐπιτιμᾶν. ψεῦδος μὲν γὰρ ἀεὶ ἀνάγκη διὰ ψευδῶν συλλογίζεσθαι· τὸ δ' ἀληθὲς ἔστι καὶ διὰ ψευδῶν ποτε συλλογίζεσθαι. φανερὸν D δὲ * ἐκ τῶν ἀναλυτικῶν. 15 Ὅταν δὲ ἀπόδειξις ᾖ τινος ὁ εἰρημένος λόγος, εἴ τι ἐστὶν ἄλλο πρὸς τὸ συμπέρασμα μηδαμῶς ἔχον, οὐκ ἔσται περὶ ἐκείνου συλλογισμός. ἐὰν δὲ φαίνηται, σόφισμα ἔσται, καὶ οὐκ ἀπόδειξις. 16 Ἔστι δὲ φιλοσόφημα μὲν, συλλογισμὸς ἀποδεικτικός· ἐπιχείρημα δὲ, συλλογισμὸς διαλεκτικός· σόφισμα δὲ, συλλογισμὸς ἐριστικός· ἀπόρημα δὲ, συλλογισμὸς διαλεκτικὸς ἀντιφάσεως. 17 Εἰ δὲ ἐξ ἀμφοτέρων τι δοκούντων δειχθείη, μὴ ὁμοίως δὲ δοκούντων, οὐδὲν κωλύει τὸ δειχθὲν μᾶλλον ἑκατέρου δοκεῖν. ἀλλ' εἰ τὸ μὲν, δοκοίη, τὸ δὲ, μηδετέρως· ἢ εἰ E τὸ μὲν, δοκοίη, τὸ δὲ, μὴ δοκοίη· εἰ μὲν ὁμοίως, ὁμοίως ἂν εἴη, καὶ μή. εἰ δὲ μᾶλλον θάτερον, ἀκολουθήσει τῷ μᾶλλον. 18 Ἔστι δέ τις ἁμαρτία καὶ αὕτη κατὰ τοὺς συλλογισμοὺς, ὅταν δείξῃ διὰ μακροτέρων, ἐνδεχόμενον δι' ἐλαττόνων, καὶ ἐν τῷ λόγῳ ὑπαρχόντων. οἷον, ὅτι ἐστὶ δόξα μᾶλλον ἑτέρα ἑτέρας, εἴ τις αἰτήσαιτο αὐτοέκαστον μάλιστα εἶναι· εἶναι δὲ δοξαστὸν αὐτὸ τἀληθῶς· ὥστε τῶν τινῶν μᾶλλον αὐτό· πρὸς δὲ τὸ μᾶλλον, μᾶλλον τὸ λεγόμενον, εἶναι· εἶναι δὲ καὶ αὐτοδόξαν ἀληθῆ, ἣ ἔσται μᾶλλον ἀκριβὴς τῶν τινῶν· ᾔτηται δὲ καὶ αὐτοδόξαν ἀληθῆ εἶναι, καὶ αὐτοέκαστον μά-

* Priorum lib. ſec. initio.

λιστα εἶναι· ὥστε αὕτη ἡ δόξα ἡ μάλιστα ἀληθὴς, ἀκριβεστέρα ἐστί. τίς δὲ ἡ μοχθηρία; ἢ ὅτι ποιεῖ, παρ' ὃ ὁ λόγος, λανθάνειν τὸ αἴτιον; A

maximè eſſe: quare hæc opinio, quæ maximè vera *eſt*, *ceteris* accuratior eſt. Sed quodnam eſt huius argumentationis vitium? An quòd facit, vt cauſa ex qua *ducitur* argumentatio, lateat?

De perſpicua & de falſa ratione. Cap. XII.

1 De ratione perſpicua. 4 De ratione falſa. 9 Quæ in rationibus ſpectanda ſunt.

ΛΟγος δέ ἐστι δῆλος, ἕνα μὲν τρόπον καὶ δημοσιώτατον, B ἐὰν ᾖ συμπεπερασμένος οὕτως, ὥστε μηδὲν δεῖν ἐπερωτῆσαι. 2 Ἕνα δὲ, καὶ ὃς μάλιστα λέγεται, ὅταν εἰλημμένα μὲν ᾖ ἐξ ὧν ἀναγκαῖον εἶναι, ἡ δὲ διὰ συμπερασμάτων συμπεραινόμενα. 3 Ἔτι, εἴ τι ἐλλείπει, εἴη δὲ τοῦτο* σφόδρα ἔνδοξον. 4 Ψευδὴς δὲ λόγος καλεῖται τετραχῶς· ἕνα μὲν τρόπον, ὅταν φαίνηται συμπεραίνεσθαι, μὴ συμπεραινόμενος, ὃς καλεῖται συλλογισμὸς ἐριστικός. 5 Ἄλλον δὲ, ὅταν συμπεραίνηται μὲν, μὴ μέντοι πρὸς τὸ προκείμενον· ὅπερ συμβαίνει μάλιστα τοῖς εἰς τὸ ἀδύνατον ἄγουσι. 6. Ἢ πρὸς τὸ προκείμενον μὲν συμπεραίνηται, μὴ μέντοι κατὰ τὴν οἰκείαν μέθοδον. τοῦτο δ' ἐστὶν, ἐὰν ὁ μὴ ὢν ἰατρι- C κὸς, δοκῇ ἰατρικὸς εἶναι· ἢ γεωμετρικὸς, μὴ ὢν γεωμετρικὸς ἢ διαλεκτικὸς, μὴ ὢν διαλεκτικός· ἄν τε ψεῦδος, ἄν τε ἀληθὲς ᾖ τὸ συμβαῖνον. 7 Ἄλλον δὲ τρόπον, ἐὰν διὰ ψευδῶν συμπεραίνηται. τούτου δὲ ἔσται ποτὲ μὲν τὸ συμπέρασμα ψεῦδος, ποτὲ δὲ ἀληθές. τὸ μὲν γὰρ ψεῦδος, ἀεὶ διὰ ψευδῶν συμπεραίνεται· τὸ δ' ἀληθὲς ἐγχωρεῖ καὶ μὴ δι' ἀληθῶν, ὥσπερ εἴρηται καὶ πρότερον. 8 Τὸ μὲν οὖν ψευδῆ τὸν λόγον εἶναι, τοῦ λέγοντος ἁμάρτημα μᾶλλον ἢ τοῦ λόγου· καὶ οὐδὲ τοῦ λέγοντος ἀεὶ, ἀλλ' ὅταν λανθάνῃ αὐτὸν, ὅτι ψευδῆ λόγον εἶπε τινά. ἐπεὶ καθ' ἑαυτόν γε πολλῶν ἀληθῶν ἀποδεχόμεθα μᾶλλον, ἂν* ἐκ τῶν μάλιστα δοκούντων ἀναιρῇ τι D τῶν ἀληθῶν. τοιοῦτος γὰρ ὢν, ἀληθῶν ἀπόδειξίς ἐστι· δεῖ γὰρ τῶν κειμένων τι μὴ εἶναι παντελῶς· ὥστε ἔσται τούτου ἀπόδειξις. εἰ δ' ἀληθὲς συμπεραίνοιτο διὰ ψευδῶν καὶ λίαν εὐηθῶν, πολλῶν ἂν εἴη χείρων ψεῦδος συλλογιζομένων· εἴη δ' ἂν τοιοῦτος καὶ ψεῦδος συμπεραινόμενος. ὥστε δῆλον, ὅτι πρώτη μὲν ἐπίσκεψις λόγου καθ' αὐτὸν, εἰ συμπεραίνεται. δευτέρα δὲ, πότερον ἀληθὲς, ἢ ψεῦδος. τρίτη δ', ἐκ ποίων τινῶν. εἰ μὲν γὰρ ἐκ ψευδῶν, ἐνδόξων δὲ,* λογικός. εἰ δ' ἐξ ὄντων μὲν, ἀδόξων δὲ, φαῦλος. εἰ δὲ καὶ ψευδῆ καὶ λίαν ἄδοξα, δῆλον ὅτι φαῦλος, ἢ ἁπλῶς, ἢ τοῦ πράγματος.

* γ. σφόδρα ἀδό-ξον.

CAP. V.

* γ. ἐὰν μ. δ.

* γ. λογικός.

ARgumentatio autē eſt perſpicua, vno modo, eóq; maximè vulgari, ſi ita concludat, vt nihil *amplius* oporteat interrogare. 2 Altero, qui etiā maximè dicitur, cū ſumpta ſunt *ea*, ex quibus eſſe neceſſe *eſt*, *quod cōcluditur*, ſed ex cōcluſionibus cōcludit. 3 Preterea ſi quid deſit, quod ſit valde probabile. 4 Falſa verò argumentatio vocatur quatuor modis. Vno modo, cùm videtur concludere, neq; concludit: qui *quidē* vocatur ſyllogiſmus cōtentioſus. 5 Alio *modo*, cùm *aliquid* concludit, ſed quod non *pertinet* ad *problema* propoſitum. quod iis maximè accidit, qui ad impoſſibile ducunt. 6 Aut *id* quidem concludit, *quod* ad propoſitum *pertinet*, non tamen ſecundùm propriam methodum. hoc autem eſt, ſi *argumētatio quæ* non *eſt* medica, videatur eſſe medica: aut *videatur eſſe* geometrica, *ea* quę non *eſt* geometrica: aut dialectica, *ea* quæ non *eſt* dialectica: ſiue verū, ſiue falſum ſit, quod efficitur. 7 Alio modo, ſi ex falſis concludat. huius autē *argumētationis* aliquando concluſio falſa *eſt*, aliquando vera. nam falſum quidem ſemper ex falſis concluditur: verum autem licet etiam ex non veris *cōcludere*, quēadmodum & antea dictū fuit. 8 Quòd igitur falſa ſit argumentatio, peccatum *eſt* potiùs argumentantis, quàm argumentationis: immo neque argumentantis ſemper, ſed *tum demum*, cùm ignorat ſe falſam quandam argumentationem dixiſſe. quoniam per ſe multis veris *argumētationibus eā* magis probamus, quę ex iis quæ maximè videntur, aliquid verum euertit. nam quæ talis eſt, *quorumdam* verorum demonſtratio eſt. oportet.n. eorum quæ poſita ſunt, quidpiam non eſſe omnino. quocirca erit huius demonſtratio. Quòd ſi verum concludat ex falſis & valde futilibus, certè multis falſum colligētibus deterior erit. poteſt autem talis eſſe, & quæ falſum concludit. 9 Quare patet primam *eſſe* conſiderationem argumētationis per ſe, an concludat: ſecundā, vtrùm verum an falſum *cōcludat*: tertiam, ex quibus. nam ſi ex falſis, at probabilibus, logica *eſt*: ſi ex iis quæ ſunt *vera*, ſed non probabilia, *eſt* praua: ſi verò ea ſint & falſa & valde improbabilia, patet argumentationem prauam eſſe, aut ſimpliciter, aut *ratione* rei *qua de agitur*.

De petitione eius quod initio propoſitum fuit, vel contrariorum.

Cap. XIII.

1 ¶ De petitione eius quod initio propoſitum fuit. Protheſis. 2 Diuiſio. 3 Modus primus, 4 ſecundus, 5 tertius, 6 quartus, 7 quintus. 8 ¶ De petitione contrariorum. 9 Modus primus, 10 ſecundus, 11 tertius, 12 quartus, 13 quintus. 14 ¶ Diſcrimen dictarum petitionum.

ΤΟ δ' ἐν ἀρχῇ καὶ τὰ ἐναντία πῶς αἰτεῖται ὁ ἐρωτῶν, κατ' E ἀλήθειαν μὲν ἐν τοῖς Ἀναλυτικοῖς εἴρηται, κατὰ δόξαν δὲ νῦν λεκτέον. 2 Αἰτεῖσθαι δὲ φαίνονται τὸ ἐν ἀρχῇ, πενταχῶς.

QVod autem in principio *quæſitum eſt*, & contraria, quomodo petat is qui interrogat, ſecundùm veritatem, in Analyticis dictum eſt: ſecundùm opinionem autem, nunc dicendum. 2 Petere videntur, quod in principio *quæſitum fuit*, quinque modis.

3 Manifeſtiſſimè & primò, ſi quis idipſum petat, quod probare oportet. hoc autem in *eo* ipſo nõ facilè latet: ſed magis in ſynonymis, & in quibus nomen ac definitio idem ſignificat. 4 Secundò cùm id quod in parte demõſtrari oportet, vniuerſaliter aliquis petit: velvti, *cùm* probaturus contrariorum vnam *eſſe* ſciẽtiam, omnino oppoſitorum vnã eſſe ſibi concedi poſtulat: videtur enim, quod oportebat per ſe probare, vnà cum pluribus aliis petere. 5 Tertiò, ſi quis, cũ vniuerſale probare inſtituerit, in parte petat. velvti, ſi, cùm propoſitum ſit *ad probandum* omnium contrariorum *eſſe vnam ſcientiam*, petat ſibi concedi certorum quorumdam *contrariorum vnam eſſe*. nam & hic videtur, quod cũ pluribus oportebat probare, per ſe ac ſeparatim petere. 6 Rurſus, ſi quis, diuiſo *problemate, id* petat quod propoſitum eſt ad diſputãdum. velvti, ſi, cùm probare oporteat medicinam *eſſe* ſalubrium & inſalubrium, ſeparatim vtrũque petat. 7 Aut ſi quis eorum, quæ ſe inuicẽ neceſſariò conſequuntur, alterum petat: vt latus cum diametro communem habere menſuram, cùm demõſtrare oporteat diametrum *habere communem menſuram* cum latere. 8 Tot autem modis & contraria petuntur, quot initio *quæſitum*. 9 Ac primùm, ſi quis contrarias poſtulet affirmationem & negationem. 10 Secundò *ſi* cõtraria ſecundùm oppoſitionem: velvti, bonum & malum eſſe idẽ. 11 Tertiò, ſi quis cùm vniuerſale ſibi cõcedi poſtulauerit, *mox* in parte contradictionem petat. velvti, ſi *hoc* ſumpto *axiomate*, cõtrariorum vnã *eſſe* ſcientiam, ſalubris & inſalubris diuerſam *eſſe* poſtulet ſibi concedi: aut hoc poſtulato, in vniuerſali oppoſitionem ſumere conetur. 12 Rurſus, ſi quis petat contrariũ ei quod neceſſariò efficitur ex iis quæ poſita ſunt. 13 Necnon ſi quis ipſa quidem oppoſita nõ ſumat, ſed duo eiuſmodi petat, ex quibus ſequetur oppoſita contradictio. 14 *Hoc* autẽ differunt, ſumere cõtraria, & *petere* quod initio *quæſitum fuit*: quòd huius peccatum ad concluſionem pertinet; nam ad eam reſpicientes dicimus peti quod initio *quæſitum fuit*: contraria verò in propoſitionibus cernuntur; nempe quia certo quodam modo ſunt inter ſe affectæ.

A 3 Φανερώτατα μὲν καὶ πρῶτον, εἴ τις αὐτὸ τὸ δείκνυσθαι δέοι αἰτήσει. τοῦτο δ᾽ ἐπ᾽ αὐτοῦ μὲν, οὐ ῥᾳδίως λανθάνει· ἐν δὲ τοῖς συνωνύμοις, καὶ ἐν ὅσοις τὸ ὄνομα καὶ ὁ λόγος τὸ αὐτὸ σημαίνει, μᾶλλον. 4 Δεύτερον δὲ, ὅταν κατὰ μέρος δέον ἀποδεῖξαι, καθόλου τις αἰτήσῃ· οἷον, ἐπιχειρῶν ὅτι τῶν ἐναντίων μία ἐπιστήμη, ὅλως τῶν ἀντικειμένων ἀξιώσειε μίαν εἶναι· δοκεῖ γὰρ ὃ ἔδει καθ᾽ αὑτὸ δεῖξαι, μετ᾽ ἄλλων αἰτεῖσθαι πλειόνων. 5 Τρίτον, εἴ τις τὸ καθόλου δεῖξαι προκειμένου, κατὰ μέρος αἰτήσειεν· οἷον, εἰ πάντων τῶν ἐναντίων προκειμένου, τῶνδέ τινων ἀξιώσειε· δοκεῖ γὰρ καὶ οὗτος, ὃ μετὰ πλειόνων ἔδει δεῖξαι, καθ᾽ αὑτὸ καὶ χωρὶς αἰτεῖσθαι. 6 Πάλιν, εἴ τις διελὼν, αἰτεῖται τὸ προβληθέν· οἷον, εἰ δέον δεῖξαι τὴν B ἰατρικὴν ὑγιεινοῦ καὶ νοσώδους, χωρὶς ἑκάτερον ἀξιώσειεν. 7 Ἢ, εἴ τις τῶν ἑπομένων ἀλλήλοις ἐξ ἀνάγκης, θάτερον αἰτήσειεν· οἷον, τὴν πλευρὰν, ἀσύμμετρον τῇ διαμέτρῳ, δέον ἀποδεῖξαι ὅτι ἡ διάμετρος τῇ πλευρᾷ. 8 Ἰσαχῶς δὲ καὶ τὰ ἐναντία αἰτοῦνται τῷ ἐξ ἀρχῆς. 9 Πρῶτον μὲν γὰρ, εἴ τις τὰς ἀντικειμένας αἰτήσαιτο, *φάσιν καὶ ἀπόφασιν. 10 Δεύτερον δὲ, τἀναντία κατὰ τὴν ἀντίθεσιν· οἷον, ἀγαθὸν καὶ κακὸν, ταὐτόν. 11 Τρίτον, εἴ τις τὸ καθόλου ἀξιώσας, ἐπὶ μέρους αἰτοίη τὴν ἀντίφασιν· οἷον, εἰ λαβὼν τῶν ἐναντίων μίαν ἐπιστήμην, ὑγιεινοῦ καὶ νοσώδους ἑτέραν ἀξιώσειεν· ἢ τοῦτο αἰτησάμενος, ἐπὶ τοῦ καθόλου τὴν ἀντίφασιν πειρῷτο λαμβάνειν. C 12 Πάλιν, ἐάν τις αἰτήσῃ τὸ ἐναντίον τῷ ἐξ ἀνάγκης συμβαίνοντι διὰ τῶν κειμένων. 13 Κἂν εἴ τις αὐτὰ μὲν μὴ λάβῃ τὰ ἀντικείμενα· τοιαῦτα δ᾽ αἰτήσαιτο δύο, ἐξ ὧν ἔσται ἡ ἀντικειμένη ἀντίφασις. 14 Διαφέρει δὲ τὸ τἀναντία λαμβάνειν, τοῦ ἐν ἀρχῇ, τοσοῦτον, ὅτι τοῦ μὲν ἐστὶν ἡ ἁμαρτία πρὸς τὸ συμπέρασμα· πρὸς γὰρ ἐκεῖνο βλέποντες, τὸ ἐν ἀρχῇ λέγομεν αἰτεῖσθαι· τὰ δ᾽ ἐναντία ἐστὶν ἐν ταῖς προτάσεσι· τῷ γὰρ ἔχειν πως ταύτας πρὸς ἀλλήλας.

* γρ. κατάφασιν

DE EXERCITATIONE,

TRACTATVS III.

Cap. XIV.

1 De rationibus conuertendis. 2 Vt in vtramque partem diſſeratur, & ſolutiones afferantur. 3 Qui ſint maximè apti ad obſeruandum hoc præceptum. 4 De problematis, quæ ſæpe in diſputationem cadunt. 5 De primis theſibus. 6 De definitionibus. 7 De propoſitionibus communibus. 10 De vna ratione in multas diuidenda. 11 Vt ex particularibus rationibus vniuerſales memoriæ cauſâ colligantur. 13 De ſyllogiſmo, & inductione. 15 De vtilitate aliqua referenda ex diſputatione. 16 Non cum quouis diſputandum. 17 Quæ argumenta confecta & parata habere oporteat.

EXercitationis autem & meditãdarum huiuſcemodi diſputationum causâ, primùm aſſueſcere oportet in argumentationibus conuertẽdis. ſic enim & ad id, de quo diſſeritur, maior nobis copia ſuppetet, & in paucis multas argumẽtationes probè ſciemus. nã conuertere eſt, tranſſumptâ concluſione, cum reliquis interrogationibus euertere aliquid eorum quæ data ſunt. neceſſe enim *eſt*, ſi concluſio non ſit, aliquam propoſitionum euerti: ſiquidem his omnibus poſitis neceſſe erat concluſionem eſſe. 2 Ad omnem etiam theſim in vtramque partem argumentatio conſideranda *eſt*: & *hac* inuentâ, ſolutio ſtatim *eſt* quærenda: ſic enim fiet vt & ad interrogandum & ad

D ΠΡὸς δὲ γυμνασίαν καὶ μελέτην τῶν τοιούτων λόγων, πρῶτον μὲν ἀντιστρέφειν ἐθίζεσθαι χρὴ τοὺς λόγους. οὕτως γὰρ πρός τε τὸ λεγόμενον εὐπορώτεροι ἕξομεν, καὶ ἐν ὀλίγοις πολλοὺς ἐξεπιστησόμεθα λόγους. τὸ γὰρ ἀντιστρέφειν ἐστὶ, τὸ μεταλαβόντα τὸ συμπέρασμα μετὰ τῶν λοιπῶν ἐρωτημάτων, ἀνελεῖν ἕν τι τῶν δοθέντων. ἀνάγκη γὰρ, εἰ τὸ συμπέρασμα μή ἐστι, μίαν τινὰ ἀναιρεῖσθαι τῶν προτάσεων, εἴπερ πασῶν αὐτῶν τεθεισῶν ἀνάγκη ἦν τὸ συμπέρασμα εἶναι. 2 Πρὸς ἅπασάν τε θέσιν, καὶ ὅτι οὕτως, καὶ ὅτι οὐχ οὕτως, τὸ ἐπιχείρημα σκεπτέον· καὶ εὑρόντα, τὴν λύσιν εὐθὺς ζητητέον· οὕτω γὰρ ἅμα συμβήσεται πρός τε τὸ ἐρωτᾶν, καὶ πρὸς τὸ CAP. XIV.

ἀποκρίνεσθαι, γεγυμνάσθαι· κἂν πρὸς μηδένα ἄλλον ἔχωμεν, καθ' αὑτούς. παραλλήλας τε παραβάλλειν, ἐκλέγοντας πρὸς τὴν αὐτὴν θέσιν ἐπιχειρήματα· τοῦτο γὰρ πρός τε τὸ * βιάζεσθαι πολλὴν εὐπορίαν ποιεῖ, καὶ πρὸς τὸ ἐλέγχειν μεγάλην ἔχει βοήθειαν, ὅταν εὐπορῇ τις, καὶ ὅτι οὕτως, καὶ ὅτι οὐχ οὕτως· πρὸς τὰ ἐναντία γὰρ ἂν συμβαίνοι ποιεῖσθαι τὴν φυλακήν. πρός τε τὴν γνῶσιν καὶ τὴν κατὰ φιλοσοφίαν φρόνησιν, τὸ δύνασθαι συνορᾶν καὶ συνεωρακέναι τὰ ἀφ' ἑκατέρας συμβαίνοντα τῆς ὑποθέσεως, οὐ μικρὸν ὄργανον· λοιπὸν γὰρ τούτων ὀρθῶς ἑλέσθαι θάτερον. 3 Δεῖ δὲ πρὸς τὸ τοιοῦτον ὑπάρχειν εὐφυᾶ· καὶ τοῦτ' ἔστιν ἡ κατ' ἀλήθειαν εὐφυΐα, τὸ δύνασθαι καλῶς ἑλέσθαι τἀληθές, καὶ φυγεῖν τὸ ψεῦδος· ὅπερ οἱ πεφυκότες εὖ, δύνανται ποιεῖν εὖ· οἱ γὰρ φιλοῦντες καὶ μισοῦντες τὸ προσφερόμενον εὖ, κρίνουσι τὸ βέλτιστον. 4 Πρός τε τὰ πλειστάκις ἐμπίπτοντα τῶν προβλημάτων, ἐξεπίστασθαι δεῖ λόγους. 5 Καὶ μάλιστα περὶ τῶν πρώτων θέσεων· ἐν τούτοις γὰρ ἀποδυσπετοῦσιν οἱ ἀποκρινόμενοι πολλάκις. 6 Ἔτι τε, ὅρων εὐπορεῖν δεῖ, καὶ τῶν ἐνδόξων τε, καὶ τῶν πρώτων ἔχειν προχείρους· διὰ γὰρ τούτων οἱ συλλογισμοὶ γίνονται. 7 Πειρατέον δὲ καὶ εἰς ἃ πλειστάκις ἐμπίπτουσιν * οἱ διάλογοι, κατέχειν. 8 Ὥσπερ γὰρ ἐν γεωμετρίᾳ πρὸ ἔργου τὸ περὶ τὰ στοιχεῖα γεγυμνάσθαι· καὶ ἐν ἀριθμοῖς τὸ περὶ τοὺς κεφαλισμοὺς προχείρως ἔχειν, μέγα διαφέρει πρὸς τὸ καὶ τὸν ἄλλον ἀριθμὸν γινώσκειν πολλαπλασιούμενον· ὁμοίως καὶ ἐν τοῖς λόγοις, τὸ πρόχειρον εἶναι περὶ τὰς ἀρχάς, καὶ τὰς προτάσεις ἀπὸ στόματος ἐξεπίστασθαι. καθάπερ γὰρ ἐν τῷ μνημονικῷ μόνον οἱ τόποι τεθέντες, εὐθὺς ποιοῦσιν αὐτὰ μνημονεύειν· καὶ ταῦτα * ποιοῦσι συλλογιστικώτερον, διὰ τὸ πρὸς ὡρισμένας αὐτὰς βλέπειν κατ' ἀριθμόν. 9 Πρότασίν τε, κοινὴν μᾶλλον ἢ λόγον, εἰς μνήμην θετέον· ἀρχῆς γὰρ καὶ ὑποθέσεως εὐπορῆσαι, μετρίως χαλεπόν. 10 Ἔτι, τὸν ἕνα λόγον πολλοὺς ποιεῖν ἐθιστέον, ὡς ἀδηλότατα κρύπτοντας. * εἴη δ' ἂν τὸ τοιοῦτον, εἴ τις ὅτι πλεῖστον ἀφισταίη τῆς συγγενείας περὶ ὧν ὁ λόγος. ἔσονται δὲ δυνατοὶ τῶν λόγων, οἱ μάλιστα καθόλου, τοῦτο πάσχειν· οἷον, ὅτι οὐκ ἔστι μία πλειόνων ἐπιστήμη· οὕτω γὰρ καὶ ἐπὶ τῶν πρός τι, καὶ ἐπὶ τῶν ἐναντίων καὶ συστοίχων ἐστί. 11 Δεῖ δὲ καὶ τὰς ἀπομνημονεύσεις καθόλου ποιεῖσθαι τῶν λόγων, κἂν ᾖ διειλεγμένος ἐπὶ μέρους· οὕτω γὰρ καὶ πολλοὺς ἐξέσται τὸν ἕνα ποιεῖν. ὁμοίως δὲ καὶ ἐν ῥητορικοῖς ἐπὶ τῶν ἐνθυμημάτων· αὐτὸν δ' ὅτι μάλιστα φεύγειν ἐπὶ τὸ καθόλου φέρειν τοὺς συλλογισμούς. 12 Ἀεί τε δεῖ σκοπεῖν τοὺς λόγους, εἰ ἐπὶ κοινῶν διαλέγονται. πάντες γὰρ οἱ ἐν μέρει, καὶ καθόλου διειλεγμένοι εἰσί· καὶ ἔνεστιν ἐν τῇ κατὰ μέρος ἡ τοῦ καθόλου ἀπόδειξις, διὰ τὸ μὴ εἶναι συλλογίσασθαι μηδὲν ἄνευ τοῦ * καθόλου. 13 Τὴν δὲ γυμνασίαν ἀποδοτέον, τῶν μὲν ἐπακτικῶν, πρὸς νέον· τῶν δὲ συλλογιστικῶν, πρὸς ἔμπειρον. 14 Πειρατέον δὲ λαμβάνειν παρὰ μὲν τῶν συλλογιστικῶν, τὰς προτάσεις, παρὰ δὲ τῶν ἐπακτικῶν τὰς παραβολάς· ἐν τούτοις γὰρ ἑκάτεροι γεγυμνασμένοι εἰσίν. 15 Ὅλως δὲ ἐκ τοῦ γυμνάζεσθαι * διαλεγόμενον, πειρατέον * ἀποφέρεσθαι ἢ συλλογισμὸν περί τινος, ἢ λύσιν, ἢ πρότασιν, ἢ ἔνστασιν· ἢ εἰ ὀρθῶς τις ἤρετο, ἢ εἰ μὴ ὀρθῶς, ἢ αὐτὸς ἢ ἕτερος, καὶ * παρὰ τί ἑκάτερον.

* Gruchius ἐκβάζεσθαι parum probabiliter.

* γρ. οἱ ἄλλοι λόγοι,

* γρ. ποιῶσι

* γρ. ποιοῦσι δ' ἂν

* γρ. τῶν καθ.

* γρ. διαλεγομένους,

* γρ. ἀποφαίνεσθαι

* γρ. παρὰ τί ἑκάτερος ἑκάτερον,

A reſpondẽdum exercitati ſimus. & ſi nemo alius ſit quo cum *diſputemus*, per noſmetipſos *id faciẽdum*. & comparari inter ſe debẽt ſelecta ad oppoſitionem argumẽta. hoc.n. & ad vrgendum magnam copiã parit, & ad redarguendum magnum affert adiumẽtum, cùm alicui ſuppetunt argumenta in vtrãque partẽ: ſic.n. fiet, vt aduerſarium oporteat ſibi à cõtrariis cauere. Ad cognitionem quoque ac philoſophicam prudentiam non eſt exiguum inſtrumentum, poſſe perſpicere & *iam* perſpexiſſe, quid ex vtraque hypotheſi eueniat. *tantum*.n. reliquum erit vt horum alterum rectè eligatur. 3 Sed ad id oportet eſſe naturâ bene informatũ: atque hęc re- B vera eſt naturæ bonitas, poſſe rectè eligere verũ, ac declinare falſum: quod quidẽ ij, qui bene à natura ſunt informati, poſſunt rectè facere. nam qui rectè diligunt & oderunt quod affertur, *hi* ſeligũt quod *eſt* optimum. 4 Ac de problematis quæ ſæpe *in diſputationem* incidunt, argumentationes probè ſcire oportet. 5 Et maximè de primis theſibus. in his.n. *ea quæ* afferuntur, reſpondentes faſtidiunt ſæpe *ac reſpuunt*. 6 Præterea & definitionibus abundare oportet, & eorum quæ probabilia primáque ſunt, *definitiones* in prõptu habere. Ex his.n. ſyllogiſmi conficiuntur. 7 Enitendum quoque *eſt*, vt ea teneamus, in quæ ſæpenumero diſputationes incidũt. 8 Nam vt in Geometria è re *eſt*, in elementis C eſſe exercitatum: & in numeris ſumma capita in promptu habere, multum confert ad cognoſcendum alium quoque numerũ multiplicatum: ſimiliter & in diſputationibus *vtile eſt*, in principiis promptũ eſſe, & propoſitiones memoriter tenere. quemadmodum.n. in memoratiua *animæ facultate* tãtùm loci poſiti, ſtatim faciunt eadem meminiſſe: *ita* etiam hæc efficiunt maximè ſyllogiſticum, quòd ad ipſas *propoſitiones* numero definitas reſpiciatur. 9 Ac propoſitionem communem potiùs quàm argumentationem memoriæ mãdare oportet: principij nãque & hypotheſis copiam habere, mediocriter difficile *eſt*. 10 Præterea ex vna argumentatione multas facere aſſueſcẽdum *eſt*, quàm D obſcuriſſimè diſſimulando. quod quidem fiet, ſi quis quàm longiſſimè recedat à cognatione *eorũ*, de quibus *inſtituta eſt* diſputatio. Poſſunt autẽ argumentationes illæ hoc ferre, quæ ſunt maximè vniuerſales: velut, nõ eſſe vnam multarum *rerum* ſcientiam: ſic.n. & in relatis, & in contrariis, & in cõiugatis erit. 11 Oportet etiam rationum commentarios vniuerſales fieri, etiamſi diſputatum ſit in parte. ſic.n. ex vna plures facere licebit. Similis *eſt* in rhetoricis enthymematum ratio. Ipſe autem *differens* quã maximè *poterit*, vniuerſale declinabit in afferendis ſyllogiſmis. 12 Ac ſẽper videre oportet, an argumentationes in cõmunibus verſentur. E omnes.n. particulares *argumẽtationes* etiam in vniuerſali verſãtur, & ineſt in probatione particulari demonſtratio ipſius vniuerſalis, quia nihil ſyllogiſmo concludi poteſt ſine vniuerſali. 13 Inſtituenda autem eſt exercitatio inductiuarũ *probationum* erga iuniores: ſyllogiſticarũ verò, erga peritos. 14 Enitendum autem eſt vt ab iis qui apti ſunt ad conficiendos ſyllogiſmos, accipiãtur propoſitiones: ab iis qui inducendi facultate ſunt præditi, ſimilitudines *ſumantur*: in his.n. vtrique ſunt exercitati. 15 Et omnino ex dialectica exercitatione enitendum *eſt* referre aut ſyllogiſmum de *re* aliqua, aut ſolutionem, aut propoſitionem, aut obiectionem: aut *notare*, rectène quiſpiam interrogarit, an nõ rectè, ſiue ipſe, ſiue alius; & qua ratione vtrumque acciderit.

In his.n. *poſita eſt diſſerēdi* facultas: & *huius* facultatis gratiâ exercitatio inſtituitur: præſertim in propoſitionibus, & obiectionibus. *is*.n.eſt (vt vno verbo dicam) dialecticus, qui eſt ad proponendum & obiiciēdum aptus. eſt autem proponere, vnum facere ex multis: quoniam oportet in toto ſumere *id* ad quod argumentatio *refertur*. obiicere autem *eſt*, vnū ex multis facere: aut.n. diſtinguit, aut refellit, partim concedens, partim negans, *quæ* propoſita fuerunt. 16 Non *eſt* autem cum quovis diſputandum, neque adverſus quēvis exercitatio inſtituenda: quoniam neceſſe *eſt* adverſus nōnullos prauas fieri argumentationes. nam adverſus eū qui omnino nititur vt videatur effugere, licet quidē omnē conatum adhibere, vt ſyllogiſmo cōcludatur, ſed non decet. Quare non oportet cum quibuſvis facilè congredi. *inde*.n. neceſſariò accidit *vt* praua *ſit* diſputatio. etenim qui ſe exercent, nequeunt ſibi temperare, quominus diſſerant contentiosè. 17 Oportet etiam paratas argumentationes habere adverſus eiuſmodi problemata, in quib. cū paucæ *argumētationes* ſuppetant, adverſus plurima *problemata* vtiles erūt. hę verò ſunt *argumentationes* vniuerſales, & quas adſumere ex rebus paſſim obuiis difficile *eſt*.

A ἐκ τούτων γὰρ ἡ δύναμις· τὸ δὲ γυμνάζεσθαι, δυνάμεως χάριν· καὶ μάλιστα περὶ τὰς προτάσεις, καὶ τὰς ἐνστάσεις· ἔστι γὰρ (ὡς ἁπλῶς εἰπεῖν) διαλεκτικὸς, ὁ προτατικὸς καὶ ἐνστατικός. ἔστι δὲ τὸ μὲν προτείνεσθαι, ἓν ποιεῖν τὰ πλείω· δεῖ γὰρ ἐν ὅλῳ ληφθῆναι, πρὸς ὃ ὁ λόγος. τὸ δὲ ἐνίστασθαι, τὸ ἓν πολλά· ἢ γὰρ διαιρεῖ, ἢ ἀναιρεῖ, τὸ μὲν διδοὺς, τὸ δ' οὔ, τῶν προτεινομένων. 16 Οὐχ ἅπαντι δὲ διαλεκτέον, οὐδὲ πρὸς τὸν τυχόντα γυμναστέον· ἀνάγκη γὰρ πρὸς ἐνίους φαύλους γίνεσθαι τοὺς λόγους. πρὸς γὰρ τὸν πάντως πειρώμενον φαίνεσθαι διαφεύγειν, δίκαιον μὲν πάντως πειρᾶσθαι* συλλογίσασθαι, B οὐκ εὔσχημον δέ. διόπερ οὐ δεῖ συνιστάναι εὐχερῶς πρὸς τοὺς τυχόντας· ἀνάγκη γὰρ πονηρολογίαν συμβαίνειν· καὶ γὰρ οἱ γυμναζόμενοι ἀδυνατοῦσιν ἀπέχεσθαι τοῦ διαλέγεσθαι μὴ ἀγωνιστικῶς. 17 Δεῖ δὲ καὶ πεποιημένους ἔχειν λόγους πρὸς τὰ τοιαῦτα τῶν προβλημάτων, ἐν οἷς ἐλαχίστων εὐπορήσαντες, πρὸς πλεῖστα χρησίμους ἕξομεν. οὗτοι δ' εἰσὶν οἱ καθόλου, καὶ πρὸς οὓς πορίζεσθαι* χαλεπὸν ἐκ τῶν παρὰ πόδας.

* γρ. συλλογίζεσθαι.

* γρ. χρησιμώτερον ἐκ τῶν π.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΣΟΦΙΣΤΙΚΩΝ ΕΛΕΓΧΩΝ.

ARISTOTELIS DE SOPHISTICIS ELENCHIS,

LIBER I.

AN SINT ARGVMENTATIONES SOPHISTICÆ,

TRACTATVS I.

Cap. I.

1 *Protheſis.* 2 *Quoſdam eſſe ſyllogiſmos, vel elenchos: quoſdam non eſſe, ſed videri.* 3 *Quid ſit ſyllogiſmus.* 4 *Quid ſit elenchus.* 5 *Cur ſint quædam rationes fallaces.*

DE ſophiſticis autem elēchis, & iis qui, cū videantur eſſe elēchi, ſunt paralogiſmi, non elēchi, dicamus, ſumpto initio ſecundùm naturā à primis. 2 Alios igitur eſſe ſyllogiſmos; alios, cùm non ſint, videri, perſpicuum *eſt*. quemadmodum.n. & in aliis rebus hoc fit ob quādam ſimilitudinem, ita etiam in argumētationibus accidit. Etenim habitum *corporis* alij bene *conſtitutū* habēt, alij *habere* vidētur, inſtar tribuariarum hoſtiarum tumentes, & apparantes ſemetipſos. & pulchri alij *ſunt* propter pulchritudinē, alij per fucū videntur. In rebus etiam inanimis itidem *ſe res habet*: harum.n. quædam argentū, quædam aurum ſunt re vera: aliæ, cùm nō ſint, tamen, quod ad ſenſum, vidētur *eſſe*: vt lithargyrina & ſtānea *videntur eſſe* argētea, quæ verò felle tincta ſunt, aurea. Eodē modo & ſyllogiſmus & elēchus aliàs eſt *re vera*, aliàs nō eſt, ſed *eſſe* videtur propter imperitiam: nam imperiti, quaſi procul diſtantes, contemplantur. 3 Syllogiſmus.n. ex quibuſdam eſt *ſic* poſitis, vt neceſſariò aliquid ab iis quæ ſunt poſita diuerſum colligatur ob ea quæ poſita ſunt. 4 Elenchus autem *eſt* ſyllogiſmus cum contradictione concluſionis. 5 Hi verò hoc quidem non faciunt, ſed *facere* multis de cauſis videntur: quorum vnus *eſt* locus naturæ conuenientiſſimus, & vulgatiſſimus, ex *rerum* nominibus. cùm enim non

C ΠΕΡΙ δὲ τῶν σοφιστικῶν ἐλέγχων, καὶ τῶν φαινομένων μὲν ἐλέγχων, ὄντων δὲ παραλογισμῶν, ἀλλ' οὐκ ἐλέγχων, λέγωμεν, ἀρξάμενοι κατὰ φύσιν ἀπὸ τῶν πρώτων. 2 Ὅτι μὲν οὖν οἱ μὲν, εἰσὶ συλλογισμοί, οἱ δὲ, οὐκ ὄντες δοκοῦσι, φανερόν. ὥσπερ γὰρ καὶ ἐπὶ τῶν ἄλλων τοῦτο γίνεται διά τινος ὁμοιότητος, καὶ ἐπὶ τῶν λόγων ὡσαύτως ἔχει. καὶ γὰρ τὴν ἕξιν οἱ μὲν, ἔχουσιν εὖ· οἱ δὲ, φαίνονται, φυλετικῶς φυσήσαντες, καὶ ἐπισκευάσαντες ἑαυτούς. καὶ καλοὶ, οἱ μὲν, διὰ κάλλος· οἱ δὲ, φαίνονται,* κομμώσαντες ἑαυτούς. ἐπί τε τῶν ἀψύχων ὡσαύτως· καὶ γὰρ τούτων, τὰ D μὲν, ἄργυρος· τὰ δὲ, χρυσός ἐστιν ἀληθῶς· τὰ δὲ, ἔστι μὲν οὔ, φαίνεται δὲ κατὰ τὴν αἴσθησιν· οἷον, τὰ μὲν λιθαργύρινα, καὶ τὰ καττιτέρινα, ἀργυρᾶ· τὰ δὲ χολοβάφινα, χρυσᾶ. τὸν αὐτὸν δὲ τρόπον καὶ συλλογισμὸς καὶ ἔλεγχος, ὁ μὲν, ἔστιν· ὁ δὲ, οὐκ ἔστι μὲν, φαίνεται δὲ διὰ τὴν ἀπειρίαν· οἱ γὰρ ἄπειροι, ὥσπερ ἂν ἀπέχοντες πόρρωθεν, θεωροῦσιν. 3 Ὁ μὲν γὰρ συλλογισμὸς, ἐκ τινῶν ἐστὶ τεθέντων, ὥστε συνάγειν ἐξ ἀνάγκης ἕτερόν τι τῶν κειμένων, διὰ τῶν κειμένων. 4 Ἔλεγχος δὲ, συλλογισμὸς μετ' ἀντιφάσεως τοῦ συμπεράσματος. 5 Οἱ δὲ, τοῦτο ποιοῦσι μὲν οὔ, δοκοῦσι δὲ διὰ πολλὰς αἰτίας· ὧν εἷς τόπος εὐφυέστατος, καὶ δημοσιώτατος, ὁ διὰ τῶν ὀνομάτων. ἐπεὶ γὰρ οὐκ

CAP. 1.

* γρ. κομμώσαντες.

ἔστιν αὐτὰ τὰ πράγματα διαλέγεσθαι φέροντας, A ἀλλὰ τοῖς ὀνόμασιν ἀντὶ τῶν πραγμάτων χρώμεθα συμβόλοις· τὸ συμβαῖνον ἐπὶ τῶν ὀνομάτων, καὶ ἐπὶ τῶν πραγμάτων ἡγούμεθα συμβαίνειν, καθάπερ ἐπὶ τῶν ψήφων τοῖς λογιζομένοις. τὸ δὲ, οὐκ ἔστιν ὅμοιον. τὰ μὲν γὰρ ὀνόματα πεπέρανται, καὶ τὸ τῶν λόγων πλῆθος· τὰ δὲ πράγματα, τὸν ἀριθμὸν ἄπειρά ἐστιν. ἀναγκαῖον οὖν πλείω τὸν αὐτὸν λόγον, καὶ τοὔνομα τὸ ἓν σημαίνειν. ὥσπερ οὖν κἀκεῖ οἱ μὴ δεινοὶ τὰς ψήφους φέρειν, ὑπὸ τῶν ἐπιστημόνων παρακρούονται, τὸν αὐτὸν τρόπον καὶ ἐπὶ τῶν λόγων, οἱ τῶν ὀνομάτων τῆς δυνάμεως ἄπειροι παραλογίζονται, καὶ αὐτοὶ διαλεγόμενοι, καὶ ἄλλων ἀκούοντες. διὰ μὲν οὖν ταύτην τε τὴν αἰτίαν, καὶ τὰς λεχθησομένας, ἔστι καὶ συλλογισμὸς καὶ ἔλεγχος φαινόμενος B

CAP. II. μὲν, οὐκ ὢν δέ. 6 Ἐπεὶ δὲ ἐστί τισι μᾶλλον πρὸ ἔργου τὸ δοκεῖν εἶναι σοφοῖς, ἢ τὸ εἶναι καὶ μὴ δοκεῖν· (ἔστι γὰρ ἡ σοφιστικὴ, φαινομένη σοφία, οὖσα δὲ μή· καὶ ὁ σοφιστὴς, χρηματιστὴς ἀπὸ φαινομένης σοφίας, ἀλλ' οὐκ οὔσης) δῆλον ὅτι ἀναγκαῖον τούτοις καὶ τὸ τοῦ σοφοῦ ἔργον μᾶλλον δοκεῖν ποιεῖν, ἢ ποιεῖν καὶ μὴ δοκεῖν. ἔστι δὲ (ὡς ἓν πρὸς ἓν εἰπεῖν) ἔργον περὶ ἕκαστον τοῦ εἰδότος, ἀψευδεῖν μὲν αὐτὸν περὶ ὧν οἶδε, τὸν δὲ ψευδόμενον ἐμφανίζειν δύνασθαι. ταῦτα δέ ἐστι, τὸ μὲν, ἐν τῷ δύνασθαι δοῦναι λόγον· τὸ δὲ, ἐν τῷ λαβεῖν. ἀναγκαῖον οὖν* τοὺς βουλομένους σοφιστεύειν, τὸ τῶν εἰρημένων λόγων γένος ζητεῖν· πρὸ ἔργου γάρ ἐστιν· ἡ γὰρ τοιαύτη δύναμις ποιήσει φαίνεσθαι* σοφὸν, οὗ τυγχάνουσι τὴν προαίρεσιν ἔχοντες. 7 Ὅτι μὲν οὖν ἔστι τι τοιοῦτον γένος λόγων, καὶ ὅτι τοιαύτης ἐφίενται δυνάμεως, οὓς καλοῦμεν σοφιστάς, δῆλον.

* γρ. τοῖς βουλομένοις

* γρ. σοφοῖς.

A liceat res ipſas per ſe in diſſerendo afferre, ſed nominibus vice rerũ vtamur, *tamquam* notis: id quod in nominibus euenit, etiã in rebus putamus euenire: quemadmodum in calculis accidit iis qui rationes ſubducunt. Hoc verò non eſt ſimile: nomina.n. ſunt finita, & orationum multitudo: res autem numero infinitæ ſunt: neceſſe igitur *eſt*, vt eadem oratio, vnúmque nomen plura ſignificet. ſicut igitur ibi, qui calculorum vſum non tenet, à ſcientibus circumueniuntur: eodem modo & in diſputationibus, qui nominum poteſtatis *ſunt* imperiti, paralogiſmis decipiuntur, & cùm ipſi diſputant, & cùm alios audiunt. Ergo & ob hanc cauſam, & ob eas quę *poſteriùs* dicentur, eſt tam ſyllogiſmus quã elenchus qui videtur, cùm non ſit. 6 Quãdo au- B tem nõnullis magis è re eſt videri ſapientes, quàm eſſe nec videri: (nam ſophiſtice eſt ſapientia quæ videtur, cùm *re vera* non ſit: & ſophiſta *eſt*, qui quęſtum captat ex *ea* ſapientia, quæ videtur *eſſe*, nec eſt) patet, his magis opus eſſe vt ſapientis officium facere videantur, quàm vt faciant, nec videantur. eſt autem (vt ſingula cum ſingulis conferam) officium in quaque re ſcientis, nec mentiri ipſum in iis quæ nouit, & poſſe *alium* mentientẽ patefacere: quorum alterum in rationis reddẽdæ, alterum in ſumẽdæ facultate *poſitum eſt*. Neceſſe *eſt* igitur, vt qui ſophiſticè cauillari volunt, dictarum argumentationum genus quærant: nam è re eſt: huiuſmodi namque facultas ſapientem videri faciet: quod *quidẽ* hi præeligunt. 7 Eſſe igitur eiuſmodi quoddam argumentationum genus, & huiuſcemodi facultatem *eos* expetere, quos vocamus ſophiſtas, manifeſtum eſt.

DE SCOPIS SOPHISTARVM,

TRACTATVS II.

Argumentationum genera. Cap. II.

1 Protheſis. 2 Expoſitio. 3 De quibus ſuprà dictum fuerit, ac de quibus deinceps dicendum ſit.

Πόσα δέ ἐστιν εἴδη τῶν λόγων τῶν σοφιστικῶν, καὶ ἐκ πόσων τὸν ἀριθμὸν ἡ δύναμις αὕτη συνέστηκε, καὶ πόσα μέρη τυγχάνει τῆς πραγματείας ὄντα, καὶ περὶ τῶν ἄλλων τῶν συντελούντων εἰς τὴν τέχνην ταύτην, ἤδη λέγωμεν. 2 Ἔστι δὴ τῶν ἐν τῷ διαλέγεσθαι λόγων γένη* τέτταρα, διδασκαλικοὶ, καὶ διαλεκτικοὶ, καὶ πειραστικοὶ, καὶ ἐριστικοί. διδασκαλικοὶ μὲν, οἱ ἐκ τῶν οἰκείων ἀρχῶν ἑκάστου μαθήματος, καὶ οὐκ ἐκ τῶν τοῦ ἀποκρινομένου δοξῶν συλλογιζόμενοι· δεῖ γὰρ πιστεύειν τὸν μανθάνοντα. διαλεκτικοὶ δὲ, οἱ ἐκ τῶν ἐνδόξων συλλογιστικοὶ ἀντιφάσεως. πειραστικοὶ δὲ, C οἱ ἐκ τῶν δοκούντων τῷ ἀποκρινομένῳ, καὶ* ἀναγκαίων εἰδέναι τῷ προσποιουμένῳ ἔχειν τὴν ἐπιστήμην. ὃν τρόπον δὲ, διώρισται ἐν ἑτέροις. ἐριστικοὶ δὲ, οἱ ἐκ τῶν φαινομένων ἐνδόξων, μὴ ὄντων δὲ, συλλογιστικοὶ, ἢ φαινόμενοι συλλογιστικοί. 3 Περὶ μὲν οὖν τῶν διδασκαλικῶν καὶ ἀποδεικτικῶν, ἐν τοῖς Ἀναλυτικοῖς εἴρηται· περὶ δὲ τῶν διαλεκτικῶν καὶ πειραστικῶν, ἐν τοῖς ἄλλοις· περὶ δὲ τῶν ἀγωνιστικῶν καὶ ἐριστικῶν νῦν λέγωμεν. D

* Alexander ait in quibuſdam codicibus ſcriptum olim fuiſſe εἴδη, quam lectionẽ ſi probauerimus, διαλεκτικοὶ & πειραστικοὶ λόγοι, pro vno membro erunt accipiendi: vt ſunt ſanè οἱ πειραστικοὶ μέρος τῶν διαλεκτικῶν.

* quidam codices, ait Alexander, ἀναγκαῖον, vt ſit leg. & ἀεὶ.

C QVót verò ſint ſpecies argumentationum ſophiſticarum, & quot numero *ſint ea ex quibus* hæc facultas conſtat, & quot partes ſint huius tractationis, ac de aliis conducentibus ad hãc artem, iam dicamus. 2 Sunt igitur argumentationum, quarum in diſſerendo *eſt vſus*, genera quatuor, didaſcalicæ, dialecticæ, tentatiuæ, & litigioſæ. Didaſcalicæ *ſunt*, quæ ex propriis cuiuſque diſciplinæ principiis, non ex reſpondentis opinionibus concludunt; oportet.n. diſcentem credere. Dialecticæ verò, quæ ex probabilibus aptæ ſunt ad concludendam contradictionem. Tentatiuæ D autẽ, quæ ex iis quæ reſpondenti videntur, & quæ neceſſe eſt eum ſcire, qui ſibi ſcientiam arrogat. quo autem modo, definitum eſt in aliis *libris*. Litigioſæ verò, quæ ex iis quæ videntur probabilia, cùm *re vera talia* non ſint, aptæ ſunt ad concludendum, aut videntur aptæ ad conclud ẽdum. 3 Ergo de didaſcalicis & demonſtratiuis, in Analyticis dictum fuit: de dialecticis verò ac tẽtatiuis, in aliis *libris*: de contentioſis autem ac litigioſis nunc dicamus.

Scopi ſophiſtarum. Cap. III.

1 Protheſis. 2 Expoſitio.

PRimùm autem ſumendum *eſt*, ad quot colli-mēt, qui in diſputationibus contendunt, ac vincere ſtudent. 2 Hæc verò quinque numero ſunt, elenchus, falſum, inopinabile, ſolœciſmus: & quintum, efficere vt is quicū diſputant, nugetur: hoc verò eſt, cogere vt ſæpius idē dicat: aut quod non eſt ſed videtur eſſe, quodvis horum. 3 Maximè igitur *hoc* præeligunt, vt videantur elencho redarguere: ſecundò, *vt* de aliqua re mentiri oſtendāt: tertiò, *vt* ad inopinabile ducant: quartò, vt ſolœciſmum committere faciant: hoc eſt, efficiant argumētatione, vt reſpondens barbarè loquatur: poſtremò, *vt* ſæpius idem dicere *cogant*.

A Πρῶτον δὲ ληπτέον, πόσων στοχάζονται οἱ ἐν τοῖς λόγοις ἀγωνιζόμενοι καὶ διαφιλονεικοῦντες. 2 Εἰσὶ δὲ ταῦτα, πέντε τὸν ἀριθμὸν, ἔλεγχος, καὶ ψεῦδος, καὶ παράδοξον, καὶ σολοικισμὸς· καὶ πέμπτον, τὸ ποιῆσαι ἀδολεσχῆσαι τὸν προσδιαλεγόμενον· τοῦτο δ' ἐστὶ τὸ πολλάκις ἀναγκάζεσθαι ταὐτὸ λέγειν* ἢ τὸ μὴ ὂν, ἀλλὰ τὸ φαινόμενον ἕκαστον εἶναι τούτων. 3 Μάλιστα μὲν οὖν προαιροῦνται φαίνεσθαι ἐλέγχοντες· δεύτερον δὲ ψευδόμενόν τι δεικνύναι· τρίτον, εἰς παράδοξον ἄγειν· τέταρτον, σολοικίζειν ποιεῖν* τοῦτο δ' ἐστὶ, τὸ ποιῆσαι τῇ λέξει βαρβαρίζειν ἐκ τοῦ λόγου τὸν ἀποκρινόμενον· τελευταῖον δὲ, τὸ πλεονάκις ταὐτὸ λέγειν. CAP. III.

* Vide Alexandrum.

* γρ. σολοικισμὸς ἐστί.

DE INVENTIONE,

TRACTATVS III.

De fallaciis in dictione conſiſtentibus. Cap. IV.

1 Reprehenſionum diuiſio, 2 & ſubdiuiſio. 3 De homonymia. 4 De amphibolia. 5 Communia de homonymia & amphibolia. 6 De compoſitione. 7 De diuiſione. 8 De accentu. 9 De figura dictionis.

MOdi autem elenchis redarguēdi duo ſunt: alij nāque ſunt in dictione, alij extra dictionem. 2 Sunt autem, quæ dictionis ratione *elenchū* videri faciunt, numero ſex: hæc verò ſunt, homonymia, amphibolia, compoſitio, diuiſio, accentus, & figura dictionis. Huius *rei* fides *fit* inductione & ſyllogiſmo: cùm *quia* ſi ſumatur alius quiſpiam *modus, ad aliquem ex his referri poterit*; tum etiam quia tot modis poſſumus hiſdē nominibus & orationibus non idem ſignificare. 3 Ex homonymia ſunt eiuſmodi argumentationes: velvti, eos qui ſciunt, μανθάνειν: quoniā ea quæ memoriter recitantur, grāmatici μανθάνουσι. nam *verbum* μανθάνειν eſt homonymū, *quod ſignificat* & intelligere, vtendo ſcientia, & acquirere ſcientiam. Rurſus mala *eſſe* bona, quoniam τὰ δέοντα *ſunt* bona: quæ verò *ſunt* mala, *ſunt* δέοντα, nā duplex eſt τὸ δέον: *nimirum* & quod neceſſarium *eſt*, quod & in malis ſæpe euenit: (eſt.n. malum quidpiam, neceſſarium) & bona quoque δέοντα eſſe dicimus. Præterea, eūdem ſedere ac ſtare, & ægrotare ac valere. nam qui ſurgebat, ſtat: & qui cōualeſcebat, valet: ſurgebat autem ſedēs, & conualeſcebat ægrotans: etenim ægrotantem quodvis facere aut pati, non vnum ſignificat, ſed interdum eum qui nunc ægrotat, vel ſedet: interdum verò *eum* qui ægrotabat priùs, *vel ſedebat*. Verumtamen conualeſcebat & ægrotans & ὁ ægrotans: valet autē, non ægrotās, ſed ὁ ægrotans, non *qui* nūc, ſed *qui* priùs. 4 Ex amphibolia *ducuntur* hę *rationes*, Velle capere me hoſtes. &, Nullum quod quiſpiam cognoſcit, hoc cognoſcit: nam & qui cognoſcit, & quod cognoſcitur, poteſt ceu cognoſcens ſignificari hac oratione. &, Nūquid quod quis videt, hoc videt? videt autem columnam: quare videt columna? &, Num quod tu dicis eſſe, hoc tu dicis eſſe? dicis autem lapidem eſſe: tu igitur dicis lapis eſſe? &, Num licet σιγῶντα dicere? duplex.n. hoc quoque eſt, σιγῶντα dicere, *quia* & eum ſilere *ſignificat*, qui dicit, & ea

B Τρόποι δέ εἰσι, τοῦ μὲν ἐλέγχειν, δύο· οἱ μὲν γάρ εἰσι παρὰ τὴν λέξιν, οἱ δὲ ἔξω τῆς λέξεως. 2 Ἔστι δὲ τὰ μὲν παρὰ τὴν λέξιν ἐμποιοῦντα τὴν φαντασίαν, ἓξ τὸν ἀριθμόν· ταῦτα δ' ἐστὶν, ὁμωνυμία, ἀμφιβολία, σύνθεσις, διαίρεσις, προσῳδία, καὶ σχῆμα λέξεως. Τούτου δὲ πίστις, ἥ τε διὰ τῆς ἐπαγωγῆς, καὶ συλλογισμὸς, ἄν τε ληφθῇ τις ἄλλος, καὶ ὅτι τοσαυταχῶς ἂν τοῖς αὐτοῖς ὀνόμασι καὶ λόγοις μὴ ταὐτὸ* δηλώσαιμεν. 3 Εἰσὶ δὲ παρὰ μὲν τὴν ὁμωνυμίαν οἱ τοιοῦτοι τῶν λόγων, ὅτι μανθάνουσιν οἱ ἐπιστάμενοι· τὰ γὰρ ἀποστοματιζόμενα μανθάνουσιν οἱ γραμματικοί. τὸ γὰρ μανθάνειν, ὁμώνυμον, τό, τε ξυνιέναι χρώμενον τῇ ἐπιστήμῃ, καὶ τὸ λαμβάνειν τὴν ἐπιστήμην. καὶ πάλιν, ὅτι τὰ κακὰ, ἀγαθά· τὰ γὰρ δέοντα, ἀγαθά· τὰ δὲ κακὰ, δέοντα. διττὸν γὰρ τὸ δέον, τό, τ' ἀναγκαῖον, ὃ συμβαίνει πολλάκις καὶ ἐπὶ τῶν κακῶν (ἔστι γὰρ κακόν τι, ἀναγκαῖον) καὶ τὰ ἀγαθὰ δὲ, δέοντα φαμὲν εἶναι. ἔτι, τὸν αὐτὸν καθῆσθαι καὶ ἑστάναι, καὶ κάμνειν καὶ ὑγιαίνειν. ὅσπερ γὰρ ἀνίστατο, ἕστηκε· καὶ ὅσπερ ὑγιάζετο, ὑγιαίνει· ἀνίστατο δὲ ὁ καθήμενος, καὶ ὑγιάζετο ὁ κάμνων. τὸ C γὰρ, τὸν κάμνοντα, ὁτιοῦν ποιεῖν, ἢ πάσχειν, οὐχ ἓν σημαίνει· ἀλλ' ὁτὲ μὲν, ὅτι ὁ νῦν κάμνων, ἢ καθήμενος· ὁτὲ δὲ, ὃς ἔκαμνε πρότερον. D πλὴν ὑγιάζετο μὲν καὶ κάμνων, καὶ ὁ κάμνων· ὑγιαίνει δὲ, οὐ κάμνων, ἀλλ' ὁ κάμνων, οὐ νῦν, ἀλλὰ πρότερον. 4 Παρὰ δὲ τὴν ἀμφιβολίαν οἱ τοιοίδε, τὸ βούλεσθαι λαβεῖν με τοὺς πολεμίους. καὶ, ἆρ' ὅ τις γινώσκει, τοῦτο γινώσκει; καὶ γὰρ καὶ τὸ γινώσκοντα, καὶ τὸ γινωσκόμενον, ἐνδέχεται ὡς γινώσκοντα σημαίνειν τούτῳ τῷ λόγῳ. καὶ ἆρα ὃ ὁρᾷ τις, τοῦτο ὁρᾷ; ὁρᾷ δὲ τὸν κίονα· ὥστε ὁρᾷ ὁ κίων. καὶ, ἆρα ὃ σὺ φῂς εἶναι, τοῦτο σὺ φῂς εἶναι; φῂς δὲ λίθον εἶναι, σὺ ἄρα φῂς λίθος εἶναι; καὶ, ἆρα ἐστὶ σιγῶντα λέγειν; διττὸν γὰρ ἐστὶ καὶ τὸ σιγῶντα λέγειν, τό, τε τὸν λέγοντα σιγᾶν, καὶ τὸ

* γρ. δηλώσαιμεν.

τὰ λεγόμενα. 5 Εἰσὶ δὲ τρεῖς τρόποι τῶν παρὰ τὴν ὁμωνυμίαν, καὶ τὴν ἀμφιβολίαν. εἷς μὲν, ὅταν ὁ λόγος ἢ τοὔνομα κυρίως σημαίνῃ πλείω· οἷον, ἀετὸς, καὶ κύων. εἷς δὲ, ὅταν εἰωθότες ὦμεν οὕτω λέγειν. τρίτος δὲ, ὅταν τὸ συντεθὲν, πλείω σημαίνῃ· κεχωρισμένον δὲ, ἁπλῶς, οἷον, τὸ ἐπίστασθαι γράμματα. ἑκάτερον μὲν γὰρ, εἰ ἔτυχεν, ἕν τι σημαίνει, τὸ ἐπίστασθαι, καὶ τὰ γράμματα· ἄμφω δὲ, πλείω, ἢ τὸ τὰ γράμματα αὐτὰ ἐπιστήμην ἔχειν, ἢ τῶν γραμμάτων ἄλλον. ἡ μὲν οὖν ἀμφιβολία, καὶ ὁμωνυμία, παρὰ τούτους τοὺς τρόπους ἐστί. 6 Παρὰ δὲ τὴν σύνθεσιν τὰ τοιάδε. οἷον, τὸ δύνασθαι καθήμενον βαδίζειν, καὶ μὴ γράφοντα γράφειν. οὐ γὰρ ταὐτὸ σημαίνει, ἂν διελών τις εἴπῃ, καὶ συνθεὶς, ὡς δυνατὸν τὸν καθήμενον βαδίζειν, καὶ μὴ γράφοντα γράφειν· καὶ τοῦθ᾽ ὡσαύτως ἄν τις συνθῇ, τὸν μὴ γράφοντα γράφειν· σημαίνει γὰρ, ὡς ἔχει δύναμιν τοῦ μὴ γράφοντα γράφειν. ἐὰν δὲ μὴ συνθῇ, ὅτι ἔχει δύναμιν, ὅτε οὐ γράφει, τοῦ γράφειν. καὶ μανθάνει νῦν γράμματα, εἴπερ ἐμάνθανεν ἃ ἐπίσταται. ἔτι, τὸ ἓν μόνον δυνάμενον φέρειν, πολλὰ δύνασθαι φέρειν. 7 Παρὰ δὲ τὴν διαίρεσιν, ὅτι τὰ πέντε ἐστὶ δύο καὶ τρία, καὶ περιττὰ καὶ ἄρτια. καὶ τὸ μεῖζον, ἴσον· τοσοῦτον γὰρ, καὶ ἔτι πρός. ὁ γὰρ αὐτὸς λόγος διῃρημένος καὶ συγκείμενος, οὐκ ἀεὶ ταὐτὸ σημαίνειν ἂν δόξειεν· οἷον,

Ἐγώ σε ἔθηκα δοῦλον ὄντα ἐλεύθερον.

Καὶ τὸ,

Πεντήκοντ᾽ ἀνδρῶν ἑκατὸν λίπε δῖος Ἀχιλλεύς.

8 Παρὰ δὲ τὴν προσῳδίαν, ἐν μὲν τοῖς ἄνευ γραφῆς διαλεκτικοῖς, οὐ ῥᾴδιον ποιῆσαι λόγον· ἐν δὲ τοῖς γεγραμμένοις καὶ ποιήμασι, μᾶλλον. οἷον, καὶ τὸν Ὅμηρον ἔνιοι διορθοῦνται πρὸς τοὺς ἐλέγχοντας, ὡς ἀτόπως εἰρηκότα,

* Iliad. ψ.

-- * τὸ μὲν οὗ καταπύθεται ὄμβρῳ.

λύουσι γὰρ αὐτὸ τῇ προσῳδίᾳ, λέγοντες τὸ οὐ, ὀξύτερον. * καὶ τὸ περὶ τὸ ἐνύπνιον τοῦ Ἀγαμέμνονος, ὅτι οὐκ αὐτὸς ὁ Ζεὺς εἶπεν,

* Iliad. β. vbi tamen hæc verba non legas, ſed Iliad. φ. vide Alexandrum.

--δίδομεν δέ οἱ εὖχος ἀρέσθαι,

ἀλλὰ τῷ ἐνυπνίῳ ἐνετέλλετο διδόναι. τὰ μὲν οὖν τοιαῦτα, παρὰ τὴν προσῳδίαν ἐστίν. 9 Οἱ δὲ παρὰ τὸ σχῆμα τῆς λέξεως συμβαίνουσιν, ὅταν τὸ μὴ ταὐτὸν ὡσαύτως ἑρμηνεύηται· οἷον, τὸ ἄρρεν, θῆλυ· ἢ τὸ θῆλυ, ἄρρεν. ἢ τὸ μεταξὺ, θάτερον τούτων· ἢ πάλιν, τὸ ποσὸν, ποιόν· ἢ τὸ ποιὸν, ποσόν· ἢ τὸ ποιοῦν, πάσχον· ἢ τὸ διακείμενον, ποιοῦν· καὶ τὰ ἄλλα, ὡς διῄρηται πρότερον. ἔστι γὰρ τὸ μὴ τῶν ποιεῖν ὂν, ὡς τῶν ποιεῖν τι, τῇ λέξει σημαίνειν. οἷον, τὸ ὑγιαίνειν ὁμοίως σχήματι τῆς λέξεως λέγεται τῷ τέμνειν, ἢ οἰκοδομεῖν. καίτοι τὸ μὲν, ποιόν τι καὶ διακείμενόν πως δηλοῖ· τὸ δὲ, ποιεῖν τι. τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἄλλων. 10 Οἱ μὲν οὖν παρὰ τὴν λέξιν ἔλεγχοι, ἐκ τούτων τῶν τόπων εἰσί.

A quæ dicuntur. 5 Sunt autem tres modi *argumentationum, quæ* ab homonymia & amphibolia *ſumũtur.* vnus, cùm oratio, vel nomen propriè multa ſignificat, vt aquila, & canis. alter, cùm ſoliti ſumus ita loqui. tertius, quando coniũctum plura ſignificat, ſeparatũ verò ſimpliciter *accipitur: vt ſcire* literas. ponatur.n. vtrũmque vnam rẽ ſignificare, & ſcire, (*inquam*) & literas: tamen ambo *ſimul iuncta* plures res *ſignificant, nempe* aut ipſas literas habere ſcientiam, aut literarum alium. Ergo amphibolia & homonymia his modis continentur. 6 Ad cõpoſitionem autem hæc *referuntur*, velvti, poſſe ſedentem ambulare, & non ſcribẽtem ſcribere. non.n. idem valet, ſi quis ſeparatim dixerit, & coniũctim, poſſe B ſedentem ambulare, & non ſcribentem ſcribere. atque hoc itidem ſi quis coniunxerit, non ſcribentem ſcribere: ſignificat.n. habere poteſtatẽ, vt non ſcribendo ſcribat. ſi verò non coniunxerit, habere poteſtatem quando non ſcribit, vt ſcribat. Ac, diſcit nunc litteras; ſiquidem didicit, quæ ſcit. Præterea, eum, qui vnum tantùm ferre poteſt, multa ferre poſſe. 7 Ad diuiſionem autem *hæc pertinent:* Quinque eſſe duo & tria, atque imparia & paria. & *quod eſt* maius, *eſſe* æquale: tantum enim *eſſe*, & etiamnum amplius. nam eadem oratio diuiſa, & coniuncta, non ſemper idem ſignificare videtur: velvti,

C „ Ego te reddidi ſeruum exiſtentem liberum.

Et illud,

„ Quinquaginta è viris centum liquit diuus Achilles.

8 Ex accentu verò in nõn ſcriptis diſſertationibus haud facile eſt efficere argumentationem: ſed in ſcriptis, & poëmatis potiùs. ſicut Homerum nonnulli tuentur adverſus eos à quibus reprehẽditur, quaſi abſurdè dixerit,

--- τὸ μὲν οὗ καταπύθεται ὄμβρῳ.

hoc enim per accentum ſoluunt, dicentes illud οὐ accentu acuto *eſſe notandum. Sed* & illud de Agamemnonis ſomnio *defendunt*, quia non ipſe Iuppiter dixit,

D --- δίδομεν δέ οἱ εὖχος ἀρέσθαι.

ſed ſomnio mandauit διδόναι. Quæ igitur *ſunt* eiuſmodi, ex accentu ſumuntur. 9 Hæ verò *argumentationes* ex figura dictionis ducuntur, cùm quis eodem modo interpretatur, quod nõ idem *eſt*: velvti maſculum *vt* feminam, aut feminã *vt* maſculum, aut neutrum *vt* alterum horum: vel rurſus quantũ *vt* quale, aut quale *vt* quantum, aut faciens *vt* patiens, aut affectum *vt* faciens, & cetera, vt antea diuiſa fuerunt. nam fieri poteſt vt quod non eſt in faciendi *categoria*, perinde quaſi in ea ſit, dictione ſignificetur. vtputà valere, ſimili dicendi formâ effertur, qua ſecare, vel ædificare. quamquam illud, quale quidpiam, & certo modo affectũ declarat: hoc verò, aliquid facere. Eodem modo & in aliis *res habet.* 10 Qui igitur ex dictione elenchi *ducuntur*, his modis fiunt.

De fallaciis extra dictionem.

Cap. V.

1 De paralogiſmis extra dictionem. 2 De accidente. 3 De eo quod eſt ſimpliciter, vel κατά τι. 4 De ignorantia elenchi. 5 De petitione quæſiti ab initio propoſiti. 6 De conſequenti. 9 De non cauſa. 11 Si duæ interrogationes pro vna ſumantur.

A PAralogiſmorum autem, qui extra dictionem *conſiſtunt*, ſpecies ſunt ſeptē: vna ex accidente: ſecunda, *quia* ſimpliciter, vel non ſimpliciter, ſed quadamtenus vel alicubi, vel aliquādo, vel ad aliquid dicitur: tertia, ob elēchi ignorātiam: quarta, ex conſequenti: quinta, quia ſumitur, quod initiò *quæſitum fuit*: ſexta, quia nō cauſa vt cauſa ponitur: ſeptima, quia multę interrogationes pro vna accipiuntur. 2 Ex accidente igitur paralogiſmi ſunt, cùm quid in poſtulatū fuerit æquè rei atque accidenti ineſſe. cùm.n. multa eidem accidant, non *eſt* neceſſe & attributis & ſubiecto hæc omnia ineſſe: alioqui omnia erunt eadē, vt ſophiſtæ dicunt. velvti, ſi Coriſcus *eſt* diuerſus ab homine, ipſe à ſe ipſo diuerſus *erit*, quoniam homo eſt. aut ſi à Socrate *eſt* B diuerſus, Socrates autē *eſt* homo, diuerſum *eſſe* ab homine aiunt conceſſiſſe: propterea quòd à quo diuerſum eſſe dixit, ei accidit vt ſit homo. 3 Hi verò *ſunt* ex eo quod ſimpliciter tale dicitur, vel quadamtenus, non propriè; cùm id quod in parte dicitur, vt ſimpliciter dictū ſumitur. Velvti, *ſi quis colligat*, ſi id quod non eſt, opinabile eſt; id quod nō eſt, eſſe. non.n. idem *valent*, eſſe aliquid *tale*, & eſſe ſimpliciter. Aut rurſus, *ſi quis cōcludat*, id quod eſt, non eſſe, ſi non eſt aliquid eorum quæ ſunt: verbi gratiâ ſi non *eſt* homo. non.n. idem *valent*, nō eſſe aliquid *tale*, & ſimpliciter non eſſe. Videtur autem *vtrumque rectè colligi*, propter vicinitatem dictionis, C & exiguitatem diſcriminis, quod eſt inter eſſe aliquid & eſſe, necnon inter non eſſe aliquid & non eſſe. Similiter *paralogiſmi ducuntur* ex eo quod quadamtenus & ſimpliciter *dicitur*. Vtputà, ſi Indus, cū ſit totus niger, albus eſt dētes: albus igitur & non albus eſt. Aut, ſi ambo, quadātenus *inſunt*, cōtraria ſimul ineſſe. Porrò huiuſmodi *paralogiſmū* in nonnullis *orationibus* animaduertere cuivis facile *eſt*: vtputà ſi *quis*, cū ſumpſerit Æthiopem eſſe nigrū, roget, an *ſit* albus dētes: perfecta igitur interrogatione, arbitretur ſyllogiſticè diſputatū, *ac probatum Æthiopem eſſe* nigrum & non nigrum. In quibuſdā autē ſæpe latet: *nēpe* in quibus, cùm quadamtenus D dicitur, cōſequi videtur, *vt* etiā ſimpliciter *dicatur*: & in quibus non facile *eſt* perſpicere, vtrū propriè *ſit* attribuēdum: hoc autem *in iis* euenit, in quibus oppoſita pariter inſunt. nam aut ambo, aut neutrū ineſſe, *ſiue* attribui, dādum videtur. vtputà, ſi *totius cuiuſdam* dimidium *ſit* album, dimidium nigrum, vtrùm *id* album, an nigrū *eſt*? 4 *Hi* verò *paralogiſmi* fiunt, quia non eſt definitum, quid ſit ſyllogiſmus, vel quid elēchus, ſed omiſſa eſt definitio. Elēchus enim eſt cōtradictio vnius & eiuſdē, non nominis, ſed rei: ac nominis, nō ſynonymi, ſed eiuſdē: *quæ* ex conceſſis neceſſariò *colligitur*, non cōnumerato eo quod in principio *quæſitum fuit*: & *ſumitur* ſecundū idem, & ad idem, eodémque modo, & eodem tē- E pore. Eodem autē modo & mentiri de aliquo *contingit*. Nonnulli verò, aliquo horum prætermiſſo, videntur elēcho redarguere. vtputà idem eſſe duplum & nō duplum: quoniā duo vnius dupla *ſunt*, triū verò non dupla. aut ſi idem eſt eiuſdem duplū & non duplum, non tamen ſecūdùm idem, ſed ſecundùm longitudinem duplum, ſecūdùm latitudinem non duplum. aut ſi eiuſdem, & ſecundùm idē, & eodem modo ſed non ſimul. idcirco eſt ſpecie tantùm elēchus. Sed hic *paralogiſmus* & ad eos referri poteſt, qui in dictione *conſiſtunt*. 5 Qui autē ex eo *oriuntur* quòd ſumitur *quæſitū* initiò *propoſitū*, iiſdē & tot modis fiūt, quot modis accidit *id* quod ab initio *quæſitum eſt*, peti. videntur autem redarguere: quia diſcerni non poteſt, quod *eſt* idem, & quod diuerſum.

Cap. IV.

Τῶν δὲ ἔξω τῆς λέξεως παραλογισμῶν εἴδη εἰσὶν ἑπτά. ἓν μὲν, παρὰ τὸ συμβεβηκός· δεύτερον δὲ, τὸ ἁπλῶς, ἢ μὴ ἁπλῶς, ἀλλὰ πῇ, ἢ ποὺ, ἢ ποτὲ, ἢ πρός τι λέγεσθαι· τρίτον δὲ, τὸ παρὰ τὴν τοῦ ἐλέγχου ἄγνοιαν· τέταρτον δὲ, τὸ παρὰ τὸ ἑπόμενον· πέμπτον δὲ, τὸ παρὰ τὸ ἐν ἀρχῇ λαμβάνειν· ἕκτον δὲ, τὸ παρὰ τὸ μὴ αἴτιον, ὡς αἴτιον τιθέναι· ἕβδομον δὲ, τὸ παρὰ τὸ τὰ πλείω ἐρωτήματα ἓν ποιεῖν. 2 Οἱ μὲν οὖν παρὰ τὸ συμβεβηκὸς παραλογισμοί εἰσιν, ὅταν ὁμοίως ὁτιοῦν ἀξιωθῇ τῷ πράγματι καὶ τῷ συμβεβηκότι ὑπάρχειν. ἐπεὶ γὰρ τῷ αὐτῷ πολλὰ συμβέβηκεν, οὐκ ἀνάγκη πᾶσι τοῖς κατηγορουμένοις, καὶ καθ' οὗ κατηγορεῖται, * ταῦτα πάντα B ὑπάρχειν. πάντα γὰρ οὕτως ἔσται ταὐτὰ, ὥσπερ φασὶν οἱ σοφισταί. οἷον, εἰ ὁ Κορίσκος, ἕτερος ἀνθρώπου, αὐτὸς αὑτοῦ ἕτερος· ἔστι γὰρ ἄνθρωπος. ἢ εἰ Σωκράτους ἕτερος, ὁ δὲ Σωκράτης ἄνθρωπος, ἕτερον ἀνθρώπου φασὶν ὡμολογηκέναι, διὰ τὸ συμβεβηκέναι, οὗ ἕτερον ἔφησεν εἶναι, τοῦτον εἶναι ἄνθρωπον. 3 Οἱ δὲ παρὰ τὸ, τὸ ἁπλῶς τόδε, ἢ πῇ λέγεσθαι, καὶ μὴ κυρίως· ὅταν τὸ ἐν μέρει λεγόμενον, ὡς ἁπλῶς εἰρημένον ληφθῇ. οἷον, εἰ τὸ μὴ ὂν, ἐστὶ δοξαστὸν, ὅτι τὸ μὴ ὂν ἔστιν. οὐ γὰρ ταὐτὸν εἶναί τέ τι, καὶ εἶναι ἁπλῶς. ἢ πάλιν, ὅτι τὸ ὂν οὐκ ἔστιν ὂν, εἰ τῶν ὄντων τι μὴ ἔστιν· οἷον, εἰ μὴ ἄνθρωπος. οὐ γὰρ ταὐτὸ, μὴ εἶναί τι, καὶ ἁπλῶς μὴ εἶναι· φαίνεται δὲ διὰ τὸ πάρεγγυς τῆς λέξεως, C καὶ μικρὸν διαφέρειν τὸ εἶναί τι τοῦ εἶναι, καὶ τὸ μὴ εἶναί τι τοῦ μὴ εἶναι. ὁμοίως δὲ, καὶ παρὰ τὸ πῇ, καὶ ἁπλῶς. οἷον, εἰ ὁ Ἰνδὸς * ὅλως μέλας ὢν, λευκός ἐστι τοὺς ὀδόντας· λευκὸς ἄρα, καὶ οὐ λευκός ἐστι. ἢ εἰ ἄμφω πῇ, ὅτι ἅμα τὰ ἐναντία ὑπάρχει. τὸ δὲ τοιοῦτον ἐπ' ἐνίων μὲν παντὶ θεωρῆσαι ῥᾴδιον. οἷον, εἰ λαβὼν μέλανα εἶναι τὸν Αἰθίοπα τοὺς ὀδόντας, ἔροιτο εἰ λευκός. εἰ οὖν ταύτῃ λευκὸς, ὅτι μέλας, καὶ οὐ μέλας, οἴοιτο διειλέχθαι συλλογιστικῶς, τελειώσας τὴν ἐρώτησιν. ἐπ' ἐνίων δὲ λανθάνει πολλάκις, ἐφ' ὅσων, ὅταν πῇ λέγηται, κἂν τὸ ἁπλῶς δόξειεν ἀκολουθεῖν· καὶ ἐν ὅσοις μὴ ῥᾴδιον θεωρῆσαι, πότερον αὐτῶν κυρίως ἀποδοτέον. γίνεται δὲ τὸ τοιοῦτον ἐν ὅσοις ὁμοίως ὑπάρ- D χει τὰ ἀντικείμενα· δοκεῖ γὰρ ἢ ἄμφω, ἢ μηδέτερον δοτέον ἁπλῶς εἶναι κατηγορεῖν. οἷον, εἰ τὸ μὲν ἥμισυ, λευκόν· τὸ δὲ ἥμισυ, μέλαν· πότερον λευκὸν, ἢ μέλαν; 4 Οἱ δὲ, παρὰ τὸ μὴ διωρίσθαι τί ἐστι συλλογισμὸς, ἢ τί ἔλεγχος, ἀλλὰ παρὰ τὴν ἔλλειψιν τοῦ λόγου γίνονται· ἔλεγχος μὲν γάρ ἐστιν ἀντίφασις τοῦ αὐτοῦ καὶ ἑνὸς, μὴ ὀνόματος, ἀλλὰ πράγματος καὶ ὀνόματος μὴ συνωνύμου, ἀλλὰ τοῦ αὐτοῦ, ἐκ τῶν δοθέντων, ἐξ ἀνάγκης, μὴ συναριθμουμένου τοῦ ἐν ἀρχῇ, καὶ κατὰ τὸ αὐτὸ, καὶ πρὸς τὸ αὐτὸ, καὶ ὡσαύτως, καὶ ἐν τῷ αὐτῷ χρόνῳ. τὸν αὐτὸν δὲ τρόπον καὶ τὸ ψεύδεσθαι περί τινος. ἔνιοι δὲ ἀπολιπόντες τι τῶν λεχθέντων, φαίνονται ἐλέγχειν. οἷον, ὅτι τὸ αὐτὸ διπλάσιον καὶ οὐ δι- E πλάσιον· τὰ γὰρ δύο, τοῦ μὲν ἑνὸς διπλάσια, τῶν δὲ τριῶν οὐ διπλάσια. ἢ, εἰ τὸ αὐτὸ τοῦ αὐτοῦ διπλάσιον, καὶ οὐ διπλάσιον, ἀλλ' οὐ κατὰ ταὐτό. κατὰ μὲν γὰρ τὸ μῆκος, διπλάσιον· κατὰ δὲ τὸ πλάτος, οὐ διπλάσιον. ἢ, εἰ τοῦ αὐτοῦ, καὶ κατὰ τὸ αὐτὸ, καὶ ὡσαύτως, ἀλλ' οὐχ ἅμα. διόπερ ἐστὶ φαινόμενος ἔλεγχος. ἕλκοι δ' ἄν τις τοῦτον καὶ εἰς τοὺς παρὰ τὴν λέξιν. 5 Οἱ δὲ παρὰ τὸ ἐν ἀρχῇ λαμβάνειν, γίνονται μὲν οὕτως καὶ τοσαυταχῶς, ὁσαχῶς ἐνδέχεται τὸ ἐξ ἀρχῆς αἰτεῖσθαι. φαίνονται δὲ ἐλέγχειν, διὰ τὸ μὴ δύνασθαι συνορᾶν, τὸ ταὐτὸν καὶ τὸ ἕτερον.

* Malim πάντα ταῦτα

* κ. ὅλος

6 Ὁ δὲ παρὰ τὸ ἑπόμενον ἔλεγχος, διὰ τὸ οἴεσθαι ἀντιστρέφειν τὴν ἀκολούθησιν. ὅταν γὰρ τουδὶ ὄντος, ἐξ ἀνάγκης τοδὶ ᾖ· καὶ τοῦδε ὄντος, οἴονται καὶ θάτερον εἶναι ἐξ ἀνάγκης. ὅθεν καὶ αἱ περὶ τὴν δόξαν ἐκ τῆς αἰσθήσεως ἀπάται γίνονται. πολλάκις γὰρ τὴν χολὴν, μέλι ὑπολαμβανόμενον εἶναι, διὰ τὸ ἕπεσθαι τὸ ξανθὸν χρῶμα τῷ μέλιτι. καὶ ἐπεὶ συμβαίνει τὴν γῆν ὕσαντος γίνεσθαι διάβροχον· κἂν ᾖ διάβροχος, ὑπολαμβανόμεν ὗσαι· τὸ δὲ, οὐκ ἀναγκαῖον. 7 Ἔν τε τοῖς ῥητορικοῖς, αἱ κατὰ τὸ σημεῖον ἀποδείξεις, ἐκ τῶν ἑπομένων εἰσί. βουλόμενοι γὰρ δεῖξαι ὅτι μοιχὸς, τὸ ἑπόμενον ἔλαβον, ὅτι καλλωπιστὴς, ἢ ὅτι νύκτωρ ὁρᾶται πλανώμενος. πολλοῖς δὲ ταῦτα μὲν ὑπάρχει, τὸ δὲ κατηγορούμενον οὐχ ὑπάρχει. 8 Ὁμοίως δὲ καὶ ἐν τοῖς συλλογιστικοῖς. οἷον, ὁ Μελίσσου λόγος, ὅτι ἄπειρον τὸ ἅπαν· λαβὼν τὸ μὲν ἅπαν, * ἀγέννητον· (ἐκ γὰρ μὴ ὄντος, οὐδὲν ἂν γενέσθαι) τὸ δὲ γενόμενον, ἐξ ἀρχῆς γενέσθαι. εἰ οὖν μὴ γέγονεν, ἀρχὴν οὐκ ἔχει τὸ πᾶν· ὥστε ἄπειρον. οὐκ ἀνάγκη δὲ τοῦτο συμβαίνειν. οὐ γὰρ, εἰ τὸ γενόμενον ἅπαν ἀρχὴν ἔχει· καὶ εἴ τι ἀρχὴν ἔχει, γέγονεν· ὥσπερ, οὐδ᾽ εἰ ὁ πυρέττων, θερμὸς, ἀνάγκη καὶ τὸν θερμὸν πυρέττειν. 9 Ὁ δὲ παρὰ τὸ μὴ αἴτιον, ὡς αἴτιον, ὅταν προσληφθῇ τὸ ἀναίτιον, ὡς παρ᾽ ἐκεῖνο γινομένου τοῦ ἐλέγχου. συμβαίνει δὲ τὸ τοιοῦτον ἐν τοῖς εἰς τὸ ἀδύνατον συλλογισμοῖς· ἐν τούτοις γὰρ ἀναγκαῖον ἀναιρεῖν τι τῶν κειμένων. ἐὰν οὖν καταριθμηθῇ ἐν τοῖς ἀναγκαίοις ἐρωτήμασι πρὸ τοῦ συμπεράσματος τὸ συμβαῖνον ἀδύνατον, δόξει παρὰ τοῦτο γίνεσθαι πολλάκις ὁ ἔλεγχος· οἷον, ὅτι οὐκ ἔστι ψυχὴ καὶ ζωὴ ταὐτόν. εἰ γὰρ φθορᾷ γένεσις ἐναντίον, καὶ τῇ τινὶ φθορᾷ ἔσται τις γένεσις ἐναντίον· ὁ δὲ θάνατος, φθορά τις, καὶ ἐναντίον ζωῇ· ὥστε γένεσις ἡ ζωὴ καὶ τὸ ζῆν, γίνεσθαι· τοῦτο δὲ, ἀδύνατον· οὐκ ἄρα ταὐτὸν ἡ ψυχὴ καὶ ἡ ζωή. οὐ δὴ συλλελόγισται· συμβαίνει γὰρ, κἂν μή τις ταὐτὸν φῇ τῇ ψυχῇ τὴν ζωὴν, τὸ ἀδύνατον. ἀλλὰ μόνον, ἐναντίον ζωὴν μὲν θανάτῳ ὄντι φθορᾷ, φθορᾷ δὲ γένεσιν· ἀσυλλόγιστοι μὲν οὖν ἁπλῶς οὐκ εἰσὶν οἱ τοιοῦτοι λόγοι· πρὸς δὲ τὸ κείμενον, ἀσυλλόγιστοι. καὶ λανθάνει πολλάκις οὐχ ἧττον αὐτοὺς τοὺς ἐρωτῶντας τὸ τοιοῦτον. 10 Οἱ μὲν οὖν παρὰ τὸ ἑπόμενον, καὶ παρὰ τὸ μὴ αἴτιον λόγοι, τοιοῦτοί εἰσιν. 11 Οἱ δὲ παρὰ τὸ τὰ δύο ἐρωτήματα ἓν ποιεῖν, ὅταν λανθάνῃ πλείω ὄντα, καὶ ὡς ἑνὸς ὄντος ἀποδοθῇ ἀπόκρισις μία. ἐπ᾽ ἐνίων μὲν οὖν ῥᾴδιον ἰδεῖν ὅτι πλείω, καὶ ὅτι οὐ δοτέον ἀπόκρισιν· οἷον, πότερον ἡ γῆ, θάλαττά ἐστιν, ἢ οὐρανός; ἐπ᾽ ἐνίων δὲ, ἧττον· καὶ * ὡς ἑνὸς ὄντος, διδόασιν ἀπόκρισιν, καὶ ἐλέγχονται, ἢ ὁμολογοῦσι τῷ μὴ ἀποκρίνεσθαι τὸ ἐρωτώμενον, * καὶ ἐλέγχεσθαι φαίνονται· οἷον, ἆρα οὗτος καὶ οὗτός ἐστιν ἄνθρωπος; ὥστε ἄν τις τύπτῃ τοῦτον καὶ τοῦτον, ἄνθρωπον, ἀλλ᾽ οὐκ ἀνθρώπους, τυπτήσει· ἢ πάλιν, ὧν τὰ μὲν, ἐστὶν ἀγαθὰ, τὰ δὲ, οὐκ ἀγαθὰ, πάντα ταῦτα ἀγαθὰ, ἢ οὐκ ἀγαθά; ὁπότερον γὰρ ἂν φῇ, ἔστι μὲν ὡς ἔλεγχον, ἢ ψεῦδος φαινόμενον δόξειεν ἂν * εἰπεῖν· τὸ γὰρ φάναι τῶν μὴ ἀγαθῶν εἶναί τι ἀγαθὸν, ἢ τῶν ἀγαθῶν μὴ ἀγαθὸν, ψεῦδος. ὁτὲ δὲ, προσληφθέντων τινῶν, κἂν ἔλεγχος γίνοιτο ἀληθινός. οἷον, εἴ τις δοίη, ὁμοίως ἓν καὶ πολλὰ λέγεσθαι λευκὰ, καὶ γυμνὰ, καὶ τυφλά. εἰ γὰρ τυφλὸν, τὸ μὴ ἔχον

* γρ. ἀγένητον

* γρ. ὡς ἑνὸς ὄντος ἢ ὁμολογοῦσι, τῷ μὴ ἀποκρίν.

* γρ. ἢ ἐλ. φ.

* γρ. ποιεῖν

A 6 Propter conſequens elenchus *videtur*, quia *nonnulli* putant reciprocari conſecutionẽ. quando.n. ſi illud ſit, neceſſariò hoc eſt, etiã putant, ſi hoc ſit, alterũ neceſſariò eſſe. vnde etiam in opinione ex ſenſu deceptiones fiunt. ſępe.n. fel pro melle accipimus, quia melli conſequens eſt flauus color: & quoniam accidit, vt terra cũ pluit, madefiat: etiam pluiſſe exiſtimamus, ſi madida ſit *terra*. ſed hoc nõ *eſt* neceſſarium. 7 Oratoriæ quoq; demonſtrationes, quæ à ſigno *ducuntur*, ex conſequentibus ſunt. nam volentes oſtendere mœchũ eſſe, conſequens ſumũt, *nimirum* accuratiùs eſſe comptũ, aut noctu oberrantem conſpici. multis autem hæc inſunt, B *quibus* attributum non ineſt. 8 Similiter *accidit* in *probationibus* ſyllogiſticis: cuiuſmodi *eſt* illa Meliſſi ratio, *qua probare nititur* vniuerſum eſſe infinitum, ſumptis *his principiis*, Vniuerſitatem eſſe ingenitã: (ex eo namque, quod nõ eſt, fieri nihil poſſe) quod autem genitum *eſt*, ex principio genitũ eſſe. quare ſi vniuerſum nõ eſt genitum, principium non habet: proinde *eſt* infinitũ. Atqui neceſſe non *eſt* hoc euenire. non.n. ſi quicquid genitum eſt, principiũ habet; etiam ſi quid principium habet, genitũ eſt: quemadmodum nec ſi febricitans *eſt* calidus, neceſſe *eſt* etiam calidũ febricitare. 9 Ex eo autem, quòd non cauſa, *accipitur* pro cauſa, *paralogiſmus eſt*, cùm adſumpta fuerit non cauſa, quaſi ob eam fiat C elenchus. Hoc autem accidit in ſyllogiſmis *ducentibus* ad impoſſibile: quoniam in his neceſſe *eſt* refellere aliquid eorum quæ poſita fuerũt. ſi igitur numeratũ ſit in neceſſariis interrogationibus ante concluſionẽ eueniẽs illud impoſſibile, ſæpe videbitur ob id fieri elenchus: verbi gratiâ, non idem eſſe animam & vitam: quia ſi interitui ortus *eſt* cõtrarius, etiam cuidam interitui erit quidam ortus contrarius: atqui mors *eſt* interitus quidam, & vitæ cõtraria: quare vita *eſt* ortus: & viuere *eſt* oriri: ſed hoc *eſt* impoſſibile: non *ſunt* igitur idem anima & vita. *Hoc* verò non eſt concluſum ſyllogiſmo: quoniam euenit impoſſibile, etiam ſi quis non aſſerat vitam *eſſe* idem atque animam: ſed tantùm, morti, D quæ eſt interitus, vitam *eſſe* contrariam; interitui autem ortũ. Ergo huiuſcemodi argumentationes non ſunt ad concludẽdũ ineptæ omnino, ſed propoſitum non concludunt. atque eiuſmodi *vitium* plerũq; nõ minùs ipſos interrogantes latet. 10 Ex conſequẽte igitur, & ex nõ cauſa argumẽtationes eiuſmodi ſunt. 11 Hæ verò ex eo quòd duæ interrogationes pro vna accipiũtur, cũ latet plures eſſe, & quaſi vna ſit *interrogatio*, datur vna reſpõſio. Sanè quaſdã facile *eſt* animaduertere multas *eſſe*, nec dandã eſſe reſponſionẽ *vnam*: veluti, vtrũ terra eſt mare, an cœlũ? in nonnullis autẽ, minùs *perſpicitur*: & quaſi vna ſit *interrogatio*, reſponſionẽ dant: ac re- E darguũtur elencho: aut aſſentiuntur. quia non reſpondent quod rogatum eſt, & redargui videntur. velvti, Num hic & hic eſt homo? quare ſi quis hũc & hunc verberet, hominẽ, non homines, verberabit. Aut rurſum, Quorum alia ſunt bona, alia non bona; hæc omnia *ſuntne* bona, an non bona? vtrũvis enim dixerit, fieri poteſt, vt *aut in* elenchũ *incidere*, aut quod videtur falſum, dicere videatur. nã ſiue dicatur aliquid eorum, quę non *ſunt* bona, eſſe bonum, ſiue *aliquid* eorum, quæ *ſunt* bona, nõ *eſſe* bonum: falſum *dicitur*. Interdum verò aſſumptis quibuſdam etiam verus elenchus fieri poteſt. velvti, ſi quis conceſſerit, æquè vnum ac multa dici alba, & nuda, & cæca. nam ſi cæcum *eſt*, quod non habet

aſpectum, cùm ſit naturâ comparatum vt habeat: etiam cæca erunt, quę non habent, cũ naturâ ſint comparata vt habeant. quãdo igitur aliud habet, aliud non habet: ambo videbunt, aut cæca erunt: quod *eſt* impoſſibile.

A ὄψιν, πεφυκὸς δὲ ἔχειν· καὶ τυφλὰ ἔσται τὰ μὴ ἔχοντα, πεφυκότα δὲ ἔχειν. ὅταν οὖν τὸ μὲν, ἔχῃ, τὸ δὲ, μὴ ἔχῃ· τὰ ἄμφω ἔσται ἢ ὁρῶντα, ἢ τυφλά· ὅπερ ἀδύνατον.

Reductio omnium fallaciarum ad ignorationem elenchi

Cap. VI.

2 ¶ Protheſis. 2 ¶ Generalis expoſitio. 3 ¶ Specialis expoſitio. De fallaciis in dictione conſiſtentibus. 4 De fallacia accidentis. 5 De fallacia ſecundùm quid. 6 De ignoratione elenchi. 7 De petitione quæſiti propoſiti. De non cauſa. 8 De fallacia conſequentis. 9 De pluribus interrogationibus. 10 ¶ Epilogus.

AVt igitur ſic diuidendi ſunt, qui videntur ſyllogiſmi, & elenchi: aut omnes reuocandi ad ignorantiam elenchi, hac pro principio ſumpta. licet.n. omnes dictos modos reſoluere in elẽchi definitionem. 2 Ac primũ, ſi ſint inepti ad concludẽdum. oportet.n. ex iis quæ poſita *ſunt*, effici concluſionem, adeo vt neceſſariò dicatur, non *effici tãtùm* videatur. 3 Deinde & ſecundùm partes definitionis. Nam eorum *paralogiſmorũ*, qui in dictione *cernũtur*, nonnulli ex duplici *ſignificatione* oriuntur: cuiuſmodi eſt homonymia, & *ambigua* oratio, & *dictionis* figura ſimilis. ſolẽt.n. *hæc* omnia, quaſi hoc aliquid ſignificantia *vſurpari*. Compoſitio verò & diuiſio, & accentus *ideò captionẽ efficiunt*, quòd non eadem eſt oratio, vel nomen *eſt* diuerſum: oportebat autem & hoc *idẽ eſſe*, quemadmodũ res eadem *eſt*, ſi futurus eſt elenchus, aut ſyllogiſmus, vtputà ſi tunica *concludi debet*: non *oportet* veſtem concludere, ſed tunicam. quamvis.n. id verum *ſit*, tamen non eſt ſyllogiſmo concluſum: ſed adhuc interrogatione eſt opus, *vt* idem ſignificare *aſſumatur*, erga quærentem quid ita? 4 *Paralogiſmi* autem, qui ex accidente *ſumuntur*, definito ſyllogiſmo fiunt manifeſti. oportet.n. eandem eſſe definitionem elenchi, præterquam quòd adiungitur contradictio: nã elenchus *eſt* ſyllogiſmus contradictionis. quare ſi non eſt ſyllogiſmus accidentis, non fit elenchus. non.n. ſi, cùm ea ſunt, neceſſe *eſt* hoc eſſe, hoc autem eſt album, neceſſe *eſt* album eſſe, propter ſyllogiſmũ. nec ſi triangulum duobus rectis æquales *angulos* habet: ei autem accidit, vt ſit figura, vel primum, vel principium: *conſequens eſt*, vt figura, vel principium, vel primum ſit tale. non.n. *de eo demõſtratio ſit*, quà *eſt* figura, nec quà primum, ſed quà triãgulum *eſt*. Similiter & in aliis *ſe res habet*. Quapropter ſi elenchus *eſt* ſyllogiſmus quidam: qui ex accidente *eſt*, elenchus eſſe nequit. Sed hinc & artifices & omnino docti ab indoctis redarguuntur: quoniã ex accidente ſyllogiſmos faciunt adverſus ſcientes: hi verò, cùm diuidere non valeãt, aut rogati dant, aut non dantes videntur dediſſe. 5 *Ex eo* verò, quod quadamtenus, vel ſimpliciter *dicitur*, *ducti paralogiſmi in eo verſantur*, quòd nõ de eodem *accipitur* affirmatio & negatio. eius.n. quod quadãtenus *eſt* album, id quod quadamtenus non eſt album, negatio *eſt*. ſi igitur, dato eſſe quadamtenus album, *alius* quaſi ſimpliciter dictum accipiat, non efficit elẽchum, ſed *efficere videtur*, quoniam ignoratur quid ſit elenchus. 6 Maximè autem omniũ perſpicui ſunt, qui ſuprà dicti ſunt ex elenchi definitione: ideóque ſunt ita appellati. nam ob definitionis defectionem fit vt elenchus videatur: &, ſi diuidantur *paralogiſmi*, *ſicut nunc diuiſimus*, *hoc* omnibus commune ponendum *eſt*, definitionis (inquam) defectio.

B Ἤδη οὕτως διαιρετέον τοὺς φαινομένους συλλογισμοὺς καὶ ἐλέγχους· ἢ πάντας ἀνακτέον εἰς τὴν τοῦ ἐλέγχου ἄγνοιαν, ἀρχὴν ταύτην ποιησαμένοις. ἔστι γὰρ ἅπαντας ἀναλῦσαι τοὺς λεχθέντας τρόπους εἰς τὸν τοῦ ἐλέγχου διορισμόν. 2 Πρῶτον μὲν, * εἰ ἀσυλλόγιστοι. δεῖ γὰρ ἐκ τῶν κειμένων συμβαίνειν τὸ συμπέρασμα, ὥστε λέγειν ἐξ ἀνάγκης, ἀλλὰ μὴ φαίνεσθαι. 3 Ἔπειτα καὶ κατὰ τὰ μέρη τοῦ διορισμοῦ. τῶν μὲν γὰρ ἐν τῇ λέξει, οἱ μέν εἰσι παρὰ τὸ διττὸν, οἷον ἥτε ὁμωνυμία, καὶ ὁ λόγος, καὶ ἡ ὁμοιοσχημοσύνη· σύνηθες γὰρ τὸ πάντα ὡς τόδε τι σημαίνειν· ἡ δὲ C σύνθεσις, καὶ ἡ διαίρεσις, καὶ ἡ προσῳδία, τῷ μὴ τὸν αὐτὸν εἶναι τὸν λόγον, ἢ τοὔνομα διαφέρον. ἔδει δὲ καὶ τοῦτο, καθάπερ καὶ τὸ πρᾶγμα ταὐτὸν, εἰ μέλλει ἔλεγχος, ἢ συλλογισμὸς ἔσεσθαι· οἷον, εἰ λώπιον, μὴ ἱμάτιον συλλογίσασθαι, ἀλλὰ λώπιον. ἀληθὲς μὲν γὰρ κἀκεῖνο· ἀλλ' οὐ συλλελόγισται· ἀλλ' ἔτι ἐρωτήματος δεῖ, ὅτι ταὐτὸν σημαίνει, πρὸς τὸν ζητοῦντα τὸ διὰ τί. 4 Οἱ δὲ παρὰ τὸ συμβεβηκὸς, ὁρισθέντος τοῦ συλλογισμοῦ, φανεροὶ γίνονται. τὸν αὐτὸν γὰρ ὁρισμὸν δεῖ καὶ τοῦ ἐλέγχου γίνεσθαι, πλὴν προσκεῖσθαι τὴν ἀντίφασιν· ὁ γὰρ ἔλεγχος, συλλογισμὸς D ἀντιφάσεως. Εἰ οὖν μὴ ἔστι συλλογισμὸς τοῦ συμβεβηκότος, οὐ γίνεται ἔλεγχος. οὐ γὰρ, εἰ τούτων ὄντων, ἀνάγκη τόδε εἶναι, τοῦτο δὲ ἐστι λευκὸν, ἀνάγκη λευκὸν εἶναι διὰ τὸν συλλογισμόν. οὐδ' εἰ τὸ τρίγωνον δυοῖν ὀρθαῖν ἴσας ἔχει, συμβέβηκε δὲ αὐτῷ, σχήματι εἶναι, ἢ πρώτῳ, ἢ ἀρχῇ· ὅτι σχῆμα, ἢ ἀρχὴ, ἢ πρῶτον τοιοῦτόν ἐστιν. οὐ γὰρ ᾗ σχῆμα, οὐδ' ᾗ πρῶτον, ἀλλ' ᾗ τρίγωνον, ἡ ἀπόδειξις. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. ὥστε, εἰ ὁ ἔλεγχος, συλλογισμός τις· οὐκ ἂν εἴη ὁ κατὰ συμβεβηκὸς, ἔλεγχος. ἀλλὰ παρὰ τοῦτο καὶ οἱ τεχνῖται, καὶ ὅλως οἱ ἐπιστήμονες ὑπὸ τῶν ἀνεπιστημόνων ἐλέγχονται· κατὰ συμβεβηκὸς γὰρ ποιοῦνται τοὺς συλλογισμοὺς πρὸς τοὺς E εἰδότας. οἱ δ' οὐ δυνάμενοι διαιρεῖν, ἢ ἐρωτώμενοι διδόασιν, ἢ οὐ διδόντες, οἴονται δεδωκέναι. 5 Οἱ δὲ παρὰ τὸ πῇ καὶ ἁπλῶς, ὅτι οὐ κατὰ τοῦ αὐτοῦ ἡ κατάφασις καὶ ἀπόφασις. τοῦ γὰρ πῇ λευκοῦ, τὸ πῇ οὐ λευκόν· τοῦ δ' ἁπλῶς λευκοῦ, τὸ ἁπλῶς οὐ λευκὸν, ἀπόφασις. εἰ οὖν, δόντος τὸ πῇ εἶναι λευκὸν, ὡς ἁπλῶς εἰρημένον λαμβάνει, οὐ ποιεῖ ἔλεγχον· φαίνεται δὲ διὰ τὴν ἄγνοιαν τοῦ τί ἐστι ἔλεγχος. 6 Φανερώτατοι δὲ πάντων οἱ πρότερον λεχθέντες παρὰ τὸν τοῦ ἐλέγχου διορισμόν· διὸ καὶ προσηγορεύθησαν οὕτως· παρὰ γὰρ τοῦ λόγου τὴν ἔλλειψιν ἡ φαντασία γίνεται· καὶ διαιρουμένοις οὕτως, κοινὸν ἐπὶ πᾶσι τούτοις θετέον τὴν τοῦ λόγου ἔλλειψιν.

CAP. V.

* γ. εἰ ἀσυμ.

7 Οἵ τε παρὰ τὸ λαμβάνειν τὸ ἐν ἀρχῇ, καὶ τὸ ἀναίτιον ὡς αἴτιον τιθέναι, δῆλοι διὰ τοῦ ὁρισμοῦ. δεῖ γὰρ τὸ συμπέρασμα τῷ ταῦτα εἶναι συμβαίνειν, ὅπερ οὐκ ἦν ἐν τοῖς ἀναιτίοις. καὶ πάλιν μὴ ἀριθμουμένου τοῦ ἐξ ἀρχῆς, ὅπερ οὐκ ἔχουσιν οἱ παρὰ τὴν αἴτησιν τοῦ ἐν ἀρχῇ. 8 Οἱ δὲ παρὰ τὸ ἑπόμενον, μέρος εἰσὶ τοῦ συμβεβηκότος· τὸ γὰρ ἑπόμενον συμβέβηκε· διαφέρει δὲ τοῦ συμβεβηκότος, ὅτι τὸ μὲν συμβεβηκός, ἔστιν ἐφ᾽ ἑνὸς μόνου λαβεῖν οἷον, ταὐτὸν εἶναι τὸ ξανθὸν καὶ τὸ μέλι, καὶ τὸ λευκὸν καὶ κύκνον· τὸ δὲ παρὰ τὸ ἑπόμενον, ἀεὶ ἐν πλείοσι· τὰ γὰρ ἑνὶ καὶ ταὐτῷ ταὐτὰ, καὶ ἀλλήλοις ἀξιοῦμεν εἶναι ταὐτά. διὸ γίνεται ὁ παρὰ τὸ ἑπόμενον ἔλεγχος. ἔστι δ᾽ οὐ πάντως ἀληθές. οἷον, ἂν ἡ λευκὸν κατὰ συμβεβηκός· καὶ γὰρ ἡ χιὼν καὶ ὁ κύκνος τῷ λευκῷ ταὐτόν. ἢ πάλιν, ὡς ἐν τῷ Μελίσσου λόγῳ, τὸ αὐτὸ λαμβάνει εἶναι τὸ γεγενῆσθαι καὶ ἀρχὴν ἔχειν. ἢ τὸ ἴσοις γίνεσθαι καὶ ταὐτὸ μέγεθος λαμβάνειν. ὅτι γὰρ τὸ γεγονὸς ἔχει ἀρχὴν, καὶ τὸ ἔχον ἀρχὴν, γεγενῆσθαι ἀξιοῖ· ὡς ἄμφω ταὐτὰ ὄντα, τῷ ἀρχὴν ἔχειν, τὸ γεγονὸς, καὶ τὸ πεπερασμένον. ὁμοίως δὲ καὶ ἐπὶ τῶν ἴσων γινομένων, εἰ τὰ τὸ αὐτὸ καὶ ἓν μέγεθος λαμβάνοντα, ἴσα γίνεται· καὶ τὰ ἴσα γινόμενα, ἓν μέγεθος λαμβάνει, ὥστε τὸ ἑπόμενον λαμβάνει. ἐπεὶ οὖν ὁ παρὰ τὸ συμβεβηκὸς ἔλεγχος, ἐν τῇ ἀγνοίᾳ τοῦ ἐλέγχου· φανερὸν ὅτι καὶ ὁ παρὰ τὸ ἑπόμενον. ἐπισκεπτέον δὲ τοῦτο καὶ ἄλλως. 9 Οἱ δὲ παρὰ τὸ τὰ πλείω ἐρωτήματα ἓν ποιεῖν, ἐν τῷ μὴ διαρθροῦν ἡμᾶς, ἢ μὴ διαιρεῖν τὸν λόγον τῆς προτάσεως. ἡ γὰρ πρότασίς ἐστιν ἓν καθ᾽ ἑνός. ὁ γὰρ αὐτὸς ὅρος ἑνὸς μόνου, καὶ ἁπλῶς τοῦ πράγματος· οἷον, ἀνθρώπου, καὶ ἑνὸς μόνου ἀνθρώπου. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. εἰ οὖν μία μόνη πρότασις, ἡ ἓν καθ᾽ ἑνὸς ἀξιοῦσα· καὶ ἁπλῶς ἔσται πρότασις, ἡ τοιαύτη ἐρώτησις. ἐπεὶ δ᾽ ὁ συλλογισμὸς, ἐκ προτάσεων· ὁ δὲ ἔλεγχος, συλλογισμός· καὶ ὁ ἔλεγχος ἔσται ἐκ προτάσεων. εἰ οὖν ἡ πρότασις, ἓν καθ᾽ ἑνός· φανερὸν ὅτι καὶ οὗτος ἐν τῇ τοῦ ἐλέγχου ἀγνοίᾳ· φαίνεται γὰρ εἶναι πρότασις, ἡ οὐκ οὖσα πρότασις. εἰ μὲν οὖν δέδωκεν ἀπόκρισιν, ὡς πρὸς μίαν ἐρώτησιν, ἔσται ἔλεγχος· εἰ δὲ μὴ δέδωκεν, ἀλλὰ φαίνεται, φαινόμενος ἔλεγχος. 10 Ὥστε πάντες οἱ τρόποι πίπτουσιν εἰς τὴν τοῦ ἐλέγχου ἄγνοιαν· οἱ μὲν οὖν παρὰ τὴν λέξιν, ὅτι φαινομένη ἀντίφασις, ὅπερ ἦν ἴδιον τοῦ ἐλέγχου· οἱ δ᾽ ἄλλοι, παρὰ τὸν τοῦ συλλογισμοῦ ὅρον.

A 7 *Sed & hi*, qui ex eo *ducuntur*, quòd ſumitur *quæſitũ* initio *propoſitum*, *& qui ex eo* quòd ponunt non cauſam pro cauſa, per *elenchi* definitionem *ſunt* manifeſti. oportet. n. concluſionẽ euenire, eo quòd illa ſint, *quæ fuerunt poſita*: quod certè non eſt in non cauſis. rurſus non connumerato eo quod ab initio *quæſitum fuit*: quod *requiſitum* non habent, qui propter petitionẽ *quæſiti* initiò *propoſiti* peccat. 8 Qui verò ex conſequente *ducũtur*, accidentis pars ſunt, nã conſequens accidit: ſed *eo* differt ab accidente, quòd licet in vno tãtùm accidens ſumere: vt puta idem eſſe flauum & mel, necnon album & cycnũ: B quod verò ex accidẽte *ducitur*, ſemper in pluribus *cernitur*. nam quæ vni & eidem *ſunt* eadem, etiam inter ſe eadem eſſe poſtulamus: vnde oritur elenchus, qui ex conſequente *appellatur*. *Id* autem non eſt omnino verum: velut ſi album ſit ex accidẽte: etenim nix & cycnus, quod ad alborẽ, idem *ſunt*. aut rurſus vt in Meliſſi ratione: *qui* idẽ eſſe ſumit Factum eſſe, & Principium habere. aut *idem eſſe*, Fieri æqualia, & Eãdem magnitudinem accipere. nam quia quod factum eſt, principium habet: & quod principium habet, factum eſſe poſtulat ſibi concedi: quaſi hæc duo, factum & finitum, eadem ſint, propterea quòd *vtraque* principium habent. C ſimiliter & in iis quæ æqualia fiũt, ſi ea quæ vnam & eãdem magnitudinem accipiunt, æqualia fiũt: *viciſſim* etiam, quæ æqualia fiũt, vnam magnitudinem accipiunt. Itaque conſequens ſumit. Quoniam igitur elenchus ex accidente *ductus*, in ignorantia elẽchi *cernitur*: apparet eodem referri etiam *elenchum* ex conſequente. *Eſt* autem hoc & alio modo conſiderandum. 9 Qui verò *ex eo ducuntur*, quòd ex pluribus interrogationibus vna fit, in eo *conſiſtunt*, quòd non articulatim ſeu non diſtinctè expendimus definitionem propoſitionis. nam propoſitio eſt vnũ de vno. *eſt*. n. eadem definitio vnius D tantùm, & ſimpliciter rei: vt hominis, & vnius tantùm hominis. ſimilitérque in aliis *res habet*. ſi igitur vna tãtùm propoſitio *eſt*, quæ vnum de vno poſtulat: etiam ſimpliciter propoſitio erit interrogatio eiuſmodi. quia verò ſyllogiſmus ex propoſitionibus *conſtat*, elenchus autem *eſt* ſyllogiſmus, etiam elenchus erit ex propoſitionibus. Quocirca ſi propoſitio *eſt* vnum de vno, apparet etiam hunc in elenchi ignorantia *verſari*: videtur. n. eſſe propoſitio, quæ non eſt propoſitio. Itaque ſi reſpõſionem dedit quaſi ad vnã interrogationẽ, erit elenchus. ſi non dedit, ſed videtur *dediſſe*, videbitur elenchus. 10 Quare omnes modi cadunt in elenchi ignorantiam: illi quidem, qui in dictione *conſiſtunt*, quia videtur contradictio, quod erat proprium elenchi: reliqui autem propter ſyllogiſmi definitionem.

Rationes deceptionum. Cap. VII.

1 De homonymia, & amphibolia. 2 De compoſitione, & diuiſione. 3 De non accentu. 4 De figura dictionis. 6 De accidente. 7 De conſequente. 8 De ignorantia elenchi. De eo quod eſt non ſimpliciter. 9 De petitione quæſiti in initio propoſiti. De non cauſa. De pluribus interrogationibus.

CAP. VI.

Ἡ δ᾽ ἀπάτη γίνεται, τῶν μὲν παρὰ τὴν ὁμωνυμίαν, καὶ τὸν λόγον, τῷ μὴ δύνασθαι διαιρεῖν τὸ πολλαχῶς λεγόμενον. ἔνια γὰρ οὐκ εὔπορον διαιρεῖν οἷον τὸ ἓν, καὶ τὸ ὂν, καὶ τὸ ταὐτόν. 2 Τῶν δὲ παρὰ τὴν σύνθεσιν, καὶ διαίρεσιν, τῷ μηδὲν οἴεσθαι διαφέρειν συντιθέμενον, ἢ διαιρούμενον τὸν λόγον, καθάπερ ἐπὶ τῶν πλείστων. 3 Ὁμοίως δὲ καὶ ἐπὶ τῶν παρὰ τὴν προσῳδίαν. οὐ γὰρ ἄλλο δοκεῖ σημαίνειν ἀνιέμενος, καὶ ἐπιτεινόμενος ὁ λόγος, ἐπ᾽ οὐδενός, ἢ οὐκ ἐπὶ πολλῶν.

E Porrò nos fallunt *paralogiſmi*, qui ex homonymia, & *qui* ex *ambigua* oratione *ducuntur*: quia non poſſumus diſtinguere, quod multifariàm dicitur. quorũdam. n. diſtinctio non eſt in promptu: vt Vnius, & Entis, & Eiuſdem. 2 Qui verò ex compoſitione, ac diuiſione: quia nihil putamus intereſſe inter coniunctam & diuiſam orationem, ſicut in plurimis *accidit*. 3 Similis ratio *eſt* eorum qui ex accentu *ducuntur*: aut enim in nulla re, aut *ſaltem* non in multis videtur idem ſignificare contentus & remiſſus ſermo.

4 Qui autem ex figura *dictionis*, propter dictionis A ſimilitudinem. nã difficile *eſt* diſcernere, quæ eodem, & quæ diuerſo modo dicuntur: (ferè.n.qui poteſt hoc facere, prope eſt vt verum perſpiciat, maximè autem ſcit annuere) quicquid.n.alicui attribuitur, exiſtimamus *eſſe* hoc aliquid, & quaſi vnum accipimus. nam vni & ſubſtantiæ maximè videtur conſequẽs eſſe hoc aliquid, & ens. 5 Quocirca inter eos *paralogiſmos*, qui in dictione *conſiſtunt*, hic *fallendi* modus *eſt* ponendus. primũ quia magis decipimur conſiderantes cum aliis, quàm apud noſmet ipſos: nam cõſideratio cum aliis per ſermonem *inſtituitur*: apud noſmet ipſos autem nõ B minùs *fit* per rẽ ipſam. Deinde & per noſmetipſos vt fallamur accidit, cùm in *rebus* conſiderãdis ſermo adhibetur. Præterea deceptio *eſt* ex ſimilitudine: ſimilitudo autem ex dictione. 6 *Paralogiſmi* verò ex accidente *fallunt*: quia non poſſumus diiudicare, quod *eſt* idẽ vel diuerſum, & quod eſt vnũ vel multa: nec quibus attributis omnia eadem ac rei accidant. 7 Similis ratio eſt eorum, qui ex conſequenti ducuntur. nam conſequens *eſt* pars quædam accidentis. Præterea & in multis videtur, & poſtulatur ita, ſi illud ab hoc non ſeparatur, neque hoc ab illo ſeparari. 8 Qui verò ex defectione de- C finitionis *ſumuntur*, & qui ex eo quod quodãmodo vel ſimpliciter dicitur, propter *diſcriminis* exiguitatem fallunt. vniuerſaliter.n.concedimus, quaſi hæc nihil adſignificent, aliquod; quadamtenus, ſimpliciter, quodammodo, nũc. 9 Similis eſt ratio eorum, qui ſumunt *quæſitum* initiò *propoſitum*, & nõ cauſarum, & eorum, qui multas interrogationes faciunt quaſi vnam. in omnibus.n.propter exiguitatem captio *eſt*: quia *ſcilicet* non expendimus accuratè definitionem propoſitionis, & ſyllogiſmi, ob antè dictam cauſam.

A 4 Τῶν δὲ παρὰ τὸ σχῆμα, διὰ τὴν ὁμοιότητα τῆς λέξεως. χαλεπὸν γὰρ διελεῖν, ποῖα ὡσαύτως, καὶ ποῖα ὡς ἑτέρως λέγεται (σχεδὸν γὰρ ὁ τοῦτο δυνάμενος ποιεῖν, ἐγγύς ἐστι τοῦ θεωρεῖν τἀληθὲς, * μάλιστα δ' ἐπίσταται συνεπινεύειν) ὅτι * κ. μάλ. τ. ἐπ. πᾶν τὸ κατηγορούμενόν τινος, ὑπολαμβάνομεν τόδε τι, καὶ ὡς ἓν ὑπακούομεν. τῷ γὰρ ἑνὶ καὶ τῇ οὐσίᾳ μάλιστα δοκεῖ παρέπεσθαι τὸ τόδε τι, καὶ τὸ ὄν. 5 Διὸ καὶ τῶν παρὰ τὴν λέξιν οὗτος ὁ τρόπος θετέος· πρῶτον μὲν, ὅτι μᾶλλον ἡ ἀπάτη γίνεται * μετ' ἄλλων σκοπουμένοις ἢ καθ' ἑαυτούς. ἡ μὲν γὰρ * κ. μετ' ἄλλων μετ' ἄλλων σκέψις, διὰ λόγου· ἡ δὲ καθ' αὑτοὺς, οὐχ ἧττον B δι' αὐτοῦ τοῦ πράγματος. εἶτα, καὶ καθ' αὑτοὺς ἀπατᾶσθαι συμβαίνει, ὅταν ἐπὶ τοῦ λόγου ποιῆται τὴν σκέψιν. ἔτι, ἡ μὲν ἀπάτη, ἐκ τῆς ὁμοιότητος· ἡ δὲ ὁμοιότης, ἐκ τῆς λέξεως. 6 Τῶν δὲ παρὰ τὸ συμβεβηκὸς, διὰ τὸ μὴ δύνασθαι διακρίνειν τὸ ταὐτὸν καὶ τὸ ἕτερον, καὶ τὸ ἓν καὶ τὰ πολλά· μηδὲ τοῖς ποίοις τῶν κατηγορημάτων πάντα ταὐτὰ καὶ τῷ πράγματι συμβέβηκεν. 7 Ὁμοίως δὲ καὶ τῶν παρὰ τὸ ἑπόμενον· μέρος γάρ τι τοῦ συμβεβηκότος, τὸ ἑπόμενον. ἔτι δὲ, καὶ ἐπὶ πολλῶν φαίνεται καὶ ἀξιοῦται οὕτως, εἰ τόδε ἀπὸ τοῦδε μὴ C χωρίζεται, μηδ' ἀπὸ θατέρου χωρίζεσθαι θάτερον. 8 Τῶν δὲ παρὰ τὴν ἔλλειψιν τοῦ λόγου, καὶ τῶν παρὰ τὸ πῇ καὶ ἁπλῶς, ἐν τῷ παρὰ μικρὸν ἡ ἀπάτη. ὡς γὰρ οὐδὲν προσσημαῖνον τὸ τὶ, ἢ πῇ, ἢ τὸ ἁπλῶς, ἢ πῶς, ἢ τὸ νῦν, καθόλου συγχωροῦμεν. 9 Ὁμοίως δὲ καὶ ἐπὶ τῶν ἐν ἀρχῇ λαμβανόντων, καὶ τῶν ἀναιτίων, καὶ ὅσοι τὰ πλείω ἐρωτήματα ὡς ἓν ποιοῦσιν. ἐν ἅπασι γὰρ ἡ ἀπάτη, διὰ τὸ παρὰ μικρόν. οὐ γὰρ διακριβοῦμεν, οὔτε τῆς προτάσεως, οὔτε τοῦ συλλογισμοῦ τὸν ὅρον, διὰ τὴν προειρημένην αἰτίαν.

Ex locis ſuprà expoſitis colligi non ſolùm eos qui videntur ſyllogiſmi & elenchi, ſed etiam falſos & ſophiſticos.

Cap. VIII.

1 Ex quibus dictum eſt fieri ſyllogiſmos & elenchos apparentes, ex iiſdem fieri ſophiſticos. 2 Sophiſticorum elenchorum genera, & diſtinctio à tentatiuis. 3 Eâdem methodo inueniri ſophiſticos, & tentatiuos. 4 Quot modis fiat elenchus apparens. 5 Sophiſticum non eſſe abſolutè ſyllogiſmum, vel elenchum.

CVm autem teneamus, ex quibus efficiuntur, D qui videntur ſyllogiſmi: tenemus etiam, ex quibus fieri poſſunt ſophiſtici ſyllogiſmi & elẽchi. 2 Voco autem ſophiſticum elenchum & ſyllogiſmum, nõ ſolùm eum, qui videtur ſyllogiſmus, vel elenchus, cùm non ſit; ſed etiam qui *re vera* eſt *ſyllogiſmus vel elenchus*, ſed *falsò* videtur *eſſe* proprius *rei qua de agitur*: tales ſunt, qui non ex re *ipſa* redarguunt, ignorantéſq; detegunt: quod erat piraſticæ *proprium*: (eſt autem piraſtice, pars dialecticæ: quæ quidẽ poteſt falſum concludere propter ignorantiam eius qui argumentationem concedit) ſed ſophiſtici elenchi, etiãſi concludant contradictionẽ, tamen non faciunt manifeſtũ, an *adverſarius* ignoret: quoniam & ſcientẽ impediũt *ſophiſtæ* hiſce argumentationibus. 3 Quòd autem habeantur eadẽ methodo, manifeſtũ *eſt*. nam propter quæ videtur audiẽtibus, vtpote in interrogationẽ deducta, cõcluſum eſſe, propter hęc ipſa videri etiã reſpondẽti poteſt. erunt igitur ſyllogiſmi falſi per hæc aut omnia, aut aliqua. quod enim *ſe* non interrogatus *quiſpiam* dediſſe putat, vtique etiam interrogatus daret.

ΕΠεὶ δ' ἔχομεν παρ' ὅσα γίνονται οἱ φαινόμενοι συλλογισμοὶ, ἔχομεν καὶ παρ' ὁπόσα οἱ σοφιστικοὶ γίνοιντ' ἂν συλλογισμοὶ καὶ ἔλεγχοι. 2 Λέγω δὲ σοφιστικὸν ἔλεγχον, καὶ συλλογισμὸν, οὐ μόνον τὸν φαινόμενον συλλογισμὸν, ἢ ἔλεγχον, μὴ ὄντα δὲ, ἀλλὰ καὶ τὸν ὄντα μὲν, φαινόμενον δὲ οἰκεῖον τοῦ πράγματος. εἰσὶ δὲ οὗτοι, οἱ μὴ κατὰ τὸ πρᾶγμα ἐλέγχοντες καὶ δεικνύοντες ἀγνοοῦντας· ὅπερ ἦν τῆς πειραστικῆς (ἔστι δ' ἡ πειραστικὴ, μέρος τῆς διαλεκτικῆς· αὕτη δὲ δύναται συλλογίζεσθαι ψεῦδος δι' ἄγνοιαν τοῦ διδόντος τὸν λόγον) οἱ δὲ σοφιστικοὶ ἔλεγχοι, ἂν καὶ συλλογίζωνται τὴν ἀντίφασιν, οὐ ποιοῦσι δῆλον εἰ ἀγνοεῖ· καὶ γὰρ τὸν εἰδότα ἐμποδίζουσι τούτοις τοῖς λόγοις. 3 Ὅτι δὲ ἔχομεν αὐτοὺς τῇ αὐτῇ μεθόδῳ, δῆλον. παρ' ὅσα γὰρ φαίνεται τοῖς ἀκούουσιν ὡς ἠρωτημένα συλλελογίσθαι, παρὰ ταῦτα κἂν τῷ ἀποκρινομένῳ δόξειεν. ὥστε ἔσονται συλλογισμοὶ ψευδεῖς διὰ τούτων, ἢ πάντων, ἢ ἐνίων· ὃ γὰρ μὴ ἐρωτηθεὶς οἴεται δεδωκέναι, κἂν ἐρωτηθεὶς * θείη. Cap. VII. * κ. εἴη.

πλὴν ἐπί γε τινῶν ἅμα συμβαίνῃ προσερωτᾶν τὸ ἐνδεές, καὶ τὸ ψεῦδος ἐμφανίζειν. οἷον, ἐν τοῖς παρὰ τὴν λέξιν, καὶ τὸν σολοικισμόν. Εἰ οὖν οἱ παραλογισμοὶ τῆς ἀντιφάσεως, παρὰ τὸν φαινόμενον ἔλεγχόν εἰσι, δῆλον ὅτι παρὰ τοσαῦτα ἂν καὶ τῶν ψευδῶν εἴησαν συλλογισμοί, παρ' ὅσα καὶ ὁ φαινόμενος ἔλεγχος. 4 Ὁ δὲ φαινόμενος, παρὰ τὰ μόρια τοῦ ἀληθινοῦ· ἑκάστου γὰρ ἐκλείποντος, φανείη ἂν ἔλεγχος· οἷον ὁ παρὰ τὸ μὴ συμβαῖνον διὰ τὸν λόγον, ὁ εἰς τὸ ἀδύνατον· καὶ ὁ τὰς δύο ἐρωτήσεις μίαν ποιῶν, ὁ παρὰ τὴν πρότασιν· καὶ ἀντὶ τοῦ καθ' αὑτὸ, ὁ παρὰ τὸ συμβεβηκός· καὶ τὸ τούτου μόριον, ὁ παρὰ τὸ ἑπόμενον· ἔτι, τὸ μὴ ἐπὶ τοῦ πράγματος, ἀλλ' ἐπὶ τοῦ λόγου συμβαίνειν· εἶτ', ἀντὶ τοῦ καθόλου τὴν ἀντίφασιν, καὶ κατὰ ταὐτὸ καὶ πρὸς ταὐτὸ, καὶ ὡσαύτως, παρά τε τὸ ἐπί τι, ἢ παρ' ἕκαστον τούτων· ἔτι, * παρὰ τὸ ἐναριθμουμένου τοῦ ἐν ἀρχῇ τὸ ἐν ἀρχῇ λαμβάνειν. ὥστ' ἔχοιμεν ἂν, παρ' ὅσα γίνονται οἱ παραλογισμοί· παρὰ πλείω μὲν γὰρ οὐκ ἂν εἶεν· παρὰ δὲ τὰ εἰρημένα ἔσονται πάντες. 5 Ἔστι δὲ ὁ σοφιστικὸς ἔλεγχος, οὐχ ἁπλῶς ἔλεγχος, ἀλλὰ πρός τινα· καὶ ὁ συλλογισμὸς ὡσαύτως. * ἂν μὲν γὰρ μὴ λάβῃ, ὅ, τε παρὰ τὸ ὁμώνυμον, ἓν σημαίνειν· καὶ ὁ παρὰ τὴν ὁμοιοσχημοσύνην, τὸ μόνον τόδε· καὶ οἱ ἄλλοι ὡσαύτως, οὔτε ἔλεγχοι, οὔτε συλλογισμοὶ ἔσονται, οὔθ' ἁπλῶς, οὔτε πρὸς τὸν ἐρωτώμενον. ἐὰν δὲ λάβωσι, πρὸς μὲν τὸν ἐρωτώμενον, ἔσονται· ἁπλῶς δὲ, οὐκ ἔσονται· οὐ γὰρ ἓν σημαῖνον εἰλήφασιν, ἀλλὰ φαινόμενον, καὶ παρὰ τοῦδε.

* γ. παρά τι, τὸ ἐν ἀρχῇ, μὴ συναριθμουμένου τοῦ ἐν ἀρχῇ λ. al. παρὰ τὸ αὐτὸ ὃ μὴ συναριθμουμένου ἐν ἀρχῇ, τι.

* γ. ἐὰν μὲν μὴ λ.

A Quamquã in nonnullis accidit, vt ſimul ac adiungitur interrogatio eius quod *ad concluſionẽ perficiendam* deerat, falſitas detegatur: vt in *captionibus*, quę propter dictionem & ſolœciſmũ *fiunt*. Si igitur paralogiſmi contradictionis in eo conſiſtũt, quod videtur elenchus: patet, ex totidem *locis* duci falſos ſyllogiſmos, ex quot *ſumitur* qui videtur elenchus. 4 At qui videtur elenchus, ob *ſingulas* partes veri *elenchi prætermiſſas efficitur*. nam quacumque parte deficiente, videbitur *tantùm, non erit verus elenchus*: vt qui ex eo *ſumitur*, quòd *concluſio* non euenit propter argumẽtationem, *id eſt*, qui ad impoſſibile *ducere tentat*: & qui ex duabus interrogationibus vnã facit, qui *ſcilicet* ob propoſitionem *malè acceptã peccat*: & qui loco eius quod *eſt* per ſe, *id ſumit quod eſt* B per accidens: & huius pars, qui *ducitur* ex conſequenti: præterea non in re, ſed in ſermone contingere: deinde loco contradictionis vniuerſaliter, & ſecundùm idẽ, & ad idem & eodem modo *ſumendæ*, in aliquo *accipere*, aut ſecũdùm vnumquodque horũ *peccare*: præterea quia, connumerato eo quod initio *quæſitum fuit*, *quæſitũ* initio *propoſitum* poſtulatur. Quare tenemus, ex quibus fiunt paralogiſmi: ex pluribus.n. *locis* eſſe nequeunt, ſed ex cõmemoratis *locis* omnes ducentur. 5 Porrò ſophiſticus elenchus non eſt ſimpliciter elenchus, ſed adverſus aliquem: itidémque *ſophiſticus* ſyllogiſmus. niſi enim ſumat, qui ex homonymia *ducitur*, vnam habere ſignificationẽ: & qui ex ſimili *dictionis* figura, *ſignificare* ſolum hoc: & alij eodem modo: neque elenchi, neque ſyllogiſmi erunt, nec ſimpliciter, nec adverſus eum qui interrogatur. ſin *id* ſumant, erunt quidem *elenchi & ſyllogiſmi* adverſus eum qui interrogatur: ſimpliciter autem non erũnt; quia non ſumpſerunt, quod vnam rem ſignificaret, ſed quod *ſignificare* videretur, idque ab hoc reſpondente *dumtaxat*.

De numero elenchorum & de eorum locis. Cap. IX.

1 De numero elenchorum demonſtratiuorum. 2 De numero falſorum elenchorum. 3 Quorum elenchorum loci pertineant ad dialecticum. 4 Diſtinctio elenchorum, qui ſcientiarum proprij ſunt, à dialecticis. 5 De locis expoſitis in Topicis, 6 & eorum ſolutionibus. 7 De locis expoſitis in hoc libro. 8 Concluſio.

CAP. VIII.

Παρ' ὁπόσα δὲ ἐλέγχονται οἱ ἐλεγχόμενοι, οὐ δεῖ πειρᾶσθαι λαμβάνειν ἄνευ τῆς τῶν ὄντων ἐπιστήμης ἁπάντων. τοῦτο δ' οὐδεμιᾶς ἐστὶ τέχνης. ἄπειροι γὰρ ἴσως αἱ ἐπιστῆμαι. ὥστε δῆλον ὅτι καὶ αἱ ἀποδείξεις. ἔλεγχοι δέ εἰσι καὶ ἀληθεῖς. ὅσα γὰρ ἔστιν ἀποδεῖξαι, ἔστι καὶ ἐλέγξαι τὸν θέμενον τὴν ἀντίφασιν τοῦ ἀληθοῦς. οἷον, εἰ σύμμετρον τὴν διάμετρον ἔθηκεν, ἐλέγξειεν ἄν τις τῇ ἀποδείξει, ὅτι ἀσύμμετρος. ὥστε πάντων δεήσει ἐπιστήμονα εἶναι. οἱ μὲν γὰρ, * ἔσονται παρὰ τὰς ἐν γεωμετρίᾳ ἀρχὰς, καὶ τὰ τούτων συμπεράσματα· οἱ δὲ παρὰ τὰς ἐν ἰατρικῇ· οἱ δὲ, παρὰ τὰς τῶν ἄλλων ἐπιστημῶν. 2 Ἀλλὰ μὴν καὶ οἱ ψευδεῖς ἔλεγχοι, ὁμοίως ἐν ἀπείροις. καθ' ἑκάστην γὰρ τέχνην ἐστὶ ψευδὴς συλλογισμός· οἷον, κατὰ γεωμετρίαν ὁ γεωμετρικὸς, καὶ κατὰ ἰατρικὴν ὁ ἰατρικός. λέγω δὲ τὸ κατὰ τέχνην, τὸ κατὰ τὰς ἐκείνης ἀρχάς. 3 Δῆλον οὖν, ὅτι οὐ πάντων τῶν ἐλέγχων, ἀλλὰ τῶν παρὰ τὴν διαλεκτικὴν ληπτέον τοὺς τόπους· οὗτοι γὰρ κοινοὶ πρὸς ἅπασαν τέχνην καὶ δύναμιν. 4 Καὶ τὸν μὲν καθ' ἑκάστην ἐπιστήμην ἔλεγχον, τοῦ ἐπιστήμονός ἐστι θεωρεῖν, εἴτε μὴ ὢν, φαίνεται, εἴτε ἔστι, καὶ διὰ τί· τὸν δὲ ἐκ τῶν κοινῶν καὶ ὑπὸ μηδεμίαν τέχνην, τοῦ διαλεκτικοῦ. 5 Εἰ γὰρ ἔχομεν, ἐξ ὧν οἱ ἔνδοξοι συλλογισμοὶ περὶ ὁτιοῦν, ἔχομεν ἐξ ὧν οἱ ἔλεγχοι· ὁ γὰρ ἔλεγχος, ἐστὶν ἀντιφάσεως συλλογισμός. ὥστε ἢ εἷς

* γρ. ἔσονται

C Ex quot autem *locis* redarguantur qui elẽchis redarguuntur, non eſt tentãdum ſumere ſine rerum omnium ſcientia. hoc autẽ nullius eſt artis *proprium*. infinitæ.n. fortaſſe *ſunt* ſcientiæ: proinde & demonſtrationes. elenchi autẽ ſunt etiam veri. nam quęcumque licet demonſtrare, licebit etiam eum redarguere, qui *theſim* veritati contradicentẽ poſuerit. verbi gratiâ, ſi diametrũ poſuerit habere communem menſuram, redarguere *eum* quiſpiam poteſt, demonſtrans non habere communem mẽſurã. Quare omnium *rerũ* ſcientiam habere oportebit. alij nãque *elenchi* erunt ex geometricis principiis, & horũ concluſionibus: alij ex *principiis* medicis: alij ex *principiis* aliarum ſcientiarum. 2 Sed D & falſi elenchi æquè *ſunt* infiniti: quoniam in vnaquaq; arte eſt falſus ſyllogiſmus: vt in geometria geometricus, & in medicina medicus. dico autem *eſſe* in arte, quod *eſt* ſecũdùm illius principia. 3 Patet igitur, non omnium elenchorum, ſed eorum *tantùm* qui ad dialecticã *pertinent*, locos ſumendos *eſſe*: hi nãque communes ſunt omnibus artibus & facultatibus. 4 Sanè elẽchus, qui in quaque ſcientia cernitur, eſſène videatur, an *reuera* ſit, & quamobrem, diſpicere ad ſciẽtem pertinet. qui verò ex cõmunibus *ſumitur*, nec ſub vllam artem *cadit*, ad dialecticam *ſpectat*. 5 Nam ſi tenemus, ex quibus probabiles ſyllogiſmi de qualibet re fiunt, tenemus *etiam*, ex quibus *probabiles* elenchi *fiant*: elenchus enim eſt contradictionis ſyllogiſmus. quare aut vnus,

aut duo ſyllogiſmi contradictionis, elenchus eſt. tenemus igitur, ex quot *locis* ducũtur, qui *ſunt* huiuſmodi. 6 Quòd ſi hoc tenemus, etiã ſolutiones tenemus: quoniam horum obiectiones, ſolutiones ſunt. 7 Tenemus autem, ex quot *locis* fiunt, qui videntur *elenchi*: videntur, inquam, non cuivis, ſed certis quibuſdam. infiniti enim *loci* ſunt, ſi quis conſideret, ex quibus videntur quibuſlibet. 8 Itaque perſpicuum *eſt*, dialectici eſſe, vt ſumere poſſit, ex quibus per communes *propoſitiones* fiat, qui elenchus eſt, videturve elenchus, vel dialecticus, vel qui videtur dialecticus, vel piraſticus.

A ἢ δύο συλλογισμοὶ ἀντιφάσεως, ἔλεγχός ἐστιν. ἔχομεν ἄρα, παρ' ὁπόσα πάντες εἰσὶν οἱ τοιοῦτοι. 6 Εἰ δὲ τοῦτ' ἔχομεν, καὶ τὰς λύσεις ἔχομεν· αἱ γὰρ τούτων ἐνστάσεις, λύσεις εἰσίν. 7 Ἔχομεν δὲ, παρ' ὁπόσα γίνονται, καὶ τοὺς φαινομένους. φαινομένους δὲ οὐχ ὁτῳοῦν, ἀλλὰ τοῖς τοιοῖσδε· ἀόριστα γὰρ ἐστιν, ἐάν τις σκοπῇ, παρ' ὁπόσα φαίνονται τοῖς τυχοῦσιν. 8 Ὥστε φανερὸν, ὅτι τοῦ διαλεκτικοῦ ἐστι τὸ δύνασθαι λαβεῖν παρ' ὁπόσα γίνεται διὰ τῶν κοινῶν, ἢ ὢν ἔλεγχος, ἢ φαινόμενος ἔλεγχος, ἢ διαλεκτικὸς, ἢ φαινόμενος διαλεκτικὸς, ἢ πειραστικός.

Malè diſputationes diuidi in eas quæ ad nomen, & eas quæ ad ſententiam pertinent.

Cap. X.

1 Protheſis. 2 Præmunitiones. 3 Probatio prima, 4 ſecunda, 5 tertia, 6 quarta, 7 quinta. 8 Quaſdam eſſe diſputationes ad nomen pertinentes. 9 Probatio ſexta, 10 ſeptima. 11 Non opus eſſe vt interrogans diſtinguat.

B Non eſt autem argumentationum differentia quam nonnulli dicunt, quaſdam argumẽtationes ad nomen, alias ad ſententiam pertinere: quippe abſurdum *eſt* exiſtimare quaſdã argumentationes ad nomẽ pertinere, diuerſas autẽ ad ſentẽtiam, non eaſdem. 2 Quid.n. *aliud* eſt non *pertinere diſputationem* ad ſentẽtiam, niſi cùm *is qui argumentatur*, non vtitur nomine *in ea ſignificatione*, in qua *ſe* interrogari putãs, conceſſit *is* qui *fuit* interrogatus: ſed hoc ipſum & ad nomen pertinet. Ad ſententiam verò, cùm, in qua ſignificatione *reſpondens* conceſſerit, *opponens* intellexit. Si quis igitur, cùm nomẽ plura ſignificet, vnam ſignificationem habere putet, *hoc eſt*, & qui interrogat, & qui interrogatur: (vt fortaſſe Ens & Vnum multa ſignificãt: C ſed & reſpõdens, *&* interrogans, Zeno *ſcilicet*, vnã *ſignificationem* eſſe putantes, *hic* interrogauit, *ille reſpondit*: atque eſt argumentatio omnia vnum eſſe *concludens*) hæc diſputatio & ad nomen ſpectat, & ad ſentẽtiam interrogati. Si quis autẽ multis modis accipi putet, ſine dubio *diſputatio* nõ *pertinet* ad ſententiam. 3 Primũ.n. illud pertinere ad nomen, & *ad* ſententiã, in iis argumentationibus cernitur, quæ multas habent ſignificationes. 4 Deinde in quocumque *reſpondente locũ habet*. nam illud, pertinere ad ſententiam, non conſiſtit in argumẽtatione, ſed in eo quòd reſpõdens certo modo affectus ſit ad ea quæ conceduntur. 5 Deinde eædem pertinere omnes poſſunt ad nomẽ; quoniam *pertinere* D ad nomen, in præſentia *nihil aliud* eſt, *quã* non pertinere ad ſententiã. niſi.n. omnes *huc referri poſſunt*, erunt aliquæ aliæ, quæ nec ad nomen, nec ad ſententiam *pertinebunt*: illi autem aiunt *ad alterum horũ generum* omnes argumẽtationes *referri*, ac *ita* diuidunt, *vt dicant* pertinere omnes vel ad nomen, vel ad ſentẽtiam, alias autẽ *præter has* non eſſe. Atqui ex iis ſyllogiſmis, qui ex multiplici *ſignificatione ducuntur*, quidam non ex nomine ſumuntur: abſurdè namque dictum eſt, ad nomen pertinere omnes *captiones*, quæ ex dictione *oriuntur*. ſed certè ſunt quidã paralogiſmi, non eò quod reſpondens ſit ad hos certo modo affectus, ſed quòd ipſa argumẽtatio continet interrogationẽ talem, *id eſt*, multa ſignificantem. 6 Et omnino abſurdũ *eſt* de elencho *ſtatim* differere, nec priùs de ſyllogiſmo. nã elẽchus eſt ſyllogiſmus: quare etiã oportet priùs de ſyllogiſmo quã de falſo elencho *diſpicere*. nam eiuſmodi elẽchus eſt fucatus ſyllogiſmus contradictionis. Idcirco vel in ſyllogiſmo eſt *captionis* cauſa, vel in contradictione,

Οὐκ ἔστι δὲ διαφορὰ τῶν λόγων, ἣν λέγουσί τινες, τὸ εἶναι τοὺς μὲν πρὸς τοὔνομα λόγους, τοὺς δὲ, πρὸς τὴν διάνοιαν· ἄτοπον γὰρ τὸ ὑπολαμβάνειν, ἄλλους μὲν εἶναι πρὸς τοὔνομα λόγους, ἑτέρους δὲ, πρὸς τὴν διάνοιαν, ἀλλ' οὐ τοὺς αὐτούς. 2 Τί γάρ ἐστι τὸ μὴ πρὸς τὴν διάνοιαν, ἀλλ' ἢ ὅταν μὴ χρῆται τῷ ὀνόματι, οἰόμενος ἐρωτᾶσθαι, ἐφ' ᾧ ὁ ἐρωτώμενος ἔδωκε; τὸ αὐτὸ δὲ τοῦτ' ἐστὶ καὶ πρὸς τοὔνομα. τὸ δὲ πρὸς τὴν διάνοιαν, ὅταν ἐφ' ᾧ ἔδωκε, διανοηθῇ. εἰ δή τις, πλείω σημαίνοντος τοῦ ὀνόματος, οἴοιτο ἓν σημαίνειν καὶ ὁ ἐρωτῶν καὶ ὁ ἐρωτώμενος (οἷον ἴσως τὸ ὂν, * ἢ τὸ ἓν πολλὰ σημαίνει, ἀλλὰ καὶ ὁ ἀποκρινόμενος, καὶ ὁ ἐρωτῶν Ζήνων, ἓν οἰόμενος εἶναι, ἠρώτησε· καὶ ἔστιν ὁ λόγος, ὅτι ἓν πάντα) οὗτος πρὸς τοὔνομά ἐστιν καὶ πρὸς τὴν διάνοιαν τοῦ ἐρωτωμένου διειλεγμένος. εἰ δέ γέ τις πολλὰ οἴεται σημαίνειν, δῆλον ὅτι οὐ πρὸς τὴν διάνοιαν. 3 Πρῶτον μὲν γὰρ περὶ τοὺς τοιούτους ἐστὶ λόγους * τὸ πρὸς τοὔνομα, καὶ τὴν διάνοιαν, ὅσοι πλείω σημαίνουσι. 4 Εἶτα περὶ ὁντιναοῦν ἐστιν. οὐ γὰρ ἐν τῷ λόγῳ ἐστὶ τὸ πρὸς τὴν διάνοιαν εἶναι, ἀλλ' ἐν τῷ τὸν ἀποκρινόμενον ἔχειν πως πρὸς τὰ δεδομένα. 5 Εἶτα πρὸς τοὔνομα ἐνδέχεται πάντας αὐτοὺς εἶναι. τὸ γὰρ πρὸς τοὔνομα, τὸ μὴ πρὸς τὴν διάνοιαν εἶναι, ἐστὶν ἐνταῦθα. εἰ γὰρ μὴ πάντες, ἔσονταί τινες ἕτεροι, οἱ οὔτε πρὸς τοὔνομα, οὔτε πρὸς τὴν διάνοιαν· οἱ δέ φασι πάντας, καὶ διαιροῦνται, ἢ πρὸς τοὔνομα, ἢ πρὸς τὴν διάνοιαν εἶναι πάντας, ἄλλους δ' οὔ. ἀλλὰ μὴν ὅσοι συλλογισμοί εἰσι παρὰ τὸ πλεοναχῶς, τούτων εἰσί τινες οὐ παρὰ τοὔνομα. ἀτόπως μὲν γὰρ εἴρηται τὸ παρὰ τοὔνομα φάναι πάντας τοὺς παρὰ τὴν λέξιν. ἀλλ' οὖν εἰσί τινες παραλογισμοὶ, οὐ τῷ τὸν ἀποκρινόμενον πρὸς τούτους ἔχειν πως· ἀλλὰ τῷ τοιόνδ' ἐρώτημα τὸν λόγον αὐτὸν ἔχειν, ὃ πλείω σημαίνει. 6 Ὅλως τε ἄτοπον τὸ περὶ ἐλέγχου διαλέγεσθαι, ἀλλὰ μὴ πρότερον περὶ συλλογισμοῦ· ὁ γὰρ ἔλεγχος, συλλογισμός ἐστιν. ὥστε χρὴ καὶ περὶ συλλογισμοῦ πρότερον, ἢ περὶ ψευδοῦς ἐλέγχου. ἔστι γὰρ ὁ τοιοῦτος ἔλεγχος, φαινόμενος συλλογισμὸς ἀντιφάσεως. διὸ ἢ ἐν τῷ συλλογισμῷ ἔστι τὸ αἴτιον, ἢ ἐν τῇ ἀντιφάσει,

Cap. IX.

* γρ. τὸ ἓν ἢ τὸ

* γρ. τοὺς τοι.

A (προσκεῖσθαι γὰρ δεῖ τὴν ἀντίφασιν) ὁτὲ δ' ἐν ἀμφοῖν, ἂν ᾖ φαινόμενος ἔλεγχος. ἔστι δὲ, ὁ μὲν, τοῦ σιγῶντα λέγειν, ἐν τῇ ἀντιφάσει, οὐκ ἐν τῷ συλλογισμῷ. ὁ δὲ, ἃ μὴ ἔχει τις, δοίη ἂν, ἐν ἀμφοῖν. ὁ δὲ, ὅτι ἡ Ὁμήρου ποίησις, σχῆμα, διὰ τοῦ κύκλου, ἐν τῷ συλλογισμῷ. ὁ δὲ ἐν μηδετέρῳ, ἀληθὴς συλλογισμός. 7 Ἀλλὰ δὴ, ὅθεν ὁ λόγος ἦλθε, πότερον, οἱ ἐν τοῖς μαθήμασι λόγοι, πρὸς τὴν διάνοιάν εἰσιν, ἢ οὔ; καὶ εἴ τινι δοκεῖ πολλὰ σημαίνειν τὸ τρίγωνον, καὶ ἔδωκε, μὴ ὡς τοῦτο τὸ σχῆμα ἐφ' οὗ συνεπεράνατο, ὅτι δύο ὀρθαὶ, πότερον πρὸς τὴν διάνοιαν τούτου διείλεκται τὴν ἐκείνου, ἢ οὔ; 8 Ἔτι, εἰ πολλὰ μὲν σημαίνει τοὔνομα· ὁ δὲ, μὴ νοεῖ, μηδὲ οἴεται· πῶς τοῦτον οὐ* πρὸς τὴν διάνοιαν διείλεκται; ἢ πῶς δεῖ ἐρωτᾶν, B πλὴν διδόντα διαίρεσιν, εἶτ' ἐρωτήσειέ τις, εἰ ἔστι σιγῶντα λέγειν, ἢ οὔ, ἢ ἔστι μὲν ὡς οὐκ, ἔστι δ' ὡς ναί; εἰ δή τις δοίη μηδαμῶς· ὁ δὲ, διαλεχθείη· ἆρ' οὐ πρὸς τὴν διάνοιαν* διείλεκται; καίτοι οὗτος ὁ λόγος δοκεῖ τῶν παρὰ τοὔνομα εἶναι. οὐκ ἄρα ἐστὶ γένος τι λόγων, τὸ πρὸς τὴν διάνοιαν. 9 Ἀλλ' οἱ μὲν, πρὸς τοὔνομά εἰσι· καὶ τοιοῦτοι οὐ πάντες, οὐχ ὅτι οἱ ἔλεγχοι, ἀλλ' οὐδ' οἱ φαινόμενοι ἔλεγχοι. εἰσὶ γὰρ καὶ μὴ παρὰ τὴν λέξιν φαινόμενοι ἔλεγχοι· οἷον, ὁ παρὰ τὸ συμβεβηκὸς, καὶ ἕτεροι. 10 Εἰ δέ τις ἀξιοῖ διαιρεῖν, ὅτι λέγω δὲ σιγῶντα λέγειν, τὰ μὲν, ὡδὶ, τὰ δ', ὡδί· ἀλλὰ τοῦτό γ' ἐστὶ πρῶτον μὲν ἄτοπον, τὸ ἀξιοῦν· ἐνίοτε γὰρ οὐ δοκεῖ τὸ ἐρωτώ- C μενον πολλαχῶς ἔχειν· ἀδύνατον δὲ διαιρεῖν, ὃ μὴ οἴεται. ἔπειτα, τὸ διδάσκειν, τί ἄλλο ἔσται; φανερὸν γὰρ ποιήσει, ὡς ἔχει, τῷ μήτε ἐπεσκεμμένῳ, μήτε εἰδότι, μήτε ὑπολαμβάνοντι, ὅτι ἄλλως λέγεται. ἐπεὶ καὶ ἐν τοῖς μὴ διπλοῖς τί κωλύει τοῦτο ποιεῖν; ἆρα ἴσαι αἱ μονάδες ταῖς δυάσιν ἐν τοῖς τέτταρσι; εἰσὶ δὲ δυάδες, αἱ μὲν, ὡδὶ ἐνοῦσαι· αἱ δὲ, ὡδί. καὶ, ἆρα τῶν ἐναντίων μία ἐπιστήμη, ἢ οὔ; ἔστι δ' ἐναντία τὰ μὲν, γνωστά· τὰ δ', ἄγνωστα. ὥστ' ἔοικεν ἀγνοεῖν, ὁ τοῦτο ἀξιῶν, ὅτι ἕτερον τὸ διδάσκειν τοῦ διαλέγεσθαι· καὶ ὅτι δεῖ τὸν μὲν διδάσκοντα μὴ ἐρωτᾶν, ἀλλ' αὐτὸν δῆλα ποιεῖν· τὸν δ' ἐρωτᾶν.

* κ. ἐν τοῖς

* κ. δ. ὑπὸ τοῖς ὀνόματα, κ.

A (ſi quidem adiungere contradictionem oportet) quandoque in vtriſque, ſi ſit fucatus elenchus. Eſt autẽ *cauſa* huius *captionis*, σιγῶντα λέγειν, in cõtradictione, non in ſyllogiſmo. huius autem, Quę quis non habet, dare põteſt, in vtriſque. huius autẽ, Homeri poëſim eſſe figurã, quia *ſit* circulus, in ſyllogiſmo. qui verò in neutro *peccat*, verus *eſt* ſyllogiſmus. 7 Sed, *vt eò reuertamur*, vnde oratio profecta eſt, argumẽtationes mathematicæ ad ſententiamne pertinent, an non? Ac ſi cui triangulũ multa videatur ſignificare, ac *de eo* cõceſſerit, non quatenus eſt figura, de qua concluditur, quòd *eius anguli ſint* duo recti, éſtne ad illius ſententiam hæc diſputatio, an non? 8 Præterea, ſi nomẽ multa ſignificat, hic verò B nec intelligit, nec putat *multiplicẽ eſſe ſignificationẽ*: quomodo hæc diſputatio non ſpectat ad ſententiam? Aut quo *tandem* modo interrogare oportet, niſi *vt* eum qui diuiſionẽ conceſſit, poſtea interroget aliquis, *verúmne* ſit σιγῶντα λέγειν, necne, an partim non *ſit*, partim ſit? Si quis igitur conceſſerit nullo modo, *contrà* autem alius diſputauerit: nónne erit adverſus ſententiam diſputatũ? Atqui hæc diſputatio videtur ad eas referẽda, quæ ex nomine *oriũtur*. Non eſt igitur *proprium* quoddam genus argumentationum, quod ad ſentẽtiam pertinet. 9 Sed quædam ad nomen ſpectãt: nec tales ſunt omnes non *dico*, qui *ſunt* veri elenchi, ſed ne quidem qui C videntur elenchi: ſunt. n. & qui extra dictionem elenchi videntur: vt qui *ducitur* ex accidẽte, & alij *nonnulli*. 10 Quòd ſi quis putet diſtingui *hoc modo oportere*, alio σιγῶντα λέγειν, partim hoc, partim illo modo: primùm quidem abſurda eſt hæc opinio: quia quod interrogatur, interdum non videtur multis modis accipi: nõ poteſt autem *quis* diuidere, quod non putat *eſſe multiplex*. Deinde docere quid aliud erit? nam declarabit, quomodo *res* habeat, ei qui neque cõſiderabat, neque ſciebat, neque ſuſpicabatur aliter accipi. Nam & in his quæ nõ ſunt duplicia, quid vetat hoc facere? *velut*, Súntne æquales vnitates binariis in quaternario? binarij verò partim hoc, partim illo modo inſunt. &, Contrariorum *éſtne* vna ſcientia, an non? contrariorum autem alia ſunt cognita, alia ignota. Quapropter videtur ignorare, qui hoc putat, aliud eſſe docere, quàm diſſerere; & opus eſſe, vt docens non interroget, ſed ipſe declaret; is autem *qui diſputat*, interroget.

Collatio dialectici, tentantis, ſophiſtici, contentioſi, demonſtrantis, & pſeudographi.

Cap. XI.

1 Diſcrimen demonſtrantis, & tentantis. 2 Diſcrimen dialectici, & ſophiſtæ. 3 Syllogiſmorum contentioſorum ac ſophiſticorum genera. 4 Differentia ſophiſtæ, & contentioſi. 5 Analogia inter contentioſos, dialecticos, pſeudographos, & demonſtrantes. 6 Dialecticum non habere ſubiectum determinatum. 7 Cur demonſtrator non interroget; dialecticus autem interroget. 8 Sub dialectica contineri piraſticam. 10 Diſcrimen inter litigioſum & pſeudographum. 11 Dialecticum noſſe debere locos elenchorum expoſitos. 14 Epilogus.

CAP. XI.

ἜΤι, τὸ φάναι ἢ ἀποφάναι ἀξιοῦν, οὐ δεικνύντος ἐστὶν, ἀλλὰ πεῖραν λαμβάνοντος. ἡ γὰρ πειραστικὴ, ἐστὶ διαλεκτική τις· διὸ καὶ περὶ πάντων ἐπισκοπεῖ καὶ θεωρεῖ, οὐ τὸν εἰδότα, ἀλλὰ τὸν ἀγνοοῦντα, καὶ προσποιούμενον. 2 Ὁ μὲν οὖν κατὰ τὸ πρᾶγμα θεωρῶν τὰ κοινὰ, διαλεκτικός ἐστιν. ὁ δὲ τοῦτο φαινομένως ποιῶν, σοφιστικός. 3 Καὶ συλλογισμὸς ἐριστικὸς καὶ σοφιστικός ἐστιν, εἷς μὲν, ὁ φαινόμενος συλλογισμὸς, περὶ ὧν ἡ διαλεκτικὴ πειραστική ἐστι, κἂν ἀληθὲς ᾖ τὸ συμπέρασμα· τοῦ γὰρ διά τι ἀπατητικός ἐστι· καὶ ὅσοι μὴ ὄντες κατὰ τὴν ἑκάστου μέθοδον παραλογισμοί, δοκοῦσιν εἶναι κατὰ τὴν τέχνην.

D AD hæc, poſtulare vt affirmetur vel negetur, non eſt demõſtrantis, ſed periculum facientis. nã piraſtice eſt dialecticæ pars: ideóq; de omnibus diſpicit, atque examinat, non cum qui ſcit, ſed eũ qui ignorat, & *ſcire ſe* fingit. 2 Qui igitur reuera conſiderat cõmunia, dialecticus eſt. qui verò hoc facere videtur, ſophiſta. 3 Porrò ſyllogiſmus litigioſus & ſophiſticus eſt *in duplici differẽtia*. Vnus *autem eſt*, qui videtur ſyllogiſmus, de *iis*, *in* quibus dialectica piraſtice verſatur, etiamſi vera ſit concluſio: quia in cauſa tradẽda fallit. *In altero genere ſunt* paralogiſmi, qui, cùm non ſint ſecundùm cuiuſq; methodum, *tamen* videntur ſecundùm artem eſſe.

Nam falſæ deſcriptiones non ſunt litigioſæ: (quia ſunt paralogiſmi ſecundùm ea quæ arti ſubiiciuntur) ne quidē ſi quæ ſit falſa deſcriptio *pertinens* ad veram *cōcluſionem*: vt *falſa deſcriptio* Hippocratis, & tetragoniſmus, qui per lunulas *fit*. ſed vt Bryſo quadrauit circulum, etiamſi circulus quadretur, quia tamen non *eſt* ſecundū rem, ideo *eſt* ſophiſticus. Quare & qui de his videtur ſyllogiſmus *eſt* argumentatio litigioſa: & qui videtur ſecundùm rē ſyllogiſmus, quamvis ſit ſyllogiſmus, *eſt* litigioſa argumentatio: quia videtur ſecundùm rem eſſe: proinde *eſt* fallax & iniuſtus. vt. n. iniuſtitia, quæ in certamine *cōmittitur*, ſpeciem quandam *æquitatis* habet, & eſt iniuſta quędā pugna: ſic ſtudioſa contradictio *eſt* iniuſta pugna litigioſa. nā & illic, qui omnino vincere præeligunt, omnia tentāt: & hîc, qui *ſunt* contentioſi. 4 Et *ij* quidē, qui ipſius victoriæ gratiâ tales *ſunt*, litigioſi homines & litiū amatores eſſe videntur: qui vero gloriæ causâ ad lucrū *conducentis*, ſophiſtæ. eſt. n. ſophiſtice, vt *ſuprà* diximus, facultas quædam lucrum captans ex ea quæ videtur ſapientia. Idcirco fucatam demonſtrationem expetunt: & iiſdem argumētationibus vtuntur litigioſi & ſophiſtæ, non tamen eorumdem finium gratiâ. eadēque argumentatio erit & ſophiſtica & litigioſa, ſed non eâdem ratione: verū quâ victoriæ fucatæ *cauſa adhibetur*, litigioſa *eſt*: quâ verò *vt* ſapientiæ *opinio comparetur*, ſophiſtica. etenim ſophiſtice eſt ſapiētia quædam, quæ videtur, cùm non ſit. 5 Litigioſus autem eſt quodāmodo ſic affectus ad dialecticū, vt pſeudographus ad geometricum. nā *litigioſus* ex iis vitioſe concludit, in quibus verſatur dialectica: quomodo & pſeudographus *affectus eſt* ad geometram. ſed hic quidem nō *eſt* litigioſus, quia ex principiis & concluſionibus arti ſubiectis falsò deſcribit: cū verò qui dialecticę ſubiicitur, quod ad alia litigioſum eſſe conſtat. Exēpli causâ, quadratio *circuli*, quæ per lunulas *fit*, nō *eſt* litigioſa: Bryſonis autē *quadratio eſt* litigioſa. & illam quidem referre non licet, niſi ad geometriam tantùm, quoniam eſt ex principiis propriis *geometriæ*: hanc verò adverſus multos *trāsferre licet*, qui *ſcilicet* non norūt, quid in quaque *re* fieri poſſit, & quid fieri non poſſit: quia congruet. Vel vt Antipho quadrauit. vel ſi quis neget melius eſſe poſt cœnam deambulare, propter Zenonis rationem: non *eſt ratio* geometrica, quia *eſt* cōmunis. Si igitur eodem planè modo affectus eſt litigioſus ad dialecticum, quo pſeudographus ad geometram, non erit in illis litigioſus. 6 Iam verò non verſatur dialecticus in genere aliquo definito: nec *eſt* cōparatus ad quidpiam demōſtrandum: nec *eſt* talis, qualis vniuerſalis *philoſophus*: quia nec ſunt omnia in vno aliquo genere: nec, ſi eſſent, fieri poſſet vt res omnes ſub iiſdē principiis continerentur. 7 Quocirca nulla earum artium, quæ naturam aliquam demōſtrant, percontatrix *eſt*, quia non poteſt vtravis pars *contradictionis* concedi: ſyllogiſmus. n. ex vtriſque non fit. Dialectica verò eſt percontatrix. *quæ* ſi demonſtraret, etſi non omnia, at certè prima *pronunciata*, & propria principia non rogaret. nam *adverſario* non concedente, non haberet ampliùs ex quibus adverſus obiectionem diſſereret. 8 Sed eadem *eſt* etiam piraſtica. nam piraſtice talis non eſt, qualis geometria, ſed quam habere etiam indoctus aliquis poſſit: fieri enim poteſt, vt periculum faciat, qui rem non nouit, de eo qui *eſt æquè* imperitus: ſiquidem concedit, non ex quibus nouit, nec ex propriis, ſed ex conſequentibus: quæ talia ſunt, vt qui ea norit, eum artem neſcire nihil vetet: qui verò non norit, *eum* neceſſe *ſit artem* ignorare.

A τὰ γὰρ ψευδογραφήματα, οὐκ ἐριστικά (κατὰ γὰρ τὰ ὑπὸ τὴν τέχνην οἱ παραλογισμοί.) οὐδέ γε, εἴ τί ἐστι ψευδογράφημα περὶ ἀληθές. * οἷον τὸ Ἱπποκράτους, καὶ ὁ τετραγωνισμὸς ὁ διὰ τῶν μηνίσκων. ἀλλ' ὡς ὁ Βρύσων ἐτετραγώνιζε τὸν κύκλον, εἰ καὶ τετραγωνίζεται ὁ κύκλος, ἀλλ' ὅτι οὐ κατὰ τὸ πρᾶγμα, διὰ τοῦτο σοφιστικός. ὥστε ὅ, τε περὶ τῶνδε φαινόμενος συλλογισμὸς, ἐριστικὸς λόγος· καὶ ὁ κατὰ τὸ πρᾶγμα φαινόμενος συλλογισμὸς, κἂν ᾖ συλλογισμὸς, ἐριστικὸς λόγος· φαινόμενος γάρ ἐστι κατὰ τὸ πρᾶγμα· ὥστ' ἀπατητικὸς καὶ ἄδικος. ὥσπερ γὰρ ἡ ἐν ἀγῶνι ἀδικία, εἶδός τι ἔχει, καὶ ἔστιν ἀδικομαχία B τις· οὕτως * ἡ ἐν ἀντιλογίᾳ, ἀδικομαχία ἐστὶν ἐριστική. ἐκεῖ τε γὰρ οἱ πάντως νικᾶν προαιρούμενοι, πάντων ἅπτονται· καὶ ἐνταῦθα οἱ ἐριστικοί. 4 Οἱ μὲν οὖν τῆς νίκης αὐτῆς χάριν τοιοῦτοι, ἐριστικοὶ ἄνθρωποι καὶ φιλέριδες δοκοῦσιν εἶναι· οἱ δὲ δόξης χάριν τῆς εἰς χρηματισμὸν, σοφιστικοί. ἡ γὰρ σοφιστική ἐστιν, ὥσπερ εἴπομεν, χρηματιστική τις ἀπὸ σοφίας φαινομένης. διὸ φαινομένης ἀποδείξεως ἐφίενται. καὶ τῶν λόγων τῶν αὐτῶν μὲν εἰσιν οἱ φιλέριδες, καὶ σοφισταί, ἀλλ' οὐ τῶν αὐτῶν ἕνεκεν. καὶ λόγος ὁ αὐτὸς μὲν ἔσται καὶ σοφιστικὸς, καὶ ἐριστικὸς, ἀλλ' οὐ * κατὰ ταὐτό· ἀλλ' ᾗ μὲν νίκης φαινομένης, ἐριστικός· ᾗ δὲ σοφίας, σοφιστικός· καὶ γὰρ ἡ σοφιστικὴ, ἐστὶ φαινο- C μένη σοφία τις, ἀλλ' οὐκ οὖσα. 5 Ὁ δὲ ἐριστικὸς, ἐστί πως οὕτως ἔχων πρὸς τὸν διαλεκτικὸν, ὡς ὁ ψευδογράφος πρὸς τὸν γεωμετρικόν· ἐκ γὰρ τῶν αὐτῶν τῇ διαλεκτικῇ παραλογίζεται, καθάπερ καὶ ὁ ψευδογράφος * πρὸς τὸν γεωμέτρην. ἀλλ' ὁ μὲν, οὐκ ἐριστικὸς, ὅτι ἐκ τῶν ἀρχῶν καὶ τῶν συμπερασμάτων τῶν ὑπὸ τὴν τέχνην ψευδογραφεῖ· ὁ δὲ ὑπὸ τὴν διαλεκτικὴν, περὶ μὲν τἄλλα ὅτι * ἐριστικός ἐστι, δῆλον. οἷον, ὁ τετραγωνισμὸς, ὁ μὲν διὰ τῶν μηνίσκων, οὐκ ἐριστικός· ὁ δὲ Βρύσωνος, ἐριστικός. καὶ τὸν μὲν οὐκ ἔστι μετενεγκεῖν, ἀλλ' ἢ πρὸς γεωμετρίαν μόνον, διὰ τὸ ἐκ τῶν ἰδίων εἶναι ἀρχῶν· τὸν δὲ, πρὸς πολλοὺς, ὅσοι μὴ ἴσασι τὸ δυνατὸν ἐν ἑκάστῳ, D καὶ τὸ ἀδύνατον· ἁρμόσει γάρ. ἢ ὡς Ἀντιφῶν ἐτετραγώνιζεν. ἢ εἴ τις μὴ φαίη βέλτιον εἶναι ἀπὸ δείπνου περιπατεῖν, διὰ τὸν Ζήνωνος λόγον, οὐκ ἰατρικὸς· κοινὸς γάρ. εἰ μὲν οὖν πάντῃ ὁμοίως εἶχεν ὁ ἐριστικὸς πρὸς τὸν διαλεκτικὸν, τῷ ψευδογράφῳ πρὸς τὸν γεωμέτρην, οὐκ ἂν ἦν περὶ ἐκείνων ἐριστικός. 6 Νῦν δὲ οὐκ ἔστιν ὁ διαλεκτικὸς περὶ γένος τι ὡρισμένον, οὐδὲ δεικτικὸς οὐδενὸς, οὐδὲ τοιοῦτος, οἷος ὁ καθόλου. οὔτε γάρ ἐστιν ἅπαντα ἐν ἑνί τινι γένει· οὔτε εἰ εἴη, οἷόν τε ὑπὸ τὰς αὐτὰς ἀρχὰς εἶναι τὰ ὄντα. 7 Ὥστε οὐδεμία τέχνη τῶν δεικνυουσῶν τινα φύσιν, ἐρωτηματική ἐστιν· οὐ γὰρ ἔξεστιν ὁποτερονοῦν τῶν μορίων δοῦναι· συλλογισμὸς γὰρ οὐ γίνεται ἐξ ἀμφοῖν. ἡ δὲ διαλεκτική, E ἐρωτηματική ἐστιν. εἰ δ' ἐδείκνυεν, εἰ καὶ μὴ πάντα, ἀλλά τοι γε τὰ πρῶτα καὶ τὰς οἰκείας ἀρχὰς οὐκ ἂν ἠρώτα. μὴ διδόντος γὰρ, οὐκ ἂν ἔτι εἶχεν, ἐξ ὧν ἔτι διαλέξεται πρὸς τὴν ἔνστασιν. 8 Ἡ δὲ αὐτὴ, καὶ πειραστική. οὐδὲ γὰρ ἡ πειραστικὴ τοιαύτη ἐστὶν, οἵα ἡ γεωμετρία, ἀλλ' ἣν ἂν ἔχοι καὶ μὴ εἰδώς τις. ἔξεστι γὰρ πεῖραν λαβεῖν καὶ τὸν μὴ εἰδότα τὸ πρᾶγμα τοῦ μὴ εἰδότος, εἴπερ καὶ δίδωσιν, οὐκ ἐξ ὧν οἶδεν, οὐδὲ ἐκ τῶν ἰδίων, ἀλλ' ἐκ τῶν ἑπομένων, ὅσα τοιαῦτά ἐστιν, ἃ εἰδότα μὲν, οὐδὲν κωλύει μὴ εἰδέναι τὴν τέχνην· μὴ εἰδότα δὲ, ἀνάγκη ἀγνοεῖν.

* Gruchius. ἢ ὁ Ἱπ. πῶς.
* Gruchius ἢ [illegible] ἀδικ.
* χ. καθ' αὑτό
* χ. τῷ γεωμέτρῃ.
* χ. ἐριστικός ἐστι,
CAP. XI.

A ὥστε φανερὸν, ὅτι οὐδενὸς ὡρισμένου ἡ πειραστική ἐπιστήμη ἐστί· διὸ καὶ περὶ πάντων ἐστί. πᾶσαι γὰρ αἱ τέχναι χρῶνται καὶ κοινοῖς τισι. 9 Διὸ πάντες καὶ οἱ ἰδιῶται τρόπον τινὰ χρῶνται τῇ διαλεκτικῇ, καὶ πειραστικῇ· πάντες γὰρ μέχρι τινὸς ἐγχειροῦσιν ἀνακρίνειν τοὺς ἐπαγγελλομένους. ταῦτα δέ ἐστι κοινά. ταῦτα γὰρ οὐδὲν ἧττον ἴσασιν αὐτοί, κἂν δοκῶσι λίαν ἔξω λέγειν. ἐλέγχουσιν οὖν ἅπαντες· ἀτέχνως γὰρ μετέχουσι τούτου, οὗ ἐντέχνως ἡ διαλεκτική ἐστι· καὶ ὁ τέχνῃ συλλογιστικῇ πειραστικὸς, διαλεκτικός. ἐπεὶ δέ ἐστι πολλὰ μὲν ταῦτα καὶ κατὰ πάντων, οὐ τοιαῦτα δέ, ὥστε φύσιν τινὰ εἶναι καὶ γένος, ἀλλ᾽ ὡς αἱ ἀποφάσεις· τὰ δ᾽, οὐ τοιαῦτα, ἀλλὰ ἴδια· ἔστιν ἐκ τούτων B περὶ ἁπάντων πεῖραν λαμβάνειν, καὶ εἶναι τέχνην τινά, καὶ μὴ τοιαύτην εἶναι, οἷαι αἱ δεικνύουσαι. 10 Διόπερ ὁ ἐριστικὸς οὐκ ἔστιν οὕτως ἔχων πάντῃ, ὡς ὁ ψευδογράφος· οὐ γάρ ἐστι παραλογιστικὸς ἐξ ὡρισμένου τινὸς γένους ἀρχῶν, ἀλλὰ περὶ πᾶν γένος ἔσται ὁ ἐριστικός. 11 Τρόποι μὲν οὖν εἰσὶν οὗτοι τῶν σοφιστικῶν ἐλέγχων. ὅτι δ᾽ ἐστὶ τοῦ διαλεκτικοῦ τὸ θεωρῆσαι περὶ τούτων, καὶ δύνασθαι ταῦτα ποιεῖν, οὐ χαλεπὸν ἰδεῖν· ἡ γὰρ περὶ τὰς προτάσεις μέθοδος, ἅπασαν ἔχει ταύτην τὴν θεωρίαν. 12 Καὶ περὶ μὲν τῶν ἐλέγχων εἴρηται τῶν φαινομένων.

Quare perſpicuum *eſt*, piraſticen, nullius definiti generis ſciētiam eſſe: ideóque in omnibus verſari. omnes. n. artes etiam communibus quibuſdam vtuntur. 9 Idcirco omnes, etiam idiotæ, quodammodo vtūtur dialectica, & piraſtica: omnes. n. quadātenus conantur iudicium ferre de iis qui profitentur hæc verò ſunt cōmunia: quoniam non minùs hi ſciunt, etiamſi valde extra rem dicere videātur. Redarguunt igitur omnes: quia inartificiosè ſunt participes eius, in quo dialectica artificiosè verſatur: ac dialecticus *is demum eſt*, qui arte ſyllogiſtica *eſt* piraſticus. Quoniam autem multa hæc ſunt, & in omnibus *reperiuntur*, non tamē *ſunt* eiuſmodi, vt naturâ quadam & *certo* genere cōtineantur, ſed vt negationes: alia vero non talia, ſed propria *ſunt*: ideo poteſt ex his de omnibus periculum fieri, & eſſe ars quædam, non tamen talis, quales ſunt quæ demōſtrant. 10 Quocirca litigioſus non omnino ita eſt affectus, vt pſeudographus: quādoquidem litigioſus non eſt comparatus ad vitiosè concludendum ex principiis definiti alicuius generis, ſed in omni genere verſatur. 11 Modi igitur hi ſunt ſophiſticorum elenchorum. Quòd autem ad dialecticum pertineat de his diſpicere, & poſſe hæc facere, facilè perſpici poteſt: quoniam methodus, quæ in propoſitionibus *verſatur*, vniuerſam hanc conſiderationem complectetur. 12 Ac de fucatis quidem elenchis dictum eſt.

Loci ad probandum falſum vel paradoxum. Cap. XII.

1 ¶ *Loci communes. Si nullum ſit problema propoſitum.* 2 *Si multa interrogentur, & petatur reſponſio.* 3 *Si quis fingat ſe diſcendi cauſâ interrogare.* 4 ¶ *Locus ad probandum falſum.* 5 ¶ *Loci ad probandum paradoxum. A ſecta.* 7 *Ab hominum voluntate, & ſermone.* 8 *A natura, & lege.* 9 *Ad quædam problemata reſponderi non poſſe, quin aliquid admirabile dicatur.* 10 *Ab opinione ſapientum, & multorum.* 12 *Epilogus.*

CAP. XII.

C ΠΕρὶ δὲ τοῦ ψευδόμενόν τι δεῖξαι, καὶ τὸν λόγον εἰς ἄδοξον ἀγαγεῖν, (τοῦτο γὰρ ἦν δεύτερον τῆς σοφιστικῆς προαιρέσεως) πρῶτον μὲν ἐκ τοῦ πυνθάνεσθαί πως, καὶ διὰ τῆς ἐρωτήσεως συμβαίνει μάλιστα. τὸ γὰρ πρὸς μηδὲν ὡρισμένον κειμένον ἐρωτᾶν, θηρευτικόν ἐστι τούτων· εἰκῇ γὰρ λέγοντες, ἁμαρτάνουσι μᾶλλον· εἰκῇ δὲ λέγουσιν, ὅταν* μηδὲν ἔχωσι προκείμενον. 2 Τό, τε ἐρωτᾶν πολλά, κἂν ὡρισμένον ᾖ πρὸς ὃ διαλέγεται, καὶ τὸ τὰ δοκοῦντα λέγειν ἀξιοῦν, ποιεῖ τινα εὐπορίαν τοῦ εἰς ἄδοξον ἀγαγεῖν, ἢ ψεῦδος· ἐάν τε ἐρωτώμενος φῇ ἢ ἀποφῇ τούτων τι, ἄγειν πρὸς ἃ ἐπιχειρήματος εὐπορεῖ. δύναται δὲ νῦν ἧττον κακουργεῖν διὰ τούτων, D ἢ πρότερον· ἀπαιτοῦνται γὰρ τί τοῦτο πρὸς τὸ ἐν ἀρχῇ. 3 Στοιχεῖον δὲ τοῦ τυχεῖν ἢ ψεύδους τινός, ἢ ἀδόξου, τὸ πρὸς μηδεμίαν εὐθὺς ἐρωτᾶν θέσιν, ἀλλὰ φάσκειν ἐρωτᾶν* μαθεῖν βουλόμενον· χώραν γὰρ ἐπιχειρήματος ἡ σκέψις ποιεῖ. 4 Πρὸς δὲ τὸ ψευδόμενον δεῖξαι, ἴδιος τόπος ὁ σοφιστικός, τὸ ἄγειν πρὸς τοιαῦτα, πρὸς ἃ εὐπορεῖ λόγων. ἔσται δὲ καὶ καλῶς καὶ μὴ καλῶς τοῦτο ποιεῖν, καθάπερ ἐλέχθη πρότερον. 5 Πάλιν, πρὸς τὸ παράδοξα λέγειν, σκοπεῖν ἐκ τίνος γένους ὁ διαλεγόμενος· εἶτα ἐπερωτᾶν, ὃ τοῖς πολλοῖς οὗτοι λέγουσι παράδοξον· ἔστι γὰρ ἑκάστοις τι τοιοῦτον. στοιχεῖον δὲ τούτων, τὸ τὰς ἑκάστων εἰληφέναι θέσεις ἐν ταῖς προτάσεσι.

* γ. μηδὲν ἔχω.

* γ. μανθάνειν

QVod verò ad id vt *aliquis* falſum quidpiā dicere oſtēdatur, ac diſputatio ad inopinabile ducatur: (hoc. n. erat, quod ſophiſtæ ſecundo loco præeligebant) primū ex certo percontandi modo, & per interrogationem *id* maximè accidit. ad nullam. n. rem propoſitam accōmodata interrogatio, ad hæc inueſtiganda valet: nam temere dicentes magis peccant: temere autem dicunt, cùm nihil propoſitum habent. 2 Item multa interrogare, etiam cùm definitum eſt id cōtra quod diſſeritur, ac poſtulare vt dicat *reſpōdens*, quid ſibi in ſingulis videatur, copiam quandam *argumentorū* præbet *ac facultatem* ducendi ad inopinabile, aut falſum; & ſiue interrogatus aliquid ex his affirmet, ſiue neget, ducendi *ad ea* adverſus quæ argumentorum copia ſuppetat. Sed nūc minùs licet per hæc cauillari, quā olim: quia *nunc reſpondentes* quærunt, quid hoc ad *quæſitum* initiò *propoſitum pertineat*. 3 Eſt autem elemētum perueniendi ad falſum quidem, vel inopinabile, ſi quis non interroget confeſtim adverſus vllam theſim, ſed dicat *ſe* diſcendi ſtudio interrogare: locum. n. argumēto hæc conſideratio facit. 4 Ad hoc autē vt quis mendacij coarguatur, proprius eſt hic ſophiſticus locus, ad ea *ſcilicet adverſarium* ducere, adverſus quæ argumētorum copia ſuppetat. Licebit autem & rectè & vitiosè hoc facere, vt ſuprà dictū fuit. 5 Rurſus, ad hoc vt paradoxa dicantur, videre *oportet*, ex quo *philoſophorum* genere ſit qui diſputat: deinde interrogare, quod hi *qui in eo genere philoſophantur*, præter multorum opinionem dicunt. nam ſingulis quibuſque eſt aliquid tale. Horum elemētum eſt, ſumere ſingulorū theſes in propoſitionibus.

6 Sed horũ ſolutio conueniẽs affertur, vt pateſiat A non ex argumẽtatione euenire quod *eſt* inopinabile: ſemper autem hoc vult, qui contẽdit. 7 Præterea *arguendum eſt* ex voluntatibus, & ex apparentibus opinionibus: quia non eadẽ volunt, ac dicũt: ſed ſermonibus honeſtiſſimis vtuntur: ea verò volũt, quæ videntur prodeſſe. velvti mori honeſtè potiùs quã iucunde viuere, aiunt oportere: & in paupertate iuſtè viuere potiùs, quã ditari turpiter: ſed contraria volunt. Qui igitur volũtatibus conſentanea dicit, ad apparentes opiniones ducẽdus *eſt*: qui verò his *cõſentanea*, ad *voluntates* occultas: vtroque.n. modo neceſſe *eſt* paradoxa dicere: quia vel apparentibus, vel occultis opinionibus contraria B dicent. 8 Latiſſimè autem patet locus ad efficiendum vt paradoxa dicãtur, (ſicut Callicles in Gorgia dicẽs inducitur, & veteres omnes euenire putabant) ex natura, & lege. contraria nãque eſſe naturam & legem inquiunt: ac iuſtitiam ſecundùm legem quidem eſſe rem honeſtã, ſecundùm naturam verò non *eſſe* rem honeſtam. oportet igitur ei qui ſecundùm naturã loquitur, ſecundùm legem occurrere: cum verò qui legi conſentanea *dicit*, ad naturam ducere. vtrouis.n. modo eſſe dicãtur, inopinabile *eſt*. vocabãt autem illi ſecundùm naturam, quod verum *eſt*: ſecundùm legem autẽ, quod multitudini videtur. Quare patet eos quoque, vt qui nunc *diſputant*, conatos fuiſſe aut elencho re- C darguere, aut ad paradoxa dicẽda cogere reſpondẽtem. 9 Quædam autem interrogationes vtrimque reſponſionem opinionibus non cõgruentem habent: velvti, vtrùm ſapientibus, an patri parẽre oportet? &, *Suntne* facienda quæ proſunt, an quæ *ſunt* iuſta? & Pati*ne* iniuriam, *eſt* optabilius, an facere? 10 Oportet autem ducere ad ea quæ multitudini & *ad ea quæ* ſapientibus *ſunt* contraria: nẽpe ſi quis *ita* dicat vt ij qui in diſputationibus *verſantur*, ad multitudini *contraria duci debet*: ſin autem vt multitudo, ad iis *contraria*, qui in diſputationibus *verſantur*. hi namque aiũt eum qui beatus *eſt*, iuſtũ eſſe: multitudini autẽ inopinabile videtur, regem non eſſe beatum. 11 Hoc autẽ modo inopinabilia colligere, idem eſt, quod ad naturæ & legis repugnãtiam ducere. lex enim *eſt* multitudinis opinio: ſapientes verò ſecundùm naturam & ſecundùm veritatem loquuntur. 12 Ac paradoxa quidem ex his locis quærere oportet.

A 6 Λύσις δὲ τούτων ἡ προσήκουσα φέρεται, τὸ ἐμφανίζειν, ὅτι οὐ διὰ τὸν λόγον συμβαίνει τὸ ἄδοξον· ἀεὶ δὲ τοῦτο βούλεται ὁ ἀγωνιζόμενος. 7 Ἔτι δὲ καὶ ἐκ τῶν βουλήσεων, καὶ ἐκ τῶν φανερῶν δοξῶν. οὐ γὰρ ταὐτὰ βούλονταί τε, καὶ φασίν· ἀλλὰ λέγουσι μὲν τοὺς εὐσχημονεστάτους τῶν λόγων, βούλονται δὲ τὰ φαινόμενα λυσιτελεῖν. οἷον, τεθνάναι καλῶς μᾶλλον, ἢ ζῆν ἡδέως φασὶ δεῖν· καὶ πένεσθαι δικαίως μᾶλλον, ἢ πλουτεῖν αἰσχρῶς· βούλονται δὲ τἀναντία. τὸν μὲν οὖν λέγοντα κατὰ τὰς βουλήσεις, εἰς τὰς * φανερὰς δόξας ἀκτέον· τὸν δὲ κατὰ ταύτας, εἰς τὰς ἀποκεκρυμμένας· ἀμφοτέρως γὰρ ἀναγκαῖον παράδοξα λέγειν· ἢ γὰρ πρὸς τὰς φανερὰς, ἢ πρὸς τὰς ἀφα- B νεῖς δόξας, ἐροῦσιν ἐναντία. 8 Πλεῖστος δὲ τόπος ἐστὶ τοῦ ποιεῖν παράδοξα λέγειν, (ὥσπερ καὶ ὁ Καλλικλῆς ἐν τῷ Γοργίᾳ γέγραπται λέγων, καὶ οἱ ἀρχαῖοι δὲ πάντες ᾤοντο συμβαίνειν) παρὰ τὸ κατὰ φύσιν, καὶ κατὰ τὸν νόμον. ἐναντία γὰρ εἶναι φύσιν καὶ νόμον φασί· καὶ τὴν δικαιοσύνην, κατὰ τὸν νόμον μὲν, εἶναι καλὸν· κατὰ φύσιν δὲ, οὐ καλὸν. δεῖ οὖν, πρὸς μὲν τὸν εἰποντα κατὰ φύσιν, κατὰ νόμον ἀπαντᾶν· πρὸς δὲ τὸν κατὰ νόμον, ἐπὶ τὴν φύσιν ἄγειν. ἀμφοτέρως γὰρ εἶναι λέγειν, παράδοξον. ἦν δὲ, τὸ μὲν κατὰ φύσιν, αὐτοῖς, τὸ ἀληθές· τὸ δὲ κατὰ νόμον, τὸ τοῖς πολλοῖς δοκοῦν. ὥστε δῆλον, ὅτι κἀκεῖνοι, καθάπερ καὶ οἱ νῦν, ἢ ἐλέγξαι, ἢ παράδοξα λέγειν τὸν ἀποκρινόμενον ἐπε- C χείρουν ποιεῖν. 9 Ἔνια δὲ τῶν ἐρωτημάτων ἔχει ὃ ἀμφοτέρως ἄδοξον εἶναι τὴν ἀπόκρισιν. οἷον, πότερον τοῖς σοφοῖς ἢ τῷ πατρὶ δεῖ πείθεσθαι, καὶ, τὰ συμφέροντα πράττειν, ἢ τὰ δίκαια, καὶ, ἀδικεῖσθαι αἱρετώτερον, ἢ ἀδικεῖν; 10 Δεῖ δὲ ἄγειν εἰς τὰ τοῖς πολλοῖς καὶ σοφοῖς ἐναντία· ἐὰν μὲν λέγῃ τις ὡς οἱ περὶ τοὺς λόγους, εἰς τὰ τοῖς πολλοῖς· ἐὰν δὲ, ὡς οἱ πολλοὶ, ἐπὶ τὰ τοῖς ἐν λόγοις. φασὶ γὰρ οἱ μὲν, ἐξ ἀνάγκης τὸν εὐδαίμονα, δίκαιον εἶναι· τοῖς δὲ πολλοῖς ἄδοξον τὸ, βασιλέα μὴ εὐδαιμονεῖν. 11 Ἔστι δὲ τὸ οὕτως ἄδοξα συνάγειν, τὸ αὐτὸ τῷ εἰς τὴν κατὰ φύσιν καὶ κατὰ τὸν νόμον ὑπεναντίωσιν ἄγειν· ὁ μὲν γὰρ νόμος, δόξα τῶν πολλῶν· οἱ δὲ σοφοὶ, κατὰ φύσιν καὶ κατ' ἀλήθειαν λέγουσιν. 12 Καὶ τὰ μὲν παράδοξα, ἐκ τούτων δεῖ ζητεῖν τῶν τόπων.

* γ. φαινομένας

De tautologia ſeu nugatione. Cap. XIII.

1 Definitio. 2 Exempla. 3 In quibus hæ rationes inueniantur. 5 Interdum videri, ſed re vera non effici nugationem.

QVod verò ad efficiendũ vt *quis* nugetur: *quid* D *illud ſit* quod appellamus nugari, ſuprà diximus. 2 Omnes autẽ huiuſmodi argumentationes hoc volunt efficere: ſi nihil refert, vtrùm nomẽ an oratio dicatur: duplum autem, & duplum dimidij, idem *valent*: ſi igitur duplum eſt dimidij duplum, erit dimidij dimidij duplum. Rurſus, ſi loco illius *verbi* duplum, poſitum ſit duplum dimidij, ter erit dictum dimidij dimidij dimidij duplum. Et, num eſt cupiditas iucundi? hoc autem eſt appetitio iucundi: cupiditas igitur erit appetitio iucundi iucundi. 3 Cernuntur autem huiuſmodi argumentationes in iis quæ ad aliquid referũtur, vbi *ſcilicet* non ſolùm *eorum* genera, ſed etiam ipſa*met* ad aliquid dicuntur, atque ad vnum & idem referũtur. velvti, appetitio *eſt* alicuius appetitio: & cupiditas,

CAP. XIII.

Περὶ δὲ τοῦ ποιῆσαι ἀδολεσχεῖν, ὃ μὲν λέγομεν τὸ ἀδολεσχεῖν, εἰρήκαμεν ἤδη. 2 Πάντες δὲ οἱ τοιοῦτοι λόγοι τοῦτο βούλονται ποιεῖν· εἰ μηδὲν διαφέρει, τὸ ὄνομα ἢ τὸν λόγον εἰπεῖν· διπλάσιον δὲ, καὶ διπλάσιον ἡμίσεος, ταὐτόν· εἰ ἄρα διπλάσιον, ἐστὶν ἡμίσεος διπλάσιον, ἔσται ἡμίσεος ἡμίσεος διπλάσιον· καὶ πάλιν ἂν ἀντὶ τοῦ διπλάσιον, διπλάσιον ἡμίσεος τεθῇ, τρὶς ἔσται εἰρημένον, ἡμίσεος ἡμίσεος ἡμίσεος διπλάσιον. καὶ ἆρά γε ἐστὶν ἡ ἐπιθυμία ἡδέος; τοῦτο δὲ ἐστὶν ὄρεξις ἡδέος· ἔστιν ἄρα ἡ ἐπιθυμία, ὄρεξις ἡδέος ἡδέος. 3 Εἰσὶ δὲ πάντες οἱ τοιοῦτοι τῶν λόγων ἐν τοῖς πρός τι, ὅσα μὴ μόνον τὰ γένη, ἀλλὰ καὶ αὐτὰ πρός τι λέγονται, καὶ πρὸς τὸ αὐτὸ καὶ ἓν ἀποδίδοται. οἷον, ἥ τε ὄρεξις, τινὸς ὄρεξις, καὶ ἡ ἐπιθυμία,

τινὸς ἐπιθυμία· καὶ τὸ διπλάσιον, τινὸς διπλάσιον, καὶ διπλάσιον ἡμίσεος. 4 Καὶ ὅσων* ἡ οὐσία οὐκ ὄντως πρός τι,* ἀλλὰ ὅλως, ὧν εἰσὶν ἕξεις, ἢ πάθη, ἤ τι τοιοῦτον, ἐν τῷ λόγῳ αὐτῶν προσδηλοῦται κατηγορουμένων ἐπὶ τούτοις. οἷον, τὸ περιττὸν, ἀριθμὸς μέσον ἔχων· ἔστι δὲ ἀριθμὸς περιττός· ἔστιν ἄρα ἀριθμὸς μέσον ἔχων ἀριθμός· καὶ εἰ τὸ σιμὸν, κοιλότης ῥινός ἐστιν· ἔστι δὲ καὶ ἡ ῥὶς, σιμή· ἔστιν ἄρα ῥὶς ῥὶς κοίλη. 5 Φαίνονται δὲ ποιεῖν, οὐ ποιοῦντες ἐνίοτε, διὰ τὸ μὴ προσπυνθάνεσθαι, εἰ σημαίνει τι καθ᾽ αὑτὸ λεχθὲν τὸ διπλάσιον, ἢ οὐδέν. καὶ εἴ τι σημαίνει, πότερον τὸ αὐτὸ, ἢ ἕτερον, ἀλλὰ τὸ συμπέρασμα λέγειν εὐθύς. καὶ φαίνεται διὰ τὸ ὄνομα ταὐτὸ, εἶναι ταὐτὸ, καὶ σημαίνειν.

* χ. τὰ ὑπαρχόμε- : locus est obſcurus, & planius ab Alexādro relatus. Eum vide.

* χ. ἀλλ᾽ ὡς ὅλως,

A alicuius cupiditas: & duplum, alicuius duplum, ac duplum dimidij. 4 Cernuntur etiam in iis quorū eſſentia non *eſt* re vera *in iis quæ* ad aliquid *referuntur*: ſed omnino quorū ſint habitus, vel affectiones, vel tale quidpiam, in horū definitione explicantur, cùm hęc illis attribuantur. vtputà impar eſt numerus medium habens: eſt autem numerus impar: eſt igitur numerus medium habens numerus. Et ſi ſimitas eſt concauitas naſi; naſus autē eſt concauus: eſt igitur naſus naſus concauus. 5 Videtur autem interdum *nugationem* efficere *huiuſcemodi captiones*, cùm *re vera* non efficiant: propterea quòd non additur percontatio, an duplum per ſe acceptum ſignificet aliquid, an nihil: &, ſi quid ſignificat, vtrū idem, *quod coniunctum*, an diuerſum *ſignificet*: ſed concluſio ſtatim profertur: ac videtur propter idē nomen, eadem eſſe res, atque *eadem* ſignificatio.

De ſolœciſmo. Cap. XIV.

1 Quid ſit. 2 Aliquando fieri nec videri, aliquando videri nec fieri. 3 Quòd pertineat ad ſophiſticen. 4 In quibus ſit. 5 Collatio ſolœciſmi & elenchi à ſimilitudine ſumpti. 6 Concluſio. 7 Epilogus.

Σολοικισμὸς δὲ, οἷον μέν ἐστιν, εἴρηται πρότερον. 2 Ἔστι B δὲ τοῦτο, καὶ ποιεῖν, καὶ μὴ ποιοῦντα, φαίνεσθαι· καὶ ποιοῦντα, μὴ δοκεῖν· καθάπερ Πρωταγόρας ἔλεγεν, εἰ ὁ μῆνις, καὶ ὁ πήληξ ἄρρεν ἐστίν. ὁ μὲν γὰρ λέγων οὐλομένην, σολοικίζει μὲν κατ᾽ ἐκεῖνον, οὐ φαίνεται δὲ τοῖς ἄλλοις. ὁ δὲ οὐλόμενον, φαίνεται μὲν, ἀλλ᾽ οὐ σολοικίζει. 3 Δῆλον οὖν ὅτι καὶ* τέχνη τις δύναται τοῦτο ποιεῖν. διὸ πολλοὶ τῶν λόγων οὐ συλλογιζόμενοι σολοικισμὸν, φαίνονται συλλογίζεσθαι, καθάπερ ἐν τοῖς ἐλέγχοις. 4 Εἰσὶ δὲ σχεδὸν πάντες οἱ φαινόμενοι σολοικισμοὶ, παρὰ τὸ τόδε· καὶ ὅταν ἡ πτῶσις, μήτε C ἄρρεν, μήτε θῆλυ δηλοῖ, ἀλλὰ τὸ μεταξύ. τὸ μὲν γὰρ οὗτος, ἄρρεν σημαίνει· τὸ δὲ αὕτη, θῆλυ· τὸ δὲ τοῦτο, θέλει μὲν τὸ μεταξὺ σημαίνειν, πολλάκις δὲ σημαίνει κἀκείνων ἑκάτερον. οἷον, τί τοῦτο; Καλλιόπη, ξύλον, Κορίσκος. τοῦ μὲν οὖν ἄρρενος καὶ τοῦ θήλεος διαφέρουσιν αἱ πτώσεις ἅπασαι· τοῦ δὲ μεταξὺ, αἱ μὲν, αἱ δὲ, οὔ. δοθέντος δὴ πολλάκις τούτου, συλλογίζονται ὡς εἰρημένου, τοῦτον. ὁμοίως δὲ καὶ ἄλλην πτῶσιν ἀντ᾽ ἄλλης. ὁ δὲ παραλογισμὸς γίνεται διὰ τὸ κοινὸν εἶναι τὸ τοῦτο, πλειόνων πτώσεων. τὸ γὰρ τοῦτο, σημαίνει, ὁτὲ μὲν οὗτος, ὁτὲ δὲ τοῦτον. δεῖ δὲ ἐναλλὰξ σημαίνειν, μετὰ μὲν τοῦ ἐστὶ, τὸ οὗτος· μετὰ δὲ τοῦ εἶναι, τὸ τοῦτον· οἷον, *ἔστι Κορίσκος, εἶναι Κορίσκον. καὶ ἐπὶ τῶν D θηλέων ὀνομάτων ὡσαύτως· καὶ ἐπὶ τῶν λεγομένων μὲν σκευῶν, ἐχόντων δὲ θηλείας ἢ ἄρρενος κλῆσιν. ὅσα γὰρ εἰς τὸ ο καὶ τὸ ν τελευτᾷ, ταῦτα μόνα σκεύους ἔχει κλῆσιν· οἷον, ξύλον, σχοινίον. τὰ δὲ μὴ οὕτως ἄρρενος, ἢ θήλεος· ὧν ἔνια φέρομεν ἐπὶ τὰ σκεύη· οἷον, ἀσκὸς μὲν, ἄρρεν τοὔνομα· κλίνη δὲ, θῆλυ. διόπερ καὶ ἐπὶ τῶν τοιούτων ὡσαύτως καὶ τὸ ἐστὶ, καὶ τὸ εἶναι, διοίσει. 5 Καὶ τρόπον τινὰ ὅμοιός ἐστιν ὁ σολοικισμὸς τοῖς παρὰ τὸ τὰ μὴ ὅμοια, ὁμοίως λεγομένοις ἐλέγχοις. ὥσπερ γὰρ ἐν ἐκείνοις ἐπὶ τῶν πραγμάτων συμβαίνει ἐλέγχειν, οὕτως ἐν τούτοις ἐπὶ τῶν ὀνομάτων συμπίπτει σολοικίζειν. ἄνθρωπος γὰρ καὶ λευκὸν, καὶ πρᾶγμα, καὶ ὄνομά ἐστι. 6 Φανερὸν E οὖν ὅτι τὸν σολοικισμὸν πειρατέον ἐκ τῶν εἰρημένων πτώσεων συλλογίζεσθαι. 7 Εἴδη μὲν οὖν ταῦτα τῶν ἀγωνιστικῶν λόγων, καὶ μέρη τῶν εἰδῶν, καὶ τρόποι οἱ εἰρημένοι.

* Vulgò τέχνης, mendosè.

* χ. ἔστι Ἱππίνης, εἶναι Ἱππίνην.

B Solœciſmus autē cuiuſmodi ſit, dictū eſt antea. 2 Sanè vſu venire poteſt, vt *quis ſolœciſmū* faciat: & vt non faciens, videatur facere: & vt faciens, nō videatur facere, quemadmodū Protagoras dicebat, ſi μῆνις & πήληξ maſculū eſt. nam qui dicit οὐλομένην, ſecundū eum committit ſolœciſmum, aliis autem *committere* nō videtur: qui verò *dicit* οὐλόμενον, videtur quidem *cōmittere*, non tamē committit ſolœciſmū. 3 Patet igitur, etiam artē quandā poſſe hoc facere. Ideo multæ argumentationes non concludentes ſolœciſmū, videntur *eum* concludere, ſicut in elēchis *contingebat*. 4 Sunt autem ferè omnes, qui ſo- C lœciſmi videntur, ex *articulo* Hoc: & quando caſus nec maſculum, nec feminā ſignificat, ſed interiectūm *medium*. nā Hic, maſculum ſignificat: Hæc, feminam: ſed Hoc, debet quidē *medium iis* interiectum ſignificare, verumtamen ſæpe alterutrum eorum ſignificat: velvti, Quid *eſt* hoc? Calliope, lignū, Coriſcus. Maſculini igitur & feminini *generis* caſus omnes differunt: eius verò quod *eſt* interiectum, alij *differunt*, alij non. Itaque ſæpe, cū datum ſit Hoc, *perinde* concludunt ac ſi dictum fuiſſet, Hunc. Similiter & alium caſum pro alio *accipiunt*. Paralogiſmus autem propterea fit, quòd *articulus* Hoc, multis caſibus eſt cōmunis. nam Hoc, modò D ſignificat hic, modò hunc. opus autē eſt, vt mutatis vicibus ſignificet, cum *verbo* Eſt, hic; cum *verbo* Eſſe, hūc: vt, Eſt Coriſcus, Eſſe Coriſcum. Eadem *eſt* ratio fœmininorū nominum: & eorum, quæ cū appellētur σκεύη, *id eſt vaſa*, fœmineam aut maſculā habent inflexionem. nam quæ in ο, & ν terminātur, hæc ſola vaſis inflexionē habent: vt ξύλον, σχοινίον. quæ verò non ita *terminātur*, maris aut feminæ *inflexionem habent*: quorum nōnulla referimus inter σκεύη vt ἀσκὸς, *eſt* nomen maſculinū. κλίνη verò, femininū. Idcirco etiam in his *verbum* Eſt, & *verbum* Eſſe, eodem modo differentiam conſtituent. 5 Ac ſimilis quodammodo eſt ſolœciſmus elenchis, qui ex eo E appellantur, quòd non ſimilia ſimiliter *accipiuntur*. vt.n. illic in rebus fit elenchus: ita hic in vocabulis committitur ſolœciſmus. homo.n. & album, tam res quàm vocabulum eſt. 6 Apparet ergo, nitendum eſſe, vt ſolœciſmus ex dictis caſibus concludatur. 7 Sunt igitur hæ ſpecies contentioſarum argumentationum, & partes ſpecierum, & modi, qui commemorati ſunt.

DE DISPOSITIONE, ET INTERROGANDI RATIONE,

TRACTATVS IV.

Cap. XV.

1 Protheſis. 2 De longitudine orationis. 3 De celeritate interrogationis. 4 De ira & altercatione. 5 De ordine interrogationum turbato. 6 De locis occultationis. 7 De interrogatione ex contrario, vel ex æquali. 8 Ne interrogetur vniuerſale conceſsis particularibus. 9 De interrogatione ſimilitudinis, cùm non eſt aliquod nomen commune. 10 De interrogatione contrariorum. 11 Si extremum proponatur quaſi rectè probatum & concluſum. 12 Si propoſito paradoxo petatur reſponſio. 13 Si quis dicat contraria iis quæ probat, aut probare debet. 14 A diſtinctione. 15 Si argumentum imperfectum deſeratur, & ad alia traducatur diſputatio. 16 Vt argumenta ad aliud dirigantur. 17 De probatione propoſitionis acceptæ. 18 An concluſio ſit interroganda, & quomodo. 19 Epilogus.

AD celãdum autem non parum refert, ſi quẽdam in modum diſponatur, quæ ad interrogationem pertinent, quemadmodũ & in dialecticis: quare deinceps poſt ea quæ cõmemorata fuerunt, hæc primùm dicẽda ſunt. 2 Valet autem ad elencho redarguendũ prolixitas *orationis*. quia difficile *eſt* multa ſimul conſpicere. Ad prolixitatem autem elementis antea cõmemoratis vtendũ *eſt*. 3 Item celeritas, quia tardiores minùs proſpiciunt. 4 Prçterea ira & altercatio. nam perturbati minùs poſſunt omnia obſeruare. Elementa verò ad iram *excitandam ſunt*, ſi quis volũtatem iniuſtè & omnino impudenter agendi præ ſe ferat. 5 Præterea interrogationum permutato ordine poſitio: ſiue ad idem *probandum* habeat quis multas argumẽtationes, ſiue *ad oſtendendum* ita *eſſe*, & non ita *eſſe*. fit. n. *hac ratione*, vt adverſarius à multis, aut à contrariis ſimul cauere ſibi debeat. 6 Et omnino quæcumq; ad occultationem valere antea diximus, conferũt etiam ad contẽtioſas argumentationes. nã occultatio eſt latẽdi gratia; latêre autem fallendi *cauſa*. 7 Sed adversùs abnuentes quæcunque putant ad argumẽtationem *facere, aut* per negationem interrogãdum quaſi contrarium ſumere velit, *qui interrogat*: aut ſaltem ex æquo *vtraque cõtradictionis pars* in interrogationem deducenda: quia cùm incertũ eſt, quid *interrogator* ſumere velit, minùs moroſos ſe præbent, *qui reſpondent*. 8 Cùm autem per partes cõcedit aliquis ſingula, inducẽdo vniuerſale: ſæpe non eſt interrogãdum, ſed *eo* vt conceſſo vtendũ. interdũ. n. & ipſi *reſpondentes* ſe conceſſiſſe putant, & audientibus videntur ob inductionis cõmemorationẽ, ceu non fruſtra *ſint* interrogata *ſingularia*. 9 Sed in quibus non ſignificatur nomine *aliquo* vniuerſale, ſimilitudine vtendũ *eſt*, prout expedit. ſæpe. n. ſimilitudo latet. 10 Iam verò vt propoſitio ſumatur, per collationẽ contrarij percontari oportet. velvti, ſi oporteat ſumere, omnibus in rebus patri eſſe obtemperãdum, *ſic interrogetur*, vtrùm in omnibus oportet obtemperare parentibus, an in omnibus repugnare? Et *ſi oporteat ſumere obtemperãdum* ſæpius, *ita interrogetur*, vtrùm multa concedẽda *ſunt*, an pauca? magis. n. ſi quidem *obſequi parẽtibus* neceſſe *eſt*, multa videbuntur eſſe *concedẽda, quã pauca*. cùm. n. contraria inter ſe componuntur, & magna & maiora videntur hominibus, & deteriora, & meliora. 11 Vt autem elencho *aliquis* conuictus videatur, vehemẽter ac ſæpe facit impoſtura illa maximè ſophiſtica, cùm qui nihil ſyllogiſticè propoſuerunt, extremũ non interrogant, ſed concludendo dicunt, quaſi facto ſyllogiſmo, non igitur hoc, & hoc. 12 Eſt etiam hoc ſophiſticum, poſito paradoxo, poſtulare, vt quid videatur, reſpondeatur, propoſito eo quod ab initio viſum fuit, atque horum inter-

Διαφέρει δ' οὐ μικρόν, ἐὰν ταχθῇ πως τὰ πρὸς τὴν ἐρώτησιν, πρὸς τὸ λανθάνειν, ὥσπερ ἐν τοῖς διαλεκτικοῖς. ἐφεξῆς οὖν τοῖς εἰρημένοις, ταῦτα πρῶτον λεκτέον. CAP. XIV. 2 Ἔστι δὲ πρὸς τὸ ἐλέγχειν, ἓν μὲν, μῆκος· χαλεπὸν γὰρ, ἅμα πολλὰ συνορᾶν. εἰς δὲ τὸ μῆκος, τοῖς προειρημένοις στοιχείοις χρηστέον. 3 Ἓν δὲ, τάχος· ὑστερίζοντες γὰρ, ἧττον προορῶσιν. 4 Ἔτι δὲ ὀργὴ, καὶ φιλονεικία. ταραττόμενοι γὰρ, ἧττον δύνανται φυλάττεσθαι πάντα. στοιχεῖα δὲ τῆς ὀργῆς, τό, τε φανερὸν ποιεῖν ἑαυτὸν βουλόμενον ἀδικεῖν, καὶ τὸ παράπαν ἀναισχυντεῖν.* 5 Ἔτι, τὸ ἐναλλὰξ τὰ ἐρωτήματα τιθέναι, ἐάν τε πρὸς αὐτὸ πλείους τις ἔχῃ λόγους· ἐάν τε, καὶ ὅτι οὕτως, καὶ ὅτι οὐχ οὕτως. ἅμα γὰρ συμβαίνει, ἢ πρὸς πλείω, ἢ πρὸς τἀναντία ποιεῖσθαι τὴν φυλακήν. 6 Ὅλως τε πάντα τὰ πρὸς τὴν κρύψιν λεχθέντα πρότερον, χρήσιμα καὶ πρὸς τοὺς ἀγωνιστικοὺς λόγους· ἡ γὰρ κρύψις ἐστὶ τοῦ λαθεῖν χάριν· τὸ δὲ λαθεῖν, τῆς ἀπάτης. 7 Πρὸς δὲ τοὺς ἀνανεύοντας ἅττ' ἂν οἰηθῶσιν εἶναι πρὸς τὸν λόγον, ἐξ ἀποφάσεως ἐρωτητέον, ὡς τοὐναντίον βουλόμενον λαβεῖν, ἢ καὶ ἐξ ἴσου ποιοῦντα τὴν ἐρώτησιν. ἀδήλου γὰρ ὄντος τί βούλεται λαβεῖν, ἧττον δυσκολαίνουσιν. 8 Ὅταν δ' ἐπὶ τῶν μερῶν τις διδῷ τὰ καθ' ἕκαστον, ἐπάγοντα τὸ καθόλου, πολλάκις οὐκ ἐρωτητέον, ἀλλ' ὡς δεδομένῳ χρηστέον. ἐνίοτε γὰρ οἴονται καὶ αὐτοὶ δεδωκέναι, καὶ τοῖς ἀκούουσι φαίνονται, διὰ τὴν τῆς ἐπαγωγῆς μνείαν, ὡς οὐκ ἂν ἠρωτημένα μάτην. 9 Ἐν ὅσοις τε ὀνόματι μὴ σημαίνεται τὸ καθόλου, ἀλλὰ τῇ ὁμοιότητι χρηστέον πρὸς τὸ συμφέρον. λανθάνει γὰρ ἡ ὁμοιότης πολλάκις. 10 Πρὸς τε τὸ λαβεῖν τὴν πρότασιν, τοὐναντίον* παραβάλλοντα, χρὴ πυνθάνεσθαι. οἷον εἰ δέοι λαβεῖν, ὅτι δεῖ πάντα τῷ πατρὶ πείθεσθαι, πότερον ἅπαντα δεῖ πείθεσθαι τοῖς γονεῦσιν, ἢ πάντ' ἀπειθεῖν; καὶ τὸ πολλάκις, πότερον πολλὰ συγχωρητέον, ἢ ὀλίγα; μᾶλλον γὰρ, εἴπερ ἀνάγκη, πολλὰ δόξειεν ἂν εἶναι. παρατιθεμένων γὰρ ἐγγὺς τῶν ἐναντίων, καὶ μείζω, καὶ μεγάλα φαίνεται, καὶ χείρω, καὶ βελτίω, τοῖς ἀνθρώποις. 11 Σφόδρα δὲ καὶ πολλάκις δοκεῖν ἐληλέγχθαι ποιεῖ τὸ μάλιστα σοφιστικὸν συκοφάντημα τῶν ἐρωτώντων, τὸ μηδὲν συλλογισαμένους, μὴ ἐρώτημα ποιεῖν τὸ τελευταῖον, ἀλλὰ συμπερασματικῶς εἰπεῖν, ὡς συλλελογισμένους, οὐκ ἄρα τό, καὶ τό. 12 Σοφιστικὸν δὲ καὶ τὸ κειμένου παραδόξου, τὸ φαινόμενον ἀξιοῦν ἀποκρίνεσθαι, προκειμένου τοῦ δοκοῦντος ἐξ ἀρχῆς, καὶ τὴν ἐρώτησιν τῶν

* γρ. προβάλλοντα

ποιούτων οὕτω πειρᾶσθαι, ποτέρως σοι δοκεῖ· αἰσχύνη γάρ, ἂν ᾖ τὸ ἐρώτημα, ἐξ ὧν ὁ συλλογισμός, ἢ ἔλεγχον, ἢ παράδοξον γίνεσθαι, ἢ ἐλεγχοειδές· δόντος μὲν, ἔλεγχον· μὴ δόντος δὲ, μηδὲ δοκεῖν φάσκοντος, ἄδοξον· μὴ δόντος δὲ, δοκεῖν δὲ ὁμολογοῦντος, ἐλεγχοειδές. 13 Ἔτι, καθάπερ ἐν τοῖς ῥητορικοῖς, καὶ ἐν τοῖς ἐλεγκτικοῖς ὁμοίως τὰ ἐναντιώματα θεωρητέον, ἢ πρὸς τὰ ὑφ' αὑτοῦ λεγόμενα, ἢ πρὸς οὓς ὁμολογεῖ καλῶς λέγειν ἢ πράττειν· ἔτι πρὸς τοὺς δοκοῦντας τοιούτους, ἢ πρὸς τοὺς ὁμοίους· ἢ πρὸς τοὺς πλείστους, ἢ πρὸς τοὺς πάντας.
* γρ. ὅταν δὲ ἐπ. 14 Ὥσπερ δὲ ἀποκρινόμενοι, πολλάκις, ὅταν ἐλέγχωνται, ποιοῦσι διττόν, ἐὰν μέλλῃ συμβαίνειν ἐλέγχεσθαι· καὶ ἐρωτῶντας χρηστέον ποτὲ τούτῳ πρὸς τοὺς ἐνισταμένους, ἐὰν ὡδὶ μὲν συμβαίνῃ, ὡδὶ δὲ μή, ὅτι οὕτως εἴληφεν· οἷον καὶ ὁ Κλεοφῶν ποιεῖ ἐν τῷ Μανδροβούλῳ. 15 Δεῖ δὲ καὶ ἀφισταμένους τοῦ λόγου, τὰ λοιπὰ τῶν ἐπιχειρημάτων ἐπιτέμνειν· καὶ τὸν ἀποκρινόμενον (* ἂν προαισθάνηται) προενίστασθαι, καὶ προαγορεύειν.
* γρ. ἴσως ἄν. 16 Ἐπιχειρητέον δὲ ἐνίοτε καὶ πρὸς ἄλλο τοῦ εἰρημένου, ἐκεῖνο λαμβάνοντας, ἐὰν μὴ πρὸς τὸ προκείμενον ἔχῃ τις ἐπιχειρεῖν· ὅπερ ὁ Λυκόφρων ἐποίησε, προβληθέντος λύραν ἐγκωμιάζειν. 17 Πρὸς δὲ τοὺς ἀπαιτοῦντας πρός τι ἐπιχειρεῖν, (ἐπειδὴ δοκεῖ δεῖν ἀποδιδόναι τὴν αἰτίαν· λεχθέντων δ' ἐνίων, εὐφυλακτότερον) τὸ καθόλου συμβαῖνον ἐν τοῖς ἐλέγχοις, λεκτέον τὴν ἀντίφασιν, ὅ,τι ἔφησεν ἀποφῆσαι, ἢ ὅ,τι ἀπέφησε φῆσαι· ἀλλὰ μὴ ὅτι τῶν ἐναντίων ἡ αὐτὴ ἐπιστήμη, ἢ οὐχ ἡ αὐτή. 18 Οὐ δεῖ δὲ τὸ συμπέρασμα προτατικῶς ἐρωτᾶν· ἔνια δὲ οὐδὲ ἐρωτητέον, ἀλλ' ὡς ὁμολογουμένοις χρηστέον. 19 Ἐξ ὧν μὲν οὖν αἱ ἐρωτήσεις, καὶ πῶς ἐρωτητέον ἐν ταῖς ἀγωνιστικαῖς διατριβαῖς, εἴρηται.

A rogationē ſic inſtituere, vt tibi videtur: neceſſe *n. eſt*, ſi interrogatio *in eorum numero* ſit, ex quibus ſyllogiſmus *extruitur*, aut elenchum, aut paradoxum confici, aut ſpeciem *habere* elenchi: elenchum, ſi concedat: inopinabile, ſi neque concedat, neque *ſibi* videri dicat: ſpeciem elenchi, ſi non concedat, fateatur tamē *ſibi* videri. 13 Prætereà, vt in rhetoricis, *ita* etiam in elenchicis ſimiliter animaduertenda *ſunt* ea quæ repugnāt vel iis quæ ab ipſo *reſpōdente* dicta ſunt, vel iis quos *ipſe* fatetur rectè loqui aut agere: necnon iis, qui videntur tales, aut ſimilibus, *iiſque* aut plurimis, aut omnibus. 14 Sicut autem qui reſpōdent, ſæpenumero, quando elencho redarguuntur, diſtinctionem adhibent, ſi futurum eſt, vt elencho redarguantur: *ita* etiam B interrogantibus vtendum *eſt* hoc *præſidio* cōtra obiicientes, *vt* ſi illo modo contingit, hoc modo non *cōtingit*, illo modo ſe accepiſſe *dicant*: vt etiā Cleophon facit in Mandrobulo. 15 Oportet etiam recedendo à *capta* diſputatione, reliquas argumentationum *partes* præcidere: ac reſpōdentem oportet, cùm præſentiat, antè occurrere & prædicere. 16 Nonnūquam etiam argumentandum *eſt* cōtra aliud *quiddam* ab eo quod dictū *eſt*, *diuerſum*, illud ſumendo, ſi quis nō habeat argumenta cōtra propoſitum *problema*, quod quidem Lycophron fecit, cùm propoſitum problema eſſet lyræ encomium. C 17 Sed adverſus eos, qui requirunt vt contra certum quid argumenta dirigantur, (quia videtur opus eſſe, vt explicetur, in quo culpetur: quibuſdā autem expreſſis, faciliùs caueri poteſt) dicendum eſt, quod vniuerſaliter accidit in elenchis, *nos ſcilicet inſtituiſſe probare* contradictionem: *nempe*, quod ille affirmauit, eſſe negandum: aut, quod negauit, affirmandū: non autem *dicendum*, *nos inſtituiſſe probare*, quòd cōtrariorum *ſit* eadem ſcientia, vel non eadem. 18 Non oportet autem concluſionem in modum propoſitionis interrogare. nonnulla verò ne quidem interrogari debent: ſed his vt conceſſis vtendum. 19 Ex quibus igitur *locis* interrogationes eruantur, & quomodo *ſit* interrogandum in contentioſis congreſſibus, dictum eſt.

DE SOLVTIONE SOPHISMATVM,

TRACTATVS V.

De vtilitate huius tractatus, ac de ratione reſpondendi. Cap. XVI.

1 Scopus & nexus. 2 Huius tractatus vtilitas 3 prima, 4 ſecunda, 5 & tertia. 6 De generali ratione ſoluendi ſophiſmata. 7 quæ non ſufficit. 8 De difficultate ſoluendi ſophiſmata.

LIB. II. CAP. I. Περὶ δὲ ἀποκρίσεως, καὶ πῶς δεῖ λύειν, καὶ τί, καὶ πρὸς τίνα χρῆσιν οἱ τοιοῦτοι τῶν λόγων ὠφέλιμοι, μετὰ ταῦτα λεκτέον. 2 Χρήσιμοι μὲν οὖν εἰσι πρὸς φιλοσοφίαν, διὰ δύο. 3 Πρῶτον μὲν γὰρ ὡς ἐπὶ τὸ πολὺ γινόμενοι παρὰ τὴν λέξιν, ἄμεινον ἔχειν ποιοῦσι πρὸς τὸ ποσαχῶς ἕκαστον λέγεται, καὶ ποῖα ὁμοίως, καὶ ποῖα ἑτέρως ἐπὶ τῶν πραγμάτων συμβαίνει, καὶ ἐπὶ τῶν ὀνομάτων. 4 Δεύτερον δέ, πρὸς τὰς καθ' ἑαυτὸν ζητήσεις· ὁ γὰρ * ὑφ' ἑτέρου ῥᾳδίως παραλογιζόμενος, καὶ τοῦτο μὴ αἰσθανόμενος, κἂν αὐτὸς ὑφ' αὑτοῦ τοῦτο πάθοι πολλάκις. 5 Τρίτον δὲ καὶ τὸ λοιπὸν ἔτι, πρὸς δόξαν, τὸ περὶ πάντα γεγυμνάσθαι δοκεῖν, καὶ μηδενὸς ἀπείρως ἔχειν. τὸ γὰρ κοινωνοῦντα λόγων, ψέγειν λόγους, μηδὲν ἔχοντα διαιρεῖν περὶ τῆς φαυλότητος

* κἀφ' ἑτέρου.

D POſt hæc, de reſponſione, quomodo oporteat ſoluere, & quid, & ad quem vſum diſputationes huiuſmodi valeant, dicendū *eſt*. 2 Sanè vtiles ſunt ad philoſophiam ob duas *cauſas*. 3 Primùm, quia cùm pleruque ſumantur ex dictione, faciunt vt meliùs affecti ſimus ad *dignoſcendū* quot modis vnūquodque dicatur, & quę ſimili & quæ diuerſo modo accidant, tam in rebus quàm in nominibus. 4 Secundò, *quia conferunt* ad inquiſitiones, *quas aliquis ipſe* ſecum *facit*. nam qui ab aliis facilè paralogiſmo decipitur, nec id animaduertit, ipſe quoq; à ſemet ipſo hoc pati ſæpenumero poteſt. 5 Tertium & reliquum *emolumentum pertinet* ad gloriam *conſequendā*: quòd *hac ratione* videatur *quis* in omnibus *rebus* exercitatus, ac nullius eſſe imperitus. Qui enim cum altero diſputans, vituperat argumentationes, nec certum quid dicere poteſt de

...tiâ vitio, ſuſpicionem præbet, quaſi videatur *eas* cum indignatione audire, non propter veritatem, ſed propter imperitiã. 6 Quomodo autem reſpõdentes occurrere debeant huiuſmodi argumẽtationibus, apparet: ſiquidem antea, ex quibus locis ducãtur paralogiſmi, rectè commemorauimus: & *ſophiſtarum* in percontãdo impoſturas ſufficienter enucleauimus. 7 Neque verò idẽ eſt, acceptâ argumẽtatione, videre ac diluere *eius* vitium, atque celeriter poſſe reſpondentem occurrere. quod.n. nouimus, ſæpe tranſpoſitum ignoramus. Preterea, ſicut in aliis *rebus* celeritas ac tarditas exercitatione accipit incrementum, ita etiam in diſputationibus *ſe res* habet. Quare ſi *quid* nobis manifeſtũ ſit, ſed meditationis expertes ſimus, tẽpore ſæpe deſtituimur. 8 Interdum autem accidit, vt in deſcriptionibus *mathematicis*, (etenim cùm eas reſoluerimus, quandoque rurſus componere nequimus) ita etiam in elenchis: nam cognoſcentes, vnde argumentationis connexus eueniat, argumentationem illam diſſoluere non valemus.

A αὐτῷ, ὑποψίαν δίδωσι τοῦ δοκεῖν δυσχεραίνειν, οὐ διὰ τἀληθές, ἀλλὰ δι' ἀπειρίαν. 6 Ἀποκρινομένοις δὲ πῶς ἀπαντητέον πρὸς τοὺς τοιούτους λόγους, φανερόν, εἴπερ ὀρθῶς εἰρήκαμεν πρότερον, ἐξ ὧν εἰσὶν οἱ παραλογισμοί, καὶ τὰς ἐν τῷ πυνθάνεσθαι πλεονεξίας ἱκανῶς διείλομεν. 7 Οὐ ταὐτὸν δέ ἐστι, λαβόντα τὸν λόγον, ἰδεῖν καὶ λῦσαι τὴν μοχθηρίαν, καὶ ἐρωτώμενον ἀπαντᾶν δύνασθαι ταχέως. ὃ γὰρ ἴσμεν, πολλάκις μετατιθέμενον ἀγνοοῦμεν. ἔτι δὲ, ὥσπερ ἐν τοῖς ἄλλοις τὸ θᾶττον, καὶ τὸ βραδύτερον, ἐκ τοῦ γεγυμνά- B σθαι γίνεται μᾶλλον, οὕτω καὶ ἐπὶ τῶν λόγων ἔχει. ὥστε, ἂν δῆλον μὲν ἡμῖν ᾖ, ἀμελέτητοι δ' ὦμεν, ὑστεροῦμεν τῶν καιρῶν πολλάκις. 8 Συμβαίνει δέ ποτε, καθάπερ ἐν τοῖς διαγράμμασι, (καὶ γὰρ ἐκεῖνα ἀναλύσαντες, ἐνίοτε συνθεῖναι πάλιν ἀδυνατοῦμεν) οὕτω καὶ ἐν τοῖς ἐλέγχοις· εἰδότες γὰρ * παρ' ὃ ὁ λόγος συμβαίνει συνείρειν, διαλῦσαι τὸν λόγον ἀποροῦμεν.

* κ. ἵπερ ὃ ὁ λόγος συμβαίνει συνείρει τ. λ. α. π.

De ea quæ videtur ſolutio. Cap. XVII.

1 *Duplex ſolutionis genus.* 2 *Sophiſtam non redarguere, ſed potius obſcurare etiam verum elenchum.* 3 *Præceptum primum de ſolutione adhibenda.* 4 *Si elenchus ab homonymia eſſet verus elenchus, ſolui non poſſet.* 5 *Captionis ab homonymia ſumptæ ſolutio vna,* 9 *atque altera.* 7 *veram ſolutionem eſſe per diſtinctionem.* 8 *Reprehenduntur ij, qui non audent diſtinguere.* 9 *Quòd diſtinguendum ſit, Ratio prima:* 10 *ſecunda:* 11 *tertia.* 12 *Concluſio.* 13 *Secundum præceptum.* 14 *Tertium.* 15 *Quartum.* 16 *Quintum.* 17 *Sextum.* 19 *Septimum.* 20 *Octauum.* 21 *Nonum.* 22 *Decimum.*

PRimùm igitur, ſicut dicimus ſyllogiſmos probabiles interdũ eſſe præeligendos potiùs quã veros, ita & ſolu͂dum *eſt* nonnunquam probabiliter potiùs, quam ſecundùm veritatem, prorſus.n. cum *hominibus* litigioſis pugnandum *eſt*, non quaſi elencho redarguãt, ſed quaſi videantur redarguere: ſiquidem non dicimus eos *aliquid* concludere. quaproptèr eò dirigenda *eſt reſponſio*, ne videantur *concludere*. Etenim ſi elenchus eſt contradictio non homonyma, *quæ* ex nõnullis *ſumptionibus colligitur*: nulla vtique diſtinctione opus eſt adverſus ambigua; & homonymiam: quoniam *is qui talia interrogat*, non facit ſyllogiſmum. verùm nõ alia de cauſa diſtinctio eſt præmittẽda, niſi quia concluſio ſpeciem quandam elenchi præ ſe fert. non *eſt* igitur cauendũ, ne redarguamur, ſed ne videamur *redargui*. 2 Quandoquidem interrogationes ambiguæ, vel propter homonymiam *multiplices*, & eiuſmodi aliæ captiones, etiam verum elenchum obſcurãt. & ſitne aliquis elẽcho conuictus nécne, incertum reddunt. Cùm.n. ad extremum, facta cõcluſione, liceat *reſpondenti* dicere, non quod *ipſe* affirmauit, negaſſe interrogantem; ſed homonymos vel ambiguè interrogaſſe; ideóque aliud ſe affirmaſſe, aliud ſumpſiſſe interrogantem, ac negaſſe in concluſione: etſi maximè ad idem retulit: incertũ *eſt*, an ſit conuictus elencho: quia incertũ eſt, an nunc verum dicat. Quòd ſi *interrogans* diſtinctione adhibitâ interrogaſſet homonymũ, vel ambiguum, non obſcurus eſſet elenchus. 3 Et quod litigioſi *interrogatores* nũc minùs requirunt, olim magis *requirebant*, vt *ſcilicet* interrogatus reſponderet aut Etiam, aut Non: *id* certè fieret. Nunc verò, quia non ſcitè interrogant, qui percontantur, neceſſe *eſt*, vt interrogatus adiiciat aliquid reſponſioni, quo vitium interrogationis corrigat. nam ſi *interrogans* diſtinxiſſet ſufficienter, neceſſe *eſſet*, vt reſpondens, vel Etiam, vel Non, diceret.

C Πρῶτον μὲν οὖν, ὥσπερ συλλογίζεσθαί φαμεν ἐνδόξως ποτὲ μᾶλλον, ἢ ἀληθῶς, προαιρεῖσθαι δεῖν, οὕτω καὶ λυτέον ἐνδόξως ποτὲ μᾶλλον, ἢ κατὰ τἀληθές. ὅλως γὰρ πρὸς τοὺς ἐριστικοὺς μαχετέον, οὐχ ὡς ἐλέγχοντας, ἀλλ' ὡς φαινομένους ἐλέγχειν· οὐ γάρ φαμεν συλλογίζεσθαί γε αὐτούς· ὥστε πρὸς τὸ μὴ δοκεῖν, διορθωτέον. εἰ γάρ ἐστιν ὁ ἔλεγχος, ἀντίφασις μὴ ὁμώνυμος, ἔκ τινων· οὐδὲν ἂν δέοι διαιρεῖσθαι πρὸς τἀμφίβολα, καὶ τὴν ὁμωνυμίαν· οὐ γὰρ ποιεῖ συλλογισμόν. ἀλλ' οὐδενὸς ἄλλου χάριν προσδιαιρετέον, ἀλλ' ἢ D ὅτι τὸ συμπέρασμα φαίνεται ἐλεγχοειδές. οὐκ οὖν τὸ ἐλεγχθῆναι, ἀλλὰ τὸ δοκεῖν, εὐλαβητέον. 2 Ἐπεὶ τό γε ἐρωτᾶν ἀμφίβολα, καὶ τὰ παρὰ τὴν ὁμωνυμίαν, ὅσαι τε ἄλλαι τοιαῦται παρακρούσεις, καὶ τὸν ἀληθινὸν ἔλεγχον ἀφανίζει, καὶ τὸν ἐλεγχόμενον καὶ μὴ ἐλεγχόμενον, ἄδηλον ποιεῖ. ἐπεὶ γὰρ ἔξεστιν ἐν τῷ τέλει συμπερανθέντος, μὴ ὅπερ ἔφησεν, ἀποφῆσαι λέγειν ἀλλ' ὁμωνύμως, ἢ ἀμφιβόλως ἐρωτῆσαι τὸν ἐρωτῶντα· καὶ διὰ τοῦτο, ἄλλο μὲν καταφῆσαι αὐτόν, ἄλλο δὲ λαβεῖν τὸν ἐρωτῶντα, καὶ ἀποφῆσαι ἐν τῷ συμπεράσματι· εἰ καὶ ὅτι μάλιστα ἔτυχεν ἐπὶ ταὐτὸ φέρων, ἄδηλον, εἰ ἐλήλεγκται· E ἄδηλον γάρ, εἰ ἀληθῆ λέγει νῦν. εἰ δὲ διελὼν εἴρετο τὸ ὁμώνυμον, ἢ τὸ ἀμφίβολον, οὐκ ἂν ἄδηλος εἴη ὁ ἔλεγχος. 3 Ὅ, τ' ἐπιζητοῦσι νῦν μὲν ἧττον, πρότερον δὲ μᾶλλον οἱ ἐριστικοὶ * τὸ ἢ ναί, ἢ οὔ, ἀποκρίνεσθαι τὸν ἐρωτώμενον, ἐγίνετ' ἄν. νῦν δὲ, διὰ τὸ μὴ καλῶς ἐρωτᾶν τοὺς πυνθανομένους, ἀνάγκη προσαποκρίνεσθαί τι τὸν ἐρωτώμενον, διορθοῦντα τὴν μοχθηρίαν τῆς ἐρωτήσεως, ἐπεὶ διελομένου γε ἱκανῶς,* ἀνάγκη, ἢ ναί, ἢ οὔ, λέγειν τὸν ἀποκρινόμενον.

CAP. II.

* κ. τὸ ἢ ναί, ἢ οὔ,

* κ. ἢ ναί, ἢ οὔ, ἀνάγκη, λ. τ. α.

4 Εἰ δέ τις ὑπολήψεται τὸν κατὰ τὴν ὁμωνυμίαν ἔλεγχον εἶναι, τρόπον τινὰ οὐκ ἔσται διαφυγεῖν τὸ ἐλέγχεσθαι τὸν ἀποκρινόμενον. ἐπὶ γὰρ τῶν ὁρατῶν, ἀναγκαῖον ὃ ἔφησεν ἀποφῆσαι ὄνομα, καὶ ὃ ἀπέφησε, φῆσαι. 5 Ὡς γὰρ διορθοῦνταί τινες, οὐδὲν ὄφελος. οὐ γὰρ Κορίσκον φασὶν εἶναι μουσικὸν καὶ ἄμουσον. ἀλλὰ τοῦτον τὸν Κορίσκον, μουσικὸν· καὶ τοῦτον τὸν Κορίσκον, ἄμουσον. ὁ γὰρ αὐτὸς ἔσται λόγος, τὸ, τὸν Κορίσκον, τῷ, τοῦτον τὸν Κορίσκον, μουσικὸν εἶναι· ὅπερ ἅμα φησί τι καὶ ἀποφησιν. ἀλλ' ἴσως οὐ ταὐτὸ σημαίνει· οὐδὲ γὰρ ἐκεῖ τοὔνομα· ὥστε οὐδέν τι διαφέρει. 6 Εἰ δὲ τῷ μὲν, τὸ ἁπλῶς λέγειν ἀποδώσει· τῷ δὲ, προσθήσει τὸ τινὰ, ἢ τόνδε· ἄτοπον· οὐδὲν γὰρ μᾶλλον θατέρῳ· ὁποτέρῳ γὰρ, οὐδὲν διαφέρει. 7 Οὐ μὴν ἀλλ' ἐπεὶ ἄδηλος μέν ἐστιν ὁ μὴ διωρισμένος τὴν ἀμφιβολίαν, πότερον ἐλήλεγκται, ἢ οὐκ ἐλήλεγκται (δέδοται γὰρ ἐν τοῖς λόγοις τὸ διελεῖν) φανερὸν ὅτι τὸ μὴ διορίσαντα δοῦναι τὴν ἐρώτησιν, ἀλλὰ ἁπλῶς, ἁμάρτημά ἐστιν. ὥστε κἂν εἰ μὴ αὐτὸς, ἀλλ' ὅ γε λόγος ἐληλεγμένῳ ὅμοιός ἐστι. 8 Συμβαίνει μέντοι πολλάκις ὁρῶντας τὴν ἀμφιβολίαν, ὀκνεῖν διαιρεῖσθαι διὰ τὴν πυκνότητα τῶν τὰ τοιαῦτα προτεινόντων, ὅπως μὴ πρὸς ἅπαν δοκῶσι δυσκολαίνειν. εἶτ', οὐκ ἂν οἰηθέντων παρὰ τοῦτο γενέσθαι τὸν λόγον, πολλάκις ἀπήντησε* παράδοξον. 9 Ὥστε, ἐπεὶ δέδοται διαιρεῖν, οὐκ ὀκνητέον, καθάπερ ἐλέχθη πρότερον. 10 Εἰ δὲ τὰ δύο ἐρωτήματα μὴ ἕν τις ποιεῖ ἐρώτημα, οὐδ' ἂν ὁ παρὰ τὴν ὁμωνυμίαν καὶ ἀμφιβολίαν ἐγίνετο παραλογισμὸς, ἀλλ' ἢ ἔλεγχος, ἢ οὔ. τί γὰρ διαφέρει ἐρωτῆσαι, εἰ Καλλίας μὲν καὶ Θεμιστοκλῆς μουσικοί εἰσιν; ἢ, εἰ ἀμφοτέροις ἓν ὄνομα ἦν, ἑτέροις οὖσιν; εἰ γὰρ πλείω δηλοῖ ἑνὸς, πλείω ἠρώτησεν. εἰ οὖν μὴ ὀρθὸν, πρὸς δύο ἐρωτήσεις μίαν ἀπόκρισιν ἀξιοῦν λαμβάνειν ἁπλῶς, φανερὸν ὅτι οὐδενὶ προσήκει τῶν ὁμωνύμων ἀποκρίνεσθαι ἁπλῶς, οὐδ' εἰ κατὰ πάντων ἀληθὲς, ὥσπερ ἀξιοῦσί τινες. οὐδὲν γὰρ τοῦτο διαφέρει, ἢ εἰ εἴρετο, Κορίσκος καὶ Καλλίας πότερον οἴκοι εἰσὶν, ἢ οὐκ οἴκοι; εἴτε παρόντων ἀμφοῖν, εἴτε μὴ παρόντων· ἀμφοτέρως γὰρ πλείους αἱ προτάσεις. οὐ γὰρ, εἰ ἀληθὲς εἰπεῖν, διὰ τοῦτο μία ἡ ἐρώτησις. ἐγχωρεῖ γὰρ καὶ μυρία ἕτερα ἐρωτηθέντα ἐρωτήματα, ἅπαντα ναὶ, ἢ οὔ, ἀληθὲς εἶναι λέγειν· ἀλλ' ὅμως οὐκ ἀποκριτέον μιᾷ ἀποκρίσει· ἀναιρεῖται γὰρ τὸ διαλέγεσθαι. τοῦτο δ' ὅμοιον, ὡς εἰ καὶ τὸ αὐτὸ ὄνομα τεθείη τοῖς ἑτέροις. εἰ οὖν μὴ δεῖ πρὸς δύο ἐρωτήσεις μίαν ἀπόκρισιν διδόναι, φανερὸν ὅτι οὐδ' ἐπὶ τῶν ὁμωνύμων τὸ ναὶ, ἢ οὒ λεκτέον. 11 Οὐδὲ γὰρ ὁ εἰπὼν ἀποκέκριται, ἀλλ' εἴρηκεν. ἀλλ' ἀξιοῦταί πως ἐν τοῖς διαλεγομένοις, διὰ τὸ λανθάνειν τὸ συμβαῖνον. 12 Ὥσπερ οὖν εἴπομεν, ἐπειδήπερ οὐδ' ἔλεγχοί τινες ὄντες, δοκοῦσιν εἶναι· κατὰ τὸν αὐτὸν τρόπον, καὶ λύσεις δόξουσιν εἶναι, οὐκ οὖσαι λύσεις· ἃς δή φαμεν ἐνίοτε μᾶλλον δεῖν φέρειν, ἢ τὰς ἀληθεῖς ἐν τοῖς ἀγωνιστικοῖς λόγοις, καὶ τῇ πρὸς τὸ διττὸν ἀπαντήσει. 13 Ἀποκριτέον δὲ, ἐπὶ μὲν τῶν δοκούντων, τὸ ἔστω, λέγοντα· καὶ γὰρ οὕτως ἥκιστα γίνοιτ' ἂν παρεξέλεγχος· ἂν δέ τι παράδοξον ἀναγκάζηται λέγειν, ἐνταῦθα μάλιστα προσθετέον τὸ δοκεῖν. οὕτω γὰρ οὔτε ἔλεγχος, οὔτε παράδοξον ἂν γίνεσθαι δόξειεν.

* γ. παρὰ δόξαν.

A 4 Si quis autem exiſtimet eum eſſe elenchum, qui ſecundùm homonymiam fit: nullo modo licebit reſpondenti effugere, quominùs elencho redarguatur. in iis.n. quæ cernuntur *oculis*, neceſſe *eſt* negare nomẽ quod affirmauit, aut affirmare quod negauit. 5 Vt.n. corrigunt nonnulli, nihil prodeſt. aiunt.n. *hi*, non Coriſcum eſſe muſicum, & immuſicum: ſed hunc Coriſcum eſſe muſicum, & hunc Coriſcum immuſicum. Nam eadem erit oratio, Coriſcum *eſſe muſicum*, & hunc Coriſcũ eſſe muſicum: quod quidem ſimul affirmat & negat, *qui reſpondet*. Sed fortaſſe non *vnũ & idem* ſignificat *verbum illud Hic Coriſcus*: quia nec illic *nomen* Coriſcus B *vnã habebat ſignificationem*. itaque, *vtrùm Coriſcus, an Hic Coriſcus dicatur*, nihil intereſt. 6 Sin autem illi ſimpliciter loquẽdo attribuet, huic verò aliquem, vel hunc adiunget, abſurdum *erit*: quia non magis alteri inerit, *quàm alteri*: vtrius.n. *attribuatur*, nihil intereſt. 7 Verumenimuero quoniam incertũ eſt, an is qui non diſtinxit amphiboliam, ſit conuictus elencho, necne: (in diſputationibus namque conceſſum eſt diſtinguere:) apparet, eũ, qui nõ diſtinguit, ſed ſimpliciter concedit interrogationẽ, peccare. quocirca ſi non ipſe *reſpondens*, at certè *eius* oratio elencho refutatæ ſimilis eſt. 8 Sæpe autem accidit, vt qui ambiguitatem vident, diſtinguere cunctentur propter frequentiam eorum, qui talia C proponunt, ne in omnibus videantur tergiuerſari: deinde, *ipſis* non putantibus ex eo pendêre argumentationem, incidit paradoxum. 9 Quare, cùm ſit conceſſum diſtinguere, non *eſt* cunctandum, vt antea dictum fuit. 10 Niſi verò duas interrogationes pro vna quis acciperet, non fieret ex homonymia vel amphibolia paralogiſmus, ſed aut *eſſet verus* elenchus, aut ne *quidem ſpeciem elenchi præ ſe ferret*. quid.n. intereſt, vtrũ interrogetur, ſintne Callias & Themiſtocles muſici, an *ſub vno communi nomine*, ſi ambobus inter ſe differentibus vnum ſit nomen commune? nam ſi *nomen illud cõmune* plura ſignificat, quàm vnum: *certè qui conſt vſus*, plura in- D terrogauit. Si igitur non rectè petitũr, vt ad duas interrogationes vna reſpõſio ſumatur ſimpliciter: apparet, ad nihil homonymum reſpondẽdum eſſe ſimpliciter, ne quidem ſi in omnibus verum *ſit*, vt nonnulli putant. hoc.n. idem valet, ac ſi interrogaretur, vtrùm Coriſcus & Callias ſint domi, an non *ſint* domi: ſiue adſint ambo, ſiue nòn adſint: quoniam vtroq; modo propoſitiones plures ſunt. non enim, ſi verè dicitur, propterea interrogatio vna *eſt*. nam poſſunt ſexcentæ diuerſæ interrogationes alicui proponi, ad quas omnes verè poſſit reſpondere Etiam, aut Non: verumtamen non *eſt ad illas omnes* vna danda reſponſio: *ſic*.n. tollitur diſputatio. hoc verò perinde eſt, ac ſi *rebus* diuerſis E idem nomen poſitum eſſet. Ergo ſi non oportet ad duas interrogationes vnam reſpõſionem dare: perſpicuum *eſt*, etiam in homonymis non *eſſe* dicendum Etiam, vel Non. 11 Non.n. qui *id* dixit, reſpõdit, ſed locutus eſt. *Hoc* tamen probatur quodammodo in diſſerẽtibus: quia non apparet, quod inde ſequitur. 12 Sicut igitur diximus: quia videtur quidã elenchi eſſe, qui non ſunt: eodem modo etiam ſolutiones *quædam* videbuntur eſſe, quæ nõ erunt: quas ſcilicet dicimus interdum eſſe afferẽdas potiùs, quàm veras, in contentioſis diſputationibus, & cùm *paralogiſmo* ex duplicitate *ducto* occurritur. 13 Porrò autem in reſpondendo ad ea quæ *vera* videntur, dicẽdum, Eſto: ſic enim minimè fiet parexelenchus. At ſi *quis* aliquod paradoxum cogatur dicere, hìc maximè adiungendum *reſpõſioni verbum* Videri. ſic.n. neque elenchus, neque paradoxum effici videbitur.

14 Quia

14 Quia verò manifeſtũ *eſt*, quomodo poſtuletur *quæſitum* initio *propoſitum*: ac omnes id *poſtulari* putant, ſi *quæſito* proximum ſit *quod petitur*: *idcirco* tollenda ſunt, non concedenda nonnulla, quaſi *quæſitum* initio *propoſitum interrogator* petat: & cùm tale quid poſtulat aliquis, quod neceſſariò quidem cõſequitur ex theſi, falſum autẽ eſt, vel inopinabile; dicendum *eſt eſſe* idem *quod quæſitum*. nam quæ neceſſariò conſequuntur, ipſius theſis *partes* vidẽtur. 15 Præterea, cùm vniuerſale non nomine, ſed *ſimilitudinis* collatione ſumptum fuerit: dicendum *eſt*, *aduerſarium*, non vt datũ fuit, nec vt *ipſe* propoſuit, *id* ſumere *in concluſione*: quia propter hoc ſæpe fit elenchus. 16 Qui verò his *reſponſionibus* excluduntur, ad *id* confugere debẽt, *vt* non rectè probatum eſſe *contẽdant*, occurrendo ſecundùm traditã *ſyllogiſmi & elechi* definitionem. 17 Sanè cùm nomina propriè accipiuntur, neceſſe *eſt* reſpõdere vel ſimpliciter, vel per diſtinctionẽ. 18 Sed *quod ad ea* quæ *tacitè* ſubintelligentes ponimus: veluti, quæ non perſpicuè, ſed deminutè interrogantur: hinc ſæpe accidit elenchus. vtputà, Quod eſt Athenienſiũ, eſtne poſſeſſio Athenienſium? vtique. ſimiliter autem & in aliis *dicendum*: at, n. *nonne* homo (*vt Græci loquuntur*) eſt animalium? etiam. homo igitur *eſt* animalium poſſeſſio. nam hominem ideo *Græca phraſi* dicimus eſſe animalium, quia eſt animal: & Lyſandrum *eſſe* Lacedæmoniorum, quia *eſt* Lacedæmonius. Patet igitur, vbi obſcurum eſt quod proponitur, non *eſſe* concedẽdum ſimpliciter. 19 Cùm autem duo ſunt *ita inter ſe affecta*, *vt* ſi alterũ ſit, alterũ quoque neceſſariò eſſe videatur: *contrà* verò ſi hoc ſit, non *ſit* neceſſariò *&* illud: *ſiue* qui interrogatur, vtrum *eorũ eſſe putet*, *id* dare debet, quod minùs *latè patet*: quia difficilius *eſt* cõcludere ex multis. 20 Si quis autem inde argumentetur, quod alteri *eſt aliquid* contrarium, alteri nõ eſt: *etiamſi* ratio vera ſit, *tamen* dicere *oportet eſſe quidẽ etiam* alterius contrarium, ſed nomẽ *ei* non eſſe poſitum. 21 Quia verò ex iis quæ multi dicũt, nonnulla *ſunt eiuſmodi*, *vt* ſi quis *illa* non admittat, *eum* falsò reſpondere autumẽt: quædam verò *talia* non *ſunt*, vt ea de quibus in vtramque partem ſunt opiniones *contrariæ*: (vtrũ enim corruptibilis, an incorruptibilis ſit animantium anima, non eſt exploratum multis) in quibus igitur incertũ eſt, vtro modo dici ſoleat, quod *ita* proponitur, *vt quæratur* vtrum *reſpondenti videatur*, quales *ſunt*, quæ ſentẽtiæ *appellantur*: (nam ſententias appellãt & veras opiniones, & vniuerſas enunciationes, vt, diameter non habet cõmunem menſuram) & præterea de cuius veritate in vtramque partem ſunt opiniones: in his (*inquam*) *omnibus* nomina transferens, maximè latẽre poterit. nam quia incertum eſt, vtro modo veritas habeat, non videbitur ſophiſticè cauillari: & quia in vtramque partem ſunt opiniones, non videbitur falsò reſpondere: translatio verò efficiet, ne oratio poſſit elencho redargui. 22 Præterea quaſcumque interrogationes quis præſenſerit, *illas*, *antequam dicantur*, debet obiicere, ac prædicere: ſic enim maximè percontantem impediet.

A 14 Ἐπεὶ δὲ, πῶς αἰτεῖται τὸ ἐν ἀρχῇ, δῆλον· οἴονται δὲ πάντες, ἂν ᾖ σύνεγγυς, ἀναιρετέον, καὶ μὴ συγχωρητέον εἶναι ἔνια, ὡς τὸ ἐν ἀρχῇ αἰτοῦντος· ὅταν τε τοιοῦτον ἀξιοῖ τις, ὃ ἀναγκαῖον μὲν συμβαίνειν ἐκ τῆς θέσεως, ᾖ δὲ ψεῦδος, ἢ ἄδοξον, ταὐτὸ λεκτέον· τὰ γὰρ ἐξ ἀνάγκης συμβαίνοντα, τῆς αὐτῆς εἶναι θέσεως δοκεῖ. 15 Ἔτι, ὅταν τὸ καθόλου μὴ ὀνόματι ληφθῇ, ἀλλὰ παραβολῇ, λεκτέον ὅτι οὐχ ὡς ἐδόθη, οὐδ᾽ ὡς προὔτεινε, λαμβάνει· καὶ γὰρ παρὰ τοῦτο γίνεται πολλάκις ἔλεγχος. 16 Ἐξειργόμενον δὲ τούτων, ἐπὶ τὸ μὴ καλῶς δεδεῖχθαι πορευτέον, ἀπαντῶντα κατὰ τὸν εἰρημένον διορισμόν. B 17 Ἐν μὲν οὖν τοῖς κυρίως λεγομένοις ὀνόμασιν, ἀνάγκη ἀποκρίνεσθαι, ἢ ἁπλῶς, ἢ διαιρούμενον. 18 Ἃ δὲ συνυπονοοῦντες τίθεμεν, οἷον ὅσα μὴ σαφῶς, ἀλλὰ κολοβῶς ἐρωτᾶται, παρὰ τοῦτο συμβαίνει * ὁ ἔλεγχος. οἷον, ἆρα ὃ ἂν ᾖ Ἀθηναίων, κτῆμά ἐστιν Ἀθηναίων; ναί. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. ἀλλὰ μὴν ὁ ἄνθρωπος, ἐστὶ τῶν ζώων; ναί. κτῆμα ἄρα ὁ ἄνθρωπος τῶν ζώων. τὸν γὰρ ἄνθρωπον, τῶν ζώων εἶναι λέγομεν, ὅτι ζῷόν ἐστι· καὶ Λύσανδρον τῶν Λακώνων, ὅτι Λάκων. δῆλον οὖν ὡς ἐν οἷς ἀσαφὲς τὸ προτεινόμενον, οὐ συγχωρητέον ἁπλῶς. C 19 Ὅταν δὲ, δυοῖν ὄντοιν, θατέρου μὲν ὄντος, ἐξ ἀνάγκης θάτερον εἶναι δοκῇ· θατέρου δὲ τούτου, μὴ ἐξ ἀνάγκης· ἐρωτώμενον * πότερον, δεῖ τὸ ἔλαττον διδόναι· χαλεπώτερον γὰρ συλλογίσασθαι ἐκ πλειόνων. 20 Ἐὰν δὲ ἐπιχειρῇ, ὅτι τῷ μὲν, ἐστὶν ἐναντίον τῷ δὲ, οὐκ ἔστιν· ἂν ὁ λόγος ἀληθὴς ᾖ, ἐναντίον φάναι, ὄνομα δὲ μὴ κεῖσθαι τοῦ ἑτέρου. 21 Ἐπεὶ δ᾽ ἔνια μὲν, ὧν λέγουσιν οἱ πολλοὶ, τὸν μὴ συγχωροῦντα ψεύδεσθαι ἂν φαῖεν· ἔνια δ᾽ οὔ· οἷον, ὅσα ἀμφιδοξοῦσι (πότερον γὰρ φθαρτὴ ἢ ἄφθαρτος ἡ ψυχὴ τῶν ζώων, οὐ διώρισται τοῖς πολλοῖς) ἐν D οἷς οὖν * ἄδηλον, ποτέρως εἴωθε λέγεσθαι τὸ προτεινόμενον πότερον, ὡς αἱ γνῶμαι (καλοῦσι γὰρ γνώμας, καὶ τὰς ἀληθεῖς δόξας, καὶ τὰς ὅλας ἀποφάσεις, ὡς ἡ διάμετρος, ἀσύμμετρος) ἔτι οὗ τἀληθὲς ἀμφιδοξεῖται, μάλιστα μεταφέρων ἄν τις λανθάνοι τὰ ὀνόματα περὶ τούτων. διὰ μὲν γὰρ τὸ ἄδηλον εἶναι, ποτέρως ἔχει τὸ ἀληθὲς, οὐ δόξει σοφίζεσθαι· διὰ δὲ τὸ ἀμφιδοξεῖν, οὐ δόξει ψεύδεσθαι· ἡ δὲ μεταφορὰ ποιήσει τὸν λόγον ἀνεξέλεγκτον. 22 Ἔτι, ὅσα ἄν τις προαισθάνηται τῶν ἐρωτημάτων, προενστατέον, καὶ προαγορευτέον· οὕτω γὰρ ἂν μάλιστα τὸν πυνθανόμενον κωλύσειεν.

* γ. ὁ συλλογισμός.
* γ. πρότερον.
* γ. οὐ δῆλον.

De vera ſolutione. Cap. XVIII.

1 De negatione, vel diſtinctione. 2 De falſitate propoſitionum, & concluſionis. 3 De methodo reſpondendi.

QVoniam autem rectè ſolutio eſt patefactio falſi ſyllogiſmi, *docendo* ex qua interrogatione falſum efficiatur: falſus autem ſyllogiſmus dicitur bifariàm; nempe ſi aut falsò cõcluſum eſt, aut ſi, cùm non ſit ſyllogiſmus, videatur eſſe ſyllogiſmus: erit vtique & quæ nunc dicta eſt ſolutio,

E Ἐπεὶ δ᾽ ἐστὶν ἡ μὲν ὀρθὴ λύσις, ἐμφάνισις ψευδοῦς συλλογισμοῦ, παρ᾽ ὁποίαν ἐρώτησιν συμβαίνει τὸ ψεῦδος· ὁ δὲ ψευδὴς συλλογισμὸς λέγεται διχῶς· * ἢ γὰρ εἰ συλλελόγισται ψευδῶς, ἢ εἰ μὴ ὢν συλλογισμὸς, δοκεῖ εἶναι συλλογισμός· εἴη ἂν ἥ τε εἰρημένη νῦν λύσις, CAP. III.

* γ. ἢ γὰρ ἐὰν.

A καὶ ἡ τοῦ φαινομένου συλλογισμοῦ, παρὰ τί φαίνεται τῶν ἐρωτημάτων διόρθωσις. ὥστε συμβαίνει, τῶν λόγων τοὺς μὲν συλλελογισμένους ἀνελόντα, τοὺς δὲ φαινομένους διελόντα λύειν. 2 Πάλιν, ἐπεὶ τῶν συλλελογισμένων λόγων, οἱ μὲν, ἀληθές· οἱ δὲ, ψευδὲς ἔχουσι τὸ συμπέρασμα· τοὺς μὲν κατὰ τὸ συμπέρασμα ψευδεῖς, διχῶς ἐνδέχεται λύειν. καὶ γὰρ τῷ ἀνελεῖν τι τῶν ἠρωτημένων, καὶ τῷ δεῖξαι τὸ συμπέρασμα ἔχον οὐχ οὕτω. τοὺς δὲ κατὰ τὰς προτάσεις, τῷ ἀνελεῖν τι μόνον· τὸ γὰρ συμπέρασμα, ἀληθές. 3 Ὥστε τοῖς βουλομένοις λύειν λόγον, πρῶτον μὲν σκεπτέον, εἰ συλλελόγισται, ἢ ἀσυλλόγιστος· εἶτα, πότερον ἀληθὲς τὸ συμπέρασμα, ἢ ψευδές· ὅπως ἢ διαιροῦντες, ἢ ἀναιροῦντες λύωμεν· καὶ ἀναιροῦντες, ἢ ὧδε, ἢ ὧδε, καθάπερ ἐλέχθη πρότερον. 4 Διαφέρει δὲ πλεῖστον, ἐρωτώμενόν τε, καὶ μὴ, λύειν λόγον· τὸ μὲν γὰρ προϊδεῖν, χαλεπόν· τὸ δὲ κατὰ σχολὴν ἰδεῖν, ῥᾴδιον.

& eius qui ſyllogiſmus videtur, correctio *docet*, ob quā interrogationem *falſò* videatur *eſſe ſyllogiſmus*. Vnde fit, vt argumentationes concludētes, negatione: quæ autem *concludere* videntur, diſtinctione ſoluantur. 2 Rurſus, quia concludentium argumentationum aliæ veram aliȩ falſam concluſionem habent: eæ quidem, quarum falſa eſt cōcluſio, dupliciter ſolui poſſunt; nempe & tollendo aliquam interrogationem, & oſtēdendo non ita ſe habere concluſionem. quæ verò propoſitiones falſas habent, tantummodò tollendo aliquam *interrogationem ſolui poſſunt*: quandoquidem concluſio vera *eſt*.
B 3 Quocirca qui argumentationem ſoluere volūt, primùm conſiderare debent, concluſeritne, an vi concludendi careat: deinde, vtrùm concluſio vera *ſit*, an falſa: vt vel diſtinguendo, vel tollēdo ſoluamus: tollendo, inquā, aut hoc, aut illo modo, ſicut antea dictum fuit. 4 Plurimùm autem intereſt, vtrùm quis interrogatus, an nō *interrogatus*, ſoluat argumentationem. nam ſtatim proſpicere, difficile *eſt*: per otium autem videre, facile.

De ſolutione captionum, quæ ex homonymia, vel amphibolia ducuntur.

Cap. XIX.

1 Multiplicem ſignificationem vel in concluſione ineſſe, vel in propoſitionibus. 2 Quomodo captio ſoluenda ſit, cùm multiplicitas ineſt in concluſione, 3 vel in propoſitionibus. 4 Generale præceptum, vt multiplicitas ſtatim diſtinguatur, 6 & vt reſpondens dicat ſophiſtam non probaſſe contrarium re ipſa, ſed verbo tenus.

C Τῶν μὲν οὖν παρὰ τὴν ὁμωνυμίαν καὶ τὴν ἀμφιβολίαν ἐλέγχων, οἱ μὲν ἔχουσί τι τῶν ἐρωτημάτων πλείω σημαῖνον· οἱ δὲ, τὸ συμπέρασμα πολλαχῶς λεγόμενον. οἷον, ἐν μὲν τῷ σιγῶντα λέγειν, τὸ συμπέρασμα διττόν. ἐν δὲ τῷ μὴ συνεπίστασθαι τὸν ἐπιστάμενον, (ὡς ἐπὶ τοῦδε, ὁ ἐπιστάμενος λέγειν, ἢ πράττειν, καὶ ἐκεῖνο συνεπίσταται ὃ λέγει, ἢ πράττει· οὗτος δὲ ἐπίσταται λέγειν ἰαμβεῖα· οὗτος ἄρα συνεπίσταται καὶ τὰ ἰαμβεῖα) ἓν τῶν ἐρωτημάτων, * ἀμφίβολον. καὶ τὸ διττὸν, ὁτὲ μὲν ἔστι, ὁτὲ δὲ οὐκ ἔστι· ἀλλὰ σημαίνει τὸ διττὸν, τὸ μὲν, ὄν· τὸ δὲ, οὐκ ὄν. 2 Ὅσοις μὲν οὖν ἐν τῷ τέλει τὸ πλεοναχῶς, ἂν μὴ προσλάβῃ τὴν ἀντίφασιν, οὐ γίνεται ἔλεγχος· οἷον, ἐν τῷ τυφλὸν ὁρᾶν· ἄνευ γὰρ ἀντιφάσεως οὐκ ἦν ἔλεγχος. D 3 Ὅσοις δὲ ἐν τοῖς ἐρωτήμασιν, οὐκ ἀνάγκη προαποφῆσαι τὸ διττόν· οὐ γὰρ πρὸς τοῦτο, ἀλλὰ διὰ τοῦτο ὁ λόγος. 4 Ἐν ἀρχῇ μὲν οὖν τὸ διπλοῦν, καὶ ὄνομα, καὶ λόγον οὕτως ἀποκριτέον, ὅτι ἔστιν ὡς ναὶ, ἔστι δ᾽ ὡς οὔ. ὥσπερ τὸ σιγῶντα λέγειν, ὅτι ἔστιν ὡς ναὶ, ἔστι δ᾽ ὡς οὔ. καὶ τὰ δέοντα πρακτέον ἔστιν ἃ, ἔστι δὲ ἃ οὔ· τὰ γὰρ δέοντα λέγεται πολλαχῶς. ἐὰν δὲ λάθῃ, ἐπὶ τέλει προστιθέντα τῇ ἐρωτήσει, διορθωτέον· ἔστιν ἄρα σιγῶντα λέγειν; οὔ· ἀλλὰ τόνδε σιγῶντα. 5 Καὶ ἐν τοῖς ἔχουσι δὲ τὸ πλεοναχῶς ἐν ταῖς προτάσεσιν, ὁμοίως. οὐκ ἄρα συνεπίστανται, ὅ, τι ἐπίστανται; ναί· ἀλλ᾽ οὐχ οἱ οὕτως ἐπιστάμενοι· οὐ γὰρ ταὐτόν ἐστιν, ὅτι οὐκ ἔστι συνεπίστασθαι, καὶ ὅτι τοὺς ὡδὶ ἐπισταμένοις οὐκ ἔστιν. 6 Ὅλως τε μαχητέον, κἂν ἁπλῶς συλλογίζηται, ὅτι οὐχ ὃ ἔφησεν ἀπέφησε πρᾶγμα, ἀλλὰ ὄνομα. ὥστε οὐκ ἔλεγχος.

* χ.ά. & διττόν.

Elenchorum igitur, qui ex homonymia & amphibolia *ducuntur*, alij habēt aliquam interrogationem plura ſignificantem, alij concluſionem multifariàm acceptam. vt in *captione illa*, σιγῶντα λέγειν, concluſio duplex *eſt*. in *hac* verò, eum qui ſcit, non ſimul ſcire, (vt in hac *argumētatione*, Qui ſcit dicere, aut facere, illud quoque ſimul ſcit, quod dicit, aut facit: atqui hic ſcit dicere *carmina* iambica: hic igitur ſimul ſcit etiam iābica) vna interrogatio *eſt* ambigua. ac quod duplex *eſt*, aliàs eſt *verum*, aliàs non eſt *verum*: quod .n. *eſt* duplex, partim ſignificat quod eſt, partim quod non eſt. 2 Quibus igitur in fine *ineſt* multiplicitas, niſi *opponens* adſumpſerit contradictionem, non fit elenchus: vt in *captione illa*, cæcum videre: quia ſine contradictione non erat elenchus. 3 Quibus verò *multiplicitas ineſt* in interrogationibus, *in his* non *eſt* neceſſe priùs negare quod duplex *eſt*: quia non ad hoc, ſed ex hoc *extruitur* argumētatio. 4 Initiò igitur, *cùm* duplex *eſt* nomen & oratio, ſic reſpondēdum, partim eſſe, partim non eſſe. vtputà σιγῶντα λέγειν, vno modo eſſe verum, altero falſum. & facienda *eſſe* τὰ δέοντα, de his verè *dici*, de illis falſò: quia τὰ δέοντα multis modis dicuntur. Sin *ab initio multiplicitas* lateat, ad extremum adiectione interrogatio *eſt* corrigenda: Eſt igitur *verū*, σιγῶντα λέγειν. minimè: ſed τόνδε σιγῶντα. 5 Sed & in iis quæ multiplicitatem habēt in propoſitionibus, ſimiliter *eſt faciendum*: *velvti*, Non igitur ſimul ſciunt, quod ſciunt. vtique: ſed non qui ita ſciunt. neque enim *hæc* idem valent: non accidere, vt *qui ſciunt*, ſimul ſciant: & non accidere, vt qui ita ſciunt, *ſimul ſciant*. 6 Et omnino pugnare debet *Reſpondens*, etiamſi *aduerſarius* ſimpliciter concluſerit, *ac dicere* non rem à ſe affirmatam, ſed nomen *eum* negaſſe: ideóque non *eſſe* elenchum.

De ſolutione captionum ex compoſitione, & diuiſione.

Cap. XX.

1 Generale præceptum vt dicatur id quod concluſioni ſophiſticæ repugnat. 2 Exemplum vnum, & alterum. 3 Collatio huius fallaciæ cum amphibologia. 4 Eos errare, qui omnes locos ſophiſticos referunt ad multiplicitatem. 5 Ratio ſoluendi ſophiſmatis. 6, 7, 8, 9, 10 Varia exempla. 11 Praua quorumdam ſolutio 12 reiicitur.

PErſpicuum etiam *eſt*, quomodo ſoluendæ ſint *argumentationes*, quæ ex compoſitione & diuiſione *ducuntur*. nã ſi diuiſa & cõpoſita oratio diuerſam habet ſignificationem, *in ſolutione eſt* dicendum, quod concluſioni repugnat. 2 Sunt autem omnes eiuſmodi argumẽtationes ex cõpoſitione & diuiſione: Num quo tu vidiſti hunc vapulantẽ, eo hic vapulauit? & quo vapulauit, eo tu vidiſti? 3 Habet ſane *hæc fallacia* aliquid ambiguæ interrogationis: ſed nihilominus eſt ex compoſitione. neque.n. duplex eſt, quod *ſumitur* ex diuiſione: quia non eadem oratio efficitur, *cùm eſt* diuiſa, *quæ antè erat cõiuncta*. niſi & ὄρος & ὅρος, cum accentu prolata, accipiuntur diuerſis modis; ſed in ſcriptis idem *eſt* nomen, quando iiſdem elementis ſcriptum eſt, & eodem modo. & illic igitur notæ eædem fiunt: ſed quæ pronuntiantur, *ſunt* diuerſa. Quare duplex non *eſt*, quod ex diuiſione *ſumitur*. 4 Perſpicuum quoque *eſt*, non omnes elenchos *ſumi* ex multiplicitate, vt nonnulli autumãt. 5 Diſtinguere igitur debet, qui reſpondet. non.n. idẽ *valet*, ſi quis dicat *aliquem* videre oculis, vapulantẽ: & ſi dicat videre, oculis vapulantem. *6 Huc referatur* & Euthydemi ratio, Nũ vidiſti tu nunc ſtantes in Piræo triremes in Sicilia exiſtens? 7 Et rurſus, Num poteſt bonus cùm ſit ſutor prauus eſſe? atqui poteſt aliquis, cùm ſit bonus ſutor, prauus eſſe: proinde ſutor prauus. 8 *Item*, Num quorũ bonæ *ſunt* ſciẽtiæ, *ea ſunt* bona mathemata? ſed mali bonum *eſt* mathema: malum igitur *eſt* bonum mathema. atqui malum, & mathema *eſt*, & malum: malum igitur *eſt* malum mathema. 9 Numquid verè dicitur nunc te natum eſſe? natus igitur es nunc. An aliud ſignificat diuiſum, *quàm coniunctum*? verè.n. dicitur nunc, te natũ eſſe: ſed non verè dicitur, nunc te natũ eſſe. 10 Nũ quomodo potes, & quę potes, hęc & eo modo vtique feceris? atqui non pulſans citharam, præditus es facultate pulſandi citharam: ergo citharã pulſaueris citharã non pulſans. An non hac præditus eſt facultate, vt non pulſans pulſet citharam: ſed quando *hoc* non facit, *habet facultatem* faciendi? 11 Soluunt autem nonnulli & aliter hoc *ſophiſma*. nã ſi *reſpondens* conceſſit *ſe facturum* quomodo facere poteſt: negant *inde* ſequi, vt non pulſans citharam pulſet: quia non quocumque modo facere poteſt, conceſſit ſe facturum: nec idem valet, quomodo poteſt, & quocumque modo poteſt facere. 12 Sed apparet *eos* non rectè ſoluere. nam argumentationum, quæ ex eodem *loco* ſumuntur, eadem *eſt* ſolutio: hæc verò non conueniet omnibus *eiuſdem generis argumentationibus*, nec quovis modo interrogatis: ſed eſt ad interrogantem, non ad argumentationem *accommodata ſolutio*.

A Φανερὸν δὲ καὶ τοὺς παρὰ τὴν σύνθεσιν καὶ διαίρεσιν πῶς λυτέον· ἐὰν γὰρ διαιρούμενος καὶ συντιθέμενος ὁ λόγος, ἕτερον σημαίνῃ, συμπεραινομένου τοὐναντίον λεκτέον. 2 Εἰσὶ δὲ πάντες οἱ τοιοῦτοι λόγοι, παρὰ σύνθεσιν καὶ διαίρεσιν· ἆρ' ᾧ εἶδες σὺ τοῦτον τυπτόμενον, τούτῳ ἐτύπτετο οὗτος; καὶ ᾧ ἐτύπτετο, τούτῳ σὺ εἶδες; 3 Ἔχει μὲν οὖν τι καὶ τῶν ἀμφιβόλων ἐρωτημάτων· ἀλλ' ἔστι παρὰ σύνθεσιν· οὐ γὰρ ἐστὶ διττόν, τὸ παρὰ τὴν διαίρεσιν· οὐ γὰρ ὁ αὐτὸς λόγος γίνεται διαιρούμενος· εἴπερ μὴ καὶ τὸ ὄρος καὶ ὅρος τῇ προσῳδίᾳ λεχθέντα, σημαίνει ἕτερον. ἀλλ' ἐν μὲν τοῖς γεγραμμένοις ταὐτὸν ὄνομα, ὅταν ἐκ τῶν αὐτῶν στοιχείων γεγραμμένον ᾖ, καὶ ὡσαύτως. κἀκεῖ δὲ τὰ παράσημα ποιοῦνται· τὰ δὲ φθεγγόμενα, οὐ ταὐτά. ὥστε οὐ διττόν, τὸ παρὰ διαίρεσιν. 4 Φανερὸν δὲ καί, ὅτι οὐ πάντες οἱ ἔλεγχοι παρὰ τὸ διττόν, καθάπερ τινές φασι. 5 Διαιρετέον οὖν τῷ ἀποκρινομένῳ. οὐ γὰρ ταὐτόν, εἰπεῖν ἰδεῖν τοῖς ὀφθαλμοῖς, τυπτόμενον· καὶ τὸ φάναι ἰδεῖν, τοῖς ὀφθαλμοῖς τυπτόμενον. 6 Καὶ ὁ Εὐθυδήμου λόγος, ἆρ' οἶδας σὺ νῦν οὔσας ἐν Πειραιεῖ τριήρεις, ἐν Σικελίᾳ ὤν; 7 Καὶ πάλιν, ἆρ' ἐστὶν ἀγαθὸν ὄντα σκυτέα μοχθηρὸν εἶναι; εἴη δ' ἄν τις, ἀγαθὸς ὢν σκυτεύς, μοχθηρός· ὥστε σκυτεὺς μοχθηρός. 8 Ἆρ' ὧν αἱ ἐπιστῆμαι σπουδαῖαι, σπουδαῖα τὰ μαθήματα; τοῦ δὲ κακοῦ σπουδαῖον τὸ μάθημα· σπουδαῖον ἄρα μάθημα, τὸ κακόν. ἀλλὰ μὴν τὸ κακόν, καὶ μάθημα, καὶ κακόν. ὥστε κακὸν μάθημα, τὸ κακόν. 9 Ἆρ' ἀληθὲς εἰπεῖν νῦν ὅτι σὺ γέγονας; γέγονας ἄρα νῦν. ἢ ἄλλο σημαίνει διαιρεθέν; ἀληθὲς γὰρ εἰπεῖν νῦν, ὅτι γέγονας· ἀλλ' οὐ, νῦν σὺ γέγονας. 10 Ἆρ' ὡς δύνασαι, καὶ ἃ δύνασαι, οὕτως καὶ ταῦτα ποιήσαις ἄν; οὐ κιθαρίζων δὲ ἔχεις δύναμιν τοῦ κιθαρίζειν· κιθαρίσαις ἂν ἄρα οὐ κιθαρίζων. ἢ οὐ τούτου ἔχει τὴν δύναμιν τοῦ οὐ κιθαρίζων κιθαρίζειν· ἀλλ' ὅτε οὐ ποιεῖ, τοῦ ποιεῖν; 11 Λύουσι δὲ τοῦτό τινες καὶ ἄλλως. εἰ γὰρ ἔδωκεν ὡς δύναται ποιεῖν, οὔ φασι συμβαίνειν μὴ κιθαρίζοντα κιθαρίζειν. οὐ γὰρ πάντως ὡς δύναται ποιεῖν, δεδόσθαι ποιήσειν· οὐ ταὐτὸν δ' εἶναι τὸ ὡς δύναται, καὶ πάντως ὡς δύναται ποιεῖν. 12 Ἀλλὰ φανερόν, ὅτι οὐ καλῶς λύουσι. τῶν γὰρ παρὰ ταὐτὸ λόγων ἡ αὐτὴ λύσις· αὕτη δ' οὐχ ἁρμόσει ἐπὶ πάντας, οὐδὲ πάντως ἐρωτωμένους· ἀλλ' ἔστι πρὸς τὸν ἐρωτῶντα, οὐ πρὸς τὸν λόγον.

De ſolutione captionum ex accentu.

Cap. XXI.

1 Hanc captionem rarò fieri. Exemplum. 2 Solutio.

Παρὰ δὲ τὴν προσῳδίαν, λόγοι μὲν οὐκ εἰσὶν, οὔτε τῶν γεγραμμένων, οὔτε τῶν λεγομένων, πλὴν εἴ τινες ὀλίγοι γένοιντ᾽ ἄν, οἷον οὗτος ὁ λόγος· ἆρά γέ ἐστι τὸ οὗ καταλύεις οἰκία; ναί. οὐκοῦν τὸ οὐ καταλύεις, τοῦ καταλύεις ἀπόφασις; ναί. ἔφησας δὲ εἶναι τὸ οὗ καταλύεις, οἰκίαν· ἡ οἰκία ἄρα, ἀπόφασις. 2 Ὡς δὴ λυτέον, δῆλον· οὐ γὰρ ταὐτὸ σημαίνει, τὸ μὲν, ὀξύτερον· τὸ δὲ, * βαρύτερον ῥηθέν.

Ex accentu verò argumentationes non ſunt, neque in ſcriptis, neque in pronuntiatis: niſi paucæ quædam fiant, vt hæc argumentatio: Eſtne τὸ οὗ καταλύεις, domus? certè. nónne τὸ οὐ καταλύεις, negatio τοῦ καταλύεις? etiam. dixeras autẽ τὸ οὗ καταλύεις, domum: domus igitur *eſt* negatio. 2 Quomodo autem ſoluendæ *ſint huiuſmodi captiones*, manifeſtum *eſt*: quoniam illud οὐ, non idem ſignificat, cùm acutiùs, & cùm grauiùs profertur.

* γρ. βεβαρύτερον inepte. Malim autem, ὀξύτερον τι & βαρ. τι. appellat ὀξύτερον τι οὐ, vt libro priore cap. 3. βαρύτερον τὸ οὐ. ſemper enim Ariſtoteles [illegible] vocat τὴν περισπωμένην.

De ſolutione captionum, quæ ducuntur ex figura dictionis. Cap. XXII.

1 De ratione ſoluendi hæc ſophiſmata. 2 Exemplum primum, 3 ſecundum. 4 Impugnatur praua ſolutio. 5 Exemplum tertium, 6 quartum, 7 quintum, ſextum. 8, 9, 10, 11, Impugnantur praue quædam ſolutiones. 12 Exemplum ſeptimum, 13 octauum, 14 nonum, 15 decimum, 16 vndecimum, 17 duodecimum.

Δῆλον δὲ, καὶ τοῖς παρὰ τὸ ὡσαύτως λέγεσθαι τὰ μὴ ταὐτὰ, πῶς ἀπαντητέον· ἐπείπερ ἔχομεν τὰ γένη τῶν κατηγοριῶν. ὁ μὲν γὰρ ἔδωκεν ἐρωτηθεὶς, μὴ ὑπάρχειν τι τῶν ὅσα τί ἐστι σημαίνει· ὁ δὲ, ἔδειξεν ὑπάρχον τι τῶν πρός τι, ἢ ποσῶν, δοκούντων δὲ τί ἐστι σημαίνειν, διὰ τὴν λέξιν. 2 Οἷον, ἐν τῷδε τῷ λόγῳ· ἆρ᾽ ἐνδέχεται τὸ αὐτὸ ἅμα ποιεῖν τε καὶ πεποιηκέναι; οὔ. ἀλλὰ μὴν ὁρᾶν γέ τι ἅμα καὶ ἑωρακέναι τὸ αὐτὸ, καὶ κατὰ τὸ αὐτὸ ἐνδέχεται. 3 Ἆρα ἐστί τι τῶν πάσχειν, ποιεῖν τι; οὔ. οὐκοῦν τὸ τέμνεται, καίεται, αἰσθάνεται, ὁμοίως λέγεται· καὶ πάντα πάσχειν τι σημαίνει· πάλιν δὲ τὸ λέγειν, τρέχειν, ὁρᾶν, ὁμοίως ἀλλήλοις λέγεται· ἀλλὰ μὴν τό γ᾽ ὁρᾶν, αἰσθάνεσθαί τι ἐστὶν· ὥστε καὶ πάσχειν τι ἅμα καὶ ποιεῖν. 4 Εἰ δέ τις ἐκεῖ δοὺς μὴ ἐνδέχεσθαι ἅμα τὸ αὐτὸ ποιεῖν τε καὶ πεποιηκέναι, τὸ ὁρᾶν καὶ ἑωρακέναι φαίη ἐγχωρεῖν, οὔπω ἐλήλεγκται, εἰ μὴ λέγει τὸ ὁρᾶν, ποιεῖν τι, ἀλλὰ πάσχειν· προσδεῖ γὰρ τούτου τοῦ ἐρωτήματος· ἀλλ᾽ ὑπὸ τοῦ ἀκούοντος ὑπολαμβάνεται δεδωκέναι· ὅτε τὸ τέμνειν, ποιεῖν τι· καὶ τὸ τετμηκέναι, πεποιηκέναι τι, ἔδωκε· καὶ ὅσα ἄλλα ὁμοίως λέγεται. τὸ γὰρ λοιπὸν αὐτὸς προστίθησιν ὁ ἀκούων, ὡς ὁμοίως λεγόμενον· τὸ δὲ, λέγεται μὲν οὐχ ὁμοίως, φαίνεται δὲ διὰ τὴν λέξιν. τὸ αὐτὸ δὲ συμβαίνει, ὅπερ ἐν ταῖς ὁμωνυμίαις· οἴεται γὰρ ἐν τοῖς ὁμωνύμοις ὁ ἀγνοῶν τοὺς λόγους, ὃ ἔφησεν ἀποφῆσαι πρᾶγμα, οὐκ ὄνομα· τὸ δὲ, ἔτι προσδεῖ ἐρωτήματος, εἰ ἐφ᾽ ἓν βλέπων λέγει τὸ ὁμώνυμον· οὕτως γὰρ δόντος, ἔσται ἔλεγχος. 5 Ὅμοιοι δὲ καὶ οἵδε οἱ λόγοι τούτοις. * εἰ ὅ τις ἔχων, ὕστερον μὴ ἔχει, ἀπέβαλεν; ὁ γὰρ ἕνα μόνον ἀποβαλὼν ἀστράγαλον, οὐχ ἕξει δέκα ἀστραγάλους. ἢ, ὃ μὲν μὴ ἔχει, πρότερον ἔχων, ἀποβέβληκεν; ὅσον δὲ μὴ ἔχει, ἢ ὅσα, οὐκ ἀνάγκη τοσαῦτα ἀποβαλεῖν; ἐρωτήσας οὖν ὃ ἔχει, συνάγει ἐπὶ τοῦ ὅσα· τὰ γὰρ δέκα, ποσά. εἰ οὖν ἤρετο ἐξ ἀρχῆς, ὅσα τις μὴ ἔχει, πρότερον ἔχων, ἆρά γε ἀποβέβληκε τοσαῦτα; οὐδεὶς ἂν ἔδωκεν, ἀλλ᾽ ἢ τοσαῦτα, ἢ τούτων τι. 6 Καὶ ὅτι δοίη ἂν ὃ μὴ ἔχει. οὐ γὰρ ἔχει μόνον ἕνα ἀστράγαλον. ἢ οὐ δέδωκεν, ὃ οὐκ εἶχεν, ἀλλ᾽ ὡς οὐκ εἶχε, τὸν ἕνα. τὸ γὰρ μόνον, οὐ τόδε σημαίνει, οὐδὲ τοιόνδε, οὐδὲ ποσόνδε τι, ἀλλ᾽ ὡς ἔχει πρός τι, οἷον, ὅτι οὐ μετὰ ἄλλου. ὥσπερ οὖν, εἰ ἤρετο,

* γρ. ἅ τις ἔχων

Patet etiam, quomodo *ſit* occurrendum argumẽtationibus ex eo *ductu*, quòd eodem modo dicuntur, quæ non eadem *ſunt*: quãdoquidem tenemus genera categoriarum. nam ille quidem interrogatus conceſſit non eſſe quidpiam eorũ quæ eſſentiam ſignificant: hic verò probauit eſſe quidpiam eorum quæ *referuntur* ad aliquid, vel *ſunt in* quãtorum *numero*, ac vidẽtur eſſentiam ſignificare propter *ſimilem* dictionem. 2 Vt in hac argumẽtatione: Acciditne idem ſimul facere & feciſſe? nequaquam. atqui eãdem rem & ſecundùm idem ſimul videre & vidiſſe contingit. 3 Eſtne aliquid facere & pati? minimè. quin hęc, τέμνεται, καίεται, αἰσθάνεται, *id eſt, ſecatur, vritur, ſentit*, ſimiliter efferuntur, & omnia pati quiddam ſignificant. rurſus λέγειν, τρέχειν, ὁρᾶν, *id eſt, dicere, currere, videre*, ſimili inter ſe modo dicuntur. atqui τὸ ὁρᾶν, *id eſt, videre*, eſt αἰσθάνεσθαί τι, *id eſt, ſpecies quædã eſt ſentire*: proinde ſimul *eſt* & facere & pati. 4 Si quis autem illic, cùm conceſſerit non poſſe *aliquem* ſimul eandem rem facere & feciſſe, fateatur *aliquem* poſſe videre & vidiſſe: nondũ eſt conuictus elencho, ſi videre non dicat eſſe facere quiddã, ſed pati: quoniam opus eſt etiã hac interrogatione. ſed auditores exiſtimant *eũ hoc* conceſſiſſe, quãdo conceſſit, ſecare, eſſe facere quiddã: & ſecuiſſe, feciſſe quiddã: & quæcumque alia ſimiliter dicuntur. reliquũ .n. ipſe auditor ſupplet, quaſi ſimiliter dicatur. ſed hoc non ſimiliter dicitur, verùm *ita* videtur propter *ſimilem* dictionem. Idem autem hîc accidit, quod in homonymiis. nam qui verborum vim ignorat, in homonymis putat, quã rem affirmauit *reſpondens*, eam negaſſe *opponentem*, non *tãtùm* nomen: cùm tamen inſuper ſit opus interrogatione, an ad vnã rem reſpiciẽs vtatur *verbo* homonymo: hoc .n. conceſſo, erit elenchus. 5 His *quas expoſui*, ſimiles ſunt hæ quoque argumẽtationes *quæ ſequuntur*: Nũ quod quis habens, poſtea non habet, amiſit? nã qui vnum modò talum amiſit, nõ habebit decẽ talos. An quod non habet, cũ priùs haberet, amiſit: quantũ verò, aut quod non habet, non *eſt* neceſſe tot *eũ* amiſiſſe? cùm igitur in interrogatione dixerit quot habet, in concluſione ponit tot: nam decem *ſunt* aliquot. Si igitur interrogaſſet ab initio, Quot aliquis non habet, cũ priùs haberet, tótne amiſit? nemo cõcederet: ſed, vel tot vel horum quidpiam. 6 Item *captio, quæ concluditur* poſſe aliquem dare, quod non habet: quia non habet vnum ſolum talum. An *qui dedit vnum ſolum talum*, non dedit quod non habebat, ſed quomodo non habebat, *nempe* vnum? nam *illa dictio* SOLVM, non ſignificat hoc, nec quale, nec quantum, ſed quomodo refertur ad alterum: velvti, non *haberi vnà* cum alio. *perinde* igitur *eſt*, ac ſi *quis* interrogaſſet,

Quod quis nõ habet, poteſtne dare? *altero* verò negante *hoc fieri poſſe*, quæreret, an poſſit aliquis dare citò, non habens citò: atq; *illo* aſſentiente, concluderet dare aliquem poſſe, quod non habet. perſpicuúmq; *eſt, eum* non *rectè* cõcluſiſſe: quia citò *dare*, non eſt hoc dare, ſed ita dare: vt verò quis non habet, dare poteſt: verbi gratiâ, libenter habens, dare poteſt grauatè. 7 *Expoſitis captionibus* hæ quoq; ſimiles ſunt: Nũ *ea*, quã non habet, manu verberare poteſt? aut, *Num eo*, quem non habet, oculo videre poteſt? quia non habet vnum tãtùm. 8 *Huiuſmodi captiones* ſoluunt nõnulli, dicentes & vnum ſolum ſine oculum, ſiue aliud quodvis habere eũ qui plura habet. 9 Alij verò *aiunt* & accepiſſe *quempiam*, quod habet. dedit.n. alter vnum ſolum calculum: & hic habet (inquiunt) vnum ſolum ab illo calculum. 10 Alij autem, ſtatim interrogationẽ tollentes, *affirmant* fieri poſſe vt *quis* habeat, quod nõ accepit: velvti, qui vinum accepit dulce, *ſi* corruptũ *ſit* inter accipiendum, habeat acidum. 11 Verùm, vt antea dictum fuit, omnes hi non ad argumẽtationem, ſed ad hominẽ ſolutionem accommodãt. nam ſi eſſet hæc ſolutio, *quam afferunt*: qui contrarium daret, ſoluere non poſſet: ſicut in aliis *quoque captionibus vſuvenit*. vtputà ſi ſolutio eſt, *quia* partim eſt, partim non *eſt*: ſi ſimpliciter conceſſerit, concluditur: ſin autẽ non concluditur, non poteſt *ea* eſſe ſolutio. in *captionibus* verò *paulò* antè dictis, conceſſis omnibus, negamus fieri ſyllogiſmum. 12 Præterea hæ quoque in huiuſmodi argumẽtationum *numero* ſunt: Num quod ſcriptum eſt, ſcripſit aliquis? ſcripta autem eſt, nunc te ſedere, falſa oratio: ſed vera erat, quando ſcribebatur: ſimul igitur ſcribebatur falſa & vera. nam verã aut falſam orationem, opinionémve eſſe, non hoc, ſed tale ſignificat. eadem namque ratio *eſt* etiam opinionis, *quæ orationis*. 13 Item, Num quod diſcit diſcẽs, hoc eſt quod diſcit? diſcit autem quis *τὸ βραδὺ, ταχύ, id eſt, tardum, celeriter*. non.n. *oppones* dixit, quod quis diſcit, ſed quomodo diſcit. 14 Et, nũ quod quis perambulat, calcat? perambulat autem totum diem. An non dixit, quod *quis* perambulat, ſed quando perambulat? 15 Neque cùm *dicimus*, Calicem bibit, *indicamus*, quòd bibit, ſed ex quo. 16 Item, Nũ quod quis nouit, inueniens vel diſcens nouit? quorũ autem alterum inuênit, alterum didicit: *his, ſi* ambo *ſimul accipiantur*, neutrum *conuenit*. An hîc omne *accipitur*, ibi verò nõ omne. 17 Item, Eſſe quemdam tertium hominem præter ipſum *hominẽ*, & ſingulos *homines*. Nam homo, & quicquid cõmune *eſt*, non hoc aliquid, ſed quale quidpiam, vel ad aliquid, vel quomodo, vel eiuſmodi quidpiam ſignificat. Idem *contingit* in *quæſtione*, vtrùm Coriſcus & Coriſcus muſicus *ſint* eadem res, an diuerſa. nam alterũ hoc aliquid: alterũ, quale ſignificat. Quare nõ licet hoc exponere. Neque verò expoſitio tertium hominem facit: ſed *illa* conceſſio, *id quod eſt cõmune*, eſſe id ipſum quod hoc aliquid. *ſic.n. fit vt* hoc aliquid eſſe, non ſit id ipſum quod Callias, & ſit id ipſũ quod homo. Nec, ſi quis dicat id quod exponitur, nõ eſſe id ipſum quod hoc aliquid, ſed id ipſum quod quale, quicquam refert: erit enim *nihilominus* præter multos vnum aliquid, vt homo. Apparet igitur, non eſſe concedendum, hoc aliquid eſſe, quod communiter multis attribuitur: ſed vel quantum, vel quale, vel ad aliquid, vel huius generis *aliud* quidpiam ſignificare.

A ἆρ' ὃ μὴ ἔχει τις, δοίη ἄν τις; μὴ φάντος δὲ, ἐρωτῴη, εἰ δοίη ἄν τις τι ταχέως, μὴ ἔχων ταχέως; φήσαντος δὲ, συλλογίζοιτο, ὅτι δοίη ἄν τις, ὃ μὴ ἔχει. καὶ φανερὸν ὅτι οὐ συλλελόγισται· τὸ γὰρ ταχέως, οὐ τόδε διδόναι ἐστὶν, ἀλλ' ὧδε διδόναι· ὡς δὲ μὴ ἔχει τις, δοίη ἂν· οἷον, ἡδέως ἔχων, δοίη ἂν λυπηρῶς. 7 Ὅμοιοι δὲ καὶ οἵδε πάντες· ἆρ' ᾗ μὴ ἔχει χειρὶ τύπτοι ἄν; ἢ ᾧ μὴ ἔχει ὀφθαλμῷ ἴδοι ἄν; οὐ γὰρ ἔχει ἕνα μόνον. 8 Λύουσι μὲν οὖν τινες λέγοντες, καὶ ὡς ἔχει ἕνα μόνον καὶ ὀφθαλμὸν, καὶ ἄλλο ὁποιοῦν, ὁ πλείω ἔχων. 9 Οἱ δὲ, καὶ ὡς ὃ ἔχει ἔλαβεν, ἐδίδου γὰρ μίαν μόνην οὗτος ψῆφον· καὶ οὗτος ἔχει (φασὶ) μίαν μόνην παρὰ τούτου ψῆφον. 10 Οἱ δὲ,
B εὐθὺς τὴν ἐρώτησιν ἀναιροῦντες, ὅτι ἐνδέχεται ὃ μὴ ἔλαβεν ἔχειν· οἷον, οἶνον λαβόντα ἡδὺν, διαφθαρέντος ἐν τῇ λήψει, ἔχειν ὀξύν. 11 Ἀλλ', ὅπερ ἐλέχθη καὶ πρότερον, οὗτοι πάντες οὐ πρὸς τὸν λόγον, ἀλλὰ πρὸς τὸν ἄνθρωπον λύουσιν. εἰ γὰρ ἦν αὕτη λύσις· δόντα τὸ ἀντικείμενον, οὐχ οἷόν τε λύειν, καθάπερ ἐπὶ τῶν ἄλλων· οἷον, εἰ ἔστι μὲν ὅ, ἔστι δὲ ὃ οὔ, ἡ λύσις· ἂν ἁπλῶς δῷ λέγεσθαι, συμπεραίνεται· ἐὰν δὲ μὴ συμπεραίνηται, οὐκ ἂν εἴη λύσις· ἐν δὲ τοῖς προειρημένοις, πάντων διδομένων, οὔ φαμεν γίνεσθαι συλλογισμόν. 12 Ἔτι δὲ καὶ οἵδε εἰσὶ τούτων τῶν λόγων· ἆρα ὃ γέγραπται, γέγραφέ τις; γέγραπται δὲ νῦν ὅτι σὺ κάθησαι,
C ψευδὴς ὁ λόγος· ἦν δ' ἀληθὴς, ὅτε ἐγράφετο· ἅμα ἄρα ἐγράφετο ψευδὴς καὶ ἀληθής. τὸ γὰρ ψευδῆ ἢ ἀληθῆ λόγον λόγον, ἢ δόξαν εἶναι, οὐ τόδε, ἀλλὰ τοιόνδε σημαίνει· ὁ γὰρ αὐτὸς λόγος καὶ ἐπὶ τῆς δόξης. 13 Καὶ, ἆρ' ὃ μανθάνει ὁ μανθάνων, τοῦτό ἐστιν ὃ μανθάνει; μανθάνει δέ τις τὸ βραδὺ, ταχύ. οὐ γὰρ ὃ μανθάνει, ἀλλ' ὡς μανθάνει, εἴρηκε. 14 Καὶ, ἆρ' ὃ βαδίζει τις, πατεῖ; βαδίζει δὲ τὴν ἡμέραν ὅλην· ἢ οὐχ ὃ βαδίζει, ἀλλ' ὅτε βαδίζει, εἴρηκεν; 15 Οὐδ' ὅταν τὴν κύλικα πίνει, ὃ πίνει, ἀλλ' ἐξ οὗ. 16 Καὶ, ἆρα ὅ τις οἶδεν, ἢ εὑρὼν ἢ μαθὼν οἶδεν; ὧν δὲ, τὸ μὲν, εὗρε· τὸ δὲ, ἔμαθε· τὰ ἄμφω, οὐδέτερον· * ἢ ὃ μὲν, ἅπαν· ὃ δὲ, οὐχ
D ἅπαν; 17 Καὶ, ὅτι ἔστι τις τρίτος ἄνθρωπος παρ' αὐτὸν, καὶ τοὺς καθ' ἕκαστον. τὸ γὰρ ἄνθρωπος, καὶ ἅπαν τὸ κοινὸν, οὐ τόδε τι, ἀλλὰ τοιόνδε τι, ἢ πρός τι, ἢ πῶς, ἢ τῶν τοιούτων τι σημαίνει. ὁμοίως δὲ καὶ ἐπὶ τοῦ, Κορίσκος καὶ Κορίσκος μουσικὸς, πότερον ταὐτὸν, ἢ ἕτερον; τὸ μὲν γὰρ, τόδε τι· τὸ δὲ, τοιόνδε σημαίνει· ὥστε οὐκ ἔστιν αὐτὸ ἐκθέσθαι· οὐ τὸ ἐκτίθεσθαι δὲ ποιεῖ τὸν τρίτον ἄνθρωπον· ἀλλὰ τὸ ὅπερ τόδε τι εἶναι συγχωρεῖν. οὐ γὰρ ἔστι τόδε τι εἶναι, ὅπερ Καλλίας, καὶ ὅπερ ἄνθρωπός ἐστιν. οὐδ' εἴ τις τὸ ἐκτιθέμενον, μὴ ὅπερ τόδε τι εἶναι λέγοι, ἀλλ' ὅπερ ποιὸν, οὐδὲν διοίσει· ἔσται γὰρ παρὰ τοὺς πολλοὺς ἕν τι, οἷον, ὁ ἄνθρω-
E πος. φανερὸν οὖν, ὅτι οὐ δοτέον τόδε τι εἶναι τὸ κοινῇ κατηγορούμενον ἐπὶ πᾶσιν· ἀλλ' ἤτοι ποσὸν, ἢ ποιὸν, ἢ πρός τι, ἢ τῶν τοιούτων σημαίνειν.

* καὶ ἔτι γε οὐχ ἅπαν ὁ δ' ἅπαν.

Communia de ſolutione captionum in dictione conſiſtentium. Cap. XXIII.

1 Ratio diſſoluendi ſophiſmata 2 ex compoſitione, diuiſione, 3 accentu, 4 homonymia, 5 amphibolia, [illegible] dictionis.

Ὅλως δὲ ἐν τοῖς παρὰ τὴν λέξιν λόγοις, ἀεὶ κατὰ τὸ ἀν- A τικείμενον ἔσται ἡ λύσις, ἢ παρ' ὅ ἐστιν ὁ λόγος. 2 Οἷον, εἰ παρὰ τὴν σύνθεσιν ὁ λόγος, ἡ λύσις διελόντι. εἰ δὲ παρὰ τὴν διαίρεσιν, συνθέντι. 3 Πάλιν, εἰ παρὰ προσῳδίαν ὀξεῖαν ἡ βαρεῖα προσῳδία, λύσις. εἰ δὲ παρὰ βαρεῖαν, ἡ ὀξεῖα. 4 Εἰ δὲ παρ' ὁμωνυμίαν ἐστί, τὸ ἀντικείμενον ὄνομα εἰπόντα, λύειν ἔστιν, εἰ ἔμψυχον συμβαίνει λέγειν, ἀποφήσαντα μὴ εἶναι, δηλοῦν ὡς ἔστιν ἔμψυχον. Εἰ δ' ἄψυχον ἔφησεν, ὁ δὲ τὸ ἔμψυχον συνελογίσατο, λέγειν ὡς ἔστιν ἄψυχον. 5 Ὁμοίως δὲ καὶ ἐπὶ τῆς ἀμφιβολίας. 6 Εἰ δὲ παρ' ὁμοιότητα λέξεως, τὸ ἀντικείμενον ἔσται λύσις· ἆρ' ὃ μὴ ἔχει, δοίη τις ἄν; ἢ οὐχ ὃ μὴ ἔχει, ἀλλ' ὡς οὐκ ἔχει, οἷον ἕνα μόνον ἀστράγαλον. ἆρα ὃ ἐπίσταται, μαθὼν ἢ εὑρὼν ἐπίσταται; ἀλλ' οὐχ ἃ ἐπίσταται. καὶ εἰ ὃ βαδίζει, πατεῖ; ἀλλ' οὐχ ὅτε. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων.

Omnino autem in diſputationibus à dictione ſumptis, ſemper oppoſitum ei ex quo argumentatio ducitur, erit ſolutio. 2 Vtputa ſi ex oppoſitione ſumitur argumentatio, ſolutio erit per diuiſionem: ſi ex diuiſione, per compoſitionem. 3 Rurſus ſi ex accentu acuto [illegible] ſolutio. ſi verò ex graui, acutus. 4 Sin autem ex homonymia: licet oppoſitum nomen dicendo ſoluere. vtputà ſi *ex argumētatione* ſequitur vt negando dicatur nō eſſe animatum, oſtendatur eſſe animatū: quòd ſi *reſpondens* dixit inanimatum: ille autem *qui argumentatur*, concluſit eſſe animatum: dicere *oportet* eſſe animatū. 5 Similiter *faciendum eſt* & in amphibolia. 6 At ſi ex ſimilitudine dictionis *ducta ſit argumētum*, oppoſitum erit ſolutio. *velut*, Num quod nō habet, dare aliquis poteſt? An non *poteſt*, quod nō habet, ſed quomodo nō habet? vt vnum ſolum talum. Nū, quod ſcit, diſcens aū inueniens ſcit? ſed non quæ ſcit. Et, Num quod perambulat, calcat? ſed non quando. Similiter & in aliis *eiuſmodi captionibus eſt faciendum.*

De ſolutione captionum ductarum ex accidente. Cap. XXIV.

1 Ratio diſſoluendi hæc ſophiſmata. 2 Varia exempla. 3 Praua quorumdam ſolutio 4 reprobatur. 7 Alia ſolutio refellitur. 8 Alia ſolutio 9 reÿcitur. 10 Alia exempla.

CAP. IV. Πρὸς δὲ τοὺς παρὰ τὸ συμβεβηκός, μία μὲν ἡ αὐτὴ λύ- B σις πρὸς ἅπαντας. ἐπεὶ γὰρ ἀδιόριστόν ἐστι τὸ πότε λεκτέον ἐπὶ τοῦ πράγματος, ὅταν ἐπὶ τοῦ συμβεβηκότος ὑπάρχῃ· καὶ ἐπ' ἐνίων μὲν δοκεῖ, καὶ φασὶν, ἐπ' ἐνίων δὲ οὔ φασιν ἀναγκαῖον εἶναι· ῥητέον οὖν συμβιβασθέντας ὁμοίως πρὸς ἅπαντας, ὅτι οὐκ ἀναγκαῖον. ἔχειν δὲ δεῖ προφέρειν τὸ οἷον. 2 Εἰσὶ δὲ πάντες οἱ τοιοίδε τῶν λόγων, παρὰ τὸ συμβεβηκός. οἷον, ἆρ' οἶδας ὃ μέλλω σε ἐρωτᾶν; ἆρ' οἶδας τὸν προσιόντα, ἢ τὸν κεκαλυμμένον; ἆρ' ὁ ἀνδριάς, σόν ἐστιν ἔργον; ἢ σὸς ὁ κύων πατήρ; ἆρα τὰ ὀλιγάκις ὀλί- C γα, ὀλίγα; φανερὸν γὰρ ἐν ἅπασι τούτοις, ὅτι οὐκ ἀνάγκη, τὸ κατὰ τοῦ συμβεβηκότος, καὶ κατὰ τοῦ πράγματος ἀληθεύεσθαι· μόνοις γὰρ τοῖς κατὰ τὴν οὐσίαν ἀδιαφόροις καὶ ἓν οὖσιν, ἅπαντα δοκεῖ ταὐτὰ ὑπάρχειν. τῷ δὲ ἀγαθῷ, οὐ ταὐτόν ἐστιν, ἀγαθῷ τε εἶναι, καὶ μέλλοντι ἐρωτᾶσθαι· οὐδὲ γὰρ προσιόντι, ἢ ἐγκεκαλυμμένῳ, προσιόντι τε εἶναι, καὶ Κορίσκῳ· ὥστε οὐκ, εἰ τὸν Κορίσκον οἶδα, ἀγνοῶ δὲ τὸν προσιόντα, τὸν αὐτὸν οἶδα καὶ ἀγνοῶ· οὐδ' εἰ τοῦτό ἐστιν ἔργον, ἐμὸν δέ ἐστι, ἐμόν ἐστιν ἔργον· ἀλλ' ἢ κτῆμα, ἢ πρᾶγμα, ἢ ἄλλο ὁτιοῦν. τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἄλλων. 3 Λύουσι δέ τινες, * διαιροῦντες D τὴν ἐρώτησιν· φασὶ γὰρ ἐνδέχεσθαι ταὐτὸ πρᾶγμα εἰδέναι καὶ ἀγνοεῖν, ἀλλὰ μὴ κατὰ ταὐτό. τὸν οὖν προσιόντα οὐκ εἰδότες, τὸν δὲ Κορίσκον εἰδότες, ταὐτὸ μὲν εἰδέναι καὶ ἀγνοεῖν φασιν, ἀλλ' οὐ κατὰ ταὐτό. 4 Καίτοι πρῶτον μέν, καθάπερ ἤδη εἴπομεν, δεῖ τὴν παρὰ ταὐτὸ λόγων τὴν αὐτὴν εἶναι διόρθωσιν· αὕτη δὲ οὐκ ἔσται,

* γρ. ἀναιροῦντες

Quod verò ad captiones, quæ ex accidente *ducūtur*, vna & eadem *eſt* omnium ſolutio. nam quia incertum *eſt*, quādo dicendum *ſit* de re, quod accidēti ineſt: ac in nonnullis quidē hoc videtur, & *vulgò* concedūt, in aliis vero negant eſſe neceſſarium: dicēdum *eſt* igitur, accōmodatā ad omnes *eadē ſolutione*, non eſt neceſſarium. Oportet autem habere *in prōptu* exemplū, quod proferatur. 2 Sunt autem omnes hæ argumentationes ex accidente, Sciſne quod ſum interrogaturus? Noſtin' eum qui accedit? aut, qui abſcōſus eſt? Num hæc ſtatua tuū eſt opus? Numquid hic canis tuus *eſt* pater? Numquid pauca paucis vicibus *accepta*, pauca *ſunt*? Perſpicuum .n. *eſt*, in his omnibus non neceſſe *eſſe*, vt quod de accidēte *verè dicitur*, etiam de re *ipſa* verè dicatur. nam in iis ſolis quæ ſecundùm eſſentiam indifferentia & vnum ſunt, omnia videntur eadem ineſſe. ei verò quod *eſt* bonum, non idem eſt, eſſe bonum, & fore interrogādum. neque ei qui accedit, vel abſconſus eſt, idem eſt, accedēte m, abſconſum eſſe, & Coriſcū *eſſe*. Itaque non, ſi Coriſcū noui, eum verò qui accedit, non noui: *propterea* eūdem noui & nō noui. Neque, ſi hoc eſt opus, meūque eſt, *ideo* meū eſt opus: ſed vel poſſeſſio, vel res, vel aliud quodvis. Eodē modo & in aliis *ſe res habet*. 3 Soluunt autem *has captiones* nōnulli diſtinguendo interrogationem: aiunt. n. fieri poſſe, vt eadē res ſciatur & ignoretur, non tamen ſecundùm idem. cùm igitur eum qui accedit, non cognoſcant, Coriſcū verò cognoſcant, idē *ſe* cognoſcere & ignorare fatentur, non tamen eodem modo. 4 Atqui primùm quidem, ſicuti iam diximus, oportet earū argumētationum, quæ ex eodem *ducuntur*, eādem eſſe correctionem: hæc autem nō e[illegible]

ſi quis non ex *verbo* Cognoſcere, ſed ex *verbo* Eſſe, aut Modo quodã affectum eſſe, idem axioma ſumat. velvti, Si hic eſt pater, & eſt tuus. Vt.n. in quibuſdam id verum ſit, idémque poſſit ſciri & ignorari: at certè huc dicta *ſolutio* nullo modo quadrat. 5 Cæterùm nihil vetat eandem argumentationem pluribus vitiis laborare: attamen non cuiuſcumq; peccati patefactio, ſolutio eſt. nam fieri poteſt, vt quis oſtẽdat falſum eſſe concluſum: vnde autem, non oſtendat: vtputà *ſoluens* argumẽtationem Zenonis, *qua concluditur* nihil poſſe moueri. Quapropter & ſi quis *reſpondens* nitatur argumẽtando ducere tamquam ad impoſſibile, peccat, etiãſi decies millies cõcludat: quia non eſt hæc ſolutio. erat.n. ſolutio, patefactio falſi ſyllogiſmi, *oſtẽdens* cur falſus *ſit*. Si igitur *opponẽs* nihil concluſit: ſiue verum, ſiue falſum conetur argumẽtatione colligere: eius *rei* declaratio, ſolutio eſt. 6 An fortaſſis hoc in quibuſdã vſuuenire nihil prohibet: ſed in his *captionibus* neque hoc videri poteſt. nam & Coriſcũ nouit *eſſe* Coriſcum: & eum qui accedit, eſſe eũ qui accedit. Sed cõtingit idem ſcire ac *neſcire*: velvti, album *eſſe*, ſcire: muſicũ verò *eſſe*, ignorare: ſic.n. idẽ nouit, & non nouit: non tamen ſecundũ idem. verùm *hic &* id quod accedit & Coriſcum ſcit *eſſe* id quod accedit, & *eſſe* Coriſcũ. 7 Similiter vt ij quos diximus, peccant & qui *ita* ſoluunt *captionẽ*, dicentes omnem numerum & multum & paucum *eſſe*. etenim ſi, cũ nihil concludatur, hoc prætermiſſo, verũ concluſum eſſe fateantur, (omnem.n. numerum & multũ *eſſe*, & paucũ) *profectò* peccant. 8 Sũt etiam, qui ex duplicitate diſſoluunt hos ſyllogiſmos, *quibus* concluditur tuũ eſſe patrem, aut filiũ, aut ſeruum. 9 Atqui perſpicuũ *eſt*, ſi ex multiplicitate videtur ſumi elẽchus, opus eſſe vt nomen vel oratio propriè multorum dicatur: hunc verò eſſe huius filiũ, nemo dicit propriè, ſi dominus eſt filij: ſed ex accidente eſt hæc compoſitio: Eſtne hoc tuum? etiam. hoc autẽ eſt filius: hoc igitur eſt tuus filius: quoniam accidit, vt ſit & tuus & filius, nõ tamen tuus filius. 10 *Huic ſimilis eſt & captio, qua concluditur* aliquod bonum eſſe τῶν κακῶν, *id eſt, malorũ*: quia prudẽtia eſt ſcientia malorum. Sed hoc eſſe horũ, non dicitur multifariàm, ſed *tantùm* poſſeſſionem *ſignificat*. Aut ſi fortè multifariàm dicitur: (etenim dicimus hominem eſſe τῶν ζώων, *id eſt, animalium*, non tamen *eſſe eorum* poſſeſſionem) etiam, ſi quid ad mala referatur, vt *aliquid dicitur eſſe* alicuius, ob id τῶν κακῶν, *id eſt, malorum*, eſt: ſed hoc non *eſt* omnino & ſimpliciter τῶν κακῶν. Ergo propter *ſignificationẽ* quadamtenus & ſimpliciter *acceptam* videtur *elenchus*. At fortaſſe contingit, vt aliquid bonum ſit τῶν κακῶν bifariàm: non tamen in hac argumentatione: ſed potiùs *in illa*, Eſtne aliquod mãcipium bonũ praui *domini*? Quãquam fortaſſe ne ſic quidem *eſt multiplicitas*. neque enim ſi bonum *eſt*, & huius *eſt*, coniunctim quoque *eſt* bonum huius. Quin ne illud quidem, cùm dicimus hominem eſſe τῶν ζώων, multifariàm accipitur. non enim ſi quando aliquid ſignificamus ſuppreſsã *aliqua parte*, id dicitur multipliciter. nam & dimidio verſu pronunciato, Da mihi Iliadem, ſignificamus: velvti, *Da mihi* Μῆνιν ἄειδε θεά.

A ἄν τις μὴ ἐπὶ τοῦ εἰδέναι, ἀλλ' ἐπὶ τοῦ εἶναι, ἢ πῶς ἔχειν, τὸ αὐτὸ ἀξίωμα λαμβάνῃ. οἷον, εἰ ὅδε ἐστὶ πατήρ, ἔστι δὲ σός. εἰ γὰρ ἐπ' ἐνίων τοῦτ' ἐστὶν ἀληθὲς, καὶ ἐνδέχεται ταὐτὸ εἰδέναι καὶ ἀγνοεῖν, ἀλλ' ἐνταῦθα οὐδὲν κοινωνεῖ τὸ λεχθέν. 5 Οὐδὲν δὲ κωλύει, τὸν αὐτὸν λόγον πλείους μοχθηρίας ἔχειν. ἀλλ' οὐχ ἡ πάσης ἁμαρτίας ἐμφάνισις, λύσις ἐστίν. ἐγχωρεῖ γὰρ δεῖξαί τινα, ὅτι ψεῦδος μὲν συλλελόγισται· παρ' ὃ δὲ, μὴ δεῖξαι· οἷον, τὸν Ζήνωνος λόγον, ὅτι οὐκ ἔστι κινηθῆναι. ὥστε καὶ εἴ τις ἐπιχειροίη συνάγειν ὡς εἰς ἀδύνατον, ἁμαρτάνει, κἂν εἰ μυριάκις ᾖ συλλελογισμένος· οὐ γάρ ἐστιν αὕτη, λύσις· ἦν γὰρ ἡ λύσις, ἐμφάνισις ψευδοῦς συλλογισμοῦ, παρ' ὃ ψευδής· εἰ οὖν B μὴ συλλελόγισται ἢ καὶ ἀληθὲς, ἢ ψεῦδος ἐπιχειρεῖ συνάγειν, ἡ ἐκείνου δήλωσις, λύσις ἐστίν. 6 Ἴσως δὲ καὶ τοῦτο ἐπ' ἐνίων οὐδὲν κωλύει συμβαίνειν· πλὴν ἐπί γε τούτων οὐδὲ τοῦτο δόξειεν ἄν· καὶ γὰρ τὸν Κορίσκον, ὅτι Κορίσκος, οἶδε· καὶ τὸ προσιὸν, ὅτι προσιόν. * ἐνδέχεται δὲ τὸ αὐτὸ εἰδέναι, καὶ μὴ εἰδέναι, ὅτι μὲν λευκὸν, εἰδέναι· ὅτι δὲ μουσικὸν, μὴ γνωρίζειν· οὕτω γὰρ αὐτὸ οἶδε, καὶ οὐκ οἶδεν· ἀλλ' οὐ κατὰ ταὐτό. τὸ δὲ προσιὸν καὶ Κορίσκον, καὶ ὅτι προσιὸν καὶ ὅτι Κορίσκος, οἶδεν. 7 Ὁμοίως δὲ ἁμαρτάνουσι καὶ οἱ λύοντες, ὅτι ἅπας ἀριθμὸς, καὶ πολὺς καὶ ὀλίγος, ὥσπερ οὓς εἴπομεν. εἰ γὰρ, μὴ συμπεραινομένου, τοῦτο παραλιπόντες, ἀληθὲς συμπεπε- C ράνθαι φασὶ (πάντα γὰρ εἶναι καὶ * πολὺν, καὶ ὀλίγον) ἁμαρτάνουσιν. 8 Ἔνιοι δὲ καὶ τῷ διττῷ λύουσι τοὺς συλλογισμοὺς, ὅτι σός ἐστι πατὴρ, ἢ υἱὸς, ἢ δοῦλος. 9 Καίτοι φανερὸν, ὡς εἰ παρὰ τὸ πολλαχῶς, φαίνεται λέγεσθαι ὁ ἔλεγχος, δεῖ τοὔνομα, ἢ τὸν λόγον, * κυρίως εἶναι πλειόνων· τὸ δὲ τόνδε εἶναι τοῦδε τέκνον, οὐδεὶς λέγει κυρίως, εἰ δεσπότης ἐστὶ τέκνου· ἀλλὰ παρὰ τὸ συμβεβηκὸς ἡ σύνθεσίς ἐστιν· ἆρα τοῦτο σόν; ναί. ἔστι δὲ τοῦτο, τέκνον· σὸν ἄρα τοῦτο τέκνον· ὅτι συμβέβηκεν εἶναι καὶ σὸν καὶ τέκνον, ἀλλ' οὐ σοὶ τέκνον. 10 Καὶ τὸ εἶναί τι τῶν κακῶν ἀγαθόν. ἡ γὰρ φρόνησις, ἐπιστήμη ἐστὶ τῶν κακῶν. τὸ δὲ τοῦτο τούτων εἶναι, οὐ λέγεται πολλαχῶς, ἀλλὰ κτῆμα. εἰ δ' D ἄρα πολλαχῶς (καὶ γὰρ τὸν ἄνθρωπον, τῶν ζώων φαμὲν εἶναι, ἀλλ' οὐ κτῆμα) καὶ ἐάν τι πρὸς τὰ κακὰ λέγηται ὥς τινος, διὰ τοῦτο τῶν κακῶν ἐστιν, ἀλλ' οὐ τοῦτο τῶν κακῶν· παρὰ τὸ πῇ οὖν καὶ ἁπλῶς φαίνεται. καίτοι ἐνδέχεται ἴσως ἀγαθὸν εἶναί τι τῶν κακῶν διττῶς· ἀλλ' οὐκ ἐπὶ τοῦ λόγου τούτου· ἀλλ' εἴ τι δοῦλον εἴη ἀγαθὸν μοχθηροῦ; μᾶλλον. ἴσως δὲ οὐδ' οὕτως· οὐ γὰρ εἰ ἀγαθὸν, καὶ τούτου, ἀγαθὸν τούτου ἅμα· ἀλλὰ οὐδὲ τὸν ἄνθρωπον φάναι τῶν ζώων εἶναι, οὐ λέγεται πολλαχῶς· οὐ γὰρ εἴ ποτέ τι σημαίνομεν ἀφελόντες, τοῦτο λέγεται πολλαχῶς· καὶ γὰρ τὸ ἥμισυ εἰπόντες τοῦ ἔπους, δός μοι Ἰλιάδα, σημαίνομεν οἷον τὸ, Μῆνιν ἄειδε θεά.

* γρ. ἐνδέχεται δὲ εἰδέναι τὸ αὐτό

* γρ. πολὺν δὲ εἰ

* γρ. κυρίως εἶ

De ſolutione captionum ex eo ductarum, quod eſt ſimpliciter, vel κατά τι.

Cap. XXV.

1 *Ratio ſoluendi has ſophiſmata.* 2 *Varia exempla fallaciarum, quæ diſſoluuntur.*

CAP. V.

Τοὺς δὲ παρὰ τὸ κυρίως τόδε, ἢ πῇ, ἢ ποῦ, ἢ πῶς, ἢ πρός τι λέγεσθαι, καὶ μὴ ἁπλῶς, λυτέον, σκοποῦντι τὸ συμπέρασμα πρὸς τὴν ἀντίφασιν, εἰ ἐνδέχεται τούτων τι πεπονθέναι. τὰ γὰρ ἐναντία, καὶ τὰ ἀντικείμενα, καὶ φάσιν καὶ ἀπόφασιν, ἁπλῶς μὲν, ἀδύνατον ὑπάρχειν τῷ αὐτῷ· πῇ μέντοι ἑκάτερον, ἢ πρός τι, ἢ πῶς, ἢ τὸ μὲν, πῇ, τὸ δὲ, ἁπλῶς, οὐδὲν κωλύει. ὥστε, εἰ τὸ μὲν, ἁπλῶς· τὸ δὲ πῇ· οὔπω ἔλεγχος. τοῦτο δὲ ἐν τῷ συμπεράσματι θεωρητέον πρὸς τὴν ἀντίφασιν. 2 Εἰσὶ δὲ πάντες οἱ τοιοῦτοι λόγοι τοῦτ' ἔχοντες· ἆρ' ἐνδέχεται τὸ μὴ ὂν, εἶναι; ἀλλὰ μὴν ἔστι γέ τι μὴ ὄν. ὁμοίως δὲ καὶ τὸ ὂν, οὐκ ἔσται· οὐ γὰρ ἔσται τι τῶν ὄντων. ἆρ' ἐνδέχεται τὸν αὐτὸν ἅμα εὐορκεῖν τε, καὶ ἐπιορκεῖν; ἆρ'* ἐνδέχεται τὸν αὐτὸν ἅμα τῷ αὐτῷ πείθεσθαι, καὶ ἀπειθεῖν; ἢ οὔτε τὸ εἶναί τι, καὶ εἶναι, ταὐτόν, (τὸ δὲ μὴ ὂν, οὐκ εἰ ἔστι τι, καὶ ἁπλῶς ἐστιν) οὔτε, εἰ εὐορκεῖ τόδε* καὶ τῇ, ἀνάγκη καὶ εὐορκεῖν; (ὁ γὰρ ὀμόσας ἐπιορκήσειν, εὐορκεῖ ἐπιορκῶν τοῦτο μόνον, εὐορκεῖ δὲ οὔ·) οὐδὲ ὁ ἀπειθῶν πείθεται. 3 Ὅμοιος δὲ ὁ λόγος καὶ περὶ τοῦ ψεύδεσθαί τι τὸν αὐτὸν ἅμα καὶ ἀληθεύειν. ἀλλὰ διὰ τὸ μὴ εἶναι εὐθεώρητον, πότερον ἄν τις ἀποδοίη τὸ ἁπλῶς ἀληθεύειν, ἢ ψεύδεσθαι, δύσκολον φαίνεται. κωλύει δ' αὐτὸν οὐδὲν ἁπλῶς μὲν εἶναι ψευδῆ, πῇ δὲ ἀληθῆ, ἢ τινός, ἢ εἶναι ἀληθῆ τινα, ἀληθῆ δὲ μή. 4 Ὁμοίως δὲ καὶ ἐπὶ τῶν πρός τι, καὶ ποῦ, καὶ πότε· πάντες γὰρ οἱ τοιοῦτοι λόγοι παρὰ τοῦτο συμβαίνουσιν· ἆρα ἡ ὑγίεια, ἢ ὁ πλοῦτος, ἀγαθόν; ἀλλὰ τῷ ἄφρονι, καὶ μὴ ὀρθῶς χρωμένῳ, οὐκ ἀγαθόν· ἀγαθὸν ἄρα, καὶ οὐκ ἀγαθόν. ἆρα τὸ ὑγιαίνειν, ἢ δύνασθαι ἐν πόλει, ἀγαθόν; ἀλλ' ἔστιν ὅτε οὐ βέλτιον· ταὐτὸν ἄρα τῷ αὐτῷ ἀγαθόν, καὶ οὐκ ἀγαθόν. ἢ οὐδὲν κωλύει, ἁπλῶς ὂν ἀγαθόν, τῷδε μὴ εἶναι ἀγαθόν; ἢ τῷδε μὲν ἀγαθόν, ἀλλ' οὐ νῦν, ἢ οὐκ ἐνταῦθα ἀγαθόν; 5 Ἆρ' ὃ μὴ βούλοιτ' ἂν ὁ φρόνιμος, κακόν; ἀποβάλλειν δ' οὐ βούλεται τὸ ἀγαθόν· κακὸν ἄρα, τὸ ἀγαθόν. οὐ γὰρ ταὐτὸν εἰπεῖν τὸ ἀγαθὸν εἶναι κακόν, καὶ τὸ ἀποβάλλειν τὸ ἀγαθόν. 6 Ὁμοίως δὲ καὶ ὁ τοῦ κλέπτου λόγος. οὐ γάρ, εἰ κακόν ἐστιν ὁ κλέπτης, καὶ τὸ λαβεῖν ἐστι κακόν· οὐκ οὖν τὸ κακὸν βούλεται, ἀλλὰ τὸ ἀγαθόν. τὸ γὰρ λαβεῖν, ἀγαθόν. 7 Καὶ ἡ νόσος κακόν ἐστιν, ἀλλ' οὐ τὸ ἀποβαλεῖν τὴν νόσον. 8 Ἆρα τὸ δίκαιον τοῦ ἀδίκου, καὶ τὸ δικαίως τοῦ ἀδίκως, αἱρετώτερον; ἀλλὰ τὸ ἀποθανεῖν ἀδίκως, αἱρετώτερον ἢ δικαίως. 9 Ἆρα δίκαιόν ἐστι, τὰ αὑτοῦ ἔχειν ἕκαστον; ἃ δ' ἄν τις κρίνῃ κατὰ δόξαν τὴν αὑτοῦ, κἂν ᾖ ψευδῆ, κύριά ἐστιν ἐκ τοῦ νόμου· τὸ αὐτὸ ἄρα δίκαιον, καὶ οὐ δίκαιον. 10 Καὶ πότερον δεῖ κρίνειν τὸν τὰ δίκαια λέγοντα, ἢ τὸν τὰ ἄδικα; ἀλλὰ μὴν καὶ τὸν ἀδικούμενον, δίκαιόν ἐστιν, ἱκανῶς λέγειν ἃ ἔπαθε· ταῦτα δ' ἦν ἄδικα. 11 Οὐ γάρ, εἰ παθεῖν τι ἀδίκως, αἱρετὸν τὸ ἀδίκως, αἱρετώτερον τοῦ δικαίως· ἀλλ' ἁπλῶς μὲν, τὸ δικαίως· τῇδε μέντοι, οὐδὲν κωλύει, ἀδίκως ἢ δικαίως. 12 Καὶ τὸ ἔχειν τὰ αὑτοῦ, δίκαιον· τὰ δὲ ἀλλότρια, οὐ δίκαιον· κρίσιν μέντοι ταύτην δικαίαν εἶναι, οὐδὲν κωλύει· οἷον, ἂν ᾖ κατὰ τὴν δόξαν τοῦ κρίνοντος· οὐ γάρ, εἰ δίκαιον τοδὶ ἢ ὡδί, καὶ ἁπλῶς δίκαιον.

* [illegible]

* [illegible]

A Argumentationes autẽ ex eo *ductæ*, quòd pro[...] dicitur hoc, vel quadãtenus, vel alicubi[...] quodãmodo, vel ad aliquid, non ſimpliciter, ſ[...] dæ ſunt, perpendẽdo concluſionem *collatam* [...] contradictione, *vt intelligatur*, an aliquid eiuſ[...] *in ea* contingat. nam contraria, & oppoſita, & [...] matio ac negatio, ſimpliciter quidẽ eidẽ *rei* [...] nequeũt, ſed quominus quadamtenus vtrum[...] aut *facta* ad aliquid *cõparatione*, aut quodamm[...] aut alterum quadãtenus, alterum ſimpliciter *inſit*, nihil prohibet. Quare ſi alterũ ſimpliciter *dicitur*, alterum quadamtenus: nondum *eſt* elẽchus. Hoc autem in concluſione ad contradictionem *collata* B ſpectandum *eſt*. 2 Omnes autem huiuſmodi argumentationes hoc habent: Fierine poteſt, vt quod non eſt, ſit? atqui aliquid eſt, id quod nõ eſt. Simili ratione, quod eſt, non erit: quia nõ erit aliquid eorũ quæ ſunt. Fieríne poteſt, vt idem ſimul liquidò iuret, ac peieret? Fieríne poteſt vt idem eidẽ ſimul credat, & non credat? An neq; eſſe aliquid, & eſſe *ſimpliciter*, idem ſunt? (quod verò non eſt, non ſi eſt aliquid, *propterea* etiam ſimpliciter eſt) neque ſi liquidò iurat hoc & quadamtenus, neceſſe eſt eũ liquidò iurare? (etenim iurans ſe peieraturum, dum peierat, liquidò iurat hoc ſolum, ſed nõ *ſimpliciter* liquidò iurat) nec qui fidẽ non habet, credit? 3 Similis quoque *eſt* argumentatio illa, *qua* eumdẽ aliC quid ſimul falsò & verè dicere *oſtenditur*. verũ quia non facilè intelligitur, vtrũ illud, SIMPLICITER, aptãdum ſit ad veracem eſſe, an ad mendacẽ eſſe, *ſophiſma explicatu* difficile videtur. ſed nihil vetat, eumdem ſimpliciter quidem eſſe mẽdacem, quadamtenus autem veracem vel de aliquo: aut eſſe vera quædam, vera autem *ſimpliciter* non *eſſe*. 4 Similiter *ſe res habet* in his *limitationibus*, ad aliquid, alicubi, aliquãdo. omnes.n. huiuſmodi argumentationes hinc proficiſcũtur: Eſtne ſanitas, vel diuitiæ, res bona? ſed imprudenti, ac non rectè vtenti, non *eſt* res bona: eſt igitur res bona, & non bona. Numquid benè valere, aut ciuitate potẽtem eſſe, D bonum *eſt*? ſed aliquando *hoc* non *eſt* melius: idem igitur eidem *eſt* bonũ & non bonum. An nihil prohibet, quod ſimpliciter eſt bonum, huic non eſſe bonum? vel huic quidem eſſe bonum, non tamen hoc tẽpore aut non hoc loco? 5 Num, quod nollet prudẽs, malum *eſt*? non vult autem perdere, quod *eſt* bonum: malum igitur *eſt*, quod *eſt* bonum. Non *eſt*.n. idem, ſi quis dicat bonum eſſe malum, & bonum perdere, eſſe malum. 6 Similiter ſoluenda *eſt* argumẽtatio de fure. non enim, ſi fur eſt res mala, etiam *eum* capere eſt res mala. *qui* igitur *eũ vult capere*, non rem malam vult, ſed bonam: quia *furẽ* capere, *eſt* res bona. 7 Et morbus *quoque* eſt res mala: non tamen perdere morbum. 8 Numquid iuſtum E *eſt* optabilius, quàm iniuſtum? & iuſtè, quã iniuſtè? atqui iniuſtè mori, eſt optabilius, quàm *mori* iuſtè. 9 Num iuſtum eſt, ſua quemque habere? quæ tamen ex ſentẽtia ſua quis iudicauerit, etiamſi falſa *ea ſententia* ſit, rata ſunt lege: idem igitur *eſt* iuſtum & non iuſtum. 10 Et, vtrùm oportet condemnare eum, qui iuſta dicit, an eum qui iniuſta? atqui iuſtũ eſt, vt & is qui iniuriã eſt affectus, ſufficienter dicat quæ paſſus eſt: hæc verò ſunt iniuſta. 11 Non enim, ſi quid pati iniuſtè, optabile *eſt*, *id ea* iniuſtè, *eſt* optabilius quàm iuſtè. ſed ſimpliciter quidem *id* iuſtè, *eſt optabilius*: hoc verò *quominus* iniuſtè, ſit optabilius quàm iuſtè, nihil vetat. 12 Et ſua *quemque* habere, iuſtum *eſt*: aliena verò *habere*, non iuſtum: hoc tamen iudicium iuſtum eſſe, nihil vetat. velvti, ſi ex ſententia iudicantis ſit. non enim ſi iuſtum eſt hoc, vel ſic, etiam ſimpliciter *eſt* iuſtum.

13 Similiter, cùm hæc iniuſta ſint, nihil prohibet, quominus ea dicere, iuſtum ſit. nõ enim, ſi iuſtum *eſt ea* dicere, neceſſe *eſt ea* iuſta eſſe: quemadmodũ nec, ſi vtile *eſt ea* dicere, neceſſe *eſt ea eſſe* vtilia. ſimiliter *enim & de rebus* iuſtis *eſt ſentiendum*. Itaque non, ſi ea quæ dicũtur, iniuſta *ſunt, propterea* qui dicit iniuſta, vincit: ea namque dicit, quæ dictu ſunt iuſta; ſimpliciter autem, & ad ferendum, iniuſta. A

13 Ὁμοίως δὲ καὶ ἄδικα ὄντα, οὐδὲν * κωλύει, λέγειν αὐτὰ, δίκαιον εἶναι· οὐ γὰρ, εἰ λέγειν, δίκαιον, ἀνάγκη δίκαια εἶναι· ὥσπερ οὐδ', εἰ ὠφέλιμον λέγειν, ὠφέλιμα. ὁμοίως δὲ καὶ ἐπὶ τῶν δικαίων. ὥστε οὐκ, εἰ τὰ λεγόμενα, ἄδικα· ὁ λέγων ἄδικα, νικᾷ· λέγει γὰρ, ἃ λέγειν ἐστὶ δίκαια, ἁπλῶς δὲ καὶ παθεῖν ἄδικα. * κ. κ. ταῦτα λέγ.

De ſolutione captionum ex definitione elenchi. Cap. XXVI.

1 *Ratio ſoluendi hæc ſophiſmata.* 3 *Exemplum primum & ſecundum*

IIs autem *argumentationibus*, quæ ex definitione elenchi exiſtunt, prout *elechus* deſcriptus antea fuit, occurrẽdum *eſt*, concluſione ad contradictionem examinata, quomodo erit eiuſdem, & ſecundùm idem, & ad idem, & eodem modo, & eodem tẽpore. 2 Quòd ſi quis ab initio rogetur, non *eſt ei* fatẽdum, quaſi non poſſit idem eſſe & duplum & non duplum: ſed concedendum, non ſic tamen, vt fieri elenchum in confeſſo *eſt*. 3 Sunt autẽ omnes hæ argumentationes ex hoc *loco*: Num qui vnumquodque nouit *eſſe* vnumquodque, rem nouit? & qui ignorat itidẽ? ſed fieri poteſt vt aliquis ſciens Coriſcum *eſſe* Coriſcum, ignoret *eum eſſe* muſicũ: itaque eandem rem & ſcit & ignorat. 4 Et rurſus, Num quadricubitum tricubito maius *eſt*? ſed fieri poteſt ex tricubito quadricubitum in longitudinem: maius autem *eſt* minore maius: igitur ſe ipſo maius *eſt* & minus. B

Τοῖς δὲ παρὰ τὸν ὁρισμὸν γινομένοις τοῦ ἐλέγχου, καθάπερ ὑπεγράφη πρότερον, ἀπαντητέον, σκοποῦσι τὸ συμπέρασμα πρὸς τὴν ἀντίφασιν, ὅπως ἔσται τοῦ αὐτοῦ, καὶ κατὰ τὸ αὐτὸ, καὶ πρὸς τὸ αὐτὸ, καὶ ὡσαύτως, καὶ ἐν τῷ αὐτῷ χρόνῳ. 2 Ἐὰν δὲ ἐν ἀρχῇ προσέρηται, οὐχ ὁμολογητέον, ὡς ἀδύνατον τὸ αὐτὸ εἶναι καὶ διπλάσιον, καὶ μὴ διπλάσιον· ἀλλὰ φατέον, μὴ μὴν τοιωδὶ, ὡς ποτε ἦν τὸ ἐλέγχεσθαι διωμολογημένον. 3 Εἰσὶ δὲ πάντες οἵδε οἱ λόγοι, παρὰ τὸ τοιόνδε· ἆρα ὁ εἰδὼς ἕκαστον ὅτι ἕκαστον, οἶδε τὸ πρᾶγμα; καὶ ὁ ἀγνοῶν ὡσαύτως; εἰδὼς δέ τις τὸν Κορίσκον ὅτι Κορίσκος, ἀγνοοίη ἂν ὅτι μουσικός· ὥστε τὸ αὐτὸ καὶ ἐπίσταται, καὶ ἀγνοεῖ. 4 Καὶ πάλιν, ἆρα τὸ τετράπηχυ τοῦ τριπήχεος μεῖζον; γένοιτο δ' ἂν ἐκ τριπήχεος τετράπηχυ κατὰ τὸ μῆκος· τὸ δὲ μεῖζον, ἐλάττονος μεῖζον· αὐτὸ ἄρα αὐτοῦ μεῖζον καὶ ἔλαττον.

De ſolutione captionum, quibus petitur quæſitum. Cap. XXVII.

1 *Soluendi ratio prima*, 2 *ſecunda*, 3 *tertia.*

QVæ verò ex eo *ducũtur* quòd poſtulatur & ſumitur *quæſitum* initio *propoſitum*, percontanti quidem, ſi *id* manifeſtum ſit, non *ſunt* concedẽdæ, ne quidem ſi probabile ſit *eum* vera dicere. 2 Sin *ab initio id* latuerit, *ad poſtremum* ignorãtia, propter huiuſmodi argumentationum vitium, in *ipſum* interrogantem *eſt* retorquenda, ceu qui non *bene* diſputarit. nam elenchus *tum demũ eſt, cùm ſyllogiſmus extruitur* ſine eo quod ab initio *quæſitũ fuit*. 3 Deinde quòd datum *id* ſit, non quaſi *aduerſarius* eo vſurus eſſet, ſed quaſi argumẽtando probaturus contrarium, quàm in parexelenchis fecerit. C

Τοὺς δὲ παρὰ τὸ αἰτεῖσθαι καὶ λαμβάνειν τὸ ἐν ἀρχῇ, πυνθανομένῳ μὲν, ἂν ᾖ δῆλον, οὐ δοτέον, οὐδ' ἂν ἔνδοξον ᾖ, λέγοντα τἀληθῆ. 2 Ἐὰν δὲ λάθῃ, τὴν ἄγνοιαν, διὰ τὴν μοχθηρίαν τῶν τοιούτων λόγων, εἰς τὸν ἐρωτῶντα μεταστρεπτέον, ὡς οὐ διειλεγμένον· ὁ γὰρ ἔλεγχος, ἄνευ τοῦ ἐξ ἀρχῆς. 3 Εἶθ', ὅτι ἐδόθη, οὐχ ὡς τούτῳ χρησομένου, ἀλλ' ὡς πρὸς τοῦτο * συλλογιουμένου τὸ ἐναντίον, ἢ ἐπὶ τῶν παρεξελέγχων. * γρ. ἀντισυλλογιουμένου

De ſolutione captionum, quæ ducuntur ex conſequentibus. Cap. XXVIII.

1 *Ratio ſoluendi hæc ſophiſmata.* 2 *Duplex conſequentium conſecutio. Exemplum fallaciæ.*

QVæ autẽ ex conſequente probant, in ipſa argumentatione *illud vitium cõtinere* oſtendantur. 2 Eſt autem duplex conſequentium conſecutio. aut enim, vt particulari vniuerſale *conſequẽs eſt*, putà homini animal: quia poſtulatur, ſi hoc cũ illo *iunctum eſt*, etiam illud cum hoc *eſſe connexum*. aut ſecundùm oppoſitiones: quia ſi hoc illi conſequẽs eſt, etiam oppoſitũ oppoſito *conſequens eſſe videtur*. 3 Vnde & Meliſſi argumentatio *orta eſt*. nã ſi quod eſt genitũ, habet principium, etiam ingenitum nõ habere poſtulat ſibi concedi: itaque ſi cœlum *eſt* ingenitum, *eſt* etiam infinitum. Sed hoc non *ita* eſt: conuerſo enim ordine *valet* conſecutio. D

Καὶ τοὺς διὰ τοῦ ἑπομένου συμβιβάζοντας, ἐπ' αὐτοῦ τοῦ λόγου δεικτέον. 2 Ἔστι δὲ διττὴ ἡ τῶν ἑπομένων ἀκολούθησις· ἢ γὰρ, ὡς τῷ ἐν μέρει τὸ καθόλου ἐστὶ, οἷον ἀνθρώπῳ ζῷον· ἀξιοῦται γὰρ, εἰ τόδε μετὰ τοῦδε, καὶ τόδε εἶναι μετὰ τοῦδε. ἢ κατὰ τὰς ἀντιθέσεις· εἰ γὰρ τόδε τῷδε ἀκολουθεῖ, καὶ τῷ ἀντικειμένῳ τὸ ἀντικείμενον. 3 Παρ' ὃ καὶ ὁ τοῦ Μελίσσου λόγος· εἰ γὰρ τὸ γεγονὸς ἔχει ἀρχὴν, καὶ τὸ * ἀγέννητον ἀξιοῖ μὴ ἔχειν· ὥστε, εἰ ἀγέννητος ὁ οὐρανὸς, καὶ ἄπειρος. τοῦτο δ' οὐκ ἔστιν· ἀνάπαλιν γὰρ ἡ ἀκολούθησις. * γρ. ἀγένητον

De ſolutione captionum, quæ non cauſam accipiunt pro cauſa.

Cap. XXIX.

Ὅσοι τε παρὰ τὸ προστιθέναι τι συλλογίζονται, σκοπεῖν, εἰ ἀφαιρουμένου συμβαίνει μηδὲν ἧττον τὸ ἀδύνατον. κἄπειτα τοῦτο ἐμφανιστέον, καὶ λεκτέον ὡς ἔδωκεν, οὐχ ὡς δοκοῦν, ἀλλ' ὡς πρὸς τὸν λόγον· ὁ δὲ κέχρηται, οὐδὲν πρὸς τὸν λόγον.

A IN *iis* autem, quæ propter aliquam adiectionem concludunt, videre *oportet*, an *aliquo* dempto nihilominus eueniat impoſſibile: deinde hoc patefaciendum *eſt*, ac dicendum *ſe* id conceſſiſſe, non quaſi *ſibi* videretur, ſed quaſi ad diſputationem *eſſet accommodandum*: ille autem non eſt vſus ad diſputationem.

De ſolutione captionum, quæ plures interrogationes pro vna accipiunt.

Cap. XXX.

1 Ratio ſoluendi. 2 In quibus potiſſimùm cauere ab his fallaciis oporteat. 3 Exemplum primum, 4 ſecundum, 5 tertium, 6 quartum. 7 Alia ſolutiones.

Πρὸς δὲ τοὺς τὰ πλείω ἐρωτήματα ἓν ποιοῦντας, εὐθὺς ἐν ἀρχῇ διοριστέον. ἐρώτησις γὰρ μία, πρὸς ἣν μία ἀπόκρισίς ἐστιν. ὥστε οὔτε πλείω καθ' ἑνός, οὔτε ἓν κατὰ πολλῶν, ἀλλ' ἓν καθ' ἑνὸς ἢ φατέον, ἢ ἀποφατέον. 2 Ὥσπερ δ' ἐπὶ τῶν ὁμωνύμων, ὁτὲ μὲν ἀμφοῖν, ὁτὲ δ' οὐδετέρῳ ὑπάρχει· * ὥστε μὴ ἁπλοῦ ὄντος τοῦ ἐρωτήματος, ἁπλῶς ἀποκρινομένοις, οὐδὲν συμβαίνει πάσχειν· ὁμοίως καὶ ἐπὶ τούτων. ὅταν μὲν ἢ τὰ πλείω τῷ ἑνί, ἢ τὸ ἓν τοῖς πολλοῖς ὑπάρχῃ, ἢ μὴ ὑπάρχῃ, τῷ ἁπλῶς δόντι, καὶ ἁμαρτόντι ταύτην τὴν * ἁμαρτίαν, οὐδὲν ὑπεναντίον συμβαίνει· ὅταν δὲ ἢ τῷ μὲν, τῷ δὲ μὴ ἢ πλείω κατὰ πλειόνων, καὶ ἔστιν ὡς ἀμφότερα ὑπάρχει ἀμφοτέροις, ἔστι δ' ὡς οὐχ ὑπάρχει· ὥστε τοῦτο εὐλαβητέον. 3 Οἷον, ἐν τοῖσδε τοῖς λόγοις· εἰ τὸ μέν, ἐστὶν ἀγαθόν· τὸ δὲ, κακόν· ὅτι ταῦτα ἀληθές, εἰπεῖν ἀγαθὸν καὶ κακόν· καὶ πάλιν μήτε ἀγαθόν, μήτε κακόν· οὐκ ἔστι γὰρ ἑκάτερον, ἑκάτερον· ὥστε ταὐτὸ, ἀγαθὸν καὶ κακόν, καὶ οὔτε ἀγαθὸν οὔτε κακόν. 4 Καί, εἰ ἕκαστον αὐτὸ αὑτῷ ταὐτόν, καὶ ἄλλοις ἕτερον· ἐπεὶ δὲ οὐκ ἄλλοις ταὐτά, ἀλλ' αὑτοῖς, καὶ ἕτερα αὑτῶν· ταὐτὰ ἑαυτοῖς ἕτερα καὶ ταὐτά. 5 Ἔτι, εἰ τὸ μὲν ἀγαθὸν, κακὸν γίνεται· τὸ δὲ κακὸν, ἀγαθόν· δύο * γένοιντ' ἄν. 6 Δυοῖν τε καὶ ἀνίσων, ἑκάτερον αὐτὸ ἑαυτῷ ἴσον· ὥστε ἴσα καὶ ἄνισα τὰ αὐτὰ ἑαυτοῖς. 7 Ἐμπίπτουσι μὲν οὖν οὗτοι οἱ λόγοι καὶ εἰς ἄλλας λύσεις· καὶ γὰρ τὸ ἄμφω, καὶ τὸ ἅπαντα, πλείω σημαίνει· οὐκ οὖν ταὐτόν, πλὴν ὄνομα, συμβαίνει φῆσαι καὶ ἀποφῆσαι· τοῦτο δ' οὐκ ἦν ἔλεγχος· ἀλλὰ φανερὸν ὅτι μὴ μιᾶς ἐρωτήσεως τῶν πλειόνων γινομένων, ἀλλ' ἓν καθ' ἑνὸς φάντος ἢ ἀποφάντος, οὐκ ἔσται τὸ ἀδύνατον.

* γρ. ὥστε τοῖς μὲν ἁπλοῦ ὄντος ἐρ. ἁπλ. ἀπ.

* γρ. τῷ μὲν, τῷ δὲ μή.

* γρ. ἦσαν ἄν.

B SEd adverſùs eas, quæ ex pluribus interrogationibus vnam faciunt, ſtatim adhibēda eſt definitio. Interrogatio namque vna *eſt*, ad quā vna eſt reſpōſio. quare nec plura de vno, nec vnū de multis, ſed vnū de vno vel affirmandum vel negandū. 2 Sicut autem in homonymis *accidit, quia* interdū vtriſque *ſignificatis*, interdum neutri ineſt *attributū*: adeo vt, cùm non ſit ſimplex interrogatio, qui ſimpliciter reſpondēt, nihil inde *incommodi* patiantur: ſimiliter & in his, quando vel plura vni, vel vnum multis ineſt, aut non ineſt; nihil ei qui ſimpliciter conceſſit, & hoc peccatum admiſit, repugnās colligitur: ſed *tunc*, cùm alterum eſt, alterum non *eſt*: C aut multa de multis dicuntur, & vtraque vtriſque partim inſunt, partim non inſunt: ideóque hoc *eſt* cauendum. 3 Vt in his argumētationibus: Si alterum eſt bonum, alterum malum; hęc verè dici bonum & malum, rurſúſq; nec bonum nec malum, quia vtrumque non eſt vtrumque. Itaque idem *eſt* bonum ac malum, & neque bonum neq; malum. 4 Item, Res quęque *eſt*ne ipſa ſecum eadem, & ab aliis diuerſa? quia verò *hæc* nō cum aliis, ſed ſecum *ſunt* eadem, & ſecūm *ſunt* diuerſa: eadē ab iiſdem diuerſa & eadem erunt. 5 Præterea ſi quod bonū *eſt*, malum fit: & quod malum, bonum: vtique duo D facta erunt. 6 Cúmque duo inæqualia *ſint*, vtrumque erit ipſum ſibi æquale: itaque æqualia & inæqualia eadem iiſdem *erunt*. 7 Incidūt [illegible] argumētationes & in alias ſolutiones. [illegible] & verbum Ambo, & *verbū* Omnia, plures ſignificationes habet. non igitur eiuſdem, præterquam nominis, affirmatio & negatio colligitur: hoc autem non erat elenchus. Sed perſpicuum *eſt*, niſi plures interrogationes pro vna ſumantur, ſed vnum de vno affirmetur, vel negetur, non fore impoſſibile.

De ſolutione paralogiſmorum colligentium nugationem.

Cap. XXXI.

Ratio ſoluendi hos paralogiſmos, qui ducunt ad tautologiam in relatis, 2 vel in ſpecie generi ſubiecta, 3 vel in propriis affectionibus.

CAP. VI.

Περὶ δὲ τῶν ἀπαγόντων εἰς ταὐτὸ πολλάκις εἰπεῖν, φανερὸν ὡς οὐ δοτέον τῶν πρός τι λεγομένων σημαίνειν τι χωριζομένας καθ' αὑτὰς τὰς κατηγορίας [illegible], τὸ διπλάσιον

E QVod verò ad eos *paralogiſmos*, qui ad idē ſæpius dicēdum perducunt: perſpicuum *eſt* nō *eſſe* concedendum, relatorum categorias ſeparatas & per ſe acceptas, aliquid ſignificare: vt duplum,

ſeorſum ab *oratione*, duplũ dimidij: quoniam vnũ A *eſſe* apparet. nam & decem *ponuntur* in *oratione* vno minus decem: & *verbum* facere, in *oratione* non facere: & omnino in negatione affirmatio: neque tamen, ſi quis dicat hoc non eſſe album, dicit ipſum album eſſe. duplũ verò fortaſſe nihil ſignificat ſolum *& per ſe*, ſicuti nec quod in dimidio: aut ſi *quid* ſignificat, non tamen idem atque coniunctum. 2 Neque ſcientia in ſpecie: (velvti, ſi eſt ſcientia medica) ſignificat id quod commune: illud autẽ erat ſcientia *rei* ſcibilis. 3 In attributis autem quæ per ſubiecta declarantur, hoc dicendum *eſt*, non idem eſſe, quod ſeorſum, & quod in oratione ſignificatur. nam curuum, ſi communiter *ac per ſe accipiatur*, idem ſignificat in ſimo & *in* varo: adiunctum autẽ *ſubiecto*, nihil prohibet *quominus aliud atque aliud ſignificet*: ſed alterũ naſo, alterũ cruri accidit: illic. n. ſimum, hic verò varum ſignificat. nec quicquã refert, naſus ſimus, an naſus curuus dicatur. 4 Præterea non *eſt* dictio concedenda in recto *caſu*: quia *id* falſum eſt: non. n. ſimũ eſt naſus curuus, ſed naſi hoc, puta affectio. Quare nihil abſurdi *ſequitur*, ſi naſus ſimus eſt naſus habens curuitatem naſi.

A δύο τοῦ διπλάσιον ἡμίσεος· ὅτι* ἓν φαίνεται. καὶ γὰρ τὰ δέκα, ἐν τοῖς ἑνὸς δέουσι δέκα· καὶ τὸ ποιῆσαι, ἐν τῷ μὴ ποιῆσαι· καὶ ὅλως ἐν τῇ ἀποφάσει ἡ φάσις. ἀλλ᾽ ὅμως οὐκ, εἴ τις λέγοι τοδὶ μὴ εἶναι λευκὸν, λέγει αὐτὸ λευκὸν εἶναι. τὸ δὲ διπλάσιον, οὐδὲ σημαίνει οὐδὲν ἴσως μόνον, ὥσπερ οὐδὲ τὸ ἐν τῷ ἡμίσει· εἰ δ᾽ ἄρα καὶ σημαίνει,* ἀλλ᾽ οὐ ταὐτὸ καὶ συνηρημένον. 2 Οὐδ᾽ ἡ ἐπιστήμη ἐν τῷ εἴδει, (οἷον, εἰ ἔστιν ἡ ἰατρικὴ ἐπιστήμη) ὅπερ τὸ κοινόν· ἐκεῖνο δ᾽ ἦν ἐπιστήμη ἐπιστητοῦ. 3 Ἐν δὲ τοῖς δι᾽ ὧν* δηλοῦται κατηγορουμένοις, τοῦτο λεκτέον, ὡς οὐ τὸ αὐτὸ χωρὶς, καὶ ἐν τῷ λόγῳ, τὸ δηλούμενον. B τὸ γὰρ κοῖλον, κοινῇ μὲν, τὸ αὐτὸ δηλοῖ ἐπὶ τοῦ σιμοῦ καὶ τοῦ ῥαιβοῦ· προστιθέμενον δὲ*, οὐδὲν κωλύει· ἀλλὰ τὸ μὲν, τῇ ῥινί· τὸ δὲ, τῷ σκέλει συμβαίνει· ἔνθα μὲν γὰρ τὸ σιμόν· ἔνθα δὲ τὸ ῥαιβὸν σημαίνει· καὶ οὐδὲν διαφέρει εἰπεῖν, ῥὶς σιμὴ, ἢ ῥὶς κοίλη. 4 Ἔτι, οὐ δοτέον τὴν λέξιν κατ᾽ εὐθύ· ψεῦδος γάρ ἐστιν. οὐ γάρ ἐστι τὸ σιμὸν, ῥὶς κοίλη· ἀλλὰ ῥινὸς τοδὶ, οἷον, πάθος. ὥστε οὐδὲν ἄτοπον, εἰ ἡ ῥὶς ἡ σιμὴ, ῥίς ἐστιν ἔχουσα κοιλότητα ῥινός.

* Rectè Gruchius ἐμφαίνεται, vulgò ἐν φαίν. ineptè.

* Alexander, ἀλλ᾽ οὐ ταὐτὸ διῃρημένως, καὶ συνηρημένως.

* κ. δηλοῦνται

* Gruchius, οὐδὲν κ. ἄλλο τὸ μὲν τῇ ῥινὶ, τὸ δὲ τῷ σκέλει σημαίνειν. quæ eſt Boëti quoque lectio, ſi tollas vocem ἄλλο. Metaphyſ. lib. ζ. c. 5. & lib. ε. c. 1.

De vitandis ſolœciſmis. Cap. XXXII.

1 Tranſitio. 2 Exemplum primum, 3 ſecundum, 4 tertium, 5 quartum, 6 quintum, 7 Hos paralogiſmos non efficere ſed tantùm videri efficere ſolœciſmum.

DE ſolœciſmis autẽ, vnde videãtur effici, dixi- C mus antea: quomodo verò ſoluendi *ſint*, in ipſis argumentationibus apparebit. 2 Hę namque omnes hoc volunt efficere: Num quod dicis verè, etiam eſt hoc re vera? ais autẽ aliquid eſſe lapidẽ: eſt igitur aliquid lapidẽ. An qui dicit lapidem, nõ dicit quod, ſed, quem: neque hoc, ſed hũc? Quare ſi quis *ita* interroget, Num quẽ verè dicis, eſt hũc? non videbitur Latinè loqui: quemadmodum nec ſi interroget, Num quam dicis eſſe, eſt hic? At *cùm* hic lignum dixit, vel quæcũque *alia* neque feminam neque maſculũ ſignificant, nihil refert. Ideó- D que non fit ſolœciſmus; ſi, quod dicis eſſe, eſt hoc; lignum autem dicis eſſe, eſt igitur lignum. Sed lapis, *& articulus* Hic, maſculi habet appellationem. Si quis autẽ interroget, Num hic eſt hæc? deinde rurſus, quid? nónne hic eſt Coriſcus? poſtea dicat, hic igitur eſt hæc: non collegit ſyllogiſmo ſolœciſmum, nequidẽ ſi Coriſcus ſignificet id quod hęc, non tamen concedatur à reſpondẽte: ſed id priùs interrogatum oportuit. Quòd ſi neque eſt, neque conceditur, non eſt ſyllogiſmus, nec re vera, nec adversùs eum, qui interrogatur. Ergo ſimiliter & ibi oportet lapidem ſignificare hic: ſi verò nec eſt nec conceditur, non *eſt* admittenda concluſio: vi- E detur tamẽ; quia nominis caſus diſſimilis, videtur ſimilis. 3 Num verè dicitur quòd hæc eſt id quod dicis hanc eſſe? ais autẽ eſſe parmam: eſt igitur hęc parmam. An non eſt neceſſe *hanc concluſionem* admittere, ſi Hęc, non ſignificat parmam, ſed parma, parmam verò *eſt* hanc. 4 Nec ſi, quod ais eſſe hunc, eſt hic, ais autem eſſe Cleonem, idcirco hic eſt Cleonẽ: non. n. eſt hic Cleonem: quippe dictũ fuit, Quem aio hunc eſſe, eſt hic, non, hunc: quia nõ eſt Latina ſic prolata interrogatio. 5 Num ſcis hoc? eſt autem lapis; ſcis igitur lapis. An non idem ſignificat in *oratione*, Num ſcis hoc? & in *oratione*, hoc autem *eſt* lapis? ſed in priore hunc: in poſteriore, hic. 6 Num cuius ſcientiam habes, hoc ſcis?

C Περὶ δὲ τῶν σολοικισμῶν, παρ᾽ ὅ τι μὲν φαίνονται συμβαίνειν, εἴπομεν πρότερον· πῶς δὲ λυτέον, ἐπ᾽ αὐτῶν τῶν λόγων ἔσται φανερόν. 2 Ἅπαντες γὰρ οἵδε τοῦτο βούλονται κατασκευάζειν· ἆρ᾽ ὃ λέγεις ἀληθῶς, καὶ ἔστι τοῦτο ἀληθῶς; φὴς δέ τι εἶναι λίθον, ἔστιν ἄρα τι λίθον. ἢ τὸ λέγειν λίθον, οὐκ ἔστι λέγειν ὃ, ἀλλ᾽ ὅν, οὐδὲ τοῦτο, ἀλλὰ τοῦτον; εἰ δὴ ἔροιτό τις, ἆρα ὃν ἀληθῶς λέγεις, ἔστι τοῦτον; οὐκ ἂν δοκοίη ἑλληνίζειν· ὥσπερ οὐδ᾽ εἰ ἔροιτο, ἆρ᾽ ἣν λέγεις εἶναι, ἔστιν οὗτος; ξύλον δ᾽ εἰπεῖν.* οὗτος, ἢ ὅσα μήτε θῆλυ μήτ᾽ ἄρρεν D σημαίνει, οὐδὲν διαφέρει. διὸ καὶ οὐ γίνεται σολοικισμὸς, εἰ ὃ λέγεις εἶναι, ἔστι τοῦτο; ξύλον δὲ λέγεις εἶναι, ἔστιν ἄρα ξύλον. ὁ δὲ λίθος καὶ τὸ οὗτος, ἄρρενος ἔχει κλῆσιν. εἰ δέ τις ἔροιτο, ἆρ᾽ οὗτος ἐστὶν αὕτη; εἶτα πάλιν, τί δέ; οὐχ οὗτός ἐστι Κορίσκος; εἶτα εἴποι, ἔστιν ἄρα οὗτος αὕτη, οὐ συλλελόγισται τὸν σολοικισμὸν, οὐδ᾽ εἰ τὸ Κορίσκος σημαίνει ὅπερ αὕτη, μὴ δίδωσι δὲ ὁ ἀποκρινόμενος· ἀλλὰ δεῖ τοῦτο προσερωτηθῆναι. εἰ δὲ μήτε ἐστὶν, μήτε δίδωσιν, οὐ συλλελόγισται, οὔτε τῷ ὄντι, οὔτε πρὸς τὸν ἐρωτώμενον. ὁμοίως οὖν κἀκεῖ δεῖ τὸν λίθον σημαίνειν οὗτος. εἰ δὲ μήτε ἐστὶ, μήτε δίδοται, οὐ λεκτέον τὸ συμπέρασμα· E φαίνεται δὲ παρὰ τὸ τὴν ἀνόμοιον πτῶσιν τοῦ ὀνόματος, ὁμοίαν φαίνεσθαι. 3 Ἆρα ἀληθές ἐστιν εἰπεῖν, ὅτι αὕτη ἐστὶν, ὅπερ εἶναι φὴς αὐτήν; εἶναι δὲ φὴς ἀσπίδα· ἔστιν ἄρα αὕτη ἀσπίδα. ἢ οὐκ ἀνάγκη, εἰ μὴ τὸ* αὕτη, ἀσπίδα σημαίνοι, ἀλλὰ ἀσπὶς, τὸ δὲ ἀσπίδα, ταύτην. 4 Οὐδ᾽ εἰ ὃ* φὴς εἶναι τοῦτον, ἐστὶν οὗτος; φὴς δὲ εἶναι Κλέωνα, ἔστιν ἄρα οὗτος Κλέωνα· οὐ γάρ ἐστιν οὗτος Κλέωνα· εἴρηται γὰρ, ὃν φημὶ τοῦτον εἶναι, ἔστιν οὗτος, οὐ τοῦτον· οὐδὲ γὰρ ἑλληνίζοι οὕτως τὸ ἐρώτημα λεχθέν. 5 Ἆρ᾽ ἐπίστασαι τοῦτο; ἔστι δὲ λίθος· ἐπίστασαι ἄρα λίθος. ἢ οὐ ταὐτὸν σημαίνει ἐν τῷ, ἆρα ἐπίστασαι τοῦτο; καὶ ἐν τῷ, τοῦτο δὲ λίθος; ἀλλ᾽ ἐν τῷ προτέρῳ, τοῦτον· ἐν δὲ τῷ ὑστέρῳ, οὗτος. 6 Ἆρ᾽ οὗ ἐπιστήμην ἔχεις, ἐπίστασαι τοῦτο;

* κ. εἴπεν

* κ. αὐτὸ, quod Gruchius rectè mutauit.

* κ. φὴς εἶναι, τοῦτον ἐστιν οὗτος,

ἐπιστήμην δὲ ἔχεις λίθου· ἐπίστασαι ἄρα λίθου. ἢ τὸ μὲν τούτου, λίθου λέγεις· τὸ δὲ τοῦτο, λίθον; ἐδόθη δὲ, οὗ ἐπιστήμην ἔχεις, ἐπίστασθαι, οὐ τούτου, ἀλλὰ τοῦτο· ὥστε οὐ λίθου, ἀλλὰ λίθον. 7 Ὅτι μὲν οὖν οἱ τοιοῦτοι τῶν λόγων οὐ συλλογίζονται σολοικισμὸν, ἀλλὰ φαίνονται, καὶ διὰ τί φαίνονται, καὶ πῶς ἀπαντητέον πρὸς αὐτοὺς, φανερὸν ἐκ τῶν εἰρημένων. A

habes autem ſcientiam lapidis: ſcis igitur lapidis. An cùm dicis huius, dicis lapidis: cùm hoc, lapidem? conceſſum eſt autem, cuius ſcientiam habes, id ſcire, non huius, ſed hoc: proinde non lapidis, ſed lapidem. 7 Quòd igitur huiuſcemodi argumentationes non concludant ſolœciſmum, ſed videantur concludere, & cur videantur, & quomodo ſit ipſis occurrendum, ex iis quæ diximus, apparet.

De facilitate vel difficultate cognoſcendi genus captionis, & reſpondendi.

Cap. XXXIII.

1 Diuiſio paralogiſmorum in faciles & difficiles, 2 quæ declaratur exemplis. 3 Hi, qui non facile cognoſcuntur, vocantur acuti. 4 Dubitationis acutæ diuiſio in dialecticam & litigioſam. 5 ac ſubdiuiſio dialecticæ in genus primum, 6 & ſecundum. 7 item litigioſæ ſubdiuiſio in genus primum, 8 & ſecundum. 9 Corollarium. 10 Diuiſio argumentationis, & ſolutionis: quia vel eſt ad rem, vel hominem, vel ad tempus.

Cap. VII.

Δεῖ δὲ κατανοεῖν, ὅτι πάντων τῶν λόγων, οἱ μὲν, εἰσὶ ῥᾴους κατιδεῖν, οἱ δὲ, χαλεπώτεροι, παρὰ τί, καὶ ἐν τίνι παραλογίζονται τὸν ἀκούοντα, πολλάκις οἱ αὐτοὶ ἐκείνοις ὄντες. τὸν αὐτὸν γὰρ λόγον δεῖ καλεῖν, τὸν παρὰ ταὐτὸ γινόμενον· ὁ αὐτὸς δὲ λόγος, τοῖς μὲν, παρὰ τὴν λέξιν· τοῖς δὲ, παρὰ τὸ συμβεβηκός· τοῖς δὲ, παρ' ἕτερον δόξειεν ἂν εἶναι· διὰ τὸ μεταφερόμενον ἕκαστον, μὴ ὁμοίως εἶναι δῆλον. 2 Ὥσπερ οὖν ἐν τοῖς παρὰ τὴν ὁμωνυμίαν, (ὅσπερ δοκεῖ τρόπος * εὐηθέστατος εἶναι τῶν παραλογισμῶν) τὰ μὲν, καὶ τοῖς τυχοῦσίν ἐστι δῆλα· (καὶ οἱ λόγοι σχεδὸν οἱ γελοῖοι, πάντες εἰσὶ παρὰ τὴν λέξιν. οἷον, ἀνὴρ ἐφέρετο κατὰ κλίμακος * δίφρον. καὶ, ὅπου στέλλεσθε; πρὸς τὴν κεραίαν, καὶ ποτέρα τῶν βοῶν ἔμπροσθεν τέξεται; οὐδετέρα, ἀλλ' ὄπισθεν ἄμφω. καὶ καθαρὸς ὁ βορέας; οὐ δῆτα· ἀπέκτεινε γὰρ τὸν πτωχὸν, καὶ τὸν ὠνούμενον. ἆρ' * Εὔαρχος; οὐ δῆτα, ἀλλὰ Ἀπολλωνίδης. τὸν αὐτὸν δὴ τρόπον, καὶ τῶν ἄλλων σχεδὸν οἱ πλεῖστοι) τὰ δὲ, καὶ τοὺς ἐμπειροτάτους φαίνεται λανθάνειν (σημεῖον δὲ τούτου, ὅτι μάχονται πολλάκις περὶ τῶν ὀνομάτων· οἷον, πότερον ταὐτὸν σημαίνει τὸ ἓν κατὰ πάντων, καὶ τὸ ὂν, ἢ ἕτερον; τοῖς μὲν γὰρ δοκεῖ ταὐτὸν σημαίνειν τὸ ὂν, καὶ τὸ ἕν· οἱ δὲ, τὸν Ζήνωνος καὶ Παρμενίδου λύουσι λόγον, διὰ τὸ πολλαχῶς φάσκειν τὸ ἓν λέγεσθαι, καὶ τὸ ὄν) ὁμοίως καὶ παρὰ τὸ συμβεβηκὸς, καὶ τῶν ἄλλων ἕκαστον, οἱ μὲν, ἔσονται ῥᾴους ἰδεῖν· οἱ δὲ, χαλεπώτεροι τῶν λόγων· καὶ λαβεῖν ἐν τίνι γένει, καὶ πότερον ἔλεγχος, ἢ οὐκ ἔλεγχος, οὐ ῥᾴδιον ὁμοίως περὶ πάντων. 3 Ἔστι δὲ δριμὺς λόγος, ὅστις ἀπορεῖν ποιεῖ μάλιστα· δάκνει γὰρ οὗτος μάλιστα. 4 Ἀπορία δέ ἐστι διττή· ἡ μὲν, ἐν τοῖς συλλελογισμένοις, ὅ,τι ἀνέλοι τις τῶν ἐρωτημάτων· ἡ δὲ, ἐν τοῖς ἐριστικοῖς, πῶς εἴποι τις τὸ προτεθέν. διόπερ ἐν τοῖς συλλογιστικοῖς, οἱ δριμύτεροι λόγοι, ζητεῖν μᾶλλον ποιοῦσιν. 5 Ἔστι δὲ συλλογιστικὸς μὲν λόγος δριμύτατος, ἂν ἐξ ὅτι μάλιστα δοκούντων ἐνδόξων, ὅτι μάλιστα ἔνδοξον ἀναιρῇ τις, καὶ κατασκευάζῃ. εἷς γὰρ ὢν ὁ λόγος, μετατιθεμένης τῆς ἀντιφάσεως, ἅπαντας ὁμοίους ἕξει τοὺς συλλογισμούς· ἀεὶ γὰρ ἐξ ἐνδόξων, ὁμοίως ἔνδοξον ἀναιρήσει, ἢ κατασκευάσει· διόπερ ἀπορεῖν ἀναγκαῖον. μάλιστα μὲν οὖν ὁ τοιοῦτος, δριμὺς, ὁ ἐξ ἴσου τὸ συμπέρασμα ποιῶν τοῖς ἐρωτήμασι. 6 Δεύτερος δὲ, ὁ ἐξ ἁπάντων ὁμοίων· οὗτος γὰρ ὁμοίως ποιήσει ἀπορεῖν, ὁποῖον τῶν ἐρωτημάτων ἀναιρετέον. τοῦτο δὲ χαλεπόν· ἀναιρετέον μὲν γάρ· ὅ,τι δὲ ἀναιρετέον, ἄδηλον.

* γ. εὐηθικώτ. minùs rectè. fortè pro εὐφυέστατος. Sic initio libri prioris, ὧν εἷς τρόπος εὐφυέστατος & δημοσιώτατος ὁ διὰ τῶν ὀνομάτων.

* γ. δίφορον. ita Alexander: quod ipſe ita interpretatus quaſi diceret, Ariſt. τί, ἀνὴρ ἐφ. κ. κλ. eſſe δίφορον, hoc eſt, ἀμφίβολον.

* γ. εὔοχος. vtroque modo accipi poteſt. vide Alexandrum.

B Oportet autem intelligere, ex omnibus argumentationibus quaſdã eſſe, in quibus facilè perſpicitur; alias, in quibus difficulter *deprehẽditur*, quam ob cauſam, & in quo decipiant auditorem, cùm *hæ* ſæpe ſint eædem, atque illæ. nam eandem argumẽtationem oportet appellare, quæ ex eodẽ *loco* ducitur. eadem verò argumentatio aliis ex dictione *ſumi*, aliis ex accidẽte, aliis ex alio *loco* videri poteſt: quia ſingula, cùm transferuntur, non æquè ſunt perſpicua. 2 Quemadmodũ igitur in *captionibus* ex homonymia *ductis*, (qui quidem modus frequẽtiſſimus eſt inter paralogiſmos) quædam ſunt C quibuſlibet perſpicua, (ac ferè omnes orationes ridiculæ ſumuntur ex dictione: velvti, Vir ferebat per ſcalas δίφρον. &, ἐπὶ τίνι ϛέλλεσθε? ad antennam. &, Vtra boum antè pariet? neutra: ſed retrò ambæ. & Eſtne Boreas καθαρὸς? nequaquam: interfecit.n. mendicũ, & mercatorẽ. *Eſt*ne Euarchus? minimè: ſed Apollonides. eodémque modo *fiunt* aliæ fermè pleræq; *captiones*) alia vel maximè peritos videntur latẽre: (cuius *rei* ſignum eſt: quia contẽdunt ſæpe de nominibus: velvti, vtrùm Ens & Vnum eãdẽ ſignificatione de omnibus dicantur; an diuerſâ. nonnullis.n. videtur & Ens & Vnum eodẽ modo ſemper accipi: alij verò Zenonis & Parmenidis argumen-D tationem *ex eo* diſſoluũt, quòd Ens & Vnum multifariam dici videntur) ita argumentationum, quæ ex accidẽte & ſingulis aliis *locis* ducũtur, aliæ *ſunt* viſu faciliores, aliæ difficiliores: & perſpicere, in quo *ſint captionũ* genere, & vtrùm elenchus, an non elenchus *ſit*, non æquè facilè *eſt* in omnibus. 3 Eſt autem acuta argumẽtatio, quæ dubitare maximè facit: hæc.n. maximè mordet. 4 Dubitatio verò eſt duplex: altera in argumẽtationibus ſyllogiſticè concludẽtibus, vtra interrogatio ſit tollẽda: altera in litigioſis, quomodo quis dicat, quod propoſitũ eſt. Idcirco in ſyllogiſticis *diſputationibus* acutiores argumentationes maximè faciunt vt quæratur. 5 E Eſt autẽ ſyllogiſtica *argumentatio* acutiſſima, ſi quis ex iis quæ quàm maximè videntur probabilia, id quod quàm maximè eſt probabile, refutet, & adſtruat. cùm.n. vna ſit diſputatio, tranſpoſitâ cõtradictione, ſimiles omnes ſyllogiſmos habebit: quia ſemper ex probabilibus æque probabile refellet, aut adſtruet: ideóque dubitare neceſſe *erit*. Ergo huiuſmodi argumentatio *eſt* maximè acuta, quæ concluſionem interrogatis parem facit. 6 Secunda *eſt*, quæ ex omnibus *ſumptionibus* ſimilibus *conſtat*: hæc enim ſimiliter faciet, vt dubitetur, quodnam interrogatum tollendum *ſit*. hoc autem *eſt* difficile: quia tollendum quidem *eſt*: ſed quodnam tollendum, non apparet.

7 Inter

7 Inter litigioſas autem acutiſſima *ea eſt*, in qua primùm ſtatim non apparet, an ſyllogiſticè concluſerit, nécne: & vtrùm per id quod falſum *eſt negatum*, an *per* diſtinctionem ſoluatur. 8 Secunda ex ceteris *eſt*, quam conſtat *ſoluendam* eſſe per diſtinctionem, vel *per* negationem: ſed non apparet per cuius interrogati negationẽ aut diſtinctionem ſit ſoluenda: immo vtrùm hæc negatio vel diſtinctio ad concluſionem, an ad aliquod interrogatum ſit *accommodanda*. 9 Interdum igitur non concludens argumentatio, fatua eſt, *videlicet* ſi ſumptiones ſint valde incredibiles, aut falſæ: interdum non contemnenda. Cùm.n. deeſt talis aliqua interrogatio, de qua, & per quam diſputatio *eſt*: ſyllogiſmus *eſt* fatuus, qui neque hanc ſumpſit, neque concluſit. cùm autẽ *deeſt interrogatio*, quæ extrinſecùs *adſumi poteſt*: nullo modo eſt *argumentatio* aſpernãda: quin ipſa argumentatio bona *eſt*: ſed interrogans ille nõ bene interrogauit. 10 Sicut autem ſolutio modò ad argumentationem ſpectat, aliàs ad interrogantem & interrogationem, quandoque ad neutrum horum: ſic licet interrogare atque concludere & aduerſus theſim, & aduerſus reſpondentem, & ratione temporis, nimirum cùm plus temporis ſolutio requirit, quàm vt præſentis opportunitatis *ſit* diſſerere aduerſus ſolutionem.

A 7 Τῶν δὲ ἐριστικῶν, δριμύτατος μὲν, ὁ πρῶτον εὐθὺς ἄδηλος, πότερον συλλελόγισται, ἢ οὔ. καὶ πότερον παρὰ τὸ ψεῦδος, ἢ διαίρεσιν ἐστὶν ἡ λύσις. 8 Δεύτερος δὲ τῶν ἄλλων, ὁ δῆλος μὲν, ὅτι παρὰ διαίρεσιν ἢ ἀναίρεσιν ἐστὶ, μὴ φανερὸς δὲ ὢν, διὰ τίνος τῶν ἠρωτημένων ἀναίρεσιν ἢ διαίρεσιν λυτέος ἐστὶν· ἀλλὰ, πότερον αὕτη παρὰ τὸ συμπέρασμα, ἢ παρά τι* τῶν ἠρωτημένων ἐστίν. 9 Ἐνίοτε μὲν οὖν ὁ μὴ συλλογισθεὶς λόγος, εὐήθης ἐστὶν, ἐὰν ᾖ λίαν ἄδοξα, ἢ ψευδῆ τὰ λήμματα· ἐνίοτε δὲ οὐκ ἄξιος καταφρονεῖσθαι. ὅταν μὲν γὰρ ἐλλείπῃ τι τῶν τοιούτων ἐρωτημάτων, περὶ οὗ ὁ λόγος, καὶ δι' ὃ, B καὶ μὴ προσλαβὼν τοῦτο, καὶ μὴ συλλογισάμενος, εὐήθης ὁ συλλογισμός. ὅταν δὲ τῶν ἔξωθεν, οὐκ εὐκαταφρόνητος οὐδαμῶς· ἀλλ' ὁ μὲν λόγος, ἐπιεικής· ὁ δὲ ἐρωτῶν, ἠρώτηκεν οὐ καλῶς. 10 Ἔστι δὲ, ὥσπερ λύειν, ὁτὲ μὲν, πρὸς τὸν λόγον· ὁτὲ δὲ, πρὸς τὸν ἐρωτῶντα, καὶ τὴν ἐρώτησιν· ὁτὲ δὲ, πρὸς οὐδέτερον τούτων· ὁμοίως καὶ ἐρωτᾶν ἐστὶ, καὶ συλλογίζεσθαι, καὶ πρὸς τὴν θέσιν, καὶ πρὸς τὸν ἀποκρινόμενον, καὶ πρὸς τὸν χρόνον, ὅταν ᾖ πλείονος χρόνου δεομένη λύσις, ἢ τοῦ παρόντος καιροῦ τὸ διαλεχθῆναι πρὸς τὴν λύσιν.

* γρ. τῶν ἐρωτημάτων.

Epilogus, & peroratio. Cap. XXXIV.

1 ¶ *Epilogus.* 2 ¶ *Anacephalæoſis. Tranſitio.* 3 *Inſtitutum dialecticæ.* 4 *Expoſita in Topicis & Elenchis.* 5 ¶ *Ariſtotelem eſſe primum dialecticæ auctorem. Protheſis.* 6 *Præmunitio.* 7 *Expoſitio.* 8 *Prolepſis.* 9 *Diſcrimen inter Ariſtotelis opera rhetorica, & logica.* 10 *Excuſatio.*

EX quot igitur & qualibus paralogiſmi fiant iis qui diſputant, & quomodo falſum probemus, & paradoxa dicere cogamus, præterea ex quibus colligatur ſyllogiſmus, & quomodo interrogandum, & quæ *ſit* interrogationum collocatio: præterea ad quid vtiles ſint omnes huiuſmodi diſputationes, ac de omni reſponſione ſimpliciter, & quomodo *ſint* ſoluendæ argumentationes & ſyllogiſmi: de *his (inquam)* omnibus hæc à nobis dicta ſunto. 2 Reliquum *eſt*, vt eò in memoriam reuocato, quod initio propoſitum *fuit*, pauca de eo dicamus, ac finem dictis imponamus. 3 Inſtituimus igitur inuenire quamdam facultatẽ ſyllogiſticam de re ad diſſerendũ propoſita, ex iis quæ *ſunt* quàm maximè probabilia. hoc enim officium eſt dialecticæ per ſe, & piraſticæ. Quia verò huic adiunctum eſt, ob ſophiſticæ affinitatem, vt non ſolùm poſſit *quis* periculum facere dialecticè, ſed etiam quaſi ſciens; idcirco non ſolùm quod dictũ eſt ſuppoſuimus eſſe huius tractationis officium, *nempe* argumentationem ſumere poſſe, verumetiam vt diſputationem ſuſtinentes tueamur theſim ſimili modo per quàm maximè probabilia. Atque huius rei cauſam diximus. nam ideo Socrates quoque interrogabat, non reſpondebat: quia *ſe* nihil ſcire profitebatur. 4 Declaratũ porro eſt in prioribus *libris*, & ad quot *problemata*, & ex qualibus & quot *ſumptionibus* hoc erit, & vnde eorum copia nobis ſuppetat: præterea, quomodo *ſit* interrogandum, vel *quomodo* collocanda *ſit* omnis interrogatio: necnon de reſponſionibus & ſolutionibus quæ ad ſyllogiſmos *afferuntur*. ſed & cetera declarata ſunt, quæcumque ad diſputationum methodum pertinẽt. Ad hæc, de paralogiſmis egimus, vt paulo antè diximus. Quæ igitur *dicere* inſtituimus, ea finem ſatis commodè habere, perſpicuum *eſt*.

C ΕΚ πόσων μὲν οὖν, καὶ ποίων γίνονται τοῖς διαλεγομένοις οἱ παραλογισμοὶ, καὶ πῶς δείξομέν τε ψευδόμενον, καὶ παράδοξα λέγειν ποιήσομεν· ἔτι δ', ἐκ τίνων συμβαίνει ὁ *συλλογισμὸς, καὶ πῶς ἐρωτητέον, καὶ τίς ἡ τάξις τῶν ἐρωτημάτων. ἔτι δὲ πρὸς τί χρήσιμοι πάντες εἰσὶν οἱ τοιοῦτοι λόγοι, καὶ περὶ ἀποκρίσεως ἁπλῶς τε πάσης, καὶ πῶς λυτέον τοὺς λόγους, καὶ συλλογισμοὺς, εἰρήσθω περὶ πάντων ἡμῖν ταῦτα. 2 Λοιπὸν δὲ, περὶ τῆς ἐξ ἀρχῆς προθέσεως ἀναμνήσασιν, εἰπεῖν τι βραχὺ περὶ αὐτῆς, καὶ τέλος ἐπιθεῖναι τοῖς εἰρημένοις. 3 Προειλόμεθα οὖν εὑρεῖν τινα δύναμιν D συλλογιστικὴν περὶ τοῦ προβληθέντος ἐκ τῶν ὑπαρχόντων ὡς ἐνδοξοτάτων. τοῦτο γὰρ ἔργον ἐστὶ τῆς διαλεκτικῆς καθ' αὑτὴν· καὶ τῆς πειραστικῆς. ἐπεὶ δὲ προσκατασκευάζεται πρὸς αὐτὴν, διὰ τὴν τῆς σοφιστικῆς γειτνίασιν, ὡς οὐ μόνον δύναται πεῖραν λαβεῖν διαλεκτικῶς, ἀλλὰ καὶ ὡς εἰδώς· διὰ τοῦτο, οὐ μόνον τὸ λεχθὲν, ἔργον ὑπεθέμεθα τῆς πραγματείας, τὸ λόγον δύνασθαι λαβεῖν, ἀλλὰ καὶ ὅπως λόγον ὑπέχοντες φυλάξομεν τὴν θέσιν ὡς δι' ἐνδοξοτάτων ὁμοτρόπως. τὴν δὲ αἰτίαν εἰρήκαμεν τούτου. ἐπεὶ καὶ διὰ τοῦτο Σωκράτης ἠρώτα, ἀλλ' οὐκ ἀπεκρίνετο· ὡμολόγει γὰρ μὴ E εἰδέναι. 4 Δεδήλωται δὲ ἐν τοῖς πρότερον, καὶ πρὸς πόσα, καὶ ἐκ ποίων, καὶ πόσων, τοῦτο ἔσται, καὶ ὅθεν εὐπορήσομεν τούτων. ἔτι δὲ, πῶς ἐρωτητέον, ἢ τακτέον τὴν ἐρώτησιν πᾶσαν, καὶ περί τε ἀποκρίσεων καὶ λύσεων τῶν πρὸς τοὺς συλλογισμούς. δεδήλωται δὲ καὶ περὶ τῶν ἄλλων, ὅσα τῆς αὐτῆς μεθόδου τῶν λόγων ἐστί. πρὸς δὲ τούτοις, περὶ τῶν παραλογισμῶν διεληλύθαμεν, ὥσπερ εἰρήκαμεν ἤδη πρότερον. ὅτι μὲν οὖν ἔχει τέλος ἱκανῶς ἃ προειλόμεθα, φανερόν.

CAP. VIII.

* Gruchius veriſſimè legit, σολοικισμὸς, vulgò συλλογισμὸς, quod nullo modo fieri poteſt.

CAP. IX. 5 Δεῖ δὲ ἡμᾶς μὴ λεληθέναι τὸ συμβεβηκὸς περὶ ταύτην τὴν πραγματείαν. 6 Τῶν γὰρ εὑρισκομένων ἁπάντων, τὰ μὲν, παρ' ἑτέρων ληφθέντα, πρότερον πεπονημένα, κατὰ μέρος ἐπιδέδωκεν ὑπὸ τῶν παραλαβόντων ὕστερον· τὰ δὲ, ἐξ ὑπαρχῆς εὑρισκόμενα, μικρὰν τὸ πρῶτον ἐπίδοσιν λαμβάνειν εἴωθε, χρησιμωτέραν μέντοι πολλῷ τῆς ὕστερον ἐκ τούτων αὐξήσεως· μέγιστον γὰρ ἴσως ἀρχὴ παντὸς, ὥσπερ λέγεται· διὸ καὶ χαλεπώτατον· ὅσῳ γὰρ κράτιστον τῇ δυνάμει, τοσούτῳ μικρότατον ὂν τῷ μεγέθει, χαλεπώτατόν ἐστιν ὀφθῆναι. ταύτης δὲ εὑρημένης, ῥᾷον τὸ προστιθέναι καὶ συναύξειν τὸ λοιπόν ἐστιν· ὅπερ καὶ περὶ τοὺς πολιτικοὺς λόγους συμβέβηκε· σχεδὸν δὲ καὶ περὶ τὰς ἄλλας ἁπάσας τέχνας. οἱ μὲν γὰρ τὰς ἀρχὰς εὑρόντες, παντελῶς ἐπὶ μικρόν τι προήγαγον· οἱ δὲ νῦν εὐδοκιμοῦντες, παραλαβόντες παρὰ πολλῶν, οἷον ἐκ διαδοχῆς, τῶν κατὰ μέρος προαγαγόντων, οὕτως ηὐξήκασι· Τισίας μὲν μετὰ τοὺς πρώτους, Θρασύμαχος δὲ μετὰ Τισίαν, Θεόδωρος δὲ μετὰ τοῦτον, καὶ πολλοὶ πολλὰ συνενηνόχασι μέρη. διόπερ οὐδὲν θαυμαστὸν, ἔχειν τι πλῆθος τὴν τέχνην. 7 Ταύτης δὲ τῆς πραγματείας, οὐ τὸ μὲν ἦν, τὸ δ' οὐκ ἦν προεξειργασμένον· ἀλλ' οὐδὲν παντελῶς ὑπῆρχε. 8 Καὶ γὰρ τῶν περὶ τοὺς ἐριστικοὺς λόγους μισθαρνούντων, ὁμοία τις ἦν ἡ παίδευσις, τῇ Γοργίου πραγματείᾳ. λόγους γὰρ, οἱ μὲν, ῥητορικούς· οἱ δὲ, ἐρωτηματικοὺς ἐδίδοσαν ἐκμανθάνειν, εἰς οὓς πλειστάκις ἐμπίπτειν * ᾠήθησαν ἑκάτεροι τοὺς ἀλλήλων λόγους. διόπερ ταχεῖα μὲν, ἄτεχνος δ' ἦν ἡ διδασκαλία τοῖς μανθάνουσι παρ' αὐτῶν· οὐ γὰρ τέχνην, ἀλλὰ τὰ ἀπὸ τῆς τέχνης διδόντες, παιδεύειν ὑπελάμβανον· ὥσπερ ἂν εἴ τις ἐπιστήμην φάσκων παραδώσειν ἐπὶ τὸ μηδὲν πονεῖν τοὺς πόδας, εἶτα σκυτοτομεῖν μὲν μὴ διδάξειε, μηδ' ὅθεν δυνήσεται πορίζεσθαι τὰ τοιαῦτα, δοίη δὲ πολλὰ γένη παντοδαπῶν ὑποδημάτων· οὗτος γὰρ βεβοήθηκε μὲν πρὸς τὴν χρείαν, τέχνην δὲ οὐ παρέδωκε. 9 Καὶ περὶ μὲν τῶν ῥητορικῶν ὑπῆρχε πολλὰ καὶ παλαιὰ τὰ λεγόμενα· περὶ δὲ τοῦ συλλογίζεσθαι, παντελῶς οὐδὲν εἴχομεν πρότερον λέγειν ἄλλο· ἀλλὰ* τριβῇ ζητοῦντες, πολὺν χρόνον ἐπονοῦμεν. 10 Εἰ δὴ φαίνεται θεασαμένοις ὑμῖν, ὡς μὴ ἐκ τοιούτων τῶν ἐξ ἀρχῆς ὑπαρχόντων ἔχειν ἡ μέθοδος ἱκανῶς, παρὰ τὰς ἄλλας πραγματείας τὰς ἐκ παραδόσεως ηὐξημένας· λοιπὸν ἂν εἴη πάντων ὑμῶν ἢ τῶν ἀκροωμένων ἔργον, τοῖς μὲν παραλελειμμένοις τῆς μεθόδου, συγγνώμην, τοῖς δ' εὑρημένοις, πολλὴν χάριν ἔχειν.

* γρ. εἰώθεισαν

* γρ. τριβῇ

A 5 Iam verò non oportet nos latêre, quod in hac tractatione accidit. 6 Nam eorum omnium quæ inueniuntur, quædam ab aliis accepta, priùs elaborata *ſunt*, poſtea per partes adaucta ab iis qui exceperunt: alia vero ab initio inuenta, exiguum primò incrementum ſuſcipere conſueuerunt, multo tamen vtilius amplificatione, quę ab his, *qui ſequuntur, proficiſcitur*. Nā principium fortaſſe *eſt* maxima totius *pars*, vt dici ſolet: ideóque *eſt* difficillimum. cùm.n quo potentiore *eſt* facultate, eo minore ſit magnitudine, difficillimum eſt viſu: hoc autē reperto, facilius *eſt* adiungere & conferre quod reliquum *eſt*. quod quidem & in politicis orationibus B accidit, & ferè in omnibus aliis artibus: etenim qui principia inuenerunt, parum admodum ſunt progreſſi. qui verò nunc ſunt celebres, accepta, quaſi per ſucceſſionem, à multis per partes promouentibus, ſic auxere: Tiſias quidem poſt primos *auctores*, Thraſymachus verò poſt Tiſiam, Theodorus autem poſt hunc, ac multi *alij* multas partes contulerunt. Quocirca non *eſt* mirum, artem illam continere multitudinem quandam *præceptorum*. 7 Huius autem *dialecticæ* tractationis, non aliud erat, aliud non erat excultum: ſed nihil prorſus extabat. 8 Nam eorum qui in litigioſis diſputationibus quæſtum faciebant, inſtitutio quædam C erat ſimilis Gorgiæ tractationi. Alij namque orationes rhetoricas, alii ad interrogandum comparatas, tradebant ediſcendas, in quas vtrique putabant mutuos ſermones ſæpenumero incidere. idcirco celeriter quidem ſed citra artem diſcipulos ſuos docebant: non n. artem, ſed quæ ab arte *efficiuntur*, tradēdo, putabant *ſe rectè inſtituere*: perinde ac ſi quis profeſſus *ſe* traditurum ſcientiam *cauendi* ne pedes doleant, poſtea non doceat corium incidere, nec vnde eiuſmodi *inſtrumēta* parari poſſint, ſed multa det genera variorum calceorum: hic n. ad vſum quidem profuit, ſed artem non tradidit. D 9 Ac de rhetoricis quidem multa & antiqua dicta extabant: de ſyllogiſmis autem conficiendis nihil aliud habebamus antea quod diceremus: ſed exercitatione quærentes, multum temporis laborauimus. 10 Si igitur vobis *ſcripta noſtra* inſpicientibus videtur non eſſe hæc, methodus ex talibus initiò extantibus perfecta, *ſi comparetur* ad alias tractationes, quæ ex traditione ſunt aucta: *quod* reliquum *eſt*, veſtræ auditorúmve partes erunt, *ea quæ ad* huius methodi *conſummationem* ſunt prætermiſſa, veniâ *dignari*: quæ verò ſunt inuenta, multâ proſequi gratiâ.

ΑΡΙΣΤΟΤΕΛΟΥΣ

ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ, Η ΠΕΡΙ φυσικῶν ἀρχῶν, τὸ Α.

ARISTOTELIS

NATVRALIS AVSCVLTATIONIS, SEV DE NATVRALIBVS PRINCIPIIS,

LIBER I.

IVL. PACIO INTERPRETE.

De ſcopo, & methodo huius libri.

Cap. I.

QVONIAM cognitio & ſcientia in omnibus methodis, quarum ſunt, principia vel cauſæ vel elementa, ex horum notitia proficiſcitur: (tunc enim putamus vnumquodque cognoſcere, cùm cauſas primas nouerimus, & principia prima, & vſque ad elementa) perſpicuum *eſt*, *hic* quoque tentandum, vt primùm definiantur ea quæ ad principia naturalis ſcientiæ *pertinent*. 2 Naturaliter autem conſtituta eſt via ab iis quæ *ſunt* nobis notiora & clariora, ad ea quæ *ſunt* clariora & notiora natura. non enim eadem *ſunt* & nobis notiora & ſimpliciter. quare neceſſe *eſt* hoc modo progredi, *nimirum* ex iis quæ natura quidem *ſunt* obſcuriora, nobis tamen *ſunt* clariora, ad ea quæ *ſunt* notiora & clariora natura. Ea verò ſunt nobis primùm perſpicua & manifeſta, quæ *ſunt* magis confuſa. deinde iis qui hæc diuidunt, ex ipſis elementa & principia innoteſcunt. 3 Idcirco ab vniuerſalibus ad ſingularia progredi oportet. totum enim ſecundùm ſenſum notius eſt: vniuerſale autem eſt totum quiddam: quoniam vniuerſale multa, tamquam partes, comprehendit. 4 Sic affecta quodammodo ſunt etiam nomina erga definitionem. totum enim quiddam & indefinite ſignificant: veluti, circulus: definitio verò eius diuidit in ſingulas *partes*. 5 Ac pueri quoque primùm omnes viros appellant patres: & omnes mulieres, matres: poſtea verò diſcernunt horum vtrumque.

A ΕΠΕΙΔΗ τὸ εἰδέναι καὶ τὸ ἐπίστασθαι συμβαίνει περὶ πάσας τὰς μεθόδους, ὧν εἰσὶν ἀρχαὶ, ἢ αἴτια, ἢ στοιχεῖα, ἐκ τοῦ ταῦτα γνωρίζειν (τότε γὰρ οἰόμεθα γινώσκειν ἕκαστον, ὅταν τὰ αἴτια γνωρίσωμεν τὰ πρῶτα, καὶ τὰς ἀρχὰς τὰς πρώτας, καὶ μέχρι τῶν στοιχείων) δῆλον ὅτι καὶ τῆς περὶ φύσεως ἐπιστήμης πειρατέον* πρότερον διορίσασθαι τὰ περὶ τὰς ἀρχάς.* 2 Πέφυκε δὲ ἐκ τῶν γνωριμωτέρων ἡμῖν ἡ ὁδὸς καὶ σαφεστέρων, ἐπὶ τὰ σαφέστερα τῇ φύσει καὶ γνωριμώτερα· οὐ γὰρ ταὐτὰ ἡμῖν τε γνώριμα, καὶ ἁπλῶς. διόπερ ἀνάγκη τὸν τρόπον τοῦτον προάγειν, ἐκ τῶν ἀσαφεστέρων μὲν τῇ φύσει, ἡμῖν δὲ σαφεστέρων, ἐπὶ τὰ
B σαφέστερα τῇ φύσει καὶ γνωριμώτερα. ἔστι δ' ἡμῖν τὸ πρῶτον δῆλα καὶ σαφῆ τὰ συγκεχυμένα μᾶλλον· ὕστερον δὲ ἐκ τούτων γίνεται γνώριμα τὰ στοιχεῖα, καὶ αἱ ἀρχαὶ, διαιροῦσι ταῦτα. 3 Διὸ ἐκ τῶν καθόλου ἐπὶ τὰ καθ' ἕκαστα δεῖ προϊέναι· τὸ γὰρ ὅλον, κατὰ τὴν αἴσθησιν γνωριμώτερον· τὸ δὲ καθόλου, ὅλον τί ἐστι. πολλὰ γὰρ περιλαμβάνει ὡς μέρη, τὸ καθόλου. 4 Πέπονθε δὲ ταὐτὸ τοῦτο τρόπον τινὰ καὶ τὰ ὀνόματα πρὸς τὸν λόγον· ὅλον γάρ τι καὶ* ἀδιορίστως σημαίνει, οἷον ὁ κύκλος· ὁ δὲ ὁρισμὸς αὐτοῦ διαιρεῖ εἰς τὰ καθ' ἕκαστα.
5 Καὶ τὰ παιδία τὸ μὲν πρῶτον* προσαγορεύει πάντας τοὺς ἄνδρας, πατέρας· καὶ μητέρας, τὰς γυναῖκας· ὕστερον δὲ διορίζει τούτων ἑκάτερον.

* γρ. πρῶτον

* Vide Nicomach. li. 1. c. 2.

* γρ. ἀδιαιρέτως

* γρ. πάντας τ... πατ. προσαγ.

Quæſtio, quot, & quæ ſint principia naturalia. Cap. II.

* Metaphyſ. li. 1. c. 1. 4. 5. &c.
* γρ. οἱ φασι
* γρ. εἰ δὲ π.
* γρ. τῷ δ' εἴδει δ.

A Ἀνάγκη δ᾽, ἤτοι μίαν εἶναι τὴν ἀρχὴν, ἢ πλείους· καὶ εἰ μίαν, ἤτοι ἀκίνητον, * ὥσπερ φησὶ Παρμενίδης καὶ Μέλισσος· ἢ κινουμένην, ὥσπερ οἱ φυσικοὶ, οἱ μὲν, ἀέρα φάσκοντες εἶναι· οἱ δὲ, ὕδωρ, τὴν πρώτην ἀρχήν. * εἰ δὲ πλείους, ἢ πεπερασμένας, ἢ ἀπείρους· καὶ εἰ πεπερασμένας, πλείους δὲ μιᾶς, ἢ δύο, ἢ τρεῖς, ἢ τέτταρας, ἢ ἄλλον τινὰ ἀριθμόν· καὶ εἰ ἀπείρους, ἢ οὕτως ὥσπερ Δημόκριτος, τὸ γένος ἓν, * σχήματι ἢ καὶ εἴδει διαφερούσας, ἢ καὶ ἐναντίας. 2 Ὁμοίως δὲ ζητοῦσι καὶ οἱ τὰ ὄντα ζητοῦντες, πόσα· ἐξ ὧν γὰρ τὰ ὄντα ἐστὶ, ζητοῦσι πρῶτον ταῦτα πότερον ἓν, ἢ πολλά· καὶ εἰ πολλὰ, ἢ πεπερασμένα, ἢ ἄπειρα· ὥστε τὴν B ἀρχὴν καὶ τὸ στοιχεῖον ζητοῦσι, πότερον ἓν, ἢ πολλά. 3 Τὸ μὲν οὖν εἰ ἓν καὶ ἀκίνητον τὸ ὂν σκοπεῖν, * οὐ περὶ φύσεώς ἐστι σκοπεῖν. ὥσπερ γὰρ καὶ τῷ γεωμέτρῃ οὐκέτι λόγος ἐστὶ πρὸς τὸν ἀνελόντα τὰς ἀρχὰς, ἀλλ᾽ ἤτοι ἑτέρας ἐπιστήμης, ἢ πασῶν κοινῆς· οὕτως οὐδὲ τῷ περὶ ἀρχῶν· οὐ γὰρ ἔτι ἀρχή ἐστιν, εἰ ἓν μόνον, καὶ οὕτως ἓν ἐστιν. ἡ γὰρ ἀρχὴ, τινὸς, ἢ τινῶν. 4 Ὅμοιον δὴ τὸ σκοπεῖν εἰ οὕτως ἓν, καὶ πρὸς ἄλλην θέσιν ὁποιανοῦν διαλέγεσθαι, τῶν λόγου ἕνεκα λεγομένων, οἷον τὴν Ἡρακλείτειον· ἢ εἴ τις φαίη ἄνθρωπον ἕνα τὸ ὂν εἶναι. 5 Ἢ λύειν λόγον ἐριστικὸν, ὅπερ ἀμφότεροι μὲν ἔχουσιν οἱ C λόγοι, καὶ ὁ Μελίσσου καὶ ὁ Παρμενίδου· καὶ γὰρ ψευδῆ λαμβάνουσι, καὶ ἀσυλλόγιστοί εἰσι. μᾶλλον δὲ ὁ Μελίσσου φορτικὸς, καὶ οὐκ ἔχων ἀπορίαν. ἀλλ᾽ ἑνὸς ἀτόπου δοθέντος, τἆλλα συμβαίνει. τοῦτο δὲ οὐδὲν χαλεπόν. 6 Ἡμῖν δὲ ὑποκείσθω, τὰ φύσει ἢ πάντα, ἢ ἔνια κινούμενα εἶναι· δῆλον δὲ ἐκ τῆς ἐπαγωγῆς. 7 Ἅμα δὲ οὐδὲ λύειν ἅπαντα προσήκει, ἀλλ᾽ ἢ ὅσα ἐκ τῶν ἀρχῶν τις ἐπιδεικνὺς ψεύδεται· ὅσα δὲ μὴ, οὔ. οἷον τὸν τετραγωνισμὸν τὸν μὲν διὰ τῶν τμημάτων, γεωμετρικοῦ διαλῦσαι· τὸν δὲ Ἀντιφῶντος, οὐ γεωμετρικοῦ. 8 Οὐ μὴν ἀλλ᾽ ἐπειδὴ * περὶ φύσεως μὲν οὔ, φυσικὰς δὲ ἀπορίας συμβαίνει λέγειν αὐτοῖς, ἴσως ἔχει καλῶς ἐπὶ μικρὸν διαλεχθῆναι περὶ αὐτῶν. ἔχει γὰρ φιλοσοφίαν ἡ σκέψις.

* Malim οὐ τῷ περὶ φ. ſupple ζητοῦντι, vel σκοποῦντι. ſiue τῷ φυσικῷ, vt habét Themiſtius, Philop. alij: ſic alibi, οἱ περὶ φύσεως dicere ſolet, pro, phyſici.

* γρ. περὶ φ. μὲν οὔ. non rectè, etſi ita Alexander & Porphyrius, & alij. vide Simplicium & Philoponum. Ipſe Ariſt. paulo ante dixit quęrere an vnú ſit τὸ ὂν, non eſſe περὶ φύσεως σκοπεῖν:

A Neceſſe autem eſt aut vnum eſſe principium, aut plura. &, ſi vnum *ſit*, aut *eſſe* immobile, inquiunt Parmenides & Meliſſus: aut quod moueatur, vt aiunt phyſici: quorum alij aërem, alij aquam ſtatuunt eſſe primum principium. quòd ſi plura *ſint*, *neceſſe eſt* vel *eſſe* finita vel infinita, &, ſi finita, vno autem plura: *certè* vel *eſſe* duo, vel tria, vel quatuor, vel aliquo alio numero. ſi infinita: vel *oportet* ſic *eſſe* vt *cenſuit* Democritus, *nimirum* genere vnum, figura autem vel forma diſcrepantia, aut etiam contraria. 2 Similiter etiam ij quærunt, qui quærunt, quot ſint entia: primùm enim quæ-B runt, vtrùm hæc, ex quibus entia conſtant, vnum ſint, an multa; &, ſi multa ſint, *vtrùm ſint* finita, an infinita. quocirca quærunt, vtrùm principium ac elementum *ſit* vnum, an multa. 3 Porro hæc conſideratio, an vnum ſit ens & immobile, non eſt conſideratio de natura. quemadmodum enim non amplùs geometræ eſt diſputare aduerſus eũ qui Geometriæ principia euertit: ſed *ea diſputatio eſt* vel alterius ſcientiæ, vel omnium communis: ita etiam ei qui de principiis *phyſicis agit*, non *eſt diſputandum aduerſus negantes principia phyſica*: quia nõ eſt ampliùs principium, ſi eſt tantùm vnum, & ita vnum: quandoquidem principium *eſt* alicuius, vel C aliquorum. 4 Perinde igitur *eſt*, conſiderare an ita *ſit* vnũ *principium*, ac ſi contra quamuis aliã theſim diſceptetur, quę diſputationis cauſa aſſeratur: velvti *aduerſus theſim* Heracliteam: vel ſi quis affirmarit id quod eſt, eſſe vnum hominem: 5 Aut ſoluere argumentationem litigioſam, quã ambo ſermones habent, tam Meliſſi quàm Parmenidis. etenim falſa accipiunt, neque concludunt. ſed ratio Meliſſi eſt magis importuna, nec habet dubitationem: ſed vno abſurdo dato cetera eueniunt: hoc verò non *eſt* difficile. 6 Nos autem ſupponamus, quæ natura *conſtant*, vel omnia vel quædam moueri. quod quidem per inductionẽ perſpicuum *eſt*. 7 Simul autem nec ſoluere omnia decet: ſed *ea* tantùm, quæ ex principiis demonſtrans quiſpiam falsò concludit: quæ verò non *ita concluduntur*, nequaquam *ſoluenda ſunt*. exempli gratia, tetragoniſmum, qui per ſegmenta *fit*, geometræ *eſt* diſſoluere: Antiphontis *verò tetragoniſmum diſſoluere*, non eſt geometræ. 8 Sed quia, licèt non de natura, tamen naturales dubitationes eos dicere contingit: fortaſſe è re erit, paululum de his diſſerere: habet enim *in ſe* philoſophiam hæc conſideratio.

Non eſſe vnum ens, vt Parmenides & Meliſſus cenſuerunt.

Cap. III.

* Metaphyſ. li. δ. cap. 7.
* γρ. οὐσίας μὲν μιᾶς ἢ τ. π.
* γρ. ἢ ποιόν. ἓν δ' ... οἷον λευκὸν, ἢ θερμὸν, ἢ ἄλλο τι τῶν τ.

Ἀρχὴ δὲ οἰκειοτάτη πασῶν, ἐπειδὴ * πολλαχῶς λέγεται D τὸ ὂν, πῶς λέγουσιν οἱ λέγοντες εἶναι ἓν τὰ πάντα; πότερον οὐσίαν τὰ πάντα, ἢ ποσὰ (τὰ πάντα,) ἢ ποιά; καὶ πάλιν, πότερον * οὐσίαν μίαν τὰ πάντα, οἷον ἄνθρωπον ἕνα, ἢ ἵππον ἕνα, ἢ ψυχὴν μίαν; * ἢ ποιὸν ἕν. καὶ τοῦτο, οἷον λευκὸν, ἢ θερμὸν, ἢ τῶν ἄλλων τι τῶν τοιούτων. ταῦτα γὰρ πάντα διαφέρει πολὺ, καὶ ἀδύνατα λέγειν. 2 Εἰ μὲν γὰρ ἔσται καὶ οὐσία, καὶ ποσὸν, καὶ ποιόν· καὶ ταῦτα εἴτε ἀπολελυμένα ἀπ᾽ ἀλλήλων, εἴτε μή· πολλὰ τὰ ὄντα.

Principium autem omnium accommodatiſſimum *eſt*, *vt videamus*, quoniam ens multis modis dicitur, quonã modo *id* accipiant, qui inquiunt omnia eſſe vnum: vtrùm *intelligant* omnia *eſſe* ſubſtantiam, an *omnia eſſe* quanta, vel qualia. rurſus vtrùm omnia *eſſe* vnam ſubſtantiam, vt hominem vnum, vel equum vnum, vel animam vnam; an vnum quale: atque hoc, vt album; vel calidum, vel aliud quidpiam tale. hæc enim omnia longè *inter ſe* differunt, ac dici nequeunt. 2 Etenim ſi ſit & ſubſtantia, & quantum, & quale: ſiue hæc ſint à ſe inuicem ſeiuncta, ſiue non *ſint ſeiuncta*: *certè* multa entia *ſunt*.

3 Si verò omnia *ſint* quãtum, vel quale: ſiue etiam ſubſtantia ſit, ſiue non ſit: abſurdum *eſt*: ſi tamen abſurdum dicere oportet, quod *eſt* impoſſibile. nihil enim aliud ſeparabile eſt præter ſubſtantiam: quoniam *reliqua* omnia de ſubiecta ſubſtantia dicuntur. atqui Meliſſus inquit ens infinitum eſſe. ens igitur *eſt* quantum quiddam: quoniam infinitum *eſt* in quantitate: ſubſtantia verò, aut qualitas, aut affectio non poteſt eſſe infinita, niſi ex accidenti, *videlicet* ſi quædam ſimul quanta ſint. nam in definitione infiniti quantũ adhibetur, non ſubſtantia, nec quale. ergo ſi & ſubſtantia eſt, & quantum: duo *ſunt* entia, non vnum. 4 Quòd ſi ſubſtantia tantùm *ſit*, *profectò* ens nec infinitum erit, nec vllam magnitudinem habebit: quandoquidem eſſet quantum quiddam. 5 Præterea quoniam ipſum quoque vnum dicitur multis modis, quemadmodum & ens: conſiderandum *eſt*, quonam modo dicant vniuerſum eſſe vnum. Dicitur autem vnum, vel quod *eſt* continuum, vel quod *eſt* indiuiduum, vel quorum vna & eadem eſt definitio quidditatem explicans, vt temetum & vinum. 6 Itaque ſi ens continuum *eſt*: multa eſt, quod *eſt* vnum: quia continuum *eſt* diuiſibile in infinitum. 7 Eſt autem dubitatio de parte ac toto, (quæ fortaſſe nihil ad hanc rationem facit, ſed ipſa per ſe *ſpectanda eſt*) vtrùm pars & totum *ſint* vnum, an multa: & quomodo *ſint* vnum, vel multa: & ſi *ſunt* multa, quomodo multa: (ac de partibus non continuis *eſt* eadem diſputatio) & ſi vtraque *pars* cum toto vnum ſit vtpote indiuidua: *hinc effici* vt & ipſæ *partes* inter ſe *vnum ſint*. 8 At verò ſi *vnum eſt ens* vt indiuiduum: nihil erit quantum, aut quale: proinde ens nec *erit* infinitum, vt inquit Meliſſus: nec finitum, *vt ait* Parmenides. finis enim *ſeu terminus* indiuiduum *eſt*, non id quod *eſt* finitum. 9 Sed ſi omnia entia ſunt definitione vnum, vt veſtimentum & indumentum: accidit eis, vt Heracliti ſermonem pronuntient. eadem enim erit eſſentia boni, & mali: item non boni, & boni. quocirca idem erit & bonum, & non bonum: necnon homo & equus: nec de hoc erit diſputatio, an omnia entia ſint vnum, ſed eo *potiùs*, an nihil *ſint*: item tale eſſe, & tantum *eſſe*, idem *erunt*. 10 Poſteri quoque, ſicut veteres, conturbati ſunt, *verentes* ne quando eis accideret *vt dicerent* idem ſimul eſſe vnum & multa. quare nonnulli verbum EST auferebant, vt Lycophron: *alij verò* orationem reformabant, non *dicentes* hominem album eſſe, ſed albeſcere: nec hominem eſſe ambulantem, ſed ambulare: ne verbum EST adiungentes, multa eſſe efficerent, quod *eſt* vnum: quaſi vno modo dicatur vnum aut ens. 12 Entia verò multa *ſunt*, vel definitione, (vt alia *eſt* albi eſſentia, & muſici: eidẽ tamen *ſubiecto inſunt*: multa igitur *eſt*, quod *eſt* vnum) vel diuiſione, vt totum & partes. Hîc verò ambigebant, & fatebantur, quod vnum *eſt*, eſſe multa: quaſi idem non poſſet eſſe vnum & multa: non *propterea* tamen oppoſita *concedebant*: eſt enim vnum, & poteſtate, & actu. 12 Iis igitur qui hoc modo aggrediuntur, apparet fieri non poſſe, vt ea quæ ſunt, vnum ſint.

A 3 Εἰ δὲ ἅπαντα ποιόν, ἢ ποσόν, εἴτε οὔσης οὐσίας, εἴτε μὴ οὔσης, ἄτοπον· εἰ δεῖ ἄτοπον λέγειν τὸ ἀδύνατον. οὐδὲν γὰρ τῶν ἄλλων χωριστόν ἐστι παρὰ τὴν οὐσίαν. πάντα γὰρ καθ᾽ *ὑποκειμένου λέγεται, τῆς οὐσίας. Μέλισσος δέ φησι τὸ ὂν ἄπειρον εἶναι. ποσὸν ἄρα τι τὸ ὄν· τὸ γὰρ ἄπειρον ἐν τῷ ποσῷ· οὐσίαν δὲ εἶναι ἄπειρον, ἢ ποιότητα, ἢ πάθος, οὐκ ἐνδέχεται, εἰ μὴ κατὰ συμβεβηκός, εἰ ἅμα καὶ ποσὰ ἄττα εἶεν· ὁ γὰρ τοῦ ἀπείρου λόγος τῷ ποσῷ προσχρῆται, ἀλλ᾽ οὐκ οὐσίᾳ, οὐδὲ τῷ ποιῷ. Εἰ μὲν τοίνυν καὶ οὐσία ἐστὶ, καὶ ποσόν, δύο, καὶ οὐχ ἕν, τὸ ὄν. 4 Εἰ δ᾽ οὐσία μόνον, οὐκ ἄπειρον, οὐδὲ μέγεθος ἕξει οὐδέν· ποσὸν γάρ τι ἔσται. 5 Ἔτι ἐπεὶ καὶ αὐτὸ *τὸ ἓν πολλαχῶς B λέγεται, ὥσπερ τὸ ὄν, σκεπτέον τίνα τρόπον λέγουσιν ἓν εἶναι τὸ πᾶν. λέγεται δ᾽ ἕν, ἢ τὸ συνεχές, ἢ τὸ ἀδιαίρετον, ἢ ὧν ὁ λόγος ὁ αὐτὸς καὶ εἷς, ὁ τοῦ τί ἦν εἶναι, ὥσπερ μέθυ καὶ οἶνος. 6 Εἰ μὲν τοίνυν συνεχές, πολλὰ *τὸ ἕν· εἰς ἄπειρον γὰρ διαιρετὸν τὸ συνεχές. 7 Ἔχει δ᾽ ἀπορίαν περὶ τοῦ μέρους, καὶ τοῦ ὅλου· ἴσως δὲ οὐ πρὸς τὸν λόγον, ἀλλ᾽ αὐτὴν καθ᾽ αὑτήν· πότερον ἓν ἢ πλείω τὸ μέρος καὶ τὸ ὅλον· καὶ πῶς ἕν, *ἢ πλείω· καὶ εἰ πλείω πῶς πλείω· καὶ περὶ τῶν μερῶν τῶν μὴ *συνεχῶν· καὶ εἰ τῷ ὅλῳ ἓν ἑκάτερον ὡς ἀδιαίρετον, ὅτι καὶ αὐτὰ αὑτοῖς. 8 Ἀλλὰ μὴν εἰ ὡς ἀδιαίρετον, *οὐδὲ ποσόν, οὐδὲ C ποιόν, οὐδὲ δὴ ἄπειρον τὸ ὄν, ὥσπερ Μέλισσός φησιν· οὐδὲ πεπερασμένον, ὥσπερ Παρμενίδης. τὸ γὰρ πέρας, ἀδιαίρετον, *οὐ τὸ πεπερασμένον. 9 Ἀλλὰ μὴν εἰ τῷ λόγῳ ἓν τὰ ὄντα πάντα, ὡς λώπιον καὶ ἱμάτιον, τὸν Ἡρακλείτου λόγον συμβαίνει λέγειν αὐτοῖς· ταὐτὸν γὰρ ἔσται καὶ ἀγαθῷ καὶ κακῷ, καὶ μὴ ἀγαθῷ εἶναι καὶ ἀγαθῷ· ὥστε τὸ αὐτὸ ἔσται ἀγαθὸν καὶ οὐκ ἀγαθόν, καὶ ἄνθρωπος καὶ ἵππος· καὶ οὐ περὶ τοῦ ἓν εἶναι τὰ ὄντα, ὁ λόγος ἔσται· ἀλλὰ περὶ τοῦ μηδὲν καὶ τὸ τοιονδὶ εἶναι καὶ τὸ τοσονδὶ ταὐτόν. 10 Ἐθορυβοῦντο δὲ καὶ οἱ ὕστεροι, καθάπερ οἱ ἀρχαῖοι, μή ποτε συμβαίνῃ αὐτοῖς ἅμα τὸ αὐτὸ ἓν εἶναι καὶ πολλά. διὸ οἱ μὲν τὸ ἐστὶν ἀφεῖλον, ὥσπερ Λυκόφρων· D οἱ δὲ τὴν λέξιν μετερρύθμιζον, ὅτι ὁ ἄνθρωπος οὐ λευκός ἐστιν, ἀλλὰ λελεύκωται· οὐδὲ βαδίζων ἐστίν, ἀλλὰ βαδίζει· ἵνα μὴ τὸ ἐστὶ προσάπτοντες, πολλὰ εἶναι ποιῶσι τὸ ἕν, ὡς μοναχῶς λεγομένου τοῦ ἑνός, ἢ τοῦ ὄντος. 11 Πολλὰ δὲ τὰ ὄντα, ἢ λόγῳ οἷον ἄλλο τὸ λευκῷ εἶναι καὶ μουσικῷ, τῷ δ᾽ αὐτῷ, ἄμφω· πολλὰ ἄρα τὸ ἓν ἢ διαιρέσει, ὥσπερ τὸ ὅλον, καὶ τὰ μέρη. ἐνταῦθα δὲ ἠπόρουν, καὶ ὡμολόγουν τὸ ἓν πολλὰ εἶναι· ὥσπερ οὐκ ἐνδεχόμενον τὸ αὐτὸ ἓν καὶ πολλὰ εἶναι, μὴ τὰ ἀντικείμενα δέ· ἔστι γὰρ τὸ ἓν καὶ δυνάμει, καὶ ἐντελεχείᾳ. 12 Τόν τε δὴ τρόπον τοῦτον ἐπιοῦσιν ἀδύνατον φαίνεται τὰ ὄντα ἓν εἶναι.

* χ. ὑποκειμένῳ, minùs eleganter & verè.

* Metaphyſ. li. 1. cap. 6.

* χ. τὸ ἕν.

* quid. ἢ ἕν, vel ἢ μὴ πλείω, aut μὴ πλείω. quia vulgata lectio bis idem quærendum proponere videtur.

* χ. συνεχῶν ἑαυτοῖς.

* χ. οὐδὲν ἔσται ποσόν.

* χ. οὐδέ τι.

Solutio rationum Parmenidis & Meliſſi.

Cap. IV.

ATque ea ex quibus demonſtrant, ſoluere non *eſt* difficile. vtrique enim litigioſe ratiocinantur, tam Meliſſus quàm Parmenides. etenim falſa ſumunt, neque concludunt:

E Καὶ ἐξ ὧν ἐπιδεικνύουσι, λύειν οὐ χαλεπόν· ἀμφότεροι γὰρ ἐριστικῶς συλλογίζονται, καὶ Μέλισσος καὶ Παρμενίδης· καὶ γὰρ ψευδῆ λαμβάνουσι, καὶ ἀσυλλόγιστοί εἰσι·

μᾶλλον δὲ ὁ Μελίσσου φορτικὸς λόγος, καὶ οὐκ ἔχων ἀπορίαν· ἀλλ' ἑνὸς ἀτόπου δοθέντος, τἆλλα συμβαίνει. τοῦτο δ' οὐδὲν χαλεπόν. 2 Ὅτι μὲν οὖν παραλογίζεται Μέλισσος, δῆλον· οἴεται γὰρ εἰληφέναι, εἰ τὸ γενόμενον ἀρχὴν ἔχει ἅπαν, ὅτι καὶ τὸ μὴ γενόμενον οὐκ ἔχει. 3 Εἶτα καὶ τοῦτο ἄτοπον, τὸ* παντὸς εἶναι ἀρχὴν τοῦ πράγματος, καὶ μὴ τοῦ χρόνου, καὶ γενέσεως μὴ τῆς ἁπλῆς, ἀλλὰ ἀλλοιώσεως, ὥσπερ οὐκ ἀθρόας γινομένης μεταβολῆς. 4 Ἔπειτα καὶ διὰ τί ἀκίνητον, εἰ ἕν; ὥσπερ γὰρ καὶ τὸ μέρος ἓν ὄν, τοδὶ τὸ ὕδωρ, κινεῖται * ἐν αὑτῷ, διὰ τί οὐ καὶ τὸ πᾶν; ἔπειτα ἀλλοίωσις διὰ τί οὐκ ἂν εἴη; 5 ἀλλὰ μὴν, οὐδὲ τῷ εἴδει οἷόν τε ἓν εἶναι, πλὴν τῷ ἐξ οὗ. οὕτως δὲ ἓν καὶ τῶν φυσικῶν τινὲς λέγουσιν, ἐκείνως δ', οὔ· ἄνθρωπος γὰρ ἵππου ἕτερον τῷ εἴδει, καὶ τἀναντία ἀλλήλων. 6 Καὶ πρὸς Παρμενίδην δέ, ὁ αὐτὸς τρόπος τῶν λόγων, καὶ εἴ τινες ἄλλοι ἴδιοί εἰσι· καὶ ἡ λύσις, τῇ μὲν ὅτι ψευδής, τῇ δὲ ὅτι οὐ συμπεραίνεται. 7 Ψευδὴς μέν, ᾗ ἁπλῶς λαμβάνει τὸ ὂν λέγεσθαι, λεγομένου πολλαχῶς*. 8 Ἀσυμπέραστος δέ, ὅτι εἰ μόνα τὰ λευκὰ ληφθείη, σημαίνοντος ἓν τοῦ λευκοῦ, οὐδὲν ἧττον πολλὰ τὰ λευκά, καὶ οὐχ ἕν· οὔτε γὰρ τῇ συνεχείᾳ ἓν ἔσται τὸ λευκόν, οὔτε τῷ λόγῳ. ἄλλο γὰρ ἔσται τὸ εἶναι λευκῷ, καὶ † τὸ δεδεγμένῳ, καὶ οὐκ ἔσται * παρὰ τὸ λευκὸν οὐδὲν χωριστόν· οὐ γὰρ ᾗ χωριστόν, ἀλλὰ τὸ εἶναι ἕτερον τῷ λευκῷ, καὶ ᾧ ὑπάρχει. ἀλλὰ τοῦτο Παρμενίδης οὔπω συνεώρα. 9 Ἀνάγκη δὴ λαβεῖν τοῖς λέγουσιν ἓν τὸ ὂν εἶναι, μὴ μόνον ἓν σημαίνειν τὸ ὄν, καθ' οὗ ἂν κατηγορηθῇ, ἀλλὰ καὶ ὅπερ ὄν, καὶ ὅπερ ἕν. τὸ γὰρ συμβεβηκὸς καθ' ὑποκειμένου τινὸς λέγεται. ὥστε ᾧ συμβέβηκε τὸ ὄν, οὐκ ἔσται· ἕτερον γὰρ τοῦ ὄντος· ἔσται τι ἄρα οὐκ ὄν * οὐ γὰρ δὴ ἔσται ἄλλῳ ὑπάρχον τὸ ὅπερ ὄν. οὐ γὰρ ἔσται ὄν τι αὐτῷ εἶναι, εἰ μὴ πολλὰ τὸ ὂν σημαίνει οὕτως, ὥστε εἶναί τι ἕκαστον. ἀλλ' ὑπόκειται τὸ ὂν σημαίνειν ἕν. 10 Εἰ οὖν τὸ ὅπερ ὂν μηδενὶ συμβέβηκεν ἀλλ' ἐκείνῳ, τί μᾶλλον τὸ ὅπερ ὂν σημαίνει τὸ ὄν, ἢ μὴ ὄν; εἰ γὰρ ἔσται τὸ ὅπερ ὄν, τὸ αὐτὸ καὶ λευκόν, τὸ λευκῷ δ' εἶναι μὴ ἔστιν ὅπερ ὄν· οὐδὲ γὰρ οὐδὲ συμβεβηκέναι αὐτῷ οἷόν τε τὸ ὄν· οὐδὲν γὰρ ὂν ὃ οὐχ ὅπερ ὄν. οὐκ ἄρα ὂν τὸ λευκόν· οὐχ οὕτω δέ, ὥσπερ τι μὴ ὄν, ἀλλ' ὅλως μὴ ὄν. τὸ ἄρα ὅπερ ὄν, οὐκ ὄν· ἀληθὲς γὰρ εἰπεῖν, τὸ ὅτι λευκόν· τοῦτο δὲ οὐκ ὂν ἐσήμαινεν. 11 Ὥστε εἰ καὶ τὸ λευκὸν ἐσήμαινεν ὅπερ ὄν, πλείω ἄρα σημαίνει τὸ ὄν. 12 Οὐ τοίνυν οὐδὲ μέγεθος ἕξει τὸ ὄν, εἴπερ ὅπερ ὂν τὸ ὄν· ἑκατέρῳ γὰρ ἕτερον τὸ εἶναι τῶν μορίων. 13 Ὅτι δὲ διαιρεῖται τὸ ὅπερ ὂν εἰς ὅπερ ὄν τι ἄλλο, καὶ τῷ λόγῳ φανερόν, οἷον ὁ ἄνθρωπος εἰ ἔστιν ὅπερ ὄν τι, ἀνάγκη καὶ τὸ ζῷον, ὅπερ ὄν τι εἶναι, καὶ τὸ δίπουν. εἰ γὰρ μὴ ὅπερ ὄντα, συμβεβηκότα ἔσται· ἢ οὖν τῷ ἀνθρώπῳ, ἢ ἄλλῳ τινὶ ὑποκειμένῳ· ἀλλ' ἀδύνατον. 14 Συμβεβηκός τε γὰρ ἔσται, καὶ λέγεται τοῦτο, ἢ ὃ ἐνδέχεται ὑπάρχειν, καὶ μὴ ὑπάρχειν, ἢ οὗ ὑπάρχει ἐν τῷ λόγῳ* τοῦτο ᾧ συμβέβηκεν, οἷον, τὸ μὲν καθῆσθαι, ὡς χωριζόμενον· ἐν δὲ τῷ σιμῷ ὑπάρχει ὁ λόγος ὁ τῆς ῥινός, ᾗ φαμὲν συμβεβηκέναι τὸ σιμόν.

* Vide Elenchorum lib. 1. c. 4.

* κ. [illegible]

* κ. αὑτ. minùs rectè: eſt enim pro ἐν ᾧ quod Themiſtius interpretatur, & [illegible]. ſic vetus interpres, in ſe ipſa. Argyr. ἐν τῷ αὐτῷ legiſſe videtur.

* κ. [illegible]

* κ. τῷ.

* Themiſtius & Simplicius [illegible] non agnoſcunt, vt annotauit Vicomercatus. Philop. & alij eam interpretantur.

* [illegible]

* κ. [illegible]

A ſed magis importuna eſt ratio Meliſſi, nec habet vllam dubitationem: verùm vno abſurdo dato, cetera ſequuntur: hoc autē nō eſt difficile. 2 Vitioſè igitur Meliſſum argumētari perſpicuum eſt. ſumpſiſſe.n. putat, ſi quicquid eſt factum, habet principium, etiam quod nō eſt factum, non habere principiū. 3 Deinde & hoc abſurdū eſt, exiſtimare quālibet generationē, non tantùm ſimplicem, ſed etiā variationem, rei quoque principium habere, non ſolùm tēporis, quaſi non fiat ſimul vlla mutatio. 4 Inſuper cur eſt immobile, ſi ſit vnum? ſicut [illegible] pars, cū ſit vna, vt hæc aqua, mouetur in eodē loco, cur non etiam vniuerſum ita mouebitur? præterea variatio

B quam ob cauſam eſſe non poterit? 5 At verò nec forma poteſt eſſe vnum, ſed tātùm eo ex quo: hoc autem modo vnum eſſe etiam phyſici quidam dicunt: illo autem modo nequaquam: homo nāque ab equo forma diuerſum eſt, & contraria inter ſe differunt. 6 Sed & adverſus Parmenidem idem eſt rationum modus, & ſi qui alij ſunt proprij: ac ſolutio eſt, partim quia falſa ſumit, partim quia non cōcludit. 7 Falſa ſumit, quatenus accipit ens ſimpliciter dici, cū dicatur multis modis. 8 Non cōcludit autē: quia ſi ſola alba ſumpta fuerint, cùm album vnam rē ſignificet, nihilominus multa alba erunt non vnum: quoniam album neque cōtinuatione vnum erit, neque definitione. diuerſa.n. erit

C eſſentia albi, & ſubiecti ſuſcipientis album: ac nihil erit ſeparabile præter album: non.n. differt, quatenus eſt ſeparabile; verùm albi eſſentia, & eius cui albor ineſt, diuerſa eſt. ſed hoc Parmenides nōdum viderat. 9 Neceſſe igitur eſt, vt qui dicunt ens eſſe vnum, non ſolùm ſumāt ens ſignificare vnum cui attribuatur; ſed etiam ſumant quod eſt propriè atque eſſentialiter ens, & quod eſt propriè atque eſſentialiter vnum. accidens.n. de ſubiecto aliquo dicitur. quare ſi ens ſit vnum accidens: certè id cui ens accidit, non erit: quandoquidem eſt diuerſum ab

D ente: erit igitur aliquid nō ens. ergo nō erit aliud, quàm id quod eſt propriè atque eſſentialiter ens: ſiquidē aliud entis eſſentiam non habebit, niſi ens multa ſignificet, ita vt vnumquodque ſit aliquid. atqui ſupponitur ens vnam rem ſignificare. 10 Si igitur quod propriè atq; eſſentialiter eſt ens, nulli accidit ſed ei aliud accidit: cur ens ſignificat potiùs id quod propriè atque eſſentialiter eſt ens, quàm nō ens? nam ſi idem ſit propriè atque eſſentialiter ens, nec non album, albi verò eſſentia non ſit propriè atque eſſentialiter ens: (etenim [illegible] poteſt ei accidere) certè, cùm non ſit ens præter id quod eſt propriè atque eſſentialiter ens, album non

E erit ens: nec tamen ita, quaſi aliquid non ens, ſed omnino eſt nō ens. Quod igitur eſt propriè atque eſſentialiter ens, eſt non ens: verè.n. dicitur eſſe album: hoc autem ſignificabat non ens. 11 Quapropter ſi etiam albū ſignificat id quod propriè atque eſſentialiter eſt ens, profectò ens multa ſignificat. 12 Ergo nec magnitudinem vllam ens habebit, ſiquidem ens nil aliud eſt quā quod eſt propriè & eſſentialiter ens: quoniam vtriuſque partis eſſentia eſt diuerſa. 13 Id autem quod eſt propriè & eſſentialiter ens, diuidi in aliud propriè atque eſſentialiter ens quiddam, etiam ratione perſpicuum eſt. Velut ſi homo eſt propriè atque eſſentialiter ens quiddam: neceſſe eſt, & animal, & bipes eſſe propriè atque eſſentialiter ens quiddam. niſi.n. propriè atque eſſentialiter entia ſint, accidentia erunt. aut igitur homini accident, aut alij cuipiam ſubiecto. atqui hoc eſt impoſſibile. 14 Id enim eſt ac dicitur accidens, vel quod poteſt ineſſe & non ineſſe, vel in cuius definitione ineſt id cui accidit. exempli cauſa, ſedere, eſt accidens, tamquam quod ſeparatur: in ſimo autem ineſt ratio naſi, cui dicimus ſimum accidere.

15 Præterea quæcũque inſunt in oratione definitiua, aut ex quibus *res* conſtat, in horũ definitione non ineſt ratio totius. vt in bipede *non ineſt* ratio hominis: aut in albo *non ineſt ratio* albi hominis. 16 Si igitur iſta hoc modo *ſe* habent, & bipes homini accidit: neceſſe *eſt* ipſum eſſe ſeparabile, adeo vt homo poſſit eſſe non bipes, aut in bipedis definitione inerit hominis ratio, ſed *hoc eſt* impoſſibile: quoniã illud in huius definitione ineſt. 17 Quòd ſi alij ſubiecto accidant bipes & animal, ac neutrũ ſit propriè atque eſſentialiter ens quoddam: certè & homo erit *in* eorum *numero* quæ alij accidunt. atqui illud eſto propriè atque eſſentialiter ens quoddam, quod nulli accidit. Item de quo ambo ſiue vtrumque, *de eo* id quoque quod ex his *cõſtat*, dicatur. 18 Ex indiuiduis igitur vniuerſum *cõſtat*. 19 Nonnulli autem vtrique rationi ſunt aſſenſi: alteri quidem, *qua cõcluditur* omnia eſſe vnum, ſi ens ſignificet vnũ: nam alioqui eſſet etiam nõ ens. alteri verò, per bipertitam diuiſionẽ efficiendo magnitudines indiuiduas. 20 Perſpicuum autem *eſt* non *eſſe* verum, ſi ens ſignificet vnũ, & cõtradictio ſimul eſſe nequeat, ſequi vt nullum non ens ſit. nihil.n. vetat *ſumi* non ens, *quod* non ſimpliciter ſit *non ens*, ſed non ens quiddam. Hæc igitur aſſertio, ſi non eſt aliud quidpiam præter ipſum ens, omnia vnum fore, abſurda *eſt*. quis.n. intelligit ipſum ens *aliud* eſſe, quàm quod eſt propriè & eſſentialiter ens quiddam? quod ſi *verum eſt*, nihil prohibet ſic eſſe multa entia, vt dictum fuit. 21 Ergo ita ens vnum eſſe non poſſe, perſpicuum *eſt*.

A 15 Ἔτι, ὅσα ἐν τῷ ὁριστικῷ λόγῳ ἔνεστιν, ἢ ἐξ ὧν ἐστιν, ἐν τῷ λόγῳ τῷ τούτων, οὐκ ἐνυπάρχει ὁ λόγος ὁ τοῦ ὅλου, οἷον ἐν τῷ δίποδι ὁ τοῦ ἀνθρώπου, ἢ ἐν τῷ λευκῷ, ὁ τοῦ λευκοῦ ἀνθρώπου. 16 Εἰ τοίνυν ταῦτα τοῦτον ἔχει τὸν τρόπον, καὶ τῷ ἀνθρώπῳ συμβέβηκε τὸ δίπουν, ἀνάγκη χωριστὸν εἶναι αὐτό· ὥστε ἐνδέχοιτο ἂν μὴ δίπουν εἶναι τὸν ἄνθρωπον, ἢ ἐν τῷ λόγῳ τῷ τοῦ δίποδος ἐνέσται ὁ τοῦ ἀνθρώπου λόγος· ἀλλ' ἀδύνατον· ἐκεῖνο γὰρ ἐν τῷ ἐκείνου λόγῳ ἔνεστιν. 17 Εἰ δ' ἄλλῳ συμβέβηκε τὸ δίπουν, καὶ τὸ ζῷον, καὶ μή ἐστιν ἑκάτερον ὅπερ ὄν τι, καὶ ὁ ἄνθρωπος ἂν εἴη τῶν συμβεβηκότων ἑτέρῳ. ἀλλὰ τὸ ὅπερ ὄν τι, ἔστω μηδενὶ συμβεβηκός· καὶ καθ' B οὗ ἄμφω, καὶ ἑκάτερον, καὶ τὸ ἐκ τούτων λεγέσθω. 18 Ἐξ ἀδιαιρέτων ἄρα* τὸ πᾶν. 19 Ἔνιοι δὲ ἐνέδοσαν τοῖς λόγοις ἀμφοτέροις· τῷ μὲν, ὅτι πάντα ἕν, εἰ τὸ ὂν ἓν σημαίνει, ὅτι ἔστι καὶ τὸ μὴ ὄν· τῷ δὲ* τῆς διχοτομίας, ἄτομα ποιήσαντες μεγέθη. 20 Φανερὸν δὲ καὶ ὅτι οὐκ ἀληθὲς, ὡς εἰ ἓν σημαίνει τὸ ὂν, καὶ μὴ οἷόν τε ἅμα τὴν ἀντίφασιν εἶναι, οὐκ ἔσται οὐδὲν μὴ ὄν· οὐδὲν γὰρ κωλύει μὴ ἁπλῶς εἶναι, ἀλλὰ μὴ ὄν τι εἶναι τὸ μὴ ὄν.* τὸ δὲ φάναι παρ' αὐτὸ τὸ ὂν, ὡς εἰ μή τι ἔσται ἄλλο, ἓν πάντα ἔσεσθαι, ἄτοπον. τίς γὰρ μανθάνει αὐτὸ τὸ ὂν, εἰ μὴ τὸ ὅπερ ὄν τι εἶναι. εἰ δὲ τοῦτο,* οὐδὲ οὕτω κωλύει πολλὰ τὰ ὄντα εἶναι, ὥσπερ εἴρηται. 21 Ὅτι μὲν οὖν οὕτως ἓν εἶναι τὸ ὂν ἀδύνατον, δῆλον.

* Vicomercatus legit, ὁ τὸ πᾶν, eum vide.

* γρ. ἐκ τῆς διχ.

* γρ. τὸ δὲ διὰ.

* γρ. οὐδὲν ἧττον.

Phyſicorum opiniones de rerum naturalium principiis, & earum examen.

Cap. V.

C Vt autẽ phyſici dicunt, duo ſunt modi. 2 Alij namque; cùm ens vnum ſtatuerint, *videlicet* corpus *quod eſt* ſubiectum, *nẽpe* aut trium *elementorum* aliquod, aut aliud, quod eſt igne denſius, aëre rarius, reliqua gignunt, denſitate ac raritate multas res efficiendo. Hæc verò ſunt cõtraria: vniuerſaliter autem *ſunt* exuperantia & defectio: vt magnum & paruum aſſerit Plato: præterquam quòd hic quidem iſta facit materiam, vnum autem, formam: illi autem vnum *quod* ſubiectum *eſt*, materiam, contraria verò, differentias & formas. 3 Alij autem ex vno contrarietates quæ in eo inſunt, ſecernunt: quemadmodum ait Anaximander, & D quicumque inquiunt vnum & multa eſſe entia, ſicut Empedocles, & Anaxagoras. ex eo namque quod mixtum *eſt*, hi quoque reliqua ſecernunt. differunt autem inter ſe: quoniam ille horum circuitum facit, hic verò ſemel: & hic quidem infinitas & ſimilares partes, & contraria *eſſe inquit*: ille verò ea tantùm quæ vocantur elementa. 4 Videtur autem ſenſiſſe Anaxagoras ſic eſſe infinita: quia exiſtimauit communem phyſicorum opinionem eſſe veram, ex nihilo nihil fieri. Ideo namque ſic inquiunt,

E

„ *Erant ſimul omnia.* &

„ *Fieri tale, eſt variari.*

Alij verò *aiunt eſſe* confuſionem & ſecretionem. 5 Præterea *mouetur Anaxagoras* eo quòd contraria ex ſe inuicem fiunt: inerant igitur. nam ſi neceſſe *eſt*, vt quicquid fit, vel ex entibus fiat, vel ex non entibus: hoc autem, vt ex non entibus fiat, *eſt* impoſſibile: (in hanc enim ſententiam

Ὡς δ' οἱ φυσικοὶ λέγουσι, δύο τρόποι εἰσίν. 2 Οἱ μὲν γὰρ ἓν ποιήσαντες τὸ ὂν σῶμα τὸ ὑποκείμενον, ἢ τῶν τριῶν τι, ἢ ἄλλο, ὅ ἐστι πυρὸς μὲν πυκνότερον, ἀέρος δὲ λεπτότερον, τἆλλα γεννῶσι, πυκνότητι καὶ μανότητι πολλὰ ποιοῦντες. ταῦτα δ' ἐστὶν ἐναντία. καθόλου δ' ὑπεροχὴ καὶ ἔλλειψις, ὥσπερ τὸ μέγα φησὶ Πλάτων καὶ τὸ μικρὸν, πλὴν ὅτι, ὁ μὲν, ταῦτα ποιεῖ ὕλην, τὸ δὲ ἓν, τὸ εἶδος· οἱ δὲ, τὸ μὲν ἓν τὸ ὑποκείμενον, ὕλην, τὰ δ' ἐναντία, διαφορὰς καὶ εἴδη. 3 Οἱ δὲ ἐκ τοῦ ἑνὸς ἐνούσας τὰς ἐναντιότητας ἐκκρίνεσθαι, ὥσπερ Ἀναξίμανδρός φησι. καὶ ὅσοι δὲ ἓν καὶ πολλά φασιν* εἶναι, ὥσπερ Ἐμπεδοκλῆς καὶ Ἀναξαγόρας· ἐκ τοῦ μίγματος γὰρ καὶ οὗτοι ἐκκρίνουσι τἆλλα. διαφέρουσι δ' ἀλλήλων, τῷ τὸν μὲν περίοδον ποιεῖν* τούτων· τὸν δ', ἅπαξ· καὶ τὸν μὲν, ἄπειρα, τά τε ὁμοιομερῆ καὶ τἀναντία· τὸν δὲ, τὰ καλούμενα στοιχεῖα μόνον. 4 Ἔοικε δὲ Ἀναξαγόρας οὕτως ἄπειρα οἰηθῆναι τὰ στοιχεῖα, διὰ τὸ ὑπολαμβάνειν τὴν κοινὴν δόξαν τῶν φυσικῶν εἶναι ἀληθῆ, ὡς οὐ γινομένου οὐδενὸς ἐκ τοῦ μὴ ὄντος. διὰ τοῦτο γὰρ οὕτως λέγουσιν,*

„ Ἦν ὁμοῦ τὰ πάντα,* καὶ

Τὸ γίνεσθαι τοιόνδε

Καθέστηκεν ἀλλοιοῦσθαι.

Οἱ δὲ, σύγκρισιν καὶ διάκρισιν. 5 Ἔτι δ', ἐκ τοῦ γίνεσθαι ἐξ ἀλλήλων τἀναντία· ἐνυπῆρχεν ἄρα. εἰ γὰρ πᾶν μὲν τὸ γινόμενον ἀνάγκη γίνεσθαι ἢ ἐξ ὄντων, ἢ ἐκ μὴ ὄντων· τούτων δὲ, τὸ μὲν ἐκ μὴ ὄντων γίνεσθαι ἀδύνατον (περὶ γὰρ ταύτης

* γρ. ἓν εἶναι.

* γρ. ποιεῖν.

* Metaphyſ. li. 1. cap. 4.

* De generatione & corrup. lib. 1. c. 1.

ὁμογνωμονοῦσι τῆς δόξης ἅπαντες οἱ περὶ φύσεως) τὸ λοιπὸν ἤδη συμβαίνειν ἐξ ἀνάγκης ἐνόμισαν, ἐξ ὄντων μὲν καὶ ἐνυπαρχόντων γίνεσθαι· διὰ δὲ σμικρότητα τῶν ὄγκων, ἐξ ἀναισθήτων ἡμῖν. 6 Διό φασι πᾶν ἐν παντὶ μεμῖχθαι, διότι πᾶν ἐκ παντὸς ἑώρων γιγνόμενον· φαίνεσθαι δὲ διαφέροντα, καὶ προσαγορεύεσθαι ἕτερα ἀλλήλων, ἐκ τοῦ μάλιστα ὑπερέχοντος, διὰ τὸ πλῆθος ἐν τῇ μίξει τῶν ἀπείρων· εἰλικρινῶς μὲν γὰρ ὅλον λευκὸν ἢ μέλαν, ἢ σάρκα, ἢ ὀστοῦν, οὐκ εἶναι· ὅτου δὲ πλεῖστον ἕκαστον ἔχει, τοῦτο δοκεῖν εἶναι τὴν φύσιν τοῦ πράγματος. 7 Εἰ δὴ τὸ μὲν ἄπειρον, ᾗ ἄπειρον, ἄγνωστον, τὸ μὲν κατὰ τὸ πλῆθος ἢ μέγεθος ἄπειρον, ἄγνωστον πόσον τι· τὸ δὲ κατ' εἶδος ἄπειρον, ἄγνωστον ποῖόν τι. τῶν δ' ἀρχῶν ἀπείρων οὐσῶν καὶ κατὰ πλῆθος καὶ κατ' εἶδος, ἀδύνατον εἰδέναι τὰ ἐκ τούτων. * οὕτω γὰρ εἰδέναι τὸ σύνθετον ὑπολαμβάνομεν, ὅταν εἰδῶμεν ἐκ τίνων καὶ πόσων ἐστίν. 8 Ἔτι δ', εἰ ἀνάγκη, οὗ τὸ μόριον ἐνδέχεται ὁπηλικονοῦν εἶναι κατὰ μέγεθος καὶ σμικρότητα, καὶ αὐτὸ ἐνδέχεσθαι· λέγω δὲ τῶν τοιούτων τι μορίων, εἰς ὃ ἐνυπάρχον διαιρεῖται τὸ ὅλον· εἰ δὲ ἀδύνατον ζῷον ἢ φυτὸν ὁπηλικονοῦν εἶναι κατὰ μέγεθος καὶ μικρότητα, φανερὸν ὅτι οὐδὲ τῶν μορίων ὁτιοῦν. ἔσται γὰρ καὶ τὸ ὅλον ὁμοίως. σὰρξ δὲ καὶ ὀστοῦν, καὶ τὰ τοιαῦτα, μόρια ζῴου, καὶ οἱ καρποὶ, τῶν φυτῶν. δῆλον τοίνυν ὅτι ἀδύνατον σάρκα, ἢ ὀστοῦν, ἢ ἄλλο τι ὁπηλικονοῦν εἶναι τὸ μέγεθος, ἢ ἐπὶ τὸ μεῖζον, ἢ ἐπὶ τὸ ἔλαττον. 9 Ἔτι, εἰ ἅπαντα μὲν ἐνυπάρχει τὰ τοιαῦτα ἐν ἀλλήλοις, καὶ μὴ γίνεται, ἀλλ' ἐκκρίνεται ἐνόντα, λέγεται δὲ ἀπὸ τοῦ πλείονος, γίνεται δὲ ἐξ ὁτουοῦν ὁτιοῦν (οἷον ἐκ σαρκὸς ὕδωρ ἐκκρινόμενον, καὶ σὰρξ ἐξ ὕδατος) ἅπαν δὲ σῶμα πεπερασμένον ἀναιρεῖται ὑπὸ σώματος πεπερασμένου· φανερὸν ὅτι οὐκ ἐνδέχεται ἐν ἑκάστῳ ἕκαστον ὑπάρχειν. ἀφαιρεθείσης γὰρ ἐκ τοῦ ὕδατος σαρκὸς, καὶ πάλιν ἄλλης γενομένης, ἐκ τοῦ λοιποῦ ἀποκρίσει, εἰ καὶ ἀεὶ ἐλάττων ἔσται ἡ ἐκκρινομένη, ἀλλ' ὅμως οὐχ ὑπερβαλεῖ μέγεθός τι τῇ σμικρότητι. ὥστε, εἰ μὲν στήσεται ἡ ἔκκρισις, οὐχ ἅπαν ἐν παντὶ ἐνέσται· ἐν γὰρ τῷ λοιπῷ ὕδατι οὐκ ἐνυπάρξει σὰρξ. εἰ δὲ μὴ στήσεται, ἀλλ' ἀεὶ ἕξει ἀφαίρεσιν, ἐν πεπερασμένῳ μεγέθει ἴσα πεπερασμένα ἐνέσται, ἄπειρα τὸ πλῆθος· τοῦτο δ' ἀδύνατον. 10 Πρὸς δὲ τούτοις, εἰ ἅπαν μὲν σῶμα ἀφαιρεθέντος τινὸς ἔλαττον ἀνάγκη γίνεσθαι, τῆς δὲ σαρκὸς ὥρισται τὸ ποσὸν καὶ μεγέθει καὶ σμικρότητι· φανερὸν ὅτι ἐκ τῆς ἐλαχίστης σαρκὸς οὐδὲν ἐκκριθήσεται σῶμα. ἔσται γὰρ ἔλαττον τῆς ἐλαχίστης. 11 Ἔτι δ', ἐν τοῖς ἀπείροις σώμασιν ἐνυπάρχοι ἂν ἤδη σὰρξ ἄπειρος, καὶ αἷμα, καὶ ἐγκέφαλος, κεχωρισμένα μέντοι ἀπ' ἀλλήλων· οὐδὲν δὲ ἧττον ὄντα, καὶ ἄπειρον ἕκαστον. τοῦτο δ' ἄλογον. 12 Τὸ δὲ μηδέποτε διακριθήσεσθαι, οὐκ εἰδότως μὲν λέγεται, ὀρθῶς δὲ λέγεται· τὰ γὰρ πάθη ἀχώριστα. εἰ οὖν μέμικται τὰ χρώματα καὶ αἱ ἕξεις, ἐὰν διακριθῶσιν, ἔσται τι λευκὸν, ἢ ὑγιεινὸν, οὐχ ἕτερόν τι ὂν, οὐδὲ καθ' ὑποκειμένου. ὥστε ἄτοπος τὰ ἀδύνατα ζητῶν ὁ νοῦς, εἴπερ βούλεται μὲν διακρῖναι· τοῦτο δὲ ποιῆσαι ἀδύνατον, καὶ κατὰ τὸ ποσὸν καὶ κατὰ τὸ ποιόν. κατὰ μὲν τὸ ποσὸν, ὅτι οὐκ ἔστιν ἐλάχιστον μέγεθος· κατὰ δὲ τὸ ποιὸν, ὅτι ἀχώριστα τὰ πάθη.

* Argyropylus οὕτω legit, & mox, ὅταν ἐκ τίν.

A conſentiunt, quicumque de natura diſſerũt) quod reliquum eſt neceſſario euenire cenſent, vt fiat ex iis quæ ſunt & inſunt, ſed propter molis paruitatẽ ſenſu à nobis non percipiantur. 6 Idcirco aiunt quodlibet eſſe cuilibet admixtũ, quia quodlibet ex quolibet fieri cernunt. Videri autem res differẽtes & appellari diuerſas inter ſe, ex eo quod propter multitudinẽ infinitorum *quæ* in mixtione *inſunt*, exſuperat: totum.n. ſyncerè album, aut nigrũ, aut carnem, aut os non eſſe: ſed cuius plurimum quæque res habet, hoc videri *eam* rei naturam eſſe. 7 Si igitur infinitum, qua infinitum, ignotum *eſt*: ſane quod numero vel magnitudine *eſt* infinitum,
B ignoratur quantum *ſit*: quod verò forma *eſt* infinitum, ignoratur quale *ſit*. ſi verò principia tam numero quam forma ſunt infinita, impoſſibile eſt ea noſſe, quæ ex his *conſtant*. nam ita demum compoſitum noſſe exiſtimamus, cùm nouimus, ex quibus & quot conſtet. 8 Præterea, ſi neceſſe *eſt*, vt cuius pars quantacumque eſſe poteſt magnitudine & paruitate, etiã ipſum *totum quantũcumque eſſe* poſſit: (eiuſmodi autem partium aliquam dico, in quam, cum in toto inſit, *ipſum* totũ diuiditur) impoſſibile autem *eſt* animal aut plantam quantácumque eſſe magnitudine & paruitate: manifeſtum *eſt* ne partium quidem vllam *quantácumque eſſe poſſe*: alioqui ſimiliter etiam totum *quantumcumque* eſſet. atqui
C caro, & os, & eiuſmodi *alia* ſunt partes animalis: nec non fructus *ſunt partes* plantarum. Patet igitur non poſſe carnem, aut os, aut aliud quidpiam *tale* quantumcumque eſſe magnitudine, ſiue augẽdo, ſiue deminuendo *magnitudo efficietur*. 9 Præterea, ſi eiuſmodi omnia in ſe viciſſim inſunt, nec fiũt, ſed cũ inſint, ſecernuntur, appellationem vero ſumũt ab eo quod plus *eſt*, fit autem ex quovis quodvis, (vt ex carne aqua per ſecretionẽ, & caro ex aqua) omne autem corpus finitum conſumitur à corpore finito: manifeſtum *eſt* non poſſe in vnoquoque vnumquodque ineſſe. ablata enim carne ex aqua, & rurſus alia carne facta ex reſidua *aqua* per ſecre-
D tionem, quámquam ea quæ ſecernitur, ſemper minor erit, tamen magnitudinem aliquam paruitate non ſuperabit. Quocirca ſi ſecretio conſiſtet, non inerunt omnia in omnibus: quoniam in aqua reſidua non inerit caro. ſin autem non conſiſtet, ſed fiet ſemper ablatio; *profectò quæ* in ſe finita inerũt, magnitudine ęqualia *ac* finita, multitudine autem infinita *erunt*: quod *eſt* impoſſibile. 10 Ad hæc, ſi neceſſe *eſt* omne corpus aliquo ablato minus fieri, carnis autem quantitas definita eſt, tam ratione magnitudinis, quàm paruitatis: manifeſtum *eſt*, ex minima carne nullum corpus ſecretum iri: alioquin erit minus *carne* minima. 11 Præterea in infinitis corporibus ineſſe iam poſſet caro infinita, &
E ſanguis, & cerebrũ: *atque hæc* à ſe inuicem ſeparata, quæ nihilominus eſſent, & *quidem* ſingula infinita: quod *eſt* à ratione alienum. 12 Quod autem *ait Anaxagoras*, numquam ſecretum, non quidem ſcitè dicitur, rectè tamen dicitur: quoniam affectiones *ſunt* inſeparabiles. ſi igitur mixti ſunt colores & habitus: ſi ſecernantur, erit aliquod album, aut ſalubre, quod non erit aliud quiddam, nec de ſubiecto *dicetur*. Quapropter mens illa inepta *erit ea* quærens quæ fieri nequeunt: ſiquidem vult ſecernere: hoc autem eſt factu impoſſibile, tam ſecundùm quantitatem, quàm ſecundùm qualitatem: & quidem ſecundùm quantitatem, quia non datur minima magnitudo: ſecundùm qualitatem autem, quoniam affectiones ſunt inſeparabiles.

23 Nec verò generationem rectè ſumit ex iis *eſſe* A quæ formam ſimilem habent. nam lutum partim in luta diuiditur, partim non *diuiditur*. nec vt lateres ex domo, & domus ex lateribus, ita etiam aqua & aër ex ſe inuicem ſunt & fiunt. 24 Præſtat autem pauciora & finita *principia* ſumere: quod quidem facit Empedocles.

13 Οὐκ ὀρθῶς δὲ οὐδὲ τὴν γένεσιν λαμβάνει τῶν* ὁμοιοειδῶν. ἔστι γὰρ ὡς ὁ πηλὸς εἰς πηλοὺς διαιρεῖται, ἔστι δ' ὡς οὔ. καὶ οὐχ ὁ αὐτὸς τρόπος, ὡς πλίνθοι ἐξ οἰκίας, καὶ οἰκία ἐκ πλίνθων· οὕτω δὲ καὶ ὕδωρ καὶ ἀὴρ ἐξ ἀλλήλων καὶ εἰσὶ καὶ γίνονται. 14 Βέλτιον δ' ἐλάττω καὶ πεπερασμένα λαβεῖν, ὅπερ ποιεῖ Ἐμπεδοκλῆς. * γρ. ὁμοιομερῶν.

Principia eſſe contraria. Cap. VI.

B Omnes igitur ea quæ contraria *ſunt*, principia *eſſe* ſtatuunt, tam ij qui dicũt vniuerſum eſſe vnum quod nõ mouetur, (etenim Parmenides calidum & frigidum principia facit: hæc autem appellat ignem & terram) quàm ij qui rarum & denſum. Democritus quoque ſolidum & inane *principia ſtatuit*: quorum illud rationem entis, hoc verò rationem non entis habere ait. præterea *ſolida illa diſtinguit* ſitu, figurâ, ordine: (hęc verò ſunt contrariorũ genera) ſitu, vt ſupra, infra, ante, retro: figurâ, vt angulis præditum, angulis carẽs, rectum, circulare. Omnes igitur quodammodo ea quæ cõtraria *ſunt*, *rerũ* principia ſtatuere, manifeſtum *eſt*. 2 Atque hoc rationi *eſt* conſentaneum: oportet.n. principia nec ex ſe inuicem eſſe, nec ex aliis, & ex ipſis C *eſſe* omnia. primis autem contrariis hæc inſunt. nã, quia prima ſunt, ex aliis non *ſunt*, & quia *ſunt* contraria, nõ *ſunt* ex ſe inuicem, ſed & hoc *quod poſtremum poſuimus, vt ex ipſis omnia fiant*, ratione cõſiderãdum *eſt* quomodo accidat. 3 Primùm igitur ſumendum *eſt*, in omnibus entibus ita eſſe natura comparatum, vt nec agat quodvis in quodvis, nec patiatur quodlibet à quolibet, nec fiat quodcumque ex quocumque, niſi quis hæc ſumat ex accidenti. 4 Nam qui fieri poſſit album ex muſico, niſi albo aut nigro muſicum accidat? ſed album fit ex non albo: atque ex hoc, non quovis ſed ex nigro, vel ex interiectis *coloribus*. muſicum quoque *fit* ex non muſico: nec tamen ex quovis, ſed ex muſicæ D experte, aut ſi quid eſt his interiectum. 5 Ergo nec interit in quodvis primum, vt album non *interit* in muſicum, niſi fortè ex accidẽti, ſed in non album: in non album inquam, nõ quodvis, ſed in nigrum aut *colorum* medium. Itidémque muſicum *interit* in non muſicum: & hoc non quodvis, ſed in muſicæ expers, aut ſi quid his eſt interiectum. 6 Nõ aliter ſe res habet in ceteris: quoniam & entiũ *illorũ*, quę non ſimplicia, ſed compoſita *ſunt*, eadem eſt ratio: ſed quia oppoſitæ affectiones nomine vacant, hoc accidere latet. 7 Neceſſe.n. *eſt*, quicquid harmonia cõſtat, ex harmoniæ experte fieri: & quod harmonia caret, ex eo fieri quod harmoniam habet. E nec non interire quod eſt harmonia præditum, in harmoniæ priuationem: & hanc non quãlibet, ſed oppoſitam. 8 Nihil autem intereſt, vtrùm de harmonia dicatur, an *de* ordine vel compoſitione. patet.n. horum omnium eandem eſſe rationem. ſed & domus & ſtatua & quodvis aliud ſimiliter fit. domus.n. fit ex eo quòd hæc nõ eſſent hoc modo compoſita, ſed ſeiuncta. ſtatua quoque & *omnino* eorum aliquid quæ figuram habent, *fit* ex figuræ priuatione. Atque horum vnumquodque partim ordo, partim compoſitio quædam eſt. 9 Si igitur hoc verũ eſt: quicquid fit, ex contrariis fit, & quicquid interit, in contraria interit, & *in media* his interiecta. Sed hęc media ex contrariis ſunt, vt *medij* colores ex albo & nigro. quapropter quæcumque natura fiunt, aut ſunt contraria, aut ex contrariis.

Πάντες δὴ τἀναντία ἀρχὰς ποιοῦσιν, οἵ τε λέγοντες ὅτι ἓν τὸ πᾶν, καὶ μὴ κινούμενον· καὶ γὰρ Παρμενίδης θερμὸν καὶ ψυχρὸν ἀρχὰς ποιεῖ, ταῦτα δὲ προσαγορεύει πῦρ καὶ γῆν· καὶ οἱ, μανὸν καὶ πυκνόν· καὶ Δημόκριτος* τὸ στερεὸν καὶ κενόν. ὧν τὸ μὲν ὡς ὄν, τὸ δ' ὡς οὐκ ὂν εἶναί φησιν· ἔτι θέσει, σχήματι, τάξει. ταῦτα δὲ γένη ἐναντίων.* θέσει, ὡς ἄνω, κάτω, πρόσθεν, ὄπισθεν·* σχήματι, γεγωνιωμένον, ἀγώνιον, εὐθύ, περιφερές. ὅτι μὲν οὖν τἀναντία πως πάντες ποιοῦσι τὰς ἀρχάς, δῆλον. 2 Καὶ τοῦτο εὐλόγως· δεῖ γὰρ τὰς ἀρχὰς μήτε ἐξ ἀλλήλων εἶναι, μήτε ἐξ ἄλλων· καὶ ἐκ τούτων πάντα. τοῖς δὲ ἐναντίοις τοῖς πρώτοις ὑπάρχει ταῦτα, διὰ μὲν τὸ πρῶτα εἶναι, μὴ ἐξ ἄλλων· διὰ δὲ τὸ ἐναντία, μὴ ἐξ ἀλλήλων. ἀλλὰ δεῖ τοῦτο καὶ ἐπὶ τοῦ λόγου σκέψασθαι, πῶς συμβαίνει. 3 Ληπτέον δὴ πρῶτον, ὅτι ἁπάντων τῶν ὄντων οὐδὲν οὔτε ποιεῖν πέφυκεν, οὔτε πάσχειν τὸ τυχὸν ὑπὸ τοῦ τυχόντος· οὐδὲ γίνεται ὁτιοῦν ἐξ ὁτουοῦν, ἐὰν μή τις λαμβάνῃ κατὰ συμβεβηκός. 4 Πῶς γὰρ ἂν γένοιτο τὸ λευκὸν ἐκ μουσικοῦ; πλὴν εἰ μὴ κατὰ συμβεβηκὸς εἴη τῷ λευκῷ, ἢ τῷ μέλανι τὸ μουσικόν; ἀλλὰ λευκὸν μὲν γίνεται ἐξ οὐ λευκοῦ, καὶ τούτου οὐκ ἐκ παντός, ἀλλ' ἐκ μέλανος, ἢ τῶν μεταξύ· καὶ μουσικόν, ἐξ οὐ μουσικοῦ, πλὴν οὐκ ἐκ παντός, ἀλλ' ἐξ ἀμούσου, ἢ εἴ τι αὐτῶν ἐστι μεταξύ. 5 Οὐδὲ δὴ φθείρεται εἰς τὸ τυχὸν πρῶτον, οἷον τὸ λευκόν, οὐκ εἰς μουσικόν, πλὴν εἴ ποτε κατὰ συμβεβηκός, ἀλλ' εἰς τὸ μὴ λευκόν· καὶ τὸ μὴ λευκόν, οὐκ εἰς τὸ τυχόν, ἀλλ' εἰς τὸ μέλαν, ἢ τὸ μεταξύ· ὡσαύτως δὲ καὶ τὸ μουσικὸν εἰς τὸ μὴ μουσικόν, καὶ τοῦτο οὐκ εἰς τὸ τυχόν, ἀλλ' εἰς τὸ ἄμουσον, ἢ εἴ τι αὐτῶν ἐστι μεταξύ. 6 Ὁμοίως δὲ* τοῦτο καὶ ἐπὶ τῶν ἄλλων. ἐπεὶ καὶ τὰ μὴ ἁπλᾶ τῶν ὄντων, ἀλλὰ σύνθετα κατὰ τὸν αὐτὸν ἔχει λόγον· ἀλλὰ διὰ τὸ μὴ τὰς ἀντικειμένας διαθέσεις ὠνομάσθαι, λανθάνει τοῦτο συμβαῖνον. ἀνάγκη γὰρ πᾶν τὸ ἡρμοσμένον ἐξ ἀναρμόστου γίνεσθαι, καὶ τὸ ἀνάρμοστον ἐξ ἡρμοσμένου. καὶ φθείρεσθαι τὸ ἡρμοσμένον εἰς ἀναρμοστίαν, καὶ ταύτην οὐ τὴν τυχοῦσαν, ἀλλὰ τὴν ἀντικειμένην. 8 Διαφέρει δ' οὐδὲν ἐπὶ ἁρμονίας εἰπεῖν, ἢ τάξεως ἢ συνθέσεως· φανερὸν γὰρ ὅτι ὁ αὐτὸς λόγος ἐστίν. ἀλλὰ μὴν καὶ οἰκία, καὶ ἀνδριάς, καὶ ὁτιοῦν ἄλλο γίνεται ὁμοίως· ἥ τε γὰρ οἰκία γίνεται ἐκ τοῦ μὴ συγκεῖσθαι,* ἀλλὰ διῃρῆσθαι ταδί, ὡδί. καὶ ὁ ἀνδριάς, καὶ τῶν ἐσχηματισμένων τι ἐξ ἀσχημοσύνης· καὶ ἕκαστον τούτων, τὰ μὲν τάξις, τὰ δὲ σύνθεσίς τίς ἐστιν. 9 Εἰ τοίνυν τοῦτ' ἔστιν ἀληθές, ἅπαν ἂν γίνοιτο τὸ γινόμενον, καὶ φθείροιτο τὸ φθειρόμενον, ἢ ἐξ ἐναντίων, ἢ εἰς ἐναντία, καὶ τὰ τούτων μεταξύ. τὰ δὲ μεταξύ, ἐκ τῶν ἐναντίων ἐστίν, οἷον χρώματα ἐκ λευκοῦ καὶ μέλανος. ὥστε πάντα ἂν εἴη τὰ φύσει γινόμενα, ἢ ἐναντία, ἢ ἐξ ἐναντίων.

* γρ. τὸ πλῆρες itaque apud Themiſt. legitur, & philop. vide Metaphyſic. lib. 1. cap. 4.
* γρ. θέσις
* γρ. σχήματος
* γρ. πάντως
* γρ. ἀλλ' ἐκ τοῦ δ.

A 10 Μέχρι μὲν οὖν τούτου, σχεδὸν συνηκολουθήκασι καὶ τῶν ἄλλων οἱ πλεῖστοι, καθάπερ εἴπομεν πρότερον· πάντες γὰρ τὰ στοιχεῖα, καὶ τὰς ὑπ᾽ αὐτῶν καλουμένας ἀρχάς, καίπερ ἄνευ λόγου τιθέντες, ὅμως τἀναντία λέγουσιν, * ὥσπερ ὑπ᾽ αὐτῆς τῆς ἀληθείας ἀναγκασθέντες. 11 Διαφέρουσι δ᾽ ἀλλήλων, τῷ τοὺς μὲν πρότερα, τοὺς δὲ ὕστερα λαμβάνειν· καὶ τοὺς μὲν γνωριμώτερα κατὰ τὸν λόγον, τοὺς δὲ κατὰ τὴν αἴσθησιν· οἱ μὲν γὰρ θερμὸν καὶ ψυχρόν, οἱ δὲ ὑγρὸν καὶ ξηρόν, ἕτεροι δὲ περιττὸν καὶ ἄρτιον, οἱ δὲ νεῖκος καὶ φιλίαν, αἰτίας τίθενται τῆς γενέσεως. ταῦτα δ᾽ ἀλλήλων διαφέρει κατὰ τὸν εἰρημένον τρόπον. 12 Ὥστε ταὐτὰ λέγειν πως, καὶ ἕτερα ἀλλήλων· ἕτερα μέν, ὥσπερ καὶ δοκεῖ τοῖς πλείστοις, ταὐτὰ δὲ ᾗ ἀνάλογον· λαμβάνουσι γὰρ ἐκ τῆς αὐτῆς συστοιχίας. τὰ μὲν γὰρ περιέχει, τὰ δὲ περιέχεται τῶν ἐναντίων. ταύτῃ δὴ ὡσαύτως λέγουσι καὶ ἑτέρως, καὶ χεῖρον, καὶ βέλτιον· καὶ οἱ μέν, γνωριμώτερα κατὰ τὸν λόγον, ὥσπερ εἴρηται πρότερον· οἱ δέ, κατὰ τὴν αἴσθησιν· τὸ μὲν γὰρ καθόλου, κατὰ τὸν λόγον γνώριμον· τὸ δὲ καθ᾽ ἕκαστον, κατὰ τὴν αἴσθησιν· ὁ μὲν γὰρ λόγος, τοῦ καθόλου· ἡ δ᾽ αἴσθησις, τοῦ κατὰ μέρος· οἷον τὸ μέγα καὶ τὸ μικρὸν κατὰ τὸν λόγον, τὸ δὲ μανὸν καὶ τὸ πυκνὸν κατὰ τὴν αἴσθησιν. 13 Ὅτι μὲν οὖν ἐναντίας δεῖ τὰς ἀρχὰς εἶναι, φανερόν.

* Metaphyſ. li. 1. cap. 4.

A 10 Hucvſque igitur fere ſimul profecti ſunt & alij plurimi, quemadmodum *&* antea diximus. omnes enim elemēta, & quæ ab ipſis vocantur principia, quamvis ſine ratione ponant, tamen contraria *eſſe* pronuntiant, tamquam ab ipſa veritate coacti. 11 Differunt autem inter ſe: quoniam alij priora, alij poſteriora *principia* ſumūt, & nonnulli quidem *accipiunt* notiora ſecundùm rationem, quidam verò ſecundùm ſenſum. alij namque calidum & frigidum, quidam humidum & ſiccū, alij impar & par, nonnulli contentionē & amicitiam, generationis cauſas ponunt: hæc verò inter ſe eo quo diximus modo differūt. 12 Adeo vt eadem quodammodo dicant, & diuerſa inter ſe. diuerſa quidē, quemadmodum & pleriſque videtur. B eadem autem, quà *in his eſt* proportio. Sumunt. n. *principia* ex eadē claſſe: quia contrariorum alia continent, alia continentur. ſic igitur eodem modo, & diuerſo loquuntur: ac *partim* deteriùs, partim meliùs: & alij quidē *ponunt* notiora ſecundùm rationem, vt antea dictū fuit, alii verò ſecundùm ſenſum. vniuerſale. n. ſecundùm rationem notum *eſt*: particulare verò ſecundùm ſenſum. quandoquidem ratio *eſt rei* vniuerſalis: ſenſus autem, *rei* particularis. Exempli cauſa magnum & paruum ſecundùm rationem; rarum autem & denſum ſecundùm ſenſum *notiora ſunt*. 13 Principia igitur contraria eſſe perſpicuum *eſt*.

Principia eſſe duo, vel tria.

Cap. VII.

C Ἐχόμενον δ᾽ ἂν εἴη λέγειν, πότερον δύο, ἢ τρεῖς, ἢ πλείους εἰσί. 2 Μίαν μὲν γὰρ οὐχ οἷόν τε, ὅτι οὐχ ἓν τὰ ἐναντία. 3 Ἀπείρους δὲ οὐχ ὅτι οὐκ ἐπιστητὸν τὸ ὂν ἔσται. 4 Μία τε ἐναντίωσις ἐν παντὶ γένει ἑνί· ἡ δ᾽ οὐσία ἕν τι γένος. 5 Καὶ ὅτι ἐνδέχεται ἐκ πεπερασμένων· βέλτιον δὲ ἐκ πεπερασμένων, ὥσπερ Ἐμπεδοκλῆς, ἢ ἐξ ἀπείρων. πάντα γὰρ ἀποδιδόναι οἴεται, ὥσπερ Ἀναξαγόρας ἐκ τῶν ἀπείρων. 6 Ἔτι δέ, ἔστιν ἄλλα ἄλλων πρότερα ἐναντία, καὶ γίνεται ἕτερα ἐξ ἄλλων, οἷον τὸ γλυκὺ καὶ πικρόν, καὶ λευκὸν καὶ μέλαν. τὰς δ᾽ ἀρχὰς ἀεὶ δεῖ μένειν. 7 Ὅτι μὲν οὖν οὔτε μία οὔτε ἄπειροι, δῆλον ἐκ τούτων. 8 Ἐπεὶ δὲ πεπερασμέναι, τὸ μὴ ποιεῖν δύο μόνον, ἔχει τινὰ λόγον. D ἀπορήσειε γὰρ ἄν τις, πῶς ἢ πυκνότης τὴν μανότητα ποιεῖν τι πέφυκεν, ἢ αὕτη τὴν πυκνότητα. ὁμοίως δὲ καὶ ἄλλη ὁποιαοῦν ἐναντιότης· οὐ γὰρ ἡ φιλία τὸ νεῖκος συνάγει, καὶ ποιεῖ τι ἐξ αὐτοῦ, οὐδὲ τὸ νεῖκος ἐξ ἐκείνης, ἀλλ᾽ ἄμφω ἕτερόν τι τρίτον· ἔνιοι δὲ καὶ πλείω λαμβάνουσιν, ἐξ ὧν κατασκευάζουσι τὴν τῶν ὄντων φύσιν. 9 Πρὸς δὲ τούτοις ἔτι κἂν τόδε τις ἀπορήσειεν, εἰ μή τις ἑτέραν * ὑποθήσεται τοῖς ἐναντίοις φύσιν· οὐδενὸς γὰρ ὁρῶμεν τῶν ὄντων οὐσίας τἀναντία. τὴν δ᾽ ἀρχήν, οὐ καθ᾽ ὑποκειμένου δεῖ λέγεσθαί τινος. ἔσται γὰρ ἀρχὴ τῆς ἀρχῆς. τὸ γὰρ ὑποκείμενον ἀρχή, καὶ πρότερον δοκεῖ τοῦ κατηγορουμένου εἶναι. 10 Ἔτι, οὐκ εἶναι φαμὲν οὐσίαν ἐναντίαν οὐσίᾳ. πῶς οὖν ἐκ μὴ οὐσιῶν οὐσία ἂν εἴη; ἢ πῶς ἂν πρότερον μὴ οὐσία οὐσίας εἴη;

* γρ. ὑποθήσει.

C Conſequens autē eſt, vt explicetur duóne ſint principia an tria an plura. 2 Vnum. n. principium *eſſe* nequit, quia contraria non *ſunt* vnum. 3 Infinita verò *principia eſſe* non *poſſunt*: quoniam ens ſub ſcientiā non caderet. 4 Item vna contrarietas *eſt* in omni genere vno: ſubſtantia verò *eſt* vnum quoddam genus. 5 Et quia poteſt *omnium rerū naturalium* ex *principiis* finitis *afferri*: melius autem *eſt* ex finitis, vt *facit* Empedocles, quàm ex infinitis. omnia nāque putat Empedocles, ſe *per cauſas* explicare *ex principiis finitis*, ſicut Anaxagoras ex infinitis. 6 Præterea alia contraria ſunt aliis priora, & fiunt alia ex aliis, vt dulce & auſterum, & album D & nigrū. principia verò ſemper manere oportet. 7 Ex his igitur perſpicuum *eſt* nec vnum, nec infinita *principia eſſe*. 8 Cùm autē *finita principia ſint*, ratio aliqua eſt, cur non ponantur duo tantū principia: dubitare enim aliquis poſſit quomodo naturā comparatum ſit vt denſitas efficiat raritatem *eſſe* aliquid, aut hæc denſitatem. Similis ratio eſt alius cuiuſuis contrarietatis: quia nec amicitia contentionem copulat, ſeu quidpiam ex ea facit neque cōtentio quicquam ex illa facit: ſed ambo aliud quiddam tertium *efficiunt*. Nonnulli autem & plura ſumunt, ex quibus rerum naturam conſtituunt. 9 Ad hæc, illud quoque in dubitationem reuocare aliquis poſſit, niſi quis aliam naturam contrariis ſubiiciat. Nam contraria nullius *rei* eſſentiam *eſſe* videmus. principium verò non oportet dici de aliquo ſubiecto: alioquin erit principium principii: quandoquidem ſubiectum videtur eſſe attributi principium, & eo prius. 10 Præterea dicimus non eſſe ſubſtantiam contrariam ſubſtantiæ. quomodo igitur ex non ſubſtantia ſubſtantia eſſe poterit? aut quomodo non ſubſtantia poterit eſſe prior quàm ſubſtantia?

11 Quare ſi quis & priorem ſermonem & hunc A verum eſſe putet, neceſſe *eſt*, ſi vtrumque ſermonem tueri velit, *vt contrariis* ſubiiciat aliquod tertium. 12 Quemadmodum affirmant, qui aiunt vniuerſum eſſe vnam naturã, vt aquam aut ignem aut quod *eſt* his interiectum. 13 Videtur autẽ *illud* potiùs *eſſe ſubiectum*, quod *eſt elementis* interiectum. ignis enim, ac terra, nec non aër & aqua, contrarietatibus implicita ſunt. proinde nõ abſurdè faciunt qui ſubiectum ab his diuerſum conſtituũt. inter cæteros autem *illi rectiùs ſentiunt*, qui aërem *ponunt*: etenim aër minùs cæteris habet differentias ſenſiles. *aërem* autem ſequitur aqua. 14 Sed omnes vnum hoc contrariis figurant: vt denſitate & raritate, nec non contentione & remiſſione. B hæc autẽ in vniuerſum profectò ſunt exſuperantia & defectio, vt antea dictum fuit. 15 Ac videtur hæc opinio antiqua eſſe: *nempe* vnum & exſuperantiam & defectionem eſſe rerum principia: quamquam non eodem modo *veteres hæc principia poſuere, quo recentiores*: ſed veteres duo illa efficere, vnum autem illud pati: quidam autem poſteriores è contrario vnum illud efficere, duo verò illa pati potiùs affirmant. 16 Hæc igitur aſſertio, tria eſſe elementa, iis qui ex his & aliis eiuſmodi *inſpectionibus* rem conſiderãt, videri poteſt habere aliquã rationem, vt antea diximus. 17 Plura autem tribus non item: quoniam vnum ad patiendum ſufficit. 18 Quòd ſi, quatuor cùm ſint *termini*, duæ contrarietates erunt: *certè* oportebit ſeorſim C vtrique ſubiici aliam quãdam mediam naturam. ſin ex ſeinuicem gignere poſſunt; vtique ſupervacua erit alterutra contrarietas. 19 Item non poſſunt eſſe plures cõtrarietates primæ. nam ſubſtantia eſt vnum quoddam entis genus: quapropter principia eo tantùm inter ſe different, quòd alia ſint priora, alia poſteriora: ſed genere non *differunt*: quia ſemper in vno genere eſt vna contrarietas. omnes autem contrarietates ad vnã referri videntur. 20 Ergo nec vnum eſſe elementum, nec plura duobus, vel tribus, manifeſtum *eſt*: horum autem vtrum *ſit verius*, quemadmodum diximus, magnam habet dubitationem.

11 Διόπερ εἴ τις τόν τε πρότερον ἀληθῆ νομίζοι εἶναι λόγον, καὶ τοῦτον, ἀναγκαῖον, εἰ μέλλει διασώσειν ἀμφοτέρους αὐτούς, ὑποτιθέναι τι τρίτον. 12 Ὥσπερ φασὶν οἱ μίαν τινὰ φύσιν εἶναι λέγοντες τὸ πᾶν, οἷον, ὕδωρ, ἢ πῦρ, ἢ τὸ μεταξὺ τούτων. 13 Δοκεῖ δὲ τὸ μεταξὺ μᾶλλον· πῦρ γὰρ ἤδη, καὶ γῆ, καὶ ἀήρ, καὶ ὕδωρ μετ' ἐναντιοτήτων συμπεπλεγμένα ἐστί. διὸ οὐκ ἀλόγως ποιοῦσιν οἱ τὸ ὑποκείμενον ἕτερον τούτων ποιοῦντες· τῶν δ' ἄλλων οἱ ἀέρα. καὶ γὰρ ὁ ἀὴρ ἥκιστα ἔχει τῶν ἄλλων διαφορὰς αἰσθητάς· ἐχόμενον δὲ τὸ ὕδωρ. 14 Ἀλλὰ πάντες γε τὸ ἓν τοῦτο τοῖς ἐναντίοις σχηματίζουσιν, οἷον πυκνότητι καὶ μανότητι, καὶ τὸ μᾶλλον καὶ ἧττον. ταῦτα δ' ἐστὶν B ὅλως, ὑπεροχὴ δηλονότι, καὶ ἔλλειψις, ὥσπερ εἴρηται πρότερον. 15 Καὶ ἔοικε παλαιὰ εἶναι καὶ αὕτη ἡ δόξα, ὅτι τὸ ἕν, καὶ ὑπεροχὴ καὶ ἔλλειψις ἀρχαὶ τῶν ὄντων εἰσί· πλὴν οὐ τὸν αὐτὸν τρόπον· ἀλλ' οἱ μὲν ἀρχαῖοι, τὰ δύο μὲν ποιεῖν, τὸ δὲ ἓν πάσχειν. τῶν δὲ ὑστέρων τινὲς τοὐναντίον, τὸ μὲν ἓν ποιεῖν, τὰ δὲ δύο πάσχειν φασὶ μᾶλλον. 16 Τὸ μὲν οὖν τρία * φαίνεται τὰ στοιχεῖα εἶναι, ἔκ τε τούτων καὶ ἐκ τοιούτων ἄλλων ἐπισκοποῦσι δόξειεν ἂν ἔχειν τινὰ λόγον, ὥσπερ * εἴπομεν. 17 Τὸ δὲ πλείω τριῶν, οὐκέτι· πρὸς μὲν γὰρ τὸ πάσχειν ἱκανὸν τὸ ἕν. 18 Εἰ δὲ τεττάρων ὄντων δύο ἔσονται ἐναντιώσεις, δεήσει χωρὶς ἑκατέρᾳ ὑπάρχειν ἑτέραν τινὰ μεταξὺ φύσιν· εἰ δ' ἐξ ἀλλήλων δύνανται * γεννᾶν, περίεργος ἂν εἴη ἡ C ἑτέρα τῶν ἐναντιώσεων. 19 Ἅμα δὲ καὶ ἀδύνατον πλείους εἶναι ἐναντιώσεις τὰς πρώτας. ἡ γὰρ οὐσία ἕν τι γένος ἐστὶ τοῦ ὄντος, ὥστε τῷ πρότερον καὶ τῷ ὕστερον διοίσουσιν ἀλλήλων αἱ ἀρχαὶ μόνον, ἀλλ' οὐ τῷ γένει. ἀεὶ γὰρ * ἑνὶ γένει μία ἐναντίωσίς ἐστιν· ἅπασαι δὲ αἱ ἐναντιώσεις ἀνάγεσθαι δοκοῦσιν εἰς μίαν. 20 Ὅτι μὲν οὖν οὔτε ἓν τὸ στοιχεῖον, οὔτε πλείω δυοῖν ἢ τριῶν, φανερόν· τούτων δὲ πότερον, καθάπερ εἴπομεν, ἀπορίαν ἔχει πολλήν.

* γ. φάναι
* γ. προείπομεν
* γ. γεννᾶν, δύνασθαι,
* γ. ἐν ἑνὶ γ.

Quot & quæ ſint principia rerum naturalium, ex ſententia Ariſtotelis.

Cap. VIII.

Nos itaque ſic dicamus, omni priùs genera- D tione pertractata. Eſt enim naturæ cõſentaneum, cùm priùs ea quæ communia ſunt, declarata fuerint, ſic deinde cuiuſque rei propria contemplari. 2 Dicimus enim fieri ex alio aliud, & ex diuerſo diuerſum, cùm aut de ſimplicibus loquamur, aut de compoſitis. hoc autem ſic dico: Poteſt enim homo fieri muſicus: poteſt etiam aliquid non muſicum, fieri muſicum: aut homo non muſicus, fieri homo muſicus. Simplex igitur quod fit, appello *vt* hominem, & non muſicum, & ſimplex, cuius eſt generatio, *vt* muſicũ. compoſitum E verò & cuius eſt generatio, & quod fit: quando non muſicum hominem, dicimus fieri hominem muſicum. 3 De horum altero non ſolùm dicitur fieri hoc aliquid, ſed etiam ex hoc: puta ex non muſico muſicum. ſed hoc de omnibus nõ dicitur. non. n. ex homine fit muſicus: ſed homo fit muſicus. 4 Iam verò eorum quæ fiunt, prout ſimplicia fieri dicimus, aliud, cùm fit, permanet, aliud non permanet. homo namque permanet, atque eſt cũ

Ὧδ' οὖν ἡμεῖς γε λέγωμεν, πρῶτον περὶ πάσης γενέσεως ἐπελθόντες· ἔστι γὰρ κατὰ φύσιν τὰ κοινὰ πρῶτον εἰπόντας, οὕτω τὰ περὶ ἕκαστον ἴδια θεωρεῖν. 2 Φαμὲν γὰρ γίνεσθαι ἐξ ἄλλου ἄλλο, καὶ ἐξ ἑτέρου ἕτερον, ἢ τὰ ἁπλᾶ λέγοντες, ἢ τὰ συγκείμενα. λέγω δὲ τοῦτο ὡδί. ἔστι γὰρ που γίνεσθαι ἄνθρωπον, μουσικόν· ἔστι δὲ τὸ μὴ μουσικὸν τι γίνεσθαι μουσικόν, ἢ τὸν μὴ μουσικὸν ἄνθρωπον, ἄνθρωπον μουσικόν. ἁπλοῦν μὲν οὖν λέγω τὸ γινόμενον τὸν ἄνθρωπον, καὶ τὸ μὴ μουσικόν· καὶ ὃ γίνεται ἁπλοῦν, τὸ μουσικόν. συγκείμενον δὲ E καὶ ὃ γίνεται, καὶ τὸ γινόμενον, ὅταν τὸν μὴ μουσικὸν ἄνθρωπον φῶμεν γίνεσθαι, ἢ μουσικόν, ἢ μουσικὸν ἄνθρωπον. 3 Τούτων δέ, τὸ μὲν οὐ μόνον λέγεται τόδε τι γίνεσθαι, ἀλλὰ καὶ ἐκ τοῦδε, οἷον ἐκ μὴ μουσικοῦ μουσικός· τὸ δέ, οὐ λέγεται ἐπὶ πάντων· οὐ γὰρ ἐξ ἀνθρώπου ἐγένετο μουσικός, ἀλλ' ὁ ἄνθρωπος ἐγένετο μουσικός. 4 Τῶν δὲ γινομένων, ὡς τὰ ἁπλᾶ λέγομεν γίνεσθαι, τὸ μὲν ὑπομένον γίνεται, τὸ δὲ οὐχ ὑπομένον. ὁ μὲν γὰρ ἄνθρωπος ὑπομένει μουσικὸς

γινόμενος ἄνθρωπος, καὶ ἔστι· τὸ δὲ μὴ μουσικὸν, καὶ τὸ ἄμουσον, οὔτε * ἁπλῶς, οὔτε συντεθειμένον ὑπομένει. 5 Διωρισμένων δὲ τούτων, ἐξ ἁπάντων τῶν γιγνομένων τοῦτο ἔστι λαβεῖν, ἄν τις * ἐπιβλέπῃ, ὥσπερ λέγομεν, ὅτι δεῖ ἀεί τι ὑποκεῖσθαι τὸ γινόμενον. 6 Καὶ τοῦτο εἰ καὶ ἀριθμῷ ἐστιν ἓν, ἀλλ' εἴδει γε οὐχ ἕν· τὸ γὰρ εἴδει λέγω καὶ λόγῳ ταὐτόν· οὐ γὰρ ταὐτὸν ἀνθρώπῳ καὶ τῷ ἀμούσῳ εἶναι. καὶ τὸ μὲν ὑπομένει· τὸ δ' οὐχ ὑπομένει· τὸ μὲν μὴ ἀντικείμενον ὑπομένει· ὁ γὰρ ἄνθρωπος ὑπομένει· τὸ δὲ μουσικὸν καὶ τὸ ἄμουσον οὐχ ὑπομένει, οὐδὲ τὸ ἐξ ἀμφοῖν συγκείμενον· οἷον ὁ ἄμουσος ἄνθρωπος. 7 Τὸ δ' ἔκ τινος γίνεσθαί τι, καὶ μὴ τόδε γίνεσθαί τι, μᾶλλον μὲν λέγεται ἐπὶ τῶν μὴ ὑπομενόντων, οἷον ἐξ ἀμούσου μουσικὸν γίνεσθαι, ἐξ ἀνθρώπου δὲ οὔ. ἀλλὰ μὴν καὶ ἐπὶ τῶν ὑπομενόντων ἐνίοτε λέγεται ὡσαύτως· ἐκ γὰρ χαλκοῦ ἀνδριάντα γίνεσθαί φαμεν, οὐ τὸν χαλκὸν ἀνδριάντα· τὸ μέντοι ἐκ τοῦ ἀντικειμένου, καὶ μὴ ὑπομένοντος, ἀμφοτέρως λέγεται, καὶ ἐκ τοῦδε τόδε, καὶ τόδε τόδε· καὶ γὰρ ἐξ ἀμούσου γίνεται μουσικὸς, καὶ ὁ ἄμουσος γίνεται μουσικός· διὸ καὶ ἐπὶ τοῦ συγκειμένου ὡσαύτως· καὶ γὰρ ἐξ ἀμούσου ἀνθρώπου, καὶ ἄμουσος ἄνθρωπος γίνεσθαι λέγεται μουσικός. 8 Πολλαχῶς δὲ λεγομένου τοῦ γίνεσθαι, καὶ τῶν μὲν οὐ γίνεσθαι ἁπλῶς, ἀλλὰ τόδε τι γίνεσθαι· ἁπλῶς δὲ γίνεσθαι τῶν οὐσιῶν μόνον· κατὰ μὲν τἆλλα, φανερὸν ὅτι ἀνάγκη ὑποκεῖσθαί τι τὸ γιγνόμενον. καὶ γὰρ ποσὸν, καὶ ποιὸν, καὶ πρὸς ἕτερον, καὶ ποτὲ, καὶ ποῦ, γίνεται ὑποκειμένου τινὸς, διὰ τὸ μόνην τὴν οὐσίαν κατὰ μηδενὸς ἄλλου λέγεσθαι ὑποκειμένου, τὰ δ' ἄλλα πάντα κατὰ τῆς οὐσίας. 9 Ὅτι δὲ καὶ * αἱ οὐσίαι, καὶ ὅσα ἄλλα ἁπλῶς ὄντα ἐξ ὑποκειμένου τινὸς γίνεται, ἐπισκοποῦντι γένοιτ' ἂν φανερόν· ἀεὶ γάρ ἐστί τι ὃ ὑπόκειται, ἐξ οὗ γίνεται τὸ γιγνόμενον, οἷον τὰ φυτὰ καὶ τὰ ζῷα ἐκ σπέρματος. γίνεται δὲ τὰ γιγνόμενα ἁπλῶς, τὰ μὲν μετασχηματίσει, οἷον ἀνδριὰς ἐκ χαλκοῦ· τὰ δὲ προσθέσει, οἷον τὰ αὐξανόμενα· τὰ δ' ἀφαιρέσει, οἷον ἐκ τοῦ λίθου ὁ Ἑρμῆς· τὰ δὲ συνθέσει, οἷον οἰκία· τὰ δ' ἀλλοιώσει, οἷον τὰ τρεπόμενα κατὰ τὴν ὕλην. πάντα δὲ τὰ οὕτω γινόμενα, φανερὸν ὅτι ἐξ ὑποκειμένων γίνεται. 10 Ὥστε δῆλον ἐκ τῶν εἰρημένων, ὅτι τὸ γινόμενον ἅπαν ἀεὶ συνθετόν ἐστι· καὶ ἔστι μέν τι τὸ γινόμενον, ἔστι δέ τι ὃ τοῦτο γίνεται· καὶ τοῦτο διττόν· ἢ γὰρ τὸ ὑποκείμενον, ἢ τὸ ἀντικείμενον. λέγω δὲ, ἀντικεῖσθαι μὲν τὸ ἄμουσον, ὑποκεῖσθαι δὲ τὸν ἄνθρωπον· καὶ τὴν μὲν ἀσχημοσύνην, καὶ τὴν ἀμορφίαν, ἢ τὴν ἀταξίαν, τὸ ἀντικείμενον· τὸν δὲ χαλκὸν, ἢ τὸν λίθον, ἢ τὸν χρυσὸν, τὸ ὑποκείμενον. 11 Φανερὸν οὖν, ὡς εἴπερ εἰσὶν αἰτίαι καὶ ἀρχαὶ τῶν φύσει ὄντων, ἐξ ὧν πρώτων εἰσὶ, καὶ γεγόνασι μὴ κατὰ συμβεβηκὸς, ἀλλ' ἕκαστον ὃ λέγεται κατὰ τὴν οὐσίαν, ὅτι γίνεται ἅπαντα ἔκ τε τοῦ ὑποκειμένου καὶ τῆς μορφῆς· σύγκειται γὰρ ὁ μουσικὸς ἄνθρωπος ἐξ ἀνθρώπου καὶ μουσικοῦ, τρόπον τινά· διαλύσεις γὰρ τοὺς λόγους εἰς τοὺς λόγους τοὺς ἐκείνων. δῆλον οὖν ὡς γίνοιτ' ἂν τὰ γιγνόμενα ἐκ τούτων. 12 Ἔστι δὲ τὸ ὑποκείμενον, ἀριθμῷ μὲν ἓν, εἴδει δὲ δύο· ὁ μὲν γὰρ ἄνθρωπος καὶ ὁ χρυσὸς· καὶ ὅλως ἡ ὕλη ἀριθμητή· τόδε γάρ τι μᾶλλον, καὶ οὐ κατὰ συμβεβηκὸς ἐξ αὐτοῦ γίνεται τὸ γιγνόμενον· ἡ δὲ στέρησις, καὶ ἡ ἐναντίωσις, συμβεβηκός. 13 Ἓν δὲ τὸ εἶδος, οἷον ἡ τάξις, ἢ ἡ μουσικὴ, ἢ τῶν ἄλλων τι τῶν οὕτω κατηγορουμένων.

* γρ. ἁπλοῦν. * γρ. ἐπιβλέψῃ. * γρ. ὄντα.

A fit homo muſicus ſed non muſicum, & muſicæ expers, neque ſimpliciter neque cõpoſitum permanet. 5 His autẽ definitis, ex iis omnibus quę fiunt, hoc licet accipere, ſi quis animum aduertat, ſicut dicimus, opus ſemper eſſe vt ſubiiciatur aliquid, quod fiat. 6 Atque hoc licèt numero ſit vnum, tamen formà non *eſt* vnum: (nã formã & definitione pro eodem accipio) non eſt.n.eadem eſſentia hominis, & muſicæ expertis: & illud quidem permanet, hoc autem non permanet. *quod*.n.non *eſt* oppoſitum, permanet: homo nãque permanet: muſicum verò, & muſicæ expers nõ permanet. immo nec *id permanet*, quod *eſt* ex ambobus cõpoſitum, B vt homo muſicus. 7 Ex aliquo autẽ fieri aliquid, & non hoc fieri aliquid, magis quidẽ dicitur de iis quæ permanẽt: exempli cauſà, ex non muſico muſicum fieri *dicitur*: ex homine autem nõ *dicitur*. Veruntamen & in iis quæ permanent, interdum dicitur eodẽ modo. dicimus.n. ex ære ſtatuam fieri: non, æs *fieri* ſtatuam. De eo autem quod eſt oppoſitum nec permanet, vtroque modo dicitur, *nimirum* & ex hoc *fieri* illud, & hoc *fieri* illud. nam & ex muſicæ experte fit muſicus, & muſicæ expers fit muſicus, idcirco etiam in cõpoſito *res ſe habet* eodem modo: quoniã & ex homine muſicæ experte, & homo muſicæ expers, dicitur fieri muſicus. 8 Cùm autẽ multis modis fieri dicatur, & quædam C dicãtur non fieri ſimpliciter, ſed fieri hoc aliquid: ſimpliciter autem fieri, tantùm ſubſtantiarum *proprium ſit*: in aliis quidẽ conſtat neceſſe *eſſe* vt ſubiiciatur aliquid quod fiat. nam & quãtum, & quale, & quod ad alterum quidpiam refertur, & quãdo, & vbi, ſe aliqua ſubiecta fiũt: propterea quòd ſola ſubſtantia de nullo alio ſubiecto dicitur, reliqua verò omnia de ſubſtãtia *dicuntur*. 9 Sed & ſubſtantias & quæcũque alia ſimpliciter ſunt, ex ſubiecto aliquo fieri, conſideranti perſpicuum vtique fiet. ſemper.n. eſt aliquid, quod ſubiicitur, ex quo fit id quod fit: vt plantæ, & animantia ex ſemine. Fiunt autem quæ ſimpliciter fiunt, partim figuræ mutatione, vt ſtatua ex ære: quædam adiectione, vt ea D quæ augentur: nonnulla ablatione, vt ex lapide Mercurius: alia ex cõpoſitione, vt domus: alia variatione, vt quorum materia mutatur. quæcunque autem ſic fiunt, conſtat ex ſubiectis fieri. 10 Quapropter ex iis quæ diximus, manifeſtum *eſt*, quicquid fit, ſemper eſſe compoſitum: & eſſe quidem aliquid quod fit; eſſe autem & aliquid in quod hoc mutatur. & hoc *quod fit* duplex *eſt*: aut enim *eſt* ſubiectum, aut *eſt* oppoſitum. Dico autem opponi quod *eſt* muſicæ expers: ſubiici autem hominem. Itẽm figuræ, & formæ, vel ordinis priuationem, oppoſitum appello: æs autem, aut lapidem, aut aurum, *voco* ſubiectum. 11 Si quidem E igitur cauſæ & principia *rerum* natura conſtantium *ea* ſunt, ex quibus primis *res* ſunt & fiunt, non ex accidenti, ſed quod quidque ſecundùm eſſentiam dicitur, perſpicuum *eſt*, rem omnẽ fieri ex ſubiecto & forma. cõponitur.n. quodammodo muſicus homo, ex homine & muſico: quoniam rationes in eorum rationes diſſolues. patet igitur ea quę fiunt, ex his fieri. 12 Porro ſubiectum numero quidẽ vnum eſt, ſpecie autem duo. homo namque & aurum, & omnino materia *eſt* numerabilis: magis. n. *eſt* hoc aliquid: nec per accidens ex eo fit quod fit. priuatio autẽ & contrarietas *eſt* accidẽs. 13 Forma verò *eſt* vnũ *principiũ* vt ordo, aut muſica, aut aliud quidpiam eorum quæ ſic attribuuntur.

14 Quapropter

14 Quapropter cùm duo principia dici poſſunt, tum etiam tria. 15 Et partim cõtraria: velut, ſi quis dicat muſicum & muſicæ expers, aut calidũ & frigidum, aut harmonia conſtans & harmonia carens: partim non *contraria*: quia contraria viciſſim pati nequeunt. ſed & hoc ſoluitur, quoniam ſubiectũ aliud eſt: hoc enim non *eſt* cõtrarium. 16 Quocirca principia nec plura quodammodo *ſunt*, quam contraria, ſed duo *tantùm* vt ita dicam, numero: nec rurſus *ſunt* omnino duo: quia diuerſa eſt eorum eſſentia, ſed *ſunt* tria: alia enim *eſt* hominis, alia muſicæ expertis eſſentia: nec non eius quod figura caret & æris. 17 Quot igitur ſint principia rerum naturalium, quæ ſub generationem *cadunt*, & quomodo tot *ſint*, dictum eſt: & conſtat opus eſſe, vt aliquid ſubiiciatur contrariis: & cõtraria duo eſſe: ſed alio quodam modo hoc non *eſſe* neceſſarium. ſufficit enim alterum contrariorum ad efficiendam ſua abſentia & præſentia mutationem. 18 Subiecta verò natura ſciri poteſt proportione. vt enim ad ſtatuam æs, vel ad lecticam lignum, vel ad aliud quidpiam eorum quæ formam habent, materia, & quod forma caret, ſe habet priuſquam formã acceperit: ſic ipſa ad ſubſtantiã *ſe* habet, & *ad id quod eſt* hoc aliquid, atque ens. 19 Hæc igitur eſt vnum principium, cùm tamẽ non ſit ita vnum, nec ita ens, vt hoc aliquid. alterum principium *eſt* ratio: inſuper *eſt* & huic cõtrarium, *id eſt*, priuatio. 20 Hæc autem quomodo *ſint* duo, & quomodo plura, dictum fuit in ſuperioribus: ac primùm quidem dictum fuit, tãtùm contraria *eſſe* principia: poſtea vero neceſſe *eſſe* etiam aliud quiddam ſubiici, & eſſe tria *principia*. ex iis verò quæ nũc *expoſita fuère*, patet quæ *ſit* differentia contrariorum, & quomodo principia ſint inter ſe affecta & quid ſit quod ſubiicitur. vtrùm autem forma an ſubiectum *ſit rei* eſſentia, nõdum manifeſtum *eſt*: ſed principia *eſſe* tria, & quomodo *ſint* tria, & quis *ſit* eorum modus, *eſt* manifeſtum. Quot igitur, & quæ ſint principia, ex his perſpicitor.

A 14 Διὸ ἔστι μὲν ὡς δύο λεκτέον εἶναι τὰς ἀρχάς, ἔστι δ' ὡς τρεῖς. 15 Καὶ ἔστι μὲν ὡς τἀναντία, οἷον εἴ τις λέγοι τὸ μουσικὸν καὶ τὸ ἄμουσον, ἢ τὸ θερμὸν καὶ τὸ ψυχρόν, ἢ τὸ ἡρμοσμένον καὶ τὸ ἀνάρμοστον· ἔστι δὲ ὡς οὔ· ὑπ' ἀλλήλων γὰρ πάσχειν τἀναντία ἀδύνατον. λύεται δὲ καὶ τοῦτο, διὰ τὸ ἄλλο εἶναι τὸ ὑποκείμενον· τοῦτο γὰρ οὐκ ἐναντίον. 16 Ὥστε οὔτε πλείους τῶν ἐναντίων αἱ ἀρχαὶ τρόπον τινά, ἀλλὰ δύο, ὡς εἰπεῖν, τῷ ἀριθμῷ· οὔτε αὖ παντελῶς δύο, διὰ τὸ ἕτερον ὑπάρχειν τὸ εἶναι αὖθις. ἀλλὰ τρεῖς· ἕτερον γὰρ τὸ B ἀνθρώπῳ καὶ τὸ ἀμούσῳ τὸ εἶναι, καὶ τῷ ἀσχηματίστῳ καὶ χαλκῷ. 17 Πόσαι μὲν οὖν αἱ ἀρχαὶ τῶν περὶ γένεσιν φυσικῶν, καὶ * πῶς ποσαί, εἴρηται· καὶ δῆλόν ἐστιν, ὅτι δεῖ ὑποκεῖσθαί τι τοῖς ἐναντίοις, καὶ τἀναντία δύο εἶναι. τρόπον δέ τινα ἄλλον οὐκ ἀναγκαῖον· ἱκανὸν γὰρ ἔσται τὸ ἕτερον τῶν ἐναντίων ποιεῖν τῇ ἀπουσίᾳ καὶ παρουσίᾳ τὴν μεταβολήν. 18 Ἡ δ' ὑποκειμένη φύσις, ἐπιστητὴ κατ' ἀναλογίαν. ὡς γὰρ πρὸς ἀνδριάντα χαλκός, ἢ πρὸς κλίνην ξύλον, ἢ πρὸς * τὸ ἄλλο τι τῶν ἐχόντων μορφήν, ἡ ὕλη καὶ τὸ ἄμορφον ἔχει, πρὶν λαβεῖν τὴν μορφήν· οὕτως αὕτη πρὸς οὐσίαν ἔχει, καὶ τὸ τόδε τι, καὶ τὸ ὄν. C 19 Μία μὲν οὖν ἀρχὴ αὕτη, οὐχ οὕτω μία οὖσα, οὐδὲ οὕτως ὄν, ὡς τὸ * τόδε τι. μία δὲ, * ᾗ ὁ λόγος. ἔτι δὲ τὸ ἐναντίον τούτῳ ἡ στέρησις. 20 Ταῦτα δὲ πῶς δύο, καὶ πῶς πλείω, εἴρηται ἐν τοῖς ἄνω. πρῶτον μὲν οὖν ἐλέχθη, ὅτι ἀρχαὶ τἀναντία μόνον. ὕστερον δ', ὅτι ἀνάγκη καὶ ἄλλο τι ὑποκεῖσθαι, καὶ εἶναι τρία· ἐκ δὲ τῶν νῦν φανερὸν τίς ἡ διαφορὰ τῶν ἐναντίων, καὶ πῶς ἔχουσιν αἱ ἀρχαὶ πρὸς ἀλλήλας, καὶ τί τὸ ὑποκείμενον. πότερον δὲ οὐσία τὸ εἶδος, ἢ τὸ ὑποκείμενον, οὔπω δῆλον. ἀλλ' ὅτι αἱ ἀρχαὶ τρεῖς, καὶ πῶς τρεῖς, καὶ τίς ὁ τρόπος αὐτῶν, δῆλον. πόσαι μὲν οὖν καὶ τίνες εἰσὶν αἱ ἀρχαί, ἐκ τούτων * θεωρείσθωσαν.

* Scrib. πῶς ποσαι.

* κ. τῶν ἄλλων

* κ. τόδε τι ὄν.

* κ. ᾗ quam lectionem etiam vetus interpr. ſecutus eſt malè. vide Philoponum.

* κ. θεωρείσθω.

Erroris, in quem veteres philoſophi ob principiorum ignorationem inciderunt, diſſolutio. Cap. IX.

SEd & hoc tantùm modo veterum dubitationem diſſolui poſt hæc dicamus. 2 Primi namque philoſophi veritatẽ & rerum naturam quærentes aberrarunt, quaſi in aliam quandam viam præ imperitia abducti atque aſſerunt, eorũ quæ ſunt, nihil fieri aut interire, propterea quod neceſſe eſt, vt quod fit, vel fiat ex ente, vel ex nõ ente: ex his autem vtriſq; fieri nequit: quia neq; ens fit, cùm iam ſit: ex nihilo autẽ nihil fit, quoniam aliquid ſubiici oportet. 3 Atq; ita deinceps conſecutionem augentes, non eſſe multas res inquiunt, ſed tantummodo ipſum ens. 4 Illi igitur hanc opinionẽ acceperunt ob ea quæ dicta ſunt. 5 Nos autem dicimus, *hæc*, ex ente vel non ente fieri, aut non ens vel ens facere quippiam, ſeu pati, aut quodvis fieri illud, quodammodo nihil differre, *ſed perinde valere, ac ſiquis dicat* medicum aliquid facere, vel pati, aut ex medico aliquid eſſe, vel fieri. 6 Quare cùm hoc duobus modis dicatur: patet etiam illud, *nimirum* ex ente & ens vel facere vel pati, *bifariã accipi*. 7 Ædificat igitur medicus, non quà medicus, ſed quà ædificator: & albus fit, nõ quà medicus, ſed quà niger. medetur autẽ, & fit medicinæ expers, quà medicus. 8 Quia verò dicimus maximè propriè medicũ aliquid facere vel pati, aut ex medico fieri, cũ, quà medicus, hæc patitur, aut facit: manifeſtũ eſt

D ΟΤι δὲ μοναχῶς οὕτω λύεται καὶ ἡ τῶν ἀρχαίων ἀπορία, λέγωμεν μετὰ ταῦτα. 2 Ζητοῦντες γὰρ οἱ κατὰ φιλοσοφίαν πρῶτοι τὴν ἀλήθειαν, καὶ τὴν φύσιν τὴν τῶν ὄντων, ἐξετράπησαν, οἷον ὁδόν τινα ἄλλην ἀπωσθέντες ὑπὸ ἀπειρίας· καί φασιν οὔτε γίνεσθαι τῶν ὄντων οὐδέν, οὔτε φθείρεσθαι· διὰ τὸ ἀναγκαῖον μὲν εἶναι γίνεσθαι τὸ γιγνόμενον ἢ ἐξ ὄντος, ἢ ἐκ μὴ ὄντος. ἐκ δὲ τούτων ἀμφοτέρων ἀδύνατον εἶναι· οὔτε γὰρ τὸ ὂν γίνεσθαι· εἶναι γὰρ ἤδη. ἔκ τε μὴ ὄντος οὐδὲν ἂν γίνεσθαι· ὑποκεῖσθαι γάρ τι δεῖ. 3 Καὶ οὕτω δὴ τὸ ἐφεξῆς συμβαῖνον αὔξοντες, οὐδ' εἶναι πολλά φασιν, ἀλλὰ μόνον αὐτὸ τὸ ὄν. 4 Ἐκεῖνοι μὲν οὖν ταύτην ἔλαβον τὴν E δόξαν διὰ τὰ εἰρημένα. 5 Ἡμεῖς δὲ λέγομεν, ὅτι τὸ ἐξ ὄντος ἢ μὴ ὄντος γίνεσθαι, ἢ τὸ μὴ ὂν, ἢ τὸ ὂν ποιεῖν τι ἢ πάσχειν, ἢ ὁτιοῦν τόδε γίνεσθαι, ἕνα μὲν τρόπον οὐδὲν διαφέρει, ἢ τὸ τὸν ἰατρὸν ποιεῖν τι ἢ πάσχειν, ἢ τὸ ἐξ ἰατροῦ εἶναί τι ἢ γίγνεσθαι. 6 Ὥστ' ἐπεὶ τοῦτο διχῶς λέγεται, δῆλον ὅτι καὶ τὸ ἐξ ὄντος, καὶ τὸ ὂν, ἢ ποιεῖν, ἢ πάσχειν. 7 Οἰκοδομεῖ μὲν οὖν ὁ ἰατρὸς, οὐχ ᾗ ἰατρὸς, ἀλλ' ᾗ οἰκοδόμος. καὶ λευκὸς γίνεται, οὐχ ᾗ ἰατρὸς ἀλλ' ᾗ μέλας. ἰατρεύει δὲ καὶ ἀνίατρος γίνεται, ᾗ ἰατρός. 8 Ἐπεὶ δὲ μάλιστα λέγομεν κυρίως τὸν ἰατρὸν ποιεῖν τι, ἢ πάσχειν, ἢ γίγνεσθαι ἐξ ἰατροῦ, ἐὰν ᾗ ἰατρὸς ταῦτα πάσχῃ, ἢ ποιῇ, δῆλον ὅτι καὶ τὸ

μὴ ἐξ ὄντος γίγνεσθαι, καὶ τοῦτο σημαίνει τὸ ᾗ μὴ ὄν. 9 ὥσπερ ἐκεῖνοι μὲν οὐ διελόντες, ἀπέστησαν· καὶ διὰ ταύτην τὴν ἄγνοιαν τοσοῦτον προσηγνόησαν, ὥστε μηδὲν οἴεσθαι γίγνεσθαι, μηδὲ εἶναι τῶν ἄλλων, ἀλλ' ἀνελεῖν πᾶσαν τὴν γένεσιν. 10 Ἡμεῖς δὲ καὶ αὐτοί φαμεν, γίγνεσθαι μὲν οὐδὲν ἁπλῶς ἐκ μὴ ὄντος, ὅμως μέντοι γίγνεσθαι ἐκ μὴ ὄντος, οἷον κατὰ συμβεβηκός. ἐκ γὰρ τῆς στερήσεως, ὅ ἐστι καθ' αὑτὸ μὴ ὄν, οὐκ ἐνυπάρχοντος γίγνεταί τι. θαυμάζεται δὲ τοῦτο, καὶ ἀδύνατον οὕτω δοκεῖ, γίγνεσθαί τι ἐκ μὴ ὄντος. 11 Ὡσαύτως δὲ οὐδ' ἐξ ὄντος οὐδὲ τὸ ὂν γίγνεσθαι, πλὴν κατὰ συμβεβηκός. 12 Οὕτω δὲ καὶ τοῦτο γίγνεσθαι τὸν αὐτὸν τρόπον, οἷον εἰ ἐκ ζῴου ζῷον γίγνοιτο, καὶ ἐκ τινὸς ζῴου τὶ ζῷον, οἷον, εἰ κύων ἐξ ἵππου γίγνοιτο· γίγνοιτο μὲν γὰρ ἄν, οὐ μόνον ἐκ τινὸς ζῴου ὁ κύων, ἀλλὰ καὶ ἐκ ζῴου, ἀλλ' οὐχ ᾗ ζῷον· ὑπάρχει γὰρ ἤδη τοῦτο· εἰ δέ τι μέλλει γίγνεσθαι ζῷον, μὴ κατὰ συμβεβηκός, οὐκ ἐκ ζῴου ἔσται. καὶ εἴ τι ὄν, οὐκ ἐξ ὄντος, οὐδ' ἐκ μὴ ὄντος· τὸ γὰρ ἐκ μὴ ὄντος εἴρηται ἡμῖν τί σημαίνει, ὅτι ᾗ μὴ ὄν. 13 Ἔτι δὲ καὶ τὸ εἶναι ἅπαν, ἢ τὸ μὴ εἶναι, οὐκ ἀναιροῦμεν. 14 Εἷς μὲν δὴ τρόπος οὗτος. 15 Ἄλλος δ', ὅτι ἐνδέχεται ταὐτὰ λέγειν κατὰ τὴν δύναμιν καὶ τὴν ἐνέργειαν. τοῦτο δ' ἐν ἄλλοις διώρισται δι' ἀκριβείας μᾶλλον. 16 Ὥσθ' (ὥσπερ ἐλέγομεν) αἱ ἀπορίαι λύονται, δι' ἃς ἀναγκαζόμενοι ἀναιροῦσι τῶν εἰρημένων ἔνια. διὰ γὰρ τοῦτο καὶ οἱ πρότερον ἐξετράπησαν τῆς ὁδοῦ τῆς ἐπὶ τὴν γένεσιν καὶ φθορὰν, καὶ ὅλως μεταβολήν. αὕτη γὰρ ἂν ὀφθεῖσα ἡ φύσις, ἅπασαν ἔλυσεν αὐτῶν τὴν ἄγνοιαν.

A etiam hoc, ex non ente fieri, ſignificare quà non ens. 9 Quod quidē illi non diſtinguentes, *à recta via* ſunt abducti: & propter hanc ignorātiam eò inſcitiæ peruenerunt, vt putarint nullā aliam rem fieri, aut eſſe, ſed tollerent omnem generationem. 10 Nos autē & ipſi dicimus nihil quidē fieri ſimpliciter ex nō ente, fieri tamen ex non ente tamquam per accidēs. fit. n. *aliquid* ex priuatione, quæ eſt per ſe non ens, cū non inſit *in eo quod fit*. admirationi autem hoc eſt, & impoſſibile ita videtur fieri aliquid ex non ente. 11 Itidemque *dicimus*, neque ex ente, neque ens [illegible] per accidens. 12 Eodem autem modo fieri hoc *dicimus*, ac ſi ex animali animal fieret, & ex aliquo animali aliquod animal. velut, ſi canis ex equo fieret. B nā canis fieret non ſolùm ex aliquo animali, verùm etiam ex animali: nō tamen quà *eſt* animal, quia hoc iam eſt. Quòd ſi futurum eſt, vt aliquid fiat animal non ex accidenti, *certè* non ex animali erit. & ſi quid *fiet* ens, non *fiet* ex ente, neque ex non ente: quippe dictum à nobis fuit quid ſignificet illud, ex nō ente, videlicet quà *eſt* non ens. 13 Præterea verò omnem rem eſſe aut non eſſe non tollimus. 14 Vnus igitur *dubitationis ſoluēdæ* modus hic *eſt*. 15 Alius autem *eſt*: quoniam eadem dici poſſunt ſecūdùm poteſtatem & ſecundùm actum. hoc verò in alijs *libris* magis exquiſitè definitum eſt. C 16 Quare (vt diximus) dubitationes ſoluuntur, quibus coacti *veteres* tollunt nonnulla eorum quæ dicta ſunt. Ideo namque priores *philoſophi* tantùm aberrarunt à via *ducente* ad generationem & interitum, & omnino mutationem. nam hæc natura *ſi ab eis* cognita *fuiſſet*, omnem hanc eorum ignorantiam diſſoluiſſet.

Reliqua de principiis naturalibus. Cap. X.

Ἡμμένοι μὲν οὖν καὶ ἕτεροί τινές εἰσιν αὐτῆς, ἀλλ' οὐχ ἱκανῶς. 2 πρῶτον μὲν γὰρ ὁμολογοῦσιν ἁπλῶς γίνεσθαί τι ἐκ μὴ ὄντος, ᾗ Παρμενίδην ὀρθῶς λέγειν. 3 Εἶτα φαίνεται αὐτοῖς, εἴπερ ἐστὶν ἀριθμῷ μία, καὶ δυνάμει μόνον μίαν εἶναι. τοῦτο δὲ διαφέρει πλεῖστον. 4 Ἡμεῖς μὲν γὰρ ὕλην καὶ στέρησιν ἕτερον εἶναί φαμεν, καὶ τούτων τὸ μὲν οὐκ ὂν εἶναι κατὰ συμβεβηκός, τὴν ὕλην· τὴν δὲ στέρησιν, καθ' αὑτήν· καὶ τὴν μὲν ἐγγὺς καὶ οὐσίαν πως, τὴν ὕλην, τὴν δὲ στέρησιν οὐδαμῶς. 5 Οἱ δὲ τὸ μὴ ὂν τὸ μέγα καὶ τὸ μικρὸν ὁμοίως, ἢ τὸ συναμφότερον, ἢ τὸ χωρὶς ἑκάτερον. ὥστε παντελῶς ἕτερος ὁ τρόπος οὗτος τῆς τριάδος, κἀκεῖνος. μέχρι μὲν γὰρ δεῦρο προῆλθον, ὅτι δεῖ τινα ὑποκεῖσθαι φύσιν· ταύτην μέντοι μίαν ποιοῦσι. καὶ γὰρ εἴ τις δυάδα ποιεῖ, λέγων μέγα καὶ μικρὸν αὐτήν, οὐδὲν ἧττον ταὐτὸ ποιεῖ· τὴν γὰρ ἑτέραν παρεῖδε, * τὴν στέρησιν.* 6 Ἡ μὲν γὰρ ὑπομένουσα, συναιτία τῇ μορφῇ τῶν γιγνομένων ἐστίν, ὥσπερ μήτηρ· ἡ δ' ἑτέρα μοῖρα τῆς ἐναντιώσεως, πολλάκις ἂν φαντασθείη τῷ πρὸς τὸ κακοποιὸν αὐτῆς ἀτενίζοντι τὴν διάνοιαν, οὐδ' εἶναι τὸ παράπαν. 7 Ὄντος γάρ τινος θείου καὶ ἀγαθοῦ καὶ ἐφετοῦ, τὸ μὲν ἐναντίον αὐτῷ φαμεν εἶναι, τὸ δέ, ὃ πέφυκεν ἐφίεσθαι καὶ ὀρέγεσθαι αὐτοῦ, κατὰ τὴν αὐτοῦ φύσιν. τοῖς δὲ συμβαίνει τὸ ἐναντίον ὀρέγεσθαι τῆς ἑαυτοῦ φθορᾶς. καίτοι οὔτε αὐτὸ ἑαυτοῦ οἷόν τε ἐφίεσθαι τὸ εἶδος, διὰ τὸ μὴ εἶναι ἐνδεές· οὔτε τὸ ἐναντίον. φθαρτικὰ γὰρ ἀλλήλων τὰ ἐναντία. ἀλλὰ τοῦτ' ἔστιν ὕλη, ὥσπερ ἂν εἰ θῆλυ ἄρρενος, καὶ αἰσχρὸν καλοῦ. πλὴν οὐ καθ' αὑτὸ αἰσχρόν,

*quidam codd. hæc duo τὴν στέρ. non habent: quos ſequitur Argyr.
* Argyropy. legit vt eſt apud Themiſtium, * μὲν γὰρ ὕλη μένουσα,

D SAnè attigerunt eam & alij nonnulli, non tamen ſatis. 2 Primùm. n. fatentur ſimpliciter fieri aliquid ex non ente, quatenus *fatentur* Parmenidem rectè dicere. 3 Deinde ipſis videtur, ſi *hæc natura* eſt vna numero, etiam poteſtate tantummodo vnā eſſe. hoc autem plurimùm differt. 4 Nos. n. materiam & priuationem diuerſa eſſe dicimus: & horū illud quidem eſſe non ens ex accidenti, *nēpe* m[illegible] priuationem vero *eſſe non ens* per ſe. & illam [illegible] prope & quodammodo ſubſtantiam, [illegible] riam: priuationem autē nequaquam. 5 [illegible] gnum & paruum, ſiue vtrūque, ſiue ſe[illegible] trum, ſimiliter *ſtatuunt eſſe non ens*. qua[illegible] ternarij modus ab illo differt. hucvſque [illegible] progreſſi ſunt *vt intelligerent* naturā aliquam ſub[illegible] E ſed hāc vnam faciunt. nam etſi quidam [illegible] facit, inquiens eam *ſubiectam naturam eſſe* magnum & paruum: nihilominus tamē idem facit: quoniam alteram neglexit, *nimirum* priuationem. 6 Alia nāque natura, cùm permaneat, eorum quæ fiunt, vna cum forma eſt cauſa, quaſi mater. altera verò, *quæ eſt* pars cōtrarietatis, ſæpe videri poterit ei qui ad ipſius maleficium animum aduerterit, ne quidem vllo modo eſſe. 7 Cùm enim ſit quiddam diuinum, & bonum, & expetendum: dicimus aliud eſſe ei contrarium, aliud, quod ſua natura id expetit & appetit. Sed illis accidit, vt contrarium appetat ſui ipſius interitum. Atqui nec ipſa forma ſeipſam expetere poteſt: quia non eſt *ſui* indigens, neque contrarium *eam expetit*: quia contraria ſui inuicē perimendi vim habent. ſed hoc eſt materia: perinde ac ſi femina marē, aut turpe pulchrū *appeteret*. Verumtamen non *eſt* per ſe turpis,

ſed ex accidenti:nec *per ſe* fœmina,ſed ex accidenti. A 8 Partim autem interit, & fit:partim minimè. vt.n. *eſt* id in quo,per ſe interit,quod.n.interit,in ipſa eſt, *nempe* priuatio. Vt autem ſecundũ poteſtatem *ſpectatur*, non per ſe gignitur & *interit*, ſed neceſſe *eſt* eam eſſe incorruptibilem & ingenitã.ſiue.n.fieret,oporteret ſubiici aliquod primum,*nempe* id ex quo inſito *ſit*:hoc autem eſt eius natura:proinde priùs erit quã fiat. materiã. n.voco primum cuiuſque rei ſubiectũ, ex quo inſito fit aliquid,non per accidens. ſiue quid intereat, in hoc vltimum abibit. quare interempta erit,antequam interimatur. 9 De principio autem, quod *eſt* ſecũdùm formam, vtrùm *ſit* vnum an multa,& quod vel quæ ſint,exquiſitè definire eſt munus B primæ philoſophiæ. quare in illud tẽpus reiiciatur. de naturalibus autem & interitui obnoxiis formis in iis dicemus, quæ poſteriùs *de*monſtrabuntur. 10 Quòd igitur ſint principia, & quæ, & quot numero *ſint*, ſic à nobis definitum eſto. Rurſus autem alio facto initio dicamus.

ἀλλὰ κατὰ συμβεβηκὸς· οὐδὲ θῆλυ, ἀλλὰ κατὰ συμβεβηκός. 8 Φθείρεται δὲ καὶ γίνεται, ἔστι μὲν ὥς, ἔστι δὲ ὡς οὔ. ὡς μὲν γὰρ τὸ ἐν ᾧ καθ' αὑτὸ φθείρεται· τὸ φθειρόμενον γὰρ ἐν τούτῳ ἐστὶν ἡ στέρησις· ὡς δὲ κατὰ τὴν δύναμιν, οὐ καθ' αὑτό, ἀλλ' ἄφθαρτον καὶ ἀγένητον ἀνάγκη αὐτὴν εἶναι. εἴτε γὰρ ἐγίνετο, ὑποκεῖσθαί τι δεῖ πρῶτον, τὸ ἐξ οὗ ἐνυπάρχοντος. τοῦτο δὲ ἐστὶν αὐτὴ ἡ φύσις· ὥστε ἔσται πρὶν γενέσθαι. λέγω γὰρ ὕλην, τὸ πρῶτον ὑποκείμενον ἑκάστῳ, ἐξ οὗ γίνεταί τι ἐνυπάρχοντος μὴ κατὰ συμβεβηκός· εἴτε φθείρεταί τι, εἰς τοῦτο ἀφίξεται ἔσχατον· ὥστε ἐφθαρμένη ἔσται, πρὶν φθαρῆναι. 9 B Περὶ δὲ τῆς κατὰ τὸ εἶδος ἀρχῆς, πότερον μία ἢ πολλαί, καὶ τίς ἢ τίνες εἰσί, δι' ἀκριβείας τῆς πρώτης φιλοσοφίας ἔργον ἐστὶ διορίσαι· ὥστε εἰς ἐκεῖνον τὸν καιρὸν ἀποκείσθω. περὶ δὲ τῶν φυσικῶν καὶ τῶν φθαρτῶν εἰδῶν ἐν τοῖς ὕστερον δεικνυμένοις ἐροῦμεν. ὅτι μὲν οὖν εἰσὶν ἀρχαί, καὶ τίνες, καὶ πόσαι τὸν ἀριθμόν, διωρίσθω ἡμῖν οὕτω. πάλιν δὲ ἄλλην ἀρχὴν ἀρξάμενοι λέγωμεν.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ, Η περὶ φυσικῶν ἀρχῶν, τὸ Β.

ARISTOTELIS, NATVRALIS AVSCVLTATIONIS, SEV DE NATVRALIBVS PRINCIPIIS, *LIBER II.*

DE NATVRA, ET EO QVOD HABET NATVRAM, VEL EST SECVNDVM NATVRAM.

TRACTATVS I. Cap. I.

EORVM quæ ſunt,alia naturâ conſtant,alia per alias cauſas. C 2 Naturâ quidem *conſtant* & animalia,& eorũ partes,& plantæ,& ſimplicia corpora, vt terra, & ignis, & aër, & aqua. hæc.n.& eiuſmodi *alia* dicimus naturâ conſtare. 3 Hæc autẽ quæ dicta ſunt,omnia differre videntur ab iis quæ naturâ non conſtant. nam quæcũque naturâ conſtant,vidẽtur in ſeipſis habere principium motus & quietis,alia ſecundùm locum, alia ſecundũ accretionem & deminutionem,alia ſecundũ variationem. lectica verò,& veſtimentũ, & ſi quod aliud eiuſmodi genus eſt, quà ſingulis his appellationibus ſignificãtur, & quatenus ab arte ſunt, D nullũ mutationis impetum inſitum habẽt. quà verò eis accidit,vt ſint lapidea,vel terrea vel ex his mixta: eatenus *id* habent. 4 Tamquã natura ſit principium quoddã & cauſa cur *id* moueatur & quieſcat,in quo ineſt primum,per ſe,non ex accidenti. 5 Dico autẽ, non ex accidenti, quia fieri poteſt vt aliquis ſibi ipſi ſit cauſa ſanitatis,cùm ſit medicus:verumtamen,nõ quatenus ſanatur,medicinã habet, ſed accidit eundem eſſe medicũ & ſanari.idcirco *hæc* aliquando à ſe inuicem ſeparantur. 6 Similiter verò *ſe habet* vnumquodq; aliorum,quæ fiunt:nullum.n. eorũ habet in ſe principium effectionis:ſed quædã in aliis & extra *habẽt*,vt domus, & vnũquodque aliorum quæ manu efficiuntur:quædam in ſeipſis quidẽ *habent*,nõ tamẽ per ſe, *nimirũ* quæcumque ex accidẽti ſibi ipſis cauſæ fieri poſſunt. 7 Natura igitur eſt, quod dictũ fuit.

ΤΩΝ ὄντων τὰ μέν ἐστι φύσει, τὰ δὲ δι' ἄλλας αἰτίας. 2 Φύσει μέν, τά τε ζῶα καὶ τὰ μέρη αὐτῶν, καὶ τὰ φυτά, καὶ τὰ ἁπλᾶ τῶν σωμάτων. οἷον γῆ, καὶ πῦρ, καὶ ἀήρ, καὶ ὕδωρ· ταῦτα γὰρ εἶναι καὶ τὰ τοιαῦτα φύσει φαμέν. 3 Πάντα δὲ τὰ ῥηθέντα φαίνεται διαφέροντα πρὸς τὰ μὴ φύσει συνεστῶτα. τὰ μὲν γὰρ φύσει ὄντα, πάντα φαίνεται ἔχοντα ἐν ἑαυτοῖς ἀρχὴν κινήσεως καὶ στάσεως, τὰ μὲν κατὰ τόπον, τὰ δὲ κατ' αὔξησιν καὶ φθίσιν, τὰ δὲ κατ' ἀλλοίωσιν. κλίνη δὲ καὶ ἱμάτιον, καὶ εἴ τι τοιοῦτον ἄλλο γένος ἐστίν, ᾗ μὲν τετύχηκε τῆς κατηγορίας ἑκάστης, καὶ καθ' ὅσον ἐστὶν ἀπὸ τέχνης, οὐδεμίαν ὁρμὴν ἔχει μεταβολῆς ἔμφυτον· ᾗ δὲ συμβέβηκεν αὐτοῖς λιθίνοις ἢ γηΐνοις εἶναι, ἢ μικτοῖς ἐκ τούτων,* ἔχει κατὰ τοσοῦτον. 4 Ὡς οὔσης τῆς φύσεως ἀρχῆς τινος καὶ αἰτίας τοῦ κινεῖσθαι καὶ ἠρεμεῖν, ἐν ᾧ ὑπάρχει πρώτως καθ' αὑτό, καὶ μὴ κατὰ συμβεβηκός. 5 Λέγω δὲ τὸ μὴ κατὰ συμβεβηκός, ὅτι γένοιτ' ἂν αὐτὸς ἑαυτῷ τις αἴτιος ὑγιείας ὢν ἰατρός· ἀλλ' ὅμως οὐ καθ' ὃ ὑγιάζεται, τὴν ἰατρικὴν ἔχει, ἀλλὰ συμβέβηκε τὸν αὐτὸν ἰατρὸν εἶναι καὶ ὑγιαζόμενον· διὸ καὶ χωρίζεταί ποτε* ἀλλήλων. 6 Ὁμοίως δὲ καὶ τῶν ἄλλων ἕκαστον τῶν ποιουμένων. οὐδὲν γὰρ αὐτῶν ἔχει τὴν ἀρχὴν ἐν ἑαυτῷ τῆς ποιήσεως, ἀλλὰ τὰ μὲν ἐν ἄλλοις καὶ ἔξωθεν, οἷον οἰκία, καὶ τῶν ἄλλων τῶν χειροκμήτων ἕκαστον· τὰ δὲ ἐν αὑτοῖς μέν, ἀλλ' οὐ καθ' ἑαυτά, ὅσα κατὰ συμβεβηκὸς αἴτια γένοιτ' ἂν ἑαυτοῖς. 7 Φύσις μὲν οὖν ἐστὶ τὸ ῥηθέν.

* κ. ἔχ. κ. το. [illegible]

* κ. ἀπ' ἀλλ.

8 Φύσιν δὲ ἔχει, ὅσα τὴν τοιαύτην ἔχει ἀρχήν. καὶ ἔστι ταῦτα πάντα, οὐσία· ὑποκείμενον γάρ τι, καὶ ἐν ὑποκειμένῳ ἐστὶν ἡ φύσις ἀεί. 9 Κατὰ φύσιν δὲ, ταῦτά τε καὶ ὅσα τούτοις ὑπάρχει καθ' αὑτά, οἷον τῷ πυρὶ τὸ φέρεσθαι ἄνω· τοῦτο γὰρ, φύσις μὲν οὐκ ἔστιν, οὐδ' ἔχει φύσιν· φύσει δὲ καὶ κατὰ φύσιν ἐστί. 10 Τί μὲν οὖν ἡ φύσις ἐστίν, εἴρηται, καὶ τί τὸ φύσει, καὶ κατὰ φύσιν. 11 Ὡς δ' ἔστιν ἡ φύσις, πειρᾶσθαι δεικνύναι γελοῖον· φανερὸν γὰρ ὅτι τοιαῦτα τῶν ὄντων ἐστὶ πολλά. τὸ δὲ δεικνύναι τὰ φανερὰ διὰ τῶν ἀφανῶν, οὐ δυναμένου κρίνειν ἐστὶ τὸ δι' αὑτὸ καὶ μὴ δι' αὑτὸ γνώριμον. ὅτι δὲ ἐνδέχεται τοῦτο πάσχειν, οὐκ ἄδηλον· συλλογίσαιτο γὰρ ἄν τις ἐκ γενετῆς ὢν τυφλὸς, περὶ χρωμάτων· ὥστε ἀνάγκη τοῖς τοιούτοις περὶ τῶν ὀνομάτων εἶναι τὸν λόγον, μηδὲν δὲ νοεῖν. 12 Δοκεῖ δὲ ἡ φύσις * καὶ ἡ οὐσία τῶν φύσει ὄντων ἐνίοις εἶναι τὸ πρῶτον ἐνυπάρχον ἑκάστῳ ἀρρύθμιστον καθ' ἑαυτό, οἷον κλίνης φύσις τὸ ξύλον, ἀνδριάντος δ' ὁ χαλκός. 13 Σημεῖον δέ φησιν Ἀντιφῶν, ὅτι εἴ τις κατορύξειε κλίνην, καὶ λάβοι δύναμιν ἡ σηπεδὼν, ὥστε ἀνεῖναι βλαστὸν, οὐκ ἂν γενέσθαι κλίνην, ἀλλὰ ξύλον· ὡς τὸ μὲν κατὰ συμβεβηκὸς ὑπάρχον, τὴν κατὰ νόμον διάθεσιν, καὶ τὴν τέχνην· τὴν δ' οὐσίαν οὖσαν ἐκείνην, ἣ καὶ διαμένει ταῦτα πάσχουσα συνεχῶς. εἰ δὲ καὶ τούτων ἕκαστον πρὸς ἕτερόν τι ταὐτὸ τοῦτο πέπονθεν (οἷον ὁ μὲν χαλκὸς καὶ ὁ χρυσὸς πρὸς ὕδωρ, τὰ δ' ὀστᾶ καὶ ξύλα πρὸς γῆν, ὁμοίως δὲ καὶ τῶν ἄλλων ὁτιοῦν) ἐκεῖνα τὴν φύσιν εἶναι καὶ τὴν οὐσίαν αὐτῶν. 14 Διόπερ οἱ μὲν γῆν, οἱ δὲ πῦρ, οἱ δ' ἀέρα φασίν, οἱ δὲ ὕδωρ, οἱ δὲ ἔνια τούτων, οἱ δὲ πάντα ταῦτα τὴν φύσιν εἶναι τὴν τῶν ὄντων. ὃ γάρ τις αὐτῶν ὑπέλαβε τοιοῦτον, εἴτε ἓν, εἴτε πλείω, τοῦτο καὶ τοσαῦτά φασιν εἶναι τὴν ἅπασαν οὐσίαν· τὰ δὲ ἄλλα πάντα πάθη τούτων, καὶ ἕξεις, καὶ διαθέσεις. 15 Καὶ τούτων μὲν ὁτιοῦν εἶναι ἀΐδιον· οὐ γὰρ εἶναι μεταβολὴν αὐτοῖς ἐξ ἑαυτῶν· τὰ δ' ἄλλα γίγνεσθαι καὶ φθείρεσθαι ἀπειράκις. 16 Ἕνα μὲν οὖν τρόπον ἡ φύσις οὕτω λέγεται, ἡ πρώτη ἑκάστῳ ὑποκειμένη ὕλη τῶν ἐχόντων ἐν ἑαυτοῖς κινήσεως ἀρχὴν καὶ μεταβολῆς. 17 Ἄλλον δὲ τρόπον, ἡ μορφὴ καὶ τὸ εἶδος τὸ κατὰ τὸν λόγον. ὥσπερ γὰρ τέχνη λέγεται, τὸ κατὰ τέχνην, καὶ τὸ τεχνικὸν· οὕτω καὶ φύσις τὸ κατὰ φύσιν λέγεται, καὶ τὸ φυσικόν. οὔτε δὲ ἐκεῖ πως φαῖμεν ἂν ἔχειν κατὰ τέχνην οὐδὲν, εἰ δυνάμει μόνον ἐστὶ κλίνη, μήπω δὲ ἔχει τὸ εἶδος τῆς κλίνης, οὐδ' εἶναι τέχνην· οὔτε ἐν τοῖς φύσει συνισταμένοις. τὸ γὰρ δυνάμει σὰρξ ἢ ὀστοῦν, οὔτ' ἔχει πω τὴν ἑαυτοῦ φύσιν, πρὶν ἂν λάβοι τὸ εἶδος τὸ κατὰ τὸν λόγον, ὃ ὁριζόμενοι λέγομεν τί ἐστι σὰρξ, ἢ ὀστοῦν· οὔτε φύσει ἐστίν· ὥστε ἄλλον τρόπον ἡ φύσις ἂν εἴη τῶν ἐχόντων ἐν ἑαυτοῖς κινήσεως ἀρχὴν, ἡ μορφὴ, καὶ τὸ εἶδος, οὐ χωριστὸν ὂν, ἀλλ' ἢ κατὰ τὸν λόγον. 18 Τὸ δ' ἐκ τούτων, φύσις μὲν οὐκ ἔστι, φύσει δέ, οἷον ὁ ἄνθρωπος. 19 Καὶ μᾶλλον φύσις αὕτη τῆς ὕλης. ἕκαστον γὰρ τότε λέγεται ὅταν ἐντελεχείᾳ ᾖ, μᾶλλον ἢ ὅταν δυνάμει. 20 Ἔτι γίγνεται ἄνθρωπος ἐξ ἀνθρώπου, ἀλλ' οὐ κλίνη ἐκ κλίνης· διὸ καί φασιν οὐ τὸ σχῆμα εἶναι τὴν φύσιν, ἀλλὰ τὸ ξύλον· ὅτι γένοιτ' ἂν, εἰ βλαστάνοι, οὐ κλίνη, ἀλλὰ ξύλον. εἰ δ' ἄρα τοῦτο * τέχνη, καὶ ἡ μορφὴ φύσις· γίνεται γὰρ ἐξ ἀνθρώπου ἄνθρωπος. 21 * Ἔτι δ' ἡ φύσις ἡ λεγομένη ὡς γένεσις, ὁδός ἐστιν εἰς φύσιν. οὐ γὰρ ὥσπερ ἡ ἰάτρευσις λέγεται, οὐκ εἰς ἰατρικὴν ὁδὸς, ἀλλ' εἰς ὑγίειαν· ἀνάγκη μὲν γὰρ ἀπὸ ἰατρικῆς, οὐκ εἰς ἰατρικὴν εἶναι τὴν ἰάτρευσιν. οὐχ οὕτω δ' ἡ φύσις ἔχει πρὸς τὴν φύσιν·

* κ. ἢ ἡ ὕλη αὐτ.

* Vocem τέχνη, nec Philoponus, nec alij veteres interpretes quidam agnoſcunt. extat tamen in veteri verſione lat.

* Metaphyſ. li. 5. cap. 4.

A 8 Naturam verò habent, quæcumque habent eiuſmodi principium. Atque hæc omnia ſunt ſubſtãtia, natura nãque ſemper eſt ſubiectum quoddam & in ſubiecto. 9 Secundùm naturam autem dicuntur & hęc & quæ his inſunt per ſe, vt igni ſurſum ferri. hoc enim non eſt natura, nec habet naturã: ſed eſt naturaliter, & ſecundùm naturã. 10 Dictũ eſt igitur quid ſit natura, & quid *ſit* quod *eſt* naturaliter, & ſecundũ naturã. 11 Eſſe autem naturã conari probare, ridiculũ *eſt*: patet.n. eiuſmodi entia multa eſſe: demõſtrare autẽ, quæ ſunt perſpicua, ex obſcuris, eius eſt qui nõ poteſt diiudicare, *quod eſt* per ſe, & *quod* non *eſt* per ſe notum. Poſſe autẽ aliquem ita eſſe affectum, non eſt B obſcurum. aliquis.n. qui ab ortu ſit cæcus, poteſt de coloribus ratiocinari. quare neceſſe *eſt* his eſſe diſputationẽ de nominibus, ſed *ipſos* nihil intelligere. 12 Iam verò quibuſdã videtur natura & eſſentia eorum quæ naturâ cõſtant, eſſe id quod primum cuiq; rei ineſt, informe per ſe: vt lecticæ natura *eſt* lignum, ſtatuæ verò æs. 13 Cuius rei ſignum *eſſe* inquit Antipho: quia ſi quis defoderit lecticam, & putredo vim acceperit, adeo vt germinet, certè nõ fiet lectica, ſed lignum: quaſi illud ex accidenti inſit, nẽpe diſpoſitio quæ eſt ſecundùm formã & artẽ: eſſentia verò ea ſit, quæ etiã permanet, ab his continenter affecta. quòd ſi etiã horum vnumquodq; ad aliud quiddã eodem modo eſt affectum: velvti, æs & aurum ad aquã, oſſa C autẽ & ligna ad terrã, ſimiliterque aliud quodvis: ea inquit eſſe ipſorum naturã & eſſentiam. 14 Idcirco alij terrã, alij ignem, alij aerem, alij aquã, alij nõnulla ex his, alij hæc omnia inquiunt eſſe rerum naturam. Quod.n. quiſque exiſtimauit eſſe tale, ſiue vnũ ſiue multa, hoc & tot inquiunt eſſe vniuerſam eſſentiã, reliqua autẽ omnia *eſſe* horũ affectiones, & habitus, & diſpoſitiones. 15 Et horum quidem quodvis eſſe ſempiternum: non.n. eſſe ipſis mutationẽ ex ſeipſis. cetera verò fieri & interire infinities. 16 Vno igitur modo natura ſic dicitur, *nimirũ* prima cuique rei in ſe motus & mutationis principium habẽti ſubiecta materia. 17 Alio autem modo forma & ſpecies, quæ in definitione *ponitur*. Vt.n. dicitur ars, quod *eſt* ſecũ- D dùm artem, & quod *eſt* artificioſum: ita etiã dicitur natura, quod *eſt* ſecũdùm naturã, & quod *eſt* naturale. Neque autem illud vllo modo dicemus habere quidpiã ſecundùm artem, ſi poteſtate tantũ ſit lectica, nec dũ habeat lecticę ſpeciem, neque *ipſam* eſſe artem: neque in iis quæ naturâ conſtant. quod.n. poteſtate *eſt* caro, aut os: *id* necdũ habet ſuã ipſius naturã, priuſquam acceperit formã, quę *ponitur* in definitione, (*hoc eſt* quã dicimus definiẽtes quid ſit caro, vel os) nec naturâ cõſtat. quare alio modo natura eſt eorum quæ in ſe principium motus habẽt, forma & ſpecies, quæ nõ eſt ſeparabilis, niſi ſecundùm definitionem. 18 Quod autem ex his *eſt compoſitum*, natura E quidem non eſt, ſed *naturaliter eſt*, *ſeu* natura *conſtat*: vt homo. 19 Atque hæc magis, quã materia, *eſt* natura. Vnumquodque enim tunc dicitur, cùm actu eſt, potiùs quàm cùm *eſt* poteſtate. 20 Præterea fit homo ex homine, non lectica ex lectica. ideóque inquiunt, non figuram, ſed lignum eſſe naturam, quia, ſi germinaret, non fieret lectica, ſed lignum. ſi igitur hoc *eſt* ars, etiam forma *eſt* natura: fit enim ex homine homo. 21 Præterea natura accepta pro generatione, eſt via ad naturam. non enim *ita ſe habet*, vt medicatio, *quæ* dicitur via non ad medicinam, ſed ad ſanitatem. neceſſe enim *eſt* medicationem à medicina eſſe, non ad medicinam. ſed non ita habet natura ad naturam.

verū id quod naſcitur, ex aliquo ad aliquid venit ſeu naſcitur. ad quod igitur *veniendo* naſcitur? non ad id ex quo, ſed *ad id* ad quod. forma igitur *eſt* natura. 22 Forma autē & natura duobus modis dicitur. etenim priuatio eſt quodammodo forma. 23 Vtrùm autem priuatio & contrarium quidpiam ſit in ſimplici generatione, nec ne, poſteriùs erit conſiderandum.

A ἀλλὰ * τὸ φυόμενον, ἐκ τινὸς εἰς τι ἔρχεται, ᾗ φύεται. εἰς τί οὖν φύεται; * οὐχὶ ἐξ οὗ, ἀλλ' εἰς ὅ. ἡ ἄρα μορφὴ, φύσις. 22 Ἡ δέ γε μορφὴ καὶ ἡ φύσις, διχῶς λέγεται· καὶ γὰρ ἡ στέρησις εἶδός πως ἐστίν. 23 Εἰ δὲ ἔστιν ἡ στέρησις, καὶ ἐναντίον τι περὶ τὴν ἁπλῆν γένεσιν, ἢ μὴ ἔστιν, ὕστερον ἐπισκεπτέον.

* χ. τὸ φυόμενον ἐκ τινός, εἰς τι ἔρχεται ᾗ φύεται. vide Philopon.
* χ. οὐχὶ εἰς τὸ ἐξ οὗ

QVOMODO PHYSICVS DISTINGVATVR A MATHEMATICO, & à primo philoſopho, & circa quid verſetur.

TRACTATVS II.

Cap. II.

CVm autem definitū ſit, quot modis natura dicatur: deinceps vidēdū *eſt* quo differat mathematicus à phyſico: naturalia nāque corpora planities habēt, & ſoliditates, & longitudines, & puncta; quę cōſiderat mathematicus. 2 Præterea *videndum eſt*, vtrū aſtrologia *ſit* diuerſa *à phyſica*: an pars phyſicę. 3 Nā ſi phyſici *eſt*, ſcire quid ſit Sol, aut Luna, nihil autē eorum *ſcire* quæ *Soli aut Lunæ* per ſe accidūt, *certè eſt* abſurdum: præſertim quia vidētur, qui de natura *diſſerūt*, etiam loqui de figura Lunæ ac Solis: & quærere, vtrùm terra & mundus ſint rotūda nec ne. 4 De his igitur tractat etiā mathematicus, nō tamen qua horum vnumquodque *eſt* terminus corporis naturalis: neque *horū* accidentia contēplatur, qua eiuſmodi rebus accidūt: ideóque ſeparat. ſunt.n. res per intellectum ſeparabiles nihilq; intereſt: nec falſum cōmittitur ab iis qui ſeparant. 5 Non animaduertunt autē ſe quoq; hoc facere, qui ideas *eſſe* dicunt. ſeparant.n. res naturales, quę minùs ſeparabiles *ſunt*, quā mathematicæ. 6 Hoc autē manifeſtum fieri poteſt, ſi quis vtrorumque definitiones afferre conetur: *id eſt*, tam *rerum* ipſarum, quàm accidentium. impar.n. & par, necnō rectum & inflexum: præterea & numerus, & linea, & figura, ſine motu erunt. caro autem, & os, & homo, nō item: ſed hæc, vt naſus ſimus, nō vt inflexū dicūtur. 7 Quinetiā hoc declarant *ea* mathematicę, quæ *ſunt* magis naturales: vt perſpectiua, & muſica, & aſtrologia. contra.n. quodāmodo *ſe* habēt ac geometria: quoniā geometria naturalem quidem lineā conſiderat, non tamen quà *eſt* naturalis: perſpectiua autē mathematicā quidē lineam *cōſiderat*, non tamē quà *eſt* mathematica, ſed quà *eſt* naturalis. 8 Cū autem natura duobus modis *dicatur*, nimirum forma & materia: ſic debemus contemplari, ac ſi de ſimitate conſideraremus quid ſit. quocirca eiuſmodi *res* neq. *ſunt* abſq. materia, neque ſecūdùm materiam. 9 Nā & de hoc dubitare quiſpiam poſſit, cùm duæ *ſint* naturæ, de vtra *diſſerere ſit munus* Phyſici: an de eo *diſſerat*, quod ex ambabus *conſtat*. atqui ſi de eo *diſſerit* quod ex ambabus *naturis cōſtat*, *certè* etiam de vtraq. natura *diſſeret*. Vtrùm igitur ad eandem, an ad aliam atque aliam *ſcientiam pertinet* vtramque naturam notificare? 10 Ad veteres philoſophos reſpicięti videri poteſt *ſolius* materię rationem haberi *à phyſico*. parum enim Empedocles ac Democritus formā & quidditatem attigerunt. 11 Quòd ſi ars imitatur naturam, eiuſdē verò ſcientiæ *eſt* quadātenus noſſe formā & materiam: (vt medici *eſt noſſe* ſanitatem nec non bilem & pituitam, in quibus ineſt ſanitas: ſimiliter etiā ædificatoris *eſt noſſe* formam domus, & materiam, quòd *ſcilicet materia domus ſint* lateres & ligna: eademque ratio *eſt* aliarū rerum) profectò etiam phyſicæ munus erit notificare ambas naturas.

B Ἐπεὶ δὲ διώρισται ποσαχῶς ἡ φύσις λέγεται, μετὰ τοῦτο θεωρητέον τίνι διαφέρει ὁ μαθηματικὸς τοῦ φυσικοῦ· καὶ γὰρ ἐπίπεδα καὶ στερεὰ ἔχει τὰ φυσικὰ σώματα, καὶ μήκη, καὶ στιγμὰς, περὶ ὧν σκοπεῖ ὁ μαθηματικός. 2 Ἔτι δὴ, * ἡ ἀστρολογία ἑτέρα ἢ μέρος τῆς φυσικῆς. 3 Εἰ γὰρ τοῦ φυσικοῦ τὸ τί ἐστιν ἥλιος ἢ σελήνη, εἰδέναι, τῶν δὲ συμβεβηκότων καθ' αὑτὰ μηδὲν, ἄτοπον· ἄλλως τε καὶ ὅτι φαίνονται λέγοντες οἱ περὶ φύσεως, καὶ περὶ σχήματος σελήνης καὶ ἡλίου. καὶ δὴ καὶ πότερον σφαιροειδὴς ἡ γῆ καὶ ὁ κόσμος, ἢ οὔ. 4 Περὶ τούτων μὲν οὖν πραγματεύεται καὶ ὁ μαθηματικὸς, ἀλλ' οὐχ ᾗ φυσικοῦ σώματος πέρας ἕκαστον· οὐδὲ τὰ συμβεβηκότα θεωρεῖ ᾗ τοιούτοις οὖσι συμβέβηκε. διὸ καὶ χωρίζει· χωριστὰ γὰρ τῇ νοήσει, κινήσεώς ἐστι· καὶ οὐδὲν διαφέρει, οὐδὲ γίνεται ψεῦδος χωριζόντων. 5 Λανθάνουσι δὲ τοῦτο ποιοῦντες καὶ οἱ τὰς ἰδέας λέγοντες. τὰ γὰρ φυσικὰ χωρίζουσιν ἧττον ὄντα χωριστὰ τῶν μαθηματικῶν. 6 Γίγνοιτο δ' ἂν τοῦτο δῆλον, εἴ τις ἑκατέρων πειρῷτο λέγειν τοὺς ὅρους, καὶ αὐτῶν καὶ τῶν συμβεβηκότων· τὸ μὲν γὰρ περιττὸν ἔσται καὶ τὸ ἄρτιον, καὶ τὸ εὐθὺ καὶ τὸ καμπύλον· ἔτι δὲ καὶ ἀριθμὸς, καὶ γραμμὴ, καὶ σχῆμα ἄνευ κινήσεως· σὰρξ δὲ καὶ ὀστοῦν καὶ ἄνθρωπος, οὐκέτι· ἀλλὰ ταῦτα ὥσπερ ῥὶς σιμὴ, ἀλλ' οὐχ D ὡς τὸ καμπύλον λέγεται. 7 Δηλοῖ δὲ καὶ τὰ φυσικώτερα * τῶν μαθημάτων, οἷον ὀπτικὴ, καὶ ἁρμονικὴ, καὶ ἀστρολογία· ἀνάπαλιν γὰρ τρόπον τινὰ ἔχουσι τῇ γεωμετρίᾳ. ἀλλὰ ἡ μὲν γεωμετρία περὶ γραμμῆς φυσικῆς σκοπεῖ· ἀλλ' οὐχ ᾗ φυσική· ἡ δ' ὀπτικὴ, μαθηματικὴν μὲν γραμμὴν, ἀλλ' οὐχ ᾗ μαθηματικὴ, ἀλλ' ᾗ φυσική. 18 Ἐπειδὴ δὲ ἡ φύσις διχῶς, τό, τε εἶδος καὶ ἡ ὕλη, ὡς ἂν εἰ περὶ σιμότητος τί ἐστι σκοποῖμεν, οὕτω θεωρητέον. ὥστ' οὔτ' ἄνευ ὕλης τὰ τοιαῦτα, οὔτε κατὰ τὴν ὕλην. 9 Καὶ γὰρ δὴ καὶ περὶ τούτου διχῶς ἀπορήσειεν ἄν τις, ἐπεὶ δύο αἱ φύσεις, περὶ ποτέρας τοῦ φυσικοῦ, ἢ περὶ τοῦ ἐξ ἀμφοῖν· ἀλλ' εἰ περὶ τοῦ ἐξ E ἀμφοῖν, καὶ περὶ ἑκατέρας. πότερον οὖν τῆς αὐτῆς, ἢ ἄλλης, ἑκατέραν γνωρίζειν; 10 Εἰς μὲν γὰρ τοὺς ἀρχαίους ἀποβλέψαντι δόξειεν ἂν εἶναι τῆς ὕλης· ἐπὶ μικρὸν γάρ τι μέρος Ἐμπεδοκλῆς καὶ Δημόκριτος τοῦ εἴδους καὶ τοῦ τί ἦν εἶναι ἥψαντο. 11 Εἰ δὲ ἡ τέχνη μιμεῖται τὴν φύσιν, τῆς δὲ αὐτῆς * ἐπιστήμης εἰδέναι τὸ εἶδος καὶ τὴν ὕλην μέχρι του (οἷον ἰατροῦ ὑγίειαν, καὶ χολὴν, καὶ φλέγμα, ἐν οἷς ἡ ὑγίεια· ὁμοίως δὲ καὶ οἰκοδόμου, τό, τε εἶδος τῆς οἰκίας, καὶ τὴν ὕλην, ὅτι πλίνθοι, καὶ ξύλα· ὡσαύτως δὲ καὶ ἐπὶ τῶν ἄλλων) καὶ τῆς φυσικῆς ἂν εἴη τὸ γνωρίζειν ἀμφοτέρας τὰς φύσεις.

* χ. ἢ μέρος
* χ. τῶν μαθηματικῶν,
* quid. τέχνης

12 Ἔτι τὸ οὗ ἕνεκα, καὶ τὸ τέλος, τῆς αὐτῆς, καὶ ὅσα τούτων ἕνεκα. ἡ δὲ φύσις, τὸ τέλος καὶ οὗ ἕνεκα. ὧν γὰρ συνεχοῦς τῆς κινήσεως οὔσης, ἐστὶ τέλος τι τῆς κινήσεως, τοῦτο ἔσχατον καὶ τὸ οὗ ἕνεκα· διὸ καὶ ὁ ποιητὴς γελοίως προήχθη εἰπεῖν,

Euripid.

„ Ἔχει τελευτήν, ἧσπερ οὕ-
„ νεκ' ἐγένετο.

Βούλεται γὰρ οὐ πᾶν εἶναι τὸ ἔσχατον, τέλος, ἀλλὰ τὸ βέλτιστον. 13 * Ἐπεὶ δὲ ποιοῦσιν αἱ τέχναι τὴν ὕλην, αἱ μὲν ἁπλῶς, αἱ δὲ εὐεργόν· καὶ χρώμεθα ὡς ἡμῶν ἕνεκα πάντων ὑπαρχόντων· ἐσμὲν γάρ πως καὶ ἡμεῖς τέλος· διχῶς γὰρ τὸ οὗ ἕνεκα· εἴρηται δὲ ἐν τοῖς περὶ φιλοσοφίας· * δύο δὴ αἱ ἄρχουσαι τῆς ὕλης καὶ γνωρίζουσαι τέχναι, ἥ τε χρωμένη, καὶ τῆς ποιητικῆς ἡ ἀρχιτεκτονική. διὸ καὶ ἡ χρωμένη, ἀρχιτεκτονική πως. διαφέρει δὲ, ᾗ ἡ μὲν τοῦ εἴδους γνωριστική, ἡ ἀρχιτεκτονική· ἡ δὲ, ὡς ποιητικὴ τῆς ὕλης. ὁ μὲν γὰρ κυβερνήτης ποιόν τι τὸ εἶδος τοῦ πηδαλίου γνωρίζει καὶ ἐπιτάττει· ὁ δὲ, ἐκ ποίου ξύλου καὶ ποίων κινήσεων ἔσται. ἐν μὲν οὖν τοῖς κατὰ τέχνην, ἡμεῖς ποιοῦμεν τὴν ὕλην τοῦ ἔργου ἕνεκα· ἐν δὲ τοῖς φυσικοῖς ὑπάρχει οὖσα. 14 Ἔτι τῶν πρός τι ἡ ὕλη· ἄλλῳ γὰρ εἴδει ἄλλη ὕλη. 15 Μέχρι δὴ πόσου τὸν φυσικὸν δεῖ εἰδέναι τὸ εἶδος καὶ τὸ τί ἐστιν; ἢ ὥσπερ τὸν ἰατρὸν νεῦρον, ἢ χαλκέα χαλκὸν, μέχρι του; τινὸς γὰρ ἕνεκα ἕκαστον, * καὶ περὶ ταῦτα ἅ ἐστι χωριστὰ μὲν εἴδει, ἐν ὕλῃ δέ. ἄνθρωπος γὰρ ἄνθρωπον * γεννᾷ καὶ ἥλιος. πῶς δὲ ἔχει τὸ χωριστὸν, καὶ τί ἐστι, φιλοσοφίας τῆς πρώτης διορίσαι ἔργον.

* γ. ἐπεὶ καὶ π.

* γ. δύο δὴ αἱ.

* Suſpectus locus. Vicom. legendum putat ἀχώριστα parum probabiliter. Scriptum reperimus χωριστὰ εἴδει. quam lectionem etiã Græci interp. agnoſcunt.

* γ. γεννᾷ ἐξ ὕλης, καὶ ἥλ.

12 Præterea eiuſdem *ſcientiæ eſt noſſe* id cuius cauſâ, & finem, & quæcumque horum cauſâ *ſunt*: natura autem *eſt* finis & id cuius cauſâ: quorum enim motus cùm ſit continuus, eſt aliquis finis illius motus, hic *finis eſt* extremum & id cuius cauſâ. Ideóque poëta ridiculè adductus eſt, vt diceret,

„ *Habet finem cuius cauſâ ge-*
„ *nitus erat.*

Non enim omne extremum meretur nomen finis, ſed id quod *eſt* optimum. 13 Cùm autem artes materiam faciant, aliæ ſimpliciter; aliæ vero idoneam: nóſque *his* omnibus vtamur tamquam noſtrâ cauſâ ſint, (ſumus enim & nos aliquo modo finis: quia bifariàm *ſumitur* id cuius cauſâ, vt dictum eſt in *libris* de philoſophia) duæ ſanè *ſunt* artes, quæ præſunt materiæ, atque eam cognoſcunt: nempe ea quæ vtitur, & quæ effectrici præeſt, architectonica. idcirco etiam ea quæ vtitur *eſt* quodammodo architectonica. differunt autem, quatenus hæc quidem architectonica formam cognoſcit, illa verò *dicitur architectonica*, tamquam efficiẽs materiam. nam gubernator, qualis ſit forma claui, nouit, & imperat: alter autem nouit, ex quali ligno, & ex quibus motibus *clauus* erit. in iis igitur quæ *ſunt* ſecundùm artem, nos materiam facimus operis cauſâ: in naturalibus autem ſuppetit. 14 Præterea materia, *in eorum numero eſt*, quæ ad aliquid *referuntur*. nam alij formæ alia materia conuenit. 15 Quouſque igitur oportet Phyſicum cognoſcere formam & quid eſt? an vt medicus *noſſe debet* neruum, aut faber æs, *nempe* vſque ad aliquem *terminum*? alicuius enim cauſâ vnumquodque conſiderat: & in iis verſatur, quę ſunt quidẽ formâ ſeparabilia, *ſunt* tamen in materia: homo namque hominem gignit, & Sol. Quomodo autem *ſe* habeat, quod *eſt* ſeparatum, & quid ſit, primæ philoſophiæ munus *eſt* definire.

DE CAVSIS, TRACTATVS III.

De cauſis per ſe. Cap. III.

Διωρισμένων δὲ τούτων, ἐπισκεπτέον περὶ τῶν αἰτίων, ποῖά τε καὶ πόσα τὸν ἀριθμόν ἐστιν. ἐπεὶ γὰρ τοῦ εἰδέναι χάριν τὰ φυσικὰ ἡ πραγματεία· εἰδέναι δὲ οὐ πρότερον οἰόμεθα ἕκαστον, πρὶν ἂν λάβωμεν τὸ διὰ τί περὶ ἕκαστον (τοῦτο δ' ἐστὶ τὸ λαβεῖν τὴν πρώτην αἰτίαν) δῆλον ὅτι καὶ ἡμῖν τοῦτο ποιητέον καὶ περὶ γενέσεως καὶ φθορᾶς, καὶ περὶ πάσης τῆς φυσικῆς μεταβολῆς· ὅπως εἰδότες αὐτῶν τὰς ἀρχὰς, ἀνάγειν εἰς αὐτὰς πειρώμεθα τῶν ζητουμένων ἕκαστον. 2 Ἕνα μὲν οὖν τρόπον αἴτιον λέγεται, τὸ ἐξ οὗ γίνεταί τι ἐνυπάρχοντος, οἷον ὁ χαλκὸς τοῦ ἀνδριάντος, καὶ ὁ ἄργυρος τῆς φιάλης, καὶ τὰ τούτων γένη. 3 Ἄλλον δὲ, τὸ εἶδος καὶ τὸ παράδειγμα· (τοῦτο δ' ἐστὶν ὁ λόγος ὁ τοῦ τί ἦν εἶναι) καὶ τὰ τούτου γένη· οἷον τοῦ διὰ πασῶν τὰ δύο πρὸς ἓν, καὶ ὅλως ὁ ἀριθμὸς, καὶ τὰ μέρη τὰ ἐν τῷ λόγῳ. 4 Ἔτι, ὅθεν ἡ ἀρχὴ τῆς μεταβολῆς ἡ πρώτη, ἢ τῆς ἠρεμήσεως, οἷον ὁ βουλεύσας αἴτιος, καὶ ὁ πατὴρ τοῦ τέκνου, καὶ ὅλως τὸ ποιοῦν τοῦ ποιουμένου, καὶ τὸ μεταβάλλον τοῦ μεταβαλλομένου. 5 Ἔτι, ὡς τὸ τέλος· τοῦτο δ' ἐστὶ τὸ οὗ ἕνεκα, οἷον τοῦ περιπατεῖν ἡ ὑγίεια· διὰ τί γὰρ περιπατεῖ; φαμὲν, ἵνα * ὑγιαίνῃ· καὶ εἰπόντες οὕτως, οἰόμεθα ἀποδεδωκέναι τὸ αἴτιον. καὶ ὅσα δὴ κινήσαντος ἄλλου μεταξὺ γίνεται τοῦ τέλους, οἷον τῆς ὑγιείας ἡ * ἰσχνασία, ἢ ἡ κάθαρσις, ἢ τὰ φάρμακα, ἢ τὰ ὄργανα· πάντα γὰρ ταῦτα τοῦ τέλους ἕνεκά ἐστι· διαφέρει δὲ ἀλλήλων, ὡς ὄντα τὰ μὲν ἔργα, τὰ δὲ ὄργανα.

* γ. ὑγιαίνῃ·

* γ. ἰσχνασία,

His definitis, conſiderandũ *eſt*, quænam & quot numero ſint cauſæ. cũ.n. res naturales cognoſcẽdi gratiâ *ſit* hæc tractatio; nec priùs vnumquodq; noſſe arbitremur, quã ſumpſerimus *cauſam* propter quã eſt: (hoc autem eſt ſumere primam cauſam) profectò nobis quoque hoc faciendum *eſt* & in ortu & interitu, & in omni naturali mutatione: vt, cognitis horũ principiis, conemur ad ea referre ſingula quæſita. 2 Vno igitur modo cauſa dicitur id ex quo inſito aliquid fit: vt æs *eſt cauſa* ſtatuæ, & argẽtum phialæ, & horũ genera. 3 Alio autem *modo* forma & exẽplar, (hæc autẽ eſt ratio quidditatis) & huius genera: vt *harmoniæ* diapaſon, *forma eſt* duo ad vnũ, & omnino numerus, ac partes quę in definitione *ponũtur*. Pręterea vnde *eſt* primũ mutationis vel quietis principiũ: cuiuſmodi cauſa *eſt*, qui cõſultat; & pater filij, & omnino quod facit, eius quod fit, & quod mutat, eius quod mutatur. 5 Præterea vt finis. hoc autẽ eſt *id* cuius gratia: vt deambulãdi ſanitas. Cur.n. deambulat? dicimus, vt benę valeat: &, cùm ſic dixerimus, putamus *nos* cauſã reddidiſſe. & quæcumque igitur alio mouente interiecta, finis *gratia* fiunt: vt ſanitatis *gratia fit* extenuatio, vel purgatio, vel pharmaca, vel inſtrumenta: hæc.n. omnia finis gratiâ ſunt: differũt autem inter ſe, quòd alia ſint opera, alia inſtrumẽta.

6 Cauſæ igitur tot fere modis dicuntur.

7 Cùm autem cauſæ multis modis dicantur: accidit, vt eiuſdem *effectus* ſint multæ cauſæ, non ex accidente: vt ſtatuæ & *ars* ſtatuaria, & æs, non alia quapiam ratione, ſed qua *eſt* ſtatua: non tamen eodem modo: ſed altera *eſt cauſa*, vt materia; altera, vt id vnde motus *profectus eſt*. 8 Sunt etiam quædam ſibi inuicem cauſæ: vt labor *eſt* cauſa firmæ corporis conſtitutionis: atque hæc *eſt cauſa* laborandi: non tamen eodem modo: ſed hæc *eſt cauſa* vt finis: illud autem, vt principium motus. 9 Præterea eadem eſt contrariorum cauſa: quod enim præſens, *eſt* cauſa huius *effectus*: hoc abſens dicimus interdum cauſam eſſe contrarij *effectus*: vt abſentiam gubernatoris *dicimus eſſe cauſam* ſubmerſionis nauis, cuius pręſentia erat cauſa ſalutis. 10 Omnes autem cauſæ quæ nunc dictæ ſunt, in quatuor modos manifeſtiſſimos cadunt: (nam elementa *ſunt cauſa* ſyllabarum: & materia, eorum quæ opificio conſtant: & ignis, & quæ *ſunt* eiuſmodi, corporum: & partes, totius: & hypotheſes, concluſionis: cauſæ *inquam* ſunt, vt id ex quo) harum verò aliæ *ſunt* vt ſubiectum, velvti partes: aliæ vt quidditas, *nempe* totum, & compoſitio & forma; ſed ſemen, & medicus & conſultans, & omnino faciens, *hæc inquam* omnia *ſunt cauſæ* vnde *eſt* principium mutationis, vel ſtatus, vel motionis. aliæ verò *ſunt cauſæ* vt finis bonúmque aliorum. id enim cuius gratiâ, debet eſſe optimum, & ceterorum finis. ſed nihil intersit, vtrùm dicatur ipſum *finem* eſſe bonum, an videri bonum. Cauſæ igitur tales, ac tot ſunt ſpecie. 11 Modi verò cauſarum numero quidem ſunt multi: ſed, ſi ſummatim colligantur, & ipſi pauciores *ſunt*. dicũtur enim cauſæ multis modis. & ipſarum *cauſarum* quæ *ſunt* eiuſdem generis, alia *eſt* prior & poſterior quàm alia. vt ſanitatis *cauſa eſt* medicus, & artifex. & *harmonia* diapaſon *cauſa eſt* duplum & numerus. ac ſemper ea quæ continẽt, *ita ſe habent* ad ſingula. 12 Præterea *dicuntur cauſæ* vt accidens, & horum genera. vt puta ſtatuę aliter *cauſa eſt* Polycletus, aliter ſtatuarius, quoniam accidit ſtatuario vt ſit Polycletus. Sed & ea quę accidens continent, *appellantur cauſæ*: veluti ſi homo ſit cauſa ſtatuæ, aut omnino animal. 13 Accidentium quoque alia ſunt aliis remotiora & propinquiora: veluti ſi albus & muſicus dicatur eſſe cauſa ſtatuæ. 14 Pręter omnes autẽ cauſas, & quæ propriè, & quæ ex accidenti dicuntur, alię dicuntur *cauſæ*, quia poſſunt; aliæ, quia agunt: vt ædificandæ domus *cauſa eſt* ædificator, aut ædificans ædificator. 15 Similiter autem dicetur etiam in iis quorum *ex* cauſæ, *quas expoſuimus*, ſunt cauſæ, vt in *ipſis cauſis* expoſitis. exempli gratiâ *eſt cauſa* huius ſtatuę, vel ſtatuæ, vel omnino imaginis. item *eſt cauſa* huius æris, vel æris, vel omnino materiæ. Eadem *eſt* accidentium ratio. 16 Pręterea & hæ & illæ dicuntur coniunctę. verbi gratiâ, non Polycletus, nec ſtatuarius, ſed Polycletus ſtatuarius. 17 Sed nihilominus omnes hæ ſunt quidem, quod ad multitudinem ſex: ſed dicuntur bifariàm: vel enim vt ſingulare vel vt genus, vel vt ex accidenti, vel genus accidentis: & vel hæc coniuncta, vel ſimpliciter accepta: *hæc* autem omnia vel agẽtia, vel ſecundùm poteſtatem. 18 Adeo autem differunt; vt agentes, & ſingulares, ſimul ſint & non ſint cum *iis* quorum *ſunt* cauſę: (veluti hic qui medetur *ſimul eſt* cum hoc qui ſanatur: & hic ædificans, *ſimul eſt* cum hac te quę ædificatur) quæ verò ſecundùm poteſtatem *cauſæ dicuntur*, non ſemper *ſimul ſunt*; quia non ſimul

A 6 Τὰ μὲν οὖν αἴτια σχεδὸν τοσαυταχῶς λέγεται. 7 Συμβαίνει δὲ πολλαχῶς λεγομένων τῶν αἰτίων καὶ πολλὰ τοῦ αὐτοῦ αἴτια εἶναι, οὐ κατὰ συμβεβηκὸς, οἷον τοῦ ἀνδριάντος, καὶ ἡ ἀνδριαντοποιητικὴ, καὶ ὁ χαλκὸς, * οὐ καθ' ἕτερόν τι, ἀλλ' ᾗ ἀνδριάς. ἀλλ' οὐ τὸν αὐτὸν τρόπον· ἀλλὰ τὸ μὲν ὡς ὕλη, τὸ δ' ὡς ὅθεν ἡ κίνησις. 8 Ἔστι δὲ τινὰ καὶ ἀλλήλων αἴτια, οἷον τὸ πονεῖν αἴτιον τῆς εὐεξίας, καὶ αὕτη τοῦ πονεῖν· ἀλλ' οὐ τὸν αὐτὸν τρόπον· ἀλλὰ τὸ μὲν ὡς τέλος, τὸ δὲ ὡς ἀρχὴ κινήσεως. 9 Ἔτι δὲ, τὸ αὐτὸ τῶν ἐναντίων ἐστὶν αἴτιον. ὃ γὰρ παρὸν αἴτιον τοῦδε, τοῦτο καὶ ἀπὸν αἰτιώμεθα ἐνίοτε τοῦ ἐναντίου· οἷον, τὴν ἀπουσίαν τοῦ κυβερνήτου, τῆς τοῦ πλοίου B ἀνατροπῆς, οὗ ἦν ἡ παρουσία αἰτία τῆς σωτηρίας. 10 Ἅπαντα δὲ τὰ νῦν εἰρημένα αἴτια, εἰς τέτταρας τρόπους πίπτει τοὺς φανερωτάτους· τὰ μὲν γὰρ στοιχεῖα τῶν συλλαβῶν, καὶ ἡ ὕλη τῶν σκευαστῶν, καὶ τὸ πῦρ, καὶ τὰ τοιαῦτα τῶν σωμάτων, καὶ τὰ μέρη τοῦ ὅλου, καὶ αἱ ὑποθέσεις τοῦ συμπεράσματος, ὡς τὸ ἐξ οὗ αἴτιά ἐστι· * τούτων δὲ, τὰ μὲν ὡς τὸ ὑποκείμενον, οἷον τὰ μέρη· τὰ δὲ ὡς τὸ τί ἦν εἶναι, τό,τε ὅλον, καὶ ἡ σύνθεσις, καὶ τὸ εἶδος· τὸ δὲ σπέρμα, καὶ ὁ ἰατρὸς, καὶ ὁ βουλεύσας, καὶ ὅλως τὸ ποιοῦν, πάντα ὅθεν ἡ ἀρχὴ τῆς μεταβολῆς, ἢ στάσεως, ἢ κινήσεως· τὰ δὲ ὡς τὸ τέλος, καὶ τἀγαθὸν τῶν ἄλλων· τὸ γὰρ οὗ ἕνεκα, C βέλτιστον, καὶ τέλος τῶν ἄλλων ἐθέλει εἶναι· διαφερέτω δὲ μηδὲν αὐτὸ εἰπεῖν ἀγαθὸν, ἢ φαινόμενον ἀγαθόν. τὰ μὲν οὖν αἴτια ταῦτα καὶ τοσαῦτά ἐστι τῷ εἴδει. 11 Τρόποι δὲ τῶν αἰτίων, ἀριθμῷ μὲν εἰσὶ πολλοὶ, συγκεφαλαιούμενοι δὲ καὶ οὗτοι ἐλάττους· λέγεται γὰρ αἴτια πολλαχῶς, καὶ αὐτῶν τῶν ὁμοειδῶν, προτέρως καὶ ὑστέρως ἄλλου ἄλλο, οἷον ὑγιείας ὁ ἰατρὸς, καὶ ὁ τεχνίτης· καὶ τοῦ διὰ πασῶν, τὸ διπλάσιον, καὶ ὁ ἀριθμὸς, καὶ ἀεὶ τὰ περιέχοντα * πρὸς τὸ καθ' ἕκαστον. 12 Ἔτι δ', ὡς τὸ συμβεβηκὸς, καὶ τὰ τούτων γένη· οἷον ἀνδριάντος ἄλλως Πολύκλειτος, καὶ ἄλλως ἀνδριαντοποιὸς, ὅτι συμβέβηκε τῷ ἀνδριαντοποιῷ τὸ D Πολυκλείτῳ εἶναι. καὶ τὰ περιέχοντα δὲ τὸ συμβεβηκός. οἷον εἰ ὁ ἄνθρωπος αἴτιος εἴη τοῦ ἀνδριάντος, ἢ ὅλως τὸ ζῶον. 13 Ἔστι δὲ καὶ τῶν συμβεβηκότων ἄλλα ἄλλων * πορρώτερον καὶ ἐγγύτερον· οἷον εἰ ὁ λευκὸς, καὶ ὁ μουσικὸς αἴτιος λέγοιτο τοῦ ἀνδριάντος. 14 Παρὰ πάντα δὲ καὶ τὰ οἰκείως λεγόμενα, καὶ τὰ κατὰ συμβεβηκὸς, τὰ μὲν ὡς δυνάμενα λέγεται, τὰ δὲ ὡς ἐνεργοῦντα· οἷον τοῦ οἰκοδομεῖσθαι οἰκίαν ὁ οἰκοδόμος, ἢ ὁ οἰκοδομῶν οἰκοδόμος. 15 Ὁμοίως δὲ λεχθήσεται καὶ ἐφ' ὧν αἴτια τὰ αἴτια τοῖς εἰρημένοις· οἷον τουδὶ τοῦ ἀνδριάντος, ἢ ἀνδριάντος, ἢ καὶ ὅλως εἰκόνος· καὶ χαλκοῦ τοῦδε, ἢ χαλκοῦ, ἢ ὅλως ὕλης· καὶ ἐπὶ τῶν συμβεβηκότων E ὡσαύτως. 16 Ἔτι δὲ συμπλεκόμενα καὶ ταῦτα κἀκεῖνα λεχθήσεται· οἷον οὐ Πολύκλειτος, οὐδὲ ἀνδριαντοποιὸς, ἀλλὰ Πολύκλειτος ἀνδριαντοποιός. 17 Ἀλλ' ὅμως ἅπαντα ταῦτά ἐστι, τὸ μὲν πλῆθος ἕξ, λεγόμενα δὲ διχῶς· ἢ γὰρ ὡς τὸ καθ' ἕκαστον, ἢ ὡς τὸ γένος, ἢ ὡς τὸ κατὰ συμβεβηκὸς, ἢ ὡς τὸ γένος τοῦ συμβεβηκότος· ἢ ὡς συμπλεκόμενα ταῦτα, ἢ ὡς ἁπλῶς λεγόμενα· πάντα δὲ ἢ ἐνεργοῦντα, ἢ κατὰ δύναμιν. 18 Διαφέρει δὲ τοσοῦτον, ὅτι τὰ μὲν ἐνεργοῦντα, καὶ τὰ καθ' ἕκαστον, ἅμα ἐστὶ καὶ οὐκ ἔστι, καὶ ὧν αἴτια· οἷον ὅδε ὁ ἰατρεύων τῷδε τῷ ὑγιαζομένῳ, καὶ ὅδε ὁ οἰκοδομῶν τῷδε τῷ οἰκοδομουμένῳ. τὰ δὲ κατὰ δύναμιν, οὐκ ἀεί· φθείρεται γὰρ οὐχ ἅμα

* κἀνταῦθα δὲ οὐ καθ' ἕτι

* γρ. πέντε

* γρ. περὶ τὰ καθ' ἕκαστα.

* γρ. πορρώτερα καὶ ἐγγύτερα sic apud Them.

ἡ οἰκία καὶ ὁ οἰκοδόμος. 19 Δεῖ δὲ ἀεὶ τὸ αἴτιον ἑκάστου τὸ ἀκρότατον ζητεῖν, ὥσπερ καὶ ἐπὶ τῶν ἄλλων· οἷον ἄνθρωπος οἰκοδομεῖ, ὅτι οἰκοδόμος· ὁ δ' οἰκοδόμος, κατὰ τὴν οἰκοδομικήν. τοῦτο τοίνυν πρότερον τὸ αἴτιον· καὶ οὕτως ἐπὶ πάντων. 20 Ἔτι, τὰ μὲν γένη τῶν γενῶν, τὰ δὲ καθ' ἕκαστα τῶν καθ' ἕκαστα, οἷον ἀνδριαντοποιὸς μὲν ἀνδριάντος, ὁδὶ δὲ τουδί. καὶ τὰς μὲν δυνάμεις τῶν δυνατῶν, τὰ δὲ ἐνεργοῦντα πρὸς τὰ ἐνεργούμενα. 21 Ὅσα μὲν οὖν τὰ αἴτια, καὶ ὃν τρόπον αἴτια, ἔστω ἡμῖν διωρισμένα* ἱκανῶς.

* κ. πῶς ἱκανῶς.

A interit domus & ædificator. 19 Oportet autem ſemper ſummā cuiuſque rei cauſam quærere, quemadmodū & in aliis *rebus*. vt homo ædificat quia *eſt* ædificator: ædificator autem *eſt* ſecundùm artem ædificandi: hæc igitur cauſa prior eſt. atque ita *ſe res habet* in omnibus. 20 Præterea *oportet* generum *quærere* genera: ſingularium autem, ſingularia: vt ſtatuarius *eſt cauſa* ſtatuæ: hic autem *ſtatuarius*, huius *ſtatuæ*. Ac poteſtates quidem, eorum quæ fieri poſſunt: agentia verò, eorum quæ agũtur. 21 Quot igitur *ſint* cauſæ, & quomodo *ſint* cauſæ, ſatis à nobis definitum ſit.

Aliorum opiniones de caſu & fortuna.

Cap. IV.

B Λέγεται δὲ καὶ ἡ τύχη καὶ τὸ αὐτόματον τῶν αἰτίων, καὶ πολλὰ καὶ εἶναι καὶ γίνεσθαι διὰ τύχην, καὶ διὰ τὸ αὐτόματον· τίνα οὖν τρόπον ἐν τούτοις ἐστὶ τοῖς αἰτίοις ἡ τύχη, καὶ τὸ αὐτόματον· καὶ πότερον τὸ αὐτὸ ἡ τύχη, καὶ τὸ αὐτόματον, ἢ ἕτερον, καὶ ὅλως τί ἐστιν ἡ τύχη, καὶ τὸ αὐτόματον, ἐπισκεπτέον. 2 Ἔνιοι γὰρ καὶ εἰ ἔστιν ἢ μή, ἀποροῦσιν· οὐδὲν γὰρ γίνεσθαι ἀπὸ τύχης φασίν, ἀλλὰ πάντων εἶναί τι αἴτιον ὡρισμένον, ὅσα λέγομεν ἀπὸ ταὐτομάτου γίνεσθαι, ἢ τύχης, οἷον τοῦ ἐλθεῖν ἀπὸ τύχης εἰς τὴν ἀγορὰν, καὶ καταλαβεῖν, ὃν ἐβούλετο μὲν, οὐκ ᾤετο δὲ, αἴτιον τὸ βούλεσθαι ἐλθόντα ἀγοράσαι· ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων τῶν C ἀπὸ τύχης λεγομένων, ἀεί τι εἶναι λαβεῖν τὸ αἴτιον, ἀλλ' οὐ τύχην. 3 Ἐπεὶ εἴ γέ τι ἦν ἡ τύχη, ἄτοπον ἂν φανείη ὡς ἀληθῶς· καὶ ἀπορήσειεν ἄν τις, διὰ τί ποτε οὐδεὶς τῶν ἀρχαίων σοφῶν τὰ αἴτια περὶ γενέσεως καὶ φθορᾶς λέγων, περὶ τύχης οὐδὲν διώρισεν· ἀλλ' ὡς ἔοικεν, οὐδὲν ᾤοντο οὐδ' ἐκεῖνοι εἶναι ἀπὸ τύχης. 4 Ἀλλὰ καὶ τοῦτο θαυμαστόν· πολλὰ γὰρ καὶ γίνεται καὶ ἔστιν ἀπὸ τύχης καὶ ἀπὸ ταὐτομάτου· ἃ οὐκ ἀγνοοῦντες, ὅτι ἔστιν ἐπανενεγκεῖν ἕκαστον ἐπί τι αἴτιον τῶν γινομένων, καθάπερ ὁ παλαιὸς λόγος εἶπεν, ὁ ἀναιρῶν τὴν τύχην· ὅμως τούτων τὰ μὲν εἶναί φασι πάν- D τες ἀπὸ τύχης, τὰ δ' οὐκ ἀπὸ τύχης. 5 Διὸ καὶ* ἁμῶς γέ πως ἦν ποιητέον αὐτοῖς μνείαν. ἀλλὰ μὴν οὐδ' ἐκείνων γέ τι ᾤοντο εἶναι τὴν τύχην, οἷον φιλίαν, ἢ νεῖκος, ἢ πῦρ, ἢ νοῦν, ἢ ἄλλο γέ τι τῶν τοιούτων. ἄτοπον οὖν εἴτε μὴ ὑπελάμβανον εἶναι, εἴτε οἰόμενοι παρέλειπον. 6 Καὶ ταῦτ' ἐνίοτε χρώμενοι· ὥσπερ Ἐμπεδοκλῆς οὐκ ἀεὶ τὸν ἀέρα ἀποκρίνεσθαι ἀνωτάτω φησίν, ἀλλ' ὅπως ἂν τύχῃ. λέγει γοῦν ἐν τῇ κοσμοποιΐᾳ,

„Ὡς οὕτω συνέκυρσε θέων τό-
„τε, πολλάκι δ' ἄλλως.

E Καὶ τὰ μόρια τῶν ζώων ἀπὸ τύχης γενέσθαι τὰ πλεῖστα φησίν. 7 Εἰσὶ δέ τινες οἳ καὶ τοῦ οὐρανοῦ τοῦδε, καὶ τῶν κοσμικῶν πάντων αἰτιῶνται τὸ αὐτόματον· ἀπὸ ταὐτομάτου γὰρ γενέσθαι φασὶ τὴν δίνην καὶ τὴν κίνησιν, τὴν διακρίνασαν καὶ καταστήσασαν εἰς ταύτην τὴν τάξιν τὸ πᾶν. 8 Καὶ μάλα τοῦτό γε αὐτὸ θαυμάσαι ἄξιον, λέγοντας, τὰ μὲν ζῷα καὶ τὰ φυτὰ ἀπὸ τύχης μήτε εἶναι μήτε γίνεσθαι, ἀλλ' ἤτοι φύσιν, ἢ νοῦν, ἤ τι τοιοῦτον ἕτερον εἶναι τὸ αἴτιον (οὐ γὰρ ὅ,τι ἔτυχεν, ἐκ τοῦ σπέρματος ἑκάστου γίνεται, ἀλλ' ἐκ μὲν τοῦ τοιουδὶ ἐλαία, ἐκ δὲ τοῦ τοιουδὶ ἄνθρωπος) τὸν δὲ οὐρανὸν καὶ τὰ θειότατα τῶν φανερῶν, ἀπὸ τοῦ αὐτομάτου γενέσθαι, τοιαύτην δὲ αἰτίαν μηδεμίαν εἶναι, οἵαν τῶν ζώων καὶ τῶν φυτῶν.

* ἀμφοτέρων

B Sed & fortuna & caſus dicuntur eſſe *in* cauſarum *numero*, multaque & eſſe & fieri fortuito & caſu. quo igitur modo in his cauſis ſit fortuna & caſus, & vtrùm idē *ſint* fortuna & caſus, an diuerſa, & omnino quid ſit fortuna & caſus, conſiderandum *eſt*. 2 Etenim nonnulli, an ſit nec ne, dubitant. aiunt enim nihil fieri à fortuna: ſed omnium, quæ dicimus caſu vel fortuitò fieri, eſſe aliquam cauſam definitam. vtputà fortuitò veniendi in forum, & reperiendi, quem volebat quidem, non tamen putabat *ſe reperturum*, cauſa *eſt* voluntas, *rem aliquam*, cùm in forum veniſſet, emendi. Similiter & in aliis, quæ fortuitò C fieri dicuntur, ſemper aliquam cauſam ſumi poſſe, non autem fortunam. 3 Nam ſi fortuna eſſet aliquid, re vera abſurdum videretur: ac dubitare quiſpiam poſſet, cur nemo vnquam veterum ſapientum, cauſas ortus & interitus tradens, de fortuna quidpiam definierit. Sed, vt videtur, ne illi quidem putarunt aliquid eſſe à fortuna. 4 Sed & hoc admirabile *eſt*. multa namque fiunt & ſunt à fortuna & caſu: quæ non ignorantes poſſe referri ſingula ad aliquam eorum quæ fiunt, cauſam, quemadmodum antiquus ſermo fortunam tollens ait, tamen horum quædam omnes aiunt eſſe à fortuna, quædam autem non à fortuna. 5 Quocirca eius quo- D que aliqua mentio ab ipſis facienda erat. At verò nec illorum quidpiam putarunt eſſe fortunam, velvti amicitiam, aut contentionem aut ignem, aut mentem, aut aliquid aliud eiuſmodi, alterutrum igitur *eſt*, ſiue non exiſtimarunt eſſe, ſiue, cùm eſſe putarent, prætermiſerunt. 6 Præſertim cùm ipſi quoque interdum *caſu & fortuna* vtantur: ſicut Empedocles non ſemper aërē in ſuperiorē locum ſecerni inquit, ſed quo modo contigerit: dicit. n. in Coſmopœia,

„*Sæpe aliàs aliter, ſed tum ſic*
„*fortè cucurrit.*

E Partes quoque animalium pleraſque à fortuna factas eſſe dicit. 7 Sunt autem nonnulli, qui & cœli huius & omnium mundi partium cauſam adſcribũt caſui: Caſu enim fieri aiunt conuerſionem, & motum, qui vniuerſum diſtinxit, & redegit in hunc ordinem. 8 Et ſanè hoc ipſum valde *eſt* admiratione dignum, quod dicunt, & animalia quidem & plantas nec eſſe nec fieri à fortuna; ſed eorum cauſam eſſe aut naturam, aut mentem, aut aliquid aliud tale: (quia non quodvis ex vnoquoque ſemine fit, ſed ex illo oliua, ex hoc autem homo) cœlum autem, & quæ ſunt inter res manifeſtas magis diuina, caſu facta eſſe, atque *eorum* nullam eſſe talem cauſam, qualem *fatentur eſſe* animalium & plantarum.

9 Atqui, ſi ita *res* habet, hoc ipſum *eſt* conſideratione dignum, & è re eſt de ipſo aliquid dicere. nam præterquam quòd alioqui eſt abſurdum, quod dicitur: adhuc abſurdius *eſt* hęc dicere, cùm videamus in cœlo quidem nihil caſu fieri, in his autem quæ non *ſunt* à fortuna, multa fortuitò accidere. atqui contrarium fieri decebat. 10 Sunt autem nónulli, quibus fortuna videtur eſſe quidem cauſa, ſed humanæ menti obſcura, tamquam ſit diuinum quid, ac numen excellens. 11 Quare conſiderandum eſt, & quid *ſit* vtrumque, & vtrùm idem *ſint*, an diuerſa. caſus (inquam) & fortuna, & quomodo in cauſas ſuprà definitas cadant.

A 9 Καίτοιγε εἰ οὕτως ἔχει, τοῦτό γε αὐτὸ ἄξιον ἐπιστάσεως. καὶ καλῶς ἔχει λεχθῆναί τι περὶ αὐτοῦ τούτου. πρὸς γὰρ τῷ καὶ ἄλλως ἄτοπον εἶναι τὸ λεγόμενον, ἔτι ἀτοπώτερον τὸ λέγειν ταῦτα, ὁρῶντας ἐν μὲν τῷ οὐρανῷ οὐδὲν ἀπὸ ταὐτομάτου γιγνόμενον, ἐν δὲ τοῖς οὐκ ἀπὸ τύχης, πολλὰ συμβαίνοντα ἀπὸ τύχης. καίτοι εἰκός γε ἦν τοὐναντίον γίγνεσθαι. 10 Εἰσὶ δέ τινες, οἷς δοκεῖ εἶναι μὲν αἰτία ἡ τύχη, ἄδηλος δὲ ἀνθρωπίνῃ διανοίᾳ, ὡς θεῖόν τι οὖσα καὶ δαιμονιώτερον. 11 Ὥστε σκεπτέον καὶ τί ἑκάτερον, καὶ εἰ ταὐτὸν ἢ ἕτερον, τό, τε αὐτόματον καὶ ἡ τύχη, καὶ πῶς εἰς τὰ διωρισμένα αἴτια ἐμπίπτουσι.

An ſit fortuna & caſus, quid ſit fortuna, & quæ ei accidant.

Cap. V.

PRimùm igitur, cùm videamus quædam ſemper, alia plerumque eodem modo fieri: manifeſtum *eſt* neutrius horum cauſam, dici aut fortunam, aut quod eſt fortuitum, *id eſt*, neque eius quod neceſſariò & ſemper *fit*, neque eius quod plerumque *fit*: ſed quia nonnulla etiam ſunt, quæ præter hæc fiunt, atque omnes hæc aiunt eſſe à fortuna: conſtat, fortunam & caſum eſſe aliquid. nam quæ *ſunt* eiuſmodi, *eſſe* à fortuna: & quæ *ſunt* à fortuna, eiuſmodi eſſe nouimus. 2 Eorum autem quæ fiunt, alia fiunt alicuius gratiâ, alia minimè: illorum autem quædam ſunt ex prælectione, quædam non ex prælectione. ambo autem ſunt in iis quę alicuius gratiâ *fiunt*. quapropter perſpicuum *eſt*, etiam in iis quæ nec neceſſariò nec plerumque *fiunt*, eſſe nonnulla, in quibus eſſe poteſt quod *fit* alicuius gratiâ. ſunt autem alicuius gratiâ, cùm ea quæ à mente fieri poſſunt, tum etiam quæ à natura. Quæ igitur *ſunt* eiuſmodi, cùm ex accidenti fiunt, ea dicimus eſſe à fortuna. 3 Sicut enim ens, aliud eſt per ſe, aliud ex accidēti: ita etiam cauſa eſſe poteſt. vt ædium per ſe cauſa eſt quod eſt ædificandi facultate præditum: ex accidenti autem, album aut muſicum. 4 Quæ igitur *eſt* cauſa per ſe, definita *eſt*. quæ vero ex accidenti, indefinita: quoniam infinita poſſunt vni accidere. 5 Sicut igitur dictum fuit: quando in iis quæ alicuius cauſa fiunt, hoc fit, tum dicitur *eſſe* à caſu & à fortuna. Horum autem inter ſe differentia poſteriùs explicanda erit. ſed hoc in præſentia conſtet, vtraque in iis eſſe quæ alicuius cauſa *fiunt*. 6 Vtputà, argenti accipiendi gratiâ veniſſet vtiq; accepturus pecuniam, ſi ſciuiſſet: ſed non huius rei gratiâ venit: verùm accidit vt veniret, & hoc faceret accipiendi gratiâ: idque nec plerumque veniens in *eum* locum, nec neceſſariò. 7 Finis autem *id eſt* acceptio *pecuniæ*, non eſt *in numero* cauſarum quæ in ipſa re *ſunt*, ſed *eſt* eorum quæ ſub prælectionem cadunt, & à mēte *proficiſcuntur*. túncque dicitur fortuitò profectus eſſe. Quòd ſi *id* prælegiſſet, & huius gratiâ *iuiſſet*, vel ſemper aut plerūque *eò* ſe conferens acciperet *pecuniam: certè id* non *eſſet* à fortuna. 8 Patet igitur fortunam *eſſe* cauſam ex accidenti, in iis quæ rarò contingunt ſecundùm prælectionem eorum quæ alicuius gratiâ *fiunt*. 9 Quapropter in eodē *verſantur* mens & fortuna: quia prælectio non *eſt* ſine mente. 10 Neceſſe *eſt* igitur, vt eæ cauſæ ſint indefinitæ, à quibus fieri poteſt, quod *eſt* à fortuna. vnde fortuna videtur eſſe rei indefinitæ, atque homini occulta.

B Πρῶτον μὲν οὖν, ἐπειδὴ ὁρῶμεν τὰ μὲν ἀεὶ ὡσαύτως γινόμενα, τὰ δὲ ὡς ἐπὶ τὸ πολύ, φανερὸν ὅτι οὐδετέρου τούτων αἰτία ἡ τύχη λέγεται, οὐδὲ τὸ ἀπὸ τύχης, οὔτε τοῦ ἐξ ἀνάγκης καὶ ἀεί, οὔτε τοῦ ὡς ἐπὶ τὸ πολύ. ἀλλ᾽ ἐπειδὴ ἔστι τινὰ ἃ γίγνεται καὶ παρὰ ταῦτα, καὶ πάντες ταῦτά φασιν εἶναι ἀπὸ τύχης, φανερὸν ὅτι ἔστι τι ἡ τύχη καὶ τὸ αὐτόματον· τά τε γὰρ τοιαῦτα ἀπὸ τύχης, καὶ τὰ ἀπὸ τύχης τοιαῦτα ὄντα ἴσμεν. 2 Τῶν δὲ γινομένων τὰ μὲν ἕνεκά του γίγνεται, τὰ δ᾽ οὔ· τούτων δὲ τὰ μὲν κατὰ προαίρεσιν, τὰ δ᾽ οὐ κατὰ προαίρεσιν, ἄμφω δ᾽ ἐν τοῖς ἕνεκά του· ὥστε δῆλον, ὅτι καὶ ἐν τοῖς παρὰ τὸ ἀναγκαῖον C καὶ τὸ ὡς ἐπὶ τὸ πολύ, ἔστιν ἔνια, περὶ ἃ ἐνδέχεται ὑπάρχειν τὸ ἕνεκά του· ἔστι δὲ ἕνεκά του, ὅσα τε ἀπὸ διανοίας ἂν πραχθείη, καὶ ὅσα ἀπὸ φύσεως. τὰ δὴ τοιαῦτα ὅταν κατὰ συμβεβηκὸς γένηται, ἀπὸ τύχης φαμὲν εἶναι. 3 Ὥσπερ γὰρ καὶ ὄν ἐστι τὸ μὲν καθ᾽ αὑτό, τὸ δὲ κατὰ συμβεβηκός, οὕτω καὶ αἴτιον ἐνδέχεται εἶναι· οἷον οἰκίας, καθ᾽ αὑτὸ μὲν αἴτιον τὸ οἰκοδομικόν, κατὰ συμβεβηκὸς δὲ τὸ λευκὸν ἢ τὸ μουσικόν. 4 Τὸ μὲν οὖν καθ᾽ αὑτὸ αἴτιον, ὡρισμένον. τὸ δὲ κατὰ συμβεβηκός, ἀόριστον· ἄπειρα γὰρ ἂν τῷ ἑνὶ συμβαίη. 5 Καθάπερ οὖν ἐλέχθη, D ὅταν ἐν τοῖς ἕνεκά του γιγνομένοις τοῦτο γένηται, τότε λέγεται ἀπὸ ταὐτομάτου καὶ ἀπὸ τύχης. αὐτῶν δὲ πρὸς ἄλληλα τὴν διαφορὰν τούτων ὕστερον διοριστέον. νῦν δὲ τοῦτο ἔστω φανερόν, ὅτι ἄμφω ἐν τοῖς ἕνεκά του ἐστίν. 6 Οἷον ἕνεκα τοῦ ἀπολαβεῖν τὸ ἀργύριον, * ἦλθεν ἂν κομισόμενος τὸν ἔρανον, εἰ ᾔδει. ἦλθε δὲ οὐ τούτου ἕνεκα, ἀλλὰ συνέβη ἐλθεῖν, καὶ ποιῆσαι τοῦτο, τοῦ κομίσασθαι ἕνεκα. τοῦτο δὲ οὐδ᾽ ὡς ἐπὶ τὸ πολὺ φοιτῶν εἰς τὸ χωρίον, οὔτε ἐξ ἀνάγκης. 7 Ἔστι δὲ τὸ τέλος ἡ κομιδή, οὐ τῶν ἐν αὐτῷ E αἰτίων, ἀλλὰ τῶν * προαιρετῶν καὶ ἀπὸ διανοίας· καὶ λέγεταί γε τότε ἀπὸ τύχης ἐλθεῖν. εἰ δὲ προελόμενος, καὶ τούτου ἕνεκα, ἢ ἀεὶ φοιτῶν, ἢ ὡς ἐπὶ τὸ πολὺ κομιζόμενος, οὐκ ἀπὸ τύχης. 8 Δῆλον ἄρα ὅτι ἡ τύχη αἰτία κατὰ συμβεβηκὸς ἐν τοῖς κατὰ προαίρεσιν, τῶν ἕνεκά του. 9 Διὸ περὶ τὸ αὐτὸ διάνοια καὶ τύχη· ἡ γὰρ προαίρεσις οὐκ ἄνευ διανοίας. 10 Ἀόριστα μὲν οὖν τὰ αἴτια ἀνάγκη εἶναι, ἀφ᾽ ὧν ἂν γένοιτο τὸ ἀπὸ τύχης. ὅθεν δοκεῖ ἡ τύχη τοῦ ἀορίστου εἶναι, καὶ ἄδηλος ἀνθρώπῳ.

* lege, ἦλθεν ἂν κομιζόμενος τὸν ἔρ. vide Philoponum. Latini interpretes hunc locum non intellexerunt.

* καὶ προαιρετῶν

11 Καὶ ἔστιν ὡς οὐδὲν ἀπὸ τύχης δόξειεν ἂν γίνεσθαι. πάντα γὰρ ταῦτα ὀρθῶς λέγεται, ὅτι εὐλόγως. ἔστι μὲν γὰρ ὡς γίνεται ἀπὸ τύχης· κατὰ συμβεβηκὸς γὰρ γίνεται, καὶ ἔστιν αἴτιον ὡς συμβεβηκὸς, ἡ τύχη· ὡς δ᾽ ἁπλῶς, οὐδενός. 12 Οἷον οἰκίας, οἰκοδόμος μὲν αἴτιος, κατὰ συμβεβηκὸς δὲ αὐλητής· καὶ τοῦ ἐλθόντα κομίσασθαι τὸ ἀργύριον, μὴ τούτου ἕνεκα ἐλθόντα, ἄπειρα τὸ πλῆθος· καὶ γὰρ ἰδεῖν τινα βουλόμενος, καὶ διώκων, καὶ θεασόμενος, καὶ φεύγων. 13 Καὶ τὸ φάναι, εἶναί τι παράλογον τὴν τύχην, ὀρθῶς· ὁ γὰρ λόγος ἢ τῶν ἀεὶ ὄντων, ἢ τῶν ὡς ἐπὶ τὸ πολύ· ἡ δὲ τύχη ἐν τοῖς γινομένοις παρὰ ταῦτα. ὥστ᾽ ἐπεὶ ἀόριστα τὰ οὕτως αἴτια, καὶ ἡ τύχη ἀόριστον. 14 Ὅμως δ᾽ ἐπ᾽ ἐνίων ἀπορήσειεν ἄν τις. ἆρ᾽ οὖν τὰ τυχόντα αἴτια ἂν γένοιτο τῆς τύχης, οἷον ὑγιείας, * ἢ πνεῦμα, ἢ εἵλησις, ἀλλ᾽ οὐ τὸ ἀποκεκάρθαι· ἔστι γὰρ ἄλλα ἄλλων ἐγγύτερα τῶν κατὰ συμβεβηκὸς αἰτίων. 15 Τύχη δὲ ἀγαθὴ μὲν λέγεται, ὅταν ἀγαθόν τι ἀποβῇ· φαύλη δὲ, ὅταν φαῦλόν τι. 16 Εὐτυχία δὲ καὶ δυστυχία, ὅταν μέγεθος ἔχοντα ταῦτα· διὸ καὶ τὸ παρὰ μικρὸν, κακὸν ἢ ἀγαθὸν λαβεῖν μέγα, ἢ δυστυχεῖν, ἢ εὐτυχεῖν ἐστιν, ὅτι ὡς ὑπάρχον λέγει ἡ διάνοια. τὸ γὰρ παρὰ μικρὸν, ὥσπερ οὐδὲν ἀπέχειν δοκεῖ. 17 Ἔτι, ἀβέβαιον ἡ εὐτυχία, εὐλόγως· ἡ γὰρ τύχη ἀβέβαιος· οὔτε γὰρ ἀεὶ, οὔθ᾽ ὡς ἐπὶ τὸ πολὺ, οἷόν τε εἶναι τῶν ἀπὸ τύχης οὐδέν.

* γ. ὁ ἥλιος.

A 11 Et aliquo modo nihil à fortuna fieri poſſe videtur. hæc. n. omnia rectè dicuntur: quia *ſunt* rationi cõſentanea. nam aliquo modo fit à fortuna: ex accidenti namque: ac fortuna eſt cauſa vt accidens, ſimpliciter autem nullius *rei cauſa eſt*. 12 Vtputà, ædium cauſa quidem *eſt* ædificator, ſed ex accidẽti tibicen. & vt, cùm in forum venerit, argentum accipiat, qui nõ huius cauſa venit, *cauſæ ſunt* multitudine infinitę. nam & videre aliquem volens, & perſequens, & inſpecturus, & fugiẽs, *cauſæ hoc modo dici poſſunt*. 13 Illud quoque rectè *dicitur*, fortunã eſſe à ratione alienam: quoniam ratio *eſt* eorum, quæ ſemper aut quæ plerumque ſunt: fortuna verò in iis *cernitur*, quæ præter hæc fiunt: adeo vt, quia indefinitæ *ſunt*, quæ ita ſunt B cauſæ, etiã fortuna ſit res indefinita. 14 Verùtamen de quibuſdã aliquis dubitare poſſit, an quævis cauſę fieri poſſint ipſius fortunæ. velvti, an valetudinis *cauſa ſit* aut ventus, aut æſtus, non detonſum eſſe. nam cauſarum accidentariarũ aliæ ſunt aliis propinquiores. 15 Secunda autem fortuna dicitur, cùm aliquid boni euenit. aduerſa verò cùm aliquid mali. 16 Fortunæ verò proſperitas, & infortunium *ſeu calamitas tum dicitur*, cùm hæc magna ſunt. quare etiã cùm parum abeſt quin in magnum aliquod malum vel bonum inciderimus, id quoque eſt infortunio vel proſperitate fortunæ vti: quia mens *id* aſſerit, quaſi ſit. quod. n. parum *abeſt*, quaſi nihil abeſſe videtur. 17 Præterea fortunę proſperitas inconſtans eſt meritò: quoniam *ipſa* fortuna inconſtans *eſt*: vtpote cùm nihil eorum quæ à fortuna *proficiſcuntur*, aut ſemper aut plerumque eſſe poſſit.

Collatio fortunæ & caſus, cùm inter ſe, tum etiam cum cauſis per ſe.

Cap. VI.

C Ἔστι μὲν οὖν ἄμφω αἴτια, καθάπερ εἴρηται, κατὰ συμβεβηκὸς, καὶ ἡ τύχη, καὶ τὸ αὐτόματον, ἐν τοῖς ἐνδεχομένοις γίνεσθαι μὴ ὡς ἁπλῶς, μηδὲ ὡς ἐπὶ τὸ πολύ· καὶ τούτων, ὅσα ἂν γένοιτο ἐν τοῖς ἕνεκά του. 2 Διαφέρει δὲ, ὅτι τὸ αὐτόματον ἐπὶ πλεῖόν ἐστι· τὸ μὲν γὰρ ἀπὸ τύχης, ἀπὸ ταὐτομάτου· τοῦτο δὲ οὐ πᾶν ἀπὸ τύχης. 3 Ἡ μὲν γὰρ τύχη καὶ τὸ ἀπὸ τύχης, ἐστὶν ὅσοις καὶ τὸ εὐτυχῆσαι ἂν ὑπάρξειε, καὶ ὅλως πρᾶξις. διὸ καὶ ἀνάγκη περὶ τὰ πρακτὰ εἶναι τὴν τύχην. σημεῖον δὲ, ὅτι δοκεῖ ἤτοι ταὐτὸν εἶναι τῇ εὐδαιμονίᾳ, ἢ ἐγγύς· ἡ δ᾽ εὐδαιμονία, πρᾶξίς τις. εὐπραξία γάρ· ὥσθ᾽ * ὅσοις μὴ ἐνδέχεται πρᾶξαι, οὐδὲ τὸ ἀπὸ τύχης τι ποιῆσαι. 4 Καὶ διὰ τοῦτο οὔτε ἄψυχον οὐδὲν, οὔτε θηρίον, οὔτε παιδίον οὐδὲν ποιεῖ ἀπὸ τύχης, ὅτι οὐκ ἔχει προαίρεσιν· οὐδ᾽ εὐτυχία οὐδὲ ἀτυχία ὑπάρχει τούτοις, εἰ μὴ καθ᾽ ὁμοιότητα· ὥσπερ ἔφη Πρώταρχος, εὐτυχεῖς εἶναι τοὺς λίθους ἐξ ὧν οἱ βωμοὶ, ὅτι τιμῶνται, οἱ δὲ ὁμόζυγες αὐτῶν καταπατοῦνται. 5 Τὸ δὲ πάσχειν ἀπὸ τύχης, ὑπάρχει πως καὶ τούτοις, ὅταν ὁ πράττων τι περὶ αὐτὰ, πράξῃ ἀπὸ τύχης. ἄλλως δὲ οὐκ ἔστι. 6 Τὸ δὲ αὐτόματον καὶ τοῖς ἄλλοις ζῴοις, καὶ πολλοῖς * τῶν ἀψύχων. οἷον ὁ ἵππος αὐτόματος, φαμὲν, ἦλθεν, ὅτι ἐσώθη μὲν ἐλθὼν, οὐ τοῦ σωθῆναι δὲ ἕνεκεν ἦλθε. καὶ ὁ τρίπους αὐτόματος κατέπεσεν· ἔστη μὲν γὰρ τοῦ καθῆσθαι ἕνεκεν, ἀλλ᾽ οὐ τοῦ καθῆσθαι ἕνεκεν κατέπεσεν. 7 Ὥστε φανερὸν ὅτι ἐν τοῖς ἁπλῶς ἕνεκά του γινομένοις, ὅταν μὴ τοῦ συμβαίνοντος ἕνεκα γένηται, ὧν ἔξω τὸ αἴτιον,

* γ. ἐπείπερ

* γ. τοῖς ἀψύχοις.

VTræque igitur ſunt cauſæ ſicut dictum fuit, ex accidenti, tam fortuna quã caſus; *videlicet* in iis quæ fieri contingit nec ſimpliciter, nec plerũque, & *ſunt in* horũ *numero* quæ fieri poſſunt alicuius gratiâ. 2 Differunt autem: quia caſus latiùs patet. quod. n. à fortuna *eſt*, caſu *eſt*: hoc autem non omne *eſt* à fortuna. 3 Nam fortuna & fortuitum *in iis* eſt, in quibus & fortunę proſperitas ineſſe poteſt, & omnino actio *ſpectatur*. quare neceſſe *eſt*, vt fortuna in iis *rebus* verſetur quæ ſub actionem cadunt. cuius ſignum *eſt*, quia fortunæ proſperitas videtur aut idem eſſe quod beatitudo, aut *ei* propinqua: beatitudo verò *eſt* actio quædam, ſi quidẽ *eſt* recta actio. quocirca quæcumque nõ poſſunt agere, *ea* nec fortuitò aliquid facere *queunt*. 4 Atque ob hanc cauſam nec inanimatũ aliD quid, nec bellua, nec infans facit aliquid fortuitò: quia non habet prælectionem. nec fortunæ proſperitas vel infortunium his ineſt, niſi ſecundùm ſimilitudinem: vt Protarchus dixit fortunatos eſſe lapides ex quibus aræ extruuntur, quia honorãtur, cùm alij eiuſdem generis, *pedibus* conculcentur. 5 Sed & pati à fortuna, his quodammodo ineſt, quãdo *ſcilicet* qui in his aliquid facit, fortuitò facit. aliter verò non *ineſt*. 6 Caſus autem aliis quoque animalibus, & multis rebus inanimatis *attribuitur*, vtputà dicimus equum caſu veniſſe: quia, cùm veniret, ſeruatus eſt, non tamen ob eam cauſam venit, vt ſeruaretur. ac tripoda caſu cecidiſſe: ſtetit enim ſedendi gratiâ: ſed non ob eam cauſam cecidit, vt quis ſederet. 7 Quare perſpicuum *eſt*, in iis quæ ſimpliciter alicuius cauſa fiunt, quando non eius quod contigit, gratiâ facta ſunt, quæ externam cauſam habent,

tunc nos dicere *hæc* caſu *eſſe facta*. Horũ autem *ea fieri* à fortuna, quę caſu fiunt, & ſub eorum præelectionẽ cadunt quæ prçelectione ſunt prædita. 8 Argumẽto *eſt vox* μάτην, *id eſt, fruſtra*: quia *tunc* dicitur *aliquid fruſtra fieri*, cùm *id* non fit cuius gratiâ, ſed quod *eſt* illius gratiâ. vt deambulatio ſi purgationis gratiâ eſt, nec purgatio euenit ei qui deambulauit: dicimus eũ fruſtra deambulaſſe, ac deambulationẽ *ſuo fine eſſe* fruſtratam: tanquam hoc ſit μάτην, *id eſt, fruſtra*, quod ſua naturâ in alterius gratiam eſt comparatum, quando *ſcilicet* non perficit id cuius gratiâ eſt, & natura comparatum eſt. Nam ſi quis dicat ſe fruſtra lauiſſe, quia ſol nõ defecit, ridiculus profectò erit: quoniam hoc nõ eſt illius gratiâ. Sic igitur τὸ αὐτόματον, *id eſt, caſus*, nominis ratione habita, *tunc dicitur*, cũ ipſum fruſtra fit. cecidit.n. lapis non feriendi gratiâ: caſu igitur lapis cecidit, quia cadere poteſt etiam ab aliquo feriendi gratiâ *proiectus*. 9 Maximè autem *à caſu* ſeiungitur, quod *eſt* à fortuna, in iis quæ à natura fiunt. cùm. n. factum eſt aliquid præter naturam, tunc nõ dicimus id factum eſſe à fortuna, ſed potiùs caſu quanquã & hoc eſt diuerſũ: illius.n. cauſa *eſt* externa, huius verò interna. 10 Quid igitur ſit caſus, & quid fortuna, dictum eſt, & quid inter ſe differant. 11 *Quod autem ad* cauſæ modum *attinet*, horũ vtrumque in iis *cauſis numeratur* vnde *eſt* principiũ motus. ſemper.n. eſt cauſa vel eorum quæ natura vel eorum quæ à mente *fiunt*: ſed horum multitudo *eſt* indefinita. 12 Cùm autem caſus & fortuna ſint *earum rerum* cauſæ, quarum mẽs aut natura poteſt eſſe cauſa, quãdo *ſcilicet* aliquid ex accidẽti fit horum ipſorum gratiâ: nihil autem *quod fit* ex accidẽti prius ſit iis quæ *ſunt* per ſe: patet etiam cauſam ex accidenti, non eſſe priorem *cauſa* per ſe. caſus igitur & fortuna ſunt *cauſæ* poſteriores mente & natura. quare etiam ſi quã maximè caſus *eſſet* cœli cauſa, *tamen* neceſſe *eſſet* mentem & naturam eſſe cauſam priorem cùm multarum aliarum rerum, tum etiam huius vniuerſi.

A τότε ἀπὸ τοῦ αὐτομάτου λέγομεν· ἀπὸ τύχης δέ, τούτων ὅσα ἀπὸ τοῦ αὐτομάτου γίνεται τῶν προαιρετῶν τοῖς ἔχουσι προαίρεσιν. 8 Σημεῖον δὲ τὸ μάτην, ὅτι λέγεται,* ὅταν μὴ γίνηται τὸ ἕνεκα ἄλλου, ἐκείνου ἕνεκα ᾖ, ὃ βαδίσαι, εἰ λαπάξεως ἕνεκά ἐστιν· εἰ δὲ μὴ ἐγένετο βαδίσαντι, μάτην ἔφαμεν βαδίσαι, καὶ ἡ βάδισις ματαία, ὡς τοῦτο ὂν τὸ μάτην, τὸ πεφυκὸς ἄλλου ἕνεκα, ὅταν μὴ περαίνῃ ἐκεῖνο οὗ ἕνεκα ἦν, καὶ ἐπεφύκει. ἐπεὶ εἴ τις λούσασθαι φαίη μάτην, ὅτι οὐκ ἐξέλιπεν ὁ ἥλιος, γελοῖος ἂν B εἴη· οὐ γὰρ ἦν τοῦτο ἐκείνου ἕνεκα. οὕτω δὴ τὸ αὐτόματον κατὰ τοὔνομα, ὅταν αὐτὸ μάτην γίνηται· κατέπεσε γὰρ οὐ τοῦ πατάξαι ἕνεκα ὁ λίθος. ἀπὸ τοῦ αὐτομάτου ἄρα κατέπεσεν ὁ λίθος· ὅτι πέσοι ἂν ἀπό τινος, καὶ τοῦ πατάξαι ἕνεκα. 9 Μάλιστα δέ ἐστι χωριζόμενον τὸ ἀπὸ τύχης ἐν τοῖς φύσει γινομένοις· ὅταν γὰρ γένηταί τι παρὰ φύσιν, τότε οὐκ ἀπὸ τύχης, ἀλλὰ μᾶλλον ἀπὸ ταὐτομάτου γεγονέναι φαμέν. ἔστι δὲ καὶ τοῦτο ἕτερον· τοῦ μὲν γὰρ ἔξω τὸ αἴτιον, τοῦ δ' ἐντός. 10 Τί μὲν οὖν ἐστι τὸ αὐτόματον, καὶ τί ἡ τύχη, εἴρηται, καὶ τί διαφέρουσιν ἀλλήλων. 11 * Τῶν δὲ τρόπων τῆς αἰ- C τίας ἐν τοῖς ὅθεν ἡ ἀρχὴ τῆς κινήσεως, * ἑκάτερον αὐτῶν. ἢ γὰρ τῶν φύσει, ἢ τῶν ἀπὸ διανοίας, αἴτιον ἀεί ἐστιν· ἀλλὰ τούτων τὸ πλῆθος ἀόριστον. 12 Ἐπεὶ δ' ἐστὶ τὸ αὐτόματον καὶ ἡ τύχη αἴτια ὧν ἂν ἢ νοῦς γένοιτο αἴτιος, ἢ φύσις, ὅταν κατὰ συμβεβηκὸς αἴτιόν τι γένηται τούτων αὐτῶν· οὐδὲν δὲ κατὰ συμβεβηκός ἐστι πρότερον τῶν καθ' αὑτό· δῆλον ὅτι οὐδὲ τὸ κατὰ συμβεβηκὸς αἴτιον πρότερον τοῦ καθ' ἑαυτό. ὕστερον ἄρα τὸ αὐτόματον καὶ ἡ τύχη καὶ νοῦ καὶ φύσεως· ὥστε εἰ ὅτι μάλιστα τοῦ οὐρανοῦ αἴτιον τὸ αὐτόματον, ἀνάγκη πρότερον νοῦν αἴτιον καὶ φύσιν εἶναι καὶ ἄλλων πολλῶν, καὶ τοῦδε τοῦ παντός.

* γρ. ὅταν μὴ γένηται τὸ οὗ ἕνεκα, ἀλλὰ ὃ ἐκείνου ἕνεκα. Vide Simplicium. Vicom. ſic, ὅταν μὴ γένηται τοῦ ἕνεκα ἄλλου, ἐκείνου ἕνεκα.

* γρ. τινὶ δὲ τρόπῳ

* γρ. ἑκατέρου

DE DEMONSTRATIONIBVS PHYSICIS,

TRACTATVS IV.

Phyſicum demonſtrare per omnia genera cauſarum.

Cap. VII.

ESſe autem cauſas, ac tot eſſe numero, quot diximus, manifeſtum *eſt*. tot etenim numero cõprehendit *quæſtio* cur ſit: nã *quæſtio* cur ſit, vel ad quidditatem inducitur, *quæ* extremum *eſt* in *rebus* immobilibus, vt in mathematicis: ad definitionem.n. recti, aut ſymmetri, aut alius cuiuſpiam ad poſtremum reuocatur. vel ad primum mouens: velut i, cur pugnarunt? quia prędati ſunt. vel cuius gratiâ? vt dominentur. vel in iis quæ fiũt, materia. Has igitur ac tot eſſe cauſas perſpicuum *eſt*. 2 Cùm autem cauſæ quatuor *ſint*: omnes noſſe, phyſici *munus* eſt: & ad omnes referens, *cauſam* cur ſit, phyſicè reddet: *nimirum ad* materiam, formam, mouens, *&* id cuius gratiâ. 3 Sed tres plerumque in vnam coeũt, nam quid eſt, & id cuius gratiâ, vnum ſunt: primum autem à quo motus *proficiſcitur*, ſpecie ab his non differt: homo namque hominẽ gignit: & omnino quæcumque mota mouent. quæcumque verò non *mota mouẽt*, non ſunt ampliùs phyſicæ *conſiderationis*: quia mouent, cùm in ſe ipſis

D ΟΤι δ' ἐστὶν αἴτια, καὶ ὅτι ἔστι τοσαῦτα τὸν ἀριθμὸν ὅσα φαμέν, δῆλον· τοσαῦτα γὰρ τὸν ἀριθμόν, τὸ διὰ τί περιείληφεν. ἢ γὰρ εἰς τὸ τί ἐστιν ἀνάγεται τὸ διὰ τί, ἔσχατον ἐν τοῖς ἀκινήτοις, οἷον ἐν τοῖς μαθήμασιν· εἰς ὁρισμὸν γὰρ τοῦ εὐθέος, ἢ συμμέτρου, ἢ ἄλλου τινὸς ἀνάγεται ἔσχατον· ἢ εἰς τὸ κινῆσαν πρῶτον, οἷον, διὰ τί ἐπολέμησαν; ὅτι ἐσύλησαν· ἢ τίνος ἕνεκα; ἵν' ἄρξωσιν· ἢ ἐν τοῖς γινομένοις, ἡ ὕλη. ὅτι μὲν οὖν τὰ αἴτια * ταῦτα καὶ τοσαῦτα, φανερόν. 2 Ἐπεὶ δὲ αἰτίαι τέσσαρες, περὶ πασῶν τοῦ φυσικοῦ εἰδέναι· καὶ εἰς πάσας ἀνάγων τὸ διὰ τί, * ἀποδώσει φυσικῶς, τὴν ὕλην, τὸ εἶδος, τὸ κινῆσαν, τὸ οὗ ἕνεκα. ἔρχεται δὲ τὰ τρία εἰς τὸ ἓν πολλάκις· τὸ μὲν γὰρ τί ἐστι, καὶ τὸ οὗ ἕνεκα, ἕν ἐστι· τὸ δὲ ὅθεν ἡ κίνησις πρῶτον, τῷ εἴδει ταὐτὸ τούτοις. ἄνθρωπος μὲν γὰρ ἄνθρωπον γεννᾷ· καὶ ὅλως ὅσα κινούμενα, κινεῖ· ὅσα δὲ μή, οὐκ ἔτι φυσικῆς· οὐ γὰρ ἐν ἑαυτοῖς

* γρ. ταῦτα δὲ τοιαῦτα,

* γρ. ἀποδείξει τις

ἔχοντα κίνησιν, οὐδ' ἀρχὴν κινήσεως, κινεῖ, ἀλλ' ἀκίνητα A ὄντα. 4 Διὸ τρεῖς αἱ πραγματεῖαι, ἡ μὲν, περὶ ἀκινήτου· ἡ δὲ, περὶ κινουμένου μὲν, ἀφθάρτου δέ· ἡ δὲ, περὶ τὰ φθαρτά. 5 Ὥστε τὸ διὰ τί καὶ εἰς τὴν ὕλην ἀνάγοντι ἀποδίδοται, καὶ εἰς τὸ τί ἐστι, καὶ εἰς τὸ πρῶτον κινῆσαν. περὶ γενέσεως γὰρ μάλιστα τοῦτον τὸν τρόπον τὰς αἰτίας σκοποῦσι, τί μετὰ τί γίνεται, καὶ τί πρῶτον ἐποίησεν, ἢ τί ἔπαθε, καὶ οὕτως ἀεὶ τὸ ἐφεξῆς. 6 Διτταὶ δὲ ἀρχαὶ αἱ κινοῦσαι φυσικῶς, ὧν ἡ ἑτέρα οὐ φυσική· οὐ γὰρ ἔχει κινήσεως ἀρχὴν ἐν ἑαυτῇ. τοιοῦτο δ' ἐστὶν, εἴ τι κινεῖ μὴ κινούμενον, ὥσπερ τό, τε παντελῶς ἀκίνητον, καὶ τὸ πάντων πρῶτον, καὶ B τὸ τί ἐστι, καὶ ἡ μορφή· τέλος γὰρ καὶ οὗ ἕνεκα. 7 Ὥστε ἐπεὶ ἡ φύσις ἕνεκά του, καὶ ταύτην εἰδέναι δεῖ * 8 Καὶ πάντως ἀποδοτέον τὸ διὰ τί, οἷον ὅτι ἐκ τοῦδε ἀνάγκη τόδε· τὸ δὲ ἐκ τοῦδε ἢ ἁπλῶς, ἢ ὡς ἐπὶ τὸ πολύ. καὶ εἰ μέλλει τοδὶ ἔσεσθαι, ὥσπερ ἐκ τῶν προτάσεων τὸ συμπέρασμα· καὶ ὅτι τοῦτο ἦν τὸ τί ἦν εἶναι, καὶ διότι βέλτιον οὕτως, οὐχ ἁπλῶς· ἀλλὰ τὸ πρὸς τὴν ἑκάστου οὐσίαν.

* γρ. πάντως, ſine καί.

A nõ habeant motum, nec principium motus, ſed ſint immobilia. 4 Idcirco tres *ſunt* tractationes: vna de immobili: altera de eo quod mouetur quidẽ, ſed eſt interitus expers: tertia de *rebus* interitui obnoxiis. 5 Quocirca redditur *cauſa* cur ſit, & ab eo qui refert ad materiã, & ad quidditatem & ad primũ mouens. Etenim de generatione maximè hoc modo cauſas conſiderant, quid poſt quid fiat, & quid primũ fecerit, aut quid paſſum ſit, & ita ſemper quod deinceps *ſequitur*. 6 Duo autem *ſunt* principia mouentia naturaliter: quorum alterum non *eſt* phyſicum, quod non habet in ſe principium motus. tale autem eſt, ſi quid mouet, nec mouetur: velvti, *quod eſt* omnino immo- B bile, & omnium primum & quidditas & forma: *eſt* enim finis, & id cuius gratiâ. 7 Quapropter cùm natura alicuius gratiâ *agat*, etiam hanc *cauſam* noſſe oportet. 8 Et omnino reddenda *eſt cauſa* cur ſit: velvti, quia ex illo neceſſe eſt hoc fieri; ex illo inquam, aut ſimpliciter, aut plerũque: & ſi hoc eſt futurum, vt ex propoſitionibus cõcluſio: & quia hæc eſt quidditas: & quia meliùs ita *eſt*, non ſimpliciter, ſed *relatione habita* ad cuiuſque rei eſſentiam.

An natura agat propter finem. Cap. VIII.

Λεκτέον δὲ, πρῶτον μὲν, * διότι ἡ φύσις τῶν ἕνεκά C του αἰτίων· ἔπειτα περὶ τοῦ ἀναγκαίου, πῶς ἔχει ἐν τοῖς φυσικοῖς· εἰς γὰρ ταύτην τὴν αἰτίαν ἀνάγουσι πάντες, ὅτι ἐπεὶ τὸ θερμὸν τοιονδὶ πέφυκε, καὶ τὸ ψυχρὸν, καὶ ἕκαστον δὴ τῶν τοιούτων, ταδὶ ἐξ ἀνάγκης ἐστὶ καὶ γίνεται, καὶ πέφυκε. καὶ γὰρ κἂν ἄλλην αἰτίαν εἴπωσιν, ὅσον ἁψάμενοι χαίρειν ἐῶσιν, ὁ μὲν τὴν φιλίαν καὶ τὸ νεῖκος, ὁ δὲ τὸν νοῦν. 2 Ἔχει δ' ἀπορίαν, τί κωλύει τὴν φύσιν μὴ ἕνεκά του ποιεῖν * μηδ' ὅτι βέλτιον, ἀλλ' ὥσπερ ὕει ὁ Ζεὺς, οὐχ ὅπως τὸν σῖτον αὐξήσῃ, ἀλλ' ἐξ ἀνάγκης· τὸ γὰρ ἀναχθὲν, ψυχθῆναι δεῖ, καὶ τὸ ψυχθὲν, ὕδωρ γενόμενον κατελθεῖν· τὸ δὲ αὐξάνεσθαι τούτου γενομένου συμβαίνει τὸν D σῖτον. ὁμοίως δὲ καὶ εἴ τῳ ἀπόλλυται ὁ σῖτος ἐν τῇ ἅλῳ, οὐ τούτου ἕνεκα ὕει, ὅπως ἀπόληται, ἀλλὰ τοῦτο συμβέβηκεν. ὥστε τί κωλύει οὕτω καὶ τὰ μέρη ἔχειν ἐν τῇ φύσει; οἷον τοὺς ὀδόντας ἐξ ἀνάγκης ἀνατεῖλαι, τοὺς μὲν ἐμπροσθίους ὀξεῖς, ἐπιτηδείους πρὸς τὸ διαιρεῖν· τοὺς δὲ γομφίους πλατεῖς, καὶ χρησίμους πρὸς τὸ λεαίνειν τὴν τροφήν· ἐπεὶ οὐ τούτου ἕνεκα γενέσθαι, ἀλλὰ συμπεσεῖν. ὁμοίως δὲ καὶ περὶ τῶν ἄλλων μερῶν, ἐν ὅσοις δοκεῖ ὑπάρχειν τὸ ἕνεκά του. 3 Ὅπου μὲν οὖν ἅπαντα συνέβη, ὥσπερ κἂν εἰ ἕνεκά του ἐγίνετο, ταῦτα μὲν ἐσώθη ἀπὸ τοῦ αὐτομάτου συστάντα ἐπιτηδείως· ὅσα δὲ μὴ οὕτως, ἀπώλετο καὶ ἀπόλ- E λυται, καθάπερ Ἐμπεδοκλῆς λέγει τὰ βουγενῆ καὶ ἀνδρόπρωρα. 4 Ὁ μὲν οὖν λόγος, * ᾧ ἄν τις ἀπορήσειεν, οὗτος, καὶ εἴ τις ἄλλος τοιοῦτός ἐστιν. 5 Ἀδύνατον δὲ ταῦτα τοῦτον ἔχειν τὸν τρόπον· ταῦτα μὲν γὰρ καὶ πάντα τὰ φύσει, ἢ ἀεὶ οὕτω γίνεται, ἢ ὡς ἐπὶ τὸ πολύ· τῶν δ' ἀπὸ τύχης καὶ τοῦ αὐτομάτου οὐδέν. οὔτε γὰρ ἀπὸ τύχης, οὔτε ἀπὸ συμπτώματος δοκεῖ ὕειν πολλάκις τοῦ χειμῶνος, ἀλλ' ἐὰν ὑπὸ κύνα· οὐδὲ καύματα ὑπὸ κύνα, ἀλλ' ἂν χειμῶνος. εἰ οὖν ἢ ἀπὸ συμπτώματος δοκεῖ, ἢ ἕνεκά του εἶναι, εἰ μὴ οἷόν τε ταῦτα εἶναι, μήτε ἀπὸ συμπτώματος, μήτε ἀπὸ ταὐτομάτου, ἕνεκά του ἂν εἴη. ἀλλὰ μὴν φύσει ἐστὶ τὰ τοιαῦτά γε πάντα, ὡς κἂν αὐτοὶ φαῖεν οἱ ταῦτα λέγοντες.

* γρ. διότι.

* γρ. μηδ' ὅ, τι male.

* γρ. ᾧ ἄν

C Dicendum porro eſt, primũ cur natura *ſit in* earũ cauſarum *numero* quę alicuius gratia *agunt*: deinde quomodo *ſe* habeat neceſſitas in *rebus* naturalibus. ad hanc. n. cauſam omnes referunt: *velvti*, quia naturâ eſt comparatum, vt, *quod eſt* calidum, ſit tale, & *quod eſt* frigidum, & vnumquodque eorum quæ talia ſunt, *idcirco* hæc neceſſariò ſunt, & fiunt, & naturâ comparatum eſt vt ſint: nam licèt aliam cauſam dicant, tamen, cùm vix attigerint, eam valere ſinũt, alius *ſcilicet* amicitiam & contentionem, alius mentem. 2 Eſt autẽ dubitatio, quid prohibeat naturam non facere alicuius gratia, nec quia *ita ſit* melius, ſed ſicut Iupiter pluit, non vt frumentum augeat, ſed ex neceſſitate. quod. n. ſublatum eſt, refrigerari opor- D tet, & refrigeratum, cùm ſit in aquam mutatum, deſcendere: accidit autem, vt hoc facto frumentũ augeatur. ſimiliter & ſi cui pereat frumentum in area: non huius gratia pluit, vt periret, ſed hoc accidit. quare quid prohibet ſic etiam partes habere in natura? velvti, dentes neceſſario ortos, anteriores quidem acutos, & ad ſcindendum aptos; molares autem latos, & ad molendum cibum idoneos. non enim huius cauſa factum *id* eſſe, ſed contigiſſe. ſimilis *ratio eſt* aliarum partium, quæ videntur eſſe alicuius gratia. 3 Vbi igitur omnia acciderunt perinde ac ſi alicuius gratia facta eſſent, hæc ſunt ſeruata, cùm caſu eſſent aptè conſtituta. quæ vero E non ita *facta ſunt*, perierunt, & pereunt: quemadmodum Empedocles inquit *periſſe* bouigena & androprora. 4 Ratio igitur, ob quam dubitare aliquis poſſit, hæc eſt, & ſi qua alia *eſt* eiuſmodi. 5 Sed impoſſibile *eſt*, vt hoc modo hæc *ſe* habeant. hæc enim, & quæcumque natura *conſtant*, aut ſemper ita fiunt, aut plerũque: eorum autem quæ à fortuna aut caſu *fiunt*, nihil *ſemper aut plerumque ita fit*: neque enim fortuitò neque caſu videtur ſæpe pluere hyeme, ſed ſi *id fiat, cùm ſol eſt* ſub cane: neque ęſtus ſub cane, ſed ſi hyeme. Si igitur aut caſu eſſe videtur, aut alicuius gratia: ſi hæc eſſe caſu non poſſunt, certè alicuius gratia erunt. atqui eiuſmodi omnia natura cõſtant, vt vel ipſi affirmarent, qui hæc dicũt.

eſſe igitur alicuius gratiâ, ineſt in rebus quæ fiunt, & conſtant natura. 6 Præterea in quibus eſt aliquis finis, huius gratiâ fit id quod *eſt* prius, & quod deinceps. ergo vt fit, ita natura aptum eſt fieri: & vt natura aptum eſt fieri, niſi quid impediat, ita vnumquodque fit. atqui fit alicuius gratia: ergo etiam natura aptum eſt fieri huius gratiâ. vtputà ſi domus *in* eorum *numero* eſſet, quæ natura fiunt: ſic vtique à natura fieret, vt nunc *fit* ab arte. quòd ſi ea quæ *fiunt* natura, non ſolùm natura, ſed etiam arte fierent: eodem ſane modo fierent, quo natura fieri apta ſunt. alterum igitur alterius gratia. & omnino ars partim perficit, quæ non poteſt natura perficere: partim *naturam* imitatur. Si igitur artificioſa fiunt alicuius gratia, patet etiam naturalia *ita fieri*. nam poſteriora & priora ſimiliter inter ſe affecta ſunt in *rebus* artificioſis, atque in *rebus* naturalibus. 7 Maximè autem *hoc* manifeſtum *eſt* in aliis animalibus, quæ nec arte nec adhibita inquiſitione aut conſultatione faciunt. ideo quidam dubitant, vtrùm mente, an alio quopiam operentur aranei, & formicæ, & eiuſmodi *animalia*. Paulatim verò ita progredienti, etiam in plantis videntur ea fieri, quæ ad finem conferunt: vt folia fructus tegendi gratia. quocirca ſi natura & alicuius gratia facit hirundo nidum, & araneus araneam, & plantæ folia fructuum gratia, & radices non ſurſum, ſed deorſum verſus, alimenti gratia: perſpicuum *eſt*, eiuſmodi cauſam eſſe in iis quæ natura fiunt & conſtant. 8 Et cùm natura duplex *ſit*, altera vt materia, altera vt forma; hæc autem *ſit* finis, & finis gratia reliqua ſint: certè hæc erit cauſa cuius gratia. 9 Peccatum autem committitur etiam in rebus artificioſis. ſcripſit enim non rectè grammaticus: & propinauit non rectè Medicus pharmacum. quare patet *id* contingere etiam in *rebus* naturalibus. Si igitur ſunt quædam artificioſa; in quibus quod rectè *fit*, alicuius gratia *fit*: in iis autem quæ peccantur, alicuius quidem* gratia *ars* aggreditur, ſed aberrat: res ſimiliter *ſe* habebit etiam in *rebus* naturalibus: ac monſtra *erunt* peccata eius quod alicuius gratia *agit*. Ergo & in primis conſtitutionibus bouigena, niſi ad aliquem terminum & finem venire poterant, vtique corrupto aliquo principio fiebant, vt nunc *fiunt* corrupto ſemine. 10 Præterea neceſſe *eſt*, ſemen priùs factum eſſe, non ſtatim animalia. & illud *οὐλοφυὲς, id eſt, confuſum & indigeſtum, exortum, quod* priùs *fuit*, ſemen erat. 11 Præterea & in plantis ineſt quod alicuius gratia *eſt*: ſed minùs eſt diſtinctum. vtrùm igitur etiam in plantis fiebant, ſicut bouigena androprora, ita etiam vitigena elæoprora, an non? quippe abſurdum *eſt*. atqui oportebat: ſiquidem & in animalibus. 12 Præterea oportebat etiam in ſeminibus fieri quidvis. 13 Omnino autem qui ſic dicit, ea tollit, quæ natura *conſtant*, & *ipſam* naturam. natura enim *conſtant*, quæcumque ab aliquo interno principio continenter mota, perueniunt ad aliquem finem. ab vnoquoque autem *principio* non *fit* idem ſingulis, nec quidvis, ſed ſemper ad eundem *peruenitur*, niſi quid impediat. 14 Id autem cuius gratia & id quod *eſt* eius gratia, fieri poſſunt etiam à fortuna: ſicut dicimus fortuitò veniſſe hoſpitem, & cùm redemerit, dimiſiſſe; quando *ſcilicet ita* egit, ac ſi huius gratia veniſſet, non tamen huius gratiâ venit: atque hoc *fecit* ex accidenti: nam fortuna *eſt in earum* cauſarum *numero*, quæ ex accidenti *agunt*, quemadmodum & antea diximus: ſed cùm hoc

A ἔστιν ἄρα τὸ ἕνεκά του ἐν τοῖς φύσει γινομένοις καὶ οὖσιν. 6 Ἔτι, ἐν ὅσοις τέλος τί ἐστι, τούτου ἕνεκα πράττεται τὸ πρότερον καὶ τὸ ἐφεξῆς. οὐκοῦν ὡς πράττεται, οὕτω πέφυκε. καὶ ὡς πέφυκεν, ἂν μή τι ἐμποδίζῃ, οὕτω πράττεται ἕκαστον. πράττεται δὲ ἕνεκά του· καὶ πέφυκεν ἄρα τούτου ἕνεκα. οἷον, εἰ οἰκία τῶν φύσει γινομένων ἦν, οὕτως ἂν ἐγίνετο, ὡς νῦν ὑπὸ τῆς τέχνης· εἰ δὲ τὰ φύσει, μὴ μόνον φύσει, ἀλλὰ καὶ τέχνῃ γίνοιτο, ὡσαύτως ἂν γίνοιτο ᾗ πέφυκεν. ἕνεκα ἄρα θατέρου θάτερον. ὅλως τε ἡ τέχνη τὰ μὲν ἐπιτελεῖ, ἃ ἡ φύσις ἀδυνατεῖ ἀπεργάσασθαι· τὰ δὲ μιμεῖται. εἰ οὖν τὰ κατὰ τέχνην ἕνεκά του, δηλονότι καὶ B τὰ κατὰ φύσιν· ὁμοίως γὰρ ἔχει πρὸς ἄλληλα ἐν τοῖς κατὰ τέχνην, καὶ ἐν τοῖς κατὰ φύσιν, τὰ ὕστερα πρὸς τὰ πρότερα. 7 Μάλιστα δὲ φανερὸν ἐπὶ τῶν ζώων* τῶν ἄλλων, ἃ οὔτε τέχνῃ, οὔτε ζητήσαντα, οὔτε βουλευσάμενα, ποιεῖ. ὅθεν διαποροῦσί τινες, πότερον νῷ, ἢ τινὶ ἄλλῳ ἐργάζονται οἵ τε ἀράχναι, καὶ οἱ μύρμηκες, καὶ τὰ τοιαῦτα. κατὰ μικρὸν δ' οὕτω* προϊόντι καὶ ἐν τοῖς φυτοῖς φαίνεται τὰ συμφέροντα γινόμενα πρὸς τὸ τέλος, οἷον, τὰ φύλλα ἕνεκα τῆς τοῦ καρποῦ σκέπης. ὥστ' εἰ φύσει τε ποιεῖ, καὶ ἕνεκά του ἡ χελιδὼν τὴν νεοττιάν, καὶ ὁ ἀράχνης τὸ ἀράχνιον, καὶ τὰ φυτὰ τὰ φύλλα, ἕνεκα τῶν καρ- C πῶν· καὶ τὰς ῥίζας οὐκ ἄνω, ἀλλὰ κάτω, ἕνεκα τῆς τροφῆς· φανερὸν ὅτι ἔστιν ἡ αἰτία ἡ τοιαύτη ἐν τοῖς φύσει γινομένοις καὶ οὖσι. 8 Καὶ ἐπεὶ ἡ φύσις διττή, ἡ μὲν ὡς ὕλη, ἡ δ' ὡς μορφή, τέλος δὲ αὕτη, τοῦ τέλους δὲ ἕνεκα τὰ ἄλλα· αὕτη ἂν εἴη ἡ αἰτία ἡ οὗ ἕνεκα. 9 Ἁμαρτία δὲ γίγνεται καὶ ἐν τοῖς κατὰ τέχνην· ἔγραψε γὰρ οὐκ ὀρθῶς ὁ γραμματικός, καὶ ἐπότισεν οὐκ ὀρθῶς ὁ ἰατρὸς τὸ φάρμακον· ὥστε δῆλον ὅτι ἐνδέχεται καὶ ἐν τοῖς κατὰ φύσιν. Εἰ δὴ ἔστιν ἔνια κατὰ τέχνην, ἐν οἷς τὸ ὀρθῶς ἕνεκά του· ἐν δὲ τοῖς ἁμαρτανομένοις, ἕνεκα μέν τινος ἐπιχειρεῖται, ἀλλ' ἀποτυγχάνεται· ὁμοίως ἂν ἔχοι D καὶ ἐν τοῖς φυσικοῖς· καὶ τὰ τέρατα ἁμαρτήματα ἐκείνου τοῦ ἕνεκά του. καὶ ἐν ταῖς ἐξ ἀρχῆς ἄρα συστάσεσι τὰ βουγενῆ, εἰ μὴ πρός τινα ὅρον καὶ τέλος δυνατὰ ἦν ἐλθεῖν, διαφθειρομένης ἂν ἀρχῆς τινος ἐγίνετο, ὥσπερ νῦν τοῦ σπέρματος. 10 Ἔτι, ἀνάγκη σπέρμα γενέσθαι πρῶτον, ἀλλὰ μὴ εὐθὺς τὰ ζῶα· καὶ τὸ* οὐλοφυὲς δὲ πρότερον σπέρμα ἦν. 11 Ἔτι καὶ ἐν τοῖς φυτοῖς ἔνεστι τὸ ἕνεκά του, ἧττον δὲ διήρθρωται. πότερον οὖν καὶ ἐν τοῖς φυτοῖς ἐγίνετο, ὥσπερ βουγενῆ (καὶ) ἀνδρόπρῳρα, οὕτως ἀμπελογενῆ (καὶ) ἐλαιόπρῳρα, ἢ οὔ. ἄτοπον γάρ· ἀλλὰ μὴν ἔδει γε, εἴπερ καὶ ἐν τοῖς ζώοις. 12 Ἔτι, E ἔδει καὶ ἐν τοῖς σπέρμασι γίνεσθαι ὅπως ἔτυχεν. 13 Ὅλως δὲ ἀναιρεῖ ὁ οὕτω λέγων τὰ φύσει τε καὶ φύσιν· φύσει γάρ, ὅσα ἀπό τινος ἐν ἑαυτοῖς ἀρχῆς συνεχῶς κινούμενα ἀφικνεῖται εἴς τι τέλος· ἀφ' ἑκάστης δέ, οὐ τὸ αὐτὸ ἑκάστοις, οὐδὲ τὸ τυχόν· ἀεὶ μέντοι ἐπὶ τὸ αὐτό, ἐὰν μή τι ἐμποδίσῃ. 14 Τὸ δὲ οὗ ἕνεκα, καὶ ὃ τούτου ἕνεκα, γένοιτο ἂν καὶ ἀπὸ τύχης, οἷον λέγομεν ὅτι ἀπὸ τύχης ἦλθεν ὁ ξένος, καὶ* λυσάμενος ἀπῆλθεν, ὅταν ὥσπερ ἕνεκα τούτου ἐλθὼν πράξῃ, μὴ ἕνεκα τούτου δὲ ἔλθῃ· καὶ τοῦτο κατὰ συμβεβηκός· ἡ γὰρ τύχη τῶν κατὰ συμβεβηκὸς αἰτίων, καθάπερ καὶ πρότερον εἴπομεν· ἀλλ' ὅταν τοῦτο

* κ. τῶν ἄλλων

* κ. προϊόντι

* Empedocles, Οὐλοφυεῖς μὲν πρῶτα τύποι χθονὸς ἐξανέτελλον, ἀμφοτέρων, ὕδατός τε καὶ εἴδεος αἶσαν ἔχοντες.

* Philoponus legit λυσάμενος, quod eſt λυτρωσάμενος: quo etiã modo legi idem annotat.

ἀεὶ, ἢ ὡς ἐπὶ τὸ πολὺ γίγνηται, οὐ κατὰ συμβεβηκὸς, οὐδ᾽ ἀπὸ τύχης· ἐν δὲ τοῖς φυσικοῖς ἀεὶ οὕτως, ἂν μή τι ἐμποδίσῃ. 15 Ἄτοπον δὲ τὸ μὴ οἴεσθαι ἕνεκά του γίνεσθαι, ἐὰν μὴ ἴδωσι τὸ κινοῦν βουλευσάμενον. καίτοι καὶ ἡ τέχνη οὐ βουλεύεται· καὶ γὰρ εἰ ἐνῆν ἐν τῷ ξύλῳ ἡ ναυπηγικὴ, ὁμοίως ἂν τῇ φύσει ἐποίει· ὥστε εἰ ἐν τῇ τέχνῃ ἔνεστι τὸ ἕνεκά του, καὶ ἐν τῇ φύσει ἔνεστι. μάλιστα δὲ δῆλον, ὅταν τις ἰατρεύῃ αὐτὸς ἑαυτόν. τούτῳ γὰρ ἔοικεν ἡ φύσις. 16 Ὅτι μὲν οὖν αἰτία ἡ φύσις, καὶ οὕτως ὡς ἕνεκά του, φανερόν.

A ſemper aut plerumque fit: *tunc* non *ſit* ex accidenti, nec à fortuna. in *rebus* verò naturalibus ſemper ita *ſit*, niſi quid impediat. 15 Illud quoque abſurdum *eſt*, quòd non putant alicuius gratiâ fieri, niſi videant mouens conſultaſſe. Atqui etiam ars non conſultat. etenim ſi in ligno ineſſet ars nauium extruendarum: ſimiliter vt natura faceret. quapropter ſi in arte ineſt, quod *eſt* alicuius gratiâ: etiam in natura ineſt. quod maximè manifeſtum *eſt*, cùm aliquis ſibi ipſe medetur: huic enim natura aſſimilatur. 16 Naturam igitur eſſe cauſam, atque ita vt alicuius gratiâ agat, perſpicuum eſt.

Quomodo ſit neceſſitas in rebus naturalibus

Cap. IX.

Τὸ δ᾽ ἐξ ἀνάγκης, πότερον ἐξ ὑποθέσεως ὑπάρχει, ἢ καὶ ἁπλῶς. 2 Νῦν μὲν γὰρ οἴονται τὸ ἐξ ἀνάγκης εἶναι ἐν τῇ γενέσει, ὥσπερ ἂν εἴ τις τὸν τοῖχον ἐξ ἀνάγκης γεγενῆσθαι νομίζοι, ὅτι τὰ μὲν βαρέα κάτω πέφυκε φέρεσθαι, τὰ δὲ κοῦφα ἐπιπολῆς· διὸ οἱ λίθοι μὲν κάτω, καὶ τὰ θεμέλια· ἡ δὲ γῆ ἄνω, διὰ τὴν κουφότητα· ἐπιπολῆς δὲ μάλιστα τὰ ξύλα· κουφότατα γάρ. 3 Ἀλλ᾽ ὅμως, οὐκ ἄνευ μὲν τούτων γέγονεν, οὐ μέντοι διὰ ταῦτα, πλὴν ὡς δι᾽ ὕλην, ἀλλ᾽ ἕνεκα τοῦ κρύπτειν ἄττα καὶ σώζειν. ὁμοίως δὲ καὶ ἐν τοῖς ἄλλοις πᾶσιν ἐν ὅσοις τὸ ἕνεκά του ἐστὶν, οὐκ ἄνευ μὲν τῶν ἀναγκαίαν ἐχόντων τὴν φύσιν, οὐ μέντοι γε διὰ ταῦτα, ἀλλ᾽ ἢ ὡς ὕλην, ἀλλ᾽ ἕνεκά του· οἷον διὰ τί ὁ πρίων τοιοσδί, ὅπως τοδί, καὶ ἕνεκα τουδί. τοῦτο μέντοι τὸ οὗ ἕνεκα, ἀδύνατον γενέσθαι, ἂν μὴ σιδηροῦς ᾖ· ἀνάγκη ἄρα σιδηροῦν εἶναι, εἰ πρίων ἔσται καὶ τὸ ἔργον αὐτοῦ. ἐξ ὑποθέσεως οὖν τὸ ἀναγκαῖον, ἀλλ᾽ οὐχ ὡς τέλος· ἐν γὰρ τῇ ὕλῃ τὸ ἀναγκαῖον, τὸ δ᾽ οὗ ἕνεκα, ἐν τῷ λόγῳ. 4 Ἔστι δὲ τὸ ἀναγκαῖον, ἔν τε τοῖς μαθήμασι, καὶ ἐν τοῖς κατὰ φύσιν γινομένοις, τρόπον τινὰ παραπλησίως· ἐπεὶ γὰρ τὸ εὐθὺ τοδί ἐστιν, ἀνάγκη τὸ τρίγωνον δύο ὀρθαῖς ἴσας ἔχειν· ἀλλ᾽ οὐκ εἰ τοῦτο, ἐκεῖνο· ἀλλ᾽ εἴ γε τοῦτο μὴ ἔστιν, οὐδὲ τὸ εὐθύ ἐστιν. ἐν δὲ τοῖς γινομένοις ἕνεκά του, ἀνάπαλιν, εἰ τὸ τέλος ἔσται, ἢ ἔστι, καὶ τὸ ἔμπροσθεν ἔσται ἢ ἔστιν· εἰ δὲ μὴ, ὥσπερ ἐκεῖ μὴ ὄντος τοῦ συμπεράσματος, ἡ ἀρχὴ οὐκ ἔσται, καὶ ἐνταῦθα, τὸ τέλος καὶ τὸ οὗ ἕνεκα· ἀρχὴ γὰρ καὶ αὕτη, οὐ τῆς πράξεως, ἀλλὰ τοῦ λογισμοῦ· ἐκεῖ δὲ, τοῦ λογισμοῦ· πράξεις γὰρ οὐκ εἰσίν. ὥστε εἰ ἔσται οἰκία, ταῦτα ἀνάγκη γενέσθαι, ἢ ὑπάρχειν, ἢ εἶναι, ἢ ὅλως τὴν ὕλην τὴν ἕνεκά του, οἷον λίθους καὶ πλίνθους, εἰ οἰκία· οὐ μέντοι διὰ ταῦτα ἐστὶ τὸ τέλος, ἀλλ᾽ ἢ ὡς ὕλην. [οὐδ᾽ ἔσται διὰ ταῦτα.] ὅλως μέντοι μὴ ὄντων, οὐκ ἔσται οὔθ᾽ ἡ οἰκία, οὔθ᾽ ὁ πρίων· ἡ μὲν, εἰ μὴ οἱ λίθοι· ὁ δὲ, εἰ μὴ ὁ σίδηρος· οὐδὲ γὰρ ἐκεῖ αἱ ἀρχαὶ, εἰ μὴ τὸ τρίγωνον δύο ὀρθαῖς. 5 Φανερὸν δὴ, ὅτι τὸ ἀναγκαῖον ἐν τοῖς φυσικοῖς, τὸ ὡς ὕλη λεγόμενον καὶ αἱ κινήσεις αἱ ταύτης. 6 Καὶ ἄμφω μὲν τῷ φυσικῷ λεκτέαι αἱ αἰτίαι, μᾶλλον δὲ ἡ τίνος ἕνεκα· αἴτιον γὰρ τοῦτο τῆς ὕλης, ἀλλ᾽ οὐχ αὕτη τοῦ τέλους· καὶ τὸ τέλος, τὸ οὗ ἕνεκα· καὶ ἡ ἀρχὴ ἀπὸ τοῦ ὁρισμοῦ καὶ τοῦ λόγου, ὥσπερ ἐν τοῖς κατὰ τέχνην. ἐπεὶ ἡ οἰκία τοιόνδε, τάδε δεῖ γενέσθαι καὶ ὑπάρχειν ἐξ ἀνάγκης. [καὶ ἐπεὶ ἡ ὑγίεια τοδί, τάδε δεῖ γενέσθαι ἐξ ἀνάγκης,

B Neceſſitas autem vtrùm ineſt ex hypotheſi, an ſimpliciter? 2 Nunc enim putant neceſſitatem in ortu eſſe. perinde ac ſi quis ædificium ex neceſſitate factum eſſe arbitraretur: quia grauia deorſum feruntur ſuapte natura, leuia verò in locum ſublimem: idcirco lapides quidem & fundamenta ſunt inferiori loco, ſupra autem *eſt* terra ob leuitatem; ſummum locum maximè obtinent ligna, quia ſunt leuiſſima. 3 Verumtamen non quidem ſine his factum eſt, non tamen propter hoc *eſt factum*, niſi vt propter materiam, ſed potiùs quædam celandi ac ſeruandi gratiâ. ſimiliter autem & in aliis omnibus, in quibus *ineſt* quod *eſt* alicuius gratiâ. non C ſunt *enim* ſine his, quæ neceſſariam naturam habent: non tamen *ſunt* propter hæc, niſi vt materiam: ſed alicuius gratiâ. velvti, cur ſerra *eſt* talis? vt hoc *ſit*, huiúſque gratiâ: hoc verò cuius gratiâ, fieri nequit, niſi ferrea ſit: neceſſe *eſt* igitur ferream eſſe, ſi futura ſit ſerra, & opus eius. Ergo ex hypotheſi *eſt* neceſſitas, non vt finis. in materia namque *eſt* neceſſitas. id verò cuius gratiâ, *eſt* in ratione. 4 Eſt autem neceſſitas & in diſciplinis, & in iis quæ natura fiunt, quodammodo ſimilis. cùm enim rectum *ſit* hoc, neceſſe *eſt* triangulum habere *tres angulos* duobus rectis æquales. at non ſi hoc *ſit*, D etiam illud *eſt*, ſed ſi hoc non ſit, neque rectum erit. In iis verò quæ alicuius gratiâ fiunt, è contrario ſi finis erit aut eſt; etiam quod antecedit, erit aut eſt. ſin minùs, vt illic cùm non eſt concluſio, non erit principium; ita etiam hîc *non erit* finis & id cuius gratiâ. hoc enim *eſt* principium non actionis, ſed ratiocinationis. ibi autem ratiocinationis, quoniam actiones non ſunt. quare ſi erit domus, neceſſe *eſt*, hæc eſſe facta, aut ſuppetere, aut eſſe: aut omnino *eſſe* ipſam materiam alicuius gratiâ: velvti, lapides & lateres, ſi *futura eſt* domus. non tamen propter hæc eſt finis, neque ob hæc erit, niſi vt ob materiam. E omnino vero, niſi *hæc* ſint, neque domus erit, neque ſerra: illa quidem, niſi *ſint* lapides: hæc autem, niſi *ſit* ferrum. quia nec ibi *ſunt* principia, niſi triangulum *habeat tres angulos æquales* duobus rectis. 5 Perſpicuum igitur *eſt*, neceſſitatem *eſſe* in *rebus* naturalibus, quæ dicitur vt materia, & huius motiones. 6 Et ambæ quidem cauſæ tradendæ ſunt à phyſico: magis tamen ea cuius gratiâ: hæc enim *eſt* cauſa materiæ, non ipſa *materia eſt cauſa* finis. Ac finis, id cuius gratiâ, & principium, à definitione & ratione *ſumitur*. Vt in rebus artificioſis, cùm domus *ſit* talis, oportet hæc eſſe facta, & eſſe ex neceſſitate: [& cum ſanitas *ſit* hoc, oportet ex neceſſitate

hæc eſſe facta & eſſe:] ita etiam ſi homo *eſt* hoc, *opor-* A *tet* hæc *quoque eſſe*: & ſi hæc, *etiam* iſta. 7 Fortaſſis autem etiam in definitione eſt neceſſitas. cùm enim opus ſecandi *aliquis* definierit eſſe diuiſionem talem: at hæc non, niſi *ſerra* habeat dentes tales: hi verò non *erunt*, niſi *ſit* ferrea. ſunt enim in definitione partes quædam *definitionis*, tamquam materia.

καὶ ὑπάρχειν.] ὥσπερ καὶ εἰ ὁ ἄνθρωπος τοδί, καὶ ταδί· εἰ δὲ ταδί, καὶ τοδί. 7 Ἴσως δὲ καὶ ἐν τῷ λόγῳ ἐστὶ τὸ ἀναγκαῖον. ὁρισαμένῳ γὰρ τὸ ἔργον τοῦ πρίειν, ὅτι διαίρεσις τοιαδί, αὕτη δ' οὐκ ἔσται, εἰ μὴ ἕξει ὀδόντας τοιουσδί· οὗτοι δ' οὔ, εἰ μὴ σιδηροῖ. ἔστι γὰρ καὶ ἐν τῷ λόγῳ ἔνια μόρια, ὡς ὕλη τοῦ λόγου.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ, Η περὶ φυσικῶν ἀρχῶν, τὸ Γ.

ARISTOTELIS, NATVRALIS AVSCVLTATIONIS, SEV DE NATVRALIBVS PRINCIPIIS,

LIBER III.

DE MOTV,

TRACTATVS I.

Quid ſit motus. Cap. I.

CVM autem natura ſit principium B motus & mutationis, ac methodus nobis ſit *inſtituta* de natura, non eſt ignorandum quid ſit motus: hoc enim ignorato, neceſſe *eſt* etiam naturam ignorari. cùm autem definierimus de motu: nitendum *erit* eodem modo tractare de iis quæ deinceps *ſequuntur*. videtur autem motus eſſe *in* rerum continuarum *numero*. infinitum verò apparet primùm in eo quod eſt continuum. ideóque plerunque accidit vt qui definiunt, adiungant rationem infiniti: tamquam id quod in infinitum diuidi poteſt, continuum ſit. Ad hæc ſine loco & inani & tempore motus eſſe nequit. Manifeſtum C *eſt* igitur, cùm propter has *cauſas*, tum etiam quoniam iſta ſunt omnibus communia & vniuerſalia, conſiderandum in primis eſſe de his ſingulis: quia propriorum inſpectio poſterior eſt, quàm ea quæ in communibus *verſatur*. Primùm autem, vt diximus, *videndum eſt* de motu. 2 Eſt autem aliquid *quod eſt* actu tantùm: aliud, *quod eſt* poteſtate & actu: *quod* partim *eſt* hoc aliquid, partim tantum, partim tale: & ſimiliter in aliis entis Categoriis. 3 Eorum autem quæ ad aliquid *referuntur*, aliud ſecundùm exuperantiam & defectionem dicitur: aliud, quia efficiendi & patiendi, & omnino vt moueat & moueatur, vim habet. quod enim mouendi vim habet, rem D mobilem mouendi vim habet: & mobile, ab eo *eſt* mobile, quod mouendi vi eſt præditum. 4 Iam verò non eſt motus extra res. quicquid enim mutatur, aut mutatur ſecundùm ſubſtantiam, aut ſecundùm quantitatem, aut ſecundùm qualitatem, aut ſecundùm locum: commune autem his ſumere nihil licet, ſicut dicimus, quòd nec *ſit* hoc aliquid, nec quantum, nec quale, nec in vlla alia categoria. quare nec motus nec mutatio erit vllius præter ea quæ dicta ſunt: cùm nihil ſit præter ea quæ dicta ſunt. 5 Vnumquodque autem bifariàm cunctis ineſt. vt hoc aliquid: nam eius aliud *eſt* forma, aliud priuatio. & in qualitate: aliud enim eſt albũ, aliud nigrum. & in quãtitate, aliud eſt perfectum, aliud imperfectum.

ΕΠΕΙ δὲ ἡ φύσις μέν ἐστιν ἀρχὴ* κινήσεως καὶ μεταβολῆς, ἡ δὲ μέθοδος ἡμῖν περὶ φύσεώς ἐστι, δεῖ μὴ λανθάνειν τί ἐστι κίνησις. ἀναγκαῖον γὰρ ἀγνοουμένης αὐτῆς, ἀγνοεῖσθαι καὶ τὴν φύσιν. διωρισμένοις δὲ περὶ κινήσεως, πειρατέον τὸν αὐτὸν ἐπελθεῖν τρόπον περὶ τῶν ἐφεξῆς. δοκεῖ δ' ἡ κίνησις εἶναι τῶν συνεχῶν· τὸ δ' ἄπειρον ἐμφαίνεται πρῶτον ἐν τῷ συνεχεῖ. διὸ καὶ τοῖς ὁριζομένοις τὸ συνεχὲς, συμβαίνει προσχρήσασθαι πολλάκις τῷ λόγῳ τῷ τοῦ ἀπείρου, ὡς τὸ εἰς ἄπειρον διαιρετὸν συνεχὲς ὄν. πρὸς δὲ τούτοις, ἄνευ τόπου, C καὶ κενοῦ, καὶ χρόνου, ἀδύνατον κίνησιν εἶναι. δῆλον οὖν, ὡς διά τε ταῦτα, καὶ διὰ τὸ πάντων εἶναι κοινὰ καὶ καθόλου ταῦτα πᾶσι, σκεπτέον προχειρισαμένοις περὶ ἑκάστου τούτων. ὑστέρα γὰρ ἡ περὶ τῶν ἰδίων θεωρία, τῆς περὶ τῶν κοινῶν ἐστί. πρῶτον δὲ, καθάπερ εἴπομεν, περὶ κινήσεως. 2 Ἔστι δή τι, τὸ μὲν ἐντελεχείᾳ μόνον,* τὸ δὲ δυνάμει καὶ ἐντελεχείᾳ, τὸ μὲν τόδε τι, τὸ δὲ τοσόνδε, τὸ δὲ τοιόνδε καὶ ἐπὶ τῶν ἄλλων τῶν τοῦ ὄντος κατηγοριῶν ὁμοίως.* τῶν δὲ πρός τι τὸ μὲν καθ' ὑπεροχὴν καὶ ἔλλειψιν λέγεται, τὸ δὲ κατὰ τὸ ποιητικὸν, καὶ παθητικὸν, καὶ D ὅλως κινητικόν τε καὶ κινητόν· τὸ γὰρ κινητικὸν, κινητικὸν τοῦ κινητοῦ καὶ τὸ κινητὸν, κινητὸν ὑπὸ τοῦ κινητικοῦ. 4 Οὐκ ἔστι δὲ κίνησις παρὰ τὰ πράγματα· μεταβάλλει γὰρ ἀεὶ τὸ μεταβάλλον, ἢ κατ' οὐσίαν, ἢ κατὰ ποσὸν, ἢ κατὰ ποιὸν, ἢ κατὰ τόπον.* κοινὸν δ' ἐπὶ τούτων οὐδέν ἐστι λαβεῖν, ὡς φαμὲν, ὃ οὔτε τόδε, οὔτε ποσὸν, οὔτε ποιὸν, οὔτε τῶν ἄλλων κατηγορημάτων οὐδέν. ὥστ' οὐδὲ κίνησις, οὔτε μεταβολὴ οὐδενὸς ἔσται παρὰ τὰ εἰρημένα, μηδενός γε ὄντος παρὰ τὰ εἰρημένα. 5 Ἕκαστον δὲ διχῶς ὑπάρχει πᾶσιν, οἷον τόδε· τὸ μὲν γὰρ μορφὴ αὐτοῦ, τὸ δὲ στέρησις· καὶ κατὰ τὸ ποιόν· τὸ μὲν γὰρ λευκὸν, τὸ δὲ μέλαν· καὶ κατὰ τὸ ποσὸν, τὸ μὲν τέλειον, τὸ δ' ἀτελές·

* γ. κιν. ἢ αἰτίας.

* Legatur, τὸ δὲ δυνάμει. & τὸ ἐντελεχείᾳ τὸ μ. quæ eſt Porphyrij lectio, pridem à doctis viris exploſa. vide Simplicium. Themiſtius verò hoc modo legiſſe videtur, τὸ δὲ δυ. καὶ ἐντελεχείᾳ. καὶ τὸ ἐντελεχείᾳ τὸ μ.

* In Categ. cap. περὶ τοῦ πρός τι. q.c. τὸ δὲ πρ.

* γ. κοινὸν δὲ οὐδὲν

ὁμοίως δὲ καὶ κατὰ τὴν φορὰν, τὸ μὲν ἄνω, τὸ δὲ κάτω· ἢ τὸ μὲν κοῦφον, τὸ δὲ βαρύ. 6 Ὥστε κινήσεως καὶ μεταβολῆς ἐστὶν εἴδη τοσαῦτα, ὅσα τοῦ ὄντος. 7 Διῃρημένου δὲ καθ᾽ ἕκαστον γένος, τοῦ μὲν ἐντελεχείᾳ, τοῦ δὲ δυνάμει, ἡ τοῦ δυνάμει ὄντος ἐντελέχεια, ᾗ τοιοῦτον, κίνησίς ἐστιν. 8 Οἷον, τοῦ μὲν ἀλλοιωτοῦ, ᾗ ἀλλοιωτὸν, ἀλλοίωσις· τοῦ δὲ αὐξητοῦ καὶ τοῦ ἀντικειμένου, φθιτοῦ (οὐδὲν γὰρ ὄνομα κοινὸν ἐπ᾽ ἀμφοῖν) αὔξησις καὶ φθίσις· τοῦ δὲ γενητοῦ καὶ φθαρτοῦ, γένεσις καὶ φθορά· τοῦ δὲ φορητοῦ, φορά. 9 Ὅτι δὲ τοῦτό ἐστιν ἡ κίνησις, ἐντεῦθεν δῆλον. ὅταν γὰρ τὸ οἰκοδομητὸν, ᾗ τοιοῦτον αὐτὸ λέγομεν εἶναι, ἐντελεχείᾳ ᾖ, οἰκοδομεῖται· καὶ ἔστι τοῦτο οἰκοδόμησις· ὁμοίως δὲ καὶ (μάθησις, καὶ) ἰάτρευσις, καὶ κύλισις, καὶ ἅλσις, * καὶ ἁδρυνσις καὶ γήρανσις. 10 Ἐπεὶ δ᾽ ἔνια τὰ αὐτὰ καὶ δυνάμει καὶ ἐντελεχείᾳ ἐστὶν, οὐχ ἅμα δὲ, ἢ οὐ κατὰ τὸ αὐτό, ἀλλ᾽ οἷον θερμὸν μὲν δυνάμει, ψυχρὸν δὲ ἐντελεχείᾳ, πολλὰ ἤδη ποιήσει καὶ πείσεται ὑπ᾽ ἀλλήλων· ἅπαν γὰρ ἔσται ἅμα ποιητικὸν καὶ παθητικόν· ὥστε καὶ τὸ κινοῦν φυσικῶς κινητόν· πᾶν γὰρ τὸ τοιοῦτο κινεῖ, κινούμενον καὶ αὐτό. 11 Δοκεῖ μὲν οὖν τισιν ἅπαν κινεῖσθαι τὸ κινοῦν. οὐ μὴν ἀλλὰ, περὶ μὲν τούτων ἐξ ἄλλων ἔσται δῆλον ὅπως ἔχει· ἔστι γάρ τι κινοῦν καὶ ἀκίνητον. 12 Ἡ δὲ τοῦ δυνάμει ὄντος ἐντελέχεια, ὅταν ἐντελεχείᾳ ὂν ἐνεργῇ,* ἢ αὐτὸ, ἢ ἄλλο, ᾗ κινητὸν, κίνησίς ἐστι. λέγω δὲ τὸ ᾗ, ὧδε. ἔστι γὰρ ὁ χαλκὸς δυνάμει ἀνδριάς, ἀλλ᾽ ὅμως οὐχ ἡ τοῦ χαλκοῦ ἐντελέχεια, ᾗ χαλκὸς, κίνησίς ἐστιν· οὐ γὰρ τὸ αὐτὸ τὸ χαλκῷ εἶναι, καὶ δυνάμει τινὶ κινητῷ· ἐπεὶ εἰ ταὐτὸν ἦν ἁπλῶς καὶ κατὰ τὸν λόγον, ἦν ἂν ἡ τοῦ χαλκοῦ, ᾗ χαλκὸς, ἐντελέχεια, κίνησις· οὐκ ἔστι δὲ ταὐτό, ὥσπερ εἴρηται. δῆλον δ᾽ ἐπὶ τῶν ἐναντίων· τὸ μὲν γὰρ δύνασθαι ὑγιαίνειν, καὶ δύνασθαι κάμνειν, ἕτερον· καὶ γὰρ ἂν τὸ κάμνειν καὶ τὸ ὑγιαίνειν ταὐτὸν ἦν· τὸ δὲ ὑποκείμενον καὶ τὸ ὑγιαῖνον, καὶ τὸ νοσοῦν, εἴθ᾽ ὑγρότης, εἴθ᾽ αἷμα, ταὐτὸν καὶ ἕν. ἐπεὶ δ᾽ οὐ ταὐτὸν, ὥσπερ οὐδὲ χρῶμα ταὐτὸν καὶ ὁρατὸν, ἡ τοῦ δυνατοῦ, ᾗ δυνατὸν, ἐντελέχεια, φανερὸν ὅτι κίνησίς ἐστιν. 13 Ὅτι μὲν οὖν ἐστὶν, αὕτη, καὶ ὅτι συμβαίνει τότε κινεῖσθαι, ὅταν ἡ ἐντελέχεια ᾖ αὐτή, καὶ οὔτε πρότερον, οὔτε ὕστερον, δῆλον· ἐνδέχεται γὰρ ἕκαστον, ὁτὲ μὲν ἐνεργεῖν, ὁτὲ δὲ μὴ, οἷον, τὸ οἰκοδομητὸν, ᾗ οἰκοδομητόν. 14 Καὶ ἡ τοῦ οἰκοδομητοῦ ἐνέργεια, ᾗ οἰκοδομητὸν, οἰκοδόμησίς ἐστιν· ἢ γὰρ τοῦτό ἐστιν ἡ οἰκοδόμησις, ἡ ἐνέργεια τοῦ οἰκοδομητοῦ, ἢ ἡ οἰκία· ἀλλ᾽ ὅταν οἰκία ᾖ, οὐκ ἔτ᾽ οἰκοδομητὸν ἔσται· οἰκοδομεῖται δὲ τὸ οἰκοδομητόν· ἀνάγκη ἄρα τὴν οἰκοδόμησιν τὴν ἐνέργειαν εἶναι· ἡ δὲ οἰκοδόμησις, κίνησίς τίς ἐστιν· ἀλλὰ μὴν ὁ αὐτὸς ἐφαρμόσει λόγος καὶ ἐπὶ τῶν ἄλλων κινήσεων. 15 Ὅτι δὲ καλῶς εἴρηται, δῆλον καὶ ἐξ ὧν οἱ ἄλλοι περὶ αὐτῆς λέγουσι, καὶ ἐκ τοῦ μὴ ῥᾴδιον εἶναι ὁρίσαι ἄλλως αὐτήν. οὔτε γὰρ τὴν κίνησιν καὶ τὴν μεταβολὴν ἐν ἄλλῳ γένει θεῖναι δύναιτ᾽ ἄν τις, οὔτε οἱ ἑτέρως εἰρηκότες περὶ αὐτῆς, κατορθοῦσι. 16 Δῆλον δὲ σκοποῦσιν, ὡς τιθέασιν ἔνιοι αὐτὴν, ἑτερότητα, καὶ ἀνισότητα, καὶ τὸ μὴ ὂν φάσκοντες εἶναι τὴν κίνησιν· ὧν οὐδὲν ἀναγκαῖον κινεῖσθαι, οὔτ᾽ ἂν ἕτερα ᾖ, οὔτ᾽ ἂν ἄνισα, οὔτ᾽ ἂν οὐκ ὄντα. 17 Ἀλλ᾽ οὐδ᾽ ἡ μεταβολὴ, οὔτ᾽ εἰς ταῦτα, οὔτ᾽ ἐκ τούτων μᾶλλόν ἐστιν ἢ ἐκ τῶν ἀντικειμένων. 18 Αἴτιον δὲ τοῦ εἰς ταῦτα τιθέναι αὐτοὺς, ὅτι ἀόριστόν τι δοκεῖ εἶναι ἡ κίνησις·

* Omittit illa Argy. καὶ ἁδ. καὶ γ. pro quibus vetus interpres, & adoleſcentia, & ſeneſcentia.

* καὶ οὐχ ᾗ αὐτό, ἀλλ᾽ ᾗ ἄλλο. ſed de varia lectione huius loci conſule Græcos interpretes.

A Similiter & in latione, aliud eſt ſupra, aliud infra: vel aliud leue, aliud graue. 6 Quocirca motus & mutationis ſpecies tot ſunt quot entis. 7 Cùm autem in vnoquoque genere diſtincta ſint, quod *eſt* actu, & quod *eſt* poteſtate: actus eius quod eſt poteſtate, qua talis *eſt*, motus eſt. 8 Vt eius quod eſt variabile, quà eſt variabile, variatio: & eius quod poteſt augeri, nec non oppoſiti, *id eſt*, eius quod poteſt deminui, (nullum enim nomen eſt commune vtriſque) accretio & deminutio. eius quod [illegible] & interire poteſt, ortus & interitus: & eius quod ferri poteſt, latio. 9. Motum autem hoc eſſe, hinc patet: cùm enim ædificabile, quatenus ipſum dicimus tale eſſe, actu eſt: *tunc* ædificatur, atque hoc eſt ędificatio. B Itidémque diſcēdi actus, & medicatio, & volutatio, & ſaltatio, & ad virilem ætatem & ſenectutem progreſſio. 10 Cùm autē nōnulla *ita ſe habeant, vt* eadem ſint poteſtate & actu, non tamen ſimul, vel non ſecundùm idem; ſed (exempli gratiâ) calidū poteſtate, frigidum actu: multa iam viciſſim facient & patientur. quoduis enim *horū* ſimul habebit vim faciendi, & patiendi. quapropter etiam quod naturaliter mouet, mobile *eſt*. quicquid enim *eſt* tale, mouet, cùm & ipſum moueatur. 11 Quibuſdam ergo videtur, quicquid mouet, moueri. ſed de his manifeſtum ex aliis *libris* erit, quomodo *res ſe* habeat: eſt enim aliquid mouēs & immobile. 12 Actus verò eius quod C poteſtate *eſt*, quando actu eſt, non quatenus *eſt id* ipſum *quod eſt*, ſed quatenus *eſt* mobile. *hic inquam actus* eſt motus. Illud autem QVATENVS, ſic dico. nam æs poteſtate eſt ſtatua: non tamen actus æris, quatenus *eſt* æs, eſt motus. non *eſt* enim eadem eſſentia æris, & poteſtate aliqua mobilis. quòd ſi eadem eſſent ſimpliciter & ſecundùm rationem: vtique actus æris quà *eſt* æs, eſſet motus. ſed non eſt *eadem*, vt dictum fuit. *hoc* autem patet in contrariis: nam poſſe valere, & poſſe ægrotare, differunt: (alioqui etiam ægrotare & valere eſſent idem) ſubiectum verò, quod valet, & quod ægrotat, (ſiue *ſit* humor, ſiue ſanguis) *eſt* vnum & idem. cùm autem non idem *ſit*, ſicuti neque color *eſt* D idem quod aſpectabile: perſpicuum *eſt*, actum poſſibilis, quatenus *eſt* poſſibile, eſſe motum. 13 Eſſe igitur hunc *actum*, & tunc accidere vt *res* moueatur, cùm eſt hic actus, non priùs, nec poſteriùs, manifeſtum *eſt*. vnum quodque enim poteſt interdum actu eſſe, interdùm non *eſſe*: veluti quod ædificari poteſt, quatenus ædificari poteſt. 14 Et actus eius quod ædificari poteſt, quatenus ædificari poteſt, ædificatio eſt. aut enim ædificatio eſt hoc, *id eſt*, actus eius quod ædificari poteſt: aut ædes: atqui cùm ædes ſunt, non erit amplius quod poteſt ædificari: ædificatur autem quod poteſt ædificari: neceſſe igitur *eſt* ædificationem eſſe actum illum. ædificatio E verò eſt motus quidam. ſed eadem ratio conueniet etiam aliis motibus. 15 Scitè autem dictū eſſe patet etiā ex iis quæ alij de ipſo *motu* dicunt, & ex eo quod non facile eſt ipſum aliter definire. neq; enim motum & mutationem in alio genere collocare aliquis poſſit: nec qui de eo aliter dixerūt, rectè locuti ſunt. 16 Quod quidem manifeſtum *fiet* conſiderantibus, quemadmodum quidam eum ponūt, qui aiunt motum eſſe diuerſitatem, & inæqualitatem, & non ens: cùm nihil horū moueri neceſſe ſit, nec ſi ſint diuerſa, nec ſi inæqualia, nec ſi non entia. 17 Sed neque mutatio, in hæc, aut ex his potiùs eſt quàm ex oppoſitis. 18 Cauſa verò cur hi *motum* ad hæc retulerint, *eſt*: quia motus videtur eſſe indefinitum quiddam;

ac alterius claſſis principia, quia ſunt priuantia, *ſunt* A indefinita. neque enim vllum eorum eſt hoc aliquid, neque tale neque *in vlla* aliarum Categoriarum. 19 Cur autem motus videatur eſſe res indefinita, cauſa *eſt*: quia neque ad entium poteſtatem, neque ad actum referri poteſt ſimpliciter. neque enim quod poteſt eſſe quantum, neceſſariò mouetur, neque *quod eſt* actu quantum. ac motus videtur quidem eſſe actus quidam, ſed imperfectus. cauſa autem eſt : quia id *eſt* imperfectum, quod eſt poteſtate, cuius actus eſt motus. 20 Ideòque difficile *eſt* ſumere, quid ipſe ſit. aut enim neceſſe *eſt eum* ad priuationem referre, aut ad poteſtatem, aut ad actum ſimplicem : quorum nullum videtur eſſe poſſe. relinquitur ergo modus, quem diximus : *nimirum motum* eſſe actum quẽdam, ac talem actum, qualem diximus, difficilem quidem cognitu, ſed nihilominus qui eſſe poſſit.

A τῆς δὲ ἑτέρας συστοιχίας αἱ ἀρχαὶ διὰ τὸ στερητικαὶ εἶναι, ἀόριστοι· οὔτε γὰρ τόδε οὔτε τοιόνδε, οὐδεμία αὐτῶν ἐστίν, ὅτι οὐδὲ τῶν ἄλλων κατηγοριῶν. 19 Τοῦ δὲ δοκεῖν ἀόριστον εἶναι τὴν κίνησιν, αἴτιον, ὅτι οὔτε εἰς δύναμιν τῶν ὄντων, οὔτε εἰς ἐνέργειαν ἔστι θεῖναι αὐτὴν ἁπλῶς· οὔτε γὰρ τὸ δυνατὸν εἶναι ποσόν, κινεῖται ἐξ ἀνάγκης, οὔτε τὸ ἐνεργείᾳ ποσόν· ἥ τε κίνησις, ἐνέργεια μέν τις εἶναι δοκεῖ, ἀτελὴς δέ. αἴτιον δ᾽, ὅτι ἀτελὲς τὸ δυνατόν, οὗ ἐστιν ἐνέργεια κίνησις. 20 Καὶ διὰ τοῦτο δὴ χαλεπὸν αὐτὴν λαβεῖν τί ἐστιν· ἢ γὰρ εἰς στέρησιν ἀναγκαῖον θεῖναι, ἢ εἰς δύναμιν, ἢ εἰς ἐνέργειαν ἁπλῆν· τούτων δ᾽ οὐδὲν φαίνεται ἐνδεχόμενον. λείπεται τοίνυν ὁ εἰρημένος τρόπος, ἐνέργειαν μέν τινα εἶναι, τοιαύτην δ᾽ ἐνέργειαν, οἵαν εἴπομεν, χαλεπὴν μὲν ἰδεῖν, ἐνδεχομένην δὲ εἶναι.

De mouente, & eo quod mouetur.

Cap. II.

MOuetur autem, vt dictum fuit, omne mouens, B quod poteſtate eſt mobile, & cuius immobilitas eſt quies. cui namque motus ineſt, eius immobilitas *eſt* quies. nam in id agere, qua tale *eſt*, idipſum eſt mouere. id autem facit tactu. quare ſimul etiam patitur : idcirco motus *eſt* actus eius quod eſt mobile, quatenus eſt mobile. atque hoc euenit tactu eius quod mouendi vim habet : quapropter ſimul etiam patitur. 2 Iam verò quod mouet, ſemper adfert aliquam formam, *id eſt*, vel hoc *aliquid* vel tale, vel tantum, quod erit principium & cauſa motus, quando mouet. vt is qui actu *eſt* homo, facit hominem ex eo quod *eſt* homo poteſtate. 3 Sed & id de quo dubitari ſolet, perſpicuum *ſit, nempe* motum, C eſſe in *re mobili*. eſt enim actus huius, & ab eo quod mouendi vim habet. 4 Atque eius quod mouendi vim habet, actus non eſt diuerſus. oportet enim ambobus eſſe actum. motiuum enim eſt quia poteſt: mouens autem, quia agit. eſt autem actiuum ipſius mobilis. quare ſimiliter vnus eſt vtriſque actus. quemadmodum idem *eſt* interuallum, *ſiue ſpectes* vnum ad duo, ſiue duo ad vnum. nec non accliue & decliue. hæc enim ſunt vnum. ſed definitio non eſt vna. ſimiliter autem *res habet* etiam in mouente & eo quod mouetur. 5 Exiſtit autem dubitatio Logica : quia fortaſſe neceſſe *eſt* eſſe aliquem actum diuerſum effectiui & paſſiui. alterum enim *eſt* effectio, alterum paſſio, opus verò & finis illius quidem D *eſt* effectus, huius verò effectio. 6 Cùm igitur ambo *ſint* motus : ſi diuerſi *ſunt*, in quonam *erunt*? aut enim ambo ſunt in eo quod patitur & mouetur : aut effectio *eſt* in efficiente, paſſio verò in patiente. quòd ſi & hanc vocare effectionem oportet, ſanè homonymus erit. at verò ſi hoc *eſt*, motus erit in eo quod mouet. *eſt* enim eadem ratio eius quod mouet & eius quod mouetur. quare aut omne mouens mouebitur, aut habens motum, non mouebitur. quòd ſi ambo *ſint* in eo quod mouetur & patitur, tam effectio quàm paſſio, & in eo quod diſcit, tam docendi quàm diſcendi actio, cùm duo ſint: primùm quidem ſuus cuiuſque actus in ipſo non erit : deinde *eueniet* abſurdum, duobus motibus *idem* ſimul moueri. erunt enim aliquæ variationes duæ vnius *ſubiecti* & ad vnam formam, quod *eſt* impoſſibile.

B Κινεῖται δὲ καὶ τὸ κινοῦν, ὥσπερ εἴρηται πᾶν, τὸ δυνάμει ὂν κινητόν, καὶ οὗ ἡ ἀκινησία ἠρεμία ἐστίν· ᾧ γὰρ ἡ κίνησις ὑπάρχει, τούτῳ ἡ ἀκινησία ἠρεμία· τὸ γὰρ πρὸς τοῦτο ἐνεργεῖν, ᾗ τοιοῦτον, αὐτὸ τὸ κινεῖν ἐστί· τοῦτο δὲ ποιεῖ *θίξει· ὥστε ἅμα καὶ πάσχει· διὸ ἡ κίνησις, ἐντελέχεια τοῦ κινητοῦ, ᾗ κινητόν. συμβαίνει δὲ τοῦτο θίξει τοῦ κινητικοῦ. ὥσθ᾽ ἅμα καὶ πάσχει. 2 Εἶδος δὲ ἀεὶ *οἴσεταί τι τὸ κινοῦν, ἤτοι τόδε, ἢ τοιόνδε, ἢ τοσόνδε, ὃ ἔσται ἀρχὴ καὶ αἴτιον τῆς κινήσεως, ὅταν κινῇ. οἷον ὁ ἐντελεχείᾳ ἄνθρωπος ποιεῖ ἐκ τοῦ δυνάμει ὄντος ἀνθρώπου ἄνθρωπον. 3 Καὶ C τὸ ἀπορούμενον δὲ φανερόν, ὅτι ἐστὶν ἡ κίνησις ἐν τῷ κινητῷ· ἐντελέχεια γάρ ἐστι τούτου, καὶ ὑπὸ τοῦ κινητικοῦ. 4 Καὶ ἡ τοῦ κινητικοῦ δὲ ἐνέργεια, οὐκ ἄλλη ἐστί· δεῖ μὲν γὰρ εἶναι ἐντελέχειαν ἀμφοῖν· κινητικὸν μὲν γάρ ἐστι, τῷ δύνασθαι· κινοῦν δέ, τῷ ἐνεργεῖν· ἀλλ᾽ ἔστιν ἐνεργητικὸν τοῦ κινητοῦ· ὥστε ὁμοίως μία ἡ ἀμφοῖν ἐνέργεια, ὥσπερ τὸ αὐτὸ διάστημα ἓν πρὸς δύο, καὶ δύο πρὸς ἕν, καὶ τὸ ἄναντες καὶ τὸ κάταντες· ταῦτα γὰρ ἓν μέν ἐστιν, ὁ μέντοι λόγος οὐχ εἷς. ὁμοίως δὲ καὶ ἐπὶ τοῦ κινοῦντος καὶ κινουμένου. 5 Ἔχει δ᾽ ἀπορίαν λογικήν· ἀναγκαῖον γὰρ ἴσως εἶναί τινα ἐνέργειαν ἄλλην τοῦ ποιητικοῦ καὶ τοῦ παθητικοῦ· τὸ μὲν γὰρ ποίησις, τὸ δὲ πάθησις. ἔργον δὲ καὶ τέλος, τοῦ μὲν D ποίημα, τοῦ δὲ πάθος. 6 Ἐπεὶ οὖν ἄμφω κινήσεις, εἰ μὲν ἕτεραι, ἐν τίνι; ἢ γὰρ ἄμφω ἐν τῷ πάσχοντι καὶ κινουμένῳ, ἢ ἡ μὲν ποίησις ἐν τῷ ποιοῦντι, ἡ δὲ πάθησις ἐν τῷ πάσχοντι. εἰ δὲ δεῖ καὶ ταύτην ποίησιν καλεῖν, *ὁμώνυμος ἂν εἴη. ἀλλὰ μὴν εἰ τοῦτο, ἡ κίνησις ἐν τῷ κινοῦντι ἔσται· ὁ γὰρ αὐτὸς λόγος ἐπὶ κινοῦντος καὶ κινουμένου. ὥστε ἢ πᾶν τὸ κινοῦν κινήσεται, ἢ ἔχον κίνησιν οὐ κινήσεται. εἰ δ᾽ ἄμφω ἐν τῷ *κινουμένῳ καὶ πάσχοντι, καὶ ἡ ποίησις καὶ ἡ πάθησις, καὶ ἡ δίδαξις καὶ ἡ μάθησις, δύο οὖσαι, ἐν τῷ μανθάνοντι. πρῶτον μέν, ἡ ἐνέργεια ἡ ἑκάστου, οὐκ ἐν ἑκάστῳ ὑπάρξει· εἶτα, ἄτοπον τὸ δύο κινήσεις ἅμα κινεῖσθαι· τίνες γὰρ ἔσονται ἀλλοιώσεις δύο τοῦ ἑνός, καὶ εἰς ἓν εἶδος; ἀλλ᾽ ἀδύνατον.

* χ. μίξει
* χ. εἴσεται
* χ. ἐνεστίμως
* χ. ποιουμένῳ

7 Ἀλλὰ μία ἔσται ἐνέργεια; ἀλλ' ἄλογον, δύο ἑτέρων τῷ εἴδει τὴν αὐτὴν καὶ μίαν εἶναι ἐνέργειαν. 8 Καὶ ἔσται, εἴπερ ἡ μάθησις καὶ ἡ δίδαξις ταὐτό, καὶ ἡ ποίησις καὶ ἡ πάθησις, καὶ τὸ διδάσκειν τῷ μανθάνειν ταὐτό, καὶ τὸ ποιεῖν τῷ πάσχειν. ὥστε τὸν διδάσκοντα ἀνάγκη ἔσται πάντα μανθάνειν, καὶ τὸν ποιοῦντα πάσχειν. 9 Ἢ οὐδὲ τὸ τὴν ἄλλου ἐνέργειαν ἐν ἑτέρῳ εἶναι ἄτοπον; ἔστι γὰρ ἡ δίδαξις ἐνέργεια τοῦ διδασκαλικοῦ ἔν τινι μέντοι, καὶ οὐκ ἀποτετμημένη, ἀλλὰ τοῦδε ἐν τῷδε· οὔτε γὰρ μίαν δυοῖν κωλύει οὐθὲν τὴν αὐτὴν εἶναι, μὴ ὡς τὸ εἶναι τὸ αὐτό, ὡς λώπιον καὶ ἱμάτιον· ἀλλ' ὡς τὸ δυνάμει ὂν ὑπάρχει πρὸς τὸ ἐνεργοῦν. 10 Οὔτ' ἀνάγκη τὸν διδάσκοντα μανθάνειν, οὐδ' εἰ τὸ πάσχειν καὶ τὸ ποιεῖν τὸ αὐτό ἐστι· μὴ μέντοι ὡς τὸν λόγον εἶναι ἕνα, τὸν τί ἦν εἶναι λέγοντα, οἷον τῷ λωπίῳ καὶ τῷ ἱματίῳ· ἀλλ' ὡς ἡ ὁδὸς ἡ Θήβηθεν Ἀθήναζε, καὶ ἡ Ἀθήνηθεν εἰς Θήβας, ὥσπερ εἴρηται καὶ πρότερον. οὐ γὰρ ταὐτὰ πάντα ὑπάρχει τοῖς ὁπωσοῦν ταὐτοῖς, ἀλλὰ μόνον οἷς τὸ εἶναι τὸ αὐτό. 11 Οὐ μὴν, ἀλλ' οὐδ' εἰ ἡ δίδαξις τῇ μαθήσει τὸ αὐτό, καὶ τὸ μανθάνειν τῷ διδάσκειν τὸ αὐτό· ὥσπερ οὐδ' εἰ ἡ διάστασις μία τῶν διεστηκότων, καὶ τὸ διίστασθαι ἐνθένδε ἐκεῖσε, καὶ ἐκεῖθεν δεῦρο, ἓν καὶ τὸ αὐτό. 12 Ὅλως δ' εἰπεῖν, οὐδ' ἡ δίδαξις τῇ μαθήσει, οὐδ' ἡ ποίησις τῇ παθήσει τὸ αὐτὸ κυρίως, ἀλλ' ᾧ ὑπάρχει ταῦτα, ἡ κίνησις· τὸ γὰρ τοῦδε ἐν τῷδε, καὶ τὸ τοῦδε ὑπὸ τοῦδε ἐνέργειαν εἶναι, ἕτερον τῷ λόγῳ.

A 7 Sed vnus erit actus? verùm à ratione eſt alienum, duarum rerum ſpecie diuerſarum vnum & eundem eſſe actum. 8 Et ſi quidē diſcendi ac docendi actus idem *ſunt*, nec non effectio & paſſio: *certe* & docere erit idem quod diſcere, & facere idem quod pati: quare neceſſe erit, omnem docentem, diſcere, & facientem, pati. 9 An nec abſurdum eſt, alius rei actū in alia re eſſe? (nam actus docendi eſt actus [illegible] quod docendi vim habet, in aliquo tamen, [illegible] ſus, ſed huius in hoc) nec quidquam prohibet [illegible] & eundem eſſe duarum *rerum* actum (non vt *eſſentia* *ſit* eadem ſicut indumentum & veſtimentum, ſed vt id quod eſt poteſtate ſe habet ad id quod agit. 10 Nec neceſſe *eſt* eum qui docet, diſcere, ne quidem B ſi pati & facere idem ſint, non ſint tamen vt vna ſit ratio quidditatem explicans, qualis *eſt* veſtimenti & indumenti, ſed vt via quæ Thebis Athenas & quæ Athenis Thebas *ducit*, ſicut & antè dictum fuit. non enim eadem omnia inſunt iis quæ quoquo modo ſunt eadem, ſed tantùm iis quorum eadem *eſt* eſſentia. 11 At verò nec ſi actus docendi eſt idem quod actus diſcendi, *propterea* etiam diſcere *eſt* idem quod docere. quemadmodum nec ſi diſtantia eſt vna eorum quæ diſtant, *propterea* etiam diſtare hoc ab illo, & illud ab hoc, *ſunt* vnum & idem. 12 Vt autem omnino dicam, nec docendi & diſcendi actus, nec effectio & paſſio *ſunt* idem propriè: ſed motus, cui hæc inſunt, *idem eſt*. nam eſſe actum huius in hoc & huius ab hoc, ratione differunt.

De ſpeciali & perfecta motus definitione.

Cap. III.

Τί μὲν οὖν ἐστιν ἡ κίνησις, καὶ καθόλου, καὶ κατὰ μέρος, C εἴρηται· οὐ γὰρ ἄδηλον ὡς ὁρισθήσεται τῶν εἰδῶν ἕκαστον αὐτῆς· ἀλλοίωσις μὲν γάρ, ἡ τοῦ ἀλλοιωτοῦ, ᾗ ἀλλοιωτόν, ἐντελέχεια. 2 Ἔτι δὲ γνωριμώτερον, ἡ τοῦ δυνάμει ποιητικοῦ καὶ παθητικοῦ, ᾗ τοιοῦτον, ἁπλῶς τε, καὶ πάλιν καθ' ἕκαστον, ἢ οἰκοδόμησις, ἢ ἰάτρευσις. τὸν αὐτὸν δὲ λεχθήσεται τρόπον καὶ περὶ τῶν ἄλλων κινήσεων ἑκάστης.

Qvid igitur ſit motus, & vniuerſaliter & in parte dictum eſt. non *eſt* enim obſcurum, quomodo vnaqueque eius ſpecies definietur. Variatio namque *eſt* actus eius quod variari poteſt, quatenus variari poteſt. 2 Præterea notiori modo *definitur actus* eius quod facere & quod pati poteſt, quatenus *eſt* tale. *idque* & ſimpliciter: & rurſus in ſingulis, vel ædificatio, vel medicatio. eodem modo docetur & de ſingulis aliis motibus.

DE INFINITO,

Tractatvs II.

Agendum eſſe de infinito: & veterum de eo opiniones.

Cap. IV.

Ἐπεὶ δ' ἐστὶν ἡ περὶ φύσεως ἐπιστήμη περὶ μεγέθη, καὶ D κίνησιν, καὶ χρόνον, ὧν ἕκαστον ἀναγκαῖον ἢ ἄπειρον, ἢ πεπερασμένον εἶναι, εἰ καὶ μὴ πᾶν ἐστιν ἢ ἄπειρον, ἢ πεπερασμένον, οἷον πάθος ἢ στιγμή (τῶν γὰρ τοιούτων ἴσως οὐδὲν ἀναγκαῖον ἐν θατέρῳ τούτων εἶναι·) προσῆκον ἂν εἴη τὸν περὶ φύσεως πραγματευόμενον θεωρῆσαι περὶ ἀπείρου, εἰ ἔστιν, ἢ μή· καὶ εἰ ἔστι, τί ἐστι. 2 Σημεῖον δέ, ὅτι ταύτης τῆς ἐπιστήμης οἰκεία ἡ θεωρία ἡ περὶ αὐτοῦ· πάντες γὰρ ὅσοι δοκοῦσιν ἀξιολόγως ἧφθαι τῆς τοιαύτης φιλοσοφίας, πεποίηνται λόγον περὶ τοῦ ἀπείρου, καὶ πάντες ὡς ἀρχήν τινα τιθέασι τῶν ὄντων. 3 Οἱ μὲν ὥσπερ οἱ Πυθαγόρειοι

Cvm autem ſcientia de natura in magnitudinibus & motibus ac temporibus verſetur, quorum vnumquodque neceſſe *eſt* vel infinitum vel finitum eſſe: (etſi non quodvis eſt vel infinitum vel finitum: vt affectio aut punctum: fortaſſis enim nihil eorum quæ *ſunt* eiuſmodi, neceſſe *eſt* in horum altero collocari) ſanè decet, eum qui de natura pertractat, conſiderare de infinito, an ſit, nec ne: & ſi ſit, quid ſit. 2 Indicat autem hanc de ipſo inſpectionem *eſſe* huius ſcientiæ propriam, quòd quicumque videntur cum dignitate huiuſmodi philoſophiam attigiſſe, de infinito diſſeruerunt. Idque omnes, vt principium quoddam entium, ponunt. 3 Alij quidem, vt Pythagorei

A & Plato, per ſe, non quaſi ipſum infinitum alij cuipiam accidat, ſed quaſi ſit ſubſtantia. (4 Verùm Pythagorei *ponunt infinitum* in *rebus* ſenſibilibus; quia numerum ſeparatum non faciunt, atque aſſerunt id quod *eſt* extra cœlum, *eſſe* infinitum: Plato verò *inquit* extra *cœlum* non eſſe vllum corpus, nec ideas, propterea quòd hæ nuſſibi ſunt: ſed infinitum & in *rebus* ſenſibilibus, & in illis *eſſe* ait. 5 Et illi quidem infinitum *aiunt* eſſe par; hoc enim comprehenſum, & ab impari terminatum præbet entibus infinitatem: huius autem *rei* ſignum eſſe, quod accidit in numeris: cùm enim circa vnum & ſeorſim ponantur normæ, aliquando fit ſemper alia forma, aliquando vna *& eadem manet*: Plato autem duo infinita *ponit, nempe* magnum & paruum.) 6 Qui verò de natura *diſſerunt*, omnes infinito ſemper ſubiiciunt aliquam aliam naturam eorum quæ vocantur elementa: vt aquam, aut aërem, aut quod *eſt* his interiectum. 7 Eorum autem qui finita elementa faciunt, nemo *ea* infinita facit. 8 Sed quicumque infinita elementa faciunt, ſicut Anaxagoras & Democritus: hi aiunt infinitum eſſe tactu continuum: *nempe* ille ex partibus ſimilaribus, hic autem ex figurarum farragine. 9 Et ille quidem quamvis particulam æquè eſſe mixturam atque vniuerſum, quia videt quodvis ex quovis fieri: (hinc enim dixiſſe videtur ſimul aliquando omnes res fuiſſe, vt hæc caro, & hoc os, atque ita quodvis, ergo & omnia. & ſimul igitur. Principium enim ſecretionis non ſolùm eſt in vnoquoque, ſed & omnium. Cùm enim quod fit, ex tali fiat corpore, omnium autem fit generatio, quamvis non ſimul: etiam principium aliquod generationis eſſe oportet. hoc autẽ eſt vnum, quam ille appellat mentẽ. mens verò à principio aliquo operatur intelligendo. quare neceſſe *eſt*, omnia ſimul aliquando fuiſſe, & quandoq; moueri cœpiſſe) Democritus autem nullum principiorum fieri alterum ex altero inquit. Verumtamen ipſum commune corpus eſt omnium *rerum* principium, magnitudine ac figura partium differens. 10 Hanc igitur inſpectionem phyſicis conuenire, manifeſtum ex his *eſt*. 11 Nec ſine ratione omnes ponunt ipſum *eſſe* principium: quia nec fruſtra eſſe poteſt, nec aliam vim habere quàm principij. omnia namque aut *ſunt* principium, aut ex principio. ſed infiniti non eſt principiũ: alioquin etiam eius eſſet finis. 12 Præterea & ingenitum, & interitus expers: vt pote quod eſt principium quoddam. quod enim factum eſt, neceſſe *eſt* accepiſſe finem. & finis *quoque* eſt cuiuſuis interitus. Ideo, ſicut dicimus, non videtur *eſſe* huius principiũ, ſed hoc eſſe aliorum *principium*. 13 Et continere omnia, atque omnia gubernare, vt aiunt quicumque præter infinitum non faciunt tales cauſas: velvti, mentem, & amicitiam. 14 Atque hoc eſſe numen: *eſſe* enim immortale, ac perire non poſſe, vt inquit Anaximander, & plurimi eorum qui de natura diſſerunt.

A καὶ Πλάτων, καθ' αὑτό, οὐχ ὡς συμβεβηκός τινι ἑτέρῳ, ἀλλ' ὡς οὐσίαν αὐτὸ ὂν τὸ ἄπειρον. 4 Πλὴν οἱ μὲν Πυθαγόρειοι ἐν τοῖς αἰσθητοῖς· οὐ γὰρ χωριστὸν ποιοῦσι τὸν ἀριθμόν· καὶ εἶναι δὲ τὸ ἔξω τοῦ οὐρανοῦ ἄπειρον. Πλάτων δέ, ἔξω μὲν οὐδὲν εἶναι σῶμα, οὐδὲ τὰς ἰδέας, διὰ τὸ μηδέ που εἶναι αὐτάς. τὸ μέντοι ἄπειρον καὶ ἐν τοῖς αἰσθητοῖς, καὶ ἐν* ἐκείνοις εἶναι. 5 Καὶ οἱ μὲν τὸ ἄπειρον εἶναι τὸ ἄρτιον· τοῦτο γὰρ ἐναπολαμβανόμενον, καὶ ὑπὸ τοῦ περιττοῦ περαινόμενον παρέχει τοῖς οὖσι τὴν ἀπειρίαν· σημεῖον δὲ εἶναι τούτου τὸ συμβαῖνον ἐπὶ τῶν ἀριθμῶν· περιτιθεμένων γὰρ τῶν γνωμόνων περὶ τὸ ἓν καὶ χωρίς, ὁτὲ μὲν ἄλ- B λο ἀεὶ γίγνεσθαι, τὸ εἶδος, ὁτὲ δὲ ἕν. Πλάτων δὲ δύο τὰ ἄπειρα, τὸ μέγα, καὶ τὸ μικρόν. 6 Οἱ δὲ περὶ φύσεως, ἅπαντες ἀεὶ ὑποτιθέασιν ἑτέραν τινὰ φύσιν τῷ ἀπείρῳ τῶν λεγομένων στοιχείων, οἷον, ὕδωρ, ἢ ἀέρα, ἢ τὸ μεταξὺ τούτων. 7 Τῶν δὲ πεπερασμένα ποιούντων στοιχεῖα, οὐδεὶς ἄπειρα ποιεῖ. 8 Ὅσοι δ' ἄπειρα ποιοῦσι στοιχεῖα, καθάπερ Ἀναξαγόρας καὶ Δημόκριτος, ὁ μὲν ἐκ τῶν ὁμοιομερῶν, ὁ δ' ἐκ τῆς πανσπερμίας τῶν σχημάτων, τῇ ἁφῇ συνεχὲς τὸ ἄπειρον εἶναί φασι. 9 Καὶ ὁ μὲν ὁτιοῦν μόριον εἶναι ὁμοίως μῖγμα τῷ παντί, διὰ τὸ ὁρᾶν ὁτιοῦν ἐξ ὁτουοῦν γιγνόμενον. ἐντεῦθεν γὰρ ἔοικε καὶ τὸ ὁμοῦ ποτὲ ἅπαντα χρήματα φάναι εἶναι, οἷον, ἥδε ἡ σὰρξ καὶ τόδε τὸ C ὀστοῦν, καὶ οὕτως ὁτιοῦν· καὶ πάντα ἄρα· καὶ ἅμα τοίνυν* ἀρχὴ γὰρ οὐ μόνον ἐν ἑκάστῳ ἐστὶ τῆς διακρίσεως, ἀλλὰ καὶ πάντων· ἐπεὶ γὰρ τὸ γιγνόμενον ἐκ τοῦ τοιούτου γίνεται σώματος, πάντων δ' ἐστὶ γένεσις πλὴν οὐχ ἅμα, καί τινα ἀρχὴν εἶναι δεῖ τῆς γενέσεως· αὕτη δ' ἐστὶ μία, ὃν ἐκεῖνος καλεῖ νοῦν. ὁ δὲ νοῦς, ἀπ' ἀρχῆς τινος ἐργάζεται νοήσας· ὥστε ἀνάγκη ὁμοῦ [πάντα] ποτ' εἶναι, καὶ ἄρξασθαί ποτε κινούμενα. Δημόκριτος δέ, οὐθὲν ἕτερον ἐξ ἑτέρου γίγνεσθαι τῶν πρώτων φησίν· ἀλλ' ὅμως αὐτό τὸ κοινὸν σῶμα ἁπάντων ἐστὶν ἀρχή, μεγέθει κατὰ τὰ μόρια καὶ σχήματι διαφέρον. 10 Ὅτι μὲν οὖν προσήκουσα τοῖς D φυσικοῖς ἡ θεωρία, δῆλον ἐκ τούτων. 11 Εὐλόγως δὲ καὶ ἀρχὴν αὐτὸ τιθέασι πάντες· οὔτε γὰρ μάτην οἷόν τε αὐτὸ εἶναι, οὔτε ἄλλην αὐτῷ ὑπάρχειν δύναμιν, πλὴν ὡς ἀρχήν· ἅπαντα γὰρ ἢ ἀρχὴ ἢ ἐξ ἀρχῆς· τοῦ δὲ ἀπείρου οὐκ ἔστιν ἀρχή· εἴη γὰρ ἂν αὐτοῦ πέρας. 12 Ἔτι δὲ καὶ ἀγένητον καὶ ἄφθαρτον, ὡς ἀρχή τις οὖσα. τό, τε γὰρ γενόμενον ἀνάγκη λαβεῖν τέλος καὶ τελευτὴ πάσης ἐστὶ φθορᾶς. διό, καθάπερ λέγομεν, οὐ ταύτης ἀρχή, ἀλλ' αὕτη τῶν ἄλλων εἶναι δοκεῖ. 13 Καὶ περιέχειν ἅπαντα καὶ πάντα κυβερνᾶν, ὥς φασιν ὅσοι μὴ ποιοῦσι παρὰ τὸ ἄπειρον ἄλλας αἰτίας, οἷον νοῦν, ἢ φιλίαν. 14 Καὶ τοῦτο εἶναι τὸ θεῖον· ἀθάνατον γὰρ καὶ ἀνώλεθρον, ὥσπερ φησὶν ὁ Ἀναξίμανδρος, καὶ οἱ πλεῖστοι τῶν φυσιολόγων.

* γ. ἐκείνοις

* γ. ἀρχὴν γὰρ μ. ὧ i. τὸ

Dubitationes de infinito.

Cap. V.

E Sſe autem quoddam infinitum, ex quinque potiſſimùm *argumentis* fides conſiderantibus fit. 2 Nempe ex tempore: hoc enim *eſt* infinitum. 3 Et ex diuiſione, quæ in magnitudinibus *cernitur*. nam & mathematici vtuntur infinito.

E Τοῦ δ' εἶναί τι ἄπειρον, ἡ πίστις ἐκ πέντε μάλιστ' ἂν συμβαίνοι σκοποῦσιν. 2 Ἔκ τε τοῦ χρόνου· οὗτος γὰρ ἄπειρος. 3 Καὶ ἐκ τῆς ἐν τοῖς μεγέθεσι διαιρέσεως· χρῶνται γὰρ καὶ οἱ μαθηματικοὶ τῷ ἀπείρῳ.

4 Ἔτι, τῷ οὕτως ἂν μόνως μὴ ὑπολείπειν γένεσιν καὶ φθοράν, εἰ ἄπειρον εἴη, ὅθεν ἀφαιρεῖται τὸ γιγνόμενον. 5 Ἔτι, τῷ τὸ πεπερασμένον ἀεὶ πρός τι περαίνειν. ὥστε ἀνάγκη μηδὲν εἶναι πέρας, εἰ ἀεὶ περαίνειν ἀνάγκη ἕτερον πρὸς ἕτερον. 6 Μάλιστα δὲ καὶ κυριώτατον, ὃ τὴν κοινὴν ποιεῖ ἀπορίαν πᾶσι· διὰ γὰρ τὸ ἐν τῇ νοήσει μὴ ὑπολείπειν, καὶ ὁ ἀριθμὸς δοκεῖ ἄπειρος εἶναι, καὶ τὰ μαθηματικὰ μεγέθη, καὶ τὸ ἔξω τοῦ οὐρανοῦ. ἀπείρου δ' ὄντος τοῦ ἔξω, καὶ σῶμα ἄπειρον εἶναι δοκεῖ, καὶ κόσμοι· τί γὰρ μᾶλλον τοῦ κενοῦ ἐνταῦθα, ἢ ἐνταῦθα; ὥστε εἴπερ μοναχοῦ, καὶ πανταχοῦ ἀνάγκη εἶναι τὸν ὄγκον. ἅμα δ' εἰ καὶ ἔστι κενόν, καὶ τόπος ἄπειρος, καὶ σῶμα ἄπειρον ἀναγκαῖον εἶναι· τὸ γὰρ ἐνδέχεσθαι τοῦ εἶναι οὐδὲν διαφέρει ἐν τοῖς ἀϊδίοις. 7 Ἔχει δ' ἀπορίαν ἡ περὶ τοῦ ἀπείρου θεωρία· καὶ γὰρ μὴ εἶναι πολλὰ ἀδύνατα συμβαίνει, καὶ εἶναι. 8 Ἔτι δὲ, ποτέρως ἐστί, πότερον ὡς οὐσία, ἢ ὡς συμβεβηκὸς καθ' αὑτὸ φύσει τινί, ἢ οὐδετέρως· ἀλλ' οὐδὲν ἧττόν ἐστιν ἄπειρον ἢ ἄπειρα τῷ πλήθει. 9 Μάλιστα δὲ φυσικοῦ ἐστι σκέψασθαι, εἰ ἔστι μέγεθος αἰσθητὸν ἄπειρον.

A 4 Præterea, quia hoc tantùm modo non deficit ortus & interitus, si *illud* sit infinitum, vnde aufertur quod fit. 5 Præterea, quia finitum ſemper ad aliquid terminatur. quare neceſſe *eſt* nullum eſſe terminum, ſi ſemper neceſſe *eſt* terminari alterum ad alterum. 6 Maximè autem *fidem facit*, & maximè proprium *eſt argumentum*, *quod* communem dubitationem omnibus efficit. nam quia cogitationis non eſt finis, videtur & numerus eſſe infinitus, & mathematicæ magnitudines, & quod est extra cælum. cùm autem infinitum ſit, quod extra *eſt*: etiam corpus infinitum eſſe videtur, ac mundi *infiniti*. cur enim potiùs in hac parte inanis, quàm in illa? B quare ſi vno *eſt* loco, etiam vbique eſſe molem neceſſe *eſt*. item ſi eſt inane, & locus infinitus: neceſſe *eſt* etiam eſſe corpus infinitum. nam poſſe, & eſſe, in ſempiternis nihil differunt. 7 Habet autem dubitationem inſpectio de infinito: quoniam & iis qui non eſſe ponunt, multa impoſſibilia eueniunt, & *iis qui* eſſe *ponunt*. 8 Præterea vtro modo ſit, vtrùm vt ſubſtantia, an vt accidens per ſe naturæ alicui, an neutro modo, ſed nihilominus ſit infinitum vel infinita numero. 9 Maximè autem phyſici eſt conſiderare an ſit magnitudo ſenſibilis infinita.

Diſputatio contra Platonem & Pythagoreos, ponentes infinitum eſſe ſubſtantiam, & per ſe.

Cap. VI.

Πρῶτον οὖν διαιρετέον, ποσαχῶς λέγεται τὸ ἄπειρον. 2 Ἕνα μὲν οὖν τρόπον, τὸ ἀδύνατον διελθεῖν, τῷ μὴ πεφυκέναι διιέναι, ὥσπερ ἡ φωνὴ ἀόρατος. ἄλλως δὲ, τὸ διέξοδον ἔχον ἀτελεύτητον, ἢ ὃ μόγις, ἢ ὃ πεφυκὸς ἔχειν, μὴ ἔχει διέξοδον, ἢ πέρας. 3 Ἔτι ἄπειρον ἅπαν, ἢ κατὰ πρόσθεσιν, ἢ κατὰ διαίρεσιν, ἢ ἀμφοτέρως. 4 Χωριστὸν μὲν οὖν εἶναι τὸ ἄπειρον τῶν αἰσθητῶν, αὐτό τι ὂν ἄπειρον, οὐχ οἷόν τε. εἰ γὰρ μήτε μέγεθός ἐστι, μήτε πλῆθος, ἀλλ' οὐσία αὐτό ἐστι τὸ ἄπειρον, καὶ μὴ συμβεβηκός, ἀδιαίρετον ἔσται· τὸ γὰρ διαιρετὸν, ἢ μέγεθος ἔσται, ἢ πλῆθος. εἰ δὲ ἀδιαίρετον, οὐκ ἄπειρον, εἰ μὴ ὡς ἡ φωνὴ ἀόρατος. ἀλλ' οὐχ οὕτως, οὔτε φασὶν εἶναι οἱ φάσκοντες εἶναι τὸ ἄπειρον, οὔτε ἡμεῖς ζητοῦμεν, ἀλλ' ὡς ἀδιέξοδον. 5 Εἰ δὲ κατὰ συμβεβηκός ἐστι τὸ ἄπειρον, οὐκ ἂν εἴη στοιχεῖον τῶν ὄντων, ᾗ ἄπειρον· ὥσπερ οὐδὲ τὸ ἀόρατον τῆς διαλέκτου, καίτοι ἡ φωνή ἐστιν ἀόρατος. 6 Ἔτι πῶς ἐνδέχεται εἶναί τι αὐτὸ ἄπειρον, εἴπερ μὴ καὶ ἀριθμὸν καὶ μέγεθος, ὧν ἐστι καθ' αὑτὸ πάθος τι τὸ ἄπειρον; ἔτι γὰρ ἧττον ἀνάγκη, ἢ τὸν ἀριθμόν, ἢ τὸ μέγεθος. 7 Φανερὸν δὲ καὶ ὅτι οὐκ ἐνδέχεται εἶναι τὸ ἄπειρον, ὡς ἐνεργείᾳ ὄν, καὶ ὡς οὐσίαν, καὶ ἀρχήν· ἔσται γὰρ ὁτιοῦν αὐτοῦ ἄπειρον τὸ λαμβανόμενον, εἰ μεριστόν. τὸ γὰρ ἀπείρῳ εἶναι, καὶ ἄπειρον, τὸ αὐτό, εἴπερ οὐσία τὸ ἄπειρον, καὶ μὴ καθ' ὑποκειμένου. ὥστ' ἢ ἀδιαίρετον, ἢ εἰς ἄπειρα διαιρετόν· πολλὰ δ' ἄπειρα ἀδύνατον τὸ αὐτὸ εἶναι. ἀλλὰ μὴν ὥσπερ ἀέρος ἀὴρ μέρος, οὕτω καὶ ἄπειρον ἀπείρου, εἴγε οὐσία ἐστὶ καὶ ἀρχή. ἀμέριστον ἄρα καὶ ἀδιαίρετον. ἀλλ' ἀδύνατον τὸ ἐντε-

C PRimùm igitur definiendum *eſt*, quot modis dicatur infinitum. 2 Vno igitur modo *dicitur infinitum*, quod eſt impoſſibile pertranſire, quia non eſt natura aptum vt percurratur: quemadmodum vox *eſt* inaſpectabilis. alio modo, cuius tranſitus non habet finem, aut vix, aut quod ſua natura poteſt habere, non tamen habet tranſitum vel finem. 3 Præterea omne infinitum *eſt* vel additione, vel diuiſione, vel vtroque modo. 4 Infinitum igitur ſeparatum à rebus ſenſibilibus, quod ſit ipſum quiddam infinitum, eſſe nequit. nam ſi ipſum infinitum nec eſt magnitudo, nec multitudo, ſed eſt ſubſtantia, D non accidens: *certè* indiuiduum erit. quod enim eſt diuiduum, aut erit magnitudo aut multitudo. ſi verò indiuiduum *ſit*, non *erit* infinitum, niſi vt vox *eſt* inaſpectabilis. ſed ita nec eſſe dicunt ij qui aiunt eſſe infinitum, nec nos quærimus, ſed vt id quod pertranſiri non poteſt. 5 Sin autem infinitum eſt ex accidenti: non poteſt eſſe elementum eorum quæ ſunt, quatenus *eſt* infinitum: quemadmodum nec aſpectabile *eſt* linguæ *elementum*, quamvis vox ſit aſpectabilis. 6 Præterea qui fieri poteſt, vt aliquid ſit ipſum infinitum? ſi quidem non *ita eſſe poſſunt* numerus & magnitudo, quorum affectio quædam per ſe eſt infinitum. neceſſe enim *eſt* adhuc mi- E nùs *eſſe infinitum*, quàm numerum, vel magnitudinem. 7 Perſpicuum quoque eſt, non poſſe infinitum eſſe vt actu exiſtens, & vt ſubſtātiam, & *vt* principium: nam quævis eius *pars* ſumatur, erit infinita, ſi partibilis *eſt*. infiniti enim eſſentia, & infinitum, idem *ſunt*: ſi quidem infinitum *eſt* ſubſtantia, nec *dicitur* de ſubiecto. quare aut indiuiduum eſt, aut in infinita diuiduum. ſed multa infinita eidem ineſſe non poſſunt. At verò vt aëris pars *eſt* aer: ita etiam infiniti infinitum, ſi eſt ſubſtantia, & principium. *Eſt* igitur impartibile & indiuiduum. ſed impoſſibile *eſt*, cùm

actu ſit infinitum: quantum enim quiddam eſſe neceſſe *eſt*. 8 Ergo ex accidẽti infinitum ineſt. Sed ſi ita *ſit*, dictum fuit non poſſe id appellari principium, ſed illud *potiùs* cui accidit, *nempe* aërem, aut par. 9 Quare abſurdè pronuntiant, qui ſic aſſerunt, vt inquiunt Pythagorei: ſimul enim ſtatuunt infinitum *eſſe* ſubſtantiam, & in partes diuidunt.

A λεχεία ὂν ἄπειρον· ποσὸν γάρ τι εἶναι ἀναγκαῖον. 8 Κατὰ συμβεβηκὸς ἄρα ὑπάρχει τὸ ἄπειρον. ἀλλ' εἰ οὕτως, εἴρηται ὅτι οὐκ ἐνδέχεται αὐτὸ ἀρχὴν λέγειν· ἀλλ' ἐκεῖνο ᾧ συμβέβηκε, τὸν ἀέρα, ἢ τὸ ἄρτιον. 9 Ὥστε ἀτόπως ἂν ἀποφαίνοιντο οἱ λέγοντες οὕτως, ὥσπερ οἱ Πυθαγόρειοί φασιν· ἅμα γὰρ οὐσίαν ποιοῦσι τὸ ἄπειρον, καὶ μερίζουσιν.

Non eſſe corpus ſenſibile infinitum.

Cap. VII.

SEd fortaſſis hæc quæſtio eſt magis vniuerſalis, an B
poſſit eſſe infinitum etiam in mathematicis, & in intelligibilibus, & in iis quæ nullam habent magnitudinem. Nos verò de *rebus* ſenſibilibus, ac de quibus methodum conſcribimus, diſpiciamus, vtrùm in his ſit an non ſit corpus infinitum accretione. 2 Logicè igitur conſiderantibus ex *rationibus* eiuſmodi videri poſſit non eſſe. 3 Nam ſi eſt corporis definitio, Quod ſuperficie terminatur: non poteſt eſſe corpus infinitum, nec intelligibile, non ſenſibile. 4 At verò neque numerus, ſic vt ſeparatus, & infinitus: quoniam numerus, aut quod habet numerum, *eſt* numerabile. Si igitur numerabile
poteſt numerari: etiam poterit infinitum pertranſ- C
iri. 5 Magis autem phyſicè diſpicientibus, ex his. 6 Etenim neque compoſitum eſſe poteſt, neque ſimplex. 7 Infinitum igitur corpus non erit compoſitum, ſi elementa ſint numero finita. neceſſe enim *eſt*, ſemper contraria eſſe plura, & *inter ſe* æquari, nec eſſe vnum eorum infinitum. nam ſi quocumque modo vis, quæ in vno *eſt* corpore, ſuperetur ab altero: veluti, ſi ignis eſt finitus, aër autem infinitus, ſed æqualis ignis æqualem aërem vi quantumvis multipla ſuperat, modò numerum aliquem habeat: perſpicuum tamen *eſt* fore, vt infinitum ſuperet & interimat quod finitum *eſt*. 8 Vnum-
quodque autem eſſe infinitum, impoſſibile *eſt*. cor- D
pus enim eſt, quod vndique habet extenſionem: infinitum verò, quod in immenſum extenditur. quare infinitum corpus vndique erit extenſum in immenſum. 9 At verò nec poteſt infinitum corpus eſſe vnum & ſimplex, neque (vt quidam dicunt) id quod *eſt* præter elementa, ex quo hæc gignuntur, neque omnino. 10 Sunt enim nonnulli, qui infinitum hoc faciunt, non aërem, aut aquam, ne cætera ab eo interimantur, quod inter illa eſt infinitum. habent enim inter ſe contrarietatem. vtputà aër *eſt* frigidus, aqua verò *eſt* humida, ignis autem calidus: quorum ſi vnum *ſit* infinitum, cetera iam interimerentur. nunc verò aliud eſſe aiunt id, ex quo hæc *ſiunt*. 11 Verùm impoſſibile *eſt* eſſe tale:
non quia infinitum (de hoc enim commune ali- E
quid dicendum *eſt*, *quod* omni corpori æquè *conueniat, id eſt* & aëri & aquæ & *alij* cuiuis:) ſed quia non eſt tale ſenſibile corpus præter ea quæ vocantur elementa. omnis enim res, ex quo eſt, in id etiam diſſoluitur. quare hîc eſſet aliud quidpiam præter aërem & ignem & terram & aquam. ſed nullum apparet. 12 Neque igitur ignis, neque vllum aliud elementum poteſt eſſe infinitum. nam omnino, & præterquam quòd eſſet aliquod eorum infinitum, impoſſibile *eſt*, vt vniuerſum, etiamſi *ſit* finitum, aut ſit aut fiat vnum aliquid illorum: ſicut Heraclitus ait omnia fieri aliquando ignem.

B Ἀλλ' ἴσως, αὕτη μὲν ἐστὶ καθόλου ἡ ζήτησις μᾶλλον, εἰ ἐνδέχεται τὸ ἄπειρον καὶ ἐν τοῖς μαθηματικοῖς εἶναι, καὶ ἐν τοῖς νοητοῖς, καὶ ἐν τοῖς μηδὲν ἔχουσι μέγεθος. ἡμεῖς δὲ ἐπισκοποῦμεν περὶ τῶν αἰσθητῶν, καὶ περὶ ὧν ποιούμεθα τὴν μέθοδον, ἆρ' ἐστιν ἐν αὐτοῖς, ἢ οὐκ ἔστι σῶμα ἄπειρον * περὶ τὴν αὔξησιν. λογικῶς μὲν οὖν σκοπουμένοις, ἐκ τῶν τοιῶνδε δόξειεν ἂν οὐκ εἶναι. 13 Εἰ γὰρ ἐστὶ σώματος λόγος τὸ ἐπιπέδῳ ὡρισμένον, οὐκ ἂν εἴη σῶμα ἄπειρον, οὔτε νοητὸν, οὔτε αἰσθητόν. 4 Ἀλλὰ μὴν οὐδ' ἀριθμὸς οὕτως ὡς κεχωρισμένος καὶ ἄπειρος· ἀρι-
C θμητὸν γὰρ ὁ ἀριθμὸς, ἢ τὸ ἔχον ἀριθμόν. εἰ οὖν τὸ ἀριθμητὸν ἐνδέχεται ἀριθμῆσαι, καὶ διεξελθεῖν ἂν εἴη δυνατὸν τὸ ἄπειρον. 5 Φυσικῶς δὲ μᾶλλον θεωροῦσιν ἐκ τῶνδε. 6 Οὔτε γὰρ σύνθετον οἷόν τε εἶναι, οὔτε ἁπλοῦν. 7 Σύνθετον μὲν οὖν οὐκ ἔσται τὸ ἄπειρον σῶμα, εἰ πεπερασμένα τῷ πλήθει τὰ στοιχεῖα εἴη. ἀνάγκη γὰρ πλείω εἶναι, καὶ ἰσάζειν ἀεὶ τἀναντία, καὶ μὴ εἶναι ἓν αὐτῶν ἄπειρον· εἰ γὰρ ὁπωσοῦν λείπεται ἡ ἐν ἑνὶ σώματι δύναμις θατέρου, οἷον εἰ τὸ πῦρ πεπέρασται, ὁ δ' ἀὴρ ἄπειρος· ἔστι δὲ τὸ ἴσον πῦρ τοῦ ἴσου ἀέρος τῇ δυνάμει ὁποσαπλασιονοῦν, μόνον δὲ ἀριθμόν τινα ἔχον· ὅμως φανερὸν, ὅτι τὸ ἄπειρον ὑπερ-
D βαλεῖ καὶ φθερεῖ τὸ πεπερασμένον. 8 Ἕκαστον δ' ἄπειρον εἶναι ἀδύνατον· σῶμα γάρ ἐστι τὸ πάντῃ ἔχον διάστασιν· ἄπειρον δὲ τὸ ἀπεράντως διεστηκός· ὥστε τὸ ἄπειρον σῶμα, πανταχῇ ἔσται διεστηκὸς εἰς ἄπειρον. 9 Ἀλλὰ μὴν οὐδὲ ἓν καὶ ἁπλοῦν εἶναι ἐνδέχεται τὸ ἄπειρον σῶμα, οὔτε ὡς λέγουσί τινες τὸ παρὰ τὰ στοιχεῖα, ἐξ οὗ ταῦτα γεννῶσιν, οὔθ' ἁπλῶς. 10 Εἰσὶ γάρ τινες οἱ τοῦτο ποιοῦσι τὸ ἄπειρον, ἀλλ' οὐκ ἀέρα, ἢ ὕδωρ, ὅπως μὴ τἆλλα φθείρηται ὑπὸ τοῦ ἀπείρου αὐτῶν· ἔχουσι γὰρ πρὸς ἄλληλα ἐναντίωσιν, οἷον ὁ μὲν ἀὴρ ψυχρὸς, τὸ δ' ὕδωρ ὑγρὸν, τὸ δὲ πῦρ θερμόν. ὧν εἰ [ἦν] ἓν ἄπειρον, ἔφθαρτο ἂν ἤδη τἆλλα· νῦν δὲ ἕτερον φασὶν εἶναι τὸ ἐξ οὗ ταῦτα. 11 Ἀδύνατον
E δ' εἶναι τοιοῦτον, οὐχ ὅτι ἄπειρον (περὶ τούτου γὰρ κοινόν τι λεκτέον ἐπὶ παντὸς ὁμοίως καὶ ἀέρος, καὶ ὕδατος, καὶ ὁτουοῦν) ἀλλ' ὅτι οὐκ ἔστι τοιοῦτον αἰσθητὸν σῶμα παρὰ τὰ καλούμενα στοιχεῖα· ἅπαν γὰρ ἐξ οὗ ἐστι, καὶ διαλύεται εἰς τοῦτο. ὥστε ἦν ἂν ἐνταῦθα παρὰ ἀέρα, καὶ πῦρ, καὶ γῆν, καὶ ὕδωρ ἄλλο τι· φαίνεται δ' οὐδέν. 12 Οὐδὲ δὴ πῦρ, οὐδ' ἄλλο τῶν στοιχείων οὐθὲν ἄπειρον ἐνδέχεται εἶναί τι· ὅλως γὰρ καὶ χωρὶς τοῦ ἄπειρον εἶναί τι αὐτῶν, ἀδύνατον τὸ πᾶν κἂν ᾖ πεπερασμένον, ἢ εἶναι, ἢ γίνεσθαι ἕν τι αὐτῶν, ὥσπερ Ἡράκλειτός φησιν, ἅπαντα γίνεσθαί ποτε πῦρ.

* κ. [illegible]

13 Ὁ δὲ αὐτὸς λόγος καὶ ἐπὶ τοῦ ἑνός, οἷον ποιοῦσι παρὰ τὰ στοιχεῖα οἱ φυσικοί· πάντα γὰρ μεταβάλλει ἐξ ἐναντίου εἰς ἐναντίον, οἷον ἐκ θερμοῦ εἰς ψυχρόν. 14 Δεῖ δὲ περὶ παντός, καὶ ἐκ τῶνδε σκοπεῖν, εἰ ἐνδέχεται ἢ οὐκ ἐνδέχεται εἶναι σῶμα ἄπειρον αἰσθητόν. 15 Ὅτι δὲ ὅλως ἀδύνατον εἶναι σῶμα ἄπειρον αἰσθητόν, ἐκ τῶνδε δῆλον· πέφυκε γὰρ πᾶν τὸ αἰσθητὸν πού εἶναι, καὶ ἔστι τόπος τις ἑκάστου, καὶ ὁ αὐτὸς τοῦ μορίου καὶ παντός, οἷον ὅλης τε τῆς γῆς καὶ μιᾶς βώλου, καὶ πυρὸς καὶ σπινθῆρος. 16 Ὥστε εἰ μὲν * ὁμοειδές, ἢ ἀκίνητον ἔσται, ἢ ἀεὶ οἰσθήσεται. καίτοι ἀδύνατον· τί γὰρ μᾶλλον κάτω ἢ ἄνω, ἢ ὁπουοῦν; λέγω δέ, οἷον εἰ βῶλος εἴη, ποῦ αὕτη κινηθήσεται, ἢ ποῦ μενεῖ; ὁ γὰρ τόπος ἄπειρος, τοῦ συγγενοῦς αὐτῇ σώματος. πότερον οὖν καθέξει τὸν ὅλον * τόπον, καὶ πῶς; τίς οὖν καὶ ποῦ ἡ μονὴ καὶ ἡ κίνησις αὐτῆς; ἢ πανταχοῦ μενεῖ; οὐ κινηθήσεται ἄρα. ἢ πανταχοῦ κινηθήσεται; οὐκ ἄρα στήσεται. 17 Εἰ δὲ ἀνόμοιον τὸ πᾶν, ἀνόμοιοι καὶ οἱ τόποι. 18 Καὶ πρῶτον μὲν οὐχ ἓν τὸ σῶμα τοῦ παντός, ἀλλ' ἢ τῷ ἅπτεσθαι. 19 Ἔπειτα, ἤτοι πεπερασμένα ταῦτ' ἔσται ἢ ἄπειρα τῷ εἴδει. 20 Καὶ πεπερασμένα μὲν οὐχ οἷόν τε· ἔσται γὰρ τὰ μὲν ἄπειρα, τὰ δ' οὔ, εἰ τὸ πᾶν ἄπειρον, οἷον τὸ πῦρ, ἢ τὸ ὕδωρ. φθορὰ δὲ τὸ τοιοῦτον τοῖς ἐναντίοις, καθάπερ εἴρηται πρότερον. 21 Καὶ διὰ τοῦτο, οὐθεὶς τὸ ἓν καὶ ἄπειρον πῦρ ἐποίησεν, οὐδὲ γῆν, τῶν φυσιολόγων, ἀλλ' ἢ ὕδωρ, ἢ ἀέρα, ἢ τὸ μέσον αὐτῶν. ὅτι τόπος ἑκατέρου, δῆλος ἦν διωρισμένος. ταῦτα δὲ ἐπαμφοτερίζει τῷ ἄνω καὶ κάτω. 22 Εἰ δ' ἄπειρα, καὶ ἁπλᾶ, καὶ οἱ τόποι ἄπειροι, καὶ ἔσται ἄπειρα τὰ στοιχεῖα. εἰ δὲ τοῦτο ἀδύνατον, καὶ πεπερασμένοι οἱ τόποι, καὶ τὸ ὅλον πεπεράνθαι ἀναγκαῖον· ἀδύνατον γὰρ μὴ ἀπαρτίζειν τὸν τόπον, καὶ τὸ σῶμα· οὔτε γὰρ ὁ τόπος ὁ πᾶς μείζων, ἢ ὅσον ἐνδέχεται τὸ σῶμα ἅμα εἶναι· ἅμα δ', οὐδ' ἄπειρον ἔσται τὸ σῶμα· οὔτε τὸ σῶμα μεῖζον, ἢ ὁ τόπος· ἢ γὰρ κενὸν ἔσται τι, ἢ σῶμα οὐδαμοῦ πεφυκὸς εἶναι. 23 Ἀναξαγόρας δ' ἀτόπως λέγει περὶ τῆς τοῦ ἀπείρου μονῆς· στηρίζειν γὰρ αὐτὸ αὑτό φησι τὸ ἄπειρον· τοῦτο δέ, ὅτι ἐν * αὑτῷ. ἄλλο γὰρ οὐδὲν περιέχει. 24 Ὡς ὅπου ἄν τι ᾖ, πεφυκὸς ἐνταῦθα εἶναι. τοῦτο δ' οὐκ ἀληθές· εἴη γὰρ ἄν τι που βίᾳ, καὶ οὐχ οὗ πέφυκεν. 25 Εἰ οὖν ὅτι μάλιστα μὴ κινεῖται τὸ ὅλον (τὸ γὰρ ἐν αὑτῷ στηριζόμενον, καὶ ἐν αὑτῷ ὄν, ἀκίνητον εἶναι ἀνάγκη) ἀλλὰ διὰ τί οὐ πέφυκε κινεῖσθαι, λεκτέον· οὐ γὰρ ἱκανὸν τὸ οὕτως εἰπόντα ἀπηλλάχθαι· εἴη γὰρ ἂν καὶ ὁτιοῦν ἄλλο οὐ κινούμενον· ἀλλὰ πεφυκέναι οὐδὲν κωλύει· ἐπεὶ καὶ ἡ γῆ οὐ φέρεται, οὐδ' εἰ ἄπειρος ἦν· εἰργομένη μέντοι ἀπὸ τοῦ μέσου· ἀλλ' οὐχ ὅτι οὐκ ἔστιν ἄλλο οὗ ἐνεχθήσεται, μένοι ἂν ἐπὶ τοῦ μέσου· ἀλλ' ὅτι οὐ πέφυκεν οὕτω. καίτοι ἐξείη ἂν λέγειν, ὅτι στηρίζει ἑαυτήν. εἰ οὖν μηδ' ἐπὶ τῆς γῆς τοῦτο αἴτιον ἀπείρου οὔσης, ἀλλ' ὅτι βάρος ἔχει, τὸ δὲ βαρὺ μένει ἐπὶ τοῦ μέσου, ἡ δὲ γῆ ἐπὶ τοῦ μέσου, ὁμοίως καὶ τὸ ἄπειρον μένει ἐν αὑτῷ, διὰ ἄλλην τινὰ αἰτίαν, καὶ οὐχ ὅτι ἄπειρον, καὶ στηρίζει αὐτὸ αὑτό. 26 Ἅμα δὲ δῆλον, ὅτι κἂν ὁτιοῦν δέοι μέρος μένειν· ὡς γὰρ τὸ ἄπειρον ἐν ἑαυτῷ μένει στηρίζον, οὕτω κἂν ὁτιοῦν ληφθῇ μέρος,

* ἄ. ὁμοιομερές,

* γρ. πότερον; ἢ πῶς;

* γρ. αὐτῷ.

A 13 Eadem ratio *eſt* etiam in vno, quale præter elementa faciunt phyſici: omnia namque mutantur ex contrario in contrarium, vt ex calido in frigidum. 14 Oportet autem de omni *corpore* etiam ex his conſiderare, vtrùm poſſit, an non poſſit eſſe corpus infinitum ſenſibile. 15 Omnino autem eſſe impoſſibile, vt ſit corpus infinitum ſenſibile, ex his manifeſtum *erit*: quia naturâ eſt comparatum, vt omne ſenſibile ſit alicubi: & ſit cuiuſque rei locus aliquis: idemque *ſit* partis & totius *locus*, vt totius terræ & vnius glebæ, nec non ignis & ſcintillæ. 16 Quocirca ſi quidem eſt vnius formæ: aut immobile erit, aut ſemper feretur. atqui *eſt* impoſſibile. cur enim B potiùs infrà, quàm ſuprà, aut vbivis? verbi gratiâ, ſi gleba ſit, vbi hæc mouebitur? aut vbi manebit? infinitus enim *eſt* locus corporis ei cognati. vtrùm igitur continebit totum locum? & quomodo? quiſnam ergo, & vbi erit ſtatus & motus eius? an vbique ſtabit? non ergo mouebitur. an vbique mouebitur? non igitur conſiſtet. 17 Quòd ſi vniuerſum diſſimile *ſit*, diſſimiles etiam *erunt* loci. 18 Ac primùm quidem non *erit* vniuerſi corpus vnum, niſi tactu. 19 Deinde aut finita hæc erunt, aut infinita, ſpecie. 20 Ac finita quidem *eſſe* non poſſunt. nam alia erunt infinita, alia minimè, ſi vniuerſum *eſt* infinitum: vt ignis, vel aqua. ſed *quod eſt* tale, contrariis interitum affert, ſicut antea dictum fuit. 21 Ideóque C nullus eorum qui de natura diſſeruerunt, vnum illud & infinitum ſtatuerunt *eſſe* ignem, aut terram: ſed vel aquam, vel aërem, vel medium his *interiectum*: quia locus *illius* vtriuſque perſpicuè definitus eſt: hæc autem participant ſuperiorem & inferiorem locum. 22 Sin autem infinita & ſimplicia *ſunt*: etiam loci *erunt* infiniti, & elementa erunt infinita. quod ſi *eſt* impoſſibile, ac finiti loci *ſunt*: neceſſe *eſt*, vt etiam vniuerſum ſit finitum. eſt enim impoſſibile, non eſſe paria locum & corpus: quia neque totus locus *eſt* maior, quàm vt poſſit corpus ſimile eſſe: (ſimul autem neque corpus erit infinitum) neque corpus *eſt* maius quã locus: alioqui aut erit aliquid inane, aut corpus, quod ſuapte natura D nullibi ſit. 23 Anaxagoras verò abſurdè loquitur de infiniti ſtatu. ait enim ipſum infinitum ſe ipſum ſuſtinere: & hoc *ideo*, quia in ſe ipſo *eſt*: quippe quod nulla alia res continet. 24 Quaſi vbi aliquid eſt, ibi ſuapte natura ſit. ſed hoc non eſt verum: poteſt enim aliquid eſſe alicubi vi, non vbi natura comparatum eſt vt ſit. 25 Si igitur quàm maximè non mouetur vniuerſum; quia neceſſe *eſt* id eſſe immobile, quod in ſe ſuſtinetur, & in ſe eſt: tamen dicendum *eſt*, cur nón ſit naturâ aptum moueri. non enim æquum eſt, eum, qui ita dixerit, aufugiſſe: quoniam & quodvis aliud eſſe poteſt, quod non moueatur: ſed naturâ aptum E eſſe *vt moueatur*, nihil prohibet. nam & terra nón fertur: nec, ſi infinita eſſet, ferretur, à medio cohibita: non *tamen*, quia non eſſet aliud quò ferretur, maneret in medio: ſed quia non eſt ei naturâ inſitum ita *moueri*. atqui dicere liceret *terram* ſe ipſam ſuſtinere. ergo ſi ne in terra quidem, ſi ſit infinita, hæc *eſt* cauſa *quietis*; ſed quia pondus habet, quod autem *eſt* graue, in medio manet, terra verò in medio *eſt*: ſimiliter etiam infinitum manet in ſe ipſo propter aliquam aliam cauſam, non quia *eſt* infinitum, & ipſum ſe ſuſtinet. 26 Item manifeſtum *eſt*, opus eſſe vt quævis eius pars maneat. vt enim infinitum in ſe ipſo manet, *ſe* ſuſtinens: ita & ſi quævis pars ſumatur,

in ſe ipſa manebit: quia loca totius & partis ſunt A eiuſdem ſpeciei: velut, totius terræ & glebæ *locus* inferus, ac totius ignis ac ſcintillæ *locus* ſuperus. quare ſi infiniti locus eſt in ſe ipſo, etiam partis *locus* idem *erit*. in ſe igitur manebit. 27 Omnino autem patet eſſe impoſſibile, vt ſimul dicatur *eſſe* infinitum corpus, & aliquem eſſe locum corporibus: ſi omne corpus ſenſibile aut pondus habet, aut leuitatem: &, ſi quidem graue *eſt*, ad medium natura fertur: ſi verò leue, ſurſum: quia neceſſe *eſt*, etiam infinitum corpus *eſſe tale*. ſed *eſt* impoſſibile, aut totum alterutro modo aut dimidium vtroque modo affectum eſſe. quo enim modo diuides? aut quomodo infiniti erit alia pars ſuprà, alia infrà? aut extrema vel media? 28 Præterea omne corpus ſen- B ſibile *eſt* in loco. loci autem ſpecies ac differentiæ *ſunt* ſuperum & inferum, & anterius & poſterius, & dextrum & ſiniſtrum: atque hæc non tantùm *relatione* ad nos *habita*, & poſitione, ſed etiam in ipſo vniuerſo definita ſunt: atqui *eſt* impoſſibile, hæc infinito ineſſe. & omnino ſi impoſſibile *eſt* locum eſſe infinitum, omne autem corpus *eſt* in loco: impoſſibile *etiam eſt*, eſſe aliquod corpus infinitum. *29 At verò quod *eſt* alicubi, *eſt* in loco. ergo ſi infinitum non poteſt eſſe quantum: (quoniam eſſet quantum quiddam, vt bicubitum & tricubitum: hæc enim quantum ſignificant) ita etiam *ſe habet* quod *eſt* in loco: quia *eſt* alicubi: hoc autem vel ſuprà, vel infrà, vel in aliqua alia ſex dimenſionum, quarum vnaquæque eſt terminus quidam. 10 Non eſſe igitur actu corpus infinitum, ex his perſpicuum *eſt*.

A ἐν ἑαυτῷ* μενεῖ· τοῦ γὰρ ὅλου καὶ τοῦ μέρους ὁμοειδεῖς οἱ τόποι, οἷον ὅλης γῆς καὶ βώλου, κάτω· καὶ παντὸς πυρὸς καὶ σπινθῆρος, ἄνω. ὥστε εἰ τοῦ ἀπείρου τόπος τὸ ἐν αὑτῷ, καὶ τοῦ μέρους ὁ αὐτός· μενεῖ ἄρα ἐν ἑαυτῷ. 27 Ὅλως δὲ φανερὸν ὅτι ἀδύνατον ἅμα ἄπειρον λέγειν σῶμα, καὶ τόπον τινὰ εἶναι τοῖς σώμασιν, εἰ πᾶν σῶμα αἰσθητὸν, ἢ βάρος ἔχει, ἢ κουφότητα. καὶ εἰ μὲν βαρὺ, ἐπὶ τὸ μέσον ἔχει τὴν φορὰν φύσει· εἰ δὲ κοῦφον, ἄνω· ἀνάγκη γὰρ καὶ τὸ ἄπειρον σῶμα. ἀδύνατον δὲ ἢ ἅπαν ὁποτερονοῦν, ἢ τὸ ἥμισυ ἑκάτερον πεπονθέναι· πῶς γὰρ διελῇς; ἢ πῶς τοῦ ἀπείρου ἔσται, τὸ μὲν ἄνω, τὸ δὲ κάτω, B ἢ ἔσχατον ἢ μέσον; 28 Ἔτι, πᾶν σῶμα αἰσθητὸν ἐν τόπῳ· τόπου δὲ εἴδη καὶ διαφοραὶ, τὸ ἄνω καὶ κάτω, καὶ ἔμπροσθεν καὶ ὄπισθεν, καὶ δεξιὸν καὶ ἀριστερόν· καὶ ταῦτα οὐ μόνον πρὸς ἡμᾶς καὶ θέσει, ἀλλὰ καὶ ἐν αὐτῷ τῷ ὅλῳ διώρισται. ἀδύνατον δ' ἐν τῷ ἀπείρῳ εἶναι ταῦτα. ἁπλῶς δὲ εἰ ἀδύνατον τόπον εἶναι ἄπειρον, ἐν τόπῳ δὲ πᾶν σῶμα, ἀδύνατον ἄπειρον εἶναί τι σῶμα. 29 Ἀλλὰ μὴν τό γε πού, ἐν τόπῳ· καὶ τὸ ἐν τόπῳ, πού. εἰ οὖν μηδὲ ποσὸν οἷόν τ' εἶναι τὸ ἄπειρον· ποσὸν γάρ τι ἔσται, οἷον δίπηχυ, ἢ τρίπηχυ· ταῦτα γὰρ σημαίνει τὸ ποσόν· οὕτω καὶ τὸ ἐν τόπῳ, ὅτι πού· τοῦτο δὲ, ἢ ἄνω, ἢ κάτω, ἢ ἐν ἄλλῃ τινὶ διαστάσει τῶν ἕξ· τούτων δ' ἕκαστον πέρας τί ἐστιν. 30 Ὅτι μὲν οὖν ἐνεργείᾳ οὐκ ἔστι σῶμα ἄπειρον, φανερὸν ἐκ τούτων.

* κ. μένει.

Infinitum eſſe, & quomodo ſit.

Cap. VIII.

SEd accidere multa impoſſibilia, ſi infinitum omnino non ſit, manifeſtum *eſt*: quia temporis erit aliquod principium, & finis; ac magnitudines non erunt diuiduæ in magnitudinem; ac numerus non erit infinitus. 2 Quando autem, *his* ſic definitis, neutro modo videtur eſſe poſſe: hinc apparet, aliquo modo *infinitum* eſſe, aliquo modo non *eſſe*. 3 Eſſe autem dicitur aliud poteſtate, aliud actu. 4 Et infinitum partim eſt adiectione, partim detractione. 5 Iam verò magnitudinem actu non eſſe infinitam dictum fuit: diuiſione autem eſſe *infinitam*. non enim difficile *eſt* tollere inſectiles lineas. relinquitur ergo, infinitum eſſe poteſtate. 6 Non oportet autem, quod eſt poteſtate, accipere: velut, ſi hoc poteſt eſſe ſtatua, hoc erit ſtatua: ſic & infinitum quidpiam, quod erit actu. ſed cùm multis modis eſſe *dicatur*: ſicut eſt dies, & certamen, quia ſemper aliud & aliud fit: ita etiam *eſt* infinitum. eſt enim in his quoque poteſtate *eſſe*, & actu. Olympia namque ſunt, & quia poteſt certamen fieri, & quia fit. 7 Aliter autem in tempore infinitum apparet, & in hominibus, & in diuiſione magnitudinum. 8 Etenim in vniuerſum ſic infinitum eſt: quia ſemper aliud & aliud ſumitur: & id quidem, quod ſumitur, ſemper finitum eſt: ſed ſemper *eſt* aliud, & aliud. Quare infinitum non oportet accipere, vt hoc aliquid: velut, hominem, aut domum: ſed vt dies dicitur, & certamen, (quorum eſſentia non vt ſubſtantia quædam facta eſt, ſed ſemper in ortu & interitu *conſiſtit*) etiam ſi *ſint* finita, tamen ſemper alia atque alia.

C Ὅτι δ' εἰ μὴ ἔστιν ἄπειρον ἁπλῶς, πολλὰ ἀδύνατα συμβαίνει, δῆλον. τοῦ τε γὰρ χρόνου ἔσται τις ἀρχὴ καὶ τελευτὴ· καὶ τὰ μεγέθη οὐ διαιρετὰ εἰς *μεγέθη· καὶ ἀριθμὸς οὐκ ἔσται ἄπειρος. 2 Ὅταν δὲ διωρισμένων οὕτως μηδετέρως φαίνηται ἐνδέχεσθαι, *διαιτητοῦ δεῖ, καὶ δῆλον ὅτι πὼς μὲν ἔστι, πὼς δ' οὔ. 3 Λέγεται δὲ τὸ εἶναι, τὸ μὲν δυνάμει, τὸ δὲ ἐντελεχείᾳ. 4 Καὶ τὸ ἄπειρον ἔστι μὲν προσθέσει, ἔστι δὲ καὶ ἀφαιρέσει. 5 Τὸ δὲ μέγεθος, ὅτι μὲν κατ' ἐνέργειαν οὐκ ἔστιν ἄπειρον, εἴρηται· διαιρέσει δ' ἐστίν· οὐ γὰρ χαλεπὸν ἀνελεῖν τὰς ἀτόμους γραμμάς. λείπεται οὖν δυνάμει εἶναι τὸ ἄπειρον. 6 Οὐ δεῖ δὲ τὸ δυνάμει ὂν λαμβάνειν, ὥσπερ εἰ δυνατὸν τοῦτ' ἀνδριάντα εἶναι, ὡς καὶ ἔσται τοῦτ' ἀνδριὰς, οὕτω καὶ ἄπει- D ρόν τι, ὃ ἔσται ἐνεργείᾳ. ἀλλ' ἐπεὶ πολλαχῶς τὸ εἶναι, ὥσπερ ἡ ἡμέρα ἐστὶ, καὶ ὁ ἀγὼν, τῷ ἀεὶ ἄλλο καὶ ἄλλο γίνεσθαι, οὕτω καὶ τὸ ἄπειρον· καὶ γὰρ *ἐπὶ τούτων ἐστὶ καὶ δυνάμει καὶ ἐνεργείᾳ· Ὀλύμπια γάρ ἐστι καὶ τῷ δύνασθαι τὸν ἀγῶνα γίνεσθαι, καὶ τῷ γίνεσθαι· 7 Ἄλλως δὲ ἔν τε τῷ χρόνῳ δῆλον τὸ ἄπειρον, καὶ ἐπὶ τῶν ἀνθρώπων, καὶ ἐπὶ τῆς διαιρέσεως τῶν μεγεθῶν. 8 Ὅλως μὲν γὰρ οὕτως ἐστὶ τὸ ἄπειρον, τῷ ἀεὶ ἄλλο καὶ ἄλλο λαμβάνεσθαι· καὶ τὸ λαμβανόμενον μὲν ἀεὶ πεπερασμένον εἶναι, ἀλλ' ἀεί γε ἕτερον, καὶ ἕτερον. (*ἔτι, τὸ εἶναι πλεοναχῶς λέγεται) ὥστε τὸ ἄπειρον οὐ δεῖ λαμβάνειν ὡς τόδε τι, οἷον ἄνθρωπον, ἢ οἰκίαν, ἀλλ' ὡς ἡ ἡμέρα λέγεται, καὶ ὁ ἀγὼν, οἷς τὸ εἶναι οὐχ ὡς οὐσία τις γέγονεν, ἀλλ' ἀεὶ ἐν γενέσει ἢ φθορᾷ, εἰ καὶ πεπερασμένον, ἀλλ' ἀεί γε ἕτερον καὶ ἕτερον.

* κ. μεγέθη

* κ. διαιτητοῦ δεῖ quam lectioné & Argyrop. & alij interpret. quidam ſequũtur.

* Incluſa verba non reperiri in melioribus codd. iam olim annotatum eſt à Philopono & Simplicio: quare inducantur. In ſcriptis codicibus optimæ notæ, leguntur & ipſa, ſublatis tamen illis: ἔτι, τὸ [illegible] ita Argyr.

9 Ἀλλ' ἐν μὲν τοῖς μεγέθεσιν, ὑπομένοντος τοῦ ληφθέντος, τοῦτο συμβαίνει· ἐπὶ δὲ τῶν ἀνθρώπων καὶ τοῦ χρόνου φθειρομένων, οὕτως, ὥστε μὴ ὑπολείπειν. 10 Τὸ δὲ κατὰ πρόσθεσιν, τὸ αὐτό πώς ἐστι, καὶ τὸ κατὰ διαίρεσιν· ἐν γὰρ τῷ πεπερασμένῳ κατὰ πρόσθεσιν γίνεται ἀντεστραμμένως· ᾗ γὰρ διαιρούμενον ὁρᾶται εἰς ἄπειρον, ταύτῃ προστιθέμενον φανεῖται πρὸς τὸ ὡρισμένον. ἐν γὰρ τῷ πεπερασμένῳ μεγέθει ἂν λαβών τις ὡρισμένον προσλαμβάνῃ τῷ αὐτῷ λόγῳ, μὴ τὸ αὐτό τι τοῦ ὅλου* μέγεθος (τῷ λόγῳ) περιλαμβάνων, οὐ διέξεισι τὸ πεπερασμένον· ἂν δ' οὕτως αὔξῃ τὸν λόγον, ὥστε ἀεί τι τὸ αὐτὸ περιλαμβάνειν μέγεθος, διέξεισι, διὰ τὸ πᾶν τὸ πεπερασμένον ἀναιρεῖσθαι ὁτῳοῦν ὡρισμένῳ. 11 Ἄλλως μὲν οὖν οὐκ ἔστιν, οὕτως δ' ἐστὶ τὸ ἄπειρον, δυνάμει τε καὶ ἐπὶ καθαιρέσει· καὶ ἐντελεχείᾳ δὲ ἐστιν, ὡς τὴν ἡμέραν εἶναι λέγομεν, καὶ τὸν ἀγῶνα· καὶ δυνάμει οὕτως ὡς ἡ ὕλη, καὶ οὐ καθ' αὑτό, ὡς τὸ πεπερασμένον. καὶ κατὰ πρόσθεσιν δὲ οὕτως ἄπειρον δυνάμει ἐστίν, ὃ ταὐτὸ λέγομεν τρόπον τινὰ εἶναι τῷ κατὰ διαίρεσιν· ἀεὶ μὲν γάρ τι αὐτοῦ ἔξω ἔσται λαμβάνειν. 12 Οὐ μέντοι ὑπερβαλεῖ παντὸς ὡρισμένου μεγέθους, ὥσπερ ἐπὶ τὴν διαίρεσιν ὑπερβάλλει παντὸς ὡρισμένου, καὶ ἔσται ἔλαττον. ὥστε* δὲ παντὸς ὑπερβάλλειν κατὰ τὴν πρόσθεσιν, οὐδὲ δυνάμει οἷόν τε εἶναι, εἴπερ μὴ ἔστι κατὰ συμβεβηκὸς ἐντελεχείᾳ ἄπειρον· ὥσπερ φασὶν οἱ φυσιολόγοι τὸ ἔξω σῶμα τοῦ κόσμου, οὗ ἡ οὐσία ἀὴρ, ἢ ἄλλο τι τοιοῦτον ἄπειρον. ἀλλ' εἰ μὴ οἷόν τε εἶναι ἄπειρον ἐντελεχείᾳ σῶμα αἰσθητὸν οὕτω, φανερὸν ὅτι οὐδὲ δυνάμει ἂν εἴη κατὰ πρόσθεσιν, ἀλλ' ἢ ὥσπερ εἴρηται ἀντεστραμμένως τῇ διαιρέσει. 13 Ἐπεὶ καὶ Πλάτων διὰ τοῦτο ἄπειρα δύο ἐποίησεν, ὅτι καὶ ἐπὶ τὴν* αὔξησιν δοκεῖ ὑπερβάλλειν, καὶ εἰς ἄπειρον ἰέναι, καὶ ἐπὶ τὴν καθαίρεσιν. 14 Ποιήσας μέντοι δύο οὐ χρῆται. οὔτε γὰρ ἐν τοῖς ἀριθμοῖς τὸ ἐπὶ τὴν καθαίρεσιν ἄπειρον ὑπάρχει· ἡ γὰρ μονὰς ἐλάχιστον. οὔτε ἐπὶ τὴν* αὔξησιν· μέχρι γὰρ δεκάδος ποιεῖ τὸν ἀριθμόν.

* μέρος
* γρ. δὲ
* γρ. αὔξην.

A 9 Sed in magnitudinibus quidem hoc accidit, permanente eo quod ſumptum eſt: in hominibus autem, ac tempore, *iis* interemptis, ita vt numquam deficiant. 10 Iam verò quod eſt ſecundùm adiectionem, & quod ſecundùm diuiſionem, idem quodammodo eſt. nam in eo quod eſt finitum ſecundùm adiectionem, fit modo conuerſo. quatenus enim diuidi conſpicitur in infinitum, tantum adiici apparet ad id quod eſt finitum. etenim in magnitudine finita, ſi quis ſumpta parte finita alteram ſumat eâdem ratione, non eandem totius partem ea ratione ſumens: non pertranſibit, quod eſt finitum. B ſin autem ita rationem auxerit, vt ſemper ſumat eandem magnitudinem: pertranſibit. quia omne finitum conſumitur quovis finito. 11 Infinitum igitur aliter non eſt: ſic autem eſt: poteſtate enim *eſt*, ac detractione. quin & actu eſt: ſicvti diem eſſe dicimus, & certamen. & poteſtate ita *eſt*, vt materia: non per ſe, vt id quod eſt finitum. ergo & ſecundùm additionem ita infinitum eſt poteſtate: quod dicimus idem quodammodo eſſe, atque *infinitum* ſecundùm diuiſionem: quia ſemper licebit aliquid extra ipſum ſumere. 12 Non tamen ſuperat omnem definitam magnitudinem: ſicut in diuiſione ſuperat omnem *magnitudinem* definitam: C & fit minus. vt igitur omnem magnitudinem ſuperet *infinitum* additione, ne quidem poteſtate eſſe poteſt, niſi ſit ex accidenti infinitum actu, vt inquiunt phyſici illi, *qui* extra mundum *ponunt* corpus, cuius eſſentia *eſt* aër, aut aliud quidpiam tale infinitum. Sed ſi corpus ſenſile infinitum actu ita eſſe non poteſt: perſpicuum *eſt*, ne poteſtate quidem infinitum eſſe poſſe ſecundùm additionem, niſi, vt dictum fuit, modo diuiſioni contrario. 13 Nam & Plato ideo fecit duo infinita, quia & accretione videtur ſuperare & in infinitum *abire*, & detractione. 14 Cùm tamen duo fecerit, *his* non vtitur. neque enim in numeris ineſt infinitas detractione, quia vnitas *eſt* minimum: neque accretione, quia numerum facit vſque ad denarium.

Quid ſit Infinitum.

Cap. IX.

Συμβαίνει δὲ τοὐναντίον εἶναι ἄπειρον, ἢ ὡς λέγουσιν. οὐ γὰρ οὗ μηδὲν ἔξω, ἀλλ' οὗ ἀεί τι ἔξω ἐστί, τοῦτο ἄπειρόν ἐστι. 2 Σημεῖον δέ· καὶ γὰρ τοὺς δακτυλίους ἀπείρους φασὶ τοὺς μὴ ἔχοντας σφενδόνην, ὅτι αἰεί τι ἔξω ἔστι λαμβάνειν, καθ' ὁμοιότητα μέν τινα λέγοντες, οὐ μέντοι κυρίως· δεῖ γὰρ τοῦτό τε ὑπάρχειν, καὶ μηδέποτε τὸ αὐτὸ λαμβάνεσθαι. ἐν δὲ τῷ κύκλῳ οὐ γίνεται οὕτως, ἀλλ' αἰεὶ τὸ ἐφεξῆς μόνον ἕτερον. ἄπειρον μὲν οὖν τοῦτ' ἐστὶν οὗ κατὰ τὸ ποσὸν λαμβάνουσιν, αἰεί τι λαβεῖν ἔξω ἐστίν. 3 Οὗ δὲ μηδὲν ἔξω, τοῦτ' ἐστὶ τέλειον καὶ ὅλον· οὕτω γὰρ ὁριζόμεθα τὸ ὅλον, οὗ πρὸς τὰ μέρη μηδὲν ἄπεστιν, οἷον ἄνθρωπον ὅλον, ἢ κιβώτιον. ὥσπερ δὲ ὁριζόμεθα τὸ καθ' ἕκαστον, οὕτω καὶ τὸ κυρίως· οἷον τὸ ὅλον, οὗ μηδέν ἐστιν ἔξω· οὗ δ' ἐστὶν ἀπουσία ἔξω, οὐ πᾶν, ὅ, τι ἂν ἀπῇ. τὸ ὅλον δὲ καὶ τέλειον, ἢ τὸ αὐτὸ πάμπαν, ἢ σύνεγγυς τὴν φύσιν ἐστί. τέλειον δ' οὐδέν, μὴ ἔχον τέλος· τὸ δὲ τέλος, πέρας.

D Contra verò accidit eſſe infinitum, quàm *alij* dicant: non enim cuius nihil extra *eſt*, ſed cuius ſemper aliquid extra eſt, id infinitum eſt. 2 *Huius* autem *rei* ſignum *eſt*: quoniam anulos illos infinitos *eſſe* aiunt, quia pala carent, propterea quòd ſemper aliquid extra licet ſumere: per ſimilitudinem quandam *hoc* dicentes, non propriè. oportet enim hoc ineſſe, & numquam idem ſumi. in circulo autem non fit ita: ſed tantummodo ſemper diuerſum *eſt*, quod deinceps *ſumitur*. infinitum igitur hoc eſt, cuius quantitate *aliqua* accepta, ſemper aliquid extra ſumere licet. 3 Cuius autem nihil extra *eſt*, id eſt perfectum ac totum. E ſic enim totum definimus, à quo nihil abeſt, *quod* ad partes *pertineat*: vt hominem totum, vel arcam. ſicut autem vnumquodque definimus, ita etiam quod propriè & præcipuè *eſt*, vt totum, cuius nihil eſt extra. cuius autem aliquid abeſt, *id* non *eſt* vniuerſum, quidquid abſit. totum verò & perfectum aut omnino idem ſunt, aut natura inter ſe affinia. atqui perfectum nihil *eſt*, quod non habeat finem: finis autem eſt terminus.

4 Idcirco.

4 Idcirco exiſtimandum *eſt*, rectiùs locutum eſſe Parmenidem, quàm Meliſſum. hic enim ait infinitum *eſſe* totum: ille verò totum eſſe finitum, à medio æquidiſtans. nam infinitum cum vniuerſo ac toto *connectere*, non eſt linum cum lino coniungere. A

4 Διὸ βέλτιον οἰητέον Παρμενίδην Μελίσσου εἰρηκέναι. ὁ μὲν γὰρ, τὸ ἄπειρον ὅλον φησίν· ὁ δὲ, τὸ ὅλον πεπεράνθαι, *Μεσσόθεν ἰσοπαλές. οὐ γὰρ ὡς λίνον λίνῳ ἐστὶ συνάπτειν τῷ παντὶ καὶ ὅλῳ τὸ ἄπειρον.

* Parmenides τὸ ὅλον eſſe ait, Πάντοθεν εὐκύκλου σφαίρης ἐναλίγκιον ὄγκῳ, Μεσσόθεν ἰσοπαλὲς πάντῃ.

Quale ſit infinitum. Cap. X.

Ceterùm hinc ſumunt excellentiam illam infiniti, Quod omnia continet: &, Quod in ſe vniuerſum habet: quoniam habet ſimilitudinem quandam cum toto. 2 Infinitum enim eſt perfectionis magnitudinis materia. 3 Et poteſtate totum, actu autem minimè. 4 Diuiduum autem detractione, & inuerſa adiectione. 5 Totum verò, & finitum, non per ſe, ſed per aliud. 6 Neque continet, ſed continetur, quatenus *eſt* infinitum. 7 Ideóque eſt ignotum, qua infinitum. materia namque formam non habet. 8 Quare perſpicuum *eſt*, infinitum potiùs habere rationem partis, quàm totius. nam materia *eſt* pars totius, vt æs æneæ ſtatuæ. 9 Ceterùm ſi magnum & paruum continet in ſenſibilibus & intelligibilibus: oportet *id* continere intelligibilia. ſed abſurdum *eſt*, & impoſſibile, id quod eſt ignotum & infinitum, continere ac definire. B

ΕΠεὶ ἐντεῦθέν γε λαμβάνουσι τὴν σεμνότητα κατὰ τοῦ ἀπείρου, τὸ πάντα περιέχειν, καὶ τὸ πᾶν ἐν ἑαυτῷ ἔχειν, διὰ τὸ ἔχειν τινὰ ὁμοιότητα τῷ ὅλῳ. 2 Ἔστι γὰρ τὸ ἄπειρον, τῆς τοῦ μεγέθους τελειότητος ὕλη. 3 Καὶ τὸ δυνάμει ὅλον, ἐντελεχείᾳ δὲ οὔ. 4 Διαιρετὸν δὲ, ἐπί τε τὴν καθαίρεσιν καὶ τὴν ἀντιστραμμένην πρόσθεσιν. 5 Ὅλον δὲ καὶ πεπερασμένον, οὐ καθ᾽ αὑτὸ, ἀλλὰ κατ᾽ ἄλλο. 6 Καὶ οὐ περιέχει, ἀλλὰ περιέχεται, ᾗ ἄπειρον. 7 Διὸ καὶ ἄγνωστον, ᾗ ἄπειρον. εἶδος γὰρ οὐκ ἔχει ἡ ὕλη. 8 Ὥστε φανερὸν, ὅτι μᾶλλον ἐν μορίου λόγῳ τὸ ἄπειρον, ἢ ἐν ὅλου· μόριον γὰρ ἡ ὕλη τοῦ ὅλου, ὥσπερ ὁ χαλκὸς τοῦ χαλκοῦ ἀνδριάντος. 9 Ἐπεὶ εἴγε περιέχει ἐν τοῖς αἰσθητοῖς καὶ ἐν τοῖς νοητοῖς τὸ μέγα καὶ τὸ μικρὸν, ἔδει περιέχειν τὰ νοητά. ἄτοπον δὲ καὶ ἀδύνατον, τὸ ἄγνωστον καὶ τὸ ἀόριστον περιέχειν καὶ ὁρίζειν.

Quotuplex ſit infinitum. Cap. XI.

IAm verò hoc rationi conſentaneum accidit, vt adiectione infinitum non ita eſſe videatur, vt omnem magnitudinem ſuperet: diuiſione autem ſit. vt enim materia intus continetur, ita etiam infinitum: forma autem continet. 2 Illud quoque rationi conſentaneum *euenit*, vt in numero verſùs minimum ſit terminus: progrediendo autem ad plura, ſemper omnis multitudo ſuperetur. in magnitudinibus verò contrarium *fit*: nam in *progreſſu ad* minimum omnis magnitudo ſuperatur: in *progreſſu autem* ad maius, non eſt magnitudo infinita. 3 Cauſa verò *eſt*: quia vnum eſt indiuiduum, quidquid vnum ſit. vt homo *eſt* vnus homo non multi. numerus autem eſt plura vno, & quanta quædam. quapropter neceſſe *eſt*, in indiuiduo conſiſtere. duo namque aut tria ſunt nomina paronyma: itidémque quilibet alius numerus. 4 Id autem verſùs quod plus *eſt*, progredienti ſemper licet intelligere: quoniam infinitæ *ſunt* bipartitæ diuiſiones magnitudinis. quocirca poteſtate quidem eſt, actu verò minimè: ſed ſemper, quod ſumitur, ſuperat omnem definitam multitudinem. verùm hic numerus non *eſt* ſeparatus à bipartita illa diuiſione, neque manet illa infinitas: ſed fit, vt & tempus, & numerus temporis. 5 In magnitudinibus autem contrarium eſt: & continuum diuiditur quidem in infinita: progrediendo autē ad id quod *eſt* maius, non eſt infinitum. quantum enim poteſt eſſe poteſtate, tantum poteſt etiam eſſe actu. quare cùm nulla magnitudo ſenſibilis ſit infinita: fieri non poteſt vt ſuperetur omnis finita magnitudo. eſſet enim aliquid cælo maius. 6 Iam verò infinitum non *eſt* idem in motu, & magnitudine, & tempore, quaſi vna quædam natura: ſed poſterius dicitur ratione prioris. C D

ΚΑτὰ λόγον δὲ συμβαίνει καὶ τὸ κατὰ πρόσθεσιν, μὴ εἶναι δοκεῖν ἄπειρον οὕτως, ὥστε παντὸς ὑπερβάλλειν μεγέθους· ἐπὶ τὴν διαίρεσιν δὲ εἶναι. περιέχεται γὰρ ὡς ἡ ὕλη ἐντὸς, καὶ τὸ ἄπειρον· περιέχει δὲ τὸ εἶδος. 2 Εὐλόγως δὲ καὶ τὸ, ἐν μὲν τῷ ἀριθμῷ εἶναι ἐπὶ τὸ ἐλάχιστον πέρας· ἐπὶ δὲ τὰ πλείω, ἀεὶ παντὸς ὑπερβάλλειν πλήθους. ἐπὶ δὲ τῶν μεγεθῶν τοὐναντίον· ἐπὶ μὲν γὰρ τὸ ἔλαττον, παντὸς ὑπερβάλλειν μεγέθους· ἐπὶ δὲ τὸ μεῖζον, μὴ εἶναι μέγεθος ἄπειρον. 3 Αἴτιον δ᾽, ὅτι τὸ ἓν ἐστὶν ἀδιαίρετον, ὅ,τι περ ἂν ἓν ᾖ, οἷον ἄνθρωπος, εἷς ἄνθρωπος καὶ οὐ πολλοί· ὁ δ᾽ ἀριθμός ἐστιν *ἕνα πλείω, καὶ ποσὰ ἄττα· ὥστε ἀνάγκη στῆναι ἐπὶ τὸ ἀδιαίρετον· τὰ γὰρ δύο καὶ τρία παρώνυμα ὀνόματά ἐστιν· ὁμοίως δὲ καὶ τῶν ἄλλων ἀριθμῶν ἕκαστος. 4 Ἐπὶ δὲ τὸ πλεῖον ἀεί ἐστι νοῆσαι· ἄπειροι γὰρ αἱ διχοτομίαι τοῦ μεγέθους. ὥστε δυνάμει μὲν ἐστὶν, ἐνεργείᾳ δ᾽ οὔ· ἀλλ᾽ ἀεὶ ὑπερβάλλει τὸ λαμβανόμενον, παντὸς ὡρισμένου πλήθους· ἀλλ᾽ οὐ χωριστὸς ὁ ἀριθμὸς οὗτος τῆς διχοτομίας. οὐδὲ μένει ἡ ἀπειρία, ἀλλὰ γίνεται, ὥσπερ καὶ ὁ χρόνος καὶ ὁ ἀριθμὸς τοῦ χρόνου. 5 Ἐπὶ δὲ τῶν μεγεθῶν, τοὐναντίον ἐστί· καὶ διαιρεῖται μὲν γὰρ εἰς ἄπειρα τὸ συνεχές. ἐπὶ δὲ τὸ μεῖζον οὐκ ἔστιν ἄπειρον. ὅσον γὰρ ἐνδέχεται δυνάμει εἶναι, καὶ ἐνεργείᾳ ἐνδέχεται τοσοῦτον εἶναι. ὥστε ἐπεὶ ἄπειρον οὐδέν ἐστι μέγεθος αἰσθητὸν, οὐκ ἐνδέχεται παντὸς ὑπερβολὴν εἶναι ὡρισμένου μεγέθους· εἴη γὰρ ἄν τι τοῦ οὐρανοῦ μεῖζον. 6 Τὸ δ᾽ ἄπειρον, οὐ ταὐτὸν ἐν κινήσει, καὶ μεγέθει, καὶ χρόνῳ, ὡς μία τις φύσις, ἀλλὰ τὸ ὕστερον λέγεται κατὰ τὸ πρότερον

* Sic legendum hoc eſt, μονάδες πλείους. vulgò ἕνες. alij ἕνα, πλείω perperam vtrumque.

ἐστι, κίνησις μὲν, ὅτι πρότερον τὸ μέγεθος, ἐφ' οὗ κινεῖται, ἢ A
ἀλλοιοῦται, ἢ αὐξάνεται. ὁ χρόνος δὲ διὰ τὴν κίνησιν. 7 Νῦν μὲν οὖν χρώμεθα τούτοις, ὕστερον δὲ πειρασόμεθα λέγειν, καὶ τί ἐστιν ἕκαστον, καὶ διότι πᾶν μέγεθος εἰς μεγέθη διαιρετόν. 8 Οὐκ ἀφαιρεῖται δ' ὁ λόγος οὐδὲ τοὺς μαθηματικοὺς τὴν θεωρίαν, ἀναιρῶν οὕτως εἶναι τὸ ἄπειρον, ὥστε ἐνεργείᾳ εἶναι ἐπὶ τὴν αὔξησιν, ὡς ἀδιεξίτητον· οὐδὲ γὰρ νῦν δέονται τοῦ ἀπείρου, οὐδὲ χρῶνται, ἀλλὰ μόνον εἶναι ὅσην ἂν βούλωνται, πεπερασμένην· τῷ δὲ μεγίστῳ μεγέθει τὸν αὐτὸν ἔστι τετμῆσθαι λόγον ὁπηλικονοῦν μέγεθος ἕτερον. ὥστε πρὸς μὲν τὸ δεῖξαι ἐκείνοις, οὐδὲν διοίσει· τὸ δὲ εἶναι, ἐν τοῖς οὖσιν ἔσται μεγέθεσιν.

vt motus *dicitur*, quia priùs *eſt* magnitudo, in qua mouetur, aut variatur, aut augetur. tempus autem propter motum. 7 Nunc igitur his vtimur. poſterius autem dicere conabimur, & quid vnumquodque ſit, & cur omnis magnitudo in magnitudines *ſit* diuiſa. 8 Porrò hæc diſputatio non aufert inſpectionem mathematicis, dum tollit infinitum ſic eſſe, vt actu ſit accretione, quaſi pertranſiri non poſſit. neque enim *mathematici* nunc egent infinito, neque vtuntur: ſed tantùm *ſumant*, finitam eſſe quamcumque velint. licet autem eadem ratione, qua maximam magnitudinem, diuidere quantulamcumque aliam magnitudinem. quare ad hoc vt illo modo demonſtretur, nihil referet. eſſe autem *infinitum*, in iis magnitudinibus reperietur quæ ſunt.

Ad quod cauſæ genus referatur infinitum.

Cap. XII.

Ἐπεὶ δὲ τὰ αἴτια διῄρηται τετραχῶς, φανερὸν ὅτι ὡς ὕλη τὸ ἄπειρον αἴτιόν ἐστι. 2 Καὶ ὅτι, τὸ μὲν εἶναι αὐτῷ στέρησίς ἐστι. τὸ δὲ καθ' αὑτὸ ὑποκείμενον, τὸ συνεχὲς καὶ αἰσθητόν. 3 Φαίνονται δὲ πάντες καὶ οἱ ἄλλοι, ὡς ὕλῃ χρώμενοι τῷ ἀπείρῳ. 4 Διὸ καὶ ἄτοπον τὸ περιέχον ποιεῖν αὐτὸ, ἀλλὰ μὴ τὸ περιεχόμενον. B

Qvia verò cauſæ diuiduntur quadrifariàm: patet infinitum eſſe cauſam vt materiam. 2 Et eſſentiam eius eſſe priuationem. Continuum autem & ſenſibile eſſe id quod per ſe ſubeſt. 3 Sed & omnes alij videntur vti infinito, tamquam materia. 4 Ideóque abſurdum *eſt*, ipſum facere id quod continet, non quod continetur.

Solutio rationum capite quinto adductarum, quibus videbatur probari infinitum actu.

Cap. XIII.

Λοιπὸν δὲ ἐπελθεῖν, καθ' οὓς λόγους τὸ ἄπειρον εἶναι C
δοκεῖ, οὐ μόνον δυνάμει, ἀλλ' ὡς ἀφωρισμένον· τὰ μὲν γάρ ἐστιν αὐτῶν οὐκ ἀναγκαῖα, τὰ δ' ἔχει τινὰς ἀληθεῖς ἑτέρας ἀπαντήσεις. 2 Οὔτε γὰρ, ἵνα ἡ γένεσις μὴ ἐπιλείπῃ, ἀναγκαῖον ἐνεργείᾳ ἄπειρον εἶναι σῶμα αἰσθητόν· ἐνδέχεται γὰρ τὴν θατέρου φθορὰν, γένεσιν θατέρου εἶναι, πεπερασμένου ὄντος τοῦ παντός. 3 Ἔτι, τὸ ἅπτεσθαι καὶ τὸ πεπεράνθαι, ἕτερον. τὸ μὲν γὰρ πρός τι καὶ τινός· ἅπτεται γὰρ πᾶν τινός, καὶ τῶν πεπερασμένων τινὶ συμβέβηκε· τὸ δὲ πεπερασμένον, οὐ πρός τι, οὐδ' ἅψασθαι τῷ τυχόντι τοῦ τυχόντος ἐστί. 4 Τὸ δὲ τῇ νοή- D
σει πιστεύειν, ἄτοπον· οὐ γὰρ ἐπὶ τοῦ πράγματος ἡ ὑπεροχὴ καὶ ἡ ἔλλειψις, ἀλλ' ἐπὶ τῆς νοήσεως· ἕκαστον γὰρ ἂν ἡμῶν νοήσειέ τις πολλαπλάσιον ἑαυτοῦ, αὔξων εἰς ἄπειρον· ἀλλ' οὐ διὰ τοῦτο ἔξω τοῦ ἄστεός τίς ἐστιν, ἢ τοῦ τηλικοῦδε μεγέθους ὃ ἔχομεν, ὅτι νοεῖ τις· ἀλλ' ὅτι ἐστί· τοῦτο δὲ συμβέβηκεν. 5 Ὁ δὲ χρόνος καὶ ἡ κίνησις, ἄπειρά ἐστι, καὶ ἡ νόησις οὐχ ὑπομένοντος τοῦ λαμβανομένου. 6 Μέγεθος δὲ, οὔτε τῇ καθαιρέσει, οὔτε τῇ νοητικῇ αὐξήσει ἐστὶν ἄπειρον. 7 Ἀλλὰ περὶ μὲν τοῦ ἀπείρου πῶς ἐστι, καὶ πῶς οὐκ ἔστι, καὶ τί ἐστιν, εἴρηται.

Reliquum *eſt*, vt percurramus rationes, propter quas infinitum eſſe videtur non tantùm poteſtate, ſed *etiam* vt definitum. nam partim non ſunt neceſſariæ, partim eis occurri poteſt aliis quibuſdam veris modis. 2 Neque enim vt generatio non deficiat, neceſſe *eſt* actu infinitum eſſe corpus ſenſile: quia poteſt alterius interitus eſſe alterius generatio, cùm vniuerſum ſit finitum. 3 Præterea tangere, & finitum eſſe, differunt. illud enim ad aliquid *refertur*, & *in Græca lingua* alicuius *eſſe dicitur*, (quodcumque enim *tangit*, ἅπτεταί τινος, *id eſt, tangit rem aliquam*) & alicui finito accidit. quod autem finitum *eſt*, non *refertur* ad aliquid. nec quamvis rem tangere quævis poteſt. 4 Cogitationi autem credere abſurdum *eſt*. non *eſt* enim exuperantia & defectio in re, ſed in cogitatione. Vnumquemque enim noſtrûm poſſet aliquis cogitare multiplo quàm ſit maiorem, infinitè augens. non ideo tamen excedit aliquis vrbem: aut *eſt* tali magnitudine *præditus*, quam habemus: quia ſic quiſpiam cogitat: ſed quia eſt: hoc autem accidit. 5 Tempus verò & motus infinita ſunt, nec non intellectio, non permanente eo quod ſumitur. 6 Sed magnitudo neque decretione, neque accretione quæ in cogitatione conſtat, infinita eſt. 7 Verùm de infinito; quomodo ſit, & quomodo non ſit, & quid ſit, dictum eſt.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ, Η περὶ φυσικῶν ἀρχῶν, τὸ Δ.

ARISTOTELIS, NATVRALIS AVSCVLTATIONIS, SEV DE NATVRALIBVS PRINCIPIIS, *LIBER IV.*

DE LOCO, TRACTATVS I.

Agendum eſſe de loco. Cap. I.

A SIMILITER neceſſe *eſt* etiam de loco, vt de infinito, phyſicum noſſe, an ſit nec ne, & quomodo ſit, & quid ſit. 2 Omnes enim exiſtimant, ea, quæ ſunt, alicubi eſſe. etenim non ens nullibi eſt. vbi namque eſt *hircoceruus*, aut ſphynx? 3 Et motus ille, qui *eſt* maximè communis & maximè proprius, ſecundùm locum eſt, quem vocamus lationem 4 Exiſtunt autem multę dubitationes, quid tandem ſit locus. non enim idem videtur diſpicientibus, ex iis omnibus quæ inſunt. 5 Præterea nihil habemus ab aliis de eo vel dubitatum, vel expoſitum.

ΟΜΟΙΩΣ δ' ἀνάγκη καὶ περὶ τόπου τὸν φυσικὸν ὥσπερ καὶ περὶ ἀπείρου γνωρίζειν, εἰ ἔστιν ἢ μή, καὶ πῶς ἐστι καὶ τί ἐστι. 2 Τά τε γὰρ ὄντα πάντες ὑπολαμβάνουσιν εἶναί που· τὸ γὰρ μὴ ὂν, οὐδαμοῦ εἶ). ποῦ γάρ ἐστι τραγέλαφος, ἢ σφίγξ; 3 Καὶ τῆς κινήσεως ἡ * κοινὴ μάλιστα καὶ κυριωτάτη, κατὰ τόπον ἐστίν, ἣν καλοῦμεν φοράν. 4 Ἔχει δὲ πολλὰς ἀπορίας τί ποτέ ἐστιν ὁ τόπος· οὐ γὰρ ταὐτὸν φαίνεται θεωροῦσιν ἐξ ἁπάντων τῶν ὑπαρχόντων. 5 Ἔτι δ' οὐδ' ἔχομεν οὐδὲν παρὰ τῶν ἄλλων, οὔτε προηπορημένον, οὔτε προηυπορημένον περὶ αὐτοῦ.

* Eudemius πρώτη legebat, non κοινή.

An ſit locus. Cap. II.

B LOcum igitur eſſe, videtur conſtare ex mutatione quæ viciſſim fit. vbi namque nunc eſt aqua; hîc, *ea* exeunte vt ex vaſe, rurſus aër inerit: quandoque verò hunc ipſum locum aliquod aliud corpus occupat. hoc ergo videtur eſſe diuerſum ab his omnibus, quæ ingrediuntur & mutantur. nam in quo *loco* nunc eſt aër, antea in eo aqua erat. quare patet, locum & receptaculum eſſe quiddam ab vtriſque diuerſum, in quod, & ex quo ſunt mutata. 2 Prætereà lationes naturalium & ſimplicium corporum, vt ignis & terræ & aliorum eiuſmodi, non ſolùm declarant locum eſſe aliquid, ſed & habere vim quandam. vnumquodque enim fertur in ſuum locum, niſi prohibeatur: aliud quidem, ſurſum: aliud verò, deorſum. hæc autem ſunt loci partes ac ſpecies: ſuperum *inquam*, & inferum, & ſex dimenſionum reliquæ. 3 Talia verò ſunt, non tantùm quod ad nos, *nempe* dextrum & ſiniſtrum, & ſuperum & inferum: quia nobis non ſemper idem *eſt*, ſed ſecundùm poſitionem fit, pro vt nos conuertimur. vnde idem ſæpe eſt dextrum & ſiniſtrum, & ſuperum & inferum, & ante & retrò. in natura verò vnumquodque ſeorſum eſt definitum. non enim quodvis eſt ſuperum, ſed quò fertur ignis, & corpus leue: itidémque non quodvis *eſt* inferum, ſed quò *feruntur*, quæ habent pondus, ac terreſtria: quaſi *hæc* nõ tantũ poſitione differant, ſed etiam facultate. 4 Declarãt *hoc* etiam res mathematicæ. cùm.n. non ſint in loco, tamen poſitione quadam, quæ ad nos *refertur*,

ΟΤι μὲν οὖν ἔστιν ὁ τόπος, δοκεῖ δῆλον εἶναι ἐκ τῆς ἀντιμεταστάσεως· ὅπου γάρ ἐστι νῦν ὕδωρ, ἐνταῦθα ἐξελθόντος ὥσπερ ἐξ ἀγγείου, πάλιν ἀὴρ ἔνεστιν· ὁτὲ δὲ τὸν αὐτὸν τόπον τοῦτον ἄλλο τι τῶν σωμάτων κατέχει. τοῦτο δὴ τῶν ἐγγινομένων, καὶ μεταβαλλόντων ἕτερον πάντων εἶναι δοκεῖ· ἐν ᾧ γὰρ ἀὴρ ἐστὶ νῦν, ὕδωρ ἐν τούτῳ πρότερον ἦν. ὥστε δῆλον, ὡς ἦν ὁ τόπος τι καὶ ἡ χώρα, ἕτερον ἀμφοῖν, εἰς ἣν, καὶ ἐξ ἧς μετέβαλλον. 2 Ἔτι δὲ καὶ αἱ φοραὶ τῶν φυσικῶν σωμάτων καὶ ἁπλῶν, οἷον πυρὸς, καὶ γῆς, καὶ τῶν τοιούτων, οὐ μόνον δηλοῦσιν ὅτι ἐστί τι ὁ τόπος, ἀλλ' ὅτι καὶ ἔχει τινὰ δύναμιν· φέρεται γὰρ ἕκαστον εἰς τὸν αὑτοῦ τόπον μὴ κωλυόμενον, τὸ μὲν ἄνω, τὸ δὲ
C κάτω. ταῦτα δ' ἐστὶ τόπου μέρη καὶ εἴδη, τό, τε ἄνω καὶ τὸ κάτω, καὶ αἱ λοιπαὶ τῶν ἓξ διαστάσεων. 3 Ἔστι δὲ τὰ τοιαῦτα οὐ μόνον πρὸς ἡμᾶς, τὸ δεξιὸν καὶ τὸ ἀριστερὸν, καὶ τὸ ἄνω καὶ τὸ κάτω· (ἡμῖν γὰρ οὐκ ἀεὶ τὸ αὐτὸ, ἀλλὰ κατὰ τὴν θέσιν, ὅπως ἂν στραφῶμεν, γίνεται· διὸ ταὐτὸ πολλάκις δεξιὸν καὶ ἀριστερὸν ἐστὶ, καὶ ἄνω καὶ κάτω, καὶ πρόσθεν καὶ ὄπισθεν.) ἐν δὲ τῇ φύσει διώρισται χωρὶς ἕκαστον. οὐ γὰρ ὅ,τι ἔτυχε τὸ ἄνω ἐστὶν, ἀλλ' ὅπου φέρεται τὸ πῦρ, καὶ τὸ κοῦφον. ὁμοίως δὲ καὶ τὸ κάτω, οὐχ ὅ,τι ἔτυχεν, ἀλλ' ὅπου τὰ ἔχοντα βάρος, καὶ τὰ γεηρά, ὡς οὐ τῇ θέσει διαφέροντα μόνον, ἀλλὰ καὶ δυνάμει. 4 Δηλοῖ δὲ καὶ τὰ μαθηματικά. οὐκ ὄντα γὰρ ἐν τόπῳ, ὅμως κατὰ τὴν θέσιν τὴν πρὸς ἡμᾶς,

ἔχει δεξιὰ καὶ ἀριστερά· ὥστε μόνον νοεῖσθαι αὐτῶν τὴν θέσιν, οὐκ ἔχοντα φύσει τούτων ἕκαστον. 5 Ἔτι, οἱ τὸ κενὸν φάσκοντες εἶναι, τόπον λέγουσι· τὸ γὰρ κενὸν, τόπος ἂν εἴη ἐστερημένος σώματος. 6 Ὅτι μὲν οὖν ἐστί τι ὁ τόπος παρὰ τὰ σώματα, καὶ πᾶν σῶμα αἰσθητὸν ἐν τόπῳ, διὰ τούτων ἄν τις ὑπολάβοι. 7 Δόξειε δ' ἂν καὶ Ἡσίοδος ὀρθῶς λέγειν, ποιήσας πρῶτον τὸ χάος. λέγει γοῦν,

* In Theogonia.

„ Πάντων μὲν πρώτιστα χάος
„ γένετ', αὐτὰρ ἔπειτα
„ Γαῖ' εὐρύστερνος.

ὡς δέον πρῶτον ὑπάρξαι χώραν τοῖς οὖσι, διὰ τὸ νομίζειν, ὥσπερ οἱ πολλοί, πάντα εἶναί που, καὶ ἐν τόπῳ. εἰ δ' ἐστὶ τοιοῦτον, θαυμαστή τις ἂν εἴη ἡ τοῦ τόπου δύναμις, καὶ προτέρα πάντων· οὗ γὰρ ἄνευ τῶν ἄλλων οὐδέν ἐστιν, ἐκεῖνο δ' ἄνευ τῶν ἄλλων, ἀνάγκη πρῶτον εἶναι· οὐ γὰρ ἀπόλλυται ὁ τόπος, τῶν ἐν αὐτῷ φθειρομένων.

A habent dextrum & ſiniſtrum : adeo vt ſolùm intelligatur earum poſitio, cùm non habeant natura hæc ſingula. 5 Præterea qui dicunt eſſe inane, hi locum *eſſe* inquiunt : quandoquidem inane eſt locus corpore priuatus. 6 Locum igitur eſſe aliquid præter corpora, & omne corpus ſenſile *eſſe* in loco, ex his poſſit aliquis exiſtimare. 7 Videri etiam poteſt Heſiodus rectè dicere, qui Chaos primum fe[illegible] quit enim,

„ *Omnium primum Chaos*
„ *factum eſt : ſed poſtea*
„ *Terra lato pectore prædita.*

B quaſi oporteat primùm ſubeſſe entibus receptaculum : propterea quòd putauit, vt multi, omnia eſſe alicubi & in loco. Si verò eſt tale, admirabilis quædam erit loci vis, & omnium prima. id enim, ſine quo nihil aliud eſt, ipſum verò eſt ſine aliis, neceſſe eſt eſſe primum. locus namque non perit, iis intereuntibus quæ in ipſo ſunt.

Dubitationes de quidditate ſeu genere loci.

Cap. III.

Οὐ μὴν ἀλλ' ἔχει γε ἀπορίαν, εἰ ἔστι, τί ἐστι πότερον ὄγκος τις σώματος, ἤ τις ἑτέρα φύσις· ζητητέον γὰρ τὸ γένος αὐτοῦ πρῶτον. 2 Διαστήματα μὲν οὖν ἔχει τρία, μῆκος, καὶ πλάτος, καὶ βάθος, οἷς ὁρίζεται σῶμα πᾶν. ἀδύνατον δὲ σῶμα τὸν τόπον εἶναι· ἐν ταὐτῷ γὰρ ἂν εἴη δύο σώματα. 3 Ἔτι εἴπερ ἐστὶ σώματος τόπος καὶ χώρα, δῆλον ὅτι καὶ ἐπιφανείας, καὶ τῶν λοιπῶν περάτων· ὁ γὰρ αὐτὸς ἁρμόσει λόγος. ὅπου γὰρ ἦν πρότερον τὰ τοῦ ὕδατος ἐπίπεδα, ἔσται πάλιν τὰ τοῦ ἀέρος. ἀλλὰ μὴν διαφορὰν οὐδεμίαν ἔχομεν στιγμῆς, καὶ τόπου στιγμῆς. ὥστ' εἰ μηδὲ ταύτης ἐστὶν ὁ τόπος ἕτερος, οὐδὲ τῶν ἄλλων οὐθενός, οὐδ' ἔστι τι παρ' ἕκαστον τούτων ὁ τόπος. 4 Τί γὰρ ἄν ποτε καὶ θείημεν εἶναι τὸν τόπον; οὔτε γὰρ στοιχεῖον, οὔτ' ἐκ στοιχείων οἷόν τ' εἶναι τοιαύτην ἔχοντα φύσιν, οὔτε τῶν σωματικῶν, οὔτε τῶν ἀσωμάτων· μέγεθος μὲν γὰρ ἔχει, σῶμα δ' οὐδέν. ἔστι δὲ τὰ μὲν τῶν αἰσθητῶν σωμάτων στοιχεῖα σώματα· ἐκ δὲ τῶν νοητῶν στοιχείων οὐδὲν γίνεται μέγεθος. 5 Ἔτι δὲ, καὶ τίνος ἄν τις θείη τοῖς οὖσιν αἴτιον εἶναι τὸν τόπον; οὐδεμία γὰρ αἰτία ὑπάρχει αὐτῷ τῶν τεττάρων· οὔτε γὰρ ὡς ὕλη τῶν ὄντων· οὐδὲν γὰρ ἐξ αὐτοῦ συνέστηκεν· οὔτε ὡς εἶδος καὶ λόγος τῶν πραγμάτων, οὔθ' ὡς τέλος, οὔτε κινεῖ τὰ ὄντα. 6 Ἔτι δὲ, καὶ αὐτὸς εἰ ἔστι τι τῶν ὄντων, ποῦ ἔσται; ἡ γὰρ Ζήνωνος ἀπορία ζητεῖ τινα λόγον· εἰ γὰρ πᾶν τὸ ὂν, ἐν τόπῳ, δῆλον ὅτι καὶ τοῦ τόπου τόπος ἔσται· καὶ τοῦτο εἰς ἄπειρον πρόεισιν. 7 Ἔτι, εἰ ὥσπερ ἅπαν σῶμα ἐν τόπῳ, οὕτω καὶ ἐν τόπῳ ἅπαν τι σῶμα· πῶς οὖν ἐροῦμεν περὶ τῶν αὐξανομένων; ἀνάγκη γὰρ ἐκ τούτων συναυξάνεσθαι τὸν τόπον * αὐτοῖς, εἰ μήτε ἐλάττων μήτε μείζων ὁ τόπος ἑκάστου. 8 Διὰ μὲν οὖν τούτων, οὐ μόνον τί ἐστιν, ἀλλὰ καὶ εἰ ἔστιν, ἀπορεῖν ἀναγκαῖον.

* γ. φησὶ & αὐτῷ.

C Verumenimvero exiſtit dubitatio, ſi *locus* eſt, quid ſit, vtrùm moles quædam corporis, an alia quædam natura. primùm namque ipſius genus eſt quærendum. 2 Sanè dimenſiones tres habet, longitudinem, & latitudinem, & altitudinem, quibus omne corpus definitur : impoſſibile tamen *eſt* locum eſſe corpus, propterea quòd in eodem eſſent duo corpora. 3 Præterea ſi corporis eſt locus & receptaculum : patet, etiam ſuperficiei *eſſe*, ac reliquorum terminorum. eadem namque ratio conueniet. vbi namque priùs erant planities aquæ, rurſus erunt *planities* aëris. Atqui differentiam nullam habemus D puncti & loci puncti. quaſi ſi non eſt locus ab hoc diuerſus, nec ab vllo alio *diuerſus erit*, nec locus eſt aliquid præter hæc ſingula. 4 Quid enim tandem poſſumus ponere locum eſſe? quia, cùm talem habeat naturam, neque poteſt eſſe elementum, neque conſtare ex elementis aut corporeis aut incorporeis. nam magnitudinem quidem habet, ſed non *eſt* corpus vllum. elementa verò corporum ſenſibilium ſunt corpora. ex elementis autem intelligibilibus nulla magnitudo fit. 5 Præterea quamobrem ponat aliquis locum eſſe entibus cauſam? nulla enim quatuor cauſarum ipſi ineſt : quia nec eſt vt entium materia, (quandoquidem ex eo nil conſtat) nec vt E rerum forma & ratio, nec vt finis, nec entia mouet. 6 Præterea & ipſe locus, ſi eſt aliquod ens, vbi erit? Zenonis enim dubitatio rationem aliquam quærit : quia ſi omne ens *eſt* in loco : patet, etiam loci locum fore : atque hoc in infinitum progreditur. 7 Præterea ſi quemadmodum omne corpus in*eſt* loco, ita etiam in omni loco eſt corpus : quomodo igitur dicemus de iis quæ augentur? neceſſe enim ex his *eſt*, eorum locum ſimul augeri, ſi locus neque minor neque maior *eſt* qualibet re *locata*. 8 Ex his igitur non ſolùm quid ſit, ſed etiam an ſit, dubitare neceſſe *eſt*.

An locus ſit materia & forma.

Cap. IV.

CVm autem aliquid per ſe, aliquid per aliud dicatur: locus quoque alius *eſt* communis, in quo ſunt omnia corpora: alius proprius, in quo primo *aliquid eſt*. Verbi gratiâ, tu nunc *es* in cælo, quia es in aëre, hic autem *eſt* in cælo: & in aëre *es*, quia *es* in terra: ſimilitérque in hac *es*, quia *es* in hoc loco, qui nihil aliud continet quàm te. 2 Si igitur locus eſt id quod primum continet vnumquodque corpus: vtique erit terminus. quare locus videtur eſſe forma & ſpecies cuiuſque rei: quo definitur magnitudo, & magnitudinis materia. hic enim *eſt* cuiuſque rei terminus. Ergo iis qui ita conſiderant, locus eſt cuiuſque *rei* ſpecies. 3 Quatenus autem locus videtur eſſe interuallum magnitudinis, *eſt potiùs* materia. hoc enim *eſt* diuerſum à magnitudine: atque hoc eſt quod continetur, ac definitur à forma, vt à planitie & termino: tale autem eſt materia, & quod interminatum eſt. cùm enim terminus & affectiones globi detractæ fuerint: nihil relinquitur præter materiam. 4 Idcirco etiam Plato in Timæo materiam & receptaculum ait idem eſſe. quod enim vim habet recipiendi, ac receptaculum, *ait eſſe* vnum & idem. Cùm autem alio modo ibi appellet id quod habet vim recipiendi, & *alio modo* in iis quæ vocantur dogmata non ſcripta: tamen locum & receptaculum pronunciauit *eſſe* idem. nam omnes quidem inquiunt locum eſſe aliquid. ſed quid ſit, hic ſolus dicere eſt aggreſſus. 5 Meritò autem, ſi quis ex his rem conſideret, difficile eſſe videbitur cognoſcere quid ſit locus: ſiquidem eſt horum alterutrum, *id eſt*, ſiue materia, ſiue forma. nam alioqui altiſſimam *hæc* habent inſpectionem: nec facile eſt ea cognoſcere à ſe inuicem ſeiuncta. 6 At verò impoſſibile eſſe, vt locus ſit horum alterutrum, non difficile *eſt* videre. forma namque & materia non ſeiunguntur à re. locus autem *ſeiungi* poteſt: in quo enim *modò* erat aër, in eum rurſus aqua (vt dicimus) ingreditur, viciſſim facta tranſlatione aëris & aquæ, & ſimiliter aliorum corporum. 7 Quocirca locus nec *eſt* pars, nec habitus, ſed eſt ſeparabilis à quaque re. 8 Etenim locus tale quidpiam eſſe videtur, quale eſt vas: nam vas eſt locus qui transferri poteſt: vas autem non eſt pars vlla rei. 9 Quatenus igitur eſt ſeparabilis à re, eatenus non eſt forma, quatenus autem continet, eatenus differt à materia. 10 Porrò ſemper videtur quod eſt alicubi, & ipſum eſſe aliquid, & extra id *eſſe* quiddam *ab eo* diuerſum. 11 Platoni ſanè dicendum *erat* (ſi oportet *hoc* in exceſſu dicere) cur formæ & numeri non *ſint* in loco: ſiquidem locus *eſt* id quod habet vim participandi: ſiue id quod habet vim participandi ſit magnum & paruum; ſiue *ſit* materia, vt in Timæo ſcripſit. 12 Præterea quomodo res ferretur ad ſuum locum, ſi locus eſſet materia, vel forma? impoſſibile enim *eſt* id eſſe locum, cuius non eſt motus, nec ſuperum, nec inferum. quapropter in huiuſmodi locus *eſt* quærendus. 13 Quòd ſi in ipſa re eſt locus: (oportet enim, ſiquidem *eſt* vel forma, vel materia) erit locus in loco. ſimul enim cum re mutatur ac mouetur & forma, & quod eſt interminatum: nec ſemper *eſt* in eodem loco,

A Ἐπεὶ δὲ, τὸ μὲν καθ' αὑτὸ, τὸ δὲ κατ' ἄλλο λέγεται· καὶ τόπος ὁ μὲν κοινὸς, ἐν ᾧ ἅπαντα τὰ σώματά ἐστιν· ὁ δ' ἴδιος, ἐν ᾧ * πρώτος· λέγω δὲ, οἷον σὺ νῦν ἐν τῷ οὐρανῷ, ὅτι ἐν τῷ ἀέρι. οὗτος δ' ἐν τῷ οὐρανῷ, καὶ ἐν τῷ ἀέρι, ὅτι ἐν τῇ γῇ· ὁμοίως δὲ καὶ ἐν ταύτῃ, ὅτι ἐν τῷδε τῷ τόπῳ, ὃς περιέχει οὐδὲν πλέον, ἢ σέ. 2 Εἰ δή ἐστιν ὁ τόπος τὸ πρῶτον περιέχον ἕκαστον τῶν σωμάτων, πέρας ἄν εἴη. ὥστε δόξειεν ἂν τὸ εἶδος καὶ ἡ μορφὴ ἑκάστου, ὁ τόπος εἶναι, ᾧ ὁρίζεται τὸ μέγεθος, καὶ ἡ ὕλη ἡ τοῦ μεγέθους· τοῦτο γὰρ ἑκάστου πέρας. οὕτω μὲν οὖν σκοποῦσιν ὁ τόπος τὸ ἑκάστου εἶδός ἐστιν. 3 Ἡ δὲ δοκεῖ ὁ τόπος B εἶναι τὸ διάστημα τοῦ μεγέθους, ἡ ὕλη· τοῦτο γὰρ ἕτερον τοῦ μεγέθους· τοῦτο δ' ἐστὶ τὸ περιεχόμενον ὑπὸ τοῦ εἴδους καὶ ὡρισμένον, οἷον, ὑπὸ ἐπιπέδου καὶ πέρατος. ἔστι δὲ τοιοῦτον ἡ ὕλη καὶ τὸ ἀόριστον· ὅταν γὰρ ἀφαιρεθῇ τὸ πέρας, καὶ τὰ πάθη τῆς σφαίρας, λείπεται οὐδὲν παρὰ τὴν ὕλην. 4 Διὸ καὶ ὁ Πλάτων τὴν ὕλην καὶ τὴν χώραν τὸ αὐτό φησιν εἶναι ἐν τῷ Τιμαίῳ· τὸ γὰρ μεταληπτικὸν καὶ τὴν χώραν ἓν καὶ ταὐτόν· ἄλλον δὲ τρόπον ἐκεῖ τε λέγων τὸ μεταληπτικὸν, καὶ ἐν τοῖς λεγομένοις ἀγράφοις δόγμασιν, ὅμως τὸν τόπον καὶ τὴν C χώραν τὸ αὐτὸ ἀπεφήνατο. λέγουσι μὲν γὰρ ἅπαντες εἶναί τι τὸν τόπον. τί δ' ἐστὶν, οὗτος μόνος ἐπεχείρησεν εἰπεῖν. 5 Εἰκότως δ' ἐκ τούτων σκοπουμένοις δόξειεν ἂν εἶναι χαλεπὸν γνωρίσαι, τί ἐστιν ὁ τόπος, εἴπερ τούτων ὁποτερονοῦν ἐστιν, εἴτε ὕλη, εἴτε τὸ εἶδος· ἄλλως τε γὰρ τὴν ἀκροτάτην ἔχει θέαν, καὶ χωρὶς ἀλλήλων οὐ ῥᾴδιον αὐτὰ γνωρίζειν. ἀλλὰ μὴν ὅτι γε ἀδύνατον ὁποτερονοῦν τούτων εἶναι τὸν τόπον, οὐ χαλεπὸν ἰδεῖν· τὸ μὲν γὰρ εἶδος καὶ ἡ ὕλη, οὐ χωρίζεται τοῦ πράγματος· τὸν δὲ τόπον, ἐνδέχεται· ἐν ᾧ γὰρ ἀὴρ ἦν, D ἐν τούτῳ πάλιν ὕδωρ, ὥς φαμεν, γίνεται, ἀντιμεθισταμένων ἀλλήλοις τοῦ τε ἀέρος καὶ ὕδατος, καὶ τῶν ἄλλων σωμάτων ὁμοίως. 7 Ὥστε, οὔτε μόριον, οὔτε ἕξις, ἀλλὰ χωριστὸς ὁ τόπος ἐστὶν ἑκάστου. 8 Καὶ γὰρ δοκεῖ τοιοῦτόν τι εἶναι ὁ τόπος, οἷον τὸ ἀγγεῖον· ἔστι γὰρ τὸ ἀγγεῖον, τόπος μεταφορητός· τὸ γὰρ ἀγγεῖον, οὐδὲν τοῦ πράγματός ἐστιν. 9 Ἡ μὲν οὖν χωριστός ἐστι τοῦ πράγματος, ταύτῃ μὲν οὐκ ἔστι τὸ εἶδος· ᾗ δὲ περιέχει, ταύτῃ ἕτερος τῆς ὕλης. 10 Δοκεῖ δὲ ἀεὶ τὸ ὄν που αὐτό τε εἶναί τι, καὶ ἕτερόν τι ἐκτὸς αὐτοῦ. 11 Πλάτωνι μέντοι E λεκτέον, εἰ δεῖ παρεκβάντας εἰπεῖν, διὰ τί οὐκ ἐν τόπῳ τὰ εἴδη καὶ οἱ ἀριθμοὶ, εἴπερ τὸ μεθεκτικὸν ὁ τόπος, εἴτε τοῦ μεγάλου καὶ τοῦ μικροῦ ὄντος τοῦ μεθεκτικοῦ, εἴτε τῆς ὕλης, καθάπερ ἐν τῷ Τιμαίῳ γέγραφεν. 12 Ἔτι, πῶς ἂν φέροιτο εἰς τὸν αὑτοῦ τόπον, εἰ ὁ τόπος ἦν ἡ ὕλη, ἢ τὸ εἶδος; ἀδύνατον γὰρ οὗ μὴ κίνησις, μηδὲ τὸ ἄνω ἢ κάτω ἐστὶ, τόπον εἶναι. ὥστε ζητητέος ἐν τοιούτοις ὁ τόπος. 13 Εἰ δ' ἐν αὐτῷ ὁ τόπος (δεῖ γὰρ εἴπερ ἢ μορφὴ, ἢ ὕλη) ἔσται ὁ τόπος ἐν τόπῳ. μεταβάλλει γὰρ ἅμα τῷ πράγματι, καὶ κινεῖται, καὶ τὸ εἶδος, καὶ τὸ ἀόριστον, οὐκ ἀεὶ ἐν τῷ αὐτῷ,

* γρ. πρώτῳ.

ἀλλ' οὗπερ καὶ τὸ πρᾶγμα. ὥστε τοῦ τόπου ἔσται τόπος. 14 Ἔτι ὅταν ἐξ ἀέρος ὕδωρ γένηται, ἀπόλωλεν ὁ τόπος· οὐ γὰρ ἐν τῷ αὐτῷ τόπῳ τὸ γινόμενον σῶμα. * τίς οὖν ἡ φθορά; 15 Ἐξ ὧν μὲν τοίνυν ἀναγκαῖον εἶναί τι τὸν τόπον, καὶ πάλιν ἐξ ὧν ἀπορήσειεν ἄν τις αὐτοῦ περὶ τῆς οὐσίας, εἴρηται.

* γρ. τίς οὖν ἡ φθορά.

A ſed vbi *eſt* res *ipſa*. quapropter loci erit locus. 4 Præterea quando ex aëre facta eſt aqua, locus periit. nam corpus, quod factum eſt, non eſt in eodem loco. quis igitur *eſt* interitus? 15 Ergo ex quibus neceſſe *eſt* locum eſſe aliquid, & rurſus ex quibus aliquis dubitare poſſit de eius eſſentia, dictum eſt.

An idem ſit in ſeipſo, & an locus ſit in loco.

Cap. V.

Μετὰ δὲ ταῦτα ληπτέον ποσαχῶς ἄλλο ἐν ἄλλῳ λέγεται. ἕνα μὲν δὴ τρόπον, ὡς ὁ δάκτυλος ἐν τῇ χειρί, καὶ ὅλως τὸ μέρος ἐν τῷ ὅλῳ. ἄλλον δέ, ὡς τὸ ὅλον ἐν τοῖς μέρεσιν· οὐ γάρ ἐστι παρὰ τὰ μέρη τὸ ὅλον. ἄλλον δὲ τρόπον, ὡς ὁ ἄνθρωπος ἐν ζῴῳ, καὶ ὅλως ὡς εἶδος ἐν γένει. ἄλλον δέ, ὡς τὸ γένος ἐν τῷ εἴδει, καὶ ὅλως τὸ μέρος τοῦ εἴδους ἐν τῷ τοῦ εἴδους λόγῳ. ἔτι δέ, ὡς ὑγίεια ἐν θερμοῖς καὶ ψυχροῖς, καὶ ὅλως τὸ εἶδος ἐν τῇ ὕλῃ. ἔτι ὡς ἐν βασιλεῖ τὰ τῶν Ἑλλήνων, καὶ ὅλως τὸ ἐν τῷ πρώτῳ κινητικῷ. ἔτι, ὡς ἐν τῷ ἀγαθῷ, καὶ ὅλως ἐν τῷ τέλει· τοῦτο δ' ἐστὶ τὸ οὗ ἕνεκα. πάντων δὲ κυριώτατον τὸ ὡς ἐν ἀγγείῳ, καὶ ὅλως τὸ ἐν τόπῳ. 2 Ἀπορήσειε δ' ἄν τις, εἰ ἄρα ἐν καὶ αὐτό τι ἐν ἑαυτῷ ἐνδέχεται εἶναι· ἢ οὐδέν, ἀλλὰ πάντα ἢ οὐδαμοῦ, ἢ ἐν ἄλλῳ. 3 Διχῶς δὲ τοῦτό ἐστιν, ἤτοι καθ' αὑτό, ἢ καθ' ἕτερον. 4 Ὅταν μὲν γὰρ ᾖ μόρια τοῦ ὅλου, τό, τ' ἐν ᾧ, καὶ τὸ ἐν τούτῳ, λεχθήσεται τὸ ὅλον ἐν αὐτῷ. λέγεται γὰρ καὶ κατὰ τὰ μέρη, οἷον λευκόν, ὅτι ἡ ἐπιφάνεια * λευκή· καὶ * ἐπιστήμων, ὅτι τὸ λογιστικόν. ὁ μὲν οὖν ἀμφορεὺς οὐκ ἔσται ἐν αὐτῷ, οὐδ' ὁ οἶνος· ὁ δὲ τοῦ οἴνου ἀμφορεὺς ἔσται· ὅ, τε γάρ, καὶ ἐν ᾧ, ἀμφότερα τοῦ αὐτοῦ μόρια. οὕτω μὲν οὖν ἐνδέχεται αὐτό τι ἐν αὐτῷ εἶναι. 5 Πρώτως δ' οὐκ ἐνδέχεται, οἷον τὸ λευκὸν ἐν σώματι. ἡ ἐπιφάνεια γὰρ ἐν σώματι, ἡ δ' ἐπιστήμη ἐν ψυχῇ. κατὰ ταῦτα δ' αἱ προσηγορίαι μέρη ὄντα, ὥστε ἐν ἀνθρώπῳ· ὁ δ' ἀμφορεὺς καὶ ὁ οἶνος, χωρὶς μὲν ὄντα, οὐ μέρη. ἅμα δέ· διὸ ὅταν ᾖ μέρη, ἔσται αὐτὸ ἐν αὐτῷ· οἷον τὸ λευκὸν ἐν ἀνθρώπῳ, ὅτι ἐν τῷ σώματι· καὶ ἐν τούτῳ, ὅτι ἐν τῇ ἐπιφανείᾳ· ἐν δὲ ταύτῃ, οὐκ ἔτι κατ' ἄλλο. καὶ ἕτερά γε τῷ εἴδει ταῦτα καὶ ἄλλην φύσιν ἔχει ἑκάτερον καὶ δύναμιν, ἥ τ' ἐπιφάνεια, καὶ τὸ λευκόν. 6 Οὔτε δὴ ἐπακτικῶς σκοποῦσιν, οὐδὲν ἐν αὐτῷ ὁρῶμεν κατ' οὐδένα τῶν διορισμῶν. 7 Τῷ τε λόγῳ δῆλον, ὅτι ἀδύνατον· δεήσει γὰρ ἀμφότερα ἑκάτερον ὑπάρχειν. οἷον τὸν ἀμφορέα, ἀγγεῖόν τε καὶ οἶνον εἶναι· καὶ τὸν οἶνον, οἶνόν τε καὶ ἀμφορέα, εἴπερ ἐνδέχεται αὐτό τι ἐν αὐτῷ εἶναι. 8 Ὥστε εἰ ὅτι μάλιστα ἐν ἀλλήλοις εἶεν, ὁ μὲν ἀμφορεὺς δέξεται τὸν οἶνον, οὐχ ᾗ αὐτὸς ὁ οἶνος, ἀλλ' ᾗ ἐκεῖνος· ὁ δ' οἶνος ἐνέσται ἐν τῷ ἀμφορεῖ, οὐχ ᾗ ἀμφορεὺς αὐτός, ἀλλ' ᾗ ἐκεῖνος ἀμφορεύς. κατὰ μὲν οὖν τὸ εἶναι ὅτι ἕτερον, δῆλον. ἄλλος γὰρ ὁ λόγος ὁ τοῦ ἐν ᾧ, καὶ ὁ τοῦ ἐν τούτῳ. 9 Ἀλλὰ μὴν οὐδὲ κατὰ συμβεβηκὸς ἐνδέχεται· ἅμα γὰρ δύο σώματα ἐν τῷ αὐτῷ ἐνέσται· αὐτός τε γὰρ ἐν αὐτῷ ὁ ἀμφορεὺς ἔσται, εἰ οὗ ἡ φύσις δεκτική, τοῦτ' ἐνδέχεται ἐν ἑαυτῷ εἶναι· καὶ ἔτι, ἐκεῖνο οὗ δεκτικὸν οἷον, εἰ οἴνου ὁ οἶνος. ὅτι μὲν οὖν ἀδύνατον ἐν ἑαυτῷ τι * πρώτως εἶναι, δῆλον. 10 Ὃ δὲ Ζήνων ἠπόρει, ὅτι εἰ ὁ τόπος

* γρ. λευκόν.
* γρ. ἐπιστήμων.
* γρ. πρώτως.

B Poſt hæc ſumendum *eſt*, quot modis aliud ſit in alio. vno igitur modo, vt digitus in manu, & omnino pars in toto. alio *modo*, vt totum in partibus: non enim totum eſt extra partes. alio modo, vt homo in animali, & omnino vt ſpecies in genere. alio, vt genus in ſpecie, & omnino pars ſpeciei in definitione ſpeciei. præterea vt ſanitas in calidis & frigidis, & omnino forma in materia. præterea vt in rege res Græcorum, & omnino quod *eſt* in primo motore. præterea vt in bono, & omnino in fine: hoc autem eſt id cuius gratia. omnium autem maxime proprie *dicitur*, quod eſt vt in vaſe, & omnino quod *eſt* in loco. 2 Iam verò dubitare quis poſſit, vtrùm aliquid poſſit eſſe vnum & idem in ſemetipſo, an nihil, ſed omnia vel nuſquam *ſint*, vel in alio. 3 Hoc autem bifariàm eſt, *nempe* vel per ſe, vel per aliud. 4 Cùm enim totius partes ſunt, & id in quo *ineſt*, & id quod in illo *ineſt*: *tunc* dicitur totum *eſſe* in ſeipſo. nam & ratione partium dicitur: vtputà albus, quia ſuperficies *eſt* alba: & *homo* ſciens, quia facultas ratiocinandi *eſt ſciens*. Ergo nec vas erit in ſeipſo, nec vinum, ſed vini vas: quod enim *ineſt*, & id in quo *ineſt*, ambo ſunt eius partes: ſic igitur fieri poteſt, vt idem ſit in ſeipſo. 5 Primo autem *eſſe* non poteſt: vt album *eſt* in corpore: quia ſuperficies eſt in corpore: ſcientia verò *eſt* in anima. ex his autem, cùm ſint partes, appellationes *ſumuntur*, adeo vt in homine *eſſe dicantur*. ſed amphora & vinum, cùm ſunt ſeorſum, non *ſunt* partes: ſimul verò *accepta partes ſunt*. idcirco, quando ſunt partes, erit idem in ſeipſo: vt album in homine, quia *eſt* in corpore: & in hoc, quia eſt in ſuperficie: verùm in hac non ampliùs per aliud. atque hæc diuerſa *ſunt* ſpecie: aliámque naturam & vim vtrumque habet, ſuperficies, & albor. 6 Si igitur per inductionem conſideremus, nihil videmus *eſſe* in ſeipſo ſecundùm vllam definitionem. 7 Et ratione patet *hoc* eſſe impoſſibile. oportebit enim vtrumque ambo eſſe: vtputà, amphoram eſſe & vas & vinum, ac vinum eſſe & vinum & amphoram: ſiquidem aliquid poteſt ipſum eſſe in ſeipſo. 8 Quocirca ſi quàm maximè in ſe inuicem ſint: tamen amphora recipiet vinum, non quatenus ipſa *eſt* vinum, ſed quatenus illud *eſt vinum*. vinum autem ineſt in amphora, non quatenus ipſum *eſt* amphora, ſed quatenus illa *eſt* amphora. ac ſecundùm eſſentiam *hæc* differre patet: alia namque *eſt* definitio eius in quo *eſt*, & eius quod in illo *eſt*. 9 Quinimmo nec ex accidenti eſſe poteſt: ſimul enim duo corpora in eodem inerunt. nam & ipſa amphora in ſe ipſa erit, ſi *id* cuius natura *eſt* ad ſuſcipiendum apta, poteſt in ſe ipſo eſſe: & inſuper *in eodem erit* id cuius ſuſcipiendi vim habet, vt vinum, ſi vini *ſuſcipiendi vim habet*. impoſſibile igitur eſſe vt aliquid ſit primò in ſeipſo, manifeſtum *eſt*. 10 Quod autem Zeno dubitabat, quia

ſi locus eſt aliquid, erit in aliquo, ſoluere non *eſt* difficile: nihil enim vetat, primum locum eſſe quidem in alio; non tamen *eſſe in* illo, vt in loco, ſed quemadmodum ſanitas *eſt* in calidis, vt habitus, calidum autem in corpore, vt affectio. quare non eſt neceſſe, in infinitum abire. 11 Sed illud perſpicuum *eſt*, quia vas non eſt vlla pars eius quod in ipſo *eſt*, (nam quod primò *ineſt*, & in quo *ineſt*, diuerſa *ſunt*) locum nec poſſe eſſe materiam, nec formam, ſed diuerſum *quidpiam*. nam hæc *ſunt* aliquid eius quod ineſt, tam materia quàm forma. 12 De his igitur dubitatum eſto.

A ἐστί τι, ἐν τίνι ἔσται, λύειν οὐ χαλεπόν· οὐδὲν γὰρ κωλύει, ἐν ἄλλῳ μὲν εἶναι τὸν πρῶτον τόπον, μὴ μέντοι ὡς ἐν τόπῳ ἐκείνῳ, ἀλλ' ὥσπερ ἡ μὲν ὑγίεια ἐν τοῖς θερμοῖς, ὡς ἕξις, τὸ δὲ θερμὸν ἐν τῷ σώματι, ὡς πάθος. ὥστ' οὐκ ἀνάγκη εἰς ἄπειρον ἰέναι. 11 Ἐκεῖνο δὲ φανερόν, ὅτι ἐπεὶ οὐδὲν τὸ ἀγγεῖον τοῦ ἐν αὐτῷ· (ἕτερον γὰρ τὸ πρώτως, ὅ, τε καὶ ἐν ᾧ) οὐκ ἂν εἴη οὔτε ἡ ὕλη, οὔτε τὸ εἶδος ὁ τόπος, ἀλλ' ἕτερον. ἐκείνου γάρ τι ταῦτα τοῦ ἐνόντος, καὶ ἡ ὕλη, καὶ ἡ μορφή. 12 Ταῦτα μὲν οὖν ἔστω διηπορημένα.

Quid ſit locus.
Cap. VI.

SEd quid tandem ſit locus, ita perſpicuum fieri poteſt. 2 De eo autem accipiamus, quæcumque videntur verè ipſi per ſe ineſſe. cenſemus igitur locum primò continere id cuius eſt locus, nec eſſe aliquid rei, *quam continet*. præterea primum locum nec *eſſe* minorem, nec maiorem *re locata*. præterea nec deſtitui quaque re, & eſſe ſeparabile. ad hæc, omnem locum habere partem ſuperam & inferam; & ſingula corpora natura ferri, ac manere in propriis locis: hoc autem facere aut ſupra, aut infra. His ſuppoſitis, reliqua ſunt diſpicienda. 3 Conari autem oportet conſiderationem ita inſtituere, quatenus quid ſit, explicetur: adeo vt & ea de quibus dubitatur, ſoluantur: & quæ videntur loco ineſſe, maneant: & præterea cauſa difficultatis, atque eorum quæ de ipſo dubitantur, perſpicua fiat. ſic enim pulcherrimè vnumquodque monſtrabitur. 4 Primùm itaque oportet intelligere, non futuram fuiſſe loci inquiſitionem, niſi motus aliquis eſſet, qui in loco *ſpectaretur*. idcirco & cœlum maximè putamus *eſſe* in loco, quia ſemper *eſt* in motu. 5 Hîc verò partim *eſt* latio, partim accretio & deminutio: nam & in accretione & deminutione fit mutatio: & quod prius hîc erat, rurſus translatum eſt in minus aut maius. 6 Quod autem mouetur, partim eſt per ſe actu, partim ex accidenti. 7 Quod autem *eſt* ex accidenti, partim poteſt moueri per ſe, vt partes corporis, & clauus qui *eſt* in naui: alia non poſſunt *per ſe moueri*, ſed ſemper *mouentur* ex accidenti; vt albor, & ſcientia, hæc enim ſic mutant locum, quia *id* in quo inſunt, mutat. 8 Quia verò dicimus eſſe in cœlo vt in loco, quia *eſt* in aëre; hic autem *eſt* in cœlo: ſed & in aëre *eſſe dicimus, id eſt*, non in toto: ſed propter eius extremum & continens, in aëre eſſe dicimus: (nam ſi vniuerſus aër *eſſet* locus, certè non eſſet æqualis cuiuſque *rei* locus & res ipſa: ſed videtur æqualis eſſe: talis autem *eſt* primus locus, in quo *res* eſt.) 9 Cùm igitur id quod continet, non eſt diuiſum: ſed continuum: *tunc* dicitur in illo *eſſe*, non vt in loco, ſed vt pars in toto. cùm autem eſt diuiſum, ac tangit: *tunc* eſt in aliquo primo, quod eſt extremum continentis, & neque eſt pars eius quod in ipſo eſt, neque maius interuallo, ſed æquale, quoniam in eodem *ſunt* extremitates eorum quæ ſe tangunt. 10 Et id quidem quod eſt continuum, non in eo mouetur, ſed cũ illo: quod autem eſt diuiſum, in illo, & ſiue continens moueatur, ſiue minimè: nihilominus *ipſum mouetur*. 11 Præterea cùm non eſt diuiſum, dicitur *eſſe* vt pars in toto: velut, vt in oculo aſpectus, aut in corpore manus. cùm autẽ eſt diuiſum, & tãgit, *dicitur eſſe* vt vt in loco:

B Τί δέ ποτ' ἐστὶν ὁ τόπος, ὧδ' ἂν γένοιτο φανερόν. 2 Λάβωμεν δὲ περὶ αὐτοῦ, ὅσα δοκεῖ ἀληθῶς καθ' αὑτὸ ὑπάρχειν αὐτῷ. ἀξιοῦμεν δὴ τὸν τόπον εἶναι, πρῶτον μὲν περιέχον ἐκεῖνο οὗ τόπος ἐστί· καὶ μηδὲν τοῦ πράγματος εἶναι. ἔτι, τὸν πρῶτον τόπον, μήτε ἐλάττω, μήτε μείζω. ἔτι, [μήτε] ἀπολείπεσθαι ἑκάστου, καὶ χωριστόν. πρὸς δὲ τούτοις, πάντα τόπον, ἔχειν τὸ ἄνω καὶ τὸ κάτω· καὶ φέρεσθαι φύσει, καὶ μένειν ἐν τοῖς οἰκείοις τόποις ἕκαστον τῶν σωμάτων. τοῦτο δὲ ποιεῖν, ἢ ἄνω, ἢ κάτω. ὑποκειμένων δὲ τούτων, τὰ λοιπὰ θεωρητέον. 3 Δεῖ δὲ πειρᾶσθαι τὴν σκέψιν οὕτω ποιεῖσθαι, ὅπως τὸ τί ἐστιν ἀποδοθήσεται· ὥστε τά τε ἀπορούμενα λύε- C σθαι, καὶ τὰ δοκοῦντα ὑπάρχειν τῷ τόπῳ, ὑπάρχοντα ἔσται· καὶ ἔτι, τὸ τῆς δυσκολίας αἴτιον, καὶ τῶν περὶ αὐτὸν ἀπορημάτων, ἔσται φανερόν. οὕτω γὰρ ἂν κάλλιστα δεικνύοιτο ἕκαστον. 4 Πρῶτον μὲν οὖν δεῖ κατανοῆσαι, ὅτι οὐκ ἂν ἐζητεῖτο ὁ τόπος, εἰ μὴ κίνησίς τις ἦν ἡ κατὰ τόπον· διὰ γὰρ τοῦτο καὶ τὸν οὐρανὸν μάλιστα οἰόμεθα ἐν τόπῳ, ὅτι ἀεὶ ἐν κινήσει. 5 Ταύτης δέ, τὸ μὲν φορά, τὸ δ' αὔξησις καὶ φθίσις· καὶ γὰρ ἐν τῇ αὐξήσει καὶ φθίσει μεταβάλλει, καὶ ὅπερ πρότερον ἦν ἐνταῦθα, πάλιν μεθέστηκεν εἰς ἔλαττον, ἢ μεῖζον. 6 Ἔστι δὲ κινούμενον τὸ μὲν καθ' αὑτὸ ἐνεργείᾳ, τὸ δὲ κατὰ συμβεβηκός. 7 Τοῦ δὲ κατὰ D συμβεβηκός, τὸ μὲν ἐνδεχόμενον κινεῖσθαι καθ' αὑτό, οἷον τὰ μόρια τοῦ σώματος, καὶ ὁ ἐν τῷ πλοίῳ ἧλος· τὰ δ' οὐκ ἐνδεχόμενα, ἀλλ' ἀεὶ κατὰ συμβεβηκός· οἷον ἡ λευκότης, καὶ ἡ ἐπιστήμη· ταῦτα γὰρ οὕτω μεταβέβληκε τὸν τόπον, ὅτι ἐν ᾧ ὑπάρχουσι, μεταβάλλει. 8 Ἐπεὶ δὲ λέγομεν εἶναι ὡς ἐν τόπῳ ἐν τῷ οὐρανῷ, διότι ἐν τῷ ἀέρι, οὗτος δ' ἐν τῷ οὐρανῷ· καὶ ἐν τῷ ἀέρι δέ, οὐκ ἐν παντί· ἀλλὰ διὰ τὸ ἔσχατον αὐτοῦ καὶ περιέχον, ἐν τῷ ἀέρι φαμὲν εἶναι. εἰ γὰρ ἅπας ὁ ἀὴρ τόπος, οὐκ ἂν ἴσος εἴη ἑκάστου ὁ τόπος, καὶ ἕκαστον. δοκεῖ δέ γε ἴσος εἶναι. τοιοῦτος δ' ὁ πρῶτος ἐν ᾧ ἐστιν. 9 Ὅταν μὲν οὖν μὴ διῃρημένον ᾖ τὸ περιέχον, ἀλλὰ συνεχές, οὐχ ὡς ἐν τόπῳ λέγεται εἶναι ἐν ἐκεί- E νῳ, ἀλλ' ὡς μέρος ἐν ὅλῳ· ὅταν δὲ διῃρημένον ᾖ καὶ ἁπτόμενον, ἐν πρώτῳ ἐστί τινι τῷ ἐσχάτῳ τοῦ περιέχοντος, ὃ οὔτ' ἐστὶ μέρος τοῦ ἐν αὐτῷ ὄντος, οὔτε μεῖζον τοῦ διαστήματος, ἀλλ' ἴσον· ἐν γὰρ τῷ αὐτῷ τὰ ἔσχατα τῶν ἁπτομένων. 10 Καὶ συνεχὲς μὲν ὄν, οὐκ ἐν ἐκείνῳ κινεῖται, ἀλλὰ μετ' ἐκείνου· διῃρημένον δέ, ἐν ἐκείνῳ. καὶ ἐάν τε κινῆται τὸ περιέχον, ἐάν τε μή, οὐδὲν ἧττον. 11 Ἔτι δ', ὅταν μὴ διῃρημένον ᾖ, ὡς μέρος ἐν ὅλῳ λέγεται· οἷον ὡς ἐν τῷ ὀφθαλμῷ ἡ ὄψις, ἢ ἐν τῷ σώματι ἡ χείρ. ὅταν δὲ διῃρημένον ᾖ ἁπτόμενον, ὡς ἐν τόπῳ·

ἐστὶν ἐν τῷ κάδῳ τὸ ὕδωρ, ἢ ἐν τῷ κεραμίῳ ὁ οἶνος. ἡ μὲν γὰρ χεὶρ μετὰ τοῦ σώματος κινεῖται, τὸ δὲ ὕδωρ ἐν τῷ κάδῳ. 12 Ἤδη τοίνυν φανερὸν ἐκ τούτων, τί ἐστιν ὁ τόπος. σχεδὸν γὰρ τέτταρά ἐστιν, ὧν ἀνάγκη τὸν τόπον ἕν τι εἶναι· ἢ γὰρ μορφή, ἢ ὕλη, ἢ διάστημά τι τὸ μεταξὺ τῶν ἐσχάτων, ἢ τὰ ἔσχατα, εἰ μή ἐστι μηδὲν διάστημα παρὰ τὸ τοῦ ἐγγινομένου σώματος μέγεθος. 13 Τούτων δ' ὅτι τὰ τρία οὐκ ἐνδέχεται εἶναι, φανερόν. 14 Ἀλλὰ διὰ μὲν τὸ περιέχειν, δοκεῖ ἡ μορφὴ εἶναι· ἐν ταὐτῷ γὰρ τὰ ἔσχατα τοῦ περιέχοντος καὶ τοῦ περιεχομένου. 15 Ἔστι μὲν οὖν ἄμφω πέρατα, ἀλλ' οὐ τοῦ αὐτοῦ. ἀλλὰ τὸ μὲν εἶδος, τοῦ πράγματος· ὁ δὲ τόπος, τοῦ περιέχοντος σώματος. 16 Διὰ δὲ τὸ μεταβάλλειν πολλάκις μένοντος τοῦ περιέχοντος τὸ περιεχόμενον καὶ διῃρημένον, οἷον ἐξ ἀγγείου ὕδωρ, τὸ μεταξὺ εἶναί τι δοκεῖ διάστημα, ὡς ὄν τι παρὰ τὸ σῶμα τὸ μεθιστάμενον. 17 Τὸ δ', οὐκ ἔστιν, ἀλλὰ τὸ τυχὸν ἐμπίπτει σῶμα τῶν μεθισταμένων, καὶ ἅπτεσθαι πεφυκότων. 18 Εἰ δ' ἦν τι τὸ διάστημα τὸ πεφυκός, καὶ μένον ἐν τῷ αὐτῷ τόπῳ, ἄπειροι ἂν ἦσαν τόποι· μεθισταμένου γὰρ τοῦ ὕδατος, καὶ τοῦ ἀέρος, τὸ αὐτὸ ποιήσει τὰ μόρια ἅπαντα ἐν τῷ ὅλῳ, ὅπερ ἅπαν τὸ ὕδωρ ἐν τῷ ἀγγείῳ. 19 Ἅμα δὲ καὶ ὁ τόπος ἔσται μεταβάλλων. ὥστ' ἔσται καὶ τοῦ τόπου ἄλλος τόπος, καὶ πολλοὶ τόποι ἅμα ἔσονται. 20 Οὐκ ἔστι δὲ ἄλλος τόπος ὁ τοῦ μορίου, ἐν ᾧ κινεῖται, ὅταν τὸ ὅλον ἀγγεῖον μεθίστηται, ἀλλ' ὁ αὐτός. ἐν ᾧ γάρ ἐστιν, ἀντιμεθίσταται ὁ ἀήρ, καὶ τὸ ὕδωρ, καὶ τὰ μόρια τοῦ ὕδατος, ἀλλ' οὐκ ἐν ᾧ γίνονται τόπῳ, ὅς μέρος ἐστὶ τοῦ τόπου, ὅς ἐστι τόπος ὅλου τοῦ οὐρανοῦ. 21 Καὶ ἡ ὕλη δὲ δόξειεν ἂν εἶναι τόπος, εἴγε ἐν ἠρεμοῦντί τις σκοποίη, καὶ μὴ κεχωρισμένῳ, ἀλλὰ συνεχεῖ. ὥσπερ γὰρ εἰ ἀλλοιοῦται, ἔστι τι ὃ νῦν μὲν λευκόν, πάλαι δὲ μέλαν· καὶ νῦν μὲν σκληρόν, πάλαι δὲ μαλακόν· διὸ φαμὲν εἶναί τι τὴν ὕλην· οὕτω καὶ ὁ τόπος διὰ τοιαύτης τινὸς εἶναι δοκεῖ φαντασίας. 22 Πλὴν ἐκεῖνο μέν, διότι ὃ ἦν ἀήρ, τοῦτο νῦν ὕδωρ· ὁ δὲ τόπος, ὅτι οὗ νῦν ἦν ὁ ἀήρ, ἐνταῦθά ἐστι νῦν ὕδωρ. 23 Ἀλλ' ἡ μὲν ὕλη, ὥσπερ ἐλέχθη ἐν τοῖς πρότερον, οὔτε χωριστὴ τοῦ πράγματος, οὔτε περιέχουσα· ὁ δὲ τόπος, ἄμφω. 24 Εἰ τοίνυν μηδὲν τούτων τῶν τριῶν ὁ τόπος ἐστί, μήτε τὸ εἶδος μήτε ἡ ὕλη, μήτε διάστημα, ἀεί τι ὑπάρχον ἕτερον παρὰ τὸ τοῦ πράγματος τοῦ μεθισταμένου, ἀνάγκη τὸν τόπον εἶναι τὸ λοιπὸν τῶν τεσσάρων, τὸ πέρας *τοῦ περιέχοντος σώματος. 25 Λέγω δὲ τὸ περιεχόμενον σῶμα, τὸ κινητὸν κατὰ φοράν. 26 Δοκεῖ δὲ μέγα τι εἶναι καὶ χαλεπὸν ληφθῆναι ὁ τόπος, διά τε τὸ παρεμφαίνεσθαι τὴν ὕλην, καὶ τὴν μορφήν· καὶ διὰ τὸ ἐν ἠρεμοῦντι τῷ περιέχοντι γίνεσθαι τὴν μετάστασιν τοῦ φερομένου· ἐνδέχεσθαι γὰρ φαίνεται εἶναι διάστημα μεταξὺ ἄλλο τι τῶν κινουμένων μεγεθῶν. συμβάλλεται δέ τι καὶ ὁ ἀήρ, δοκῶν ἀσώματος εἶναι· φαίνεται γὰρ οὐ μόνον τὰ πέρατα τοῦ ἀγγείου εἶναι ὁ τόπος, ἀλλὰ καὶ τὸ μεταξὺ ὄν, ὡς κενόν. 27 Ἔστι δ' ὥσπερ τὸ ἀγγεῖον τόπος μεταφορητός, οὕτως ὁ τόπος ἀγγεῖον ἀμετακίνητον. διὸ ὅταν μὲν ἐν κινουμένῳ τι κινῆται καὶ μεταβάλλῃ τὸ ἐντός, οἷον ἐν ποταμῷ πλοῖον, ὡς ἀγγείῳ χρῆται μᾶλλον ἢ τόπῳ τῷ περιέχοντι. βούλεται δ' ἀκίνητον εἶναι ὁ τόπος. διὸ ὁ πᾶς μᾶλλον ποταμὸς τόπος, ὅτι ἀκίνητος ὁ πᾶς. 28 Ὥστε τὸ τοῦ περιέχοντος πέρας ἀκίνητον πρῶτον, τοῦτ' ἔστιν ὁ τόπος.

A velut in cado aqua, aut in dolio vinum. etenim manus cum corpore mouetur: aqua verò in cado. 12 Iam verò ex his perſpicuum *eſt*, quid ſit locus. ferè enim quatuor ſunt, ad quorum vnum neceſſe *eſt* locum referri. aut enim *eſt* forma, aut materia, aut interuallum quoddam, quod eſt extremis interiectum, aut extrema, ſi nullum eſt interuallum præter magnitudinem corporis quod ineſt. 13 Horum autem tria eſſe non poſſe, perſpicuum *eſt*. 14 Verùm, quia continet, videtur eſſe forma. in eodem enim *ſunt* extremitates eius quod continet & eius quod continetur. 15 Sanè ambo ſunt termini: non tamen eiuſdem: ſed forma *eſt terminus* rei: locus autem, corporis continentis. 16 Quia verò id quod B continetur ac diuiſum eſt, eo quod continet manente, mutatur ſæpe, vt ex vaſe aqua: *idcirco* quod eſt interiectum, videtur eſſe aliquod interuallum, quaſi quippiam ſit præter corpus, quod transfertur. 17 Quod non *ita* eſt: ſed incidit quodvis corpus eorum, quæ transferuntur, & ſuâ naturâ tangere poſſunt. 18 Cæterùm ſi interuallum eſſet aliquid, quod ſua natura eſſet, ac maneret eodem in loco: infiniti eſſent loci. translatis enim aqua & aëre: idem faciunt omnes partes in toto, quod vniuerſa aqua *facit* in vaſe. 19 Item locus mutabitur. quapropter erit etiam loci alius locus: & multi loci ſimul erunt. 20 Non eſt autem alius locus partis in quo mouetur. cùm C totum vas transfertur, ſed idem *manet*. nam in quo ſunt, *in eo* viciſſim transferuntur aër & aqua & partes aquæ: non in eo loco, in quem tranſeunt: qui ſcilicet eſt pars loci, qui eſt locus totius cæli. 21 Sed & materia videri poteſt eſſe locus, ſi quis conſideret in eo quod quieſcit nec eſt ſeparatum ſed continuum. quemadmodum enim ſi variatur, eſt aliquid quod nunc *eſt* album, olim *erat* nigrum: & nunc *eſt* durum, olim *erat* molle: vnde dicimus materiam eſſe aliquid: ita & locus videtur eſſe *aliquid*, quia eiuſmodi quandam ſpeciem præ ſe fert. 22 Verùm illud *ideo dicitur*: quia quod erat aër, nunc *eſt* aqua. locus autem; quia vbi erat aër, ibi nunc eſt aqua. 23 Sed D materia quidem, vt in ſuperioribus dictum fuit, neque ſeparabilis *eſt* à re, neque continet: cùm vtrumque loco conueniat. 24 Si igitur locus non eſt vllum ex his tribus: *hoc eſt*, neque forma, neque materia, neque interuallum, quod ſemper diuerſum quiddam ſit præter rem quæ transfertur: neceſſe *eſt*, locum eſſe id quod ex his tribus eſt reliquum, *nempe* terminus corporis continentis. 25 Corpus autem contentum appello, quod eſt latione mobile. 26 Iam verò magnum quiddam ac difficile eſſe videtur, ſumere quid ſit locus: cùm quia materiæ & formæ ſpeciem refert: tum etiam quia in eo, quod continet, quieſcente, fit translatio eius quod fertur. videtur enim eſſe poſſe interuallum quoddam interiectum, E diuerſum à magnitudinibus quæ mouentur. confert etiam aliquid aër, qui videtur eſſe incorporeus. nam locus videtur eſſe non ſolùm extremitates vaſis, ſed etiam quod eſt interiectum quaſi inane. 27 Porrò ſicut vas *eſt* locus qui transferri poteſt, ita locus eſt vas immobile. idcirco quando in re mota aliquid mouetur, & quod intus eſt, mutat *locum*: velvti, in flumine nauigium, eo vtitur quod continet, potiùs vt vaſe, quàm *vt* loco. locus autem debet eſſe *quiddam* immobile. quare vniuerſum flumen magis *eſt* locus: quia vniuerſum *eſt* immobile. 28 Quocirca eius quod continet, terminus immobilis primus, idipſum eſt locus.

* Vicomerc. legendum ſuſpicatur, τοῦ σώματος. καθ' ὃ συνάπτει τῷ περιεχομένῳ. vt in Simplicij Commentariis legitur.

Corollaria.

IDeóque medium cæli, & extremum conuerſionis quod nos versùs eſt, omnibus maximè propriè videtur eſſe, hoc quidem ſuprà, illud autem infrà: quoniam illud ſemper manet: circuli autem extremum ſemper eodem modo *ſe* habens manet. quapropter cùm leue *id* ſit, quod ſurſum naturâ fertur, graue autem, quod deorſum: certè terminus, qui medium versùs continet, infrà eſt, *nec non* & ipſum medium. qui verò extremum verſùs *continet*, ſuprà *eſt*, *nec non* & ipſum extremum. 2 Proinde locus videtur eſſe planum quiddam, & quaſi vas, & *rem locatam* continens. 3 Præterea locus ſimul *eſt* aliquo modo cum re: quia termini ſimul *ſunt* cum eo quod terminatur. 4 Illud corpus igitur eſt in loco, extra quod eſt aliquod *aliud* corpus, quod ipſum continet. *illud* verò non *eſt in loco*, extra quod non *eſt vllum corpus*. 5 Idcirco etiamſi aqua talis fiat: partes quidem eius mouebuntur, quia continentur aliæ ſub aliis: vniuerſum autem aliquo modo mouebitur, aliquo modo non *mouebitur*. vt enim *eſt* totum, ſimul locum non mutabit: in orbem autem mouebitur, quia partium hic locus *eſt*. 6 Et nonnulla quidem non *mouentur* ſurſum & deorſum, ſed in orbem: alia verò ſurſum, ac deorſum, quæcumque *ſcilicet* habent denſitatem & raritatem. 7 Sicut autem dictum fuit, alia ſunt in loco poteſtate, alia actu. quare cùm id quod conſtat ex ſimilibus partibus, eſt continuum: partes poteſtate in loco *ſunt*. cùm autem ſeparatæ ſunt, ac tangunt, velut aceruus: *tunc* actu *in loco ſunt*. 8 Et alia quidem per ſe *ſunt in loco*: vt omne corpus aut latione aut accretione mobile, per ſe *eſt* alicubi. cælum autem (vt dictum fuit) nuſquam totum eſt, nec in aliquo loco: ſiquidem nullo corpore continetur. quatenus autem mouetur, eatenus etiam locus eſt eius partibus: alia namque pars alij cohæret. Alia verò *ſunt in loco* ex accidenti: vt anima, & cœlum. nam omnes partes *ſunt* quodammodo in loco: quoniam in circulo alia *pars* aliam continet. idcirco ſuperum corpus tantùm in orbem mouetur. vniuerſum autem non *eſt* alicubi: quod enim *eſt* alicubi & ipſum eſt aliquid, & inſuper oportet præter hoc eſſe aliud quidpiam, in quo *ſit*, *ſeu* quod ipſum contineat: ſed præter vniuerſum ac totum, nihil eſt *quod ſcilicet ſit* extra vniuerſum. 9 Proinde in cælo omnia ſunt: nam cælum fortaſſe *eſt* vniuerſum. Locus autem eſt, non cælum, ſed cæli quoddam extremum ac terminus quieſcens, qui tangit corpus mobile. 10 Ideóque terra *eſt* in aqua: hæc verò in aëre: hic autem in æthere: æther autem in cœlo. ſed cœlum non *eſt* ampliùs in alio. 11 Ex his perſpicuum *eſt*, omnes dubitationes diſſolui poſſe, ſi ita locus explicetur: quia neque neceſſe *eſt*, ſimul augeri locum: neque puncti eſſe locum: neque duo corpora *eſſe* in eodem loco: neque eſſe aliquod interuallum corporeum. quod enim loco *eſt* interiectum, *eſt* corpus quodlibet, non interuallum corporis. & locus eſt alicubi, non tamen vt in loco, ſed vt terminus in re terminata. non enim omne ens *eſt* in loco, ſed *tantùm* corpus mobile. 12 Et fertur igitur vnumquodque optimâ ratione ad ſuum locum. quod enim deinceps *collocatum eſt*, ac tangit non vi, *illud eſt* cognatum: & copulata quidem in vnam naturam, *ſunt* impatibilia. cùm autem ſe tangunt, viciſſim pati & agere poſſunt.

Cap. VII.

A Καὶ διὰ τοῦτο τὸ μέσον τοῦ οὐρανοῦ, καὶ τὸ ἔσχατον τὸ πρὸς ἡμᾶς τῆς κύκλῳ φορᾶς, δοκεῖ εἶναι, τὸ μὲν ἄνω, τὸ δὲ κάτω, μάλιστα πᾶσι κυρίως· ὅτι τὸ μὲν ἀεὶ μένει. τοῦ δὲ κύκλου τὸ ἔσχατον ὡσαύτως ἔχον μένει. ὥστ' ἐπεὶ τὸ μὲν κοῦφον, τὸ ἄνω φερόμενόν ἐστι φύσει, τὸ δὲ βαρὺ τὸ κάτω, τὸ μὲν πρὸς τὸ μέσον περιέχον, πέρας, κάτω ἐστὶ, καὶ αὐτὸ τὸ μέσον· τὸ δὲ πρὸς τὸ ἔσχατον, ἄνω, καὶ αὐτὸ τὸ ἔσχατον. 2 Καὶ διὰ τοῦτο δοκεῖ ἐπίπεδόν τι εἶναι, καὶ οἷον ἀγγεῖον ὁ τόπος καὶ περιέχον. 3 Ἔτι, ἅμα τῷ πράγματί πως καὶ ὁ τόπος· ἅμα γὰρ τῷ πεπερασμένῳ τὰ πέρατα. 4 Ὧι μὲν οὖν σώματί B ἐστί τι ἐκτὸς σῶμα περιέχον αὐτὸ, τοῦτό ἐστιν ἐν τόπῳ· ᾧ δὲ μὴ, οὔ. 5 Διὸ κἂν ὕδωρ γένηται τοιοῦτο, τὰ μὲν μόρια κινήσεται αὐτοῦ· περιέχεται γὰρ ὑπ' ἀλλήλων. τὸ δὲ πᾶν, ἔστι μὲν ὡς κινήσεται, ἔστι δ' ὡς οὔ. ὡς μὲν γὰρ ὅλον, ἅμα τὸν τόπον οὐ μεταβάλλει· κύκλῳ δὲ κινήσεται· τῶν μορίων γὰρ οὗτος ὁ τόπος.* 6 Καὶ ἄνω μὲν καὶ κάτω, οὔ· κύκλῳ δὲ, ἔνια. τὰ δὲ ἄνω καὶ κάτω, [καὶ] ὅσα ἔχει πύκνωσιν καὶ μάνωσιν. 7 Ὥσπερ δ' ἐλέχθη, τὰ μέν ἐστιν ἐν τόπῳ κατὰ δύναμιν, τὰ δὲ κατ' ἐνέργειαν. διὸ, ὅταν μὲν συνεχὲς ᾖ τὸ ὁμοιομερὲς, κατὰ δύναμιν ἐν τόπῳ τὰ μέρη· ὅταν δὲ χωρισθῇ μὲν, ἅπτηται δὲ ὥσπερ σωρὸς, κατ' ἐνέργειαν. 8 Καὶ τὰ μὲν, καθ' αὑτὰ, οἷον πᾶν σῶμα, ἢ κατὰ φορὰν, ἢ κατ' αὔξη- C σιν κινητὸν καθ' αὑτὸ πού. ὁ δ' οὐρανὸς, ὥσπερ εἴρηται, οὔ που ὅλος, οὐδ' ἔν τινι τόπῳ ἐστὶν, εἴ γε μηδὲν αὐτὸν περιέχει σῶμα. ἐφ' ᾧ δὲ κινεῖται, ταύτῃ καὶ τόπος ἐστὶ τοῖς μορίοις· ἕτερον γὰρ ἑτέρου ἐχόμενον τῶν μορίων ἐστί. τὰ δὲ κατὰ συμβεβηκὸς, οἷον ἡ ψυχὴ, καὶ ὁ οὐρανός· τὰ γὰρ μόρια ἐν τόπῳ πως* πάντα· ἐπὶ τῷ κύκλῳ γὰρ περιέχει ἄλλο ἄλλο. διὸ κινεῖται μὲν κύκλῳ μόνον τὸ ἄνω· τὸ δὲ πᾶν, οὔ που· τὸ γὰρ πού αὐτό τε ἐστί τι, καὶ ἔτι ἄλλο τι δεῖ εἶναι παρὰ τοῦτο ἐν ᾧ ὃ περιέχει. παρὰ δὲ τὸ πᾶν καὶ ὅλον, οὐδέν ἐστιν ἔξωθεν τοῦ παντός. 9 Καὶ διὰ τοῦτο ἐν τῷ οὐρανῷ πάντα· ὁ γὰρ οὐρανὸς τὸ D πᾶν ἴσως. ἔστι δὲ ὁ τόπος οὐχ ὁ οὐρανὸς, ἀλλὰ τοῦ οὐρανοῦ τι τὸ ἔσχατον, καὶ ἁπτόμενον τοῦ κινητοῦ σώματος πέρας ἠρεμοῦν. 10 Καὶ διὰ τοῦτο, ἡ μὲν γῆ, ἐν τῷ ὕδατι, τοῦτο δ' ἐν τῷ ἀέρι, οὗτος δ' ἐν τῷ αἰθέρι, ὁ δ' αἰθὴρ ἐν τῷ οὐρανῷ. ὁ δ' οὐρανὸς οὐκ ἔτι ἐν ἄλλῳ. 11 Φανερὸν δὲ ἐκ τούτων, ὅτι καὶ αἱ ἀπορίαι πᾶσαι λύοιντ' ἂν, οὕτω λεγομένου τοῦ τόπου. οὔτε γὰρ συναυξάνεσθαι ἀνάγκη τὸν τόπον, οὔτε στιγμῆς εἶναι τόπον, οὔτε δύο σώματα ἐν τῷ αὐτῷ τόπῳ, οὔτε διάστημά τι εἶναι σωματικόν. σῶμα γὰρ τὸ μεταξὺ τοῦ τόπου τὸ τυχὸν, ἀλλ' οὐ διάστημα σώματος· καὶ ἔστιν ὁ τόπος καὶ πού, οὐχ ὡς ἐν τόπῳ δὲ, ἀλλ' ὡς τὸ πέρας ἐν τῷ πεπερασμένῳ. οὐ γὰρ πᾶν τὸ ὂν ἐν τόπῳ, ἀλλὰ τὸ κινητὸν σῶμα. 12 Καὶ φέρεται δὴ εἰς τὸν ἑαυτοῦ τόπον ἕκαστον, εὐλόγως· τὸ γὰρ ἐφεξῆς καὶ ἁπτόμενον μὴ βίᾳ, συγγενές· καὶ συμπεφυκότα μὲν ἀπαθῆ, ἁπτόμενα δὲ, παθητικὰ καὶ ποιητικὰ ἀλλήλων.

* κ. ἄνω, &c.
* ait Simplicius, καὶ ἄνω μὲν καὶ κάτω οὔ. κύκλῳ δέ. τὰ δὲ ἄνω καὶ κάτω. vide interpretes.
* πάντα ἐστὶ τῷ κ.

13 Καὶ μένει δὴ φύσει ἕκαστον ἐν τῷ οἰκείῳ τόπῳ, A οὐκ ἀλόγως· καὶ γὰρ τὸ μέρος τόδε ἐν ὅλῳ τῷ τόπῳ, ὡς διαιρετὸν μέρος πρὸς ὅλον ἐστὶν· οἷον, ὅταν ὕδατος κινήσῃ τις μόριον, ἢ ἀέρος. οὕτω δὲ καὶ ὁ ἀὴρ ἔχει πρὸς ὕδωρ· οἷον ὕλη γάρ· τὸ δὲ, εἶδος· τὸ μὲν ὕδωρ ὕλη ἀέρος, ὁ δὲ ἀὴρ οἷον ἐνέργειά τις ἐκείνου· τὸ γὰρ ὕδωρ δυνάμει ἀήρ ἐστιν· ὁ δὲ ἀὴρ δυνάμει ὕδωρ ἄλλον τρόπον. διοριστέον δὲ περὶ τούτων * ὕστερον· ἀλλὰ διὰ τὸν καιρὸν ἀνάγκη μὲν εἰπεῖν. ἀσαφῶς δὲ νῦν ῥηθὲν, τότ᾽ ἔσται σαφέστερον. εἰ οὖν τὸ αὐτὸ ἡ ὕλη, καὶ ἡ ἐντελέχεια· ὕδωρ γὰρ ἄμφω· ἀλλὰ τὸ μὲν δυνάμει, τὸ δὲ ἐντελεχείᾳ· ἔχοι ἂν ὡς μόριόν πως πρὸς ὅλον. διὸ καὶ τούτοις ἁφή ἐστι· σύμφυσις δὲ, ὅταν ἄμφω ἐνεργείᾳ ἓν γένωνται. 14 Καὶ περὶ μὲν τόπου, καὶ ὅτι ἔστι, καὶ τί ἐστιν, εἴρηται.

* De generatione & corrupt. lib. 1.

A 13 Et manet igitur naturaliter vnumquodque in loco proprio non ſine ratione. nam & hæc pars habet eandem rationem ad locum totum, quam *habet* pars diuiſa ad totum. velvti, cùm aliquis amouerit partem aquæ, vel aëris. Sic verò & aër *ſe* habet ad aquam. *hæc* enim eſt vt materia: ille verò, *vt* forma: nempe aqua *eſt* materia aëris, aër autem eſt tanquam actus quidam illius. etenim aqua eſt poteſtate aër, ſed aër eſt poteſtate aqua alio modo. Definiendum autem de his *eſt* poſteriùs: ſed per occaſionem neceſſe *fuit aliquid* dicere. verùm quod in præſentia obſcurè dictum eſt, tunc erit magis perſpicuum. ſi igitur idem *eſt* materia & actus: nam aqua *eſt* vtrumque, ſed *eſt* alterum poteſtate, alterum actu: vtique alio modo *ſe* habebit vt pars ad totum. ideóque his eſt tactus: copulatio verò *eſt* in vnam naturam, quando ambo fiunt vnum actu. 14 Ac locum quidem eſſe & quid ſit, dictum eſt.

DE INANI.

TRACTATVS II.

Aliorum rationes de inani. Cap. VIII.

Τὸν αὐτὸν δὲ τρόπον ὑποληπτέον εἶναι τοῦ φυσικοῦ θεωρῆσαι καὶ περὶ κενοῦ, εἰ ἔστιν, ἢ μή· καὶ πῶς ἐστιν, ἢ τί ἐστιν, ὥσπερ καὶ περὶ τοῦ τόπου· καὶ γὰρ παραπλησίαν ἔχει τήν τε ἀπιστίαν, καὶ τὴν πίστιν, διὰ τῶν ὑπολαμβανομένων· οἷον γὰρ τόπον τινὰ καὶ ἀγγεῖον τὸ κενὸν τιθέασιν οἱ λέγοντες. δοκεῖ δὲ, πλῆρες μὲν εἶναι, ὅταν ἔχῃ τὸν ὄγκον, οὗ δεκτικόν ἐστιν· ὅταν δὲ στερηθῇ, κενόν· ὡς τὸ αὐτὸ μὲν ὂν κενὸν καὶ πλῆρες καὶ τόπον. τὸ δ᾽ εἶναι αὐτοῖς, οὐ ταὐτὸ ὄν. 2 Ἄρξασθαι δὲ δεῖ τῆς σκέψεως λαβοῦσιν, ἅτε λέγουσιν οἱ φάσκοντες εἶναι· καὶ πάλιν ἃ λέγουσιν οἱ μὴ φάσκοντες εἶναι· καὶ τρίτον, τὰς κοινὰς δόξας περὶ αὐτῶν. 3 Οἱ μὲν οὖν δεικνύναι πειρώμενοι ὅτι οὐκ ἔστιν, οὐχ ὃ βούλονται λέγειν οἱ ἄνθρωποι κενόν, τοῦτο ἐξελέγχουσιν, ἀλλ᾽ ἁμαρτάνοντες λέγουσιν, ὥσπερ Ἀναξαγόρας, καὶ οἱ τοῦτον τὸν τρόπον ἐλέγχοντες. ἐπιδεικνύουσι γὰρ, ὅτι ἐστί τι ὁ ἀὴρ, στρεβλοῦντες τοὺς ἀσκοὺς, καὶ δεικνύοντες, ὡς ἰσχυρὸς ὁ ἀὴρ, καὶ ἐναπολαμβάνοντες ἐν ταῖς κλεψύδραις. οἱ δὲ ἄνθρωποι βούλονται κενὸν εἶναι διάστημα, ἐν ᾧ * μηδέν ἐστι σῶμα αἰσθητόν. οἰόμενοι δὲ τὸ ὂν ἅπαν εἶναι σῶμα, φασὶν ἐν ᾧ ὅλως μηδέν ἐστι, τοῦτ᾽ εἶναι κενόν· διὸ τὸ πλῆρες ἀέρος, κενὸν εἶναι. οὐκ οὖν τοῦτο δεῖ δεικνύναι, ὅτι ἐστί τι ὁ ἀὴρ, ἀλλ᾽ ὅτι οὐκ ἔστι διάστημα ἕτερον τῶν σωμάτων, οὔτε χωριστὸν, οὔτε ἐνεργείᾳ ὄν, ὃ διαλαμβάνει τὸ πᾶν σῶμα ὥστ᾽ εἶναι μὴ συνεχὲς, καθάπερ λέγουσι Δημόκριτος καὶ Λεύκιππος, καὶ ἕτεροι πολλοὶ τῶν φυσιολόγων, ἢ καὶ εἴ τι ἔξω τοῦ παντὸς σώματός ἐστιν, ὄντος συνεχοῦς. οὗτοι μὲν οὖν οὐ κατὰ θύρας πρὸς τὸ πρόβλημα ἀπαντῶσιν. 4 Ἀλλ᾽ οἱ φάσκοντες εἶναι, μᾶλλον. λέγουσι δ᾽, ἓν μὲν, ὅτι ἡ κίνησις ἡ κατὰ τόπον οὐκ ἂν εἴη· αὕτη δ᾽ ἐστὶ φορὰ καὶ αὔξησις· οὐ γὰρ ἂν δοκοίη εἶναι κίνησις, εἰ μὴ ἦ κενόν· τὸ γὰρ πλῆρες ἀδύνατον εἶναι δέξασθαι· εἰ δὲ δέξαιτο, καὶ ἔσται δύο ἐν τῷ αὐτῷ, ἐνδέχοιτ᾽ ἂν καὶ ὁποσαοῦν ἅμα εἶναι σώματα· τὴν γὰρ διαφορὰν, δι᾽ ἣν οὐκ ἂν εἴη τὸ λεχθὲν, οὐκ ἔστιν εἰπεῖν. εἰ δὲ τοῦτο ἐνδέχεται, καὶ τὸ μικρότατον δέξεται τὸ μέγιστον· πολλὰ γὰρ τὰ μικρὰ τὸ μέγα ἐστὶν·

* κ. μηδὲν μὴ ε.

B Eodem modo exiſtimandum *eſt*, phyſici eſſe diſpicere etiam de inani, an ſit, nec ne, & quomodo ſit, vel quid ſit; quemadmodum & de loco. etenim ſimilem habet refutationem & fidem ex iis quæ de eo exiſtimantur. nam qui *id eſſe* dicunt, *hi* ponunt inane quaſi locum quendam & vas. videtur autem plenum quidem eſſe, cùm molem habet, cuius eſt capax: cùm autem *ea* deſtitutum fuerit, *tunc eſſe* inane; quaſi idem ſit inane & plenum & locus, ſed eorum eſſentia non ſit eadem. 2 Initium autem conſiderationis fieri oportet, ſumptis *iis* quæ dicunt, qui aiunt eſſe *inane*; & rurſus quæ dicunt, qui C negant eſſe; ac tertiùm communes de iis opiniones. 3 Qui igitur oſtendere conantur non eſſe *inane*, *hi* non id refellunt, quod homines inane dicere volunt, ſed quod aberrantes inquiunt: ſicut Anaxagoras, & *alij*, qui hoc modo redarguunt: demonſtrant enim aërem eſſe aliquid, vtres torquendo, & oſtendendo quanta ſit vis aëris, eúmque in clepſydris intercipiendo: homines autem volunt inane eſſe interuallum, in quo nullum eſt corpus ſenſile. cùm autem putent omne ens eſſe corpus, inquiunt, in quo omnino nihil eſt, id eſſe inane: idcirco quod eſt aëre plenum, eſſe inane. non oportet igitur hoc probare, aërem eſſe aliquid: ſed non eſſe interual- D lum diuerſum à corporibus, neque ſeparatum, neque quod actu ſit & permeet *per* omne corpus, adeo vt non ſit continuum, quemadmodum inquiunt Democritus & Leucippus, & multi alij de natura diſſerentes: aut ſi quid eſt extra omne corpus, cùm *corpus* ſit continuum. Ergo hi non per ianuam problemati occurrunt. 4 Sed potiùs qui *inane* eſſe dicunt. Primùm autem inquiunt non fore motum ſecundùm locum: hic verò eſt latio, & accretio. non videbitur enim eſſe motus, niſi ſit inane: quia quod eſt plenum, recipere nequit. ſin autem reciperet, & duo corpora in eodem eſſent: certè poſſent quotcumque corpora ſimul eſſe. nam differentia, propter quam, quod dixi, eſſe nequeat, afferri non poteſt. quòd ſi hoc fieri poteſt: etiam quod eſt minimum, recipiet quod eſt maximum. multa namque parua eſt quod magnum *eſt*. qua-

A propter ſi multa æqualia poſſunt in eodẽ eſſe, etiam multa inæqualia *eſſe poterunt*. 5 Ac Meliſſus quidem ex his oſtendit vniuerſum eſſe immobile: quia ſi mouebitur, neceſſe (inquit) *erit* inane eſſe: inane autem non *eſt* in entium *numero*. *6 Vno igitur modo ex his oſtendunt inane eſſe aliquid. alio autem; quia videntur quædam coire & comprimi, ſicut & vinum aiunt vnà cum vtribus recipi à doliis, tanquam corpus condenſatum coeat, in ea *ſpatia* inania quæ inſunt. 7 Præterea etiam accretio videtur omnibus fieri per inane: alimentum enim eſſe corpus: duo verò corpora ſimul eſſe non poſſe. B 8 Teſtimonium quoque de cinere afferunt, qui recipit tantum aquæ, quantum vas, *cùm eſt* inane. 9 Pythagorei quoque dixerunt eſſe inane: & in cœlum, quaſi reſpiret, ingredi ex infinito ſpiritu: atque inane *eſſe*, quod naturas diſterminat: tanquam inane ſit ſeparatio quædam & diſtinctio eorum quæ deinceps *collocantur*: & hoc eſſe primum in numeris: inane enim diſtinguere eorum naturam. 10 Ex quibus igitur alij aiunt eſſe, alij negant, tot ferè ac talia ſunt.

A ὥστ᾽ εἰ πολλὰ ἴσα ἐνδέχεται ἐν ταὐτῷ εἶναι, καὶ πολλὰ ἄνισα. 5 Μέλισσος μὲν οὖν καὶ δείκνυσιν, ὅτι τὸ πᾶν ἀκίνητον ἐκ τούτων· εἰ γὰρ κινήσεται, ἀνάγκη εἶναι, φησί, κενόν· τὸ δὲ κενὸν, οὐ τῶν ὄντων. 6 Ἕνα μὲν οὖν τρόπον ἐκ τούτων δεικνύουσιν, ὅτι ἔστι τι κενόν, ἄλλον δ᾽, ὅτι φαίνεται ἔνια συνιόντα καὶ πιλούμενα· οἷον καὶ τὸν οἶνόν φασι μετὰ τῶν ἀσκῶν δέχεσθαι τοὺς πίθους, ὡς εἰς τὰ ἐνόντα κενὰ συνιόντος τοῦ πυκνουμένου σώματος. 7 Ἔτι δὲ καὶ ἡ αὔξησις δοκεῖ γίνεσθαι πᾶσι διὰ κενοῦ· τὴν μὲν γὰρ τροφὴν εἶναι σῶμα· δύο δὲ σώματα ἀδύνατον ἅμα εἶναι. B 8 Μαρτύριον δὲ καὶ τὸ περὶ τῆς τέφρας ποιοῦνται, ἣ δέχεται ἴσον ὕδωρ, ὅσον τὸ ἀγγεῖον τὸ κενόν. 9 Εἶναι δ᾽ ἔφασαν καὶ οἱ Πυθαγόρειοι κενόν, καὶ ἐπεισιέναι αὐτὸ τῷ οὐρανῷ ἐκ τοῦ ἀπείρου πνεύματος, ὡς ἂν ἀναπνέοντι· καὶ τὸ κενόν, ὃ διορίζει τὰς φύσεις, ὡς ὄντος τοῦ κενοῦ χωρισμοῦ τινος τῶν ἐφεξῆς, καὶ τῆς διορίσεως· καὶ τοῦτ᾽ εἶναι πρῶτον ἐν τοῖς ἀριθμοῖς. τὸ γὰρ κενὸν διορίζειν τὴν φύσιν αὐτῶν. 10 Ἐξ ὧν μὲν οὖν, οἱ μέν φασιν εἶναι, οἱ δ᾽ οὔ φασι, σχεδὸν τοσαῦτα καὶ τοιαῦτά ἐστι.

Quid ſignificat inane.

Cap. IX.

C Ceterùm *ad intelligendum* vtro modo *res* habet, oportet ſumere quid nomen ſignificet. 2 Videtur igitur inane eſſe locus, in quo nihil eſt. 3 Huius cauſa eſt: quia quod eſt, putant eſſe corpus: omne autem corpus *eſſe* in loco: inane verò, in quo loco nullum eſt corpus. quare ſicubi non eſt corpus, ibi eſſe inane. rurſus putant omne corpus eſſe tactile: tale autem *eſſe*, quodcumque habet grauitatem aut leuitatem. Itaque ſyllogiſmo efficitur id eſſe inane, in quo nihil eſt graue aut leue. hæc igitur, vt & antea diximus, ſyllogiſmo colliguntur. 4 Abſurdum autem *eſt*, punctum *eſſe* inane. oportet enim *inane* eſſe locum, in quo ſit corporis tactilis interuallum. D 5 At verò videtur inane dici vno quidem modo, quod non eſt plenum corporis tactu ſenſibilis: tactu autem ſenſibile eſt, quod habet pondus & leuitatem. 6 Idcirco & dubitare quiſpiam poſſit, quid dicerent, ſi interuallum haberet colorem aut ſonum, vtrum *eſſet* inane nec ne. An manifeſtum *eſt*, ſi poſſit recipere corpus tactile, inane eſſe. ſin minùs, non *eſſe*. 7 Alio autem modo *inane dicitur*, in quo non *eſt* hoc aliquid nec ſubſtantia aliqua corporea. 8 Quare nonnulli aiunt inane eſſe corporum materiam: qui hoc ipſum dicunt etiam *eſſe* locum, haud ſcitè: nam materia non eſt ſeparabilis à corporibus: inane autem quærunt vt ſeparabile.

C Πρὸς δὲ τὸ, ποτέρως ἔχει, δεῖ λαβεῖν τί σημαίνει τοὔνομα. 2 Δοκεῖ δὴ τὸ κενὸν τόπος εἶναι, ἐν ᾧ μηδέν ἐστι. 3 Τούτου δ᾽ αἴτιον, ὅτι τὸ ὂν σῶμα, οἴονται εἶναι· πᾶν δὲ σῶμα ἐν τόπῳ· κενὸν δὲ, ἐν ᾧ τόπῳ μηδὲν ἐστὶ σῶμα. ὥστ᾽ εἴ που μή ἐστι σῶμα, κενὸν εἶναι ἐνταῦθα. σῶμα δὲ πάλιν ἅπαν οἴονται εἶναι ἁπτόν· τοιοῦτον δὲ, ὃ ἂν ἔχῃ βάρος ἢ κουφότητα. συμβαίνει οὖν ἐκ συλλογισμοῦ τοῦτο εἶναι κενὸν, ἐν ᾧ μηδέν ἐστι βαρύ τι ἢ κοῦφον. ταῦτα μὲν οὖν ὥσπερ εἴπομεν καὶ πρότερον, ἐκ συλλογισμοῦ συμβαίνει. 4 Ἄτοπον δὲ, εἰ ἡ στιγμὴ κενόν· δεῖ γὰρ τόπον D εἶναι, ἐν ᾧ σώματός ἐστι διάστημα ἁπτοῦ. 5 Ἀλλ᾽ οὖν φαίνεται λέγεσθαι τὸ κενὸν, ἕνα μὲν τρόπον, τὸ μὴ πλῆρες αἰσθητοῦ σώματος, κατὰ τὴν ἁφήν· αἰσθητὸν δ᾽ ἐστὶ κατὰ τὴν ἁφὴν τὸ βάρος ἔχον καὶ κουφότητα. 6 Διὸ κἂν ἀπορήσειέ τις, τί ἂν φαῖεν, εἰ ἔχοι τὸ διάστημα, χρῶμα, ἢ ψόφον, πότερον κενὸν, ἢ οὔ; ἢ δῆλον, ὅτι εἰ μὲν δέχοιτο σῶμα ἁπτὸν, κενὸν εἶναι· εἰ δὲ μὴ, οὔ. 7 Ἄλλον δὲ τρόπον, ἐν ᾧ μὴ τόδε τι, μηδ᾽ οὐσία τις σωματική. 8 Διό φασί τινες εἶναι τὸ κενὸν τὴν τοῦ σώματος ὕλην, οἵπερ καὶ τὸν τόπον, τὸ αὐτὸ τοῦτο λέγοντες, οὐ καλῶς· ἡ μὲν γὰρ ὕλη οὐ χωριστὴ τῶν σωμάτων· τὸ δὲ κενὸν ζητοῦσιν ὡς χωριστόν.

Solutio rationum, quibus eſſe inane confirmabatur.

Cap. X.

E Qvia verò de loco definitum fuit, & neceſſe *eſt* inane eſſe locum, ſi eſt corpore priuatum; dictum autem eſt, quomodo locus ſit, & quomodo non ſit: patet igitur non eſſe ita inane, nec ſeparatum, nec inſeparabile: quandoquidem inane non debet eſſe corpus, ſed corporis interuallum. Quocirca etiam inane videtur eſſe aliquid: quia & locus *ita videtur*: atque iiſdem de cauſis. etenim motus ſecundùm locum *in mentem* venit & iis qui dicunt locum eſſe aliquid præter corpora quæ incidunt, & iis qui inane. putant autẽ inane eſſe

E Ἐπεὶ δὲ καὶ περὶ τοῦ τόπου διώρισται, καὶ τὸ κενὸν τόπον ἀνάγκη εἶναι, εἰ ἔστιν ἐστερημένον σώματος· τόπος δὲ καὶ πῶς ἐστι, καὶ πῶς οὐκ ἔστιν, εἴρηται· φανερὸν οὖν, ὅτι οὕτω μὲν κενὸν οὐκ ἔστιν, οὔτε κεχωρισμένον, οὔτε ἀχώριστον· τὸ γὰρ κενὸν, οὐ σῶμα, ἀλλὰ σώματος διάστημα βούλεται εἶναι. διὸ καὶ τὸ κενὸν δοκεῖ τι εἶναι, ὅτι καὶ ὁ τόπος, καὶ διὰ τὰ αὐτά. ἥκει γὰρ δὴ * ἡ κατὰ τόπον, καὶ τοῖς τόπον φάσκουσιν εἶναι παρὰ τὰ σώματα τὰ ἐμπίπτοντα, καὶ τοῖς τὸ κενόν. αἴτιον δὲ κινήσεως οἴονται

* κ. ἡ κίνησις ἡ κατὰ τόπον,

εἶναι τὸ κενόν, οὕτως ὡς ἐν ᾧ κινεῖται· τοῦτο δ' ἂν εἴη, οἷον τὸν τόπον φασί τινες εἶναι. 2 Οὐδεμία δ' ἀνάγκη, εἰ ἔστι κίνησις, εἶναι κενόν. ὅλως μὲν οὖν ἁπάσης κινήσεως, οὐδαμῶς. διὸ καὶ Μέλισσον ἔλαθεν· ἀλλοιοῦσθαι γὰρ ἐνδέχεται τὸ πλῆρες. 3 Ἀλλὰ δὴ οὐδὲ τὴν κατὰ τόπον κίνησιν· ἅμα γὰρ ὑπεξιέναι, ἀλλήλοις ἐνδέχεται, οὐδενὸς ὄντος διαστήματος χωριστοῦ παρὰ τὰ σώματα τὰ κινούμενα. καὶ τοῦτο δῆλον καὶ ἐν ταῖς τῶν συνεχῶν δίναις, ὥσπερ καὶ ἐν ταῖς τῶν ὑγρῶν. 4 Ἐνδέχεται δὲ καὶ πυκνοῦσθαι μὴ εἰς τὸ κενόν, ἀλλὰ διὰ τὸ τὰ ἐνόντα ἐκπυρηνίζειν· οἷον ὕδατος συνθλιβομένου, τὸν ἐνόντα ἀέρα. 5 Καὶ αὐξάνεσθαι, οὐ μόνον εἰσιόντος τινός, ἀλλὰ καὶ ἀλλοιώσει, οἷον εἰ ἐξ ὕδατος γίνοιτο ἀήρ. 6 Ὅλως δὲ ὅ,τε περὶ τῆς αὐξήσεως λόγος, καὶ τοῦ εἰς τὴν τέφραν ἐγχεομένου ὕδατος, αὐτὸς αὐτὸν ἐμποδίζει. ἢ γὰρ οὐκ αὐξάνεται ὁτιοῦν, ἢ οὐ σώματι· ἢ ἐνδέχεται δύο σώματα ἐν τῷ αὐτῷ εἶναι* (ἀπορίαν οὖν ἀξιοῦσι κοινὴν λύειν, ἀλλ' οὐ κενὸν ἐπιδεικνύουσιν ὡς ἔστιν) ἢ πᾶν εἶναι τὸ σῶμα ἀναγκαῖον κενόν, εἰ πάντῃ αὐξάνεται, καὶ αὐξάνεται διὰ κενοῦ. ὁ δ' αὐτὸς λόγος καὶ ἐπὶ τῆς τέφρας. 7 Ὅτι μὲν οὖν ἐξ ὧν δεικνύουσι τὸ κενὸν εἶναι, λύειν ῥᾴδιον, φανερόν.

* Vicomercatus obſcurum hunc locum tranſpoſitione verborum illuſtrat: eum vide.

A cauſam motus, ſicut *id* in quo mouetur: quod perinde eſt, vt nonnulli locum eſſe inquiunt. 2 Sed nulla neceſſitas *cogit*, ſi ſit motus, eſſe inane. Ac omnino quidem omnis motus *inane cauſa eſſe nullo modo poteſt*, ob id quòd & Meliſſum latuit: variari enim poteſt, quod eſt plenum. 3 Sed neque motum ſecundùm locum *neceſſe eſt eſſe propter inane.* ſimul enim ſibi viciſſim cedere poſſunt corpora quæ mouentur, cùm nullum præter ea ſit interuallum ſeparatum. atque hoc manifeſtum *eſt* etiam in rerum continuarum, vt & in humidarum, conuerſionibus. 4 Poſſunt etiam corpora cogi non in inane, ſed B quia extruduntur ea quæ inſunt, vt aquâ compreſſâ *extruditur* aër qui ineſt. 5 Et augeri *poſſunt*, non ſolùm corpore aliquo ingrediente, ſed etiam variatione: velvti, ſi ex aqua fiat aër. 6 Omnino autem & hæc ratio de accretione & *illa* de aqua in cinerem infuſa, ſibi ipſi eſt impedimento. aut enim non quodvis augetur: aut non corpore *augetur*: aut poſſunt duo corpora eſſe in eodem loco: (dubitationem igitur communem putant *ſe* ſoluere, ſed non probant eſſe inane) aut neceſſe eſt, vniverſum corpus eſſe inane, ſi vndique augetur, & per inane augetur. Eadem ratio *eſt* etiam in cinere. 7 Ea igitur, ex quibus demonſtrant eſſe inane, facilè ſolui, perſpicuum *eſt*.

Non eſſe inane ſeparatum à corporibus.

Cap. XI.

Ὅτι δ' οὐκ ἔστι κενόν, οὕτω κεχωρισμένον, ὡς ἔνιοί φασι, λέγωμεν πάλιν. 2 Εἰ γάρ ἐστιν ἑκάστου φορά τις τῶν ἁπλῶν σωμάτων φύσει, οἷον, τῷ πυρὶ μὲν ἄνω, τῇ δὲ γῇ κάτω, καὶ πρὸς τὸ μέσον, δῆλον ὅτι οὐκ ἂν τὸ κενὸν εἴη αἴτιον τῆς φορᾶς. τίνος οὖν* αἴτιον τὸ κενόν; δοκεῖ γὰρ αἴτιον εἶναι κινήσεως τῆς κατὰ τόπον· ταύτης δ' οὐκ ἔστιν. 3 Ἔτι, εἰ ἔστι τι, οἷον τόπος ἐστερημένος σώματος, ὅταν ᾖ κενόν, ποῦ οἰσθήσεται τὸ ἐντεθὲν εἰς αὐτὸ σῶμα; οὐ γὰρ δὴ εἰς ἅπαν. ὁ δ' αὐτὸς λόγος καὶ πρὸς τοὺς τὸν τόπον εἶναί τι οἰομένους κεχωρισμένον, εἰς ὃ *φέρεται· πῶς γὰρ οἰσθήσεται τὸ ἐντεθέν, ἢ μενεῖ; καὶ περὶ τοῦ ἄνω καὶ κάτω, καὶ* περὶ τοῦ κενοῦ, ἁρμόσει ὁ αὐτὸς λόγος εἰκότως· τὸ γὰρ κενὸν τόπον ποιοῦσιν οἱ φάσκοντες εἶναι. 4 Καὶ πῶς δὴ ἐνέσται, ἢ ἐν τόπῳ ἢ ἐν τῷ κενῷ; [*οὐ γὰρ συμβαίνει, ὅταν ὅλον τι τεθῇ, ὡς ἐν κεχωρισμένῳ τόπῳ, καὶ ὑπομένοντι σώματι. τὸ γὰρ μέρος ἐὰν μὴ χωρὶς τιθῆται, οὐκ ἔσται ἐν τόπῳ, ἀλλ' ἐν τῷ ὅλῳ. 5 Ἔτι, εἰ μηδὲ τόπος, οὐδὲ κενὸν ἔσται.] 6 Συμβαίνει δὲ τοῖς λέγουσιν εἶναι κενόν, ὡς ἀναγκαῖον, εἴπερ ἔσται κίνησις, τοὐναντίον μᾶλλον ἐάν τις ἐπισκοπῇ, μὴ* ἐνδέχεσθαι μηδέν, ἐὰν ᾖ κενόν [*ὥσπερ γὰρ οἱ διὰ τὸ ὅμοιον φάμενοι καὶ τὴν γῆν ἠρεμεῖν, οὕτως καὶ ἐν κενῷ ἀνάγκη ἠρεμεῖν· οὐ γάρ ἐστιν οὗ μᾶλλον ἢ ἧττον κινηθήσεται· ᾗ γὰρ κενόν, οὐκ ἔχει διαφοράν.] 7 Πρῶτον μὲν οὖν, ὅτι πᾶσα κίνησις, ἢ βίᾳ ἢ κατὰ φύσιν· ἀνάγκη δὲ ἄν περ ᾖ βίαιος, εἶναι καὶ τὴν κατὰ φύσιν· ἡ μὲν γὰρ βίαιος παρὰ φύσιν· ἡ δὲ παρὰ φύσιν, ὑστέρα τῆς κατὰ φύσιν. ὥστε εἰ μὴ κατὰ φύσιν ἐστὶν ἑκάστῳ τῶν φυσικῶν σωμάτων κίνησις, οὐδὲ τῶν ἄλλων ἔσται κινήσεων οὐδεμία. ἀλλὰ μήν, φύσει γε πῶς ἔσται, μηδεμιᾶς οὔσης διαφορᾶς κατὰ τὸ κενὸν καὶ τὸ ἄπειρον; ᾗ μὲν γὰρ ἄπειρον, οὐδὲν ἔσται ἄνω, οὐδὲ

* χ. αἴτιον εἶναι τὸ κ.

* χ. φέρεται τὸ φερόμενον.

* χ. ἐπὶ τοῦ κ.

* Incluſa non reperiri in quibuſdam codicibus annotat Simplicius.

* χ. ἐνδ. κινεῖσθαι.

* Hæc quoque in quibuſdam codicibus non fuiſſe lecta, annotatum eſt à Græcis interpretibus.

C NOn eſſe autem inane ita ſeparatum, vt nonnulli aiunt, rurſus dicamus. 2 Nam ſi cuique ſimplici corpori eſt naturalis quædam latio, vt igni ſurſum *verſus*, terræ autem deorſum & ad medium: vtique patet, inane non eſſe cauſam lationis. cuius igitur cauſa inane *erit*? quandoquidem videtur eſſe cauſa motus, qui *fit* in loco: ſed *tamen* huius *cauſa* non eſt. 3 Præterea ſi eſt aliquid vt locus priuatus corpore, cùm ſit inane, quò feretur corpus in illud impoſitum? non enim *fertur* ad vniuerſum. eadem ratio *eſt* & aduersùs eos qui putant locum eſſe aliquid ſeparatum, in quem fertur id quod fertur. quo- D modo enim feretur, quod impoſitum eſt? aut *quomodo* manebit? ac de ſupero atque infero & de inani eadem ratio meritò conueniet: quoniam ij qui dicunt eſſe inane, ſtatuunt *id* eſſe locum. 4 Quomodo igitur inerit vel in loco vel in inani? *hoc* enim eſſe nequit, cùm totum aliquod corpus ponitur tamquam in loco ſeparato ac permanente. pars enim, niſi ſeorſim ponatur, non erit in loco, ſed in toto. 5 Præterea ſi non *eſt* locus, nec inane erit. 6 Quòd ſi quis rem conſideret: iis qui dicunt eſſe inane quaſi *hoc ſit* neceſſarium ſi ſit motus, contrarium potiùs euenit, *id eſt*, non poſſe quidpiam moue- E ri ſi ſit inane. ſicut enim quidam propter ſimilitudinem inquiunt terram quieſcere: ita etiam neceſſe *eſt*, in inani quieſcere. non eſt enim vbi magis vel minùs moueatur. nam quà eſt inane, non habet differentiam. 7 Primùm igitur quia omnis motus aut *eſt* vi aut natura: neceſſe *eſt*, ſi violentus *ſit*, etiam naturalem eſſe. nam violentus *eſt* præter naturam. qui verò *eſt* præter naturam, *eſt* naturali poſterior. quare niſi motus naturalis ineſt cuique naturali corpori, nec vllus alius motus inerit. atqui naturalis quomodo erit, cùm nulla ſit differentia in inani & infinito? quatenus enim *eſt* infinitum, nihil erit ſuperum

aut

aut inferum, aut medium. quatenus verò *eſt* inane, nihil differet inferum à ſupero. nam ſicvti nihili nulla eſt differentia, ita etiam non entis: inane autem videtur eſſe non ens quiddam ac priuatio. ſed naturalis latio *eſt* differens: quocirca & quæ natura *mouentur*, differentia erunt. aut igitur nulli vſquam eſt naturalis latio: aut, ſi hoc eſt, non eſt inane. 8 Præterea, quæ iaciuntur, nunc mouentur, cùm is qui impulit, *amplius* non tangit; vel propter antiperiſtaſin, vt nonnulli inquiunt; vel quoniam aër impulſus celeriori motu impellit quàm *ſit* latio *corporis* impulſi, quà fertur ad proprium locum. in inani autem nihil tale ineſſe poteſt: nec ferri quicquam poterit, niſi vt id quod vehitur. 9 Præterea nemo poteſt dicere, cur res mota ſiſtetur alicubi. cur enim potiùs hic quàm illic? quare aut quieſcet: aut neceſſe eſt in infinitum ferri; niſi quid potentius impediet. 10 Præterea nunc ad inane, quia cedit, ferri videtur. ſed in omni parte inanis ſimiliter *eſt* eiuſmodi *quod cedit*. quare in omnem partem feretur. 11 Præterea ex his quoque perſpicuum fit quod dicitur: videmus enim idem pondus & corpus celeriùs ferri ob duas cauſas: *nimirum* vel quia differt id per quod *fertur*: velvti, per aquam aut terram, aut aërem: vel quia id quod fertur, ſi cetera eadem ſint, differt ob exuperantiam ponderis vel leuitatis. 12 Id igitur per quod fertur, *eſt* cauſa, quia impedit, maximè quidem ſi contra feratur, deinde etiam ſi maneat: magis autem quod non facilè diuidi poteſt, cuiuſmodi *eſt*, quod craſſius *eſt*. 13 *Pondus* igitur α feretur per *magnitudinem* β in tempore γ: per *magnitudinem* verò δ, quæ eſt ſubtilior, in tempore ε: ſi æqualis *eſt* longitudo *magnitudinis* β & *magnitudinis* δ, ſecundùm proportionem impedientis corporis. eſto namque τὸ β, aqua: τὸ δ autem aër. quanto igitur aër *eſt* res ſubtilior & magis incorporea quàm aqua, tanto celeriùs τὸ α feretur per δ, quàm per β: habeat ergo eandem rationem celeritas ad celeritatem, quam aër ad aquam. quare ſi duplo *eſt* ſubtilius: in duplo tempore conficiet *ſpatium* β, quàm *ſpatium* δ: ac tempus γ erit duplo maius *tempore* ε. & ſemper igitur quanto magis erit incorporeum, & minus habebit vim impediendi, & faciliùs diuidi poterit *id* per quod fertur; *tanto* celeriùs *pondus* feretur. 14 Inane autem nullam habet proportionem, qua ſuperetur à corpore: ſicvti nihil *nullam habet proportionem* ad numerum. nam ſi quatuor vno ſuperant tria, pluribus autem duo, & adhuc pluribus vnum quàm duo: iam nulla erit proportio, qua ſuperet nihil: quandoquidem neceſſe *eſt*, id, quod ſuperat, diuidi in exſuperantiam & id quod ſuperatur: proinde quatuor erunt *id* quo ſuperant & nihil. idcirco nec linea ſuperat punctum, niſi componatur ex punctis. itidemque inane non poteſt vllam rationem habere ad plenum. quocirca neque motus *per inane, vllam rationem habebit ad motum qui fit per plenum*. ſed ſi *pondus* conficit tantum *ſpatij*, tanto *tempore*, per id quod eſt ſubtiliſſimum: *profectò ſi feratur* per inane, ſuperat omnem proportionem. Eſto namque τὸ ζ, inane æquale magnitudinibus β & δ. ſi igitur τὸ α tranſeat & moueatur in aliquo tempore, *nempe in tempore* vbi η, quod minus *eſt* quàm tempus ε, certè etiam inane ad plenum hanc rationem habebit. 15 Atqui in tanto tempore, quantum *eſt* η, pondus α pertranſit τῆς δ *partem* θ. 16 Verùm pertranſibit etiam, ſi quid ſit, in quo ζ ſubtilitate differẽs ab aëre,

A ἄνω, οὐδὲ μέσον· ᾗ δὲ κενόν, οὐδὲν * διαφέρει τὸ κάτω * τοῦ ἄνω· ὥσπερ γὰρ τοῦ μηδενὸς οὐδεμία ἐστὶ διαφορά, οὕτως καὶ τοῦ μὴ ὄντος. τὸ δὲ κενὸν μὴ ὄν τι, καὶ στέρησις δοκεῖ εἶναι· ἡ δὲ φύσει φορὰ, διάφορος· ὥστ' ἔσται τὰ φύσει διάφορα. ἢ οὖν οὐκ ἔστι φύσει οὐδαμοῦ οὐδενὶ φορὰ, ἢ εἰ τοῦτ' ἔστιν, οὐκ ἔστι κενόν. 8 Ἔτι, νῦν μὲν κινεῖται τὰ ῥιπτούμενα, τοῦ ὤσαντος οὐχ ἁπτομένου, ἢ δι' ἀντιπερίστασιν, ὥσπερ ἔνιοί φασιν· ἢ διὰ τὸ ὠθεῖν τὸν ὠσθέντα ἀέρα θάττω κίνησιν τῆς τοῦ ὠσθέντος φορᾶς, ἣν φέρεται εἰς τὸν οἰκεῖον τόπον. ἐν δὲ τῷ κενῷ οὐδὲν τούτων ἐνδέχεται ὑπάρχειν· οὐδ' ἔσται φέρεσθαι, B ἀλλ' ἢ ὡς τὸ ὀχούμενον. 9 Ἔτι, οὐδεὶς ἂν ἔχοι εἰπεῖν, διὰ τί κινηθὲν στήσεταί που; τί γὰρ μᾶλλον ἐνταῦθα ἢ ἐνταῦθα; ὥστ' ἢ ἠρεμήσει, ἢ εἰς ἄπειρον ἀνάγκη φέρεσθαι, ἐὰν μή τι ἐμποδίσῃ κρεῖττον. 10 Ἔτι δὲ νῦν μὲν εἰς τὸ κενὸν, διὰ τὸ ὑπείκειν, φέρεσθαι δοκεῖ· ἐν δὲ τῷ κενῷ, πάντῃ ὁμοίως τὸ τοιοῦτον· ὥστε πάντῃ οἰσθήσεται. 11 Ἔτι δὲ καὶ ἐκ τῶνδε φανερὸν τὸ λεγόμενον· ὁρῶμεν γὰρ τὸ αὐτὸ βάρος καὶ σῶμα θᾶττον φερόμενον, διὰ δύο αἰτίας· ἢ τῷ διαφέρειν τὸ δι' οὗ, οἷον, δι' ὕδατος, ἢ γῆς, ἢ ἀέρος· ἢ τῷ διαφέρειν τὸ φερόμενον, ἂν τἆλλα ταὐτὰ ὑπάρχῃ, διὰ τὴν ὑπεροχὴν τοῦ βά- C ρους ἢ τῆς κουφότητος. 12 Τὸ μὲν οὖν δι' οὗ φέρεται αἴτιον, ὅτι ἐμποδίζει, μάλιστα μὲν ἀντιφερόμενον, ἔπειτα δὲ καὶ μένον· μᾶλλον δὲ, τὸ μὴ εὐδιαίρετον. τοιοῦτον δὲ τὸ παχύτερον. 13 Τὸ δὴ ἐφ' οὗ α, οἰσθήσεται διὰ τοῦ β, τὸν ἐφ' ᾧ γ χρόνον· διὰ δὲ τοῦ δ, λεπτομεροῦς ὄντος, τὸν ἐφ' ᾧ ε, εἰ ἴσον τὸ μῆκος [τὸ] τοῦ β τῷ δ, κατὰ τὴν ἀναλογίαν τοῦ ἐμποδίζοντος σώματος. ἔστω μὲν γὰρ, τὸ μὲν β ὕδωρ, τὸ δὲ δ ἀήρ· ὅσῳ δὴ λεπτότερον ἀὴρ ὕδατος, καὶ ἀσωματώτερον, τοσούτῳ θᾶττον τὸ α διὰ τοῦ δ οἰσθήσεται, ἢ διὰ τοῦ β. ἐχέτω δὴ τὸν αὐτὸν λόγον ὅνπερ διέστηκεν ἀὴρ πρὸς ὕδωρ, τὸ τάχος πρὸς D τὸ τάχος. ὥστ' εἰ διπλασίως λεπτὸν, ἐν διπλασίῳ χρόνῳ τὴν τὸ β δίεισιν, ἢ τὴν τὸ δ. καὶ ἔσται ὁ ἐφ' ᾧ γ χρόνος διπλάσιος τοῦ ἐφ' ᾧ ε. καὶ ἀεὶ δὴ ὅσῳ ἂν εἴη ἀσωματώτερον καὶ ἧττον ἐμποδιστικὸν, καὶ εὐδιαιρετώτερον δι' οὗ φέρεται, θᾶττον οἰσθήσεται. 14 Τὸ δὲ κενὸν, οὐδένα ἔχει λόγον ᾧ ὑπερέχεται ὑπὸ τοῦ σώματος. ὥσπερ οὐδὲ τὸ μηδὲν πρὸς τὸν ἀριθμόν. εἰ γὰρ τὰ τέτταρα τῶν τριῶν ὑπερέχει ἑνὶ, πλείονι δὲ τοῖν δυοῖν, καὶ ἔτι τοῦ ἑνὸς πλείονι, ἢ τοῖν δυοῖν· τοῦ δὲ μηδενὸς οὐκ ἔτι ἔχει λόγον ᾧ ὑπερέχει· ἀνάγκη γὰρ διαιρεῖσθαι τὸ ὑπερέχον, εἴς τε τὴν ὑπεροχὴν, καὶ εἰς τὸ ὑπερεχόμενον. ὥστε ἔσται τὰ τέτ- E ταρα ὅσῳ τε ὑπερέχει καὶ οὐδέν· διὸ, οὐδὲ γραμμὴ στιγμῆς ὑπερέχει, εἰ μὴ σύγκειται ἐκ στιγμῶν. ὁμοίως δὲ καὶ τὸ κενὸν, πρὸς τὸ πλῆρες, οὐδένα οἷόν τε ἔχειν λόγον· ὥστ' οὐδὲ τὴν κίνησιν. ἀλλ' εἰ διὰ τοῦ λεπτοτάτου ἐν τοσῳδὶ τὴν τοσήνδε φέρεται, διὰ τοῦ κενοῦ, πάντως ὑπερβάλλει λόγου. ἔστω γὰρ τὸ ζ κενὸν, ἴσον δὲ τῷ μεγέθει ταῖς β καὶ δ. τὸ δὴ α εἰ δίεισι, καὶ κινήσεται μὲν ἔν τινι χρόνῳ, τῷ ἐφ' οὗ η, ἐν ἐλάττονι δὲ, ἢ τῷ ἐφ' οὗ ε· καὶ τοῦτον ἕξει τὸν λόγον τὸ κενὸν πρὸς τὸ πλῆρες. 15 Ἀλλ' ἐν τοσούτῳ χρόνῳ, ὅσος ἐφ' οὗ τὸ η, τῆς δ τὸ α δίεισι τὴν τὸ θ. 16 Δίεισι δέ γε, κἂν ᾖ τι λεπτότητι διαφέρον τοῦ ἀέρος

* κ. διαφέρει

ἐφ' ᾧ τὸ Ζ, ταύτην τὴν ἀναλογίαν ἣν ἔχει ὁ χρόνος ἐφ' ᾧ Ε, πρὸς τὸν ἐφ' ᾧ Η· ἐὰν γὰρ ᾖ τοσούτῳ λεπτότερον τὸ ἐφ' ᾧ Ζ σῶμα, τοῦ Δ, ὅσῳ ὑπερέχει τὸ Ε τοῦ Η, ἀντεστραμμένως δίεισι τῷ τάχει ἐν τοσούτῳ, ὅσον τὸ Η τὴν Ζ, τὸ ἐφ' οὗ Α, ἐὰν φέρηται. ἐὰν τοίνυν μηδὲν ᾖ σῶμα ἐν τῷ Ζ, ἔτι θᾶττον· ἀλλ' ἦν ἐν τῷ Η. ὥστ' ἐν ἴσῳ χρόνῳ δίεισι, πλῆρές τε ὂν καὶ κενόν· ἀλλ' ἀδύνατον. φανερὸν τοίνυν, ὅτι εἰ ἔστι τις χρόνος ἐν ᾧ διὰ τοῦ κενοῦ ὁποιονοῦν οἰσθήσεται, συμβήσεται τοῦτο τὸ ἀδύνατον· ἐν ἴσῳ γὰρ ληφθήσεται πλῆρές τε ὂν διεξιέναι τι, καὶ κενόν· ἔσται γὰρ τι ἀνάλογον σῶμα ἕτερον πρὸς ἕτερον, ὡς ὁ χρόνος πρὸς χρόνον. B 17 Ὡς δ' ἐν κεφαλαίῳ εἰπεῖν, δῆλον τὸ τοῦ συμβαίνοντος αἴτιόν ἐστιν, ὅτι κινήσεως μὲν πρὸς κίνησιν πάσης ἐστὶ λόγος· ἐν χρόνῳ γάρ ἐστι· [καὶ χρόνου δὲ παντὸς ἐστὶ πρὸς χρόνον, πεπερασμένων ἀμφοῖν. κενοῦ δὲ πρὸς πλῆρες, οὐκ ἔστιν. ᾗ μὲν οὖν διαφέρουσι δι' ὧν φέρονται, ταῦτα συμβαίνει. 18 Κατὰ δὲ τὴν τῶν φερομένων ὑπεροχὴν, τάδε· ὁρῶμεν γὰρ τὰ μείζω ῥοπὴν ἔχοντα, ἢ βάρους, ἢ κουφότητος, ἐὰν τἆλλα ὁμοίως ἔχῃ τοῖς σχήμασι, θᾶττον φερόμενα τὸ ἴσον χωρίον, καὶ κατὰ λόγον ὃν ἔχουσι τὰ C μεγέθη πρὸς ἄλληλα. ὥστε καὶ διὰ τοῦ κενοῦ· ἀλλ' ἀδύνατον. διὰ τίνα γὰρ αἰτίαν οἰσθήσεται θᾶττον; ἐν μὲν γὰρ τοῖς πλήρεσιν, ἐξ ἀνάγκης· θᾶττον γὰρ διαιρεῖ τῇ ἰσχύϊ τὸ μεῖζον. ἢ γὰρ σχήματι διαιρεῖ, ἢ ῥοπῇ ἣν ἔχει τὸ φερόμενον, ἢ τὸ ἀφεθέν. ἰσοταχῆ ἄρα πάντ' ἔσται· ἀλλ' ἀδύνατον. 14 Ὅτι μὲν οὖν εἰ ἔστι κενὸν, συμβαίνει τοὐναντίον, ἢ δι' ὃ κατασκευάζουσιν οἱ φάσκοντες εἶναι κενὸν, φανερὸν ἐκ τῶν εἰρημένων. οἱ μὲν οὖν οἴονται τὸ κενὸν εἶναι, εἴπερ ἔσται ἡ κατὰ τόπον κίνησις, ἀποκεκριμένον καθ' αὑτό. τοῦτο δὲ ταὐτόν ἐστι τῷ τὸν τόπον φάναι εἶναί τι κεχωρισμένον. τοῦτο δ' ὅτι ἀδύνατον, εἴρηται πρότερον.

A eadem proportione, quam habet tempus ε ad *tempus* η. nam ſi corpus ζ tanto ſit ſubtilius *corpore* δ quanto *tempus* ε ſuperat *tempus* η: vice verſa pondus α ſi feratur, celeritate pertranſibit *magnitudinem* ζ tanto *tempore* quantum *eſt* τὸ η. Si igitur nullum ſit corpus in ζ, adhuc celeriùs. atqui erat in *tempore* η. quare in tempore æquali pertranſit, quod eſt plenum, & *quod eſt* inane. ſed *hoc eſt* impoſſibile. Perſpicuum igitur *eſt*, ſi erit aliquod tempus, quo feretur quodvis per inane, euenturum hoc impoſſibile. Sumetur enim, aliquid in *tempore* æquali pertranſire quod eſt plenum & *quod eſt* inane. erit B enim corpus aliquod proportione habens alterum, vt tempus ad tempus. 17 Et vt in ſumma dicam, manifeſta eſt eius quod accidit, cauſa: quia ſcilicet omnis motionis ad motionem ratio eſt: in tempore enim eſt: omnis autem temporis ad tempus eſt *ratio*, cùm ambo ſunt finita: ſed vacui ad plenum non eſt *ratio*. Ergo hæc eueniunt, quatenus differunt *ea*, per quæ feruntur. 18 Hæc verò ex eorum quæ feruntur, exuperantia. videmus enim, ea quæ maius momentum habent aut ponderis aut leuitatis, ſi, quod ad cetera, ſimilibus figuris prædita ſint, celeriùs ferri *per* æquale ſpatium: *idque* ſecundùm ra- C tionem, quam habent magnitudines inter ſe. quapropter & per inane *ita fiet*: ſed *eſt* impoſſibile. quam enim ob cauſam feretur celeriùs? etenim in iis quæ plena ſunt, *hoc* neceſſariò *accidit*. quod enim *eſt* maius, vi *ſua* celeriùs diuidit. quod enim fertur aut proiectum eſt, *id* vel figura diuidit vel momento quod obtinet. æquali igitur celeritate omnia ciebuntur: quod *eſt* impoſſibile. 19 Ex his igitur, quæ dicta ſunt, apparet, ſi inane ſit, contrarium accidere quã cuius cauſa, qui dicunt eſſe inane, *illud* aſtruunt. hi namque putant, ſi ſit motus ſecundùm locum, eſſe inane ſeparatum *ac* per ſe. quod perinde eſt ac ſi dicatur, eſſe locum quemdam ſeparatum. ſed antea dictum fuit, hoc *eſſe* impoſſibile.

Non eſſe inane aliquo corpore occupatum.

Cap. XII.

KAὶ καθ' αὑτὸ δὲ σκοποῦσι, φανείη ἂν τὸ λεγόμενον κενὸν, ὡς ἀληθῶς κενόν. 2 Ὥσπερ γὰρ ἐν ὕδατι ἂν θῇ τις κύβον, ἐκστήσεται τοσοῦτον ὕδωρ ὅσον ὁ κύβος· οὕτω καὶ ἐν ἀέρι· ἀλλὰ τῇ αἰσθήσει ἄδηλον. καὶ ἀεὶ δὴ ἐν παντὶ σώματι ἔχοντι μετάστασιν, ἐφ' ὃ πέφυκε συμμεθίστασθαι, ἀνάγκη, ἂν μὴ συμπιλῆται, μεθίστασθαι, ἢ κάτω ἀεὶ, εἰ κάτω ἡ φορὰ, ὥσπερ γῆς· ἢ ἄνω, εἰ πῦρ· ἢ ἐπ' ἄμφω, ὡς ὁ ἀήρ· ἢ ὁποῖον ἄν τι ᾖ τὸ ἐντιθέμενον. ἐν δὲ δὴ τῷ κενῷ, τοῦτο μὲν ἀδύνατον· οὐδὲ γὰρ σῶμα· διὰ δὲ τοῦ * κενοῦ τὸ ἴσον διάστημα διεληλυθέναι δόξειεν, ὅπερ ἦν καὶ πρότερον ἐν τῷ κενῷ. ὥσπερ ἂν εἰ τὸ ὕδωρ μὴ μεθίστατο τῷ ξυλίνῳ κύβῳ, μηδ' ὁ ἀὴρ, ἀλλὰ * πάντα διῄεσαν δι' αὐτοῦ. 3 Ἀλλὰ μὴν καὶ ὁ κύβος ἔχει τοσοῦτον μέγεθος, ὅσον κατέχει τὸ κενόν· εἰ καὶ θερμόν ἐστιν ἢ ψυχρὸν, ἢ βαρὺ, ἢ κοῦφον, οὐδὲν ἧττον ἕτερον, ἀλλὰ καὶ μᾶλλον, τῷ εἶναι πάντων τῶν παθημάτων ἐστί. καὶ εἰ μὴ χωριστόν· λέγω δὲ τὸν ὄγκον τοῦ ξυλίνου κύβου. ὥστε εἰ καὶ χωρισθείη πάντων τῶν ἄλλων, καὶ μήτε βαρὺ,

* γρ. κύβου

* γρ. πάντη

D SEd & per ſe conſiderantibus videbitur, quod dicitur inane, reuera *eſſe* inane. 2 Sicut enim in aqua ſi quis ponat teſſeram, tantum aquæ cedet, quanta eſt teſſera: ita etiam in aëre: quamquam ſenſu non percipitur. ſemper itaque in omni corpore quod transferri poteſt, quatenus natura aptum eſt vt transferatur, neceſſe *eſt*, vt, niſi comprimatur, transferatur vel ſemper deorſum, ſi deorſum ſit *eius* latio, vt terræ: vel ſurſum, ſi *ſit* ignis: vel in vtramque *partem*: veluti, *ſi ſit* aër: aut qualecumque ſit, quod imponitur. in inani autem hoc *eſt* impoſſibile: quia non *eſt* corpus: ſed videbitur per teſſeram æquale interuallum meare, quod erat antea in inani, perinde ac ſi aqua non E cederet ligneæ teſſeræ, nec aër, ſed in omnem partem per ipſam permearet. 3 At verò & teſſera habet tantam magnitudinem, quantum inane continet: quæ etiam ſi calida ſit aut frigida, aut grauis aut leuis, nihilominus immo & magis eſſentia differt ab omnibus affectionibus, quamvis non ſit ſeparabilis, molem dico ligneę teſſerę. quocirca etiamſi ſeparetur ab omnibus aliis: & neque ſit grauis,

neque leuis, *tamen* occupabit æquale inane, & erit in eadem loci atque inanis parte ſibi æquali. Quid ergo differet corpus teſſeræ ab æquali inani & loco? & ſi duo eiuſmodi, cur non etiam quæcunque in eodem erunt? Hoc igitur *eſt* vnum abſurdum & impoſſibile. 4 Præterea perſpicuum *eſt*, teſſeram etiam *aliò* translatam, hoc habituram, quod & reliqua omnia corpora habent. quare ſi nihil à loco differt, quid opus eſt efficere locum corporibus præter cuiuſque rei molem, ſi moles *eſt* impatibilis? nihil enim confert, ſi æquale huiuſmodi interuallum in ipſa ſit. [5 Præterea oportet manifeſtum eſſe, cuiuſmodi *ſit* inane in iis quæ mouentur. nunc verò nuſquam *apparet* intra mundum. nam aër eſt aliquid: atqui non videtur. ſed nec aqua *videretur*, ſi piſces eſſent ferrei: quoniam tactu iudicatur res tactilis.] 6 Ex his igitur perſpicuum eſt, non eſſe inane ſeparatum.

A μήτε κοῦφον εἴη, ἀλλ' ἕξει δ' ἴσον κενὸν καὶ ἐν τῷ αὐτῷ ἔσται τῷ τοῦ τόπου καὶ τῷ τοῦ κενοῦ μέρει ἴσῳ αὐτῷ. τί δὴ διοίσει δὲ τὸ τοῦ κύβου σῶμα, τοῦ ἴσου κενοῦ καὶ τόπου; καὶ εἰ δύο τοιαῦτα, διὰ τί οὐ καὶ ὁποσαοῦν ἐν τῷ αὐτῷ ἔσται; ἓν μὲν δὴ τοῦτο ἄτοπον καὶ ἀδύνατον. 4 Ἔτι δὲ φανερόν, ὅτι τοῦτο ὁ κύβος ἕξει καὶ μεθιστάμενος, ὃ καὶ τὰ ἄλλα σώματα πάντα ἔχει· ὥστ' εἰ τοῦτο τοῦ τόπου μηδὲν διαφέρει, τί δεῖ ποιεῖν τόπον τοῖς σώμασι παρὰ τὸν ἑκάστου ὄγκον, εἰ ἀπαθὴς ὁ ὄγκος; οὐδὲν γὰρ συμβάλλεται, εἰ ἕτερον περὶ αὐτὸν ἴσον διάστημα τοιοῦτον εἴη. [* 5 Ἔτι δεῖ δῆλον εἶναι, τὸ κενὸν ἐν τοῖς κινουμένοις. νῦν δὲ οὐδαμοῦ ἐντὸς τοῦ κόσμου· ὁ γὰρ ἀήρ ἐστί τι, οὐ δοκεῖ δέ· οὐδὲ τὸ ὕδωρ, εἰ ἦσαν οἱ ἰχθύες σιδηροῖ· τῇ γὰρ ἁφῇ ἡ κρίσις τοῦ ἁπτοῦ.] 6 Ὅτι μὲν τοίνυν οὐκ ἔστι κεχωρισμένον κενόν, ἐκ τούτων ἐστὶ δῆλον.

* Græci interpretes non agnoſcunt: nec multi alij interpretes: in his Argyropylus.

Non eſſe inane in corporibus.

Cap. XIII.

SVnt autem nonnulli, qui ex raro & denſo perſpicuum eſſe putant, eſſe inane. niſi enim ſit rarum ac denſum, neque coire & comprimi res poterunt: quod ſi non ſit: aut omnino motus non erit, aut fluctuabit vniuerſum, vt dicebat Xuthus, aut ſemper *oportebit* tantumdem mutari aëris & aquæ: verbi gratia, ſi ex aquæ poculo ſit factus aër, ſimul ex æquali aëre factum eſſe tantumdem aquæ, aut vacuum eſſe neceſſariò: comprimi enim ac dilatari non aliter accidit. 2 Si igitur rarum appellant, quod multa inania ſeparata habet: perſpicuum *eſt*, ſi non poteſt eſſe inane ſeparatum, quemadmodum nec locus habens ſui interuallum, ne quidem rarum ita eſſe. 3 At ſi non ſeparatum eſſe *aiunt*, ineſſe tamen aliquid vacui: minùs quidem *eſt* impoſſibile: verumtamen accidit, primùm vt inane non ſit cauſa omnis motionis, ſed tantùm adſcenſus. quod enim *eſt* rarum, leue *eſt*. idcirco & ignem rarum eſſe inquiunt. 4 Deinde inane non *erit* cauſa motus, vt in quo: ſed quemadmodum vtres, quia ipſi ſurſum feruntur, efferunt etiam quod cohæret, ita inane vim habebit ſurſum ferendi. Atqui quomodo poteſt eſſe latio vacui, aut locus vacui? ſit enim vacuum vacui in quod fertur. 5 Prætereà quomodò de pondere *rationem* afferunt, *propter quam* deorſum feratur? 6 Ac manifeſtum *eſt*, ſi corpus, quo rarius & inanius eſt, *eo magis* ſurſum fertur, *conſequens eſſe, vt*, ſi omnino ſit inane, celerrimè feratur. fortaſſis autem & impoſſibile *eſt*, hoc moueri. ac ratio eſt eadem: quia ſicut in vacuo *ſunt* omnia immobilia, ita etiam vacuum *eſt* immobile: quandoquidem celeritates inter ſe conferri nequeunt. 7 Quia verò inane eſſe negamus, de reliquis autem verè dubitatum eſt *profectò* aut motus non erit, niſi ſit condenſatio & rarefactio, aut fluctuabit cælum, aut ſemper tantumdem aquæ fiet ex aëre & aëris ex aqua. conſtat enim plus aëris ex aqua fieri. neceſſe igitur *eſt*, niſi ſit compreſſio, aut expulſum id quod cohæret, efficere vt extremum fluctuet, aut aliquo alio loco tantumdem aëris mutari in aquam, vt tota moles vniuerſi ſit æqualis, aut nihil moueri. 8 Semper enim, *aliquo corpore* translato, hoc eueniet, niſi in orbem voluatur. verùm latio non ſemper in orbem *ſit*, ſed etiam in rectum.

B Εἰσὶ δέ τινες οἳ διὰ τοῦ μανοῦ καὶ πυκνοῦ οἴονται φανερὸν εἶναι, ὅτι ἔστι κενόν. εἰ μὲν γὰρ μὴ ἔστι μανὸν καὶ πυκνόν, οὐδὲ συνιέναι καὶ πιλεῖσθαι οἷόν τε. εἰ δὲ τοῦτο * μή, ἢ ὅλως κίνησις οὐκ ἔσται, ἢ κυμανεῖ τὸ ὅλον, ὥσπερ ἔφη Ξοῦθος, ἢ εἰς ἴσον ἀεὶ μεταβάλλειν ἀέρα καὶ ὕδωρ. λέγω δέ, οἷον εἰ ἐξ ὕδατος κοτύλου γέγονεν ἀήρ, ἅμα ἐξ ἴσου ἀέρος ὕδωρ τοσοῦτον γεγονέναι, ἢ κενὸν εἶναι ἐξ ἀνάγκης· συμπιλεῖσθαι γὰρ καὶ συνεπεκτείνεσθαι οὐκ ἐνδέχεται ἄλλως. 2 Εἰ μὲν οὖν τὸ μανὸν λέγουσι, τὸ πολλὰ κενὰ κεχωρισμένα ἔχον, φανερὸν ὡς εἰ μηδὲ κενὸν ἐνδέχεται C εἶναι χωριστόν, ὥσπερ μηδὲ τόπον ἔχοντα διάστημα ἑαυτοῦ, οὐδὲ μανὸν οὕτως. 3 Εἰ δὲ μὴ χωριστόν, ἀλλ' ὅμως ἐνεῖναί τι κενόν, ἧττον μὲν ἀδύνατον· συμβαίνει δέ, πρῶτον μὲν οὐ πάσης * κινήσεως αἴτιον τὸ κενόν, ἀλλὰ τῆς ἄνω· τὸ γὰρ μανόν, κοῦφον· διὸ καὶ τὸ πῦρ μανὸν εἶναί φασιν. 4 Ἔπειτα κινήσεως αἴτιον οὐχ οὕτω τὸ κενόν, ὡς ἐν ᾧ, ἀλλ' ὥσπερ οἱ ἀσκοὶ τῷ φέρεσθαι αὐτοὶ ἄνω, φέρουσι τὸ συνεχές, οὕτω τὸ κενὸν * ἀναφερές. καίτοι, πῶς οἷόν τε φορὰν εἶναι κενοῦ, ἢ τόπον κενοῦ; κενοῦ γὰρ γίνεται κενόν, εἰς ὃ φέρεται. 5 Ἔτι δέ, πῶς ἐπὶ τοῦ βαρέος ἀποδώσουσι τὸ φέρεσθαι D κάτω; 6 Καὶ δῆλον ὅτι εἰ ὅσῳ ἂν μανότερον καὶ κενώτερον ᾖ, ἄνω οἰσθήσεται, εἰ ὅλως εἴη κενόν, τάχιστ' ἂν φέροιτο. ἴσως δὲ καὶ τοῦτο ἀδύνατον κινεῖσθαι· λόγος δ' ὁ αὐτός, ὅτι ὥσπερ καὶ ἐν τῷ κενῷ ἀκίνητα πάντα, οὕτω καὶ τὸ κενόν, ὅτι ἀκίνητον· ἀσύμβλητα γὰρ τὰ τάχη. 7 Ἐπεὶ δὲ κενὸν μὲν οὔ φαμεν εἶναι, τἆλλα δ' ἠπόρηται ἀληθῶς, ὅτι ἡ κίνησις οὐκ ἔσται, εἰ μὴ ἔσται πύκνωσις καὶ μάνωσις· ἢ κυμανεῖ ὁ οὐρανός· ἢ ἀεὶ ἴσον ὕδωρ ἐξ ἀέρος ἔσται, καὶ ἀὴρ ἐξ ὕδατος. δῆλον γὰρ ὅτι πλείων ἀὴρ ὕδατος γίνεται· ἀναγκαῖον τοίνυν, εἰ μὴ ἔστι πίλησις, ἢ ἐξωθούμενον τὸ ἐχόμενον τὸ E ἔσχατον κυμαίνειν ποιεῖν, ἢ ἄλλοθί που τὸ ἴσον * μεταβάλλειν ἐξ ἀέρος εἰς ὕδωρ, ἵν' ὁ πᾶς ὄγκος τοῦ ὅλου ἴσος ᾖ, ἢ μηδὲν κινεῖσθαι. 8 Ἀεὶ γὰρ μεθισταμένου τούτου συμβήσεται, ἐὰν μὴ κύκλῳ περιίστηται. οὐκ ἀεὶ δὲ εἰς τὸ κύκλῳ ἡ φορά, ἀλλὰ καὶ εἰς τὸ εὐθύ.

* γ. μὴ, ἐᾶν.

* γρ. [illegible] αἴτιον

* γρ. καὶ [illegible]

* γρ. μεταβάλλειν

9 Οἱ μὲν οὖν διὰ ταῦτα κενόν φασιν εἶναι. 10 Ἡμεῖς δὲ λέγομεν ἐκ τῶν ὑποκειμένων, ὅτι ἐστὶν ὕλη μία τῶν ἐναντίων, θερμοῦ καὶ ψυχροῦ, καὶ τῶν ἄλλων τῶν φυσικῶν ἐναντιώσεων· καὶ ἐκ δυνάμει ὄντος, ἐνεργείᾳ ὂν γίνεται· καὶ οὐ χωριστὴ μὲν ἡ ὕλη, τῷ δ' εἶναι ἕτερον· καὶ μία τῷ ἀριθμῷ, εἰ ἔτυχε χρώματος, καὶ θερμοῦ καὶ ψυχροῦ. 11 Ἔστι δὲ καὶ σώματος ὕλη, καὶ μεγάλου καὶ μικροῦ, ἡ αὐτή. δῆλον δέ· ὅταν γὰρ ἐξ ὕδατος ἀὴρ γένηται, ἡ αὐτὴ ὕλη, οὐ προσλαβοῦσά τι ἄλλο ἐγένετο, ἀλλ' ὃ ἦν δυνάμει, ἐνεργείᾳ ἐγένετο· καὶ πάλιν ὕδωρ ἐξ ἀέρος ὡσαύτως, ὁτὲ μὲν εἰς μέγεθος ἐκ μικρότητος, ὁτὲ δὲ εἰς μικρότητα ἐκ μεγέθους. ὁμοίως τοίνυν καὶ ἂν ὁ ἀὴρ πολὺς ὢν ἐν ἐλάττονι γίνηται ὄγκῳ, καὶ ἐξ ἐλάττονος μείζων, ἡ δυνάμει οὖσα ὕλη γίνεται ἄμφω. 12 Ὥσπερ γὰρ ἐκ ψυχροῦ θερμόν, καὶ ἐκ θερμοῦ ψυχρὸν ἡ αὐτή, ὅτι ἦν δυνάμει· οὕτω καὶ ἐκ θερμοῦ μᾶλλον θερμόν, οὐδενὸς γινομένου ἐν τῇ ὕλῃ θερμοῦ, ὃ οὐκ ἦν θερμόν, ὅτε ἧττον ἦν θερμόν· ὥσπερ οὐδ' εἰ τοῦ μείζονος κύκλου ἡ περιφέρεια καὶ κυρτότης ἐλάττονος γίνεται κύκλου, ἡ αὐτὴ οὖσα, ἢ ἄλλη, ἐν οὐθενὶ ἐγγέγονε τὸ κυρτόν, ὃ οὐ κυρτὸν ἀλλ' εὐθὺ ἦν. οὐ γὰρ τῷ διαλείπειν τὸ ἧττον ἢ τὸ μᾶλλον ἐστίν· *οὐδὲ ἔστι τῆς φλογὸς λαβεῖν τι μέγεθος, ἐν ᾧ οὐ καὶ λευκότης καὶ θερμότης ἔνεστιν· *ἡ προτέρα θερμότης πρὸς τὴν ὑστέραν. ὥστε καὶ τὸ μέγεθος καὶ ἡ μικρότης τοῦ αἰσθητοῦ ὄγκου, οὐ προσλαβούσης τι τῆς ὕλης ἐπεκτείνεται, ἀλλ' ὅτι δυνάμει ἐστὶν ἡ ὕλη ἀμφοῖν. 13 Ὥστε ἐστὶ τὸ αὐτὸ πυκνὸν καὶ μανόν, καὶ μία ὕλη αὐτῶν. ἔστι δὲ τὸ μὲν πυκνὸν, βαρύ· τὸ δὲ μανόν, κοῦφον. [*ἔτι ὥσπερ ἡ τοῦ κύκλου περιφέρεια συναγομένη εἰς ἔλαττον, οὐκ ἄλλο τι λαμβάνει τὸ κοῖλον, ἀλλ' ὃ ἦν συνήχθη, οὕτω καὶ τοῦ πυρὸς ὅτι ἄν τις λάβῃ πᾶν ἐστὶ θερμόν, οὕτω καὶ τὸ πᾶν συναγωγῇ καὶ διαστολῇ τῆς αὐτῆς ὕλης.] δύο γάρ ἐστιν ἐφ' ἑκατέρῳ, τῷ τε πυκνῷ καὶ τῷ μανῷ. τό, τε γὰρ βαρὺ καὶ τὸ σκληρόν, πυκνὰ δοκεῖ εἶναι· καὶ τἀναντία μανά, τό, τε κοῦφον καὶ τὸ μαλακόν. διαφωνεῖ δὲ τὸ βαρὺ καὶ τὸ σκληρὸν ἐπὶ μολύβδου καὶ σιδήρου. 14 Ἐκ δὴ τῶν εἰρημένων φανερόν, ὅτι οὔτ' ἀποκεκριμένον ἐστὶ κενόν, οὔθ' ἁπλῶς, οὔτ' ἐν τῷ μανῷ, οὔτε δυνάμει, εἰ μή τις βούλοιτο πάντως καλεῖν κενόν, τὸ αἴτιον τοῦ φέρεσθαι. οὕτω δ' ἡ τοῦ βαρέος καὶ κούφου* ὕλη, ᾗ τοιαύτη, εἴη ἂν τὸ κενόν. τὸ γὰρ πυκνὸν καὶ τὸ μανὸν κατὰ ταύτην τὴν ἐναντίωσιν, φορᾶς ποιητικά· κατὰ δὲ τὸ σκληρὸν καὶ μαλακόν, πάθους καὶ ἀπαθείας, καὶ οὐ φορᾶς, ἀλλ' ἑτεροιώσεως μᾶλλον. 15 Καὶ περὶ μὲν κενοῦ πῶς ἐστι, καὶ πῶς οὐκ ἔστι, διωρίσθω τὸν τρόπον τοῦτον.

[illegible] · * [illegible]

* Interpretes plerique notis inclusa censent inducenda: nec legebātur olim in omnibus codicibus, vt annotat Simplic. eos codices sequitur Argyrop.

* [illegible]

9 Ergo hi propter huiuſmodi *argumenta* inane aliquod eſſe affirmarent. 10 Nos autem ex iis quæ ſuppoſita ſunt, dicimus vnam eſſe materiam contrariorum, *nempe* calidi & frigidi, & aliarum naturalium contrarietatum. & ex eo quod eſt poteſtate, fieri quod eſt actu. & materiam non eſſe ſeparabilem, ſed eſſentia diuerſam. & vnam numero *eſſe materiam*: verbi gratia, coloris, & calidi & frigidi. 11 Ergo & corporis tam magni quam parui eadem eſt materia. *hoc* autem manifeſtum *eſt*: quia cùm ex aqua fit aër, eadem materia, non aſſumpto aliquo alio, fit *aër*: ſed quod erat poteſtate, fit actu: itidemque rurſus *fit* aqua ex aëre: modò ex paruitate in magnitudinem, modò ex magnitudine in exiguitatem *mutatione facta*. ſimiliter itaque, ſi aër ex maiori mole in minorem, & ex minore in maiorem mutetur: materia, quæ poteſtate eſt, fit vtrumque. 12 *Sicut* enim eadem *materia* ex frigida *fit* calida, & ex calida *fit* frigida, quoniam erat poteſtate: ita etiam ex calida *fit* magis calida, cùm nulla materiæ pars calefiat, quæ non eſſet *antea* calida, cùm erat minus caloris. quemadmodum nec minoris circuli circumferentia & conuexitas ſi fiat minoris circuli, *ſiue* ſit eadem ſiue alia; in nulla *parte* fit conuexitas, quæ non conuexa, ſed recta eſſet. (non enim intermiſſione eſt minus vel magis) nec licet ſumere aliquam flammæ magnitudinem, in qua non inſit & candor & calor: ſic igitur & prior calor ſe ad poſteriorem *habet*. quare & magnitudo & paruitas molis ſenſibilis, non adſumente aliquid materia, extenditur: ſed quia materia poteſtate eſt ad vtrumque. Quocirca idem eſt denſum & rarum, & vna *eſt* ipſorum materia. 13 Porrò denſum eſt graue: rarum autem *eſt* leue. Duo namque in vtroque ſunt, *id eſt*, raro & denſo. nam graue & durum, videntur eſſe denſa: & contraria *videntur eſſe* rara, nempe leue & molle. diſcordant autem graue & durum in ferro & plumbo. 14 Ex iis igitur quæ dicta fuerunt, perſpicuum *eſt*, neque eſſe inane ſeparatum, ſiue ſimpliciter ſiue in eo quod eſt rarum, neque poteſtate: niſi quis omnino appellare velit inane, *id* quod *eſt* cauſa lationis. ſic autem grauis & leuis *rei* materia, quā *eſt* talis, erit inane illud. nam denſum & rarum, ratione huius contrarietatis, vim habent efficiendæ lationis: ratione autem duri & mollis, *vim habent efficiendæ* paſſionis & impatibilitatis, nec lationis, ſed variationis potiùs. 15 Ac de inani quidem, quomodo ſit, & quomodo non ſit, hoc modo definitum eſto.

DE TEMPORE.

TRACTATVS III.

Dubitationes de quæſtione an ſit tempus. Cap. XIV.

Ἐχόμενον δὲ τῶν εἰρημένων ἐστὶ περὶ χρόνου ἐπελθεῖν. πρῶτον δὲ καλῶς ἔχει διαπορῆσαι περὶ αὐτοῦ, καὶ διὰ τῶν ἐξωτερικῶν λόγων, πότερον τῶν ὄντων ἐστὶν, ἢ τῶν μὴ ὄντων· εἶτα τίς ἡ φύσις αὐτοῦ. 2 Ὅτι μὲν οὖν ὅλως οὐκ ἔστιν, ἢ μόλις καὶ ἀμυδρῶς, ἐκ τῶνδέ τις ἂν ὑποπτεύσειε. τὸ μὲν γὰρ αὐτοῦ γέγονε, καὶ οὐκ ἔστι· τὸ δὲ μέλλει, καὶ οὔπω ἔστιν. ἐκ δὲ τούτων καὶ ὁ ἄπειρος, καὶ ὁ ἀεὶ λαμβανόμενος χρόνος σύγκειται. τὸ δ' ἐκ μὴ ὄντων συγκείμενον, ἀδύνατον ἂν δόξειε* κατέχειν ποτὲ οὐσίας.

* Argyropylus vertit quaſi legiſſet μετ. τ. π. μεγιστ. vel. participare legit, μετέχειν, vt eſt in quibuſdam codd.

His quæ dicta ſunt conſequens *eſt*, vt agatur de tempore. primùm autem e re erit, de eo dubitare etiam per rationes exotericas, vtrùm ſit *in numero* entium an non entium: deinde quę *ſit* eius natura. 2 Omnino igitur *tempus* non eſſe, aut *ſaltem* vix & obſcurè *eſſe*, ex his ſuſpicari quiſpiam poſſit. pars enim eius fuit, nec eſt: pars autem futura eſt, nec dum eſt: ex his autem *partibus* conſtat tempus infinitum & quod ſemper ſumitur. quod vero conſtat ex iis quæ non ſunt, non videtur poſſe vnquam obtinere eſſentiam.

A 3 Ad hæc cuiuſvis rei diuiduæ, ſi ſit, neceſſe *eſt*, vt, quando eſt, vel aliquæ vel omnes eius partes ſint. atqui temporis aliæ *partes* prætericrunt, aliæ futuræ ſunt, nulla autem eſt, cùm ſit diuiduum. 4 Inſtans autem non *eſt* pars. nam pars metitur: & opus eſt vt totum componatur ex partibus: tempus autem non videtur componi ex inſtantibus. 5 Præterea & hoc inſtans, quod videtur diſterminare præteritum & futurum, vtrùm ſemper vnum & idem permaneat, an *ſit* aliud & aliud, non facile *eſt* videre. 6 Nam ſi ſemper *eſt* aliud atque aliud: non eſt autem in tempore vlla pars alia atque alia ſimul, quarum vna non contineat, & altera contineatur, vt minus tempus *continetur* à maiori: quod verò nunc non eſt, & antea erat, neceſſe *eſt* aliquando interiiſſe: *profectò* etiam inſtantia viciſſim ſimul non erunt, ſed neceſſe ſemper *erit* prius inſtans interiiſſe. itaque in ſe ipſo interiiſſe non poteſt, quia tunc eſt. in alio autem inſtanti interiiſſe prius inſtans non poteſt. eſto namque impoſſibile, vt inſtantia ſibi inuicem cohęreant, ſicvti punctum puncto. ergo ſi in eo quod *eſt* deinceps, non interiit, ſed in alio: *certè* in infinitis inſtantibus interiectis ſimul erit: quod *eſt* impoſſibile. 7 At verò nec ſemper idem permanere poteſt. nullius enim rei diuiduæ finitæ vnus eſt terminus, nec ſi ad vnum ſit continua, nec ſi ad plura: inſtans autem eſt terminus: ac licet ſumere tempus terminatum. 8 Præterea ſi ſimul eſſe tempore, & neque prius neque poſterius *eſſe, nihil aliud* eſt *quàm* in eodem eſſe, & in inſtanti *eſſe*: *certè* ſi ea quæ ſunt priùs & quæ poſteriùs, ſint in eodem inſtanti, etiam ea quæ ante decem millia annorum facta ſunt, ſimul erunt cum iis quæ facta ſunt hodie, nec erit quicquam prius aut poſterius aliud alio. 9 De iis igitur quæ ipſi *tempori* inſunt, tot in dubium reuocata ſunto.

3 Πρὸς δὲ τούτοις, παντὸς μεριστοῦ, ἐάνπερ ᾖ, ἀνάγκη, ὅτε ἔστιν, ἤτοι ἔνια, ἢ πάντα τὰ μέρη εἶναι· τοῦ δὲ χρόνου, τὰ μὲν γέγονε, τὰ δὲ μέλλει, ἔστι δ' οὐδὲν, ὄντος μεριστοῦ. 4 Τὸ δὲ νῦν, οὐ μέρος·* μετρεῖ τε γὰρ τὸ μέρος, καὶ συγκεῖσθαι δεῖ τὸ ὅλον ἐκ τῶν μερῶν· ὁ δὲ χρόνος οὐ δοκεῖ συγκεῖσθαι ἐκ τῶν νῦν. 5 Ἔτι δὲ καὶ τοῦτο τὸ νῦν ὃ φαίνεται διορίζειν τὸ παρελθὸν καὶ τὸ μέλλον, πότερον ἓν καὶ ταὐτὸ ἀεὶ διαμένει, ἢ ἄλλο καὶ ἄλλο, οὐ ῥᾴδιον ἰδεῖν. 6 Εἰ μὲν γὰρ ἀεὶ ἕτερον καὶ ἕτερον, μηδὲν δ' ἐστὶ τῶν ἐν τῷ χρόνῳ ἄλλο καὶ ἄλλο μέρος ἅμα, ὃ μὴ περιέχει, τὸ δὲ περιέχεται, ὥσπερ ὁ ἐλάττων χρόνος ὑπὸ τοῦ πλείονος· B τὸ δὲ νῦν μὴ ὂν, πρότερον δὲ ὂν, ἀνάγκη ἐφθάρθαι ποτέ· καὶ τὰ νῦν, ἅμα μὲν ἀλλήλοις οὐκ ἔσται· ἐφθάρθαι δὲ ἀνάγκη ἀεὶ τὸ πρότερον. ἐν ἑαυτῷ μὲν οὖν ἐφθάρθαι οὐχ οἷόν τε, διὰ τὸ εἶναι τότε· ἐν ἄλλῳ δὲ νῦν ἐφθάρθαι τὸ πρότερον νῦν, οὐκ ἐνδέχεται· ἔστω γὰρ ἀδύνατον, ἐχόμενα εἶναι ἀλλήλων τὰ νῦν, ὥσπερ στιγμὴν στιγμῆς· εἴπερ οὖν ἐν τῷ ἐφεξῆς οὐκ ἔφθαρται, ἀλλ' ἐν ἄλλῳ, ἐν τοῖς μεταξὺ τοῖς νῦν ἀπείροις οὖσιν, ἅμα ἂν εἴη· τοῦτο δὲ ἀδύνατον. 7 Ἀλλὰ μὴν οὐδὲ ἀεὶ τὸ αὐτὸ διαμένειν δυνατόν· οὐδενὸς γὰρ διαι- C ρετοῦ πεπερασμένου, ἓν πέρας ἐστὶν, οὔτε ἂν ἐφ' ἓν ᾖ συνεχὲς, οὔτε ἂν ἐπὶ πλείω· τὸ δὲ νῦν πέρας ἐστὶ, καὶ χρόνον ἐστὶ λαβεῖν πεπερασμένον. 8 Ἔτι, εἰ τὸ ἅμα εἶναι κατὰ χρόνον, καὶ μήτε πρότερον, μήτε ὕστερον, τὸ ἐν τῷ αὐτῷ εἶναι, καὶ ἐν τῷ νῦν ἐστιν, εἰ τά τε πρότερον καὶ τὰ ὕστερον ἐν τῷ νῦν ἐστιν, ἅμα ἂν εἴη τὰ εἰς ἔτος γινόμενα μυριοστὸν τοῖς γενομένοις τήμερον· καὶ οὔτε πρότερον, οὔτε ὕστερον οὐδὲν ἄλλο ἄλλου. 9 Περὶ μὲν οὖν τῶν* ὑπαρχόντων αὐτῷ, τοσαῦτα ἔστω διηπορημένα.

* Alexander μετρεῖται. vide Simplicium.

* γρ. ὑπεχόντων.

Variæ opiniones de natura & eſſentia temporis.

Cap. XV.

D QVid autem ſit tempus, & quæ ſit eius natura, æquè ex iis quæ tradita ſunt, eſt incertum, atque *de iis* de quibus antea diſſeruimus. 2 Alij namque aiunt eſſe motum vniuerſi: alij verò ipſam ſphæram. 3 Atqui conuerſionis etiam pars eſt motus quidam: non tamen *eſt* conuerſio. quod enim ſumptum eſt, pars *eſt* conuerſionis, non conuerſio. 4 Præterea ſi plures eſſent cœli, æquè tempus eſſet cuiuſvis horum motio. quare multa tempora ſimul *eſſent*. 5 Vniuerſi autem ſphæra viſum eſt iis qui *id* dixerunt, tempus eſſe: quia & in tempore omnia ſunt, & in vniuerſi ſphæra. Sed hoc *eorum* dictum magis fatuum *eſt*, quã vt ſit opus de eo conſiderare impoſſibilia, *quæ conſequantur*. Cùm autem maximè videatur tempus eſſe motum & mutationem quandam: hoc vtique conſiderandum eſt. ergo cuiuſque mutatio ac motus eſt ſolùm in eo quod mutatur, vel vbicumque eſt *illud* ipſum quod mouetur & mutatur. tempus verò peræquè eſt & vbique & apud omnia. 7 Inſuper omnis quidem mutatio eſt celerior & tardior: tempus verò non eſt: nam tardum & velox tẽpore definitur. velox etenim *eſt* quod breui *tempore* multum mouetur: tardum autem quod longo *tempore* paruum. atqui tempus non definitur tempore, nec quia ſit quantum quiddam, nec quia *ſit* quale. Patet igitur tempus non eſſe motum. 8 Nihil autem differat ſiue in præſentia dicamus motum, ſiue mutationem.

ΤΙ δέ ἐστιν ὁ χρόνος, καὶ τίς αὐτοῦ ἡ φύσις, ὁμοίως ἔκ τε τῶν παραδεδομένων ἄδηλόν ἐστι, καὶ περὶ ὧν τυγχάνομεν διεληλυθότες πρότερον. 2 Οἱ μὲν γὰρ τὴν τοῦ ὅλου κίνησιν εἶναί φασιν, οἱ δὲ, τὴν σφαῖραν αὐτήν. 3 Καίτοι τῆς περιφορᾶς καὶ τὸ μέρος, χρόνος τίς ἐστι· περιφορά δέ γε οὔ· μέρος γὰρ περιφορᾶς τὸ ληφθὲν, ἀλλ' οὐ περιφορά. 4 Ἔτι δὲ, εἰ πλείους ἦσαν οὐρανοὶ, ὁμοίως ἂν ἦν ὁ χρόνος, ἑκατέρου αὐτῶν κίνησις· ὥστε πολλοὶ χρόνοι ἅμα. 5 Ἡ δὲ τοῦ ὅλου σφαῖρα, ἔδοξε μὲν τοῖς εἰποῦσιν εἶναι ὁ χρόνος, ὅτι ἔν τε τῷ χρόνῳ πάντα ἐστὶ, καὶ ἐν τῇ τοῦ ὅλου σφαίρᾳ. ἔστι δ' εὐηθικώτερον τὸ εἰρημένον, ἢ ὥστε περὶ αὐτοῦ τὰ ἀδύνατα ἐπι- E σκοπεῖν. 6 Ἐπεὶ δὲ δοκεῖ μάλιστα κίνησις εἶναι καὶ μεταβολή τις ὁ χρόνος, τοῦτ' ἂν εἴη σκεπτέον. ἡ μὲν οὖν ἑκάστου μεταβολὴ καὶ κίνησις, ἐν αὐτῷ τῷ μεταβάλλοντί ἐστι μόνον, ἢ οὗ ἂν τύχῃ ὂν αὐτὸ τὸ κινούμενον καὶ μεταβάλλον· ὁ δὲ χρόνος ὁμοίως καὶ πανταχοῦ, καὶ παρὰ πᾶσιν. 7 Ἔτι δὲ, μεταβολὴ μέν ἐστι πᾶσα θάττων καὶ βραδυτέρα, χρόνος δ' οὐκ ἔστι· τὸ γὰρ βραδὺ καὶ ταχὺ χρόνῳ ὥρισται· ταχὺ μὲν γὰρ τὸ ἐν ὀλίγῳ πολὺ κινούμενον, βραδὺ δὲ, τὸ ἐν πολλῷ ὀλίγον· ὁ δὲ χρόνος οὐχ ὥρισται χρόνῳ, οὔτε τῷ ποσός τις εἶναι, οὔτε τῷ ποιός. ὅτι μὲν τοίνυν οὐκ ἔστι κίνησις, φανερόν. 8 Μηδὲν δὲ διαφερέτω λέγειν ἡμῖν ἐν τῷ παρόντι κίνησιν, ἢ μεταβολήν.

Quid ſit tempus.
Cap. XVI.

Ἀλλὰ μὴν οὐδ' ἄνευ γε μεταβολῆς· ὅταν γὰρ αὐτοὶ μηδὲν μεταβάλλωμεν τὴν διάνοιαν, ἢ λάθωμεν μεταβάλλοντες, οὐ δοκεῖ ἡμῖν γεγονέναι ὁ χρόνος· καθάπερ οὐδὲ τοῖς ἐν τῇ Σαρδοῖ μυθολογουμένοις καθεύδειν παρὰ τοῖς ἥρωσιν, ὅταν ἐγερθῶσι. συνάπτουσι γὰρ τὸ πρότερον νῦν τῷ ὕστερον νῦν, καὶ ἓν ποιοῦσιν, ἐξαιροῦντες διὰ τὴν ἀναισθησίαν τὸ μεταξύ. ὥσπερ οὖν εἰ μὴ ἦν ἕτερον τὸ νῦν, ἀλλὰ ταὐτὸ καὶ ἕν, οὐκ ἂν ἦν χρόνος· οὕτως καὶ ἐπεὶ λανθάνει ἕτερον ὄν, οὐ δοκεῖ εἶναι τὸ μεταξὺ χρόνος. εἰ δὲ τὸ μὴ οἴεσθαι εἶναι χρόνον τότε συμβαίνει ἡμῖν, ὅταν μὴ ὁρίζωμεν μηδεμίαν μεταβολήν, ἀλλ' ἐν ἑνὶ καὶ ἀδιαιρέτῳ φαίνηται ἡ ψυχὴ μένειν· ὅταν δ' αἰσθώμεθα, καὶ ὁρίσωμεν, τότε φαμὲν γεγονέναι χρόνον· φανερὸν ὅτι οὐκ ἔστιν ἄνευ κινήσεως καὶ μεταβολῆς ὁ χρόνος. ὅτι μὲν οὖν οὔτε κίνησις, οὔτε ἄνευ κινήσεως ὁ χρόνος ἐστί, φανερόν. 2 Ληπτέον δέ, ἐπεὶ ζητοῦμεν τί ἐστιν ὁ χρόνος, ἐντεῦθεν ἀρχομένοις, τί τῆς κινήσεώς ἐστιν. ἅμα γὰρ κινήσεως αἰσθανόμεθα καὶ χρόνου· καὶ γὰρ ἐὰν ᾖ σκότος, καὶ μηδὲν διὰ τοῦ σώματος πάσχωμεν, κίνησις δέ τις ἐν τῇ ψυχῇ ἐνῇ, εὐθὺς ἅμα δοκεῖ* τι γεγονέναι, καὶ χρόνος. ἀλλὰ μὴν καὶ ὅταν γε χρόνος δοκῇ γενέσθαι τις, ἅμα καὶ κίνησίς τις φαίνεται γεγονέναι. ὥστε ἤτοι κίνησις, ἢ τῆς κινήσεώς τι ἐστὶ χρόνος. ἐπεὶ οὖν οὐ κίνησις, ἀνάγκη τῆς κινήσεώς τι εἶναι αὐτόν. 3 Ἐπεὶ δὲ τὸ κινούμενον κινεῖται ἔκ τινος εἴς τι, καὶ πᾶν μέγεθος συνεχές, ἀκολουθεῖ τῷ μεγέθει ἡ κίνησις· διὰ γὰρ τὸ μέγεθος εἶναι συνεχές, καὶ ἡ κίνησίς ἐστι συνεχής· διὰ δὲ τὴν κίνησιν καὶ ὁ χρόνος· ὅση γὰρ ἡ κίνησις, τοσοῦτος καὶ ὁ χρόνος ἀεὶ δοκεῖ γεγονέναι. 4 Τὸ δὲ δὴ πρότερον καὶ ὕστερον ἐν τόπῳ, πρῶτόν ἐστιν. ἐνταῦθα μέντοι τῇ θέσει. ἐπεὶ δ' ἐν τῷ μεγέθει ἐστὶ τὸ πρότερον καὶ τὸ ὕστερον, ἀνάγκη καὶ ἐν κινήσει εἶναι τὸ πρότερον καὶ ὕστερον, ἀνάλογον τοῖς ἐκεῖ. ἀλλὰ μὴν καὶ ἐν τῷ χρόνῳ ἐστὶ τὸ πρότερον καὶ ὕστερον, διὰ τὸ ἀκολουθεῖν ἀεὶ θατέρῳ θάτερον αὐτῶν. 5 Ἔστι δὲ τὸ πρότερον καὶ τὸ ὕστερον αὐτῶν ἐν τῇ κινήσει, ὃ μέν ποτε ὂν κίνησίς ἐστι· τὸ μέντοι εἶναι αὐτοῦ ἕτερον, καὶ οὐ κίνησις. 6 Ἀλλὰ μὴν καὶ τὸν χρόνον γε γνωρίζομεν, ὅταν* ὁρίζωμεν τὴν κίνησιν, τὸ πρότερον καὶ ὕστερον ὁρίζοντες· καὶ τότε φαμὲν γεγονέναι χρόνον, ὅταν τοῦ προτέρου καὶ ὑστέρου ἐν τῇ κινήσει αἴσθησιν λάβωμεν. ὁρίζομεν δέ, τῷ ἄλλο καὶ ἄλλο ὑπολαβεῖν αὐτά, καὶ μεταξύ τι αὐτῶν ἕτερον· ὅταν γὰρ τὰ ἄκρα ἕτερα τοῦ μέσου νοήσωμεν, καὶ δύο εἴπῃ ἡ ψυχὴ τὰ νῦν, τὸ μὲν πρότερον, τὸ δὲ ὕστερον, τότε καὶ τοῦτό φαμεν εἶναι χρόνον· τὸ γὰρ ὁριζόμενον‡ τῷ νῦν, χρόνος εἶναι δοκεῖ· καὶ ὑποκείσθω. ὅταν μὲν οὖν ὡς ἓν τὸ νῦν αἰσθανώμεθα, καὶ μὴ ἤτοι ὡς τὸ πρότερον καὶ ὕστερον ἐν τῇ κινήσει, ἢ ὡς τὸ αὐτὸ μέν, μὴ προτέρου δὲ καὶ ὑστέρου τινός, οὐ δοκεῖ χρόνος γεγονέναι οὐδείς, ὅτι οὐδὲ κίνησις. ὅταν δὲ τὸ πρότερον καὶ ὕστερον, τότε λέγομεν χρόνον. 7 Τοῦτο γάρ ἐστιν ὁ χρόνος, ἀριθμὸς κινήσεως κατὰ τὸ πρότερον καὶ ὕστερον.

* ἢ ἐσχηκέναι ἐχ.

* ἢ ὁρίσωμεν

‡ ἢ τὸ νῦν,

A At verò nec *eſt* ſine mutatione. cùm enim ipſi nihil mutamur cogitatione, aut, ſi mutemur, non animaduertimus: tunc non videtur nobis fuiſſe tempus: quemadmodum nec iis quos in Sardo fabulantur dormire apud heroas, cùm experrecti fuerint: coniungunt enim prius inſtans cum poſteriori inſtanti, & vnum faciunt, eximentes tempus interiectum, quia *id* ſenſu non percipiunt. ſicut igitur ſi non eſſet aliud inſtans, ſed vnum & idem, non eſſet tempus: ita etiam quando non animaduertitur eſſe diuerſum, non videtur eſſe tempus quod *eſt* interiectum. ergo ſi tunc nobis accidit, vt non B putemus eſſe tempus, cùm nullam mutationem diſtinguimus, ſed anima in vno & indiuiduo manere videtur: cùm autem ſentimus ac diſtinguimus, tunc dicimus fuiſſe tempus: perſpicuum *eſt*, non eſſe tempus ſine motu & mutatione. patet igitur tempus nec eſſe motum nec ſine mutatione. 2 Quoniam autem quærimus quid ſit tempus, ſumendum *eſt*, hinc facto initio, quid motionis ſit. ſimul enim motionem ſentimus ac tempus. nam etiam ſi tenebræ ſint, & nihil corpore patiamur, motus tamen aliquis in anima inſit: confeſtim ſimul videtur fuiſſe etiam aliquod tempus. at verò & cùm tempus aliquod videtur fuiſſe, ſimul etiam C motus aliquis fuiſſe apparet. quocirca tempus aut eſt motus aut aliquid ipſius motus. quoniam igitur non *eſt* motus; neceſſe *eſt*, vt ſit aliquid ipſius motus. 3 Cùm autem id quod mouetur, moueatur ab aliquo ad aliquod, *cùmque* omnis magnitudo *ſit* continua: magnitudini conſequens eſt motus. nam quia magnitudo eſt continua, etiam motus eſt continuus. & quia motus, etiam tempus. quantus enim *fuit* motus, tantum etiam ſemper videtur tempus fuiſſe. 4 Iam verò prius & poſterius in loco primum ſunt: & hic quidem poſitione *partium*. cùm autem in magnitudine ſit D prius & poſterius; neceſſe eſt, vt etiam in motu ſint prius & poſterius, quæ illis proportione reſpondeant. quinetiam in tempore eſt prius & poſterius, quia ſemper horum alterum alteri conſequens eſt. 5 Horum autem prius & poſterius eſt in motu quod re ipſa eſt motus, ſed eius eſſentia diuerſa non motus eſt. 6 At verò etiam tempus cognoſcimus, cùm motum diſtinguimus, prius & poſterius diſtinguentes: tuncque dicimus fuiſſe tempus, cùm ſenſu percepimus prius & poſterius in motu. diſtinguimus autem: quoniam hæc aliud atque aliud *eſſe*, & his diuerſum quiddam *eſſe* interiectum exiſtimamus. cùm enim E extrema à medio diuerſa intelligimus, ac duo momenta affirmat anima, alterum prius, alterum poſterius: tunc id dicimus eſſe tempus. quod enim momentis terminatur, tempus eſſe videtur: atque *hoc* ſupponatur. Cùm igitur ſentimus momentum, quaſi vnum, nec eſt aliquid tanquam prius & poſterius in motu: vel *ſentimus* quaſi idem, non prioris & poſterioris alicuius: *tunc* non videtur fuiſſe vllum tempus, quia nec motus. cùm autem prius & poſterius *ſentimus*, tunc dicimus *eſſe* tempus. 7 Tempus enim nihil aliud eſt quam numerus motus ſecundùm prius & poſterius.

8 Tempus igitur non *eſt* motus, niſi quatenus motus numerum habet. argumento eſt, quòd plus & minus diiudicamus numero, motum autem maiorem & minorem *diiudicamus* tempore: ergo tempus *eſt* numerus quidam. 9 Cùm autem numerus bifariàm accipiatur (nam & quod numeratur, & quod eſt numerabile, numerum vocamus, & *id* quo numeramus) tempus igitur eſt id quod numeratur, non quo numeramus. ſunt autem diuerſa, *id* quo numeramus, & quod numeratur.

A 8 Οὐκ ἄρα κίνησις ὁ χρόνος, ἀλλ' ᾗ ἀριθμὸν ἔχει ἡ κίνησις. σημεῖον δέ· τὸ μὲν γὰρ πλεῖον καὶ ἔλαττον κρίνομεν ἀριθμῷ· κίνησιν δὲ πλείω καὶ ἐλάττω, χρόνῳ. ἀριθμὸς ἄρα τις ὁ χρόνος. 9 Ἐπεὶ δ' ἀριθμός ἐστι διχῶς (καὶ γὰρ τὸ ἀριθμούμενον, καὶ τὸ ἀριθμητὸν, ἀριθμὸν λέγομεν, καὶ ᾧ ἀριθμοῦμεν·) * ὁ δὲ χρόνος ἐστὶ τὸ ἀριθμούμενον, καὶ οὐχ ᾧ ἀριθμοῦμεν. ἔστι δ' ἕτερον ᾧ ἀριθμοῦμεν, καὶ τὸ ἀριθμούμενον. * καὶ ἐν χ.

De momento.

Cap. XVII.

ET quemadmodum motus ſemper *eſt* alius atque alius, *ita* etiam tempus. vniuerſum verò tempus ſimul *acceptum*, idem *eſt*: quoniam momentum re ipſa *vnum & idem eſt*, ſed eſſentia eius *eſt* diuerſa. momentum autem metitur tempus, quatenus *eſt* prius & poſterius. 2 Iam verò momentum partim eſt idem, partim non eſt idem. quatenus enim in alio atque alio *eſt*, diuerſum eſt: hoc autem eſt ipſum momentum: ſed quatenus momentum *eſt id* quod tandem eſt, *eatenus eſt* idem. conſequens enim eſt, vt dictum fuit, magnitudini motus, huic verò tempus, vt aſſerimus. peræque igitur puncto id quod fertur, quo motum cognoſcimus, atque in eo prius & poſterius. hoc autem reipſa idem eſt: aut enim eſt punctum, aut lapis, aut aliquid aliud eiuſmodi: ſed ratione *eſt* aliud: ſicvti ſophiſtæ ſumunt alium eſſe Coriſcum in Lyceo, & Coriſcum in foro: ergo & hoc, quia alibi & alibi eſt, diuerſum *eſt*. Atqui ei quod fertur, conſequens eſt momentum, & motui tempus: nam eo quod fertur cognoſcimus prius ac poſterius in motu: momentum autem eſt, quatenus prius ac poſterius *eſt* numerabile. Quocirca & in his re ipſa momentum eſt idem; quia quod in motu *eſt*, vel eſt prius vel poſterius: eſſentia verò *eſt* diuerſa: quoniam momentum eſt, quatenus prius & poſterius *eſt* numerabile. atque hoc eſt maximè notum: quia & motus per id quod mouetur, *cognoſcitur*: & latio per id quod fertur. quod enim fertur, *eſt* hoc aliquid: motus autem non *eſt hoc aliquid*, partim itaque id quod vocatur momentum, eſt ſemper idem, partim non idem: quoniam & id quod fertur, *ſimiliter ſe habet*. 3 Perſpicuum etiam *eſt*, ſiue tempus non ſit, momentum non fore: ſiue non ſit momentum, non fore tempus. vt enim ſimul *ſunt* id quod fertur & latio, ita etiam numerus eius quod fertur & numerus lationis. tempus enim *eſt* lationis numerus: momentum verò *eſt* velut id quod fertur, vt vnitas numeri. 4 Ergo & continuum *eſt* tempus propter momentum, ac diuiditur ratione momenti. nam & *quod ad* hoc, ſequitur lationem, & rem quæ fertur. etenim motio & latio vna eſt propter id quod fertur, quia *eſt* vnum: nec *ſolum*, quoniam interrumpi poſſet, ſed etiam ratione. hoc igitur terminat priorem & poſteriorem motum. 5 Quin etiam *quod ad* hoc, aliquo modo eſt conſequens puncto. nam punctum quoque & continet quodammodo longitudinem, & terminat: quoniam alterius eſt principium, alterius *eſt* finis. ſed cùm ita quiſpiam accipit, vtens vno puncto quaſi duobus: neceſſe *eſt* conſiſtere, ſi idem punctum erit principium & finis. momentum autem, quia quod fertur, mouetur, ſemper diuerſum *eſt*.

B ΚΑὶ ὥσπερ ἡ κίνησις ἀεὶ ἄλλη καὶ ἄλλη, καὶ ὁ χρόνος· ὁ δ' ἅμα πᾶς χρόνος ὁ αὐτός· τὸ γὰρ νῦν τὸ αὐτὸ ὅ ποτ' ἦν· τὸ δ' εἶναι αὐτῷ, ἕτερον· τὸ δὲ νῦν τὸν χρόνον μετρεῖ, ᾗ πρότερον καὶ ὕστερον. 2 Τὸ δὲ νῦν, ἔστι μὲν ὡς τὸ αὐτό, ἔστι δ' ὡς οὐ τὸ αὐτό· ᾗ μὲν γὰρ ἐν ἄλλῳ, καὶ ἄλλῳ ἕτερον· τοῦτο δ' ἦν αὐτῷ * τὸ νῦν· ᾗ δὲ ὅ ποτε ὄν ἐστι τὸ νῦν, τὸ αὐτό. ἀκολουθεῖ γὰρ ὥσπερ ἐλέχθη, τῷ μὲν μεγέθει ἡ κίνησις, ταύτῃ δ' ὁ χρόνος ὡς φαμέν. καὶ ὁμοίως δὴ τῇ στιγμῇ τὸ φερόμενον ᾧ τὴν κίνησιν γνωρίζομεν, καὶ τὸ πρότερον ἐν αὐτῇ, καὶ τὸ ὕστερον. C τοῦτο δ' ὃ μὲν ποτε ὄν, τὸ αὐτό ἐστι· στιγμὴ γάρ, ἢ λίθος, ἤ τι ἄλλο τοιοῦτον· τῷ λόγῳ δὲ ἄλλο· ὥσπερ οἱ σοφισταὶ λαμβάνουσιν ἕτερον τὸ Κορίσκον ἐν Λυκείῳ εἶναι, καὶ τὸ Κορίσκον ἐν ἀγορᾷ. καὶ τοῦτο δὴ τῷ ἄλλοθι καὶ ἄλλοθι εἶναι, ἕτερον· τῷ δὲ φερομένῳ ἀκολουθεῖ τὸ νῦν, ὥσπερ ὁ χρόνος τῇ κινήσει· τῷ γὰρ φερομένῳ γνωρίζομεν τὸ πρότερον καὶ ὕστερον ἐν κινήσει· ᾗ δ' ἀριθμητὸν τὸ πρότερον καὶ ὕστερον, τὸ νῦν ἐστιν· ὥστε καὶ ἐν τούτοις, ὃ μὲν ποτε ὂν νῦν, ἔστι τὸ αὐτό· πρότερον γὰρ ἢ ὕστερόν ἐστι τὸ ἐν κινήσει· D τὸ δ' εἶναι, ἕτερον· ᾗ ἀριθμητὸν γὰρ τὸ πρότερον καὶ ὕστερον, τὸ νῦν ἐστι, καὶ γνώριμον μάλιστα τοῦτ' ἐστι· καὶ γὰρ ἡ κίνησις διὰ τὸ κινούμενον, καὶ ἡ φορὰ διὰ τὸ φερόμενον· τόδε γάρ τι, τὸ φερόμενον· ἡ δὲ κίνησις, οὔ. ἔστι μὲν οὖν ὡς τὸ αὐτὸ τὸ νῦν λεγόμενον ἀεί, ἔστι δ' ὡς οὐ τὸ αὐτό· καὶ γὰρ καὶ τὸ φερόμενον. 3 Φανερὸν δὲ καὶ ὅτι εἴτε χρόνος μὴ εἴη, τὸ νῦν οὐκ ἂν εἴη· εἴτε τὸ νῦν μὴ εἴη, ὁ χρόνος οὐκ ἂν εἴη· ἅμα γὰρ ὥσπερ τὸ φερόμενον καὶ ἡ φορά, οὕτως καὶ ὁ ἀριθμὸς ὁ τοῦ φερομένου καὶ ὁ τῆς φορᾶς. χρόνος μὲν γὰρ ὁ τῆς φορᾶς ἀριθμός· τὸ δὲ νῦν ὡς τὸ φερόμενον, οἷον μονὰς ἀριθμοῦ. E 4 Καὶ συνεχής τε δὴ ὁ χρόνος τῷ νῦν, καὶ διῄρηται κατὰ τὸ νῦν· ἀκολουθεῖ γὰρ καὶ τοῦτο τῇ φορᾷ, καὶ τῷ φερομένῳ· καὶ γὰρ ἡ κίνησις, καὶ ἡ φορὰ μία τῷ φερομένῳ, ὅτι ἕν, καὶ οὐχ ὅ ποτε ὄν· καὶ γὰρ ἂν διαλίποι· ἀλλὰ τῷ λόγῳ. καὶ ὁρίζει δὴ τὴν πρότερον καὶ ὕστερον κίνησιν τοῦτο. 5 Ἀκολουθεῖ δὲ καὶ τοῦτό πως τῇ στιγμῇ· καὶ γὰρ ἡ στιγμὴ καὶ συνέχει πως τὸ μῆκος, καὶ ὁρίζει· ἔστι γὰρ, τοῦ μὲν ἀρχή, τοῦ δὲ τελευτή. 6 Ἀλλ' ὅταν μὲν οὕτω λαμβάνῃ τις, ὡς δυσὶ χρώμενος τῇ μιᾷ, ἀνάγκη ἵστασθαι, εἰ ἔσται ἀρχὴ καὶ τελευτὴ ἡ αὐτὴ στιγμή. τὸ δὲ νῦν, διὰ τὸ κινεῖσθαι τὸ φερόμενον, ἀεὶ ἕτερον.

* Vicomercatus ᾗ ἦν.

7 Ὥστ' ὁ χρόνος ἀριθμὸς, οὐχ ὡς τῆς αὐτῆς στιγμῆς, ὅτι καὶ ἀρχὴ καὶ τελευτὴ, ἀλλ' ὡς τὰ ἔσχατα τῆς γραμμῆς μᾶλλον, καὶ οὐχ ὡς τὰ μέρη, διά τε τὸ εἰρημένον (τῇ γὰρ μέσῃ στιγμῇ, ὡς δυσὶ χρήσεται, ὥστε ἠρεμεῖν συμβήσεται) καὶ ἔτι, * φανερὸν ὅτι οὐδὲ μόριον τὸ νῦν τοῦ χρόνου, οὐδ' ἡ διαίρεσις τῆς κινήσεως, ὥσπερ οὐδ' αἱ στιγμαὶ τῆς γραμμῆς. αἱ δὲ γραμμαὶ δύο τῆς μιᾶς μόρια. 8 Ἡ μὲν οὖν πέρας τὸ νῦν, οὐ χρόνος, ἀλλὰ συμβέβηκεν· * ᾗ δ' ἀριθμεῖ, ἀριθμός. τὰ μὲν γὰρ πέρατα, ἐκείνου μόνον ἐστὶν, οὗ ἐστι πέρατα. ὁ δ' ἀριθμὸς ὁ τῶνδε τῶν ἵππων, ἡ δεκὰς, καὶ ἄλλοθι.

* Græci interpretes ita legũt, ἔτι, ἐν ᾧ οὐδὲ μόριον ... χρόνου τῆς κινήσεως, ... τῆς γραμμῆς. vide Simplicium.
* Alexander legendum putabat, ᾗ δ' ἀριθμεῖ.

A 7 Quocirca tempus *eſt* numerus, non vt eiuſdem puncti, quia *ſit* principium & finis. ſed potiùs vt extremitates lineæ, nec vt partes: cùm ob id quod dictum fuit, quia medio puncto quaſi duobus vtetur, vnde accidet vt quieſcat: tum etiam quia perſpicuum *eſt*, neque momentum eſſe partem temporis, neque diuiſionem *eſſe partẽ* motus, quemadmodum nec puncta lineæ: ſed duæ lineæ *ſunt* partes vnius. 8 Quatenus igitur momentum *eſt* terminus, non *eſt* tempus, ſed ei accidit. quatenus autem numerat, *eſt* numerus. termini namque illius *res* tantùmodo ſunt, cuius ſunt termini. ſed numerus qui *eſt* horum equorum, *vt* denarius, etiam alibi *reperitur*.

De diuerſis temporis attributis.

Cap. XVIII.

ΟΤι μὲν τοίνυν ὁ χρόνος ἀριθμὸς κινήσεώς ἐστι, κατὰ τὸ πρότερον καὶ ὕστερον, * καὶ συνεχής· συνεχοῦς γὰρ φανερόν. 2 Ἐλάχιστος δὲ ἀριθμὸς, ὁ μὲν ἁπλῶς ἐστὶν ἡ δυάς· τὶς δὲ * ἀριθμὸς ἐστὶν, ἔστι μὲν ὡς, ἔστι δὲ ὡς οὐκ ἔστιν· οἷον γραμμῆς ἐλάχιστος ἀριθμὸς πλήθει μέν ἐστιν αἱ δύο, ἢ μία· μεγέθει δ' οὐκ ἔστιν ἐλάχιστος· ἀεὶ γὰρ διαιρεῖται πᾶσα γραμμή· ὥστε ὁμοίως καὶ ὁ χρόνος· ἐλάχιστος γὰρ κατὰ μὲν ἀριθμόν ἐστιν, ὁ εἷς, ἢ οἱ δύο· κατὰ μέγεθος δ' οὐκ ἔστι. 3 Φανερὸν δὲ δὴ καὶ διότι ταχὺς μὲν καὶ βραδὺς οὐ λέγεται, πολὺς δὲ καὶ ὀλίγος, καὶ μακρὸς καὶ βραχύς. ᾗ μὲν γὰρ συνεχής, μακρὸς καὶ βραχύς· ᾗ δὲ ἀριθμὸς, πολὺς καὶ ὀλίγος· ταχὺς δὲ καὶ βραδὺς οὐκ ἔστιν· οὐδὲ γὰρ ὁ ἀριθμὸς ᾧ ἀριθμοῦμεν, ταχὺς καὶ βραδὺς οὐδείς. 4 Καὶ ὁ αὐτὸς δὲ, πανταχοῦ ἅμα· πρότερος δὲ καὶ ὕστερος, οὐχ ὁ αὐτὸς, ὅτι καὶ ἡ μεταβολὴ, ἡ μὲν παροῦσα, μία· ἡ δὲ γεγενημένη, καὶ ἡ μέλλουσα, ἑτέρα. ὁ δὲ χρόνος ἀριθμός ἐστιν, οὐχ ᾧ ἀριθμοῦμεν, ἀλλ' ὁ ἀριθμούμενος. οὗτος δὲ συμβαίνει κατὰ τὸ πρότερον καὶ ὕστερον, ἀεὶ ἕτερος· τὰ γὰρ νῦν, ἕτερα. ἔστι δὲ ὁ ἀριθμὸς, εἷς μὲν καὶ ὁ αὐτὸς, ὁ τῶν ἑκατὸν ἵππων, καὶ τῶν ἑκατὸν ἀνθρώπων. ὧν δ' ἀριθμὸς, ἕτερα, οἱ ἵπποι τῶν ἀνθρώπων. 5 Ἔτι, ὡς ἐνδέχεται κίνησιν εἶναι τὴν αὐτὴν καὶ μίαν πάλιν καὶ πάλιν, οὕτω καὶ * χρόνος ἐνδέχεται, οἷον ἐνιαυτὸν, ἢ ἔαρ, ἢ μετόπωρον. 6 Οὐ μόνον δὲ τὴν κίνησιν τῷ χρόνῳ μετροῦμεν, ἀλλὰ καὶ τῇ κινήσει τὸν χρόνον, διὰ τὸ ὁρίζεσθαι ὑπ' ἀλλήλων· ὁ μὲν γὰρ χρόνος ὁρίζει τὴν κίνησιν, ἀριθμὸς ὢν αὐτῆς· ἡ δὲ κίνησις, τὸν χρόνον. καὶ λέγομεν πολὺν ἢ ὀλίγον χρόνον, τῇ κινήσει μετροῦντες· καθάπερ καὶ τῷ ἀριθμητῷ τὸν ἀριθμόν· οἷον, τῷ ἑνὶ ἵππῳ, τὸν τῶν ἵππων ἀριθμόν. τῷ μὲν γὰρ ἀριθμῷ τὸ τῶν ἵππων πλῆθος γνωρίζομεν· πάλιν δὲ τῷ ἑνὶ ἵππῳ, τὸν τῶν ἵππων ἀριθμὸν αὐτόν. ὁμοίως δὲ καὶ ἐπὶ τοῦ χρόνου καὶ τῆς κινήσεως· τῷ μὲν γὰρ χρόνῳ τὴν κίνησιν, τῇ δὲ κινήσει τὸν χρόνον μετροῦμεν. 7 Καὶ τοῦτ' εὐλόγως συμβέβηκεν· ἀκολουθεῖ γὰρ τῷ μεγέθει ἡ κίνησις, τῇ δὲ κινήσει ὁ χρόνος, τῷ καὶ ποσὰ, καὶ συνεχῆ, καὶ διαιρετὰ εἶναι· διὰ μὲν γὰρ τὸ μέγεθος εἶναι τοιοῦτον, ἡ κίνησις ταῦτα πέπονθε· διὰ δὲ τὴν κίνησιν, ὁ χρόνος. καὶ μετροῦμεν καὶ τὸ μέγεθος τῇ κινήσει, καὶ τὴν κίνησιν τῷ μεγέθει· πολλὴν γὰρ φαμὲν εἶναι τὴν ὁδὸν, ἂν ᾖ ἡ πορεία πολλή· καὶ ταύτην πολλὴν, ἂν * ἡ ὁδὸς πολλή. * καὶ τὸν χρόνον, ἂν ἡ κίνησις· καὶ τὴν κίνησιν, ἂν ὁ χρόνος.

* καὶ ὁ συνεχὴς συνεχοῦς, φανερόν.
* καὶ ἀριθμὸς ἔστι μὲν ὡς ἔστιν, ἔστι δ' ὡς οὐκ ἔστι.
* καὶ χρόνον.
* καὶ ἡ ὁδὸς ᾖ π.
* Vide Simplicium.

B TEmpus igitur eſſe numerũ motus ratione prioris & poſterioris, & *eſſe* continuum, quia *eſt* continui, perſpicuum *eſt*. 2 Minimus autem numerus, qui ſimpliciter *accipitur*, eſt binarius: aliquis autem numerus partim eſt *minimus*, partim non eſt. vt lineæ minimus numerus multitudine quidem ſunt duæ, aut vna: magnitudine vero non eſt minimus: ſemper enim omnis linea diuiditur. quare ſimiliter etiã tempus: minimum enim numero eſt vnum, aut duo: magnitudine autem non eſt. 3 Perſpicuum quoque *eſt*, cur non dicatur velox & tardum: ſed multum & paucum, & longũ & breue. nam quà *eſt* continuum, C *eſt* longum & breue: quà verò *eſt* numerus, *eſt* multum & paucum. ſed velox & tardum non eſt: quia nec vllus numerus quo numeramus, eſt velox & tardus. 4 Et idem *tempus* ſimul *eſt* vbique. prius autem & poſterius non eſt idem: quoniam & mutatio, præſens quidem vna *eſt*, præterita verò & futura *eſt* diuerſa. tempus autem eſt numerus, non quo numeramus, ſed qui numeratur. hoc autem euenit ratione prioris & poſterioris ſemper diuerſum: quia momenta ſunt diuerſa. numerus autem eſt vnus & idem, centum equorum, & centum hominum: ſed quorum *eſt* numerus, *caſunt* diuerſa, *nempe* equi & homines. 5 Præterea vt accidit motum eſſe vnum & D eundem iterum atque iterum, ita & tempus *idem eſſe* accidit: vt annum, aut ver, vel autumnum. 6 Non ſolùm autem metimur motum tempore, ſed etiam motu tempus: quia ſe inuicem definiunt. tempus enim definit motum, cùm ſit eius numerus: ac motus tempus. dicimúſque multum ac paucum tempus, motu metientes, quemadmodum & numerabili numerum: verbi gratiã, vno equo, numerum equorum. etenim numero cognoſcimus multitudinem equorum: ruſúſque vno equo ipſum numerũ equorum: ſimiliter autem & in tempore, & in motu *res habet*. nam tempore motum, & motu tempus meti- E mur. 7 Atque hoc eſt rationi conſentaneum: ſequitur enim magnitudinem motus, & motum tempus: quia ſunt & quanta, & continua, & diuidua. nam propterea quòd talis eſt magnitudo, motus ita eſt affectus: & propter motum tempus: metimúrque magnitudinem motu, & motum magnitudine. dicimus enim longam eſſe viam, ſi ſit longa profectio: & hanc longam, ſi *ſit longa* via: nec non tempus, ſi motus: & motum, ſi tempus.

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1 2 . ' # ' " 9 7 ' D 0 F ' 6 2 ' 2 ' / . / ' 0 ' ' 0 < V ' 9S ' 9B (SA @ ' V ' S19 L , ' 2@/ M = ' M

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(E 2 / 4 0 1 1 ' 4 . 9 9 1 / P 8 6 3 1 9 8 / 3 ? S , ' . . 2 6 / . ' (V A ' Z S X'

' 0 . ' . . 1' T 9 4' 8 2 2 0 ' 9 2 9 (9 9 ' C ' / O 6 / A Z / ' 2 ' & @ 3') 4 4 , - : K

' 4 6 ! ' M . 9 ' 1 9 1 2 6 3 $' 9 4 ' 2 / 2 ' 4 E 4 . . ' 2 9 F 6 9 ' 0 ' ' 2 ($' $' ! ! 3' ' " R ' - ' ' ' ' ' 3 J : 9

V 6 9 2 1 H 1 9 8 ' 0 6 . ' 6 . G @ 4 2 9 8 ' 1 9 8 / 9 ' 2 0 ' 8 ' " ? ' * ' D ($6]P3@ ' - b ' @ D ' ' - 3 $

. 9 8 2 3 9 2 8 9 ' 9 ') 3 ' / 8 3 9 0 6 0 ' # & ! O ' - ML : O < O1W. \ ) ')

1 P 6 3 ' V F 6 0 ' 9 1' 2 6 8 9 6 3 8 T 1 6 3 $' 8 / 2 3 ' 0 6 . 9 8 ' 4 ' ' P " D 0' \1' ' BS& 4 3 [d ? 0 & E 1 F B

! H / 4' 9 1 ' 4 9 ' 1 0 8 ' 6 / 4 8 4 6 9 1 ' ' T 6 / . . 0 A ' 9 , ' 2 ; 1 , S K J ? KS 0 ' U / $ 0 ' B S . 4 ' / R ' ! U

8 ' 8 6 8 9 0 F H 9 2 9 0 2 1 ' F M 0 . 9 1 6 3' 9 1 2 9 A ' . N , < 7 ' ' F E ' R

6 8 2 ' S 9 9 2 1 F 8 / 9 # F 6 0 2 / 2 ' / 2 2 2 ' $ 8 ' ' ' ' " ' A ' $' <

1 9 2 @ A ' 2 9 1' 1 9 8 0 3 ' 1 1 . 0 8 ' 9 / 6 0 ' 9 1 9 2 . 0 8 '

8 4 3' @ 0 1 [S 8 . 1 S 6 8 * B F S 7 4 2 , ? ' 0 2 6 8 2

1 9 8 / 9 ' ' " 9 / 1 9 ' F 6 ' 2 / 2 ' 1 8 1' 2 ' 1 9 8 / 9 ' + ' B 8 ! E ; 9 ; 8 $ $ / 4 ; ! " M ' 0 0 ' . ' R

T 6 / 2 0 8 ' 0 " 1 9 8 ' 1 9 8 / 3 ' 9 1' 8 9 2 6 0 ' 8 " ' A S 1' 9 + ' T % " ! ! :

9 1 6 8 ' F 8 0 3 ' 8 . 2 8 ' . ' . . 4 3 8 ' / 8 8 3 ' . 0 8 ' ' ? ' 1 1 ! I = 3 @ R ' V A e B K

6 . 3 ' 2 ' 1 9 8 / 9 ' * ' / 2 ' . 8 1' 9 2 . ' 2 . 9 . 9 ' ' $ ' ? ' ' 2 ? ' 3 ' ' A ' < ' (

? ' 4 ' F 6 / 4 = 2 ? / 1 S ' / / 6 . 1 ' 1 ' / ' 9 1 1 / 8 ' F 6 / 4 ' ' S / ' ' , $ ' G E 6 / 8 6

; B 8 1 . 8 / 9 # F / 0 . 9 0 " O ' ' 2 / 2 8 / 1 6 3 ' 9 4 ' ' = 2 / =

, 8 8 . 6 3 8 / 6 = # 2 2 S 8 . 8 0 6 1 ! 8 2 / 1 6 3 / J . 1 9 ' R ' 1 0 d 0 E $' E / @ 0 1 0 ' . 2 9 F 6 . ' 9 9 2

. . 0 2 F 6 / 4 ' F 6 . . . A ' 2 / 2 9 2 2 ' M 8 2 9 ' 2 8 / 7 . ' < 9) " 7 < ' ; ' ' E B / J S ' ' 0 ' f' . 1 . K2 ' 6 ' ' . P 6 6 9

, , , ' ? , ' [, A R S S a A A S A (A (, ' ' , , O ' , , O , ?

7 * ; 4 = ' = : 4 5 ' 3 4 5 3 7 , = : , 1 9 9 G 1 = 2 4 ; 6

2 / 6 3 ' 0 I 1 9 0 2 I f 2 S 1 8 ? ' , S = ? , R . 1 V ' ' /

ἐστι τὸ εἶναι ἀριθμὸν τοῦ πράγματος, καὶ μετρεῖσθαι δὲ τὸ εἶναι αὐτοῦ τῷ ἀριθμῷ ἐν ᾧ ἐστιν. ὥστ' εἰ ἐν χρόνῳ, ὑπὸ χρόνου. μετρήσει δ' ὁ χρόνος τὸ κινούμενον καὶ τὸ ἠρεμοῦν, ᾗ τὸ μὲν κινούμενον, τὸ δὲ ἠρεμοῦν· τὴν γὰρ κίνησιν αὐτῶν μετρήσει καὶ τὴν ἠρεμίαν, πόση τις. 11 Ὥστε τὸ κινούμενον οὐχ ἁπλῶς ἔσται μετρητὸν ὑπὸ τοῦ χρόνου, ᾗ ποσόν τι ἐστίν, ἀλλ' ᾗ ἡ κίνησις αὐτοῦ ποσή. ὥστε ὅσα μήτε κινεῖται, μήτε ἠρεμεῖ, οὐκ ἔστιν ἐν χρόνῳ· τὸ μὲν γὰρ ἐν χρόνῳ εἶναι, ἐστὶ τὸ μετρεῖσθαι χρόνῳ· ὁ δὲ χρόνος κινήσεως καὶ ἠρεμίας μέτρον. 12 Φανερὸν οὖν ὅτι οὐδὲ τὸ μὴ ὂν ἔσται πᾶν ἐν χρόνῳ, οἷον ὅσα μὴ ἐνδέχεται ἄλλως, ὥσπερ τὸ τὴν διάμετρον εἶναι τῇ πλευρᾷ σύμμετρον. 13 Ὅλως γὰρ, εἰ μέτρον μέν ἐστι κινήσεως ὁ χρόνος καθ' αὑτὸ, τῶν δὲ ἄλλων κατὰ συμβεβηκὸς, δῆλον ὅτι ὧν τὸ εἶναι μετρεῖ, τούτοις ἅπασιν ἔσται τὸ εἶναι ἐν τῷ ἠρεμεῖν ἢ κινεῖσθαι. ὅσα μὲν οὖν φθαρτὰ καὶ γενητὰ, καὶ ὅλως, ὅτε μὲν ὄντα, ὅτε δὲ μὴ, ἀνάγκη ἐν χρόνῳ εἶναι· ἔστι γὰρ χρόνος τις πλείων, ὃς ὑπερέξει τὸ εἶναι αὐτῶν, καὶ τοῦ μετροῦντος τὴν οὐσίαν αὐτῶν. τῶν δὲ μὴ ὄντων, ὅσα μὲν περιέχει ὁ χρόνος, τὰ μὲν ἦν, οἷον Ὅμηρός ποτε ἦν, τὰ δὲ ἔσται, οἷον τῶν μελλόντων τι, ἐφ' ὁπότερα περιέχει· καὶ εἰ ἐπ' ἄμφω, ἀμφότερα καὶ ἦν, καὶ ἔσται. ὅσα δὲ μὴ περιέχει μηδαμῇ, οὔτ' ἦν, οὔτ' ἔστιν, οὔτ' ἔσται. ἔστι δὲ τοιαῦτα τῶν μὴ ὄντων, ὅσων τὰ ἀντικείμενα ἀεί ἐστιν, οἷον τὸ ἀσύμμετρον εἶναι τὴν διάμετρον, ἀεί ἐστι, καὶ οὐκ ἔσται τοῦτο ἐν χρόνῳ. οὐ τοίνυν οὐδὲ τὸ σύμμετρον· διὸ ἀεὶ οὐκ ἔστιν, ὅτι ἐναντίον τῷ ἀεὶ ὄντι. ὅσων δὲ τὸ ἐναντίον μὴ ἀεὶ, ταῦτα δύναται καὶ εἶναι καὶ μὴ, καὶ ἔστι γένεσις καὶ φθορὰ αὐτῶν. 14 Τὸ δὲ νῦν ἐστι συνέχεια χρόνου, ὥσπερ ἐλέχθη· συνέχει γὰρ τὸν χρόνον τὸν παρελθόντα καὶ ἐσόμενον, καὶ ὅλως πέρας χρόνου ἐστίν· ἔστι γὰρ τοῦ μὲν ἀρχὴ, τοῦ δὲ τελευτή. ἀλλὰ τοῦτ' οὐχ ὥσπερ ἐπὶ τῆς στιγμῆς μενούσης φανερόν. διαιρεῖ δὲ δυνάμει. καὶ ᾗ μὲν τοιοῦτον, ἀεὶ ἕτερον τὸ νῦν, ᾗ δὲ συνδεῖ, ἀεὶ τὸ αὐτὸ, ὥσπερ ἐπὶ τῶν μαθηματικῶν γραμμῶν. οὐ γὰρ * ἡ αὐτὴ ἀεὶ καὶ μία στιγμὴ τῇ νοήσει· διαιρούντων γὰρ, * ἄλλη· ᾗ δὲ μία, ἡ αὐτὴ πάντῃ. οὕτω καὶ τὸ νῦν τὸ μὲν, τοῦ χρόνου διαίρεσις κατὰ δύναμιν· τὸ δὲ, πέρας ἀμφοῖν καὶ ἑνότης· ἔστι δὲ τὸ αὐτὸ καὶ κατὰ τὸ αὐτὸ ἡ διαίρεσις καὶ ἡ ἕνωσις· τὸ δ' εἶναι οὐ ταὐτό. τὸ μὲν οὖν οὕτω λέγεται τῶν νῦν. 15 Ἄλλο δὲ, ὅταν ὁ χρόνος ὁ τούτου ἐγγὺς ᾖ. ἥξει νῦν, ὅτι τήμερον ἥξει· ἥκει νῦν, ὅτι ἦλθε τήμερον. τὰ δ' ἐν Ἰλίῳ γέγονεν οὐ νῦν, οὐδ' ὁ κατακλυσμὸς γέγονε νῦν· καίτοι συνεχὴς ὁ χρόνος εἰς αὐτὰ, ἀλλ' ὅτι οὐκ ἐγγύς. 16 Τὸ δὲ ποτὲ, χρόνος ὡρισμένος πρὸς τὸ πρότερον νῦν, οἷον ποτὲ ἐλήφθη ἡ Τροία, καὶ ποτὲ ἔσται κατακλυσμός· δεῖ γὰρ πεπεράνθαι πρὸς τὸ νῦν. ἔσται ἄρα ποσός τις ἀπὸ τοῦδε * χρόνος εἰς ἐκεῖνο, καὶ ἦν εἰς τὸ παρελθόν. 17 Εἰ δὲ μηδεὶς χρόνος, ὃς οὐ ποτὲ, πᾶς ἂν εἴη χρόνος πεπερασμένος. * 18 Ἆρ' οὖν ὑπολείψει, ἢ οὔ, εἴπερ ἀεὶ ἔστι κίνησις. 19 Ἄλλος οὖν, ἢ ὁ αὐτὸς πολλάκις; δῆλον ὅτι ὡς ἂν ἡ κίνησις,

* γρ. ἡ αὐτὴ ἀεὶ στιγμή.
* γρ. ἄλλη δὲ ἄλλη.

* γρ. χρόνος ἔσται εἰς.

* Scrib. ἆρ' οὖν ὑπολείψει; ἢ οὔ; vel ἆρ' οὖν ὑπολείψει ὁ χρόνος;

quàm eſſe aliquem numerum rei, & numerum, in quo *ea res* eſt, metiri eius rei eſſentiam. quare ſi *eſt* in tempore, *eius rei eſſentiam metitur* tempus. metietur autem tẽpus, id quod mouetur, & id quod quieſcit, quatenus illud mouetur, hoc autem quieſcit. nam motionem eorum & quietem metietur, quota ſit. quocirca id quod mouetur, nõ ſimpliciter cadit ſub menſuram tẽporis, quatenus eſt quantum quiddam, ſed quatenus motio eius *eſt* tanta. 11 Quapropter quæcumque nec mouentur nec quieſcunt, non ſunt in tempore. nam eſſe in tempore, *nihil aliud eſt* quàm comprehendi menſura temporis: tempus autem *eſt* menſura motus & quietis. 12 Patet igitur, nec quidquid non eſt, in tempore eſſe: velvti, quæcumque non poſſunt aliter *ſe habere*, vt dimetientem habere communem menſuram cum latere. 13 Omnino enim ſi tempus eſt motus menſura per ſe, cæterorum autem ex accidenti: manifeſtum *eſt*, quorum eſſentiam *tempus* metitur, eorum omnium eſſentiam conſiſtere in eo vt moueantur & quieſcant. quæcumque igitur interitui & generationi ſunt obnoxia, & omnino quandoque ſunt, quandoque non ſunt hæc, neceſſe *eſt* eſſe in tempore. eſt enim tempus quoddam maius, quod excedet eorum eſſentiam, ac tẽpus metiens eorum eſſentiam. ſed inter ea quæ non ſunt, quæcumque tẽpus continet, partim fuerunt, vt Homerus aliquando fuit: partim erunt, vt futurum aliquid: in vtramvis partem *ea tempus* contineat. & ſi in vtramque partem *contineat*, & erant & erunt. Quæ verò *tempus* nullo modo continet, *hæc* neque fuerunt, neque ſunt, neq; erunt. eiuſmodi autem ſunt ea non entia, quorum oppoſita ſemper ſunt. verbi gratia, dimetientem non habere communem mẽſuram, ſemper eſt: atque hoc non erit in tempore: proinde nec habere communem menſuram. ideo ſemper non eſt, quia *eſt* contrarium ei quod ſemper eſt: quorum autem contrarium non ſemper *eſt*, hæc poſſunt eſſe & non *eſſe*: eorumque eſt ortus & interitus. 14 Porrò Nunc, *ſeu momentum*, eſt continuatio temporis, ſicvti dictum fuit: continet enim tempus præteritum & futurum: & omnino eſt terminus temporis. quoniam alterius eſt principium, alterius *eſt* finis. quamquam hoc non *eſt*, vt in puncto permanente, perſpicuum. diuidit autem poteſtate, & quatenus *eſt* tale, ſemper *eſt* diuerſum Nunc, quatenus verò conectit, ſemper *eſt* idem: vt in mathematicis lineis. non enim *eſt* ſemper vnum & idem punctum intellectu: quia diuidentibus eſt aliud atque aliud: ſed quatenus *eſt* vna *linea*, idem *punctum* eſt omnino. ita etiam Nunc, partim eſt temporis diuiſio ſecundùm poteſtatem: partim terminus vtriuſque & copula. eſt autem idem & ſecundùm idem diuiſio & copulatio: ſed eſſentia non *eſt* eadem. Sic ergo dicitur aliquod Nunc. 15 Aliud autem *eſt*, quando eſt tempus huic propinquum. veniet *enim* nunc, quia hodie veniet: *aut* venit nunc, quia venit hodie. ſed quæ Ilij *ſunt geſta*, non ſunt facta nunc, neque inundatio nunc eſt facta. atqui vſque ad ea tempus eſt continuum. ſed *nihilo magis dicuntur nunc facta*, quia non *ſunt* propinqua. 16 Aliquando autem, eſt tempus terminatum priori *&* *poſteriori* Nunc: velvti, aliquando capta eſt Troia: & aliquando erit inundatio. oportet enim eſſe terminatum ipſo Nunc. erit igitur tempus certa quantitate præditum, ab hoc *Nunc* vſque ad illud. & *ita* fuit in præteritum. 17 Si verò nullum *eſt* tẽpus, quod non *ſit* aliquando, certè omne tempus finitum erit. 18 Numquid ergo deficiet? an non? ſi quidem ſemper eſt motus. 19 Aliúſne igitur, an idem ſæpius? manifeſtum *eſt*, vt eſt motus,

ita etiam *eſſe* tempus. nam ſi vnus & idem motus ali- A quando ſit, erit vnum & idem tempus. ſin minùs, non erit. 20 Quia verò Nunc *eſt* finis & principium temporis, non tamen eiuſdem, ſed finis præteriti, principium autem futuri: vtique ſicut circulus in eodem quodammodo habet conuexum & concauum, ita etiam tempus ſemper *eſt* in principio & fine. ideóque ſemper aliud videtur *eſſe*: quia Nunc non *eſt* principium & finis eiuſdem: alioqui ſimul & ſecundùm idem eſſent oppoſita. non deficiet igitur *tempus*, quia ſemper in principio *eſt*. 21 Modò autem dicitur, *quod eſt* propinquum præſenti Nunc indiuiduo, cùm ſit pars futuri temporis: *velvti*, quando ambulabis? modò: quia propinquum *eſt* tempus, quo futurum eſt, *vt ambulet*. & præteriti B temporis *illud*, quod non procul *diſtat* à præſenti Nunc: *velvti*, quando ambulabis? modò ambulaui. Ilium autem modò captum eſſe non dicimus, quia *eſt* valde remotum à præſenti Nunc. 22 Et nuper dicitur, *quod eſt* propinquum præſenti Nunc, & *eſt* pars præteriti. velvti, quando veniſti? nuper: ſi ſit tempus propinquum præſenti Nunc. 23 Olim autem, quod longè *diſtat*. 24 Repentè verò *dicitur*, quod in tempore propter exiguitatem inſenſibili de ſtatu dimouetur. 25 Omnis autem mutatio naturaliter vim habet de ſtatu dimouendi. omnia verò in tempore fiunt, & intereunt, idcirco alij dixerunt *tempus eſſe* ſapientiſſimum: Pythagoreus autem Paro rectiùs dixit *eſſe* inſipientiſſimum; quia & obliuiſcuntur in eo. manifeſtum igitur *eſt*, *tempus* per ſe fore po- C tiùs cauſam interitus, quàm generationis, quemadmodum & antea dictum fuit. nam mutatio per ſe vim habet de ſtatu dimouendi: ex accidenti autem *eſt* cauſa generationis, & cur *quidque* ſit *cuius rei* argumentum ſufficiens *eſt*: quia nihil fit, quin aliquo modo ipſum moueatur & agat: interit autem, etiam quod nihil mouetur. atque hunc maximè interitum dicere ſolemus *eſſe* à tempore. at verò ne huc quidem tempus facit: ſed accidit, vt hæc quoque mutatio in tempore fiat. 26 Eſſe igitur tempus, & quid *ſit*, & quot modis dicimus Nunc, & quid *ſit* Aliquando, & Nuper, & Modò, & Olim, & Repentè, dictum eſt.

A οὕτω καὶ ὁ χρόνος. εἰ μὲν γὰρ ἡ αὐτὴ καὶ μία γίνεταί ποτε, ἔσται χρόνος εἷς καὶ ὁ αὐτός· εἰ δὲ μή, οὐκ ἔσται. 20 Ἐπεὶ δὲ τὸ νῦν τελευτὴ καὶ ἀρχὴ τοῦ χρόνου, ἀλλ' οὐ τοῦ αὐτοῦ, ἀλλὰ τοῦ μὲν παρήκοντος τελευτή, ἀρχὴ δὲ τοῦ μέλλοντος· ἔχοι ἂν ὥσπερ ὁ κύκλος ἐν τῷ αὐτῷ πως τὸ κυρτὸν καὶ τὸ κοῖλον, οὕτω καὶ ὁ χρόνος ἀεὶ ἐν ἀρχῇ καὶ τελευτῇ. καὶ διὰ τοῦτο δοκεῖ ἀεὶ ἕτερος· οὐ γὰρ τοῦ αὐτοῦ ἀρχὴ καὶ τελευτὴ τὸ νῦν· ἅμα γὰρ ἂν καὶ κατὰ τὸ αὐτὸ, τἀντικείμενα εἴη, καὶ οὐχ ὑπολείψει δή· ἀεὶ γὰρ ἐν ἀρχῇ. 21 Τὸ δ' ἤδη, τὸ ἐγγύς ἐστι τοῦ παρόντος νῦν ἀτόμου, μέρος τοῦ μέλλοντος χρόνου. πότε[*] βαδίζεις; ἤδη· ὅτι ἐγγὺς ὁ χρόνος ἐν ᾧ μέλλει. καὶ τοῦ παρεληλυθότος χρό- B νου τὸ μὴ πόῤῥω τοῦ νῦν.[*] πότε βαδίζεις; ἤδη βεβάδικα. τὸ δὲ Ἴλιον φάναι ἤδη ἑαλωκέναι οὐ λέγομεν, ὅτι πόῤῥω λίαν τοῦ νῦν. 22 Καὶ τὸ ἄρτι, τὸ ἐγγὺς τοῦ παρόντος νῦν, καὶ μόριον τοῦ παρελθόντος. πότε ἦλθες; ἄρτι· ἐὰν ᾖ ὁ χρόνος ἐγγὺς τοῦ ἐνεστῶτος νῦν. 23 Πάλαι δὲ, τὸ πόῤῥω. 24 Τὸ δὲ ἐξαίφνης, τὸ ἐν ἀναισθήτῳ χρόνῳ διὰ μικρότητα ἐκστάν. 25 Μεταβολὴ δὲ πᾶσα φύσει ἐκστατικόν. ἐν δὲ τῷ χρόνῳ πάντα γίνεται καὶ φθείρεται· διὸ καὶ, οἱ μὲν σοφώτατον ἔλεγον, ὁ δὲ Πυθαγόρειος Πάρων, ἀμαθέστατον, ὅτι καὶ ἐπιλανθάνονται ἐν τούτῳ, λέγων ὀρθότερον. δῆλον οὖν ὅτι φθορᾶς μᾶλλον ἔσται καθ' C αὑτὸν αἴτιος, ἢ γενέσεως, καθάπερ ἐλέχθη καὶ πρότερον· ἐκστατικὸν γὰρ ἡ μεταβολὴ καθ' αὑτήν· γενέσεως δὲ καὶ τοῦ εἶναι, κατὰ συμβεβηκός. σημεῖον δὲ ἱκανὸν, ὅτι γίνεται μὲν μηδὲν ἄνευ τοῦ κινεῖσθαί πως αὐτὸ καὶ πράττειν. φθείρεται δὲ καὶ μηδὲν κινούμενον· καὶ ταύτην μάλιστα λέγειν εἰώθαμεν ὑπὸ τοῦ χρόνου φθοράν· οὐ μὴν ἀλλ' οὐδὲ ταύτην ὁ χρόνος ποιεῖ, ἀλλὰ συμβαίνει ἐν χρόνῳ γίνεσθαι καὶ ταύτην τὴν μεταβολήν. 26 Ὅτι μὲν οὖν ἔστιν ὁ χρόνος, καὶ τί, καὶ ποσαχῶς, λέγομεν τὸ νῦν, καὶ τί τὸ ποτὲ, καὶ τὸ ἄρτι, καὶ τὸ ἤδη, καὶ τὸ πάλαι, καὶ τὸ ἐξαίφνης, εἴρηται.

[*] γρ. βαδίζει;

[*] quidam πότε βαδίζεις;

Reliqua de tempore.

Cap. XX.

HIS à nobis ita commemoratis, perſpicuum *eſt* D neceſſe *eſſe*, vt omnis mutatio *ſit in tempore*; & quicquid mouetur, moueatur in tempore. celerius enim ac tardius, eſt in omni mutatione: quoniam in omnibus ſic apparet. dico autem celeriùs moueri, quod priùs mutatur in ſubiectum, cùm moueatur in eodem interuallo, & æquabili motu. vt in latione ſi ambo moueantur per circumferentiam, vel ambo per *lineam* rectam. ſimiliterque in aliis *ſe res habet*. at verò prius, in tempore eſt. prius namque & poſterius dicimus ratione diſtantiæ à præſenti momento: præſens autem momentum *eſt* terminus præteriti & futuri. quare cùm præſens E momentum ſit in tempore, etiam prius & poſterius in tempore erunt: nam in quo *eſt* præſens momentum, in eo eſt etiam diſtantia à præſenti momento: ſed contrario modo dicitur prius in tempore præterito & in futuro. quoniam in præterito prius dicimus, *quod eſt* remotius à præſenti momento: poſterius autem, *quod eſt* propinquius.

D ΤΟύτων δ' ἡμῖν οὕτω διωρισμένων, φανερὸν ὅτι ἅπασαν μεταβολὴν, καὶ ἅπαν τὸ κινούμενον ἀνάγκη κινεῖσθαι ἐν χρόνῳ. τὸ γὰρ θᾶττον καὶ βραδύτερον, κατὰ πᾶσάν ἐστι μεταβολήν· ἐν πᾶσι γὰρ οὕτω φαίνεται. λέγω δὲ θᾶττον κινεῖσθαι τὸ πρότερον μεταβάλλον εἰς τὸ ὑποκείμενον κατὰ τὸ αὐτὸ διάστημα, καὶ ὁμαλὴν κίνησιν κινούμενον· οἷον, ἐπὶ τῆς φορᾶς, εἰ ἄμφω κατὰ τὴν περιφερῆ κινεῖται, ἢ ἄμφω κατὰ τὴν εὐθεῖαν· ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. ἀλλὰ μὴν τό γε πρότερον ἐν χρόνῳ ἐστί· πρότερον γὰρ καὶ ὕστερον λέγομεν κατὰ τὴν πρὸς τὸ νῦν ἀπόστα- E σιν· τὸ δὲ νῦν, ὅρος τοῦ παρήκοντος, καὶ τοῦ μέλλοντος· ὥστε ἐπεὶ τὰ νῦν ἐν χρόνῳ, καὶ τὸ πρότερον καὶ ὕστερον ἐν χρόνῳ ἔσται· ἐν ᾧ γὰρ τὸ νῦν, καὶ ἡ τοῦ νῦν ἀπόστασις. ἐναντίως δὲ λέγεται τὸ πρότερον κατά τε τὸν παρεληλυθότα χρόνον, καὶ τὸν μέλλοντα· ἐν μὲν γὰρ τῷ παρεληλυθότι πρότερον λέγομεν, τὸ πορρώτερον τοῦ νῦν, ὕστερον δὲ, τὸ ἐγγύτερον.

ἐν δὲ τῷ μέλλοντι, πρότερον μὲν τὸ ἐγγύτερον, ὕστερον δὲ τὸ πορρώτερον. ὥστε ἐπεὶ, τὸ μὲν πρότερον ἐν χρόνῳ, πάσῃ δ᾽ ἀκολουθεῖ κινήσει τὸ πρότερον, φανερὸν ὅτι πᾶσα μεταβολὴ καὶ πᾶσα κίνησις ἐν χρόνῳ ἐστίν. 2 Ἄξιον δὲ ἐπισκέψεως, καὶ πῶς ποτε ἔχει ὁ χρόνος πρὸς τὴν ψυχὴν, καὶ διὰ τί ἐν παντὶ εἶναι δοκεῖ ὁ χρόνος, καὶ ἐν γῇ, καὶ ἐν θαλάττῃ, καὶ οὐρανῷ. 3 Ἢ ὅτι κινήσεώς τι πάθος, ἢ ἕξις, ἀριθμός γε ὤν, ταῦτα δὲ κινητὰ πάντα. ἐν τόπῳ γὰρ πάντα· ὁ δὲ χρόνος καὶ ἡ κίνησις ἅμα, κατά τε τὴν δύναμιν, καὶ κατ᾽ ἐνέργειαν. 4 Πότερον δὲ μὴ οὔσης τῆς ψυχῆς, εἴη ἂν ὁ χρόνος, ἢ οὔ, ἀπορήσειεν ἄν τις· ἀδυνάτου γὰρ ὄντος εἶναι τοῦ ἀριθμήσοντος, ἀδύνατον καὶ ἀριθμητόν τι *εἶναι· ὥστε δῆλον ὅτι οὐδὲ ἀριθμός· ἀριθμὸς γὰρ ἢ τὸ ἠριθμημένον, ἢ τὸ ἀριθμητόν. Εἰ δὲ μηδὲν ἄλλο πέφυκεν, ἢ ψυχὴ, ἀριθμεῖν, καὶ ψυχῆς νοῦς, ἀδύνατον εἶναι χρόνον, ψυχῆς μὴ οὔσης· ἀλλ᾽ ἢ τοῦτο ὅ ποτε ὂν ἐστὶν ὁ χρόνος· οἷον εἰ ἐνδέχεται κίνησιν ἄνευ ψυχῆς εἶναι. τὸ δὲ πρότερον καὶ ὕστερον ἐν κινήσει ἐστί· χρόνος δὲ ταῦτ᾽ ἐστὶν ᾗ ἀριθμητά ἐστιν. 5 Ἀπορήσειε δ᾽ ἄν τις καὶ ποίας κινήσεως ὁ χρόνος ἀριθμὸς, ἢ ὁποιασοῦν. καὶ γὰρ γίνεται ἐν χρόνῳ* καὶ φθείρεται, καὶ αὐξάνεται, καὶ ἀλλοιοῦται ἐν χρόνῳ, καὶ φέρεται· ᾗ οὖν κίνησίς ἐστι, ταύτῃ ἐστὶν ἑκάστης κινήσεως ἀριθμός. διὸ κινήσεως ἁπλῶς ἀριθμός ἐστι συνεχοῦς, ἀλλ᾽ οὐ τινός. 6 Ἀλλ᾽ ἔστι νῦν κεκινῆσθαι καὶ ἄλλο, ὧν ἑκατέρας τῆς κινήσεως εἴη ἂν ἀριθμός· ἕτερος οὖν χρόνος ἔσται, καὶ ἅμα δύο ἴσοι χρόνοι ἂν εἶεν, ἢ οὔ; ὁ αὐτὸς γὰρ χρόνος εἷς ὁμοίως καὶ ἅμα· εἴδει δὲ καὶ οἱ μὴ ἅμα. Εἰ γὰρ εἶεν [οἱ μὲν] κύνες, οἱ δ᾽ ἵπποι, ἑκάτεροι δ᾽ ἑπτὰ, ὁ αὐτὸς ἀριθμός· οὕτω καὶ τῶν κινήσεων τῶν ἅμα περαινομένων, ὁ αὐτὸς χρόνος· ἀλλ᾽ ἡ μὲν ταχεῖα ἴσως, ἡ δ᾽ οὔ· καὶ ἡ μὲν φορὰ, ἡ δ᾽ ἀλλοίωσις. *ὁ μέντοι χρόνος, ὁ αὐτὸς, εἴπερ καὶ ὁ ἀριθμὸς ἴσος, καὶ ἅμα, τῆς τε ἀλλοιώσεως, καὶ τῆς φορᾶς· καὶ διὰ τοῦτο, αἱ μὲν κινήσεις ἕτεραι καὶ χωρίς· ὁ δὲ χρόνος πανταχοῦ ὁ αὐτὸς, ὅτι καὶ ὁ ἀριθμὸς εἷς, καὶ πανταχοῦ ὁ αὐτὸς, ὁ τῶν ἴσων καὶ ἅμα. 7 Ἐπεὶ δ᾽ ἐστὶ φορὰ καὶ ταύτης ἡ κύκλῳ, ἀριθμεῖται δ᾽ ἕκαστον ἑνί τινι συγγενεῖ, μονάδες μονάδι, ἵπποι δ᾽ ἵππῳ· οὕτω καὶ ὁ χρόνος, χρόνῳ τινὶ ὡρισμένῳ· μετρεῖται δ᾽ ὥσπερ εἴπομεν, ὅ, τε χρόνος κινήσει, καὶ ἡ κίνησις χρόνῳ. τοῦτο δ᾽ ἐστὶν, ὅτι ὑπὸ τῆς ὡρισμένης κινήσεως χρόνῳ μετρεῖται τῆς τε κινήσεως τὸ ποσὸν, καὶ τοῦ χρόνου. 8 Εἰ οὖν τὸ πρῶτον μέτρον πάντων τῶν συγγενῶν, ἡ κυκλοφορία ἡ ὁμαλὴς, μέτρον μάλιστα, ὅτι ὁ ἀριθμὸς ὁ ταύτης *γνωριμώτατος. ἀλλοίωσις μὲν οὖν, οὐδὲ αὔξησις, οὐδὲ γένεσις, οὐκ εἰσὶν ὁμαλεῖς. φορὰ δ᾽ ἐστί. 9 Διὸ καὶ δοκεῖ ὁ χρόνος εἶναι ἡ τῆς σφαίρας κίνησις, ὅτι ταύτῃ μετροῦνται αἱ ἄλλαι κινήσεις, καὶ ὁ χρόνος ταύτῃ τῇ κινήσει. 10 Διὰ δὲ τοῦτο, καὶ τὸ εἰωθὸς λέγεσθαι συμβαίνει· φασὶ γὰρ κύκλον εἶναι τὰ ἀνθρώπινα πράγματα, καὶ τῶν ἄλλων τῶν κίνησιν ἐχόντων φυσικὴν, καὶ γένεσιν, καὶ φθοράν. τοῦτο δὲ, ὅτι ταῦτα πάντα τῷ χρόνῳ κρίνεται, καὶ λαμβάνει τελευτὴν καὶ ἀρχὴν, ὥσπερ ἂν εἰ κατά τινα περίοδον· καὶ γὰρ ὁ χρόνος αὐτὸς εἶναι δοκεῖ κύκλος τις. τοῦτο δὲ πάλιν δοκεῖ, διότι τοιαύτης φορᾶς ἐστὶ μέτρον, καὶ μετρεῖται

* γρ. εἶναι ἀριθμούμενον.

* Vetus & fertur legit, & φθείρεται. alij hæc verba non agnoſcunt.

* Neſcio quid legerit hîc Argyropylus: ita aberrat à ſententia, & verbis Græcis.

* γρ. γνωριμώτατον.

A in futuro autem, prius, *quod eſt* propius: poſterius, *quod* remotius. Quapropter cùm prius *ſit* in tempore, omni autem motui prius ſit conſequens: perſpicuum *eſt*, omnem mutationem & omnem motum eſſe in tempore. 2 Dignum porro eſt conſideratione, & quonam modo affectum ſit tempus erga animam: & cur in omni re videatur eſſe tempus, & in terra, & in mari, & *in* cœlo. 3 An quia *eſt* motionis affectio quædam, ſiue habitus, cùm ſit *eius* numerus: hæc vero omnia mobiliā *ſunt*, quia omnia *ſunt* in loco: tempus autem & motus ſimul *ſunt*, tam poteſtate quàm actu. 4 Vtrùm autem niſi ſit anima, erit tempus, an non, du-

B bitare quiſpiam poſſit: cùm enim numerans eſſe nequit, impoſſibile eſt eſſe numerabile. quare manifeſtum *eſt*, ne quidem numerum *eſſe poſſe*: numerus enim *eſt* vel *quod eſt* numeratum, vel *quod eſt* numerabile. quòd ſi nihil aliud natura aptum eſt ad numerandum quàm anima, & quidem *ea pars* animæ, *quæ vocatur* intellectus: impoſſibile *eſt*, tempus eſſe, cùm anima non ſit, niſi hoc ipſum quod re & ſubiecto eſt tempus: veluti, ſi poteſt eſſe motus ſine anima: prius autem ac poſterius in motu eſt: ac tempus hæc eſt, quatenus ſunt numerabilia. 5 Sed & dubitare aliquis poſſit, cuius motionis numerus *ſit* tempus. an *eſt* cuiuſvis? quoniam & fit in tempore, & interit, & augetur, & variatur in tempore, &

C fertur. quatenus igitur eſt motus, eatenus eſt cuiuſque motionis numerus. idcirco eſt continuæ motionis ſimpliciter numerus, non cuiuſdam. 6 Verùm fieri poteſt, vt nunc aliud quoque motum ſit, quorum vtriuſque motionis erit numerus. ergo diuerſum tempus erit & ſimul duo æqualia tempora erunt? an non? omne enim tempus *eſt* vnum, ſimiliter & ſimul. ſpecie verò *vnum ſunt* etiam ea quæ non ſunt ſimul. etenim ſi ſint hi quidem canes: illi vero, equi: vtrique autem, ſeptem: numerus *eſt* idem: ſic etiam motuum, qui ſimul perficiuntur, idem eſt tempus. ſed alter fortaſſe *eſt* velox, alter minimè. & alter, latio: alter, variatio. tempus ta-

D men *eſt* idem; ſi quidem & numerus æqualis ac ſimul *eſt* tam variationis quam lationis. ideóque motus quidem diuerſi & ſeparati *ſunt*: tempus verò vbique *eſt* idem: quia etiam numerus *eſt* vnus & vbique idem, qui æqualium & ſimul eſt. 7 Quoniam autem eſt latio, & huius *ſpecies* conuerſio: numeratur autem vnumquodque vno aliquo eiuſdem generis, *vt* vnitates vnitate, equi equo, ita etiam tempus tempore aliquo definito: metitur autem (vt diximus) tempus motio, & motionem tempus: (quod quidem ideo eſt, quia motio tempore definita metitur & motionis quantitatem & temporis.) 8 Si igitur *quod eſt* primum, *eſt* menſura eorum omnium quæ *ſunt* eiuſdem generis: *certè* conuerſio æquabi-

E lis maximè *eſt* menſura: quia numerus eius *eſt* notiſſimus. ergo variatio quidem & accretio & generatio nón ſunt æquabiles: latio verò eſt *æquabilis*. 9 Ideóque tempus videtur eſſe motus ſphæræ: quia & alios motus, & ipſum tempus hic motus metitur. 10 Sed & propterea accidit, quod dici conſueuit. inquiunt enim res humanas eſſe circulum, & ceterarum quoque rerum, quæ motum naturalem & ortum & interitum habent, *circulum eſſe*. hoc autem *ideo*, quia hæc omnia tempore iudicantur, & accipiunt finem & principium, quaſi circuitione quadam. etenim ipſum quoque tempus videtur eſſe circulus quidam. & hoc rurſus ideo videtur, quia eſt huiuſmodi lationis menſura, & ipſum

metitur

A metitur huiuſmodi *latio*. quocirca dicere eas res quæ ſunt, eſſe circulum, *nihil aliud* eſt *quàm* dicere temporis eſſe quendam circulum. hoc autem *ideo*, quia ipſum metitur conuerſio. nam præter id quod metitur, nihil aliud eſſe videtur totum illud quod menſura definitur, quàm plures menſuræ. 11 Rectè etiam dicitur eundem *eſſe* numerum, ouium & canum, ſi vterque *ſit* æqualis. non *eſſe* tamen eundē denarium, nec eadem decē. ſicuti nec trianguli idem *ſunt* æquilaterus, & ſcalenus: quanquam figura *eſt* eadem, quia *ſunt* ambo trianguli. idem quippe dicitur, cuius differentia non differt, non *id* cuius *differentia* differt. vtputà triangulus, trianguli differentia differt: *ſunt* B igitur diuerſi trianguli. figura verò, figuræ *differentia* non *differt*, ſed *eſt* in vna & eadem diuiſione. figura enim quę *eſt* talis, *eſt* circulus: quę verò talis, *eſt* triangulus. horum autem, *is* qui *eſt* talis, *eſt* æquilaterus: qui verò talis, ſcalenus. ergo & hęc eſt eadem figura, quia *eſt* triangulus: ſed triangulus non idem *eſt*. Quare & numerus eſt idem: quia numerus ipſorum non differt numeri differentia ſed denarius non *eſt* idem: quoniam *ea*, de quibus dicitur, differunt, cum alia *ſint* canes, alia equi. 12 Ac de tempore quidem, tum ipſo tum iis quæ ad ipſum *pertinent*, & *huius* conſiderationis propria ſunt, dictum eſt.

A αὐτῆς ὥσπερ τοιαύτης· ὥστε τὸ λέγειν εἶναι τὰ γινόμενα τῶν πραγμάτων κύκλον, ὃ λέγειν ἐστὶ τοῦ χρόνου εἶναί τινα κύκλον· τοῦτο δέ, ὅτι μετρεῖται τῇ κυκλοφορίᾳ· παρὰ γὰρ τὸ* μέτρον, οὐδὲν ἄλλο παρεμφαίνεται τὸ μετρούμενον, ἀλλ' ἢ πλείω μέτρα, τὸ ὅλον. 11 Λέγεται δὲ ὀρθῶς, καὶ ὅτι ὁ ἀριθμὸς μὲν ὁ αὐτὸς ὁ τῶν προβάτων καὶ τῶν κυνῶν, εἰ ἴσος ἑκάτερος. δεκὰς δὲ οὐχ ἡ αὐτή, οὐδὲ δέκα τὰ αὐτά, ὥσπερ οὐδὲ τρίγωνα τὰ αὐτά, τὸ ἰσόπλευρον, καὶ τὸ σκαληνόν. καίτοι σχῆμά γε ταὐτό, ὅτι τρίγωνα ἄμφω· ταὐτὸν γὰρ λέγεται, οὗ μὴ διαφέρει διαφορᾷ, ἀλλ' οὐχὶ B οὗ διαφέρει· οἷον τρίγωνον τριγώνου διαφορᾷ διαφέρει· τοιγαροῦν ἕτερα τρίγωνα. *σχήματος δὲ οὔ, ἀλλ' ἐν τῇ αὐτῇ διαιρέσει καὶ μιᾷ. σχῆμα γὰρ τὸ μὲν τοιόνδε, κύκλος· τὸ δὲ τοιόνδε, τρίγωνον. τούτου δὲ τὸ μὲν τοιόνδε ἰσόπλευρον, τὸ δὲ τοιόνδε σκαληνόν. σχῆμα μὲν οὖν τὸ αὐτὸ καὶ τοῦτο τρίγωνον· τρίγωνον δ' οὐ τὸ αὐτό· καὶ ὁ ἀριθμὸς δὴ ὁ αὐτός· οὐ γὰρ διαφέρει ἀριθμοῦ διαφορᾷ ὁ ἀριθμὸς αὐτῶν. δεκὰς δὲ οὐχ ἡ αὐτή· ἐφ' ὧν γὰρ λέγεται, διαφέρει· τὰ μὲν γὰρ κύνες, τὰ δ' ἵπποι. 12 Καὶ περὶ μὲν χρόνου καὶ αὐτοῦ, καὶ τῶν περὶ αὐτὸν οἰκείων τῇ σκέψει εἴρηται.

* κ. μετρῶ,

* κ. σχήματος δ' ὅ.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ, Η περὶ φυσικῶν ἀρχῶν, τὸ Ε.

ARISTOTELIS, NATVRALIS AVSCVLTATIONIS, SEV DE NATVRALIBVS PRINCIPIIS, LIBER V.

DE MOTV.

Diuiſio motuum & mutationum.

Cap. I.

MVTATVR autem, quicquid mutatur, partim ex accidenti: (vt cùm dicimus muſicā ambulare, quia id ambulat, cui accidit eſſe muſicum) partim quia eius aliquid mutatur, ſimpliciter dicitur mutari (vt quæcumque dicuntur *mutari* ratione partium. ſanatur. n. corpus, quia *ſanatur* oculus, vel pectus: hæc verò *ſunt* partes totius corporis) eſt autē aliquid, quod nec ex accidēti mouetur, nec quia aliquid aliud ipſius moueatur, ſed quia ipſum mouetur primum. atque hoc eſt quod eſt per ſe mobile. 2 Sed in alia mutatione aliud eſt: vt variabile. ſed & variationis *ſubiectum*, quod ſanari vel calefieri poteſt, diuerſum *eſt*. 3 Eſt igitur & in eo quod mouet, eodem modo. nam aliud ex accidenti mouet: aliud ratione partis, quoniam aliqua eius partium *mouet*: aliud per ſe primum, vt medicus medetur, & manus percutit. 4 Quoniam autem eſt aliquid quod primū mouet, & eſt aliquid quod mouetur: præterea tempus, quo *mouetur*: & pręter hęc id ex quo, & in quo (omnis enim motus *eſt* ex aliquo, & in aliquid. nam aliud eſt quod primum mouet, & in

C ΜΕΤΑΒΑΛΛΕΙ δὲ τὸ μεταβάλλον πᾶν, τὸ μὲν κατὰ συμβεβηκός. οἷον ὅταν λέγωμεν τὸ μουσικὸν βαδίζειν, ὅτι ᾧ συμβέβηκε μουσικῷ εἶναι, τοῦτο βαδίζει· τὸ δέ, τῷ τούτου τι μεταβάλλειν, ἁπλῶς λέγεται μεταβάλλειν· οἷον ὅσα λέγεται κατὰ μέρη· ὑγιάζεται γὰρ τὸ σῶμα, ὅτι ὁ ὀφθαλμός, ἢ ὁ θώραξ. ταῦτα δὲ μέρη τοῦ ὅλου σώματος. ἔστι δὲ δή τι, ὃ οὔτε κατὰ συμβεβηκὸς κινεῖται, οὔτε τῷ ἄλλο τι τῶν αὐτοῦ, ἀλλὰ τῷ αὐτὸ κινεῖσθαι πρῶτον. καὶ τοῦτό ἐστι τὸ καθ' αὑτὸ κινητόν. 2 D Κατ' ἄλλην δὲ κίνησιν, ἕτερον· οἷον ἀλλοιωτόν, καὶ ἀλλοιώσεως ὑγιαντόν, ἢ θερμαντόν, ἕτερον. 3 Ἔστι δὲ δὴ καὶ ἐπὶ τοῦ κινοῦντος ὡσαύτως· τὸ μὲν γὰρ κατὰ συμβεβηκὸς κινεῖ, τὸ δέ, κατὰ μέρος, τῷ τῶν τούτου τι· τὸ δέ, καθ' αὑτὸ πρῶτον, οἷον ὁ μὲν ἰατρὸς ἰᾶται, ἡ δὲ χεὶρ πλήττει. 4 Ἐπεὶ δ' ἐστὶ μέν τι τὸ κινοῦν πρῶτον, ἔστι δέ τι τὸ κινούμενον, ἔτι ἐν ᾧ ὁ χρόνος· καὶ παρὰ ταῦτα, ἐξ οὗ, καὶ εἰς ὅ· (πᾶσα γὰρ κίνησις ἔκ τινος, καὶ εἴς τι· ἕτερον γὰρ τὸ πρῶτον κινούμενον, καὶ εἰς

A ὃ κινεῖται, καὶ ἐξ οὗ εἰς ὅ· οἷον τὸ ξύλον, καὶ τὸ θερμόν, καὶ τὸ ψυχρόν. τούτων δέ, τὸ μὲν ὅ, τὸ δ' εἰς ὅ, τὸ δ' ἐξ οὗ.) ἡ δὴ κίνησις δῆλον ὅτι ἐν τῷ ξύλῳ, οὐκ ἐν τῷ εἴδει· οὔτε γὰρ κινεῖ, οὔτε κινεῖται τὸ εἶδος, ἢ ὁ τόπος, ἢ τὸ τοσόνδε· ἀλλ' ἔστι κινοῦν, καὶ κινούμενον, καὶ εἰς ὃ κινεῖται. μᾶλλον γὰρ εἰς ὅ, ἢ ἐξ οὗ κινεῖται, ὀνομάζεται ἡ μεταβολή. διὸ καὶ ἡ φθορά, εἰς τὸ μὴ ὄν, μεταβολή ἐστι· καίτοι καὶ ἐξ ὄντος μεταβάλλει τὸ φθειρόμενον· καὶ ἡ γένεσις εἰς ὄν, καίτοι ἐκ μὴ ὄντος. 5 Τί μὲν οὖν ἐστιν ἡ κίνησις, εἴρηται πρότερον. 6 Τὰ δ' εἴδη, καὶ τὰ πάθη, καὶ ὁ τόπος, εἰς ἃ κινοῦνται τὰ κινούμενα, ἀκίνητά ἐστιν· οἷον, ἡ ἐπιστήμη, καὶ ἡ θερμότης. 7 Καίτοι ἀπορήσειεν ἄν τις, εἰ B τὰ πάθη κινήσεις, ἡ δὲ λευκότης πάθος· ἔσται γὰρ εἰς κίνησιν μεταβολή. 8 Ἀλλ' ἴσως οὐχ ἡ λευκότης κίνησις, ἀλλ' ἡ λεύκανσις. 9 Ἔστι δὲ καὶ ἐν ἐκείνοις καὶ τὸ κατὰ συμβεβηκὸς καὶ τὸ κατὰ μέρος, καὶ τὸ κατ' ἄλλο, καὶ τὸ πρώτως, καὶ μὴ κατ' ἄλλο· οἷον, τὸ λευκαινόμενον, εἰς μὲν τὸ νοούμενον μεταβάλλει κατὰ συμβεβηκός· τῷ γὰρ χρώματι συμβέβηκε νοεῖσθαι· εἰς δὲ χρῶμα, ὅτι μέρος τὸ λευκὸν τοῦ χρώματος· καὶ εἰς τὴν Εὐρώπην, ὅτι μέρος αἱ Ἀθῆναι τῆς Εὐρώπης· εἰς δὲ τὸ λευκὸν χρῶμα καθ' αὑτό. 10 Πῶς μὲν οὖν καθ' αὑτὸ *κινεῖται, καὶ πῶς κατὰ συμβεβηκός, καὶ πῶς κατ' ἄλλο τι, καὶ *πῶς τὸ αὐτὸ πρῶτον, καὶ ἐπὶ κινοῦντος, καὶ ἐπὶ κινουμένου, δῆλον· καὶ ὅτι ἡ κίνησις οὐκ ἐν τῷ εἴδει, ἀλλ' ἐν τῷ C κινουμένῳ, καὶ κινητῷ κατ' ἐνέργειαν. 11 Ἡ μὲν οὖν κατὰ συμβεβηκὸς μεταβολή, ἀφείσθω· ἐν ἅπασί τε γάρ ἐστι, καὶ ἀεί, καὶ πάντων· ἡ δὲ μὴ κατὰ συμβεβηκός, οὐκ ἐν ἅπασιν, ἀλλ' ἐν τοῖς ἐναντίοις καὶ τοῖς μεταξύ, καὶ ἐν ἀντιφάσει· τούτου δὲ πίστις ἐκ τῆς ἐπαγωγῆς. 12 Ἐκ δὲ τοῦ μεταξὺ μεταβάλλει, ὡς ἐναντίου· χρῆται γὰρ αὐτῷ ὡς ἐναντίῳ ὄντι πρὸς ἑκάτερον· ἔστι γάρ πως τὸ μεταξύ, τὰ ἄκρα. διὸ καὶ τοῦτο πρὸς ἐκεῖνα, καὶ ἐκεῖνα πρὸς τοῦτο λέγεταί πως ἐναντία· οἷον, ἡ μέση βαρεῖα πρὸς τὴν νήτην, καὶ ὀξεῖα πρὸς τὴν ὑπάτην· καὶ τὸ φαιὸν λευκὸν πρὸς τὸ μέλαν, καὶ μέλαν πρὸς τὸ λευκόν.

* κινεῖται.

* κ. πῶς τὸ πρῶτον sublata voce αὐτό.

A quod mouetur, & ex quo: vt lignum, & calidum, & frigidum: horum autem aliud eſt quod: aliud, in quo: aliud ex quo.) Patet igitur motum eſſe in ligno, non in forma: quia forma, vel locus, vel tantum, non mouet, nec mouetur. ſed eſt mouens, & quod mouetur, & in quod mouetur. magis enim ab eo in quod, quàm ab eo ex quo mouetur, nominatur mutatio. ideóque interitus eſt mutatio in non ens, quamvis etiam ex ente mutetur id quod interit. & generatio eſt mutatio in ens, quamvis ſit ex non ente. 5 Quid igitur ſit motus, antea dictum fuit. 6 Formæ verò, & affectiones, & locus, in quæ mouentur ea quæ mouentur, ſunt res immobiles: vt ſcientia & calor. 7 Atqui dubitare quiſpiam poſſit, ſi affectiones B ſint motus, albor autem ſit affectio: erit enim mutatio in motu. 8 Sed fortaſſe non albor, ſed dealbatio eſt motus. 9 Sed in illis quoque eſt & ex accidenti, & ratione partis, ac per aliud, & primò non per aliud. vtputà quod dealbatur, in id quod intelligitur, mutatur ex accidente, quia colori accidit vt intelligatur: in colorem autem, quia album eſt pars coloris: & in Europam, quia Athenæ ſunt pars Europæ: in albũ autem colorem per ſe. 10 Quomodo igitur per ſe mouetur, & quomodo ex accidenti, & quomodo ſecundùm aliquid aliud: & quomodo idem primum eſt tam in eo quod mouet, quàm in eo quod mouetur, manifeſtum eſt, ac motum non eſſe in forma, ſed in eo quod mouetur & actu eſt mobile. 11 Quæ igitur C ex accidenti mutatio eſt, miſſa fiat: quippe quæ eſt in omnibus, & ſemper, & omnium. quæ verò non eſt ex accidenti, non eſt in omnibus, ſed in contrariis, & in mediis interiectis, & in contradictione. cuius rei fidẽ facit inductio. 12 Ex eo autem quod eſt interiectum, mutatur tamquam ex contrario: nam ipſo vtitur, tamquam eo quod vtrique extremo eſt contrarium. quod enim eſt interiectum, quodammodo eſt extrema. proinde & hoc cum illis & illa cum hoc collata, dicuntur quodammodo contraria: vt media chorda ad neten comparata, eſt grauis: & ad hypaten cõparata: eſt acuta. & fuſcum comparatum ad nigrum, eſt album: & comparatum ad album, eſt nigrum.

Diuiſio mutationum per ſe.

Cap. II.

D Ἐπεὶ δὲ πᾶσα μεταβολή ἐστιν ἔκ τινος εἴς τι· δηλοῖ δὲ καὶ τοὔνομα· μετ' ἄλλο γάρ τι· καὶ τὸ μέν, πρότερον δηλοῖ, τὸ δ', ὕστερον. μεταβάλλοι ἂν τὸ μεταβάλλον τετραχῶς· ἢ γὰρ ἐξ ὑποκειμένου εἰς ὑποκείμενον, *ἢ οὐκ ἐξ ὑποκειμένου εἰς οὐχ ὑποκείμενον, ἢ μὴ ἐξ ὑποκειμένου εἰς ὑποκείμενον, ἢ ἐξ ὑποκειμένου εἰς μὴ ὑποκείμενον· λέγω δὲ τὸ ὑποκείμενον, τὸ καταφάσει δηλούμενον. 2 Ὥστε ἀνάγκη ἐκ τῶν εἰρημένων τρεῖς εἶναι μεταβολάς, τήν τε ἐξ ὑποκειμένου εἰς ὑποκείμενον, καὶ τὴν ἐξ ὑποκειμένου εἰς μὴ E ὑποκείμενον, καὶ τὴν ἐκ μὴ ὑποκειμένου εἰς ὑποκείμενον· ἡ γὰρ μὴ ἐξ ὑποκειμένου εἰς μὴ ὑποκείμενον οὐκ ἔστι μεταβολή, διὰ τὸ μὴ εἶναι κατ' ἀντίθεσιν· οὔτε γὰρ ἐναντία, οὔτε ἀντίφασίς ἐστιν. 3 Ἡ μὲν οὖν ἐξ οὐχ ὑποκειμένου εἰς ὑποκείμενον μεταβολὴ κατ' ἀντίφασιν, γένεσίς ἐστιν· ἡ μὲν ἁπλῶς ἁπλῆ, ἡ δὲ τὶς τινός· οἷον, ἡ μὲν ἐκ μὴ λευκοῦ, εἰς λευκόν, γένεσις τούτου· ἡ δ' ἐκ τοῦ μὴ ὄντος ἁπλῶς εἰς οὐσίαν,

* κ. ἢ ἐξ οὐχ ὑποκειμένου.

D CVm autem omnis mutatio ſit ex quopiam in quidpiam: (id autem declarat Græcum nomen μεταβολή. eſt enim μετ' ἄλλο τι, id eſt, poſt aliud, aliquid: & alterum quidem ſignificat prius: alterum verò poſterius) id quod mutatur, quatuor modis mutari poteſt: aut enim ex ſubiecto in ſubiectum, aut ex non ſubiecto in non ſubiectum, aut ex non ſubiecto in ſubiectum, aut ex ſubiecto in non ſubiectum. voco autem ſubiectum, quod affirmatione ſignificatur. 2 Quare neceſſe eſt ex iis quæ dicta ſunt, tres eſſe mutationes, eam quæ eſt ex ſubiecto in ſubiectum, & E eam quæ eſt ex ſubiecto in non ſubiectum, & eam quæ eſt ex non ſubiecto in ſubiectum. nam quæ eſt ex non ſubiecto in non ſubiectum, nõ eſt mutatio, quia non eſt ſecundùm oppoſitionem: quandoquidem nec ſunt contraria, nec eſt contradictio. 3 Mutatio igitur quæ in contradictione eſt ex non ſubiecto in ſubiectum, eſt generatio: ſimplex quidem, quæ eſt ſimpliciter: aliqua verò, quæ eſt alicuius. vtputà quæ eſt ex non albo in album, eſt generatio huius. quæ verò ex non ente ſimpliciter, in ſubſtantiam,

A generatio ſimpliciter, ſecundùm quam ſimpliciter fieri, non aliquid fieri dicimus. 4 Quæ verò *eſt* ex ſubiecto in non ſubiectum, *eſt* interitus: ſimpliciter quidem, quæ *eſt* ab eſſentia ad non eſſe: quædam verò, quæ *eſt* in oppoſitam negationem, quemadmodum dictum etiam fuit in generatione. 5 Itaque ſi non ens dicitur multifariam: & neque quod *ſumitur* in compoſitione vel diuiſione, poteſt moueri, neque quod *ſumitur* poteſtate, quod *eſt* oppoſitum enti ſimpliciter ſecundùm actum *accepto*: (etenim non album aut non bonum poteſt moueri ex accidenti, quia non album poteſt eſſe homo. ſed quod *eſt* ſimpliciter non hoc, nullo modo *moueri poteſt*: impoſſi- B bile enim eſt, id quod non eſt, moueri) hoc, inquam, ſi *ita eſt*, etiam *eſt impoſſibile* generationem eſſe motum: quia fit, quod non eſt. 6 Nam etiamſi quàm maximè ex accidenti fiat: tamen de eo quod ſimpliciter fit, verè dicitur *id* eſſe non ens. 7 Similiter autem & quieſcere. omnia verò eadem abſurda eueniunt, æquè ac ſi dicatur moueri quod non eſt. 8 Et ſi quicquid mouetur, *eſt* in loco: non ens autem non eſt in loco: eſſet enim alicubi. 9 Ergo nec interitus *eſt* motus. motui namque contrarium *eſt* mo- C tus, aut quies: interitus autem *eſt* generationi contrarium. 10 Quoniam autem omnis motus *eſt* mutatio quædam: mutationes verò *ſunt* tres, quæ commemoratæ fuerunt: harum autem eæ quæ in ortu & interitu *ſpectantur*, non *ſunt* motus: hæ verò ſunt, quæ in contradictione *conſiſtunt*: neceſſe *eſt*, eam tantùm mutationem, quæ eſt ex ſubiecto in ſubiectum, eſſe motum. 11 Subiecta verò, aut *ſunt* contraria, aut *interiecta*. nam & priuatio ponatur *eſſe* contrarium. & declaratur affirmatione nudum, & album & nigrum.

γένεσις ἁπλῶς, καθ' ἣν ἁπλῶς γίνεσθαι, καὶ οὐ τὶ γίνεσθαι λέγομεν. 4 Ἡ δ' ἐξ ὑποκειμένου εἰς οὐχ ὑποκείμενον, φθορὰ ἁπλῶς μὲν, ἡ ἐκ τῆς οὐσίας εἰς τὸ μὴ εἶναι. τὶς δὲ ἡ εἰς τὴν ἀντικειμένην ἀπόφασιν, καθάπερ ἐλέχθη καὶ ἐπὶ τῆς γενέσεως. 5 Εἰ δὴ τὸ μὴ ὂν λέγεται πλεοναχῶς, καὶ μήτε τὸ κατὰ σύνθεσιν ἢ διαίρεσιν ἐνδέχεται κινεῖσθαι, μήτε τὸ κατὰ δύναμιν, τὸ τῷ ἁπλῶς κατ' ἐνέργειαν ὄντι ἀντικείμενον. τὸ μὲν γὰρ μὴ λευκὸν, ἢ μὴ ἀγαθὸν, ὅμως ἐνδέχεται κινεῖσθαι κατὰ συμβεβηκός. εἴη γὰρ ἂν ἄνθρωπος τὸ μὴ λευκόν. τὸ δὲ ἁπλῶς μὴ τόδε, οὐδαμῶς· ἀδύνατον γὰρ τὸ μὴ ὂν κινεῖσθαι· εἰ δὲ τοῦτο, καὶ τὴν γένεσιν κίνησιν εἶναι· γίνεται γὰρ τὸ μὴ ὄν. 6 Εἰ γὰρ καὶ ὅτι μάλιστα κατὰ συμβεβηκὸς γίνεται, ἀλλ' ὅμως ἀληθὲς εἰπεῖν, ὅτι ὑπάρχει τὸ μὴ ὂν κατὰ τοῦ γινομένου ἁπλῶς. 7 Ὁμοίως δὲ καὶ τὸ ἠρεμεῖν. ταῦτά τε δὴ πολλὰ συμβαίνει δυσχερῆ, τῷ κινεῖσθαι τὸ μὴ ὄν. 8 Καὶ εἰ πᾶν τὸ κινούμενον ἐν τόπῳ, τὸ δὲ μὴ ὂν οὐκ ἔστιν ἐν τόπῳ· εἴη γὰρ ἄν που. 9 Οὐδὲ δὴ ἡ φθορὰ κίνησις· ἐναντίον μὲν γὰρ κινήσει κίνησις ἢ ἠρεμία. ἡ δὲ φθορὰ γενέσει ἐναντίον. 10 Ἐπεὶ δὲ πᾶσα κίνησις μεταβολή τις· μεταβολαὶ δὲ τρεῖς αἱ εἰρημέναι· τούτων δὲ αἱ κατὰ γένεσιν καὶ φθορὰν, οὐ κινήσεις· αὗται δὲ εἰσὶν αἱ κατ' ἀντίφασιν· ἀνάγκη τὴν ἐξ ὑποκειμένου εἰς ὑποκείμενον μεταβολὴν, κίνησιν εἶναι μόνον. 11 Τὰ δὲ ὑποκείμενα, ἢ ἐναντία, ἢ μεταξύ. καὶ γὰρ ἡ στέρησις κείσθω ἐναντίον, καὶ δηλοῦται καταφάσει, τὸ γυμνὸν, καὶ λευκὸν, καὶ μέλαν.

Diuiſio motuum per ſe.

Cap. III.

D SI igitur categoriæ diuiduntur ſubſtantia, & qualitate, & *ipſo* vbi, & eo quod eſt ad aliquid, & quátitate, & actione, vel paſſione: neceſſe *eſt* tres eſſe motus, *nempe* eum qui eſt quanti, & eum qui eſt qualis, & eum qui eſt ſecundùm locum. 2 In ſubſtantia verò non eſt motus: quia nulla res ſubſtantiæ eſt contraria. 3 Sed neque *in* eo quod eſt ad aliquid: quia fieri poteſt vt altero mutato alterum verè dicatur, *quamquam* nihil mutatum, quapropter ex accidenti eſt horum motus. 4 Neque igitur *motus eſt* efficientis & patientis, neque vllius moti & mouentis: quia non eſt motionis motio, nec generationis generatio, nec omnino mutatio mutationis. 5 Primùm enim duobus modis poteſt eſſe motionis motio, vel vt ſubiecti: vt homo mouetur, quia ex albo in E nigrum mutatur. an igitur ita etiam motus aut caleſit, aut refrigeratur, aut locum mutat, aut augetur, aut deminuitur? ſed hoc *eſt* impoſſibile: quoniam mutatio non eſt ſubiectum aliquod. Vel quia aliud quoddam ſubiectum ex mutatione mutatur in alteram ſpeciem: vt homo ex morbo in ſanitatem. ſed neque hoc *eſt* poſſibile, niſi ex accidenti. hic enim motus eſt mutatio ex vno in aliud: & generatio atq; interitus eodem modo: præterquam quòd hæ mutationes *ſunt* in oppoſito, hoc modo, motus autem alio modo. Simul igitur mutatur ex ſanitate in morbũ, & ex hac mutatione in aliã. ſed manifeſtũ *eſt*, cùm ęgrotauerit, mutatũ fore in quẽvis *morbũ*: poteſt.n. quieſcere. ac præterea non in quamlibet ſemper, & illa ex aliquo in aliud quidpiã quocirca erit motio oppoſita,

ΕΙ οὖν αἱ κατηγορίαι διῄρηνται οὐσίᾳ, καὶ ποιότητι, καὶ τῷ ποὺ, καὶ τῷ ποτὲ, καὶ τῷ πρός τι, καὶ τῷ ποσῷ, καὶ τῷ ποιεῖν, ἢ πάσχειν, ἀνάγκη τρεῖς εἶναι κινήσεις, τήν τε τοῦ ποσοῦ, καὶ τὴν τοῦ ποιοῦ, καὶ τὴν κατὰ τόπον. 2 Κατ' οὐσίαν δὲ οὐκ ἔστι κίνησις, διὰ τὸ μηδὲν εἶναι τῶν ὄντων οὐσίᾳ ἐναντίον. 3 Οὐδὲ δὴ τοῦ πρός τι· ἐνδέχεται γὰρ θατέρου μεταβάλλοντος, ἀληθεύεσθαι θάτερον, μηδὲν μεταβάλλον· ὥστε κατὰ συμβεβηκὸς ἡ κίνησις αὐτῶν. 4 Οὐδὲ δὴ ποιοῦντος καὶ πάσχοντος, οὐδὲ παντὸς κινουμένου καὶ κινοῦντος, ὅτι οὐκ ἔστι κινήσεως κίνησις, οὐδὲ γενέσεως γένεσις, οὐδ' ὅλως μεταβολὴ μεταβολῆς. 5 Πρῶτον μὲν γὰρ διχῶς ἐνδέχεται κινήσεως εἶναι κίνησιν, ἢ ὡς ὑποκειμένου, οἷον ἄνθρωπος κινεῖται, ὅτι ἐκ λευκοῦ εἰς μέλαν μεταβάλλει. ἆρά γε οὕτω καὶ ἡ κίνησις, ἢ θερμαίνεται, ἢ ψύχεται, ἢ τόπον μεταλλάττει, ἢ αὐξάνεται, ἢ φθίνει; τοῦτο δὲ ἀδύνατον. οὐ γὰρ τῶν ὑποκειμένων τι ἐστὶν ἡ μεταβολή, ἢ τῷ ἕτερόν τι ὑποκείμενον ἐκ μεταβολῆς μεταβάλλειν εἰς ἕτερον εἶδος, οἷον ἄνθρωπος ἐκ νόσου εἰς ὑγίειαν. ἀλλ' οὐδὲ τοῦτο δυνατὸν, πλὴν κατὰ συμβεβηκός. αὐτὴ γὰρ ἡ κίνησις, ἐξ ἄλλου εἴδους εἰς ἄλλο ἐστὶ μεταβολή. καὶ ἡ γένεσις δὲ καὶ ἡ φθορὰ, ὡσαύτως πλὴν, αἱ μὲν εἰς ἀντικείμενα ὡδί, ἡ δὲ κίνησις οὐχ ὁμοίως. ἅμα οὖν μεταβάλλει ἐξ ὑγιείας εἰς νόσον, καὶ ἐξ αὐτῆς ταύτης τῆς μεταβολῆς εἰς ἄλλην. δῆλον δ' ὅτι ὅταν νοσήσῃ, μεταβεβληκὸς ἔσται εἰς ὁποιανοῦν. ἐνδέχεται γὰρ ἠρεμεῖν. καὶ ἔτι εἰς μὴ τὴν τυχοῦσαν ἀεί, κἀκείνη ἔκ τινος εἴς τι ἕτερον ὥστε καὶ ἡ ἀντικειμένη ἔσται

ἡ ὑγίανσις· ἀλλὰ τῷ συμβεβηκέναι ἐστίν, εἰ ἐξ ἀναμνήσεως εἰς λήθην μεταβάλλοι, ὅτι ᾧ ὑπάρχει, ἐκεῖνο μεταβάλλει, ὁτὲ μὲν εἰς ἐπιστήμην, ὁτὲ δὲ εἰς ὑγίειαν. 6 Ἔτι δ', * εἰς ἄπειρον βαδιεῖται, εἰ ἔσται μεταβολῆς μεταβολή, καὶ γενέσεως γένεσις. ἀνάγκη δὴ καὶ * τὴν προτέραν, εἰ ἡ ὑστέρα ἔσται· οἷον, εἰ ἡ ἁπλῆ γένεσις ἐγίνετό ποτε, καὶ τὸ γινόμενον ἐγίνετο. ὥστε οὔπω ἦν τι γιγνόμενον ἁπλῶς, ἀλλά τι γιγνόμενον, καὶ γιγνόμενον ἤδη, καὶ πάλιν τοῦτ' ἐγίνετό ποτε· ὥστε οὐκ ἦν πω τότε γινόμενον. ἐπεὶ δὲ τῶν ἀπείρων οὐκ ἔστι τι πρῶτον, οὐκ ἔσται τὸ πρῶτον· ὥστ' οὐδὲ τὸ ἐχόμενον, οὔτε γίνεσθαι οὖν, οὔτε κινεῖσθαι οἷόν τε, οὔτε μεταβάλλειν οὐδέν. 7 Ἔτι, τοῦ αὐτοῦ κίνησις ἡ ἐναντία, καὶ ἔτι ἠρέμησις, καὶ γένεσις καὶ φθορά· ὥστε τὸ * γιγνόμενον ὅταν γένηται γιγνόμενον, τότε φθείρεται· οὔτε γὰρ εὐθὺς * γινόμενον, οὔθ' ὕστερον· εἶναι γὰρ δεῖ τὸ φθειρόμενον. 8 Ἔτι, δεῖ ὕλην ὑπάρχειν καὶ τῷ γινομένῳ, καὶ τῷ μεταβάλλοντι. * τίς οὖν ἔσται; ὥσπερ τὸ ἀλλοιωτὸν ἢ σῶμα, ἢ ψυχή, οὕτω δὴ τὸ γινόμενον, κίνησις ἢ γένεσις, καὶ πάλιν τί εἰς ὃ κινοῦνται. δεῖ γὰρ εἶναί τι τὴν τοῦδε ἐκ τοῦδε εἰς τόδε κίνησιν, καὶ μὴ κίνησιν ἢ γένεσιν. ἅμα δὲ καὶ πῶς ἔσται; οὐ γὰρ ἔσται μάθησις ἡ τῆς μαθήσεως γένεσις· ὥστε οὐδὲ γενέσεως γένεσις, οὐδέ τις τινός. ἔτι, εἰ τρία εἴδη κινήσεώς ἐστι, τούτων τινὰ ἀνάγκη εἶναι τὴν ὑποκειμένην φύσιν, καὶ εἰς ἃ κινοῦνται. οἷον, ἀνάγκη τὴν φορὰν ἀλλοιοῦσθαι, ἢ φέρεσθαι. 9 Ὅλως δὲ ἐπεὶ κινεῖται τὸ κινούμενον πᾶν τριχῶς, ἢ τῷ κατὰ συμβεβηκός, ἢ τῷ μέρος τι, ἢ τῷ καθ' αὑτό, κατὰ συμβεβηκὸς * μόνον ἂν ἐνδέχοιτο μεταβάλλειν τὴν μεταβολὴν· οἷον, εἰ ὁ ὑγιαζόμενος τρέχοι, ἢ μανθάνοι· τὴν δὲ κατὰ συμβεβηκὸς ἀφεῖμεν πάλαι. 10 Ἐπεὶ δὲ οὔτε οὐσίας, οὔτε τοῦ πρός τι, οὔτε τοῦ ποιεῖν καὶ πάσχειν, λείπεται κατὰ τὸ ποιὸν καὶ τὸ ποσόν, καὶ τὸ ποῦ κίνησιν εἶναι μόνον· ἐν ἑκάστῳ γάρ ἐστι τούτων ἐναντίωσις. 11 Ἡ μὲν οὖν κατὰ τὸ ποιὸν κίνησις, ἀλλοίωσις ἔστω. τοῦτο γὰρ ἐπέζευκται κοινὸν ὄνομα. λέγω δὲ τὸ ποιόν, οὐ τὸ ἐν τῇ οὐσίᾳ· καὶ γὰρ ἡ διαφορά, ποιόν· ἀλλὰ τὸ παθητικόν, καθ' ὃ λέγεται πάσχειν, ἢ ἀπαθὲς εἶναι. 12 Ἡ δὲ κατὰ τὸ ποσόν, τὸ μὲν κοινὸν ἀνώνυμον· καθ' ἑκάτερον δέ, αὔξησις καὶ φθίσις· ἡ μὲν εἰς τὸ τέλειον μέγεθος, αὔξησις· ἡ δὲ ἐκ τούτου, φθίσις. 13 Ἡ δὲ κατὰ τὸ ποῦ, καὶ τὸ ἴδιον, καὶ τὸ κοινόν, ἀνώνυμος. ἔστω δὲ φορὰ καλουμένη τὸ κοινόν. καίτοι λέγεταί γε φέρεσθαι ταῦτα μόνα κυρίως, ὅταν μὴ * ἐπ' αὐτοῖς ᾖ τὸ στῆναι τοῖς μεταβάλλουσι τὸν τόπον, καὶ * ὅσα αὐτὰ μὴ ἑαυτὰ κινεῖ κατὰ τόπον. 14 Ἡ δ' ἐν τῷ αὐτῷ εἴδει μεταβολὴ ἐπὶ τὸ μᾶλλον καὶ ἧττον, ἀλλοίωσίς ἐστιν· ἢ γὰρ ἐξ ἐναντίου εἰς ἐναντίον, κίνησις, ἢ ἁπλῶς, ἢ πῇ· ἐπὶ μὲν γὰρ τὸ ἧττον ἰοῦσα, εἰς τοὐναντίον λεχθήσεται μεταβάλλειν· ἐπὶ δὲ τὸ μᾶλλον, ὡς ἐκ τοῦ ἐναντίου εἰς τὸ αὐτό. διαφέρει γὰρ οὐδὲν πῇ μεταβάλλειν, ἢ ἁπλῶς· πλὴν πῇ δεήσει τὰ ἐναντία ὑπάρχειν· τὸ δὲ μᾶλλον καὶ ἧττόν ἐστι, τὸ πλέον ἢ ἔλαττον τοῦ ἐναντίου ἐνυπάρχειν, καὶ μή. ὅτι μὲν οὖν αὗται τρεῖς μόναι κινήσεις εἰσίν, ἐκ τούτων δῆλον.

* γρ. εἰς ἄπειρον
* γρ. τὴν πρ. εἶναι. Variè verò locum hunc fuiſſe olim lectum, ex Simplicio intelliges.
* γρ. γινόμενον
* γρ. ἢ. ποτε φθείρεται.
* Argyropylus τίς οὖν ἔσται; ὥσπ.
* γρ. μόνως
* γρ. ἐφ' ἑαυτοῖς
* γρ. ὅσα μὴ αὐτὰ ἑαυτά.

nempe ſanatio. ſed quia ſic accidit: velvti, ſi ex recordatione in obliuionem mutetur: quoniam cui ineſt, illud mutatur quandoque in ſcientiam, quandoque in ſanitatem. 6 Præterea in infinitum *res* abibit, ſi erit mutationis mutatio, & generationis generatio. neceſſe igitur *eſt* etiam priorem eſſe, ſi poſterior erit. vtputà ſi generatio ſimplex aliquando fiebat: etiam quod fit, fiebat. quare nondum erat, quod fit ſimpliciter, ſed *erat* aliquid quod fiebat, *idque* olim fiebat, & rurſus hoc aliquando fiebat. quocirca nondum erat tunc id quod fit. Quoniam autem in infinitis non eſt aliquid primum: non erit primum *quod fit*. quare neque conſequens *erit*. neque igitur fieri, neque moueri, neque mutari quidpiam poſſibile *eſt*. 7 Præterea eiuſdem *eſt* motus contrarius, & præterea quies: item generatio, & corruptio. quare quod fit, tunc corrumpitur, cùm fit. non enim ſtatim ac fit, tunc corrumpitur, nec poſtea: quoniam oportet eſſe, quod interit. 8 Præterea oportet materiam ſubeſſe & ei quod fit, & ei quod mutatur. quænam igitur erit? ſicvti variabile *eſt* aut corpus, aut anima: ita quod fit, *eſt* motus vel generatio. Rurſus quid *eſt*, in quod mouentur? oportet enim eſſe motum & generationem huius ex hoc in hoc. item quomodo erit? non enim diſciplinæ generatio eſt diſciplina. quare nec generationis generatio, nec alicuius aliqua. Præterea ſi tres ſunt ſpecies motus: neceſſe *eſt*, vt harum aliqua ſit natura ſubiecta, & ad quas mouentur: vtputa neceſſe *eſt* lationem variari, vel ferri. 9 Omnino autem cùm moueatur, quicquid mouetur, tribus modis, id eſt, vel quia ex accidenti vel quia pars aliqua, vel quia per ſe *mouetur*: ſolùm ex accidenti poteſt mutari mutatio: velvti, ſi is qui ſanatur, currat, aut diſcat. ſed mutationem ex accidenti, iam miſſam fecimus. 10 Quoniam autem motus nec eſt ſubſtantiæ, nec eius quod ad aliquid *refertur*, nec ipſius facere, vel pati: relinquitur, vt in qualitate, & quantitate, & vbi dumtaxat ſit. nam in his ſingulis eſt contrarietas. 11 Motus igitur, qui *eſt* in qualitate, eſto variatio. hoc enim commune nomen ei aptum eſt. dico autem qualitatem, non quæ *eſt* in ſubſtantia: quandoquidem etiam differentia *eſt* qualitas: ſed patibilem, ex qua dicitur pati aut impatibile eſſe. 12 Qui verò *eſt* quantitate, communiter quidem vacat nomine: vtriuſque autem ratione vocatur accretio, & deminutio: is quidem qui *tendit* ad perfectam magnitudinem, accretio: qui verò ab hac, deminutio. 13 Qui autem *eſt* ſecundùm locum, & propriè & communiter nomine caret: vocatur autem communiter latio. quamquam ea ſola propriè dicuntur ferri, quæ cùm locum mutent, non eſt in ipſis *ſitum*, vt ſe ſiſtant; & quæ ſe ipſa non mouent ſecundùm locum. 14 Iam verò mutatio, quæ *fit* in eadem forma ad magis & minus, variatio eſt. etenim motus *eſt* ex contrario in contrarium vel ſimpliciter, vel quadamtenus. nam qui ad minus progreditur, in contrarium dicetur mutari. *qui* verò ad magis, tamquam ex contrario ad ipſum. nihil autem intereſt vtrùm quadamtenus mutetur, an ſimpliciter: *præterquam* quòd oportebit quadamtenus eſſe contraria: magis autem & minus eſt, quia plus vel minus contrarij ineſt, & non *ineſt*. 15 Eſſe igitur hos tres ſolos motus, ex his manifeſtum *eſt*.

De immobili. Cap. IV.

IMmobile autem eſt, & quod omnino moueri nequit, vt ſonus *eſt* inaſpectabilis: & quod lõgo tempore vix mouetur, aut tardè moueri incipit, quod dicitur difficulter mobile: & quod natura aptum eſt moueri, & poteſt *moueri*, ſed non mouetur tunc cùm natura aptum eſt, & vbi, & quomodo: quod quidem inter immobilia ſolùm quieſcere appello: cõtrarium enim *eſt* quies motui: proinde erit priuatio eius quod eſt *motionis* capax. 2 Quid igitur ſit motus, & quid quies, & quot ſint mutationes, & quales *mutationes ſint* motus, perſpicuum *eſt* ex his quæ dicta ſunt. A

A Κίνητον δ' ἐστὶ, τό, τε ὅλως ἀδύνατον κινηθῆναι, ὥσπερ ὁ ψόφος ἀόρατος· καὶ τὸ ἐν πολλῷ χρόνῳ μόγις κινούμενον, ἢ τὸ βραδέως ἀρχόμενον, ὃ λέγεται δυσκίνητον· καὶ τὸ πεφυκὸς μὲν κινεῖσθαι καὶ δυνάμενον, μὴ κινούμενον δὲ τότε, ὅτε πέφυκε, καὶ οὗ, καὶ ὡς· ὅπερ ἠρεμεῖν καλῶ τῶν ἀκινήτων μόνον· ἐναντίον γὰρ ἠρεμία κινήσει· ὥστε στέρησις ἂν εἴη τοῦ δεκτικοῦ. 2. Τί μὲν οὖν ἐστι κίνησις, καὶ τί ἠρεμία, καὶ πόσαι μεταβολαί, καὶ ποῖαι κινήσεις, φανερὸν ἐκ τῶν εἰρημένων.

De eo quod eſt ſimul, vel ſeparatim: & eo quod tangit, vel eſt interiectum: & eo quod eſt deinceps, vel cohærens, vel continuum.

Cap. V.

POſt hæc dicamus, quid ſit ſimul, & *quid* ſeparatim: & quid tãgere, & quid interiectum: & quid *eſſe* deinceps, & quid cohærens, & quid continuum: & quibus vt hæc ſingula inſunt, natura eſt comparatum. 2 Simul igitur dicuntur hæc eſſe ſecundùm locum, quæcumque ſunt in vno loco primo. 3 Separatim verò, quæcũque *ſunt* in diuerſo. 4 *Se* autem tangere *dicuntur ea*, quorum extrema *ſunt* ſimul. 5 Interiectum verò, id quod vt priùs perueniat quod mutatur, natura eſt comparatum, quàm ad extremum in quod mutatur, cùm ſecundùm naturam continenter mutetur. minimum autem eſt interiectum in tribus: quia contrarium eſt mutationis extremum. 6 Continenter autem mouetur, quod nihil aut parum intermittit rei, non temporis. nihil enim prohibet, intermiſſione facta, & quidem ſtatim poſt ſummam *chordam*, ſonare infimam. ſed *hæc eſt intermiſſio* rei, in qua ſit motus. quod quidem & in loci & in aliis mutationibus perſpicuum eſt. 7 Contrarium verò ſecundùm locum *eſt*, quod recta *linea* plurimùm diſtat. quæ *eſt* enim minima, terminata eſt. quod verò *eſt* terminatum, *eſt* menſura. 8 Deinceps verò *eſt*, inter quod (cùm ſolùm poſt principium ſit vel poſitione, vel natura vel alio aliquo *modo* ita definitum) & id cui eſt conſequens, deinceps nihil eſt eiuſdem generis interiectum. Verbi gratia, linea vel lineæ inter lineam: aut inter vnitatem vnitas, vel vnitates: aut inter domum domus. aliud verò interiectum eſſe nihil prohibet. quod enim *eſt* deinceps, alicui *eſt* deinceps, & *eſt* poſterius quiddam. non enim vnum deinceps ſequitur duo: neque Kalendę deinceps ſequuntur alterum diem menſis: ſed hæc *ſequuntur* illa. 9 Cohærens autem *dicitur*, quod cùm ſit deinceps, tangit. 10 Quia verò omnis mutatio in oppoſitis *cernitur*: oppoſita verò *ſunt* & ea quæ ſunt contraria, & quæ ſecundùm contradictionem *opponuntur*: contradictionis autem nihil *eſt* medium: perſpicuum *eſt*, in contrariis fore quod eſt interiectum. 11 Continuum verò eſt ſpecies cohærentis. dico autem eſſe continuum, cùm vtriuſque termini quibus ſe contingunt, facti ſunt vnum & idem: &, vt nomen ſignificat, continentur. hoc autem eſſe nequit, cùm extrema duo ſunt. 12 Iam verò hoc definito perſpicuum *eſt*, in his eſſe continuum, ex quibus vt vnum quiddam contactu fiat, natura eſt comparatum,

B Μετὰ δὲ ταῦτα λέγωμεν τί ἐστι τὸ ἅμα, καὶ χωρὶς, καὶ τί τὸ ἅπτεσθαι, καὶ τί τὸ μεταξὺ, καὶ τί τὸ ἐφεξῆς, καὶ τί τὸ ἐχόμενον, καὶ τί τὸ συνεχὲς, καὶ τοῖς ποίοις ἕκαστον τούτων ὑπάρχειν πέφυκεν. 2 Ἅμα μὲν οὖν λέγεται ταῦτ' εἶναι κατὰ τόπον, ὅσα ἐν ἑνὶ τόπῳ ἐστὶ πρώτῳ. 3 Χωρὶς δὲ, ὅσα ἐν ἑτέρῳ. 4 Ἅπτεσθαι δὲ, ὧν τὰ ἄκρα ἅμα. 5 Μεταξὺ δὲ, εἰς ὃ* πρότερον πέφυκεν ἀφικνεῖσθαι τὸ μεταβάλλον, ἢ εἰς ὃ ἔσχατον μεταβάλλει, κατὰ φύσιν συνεχῶς μεταβάλλον. ἐν ἐλαχίστοις δ' ἐστὶ τὸ μεταξὺ τρισίν. ἔσχατον μὲν γάρ ἐστι τῆς μεταβολῆς τὸ ἐναντίον. 6 Συνεχῶς δὲ κινεῖται, τὸ C μηδὲν, ἢ τὸ ὀλίγιστον διαλεῖπον* τοῦ πράγματος, μὴ τοῦ χρόνου· οὐδὲν γὰρ κωλύει* διαλείποντα, καὶ εὐθὺς δὲ *μετὰ τὴν ὑπάτην φθέγξασθαι τὴν νεάτην· ἀλλὰ τοῦ πράγματος, ἐν ᾧ κινεῖται. τοῦτο δὲ ἔν τε ταῖς κατὰ τόπον, καὶ ἐν ταῖς ἄλλαις μεταβολαῖς φανερόν. 7 Ἐναντίον δὲ κατὰ τόπον, τὸ κατ' εὐθεῖαν ἀπέχον πλεῖστον· ἡ γὰρ ἐλαχίστη πεπέρασται· μέτρον δὲ, τὸ πεπερασμένον. 8 Ἐφεξῆς δὲ (οὗ μετὰ τὴν ἀρχὴν μόνον ὄντος *ἢ θέσει, ἢ φύσει, ἢ ἄλλῳ τινὶ, οὕτως ἀφορισθέντος) μηδὲν μεταξύ D ἐστι τῶν ἐν ταὐτῷ γένει, καὶ οὗ ἐφεξῆς ἐστι. λέγω δ', οἷον γραμμὴ γραμμῆς, ἢ γραμμαί· ἢ μονάδος μονὰς, ἢ μονάδες· ἢ οἰκίας οἰκία· ἄλλο δ' οὐδὲν κωλύει μεταξὺ εἶναι· τὸ γὰρ ἐφεξῆς, τινὶ ἐφεξῆς, καὶ ὕστερόν τι· οὐ γὰρ τὸ ἓν ἐφεξῆς τοῖν δυοῖν, οὐδὲ ἡ νουμηνία τῆς δευτέρας ἐφεξῆς, ἀλλὰ ταῦτ' ἐκείνων. 9 Ἐχόμενον δὲ, ὃ ἂν ἐφεξῆς ὂν ἅπτηται. 10 Ἐπεὶ δὲ πᾶσα μεταβολὴ ἐν τοῖς ἀντικειμένοις, τὰ δὲ ἀντικείμενα τά τε ἐναντία καὶ τὰ κατὰ ἀντίφασιν· ἀντιφάσεως δὲ οὐδὲν ἀνὰ E μέσον· φανερὸν ὅτι ἐν τοῖς ἐναντίοις ἔσται τὸ μεταξύ. 11 Τὸ δὲ συνεχὲς, ἐστὶ μὲν ὅπερ ἐχόμενόν τι. λέγω δὲ εἶναι συνεχὲς, ὅταν ταὐτὸ γένηται καὶ ἓν τὸ ἑκατέρου πέρας οἷς ἅπτονται, καὶ ὥσπερ σημαίνει τοὔνομα, συνέχηται. τοῦτο δὲ οὐχ οἷόν τε, δυοῖν ὄντοιν εἶναι τοῖν ἐσχάτοιν. 12 Τούτου δὲ διωρισμένου, φανερὸν, ὅτι ἐν τούτοις ἐστὶ τὸ συνεχὲς, ἐξ ὧν ἕν τι πέφυκε γίνεσθαι κατὰ τὴν σύναψιν.

* γρ. πρῶτον
* Vide Vicom.
* γρ. διαλείποντα καὶ
* μετὰ τὴν
* γρ. ἢ θέσει, ἢ φύσει, ἢ ἄλλῳ τινί

* [illegible]

καὶ ὡς ποτὲ γίνεται τὸ* συνέχον ἕν, οὕτω καὶ τὸ ὅλον ἔσται ἕν, οἷον ἢ γόμφῳ, ἢ κόλλῃ, ἢ ἁφῇ, ἢ προσφύσει. 13 Φανερὸν δὲ καὶ ὅτι πρῶτον τὸ ἐφεξῆς ἐστί· τὸ μὲν γὰρ ἁπτόμενον, ἀνάγκη ἐφεξῆς εἶναι· τὸ δ' ἐφεξῆς, οὐ πᾶν ἅπτεσθαι· διὸ καὶ ἐν προτέροις τῷ λόγῳ τὸ ἐφεξῆς ἐστιν, οἷον ἐν ἀριθμοῖς. ἁφὴ δ' οὐκ ἔστι. 14 Καὶ εἰ μὲν συνεχές, ἀνάγκη ἅπτεσθαι· εἰ δ' ἅπτεται, οὔπω συνεχές· οὐ γὰρ ἀνάγκη ἓν εἶναι αὐτῶν τὰ ἄκρα, εἰ ἅμα εἶεν· ἀλλ' εἰ ἕν, ἀνάγκη καὶ ἅμα. ὥστε ἡ σύμφυσις ὑστάτη κατὰ τὴν γένεσιν· ἀνάγκη γὰρ ἅψασθαι, εἰ συμφύσεται τὰ ἄκρα· τὰ δὲ ἁπτόμενα, οὐ πάντα συμπέφυκεν· ἐν οἷς δὲ μή ἐστιν ἁφή, δῆλον ὅτι οὐκ ἔστιν οὐδὲ σύμφυσις ἐν τούτοις. 15 Ὥστ' εἰ ἔστι στιγμὴ καὶ μονάς, οἵας λέγουσι κεχωρισμένας, οὐχ οἷόν τε εἶναι μονάδα καὶ στιγμὴν τὸ αὐτό· ταῖς μὲν γὰρ ὑπάρχει τὸ ἅπτεσθαι, ταῖς δὲ μονάσι τὸ ἐφεξῆς. καὶ τῶν μὲν ἐνδέχεται εἶναί τι μεταξύ. πᾶσα γὰρ γραμμή, μεταξὺ στιγμῶν· τῶν δ', οὐκ ἀνάγκη· οὐδὲν γὰρ μεταξὺ δυάδος καὶ μονάδος. 16 Τί μὲν οὖν ἐστι τὸ ἅμα καὶ χωρίς, καὶ τί τὸ ἅπτεσθαι, καὶ τί τὸ μεταξύ, καὶ τὸ ἐφεξῆς, καὶ τί τὸ ἐχόμενον καὶ συνεχές, καὶ τοῖς ποίοις ἕκαστον τούτων ὑπάρχει, εἴρηται.

A & vt tandem id quod continet, ſit vnum, ita etiam totum erit vnum: vt clauo, aut glutine, aut tactu, aut naturali copulatione. 13 Perſpicuum etiam *eſt* primum eſſe id quod eſt deinceps. neceſſe *eſt* enim, vt quod tangit, deinceps ſit: non quicquid eſt deinceps, tangat. ideóque in iis quæ ratione priora *ſunt*, eſt ipſum deinceps, vt in numeris: tactus verò non eſt. 14 Item ſi *eſt* continuum, neceſſe *eſt* vt tangat. ſi verò tangit, nondum *eſt* continuum: quia non *eſt* neceſſe vt eorum extrema ſint vnum, ſi ſimul ſint: ſed ſi *ſunt* vnum, neceſſe eſt etiam ſimul *eſſe*. Quare naturalis copulatio ortu eſt poſtrema: neceſſe eſt n. tangere, ſi extrema copulari naturaliter debeant: ſed quæ tangunt, non omnia ſunt naturaliter copulata:
B in quibus verò non eſt tactus, manifeſtum *eſt* in his non eſſe naturalem copulationem. 15 Quocirca ſi eſt punctum & vnitas, vt quidam ponunt ſeparata: fieri nequit vt vnitas & punctum ſint idem, quoniam his quidem ineſt tactus: vnitatibus verò, deinceps *eſſe*. & iis quidem poteſt eſſe aliquid interiectum; quoniam omnis linea *eſt* punctis interiecta: illis verò non *eſſe aliquid interiectum* neceſſe *eſt*: nihil enim *eſt* interiectum binario & vnitati. 16 Quid igitur ſit ſimul, & ſeparatim, & quid tangere, & quid interiectum, & *quid* deinceps, & quid cohærens, & continuum, & quibus vnumquodque horum inſit, dictum eſt.

De vnitate & diuerſitate motuum.

Cap. VI.

Μία δὲ κίνησις λέγεται πολλαχῶς· τὸ γὰρ ἓν πολλαχῶς λέγομεν. 2 Γένει μὲν οὖν μία, κατὰ τὰ σχήματα τῆς κατηγορίας ἐστί. φορὰ μὲν γὰρ, πάσῃ φορᾷ τῷ γένει μία· ἀλλοίωσις δέ, φορᾶς ἑτέρα τῷ γένει.* 3 Εἴδει δὲ μία, ὅταν τῷ γένει μία οὖσα, καὶ ἐν ἀτόμῳ εἴδει ᾖ. οἷον, χρώματος μὲν εἰσὶ διαφοραί. τοιγαροῦν ἄλλη τῷ εἴδει μέλανσις, καὶ λεύκανσις· πᾶσα οὖν λεύκανσις πάσῃ λευκάνσει ἡ αὐτὴ κατὰ τὸ εἶδος ἔσται, καὶ πᾶσα μέλανσις μελάνσει· λευκότητι δ' οὐκ ἔτι. διὸ τῷ εἴδει μία λεύκανσις λευκάνσει πάσῃ. 4 Εἰ δέ ἐστιν ἄττα ἃ καὶ γένη ἅμα καὶ εἴδη ἐστί, δῆλον οὖν ὡς εἴδει πως μία ἔσται, ἁπλῶς δὲ μία εἴδει, οὔ· οἷον, ἡ μάθησις, εἰ ἡ ἐπιστήμη, εἶδος μὲν ὑπολήψεως, γένος δὲ τῶν ἐπιστημῶν. 5 Ἀπορήσειε δ' ἄν τις, εἰ εἴδει μία κίνησις, ὅταν ἐκ τοῦ αὐτοῦ τὸ αὐτὸ εἰς τὸ αὐτὸ μεταβάλλῃ· οἷον, ἡ μία στιγμὴ ἐκ τοῦδε τοῦ τόπου εἰς τόνδε τὸν τόπον πάλιν καὶ πάλιν. εἰ δὲ τοῦτο, ἔσται ἡ κυκλοφορία τῇ εὐθυφορίᾳ ἡ αὐτή· καὶ ἡ κύλισις τῇ βαδίσει. ἢ διώρισται τὸ ἐν ᾧ ἐὰν ἕτερον ᾖ τῷ εἴδει ὅτι ἑτέρα κίνησις; τὸ δὲ περιφερές, τοῦ εὐθέος ἕτερον τῷ εἴδει. 6 Γένει μὲν οὖν καὶ εἴδει κίνησις μία, οὕτως. 7 Ἁπλῶς δὲ μία κίνησις, ἡ τῇ οὐσίᾳ μία, καὶ τῷ ἀριθμῷ· τίς δ' ἡ τοιαύτη, δῆλον διελομένοις· τρία γάρ ἐστι τὸν ἀριθμὸν περὶ ἃ λέγομεν τὴν κίνησιν μίαν, ὃ, καὶ ἐν ᾧ, καὶ ὅτε. λέγω δὲ ὃ, ὅτι ἀνάγκη εἶναί τι τὸ κινούμενον· οἷον ἄνθρωπον, ἢ χρυσόν. καὶ ἔν τινι τοῦτο κινεῖσθαι· οἷον ἐν τόπῳ, ἢ ἐν πάθει. καὶ ποτέ· ἐν χρόνῳ γὰρ πᾶν κινεῖται. τούτων δὲ τὸ μὲν εἶναι τῷ γένει ἢ τῷ εἴδει μίαν, ἔστιν ἐν τῷ πράγματι ἐν ᾧ κινεῖται· τὸ δὲ ἐχόμενον, ἐν τῷ χρόνῳ· τὸ δ' ἁπλῶς μίαν, ἐν ἅπασι τούτοις. καὶ γὰρ ἐν ᾧ ἕν, δεῖ εἶναι καὶ ἄτομον·

B Vnus autem motus dicitur multis modis: quia vnum multis modis dicimus. 2 Genere igitur vnus eſt ſecundùm categoriæ figuras. nam latio cum omni latione *eſt* vnus genere *motus*. variatio verò à latione differt genere. 3 Specie autem vnus *eſt motus*, ſi, cùm genere vnus ſit, etiam in indiuidua ſpecie ſit. vt coloris ſunt differentiæ, ſpecie igitur differunt, denigratio & dealbatio. omnis itaque dealbatio cum omni dealbatione eadem erit ſpecie: nec non omnis denigratio cum denigratione, cum dealbatione verò non item. itaque ſpecie vnus *motus eſt* dealbatio cum omni dealbatione. 4 Quòd ſi quædam & genera
C ſimul & ſpecies ſint: manifeſtum *eſt*, aliquo modo vnum ſpecie *motũ* fore, ſimpliciter autem vnum ſpecie non *fore*. vt diſcẽdi actus, ſi ſcientia *eſt* ſpecies exiſtimationis, ac genus ſcientiarum. 5 Dubitare autem quiſpiam poſſit, *ſit*ne vnus ſpecie motus, quando ab eodem idem ad idem mutatur: vt puta vnum pũctum ex hoc loco in illum locũ ſemel atque iterum. quod ſi *eſt*, conuerſio eadem erit cum recta latione: & volutatio cum ambulatione. An definitum eſt, diuerſum *eſſe* motum, ſi id, in quo *ſit*, diuerſum ſit ſpecie? orbiculare autem à recto diuerſum eſt ſpecie. 6 Genere igitur ac ſpecie motus vnus ita *eſt*. 7 Simpliciter autem vnus *eſt* motus, qui *eſt* eſſentia vnus & numero.
D quis autem *ſit* talis, manifeſtum diuidẽtibus *fiet*. tria namq; ſunt numero, circa quæ dicimus motum vnũ *eſſe*, *nempe* quod, & in quo, & quando. dico autem quod: quia neceſſe *eſt* eſſe aliquid quod moueatur: vt hominem, aut aurũ. & in aliquo hoc moueri: velut in loco, vel in affectione. & aliquando: propterea quòd in tempore omnis res mouetur. Ex his autẽ in re in qua mouetur, *poſitũ* eſt vt ſit motus vnus genere, vel ſpecie. cohærentia verò *poſita* eſt in tempore. ſimpliciter autem vnum *eſſe motum* in his omnibus: nam & *id* in quo, vnum eſſe oportet atque indiuiduum:

veluti, formam. & rurſus quando: veluti, tempus vnum *eſſe*, nec interrumpi. *ſed* & mobile vnum eſſe, non ex accidenti, (vt album nigreſcere, & Coriſcum ambulare: vnum autem *ſunt* Coriſcus & album, ſed ex accidenti) neque commune: quia poſſunt duo homines ſimul curari eadem curatione, vt lippitudinis: verùm hic non *eſt* vnus *motus ſimpliciter*, ſed ſpecie vnus. 8 Sed *pone* Socratem eadem variationis ſpecie variari, in alio tamen atque alio tempore: ſiquidem poteſt, quod interiit, rurſus vnum fieri numero: erit & hic *motus* vnus. ſin minùs, erit quidem idem *motus*, non tamen vnus. 9 Exiſtit etiam dubitatio huic affinis, an eſſentialiter in corporibus vna ſit ſanitas, & omnino habitus & affectiones. nam quæ *his* prædita ſunt, videntur moueri & fluere. quòd ſi vna & eadem *eſt* ſanitas, quæ *erat* manè, & quæ nunc *eſt*: cur non etiam, cùm intermiſſam ſanitatem rurſus receperit, hęc quoque vna & eadem numero erit? nam *eſt* eadem ratio. ſed hoc differt: quòd ſi duo propter hoc ipſum *ſunt* tamquam vnus *actus* numero, etiam habitus neceſſe eſt *eſſe vnos*: vnus enim numero actus *eſt* vnius numero. verùm ſi habitus *ſit* vnus, fortaſſe nondum alicui videbitur eſſe etiam vnus actus. cùm enim deſierit ambulare, non eſt ampliùs ambulatio: rurſus autem *eo* ambulante, erit. ſi igitur *eſt* vna & eadem, certè vnum & idem poterit & interire & eſſe ſæpius. *Sanè* hæ dubitationes ſunt alienæ à præſenti conſideratione. 10 Cùm autem omnis motus *ſit* continuus: neceſſe *eſt*, eum qui ſimpliciter eſt vnus, eſſe etiam continuum: ſiquidem omnis *eſt* diuiduus: &, ſi *eſt* continuus, *eſt* vnus. 11 Non enim omnis *motus* omni *motui* continuus fieri poteſt: quemadmodum nec aliud quodvis cuiuis: ſed *ea tantum continua ſunt*, quorum extrema *ſunt* vnum. extrema verò quorumdam non ſunt, quorumdam autem ſunt diuerſa ſpecie & homonyma. quo enim modo ſe tangere aut vnum fieri poſſunt extremum lineæ & ambulationis? 12 Cohærere igitur poſſunt etiam *motus*, qui non *ſunt* iidem ſpecie, nec genere: quia fieri poteſt, vt cùm aliquis cucurrerit, confeſtim febricitet: & veluti, fax ex ſucceſſione, latio cohæret: ſed continua non eſt; quia poſitum eſt, continuum *eſſe*, quorum extrema *ſunt* vnum. 13 Quapropter cohærent, & deinceps ſunt, eo quòd tempus eſt continuum. Continui autem *ſunt*, eo quòd *ipſi* motus *ſunt tales*: quod quidem *tunc eſt* cùm amborum extremum factum eſt vnum. 14 Idcirco neceſſe *eſt* vt motus qui eſt ſimpliciter continuus & vnus, ſit idem ſpecie, & vnius, & in vno tempore. *in vno* quidem tempore, ne motus vacuitas intericiatur: quoniam in interuallo quieſcere neceſſe *eſt*: proinde multi non vnus *eſt* motus, quibus eſt quies interiecta. quare ſi motus aliquis ſtatu interrumpitur, neque *eſt* vnus, neque continuus. interrcitur autem, ſi tempus *ſit* interiectum. eius autem *motus* qui ſpecie non eſt motus, non *poteſt dici vnitas*, etiamſi non intermittatur tempus. nam tempus quidem *eſt* vnum: ſed motus *eſt* ſpecie diuerſus. etenim *motum* qui *eſt* vnus, neceſſe *eſt* etiam ſpecie vnum eſſe: hunc verò ſimpliciter eſſe vnum, non *eſt* neceſſe. 15 Quis igitur *ſit* motus ſimpliciter vnus, dictum eſt. 16 Præterea dicitur vnus, etiam is qui *eſt* perfectus: ſiue genere, ſiue ſpecie ſit, ſiue eſſentia: ſicut & in aliis perfectum & totum *eſt* vnius. quandoque verò, etiamſi imperfectus ſit, vnus dicitur, dummodo ſit continuus. 17 Præterea & aliter præter eos qui commemorati ſunt, dicitur vnus motus, qui *eſt* æquabilis. nam qui *eſt* inæquabilis, quodammodo non videtur vnus, ſed magis qui *eſt* æquabilis, vt recta li-

A δεῖ τὸ εἶδος. καὶ αὖ τὸ ὅτε, δεῖ τὸν χρόνον ἕνα καὶ μὴ διαλείπειν· καὶ τὸ κινούμενον ἓν εἶναι, μὴ κατὰ συμβεβηκός· ὥσπερ τὸ λευκὸν μελαίνεσθαι, καὶ Κορίσκον βαδίζειν. ἓν δὲ καὶ ὁ Κορίσκος, καὶ λευκόν, ἀλλὰ κατὰ συμβεβηκός. μηδὲ κοινόν· εἴη γὰρ ἂν ἅμα δύο ἀνθρώπους ὑγιάζεσθαι τὴν αὐτὴν ὑγίανσιν, οἷον ὀφθαλμίας. ἀλλ' οὐ μία αὕτη, ἀλλ' εἴδει μία. 8 Τὸ δὲ, Σωκράτη τὴν αὐτὴν μὲν ἀλλοίωσιν ἀλλοιοῦσθαι τῷ εἴδει, ἐν ἄλλῳ δὲ χρόνῳ, καὶ πάλιν ἐν ἄλλῳ, εἰ μὲν ἐνδέχεται τὸ φθαρὲν, πάλιν ἓν γίνεσθαι τῷ ἀριθμῷ, εἴη ἂν καὶ αὕτη μία. εἰ δὲ μὴ, ἡ αὐτὴ μὲν, μία δ' οὔ. 9 Ἔχει δ' ἀπορίαν ταύτῃ παραπλησίαν, καὶ πότερον μία ἡ ὑγίεια, καὶ ὅλως αἱ ἕξεις καὶ τὰ

B πάθη τῇ οὐσίᾳ εἰσὶν ἐν τοῖς σώμασι· κινούμενα γὰρ φαίνεται τὰ ἔχοντα καὶ ῥέοντα. εἰ δ' ἡ αὐτὴ καὶ μία ἡ ἕωθεν καὶ νῦν ὑγίεια, διὰ τί οὐκ ἂν καὶ ὅταν διαλιπὼν λάβῃ καὶ πάλιν τὴν ὑγίειαν, καὶ αὕτη κἀκείνη μία τῷ ἀριθμῷ ἂν εἴη; ὁ γὰρ αὐτὸς λόγος. πλὴν τοσοῦτον διαφέρει, ὅτι, * εἰ μὲν δύο, δι' αὐτὸ τοῦτο, ὡς τῷ ἀριθμῷ μία, καὶ τὰς ἕξεις ἀνάγκη. μία γὰρ ἀριθμῷ ἐνέργεια, ἑνὸς ἀριθμῷ. εἰ δ' ἡ ἕξις μία, ἴσως οὐκ ἄν τῳ δόξειέ πω μία καὶ ἐνέργεια εἶναι. ὅταν γὰρ παύσηται βαδίζων, οὐκ ἔτι ἔστιν ἡ βάδισις. πάλιν δὲ βαδίζοντος ἔσται. εἰ οὖν μία καὶ

C ἡ αὐτὴ, ἐνδέχοιτ' ἂν τὸ αὐτὸ καὶ ἓν καὶ φθείρεσθαι καὶ εἶναι πολλάκις. αὗται μὲν εἰσὶν αἱ ἀπορίαι ἔξω τῆς νῦν σκέψεως. 10 Ἐπεὶ δὲ συνεχὴς πᾶσα κίνησις, τήν τε ἁπλῶς μίαν ἀνάγκη καὶ συνεχῆ εἶναι, * εἴπερ πᾶσα διαιρετὴ, καὶ εἰ συνεχὴς μία. 11 Οὐ γὰρ πᾶσα γένοιτ' ἂν συνεχὴς πάσῃ, ὥσπερ οὐδὲ ἄλλο οὐδὲν, τῷ τυχόντι τὸ τυχόν· ἀλλ' ὅσων ἓν τὰ ἔσχατα. ἔσχατα δὲ, τῶν μὲν οὐκ ἔστι, τῶν δ' ἔστιν, ἀλλὰ τῷ εἴδει καὶ ὁμώνυμα· πῶς γὰρ ἂν ἅψαιτο, ἢ ἓν γένοιτο τὸ ἔσχατον, γραμμῆς καὶ βαδίσεως; 12 Ἐχόμεναι μὲν οὖν εἶεν ἂν καὶ αἱ μὴ αὐταὶ τῷ εἴδει, μηδὲ τῷ γένει· δραμὼν γὰρ ἄν τις πυρέξειεν εὐ-

D θὺς, καὶ οἷον ἡ λαμπὰς, ἐκ διαδοχῆς, φορὰ ἐχομένη, συνεχὴς δ' οὐκ ἔστι. κεῖται γὰρ τὸ συνεχὲς, ὧν τὰ ἔσχατα ἕν. 13 Ὥστε ἐχόμεναι καὶ ἐφεξῆς εἰσι, τῷ τὸν χρόνον εἶναι συνεχῆ· συνεχὲς δὲ, τῷ τὰς κινήσεις· τοῦτο δ', ὅταν ἓν τὸ ἔσχατον γένηται ἀμφοῖν. 14 Διὸ ἀνάγκη τὴν αὐτὴν τῷ εἴδει εἶναι καὶ ἑνὸς, καὶ ἐν ἑνὶ χρόνῳ τὴν ἁπλῶς συνεχῆ κίνησιν καὶ μίαν· τῷ χρόνῳ μὲν, ὅπως μὴ ἀκινησία μεταξὺ ᾖ· ἐν τῷ διαλείποντι γὰρ ἠρεμεῖν ἀνάγκη. πολλαὶ οὖν καὶ οὐ μία ἡ κίνησις, ὧν ἐστὶν ἠρεμία μεταξύ. ὥστε εἴ τις κίνησις στάσει διαλαμβάνεται, οὔτε μία, οὔτε συνεχής· διαλαμβάνεται δὲ, εἰ μεταξὺ χρόνος·

E * τῆς δὲ τῷ εἴδει μὴ μιᾶς, οὐ καὶ εἰ μὴ διαλείπεται ὁ χρόνος· ὁ μὲν γὰρ χρόνος, εἷς· τῷ δ' εἴδει, ἡ κίνησις ἄλλη· τὴν μὲν γὰρ μίαν ἀνάγκη καὶ τῷ εἴδει μίαν εἶναι· ταύτην δὲ ἁπλῶς εἶναι μίαν, οὐκ ἀνάγκη. 15 Τίς μὲν οὖν κίνησις ἁπλῶς μία, εἴρηται. 16 Ἔτι δὲ, λέγεται μία καὶ ἡ τέλειος, ἐάν τε κατὰ γένος, ἐάν τε κατ' εἶδος ᾖ, ἐάν τε κατ' οὐσίαν· ὥσπερ καὶ ἐπὶ τῶν ἄλλων τὸ τέλειον καὶ ὅλον τοῦ ἑνός. ἔστι δὲ ὅτε κἂν ἀτελὴς ᾖ, μία λέγεται, ἐὰν μόνον ᾖ συνεχής. 17 Ἔτι δ', ἄλλως παρὰ τὰς εἰρημένας λέγεται μία κίνησις, ἡ ὁμαλής. ἡ γὰρ ἀνώμαλος ἔστιν ὡς, οὐ δοκεῖ μία, ἀλλὰ μᾶλλον ἡ ὁμαλής, ὥσπερ

* καὶ εἰ μὲν δύο αὐταὶ τῷ ἀριθμῷ, ἢ τὰς ἕξεις ἀνάγκη. μία γὰρ ἀριθμῷ ἐνέργεια, ἑνὸς ἀριθμῷ. vt ex Alexandro refert Simplicius, quem vide.

* κ. εἴπερ πᾶσα διαιρετὴ, ἢ εἰ συνεχὴς μία. vide interpretes.

* Argyropylus vel legiſſe aliter, vel obſcuram breuitatē philoſophi paraphraſi, vt alibi, illuſtrare voluiſſe videtur.

ἡ εὐθεῖα. ἡ γὰρ ἀνώμαλος, διαιρετή. ἔοικε δὲ διαφέρειν ὡς τὸ μᾶλλον καὶ ἧττον. 18 Ἔστι δὴ ἐν ἁπάσῃ κινήσει τὸ ὁμαλῶς ἢ μή· καὶ γὰρ ἂν ἀλλοιοῖτο ὁμαλῶς, καὶ φέροιτο ἐφ' ὁμαλοῦ, οἷον κύκλου, ἢ εὐθείας, καὶ περὶ αὐξήσεως ὡσαύτως καὶ φθίσεως. 19 Ἀνωμαλίας δ' ἐστὶ διαφορά, ὁτὲ μὲν ἐφ' ᾧ κινεῖται· ἀδύνατον γὰρ ὁμαλὴν εἶναι τὴν κίνησιν μὴ ἐπὶ ὁμαλῷ μεγέθει, οἷον ἡ τῆς κεκλασμένης κίνησις, ἢ ἡ τῆς ἕλικος, ἢ ἄλλου μεγέθους, ὧν μὴ ἐφαρμόττει τὸ τυχὸν ἐπὶ τὸ τυχὸν μέρος. ὁτὲ δὲ οὔτε ἐν τῷ ποῦ, οὔτε ἐν τῷ ποτέ, οὔτε ἐν τῷ εἰς ὅ, ἀλλ' ἐν τῷ ὥς. ταχυτῆτι γὰρ καὶ βραδυτῆτι ἐνίοτε διώρισται· ἧς μὲν γὰρ τὸ αὐτὸ τάχος, ὁμαλής· ἧς δὲ μή, ἀνώμαλος. 20 Διὸ οὐκ εἴδη κινήσεως, οὐδὲ διαφοραί, τάχος καὶ βραδυτής, ὅτι πάσαις ἀκολουθεῖ ταῖς διαφόροις κατ' εἶδος. ὥστε οὐδὲ βαρύτης καὶ κουφότης ἡ εἰς τὸ αὐτό, οἷον γῆς πρὸς αὑτήν, ἢ πυρὸς πρὸς αὑτό. 21 Μία μὲν οὖν ἡ ἀνώμαλος, τῷ συνεχής· ἧττον δὲ ὅπερ τῇ κεκλασμένῃ συμβαίνει φορᾷ· τὸ δὲ ἧττον, μίξις ἀεὶ τοῦ ἐναντίου. 22 Εἰ δὲ πᾶσαν τὴν μίαν ἐνδέχεται καὶ ὁμαλὴν εἶναι καὶ μή, οὐκ ἂν εἴησαν αἱ μὴ κατ' εἶδος ἐχόμεναι καὶ αὗται, μία καὶ συνεχής· πῶς γὰρ ἂν εἴη ὁμαλὴς ἡ ἐξ ἀλλοιώσεως συγκειμένη καὶ φορᾶς; δέοι γὰρ ἂν ἐφαρμόττειν.

A *nea*: inæquabilis enim *eſt* indiuiduus. videntur autem differre, vt magis & minus. 18 Porrò in omni motu eſt æquabilitas vel inæquabilitas. nam & variari poteſt æquabiliter, & ferri ſuper æquabili *ſpatio*, vt circulo, aut linea *recta*. eadémque ratio eſt accretionis, & deminutionis. 19 Inæquabilitatis autem differentia quandoque conſiſtit in eo in quo mouetur: quia fieri nequit vt motus ſit æquabilis ſuper non æquabili magnitudine: vt inflexæ lineæ, vel anfractus, vel alſius magnitudinis, quarum quævis pars cum quavis non congruit. quandoque verò nec in *ipſo* vbi, nec in *ipſo* quando, nec in *eo* ad quod *mouetur*, ſed in modo. B celeritate enim ac tarditate interdum definitur. nam cuius eadem *eſt* celeritas, *is eſt* æquabilis: cuius autem non *eſt eadem*, inæquabilis. 20 Idcirco celeritas ac tarditas *non* ſunt ſpecies, nec differentiæ motus: quia conſequuntur omnes *motus* ſpecie differentes: quocirca neque grauitas & leuitas, quæ *eſt* ad idem: vt terræ ad ſeipſam, aut ignis ad ſeipſum. 21 *Motus* igitur inæquabilis *eſt* vnus, quia *eſt* continuus: ſed minus: quod quidem inflexæ lationi accidit. quod autem *eſt* minus, ſemper habet contrarium admixtum. 22 Quòd ſi omnis motus vnus, poteſt eſſe æquabilis & non *æquabilis*: certè motus, qui non ſunt ſpecie cohærentes & vni, non poſſunt eſſe vnus & continuus. quo enim modo poteſt eſſe æquabilis, qui componitur ex variatione & latione? nam oporteret *eos inter ſe* congruere.

De contrarietate motus.

Cap. VII.

ΕΤι δέ, διοριστέον ποία κίνησις ἐναντία κινήσει· καὶ περὶ μονῆς δέ, τὸν αὐτὸν τρόπον. 2 Διαιρετέον δὲ πρῶτον, πότερον ἐναντία κίνησις ἡ ἐκ τοῦ αὐτοῦ τῇ εἰς τὸ αὐτό, οἷον ἡ ἐξ ὑγιείας, τῇ εἰς ὑγίειαν, οἷον καὶ γένεσις καὶ φθορὰ δοκεῖ· ἢ ἡ ἐξ ἐναντίων, οἷον ἡ ἐξ ὑγιείας τῇ ἐκ νόσου· ἢ ἡ εἰς ἐναντία, οἷον ἡ εἰς ὑγίειαν τῇ εἰς νόσον· ἢ ἡ ἐξ ἐναντίου, τῇ εἰς ἐναντίον, οἷον ἡ ἐξ ὑγιείας, τῇ εἰς νόσον· ἢ ἡ ἐξ ἐναντίου εἰς ἐναντίον, τῇ ἐξ ἐναντίου εἰς ἐναντίον, οἷον, ἡ ἐξ ὑγιείας εἰς νόσον, τῇ ἐκ νόσου εἰς ὑγίειαν. ἀνάγκη γὰρ ἢ ἕνα τινὰ τούτων εἶναι τῶν τρόπων, ἢ πλείους· οὐ γὰρ ἔστιν ἄλλως ἀντιτεθῆναι. 3 Ἔστι δέ, ἡ μὲν ἐξ ἐναντίου τῇ εἰς ἐναντίον οὐκ ἐναντία, οἷον ἡ ἐξ ὑγιείας τῇ εἰς νόσον· ἡ αὐτὴ γὰρ καὶ μία. τὸ μέντοι εἶναι, οὐ τὸ αὐτὸ αὐταῖς. ὥσπερ οὐδὲ τὸ αὐτὸ τὸ ἐξ ὑγιείας μεταβάλλειν, καὶ τὸ εἰς νόσον. 4 Οὐδ' ἡ ἐξ ἐναντίου, τῇ ἐξ ἐναντίου· ἅμα γὰρ συμβαίνει ἐξ ἐναντίου, καὶ εἰς ἐναντίον, ἢ μεταξύ. ἀλλὰ περὶ μὲν τούτου, ὕστερον ἐροῦμεν. ἀλλὰ μᾶλλον τὸ εἰς ἐναντίον μεταβάλλειν δόξειεν ἂν αἴτιον εἶναι τῆς ἐναντιώσεως, ἢ τὸ ἐξ ἐναντίου· ἡ μὲν γάρ, ἀπαλλαγὴ ἐξ ἐναντιότητος· ἡ δέ, λῆψις. καὶ λέγεται δὲ ἑκάστη εἰς ὃ μεταβάλλει μᾶλλον, ἢ ἐξ οὗ· οἷον ὑγίανσις ἡ εἰς ὑγίειαν· νόσανσις δὲ ἡ εἰς νόσον. 5 Λείπεται δὴ ἡ εἰς ἐναντία, καὶ ἡ εἰς ἐναντία * ἐξ ἐναντίων. 6 Τάχα μὲν οὖν συμβαίνει τὰς εἰς ἐναντία, καὶ ἐξ ἐναντίων εἶναι· ἀλλὰ τὸ εἶναι ἴσως οὐ τὸ αὐτό· λέγω δέ, τὸ εἰς ὑγίειαν, τῷ ἐκ νόσου· καὶ τὸ ἐξ ὑγιείας, τῷ εἰς νόσον. 7 Ἐπεὶ δὲ διαφέρει μεταβολὴ κινήσεως· (ἡ ἐκ τινος γὰρ ὑποκειμένου εἰς τι ὑποκείμενον μεταβολή, κίνησις

* γρ. ἐξ ἐν. τῇ εἰς ἐναντία ἐξ ἐναντίων.

C PRæterea definiendum *eſt*, quis motus *ſit* motui contrarius: & eodem modo de ſtatu. 2 Primùm autē explicandum *eſt*, ſitne contrarius motus qui eſt ex eodem, ei *motui* qui *eſt* in idem: velvti, qui *eſt* ex ſanitate, ei qui in ſanitatem, cuiuſmodi & ortus & interitus *eſſe* videtur: an qui eſt ex contrariis, vt qui *eſt* ex ſanitate, ei qui ex morbo: an qui in contraria, vt is qui in ſanitatem, ei qui in morbum: an qui ex cōtrario, ei qui in contrarium: velvti, qui *eſt* ex ſanitate, ei qui in morbum: an qui ex contrario in cōtrarium, ei qui ex contrario in cōtrarium, velvti, qui ex ſanitate in morbum, ei qui ex morbo in ſanitatem. neceſſe *eſt* D enim, vel vnum aliquē eſſe ex his modis, vel plures: quia non licet *motus* aliter opponere. 3 Sed qui *eſt* ex contrario, ei qui *eſt* in contrarium, cōtrarius non *eſt*: velvti, qui *eſt* ex ſanitate, ei qui *eſt* in morbū: quippe qui *eſt* vnus & idem: verùm eſſentia non eſt ipſis eadem: ſicvti nec mutari ex ſanitate, & in morbum, idē *eſt*. 4 Nec qui *eſt* ex contrario, ei qui *eſt* ex *altero* contrario. ſimul enim accidit *vt ſit* ex cōtrario & in contrarium vel *medium* interiectum. Sed de hoc poſteriùs dicemus. Sed potiùs in cōtrarium mutari, videri poteſt eſſe cauſa contrarietatis, quàm *mutari* ex contrario: quoniam hoc *eſt* liberatio à cōtrario, illud autem *eſt* aſſumptio: ac dicitur quiſque *motus ab eo* in quod E mutatur, potiùs quàm *ab eo* ex quo *mutatur*: vt ſanatio dicitur, quæ *tēdit* in ſanitatem: morbi autē correptio, quæ in morbum. 5 Reſtat igitur motus qui eſt in cōtraria, & qui *eſt* ex contrariis in contraria. 6 Fortaſſis quidem accidit, vt *motus* qui ſunt in contraria, etiam ſint ex contrariis: ſed eſſentia fortaſſe non *eſt* eadem. Verbi gratia, qui *eſt* ad ſanitatē, ei qui *eſt* ex morbo: & qui ex ſanitate, ei qui in morbum. 7 Cùm autem differat mutatio à motu: quoniam *ea demum* mutatio *quæ eſt* ex ſubiecto in aliquod ſubiectum, motus

eſt: certè motus qui eſt ex contrario in contrarium, ei A qui eſt ex contrario in contrarium, contrarius eſt: velut, qui eſt ex ſanitate in morbum, ei qui eſt ex morbo in ſanitatem. 8 Sed & inductione manifeſtũ eſt, qualia videtur eſſe, quæ ſunt contraria. nam morbo corripi & ſanari contraria ſunt: item diſcere & falli non à ſe ipſo: ſunt enim in contraria. nam vt ſcientiam, ita & deceptionem & per ſe nanciſci licet & per alium. item latio quæ eſt ſurſum verſùs, ei quæ eſt deorſum verſùs: quoniam hæc ſunt contraria in logitudine: & quæ eſt in dexteram, ei quæ eſt in ſiniſtram: quoniam hæc ſunt cõtraria in latitudine. & quæ eſt in anteriorem partem, ei quæ eſt in poſteriorem: quoniam & hæc ſunt contraria in altitudine. 9 *Mutatio* verò quæ dumtaxat *eſt* in contrarium, non *eſt* motus, ſed mutatio: velut, fieri album nõ ex aliquo. 10 Sed & quibus B non eſt aliquid contrarium, *mutatio* quæ eſt ex eodẽ, mutationi quæ eſt in idem, cõtraria *eſt*. idcirco ortus *eſt* interitui contrarius: & abiectio *aſſumptioni*. verũ hæ ſunt mutationes, non motus. 11 Motus verò qui ad inter*iectum medium fiunt*, quibus ſcilicet contrariis aliquod eſt inter*iectum*, tamquam in contraria quodammodo ponendi *ſunt*: quoniam motus vtitur eo quod *eſt* inter*iectum* quaſi contrario, in vtramvis partem mutetur: vtputa ex fuſco in album, quaſi ex nigro: & ex albo in fuſcum, quaſi in nigrum: ex nigro autem in fuſcum, quaſi in album. nam fuſcum, *quod eſt* medium, ad vtrumque extremum quodammodo refertur, vt & antea dictum fuit. 12 Motus igitur motui contrarius ita *eſt*: *nempe* qui *eſt* ex contrario in contrarium, ei qui *eſt* ex contrario in contrarium.

A ἐστιν) ἡ ἐξ ἐναντίου εἰς ἐναντίον, τῇ ἐξ ἐναντίου εἰς ἐναντίον, κίνησις ἐναντία ἐστί, ἡ ἐξ ὑγιείας εἰς νόσον, τῇ ἐκ νόσου εἰς ὑγίειαν. 8 Δῆλον δὲ καὶ ἐκ τῆς ἐπαγωγῆς, ὁποῖα δοκεῖ τὰ ἐναντία εἶναι· τὸ νοσάζεσθαι γὰρ τῷ ὑγιάζεσθαι, καὶ τὸ μανθάνειν τῷ ἀπατᾶσθαι μὴ δι' αὑτοῦ· εἰς ἐναντία γάρ· ὥσπερ γὰρ ἐπιστήμην ἔστιν, οὕτω καὶ ἀπάτην καὶ δι' αὑτοῦ κτᾶσθαι, καὶ δι' ἄλλου. καὶ ἡ ἄνω φορὰ, τῇ κάτω· ἐναντία γὰρ ταῦτα ἐν μήκει. καὶ ἡ εἰς δεξιὰ, τῇ εἰς ἀριστερά· ἐναντία γὰρ ταῦτα ἐν πλάτει. καὶ ἡ εἰς τὸ ἔμπροσθεν, τῇ εἰς τὸ ὄπισθεν. ἐναντία γὰρ καὶ ταῦτα ἐν βάθει. 9 Ἡ δ' εἰς τὸ ἐναντίον μόνον, οὐ κίνησις, ἀλλὰ μεταβολή, ἐστι τὸ γίγνεσθαι λευκὸν μὴ ἔκ τινος. 10 Καὶ ὅσοις δὲ μὴ B ἔστι τι ἐναντίον, ἡ ἐξ αὐτοῦ, τῇ εἰς αὐτὸ μεταβολῇ, ἐναντία. διὸ γένεσις φθορᾷ ἐναντία, καὶ ἀποβολὴ λήψει. αὗται δὲ, μεταβολαὶ μὲν, κινήσεις δ' οὔ. 11 Τὰς δ' εἰς τὸ μεταξὺ κινήσεις, ὅσοις τῶν ἐναντίων τί ἐστι μεταξὺ, ὡς εἰς ἐναντία πως θετέον· ὡς ἐναντίῳ γὰρ χρῆται τῷ μεταξὺ ἡ κίνησις, ἐφ' ὁπότερα ἂν μεταβάλλῃ ἐστὶν, ἐκ φαιοῦ μὲν εἰς τὸ λευκὸν, ὡς ἐκ μέλανος· καὶ ἐκ λευκοῦ, εἰς φαιὸν, ὡς εἰς μέλαν· ἐκ δὲ μέλανος εἰς φαιὸν, ὡς εἰς λευκόν· τὸ γὰρ φαιὸν, τὸ μέσον πρὸς ἑκάτερον λέγεταί πως τῶν ἄκρων, καθάπερ εἴρηται καὶ πρότερον. 12 Κίνησις μὲν δὴ κινήσει ἐναντία οὕτως, ἡ ἐξ ἐναντίου εἰς ἐναντίον, τῇ ἐξ ἐναντίου εἰς ἐναντίον.

De contrarietate motus & quietis.

Cap. VIII.

CVm autẽ motui non ſolùm videatur motus eſſe C cõtrarius, ſed etiam quies: hoc definiendum *eſt*. ſimpliciter enim contrarius *eſt* motus motui: ſed opponitur etiam quies: quandoquidem *eſt* priuatio, & priuatio quodam modo contraria dicitur. 2 Quali autem qualis? velut, *motui* qui eſt ſecundùm locum, *quies quæ eſt* ſecundum locum? 3 Sed hoc nunc dicitur ſimpliciter. vtrùm enim ſtatui *qui eſt* in hoc, opponitur motus qui *eſt* ex hoc, an qui in hoc? 4 Manifeſtum igitur *eſt*, cùm in duobus ſubiectis motus *cernatur*, ei qui *eſt* ex hoc in contrarium, *opponi* ſtatum qui *eſt* in hoc, contrario verò qui *eſt* ex contrario in hoc, cum qui *eſt* in contrario. 3 Quin etiam hæ *quietes* ſunt inter ſe contrariæ: etenim abſurdum *eſt*, ſi motus quidã contrarij ſunt; quietes autem *illis* oppoſitæ, *contrariæ* non ſunt. 4 Sunt autem, quæ in contrariis *cernuntur*, vt D *quies* quę eſt in ſanitate, quieti quæ *eſt* in morbo: motui verò qui eſt ex ſanitate in morbum. nam ei qui *eſt* ex morbo in ſanitatem, *eſſe hanc quietem contrariam*, à ratione alienum *eſt*. nam motus qui *eſt* ad *illud* ipſum in quo ſtetit, eſt potiùs procreatio quietis. quã accidit ſimul fieri cum motu. neceſſe autem *eſt* aut hanc aut illam eſſe. non enim quies quæ *eſt* in albore, *eſt* cõtraria ei *motui* qui eſt in ſanitate. 7 Quibus autem non ſunt contraria, horum mutatio eſt quidem oppoſita, *nẽpe* quæ *eſt* ex eodem, ei quæ eſt in idem: ſed motus nõ eſt: velut, quæ *eſt* ex ente, ei quæ *eſt* in ens. ac ſtatus quidem horum non eſt, ſed mutationis vacuitas. 8 Et ſiquidem non ens ſit aliquod ſubiectum: ea mutationis vacuitas quæ eſt in ente, contraria erit ei quæ *eſt* in non ente. ſed ſi non ens non eſt aliquid: dubitare quiſpiam poſſit, cui contraria *ſit ea* mutationis vacuitas quæ *eſt* in ente, & an ſit quies.

C Ἐπεὶ δὲ κινήσει οὐ μόνον δοκεῖ κίνησις εἶναι ἐναντία, ἀλλὰ καὶ ἠρεμία, τοῦτο διοριστέον· ἁπλῶς μὲν γὰρ ἐναντίον κίνησις κινήσει, ἀντίκειται δὲ καὶ ἡ ἠρεμία· στέρησις γάρ ἐστιν. ἔστι δ' ὡς καὶ ἡ στέρησις ἐναντία λέγεται. 2 Ποία δὲ ποίᾳ, οἷον τῇ κατὰ τόπον, ἡ κατὰ τόπον; 3 Ἀλλὰ τοῦτο μὲν νῦν λέγεται ἁπλῶς· πότερον γὰρ τῇ ἐνταῦθοι μονῇ, ἡ ἐκ τούτου, ἢ εἰς τοῦτο κίνησις ἀντίκειται. 4 Δῆλον δὴ ὅτι, ἐπεὶ ἐν δυσὶν ἡ κίνησις ὑποκειμένοις, τῇ μὲν ἐκ τούτου εἰς τὸ ἐναντίον, ἡ ἐν τούτῳ μονή· τῇ δ' ἐκ τοῦ ἐναντίου εἰς τοῦτο, ἡ ἐν τῷ ἐναντίῳ. 5 Ἅμα δὲ καὶ ἀλλήλαις ἐναντίαι αὗται· καὶ γὰρ ἄτοπον, εἰ κινήσεις μὲν ἐναντίαι εἰσὶν, ἠρεμίαι δὲ ἀντικείμεναι οὐκ εἰσίν. 6 Εἰσὶ δὲ αἱ ἐν D τοῖς ἐναντίοις· οἷον, ἡ ἐν ὑγιείᾳ, τῇ ἐν νόσῳ ἠρεμίᾳ, κινήσει δὲ τῇ ἐξ ὑγιείας εἰς νόσον· τῇ γὰρ ἐκ νόσου εἰς ὑγίειαν, ἄλογον· ἡ γὰρ εἰς αὐτὸ κίνησις, ἐν ᾧ ἕστηκεν, ἠρέμησις μᾶλλόν ἐστιν, ἢ συμβαίνει γε ἅμα γίγνεσθαι τῇ κινήσει. ἀνάγκη δὲ ἢ ταύτην, ἢ ἐκείνην εἶναι· οὐ γὰρ ἥ γε ἐν λευκότητι ἠρεμία ἐναντία τῇ ἐν ὑγιείᾳ. 7 Ὅσοις δὲ μή ἐστιν ἐναντία, τούτων μεταβολὴ μέν ἐστιν ἀντικειμένη ἡ ἐξ αὐτοῦ τῇ εἰς αὐτό. κίνησις δ' οὐκ ἔστιν. οἷον ἡ ἐξ ὄντος τῇ εἰς ὄν. καὶ μονὴ μὲν τούτων οὐκ ἔστιν, ἀμεταβλησία δέ. 8 Καὶ εἰ μέν τι εἴη ὑποκείμενον τὸ μὴ ὄν, ἡ ἐν τῷ ὄντι ἀμεταβλησία, τῇ ἐν τῷ μὴ ὄντι, ἐναντία. εἰ δὲ μή ἐστί τι τὸ μὴ ὄν, ἀπορήσειεν ἄν τις, τίνι ἐναντία ἡ ἐν τῷ ὄντι ἀμεταβλησία, καὶ εἰ ἠρεμία ἐστίν.

9 Εἰ δὲ τοῦτο, ἢ οὐ πᾶσα ἠρεμία κινήσει ἐναντία, ἢ ἡ γένεσις καὶ ἡ φθορὰ κίνησις. δῆλον τοίνυν ὅτι ἠρεμία μὲν οὐ λεκτέα, εἰ μὴ καὶ αὗται κινήσεις, ὅμοιον δέ τι, καὶ ἀμεταβλησία. 10 ἐναντία δέ, ἢ οὐδενί, ἢ τῇ ἐν τῷ μὴ ὄντι, ἢ τῇ φθορᾷ· αὕτη γὰρ ἐξ αὐτῆς· ἡ δὲ γένεσις εἰς ἐκείνην.

A 9 At ſi hoc *eſt*: vel non omnis quies *erit* motui contraria, vel ortus & interitus *erit* motus. patet igitur non eſſe dicendam quietem, niſi & hi *dicantur* motus, verùm ſimile quiddam, & mutationis vacuitatem. 10 Contraria verò *eſt* aut nulli, aut ei *mutationis vacuitati* quæ *eſt* in non ente, aut interitui: hic enim ex ea *eſt*: ortus verò, in eam.

De contrarietate motus vel quietis naturalis aut præter naturam.

Cap. IX.

Ἀπορήσειε δ' ἄν τις, διὰ τί ἐν μὲν τῇ κατὰ τόπον μεταβολῇ, εἰσὶ καὶ κατὰ φύσιν καὶ παρὰ φύσιν, καὶ μοναὶ καὶ κινήσεις· ἐν δὲ ταῖς ἄλλαις, οὔ. οἷον ἀλλοίωσις, ἡ μὲν, κατὰ φύσιν· ἡ δέ, παρὰ φύσιν· οὐθὲν γὰρ μᾶλλον ἡ ὑγίανσις, ἢ ἡ νόσανσις, κατὰ φύσιν, ἢ παρὰ φύσιν. οὐδὲ λεύκανσις, ἢ μέλανσις. ὁμοίως δὲ καὶ ἐπ' αὐξήσεως καὶ φθίσεως. οὔτε γὰρ αὗται ἀλλήλαις ἐναντίαι, ὡς φύσει, ἢ παρὰ φύσιν, οὔτε αὔξησις αὐξήσει. καὶ ἐπὶ γενέσεως δὲ καὶ φθορᾶς ὁ αὐτὸς λόγος. οὔτε γάρ, ἡ μὲν γένεσις κατὰ φύσιν, ἡ δὲ φθορὰ παρὰ φύσιν. τὸ γὰρ * γηρᾶν κατὰ φύσιν. οὔτε γένεσιν ὁρῶμεν, τὴν μὲν κατὰ φύσιν, τὴν δὲ παρὰ φύσιν. 2 Εἰ δὲ ἐστὶ τὸ βίᾳ παρὰ φύσιν, καὶ φθορὰ ἂν εἴη φθορᾷ ἐναντία ἡ βίαιος, ὡς παρὰ φύσιν οὖσα, τῇ κατὰ φύσιν. * ἆρα οὖν καὶ γενέσεις εἰσὶν ἔνιαι βίαιοι, καὶ οὐχ εἱμαρμέναι, αἷς ἐναντίαι αἱ κατὰ φύσιν, καὶ αὐξήσεις βίαιοι, καὶ φθίσεις· οἷον αὐξήσεις, αἱ τῶν ταχὺ διὰ τρυφὴν ἡβώντων. καὶ οἱ σῖτοι, οἱ ταχὺ ἁδρυνόμενοι, καὶ μὴ πιληθέντες. ἐπὶ δ' ἀλλοιώσεως, πῶς; ἢ ὡσαύτως; εἴησαν γὰρ ἄν, αἱ μὲν τινὲς βίαιοι, αἱ δὲ φυσικαί, οἷον οἱ ἀφιέμενοι μὴ ἐν κρισίμοις ἡμέραις· οἱ δ' ἐν κρισίμοις· οἱ μέν, παρὰ φύσιν ἠλλοίωνται· οἱ δέ, κατὰ φύσιν. 3 Ἔσονται δ' ἐναντίαι αἱ φθοραὶ ἀλλήλαις, * οὐ γενέσεσι. καὶ τί γε κωλύει; ἔστι γὰρ ὡς. καὶ γὰρ εἰ, ἡ μὲν ἡδεῖα· ἡ δέ, λυπηρὰ εἴη· ὥστε οὐχ ἁπλῶς φθορὰ φθορᾷ ἐναντία· ἀλλ' ᾗ, ἡ μέν, τοιαδὶ αὐτῶν ἐστιν· ἡ δὲ τοιαδί. 4 Ὅλως μὲν οὖν ἐναντίαι κινήσεις καὶ ἠρεμίαι, τὸν εἰρημένον τρόπον εἰσίν· οἷον ἡ ἄνω, τῇ κάτω· τόπου γὰρ ἐναντιώσεις αὗται. φέρεται δέ, τὴν μὲν ἄνω φορὰν φύσει τὸ πῦρ· τὴν δὲ κάτω ἡ γῆ· καὶ ἐναντίαι αὐτῶν αἱ φοραί. τὸ δὲ πῦρ, ἄνω μὲν φύσει· κάτω δέ, παρὰ φύσιν. καὶ ἐναντία γε ἡ κατὰ φύσιν αὐτοῦ, τῇ παρὰ φύσιν. καὶ μοναὶ δ' ὡσαύτως. ἡ γὰρ ἄνω μονή, τῇ ἄνωθεν κάτω κινήσει ἐναντία. γίγνεται δὲ τῇ γῇ, ἡ μὲν μονὴ ἐκείνη παρὰ φύσιν· ἡ δὲ κίνησις αὕτη κατὰ φύσιν. ὥστε κινήσει μονὴ ἐναντία, ἡ παρὰ φύσιν τῇ κατὰ φύσιν τοῦ αὐτοῦ· καὶ γὰρ ἡ κίνησις ἡ τοῦ αὐτοῦ, ἐναντία οὕτως. ἡ μὲν γὰρ κατὰ φύσιν αὐτῶν ἔσται, ἡ ἄνω, ἢ ἡ κάτω· ἡ δὲ παρὰ φύσιν. 5 Ἔχει δ' ἀπορίαν, εἰ ἔστι πάσης ἠρεμίας τῆς μὴ ἀεί, γένεσις, καὶ αὕτη τὸ ἵστασθαι. 6 Τοῦ δὴ παρὰ φύσιν μένοντος, οἷον τῆς γῆς ἄνω, εἴη ἂν γένεσις. ὅτε ἄρα ἐφέρετο ἄνω βίᾳ, ἵστατο. 7 Ἀλλὰ τὸ μὲν ἱστάμενον, ἀεὶ δοκεῖ φέρεσθαι θᾶττον· τὸ δὲ βίᾳ, τοὐναντίον, οὐ γενόμενον ἄρα ἠρεμοῦν, ἔσται ἠρεμοῦν.

* κ. γῆρας

* Argyrop. ἔστ' οὖν sine interrog.

* κ. ἢ φθίσει

B Iam verò dubitare aliquis poſſit, quamobrem in loci mutatione ſunt & ſecundùm naturam, & præter naturam, tam manſiones quàm motus: in aliis autem minimè, vt variatio, alia *eſt* ſecundùm naturam, alia præter naturam. non *eſt* enim magis ſanatio quã ægrotatio, ſecundùm naturam, vel præter naturam: nec dealbatio, quàm denigratio. ſimiliter *ſe res habet* etiam in accretione, & diminutione: quia nec hę *ſunt* ſibi inuicem contrariæ, tamquam natura, vel præter naturã: nec accretio accretioni. ortus quoque & interitus eadem *eſt* ratio: neque enim ortus *eſt* ſecundùm naturam, interitus verò præter naturam: nam ſeneſcere *eſt* ſecundùm naturam. neque ortum videmus partim *eſſe* ſecundùm naturam, partim præter naturam. C 2 Sed ſi id quod *eſt* vi, eſt præter naturam: etiam interitus erit interitui contrarius, *nimirum* violentus; quippe qui eſt præter naturam, ei qui *eſt* ſecundùm naturam. Sunt igitur & ortus quidam violenti, non fatales, quibus contrarij ſunt ortus naturales: & auctiones violentę, & diminutiones: vt auctiones eorũ qui citò propter delicias pubeſcunt: & frumenta, quæ citò adoleſcunt, nec terra ſubacta altiùs radices agunt. In variatione autem quomodo *res habet*? an eodem modo: erunt enim quædam violentæ, aliæ naturales. vtputa alij *morbo* liberãtur non in diebus criticis, alij verò in diebus criticis: *quorum* illi præter naturam variantur; hi verò ſecundùm naturam. D 3 Erunt autem interitus inter ſe contrarij, non *ſolum* generationi. & quid prohibet? *hoc* enim eſt aliquo modo, nempe ſi alter ſit iucundus, alter moleſtus: quocirca non ſimpliciter interitus *eſt* interitui contrarius: ſed quatenus alter ex ipſis eſt talis, alter verò talis. 4 Omnino igitur contrariæ ſunt motiones & quietes eo quo diximus modo: vel vt quæ *eſt* ſurſum, ei quæ *eſt* deorſum: loci namque contrarietates hæ *ſunt*. naturaliter autem fertur ea latione quæ ſurſum *tendit*, ignis: ea quæ deorſum, terra: & contrariæ *ſunt* E horum lationes. ignis verò ſurſum quidem *fertur* natura, deorſum autem præter naturam: & cõtraria *eſt* eius motio naturalis ei quę *eſt* pręter naturam. quin etiam quietes itidem *ſe habent*: nã quies in *loco* ſupero, motui ex *loco* ſupero ad inferum contraria *eſt*. accidit autem terrę quies illa præter naturam, hic autẽ motus ſecundùm naturam. quapropter motui quies *eſt* cõtraria: nempe quæ *eſt* præter naturam, ei qui *eſt* ſecundùm naturam, eiuſdem *rei*: quoniam & motus eiuſdem *rei* ita *eſt* contrarius. alter enim ipſorum eſt ſecundùm naturam, qui eſt ſurſum, vel deorſum verſùs: alter autem præter naturam. 5 Exiſtit autem dubitatio, an omnis quietis, quæ non *eſt* ſemper, *ſit* generatio. & an hæc *ſit* progreſſus ad quietem. 6 Eius igitur quod præter naturam manet vt terræ in loco ſupero, erit generatio. quando igitur vi ſurſum ferebatur, ad quietem progrediebatur. 7 Atqui quod ad quietem tendit, ſemper videtur ferri celeriùs: quod autem vi *mouetur*, è contrario. erit igitur quieſcens, cùm non ſit factum quieſcens.

8 Præterea tendere ad quietem, videtur propriè dici A dè eo quod ſecundùm naturam ad ſuum locum fertur, *hoc eſt*, vel omnino *id* eſſe, vel ſimul accidere. 9 Item exiſtit dubitatio, an quies quæ *eſt* hîc, ſit contraria motui qui *eſt* hinc. quando enim mouetur ex hoc, vel etiam abiicit, adhuc videtur habere id quod abiicitur. quare ſi hæc quies *eſt* contraria motui qui *eſt* hinc in contrarium: *certè* ſimul inerunt contraria. 10 An quadamtenus quieſcit, ſi adhuc manet? & omnino quod mouetur, partim *eſt* hîc, partim in eo in quod mutat. 11 Ideóq; magis motus motui eſt contrarius, quàm quies. 12 Dubitare autem quiſpiam poſſit etiam de progreſſu ad ſtatum, an quicumque *ſunt* motus præter naturam, his ſit *aliqua* quies oppoſita. 13 Si igitur non erit, abſurdum *eſt*. manet enim B ſed vi *manet*. 14 Quocirca erit aliquid quieſcẽs, *quod* non ſemper *quieſcit*, ſine quietis generatione. 15 Atqui conſtat fore. vt enim mouetur præter naturam, etiam quieſcere aliquid poteſt præter naturam. 16 Cùm autem quibuſdam motus ſit ſecundùm naturam, & præter naturam: vt igni ſecundùm naturam *eſt motus* ſurſum versùs: qui verò *eſt* deorſum versùs, *eſt* præter naturam. vtrum hic *eſt* contrarius, an motus terræ? ſiquidem hæc deorſum fertur ſecundùm naturam. 17 An patet vtroſque *eſſe contrarios*, ſed non eodem modo: verùm hic vt ſecundùm naturam, ei qui *eſt* ſecũdùm naturam: *motus* verò ignis ad locum ſuperum, *eiuſdem motui* ad inferum opponitur, vt *motus* qui *eſt* ſecundùm naturam, ei qui *eſt* præter naturam. 18 Similiter *dicendum eſt* etiam *de* quietibus. 19 Ac de motione quidem & quiete, quomodo vtraque *ſit* vna, & quæ quibus *ſint* contraria, dictum eſt.

8 Ἔτι δοκεῖ τὸ ἵστασθαι κυρίως λέγεσθαι, ἢ ὅλως εἶναι ἐπὶ τοῦ κατὰ φύσιν εἰς τὸν αὐτοῦ τόπον φέρεσθαι, ἢ συμβαίνειν ἅμα. 9 Ἔχει δ' ἀπορίαν εἰ ἐναντία ἡ μονὴ ἡ ἐνταῦθα, τῇ ἐντεῦθεν κινήσει. ὅταν γὰρ κινῆται ἐκ τουδί, ἢ καὶ ἀποβάλλῃ, ἔτι δοκεῖ ἔχειν τὸ ἀποβαλλόμενον. ὥστε εἰ αὕτη ἡ ἠρεμία ἐναντία τῇ ἐντεῦθεν εἰς τοὐναντίον κινήσει, ἅμα ὑπάρξει τἀναντία. 10 Ἢ πῇ ἠρεμεῖ, εἰ ἔτι μένει; ὅλως δὲ τοῦ κινουμένου, τὸ μὲν ἐκεῖ, τὸ δ', εἰς ὃ μεταβάλλει. 11 Διὸ καὶ μᾶλλον κίνησις κινήσει ἐναντίον, ἢ ἠρέμησις. 12 Ἀπορήσειε δ' ἄν τις καὶ περὶ τοῦ ἵστασθαι, εἰ καὶ ὅσαι παρὰ φύσιν κινήσεις, εἰ ταύταις ἐστὶν ἠρεμία ἀντικειμένη. 13 Εἰ μὲν οὖν μὴ ἔσται, ἄτοπον. μένει γάρ, βίᾳ δέ. 14 Ὥστε ἠρεμοῦν τι ἔσται οὐκ ἀεὶ ἄνευ τοῦ γίνεσθαι. 15 Ἀλλὰ δῆλον ὅτι ἔσται. ὥσπερ γὰρ κινεῖται παρὰ φύσιν, καὶ ἠρεμοίη ἄν τι παρὰ φύσιν. 16 Ἐπεὶ δ' ἐστὶν ἐνίοις κίνησις κατὰ φύσιν καὶ παρὰ φύσιν, οἷον τῷ πυρὶ, κατὰ φύσιν μὲν, ἡ ἄνω· ἡ δὲ κάτω, παρὰ φύσιν, πότερον αὕτη ἐναντία, ἢ ἡ τῆς γῆς; αὕτη γὰρ φέρεται κατὰ φύσιν κάτω. 17 Ἢ δῆλον ὅτι ἄμφω, ἀλλ' οὐχ ὡσαύτως, ἀλλ' ἡ μὲν, ὡς κατὰ φύσιν, τῇ ὡς κατὰ φύσιν· ἡ δ' ἄνω τοῦ πυρὸς, τῇ κάτω, ὡς ἡ κατὰ φύσιν τῇ παρὰ φύσιν. 18 Ὁμοίως δὲ καὶ ταῖς μοναῖς. 19 Καὶ περὶ μὲν κινήσεως καὶ ἠρεμίας, καὶ πῶς ἑκατέρα μία, καὶ τίνες ἐναντίαι τίσιν, εἴρηται.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ, Η περὶ φυσικῶν ἀρχῶν, τὸ Ζ.

ARISTOTELIS, NATVRALIS AVSCVLTATIONIS, SEV DE NATVRALIBVS PRINCIPIIS, *LIBER VI.*

DE MOTV,

Omne continuum conſtare ex partibus continuis & diuiduis.

Cap. I.

IAM verò ſi eſt continuum, ac tangens, & deinceps, vt antea definitum fuit: (nempe continua, quorum extrema *ſunt* vnum: tangentia verò, quorum *ſunt* ſimul: deinceps autem, quibus nihil eſt interiectum eiuſdẽ generis) *profectò* impoſſibile *eſt*, ex indiuiduis eſſe aliquid continuum: vt lineam ex punctis, ſi quidem linea *eſt* res continua, punctum autem res indiuidua. C etenim nec extrema punctorum *ſunt* vnum: quandoquidem indiuidui non eſt hoc quidem extremum, illud verò alia quædam pars. nec extrema ſimul *ſunt*: quia nullum extremum eſt eius quod partibus vacat, cùm aliud *ſit* extremũ, & *id* cuius *eſt* extremum. 2 Præterea neceſſe *eſt*, vel puncta, ex quibus eſt con-

Εἰ δ' ἐστὶ συνεχὲς, καὶ ἁπτόμενον, καὶ ἐφεξῆς, ὡς διώρισται πρότερον· συνεχῆ μὲν, ὧν τὰ ἔσχατα ἕν· ἁπτόμενα δὲ, ὧν ἅμα· ἐφεξῆς δὲ, ὧν μηδὲν μεταξὺ συγγενές· ἀδύνατον ἐξ ἀδιαιρέτων εἶναί τι συνεχές. οἷον, γραμμὴν ἐκ στιγμῶν, εἴπερ ἡ γραμμὴ μὲν συνεχὲς, ἡ στιγμὴ δὲ ἀδιαίρετον. οὔτε γὰρ ἓν τὰ ἔσχατα τῶν στιγμῶν. οὐ γάρ ἐστι τὸ μὲν, ἔσχατον· τὸ δ', ἄλλο τι μόριον τοῦ ἀδιαιρέτου· οὔθ' ἅμα τὰ ἔσχατα· οὐ γάρ ἐστιν ἔσχατον οὐδὲν τοῦ ἀμεροῦς· ἕτερον γὰρ τὸ ἔσχατον, καὶ οὗ ἔσχατον. 2 Ἔτι ἀνάγκη ἤτοι συνεχεῖς εἶναι τὰς στιγμὰς, ἢ ἁπτομένας

ἀλλήλων, ἐξ ὧν ἐστὶ τὸ συνεχές. ὁ δ' αὐτὸς λόγος καὶ ἐπὶ πάντων τῶν ἀδιαιρέτων. συνεχῆ μὲν δὴ οὐκ ἂν εἴεν, διὰ τὸν εἰρημένον λόγον. ἅπτεται δ' ἅπαν, ἢ ὅλον ὅλου, ἢ μέρος μέρους, ἢ ὅλου μέρος. ἐπεὶ δ' ἀμερὲς τὸ ἀδιαίρετον, ἀνάγκη ὅλον ὅλου ἅπτεσθαι. ὅλον δ' ὅλου ἁπτόμενον οὐκ ἔσται συνεχές· τὸ γὰρ συνεχὲς ἔχει, τὸ μὲν ἄλλο, τὸ δ' ἄλλο μέρος· καὶ διαιρεῖται εἰς * οὕτως ἕτερα καὶ τόπῳ κεχωρισμένα. ἀλλὰ μὴν οὐδὲ ἐφεξῆς ἔσται στιγμὴ στιγμῆς, ἢ τὸ νῦν τῷ νῦν, ὥστ' ἐκ τούτων εἶναι τὸ μῆκος, ἢ τὸν χρόνον. ἐφεξῆς μὲν γάρ ἐστιν, ὧν μηθέν ἐστι μεταξὺ συγγενές· στιγμῶν δ' ἀεὶ τὸ μεταξὺ γραμμή, καὶ τῶν νῦν χρόνος. 3 Ἔτι διαιροῖτ' ἂν εἰς ἀδιαίρετα, εἴπερ ἐξ ὧν ἐστιν ἑκάτερον, εἰς ταῦτα διαιρεῖται. ἀλλ' οὐθὲν ἦν τῶν συνεχῶν εἰς ἀμερῆ διαιρετόν. 4 Ἄλλο δὲ γένος οὐχ οἷόν τε εἶναι μεταξὺ τῶν στιγμῶν καὶ τῶν νῦν οὐθέν. εἰ γὰρ ἔσται, δῆλον, ὡς ἤτοι διαιρετόν, ἢ ἀδιαίρετον ἔσται· καὶ εἰ διαιρετόν, ἢ εἰς ἀδιαίρετα, ἢ εἰς ἀεὶ διαιρετά· τοῦτο δὲ συνεχές. 5 Φανερὸν δὲ καὶ ὅτι πᾶν συνεχὲς διαιρετὸν εἰς ἀεὶ διαιρετά· εἰ γὰρ εἰς ἀδιαίρετα, ἔσται ἀδιαίρετον ἀδιαιρέτου ἁπτόμενον· ἓν γὰρ τὸ ἔσχατον, καὶ ἅπτεται τῶν συνεχῶν. 6 Τοῦ δ' αὐτοῦ λόγου, καὶ μέγεθος, καὶ χρόνον, καὶ κίνησιν ἐξ ἀδιαιρέτων συγκεῖσθαι, καὶ διαιρεῖσθαι εἰς ἀδιαίρετα, ἢ μηθέν. δῆλον δὲ ἐκ τῶνδε. εἰ γὰρ τὸ μέγεθος ἐξ ἀδιαιρέτων σύγκειται, καὶ ἡ κίνησις ἡ τούτου ἐξ ἴσων κινήσεων ἔσται ἀδιαιρέτων· οἷον, εἰ τὸ α β γ, ἐκ τῶν α β γ, ἐστὶν ἀδιαιρέτων· καὶ ἡ κίνησις ἐφ' ἧς δ ε ζ, ἣν ἐκινήθη τὸ ω ἐπὶ * τῆς α β γ, ἕκαστον μέρος ἔχει ἀδιαίρετον. 7 Εἰ δὴ παρούσης κινήσεως ἀνάγκη κινεῖσθαί τι, καὶ εἰ κινεῖταί τι, [ἀνάγκη] παρεῖναι κίνησιν, καὶ τὸ κινεῖσθαι ἔσται ἐξ ἀδιαιρέτων. τὸ μὲν δὴ α, ἐκινήθη τὸ ω, τὴν τὸ δ κινούμενον κίνησιν· τὸ δὲ β, τὴν τὸ ε· καὶ τὸ γ, ὡσαύτως τὴν τὸ ζ. 8 Εἰ δὴ ἀνάγκη τὸ κινούμενον ποθέν, ποῖ, μὴ ἅμα κινεῖσθαι καὶ κεκινῆσθαι οὗ ἐκινεῖτο, ὅτε ἐκινεῖτο (οἷον, εἰ Θήβαζέ τις βαδίζει, ἀδύνατον ἅμα βαδίζειν Θήβαζε, καὶ βεβαδικέναι Θήβαζε·) τὴν δὴ τὸ α τὴν ἀμερῆ ἐκινεῖτο τὸ ω, ᾗ ἡ τὸ δ κίνησις παρῆν. ὥστ' εἰ μὲν ὕστερον διελήλυθεν ἢ διῄει, διαιρετὴ ἂν εἴη. ὅτε γὰρ διῄει, οὔτε ἠρέμει, οὔτε διεληλύθει, ἀλλὰ μεταξὺ ἦν. εἰ δ' ἅμα διέρχεται, καὶ διελήλυθε, τὸ βαδίζον ὅτε βαδίζει, βεβαδικὸς ἐκεῖ ἔσται, καὶ κεκινημένον οὗ κινεῖται. 9 Εἰ δὲ τὴν μὲν ὅλην τὴν α β γ κινεῖταί τι, καὶ ἡ κίνησις ἣν κινεῖται, τὰ δ ε ζ ἐστί· τὴν δ' ἀμερῆ, τὴν α, οὐθὲν κινεῖται, ἀλλὰ κεκίνηται· εἴη ἂν κίνησις, οὐκ ἐκ κινήσεων, ἀλλ' ἐκ κινημάτων· καὶ τὸ * κινεῖσθαί τι μὴ κινούμενον. τὴν γὰρ α διελήλυθεν οὐ διεξιόν. ὥστε ἔσται τι βεβαδικέναι μηδέποτε βαδίζον· ταύτην γὰρ βεβάδικεν, οὐ βαδίζον ταύτην. εἰ οὖν * ἀνάγκη ἢ ἠρεμεῖν, ἢ κινεῖσθαι πᾶν, ἠρεμεῖ δὲ καθ' ἕκαστον τῶν α β γ, ὥστ' ἔσται τι συνεχῶς ἠρεμοῦν ἅμα καὶ κινούμενον. τὴν γὰρ α β γ ὅλην ἐκινεῖτο καὶ ἠρέμει ὁτιοῦν μέρος, ὥστε καὶ πᾶσαν. καὶ εἰ μὲν τὰ ἀδιαίρετα τῆς δ ε ζ κινήσεως παρούσης, ἐνδέχοιτ' ἂν μὴ κινεῖσθαι, ἀλλ' ἠρεμεῖν· εἰ δὲ μὴ κινήσεις εἰσί, τὴν κίνησιν μὴ ἐκ κινήσεων εἶναι. 10 Ὁμοίως δὲ ἀνάγκη τῷ μήκει καὶ τῇ κινήσει ἀδιαίρετον εἶναι τὸν χρόνον, καὶ συγκεῖσθαι ἐκ τῶν νῦν ὄντων ἀδιαιρέτων·

* χωρὶς ἀπ' ἀλλήλων.

* γρ. τῆς α, ἣν ἐκινεῖτο.

* γρ. κεκινῆσθαι

* γρ. πᾶν ἄνευ

A tinuum, eſſe continua, vel ſe viciſſim tãgere. Eadémque ratio *eſt* in omnibus indiuiduis. Continua igitur eſſe nequeunt propter rationem quæ iam dicta eſt. Res autem omnis *tangit* vel tota totam, vel pars partem, vel totam pars. ſed cùm indiuiduum partibus vacet, neceſſe eſt vt totum tangat totum. atqui totum, quod tangit totum, non erit cõtinuum: quandoquidem continuum habet aliam atque aliam partem, atque diuiditur in ita diuerſa, & loco ſeiuncta. Quin nec punctum deinceps ſequetur punctum aut momentum momentum, vt ex his ſit longitudo vel tempus. deinceps enim ſunt, quibus nihil eſt interiectum eiuſdem generis: quod verò punctis *eſt* interiectum, ſemper *eſt* linea: & *quod* momentis, tempus.
B 3 Præterea diuideretur in indiuidua: ſiquidem ex quibus eſt vtrumque, in hæc diuiditur. ſed nullum continuum eſt in ea diuiduum quę partibus vacant. 4 Nullũ autem aliud genus poteſt eſſe interiectum punctis, & momentis. nã ſi erit, conſtat fore vel diuiduum, vel indiuiduum: & ſi diuiduũ: vel in indiuidua, vel in ſemper diuidua: hoc verò *eſt* cõtinuum. 5 Perſpicuum quoque *eſt*, omne continuum *eſſe* diuiduum in ſemper diuidua: nam ſi *diuidatur* in indiuidua, indiuiduum ab indiuiduo tangetur: quandoquidem continuorum extremum *eſt* vnum, ac tangit. 6 Porrò eiuſdem rationis *eſt*, & magnitudinem, & tempus, & motum ex indiuiduis cõſtare, ac diui-
C di in indiuidua, vel nullũ *horum*. patet autem ex his: quia ſi magnitudo ex indiuiduis conſtat, etiam motus, qui *per ſpatium* huius *magnitudinis fit*, ex æqualibus motibus indiuiduis erit. velvti, ſi *magnitudo* α β γ conſtet ex α β γ indiuiduis: etiam motus δ ε ζ, quo motum eſt ω per interuallum α β γ, habet ſingulas partes indiuiduas. 7 Si igitur præſente motu neceſſe *eſt* moueri aliquid; & ſi quid mouetur, neceſſe *eſt* adeſſe motum: etiam ipſum moueri conſtabit ex indiuiduis. itaque per α, motum eſt ω, cùm moueretur motu δ: & per β, *motu* ε: & per γ itidem *motu* ζ. 8 Si igitur neceſſe *eſt* id quod mouetur ab aliquo loco ad aliquem locum, non ſimul moueri & eſſe motum
D quò mouebatur, cùm mouebatur: (velvti, ſi quis Thebas proficiſcatur: impoſſibile *eſt*, vt ſimul proficiſcatur Thebas & profectus ſit Thebas) certè per α partibus vacans, mouebatur ω, quatenus motus δ aderat. quare ſi poſt pertranſiit quàm pertranſibat, diuiduum erit. quando enim pertranſibat, nec quieſcebat nec pertranſierat, ſed inter medium erat. quod ſi ſimul pertranſit & pertranſiit, profectò quod proficiſcitur, quando proficiſcitur, profectum erit & motum, quò mouetur. 9 Quod ſi mouetur aliquid per totam *longitudinem* α β γ, & motus, quo mouetur, eſt δ ε ζ: nihil autem mouetur per *partem* α quæ partibus caret, ſed motum eſt: erit vtique motus, non ex motibus, ſed ex terminis motuum; & ali-
E quod motum erit, quod non mouebatur: quia pertranſiit *partem* α, non pertranſeundo. quocirca fieri poterit vt aliquid profectum ſit, cùm numquam proficiſceretur: quia per hanc eſt profectũ, non per eam proficiſcendo. Itaque ſi neceſſe *eſt* quodvis aut quieſcere aut moueri, quieſcit autem in ſingulis α β γ: erit igitur aliquid continenter quieſcens ſimul & motũ. nam per totam *magnitudinem* α β γ mouebatur: & in quavis parte quieſcebat, proinde etiam in tota. Et ſi quidẽ indiuiduæ *partes* δ ε ζ, *ſint* motus: fieri poterit vt motu pręsẽte *res* nõ moueatur, ſed quieſcat ſi verò nõ ſint motus: *eueniet* vt motus ex nõ motibus cõſtet. 10 Vt autẽ longitudinem & motũ, ſic tempus eſſe indiuiduũ & ex momẽtis indiuiduis cõſtare neceſſe *eſt*.

nam ſi omnis *eſt* diuiduus; quod autem æquè velox eſt, in minori *tempore* conficit minus *ſpatij*: etiam tempus diuiduum erit. quòd ſi tempus diuiduum erit, quo aliquid fertur per *magnitudinem* α: etiam *magnitudo* α, erit diuidua. 11 Cùm autem omnis magnitudo in magnitudines diuidua *ſit*: (quippe oſtẽſum eſt fieri non poſſe vt ex indiuiduis conſtet aliquid continuum: omnis verò magnitudo eſt continua) neceſſe *eſt* id quod eſt velocius, æquali tempore maius *ſpatij* pertrãſire, & minori æquale, & minori maius, quemadmodum nonnulli definiunt id quod eſt velocius. 12 Eſto namque id in quo eſt α, velocius eo in quo eſt β. quoniã igitur quod priùs mutatur, eſt velocius: *certè* quo tempore ζη α mutatum eſt à γ ad δ, puta *tẽpore* ζη, hoc *tempore* ζη β nondum peruenit ad δ, ſed citrà erit. quapropter id quod eſt velocius, æquali tẽpore plus *ſpatij* conficit. 13 Quin etiam minori *tempore* plus *ſpatij conficit* quàm id *quod eſt tardius*. nam quo *tempore* ζη α peruenit ad δ, ζη β perueniet ad ε, cùm ſit tardius. ergo quia ζη α ad δ peruenit toto illo tẽpore ζη, ad θ perueniet minori *tempore* quàm hoc *ſit*. ac perueniat *tempore* ζκ. *ſpatium* igitur γθ, quod pertranſibit α, eſt maius quàm γε. tempus verò ζκ *eſt* minus toto illo *tẽpore* ζη. quare minori *tempore* conficit maius *ſpatium*. 14 Ex his etiam patet, id quod eſt velocius, minori tempore conficere æquale *ſpatium*. nam quia maiorem *longitudinem* pertranſit minori *tempore*, quàm id quod eſt tardius: ipſum autem per ſe acceptum maiori tempore pertranſit *longitudinem* maiorem minore: velut, *longitudinem* λμ, *quæ eſt maior longitudine* λξ, profectò tempus πρ, quo pertranſit *longitudinem* λμ, eſt maius quàm tempus πσ, quo pertranſit *longitudinem* λξ. quocirca ſi tempus πρ *eſt* minus *tempore* πχ, quo *mobile* tardius pertranſit *longitudinem* λξ: etiam tempus πσ *eſt* minus *tempore* in quo eſt πχ: ſiquidem *eſt* minus *tempore* πρ: quod autem eſt minore minus, ipſum quoque *eſt* minus. quapropter minori tempore conficiet æquale ſpatium. 15 Prætereà ſi neceſſe *eſt* quodvis aut æquali aut minori aut maiori tempore moueri: & quod maiori *tempore mouetur*, *eſt* tardius: quod autẽ æquali, *eſt* æquè velox: quod verò eſt celerius, nec *eſt* æquè velox, nec tardius: *profectò* quod eſt velocius, nec æquali nec maiori *tempore* mouetur. reſtat igitur, *vt moueatur* minori *tempore*. quare neceſſe etiam *eſt*, vt velocius minori tẽpore pertranſeat ęqualem magnitudinem. 16 Quoniam autem omnis motus *eſt* in tẽpore, & in omni tempore poſſibile *eſt aliquid* moueri, quicquid autem mouetur, poteſt & celeriùs moueri & tardius: *certè* in omni tempore fieri poterit vt celeriùs moueatur & tardiùs. 17 Cùm hæc *ita* ſint, neceſſe eſt etiam tempus eſſe cõtinuum. dico autem continuum quod eſt diuiduum in ſemper diuidua. nam ſi ſupponatur continuum eſſe hoc, neceſſe *eſt* tẽpus eſſe continuum. Cùm enim oſtenſum ſit, id quod eſt velocius, minori tempore conficere æquale *ſpatium*: eſto vbi α, *mobile* velocius: vbi β, tardius: ac tardius pertranſeat magnitudinem γδ, tempore ζη. patet igitur velocius minori quàm hoc tempore pertranſiturum eandem magnitudinem: ac pertranſeat tempore ζθ. Rurſus quia velocius *mobile tempore* ζθ pertranſit totam *longitudinem* γδ: certè tardius eodem tempore minorem cõficit: *hæc* eſto, vbi γκ. cùm autem β, *mobile tardius*, tempore ζθ pertranſeat *lõgitudinem* γκ: velociùs *eam* conficit minori *tempore*. quapropter rurſus diuidetur tẽpus ζθ. hoc autem diuiſo, etiam magnitudo γκ diuidetur ſecundùm eandem rationem. quòd ſi magnitudo, etiam tempus. ac ſemper hoc erit, ſi ſumẽtes progrediamur à velociori ad tardius,

A εἰ γὰρ ἅπασα* διαιρετὸς, ἐν τῷ ἐλάττονι δὲ τὸ ἰσοταχὲς δίεισιν ἔλαττον, διαιρετὸς ἔσται καὶ ὁ χρόνος. εἰ δ' ὁ χρόνος διαιρετός ἐστι, ἐν ᾧ φέρεταί τι τὴν α, καὶ ἡ τὸ α ἔσται διαιρετή. 11 Ἐπεὶ δὲ πᾶν μέγεθος εἰς μεγέθη διαιρετόν (δέδεικται γὰρ ὅτι ἀδύνατον ἐξ ἀτόμων εἶναί τι συνεχές, μέγεθος δ' ἐστὶν ἅπαν συνεχές) ἀνάγκη τὸ θᾶττον, ἐν τῷ ἴσῳ χρόνῳ μεῖζον, καὶ ἐν τῷ ἐλάττονι ἴσον, καὶ ἐν τῷ ἐλάττονι πλέον κινεῖσθαι, καθάπερ ὁρίζονταί τινες τὸ θᾶττον. 12 Ἔστω γὰρ τὸ ἐφ' ᾧ τὸ α, τοῦ ἐφ' ᾧ β, θᾶττον. ἐπεὶ τοίνυν θᾶττόν ἐστι τὸ πρότερον μεταβάλλον, ἐν ᾧ χρόνῳ τὸ α μεταβέβληκεν ἀπὸ τοῦ γ εἰς τὸ δ, οἷον ἐν τῷ ζη, ἐν B τούτῳ τῷ β, οὔπω ἔσται* πρὸς τὸ δ, ἀλλ' ἀπολείψει. ὥστε ἐν τῷ ἴσῳ χρόνῳ πλέον δίεισι τὸ θᾶττον. 13 Ἀλλὰ μὴν καὶ ἐν τῷ ἐλάττονι, πλέον τούτου· ἐν ᾧ γὰρ τὸ α γεγένηται πρὸς τῷ δ, τὸ β ἔσται πρὸς τῷ ε τὸ βραδύτερον ὄν. οὐκοῦν, ἐπεὶ τὸ α πρὸς τῷ δ γέγονεν, ἐν ἅπαντι τῷ ζη χρόνῳ, πρὸς τῷ θ ἔσται ἐν ἐλάττονι τούτου· καὶ ἔστω ἐν τῷ ζκ. τὸ μὲν οὖν γθ, ὃ διελήλυθε τὸ α, μεῖζόν ἐστι τοῦ γε· ὁ δὲ χρόνος ὁ ζκ ἐλάττων τοῦ παντὸς, τοῦ ζη. ὥστε ἐν ἐλάττονι, δίεισι μεῖζον. 14 Φανερὸν δὲ ἐκ τούτων, καὶ ὅτι τὸ θᾶττον ἐν ἐλάττονι χρόνῳ δίεισι τὸ ἴσον. ἐπεὶ γὰρ τὴν μείζω ἐν ἐλάττονι διέρχεται τοῦ βραδυτέρου, αὐτὸ C δὲ καθ' αὑτὸ λαμβανόμενον, ἐν πλείονι χρόνῳ τὴν μείζω τῆς ἐλάττονος, οἷον τὴν λμ, τῆς λξ, πλείων ἂν εἴη ὁ χρόνος ὁ πρ, ἐν ᾧ τὴν λμ διέρχεται, ἢ ὁ πσ, ἐν ᾧ τὴν λξ. ὥστε εἰ ὁ πρ χρόνος ἐλάττων ἐστὶ τοῦ πχ, ἐν ᾧ τὸ βραδύτερον διέρχεται τὴν λξ, καὶ ὁ πσ ἐλάττων ἐστὶ τοῦ ἐφ' ᾧ πχ. τοῦ γὰρ πρ ἐλάττων· τὸ δὲ τοῦ ἐλάττονος ἔλαττον, καὶ αὐτὸ ἔλαττον. ὥστε ἐν ἐλάττονι κινήσεται τὸ ἴσον. 15 Ἔτι δὲ, εἰ πᾶν, ἀνάγκη μὲν ἢ ἐν ἴσῳ χρόνῳ, ἢ ἐν ἐλάττονι, ἢ ἐν πλείονι κινεῖσθαι, καὶ τὸ μὲν ἐν πλείονι βραδύτερον, τὸ δ' ἐν ἴσῳ ἰσοταχὲς, τὸ δὲ θᾶττον, οὔτε ἰσοταχὲς, D οὔτε βραδύτερον, οὔτ' ἐν ἴσῳ, οὔτ' ἐν πλείονι κινοῖτο τὸ θᾶττον· λείπεται οὖν ἐν ἐλάττονι· ὥστε ἀνάγκη καὶ τὸ ἴσον μέγεθος ἐν ἐλάττονι χρόνῳ διιέναι τὸ θᾶττον. 16 Ἐπεὶ δὲ, πᾶσα μὲν κίνησις ἐν χρόνῳ, καὶ ἐν ἅπαντι χρόνῳ δυνατὸν κινηθῆναι, πᾶν δὲ τὸ κινούμενον, ἐνδέχεται καὶ θᾶττον κινεῖσθαι καὶ βραδύτερον, ἐν ἅπαντι χρόνῳ ἔσται τὸ θᾶττον κινεῖσθαι καὶ βραδύτερον. 17 Τούτων δ' ὄντων, ἀνάγκη καὶ τὸν χρόνον συνεχῆ εἶναι. λέγω δὲ συνεχὲς, τὸ διαιρετὸν εἰς ἀεὶ διαιρετά. τούτου γὰρ ὑποκειμένου τοῦ συνεχοῦς, ἀνάγκη συνεχῆ εἶναι τὸν χρόνον. ἐπεὶ γὰρ δέδεικται, ὅτι τὸ θᾶττον, ἐν ἐλάττονι χρόνῳ δίεισι τὸ ἴσον· ἔστω τὸ μὲν ἐφ' ᾧ α, θᾶττον· τὸ δ' ἐφ' ᾧ β, βραδύτερον, καὶ κεκινήσθω τὸ E βραδύτερον, τὸ ἐφ' ᾧ γδ μέγεθος, ἐν τῷ ζη χρόνῳ. δῆλον τοίνυν ὅτι τὸ θᾶττον ἐν ἐλάττονι τούτου κινηθήσεται τὸ αὐτὸ μέγεθος· καὶ κεκινήσθω ἐν τῷ ζθ. πάλιν δ', ἐπεὶ τὸ θᾶττον ἐν τῷ ζθ διελήλυθε τὴν ὅλην τὴν γδ, τὸ βραδύτερον ἐν τῷ αὐτῷ χρόνῳ, τὴν ἐλάττω δίεισιν. ἔστω οὖν ἐφ' ἧς γκ. ἐπεὶ δὲ τὸ βραδύτερον τὸ β, ἐν τῷ ζθ χρόνῳ, τὴν γκ διελήλυθε, τὸ θᾶττον ἐν ἐλάττονι δίεισιν· ὥστε πάλιν διαιρεθήσεται ὁ ζθ χρόνος. τούτου δὲ διαιρουμένου καὶ τὸ γκ μέγεθος διαιρεθήσεται κατὰ τὸν αὐτὸν λόγον. εἰ δὲ τὸ μέγεθος, καὶ ὁ χρόνος. καὶ ἀεὶ τοῦτ' ἔσται μεταλαμβάνουσιν ἀπὸ τοῦ θάττονος τὸ βραδύτερον,

* γρ. ἀδιαίρετος. alij codd. ἅπας ἀδιαίρετος ac vocem ἅπας quidam ex veteribus Græcis agnouerũt, vide Simplic.

* γρ. πρὸς τῷ δ.

καὶ ἀπὸ τοῦ βραδυτέρου τὸ θᾶττον, καὶ τοῖς ἀποδεδειγμένοις χρωμένοις· διαιρήσει γὰρ, τὸ μὲν θᾶττον τὸν χρόνον, τὸ δὲ βραδύτερον τὸ μῆκος. εἰ οὖν ἀεὶ μὲν ἀντιστρέφειν ἀληθές, ἀντιστρεφομένων δὲ ἀεὶ γίνεται διαίρεσις, φανερὸν ὅτι πᾶς χρόνος ἐστὶ συνεχής. 18 Ἅμα δὲ δῆλον, καὶ ὅτι μέγεθος ἅπαν ἐστὶ συνεχές· τὰς αὐτὰς γὰρ καὶ τὰς ἴσας διαιρέσεις ὅ, τε χρόνος καὶ τὸ μέγεθος διαιρεῖται. ἔτι δὲ καὶ ἐκ τῶν εἰωθότων λόγων λέγεσθαι, φανερὸν, ὡς εἴπερ ὁ χρόνος ἐστὶ συνεχής, ὅτι καὶ τὸ μέγεθος, εἴπερ ἐν τῷ ἡμίσει χρόνῳ ἥμισυ διέρχεται καὶ ἁπλῶς ἐν τῷ ἐλάττονι ἔλαττον· αἱ γὰρ αὐταὶ διαιρέσεις ἔσονται τοῦ χρόνου καὶ τοῦ μεγέθους. 20 Καὶ εἰ ὁποτερονοῦν ἄπειρον, καὶ θάτερον· καὶ ὡς θάτερον, καὶ θάτερον· οἷον, εἰ μὲν τοῖς ἐσχάτοις ἄπειρος ὁ χρόνος, καὶ τὸ μῆκος τοῖς ἐσχάτοις· εἰ δὲ τῇ διαιρέσει, τῇ διαιρέσει καὶ τὸ μῆκος. εἰ δὲ ἀμφοῖν ὁ χρόνος, ἀμφοῖν καὶ τὸ* μέγεθος. 21 Διὸ καὶ ὁ Ζήνωνος λόγος ψεῦδος λαμβάνει, τὸ μὴ ἐνδέχεσθαι τὰ ἄπειρα διελθεῖν, ἢ ἅψασθαι τῶν ἀπείρων καθ' ἕκαστον ἐν πεπερασμένῳ χρόνῳ· διχῶς γὰρ λέγεται καὶ τὸ μῆκος, καὶ ὁ χρόνος ἄπειρον, καὶ ὅλως πᾶν τὸ συνεχές· ἤτοι κατὰ διαίρεσιν, ἢ τοῖς ἐσχάτοις. τῶν μὲν οὖν κατὰ τὸ ποσὸν ἀπείρων οὐκ ἐνδέχεται ἅψασθαι ἐν πεπερασμένῳ χρόνῳ· τῶν δὲ κατὰ διαίρεσιν, ἐνδέχεται· καὶ γὰρ αὐτὸς ὁ χρόνος οὕτως ἄπειρος. ὥστε ἐν τῷ ἀπείρῳ, καὶ οὐκ ἐν τῷ πεπερασμένῳ συμβαίνει διιέναι * τὸ ἄπειρον, καὶ ἅπτεσθαι τῶν ἀπείρων * τοῖς ἀπείροις οὐ τοῖς πεπερασμένοις. 22 Οὔτε δὴ οὖν τὸ ἄπειρον οἷόν τε ἐν πεπερασμένῳ χρόνῳ διελθεῖν, οὔτ' ἐν ἀπείρῳ τὸ πεπερασμένον· ἀλλ' ἄν τε ὁ χρόνος * ᾖ, καὶ τὸ μέγεθος ἔσται ἄπειρον· ἄν τε τὸ μέγεθος, καὶ ὁ χρόνος. 23 Ἔστω γὰρ πεπερασμένον μέγεθος, ἐφ' οὗ αβ· χρόνος δ' ἄπειρος, * ἐφ' οὗ γ. εἰλήφθω δή τι τοῦ χρόνου πεπερασμένον, ἐφ' ᾧ γδ. ἐν τούτῳ οὖν δίεισί τι τοῦ μεγέθους, καὶ ἔστω διεληλυθός, ἐφ' ᾧ βε. τοῦτο δ' ἢ καταμετρήσει τὸ ἐφ' ᾧ αβ, ἢ ἐλλείψει, ἢ ὑπερβαλεῖ· διαφέρει γὰρ οὐδέν. εἰ γὰρ ἀεὶ τὸ ἴσον τῷ βε μέγεθος ἐν ἴσῳ χρόνῳ δίεισι, τοῦτο δὲ καταμετρεῖ τὸ ὅλον, πεπερασμένος ἔσται ὁ πᾶς χρόνος, ἐν ᾧ διῆλθεν. εἰς ἴσα γὰρ διαιρεθήσεται, ὡς καὶ τὸ μέγεθος. 24 Ἔτι δ', εἰ μὴ πᾶν μέγεθος ἐν ἀπείρῳ χρόνῳ δίεισιν, ἀλλ' ἐνδέχεταί τι καὶ ἐν πεπερασμένῳ διελθεῖν, οἷον τὸ βε· τοῦτο δὲ καταμετρήσει τὸ πᾶν, καὶ τὸ ἴσον ἐν ἴσῳ δίεισιν. ὥστε πεπερασμένος ἔσται καὶ ὁ χρόνος. ὅτι δ' οὐκ ἐν ἀπείρῳ δίεισι τὸ βε, φανερὸν, εἰ ληφθείη ἐπὶ θάτερα πεπερασμένος ὁ χρόνος· εἰ γὰρ ἐν ἐλάττονι τὸ μέρος δίεισι, τοῦτ' ἀνάγκη πεπεράνθαι, θατέρου γε πέρατος ὑπάρχοντος. 25 Ἡ αὐτὴ δὲ ἀπόδειξις, καὶ εἰ τὸ μὲν μῆκος ἄπειρον, ὁ δὲ χρόνος πεπερασμένος. 26 Φανερὸν οὖν ἐκ τῶν εἰρημένων, ὡς οὔτε γραμμή, οὔτε ἐπίπεδον, οὔτε ὅλως τῶν συνεχῶν οὐθὲν ἔσται ἄτομον, οὐ μόνον διὰ τὸ νῦν λεχθὲν, ἀλλὰ καὶ διότι συμβήσεται διαιρεῖσθαι τὸ ἄτομον. ἐπεὶ γὰρ ἐν ἅπαντι χρόνῳ τὸ θᾶττον καὶ βραδύτερόν ἐστι, τὸ δὲ θᾶττον πλεῖον διέρχεται ἐν τῷ ἴσῳ χρόνῳ, ἐνδέχεται δὲ καὶ διπλάσιον καὶ ἡμιόλιον διιέναι μῆκος· εἴη γὰρ ἂν οὗτος ὁ λόγος τοῦ τάχους. ἐνηνέχθω δὴ τὸ θᾶττον ἡμιόλιον ἐν τῷ αὐτῷ χρόνῳ, καὶ διῃρήσθω τὰ μεγέθη, τὰ μὲν τοῦ θάττονος, ἐφ' ᾧ αβ, βγ, γδ, εἰς τρία ἄτομα· τὰ δὲ τοῦ βραδυτέρου εἰς δύο, ἐφ' ὧν εζ, ζη. οὐκοῦν καὶ ὁ χρόνος διαιρεθήσεται εἰς τρία ἄτομα. τὸ γὰρ ἴσον ἐν τῷ ἴσῳ χρόνῳ δίεισι. διῃρήσθω οὖν ὁ χρόνος, εἰς τὰ κλ, λμ, μν, πάλιν δ' * ἐπεὶ τὸ βραδύτερον ἐνήνεκται τὴν εζη·

* γ. χρόνος.
* γ. τὸ ἄπειρον.
* γ. ἅπτ. τ.
* γ. ἄπειρος ᾖ.
* γ. ἐφ' ᾧ γ.
* γ. ἐπεὶ τὸ ζ.

A & à tardiore ad velocius; atque eo quod demonſtratum erit, vtamur. nam velocius diuidit tẽpus: ac tardius longitudinem. ergo ſi ſemper cõuerſio *eſt* vera, conuertendo autem ſemper fit diuiſio: perſpicuum *eſt* omne tempus eſſe continuum. 18 Simul autem patet omnem magnitudinem eſſe continuam: quoniam iiſdem & æqualibus diuiſionibus tẽpus & magnitudo diuiduntur. 19 Præterea etiam ex ſermonibus qui vulgò haberi ſolent, perſpicuum *eſt*, ſi tempus ſit continuũ, etiam magnitudinem *eſſe continuam*: ſiquidem dimidio tẽpore pertranſit dimidium *ſpatij*, & omnino minori *tempore* minus *ſpatij*. eædem enim diuiſiones erunt temporis ac magnitudinis. 20 Et ſi

B alterutrum *eſt* infinitum, etiam alterum, *infinitum eſt*. & vt alterum, ita etiam alterum. velvti, ſi tempus ſit extremis infinitum, etiam longitudo extremis *infinita erit*. ſi verò *illud eſt* diuiſione *infinitum*: diuiſione *erit infinita* etiam magnitudo. ſin autem vtroque modo tempus, vtroque modo etiam magnitudo. 21 Ideóque Zenonis ratio falſum ſumit, non poſſe *aliquid* infinita pertranſire, ſeu tãgere infinita ſingillatim tempore finito. nam & longitudo, & tempus, & omnino continuum bifariàm dicitur infinitum: *nimirum* vel diuiſione, vel extremis. Quæ igitur ſecundùm quantitatem ſunt infinita, non poſſunt tangi tempore finito. quæ verò ſecundùm diuiſionem, poſſunt: quoniam & ipſum tempus ita *eſt* infinitum. quare *tempore*

C infinito, non finito, accidit vt *aliquid* pertranſeat infinita: ac tangat infinita infinitis, non finitis. 22 Ergo nec infinitum poteſt finito tempore pertranſiri, nec infinito finitũ: ſed ſi tempus infinitum ſit, etiam magnitudo erit infinita, & ſi magnitudo, etiam tempus. 23 Eſto namque finita magnitudo, vbi αβ: tempus infinitum, vbi γ. ſumitur igitur aliqua pars temporis finita, vbi γδ. hoc igitur *tempore* conficiet aliquam partem magnitudinis: ac pertranſeat *partem*, vbi βε. hæc verò aut metietur *magnitudinem* αβ, aut deficiet, aut ſuperabit: nihil enim refert. nam ſi ſemper æqualem magnitudinem *parti* βε, æquali tempore conficit; hæc autem metitur totam *magnitudinem*: vniuerſum tempus, quo pertranſiit, finitum erit: quandoquidem in

D *partes* æquales diuidetur, ſic vt & magnitudo. 24 Præterea ſi non omnem magnitudinẽ infinito tempore pertranſit, ſed aliquam tẽpore finito pertranſire poteſt, vt *partem* βε, hæc autem metitur totum: *cum* æqualem *partem*, æquali tempore pertranſit. quare tempus finitum erit. Quod autem non infinito tempore *mobile* pertranſeat *partem* βε, perſpicuum *erit*, ſi ſumptum fuerit ab altera parte finitum tempus. nam ſi minori *tempore* conficit partem, neceſſe *eſt* hoc eſſe finitum, *cùm* alter terminus adſit. 25 Eadem *eſt* demonſtratio, & ſi *ponatur* longitudo *eſſe* infinita; tempus verò, finitum. 26 Patet igitur ex iis quæ dicta ſunt, neque lineam, neque ſuperficiem, neque omni-

E no vllum cõtinuum eſſe indiuiduum, non ſolùm ob id quod nunc dictum fuit, ſed etiam quia accidet diuidi quod eſt indiuiduum. cùm enim in omni tempore ſit celerius ac tardius, celerius autem plus conficiat æquali tempore: fieri poteſt, vt cõficiat duplam aut ſeſcuplam longitudinem: quandoquidem hæc poteſt eſſe ratio celeritatis. latum igitur *eſto* velocius *per longitudinem* ſeſcuplam eodem tempore: ac diuidantur magnitudines, velocioris quidem, vbi αβ, βγ, γδ, in tres *partes* indiuiduas: tardioris autem in duas, vbi εζ, ζη. ergo etiam tempus diuidetur in tres *partes* indiuiduas: quoniam æquale *ſpatium* æquali tempore conficit. diuidatur igitur tempus in κλ, λμ, μν. rurſus quia tardius latum eſt per εζ, ζη

tempus igitur ſecabitur in duas partes. itaque quod A eſt indiuiduum, diuidetur: & quod partibus vacat, non pertranſit indiuiduo tempore, ſed longiori. Perſpicuum igitur *eſt*, nullum continuum partibus carere.

οὐκοῦν καὶ ὁ χρόνος τμηθήσεται δίχα. διαιρεθήσεται ἄρα τὸ ἄτμητον, καὶ τὸ ἀμερὲς οὐκ ἐν ἀτόμῳ δίεισιν, ἀλλ' ἐν πλείονι. φανερὸν οὖν, ὅτι οὐδέν ἐστι τῶν συνεχῶν ἀμερές.

Momentum eſſe indiuiduum, & nihil in momento moueri, vel quieſcere.

Cap. II.

NEceſſe a. *eſt*, momentum, quod non per aliud, B ſed per ſe & primò dicitur, eſſe indiuiduum, ac tale *momentum* in omni tempore ineſſe, eſt enim extremum quiddam præteriti, citra quod nihil eſt futuri: & rurſus futuri, vltra quod nihil eſt præteriti: quod quidē diximus eſſe vtriuſque terminū. 2 Hoc autē ſi oſtenſum fuerit tale eſſe per ſe, atque idem: ſimul perſpicuū erit *eſſe* indiuiduum. 3 Neceſſe igitur *eſt* momentū quod eſt vtriuſque temporis extremū, eſſe idē. nam ſi *ſit* diuerſum, non poterit alterū alteri deinceps eſſe, propterea quòd non eſt continuum ex iis quæ partibus vacant. ſi verò vtrūque ſeorſum *eſt*, tempus erit interiectum: omne enim continuum *eſt* tale, vt ſit aliquod ſynonymū extremis interiectum. atqui ſi tempus *eſt*, quod eſt interiectum, diuiduum C erit: quia probatum eſt omne tempus *eſſe* diuiduum: quapropter momentum erit diuiduum. quòd ſi momentum ſit diuiduum, erit aliquid præteriti in futuro, & futuri in præterito. id enim quo diuidetur, præſens ac futurum tempus diſterminabit. 4 Item momentum non erit *terminus* per ſe, ſed per aliud. diuiſio namque non *eſt* eius quod eſt per ſe. 5 Ad hæc præſentis momenti aliquid erit præteritum: aliud, futurum: nec ſemper idem præteritum, aut futurū. ergo nec præſens momentum ſemper *eſt* idem: quia tempus multis modis diuidi poteſt. quocirca ſi hæc momento ineſſe nequeunt: neceſſe *eſt* idem eſſe in vtroque momentum. 6 At verò ſi idem *ſit*, patet etiam *eſſe* indiuiduum: quia ſi *ſit* diuiduum, rurſus eadem euenient quæ in priori *argumento dicta ſunt*. 7 D Eſſe igitur aliquid in tēpore indiuiduum, quod dicimus eſſe momentum, cōſtat ex iis quæ dicta ſunt. 8 Nihil autem in momēto moueri, ex his perſpicuum *erit*. quoniā ſi *id* ſit, poterit & celerius in eo moueri & tardius. eſto igitur momētū, in quo ν, & in eo moueatur, quod eſt celerius per *longitudinem* α β. quod igitur eſt tardius in eodem mouebitur per *longitudinem* minorem quā α β: velut, per α γ. quia verò quod eſt tardius in toto momento motum eſt per α γ: id quod eſt celerius, in minori quàm hoc *ſit* mouebitur. quapropter diuidetur momentum. atqui erat indiuiduum. non poteſt igitur moueri in momento. 9 Sed nec quieſcere. nam quieſcere dicebamus, quod na- E tura aptum eſt moueri, nec mouetur quando natura aptum eſt, & vbi, & quomodo. quare cùm in momento nihil ſit natura aptum moueri; conſtat non eſſe etiam *aptum* quieſcere. 10 Præterea ſi idem eſt momentum in vtroque tempore: poteſt autem *toto* altero moueri, altero toto quieſcere: quod autem toto tempore mouetur, in quauis huius *parte* mouebitur, in quo natura aptum eſt moueri: & quieſcens itidem quieſcet: *profectò* eueniet vt idem ſimul quieſcat & moueatur. idem enim *eſt* extremum vtriuſque temporis, *nimirum* momentum. 11 Præterea quieſcere dicimus, quod ſimiliter ſe habet & ipſum & partes *eius* tam nunc quàm priùs: ſed in momento non eſt priùs: quare nec quieſcere.

Ἀνάγκη δὲ καὶ τὸ νῦν τὸ μὴ καθ' ἕτερον, ἀλλὰ καθ' αὑτὸ καὶ πρώτως λεγόμενον, ἀδιαίρετον εἶναι, καὶ ἐν ἅπαντι τοιοῦτον χρόνῳ ἐνυπάρχειν. ἔστι γὰρ ἔσχατόν τι τοῦ γεγονότος, οὗ ἐπὶ τάδε οὐδέν ἐστι τοῦ μέλλοντος· καὶ πάλιν τοῦ μέλλοντος, οὗ ἐπὶ τάδε οὐδέν ἐστι τοῦ γεγονότος· ὃ δὴ ἔφαμεν ἀμφοῖν εἶναι πέρας. 2 Τοῦτο δὲ ἂν δειχθῇ ὅτι τοιοῦτόν ἐστι, καθ' αὑτὸ καὶ ταὐτό, ἅμα φανερὸν ἔσται καὶ ὅτι ἀδιαίρετον. 3 Ἀνάγκη δὴ τὸ αὐτὸ εἶναι τὸ νῦν τὸ ἔσχατον ἀμφοτέρων τῶν χρόνων· εἰ γὰρ ἕτερον, ἐφεξῆς μὲν οὐκ ἂν εἴη θάτερον θατέρῳ, διὰ τὸ μὴ εἶναι συνεχὲς ἐξ ἀμερῶν· εἰ δὲ χωρὶς ἑκάτερον, μεταξὺ ἔσται χρόνος· πᾶν γὰρ τὸ συνεχὲς τοιοῦτον, ὥστ' εἶναί τι συνώνυμον μεταξὺ τῶν περάτων. ἀλλὰ μὴν εἰ ὁ χρόνος τὸ μεταξύ, διαιρετὸς ἔσται. πᾶς γὰρ χρόνος δέδεικται ὅτι διαιρετός. ὥστε διαιρετὸν τὸ νῦν. εἰ δὲ διαιρετὸν τὸ νῦν, ἔσται τι τοῦ γεγονότος ἐν τῷ μέλλοντι, καὶ τοῦ μέλλοντος ἐν τῷ γεγονότι· καθ' ὃ γὰρ ἂν διαιρεθῇ, τοῦτο διοριεῖ τὸν παρήκοντα καὶ τὸν μέλλοντα χρόνον. 4 Ἅμα δὲ καὶ οὐκ ἂν καθ' αὑτὸ εἴη τὸ νῦν, ἀλλὰ καθ' ἕτερον· ἡ γὰρ διαίρεσις οὐ καθ' αὑτό. 5 Πρὸς δὲ τούτοις, τοῦ νῦν, τὸ μέν τι γεγονὸς ἔσται, τὸ δὲ μέλλον· καὶ οὐκ ἀεὶ τὸ αὐτὸ γεγονὸς ἢ μέλλον. οὐδὲ δὴ τὸ νῦν τὸ αὐτό· πολλαχῇ γὰρ διαιρετὸς ὁ χρόνος. ὥστ' εἰ ταῦτα ἀδύνατα ὑπάρχειν τῷ νῦν, ἀνάγκη τὸ αὐτὸ εἶναι τὸ ἐν ἑκατέρῳ νῦν. 6 Ἀλλὰ μὴν εἰ ταὐτό, φανερὸν ὅτι καὶ ἀδιαίρετον· εἰ γὰρ διαιρετόν, πάλιν τὰ αὐτὰ συμβήσεται ἃ καὶ ἐν τῷ πρότερον. 7 Ὅτι μὲν τοίνυν ἐστί τι ἐν τῷ χρόνῳ ἀδιαίρετον, ὃ φαμὲν εἶναι τὸ νῦν, δῆλον ἐκ τῶν εἰρημένων. 8 Ὅτι δ' οὐδὲν ἐν τῷ νῦν κινεῖται, ἐκ τῶνδε φανερόν. εἰ γάρ ἐστιν, ἐνδέχεται καὶ θᾶττον κινεῖσθαι ἐν αὐτῷ καὶ βραδύτερον. ἔστω δὴ τὸ νῦν, ἐφ' ᾧ ν. καὶ κεκινήσθω δ' ἐν αὐτῷ τὸ θᾶττον, τὴν α β. οὐκοῦν τὸ βραδύτερον ἐν τῷ αὐτῷ, ἐλάττω τῆς α β κινηθήσεται, οἷον τὴν α γ. ἐπεὶ δὲ τὸ βραδύτερον ἐν ὅλῳ τῷ νῦν κεκίνηται τὴν α γ, τὸ θᾶττον ἐν ἐλάττονι τούτου κινηθήσεται. ὥστε διαιρεθήσεται τὸ νῦν· ἀλλ' ἦν ἀδιαίρετον. οὐκ ἄρα ἔστι κινεῖσθαι ἐν τῷ νῦν. 9 Ἀλλὰ μὴν οὐδ' ἠρεμεῖν· ἠρεμεῖν γὰρ ἐλέγομεν, τὸ πεφυκὸς κινεῖσθαι μὴ κινούμενον ὅτε πέφυκε, καὶ οὗ, καὶ ὥς. ὥστ' ἐπεὶ ἐν τῷ νῦν οὐδὲν πέφυκε κινεῖσθαι, δῆλον ὅτι οὐδ' ἠρεμεῖν. 10 Ἔτι δ', εἰ τὸ αὐτὸ μέν ἐστι τὸ νῦν ἐν ἀμφοῖν τοῖν χρόνοιν, ἐνδέχεται δὲ, τὸν μὲν κινεῖσθαι, τὸν δὲ ἠρεμεῖν ὅλον· τὸ δ' ὅλον κινούμενον τὸν χρόνον ἐν ὁτῳοῦν κινηθήσεται τῶν τούτου, καθ' ὃ πέφυκε κινεῖσθαι, καὶ τὸ ἠρεμοῦν ὡσαύτως ἠρεμήσει, συμβήσεται τὸ αὐτὸ ἅμα ἠρεμεῖν καὶ κινεῖσθαι· τὸ γὰρ αὐτὸ ἔσχατον τῶν χρόνων ἀμφοτέρων, τὸ νῦν. 11 Ἔτι δ', ἠρεμεῖν μὲν λέγομεν τὸ ὁμοίως ἔχον καὶ αὐτό, καὶ τὰ μέρη, νῦν καὶ πρότερον· ἐν δὲ τῷ νῦν, οὐκ ἔστι τὸ πρότερον· ὥστε οὐδ' ἠρεμεῖν.

2. Ἀνάγκη ἄρα καὶ κινεῖσθαι, τὸ κινούμενον, ἐν χρόνῳ, καὶ ἠρεμεῖν τὸ ἠρεμοῦν. A

21 Neceſſe *eſt* igitur, id quod mouetur, in tempore moueri: &, quod quieſcit, *in tempore* quieſcere.

Quicquid mouetur, eſſe diuiduum.

Cap. III.

Τὸ δὲ μεταβάλλον ἅπαν, ἀνάγκη διαιρετὸν εἶναι. ἐπεὶ γὰρ ἔκ τινος εἴς τι πᾶσα μεταβολή, καὶ ὅταν μὲν ᾖ ἐν τούτῳ εἰς ὃ * μετέβαλλεν, οὐκέτι μεταβάλλει. ὅταν δὲ ἐξ οὗ μετέβαλλε, καὶ αὐτὸ * καὶ τὰ μέρη οὐ μεταβάλλει· ἀνάγκη δὴ τὸ μέν τι ἐν τούτῳ εἶναι, τὸ δὲ ἐν θατέρῳ τοῦ μεταβάλλοντος· οὔτε γὰρ ἐν * ἀμφοτέροις, οὔτ᾽ ἐν μηδετέρῳ [ὅλον] δυνατόν. λέγω δὲ εἰς ὃ μεταβάλλει τὸ πρῶτον κατὰ τὴν μεταβολήν. οἷον, ἐκ τοῦ λευκοῦ τὸ φαιόν, οὐ τὸ μέλαν· οὐ γὰρ ἀνάγκη τὸ μεταβάλλον ἐν ὁποτερῳοῦν εἶναι τῶν ἄκρων. φανερὸν δὴ ὅτι πᾶν τὸ μεταβάλλον ἔσται διαιρετόν. B

* χ. μετέβαλεν,
* χ. ἢ τὰ μέρη αὐτοῦ οὐ μεταβάλλει. alij codd. post οὐ μ. addunt, τὸ γὰρ ὡσαύτως ἔχον, & αὐτὸ καὶ τὰ μέρη οὐ μεταβάλλει.
* χ. ἀμφοτέροις,

QVicquid autem mutatur, neceſſe *eſt* vt diuiduum ſit. cùm enim omnis mutatio *ſit* ex aliquo in aliquod: & quando *res* eſt in hoc in quod mutata eſt, non mutatur ampliùs: quando autem *in eo* ex quo eſt mutata, tam ipſa quàm partes eius non*dum* mutatur: (quod enim eodem modo ſe habet, nec ipſum nec *eius* partes mutantur) neceſſe igitur eſt partem eius quod mutatur, eſſe in hoc, partem in altero: quia nec in vtriſque nec in neutro totum *eſſe* poteſt. dico autem in quod mutatur, *id eſt*, quod eſt primum in mutatione: veluti, ex albo fuſcum, non nigrum. non *eſt* enim neceſſe, vt quod mutatur, ſit in vtroque extremo. Perſpicuum igitur *eſt*, quicquid mutatur, fore diuiduum.

De diuiſione motus.

Cap. IV.

Κίνησις δ᾽ ἐστὶ διαιρετὴ διχῶς, ἕνα μὲν τρόπον, τῷ χρόνῳ· ἄλλον δέ, κατὰ τὰς τῶν μερῶν τοῦ κινουμένου κινήσεις. C 2 Οἷον, εἰ τὸ α γ κινεῖται ὅλον, καὶ τὸ α β κινηθήσεται, καὶ τὸ β γ. ἔστω δὴ τοῦ μὲν α β, ἡ δ ε· τοῦ δὲ β γ, ἡ ε ζ, κίνησις τῶν μερῶν. ἀνάγκη δὴ τὴν ὅλην, ἐφ᾽ ἧς ἡ δ ζ, τοῦ α γ εἶναι κίνησιν. κινήσεται γὰρ κατὰ ταύτην, ἐπειδὴ ἑκάτερον τῶν μερῶν κινεῖται καθ᾽ ἑκατέραν. οὐδὲν δὲ κινεῖται κατὰ τὴν τοῦ ἄλλου κίνησιν· ὥστε ἡ ὅλη κίνησις τοῦ ὅλου ἐστὶ μεγέθους κίνησις. 3 Ἔτι δέ, εἰ ἅπασα μὲν κίνησις τινός, ἡ δ᾽ ὅλη κίνησις ἡ ἐφ᾽ ἧς δ ζ, μήτε τῶν μερῶν ἐστὶ μηδετέρου· μέρους γὰρ * ἑκατέρα μήτε ἄλλου μηδενός· οὗ γὰρ ἡ ὅλη ὅλου, καὶ τὰ μέρη τῶν μερῶν· τὰ δὲ μέρη τῆς δ ζ, τῶν α β, β γ, καὶ οὐκ ἄλλων· πλειόνων γὰρ οὐκ ἦν μία κίνησις, κἂν ἡ ὅλη κίνησις εἴη αὐ * τοῦ α β γ μεγέθους. D 4 Ἔτι δ᾽, εἰ μέν ἐστι τοῦ ὅλου κίνησις ἄλλη, οἷον ἐφ᾽ ἧς θ ι, ἀφαιρεθήσεται ἀπ᾽ αὐτῆς ἡ ἑκατέρων τῶν μερῶν κίνησις· αὗται δ᾽ ἴσαι ἔσονται ταῖς δ ε, ε ζ· μία γὰρ ἑνὸς κίνησις. ὥστ᾽, εἰ μὲν ὅλη διαιρεθήσεται ἡ θ ι, εἰς τὰς τῶν μερῶν κινήσεις, ἴση ἔσται ἡ θ ι, τῇ δ ζ· εἰ δ᾽ ἀπολείπει τι, οἷον τὸ κ ι, αὕτη οὐδενὸς ἔσται κίνησις· οὔτε γὰρ τοῦ ὅλου, οὔτε τῶν μερῶν, διὰ τὸ μίαν εἶναι τοῦ ἑνός, οὔτε ἄλλου οὐδενός· ἡ γὰρ συνεχὴς κίνησις ἐστὶ συνεχῶν τινῶν. E ὡσαύτως δὲ καὶ εἰ ὑπερβάλλει κατὰ τὴν διαίρεσιν. ὥστ᾽ εἰ τοῦτο ἀδύνατον, ἀνάγκη τὴν αὐτὴν εἶναι καὶ ἴσην. 5 Αὕτη μὲν οὖν ἡ διαίρεσις, κατὰ τὰς τῶν μερῶν κινήσεις ἐστί, καὶ ἀνάγκη παντὸς εἶναι τοῦ μεριστοῦ αὐτήν. 6 Ἄλλη δὲ κατὰ τὸν χρόνον· ἐπεὶ γὰρ ἅπασα κίνησις ἐν χρόνῳ, χρόνος δὲ πᾶς διαιρετός, ἐν δὲ τῷ ἐλάττονι ἐλάττων ἡ κίνησις, ἀνάγκη πᾶσαν κίνησιν διαιρεῖσθαι κατὰ τὸν χρόνον.

* Vicomerc. ex Simplicio, ἑκατέρου
* χ. τοῦ α β γ.

MOtus autem bifariàm eſt diuiduus: vno modo, ratione temporis: altero, ſecundùm motus partium eius quod mouetur. 2 Vtputa ſi α γ mouetur totum, etiam *pars* α β mouebitur, & *pars* β γ. Eſto igitur partis α β, motus δ ε: partis autem β γ, motus ε ζ. ergo neceſſe *eſt*, totum δ ζ eſſe motum ipſius α γ: mouebitur enim ſecundùm hunc *motum*: quandoquidem vtraque pars mouetur ſecundùm vtrumque: nihil autẽ mouetur alius *rei* motu. quapropter totus motus eſt totius magnitudinis motus. 3 Præterea ſi omnis motus *eſt* alicuius: totus autem motus δ ζ nec eſt alterutrius partis, (nam *vtriuſque* partis *eſt* vtraque *pars motus*) nec alius cuiuſpiam: (cuius enim totius *eſt* totus *motus*, etiam partes *ſunt* partium: partes autem *motus* δ ζ, ſunt *partium* α β, β γ, non aliorum: quia plurium non eſt vnus motus) profectò etiam totus motus erit magnitudinis α β γ. 4 Præterea ſi alius eſt motus totius: velut, in quo *eſt* θ ι, auferetur ab eo motus vtriuſque partis. hi verò *motus* æquales erunt *ipſis* δ ε, ε ζ: quandoquidem vnus motus *eſt* vnius. quocirca ſi totus *motus* θ ι diuidetur in partium motus, æqualis erit *motus* θ ι, *motui* δ ζ. Si quid autem reſtat: velut, κ ι, hic nullius erit motus. nam nec totius, nec partium, propterea quòd vnus eſt vnius, nec alius cuiuſpiam; quia continuus motus eſt aliquorum continuorum. Itidemque ſi ſuperat ſecundùm diuiſionem. Quare ſi hoc *eſt* impoſſibile, neceſſe *eſt* eundem eſſe & æqualem. 5 Hæc igitur diuiſio eſt ex partium motibus: ac neceſſe eſt eam eſſe cuiuſvis partes habentis. 6 Alia verò *ſumitur* ex tempore. cùm enim omnis motus *ſit* in tempore, omne autem tempus *ſit* diuiduum, & minori tempore motus *ſit* minor: neceſſe *eſt* omnem motum diuidi pro ratione temporis.

Eandem ineſſe diuiſionem temporis, motus, ipſius moueri, mobilis, & eius in quo fit motus.

Cap. V.

A CVm autẽ quicquid mouetur, in aliquo moueatur & in aliquo tempore; & cuiuſcumque rei quæ mouetur, ſit motus: neceſſe *eſt* eaſdem eſſe diuiſiones & temporis, & motus, & ipſius moueri, & eius quod mouetur, *& eius* in quo *fit* motus: quamquam non ſimiliter *diuiſio eſt omnium eorũ* in quibus eſt motus; ſed quantitatis *eſt* per ſe: qualitatis verò, ex accidenti. 2 Sumatur enim tempus quo mouetur, vbi *a*: & motus, vbi *b*. ſi igitur totum motum toto tempore confecit: *certè* dimidia parte *temporis* minorem *motum conficiet*. & rurſus hoc *minore tempore* diuiſo, *conficiet motum* hoc minorem: atque ita ſemper. 3 Similiterque ſi motus *eſt* diuiduus, etiam tempus B *eſt* diuiduum. nam ſi totum *motum* toto *tempore conficit*, *etiam* dimidiam *partem motus* dimidia *parte temporis conficiet*: ac rurſus minorem *motum* minori *tempore*. 4 Eodem modo etiam ipſum moueri diuidetur. eſto namque moueri, vbi *γ*. ergo ſecundùm dimidiam motus partem erit minus toto: & rurſus ſecundùm dimidiam dimidiæ: atq; ita perpetuò. 5 Licet etiam expoſito ipſo moueri ſecundùm vtrunque motum, veluti ſecundùm *δγ*, & *γε*, dicere totum *moueri* fore ſecundùm totum *motum*. nam ſi aliud *ſit*, plura erunt moueri ſecundùm eũdem motum, ſicut oſtendimus etiam motum diuiduum eſſe in motus partium. ſum- C pto enim ipſo moueri ſecundùm vtrumque *motum*, certè totum erit continuum. 6 Itidem etiam probabitur longitudinẽ *eſſe* diuiduam. & omnino id omne in quo eſt mutatio, (niſi quòd nonnulla ex accidenti *diuidantur*) quia quod mutatur, eſt diuiduum. etenim ſi vnum diuiditur, omnia diuidentur. 7 Et quantum ad hoc vt finita ſint vel infinita, ſimiliter *ſe res* habet in omnibus. 8 Omnia verò diuidi, & eſſe infinita, maximè conſequens eſt ex eo quod mutatur. ſtatim enim ineſt ei quod mutatur, *eſſe* diuiduum, & infinitum. diuiduum igitur *eſſe*, probatum eſt anteà: infinitas verò in ſequentibus erit manifeſta.

Ἐπεὶ δὲ πᾶν τὸ κινούμενον ἔν τινι κινῆται, καὶ χρόνον τινά, καὶ παντὸς τοῦ κινουμένου ἐστὶ κίνησις, ἀνάγκη τὰς αὐτὰς εἶναι διαιρέσεις, τοῦ τε χρόνου καὶ τῆς κινήσεως, καὶ τοῦ κινεῖσθαι καὶ τοῦ κινουμένου, καὶ ἐν ᾧ ἡ κίνησις. πλὴν οὐ πάντων ὁμοίως, ἐν οἷς ἡ κίνησις, ἀλλὰ τοῦ μὲν ποσοῦ, καθ' αὑτὸ· τοῦ δὲ ποιοῦ, κατὰ συμβεβηκός. 2 Εἰλήφθω γὰρ ὁ χρόνος ἐν ᾧ κινεῖται ἐφ' ᾧ α, καὶ ἡ κίνησις ἐφ' ᾧ β. εἰ οὖν τὴν ὅλην ἐν τῷ παντὶ χρόνῳ κεκίνηται, ἐν τῷ ἡμίσει, ἐλάττω· καὶ πάλιν τούτου διαιρεθέντος, ἐλάττω ταύτης, καὶ ἀεὶ οὕτως. 3 Ὁμοίως δὲ καὶ εἰ ἡ κίνησις διαιρετή, καὶ ὁ χρόνος διαιρετός. εἰ γὰρ τὴν ὅλην ἐν τῷ παντί, τὴν ἡμίσειαν ἐν τῷ ἡμίσει, καὶ πάλιν τὴν ἐλάττονα ἐν τῷ ἐλάττονι. 4 Τὸν αὐτὸν δὲ τρόπον καὶ τὸ κινεῖσθαι διαιρεθήσεται. ἔστω γὰρ ἐφ' ᾧ γ, τὸ κινεῖσθαι. κατὰ δὴ τὴν ἡμίσειαν κίνησιν, ἔλαττον ἔσται τοῦ ὅλου· καὶ πάλιν κατὰ τὴν τῆς ἡμισείας ἡμίσειαν. καὶ ἀεὶ οὕτως. 5 Ἔστι δὲ καὶ ἐκτιθέμενον τὸ καθ' ἑκατέραν τὴν κίνησιν κινεῖσθαι, οἷον κατά τε τὴν δγ, καὶ τὴν γε λέγειν,* ὅτι τὸ ὅλον ἔσται κατὰ τὴν ὅλην. εἰ γὰρ ἄλλο, πλείω ἔσται κινεῖσθαι κατὰ τὴν αὐτὴν κίνησιν, ὥσπερ ἐδείξαμεν καὶ τὴν κίνησιν διαιρετὴν εἰς τὰς τῶν μορίων κινήσεις οὖσαν. ληφθέντος γὰρ τοῦ κινεῖσθαι καθ' ἑκατέραν, συνεχὲς ἔσται τὸ ὅλον. 6 Ὡσαύτως δὲ δειχθήσεται καὶ τὸ μῆκος διαιρετόν, καὶ ὅλως πᾶν ἐν ᾧ ἐστιν ἡ μεταβολή· πλὴν ἔνια κατὰ συμβεβηκός, ὅτι τὸ μεταβάλλον ἐστὶ διαιρετόν· ἑνὸς γὰρ διαιρουμένου, πάντα διαιρεθήσεται. 7 Καὶ ἐπὶ τοῦ πεπερασμένα εἶναι ἢ ἄπειρα, ὁμοίως ἕξει κατὰ πάντων. 8 * Ἠκολούθηκε δὲ μάλιστα τὸ διαιρεῖσθαι πάντα, καὶ ἄπειρα εἶναι, ἀπὸ τοῦ μεταβάλλοντος· εὐθὺς γὰρ ὑπάρχει τῷ μεταβάλλοντι τὸ διαιρετὸν καὶ τὸ ἄπειρον. τὸ μὲν οὖν διαιρετὸν δέδεικται πρότερον, τὸ δ' ἄπειρον ἐν τοῖς ἑπομένοις ἔσται δῆλον.

* χ. ἐπὶ τ.

* χ. ἐπηκολούθηκε

Quicquid eſt mutatum, id cùm primùm mutatum eſt, in eo eſſe in quod eſt mutatum.

Cap. VI.

D QVia verò quicquid mutatur, ex aliquo in aliquod mutatur: neceſſe *eſt*, id quod eſt mutatum, cùm primum eſt mutatum, eſſe *in eo* in quod eſt mutatum. quod enim mutatur, exit ex eo ex quo mutatur, ſeu ipſum relinquit: & vel idem eſt mutari ac relinquere; vel ipſi mutari conſequens eſt relinquere; & ipſi mutatum eſſe, *conſequens eſt* reliquiſſe: quia ſimiliter vtrumque affectum eſt ad vtrumque. Quoniam igitur mutationum vna *eſt*, quæ in contradictione *cernitur*, quando mutatum eſt ex non ente in ens, reliquit non ens. erit igitur in ente: quia rem omnem neceſſe eſt aut eſſe aut non eſſe. Perſpicuũ *eſt* igitur, in ea mutatione, quæ in contradictione *ſpectatur*, id quod eſt mutatum, eſſe in eo, in quod eſt mutatum. quod ſi *ita* eſt in hac *mutatione*, *certè* etiam in aliis. ſimilis enim ratio eſt vnius & aliarum.

Ἐπεὶ δὲ πᾶν τὸ μεταβάλλον, ἔκ τινος εἴς τι μεταβάλλει, ἀνάγκη τὸ μεταβεβληκός, ὅτε πρῶτον μεταβέβληκεν, εἶναι ἐν ᾧ μεταβέβληκε. τὸ γὰρ μεταβάλλον, ἐξ οὗ μεταβάλλει, ἐξίσταται ἢ ἀπολείπει αὐτό· καὶ ἤτοι ταὐτόν ἐστι τὸ μεταβάλλειν καὶ τὸ ἀπολείπειν, ἢ ἀκολουθεῖ τῷ μεταβάλλειν τὸ ἀπολείπειν· τῷ δὲ μεταβεβληκέναι, τὸ ἀπολελοιπέναι· ὁμοίως γὰρ ἑκάτερον ἔχει πρὸς ἑκάτερον. ἐπεὶ οὖν μία τῶν μεταβολῶν ἡ κατ' ἀντίφασιν, ὅτε μεταβέβληκεν ἐκ τοῦ μὴ ὄντος εἰς τὸ ὄν, ἀπολέλοιπε τὸ μὴ ὄν. ἔσται ἄρα ἐν τῷ ὄντι· πᾶν γὰρ ἀνάγκη ἢ εἶναι, ἢ μὴ εἶναι. φανερὸν οὖν ὅτι ἐν τῇ κατ' ἀντίφασιν μεταβολῇ, τὸ μεταβεβληκὸς ἔσται ἐν ᾧ μεταβέβληκεν. εἰ δ' ἐν ταύτῃ, καὶ ἐν ταῖς ἄλλαις· ὁμοίως γὰρ ἐπὶ μιᾶς καὶ τῶν ἄλλων.

2 Ἐπεὶ δὲ καὶ καθ' ἑκάστην λαμβάνουσι φανερόν, εἰ γὰρ ἀνάγκη τὸ μεταβεβληκὸς εἶναί που, ἐξ οὗ μεταβέβληκεν, ἢ ἐν τινι· ἐπεὶ γὰρ ἐξ οὗ μεταβέβληκεν, ἀπολέλοιπεν, ἀνάγκη δὲ εἶναί που, ἢ ἐν τούτῳ, ἢ ἐν ἄλλῳ ἔσται. εἰ μὲν οὖν ἐν ἄλλῳ, οἷον ἐν τῷ γ, τὸ εἰς τὸ β μεταβεβληκὸς, πάλιν ἐκ τοῦ γ μεταβάλλει εἰς τὸ β· οὐ γὰρ ἦν ἐχόμενον τοῦ β· ἡ γὰρ μεταβολὴ, συνεχής. ὥστε τὸ μεταβεβληκὸς ὅτε μεταβέβληκε, μεταβάλλει εἰς ὃ μεταβέβληκε· τοῦτο δ' ἀδύνατον· ἀνάγκη ἄρα τὸ μεταβεβληκὸς εἶναι ἐν τούτῳ, εἰς ὃ μεταβέβληκε. 3 Φανερὸν οὖν ὅτι καὶ τὸ γεγονὸς, ὅτε γέγονεν, ἔσται, καὶ τὸ ἐφθαρμένον οὐκ ἔσται· καθόλου τε γὰρ εἴρηται περὶ πάσης μεταβολῆς, καὶ μάλιστα δῆλον ἐν τῇ κατὰ ἀντίφασιν. 4 Ὅτι μὲν τοίνυν τὸ μεταβεβληκὸς, ὅτε μεταβέβληκε πρῶτον, ἐν ἐκείνῳ ἐστὶ, δῆλον. A

2 Præterea etiam ſingillatim ſumentibus perſpicuum *erit*: ſiquidem neceſſe *eſt*, id quod eſt mutatum, eſſe alicubi ſiue in aliquo. nam quia deſeruit id ex quo eſt mutatum, neceſſe autem *eſt*, vt ſit alicubi: *certè* aut in hoc, aut in alio erit. Si igitur in alio, puta, in γ, *id ſit* quod eſt mutatum in β, ruſus ex γ mutatur in β: non cohærebat enim ipſi β: quia mutatio *eſt* continua. quapropter quod mutatum eſt, quando mutatum eſt, mutatur in id in quod eſt mutatum: quod eſt impoſſibile. Neceſſe igitur *eſt*, vt quod eſt mutatum, ſit in hoc in quod eſt mutatum. 3 Perſpicuum igitur *eſt*, etiam id quod eſt factum, tunc eſſe, cùm eſt factum: & quod interiit, *tunc* non eſſe, *cùm interiit*: quoniam vniuerſaliter dictum eſt de omni mutatione: & maximè *eſt* in ea manifeſtum, quæ in contradictione *conſiſtit*. 4 Ergo quod eſt mutatum, cùm primùm eſt mutatum, in illo eſſe conſtat.

Id in quo primo mutatum eſt, eſſe indiuiduum.

Cap. VII.

ἘΝ ᾧ δὲ πρώτῳ [νῦν πρῶτον] μεταβέβληκε τὸ μεταβεβληκὸς, ἀνάγκη ἄτομον εἶναι. 2 Λέγω δὲ πρῶτον, ὃ μὴ τῷ ἕτερόν τι αὐτοῦ εἶναι πρῶτον, τοιοῦτόν ἐστιν. 3 Ἔστω γὰρ διαιρετὸν τὸ α γ, καὶ διῃρήσθω κατὰ τὸ β. εἰ μὲν οὖν ἐν τῷ α β μεταβέβληκεν, ἢ πάλιν ἐν τῷ β γ, οὐκ ἂν ἐν πρώτῳ τῷ α γ μεταβεβληκὸς εἴη. εἰ δ' ἐν ἑκατέρῳ μετέβαλλεν (ἀνάγκη γὰρ ἢ μεταβεβληκέναι, ἢ μεταβάλλειν ἐν ἑκατέρῳ) κἂν ἐν τῷ ὅλῳ μεταβάλλοι· ἀλλ' ἦν μεταβεβληκός. ὁ αὐτὸς δὲ λόγος, καὶ εἰ ἐν τῷ μὲν μεταβάλλει, ἐν δὲ τῷ μεταβέβληκεν· ἔσται γάρ τι τοῦ πρώτου πρότερον· ὥστε οὐκ ἂν εἴη διαιρετὸν τὸ πρῶτον ἐν ᾧ μεταβέβληκε. 4 Φανερὸν τοίνυν ὅτι καὶ τὸ ἐφθαρμένον καὶ τὸ γεγονὸς, ἐν ἀτόμῳ, τὸ μὲν ἔφθαρται, τὸ δὲ γέγονε. B

ID autem, in quo primo eſt mutatum, quod eſt mutatum, neceſſario eſt indiuiduum. 2 Dico autem primum, quod non eſt tale, eo quòd aliud quiddam ipſius ſit primum. 3 Eſto namque α γ diuiduum: & diuidatur in β. ſi igitur mutatum eſt in α β, aut rurſus in β γ: certè non erit mutatum in primo α γ. quòd ſi in vtroque mutabatur; (neceſſe *eſt* enim vel mutatum eſſe, vel mutari in vtroque) etiam in toto mutaretur: atqui mutatum erat. eadem *eſt* ratio, & ſi in altero mutatur, in altero autem eſt mutatum: erit enim aliquid primo prius. quocirca primum, in quo mutatum eſt, non poteſt eſſe diuiduum. 4 Perſpicuum igitur *eſt*, & quod interiit, & quod ortum eſt, in indiuiduo illud quidem interiiſſe, hoc autem ortum eſſe.

In mutatione eſſe vltimum, non primum.

Cap. VIII.

* γρ. δίχα

ΛΕγεται δὲ τὸ ἐν ᾧ πρώτῳ μεταβέβληκε, διχῶς· τὸ μὲν, ἐν ᾧ πρώτῳ ἐπετελέσθη ἡ μεταβολή· τότε γὰρ ἀληθὲς εἰπεῖν, ὅτι μεταβέβληκε· τὸ δὲ ἐν ᾧ πρώτῳ ἤρξατο μεταβάλλειν. 2 Τὸ μὲν οὖν κατὰ τὸ τέλος τῆς μεταβολῆς πρῶτον λεγόμενον ὑπάρχει τε καὶ ἔστιν· ἐνδέχεται γὰρ ἐπιτελεσθῆναι τὴν μεταβολὴν, καὶ ἔστι μεταβολῆς τέλος· ὃ δὴ καὶ δέδεικται ἀδιαίρετον ὂν διὰ τὸ πέρας εἶναι. 3 Τὸ δὲ κατὰ τὴν ἀρχὴν, ὅλως οὐκ ἔστιν· οὐ γάρ ἐστιν ἀρχὴ μεταβολῆς, οὐδ' ἐν ᾧ πρώτῳ τοῦ χρόνου** μετέβαλλεν· ἔστω γὰρ πρῶτον, ἐφ' ᾧ τὸ α δ. τοῦτο δὴ, ἀδιαίρετον μὲν οὐκ ἔστι· συμβήσεται γὰρ ἐχόμενα εἶναι τὰ νῦν. ἔτι δ' εἰ ἐν τῷ γ α χρόνῳ παντὶ ἠρεμεῖ (κείσθω γὰρ ἠρεμοῦν) καὶ ἐν τῷ α* ἠρεμήσει· ὥστε εἰ ἀμερές ἐστι τὸ α δ, ἅμα ἠρεμήσει καὶ μεταβεβληκὸς ἔσται· ἐν μὲν γὰρ τῷ α ἠρεμεῖ, ἐν δὲ τῷ δ μεταβέβληκεν. ἐπεὶ δ' οὐκ ἔστιν ἀμερὲς, ἀνάγκη διαιρετὸν εἶναι, καὶ ἐν ὁτῳοῦν τῶν τούτου μεταβεβληκέναι· διαιρεθέντος γὰρ τοῦ α δ, εἰ μὲν ἐν* μηδετέρᾳ μεταβέβληκεν, οὐδ' ἐν τῷ ὅλῳ· εἰ δ' ἐν ἀμφοῖν μεταβάλλει, κἂν ἐν τῷ παντί· εἰ δ' ἐν θατέρῳ μεταβέβληκεν, οὐκ ἐν τῷ ὅλῳ πρώτῳ. C D

** γρ. μετέβαλλεν

* γρ. ἠρεμεῖ

* γρ. μηδετέρῳ

IAm verò id, in quo primum mutatum eſt, bifariam dicitur: alterum, in quo primo perfecta eſt mutatio: tunc enim verè dicitur mutatum eſſe: alterum autem, in quo primo cœpit mutari. Quod igitur ſecundùm finem mutationis primum dicitur, ineſt, atque eſt: poteſt enim perfici mutatio: & eſt finis mutationis, quem probatum eſt eſſe indiuiduum, propterea quòd eſt terminus. 3 Quod verò ratione principij dicitur, omnino non eſt: quia non eſt principium mutationis, nec in quo primo temporis mutatum ſit. eſto namque primum, vbi α δ. hoc igitur indiuiduum non eſt: quoniam eueniet vt momenta ſint cohærentia. Præterea ſi in toto α γ tempore quieſcit: (ponatur enim quieſcere) etiam in α quieſcit. quapropter ſi α δ eſt indiuiduum, ſimul quieſcet & mutatum erit. etenim in α quieſcit: in δ autem mutatum eſt. Quia verò partibus non caret: neceſſe *eſt* vt ſit diuiduum, & in quavis eius *parte* mutatum fuerit. diuiſo enim ipſo α δ, ſiquidem in neutra *parte* mutatum fuerit, *certè* nec in toto: ſi verò in vtriſque mutatur, etiam in toto. at ſi in altero mutatum eſt, non in toto primo *eſt mutatum*.

quare neceſſe *eſt* in quavis *parte* mutatum fuiſſe, perſpicuum igitur *eſt*, non eſſe in quo primo eſt mutatum: quoniam diuiſiones *ſunt* infinitæ. 4 Neque igitur eius quod eſt mutatum, eſt aliquid primum quod mutatum ſit. eſto namque δζ, primum quod ſit mutatum δε: quicquid enim mutatur, probatum eſt diuiduum eſſe. tempus verò, quo δζ eſt mutatum, ſit vbi θι. Ergo ſi δζ eſt toto *tempore* mutatum: quod dimidia *parte temporis* mutatum *erit*, minus erit, & prius ipſo δζ: rurſúſque hoc aliud *prius*: illo aliud: & ita perpetuò. quocirca eius quod mutatur, nihil erit primum quod mutatum ſit. 5 Ergo nec eius quod mutatur, nec temporis quo mutatur, eſſe quicquam primum, perſpicuum *eſt* ex iis quæ dicta ſunt. 6 Id autem quod mutatur, vel ſecundùm quod mutatur, non ampliùs ſimiliter *ſe* habebit. tria namque ſunt, quæ in mutatione ſpectantur, quod mutatur, & in quo, & ſecundùm quod mutatur: vt homo, ac tempus, & album. homo igitur ac tempus diuidua *ſunt*. albi autem *eſt* alia ratio. niſi quòd ex accidenti *ſunt* omnia diuidua: quia cui qualitas, aut albor accidit, illud eſt diuiduum. nam quæcumque per ſe dicuntur diuidua, non ex accidenti, nec in his primum erit: vt in magnitudinibus: eſto enim magnitudo, vbi αβ: & moueatur ex β in γ primum. ergo, ſi βγ erit indiuiduum: id quod partibus vacat, ei quod partibus vacat, cohærebit. ſi verò diuiduum: erit aliquid prius quam γ, in quod eſt mutatum, & rurſus illo aliud, & ita ſemper, proptereà quòd numquam deficit diuiſio. quare non erit primum, in quo mutatum ſit. ſimiliter etiam *ſe res habet* in quantitatis mutatione: etenim hæc quoque in continuo eſt. Perſpicuum *eſt* igitur, in eo ſolo motu, qui in qualitate *ſpectatur*, eſſe poſſe indiuiduum per ſe.

A ὥστε ἀνάγκη ἐν ὁτῳοῦν μεταβεβληκέναι. φανερὸν τοίνυν ὅτι οὐκ ἔστιν ἐν ᾧ πρώτῳ μεταβέβληκεν· ἄπειροι γὰρ αἱ διαιρέσεις. 4 Οὐδὲ δὴ τοῦ μεταβεβληκότος ἔστι τι πρῶτον ὃ μεταβέβληκεν. ἔστω γὰρ τὸ δζ πρῶτον μεταβεβληκὸς τοῦ δε· πᾶν γὰρ δέδεικται διαιρετὸν τὸ μεταβάλλον. ὁ δὲ χρόνος ἐν ᾧ τὸ δζ μεταβέβληκεν, ἔστω ἐφ' ᾧ θι. εἰ οὖν ἐν τῷ παντὶ τὸ δζ μεταβέβληκεν, ἐν τῷ ἡμίσει ἔλαττον ἔσται τὸ μεταβεβληκὸς, καὶ πρότερον τοῦ δζ, καὶ πάλιν τούτου ἄλλο, κἀκείνου ἕτερον, καὶ ἀεὶ οὕτως. ὥστε οὐδὲν ἔσται πρῶτον τοῦ μεταβάλλοντος ὃ μεταβέβληκεν. B 5 Ὅτι μὲν οὖν οὔτε τοῦ μεταβάλλοντος, οὔτε ἐν ᾧ μεταβάλλει χρόνῳ πρῶτον οὐδέν ἐστι, φανερὸν ἐκ τῶν εἰρημένων. 6 Αὐτὸ δὲ ὃ μεταβάλλει, ἢ καθ' ὃ μεταβάλλει, οὐκέτι ὁμοίως ἕξει. τρία γάρ ἐστιν ἃ λέγεται κατὰ τὴν μεταβολὴν, τό τε μεταβάλλον, καὶ ἐν ᾧ, καὶ καθ' ὃ μεταβάλλει· οἷον ὁ ἄνθρωπος, καὶ ὁ χρόνος, καὶ τὸ λευκόν. ὁ μὲν οὖν ἄνθρωπος καὶ ὁ χρόνος διαιρετοὶ, περὶ δὲ τοῦ λευκοῦ ἄλλος λόγος. πλὴν κατὰ συμβεβηκός γε πάντα διαιρετά· C ᾧ γὰρ συμβέβηκε τὸ ποιὸν, ἢ τὸ λευκὸν, ἐκεῖνο διαιρετόν ἐστιν, ἐπεὶ ὅσα γε καθ' αὑτὰ λέγεται διαιρετὰ, καὶ μὴ κατὰ συμβεβηκὸς, οὐδ' ἐν τούτοις ἔσται τὸ πρῶτον. οἷον, ἐν τοῖς μεγέθεσιν· ἔστω γὰρ ἐφ' ᾧ αβ, μέγεθος· καὶ κεκινήσθω ἐκ τοῦ β, εἰς τὸ γ πρῶτον. οὐκοῦν, εἰ μὲν ἀδιαίρετον ἔσται τὸ βγ, ἀμερὲς ἀμεροῦς ἔσται ἐχόμενον· εἰ δὲ διαιρετὸν, ἔσται τι τοῦ γ πρότερον, εἰς ὃ μεταβέβληκε, κἀκείνου πάλιν ἄλλο, καὶ ἀεὶ οὕτω, διὰ τὸ μηδέποτε ὑπολείπειν τὴν διαίρεσιν. ὥστε οὐκ ἔσται πρῶτον εἰς ὃ μεταβέβληκεν. ὁμοίως δὲ καὶ ἐπὶ τῆς τοῦ ποσοῦ μεταβολῆς· καὶ γὰρ αὕτη ἐν συνεχεῖ ἐστι. φανερὸν οὖν ὅτι ἐν μόνῃ τῇ κινήσει τῇ κατὰ τὸ ποιὸν, ἐνδέχεται ἀδιαίρετον καθ' αὑτὸ εἶναι.

In quo tempore primo aliquid mutatur, id in quavis eius temporis parte mutari.

Cap. IX.

QVoniam autem quicquid mutatur, in tempore mutatur; dicitur autem in tempore mutari, & vt in primo, & vt ſecundùm alterum; vt in anno, quia in die mutatur: ſanè, in quo primo tempore mutatur id quod mutatur, neceſſe *eſt* vt in quavis eius temporis parte mutetur. 2 Manifeſtum igitur *hoc* eſt ex definitione; primum enim ita appellabamus. 3 Sed ex his quoque perſpicuum *fiet*. ſit enim in quo primo mouetur id quod mouetur, vbi χρ: & diuidatur in κ: omne enim tempus *eſt* diuiduum. ergo in χκ tempore aut mouetur, aut non mouetur. itidémque rurſus in κρ. ſi igitur in neutro mouetur, quieſcet vtique in toto: moueri enim, quod in nulla huius parte mouetur, impoſſibile *eſt*. quòd ſi in altero ſolo mouetur, non in primo χρ mouebitur: quia motus *eſt* ſecundùm aliud. neceſſe igitur *eſt* in quavis parte, τοῦ χρ moueri.

D ἘΠεὶ δὲ τὸ μεταβάλλον ἅπαν ἐν χρόνῳ μεταβάλλει, λέγεται δ' ἐν χρόνῳ μεταβάλλειν, καὶ ὡς ἐν πρώτῳ, καὶ ὡς καθ' ἕτερον· οἷον ἐν τῷ ἐνιαυτῷ, ὅτι ἐν τῇ ἡμέρᾳ μεταβάλλει· ἐν ᾧ πρώτῳ χρόνῳ μεταβάλλει τὸ μεταβάλλον, ἐν ὁτῳοῦν ἀνάγκη τούτου μεταβάλλειν. δῆλον μὲν οὖν ἐκ τοῦ ὁρισμοῦ· τὸ γὰρ πρῶτον οὕτως ἐλέγομεν. ἀλλὰ δὴ καὶ ἐκ τῶνδε φανερόν. ἔστω γὰρ ἐν ᾧ πρώτῳ κινεῖται τὸ κινούμενον, ἐφ' ᾧ χρ, καὶ διῃρήσθω κατὰ τὸ κ· πᾶς γὰρ χρόνος διαιρετός. ἐν δὴ τῷ χκ χρόνῳ, ἤτοι κινεῖται, ἢ οὐ κινεῖται. καὶ πάλιν ἐν τῷ κρ, ὡσαύτως. εἰ μὲν οὖν ἐν μηδετέρῳ κινεῖται, ἠρεμοίη ἂν ἐν τῷ παντί· κινεῖσθαι γὰρ ἐν μηδενὶ τῶν τούτου κινούμενον, ἀδύνατον. εἰ δ' ἐν θατέρῳ μόνῳ κινεῖται, οὐκ ἂν ἐν πρώτῳ κινοῖτο τῷ χρ· καθ' ἕτερον γὰρ ἡ κίνησις. ἀνάγκη ἄρα ἐν ὁτῳοῦν τοῦ χρ κεκινῆσθαι.

Quicquid mutatur, antea mutatum eſſe: & quicquid mutatum eſt, antea mutari.

Cap. X.

HOc autem oſtenſo, perſpicuum *eſt* neceſſe *eſſe*, vt quicquid mouetur, mutatum antea ſit. nam

ΔΕδειγμένου δὲ τούτου, φανερὸν ὅτι πᾶν τὸ κινούμενον ἀνάγκη κεκινῆσθαι πρότερον. εἰ γὰρ

ἐν τῷ χρ χρόνῳ πρώτῳ τὸ κλ κεκίνηται μέγεθος, ἐν τῷ ἡμίσει τὸ ὁμοταχῶς κινούμενον, καὶ ἅμα ἀρξάμενον, τὸ ἥμισυ ἔσται κεκινημένον. εἰ δὲ τὸ ὁμοταχὲς ἐν τῷ αὐτῷ χρόνῳ κεκίνηταί τι, καὶ θάτερον ἀνάγκη τὸ αὐτὸ κεκινῆσθαι μέγεθος. ὥστε κεκινημένον ἔσται τὸ κινούμενον. 2 Ἔτι δέ, εἰ ἐν τῷ παντὶ χρόνῳ τῷ χρ κεκινῆσθαι λέγομεν, ἢ ὅλως ἐν ὁτῳοῦν χρόνῳ τῷ λαβεῖν τὸ ἔσχατον αὐτοῦ νῦν· τοῦτο γάρ ἐστι τὸ ὁρίζον, καὶ τὸ μεταξὺ τῶν νῦν χρόνος, κἂν ἐν τοῖς ἄλλοις ὁμοίως λέγοιτο κεκινῆσθαι. τοῦ δὴ ἡμίσεος ἔσχατον ἡ διαίρεσις. ὥστε καὶ ἐν τῷ ἡμίσει κεκινημένον ἔσται, καὶ ὅλως ἐν ὁτῳοῦν τῶν μερῶν· ἀεὶ γὰρ ἅμα τῇ τομῇ χρόνος ἐστὶν ὡρισμένος ὑπὸ τῶν νῦν. εἰ οὖν ἅπας μὲν χρόνος διαιρετός, ὁ δὲ μεταξὺ τῶν νῦν χρόνος, ἅπαν τὸ μεταβάλλον, ἄπειρα ἔσται μεταβεβληκός. 3 Ἔτι δή, εἰ τὸ συνεχῶς μεταβάλλον, καὶ μὴ φθαρέν, μηδὲ πεπαυμένον τῆς μεταβολῆς, ἢ μεταβάλλειν, ἢ μεταβεβληκέναι ἀναγκαῖον ἐν ὁτῳοῦν, ἐν δὲ τῷ νῦν οὐκ ἔστι μεταβάλλειν, ἀνάγκη μεταβεβληκέναι καθ᾽ ἕκαστον τῶν νῦν. ὥστε εἰ τὰ νῦν ἄπειρα, πᾶν τὸ μεταβάλλον, ἄπειρα ἔσται μεταβεβληκός. 4 Οὐ μόνον δὲ τὸ μεταβάλλον ἀνάγκη μεταβεβληκέναι, ἀλλὰ καὶ τὸ μεταβεβληκὸς ἀνάγκη μεταβάλλειν πρότερον. ἅπαν γὰρ τὸ ἔκ τινος εἴς τι μεταβεβληκός, ἐν χρόνῳ μεταβέβληκεν. ἔστω γὰρ ἐν τῷ νῦν ἐκ τοῦ α εἰς τὸ β μεταβεβληκός. οὐκοῦν ἐν μὲν τῷ αὐτῷ νῦν ἐν ᾧ ἐστιν ἐν τῷ α, οὐ μεταβέβληκεν. ἅμα γὰρ ἂν εἴη ἐν τῷ α καὶ τῷ β. τὸ γὰρ μεταβεβληκός, ὅτε* μεταβάλλει, ὅτι οὐκ ἔστιν ἐν τούτῳ, δέδεικται πρότερον. εἰ δ᾽ ἐν ἄλλῳ, μεταξὺ ἔσται χρόνος. οὐ γὰρ ἦν ἐχόμενα τὰ νῦν. ἐπεὶ οὖν ἐν χρόνῳ μεταβέβληκε, χρόνος δὲ πᾶς διαιρετός, ἐν τῷ ἡμίσει ἄλλο ἔσται μεταβεβληκός, καὶ πάλιν ἐν τῷ ἐκείνου ἡμίσει ἄλλο, καὶ ἀεὶ οὕτως· ὥστε μεταβάλλοι ἂν πρότερον. 5 Ἔτι δ᾽ ἐπὶ τοῦ μεγέθους φανερώτερον τὸ λεχθέν, διὰ τὸ συνεχὲς εἶναι τὸ μέγεθος ἐν ᾧ μεταβάλλει τὸ μεταβάλλον. ἔστω γάρ τι μεταβεβληκὸς ἐκ τοῦ γ εἰς τὸ δ. οὐκοῦν εἰ μὲν ἀδιαίρετόν ἐστι τὸ γδ, ἀμερὲς ἀμεροῦς ἔσται ἐχόμενον. ἐπεὶ δὲ τοῦτο ἀδύνατον, ἀνάγκη μέγεθος εἶναι τὸ μεταξύ, καὶ εἰς ἄπειρα διαιρετόν. ὥστ᾽ εἰς ἐκεῖνα μεταβάλλει πρότερον. 6 Ἀνάγκη ἄρα πᾶν τὸ μεταβεβληκὸς μεταβάλλειν πρότερον. ἡ γὰρ αὐτὴ ἀπόδειξις καὶ ἐν τοῖς μὴ συνεχέσιν, οἷον ἔν τε τοῖς ἐναντίοις, καὶ ἐν τῇ ἀντιφάσει. ληψόμεθα γὰρ τὸν χρόνον ἐν ᾧ μεταβέβληκε, καὶ πάλιν τὰ αὐτὰ ἐροῦμεν. 7 Ὥστε ἀνάγκη τὸ μεταβεβληκὸς μεταβάλλειν, καὶ τὸ μεταβάλλον μεταβεβληκέναι. καὶ ἔστι, τοῦ μὲν μεταβάλλειν, τὸ μεταβεβληκέναι πρότερον· τοῦ δὲ μεταβεβληκέναι, τὸ μεταβάλλειν, καὶ οὐδέποτε ληφθήσεται τὸ πρῶτον. 8 Αἴτιον δὲ τούτου, τὸ μὴ εἶναι ἀμερὲς ἀμεροῦς ἐχόμενον. ἄπειρος γὰρ ἡ διαίρεσις, καθάπερ ἐπὶ τῶν αὐξανομένων καὶ καθαιρουμένων γραμμῶν. 9 Φανερὸν οὖν, ὅτι καὶ τὸ γεγονὸς ἀνάγκη γίνεσθαι πρότερον, καὶ τὸ γινόμενον γεγονέναι, ὅσα διαιρετὰ καὶ συνεχῆ, οὐ μέντοι ἀεὶ ὃ γίνεται, ἀλλ᾽ ἄλλο ἐνίοτε, οἷον τῶν ἐκείνου τι, ὥσπερ τῆς οἰκίας τὸν θεμέλιον. ὁμοίως δὲ καὶ ἐπὶ τοῦ φθειρομένου καὶ ἐφθαρμένου. εὐθὺς γὰρ ἐνυπάρχει τῷ γινομένῳ καὶ φθειρομένῳ ἄπειρόν τι, συνεχεῖ γε ὄντι. καὶ οὐκ ἔστιν, οὔτε γίνεσθαι μὴ γεγονός τι, οὔτε γεγονέναι μὴ γινόμενόν τι. ὁμοίως δὲ ἐπὶ τοῦ φθείρεσθαι καὶ ἐπὶ τοῦ ἐφθάρθαι· ἀεὶ γὰρ ἔσται, τοῦ μὲν φθείρεσθαι τὸ ἐφθάρθαι πρότερον, τοῦ δὲ ἐφθάρθαι τὸ φθείρεσθαι. Φανερὸν οὖν

* γρ. μετεβάλλετο.
[γρ. ἀμερ.
* γρ. ἄλλο ἄλλο.

A ſi in χ ρ tempore primo motum eſt per magnitudinē κ λ, in dimidia parte tēporis id quod æquè celeriter mouetur & ſimul moueri incipit, per dimidiam partem magnitudinis motum erit. quod ſi æquè velox hoc tempore per aliquam partem eſt motum: neceſſe eſt etiam alterum per eandem magnitudinem eſſe motum. quare motum erit, quod mouetur. 2 Præterea ſi in toto tempore χ ρ motum eſſe dicimus, vel omnino fuiſſe in quovis tempore, eo quòd ſumitur extremum ipſius momentum: hoc enim eſt, quod terminat: & quod momentis eſt interiectum, eſt tēpus: certè etiam in aliis dici poteſt motum eſſe. Atqui diuiſio eſt dimidij extremum. quare etiam in dimidio motum B erit. & omnino in quavis parte: ſemper enim vna cum ſectione eſt tempus terminatum à momentis. ſi igitur omne tempus eſt diuiduum; & quod momentis eſt interiectum, eſt tempus: quicquid mutatur, infinities erit mutatum. 3 Præterea ſi id quod continenter mutatur, & neque interiit, neque ceſſauit à mutatione, vel mutari vel eſſe mutatum in quovis neceſſe eſt, in momento autem non poteſt mutari: neceſſe eſt mutatum eſſe in ſingulis momentis. quare ſi momenta ſunt infinita: quicquid mutatur, erit infinities mutatum. 4 Non ſolùm autem neceſſe eſt vt quod mutatur, mutatum ſit: ſed etiam eſt neceſſe vt quod mutatum eſt, antea mutetur. quicquid enim ex aliquo in aliquod eſt mutatum, in tempore eſt C mutatum. eſto namque in momento mutatum ex α in β. ergo in ipſo momento, in quo eſt in α, non eſt mutatū: alioqui ſimul eſſet in α & in β. quod enim mutatum eſt, quando mutatum eſt, non eſſe in hoc, probatum antea fuit. quod ſi eſt in alio, tempus eſt interiectum: quia momenta non cohærent. Quoniam igitur in tempore eſt mutatum, omne autem tempus eſt diuiduum: certè in dimidio aliud erit mutatum: & rurſus in illius dimidio aliud: & ita ſemper. quare priùs mutabitur. 5 Præterea quòd continua eſt magnitudo, in qua mutatur id quod mutatur. ſit enim aliquid mutatum ex γ in δ. ergo ſi γ δ ſit indiuiduum: ea quæ partibus vacant, inter ſe cohærebunt. D quia verò hoc eſt impoſſibile; neceſſe eſt, id quod eſt interiectum, eſſe magnitudinem, & in infinitas partes poſſe diuidi. quare in illas antea mutatur. 6 Neceſſe eſt igitur, vt quicquid mutatum eſt, antea mutetur. eſt enim eadem demonſtratio etiam in non continuis: vt in contrariis, & in contradictione. ſumemus enim tempus, quo mutatum eſt: & rurſus eadem dicemus. 7 Quare neceſſe eſt id quod eſt mutatum, mutari, & quod mutatur, mutatum eſſe: & prius eſt mutatum eſſe, quàm mutari: item prius eſt mutari, quàm mutatum eſſe: nec vnquam primum ſumitur. 8 Huius cauſa eſt: quòd partibus vacans partibus vacanti non cohæret: quippe cùm diuiſio fiat in infinitum, quemadmodum in literis quæ augentur, & quibus detrahitur. E 9 Perſpicuum igitur eſt, neceſſe eſſe, vt quod factum eſt, antea fiat: & quod fit, factum ſit, quæcunque ſcilicet ſunt diuidua & continua: non tamen ſemper quod fit, ſed interdū aliud, vt illius aliquid, puta domus fundamentum. Similiter etiam ſe res habet in eo quod interit, & eo quod interiit. cùm enim id quod fit, & quod interit, ſit cōtinuum: ſtatim ineſt ei quædam infinitas: nec poteſt aliquid fieri, quod non ſit factum: nec eſſe factum, quod non fiat. Similiter ſe res habet in ipſo interire, & ipſo interiiſſe. nam ſemper interiiſſe eſt priùs quàm interire, & interire priùs quàm interiiſſe. Patet igi-

tur neceſſe *eſſe*, vt quod factum eſt, anteà fiat: & quod fit, factum ſit. omnis enim magnitudo, & omne tempus, ſemper diuidua *ſunt*. quapropter in quo ſunt, non poſſunt in eo eſſe tamquam primo.

A ὅτι καὶ τὸ γεγονὸς ἀνάγκη γίνεσθαι πρότερον, καὶ τὸ γινόμενον γεγονέναι· πᾶν γὰρ μέγεθος, καὶ πᾶς χρόνος, ἀεὶ διαιρετά. ὥστ' ἐν ᾧ ἂν ᾖ, οὐκ ἂν εἴη ὡς πρώτῳ.

Definitate vel infinitate motus, magnitudinis, & mobilis.

Cap. XI.

CVm autem quicquid mouetur, in tempore moueatur, & in maiori *tempore* maiorem magnitudinem *conficiat*: impoſſibile *eſt*, vt infinito tempore *per* finitum *ſpatium* moueatur, quod nec per idem ſemper, nec per aliquam eius *partem* moueatur, ſed toto tempore per totum. 2 Si igitur æqua celeritate moueatur, conſtat neceſſe *eſſe* vt *per magnitudinem* finitam finito tempore moueatur. ſumpta enim parte, quæ metietur totum *ſpatium*, in tot æquabilibus temporibus, quot ſunt partes, motum eſt *per* totum *ſpatium*. quapropter cùm hæ ſint finitæ, & quia ſingulæ ſunt quantæ, & quia aliquoties ſumptæ omnes *ſunt*: certè etiam tempus erit finitum. toties enim erit tantum, quantum eſt partis tempus multiplicatum numero partium. 3 Sed & ſi non æqua celeritate *moueatur*, nihil refert. ſit enim, vbi α & β, inter nullum finitum, *per* quod motum eſt *tempore* infinito: ac *ſit* tempus infinitum, vbi γ δ. ſi igitur neceſſe *eſt*, vt priùs per vnam, quàm per alteram *partem* motum ſit: hoc certò conſtat, in priori & poſteriori *parte* temporis *per* aliam *atque aliam partem* motum eſſe: quia ſemper vlteriori tempore per aliam *partem* erit motum; ſiue æquali celeritate, ſiue inæquali mutetur; & ſiue intendatur motus, ſiue remittatur, ſiue *idem* maneat, nihilo minus: ſumatur itaq; *pars* aliqua interualli α β, *nimirum pars* α ε, quæ metietur *interuallum* α β. hæc igitur *pars* in aliqua infiniti temporis parte conficiebatur: infinito enim *tempore* non poteſt, quia totum *interuallum* infinito *tempore conficitur*. & ruſus igitur alteram *partem*, ſi *tantum* ſumſero, quanta *eſt pars* α ε, neceſſe *eſt* finito tempore *pertranſire*: quãdoquidem totum *tempore* infinito *pertranſitur*. ita igitur *deinceps* ſumendo, quoniam infiniti nulla eſt pars quę *ipſum* metiatur (quippe impoſſibile *eſt*, infinitum conſtare ex finitis tam æqualibus quàm inæqualibus: propterea quòd ea quæ finita numero & magnitudine ſunt, vnũ quidpiam metitur: [illegible] nihil minus, ſiue æqualia ſint, ſiue inæqualia, ſed magnitudinę definita) interuallum autem, quod eſt finitũ, quanta illa α ε, metiuntur: vtique finito tempore per *ſpatium* α β mouebitur. 4 Itidémq; *ſe res habet* in profectione ad quietẽ. 5 Quocirca nec fieri nec interire aliquid poteſt, *quod* ſemper *ſit* vnum & idem. 6 Eadem quoque ratio *eſt*, quòd neque finito tempore *per* infinitum poteſt moueri, nec ad quietẽ tranſire, ſiue æquabiliter moueatur, ſiue inæquabiliter. ſumpta enim aliqua parte, quæ metietur totũ tempus, hac *parte* pertranſibit quantitatem aliquam magnitudinis, non totam *magnitudinem*, quandoquidem toto *tempore* totam *cõficit*. & ruſus æquali *tẽporis parte pertranſibit* aliam *quãtitatem* magnitudinis, & in qualibet *parte tẽporis* ſimiliter *cõficiet aliquam quantitatẽ magnitudinis* ſiue æqualem, ſiue inæqualem *quantitati* quã ab initio *pertrãſiit*: nihil enim intereſt, ſi modò quælibet *pars* ſit finita. conſtat enim conſumpto tempore infinitum *ſpatium* non conſumptum fore, facta detractione finita tam ratione quãtitatis, quàm numeri. quare non pertrãſit finito tempore infinitam *magnitudinẽ*. ac nihil refert,

B ἘΠεὶ δὲ πᾶν τὸ κινούμενον, ἐν χρόνῳ κινεῖται, καὶ ἐν τῷ πλείονι μεῖζον μέγεθος, ἐν τῷ ἀπείρῳ χρόνῳ ἀδύνατόν ἐστι, πεπερασμένην κινεῖσθαι, μὴ τὴν αὐτὴν ἀεὶ, καὶ τῶν ἐκείνης τι κινούμενον, ἀλλ' ἐν τῷ ἅπαντι ἅπασαν. 2 Ὅτι μὲν οὖν εἴ τι ἰσοταχῶς κινοῖτο, ἀνάγκη τὸ πεπερασμένον ἐν πεπερασμένῳ κινεῖσθαι, δῆλον. ληφθέντος γὰρ μορίου, ὃ καταμετρήσει τὴν ὅλην ἐν ἴσοις τοῖς χρόνοις τοσούτοις ὅσα τὰ μόριά ἐστι, τὴν ὅλην κεκίνηται. ὥστ' ἐπεὶ ταῦτα πεπέρανται, καὶ τῷ πόσον ἕκαστον, καὶ τῷ ποσάκις ἅπαντα, καὶ ὁ χρόνος ἂν εἴη πεπερασμένος. τοσαυτάκις γὰρ ἔσται τοσοῦτος, ὅσος ὁ τοῦ μορίου χρόνος πολλαπλασιασθεὶς τῷ πλήθει τῶν μορίων. C 3 Ἀλλὰ δὴ κἂν εἰ μὴ ἰσοταχῶς, διαφέρει οὐδέν. ἔστω γὰρ ἐφ' ἧς τὸ α καὶ τὸ β διάστημα πεπερασμένον, ὃ κεκίνηται ἐν τῷ ἀπείρῳ, καὶ ὁ χρόνος ἄπειρος ἐφ' οὗ τὸ γ δ. Εἰ δὴ ἀνάγκη πρότερον, ἕτερον ἑτέρου κεκινῆσθαι, τοῦτο δὴ δῆλον ὅτι τοῦ χρόνου ἐν τῷ προτέρῳ καὶ ὑστέρῳ ἕτερον κεκίνηται· ἀεὶ γὰρ ἐν τῷ πλείονι, ἕτερον ἔσται κεκινημένον, ἐάν τε ἰσοταχῶς, ἐάν τε μὴ ἰσοταχῶς μεταβάλλῃ, καὶ ἐάν τε ἐπιτείνῃ ἡ κίνησις, ἐάν τε ἀνίῃ, ἐάν τε μένῃ, οὐθὲν ἧττον. εἰλήφθω δή τι τοῦ α β διαστήματος, τὸ α ε, ὃ καταμετρήσει τὴν α β. τοῦτο δὴ τοῦ ἀπείρου, ἔν τινι ἐγένετο χρόνῳ· D ἐν ἀπείρῳ γὰρ οὐχ οἷόν τε· τὸ γὰρ ἅπαν ἐν ἀπείρῳ. καὶ πάλιν ἕτερον δὴ, ἐὰν λάβω ὅσον τὸ α ε, ἀνάγκη ἐν πεπερασμένῳ χρόνῳ. τὸ γὰρ ἅπαν, ἐν ἀπείρῳ. καὶ οὕτω δὴ λαμβάνων ἐπεὶ, τοῦ μὲν ἀπείρου οὐθέν ἐστι μόριον ὃ καταμετρήσει· ἀδύνατον γὰρ τὸ ἄπειρον εἶναι ἐκ πεπερασμένων, καὶ ἴσων, καὶ ἀνίσων, διὰ τὸ καταμετρηθήσεσθαι τὰ πεπερασμένα * πλήθει καὶ μεγέθει ὑπό τινος ἑνὸς, ἐάν τε ἴσα ᾖ, ἐάν τε ἄνισα· ὡρισμένα δὲ τῷ μεγέθει, οὐθὲν ἧττον. τὸ δὲ διάστημα τὸ πεπερασμένον ποσοῖς τοῖς α ε μετρεῖται, ἐν πεπερασμένῳ ἂν χρόνῳ τὸ α β κινοῖτο. 4 Ὡσαύτως E δὲ καὶ ἐπὶ ἠρεμήσεως. 5 Ὥστε οὔτε γίνεσθαι, οὔτε φθείρεσθαι οἷόν τε ἀεί τι τὸ αὐτὸ καὶ ἕν. 6 Ὁ αὐτὸς δὲ λόγος καὶ ὅτι οὐδ' ἐν πεπερασμένῳ χρόνῳ ἄπειρον οἷόν τε κινεῖσθαι, οὐδ' ἠρεμίζεσθαι, οὔθ' ὁμαλῶς κινούμενον, οὔτ' ἀνωμάλως. ληφθέντος γάρ τινος μέρους, ὃ ἀναμετρήσει τὸν ὅλον χρόνον, ἐν τούτῳ ποσόν τι διέξεισι τοῦ μεγέθους, καὶ οὐχ ὅλον· ἐν γὰρ τῷ παντὶ, ὅλον· καὶ πάλιν ἐν τῷ ἴσῳ ἄλλο, καὶ ἐν ἑκάστῳ ὁμοίως, εἴτε ἴσον, εἴτε ἄνισον τῷ ἐξ ἀρχῆς· διαφέρει γὰρ οὐδὲν, εἰ εἴη μόνον πεπερασμένον τι ἕκαστον· δῆλον γὰρ ὡς ἀναιρουμένου τοῦ χρόνου, τὸ ἄπειρον οὐκ ἀναιρεθήσεται, πεπερασμένης τῆς ἀφαιρέσεως γινομένης, καὶ τῷ ποσῷ, καὶ τῷ ποσάκις· ὥστ' οὐ δίεισιν ἐν πεπερασμένῳ χρόνῳ τὸ ἄπειρον. οὐδὲν τι διαφέρει

* γρ. πάντῃ ἢ μη-[illegible]

τὸ μέγεθος ἐπὶ θάτερα, ἢ ἐπ᾽ ἀμφότερα εἶναι ἄπειρον· ὁ γὰρ αὐτὸς ἔσται λόγος. 7 Ἀποδεδειγμένων δὲ τούτων, φανερὸν ὅτι οὐδὲ τὸ πεπερασμένον μέγεθος τὸ ἄπειρον ἐνδέχεται διελθεῖν ἐν πεπερασμένῳ χρόνῳ διὰ τὴν αὐτὴν αἰτίαν· ἐν γὰρ τῷ μορίῳ τοῦ χρόνου πεπερασμένον δίεισι, καὶ ἐν ἑκάστῳ ὡσαύτως, ὥστ᾽ ἐν τῷ παντὶ πεπερασμένον. 8 Ἐπεὶ δὲ τὸ πεπερασμένον οὐ δίεισι τὸ ἄπειρον ἐν πεπερασμένῳ χρόνῳ, δῆλον ὡς οὐδὲ τὸ ἄπειρον τὸ πεπερασμένον· εἰ γὰρ τὸ ἄπειρον τὸ πεπερασμένον, ἀνάγκη καὶ τὸ πεπερασμένον διιέναι τὸ ἄπειρον. οὐδὲν γὰρ διαφέρει* ὁπότερον εἶναι τὸ κινούμενον· ἀμφοτέρως γὰρ τὸ πεπερασμένον δίεισι τὸ ἄπειρον· ὅταν γὰρ κινῆται τὸ ἄπειρον ἐφ᾽ ᾧ τὸ α, ἔσται τι αὐτοῦ κατὰ τὸ β πεπερασμένον, οἷον τὸ γ δ, καὶ πάλιν ἄλλο καὶ ἄλλο, καὶ ἀεὶ οὕτως. ὥστε ἅμα συμβήσεται τὸ ἄπειρον κεκινῆσθαι τὸ πεπερασμένον, καὶ τὸ πεπερασμένον διεληλυθέναι τὸ ἄπειρον· οὐδὲ γὰρ δυνατὸν ἴσως τὸ ἄπειρον ἄλλως κινηθῆναι διὰ τοῦ πεπερασμένου, ἢ τῷ τὸ πεπερασμένον διιέναι τὸ ἄπειρον, ἢ φερόμενον, ἢ ἀναμετροῦν. ὥστ᾽ ἐπεὶ τοῦτ᾽ ἀδύνατον, οὐκ ἂν δίοι τὸ ἄπειρον τὸ πεπερασμένον. 9 Ἀλλὰ μὴν οὐδὲ τὸ ἄπειρον ἐν πεπερασμένῳ χρόνῳ, τὸ ἄπειρον δίεισιν· εἰ γὰρ τὸ ἄπειρον, καὶ τὸ πεπερασμένον· ἐνυπάρχει γὰρ τῷ ἀπείρῳ καὶ τὸ πεπερασμένον. 10 Ἔτι δὲ καὶ τοῦ χρόνου ληφθέντος ἡ αὐτὴ ἔσται ἀπόδειξις. 11 Ἐπεὶ δ᾽ οὔτε τὸ πεπερασμένον τὸ ἄπειρον δίεισι, οὔτε τὸ ἄπειρον τὸ πεπερασμένον, οὔτε τὸ ἄπειρον ἐν πεπερασμένῳ χρόνῳ κινεῖται, φανερὸν ὅτι οὐδὲ κίνησις ἔσται ἄπειρος ἐν τῷ πεπερασμένῳ χρόνῳ· τί γὰρ διαφέρει, τὴν κίνησιν ἢ τὸ μέγεθος ποιεῖν ἄπειρον; ἀνάγκη γὰρ ὁποτερονοῦν καὶ θάτερον εἶναι ἄπειρον· πᾶσα γὰρ φορὰ ἐν τόπῳ.

* ὁποτερονοῦν

A vtrùm magnitudo ex alterutra parte, an ex vtraque ſit infinita: nam eadem erit ratio. 7 His autem demonſtratis, perſpicuum *eſt*, nec finitam magnitudinem poſſe infinitum *ſpatium* pertranſire tempore finito, propter eandem cauſam: quoniam *certa* temporis parte pertranſit finitum & in ſingulis *partibus* itidem. quare toto tempore *conficit ſpatium* finitum. 8 Quoniam autem *mobile* finitum non conficit *ſpatium* infinitum tempore finito: manifeſtum *eſt*, nec *mobile* infinitum *pertranſire* finitum. nam ſi infinitum *pertranſeat* finitum: neceſſe *eſt*, etiam finitum pertranſire infinitum: quia nihil intereſt, vtrum ſit B quod moueatur: vtroque enim modo finitum pertranſit infinitum. cùm enim mouetur infinitum, in quo ſ α: erit aliqua eius *pars* in β finito: velvti, *pars* γδ: & rurſus alia, atque alia: & ita perpetuò. quare ſimul accidet infinitum moueri per infinitum, & finitum pertranſire infinitum. nam fortaſſis nec poſſibile *eſt*, infinitum moueri per finitum, quàm quòd finitum pertranſeat infinitum, aut latione, aut metiendo. quapropter cùm hoc *ſit* impoſſibile, infinitum non poteſt pertranſire finitum. 9 At verò nec *magnitudo* infinita finito tempore infinitam *magnitudinem* pertranſit. nam ſi infinitam, *certè* etiam finitam *pertranſiret*: quandoquidem finita in infinita inſit. C 10 Præterea etiam ſumpto tempore, eadem erit demonſtratio. 11 Cùm autem nec *magnitudo* finita infinitam pertranſeat, nec infinita finitam, nec per infinitam finito tempore moueatur: perſpicuum *eſt*, nec motum fore infinitum tẽpore finito. quid enim intereſt vtrùm motus, an magnitudo ſtatuatur infinita? neceſſe *eſt* enim, ſi alterutrum *ſit infinitum*, etiam alterum eſſe infinitum: quoniam omnis latio *eſt* in loco.

De profectione ad ſtatum ſeu quietem, & de quiete.

Cap. XII.

Ἐπεὶ δὲ πᾶν ἢ κινεῖται, ἢ ἠρεμεῖ, τὸ πεφυκὸς ὅτε πέφυκε, καὶ οὗ, καὶ ὥς· ἀνάγκη τὸ ἱστάμενον ὅτε ἵσταται κινεῖσθαι· εἰ γὰρ μὴ κινεῖται, ἠρεμήσει· ἀλλ᾽ οὐκ ἐνδέχεται ἠρεμίζεσθαι τὸ ἠρεμοῦν. 2 Τούτου δ᾽ ἀποδεδειγμένου, φανερὸν ὅτι καὶ ἐν χρόνῳ ἵστασθαι ἀνάγκη· τὸ γὰρ κινούμενον ἐν χρόνῳ κινεῖται· τὸ δ᾽ ἱστάμενον, δέδεικται κινούμενον· ὥστε ἀνάγκη ἐν χρόνῳ ἵστασθαι. 3 Ἔτι δ᾽, εἰ τὸ μὲν θᾶττον καὶ βραδύτερον ἐν χρόνῳ λέγομεν, ἵστασθαι δ᾽ ἔστι θᾶττον καὶ βραδύτερον. 4 Ἐν ᾧ δὲ χρόνῳ* πρώτως τὸ ἱστάμενον ἵσταται, ἐν ὁτῳοῦν ἀνάγκη τούτου ἵστασθαι· διαιρεθέντος γὰρ τοῦ χρόνου, εἰ μὲν ἐν μηδετέρῳ τῶν μερῶν ἵσταται, οὐδ᾽ ἐν τῷ ὅλῳ. ὥστ᾽ οὐκ ἂν ἵσταιτο τὸ ἱστάμενον. εἰ δ᾽ ἐν θατέρῳ, οὐκ ἂν ἐν πρώτῳ τῷ ὅλῳ ἵσταιτο· καθ᾽ ἕτερον γὰρ ἐν τούτῳ ἵσταται, καθάπερ ἐλέχθη καὶ ἐπὶ τοῦ κινουμένου πρότερον. 5 Ὥσπερ δὲ τὸ κινούμενον οὐκ ἔστιν ἐν ᾧ πρώτῳ κινεῖται, οὕτως οὐδ᾽ ἐν ᾧ ἵσταται τὸ ἱστάμενον· οὔτε γὰρ τοῦ κινεῖσθαι, οὔτε τοῦ ἵστασθαί ἐστί τι πρῶτον· ἔστω γὰρ ἐν ᾧ πρώτῳ ἵσταται, ἐφ᾽ ᾧ τὸ α β. τοῦτο δὴ, ἀμερὲς μὲν οὐκ ἐνδέχεται εἶναι· κίνησις γὰρ οὐκ ἔστιν ἐν τῷ ἀμερεῖ, διὰ τὸ κεκινῆσθαί τι αὐτοῦ· τὸ δ᾽ ἱστάμενον δέδεικται κινούμενον.

* ἐν πρώτῳ

D Quoniam autẽ id omne aut mouetur aut quieſcit, quod natura aptum eſt, quando natura eſt aptum, & vbi, & quomodo: *idcirco* neceſſe *eſt*, id quod ſiſtitur, quando ſiſtitur, moueri. niſi enim moueatur, quieſcet. ſed non poteſt tendere ad quietem quod quieſcit. 2 Hoc autem demonſtrato, perſpicuum quoque *eſt* neceſſe eſſe, vt in tempore ſiſtatur. quod enim mouetur, in tempore mouetur: quod autem ſiſtitur, probatum eſt moueri: quare neceſſe *eſt* in tempore ſiſti. 3 Præterea ſi celerius & tardius, in tempore dicimus: ſiſti autem eſt celerius & tardius. 4 In quo autem tempore primo ſiſtitur id quod ſiſtitur, neceſſe *eſt* vt in quavis huius temporis *parte* E ſiſtatur: diuiſo enim tempore, ſi in neutra parte ſiſtitur, nec in toto *ſiſtetur*. quare non ſiſteretur, quod ſiſtitur. ſi verò in altera, non in primo toto ſiſteretur: ſecũdùm alteram enim *partem* in hoc ſiſtitur, quemadmodum antea quoque dictũ fuit, de eo quod mouetur. 5 Sicut autem non eſt in quo primo mouetur, id quod mouetur: ita etiam non *eſt* in quo primo ſiſtatur id quod ſiſtitur: quia neque ipſius moueri, neque ipſius ſiſti, eſt aliquid primum. eſto namque, in quo primo ſiſtitur, vbi α β. hoc igitur non poteſt vacare partibus: quia motus non eſt in eo quod partibus vacat, propterea quòd per aliquid ipſius motum eſt: quod autem ſiſtitur, moueri probatum fuit.

atqui ſi diuiduũ eſt, in quavis eius parte ſiſtitur: hoc A enim antea probatum fuit, in quo primo ſiſtitur, in quavis eius *parte* ſiſti. quoniam igitur tempus eſt, in quo primo ſiſtitur, non indiuiduum, omne autem tempus in infinita ſecari poteſt: nõn eſt, in quo primo ſiſtitur. 6 Nec igitur eſt, quando primùm quieuerit id quod quieſcit: quoniam in eo quod partibus vacat, non quieuit, propterea quòd non eſt motus in indiuiduo: in quo autem *eſt* quieſcere, *in eo* etiam *eſt* moueri: tunc enim dicimus quieſcere, quando & in quo natura aptum eſt moueri, non mouetur id quod natura moueri aptum eſt. Præterea tunc quoque dicimus quieſcere, cùm ſimiliter *ſe* habet nunc atque B priùs, tamquam non vno aliquo iudicantes, ſed minimùm duobus. quapropter id in quo quieſcit, partibus non carebit. Quòd ſi in partes diuidi poteſt, vtique erit tempus, & in quavis ipſius parte quieſcet: eodem namque modo probabitur, quo etiam in ſuperioribus. quocirca nihil erit primum. 7 Huius verò cauſa *eſt*: quia res omnis quieſcit & mouetur in tempore: non eſt autem primum tempus, nec *prima* magnitudo, nec omnino vllum cõtinuum, quoniam omne *continuum* ſecari poteſt in infinitum.

A ἀλλὰ μὴν, εἰ διαιρετόν ἐστιν, ἐν ὁτῳοῦν αὐτοῦ τῶν μερῶν ἵσταται. τοῦτο γὰρ δέδεικται πρότερον, ὅτι ἐν ᾧ πρώτως ἵσταται, ἐν ὁτῳοῦν τῶν ἐκείνου ἵσταται. ἐπεὶ οὖν χρόνος ἐστὶν, ἐν ᾧ πρώτως ἵσταται, καὶ οὐκ ἄτομον· ἅπας δὲ χρόνος εἰς ἄπειρα μεριστὸς οὐκ ἔσται ἐν ᾧ πρώτως ἵσταται. 6 Οὐδὲ δὴ τὸ ἠρεμοῦν, ὅτε πρῶτον ἠρέμησεν, ἔστιν· ἐν ἀμερεῖ μὲν γὰρ οὐκ ἠρέμησε, διὰ τὸ μὴ εἶναι κίνησιν ἐν ἀτόμῳ· ἐν ᾧ δὲ τὸ ἠρεμεῖν καὶ τὸ κινεῖσθαι· τότε γὰρ ἔφαμεν ἠρεμεῖν, ὅτε καὶ ἐν ᾧ πέφυκε κινεῖσθαι, μὴ κινεῖται τὸ πεφυκός. ἔτι δὲ καὶ τότε λέγομεν ἠρεμεῖν, ὅταν ὁμοίως ἔχῃ νῦν καὶ πρότερον, B ὡς οὐχ ἑνί τινι κρίνοντες, ἀλλὰ δυοῖν τοῖν ἐλαχίστοιν· ὥστ᾽ οὐκ ἔσται ἐν ᾧ ἠρεμεῖ, ἀμερές. εἰ δὲ μεριστὸν, χρόνος ἂν εἴη, καὶ ἐν ὁτῳοῦν αὐτοῦ τῶν μερῶν ἠρεμήσει· τὸν αὐτὸν γὰρ τρόπον δειχθήσεται ὃν καὶ ἐπὶ τῶν πρότερον· ὥστ᾽ οὐδὲν ἔσται πρῶτον. 7 Τούτου δ᾽ αἴτιον, ὅτι ἠρεμεῖ μὲν καὶ κινεῖται πᾶν ἐν χρόνῳ· χρόνος δ᾽ οὐκ ἔστι πρῶτος, οὐδὲ μέγεθος, οὐδ᾽ ὅλως συνεχὲς οὐδέν· ἅπαν γὰρ εἰς ἄπειρα μεριστόν.

Rem, quæ aliquo tempore primo mouetur, nulla eius temporis parte eſſe in parte ſpatij per quod mouetur.

Cap. XIII.

CVm autem quicquid mouetur, in tempore mo- C ueatur, & ex aliquo in aliquid mutetur: impoſſibile *eſt*, vt id quod mouetur, quo tempore per ſe mouetur, nõ quia in aliqua eius *temporis parte* moueatur, tunc ſit in aliquo primo. 2 Hoc enim eſt quieſcere, aliquo tempore in eodem eſſe tam ipſam rem, quàm ſingulas eius partes. ita namque dicimus quieſcere, quando in alio atque alio momento verè dicitur in eodem eſſe tam rem ipſam quàm eius partes. ſi verò hoc eſt quieſcere; id quod mutatur, non poteſt in tempore primo totũ eſſe in aliquo. nam omne tempus eſt diuiduum. quare in alia atque alia eius parte verè dicetur in eodem eſſe & rem ipſam & eius par- D tes. 3 Niſi enim ita ſit, ſed in vno tantùm momento: *certè* non erit vllo tempore in aliquo, ſed in termino temporis. 4 Iam verò in momento ſemper quidem in aliquo manet, non tamen quieſcit: quia nec moueri, nec quieſcere eſt in momento: ſed non moueri quidem in momento, verum eſt, & eſſe in aliquo: in tempore autem non poteſt eſſe vt quieſcens: quoniam eueniret, vt id quod fertur, quieſcat.

C ἘΠεὶ δὲ πᾶν τὸ κινούμενον, ἐν χρόνῳ κινεῖται, καὶ ἔκ τινος εἴς τι μεταβάλλει, ἐν ᾧ χρόνῳ κινεῖται καθ᾽ αὑτὸ, καὶ μὴ τῷ ἐν ἐκείνου τινὶ, ἀδύνατον τότε κατά τι εἶναι πρῶτον τὸ κινούμενον. 2 Τὸ γὰρ ἠρεμεῖν ἐστὶ τὸ ἐν τῷ αὐτῷ εἶναι χρόνον τινὰ καὶ αὐτὸ, καὶ τῶν μερῶν ἕκαστον. οὕτω γὰρ λέγομεν ἠρεμεῖν, ὅταν ἐν ἄλλῳ καὶ ἄλλῳ τῷ νῦν ἀληθὲς ᾖ εἰπεῖν, ὅτι ἐν τῷ αὐτῷ καὶ αὐτὸ, καὶ τὰ μέρη. Εἰ δὲ τοῦτ᾽ ἐστὶ τὸ ἠρεμεῖν, οὐκ ἐνδέχεται τὸ μεταβάλλον κατά τι εἶναι ὅλον, κατὰ τὸν πρῶτον χρόνον· ὁ γὰρ χρόνος, διαιρετὸς D ἅπας. ὥστε ἐν ἄλλῳ καὶ ἄλλῳ αὐτοῦ μέρει ἀληθὲς ἔσται εἰπεῖν, ὅτι ἐν τῷ αὐτῷ ἐστὶ καὶ αὐτὸ, καὶ τὰ μέρη. 3 Εἰ γὰρ μὴ οὕτως, ἀλλ᾽ ἐν ἑνὶ μόνῳ τῷ νῦν, οὐκ ἔσται χρόνον οὐδένα κατά τι, ἀλλὰ κατὰ τὸ πέρας τοῦ χρόνου. ἐν δὲ τῷ νῦν, ἔστι μὲν ἀεὶ κατά τι μένον, οὐ μέντοι ἠρεμεῖ· οὔτε γὰρ κινεῖσθαι, οὔτε ἠρεμεῖν ἐστὶν ἐν τῷ νῦν, ἀλλὰ μὴ κινεῖσθαι μὲν ἀληθὲς ἐν τῷ νῦν, καὶ εἶναι κατά τι. ἐν χρόνῳ δ᾽ οὐκ ἐνδέχεται εἶναι, κατὰ τὸ ἠρεμοῦν· συμβαίνει γὰρ τὸ φερόμενον ἠρεμεῖν.

Solutio rationum, quibus tollitur motus.

Cap. XIV.

ZEno autem captioſè ratiocinatur. inquit enim, E ſi ſemper res omnis quieſcit aut mouetur, quãdo eſt in *loco* ſibi æquali, ſemper autem quod mouetur, in momento eſt in *loco* ſibi æquali: ſagittam quæ fertur, eſſe immobilem. Sed hoc eſt falſum: quoniam tempus non componitur ex momentis quæ ſunt indiuidua, quemadmodum nec vlla alia magnitudo. 2 Quatuor autem ſunt rationes Zenonis de motu, quæ negotium ſoluẽtibus faceſſunt. 3 Prima *eſt*, quæ

E ΖΗνων δὲ παραλογίζεται. εἰ γὰρ ἀεὶ, φησὶν, ἠρεμεῖ πᾶν, ἢ κινεῖται, ὅταν ᾖ κατὰ τὸ ἴσον· ἔστι δ᾽ ἀεὶ τὸ φερόμενον ἐν τῷ νῦν, τῷ κατὰ τὸ ἴσον, ἀκίνητον τὴν φερομένην εἶναι οἰστόν. τοῦτο δέ ἐστι ψεῦδος· οὐ γὰρ σύγκειται ὁ χρόνος ἐκ τῶν νῦν ὄντων ἀδιαιρέτων, ὥσπερ οὐδ᾽ ἄλλο μέγεθος οὐδέν. 2 Τέτταρες δ᾽ εἰσὶ λόγοι περὶ κινήσεως, Ζήνωνος, οἱ παρέχοντες τὰς δυσκολίας τοῖς λύουσι. 3 Πρῶτος μὲν, ὁ

περὶ τοῦ μὴ κινεῖσθαι, διὰ τὸ πρότερον εἰς τὸ ἥμισυ δεῖν ἀφικέσθαι τὸ φερόμενον, ἢ πρὸς τὸ τέλος, περὶ οὗ διείλομεν ἐν τοῖς πρόσθεν λόγοις. 4 Δεύτερος δὲ, ὁ καλούμενος Ἀχιλλεύς. ἔστι δ' οὗτος, ὅτι τὸ βραδύτερον οὐδέποτε καταληφθήσεται θέον ὑπὸ τοῦ ταχίστου· ἔμπροσθεν γὰρ ἀναγκαῖον ἐλθεῖν τὸ διῶκον, ὅθεν ὥρμησε τὸ φεῦγον. ὥστ' ἀεί τι προέχειν ἀναγκαῖον τὸ βραδύτερον. 5 Ἔστι δὲ καὶ οὗτος ὁ αὐτὸς λόγος τῷ διχοτομεῖν. διαφέρει δὲ ἐν τῷ διαιρεῖν, μὴ δίχα τὸ προσλαμβανόμενον μέγεθος. τὸ μὲν οὖν μὴ καταλαμβάνεσθαι τὸ βραδύτερον, συμβέβηκεν ἐκ τοῦ λόγου. γίνεται δὲ παρὰ ταὐτὸ τῇ διχοτομίᾳ. ἐν ἀμφοτέροις γὰρ συμβαίνει μὴ ἀφικνεῖσθαι πρὸς τὸ πέρας, διαιρουμένου πως τοῦ μεγέθους· ἀλλὰ πρόσκειται ἐν τούτῳ, ὅτι οὐδὲ τὸ τάχιστον τετραγῳδημένον ἐν τῷ διώκειν τὸ βραδύτερον. 6 Ὥστ' ἀνάγκη καὶ τὴν λύσιν εἶναι τὴν αὐτήν. τὸ δ' ἀξιοῦν ὅτι τὸ προέχον οὐ καταλαμβάνεται, ψεῦδος. ὅτε γὰρ προέχει, οὐ καταλαμβάνεται, ἀλλ' ὅμως καταλαμβάνεται, εἴπερ δώσει διεξιέναι τὴν πεπερασμένην. 7 Οὗτοι μὲν οὖν οἱ λόγοι δύο. 8 Τρίτος δὲ, ὁ νῦν ῥηθεὶς, ὅτι ἡ ὀϊστὸς φερομένη ἕστηκε. *συμβαίνει δὲ παρὰ τὸ λαμβάνειν τὸν χρόνον συγκεῖσθαι ἐκ τῶν νῦν· μὴ διδομένου γὰρ τούτου, οὐκ ἔσται ὁ συλλογισμός. 9 Τέταρτος δὲ, ὁ περὶ τῶν ἐν τῷ σταδίῳ κινουμένων ἐξ ἐναντίας ἴσων ὄγκων, παρ' ἴσους, τῶν μὲν, ἀπὸ τέλους τοῦ σταδίου, τῶν δὲ, ἀπὸ μέσου, ἴσῳ τῷ τάχει, ἐν ᾧ συμβαίνειν οἴεται ἴσον εἶναι χρόνον, τῷ διπλασίῳ τὸν ἥμισυν. 10 Ἔστι δ' ὁ παραλογισμὸς ἐν τῷ, τὸ μὲν παρὰ κινούμενον, τὸ δὲ παρ' ἠρεμοῦν, τὸ ἴσον μέγεθος ἀξιοῦν τῷ ἴσῳ τάχει τὸν ἴσον φέρεσθαι χρόνον. τοῦτο δὲ ψεῦδος. 11 Οἷον ἔστωσαν οἱ ἑστῶτες ἴσοι ὄγκοι, ἐφ' ὧν τὰ α α α α, οἱ δὲ ἐφ' ὧν τὰ β β β β, ἀρχόμενοι ἀπὸ τοῦ μέσου τῶν α, ἴσοι τὸν ἀριθμὸν τούτοις ὄντες καὶ τὸ μέγεθος. οἱ δ' ἐφ' ὧν τὰ γ γ γ γ, ἀπὸ *τοῦ ἐσχάτου ἴσοι τὸν ἀριθμὸν τούτοις ὄντες καὶ τὸ μέγεθος, καὶ ἰσοταχεῖς τοῖς β. συμβαίνει δὴ τὸ πρῶτον β, ἅμα ἐπὶ τῷ ἐσχάτῳ εἶναι, καὶ τὸ πρῶτον γ, παρ' ἄλληλα κινουμένων. *συμβαίνει δὴ τὸ γ, παρὰ πάντα *τὰ β διεξεληλυθέναι· τὰ δὲ β, παρὰ τὰ ἡμίση· ὥστε καὶ ἥμισυν εἶναι τὸν χρόνον. ἴσον γὰρ ἑκάτερόν ἐστι παρ' ἕκαστον. ἅμα δὲ συμβαίνει τὰ β παρὰ πάντα τὰ γ παρεληλυθέναι. ἅμα γὰρ ἔσται τὸ πρῶτον γ, καὶ τὸ πρῶτον β, ἐπὶ τοῖς ἐναντίοις ἐσχάτοις, ἴσον χρόνον παρ' ἕκαστον γινόμενον τῶν β, ὅσον περὶ τῶν α, ὥς φησι, διὰ τὸ ἀμφότερα ἴσον χρόνον παρὰ τὰ α γίνεσθαι. 12 Ὁ μὲν οὖν λόγος, οὗτός ἐστι. συμβαίνει δὲ *τὸ εἰρημένον ψεῦδος. 13 Οὐδὲ δὴ κατὰ τὴν ἐν τῇ ἀντιφάσει μεταβολὴν οὐδὲν ἡμῖν ἔσται ἀδύνατον. οἷον εἰ ἐκ τοῦ μὴ λευκοῦ εἰς τὸ λευκὸν μεταβάλλει, καὶ ἐν μηδετέρῳ ἐστίν· ὡς ἄρα οὔτε λευκὸν, οὔτε μὴ λευκόν· οὐ γὰρ εἰ μὴ ὅλον ἐν ὁποτερῳοῦν ἐστιν, οὐ λεχθήσεται λευκὸν, ἢ οὐ λευκόν· λευκὸν γὰρ λέγομεν, ἢ οὐ λευκὸν, οὐ τῷ ὅλον εἶναι τοιοῦτον, ἀλλὰ τῷ τὰ πλεῖστα ἢ τὰ κυριώτατα μέρη· οὐ ταὐτὸ δέ ἐστι μὴ εἶναί τε ἐν τούτῳ, καὶ μὴ εἶναι ἐν τούτῳ ὅλον. ὁμοίως δὲ καὶ ἐπὶ τοῦ ὄντος, καὶ ἐπὶ τοῦ μὴ ὄντος, καὶ τῶν ἄλλων τῶν κατ' ἀντίφασιν ἔσται· μὴ γὰρ ἐξ ἀνάγκης ἐν θατέρῳ τῶν ἀντικειμένων, ἐν οὐδετέρῳ δ' ὅλον ἀεί. 14 Πάλιν ἐπὶ τοῦ κύκλου, καὶ ἐπὶ τῆς σφαίρας, καὶ ὅλως τῶν ἐν αὑτοῖς κινουμένων,

* γρ. συμβαίνει [illegible]
* γρ. ἐσχάτου τῶν β.
* γρ. [illegible]
* γρ. [illegible]
* γρ. παρὰ τὸ ἀν- ρημ. ψ.

A probat nõ moueri, quoniam oportet, id quod fertur, prius peruenire ad dimidium, quàm ad finem, quam rationem in ſuperioribus diſputationibus diuiſimus. 4 Secunda eſt, quæ vocatur Achilles. eſt autem hæc: quia tardius numquam comprehendetur curſu à velociſſimo. nam prius neceſſe *eſt* vt id quod perſequitur, eò perueniat, vnde id, quod fugit, diſceſſit: quapropter neceſſe *eſt*, vt ſemper quod eſt tardius, aliquantum progrediatur. 5 Sed hæc ratio eadem eſt, atque ea quæ in duas partes ſecat: differt tamen, quatenus aſſumptam magnitudinem non bifariam diuidit. ergo non comprehendi quod eſt tardius, ratione concluditur: ſed ob idem efficitur, atque in ſe-
B ctione in duas partes: in vtriſque enim euenit, vt non perueniatur ad finem, diuiſa aliquo modo magnitudine. ſed in hac *ratione* adiicitur tragicè ne quidem velociſſimè perſequendo *aſſequi* quod tardius eſt. 6 Quare neceſſe *eſt* ſolutionem quoque eandem eſſe. Quod autem exiſtimat, id, quod progreditur, non comprehendi; falſum *eſt*. quando enim progreditur, non comprehenditur: verumtamen comprehenditur, ſi quidem concedet pertranſiri *ſpatium* finitum. 7 Hæ igitur *ſunt* duæ rationes. 8 Tertia verò *eſt*, quæ nunc dicta fuit; quia ſagitta, quæ fertur, ſtat. *hoc* autem ex eo colligitur, quod ſumit tempus conſtare ex momentis. nam hoc non conceſſo, ſyllogiſmus non erit. 9 Quarta ratio *eſt* de æqualibus *molibus*, quæ in
C ſtadio mouentur ex contrario iuxta *moles* æquales, aliæ quidem à fine ſtadij, aliæ verò à medio, celeritate æquali. in quo euenire putat, vt tempus dimidium ſit æquale duplo. 10 Sed eſt rationis fallacia in eo *poſita*, quòd ſibi concedi poſtulat alterum iuxta id quod mouetur, alterum iuxta quieſcens, æquali celeritate moueri æquali tempore per æqualem magnitudinem. hoc autẽ eſt falſum. vt puta ſtent æquales moles, in quibus *ſunt* α α α α: *moles* autem, in quibus *ſunt* β β β β, incipiant *moueri* à medio ipſorum α, cùm his ſint æquales numero & magnitudine: *moles* verò, in quibus γ γ γ γ, incipiant moueri ab extremo, cùm his ſint æquales numero & magnitudine,
D eadémque celeritate moueantur atque ipſa β. accidit ergo, vt primum β & primum γ ſimul ſint in extremo (α,) cùm iuxta ſe moueantur. euenit igitur, vt γ pertranſierint omnia α: ſed β *pertranſierint* dimidiam partem: adeò vt etiam tempus dimidium ſit: vtrumque enim iuxta ſingula eſt æquale. ſimul autem accidit, vt β pertranſierint omnia γ (ſimul enim primum γ & primum β ſunt in extremis contrariis) cùm æquale tempus conſumatur iuxta ſingula β, quantum *conſumatur* iuxta ipſa α, vt *Zeno* ait, quoniam ambo æquali tempore mouentur iuxta ipſa α. 12 Ratio igitur hæc eſt: euenit autem propter falſitatem, quæ dicta eſt. 13 Nec itaque ſecundùm mutationem quæ in contradi-
E ctione *ſpectatur*, vllum impoſſibile nobis eueniet: velut, ſi ex non albo in album mutatur, & in neutro eſt, neque album igitur fore neque non album. non enim ſi totum non eſt in vtrovis, non dicetur album, vel non album: quandoquidem album dicimus, aut non album, non quia totum ſit tale, ſed quia pleræque, aut præcipuæ partes. nec idem eſt, non eſſe in hoc, & totum non eſſe in hoc. Similiter *res* habebit etiam in ente & non ente, & cæteris quæ in contradictione *ſpectantur*: non enim neceſſariò *erit* totum in oppoſitorum altero, ſed ſemper in neutro. 14 Rurſus in circulo, & in globo, & omnino in iis quæ mouentur in ſe ipſis,

euenturum

euenturum vt hæc quieſcant: quoniam aliquo tempore in eodem loco ſunt & ipſa & eorum partes. quocirca quieſcent ſimul & mouebuntur. 15 Primùm enim partes nullo tempore ſunt in eodem *loco*. 16 Deinde etiam totum mutatur ſemper in alterum: non eſt enim eadem circumferentia quæ *ſumitur à puncto α*, & à β, & à γ, & à ſingulis alijs punctis, niſi vt muſicus homo, & homo, quoniam accidit. quare mutatur ſemper altera in alteram & numquam quieſcet. Eodem modo *ſe res habet* etiam in globo, & ceteris quæ in ſeipſis mouentur.

ὅτι συμβήσεται αὐτὰ ἠρεμεῖν· ἐν γὰρ τῷ αὐτῷ τόπῳ χρόνον τινὰ ἔσται καὶ αὐτά, καὶ τὰ μέρη. ὥστε ἠρεμήσει ἅμα καὶ κινήσεται. 15 Πρῶτον μὲν γὰρ τὰ μέρη οὐκ ἔστιν ἐν τῷ αὐτῷ οὐδένα χρόνον. 16 Εἶτα καὶ τὸ ὅλον μεταβάλλει αἰεὶ εἰς ἕτερον.* οὐ γὰρ ἡ αὐτή ἐστιν ἡ ἀπὸ τοῦ α λαμβανομένη περιφέρεια, καὶ ἡ ἀπὸ τοῦ β, καὶ ἡ ἀπὸ τοῦ γ, καὶ τῶν ἄλλων ἑκάστου σημείων. πλὴν ὡς ὁ μουσικὸς ἄνθρωπος, καὶ ἄνθρωπος, ὅτι συμβέβηκεν. ὥστε μεταβάλλει αἰεὶ ἡ ἑτέρα εἰς τὴν ἑτέραν, καὶ οὐδέποτε ἠρεμήσει. τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῆς σφαίρας* καὶ τῶν ἐν αὑτοῖς κινουμένων.

* γρ. ἡ γὰρ αὐτή.

* γρ. ἐπὶ τῶν ἄλλων τ.

Id quod partibus vacat, moueri non poſſe.

Cap. XV.

His demonſtratis, dicimus, id quod partibus vacat, non poſſe moueri, niſi ex accidenti: veluti moto corpore, vel magnitudine in quo ineſt: quẽadmodum ſi id quod *eſt* in nauigio, moueatur nauigij latione, aut pars moueatur totius motu. Partibus autem vacare dico, quod eſt ſecundùm quantitatem indiuiduum. 3 Etenim partium motus diuerſi ſunt ſecundùm ipſas partes, & ſecundùm totius motionem. quod diſcrimen etiam in globo maximè videre aliquis poteſt: quia non eadem celeritas erit *partium* quæ ſunt ad cẽtrum, & externarum, & totius *globi*, tãquam non vnus ſit motus. 4 Quemadmodum igitur diximus, ita poteſt moueri quod partib. vacat, vt is qui in nauigio ſedet, nauigio currente mouetur: per ſe autem *moueri* non poteſt. mutetur enim ex α β in β γ: ſiue ex magnitudine in magnitudinem, ſiue ex forma in formam, ſiue ſecundùm contradictionem. ſit autem tempus, in quo primo mutatur, vbi δ. ergo neceſſe *eſt*, quo tempore illud mutatur, aut eſſe in α β, aut in β γ, aut partem eius in hoc, partem in altero: quicquid enim mutatur, ita *ſe* habebat. in vtroque igitur non erit aliquid ipſius: quia partibus conſtaret. ſed nec erit in β γ: quia mutatum erit: ſupponitur autem mutari. relinquitur ergo, vt id ſit in α β, quo tempore mutatur. quieſcet igitur. nam in eodem eſſe *per* aliquod tempus, quieſcere erat. quocirca quod caret partibus, non poteſt moueri, nec omnino mutari. 5 Vno enim modo ſic eſſe poteſt eius motio, ſi tempus conſtet ex momentis: ſemper enim in momento *res* mota eſt & mutata: adeò vt nunquam moueatur, ſed ſemper mota ſit. Hoc autem eſſe impoſſibile probatum antea fuit: quia nec tempus ex momentis *conſtat*, nec linea ex punctis, nec motus ex terminis, qui vocantur κινήματα. nihil enim aliud facit, qui hoc dicit, quàm motum conſtare ex iis quæ partibus carent: perinde ac ſi tempus *conſtitueret* ex momentis, aut magnitudinem ex punctis. 6 Præterea ex his quoque perſpicuum *eſt*, nec punctum nec vllum aliud indiuiduum poſſe moueri. quicquid enim mouetur, non poteſt priùs trãſire maius ſe ipſo, quàm tranſeat vel æquale, vel minus. quod ſi *eſt*, apparet etiam punctum primò tranſiturum aut minus aut æquale. quia verò *eſt* indiuiduum, non poteſt priùs tranſire minus: *tranſibit* igitur *lineam* ſibi æqualem. quapropter linea conſtabit ex punctis: quia punctum ſemper æqualem *ſibi* tranſeundo metietur totam lineam. quod ſi *eſt* impoſſibile, etiam moueri quod eſt indiuiduum, *eſt* impoſſibile. 7 Præterea ſi omnis res in tempore mouetur, in momẽto autem nihil *mouetur*,

Ἀποδεδειγμένων δὲ τούτων, λέγομεν, ὅτι τὸ ἀμερὲς οὐκ ἐνδέχεται κινεῖσθαι, πλὴν κατὰ συμβεβηκός· οἷον κινουμένου τοῦ σώματος, ἢ τοῦ μεγέθους, τῷ ἐνυπάρχειν, καθάπερ ἂν εἰ τὸ ἐν τῷ πλοίῳ κινοῖτο ὑπὸ τῆς τοῦ πλοίου φορᾶς, ἢ τὸ μέρος τῇ τοῦ ὅλου κινήσει. 2 Ἀμερὲς δὲ λέγω, τὸ κατὰ ποσὸν ἀδιαίρετον. 3 Καὶ γὰρ αἱ τῶν μερῶν κινήσεις ἕτεραί εἰσι κατ' αὐτά τε τὰ μέρη, καὶ κατὰ τὴν τοῦ ὅλου κίνησιν. ἴδοι δ' ἄν τις καὶ ἐπὶ τῆς σφαίρας μάλιστα τὴν διαφοράν· οὐ γὰρ ταὐτὸ τάχος ἔσται τῶν τε πρὸς τῷ κέντρῳ, καὶ τῶν ἐκτός, καὶ τῆς ὅλης, ὡς οὐ μιᾶς οὔσης κινήσεως. 4 Καθάπερ οὖν εἴπομεν, οὕτω μὲν ἐνδέχεται κινεῖσθαι τὸ ἀμερές, ὡς ὁ ἐν τῷ πλοίῳ καθήμενος τοῦ πλοίου θέοντος, καθ' αὑτὸ δ' οὐκ ἐνδέχεται. μεταβαλλέτω γὰρ ἐκ τοῦ α β, εἰς τὸ β γ, εἴτ' ἐκ μεγέθους εἰς μέγεθος, εἴτ' ἐξ εἴδους εἰς εἶδος, εἴτε κατ' ἀντίφασιν. ὁ δὲ χρόνος ἔστω ἐν ᾧ πρώτῳ μεταβάλλει, ἐφ' οὗ δ. οὐκοῦν ἀνάγκη αὐτὸ καθ' ὃν μεταβάλλει χρόνον, ἢ ἐν τῷ α β εἶναι, ἢ ἐν τῷ β γ, ἢ τὸ μὲν αὐτοῦ ἐν τούτῳ, τὸ δέ τι ἐν θατέρῳ· πᾶν γὰρ τὸ μεταβάλλον οὕτως εἶχεν. ἐν ἑκατέρῳ μὲν οὖν, οὐκ ἔσται τι αὐτοῦ· μεριστὸν γὰρ ἂν εἴη. ἀλλὰ μὴν οὐδ' ἐν τῷ β γ· μεταβεβληκὸς γὰρ ἔσται· ὑπόκειται δὲ μεταβάλλειν. λείπεται δὴ αὐτὸ ἐν τῷ α β εἶναι, καθ' ὃν μεταβάλλει χρόνον. ἠρεμήσει ἄρα· τὸ γὰρ ἐν τῷ αὐτῷ εἶναι χρόνον τινά, ἠρεμεῖν ἦν. ὥστ' οὐκ ἐνδέχεται τὸ ἀμερὲς κινεῖσθαι, οὐδ' ὅλως μεταβάλλειν. 5 Μοναχῶς γὰρ ἂν οὕτως ἦν αὐτοῦ κίνησις, εἰ ὁ χρόνος ἦν ἐκ τῶν νῦν· ἀεὶ γὰρ ἐν τῷ νῦν κεκινημένον ἂν ἦν, καὶ μεταβεβληκός. ὥστε κινεῖσθαι μὲν μηδέποτε, κεκινῆσθαι δ' ἀεί. τοῦτο δ' ὅτι ἀδύνατον, δέδεικται καὶ πρότερον· οὔτε γὰρ ὁ χρόνος ἐκ τῶν νῦν, οὔθ' ἡ γραμμὴ ἐκ στιγμῶν, οὔθ' ἡ κίνησις ἐκ κινημάτων. οὐθὲν γὰρ ἄλλο ποιεῖ ὁ τοῦτο λέγων, ἢ τὴν κίνησιν ἐξ ἀμερῶν, καθάπερ ἂν εἰ τὸν χρόνον ἐκ τῶν νῦν, ἢ τὸ μέγεθος ἐκ στιγμῶν. 6 Ἔτι δὲ καὶ ἐκ τῶνδε φανερόν, ὅτι οὔτε στιγμήν, οὔτ' ἄλλο ἀδιαίρετον οὐδὲν ἐνδέχεται κινεῖσθαι. ἅπαν γὰρ τὸ κινούμενον, ἀδύνατον πρότερον μεῖζον κινηθῆναι ἑαυτοῦ, πρὶν ἂν ἢ ἴσον, ἢ ἔλαττον. εἰ δὲ τοῦτο, φανερὸν ὅτι καὶ ἡ στιγμὴ ἔλαττον ἢ ἴσον κινηθήσεται πρότερον. ἐπεὶ δ' ἀδιαίρετος, ἀδύνατον ἔλαττον κινηθῆναι πρότερον· ἴσην ἄρα ἑαυτῇ. ὥστε ἔσται ἡ γραμμὴ ἐκ στιγμῶν· ἀεὶ γὰρ τὸ* ἴσον κινουμένη, τὴν πᾶσαν γραμμὴν στιγμὴ καταμετρήσει. εἰ δὲ τοῦτο ἀδύνατον, καὶ τὸ κινεῖσθαι τὸ ἀδιαίρετον, ἀδύνατον. 7 Ἔτι δ', εἰ ἅπαν ἐν χρόνῳ κινεῖται, ἐν δὲ τῷ νῦν μηδέν,

* γρ. ἴσην κ.

ἅπας δὲ χρόνος διαιρετός, εἴη ἄν τις χρόνος ἐλάττων ὁτῳοῦν τῶν κινουμένων ἐν ᾧ κινεῖται ὅσον αὐτό. ἔτι μὲν γὰρ ἔσται ὁ χρόνος ἐν ᾧ κινεῖται, διὰ τὸ πάντα ἐν χρόνῳ κινεῖσθαι· χρόνος δὲ πᾶς διαιρετὸς δέδεικται πρότερον. εἰ δὲ ἄρα ἡ στιγμὴ κινεῖται, ἔσται τις χρόνος ἐλάττων ἐν ᾧ αὐτὴ ἐκινήθη. ἀλλ' ἀδύνατον· ἐν γὰρ τῷ ἐλάττονι ἔλαττον ἀνάγκη κινεῖσθαι. ὥστε ἔσται διαιρετὸν τὸ ἀδιαίρετον εἰς τὸ ἔλαττον, ὥσπερ καὶ ὁ χρόνος εἰς τὸν χρόνον. 8 Μοναχῶς γὰρ ἂν κινοῖτο τὸ ἀμερὲς καὶ ἀδιαίρετον, εἰ ἦν ἐν τῷ νῦν κινεῖσθαι δυνατὸν τῷ ἀτόμῳ· τοῦ γὰρ αὐτοῦ λόγου, ἐν τῷ νῦν κινεῖσθαι, καὶ ἀδιαίρετόν τι κινεῖσθαι.

A omne verò tempus eſt diuiduum: vtique erit [illegible] mobili aliquod tempus *eo* minus, in quo m[illegible] per *ſpatium* ſibi æquale. hoc enim erit tempus [illegible] mouetur; propterea quòd omnis res in tēpo[illegible]uetur; omne autem tempus *eſſe* diuiduum an[illegible]batum fuit. ſi igitur punctum mouetur, erit aliquod tempus minus *eo tempore*, quo ipſum punctum mouebatur. atqui *hoc eſt* impoſſibile. nam in minori tempore neceſſe *eſt per* minus *ſpatium moueri*. quapropter quod indiuiduum eſt, diuiduū erit in minus, quemadmodum & tempus in tempus. 8 Vno enim modo fieri poteſt, vt moueatur, quod partibus caret & eſt indiuiduum, ſi moueri poſſit in momento indiuiduo: quippe eiuſdem rationis *eſt*, in momento moueri, & aliquod indiuiduum moueri.

Vtrùm mutatio infinita eſſe poſſit?

Cap. XVI.

Μεταβολὴ δ' οὐκ ἔστιν οὐδεμία ἄπειρος· ἅπασα B γὰρ ἦν ἔκ τινος εἴς τι, καὶ ἡ ἐν ἀντιφάσει, καὶ ἡ ἐν ἐναντίοις. 2 Ὥστε, τῶν μὲν κατὰ τὴν ἀντίφασιν, ἡ * φάσις καὶ ἡ ἀπόφασις πέρας ἐστί, γενέσεως μὲν τὸ ὄν, φθορᾶς δὲ τὸ μὴ ὄν. 3 Τῶν δὲ ἐν τοῖς ἐναντίοις, τὰ ἐναντία· ταῦτα γάρ ἐστιν ἄκρα τῆς μεταβολῆς. 4 Ὥστε καὶ ἀλλοιώσεως πάσης· ἐξ ἐναντίων γάρ τινων ἡ ἀλλοίωσις. 5 Ὁμοίως δὲ καὶ αὐξήσεως καὶ φθίσεως. αὐξήσεως μὲν γὰρ τὸ πέρας, * τὸ κατὰ τὴν οἰκείαν φύσιν τελείου μεγέθους· φθίσεως δέ, ἡ τούτου ἔκστασις. 6 Ἡ δὲ φορὰ οὕτω μὲν C οὐκ ἔσται πεπερασμένη· οὐ γὰρ ἅπασα ἐν ἐναντίοις. ἀλλ' ἐπεὶ τὸ ἀδύνατον τμηθῆναι οὕτω, τῷ μὴ ἐνδέχεσθαι τμηθῆναι (πολλαχῶς γὰρ λέγεται τὸ ἀδύνατον) οὐκ ἐνδέχεται τὸ οὕτως ἀδύνατον τέμνεσθαι· οὐδ' ὅλως τὸ ἀδύνατον γενέσθαι, γίνεσθαι· οὐδὲ τὸ μεταβάλλειν ἀδύνατον ἐνδέχοιτ' ἂν μεταβάλλειν εἰς ὃ ἀδύνατον μεταβάλλειν. εἰ οὖν τὸ φερόμενον μεταβάλλοι εἴς τι, καὶ δυνατὸν ἔσται μεταβάλλειν. ὥστε οὐκ ἄπειρος ἡ κίνησις, οὐδ' οἰσθήσεται τὴν ἄπειρον. 7 Ἀδύνατον γὰρ διελθεῖν αὐτήν. ὅτι μὲν οὖν οὕτως οὐκ ἔστιν * ἄπειρος μεταβολή, ὥστε μὴ διωρίσθαι πέρασι, φανερόν. 8 Ἀλλ' εἰ οὕτως ἐνδέχεται, D ὥστε τῷ χρόνῳ εἶναι ἄπειρον τὴν αὐτὴν οὖσαν καὶ μίαν, σκεπτέον. μὴ μιᾶς μὲν γὰρ γινομένης, οὐθὲν ἴσως κωλύει, εἰ μετὰ τὴν φορὰν ἀλλοίωσις εἴη, καὶ μετὰ τὴν ἀλλοίωσιν αὔξησις, καὶ πάλιν γένεσις· οὕτω γὰρ ἀεὶ μὲν ἔσται τῷ χρόνῳ κίνησις, ἀλλ' οὐ μία, διὰ τὸ μὴ εἶναι μίαν ἐξ ἁπασῶν. ὥστε δὲ γίνεσθαι μίαν, οὐκ ἐνδέχεται ἄπειρον εἶναι τῷ χρόνῳ, πλὴν μιᾶς· αὕτη δ' ἐστὶ μία, ἡ κύκλῳ φορά.

* γρ. κατάφασις

* γρ. τὸ κατὰ τὴν οἰκείαν φύσιν μεγέθους τέλος.

* γρ. ἄπειρος

B Porrò nulla mutatio eſt infinita: quandoquidem omnis *eſt* ex aliquo in aliquid, tam ea quæ in contradictione, quam ea quæ in contrariis *ſpectatur*. 2 Quare *mutationum* earum quæ in contradictione *ſpectantur*, affirmatio & negatio *eſt* terminus: vt generationis, ens: interitus autem, non ens. 3 Earum autem quæ in contrariis *ſpectantur*, contraria *ſunt termini*. hæc enim ſunt extrema mutationis. 4 Quocirca & omnis variationis. nam variatio ex contrariis quibuſdam *eſt*. 5 Similiter etiam accretionis & deminutionis. accretionis enim terminus *eſt* finis magnitudinis, quæ *eſt* ſecundùm propriam naturam, C deminutionis verò, ab hac *magnitudine* receſſus. 6 Latio autem ita non eſt terminata: nōn enim omnis in contrariis *cernitur*. ſed quia quod non poteſt ſectum eſſe, ita vt nō poſſit euenire vt ſectum ſit (multis enim modis impoſſibile dicitur) quod, *inquam*, ita eſt impoſſibile, non poteſt ſecari: & omnino quod non poteſt eſſe factum, *non poteſt* fieri: *profectò* nec quod non poteſt eſſe mutatum, poterit mutari in id in quod non poteſt eſſe mutatum. Ergo ſi id quod fertur, mutetur in aliquid, etiam poterit mutatum eſſe. quapropter motus non *erit* infinitus, nec feretur *per ſpatium* infinitum, quoniam impoſſibile eſt id D pertranſire. 7 Non eſſe igitur ita infinitam mutationem, vt terminis non [illegible], perſpicuum *eſt*. 8 Sed conſiderandum *eſt*, an ita fieri poſſit, vt cum vna & eadem ſit, tempore ſit infinita. niſi eadem vna ſit, fortaſſe nihil prohibet: veluti ſi poſt lationem variatio fiat, & poſt variationem accretio, & iterum generatio: ſic enim perpetuo quidem tempore erit motio, non tamen vna, quia non eſt vna ex omnibus. ſic autem vt ſit vna, non poteſt eſſe tempore infinita, præter vnam: hæc autem vna eſt circuli conuerſio.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ, Η ΠΕΡΙ κινήσεως, τὸ Η.

ARISTOTELIS, NATVRALIS AVSCVLTATIONIS, SEV DE MOTV, *Liber VII.*

Quidquid mouetur, ab aliquo moueri.

Cap. I.

QVICQVID mouetur, neceſſe *eſt* A vt ab aliquo moueatur. 2 Nam ſi in ſe ipſo non habet principium motus, ab alio moueri perſpicuum *eſt*. 3 Si verò in ſe ipſo *habet*, ſumatur, vbi α β, id quod mouetur, non quia *pars* eius aliqua moueatur. primùm igitur exiſtimare α β à ſe ipſo moueri, quia totum mouetur, & à nullo externo moueatur: perinde eſt ac ſi quis, cùm τὸ δ ε moueat ε ζ, & ipſum quoque moueatur, exiſtimet δ ε ζ à ſe ipſo moueri, quia non perſpiciat vtrum ab vtro moueatur, *id eſt*, vtrum τὸ δ ε, moueatur ab ε ζ, an τὸ ε ζ *moueatur* à δ ε. 4 Præterea quod à ſe ipſo mo- B uetur, nunquam moueri deſinet, eo quòd aliud quiddam motum ſiſtatur. neceſſe *eſt* igitur, ſi quid moueri deſinit, eo quòd aliud quiddam ſiſtatur, hoc ab altero moueri. quod cùm perſpicuum factum ſit, neceſſe *eſt* quicquid mouetur, moueri ab aliquo. 5 Nam quia ſumptum eſt τὸ α β moueri, diuiduum erit. quicquid enim mouetur, diuiduum erat. diuidatur igitur ratione ipſius γ: ergo neceſſe *eſt*, cùm τὸ β γ quieſcit, etiam τὸ α β quieſcere. niſi enim *ita ſit*, ſumatur moueri. ergo cùm β γ quieſcente, mouebitur τὸ α γ. non igitur per ſe mouetur τὸ α β. verùm ſupponebatur per ſe moueri primùm: patet igitur, futurum vt C quieſcente γ β, quieſcat etiam τὸ β α, ac tum moueri deſinat. 6 Atqui ſi quid ſiſtitur & moueri deſinit eo quòd aliud quieſcit, hoc ab altero mouetur. perſpicuum igitur *eſt*, quicquid mouetur, ab aliquo moueri. quicquid enim mouetur, diuiduum eſt: & parte quieſcente, totum quieſcet. 7 Quoniam autem quicquid mouetur, ab aliquo mouetur, neceſſe *eſt* etiam quicquid mouetur in alio, moueri ab alio. 9 Ergo & quod mouet, ab altero *mouetur*, quando ipſum quoque mouetur: & rurſus hoc ab altero.

A ΠΑΝ τὸ κινούμενον, ἀνάγκη ὑπό τινος κινεῖσθαι. 2 Εἰ μὲν γὰρ ἐν ἑαυτῷ μὴ ἔχει τὴν ἀρχὴν τῆς κινήσεως, φανερὸν ὅτι ὑφ' ἑτέρου κινεῖται. 3 Εἰ δὲ ἐν αὑτῷ, εἰλήφθω ἐφ' οὗ τὸ α β, ὃ κινεῖται, μὴ τῷ τῶν τούτου κινεῖσθαί τι. πρῶτον μὲν οὖν, τὸ ὑπολαμβάνειν τὸ α β ὑφ' ἑαυτοῦ κινεῖσθαι διὰ τὸ ὅλον τε κινεῖσθαι, καὶ ὑπὸ μηδενὸς τῶν ἔξωθεν, ὅμοιόν ἐστιν, ὥσπερ ἂν εἰ τοῦ δ ε κινοῦντος τὸ ε ζ, καὶ αὐτοῦ κινουμένου, ὑπολαμβάνοι τὸ δ ε ζ, ὑφ' αὑτοῦ κινεῖσθαι, διὰ τὸ μὴ συνορᾶν B πότερον ὑπὸ ποτέρου κινεῖται, πότερον τὸ δ ε ὑπὸ τοῦ ε ζ, ἢ τὸ ε ζ ὑπὸ τοῦ δ ε. 4 Ἔτι, τὸ ὑφ' ἑαυτοῦ κινούμενον οὐδέποτε παύσεται κινούμενον, τῷ ἕτερόν τι στῆναι κινούμενον. ἀνάγκη τοίνυν εἴ τι παύεται κινούμενον τῷ ἕτερόν τι στῆναι, τοῦθ' ὑφ' ἑτέρου κινεῖσθαι. τούτου δὲ φανεροῦ γενομένου, ἀνάγκη πᾶν τὸ κινούμενον κινεῖσθαι ὑπό τινος. 5 Ἐπεὶ γὰρ εἴληπται τὸ α β κινούμενον, διαιρετὸν ἔσται· πᾶν γὰρ τὸ κινούμενον, διαιρετὸν ἦν. διῃρήσθω τοίνυν * ᾗ τὸ γ. ἀνάγκη δὴ τοῦ β γ ἠρεμοῦντος, ἠρεμεῖν καὶ τὸ α β. εἰ γὰρ μὴ, εἰλήφθω κινούμενον. τοῦ τοίνυν β γ ἠρεμοῦντος, κινοῖ- C το ἂν τὸ α γ. οὐκ ἄρα καθ' αὑτὸ κινεῖται τὸ α β. ἀλλ' ὑπέκειτο καθ' αὑτὸ κινεῖσθαι πρῶτον. δῆλον τοίνυν ὅτι τοῦ γ β ἠρεμοῦντος, ἠρεμήσει καὶ τὸ β α, καὶ τότε παύσεται κινούμενον. 6 Ἀλλ' εἴ τι τῷ ἄλλο ἠρεμεῖν ἵσταται καὶ παύεται κινούμενον, τοῦθ' ὑφ' ἑτέρου κινεῖται. φανερὸν δὴ ὅτι πᾶν τὸ κινούμενον, ὑπό τινος κινεῖται. διαιρετὸν γὰρ πᾶν τὸ κινούμενόν ἐστι, καὶ τοῦ μέρους ἠρεμοῦντος, ἠρεμήσει τὸ ὅλον. ἐπεὶ δὲ κινούμενον πᾶν ὑπό τινος κινεῖται, ἀνάγκη καὶ τὸ κινούμενον πᾶν ἐν τόπῳ κινεῖσθαι ὑπ' ἄλλου. 8 Καὶ τὸ κινοῦν τοίνυν ὑφ' ἑτέρου, ὅτι καὶ αὐτὸ κινεῖται, καὶ πάλιν τοῦτο ὑφ' ἑτέρου.

Interpretes, εἰς τὸ γ.

Eſſe aliquod primum mouens, quod ab alio non mouetur. Cap. II.

NOn tamen in infinitum procedit: ſed alicubi D ſiſtitur, & erit aliquid quod primò cauſa erit motionis. 2 Niſi enim *ita ſit* ſed in infinitum procedat, moueatur τὸ α à β; & τὸ β à γ, & τὸ γ à δ: & hoc modo in infinitum progrediatur. 3 Quoniam igitur id quod mouet, ipſum quoque ſimul mouetur: manifeſtum *eſt*, ſimul motum iri & α & β.

ΟΥ δὴ εἰς ἄπειρον πρόεισιν, ἀλλὰ στήσεταί που καὶ ἔσται τι ὃ πρώτως αἴτιον ἔσται τοῦ κινεῖσθαι. 2 Εἰ γὰρ μὴ, ἀλλ' εἰς ἄπειρον πρόεισιν, ἔστω, τὸ μὲν α ὑπὸ τοῦ β κινούμενον, τὸ δὲ β ὑπὸ τοῦ γ, τὸ δὲ γ, ὑπὸ τοῦ δ. καὶ τοῦτ' ἀεὶ τὸ ἐφεξῆς εἰς ἄπειρον προβαινέτω. 3 Ἐπεὶ οὖν ἅμα τὸ κινοῦν, καὶ αὐτὸ κινεῖται, δῆλον ὡς ἅμα κινηθήσεται τό, τε α καὶ τὸ β

A κινουμένου γὰρ τοῦ β, κινηθήσεται καὶ τὸ α· καὶ τοῦ β δὲ κινουμένου, τὸ γ· καὶ τοῦ γ, τὸ δ. ἔσται δὴ τοίνυν ἅμα ἥτε τοῦ α κίνησις, καὶ τοῦ β, καὶ τοῦ γ, καὶ τῶν λοιπῶν ἑκάστου. 4 Καὶ λαβεῖν τοίνυν αὐτῶν ἕκαστον δυνησόμεθα· καὶ γὰρ εἰ ἕκαστον ὑφ' ἑκάστου κινεῖται, οὐδὲν ἧττον μία τῷ ἀριθμῷ ἡ ἑκάστου κίνησις, καὶ οὐκ ἄπειρος τοῖς ἐσχάτοις· ἐπειδὴ πᾶν τὸ κινούμενον, ἔκ τινος εἴς τι κινεῖται. 5 Ἢ γὰρ ἀριθμῷ, συμβαίνει τὴν αὐτὴν κίνησιν εἶναι, ἢ γένει, ἢ εἴδει. ἀριθμῷ μὲν οὖν λέγω τὴν αὐτὴν κίνησιν τὴν ἐκ τοῦ αὐτοῦ εἰς τὸ αὐτὸ τῷ ἀριθμῷ, ἐν τῷ αὐτῷ χρόνῳ τῷ ἀριθμῷ γινομένην· οἷον ἐκ τοῦδε τοῦ λευκοῦ, ὅ ἐστιν ἓν τῷ ἀριθμῷ, εἰς τόδε τὸ μέλαν κατὰ τόνδε τὸν χρόνον, ἕνα ὄντα τῷ ἀριθμῷ· εἰ γὰρ κατ' B ἄλλον, οὐκ ἔτι μία ἔσται τῷ ἀριθμῷ, ἀλλὰ τῷ εἴδει. γένει δ' ἡ αὐτὴ κίνησις, ἡ ἐν τῇ αὐτῇ κατηγορίᾳ τῆς οὐσίας ἢ τοῦ γένους· εἴδει δὲ, ἡ ἐκ τοῦ αὐτοῦ τῷ εἴδει εἰς ταὐτὸ τῷ εἴδει, οἷον ἐκ τοῦ λευκοῦ εἰς τὸ μέλαν, ἢ ἐκ τοῦ ἀγαθοῦ εἰς τὸ κακόν. ταῦτα δ' εἴρηται καὶ ἐν τοῖς πρότερον. 6 Εἰλήφθω τοίνυν ἡ τοῦ α κίνησις, καὶ ἔστω ἐφ' οὗ τὸ ε, καὶ ἡ τοῦ β, ἐφ' οὗ τὸ ζ, καὶ ἡ τοῦ γ δ ἐφ' οὗ τὸ η θ. 7 Καὶ ὁ χρόνος ἐν ᾧ κινεῖται τὸ α, ὁ κ. 8 Ὡρισμένης δὴ τῆς κινήσεως τοῦ α, ὡρισμένος ἔσται καὶ ὁ χρόνος, καὶ οὐκ ἄπειρος ὁ κ. ἀλλ' ἐν τῷ αὐτῷ χρόνῳ ἐκινεῖτο τὸ α, καὶ τὸ β, καὶ τῶν λοιπῶν ἕκα-C στον· συμβαίνει τοίνυν τὴν κίνησιν τὴν ε ζ η θ, ἄπειρον οὖσαν, ἐν ὡρισμένῳ χρόνῳ κινεῖσθαι τῷ κ. ἐν ᾧ γὰρ τὸ α ἐκινεῖτο, καὶ τὰ τοῦ α ἐφεξῆς ἅπαντα ἐκινεῖτο ἄπειρα ὄντα. ὥστ' ἐν τῷ αὐτῷ κινεῖται. 9 Καὶ γὰρ ἤτοι ἴση ἡ κίνησις ἔσται ἡ τοῦ α τῇ τοῦ β, ἢ μείζων. 10 Διαφέρει δ' οὐδέν· πάντως γὰρ τὴν ἄπειρον κίνησιν ἐν πεπερασμένῳ χρόνῳ συμβαίνει κινεῖσθαι· τοῦτο δ' ἀδύνατον. 11 Οὕτω μὲν οὖν δόξειεν ἂν δείκνυσθαι τὸ ἐξ ἀρχῆς· οὐ μὴν δείκνυταί γε, διὰ τὸ μηδὲν ἄτοπον συμβαίνειν· ἐνδέχεται γὰρ ἐν πεπερασμένῳ χρόνῳ κίνησιν ἄπειρον εἶναι, μὴ τὴν αὐτὴν δὲ, ἀλλ' ἑτέραν καὶ ἑτέραν πολλῶν κινουμένων καὶ ἀπείρων· ὅπερ συμβαίνει καὶ τοῖς νῦν. 12 Ἀλλ' εἰ τὸ κινούμενον πρώτως D κατὰ τόπον καὶ σωματικὴν κίνησιν, ἀνάγκη ἅπτεσθαι ἢ συνεχὲς εἶναι τῷ κινοῦντι, καθάπερ ὁρῶμεν ἐπὶ πάντων, τοῦτο συμβαῖνον· ἔσται γὰρ ἐξ ἁπάντων ἕν τι, ἢ συνεχές· τοῦτο δὴ ἐνδεχόμενον εἰλήφθω, καὶ ἔστω, τὸ μὲν μέγεθος ἢ τὸ συνεχὲς, ἐφ' οὗ τὸ α β γ δ· ἡ δὲ τούτου κίνησις, ἡ ε ζ η θ. διαφέρει δ' οὐδὲν, ἢ πεπερασμένον, ἢ ἄπειρον· ὁμοίως γὰρ ἐν πεπερασμένῳ τῷ κ κινηθήσεται, ἢ ἄπειρον, ἢ πεπερασμένον. τούτων δ' ἑκάτερον, τῶν ἀδυνάτων. 13 Φανερὸν οὖν ὅτι στήσεταί ποτε, καὶ οὐκ εἰς ἄπειρον πρόεισι τὸ ἀεὶ ὑφ' ἑτέρου, ἀλλ' ἔσται τι ὃ πρῶτον κινηθήσεται. μηδὲν δὲ διαφερέτω, ὑποτεθέντος τινὸς τοῦτο δείκνυσθαι· τῷ γὰρ ἐνδεχομένῳ τεθέντος, οὐδὲν ἄτοπον ἔδει συμβαίνειν.

A moto enim β, mouebitur etiam τὸ α: ergo & moto β, mouebitur τὸ γ: & moto γ, mouebitur τὸ δ. ſimul igitur erit motus τοῦ α, & τοῦ β, & τοῦ γ, & cęterorũ cuiuſque. 4 Et & horum vnum quodque ſumere poterimus: nam etſi ſingula à ſingulis mouentur, nihilominus vna numero *eſt* cuiuſque motio, non infinita extremis: quia quicquid mouetur, ex aliquo in aliquid mouetur. 5 Aut enim numero accidit eundem motum eſſe, aut genere, aut ſpecie. Ac numero quidem dico eundem motum *eſſe eum* qui ex eodem in idem numero fit in tempore quod eſt idem numero: vt ex hoc albo, quod eſt vnum numero, in hoc nigrum, hoc tempore quod vnum numero eſt: nam ſi alio *tempore* non erit ampliùs vnus *motus* numero, ſed ſpe-B cie. Genere autem idem motus *eſt*, qui *fit* in eadem categoria *ſiue* ſubſtantiæ, ſiue *alius* generis. Specie verò, qui fit ex eodem ſpecie, in idem ſpecie: vt ex albo in nigrum, aut ex bono in malum. ſed hæc etiam in ſuperioribus tradita fuerunt. 6 Sumatur igitur motus τοῦ α, & ſit vbi τὸ ε: & *motus* τοῦ β, vbi τὸ ζ: & *motus* τοῦ γ δ, vbi τὸ η θ. 7 Et tempus, quo mouetur τὸ α, ſit κ. 8 Cùm igitur motus τοῦ α *ſit* definitus, etiam tempus κ erit finitum, non infinitum. atqui eodem tempore mouebatur τὸ α, & τὸ β, & cęterorum vnumquodque: accidit igitur, vt motus ε ζ η θ, cum ſit infinitus, fiat finito tempore κ. nam quo *tempore* τὸ α mouebatur, etiam reliqua omnia quæ *poſt* α deinceps C *ſibi*, mouebantur, cùm ſint infinita, quocirca eodem *tempore* mouentur. 9 Etenim vel æqualis erit motus τοῦ α *motui* τοῦ β & reliquorum, vel maior. 10 Sed nihil refert. nam omnino accidit infinitum motum finito tempore fieri: quod eſt impoſſibile. 11 Sic igitur videri poteſt probari quod ab initio *fuit quæſitum*: non tamen probatur, propterea quod nihil abſurdi accidit. poteſt enim finito tempore motus infinitus eſſe, non tamen idem, ſed alius atque alius, cùm multæ & infinitæ res moueantur: quod quidem euenit etiam *in* his quæ nunc *ſumpſimus*. 12 Verùm ſi id quod primo ſecundùm locum & corporali motu cietur, neceſſe *eſt* vt tangat vel continuum ſit ei quod mouet, quemadmodum videmus in omnibus D hoc accidere: (nam totum erit ex omnibus vnum, aut continuum) hoc igitur quod eſſe poteſt, ſumitur, ac ſit magnitudo vel continuum, vbi α β γ δ: huius autem motio ſit ε ζ η θ. nihil autem intereſt vtrum finitum *ſit*, an infinitum: æquè enim finito *tempore* mouebitur vel infinitum, vel finitum: quorum vtrumque *eſt* impoſſibile. 13 Perſpicuum igitur *eſt*, fore aliquando vt ſiſtatur, nec progredi in infinitum ſemper ab alio *moueri*. ſed fore aliquid, quod primum mouebit. 14 Nihil autem intereſt, ſuppoſito aliquo, hoc probari: quia poſito eo quod eſſe poteſt, nihil abſurdi euenire oportet.

Mouens, & quod mouetur, ſimul eſſe. Cap. III.

Τὸ δὲ πρῶτον κινοῦν, μὴ ὡς τὸ οὗ ἕνεκεν, ἀλλ' ὅθεν ἡ ἀρχὴ τῆς κινήσεως, ἅμα ἐστὶ τῷ κινουμένῳ. ἅμα δὲ λέγω, διότι οὐδέν ἐστιν αὐτῶν μεταξύ. τοῦτο γὰρ κοινὸν ἐπὶ παντὸς κινουμένου καὶ κινοῦντός ἐστιν. 2 Ἐπειδὴ τρεῖς εἰσι κινήσεις, ἥτε κατὰ τόπον, καὶ κατὰ τὸ ποιὸν, καὶ κατὰ τὸ ποσὸν, ἀνάγκη καὶ τὰ κινούμενα τρία.

E Qvod autem primum mouet, non vt id cuius gratia, ſed vnde principium motus, ſimul eſt cum eo quod mouetur. ſimul autem dico, quia nihil eſt his interiectum. hoc enim commune eſt omni rei quæ mouetur & quæ mouet. 2 Cùm autẽ tres ſint motus, *nempe* in loco, in quantitate, & in qualitate: neceſſe *eſt* tria quoque eſſe quæ mouentur.

motus igitur qui *fit* in loco, *eſt* latio. qui autem in qualitate, variatio. qui verò in quantitate, accretio & deminutio. 3 Primùm igitur de latione dicamus: hic enim eſt motuum primus. 4 Quicquid igitur fertur, vel à ſe mouetur, vel ab alio. 5 Quæcumque igitur ipſa à ſe ipſis mouentur, in his perſpicuum *eſt*, ſimul eſſe quod mouetur & quod mouet: ineſt enim ipſis id quod primum mouet. quare nihil eſt interiectum. 6 Quæcumque verò ab alio mouentur, quatuor modis moueri neceſſe *eſt*: quatuor enim ſũt ſpecies lationis quæ ab alio *fit*, tractus, pulſus, vectio, conuerſio. omnes enim motus qui in loco *fiunt*, ad hos reducuntur. Etenim impulſio eſt pulſus quidam, cùm id quod à ſe pellit, ſequitur rem quam pellit. Depulſio verò eſt, cùm non ſequitur mouendo. Iactus autem, cùm vehementiorem motũ efficit *quo rem à ſe pellit*, quàm fit illius rei latio naturalis, & *ea res* eò vſq; fertur, donec motio vim ſuam retinet. Rurſus depulſio & compulſio ſunt depulſio & tractus. nam diſpulſio *eſt* depulſio: quandoquidem depulſio eſt vel à ſe, vel ab alio. Compulſio verò *eſt* tractus: quoniam tractus *eſt* ad ſe & ad aliud. Quocirca & quæcumque *ſunt* horum *motuum* ſpecies, *eòdem referri debent*, vt telæ denſatio, & contextus: illa namq; *eſt* compulſio: hic verò *eſt* diſpulſio. Similiter etiam aliæ concretiones & ſecretiones *eòdem ſunt referendæ*: omnes enim erunt diſpulſiones, aut compulſiones, exceptis iis quæ in ortu & interitu ſunt. Simul autem perſpicuum *eſt*, cõcretionem & ſecretionem non eſſe aliud quoddam genus motus: nam omnes diſtribuuntur in aliquos ex iis *motibus* qui dicti fuerunt. Præterea inſpiratio eſt tractus: exſpiratio autem eſt pulſus. Similiter etiam excreatio, & quicũq; alij motus per corpus *fiunt*, quibus vel aliquid excernitur, vel ſumitur. nam hi *ſunt* tractus: illi verò *ſunt* depulſiones. Oportet autem & alios *motus* qui in loco *fiunt*, reducere: quoniam omnes in hos quatuor cadunt. 7 Rurſus ex his *motibus* vectio & conuerſio *referuntur* ad tractum & pulſum. 8 Nam vectio eſt aliquo ex his tribus modis. quod enim vehitur, ex accidenti mouetur, quia eſt in eo quod mouetur, aut ſuper aliquo quod mouetur. quod autem vehit, mouetur, vel pulſum, vel tractum, vel conuerſum. Quapropter communis his omnibus tribus eſt vectio. 9 Conuerſio autem conſtat ex tractu & pulſu: quia neceſſe *eſt* vt id quod conuertit, partem trahat, partem pellat: partem enim à ſe, partem ad ſe ducit. 10 Quare ſi id quod pellit, & quod trahit, ſimul *eſt* cum eo quod pellitur, & eo quod trahitur: patet ei quod in loco mouetur, & *ei* quod mouet, nihil eſſe interie*ctum*. Atq; hoc manifeſtũ *eſt* etiam ex definitionibus. nã pulſus eſt motus, *qui* vel à ſe vel ab alio *fit* ad aliud. tractus autem, qui *fit* ab alio, ad ſe, vel ad aliud, cùm celerior eſt motus eius quod trahit, qui à ſe inuicem ſeparat ea quæ ſunt continua: ſic enim alterũ ſimul attrahitur. (fortaſſis autem videri poteſt eſſe quidam tractus etiam alio modo. nam lignũ trahit ignem nõ hoc modo: nihil autem intereſt vtrùm moueatur, an maneat id quod trahit. quandoq. enim *eò* trahit vbi eſt: quandoque, vbi erat) ſed impoſſibile eſt, vel à ſe ad aliud, vel ab alio ad ſe mouere, non tãgendo. quare perſpicuum *eſt*, ei quod in loco mouetur, & ei quod mouet, nihil eſſe interiectum. 11 Sed nec ei quod variatur, & ei quod variat. hoc autem ex inductione manifeſtum *eſt*. in omnibus enim accidit vt ſimul ſint, quod extremum variat, & quod primum variatur. 12 Aut enim quod calefit, aut quod dulceſcit, aut quod denſatur, aut quod exſiccatur,

A ἡ μὲν οὖν κατὰ τόπον, φορά· ἡ δὲ κατὰ τὸ ποιὸν, ἀλλοίωσις· ἡ δὲ κατὰ τὸ ποσὸν, αὔξησις καὶ φθίσις. 3 Πρῶτον μὲν οὖν περὶ τῆς φορᾶς εἴπωμεν· αὕτη γὰρ πρώτη τῶν κινήσεών ἐστιν. 4 Ἅπαν δὴ τὸ φερόμενον, ἢ ὑφ' αὑτοῦ κινεῖται, ἢ ὑπ' ἄλλου. 5 Ὅσα μὲν οὖν αὐτὰ ὑφ' αὑτῶν κινεῖται, φανερὸν ἐν τούτοις, ὅτι ἅμα τὸ κινούμενον καὶ τὸ κινοῦν ἐστιν· ἐνυπάρχει γὰρ αὐτοῖς τὸ πρῶτον κινοῦν· ὥστ' οὐδέν ἐστιν* ἀνὰ μεταξύ. 6 Ὅσα δ' ὑπ' ἄλλου κινεῖται, τετραχῶς ἀνάγκη γίνεσθαι. τέτταρα γὰρ εἴδη τῆς ὑπ' ἄλλου φορᾶς, ἕλξις, ὦσις, ὄχησις, δίνησις· ἅπασαι γὰρ αἱ κατὰ τόπον κινήσεις ἀνάγονται εἰς ταύτας. ἡ μὲν γὰρ ἔπωσις, ὦσίς τίς ἐστιν, ὅταν B τὸ ἀπ' αὐτοῦ κινοῦν ἐπακολουθοῦν ὠθῇ. ἡ δ' ἄπωσις, ὅταν μὴ ἐπακολουθῇ κινῆσαν. ἡ δὲ ῥῖψις, ὅταν σφοδροτέραν ποιήσῃ τὴν ἀπ' αὐτοῦ κίνησιν τῆς κατὰ φύσιν φορᾶς, καὶ μέχρι τοσούτου φέρηται, ἕως ἂν κρατῇ ἡ κίνησις. πάλιν ἡ δίωσις καὶ σύνωσις, ἄπωσις καὶ ἕλξις εἰσίν· ἡ μὲν γὰρ δίωσις, ἄπωσις· ἢ γὰρ ἀπ' αὐτοῦ, ἢ ἀπ' ἄλλου ἐστὶν ἡ ἄπωσις· ἡ δὲ σύνωσις, ἕλξις· καὶ γὰρ πρὸς αὐτὸ καὶ πρὸς ἄλλο ἡ ἕλξις· ὥστε καὶ ὅσα τούτων εἴδη, οἷον σπάθησις καὶ κέρκισις· ἡ μὲν γὰρ, σύνωσις· ἡ δὲ, δίωσις· ὁμοίως δὲ καὶ αἱ ἄλλαι συγκρίσεις, καὶ διακρίσεις· ἅπασαι γὰρ ἔσονται διώσεις ἢ συνώσεις. πλὴν ὅσαι ἐν γενέσει καὶ φθορᾷ εἰσιν. ἅμα δὲ φανερὸν, ὅτι οὐδὲ C ἐστιν ἄλλο τι γένος κινήσεως, ἡ σύγκρισις καὶ διάκρισις. ἅπασαι γὰρ διανέμονται εἴς τινας τῶν εἰρημένων. ἔτι δ' ἡ μὲν εἰσπνοὴ, ἕλξις· ἡ δ' ἐκπνοὴ, ὦσίς ἐστιν. ὁμοίως δὲ καὶ ἡ πτύσις, καὶ ὅσαι ἄλλαι διὰ τοῦ σώματος ἢ ἐκκριτικαὶ ἢ ληπτικαὶ κινήσεις. αἱ μὲν γὰρ, ἕλξεις· αἱ δὲ, ἀπώσεις. δεῖ δὲ καὶ τὰς ἄλλας τὰς κατὰ τόπον ἀνάγειν· ἅπασαι γὰρ πίπτουσιν εἰς τέσσαρας ταύτας. 7 Τούτων δὲ πάλιν ἡ ὄχησις καὶ ἡ δίνησις, εἰς ἕλξιν καὶ ὦσιν. 8 Ἡ μὲν γὰρ ὄχησις, κατὰ τούτων τινὰ τῶν τριῶν τρόπων ἐστί· τὸ μὲν γὰρ ὀχούμενον κινεῖται κατὰ συμβεβηκὸς, ὅτι ἐν κινουμένῳ ἐστὶν, ἢ ἐπὶ κινουμένου τινός. *τὸ δ' ὀχοῦν ὀχεῖ, ἢ ἑλκόμενον, ἢ ὠθούμενον, ἢ δινούμενον. D ὥστε κοινή ἐστιν ἁπασῶν τῶν τριῶν ἡ ὄχησις. 9 Ἡ δὲ δίνησις σύγκειται ἐξ ἕλξεώς τε καὶ ὤσεως. ἀνάγκη γὰρ τὸ δινοῦν, τὸ μὲν ἕλκειν, τὸ δ' ὠθεῖν. τὸ μὲν γὰρ ἀφ' αὑτοῦ, τὸ δὲ πρὸς αὑτὸν ἄγει. 10 Ὥστ' εἰ τὸ ὠθοῦν καὶ τὸ ἕλκον ἅμα τῷ ὠθουμένῳ καὶ τῷ ἑλκομένῳ, φανερὸν ὅτι τοῦ κατὰ τόπον κινουμένου καὶ κινοῦντος οὐδέν ἐστι μεταξύ. ἀλλὰ μὴν τοῦτο δῆλον καὶ ἐκ τῶν ὁρισμῶν. ὦσις μὲν γάρ ἐστιν ἡ ἐφ' αὑτοῦ, ἢ ἀπ' ἄλλου πρὸς ἄλλο κίνησις· ἕλξις δὲ, ἡ ἀπ' ἄλλου πρὸς αὑτὸ, ἢ πρὸς ἄλλο, ὅταν θᾶττον ἡ κίνησις ᾖ τοῦ ἕλκοντος, ἡ χωρίζουσα ἀπ' ἀλλήλων τὰ συνεχῆ. οὕτω γὰρ συνεφέλκεται θάτερον. τάχα δὲ δόξειεν ἂν εἶναί τις ἕλξις E καὶ ἄλλως· τὸ γὰρ ξύλον ἕλκει τὸ πῦρ. οὐχ οὕτω· τὸ δ', οὐθὲν διαφέρει κινουμένου τοῦ ἕλκοντος ἢ μένοντος ἕλκειν· ὁτὲ μὲν γὰρ ἕλκει οὗ ἐστιν, ὁτὲ δὲ οὗ ἦν. ἀδύνατον δὲ ἢ ἀφ' αὑτοῦ πρὸς ἄλλο, ἢ ἀπ' ἄλλου πρὸς αὑτὸ κινεῖν, μὴ ἁπτόμενον. ὥστε φανερὸν ὅτι τοῦ κατὰ τόπον κινουμένου καὶ κινοῦντος, οὐδέν ἐστι μεταξύ. 11 Ἀλλὰ μὴν οὐδὲ τοῦ ἀλλοιουμένου καὶ τοῦ ἀλλοιοῦντος. τοῦτο δὲ δῆλον ἐξ ἐπαγωγῆς· ἐν ἅπασι γὰρ συμβαίνει ἅμα εἶναι τὸ ἔσχατον ἀλλοιοῦν καὶ τὸ ἀλλοιούμενον ὑπὸ τῶν εἰρημένων. ταῦτα γάρ ἐστι πάθη τῆς ὑποκειμένης ποιότητος. 12 Ἡ γὰρ θερμαινόμενον, ἢ γλυκαινόμενον, ἢ πυκνούμενον, ἢ ξηραινόμενον,

* Scrib. ἀνὰ μέσον, vel μεταξύ.

* Vulgo τὸ δ' ὀχοῦν inepte.

A ἢ λευκαινόμενον, ἀλλοιοῦσθαί φαμεν· ὁμοίως τε τὸ ἄψυχον καὶ τὸ ἔμψυχον λέγοντες, καὶ πάλιν τῶν ἐμψύχων, τά τε μὴ αἰσθητικὰ τῶν μερῶν [καὶ] αὐτὰς τὰς αἰσθήσεις. ἀλλοιοῦνται γάρ πως καὶ αἱ αἰσθήσεις· ἡ γὰρ αἴσθησις ἡ κατ᾽ ἐνέργειαν, κίνησίς ἐστι διὰ τοῦ σώματος, πασχούσης τι τῆς αἰσθήσεως. 13 Καθ᾽ ὅσα μὲν οὖν τὸ ἄψυχον ἀλλοιοῦται, καὶ τὸ ἔμψυχον· καθ᾽ ὅσα δὲ τὸ ἔμψυχον, οὐ κατὰ ταῦτα πάντα τὸ ἄψυχον· οὐ γὰρ ἀλλοιοῦται κατὰ τὰς αἰσθήσεις. καὶ τὸ μὲν λανθάνει, τὸ δ᾽ οὐ λανθάνει πάσχον. οὐδὲν δὲ κωλύει καὶ τὸ ἔμψυχον λανθάνειν, ὅταν μὴ κατὰ τὰς αἰσθήσεις γίνηται ἡ ἀλλοίωσις. 15 Εἴπερ οὖν ἀλλοιοῦται τὸ ἀλλοιούμενον ὑπὸ τῶν αἰσθητῶν, ἐν ἅπασί B γε τούτοις, φανερὸν ὅτι ἅμα ἐστὶ τὸ ἔσχατον ἀλλοιοῦν, καὶ τὸ πρῶτον ἀλλοιούμενον· τῷ μὲν γὰρ συνεχὴς ὁ ἀήρ, τῷ δ᾽ ἀέρι τὸ σῶμα. πάλιν δὲ, τὸ μὲν χρῶμα τῷ φωτί, τὸ δὲ φῶς τῇ ὄψει. τὸν αὐτὸν δὲ τρόπον καὶ ἡ ἀκοὴ καὶ ἡ ὄσφρησις. πρῶτον γὰρ κινοῦν πρὸς τὸ κινούμενον, ὁ ἀήρ. καὶ ἐπὶ τῆς γεύσεως ὁμοίως. ἅμα γὰρ τῇ γεύσει ὁ χυμός. 16 Ὡσαύτως δὲ καὶ ἐπὶ τῶν ἀψύχων καὶ ἀναισθήτων. 17 Ὥστ᾽ οὐδὲν ἔσται μεταξὺ τοῦ ἀλλοιουμένου καὶ τοῦ ἀλλοιοῦντος. 18 Οὐδὲ μὴν τοῦ αὐξανομένου τε καὶ αὔξοντος· αὐξάνει γὰρ τὸ πρῶτον αὖξον προσγινόμενον, ὥστε ἓν γίγνεσθαι τὸ ὅλον. καὶ πάλιν φθίνει τὸ C φθῖνον ἀπογινομένου τινὸς τῶν τοῦ φθίνοντος. ἀνάγκη οὖν συνεχὲς εἶναι καὶ τὸ αὖξον καὶ τὸ φθῖνον. τῶν δὲ συνεχῶν οὐδὲν μεταξύ. 19 Φανερὸν οὖν ὅτι * τοῦ κινουμένου καὶ τοῦ κινοῦντος πρώτου καὶ ἐσχάτου * πρὸς τὶ κινούμενον οὐδέν ἐστιν ἀνὰ μέσον.

* γρ. τοῦ κινοῦντος ἐσχάτου καὶ τοῦ κινουμένου πρώτου
* γρ. πρὸς τὸ κινούμενον

A aut quod dealbatur, variari dicimus: ſimil[...] dicentes tã de inanimato quàm de animato [...]ſus tam de animatorum partibus ſenſu vaca[...] quàm de ipſis ſenſibus. variantur enim aliqu[...] etiam ſenſus. nam ſenſus, qui *eſt* actu, eſt mo[...] corpus, ſenſu aliquid patiente. 13 Quibus [...] inanimatum variatur, *his variatur* etiam anim[...] quibus autem animatum, non his omnibus *varia[...]* inanimatum: quandoquidem non variatur ſecundùm ſenſus. 14 Et alterum latet, alterum non latet, cùm patitur. ſed nihil prohibet etiam inanimatum latere, quando non ſecundùm ſenſus variatio B fit. 15 Si igitur quod variatur, à ſenſibilibus variatur: in his omnibus perſpicuum *eſt* ſimul eſſe quod extremum variat, & quod primum variatur: illi namque continuus *eſt* aër, aëri autem corpus: rurſus color lumini, lumen aſpectui. Et eodem modo *ſe habet* & auditus, & odoratus: quoniam aër *eſt* primum mouens, *relatum* ad id quod mouetur. Et in guſtu ſimiliter *res ſe habet*. nam ſapor *eſt* ſimul cum guſtu. 16 Itidem etiam *res habet* in *rebus* inanimatis, & ſenſu carentibus. 17 Quare nihil erit interiectum ei quod variatur, & ei quod variat. 18 Quin nec eius quod augetur, & eius quod auget. quod enim primum auget, appoſitum auget, adeò vt totum fiat C vnum. & rurſus minuitur id quod minuitur, abſcedente aliqua parte ipſius quod minuitur. neceſſe *eſt* igitur, & id quod auget, & id quod minuitur, eſſe continuum: continuis verò nihil *eſt* interiectum. 19 Perſpicuum igitur *eſt*, ei quod mouetur, & ei quod mouet, primo atque vltimo, ad id quod mouetur *relato*, nihil eſſe interiectum.

Omnem variationem pertinere ad tertiam ſpeciem qualitatis, id eſt, ad patibiles qualitates.

Cap. IV.

D ΟΤι δὲ τὸ ἀλλοιούμενον ἅπαν ἀλλοιοῦται ὑπὸ τῶν αἰσθητῶν, * καὶ ἐν τούτοις μόνοις ἀλλοίωσις λέγεται ὅσα καθ᾽ αὑτὰ πάσχει, ἐκ τῶνδε θεωρητέον. τῶν γὰρ ἄλλων * μάλιστα ἄν τις ὑπολάβοι, ἔν τε τοῖς σχήμασι, καὶ ἐν ταῖς μορφαῖς, καὶ ἐν ταῖς ἕξεσι, καὶ ταῖς τούτων λήψεσι καὶ ἀποβολαῖς, ἀλλοίωσιν ὑπάρχειν· ἐν οὐδετέροις δ᾽ ἐστί. 2 Τὸ μὲν γὰρ σχηματιζόμενον ὅταν ἐπιτελεσθῇ, οὐ λέγομεν ἐκεῖνο ἐξ οὗ ἐστιν, οἷον τὸν ἀνδριάντα χαλκόν, ἢ τὴν πυραμίδα, κηρόν, ἢ τὴν κλίνην, ξύλον· ἀλλὰ παρωνυμιάζοντες, τὸν μὲν χαλκοῦν, τὸν δὲ κήρινον, τὸ δὲ ξύλινον. τὸ δὲ πεπονθὸς καὶ ἠλλοιωμένον, προσαγορεύομεν· ξηρὸν γὰρ, καὶ ὑγρὸν, καὶ σκληρὸν, καὶ θερμὸν, τὸν χαλκὸν λέγομεν, καὶ τὸν κηρόν. καὶ E οὐ μόνον οὕτως, ἀλλὰ καὶ τὸ ὑγρὸν καὶ τὸ θερμὸν χαλκὸν λέγομεν, ὁμωνύμως τῷ πάθει προσαγορεύοντες τὴν ὕλην. ὥστ᾽ εἰ κατὰ μὲν τὸ σχῆμα καὶ τὴν μορφὴν οὐ λέγεται τὸ γεγονὸς ἐν ᾧ ἐστι τὸ σχῆμα, κατὰ δὲ τὰ πάθη καὶ τὰς ἀλλοιώσεις λέγεται, φανερὸν ὅτι οὐκ ἂν εἶεν αἱ γενέσεις αὗται ἀλλοιώσεις. 3 Ἔτι δὲ καὶ εἰπεῖν οὕτως ἄτοπον ἂν δόξειεν, ἀλλοιοῦσθαι τὸν ἄνθρωπον, ἢ τὴν οἰκίαν, ἢ ἄλλο ὁτιοῦν τῶν γεγενημένων· ἀλλὰ γίνεσθαι μὲν, ἴσως ἕκαστον ἀναγκαῖον, ἀλλοιουμένου τινός. οἷον τῆς ὕλης πυκνουμένης, ἢ μανουμένης, ἢ θερμαινομένης, ἢ ψυχομένης. οὐ μέντοι τὰ γινόμενα ἀλλοιοῦται, οὐδ᾽ ἡ γένεσις αὐτῶν ἀλλοίωσίς ἐστιν. 4 Ἀλλὰ μὴν οὔτε αἱ ἕξεις, * οὔτε αἱ τοῦ σώματος ἀρεταί. αἱ μὲν γὰρ ἀρεταί, αἱ δὲ κακίαι, τῶν ἕξεων.

* γρ. καὶ ἐν μόνοις ὑπάρχει τούτοις ἀλλοίωσις, ὅσα καθ᾽ αὑτὰ λέγεται πάσχειν ὑπὸ τῶν αἰσθητῶν, ἐκ τ. θ.
* γρ. κάλλιστα
* γρ. ὅτι αἱ τοῦ σώματος, ὅτι αἱ τῆς ψυχῆς ἀλλοιώσεις.

QVicquid autem variatur, variari à ſenſibilibus, & in his ſolis eſſe variationem, quæ per ſe dicuntur pati à ſenſibilibus, ex his diſpiciendum *eſt*. nam aliorum maximè quiſpiam exiſtimare poſſit in figuris, & in formis, & in habitibus, horúmque ſumptionibus & amiſſionibus variationem ineſſe. ſed in neutris eſt. 2 Quod enim figuratur, cùm perfectum fuerit, non dicimus *eſſe* id ex quo eſt: veluti ſtatuam *non dicimus eſſe* æs: aut pyramidem, ceram: aut lecticam, lignum: ſed denominãtes *dicimus* aliud eſſe æneum, aliud cereum, aliud ligneum. quod verò paſſum & variatum eſt, appellamus: nam dicimus *eſſe* aridum, & humidum, & durum, & calidum: item ceram. nec ſolùm ita, ſed etiam ipſum humidum, & E ipſum calidum dicimus *eſſe* æs, eodem nomine appellantes materiam, quo affectionem. Quapropter ſi ſecundùm figuram & formam nõ dicitur id quod eſt factum in quo eſt figura, ſecundùm autem affectiones & variationes dicitur: perſpicuum *eſt*, has generationes non eſſe variationes. 3 Præterea & ſic dicere, abſurdum videri poteſt: *nimirum* aut variari hominem, aut domum, aut quoduis aliud eorum quæ fiunt. ſed fortaſſe neceſſe *eſt*, vnumquodq; fieri aliquo variato, veluti materiâ denſatâ, aut rarefactâ, aut calefactâ, aut refrigeratâ: non tamen ea quæ fiunt, variantur, nec generatio ipſorum eſt variatio. 4 Quin nec corporis, nec animi habitus, *ſunt* variationes. etenim habituum alij *ſunt* virtutes, alij vitia:

verùm neque virtus neque vitium eſt variatio: ſed virtus *eſt* perfectio quædam: cùm enim vnumquodque propriam ſuam virtutem acceperit, tunc dicitur perfectum. tunc enim maximè id quod *eſt* ſecundùm naturam, *adeſt*: vt circulus perfectus *dicitur*, cùm maximè factus eſt circulus optimus. Vitium autem eſt *huius* interitus & amotio. quemadmodum igitur nec domus perfectionem vocamus variationem: (abſurdum enim *eſt*, ſi faſtigium ac tegula *ſit* variatio: vel ſi domus, cùm accipit faſtigium ac tegitur, variatur, ac non potius perficitur) eodem modo *ſe res habet* etiam in virtutibus & vitiis, & *in* habentibus & ſuſcipientibus *virtutes vel vitia*. nam illæ *ſunt* perfectiones: hæ verò *ſunt* amotiones: quare non *ſunt* variationes. 5 Præterea dicimus omnes virtutes in eo conſiſtere quod eſt ad aliquid aliquo modo affectum eſſe. corporis enim *virtutes*, vt ſanitatem, & firmam corporis conſtitutionem, in temperatione ac ſymmetria calidorum ac frigidorum collocamus, *ita vt* vel ipſa interna inter ſe *conferantur*, vel ad id quod continet. ſimiliter autem & pulchritudinem & robur, & alias virtutes, ac vitia. quælibet enim in eo conſiſtit quod eſt ad aliquid aliquo modo affectum eſſe: & ad proprias affectiones bene vel malè diſponit id in quo eſt. propriæ verò *affectiones dicuntur*, à quibus rem gigni & perimi comparatum natura eſt. quoniam igitur quæ ad aliquid *referuntur*, nec ipſa ſunt variationes, nec ipſorum eſt variatio, nec generatio, nec omnino vlla mutatio: perſpicuum *eſt*, neque habitus neque habituum amiſſiones & ſuſceptiones eſſe variationes. 6 Sed fieri fortaſſe hæc atque interire variatis quibuſdam neceſſe *eſt*, quemadmodum & ſpeciem ac formam, vtputa calidis & frigidis, vel ſiccis & humidis, vel in quibus primis inſunt. in his enim dicitur quodcumque vitium & virtus, à quibus natura aptum eſt variari id quod ea habet. virtus enim efficit impatibile, vel vt oportet patibile: vitium verò contrario modo patibile, & impatibile. 7 Similiter etiam *res habet* in animæ habitibus. hi namque omnes *in eo ſpectantur* quod eſt ad aliquid aliquo modo affectum eſſe. 8 Et virtutes quidem *ſunt* perfectiones: vitia verò, amotiones. 9 Præterea virtus bene diſponit ad proprias affectiones: vitium autem, malè. quare neque hæc erunt variationes, neque ipſorum amiſſiones, & ſuſceptiones. Neceſſe *eſt* autem hæc gigni variatâ parte ſenſitiua. variabitur autẽ à ſenſibilibus. omnis enim virtus moralis in voluptatibus & doloribus corporeis *verſatur*: quæ vel in actione, vel in memoria, vel in ſpe *conſiſtunt*. aliæ igitur *voluptates* conſiſtunt in actione ſenſus, adeò vt à ſenſibili aliquo *ſenſus* moueatur: aliæ verò in memoria, & ſpe *conſiſtentes*, ab hac *actione* oriuntur: aut enim recordantes, quæ paſſi ſunt, lætantur; aut ſperantes, quæ expectant. quapropter neceſſe *eſt*, omnem eiuſmodi voluptatem à ſenſibilibus fieri. Quoniam autem cùm voluptas & dolor gignitur, etiam virtus & vitium gignitur: (quandoquidem in his verſantur) voluptates verò & dolores *ſunt* variationes *partis* ſenſitiuæ: perſpicuum *eſt*, neceſſe *eſſe*, vt variato aliquo & hæc amittantur, & ſuſcipiantur. 11 Præterea horum generatio *eſt* cum variatione: ipſa verò non eſt variatio. 12 Sed neque partis intellectiuæ habitus *ſunt* variationes. nam ſciens maximè dicitur eſſe *in* eorum *numero* quæ ad aliquid *referuntur*. hoc autem manifeſtum *eſt*: quia ſcientia in nobis gignitur non ſecundùm aliquam facultatem motis, ſed cùm aliquid inſit. etenim ex particulari experientia

A οὐκ ἔστι δὲ οὔτε ἡ ἀρετή, οὔτε ἡ κακία ἀλλοίωσις· ἀλλ' ἡ μὲν ἀρετή, τελείωσίς τις ἐστίν· ὅταν [γὰρ] λάβῃ τὴν ἑαυτοῦ ἀρετήν, τότε λέγεται τέλειον ἕκαστον· τότε γάρ ἐστι μάλιστα τὸ κατὰ φύσιν· ὥσπερ κύκλος τέλειος, ὅταν μάλιστα γένηται κύκλος βέλτιστος. ἡ δὲ κακία, φθορὰ τούτου καὶ ἔκστασις. ὥσπερ οὖν οὔτε τὸ τῆς οἰκίας τελείωμα λέγομεν ἀλλοίωσιν· ἄτοπον γὰρ εἰ ὁ * θριγκὸς καὶ ὁ κέραμος ἀλλοίωσις, ἢ εἰ θριγκουμένη καὶ κεραμουμένη ἀλλοιοῦται, ἀλλὰ μὴ τελειοῦται ἡ οἰκία· τὸν αὐτὸν τρόπον καὶ ἐπὶ τῶν ἀρετῶν καὶ τῶν κακιῶν, καὶ τῶν ἐχόντων ἢ λαμβανόντων. αἱ μὲν γὰρ τελειώσεις, αἱ δὲ *γρ. θριγκὸς, & mox, θριγκουμένη
B ἐκστάσεις εἰσίν· ὥστε οὐκ ἀλλοιώσεις. 5 Ἔτι δὲ καὶ φαμὲν ἁπάσας εἶναι τὰς ἀρετὰς ἐν τῷ πρός τι πῶς ἔχειν· τὰς μὲν γὰρ τοῦ σώματος, οἷον ὑγίειαν καὶ εὐεξίαν, ἐν κράσει καὶ συμμετρίᾳ θερμῶν καὶ ψυχρῶν τίθεμεν, ἢ αὐτῶν πρὸς αὑτὰ τῶν ἐντός, ἢ πρὸς τὸ περιέχον. ὁμοίως δὲ καὶ τὸ κάλλος καὶ τὴν ἰσχύν, καὶ τὰς ἄλλας ἀρετὰς καὶ κακίας. ἑκάστη γάρ ἐστι τῷ πρός τι πῶς ἔχειν, καὶ περὶ τὰ οἰκεῖα πάθη εὖ ἢ κακῶς διατίθησι τὸ ἔχον· οἰκεῖα δ' ὑφ' ὧν γίγνεσθαι καὶ φθείρεσθαι πέφυκεν. ἐπεὶ οὖν τὰ πρός τι οὔτε αὐτά ἐστιν ἀλλοιώσεις, οὔτε αὐτῶν ἐστιν ἀλλοίωσις, οὔτε γένεσις, οὐδ' ὅλως οὐδὲ μεταβολὴ οὐδεμία,
C φανερὸν ὅτι οὐδ' αἱ ἕξεις, οὐδ' αἱ τῶν ἕξεων ἀποβολαὶ καὶ λήψεις, ἀλλοιώσεις εἰσίν. 6 Ἀλλὰ γίγνεσθαι μὲν ἴσως αὐτὰς καὶ φθείρεσθαι ἀλλοιουμένων τινῶν, ἀνάγκη, καθάπερ καὶ τὸ εἶδος, καὶ τὴν μορφήν, οἷον θερμῶν καὶ ψυχρῶν, ἢ ξηρῶν καὶ ὑγρῶν, ἢ ἐν οἷς τυγχάνουσιν οὖσαι πρώτοις· περὶ ταῦτα γὰρ ἑκάστη λέγεται κακία καὶ ἀρετή, ὑφ' ὧν ἀλλοιοῦσθαι πέφυκε τὸ ἔχον· ἡ μὲν γὰρ ἀρετή, ποιεῖ ἀπαθὲς ἢ ὡς δεῖ παθητικόν· ἡ δὲ κακία, παθητικὸν μὲν ἐναντίως καὶ ἀπαθές. 7 Ὁμοίως δὲ καὶ ἐπὶ τῶν τῆς ψυχῆς ἕξεων. ἅπασαι γὰρ καὶ αὗται τῷ πρός τι πῶς ἔχειν. 8 Καὶ αἱ μὲν ἀρεταὶ τελειώσεις· αἱ δὲ κακίαι, ἐκστάσεις.
D 9 Ἔτι δέ, ἡ μὲν ἀρετή, εὖ διατίθησι πρὸς τὰ οἰκεῖα πάθη· ἡ δὲ κακία, κακῶς. ὥστ' οὐδ' αὗται ἔσονται ἀλλοιώσεις· οὐδὲ δὴ καὶ ἀποβολαὶ καὶ αἱ λήψεις αὐτῶν. 10 Γίνεσθαι δ' αὐτὰς ἀναγκαῖον ἀλλοιουμένου τοῦ αἰσθητικοῦ μέρους, ἀλλοιωθήσεται δὲ ὑπὸ τῶν αἰσθητῶν· ἅπασα γὰρ ἡ ἠθικὴ ἀρετὴ περὶ ἡδονὰς καὶ λύπας τὰς σωματικάς· αὗται δὲ ἢ ἐν τῷ πράττειν, ἢ ἐν τῷ μεμνῆσθαι, ἢ ἐν τῷ ἐλπίζειν. αἱ μὲν οὖν * ἐν τῇ κατὰ τὴν αἴσθησίν εἰσιν, ὥσθ' ὑπὸ αἰσθητοῦ τινος κινεῖσθαι. αἱ δ' ἐν τῇ μνήμῃ καὶ τῇ ἐλπίδι, ἀπὸ ταύτης εἰσίν. ἢ γὰρ οἷα ἔπαθον μεμνημένοι ἥδονται, ἢ ἐλπίζοντες οἷα μέλλουσιν. ὥστ' ἀνάγκη *[illegible]
E πᾶσαν τὴν τοιαύτην ἡδονήν, ὑπὸ τῶν αἰσθητῶν γίγνεσθαι. ἐπεὶ δ' ἡδονῆς καὶ λύπης ἐγγιγνομένης, καὶ ἡ κακία, καὶ ἡ ἀρετὴ ἐγγίνεται· (περὶ ταύτας γάρ εἰσιν·) αἱ δὲ ἡδοναὶ καὶ αἱ λῦπαι ἀλλοιώσεις τοῦ αἰσθητικοῦ· φανερὸν ὅτι ἀλλοιουμένου τινός, ἀνάγκη καὶ ταύτας ἀποβάλλειν, καὶ λαμβάνειν. 11 Ἔτι, ἡ μὲν γένεσις αὐτῶν μετ' ἀλλοιώσεως, αὕτη δ' οὐκ ἔστιν. 12 Ἀλλὰ μὴν οὐδὲ τοῦ διανοητικοῦ μέρους τῆς ψυχῆς ἡ ἀλλοίωσις. τὸ γὰρ ἐπιστῆμον μάλιστα τῶν πρός τι λέγεται. τοῦτο δὲ δῆλον· κατ' οὐδεμίαν γὰρ δύναμιν κινηθεῖσιν ἐγγίνεται τὸ τῆς ἐπιστήμης, ἀλλ' ὑπάρξαντός τινος· ἐκ γὰρ τῆς κατὰ μέρος ἐμπειρίας τὴν

καθόλου λαμβανόμεθα ἐπιστήμην. 13 Οὐδὲ δὴ ἡ ἐνέργεια γένεσις, εἰ μή τις καὶ τὴν ἀνάβλεψιν καὶ τὴν ἁφὴν γένεσιν φησί· τοιοῦτον γὰρ ἡ ἐνέργεια. 14 Πάλιν δὲ τῆς χρήσεως καὶ τῆς ἐνεργείας οὐκ ἔστι γένεσις, εἰ μή τις καὶ τῆς ἀναβλέψεως, καὶ τῆς ἁφῆς οἴεται γένεσιν εἶναι, καὶ τὸ ἐνεργεῖν ὅμοιον τούτοις. 15 Ἡ δὲ ἐξ ἀρχῆς λῆψις τῆς ἐπιστήμης, γένεσις μὲν οὐκ ἔστιν, οὐδ᾽ ἀλλοίωσις· τὸ γὰρ ἠρεμῆσαι καὶ στῆναι τὴν διάνοιαν, ἐπίστασθαι καὶ φρονεῖν λεγόμεθα. εἰς δὲ τὸ ἠρεμεῖν, οὐκ ἔστι γένεσις· ὅλως γὰρ οὐδεμιᾶς μεταβολῆς, καθάπερ εἴρηται πρότερον. 16 Ἔτι δέ, ὥσπερ ὅταν ἐκ τοῦ μεθύειν, ἢ καθεύδειν, ἢ νοσεῖν εἰς τἀναντία μεταστῇ τις, οὔ φαμεν ἐπιστήμονα γεγονέναι πάλιν. καίτοι ἀδυνάτως* ἦν τῇ ἐπιστήμῃ χρῆσθαι πρότερον. οὕτως οὐδ᾽ ὅταν ἐξ ἀρχῆς λαμβάνῃ τὴν ἕξιν· τῷ γὰρ καθίστασθαι τὴν ψυχὴν ἐκ* τῆς ἠθικῆς ἀρετῆς, φρόνιμόν τι γίνεται καὶ ἐπιστῆμον. 17 Διὸ καὶ τὰ παιδία οὔτε μανθάνειν δύναται, οὔτε κατὰ τὰς αἰσθήσεις ὁμοίως κρίνειν τοῖς πρεσβυτέροις· πολλὴ γὰρ ἡ ταραχὴ καὶ ἡ κίνησις. *καθίσταται δὲ καὶ ἠρεμίζεται, πρὸς ἔνια δ᾽ ὑπ᾽ ἄλλων. 18 Ἐν ἀμφοτέροις δὲ ἀλλοιουμένων τινῶν τῶν ἐν σώματι, καθάπερ ἐπὶ* τῆς ἐγέρσεως, καὶ τῆς ἐνεργείας, ὅταν νήφων γίνηται καὶ ἐγερθῇ. 10 Φανερὸν οὖν ἐκ τῶν εἰρημένων, ὅτι τὸ ἀλλοιοῦσθαι καὶ ἀλλοίωσις, ἔν τε τοῖς αἰσθητοῖς γίνεται, καὶ ἐν τῷ αἰσθητικῷ μορίῳ τῆς ψυχῆς· ἐν ἄλλῳ δὲ οὐδενί, πλὴν κατὰ συμβεβηκός.

* Scrib. ὦν τ.

* κ. τῆς φυσικῆς

* emendandus locus ex paraphraſi, vbi ſic legitur, καθίσταται δὲ ἢ παύεται τῆς ταραχῆς ποτὲ μὲν ὑπὸ τῆς φύσεως ποτὲ δὲ ὑπ᾽ ἄλλων.

* κ. τῆς χρήσεως

A vniuerſalem ſcientiam accipimus. 13 Neque igitur actio *eſt* generatio : niſi quis & aſpectum, & tactum, generationes *eſſe* inquiat : nam actio *eſt* tale quidpiam. 14 Rurſus ipſius vſus & actionis non eſt generatio : niſi quis etiam ipſius aſpectus ac tactus putet generationem eſſe. atque agere eſt his ſimile. 15 Prima verò ſcientiæ acquiſitio non eſt generatio, nec variatio. nam quieuiſſe ac ſtetiſſe dianœam, *id* vocamus ſcire ac prudentem eſſe. ad quietem autem non eſt generatio : quoniam omnino nullius motionis *eſt*, quemadmodum antea dictum fuit. 16 Præterea ſicuti cùm ex ebrietate, aut ſomno, aut morbo, in contraria quiſpiam eſt mutatus, non dicimus eum iterum ſcientem factum eſſe, quamquam ſcientiâ vti antea non poſſet : ita nec quando ab initio B ſumit *aliquis* habitum. nam eò quòd ſiſtitur anima à morali virtute, fit aliquid prudens, & ſciens. 17 Ideóque pueri nec intelligere poſſunt, nec ſenſibus æquè iudicare, vt ſeniores : quia multa *in eis eſt* perturbatio, & motio. ſedantur autem, & à perturbatione liberantur, quandoque à natura, quandoque ab aliis. 18 Sed in vtriſque *hoc accidit*, dum quædam, quæ corpore *ſunt*, variantur, quemadmodum in expergefactione & actione *euenit*, cùm aliquis ſobrius fit, & expergiſcitur. 19 Perſpicuum igitur *eſt* ex iis quæ dicta ſunt, ipſum variari, & variationem, in rebus ſenſilibus fieri, & in ſenſitiua animæ parte; non in vlla alia, niſi ex accidenti.

De motuum comparatione. Cap. V.

Ἀπορήσειε δ᾽ ἄν τις πότερον ἔσται κίνησις πᾶσα πάσῃ συμβλητή, ἢ οὔ. 2 Εἰ δὴ ἐστὶ πᾶσα συμβλητή, καὶ ὁμοταχὲς τὸ ἐν ἴσῳ χρόνῳ ἴσον κινούμενον, ἔσται περιφερής τις ἴση εὐθείᾳ, καὶ μείζων δὴ καὶ ἐλάττων. 3 Ἔτι, ἀλλοίωσις καὶ φορά τις ἴση, ὅταν ἐν ἴσῳ χρόνῳ, τὸ μὲν ἀλλοιωθῇ, τὸ δ᾽ ἐνεχθῇ. ἔσται ἄρα ἴσον τὸ πάθος μήκει· ἀλλ᾽ ἀδύνατον. ἀλλ᾽ ἄρα ὅταν ἐν ἴσῳ χρόνῳ ἴσον κινηθῇ, τότε ἰσοταχές· ἴσον δὲ οὐκ ἔστι* πάθος μήκει. ὥστε οὐκ ἔστιν ἀλλοίωσις φορᾷ ἴση, οὐδὲ ἐλάττων, ὥστε οὐ πᾶσα συμβλητή. 4 Ἐπὶ δὲ τοῦ κύκλου καὶ τῆς εὐθείας πῶς συμβήσεται; ἄτοπόν τε γὰρ εἰ μὴ ἔσται κύκλῳ, ὁμοίως τοῦτο κινεῖσθαι, καὶ τοῦτο ἐπὶ τῆς εὐθείας· ἀλλὰ εὐθὺς ἀνάγκη ἢ θᾶττον, ἢ βραδύτερον, ὥσπερ εἰ, τὸ μὲν κάταντες, τὸ δ᾽ ἄναντες. 5 Ἔτι οὐδὲν διαφέρει οὐδ᾽ ἐν τῷ λόγῳ, εἴ τις φήσειεν ἀνάγκην εἶναι θᾶττον εὐθὺς ἢ βραδύτερον κινεῖσθαι· ἔσται γὰρ μείζων καὶ ἐλάττων ἡ περιφερὴς τῆς εὐθείας, ὥστε καὶ ἴση. εἰ γὰρ ἐν τῷ α χρόνῳ, τὸ μὲν τὴν β διῆλθε, τὸ δὲ τὴν γ, μείζων ἂν εἴη ἡ β τῆς γ. οὕτω γὰρ τὸ θᾶττον ἐλέγετο. οὐκοῦν καὶ εἰ ἐν ἐλάττονι ἴσον θᾶττον· ὥστ᾽ ἔσται τι μέρος τοῦ α ἐν ᾧ τὸ β τοῦ κύκλου τὸ ἴσον δίεισι, καὶ τὸ γ ἐν ὅλῳ τῷ α τὴν γ. 6 Ἀλλὰ μὴν εἰ ἔστι ξυμβλητά, συμβαίνει τὸ ἄρτι ῥηθὲν ἴσην εὐθεῖαν εἶναι κύκλῳ· ἀλλ᾽ οὐ ξυμβλητά· οὐδ᾽ ἄρα αἱ κινήσεις. 7 Ἀλλ᾽ ὅσα μὴ ὁμώνυμα, ἅπαντα ξυμβλητά. οἷον διὰ τί οὐ ξυμβλητόν, πότερον ὀξύτερον τὸ γραφεῖον, ἢ ὁ οἶνος, ἢ ἡ νήτη; ὅτι γὰρ ὁμώνυμα, οὐ ξυμ-

* γρ. πάθος τῷ μ.

C Dubitare autem quiſpiam poſſit, an omnis motus ſit omni motui comparabilis, necne. 2 Si igitur omnis *motus* ſit comparabilis; & æquè velox *ſit*, quod æquali tempore per æquale mouetur : *certè* aliqua *linea* circularis erit rectæ æqualis, & maior quoque, & minor. 3 Præterea variatio & latio quædam *erunt* æquales, cùm *ſcilicet* æquali tempore alterum variatum, alterum illatum fuerit. erit igitur æqualis affectio longitudini : quod *eſt* impoſſibile. Verùm cùm æquali tempore per æquale motum fuerit, tunc æquè velox *dicitur*. ſed affectio non eſt longitudini æqualis. quapropter variatio non eſt lationi æqualis, nec minor. Quare non omnis *motus eſt* comparabilis. 4 In circulo autem & recta linea quonam modo accidet? quippe abſurdum *eſt*, niſi poterit ſimiliter hoc moueri circulo, & illud in rectum, D ſed illico neceſſe ſit aut celeriùs aut tardiùs *moueri*. perinde ac ſi alterum eſſet decliue, alterum accliue. 5 Præterea nihil refert, quod ad hanc rationem *attinet*, ſi quis dixerit neceſſe eſſe vt illico celeriùs vel tardiùs moueatur : erit enim maior & minor *linea* circularis, quã recta. quare *erit* etiam æqualis. nam ſi in α tempore alterum conficit *lineam* β, alterum *lineam* γ : vtiquè maior erit *linea* β, quàm γ : ſic enim celeriùs dicebatur. ergo & ſi minori *tempore* æquale *ſpatium conficiat*, celerius *erit*. quocirca erit aliqua pars *temporis* α, qua *mobile* β æqualem circuli *partem* conficit, atque *mobile* γ, toto α *tempore* conficit *lineam* γ. 6 At verò ſi ſint comparabilia, euenit quod nuper dictum fuit, rectam *lineam* eſſe circulo æqualem. atqui *hæc* non *ſunt* comparabilia. proinde neque motus. 7 Sed quæcunque non ſunt homonyma, *ea* omnia *ſunt* comparabilia. veluti, cur non eſt comparabile quodnam ſit acutius, ſtilúſne, an vinum, an nete? quia ſcilicet *ſunt* homonyma, *ideo*, non *ſunt* compa-

rabilia. ſed nete cum proxima chorda cõferri poteſt: quoniam acutum in vtriſque idem ſignificat. num igitur velox non idem ſignificat hic & ibi? multò autem minùs in variatione & latione. 8 An primum quidem hoc non eſt verum, ſi homonyma non *ſunt*, comparabilia *eſſe*? multum enim, idem ſignificat in aqua & aëre: nec *tamen hæc ſunt* comparabilia. Si verò non *ita ſit*, at certè duplum, idem *ſignificat*, nempe duo ad vnum. neque *hæc ſunt* comparabilia. 9 An & in his eſt eadem ratio? nam & multum *eſt* homonymum. ſed quorundam etiam definitiones *ſunt* homonymæ: veluti, ſi quis dicat multum *eſſe* tantum, & ſuper aliud: tantum, & æquale, *eſt* homonymum. ſed & vnum fortaſſis illico *eſt* homonymum: quòd ſi hoc *eſt*, etiam duo: alioqui cur alia *eſſent* comparabilia, alia minimè? ſi ſit vna natura. 10 An quia in alio primo receptaculo? equus igitur & canis ſunt res comparabiles, vtrum *ſcilicet ſit* candidius: quoniam *id*, in quo primo *ineſt candor*, *eſt* idem, *nempe* ſuperficies. & ſecundùm magnitudinem itidem *res ſunt comparabiles*. ſed aqua & vox nequaquam: quoniam *eſt* in alio. 11 An manifeſtum *eſt*, ita fore vt omnia liceat vnum facere, ſed dicere vnumquodque eſſe in alio: atque idem erit æquale & dulce & candidum, ſed in alio. 12 Præterea non quoduis eſt receptaculum, ſed vnum *eſt* vnius primum. 13 Num igitur non ſolùm oportet ea quæ ſunt comparabilia, non eſſe homonyma, ſed etiam neque *id* quod *comparatur*, neque id in quo *illud eſt*, habere differentiam? Verbi gratia, color recipit differentiam, ſeu diuiſionem: ergo non *eſt aliquid* ſecundùm hunc comparabile: veluti vtrum magis coloratum ſit, non ratione alicuius coloris, ſed quatenus eſt color: verùm *eſt comparabile* ratione alboris. 14 Ita etiam in motu æquè velox *dicitur*, quod æquali tempore motum eſt *per* tantum æquale. Si igitur hoc *tempore*, pars magnitudinis variata eſt, pars verò illata: æqualiſne eſt hæc variatio & æquè velox ac latio? ſed *hoc eſt* abſurdum. cauſa verò *eſt*, quia motus habet ſpecies. 15 Quare ſi ea quæ æquali tempore feruntur per æqualem longitudinem, *ſunt* æquè velocia, *linea* recta & circularis erunt æquales. 16 Vtrum igitur cauſa *eſt*, quia latio *eſt* genus, an quia linea *eſt* genus? nam tempus idem *eſt* ſemper indiuiduum ſpecie. An ea ſimul ſpecie differunt? etenim latio ſpecies habet, ſi illud habeat ſpecies, in quo mouetur. 17 Præterea ſi *id* per quod *fit motus*: veluti, ſi *ſint* pedes, ambulatio: ſi alæ, volatus; an non, ſed figuris *tantùm* latio diuerſa *eſt*? 18 Quapropter ea quæ æquali tempore *per* eandem magnitudinem mouentur, *ſunt* æquè velocia: eadem autem *magnitudo eſt*, *quæ* non diuiditur in ſpecies, & motus *ſimiliter idem*, qui non diuiditur in ſpecies. 19 Quocirca hoc *eſt* conſiderandum, quænam *ſit* differentia motus. 20 Atque hic ſermo indicat genus non *eſſe* vnum quid, ſed propter hoc multa latere. 21 Homonymiarum autem aliæ longè diſtant: aliæ quandam ſimilitudinem habent: aliæ *ſunt* propinquæ aut genere, aut proportione: ideo non videntur homonymiæ, cùm *tamen* ſint. 22 Quando igitur ſpecies diuerſa eſt? *vtrùm* ſi eadem *eſt* in alio, an ſi alia in alio? & quæ-*nam eſt* definitio, ſeu quo-*nam* iudicamus album & dulce *eſſe* idem, vel diuerſum? An quia in alio videtur *ſpecies* diuerſa? an quia omnino non *eſt* eadem? 23 Quod igitur ad variationem *attinet*, quo modo altera eſt æquè velox atque altera? Sanè ſi ſanari eſt variari, & fieri poteſt, vt alius celeriter: alius tardè ſanetur: etiam *fieri poteſt*, vt quidam ſimul *ſanentur*. quapropter eſt variatio æquè velox: æquali enim tempore variatum eſt.

A βλητά· ἀλλ' ἡ νήτη τῇ παρανήτῃ ξυμβλητή, ἐπεὶ τὸ αὐτὸ* σημαίνει τὸ ὀξὺ ἐπ' ἀμφοῖν. ἆρ' οὖν οὐ ταὐτὸ τὸ ταχὺ ἐνταῦθα, κἀκεῖ; πολὺ δὲ ἔτι ἧττον ἐν ἀλλοιώσει καὶ φορᾷ. 8 Ἢ πρῶτον μὲν τοῦτο οὐκ ἀληθές,* ὡς εἰ μὴ ὁμώνυμα, ξυμβλητά. τὸ γὰρ πολὺ τὸ αὐτὸ* σημαίνει ἐν ὕδατι καὶ ἀέρι, καὶ οὐ συμβλητά. εἰ δὲ μή, τό γε διπλάσιον τὸ αὐτό. δύο γὰρ πρὸς ἕν, καὶ οὐ συμβλητά. 9 Ἢ καὶ ἐπὶ τούτων ὁ αὐτὸς λόγος, καὶ γὰρ τὸ πολὺ ὁμώνυμον. ἀλλ' ἐνίων* καὶ οἱ ὁμώνυμοι λόγοι. οἷον εἰ λέγοι τις, ὅτι τὸ πολύ, τὸ τοσοῦτον, καὶ* ἔτι ἄλλο τὸ τοσοῦτον· καὶ τὸ ἴσον ὁμώνυμον, καὶ τὸ ἓν δέ, εἰ
B ἔτυχεν εὐθὺς ὁμώνυμον. εἰ δὲ τοῦτο, καὶ τὰ δύο· ἐπεὶ διὰ τί τὰ μὲν συμβλητά, τὰ δὲ οὔ, εἴπερ ἦν μία φύσις; 10 Ἢ ὅτι ἐν ἄλλῳ πρώτῳ δεκτικῷ; ὁ μὲν οὖν ἵππος, καὶ ὁ κύων, ξυμβλητά, πότερον λευκότερον· ἐν ᾧ γὰρ πρώτῳ τὸ αὐτό, ἡ ἐπιφάνεια· καὶ κατὰ μέγεθος ὡσαύτως. ὕδωρ δὲ καὶ φωνὴ οὔ· ἐν ἄλλῳ γάρ. 11 Ἢ δῆλον ὅτι ἔσται οὕτω γε πάντα ἓν ποιεῖν, ἐν ἄλλῳ δ' ἕκαστον φάσκειν εἶναι, καὶ ἔσται ταὐτὸν ἴσον, καὶ γλυκύ, καὶ λευκόν, ἀλλ' ἐν ἄλλῳ. 12 Ἔτι δεκτικὸν οὐ τὸ τυχόν ἐστιν, ἀλλ' ἓν ἑνὸς τὸ πρῶτον. 13 Ἀλλ' ἆρα οὐ μόνον δεῖ τὰ ξυμβλητὰ μὴ ὁμώνυμα εἶναι, ἀλλὰ καὶ
C μὴ ἔχειν διαφοράν, μήτε ὅ,* μήτ' ἐν ᾧ. λέγω δέ, οἷον χρῶμα* ἔχει διαίρεσιν. τοιγαροῦν οὐ συμβλητὸν κατὰ τοῦτο, οἷον πότερον κεχρωμάτισται μᾶλλον, (μὴ κατά τι χρῶμα, ἀλλ' ᾗ χρῶμα) ἀλλὰ κατὰ τὸ λευκόν. 14 Οὕτω καὶ περὶ κίνησιν ὁμοταχὲς τὸ ἐν ἴσῳ χρόνῳ κινηθὲν ἴσον* τοσονδί. εἰ δὴ τοῦ μήκους ἐν τῳδί, τὸ μὲν ἠλλοιώθη, τὸ δὲ ἠνέχθη, ἴση ἄρα αὕτη ἡ ἀλλοίωσις καὶ ὁμοταχὴς τῇ φορᾷ; ἀλλ' ἄτοπον. αἴτιον δ', ὅτι ἡ κίνησις ἔχει εἴδη. 15 Ὥστε εἰ τὰ ἐν ἴσῳ χρόνῳ ἐνεχθέντα ἴσον μῆκος, ἰσοταχῆ ἔσται, ἴση ἡ εὐθεῖα καὶ ἡ περιφερής. 16 Πότερον οὖν αἴτιον, ὅτι ἡ φορὰ γένος, ἢ
D ὅτι ἡ γραμμὴ γένος; ὁ μὲν γὰρ χρόνος ὁ αὐτὸς ἀεὶ ἄτομος τῷ εἴδει,* ἢ καὶ ἅμα ἐκεῖνα εἴδει διαφέρει. καὶ γὰρ ἡ φορὰ εἴδη ἔχει, ἂν ἐκεῖνο ἔχῃ εἴδη, ἐφ' οὗ κινεῖται.* 17 Ἔτι δέ, ἂν δι' οὗ, οἷον εἰ πόδες, βάδισις· εἰ πτέρυγες, πτῆσις, ἢ οὔ; ἀλλὰ τοῖς σχήμασιν ἡ φορὰ ἄλλη. 18 Ὥστε τὰ ἐν ἴσῳ χρόνῳ τὸ αὐτὸ μέγεθος κινούμενα, ἰσοταχῆ· τὸ αὐτὸ δὲ ἀδιάφορον εἴδει, καὶ κινήσεως ἀδιάφορον εἴδει. 19 Ὥστε, τοῦτο σκεπτέον, τίς διαφορὰ κινήσεως. 20 Καὶ σημαίνει γε ὁ λόγος οὗτος, ὅτι τὸ γένος οὐχ ἕν τι, ἀλλὰ παρὰ τοῦτο λανθάνει πολλά. 21 Εἰσί τε τῶν ὁμωνυμιῶν, αἱ μὲν πολὺ ἀπέχουσαι, αἱ δὲ τινὰ ὁμοιότητα ἔχουσαι, αἱ δὲ
E ἐγγύς, ἢ γένει, ἢ ἀναλογίᾳ. διὸ οὐ δοκοῦσιν ὁμωνυμίαι εἶναι, οὖσαι. 22 Πότερον οὖν ἕτερον τὸ εἶδος, ἐὰν ταὐτὸ ἐν ἄλλῳ, ἢ ἂν ἄλλο ἐν ἄλλῳ, καὶ τίς ὅρος, ἢ τῷ κρινοῦμεν, ὅτι ταὐτὸ τὸ λευκόν,* καὶ τὸ γλυκύ, ἢ ἄλλο· ἢ ὅτι ἐν ἄλλῳ φαίνεται ἕτερον, ἢ ὅτι ὅλως οὐ ταὐτό. 23 Περὶ δὴ ἀλλοιώσεως πῶς ἔσται ἰσοταχὴς ἑτέρα ἑτέρᾳ; εἰ δή ἐστι τὸ ὑγιάζεσθαι ἀλλοιοῦσθαι, ἔστι δέ, τὸν μὲν ταχύ, τὸν δὲ βραδέως ἰαθῆναι, καὶ ἅμα τινάς· ὥστ' ἔσται ἀλλοίωσις ἰσοταχής· ἐν ἴσῳ γὰρ χρόνῳ ἠλλοιώθη.

* γρ. σημαίνειν
* γρ. ὥστ' εἰ
* γρ. συμβαίνει
* Scrib. ἐνίων λεγόμενοι.
* γρ. ἔτι ἄλλος τις.
* γρ. μήτε ᾧ ἐν ᾧ
* γρ. ἔχει διαφορὰν ἔτι.
* γρ. τοσονδὶ τοῦ μήκους ἐν τῳδί. εἰ δὲ τὸ μὲν ἠλλ.
* γρ. ἢ ἅμα κἀκεῖνα ἀδιάφορα· al. ἢ ἅμα ἐκεῖνα δεῖ εἴδει δ.
* γρ. ἐπὶ ᾧ, ἐν ᾧ.
* γρ. ἢ τί τῷ.

A 24 Ἀλλὰ τί ἠλλοίωται; τὸ γὰρ ἴσον οὐκ ἔστιν ἐνταῦθα λεγόμενον, ἀλλ' ὡς ἐν τῷ ποσῷ ἰσότης, ἐνταῦθα ὁμοιότης. ἀλλ' ἔστω τὸ αὐτὸ μεταβάλλον ἐν ἴσῳ χρόνῳ ἰσοταχές. 25 Πότερον οὖν ἐν ᾧ τὸ πάθος, ἢ τὸ πάθος δεῖ συμβάλλειν; ἐνταῦθα μὲν δὴ ὅτι ἡ ὑγίεια ἡ αὐτή, ἔστι λαβεῖν, ἢ ὅτι οὔτε μᾶλλον, οὔτε ἧττον, ἀλλ' ὁμοίως ὑπάρχει. ἐὰν δὲ τὸ πάθος ἄλλο ᾖ, οἷον ἀλλοιοῦται τὸ λευκαινόμενον, * καὶ τὸ ὑγιαζόμενον, τούτοις οὐδὲν τὸ αὐτό, οὐδ' ἴσον, οὐδ' ὅμοιον, ᾗ ἤδη ταῦτα εἴδη ποιεῖ ἀλλοιώσεως, καὶ οὐκ ἔστι μία, ὥσπερ οὐδὲ φορά. 26 Ὥστε ληπτέον πόσα εἴδη ἀλλοιώσεως, καὶ πόσα φορᾶς. 27 Εἰ μὲν οὖν τὰ κινούμενα εἴδει διαφέρει, ὧν εἰσὶν αἱ κινήσεις καθ' αὑτά, καὶ μὴ κατὰ συμβεβηκός, καὶ αἱ κινήσεις εἴδει διοίσουσιν· εἰ δὲ γένει, γένει· εἰ δὲ ἀριθμῷ, ἀριθμῷ. 28 Ἀλλὰ δὴ πότερον εἰς τὸ πάθος δεῖ βλέψαι, ἐὰν ᾖ τὸ αὐτὸ ἢ ὅμοιον, εἰ ἰσοταχεῖς αἱ ἀλλοιώσεις, ἢ εἰς τὸ ἀλλοιούμενον, οἷον εἰ τοῦ μὲν τοσονδὶ λελεύκανται, τοῦ δὲ τοσονδί; ἢ εἰς ἄμφω; καὶ ἡ αὐτὴ μέν, ἢ ἄλλη τῷ πάθει, εἰ τὸ αὐτό, ἢ ἄλλο· ἴση δὲ ἢ ἄνισος, εἰ ἐκεῖνο ἴσον ἢ ἄνισον. 29 Καὶ ἐπὶ γενέσεως δὲ καὶ φθορᾶς τὸ αὐτὸ σκεπτέον, πῶς ἰσοταχὴς ἡ γένεσις, εἰ ἐν ἴσῳ χρόνῳ τὸ αὐτὸ καὶ ἄτομον, οἷον ἄνθρωπος, ἀλλὰ μὴ ζῷον· θάττων δέ, C εἰ ἐν ἴσῳ ἕτερον· οὐ γὰρ * ἔχομέν τινα δύο, ἐν οἷς ἡ ἑτερότης, ὡς ἡ ἀνομοιότης. καὶ εἰ ἔστιν ἀριθμὸς ἡ οὐσία, πλείων ἢ ἐλάττων ἀριθμὸς ὁμοειδής, ἀλλ' ἀνώνυμον τὸ κοινόν, καὶ τὸ ἑκάτερον [ποιόν· τὸ μὲν ποιόν,] ὥσπερ τὸ πλεῖον πάθος, ἢ τὸ ὑπερέχον μᾶλλον, τὸ δὲ ποσὸν μεῖζον.

* γ. ὑγιαζ.

* γ. ἔχομέν τι.

A 24 Sed quid variatũ eſt? nam æquale hîc non dicitur, ſed vt eſt in quantitate æqualitas, ita hîc ſimilitudo, ſed eſto æquè velox, quod idem mutatur æquali tempore. 25 Vtrùm igitur id conferre oportet in quo eſt affectio, an ipſam affectionem? hîc ſanè licet ſumere ſanitatem eſſe eandem, vel neque plus neque minus, ſed ſimiliter ineſſe. ſi verò affectio diuerſa ſit: vt putà variatur, quod albeſcit, & quod ſanatur: his nihil eſt idem, nec æquale, nec ſimile; quatenus hæc faciunt ſpecies variationis; nec eſt vna variatio, ſicuti nec vna latio. 26 Quocirca ſumendum eſt, quot ſint ſpecies variationis, & quot ſpecies B lationis. 27 Si igitur ea quæ mouentur, ſpecie differunt, ea ſcilicet quorum ſunt motiones per ſe, non ex accidenti: etiam motiones ſpecie differunt. ſin autem genere, genere: ſin numero, numero. 28. Sed vtrùm ad affectionem reſpicere oportet, ſitne eadem vel ſimilis, ſi variationes ſint ſimiles, an id quod variatur, (vt putà ſi huius tantùm eſt dealbatio, illius verò tantùm) an ad vtrumque? & eadem quidem vel diuerſa eſt variatio ratione affectionis, ſi affectio ſit eadem vel diuerſa: æqualis autem vel inæqualis eſt variatio, ſi affectio illa ſit æqualis vel inæqualis. 29 Quin & in generatione & interitu idem conſiderandum eſt, quomodo generatio ſit æquè velox, nempe C ſi æquali tempore idem atque indiuiduum gignatur, vt homo, non autem animal. velocior autẽ, ſi æquali tempore diuerſum: non habemus enim duo aliqua, in quibus ſit diuerſitas, vt diſſimilitudo. & ſi eſſentia eſt numerus; certè maior vel minor numerus eſt eiuſdem ſpeciei. ſed nomine caret id quod eſt cõmune, & vtrumque: velut plus affectionis, ſeu quod excedit, dicitur magis: quantum autem, dicitur maius.

De motuum proportione. Cap. VI.

Ἐπεὶ δὲ τὸ κινοῦν κινεῖ ἀεί τι, καὶ ἔν τινι, καὶ μέχρι του· D λέγω δέ, τὸ μὲν ἔν τινι, ὅτι ἐν χρόνῳ· τὸ δὲ μέχρι του, ὅτι ποσόν τι μῆκος· ἀεὶ γὰρ ἅμα κινεῖ καὶ κεκίνηκεν. ὥστε ποσόν τι ἔσται ὃ ἐκινήθη, καὶ ἐν ποσῷ. 2 Εἰ δή, τὸ μὲν α τὸ κινοῦν, τὸ δὲ β τὸ κινούμενον· ὅσον δὲ κεκίνηται μῆκος, τὸ γ· ἐν ὅσῳ δὲ ὁ χρόνος ἐφ' οὗ δ. ἐν δὴ τῷ ἴσῳ χρόνῳ ἡ ἴση δύναμις ἡ ἐφ' ᾧ α, τὸ ἥμισυ τοῦ β διπλασίαν τῆς γ κινήσει· τὴν δὲ τὸ γ, ἐν τῷ ἡμίσει τοῦ δ. οὕτω γὰρ ἀνάλογον ἔσται. 3 Καὶ εἰ ἡ αὐτὴ δύναμις τὸ αὐτὸ ἐν τῳδὶ τῷ χρόνῳ, τὴν τοσήνδε κινεῖ, καὶ τὴν ἡμίσειαν ἐν τῷ ἡμίσει, καὶ ἡ ἡμίσεια ἰσχὺς τὸ ἥμισυ κινήσει, ἐν τῷ ἴσῳ E χρόνῳ τὸ ἴσον. οἷον τῆς α δυνάμεως ἔστω ἡμίσεια ἡ τὸ ε, καὶ τοῦ β τὸ ζ ἥμισυ· ὁμοίως δὴ ἔχουσι καὶ ἀνάλογον ἡ ἰσχὺς πρὸς τὸ βάρος. ὥστε τὸ ἴσον ἐν ἴσῳ χρόνῳ κινήσουσι. 4 Καὶ εἰ τὸ ε τὸ ζ κινεῖ ἐν τῷ δ τὴν γ, οὐκ * ἀνάγκη ἐν τῷ ἴσῳ χρόνῳ τὸ ἐφ' οὗ ε τὸ διπλάσιον τοῦ ζ κινεῖν, τὴν ἡμίσειαν τῆς γ. 5 Εἰ δὴ τὸ α, τὴν τὸ β κινήσει ἐν τῷ δ, ὅσην ἡ γ, τὸ ἥμισυ τοῦ α, τὸ ἐφ' οὗ ε, τὴν τὸ β οὐ κινήσει ἐν τῷ χρόνῳ ἐφ' ᾧ δ, οὐδ' ἔν τινι τοῦ δ τι τῆς γ, ἢ ἀνάλογον πρὸς τὴν ὅλην τὴν γ, ὡς τὸ α πρὸς τὸ ε· ὅλως γὰρ εἰ ἔτυχεν, οὐ κινήσει οὐδέν· εἰ γὰρ ἡ ὅλη ἰσχὺς τοσήνδε ἐκίνησεν, ἡ ἡμίσεια οὐ κινήσει, οὔτε ποσήν, οὔτε ἐν ὁποσῳοῦν· εἷς γὰρ ἂν κινοίη

* γ. ἀναγκαῖον

D CVm autem id quod mouet, aliquid ſemper moueat, & in aliquo, & vſque ad aliquid: (dico autem in aliquo, quia in tempore mouet. vſque ad aliquid verò, quia per quantam aliquam longitudinem: ſemper enim ſimul mouet & mouit: quapropter erit quantum quiddam, quod motum eſt, & in quanto.) 2 Si igitur τὸ α eſt quod mouet: τὸ β autem, quod mouetur: τὸ γ verò, lõgitudo per quam motum eſt: tempus autem, quo mouetur, eſt vbi δ: ſanè æquali tempore æqualis vis, quæ eſt vbi α, dimidium ipſius β mouebit per longitudinem duplo maiorem quàm γ: per longitudinem autem γ mouebit in dimidio temporis δ. ſic enim erit proportio. 3 Etſi eadem vis E idem pondus hoc tempore per tantam longitudinem mouet: etiam per dimidiam longitudinis partem mouebit dimidiato tempore: & dimidiatá vis dimidiatum pondus mouebit æquali tempore per æquale ſpatium. Vt puta virtutis α eſto dimidia virtus ε: & ponderis β, eſto dimidium τὸ ζ. ſimiliter itaque affecta erũt: & eandem rationem habebit vis ad pondus. quapropter per æquale ſpatium æquali tempore mouebunt. Et ſi τὸ ε mouet pondus ζ tempore δ per longitudinem γ: non eſt neceſſe, vt æquali tempore τὸ ε moueat duplum ponderis ζ per dimidiam partem longitudinis γ. 5 Si igitur τὸ α mouebit pondus β in tempore δ per longitudinem γ non propterea dimidium τοῦ α, nempe τὸ ε, mouebit pondus β in tempore δ: nec in aliqua parte temporis δ mouebit per aliquam partem longitudinis γ, ſeu quæ eandem rationem habeat ad totam longitudinem γ, vt virtus α ad virtutem ε. omnino n. fortaſſe per nullam ſpatij partem mouebit. nam ſi tota vis per tantam longitudinem mouit: non propterea vis dimidiata mouebit, nec per quantamvis longitudinem, nec quouis tempore. alioqui vnus moueret naui-

giur, ſi eorum qui nauigium trahunt, vis diuidere- A tur in numerum, & longitudinem *per* quam omnes mouerunt. 6 Idcirco Zenonis ratio non *eſt* vera, quantamuis milij partem ſonum edere: quia nihil prohibet, quominùs nullo tempore moueat hunc aërem, quem totus incidens modius mouebat. nec igitur tantam partem, quantam moueret vnà cum toto, hæc *milij pars*, ſi ſit per ſe, mouebit: quia nulla *pars* eſt in toto, niſi poteſtate. 7 Si verò duo *ſunt*, & horum vtrumque mouet vtrumque *pondus per* tantum *ſpatij* tanto *tempore*: etiam coniunctæ vires, id quod ex ponderibus eſt compoſitum, per æqualem longitudinem mouebunt; & æquali tempore: proportio namque *eſt*. 8 Num igitur ita *res habet* & in variatione, & accretione? *eſt* enim aliquid, quod auget: & aliquid, quod augetur: tanto autem tempore, & *ſecundum* tantam *magnitudinem*, alterum auget, alterum augetur. & quod variat, & quod variatur, itidem *ſecundùm* aliquid ſeu ſecundùm quantitatem aliquam vel magis vel minùs variatum eſt: ac tanto tempore: duplo *tempore* duplum, & duplum duplo *tempore*: dimidium autem dimidiato tempore, vel dimidiato *tempore* dimidium, vel æquali *tempore* duplum. Si verò quod variat vel auget, tantum tanto tempore vel auget vel variat: non *eſt* neceſſe, vt etiam dimidium dimidiato *tempore*, & dimidiato *tempore* dimidium *augeat ſeu variet*: ſed fortaſſe nulla ex parte variabit vel augebit, ſicut & in pondere *contingebat*.

A τὸ πλεῖον, εἴπερ ἦττε τῶν νεωλκῶν τέμνεται ἰσχὺς, εἰς τὸν ἀριθμὸν καὶ εἰς τὸ μῆκος, ὃ πάντες ἐκίνησαν. 6 Διὰ τοῦτο ὁ Ζήνωνος λόγος οὐκ ἀληθὴς, ὡς ψοφεῖ τῆς κέγχρου ὁποιονοῦν μέρος· οὐδὲν γὰρ κωλύει μὴ κινεῖν τὸν ἀέρα ἐν μηδενὶ χρόνῳ τοῦτον ὃν ἐκίνησεν ἐμπεσὼν ὁ ὅλος μέδιμνος· οὐδὲ δὴ τοσοῦτον μόριον, ὅσον ἂν κινήσῃ τοῦ ὅλου, εἰ εἴη καθ' αὐτὸ τοῦτο, οὐ κινεῖ. οὐδὲ γὰρ οὐδέν ἐστιν ἀλλ' ἢ ἐν τῷ ὅλῳ δυνάμει. 7 Εἰ δὲ τὰ δύο, * ἑκάτερον δὲ τῶνδε ἑκάτερον κινεῖ τοσόνδε ἐν τοσῷδε, καὶ συντιθέμεναι αἱ δυνάμεις τὸ συνθετὸν ἐκ τῶν βαρῶν, τὸ ἴσον κινήσουσι μῆκος, καὶ ἐν ἴσῳ χρόνῳ· ἀνάλογον γάρ. 8 Ἆρ' οὖν οὕτω καὶ ἐπὶ ἀλλοιώσεως καὶ ἐπὶ αὐξήσεως; τὶ μὲν γὰρ τὸ αὖξον, τὶ δὲ τὸ αὐξανόμενον; ἐν ποσῷ δὲ χρόνῳ, καὶ ποσὸν, τὸ μὲν αὔξει, τὸ δὲ αὐξάνεται. καὶ τὸ ἀλλοιοῦν, καὶ τὸ ἀλλοιούμενον ὡσαύτως, καὶ τὶ, καὶ ποσὸν κατὰ τὸ μᾶλλον καὶ τὸ ἧττον ἠλλοίωται· καὶ ἐν ποσῷ χρόνῳ, ἐν διπλασίῳ διπλάσιον, καὶ τὸ διπλάσιον ἐν διπλασίῳ· τὸ δὲ ἥμισυ ἐν ἡμίσει χρόνῳ, ἢ ἐν ἡμίσει ἥμισυ, ἢ ἐν ἴσῳ διπλάσιον. εἰ δὲ τὸ ἀλλοιοῦν ἢ αὖξον τὸ τοσόνδε, ἐν τῷ τοσῷδε ἢ αὔξει ἢ ἀλλοιοῖ, οὐκ ἀνάγκη καὶ τὸ ἥμισυ ἐν ἡμίσει, καὶ ἐν ἡμίσει ἥμισυ. ἀλλ' οὐδὲν, εἰ ἔτυχεν ἀλλοιώσει ἢ αὐξήσει, ὥσπερ καὶ ἐπὶ τοῦ βάρους.

* κ. ἢ ἑκάτερον θάτερον κινεῖ.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΦΥΣΙΚΗΣ ΑΚΡΟΑΣΕΩΣ, Η ΠΕΡΙ κινήσεως, τὸ Θ.

ARISTOTELIS, NATVRALIS AVSCVLTATIONIS SEV DE MOTV, *Liber VIII.*

Motum ſemper fuiſſe, ac ſemper fore.

CAP. I.

VTRVM autem factus eſt aliquando C motus cùm antea non eſſet, & interit rurſus ita vt nihil moueatur: an neque factus eſt, neque interit, ſed ſemper erat, & ſemper erit, atque hoc immortale & indeſinens rebus ineſt, tanquam ſit vita quædam omnibus naturâ cõſtantibus? 2 Eſſe igitur motum omnes aſſerunt, qui de natura aliquid dicunt: propterea quòd mundum faciunt, ac de generatione & interitu his omnibus eſt inſpectio, quæ eſſe nequeunt, niſi motus ſit. 3 Sed quotcumque, infinitos mundos eſſe aiunt, & alios quidẽ mundos fieri, alios verò interire, hi ſemper inquiunt eſſe motũ: quia neceſſe *eſt* eorũ generationes & interitus eſſe cum motu. quicumq; verò vnũ *mundum*, aut non ſemper *eſſe affirmant*, etiam de motu *id* ponunt: *quod eſt ei ſententiæ* conſentaneum. 4 Si igitur fieri poteſt, vt aliquando nihil moueatur, bifariàm neceſſe *eſt* hoc accidere. vel enim, vt Anaxagoras dicit (is enim ait, cùm ſimul omnia eſſent ac quieſcerent infinito tempore, mentem illam produxiſſe motum & ſecreuiſſe) vel, vt inquit Empedocles,

ΠΟΤΕΡΟΝ δὲ γέγονέ ποτε κίνησις οὐκ οὖσα πρότερον, καὶ φθείρεται πάλιν οὕτως ὥστε κινεῖσθαι μηδέν; ἢ οὔτε ἐγένετο, οὔτε φθείρεται, ἀλλ' ἀεὶ ἦν, καὶ ἀεὶ ἔσται, καὶ τοῦτ' ἀθάνατον καὶ ἄπαυστον ὑπάρχει τοῖς οὖσιν, οἷον ζωή τις οὖσα τοῖς φύσει συνεστῶσι πᾶσιν; 2 Εἶναι μὲν οὖν κίνησιν πάντες φασὶν οἱ περὶ φύσεώς τι λέγοντες, διὰ τὸ κοσμοποιεῖν, καὶ περὶ γενέσεως καὶ φθορᾶς εἶναι τὴν θεωρίαν * πᾶσαν αὐτοῖς, ἣν ἀδύνατον ὑπάρχειν μὴ κινήσεως οὔσης. 3 Ἀλλ' ὁπόσοι μὲν ἀπείρους κόσμους D τε εἶναί φασι, καὶ τοὺς μὲν γίνεσθαι, τοὺς δὲ φθείρεσθαι τῶν κόσμων, ἀεί φασιν εἶναι κίνησιν· ἀναγκαῖον γὰρ τὰς γενέσεις καὶ τὰς φθορὰς εἶναι μετὰ κινήσεως αὐτῶν. ὅσοι δὲ ἕνα καὶ ἀεὶ, ἢ ἕνα καὶ μὴ ἀεὶ, καὶ περὶ τῆς κινήσεως ὑποτίθενται κατὰ λόγον. 4 Εἰ δὴ ἐνδέχεταί ποτε μηδὲν κινεῖσθαι, διχῶς ἀνάγκη τοῦτο συμβαίνειν· ἢ γὰρ ὡς Ἀναξαγόρας λέγει· φησὶ γὰρ ἐκεῖνος, ὁμοῦ πάντων ὄντων καὶ ἠρεμούντων τὸν ἄπειρον χρόνον, κίνησιν ἐμποιῆσαι τὸν νοῦν καὶ διακρῖναι· ἢ ὡς Ἐμπεδοκλῆς,

* κ. πᾶσιν

A ἐν μέρει κινεῖσθαι, καὶ πάλιν ἠρεμεῖν· κινεῖσθαι μὲν, ὅταν ἡ φιλία ἐκ πολλῶν ποιῇ τὸ ἕν, ἢ τὸ νεῖκος πολλὰ ἐξ ἑνός· ἠρεμεῖν δ' ἐν τοῖς μεταξὺ χρόνοις· λέγων οὕτως,

* γ. ἓν μὲν

—ᾗ μὲν ἓν ἐκ πλεόνων μεμάθηκε φύεσθαι,
Ἠ δὲ πάλιν διαφύντος ἑνὸς, πλέον' ἐκτελέθουσι,
Τῇ μὲν γίγνονταί τε, καὶ οὔ σφισιν ἔμπεδος αἰών·
* Τῇδε διαλλάσσονται διαμπερὲς, οὐδ᾽ * ἅμα λήγει·
Ταύτῃ δ' αἰὲν ἔασιν ἀκίνητοι κατὰ κύκλον.

* γ. οὐδαμᾶ al. τῇδε δ' ἀλ.

τὸ γὰρ, ᾗδε διαλλάσσονται, ἐντεῦθεν ἐκεῖσε λέγειν αὐτὸν ὑποληπτέον. 5 Σκεπτέον δὴ * περὶ τούτων πῶς ἔχει. πρὸ ἔργου γὰρ οὐ μόνον πρὸς τὴν περὶ φύσεως θεωρίαν ἰδεῖν τὴν ἀλήθειαν, ἀλλὰ καὶ πρὸς τὴν μέθοδον τὴν περὶ B τῆς ἀρχῆς τῆς πρώτης. 6 Ἀρξώμεθα δὲ πρῶτον ἐκ τῶν διωρισμένων ἡμῖν ἐν τοῖς φυσικοῖς πρότερον. φαμὲν δὴ τὴν κίνησιν εἶναι ἐντελέχειαν τοῦ κινητοῦ ᾗ κινητόν. ἀναγκαῖον ἄρα ὑπάρχειν τὰ πράγματα τὰ δυνάμενα κινεῖσθαι καθ' ἑκάστην κίνησιν. καὶ χωρὶς δὲ τοῦ τῆς κινήσεως ὁρισμοῦ, πᾶς ἂν ὁμολογήσειεν ἀναγκαῖον εἶναι κινεῖσθαι τὸ δυνατὸν κινεῖσθαι καθ' ἑκάστην κίνησιν· οἷον, ἀλλοιοῦσθαι μὲν τὸ ἀλλοιωτὸν, φέρεσθαι δὲ κατὰ τόπον τὸ μεταβλητόν. ὥστε δεῖ πρότερον καυστὸν εἶναι πρὶν κάεσθαι, καὶ καυστικὸν πρὶν κάειν. 7 Οὐκοῦν καὶ ταῦτα ἀναγκαῖον ἢ γενέσθαι ποτὲ οὐκ ὄντα, ἢ ἀΐδια εἶναι. 8 Εἰ μὲν τοίνυν ἐγένετο τῶν κινη- C τῶν καὶ κινητικῶν ἕκαστον, ἀναγκαῖον πρότερον τῆς ληφθείσης ἄλλην γενέσθαι μεταβολὴν καὶ κίνησιν, καθ' ἣν ἐγένετο τὸ δυνατὸν κινηθῆναι, ἢ κινῆσαι. 9 Εἰ δ' ὄντα προϋπῆρχεν ἀεὶ κινήσεως μὴ οὔσης, ἄλογον μὲν φαίνεται καὶ αὐτόθεν ἐπιστήσασιν. 10 Οὐ μὴν ἀλλὰ μᾶλλον ἔτι προϊοῦσι τοῦτο συμβαίνειν ἀναγκαῖον. εἰ γὰρ, τῶν μὲν κινητῶν ὄντων, τῶν δὲ κινητικῶν, ὁτὲ μὲν ἔσται τι πρῶτον κινοῦν, τὸ δὲ κινούμενον, ὁτὲ δ', οὐδὲν, ἀλλ' ἠρεμεῖ, * ἀναγκαῖον τοῦτο μεταβάλλειν πρότερον· ἦν γάρ τι αἴτιον τῆς ἠρεμίας· ἡ γὰρ ἠρέμησις, στέρησις τῆς κινήσεως. ὥστε πρὸ τῆς πρώτης μεταβολῆς ἔσται μεταβολὴ προτέρα. 11 Τὰ μὲν γὰρ κινεῖ D μοναχῶς, τὰ δὲ τὰς ἐναντίας κινήσεις εἶναι· τὸ μὲν πῦρ θερμαίνει, ψύχει δ' οὔ· ἡ δὲ ἐπιστήμη δοκεῖ τῶν ἐναντίων εἶναι μία. φαίνεται μὲν οὖν καὶ ἐκεῖ εἶναι τι ὁμοιότροπον. τὸ γὰρ ψυχρὸν θερμαίνει στραφέν πως καὶ ἀπελθὸν, ὥσπερ καὶ ἁμαρτάνει ἑκὼν ὁ ἐπιστήμων, ὅταν ἀνάπαλιν χρήσηται τῇ ἐπιστήμῃ. 12 Ἀλλ' οὖν γε ὅσα δυνατὰ ποιεῖν καὶ πάσχειν ἢ κινεῖν, τὰ δὲ κινεῖσθαι, οὐ πάντως δυνατά ἐστιν, ἀλλ' ὡδὶ ἔχοντα καὶ πλησιάζοντα ἀλλήλοις. ὥσθ' ὅταν πλησιάσῃ, τὸ μὲν κινεῖ, τὸ δὲ κινεῖται· καὶ ὅταν ὑπάρξῃ, ὡς εἶναι τὸ μὲν κινητικὸν, τὸ δὲ κινητόν. 13 Εἰ τοίνυν μὴ ἀεὶ ἐκινεῖτο, δῆλον ὡς οὐχ οὕτως εἶχον, ὡς [μὴ] δυνάμενα, τὸ μὲν κινεῖσθαι, τὸ δὲ κινεῖν, ἀλλ' E ἔδει μεταβάλλειν θάτερον αὐτῶν· ἀνάγκη γὰρ ἐν τοῖς πρός τι τοῦτο συμβαίνειν εἶναι· εἰ μὴ ὂν διπλάσιον, νῦν διπλάσιον, * μεταβάλλειν ἢ εἰ μὴ ἀμφότερα, θάτερον. ἔσται ἄρα τις προτέρα μεταβολὴ τῆς πρώτης. 14 Πρὸς δὲ τούτοις, πρότερον καὶ ὕστερον πῶς ἔσται, χρόνου μὴ ὄντος; ἢ ὁ χρόνος, μὴ οὔσης κινήσεως; εἰ δή ἐστιν ὁ χρόνος κινήσεως ἀριθμὸς ἢ κίνησίς τις, εἴπερ ἀεὶ χρόνος ἐστὶν, ἀνάγκη καὶ κίνησιν ἀΐδιον εἶναι. ἀλλὰ μὴν περί γε χρόνου ἔξω ἑνὸς, ὁμονοητικῶς ἔχοντες φαίνονται πάντες· ἀγένητον γὰρ εἶναι λέγουσι. καὶ διὰ τούτου Δημόκριτός τε δείκνυσιν ὡς ἀδύνατον ἅπαντα γεγονέναι·

* γ. περὶ τούτου
* γ. ἀεὶ μετ.
* γ. μεταβάλλειν.

A viciſſim moueri, & rurſus quieſcere: moueri quidem, cùm amicitia ex multis vnum facit, aut diſſidium multa ex vno: quieſcere autem temporibus interiectis: ita inquiens:

-- *Quatenus vnum ex multis conſueuit oriri,*
Aut rurſus ex vno genito plura perficiuntur,
Eatenus fiunt, nec eſt ipſis conſtans æuum:
Quatenus autem mutantur perpetuò, neque deſinunt.
Eatenus ſemper immobiles ſunt in orbem.

Quod enim ait, quatenus mutantur, hinc illuc eum dicere exiſtimandum *eſt*. 5 De his igitur conſiderandum *eſt*, quonam modo ſe habeant: quia veritatem perſpicere non ſolùm confert ad eam contem- B plationem quæ *eſt* de natura, ſed etiam ad methodum quæ *eſt* de primo principio. 6 Primùm autem incipiamus ab iis quæ à nobis antea definita ſunt in Phyſicis. dicimus ergo motum eſſe actum mobilis, quatenus *eſt* mobile. neceſſarium igitur *eſt* res ſubeſſe, quæ poſſint vnoquoque motu cieri. Sed & ſine definitione motus, quilibet fateretur neceſſarium eſſe, vt moueatur, quod poteſt moueri vnoquoque motu: vtputà variari, quod eſt variabile; ferri autem, quod eſt loco mutabile. quapropter oportet priùs eſſe cremabile, quàm crematur: & id quod cremandi vim habet, priùs quàm cremet. 7 Ergo & hæc neceſſe *eſt* aut facta aliquando fuiſſe, cùm non eſſent, aut æterna eſſe. 8 Si igitur factum eſt vnum- C quodque eorum quæ mouere & moueri poſſunt: neceſſe *eſt*, eâ mutatione, quæ ſumpta fuit, aliam priorem factam eſſe mutationem ac motionem, qua factum eſt id quod poteſt mouere & moueri. 9 Quòd ſi ſemper fuerunt, cùm motus non eſſet: abſurdum etiam apparet per ſe iis qui animaduertunt. 10 Sed magis adhuc progredientibus, hoc euenire neceſſe *eſt*: nam ſi cùm alia ſint mobilia, alia quæ mouendi vim habent; aliquando eſt aliquid primum mouens, & quod mouetur; aliquando verò nihil, ſed quieſcit: neceſſe *eſt*, hoc mutari priùs: erat enim aliqua cauſa quietis: quãdoquidem quies *eſt* priuatio motus. quare primâ mutatione erit mu- D tatio prior. 11 Alia namque mouent vno motu, alia contrariis motibus. vt ignis calefacit quidem, non tamen refrigerat: ſcientia verò videtur contrariorum vna eſſe. verumenimuero & illic apparet aliquid ſimile. etenim frigidum calefacit conuerſum aliquo modo ac remotum; ſicuti ſponte peccat ſciens, cùm abutitur ſcientiâ. 12 Sed quæcumque poſſunt facere & pati, vel mouere ac moueri, non omnino *id* poſſunt, ſed ſi ita ſe habeant, & ſibi inuicem propinqua ſint. quocirca cùm propè acceſſerint, alterum mouet, alterum mouetur: & cùm ita fuerint, vt alterum ſit motiuum, alterum mobile. 13 Si igitur non ſemper mouebatur, patet *ea* non fuiſſe ita affecta, vt alterum poſſet moueri, E alterum mouere: ſed oportebat alterum eorum mutari. neceſſe *eſt* enim, in iis quæ ad aliquid *referuntur*, hoc accidere: veluti ſi cùm non eſſet duplum, nunc *eſt* duplum, *neceſſe eſt* vt ſi non ambo, ſaltem alterum ſit mutatum. erit igitur aliqua mutatio prior *mutatione* prima. 14 Ad hæc, prius & poſterius quonam modo erit, niſi ſit tempus: aut tempus, niſi ſit motus? 15 Quòd ſi tempus eſt numerus motus, aut quidam motus: ſiquidem ſemper eſt tempus, neceſſe *eſt* motum quoque ſempiternum eſſe. atqui de tempore, præter vnum, omnes videntur in eadem ſententia conuenire: ingenitum enim eſſe dicunt. ideoque Democritus probat non poſſe omnia eſſe genita

A qui tempus eſt ingenitum. Plato autem ſolus ipſum gignit: ipſum enim ſimul cum cælo genitum eſſe, ac cælum genitum eſſe aſſerit. Si igitur impoſſibile eſt & eſſe & intelligere tempus ſine momento, momentum verò eſt medietas quædam, ſimulque habet principium & finem, principium quidem futuri temporis, finem autem præteriti: neceſſe *eſt*, ſemper eſſe tempus: quia extremum vltimi accepti temporis erit in aliquo momento: quandoquidem nihil licet ſumere in tempore præter momentum. quapropter cùm momentum ſit principium & finis: neceſſe *eſt*, ex vtraque eius parte ſemper eſſe tempus. atqui ſi tempus, patet neceſſe *eſſe* vt ſit etiam motus: ſiquidem tempus *eſt* affectio quædam motus. 16 B Eadem ratio de eo quoque *valet*, quòd motus non ſit interitui obnoxius. 17 Sicut enim eo poſito quòd motus factus fuerit, eueniebat mutationem aliquam eſſe priorem primâ: ita hic *euenit eſſe* poſteriorem poſtremâ: quia non ſimul deſinet eſſe mobile, & moueri; aut eſſe cremabile, & cremari. (poteſt enim eſſe cremabile, quòd non crematur) nec habere vim mouendi, & mouere. 18 Sed & quod interitui eſt obnoxium, oportebit interiiſſe, quando interit. & rurſus poſtea, quod huius interimendi vim habet. etenim interitus eſt mutatio quædam. 19 Ergo ſi hæc *ſunt* impoſſibilia: manifeſtum *eſt* motum eſſe æternum, non interdum eſſe, interdum non *eſſe*. 20 Etenim ſic dicere, C figmento potiùs ſimile videtur. 21 Similiter etiam dicere ſic naturâ eſſe comparatum, & hoc pro principio haberi debere. quod quidem videtur dixiſſe Empedocles, *id eſt*, vt amicitia & diſſidium viciſſim dominentur & moueant, rebus neceſſariò ineſſe, & vt quieſcant tempore intercecto. 22 Fortaſſis autem & qui vnum principium faciunt, vt & Anaxagoras, idem dicerent. 23 At verò nihil ordine vacat ex iis quæ naturâ & ſecundùm naturam *conſtant*: quandoquidem natura omnibus *eſt* cauſa ordinis. infinitum verò ad infinitum nullam rationem habet. omnis autem ordo *eſt* ratio. Ceterùm infinito tempore quieſcere, deinde motum aliquando D eſſe; & huius nullam eſſe differentiam, cur nunc potiùs quàm antea, nec rurſus aliquem ordinem habere; *certè hoc* non *eſt* ampliùs naturæ opus. aut enim ſimpliciter ſe habet, quod naturâ *conſtat*, non modò ſic, modò aliter (vt ignis ſurſum naturâ fertur, nec aliquando *fertur*, aliquando minimè) aut rationem habet, quod non eſt ſimplex. 24 Idcirco meliùs *eſt*, vt Empedocles, & ſi quis alius dixit ita *res ſe* habere, vt vniuerſum viciſſim quieſcat, & rurſus moueatur: iam enim ordinem aliquem habet, quod tale eſt. 25 Sed & qui hoc dicit, non ſolùm id pronuntiare debet, ſed etiam eius cauſam dicere: nec ponere, nec petere ſibi concedi aliquod axioma ſine ratione: E ſed vel inductionem, vel demonſtrationem afferre. 26 Nam ea quæ ſunt ab *Empedocle* ſuppoſita, non *ſunt* cauſæ: neque hæc eſt amicitiæ vel diſſidij eſſentia: ſed illius *eſt* coniungere; huius verò, ſecernere. quod ſi adiungatur illud VICISSIM, dicendum *eſt* in quibus *res* ita *ſe habeat*: veluti quia eſt aliquid, quod homines coniungit, *nempe* amicitia; & inimici ſe inuicem fugiunt. hoc enim ſupponitur eſſe etiam in vniuerſo, quia in quibuſdam ita *eſſe* videtur. Sed illud quoque ÆQVALIBVS TEMPORIBVS, eget aliqua ratione. 27 Omnino autem putare hoc eſſe principium ſufficiens, *nempe* ſemper vel ita eſſe vel fieri, non rectè ſe habet. ad quod Democritus refert naturales cauſas, quia ſic & antea fiebat:

A τὸν γὰρ χρόνον,* ἀγένητον εἶναι. Πλάτων δὲ αὐτὸν γεννᾷ μόνος. ἅμα γὰρ αὐτὸν τῷ οὐρανῷ γεγονέναι, τὸν δὲ οὐρανὸν γεγενῆσθαι φησίν. Εἰ οὖν ἀδύνατόν ἐστι, καὶ εἶναι καὶ νοῆσαι χρόνον ἄνευ τοῦ νῦν· τὸ δὲ νῦν ἐστι μεσότης τις, καὶ ἀρχὴν καὶ τελευτὴν ἔχον ἅμα· ἀρχὴν μὲν, τοῦ ἐσομένου χρόνου, τελευτὴν δὲ τοῦ* παρελθόντος, ἀνάγκη ἀεὶ εἶναι χρόνον. τὸ γὰρ ἔσχατον τοῦ τελευταίου ληφθέντος χρόνου ἔν τινι τῶν νῦν ἔσται· οὐδὲν γὰρ ἔστι λαβεῖν ἐν τῷ χρόνῳ παρὰ τὸ νῦν. ὥστε ἐπεί ἐστιν ἀρχή τε καὶ τελευτὴ τὸ νῦν, ἀνάγκη αὐτοῦ ἐπ' ἀμφότερα εἶναι ἀεὶ χρόνον. ἀλλὰ μὴν εἴγε χρόνον, φα- B νερὸν ὅτι ἀνάγκη εἶναι καὶ κίνησιν, εἴπερ ὁ χρόνος πάθος τι κινήσεως. 16 Ὁ δὴ αὐτὸς λόγος καὶ περὶ τοῦ ἄφθαρτον εἶναι τὴν κίνησιν. 17 Καθάπερ γὰρ ἐπὶ τοῦ γίνεσθαι κίνησιν συνέβαινε προτέραν τινὰ εἶναι μεταβολὴν τῆς πρώτης· οὕτως ἐνταῦθα ὑστέραν τῆς τελευταίας· οὐ γὰρ ἅμα* παύεται κινούμενον καὶ κινητὸν ὄν,* ἢ καιόμενον, καὶ καυστόν. (ἐνδέχεται γὰρ καυστὸν εἶναι μὴ καιόμενον)* οὐδὲ κινητικὸν καὶ κινοῦν. 18 Καὶ τὸ φθαρτὸν δὲ δεήσει φθαρῆναι, ὅταν φθείρηται· καὶ τὸ τούτου φθαρτικὸν, πάλιν ὕστερον· καὶ γὰρ ἡ φθορὰ μεταβολή τίς ἐστιν. 19 Εἰ δὲ* ταῦτα ἀδύνατα, δῆλον ὡς ἔστιν ἀΐδιος κίνησις, ἀλλ' οὐχ ὁτὲ μὲν C ἦν ὁτὲ δ' οὔ. 20 Καὶ γὰρ ἔοικε τὸ οὕτω λέγειν* πλάσματι μᾶλλον. 21 Ὁμοίως δὲ καὶ τὸ λέγειν ὅτι πέφυκεν οὕτω, καὶ ταύτην δεῖ νομίζειν ἀρχὴν εἶναι· ὅπερ ἔοικεν Ἐμπεδοκλῆς ἂν εἰπεῖν, ὡς τὸ κρατεῖν καὶ κινεῖν ἐν μέρει τὴν φιλίαν καὶ τὸ νεῖκος ὑπάρχει τοῖς πράγμασιν ἐξ ἀνάγκης· ἠρεμεῖν δὲ τὸν μεταξὺ χρόνον. 22 Τάχα δὲ καὶ οἱ μίαν ἀρχὴν ποιοῦντες, ὥσπερ καὶ Ἀναξαγόρας, οὕτως ἂν εἴποιεν. 23 Ἀλλὰ μὴν οὐδέν γε ἄτακτον τῶν φύσει καὶ κατὰ φύσιν· ἡ γὰρ φύσις αἰτία πᾶσι τάξεως. τὸ δὴ ἄπειρον πρὸς τὸ ἄπειρον οὐδένα λόγον ἔχει· τάξις δὲ πᾶσα, λόγος. τὸ δὴ ἄπειρον χρόνον ἠρεμεῖν, D εἶτα κινηθῆναί ποτε, τούτου δὲ μηδεμίαν εἶναι διαφοράν, ὅτι νῦν μᾶλλον ἢ πρότερον, μηδ' αὖ τινα τάξιν ἔχειν, οὐκ ἔτι φύσεως ἔργον. ἢ γὰρ ἁπλῶς* ἔχει δεῖ τὸ φύσει, καὶ οὐχ ὁτὲ μὲν οὕτως, ὁτὲ δὲ ἄλλως εἶναι, οἷον τὸ πῦρ ἄνω φύσει φέρεται, καὶ οὐχ ὁτὲ μὲν, ὁτὲ δὲ οὔ. ἢ λόγον * ἔχει τὸ μὴ ἁπλοῦν. 24 Διόπερ βέλτιον ὡς Ἐμπεδοκλῆς, κἂν εἴ τις ἕτερος εἴρηκεν οὕτως ἔχειν, ἐν μέρει τὸ πᾶν ἠρεμεῖν, καὶ κινεῖσθαι πάλιν· τάξιν γὰρ ἤδη τινὰ ἔχει τὸ τοιοῦτο. 25 Ἀλλὰ καὶ τοῦτο δεῖ τὸν λέγοντα μὴ ἀποφήνασθαι μόνον, ἀλλὰ καὶ τὴν αἰτίαν αὐτοῦ λέγειν, καὶ μὴ τιθέναι μηδὲν, μηδ' ἀξιοῦν ἀξίωμα ἄλογον, ἀλλ' ἢ ἐπα- E γωγὴν, ἢ ἀπόδειξιν φέρειν. 26 Αὐτὰ μὲν γὰρ οὐκ αἴτια τὰ ὑποτεθέντα. οὐδὲ τοῦτο ἦν τὸ φιλότητι εἶναι, ἢ νείκει, ἀλλὰ τῆς μὲν τὸ συνάγειν, τοῦ δὲ τὸ διακρίνειν· εἰ δὲ* προσδιορίζεται τὸ ἐν μέρει, λεκτέον ἐφ' ὧν οὕτως, ὥσπερ ὅτι ἔστι τι* ὃ συνάγει τοὺς ἀνθρώπους ἡ φιλία, καὶ φεύγουσιν οἱ ἐχθροὶ ἀλλήλους·* τοῦτο γὰρ ὑποτίθεται καὶ ἐν τῷ ὅλῳ εἶναι· φαίνεται γὰρ ἐπί τινων οὕτως. τὸ δὲ καὶ δι' ἴσων χρόνων δεῖται καὶ λόγου τινός. 27 Ὅλως δὲ τὸ νομίζειν ἀρχὴν εἶναι ταύτην ἱκανὴν, ὅτι ἀεὶ ἢ ἔστιν οὕτως, ἢ γίνεται, οὐκ ὀρθῶς ἔχει ὑπολαβεῖν,* εἰς ὃ Δημόκριτος ἀνάγει τὰς περὶ φύσεως αἰτίας, ὡς οὕτω καὶ τὸ πρότερον ἐγίνετο.

* γρ. ἀδύνατον γεγονέναι.
* γρ. παρεληλυθότος.
* γρ. παύεται
* γρ. ἔσται.
* γρ. οὐδὲ κινητὸν
* γρ. ὅτι ἀδύνατον,
* γρ. πλάσματι π. minus rectè
* γρ. ἔχει τὸ φ.
* γρ. ἔχει
* γρ. συγκρίνοντα
* γρ. τὸ συνάγει
* γρ. ταῦτα γ.
* γρ. ἢ γί.

τοῦ ἀεὶ, οὐκ ἀξιοῖ ἀρχὴν ζητεῖν, λέγων ἐπὶ τινῶν ὀρθῶς, ὅτι δ' ἐπὶ πάντων, οὐκ ὀρθῶς. καὶ γὰρ τὸ τρίγωνον ἔχει δυσὶν ὀρθαῖς ἀεὶ τὰς γωνίας ἴσας. ἀλλ' ὅμως ἐστί τι τῆς ἀϊδιότητος ταύτης ἕτερον αἴτιον. τῶν μέντοι ἀρχῶν, οὐκ ἔστιν ἕτερον αἴτιον, ἀϊδίων οὐσῶν. 28 Ὅτι μὲν οὖν οὐδεὶς ἦν χρόνος, οὐδ' ἔσται, ὅτε κίνησις οὐκ ἦν, ἢ οὐκ ἔσται, εἰρήσθω τοσαῦτα.

A æternitatis autem non putat principium eſſe quærendum, in quibuſdam rectè dicens: ſed quia de omnibus *loquitur*, non rectè: etenim triãgulum ſemper habet angulos duobus rectis æquales: attamen eſt alia quædam huius æternitatis cauſa. ceterùm principiorum non eſt alia cauſa, cùm æterna ſint. 28 Nullum igitur fuiſſe tempus aut fore, quo motus non fuerit, aut non erit, hactenus dictum eſto.

Obiectionum æternitatem motus impugnantium ſolutio.

Cap. II.

Τὰ δ' ἐναντία τούτοις, οὐ χαλεπὸν λύειν. δόξειε δ' ἂν ἐκ τῶν τοιῶνδε σκοπουμένοις, ἐνδέχεσθαι μάλιστα κίνησιν εἶναί ποτε μὴ οὖσαν ὅλως. 2 Πρῶτον μὲν ὅτι οὐδεμία ἀΐδιος μεταβολή· μεταβολὴ γὰρ ἅπασα πέφυκεν ἔκ τινος εἴς τι. ὥστ' ἀνάγκη πάσης μεταβολῆς εἶναι πέρας τὰ ἐναντία ἐν οἷς γίγνεται· εἰς ἄπειρον δὲ κινεῖσθαι μηδέν. 3 Ἔτι ὁρῶμεν, ὅτι δυνατὸν κινεῖσθαι μήτε κινούμενον, μήτε ἔχον ἐν αὑτῷ μηδεμίαν κίνησιν, οἷον ἐπὶ τῶν ἀψύχων, ὧν οὔτε μέρος οὐδὲν, οὔτε τὸ ὅλον κινούμενον, ἀλλ' ἠρεμοῦν, κινεῖταί ποτε. προσῆκε δὲ, ἢ ἀεὶ κινεῖσθαι, ἢ μηδέποτε, εἴπερ μὴ γίνεται οὐκ οὖσα. 4 Πολὺ δὲ μάλιστα τὸ τοιοῦτον ἐπὶ τῶν ἐμψύχων[*] ἐστὶ φανερόν. οὐδεμιᾶς γὰρ ἐν ἡμῖν ἐνούσης κινήσεως ἐνίοτε, ἀλλ' ἡσυχαζόντων, ὅμως κινούμεθά ποτε, καὶ γίνεται ἐν ἡμῖν ἐξ ἡμῶν αὐτῶν ἀρχὴ κινήσεως ἐνίοτε, κἂν μηδὲν ἔξωθεν κινήσῃ. τοῦτο γὰρ ἐπὶ τῶν ἀψύχων οὐχ ὁρῶμεν ὁμοίως, ἀλλ' ἀεί τι κινεῖ αὐτὰ τῶν ἔξωθεν ἕτερον. τὸ δὲ ζῶον, αὐτὸ φαμὲν ἑαυτὸ κινεῖν. ὥστ' εἴπερ ἠρεμεῖ ποτὲ παντελῶς, ἐν ἀκινήτῳ κίνησις ἂν γίνοιτο ἐξ αὐτοῦ, καὶ οὐκ ἔξωθεν. Εἰ δ' ἐν ζώῳ τοῦτο δυνατὸν γενέσθαι, τί κωλύει τὸ αὐτὸ τοῦτο συμβῆναι καὶ κατὰ τὸ πᾶν; εἰ γὰρ ἐν μικρῷ κόσμῳ γίνεται, καὶ ἐν μεγάλῳ· καὶ εἰ ἐν τῷ κόσμῳ, καὶ ἐν τῷ ἀπείρῳ, εἴπερ ἐνδέχεται κινεῖσθαι τὸ ἄπειρον, καὶ ἠρεμεῖν ὅλον. 5 Τούτων δὴ, τὸ μὲν πρῶτον λεχθὲν, τὸ μὴ τὴν αὐτὴν ἀεὶ καὶ μίαν τῷ ἀριθμῷ εἶναι τὴν κίνησιν τὴν εἰς τὰ ἀντικείμενα, ὀρθῶς λέγεται. τοῦτο μὲν γὰρ ἴσως ἀναγκαῖον, εἴπερ μὴ ἀεὶ μίαν καὶ τὴν αὐτὴν τῷ ἀριθμῷ εἶναι δυνατὸν, τὴν τοῦ αὐτοῦ καὶ ἑνὸς κίνησιν. λέγω δ', οἷον, πότερον τῆς μιᾶς χορδῆς εἷς καὶ ὁ αὐτὸς φθόγγος, ἢ ἀεὶ ἕτερος, ὁμοίως ἐχούσης καὶ κινουμένης. ἀλλ' ὅμως ὁποτέρως ποτ' ἔχει, οὐδὲν κωλύει μίαν καὶ τὴν αὐτὴν εἶναι τινα, τῷ συνεχῆ εἶναι καὶ ἀΐδιον. δῆλον δ' ἔσται μᾶλλον ἐκ τῶν ὕστερον. 6 Τὸ δὲ κινεῖσθαι μὴ κινούμενον, οὐδὲν ἄτοπον, εἰ ὅτε μὲν ἔσται τὸ κινῆσον ἔξωθεν, ὅτε δὲ μή. τοῦτο μέντοι πῶς ἂν εἴη, ζητητέον. λέγω δὲ, ὥστε τὸ αὐτὸ ὑπὸ τοῦ αὐτοῦ κινητικοῦ ὄντος, ὅτε μὲν κινεῖσθαι, ὅτε δὲ μή. οὐδὲν γὰρ ἄλλο ἀπορεῖ ὁ τοῦτο λέγων, ἢ διὰ τί οὐκ ἀεὶ, τὰ μὲν ἠρεμεῖ τῶν ὄντων, τὰ δὲ κινεῖται. 7 Μάλιστα δ' ἂν δόξειε τὸ τρίτον ἔχειν ἀπορίαν, ὡς ἐγγινομένης οὐκ ἐνούσης πρότερον κινήσεως, ὃ συμβαίνει ἐπὶ τῶν ἐμψύχων. ἠρεμοῦν γὰρ πρότερον, μετὰ ταῦτα βαδίζει, κινήσαντος τῶν ἔξωθεν οὐδενὸς, ὡς δοκεῖ. τοῦτο δ' ἐστὶ ψεῦδος. ὁρῶμεν γὰρ

[*] χ. ἐστι

B Quæ verò his ſunt contraria, non *eſt* difficile ſoluere, conſiderantibus autem videri ex his maximè poteſt euenire, vt motus aliquando ſit, cùm omnino non eſſet. 2 Primùm quia nulla mutatio *eſt* æterna: natura enim comparatum eſt, vt omnis mutatio ſit ex aliquo in aliquid: quare neceſſe *eſt* omnis mutationis eſſe terminum, *nempe* contraria, in quibus fit. in infinitum verò nihil moueri. 3 Præterea videmus poſſe moueri, quod nec mouetur nec habet in ſe vllum motum: vt in rebus inanimatis, quorum cùm nec pars vlla, nec totum moueretur, ſed quieſceret, aliquando mouetur. conueniebat autem vel ſemper moueri, vel nunquam, ſi quidem

C non fit *motus* cùm non eſſet. 4 Sed multo maximè tale quippiam in animatis apparet. cùm enim nullus motus interdum in nobis ineſſet, ſed quieſceremus, tamen mouemur quandoque, & fit interdum ex nobiſmet ipſis principium motus, etiamſi nihil extrinſecus mouerit. hoc enim in inanimatis non ſimiliter cernimus; ſed ſemper aliquid aliud, quod extra eſt, ea mouet. animal autem dicimus ſeipſum mouere. quocirca ſi quando totum quieſcit, in immobili motus fieri poteſt à ſe ipſo, non extrinſecus. quòd ſi in animali hoc fieri poteſt, quid prohibet hoc idem euenire etiam in vni-

D uerſo? nam ſi in paruo mundo fit, etiam in magno. & ſi in mundo, etiam in infinito, ſiquidem totum infinitum poteſt moueri & quieſcere. 5 Ex his igitur, quod primo loco dictum eſt, *videlicet* non eſſe eundem ſemper & vnum numero motum, qui fit in oppoſita, rectè dicitur: hoc enim fortaſſe neceſſarium *eſt*, ſi motus vnius & eiuſdem *rei* non poteſt eſſe ſemper vnus & idem numero: dico autem, exempli gratia, vtrùm vnius chordæ *ſit* vnus & idem ſonus, an ſemper alius, cùm *chorda* ſimiliter *ſe* habeat, & moueatur. verumtamen vtrouis tandem modo *hoc ſe* habeat, nihil vetat

E aliquem *motum* eſſe vnum & eundem: quia ſit continuus & ſempiternus. *quod* ex iis quæ poſtea *ſequentur*, magis erit manifeſtum. 6 Moueri autem quod non mouebatur, nihil abſurdi *eſt*, ſi id quod extrinſecus mouet, modò *adſit*, modò non *adſit*. hoc verò quonam modo eſſe poſſit, quærendum *eſt*: vt, inquam, idem ab eodem mouendi vim habente, modò moueatur, modò non *moueatur*. nihil enim aliud in dubium reuocat qui hoc dicit, quàm cur non ſemper alia entia quieſcunt, alia mouentur. 7 Maximè autem videri poteſt tertium illud habere dubitationem, quod euenit in rebus inanimatis, quaſi in nobis fiat motus cùm antea non eſſet. quod enim priùs quieſcebat, poſtea ambulat, nulla re externa mouente, vt videtur. Sed hoc eſt falſum. videmus enim

ſemper aliquid innatum moueri in animali. cur autem hoc moueatur, non ipſum animal *eſt* cauſa, ſed fortaſſe id quod ambit. Ipſum autem dicimus ſeipſum mouere, non quouis motu, ſed eo qui *eſt* ſecundùm locum. Ergo nihil vetat, quin potiùs neceſſarium *eſt*, in corpore fieri multos motus ab eo quod ambit: horum autem aliquos mouere cogitationem vel appetitionem: eam verò iam mouere totum animal. cuiuſmodi accidit in ſomnis. cùm enim nullus ſenſitiuus motus inſit, aliquis tamen *motus* inſit, animalia rurſus expergiſcuntur. Sed & de his perſpicuum erit ex iis quæ ſequentur.

A ἀεί τι κινούμενον ἐν τῷ ζῴῳ τῶν συμφύτων· τούτου δὲ τῆς κινήσεως, οὐκ αὐτὸ τὸ ζῷον αἴτιον, ἀλλὰ τὸ περιέχον ἴσως. αὐτὸ δὲ φαμὲν ἑαυτὸ κινεῖν οὐ πᾶσαν κίνησιν, ἀλλὰ τὴν κατὰ τόπον. οὐδὲν οὖν κωλύει, μᾶλλον δ' ἴσως ἀναγκαῖον, * τῷ σώματι ἐγγίγνεσθαι πολλὰς κινήσεις ὑπὸ τοῦ περιέχοντος. τούτων δ' ἐνίας, τὴν διάνοιαν ἢ τὴν ὄρεξιν κινεῖν. ἐκείνην δὲ τὸ ὅλον ἤδη ζῷον κινεῖν· ὅπερ συμβαίνει περὶ τοὺς ὕπνους· αἰσθητικῆς μὲν γὰρ οὐδεμιᾶς ἐνούσης κινήσεως, ἐνούσης μέντοι τινός, ἐγείρεται τὰ ζῷα πάλιν. ἀλλὰ [γὰρ] φανερὸν [ἔσται] καὶ περὶ τούτων, ἐκ τῶν ἑπομένων.

* γρ. τῷ ποιαί ἐγγίνεσθαι κινήσεις σώματι

Nonnulla modò moueri, modò quieſcere.

Cap. III.

PRincipium verò conſiderationis erit, quod *fuit* B etiam dubitationis *antea* dictæ, curnam quædam entia modò mouentur, modò rurſus quieſcant. 2 Neceſſe igitur *eſt*, vel omnia ſemper quieſcere; vel omnia ſemper moueri; vel alia moueri, alia quieſcere. & rurſus ex his vel ea quæ mouentur, ſemper moueri, & ea quæ quieſcunt, *ſemper* quieſcere: vel ita naturâ eſſe comparatum, vt omnia æquè moueantur & quieſcant: vel quod reliquum adhuc *eſt* ac tertium: contingit enim quædam entia ſemper eſſe immobilia, nonnulla ſemper moueri, alia vtroque participare. quod quidem nobis dicendum eſt: hoc enim habet ſolutionem eorum omnium de quibus C dubitatum eſt, & eſt nobis finis huius tractationis. 3 *Dicere* igitur omnia quieſcere, & huius rationem quærere, omiſſo ſenſu, eſt infirmitas quædam cogitationis. 4 Ac de toto aliquo, non de parte dubitatio *eſt*. 5 Nec ſolùm aduerſùs Phyſicum, ſed aduerſùs omnes ſcientias, vt *ita* dicam, & omnes opiniones, propterea quòd motu omnes vtuntur. 6 Præterea obiectiones quæ de principiis *fiunt*, ſicut in mathematicis diſputationibus nihil ad Mathematicum *pertinent*, ſimiliterque in aliis: ita nec *obiectio* de eo quod nunc dictum fuit, ad Phyſicum attinet. hypotheſis enim *eſt*, Naturam eſſe principium motus. D 7 Ferè autem & dicere omnia moueri, falſum quidem *eſt*, ſed minùs ab hac methodo alienum. quamquam enim poſitum in *libris* phyſicis eſt, naturam in rebus Phyſicis eſſe principium, vt motionis, ita etiam quietis: tamen quies *eſt* res naturalis. 8 Ac nonnulli aiunt, non alia entia moueri, alia minimè: ſed omnia & ſemper *moueri*, ſed hoc latere noſtrum ſenſum. 9 Quibus, etiam ſi non definiant de quo motu loquantur, an de omnibus, *tamen* non *eſt* difficile occurrere. 10 Neque enim *res* augeri neque diminui poſſunt continenter: ſed eſt etiam medium. Eſt autem hic ſermo ei ſimilis, *quo dicitur* à gutta conſumi, & ab iis E quæ pullulant, diuidi lapides. non enim, ſi tantum abraſit ſiue abſtulit gutta, antea quoque dimidium *abraſit ſeu abſtulit* dimidiato tempore. ſed quemadmodum nauigij tractus *fit*, *ita* etiam tot guttæ tantum mouent: pars autem earum nullo tempore tantum *mouet*. ergo diuiditur quidem id quod ablatum eſt, in plura: ſed nihil horum motum eſt ſeorſum, verùm ſimul. Perſpicuum igitur *eſt*, non eſſe neceſſarium ſemper aliquid abire, quia deminutio diuiditur in infinita, ſed totum aliquando abire. 11 Similiter etiam *ſe res habet* in variatione quacumque. non enim, ſi id quod variatur, infinitè diuidi poteſt,

Ἀρχὴ δὲ τῆς σκέψεως ἐστὶν ἥπερ καὶ περὶ τῆς λεχθείσης ἀπορίας, διὰ τί ποτε ἔνια τῶν ὄντων ὁτὲ μὲν κινεῖται, ὁτὲ δὲ ἠρεμεῖ πάλιν. 2 Ἀνάγκη δὴ ἤτοι πάντα ἠρεμεῖν ἀεί, ἢ πάντα ἀεὶ κινεῖσθαι, ἢ τὰ μὲν κινεῖσθαι, τὰ δὲ ἠρεμεῖν· καὶ πάλιν τούτων, ἤτοι τὰ μὲν κινούμενα κινεῖσθαι ἀεί, τὰ δ' ἠρεμοῦντα ἠρεμεῖν. ἢ πάντα τὰ πεφυκέναι ὁμοίως κινεῖσθαι καὶ ἠρεμεῖν, ἢ τὸ λοιπὸν ἔτι καὶ τρίτον· ἐνδέχεται γὰρ τὰ μὲν ἀεὶ τῶν ὄντων ἀκίνητα εἶναι· τὰ δ' ἀεὶ κινούμενα, τὰ δ' ἀμφοτέρων μεταλαμβάνειν· ὅπερ ἡμῖν λεκτέον ἐστί. τοῦτο γὰρ ἔχει λύσιν πάντων τε C τῶν ἀπορουμένων, καὶ τέλος ἡμῖν ταύτης τῆς πραγματείας ἐστί. 3 Τὸ μὲν οὖν πάντα ἠρεμεῖν, καὶ τούτου ζητεῖν λόγον, ἀφέντας τὴν αἴσθησιν, ἀρρωστία τίς ἐστι διανοίας. 4 Καὶ περὶ ὅλου τινός, ἀλλ' οὐ περὶ μέρους ἀμφισβήτησις. 5 Οὐδὲ μόνον πρὸς τὸν φυσικόν, ἀλλὰ πρὸς πάσας τὰς ἐπιστήμας, ὡς εἰπεῖν, καὶ πάσας τὰς δόξας, διὰ τὸ κινήσει χρῆσθαι πάσας. 6 Ἔτι δ' αἱ περὶ τῶν ἀρχῶν ἐνστάσεις, ὥσπερ ἐν τοῖς περὶ τὰ μαθήματα λόγοις οὐδέν εἰσι πρὸς τὸν μαθηματικόν· ὁμοίως δὲ καὶ * ἐπὶ τῶν ἄλλων· οὕτως οὐδὲ περὶ τοῦ νῦν ῥηθέντος πρὸς τὸν φυ- D σικόν· ὑπόθεσις γὰρ ὅτι ἡ φύσις ἀρχὴ τῆς κινήσεως. 7 Σχεδὸν δέ τι καὶ τὸ φάναι πάντα κινεῖσθαι, ψεῦδος μέν, ἧττον δὲ τοῦτο παρὰ τὴν μέθοδον· ἐτέθη μὲν γὰρ ἡ φύσις ἐν τοῖς φυσικοῖς ἀρχὴ καθάπερ κινήσεως καὶ ἠρεμίας. * ὁμοίως δὲ φυσικὸν ἡ κίνησις. 8 Καί φασί τινες κινεῖσθαι τῶν ὄντων, οὐ τὰ μὲν, τὰ δ' οὔ, ἀλλὰ πάντα, καὶ ἀεί· ἀλλὰ λανθάνειν τοῦτο τὴν ἡμετέραν αἴσθησιν. 9 Πρὸς οὓς καίπερ οὐ διορίζοντας ποίαν κίνησιν λέγουσιν, ἢ πάσας, οὐ χαλεπὸν ἀπαντῆσαι. 10 Οὔτε γὰρ αὐξάνεσθαι, οὔτε φθίνειν οἷόν τε συνεχῶς, ἀλλ' ἔστι καὶ τὸ μέσον. ἔστι δ' ὅμοιος ὁ λόγος τῷ E περὶ τοῦ τὸν σταλαγμὸν κατατρίβειν, καὶ τὰ ἐκφυόμενα τοὺς λίθους διαιρεῖν· οὐ γὰρ εἰ τοσόνδε ἐξέωσεν ἢ ἀφεῖλεν ὁ σταλαγμός, καὶ τὸ ἥμισυ ἐν ἡμίσει χρόνῳ πρότερον· ἀλλ' ὥσπερ ἡ νεωλκία, καὶ οἱ σταλαγμοὶ οἱ τοσοίδε τοσονδὶ κινοῦσι, τὸ δὲ μέρος αὐτῶν ἐν οὐδενὶ χρόνῳ τοσοῦτον. διαιρεῖται μὲν οὖν τὸ ἀφαιρεθὲν, εἰς πλείω, ἀλλ' οὐδὲν αὐτῶν ἐκινήθη χωρίς, ἀλλ' ἅμα. φανερὸν οὖν ὡς οὐκ ἀναγκαῖον ἀεί τι ἀπιέναι, ὅτι διαιρεῖται ἡ φθίσις εἰς ἄπειρα· ἀλλ' ὅλον ποτὲ ἀπιέναι. 11 Ὁμοίως δὲ καὶ ἐπὶ ἀλλοιώσεως ὁποιασοῦν. οὐ γὰρ εἰ μεριστὸν εἰς ἄπειρον τὸ ἀλλοιούμενον,

* γρ. οὐδ' ἐπὶ ἄ.

* γρ. ἔτι δὲ

διὰ τοῦτο καὶ ἡ ἀλλοίωσις· ἀλλ' ἀθρόα γίνεται πολλάκις, ὥσπερ ἡ πῆξις. 12 Ἔτι, ὅταν νοσήσῃ τις, ἀνάγκη χρόνον γενέσθαι ἐν ᾧ ὑγιασθήσεται, καὶ μὴ ἐν πέρατι χρόνου μεταβάλλειν. 13 Ἀνάγκη δὲ εἰς ὑγίειαν μεταβάλλειν, καὶ εἰς ἄλλο μηδέν. ὥστε τὸ φάναι συνεχῶς ἀλλοιοῦσθαι, λίαν ἐστὶ τοῖς φανεροῖς ἀμφισβητεῖν. εἰς τοὐναντίον γὰρ ἡ ἀλλοίωσις. 14 Ὅ, τε λίθος οὔτε σκληρότερος γίνεται, οὔτε μαλακώτερος. 15 Κατά τε τὸ φέρεσθαι θαυμαστὸν, εἰ λέληθεν ὁ λίθος κάτω φερόμενος, ἢ μένων ἐπὶ τῆς γῆς. 16 Ἔτι δ', ἡ γῆ καὶ τῶν ἄλλων ἕκαστον, ἐξ ἀνάγκης μένουσι μὲν ἐν τοῖς οἰκείοις τόποις, κινοῦνται δὲ βιαίως ἐκ τούτων. εἴπερ οὖν ἔνια αὐτῶν ἐστὶν ἐν τοῖς οἰκείοις τόποις, ἀνάγκη μηδὲ κατὰ τόπον πάντα κινεῖσθαι. 17 Ὅτι μὲν οὖν ἀδύνατον, ἢ ἀεὶ πάντα κινεῖσθαι, ἢ ἀεὶ πάντα ἠρεμεῖν, ἐκ τούτων καὶ ἄλλων τοιούτων πιστεύσειεν ἄν τις. *18 Ἀλλὰ μὴν οὔτε τὰ μὲν ἀεὶ ἐνδέχεται ἠρεμεῖν, τὰ δ' ἀεὶ κινεῖσθαι· ποτὲ δ' ἠρεμεῖν, καὶ ποτὲ κινεῖσθαι μηδέν. 19 Λεκτέον δ' ὅτι ἀδύνατον, ὥσπερ ἐπὶ τῶν εἰρημένων πρότερον, καὶ ἐπὶ τούτων. ὁρῶμεν γὰρ ἐπὶ τῶν αὐτῶν γιγνομένας τὰς εἰρημένας μεταβολάς. 20 Καὶ πρὸς τούτοις, ὅτι μάχεται τοῖς φανεροῖς ὁ ἀμφισβητῶν· οὔτε γὰρ αὔξησις, οὔθ' ἡ βίαιος ἔσται κίνησις, εἰ μὴ κινήσεται παρὰ φύσιν τὸ ἠρεμοῦν πρότερον. γένεσιν οὖν ἀναιρεῖ καὶ φθορὰν οὗτος ὁ λόγος. σχεδὸν δὲ καὶ τὸ κινεῖσθαι, γίνεσθαί τι καὶ φθείρεσθαι δοκεῖ πᾶσιν. εἰς ὃ μὲν γὰρ μεταβάλλει, γίνεται τοῦτο, ἢ ἐν τούτῳ· ἐξ οὗ δὲ μεταβάλλει, φθείρεται τοῦτο, ἢ ἐντεῦθεν. 21 Ὥστε δῆλον, ὅτι τὰ μὲν κινεῖται, τὰ δ' ἠρεμεῖ ἐνίοτε. 22 Τὸ δὲ πάντα ἀξιοῦν, ὁτὲ μὲν ἠρεμεῖν, ὁτὲ δὲ κινεῖσθαι· τοῦτο ἤδη συναπτέον πρὸς τοὺς πάλαι λόγους. 23 Ἀρχὴν δὲ πάλιν ποιητέον ἀπὸ τῶν νῦν διορισθέντων, τὴν αὐτὴν ἀφ' ἧσπερ ἠρξάμεθα πρότερον. ἢ γὰρ τοι πάντα ἠρεμεῖ, ἢ πάντα κινεῖται· ἢ τὰ μὲν ἠρεμεῖ, τὰ δὲ κινεῖται τῶν ὄντων. καὶ εἰ τὰ μὲν ἠρεμεῖ, τὰ δὲ κινεῖται τῶν ὄντων, ἀνάγκη ἤτοι πάντα, ὁτὲ μὲν ἠρεμεῖν, ὁτὲ δὲ κινεῖσθαι· ἢ τὰ μὲν ἀεὶ ἠρεμεῖν, τὰ δὲ ἀεὶ κινεῖσθαι αὐτῶν, τὰ δ', ὁτὲ μὲν ἠρεμεῖν, ὁτὲ δὲ κινεῖσθαι. 24 Ὅτι μὲν οὖν τοίνυν οὐχ οἷόν τε πάντα ἠρεμεῖν, εἴρηται μὲν καὶ πρότερον· εἴπωμεν δὲ καὶ νῦν. εἰ γὰρ κατ' ἀλήθειαν οὕτως ἔχει, καθάπερ τινές φασιν, εἶναι τὸ ὂν ἄπειρον καὶ ἀκίνητον, ἀλλ' οὔτι φαίνεταί γε κατὰ τὴν αἴσθησιν, ἀλλὰ κινεῖται πολλὰ τῶν ὄντων. εἴπερ οὖν ἐστὶ δόξα ψευδὴς, ἢ ὅλως δόξα, καὶ κίνησις ἐστὶ, κἂν εἰ φαντασία, κἂν ὁτὲ μὲν οὕτως δοκῇ εἶναι, ὁτὲ δ' ἑτέρως. ἡ γὰρ φαντασία καὶ ἡ δόξα κινήσεις τινὲς δοκοῦσιν εἶναι. 25 Ἀλλὰ τὸ μὲν † περὶ τούτου σκοπεῖν, καὶ ζητεῖν λόγον, ὧν βέλτιον ἔχομεν ἢ λόγου δεῖσθαι, κακῶς κρίνειν ἐστὶ τὸ βέλτιον καὶ τὸ χεῖρον, καὶ τὸ πιστὸν καὶ τὸ μὴ πιστόν, καὶ ἀρχὴν καὶ μὴ ἀρχήν. 26 Ὁμοίως δὲ ἀδύνατον καὶ τὸ πάντα κινεῖσθαι· ἢ τὰ μὲν ἀεὶ κινεῖσθαι, τὰ δ' ἀεὶ ἠρεμεῖν. πρὸς ἅπαντα γὰρ ταῦτα ἱκανὴ μία πίστις· ὁρῶμεν γὰρ ἔνια, ὁτὲ μὲν κινούμενα, ὁτὲ δ' ἠρεμοῦντα. ὥστε φανερὸν ὅτι ἀδύνατον ὁμοίως τὸ πάντα ἠρεμεῖν, καὶ τὸ πάντα κινεῖσθαι συνεχῶς, τῷ τὰ μὲν ἀεὶ κινεῖσθαι, τὰ δ' ἠρεμεῖν ἀεί. 27 Λοιπὸν οὖν θεωρητέον, πότερον πάντα τοιαῦτα οἷα κινεῖσθαι καὶ ἠρεμεῖν,

idcirco etiam variatio *infinitè diuiditur*: ſed contini & ſimul fit ſæpenumero, vt concretio. 12 Præterea cùm aliquis ægrotauerit, neceſſe *eſt* fuiſſe tempus, quo ſanabitur, nec in termino temporis mutari. 13 Porro neceſſe *eſt* mutari in ſanitatem, non in aliquid aliud. quocirca hæc aſſertio, *res* continenter variari, ea in dubium reuocat, quæ ſunt admodum perſpicua: quandoquidem variatio in contrarium *eſt*. 14 Ac lapis nec durior fit, nec mollior. 15 Quod etiam ad lationem *attinet*, admirabile *eſt*, ſi latet lapis, qui deorſum fertur, aut in terra manet. 16 Præterea terra & cæterorum vnumquodque neceſſariò manent in propriis locis, ex his autem vi mouentur. ſi igitur horum nonnulla ſint in propriis locis: neceſſe *eſt*, ne quidem ſecundùm locum omnia moueri. 17 Impoſſibile igitur eſſe, vel ſemper omnia moueri, vel ſemper omnia quieſcere, ex his & aliis huiuſmodi *rationibus* aliquis crediderit. 18 At verò nec fieri poteſt, vt alia ſemper quieſcant, alia ſemper moueantur; nihil autem interdum quieſcat, interdum moueatur. 19 Dicendum autem impoſſibile eſſe, vt in iis quæ antea dicta fuerunt, *ita* etiam in his: quia videmus in iiſdem *rebus* fieri dictas mutationes. 20 Et ad hæc, quia *rebus* perſpicuis repugnat, qui de hoc controuerſatur. neque enim auctio, neque violentus erit motus, niſi moueatur præter naturam, quod antea quieſcebat. generationem igitur tollit & interitum hic ſermo. Ferè autem & ipſum moueri omnibus videtur *nihil aliud eſſe quam* fieri quiddam & interire. in quod enim mutatur, fit hoc, vel in hoc: ex quo autem mutatur, interit hoc, vel hinc. 21 Quare manifeſtum *eſt*, quædam moueri, quædam quieſcere aliquando. 22 Omnia verò exiſtimare quandoque quieſcere, quandoque moueri, hoc iam adiungendum *eſt* ad rationes ſuprà *allatas*. 23 Initium autem poſt hæc quæ nunc definita ſunt, idem iterum ſumendum *eſt*, ex quo antea exorſi ſumus. Aut enim omnia entia quieſcunt, aut omnia mouentur: aut alia quieſcunt, alia mouentur. & ſi alia entia quieſcunt, alia mouentur, neceſſe *eſt*, vel omnia quandoque quieſcere, quandoque moueri; vel alia ſemper quieſcere, alia ſemper moueri; *vel alia ſemper quieſcere, alia ſemper moueri*, alia modò quieſcere, modò moueri. 24 Fieri igitur non poſſe, vt omnia quieſcant, dictum quidem & antea fuit: dicamus tamen & nunc. nam etſi reuera ita ſit, vt nonnulli dicunt, *id eſt*, ens ſit infinitum & immobile, tamen hoc ſenſui non videtur, ſed multa entia mouentur. Si igitur eſt opinio falſa, aut omnino opinio: *certè* eſt etiam motus: necnon ſi *ſit* phantaſia: & ſi quandoque ita videatur, quandoque aliter: quoniam phantaſia & opinio videntur eſſe motiones quædam. 26 Verùm de his conſiderare, & rationem quærere, in quibus ſumus meliùs affecti, quàm vt ratione egeamus, *nihil aliud* eſt *quàm* malè iudicare, quod eſt melius & quod deterius, & quod eſt credibile & quod non credibile, item principium & non principium. 27 Similiter & impoſſibile *eſt*, omnia moueri: aut alia ſemper moueri, alia ſemper quieſcere. nam aduersùs hæc omnia ſufficit probatio vna: quia videmus nonnulla modò moueri, modò quieſcere. quare perſpicuum *eſt*, omnia quieſcere, & omnia moueri continenter, æquè eſſe impoſſibile atque alia ſemper moueri, alia ſemper quieſcere. 28 Relinquitur ergo diſpiciendum, vtrùm omnia ſint eiuſmodi, vt moueantur & quieſcant:

† γρ. ἀεὶ πάντων

an quędam ita *ſe habeant*, quædam ſemper quieſcant, quædam ſemper moueantur: hoc enim nobis eſt probandum.

A ἢ ἔνια μὲν οὕτως, ἔνια δὲ ἀεὶ ἠρεμεῖ, ἔνια δὲ ἀεὶ κινεῖται· τοῦτο γὰρ δεικτέον ἡμῖν.

Quicquid mouetur, ab alio moueri. Cap. IV.

MOuentium igitur, & eorum quæ mouentur, alia ex accidenti mouent & mouentur, alia per ſe. ex accidenti quidem, vt quæcumq; eo quòd inſunt mouentibus aut iis quæ mouentur, & quæ per partem. per ſe autem, quæcumque nec eò quòd inſint in mouente aut eo quod mouetur, nec eo quòd aliqua ipſorum pars moueat aut moueatur. 2 Eorum verò quæ per ſe *dicuntur*, alia à ſe ipſis, alia ab alio: & alia naturâ, alia vi & præter naturam. 3 Id enim quod à ſe ipſo mouetur, naturâ mouetur: vt vnumquodque animal: mouetur enim animal à ſe ipſo: *ea* verò, in quibus eſt principium motus, naturâ moueri dicimus. idcirco totum quidem animal naturâ ſeipſum mouet. corpori autem accidit, vt moueatur naturâ, & præter naturam: intereſt enim, & quo motu cieatur, & ex quo elemento conſtet. 4 Et eorum quæ ab alio mouentur, quædam naturâ mouentur, quædam præter naturam. Præter naturam quidem, vt terreſtria ſurſum, & ignis deorſum. 5 Præterea partes animalium ſæpe mouentur præter naturam, propter poſitiones & modos motionis. 6 Ac maximè ab aliquo moueri id quod mouetur, in iis quæ præter naturam mouentur, perſpicuum *eſt*: quia patet ab alio moueri. 7 Poſt *hæc* autem quæ præter naturam *mouentur*, inter ea quæ *mouentur* ſecundùm naturam, *illa ſunt magis manifeſta*, quæ à ſeipſis *mouentur*, vt animalia. non eſt enim hoc obſcurũ, an ab aliquo moueantur, ſed quomodo oporteat diſtinguere ipſum mouens & quod mouetur. nam videtur, vt in nauibus & iis quæ naturâ non conſtant, ita etiam in animalibus eſſe diuiſum id quod mouet & id quod mouetur, atque ita totum mouere ſeipſum. 8 Maximè autem dubitatur de reliquo dictæ poſtremæ diuiſionis *membro*. eorum enim quæ ab alio mouentur, quædam præter naturam moueri poſuimus: alia verò opponenda reſtãt, quia naturâ mouentur. hæc autem ſunt, quæ dubitationem præbere poſſunt, à quo*nam* moueantur: vt leuia, & grauia. nã hæc ad oppoſitos locos vi mouentur: ad proprios autem, nempe leue ſurſum, graue deorſum naturâ *mouentur*. ſed à quo*nam mouea ntur*, nondum liquet, ſicuti cùm mouentur præter naturam. 9 Ipſa namque à ſe ipſis moueri, *eſt* dictu impoſſibile: quoniam hoc *eſt* vitale, & animantium proprium. 10 Et ſiſtere ſe ipſa poſſent. Verbi gratiâ, ſi *quid ſit* ſibi cauſa ambulandi, *erit* etiam non ambulandi. quare cùm in ipſo igne *poſitum ſit* vt ſurſum feratur, manifeſtum *eſt* in ipſo etiam *poſitum eſſe* vt feratur deorſum. 11 Abſurdum quoque *eſt*, vno tantùm motu à ſe ipſis cieri, ſi ipſa ſe ipſa mouent. 12 Præterea qui fieri poteſt, vt continuum quid & copulatum ſeipſum moueat? nam quatenus vnum & continuum non tactu *eſt*, eatenus *eſt* impatibile. ſed quatenus ſeparata ſunt, eatenus naturâ eſt comparatum, vt alterum efficiat, alterum patiatur? neque igitur horum aliquid ſeipſum mouet, quoniam *ſunt* copulata: neque aliud quicquam continuum. ſed neceſſe *eſt*, in vnaquaque re diuiſum eſſe id quod mouet, ab eo quod mouetur: vt in rebus inanimis cernimus, cùm aliquid animatum ea mouet. 13 Sed euenit vt & hæc ab aliquo ſemper moueantur.

B Τῶν δὲ κινούντων καὶ κινουμένων, τὰ μὲν κατὰ συμβεβηκὸς κινεῖ καὶ κινεῖται, τὰ δὲ καθ' αὑτά. κατὰ συμβεβηκὸς μὲν, οἷον ὅσα τε τῷ ὑπάρχειν τοῖς κινοῦσιν ἢ κινουμένοις, καὶ τὰ κατὰ μέρος· τὰ δὲ καθ' αὑτά, ὅσα μὴ τῷ ὑπάρχειν τῷ κινοῦντι ἢ κινουμένῳ, μηδὲ τῷ μέρος τι αὐτῶν κινεῖν ἢ κινεῖσθαι. 2 Τῶν δὲ καθ' αὑτά, τὰ μὲν ὑφ' αὑτῶν, τὰ δ' ὑπ' ἄλλου· καὶ τὰ μὲν φύσει, τὰ δὲ βίᾳ καὶ παρὰ φύσιν. 3 Τό, τε γὰρ αὐτὸ ὑφ' αὑτοῦ κινούμενον, φύσει κινεῖται, οἷον ἕκαστον τῶν ζῴων· κινεῖται γὰρ τὸ ζῷον αὐτὸ ὑφ' αὑτοῦ. ὅσων δ' ἡ ἀρχὴ ἐν αὐτοῖς τῆς κινήσεως, ταῦτα φύσει φαμὲν κινεῖσθαι. διὸ, τὸ μὲν ζῷον ὅλον φύσει αὐτὸ ἑαυτὸ κινεῖ· τὸ μέντοι σῶμα ἐνδέχεται καὶ φύσει καὶ παρὰ φύσιν κινεῖ-
C σθαι· διαφέρει γὰρ ὁποίαν τε κίνησιν κινούμενον τύχῃ, καὶ ἐκ ποίου στοιχείου συνεστηκός. 4 Καὶ τῶν ὑπ' ἄλλου κινουμένων, τὰ μὲν φύσει κινεῖται, τὰ δὲ παρὰ φύσιν. παρὰ φύσιν μὲν, οἷον τὰ γεηρὰ ἄνω, καὶ τὸ πῦρ κάτω. 5 Ἔτι δὲ, τὰ μόρια τῶν ζῴων πολλάκις κινεῖται παρὰ φύσιν, παρὰ τὰς θέσεις καὶ τοὺς τρόπους τῆς κινήσεως. 6 Καὶ μάλιστα τὸ ὑπό τινος κινεῖσθαι τὸ κινούμενον ἐν τοῖς παρὰ φύσιν κινουμένοις ἐστὶ φανερὸν, διὰ τὸ δῆλον εἶναι ὑπ' ἄλλου κινούμενον. 7 Μετὰ δὲ τὰ παρὰ φύσιν τῶν κατὰ φύσιν τὰ αὐτὰ ὑφ' αὑτῶν, οἷον τὰ ζῷα· οὐ γὰρ τοῦτ' ἄδηλον, εἰ ὑπό τινος κινεῖται· ἀλλὰ πῶς δεῖ διαλαβεῖν * αὐτοῦ τὸ κινοῦν καὶ τὸ κι- [* κ. αὐτ.]
D νούμενον, ἔοικε γὰρ ὥσπερ ἐν τοῖς πλοίοις καὶ τοῖς μὴ φύσει συνισταμένοις, οὕτω καὶ ἐν τοῖς ζῴοις εἶναι διῃρημένον τὸ κινοῦν καὶ τὸ κινούμενον, καὶ οὕτω τὸ πᾶν αὐτὸ ἑαυτὸ κινεῖν. 7 Μάλιστα δ' ἀπορεῖται τὸ λοιπὸν τῆς εἰρημένης τελευταίας διαιρέσεως· τῶν γὰρ ὑπ' ἄλλου κινουμένων, τὰ μὲν παρὰ φύσιν ἐθήκαμεν κινεῖσθαι, τὰ δὲ λείπεται ἀντιθεῖναι, ὅτι φύσει. ταῦτα δ' ἐστὶν ἃ τὴν ἀπορίαν παράσχοι ἂν ὑπό τινος κινεῖται, οἷον τὰ κοῦφα καὶ τὰ βαρέα. ταῦτα γὰρ εἰς μὲν τοὺς ἀντικειμένους τόπους βίᾳ κινεῖται· εἰς δὲ τοὺς οἰκείους, τὸ μὲν κοῦφον ἄνω, τὸ δὲ βαρὺ κάτω φύσει. τὸ δ' ὑπό τινος, οὐκ ἔτι φανερὸν, ὥσπερ ὅταν κινῶνται παρὰ
E φύσιν. 9 Τό, τε γὰρ αὐτὰ ὑφ' αὑτῶν φάναι ἀδύνατον· ζωτικόν τε γὰρ τοῦτο καὶ τῶν ἐμψύχων ἴδιον. 10 Καὶ ἱστάναι ἂν * ἐδύνατο αὐτὰ αὑτά· λέγω δ' * οἷον, εἰ τοῦ βαδίζειν αἴτιον αὑτῷ, καὶ τοῦ μὴ βαδίζειν. ὥστ' ἐπεὶ ἐπ' αὐτῷ τὸ ἄνω φέρεσθαι τῷ πυρὶ, δῆλον ὅτι ἐπ' αὐτῷ καὶ τὸ κάτω. 11 Ἄλογον δὲ καὶ τὸ μίαν κίνησιν κινεῖσθαι * μόνον ὑφ' αὑτῶν, εἴγε αὐτὰ ἑαυτὰ κινοῦσιν. 12 Ἔτι, πῶς ἐνδέχεται συνεχές τι καὶ συμφυὲς αὐτὸ ἑαυτὸ κινεῖν; ᾗ γὰρ ἓν καὶ συνεχὲς μὴ ἁφῇ, ταύτῃ ἀπαθές· ἀλλ' ᾗ κεχώρισται, ταύτῃ τὸ μὲν πέφυκε ποιεῖν, τὸ δὲ πάσχειν. οὔτ' ἄρα τούτων οὐθὲν αὐτὸ ἑαυτὸ κινεῖ· συμφυῆ γάρ· οὔτ' ἄλλο συνεχὲς οὐθέν· ἀλλ' ἀναγκαῖον διῃρῆσθαι τὸ κινοῦν ἐν ἑκάστῳ πρὸς τὸ κινούμενον, οἷον ἐπὶ τῶν ἀψύχων ὁρῶμεν, ὅταν κινῇ τι τῶν ἐμψύχων αὐτά. 13 ἀλλὰ συμβαίνει καὶ ταῦτα ὑπό τινος ἀεὶ κινεῖσθαι·

* γρ. ἱστάναι
* Vulgo, αὐτοῖ, perperam.
* γρ. μόνω

γένοιτ' ἂν φανερὸν διαιροῦσι τὰς αἰτίας. ἔστι δὲ καὶ ἐπὶ τῶν κινούντων λαβεῖν τὰ εἰρημένα. τὰ μὲν γὰρ παρὰ φύσιν αὐτῶν κινητικά ἐστιν, οἷον ὁ μοχλὸς, οὐ φύσει τοῦ βάρους κινητικός. τὰ δὲ φύσει, οἷον τὸ ἐνεργείᾳ θερμὸν κινητικὸν τοῦ δυνάμει θερμοῦ. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων τῶν τοιούτων. καὶ κινητὸν δὴ ὡσαύτως φύσει, τὸ δυνάμει ποιὸν, ἢ ποσὸν, ἢ που, ὅταν ἔχῃ τὴν ἀρχὴν [τὴν] τοιαύτην ἐν ἑαυτῷ, καὶ μὴ κατὰ συμβεβηκός. εἴη γὰρ ἂν τὸ αὐτὸ* καὶ ποσὸν, καὶ ποιόν. ἀλλὰ θατέρῳ θάτερον συμβέβηκε, καὶ οὐ καθ' αὑτὸ ὑπάρχει. 14 Τὸ δὴ πῦρ καὶ ἡ γῆ κινοῦνται ὑπό τινος, βίᾳ μὲν, ὅταν παρὰ φύσιν· φύσει δὲ, ὅταν εἰς τὰς ἑαυτῶν ἐνεργείας δυνάμει ὄντα. 15 Ἐπεὶ δὲ τὸ δυνάμει πλεοναχῶς λέγεται, τοῦτ' αἴτιον τοῦ μὴ φανερὸν εἶναι ὑπό τινος τὰ τοιαῦτα κινεῖται, οἷον τὸ πῦρ ἄνω, καὶ ἡ γῆ κάτω. 16 Ἔστι δὲ δυνάμει ἄλλως ὁ μανθάνων ἐπιστήμων, καὶ ὁ ἔχων ἤδη, καὶ μὴ θεωρῶν. 17 Ἀεὶ δ', ὅταν ἅμα τὸ ποιητικὸν καὶ τὸ παθητικὸν ὦσι, γίνεται ἐνίοτε ἐνεργείᾳ τὸ δυνατὸν, οἷον τὸ μανθάνον ἐκ δυνάμει ὄντος, ἕτερον γίνεται δυνάμει. ὁ γὰρ ἔχων ἐπιστήμην, μὴ θεωρῶν δὲ, δυνάμει ἐστὶν ἐπιστήμων πῶς, ἀλλ' οὐχ ὡς καὶ πρὶν μαθεῖν. ὅταν δ' οὕτως ἔχῃ, ἐὰν μή τι κωλύῃ, ἐνεργεῖ, καὶ θεωρεῖ, ἢ ἔσται ἐν τῇ ἀντιφάσει καὶ ἀγνοίᾳ. ὁμοίως δὲ ταῦτ' ἔχει καὶ ἐπὶ τῶν φυσικῶν. τὸ γὰρ ψυχρὸν δυνάμει θερμόν· ὅταν δὲ μεταβάλλῃ, ἤδη πῦρ, καίει δὲ, ἂν μή τι κωλύῃ καὶ ἐμποδίζῃ. 18 Ὁμοίως δ' ἔχει καὶ περὶ τὸ βαρὺ καὶ κοῦφον. τὸ γὰρ κοῦφον γίνεται ἐκ βαρέος, οἷον ἐξ ὕδατος ἀήρ· τοῦτο γὰρ δυνάμει πρῶτον, καὶ ἤδη κοῦφον καὶ ἐνεργήσει γε εὐθὺς, ἐὰν* μή τι κωλύσῃ. ἐνέργεια δὲ τοῦ κούφου, τὸ πού εἶναι, καὶ ἄνω. κωλύεται δ', ὅταν ἐν τῷ* ἐναντίῳ ᾖ. καὶ τοῦτο ὁμοίως ἔχει καὶ ἐπὶ τοῦ ποσοῦ καὶ ἐπὶ τοῦ ποιοῦ. 19 Καίτοι τοῦτο ζητεῖται διὰ τί ποτε κινεῖται εἰς τὸν* αὑτῶν τόπον τὰ κοῦφα καὶ τὰ βαρέα. αἴτιον δ', ὅτι πέφυκέ ποι, καὶ τοῦτ' ἔστι τὸ κούφῳ καὶ βαρεῖ εἶναι, τὸ μὲν τῷ ἄνω, τὸ δὲ τῷ κάτω διωρισμένον. 20 Δυνάμει δ' ἐστὶ κοῦφον καὶ βαρὺ* πολλαχῶς, ὥσπερ εἴρηται. ὅταν γὰρ ᾖ ὕδωρ, δυνάμει γέ πως ἐστὶ κοῦφον· καὶ ὅταν ἀήρ, ἔστιν ἔτι δυνάμει· ἐνδέχεται γὰρ ἐμποδιζόμενον μὴ ἄνω εἶναι, ἀλλ' ἐὰν ἀφαιρεθῇ τὸ ἐμποδίζον, ἐνεργεῖ, καὶ ἀεὶ ἀνωτέρω* γίνεται. ὁμοίως δὲ καὶ τὸ ποιὸν εἰς τὸ ἐνεργείᾳ εἶναι μεταβάλλει· εὐθὺς γὰρ θεωρεῖ τὸ ἐπιστῆμον, ἐὰν μή τι κωλύῃ· καὶ τὸ ποσὸν ἐκτείνεται, ἐὰν μή τι κωλύῃ. 21 Ὁ δὲ τὸ ὑφιστάμενον καὶ κωλῦον κινήσας, ἔστι μὲν ὡς κινεῖ, ἔστι δ' ὡς οὐ. οἷον, ὁ τὸν κίονα ὑποσπάσας, ἢ ὁ τὸν λίθον ἀφελὼν ἀπὸ τοῦ ἀσκοῦ ἐν ὕδατι· κατὰ συμβεβηκὸς γὰρ κινεῖ, ὥσπερ καὶ ἡ ἀνακλασθεῖσα σφαῖρα, οὐχ ὑπὸ τοῦ τοίχου ἐκινήθη, ἀλλ' ὑπὸ τοῦ βαλόντος. 22 Ὅτι μὲν οὖν οὐδὲν τούτων αὐτὸ κινεῖ ἑαυτὸ, δῆλον. ἀλλὰ κινήσεως ἀρχὴν ἔχει, οὐ τοῦ κινεῖν, οὐδὲ τοῦ ποιεῖν, ἀλλὰ τοῦ πάσχειν. 23 Εἰ δὴ πάντα τὰ κινούμενα ἢ φύσει κινεῖται, ἢ παρὰ φύσιν, καὶ βίᾳ· καὶ τά τε βίᾳ, καὶ τὰ παρὰ φύσιν πάντα ὑπό τινος καὶ ὑπ' ἄλλου· τῶν δὲ φύσει πάλιν τά τε ὑφ' αὑτῶν κινούμενα, ὑπό τινος κινεῖται, καὶ τὰ μὴ ὑφ' αὑτῶν, οἷον τὰ κοῦφα καὶ τὰ βαρέα· (ἢ γὰρ ὑπὸ τοῦ γεννήσαντος καὶ ποιήσαντος κοῦφον, ἢ βαρὺ, ἢ ὑπὸ τοῦ τὰ ἐμποδίζοντα καὶ κωλύοντα λύσαντος·) * ἅπαντα ἂν τὰ κινούμενα ὑπό τινος κινοῖτο.

* γρ. τὸ ποιὸν

* γρ. μὴ κω-

* γρ. ἐν τῷ τόπῳ

* Vulgò αὐτῶν inepte.

* γρ. πολλαχῶς.

* γρ. φέρεται.

* γρ. ἅπαντα ἄρα.

A *quod* quidem perſpicuum fiet diuidentibus cauſas. licet autem etiam in mouentibus ſumere ea quæ dicta ſunt. nam alia præter ſuam naturam habent vim mouendi, vt vectis non naturaliter habet vim mouendi ponderis: alia naturaliter, vt id quod eſt actu calidum, vim habet eius mouendi quod eſt calidum poteſtate. ſimiliter etiam in eiuſmodi aliis *ſe res habet*. Sed & mobile itidem naturaliter *eſt*, quod poteſtate *eſt* quale, vel quantum, vel alicubi, cùm habeat eiuſmodi principium in ſeipſo, non ex accidenti. non enim idem poteſt eſſe & quantum, & quale: *ſed* alteri alterum accidit, nec per ſe ineſt. 14 Ignis igitur ac terra mouentur ab aliquo, vi quidem, quan-B do præter naturam; naturaliter verò, quando ad ſuos ipſorum actus mouentur, cùm ſint poteſtate. 15 Quoniam autem *eſſe* poteſtate, dicitur multis modis: hæc *eſt* cauſa, cur non appareat, à quo talia moueantur: vt ignis ſurſum, ac terra deorſum. 16 Eſt verò poteſtate ſciens aliter qui diſcit, & is qui iam ſcientiam habet neque contemplatur. 17 Quotieſcumque autem id quod efficiendi & id quod patiendi vim habet, ſimul ſunt: id quod eſt poteſtate, fit actu. vt is qui diſcit, ex eo quod eſt poteſtate, fit aliud poteſtate. nam qui ſcientia eſt præditus, neque contemplatur, *is* eſt quodammodo poteſtate ſciens, ſed non vt *erat* antequam diſceret. cùm autem ita *ſe* habeat, niſi quid prohibeat, agit & contemplatur, C aut erit in contradictione & ignorantia. ſimiliter autem hæc *ſe* habent etiam in *rebus* naturalibus. nam frigidum *eſt* poteſtate calidum. cùm autem eſt mutatum, iam *eſt* ignis, & comburit, niſi quid prohibeat & impediat. 18 Similiter *ſe res* habet etiam in graui & leui. nam leue fit ex graui, vt ex aqua aër. hoc enim priùs *erat* poteſtate, & iam *eſt* leue, atque aget confeſtim, niſi quid prohibeat. actus autem *rei* leuis *eſt*, alicubi eſſe, & in loco ſupero: ſed prohibetur, quando eſt in loco contrario. Atque hoc ſimiliter *ſe* habet & in quanto, & in quali. 19 Atqui hoc quæritur, cur ad ſua ipſorum loca moueantur grauia & leuia. cauſa verò *eſt*, quia naturâ eſt comparatum, vt *ſint* alicubi atque hæc eſt *rei* leuis & grauis eſſen-D tia, ita vt illa *loco* ſupero, hæc *loco* infero definiatur. 20 Poteſtate autem eſt leue & graue multis modis, ſicuti dictum fuit. cùm enim eſt aqua, poteſtate quodammodo eſt leue: & cùm aër, adhuc eſt poteſtate: quia fieri poteſt, vt impeditum ſupero loco non ſit: verùm ſi auferatur quod impedit, agit, ac ſemper ſurſum tendit. Similiter etiam quale in id mutatur vt ſit poteſtate. nam ſciens ſtatim contemplatur, niſi quid impediat. Et quantum extenditur, niſi quid impediat. 21 Qui verò id amouet quod ſubeſt & prohibet, aliquo modo mouet, aliquo modo non *mouet*: veluti qui columnam ſubtraxit, aut qui lapidem exemit ex vtre in aqua: ex accidenti namque E mouet: ſicut & pila repercuſſa, non à pariete mota eſt, ſed ab eo qui proiecit. 22 Patet igitur nihil horum ſeipſum mouere: ſed motus principium habere, *id eſt*, non mouendi, nec faciendi, ſed patiendi. 23 Si igitur quæcumque mouentur, aut naturâ mouentur, aut præter naturam & vi; atque ea quæ vi & præter naturam, omnia ab aliquo & ab alio *mouentur*; eorum rurſus quæ natura, tam ea quæ à ſeipſis mouentur, ab aliquo mouentur, quàm ea quæ non à ſeipſis, vt leuia & grauia: (aut enim mouentur ab eo qui genuit & fecit leue ſeu graue, aut ab eo quod impedientia & prohibentia amouit) profectò quæcumque mouentur, ab aliquo mouentur.

Primum mouens, ab externo non moueri.

Cap. V.

A HOc autem bifariàm. aut enim non per ipſum mouens, ſed per aliud à quo mouens mouetur, aut per ipſum. atque hoc vel *eſt* primum poſt vltimum, vel per plura *mouet*. vt baculus mouet lapidem, & à manu mouetur, quæ mouetur ab homine: hic autem non ampliùs *mouet* eo quòd ab alio moueatur. 2 Vtrumque igitur mouere dicimus, & quod eſt poſtremum, & quod eſt primum inter mouentia: ſed magis quod eſt primum: quippe quod mouet poſtremum, ſed ab eo non mouetur. & ſine primo quidem poſtremum non mouebit: illud autem ſine hoc *mouebit*: vt baculus non mouebit, niſi homo moueat. B 3 Si igitur neceſſe *eſt*, quicquid mouetur, ipſum ab aliquo moueri: etiam *neceſſe eſt* vel ab eo *moueri* quod ab alio mouetur, vel non *ab eo*. & ſi *mouetur ab* eo quod ab alio mouetur: neceſſe *eſt* eſſe aliquod mouens primum, quod non *mouetur* ab alio. ſi verò primum eiuſmodi *eſt*, non *eſt* neceſſe alterum *eſſe*. Impoſſibile enim *eſt*, id quod mouet, ipſúmq; ab alio mouetur, in infinitum abire: quandoquidem infinitorum nihil eſt primum. 4 Si igitur quicquid mouetur, ab aliquo mouetur; primum autem mouẽs mouetur quidem, non tamen ab alio mouetur: neceſſe *eſt* ipſum à ſeipſo moueri. 5 Prǽterea ſic quoque licet eandem diſputationem aggredi. quicquid C enim mouet, & aliquid mouet, & aliquo. quod enim mouet, aut ſeipſo mouet, aut alio: vt homo ſeipſo, aut baculo: & ventus vel ipſe deiecit, vel lapis quem *ventus* impulit. 6 Impoſſibile autem *eſt*, id quod mouet, ſine eo mouere quod ſeipſo mouet. ſed ſi ipſum ſeipſo moueat, non *eſt* neceſſe aliud eſſe, quo moueat: ſi verò ſit alterum, *nempe* id quo mouet, eſt etiam aliquid quod mouebit, non aliquo, ſed ſeipſo: aut in infinitum *hæc abibunt*. 7 Si quid igitur, cùm moueatur, mouet: neceſſe *eſt* conſiſtere, non in infinitum *abire*. nam ſi baculus mouet eo quòd mouetur à manu, manus mouet baculum: ſi verò & hac aliud D mouet: eſt etiam aliquid aliud quod hanc mouet. cùm igitur aliud aliquo mouet, neceſſe *eſt*, eſſe prius id quod ſeipſo mouet. 8 Ergo ſi hoc mouetur, nec eſt aliud quod ipſum moueat: neceſſe *eſt*, ipſum ſe mouere: quapropter etiam ex hac ratione vel ſtatim id quod mouetur, ab eo quod ſe ipſo mouet, mouetur, aut tãdem peruenit ad tale quidpiam. 9 Prǽter hæc quæ dicta ſunt, etiam ita conſiderantib. hæc eadem euenient. nã ſi quicquid mouetur, ab eo, quod mouetur, moueatur: vel hoc rebus ineſt ex accidẽti, vt id quod mouetur moueat, nõ quia ipſum moueatur: vel non *ex accidenti*, ſed per ſe. 10 Primum igi- E tur, ſi ex accidenti *eſt*, non *eſt* neceſſe moueri id quod mouet. hoc autem ſi *concedatur*, patet fieri poſſe, vt nihil moueatur: quoniam accidens non *eſt* neceſſarium, ſed poteſt non eſſe. 11 Itaque ſi ponamus eſſe quod *eſt* poſſibile: nihil impoſſibile eueniet, ſed fortaſſe falſum. at motum non eſſe *eſt* impoſſibile: quoniam hoc antea probatũ fuit, neceſſe *eſſe* vt motus ſemper ſit. 12 Atque hoc rationi conſentaneum accidit. tria namq; eſſe neceſſe eſt: *nimirum* id quod mouetur, & id quod mouet, & id quo mouet. id igitur quod mouetur, neceſſe *eſt* quidem moueri, ſed mouere non *eſt* neceſſe. id autem quo mouet, *neceſſe eſt* & mouere & moueri: hoc enim vnà mutatur, cùm ſimul & in eodem ſit cũ eo quod mouetur:

A Τοῦτο δὲ διχῶς· ἢ γὰρ οὐ δι' αὐτὸ τὸ κινοῦν, ἀλλὰ δι' ἕτερον ὃ κινεῖ τὸ κινοῦν· ἢ δι' αὐτό. καὶ τοῦτο, ἢ πρῶτον μετὰ τὸ ἔσχατον, ἢ διὰ πλειόνων, οἷον, ἡ βακτηρία κινεῖ τὸν λίθον, καὶ κινεῖται ὑπὸ τῆς χειρὸς κινουμένης ὑπὸ τοῦ ἀνθρώπου· οὗτος δ', οὐκέτι τῷ ὑπ' ἄλλου κινεῖσθαι. 2 Ἄμφω δὴ κινεῖν φαμὲν καὶ τὸ τελευταῖον καὶ τὸ πρῶτον τῶν κινούντων, ἀλλὰ μᾶλλον τὸ πρῶτον· ἐκεῖνο γὰρ κινεῖ τὸ τελευταῖον, ἀλλ' οὐ τοῦτο τὸ πρῶτον· καὶ ἄνευ μὲν τοῦ πρώτου, τὸ τελευταῖον οὐ κινήσει, ἐκεῖνο δ' ἄνευ τούτου· οἷον, ἡ βακτηρία οὐ κινήσει, μὴ κινοῦντος τοῦ ἀνθρώπου. B 3 Εἰ δὴ ἀνάγκη πᾶν τὸ κινούμενον ὑπό τινός τε κινεῖσθαι, καὶ ἢ ὑπὸ τοῦ κινουμένου ὑπὸ ἄλλου, ἢ μή· καὶ εἰ μὲν ὑπ' ἄλλου κινουμένου, ἀνάγκη τι εἶναι κινοῦν ὃ οὐχ ὑπ' ἄλλου πρῶτον. εἰ δὲ τοιοῦτον τὸ πρῶτον, οὐκ ἀνάγκη θάτερον· ἀδύνατον γὰρ εἰς ἄπειρον ἰέναι τὸ κινοῦν καὶ τὸ κινούμενον ὑπ' ἄλλου αὐτό· τῶν γὰρ ἀπείρων οὐκ ἔστιν οὐδὲν πρῶτον. 4 Εἰ οὖν ἅπαν μὲν τὸ κινούμενον ὑπό τινος κινεῖται, τὸ δὲ πρῶτον κινοῦν, κινεῖται μὲν, οὐχ ὑπ' ἄλλου δὲ, ἀνάγκη αὐτὸ ὑφ' αὑτοῦ κινεῖσθαι. 5 Ἔτι δὲ καὶ ὧδε τὸν αὐτὸν τοῦτον λόγον ἔστιν ἐπελθεῖν. ἅπαν γὰρ τὸ κι- C νοῦν τί τε κινεῖ, καὶ τινί. ἢ γὰρ αὑτῷ κινεῖ τὸ κινοῦν, ἢ ἄλλῳ· οἷον, ἄνθρωπος αὐτῷ ἢ τῇ βακτηρίᾳ· καὶ ὁ ἄνεμος κατέβαλλεν, ἢ αὐτὸς, ἢ ὁ λίθος ὃν ἔωσεν. 6 Ἀδύνατον δὲ κινεῖν ἄνευ τοῦ * αὐτὸ αὑτῷ κινοῦντος, τὸ ᾧ κινεῖ· ἀλλ' εἰ μὲν αὐτὸ αὑτῷ κινεῖ, οὐκ ἀνάγκη ἄλλο εἶναι ᾧ κινεῖ. ἐὰν δὲ ᾖ ἕτερον τὸ ᾧ κινεῖ, ἔστι τι ὃ κινήσει, οὐ τινὶ, ἀλλ' αὑτῷ, ἢ εἰς ἄπειρον εἶσιν. 7 Εἰ οὖν τι κινούμενον κινεῖ, ἀνάγκη στῆναι, καὶ μὴ εἰς ἄπειρον ἰέναι· εἰ γὰρ ἡ βακτηρία κινεῖ τῷ κινεῖσθαι ὑπὸ τῆς χειρὸς, ἡ χεὶρ κινεῖ τὴν βακτηρίαν. εἰ δὲ ταύτην ἄλλο κινεῖ, καὶ ταύτην ἕτερόν τι τὸ κινοῦν. D ὅταν δὴ τινὶ κινῇ ἀεὶ ἕτερον, ἀνάγκη εἶναι πρότερον τὸ αὐτὸ αὑτῷ κινοῦν. 8 Εἰ οὖν κινεῖται μὲν τοῦτο, μὴ ἄλλο δὲ τὸ κινοῦν αὐτὸ, ἀνάγκη * αὐτὸ αὑτὸ κινεῖν. ὥστε καὶ κατὰ τοῦτον τὸν λόγον, ἤτοι εὐθὺς τὸ κινούμενον ὑπὸ τοῦ αὐτὸ αὑτῷ κινοῦντος κινεῖται, ἢ ἔρχεταί ποτε εἴς τι τοιοῦτον. 9 Πρὸς δὲ τοῖς εἰρημένοις καὶ ὧδε σκοποῦσι, ταὐτὰ συμβήσεται * ταῦτα· εἰ γὰρ ὑπὸ κινουμένου κινεῖται τὸ κινούμενον πᾶν, ἤτοι τοῦτο ὑπάρχει τοῖς πράγμασι κατὰ συμβεβηκὸς, ὥστε κινεῖ μὲν κινούμενον, οὐ μέντοι διὰ τὸ κινεῖσθαι αὐτὸ ἀεὶ ἢ οὔ, ἀλλὰ καθ' αὑτό. 10 Πρῶτον μὲν E οὖν εἰ κατὰ συμβεβηκὸς, οὐκ ἀνάγκη κινεῖσθαι τὸ κινούμενον. εἰ δὲ τοῦτο, δῆλον ὡς ἐνδέχεταί ποτε μηδὲν κινεῖσθαι τῶν ὄντων· οὐ γὰρ ἀναγκαῖον τὸ συμβεβηκὸς, ἀλλ' ἐνδεχόμενον μὴ εἶναι. 11 Ἐὰν οὖν θῶμεν τὸ δυνατὸν εἶναι, οὐδὲν ἀδύνατον συμβήσεται, ψεῦδος δ' ἴσως. ἀλλὰ τὸ κίνησιν μὴ εἶναι, ἀδύνατον· δέδεικται γὰρ τοῦτο πρότερον, ὅτι ἀνάγκη κίνησιν ἀεὶ εἶναι. 12 Καὶ εὐλόγως τοῦτο συμβέβηκε. τρία γὰρ ἀνάγκη εἶναι, τό, τε κινούμενον, καὶ τὸ κινοῦν, καὶ τὸ ᾧ κινεῖ. τὸ μὲν οὖν κινούμενον, ἀνάγκη μὲν κινεῖσθαι, κινεῖν δὲ οὐκ ἀνάγκη· τὸ δ' ᾧ κινεῖ, καὶ κινεῖν, καὶ κινεῖσθαι· συμμεταβάλλει γὰρ τοῦτο ἅμα καὶ κατὰ τὸ αὐτὸ τῷ κινουμένῳ ὄν·

* ἢ, αὐτὸ αὑτὸ κ.

* καὶ αὐτὸ αὑτῷ εἶναι.

* ἔσονται.

δῆλον δὲ ἐπὶ τῶν κατὰ τόπον κινούντων· ἅπτεσθαι γὰρ ἀλλή- A
λων ἀνάγκη ἐστὶ, μέχρι τινός· τὸ δὲ κινοῦν οὕτως ὥστ' εἶναι
μὴ ᾧ κινεῖ, ἀκίνητον. ἐπεὶ δ' ὁρῶμεν τὸ ἔσχατον, ὃ κινεῖσθαι
μὲν δύναται, κινήσεως δὲ ἀρχὴν οὐκ ἔχει, καὶ ὃ κινεῖται
μὲν, ὑπ' ἄλλου δὲ, ἀλλ' οὐχ ὑφ' αὑτοῦ, εὔλογον, ἵνα μὴ
ἀναγκαῖον εἴπωμεν, καὶ τὸ τρίτον εἶναι ὃ κινεῖ ἀκίνητον ὄν. 13
Διὸ καὶ Ἀναξαγόρας ὀρθῶς λέγει, τὸν νοῦν ἀπαθῆ φάσκων
καὶ ἀμιγῆ εἶναι· ἐπειδήπερ κινήσεως ἀρχὴν ποιεῖ αὐτὸν εἶναι·
οὕτω γὰρ μόνως ἂν κινοίη ἀκίνητος ὢν, καὶ κρατοίη ἀμιγὴς
ὤν. 14 Ἀλλὰ μὴν, εἰ μὴ κατὰ συμβεβηκὸς, ἀλλ' ἐξ
ἀνάγκης κινεῖται τὸ κινοῦν, εἰ δὲ μὴ κινοῖτο, οὐκ ἂν κινοίη· B
ἀνάγκη τὸ κινοῦν, ᾗ κινεῖται, ἤτοι οὕτω κινεῖσθαι, ὥστε κατὰ τὸ
αὐτὸ εἶδος τῆς κινήσεως, ἢ καθ' ἕτερον. λέγω δὲ, ὅτι ἤτοι τὸ
θερμαῖνον καὶ αὐτὸ θερμαίνεσθαι, καὶ τὸ ὑγιάζον ὑγιάζεσθαι,
καὶ τὸ φέρον φέρεσθαι· ἢ τὸ ὑγιάζον φέρεσθαι, τὸ δὲ φέρον
* αὐξάνεσθαι. ἀλλὰ φανερὸν ὅτι ἀδύνατον· δεῖ γὰρ μέχρι
τῶν ἀτόμων διαιρουμένους λέγειν, οἷον εἴ τι διδάσκει γεωμετρεῖν,
τοῦτο διδάσκεσθαι γεωμετρεῖν τὸ αὐτὸ, ἢ εἰ ῥιπτεῖ, ῥιπτεῖσθαι
τὸν αὐτὸν τρόπον τῆς ῥίψεως· * ἢ οὕτω μὲν, μὴ ἄλλο δὲ, ἐξ
ἄλλου γένους· οἷον, τὸ φέρον μὲν αὐξάνεσθαι, τὸ δὲ τοῦτο αὔ-
ξον ἀλλοιοῦσθαι ὑπ' ἄλλου· τὸ δὲ τοῦτο ἀλλοιοῦν, ἑτέραν C
τινὰ κινεῖσθαι κίνησιν. ἀλλ' ἀνάγκη στῆναι· πεπερασμέναι
γὰρ αἱ κινήσεις. τὸ δὲ πάλιν ἀνακάμπτειν, καὶ τὸ ἀλλοιοῦν
φάναι φέρεσθαι, ταὐτὸ ποιεῖν ἐστι, κἂν εἰ εὐθὺς * ἔφη τὸ
φέρον φέρεσθαι, καὶ διδάσκεσθαι τὸ διδάσκον· δῆλον γὰρ
ὅτι κινεῖται καὶ ὑπὸ τοῦ ἀνωτέρω κινοῦντος τὸ κινούμενον
πᾶν, καὶ μᾶλλον ὑπὸ τοῦ προτέρου τῶν κινούντων. ἀλ-
λὰ μὴν, τοῦτό γε ἀδύνατον· τὸ διδάσκον γὰρ συμβαίνει
μανθάνειν, ὧν τὸ μὲν μὴ ἔχειν, τὸ δ' ἔχειν ἐπιστήμην ἀναγ-
καῖον. 15 Ἔτι δὲ μᾶλλον τούτων ἄλογον, ὅτι συμβαίνει
πᾶν τὸ κινητικὸν εἶναι κινητὸν, εἴπερ ἅπαν ὑπὸ κινουμένου D
κινεῖται τὸ κινούμενον· ἔσται γὰρ κινητόν· ὥσπερ εἴ τις λέγοι, ὅτι
πᾶν τὸ ὑγιαστικὸν, καὶ ὑγιάζον, καὶ ὑγιαστὸν ἔσται· καὶ τὸ οἰκο-
δομητικὸν οἰκοδομητὸν, ἢ εὐθὺς, ἢ διὰ πλειόνων. λέγω δ',
οἷον εἰ κινητὸν μὲν ὑπ' ἄλλου πᾶν τὸ κινητικὸν, ἀλλ' οὐ ταύ-
την τὴν κίνησιν κινητὸν, ἣν κινεῖ τὸ πλησίον, ἀλλ' ἑτέραν
οἷον, τὸ ὑγιαστικὸν * μαθητόν· ἀλλὰ τοῦτο ἐπαναβαῖνον ἥξει
ποτὲ εἰς τὸ αὐτὸ εἶδος, ὥσπερ εἴπομεν πρότερον. τὸ μὲν οὖν
τούτων, ἀδύνατον· τὸ δὲ, πλασματῶδες· ἄτοπον γὰρ τὸ
ἀλλοιωτικὸν αὐξητὸν ἐξ ἀνάγκης εἶναι. οὐκ ἄρα ἀνάγκη
ἀεὶ κινεῖσθαι τὸ κινούμενον ὑπ' ἄλλου, καὶ τούτου κινου- E
μένου· στήσεται ἄρα. ὥστε ἤτοι ὑπὸ ἠρεμοῦντος κινηθήσεται
τὸ κινούμενον πρῶτον, ἢ αὐτὸ ἑαυτὸ κινήσει. 16 Ἀλλὰ
μὴν καὶ εἴ γε δέοι σκοπεῖν πότερον αἴτιον κινήσεως καὶ ἀρ-
χὴ, τὸ αὐτὸ αὑτὸ κινοῦν, ἢ τὸ ὑπ' ἄλλου κινούμενον, ἐκεῖ-
νο πᾶς ἂν θείη· τὸ γὰρ αὐτὸ καθ' αὑτὸ ὂν αἴτιον, ἀεὶ πρότε-
ρον τοῦ καθ' ἕτερον καὶ αὐτοῦ ὄντος.

* γρ. αὔξεσθαι

* γρ. ἢ οὕτω μὲν μὴ, ἄλλο δὲ ἐξ ἄλλου γένους. al. ἢ οὕτω μὲν μὴ, ἀλλ' ἄλλο ἐξ ἄλλου γένους

* [illegible], mendose.

* γρ. μαθητικόν

A quod manifeſtum eſt in iis quæ loco mouent: quia
neceſſe *eſt*, vt ita ſe inuicem tangant vſque ad ali-
quid: id verò quod mouet ita vt non ſit quo mouet,
immobile *eſt*. cùm autem videamus poſtremũ, quod
moueri poteſt, ſed motionis principium non habet;
nec non quod mouetur quidem, ſed ab alio, non à
ſeipſo: rationi conſentaneum *eſt*, ne dicamus ne-
ceſſarium, vt tertium quoque ſit, quod mouet, cùm
ſit immobile. 13 Idcirco & Anaxagoras rectè ait,
mentem inquiens eſſe impatibilem & non mixtam:
quoniam eam facit principium motus: hoc enim
duntaxat modo mouere poteſt, cùm ſit immobilis;
& dominari, cùm non ſit mixta. 14 At verò ſi non
B ex accidenti, ſed neceſſariò mouetur id quod mo-
uet; ſi verò non moueatur, moueri non poſſit: neceſ-
ſe *eſt* id quod mouet, quatenus mouetur, aut eadem
motus ſpecie cieri, aut alia. verbi gratia, vel id quod
calefacit, ipſum quoque calefieri; & quod ſanat, ſa-
nari; & quod fert, ferri: vel quod ſanat, ferri; quod
autem fertur, augeri. ſed patet *hoc eſſe* impoſſibile: di-
cere enim oportet diuidendo vſq; ad indiuidua: vel-
uti ſi quid docet geometriã, hoc ipſum doceri geo-
metriam; vel ſi iacit, eodem iactus modo iaci: aut
non ita, ſed aliud ex alio genere: veluti id quod fert,
augeri, quod autem illud auget, variari ab alio; &
C quod hoc variat, alio quodam motu cieri, ſed neceſ-
ſe *eſt* conſiſtere: quia motus finiti *ſunt*. Si quis autem
dicat rurſus reflecti, & quod variat, ferri: perinde fa-
cit, ac ſi ſtatim diceret id quod fert, ferri; & quod do-
cet, doceri. conſtat enim, quicquid mouetur, etiam à
ſuperiore mouente moueri, & *quidem* magis *moueri*
ab eo quod inter mouentia prius eſt. At verò hoc *eſt*
impoſſibile. euenit enim vt docens diſcat: quorum
alterum habere, alterum non habere ſcientiam, ne-
ceſſarium *eſt*. 15 Inſuper *aliud accidit*, magis quàm
hæc à ratione alienum: quoniam euenit, vt quicquid
mouendi vim habet, mobile ſit: ſiquidem quicquid
D mouetur, ab eo moueatur quod mouetur: erit enim
mobile: perinde ac ſi quis diceret, quicquid ſanandi
vim habet, & ſanat, etiam ſanabile eſſe: & *quicquid*
ædificandi vim habet, ædificabile, vel ſtatim, vel per
plura. vtputà ſi quicquid mouendi vim habet, *ſit* mo-
bile ab alio, non tamen mobile eodem motu, quo
rem propinquã mouet, ſed diuerſo: veluti *ſi* id quod
ſanandi vim habet, diſcere poſſit: ſed hoc adſcen-
dendo *per*ueniat aliquando ad eandem ſpeciem, vt
antea diximus. horum igitur alterum *eſt* impoſſibile:
alterum commentitium. nam abſurdum *eſt*, id quod
variandi vim habet, neceſſariò poſſe augeri. Non
igitur neceſſe *eſt* ſemper id quod mouetur, moueri
E ab alio quod rurſus moueatur. conſiſtet igitur. Qua-
propter quod primum mouetur, vel à quieſcente
mouebitur, vel ipſum ſe mouebit. 16 At verò etiamſi
oporteret conſiderare vtrùm id quod ſeipſum mouet,
an quod ab alio mouetur, *ſit* cauſa & principium
motus: illud quiuis poneret. quod enim per ſe eſt
cauſa, ſemper eſt prius eo quod eſt per aliud.

Primum mouens, eſſe immobile.

Cap. VI.

ΩΣτε τοῦτο σκεπτέον λαβοῦσιν ἄλλην ἀρχὴν, εἴ τι κινεῖ αὐτὸ αὑτὸ, πῶς κινεῖ, καὶ τίνα τρόπον. 2 Ἀναγκαῖον δὴ τὸ κινούμενον ἅπαν εἶναι διαιρετὸν εἰς ἀεὶ διαιρετά.

QVapropter hoc *eſt* conſiderãdum, ſumpto alio initio, ſi quid ſeipſum mouet, quo pacto & quomodo moueat. 2 Neceſſarium itaque *eſt*, quicquid mouetur, eſſe diuiduum in ſemper diuidua:

hoc enim antea probatum fuit in *libris* vniuerſalibus de natura, quicquid per ſe mouetur, continuum *eſſe*. 3 Impoſſibile igitur *eſt*, vt id quod ſeipſum mouet, vt totum moueat ſeipſum. nam totum ferretur & ferret eadem latione, cùm ſit vnum & indiuiduum ſpecie: & variaretur & variaret: quare doceret & doceretur ſimul: & ſanaret & ſanaretur eadem ſanitate. 4 Præterea definitum fuit, moueri id quod eſt mobile: hoc autem, dum mouetur, eſſe poteſtate, non actu: quod autem poteſtate *eſt*, ad actum progredi: motum verò eſſe actum imperfectum *rei* mobilis: quod autem mouet, iam actum eſt: vt puta calidum calefacit: & omnino quod habet formam, gignit. quare ſimul idem, & ſecundùm idem, erit calidum & non calidum. ſimiliterq; *ſe habebit* vnumquodque aliorum, quorum mouens neceſſariò habet id quod eſt ſynonymum. 5 Eius igitur quod ſe ipſum mouet, aliud mouet, aliud mouetur. Non poſſe autem idem ſe ipſum ita mouere, vt vtraque pars ab vtraque moueatur, ex his perſpicuum *eſt*: quia nullum erit primum mouens, ſi vtraque *pars* vtramque moueat. quod enim eſt prius, magis *eſt* cauſa mouendi, & magis mouebit, quàm id quod hæret. 7 Bifariàm enim erat mouere. nam quoddam *erat mouens*, quod ab alio mouetur; quoddam verò *mouebat* ſe ipſo. ſed quod eſt remotius à re quæ mouetur, *id* propinquius *eſt* principio quàm medium. 8 Præterea non *eſt* neceſſe, vt id quod mouet, moueatur, niſi a ſe ipſo. alterum igitur ex accidenti inuicē mouet, proinde ſumebam contingere, vt non moueret. erit igitur aliud, quod mouetur, aliud, mouens immobile. 9 Præterea non *eſt* neceſſe, vt id quod mouet, inuicem moueatur: ſed vel neceſſe *eſt* aliquod immobile moueri, vel ipſum à ſeipſo moueri, ſiquidem neceſſe *eſt* ſemper motum eſſe. 10 Præterea quo motu mouet, eodem etiam moueretur. quare calefaciens calefieret. 11 At verò nec eius quod primùm ſe ipſum mouet, aut vna pars aut plures mouebunt ſingulæ ſeipſas. nam ſi totum moueatur a ſemetipſo: vel ab aliqua ſui ipſius *parte* mouebitur, vel totum à toto. ergo ſi *ideò mouetur*, quòd aliqua eius pars à ſe mouetur: certè hæc *pars* erit id quod primum ſeipſum mouet: quia ſi ſeparata fuerit, ipſa quidem ſeipſam mouebit, ſed totum non ampliùs *ſe mouebit*. Quòd ſi totum à toto moueatur: ex accidenti hæ *partes* ſe ipſas mouebunt. quare ſi non neceſſariò, ſumatur *eas* à ſe ipſis non moueri. totius igitur altera pars mouebit, cùm ſit immobilis: altera verò mouebitur. nam hoc tantùm modo fieri poteſt, vt aliquid ſui mouendi vim habeat. 12 Præterea ſi tota *linea* moueat ſe ipſam: altera eius *pars* mouebit, altera mouebitur. itaque *linea* α β & à ſe ipſa mouebitur, & ab α. 13 Cùm autem aliud moueat, quod mouetur ab alio; aliud, quod eſt immobile: cúmque aliud moueatur, quod etiam mouet; aliud, quod nullam rem mouet: neceſſe *eſt* vt id quod ſe ipſum mouet, conſtet ex eo quod eſt immobile, ſed mouet, & præterea ex eo quod mouetur, nec neceſſariò mouet, ſed prout accidit. eſto namque τὸ α, quod mouet quidem, ſed eſt immobile: τὸ β verò, quod mouetur ab α, & mouet id in quo *eſt* γ. hoc autem moueatur quidem à β, ſed nullam rem moueat. licèt enim etiam per plura aliquando perueniet ad γ, *tamen* eſto per vnum tantùm. totum igitur α β γ, ſe ipſum mouet. verùm ſi detraxero τὸ γ, certè τὸ α β ſeipſum mouebit, (nam τὸ α *eſt id* quod mouet; τὸ β, *id* quod mouetur) τὸ γ verò non mouebit ſe ipſum, nec omnino mouebitur. at verò nec pars β γ mouebit

A τοῦτο γὰρ δέδεικται πρότερον ἐν τοῖς καθόλου περὶ φύσεως, ὅτι πᾶν τὸ καθ' αὑτὸ κινούμενον, συνεχές. 3 Ἀδύνατον δὴ τὸ αὐτὸ αὑτὸ κινοῦν, πάντῃ κινεῖν αὐτὸ ἑαυτό· φέροιτο γὰρ ἂν ὅλον καὶ φέροι τὴν αὐτὴν φορὰν, ἓν ὂν καὶ ἄτομον τῷ εἴδει, καὶ ἀλλοιοῖτο καὶ ἀλλοιοῖ. ὥστε διδάσκοι ἂν καὶ διδάσκοιτο ἅμα, καὶ ὑγιάζοι καὶ ὑγιάζοιτο τὴν αὐτὴν ὑγίειαν. 4 Ἔτι διώρισται ὅτι κινεῖται τὸ κινητόν· τοῦτο δὲ ἐστὶ δυνάμει κινούμενον, οὐκ ἐντελεχείᾳ· τὸ δὲ δυνάμει, εἰς ἐντελέχειαν βαδίζει. ἔστι δὲ ἡ κίνησις ἐντελέχεια κινητοῦ ἀτελής. τὸ δὲ κινοῦν ἤδη ἐνεργείᾳ ἐστὶν· οἷον θερμαίνει τὸ θερμὸν, καὶ B ὅλως γεννᾷ τὸ ἔχον τὸ εἶδος. ὥσθ' ἅμα τὸ αὐτὸ καὶ κατὰ τὸ αὐτὸ θερμὸν ἔσται καὶ οὐ θερμόν. ὁμοίως δὲ καὶ τῶν ἄλλων ἕκαστον, ὅσων τὸ κινοῦν ἀνάγκη ἔχειν τὸ συνώνυμον. 5 Τὸ μὲν ἄρα κινεῖ, τὸ δὲ κινεῖται τοῦ αὐτὸ αὑτὸ κινοῦντος. 6 Ὅτι δ' * οὐκ ἔστι τὸ αὐτὸ αὑτὸ κινοῦν οὕτως, ὥστε ἑκάτερον ὑφ' ἑκατέρου κινεῖσθαι, ἐκ τῶνδε φανερόν· οὔτε γὰρ ἔσται πρῶτον κινοῦν οὐδὲν, εἴ γε ἑκάτερον κινήσει ἑκάτερον· τὸ γὰρ πρότερον, αἰτιώτερον τοῦ κινεῖσθαι τοῦ ἐχομένου καὶ κινήσει μᾶλλον. 7 Διχῶς γὰρ κινεῖν ἦν, τὸ μὲν τῷ ὑπ' ἄλλου κινούμενον αὐτὸ, τὸ δ' αὐτῷ. ἐγγύτερον δὲ, τὸ πορρώτερον τοῦ κι- C νουμένου τῆς ἀρχῆς, ἢ τὸ μεταξύ. 8 Ἔτι οὐκ ἀνάγκη τὸ κινοῦν κινεῖσθαι, εἰ μὴ ὑφ' αὑτοῦ. κατὰ συμβεβηκὸς ἄρα ἀντικινεῖ θάτερον. ἔλαβον τοίνυν ἐνδέχεσθαι μὴ κινεῖν. ἔσται ἄρα, τὸ μὲν κινούμενον, τὸ δὲ κινοῦν ἀκίνητον. 9 Ἔτι οὐκ ἀνάγκη τὸ κινοῦν ἀντικινεῖσθαι, ἀλλ' ἢ ἀκίνητόν γε τι κινεῖν ἀνάγκη, ἢ αὐτὸ ὑφ' αὑτοῦ κινούμενον, εἴπερ ἀνάγκη ἀεὶ κίνησιν εἶναι. 10 Ἔτι, ἣν κινεῖ κίνησιν, καὶ κινοῖτ' ἂν· ὥστε τὸ θερμαῖνον θερμαίνοιτο. 11 Ἀλλὰ μὴν οὐδὲ τοῦ πρώτως αὐτὸ αὑτὸ κινοῦντος, οὔτε ἓν μόριον, οὔτε πλείω κινήσει αὐτὸ αὑτὸ ἕκαστον. τὸ γὰρ ὅλον εἰ κινεῖται αὐτὸ ὑφ' αὑτοῦ, ἤτοι ὑπὸ D τῶν αὑτοῦ τινὸς κινηθήσεται, ἢ ὅλον ὑπὸ ὅλου. εἰ μὲν οὖν, τῷ κινεῖσθαί τι μόριον αὐτὸ ὑφ' αὑτοῦ, τοῦτ' ἂν εἴη τὸ πρῶτον αὐτὸ αὑτὸ κινοῦν· χωρισθὲν γὰρ, τοῦτο μὲν κινήσει αὐτὸ αὑτὸ, τὸ δὲ ὅλον οὐκ ἔτι. εἰ δὲ ὅλον ὑφ' ὅλου κινεῖται, κατὰ συμβεβηκὸς ἂν ταῦτα κινοῖ αὐτὰ ἑαυτά. ὥστ' εἰ μὴ ἀναγκαῖα, εἰλήφθω μὴ κινούμενα ὑφ' αὑτῶν. τοῦ ὅλου ἄρα τὸ μὲν κινήσει ἀκίνητον ὂν, τὸ δὲ κινηθήσεται· μόνως γὰρ οὕτως οἷόν τέ τι * αὐτοῦ κινητικὸν εἶναι. 12 Ἔτι, εἴπερ ἡ ὅλη αὐτὴ αὑτὴν κινεῖ, τὸ μὲν κινήσει αὐτῆς, τὸ δὲ κινηθήσεται, ἡ ἄρα α β ὑφ' αὑτῆς τε κινηθήσεται, καὶ ὑπὸ τῆς α. 13 Ἐπειδὴ δὲ κινεῖ τὸ μὲν κινούμενον ὑπ' ἄλλου, τὸ δὲ ἀκίνη- E τον ὂν· καὶ κινεῖται, τὸ μὲν κινοῦν, τὸ δὲ οὐθὲν κινοῦν, τὸ αὐτὸ αὑτὸ κινοῦν ἀνάγκη ἐξ ἀκινήτου εἶναι, κινοῦντος δὲ, καὶ ἔτι ἐκ κινουμένου, μὴ κινοῦντος δὲ ἐξ ἀνάγκης, ἀλλ' ὁπότερ' ἔτυχεν. ἔστω γὰρ τὸ α κινοῦν μὲν, ἀκίνητον δὲ, τὸ δὲ β κινούμενόν τε ὑπὸ τοῦ α, καὶ κινοῦν τὸ ἐφ' ᾧ γ. τοῦτο δὲ κινούμενον μὲν ὑπὸ τοῦ β, μὴ κινοῦν δὲ μηδέν. εἴπερ γὰρ καὶ διὰ πλειόνων ἥξει ποτὲ εἰς τὸ γ, ἔστω διὰ ἑνὸς μόνου. τὸ δὴ ἅπαν α β γ, αὐτὸ ἑαυτὸ κινεῖ, ἀλλ' ἐὰν ἀφέλω τὸ γ, τὸ μὲν α β κινήσει αὐτὸ ἑαυτό· τὸ μὲν γὰρ α κινοῦν, τὸ δὲ β κινούμενον, τὸ δὲ γ οὐ κινήσει αὐτὸ ἑαυτὸ, οὐδ' ὅλως κινηθήσεται. ἀλλὰ μὴν οὐδ' ἡ β γ κινήσει

* γ. ἐκ ὑπὸ χ) τ.

* γ. αὐτοκίνητον

αὐτὸ ἑαυτὸ ἄνευ τοῦ α. τὸ γὰρ β κινεῖ τῷ κινεῖσθαι ὑπ' ἄλλου, οὐ τῷ ὑφ' αὑτοῦ τινὸς μορίου. τὸ ἄρα αβ μόνον αὐτὸ ἑαυτὸ κινεῖ. ἀνάγκη ἄρα τὸ αὐτὸ ἑαυτὸ κινοῦν ἔχειν καὶ τὸ κινοῦν, ἀκίνητον δέ· καὶ τὸ κινούμενον, μηδὲν δὲ κινοῦν ἐξ ἀνάγκης. 14 Ἁπτόμενα δὲ ἤτοι ἄμφω ἀλλήλων, ἢ θάτερον θατέρου. 15 Εἰ μὲν οὖν συνεχές ἐστι τὸ κινοῦν (τὸ γὰρ κινούμενον συνεχὲς ἀναγκαῖον εἶναι) δῆλον ὅτι τὸ πᾶν αὐτὸ ἑαυτὸ κινεῖ, οὐ τῷ αὐτοῦ εἶναί τι τοιοῦτον, οἷον αὐτὸ ἑαυτὸ κινεῖν, ἀλλ' ὅλον κινεῖ αὐτὸ ἑαυτό, κινούμενόν τε καὶ κινοῦν, τῷ αὐτοῦ τι εἶναι τὸ κινοῦν καὶ τὸ κινούμενον. οὐ γὰρ ὅλον κινεῖ, οὐδ' ὅλον κινεῖται, ἀλλὰ κινεῖ μὲν τὸ α, κινεῖται δὲ τὸ β μόνον. τὸ δὲ γ ὑπὸ τοῦ α οὐκ ἔτι· ἀδύνατον γάρ. 16 Ἀπορίαν δὲ ἔχει, ἐὰν ἀφέλῃ τις ἢ τοῦ α, εἰ συνεχὲς τὸ κινοῦν μὲν, ἀκίνητον δὲ, ἢ τοῦ β τοῦ κινουμένου· ἆρα τὸ λοιπὸν τοῦ α κινήσει, ἢ τὸ τοῦ β κινηθήσεται; εἰ γὰρ τοῦτο, οὐκ ἂν εἴη πρώτως κινούμενον ὑφ' αὑτοῦ τὸ αβ. ἀφαιρεθέντος γὰρ ἀπὸ τοῦ αβ, ἔτι κινήσει ἑαυτὸ τὸ λοιπὸν αβ. 17 Ἢ δυνάμει μὲν ἑκάτερον, οὐδὲν κωλύει, ἢ θάτερον τὸ κινούμενον διαιρετὸν εἶναι, ἐντελεχείᾳ δὲ ἀδιαίρετον· ἐὰν δὲ διαιρεθῇ, μηκέτι εἶναι τὴν αὐτὴν ἔχον δύναμιν· ὥστε οὐδὲν κωλύει ἐν διαιρετοῖς δυνάμει πρώτως ἐνεῖναι. 18 Φανερὸν τοίνυν ἐκ τούτων ὅτι ἐστὶ τὸ πρώτως κινοῦν, ἀκίνητον· εἴτε γὰρ εὐθὺς ἵσταται τὸ κινούμενον, ὑπό τινος δὲ κινούμενον, εἰς ἀκίνητον τὸ πρῶτον· εἴτε εἰς κινούμενον μὲν, αὐτὸ δ' ἑαυτὸ κινοῦν καὶ ἱστάν, ἀμφοτέρως συμβαίνει τὸ πρώτως κινοῦν, ἐν ἅπασιν εἶναι τοῖς κινουμένοις ἀκίνητον.

A ſeipſam ſine α. nam β ideo mouet, quia mouetur ab alio, non quòd moueatur ab aliqua ſui ipſius parte. ſolum igitur α β, ſe ipſum mouet. neceſſe igitur eſt, vt id quod ſeipſum mouet, habeat & id quod mouet, ſed eſt immobile; & id quod mouetur, ſed nullam rem neceſſariò mouet. 14 Quæ quidem vel ambo ſe mutuò tangant, vel alterum *tangat* alterum. 15 Si igitur id quod mouet, continuum *ſit*: (neceſſe *eſt* enim, id quod mouetur, eſſe continuum) manifeſtum *eſt*, totum mouere ſeipſum; non quia aliqua eius pars ſit talis, vt mouert ſeipſam; ſed totum mouet ſe ipſum, & ſimul mouetur & mouet, quoniam B aliqua eius pars eſt quæ mouet, & quæ mouetur. non enim totum mouet, nec totum mouetur: ſed α mouet, ac β mouetur dumtaxat. 16 Eſt autē dubitatio, ſi quis detraxerit vel ab α (ſi id quod mouetur, & eſt immobile, ſit continuum) vel à β quod mouetur, an reliqua *pars* ipſius α mouebit, vel reliqua *pars* ipſius β mouebitur. nam ſi hoc *ſit*, certè α β non mouebitur primùm à ſe ipſo: quia detractione facta ab α β, nihilominus reſiduum α β ſe mouebit. 17 An nihil prohibet, vtrumque, vel alterum, *id* quod mouetur, poteſtate diuiduum eſſe, actu verò indiuiduum. quòd ſi diuiſum fuerit, non habere ampliùs eandem vim? quare nihil vetat primùm ineſſe indiC uiduis poteſtate. 18 Ex his perſpicuum *eſt*, id quod primùm mouet, eſſe immobile. ſiue enim id quod mouetur, & ab aliquo mouetur, ſtatim conſiſtat in primo immobili; ſiue in eo quod mouetur quidem, ſed ipſum ſe mouet & conſiſtit: vtroque modo euenit, vt id quod primum mouet, in omnibus iis quæ mouentur, ſit immobile.

Primum mouens immobile, eſſe æternum, & vnum.

Cap. VII.

Ἐπεὶ δὲ δεῖ κίνησιν ἀεὶ εἶναι καὶ μὴ διαλείπειν, ἀνάγκη εἶναί τι ἀΐδιον ὃ πρῶτον κινεῖ, εἴτε ἓν, εἴτε πλείω, καὶ τὸ πρῶτον κινοῦν ἀκίνητον. 2 Ἕκαστον μὲν οὖν ἀΐδιον εἶναι, τῶν ἀκινήτων μὲν, * κινούντων δὲ, οὐδὲν πρὸς τὸν νῦν λόγον. ὅτι δ' ἀναγκαῖον εἶναί τι τὸ ἀεὶ, ἀκίνητον μὲν αὐτὸ πάσης τῆς ἐκτὸς μεταβολῆς, καὶ ἁπλῶς, καὶ κατὰ συμβεβηκὸς, κινητικὸν δ' ἑτέρου, δῆλον ὧδε σκοποῦσιν. 3 Ἔστω δὴ εἴ τις βούλεται ἐπί τινων ἐνδεχόμενον, ὥστε εἶναί ποτε καὶ μὴ εἶναι ἄνευ γενέσεως καὶ φθορᾶς· τάχα γὰρ ἀναγκαῖον, εἴ τι ἀμερὲς, ὁτὲ μὲν ἔστιν, ὁτὲ δὲ μὴ ἔστιν, ἄνευ τοῦ μεταβάλλειν, ὁτὲ μὲν εἶναι, ὁτὲ δὲ μὴ εἶναι πᾶν τὸ τοιοῦτον· καὶ τῶν ἀρχῶν τῶν ἀκινήτων μὲν, κινητικῶν δὲ, ἐνίας ὁτὲ μὲν εἶναι, ὁτὲ δὲ μὴ εἶναι· ἐνδεχέσθω καὶ τοῦτο. ἀλλ' οὔτι πάσας γε δυνατόν. 4 Δῆλον γὰρ ὡς αἴτιόν τι τοῖς αὐτὰ ἑαυτὰ κινοῦσίν ἐστι τοῦ ὁτὲ μὲν εἶναι, ὁτὲ δὲ μὴ εἶναι· τὸ μὲν γὰρ αὐτὸ ἑαυτὸ κινοῦν ἅπαν ἔχειν ἀνάγκη μέγεθος, εἰ μηδὲν κινεῖται ἀμερές· τὸ δὲ κινοῦν οὐδεμία ἀνάγκη ἐκ τῶν εἰρημένων. τοῦ δὴ, τὰ μὲν γίγνεσθαι, τὰ δὲ φθείρεσθαι, καὶ τοῦτ' εἶναι συνεχῶς, οὐδὲν αἴτιον τῶν ἀκινήτων μὲν, μὴ ἀεὶ δ' ὄντων· οὐδ' αὖ τῶν ἀεὶ μὲν τάδι κινούντων, τούτων δ' ἕτερα. τοῦ γὰρ ἀεὶ ὄντος καὶ συνεχοῦς, οὔτε ἕκαστον αὐτῶν αἴτιον, οὔτε πάντα· τὸ μὲν γὰρ οὕτως ἔχειν, ἀΐδιον καὶ ἐξ ἀνάγκης· τὰ δὲ πάντα ἄπειρα, καὶ οὐχ

* κινουμ. mendoſè.

D Quoniam autem oportet motum ſemper eſſe, nec intermitti: neceſſe *eſt* eſſe aliquid æternum, quod primum moueat, ſiue ſit vnum, ſiue plura, nēpe primum illud mouens immobile. 2 Vnumquodque igitur eorum quæ immobilia ſunt, neque mouent, eſſe æternum, nihil *facit* aduerſus hanc rationem. ſed neceſſe *eſſe*, vt ſit aliquid, quod ſemper *ſit* quidem immobile, *&* omnis externæ mutationis *expers*, tam ſimpliciter quàm ex accidenti, vim autem habeat alterius mouendi, ita conſiderantibus *fiet* manifeſtum. 3 Fieri autem in quibuſdam poſſit, ſi cui placet, vt aliquando ſint & non ſint ſine ortu & interitu. fortaſſis enim *eſt* neceſſarium; ſi quid vacans partibus, modò ſit modò non ſit; vt quicquid E tale eſt ſine mutatione interdum ſit, interdum non ſit. & quædam principia immobilia quidem, ſed quæ mouendi vim habeant, modò eſſe, modò non eſſe, hoc etiam fieri poſſit. ſed non *eſt* poſſibile, vt omnia ſint *eiuſmodi*. 4 Patet enim eſſe aliquam cauſam iis quæ ſeipſa mouent, cur modò ſint, modò non ſint. nam quicquid ſe ipſum mouet, neceſſe *eſt* vt habeat magnitudinem: ſiquidem nihil mouetur, quod partibus vacet. id verò quod mouet, nihil neceſſe *eſt habere magnitudinem*, *vt liquet* ex eis quæ dicta fuerunt. ergo cur alia gignantur, alia intereant, idque fiat continenter, nihil eorum cauſa *eſt*, quæ ſunt quidem immobilia, non tamen ſemper ſunt: nec rurſus eorum, quæ ſemper hæc mouent, ita vt hæc moueant alia. nam æternitatis & continuationis nec eorum vnumquodq. eſt cauſa, nec omnia. etenim ita ſe habere, *eſt* æternū & neceſſariū: omnia verò *ſunt* infinita, nec

omnia entia ſimul *ſunt*. manifeſtũ igitur *eſt*, etiamſi decies millies quædam principia, quæ *ſunt* immobilia, ſed mouent; & multa ex iis quæ ſeipſa mouent, intereant, alia verò generentur; & hoc quidẽ quod eſt immobile, hanc rem moueat; aliud verò illam: nihilominus tamen eſſe aliquid, quod continet, & hoc præter ſingula: quod *quidem* eſt cauſa cur alia ſint, alia non *ſint*, & *cauſa* continuæ mutationis. atque hoc quidem hiſce: hæc verò aliis *ſunt* cauſæ motionis. 5 Siquidem igitur motus *ſit* æternus, etiam primum mouens æternum erit, ſi vnum *ſit*, ſi verò multa, *erunt* multa æterna. 6 Vnum autem *eſſe* potiùs quàm multa: & finita *potius* quàm infinita, putare oportet. nam ſi eadem eueniant, ſemper finita potius ſumenda ſunt. in iis enim quæ natura *conſtant*, oportet id potiùs ineſſe, quod eſt finitum & melius, ſi modò *ineſſe* poſſit. atqui ſufficit, etſi vnũ *ſit*, quod cùm primum ſit inter immobilia, & æternum, aliis erit principium motus. 7 Ex hoc quoque perſpicuum *eſt*, neceſſe *eſſe*, vt id quod primum mouet, ſit vnum quiddam & æternum. probatum enim fuit, neceſſe *eſſe*, vt ſemper ſit motus: quòd ſi ſemper *eſt*, neceſſe *eſt* vt ſit continuus. quod enim eſt ſemper, *eſt* continuum. quod verò eſt deinceps, non *eſt* continuum. at verò ſi *eſt* continuus, *eſt* vnus. *eſt* autem vnus qui ab vno mouente *eſt*, & vnius quod moueatur. ſi quam enim rem aliud atque aliud moueat, totus motus non *eſt* continuus, ſed deinceps.

A ἅμα πάντα ὄντα. δῆλον τοίνυν ὅτι εἰ καὶ μυριάκις ἔνιαι ἀρχαὶ τῶν ἀκινήτων μὲν, κινουσῶν δὲ καὶ πολλὰ τῶν αὐτὰ ἑαυτὰ κινούντων, φθείρεται, τὰ δ' ἐπιγίνεται· καὶ τόδε μὲν ἀκίνητον ὂν, τόδε κινεῖ, ἕτερον δὲ, τοδί· ἀλλ' οὐδὲν ἧττον ἔστι τι ὃ περιέχει, καὶ τοῦτο παρ' ἕκαστον, ὅ ἐστιν αἴτιον, τοῦ τὰ μὲν εἶναι, τὰ δὲ μή, καὶ τῆς συνεχοῦς μεταβολῆς· καὶ τοῦτο μὲν τούτοις, ταῦτα δὲ τοῖς ἄλλοις αἴτια κινήσεως. 5 Εἴπερ οὖν ἀΐδιος ἡ κίνησις, ἀΐδιον καὶ τὸ κινοῦν ἔσται πρῶτον, εἰ ἕν· εἰ δὲ πλείω, πλείω τὰ ἀΐδια. 6 Ἓν δὲ μᾶλλον, ἢ πολλὰ, καὶ πεπερασμένα, ἢ ἄπειρα δεῖ νομίζειν. τῶν αὐτῶν γὰρ συμβαινόντων, ἀεὶ τὰ πεπερασμένα μᾶλλον ληπτέον. ἐν γὰρ τοῖς φύσει, δεῖ τὸ πεπερασμένον καὶ τὸ B βέλτιον, ἐὰν ἐνδέχηται, ὑπάρχειν μᾶλλον. ἱκανὸν δὲ καὶ ἓν, ὃ πρῶτον τῶν ἀκινήτων ἀΐδιον ὂν, ἔσται τοῖς ἄλλοις ἀρχὴ κινήσεως. 7 Φανερὸν δὲ καὶ ἐκ τῶνδε ὅτι ἀνάγκη εἶναί τι ἓν καὶ ἀΐδιον τὸ πρῶτον κινοῦν. δέδεικται γὰρ ὅτι ἀνάγκη ἀεὶ κίνησιν εἶναι. εἰ δὲ ἀεὶ, ἀνάγκη καὶ συνεχῆ εἶναι. καὶ γὰρ τὸ ἀεὶ ὂν συνεχές. τὸ δ' ἐφεξῆς, οὐ συνεχές. ἀλλὰ μὴν εἴ γε συνεχὴς, μία. μία δ', εἰ ὑφ' ἑνός τε κινοῦντος, καὶ ἑνὸς τοῦ κινουμένου. εἰ γὰρ τι ἄλλο καὶ ἄλλο κινήσει, οὐ συνεχὴς ἡ ὅλη κίνησις, ἀλλ' ἐφεξῆς.

Primum mouens ne quidem ex accidenti moueri

Cap. VIII.

ERgo & ex his credere aliquis poſſit eſſe aliquod immobile. Et rurſus ſi reſpexerit ad principia eorum quæ mouent. 2 Eſſe igitur quædam, quæ modo mouentur, modò quieſcunt, perſpicuum *eſt*. & ex hoc manifeſtum factum eſt neque omnia moueri, neque omnia quieſcere: neque alia ſemper quieſcere, alia ſemper moueri. nam quæ ſunt natura ancipiti, & vim habent, vt interdum moueantur, interdum quieſcant, de his fidem faciunt. 3 Cùm autem ea quæ ſunt eiuſmodi, *ſint* omnibus manifeſta: velimus autem probare etiam vtramque reliquarum duarum naturarum, *nempe* alia ſemper eſſe immobilia, alia quæ ſemper moueantur: procedentes ad hoc *probandum*, & poſitis *his principiis*, quicquid mouetur, ab aliquo moueri, & hoc aut eſſe immobile aut moueri, & moueri vel à ſe, vel ab alio ſemper. progreſſi ſumus eò vſque, vt ſumeremus eorum quæ mouerentur eſſe principium: *id eſt*, eorum quæ mouentur, id quod ſeipſum mouet: omnium verò, id quod eſt immobile. 4 Videmus autem, & *quidem* perſpicuè, quædam eſſe eiuſmodi vt ſeipſa moueãt: vt animatorum & animalium genus. quæ quidem & opinionem præbebant, ne quando contingeret motum fieri, cùm non eſſet omnino, propterea quòd in his videmus hoc accidere. cùm enim aliquando ſint immobilia, mouentur rurſus, vt videtur. 5 Hoc igitur ſumere oportet, hæc vnò motu *ſe* ciere: eóque non propriè: non eſt enim cauſa ex ipſo *animali*: ſed alij motus naturales animalibus inſunt, quibus non mouentur à ſemetipſis: vt auctio, deminutio, reſpiratio: quibus motibus cietur vnumquodque animal cùm quieſcat, nec eo motu cieatur, quo à ſeipſo *mouetur*. horum autem cauſa *eſt* id quod continet, & multa ex iis quæ ingrediuntur: vt quorun-

C ΕΚ τε δὴ τούτων πιστεύσειεν ἄν τις εἶναί τι πρῶτον ἀκίνητον. καὶ πάλιν ἐπιβλέψας ἐπὶ τὰς ἀρχὰς τῶν κινούντων. 2 Τὸ μὲν δὴ εἶναι ἄττα τῶν ὄντων, ἃ ὁτὲ μὲν κινεῖται, ὁτὲ δ' ἠρεμεῖ, φανερὸν καὶ διὰ τούτου γέγονε δῆλον ὅτι οὔτε πάντα κινεῖται, οὔτε πάντα ἠρεμεῖ, οὔτε τὰ μὲν ἀεὶ ἠρεμεῖ, τὰ δ' ἀεὶ κινεῖται· τὰ γὰρ ἐπαμφοτερίζοντα, καὶ δύναμιν ἔχοντα τοῦ, ὁτὲ μὲν κινεῖσθαι, ὁτὲ δὲ ἠρεμεῖν, δείκνυσι περὶ αὐτῶν. 3 Ἐπεὶ δὲ τὰ μὲν τοιαῦτα δῆλα πᾶσι, βουλόμεθα δὲ δεῖξαι καὶ τοῖν δυοῖν D ἑκατέραν τὴν φύσιν, ὅτι ἔστι τὰ μὲν ἀεὶ ἀκίνητα, τὰ δ' ἀεὶ κινούμενα· προϊόντες δ' ἐπὶ τοῦτο, καὶ θέντες ἅπαν τὸ κινούμενον, ὑπό τινος κινεῖσθαι, καὶ τοῦτο εἶναι ἢ ἀκίνητον ἢ κινούμενον, καὶ κινούμενον ἢ ὑφ' αὑτοῦ ἢ ὑπ' ἄλλου ἀεί, προήλθομεν ἐπὶ τὸ λαβεῖν, ὅτι τῶν κινουμένων ἐστὶν ἀρχή, κινουμένων μὲν ὃ αὐτὸ ἑαυτὸ κινεῖ, πάντων δὲ τὸ ἀκίνητον. 4 Ὁρῶμεν δὲ καὶ φανερῶς ὄντα τοιαῦτα ἃ κινεῖ αὐτὰ ἑαυτά. οἷον τὸ τῶν ἐμψύχων καὶ τὸ τῶν ζῴων γένος. ταῦτα δὴ καὶ δόξαν παρεῖχε, μή ποτ' ἐνδέχεται κίνησιν ἐγγίνεσθαι μὴ οὖσαν ὅλως, διὰ τὸ ἐν E τούτοις ὁρᾶν ἡμᾶς τοῦτο συμβαῖνον· ἀκίνητα γάρ ποτε ὄντα, κινεῖται πάλιν ὡς δοκεῖ. τοῦτο δὴ δεῖ λαβεῖν, ὅτι μίαν κίνησιν αὐτὰ κινεῖ, καὶ ὅτι ταύτην οὐ κυρίως· οὐ γὰρ ἐξ αὐτοῦ τὸ αἴτιον, ἀλλ' ἔνεισιν ἄλλαι κινήσεις φυσικαὶ τοῖς ζῴοις, ἃς οὐ κινοῦνται δι' ἑαυτῶν, οἷον, αὔξησις, φθίσις, ἀναπνοή, ἃς κινεῖται τῶν ζῴων ἕκαστον ἠρεμοῦν, καὶ οὐ κινούμενον τὴν ὑφ' ἑαυτοῦ κίνησιν. τούτων δ' αἴτιον τὸ περιέχον καὶ πολλὰ τῶν εἰσιόντων, οἷον,

A ἐνίων ἡ τροφή· πεττομένης γὰρ καθεύδουσι, διακρινομένης δὲ, ἐγείρονται καὶ κινοῦσιν ἑαυτούς, τῆς πρώτης ἀρχῆς ἔξωθεν οὔσης. διὸ οὐκ ἀεὶ κινοῦνται συνεχῶς ὑφ' αὑτῶν· ἄλλο γὰρ τὸ κινοῦν αὐτὸ κινούμενον καὶ μεταβάλλον, πρὸς ἕκαστον τῶν κινούντων ἑαυτά. 6 Ἐν πᾶσι δὲ τούτοις κινεῖται τὸ πρώτως κινοῦν, καὶ τὸ αἴτιον τοῦ αὐτὸ ἑαυτὸ κινεῖν ὑφ' αὑτοῦ, κατὰ συμβεβηκὸς μέντοι. μεταβάλλει γὰρ τὸν τόπον τὸ σῶμα. ὥστε καὶ τὸ ἐν τῷ σώματι ὄν, καὶ τὸ ἐν τῇ μοχλείᾳ κινοῦν ἑαυτό. 7 Ἐξ ὧν ἔστι πιστεῦσαι, ὅτι εἴ τί ἐστι τῶν ἀκινήτων μὲν, κινούντων δὲ, καὶ αὐτῶν κινουμένων κατὰ συμβεβηκὸς, ἀδύνατον συνεχῆ κίνησιν κινεῖν. ὥστ' εἴπερ B ἀνάγκη συνεχῶς εἶναι κίνησιν, εἶναί τι δεῖ τὸ πρῶτον κινοῦν ἀκίνητον, καὶ μὴ κατὰ συμβεβηκὸς· εἰ μέλλει καθάπερ εἴπομεν, ἔσεσθαι ἐν τοῖς οὖσιν ἄπαυστός τις καὶ ἀθάνατος κίνησις, καὶ μένειν τὸ ὂν αὐτὸ ἐν αὑτῷ, καὶ ἐν τῷ αὐτῷ· τῆς γὰρ ἀρχῆς μενούσης, ἀνάγκη καὶ τὸ πᾶν μένειν συνεχὲς ὂν πρὸς τὴν ἀρχήν. 8 Οὐκ ἔστι δὲ ταὐτὸ τὸ κινεῖσθαι κατὰ συμβεβηκὸς ὑφ' αὑτοῦ καὶ ὑφ' ἑτέρου. τὸ μὲν γὰρ ὑφ' ἑτέρου ὑπάρχει καὶ τῶν ἐν τῷ οὐρανῷ ἐνίαις ἀρχαῖς, ὅσα πλείους φέρεται φοράς· θάτερον δὲ τοῖς φθαρτοῖς μόνον.

A dam *cauſa eſt* alimentum. cùm enim concoquitur, dormiunt, cùm autem diſtribuitur, excitantur, & mouent ſe ipſos, primo principio extra conſtituto. proinde non ſemper *neque* continenter mouentur à ſeipſis. nam ad ſingula quæ ſeipſa mouēt, *adeſt* aliud, quod mouet, cùm ipſum moueatur & mutetur. 6 In his autem omnibus, quod primùm mouet, & eſt cauſa cur *aliud* ſeipſum moueat, id quoque à ſe mouetur, ſed ex accidenti. corpus enim mutat locum. quocirca & id quod eſt in corpore & quod vecte ſeipſum mouet. 7 Ex quibus licet credere, ſi quid eſt *in numero* eorum quæ ſunt quidem immobilia, ſed B mouent, & ipſa mouentur ex accidenti; impoſſibile *eſſe*, vt id continuum motum efficiat. quapropter ſi neceſſe *eſt* continenter eſſe motum: oportet eſſe aliquod primum mouens immobile, *quod* ne quidem ex accidenti *moueatur*: ſi debet, quemadmodum diximus, eſſe in rebus indeficiens quidam & immortalis motus, ac manere ipſum ens in ſeipſo, & in eodem principio. itaque manente, neceſſe *eſt* etiam vniuerſum manere, cùm ſit continenter iunctum principio. 8 Non eſt autem idem, moueri ex accidenti à ſe ipſo, & ab altero. nam *moueri* ab altero, ineſt & quibuſdam principiis eorum quæ ſunt in cœlo, *id eſt*, *eorum* quæ plurib. lationibus feruntur: alterū verò iis ſolùm ineſt, quæ interitui ſunt obnoxia.

Primum mobile eſſe æternum. Cap. IX.

C Ἀλλὰ μὴν εἴπερ ἐστί τι ἀεὶ τοιοῦτον, τὸ κινοῦν μέν τι, ἀκίνητον δὲ καὶ αὐτὸ ἀΐδιον, ἀνάγκη καὶ τὸ πρῶτον ὑπὸ τούτου κινούμενον ἀΐδιον εἶναι. 2 Ἔστι δὲ τοῦτο δῆλον μὲν καὶ ἐκ τοῦ μὴ ἂν ἄλλως εἶναι γένεσιν καὶ φθορὰν καὶ μεταβολὴν τοῖς ἄλλοις, εἰ μή τι κινήσει κινούμενον. τὸ μὲν γὰρ ἀκίνητον τὴν αὐτὴν ἀεὶ κινήσει τὸν αὐτὸν τρόπον, καὶ μίαν κίνησιν, ἅτε οὐδὲν αὐτὸ μεταβάλλον πρὸς τὸ κινούμενον. * τὸ δὲ κινούμενον, ὑπὸ τοῦ κινουμένου μὲν, ὑπὸ τοῦ ἀκινήτου δὲ κινουμένου ἤδη, διὰ τὸ ἄλλως καὶ ἄλλως ἔχειν πρὸς τὰ πράγματα, οὐ τῆς αὐτῆς ἔσται κινήσεως αἴτιον, ἀλλὰ διὰ τὸ ἐν ἐναντίοις εἶναι τόποις ἢ εἴδεσιν, ἐναντίως D παρέξεται κινούμενον ἕκαστον τῶν ἄλλων, καὶ ὁτὲ μὲν ἠρεμοῦν, ὁτὲ δὲ κινούμενον. 3 Φανερὸν δὴ γέγονεν ἐκ τῶν εἰρημένων, καὶ ὃ κατ' ἀρχὰς ἠπορήσαμεν, τί δή ποτε οὐ πάντα ἢ κινεῖται, ἢ ἠρεμεῖ· ἢ τὰ μὲν κινεῖται ἀεὶ, τὰ δ' ἀεὶ ἠρεμεῖ· ἀλλ' ἔνια ὁτὲ μὲν ὁτὲ δ' οὔ. τούτου γὰρ τὸ αἴτιον δῆλόν ἐστι νῦν, ὅτι, τὰ μὲν ὑπὸ ἀκινήτου κινεῖται ἀϊδίου. διὸ ἀεὶ μεταβάλλει· τὰ δ' ὑπὸ κινουμένου, καὶ μεταβάλλοντος· ὥστε καὶ αὐτὰ ἀναγκαῖον μεταβάλλειν. τὸ δ' ἀκίνητον, ὥσπερ εἴρηται, ἅτε ἁπλῶς καὶ ὡσαύτως καὶ ἐν τῷ αὐτῷ διαμένον, μίαν καὶ ἁπλῆν κινήσει κίνησιν.

* Hunc locum variis modis legendum cenſent interpretes: quos conſule.

C Verumenimuero ſi eſt aliquid ſemper eiuſmodi quod mouet quidē, ſed eſt immobile, & ipſum eſt æternum: neceſſe eſt, etiam id quod primum ab hoc mouetur, eſſe æternum. 2 Hoc autem manifeſtum etiam ex eo eſt, quod alioqui non eſſet generatio & interitus & mutatio aliis rebus, niſi quid moueat cùm moueatur. quod enim eſt immobile, vno & eodem motu ſemper, & eodem modo mouebit: quippe quod nihil mutatur *relatione habita* ad id quod mouetur. quod autem mouetur ab immobili vel ab eo quod iam mouetur, proptérea quòd aliter atque aliter ad res affectum eſt, non erit cauſa eiuſ- D dem motus: ſed quia eſt in contrariis locis aut formis, efficiet alia ſingula contrariis motibus cieri, & modo quieſcere, modo moueri. 3 Ex iis quæ dicta fuerunt, perſpicuum factum eſt etiam id quod initio in dubium reuocauimus, cur non omnia vel moueantur, vel quieſcant, vel alia ſemper moueantur, alia ſemper quieſcant, ſed quædam interdum moueantur, interdum minimè. huius enim cauſa nunc manifeſta eſt: quoniam alia mouentur ab immobili æterno, proinde ſemper mutantur: alia verò ab eo quod mouetur & mutatur, vnde & ipſa neceſſe eſt mutari: aliud verò eſt immobile, ſicuti dictum fuit, quippe quod ſimpliciter & eodē modo, & in ſe ipſo permanens, vnum & ſimplicem motum efficit.

Lationem eſſe primum motum. Cap. X.

E Οὐ μὴν ἀλλὰ καὶ ἄλλην ποιησαμένοις ἀρχὴν μᾶλλον ἔσται περὶ τούτων φανερόν. σκεπτέον γὰρ πότερον ἐνδέχεταί τινα κίνησιν εἶναι συνεχῆ, ἢ οὔ· καὶ εἰ ἐνδέχεται, τίς αὕτη, καὶ τίς πρώτη τῶν κινήσεων. δῆλον γὰρ ὡς εἴπερ ἀναγκαῖον μὲν ἀεὶ κίνησιν εἶναι, πρώτη δὲ ἥδε καὶ συνεχὴς, ὅτι τὸ πρῶτον κινοῦν κινεῖ ταύτην τὴν κίνησιν, ἣν

E Sed tamen & alio facto initio magis erunt hæc perſpicua. diſpiciendum eſt enim, vtrùm eſſe poſſit aliquis motus continuus, necne: &, ſi eſſe poſſit, quiſnam hic ſit: & quis ſit motuum primus. Conſtat enim, ſi neceſſe eſt ſemper motum eſſe, hic vero eſt primus & continuus, primum mouens hoc motu ciere, quem neceſſe eſt

eſt vnum & eundem eſſe atque continuũ,& primũ. A Cùm autem tres ſint motus, is qui in magnitudine ſpectatur,& is qui in affectione,& is qui in loco,quẽ vocamus lationem:hunc neceſſe eſt eſſe primũ.impoſſibile enim eſt,auctionem eſſe,quin variatio antecedat.quod enim augetur,partim ſimili augetur, partim diſſimili.etenim quod eſt contrarium, dicitur alimentum contrario : accedit autem quoduis factum ſimile ſimili. neceſſe eſt igitur mutationem in contraria eſſe variatione. atqui ſi varietur, oportebit eſſe id quod variet, & quod efficiat ex poteſtate calido actu calidum.patet igitur id,quod mouet,nõ ſimiliter ſe habere, ſed interdũ eſſe propinquius,interdum remotius ab eo quod variatur: B hæc autem ſine latione eſſe nequeunt. ergo ſi neceſſe eſt ſemper motum eſſe , neceſſe etiam eſt lationem eſſe motionum primam.& ſi lationum alia eſt prior,alia poſterior : eam eſſe primam motionẽ, quæ eſt prima latio. 3 Præterea omniũ affectionum principium eſt denſatio & rarefactio.etenim graue & leue,nec non molle ac durũ,item calidum & frigidum,videntur eſſe denſitates & raritates quędã. denſatio verò & rarefactio ſunt concretio & ſecretio,ſecundũ quas etiã dicitur generatio& interitus ſubſtantiarũ.atqui ea quę concreſcũt,vel diſijciuntur,neceſſe eſt etiã loco mutari. Iam verò etiã eius quod augetur,vel minuitur,magnitudo locum mutat. C 4 Præterea hinc quoque conſiderãtibus perſpicuum erit lationem *eſſe* primam.nã primũ , ſicvt in aliis,ita etiam in motu dici poteſt multis modis. dicitur enim prius , & id ſine quo alia non erunt, ipſum vero *erit* ſine aliis:& quod *eſt prius* tẽpore: & quod eſſentia. 5 Quapropter cùm neceſſe *ſit* motum eſſe continenter:poſſit autem eſſe contirıẽter vel qui continuus vel qui deinceps *eſt*, ſed magis qui *eſt* continuus:& præſtet eſſe continuum,quàm deinceps:quod autem prę̨ſtat,ſemper exiſtimemus in natura eſſe,ſi ſit poſſibile: poſſit autem eſſe cõtinuus:quod quidem probabitur poſteriùs,nũc verò ſupponatur : atque hunc nullum alium eſſe poſſe, quàm lationem : neceſſe igitur eſt lationẽ eſſe pri- D mam. Nulla enim ſubeſt neceſſitas aut augeri aut variari id quod fertur: nec igitur fieri aut interire. ſed nullus horũ motuum eſſe poteſt, niſi ſit motus continuus,quem primũ mouens efficit. 6 Prȩterea tempore primam , nam æterna hoc tantùm motu cieri poſſunt. 7 Atqui in vnoquoque eorũ quæ generationẽ ſubeunt,neceſſe *eſt* lationẽ eſſe motionẽ vltimam.poſtquam enim *res* facta eſt , primũ *neceſſe eſt* variationem *eſſe*, & auctionem : latio autem eſt motus *rerum* iam perfectarum. 8 Sed neceſſe *eſt* eſſe aliud prius,quod latione moueatur,& generationis cauſa ſit iis quæ fiunt,cùm ipſum non fiat: vt generans *eſt prius* eo quod gignitur. Videri autem E poſſit generatio eſſe mutationum prima propterea quod oportet primùm rem factam eſſe. hoc autem in vnoquoque horum quæ fiunt,ſic habet : ſed neceſſe *eſt* moueri aliquid aliud prius iis quę fiũt,cùm ipſum ſit,nec fiat:& rurſus hoc aliud prius. 9 Cùm autem impoſſibile *ſit* generationẽ eſſe primã:(alioqui quæcumque mouentur,interire poſſent) manifeſtum *eſt*,nullum ex motibus *qui* deinceps *ſunt*, eſſe priorem. dico autem *eſſe* deinceps,accretionem, deinde variationem, & deminutionem , & interitum. omnes enim *ſunt* poſteriores generatione. quocirca ſi nec generatio *eſt* prior latione , *certè* nec vlla alia mutatio *erit prior*. 10 Omnino autem videtur id quod fit, *eſſe* imperfectum , & ad

A ἀναγκαῖον μίαν καὶ τὴν αὐτὴν εἶναι καὶ συνεχῆ, καὶ πρώτην. 2 Τριῶν δὲ οὐσῶν κινήσεων, τῆς τε κατὰ μέγεθος, καὶ τῆς κατὰ πάθος, καὶ τῆς κατὰ τόπον, ἣν καλοῦμεν φοράν, ταύτην ἀναγκαῖον εἶναι πρώτην. ἀδύνατον γὰρ αὔξησιν εἶναι, ἀλλοιώσεως μὴ προϋπαρχούσης· τὸ γὰρ αὐξανόμενον, ἔστι μὲν ὡς ὁμοίῳ αὐξάνεται, ἔστι δ' ὡς ἀνομοίῳ· τὸ γὰρ ἐναντίον, τροφὴ λέγεται τῷ ἐναντίῳ. προσγίνεται δὲ πᾶν γινόμενον ὅμοιον ὁμοίῳ. ἀνάγκη οὖν ἀλλοίωσιν εἶναι τὴν εἰς τἀναντία μεταβολήν. ἀλλὰ μὴν εἴ γε ἀλλοιοῦται, δεῖ τι εἶναι τὸ ἀλλοιοῦν καὶ τὸ ποιοῦν ἐκ τοῦ δυνάμει θερμοῦ τὸ ἐνεργείᾳ θερμόν. δῆλον οὖν ὅτι, τὸ κινοῦν οὐχ ὁμοίως ἔχει, ἀλλ' ὁτὲ μὲν B ἐγγύτερον, ὁτὲ δὲ πορρώτερον τοῦ ἀλλοιουμένου ἐστί. ταῦτα δ' ἄνευ φορᾶς οὐκ ἐνδέχεται ὑπάρχειν. εἰ ἄρα ἀνάγκη ἀεὶ κίνησιν εἶναι, ἀνάγκη καὶ φορὰν εἶναι ἀεὶ πρώτην τῶν κινήσεων, καὶ φορᾶς, εἰ ἔστιν ἡ μὲν, πρώτη, ἡ δ' ὑστέρα, τὴν πρώτην. 3 Ἔτι δὲ πάντων τῶν παθημάτων ἀρχὴ, πύκνωσις καὶ μάνωσις· καὶ γὰρ βαρὺ καὶ κοῦφον, καὶ μαλακὸν, καὶ σκληρὸν, καὶ θερμὸν καὶ ψυχρὸν, πυκνότητες δοκοῦσι καὶ ἀραιότητες εἶναι τινές. πύκνωσις δὲ καὶ μάνωσις, σύγκρισις καὶ διάκρισις, καθ' ἃς καὶ γένεσις καὶ φθορὰ λέγεται τῶν οὐσιῶν. συγκρινόμενα δὲ καὶ διακρινόμενα, ἀνάγκη καὶ κατὰ τόπον μεταβάλλειν. ἀλλὰ μὴν καὶ τοῦ αὐξανομένου καὶ φθίνοντος, μεταβάλλει C κατὰ τόπον τὸ μέγεθος. 4 Ἔτι καὶ ἐντεῦθεν ἐπισκοποῦσιν ἔσται φανερὸν, ὅτι ἡ φορὰ πρώτη· τὸ γὰρ πρῶτον ὥσπερ καὶ ἐπὶ τῶν ἄλλων, οὕτω καὶ ἐπὶ κινήσεως ἂν λέγοιτο πλεοναχῶς. λέγεται γὰρ πρότερον, οὗ τε μὴ ὄντος οὐκ ἔσται τἆλλα, ἐκεῖνο δὲ ἄνευ τῶν ἄλλων· καὶ τὸ τῷ χρόνῳ· καὶ τὸ κατ' οὐσίαν. 5 Ὥστ' ἐπεὶ κίνησιν μὲν ἀναγκαῖον εἶναι συνεχῶς, εἴη δ' ἂν συνεχῶς, ἢ ἡ συνεχὴς, ἢ ἡ ἐφεξῆς, μᾶλλον δ' ἡ συνεχής· καὶ βέλτιον συνεχῆ ἢ ἐφεξῆς εἶναι. τὸ δὲ βέλτιον ἀεὶ ὑπολαμβάνομεν ἐν τῇ φύσει ὑπάρχειν, ἐὰν ᾖ δυνατόν. δυνατὸν δὲ συνεχῆ εἶναι. δειχθήσεται δὲ ὕστερον. νῦν δὲ τοῦτο ὑποκείσθω, καὶ ταύτην * οὐδεμίαν οἷόν τ' εἶναι, * ἀλ- D λὰ φοράν· ἀνάγκη δὴ τὴν φορὰν εἶναι πρώτην. οὐδεμία γὰρ ἀνάγκη οὔτε αὐξάνεσθαι, οὔτε ἀλλοιοῦσθαι τὸ φερόμενον, οὐδὲ δὴ γίνεσθαι ἢ φθείρεσθαι. τούτων δὲ οὐδεμίαν ἐνδέχεται τῆς συνεχοῦς μὴ οὔσης, ἣν κινεῖ τὸ πρῶτον κινοῦν. 6 Ἔτι χρόνῳ πρώτην ταύτην· τοῖς γὰρ ἀϊδίοις μόνον ἐνδέχεται κινεῖσθαι ταύτην. 7 Ἀλλ' ἐφ' ἑνὸς μὲν ὁτουοῦν τῶν ἐχόντων γένεσιν, τὴν φορὰν ἀναγκαῖον ὑστάτην εἶναι τῶν κινήσεων. μετὰ γὰρ τὸ γενέσθαι πρῶτον, ἀλλοίωσις καὶ αὔξησις. φορὰ δ' ἤδη τελειουμένων κίνησίς ἐστι. 8 Ἀλλ' ἕτερον ἀνάγκη κινούμενον εἶναι κατὰ φορὰν πρότερον, ὃ καὶ τῆς γενέσεως αἴτιον ἔσται τοῖς γινομένοις, οὐ γινόμενον. οἷον τὸ γεννῆσαν τοῦ γεννηθέντος. E δόξειε δ' ἂν ἡ γένεσις πρώτη εἶναι τῶν κινήσεων, διὰ τοῦτο, ὅτι γενέσθαι δεῖ τὸ πρᾶγμα πρῶτον. τὸ δ' ἐφ' ἑνὸς μὲν ὁτουοῦν τῶν γινομένων οὕτως ἔχει, ἀλλ' ἕτερον ἀναγκαῖον πρότερόν τι κινεῖσθαι, τῶν γινομένων ὂν αὐτὸ καὶ μὴ γινόμενον, καὶ τούτου ἕτερον πρότερον. 9 Ἐπεὶ δὲ γένεσιν ἀδύνατον εἶναι πρώτην (πάντα γὰρ ἂν εἴη τὰ κινούμενα φθαρτά) δῆλον ὡς οὐδὲ τῶν ἐφεξῆς κινήσεων οὐδεμία προτέρα. λέγω δ' ἐφεξῆς αὔξησιν, εἶτ' ἀλλοίωσιν, καὶ φθίσιν, καὶ φθοράν. πᾶσαι γὰρ ὕστεραι γενέσεως. ὥστ' εἰ μηδὲ γένεσις προτέρα φορᾶς, οὐδὲ τῶν ἄλλων οὐδεμία μεταβολῶν. 10 Ὅλως δὲ φαίνεται τὸ γινόμενον ἀτελὲς, καὶ

* γρ. οὐδεμίαν ἄλλην
* γρ. ἀλλ' ἢ φ.

ἐπ' ἀρχὴν ἰόν. ὥστε τὸ τῇ γενέσει ὕστερον, τῇ φύσει πρότερον εἶναι. τελευταῖον δὲ φορὰ πᾶσιν ὑπάρχει τοῖς ἐν γενέσει. 11 Διό, τὰ μὲν ὅλως ἀκίνητα τῶν ζώντων δι' ἔνδειαν τοῦ ὀργάνου, οἷον τὰ φυτὰ καὶ πολλὰ γένη τῶν ζώων· τοῖς δὲ τελειουμένοις ὑπάρχει. ὥστ' εἰ μᾶλλον ὑπάρχει φορὰ, τοῖς μᾶλλον ἀπειληφόσι τὴν φύσιν, καὶ ἡ κίνησις αὕτη πρώτη τῶν ἄλλων ἂν εἴη κατ' οὐσίαν. 12 Διά τε ταῦτα, καὶ διότι ἥκιστα τῆς οὐσίας ἐξίσταται τὸ κινούμενον τῶν κινήσεων ἐν τῷ φέρεσθαι· κατὰ μόνην γὰρ οὐδὲν μεταβάλλει τοῦ εἶναι, ὥσπερ ἀλλοιουμένου μὲν τὸ ποιόν, αὐξανομένου δὲ καὶ φθίνοντος τὸ ποσόν. 13 Μάλιστα δὲ δῆλον, ὅτι τὸ κινοῦν αὐτὸ αὑτὸ μάλιστα ταύτην κινεῖ κυρίως τὴν κατὰ τόπον. καίτοι φαμὲν τοῦτ' εἶναι τῶν κινουμένων καὶ κινούντων ἀρχήν, καὶ πρῶτον τοῖς κινουμένοις τὸ αὐτὸ αὑτὸ κινοῦν. ὅτι μὲν τοίνυν τῶν κινήσεων ἡ φορὰ πρώτη, φανερὸν ἐκ τούτων.

A principium proficiſci. quapropter quod eſt generatione poſterius, naturâ prius eſſe. poſtremò autem latio ineſt iis omnibus quæ gignuntur. 11 Idcirco alia viuentia *ſunt* omnino immobilia, propter defectum inſtrumẽti, vt plantæ, & multa genera animalium: aliis verò *motus* ineſt cùm ſunt perfecta. quare ſi magis ineſt latio iis, quæ magis adepta ſunt naturam, etiam hic motus erit aliorum primus eſſentiâ. 12 Cùm propter hæc, tum etiam quia minimè omnium motuum latione ab eſſentia recedit id quod mouetur. ſolo enim hoc *motu* non mutatur aliquid quod inſit: vt eius quod variatur, qualitas *mutatur*: eius autem quod augetur & minuitur, B quantitas. 13 Maximè autem manifeſtum *eſt*: quia quod ſeipſum mouet, maximè propriè hoc motu mouet, qui *fit* ſecundùm locum. atqui dicimus hoc eſſe eorum quæ mouentur, & mouent, principium, & primum iis quæ mouentur, id *ſcilicet* quod ſeipſum mouet. lationem igitur *eſſe* motionum primam, ex his perſpicuum *eſt*.

Nullam motionem vel mutationem eſſe continuam præter lationem. Cap. XI.

Τίς δὲ φορὰ πρώτη, νῦν δεικτέον. ἅμα δὲ καὶ τὸ νῦν καὶ τὸ πρότερον ὑποτεθέν, ὅτι ἐνδέχεταί τινα κίνησιν εἶναι συνεχῆ καὶ ἀΐδιον, φανερὸν ἔσται τῇ αὐτῇ μεθόδῳ. 2 Ὅτι μὲν οὖν τῶν ἄλλων κινήσεων οὐδεμίαν ἐνδέχεται συνεχῆ εἶναι, ἐκ τῶνδε φανερόν. ἅπασαι γὰρ ἐξ ἀντικειμένων εἰς ἀντικείμενά εἰσι, καὶ αἱ κινήσεις καὶ αἱ μεταβολαί· οἷον, γενέσει μὲν καὶ φθορᾷ τὸ ὂν καὶ μὴ ὂν ὅροι, ἀλλοιώσει δὲ τἀναντία πάθη, αὐξήσει δὲ καὶ φθίσει ἢ μέγεθος καὶ μικρότης, ἢ τελειότης μεγέθους καὶ ἀτέλεια· ἐναντίαι δέ, αἱ εἰς τὰ ἐναντία. τὸ δὲ μὴ ἀεὶ κινούμενον τήνδε τὴν κίνησιν, ὂν δὲ πρότερον, ἀνάγκη πρότερον ἠρεμεῖν. φανερὸν οὖν ὅτι ἠρεμήσει ἐν τῷ ἐναντίῳ τὸ μεταβάλλον. 3 Ὁμοίως δὲ καὶ ἐπὶ τῶν μεταβολῶν· ἀντίκειται γὰρ ἡ φθορὰ καὶ γένεσις ἁπλῶς τῇ ἁπλῶς, καὶ ἡ καθ' ἕκαστον τῇ καθ' ἕκαστον. ὥστ' εἰ ἀδύνατον ἅμα μεταβάλλειν τὰς ἀντικειμένας, οὐκ ἔσται συνεχὴς ἡ μεταβολή, ἀλλὰ μεταξὺ αὐτῶν ἔσται χρόνος. 4 Οὐδὲν γὰρ διαφέρει ἐναντίας ἢ μὴ ἐναντίας εἶναι τὰς κατ' ἀντίφασιν μεταβολάς, εἰ μόνον ἀδύνατον ἅμα τῷ αὐτῷ παρεῖναι· τοῦτο γὰρ τῷ λόγῳ οὐδὲν χρήσιμον. 5 Οὐδ' εἰ μὴ ἀνάγκη μὲν ἠρεμῆσαι ἐν τῇ ἀντιφάσει, μηδ' ἔστι μεταβολὴ ἠρεμίᾳ ἐναντίον· οὐ γὰρ ἴσως ἠρεμεῖ τὸ μὴ ὄν, ἡ δὲ φθορὰ εἰς τὸ μὴ ὄν· ἀλλ' εἰ μόνον μεταξὺ γίγνεται χρόνος· οὕτω γὰρ οὐκ ἔστιν ἡ μεταβολὴ συνεχής· οὐδὲ γὰρ ἐν τοῖς πρότερον ἡ ἐναντίωσις χρήσιμος, ἀλλὰ τὸ μὴ ἐνδέχεσθαι ἅμα ὑπάρχειν. 6 Οὐ δεῖ δὲ ταράττεσθαι, ὅτι τὸ αὐτὸ πλείοσιν ἔσται ἐναντίον, οἷον ἡ κίνησις, καὶ στάσει καὶ κινήσει τῇ εἰς τοὐναντίον· ἀλλὰ μόνον τοῦτο λαμβάνειν, ὅτι ἀντίκειταί πως καὶ τῇ κινήσει καὶ τῇ ἠρεμίᾳ ἡ κίνησις ἡ ἐναντία, καθάπερ * τὸ ἴσον καὶ τὸ μέτριον τῷ ὑπερέχοντι καὶ τῷ ὑπερεχομένῳ· καὶ ὅτι οὐκ ἐνδέχεται ἅμα τὰς ἀντικειμένας, οὔτε κινήσεις, οὔτε μεταβολὰς ὑπάρχειν. 7 Ἔτι δ' ἐπί τε τῆς γενέσεως καὶ τῆς φθορᾶς καὶ παντελῶς ἄτοπον ἂν εἶναι δόξειεν, εἰ γενόμενον * εὐθὺς ἀνάγκη φθαρῆναι, καὶ μηδένα χρόνον διαμεῖναι. ὥστ' ἐκ τούτων ἂν ἡ πίστις γένοιτο ταῖς ἄλλαις. φυσικὸν γὰρ τὸ ὁμοίως ἔχειν ἐν ἁπάσαις.

* γρ. τὸ ἴσον τῷ μείζονι καὶ τῷ ἐλάττονι.

* γρ. ἀνάγκη εὐθὺς φθείρεσθαι,

C QVæ autem latio *ſit* prima, nunc *eſt* oſtendendum ſimul autem & quod nunc, & quod antea ſuppoſitum fuit, poſſe aliquem motum eſſe continuum & æternum, perſpicuum erit eâdẽ methodo. 2 Nullum igitur aliorum motuum poſſe eſſe continuum, ex his perſpicuum *eſt*. omnes enim motiones & mutationes ſunt ex oppoſitis in oppoſita: vt ortui & interitui ens & non ens ſunt termini: variationi verò contrariæ affectiones: auctioni autem & deminutioni vel magnitudo & paruitas, vel magnitudinis perfectio & imperfectio. contrariæ autem *motiones* ſunt eæ quæ ſunt in contraria. quod verò nõ ſemper hoc motu cietur, cùm antea eſſet, neceſſe *eſt* vt priùs quieſceret. patet igitur, id D quod mutatur, quieturum in contrario. 3 Similiter etiam *ſe res habet* in mutationibus. opponitur enim interitus & ortus ſimpliciter *acceptus*, ei qui ſimpliciter *ſumitur*: & ſinguli ſingulis. quare ſi *eſt* impoſſibile, mutari ſimul contrariis *mutationibus*, *certè* mutatio nõ erit continua, ſed interiectum his erit tẽpus. 4 Nihil enim intereſt, vtrùm mutationes, quæ in contradictione *ſpectantur*. cõtrariæ ſint, an non contrariæ: ſi modò *ſit* impoſſibile vt ſimul eidem adſint. id enim ad rationem nihil confert. 5 Nec ſi neceſſe non *eſt* quieſcere in contradictione, nec eſt mutatio quieti contraria: (quia non ens fortaſſe non quieſcit: interitus autem *eſt motus* ad non ens.) ſed ſi tantũmodo interiectum ſit tempus: E quoniam ita mutatio non eſt continua. etenim nec in prioribus contrarietas conducebat, ſed nõ poſſe ſimul ineſſe. 6 Non oportet autẽ conturbari, quia idẽ pluribus erit contrariũ: vt motus & ſtatui & motui qui eſt in contrariũ. ſed hoc tantũ ſumere *oportet*, opponi aliquo modo & motui & quieti eũ motum qui eſt contrarius, quemadmodum æquale & mediocre opponitur ei quod exſuperat & ei quod ſuperatur: nec poſſe ſimul ineſſe vel motiones vel mutationes quæ ſunt oppoſitæ. 7 Inſuper in generatione & interitu etiã omnino abſurdũ videri poteſt, ſi neceſſe *ſit*, vt quod factum eſt, protinus intereat, nec vllo tempore permaneat. Quapropter ex his fides fieri poteſt etiam aliis *mutationibus*: quia naturale *eſt*, vt *res* ſimiliter habeat in omnibus.

Solam conuerſionem eſſe poſſe continuam, & infinitam.

Cap. XII.

A AT verò eſſe poſſe aliquem *motum* infinitum, cùm ſit vnus & continuus: & hunc eſſe eum qui fit in orbem, nunc dicamus. 2 Quicquid enim fertur, aut in orbem mouetur, aut *per lineam* rectam, aut *per* mixtam. 3 Quocirca ſi neuter illorum *eſt* continuus, ne quidem is continuus eſſe poteſt, qui ex vtriſque conſtat. 4 Id autem quod fertur *per lineam* rectam & finitam, non ferri continenter, manifeſtum *eſt*: quoniam recurrit: quod autem *per* rectam recurrit, contrariis motibus cietur. ſunt enim contraria ſecundùm locum *motus* ſurſum verſùs, *motui* deorſum verſùs: & *motus* in interiorem *partem*, *motui* in poſteriorem: & motus dextrorſum B motui ſiniſtrorſum. loci namque contrarietates hæ *ſunt*. quis autem ſit vnus & continuus motus, definitum antea fuit, nempe qui *eſt* vnius, & in vno tempore, & in eo quod non habet formæ differentiam. tria namque ſunt: *videlicet* id quod mouetur, vt homo, vel Deus: & quando, vt tempus: & tertium, *id eſt* id in quo *fit motus*: hoc autem eſt locus, vel affectio, vel forma, vel magnitudo. atqui contraria differunt ſpecie, nec *ſunt* vnum. loci verò differentiæ *ſunt*, quæ commemoratæ fuerunt. 5 Indicat autem motum ab α ad β, eſſe contrarium *motui* à β ad α: quia ſe mutuò ſiſtunt, & ceſſare faciunt, ſi ſimul fiant. C Itidémque in circulo: veluti *motus* ab α ad β, *eſt contrarius* motui ab α ad γ: quoniam *ſe mutuò* ſiſtunt, etiamſi continui ſint, nec fiat recurſus: propterea quòd ea quæ ſunt contraria, ſe inuicem interimunt & impediunt: ceterùm *motus* in latus, non eſt contrarius *motui* ſurſum verſùs. 6 Maximè autem perſpicuum *eſt*, fieri non poſſe, vt motus ſuper recta ſit continuus: quia quod recurrit, neceſſe *eſt* conſiſtere non ſolùm ſuper recta, ſed etiam ſi ſuper orbe feratur. 7 Non *eſt* enim idem, in orbe ferri, & ſuper orbe. nam id quod mouetur, aliquando continuat *motum*, aliquando verò, cùm ad idem peruenerit, à quo diſceſſit, rurſus retrocedit. 8 Neceſſe autem D *eſſe* vt conſiſtat, non ſolùm ſenſus fidem facit, ſed etiam ratio. 9 Principium autem hoc *eſt*: Cùm enim tria ſint, principium, medium, finis; medium cum vtroque *collatum*, eſt vtrumque: & numero quidem *eſt* vnum, ratione verò duo. 10 Præterea aliud eſt, *eſſe* poteſtate, & *eſſe* actu. quocirca rectæ *lineæ* quoduis punctum, quod *eſt* inter extrema, poteſtate quidem eſt medium, actu verò non eſt, niſi hanc diuidat, &, cùm conſtiterit, rurſus cœperit moueri. ſic autem id quod eſt medium, fit principium & finis, principium quidem poſterioris, finis autem prioris *motus*. 11 Verbi gratiâ, ſi α E quod fertur, conſiſtat in β, & rurſus feratur ad γ. cùm autem continenter fertur, nec poteſt acceſſiſſe α ad punctum β, nec *ab eo* receſſiſſe, ſed tantùm eſſe in momento, non in vllo tempore, præterquam in eo toto cuius diuiſio eſt momentum illud. 12 Quòd ſi quis poſuerit acceſſiſſe & receſſiſſe, α quod fertur, ſemper ſtabit: quoniam impoſſibile *eſt*, α ſimul acceſſiſſe ad β, & *ab eo* receſſiſſe: in alio igitur & alio puncto temporis. tempus igitur erit, quod *eſt* interiectum. quare α quieſcet in β. ſimiliter autem & in aliis punctis: nam eadem *eſt* omnium ratio.

A ΟΤι δ' ἐνδέχεται εἶναί τινα ἄπειρον, μίαν οὖσαν καὶ συνεχῆ, καὶ αὕτη ἐστὶν ἡ κύκλῳ, λέγωμεν νῦν. 2 Πᾶν γὰρ κινεῖται τὸ φερόμενον, ἢ κύκλῳ, ἢ εὐθείαν, ἢ μικτήν. 3 ὥστ' εἰ μηδ' ἐκείνων ἑτέρα συνεχής, οὐδὲ τὴν ἐξ ἀμφοῖν οἷόν τε εἶναι συγκειμένην. 4 Ὅτι δὲ τὸ φερόμενον τὴν εὐθείαν καὶ πεπερασμένην, οὐ φέρεται συνεχῶς, δῆλον· ἀνακάμπτει γάρ· τὸ δ' ἀνακάμπτον τὴν εὐθείαν, τὰς ἐναντίας κινεῖται κινήσεις· ἐναντία γὰρ κατὰ τόπον ἡ ἄνω τῇ κάτω, καὶ ἡ εἰς τὸ πρόσθεν τῇ εἰς τὸ ὄπισθεν, καὶ* ἡ εἰς τὰ ἀριστερὰ τῇ εἰς τὰ δεξιά. *γ. ἡ εἰς τὰ δεξιὰ τῇ εἰς τὰ ἀριστερά. B τόπου γὰρ ἐναντιώσεις αὗται. τίς δ' ἐστὶ μία καὶ συνεχὴς κίνησις, διώρισται πρότερον, ὅτι ἡ τοῦ ἑνὸς καὶ ἐν ἑνὶ χρόνῳ, καὶ ἐν ἀδιαφόρῳ κατ' εἶδος. τρία γὰρ ἐστί, τό, τε κινούμενον, οἷον ἄνθρωπος ἢ θεός· καὶ ὅτε, οἷον ὁ χρόνος· καὶ τρίτον, τὸ ἐν ᾧ. τοῦτο δ'* ἐστὶ τόπος, ἢ πάθος, ἢ εἶδος, ἢ μέγεθος. *γ. ἐστὶν ἢ π. ἢ εἶδος, ἢ τόπος, ἢ μ. τὰ δ' ἐναντία διαφέρει τῷ εἴδει, καὶ οὐχ ἕν. τόπου δ' αἱ εἰρημέναι διαφοραί. 5 Σημεῖον δ', ὅτι ἐναντία κίνησις ἡ ἀπὸ τοῦ α πρὸς τὸ β, τῇ ἀπὸ τοῦ β πρὸς τὸ α, ὅτι ἱστᾶσι καὶ παύουσιν ἀλλήλας, ἐὰν ἅμα γίγνωνται. καὶ ἐπὶ κύκλου ὡσαύτως· οἷον* ἡ ἀπὸ τοῦ α ἐπὶ *γ. ἡ ἀπὸ τ. α. C τὸ β τῇ ἀπὸ τοῦ α ἐπὶ τὸ γ· ἵστησι γάρ. καὶ ἐὰν συνεχεῖς ὦσι, καὶ μὴ γίνηται ἀνάκαμψις, διὰ τὸ τὰ ἐναντία φθείρειν καὶ κωλύειν ἄλληλα, ἀλλ' οὐχ ἡ εἰς τὸ πλάγιον τῇ ἄνω. 6 Μάλιστα δὲ φανερόν, ὅτι ἀδύνατον εἶναι συνεχῆ τὴν ἐπὶ τῆς εὐθείας κίνησιν, ὅτι ἀνακάμπτον ἀναγκαῖον στῆναι, οὐ μόνον ἐπὶ τῆς εὐθείας, ἀλλὰ κἂν κύκλον φέρηται. 7 Οὐ γὰρ τὸ αὐτὸ κύκλῳ φέρεσθαι καὶ κύκλον· ἔστι γάρ, ὁτὲ μὲν συνείρειν κινούμενον, ὁτὲ δὲ ἐπὶ τὸ αὐτὸ ἐλθὸν ὅθεν ὡρμήθη,* ἀνακάμψαι πάλιν. *γ. ἀνακάμψειεν 8 Ὅτι δ' ἀνάγκη ἵστασθαι, ἡ πίστις οὐ μόνον ἐπὶ τῆς αἰσθήσεως, ἀλ- D λὰ καὶ* ἐπὶ τοῦ λόγου. *γ. ἀπὸ τ. λ. 9 Ἀρχὴ δὲ ἥδε· τριῶν γὰρ ὄντων, ἀρχῆς, μέσου, τελευτῆς, τὸ μέσον πρὸς ἑκάτερον ἄμφω ἐστί, καὶ τῷ μὲν ἀριθμῷ ἕν, τῷ λόγῳ δὲ δύο. 10 Ἔτι δὲ, ἄλλο ἐστὶ τὸ δυνάμει καὶ τὸ ἐνεργείᾳ. ὥστε τῆς εὐθείας τῶν ἐντὸς τῶν ἄκρων ὁτιοῦν σημεῖον, δυνάμει μὲν ἐστὶ μέσον, ἐνεργείᾳ δ' οὐκ ἔστιν, ἐὰν μὴ* διέλῃ ταύτην, *γ. διέλοιτο καὶ ἐπιστὰν πάλιν ἄρξηται κινεῖσθαι· οὕτω δὲ τὸ μέσον ἀρχὴ γίνεται καὶ τελευτή· ἀρχὴ μὲν τῆς ὕστερον, τελευτὴ δὲ τῆς προτέρας. 11 Λέγω δέ, οἷον ἐὰν φερόμενον τὸ α στῇ ἐπὶ τοῦ β, καὶ πάλιν φέρηται ἐπὶ τὸ γ· ὅταν δὲ E συνεχῶς φέρηται, οὔτε γεγονέναι, οὔτε ἀπογεγονέναι, οἷόν τε τὸ α κατὰ τὸ β σημεῖον, ἀλλὰ μόνον εἶναι ἐν τῷ νῦν, ἐν χρόνῳ δ' οὐδενὶ πλὴν οὗ τὸ νῦν διαίρεσίς ἐστιν ἐν τῷ ὅλῳ τῷ α β γ. 12 Εἰ δὲ γεγονέναι τις θήσει καὶ ἀπογεγονέναι, αἰεὶ στήσεται τὸ α φερόμενον· ἀδύνατον γὰρ ἅμα γεγονέναι τε τὸ α κατὰ τὸ β, καὶ ἀπογεγονέναι· ἐν ἄλλῳ ἄρα καὶ ἄλλῳ σημείῳ χρόνου. χρόνος ἄρα ἔσται ὁ ἐν μέσῳ. ὥστε ἠρεμήσει τὸ α ἐπὶ τοῦ β. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων σημείων· ὁ γὰρ αὐτὸς λόγος καὶ ἐπὶ πάντων.

13 Ὅταν δὲ γένηται τὸ φερόμενον α τῷ β μέσῳ καὶ τελευτῇ καὶ ἀρχῇ, ἀνάγκη στῆναι διὰ τὸ δύο ποιεῖν, ὥσπερ ἂν εἰ καὶ νοήσειεν. 14 Ἀλλ' ἀπὸ μὲν τοῦ α σημείου ἀπογέγονε τῆς ἀρχῆς, ἐπὶ δὲ τοῦ γ γέγονεν, ὅταν τελευτήσῃ καὶ στῇ. 15 Διὸ καὶ πρὸς τὴν ἀπορίαν τοῦτο λεκτέον. ἔχει γὰρ ἀπορίαν τήνδε. εἰ γὰρ εἴη ἡ τὸ ε τῇ ζ ἴση, καὶ τὸ α φέροιτο συνεχῶς ἀπὸ τοῦ ἄκρου πρὸς τὸ γ, ἅμα δὲ εἴη τὸ α ἐπὶ τῷ β σημείῳ, καὶ τὸ δ φέροιτο ἀπὸ τῆς ζ ἄκρας πρὸς τὸ η ὁμαλῶς, καὶ τῷ αὐτῷ τάχει τῷ α, τὸ δ ἔμπροσθεν ἥξει ἐπὶ τὸ η, ἢ τὸ α ἐπὶ τὸ γ. τὸ γὰρ πρότερον ὁρμῆσαν καὶ ἀπελθὸν, πρότερον ἐλθεῖν ἀνάγκη. 16 Οὐκ ἄρα ἅμα γέγονε τὸ α ἐπὶ τὸ β, καὶ ἀπογέγονεν ἀπ' αὐτοῦ. διὸ ὑστερίζει. εἰ γὰρ ἅμα, οὐχ ὑστεριεῖ, ἀλλ' ἀνάγκη ἔσται ἵστασθαι. 17 Οὐκ ἄρα θετέον ὅτε τὸ α ἐγένετο κατὰ τὸ β, τὸ δ κινεῖσθαι ἅμα ἀπὸ τοῦ ζ ἄκρου. εἰ γὰρ ἔσται γεγονὸς τὸ α ἐπὶ τὸ β, ἔσται καὶ τὸ ἀπογίνεσθαι, καὶ οὐχ ἅμα. ἀλλ' ἦν ἐν τομῇ χρόνου, καὶ οὐκ ἐν χρόνῳ. ἐνταῦθα μὲν οὖν ἀδύνατον οὕτω λέγειν ἐπὶ τῆς συνεχοῦς. 18 Ἐπὶ δὲ τοῦ ἀνακάμπτοντος, ἀνάγκη* λέγειν οὕτως. εἰ γὰρ ἡ τὸ η φέροιτο πρὸς τὸ δ, καὶ πάλιν ἀνακάμψαν, κάτω φέροιτο, τῷ ἄκρῳ τῷ ἐφ' οὗ τῷ δ τελευτῇ καὶ ἀρχῇ κέχρηται, τῷ ἑνὶ σημείῳ ὡς δυσί. διὸ στῆναι ἀνάγκη. καὶ οὐχ ἅμα γέγονεν ἐπὶ τῷ δ, καὶ ἀπελήλυθεν ἀπὸ τοῦ δ. ἐκεῖ γὰρ ἂν ἅμα εἴη καὶ οὐκ εἴη ἐν τῷ αὐτῷ νῦν. 19 Ἀλλὰ μὴν τήν γε πάλαι λύσιν οὐ λεκτέον. οὐ γὰρ ἐνδέχεται λέγειν, ὅτι ἐστὶ κατὰ τὸ δ, ἡ τὸ η ἐν τομῇ. ὅτι γέγονεν, οὔτε ἀπογέγονεν. ἀνάγκη γὰρ ἐπὶ τέλος ἐλθεῖν τὸ ἐνεργείᾳ ὄν, μὴ δυνάμει. τὸ μὲν οὖν ἐν μέσῳ, δυνάμει ἐστί, τοῦτο δὲ ἐνεργείᾳ. καὶ τελευτὴ μὲν κάτωθεν, ἀρχὴ δὲ ἄνωθεν. καὶ τῶν κινήσεων ἄρα ὡσαύτως. 20 Ἀνάγκη ἄρα στῆναι τὸ ἀνακάμπτον ἐπὶ τῆς εὐθείας. οὐκ ἄρα ἐνδέχεται συνεχῆ κίνησιν εἶναι ἀΐδιον ἐπὶ τῆς εὐθείας. 21 Τὸν αὐτὸν δὲ τρόπον ἀπαντητέον καὶ πρὸς τοὺς ἐρωτῶντας τὸν Ζήνωνος λόγον, καὶ ἀξιοῦντας, εἰ ἀεὶ τὸ ἥμισυ διιέναι δεῖ, ταῦτα δὲ ἄπειρα, τὰ δὲ ἄπειρα ἀδύνατον διεξελθεῖν. 22 Ἢ ὡς τὸν αὐτὸν τοῦτον λόγον τινὲς ἄλλως ἐρωτῶσιν, ἀξιοῦντες ἅμα τῷ κινεῖσθαι τὴν ἡμίσειαν, πρότερον ἀριθμεῖν καθ' ἕκαστον γιγνόμενον τὸ ἥμισυ, ὥστε διελθόντος τὴν ὅλην ἄπειρον,* συμβαίνῃ ἠριθμηκέναι ἀριθμόν. τοῦτο δὲ ὁμολογουμένως ἐστὶν ἀδύνατον. 23 Ἐν μὲν οὖν τοῖς πρώτοις λόγοις τοῖς περὶ κινήσεως ἐλύομεν, διὰ τὸ τὸν χρόνον ἄπειρα ἔχειν ἐν αὐτῷ. οὐδὲν γὰρ ἄτοπον, εἰ ἐν ἀπείρῳ χρόνῳ ἄπειρα διέρχεταί τις. ὁμοίως δὲ τὸ ἄπειρον ἔν τε τῷ μήκει ὑπάρχει, καὶ ἐν τῷ χρόνῳ. 24 Ἀλλ' αὕτη ἡ λύσις, πρὸς μὲν τὸν ἐρωτῶντα ἱκανῶς ἔχει. ἠρωτᾶτο γὰρ, εἰ ἐν πεπερασμένῳ ἐνδέχεται ἄπειρα διεξελθεῖν ἢ ἀριθμῆσαι. πρὸς δὲ τὸ πρᾶγμα καὶ τὴν ἀλήθειαν, οὐχ ἱκανῶς. ἐὰν γάρ τις ἀφέμενος τοῦ μήκους, καὶ τοῦ ἐρωτᾶν, εἰ ἐν πεπερασμένῳ χρόνῳ ἐνδέχεται ἄπειρα διεξελθεῖν, πυνθάνηται ἐπ' αὐτοῦ τοῦ χρόνου ταῦτα. ἔχει γὰρ ὁ χρόνος ἀπείρους διαιρέσεις. οὐκέτι ἱκανὴ ἔσται αὕτη ἡ λύσις. 25 Ἀλλὰ τὸ ἀληθὲς λεκτέον, ὅπερ εἴπομεν ἐν τοῖς ἄρτι λόγοις. ἂν γάρ τις τὴν συνεχῆ διαιρῇ εἰς δύο ἡμίση, οὗτος τῷ ἑνὶ σημείῳ ὡς δυσὶ χρῆται. ποιεῖ γὰρ αὐτὸ καὶ ἀρχὴν καὶ τελευτήν. οὕτω δὲ ποιεῖ, ὅ τε ἀριθμῶν, καὶ ὁ εἰς τὰ ἡμίση διαιρῶν. οὕτω δὲ διαιροῦντος, οὐκ ἔσται συνεχὴς, οὔθ' ἡ γραμμὴ, οὔθ' ἡ κίνησις. ἡ γὰρ συνεχὴς κίνησις, συνεχοῦς ἐστιν. ἐν δὲ τῷ συνεχεῖ, ἔνεστι

* γρ. λέγειν

* γρ. συμβαίνει

A 13 Cùm autem id quod fertur, *nempe* α, vtetur ipso β, *vt* medio, & fine, & principio: neceſſe *eſt*, vt conſiſtat, quia duo facit, perinde ac ſi animo conciperet. 14 Sed ab α puncto, *id eſt*, à principio, receſſit, ad γ verò acceſſit, cùm perfecerit *motum* & ſteterit. 15 Ideóque ad dubitationem hoc dicendum *eſt*. exiſtit enim hæc dubitatio: quoniam ſi ſit *linea* ε *linea* ζ æqualis, ac τὸ α feratur continenter ab extremo ad γ, ſimul autem ſit τὸ α in puncto β, ac τὸ δ feratur ab extrema *linea* ζ ad η æquabiliter, & eâdem celeritate, quâ *mouetur* τὸ α: *certè* τὸ δ priùs perueniet ad η quàm τὸ α ad γ. quod enim priùs receſſit & abiit, priùs perueniat, neceſſe *eſt*. 16 Non ſimul igitur B acceſſit τὸ α ad β, & ab eo receſſit: idcirco ſeriùs ad finem peruenit. nam ſi ſimul *recederet*, non perueniret ſeriùs. ſed neceſſe *eſt* vt conſiſtat. 17 Non *eſt* igitur ponendum, quando τὸ α acceſſit ad β, ſimul τὸ δ moueri à ζ extremo. nam ſi τὸ α acceſſit ad β, fiet vt & receſſerit, nec ſimul. ſed erat in ſectione temporis, non in tempore. hic igitur impoſſibile *eſt* ita dicere, *nempe* in eo quod eſt continuum. 18 In eo autem quod recurrit, neceſſe *eſt* ita dicere. nam ſi τὸ η feratur ad δ, & rurſus, cùm retroceſſerit, deorſum feratur: *certè* vſum eſt extremo δ vt fine & principio, *nimirùm* vno puncto quaſi duobus. idcirco ſtetiſſe neceſſe *eſt*: nec ſimul acceſſit ad δ, & receſſit à δ. illic enim ſimul eſſet, & non eſſet C eodem momento. 19 At verò ſolutio ſuprà allata, non *eſt hîc* afferenda. nam dici non poteſt, τὸ η in δ eſſe in ſectione temporis, & neque acceſſiſſe, neque receſſiſſe: neceſſe *eſt* enim, vt perueniat ad finem, qui ſit actu, non poteſtate. *punctum* itaque, quod eſt in medio, poteſtate: hoc autem *eſt* actu: & *eſt* quidem finis *loci*, *ſi ſpectetur ab* infero *ad ſuperum*: principium verò, *ſi à* ſupero. eodem igitur modo *eſt* etiã *principium & finis* motionum. 20 Ergo neceſſe *eſt*, vt id quod ſuper recta regreditur, cõſtiterit. quare non poteſt eſſe continuus æternus motus ſuper recta. 21 Eodem modo occurrendum *eſt* iis qui rationem Zenonis interrogant, ac poſtulant *ſi* ſemper dimidiũ D pertranſire oporteat. hæc verò (*inquiunt*) *ſunt* infinita: infinita autem impoſſibile *eſt* pertranſire. 22 Vel, vt nonnulli eandem rationem aliter interrogant, qui ſimul cum eo *quod* priùs moueri dimidiam, ſibi concedi poſtulant *licere* numerare dimidium, prout vnumquodque fit. quare cùm *mobile* totam *lineam* confecerit, euenit vt numerauerit numerum infinitum. hoc autem *omnium* conceſſione *eſt* impoſſibile. 23 In primis itaque ſermonibus qui de motu *ſunt*, eo ſoluebamus, quòd tempus habet in ſe infinita. nihil enim abſurdi *eſt*, ſi infinito tempore infinita quiſpiam pertranſeat: ſimiliter autem infinitas & in longitudine ineſt, & in tempore. 24 Verùm hæc ſolutio aduerſus interrogantem quidem ſatisfacit: in- E terrogabat enim, an *tempore* finito poſſint infinita pertranſiri, vel numerari. *quod* autem ad rem & ad veritatem *attinet*, non ſatisfacit. nam ſi quis omiſſa longitudine, & interrogatione illa an finito tempore poſſint infinita pertranſiri, percontetur hæc de ipſo tempore: (habet enim tempus infinitas diuiſiones) hæc ſolutio non ampliùs ſatisfaciet. 25 Sed veritas dicenda *eſt*, quam in proximis ſermonibus diximus. ſi quis enim *lineam* continuam diuidat in duo dimidia, hic vno puncto vtitur quaſi duobus: quoniã id facit & principium & finem. ſic autem facit, & qui numerat, & qui in dimidia diuidit. ſic autem *eo* diuidente, nec linea nec motio erit continua. etenim cõtinua motio *eſt* continui. in continuo autem inſunt

quidem infinita dimidia, non tamen actu, ſed poteſtate. quod ſi faciet actu, non faciet continuum, ſed ſtabit: quod quidem in eo qui dimidia numerat, perſpicuè accidit: quandoquidem neceſſe *eſt*, vt hic vnũ punctum quaſi duo numeret: quoniam alterius dimidij principium alterius verò finis erit, ſi non vnam *lineam* continuam numeret, ſed duas dimidiatas. 26 Quocirca ad eum qui interrogat, an poſſint pertranſiri infinita vel in tempore vel in longitudine, dicendum *eſt*, partim poſſe, partim non *poſſe*. nam quæ actu ſunt, non poſſe: *quæ* verò poteſtate, poſſe. etenim qui continenter mouetur, ex accidẽti infinita pertranſit, ſimpliciter autem minimè. accidit enim lineæ, vt ſint infinita dimidia: ſubſtantia verò atque eſſentia diuerſa eſt. 27 Quinetiam perſpicuum *eſt*, niſi quis temporis punctum, quo prius & poſterius diuiditur, ſemper poſteriori attribuat, ratione ipſius rei habita: idem ſimul fore ens & non ens: item cùm factum erit, non fore. Punctum igitur *eſt* vtriſque commune, tam priori quàm poſteriori: atque *eſt* vnum & idem numero: definitione verò non eſt idem. alterius enim *eſt* finis, alterius verò principium. quod autem ad rem attinet, ſemper eſt poſterioris affectionis. 28 Eſto tempus, vbi α β γ: res, vbi δ. hæc in tempore α *eſt* alba, in tempore autem β non alba: in γ igitur *eſt* alba & non alba. in quouis enim *puncto* ipſius α verè dicebatur alba, ſi toto hoc tempore erat alba: & in β non alba: *ipſum* γ verò *eſt* in vtriſque. Non igitur dandum *eſt* in toto, ſed excipiendum extremum momentum, vbi γ: hoc autem iam *eſt* poſterius. 29 Et ſi fiebat non album, & ſi peribat album in toto α: factum eſt, vel perit in γ. quapropter album, vel non album, in eo primùm verè dicitur: aut quando factum eſt, non erit: & quando perit, erit: aut neceſſe *eſt* vt ſimul ſit album & nõ album, ens & nõ ens. 30 Iam verò ſi neceſſe *eſt* id quod erat antea non ens, fieri ens; & quando fit, non eſt: *certe* non poteſt in indiuidua tempora tempus diuidi. nam ſi in α tempore ipſum δ fiebat album, ſimul autem eſt factum, & eſt in alio indiuiduo tempore cohærente, *id eſt* in β: ſi in α fiebat, non erat: in β autem eſt: generationem quandam oportet eſſe *interiectam*. quapropter etiam tempus erat, quo fiebat. 31 Non erit enim eadem ratio etiam iis qui dicunt non *eſſe* indiuidua *tempora*: ſed in ipſius temporis, quo fiebat, extremo puncto eſt factum & eſt: cui *puncto* nihil cohæret, aut eſt deinceps: ſi verò *ſint* indiuidua tempora, deinceps *erunt*. 32 Perſpicuum igitur *eſt*, ſi in toto α tempore fiebat, non eſſe maius tempus quo fiebat & factum eſt, quàm quo toto fiebat dumtaxat. 33 Quibus igitur tanquam propriis rationibus *ductus* credat aliquis, hæ ac tales quædam ſunt. Logicè autem conſiderantibus, etiam ex his alicui videri poſſit hoc idem effici. 34 Quicquid enim continenter mouetur, ſi à nullo impediatur, ad quod latione peruenit, ad id etiam priùs ferebatur. vtputa ſi ad β peruenit, etiam ferebatur ad β. neque *tunc ſolum* cùm vicinum erat, ſed ſtatim accepit moueri. cur enim potiùs nunc quàm priùs? Similiter autem in aliis *ſe res habet*. Atqui quod ab α in γ fertur, rurſus veniet in α, cùm moueatur continenter. quando igitur ab α ferebatur in γ, tunc etiam fertur in α eo motu qui *eſt* à γ. quapropter ſimul contrariis motibus *cietur*: contrarij namque *ſunt*, qui fiunt ſuper recta. 35 Item ex hoc mutatur in quo non eſt. ſi igitur hoc *eſt* impoſſibile, neceſſe *eſt* vt conſiſtat in γ. non *eſt* igitur motus vnus: nam qui intercipitur ſtatu, non eſt vnus.

μὲν ἄπειρα ἡμίση, ἀλλ' οὐκ ἐντελεχείᾳ, ἀλλὰ δυνάμει· ἂν δὲ ποιῇ ἐντελεχείᾳ, οὐ ποιήσει συνεχῆ, ἀλλὰ στήσει, ὅπερ ἐπὶ τοῦ ἀριθμοῦντος τὰ ἡμίση φανερόν ἐστιν ὅτι συμβαίνει· τὸ γὰρ ἓν σημεῖον, ἀνάγκη αὐτῷ δύο ἀριθμεῖν· τοῦ μὲν γὰρ ἑτέρου ἡμίσεος, ἀρχὴ· τοῦ δ' ἑτέρου τελευτὴ ἔσται, ἐὰν μὴ μίαν ἀριθμῇ τὴν συνεχῆ, ἀλλὰ δύο ἡμισείας. 26 Ὥστε λεκτέον πρὸς τὸν ἐρωτῶντα, εἰ ἐνδέχεται ἄπειρα διεξελθεῖν, ἢ ἐν χρόνῳ, ἢ ἐν μήκει, ὅτι ἔστι μὲν ὡς, ἔστι δ' ὡς οὔ. ἐντελεχείᾳ μὲν γὰρ ὄντα οὐκ ἐνδέχεται, δυνάμει δὲ ἐνδέχεται· ὁ γὰρ συνεχῶς κινούμενος κατὰ συμβεβηκὸς ἄπειρα διελήλυθεν, ἁπλῶς δ' οὔ. συμβέβηκε γὰρ τῇ γραμμῇ ἄπειρα ἡμίση εἶναι· ἡ δ' οὐσία ἐστὶν ἑτέρα, καὶ τὸ εἶναι. 27 Δῆλον δὲ ὅτι καὶ ἐὰν μή τις ποιῇ τὸ τοῦ χρόνου σημεῖον τὸ διαιροῦν τὸ πρότερον καὶ ὕστερον, ἀεὶ τοῦ ὑστέρου τῷ πράγματι, ἔσται ἅμα τὸ αὐτὸ ὂν, καὶ οὐκ ὂν, καὶ ὅτε γέγονεν, οὐκ ὄν. τὸ σημεῖον μὲν οὖν ἀμφοῖν κοινόν, καὶ τοῦ προτέρου καὶ τοῦ ὑστέρου, καὶ ταὐτὸν καὶ ἓν ἀριθμῷ, λόγῳ δ' οὐ ταὐτόν* τοῦ μὲν γὰρ τελευτή, τοῦ δὲ ἀρχή. τῷ δὲ πράγματι ἀεὶ τοῦ ὑστέρου πάθους ἐστίν. 28 Ἔστω χρόνος ἐφ' ᾧ α γ β, πρᾶγμα ἐφ' ᾧ δ. τοῦτο ἐν μὲν τῷ α χρόνῳ λευκόν, ἐν δὲ τῷ β, οὐ λευκόν· ἐν τῷ γ ἄρα λευκὸν καὶ οὐ λευκόν. ἐν ὁτῳοῦν γὰρ τοῦ α λευκὸν ἀληθὲς εἰπεῖν, εἰ πάντα τὸν χρόνον τοῦτον ἦν λευκόν, καὶ ἐν τῷ β μὴ λευκόν· τὸ δὲ γ ἐν ἀμφοῖν. οὐκ ἄρα δοτέον ἐν ἅπαντι, ἀλλὰ πλὴν τοῦ τελευταίου νῦν ἐφ' οὗ γ. τοῦτο δ' ἤδη τοῦ ὑστέρου. 29 Καὶ εἰ ἐγίνετο οὐ λευκόν, καὶ εἰ ἐφθείρετο λευκὸν ἐν τῷ α παντί, γέγονεν ἢ ἔφθαρται ἐν τῷ γ. ὥστε λευκὸν ἢ μὴ λευκὸν πρῶτον ἐν ἐκείνῳ ἀληθὲς εἰπεῖν, ἢ ὅτε γέγονεν οὐκ ἔσται, καὶ ὅτε ἔφθαρται, ἔσται, ἢ ἅμα λευκόν* καὶ οὐ λευκόν, καὶ ὂν καὶ μὴ ὂν ἀνάγκη εἶναι. 30 Εἰ δ' ὃ ἂν ᾖ πρότερον μὴ ὄν, ἀνάγκη γίγνεσθαι ὄν, καὶ ὅτε γίγνεται μὴ ἔστιν, οὐχ οἷόν τε εἰς ἀτόμους χρόνους διαιρεῖσθαι τὸν χρόνον· εἰ γὰρ ἐν τῷ α χρόνῳ τὸ δ ἐγίγνετο λευκόν, γέγονε δ' ἅμα καὶ ἔστιν ἐν ἑτέρῳ ἀτόμῳ χρόνῳ, ἐχομένῳ δὲ ἐν τῷ β, εἰ ἐν τῷ α ἐγίγνετο, οὐκ ἦν· ἐν δὲ τῷ β, ἔστι· γένεσιν δεῖ εἶναί τινα μεταξύ, ὥστε καὶ χρόνον ἐν ᾧ ἐγίγνετο. 31 Οὐ γὰρ ὁ αὐτὸς λόγος ἔσται καὶ τοῖς μὴ ἄτομα λέγουσιν, ἀλλ' αὐτοῦ τοῦ χρόνου, ἐν ᾧ ἐγίγνετο, γέγονε, καὶ ἔστιν ἐν τῷ ἐσχάτῳ σημείῳ· οὗ οὐδὲν ἐχόμενόν ἐστιν, οὐδὲ ἐφεξῆς· οἱ δ' ἄτομοι χρόνοι, ἐφεξῆς. 32 Φανερὸν δ' ὅτι εἰ ἐν τῷ α ὅλῳ χρόνῳ ἐγίγνετο, οὐκ ἔστι πλείων χρόνος ἐν ᾧ γέγονε καὶ ἐγίγνετο, ἢ ἐν ᾧ ἐγίγνετο μόνον παντί. 33 Οἷς μὲν οὖν ἄν τις ὡς οἰκείοις λόγοις πιστεύσειεν, οὗτοι καὶ τοιοῦτοί τινές εἰσι· λογικῶς δὲ ἐπισκοποῦσι, κἂν ἐκ τῶνδε δόξειέ τῳ ταὐτὸ τοῦτο συμβαίνειν. 34 Ἅπαν γὰρ τὸ κινούμενον συνεχῶς, ἐὰν ὑπὸ μηδενὸς ἐκκρούηται, εἰς ὅπερ ἦλθε κατὰ τὴν φοράν, εἰς τοῦτο καὶ ἐφέρετο πρότερον, οἷον εἰ ἐπὶ τὸ β ἦλθε, καὶ ἐφέρετο ἐπὶ τὸ β, καὶ οὐχ ὅτε πλησίον ἦν, ἀλλ' εὐθὺς ὡς ἤρξατο κινεῖσθαι. τί γὰρ μᾶλλον νῦν, ἢ πρότερον; ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. τὸ δ' ἀπὸ τοῦ α ἐπὶ τὸ γ φερόμενον, πάλιν ἥξει ἐπὶ τὸ α συνεχῶς κινούμενον. ὅτε ἄρα ἀπὸ τοῦ α ἐφέρετο εἰς τὸ γ, τότε καὶ εἰς τὸ α φέρεται τὴν ἀπὸ τοῦ γ κίνησιν, ὥσθ' ἅμα τὰς ἐναντίας· ἐναντίαι γὰρ αἱ κατ' εὐθεῖαν. 35 Ἅμα δὲ καὶ ἐκ τούτου μεταβάλλει ἐν ᾧ οὐκ ἔστιν. εἰ οὖν τοῦτ' ἀδύνατον, ἀνάγκη ἵστασθαι ἐπὶ τοῦ γ. οὐκ ἄρα μία ἡ κίνησις· ἡ γὰρ διαλαμβανομένη στάσει, οὐ μία ἐστίν.

* γρ. τοῦ μὲν γὰρ ἑτέρου τελευτή, τοῦ δ' ἑτέρου ἀρχή.

* γρ. καὶ οὐ λευκόν, καὶ ὅλως ὂν καὶ μὴ ὂν ἀνάγκη εἶναι.

A 36 Ἔτι δὲ καὶ ἐκ τῶνδε φανερὸν καθόλου μᾶλλον περὶ πάσης κινήσεως. εἰ γὰρ ἅπαν τὸ κινούμενον τῶν εἰρημένων τινὰ κινεῖται κινήσεων, καὶ ἠρεμεῖ τῶν ἀντικειμένων ἠρεμιῶν. οὐ γὰρ ἦν ἄλλη παρὰ ταύτας. τὸ δὲ μὴ ἀεὶ κινούμενον τήνδε τὴν κίνησιν, λέγω δ' ὅσαι ἕτεραι τῷ εἴδει, καὶ μὴ εἴ τι μόριόν ἐστι τῆς ὅλης, ἀνάγκη πρότερον ἠρεμεῖν τὴν ἀντικειμένην ἠρεμίαν· ἡ γὰρ ἠρεμία, στέρησις τῆς κινήσεώς ἐστιν. 37 Εἰ οὖν ἐναντίαι μὲν κινήσεις αἱ κατ' εὐθεῖαν, ἅμα δὲ μὴ ἐνδέχεται κινεῖσθαι τὰς ἐναντίας, τὸ ἀπὸ τοῦ α πρὸς τὸ γ φερόμενον οὐκ ἂν φέροιτο ἅμα, καὶ ἀπὸ τοῦ γ πρὸς τὸ α. ἐπεὶ δὲ οὐχ ἅμα φέρεται, * κινηθήσεται
B δὲ ταύτην τὴν κίνησιν, ἀνάγκη ἠρεμηκέναι πρότερον πρὸς τῷ γ· αὕτη γὰρ ἦν ἡ ἀντικειμένη ἠρεμία τῇ ἀπὸ τοῦ γ κινήσει. δῆλον τοίνυν ἐκ τῶν εἰρημένων, ὅτι οὐκ ἔστι συνεχὴς ἡ κίνησις. 38 Ἔτι δὲ καὶ ὅδε ὁ λόγος μᾶλλον οἰκεῖος τῶν εἰρημένων. ἅμα γὰρ ἔφθαρται τὸ οὐ λευκὸν, καὶ γέγονε λευκόν. εἰ οὖν συνεχὴς ἡ ἀλλοίωσις εἰς λευκὸν, καὶ ἐκ λευκοῦ, καὶ μὴ μένει τινὰ χρόνον, ἅμα ἔφθαρται τὸ οὐ λευκὸν, * καὶ γέγονεν οὐ λευκόν. τριῶν γὰρ ἔσται ὁ αὐτὸς χρόνος. 39 Ἔτι, οὐκ εἰ συνεχὴς ὁ χρόνος, καὶ ἡ κίνησις· ἀλλ' ἐφεξῆς. 40 Πῶς [δ'] ἂν εἴη τὸ ἔσχατον τὸ αὐτὸ τῶν ἐναντίων, οἷον λευκότητος καὶ μελανίας; 41 Ἡ δὲ ἐπὶ τῆς
C περιφεροῦς, ἔσται μία καὶ συνεχής· οὐδὲν γὰρ ἀδύνατον συμβαίνει· τὸ γὰρ ἐκ τοῦ α κινούμενον, ἅμα κινηθήσεται εἰς τὸ α κατὰ τὴν αὐτὴν πρόθεσιν· εἰς ὃ γὰρ ἥξει, καὶ κινεῖται εἰς τοῦτο, ἀλλ' οὐχ ἅμα κινηθήσεται τὰς ἐναντίας, οὐδὲ τὰς ἀντικειμένας· οὐ γὰρ ἅπασα * ἡ ἐκ τούτου τῇ εἰς τοῦτο ἐναντία, οὐδ' ἀντικειμένη· ἀλλ' ἐναντία μὲν, ἡ ἐπ' εὐθείας· ταύτῃ γάρ ἐστιν ἐναντία κατὰ τόπον, οἷον ἡ κατὰ διάμετρον· ἀπέχει γὰρ πλεῖστον. ἀντικειμένη δὲ, ἡ κατὰ τὸ αὐτὸ μῆκος. ὥστε οὐδὲν κωλύει συνεχῶς κινεῖσθαι, καὶ μηδένα χρόνον διαλείπειν. 42 Ἡ μὲν γὰρ κύκλῳ κίνησίς ἐστιν, ἡ ἀφ' αὐτοῦ * εἰς τὸ αὐτό· ἡ δὲ κατ' εὐθεῖαν, ἀφ' αὐτοῦ εἰς ἄλλο.
D 43 Καὶ ἡ μὲν ἐν τῷ κύκλῳ, οὐδέποτε ἐν τοῖς αὐτοῖς· ἡ δὲ κατ' εὐθεῖαν, πολλάκις ἐν τοῖς αὐτοῖς. τὴν μὲν οὖν ἀεὶ ἐν ἄλλῳ καὶ ἄλλῳ γιγνομένην, ἐνδέχεται κινεῖσθαι συνεχῶς· τὴν δ' ἐν τοῖς αὐτοῖς πολλάκις, οὐκ ἐνδέχεται· ἀνάγκη γὰρ ἅμα κινεῖσθαι τὰς ἀντικειμένας. 44 Ὥστ' οὐδ' ἐν τῷ ἡμικυκλίῳ, οὐδ' ἐν ἄλλῃ περιφερείᾳ οὐδεμιᾷ ἐνδέχεται συνεχῶς κινεῖσθαι· πολλάκις γὰρ ἀνάγκη * ταὐτὰ κινεῖσθαι, καὶ τὰς ἐναντίας μεταβάλλειν μεταβολάς· οὐ γὰρ συνάπτει τῇ ἀρχῇ τὸ πέρας. ἡ δὲ τοῦ κύκλου, συνάπτει, καὶ ἔστι μόνη τέλειος. 45 Φανερὸν δὲ καὶ ἐκ ταύτης τῆς διαιρέσεως, * ὅτι οὐδὲ τὰς ἄλλας ἐνδέχεται κινή-
E σεις εἶναι συνεχεῖς· ἐν ἁπάσαις γὰρ ταὐτὰ συμβαίνει κινεῖσθαι πολλάκις, οἷον ἐν ἀλλοιώσει τὰ μεταξὺ, καὶ ἐν τῇ τοῦ ποσοῦ, τὰ ἀνὰ μέσον μεγέθη· καὶ ἐν γενέσει καὶ φθορᾷ ὡσαύτως· οὐδὲν γὰρ διαφέρει, ὀλίγα ἢ πολλὰ ποιῆσαι, ἐν οἷς ἐστιν ἡ μεταβολή, οὐδὲ μεταξὺ * προσθεῖναί τι ἢ ἀφελεῖν· ἀμφοτέρως γὰρ συμβαίνει ταὐτὰ κινεῖσθαι πολλάκις. 46 Δῆλον οὖν ἐκ τούτων, ὅτι οὐδ' οἱ φυσιολόγοι καλῶς λέγουσιν, οἱ πάντα τὰ αἰσθητὰ κινεῖσθαι φάσκοντες αἰεί· κινεῖσθαι γὰρ ἀνάγκη τούτων τινὰ τῶν κινήσεων, καὶ μάλιστα κατ' ἐκείνους ἐστὶν ἀλλοιοῦσθαι· ῥεῖν γάρ φασιν αἰεὶ καὶ φθίνειν. ἔτι δὲ καὶ τὴν γένεσιν καὶ τὴν φθορὰν ἀλλοίωσιν λέγουσιν. ὁ δὲ λόγος νῦν εἴρηκε καθόλου περὶ πάσης

* γρ. κινήσεται
* γρ. ἔφθαρται λευκὸν καὶ γέγονεν οὐ λευκόν.
* γρ. ἡ εἰς τοῦτο τῇ ἐκ τούτου
* γρ. εἰς ἑαυτό
* γρ. ταὐτὰ
* γρ. ὅτι οὐδ' ἐνδέχεται οὐδὲ τὰς ἄλλας κινήσεις εἶναι.
* γρ. προσθεῖναι

A 36 Inſuper ex his quoque perſpicuum eſt magis vniuerſaliter de omni motu. nam ſi quicquid mouetur, aliquo ex commemoratis motionibus cietur, etiam quieſcit *aliqua* ex oppoſitis quietibus, quia non erat alia præter has. quod verò non ſemper hoc motu cietur (dico autem *motus* qui *ſunt* diuerſi ſpecie, non ſi qua eſt pars totius) neceſſe *eſt* priùs quieſcere oppoſita quiete: nam quies eſt priuatio motus. 37 Quare ſi contrarij motus *ſunt*, qui fiunt per *lineam* rectam; ſimul autem non poteſt *aliquid* contrariis motibus cieri: *profectò* quod fertur ab α ad γ, non poteſt ſimul ferri etiam à γ ad α. quia verò non ſimul fertur, hoc autem motu cietur: neceſſe *eſt*
B antea quieuiſſe in γ: hæc enim eſt quies oppoſita motui αγ. manifeſtū *eſt* igitur ex iis quæ dicta ſunt, motum non eſſe continuum. 38 Præterea eſt hæc ratio magis propria quàm eæ quæ dictæ fuerunt. ſimul enim interiit non album, & factum eſt album. ſi igitur variatio in album, & ex albo, ſit continua, nec maneat aliquo tempore: ſimul interiit non album & factum eſt non album: trium namque erit idem tempus. 39 Præterea non ſi tempus eſt continuum, *propterea* etiam motus *eſt continuus*, ſed eſt deinceps. 40 Quomodo autem poteſt eſſe idem extremum contrariorum, vt alboris & nigroris? 41 *Motus* autem qui fit ſuper *linea* orbiculata, erit vnus & continuus: quia nihil impoſſibile accidit. quod
C enim ex α mouetur ſimul ad α mouebitur eodem impetu: ad quod enim veniet, ad id etiam mouetur. ſed non mouebitur ſimul contrariis aut oppoſitis *motibus*. non enim omnis *motus* qui fit ex hoc, eſt contrarius ei qui fit ad hoc, nec oppoſitus. ſed is eſt contrarius, qui fit ſuper recta: quoniam huic ſunt contraria ſecundùm locum: veluti qui fit per diametrum: plurimùm enim diſtant. oppoſitus autem *eſt*, qui *fit* per eandem longitudinem. quocirca nihil prohibet continenter moueri, ac nullo tempore intermitti. 42 Nam conuerſio eſt motus, qui *fit* ab eodem in idem. *motus* autem per rectam, ab eodem in aliud. 43 Et conuerſio quidem nunquam in iiſdem
D *fit*. qui verò ſuper recta *fit*, ſæpe *eſt* in iiſdem. *motu* igitur qui ſemper in alio atque alio fit, poteſt *aliquid* moueri continenter: eo autem qui in eiſdem ſæpe fit, non poteſt: quia neceſſe *eſt* ſimul oppoſitis *motibus* cieri. 44 Quapropter nec in ſemicirculo, nec in vlla alia circumferentia poteſt continenter moueri: quia neceſſe *eſt* per eadem ſæpe moueri, & contrariis mutationibus mutari: non coniungit enim finem cum principio: conuerſio verò coniungit, & ſola eſt perfecta. 45 Quinetiam ex hac diuiſione perſpicuum *eſt* ne alios quidem motus eſſe poſſe continuos, quoniam in omnibus accidit *per* eadem ſæpe moueri: vt in variatione, *per media* interiecta: & in *mutatione* quantitatis, *per* medias magnitudines:
E itidemque in generatione & interitu. nihil enim refert, pauca an multa *ea* facere, in quibus eſt mutatio: nec medium aliquid addere, vel detrahere: quoniam vtroque modo accidit *per* eadem ſæpe moueri. 46 Ex his igitur manifeſtum *eſt*, nec eos qui de natura diſſerunt, rectè dicere, qui omnia ſenſilia inquiunt ſemper moueri. etenim neceſſe *eſt* aliquo horum motuum cieri: & maximè ſecundùm illos variari: nam fluere ſemper aiunt, & imminui: præterea generationem & interitum, variationem appellant. præſens autem diſputatio vniuerſaliter de omni

motu oſtendit nullo motu poſſe aliquid continenter cieri, præterquam conuerſione. quapropter nec variatione, nec auctione. 47 Quod igitur neque infinita ſit vlla mutatio, neque continua, tot à nobis dicta ſunto.

A κινήσεως, ὅτι κατ᾽ οὐδεμίαν κίνησιν ἐνδέχεται κινεῖσθαι συνεχῶς, ἔξω τῆς κύκλῳ· ὥστε οὔτε κατ᾽ ἀλλοίωσιν, οὔτε κατ᾽ αὔξησιν. 47 Ὅτι μὲν οὖν οὔτ᾽ ἄπειρός ἐστι μεταβολὴ οὐδεμία, οὔτε συνεχὴς ἔξω τῆς κύκλῳ φορᾶς, ἔστω τοσαῦθ᾽ ἡμῖν εἰρημένα.

Conuerſionem eſſe lationum primam.

Cap. XIII.

AT verò lationum primam *eſſe* conuerſionem, manifeſtum *eſt*. 2 Omnis enim latio, vt antea diximus, vel eſt in orbem, vel ſuper rectâ, vel mixta. 3 Hac autem neceſſe *eſt* illas eſſe priores: quoniam ex illis conſtat. 4 Rectâ autem prior *eſt*, quæ *fit* in orbem: quia ſimplex & perfecta magis *eſt*. etenim per infinitam *lineam* rectam non poteſt *aliquid* ferri: quoniam ita infinitum non eſt. ſed nec ſi eſſet, quicquam *per id* moueretur: quia non fit quod eſt impoſſibile: pertranſire autem infinitum, *eſt* impoſſibile. latio verò quæ ſuper finita recta *fit*, ſi recurrit, *eſt* compoſita & duo motus. ſin autem non recurrat, eſt imperfecta & interitui obnoxia. atqui & naturâ & definitione & tempore prius *eſt* perfectum imperfecto: & quod non interit, eo quod eſt interitui obnoxium. 5 Præterea *prior eſt latio* quæ poteſt eſſe æterna, quàm ea quæ non poteſt. & conuerſio quidem poteſt eſſe æterna: aliarum verò lationum vel mutationum nulla *poteſt eſſe æterna*. ſtatum enim fieri oportet. quòd ſi ſtatus ſit, motus perit.

B ΟΤι δὲ τῶν φορῶν ἡ κυκλοφορία πρώτη, δῆλον. 2 Πᾶσα γὰρ φορά, ὥσπερ καὶ πρότερον εἴπομεν, ἢ κύκλῳ, ἢ ἐπ᾽ εὐθείας, ἢ μικτή. 3 Ταύτης δ᾽ ἀνάγκη προτέρας εἶναι ἐκείνας· ἐξ ἐκείνων γὰρ συνέστηκε. 4 Τῆς δ᾽ εὐθείας, ἡ κύκλῳ· ἁπλῆ γὰρ καὶ τέλειος μᾶλλον. ἄπειρον μὲν γὰρ οὐκ ἔστιν εὐθεῖαν φέρεσθαι· τὸ γὰρ οὕτως ἄπειρον οὐκ ἔστιν· ἀλλ᾽ οὐδ᾽ εἰ ἦν, ἐκινεῖτ᾽ ἂν οὐθέν. οὐ γὰρ γίνεται τὸ ἀδύνατον. διελθεῖν δὲ τὴν ἄπειρον, ἀδύνατον. ἡ δ᾽ ἐπὶ τῆς πεπερασμένης εὐθείας, ἀνακάμπτουσα μὲν * συνθετή, καὶ δύο κινήσεις· μὴ ἀνακάμπτουσα δέ, ἀτελὴς C καὶ φθαρτή. πρότερον δὲ καὶ φύσει, καὶ λόγῳ, καὶ χρόνῳ, τὸ τέλειον μὲν τοῦ ἀτελοῦς, τοῦ φθαρτοῦ δὲ τὸ ἄφθαρτον. 5 Ἔτι προτέρα ἣν ἐνδέχεται ἀΐδιον εἶναι τῆς μὴ ἐνδεχομένης. τὴν μὲν οὖν κύκλῳ ἐνδέχεται ἀΐδιον εἶναι, τῶν δ᾽ ἄλλων οὔτε φορὰν, οὔτ᾽ ἄλλην οὐδεμίαν· στάσιν γὰρ δεῖ γενέσθαι. εἰ δὲ στάσις, ἔφθαρται ἡ κίνησις.

* γρ. συνθετός.

Confirmatio eorum quæ ſuprà tradita fuerunt.

Cap. XIV.

RAtioni autem conſentaneum hoc euenit, vt *motus* qui *fit* in orbem, ſit vnus & cōtinuus: non is qui *fit* ſuper recta. nam eius qui *fit* ſuper recta, definitum eſt & principium, & medium, & finis: atque hæc omnia in ſe habet. quocirca eſt, vnde incipiet id quod mouetur, & vbi deſinet. in extremis enim quælibet res quieſcit, *id eſt*, vel vnde vel quò *mouetur*. conuerſionis autem non *ſunt* hæc diſtincta. cur enim quoduis eorum quæ ſunt in conuerſione, potiùs *quàm cetera, ſit* extremum? quia ſimiliter vnumquodque *eſt* & principium, & medium, & finis: adeo vt ſemper aliqua ſint in principio & in fine, & numquam. idcirco mouetur & quieſcit quodammodo globus, quoniam occupat eundem locum. 2 Cauſa verò *eſt*: quia hæc omnia centro accidunt: quoniam & principium eſt, & medium magnitudinis, & finis. quare cùm hoc ſit extra circumferentiam, non eſt, vbi id quod fertur, quieſcet, quaſi pertranſierit: ſemper enim fertur circa medium, non ad extremū. Ideóque totum manet ſemper & quieſcit quodammodo, & *nihilominus* mouetur continenter. 3 Euenit autem reciprocè. nam & quia conuerſio eſt menſura motuum, neceſſe *eſt* eam eſſe primam: omnia namque primum metitur, & quia *eſt* prima, eſt menſura aliorum *motuum*. 4 Præterea ſola conuerſio poteſt eſſe æquabilis, nam quæ ſuper recta *mouentur*, inæqualiter à principio feruntur, & ad finem: quoniam omnia, quo longiùs diſtant ab eo quod quieſcit, *eo* celeriùs feruntur. naturâ autem eſt comparatum vt ſolius conuerſionis nec principium, nec finis

D ΕΥλόγως δὲ συμβέβηκε τό, τὴν κύκλῳ μίαν εἶναι καὶ συνεχῆ, καὶ μὴ τὴν ἐπ᾽ εὐθείας· τῆς μὲν γὰρ ἐπ᾽ εὐθείας ὥρισται καὶ ἀρχή, καὶ μέσον, καὶ τέλος, καὶ πάντ᾽ ἔχει ἐν ἑαυτῇ, ὥστ᾽ ἔστιν ὅθεν ἄρξεται τὸ κινούμενον, καὶ οὗ τελευτήσει· πρὸς γὰρ τοῖς πέρασιν ἠρεμεῖ πᾶν, ἢ ὅθεν, ἢ οὗ. τῆς δὲ περιφεροῦς, ἀόριστα· τί γὰρ μᾶλλον ὁποιονοῦν πέρας τῶν ἐπὶ τῆς * γραμμῆς; ὁμοίως γὰρ ἕκαστον καὶ ἀρχή, καὶ μέσον, καὶ τέλος· ὥστ᾽ ἀεί τε εἶναι ἐν ἀρχῇ καὶ ἐν τέλει, καὶ μηδέποτε. διὸ κινεῖται καὶ ἠρεμεῖ πως ἡ σφαῖρα· τὸν αὐτὸν γὰρ κατέχει E τόπον. 2 Αἴτιον δ᾽, ὅτι πάντα συμβέβηκε ταῦτα τῷ κέντρῳ· καὶ γὰρ ἀρχὴ καὶ μέσον τοῦ μεγέθους καὶ τέλος ἐστίν. ὥστε διὰ τὸ ἔξω εἶναι τοῦτο τῆς περιφερείας, οὐκ ἔστιν ὅπου τὸ φερόμενον ἠρεμήσει, ὡς διεληλυθός· ἀεὶ γὰρ φέρεται περὶ τὸ μέσον, ἀλλ᾽ οὐ πρὸς τὸ ἔσχατον. διὰ δὲ τοῦτο * μένει, ἀεί τε ἠρεμεῖ πως τὸ ὅλον, καὶ κινεῖται συνεχῶς. 3 Συμβαίνει δὲ ἀντιστρόφως· καὶ γὰρ ὅτι μέτρον τῶν κινήσεων ἡ περιφορά ἐστι, πρώτην ἀναγκαῖον αὐτὴν εἶναι· ἅπαντα γὰρ μετρεῖται τῷ πρώτῳ· καὶ διότι πρώτη, μέτρον ἐστὶ τῶν ἄλλων. 4 Ἔτι δὲ καὶ ὁμαλὴν ἐνδέχεται εἶναι τὴν κύκλῳ μόνην· τὰ γὰρ ἐπὶ τῆς εὐθείας * ἀνωμάλως ἀπὸ τῆς ἀρχῆς φέρεται, καὶ πρὸς τὸ τέλος· πάντα γὰρ ὅσῳ ἂν ἀφίστηται πλεῖον τοῦ ἠρεμοῦντος, φέρεται θᾶττον· τῆς δὲ κύκλῳ μόνης, οὔτε ἡ ἀρχή, οὔτε τὸ τέλος

* γρ. περιφερείας.
* γρ. μένει ἀεί, ἡ.
* γρ. ἀνωμάλως.

ἐν αὐτῷ πέφυκεν, ἀλλ' ἐκτός. 5 Ὅτι δ' ἡ κατὰ τόπον φορὰ πρώτη τῶν κινήσεων, μαρτυροῦσι πάντες, ὅσοι περὶ κινήσεως πεποίηνται μνείαν· τὰς γὰρ ἀρχὰς αὐτῆς ἀποδιδόασι τοῖς κινοῦσι τὴν τοιαύτην κίνησιν. διάκρισις γὰρ καὶ σύγκρισις κινήσεις κατὰ τόπον εἰσίν· οὕτω δὲ κινοῦσιν ἡ φιλία καὶ τὸ νεῖκος· τὸ μὲν γὰρ διακρίνει, τὸ δὲ συγκρίνει αὐτῶν. καὶ τὸν νοῦν δέ φησιν Ἀναξαγόρας διακρίνειν τὸν κινήσαντα* πρῶτον. ὁμοίως δὲ καὶ ὅσοι τοιαύτην μὲν οὐδεμίαν αἰτίαν λέγουσι, διὰ δὲ τὸ κενὸν κινεῖσθαί φασι· καὶ γὰρ οὗτοι τὴν κατὰ τόπον κίνησιν κινεῖσθαι τὴν φύσιν λέγουσιν· ἡ γὰρ διὰ τὸ κενὸν κίνησις, φορά ἐστι, καὶ ὡς ἐν τόπῳ. τῶν δ' ἄλλων οὐδεμίαν ὑπάρχειν τοῖς πρώτοις, ἀλλὰ τοῖς ἐκ τούτων οἴονται. αὐξάνεσθαι γὰρ καὶ φθίνειν, καὶ ἀλλοιοῦσθαι συγκρινομένων καὶ διακρινομένων τῶν ἀτόμων σωμάτων φασί. τὸν αὐτὸν δὲ τρόπον καὶ ὅσοι διὰ πυκνότητα ἢ μανότητα κατασκευάζουσι γένεσιν ἢ φθοράν· συγκρίσει γὰρ καὶ διακρίσει ταῦτα διακοσμοῦσιν. ἔτι δὲ καὶ παρὰ τούτους οἱ τὴν ψυχὴν αἰτίαν ποιοῦντες κινήσεως· τὸ γὰρ αὐτὸ ἑαυτὸ κινοῦν, ἀρχὴν εἶναι φασὶ τῶν κινουμένων. * κινεῖ δὲ τὸ ζῷον, καὶ πᾶν τὸ ἔμψυχον, τὴν κατὰ τόπον αὐτοκίνησιν. 6 Καὶ κυρίως δὲ κινεῖσθαί φαμεν μόνον τὸ κινούμενον τὴν κατὰ τόπον κίνησιν. ἐὰν δ' ἠρεμῇ μὲν ἐν τῷ αὐτῷ, αὐξάνηται δὲ ἢ φθίνῃ, ἢ ἀλλοιούμενον τυγχάνῃ, πῇ κινεῖσθαι, ἁπλῶς δὲ κινεῖσθαι οὔ φαμεν. 7 Ὅτι μὲν οὖν ἀεί τε κίνησις ἦν, καὶ ἔσται τὸν ἅπαντα χρόνον, καὶ τίς ἀρχὴ τῆς ἀιδίου κινήσεως, ἔτι δὲ, τίς πρώτη κίνησις, καὶ τίνα κίνησιν ἀΐδιον ἐνδέχεται μόνην εἶναι, καὶ τὸ κινοῦν πρῶτον ὅτι ἀκίνητον, εἴρηται.

* γρ. πρῶτον

* γρ. κινεῖ δὲ τὸ ζ. & π. τ. ἔμ. τὴν κατὰ τόπον αὐτὸ αὑτὸ κίνησιν.

A in ipſa ſit, ſed extrà. 5 At verò lationem quæ *eſt* ſecundùm locum, *eſſe* motionum primam, teſtantur omnes, quotquot de motu mentionem fecerunt. nam eius principia attribuunt iis quæ hunc motum efficiunt. Segregatio namq; & aggregatio ſunt motus ſecundùm locum. Sic autem mouent amicitia & contentio: quandoquidem alterum eorum ſegregat, alterum congregat. Sed & mentem, quæ primùm mouit, ſegregare ait Anaxagoras. Similiter etiam *ſentiunt*, quicumque nullam eiuſmodi cauſam dicunt, ſed per inane moueri inquiunt. nam hi quoque naturam aiunt moueri eo motu qui *eſt* ſecundùm locum. etenim motus per inane, eſt latio, & B quaſi in loco. nullum autem alium *motum* putant ineſſe primis, ſed iis quæ ex his *conſtant*: augeri namque, ac deminui ac variari aiunt, dum indiuidua corpora congregantur & ſegregantur. Eodem modo *ſentiunt* etiam quicumque per denſitatem vel raritatem conſtituunt, ortum & interitum: quia congregatione & ſegregatione, hæc diſponunt. Præter hos etiam *adde eos*, qui animam faciunt cauſam motus. quod enim ſe ipſum mouet, principium eſſe inquiũt eorum quæ mouentur. animal autem, & omne animatum, eo motu qui eſt ſecundùm locum, ſeipſum mouet. 6 Sed & propriè moueri dicimus dumta- C xat, quod ſecundùm locum mouetur. quod ſi quieſcat in eodem *loco*, augeatur autem, vel minuatur, aut varietur: quadamtenus moueri, non ſimpliciter moueri dicimus. 7 Motum igitur & ſemper fuiſſe, & fore omni tempore; & quod*nam ſit* principium æterni motus, præterea quiſ*nam ſit* primus motus, & quis motus ſolus poſſit eſſe æternus, & mouens primum eſſe immobile, dictum eſt.

Primum motorem partibus & magnitudine carere, atque eſſe in ſuprema mundi parte.

Cap. XV.

Ὅτι δὲ τοῦτ' ἀμερὲς ἀναγκαῖον εἶναι, καὶ μηδὲν ἔχειν μέγεθος, νῦν λέγωμεν, πρῶτον περὶ τῶν προτέρων αὐτοῦ διορίσαντες. 2 Τούτων δὲ, ἓν μέν ἐστιν, ὅτι οὐχ οἷόν τε οὐδὲν πεπερασμένον κινεῖν ἄπειρον χρόνον. 3 Τρία γάρ ἐστι, τὸ κινούμενον, καὶ τὸ κινοῦν, καὶ τὸ ἐν ᾧ τρίτον ὁ χρόνος. ταῦτα δὲ, ἢ πάντα ἄπειρα, ἢ πάντα πεπερασμένα, ἢ ἔνια, οἷον τὰ δύο, ἢ τὸ ἕν. 4 Ἔστω δὴ τὸ α κινοῦν, τὸ δὲ κινούμενον β, χρόνος ἄπειρος ἐφ' οὗ γ. τὸ δὴ δ, κινείτω τι μέρος τοῦ β, τὸ ἐφ' ᾧ ε. οὐ δὴ ἐν ἴσῳ τῷ γ· ἐν πλείονι γὰρ τὸ μεῖζον· ὥστ' οὐκ ἄπειρος ὁ χρόνος ὁ τοῦ ζ. οὕτω δὴ* τῷ δ προστιθεὶς, καταναλώσω τὸ α, καὶ τῷ ε τὸ β· τὸν δὲ χρόνον οὐ καταναλώσω, ἀεὶ ἀφαιρῶν ἴσον· ἄπειρος γάρ· ὥστε ἡ πᾶσα α τὴν ὅλην β κινήσει ἐν πεπερασμένῳ* χρόνῳ τῷ γ. οὐκ ἄρα οἷόν τε ὑπὸ πεπερασμένου κινεῖσθαι οὐδὲν ἄπειρον κίνησιν. ὅτι μὲν οὖν οὐκ ἐνδέχεται τὸ πεπερασμένον ἄπειρον κινεῖν χρόνον, φανερόν. 5 Ὅτι δ' ὅλως οὐκ ἐνδέχεται ἐν πεπερασμένῳ μεγέθει ἄπειρον εἶναι δύναμιν, ἐκ τῶνδε δῆλον. 6 Ἔστω γὰρ ἡ πλείων δύναμις ἀεὶ ἡ τὸ ἴσον ἐν ἐλάττονι χρόνῳ ποιοῦσα, οἷον θερμαίνουσα, ἢ γλυκαίνουσα, ἢ ῥιπτοῦσα, καὶ ὅλως κινοῦσα. ἀνάγκη ἄρα καὶ ὑπὸ τοῦ

* γρ. τῷ δ.

* γρ. χρόνῳ τοῦ γ.

D Neceſſe autem eſſe, vt hoc vacet partibus, & nullam habeat magnitudinem, nũc explicemus, iis priùs definitis quæ hoc *ſunt* priora. 2 Horum autem vnum *eſt*, fieri non poſſe vt aliquid finitum moueat tempore infinito. 3 Tria namque ſunt, id quod mouetur, & id quod mouet, & tertium quo mouetur, *nempe* tempus: hæc autem vel *ſunt* omnia infinita, vel omnia finita, vel aliqua, vt duo, vel vnum. 4 Eſto igitur α, mouens: id autem quod mouetur, β: tempus, infinitum, in quo γ. itaque δ moueat aliquam partẽ ipſius β, quæ *pars ſit* vbi ε. non *mouebit* igitur *tempore* quod ſit æquale ipſi γ: quia maiori tempore maius E *mouet*. quocirca non *eſt* infinitum tempus ζ. ſic igitur ipſi δ adiectione facta, conſumam τὸ α: & ipſi ε *adiectione facta, conſumam* τὸ β: tempus autem non conſumam, ſemper æquale detrahendo, quia *eſt* infinitum. quapropter vniuerſa *virtus* α mouebit totam *magnitudinem* β finito tempore, *quod eſt pars* ipſius γ. fieri igitur nequit vt à re finita quicquam moueatur motu infinito. fieri ergo non poſſe vt finitum moueat tempore infinito, perſpicuum *eſt*. 5 Omnino autem non poſſe in magnitudine finita eſſe vim infinitam, ex his manifeſtum *eſt*. 6 Sit enim maior vis ſemper, quæ æquale minori tempore facit, vtputà calefacit, aut dulcedinem affert, aut proiicit & omnino mouet. neceſſe *eſt* igitur, vt ab eo quod

finitum quidem eſt, ſed infinitam vim habet, aliquid patiens patiatur, & quidem magis quàm ab alio *pateretur*, quoniam vis infinita eſt maior. 7 At verò tempus nullum eſſe poteſt. nam ſi ſit tempus α, quo infinita vis calefecit, aut pepulit; *ſit autem tempus* α ϛ, *quo* finita aliqua *vis id fecit*: ad hanc ſemper maiorem adiiciens finitam, perueniam tandem ad id quod ipſo α tempore mouit. nam ſi ad finitum ſemper adiecero, ſuperabo quoduis finitum: itidemque ſi detraxero, deminuam. æquali igitur tempore mouebunt magnitudo finita & infinita. hoc autem *eſt* impoſſibile. nihil igitur finitum poteſt habere vim infinitam. 8 Neque igitur in infinito poteſt *eſſe virtus* finita. 9 Atqui poteſt in minori magnitudine maior vis eſſe. ſed adhuc multò maior *erit* in maiori. 10 Eſto igitur, vbi α ϛ, infinitum. itaque τὸ ϐ γ vim quandam habet, quæ aliquo tempore mouit τὸ δ, *nimirum* tempore ε ζ. ergo ſi ipſius β γ, duplum accipiam, mouebit dimidio temporis ε ζ. ſit enim hæc proportio. quare mouebit *tempore* ζ θ. ſic igitur ſemper accipiens, nunquam pertranſibo magnitudinem α ϛ: ſed dato tempore ſemper minus accipiam. Vis igitur erit infinita: quia ſuperat omnem vim finitam. omnis autem virtutis finitæ neceſſe *eſt* finitum eſſe etiam tempus. nam ſi *tempore* aliquo *mouet*, quæ tanta eſt: *certè* maior minori quidem, finito tamen tempore mouebit, ſecundùm conuerſionem proportionis. vniuerſa autem vis *eſt* infinita, quemadmodum & multitudo, & magnitudo, quæ ſuperat omnem finitam. 11 Licet autem ſic quoque hoc probare. ſumemus enim in magnitudine finita aliquam vim, quæ ſit eiuſdem generis, atque ea quæ eſt in magnitudine finita, *&* quæ vim illam in magnitudine infinita *collocatam* metiatur. 12 Eſſe igitur non poſſe infinitam vim in magnitudine finita, nec finitam in infinita, ex his manifeſtum *eſt*. 13 De his autem quæ feruntur, rectè habet dubitationem quandam primùm proponere. Nam ſi quicquid mouetur, ab aliquo mouetur: quæcumque non ſe ipſa mouent, *horum* nonnulla quomodo continenter mouentur, nō tangente eo quod mouet? veluti quæ proiiciuntur. 14 Quòd ſi is qui mouet, ſimul etiam aliud quodpiam moueat, vt aërem, qui dum mouetur, mouet: ſimiliter impoſſibile *eſt*, primo non tangente, nec mouente, moueri: ſed ſimul omnia moueri: & ceſſare, cùm mouens primum ceſſauerit, etiamſi faciat vt lapis ille, nempe vt id moueat quod mouit. 15 Sed neceſſe *eſt* hoc dicere, primum mouens efficere vt poſſit mouere vel aër talis, vel aqua, vel aliud quidpiam tale, quod naturâ aptum eſt mouere & moueri. non tamen ſimul & deſinit mouere & moueri: ſed *deſinit* moueri, ſimul ac mouens deſinit mouere: adhuc tamen eſt mouens: idcirco mouet aliquid aliud, quod hæret. atque huius eadem *eſt* ratio. ceſſat autem, quando minor vis mouendi imprimitur in eo quod hæret. tandem verò deſinit, quando id quod eſt prius, non facit ampliùs vt moueat, ſed ſolùm vt moueatur. Verùm neceſſe *eſt* hæc ſimul deſinere, id quod mouet, & id quod mouetur, ac totum motum. 16 Hic igitur motus fit in iis quæ poſſunt modò moueri, modò quieſcere. 17 Nec *eſt* continuus, ſed videtur. aut enim *eſt* eorum quæ deinceps ſunt, aut quæ ſe tangunt: quādoquidem non eſt vnum, quod mouet, ſed *multa* ſibi inuicem cohærentia. 18 Ideóque huiuſmodi motus fit in aëre, & in aqua.

A πεπερασμένον μὲν, ἄπειρον δὲ ἔχοντος δύναμιν, *πείσεται τι πάσχον, καὶ πλείω ἢ ὑπ' ἄλλου· πλείων γὰρ ἡ ἄπειρος δύναμις. 7 Ἀλλὰ μὴν χρόνον γε οὐκ ἐνδέχεται εἶναι οὐδένα. εἰ γάρ ἐστιν ὁ ἐφ' ᾧ α χρόνος, ἐν ᾧ ἡ ἄπειρος ἰσχὺς ἐθέρμανεν, ἢ ἔωσεν· ἐν ᾧ δὲ ὁ α ϐ, πεπερασμένη τις· πρὸς ταύτην μείζω ἀεὶ λαμβάνων πεπερασμένην, ἥξω ποτὲ εἰς τὸ ἐν τῷ α χρόνῳ κεκινηκέναι· πρὸς πεπερασμένον γὰρ ἀεὶ προστιθεὶς ὑπερβαλῶ πᾶν τὸ ὡρισμένον, καὶ ἀφαιρῶν ἐλλείψω ὡσαύτως. ἐν ἴσῳ ἄρα χρόνῳ κινήσει ἡ πεπερασμένη τῇ ἀπείρῳ· τοῦτο δὲ ἀδύνατον. οὐδὲν ἄρα πεπερασμένον ἐνδέχεται ἄπειρον δύναμιν ἔχειν. 8 Οὐ
B τοίνυν οὐδὲ ἐν ἀπείρῳ πεπερασμένην. 9 Καίτοι ἐνδέχεται ἐν ἐλάττονι μεγέθει πλείονα δύναμιν εἶναι, ἀλλ' ἔτι μᾶλλον ἐν μείζονι πλείω. 10 Ἔστω δὴ τὸ ἐφ' οὗ α ϐ, ἄπειρον· τὸ δὴ β γ, ἔχει δύναμίν τινα, ἣ ἔν τινι χρόνῳ ἐκίνησε τὴν δ, ἐν τῷ χρόνῳ ἐφ' ᾧ ε ζ. ἂν δὴ τῆς β γ διπλάσιον λαμβάνω, ἐν ἡμίσει κινήσει χρόνῳ τοῦ ε ζ· ἔστω γὰρ αὕτη ἡ ἀναλογία· ὥστ' ἐν τῷ ζ θ κινήσει. οὐκοῦν οὕτω λαμβάνων ἀεὶ, τὴν μὲν α β, οὐδέποτε διέξειμι, χρόνου δὲ τοῦ δοθέντος ἀεὶ ἐλάττω λήψομαι. ἄπειρος ἄρα ἡ δύναμις ἔσται· πάσης γὰρ πεπερασμένης ὑπερβάλλει δυνάμεως. πάσης δὲ πεπερασμένης δυνάμεως, ἀνάγκη
C πεπερασμένον εἶναι καὶ τὸν χρόνον. εἰ γὰρ ἔν τινι ἡ τοσηδὶ, ἡ μείζων ἐλάττονι μὲν, ὡρισμένῳ δὲ κινήσει χρόνῳ, κατὰ τὴν ἀντιστροφὴν τῆς ἀναλογίας. ἄπειρος δὲ πᾶσα δύναμις, ὥσπερ καὶ πλῆθος, καὶ μέγεθος τὸ ὑπερβάλλον πᾶν τὸ ὡρισμένον. 11 Ἔστι δὲ καὶ ὧδε δεῖξαι τοῦτο· ληψόμεθα γὰρ δή τινα δύναμιν τὴν αὐτὴν τῷ γένει τῇ ἐν τῷ ἀπείρῳ μεγέθει, ἐν πεπερασμένῳ μεγέθει οὖσαν, ἣ καταμετρήσει τὴν ἐν τῷ ἀπείρῳ πεπερασμένην δύναμιν. 12 Ὅτι μὲν οὖν οὐκ ἐνδέχεται ἄπειρον εἶναι δύναμιν ἐν πεπερασμένῳ μεγέθει, οὐδὲ πεπερασμένην ἐν ἀπείρῳ, ἐκ τούτων δῆλον. 13 Περὶ δὲ τῶν φερομένων,
D καλῶς ἔχει διαπορῆσαί τινα ἀπορίαν πρῶτον. εἰ γὰρ πᾶν τὸ κινούμενον κινεῖται ὑπό τινος, ὅσα μὴ αὐτὰ ἑαυτὰ κινεῖ, πῶς κινεῖται ἔνια συνεχῶς μὴ ἁπτομένου τοῦ κινήσαντος; οἷον τὰ ῥιπτούμενα. 14 Εἰ δὴ ἅμα κινεῖ καὶ ἄλλο τι ὁ κινήσας, οἷον τὸν ἀέρα, ὃς κινούμενος *κινεῖ. ὁμοίως *ἀδύνατον τοῦ πρώτου μὴ ἁπτομένου, μηδὲ κινοῦντος κινεῖσθαι, ἀλλ' ἅμα πάντα καὶ κινεῖσθαι, καὶ πεπαῦσθαι, ὅταν τὸ πρῶτον κινοῦν παύσηται, καὶ εἰ ποιεῖ ὥσπερ ὁ λίθος, οἷον κινεῖ ὃ ἐκίνησεν. 15 Ἀνάγκη δὲ, τοῦτο μὲν λέγειν, ὅτι τὸ πρῶτον κινῆσαν ποιεῖ, *οἷον τε κινεῖν, ἢ τὸν ἀέρα τοιοῦτον, ἢ τὸ ὕδωρ, ἢ ἄλλο τι τοιοῦτον ὃ πέφυκε κινεῖν καὶ κινεῖ-
E σθαι. ἀλλ' οὐχ ἅμα παύεται κινοῦν καὶ κινούμενον, ἀλλὰ κινούμενον μὲν ἅμα, ὅταν ὁ κινῶν παύσηται κινῶν, κινοῦν δὲ ἔτι ἐστί. διὸ *κινεῖταί τι ἄλλου ἐχόμενον· καὶ ἐπὶ τούτου ὁ αὐτὸς λόγος. παύεται δὲ, ὅταν ἐλάττων ἡ δύναμις τοῦ κινεῖν ἐγγένηται τῷ ἐχομένῳ· τέλος δὲ παύεται, ὅταν μηκέτι ποιήσῃ τὸ πρότερον κινοῦν, ἀλλὰ κινούμενον μόνον. ταῦτα δὲ ἀνάγκη ἅμα παύεσθαι, τὸ μὲν κινοῦν, τὸ δὲ κινούμενον, καὶ τὴν ὅλην κίνησιν. 16 Αὕτη μὲν οὖν ἐν τοῖς ἐνδεχομένοις, ὁτὲ μὲν κινεῖσθαι, ὁτὲ δὲ ἠρεμεῖν ἐγγίνεται ἡ κίνησις. 17 Καὶ οὐ συνεχὴς, ἀλλὰ φαίνεται· ἢ γὰρ ἐφεξῆς ὄντων, ἢ ἁπτομένων ἐστίν· οὐ γὰρ ἓν τὸ κινοῦν, ἀλλ' ἐχόμενα ἀλλήλων. 18 Διὸ καὶ ἐν ἀέρι, καὶ ἐν ὕδατι γίνεται ἡ τοιαύτη κίνησις.

* γρ. π. ἢ τὸ πάσχον.
* γρ. κινεῖ.
* γρ. ἀδύνατος
* γρ. οἷόν τι.
* γρ. κινεῖ καὶ ἄλλο.

19 Ἣν λέγουσί τινες ἀντιπερίστασιν εἶναι. 20 Ἀδύνατον δὲ ἄλλως τὰ ἀπορηθέντα λύειν, εἰ μὴ τὸν εἰρημένον τρόπον. ἡ δ' ἀντιπερίστασις ἅμα πάντα ποιεῖ κινεῖσθαι, καὶ κινεῖν· ὥστε καὶ παύεται. νῦν δὲ φαίνεταί ἕν τι κινούμενον συνεχῶς· ὑπὸ τίνος οὖν; οὐ γὰρ ὑπὸ τοῦ αὐτοῦ. 21 Ἐπεὶ δ' ἐν τοῖς οὖσιν ἀνάγκη ἀεὶ κίνησιν εἶναι συνεχῆ, αὕτη δὲ μία ἐστίν, ἀνάγκη δὲ τὴν μίαν μεγέθους τέ τινος εἶναι· οὐ γὰρ κινεῖται τὸ ἀμέγεθες· καὶ ἑνός, καὶ ὑφ' ἑνός· οὐ γὰρ ἔσται συνεχής, ἀλλ' ἐχομένη ἑτέρα ἑτέρας, καὶ διῃρημένη. 22 Τὸ δὴ κινοῦν εἰ ἕν, ἢ κινούμενον κινεῖ, ἢ ἀκίνητον ὄν. εἰ μὲν δὴ κινούμενον, συνακολουθεῖν δεήσει καὶ μεταβάλλειν αὐτό, ἅμα δὲ κινεῖσθαι ὑπό τινος· ὥστε στήσεται, καὶ ἥξει εἰς τὸ κινεῖσθαι ὑπὸ ἀκινήτου. 23 Τοῦτο γὰρ οὐκ ἀνάγκη συμμεταβάλλειν, ἀλλ' ἀεί τι δυνήσεται κινεῖν· ἄπονον γὰρ καὶ τὸ οὕτω κινεῖν, καὶ ὁμαλὴς αὕτη ἡ κίνησις, ἢ μόνη, ἢ μάλιστα· οὐ γὰρ ἔχει μεταβολὴν οὐδεμίαν τὸ κινοῦν. δεῖ δὲ οὐδὲ τὸ κινούμενον πρὸς ἐκεῖνο ἔχειν μεταβολήν, ἵνα ὁμοία ᾖ ἡ κίνησις. 24 Ἀνάγκη δὴ ἢ ἐν μέσῳ, ἢ ἐν κύκλῳ εἶναι· αὗται γὰρ αἱ ἀρχαί. ἀλλὰ τάχιστα κινεῖται τὰ ἐγγύτατα τοῦ κινοῦντος. τοιαύτη δ' ἡ * τοῦ ὅλου κίνησις· ἐκεῖ ἄρα τὸ κινοῦν. 25 Ἔχει δ' ἀπορίαν, εἰ ἐνδέχεταί τι κινούμενον κινεῖν συνεχῶς, ἀλλὰ μὴ ὥσπερ τὸ ὠθοῦν πάλιν καὶ πάλιν,* καὶ τῷ ἐφεξῆς εἶναι συνεχῶς· ἢ γὰρ αὐτὸ δεῖ ὠθεῖν, ἢ ἕλκειν, ἢ ἄμφω, ἢ ἕτερόν τι ἐκδεχόμενον ἄλλο παρ' ἄλλου, ὥσπερ πάλαι ἐλέχθη ἐπὶ τῶν ῥιπτουμένων. εἰ δὲ διαιρετὸς ὢν ὁ ἀὴρ ἢ τὸ ὕδωρ κινεῖ, ἀλλ' ὡς ἀεὶ κινούμενος, ἀμφοτέρως δ' οὐχ οἷόν τε μίαν εἶναι, ἀλλ' ἐχομένην.* μόνη ἄρα συνεχής, ἣν κινεῖ τὸ ἀκίνητον· ἀεὶ γὰρ ὁμοίως ἔχον, καὶ πρὸς τὸ κινούμενον ὁμοίως ἕξει καὶ συνεχῶς. 26 Διωρισμένων δὲ τούτων, φανερὸν ὅτι ἀδύνατον τὸ πρῶτον κινοῦν, καὶ ἀκίνητον ἔχειν τι μέγεθος. εἰ γὰρ μέγεθος ἔχει, ἀνάγκη ἤτοι πεπερασμένον αὐτὸ εἶναι, ἢ ἄπειρον. ἄπειρον μὲν οὖν ὅτι οὐκ ἐνδέχεται μέγεθος εἶναι, δέδεικται πρότερον ἐν τοῖς φυσικοῖς. ὅτι δὲ τὸ πεπερασμένον ἀδύνατον ἔχειν ἄπειρον δύναμιν, καὶ ὅτι ἀδύνατον ὑπὸ πεπερασμένου κινεῖσθαί τι ἄπειρον χρόνον, δέδεικται νῦν. τὸ δέ γε πρῶτον κινοῦν, ἀΐδιον κινεῖ κίνησιν, καὶ ἄπειρον χρόνον. φανερὸν τοίνυν ὅτι ἀδιαίρετόν ἐστι καὶ ἀμερές, καὶ οὐδὲν ἔχον μέγεθος.

* γρ. ὃ κινεῖ]

* γρ. ἢ τὸ ἐφεξῆς εἶναι συνεχῆ.

* γρ. μόνη δ' ἄρα.

A 19 Quem nonnulli aiunt eſſe antiperiſtaſin. 20 Sed *eſt* impoſſibile, ea de quibus dubitatum fuit, aliter ſoluere, quàm eo modo quem diximus. Antiperiſtaſis autem ſimul facit omnia moueri, & mouere, proinde etiam quieſcere. nũc verò videtur vnum quidpiam moueri continenter. à quonam igitur? quandoquidem non *mouetur* à ſeipſo. 21 Quoniam autem in iis quæ ſunt, neceſſe *eſt* ſemper motum eſſe continuum, hic verò eſt vnus, neceſſe autem *eſt* vnum motum eſſe alicuius magnitudinis (id enim non mouetur, quod eſt magnitudinis expers) & vnius & ab vno: (alioqui non erit continuus, ſed alter alteri hærens, ac diuiſus.) 22 Id igitur quod mo-

B uet, ſi vnum *eſt*, aut mouet cùm moueatur, aut cùm ſit immobile. ac ſiquidem moueatur, cõſequi oportebit, vt & ipſum mutetur, & ſimul moueatur ab aliquo. quocirca ſtabitur; & ad hoc peruenietur vt moueatur ab immobili. 23 Hoc enim non *eſt* neceſſe vt ſimul mutetur, ſed ſemper poterit aliquid mouere. nam & ita mouere, labore vacat: & hic motus aut ſolus, aut maximè omnium *eſt* æquabilis: quoniam id quod mouet, nullam ſuſcipit mutationem. oportet autem ne id quidem quod mouetur, ratione habita eius quod mouet, ſuſcipere mutationem, vt motus *ſibi* ſimilis ſit. 24 Porrò neceſſe *eſt*,

C vt vel ſit in medio, vel in circulo. principia namque hæc *ſunt*. atqui celerrimè ea mouentur, quæ ſunt mouenti maximè propinqua: talis autem *eſt* motus vniuerſi: illic igitur *eſt* id quod mouet. 25 Exiſtit autem dubitatio, an poſſit aliquid, cùm moueatur, moueri continenter, ac non *potiùs* vt id quod pellit iterum atque iterum, eo quòd deinceps eſt continenter. vel enim oportet vt ipſum pellat, vel vt trahat, vel *vt faciat* vtrumque, vel aliquid diuerſum excipiet, nempe aliud ab alio, vt antea dictum fuit de iis quæ proiiciuntur. quòd ſi, cùm diuiduus ſit, aër

D vel aqua mouet, non tamen vt ſemper moueatur; vtroque autem modo non poteſt eſſe vnus *motus*, ſed cohærens: ſolus igitur *eſt* continuus, quem id efficit, quod eſt immobile. cùm enim ſemper *ſe* similiter habeat, etiam ad id quod mouetur, ſimiliter *ſe* habebit, & continenter. 26 His autem definitis, perſpicuum *eſt*, impoſſibile *eſſe*, vt id quod primùm mouet, & eſt immobile, habeat aliquam magnitudinem. nam ſi magnitudinem habet, neceſſe *eſt* vt ipſum ſit vel finitum vel infinitum. ac non poſſe quidem eſſe magnitudinem infinitam, probatum eſt antea in Phyſicis. magnitudinem verò finitam non poſſe habere vim infinitam, & eſſe impoſſibile vt à finito moueatur aliquid tempore infinito, nunc probatum fuit. atqui primum mouens, efficit motum æternum, atque infinito tempore. perſpicuum igitur *eſt*, *id* eſſe indiuiduum, & vacare partibus, & nullam habere magnitudinem.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ ΟΥΡΑΝΟΥ ΒΙΒΛΙΑ Δ.

ARISTOTELIS STAGIRITÆ, DE CÆLO LIBER PRIMVS.

Ioanne Argyropylo Byzantio interprete.

CAPVT I.

A

Quid doceat ſcientia naturalis: quòd corpus ſit perfecta magnitudo: quòdque vniuerſum perfectum eſſe neceſſe ſit.

SCientia naturalis ferè plurima, circa corpora, magnitudines, atque horum affectus, motúſve, & inſuper circa principia, quæ ſunt ſubſtantię talis, verſari videtur. Eorum enim, quæ natura ſunt, alia ſunt corpora, magnitudinéſve, alia corpora ac magnitudinẽ habent, alia principia habentium ſunt. Continuũ igitur eſt, quod in diuiſibilia sẽper diuiſibile eſt. Corpus autem eſt, quod eſt diuiſibile omni ex parte. at B magnitudinis ea quidem quæ ad vnum eſt diuiſibilis, linea eſt: ea verò, quæ ad duo, ſuperficies: at ea quæ ad tria, eſt corpus. atque præter has nulla alia prorſus eſt magnitudo, propterea quòd ipſa tria omnia ſunt, & ter ipſum omni ex parte. Nam, vt Pythagorici etiam inquiũt, ipſum omne, ac omnia tribus ſunt definita. Finis enim, medium atque principium, ipſius omnis numerum habent: hæc autem trinitatis. Quapropter hoc à natura numero ſumpto, perinde atque quadã illius lege, & in deorum ſacrificiis celebrandis vti ſolemus. aſſignamus inſuper & appellationes, hoc modo: duo enim ambo dicimus, & duos ambos, atque vtroſque, non omnes: at de tribus hanc appellationẽ dicimus primò. Hęc autẽ ita dicimus, quia ſequimur, vti diximus, ipſam C ſic proficiſcentem naturam. Quare cùm omnia, omne, atque perfectum inter ſeſe non differant forma, niſi materia tantùm, & hiſce, de quibus dicuntur: corpus profectò magnitudinum ſolum perfectum erit. Solum enim, iſtis tribus eſt definitum, hoc autem, eſt omne: atque cùm ſit tribus ex partibus diuiſibile, omni ex parte, atque omnino eſt diuiſibile. Cæterarum autem magnitudinum, altera ad vnũ, altera ad duo eſt diuiſibilis. Nam vt numerum ſubeunt, ſic & diuiſionis cõtinuationiſve participes ſunt. alia enim ad vnum cõtinua eſt, alia ad duo, alia omni ex parte, atq; omnino eſt talis. Quæ igitur magnitudinum ſunt diuiſibiles, eæ continuæ quoque ſunt. at ſi omnes quoque cõtinuæ diuiſibiles ſint, nondum ex hiſce, quę nunc diximus, patet.

ΚΕΦΑΛ. α'.

Περὶ τί ἐστιν ἡ περὶ φύσεως ἐπιστήμη· καὶ ὅτι σῶμα ἐστὶ τέλειον μέγεθος.

Η ΠΕΡΙ φύσεως ἐπιστήμη σχεδὸν ἡ πλείστη φαίνεται περί τε σώματα καὶ μεγέθη, καὶ τὰ τούτων οὖσα πάθη, καὶ τὰς κινήσεις· ἔτι δὲ περὶ τὰς ἀρχάς, ὅσαι τῆς τοιαύτης οὐσίας εἰσί· τῶν γὰρ φύσει συνεστώτων, τὰ μέν ἐστι σώματα καὶ μεγέθη, τὰ δ' ἔχει σῶμα καὶ μέγεθος, τὰ δ' ἀρχαὶ τῶν ἐχόντων εἰσί. B συνεχὲς μὲν οὖν ἐστι τὸ διαιρετὸν εἰς ἀεὶ διαιρετά· σῶμα δὲ, τὸ πάντῃ διαιρετόν. μεγέθους δὲ, τὸ μὲν ἐφ' ἕν, γραμμή· τὸ δ' ἐπὶ δύο, ἐπίπεδον· τὸ δ' ἐπὶ τρία, σῶμα· καὶ παρὰ ταῦτα οὐκ ἔστιν ἄλλο μέγεθος, διὰ τὸ τὰ τρία πάντα εἶναι, καὶ τὸ τρὶς πάντῃ. καθάπερ γάρ φασι καὶ οἱ Πυθαγόρειοι, τὸ πᾶν καὶ τὰ πάντα τοῖς τρισὶν ὥρισται· τελευτὴ γὰρ, καὶ μέσον, καὶ ἀρχὴ, τὸν ἀριθμὸν ἔχει τὸν τοῦ παντός· ταῦτα δὲ τὸν τῆς τριάδος. διὸ παρὰ τῆς φύσεως εἰληφότες ὥσπερ νόμους ἐκείνης, καὶ πρὸς τὰς ἁγιστείας τῶν θεῶν χρώμεθα τῷ ἀριθμῷ τούτῳ. ἀποδίδομεν δὲ καὶ τὰς προσηγορίας τὸν τρόπον τοῦτον· τὰ γὰρ δύο, ἄμφω μὲν λέγομεν, καὶ τοὺς δύο ἀμφοτέρους· πάντας δ' οὐ λέγομεν· ἀλλὰ κατὰ τῶν τριῶν ταύτην τὴν C προσηγορίαν φαμὲν πρῶτον. ταῦτα δ' ὥσπερ εἴρηται, διὰ τὸ τὴν φύσιν αὐτὴν οὕτως ἐπάγειν, ἀκολουθοῦμεν. ὥστ' ἐπεὶ τὰ πάντα, καὶ τὸ πᾶν, καὶ τὸ τέλειον, οὐ κατὰ τὴν ἰδέαν διαφέρουσιν ἀλλήλων· ἀλλ' εἴπερ ἄρα ἐν τῇ ὕλῃ, καὶ ἐφ' ὧν λέγονται· τὸ σῶμα μόνον ἂν εἴη τῶν μεγεθῶν τέλειον· μόνον γὰρ ὥρισται τοῖς τρισί. τοῦτο δ' ἐστὶ πᾶν. τριχῆ δὲ ὂν διαιρετὸν, πάντῃ διαιρετόν ἐστι· τῶν δ' ἄλλων, τὸ μὲν ἐφ' ἕν, τὸ δ' ἐπὶ δύο· ὡς γὰρ τοῦ ἀριθμοῦ τετυχήκασιν, οὕτω καὶ τῆς διαιρέσεως καὶ τοῦ συνεχοῦς· τὸ μὲν γὰρ ἐφ' ἓν συνεχές, τὸ δ' ἐπὶ δύο, τὸ δὲ πάντῃ τοιοῦτον. ὅσα μὲν οὖν διαιρετὰ τῶν μεγεθῶν, καὶ συνεχῆ ταῦτα. εἰ δὲ καὶ τὰ συνεχῆ ἅπαντα διαιρετά, οὔπω δῆλον ἐκ τῶν νῦν·

ἀλλ' ἐκεῖνο μὲν δῆλον, ὡς οὐκ ἔστιν εἰς ἄλλο γένος μετάβασις, ὥσπερ ἐκ μήκους εἰς ἐπιφάνειαν, εἰς δὲ σῶμα ἐξ ἐπιφανείας· οὐ γὰρ ἔτι τὸ τοιοῦτον τέλειον ἂν εἴη μέγεθος· ἀνάγκη γὰρ γίνεσθαι τὴν ἔκβασιν, κατὰ τὴν ἔλλειψιν. οὐχ οἷόν τε δὲ τὸ τέλειον ἐλλείπειν· πάντῃ γάρ ἐστι. τῶν μὲν οὖν ἐν μορίου εἴδει σωμάτων κατὰ τὸν λόγον ἕκαστον τοιοῦτόν ἐστι· πάσας γὰρ ἔχει τὰς διαστάσεις. ἀλλὰ ἀφώρισται πρὸς τὸ πλησίον ἁφῇ. διὸ ἔστιν τινὰ πολλὰ τῶν σωμάτων ἕκαστόν ἐστι. τὸ δὲ πᾶν οὗ ταῦτα μόρια, τέλειον ἀναγκαῖον εἶναι· καὶ καθάπερ τοὔνομα σημαίνει πάντῃ, καὶ μὴ τῇ μέν, τῇ δὲ μή.

A Verùm illud emerſit, in aliud, inquam, genus è corpore migrationem non eſſe: vt ex lõgitudine in ſuperficiem, & ex ſuperficie ſit in corpus. Non.n.talis profectò magnitudo perfecta erit: fiat enim egreſſio ratione defectionis neceſſe eſt. at perfectũ, defectionem habere negant: eſt.n. omni ex parte. Eorum igitur corporum, quæ partis ſubeunt formam, tale vnumquodque per rationem: omnes enim habent dimenſiones. attamen id, ad quod eſt propinquum, tactu eſt definitum. Idcirco corporũ vnumquodq; multa quodãmodo eſt. Ipſum autẽ omne, ac vniuerſum, cuius hæc ſunt partes, perfectũ eſſe neceſſe eſt, & omni ex parte, atq; omnino, vt nomẽ ipſum ſignificet, & non partim eſſe, partim nõ eſſe. B

ΚΕΦΑΛ. β.

Ὅτι ἐστί τι παρὰ τὰ σώματα, τὰ δεῦρο καὶ περὶ ἡμᾶς, ἕτερον κεχωρισμένον.

Περὶ μὲν οὖν τῆς τοῦ παντὸς φύσεως, εἴτ' ἄπειρόν ἐστι κατὰ τὸ μέγεθος, εἴτε πεπέρανται τὸν σύνολον ὄγκον, ὕστερον ἐπισκεπτέον. περὶ δὲ τῶν κατ' εἶδος αὐτοῦ μορίων, νῦν λέγωμεν, ἀρχὴν ποιησάμενοι τήνδε· πάντα γὰρ τὰ φυσικὰ σώματα καὶ μεγέθη, καθ' αὑτὰ κινητὰ λέγομεν εἶναι κατὰ τόπον· τὴν C γὰρ φύσιν, κινήσεως ἀρχὴν φαμὲν εἶναι αὐτοῖς. πᾶσα δὲ κίνησις, ὅση κατὰ τόπον, ἣν καλοῦμεν φοράν, ἢ εὐθεῖα, ἢ κύκλῳ, ἢ ἐκ τούτων μικτή· ἁπλαῖ γὰρ αὗται δύο μόναι. αἴτιον δ', ὅτι καὶ τὰ μεγέθη ταῦτα ἁπλᾶ μόνον, ἥ τε εὐθεῖα, καὶ ἡ περιφερής. κύκλῳ μὲν οὖν ἐστιν ἡ περὶ τὸ μέσον· εὐθεῖα δέ, ἡ ἄνω καὶ κάτω. λέγω δ', ἄνω μέν, τὴν ἀπὸ τοῦ μέσου· κάτω δέ, τὴν ἐπὶ τὸ μέσον. ὥστ' ἀνάγκη πᾶσαν εἶναι τὴν ἁπλῆν φοράν, τὴν μὲν ἀπὸ τοῦ μέσου, τὴν δ' ἐπὶ τὸ μέσον, τὴν δὲ περὶ τὸ μέσον. καὶ ἔοικεν ἠ D κολουθηκέναι κατὰ λόγον τοῦτο τοῖς ἐξ ἀρχῆς. τό, τε γὰρ σῶμα ἀπετελέσθη ἐν τρισί, καὶ ἡ κίνησις αὐτοῦ. ἐπεὶ δὲ τῶν σωμάτων, τὰ μέν ἐστιν ἁπλᾶ, τὰ δὲ σύνθετα ἐκ τούτων (λέγω δ' ἁπλᾶ μέν, ὅσα κινήσεως ἀρχὴν ἔχει κατὰ φύσιν, οἷον πῦρ καὶ γῆν, καὶ τὰ τούτων εἴδη, καὶ τὰ συγγενῆ τούτοις,) ἀνάγκη καὶ τὰς κινήσεις εἶναι, τὰς μὲν ἁπλᾶς, τὰς δὲ μικτάς πως· τῶν μὲν ἁπλῶν, ἁπλᾶς, μικτὰς δὲ τῶν συνθέτων· κινεῖσθαι δὲ κατὰ τὸ ἐπικρατοῦν. εἴπερ οὖν ἐστιν ἁπλῆ κίνησις· ἁπλῆ δ' ἡ κύκλῳ κίνησις· καὶ τοῦ τε ἁπλοῦ σώματος ἁπλῆ ἡ κίνησις, καὶ ἡ ἁπλῆ κί E νησις ἁπλοῦ σώματος· (καὶ γὰρ ἂν συνθέτου ᾖ, κατὰ τὸ ἐπικρατοῦν ἔσται,) ἀναγκαῖον εἶναί τι σῶμα ἁπλοῦν, ὃ πέφυκε φέρεσθαι τὴν κύκλῳ κίνησιν κατὰ τὴν ἑαυτοῦ φύσιν· βίᾳ μὲν γὰρ ἐνδέχεται τὴν ἄλλου εἶναι καὶ ἑτέρου· κατὰ φύσιν δὲ ἀδύνατον· εἴπερ μία ἑκάστου κίνησις ἡ κατὰ φύσιν, τῶν ἁπλῶν ἔτι, εἰ ἡ παρὰ φύσιν ἐναντία τῇ κατὰ φύσιν, καὶ ἓν ἑνὶ ἐναντίον, ἀνάγκη, ἐπεὶ ἁπλῆ ἡ κύκλῳ εἰ μὴ ἔσται κατὰ φύσιν τοῦ φερομένου σώματος, παρὰ φύσιν αὐτοῦ εἶναι. Εἰ οὖν πῦρ ἢ ἄλλο τι τῶν τοιούτων ἐστὶ τὸ κύκλῳ φερόμενον, ἐναντία ἡ κατὰ φύσιν αὐτοῦ φορὰ ἔσται τῇ κύκλῳ· ἀλλ' ἓν ἑνὶ ἐναντίον·

CAPVT II.

Quòd præter corpora quatuor ſimplicia, quæ recto motu feruntur, ſit corpus ſimplex reliquis omnibus præſtantius, quod ſuapte natura in orbem vertitur.

DE ipſius igitur vniuerſi natura, ſiue ſit magnitudine infinita, ſiue tota mole finita, poſteriùs conſideremus oportet. Nunc de partibus ipſius per ſpeciem dicendum eſſe videtur, hinc exordio ſumpto. Omnia namque corpora naturalia, magnitudinéſve mobiles per ſe loco dicimus eſſe. Naturã enim, C principiũ ipſis inſitũ eſſe motus aſſerimus. Omnis autẽ motus ad locũ accõmodatus, quẽ lationem conſueuimus appellare, aut rectus eſt, aut circularis, aut ex hiſce miſtus. Simplices enim ij duo ſunt ſoli, propterea quòd & magnitudines hæ ſolũ ſimplices ſunt, recta & circularis. Circularis igitur is eſt, qui circa mediũ ſit. Rectus autẽ, quo ſurſum itur, atque deorſum. atque eo ſurſum ire dico, quo è medio pergitur: eo verò deorſum, quo ad mediũ itur. Quare lationum ſimpliciũ, aliam è medio, aliã ad medium, aliã circa medium eſſe neceſſe eſt. atque hoc cum ratione, ea, quæ initio dicta ſunt, ſecutum eſſe videtur. Nam & corpus tribus confectũ D eſt, & ipſius etiam motus. Cùm autẽ corporum, alia ſimplicia ſint, alia ex hiſce cõpoſita, (atque ea ſimplicia dico, quæ motus ſecundùm naturã principiũ habent, vt ignẽ, terrã, horúmque ſpecies, & ea quæ ſunt hiſce propinqua) motiones etiam alias ſimplices, alias quodammodo miſtas eſſe neceſſe eſt: ſimplicium quidem ſimplices, compoſitorum autẽ miſtas, mouerique compoſita nutu eiuſce ſimplicis, quod in his ipſis dominatur, ac ſuperat. Si igitur ſimplex in ratione rerum eſt motus conuerſio, cõuerſio autẽ motus eſt ſimplex, atque corporis ſimplicis ſimplex eſt motus, & ſimplex motus corporis ſimplicis eſt (nam ſi compoſiti ſit, per id illi ſimplex, quod ſuperat, cõpetit) ſimplex quippiã eſſe corpus E in ratione rerũ, profectò neceſſe eſt, quod quidẽ ſit aptum circulari motu ſuapte natura ferri. Etenim fieri poteſt vt vi quippiam eo moueatur motu, qui ad aliud & aliud corpus accommodatur: at vt eo moueatur ſecundùm naturam, fieri nequit, ſi vniuſcuiuſque corporis ſimplicis vnus ſit motus ei competens ſecundũ naturam. Si is præterea motus, qui præter naturam eſt, ei, qui ſecundùm naturam eſt, aduerſatur, vnúmque vni contrariũ eſt, cùm cõuerſio ſit motio ſimplex, ſi non ſecundùm naturam ei corpori, quod fertur, ineſt, præter naturam inſit eidem neceſſe eſt. Si igitur ignis ſit quod aduerſatur, aut quippiã aliud tale, naturalis ipſius motus cõuerſioni contrarius erit. at vnum vni contrarium eſt:

atque

atque motus ij, quibus infera ſuperáque loca petũtur, inter ſeſe contrarij ſunt. Sin verò quippiã aliud corpus adſit, quod præter naturã in orbem fertur, erit alius quiſpiã motus ipſius ſecundùm naturam. At id eſſe nõ poteſt. Nam ſi ſit is motus, quo ſurſum itur, ignis vel aër erit: ſin is quo deorſum acceditur, terra erit, vel aqua. At verò talem lationem & primam eſſe neceſſe eſt. perfectum enim, imperfectũ antecedit natura. Atque circulus quidem perfectũ eſt, linea verò recta, nulla eſt ſanè perfecta. Neque enim infinita: terminum enim atque finẽ haberet: neque finitarum vlla ratio: eſt enim quippiã extra omnes, quippe cùm fieri poſſit vt cuiuis incrementum addatur. Quare ſi prior quidẽ motus corporis ſit prioris natura, conuerſio verò prior ſit recto, atq; ipſe rectus corporũ ſit ſimpliciũ motus (ignis enim loca recto motu ſupera petit, & terrea corpora eodem ad infera mediũmque feruntur) & ipſam ſanè conuerſionem cuiuſpiã corporis ſimplicis eſſe neceſſe eſt. Miſtorum enim lationẽ, eiuſce nutu ſimplicis fieri diximus quod in miſtione dominatur, ac ſuperat. Ex his igitur patet, aliam quãdam in ratione rerũ corporis ſubſtantiã eſſe, præter eas corporum conſtitutiones, quæ hìc ſunt, diuiniorẽ his vniuerſis, atque priorem. Præterea, ſi motus omnis, aut ſecundùm naturam, aut præter naturam eſt, & qui motuum eſt cuipiam præter naturam, is alij naturalis eſt: (quod quidem intueri licet in hiſce motibus, quibus ſurſum itur, atq; deorſum: alter enim igni, alter terræ, ſecũdùm naturam & præter naturã eſt:) conuerſionem etiam, cùm horum reſpectu ſit præter naturam, alij cuipiam competere ſecũdùm naturam, neceſſe eſt. Inſuper, ſi conuerſio cuipiam competit ſecundùm naturam, patet eſſe quippiam corporum ſimplicium atque priorum, quod quidẽ ſic ſuapte natura verſatur: vt ignis ſurſum, & terra deorſum fertur. Si verò corpora, quæ verſantur circa medium, præter naturam ferũtur, mirabile ſanè, metáſque penitus egredi rationis videtur, hunc ſolum motuum continuum eſſe, perpetuúmque, qui quidem præter naturã illis corporibus ineſt. In cæteris enim ea quæ præter naturam ſunt, citiſſimè corrumpi periróque videntur. Quare ſi ignis ſit id quod verſatur, vt quidã inquiunt, non minùs hæc motio præter naturam eſt ipſi, quàm ea qua infera loca petuntur. Ignis enim eum eſſe motum videmus, quo rectà pergitur è medio ſurſum. Quapropter ex his omnibus quiſpiam rationibus, corpus quippiam aliud eſſe crediderit, præter ea corpora, quæ hìc, & circa nos ſunt, ſeparatum, tanto præſtabiliorem habens naturam, quanto plus ab iſtis corporibus diſtat.

CAPVT III.

Corpus ſimplex, quod circumferri dictum eſt, neque graue neque leue eſſe. Quódque nec genitum ſit nec corruptibile, neque augmentum ſuſcipiens, neque decrementum neque alterationem vllam.

CVm eorũ, quæ dicta sũt, alia ſuppoſita ſint, alia demonſtrata: patet, nõ omne corpus leuitatẽ aut grauitatẽ habere. Atque ſupponatur quidnam id quod leue, & quid id quod graue nuncupamus, oportet, quo ad ſatis eſt ad vſum præſentẽ. Exactiùs autem rurſus dicemus, cùm ſubſtantiã ipſorũ conſiderandam aggrediemur. Graue igitur id ſit, quod aptũ eſt ad mediũ ferri. Leue id, quod aptum eſt è medio ferri. Grauiſſimum id, quod ſub iis omnibus collocatur, quæ deorſum feruntur. Leuiſſimum id, quod ſuper omnia collocatur, quæ ſurſum pergũt.

ἡ δ' ἄνω καὶ ἡ κάτω ἀλλήλαις ἐναντίαι. Εἰ δ' ἕτερόν τι ἐστὶ σῶμα τὸ φερόμενον κύκλῳ παρὰ φύσιν, ἔσται τις αὐτοῦ ἄλλη κίνησις κατὰ φύσιν. ἀλλὰ τοῦτ' ἀδύνατον· εἰ μὲν γὰρ ἡ ἄνω, πῦρ ἔσται ἢ ἀήρ· εἰ δὲ ἡ κάτω, ὕδωρ ἢ γῆ. ἀλλὰ μὴν καὶ πρώτην γε ἀναγκαῖον εἶναι τὴν τοιαύτην φοράν. τὸ γὰρ τέλειον πρότερον τῇ φύσει τοῦ ἀτελοῦς. ὁ δὲ κύκλος τῶν τελείων. εὐθεῖα δὲ γραμμὴ, οὐδεμία· οὔτε γὰρ ἡ ἄπειρος· ἔχοι γὰρ ἂν πέρας καὶ τέλος· οὔτε τῶν πεπερασμένων οὐδεμία· πασῶν γάρ ἐστί τι ἐκτός. αὐξῆσαι γὰρ ἐνδέχεται ὁποιανοῦν. ὥστε εἴπερ ἡ μὲν προτέρα κίνησις προτέρου τῇ φύσει σώματος· ἡ δὲ κύκλῳ προτέρα τῆς εὐθείας· ἡ δὲ ἐπ' εὐθείας τῶν ἁπλῶν σωμάτων ἐστί (τό, τε γὰρ πῦρ ἐπ' εὐθείας ἄνω φέρεται, καὶ τὰ γεηρὰ κάτω πρὸς τὸ μέσον) ἀνάγκη καὶ τὴν κύκλῳ κίνησιν τῶν ἁπλῶν τινος εἶναι σωμάτων· τὴν γὰρ μικτῶν τὴν φορὰν ἔφαμεν εἶναι κατὰ τὸ ἐπικρατοῦν ἐν τῇ μίξει τῶν ἁπλῶν. ἔκ τε δὴ τούτων φανερὸν, ὅτι πέφυκέ τις οὐσία σώματος ἄλλη παρὰ τὰς ἐνταῦθα συστάσεις θειοτέρα καὶ προτέρα τούτων ἁπάντων. κἂν εἴ τις ἐπιλάβοι πᾶσαν εἶναι κίνησιν ἢ κατὰ φύσιν, ἢ παρὰ φύσιν· καὶ τὴν ἄλλῳ παρὰ φύσιν, ἑτέρῳ κατὰ φύσιν· οἷον ἡ ἄνω καὶ ἡ κάτω πέπονθεν· ἡ μὲν γὰρ τῷ πυρί, ἡ δὲ τῇ γῇ παρὰ φύσιν καὶ κατὰ φύσιν· ὥστ' ἀναγκαῖον καὶ τὴν κύκλῳ κίνησιν, ἐπεὶ τούτοις παρὰ φύσιν, ἑτέρου τινὸς εἶναι κατὰ φύσιν. πρὸς δὲ τούτοις, εἰ μὲν ἐστιν ἡ κύκλῳ τινὶ φορὰ κατὰ φύσιν, δῆλον ὡς εἴη ἄν τι σῶμα τῶν ἁπλῶν τε καὶ πρώτων, ὃ πέφυκεν, ὥσπερ τὸ πῦρ ἄνω καὶ ἡ γῆ κάτω, ἐκεῖνο κύκλῳ φέρεσθαι κατὰ φύσιν. εἰ δὲ παρὰ φύσιν φέρεται τὰ φερόμενα κύκλῳ τὴν πέριξ φορὰν, θαυμαστὸν καὶ παντελῶς ἄλογον τὸ μόνην εἶναι συνεχῆ ταύτην τὴν κίνησιν καὶ * ἀΐδιον· οὖσαν παρὰ φύσιν. φαίνεται γὰρ ἔν τε τοῖς ἄλλοις τάχιστα φθειρόμενα τὰ παρὰ φύσιν. ὥστ' εἴπερ ἐστὶ πῦρ τὸ φερόμενον, καθάπερ φασί τινες, οὐδὲν ἧττον αὐτῷ παρὰ φύσιν ἡ κίνησις ἐστὶν αὕτη, ἢ ἡ κάτω. πυρὸς γὰρ κίνησιν ὁρῶμεν τὴν ἀπὸ τοῦ μέσου κατ' εὐθεῖαν. διόπερ ἐξ ἁπάντων ἄν τις τούτων συλλογιζόμενος πιστεύσειεν, ὡς ἔστι τι παρὰ τὰ σώματα, τὰ δεῦρο καὶ περὶ ἡμᾶς, ἕτερον κεχωρισμένον, τοσούτῳ τιμιωτέραν ἔχον τὴν φύσιν, ὅσωπερ ἀφέστηκε τῶν ἐνταῦθα πλεῖον.

* Vulgò diſtin. ἀΐ. οὖσαν, παρὰ φύσιν. minùs rectè. etſi ita vetus interpres.

ΚΕΦΑΛ. γ'.

Ὅτι τὸ πρῶτον τῶν σωμάτων οὔτε βαρὺ, οὔτε κοῦφόν ἐστι, καὶ ὅτι ἀΐδιόν ἐστι, καὶ οὔτε αὔξησιν οὔτε φθίσιν ἔχον, ἀλλ' ἀγήρατον καὶ ἀναλλοίωτον καὶ ἀπαθές.

ΕΠεὶ δὲ τὰ μὲν ὑπόκειται, τὰ δ' ἀποδέδεικται, τῶν εἰρημένων, φανερὸν ὅτι οὔτε κουφότητα, οὔτε βάρος ἔχει σῶμα ἅπαν. δεῖ δὲ ὑποθέσθαι, τί λέγομεν τὸ βαρὺ καὶ τὸ κοῦφον, νῦν μὲν ἱκανῶς, ὡς πρὸς τὴν παροῦσαν χρείαν· ἀκριβέστερον δὲ πάλιν, ὅταν ἐπισκοπῶμεν περὶ τῆς οὐσίας αὐτῶν. βαρὺ μὲν οὖν ἔστω τὸ φέρεσθαι πεφυκὸς ἐπὶ τὸ μέσον· κοῦφον δὲ, τὸ ἀπὸ τοῦ μέσου. βαρύτατον δὲ τὸ πᾶσιν ὑφιστάμενον τοῖς κάτω φερομένοις· κουφότατον δὲ τὸ πᾶσιν ἐπιπολάζον τοῖς ἄνω φερομένοις.

A ἀνάγκη δὲ πᾶν τὸ φερόμενον, ἢ κάτω ἢ ἄνω, ἢ κουφότητ' ἔχειν ἢ βάρος, ἢ ἄμφω, μὴ πρὸς τὸ αὐτό γε· * πρὸς ἄλληλα γάρ ἐστι βαρέα καὶ κοῦφα εἶναι, ἀὴρ πρὸς ὕδωρ, καὶ πρὸς γῆν ὕδωρ. τὸ δὴ κύκλῳ σῶμα φερόμενον, * ἀδύνατον ἔχειν βάρος ἢ κουφότητα· οὔτε γὰρ κατὰ φύσιν, οὔτε παρὰ φύσιν ἐνδέχεται αὐτῷ κινηθῆναι, ἢ ἐπὶ τὸ μέσον, ἢ ἀπὸ τοῦ μέσου· κατὰ φύσιν μὲν γὰρ οὐκ ἔστιν αὐτῷ ἡ ἐπ' εὐθείας φορά· μία γὰρ ἦν ἑκάστου τῶν ἁπλῶν. ὥστ' ἔσται τὸ αὐτὸ τῶν οὕτω τινὶ φερομένων. παρὰ φύσιν δ' ἐνεχθέντος, εἰ μὲν ἡ κάτω παρὰ φύσιν, ἡ ἄνω κατὰ φύσιν· εἰ δὲ ἡ ἄνω παρὰ φύσιν, ἡ κάτω κατὰ φύσιν· ἔθεμεν γὰρ τῶν ἐναντίων εἰ ἡ ἑτέρα παρὰ φύσιν, τὴν ἑτέραν εἶναι κατὰ φύσιν. ἐπεὶ δ' εἰς τὸ αὐτὸ φέρεται τὸ ὅλον καὶ τὸ μόριον κατὰ φύσιν, οἷον πᾶσα γῆ καὶ μικρὰ βῶλος, συμβαίνει πρῶτον μὲν μήτε κουφότητ' ἔχειν αὐτὸ μηδεμίαν, μήτε βάρος· ἢ γὰρ ἂν πρὸς τὸ μέσον, ἢ ἀπὸ τοῦ μέσου ἠδύνατο φέρεσθαι κατὰ τὴν αὑτοῦ φύσιν. ἔπειθ', ὅτι ἀδύνατον κινηθῆναι τὴν κατὰ τόπον κίνησιν, * ἢ ἄνω ἢ κάτω κατασπώμενον· οὔτε γὰρ κατὰ φύσιν ἐνδέχεται κινηθῆναι κίνησιν αὐτῷ ἄλλην, οὔτε παρὰ φύσιν, οὔτ' αὐτῷ, οὔτε τῶν μορίων οὐδενί· ὁ γὰρ αὐτὸς λόγος περὶ ὅλου καὶ μέρους. ὁμοίως δ' εὔλογον ὑπολαβεῖν περὶ αὐτοῦ, καὶ ὅτι ἀγένητον καὶ ἄφθαρτον, καὶ ἀναυξὲς, καὶ ἀναλλοίωτον, διὰ τὸ γίνεσθαι μὲν ἅπαν τὸ γενόμενον ἐξ ἐναντίου τε καὶ ὑποκειμένου τινός, καὶ φθείρεσθαι ὡσαύτως ὑποκειμένου τέ τινος καὶ ὑπ' ἐναντίου καὶ εἰς ἐναντίον, καθάπερ ἐν τοῖς πρώτοις εἴρηται λόγοις· τῶν δ' ἐναντίων καὶ αἱ φοραὶ ἐναντίαι. εἰ δὴ τούτῳ μηδὲν ἐναντίον ἐνδέχεται εἶναι, διὰ τὸ καὶ τῇ φορᾷ τῇ κύκλῳ μὴ εἶναι ἄλλην τινὰ ἐναντίαν κίνησιν, ὀρθῶς ἔοικεν ἡ φύσις τὸ μέλλον ἔσεσθαι ἀγένητον καὶ ἄφθαρτον ἐξελέσθαι ἐκ τῶν ἐναντίων· ἐν τοῖς ἐναντίοις γὰρ ἡ γένεσις καὶ ἡ φθορά. ἀλλὰ μὴν καὶ τὸ αὐξανόμενον ἅπαν αὐξάνεται, καὶ φθῖνον φθίνει ὑπὸ συγγενοῦς προσιόντος καὶ ἀναλυομένου εἰς τὴν ὕλην. τούτῳ δ' οὐκ ἔστιν ἐξ οὗ γέγονεν. εἰ δὲ ἐστὶ καὶ ἀναύξητον καὶ ἄφθαρτον, τῆς αὐτῆς διανοίας ἐστὶν ὑπολαβεῖν καὶ ἀναλλοίωτον εἶναι. ἔστι μὲν γὰρ ἡ ἀλλοίωσις, κίνησις κατὰ τὸ ποιόν. τοῦ δὲ ποιοῦ αἱ μὲν ἕξεις καὶ διαθέσεις, οὐκ ἄνευ τῶν κατὰ πάθη γίνονται μεταβολῶν, οἷον ὑγίεια καὶ νόσος. κατὰ δὲ πάθος ὅσα μεταβάλλει τῶν φυσικῶν σωμάτων, ἔχονθ' ὁρῶμεν πάντα καὶ αὔξησιν καὶ φθίσιν· οἷον τά τε τῶν ζῴων σώματα καὶ τὰ μόρια αὐτῶν, καὶ τὰ τῶν φυτῶν· ὁμοίως δὲ καὶ τὰ τῶν στοιχείων· ὥστ' εἴπερ τὸ κύκλῳ σῶμα, μήτε αὔξησιν ἔχειν ἐνδέχεται, μήτε φθίσιν, εὔλογον καὶ ἀναλλοίωτον εἶναι. διότι μὲν οὖν E ἀΐδιον καὶ οὔτε αὔξησιν ἔχοι, οὔτε φθίσιν, ἀλλ' ἀγήρατον καὶ ἀναλλοίωτον καὶ ἀπαθές ἐστι τὸ πρῶτον τῶν σωμάτων, εἴ τις τοῖς ὑποκειμένοις πιστεύει, φανερὸν ἐκ τῶν εἰρημένων ἐστίν. ἔοικε δ' ὅ,τε λόγος τοῖς φαινομένοις μαρτυρεῖν, καὶ τὰ φαινόμενα τῷ λόγῳ. πάντες γὰρ ἄνθρωποι περὶ θεῶν ἔχουσιν ὑπόληψιν, καὶ πάντες τὸν ἀνωτάτω τῷ θείῳ τόπον ἀποδιδόασι, καὶ βάρβαροι καὶ Ἕλληνες, ὅσοι περ εἶναι νομίζουσι θεούς, δηλονότι, ὡς τῷ ἀθανάτῳ τὸ ἀθάνατον * σωυρτημένον.

* κ. πρὸς ἄλλα. sic Argyrop. vetus ἄλληλα.

* κ. ἀνάγκη μὴ ἔχειν

* κ. ἢ ἄ. ἐκλείπει ἢ: quam vocem nec Arg. nec vetus interpres agnoſcunt.

* Scrib. συνηρτημένον.

A Omne autē quod fertur ſurſum aut deorſum, aut leuitatem aut grauitatem habeat, aut vtrunque, at non ad idē neceſſe eſt. Ad alia namque grauia ſunt, leuiáque, vt aër ad aquam, & aqua ad terrā. Corpus igitur id, quod verſatur, impoſſibile eſt grauitatem aut leuitatē habere. Fieri enim non poteſt vt ipſum aut ſecundùm naturā, aut præter naturā ad mediū aut è medio moueatur. Latio enim recta, non competit ipſi natura: nam vniuſcuiuſque corporis ſimplicis, vna eſſe latio dicebatur. Quare erit idē quod ignis, aut cæterorum quippiā corporum, quæ recto motu cientur. Quòd ſi præter naturam feratur, ſi ea latio, qua deorſum itur, ſit præter naturam, ea ſanè, qua ſurſum pergitur, ipſi competit ſecundùm B naturam. Si præter naturam ſit iſta, ſecundùm naturam illa competet ſanè. Poſuimus enim ſi cōtrariorum motuum alter eſt cuipiam præter naturam, alterū eidem competere ſecundùm naturam. Cùm autem ad idem totum & pars ſecundùm naturā feratur, veluti tota terra, paruáque gleba, primò quidem fit, vt neque grauitatē neque leuitatē habeat vllā. Nam aut ad mediū, aut è medio ſanè ferri ſuapte natura poſſet. Deinde fieri nequit vt ipsū moueatur motu ad locum accommodato, aut ſurſum aut deorſum ſubiens detractionem. Neque enim ſecundùm naturam, neque præter naturā alio motu moueri poteſt, aut ipſum, aut pars vlla. Eadem enim eſt ratio de toto, & parte. Simili modo ratio- C ni conſentaneum eſt, & ingenerabile, atque incorruptibile ipſum eſſe exiſtimare, neque incrementa decrementaq; ſuſcipere, neque alterationibus ſubiici poſſe: propterea quòd omne quod generatur, ex contrario, & ex ſubiecto fit quodam: & identidē quod corrumpitur, ſubiecta materia & à contrario & ad cōtrarium ſanè corrumpitur, vt primis in ſermonibus diximus. Contrariarum verò rerum, & lationes contrariæ ſunt. Si igitur nihil huic contrarium eſſe poteſt, propterea quòd & cōuerſioni nullus eſt contrarius motus: natura rectè id à cōtrariis excepiſſe videtur, quod ingenerabile atque incorruptibile eſt: generatio namque corruptióq; in ipſis cōtrariis eſt. At verò & id quod accreſcit, à propin- D quo quodam accedēte, ſubeuntéque reſolutionē, in materiam augetur: hoc autem non habet id ex quo eſt ortum. Quod ſi neque accreſcere, neque corrumpi poteſt, eiuſdem eſt profectò ſententiæ, & alterationibus ipſum ſubiici nō poſſe putare: alteratio enim, motio eſt in qualitate. Qualitatis autem habitus quidem, & diſpoſitio, non ſinē mutationibus in paſſionibus fiunt, vt ſanitas, atque morbus. Quæ verò naturalium corporum in paſſionibus mutantur, ea vniuerſa incremēta ſuſcipere, decrementaque videmus, vt animalium corpora, parteſque ipſorum, atque plantarum etiam, & elemētorū ſimili modo. Quare ſi corpus, quod verſatur, neque incrementa, neque decremēta ſuſcipere po- E teſt, expers ipſum & alterationum eſſe, conſentaneum eſt rationi. Patet igitur ex hiſce, quæ dicta ſunt, id quod primum eſt corporum, perpetuū eſſe, & neque accreſcere, neque decreſcere, neque ſeneſcere, neque alterationibus, neque paſſionibus ſubiici, ſi quiſpiā hiſce, quæ ſunt ſuppoſita, credit. Videtur autem & ratio teſtis iis eſſe quæ apparent, & quæ apparent teſtes eſſe etiam rationi. Omnes enim homines de Diis exiſtimationē habēt, & vniuerſi, qui Deos eſſe putant, tā Græci quam Barbari, ipſum ſupremum locum Diis tribuerūt, propterea quòd immortale ad immortale eſt accommodatū.

alio namque modo, eſt impoſſibile. Si igitur quippiam eſt diuinum, quemadmodum & eſt: ea ſane, quę de prima corporum ſubſtantia dicta ſunt, bene rectéque ſunt dicta. Emergit autem hoc & per ſenſum reſpectu fidei humanæ ſufficienter. In toto namque præterito tempore per traditam ſucceſſione memoriam poſteris, non mutatum vllo pacto fuiſſe videtur, aut in toto vltimo cælo, aut in ſuarum partium vlla. Videtur autem & ipſum nomen vſque ad hoc tempus ab antiquis hæc opinatis, quæ & nos dicimus, ſucceſſione traditum eſſe. Non enim ſemel, neque bis, ſed infinities eaſdem opiniones ad nos accedere putare oportet. Quapropter quia primum corpus diuerſum quiddam eſt à terra, igne, aëre, atque aqua, ætherem ſuperum locum appellauerunt, à ſemper currendo perpetuo tempore poſita appellatione. Anaxagoras verò, hoc nomine abutitur non rectè: pro igne enim, ætherem dicit. Patet autem ex dictis, & cur impoſſibile eſt, numero plura eſſe ea quæ ſimplicia corpora dicuntur. Simplicis enim corporis motum, ſimplicem eſſe neceſſe eſt. Solos autem motus hoſce ſimplices dicimus eſſe, circularem, & rectum: & huius duas partes, vnam, qua à medio, alteram, qua ad medium pergitur.

CAPVT IV.

Quòd motui circulari rectus motus non ſit contrarius, nec diuerſorum circulorum motus eſſe contrarios, ſi ab eiſdem ſignis verſus eadem fiant, & alij itidem, qui videntur.

NOn eſſe autem aliam lationem conuerſioni contrariam, ex compluribus quiſpiam ſumere fidem poteſt. Primò quidē ex eo, quia circumflexæ lineæ rectā opponi maximè ponimus. Concauum enim, & curuum, non ſolùm inter ſeſe oppoſita eſſe videntur, ſed etiam recto coniuncta ſimúlque ſumpta. Quare ſi qua eſt contraria latio, eum motum maximè, qui fit ſuper linea recta, conuerſioni contrarium eſſe neceſſe eſt. At ij qui ſuper linea recta fiunt, inter ſeſe oppoſiti ſunt ob loca. Suprà enim, & infrà, differentia loci, atque contrarietas eſt. Deinde ſi quiſpiam eandem etiā rationem & in recta linea, & in circumflexa (lationem enim ab a ad b, ei contrariā eſſe dicit, qua à b ad a pergitur) is eam lationē dicit, quæ ſuper linea recta fit: hæc enim finita eſt. Circūflexæ autē, circa eadē puncta infinitæ eſſe poſſunt. Similiter & in ſemicirculo vno, velut à c ad d, & à d ad c. eſt enim illa, quæ ſuper diametro fit. Semper enim vnumquodque per lineā rectam diſtare ponimus. ſimiliter res ſeſe habēt, & ſi quiſpiam circulo facto lationē eam, quæ ſuper altero fit ſemicirculo, ei contrariam poſuerit lationi, quæ ſuper altero fit: veluti toto in circulo eam, qua ab e ad f itur ſuper g ſemicirculū, ei, qua ad f ad e pergitur in ſemicirculo h. Quòd ſi & hæ ſunt cōtrarię, at non eæ ſunt ob hoc inter ſeſe contrarię lationes, quæ ſuper toto circulo fiūt. At verò neque ea latio circularis, qua b ab a petitur, ei contraria eſt, qua ab a ad b proficiſcitur. Ad idem enim, hæc ex eodem eſt motio: cōtraria verò latio, contrariis eſt locis definita: à cōtrario enim ad cōtrariū itur. Quòd ſi circularis motio, circulari eſſet cōtraria, fruſtra altera eſſet, ad idē enim fit profectio per vtraſq;. Præterea id, quod verſatur, à quocunque ſigno inceperit,

A ἀδύνατον γὰρ ἄλλως. εἴπερ οὖν ἐστί τι θεῖον, ὥσπερ καὶ ἔστι, καὶ τὰ νῦν εἰρημένα περὶ τῆς πρώτης οὐσίας τῶν σωμάτων εἴρηται καλῶς. συμβαίνει δὲ τοῦτο καὶ διὰ τῆς αἰσθήσεως ἱκανῶς, ὥς γε πρὸς ἀνθρωπίνην εἰπεῖν πίστιν. ἐν ἅπαντι γὰρ τῷ παρεληλυθότι χρόνῳ κατὰ τὴν παραδεδομένην ἀλλήλοις μνήμην, οὐδὲν φαίνεται μεταβεβληκὸς οὔτε καθ᾽ ὅλον τὸν ἔσχατον οὐρανόν, οὔτε κατὰ μόριον αὐτοῦ τῶν οἰκείων οὐδέν. ἔοικε δὲ καὶ τοὔνομα παρὰ τῶν ἀρχαίων *διαδεδόσθαι μέχρι καὶ τοῦ νῦν χρόνου, τοῦτον τὸν τρόπον ὑπολαβόντων, ὅνπερ καὶ ἡμεῖς λέγομεν. οὐ γὰρ ἅπαξ, οὐδὲ δίς, ἀλλ᾽ ἀπειράκις δεῖ νομίζειν τὰς αὐτὰς ἀφικνεῖσθαι δόξας εἰς ἡμᾶς. B διόπερ ὡς ἑτέρου τινὸς ὄντος τοῦ πρώτου σώματος παρὰ γῆν καὶ πῦρ, καὶ ἀέρα καὶ ὕδωρ, αἰθέρα προσωνόμασαν τὸν ἀνωτάτω τόπον, ἀπὸ τοῦ θεῖν ἀεὶ τὸν ἀΐδιον χρόνον, θέμενοι τὴν ἐπωνυμίαν αὐτῷ. Ἀναξαγόρας δὲ καταχρῆται τῷ ὀνόματι τούτῳ οὐ καλῶς· ὀνομάζει γὰρ αἰθέρα ἀντὶ πυρός. φανερὸν δὲ ἐκ τῶν εἰρημένων, *καὶ διότι τὸν ἀριθμὸν ἀδύνατον εἶναι πλείω τῶν λεγομένων σωμάτων ἁπλῶν· τοῦ μὲν γὰρ ἁπλοῦ σώματος ἀνάγκη τὴν κίνησιν ἁπλῆν εἶναι. μόνας δὲ ταύτας φαμὲν ἁπλᾶς, τήν τε κύκλῳ, καὶ τὴν ἐπ᾽ εὐθείας καὶ ταύτης δύο μόρια· τὴν μὲν ἀπὸ τοῦ μέσου, τὴν δ᾽ ἐπὶ τὸ μέσον. * γρ. διότι ἔτ.

C

ΚΕΦΑΛ. δ'.

Ὅτι οὐκ ἔστι τῇ κύκλῳ φορᾷ ἐναντία ἄλλη φορά.

ΟΤι δ᾽ οὐκ ἔστι τῇ κύκλῳ φορᾷ ἐναντία ἄλλη φορά, πλεοναχόθεν ἄν τις λάβοι τὴν πίστιν. πρῶτον μὲν, ὅτι τῇ περιφερεῖ τὴν εὐθεῖαν ἀντικεῖσθαι μάλιστα τίθεμεν· τὸ γὰρ κοῖλον καὶ κυρτὸν οὐ μόνον ἀλλήλοις ἀντικεῖσθαι δοκεῖ, ἀλλὰ καὶ τῷ εὐθεῖ, συνδυαζόμενα καὶ λαβόντα σύνθεσιν· ὥστ᾽ εἴπερ ἐναντία τίς ἐστι, τὴν ἐπὶ τῆς εὐθείας μάλιστα ἀναγκαῖον ἐναντίαν εἶναι πρὸς τὴν κύκλῳ κίνησιν. αἱ δὲ ἐπὶ τῆς εὐθείας, *ἀλλήλων ἀντίκεινται διὰ τοὺς τόπους. D τὸ γὰρ ἄνω καὶ τὸ κάτω, τόπου τε ἐστὶ διαφορά, καὶ ἐναντίωσις. ἔπειτ᾽, εἴ τις ὑπολαμβάνοι τὸν αὐτὸν εἶναι λόγον ὅνπερ ἐπὶ τῆς εὐθείας, καὶ ἐπὶ τῆς περιφερείας (τὴν γὰρ ἀπὸ τοῦ α πρὸς τὸ β φορὰν ἐναντίαν εἶναι τῇ ἀπὸ τοῦ β πρὸς τὸ α) τὴν ἐπὶ τῆς εὐθείας *λέγει· αὕτη γὰρ πεπέρανται. περιφερεῖς δ᾽ ἄπειροι ἂν εἶεν περὶ τὰ αὐτὰ σημεῖα. ὁμοίως δὲ καὶ ἐπὶ τοῦ ἡμικυκλίου τοῦ ἑνός. οἷον, ἡ ἀπὸ τοῦ γ ἐπὶ τὸ δ, καὶ ἡ ἀπὸ τοῦ δ ἐπὶ τὸ γ· ἡ γὰρ αὐτὴ τῇ ἐπὶ τῆς διαμέτρου ἐστίν. ἀεὶ γὰρ ἕκαστον ἀπέχειν κατὰ τὴν εὐθεῖαν τίθεμεν. ὁμοίως δὲ καὶ κἂν εἴ τις κύκλον ποιήσας, τὴν ἐπὶ θα- E τέρου ἡμικυκλίου φορὰν ἐναντίαν θείη τῇ ἐπὶ θατέρου, οἷον ἐν τῷ ὅλῳ κύκλῳ τὴν ἀπὸ τοῦ ε πρὸς τὸ ζ τοῦ η ἡμικυκλίου *τῇ ἀπὸ τοῦ ζ πρὸς τὸ ε, ἐν τῷ θ ἡμικυκλίῳ. εἰ δὲ καὶ αὗται ἐναντίαι, ἀλλ᾽ *οὔτι γε καὶ αἱ ἐπὶ τοῦ ὅλου κύκλου φοραὶ ἀλλήλαις διὰ τοῦτο ἐναντίαι. ἀλλὰ μὴν οὐδ᾽ ἡ ἀπὸ τοῦ α *ἐπὶ τὸ β κύκλῳ φορὰ ἐναντία τῇ ἀπὸ τοῦ α ἐπὶ τὸ δ. ἐκ ταὐτοῦ γὰρ εἰς τὸ αὐτὸ ἡ κίνησις. ἡ δ᾽ ἐναντία διωρίσθη φορὰ ἐκ τοῦ ἐναντίου εἰς τὸ ἐναντίον εἶναι. εἰ δὲ καὶ ἦν ἡ κύκλῳ τῇ κύκλῳ ἐναντία, μάτην ἂν ἦν ἑτέρα· ἐπὶ τὸ αὐτὸ γάρ. ἔτι ἀνάγκη τὸ κύκλῳ φερόμενον ὁποθενοῦν ἀρξάμενον,

* γρ. ἀλλήλαις ἀντ.
* γρ. φορὰν λέγει.
* γρ. τῷ α.
* γρ. οὔ τι γε
* κ. ἐπὶ τὸ γ.

A εἰς πάντας ὁμοίως ἀφικνεῖσθαι τοὺς ἐναντίους τόπους· εἰσὶ δὲ τόπου ἐναντιότητες, τὸ ἄνω καὶ τὸ κάτω, καὶ τὸ * πρόσθεν καὶ τὸ ὄπισθεν, καὶ τὸ δεξιὸν καὶ τὸ ἀριστερόν. αἱ δὲ τῆς φορᾶς ἐναντιώσεις κατὰ τὰς τῶν τόπων εἰσὶν ἐναντιώσεις. εἰ μὲν * γὰρ ἴσαι ἦσαν, οὐκ ἂν ἦν κίνησις αὐτῶν· εἰ δὲ ἑτέρα κίνησις * ἐκράτει, ἡ ἑτέρα οὐκ ἂν ἦν. ὥστ' εἰ ἀμφότερα ἦν, μάτην ἂν θάτερον ἦν σῶμα μὴ κινούμενον * τὴν αὑτοῦ κίνησιν. μάτην γὰρ ὑπόδημα τοῦτο λέγομεν, οὗ μὴ ἐστιν ὑπόδεσις. ὁ δὲ θεὸς καὶ ἡ φύσις οὐδὲν μάτην ποιοῦσιν. ἀλλ' ἐπειδὴ δῆλον περὶ τούτων, καὶ περὶ τῶν λοιπῶν σκεπτέον.

* κ. ἔμπροσθεν
* κ. οὐ,

ΚΕΦΑΛ. ε'.

B *Ὅτι οὐδὲν σῶμα κύκλῳ κινούμενον, ἄπειρον.*

ΚΑὶ πρῶτον, πότερόν ἐστί τι σῶμα ἄπειρον, ὥσπερ οἱ πλεῖστοι τῶν ἀρχαίων φιλοσόφων ᾠήθησαν, ἢ τοῦτό ἐστιν ἕν τι τῶν ἀδυνάτων· τὸ γὰρ οὕτως ἢ ἐκείνως ἔχειν οὐ τι μικρόν, ἀλλ' ὅλον διαφέρει, καὶ πᾶν πρὸς τὴν περὶ τῆς ἀληθείας θεωρίαν· σχεδὸν γὰρ αὕτη πασῶν ἀρχὴ τῶν ἐναντιώσεων τοῖς ἀποφηναμένοις τι περὶ τῆς ὅλης φύσεως καὶ γέγονε καὶ γένοιτ' ἄν. εἴπερ καὶ τὸ μικρὸν παραβῆναι τῆς ἀληθείας ἀφισταμένοις, γίνεται πόρρω μυριοπλάσιον· οἷον, εἴ τις ἐλάχιστον εἶναί τι φαίη μέγεθος· οὗτος γὰρ τοὐλάχιστον εἰσαγαγὼν, τὰ μέγιστ' ἂν κινήσειε τῶν C μαθηματικῶν. τούτου δ' αἴτιον, ὅτι ἡ ἀρχὴ δυνάμει μείζων ἢ μεγέθει. διόπερ τὸ ἐν ἀρχῇ μικρὸν, ἐν τῇ τελευτῇ γίνεται παμμέγεθες· τὸ δ' ἄπειρον, καὶ ἀρχῆς ἔχει δύναμιν, καὶ τοῦ ποσοῦ τὴν μεγίστην. ὥστ' οὐδὲν ἄτοπον οὐδ' ἄλογον τὸ θαυμαστὴν εἶναι τὴν διαφορὰν ἐκ τοῦ λαβεῖν ὡς ἔστι τι σῶμα ἄπειρον. διὸ περὶ αὐτοῦ λεκτέον ἐξ ἀρχῆς ἀναλαβοῦσιν. ἀνάγκη δὴ πᾶν σῶμα, ἢ τῶν ἁπλῶν εἶναι, ἢ τῶν συνθέτων· ὥστε καὶ τὸ ἄπειρον, ἢ ἁπλοῦν ἔσται, ἢ σύνθετον. ἀλλὰ μὴν καὶ ὅτι γε πεπερασμένων τῶν ἁπλῶν, ἀνάγκη πεπερασμένον εἶναι τὸ σύνθετον, δῆλον· τὸ γὰρ ἐκ πεπερασμένων καὶ πλήθει καὶ μεγέθει συγκείμενον, πεπέρανται καὶ D πλήθει, καὶ μεγέθει· τοσοῦτον γὰρ ἔσται, ἐξ ὅσων ἐστὶ συγκείμενον· λοιπὸν τοίνυν ἰδεῖν πότερον ἐνδέχεταί τι τῶν ἁπλῶν ἄπειρον εἶναι τὸ μέγεθος, ἢ τοῦτ' ἀδύνατον. προχειρισάμενοι δὴ περὶ τοῦ πρώτου τῶν σωμάτων, οὕτω σκοπῶμεν καὶ περὶ τῶν λοιπῶν. ὅτι μὲν τοίνυν ἀνάγκη τὸ σῶμα τὸ κύκλῳ φερόμενον πεπεράνθαι πᾶν, ἐκ τῶνδε δῆλον· εἰ γὰρ ἄπειρον τὸ κύκλῳ φερόμενον σῶμα, ἄπειροι ἔσονται αἱ ἀπὸ τοῦ μέσου ἐκβαλλόμεναι· τῶν δ' ἀπείρων τὸ διάστημα ἄπειρον. διάστημα δὲ λέγω τῶν γραμμῶν, οὗ μηδέν ἐστιν ἔξω λαβεῖν μέγεθος ἁπτόμενον τῶν γραμμῶν. τοῦτ' οὖν ἀνάγκη ἄπειρον εἶναι· E τῶν γὰρ πεπερασμένων ἀεὶ ἔσται πεπερασμένον. ἔτι δ', ἀεὶ ἔστι τοῦ δοθέντος μεῖζον λαβεῖν. ὥστε καθάπερ ἀριθμὸν λέγομεν ἄπειρον, ὅτι μέγιστος οὐκ ἔστιν, ὁ αὐτὸς λόγος καὶ περὶ τοῦ διαστήματος. εἰ οὖν τὸ μὲν ἄπειρον μὴ ἔστι διελθεῖν, ἀπείρου δ' ὄντος ἀνάγκη ἄπειρον τὸ διάστημα εἶναι, οὐκ ἂν ἐνδέχοιτο κινηθῆναι κύκλῳ· τὸν δ' οὐρανὸν ὁρῶμεν κύκλῳ * περιφερόμενον. καὶ τῷ λόγῳ δὲ διωρίσαμεν, ὅτι ἐστί τινος ἡ κύκλῳ κίνησις.

* κ. περιφερόμενον.

A ad omnia ſimiliter accedere contraria loca neceſſe eſt. Sunt autem loci contrarietates ſuprà & infrà, ante & retro, dextrum & ſiniſtrum. Lationis verò contrarietates, per locorum ſunt contrarietates. Si igitur æqualia eſſent, motus ipſorum non eſſet. Si alter alterum ſuperaret, alter profectò non eſſet. Quare ſi vtraque eſſent, fruſtra ſanè corpus alterum eſſet, ſuum non ſubiens motum. Fruſtra enim calceum eum dicimus eſſe, cuius vſus non eſt. At Deus, & natura, nihil prorſus faciunt fruſtra. Verùm vbi hæc ſatis emerſerunt, de reliquis conſideremus oportet.

CAPVT V.

B *Probat, nihil quod in orbem moueatur, poſſe eſſe infinitum.*

ATque primò conſiderandum eſt, vtrùm ſit corpus quippiam infinitum, vt complures antiquorum putarunt, an id ipſum vnum quid ſit eorum quæ fieri nequeunt: hoc enim an illo modo res ſeſe habeat, non parum, ſed totum ad veritatis contemplationem vtique refert. Etenim hoc ferè contrarietatum omnium, hiſce qui de natura tota aliquid dixerunt, principium & fuit, & fieri ſanè poteſt. Siquidem & paruus exitus à veritate fit hiſce, qui exorbitauerunt, ſi longè progrediantur, decies millies maior. Veluti ſi quiſpiam magnitudiné aliquam minimam dixerit eſſe. Hic enim minima C magnitudine introducta, maximas rerũ mathematicarum vtique dimouebit. Atque huius cauſa eſt, principiũ vi maius, quàm magnitudine eſſe. Idcirco quod in principio paruũ eſt, id in fine valde magnum emerget. Infinitũ autem, & principij vim, & quantitatis maximam habet. Quare non eſt abſurdum, neque egreditur rationẽ, admirabilem differentiã eſſe ex infiniti poſitione, ſi quiſpiã ſumpſerit infinitum corpus in ratione rerum quodpiam eſſe. Quamobrẽ à principio repetẽtes, de ipſo dicamus oportet. Omne itaque corpus aut ſimplex, aut cõpoſitũ eſſe neceſſe eſt. Quare & infinitũ ipſum, aut ſimplex, aut compoſitũ erit: atqui patet, ſi ſimplicia ſint finita, compoſitũ neceſſariò finitũ eſſe. Quod enim ex multitudine finitis ac magnitudine con- D ſtat, id & multitudine, & magnitudine eſt finitum. Tantum enim erit, quanta ſunt ea ex quibus componitur, atque conſtat. Reſtat igitur videre vtrum ſimpliciũ quippiam corporum infinitum magnitudine eſſe poſſit, an hoc fieri nequeat. Atque priùs hoc de primo corpore viſo ac pertractato, de reliquis deinceps conſideremus. Corpus igitur, quod verſatur, neceſſariò omne finitum eſſe ex hiſce patere poteſt. Nam ſi corpus, quod verſatur, eſt infinitum, infinitæ profectò erunt & rectæ lineæ, quæ è medio protrahuntur. Infinitarũ autẽm interuallũ infinitum etiam eſt. Atque interuallum linearũ id dico, extra quod nulla magnitudo tangens lineas E ſumi poteſt. Hoc igitur infinitum eſſe neceſſe eſt. Finitarũ enim interuallum ſemper finitũ erit. Fieri præterea poteſt, vt eo maius ſemper ſumatur, quod datum eſt. Quare eadẽ ratio eſt & de ſpatio: quemadmodum numerum ex eo dicimus infinitũ, quia maximus non eſt. Si igitur fieri nequit, vt in infinito tranſitus fiat, atque ſi cælum ſit infinitum, interuallum etiam infinitum eſſe neceſſe eſt: fieri profectò non poteſt vt ipſum cælum verſetur. At verſari cælum videmus, rationéque iam definiuimus, conuerſionem corporis motionem cuiuſpiam eſſe.

Præterea ſi à finito tempore finitum tēpus abſtuleris,& reliquum finitum eſſe, principiúmque habere neceſſe eſt. Si tempus autem ambulationis principium habet, & motionis etiam principium eſt. Quare principium & magnitudinis eius erit, ſuper qua ambulatio fuit. Eadē eſt & in cæteris ratio. Sit itaque a b c linea,altera ex parte infinita,quia ipſum eſt c: & rurſus alia infinita vtraque ex parte d e. Si igitur ab a centro,circulū,linea a b c deſcribat,lineā ſecans d e, in orbem aliquando lato finito in tēpore erit. Totū enim tēpus, quo verſatū eſt cælum, finitū eſt: & id ergo tempus finitum eſt, quod eſt ablatum, in quo ſecās linea ferebatur. Erit igitur principium quoddam,quo primùm a b c linea, d e lineā ſecuit. At eſſe non poteſt. Non ergo fieri poteſt vt infinitum verſetur:quare neque Mūdus,ſi infinitus eſſet. Præterea,ex his etiā patet,fieri non poſſe vt infinitum motu ſit agitatum. Sit enim linea a, quæ propter b lineam feratur, finita, inquam,propter finitam. Simul igitur a lineā à b,& b ab a abſolutam fore, neceſſe eſt. Quantū enim alterius altera occupabit, tātum illius & altera occupabit. Si igitur ambæ in contrarium moueantur, citiùs abſoluentur:ſin altera prope manentem alteram moueatur, tardiùs:ſi modò eadem quod prope illam mouetur celeritate feratur. Verùm illud eſt manifeſtum, fieri nō poſſe vt finito in tēpore quicquam tranſeat in infinitum:tranſibit ergo in tēpore infinito. Hoc enim eſt demonſtratū priùs in hiſce, quæ de motu ſunt pertractata. Nihil autem intereſt, finita prope infinitā feratur, an infinita prope finitam. Nam cùm hæc prope illam mouetur, & illa per hāc tranſire videtur. Similiter,& ſi moueatur,& ſi non moueatur. Verùm ſi moueātur ambæ, citiùs abſoluentur. Quanquam nihil prohibet, eam interdum, quæ prope quieſcentem mouetur, citiùs, quàm eam quæ fertur cōtrà, tranſire, ſi quiſpiā eas quidem, quæ cōtrà mouentur, vtraſque ferri tardè poſuerit, eam verò, quæ prope quieſcentem mouetur, multo celeriùs illis ferri. Nullum igitur rationi prorſus impedimentum afferetur, ſi prope quieſcētem altera moueatur: cùm fieri poſſit, vt a, ſi prope b lineam moueatur, motionē & ipſam etiā ſubeūtem, tardiùs tranſeat, vti diximus. Si igitur id infinitum eſt tempus, quo finita ſubiens motū abſoluitur: & id ſanè, quo infinita finitam tranſiuit, infinitum eſſe pari ratione neceſſe eſt. Vt infinitum ergo ſit motum, minimè fieri poteſt. Nam tēpus fiat infinitum neceſſe eſt, etiam ſi per minimū fuerit motum. At cælum tempore finito verſatur, totúmque fertur in orbē. Quare totam eam tranſit circunferentiā, quæ eſt intus, ceu a b finitam. Impoſſibile eſt ergo, id infinitum eſſe, quod ſubit conuerſionē. Præterea, vt eſſe nō poteſt linea infinita ex ea parte, qua finis eſt, niſi ad longitudinē ſine careret: ſic & ſuperficies infinita eſſe nō poteſt ex ea parte, qua finis. Cùm verò fuerit terminata, nulla ex parte eſt infinita. Quadratū enim, aut circulum, aut ſphærā infinitā eſſe non dixeris, quemadmodū neque lineā bipedalem. Si igitur neque ſphæra, neque circulus, neque quadratū eſt infinitū, atque circulus nō eſt, conuerſio nō erit: & ſi infinitus non eſt, infinita nō erit: ſi ipſe circulus infinitus nō eſt, verſari profectò corpus infinitum non poteſt. Præterea, ſi c ſit centrum, a b verò ſit infinita, & c ſit erecta ad rectos angulos infinita, & inſuper infinita ſit c d ſubiens motum, nunquam ipſa c d ab c linea abſoluetur, ſed ſemper perinde atque a b linea, ſeſe habebit.

A ἔτι ἀπὸ πεπερασμένου χρόνου ἐὰν ἀφέλῃς πεπερασμένον, ἀνάγκη καὶ τὸ λοιπὸν εἶναι πεπερασμένον, καὶ ἔχειν ἀρχήν. εἰ δ' ὁ χρόνος τῆς βαδίσεως ἔχει ἀρχήν, ἔστιν ἀρχὴ καὶ τῆς κινήσεως· ὥστε καὶ τοῦ μεγέθους ὃ βεβάδικεν. ὁμοίως δὲ τοῦτο καὶ ἐπὶ τῶν ἄλλων. ἔστω δὴ γραμμὴ ἄπειρος, * ἐφ' ἧ α γ ε, ἐπὶ θάτερα ἡ τὸ ε, ἡ δ' ἐφ' ἧ τὰ β β, ἐπ' ἀμφότερα ἄπειρος. εἰ δὴ γράψει κύκλον ἡ τὸ α γ ε ἀπὸ τοῦ γ κέντρου, τεμοῦσά ποτε οἰσθήσεται κύκλῳ τὴν β β ἡ τὸ α γ ε, πεπερασμένον χρόνον· ὁ γὰρ πᾶς χρόνος ἐν ὅσῳ κύκλῳ ἠνέχθη ὁ οὐρανός, πεπερασμένος. καὶ ἀφῃρημένος ἄρα, ὃν ἡ τέμνουσα ἐφέρετο. ἔσται ἄρα τις ἀρχή * ἣ πρῶτον ἡ τὸ

B α γ ε, τὴν τὰ β β ἔτεμεν. ἀλλ' ἀδύνατον. οὐκ ἄρα ἐστὶ κύκλῳ στραφῆναι τὸ ἄπειρον. ὥστε οὐδὲ τὸν κόσμον, εἰ ἦν ἄπειρος. ἔτι δὲ καὶ ἐκ τῶνδε φανερόν, ὅτι τὸ ἄπειρον ἀδύνατον κινηθῆναι· ἔστω γὰρ ἡ τὸ α φερομένη παρὰ τὴν β, πεπερασμένη παρὰ πεπερασμένην. ἀνάγκη δὴ ἅμα τήν τε α τῆς β ἀπολελύσθαι, καὶ τὴν β τῆς α. ὅσον γὰρ ἡ ἑτέρα ἐπιλάβοι τῆς ἑτέρας, καὶ ἡ ἑτέρα ἐκείνης τοσοῦτον. εἰ μὲν οὖν ἄμφω * κινοῖντο εἰς τοὐναντίον, θᾶττον ἂν ἀπολύοιντο. εἰ δὲ παρὰ μένουσαν παραφέροιτο, βραδύτερον, τοῦ αὐτοῦ τάχους κινουμένου τοῦ παραφερομένου. ἀλλ' ἐκεῖνό γε φανερόν, ὅτι ἀδύνατον τὴν ἄπειρον διελθεῖν ἐν

C πεπερασμένῳ χρόνῳ. ἐν ἀπείρῳ ἄρα· δέδεικται γὰρ τοῦτο πρότερον ἐν τοῖς περὶ κινήσεως. διαφέρει δέ γε οὐδέν, ἢ τὴν πεπερασμένην φέρεσθαι παρὰ τὴν ἄπειρον, ἢ τὴν ἄπειρον παρ' ἐκείνην· ὅταν γὰρ ἐκείνη παραλλάττῃ ἐκείνην, κἀκείνη παραλλάττει ἐκείνην, ὁμοίως κινουμένη καὶ ἀκίνητος· πλὴν θᾶττον ἐὰν κινῶνται ἀμφότεραι, ἀπολυθήσονται. καίτοι γ' ἐνίοτε οὐδὲν κωλύει τὴν κινουμένην παρ' ἠρεμοῦσαν θᾶττον παρελθεῖν, ἢ τὴν ἀντικινουμένην, ἐάν τις ποιήσῃ τὰς μὲν ἀντικινουμένας ἀμφοτέρας φερομένας βραδέως· τὴν δὲ παρὰ τὴν ἠρεμοῦσαν, πολλῷ ἐκείνων φερομένην θᾶττον. οὐδὲν οὖν περὶ τὸν λόγον ἐμποδίζει, ὅτι παρ' ἠρεμοῦσαν, ἐπείπερ κινουμένην ἐν-

D δέχεται τὴν α, παρὰ κινουμένην τὴν β, βραδύτερον * ἐλθεῖν. εἰ οὖν ἄπειρος ὁ χρόνος, ὃν ἡ πεπερασμένη ἀπολύεται κινουμένη, καὶ ἐν ᾧ ἡ ἄπειρος τὴν πεπερασμένην ἐκινήθη, ἀνάγκη ἄπειρον εἶναι. ἀδύνατον ἄρα τὸ ἄπειρον κινεῖσθαι ὅλως. ἐὰν γὰρ καὶ τοὐλάχιστον κινηθῇ, ἀνάγκη ἄπειρον γίνεσθαι χρόνον. ἀλλὰ μὴν ὅ γε οὐρανὸς περιέρχεται καὶ στρέφεται ὅλος κύκλῳ ἐν πεπερασμένῳ χρόνῳ. ὥστε περίεισι τοῦ κύκλου ἅπασαν τὴν ἐντός, οἷον τὴν α β πεπερασμένην. ἀδύνατον ἄρα ἄπειρον εἶναι * τὸ κύκλῳ. ἔτι ὥσπερ γραμμὴν * ἧς πέρας ἐστίν, ἀδύνατον εἶναι ἄπειρον, ἀλλ' εἴπερ ἐπὶ μῆ-

E κος, καὶ ἐπίπεδον, ὡσαύτως ᾗ πέρας οὐκ ἐνδέχεται· ὅταν δ' ὁρισθῇ, οὐδαμῇ· οἷον, τετράγωνον ἄπειρον, ἢ κύκλον, ἢ σφαῖραν· ὥσπερ οὐδὲ ποδιαῖον ἄπειρον. εἰ οὖν μήτε σφαῖρα, μήτε τετράγωνον, μήτε κύκλος ἐστὶν ἄπειρος· μὴ ὄντος δὲ κύκλου, οὐδ' ἂν ἡ κύκλῳ εἴη φορά. ὁμοίως δὲ μηδὲ ἀπείρου ὄντος, οὐκ ἂν εἴη ἄπειρος. εἰ μηδ' ὁ κύκλος ἄπειρός ἐστιν, οὐκ ἂν κινοῖτο κυκλικῶς ἄπειρον σῶμα. ἔτι δὲ εἰ τὸ γ κέντρον, ἡ δὲ τὸ α β ἄπειρος, καὶ ἡ δ ε πρὸς ὀρθὴν ἄπειρος· καὶ ἡ τὸ γ δ κινουμένη, οὐδέ ποτ' * ἀπολύσεται τῆς ε ἀλλ' ἀεὶ ἕξει ὥσπερ ἡ γ ε

* γρ. ἐφ' ἧς τὰ α γ ε.
* γρ. ἧς πρ.
* γρ. κινοῖντο. & mox ἀπολύοιντο.
* γρ. παρελθεῖν.
* γρ. τὸ κ. φερόμενον.
* γρ. ᾗ π.
* Scrib. ἀπολυθήσεται

τέμνει γὰρ ἡ τὸ ζ. οὐκ ἄρα κύκλῳ περιοίσεται ἡ ἄπειρος. A ἔτι εἰ ἄπειρος ὁ οὐρανὸς, κινεῖται δὲ κύκλῳ, ἐν πεπερασμένῳ χρόνῳ ἄπειρον ἔσται διεληλυθός. ἔστω γὰρ ὁ μὲν μένων οὐρανὸς ἄπειρος, ὁ δ' ἐν τούτῳ κινούμενος ἴσος. ὥστε * εἰ ἄπειρος ἐλήλυθε κύκλῳ ἄπειρος ὢν, ἄπειρον ὃ ἴσον αὐτῷ διελήλυθεν ἐν πεπερασμένῳ χρόνῳ. ἀλλὰ τοῦτ' ἦν ἀδύνατον. ἔστι δὲ καὶ ἀντεστραμμένως εἰπεῖν, ὅτι εἰ πεπερασμένος ὁ χρόνος ἐν ᾧ περιεστράφη, καὶ τὸ μέγεθος ὃ διελήλυθεν, ἀναγκαῖον εἶναι πεπερασμένον· ἴσον δ' αὐτῷ διελήλυθε· πεπέρανται ἄρα καὶ αὐτός. ὅτι μὲν οὖν τὸ κύκλῳ κινούμενον, οὐκ ἔστιν ἀτελεύτητον, οὐδ' ἄπειρον, ἀλλ' ἔχει τέλος, φανερόν. B

* γρ. εἰ περιελήλυθε

ΚΕΦΑΛ. ϛ΄.

Ὅτι οὐδὲ τὸ ἐπὶ τὸ μέσον οὐδὲ τὸ ἀπὸ τοῦ μέσου φερόμενον ἄπειρον.

Ἀλλὰ μὴν οὐδὲ τὸ ἐπὶ τὸ μέσον, οὐδὲ τὸ ἀπὸ τοῦ μέσου φερόμενον, ἄπειρον ἔσται· ἐναντίαι γὰρ αἱ φοραὶ ἡ ἄνω καὶ ἡ κάτω· αἱ δ' ἐναντίαι εἰς ἐναντίους τόπους. τῶν δ' ἐναντίων εἰ θάτερον ὥρισται, καὶ θάτερον ὡρισμένον ἔσται· τὸ δὲ μέσον ὥρισται· εἰ γὰρ ὁποθενοῦν φέροιτο κάτω τὸ ὑφιστάμενον, οὐκ ἐνδέχεται πορρωτέρω διελθεῖν τοῦ μέσου. ὡρισμένου οὖν τοῦ μέσου, καὶ τὸν ἄνω τόπον ἀνάγκη ὡρίσθαι. εἰ δ' οἱ τόποι ὡρισμένοι καὶ C πεπερασμένοι, καὶ τὰ σώματα ἔσται πεπερασμένα. ἔτι, εἰ τὸ ἄνω καὶ τὸ κάτω ὥρισται, καὶ τὸ μεταξὺ ἀνάγκη ὡρίσθαι. εἰ γὰρ μὴ ὥρισται, ἄπειρος ἂν εἴη κίνησις. τοῦτο δὲ ὅτι ἀδύνατον, δέδεικται πρότερον· ὥρισται ἄρα τὸ μέσον· ὥστε καὶ τὸ ἐν τούτῳ σῶμα ἢ ὂν, ἢ γενέσθαι δυνατόν. ἀλλὰ μὴν τὸ ἄνω καὶ τὸ κάτω φερόμενον σῶμα δύναται ἐν τούτῳ γενέσθαι. πέφυκε γὰρ τὸ μὲν ἀπὸ τοῦ μέσου κινεῖσθαι, τὸ δὲ ἐπὶ τὸ μέσον. ἔκ τε δὴ τούτων φανερὸν, ὅτι οὐκ ἐνδέχεται σῶμα εἶναι ἄπειρον. καὶ πρὸς τούτοις, εἰ βάρος μὴ ἔστιν ἄπειρον, οὐδ' ἂν τούτων τῶν σωμάτων οὐδὲν εἴη ἄπειρον· ἀνάγκη γὰρ τοῦ ἀπείρου σώματος, ἄπειρον εἶναι καὶ τὸ βάρος. ὁ δ' αὐτὸς D λόγος ἔσται καὶ ἐπὶ τοῦ κούφου· εἰ γὰρ ἔστιν ἄπειρος βαρύτης, ἔστι καὶ κουφότης, ἐὰν ἄπειρον ᾖ τὸ ἐπιπολάζον. δῆλον δ' ἐκ τῶνδε· ἔστω γὰρ πεπερασμένον, καὶ εἰλήφθω τὸ μὲν ἄπειρον σῶμα ἐφ' ᾧ τὸ α β, τὸ δὲ βάρος αὐτοῦ ἐφ' ᾧ γ· ἀφῃρήσθω οὖν ἀπὸ τοῦ ἀπείρου πεπερασμένον μέγεθος, ἐφ' ᾧ τὸ β δ· καὶ τὸ βάρος αὐτοῦ ἔστω, ἐφ' ᾧ τὸ ε. τὸ δὴ ε τοῦ γ ἔλαττον ἔσται· τὸ γὰρ τοῦ ἐλάττονος βάρος ἔλαττον. καταμετρείτω δὴ τὸ ἔλαττον ὁποσακισοῦν, καὶ ὡς τὸ βάρος τοὔλαττον πρὸς τὸ μεῖζον, τὸ β δ πρὸς τὸ β ζ γεγενήσθω· ἐνδέχεται γὰρ ἀφελεῖν τοῦ ἀπείρου ὁποσονοῦν. E εἰ τοίνυν * ἀνάλογα τὰ μεγέθη τοῖς βάρεσι, τὸ δ' ἔλαττον βάρος τοῦ ἐλάττονός ἐστι μεγέθους, καὶ τὸ μεῖζον ἂν εἴη τοῦ μείζονος· ἴσον ἄρα ἔσται τὸ τοῦ πεπερασμένου καὶ τὸ τοῦ ἀπείρου βάρος. ἔτι δὲ, εἰ τοῦ μείζονος σώματος μεῖζον τὸ βάρος, τὸ τοῦ η β μεῖζον ἔσται βάρος, ἢ τὸ τοῦ ζ β. ὥστε τὸ τοῦ πεπερασμένου βάρος ἢ τὸ τοῦ ἀπείρου μεῖζον ἔσται· καὶ τὸ τῶν ἀνίσων δὲ μεγεθῶν, ταὐτὸν ἔσται βάρος· ἄνισον γὰρ τῷ πεπερασμένῳ τὸ ἄπειρον. οὐδὲν δὲ διαφέρει, τὰ βάρη σύμμετρα εἶναι, ἢ ἀσύμμετρα.

* γρ. ἀνάλογον

A Secat enim in ipſo f puncto. Non ergo infinitum verſatur. Inſuper ſi cælum eſt infinitum, atque verſatur, infinitum profectò finito tempore pertranſibit. Sit enim cælum quidem, quod manet, infinitum: id autem, quod in hoc mouetur, æquale. Quare ſi verſatum fuerit, cùm ſit infinitum, æquale ſibi infinitum tempore finito tranſibit. At hoc eſſe impoſſibile dicebatur. Atqui dicere contrà etiam licet. Cùm finitum ſit id tempus, in quo eſt verſatum, magnitudinem quoque finitam eſſe neceſſe eſt eam quam conuerſione tranſiuit. At æquale ſibi conuerſione tranſiuit: & ipſum ergo cælum finitum eſt. Corpus igitur id, quod verſatur, exitu non vacare, nec infinitum eſſe, ſed finem habere, B ex hiſce, quæ iam diximus, patuit.

CAPVT VI.

Probat neque id quod ad medium, neque id quod à medio fertur, eſſe poſſe infinitum.

At verò neque id, quod è medio, neque id, quod ad medium fertur, infinitionem ſubibit. Lationes enim eas, quibus ſurſum itur atque deorſum, contrarias eſſe conſtat. Contrariis autem contraria loca petuntur. Atque contrariorum ſi alterũ definitum eſt, & alterum definitum erit. Medium verò, eſt definitum. Nam ſi vndeuis deorſum feratur id quod ſub omnibus collocatur, fieri non poteſt vt vltra medium ipſum progrediatur. Cùm igi- C tur medium ſit definitum, & ſuperum locum definitum eſſe, neceſſe eſt. Quòd ſi loca ſunt definita, atque finita, & corpora ſanè erunt finita. Præterea, ſi ſuperus ac inferus locus eſt definitus, & id quod eſt inter hæc, definitũ eſſe neceſſe eſt: nã ſi definitũ non eſt, motus infinitus erit profectò. Hoc autẽ impoſſibile eſſe, antea demõſtrauimus: ergo medium ipſum eſt definitũ. Quare & id corpus definitũ eſt ſanè, quod in hoc eſt, aut fore poteſt. At id corpus, quod ſurſum & deorſum fertur, in hoc fore poteſt. Aliud enim è medio, aliud ad medium ferri ſuapte natura poteſt. Ex his igitur patet, corpus infinitum in rationem rerum eſſe non poſſe. Et inſuper ſi pondus nõ ſit infinitum, neque quicquam horum corporum infinitum eſſe profectò poteſt. Infiniti nam- D que corporis pondus, infinitum eſſe neceſſe eſt. Eadem fuerit ratio & de corpore leui: nam ſi eſt grauitas infinita, eſt & leuitas infinita, ſi id eſt infinitũ, quod ſuper omnia eminet. Quod quidem ex hiſce patere poteſt. Sit enim finitum, atque ſumatur infinitum quidem corpus a b, põdus autem ipſius c: ab infinito igitur magnitudo finita auferatur b d, atque pondus ipſius ſit e: ipſum igitur b pondus, minus erit ipſo pondere c. Minoris enim magnitudinis, pondus minus nimirum eſt. Minus itaque pondus, maius menſuret numero aliquo repetitũ. Itaque vt minus ſeſe habet ad maius, ita b d ſeſe E habet ad b f magnitudinem. Fieri enim poteſt vt quantauis ab infinita auferatur. Si igitur magnitudines ſimilitudinem rationum ſubeũt cum ponderibus, & minus pondus minoris eſt magnitudinis, maius etiam magnitudinis erit maioris. æquale ergo finiti pondus erit, ac infiniti. Si maioris præterea corporis maius eſt põdus, ipſius b d pondus maius erit pondere corporis ipſius b f. Quare finiti pondus, maius erit pondere infiniti. Inæqualiũ etiã magnitudinũ, idẽ fuerit põdus. Finitũ enim ac infinitũ inæqualia eſſe cõſtat. Nihil autẽ intereſt, commenſurabilia ipſa pondera, an incommenſurabilia ſint.

Etenim eadem erit ratio, ſi incommenſurabilia ſint. Veluti ſi e pondus menſurans c pondus, ter repetitum exuperet. Nam ſi tres totæ magnitudines b d ſumantur, pondus ipſarum maius erit pondere c. Quare idem eueniet impoſſibile. Præterea, fieri poteſt vt commenſurabilia ipſa ſumantur. Nihil enim intereſt, à pondere an à magnitudine initium fiat. Velut ſi e pondus commenſurabile ſumatur ipſi ponderi c, atque ab initio ea magnitudo auferatur, quæ habet ipſum e pondus, ceu b d. Deinde allata fuerit alia magnitudo, ceu b f, ad quam ita b d magnitudo ſe habet, vt pondus ſe habet ad pondus. Fieri enim poteſt vt ſi magnitudo a b ſit infinita, quantauis ab ea magnitudo auferatur. His enim ſumptis, tam magnitudines quàm pondera inter ſeſe ſanè commenſurabilia erunt. At verò nihil ad demonſtrationem etiam refert, ſimilis ipſa magnitudo ponderis, an diſſimilis ſit. Semper enim æqualis corpora ponderis, magnitudinis ipſius b d ponderi quotquotuis ab infinito ſumere, aut auferendo aut addendo licet. Quare patet ex his, quæ diximus, corporis infiniti pondus finitum non eſſe: erit igitur infinitum. Quòd ſi hoc eſſe non poteſt, nec infinitum quicquam in ratione rerum corpus etiam eſſe poteſt. Atqui pondus infinitum quid in ratione rerum eſſe non poſſe, ex hiſce patere poteſt. Si enim tantum pondus per tantum ſpatium hoc in tempore motu cietur, tantum & inſuper, in minore ſanè mouebitur. Atque tempora rationem eam, quam habent pondera, contra ſanè habebunt. Veluti ſi dimidium pondus hoc in tempore mouetur, duplum in dimidio huiuſce mouetur. Præterea, pondus finitum omne, finitum ſpatium finito quodam in tempore tranſit. Quæ cùm ita ſint, ſi quodpiam pondus ſit infinitum, moueatur *ipſum*, & non moueatur neceſſe eſt. Moueatur enim neceſſe eſt, quo tantum eſt, quantum finitum: & inſuper non moueatur rurſus neceſſe eſt, quo exceſſiuum quidem ratione ipſum moueri oportet. contráque maius in minore moueri. Ratio verò infiniti, nulla eſt ad finitum. Temporis autem minoris eſt ad maius tempus finitum, ſed in minore ſemper. Minimum autem nõ eſt. Neque ſi eſſet, vtilitas vlla eſſet. Sumptum enim fuiſſet quippiam finitum maius in eadem ratione, in qua reſpectu temporis infinitum ad minus eſſet. Quare æquali in tempore, per ſpatium æquale, finitum ac infinitũ vtique moueretur: at fieri non poteſt. at neceſſe eſt, ſi infinitum quantouis, finito tamen tempore moueatur, aliud etiam pondus finitum in hoc eodem, per ſpatium finitum quoddam moueri. Impoſſibile eſt ergo, pondus infinitum eſſe, & ſimiliter leuitatem. Et corpora ergo infinitum pondus habentia, leuitatémve, in ratione rerum eſſe non poſſunt. Patet igitur corpus infinitum non eſſe: & ſi hoc modo contemplatio de ipſo fiat per rationes particulares, & ſi vniuerſaliter conſideretur, non ſolùm per rationes eas quæ in ſermonibus de principiis à nobis ſunt dictæ. Determinatum eſt enim & illo in loco de infinito vniuerſaliter priùs, quomodo eſt, & quomodo non eſt: ſed etiam nunc, alio modo. Poſt hæc autem conſiderandum eſt, ſi infinitum quidẽ vniuerſum corpus non ſit, tantum tamen ſit, vt plures ſint cæli. Forſitan enim hoc quiſpiam dubitauerit, nihil obſtare, vt hic, qui nos circundat, Mundus eſt conſtitutus, ſic & plures alios eſſe cælos, plures quidem vno non tamen infinitos. Priùs autem, vniuerſaliter de infinito dicamus.

A καὶ γὰρ ἀσυμμέτρων ὄντων, ὁ αὐτὸς ἔσται λόγος· οἷον, εἰ τὸ ε τρίτον ὑπερβάλλει μετρεῖν τὸ γ βάρος. τῶν γὰρ β δ μεγεθῶν τριῶν ὅλων ληφθέντων, μεῖζον ἔσται τὸ βάρος, ἢ τὸ ἐφ᾽ ᾧ γ. ὥστε τὸ αὐτὸ ἔσται ἀδύνατον. ἔτι δὲ καὶ ἐξαρκεῖ σύμμετρα λαβεῖν· οὐδὲν γὰρ διαφέρει ἄρχεσθαι ἀπὸ τοῦ βάρους, ἢ ἀπὸ τοῦ μεγέθους, οἷον, ἐὰν ληφθῇ σύμμετρον βάρος τῷ γ, τὸ ἐφ᾽ ᾧ τὸ ε, καὶ ἀπὸ τοῦ ἀπείρου ἀφαιρεθῇ, τὸ ἔχον τὸ ἐφ᾽ ᾧ τὸ ε βάρος, οἷον τὸ β δ. εἶτα ὡς τὸ βάρος πρὸς τὸ βάρος, τὸ β δ πρὸς ἄλλο γένηται μέγεθος, οἷον πρὸς τὸ β ζ. ἐνδέχεται γὰρ ἀπείρου ὄντος τοῦ μεγέθους, ὁποσονοῦν ἀφαιρεθῆναι. τούτων γὰρ ληφθέντων, σύμμετρα ἔσται καὶ τὰ μεγέθη, καὶ

B τὰ βάρη ἀλλήλοις. οὐδὲ δὴ τὸ μέγεθος ὁμοιοβαρὲς εἶναι ἢ ἀνομοιοβαρές, οὐδὲν διοίσει πρὸς τὴν ἀπόδειξιν· ἀεὶ γὰρ ἔσται λαβεῖν ἰσοβαρῆ σώματα τῷ β δ, ἀπὸ τοῦ ἀπείρου ὁποσαοῦν ἢ ἀφαιροῦντας, ἢ προστιθέντας. ὥστε δῆλον ἐκ τῶν εἰρημένων ὅτι οὐκ ἔσται τοῦ ἀπείρου σώματος πεπερασμένον τὸ βάρος. ἄπειρον ἄρα. Εἰ τοίνυν τοῦτ᾽ ἀδύνατον, καὶ τὸ ἄπειρόν τι εἶναι σῶμα ἀδύνατον. ἀλλὰ μὴν ὅτι γε ἄπειρόν τι εἶναι βάρος ἀδύνατον, ἐκ τῶνδε φανερόν. Εἰ γὰρ τὸ τοσονδὶ βάρος τὴν τοσήνδε ἐν τῷδε τῷ χρόνῳ κινεῖται, τὸ τοσόνδε καὶ ἔτι, ἐν ἐλάττονι, καὶ τὴν ἀναλογίαν ἣν τὰ βάρη * ἔχῃ, οἱ χρό- * γρ. ἔχει

C νοι ἀνάπαλιν ἕξουσιν. οἷον, εἰ τὸ ἥμισυ βάρος ἐν τῷδε, τὸ διπλάσιον ἐν [τῷ] ἡμίσει τούτου. ἔτι τὸ πεπερασμένον βάρος ἅπασαν πεπερασμένην δίεισιν ἔν τινι χρόνῳ πεπερασμένῳ. ἀνάγκη ἄρα ἐκ τούτων, εἴ τί ἐστιν ἄπειρον βάρος, κινεῖσθαι μὲν ᾗ τοσόνδε ὅσον τὸ πεπερασμένον. καὶ ἔτι μὴ κινεῖσθαι δέ, ᾗ ἀνάλογον μὲν δεῖ κατὰ τὰς ὑπεροχὰς κινεῖσθαι, ἐναντίως δὲ τὸ μεῖζον ἐν τῷ ἐλάττονι· λόγος δὲ οὐδείς ἐστι τοῦ ἀπείρου πρὸς τὸ πεπερασμένον, τοῦ δ᾽ ἐλάττονος χρόνου πρὸς τὸν μείζω πεπερασμένον· ἀλλ᾽ ἀεὶ ἐν ἐλάττονι· ἐλάχιστος δ᾽ οὐκ ἔστιν· οὐδ᾽ εἰ ἦν, ὄφελός τι ἂν ἦν· ἄλλο γὰρ ἄν τι

D πεπερασμένον ἐλήφθη ἐν τῷ αὐτῷ λόγῳ, ἐν ᾧ τὸ ἄπειρον πρὸς ἕτερον μεῖζον. ὥστε ἐν ἴσῳ χρόνῳ τὴν ἴσην ἂν ἐκινεῖτο τὸ ἄπειρον τῷ πεπερασμένῳ· ἀλλ᾽ ἀδύνατον. ἀλλὰ μὴν ἀνάγκη γε εἴπερ ἐν ὁπηλικῳοῦν χρόνῳ, πεπερασμένῳ δέ, κινεῖται τὸ ἄπειρον, καὶ ἄλλο ἐν τῷ αὐτῷ τούτῳ πεπερασμένον βάρος κινεῖσθαί τινα πεπερασμένην. ἀδύνατον ἄρα ἄπειρον εἶναι βάρος· ὁμοίως δὲ καὶ κουφότητα. καὶ σώματα ἄρα ἄπειρον βάρος ἔχοντα καὶ κουφότητα, ἀδύνατον· ὅτι μὲν οὖν οὐκ ἔστιν ἄπειρον σῶμα, δῆλον, διά τε τῶν κατὰ μέρος θεωροῦσι τοῦτον τὸν τρόπον, καὶ καθόλου σκοπουμένοις μὴ μόνον κατὰ τοὺς

E λόγους τοὺς ἐν τοῖς περὶ τὰς ἀρχὰς εἰρημένοις ἡμῖν· διωρίσθη γὰρ κἀκεῖ καθόλου πρότερον περὶ ἀπείρου πῶς ἐστι καὶ πῶς οὐκ ἔστι. ἀλλὰ καὶ νῦν ἄλλον τρόπον. μετὰ Physicorũ l. 3. δὲ ταῦτ᾽ ἐπισκεπτέον κἂν εἰ μὴ ἄπειρον μὲν τὸ σῶμα τὸ πᾶν· οὐ μὴν ἀλλὰ τοσοῦτόν γε, ὥστ᾽ εἶναι πλείους οὐρανούς· τάχα γὰρ ἄν τις τοῦτ᾽ ἀπορήσειεν, ὅτι καθάπερ ὁ περὶ ἡμᾶς κόσμος συνέστηκεν, οὐδὲν κωλύει καὶ ἑτέρους εἶναι * πλείους μὲν ἑνός, μὴ μέντοι γε ἀπείρους. * γρ. κόσμους πρῶτον δ᾽ εἴπωμεν καθόλου περὶ τοῦ ἀπείρου.

ΚΕΦΑΛ. ζ.

Ὅτι οὐκ ἔστι τὸ τοῦ παντὸς σῶμα ἄπειρον.

Ἀνάγκη δὴ σῶμα πᾶν, ἤτοι ἄπειρον εἶναι, ἢ πεπερασμένον. καὶ εἰ ἄπειρον, ἤτοι ἀνομοιομερὲς ἅπαν, ἢ ὁμοιομερές. κἂν εἰ ἀνομοιομερές, ἤτοι ἐκ πεπερασμένων εἰδῶν, ἢ ἐξ ἀπείρων. ὅτι μὲν τοίνυν οὐχ οἷόν τε ἐξ ἀπείρων, φανερόν, εἴ τις ἡμῖν ἐάσει μένειν τὰς πρώτας ὑποθέσεις· πεπερασμένων γὰρ τῶν πρώτων κινήσεων οὐσῶν, ἀνάγκη καὶ τὰς ἰδέας τῶν ἁπλῶν σωμάτων εἶναι πεπερασμένας. ἁπλῆ μὲν γὰρ ἡ τοῦ ἁπλοῦ σώματος κίνησις· αἱ δὲ ἁπλαῖ πεπερασμέναι κινήσεις εἰσίν. ἀνάγκη δὲ ἀεὶ κίνησιν ἔχειν πᾶν σῶμα φυσικόν· ἀλλὰ μὴν εἴγε ἐκ πεπερασμένων ἔσται τὸ ἄπειρον, ἀνάγκη καὶ τῶν μορίων εἶναι ἕκαστον ἄπειρον. λέγω δ', οἷον τὸ ὕδωρ, ἢ τὸ πῦρ· ἀλλ' ἀδύνατον. δέδεικται γὰρ ὅτι οὔτε βάρος, οὔτε κουφότης ἐστὶν ἄπειρος. ἔτι ἀναγκαῖον ἀπείρους τῷ μεγέθει εἶναι καὶ τοὺς τόπους αὐτῶν· ὥστε καὶ τὰς κινήσεις ἀπείρους ἁπάντων εἶναι. τοῦτο δ' ἀδύνατον, εἰ θήσομεν ἀληθεῖς εἶναι τὰς πρώτας ὑποθέσεις· καὶ μήτε τὸ κάτω φερόμενον εἰς ἄπειρον ἐνδέχεσθαι φέρεσθαι, μήτε τὸ ἄνω κατὰ τὸν αὐτὸν λόγον. ἀδύνατον γὰρ γίνεσθαι, ὃ μὴ ἐνδέχεται γενέσθαι· ὁμοίως ἐπὶ τοῦ τοιόνδε καὶ ποσὸν, καὶ τοῦ ποῦ. λέγω δ', εἰ ἀδύνατον γενέσθαι λευκὸν ἢ πηχυαῖον, ἢ ἐν Αἰγύπτῳ, καὶ γίνεσθαί τι τούτων ἀδύνατον. ἀδύνατον ἄρα καὶ φέρεσθαι ἐκεῖ, οὗ μηδὲν δυνατὸν ἀφικνεῖσθαι φερόμενον. ἔτι δ' εἰ καὶ διεσπασμένον ἐστίν, οὐδὲν ἧττον ἐνδέχοιτ' ἂν τὸ ἐξ ἁπάντων πῦρ ἄπειρον εἶναι. ἀλλὰ σῶμα ἦν τὸ πάντῃ διάστασιν ἔχον· ὥστε πῶς οἷόν τε πλείω μὲν ἀνόμοια, ἕκαστον δ' αὐτῶν ἄπειρον εἶναι. πάντῃ γὰρ ἕκαστον δεῖ ἄπειρον εἶναι. ἀλλὰ μὴν οὐδὲ πᾶν ὁμοιομερὲς ἐνδέχεται τὸ ἄπειρον εἶναι. πρῶτον μὲν γὰρ οὐκ ἔστιν ἄλλη παρὰ ταύτας κίνησις. ἕξει οὖν μίαν τούτων. εἰ δὲ τοῦτο, συμβήσεται ἢ βάρος ἄπειρον, ἢ κουφότητα εἶναι ἄπειρον. ἀλλὰ μὴν οὐχ οἷόν τε τὸ κύκλῳ σῶμα φερόμενον ἄπειρον. ἀδύνατον γὰρ τὸ ἄπειρον φέρεσθαι κύκλῳ· οὐδὲν γὰρ διαφέρει τοῦτο λέγειν, ἢ τὸν οὐρανὸν φάναι ἄπειρον εἶναι. τοῦτο δὲ δέδεικται ὅτι ἀδύνατον. ἀλλὰ μὴν οὐδ' ὅλως γε τὸ ἄπειρον ἐνδέχεται κινεῖσθαι. ἢ γὰρ κατὰ φύσιν κινηθήσεται, ἢ βίᾳ· καὶ εἰ βίᾳ, ἔστιν αὐτῷ καὶ ἡ κατὰ φύσιν. ὥστε καὶ τόπος ἄλλος ἴσος εἰς ὃν οἰσθήσεται. τοῦτο δ' ἀδύνατον. Ὅτι δ' ὅλως ἀδύνατον ἄπειρον ὑπὸ πεπερασμένου παθεῖν τι ἢ ποιῆσαι τὸ πεπερασμένον, ἐκ τῶνδε φανερόν. ἔστω γὰρ ἄπειρον ἐφ' οὗ α, πεπερασμένον δὲ ἐφ' οὗ β, χρόνος δὲ ἐν ᾧ ἐκίνησέ τι ἢ ἐκινήθη ἐφ' ᾧ γ. Εἰ δὴ ὑπὸ τοῦ β τὸ α ἐθερμάνθη, ἢ ὤσθη, ἢ ἄλλο τι ἔπαθεν, ἢ καὶ ὁπωσοῦν ἐκινήθη, ἐν τῷ χρόνῳ ἐφ' οὗ γ, ἔστω τὸ δ τοῦ β ἔλαττον, καὶ τὸ ἔλαττον ἐν τῷ ἴσῳ χρόνῳ ἔλαττον κινείτω· ἔστω δὲ τὸ ἐφ' ᾧ ε, ὑπὸ τοῦ δ ἠλλοιωμένον· ὃ δή ἐστι τὸ δ πρὸς τὸ β, τὸ ε ἔσται πρὸς τὸ πεπερασμένον τι. ἔστω δὴ τὸ μὲν ἴσον, ἐν ἴσῳ χρόνῳ ἴσον ἀλλοιοῦν· τὸ δὲ ἔλαττον ἐν τῷ ἴσῳ, ἔλαττον· τὸ δὲ μεῖζον, μεῖζον· τοσοῦτον δὲ, ὅσον ἀνάλογόν ἐστιν ὅπερ τὸ μεῖζον πρὸς τὸ ἔλαττον. οὐκ ἄρα τὸ ἄπειρον ὑπ' οὐδενὸς πεπερασμένου κινηθήσεται ἐν οὐδενὶ χρόνῳ·

CAPVT VII.

Quòd vniuerſitatis corpus non poſſit eſſe infinitum.

Omne itaque corpus, aut infinitũ aut finitũ eſſe neceſſe eſt. Et ſi infinitum eſt, aut ſimiliũ, aut diſſimiliũ partium eſſe. Et ſi diſſimiliũ partium eſt, aut ex finitis ſpecie, aut ex infinitis conſtare. Patet igitur ex infinitis conſtare non poſſe, ſi quiſpiã nobis primas ſuppoſitiones manere ſinat. Nã ſi primi motus finiti ſint, ſpecies quoque ſimpliciũ corporum finitas eſſe neceſſe eſt. Etenim ſimplicis quidẽ corporis motio, ſimplex eſt. Simplices autẽ motiones, finitæ ſunt: atq; omne naturale corpus motionem habere neceſſe eſt. At verò ſi infinitum ex infinitis erit, & quamque partium infinitam eſſe neceſſe eſt. Dico autem aquam, vel ignẽ. At hoc eſſe non poteſt: demonſtratum eſt enim, neque pondus neque leuitatem in ratione rerum infinitam eſſe. Præterea, loca quoque ipſarum, magnitudine infinita eſſe neceſſe eſt: quare & motus omnium infinitos eſſe. Hoc autem eſſe nequit, ſi primas ſuppoſitiones poſuerimus veras eſſe, & neque id quod deorſum, neque id quod ſurſum fertur, in infinitũ moueri poſſit. Impoſſibile eſt enim fieri id quod ortum ſubire non poteſt, tam in qualitate, quàm quantitate, quàm etiã in vbi. Dico autẽ hoc pacto: Si impoſſibile eſt, album quippiã fore, aut pedale, aut in Ægypto eſſe, & fieri quicquam horũ impoſſibile eſt: impoſſibile eſt igitur, & illuc etiam quicquã ferri, quò nullũ corpus peruenire poteſt ſubiẽs lationem. Præterea & ſi ſeiũcta ſunt, non minùs tamen hiſce, qui eſt ex omnibus ignis, infinitus eſſe poteſt. At corpus eſt id quod omni ex parte dimẽſionem habet. Quare qui fieri poteſt vt plura quidem ſint diſſimilia, vnumquodque autem ipſorum ſit infinitum? Omni enim ex parte, quodque infinitum eſſe oportet. At verò neque diſſimilium partium, infinitum eſſe poteſt. Primò enim nõ eſt alius præter hos, motus: horum igitur vnum habebit. Quòd ſi hoc cõcedetur, eueniet ſanè, grauitatem, aut leuitatem infinitam in ratione rerum eſſe. Atqui impoſſibile eſt, id quod verſatur, infinitũ eſſe. Fieri enim non poteſt vt infinitum ipſum verſetur: nihil enim intereſt, hoc, an cælum infinitum eſſe dicatur. Hoc autem demonſtratum eſt, impoſſibile eſſe. At verò fieri omnino non poteſt, vt infinitum ſubeat motum. Aut enim ſecundùm naturam aut vt motu ciebitur. Atque ſi vi moueatur, eſt ipſius profectò & ſecundùm naturam motus. Quare & locus proprius alius erit, ad quem ipſum ſuapte natura feretur. At hoc, impoſſibile eſſe conſtat. Omnino autem fieri non poſſe, vt infinitum à finito patiatur, aut in quippiam finitum agat, ex hiſce patere poteſt. Sit enim infinitum quidem a, finitum autem b, & tempus, in quo finitum mouit, ac infinitum eſt motum, c. Si igitur ipſum a calefactum eſt, aut pulſum à b, aut aliud quippiam paſſum in tempore c, ſit d ipſo b minus, atque minus æquali in tempore moueat minus: ſit autem e, ab ipſo d alteratum. Quod igitur d eſt ad b, id ipſum e ad finitum aliquod erit, puta f. Atque alterare ponatur, æquale quidem æquali in tempore æquale, minus autem in æquali minus, & maius etiam maius, atque tantum ſanè, quantum ratio flagitabit, quam habet maius ad minus. A nullo ergo finito, vllo in tempore mouebitur infinitum,

Minus enim aliud, æquali in tẽpore à minore mouebitur, ad quod id quod rationem ſubit, finitum nimirum erit. Infinitum enim, ad finitum nullam rationem ſubire poteſt. At verò neque infinitũ, vllo in tempore finitum mouebit. Sit enim infinitum quidem a, finitum verò b, tempus autem c. Igitur d in c tempore, minus b ipſo mouebit. Sit illud f: atque quam rationem b totum habet ad f, eam habeat e ad d: ergo e mouebit ipſum b f in tempore c. Finitum ergo & infinitũ æquali in tẽpore alterabunt. At fieri non poteſt. Supponebatur enim maius, minore in tẽpore alterare: atque tẽpus ſumptum idem faciet ſemper. Quare nullum erit tempus, in quo mouebit. At verò fieri non poteſt, vt tempore infinito moueat, aut etiam moueatur: finem enim non habet: actio autẽ atque paſſio habent. Atqui neque fieri poteſt, vt infinitũ ab infinito aliquid patiatur. Sit enim tam a quam b infinitum, c d autem tempus, in quo paſſum eſt b ab a: pars igitur infinitæ, quæ eſt e, quoniam totum a fuit paſſum, non æquali tempore paſſa eſt idẽ. Supponatur enim minus tempore minore moueri, ſit e motum ab a, in tẽpore d f. Quod igitur eſt ipſum f d ad c d, id eſt ipſum e ad quippiã finitum ipſius b. Hoc igitur ab a, in c d tẽpore motũ eſſe, neceſſe eſt. Supponatur enim, ab eodem in maiore tempore, atque minore maius, minúſve pati, quę quidẽ diuiſa ſunt per temporis rationem. Nullo ergo tẽpore finito, infinitum ab infinito moueri poteſt: in infinito ergo. Sed infinitum quidẽ tempus, finẽ nõ habet. Id autem, quod eſt motum, habet. Si igitur omne ſenſibile corpus, actiuam, aut paſſiuam, aut vtranque potẽtiam habet, impoſſibile eſt, corpus infinitũ, ſenſibile eſſe. At verò quæ corpora etiã ſunt in loco, omnia ſenſibilia ſunt. Non ergo corpus vllum, extra cælum infinitum erit: at neque etiam finitum. Nullum ergo corpus omnino eſt extra cælum. Nam ſi intelligibile ſit, erit ſanè in loco. Extra enim, & intus, locũ ſignificat. Quare ſenſibile corpus erit: ſenſibile autem nullum, eſt nõ in loco. Licet etiã & rationes afferre magis logicas huiuſmodi. Neque enim verſari poteſt infinitum ſi ſit ſimilium partium, quippe cùm non ſit medium infiniti: id verò, quod verſatur, circa medium moueatur. Neque rectà moueri: oportebit enim alium tãtum infinitum eſſe locum, ad quem ſuapte natura mouebitur: & alium item tantùm, ad quem præter naturam feretur. Præterea, ſiue natura motum habeat rectà pergẽdi, ſiue vi moueatur, vtroque profectò modo mouentes vires infinitas eſſe oportet. Vires enim infinitæ ſunt infiniti, & infiniti vires ſunt infinitæ. Quare & id quod mouet, infinitum eſſe neceſſe eſt. Eſt autem in hiſce, quæ de motu ſunt dicta, ratio quædam, qua demonſtratur, nihil finitorum potentiam infinitam, neque quicquam infinitorum finitam habere. Si igitur id quod ſecundùm naturam mouetur, & præter naturam moueri poteſt: erunt infinita duo, id, inquam, quod ſic mouet, & id quod mouetur. Præterea, quid eſt id quod infinitum mouet? Nam ſi ipſum ſe ipſum mouet, animatum erit profectò. Hoc autem, quònam pacto infinitum animal eſſe poteſt? Sin aliud quippiam eſt, duo erunt infinita profectò: id, inquam, quod mouet, & id, quod mouetur, forma, potentiaque diuerſa. Si vniuerſum autem non ſit continuum, ſed, vt Democritus dicit, ac Leucippus, corpora vacuo ſint diſtincta, vnum omnium eſſe motum neceſſe eſt Sunt enim figuris diſtincta.

A ἔλαττον γὰρ ἄλλο ἐν τῷ ἴσῳ χρόνῳ ὑπὸ ἐλάττονος κινηθήσεται, πρὸς ὃ τὸ ἀνάλογον πεπερασμένον ἔσται. τὸ γὰρ ἄπειρον πρὸς τὸ πεπερασμένον ἐν οὐδενὶ λόγῳ ἐστίν. ἀλλὰ μὴν οὐδὲ τὸ ἄπειρον, ἐν οὐδενὶ χρόνῳ κινήσει τὸ πεπερασμένον. ἔστω γὰρ ἐφ' ᾧ τὸ α ἄπειρον, τὸ δὲ β πεπερασμένον, χρόνος ἐν ᾧ τὸ γ. οὐκοῦν τὸ δ ἐν τῷ γ ἔλαττον τοῦ β κινήσει· ἔστω τὸ ζ. ὃ δὴ ἐστὶ τὸ β ζ, ὅλον πρὸς τὸ ζ τὸ ε ἔχον, τὸν λόγον τοῦτον ἔστω πρὸς τὸ δ. κινήσει ἄρα τὸ ε, τὸ β ζ ἐν τῷ γ. πεπερασμένον δὴ καὶ τὸ ἄπειρον ἐν ἴσῳ χρόνῳ ἀλλοιώσει· ἀλλ' ἀδύνατον. ἐν ἐλάττονι γὰρ τὸ μεῖζον ὑπέκειτο. ἀλλ' ἀεὶ ὁ ληφθεὶς χρόνος ταὐτὸ ποιήσει. ὥστ' οὐκ ἔσται χρόνος οὐδεὶς B ἐν ᾧ κινήσει. ἀλλὰ μὴν ἐν ἀπείρῳ γε οὐκ ἔστι κινῆσαι, οὐδὲ κινηθῆναι· πέρας γὰρ οὐκ ἔχει· ἡ δὲ ποίησις καὶ τὸ πάθος ἔχει. οὐδ' ἄπειρον * δὴ ὑπ' ἀπείρου ἐνδέχεται οὐδὲν παθεῖν. ἔστω γὰρ τὸ α ἄπειρον, καὶ τὸ β, χρόνος δ' ἐν ᾧ ἔπαθε τὸ β ὑπὸ τοῦ α, ἐφ' ᾧ γ δ. τὸ δὴ ἐφ' ᾧ τὸ ε, τοῦ ἀπείρου μέρος, ἐπεὶ ὅλον πέπονθε τὸ β, οὐκ ἐν ἴσῳ χρόνῳ τὸ αὐτό. ὑποκείσθω γὰρ ἐν ἐλάττονι κινεῖσθαι τὸ ἔλαττον χρόνῳ. ἔστω τὸ ε κεκινημένον ὑπὸ τοῦ α ἐν τῷ δ. ὃ δὴ τὸ δ πρὸς τὸ γ δ, τὸ ε, ἐστὶ πρός τι τοῦ β πεπερασμένον. τοῦτο τοίνυν ἀνάγκη ὑπὸ τοῦ α κινηθῆναι ἐν τῷ γ δ χρόνῳ· ὑπὸ γὰρ τοῦ αὐτοῦ ὑποκείσθω ἐν τῷ πλείονι καὶ C ἐλάττονι χρόνῳ τὸ μεῖζον καὶ τὸ ἔλαττον πάσχειν, ὅσα ἀνάλογον τῷ χρόνῳ διῄρηται. ἐν οὐδενὶ ἄρα χρόνῳ δυνατὸν πεπερασμένῳ ἄπειρον ὑπ' ἀπείρου κινηθῆναι· ἐν ἀπείρῳ ἄρα. ἀλλ' ὁ μὲν ἄπειρος χρόνος οὐκ ἔχει τέλος. τὸ δὲ κεκινημένον ἔχει. εἰ τοίνυν πᾶν σῶμα αἰσθητὸν ἔχει δύναμιν ποιητικὴν, ἢ παθητικὴν, ἢ ἄμφω, ἀδύνατον σῶμα ἄπειρον αἰσθητὸν εἶναι. ἀλλὰ μὴν καὶ ὅσα γε σώματα ἐν τόπῳ, πάντα αἰσθητά. οὐκ ἔστιν ἄρα σῶμα ἄπειρον ἔξω τοῦ οὐρανοῦ οὐδέν· ἀλλὰ μὴν οὐδὲ μέχρι τινός. οὐδὲν ἄρα ὅλως σῶμα ἔξω τοῦ οὐρανοῦ. εἰ μὲν γὰρ νοητὸν, ἔσται * ἐν τόπῳ. τὸ γὰρ ἔξω καὶ εἴσω τόπον σημαίνει. ὥστ' ἔσται D αἰσθητόν· αἰσθητὸν δ' οὐδὲν μὴ ἐν τόπῳ. λογικώτερον δὲ ἐστὶν ἐπιχειρεῖν καὶ ὧδε· οὔτε γὰρ κύκλῳ οἷόν τε κινεῖσθαι τὸ ἄπειρον ὁμοιομερὲς ὄν· μέσον μὲν γὰρ τοῦ ἀπείρου οὐκ ἔστι. τὸ δὲ κύκλῳ, περὶ τὸ μέσον κινεῖται. ἀλλὰ μὴν οὐδ' ἐπ' εὐθείας οἷόν τε φέρεσθαι τὸ ἄπειρον· δεήσει γὰρ ἕτερον εἶναι τοσοῦτον τόπον ἄπειρον εἰς ὃν οἰσθήσεται κατὰ φύσιν· καὶ ἄλλον τοσοῦτον, εἰς ὃν παρὰ φύσιν· ἔτι, εἴτε φύσει ἔχει κίνησιν τοῦ εἰς εὐθὺ, εἴτε βίᾳ κινεῖται, ἀμφοτέρως δεήσει ἄπειρον εἶναι τὴν κινοῦσαν ἰσχύν· ἥτε γὰρ ἄπειρος ἀπείρου, καὶ τοῦ ἀπείρου ἄπειρος ἡ ἰσχύς. ὥστε ἔσται καὶ τὸ κινοῦν ἄπειρον. λόγος δ' ἐν τοῖς περὶ κινήσεως, ὅτι οὐδὲν ἔχει ἄπειρον E δύναμιν τῶν πεπερασμένων, οὐδὲ τῶν ἀπείρων πεπερασμένην. εἰ οὖν τὸ κατὰ φύσιν καὶ παρὰ φύσιν ἐνδέχεται κινηθῆναι, ἔσται ἄπειρα δύο, τό, τε κινοῦν οὕτω, καὶ τὸ κινούμενον. ἔτι τὸ κινοῦν τὸ ἄπειρον τί ἐστιν; εἰ μὲν γὰρ αὐτὸ ἑαυτὸ, ἔμψυχον ἔσται. τοῦτο δὲ πῶς δυνατὸν ἄπειρον εἶναι ζῷον; εἰ δ' ἄλλο τι κινοῦν, δύο ἔσται ἄπειρα, τό, τε κινοῦν καὶ τὸ κινούμενον, διαφέροντα τὴν μορφὴν καὶ τὴν δύναμιν. εἰ δὲ μὴ συνεχὲς τὸ πᾶν, ἀλλ' ὥσπερ λέγει Δημόκριτος καὶ Λεύκιππος, διωρισμένα τῷ κενῷ, μίαν ἀναγκαῖον πάντων εἶναι τὴν κίνησιν. διώρισται μὲν γὰρ τοῖς σχήμασι·

* γρ. δὴ

* γρ. ἐν τόπῳ. εἰ δὲ αἰσθητόν, ἔσται ἐν χώρῳ. τὸ γ.

τὴν δὲ φύσιν φασὶν αὐτῶν εἶναι μίαν, ὥσπερ ἂν εἰ χρυσὸς ἕκαστον εἴη * κεχωρισμένος· τούτων δὲ καθάπερ λέγομεν, ἀναγκαῖον εἶναι τὴν αὐτὴν κίνησιν· ὅπου γὰρ μία βῶλος, καὶ ἡ σύμπασα γῆ φέρεται· καὶ τό, τε πᾶν πῦρ καὶ ὁ σπινθὴρ εἰς τὸν αὐτὸν τόπον. ὥστ' οὔτε κοῦφον ἁπλῶς οὐδὲν ἔσται τῶν σωμάτων, εἰ πάντ' ἔχει βάρος· εἰ δὲ κουφότητα, οὐδὲν βαρύ. ἔτι, εἰ βάρος ἔχει ἢ κουφότητα, ἔσται ἢ ἔσχατόν τι τοῦ παντὸς, ἢ μέσον· τοῦτο δ' ἀδύνατον, ἀπείρου γ' ὄντος. ὅλως τε, οὗ μή ἐστι μέσον ἢ ἔσχατον, μηδὲ τὸ μὲν ἄνω, τὸ δὲ κάτω, τόπος οὐδεὶς ἔσται τοῖς σώμασι τῆς φορᾶς. τούτου δὲ μὴ ὄντος, κίνησις οὐκ ἔσται. ἀνάγκη γὰρ κινεῖσθαι ἤτοι παρὰ φύσιν ἢ κατὰ φύσιν. ταῦτα δ' ὥρισται τοῖς τόποις τοῖς τ' οἰκείοις, καὶ τοῖς ἀλλοτρίοις. ἔτι, εἰ οὗ παρὰ φύσιν τι μένει ἢ φέρεται, ἀνάγκη τινὸς ἄλλου εἶναι τοῦτον τὸν τόπον κατὰ φύσιν· (τοῦτο δὲ πιστὸν ἐκ τῆς ἐπαγωγῆς) ἀνάγκη δὴ μὴ πάντα ἢ βάρος ἔχειν, ἢ κουφότητα, ἀλλὰ τὰ μὲν, τὰ δὲ οὔ. ὅτι μὲν οὖν οὐκ ἔστι τὸ σῶμα τὸ τοῦ παντὸς ἄπειρον, ἐκ τούτων φανερόν.

* γρ. κεχωρισμένον.

Naturam autem ipſorum vnam inquiunt eſſe, perinde atque ſi quodque ſeparatū aurum eſſet. Horum autem, vti dicimus, eundem eſſe motum neceſſe eſt. Quò namque gleba fertur, eò & vniuerſa terra mouetur: & totus ignis, atque ſcintilla, eundē ad locum feruntur. Quare ſi cuncta pondus habēt, nullum corpus leue ſimpliciter erit. Si cuncta ſunt leuia, nullum erit particeps grauitatis. Præterea ſi pondus habent, vel leuitatem, aut vltimum quid vniuerſi, aut medium erit. Hoc autem eſſe nequit: quippe cùm ſit infinitum. Omnino autem vbi medium nō eſt, aut vltimum, neque hoc quidē eſt ſupra, hoc autem infra: & nullus lationis locus corporibus erit. At hic ſi non ſit, motus non erit. Moueantur enim, aut ſecundùm naturam, aut præter naturam, neceſſe eſt. Hæc autem, definita ſunt propriis alieniſque locis. Præterea ſi vbi præter naturam manet quippiam, aut quò fertur, illum alij locum cuipiam competere natura neceſſe eſt, (quod quidē ex inductione patere poteſt) non omnia ſanè pōdus, aut leuitatem habere, ſed quædam habere, quædā non habere neceſſe eſt. Vniuerſi igitur corpus infinitum non eſſe, ex iis quæ diximus, patet.

ΚΕΦΑΛ. ε'.

Ὅτι οὐχ οἷόν τε πλείους οὐρανοὺς εἶναι.

Διότι δὲ οὐδὲ πλείους οἷόν τ' οὐρανοὺς εἶναι λέγωμεν. τοῦτο γὰρ ἔφαμεν ἐπισκεπτέον, εἴ τις μὴ νομίζοι καθόλου δεδεῖχθαι περὶ τῶν σωμάτων, ὅτι ἀδύνατον ἐκτὸς εἶναι τοῦ κόσμου τοῦδε ὁτιοῦν αὐτῶν, ἀλλὰ μόνον ἐπὶ τῶν ἀορίστως κειμένων εἰρῆσθαι τὸν λόγον. ἅπαντα γὰρ καὶ μένει, καὶ κινεῖται βίᾳ, καὶ κατὰ φύσιν· κατὰ φύσιν μὲν, ἐν ᾧ μένει μὴ βίᾳ, καὶ φέρεται· καὶ εἰς ὃν φέρεται καὶ μένει· ἐν ᾧ δὲ βίᾳ, καὶ φέρεται βίᾳ· καὶ εἰς ὃν βίᾳ φέρεται, βίᾳ καὶ μένει. ἔτι, εἰ βίᾳ ἥδε ἡ φορὰ, ἡ ἐναντία κατὰ φύσιν. ἐπὶ δὲ τὸ μέσον τὸ ἐνταῦθα εἰ βίᾳ οἰσθήσεται ἡ γῆ ἐκεῖθεν, ἐντεῦθεν οἰσθήσεται ἐκεῖ κατὰ φύσιν. καὶ εἰ μένει ἐνταῦθα ἡ ἐκεῖθεν μὴ βίᾳ, καὶ οἰσθήσεται δεῦρο κατὰ φύσιν. μία γὰρ ἡ κατὰ φύσιν. ἔτι ἀνάγκη πάντας τοὺς κόσμους ἐκ τῶν αὐτῶν εἶναι σωμάτων, ὁμοίους γε ὄντας τὴν φύσιν. ἀλλὰ μὴν καὶ τῶν σωμάτων ἕκαστον ἀναγκαῖον τὴν αὐτὴν ἔχειν δύναμιν· οἷον, λέγω πῦρ καὶ γῆν, καὶ τὰ μεταξὺ τούτων· εἰ γὰρ ὁμώνυμα ταῦτα καὶ μὴ κατὰ τὴν αὐτὴν ἰδέαν λέγονται, τὰ ἐκεῖ τοῖς παρ' ἡμῖν, καὶ τὸ πᾶν * ὁμωνύμως ἂν λέγοιτο κόσμος. δῆλον τοίνυν ὅτι τὸ μὲν ἀπὸ τοῦ μέσου φέρεσθαι πέφυκε, τὸ δ' ἐπὶ τὸ μέσον αὐτῶν, εἴπερ πᾶν ὁμοειδὲς τὸ πῦρ τῷ πυρὶ καὶ τῶν ἄλλων ἕκαστον, ὥσπερ καὶ τὰ ἐν τούτῳ μόρια τοῦ πυρός. ὅτι δ' ἀναγκαῖον οὕτως ἔχειν, ἐκ τῶν περὶ τὰς κινήσεις ὑποθέσεων φανερόν. αἵ τε γὰρ κινήσεις πεπερασμέναι, ἕκαστόν τε τῶν στοιχείων λέγεται καθ' ἑκάστην τῶν κινήσεων. ὥστ' εἴπερ καὶ αἱ κινήσεις αἱ αὐταί, καὶ τὰ στοιχεῖα ἀναγκαῖον εἶναι πανταχοῦ τὰ αὐτά. πέφυκεν ἄρα φέρεσθαι καὶ ἐπὶ τόδε τὸ μέσον τὰ ἐν ἄλλῳ κόσμῳ τῆς γῆς μόρια, καὶ πρὸς τόδε τὸ ἔσχατον τὸ ἐκεῖ πῦρ. ἀλλ' ἀδύνατον· τούτου γὰρ συμβαίνοντος, ἀνάγκη φέρεσθαι, ἄνω μὲν τὴν γῆν * ἐν τῷ οἰκείῳ κόσμῳ, τὸ δὲ πῦρ ἐπὶ τὸ μέσον. ὁμοίως δὲ καὶ τὴν ἐντεῦθεν γῆν ἀπὸ τοῦ μέσου φέρεσθαι κατὰ φύσιν, πρὸς τὸ ἐκεῖ * φερομένην μέσον,

* γρ. ὁμ. λέγοιτ' ἂν ὁ κ.

* γρ. ἐπὶ τὸ ἐκείνου τὸ πῦρ.

* γρ. φερόμενον

CAPVT VIII.

Quòd cæli plures eſſe non poſſint.

Nvnc autē dicamus, cur & plures eſſe cæli non poſsūt. Hoc enim conſiderandū diximus eſſe, ſi quiſpiā demonſtratū eſſe de corporibus vniuerſaliter non putet, extra mundū hunc nihil ipſorū eſſe poſſe, ſed ſermonē dictum eſſe duntaxat exiſtimet de hiſce corporibus, quæ indefinitè ponuntur. Omnia itaque corpora, & vi, & natura, & manent, & etiam mouentur. atque quo in loco non vi manēt, ad eum ſecundùm naturam feruntur, & ad quem non vi feruntur, in eo manent natura. Quo verò in loco vi manent, ad eum & vi ſanè feruntur: & ad quē vi feruntur, in eo vi quoque manēt. Præterea, ſi hæc latio vi fit, contraria cōpetit ſecūdùm naturam. atque ſi ad hoc medium illinc vi terra feretur, hinc illuc ſecundùm naturā feretur. Et ſi hic terra nō vi manet, & huc natura ſanè feretur. Vnū enim eum motum, qui ſecundùm naturā competit, eſſe conſtat. Præterea, Mūdos vniuerſos ex eiſdē corporibus conſtare, cùm ſint eiuſdē naturæ, neceſſe eſt. Corporū etiam vnūquodq; potentiā eandē habere neceſſe eſt: vt terrā, ignē, & ea quæ inter hæc collocantur. Nā ſi hæc ſolo conueniunt nomine, & non forma, eadē ea quæ illic & hîc ſunt, dicuntur, vniuerſum quoque nomine profectò tantùm Mundus dicetur. Patet igitur, ipſorū aliud è medio, aliud ad medium aptum eſſe ſuapte natura ferri, ſi ignis omnis eiuſdē eſt formæ, & vnumquodque etiam cæterorum, quemadmodū & eæ partes ignis, quæ hoc in Mundo ſunt. Hæc autem ita ſeſe habere neceſſariò, ex ſuppoſitionibus hiſce patet, quas de motibus priùs attulimus. Nam & motiones finitæ ſunt, & vnumquodque elementorū per vnumquemque motuum dicitur. Quare ſi motiones eædē ſunt, & elemēta ſint eadē vbique, neceſſe eſt. Partes igitur terræ, quæ in alio Mūdo ſunt, ad hoc medium aptæ ſunt ferri: & ignis etiā, qui eſt ibi, ad hoc vltimū ferri ſuapte natura poteſt. at impoſſibile eſt. Si enim hoc eueniat, ſurſum quidē terrā ſuo in mūdo, ignē autem ad medium ferri neceſſe eſt. Similimodo & terram, quæ eſt hîc, è medio ſecundùm naturam ferri, medium illius mundi petentem, neceſſe eſt,

A propterea quòd mundi inter ſeſe talẽ habent poſitionẽ. Aut enim ponendũ non eſt, eandem corporũ naturã ſimplicium in cælis pluribus eſſe: aut ſi eandem eſſe ponamus, ipſum mediũ vnum, & vltimũ itidem vnum faciamus, neceſſe eſt. Quòd ſi hoc abſurdũ eueniat, vno plures eſſe mundos impoſſibile eſt. Cenſere autẽ aliam ſimplicium eſſe naturam, ſi minùs, aut plùs à propriis locis diſtent, metas egredietur rationis. Quid enim refert, tãta longitudine, an tanta diſtent? Different enim tanto ratione magis, quanto plus diſtent: formã autem eandem habent. At verò motum ipſorũ aliquem eſſe, neceſſe eſt: patet enim, ipſa moueri. Omnibúſne igitur motibus vi moueri, contrariiſque dicemus? At quod omnino moueri aptum non eſt, id vt vi moueatur B fieri nequit. Si igitur eſt quiſpiam motus ipſorũ ſecundùm naturã, & eorum ſanè, quæ ſunt eiuſdem formæ, & ſingulorũ ad vnum numero locũ, ad hoc, inquam, mediũ, & ad hoc vltimũ, motionẽ eſſe neceſſe eſt. Si verò ad eadẽ ſpecie, plura autẽ numero motus ipſorum ſit, propterea quòd & ſingula plura quidem ſunt, ſpecie verò non differunt: non huic quidẽ partium tale, huic autẽ non tale, ſed ſimiliter omnibus idẽ accommodabitur. Eadẽ enim omnes inter ſeſe ſpecie conſtat eſſe, numero verò quáuis à quauis differre. Hoc autẽ ideo dico, quia partes, quæ hic ſunt, & partes, quæ in altero mundo ſunt, inter ſeſe ſimiliter habent, & ea quæ hinc eſt ſumpta, nullã differentiã ad earum partiũ vllam habet, C quæ in alio, & in eodem ſunt mundo, ſed eodem ſe habet ad omnes: quippe cùm inter ſe non differant forma. Quare aut haſce ſuppoſitiones mouere, aut medium vnum, & vltimum vnum eſſe, neceſſe eſt. Quod ſi ſit, & cælũ his eiſdem profectò ſignis, eiſdémque neceſſitatibus vnũ ſolũ, & non plures eſſe neceſſe eſt. Eſſe autẽ quippiam, quò ferri terra eſt apta, ac ignis, ex cæteris etiã patet. Omnino enim id quod mouetur, ex quopiã in quippiam mutatur. Atque hæc ex quo, inquã, & in quod, ſpecie differũt. Omnis autem mutatio, finita eſt ſanè. Id enim quod ſanatur, ex morbo it ad ſanitatem: & id quod accreſcit, è quãtitate parua ad magnã accedit: & id D ergo, quod fertur, legẽ eandẽ ſubit: etenim hoc ex loco in locũ eũdo fit. Id ergo, ex quo, & id, ad quod aptũ eſt ferri, ſpecie differre oportet, quemadmodũ id quod ſanatur, nõ quouis ſine vllo diſcrimine pergit, neq; quò vult is, qui mouet. Et ignis ergo, & terra, non in infinitũ, ſed in oppoſita ſanè feruntur. Supra autẽ, & infra, sũt ea quæ in loco ſubeunt oppoſitionem. Quibus efficitur vt hæc lationis ſint fines. Nam & cõuerſio, oppoſita quodã modo habet ea quæ per diametrũ diſtãt: toti verò, nõ eſt cõtrariũ quicquã. Quare & ex hiſce motio, quodã modo in oppoſita fit, atq; finita. Si igitur quiſpiã exitus, & non ſine fine ferãtur, neceſſe eſt. Nõ ferri autẽ hæc in infinitũ, ſignũ etiã hoc eſſe videtur. Terra náq;, & ignis, quò propinquiora sũt locis ſuis, illa quidẽ E medio, ignis verò ſupero loco, eo celeriùs porrò ferũtur. Quòd ſi infinitus eſſet ſuperus locus, infinita nimirũ & celeritas eſſet. Et ſi celeritas infinita eſſet & grauitas etiã & leuitas infinita eſſet. Nam vt id, quod inferiùs pergeret, celeritate differens, grauitate celere eſſet: ſic ſi infinita eſſet huius accretio, & incrementum ſanè celeritatis infinitum etiam eſſet. At verò neque ab alio, neque vi, vt quidã inquiunt, extruſum, ſurſum alterũ ipſorum, deorſum alterum fertur. Tardiùs enim maior ignis ſurſum, & maior terra deorſum vtique moueretur. Nunc autem contrarium fit. Ignis enim maior, & terra etiam maior celeriùs ſemper proprium locum petit.

A διὰ τὸ τοὺς κόσμους οὕτω κεῖσθαι πρὸς ἀλλήλους. ἢ γὰρ οὐ θετέον τὴν αὐτὴν εἶναι φύσιν τῶν ἁπλῶν σωμάτων ἐν τοῖς πλείοσιν οὐρανοῖς, ἢ λέγοντας οὕτως, τὸ μέσον ἓν ποιεῖν ἀνάγκη, καὶ τὸ ἔσχατον. τούτου δ' ὄντος τοῦ ἀτόπου, ἀδύνατον εἶναι κόσμους πλείους ἑνός. τὸ δ' ἀξιοῦν ἄλλην φύσιν εἶναι τῶν ἁπλῶν σωμάτων, ἐὰν ἀπέχωσιν ἔλαττον ἢ πλεῖον τῶν οἰκείων τόπων, ἄλογον· τί γὰρ διαφέρει τὸ τοσονδὶ φάναι μῆκος ἀπέχειν, ἢ τοσονδί; διοίσει γὰρ κατὰ λόγον, ὅσῳ πλεῖον μᾶλλον, τὸ δ' εἶδος τὸ αὐτό. ἀλλὰ μὴν ἀνάγκη γ' εἶναί τινα κίνησιν αὐτῶν· ὅτι μὲν γὰρ κινοῦνται, φανερόν. πότερον οὖν βίᾳ πάσας ἐροῦμεν κινεῖσθαι B καὶ τὰς ἐναντίας; ἀλλ' ὃ μὴ πέφυκεν ὅλως κινεῖσθαι, ἀδύνατον τοῦτο κινεῖσθαι βίᾳ. εἰ τοίνυν ἐστί τις κίνησις αὐτῶν κατὰ φύσιν, ἀνάγκη τῶν ὁμοειδῶν, καὶ τῶν καθ' ἕκαστον πρὸς ἕνα ἀριθμῷ τόπον ὑπάρχειν τὴν κίνησιν· οἷον, πρὸς τοδὶ τὸ μέσον, καὶ πρὸς τοδὶ τὸ ἔσχατον. εἰ δὲ πρὸς τὰ εἴδει ταὐτά, πλείω δέ, διότι καὶ τὰ καθ' ἕκαστα πλείω μέν, εἴδει δὲ ἕκαστον αὐτῶν ἀδιάφορον,* οὐ τὸ μέν, τὸ δ' οὔ, τοιοῦτον ἔσται τῶν μορίων, ἀλλ' ὁμοίως πᾶσιν· ὁμοίως γὰρ πάντα κατ' εἶδος ἀδιάφορα ἀλλήλων, ἀριθμῷ δ' ἕτερον [ὁτιοῦν] ὁτουοῦν. λέγω δὲ τοῦτο, ὅτι εἰ τὰ ἐνταῦθα μόρια πρὸς ἄλληλα, καὶ τὰ ἐν ἑτέρῳ κόσμῳ ὁμοίως ἔχει,* καὶ τὸ ληφθὲν ἐντεῦθεν, οὐδὲν διαφε- C ρόντως πρὸς τι τῶν ἐν ἄλλῳ τινὶ κόσμῳ μορίων, καὶ πρὸς τῶν ἐν αὐτῷ, ἀλλ' ὡσαύτως. διαφέρουσι γὰρ οὐδὲν εἴδει ἀλλήλων. ὥστ' ἀναγκαῖον ἢ κινεῖν ταύτας τὰς ὑποθέσεις, ἢ τὸ μέσον ἓν εἶναι καὶ τὸ ἔσχατον. τούτου δὲ ὄντος, ἀνάγκη καὶ τὸν οὐρανὸν ἕνα μόνον εἶναι, καὶ μὴ πλείους, τοῖς αὐτοῖς τεκμηρίοις τούτοις καὶ ταῖς αὐταῖς ἀνάγκαις. ὅτι δ' ἔστι τι οὗ πέφυκεν ἡ γῆ φέρεσθαι καὶ τὸ πῦρ, δῆλον καὶ ἐκ τῶν ἄλλων. ὅλως γὰρ τὸ κινούμενον ἔκ τινος εἴς τι μεταβάλλει, καὶ ταῦτα ἐξ οὗ καὶ εἰς ὃ εἴδει διαφέρει. πᾶσα δὲ πεπερασμένη μεταβολή, οἷον τὸ ὑγιαζόμενον ἐκ νόσου εἰς ὑγίειαν, καὶ τὸ αὐξανόμενον ἐκ μικρότητος εἰς μέγε- D θος· καὶ τὸ φερόμενον ἄρα. καὶ γὰρ τοῦτο γίνεται ποθέν ποι. δεῖ ἄρα εἴδει διαφέρειν, ἐξ οὗ καὶ εἰς ὃ πέφυκε φέρεσθαι· ὥσπερ τὸ ὑγιαζόμενον οὐχ οὗ ἔτυχεν, οὐδ' οὗ βούλεται ὁ κινῶν. καὶ τὸ πῦρ ἄρα καὶ ἡ γῆ οὐκ εἰς ἄπειρον φέρονται, ἀλλ' εἰς ἀντικείμενα. ἀντίκειται δὲ κατὰ τόπον τὸ ἄνω τῷ κάτω· ὥστε ταῦτα πέρατα τῆς φορᾶς. ἐπεὶ καὶ ἡ κύκλῳ ἔχει πως ἀντικείμενα τὰ κατὰ διάμετρον. τῇ δ' ὅλῃ οὐκ ἔστιν ἐναντίον οὐδέν· ὥστε καὶ τούτοις τρόπον τινὰ ἡ κίνησις εἰς τὰ ἀντικείμενα καὶ πεπερασμένα. ἀνάγκη ἄρα εἶναί τι τέλος, καὶ μὴ εἰς ἄπειρον φέρεσθαι. τεκμήριον δὲ τοῦ μὴ εἰς ἄπειρα φέρεσθαι, καὶ τὸ τὴν γῆν μὲν ὅσῳ ἂν ἐγγυτέρω ᾖ τοῦ μέσου, θᾶττον φέρεσθαι. τὸ δὲ πῦρ, ὅσῳ ἂν E τοῦ ἄνω. εἰ δ' ἄπειρον ἦν, ἄπειρος ἂν ἦν καὶ ἡ ταχυτής, καὶ τὸ βάρος, καὶ ἡ κουφότης. ὡς γὰρ τὸ κατωτέρω ταχυτῆτι ἕτερον τῷ* βαρεῖ ἂν ἦν ταχύ, οὕτως εἰ ἄπειρος ἦν ἡ τούτου ἐπίδοσις, καὶ ἡ τῆς ταχυτῆτος ἐπίδοσις ἄπειρος ἂν ἦν. ἀλλὰ μὴν οὐδ' ὑπ' ἄλλου φέρεσθαι αὐτῶν, τὸ μὲν ἄνω, τὸ δὲ κάτω· οὐδὲ βίᾳ, ὥσπερ τινές φασι τῇ ἐκθλίψει. βραδύτερον γὰρ ἂν ἐκινεῖτο τὸ πλέον πῦρ ἄνω, καὶ ἡ πλείων γῆ κάτω. νῦν δὲ τοὐναντίον ἀεὶ τὸ πλέον πῦρ θᾶττον φέρεται, καὶ ἡ πλείων γῆ εἰς τὸν* αὑτῆς τόπον.

* γρ. οὐ τὸ μέν, τὸ δ'

* γρ. ἢ τὸ πλησίον.

* γρ. βαρύ

* γρ. αὐτῶν

οὐδὲ θᾶττον ἂν πρὸς τῷ τέλει ἐφέρετο, εἰ τῇ βίᾳ καὶ τῇ ἐκθλίψει. πάντα γὰρ τοῦ βιασαμένου πορρωτέρω γιγνόμενα βραδύτερον φέρεται· καὶ ὅθεν ἂν βία, ἐκεῖ φέρονται οὐ βίᾳ· ὥστ᾽ ἐκ τούτων θεωροῦσιν ἐστὶ λαβεῖν τὴν πίστιν περὶ ὧν λέγομεν ἱκανῶς. ἔτι δὲ καὶ διὰ τῶν ἐκ τῆς πρώτης φιλοσοφίας λόγων δειχθείη ἄν, καὶ ἐκ τῆς κύκλῳ κινήσεως, ἣν ἀναγκαῖον ἀΐδιον ὁμοίως ἐνταῦθα εἶναι, καὶ ἐν τοῖς ἄλλοις κόσμοις. δῆλον δὲ κἂν ὧδε γένοιτο σκοπουμένοις, ὅτι ἀνάγκη εἶναι ἕνα τὸν οὐρανόν. τριῶν γὰρ ὄντων σωματικῶν στοιχείων, τρεῖς ἔσονται καὶ οἱ τόποι τῶν στοιχείων· εἷς μὲν, ὁ τοῦ ὑφισταμένου σώματος ὁ περὶ τὸ μέσον· ἄλλος δὲ, ὁ τοῦ κύκλῳ φερομένου, ὅσπερ ἐστὶν ἔσχατος· τρίτος, ὁ μεταξὺ τούτων * ὁ τοῦ μεταξὺ σώματος. ἀνάγκη γὰρ ἐν τούτῳ εἶναι τὸ ἐπιπολάζον· εἰ γὰρ μὴ ἐν τούτῳ, * ἔξω ἔσται· ἀλλ᾽ ἀδύνατον ἔξω. τὸ μὲν γὰρ ἀβαρές, τὸ δ᾽ ἔχον βάρος. κατωτέρω δὲ ὁ τοῦ βάρος ἔχοντος σώματος τόπος, εἴπερ ὁ πρὸς τῷ μέσῳ τοῦ βαρέος. ἀλλὰ μὴν οὐδὲ παρὰ φύσιν· ἄλλῳ γὰρ ἔσται κατὰ φύσιν, ἄλλῳ δὲ οὐκ ἦν. ἀνάγκη ἄρα ἐν τῷ μεταξὺ εἶναι. τούτου δ᾽ αὐτοῦ, τίνες εἰσὶ διαφοραὶ, ὕστερον ἐροῦμεν. περὶ μὲν οὖν τῶν σωματικῶν στοιχείων ποῖά τ᾽ ἐστὶ καὶ πόσα, καὶ τίς ἑκάστου τόπος, ἔτι δ᾽ ὅλως, πόσοι τὸ πλῆθος οἱ τόποι, δῆλον ἡμῖν ἐκ τῶν εἰρημένων.

* γρ. ἐν τῷ μέσῳ ν.
* γρ. ἔσω ἔξω.

ΚΕΦΑΛ. θ'.

Ὅτι εἷς οὐρανός ἐστι καὶ ἀΐδιος.

ΟΤι δ᾽ οὐ μόνον εἷς ἐστιν [οὐρανὸς,] ἀλλὰ καὶ ἀδύνατον γενέσθαι πλείους· ἔτι δ᾽, ὡς ἀΐδιος ἄφθαρτος ὢν καὶ ἀγένητος, λέγωμεν, πρῶτον διαπορήσαντες περὶ αὐτοῦ. δόξειε γὰρ ἂν ὧδε σκοπουμένοις ἀδύνατον ἕνα καὶ μόνον εἶναι αὐτόν· ἐν ἅπασι γὰρ καὶ τοῖς φύσει καὶ τοῖς ἀπὸ τέχνης γεγενημένοις καὶ συνεστῶσιν, ἕτερόν ἐστιν αὐτή τε καθ᾽ αὑτὴν ἡ μορφὴ καὶ μεμιγμένη μετὰ τῆς ὕλης· οἷον, τῆς σφαίρας ἕτερον τὸ εἶδος, καὶ ἡ χρυσῆ, καὶ ἡ χαλκῆ σφαῖρα· καὶ πάλιν κύκλου ἑτέρα ἡ μορφὴ καὶ ὁ χαλκοῦς καὶ ὁ ξύλινος κύκλος· τὸ γὰρ τί ἦν εἶναι λέγοντες σφαίρᾳ ἢ κύκλῳ, οὐκ ἐροῦμεν ἐν τῷ λόγῳ χρυσὸν ἢ χαλκὸν, ὡς οὐκ ὄντα ταῦτα τῆς οὐσίας· ἂν δὲ τὴν χαλκῆν ἢ χρυσῆν ἐροῦμεν, καὶ ἐὰν μὴ δυνώμεθα νοῆσαι μηδὲ λαβεῖν ἄλλο τι παρὰ τὸ καθ᾽ ἕκαστον· (ἐνίοτε γὰρ οὐδὲν κωλύει τοῦτο συμβαίνειν· οἷον, εἰ μόνος εἷς ληφθείη κύκλος.) οὐδὲν γὰρ ἧττον ἄλλο ἔσται τὸ κύκλῳ εἶναι, καὶ τῷδε τῷ κύκλῳ, καὶ τὸ μὲν εἶδος, τὸ δὲ εἶδος ἐν τῇ ὕλῃ, καὶ τῶν καθ᾽ ἕκαστον. ἐπεὶ οὖν ἐστιν ὁ οὐρανὸς αἰσθητὸς, τῶν καθ᾽ ἕκαστον ἂν εἴη· τὸ γὰρ αἰσθητὸν ἅπαν, ἐν τῇ ὕλῃ ὑπῆρχεν. Εἰ δὲ τῶν καθ᾽ ἕκαστον, ἕτερον ἂν εἴη τῷδε τῷ οὐρανῷ εἶναι, καὶ οὐρανῷ ἁπλῶς· ἕτερον ἄρα ὅδε ὁ οὐρανὸς καὶ οὐρανὸς ἁπλῶς. καὶ τὸ μὲν ὡς εἶδος καὶ μορφὴ, τὸ δ᾽ ὡς τῇ ὕλῃ μεμιγμένον. ὧν δ᾽ ἐστὶ μορφή τις καὶ εἶδος, ἤτοι ἐστὶν, ἢ ἐνδέχεται πλείω γενέσθαι τὰ καθ᾽ ἕκαστα. εἴτε γὰρ ἐστὶν εἴδη, καθάπερ φασί τινες, ἀνάγκη τοῦτο συμβαίνειν· εἴτε καὶ χωριστὸν μηδὲν τῶν τοιούτων, οὐδὲν ἧττον. ἐπὶ πάντων γὰρ οὕτως ὁρῶμεν, ὅσων ἡ οὐσία ἐν ὕλῃ ἐστὶ, πλείω καὶ ἄπειρα ὄντα τὰ ὁμοειδῆ.

A Neque porrò celeriùs prope finē pergeret, ſi vi protruſioneq; moueretur. Omnia nãq; quæ ita mouētur, cùm lõgiùs ab eo quod vim attulit, diſtāt, tardiùs ſanè ferũtur: atq; vnde vi pulſa sũt, illuc nõ vi ſed ſuopte nutu ferũtur. Quare fides ex hiſce, ſumi de hiſce quibus de loquimur, ſatis poteſt. Præterea per rationes etiã, quæ ex prima Philoſophia adduci poſsũt, & ex ipſa conuerſione (quã quidē hic ſimiliter, & in cæteris mũdis perpetuam eſſe, neceſſe eſt) hoc idē demõſtrari profectò poteſt. Fuerit inſuper manifeſtũ, cælũ neceſſariò vnũ eſſe, etſi hoc cõſiderabimus modo. Nã cùm tria ſint elemēta corporea, tria nimirũ & loca elementorũ erũt. Atq; vnus quidē locus corporis eius erit quod ſub omnibus col-
B locatur, qui quidē circa mediũ eſt. Alius autē eius quod orbe fertur, qui quidē vltimus eſt. Et tertius, eius quod eſt mediũ corpus, qui quidem in[illegible] loca medius eſt. In hoc enim id eſſe corpus [illegible] eſt, quod eminet leuitate. Nã ſi in hoc nõ e[illegible] collocabitur ſanè. At fieri non poteſt. Ali[illegible] põdere caret, aliud põdus habet. Locus au[illegible] corporis, quod põdus habet, inferior eſt, ſi [illegible] in medio, grauis eſt corporis locus. At ne[illegible]ter naturã in hoc eſt loco: cõpetet enim a[illegible] dùm naturã. At nullum eſt aliud corpus [illegible] rerum, vt patuit. In ipſo ergo medio, qui eſt [illegible] dicta loca, hoc eſſe neceſſe eſt. Huius autem ipſius quænam ſint differentiæ, poſteriùs explicabimus.
C De corporeis igitur elementis quænam, & quot ſunt, & quis cuiuſque locus, & quot inſuper ſunt multitudine ipſa loca, ex his quæ diximus, patuit.

CAPVT IX.

Non ſolùm non eſſe plures mundos, ſed & fieri non poſſe vt ſint plures. Cælum ex omni ſenſibili materia conſtare. Non contingere extra cælum corpus vllum factum eſſe.

DIcamus autem deinceps oportet, Mundum non ſolùm vnum eſſe, ſed etiam plures eſſe non poſſe, & inſuper perpetuum eſſe, cùm neque corruptionem, neque generationem ſubire poſſit: primò dubitatione de ipſo allata. Nam ſi hoc pacto conſiderabimus, impoſſibile eſſe videbitur, vnum ipſum ac ſolum eſſe. Vniuerſis enim rebus, quæ aut
D à natura, aut ab arte ſunt factæ, aliud eſt ipſa per ſe ipſã forma, & quæ eſt cũ materia miſta, ceu ſphæræ forma alia eſt, & aurea, atque ænea ſphera: & circuli rurſus alia eſt ipſa forma, & æneus circulus, ligneúſve. Sphæræ namq; quidditatē, aut circuli aſſignãtes, non aurũ, nõ æs in ratione dicemus: quippe cùm hæc ſubſtantiæ huiuſce non ſint. ſi verò æneã aut aureã ſphæram dicemus, etiamſi præter ſingulare quicquã aliud intelligere, aut ſumere non poſſumus: (interdũ enim vt hoc accidat, nihil obſtat: veluti ſi ſolus vnus circulus fuerit ſumptus:) nõ minùs enim aliud eſſe circuli, & huius circuli erit, & illud quidē forma, hoc autē in materia forma erit, ac ſingulare. Cùm igitur cælũ ſenſibile ſit, ſingula-
E re erit profectò. Sēſibile enim omne, in materia eſt. Si ſingulare autē eſt, aliud eſſe huiuſce cæli, & cæli ſimpliciter, erit. Eſt ergo aliud, hoc cælum, & ſimpliciter cælum: atque hoc eſt vt ſpecies, atque forma, illud vt cum materia miſtum. Quorum autem forma quædam, & ſpecies eſt, eorum aut ſunt, aut eſſe plura ſingulariter poſſunt. Nam ſi ſint, vt quidam inquiunt, formæ: hoc accidere ſanè neceſſe eſt. Sin nihil ſit talium ſeparatum, non minùs idem euenire neceſſe eſt. In omnibus enim hiſce, quorum ſubſtantia in materia eſt, plura eſſe, & infinita ea quæ ſunt eiuſdem ſpeciei, videmus.

Quare aut plures ſunt cæli, aut plures eſſe profectò poſſunt. Ex his igitur quiſpiam exiſtimauerit, & eſſe plures cælos, & etiam eſſe poſſe. Conſiderandum autem rurſus eſt, quidnam horum dicitur rectè, & quid non rectè. Aliam igitur eſſe formæ rationem, eam quæ ſine materia eſt, aliam, eam quæ in materia eſt, rectè profectò dicitur: atque verum eſſe ponatur. Nulla tamen ob id ipſum mundos aut plures eſſe, aut plures eſſe poſſe, neceſſitas eſt: ſi hic vniuerſa ex materia cōſtat, vt & conſtare videtur. Hoc autem modo forſitā id quod dicitur, magis patebit. Si enim ſimitas, concauitas eſt in naſo, aut in carne, caróque materies eſt ſimitatis: ſi omnibus ex carnibus vna fieret caro, atque in hac ſimitas eſſet orta, nullum aliud ſimū aut eſſet, aut fore omnino poſſet. Simili quoq; modo ſi materies in homine caro eſt, atque oſſa, ſi vniuerſa ex carne atq; oſſibus fieret homo, atque illa diſſolui nō poſſent, alius homo profectò eſſe non poſſet. Eadem fuerit & in cæteris ratio. Omnino enim quorum ſubſtantia in ſubiecta materia quadam eſt, eorum nihil oriri poteſt, ſi non aliqua materia ſit. Cælum autem, eſt quidē ſingulare, & ex materia conſtat. Sed ſi nō ex ipſius materiei parte, ſed ex vniuerſa materia conſtat, eſſe quidem ipſius cæli, atque huiuſce cęli, aliud eſt. Non tamen aut aliud erit, aut plures fieri poſſunt: propterea quòd vniuerſam hoc materiā eſt complexum. Reſtat ergo hoc demonſtrare, ex vniuerſo, inquam, ipſum naturali corpore, ſenſibilique conſtare. Dicamus autem primùm quidnam cælū eſſe dicimus, atque quot modis: quò magis id nobis manifeſtum, quod quæritur, fiat. Vno igitur modo cælum dicimus, ſubſtantiam vltimæ vniuerſi conuerſionis: aut id naturale corpus, quod eſt in vltima vniuerſi conuerſione. Vltimum enim, ſuperúmque corpus, cælum maximè conſueuimus appellare, in quo & vniuerſum diuinum dicimus eſſe. Alio modo cælū id corpus dicimus, quod eſt proximum vltimę vniuerſi conuerſioni, in quo Luna, & Sol, & nōnullæ ſtellarum ſunt collocatæ: hæc enim in cælo dicimus eſſe. Inſuper alio modo dicitur cælum, id corpus quod à conuerſione vltima cōtinetur: totum enim, ac vniuerſum, cælum dicere cōſueuimus. Cùm igitur cælum tribus modis dicatur, totum id quod ab extrema conuerſione continetur, ex vniuerſo naturali, ſenſibilique corpore conſtare neceſſe eſt: propterea quòd extra cælū neque eſt quicquā corpus, neque eſſe omnino poteſt. Nam ſi extra vltimam conuerſionem corpus ſit naturale, ipſum aut ſimplicium quippiam corporum, aut compoſitorum eſſe, & aut ſecundùm naturam, aut præter naturam ſeſe habere, neceſſe eſt. Simplicium igitur corporum quicquam omnino non erit. Demonſtratum eſt enim, id quod orbe fertur, mutare ſuum locum non poſſe. At neque id eſſe poteſt, quod è medio fertur, neque etiam id quod ſub omnibus collocatur. Etenim natura quidem ibi non erunt: alia namque ſunt ipſorum propria loca. Si verò præter naturam ſunt, alij cuipiam corporum exterus ille locus competet ſecundùm naturam. Qui namque huic præter naturā tribuitur, is alij cōpetat ſecundū naturam, neceſſe eſt. At nullum aliud præter hæc in ratione rerū ſimplex eſt corpus. Impoſſibile eſt ergo, corporū extra cælum quicquā ſimplicium eſſe. Quòd ſi corpus ſimplex nequeat vllum eſſe, neque quicquam miſtorum etiam eſſe poteſt. Sint enim & ſimplicia, ſi ſit miſtum, neceſſe eſt. At verò neque fore etiam poteſt. Aut enim præter naturam,

A ὥστε ἤτοι εἰσὶ πλείους οἱ οὐρανοί, ἢ ἐνδέχεται εἶναι πλείους. ἐκ μὲν δὴ τούτων ὑπολάβοι ἄν τις καὶ εἶναι καὶ ἐνδέχεσθαι πλείους εἶναι οὐρανούς. σκεπτέον δὲ πάλιν, τί τούτων λέγεται καλῶς, καὶ τί οὐ καλῶς. τὸ μὲν οὖν ἕτερον εἶναι τὸν λόγον τὸν ἄνευ τῆς ὕλης, καὶ τὸν ἐν τῇ ὕλῃ τῆς μορφῆς, καλῶς τε λέγεται, καὶ ἔστω τοῦτο ἀληθές. ἀλλ᾽ οὐδὲν ἧττον οὐδεμία ἀνάγκη διὰ τοῦτο πλείους εἶναι κόσμους, οὐδ᾽ ἐνδέχεται* πλείους εἶναι, εἴπερ οὗτος ἐξ ἁπάσης ἐστὶ τῆς ὕλης, ὥσπερ ἐστίν. ὧδε δὲ μᾶλλον ἴσως ἔσται τὸ λεγόμενον δῆλον. εἰ γάρ ἐστιν ἡ γρυπότης καμπυλότης ἐν ῥινὶ ἢ σαρκί, καὶ ἔστιν ὕλη τῇ γρυπότητι ἡ σάρξ, εἰ ἐξ ἁπασῶν τῶν σαρκῶν
B μία γένοιτο σάρξ, καὶ ὑπάρξει ἐν ταύτῃ τὸ γρυπόν, οὐδὲν ἂν ἄλλο οὔτ᾽ εἴη γρυπόν, οὔτε ἐνδέχοιτο γενέσθαι. ὁμοίως δὲ καὶ εἰ τῷ ἀνθρώπῳ ἐστὶν ὕλη σάρκες καὶ ὀστᾶ, εἰ ἐκ πάσης τῆς σαρκὸς καὶ ἐκ πάντων τῶν ὀστῶν ἄνθρωπος γένοιτο ἀδυνάτων ὄντων διαλυθῆναι, οὐκ ἂν ἐνδέχοιτο ἄλλον εἶναι ἄνθρωπον. ὡσαύτως δὲ καὶ ἐπὶ τῶν ἄλλων. ὅλως γὰρ ὅσων ἐστὶν ἡ οὐσία ἐν ὑποκειμένῃ τῇ ὕλῃ, τούτων οὐδὲν ἐνδέχεται γενέσθαι μὴ ὑπαρχούσης τινὸς ὕλης. ὁ δ᾽ οὐρανός, ἔστι μὲν τῶν καθ᾽ ἕκαστα, καὶ τῶν ἐκ τῆς ὕλης. ἀλλ᾽ εἰ μὴ ἐκ μορίου αὐτῆς συνέστηκεν, ἀλλ᾽ ἐξ ἁπάσης, τὸ μὲν εἶναι αὐτῷ οὐρανῷ, καὶ τῷδε τῷ οὐρανῷ, ἕτε-
C ρόν ἐστιν. οὐ μέντοι οὔτ᾽ ἂν εἴη ἄλλος, οὔτ᾽ ἂν ἐνδέχοιτο γενέσθαι πλείους, διὰ τὸ πᾶσαν τὴν ὕλην περιειληφέναι τοῦτον. λείπεται ἄρα αὐτὸ τοῦτο δεῖξαι, ὅτι ἐξ ἅπαντος τοῦ φυσικοῦ καὶ τοῦ αἰσθητοῦ συνέστηκε σώματος. εἴπωμεν δὲ πρῶτον, τί λέγομεν εἶναι τὸν οὐρανόν, καὶ ποσαχῶς, ἵνα μᾶλλον ἡμῖν δῆλον γένηται τὸ ζητούμενον. ἕνα μὲν οὖν τρόπον οὐρανὸν λέγομεν, τὴν οὐσίαν τὴν τῆς ἐσχάτης τοῦ παντὸς περιφορᾶς· ἢ σῶμα φυσικὸν τὸ ἐν τῇ ἐσχάτῃ περιφορᾷ τοῦ παντός· εἰώθαμεν γὰρ τὸ ἔσχατον καὶ ἄνω μάλιστα καλεῖν οὐρανόν, ἐν ᾧ τὸ θεῖον πᾶν ἱδρῦσθαί φαμεν. ἄλλον δ᾽ αὖ τρόπον, τὸ συνεχὲς σῶμα τῇ ἐσχά-
D τῃ περιφορᾷ τοῦ παντός, ἐν ᾧ σελήνη καὶ ἥλιος καὶ ἔνια τῶν ἄστρων· καὶ γὰρ ταῦτα ἐν τῷ οὐρανῷ εἶναί φαμεν. ἔτι δ᾽ ἄλλως λέγομεν οὐρανόν, τὸ περιεχόμενον σῶμα ὑπὸ τῆς ἐσχάτης περιφορᾶς. τὸ γὰρ ὅλον καὶ τὸ πᾶν εἰώθαμεν λέγειν οὐρανόν. τριχῶς δὴ λεγομένου τοῦ οὐρανοῦ, τὸ ὅλον ὑπὸ τῆς ἐσχάτης περιεχόμενον περιφορᾶς, ἐξ ἅπαντος ἀνάγκη συνεστάναι τοῦ φυσικοῦ καὶ τοῦ αἰσθητοῦ σώματος, διὰ τὸ μήτε εἶναι μηδὲν ἔξω σῶμα τοῦ οὐρανοῦ μήτε ἐνδέχεσθαι γενέσθαι. εἰ γάρ ἐστιν ἔξω τῆς ἐσχάτης περιφορᾶς σῶμα φυσικόν, ἀνάγκη αὐτὸ ἤτοι τῶν ἁπλῶν εἶναι σωμάτων, ἢ τῶν συνθέτων· καὶ ἢ κατὰ φύσιν,
E ἢ παρὰ φύσιν ἔχειν. τῶν μὲν οὖν ἁπλῶν οὐδὲν ἂν εἴη. τὸ μὲν γὰρ κύκλῳ φερόμενον, δέδεικται ὅτι οὐκ ἐνδέχεται μεταλλάξαι τὸν ἑαυτοῦ τόπον. ἀλλὰ μὴν οὐδὲ τὸ ἀπὸ τοῦ μέσου δυνατόν, οὐδὲ τὸ ὑφιστάμενον κατὰ φύσιν μὲν γὰρ οὐκ ἂν εἴησαν. ἄλλοι γὰρ αὐτῶν οἰκεῖοι τόποι. παρὰ φύσιν δ᾽ εἴπερ εἰσίν, ἄλλῳ τινὶ ἔσται κατὰ φύσιν ὁ ἔξω τόπος. ὁ γὰρ τούτῳ παρὰ φύσιν, ἀναγκαῖον ἄλλῳ εἶναι κατὰ φύσιν. ἀλλ᾽ οὐκ ἦν ἄλλο σῶμα παρὰ ταῦτα. οὐκ ἄρα ἐστὶ δυνατὸν οὐδὲν τῶν ἁπλῶν ἔξω εἶναι τοῦ οὐρανοῦ σῶμα. εἰ δὲ μὴ τῶν ἁπλῶν, οὐδὲ τῶν μικτῶν. ἀνάγκη γὰρ εἶναι καὶ τὰ ἁπλᾶ τοῦ μικτοῦ ὄντος. ἀλλὰ μὴν οὐδὲ γενέσθαι δυνατόν· ἤτοι γὰρ παρὰ φύσιν ἔσται,

* κ. δύναιτο πλείους,

ἢ κατὰ φύσιν καὶ ἢ ἁπλοῦν, ἢ μικτόν. ὥστε πάλιν ὁ αὐτὸς A
* λόγος. οὐδὲν γὰρ διαφέρει σκοπεῖν, εἰ ἔστιν, ἢ γενέσθαι δυνατόν. φανερὸν τοίνυν ἐκ τῶν εἰρημένων, ὅτι οὔτε ἔστιν ἔξω, οὔτ' ἐγχωρεῖ γενέσθαι σώματος ὄγκον οὐθενός. ἐξ ἁπάσης γὰρ ἐστὶ τῆς οἰκείας ὕλης ὁ πᾶς κόσμος· ὕλη γὰρ ἦν αὐτῷ τὸ φυσικὸν σῶμα καὶ αἰσθητόν. ὥστε οὔτε νῦν εἰσὶ πλείους οὐρανοί, οὔτ' ἐγένοντο, οὔτ' ἐνδέχεται γενέσθαι πλείους· ἀλλ' εἷς καὶ μόνος καὶ τέλειος οὗτος οὐρανός ἐστιν. ἅμα δὲ δῆλον ὅτι οὐδὲ τόπος, οὐδὲ κενόν, οὐδὲ χρόνος ἐστὶν ἔξω τοῦ οὐρανοῦ. ἐν ἅπαντι γὰρ τόπῳ δυνατὸν ὑπάρξαι σῶμα· κενὸν δ' εἶναί φασιν ἐν ᾧ μὴ ὑπάρχει σῶμα, δυνατὸν δὲ γενέσθαι· χρόνος δέ ἐστιν ἀριθμὸς κινήσεως· κίνησις δ' ἄνευ B φυσικοῦ σώματος οὐκ ἔστιν. ἔξω δὲ τοῦ οὐρανοῦ δέδεικται ὅτι οὔτ' ἔστιν, οὔτ' ἐνδέχεται γενέσθαι σῶμα. φανερὸν ἄρα ὅτι οὔτε τόπος, οὔτε κενόν, οὔτε χρόνος ἐστὶν ἔξωθεν. διόπερ οὔτ' ἐν τόπῳ τἀκεῖ πέφυκεν, οὔτε χρόνος αὐτὰ ποιεῖ γηράσκειν, οὐδ' ἐστὶν οὐδενὸς οὐδεμία μεταβολὴ τῶν ὑπὲρ τὴν ἐξωτάτω τεταγμένων φοράν, ἀλλ' ἀναλλοίωτα καὶ ἀπαθῆ, τὴν ἀρίστην ἔχοντα ζωὴν καὶ τὴν αὐταρκεστάτην διατελεῖ τὸν ἅπαντα αἰῶνα. καὶ γὰρ τοῦτο τοὔνομα θείως ἔφθεγκται παρὰ τῶν ἀρχαίων. τὸ γὰρ τέλος τὸ περιέχον τὸν τῆς ἑκάστου ζωῆς χρόνον, οὗ μηθὲν ἔξω κατὰ φύσιν, αἰὼν ἑκάστου κέκληται. κατὰ τὸν αὐτὸν δὲ λόγον καὶ τὸ τοῦ πάντος οὐρανοῦ τέλος, καὶ τὸ C τὸν * πάντων ἄπειρον χρόνον καὶ τὴν ἀπειρίαν περιέχον τέλος, αἰών ἐστιν, ἀπὸ τοῦ ἀεὶ εἶναι εἰληφὼς τὴν ἐπωνυμίαν, ἀθάνατος καὶ θεῖος. ὅθεν καὶ τοῖς ἄλλοις ἐξήρτηται, τοῖς μὲν ἀκριβέστερον, τοῖς δ' ἀμαυρότερον, τὸ εἶναί τε καὶ ζῆν. καὶ γὰρ καθάπερ ἐν τοῖς ἐγκυκλίοις φιλοσοφήμασι περὶ τὰ θεῖα πολλάκις προφαίνεται τοῖς λόγοις, ὅτι τὸ θεῖον ἀμετάβλητον ἀναγκαῖον εἶναι πᾶν τὸ πρῶτον καὶ ἀκρότατον· ὃ οὕτως ἔχον μαρτυρεῖ τοῖς εἰρημένοις. οὔτε γὰρ ἄλλο κρεῖττόν ἐστιν ὅ, τι κινήσει· ἐκεῖνο γὰρ ἂν εἴη θειότερον. οὔτ' ἔχει φαῦλον οὐθέν, οὔτ' ἐνδεὲς τῶν αὐτοῦ καλῶν οὐδενός ἐστι. καὶ ἄπαυστον δὴ κίνησιν κινεῖται εὐλόγως. ἅπαντα γὰρ παύεται κινούμενα, D ὅταν ἔλθῃ εἰς τὸν οἰκεῖον τόπον. τοῦ δὲ κύκλῳ σώματος, ὁ αὐτὸς τόπος, ὅθεν ἤρξατο καὶ εἰς ὃν τελευτᾷ.

* κ. μέγεθος

* κ. ἄπαντα

aut ſecundùm naturam, & aut ſimplex, aut miſtum identidem erit. Quare eadẽ ratio ſanè redibit. Nihil enim refert, ſi ſit, an fore poſſit, conſiderare. Patet igitur ex dictis, nec eſſe nec fore poſſe vllius extra cælum corporis molem. Vniuerſus enim mundus, ex ſua tota materia conſtat. Materia namque ipſius, naturale eſt atque ſenſibile corpus. Quare neque nunc plures ſunt cœli, neque fuêre, neque etiam fore poſſunt: ſed vnicum eſt hoc cælũ, atque perfectum. Patet inſuper, neque locũ extra cælum eſſe, neque vacuum, neque tempus. In omni nãque loco, corpus eſſe profectò poteſt. Vacuum autẽ id eſſe dicunt, in quo corpus non eſt, ſed eſſe poteſt. Tempus verò, motus numerum eſſe conſtat, & motus, ſine naturali corpore nullus eſt. At demonſtratum eſt, extra cælum nec eſſe corpus, nec etiã eſſe poſſe. Patet ergo neque locum extra cælũ eſſe, neque vacuum, neque tempus. Quocirca neque apta ſunt ea, quæ illic ſunt, eſſe in loco, neque tẽpus ſeneſcere ipſa facit, neque vllius eorum eſt vlla mutatio, quæ ſuper extima ſunt diſpoſita lationem: ſed nullis alterationibus, nullis paſſionibus prorſus ſubiecta, optimam in vniuerſa ſempiternitate vitã, & ſufficiẽtiſſimam habent. Diuinè namque nomen hoc pronuntiatum eſt ab antiquis. Finis enim, qui vitæ vniuſcuiuſque cõtinet tempus, cuius nihil eſt extra ſecundùm naturã, ſempiternitas vniuſcuiuſq; C eſt nuncupatus. Per eãdem etiam rationẽ finis vniuerſi cæli, ac finis, qui tempus totum, infinitúmque cõtinet ſemper, ſempiternitas eſt, à ſemper eſſẽdo appellatione ſũpta: immortalis ſanè, atq; diuina: vnde & cæteris aliis exactiùs, aliis offuſcatiùs ipſum eſſe, viueréque dependet. Etenim vt in externis circa diuina ſententiis, perſæpe rationibus, diuinum omne neceſſariò mutatione vacare videtur: primum ipſum, ac ſummum ita ſe habens, teſtis eſt dictis. Neque enim aliud præſtabilius eſt, quod quidem moueret: illud enim porrò diuinius eſſet. Neque prauitatis cuiuſquam eſt particeps, neque bonorum ſuorum cuiuſquam indiget. Et inceſſabili igitur motu, non abſque ratione mouetur. D Vniuerſa enim ceſſant, deſinúntque moueri, cùm venerint ſuum in locum. Eius autem corporis, quod verſatur, idem eſt locus, in quo incœpit, & in quo finit.

ΚΕΦΑΛ. ι΄.

Πότερον ὁ οὐρανὸς ἀγένητός ἐστι καὶ ἄφθαρτος, παλαιῶν δόξαι.

Τούτων δὲ διωρισμένων λέγωμεν μετὰ ταῦτα, πότερον ἀγένητος ἢ γενητός, καὶ ἄφθαρτος ἢ φθαρτός, διεξελθόντες πρότερον τὰς τῶν ἄλλων ὑπολήψεις· αἱ γὰρ τῶν ἐναντίων ἀποδείξεις, ἀπορίαι περὶ τῶν E ἐναντίων εἰσίν. ἅμα δὲ καὶ μᾶλλον ἂν εἴη πιστὰ τὰ μέλλοντα λεχθήσεσθαι, προακηκοόσι τὰ τῶν ἀμφισβητούντων λόγων δικαιώματα. τὸ γὰρ ἐρήμην καταδικάζεσθαι δοκεῖν, ἧττον ἂν ἡμῖν ὑπάρχοι. καὶ γὰρ δεῖ διαιτητάς, ἀλλ' οὐκ ἀντιδίκους εἶναι, τοὺς μέλλοντας τἀληθὲς κρίνειν ἱκανῶς. γενόμενον μὲν οὖν ἅπαντες εἶναί φασιν, ἀλλὰ γενόμενον οἱ μὲν ἀΐδιον, οἱ δὲ φθαρτόν, ὥσπερ ὁτιοῦν ἄλλο τῶν φύσει συνισταμένων. οἱ δ' ἐναλλάξ, ὁτὲ μὲν οὕτως, ὁτὲ δὲ ἄλλως ἔχειν φθειρόμενον. καὶ τοῦτο ἀεὶ διατελεῖν οὕτως, ὥσπερ Ἐμπεδοκλῆς ὁ Ἀκραγαντῖνος,

CAPVT X.

De ortu & interitu mundi ſententias veterum examinat.

Hiſce determinatis, conſideremus deinceps oportet, vtrùm mundus ingenerabilis ſit, an generabilis, & incorruptibilis, an corruptibilis: E priùs cæterorum opinionibus recitatis. Demonſtratione enim contrariorum, dubitationes de contrariis ſunt. Inſuper & dicenda, magis credentur, ſi ſententiarum earum, quę in controuerſiam veniũt, iura priùs fuerint audita. Abſentes enim condemnari minùs vtiq; videbuntur. Etenim eos, qui bene iudicare volunt de veritate, non aduerſarios, ſed arbitros eſſe oportet. Omnes itaque factum quidem aſſerunt eſſe: ſed factum quidam perpetuum, quidam caducũ, perinde vt quoduis aliud eorum quæ natura conſtant, inquiunt eſſe. Quidam viciſſim interdum hoc, interdum alio modo ſeſe habere ſubeuntem corruptionem, idque ſemper hoc fieri modo dicunt, vt Agrigentinus Empedocles,

vt Epheſius Heraclitus dicit. Igitur factū quidem eſſe, perpetuum tamen eſſe aſſerere, ex iis eſt profectò, quæ nequeunt eſſe. Ea namque ſola ponenda ſunt, quæ in multis, aut in omnibus eſſe videmus. De hoc autem, cõtrarium accidit. Vniuerſa enim quæ fiunt, & corruptionem ſubire videntur. Præterea, quod non habet principium hoc habēdi modo, ſed aliter habere priùs vniuerſa æternitate non poteſt, id & mutari profectò nequit: erit enim aliqua cauſa, quæ quidem ſi priùs eſſet, aliter id ſeſe habere poſſet, quod aliter ſeſe habere non poteſt. Quòd ſi Mundus ex aliter priùs habentibus conſtat, ſi ſemper ſic ſe habentibus, & non potentibus aliter ſe habere, factus ipſe profectò non eſt: ſi verò eſt factus, & illa aliter ſeſe habere poſſe, & nõn ſemper ita ſeſe habere, neceſſe eſt. Quare & conſtituta diſſoluentur, & diſſoluta antè conſtiterunt: atque hoc infinities, aut ſic ſe habuit, aut poterat ſic habere. Quod ſi ita eſt, non vacabit ſanè corruptione, neque ſi olim aliter ſeſe habebat, neque ſi aliter ſeſe habere poſſit. Subſidium autem, quod quidam eorum, qui dicunt Mundum incorruptibilem quidem eſſe, attamen factum eſſe, ſibi ipſis enituntur ferre, verum non eſſe videtur. Inquiunt enim, & ſe, perinde vt geometræ, qui deſignationes deſcribunt, de generatione Mundi dixiſſe: non quia aliquando Mundus eſt ortus, ſed gratia doctrinæ, quia diſcentes magis cognoſcunt, ſi vt deſignationem viderint factum. Hoc autem non idem eſt, vti dicimus. Nam in deſignationum quidem effectione, omnibus poſitis eſſe ſimul accidit idem. In horum autem demonſtrationibus, non idem, ſed impoſſibile ſanè accidit. Ea namque, quæ priùs poſteriúſve ſumuntur, ſubcontraria ſunt. Ex inordinatis enim olim, inquiūt ordinata fuiſſe. Vt autem idem ordinatum ſit ſimul, atque inordinatum, fieri nequit, ſed generationem eſſe quæ ſeparat, tempúſve, neceſſe eſt. In deſignationibus verò, nihil eſt tempore ſeparatum. Eſſe igitur impoſſibile, perpetuum ipſum ſimul, ac factum eſſe, ex his quæ diximus, patet. Conſtituere verò mundum viciſſim, atque diſſoluere, nil aliud eſſe videtur quàm ipſum ſempiternum quidem, formam autem mutantem extruere: perinde atque ſi quis interdum corrumpi interdum eſſe putaret quempiam, qui vir, ex puero, & ex viro fieret puer. Eſt enim perſpicuum, ſi elementa inter ſeſe conueniunt, non quēuis, ſed eundem ordinem, eandémque fieri conſtitutionem: præſertim ſecundùm eos, qui hanc ſententiam dicunt, qui quidem vtriuſque diſpoſitionis contrariū ipſum cauſam inquiunt eſſe. Quare ſi totū quidem corpus continuum permanens, interdum hoc, interdum illo diſponitur modo, ac perornatur, conſtitutio verò totius Mundus eſt, atque cælum nõ vtique mundus, ſed diſpoſitiones ipſius fiunt, ac corrumpuntur. Hoc autem, ortum, inquam, Mundum, omnino corruptum iri, & non redire, ſi ſit quidem vnus, impoſſibile eſt. Nam antea quàm ortus eſſet, cõſtitutio præcedens ipſum, ſemper nimirum erat: quam quidem haud factam, mutari non poſſe dicimus. Sin verò ſint infiniti, magis fieri poteſt. At verò hoc etiam ſi fieri poſſit necne, perſpicuū ex hiſce quæ poſteriùs dicentur, euadet. Sunt enim, quibus fieri poſſe videtur, vt & ingenerabile quippiā corrumpatur, & ortum vacet corruptione: vt in Timæo aſſeritur. Illic enim Timæus cælum eſſe quidem ortum, non tamen eſſe caducum, ſed reliquo ſemper fore tempore dicit: ad quos, naturaliter quidem de cælo ſolū eſt dictū: ſi verò de omnibus vniuerſaliter conſiderauerimus, de hoc quoq; fuerit manifeſtū.

A καὶ Ἡράκλειτος ὁ Ἐφέσιος. τὸ μὲν οὖν γενέσθαι μέν, ἀΐδιον δ' ὅμως εἶναι φάναι, τῶν ἀδυνάτων. μόνα γὰρ ταῦτα θετέον εὐλόγως, ὅσα ἐπὶ πολλῶν ἢ πάντων ὁρῶμεν ὑπάρχοντα. περὶ δὲ τούτου συμβαίνει τοὐναντίον. ἅπαντα γὰρ τὰ γινόμενα καὶ φθειρόμενα φαίνεται. ἔτι δὲ τὸ μὴ ἔχον ἀρχὴν τοῦ ὡδὶ ἔχειν, ἀλλ' ἀδύνατον ἄλλως ἔχειν πρότερον τὸν ἅπαντα αἰῶνα, ἀδύνατον καὶ μεταβάλλειν· ἔσται γάρ τι αἴτιον, ὃ εἰ ὑπῆρχε πρότερον, δυνατὸν ἂν ἦν ἄλλως ἔχειν τὸ ἀδύνατον ἄλλως ἔχειν. εἰ δὲ πρότερον, ἐξ ἄλλως ἐχόντων συνέστη ὁ κόσμος, εἰ μὲν ἀεὶ οὕτως ἐχόντων, καὶ ἀδυνάτων ἄλλως ἔχειν, οὐκ ἂν ἐγένετο. εἰ δὲ γέ-B γονεν, ἀνάγκη δηλονότι κἀκεῖνα δυνατὰ εἶναι ἄλλως ἔχειν, καὶ μὴ ἀεὶ οὕτως ἔχειν· ὥστε καὶ συνεστῶτα διαλυθήσεται, καὶ διαλελυμένα συνέστη ἔμπροσθεν. καὶ τοῦτ' ἀπειράκις ἢ οὕτως εἶχεν, ἢ δυνατὸν ἦν. εἰ δὲ τοῦτο, οὐκ ἂν εἴη ἄφθαρτος, οὔτ' εἰ ἄλλως εἶχέ ποτε, οὔτ' εἰ δυνατὸν ἄλλως ἔχειν. ἣν δέ τινες βοήθειαν ἐπιχειροῦσιν ἐπιφέρειν ἑαυτοῖς τῶν λεγόντων ἄφθαρτον μὲν εἶναι, γενόμενον δέ, οὐκ ἔστ' ἀληθής· ὁμοίως γάρ φασι τοῖς τὰ διαγράμματα γράφουσι, καὶ σφᾶς εἰρηκέναι περὶ τῆς γενέσεως, οὐχ ὡς γενομένου ποτέ, ἀλλὰ διδασκαλίας χάριν, ὡς μᾶλλον γνωριζόντων, ὥσ-C περ τὸ διάγραμμα γιγνόμενον θεασαμένους. τοῦτο δ' ἐστὶν ὥσπερ λέγομεν, οὐ τὸ αὐτό· ἐν μὲν γὰρ τῇ ποιήσει, τῶν διαγραμμάτων πάντων τεθέντων εἶναι ἅμα, τὸ αὐτὸ συμβαίνει· ἐν δὲ ταῖς τούτων ἀποδείξεσιν, οὐ ταὐτόν. ἀλλ' ἀδύνατον· τὰ γὰρ λαμβανόμενα πρότερον καὶ ὕστερον ὑπεναντία ἐστίν· ἐξ ἀτάκτων γάρ ποτε τεταγμένα φασὶ γενέσθαι. ἅμα δὲ τὸ αὐτὸ τεταγμένον εἶναι καὶ ἄτακτον ἀδύνατον. ἀλλ' ἀνάγκη γένεσιν εἶναι τὴν χωρίζουσαν, καὶ χρόνον· ἐν δὲ τοῖς διαγράμμασιν οὐδὲν τῷ χρόνῳ κεχώρισται. ὅτι μὲν οὖν ἀδύνατον ἅμα ἀΐδιον αὐτὸν εἶναι καὶ γενέσθαι, φανερόν. τὸ δ' ἐναλλὰξ συνίστασθαι καὶ διαλύειν, οὐδὲν ἀλλοιότερον ποιεῖν ἐστιν, ἢ τὸ κατασκευάζειν αὐτὸν ἀΐδιον μέν, ἀλλὰ μεταβάλλοντα τὴν D μορφήν· ὥσπερ εἴ τις ἐκ παιδὸς ἄνδρα γινόμενον, καὶ ἐξ ἀνδρὸς παῖδα, ὁτὲ μὲν φθείρεσθαι, ὁτὲ δ' εἶναι οἴοιτο· δῆλον γὰρ ὅτι καὶ εἰς ἄλληλα τῶν στοιχείων συνιόντων, οὐχ ἡ τυχοῦσα τάξις γίνεται, καὶ σύστασις, ἀλλ' ἡ αὐτή· ἄλλως τε καὶ κατὰ τοὺς τοῦτον τὸν λόγον εἰρηκότας, οἳ τῆς διαθέσεως ἑκατέρας αἰτιῶνται τὸ ἐναντίον. ὥστ' εἰ τὸ ὅλον σῶμα συνεχὲς ὄν, ὁτὲ μὲν οὕτως, ὁτὲ δ' ἐκείνως διατίθεται καὶ διακεκόσμηται, ἡ δὲ τοῦ ὅλου σύστασίς ἐστι κόσμος καὶ οὐρανός, οὐκ ἂν ὁ κόσμος γίγνοιτο καὶ φθείροιτο, ἀλλ' αἱ διαθέσεις αὐτοῦ. τὸ δ' ὅλως γενόμενον φθαρῆναι, καὶ μὴ ἀνακάμπτειν ὄντος μὲν ἑνός, ἀδύνατόν ἐστι. πρὶν γὰρ γενέσθαι ἀεὶ ὑπῆρχεν ἡ πρὸ αὐτοῦ σύ-E στασις, ἣν μὴ γενομένην οὐχ οἷόν τ' εἶναι φαμὲν μεταβάλλειν· ἀπείρων δ' ὄντων τῶν κόσμων ἐνδέχεται μᾶλλον. ἀλλὰ μὴν καὶ τοῦτο πότερον ἀδύνατον ἢ δυνατόν, ἔσται δῆλον ἐκ τῶν ὕστερον· εἰσὶ γάρ τινες οἷς ἐνδέχεσθαι δοκεῖ καὶ ἀγένητόν τι ὂν φθαρῆναι, καὶ γενόμενον ἄφθαρτον διατελεῖν, ὥσπερ ἐν τῷ Τιμαίῳ· ἐκεῖ γάρ φησι τὸν οὐρανὸν γενέσθαι μέν, οὐ μὴν φθαρτόν, ἀλλ' ἔσεσθαί γε τὸν λοιπὸν ἀεὶ χρόνον. πρὸς οὓς φυσικῶς μὲν περὶ τοῦ οὐρανοῦ μόνον εἴρηται, καθόλου δὲ περὶ ἅπαντος σκεψαμένοις, ἔσται καὶ περὶ τούτου δῆλον.

ΚΕΦΑΛ. ια΄.

Πῶς ἀγένητα καὶ γενητὰ φαμὲν, καὶ φθαρτὰ καὶ ἄφθαρτα, καὶ δυνατὰ καὶ ἀδύνατα.

Πρῶτον δὲ διαιρετέον, πῶς ἀγένητα καὶ γενητὰ φαμὲν, καὶ φθαρτὰ καὶ ἄφθαρτα. πολλαχῶς γὰρ λεγομένων, κἂν μηδὲν διαφέρῃ πρὸς τὸν λόγον, ἀνάγκη τὴν διάνοιαν ἀορίστως ἔχειν, ἄν τις τῷ διαιρουμένῳ πολλαχῶς ὡς ἀδιαιρέτῳ χρῆται· ἄδηλον γὰρ κατὰ ποίαν φύσιν αὐτῷ συμβαίνει τὸ λεχθέν. λέγεται δ᾽ ἀγένητον, ἕνα μὲν τρόπον, ἐὰν ᾖ τι νῦν πρότερον μὴ ὂν ἄνευ γενέσεως καὶ μεταβολῆς· καθάπερ ἔνιοι τὸ ἅπτεσθαι καὶ τὸ κινεῖσθαι λέγουσιν. οὐ γὰρ εἶναι γίνεσθαί φασιν ἁπτόμενον, οὐδὲ κινούμενον. ἕνα δ᾽, εἴ τι ἐνδεχόμενον γίνεσθαι ἢ γενέσθαι μὴ ἔστιν. ὁμοίως γὰρ καὶ τοῦτο ἀγένητον, ὅτι ἐνδέχεται γίνεσθαι· ἕνα δ᾽, εἴ τι ὅλως ἀδύνατον γενέσθαι, ὥστε ὁτὲ μὲν εἶναι, ὁτὲ δὲ μή. τὸ δ᾽ ἀδύνατον λέγεται διχῶς· ἢ γὰρ τῷ μὴ ἀληθὲς εἶναι εἰπεῖν, ὅτι γένοιτ᾽ ἄν, ἢ τῷ μὴ ῥᾳδίως, μηδὲ ταχὺ, ἢ καλῶς. τὸν αὐτὸν δὲ τρόπον καὶ τὸ γενητὸν, ἕνα μὲν, εἰ μὴ ὂν πρότερον, ὕστερόν ἐστιν εἴτε γινόμενον, εἴτε ἄνευ τοῦ γίνεσθαι, ὁτὲ μὲν μὴ ὂν, πάλιν δ᾽ ὄν. ἕνα δ᾽, εἰ δυνατὸν, εἴτε τῷ ἀληθεῖ διορισθέντος τοῦ δυνατοῦ, εἴτε τῷ ῥᾳδίως. ἕνα δὲ, ἐὰν ἡ γένεσις αὐτοῦ ἐκ τοῦ μὴ ὄντος εἰς τὸ ὂν, εἴτε ἤδη ὄντος, διὰ τοῦ γίνεσθαι δὲ ὄντος· εἴτε καὶ μήπω ὄντος, ἀλλ᾽ ἐνδεχομένου, καὶ φθαρτὸν δὲ καὶ ἄφθαρτον ὡσαύτως· εἴτε γὰρ πρότερόν τι ὂν, ὕστερον μὴ ἔστιν, ἢ ἐνδέχεται μὴ εἶναι, φθαρτὸν εἶναί φαμεν· εἴτε φθειρόμενόν ποτε καὶ μεταβάλλον, εἴτε μή. ἔστι δ᾽ ὅτε καὶ τὸ διὰ τοῦ φθείρεσθαι ἐνδεχόμενον μὴ εἶναι, φθαρτὸν εἶναί φαμεν. καὶ ἔτι ἄλλως τὸ ῥᾳδίως φθειρόμενον, ὃ εἴποι τις ἂν εὔφθαρτον. καὶ περὶ τοῦ ἀφθάρτου ὁ αὐτὸς λόγος. ἢ γὰρ τὸ ἄνευ φθορᾶς ὁτὲ μὲν ὂν, ὁτὲ δὲ μὴ ὄν· οἷον τὰς ἁφάς, ὅτι ἄνευ τοῦ φθείρεσθαι πρότερον οὖσαι, ὕστερον οὐκ εἰσίν. ἢ τὸ ὂν μὲν, ἀδύνατον δὲ μὴ εἶναι. ἢ καὶ οὐκ ἐσόμενον ποτε, νῦν δὲ ὄν· σὺ γὰρ εἶ, καὶ ἡ ἁφὴ νῦν· ἀλλ᾽ ὅμως φθαρτὸν, ὅτι ἔσται ποτὲ ὅτε οὐκ ἀληθὲς σὲ εἰπεῖν ὅτι εἶ, οὐδὲ ταῦτα ἅπτεσθαι. τὸ δὲ μάλιστα κυρίως, τὸ ὂν μὲν, ἀδύνατον δὲ * φθαρῆναι οὕτως, ὥστε νῦν ὂν, ὕστερον μὴ εἶναι, ἢ ἐνδέχεσθαι μὴ εἶναι· ἢ καὶ τὸ μή πω ἐφθαρμένον, ὂν δὲ, ἐνδεχόμενον δ᾽ ὕστερον μὴ εἶναι. λέγεται δ᾽ ἄφθαρτον, καὶ τὸ μὴ ῥᾳδίως φθειρόμενον. εἰ δὴ ταῦτα οὕτως ἔχει, σκεπτέον πῶς λέγομεν τὸ δυνατὸν, καὶ τὸ ἀδύνατον. τό, τε γὰρ κυριώτατα λεγόμενον ἄφθαρτον τῷ μὴ δύνασθαι ἂν φθαρῆναι, μηδ᾽ ὁτὲ μὲν εἶναι, ὁτὲ δὲ μή. λέγεται δὲ καὶ τὸ ἀγένητον τὸ ἀδύνατον, καὶ τὸ μὴ δυνάμενον γενέσθαι οὕτως, ὥστε * πρότερον μὲν εἶναι, ὕστερον δὲ μὴ εἶναι. δεῖ τὴν διορίζειν συμμέτρον. εἰ δή τι δύναται κινηθῆναι στάδια ἑκατὸν, ἢ ἆραι βάρος, ἀεὶ πρὸς τὸ πλεῖστον λέγομεν. οἷον τάλαντα ἆραι ἑκατὸν, ἢ στάδια βαδίσαι ἑκατὸν, καίτοι καὶ τὰ μόρια δύναται τὰ ἐντὸς, εἴπερ καὶ τὴν ὑπεροχήν.

* γρ. φθαρθῆναι

* γρ. πρ. μὲν μὴ εἶ. ὕστ. δὲ εἶ.

A

CAPVT XI.

Quot modis aliquid dici ſoleat generabile aut non generabile; & corruptibile aut incorruptibile, & poſſibile aut impoſſibile.

PRimùm autem diſtinguamus oportet, quomodo generabilia, & ingenerabilia, & corruptibilia, & incorruptibilia dicimus. Nam cùm multipliciter dicantur, etſi nihil ad rationem refert, mentem indefinitè ſeſe habere neceſſe eſt, ſi quiſpiam vt indiuiſibili eo vtatur, quod multis diuiditur modis. Non eſt enim manifeſtum, per quam ipſorum
B naturam id accidit, quod eſt dictum. Dicitur itaq; ingenerabile vno modo, ſi ſit quippiam nunc, quod antea non erat, ſine generatione, mutationéve: vt ipſum tangi quidam inquiunt atque moueri. Dicunt enim, nõ poſſe tangẽs generari: neque [illegible] motum. Alio modo ſi fieri vel ortum eſſe quippiam poſſit, & nõ ſit. Nam hoc ingenerabile dicitur, quia ortum ſubire poteſt. Alio modo, ſi quippiam omnino factum eſſe impoſſibile ſit, vt interdum ſit, interdum non ſit. Impoſſibile autem dupliciter dicitur. Aut enim quia non verum eſt dicere ortũ eſſe poſſe, aut quia non facilè, nec citò, nec bene oriri poteſt. Eodem modo & generabile vno dicitur modo,
C ſi ſit quippiã poſteriùs, quod priùs non erat, ſiue per generationem, ſiue ſine generatione. Alio modo ſi poſſibile ſit, ſiue veritate, ſiue facilitate poſſibile ipſum ſit definitũ. Alio modo ſi generatio ſit ipſius ex eo quod non eſt, ad id quod eſt, ſiue iam ſit, per generationem autem ſit, ſiue & nõdum ſit, eſſe autem poſſit. Corruptibile etiam, & incorruptibile ſimiliter dicitur. Nam ſi quippiam priùs erat, poſtea verò non eſt, aut eſt quidem, non eſſe autem poteſt, ſiue per corruptionẽ, mutationémve, ſiue ſine corruptione, corruptibile illud dicimus eſſe. Interdum & id, quod per corruptionem non eſſe poteſt, corruptibile eſſe dicimus. Et inſuper alio modo, id quod facilè corrumpitur, quod quidem quiſpiam
D facilè corruptibile dixerit. De incorruptibili, eadẽ eſt etiam ratio. Aut enim id quod ſine corruptione interdũ eſt, interdũ nõ eſt, incorruptibile dicimus: quo pacto tactus incorruptibiles eſſe dicuntur, propterea quod priùs erãt, & poſtea nõ sũt ſine corruptione. Aut id, quod quidem eſt, non eſſe autẽ non poteſt: aut nõ eſt futurũ vnquã, nũc autẽ eſt. Tu n. es nũc, & tactus eſt etiã nũc: corruptibiles tamen eſtis, quia erit aliquãdo tẽpus quãdo nec te eſſe, nec hæc tangere verè dicetur. Id verò maximè propriè incorruptibile dicitur, quod quidẽ eſt, nõ poteſt autẽ ſic corruptũ eſſe, vt nũc quidẽ ſit, poſtea verò nõ ſit, aut non eſſe poſſit: aut & id, quod nondũ corru-
E ptũ eſt, nõ eſſe autẽ poſterius poteſt. Dicitur etiam incorruptibile & id quod non facilè corrũpitur. Si igitur hæc ita ſint, conſiderandũ eſt quomodo poſſibile & impoſſibile dicimus. Nã & quod propriiſſimè incorruptibile dicitur, ex eo dicitur ſanè, quia corrũpi non poteſt, neq; quãdoque eſſe, quãdoque non eſſe. Et ingenerabile id propriiſſimè dicitur, quod ſic generari nõ poteſt, vt priùs quidẽ non ſit, poſteriùs verò ſit: qualis eſt diameter cõmenſurabilis lateri. Si igitur quippiã per decẽ millia paſſuum moueri poteſt, aut pondus leuare, id, quod maximũ poteſt, dicere ſẽper ſolemus: velvti centũ leuare libras, aut per decẽ millia paſſuũ ambulare: quanquã & partes, quæ citrà ſunt, poteſt, ſi & exceſſũ poteſt.

Quo patet, ad finem, atque exceſſum, definiri potentiam oportere. Id igitur quod poteſt tot per exceſſum, & ea quæ ſunt citrà, neceſſe eſt: ceu ſi centum libras leuare poteſt, & duas poſſe: & ſi per decem millia paſſuũ ambulare poteſt, & per duo ambulare poſſe. Potentia verò, ipſius exceſſionis eſt, & ſi quippiam tantum non poteſt, eo per exuperationem dicto, & plura non poteſt. Qui namque centum paſſus tranſire non poteſt, is & centum & vnũ non poteſt. Nihil autem nos conturbet. id enim quod propriè poteſt, per finem exceſſionis ſit definitum. Forſitan enim quiſpiam dicet, id quod dictum eſt, non neceſſariò ita eſſe. Qui namque magnitudinem decem paſſuum videt, is non & magnitudines eas quæ ſunt citrà, videbit: ſed contrà potiùs, qui punctum videre poteſt, aut paruum audire ſonum, is & maiorum ſenſum habebit. Verùm nihil ad rationem refert: ipſa enim exuperatio, aut in potentia, aut in re ipſa ſit definita. Id enim, quod dicitur, patet. Nam viſus quidem is, qui eſt minoris, excedit: celeritas autem ea, quæ eſt maioris.

A ὡς δέον ὁρίζεσθαι πρὸς τὸ τέλος καὶ τῆς ὑπεροχῆς τὴν δύναμιν. ἀνάγκη μὲν οὖν τὸ δυνατὸν καθ' ὑπεροχὴν τοσαδὶ, καὶ τὰ ἐντὸς δύνασθαι· οἷον εἰ τάλαντα ἑκατὸν αἴρει, καὶ δύο κἂν εἰ στάδια ἑκατὸν, καὶ δύο δύνασθαι βαδίσαι. ἡ δὲ δύναμις τῆς ὑπεροχῆς ἐστί· κἂν εἴ τι ἀδύνατον τοσονδὶ καθ' ὑπερβολὴν εἰπόντων, καὶ τὰ πλείω ἀδύνατον· οἷον ὁ χίλια βαδίσαι στάδια μὴ δυνάμενος, δῆλον ὅτι καὶ χίλια καὶ ἕν. μηδὲν δ' ἡμᾶς τὸ τελευταῖον ἂν δύναιτο, παρενοχλείτω. διωρίσθω γὰρ κατὰ τῆς ὑπεροχῆς τὸ τέλος λεγόμενον τὸ κυρίως δυνατόν. τάχα γὰρ ἐνσταίη τις ἂν ὡς οὐκ ἀνάγκη τὸ λεχθέν. ὁ γὰρ ὁρῶν στάδιον, οὐκ ἂν τὰ ἐντὸς B ὄψεται μεγέθη· ἀλλὰ τοὐναντίον μᾶλλον ὁ δυνάμενος ἰδεῖν στιγμὴν, ἢ ἀκοῦσαι μικροῦ ψόφου, καὶ τῶν μειζόνων ἕξει αἴσθησιν. ἀλλ' οὐδὲν διαφέρει πρὸς τὸν λόγον. διωρίσθω γὰρ ἢ ἐπὶ τῆς δυνάμεως, ἢ ἐπὶ τοῦ πράγματος ἡ ὑπερβολή. τὸ γὰρ λεγόμενον δῆλον· ἡ μὲν γὰρ ὄψις ἡ τοῦ ἐλάττονος, ὑπερέχει· ἡ δὲ ταχυτὴς, ἡ τοῦ πλείονος.

CAPVT XII.

Probat fieri non poſſe vt aut interitu careat quod ortum habet: aut intereat quod ortu caret.

His autem determinatis, dicenda ſunt ea quæ deinceps ſequuntur. Si igitur aliqua ſint, quæ eſſe, & non eſſe poſſunt, quoddam tempus maximum & eſſendi, & non eſſendi, definitum eſſe neceſſe eſt. Atque dico rem eſſe poſſe, & non eſſe poſſe, in vnoquoque prædicamento: vt hominem, aut album, aut tricubitum, aut aliquid aliud tale. Nam ſi non erit definitum quiddam, ſed ſemper propoſito maius, & quo non eſt minus: idem erit profectò poſſibile eſſe tempore infinito, & non eſſe alio tempore infinito. At hoc eſſe nequit. Principiũ autem hinc ſumatur. Impoſſibile enim, & falſum, nõ idem ſignificant. Eſt autem impoſſibile, & poſſibile, & falſum, ac verum, ex ſuppoſitione. Velut triangulum impoſſibile eſt ſuos tres angulos duobus rectis æquales habere: ſi hæc ſint, & diameter commenſurabilis eſt. Sunt autem ſimpliciter & poſſibilia, & impoſſibilia, & vera, & falſa. Non eſt igitur idem, falſũ aliquid eſſe ſimpliciter, & ſimpliciter impoſſibile. Te namque dicere ſtare, falſum eſt quidem, ſed non impoſſibile. Similiter & eum, qui citharam quidem pulſat, non autem cantat, cãtare dicere falſum eſt, ſed non impoſſibile eſt. Simul autem ſtare, atque ſedere, & diametrum commenſurabilem eſſe, nõ ſolùm eſt falſum, ſed etiam impoſſibile. Non igitur idẽ eſt ſupponere falſum, ac impoſſibile. Impoſſibile autẽ, ex impoſſibili accidit. Sedendi itaq; quippiam, ſtandique ſimul potentiam habet: quia quando habet illam, & alteram habet: at non vt ſimul ſtet, atque ſedeat, ſed in alio tempore. Si verò quippiam plurium potentiam habeat tempore infinito, non eſt in alio tempore, ſed ſimul. Quare ſi quippiam, quod eſt tempore infinito, eſt corruptibile, illud, vt non ſit, potentiam habet. Si igitur eſt tempore infinito, ſit id quod poteſt. Simul ergo erit atque non erit actu. Falſum igitur accidit, quia falſum ſuppoſitum eſt. Sed ſi impoſſibile non eſſet, nõ id vtique, quod accidit, etiam impoſſibile, eſſet. Omne ergo, quod ſemper eſt incorruptibile, ſimpliciter eſt. Similiter & ingenitũ eſt. Nam ſi generabile eſt, erit poſſibile aliquo in tẽpore nõ eſſe.

ΚΕΦΑΛ. ιβ'.

Ὅτι ἀδύνατον, ἢ γινόμενόν ποτε ἄφθαρτόν τι διατελεῖν, ἢ ἀγέννητον, καὶ ἀεὶ πρότερον ὂν, φθαρῆναι.

C Διωρισμένων δὲ τούτων, λεκτέον τὸ ἐφεξῆς. εἰ δή ἐστιν ἔνια δυνατὰ καὶ εἶναι καὶ μὴ, ἀνάγκη χρόνον τινὰ ὡρίσθαι τὸν πλεῖστον καὶ τοῦ εἶναι καὶ τοῦ μή. λέγω δ' ὃν δυνατὸν τὸ πρᾶγμα εἶναι, καὶ ὃν δυνατὸν μὴ εἶναι καθ' ὁποιανοῦν κατηγορίαν· οἷον ἄνθρωπον, ἢ λευκὸν, ἢ τρίπηχυ, ἢ ἄλλο ὁτιοῦν τῶν τοιούτων. εἰ γὰρ μὴ ἔσται ποσός τις, ἀλλ' ἀεὶ πλείων τοῦ προτεθέντος, καὶ οὐκ ἔστιν οὗ ἐλάττων, ἄπειρον ἔσται χρόνον τὸ αὐτὸ δυνατὸν εἶναι καὶ μὴ εἶναι ἄλλον ἄπειρον. ἀλλὰ τοῦτ' ἀδύνατον. ἀρχὴ δ' ἔστω ἐντεῦθεν. τὸ γὰρ ἀδύνατον καὶ τὸ ψεῦδος οὐ ταυτὸ σημαίνει. ἔστι δὲ τὸ ἀδύνατον καὶ τὸ δυνατὸν, καὶ τὸ ψεῦδος καὶ τὸ ἀληθὲς, τὸ D μὲν ἐξ ὑποθέσεως· λέγω δ', οἷον τὸ τρίγωνον ἀδύνατον δύο ὀρθὰς ἔχειν, εἰ τάδε· καὶ ἡ διάμετρος σύμμετρος, εἰ τάδε. ἔστι δ' ἁπλῶς καὶ δυνατὰ, καὶ ἀδύνατα, καὶ ψευδῆ καὶ ἀληθῆ. οὐ δὴ ταυτό ἐστι ψεῦδός τέ τι εἶναι ἁπλῶς, καὶ ἀδύνατον ἁπλῶς. τὸ γὰρ σε μὴ ἑστῶτα φάναι ἑστάναι, ψεῦδος μὲν, οὐκ ἀδύνατον δέ. ὁμοίως δὲ καὶ τὸν κιθαρίζοντα, μὴ ᾄδοντα δὲ, ᾄδειν φάναι, ψεῦδος μὲν, ἀλλ' οὐκ ἀδύνατον. τὸ δ' ἅμα ἑστάναι καὶ καθῆσθαι, καὶ τὴν διάμετρον σύμμετρον εἶναι, οὐ μόνον ψεῦδος, ἀλλὰ καὶ ἀδύνατον. οὐ δὴ ταυτόν ἐστιν ὑποθέσθαι ψεῦδος, καὶ ἀδύνατον· συμβαίνει δὲ ἀδύνατον ἐξ ἀδυνάτου. τοῦ μὲν οὖν καθῆσθαι καὶ ἑστάναι, ἅμα ἔχει τὴν E δύναμιν, ὅτι ὅτε ἔχει ἐκείνην, καὶ τὴν ἑτέραν· ἀλλ' οὐχ ὥστε ἅμα καθῆσθαι καὶ ἑστάναι, ἀλλ' ἐν ἄλλῳ χρόνῳ. εἰ δή τι ἄπειρον χρόνον ἔχει πλειόνων δύναμιν, οὐκ ἔστιν ἐν ἄλλῳ χρόνῳ, ἀλλὰ τοῦθ' ἅμα. ὥστ' εἴ τι ἄπειρον χρόνον ὂν φθαρτόν ἐστι, δύναμιν ἔχοι ἂν τοῦ μὴ εἶναι. εἰ δὴ ἄπειρον χρόνον ἐστὶν, ἔστω ὑπάρχον, ὃ δύναται μὴ εἶναι. ἅμα ἄρα ἔσται τε καὶ οὐκ ἔσται κατ' ἐνέργειαν. ψεῦδος μὲν οὖν συμβαίνοι ἄν, ὅτι ψεῦδος ἐτέθη. ἀλλ' εἰ μὴ ἀδύνατον ἦν, οὐκ ἂν καὶ ἀδύνατον ἦν τὸ συμβαῖνον. ἅπαν ἄρα τὸ ἀεὶ ὂν ἁπλῶς, ἄφθαρτον. ὁμοίως δὲ καὶ ἀγέννητον· εἰ γὰρ γεννητὸν, ἔσται δυνατὸν χρόνον τινὰ μὴ εἶναι.

φθαρτὸν μὲν γάρ ἐστι τὸ πρότερον μὲν ὄν, νῦν δὲ μὴ ὄν, ἢ ἐνδεχόμενόν ποτε ὕστερον μὴ εἶναι· γενητὸν δὲ, ὃ ἐνδέχεται πρότερον μὴ εἶναι· ἀλλ' οὐκ ἔστιν ἐν ᾧ χρόνῳ δυνατὸν τὸ ἀεὶ ὄν, ὥστε μὴ εἶναι, οὔτ' ἄπειρον, οὔτε πεπερασμένον· καὶ γὰρ τὸν πεπερασμένον χρόνον δύναται εἶναι, εἴπερ καὶ τὸν ἄπειρον. οὐκ ἄρα ἐνδέχεται τὸ αὐτὸ καὶ εἰ ἀεί τι δύνασθαι εἶναι* καὶ μὴ εἶναι. ἀλλὰ μὴν οὐδὲ τὴν ἀπόφασιν, λέγω δὴ μὴ ἀεὶ εἶναι. ἀδύνατον ἄρα καὶ ἀεὶ μέν τι εἶναι, φθαρτὸν δὲ εἶναι. ὁμοίως δὲ οὐδὲ γενητόν. δυοῖν γὰρ ὅροιν εἰ ἀδύνατον τὸ ὕστερον ἄνευ τοῦ προτέρου ὑπάρξαι, ἐκεῖνο δ' ἀδύνατον ὑπάρξαι, καὶ τὸ ὕστερον. ὥστ' εἰ τὸ ἀεὶ ὂν μὴ ἐνδέχεταί ποτε μὴ εἶναι, ἀδύνατον καὶ γενητὸν εἶναι. ἐπεὶ δ' ἡ ἀπόφασις τοῦ μὲν ἀεὶ δυναμένου εἶναι, τὸ μὴ ἀεὶ δυνάμενον εἶναι· τὸ δ' ἀεὶ δυνάμενον μὴ εἶναι ἐναντίον, οὗ ἀπόφασις τὸ μὴ ἀεὶ δυνάμενον μὴ εἶναι· ἀνάγκη τὰς ἀποφάσεις ἀμφοῖν τῷ αὐτῷ ὑπάρχειν, καὶ εἶναι μέσον τοῦ ἀεὶ ὄντος, καὶ τοῦ ἀεὶ μὴ ὄντος, τὸ δυνάμενον εἶναι, καὶ μὴ εἶναι· ἡ γὰρ ἑκατέρου ἀπόφασις, ποτὲ ὑπάρξει εἰ μὴ εἴη ἀεί. ὥστε καὶ τὸ μὴ ἀεὶ μὴ ὄν, ἔσται ποτὲ καὶ οὐκ ἔσται, καὶ τὸ μὴ ἀεὶ δυνάμενον εἶναι δηλονότι, ἀλλά ποτε ὄν· ὥστε καὶ μὴ εἶναι· τὸ αὐτὸ ἄρ' ἔσται δυνατὸν εἶναι καὶ μὴ, καὶ τοῦτ' ἐστὶν ἀμφοῖν μέσον. λόγος δὲ καθόλου ὅδε· ἔστω γὰρ τὸ α καὶ τὸ β, μηδενὶ τῷ αὐτῷ δυνάμενα ὑπάρχειν· ἅπαντι δὲ τὸ α ἢ τὸ γ, καὶ τὸ β ἢ τὸ δ. ἀνάγκη δὴ ᾧ μήτε τὸ α ὑπάρχει, μήτε τὸ β, παντὶ ὑπάρχειν τὰ γ δ. ἔστω δὴ τὸ ε τὸ μεταξὺ τῶν α β· ἐναντίων γὰρ τὸ μηδέτερον μέσον. τούτῳ δὴ ἀνάγκη ἄμφω ὑπάρχειν τό, τε γ καὶ τὸ δ. παντὶ γὰρ ἢ τὸ α ἢ τὸ γ. ὥστε καὶ τῷ ε. ἐπεὶ οὖν τὸ α ἀδύνατον, τὸ γ ὑπάρξει. ὁ δ' αὐτὸς λόγος καὶ ἐπὶ τοῦ δ. οὔτε δὴ τὸ ἀεὶ ὂν γενητὸν οὐδὲ φθαρτόν, οὐδὲ τὸ ἀεὶ μὴ ὄν. δῆλον δ' ὅτι καὶ εἰ γενητὸν ἢ φθαρτόν, οὐκ ἀΐδιον· ἅμα γὰρ ἔσται δυνάμενον ἀεὶ εἶναι, καὶ δυνάμενον μὴ ἀεὶ εἶναι. τοῦτο δ' ὅτι ἀδύνατον, δέδεικται πρότερον. ἆρ' οὖν εἰ τὸ ἀγένητον, ὂν δὲ τοῦτ' ἀνάγκη ἀΐδιον εἶναι. ὁμοίως δὲ καὶ εἰ ἄφθαρτον, ὂν δέ. λέγω δὲ τὸ ἀγένητον καὶ ἄφθαρτον, τὰ κυρίως λεγόμενα· ἀγένητον μὲν ὃ ἔστι νῦν, καὶ πρότερον οὐκ ἀληθὲς ἦν εἰπεῖν τὸ μὴ εἶναι· ἄφθαρτον δὲ, ὃ νῦν ὄν, ὕστερον μὴ ἀληθὲς ἔσται εἰπεῖν μὴ εἶναι. ἢ εἰ μὲν ταῦτα ἀλλήλοις ἀκολουθεῖ, καὶ τό, τε ἀγένητον ἄφθαρτον, καὶ τὸ ἄφθαρτον ἀγένητον, ἀνάγκη καὶ τὸ ἀΐδιον ἑκατέρῳ ἀκολουθεῖν· καὶ εἴτε τι ἀΐδιον ἀγένητον, εἴτε τι ἄφθαρτον ἀΐδιον. δῆλον δὲ καὶ ἐκ τοῦ ὁρισμοῦ αὐτῶν· καὶ γὰρ ἀνάγκη εἰ φθαρτὸν, γενητόν. ἢ γὰρ ἀγένητον, ἢ γενητόν· εἰ γὰρ ἀγένητον, ἄφθαρτον ὑπόκειται· καὶ εἰ γενητὸν δὲ, φθαρτὸν ἀνάγκη· ἢ γὰρ φθαρτὸν, ἢ ἄφθαρτον. ἀλλ' εἰ ἄφθαρτον, ἀγένητον ὑπέκειτο. εἰ δὲ μὴ ἀκολουθοῦσιν ἀλλήλοις τὸ ἄφθαρτον καὶ τὸ ἀγένητον, οὐκ ἀνάγκη οὔτε τὸ ἀγένητον, οὔτε τὸ ἄφθαρτον ἀΐδιον εἶναι. ὅτι δ' ἀνάγκη ἀκολουθεῖν, ἐκ τῶνδε φανερόν· τὸ γὰρ γενητὸν καὶ φθαρτὸν, ἀκολουθοῦσιν ἀλλήλοις. δῆλον δὲ καὶ τοῦτο ἐκ τῶν πρότερον· τοῦ γὰρ ἀεὶ ὄντος καὶ

* χ. τὸ ἀεὶ μὴ εἶναι.

A Corruptibile enim id eſt quod priùs quidem erat, nunc verò non eſt: aut quod nunc quidem eſt, poteſt autem aliquando poſteriùs non eſſe. Generabile verò id, quod priùs non eſſe poteſt. At non eſt tẽpus aut infinitum, aut finitum, in quo id quod ſemper eſt, non eſſe poteſt. Etenim finito tempore eſſe poteſt, quippe cùm eſſe & tempore infinito poſſit. Non ergo contingit idem ac vnum, & ſemper eſſe, & ſemper non eſſe poſſe, at neque non ſemper eſſe, quod patet eſſe negationẽ. Impoſſibile eſt ergo, & ſemper quippiam eſſe, & corruptibile eſſe. Pari modo nec generabile. Nam ſi duo ſint termini, poſteriórque ſine priore ineſſe nõ poſſit, ſi ille competere B non poteſt, & poſterior etiam cõpetere nequit. Quare ſi id, quod eſt ſemper, non eſſe aliquãdo non poteſt, impoſſibile eſt & generabile eſſe. Cùm autẽ negatio quidem eius, quod ſemper eſſe poteſt, ſit id, quod non ſemper eſſe poteſt, contrarium autem id, quod non ſemper eſſe poteſt, & negatio eſt id quod non ſemper non eſſe poteſt: negationes amborum competere eidem neceſſe eſt, & eſſe medium eius, quod ſemper eſt, & eius, quod ſemper non eſt, id, quod eſſe, & non eſſe poteſt. Vtriuſque namque negatio quandoque competet, ſi non ſemper ſit. Quare ſi id, quod non ſemper non eſt, erit quandoque, atque non erit, & id, quod non ſemper eſſe po-C teſt, ſed quandoq; eſt vt & nõ ſit, erit ſanè atque nõ erit. Idem ergo poſſibile erit eſſe atque non eſſe. & hoc eſt medium vtrorumque. Ratio autem vniuerſalis hæc eſt: Nam a & b, nulli eidem ineſſe poſſint: a verò aut c, & b aut d, cuilibet inſint. Cui igitur neque a, neque b ineſt, ei c b cuilibet inſint, neceſſe eſt. Sit autẽ id, quod inter a & b medium eſt, e: id enim, quod neutrum contrariorum eſt, eorumdẽ medium eſſe conſtat. Ambo igitur, c, inquã, & d, huic inſint neceſſe eſt. Nam aut a, aut c cuilibet ineſt. quare & ipſi e. Cùm igitur a impoſſibile ſit eſſe, inerit ipſum c. Eadem eſt & in ipſo d ratio. Neque igitur id, quod ſemper eſt, neque id D quod ſemper non eſt, generabile aut corruptibile eſt. Patet autẽ & ſi generabile, aut corruptibile ſit, non perpetuũ eſſe. Simul enim poterit ſemper eſſe, & non ſemper eſſe. hoc autem priùs demonſtratum eſt impoſſibile eſſe. Si igitur ingenerabile quippiã eſt, atque eſt ens, idnẽ ſempiternum eſse neceſse eſt? & pari modo, ſi incorruptibile eſt? Dico autẽ ingenerabile, & incorruptibile, ea quæ propriè dicũtur. Ingenerabile quidem id quod nũc eſt, & priùs non erat verum dicere haud eſse. Incorruptibile verò, quod nunc eſt, & poſteriùs verum non erit dicere haud eſse. at ſi hæc mutuò ſe ſequuntur, at-E que ingenerabile eſt incorruptibile, & incorruptibile, ingenerabile, ipſum etiam perpetuũ vtrumque ſequatur, neceſse eſt.* Et ſi eſt quippiam ingenerabile, & ſi eſt quippiam incorruptibile, ſit continuò ſempiternum neceſse eſt. Hoc ita eſse, & ex definitione ipſorum patet. Etenim ſi corruptibile eſt, generabile eſse neceſse eſt: aut .n. ingenerabile, aut generabile eſt. at ſi ingenerabile eſt, incorruptibile eſse ſupponitur: & ſi generabile eſt, & corruptibile eſse neceſse eſt. aut .n. corruptibile, aut incorruptibile eſt. at ſi incorruptibile eſt, ingenerabile eſse ſanè ſupponebatur. Sin verò mutuò ſe non ſequũtur incorruptibile, atq; ingenerabile, nõ neceſse eſt aut ipſũ ingenerabile, aut incorruptibile, perpetuũ eſſe. Sequi aũt hęc ſeſe mutuò neceſſariò, ex his emergere poteſt. generabile .n. & iorruptibile, mutuò ſe ſequuntur. Manifeſtum eſt autem & hoc, ex anteà dictis. Eſt enim id medium inter id quod ſemper eſt, &

A id quod ſemper non eſt, quod neutrum ſequitur: hoc autem eſt, generabile ipſum, ac corruptibile. Vtrumque enim, definito tempore quodam & eſſe, & non eſſe poteſt. Si igitur quippiam aut generabile, aut corruptibile ſit, id medium eſſe neceſſe eſt. Sit enim id quidem, quod ſemper eſt, a, id autẽ quod ſemper non eſt, b. c, verò ſit generabile, & d, ſit corruptibile: c igitur inter a & b medium eſſe neceſſe eſt. Illorum enim ad neutrum vltimũ tempus eſt, in quo a ipſum non erat, aut b ipſum erat. Generabile autem, aut actu, aut potentia neceſſe eſt eſſe: ipſis verò a b, neutro modo. Tempore igitur quodam, a definito, c ipſum & erit & rurſus nõ erit. Similiter eſt dicendum & de ipſo corruptibili B d. Generabile ergo, corruptibileve, vtrumque eſt. Generabile ergo, corruptibileve, mutuo ſe ſequuntur. Sit itaque ingenerabile e, generabile f: incorruptibile g, & corruptibile h. Eſt igitur demonſtratum, f atque h ſeſe mutuò ſequi. Quãdo autem ſic aliqua vt hæc iacent, velvt f quidem, & h ſeſe mutuo ſequuntur, e verò & f nulli eidem competunt, ſed alterum omni competit, & ſimili modo ipſa g, atque h, tunc & e g mutuo ſe ſequãtur neceſſe eſt. e namque ipſum g non ſequatur: ergo f ipſum ſequetur, quippe cùm cuilibet ipſum e aut f cõpetat. At g etiam id ſequetur, quod ſequitur ipſum f: ergo h ſequetur g ipſum. At impoſſibile eſſe ſupponebatur. Eadem ratione & g ſequi ipſum e, de- C monſtrabitur. At ſic ſe habet ingenerabile e, ad generabile f, & incorruptibile g, ad corruptibile h. Dicere autem nihil prohibere generatum quippiam incorruptibile eſſe, & ingenerabile quippiam corruptum eſſe, ſemel illo generato, hoc corrupto, tollere eſt aliquid eorum quæ data ſunt. Aut enim infinito, aut quodam definito tempore, omnia aut agere, aut pati, aut eſſe, aut non eſſe poſſunt: & infinito, propterea quòd tempus infinitum aliquo modo eſt definitum, quo nõn eſt maius. Id verò, quod aliqua ex parte eſt infinitum, neq; infinitum eſt, neque etiam definitum. Prçterea cur magis hoc in ſigno corruptum eſt id, quod antea ſemper erat, D aut generatum eſt id quod priùs non erat tempore infinito? Nam ſi non magis in hoc quàm in alio, & ipſa ſigna ſunt infinita, erat quippiam, vt patet, generabile, & corruptibile tempore infinito: ergo non eſſe tempore infinito poteſt. Simul enim, vt non ſit, & ſit, potentiam ſanè habebit, ipſum quidem prius, ſi corruptibile eſt: ipſum autem poſterius, ſi generabile eſt. Quare ſi poſuerimus eſſe quæ poſſunt, oppoſita ſimul erunt. Atque hoc inſuper in omni ſigno ſimiliter erit. Quare vt non ſit, & ſit tempore infinito, potentiam ſanè habebit. At demonſtratum eſt, hoc impoſſibile eſſe. Præterea ſi actum potentia antecedit, vniuerſo tempore erit, & quod ingenerabile erat, atque non ens tempore infinito, E fieri autẽ potens. Simul igitur non erat, & vt ſit potentiã habebat, & vt tũc ſit, & poſtea tẽpore infinito. Patet autem & alio modo impoſſibile eſſe, quippiam corruptibile non aliquãdo corrumpi. Semper enim ſimul, & corruptibile & incorruptibile erit actu. Quare ſimul erit poſſibile, ſemper eſſe, & non ſemper eſſe. Corruptibile ergo aliquando corrũpitur: & ſi generabile eſt, ortũ eſt. Poſſibile. n. eſt ortũ eſſe, & non ſemper eſſe. Poſſumus autẽ & hoc contemplari modo impoſſibile eſſe, aut ſi ortũ aliquando quippiam eſt, incorruptibile eſſe, aut ſi ingene-

A τοῦ ἀεὶ μὴ ὄντος ἐστὶ μεταξὺ, ᾧ μηδέτερον ἀκολουθεῖ. τοῦτο δ' ἐστὶ τὸ γενητὸν καὶ φθαρτόν. δυνατὸν γὰρ καὶ εἶναι, καὶ μὴ εἶναι ὡρισμένον χρόνον ἑκάτερον· λέγω δ' ἑκάτερον, καὶ εἶναι ποσόν τινα χρόνον, καὶ μὴ εἶναι. εἰ τοίνυν ἐστί τι γενητὸν ἢ φθαρτὸν, ἀνάγκη τοῦτο μεταξὺ εἶναι· ἔστω γὰρ τὸ α, τὸ ἀεὶ ὄν· τὸ δὲ β, τὸ ἀεὶ μὴ ὄν. τὸ δὲ γ, γενητόν· τὸ δὲ δ, φθαρτόν. ἀνάγκη δὴ τὸ γ μεταξὺ εἶναι τοῦ α καὶ β. τούτων μὲν γὰρ οὐκ ἔστι χρόνος ἐπ' οὐδέτερον τὸ πέρας ἐν ᾧ ἢ τὸ α οὐκ ἦν, ἢ τὸ β ἦν. τοῦ δὲ γενητοῦ ἀνάγκη ἢ ἐνεργείᾳ εἶναι, ἢ δυνάμει· τοῖς δὲ α β οὐδετέρως. ποσὸν ἄρα τινὰ καὶ ὡρισμένον χρό- B νον,* καὶ ἔσται, καὶ πάλιν οὐκ ἔσται τὸ γ. ὁμοίως δὲ καὶ ἐπὶ τοῦ δ φθαρτοῦ. γενητὸν ἄρα καὶ φθαρτὸν ἑκάτερον. ἀκολουθοῦσιν ἄρα ἀλλήλοις τὸ γενητὸν καὶ φθαρτόν. ἔστω δὴ τὸ ἐφ' ᾧ ε, ἀγένητον· τὸ δ' ἐφ' ᾧ ζ, γενητόν· τὸ δ' ἐφ' ᾧ η, ἄφθαρτον· τὸ δ' ἐφ' ᾧ θ, φθαρτόν· τὰ δὴ ζ θ δέδεικται ὅτι ἀκολουθεῖ ἀλλήλοις. ὅταν δὴ οὕτω κείμενα ὡς ταῦτα, οἷον τὸ μὲν ζ καὶ θ, ἀκολουθοῦντα· τὸ δὲ ε καὶ τὸ ζ, μηδενὶ τῷ αὐτῷ, ἀπαντὶ δὲ θάτερον. ὁμοίως δὲ καὶ τὰ η θ, ἀνάγκη καὶ τὰ ε η ἀκολουθεῖν ἀλλήλοις· ἔστω γὰρ τῷ η τὸ ε μὴ ἀκολουθοῦν. τὸ ἄρα ζ ἀκολουθήσει· παντὶ γὰρ τὸ ε ἢ τὸ ζ. ἀλλὰ μὴν ᾧ C τὸ ζ καὶ τὸ θ.* τῷ ἄρα η τὸ θ ἀκολουθήσει. ἀλλ' ὑπέκειτο ἀδύνατον εἶναι. ὁ δ' αὐτὸς λόγος, καὶ ὅτι τὸ η τῷ ε. ἀλλὰ μὴν οὕτως ἔχει τὸ ἀγένητον, ἐφ' ᾧ ε, πρὸς τὸ γενητὸν, ἐφ' ᾧ τὸ ζ καὶ τὸ ἄφθαρτον, ἐφ' ᾧ τὸ η, πρὸς τὸ φθαρτὸν, ἐφ' ᾧ θ. τὸ δὴ φάναι μηδὲν κωλύειν γενόμενόν τι ἄφθαρτον εἶναι καὶ ἀγένητον ὂν φθαρῆναι, ἅπαξ ὑπαρχούσης τῷ μὲν τῆς γενέσεως, τῷ δὲ τῆς φθορᾶς, ἀναιρεῖν ἐστὶ τῶν δεδομένων τι. ἢ γὰρ ἄπειρον, ἢ ποσόν τινα ὡρισμένον χρόνον, δύναται ἅπαντα ἢ ποιεῖν ἢ πάσχειν, ἢ εἶναι, ἢ μὴ εἶναι, καὶ τὸν ἄπειρον διὰ τοῦτο, ὅτι ὥρισταί πως ὁ ἄπειρος χρόνος, D οὗ οὐκ ἔστι πλείων. τὸ δὲ πῇ ἄπειρον, οὔτε ἄπειρον, οὔτε ὡρισμένον. ἔτι, τί μᾶλλον ἐπὶ τῳδὶ τῷ σημείῳ ἀεὶ ὂν πρότερον, ἐφθάρη, ἢ μὴ ὂν ἄπειρον ἐγένετο; εἰ γὰρ μηδὲν μᾶλλον, ἄπειρα δὲ τὰ σημεῖα, δηλονότι ἄπειρον χρόνον ἦν τι γενητὸν καὶ ἄφθαρτον. δύναται ἄρα μὴ εἶναι τὸν ἄπειρον χρόνον· ἅμα γὰρ ἕξει δύναμιν τοῦ μὴ εἶναι καὶ εἶναι· τὸ μὲν πρότερον, εἰ φθαρτὸν· τὸ δ' ὕστερον, εἰ γενητόν. ὥστε ἐὰν ὑπάρχειν θῶμεν ἃ δύναται, τὰ ἀντικείμενα ἅμα ὑπάρξει. ἔτι δὲ καὶ τοῦτο ὁμοίως ἐν ἅπαντι σημείῳ ὑπάρξει. ὥστε ἄπειρον χρόνον τοῦ μὴ εἶναι καὶ τοῦ εἶναι ἕξει δύναμιν. E ἀλλὰ δέδεικται ὅτι ἀδύνατον τοῦτο. ἔτι εἴπερ πρότερον ἡ δύναμις* ὑπάρχοι τῆς ἐνεργείας, ἅπαντα ὑπάρξει τὸν χρόνον, καὶ ὂν ἀγένητον ἦν, καὶ μὴ ὂν τὸν ἄπειρον χρόνον, γενέσθαι δὲ δυνάμενον. ἅμα δὴ οὐκ ἦν, καὶ τοῦ εἶναι δύναμιν εἶχε, καὶ τοῦ τότε μὴ εἶναι καὶ ὕστερον ἄπειρον χρόνον. φανερὸν δὲ καὶ ἄλλως, ὅτι ἀδύνατον φθαρτὸν ὂν μὴ φθαρῆναί ποτε· ἀεὶ γὰρ ἔσται ἅμα καὶ φθαρτὸν καὶ ἄφθαρτον ἐντελεχείᾳ· ὥστε ἅμα ἔσται δυνατὸν, ἀεί τι εἶναι, καὶ μὴ ἀεί. φθείρεται ἄρα ποτὲ τὸ φθαρτὸν, καὶ εἰ γενητὸν γέγονε. δυνατὸν γὰρ γεγονέναι, καὶ μὴ ἀεὶ ἄρα εἶναι. ἔστι δὲ καὶ ὧδε θεωρῆσαι, ὅτι ἀδύνατον ἢ γενόμενόν ποτε, ἄφθαρτόν τι διατε-

* γρ. ὃ ἔσται πάλιν, ὃ οὐκ ἔσται τὸ γ.

* γρ. τὸ ἄρα η τῷ θ ἀκολ.

* γρ. ὑπάρχει

λεῖν, ἢ ἀγένητον ὂν καὶ ἀεὶ πρότερον ὂν φθαρῆναι· οὐθὲν γὰρ ἀπὸ τοῦ αὐτομάτου, οὔτ' ἄφθαρτον, οὔτ' ἀγένητον οἷόν τ' εἶναι. τὸ μὲν γὰρ αὐτόματόν ἐστι, καὶ τὸ ἀπὸ τῆς τύχης, παρὰ τὸ ἀεί, καὶ τὸ ὡς ἐπὶ τὸ πολὺ ἢ ὄν, ἢ γινόμενον· τὸ δ' ἄπειρον χρόνον, ἢ ἁπλῶς, ἢ ἀπό τινος χρόνου ἢ ἀεί, ἢ ὡς ἐπὶ τὸ πολὺ ὑπάρχει ὄν. ἀνάγκη τοίνυν φύσει τὰ τοιαῦτα, ὁτὲ μὲν εἶναι, ὁτὲ δὲ μή· τῶν δὲ τοιούτων, ἡ αὐτὴ δύναμις τῆς ἀντιφάσεως, καὶ αἰτία ἡ ὕλη, τοῦ εἶναι καὶ μή. ὥστ' ἀνάγκη ἅμα ὑπάρχειν ἐνεργείᾳ τὰ ἀντικείμενα. ἀλλὰ μὴν οὐδὲ τἀληθὲς εἰπεῖν νῦν, ὅτι ἐστὶ πέρυσιν, οὐδὲ πέρυσιν, ὅτι νῦν ἐστιν. ἀδύνατον ἄρα μὴ ὄν ποτε ὕστερον ἀΐδιον εἶναι· ἕξει γὰρ ὕστερον καὶ τὴν τοῦ μὴ εἶναι δύναμιν. πλὴν οὐ τὴν τοῦ τότε μὴ εἶναι ὅτε ἐστίν· ὑπάρχει γὰρ ἐνεργείᾳ ὄν, ἀλλὰ τοῦ πέρυσιν καὶ ἐν τῷ παρελθόντι χρόνῳ. ἔστω δὴ οὗ ἔχει τὴν δύναμιν ὑπάρχον ἐνεργείᾳ. ἔσται ἄρα ἀληθὲς εἰπεῖν νῦν, ὅτι οὐκ ἔστι πέρυσιν. ἀλλ' ἀδύνατον· οὐδεμία γὰρ δύναμις τοῦ γεγονέναι ἐστίν, ἀλλὰ τοῦ εἶναι ἢ ἔσεσθαι. ὁμοίως δὲ καὶ εἰ πρότερον ὂν ἀΐδιον ὕστερον μὴ ἐστίν· ἕξει γὰρ δύναμιν οὗ* ἐνεργείᾳ οὐκ ἔστιν. ὥστ' ἂν θῶμεν τὸ δυνατόν, ἀληθὲς ἔσται εἰπεῖν νῦν, ὅτι τοῦτ' ἔστι πέρυσιν, καὶ ὅλως ἐν τῷ παρελθόντι χρόνῳ. καὶ φυσικῶς δὲ καὶ μὴ καθόλου σκοποῦσιν, ἀδύνατον ἢ ἀΐδιον ὂν πρότερον φθαρῆναι ὕστερον ἢ πρότερον μὴ ὄν, ὕστερον ἀΐδιον εἶναι· τὰ γὰρ φθαρτά, καὶ γενητά, καὶ ἀλλοιωτὰ πάντα. ἀλλοιοῦται δὲ τοῖς ἐναντίοις καὶ ἐξ ὧν συνίσταται, τὰ φύσει ὄντα, καὶ ὑπὸ τῶν αὐτῶν τούτων φθείρεται.

* γρ. ἐνέργεια

A rabile eſt,& antea ſemper erat, corruptionē ſubire. Nihil enim caſu, aut incorruptibile, aut ingenerabile eſse poteſt. Quod enim caſu eſt, atque fortuna, eſt præter id quod ſemper aut plerumque, aut eſt, aut fit. Quod verò infinito tempore aut ſimpliciter, aut ab aliquo tempore eſt, id aut ſemper aut plerumque eſt ens. Talia igitur interdū eſse, interdum nō eſse natura, neceſse eſt. Talium autem eadem potentia eſt contradictionis, & vt ſint, & non ſint, cauſa, materies eſt. Quare oppoſita ſimul eſse actu neceſse eſt. At verò neque verum eſt dicere nunc, tranſacto in anno eſse, neque tranſacto in anno nunc eſse. Impoſſibile eſt ergo, ſi aliquando non
B eſt, poſterius perpetuum eſse: habet enim poſterius, & potentiam non eſsendi. Verùm non vt tunc non ſit, quando eſt (eſt enim ens actu) ſed in anno præterito, temporéque tranſacto. Sit igitur id actu, cuius potentiam habet. Verum igitur erit, ſi tranſacto in anno non eſse dicatur. At impoſſibile eſt: nulla nempe potentia eſt reſpectu ipſius fuiſse: ſed eſse, vel fore. Similiter & ſi prius ſempiternum erat, & poſterius non eſt: habebit enim potentiam eius quod actu non eſt. Quare ſi poſuerimus id quod poteſt, verè dicetur nunc hoc eſse tranſacto in anno, in temporéq; omnino exacto. Naturaliter etiā, & non vniuerſaliter ſi conſideremus, impoſſibile ſanè videbitur, aut corrumpi poſterius, quod per-
C petuum prius erat, aut poſterius ſempiternum eſse, quod priùs non erat. Corruptibilia enim, & generabilia, & alterabilia ſunt vniuerſa: alterantur autem contrariis, & ex quibus conſtant ea quæ ſunt natura, & ab iis ipſis corrumpuntur.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ οὐρανοῦ τῶν εἰς Δ, τὸ Β.

ΚΕΦΑΛ. α'.

Ὅτι τοῖς ἔμπροσθεν εἰρημένοις περὶ τῆς τοῦ παντὸς οὐρανοῦ ἀϊδιότητος, καὶ τῶν ἄλλως λεγόντων καὶ γεννώντων αὐτόν, μαρτυροῦσιν οἱ λόγοι.

ΟΤΙ μὲν οὖν οὔτε γέγονεν ὁ πᾶς οὐρανός, οὔτε ἐνδέχεται φθαρῆναι, καθάπερ φασί τινες αὐτόν, ἀλλ' ἔστιν εἷς καὶ ἀΐδιος, ἀρχὴν μὲν καὶ τελευτὴν οὐκ ἔχων τοῦ παντὸς αἰῶνος, ἔχων δὲ καὶ περιέχων ἐν ἑαυτῷ τὸν ἄπειρον χρόνον, ἔκ τε τῶν εἰρημένων ἔξεστι λαβεῖν τὴν πίστιν, καὶ διὰ τῆς δόξης τῆς παρὰ τῶν ἄλλως λεγόντων καὶ γεννώντων αὐτόν. εἰ γὰρ οὕτως μὲν ἔχειν ἐνδέχεται, καθ' ὃν δὲ τρόπον ἐκεῖνοι λέγουσιν, οὐκ ἐνδέχεται, μεγάλην ἂν ἔχοι καὶ τοῦτο ῥοπὴν εἰς πίστιν περὶ τῆς ἀθανασίας αὐτοῦ καὶ τῆς ἀϊδιότητος· διόπερ καλῶς ἔχει συμπείθειν ἑαυτόν, τοὺς ἀρχαίους, καὶ μάλιστα τοὺς πατρίους ἡμῶν ἀληθεῖς εἶναι λόγους, ὡς ἔστιν ἀθάνατόν τι καὶ θεῖον τῶν ἐχόντων μὲν κίνησιν, ἐχόντων μέντοι τοιαύτην, ὥστε μηδὲν εἶναι πέρας αὐτῆς, ἀλλὰ μᾶλλον ταύτην τῶν ἄλλων πέρας· τό, τε γὰρ πέρας τῶν περιεχόντων ἐστί· καὶ αὕτη ἡ κυκλοφορία τέλειος οὖσα περιέχει τὰς ἀτελεῖς καὶ τὰς ἐχούσας πέρας καὶ παῦλαν,

ARISTOTELIS STAGIRITÆ, DE CÆLO

LIBER II.

CAPVT I.

D *Probat ſuperiori libro expoſitam de mundo ſententiam etiam aliter ſentientis teſtimonio poſſe confirmari.*

CÆlum igitur vniuerſum neque ortum eſse, neque corrumpi poſse, vt quidam inquiunt, ſed vnum eſse, ac ſempiternum principium quidem, & exitum æternitatis vniuerſæ non habens, infinitum autem habens, & continens in ſe ipſo tempus: & ex hiſce quæ dicta ſunt, & per opinionem eorum qui aliter
E dicunt, ipſumque generant, fidem ſumere licet. Nam ſi ſic quidem ſeſe habere poteſt, eo autem modo, quem illi dicunt, non poteſt, magnum & hoc vtique momentum ad faciendam fidem de immortalitate æternitatéque ipſius habet. Quare bene ſeſe habet, quemque ſibi perſuadere, veteres, & maiorum maximè noſtrorum ſententias veras eſse, quæ quidem aſserunt, eſse quippiam eorum immortale, atque diuinum, quæ motum quidem ſubeunt, talem tamen vt nullus ipſius ſit finis, ſed potiùs ipſe cæterorum ſit finis. Et finem enim ex his eſse conſtat, quæ continent. Et hic cùm ſit perfectus, imperfectos continet, & eos, qui finem habent atque ceſsationem.

Ipſe namque neque principium, neque exitum vllum habet, ſed inceſſabilis eſt tempore infinito. Cæterorum autem, aut eſt principij cauſa, aut ſuſcipit exitum, ceſſationémve. Atque ſuperum locum cælúmque veteres quidem diis tribuerunt, propterea quòd ſolum eſt immortale. Præſens autem oratio teſtis eſt, incorruptibile ac ingenerabile eſſe, vacaréque præterea omni difficultate mortali. Et inſuper eſſe ſine labore, propterea quòd nullius indiget vim inferentis neceſſitatis, quæ quidem prohibens detineret ipſum aptum alio modo ferri. Omne namque tale, laborioſum eſt, quo magis perpetuum eſt, & optimæ diſpoſitionis expers. Idcirco neque putandum eſt, ipſum in ſeſe habere, vt veterum fabula dicit, qui quidem ſalutem ipſius Atlante quodam inquiunt indigere. Et ij namque, qui hanc ſentẽtiam attulerunt, idem, quod poſteri, videntur exiſtimaſſe. Nam quaſi pondus haberent ſupera corpora omnia, terreáque eſſent, neceſſitatem animæ participem ipſi fabuloſè ſuppoſuere. Neque igitur hoc modo, neque ob conuerſionem (propterea quòd lationem habet motu ſuopte celeriorem, vt Empedocles dicit) conſeruari putãdum eſt adhuc ipſum tempore tanto, atque incolumem eſſe. At verò nec ab anima cogente ſempiternum manere, conſentaneum eſt rationi. Neque enim talis ipſius animæ vita, ſine dolore, beatáque eſſe poteſt. Et motum enim, qui eſt cum vi, ſi mouet corpus primum aliter aptum ferri, continuéque mouet, negotioſum, atque ab omni voluptate mentis ſemotum eſſe neceſſe eſt, ſi neque vt animæ mortalium animalium requies ineſt ea, quæ circa ſomnum fit corporis relaxatio: ſed Ixionis fatum cuiuſdam ipſam perpetuum inſuperabiléque detinere neceſſe eſt. Si igitur (vti diximus) res dicto modo de prima latione ſeſe habere poteſt, non ſolùm concinnius eſt ita de æternitate ipſius exiſtimare, ſed etiam hoc modo dumtaxat conſentaneas magis ei vaticinationi, quam de diis habemus, ſententias poſſumus certò proferre. Sed de his hactenus.

CAPVT II.

Quæ ſit cæli partium inuicem ratio: & an alia dextra ſit, alia ſiniſtra eius pars.

CVm autem ſint, qui dextrum ipſius cæli quippiam, & læuum inquiunt eſſe, vt ij qui Pythagorici nuncupantur, (eſt enim hæc illorum ſententia) conſiderandum eſt, vtrùm res ſic ſeſe habeat, vt illi dicunt, an alio potiùs modo, ſi hæc principia corpori ipſius vniuerſi ſunt adiungenda. Continuò namque ſi dextrum ineſt ei, læuúmque, priora principia priùs in ipſo eſſe exiſtimandum eſt. Determinatum igitur de his eſt in iis quæ de animalium motibus ſunt tractata, propterea quòd hęc propria ſunt illorum naturæ, atque accommodata, manifeſtè namque animalibus ineſſe videntur quibuſdam omnes iſtiuſmodi partes, (dextrum, inquam, atque ſiniſtrum) quibuſdam nonnullæ: plantis verò, ſupera atque infera ſolùm. Quòd ſi cælo talium quippiam eſt adiungendum, & id ipſi competere, quod primum (vt dicimus) in animalibus ineſt, conſentaneum eſt rationi. Vnumquodque enim trium, (dico autem trium, ſuperum inferúmque, ipſum ante atque oppoſitũ, & dextrum læuúmque) vt principium quoddam eſſe videtur.

A αὕτη μὲν οὐδεμίαν οὔτε ἀρχὴν ἔχουσα, οὔτε τελευτὴν, ἀλλ' ἄπαυστος οὖσα τὸν ἄπειρον χρόνον. τῶν δὲ ἄλλων, τῶν μὲν αἰτία τῆς ἀρχῆς· τῶν δὲ, δεχομένη τὴν παῦλαν. τὸν δ' οὐρανὸν καὶ τὸν ἄνω τόπον, οἱ μὲν ἀρχαῖοι τοῖς θεοῖς ἀπένειμαν, ὡς ὄντα μόνον ἀθάνατον· ὁ δὲ νῦν μαρτυρεῖ λόγος, ὡς ἄφθαρτος, καὶ ἀγένητος, ἔτι δὲ ἀπαθὴς πάσης θνητῆς δυσχερείας ἐστί. πρὸς δὲ τούτοις, ἄπονος, διὰ τὸ μηδεμιᾶς προσδεῖσθαι βιαίας ἀνάγκης, ἣ κατέχει κωλύουσα φέρεσθαι πεφυκότα αὐτὸν ἄλλως· πᾶν γὰρ τὸ τοιοῦτον ἐπίπονον, ὅσῳπερ ἂν ἀϊδιώτερον ᾖ, καὶ διαθέσεως τῆς ἀρίστης ἄμοιρον. διόπερ οὔτε κατὰ τὸν τῶν παλαιῶν μῦθον ὑποληπτέον B ἔχειν, οἵ φασιν Ἄτλαντός τινος αὐτῷ προσδεῖσθαι τὴν σωτηρίαν· ἐοίκασι γὰρ καὶ τοῦτον οἱ συστήσαντες τὸν λόγον, τὴν αὐτὴν ἔχειν ὑπόληψιν τοῖς ὕστερον· ὥσπερ γὰρ περὶ βάρος ἐχόντων καὶ γεηρῶν ἁπάντων τῶν ἄνω σωμάτων, ὑπέστησαν αὐτῷ μυθικῶς ἀνάγκην ἔμψυχον. οὔτε δὴ τοῦτον τὸν τρόπον ὑποληπτέον, οὔτε διὰ τὴν δίνησιν θάττονος τυγχάνοντα φορᾶς τῆς οἰκείας ῥοπῆς, ἔτι σῴζεσθαι τοσοῦτον χρόνον, καθάπερ Ἐμπεδοκλῆς φησιν. ἀλλὰ μὴν οὔτε ὑπὸ ψυχῆς εὔλογον ἀναγκαζούσης μένειν ἀΐδιον· οὐδὲ γὰρ τῆς ψυχῆς οἷόν τ' εἶναι τὴν τοιαύτην ζωὴν ἄλυπον καὶ μακαρίαν. ἀνάγκη γὰρ καὶ τὴν κίνησιν μετὰ βίας οὖσαν, εἴπερ C κινεῖ, φέρεσθαι πεφυκότος τοῦ πρώτου σώματος ἄλλως, καὶ κινεῖ συνεχῶς, ἄσχολον εἶναι, καὶ πάσης ἀπηλλαγμένην ῥᾳστώνης ἔμφρονος· εἴ γε μηδ' ὥσπερ τῇ ψυχῇ τῇ τῶν θνητῶν ζῴων ἐστὶν ἀνάπαυσις ἡ περὶ τὸν ὕπνον γινομένη τοῦ σώματος ἄνεσις. ἀλλ' ἀναγκαῖον Ἰξίονός τινος μοῖραν κατέχειν αὐτὴν ἀΐδιον καὶ ἄτρυτον. εἰ δὴ καθάπερ εἴπομεν, ἐνδέχεται τὸν εἰρημένον ἔχειν τρόπον περὶ τῆς πρώτης φορᾶς, οὐ μόνον αὐτοῦ περὶ τῆς ἀϊδιότητος οὕτως ὑπολαβεῖν ἐμμελέστερον, ἀλλὰ καὶ τῇ μαντείᾳ τῇ περὶ * τὸν θεὸν, μόνως ἂν ἔχοιμεν οὕτως ὁμολογουμένως ἀποφαίνεσθαι συμφώνους λόγους. ἀλλὰ τῶν μὲν τοιούτων λόγων ἅλις ἔστω τὰ νῦν. * γρ. περὶ τῶν θεῶν, D

ΚΕΦΑΛ. β'.

Περὶ τῶν κατὰ τὰς διαστάσεις μορίων, καὶ τῶν κατὰ τόπον ὡρισμένων, καὶ ὅτι τοῦ οὐρανοῦ οὐδὲν δεξιὸν καὶ ἀριστερόν.

ΕΠεὶ δὲ τινές εἰσιν, οἵ φασιν εἶναί τι δεξιὸν καὶ ἀριστερὸν τοῦ οὐρανοῦ, καθάπερ οἱ καλούμενοι Πυθαγόρειοι (ἐκείνων γὰρ οὗτος ὁ λόγος ἐστί,) σκεπτέον πότερον οὕτως ἔχει τὸν τρόπον, ὡς ἐκεῖνοι λέγουσιν, ἢ μᾶλλον ἑτέρως· εἴπερ δεῖ προσάπτειν τῷ τοῦ παντὸς σώματι ταύτας τὰς ἀρχάς· εὐθὺς γὰρ πρῶτον, εἰ τὸ δεξιὸν ὑπάρχει, καὶ τὸ ἀριστερὸν, ἔτι E πρότερον τὰς προτέρας ὑποληπτέον ὑπάρχειν ἀρχὰς ἐν αὐτῷ. διώρισται μὲν οὖν περὶ τούτων ἐν τοῖς περὶ τὰς τῶν ζῴων κινήσεις, διὰ τὸ τῆς φύσεως οἰκεῖα τῆς ἐκείνων εἶναι· φανερῶς γὰρ ἔν γε τοῖς ζῴοις ὑπάρχοντα φαίνεται, τοῖς μὲν πάντα τὰ τοιαῦτα μόρια· λέγω δ' οἷον τό, τε ἀριστερὸν καὶ τὸ δεξιόν· τοῖς δ' ἔνια· τοῖς δὲ φυτοῖς τὸ ἄνω καὶ τὸ κάτω μόνον. εἰ δὲ δεῖ καὶ τῷ οὐρανῷ προσάπτειν τι τῶν τοιούτων, καὶ τὸ πρῶτον, καθάπερ εἴπομεν ἐν τοῖς ζῴοις ὑπάρχειν, εὔλογον ὑπάρχειν ἐν αὐτῷ· τριῶν γὰρ ὄντων, ἕκαστον οἷον ἀρχή τίς ἐστι. λέγω δὲ τρία, τὸ ἄνω καὶ τὸ κάτω, καὶ τὸ πρόσθεν καὶ τὸ ἀντικείμενον, καὶ τὸ δεξιὸν καὶ τὸ ἀριστερόν·

ταύτας γὰρ τὰς διαστάσεις εὔλογον ὑπάρχειν τοῖς σώμασι τοῖς τελείοις πάσας. ἔστι δὲ τὸ μὲν ἄνω τοῦ μήκους ἀρχή, τὸ δὲ δεξιὸν τοῦ πλάτους, τὸ δ' ἔμπροσθεν τοῦ βάθους. ἔτι δὲ ἄλλως κατὰ τὰς κινήσεις. ἀρχαὶ γὰρ ταύτας λέγω, ὅθεν ἄρχονται πρῶτον αἱ κινήσεις τοῖς ἔχουσιν. ἔστι δὲ ἀπὸ μὲν τοῦ ἄνω, ἡ αὔξησις· ἀπὸ δὲ τῶν δεξιῶν, ἡ κατὰ τόπον· ἀπὸ δὲ τῶν ἔμπροσθεν, ἡ κατὰ τὴν αἴσθησιν. ἔμπροσθεν δὲ λέγω, ἐφ' ὃ αἱ αἰσθήσεις. διὸ καὶ οὐκ ἐν ἅπαντι σώματι τὸ ἄνω καὶ τὸ κάτω, καὶ τὸ δεξιὸν καὶ τὸ ἀριστερόν, καὶ τὸ ἔμπροσθεν καὶ τὸ ὄπισθεν ζητητέον· ἀλλ' ὅσα ἔχει κινήσεως ἀρχὴν ἐν ἑαυτοῖς ἔμψυχα ὄντα· τῶν γὰρ ἀψύχων ἐν οὐθενὶ ὁρῶμεν, ὅθεν ἡ ἀρχὴ τῆς κινήσεως. τὰ μὲν γάρ, ὅλως οὐ κινεῖται· τὰ δέ, κινεῖται μέν, ἀλλ' οὐ πανταχόθεν ὁμοίως· οἷον, τὸ πῦρ ἄνω μόνον· καὶ ἡ γῆ ἐπὶ τὸ μέσον. ἀλλ' ἐν μὲν τούτοις λέγομεν τὸ ἄνω καὶ τὸ κάτω, καὶ τὸ δεξιὸν καὶ τὸ ἀριστερὸν πρὸς ἡμᾶς ἐπαναφέροντες. ἢ γὰρ κατὰ τὰ ἡμέτερα δεξιά, ὥσπερ οἱ μάντεις· ἢ καθ' ὁμοιότητα τοῖς ἡμετέροις, οἷον τὰ τῶν ἀνδριάντων· ἢ τὰ ἐναντίως ἔχοντα τῇ θέσει, δεξιὸν μὲν τὸ κατὰ τὸ ἡμέτερον ἀριστερόν· ἀριστερὸν δὲ τοὐναντίον· καὶ ὄπισθεν τὸ κατὰ τὸ ἡμέτερον ἔμπροσθεν. ἐν αὐτοῖς δὲ τούτοις οὐδεμίαν ὁρῶμεν διαφοράν. ἐὰν γὰρ ἀνάπαλιν στραφῇ, τὰ ἐναντία ἐροῦμεν δεξιὰ καὶ ἀριστερά, καὶ ἄνω καὶ κάτω, καὶ ἔμπροσθεν καὶ ὄπισθεν. διὸ καὶ τῶν Πυθαγορείων ἄν τις θαυμάσειεν, ὅτι δύο μόνας ταύτας ἀρχὰς ἔλεγον, τὸ δεξιὸν καὶ τὸ ἀριστερόν· τὰς δὲ τέτταρας παρέλιπον οὐδὲν ἧττον κυρίας οὔσας· οὐδὲν γὰρ ἐλάττω διαφορὰν ἔχει τὰ ἄνω πρὸς τὰ κάτω, καὶ τὰ ἔμπροσθεν πρὸς τὰ ὄπισθεν, ἢ τὰ δεξιὰ πρὸς τὰ ἀριστερὰ ἐν ἅπασι τοῖς ζώοις· τὰ μὲν γάρ, τῇ δυνάμει μόνον διαφέρει· τὰ δέ, καὶ τοῖς σχήμασι. καὶ τὸ μὲν ἄνω καὶ τὸ κάτω πᾶσι τοῖς ἐμψύχοις ἐστὶν ὁμοίως ζώοις καὶ φυτοῖς· τὸ δὲ δεξιὸν καὶ τὸ ἀριστερὸν οὐχ ὑπάρχει τοῖς φυτοῖς. ἔτι δ' ὡς τὸ μῆκος τοῦ πλάτους πρότερον, εἰ τὸ μὲν ἄνω, τοῦ μήκους ἀρχή· τὸ δὲ δεξιόν, τοῦ πλάτους· ἡ δὲ τοῦ προτέρου ἀρχὴ προτέρα· πρότερον ἂν εἴη τὸ ἄνω τοῦ δεξιοῦ κατὰ γένεσιν· ἐπειδὴ πολλαχῶς λέγεται τὸ πρότερον. πρὸς δὲ τούτοις, εἰ τὸ μὲν ἄνω ἐστὶ τὸ ὅθεν ἡ κίνησις· τὸ δὲ δεξιόν, ἀφ' οὗ· τὸ δ' εἰς τὸ ἔμπροσθεν, ἐφ' ὅ, κἂν οὕτως ἔχοι τινὰ δύναμιν ἀρχῆς τὸ ἄνω πρὸς τὰς ἄλλας ἰδέας. διά τε δὴ τὸ παραλιπεῖν τὰς κυριωτέρας ἀρχάς, δίκαιον αὐτοῖς ἐπιτιμᾶν· καὶ διότι ταύτας ἐν ἅπασιν ὁμοίως ἐνόμιζον ὑπάρχειν. ἡμῖν δ' ἐπειδὴ ἀφώρισται πρότερον, ὅτι ἐν τοῖς ἔχουσιν ἀρχὴν κινήσεως αἱ τοιαῦται δυνάμεις ὑπάρχουσιν· ὁ δ' οὐρανὸς ἔμψυχος, καὶ ἔχει κινήσεως ἀρχήν· δῆλον ὅτι ἔχει τὸ ἄνω καὶ τὸ κάτω, καὶ τὸ δεξιὸν καὶ τὸ ἀριστερόν. οὐ δεῖ γὰρ ἀπορεῖν διὰ τὸ σφαιροειδὲς εἶναι τὸ σχῆμα τοῦ παντός, ὅπως ἔσται αὐτοῦ τὸ μὲν δεξιόν, τὸ δὲ ἀριστερόν, ὁμοίων γε ὄντων τῶν μορίων ἁπάντων καὶ κινουμένων τὸν ἅπαντα χρόνον· ἀλλὰ νοεῖν, ὥσπερ ἂν εἴ τις ἐν οἷς ἔχοι τὸ δεξιὸν πρὸς τὸ ἀριστερὸν διαφοράν, καὶ τοῖς σχήμασιν εἶτα περιθείη σφαῖραν. ἕξει μὲν γὰρ τὴν δύναμιν διαφέρουσαν· δόξει δ' οὐ διὰ τὴν ὁμοιότητα τοῦ σχήματος. τὸν αὐτὸν δὲ τρόπον καὶ περὶ τῆς ἀρχῆς τοῦ κινεῖσθαι. καὶ γὰρ εἰ μηδέποτ' ἤρξατο, ὅμως ἔχειν ἀναγκαῖον ἀρχήν, ὅθεν ἂν ἤρξατο, εἰ ἤρχετο κινούμενον κινεῖσθαι. κἂν εἰ σταίη, κινηθείη γε ἂν πάλιν.

A Has enim omnes dimenſiones, perfectis corporibus ineſſe conſonum eſt rationi: atque ſuperum quidem longitudinis, dextrum autem latitudinis, ipſum verò ante, altitudinis principium eſt. Inſuper aliò modo motuum ratione. hæc enim principia dico, vnde motus iis incipiunt, quæ hæc habent. Eſt autem ab ipſo quidem ſupero accretio, à dextris autem ea motio, quæ loco accommodatur: ab hiſce verò, quæ ante ſunt, ea motio quæ fit ſenſu. Atque id ante dico, in quo ſunt ſenſus. Quapropter & non omni in corpore quærendum eſt ſupernum, atque inferum, & dextrum læuúmque, atque ante, & retro: ſed in hiſce quæ cũ animata ſint, motus in ſe ipſis principium habent. In nullo enim eo-B rum, quæ vocant inanima, id cernimus, vnde eſt principium motus. Quædam enim omnino non mouentur: quædam mouentur quidem, ſed omni ex parte ſimili modo: velut ignis ſurſum ſolùm, & terra ad medium. Sed in his ſuperum & inferum, dextrum læuúmque dicimus, ad nos ipſos referentes. Nam aut reſpectu noſtri, dextri læuique, vt augures dicunt: aut ſimilitudine noſtri, vt ea quæ ſunt ſtatuæ, aut ea quę contrario modo ſeſe habent poſitione. Etenim dextrum quidem id dicimus, quod opponitur noſtro ſiniſtro, læuum autem, contrarium, & retro, ac ante, ſimili modo. In his autem ipſis, nullam differentiam cernimus. Si contrà nam-C que vertantur, contraria dextra læuáque, ſupera ac infera, & ante retróque ſanè dicemus. Quapropter & Pythagoricos quiſpiam mirabitur, ſola hæc duo principia dixiſſe, dextrum, inquam, atque ſiniſtrum: cæteras autem quatuor differentias omiſiſſe, non minùs rationem principij ſubeuntes. Non enim minorem ad infera, ſupera, & ad ea quæ ſunt retro, ea quæ ſunt ante, quàm ad læua, dextra vniuerſis in animalibus differentiam habent. Hæc enim vi ſolùm, illa figura etiam differunt. Et ſuperum quidem, ac inferum, omnibus animantibus ineſt, tam animalibus, quàm etiam plantis. Dextrum autem læuúmque plantis non ineſt. Præterea vt longitu-D do latitudinem antecedit, ſic prius erit generatione ſuperum, dextro, cùm multipliciter prius dicatur. Si longitudinis quidem ſuperum, latitudinis verò dextrum principium eſt, atque prioris principium antecedit. Inſuper ſi ſuperum quidem eſt id, vnde eſt motio, dextrum autem àquo, & antè, ad quod: hoc quoque modo vim quandam principij ſuperum ad cæteras ſpecies habet. Increpandi ſunt igitur Pythagorici, & quia maximè propria principia omiſerunt, & quia in vniuerſis hæc ſimiliter ineſſe putabant. Cùm autem à nobis ſit antea definitum, tales potentias iis ineſſe, quæ principium motus habent: & cælum ſit animatum, atque principium habeat motus: patet, ipſi ſuperum inferúmque, & dextrum atque læuum ineſſe. Non E enim dubitare oportet ob vniuerſi rotundam figuram, quónam pacto aliud ipſius dextrum, aliud læuum erit, ſi partes ſint ſimiles vniuerſæ, perpetuóque motu cieantur. Sed intelligere perinde oportet, atque ſi quiſpiam in hiſce quæ dextri ad læuum, figuris quoque differentiam habent, circumpoſuerit ſphæram. Habebunt enim potentiam differentem: at ob figuræ ſimilitudinem habere non videbuntur. Eodem modo, de principio quoque motus intelligamus oportet. Etenim & ſi nunquam moueri cælum incœpit, principium tamen habeat ipſum neceſſe eſt, vnde incœpiſſet, ſi inciperet moueri: & rurſus cietur motu, ſi ſtabit.

Dico autem longitudinem ipſius quidem eam eſſe, quæ inter polos, diſtātiam: & polorum alterum ſuperam, alterum inferam partem. Differētiam enim in ſolis his hemiſphæriorum cernimus, ex eo quia poli non mouentur, & inſuper in Mundo nō ipſum ſuperum, atque inferum, ſed ea, quæ ſunt præter polos, latera dicere conſueuimus. Quo patet, hanc ipſius cæli longitudinem eſſe. Id eſt enim latus, quod eſt præter ſuperum, inferúmque. Polorum autem is quidem, qui apud nos videtur, pars infera eſt: is autem qui nobis manifeſtus non eſt, partis rationem ſuperæ ſubit. Dextrum enim vniuſcuiuſque id eſſe dicimus, vnde principium ad locum accommodatæ motionis emerget. Conuerſionis verò cæli principium id eſt, vnde oriuntur ſtellæ. Quare hoc erit dextrum: id verò, vbi ſiunt occaſus, læuum. Si igitur à dextris incipit & circumfertur ad dextra, polum eum qui non videtur, ſuperum eſſe neceſſe eſt. Si enim erit is, qui videtur, motus, ad partes erit ſiniſtras: quod quidem non dicimus. Patet igitur, eum polum, qui non videtur à nobis, cæli partem ſuperam eſſe: & eos quidem, qui illic habitant, in hemiſphærio ſupero eſſe, atque in dextris, nos autē in infero, ac ſiniſtris, contrà atque Pythagorici dicunt. Illi enim nos ſupra faciunt, dextráque in parte, illos infra, atque in læuis. Contrarium autem accidit. Verùm ſecundę conuerſionis, velvti vagarum ſtellarum, nos quidem in ſuperis dextriſque ſumus, illi verò in inferis ſunt, atq; ſiniſtris. Eſt enim hiſce principium motionis contra, propterea quòd lationes contrariæ ſunt. Quare ſit vt nos in principio ſimus, illi in fine ſint collocati. De partibus igitur per dimenſiones locóve definitis tot à nobis ſint dicta.

CAPVT III.

Quam ob rēm plures ſint circulorum lationes.

CVm autem conuerſio non ſit contraria, conſiderandū cur plures ſint lationes. Quanquam eminus facere inquiſitionem conamur, eminúſque nō adeo loco, ſed multò magis hoc ipſo quod accidentium ipſis cęlis perpaucorum ſenſum habemus. Dicamus tamen, atque de ipſis cauſam hinc ſumamus oportet. Eorū quodque, quorū eſt opus, operis ipſius eſſe gratia cōſtat. Dei verò operatio, immortalitas eſt, hoc autem eſt perpetua vita. Quare Deo perpetuum ineſſe motum neceſſe eſt. Cùm autem cælum ſit tale (eſt enim corpus quoddā diuinum) ideo corpus rotundum habet, quod ſuapte natura ſemper cōuertitur. Cur igitur totū corpus cæli tale non eſt? Quia corporis eius, quod verſatur, aliquid, id inquā quod eſt in medio, manere neceſſe eſt. Huius autē manere nulla pars, aut omnino, aut in medio poteſt. Naturalis enim ipſius motus, ad ipſum mediū eſſet. At ipſum ſuapte natura verſatur. Motus enim ſempiternus non eſſe, quippe cùm nihil præter naturā ſit ſempiternū. Id enim, quod eſt pręter naturā, poſterius eſt eo quod eſt ſecundū naturā: atque id quod eſt præter naturā, exceſſus quidā eſt in ipſa generatione, eius quod eſt ſecundū naturā. Sit igitur terra neceſſe eſt: hæc enim in medio ſanè quieſcit. Atque nunc quidē hoc ſupponatur: poſteriùs autē de ipſo dicetur. At ſi terram eſſe neceſſe eſt, ignem etiam eſſe neceſſe eſt. Contrariorum enim ſi alterum eſt natura, & alterū eſſe natura neceſſe eſt, ſi ſit contrarium, atque aliquam ipſius eſſe naturā. Eſt enim eadem contrariorū materies:

A λέγω δὲ μῆκος αὐτοῦ τὸ κατὰ τοὺς πόλους διάστημα· καὶ τῶν πόλων, τὸν μὲν ἄνω, τὸν δὲ κάτω· διαφορὰν γὰρ ἐν μόνοις τούτοις ὁρῶμεν τῶν ἡμισφαιρίων, τῷ μὴ κινεῖσθαι τοὺς πόλους. ἅμα δὲ καὶ εἰώθαμεν λέγειν τὰ πλάγια ἐν τῷ κόσμῳ, οὐ τὸ ἄνω καὶ τὸ κάτω, ἀλλὰ τὰ παρὰ τοὺς πόλους, ὡς τούτου μήκους ὄντος· τὸ γὰρ εἰς τὸ πλάγιον ἐστί, τὸ παρὰ τὸ ἄνω καὶ τὸ κάτω. τῶν δὲ πόλων, ὁ μὲν ὑπὲρ ἡμᾶς φαινόμενος, τὸ κάτω μέρος ἐστίν· ὁ δ' ἡμῖν ἄδηλος, τὸ ἄνω. δεξιὸν γὰρ ἑκάστου λέγομεν, ὅθεν ἡ ἀρχὴ τῆς κατὰ τόπον κινήσεως. τοῦ δ' οὐρανοῦ ἀρχὴν τῆς περιφορᾶς, ὅθεν αἱ ἀνατολαὶ τῶν ἄστρων. ὥστε τοῦτ' ἂν εἴη δεξιόν· οὗ δὲ αἱ δύσεις, B ἀριστερόν. εἰ οὖν ἄρχεταί τε ἀπὸ τῶν δεξιῶν, καὶ ἐπὶ τὰ δεξιὰ περιφέρεται, ἀνάγκη τὸ ἄνω εἶναι τὸν ἀφανῆ πόλον· εἰ γὰρ ἔσται ὁ φανερὸς, ἐπ' ἀριστερὰ ἔσται ἡ κίνησις· ὅπερ οὔ φαμεν. δῆλον τοίνυν, ὅτι ὁ ἀφανὴς πόλος ἐστὶ τὸ ἄνω. καὶ οἱ μὲν ἐκεῖ οἰκοῦντες, ἐν τῷ ἄνω εἰσὶν ἡμισφαιρίῳ, καὶ πρὸς τοῖς δεξιοῖς· ἡμεῖς δ' ἐν τῷ κάτω, καὶ πρὸς τοῖς ἀριστεροῖς, ἐναντίως ἢ ὡς οἱ Πυθαγόρειοι λέγουσιν. ἐκεῖνοι γὰρ ἡμᾶς ἄνω τε ποιοῦσι, καὶ ἐν τῷ δεξιῷ μέρει· τοὺς δ' ἐκεῖ κάτω, καὶ ἐν τῷ ἀριστερῷ. συμβαίνει δὲ τοὐναντίον. ἀλλὰ τῆς μὲν δευτέρας περιφορᾶς, οἷον τῆς τῶν πλανήτων, ἡμεῖς μὲν ἐν τοῖς ἄνω, καὶ ἐν τοῖς δεξιοῖς ἐσμέν· ἐκεῖ- C νοι δὲ ἐν τοῖς κάτω, καὶ ἐν τοῖς ἀριστεροῖς. ἀνάπαλιν γὰρ ἡ ἀρχὴ τούτοις τῆς κινήσεώς ἐστι, διὰ τὸ ἐναντίας εἶναι τὰς φοράς. ὥστε συμβαίνει ἡμᾶς μὲν εἶναι πρὸς τῇ ἀρχῇ, ἐκείνους δὲ πρὸς τῇ τελευτῇ. περὶ μὲν οὖν τῶν κατὰ τὰς διαστάσεις μορίων, καὶ τῶν κατὰ τόπον ὡρισμένων, τοσαῦτα εἰρήσθω.

ΚΕΦΑΛ. γ'.

Διὰ τί πλείους εἰσὶ φοραί.

ΕΠεὶ δ' οὐκ ἔστιν ἐναντία κίνησις ἡ κύκλῳ τῇ κύκλῳ, σκεπτέον διὰ τί πλείους εἰσὶ φοραὶ, καίπερ D πόρρωθεν πειρωμένοις ποιεῖσθαι τὴν ζήτησιν. πόρρω δ' οὐχ οὕτω* τῷ τόπῳ, πολὺ δὲ μᾶλλον τῷ τῶν συμβεβηκότων αὐτοῖς* περὶ, πάμπαν ὀλίγην ἔχειν αἴσθησιν. ὅμως δὲ λέγωμεν. ἡ δ' αἰτία περὶ αὐτῶν ἐντεῦθεν ληπτέα. ἕκαστόν ἐστιν ὧν ἔργον ἐστὶν, ἕνεκα τοῦ ἔργου. θεοῦ δὲ ἐνέργεια, ἀθανασία· τοῦτο δὲ ἐστὶ ζωὴ ἀΐδιος. ὥστε ἀνάγκη τῷ θείῳ κίνησιν ἀΐδιον ὑπάρχειν. ἐπεὶ δὲ ὁ οὐρανὸς τοιοῦτος· (σῶμα γάρ τι θεῖον) διὰ τοῦτο ἔχει τὸ ἐγκύκλιον σῶμα, ὃ φύσει κινεῖται κύκλῳ ἀεί. διὰ τί οὖν οὐχ ὅλον τὸ τοῦ οὐρανοῦ σῶμα τοιοῦτον; ὅτι ἀνάγκη μένειν τι τοῦ σώματος τοῦ φερομένου κύκλῳ τὸ ἐπὶ τοῦ μέσου· τούτου E δὲ οὐδὲν οἷόν τε μένειν μόριον, οὔθ' ὅλως, οὔτε ἐπὶ τοῦ μέσου. καὶ γὰρ ἂν ἡ κατὰ φύσιν κίνησις ἦν αὐτοῦ ἐπὶ τὸ μέσον· φύσει δὲ κύκλῳ κινεῖται· * οὐκ ἂν ἦν ἀΐδιος ἡ κίνησις. οὐθὲν γὰρ παρὰ φύσιν ἀΐδιον. ὕστερον δὲ τὸ παρὰ φύσιν τοῦ κατὰ φύσιν, καὶ ἔκστασίς τίς ἐστιν ἐν τῇ γενέσει τὸ παρὰ φύσιν τοῦ κατὰ φύσιν. ἀνάγκη τοίνυν γῆν εἶναι· τοῦτο γὰρ ἠρεμεῖ ἐπὶ μέσου. νῦν μὲν οὖν ὑποκείσθω * τοῦτο. ὕστερον δὲ λεχθήσεται περὶ αὐτοῦ. ἀλλὰ μὴν εἰ γῆν, ἀνάγκη καὶ πῦρ εἶναι. τῶν γὰρ ἐναντίων εἰ θάτερον φύσει, ἀνάγκη καὶ θάτερον εἶναι φύσει, ἄνπερ ᾖ ἐναντίον, καὶ εἶναί τινα αὐτοῦ φύσιν· ἡ γὰρ αὐτὴ ὕλη τῶν ἐναντίων,

* κ. τῷ τρόπῳ.

* κ. περὶ πάμπαν ὀλίγων, mutata diſtinctione.

* κ. ἦν γὰρ ἂν

* κ. τοῦτο, ἐπὶ αἰτίας ἡ γῆ.

καὶ τῆς στερήσεως πρότερον ἡ κατάφασις. λέγω δὲ, οἷον τὸ θερμὸν τοῦ ψυχροῦ. ἡ δὲ ἠρεμία καὶ τὸ βαρὺ λέγονται κατὰ στέρησιν κουφότητος καὶ κινήσεως. ἀλλὰ μὴν εἴπερ ἐστὶ πῦρ καὶ γῆ, ἀνάγκη καὶ τὰ μεταξὺ αὐτῶν εἶναι σώματα· ἐναντίωσιν γὰρ ἔχει ἕκαστον τῶν στοιχείων πρὸς ἕκαστα. ὑποκείσθω δὲ καὶ τοῦτο νῦν· ὕστερον δὲ πειρατέον δεῖξαι. τούτων δὲ ὑπαρχόντων, φανερὸν ὅτι ἀνάγκη γένεσιν εἶναι, διὰ τὸ μηδὲν οἷόν τ' αὐτῶν εἶναι ἀΐδιον· πάσχει γὰρ καὶ ποιεῖ τἀναντία ὑπ' ἀλλήλων, καὶ φθαρτικὰ ἀλλήλων ἐστίν. ἔτι δὲ οὐκ εὔλογον τί κινητὸν εἶναι ἀΐδιον, οὗ μὴ ἐνδέχεται εἶναι κατὰ φύσιν τὴν κίνησιν ἀΐδιον· τούτων δὲ ἐστὶ κίνησις. ὅτι μὲν τοίνυν ἀναγκαῖον εἶναι γένεσιν, ἐκ τούτων δῆλον. εἰ δὲ γένεσιν, ἀναγκαῖον καὶ ἄλλην εἶναι φοράν, ἢ μίαν, ἢ πλείους· κατὰ γὰρ τὴν τοῦ ὅλου, ὡσαύτως ἀναγκαῖον ἔχειν τὰ στοιχεῖα τῶν σωμάτων πρὸς ἄλληλα. λεχθήσεται δὲ καὶ περὶ * τούτου ἐν τοῖς ἑπομένοις σαφέστερον. νῦν δὲ τοσοῦτον ἐστὶ δῆλον, διὰ τίνα αἰτίαν πλείω τὰ ἐγκύκλιά ἐστι σώματα· ὅτι ἀνάγκη γένεσιν εἶναι· γένεσιν δὲ, εἴπερ καὶ πῦρ. τοῦτο δὲ καὶ τὰ ἄλλα, εἴπερ καὶ γῆν· ταύτην δὲ, ὅτι ἀνάγκη μένειν τι ἀεὶ, εἴπερ κινεῖσθαί τι αἰεὶ δεῖ.

* γρ. πάντων

ΚΕΦΑΛ. δ'.

Ὅτι σχῆμα ἀνάγκη σφαιροειδὲς ἔχειν τὸν οὐρανόν.

Σχῆμα δὲ ἀνάγκη σφαιροειδὲς ἔχειν τὸν οὐρανόν. τοῦτο γὰρ οἰκειότατόν τε τῇ οὐσίᾳ καὶ τῇ φύσει πρῶτον. εἴπωμεν δὲ πρῶτον καθόλου περὶ τῶν σχημάτων, τὸ ποῖόν ἐστι πρῶτον, καὶ ἐν ἐπιπέδοις, καὶ ἐν στερεοῖς. ἅπαν δὴ σχῆμα ἐπίπεδον, ἢ εὐθύγραμμόν ἐστιν, ἢ περιφερόγραμμον. καὶ τὸ μὲν εὐθύγραμμον ὑπὸ πλειόνων περιέχεται γραμμῶν· τὸ δὲ περιφερόγραμμον, ὑπὸ μιᾶς. ἐπεὶ δὲ πρότερον τῇ φύσει ἐν ἑκάστῳ γένει τὸ ἓν τῶν πολλῶν, καὶ τὸ ἁπλοῦν * τῶν συνθέτων, πρῶτον ἂν εἴη τῶν ἐπιπέδων σχημάτων ὁ κύκλος. ἔτι δὲ εἴπερ τέλειόν ἐστιν, οὗ μηδὲν ἔξω τῶν αὐτοῦ λαβεῖν δυνατὸν, ὥσπερ ὥρισται πρότερον, καὶ τῇ μὲν εὐθείᾳ πρόσθεσίς ἐστιν ἀεὶ, τῇ δὲ τοῦ κύκλου οὐδέποτε· φανερὸν ὅτι τέλειος ἂν εἴη ἡ περιέχουσα τὸν κύκλον· ὥστ' εἰ τὸ τέλειον πρότερον τοῦ ἀτελοῦς, καὶ διὰ ταῦτα πρότερος ἂν εἴη τῶν σχημάτων ὁ κύκλος. ὡσαύτως δὲ καὶ ἡ σφαῖρα τῶν στερεῶν· μόνη γὰρ ἐκείνη περιέχεται μιᾷ ἐπιφανείᾳ· τὰ δὲ εὐθύγραμμα, πλείοσιν. ὡς γὰρ ἔχει ὁ κύκλος ἐν τοῖς ἐπιπέδοις, οὕτως ἡ σφαῖρα ἐν τοῖς στερεοῖς. ἔτι δὲ καὶ οἱ διαιροῦντες εἰς ἐπίπεδα, καὶ ἐξ ἐπιπέδων τὰ σώματα γεννῶντες μεμαρτυρηκέναι φαίνονται τούτοις· μόνην γὰρ τῶν στερεῶν οὐ διαιροῦσι τὴν σφαῖραν, ὡς οὐκ ἔχουσαν πλείους ἐπιφανείας ἢ μίαν. ἡ γὰρ εἰς τὰ ἐπίπεδα διαίρεσις, οὐχ ὡς ἂν τέμνων τις εἰς τὰ μέρη διέλοι τὸ ὅλον, τοῦτον διαιρεῖται τὸν τρόπον, ἀλλ' ὡς εἰς ἕτερα τῷ εἴδει. ὅτι μὲν οὖν πρώτη ἐστὶν ἡ σφαῖρα τῶν στερεῶν σχημάτων δῆλον. ἔστι δὲ καὶ κατὰ τὸν ἀριθμὸν τὴν τάξιν ἀποδιδοῦσιν οὕτω τιθεμένοις εὐλογώτατον· τὸν μὲν κύκλον, κατὰ τὸ ἓν· τὸ δὲ τρίγωνον, κατὰ τὴν δυάδα, ἐπειδὴ δύο ὀρθαί. ἐὰν δὲ τὸ ἓν κατὰ τὸ τρίγωνον, ὁ κύκλος οὐκ ἔτι ἔσται σχῆμα. ἐπεὶ δὲ τὸ μὲν πρῶτον σχῆμα, τοῦ πρώτου σώματος· πρῶτον δὲ σῶμα, τὸ ἐν τῇ ἐσχάτῃ περιφορᾷ· σφαιροειδὲς ἂν εἴη τὸ τὴν κύκλῳ περιφερόμενον φοράν. καὶ τὸ συνεχὲς ἄρα ἐκείνῳ· τὸ γὰρ

* γρ. τῶν συνθέτων,

A & affirmatio priuatione eſt prior, velvti calidum frigido. Quies verò, ac graue, per leuitatis motuſve priuationem dicũtur. Atqui ſi terra eſt, atque ignis, ea quoque corpora eſſe, quæ ſunt inter ipſa, neceſſe eſt. Elementorum enim vnumquodque contrarietatem ad quodque nimirum habet. Atque hoc etiã nunc ſupponatur: poſterius autem eſt demonſtrandum. Hęc cùm ſint, patet neceſſario generationem eſſe, propterea quòd nihil ipſorum perpetuum eſſe poteſt. Agunt enim inter ſeſe contraria ipſa, mutuóque à ſeſe patiuntur, ac corrumpuntur. Non eſt propterea conſentaneum rationi, mobile quippiam perpetuum eſſe, cuius motus ſecundùm naturam

B perpetuus eſſe non poteſt. At horum eſt motus. Ex his igitur patet, neceſſariò generationẽ eſſe. Quòd ſi generationem eſſe neceſſe eſt, & aliam lationem aut vnam, aut plures eſſe neceſſe eſt. Nam vt ſeſe habet totius motio cæli, ſic elementa corporũ inter ſeſe reſpectu generationis habere neceſſe eſt. Et hoc etiam in ſequentibus dilucidiùs declarabitur. Nunc tantùm patet, quam ob cauſam plura ſunt corpora, quæ verſantur: generationem eſſe enim neceſſe eſt: & generationem, ſi & ignem eſſe neceſſe eſt: & hunc, cæteraque, ſi & terram: & hanc, propterea quòd conſiſtat aliquid, maneátque ſemper neceſſe eſt, ſi moueri quippiam ſemper oportet.

C

CAPVT IV.

Quòd cælum figura ſit ſphærica.

Figuram autem cælum rotundam habere neceſſe eſt. Hæc enim eſt accommodatiſſima ſubſtantiæ ipſius, & natura etiam prima. Dicamus autem vniuerſaliter quænam & in planis & in ſolidis figura ſit prima. Omnis itaque figura plana, aut à rectis lineis, aut à circũferentia cõtinetur: & illa quidem à pluribus, hæc ab vna linea ſolùm. Cùm vnũ igitur in vnoquoque genere prius ſit multis natura, compoſitióque ſimplex, figurarum planarum profectò circulus erit prima. Præterea, ſi perfectum id eſt, extra quod nihil eorum quæ ſunt ipſius, acci-

D pi poteſt, quemadmodum priùs eſt definitum, & lineæ quidem rectæ ſemper additio fieri poteſt, lineæ verò circulari nunquam: patet, perfectam eam lineam eſſe, quæ ipſum circulum continet. Quare ſi perfectum prius eſt imperfecto, ob hæc & circulus prima erit figura. Eodem & ſphæra modo, ſolidarum figurarum prima erit figura. Sola namque ab vna ſuperficie continetur: rectarum verò linearum figuræ à pluribus continentur. Vt enim in planis circulus ſeſe habet, ſic in ſolidis ſphæra. Qui præterea ſolida diuidunt in plana, atque ex planis corpora generant, his teſtes fuiſse videntur. Solam enim figuram ſolidarum ſphæram non diuidunt,

E vt non plures ſuperficies, quàm vnam habentem. Diuiſio enim in plana non perinde efficitur, vt quiſpiam diuidens in partes diuidet totum, ſed vt in ſpecie diuerſa. Patet igitur, ſphæram figurarum eſſe ſolidarum primam. Eſt inſuper maximè conſonum rationi, ſi ordo per numerum etiam aſſignetur, hoc ipſam modo diſponere, vnitatem quidem circulo, dualitatem autem triangulo tribuendo: cùm duobus æquales ſuos angulos habeat rectis. Si verò vnitas triangulo tribuatur, circulus non erit ſanè figura. Cùm autem prima figura primi ſit corporis, primum verò corpus id ſit, quod eſt vltima in cõuerſione, rotundũ id erit ſanè, quod fertur cõuerſione. Et id ergo quod illi hæret: quod.n.

hæret

hæret rotundo, id rotundum etiam eſt. Similiter & ea, quæ in medio collocantur: ea namque quæ à rotundo corpore continentur, ac tangunt, rotunda eſſe cuncta neceſſe eſt. At quæ ſunt ſub vagarum ſphæra, ſuperam ſphæram tangunt. Quare ipſum vniuerſum rotundum erit: omnia namque tangunt, hærentque ſphæris. Præterea cùm videatur ac ſupponatur, vniuerſum ipſum verſari, demonſtratúmque ſit extra conuerſionem extimam neque locum, neque vacuum eſſe, rotundum ipſum eſſe ob hæç etiam ipſa neceſſe eſt. Nam ſi rectarum linearum erit figura, eueniet & locum eſſe, & corpus, & vacuum extima: nam cùm rectarum linearũ figura verſatur, nunquam eundem occupabit locum, ſed vbi priùs erat corpus, nunc non erit, & vbi nunc non eſt, rurſus ob angulorum tranſitionem erit. Eadem euenient, & ſi quiſpiam aliquam figuram aliam ipſi tribuerit, non habentem eas lineas, quæ ex medio progrediuntur æquales, veluti lentis figuræ ſimilem, aut oui. In omnibus enim eueniet & locum eſſe, & vacuũ extra cælum, propterea quòd totum non eundem occupat locũ. Præterea ſi cæli latio quidem menſura eſt motuum, propterea quòd ſola continuus eſt, & vniformis, ſempiternúſque motus, in vnoquoque autem genere menſura id eſt, quod eſt minimum, minimus verò motus, is eſt celerrimus: patet, cæli motum omnium motuum celerrimum eſſe. At eorum, quæ ab eodem ad idem pergunt, minima ipſius circuli linea eſt, per minimã autem, eſt motus celerrimus. Quare ſi cælum conuertitur, celerriméque mouetur, rotundum ipſum eſſe neceſſe eſt. Sumere etiam quiſpiam & ex hiſce corporibus, quæ circa mediũ collocantur, hanc fidem poteſt. Si enim aqua quidem eſt circa terram, aër autem circa aquam, & ignis circa aërem collocatur, & ſupera corpora per rationem eandem ita ſe habent. Etenim continua quidem non ſunt, tangunt autem hæc. Aquæ verò ſuperficies rotunda eſt ſanè: atque quod rotundum tangit, circáque rotundum eſt ſitum, & ipſum tale eſſe neceſſe eſt. Patet hac etiam ratione, cælum rotundum eſſe. At verò ſuperficiem aquæ talem eſſe patebit, ſi ſuppoſitionem ſumpſerimus, aquam ſuapte natura ſemper ad magis concauum locum cõfluere, & eum locum magis concauum eſſe, qui eſt propinquior centro. Ducantur igitur ex a centro rectæ lineæ a b, & a c, & ex b in c. linea producatur b c, ad quam ab a perpendicularis ducatur a d, & protrahatur in e: patet itaque, lineam a d, minorem eſſe lineis a b, & a c. ergo hic locus, magis concauus eſt: quare affluet aqua, quouſque fuerit in æqualitatem redacta. At a e, æqualis eſt hiſce, quæ à centro ſunt ductæ. Quare aquam ipſam in hiſce eſſe, quæ ſunt ex centro ductæ, neceſſe eſt. tunc enim quieſcit. At ea, quæ tãgit eas, quæ ſunt ex centro ductæ, circumferentia eſt. Rotunda eſt ergo ſuperficies aquæ, quæ quidem eſt b e c. Patet igitur ex hiſce, quæ dicta ſunt, Mundum eſſe rotundum, atque adeò exactè, vt nihil eorum quæ manu conficiuntur, nec aliud quicquam eorum, quæ apud nos oculis cernuntur, ſit tam exactè rotundum. Nihil eorum, ex quibus conſtat, adeo vniformitatem, exactámve rotunditatem ſuſcipere poteſt, vt ipſius corporis obeuntis natura. Manifeſtum eſt enim, rationem eam ſubire, quam aqua ſubit ad terram, & elementa ea, quæ plus ſemper remota ſunt, atque diſtant.

A τῷ σφαιροειδεῖ συνεχές, σφαιροειδές. ὡσαύτως δὲ καὶ τὰ πρὸς τὸ μέσον τούτων· τὰ γὰρ ὑπὸ τοῦ σφαιροειδοῦς περιεχόμενα καὶ ἁπτόμενα, ὅλα σφαιροειδῆ ἀνάγκη εἶναι· τὰ δὲ κάτω τῆς τῶν πλανήτων, ἅπτεται τῆς ἐπάνω σφαίρας. ὥστε σφαιροειδὴς ἂν εἴη πᾶσα φορά· πάντα γὰρ ἅπτεται, καὶ συνεχῆ ἐστι ταῖς σφαίραις. ἔτι δὲ ἐπεὶ φαίνεται, καὶ ὑπόκειται κύκλῳ περιφέρεσθαι τὸ πᾶν· δέδεικται δ', ὅτι τῆς ἐσχάτης περιφορᾶς οὔτε κενόν ἐστιν ἔξωθεν, οὔτε τόπος· ἀνάγκη καὶ διὰ ταῦτα σφαιροειδῆ εἶναι αὐτόν. εἰ γὰρ ἔσται εὐθύγραμμος, συμβήσεται καὶ τόπον εἶναι ἔξω, καὶ σῶμα, καὶ κενόν. κύκλῳ γὰρ

B στρεφόμενον τὸ εὐθύγραμμον, οὐδέποτε τὴν αὐτὴν ἐφέξει χώραν. ἀλλ' ὅπου πρότερον ἦν σῶμα, νῦν οὐκ ἔσται· καὶ οὗ νῦν οὐκ ἔστι, πάλιν ἔσται διὰ τὴν παράλλαξιν τῶν γωνιῶν. ὁμοίως δὲ κἂν * εἴ τι ἄλλο σχῆμα γένοιτο μὴ ἴσας ἔχον τὰς ἐκ τοῦ * μέσου γραμμάς, οἷον φακοειδὲς ἢ ᾠοειδές. ἐν ἅπασι γὰρ συμβήσεται, καὶ τόπον ἔξω, καὶ κενὸν εἶναι τῆς φορᾶς, διὰ τὸ μὴ τὴν αὐτὴν χώραν κατέχειν τὸ ὅλον. ἔτι δ', εἰ τὸ τῶν μὲν κινήσεων τὸ μέτρον, ἡ τοῦ οὐρανοῦ φορά, διὰ τὸ εἶναι μόνη συνεχής, καὶ ὁμαλής, καὶ ἀΐδιος· ἐν ἑκάστῳ δὲ μέτρον τὸ ἐλάχιστον· ἐλαχίστη δὲ κίνησις ἡ ταχίστη· δῆλον ὅτι ταχίστη ἂν εἴη πασῶν τῶν κινήσεων, ἡ τοῦ οὐρανοῦ κίνησις. ἀλλὰ μὴν τῶν * ἀπὸ τοῦ αὐ- * γ. ἐπά. * κινήσεων. * γ. ἀφ' αὐτοῦ ἐφ' αὐτό.

C τοῦ, καὶ ἐπὶ τὸ αὐτὸ ἐλαχίστη ἐστὶν ἡ τοῦ κύκλου γραμμή· κατὰ δὲ τὴν ἐλαχίστην ταχίστη ἡ κίνησις· ὥστ' εἰ ὁ οὐρανὸς κύκλῳ τε φέρεται, καὶ τάχιστα κινεῖται, σφαιροειδῆ αὐτὸν ἀνάγκη εἶναι. λάβοι δ' ἄν τις καὶ ἐκ τῶν περὶ τὸ μέσον ἱδρυμένων σωμάτων, ταύτην τὴν πίστιν· εἰ γὰρ τὸ μὲν ὕδωρ ἐστὶ περὶ τὴν γῆν, ὁ δὲ ἀὴρ περὶ τὸ ὕδωρ, τὸ δὲ πῦρ περὶ τὸν ἀέρα, καὶ τὰ ἄνω σώματα κατὰ τὸν αὐτὸν λόγον· συνεχῆ μὲν γὰρ οὐκ ἔστιν, ἅπτεται δὲ τούτων· ἡ δὲ τοῦ ὕδατος ἐπιφάνεια σφαιροειδής ἐστι· τὸ δὲ τῷ σφαιροειδεῖ συνεχές, ἢ κείμενον περὶ τὸ σφαιροειδές, καὶ αὐτὸ τοιοῦτον ἀναγκαῖον εἶναι. ὥστε καὶ διὰ τοῦτο φανερὸν

D εἴη, ὅτι σφαιροειδής ἐστιν ὁ οὐρανός· ἀλλὰ μὴν ὅτι γε ἡ τοῦ ὕδατος ἐπιφάνεια τοιαύτη, φανερὸν ὑπόθεσιν λαβοῦσιν, ὅτι πέφυκεν ἀεὶ συρρεῖν τὸ ὕδωρ εἰς τὸ κοιλότερον· κοιλότερον δέ ἐστι τὸ τοῦ κέντρου ἐγγύτερον. ἤχθωσαν μὲν οὖν ἐκ τοῦ κέντρου, ἡ α β, καὶ ἡ α γ· καὶ ἐπεζεύχθω, ἐφ' ἧς β γ. ἡ οὖν ἀχθεῖσα ἐπὶ τὴν βάσιν, ἐφ' ἧς ἡ α δ, ἐλάττων ἐστὶ τῶν ἐκ τοῦ κέντρου· κοιλότερος ἄρα ὁ τόπος. ὥστε ἐπιρρυήσεται τὸ ὕδωρ, ἕως ἂν ἰσασθῇ· ἴση δὲ ταῖς ἐκ τοῦ κέντρου, ἡ α ε. ὥστ' ἀνάγκη πρὸς ταῖς ἐκ τοῦ κέντρου εἶναι τὸ ὕδωρ· τότε γὰρ ἠρεμήσει. ἡ δὲ τῶν ἐκ τοῦ κέντρου ἁπτομένη περιφερής. σφαιροειδὴς ἄρα ἡ τοῦ ὕδατος ἐπι-

E φάνεια, ἐφ' ἧς β ε γ. ὅτι μὲν οὖν σφαιροειδής ἐστιν ὁ κόσμος, δῆλον ἐκ τούτων· καὶ ὅτι κατ' ἀκρίβειαν ἔντορνος οὕτως, ὥστε μηδὲν μήτε χειρόκμητον ἔχειν παραπλησίως, μήτε ἄλλο μηδὲν τῶν παρ' ἡμῖν ἐν ὀφθαλμοῖς φαινομένων. ἐξ ὧν γὰρ τὴν σύστασιν εἴληφεν, οὐδὲν οὕτω δύναται ὁμαλότητα δέξασθαι καὶ ἀκρίβειαν, ὡς ἡ τοῦ περιέχοντος σώματος φύσις. δῆλον γὰρ ὡς ἀνάλογον ἔχει, καθάπερ ὕδωρ πρὸς γῆν, καὶ τὰ πλεῖον ἀεὶ ἀπέχοντα τῶν στοιχείων.

ΚΕΦΑΛ. ε΄.

Διὰ τίνα αἰτίαν ἐπὶ θάτερα φέρεται ὁ οὐρανός, ἀλλ' οὐκ ἐπὶ θάτερα.

Ἐπεὶ δ' ἔστι διχῶς ἐπὶ τοῦ κύκλου κινηθῆναι, οἷον ἀπὸ τοῦ α, τὴν μὲν ἐπὶ τὸ β, τὴν δ' ἐπὶ τὸ γ· ὅτι μὲν οὖν οὐκ εἰσὶν ἐναντίαι αὗται, πρότερον εἴρηται. ἀλλ' εἰ μηδὲν ὡς ἔτυχε, μηδ' ἀπὸ ταὐτομάτου ἐνδέχεται ἐν τοῖς ἀϊδίοις εἶναι, ὁ δ' οὐρανὸς ἀΐδιος, καὶ ἡ κύκλῳ φορά, διὰ τίνα ποτ' αἰτίαν ἐπὶ θάτερα φέρεται, ἀλλ' οὐκ ἐπὶ θάτερα; ἀνάγκη γὰρ καὶ τοῦτο ἢ ἀρχὴν εἶναι, ἢ εἶναι αὐτοῦ ἀρχήν. ἴσως μὲν οὖν τὸ περὶ ἐνίων ἀποφαίνεσθαί τι πειρᾶσθαι, καὶ τὸ περὶ πάντων, καὶ τὸ παραλείπειν μηδέν, τάχ' ἂν δόξειεν εἶναι σημεῖον ἢ πολλῆς εὐηθείας, ἢ πολλῆς προθυμίας. οὐ μὴν δίκαιόν γε πᾶσιν ὁμοίως ἐπιτιμᾶν· ἀλλ' ὁρᾶν δεῖ τὴν αἰτίαν τοῦ λέγειν τίς ἐστιν, *ἔτι δὲ πῶς ἔχων τῷ πιστεύειν, πότερον ἀνθρωπίνως, ἢ καρτερώτερον. τὰς μὲν οὖν ἀκριβεστέρας ἀνάγκας ὅταν τις ἐπιτύχῃ, τότε χάριν ἔχειν δεῖ τοῖς εὑρίσκουσι· νῦν δὲ τὸ φαινόμενον ῥητέον. εἰ γὰρ ἡ φύσις ἀεὶ ποιεῖ τῶν ἐνδεχομένων τὸ βέλτιστον, ἔστι δὲ καθάπερ τῶν ἐπὶ τῆς εὐθείας φορῶν, ἡ πρὸς τὸν ἄνω τόπον τιμιωτέρα (θειότερος γὰρ ὁ τόπος ἄνω τοῦ κάτω) τὸν αὐτὸν τρόπον καὶ ἡ εἰς τὸ ἔμπροσθεν, τῆς εἰς τοὔπισθεν ἔχει, εἴπερ καὶ εἰς τὸ δεξιὸν καὶ τὸ ἀριστερόν, καθάπερ ἐλέχθη πρότερον. καὶ μαρτυρεῖ δὲ ἡ ῥηθεῖσα ἀπορία, ὅτι ἔχει τὸ πρότερον καὶ τὸ ὕστερον. αὕτη γὰρ ἡ αἰτία λύει τὴν ἀπορίαν. εἰ γὰρ ἔχει ὡς ἐνδέχεται βέλτιστα, αὕτη ἂν εἴη ἡ αἰτία καὶ τοῦ εἰρημένου. βέλτιστον γὰρ κινεῖσθαι ἁπλῆν τε κίνησιν, καὶ ἄπαυστον, καὶ ταύτην ἐπὶ τὸ τιμιώτερον.

* κἀν δὲ πῶς

ΚΕΦΑΛ. ϛ΄.

Ὅτι ὁμαλῶς κινεῖται ὁ οὐρανός.

Περὶ δὲ τῆς κινήσεως αὐτοῦ, ὅτι ὁμαλής ἐστι καὶ οὐκ ἀνώμαλος, ἐφεξῆς ἂν εἴη τῶν εἰρημένων διελθεῖν. λέγω δὲ τοῦτο περὶ τοῦ πρώτου οὐρανοῦ, καὶ περὶ τῆς πρώτης φορᾶς· ἐν γὰρ τοῖς ὑποκάτω πλείους ἤδη αἱ φοραὶ συνεληλύθασιν εἰς ἕν· εἰ γὰρ ἀνωμάλως κινηθήσεται, δῆλον ὅτι ἐπίτασις ἔσται, καὶ ἀκμή, καὶ ἄνεσις τῆς φορᾶς· ἅπασα γὰρ ἡ ἀνώμαλος φορὰ καὶ ἄνεσιν ἔχει, καὶ ἐπίτασιν, καὶ ἀκμήν· ἀκμὴ δ' ἐστὶν, ἢ ὅθεν φέρεται, ἢ οἷ, ἢ ἀνὰ μέσον· οἷον, ἴσως τοῖς μὲν κατὰ φύσιν εἰς ὃ φέρονται· τοῖς δὲ παρὰ φύσιν, ὅθεν· τοῖς δὲ ῥιπτουμένοις, ἀνὰ μέσον. τῆς δὲ κύκλῳ φορᾶς οὐκ ἔστιν οὔτε ὅθεν, οὔτε οἷ, οὔτε μέσον· οὔτε γὰρ ἀρχή, οὔτε πέρας, οὔτε μέσον ἐστὶν αὐτῆς ἁπλῶς· τῷ τε γὰρ χρόνῳ ἀΐδιος, καὶ τῷ μήκει συνηγμένη, καὶ ἄκλαστος. ὥστ' εἰ μὴ ἔστιν ἀκμὴ αὐτοῦ τῆς φορᾶς, οὐδ' ἀνωμαλία εἴη· ἡ γὰρ ἀνωμαλία γίγνεται διὰ τὴν ἄνεσιν, καὶ ἐπίτασιν· ἔτι δέ, εἰ πᾶν τὸ κινούμενον ὑπό τινος κινεῖται, ἀνάγκη τὴν ἀνωμαλίαν γίγνεσθαι τῆς κινήσεως, ἢ διὰ τὸ κινοῦν, ἢ διὰ τὸ κινούμενον, ἢ δι' ἄμφω. εἴτε γὰρ τὸ κινοῦν μὴ τῇ αὐτῇ δυνάμει κινοίη, εἴτε τὸ κινούμενον ἀλλοιοῖτο, καὶ μὴ διαμένοι τὸ αὐτό, εἴτε ἄμφω μεταβάλλοιεν, οὐδὲν κωλύει ἀνωμάλως κινεῖσθαι τὸ κινούμενον.

A

CAPVT V.

Cur potiùs cælum ab A ad C moueatur, quàm contrà, quæſtio.

Cvm autem in circulo duo motus fieri poſſint, vt ab a vnus ad b, alter ad c: non eſſe quidem hos contrarios, priùs eſt dictum. Sed ſi nihil in æternis eſſe fortuitò, aut à caſu poteſt, cælum verò perpetuum eſt, atque ipſa conuerſio, quam ob cauſam ad altera, & non ad altera fertur? Nam & hoc principium eſſe, aut ipſius principium eſſe, neceſſe eſt. De nonnullis igitur, atque de o-
B mnibus eniti quippiam dicere, nihilque prætermittere, aut inſignis ſtultitiæ forſitan, aut valde parati animi videbitur eſſe. Non tamen omnes ſimiliter ſunt increpandi. Sed dicendi cauſam, quænam ſit, videre oportet. Et quo præterea modo ſe habet in credẽdo, vtrùm humanè, an ita vt aſſerat, atque perſiſtat. Cùm igitur quiſpiam exactiores neceſſitates fuerit nactus, tunc hiſce, qui inueniũt, gratias agere oportet. Nunc autem id, quod videtur, dicendum eſt. Natura ſemper id facit, quod eſt optimum eorum quæ fieri poſſunt. Vt autem lationum rectarum ea præſtabilior eſt, qua locus ſuperus petitur, (eſt enim diuinior locus ſuperus infero) ſic & ea qua itur versùs anteriora, præſtabilior eſt ea qua itur retrorſum: ſiquidem ita ſeſe
C habent & dextrum, atque ſiniſtrum, vt priùs eſt dictum. Atque dubitatio dicta declarat, prius poſteriúſve cælum habere: hæc enim cauſa dubitationem ſoluit. Nam ſi ſeſe habet vt poteſt optimè, hæc erit profectò cauſa eius, quod diximus. Eſt enim optimum ſanè ſimplici ac inceſſabili motu cieri, atque hoc ad id quod præſtabilius eſt.

CAPVT VI.

Quòd cæli lationem, & quæ prima lationum eſt, regularem eſſe ſit cenſendum.

Poſt hæc motum ipſius vniformem, & non difformem eſſe, demonſtremus oportet. Atq; hoc
D dico de primo cælo, de lationéque prima. In his enim, quæ ſunt ſub illo, plures lationes in vnum iam conuenêre. Nam ſi difformiter mouebitur, patet, intenſionem lationis, ſtatum, remiſſionemque fore: omnis enim difformis latio, remiſſionem, intenſionem, ac ſtatum habet. Status autem eſt, aut vnde mobile fertur, aut ibi, quò fertur, aut in medio. Veluti forſitan hiſce quidem, quæ natura feruntur, in eo, ad quod mouentur: in his autem, quæ præter naturam feruntur, in eo, vnde mouentur: hiſce verò, quæ proiiciuntur, in medio. At conuerſionis, neque vnde, neque quò, neque medium eſt. Neque enim ipſius
E principium, neque finis, neque medium eſt abſolutè. Nam & tempore eſt ſempiterna, & longitudine coacta, nec frangetur. Quare ſi lationis cæli ſtatus non eſt, neque difformitas erit. Difformitas enim ob remiſſionem intenſionémve fieri ſolet. Præterea, ſi omne quod mouetur, ab aliquo moueatur, difformitas motionis ob id quod mouet, aut ob id quod mouetur, aut ob vtrumque fiat, neceſſe eſt. Nam & ſi id quod mouet, non eiſdem viribus moueat, & ſi id quod mouetur, alteretur, nec idem permaneat, & ſi vtrumque mutetur, nihil prohibet id quod mouetur, difformi motu cieri.

Nihil autem horum, circa cælum euenire poteſt. Id enim quod mouetur, & primum, & ſimplex, & ingenerabile, atque incorruptibile, & omnino immutabile, demonſtratum eſt eſſe. Id etiam quod mouet, longè magis tale eſſe, conſentaneum eſt rationi. Primi namque primum, & ſimplicis ſimplex, & incorruptibilis ingenerabiliſve, incorruptibile ingenerabileve motiuum eſt. Cùm igitur id, quod mouetur, non mutetur, etſi eſt corpus: nec id quod mouet, mutari poteſt, corpore vacans. Quare impoſſibile eſt, lationem eſſe difformem. Etenim ſi ſit difformis, aut ipſa tota mutatur, & interdum celerior, interdum tardior fit, aut ipſius partes. Patet igitur, partes difformes non eſſe. Iam enim diſtantia ſtellarum in tempore infinito fuiſſet, ſi alia tardiùs alia celeriùs moueretur. At nulla in diſtantiis aliter ſeſe habere videtur. At neque tota mutari poteſt. Remiſſio namque cuiuſque ob imbecillitatem fieri ſolet: imbecillitas verò res eſt profectò præter naturam. Etenim omnes imbecillitates, quæ in animalibus inſunt, præter naturam eſſe videntur: vt ſenectus, & decrementum. Tota namque fortaſſe conſtitutio animalium, ex talibus conſtat, quæ propriis differunt locis. Nulla enim partium, eſt ſuo in loco. Si igitur in hiſce quæ prima ſunt, non eſt id quod præter naturam ineſt (ſimplicia namque ſunt, & non miſta, & ſuis in locis ſunt, atque nihil prorſus eſt contrarium ipſis) neque profectò imbecillitas erit in ipſis: quare neque remiſſio, neque intenſio. Nam ſi intenſio fuerit, & remiſſio etiam erit. Præterea cancellos etiam egreditur rationis, id quod mouet, viribus carere tempore infinito, & rurſus alio tempore infinito vires habere. Nihil enim tempore infinito præter naturam eſſe videtur: & imbecillitas res eſt, vt patet, præter naturam. Nec æquali in tempore præter naturam, & ſecundùm naturam eſt, nec omnino potens, ac imbecille. Si verò motus remittatur, infinito in tempore remittatur neceſſe eſt. at verò neque fieri poteſt in quippiam vt ſemper intendatur, aut rurſus remittatur. Erit enim infinitus indeterminatúſque ipſe motus. Omne autem ex quopiam in quippiam eſſe dicimus, definitúmve. Præterea hoc idem emerget, ſi quiſpiam ſumpſerit tempus quoddam minimum eſſe, in minore quo cælum moueri non poteſt. (Vt enim neque ambulare quiſpiam, neque pulſare citharam quouis in tempore poteſt, ſed vniuſcuiuſque actionis definitum eſt minimum corpus in non exuperando, ſic neque cælum moueri quouis in tempore poteſt.) Si igitur hoc verum eſt, non erit ſanè lationis ſemper intenſio. Quòd ſi non erit intenſio, neque remiſſio erit. Similiter enim ambo erunt ac alterum, ſi eadem celeritate, aut maiore intenditur, atque tempore infinito. Reſtat igitur dicere, motui celeritatem viciſſim ac tarditatem ineſſe. Hoc autem ratione penitus vacat, & figmento eſt ſimile. Inſuper & rationi magis conſentaneum eſt, nos id ipſum, ſi ita ſit, non latere. Ea namque quæ iuxta ſe ponuntur, faciliùs ſanè ſenſu percipiuntur. Vnicum igitur cælum eſſe, & hoc ingenerabile, ac ſempiternum, & vniformi ſemper motu cieri, per ea ſatis, quæ iam diximus, patuit.

A οὐθὲν δὲ τούτων δυνατὸν περὶ τὸν οὐρανὸν γίνεσθαι· τὸ μὲν γὰρ κινούμενον, δέδεικται ὅτι πρῶτον καὶ ἁπλοῦν, καὶ ἀγένητον, καὶ ἄφθαρτον, καὶ ὅλως ἀμετάβλητον· τὸ δὲ κινοῦν πολὺ μᾶλλον εὔλογον εἶναι τοιοῦτον· τὸ γὰρ πρῶτον τοῦ πρώτου, καὶ τὸ ἁπλοῦν τοῦ ἁπλοῦ, καὶ τὸ ἄφθαρτον καὶ ἀγένητον τοῦ ἀφθάρτου καὶ ἀγενήτου κινητικόν. ἐπεὶ οὖν τὸ κινούμενον οὐ μεταβάλλει σῶμα ὄν, οὐδ᾽ ἂν τὸ κινοῦν μεταβάλλοι ἀσώματον ὄν· ὥστε καὶ τὴν φορὰν ἀδύνατον ἀνώμαλον εἶναι. καὶ γὰρ εἰ γίνεται* ἀνώμαλος, ἤτοι ὅλη μεταβάλλει, καὶ ὁτὲ μὲν γίνεται θάττων, ὁτὲ δὲ βραδυτέρα πάλιν, (* γρ. ἀνώμαλος)
B ἢ τὰ μέρη αὐτῆς. τὰ μὲν οὖν μέρη ὅτι οὐκ ἔστιν ἀνώμαλα, φανερόν· ἤδη γὰρ ἂν ἐγεγόνει διάστασις τῶν ἄστρων ἐν τῷ ἀπείρῳ χρόνῳ, τοῦ μὲν θᾶττον κινουμένου, τοῦ δὲ βραδύτερον. οὐ φαίνεται δ᾽ οὐθὲν ἄλλως ἔχον τοῖς διαστήμασιν. ἀλλὰ μὴν οὐδὲ τὴν ὅλην ἐγχωρεῖ μεταβάλλειν· ἡ γὰρ ἄνεσις ἑκάστου γίνεται δι᾽ ἀδυναμίαν· ἡ δ᾽ ἀδυναμία παρὰ φύσιν. καὶ γὰρ αἱ ἐν τοῖς ζῴοις ἀδυναμίαι πᾶσαι παρὰ φύσιν εἰσίν, οἷον γῆρας καὶ φθίσις· ὅλη γὰρ ἴσως ἡ σύστασις τῶν ζῴων ἐκ τοιούτων συνέστηκεν, ἃ διαφέρει τοῖς οἰκείοις τόποις· οὐθὲν γὰρ τῶν μερῶν ἔχει τὴν αὐτοῦ χώραν. εἰ οὖν ἐν τοῖς πρώτοις μή ἐστι τὸ παρὰ
C φύσιν (ἁπλᾶ γὰρ καὶ ἄμικτα, καὶ ἐν τῇ οἰκείᾳ χώρᾳ, καὶ οὐδὲν αὐτοῖς ἐναντίον) οὐδ᾽ ἂν ἀδυναμία εἴη, ὥστ᾽ οὐδ᾽ ἄνεσις, οὐδ᾽ ἐπίτασις· εἰ γὰρ ἐπίτασις καὶ ἄνεσις. ἔτι δὲ καὶ ἄλογον ἄπειρον χρόνον ἀδύνατον εἶναι τὸ κινοῦν, καὶ πάλιν ἄλλον ἄπειρον δυνατόν· οὐθὲν γὰρ* φαίνεται ὂν ἄπειρον χρόνον παρὰ φύσιν. ἡ (* γρ. διαφαίνεται) δ᾽ ἀδυναμία παρὰ φύσιν, οὐδὲ τὸν ἴσον χρόνον παρὰ φύσιν καὶ κατὰ φύσιν· οὐδ᾽ ὅλως δυνατὸν καὶ ἀδύνατον. ἀνάγκη δ᾽ εἰ ἀνίησιν ἡ κίνησις, ἄπειρον ἀνιέναι χρόνον· ἀλλὰ μὴν οὐδὲ ἐπιτείνειν ἀεί, ἢ πάλιν ἀνιέναι δυνατόν. ἄπειρος γὰρ ἂν εἴη καὶ ἀόριστος ἡ κίνη-
D σις. ἅπασαν δέ φαμεν ἔκ τινος εἴς τι εἶναι, καὶ ὡρισμένην. ἔτι δέ, εἴ τις λάβοι εἶναί τινα χρόνον ἐλάχιστον, οὗ οὐκ ἐνδέχεται ἐν ἐλάττονι κινηθῆναι τὸν οὐρανόν, ὥσπερ γὰρ οὐδὲ βαδίσαι, οὐδὲ κιθαρίσαι ἐν ὁτῳοῦν χρόνῳ δυνατόν, ἀλλ᾽ ἔστιν ἑκάστης πράξεως ὡρισμένος ὁ ἐλάχιστος χρόνος κατὰ τὸ μὴ ὑπερβάλλειν· οὕτως οὐδὲ κινηθῆναι τὸν οὐρανὸν ἐν ὁτῳοῦν χρόνῳ δυνατόν. εἰ οὖν τοῦτ᾽ ἀληθές, οὐκ ἂν εἴη ἀεὶ ἐπίτασις τῆς φορᾶς· εἰ δὲ μὴ ἐπίτασις, οὐδὲ ἄνεσις. ὁμοίως γὰρ ἄμφω, καὶ θάτερον, εἴπερ τῷ αὐτῷ τε ἐπιτείνεται τάχει ἢ μείζονι, καὶ ἄπειρον χρόνον. λείπεται δὴ λέγειν
E ἐναλλὰξ εἶναι τῇ κινήσει τὸ θᾶττον καὶ τὸ βραδύτερον. τοῦτο δὲ παντελῶς ἄλογον καὶ πλάσματι ὅμοιον. ἔτι δὲ καὶ τὸ μὴ λανθάνειν ἐπὶ τούτων εὐλογώτερον· εὐαισθητότερα γὰρ τὰ παρ᾽ ἄλληλα τιθέμενα. ὅτι μὲν οὖν εἷς καὶ μόνος ἐστὶν οὐρανός, καὶ οὗτος ἀγένητος καὶ ἀΐδιος, ἔτι δὲ κινούμενος ὁμαλῶς, ἐπὶ τοσοῦτον ἡμῖν εἰρήσθω.

ΚΕΦΑΛ. ζ'.

Περὶ τῶν ἄστρων· ὅτι οὔτε πύρινά ἐστιν, οὔτ' ἐν πυρὶ φέρεται.*

ΠΕρὶ δὲ τῶν καλουμένων ἄστρων ἑπόμενον ἂν εἴη λέγειν, ἐκ τίνων τε συνεστᾶσι καὶ ἐν ποίοις σχήμασι καὶ τίνες αἱ κινήσεις αὐτῶν. εὐλογώτατον δὴ καὶ τοῖς εἰρημένοις ἑπόμενον ἡμῖν, τὸ ἕκαστον τῶν ἄστρων ποιεῖν ἐκ τούτου τοῦ σώματος, ἐν ᾧ τυγχάνει τὴν φορὰν ἔχον. ἐπειδὴ ἔφαμέν τι εἶναι ὃ κύκλῳ φέρεσθαι πέφυκεν· ὥσπερ γὰρ οἱ πύρινα φάσκοντες εἶναι, διὰ τοῦτο λέγουσιν, ὅτι τὸ ἄνω σῶμα πῦρ εἶναί φασιν, ὡς εὔλογον ὂν ἕκαστον συνεστάναι ἐκ τούτων ἐν οἷς ἕκαστόν ἐστιν, ὁμοίως καὶ ἡμεῖς λέγομεν. ἡ δὲ θερμότης ἀπ' αὐτῶν καὶ τὸ φῶς γίνεται, παρεκτριβομένου τοῦ ἀέρος ὑπὸ τῆς ἐκείνων φορᾶς. πέφυκε γὰρ ἡ κίνησις ἐκπυροῦν καὶ ξύλα, καὶ λίθους, καὶ σίδηρον. εὐλογώτερον οὖν τὸ ἐγγύτερον τοῦ πυρός, ἐγγύτερον δὲ ὁ ἀήρ, οἷον καὶ ἐπὶ τῶν φερομένων βελῶν· ταῦτα γὰρ αὐτὰ ἐκπυροῦται οὕτως, ὥστε τήκεσθαι τὰς μολυβδίδας· καὶ ἐπείπερ αὐτὰ ἐκπυροῦται, ἀνάγκη καὶ τὸν κύκλῳ αὐτῶν ἀέρα τὸ αὐτὸ τοῦτο πάσχειν· ταῦτα μὲν οὖν αὐτὰ ἐκθερμαίνεται διὰ τὸ ἐν ἀέρι φέρεσθαι, ὃς διὰ τὴν πληγὴν τῇ κινήσει γίνεται πῦρ. τῶν δὲ ἄνω ἕκαστον ἐν τῇ σφαίρᾳ φέρεται, ὥστε αὐτὰ μὲν μὴ ἐκπυροῦσθαι· τοῦ δὲ ἀέρος ὑπὸ τὴν τοῦ κυκλικοῦ σώματος σφαῖραν ὄντος, ἀνάγκη φερομένης ἐκείνης ἐκθερμαίνεσθαι, καὶ ταύτῃ μάλιστα, ᾗ ὁ ἥλιος τετύχηκεν ἐνδεδεμένος. διὸ δὴ πλησιάζοντός τε αὐτοῦ, καὶ ἀνίσχοντος, καὶ ὑπὲρ ἡμᾶς ὄντος, γίγνεται ἡ θερμότης. ὅτι μὲν οὖν οὔτε πύρινά ἐστιν, οὔτ' ἐν πυρὶ φέρεται, ταῦτα ἡμῖν εἰρήσθω περὶ αὐτῶν.

ΚΕΦΑΛ. η'.

Ὅτι τὰ ἄστρα σφαιροειδῆ ὄντα τοῖς κύκλοις ἐνδεδεμένα φέρεται.

ΕΠεὶ δὲ φαίνεται καὶ τὰ ἄστρα μεθιστάμενα, καὶ ὅλος ὁ οὐρανός, ἀναγκαῖον ἤτοι ἠρεμούντων ἀμφοτέρων γίγνεσθαι τὴν μεταβολήν, ἢ κινουμένων· ἢ τοῦ μὲν ἠρεμοῦντος, τοῦ δὲ κινουμένου. ἀμφότερα μὲν τοίνυν ἠρεμεῖν ἀδύνατον, ἠρεμούσης γε τῆς γῆς.* οὐδὲ γὰρ ἂν ἐγίγνετο τὰ φαινόμενα. τὴν δὲ γῆν ὑποκείσθω ἠρεμεῖν. λείπεται δὲ ἢ ἀμφότερα κινεῖσθαι, ἢ τὸ μὲν κινεῖσθαι, τὸ δ' ἠρεμεῖν. εἰ μὲν οὖν ἀμφότερα κινήσεται, ἄλογον τὸ τὰ αὐτὰ τάχη τῶν ἄστρων εἶναι, καὶ τῶν κύκλων· ἕκαστον γὰρ ὁμοταχὲς ἔσται τῷ κύκλῳ, *καθ' ὃν φέρεται. φαίνεται γὰρ ἅμα τοῖς κύκλοις καθιστάμενα πάλιν εἰς τὸ αὐτό. συμβαίνει οὖν ἅμα τό, τε ἄστρον διεληλυθέναι τὸν κύκλον, καὶ τὸν κύκλον ἐνηνέχθαι τὴν αὑτοῦ φοράν, διεληλυθότα τὴν αὑτοῦ περιφέρειαν. οὐκ ἔστι δὲ εὔλογον τὸ τὸν αὐτὸν λόγον ἔχειν τὰ τάχη τῶν ἄστρων, καὶ τὰ μεγέθη τῶν κύκλων. τοὺς μὲν γὰρ κύκλους οὐδὲν ἄτοπον, ἀλλὰ καὶ ἀναγκαῖον ἀνάλογον ἔχειν τὰ τάχη τοῖς μεγέθεσι· τῶν δὲ ἄστρων ἕκαστον ἐν τούτοις, οὐδαμῶς εὔλογον. εἴτε γὰρ ἐξ ἀνάγκης τὸ τὸν μείζω κύκλον φερόμενον, θᾶττον ἔσται, δῆλον ὅτι κἂν μετατεθῇ τὰ ἄστρα εἰς τοὺς ἀλλήλων κύκλους, τὸ μὲν ἔσται θᾶττον, τὸ δὲ βραδύτερον· οὕτω δ' οὐκ ἂν ἔχοιεν οἰκείαν κίνησιν·

*κ. ἐνίοτ.

*Vulgò καθ' ὃ φ. malè.

A

CAPVT VII.

Quòd rationi conſentaneum ſit, aſtra eius naturæ, cuius ſit corpus, in quo ſunt fixa.

DE his autem, quæ ſtellæ vocantur, [illegible] dicendum eſſe videtur, ex quibus conſtent, quáſque figuras habent, & quæ ſunt motiones ipſarum. Conſonum eſt itaque maximè rationi, & iis, quæ dicta ſunt, cõmitatur, vnamquamque ſtellarum ex hoc aſſerere eſſe corpore, in quo lationem habet: cùm quippiam eſſe dicamus, quod aptum eſt ſuapte natura ferri cõuerſione. Vt enim qui dicunt igneas eſſe, ideo dicunt, quia ſuperum cor-
B pus ignem inquiunt eſſe: quippe cùm conſonum ſit rationi, ex iis vnamquamque conſtare, in quibus eſt quæque: ſic & nos hanc in ſententia noſtra dicimus. Caliditas autem ab ipſis, lumenque ideo fit, quia aër ab illarum motione fricatur. Motus enim, & ligna, & lapides, & ferrum ignire ſolet. Magis igitur conſentaneum eſt rationi, id quod eſt propinquius igni, propinquius verò eſt, aër, quale fit & in hiſce ſagittis, quæ feruntur. Hæ namque adeo igniuntur, vt ipſum plumbum quod eſt in ipſis, liqueſcat. Atque cùm in ipſis hoc fiat, circundans etiam ipſas aër hoc idem patiatur neceſſe eſt. Hæc igitur ideo calefiunt, quia in aëre feruntur, qui quidem ob ictum motione fit ignis. Supero-
C rum autem corporum vnumquodque fertur in ſphæra, vt ipſa quidem non igniantur: ſed aër cùm ſub obeuntis corporis ſphæra ſit, ob illius motum neceſſariò calefiat, & maximè hac, in qua ſol eſt infixus. Quocirca cùm propius accedit, ac oritur, & ſuper nos eſt, fit & calor. Hæc igitur à nobis ſint dicta de ipſis, quibus patet, neque igneas ipſas eſſe, neque in igne ferri.

CAPVT VIII.

Quòd aſtra non moueantur proprio motu ſecundum cæli circulum.

CVm autem & ſtellæ transferri videantur, & totum cælum, aut vtriſque quieſcentibus, aut vtriſque ſubeuntibus motum, aut altero qui-
D eſcente, altero ſubeunte motum, hinc fieri mutationem neceſſe eſt. Ambo igitur quieſcere, terra quieſcente, impoſſibile eſt. Non enim fierent, quæ videntur. At ſupponatur, terram quieſcere: reſtat igitur, ambo moueri, aut alterum quieſcere, alterum motu cieri. Si igitur ambo mouebuntur, ratione profectò vacat, eaſdem ſtellarum, aut circulorum eſſe celeritates. Vnaquæque enim æquè celeris erit, atque circulus, in quo fertur. Simul enim cum circulis, in idem redire videtur. Accidit igitur, ſimul ſtellam circulum transiuiſſe, & circulum lationem ſuam egiſſe, ſuámque circumferentiam tranſiiſſe. Non eſt autem con-
E ſentaneum rationi, celeritates ſtellarum, & magnitudines circulorum, eandem rationem habere. Circulos enim, non eſt abſurdum, ſed neceſſarium, celeritates habere, rationem ſubeuntes eandem, quam & magnitudines ſubeunt: ſtellarum autem earum quamque, quæ ſunt in iſtis, nullo modo conſentaneum eſt rationi. Nam ſi neceſſariò ea celerior erit, quæ per maiorem circulum fertur, patet quòd ſi circulos ſtellæ ſuos mutabunt, alia celerior, alia tardior erit: hoc autem modo motionem propriam non habere,

A ſed ab ipſis orbibus ferri videntur. Sin caſu accidit, neque hoc pacto conſonum eſt rationi, vt in omnibus ſimul & circulus ſit maior, & latio ſtellæ, quæ eſt in ipſo, celerior. Vnam enim, vel duas hoc modo ſeſe habere, non eſt abſurdum. Vniuerſas verò ſimili modo ſeſe habere, figmento eſt ſimile. Et inſuper in hiſce quæ ſunt natura, non eſt id quod fit caſu: neque id quod vbique, & in omnibus eſt, proficiſcitur à fortuna. At verò ſi orbes quieſcant, ſtellæ autem moueantur, eadem abſurda & ſimiliter erunt. Eueniet enim celerius eas moueri, quæ ſunt extra, & celeritates per orbium magnitudines eſſe. Cùm igitur neque vtraque, neque ſtellam ſolùm moueri conſentaneum ſit rationi, reſtat, orbes quidem moueri, ſtellas verò quieſcere, & infixas in B ipſis orbibus ferri: hoc enim modo duntaxat nihil accidit, quod rationis fines egrediatur. Et velocitatem enim orbis maioris celeriorem eſſe, conſentaneum eſt rationi, circa idem centrum in orbibus ſtellis infixis. Vt enim in cæteris maius corpus celeriùs latione propria fertur, ſic & in orbibus ipſis. Pars enim orbis maioris, maior eſt hiſce partibus, quæ auferuntur ab eo plano, quod per centrum extenditur. Quare congruè æquali tempore maior orbis circunferetur: & cælum accidet non diuelli, & propter hoc ipſum, & quia demonſtratum eſt, totum ipſum continuum eſſe. Præterea cùm ſtellæ ſint rotundæ, quemadmodum & cæteri dicunt, & nos etiam vt in noſtris conſonum ſententiis dici- C mus, ex illo corpore ipſas generantes: rotundique ipſius duæ ſint per ſe motiones, volutio, & conuerſio: ſi ſtellæ per ſe mouerentur, harum altera motione mouerentur, at neutra moueri videntur. Si verſarentur enim, eodem in loco ſanè manerent, locúmve non mutarent. Videntur autem locum mutare, ac omnes dicunt. Præterea, omnes quidem conſentaneum eſt rationi eodem motu cieri. Sol autem ſtellarum ſolus hoc facere videtur, cùm oritur, atque occidit: & hic non per ſe, ſed ob noſtri ſenſus remotionem. Viſus enim longè ſeſe extendens, verſatur ob imbecillitatem: quæ quidem fortaſſe cauſa eſt, vt & ſtellæ quidem fixæ micare, vagántes autem non micare videantur. Vagæ nam- D que ſtellæ ſunt prope: quare viſus ſui compos ad ipſas accedit. Ad fixas autem longè valde ſeſe extendens, ob longitudinem tremit. Tremor autem ipſius, facit vt hæc motio ſtellæ ipſius eſſe videatur. Nihil enim intereſt, viſus, an id quod cernitur, moueatur. At verò nec volui ſtellas perſpicuum eſſe videtur. Id enim, quod voluitur, verſetur neceſſe eſt. At id, Lunæ quod facies nuncupatur, ſemper videtur. Quare, cùm conſonum ſit rationi, ſtellas hiſce motibus, qui ad ipſas ſunt accommodati, moueri, ſi per ſe moueantur, his autem moueri non videantur, patet, ipſas per ſe non moueri. Inſuper nullum ipſis inſtrumentum ad motum tribuiſſe naturam, metas egreditur ratio- E nis. Nihil enim caſu Natura facit. neque animalia quidem ipſi curæ fuere: adeo verò præſtabiles res deſpexit: ſed vniuerſa videtur, tanquam de induſtria, abſtuliſſe, quibus per ſe procedere ipſa poſſent, atque ab hiſce quæ inſtrumenta ad motum habent, quàm plurimùm ſe mouiſſe. Quapropter & totum cælum rotundum cum ratione, & vnaquæque ſtellarum eſſe videbitur. Sphæra enim figurarum maximè vtilis eſt ad eum motum, qui eodem in loco ſit. Sic enim & celerrimè moueri, & eundem maximè locum occupare poteſt.

A ἀλλὰ φέρεσθαι ὑπὸ τῶν κύκλων. εἴτε ἀπὸ ταὐτομάτου συνέπεσεν, οὐδ' οὕτως εὔλογον, ἐν ἅπασιν ἅμα τόν τε κύκλον εἶναι μείζω, καὶ τὴν φορὰν θάττω τοῦ ἐν αὐτῷ ἄστρου· τὸ, τε μὲν γὰρ ἓν ἢ δύο τοῦτον τὸν τρόπον ἔχειν, οὐδὲν ἄτοπον· τὸ δὲ πάντα ὁμοίως, πλάσματι ἔοικεν· ἅμα δὲ καὶ οὐκ ἔστιν ἐν τοῖς φύσει τὸ ὡς ἔτυχεν, οὐδὲ τὸ πανταχοῦ καὶ πᾶσιν ὑπάρχον, τὸ ἀπὸ τῆς τύχης. ἀλλὰ μὴν πάλιν εἰ οἱ μὲν κύκλοι μένουσιν, αὐτὰ δὲ τὰ ἄστρα κινεῖται, ταὐτὰ καὶ ὁμοίως ἔσται ἄλογα· συμβήσεται γὰρ θᾶττον κινεῖσθαι τὰ ἔξω, καὶ τὰ τάχη εἶναι κατὰ τὰ μεγέθη τῶν κύκλων. ἐπεὶ τοίνυν οὔτε ἀμφότερα κινεῖσθαι, εὔλογον, οὔτε B τὸ ἄστρον * μόνον, λείπεται τοὺς μὲν κύκλους κινεῖσθαι, τὰ δὲ ἄστρα ἠρεμεῖν, καὶ ἐνδεδεμένα τοῖς κύκλοις * φέρεσθαι· μόνως γὰρ ἂν οὕτως οὐδὲν ἄλογον συμβαίνοι· τό, τε γὰρ θᾶττον εἶναι τοῦ μείζονος κύκλου τὸ τάχος εὔλογον, περὶ τὸ αὐτὸ κέντρον ἐνδεδεμένων· ὥσπερ γὰρ ἐν τοῖς ἄλλοις τὸ μεῖζον σῶμα θᾶττον φέρεται τὴν οἰκείαν φοράν, οὕτως καὶ ἐν τοῖς ἐγκυκλίοις· μεῖζον γὰρ τῶν ἀφαιρουμένων ὑπὸ τῶν ἐκ τοῦ κέντρου, τὸ τοῦ μείζονος κύκλου τμῆμα. ὥστ' εὐλόγως ἐν τῷ ἴσῳ χρόνῳ ὁ μείζων περιοισθήσεται κύκλος· τό, τε μὴ διασπᾶσθαι τὸν οὐρανόν, διά τε τοῦτο συμβήσεται, καὶ ὅτι δέδεικται συνεχὲς ὂν τὸ ὅλον. ἔτι δέ, ἐπεὶ σφαιροειδῆ τὰ ἄστρα, καθάπερ οἵ τε ἄλλοι φασὶ καὶ ἡμῖν C ὁμολογούμενον εἰπεῖν, ἐξ ἐκείνου γε τοῦ σώματος γεννῶσι. τοῦ δὲ σφαιροειδοῦς δύο κινήσεις εἰσὶ καθ' αὑτό, κύλισις καὶ δίνησις. εἴπερ οὖν κινοῖτο τὰ ἄστρα δι' αὐτῶν, τὴν ἑτέραν ἂν κινοῖτο τούτων· ἀλλ' οὐδετέραν φαίνεται. δινούμενα μὲν γὰρ ἔμενεν ἂν ἐν ταὐτῷ, καὶ οὐ μετέβαλε τὸν τόπον, ὅπερ φαίνεταί τε, καὶ πάντες φασίν. ἔτι δὲ πάντα μὲν εὔλογον τὴν αὐτὴν κίνησιν κινεῖσθαι· μόνος δὲ δοκεῖ τῶν ἄστρων ὁ ἥλιος τοῦτο δρᾶν, ἀνατέλλων ἢ δύνων, καὶ οὗτος οὐ δι' αὐτόν, ἀλλὰ διὰ τὴν ἀπόστασιν τῆς ἡμετέρας ὄψεως. ἡ γὰρ ὄψις ἀποτεινομένη μακρὰν ἑλίσσεται διὰ τὴν ἀσθένειαν· ὅπερ αἴτιον ἴσως καὶ τοῦ στίλβειν D φαίνεσθαι τοὺς ἀστέρας τοὺς ἐνδεδεμένους, τοὺς δὲ πλάνητας μὴ στίλβειν· οἱ μὲν γὰρ πλάνητες ἐγγύς εἰσιν· ὥστ' ἐγκρατὴς οὖσα πρὸς αὐτοὺς ἀφικνεῖται ἡ ὄψις· πρὸς δὲ τοὺς μένοντας κραδαίνεται διὰ τὸ μῆκος, ἀποτεινομένη πόρρω λίαν. ὁ δὲ τρόμος αὐτῆς ποιεῖ τοῦ ἄστρου δοκεῖν εἶναι τὴν κίνησιν. οὐθὲν γὰρ διαφέρει κινεῖν τὴν ὄψιν, ἢ τὸ ὁρώμενον. ἀλλὰ μὴν ὅτι οὐδὲ κυλίεται τὰ ἄστρα, φανερόν· τὸ μὲν γὰρ κυλιόμενον στρέφεσθαι ἀνάγκη· τῆς δὲ σελήνης ἀεὶ δῆλόν ἐστι τὸ καλούμενον πρόσωπον. ὥστ' ἐπεὶ κινούμενα μὲν δι' αὐτῶν τὰς οἰκείας κινεῖσθαι κινήσεις εὔλογον· ταύτας δ' οὐ φαίνεται κινούμενα· δῆλον ὅτι οὐκ ἂν κινοῖτο δι' E αὐτῶν. πρὸς δὲ τούτοις, ἄλογον τὸ μηθὲν ὄργανον αὐτοῖς ἀποδοῦναι τὴν φύσιν πρὸς τὴν κίνησιν· οὐδὲν γὰρ ὡς ἔτυχε ποιεῖ ἡ φύσις, οὐδὲ τῶν μὲν ζῴων φροντίσαι, τῶν δὲ οὕτω τιμίων ὑπεριδεῖν. ἀλλ' ἔοικεν, ὥσπερ ἐπίτηδες ἀφελεῖν πάντα, δι' ὧν ἐνεδέχετο προϊέναι καθ' αὑτά, καὶ ὅτι πλεῖστον ἀποστῆσαι τῶν ἐχόντων ὄργανα πρὸς κίνησιν. διὸ καὶ εὐλόγως ἂν δόξειεν ὅ, τε ὅλος οὐρανὸς σφαιροειδὴς εἶναι, καὶ ἕκαστον τῶν ἄστρων. πρὸς μὲν γὰρ τὴν ἐν αὑτῷ κίνησιν, ἡ σφαῖρα τῶν σχημάτων χρησιμώτατον. οὕτω γὰρ ἂν καὶ τάχιστα κινοῖτο, καὶ μάλιστα κατέχοι τὸν αὐτὸν τόπον.

* γρ. μένον.
* γρ. περιφέρ.

πρὸς δὲ τὴν εἰς τὸ πρόσθεν, ἀχρηστότατον· ἥκιστα γὰρ ὅμοιόν ἐστι τοῖς δι' αὑτῶν κινητικοῖς· οὐδὲν γὰρ ἀπηρτημένον ἔχει, οὐδὲ προέχον, ὥσπερ τὸ εὐθύγραμμον· ἀλλὰ πλεῖστον ἀφέστηκε τῷ σχήματι τῶν πορευτικῶν σωμάτων. ἐπεὶ οὖν δεῖ τὸν μὲν οὐρανὸν κινεῖσθαι τὴν ἐν αὑτῷ κίνησιν, τὰ δ' ἄλλα ἄστρα μὴ προϊέναι δι' αὑτῶν, εὐλόγως ἂν ἑκάτερον εἴη σφαιροειδές. οὕτω μὲν γὰρ μάλιστα τὸ μὲν κινηθήσεται, τὸ δὲ ἠρεμήσει.

ΚΕΦΑΛ. θʹ.

Ὅτι οὐ γίνεται φερομένων τῶν οὐρανίων σωμάτων ἁρμονία.

Φανερὸν δὲ ἐκ τούτων, ὅτι καὶ τὸ φάναι γίνεσθαι φερομένων ἁρμονίαν, ὡς συμφώνων γινομένων τῶν ψόφων, κομψῶς μὲν εἴρηται καὶ περιττῶς ὑπὸ τῶν εἰπόντων, οὐ μὴν οὕτως ἔχει τὸ ἀληθές. δοκεῖ γάρ τισιν ἀναγκαῖον εἶναι τηλικούτων φερομένων σωμάτων γίνεσθαι ψόφον· ἐπεὶ καὶ τῶν παρ' ἡμῖν οὔτε τοὺς ὄγκους ἐχόντων ἴσους, οὔτε τοιούτῳ τάχει φερομένων ἡλίου τε καὶ σελήνης· ἔτι δὲ τοσούτων τὸ πλῆθος ἄστρων, καὶ τὸ μέγεθος φερομένων τῷ τάχει τοιαύτην φοράν, ἀδύνατον μὴ γίνεσθαι ψόφον, ἀμήχανόν τινα τὸ μέγεθος· ὑποθέμενοι δὲ ταῦτα καὶ τὰς ταχυτῆτας ἐκ τῶν ἀποστάσεων ἔχειν τοὺς τῶν συμφωνιῶν λόγους, ἐναρμόνιον γίνεσθαί φασι τὴν φωνὴν, φερομένων κύκλῳ τῶν ἄστρων. ἐπεὶ δὲ ἄλογον ἐδόκει τὸ μὴ συνακούειν ἡμᾶς τῆς φωνῆς ταύτης, αἴτιον τούτου φασὶν εἶναι τὸ γινομένοις εὐθὺς ὑπάρχειν τὸν ψόφον· ὥστε μὴ διάδηλον εἶναι πρὸς τὴν ἐναντίαν σιγήν. πρὸς ἄλληλα γὰρ φωνῆς καὶ σιγῆς εἶναι τὴν διάγνωσιν· ὥστε καθάπερ τοῖς χαλκοτύποις διὰ συνήθειαν οὐδὲν δοκεῖ διαφέρειν, καὶ τοῖς ἀνθρώποις τὸ αὐτὸ συμβαίνειν. ταῦτα δὴ καθάπερ εἴρηται πρότερον, ἐμμελῶς μὲν λέγεται καὶ μουσικῶς· ἀδύνατον δὲ τοῦτον ἔχειν τὸν τρόπον· οὐ γὰρ μόνον τὸ μηδὲν ἀκούειν ἄτοπον, περὶ οὗ λύειν ἐγχειροῦσι τὴν αἰτίαν, ἀλλὰ καὶ τὸ μηδὲν πάσχειν χωρὶς αἰσθήσεως· οἱ γὰρ ὑπερβάλλοντες ψόφοι διακναίουσι καὶ τῶν ἀψύχων σωμάτων τοὺς ὄγκους, οἷον ὁ τῆς βροντῆς διίστησι καὶ λίθους καὶ τὰ καρτερώτατα τῶν σωμάτων. τοσούτων δὲ φερομένων, καὶ τοῦ ψόφου διιόντος πρὸς τὸ φερόμενον μέγεθος, πολλαπλάσιον μέγεθος ἀναγκαῖον ἀφικνεῖσθαί τε δεῦρο, καὶ τὴν ἰσχὺν ἀμήχανον εἶναι τῆς βίας. ἀλλ' εὐλόγως οὔτε ἀκούομεν, οὔτε πάσχοντα φαίνεται τὰ σώματα βίαιον οὐδὲν πάθος, διὰ τὸ μὴ ψοφεῖν. ἅμα δ' ἐστὶ δῆλον τό τε αἴτιον τούτων, καὶ μαρτύριον τῶν εἰρημένων ἡμῖν λόγων, ὡς εἰσὶν ἀληθεῖς. τὸ γὰρ ἀπορηθὲν καὶ ποιῆσαν τοὺς Πυθαγορείους φάναι γίνεσθαι τὴν συμφωνίαν τῶν φερομένων, ἡμῖν ἐστι τεκμήριον. ὅσα μὲν γὰρ καθ' αὑτὰ φέρεται, ποιεῖ ψόφον καὶ πληγήν· ὅσα δ' ἐν φερομένῳ ἐνδέδεται, ἢ ἐνυπάρχει, καθάπερ ἐν τῷ πλοίῳ τὰ μόρια, οὐχ οἷόν τε ψοφεῖν· οὐδὲ αὖ τὸ πλοῖον, εἰ φέροιτο ἐν ποταμῷ. καίτοι τοὺς αὐτοὺς λόγους ἂν ἐξείη λέγειν, ὡς ἄτοπον, εἰ μὴ φερόμενος ὁ ἱστὸς καὶ ἡ πρύμνα ποιεῖ ψόφον πολὺν τηλικαύτης νεώς, ἢ πάλιν αὐτὸ τὸ πλοῖον κινούμενον. τὸ δ' ἐν μὴ φερομένῳ φερόμενον ποιεῖ ψόφον· ἐν φερομένῳ δὲ συνεχῶς καὶ μὴ ποιοῦντι πληγὴν ἀδύνατον ψοφεῖν.

A Ad motum autem cum quo ad ea pergitur loca quæ ſunt ante, maximè inutilis eſt. Eſt enim minimè ſimilis hiſce quæ per ſe ipſa mouentur. Nihil enim dependens, nihil eminens habet, vt rectarum linearum figura: ſed plurimùm à corporibus hiſce quæ progrediuntur, figura ſemota eſt. Cùm igitur cælum quidem in ſe ipſo moueri oporteat, ſtellas autem non per ſe ipſas procedere, cum ratione nimirum ſit vtrumque vt figuræ rotundæ ſit. Sic enim alterum quidem motu ciebitur, alterum verò quieſcet.

CAPVT IX.

Quòd præter rationem ſit Pythagoricorum opinio, ponentium corpora cæleſtia rotatu ſonum harmoniámque efficere.

B EX his autem patet, id quod dictum eſt à quibuſdam, horum, inquam, latione concentum fieri, ſonis emergentibus inde ratione rata diſtinctis, lepidè quidem eſſe dictum, atque concinnè, non tamen eſſe verum, nec ita rem ſe habere. Sunt enim, quibus neceſſarium eſſe videtur, ſonum fieri tantorum corporum latione, quippe cùm & eorum corporum motu, quæ apud nos ſunt, neque molem habentium æqualem, neque talem motionis celeritatem, qualis eſt Solis, & Lunæ, ſonus efficiatur: & inſuper cùm tot multitudine, tantæque magnitudine ſtellæ, tanta celeritate motus ferantur, impoſſibile eſt, ſonum non fieri grandem. Hæc autem C ſupponentes, & celeritates inſuper concentuũ rationes ex interuallis habere, varios æqualiter ſonos ſtellarum conuerſione fieri dicunt. Quoniam verò rationis fines egredi videbatur, nos hunc ſonitum non audire, cauſam huius inquiunt eſſe, continuò ſonum hunc eſſe cùm orimur, vt non ſit ad ſilentium contrarium manifeſtus. Vocis enim, ſilentiive perceptionẽ, viciſſitudine fieri dicunt. Quare vt hiſce, qui mulcent ferrum, ob conſuetudinem nihil intereſſe videtur, ſic & hominibus idem accidere aiunt. Hoc vti dictum priùs eſt, concinnè quidem muſicéque dicunt: impoſſibile eſt autem ita ſeſe habere. Nõ enim ſolùm hoc eſt abſurdum, nihil, inquam, nos audire, quod quidem ſoluere aggredientes D dictam cauſam, afferunt: ſed etiam illud ſine ſenſu nihil omnino pati. Exuperantes enim ſoni, & inanimatorum corporum moles offendunt. Tonitrui namq; ſonus, lapides, & robuſtiſſima corpora ſcindit. Quòd ſi tot feruntur corpora, atque ad eam magnitudinem, quæ fertur, multiplicẽ ſonitus magnitudinẽ tranſit: huc profectò perueniat ipſe ſonus, ac ipſius violentiæ magnæ ſint admodũ vires, neceſſe eſt. Sed nõ ſine ratione neque nos audimus, neque corpora pati quicquam violentum videntur: propterea quòd nullum ſtellæ motione ſonum efficiunt, atque ſimul iſtorum cauſa patet, & teſtis eſt hiſce quæ à nobis ſunt dicta, veráque E eſſe declarat. Id enim, quod dubitatum eſt, Pythagoricóſve compulit hanc ſententiam ferre, ſtellarum, inquam, latione concentum fieri, indicium efficitur nobis. Quæ namque per ſe feruntur, ea ſonitum ictúmve faciunt. Quæ verò in eo quod fertur, infixa ſunt aut inſunt, vt in nauigio partes, ea ſonum elicere nequeunt, neque ipſum nauigium, ſi in fluuio feratur. Et tamen eadem dicere licebit abſurdum eſſe ſi tãtæ nauis malus motione puppiſve, aut ipſum nauigium vehementem non faciet ſonum. Quod verò fertur, in eo quod nõ fertur, id facit ſonum: at quod eſt in eo quod fertur, ictúmve non facit, id efficere ſonum impoſſibile eſt.

Quare dicendum eſt hîc, ſi ſtellarum corpora per aerem fuſum per vniuerſum, aut ignem (vt omnes aiunt) ferātur, neceſſariò vehementem fieri ſonum, atque huc peruenire, & hæc offendere corpora. Sed cùm fieri nō videatur, neque animantis motu, neque violento, vllam ſtellarum ferri, quaſi futuris ipſa prouidente natura. Quòd ſi hoc modo non ſeſe haberet motus ſtellarum, nihil prorſus eorum eſſet, quæ hoc in loco ſunt, quod ſimili modo ſeſe haberet. Stellas igitur eſſe rotundas, & per ſe ipſas non moueri, ſatis iam diximus.

CAPVT X.

Ordinem quempiam orbium eſſe, & illum ex aſtronomia notum eſſe.

DE ordine verò ipſarum, quomodo quæque diſpoſita eſt, vt quædam ſint priores, quædam poſteriores, & quomodo ſeſe habent interuallis, ex hiſce quæ in aſtrologia dicuntur, contemplemur oportet, dicitur enim ibi ſufficienter. Accidit autem per rationem ſingularum fieri motiones, ipſis nimirum interuallis, vt aliæ ſint celeriores, aliæ tardiores. Nam cùm ſupponatur, extimam quidem cæli lationem ſimplicem, atque celerrimam eſſe, cæteras verò tardiores, ac plures, (quæque namque ſtella, motu fertur contrario atque cælum, ſuo in orbe) conſentaneum iam eſt rationi, eam quidem, quæ propinquiſſima eſt ſimplici, primæque conuerſioni, plurimo in tempore ſuum orbem tranſire: eam verò, quæ remotiſſima eſt, in minimo. Cæterarum autem ſemper eam quæ eſt propinquior, in maiore: eam verò, quæ eſt remotior, in minore. Propinquiſſima namque maximè ſuperatur, remotiſſima verò minimè omnium, ob remotionem. At media, per diſtantiæ iam rationem, vt mathematici quoque demonſtrant.

CAPVT XI.

Quòd aſtra ſphærica figura ſint.

ATqui figuram vniuſcuiuſque ſtellarum rotundam, maximè non abſque ratione quiſpiam eſſe exiſtimabit. Nam cùm demonſtratum ſit, ſtellas haud aptas eſſe per ſe moueri: Naturáque nihil abſque ratione, fruſtráque faciat: patet, eam figuram ipſam immobilibus tribuiſſe, quæ minimè eſt motiua. Talis autem eſt rotunda, propterea quòd inſtrumentum nullum habet ad motum. Quare patet, ſtellarum molem rotundam eſſe. Præterea, ſimiliter ſeſe habent omnes ac vna. At Luna per ea quæ circa viſum accidunt, rotunda eſſe oſtenditur. non enim accreſcens, atque decreſcens, pluries quidem altera ex parte curua, altera concaua fieret, aut vtraque ex parte curua, ſemel autem duas in partes æquales bipartita videretur, & rurſus per aſtrologiam. non enim Sol cùm deficit, concauus ea ex parte qua deficit, videretur. Quare ſi ſtella vna eſt talis, patet & cæteras omnes rotundas eſſe.

CAPVT XII.

Ob quam cauſam cæleſtium corporum motus multiplicentur iuxta diſtantiam à primo orbe. Et quare in primo orbe ſint plures ſtellæ, in reliquis ſingulæ.

CVm autē duæ ſint dubitationes, de quib. quiuis nō immeritò dubitauerit, enitamur id di-

A ὥστ' ἐνταῦθα λεκτέον, ὡς εἴπερ ἐφέρετο τὰ σώματα τούτων εἴτ' ἐν ἀέρος πλήθει κεχυμένῳ κατὰ τὸ πᾶν, εἴτε πυρός, ὥσπερ πάντες φασίν, ἀναγκαῖον ποιεῖν ὑπερφυᾶ τῷ μεγέθει τὸν ψόφον· τούτου δὲ γινομένου, καὶ δεῦρο ἀφικνεῖσθαι, καὶ διακναίειν. ὥστ' ἐπείπερ οὐ φαίνεται τοῦτο συμβαῖνον, οὔτ' ἂν ἔμψυχοι, οὔτε βίαιον φέροιντο φορὰν οὐθὲν αὐτῶν. ὥσπερ τὸ μέλλον ἔσεσθαι προνοούσης τῆς φύσεως· ὅτι μὴ τοῦτον τὸν τρόπον ἐχούσης τῆς κινήσεως, οὐθὲν ἂν ἦν τῶν περὶ τὸν δεῦρο τόπον ὁμοίως ἔχον. ὅτι μὲν οὖν σφαιροειδῆ τὰ ἄστρα, καὶ ὅτι οὐ κινεῖται δι' αὑτῶν, εἴρηται.

ΚΕΦΑΛ. ι΄.

B Περὶ τῆς τῶν ἄστρων τάξεως.

ΠΕρὶ δὲ τῆς τάξεως αὐτῶν, ὃν μὲν τρόπον ἕκαστον αὐτῶν κεῖται τῷ τὰ μὲν εἶναι πρότερα, τὰ δὲ ὕστερα, καὶ πῶς ἔχει πρὸς ἄλληλα τοῖς ἀποστήμασιν, ἐκ τῶν περὶ ἀστρολογίαν θεωρείσθω· λέγεται γὰρ ἱκανῶς. συμβαίνει δὲ κατὰ λόγον γίγνεσθαι τὰς ἑκάστου κινήσεις τοῖς ἀποστήμασι, τῷ τὰς μὲν εἶναι θάττους, τὰς δὲ βραδυτέρας· ἐπεὶ γὰρ ὑπόκειται, τὴν μὲν ἐσχάτην τοῦ οὐρανοῦ περιφορὰν ἁπλῆν τε εἶναι καὶ ταχίστην, τὰς δὲ τῶν ἄλλων βραδυτέρας τε καὶ πλείους. (ἕκαστον γὰρ ἀντιφέρεται τῷ οὐρανῷ C κατὰ τὸν αὑτοῦ κύκλον) εὔλογον ἤδη τὸ μὲν ἐγγυτάτω τῆς ἁπλῆς καὶ πρώτης περιφορᾶς ἐν πλείστῳ χρόνῳ διιέναι τὸν αὑτοῦ κύκλον, τὸ δὲ πορρωτάτω, ἐν ἐλαχίστῳ. τῶν δὲ ἄλλων ἀεὶ τὸ ἐγγύτερον ἐν πλείονι, τὸ δὲ πορρώτερον ἐν ἐλάττονι· τὸ μὲν γὰρ ἐγγυτάτω μάλιστα κρατεῖται· τὸ δὲ πορρωτάτω πάντων, ἥκιστα διὰ τὴν ἀπόστασιν· τὰ δὲ μεταξὺ κατὰ λόγον ἤδη τῆς ἀποστάσεως, ὥσπερ καὶ δεικνύουσιν οἱ μαθηματικοί.

ΚΕΦΑΛ. ια΄.

Ὅτι τὰ ἄστρα σφαιροειδῆ ἐστι.

D ΤΟ δὲ σχῆμα τῶν ἄστρων ἑκάστου σφαιροειδὲς μάλιστ' ἄν τις εὐλόγως ὑπολάβοι. ἐπεὶ γὰρ δέδεικται, ὅτι οὔτε κινεῖσθαι πεφύκασι δι' ἑαυτῶν· ἡ δὲ φύσις οὐδὲν ἀλόγως οὐδὲ μάτην ποιεῖ. δῆλον ὅτι καὶ σχῆμα τοιοῦτον ἀπέδωκε τοῖς ἀκινήτοις, ὃ ἥκιστά ἐστι κινητικόν. ἥκιστα δὲ κινητικὸν ἡ σφαῖρα, διὰ τὸ μηδὲν ἔχειν ὄργανον πρὸς τὴν κίνησιν. ὥστε δῆλον ὅτι σφαιροειδῆ ἂν εἴη τὸν ὄγκον. ἔτι δ', ὁμοίως μὲν ἅπαντα καὶ ἕν. ἡ δὲ σελήνη δείκνυται διὰ τῶν περὶ τὴν ὄψιν, ὅτι σφαιροειδής. οὐ γὰρ ἂν ἐγίνετο αὐξανομένη, καὶ φθίνουσα, τὰ μὲν πλεῖστα μηνοειδής, ἢ ἀμφίκυρτος, ἅπαξ δὲ διχότομος. καὶ πάλιν διὰ τῶν ἀστρολογικῶν, ὅτι E οὐκ ἂν ἦσαν αἱ τοῦ ἡλίου ἐκλείψεις μηνοειδεῖς· ὥστ' εἴπερ ἐστὶν ἓν τοιοῦτον, δῆλον ὅτι καὶ τἆλλα ἂν εἴη σφαιροειδῆ.

ΚΕΦΑΛ. ιβ΄.

Ἀπορίαι δύο· Διὰ τί οὐκ ἀεὶ τὸ πλεῖον ἀπέχοντα τῆς πρώτης φορᾶς κινεῖται πλείους κινήσεις· Καὶ διὰ τί ἐν μὲν τῇ πρώτῃ φορᾷ τοσοῦτόν ἐστιν ἄστρων πλῆθος, ἐπὶ δὲ τῶν ἄλλων ἓν ἄστρον, χωρὶς ἕκαστον.

ΔΥοῖν δ' ἀπορίαιν οὔσαιν, περὶ ὧν εἰκότως ἂν ὁστισοῦν ἀπορήσειε, πειρατέον λέγειν τὸ φαι-

A νόμενον, αἰδοῦς ἀξίαν εἶναι νομίζοντας τὴν προθυμίαν μᾶλλον, ἢ θράσους, εἴ τις διὰ τὸ φιλοσοφίας διψῆν, καὶ μικρὰς εὐπορίας ἀγαπᾷ, περὶ ὧν τὰς μεγίστας ἔχομεν ἀπορίας. * ἔστι δὲ, πολλῶν ὄντων τοιούτων, οὐχ ἥκιστα θαυμαστὸν, διὰ τίνα ποτὲ αἰτίαν οὐκ ἀεὶ τὰ πλεῖον ἀπέχοντα τῆς πρώτης φορᾶς κινεῖται πλείους κινήσεις, ἀλλὰ τὰ μεταξὺ πλείους. καὶ εὔλογον γὰρ ἂν εἶναι δόξειε τοῦ πρώτου σώματος μίαν κινουμένου φορὰν, τὸ πλησιαίτατον ἐλαχίστας κινεῖσθαι κινήσεις, οἷον δύο· τὸ δὲ ἐχόμενον τρεῖς, ἤ τινα ἄλλην τοιαύτην τάξιν. νῦν δὲ συμβαίνει τοὐναντίον· ἐλάττους γὰρ ὁ ἥλιος καὶ ἡ σελήνη κινεῖται κινήσεις, ἢ τῶν * πλανωμένων ἄστρων ἔνια· καίτοι πορρώτερον

B τοῦ μέσου, καὶ πλησιαίτερον τοῦ πρώτου σώματός εἰσιν αὐτῶν. δῆλον δὲ τοῦτο περὶ ἐνίων καὶ τῇ ὄψει γέγονε. τὴν δὲ σελήνην ἑωράκαμεν διχότομον μὲν * οὖσαν· ὑπεισελθοῦσαν δὲ τῶν ἀστέρων τὸν τοῦ Ἄρεος, καὶ ἀποκρυφθέντα μὲν * τὸ μέλαν αὐτῆς, ἐξελθόντα δὲ κατὰ τὸ φανὸν καὶ λαμπρόν. ὁμοίως δὲ καὶ * περὶ τοὺς ἄλλους ἀστέρας λέγουσιν οἱ πάλαι τετηρηκότες ἐκ πλείστων ἐτῶν Αἰγύπτιοι, καὶ Βαβυλώνιοι παρ' ὧν πολλὰς πίστεις ἔχομεν περὶ ἑκάστου τῶν ἄστρων. τοῦτό τε δὴ δικαίως ἀπορήσειεν ἄν τις, καὶ διὰ τίνα ποτ' αἰτίαν ἐν μὲν τῇ πρώτῃ φορᾷ τοσοῦτόν ἐστιν ἄστρων πλῆθος, ὥστε τῶν ἀναριθμήτων εἶναι δοκεῖν τὴν πᾶσαν τάξιν· * ἐπὶ δὲ τῶν ἄλλων, ἓν χωρὶς ἕκαστον. δύο δὲ ἢ

C πλείω οὐ φαίνεται ἐν τῇ αὐτῇ ἐνδεδεμένα φορᾷ. περὶ δὲ τούτων ζητεῖν μὲν καλῶς ἔχει, καὶ τὴν ἐπὶ πλεῖον σύνεσιν, καίπερ μικρὰς ἔχοντας ἀφορμὰς καὶ τοσαύτην ἀπόστασιν ἀπέχοντας τῶν περὶ αὐτὰ συμβαινόντων· ὅμως δὲ ἐκ τῶν τοιούτων θεωροῦσιν, οὐδὲν ἄλογον ἂν δόξειεν εἶναι τὸ νῦν ἀπορούμενον· ἀλλ' ἡμεῖς ὡς περὶ σωμάτων μόνον αὐτῶν, καὶ μονάδων τάξιν μὲν ἐχόντων, ἀψύχων δὲ πάμπαν, διανοούμεθα· δεῖ δ' ὡς μετεχόντων ὑπολαμβάνειν πράξεως καὶ ζωῆς· οὕτω γὰρ οὐθὲν δόξει παράλογον εἶναι τὸ συμβαῖνον. ἔοικε γὰρ τῷ μὲν ἄριστα ἔχοντι ὑπάρχειν τὸ εὖ ἄνευ πράξεως· τῷ δ' ἐγγύτατα, διὰ ὀλίγης καὶ μιᾶς· τοῖς δὲ πορρωτάτω, διὰ πλειόνων· ὥσπερ ἐπὶ

D σώματος, τὸ μὲν οὐδὲ γυμναζόμενον εὖ ἔχει, τὸ δὲ μικρὰ περιπατῆσαν· τὸ δὲ καὶ πάλαισιν δεῖ, καὶ δρόμου, καὶ κονίσεως. πάλιν δὲ ἑτέρῳ οὐδ' ὁποσονοῦν * ποιοῦντι τοῦτό γ' ἂν ἔστιν ὑπάρξαι τἀγαθὸν, ἀλλ' ἕτερόν τι. ἔστι δὲ τὸ κατορθοῦν χαλεπὸν ἢ τὸ πολλὰ, ἢ τὸ πολλάκις· οἷον * μυρίους ἀστραγάλους * Χίους βαλεῖν ἀμήχανον, ἀλλ' ἕνα ἢ δύο ῥᾷον. καὶ πάλιν ὅταν τόδε μὲν δέῃ τοῦδε ἕνεκα ποιῆσαι, τοῦτο δ' ἄλλου, καὶ τοῦτο ἑτέρου, ἐν μὲν ἑνὶ καὶ δυσὶ ῥᾷον ἐπιτυχεῖν· ὅσῳ δ' ἂν διὰ πλειόνων, χαλεπώτερον. διὸ δεῖ νομίζειν καὶ τὴν τῶν ἄστρων πρᾶξιν εἶναι τοιαύτην, οἵαπερ ἡ τῶν ζῴων

E καὶ τῶν φυτῶν· καὶ γὰρ ἐνταῦθα αἱ τοῦ ἀνθρώπου πλεῖσται πράξεις· πολλῶν γὰρ τῶν εὖ δύναται τυχεῖν· ὥστε πολλὰ * πράττει, καὶ ἄλλων ἕνεκα· τῷ δ' ὡς ἄριστα ἔχοντι οὐθὲν δεῖ πράξεως· ἔστι γὰρ αὐτὸ τὸ οὗ ἕνεκα. ἡ δὲ πρᾶξις ἐστὶν ἀεὶ ἐν δυσὶν, ὅταν καὶ οὗ ἕνεκα ᾖ, καὶ τὸ τούτου ἕνεκα. τῶν δ' ἄλλων ζῴων ἐλάττους· τῶν δὲ φυτῶν μικρά τις καὶ μία ἴσως· ἢ γὰρ ἕν τι ἐστὶν οὗ τύχοι ἄν, ὥσπερ καὶ ὁ ἄνθρωπος· ἢ καὶ τὰ * πολλὰ πάντα πρὸ ὁδοῦ ἐστι πρὸς τὸ ἄριστον.

* Sic rectè Argyropylus. vulgò, ἔστι δὲ,
* κ. ὑπελθοῦσαν
* κ. κατὰ τὸ μ.
* γρ. περὶ τῶν ἄλλων ἀστέρων λέγουσι οἱ τετηρηκότες
* γρ. τῶν δ' ἄλλων,
* γρ. πονοῦντι
* γρ. μυρίοις
* Argy. Κῷος, vt & vet. interpr. rectè. nam apud Græcos iactus Cous erat felix, vt apud Latinos Venerius. at Chius qui & Canis, infelix: quare Κύων.
* γρ. πράττειν,
* γρ. ἄλλα

A cere, quod nobis videtur. Atque hunc omnium veneratione potiùs dignum quàm temerarium arbitrari oportet, ſi quiſpiam ob philoſophiæ ſitim exiguas etiam in hiſce rebus facultates amet, de quibus maximas dubitationes habemus. Eſt autem in talibus, quæ multa ſunt, non minimè admirabile. Quam ob cauſam non ſemper hæ ſtellæ, quæ magis à prima latione diſtant pluribus motibus, ſed mediæ plurimis mouentur. Conſentaneum enim rationi videbitur, primo corpore vnam lationem ſubeunte, propinquiſſimum minimis motibus moueri, ceu duobus: id autem, quod hæret illi, tribus: aut aliquo alio ordine tali. Nunc verò contrarium accidit: paucioribus enim Sol, & Luna mouentur, quàm ſtellarum nonnullæ vagarum, quæ tamen

B longiùs à medio diſtant, & propinquiores primo corpori ſunt. Manifeſtum autem hoc de nonnullis etiam ipſo viſu fuit. Lunam enim vidimus dimidia parte lucidam, Martis ſtellam ſubiſſe, quæ celata quidem fuit in parte obſcura, egreſſa autem per lucidam partem. Similiter & de cæteris ſtellis Ægyptij & Babylonij dicunt, qui plurimis iam annis antè hæc obſeruauerunt, & à quibus multa fide digna de ſingulis ſtellis accepimus. Hoc etiam non iniuria quiſpiam dubitauerit, quam ob cauſam etiam in prima quidem conuerſione tanta eſt multitudo ſtellarum, vt vniuerſus ordo ſubire non poſſe numerum videatur: in cæteris autem vna ſeorſum eſt ſtella, duæ verò aut plures eodem in orbe non

C videntur eſſe infixæ. De his igitur bene ſeſe habet, & maiorem quærere cognitionem, etſi paruæ occaſiones habentur, tantaque eſt eorum remotio, quæ accidunt circa ipſa: ſi tamen ex talibus contemplemur, non egredi metas rationis videbitur id quod nunc dubitatur. Sed nos de ipſis, vt de corporibus, ac vnitatibus ordinem quidem habentibus, inanimatis autem penitus, cogitamus. Oportet autem ipſa viuentia eſſe exiſtimare, atque actionem habere. Sic enim id quod accidit, non videbitur à ratione exorbitare. Nam ei quidē, quod optimè ſeſe habet, ineſſe ipſum bonū ſine actione videtur: ei verò, quod illi eſt propinquiſſimum, per paruam, ac vnam. At hiſce quæ ſunt remotiſſima, per plures, quemadmodum & in corporibus fieri

D ſolet. Aliud enim bene ſeſe habet, nullum exercitium ſubiens, aliud ſeui deambulatione facta, aliud & curſu indiget, & luctatione, ac puluere: alij rurſus neque quouis exercendi modo, hoc vnquam inerit bonum, ſed aliud quippiam conſequitur. Rectè autem agere, aut multa, aut ſæpe, difficile eſt, veluti talos Coenſes mille proijcere, impoſſibile eſt: ſed vnum, vel duos, facilius eſt. Et rurſus cùm hoc quidem illius gratia, illud autem ob aliud, & illud item ob aliud eſt faciendum: in vno quidem, duobúſve, faciliùs quiſpiam finem attinget. Ac quò per plura procedit, eò illum difficiliùs aſſequetur: quapropter & ſtellarum actio-

E nem talem exiſtimare oportet, qualis animalium eſt, ac plantarum. Etenim hic hominis actiones, plurimæ ſunt. Multa enim bona conſequi poteſt. Quare multa agit, & aliorū nimirū gratia. Ei verò, quod quàm optime ſeſe habet, non eſt opus actione. Eſt enim id, gratia cuius cætera agūt. Actio verò ſemper in duobus cōſiſtit, quādo & id gratia cuius agitur, eſt, & id quod huius gratia agit. At cæterorū animaliū, pauciores ſunt. Et plantarum, parua quædā eſt, ac vna fortaſſe. aut enim vnū quidē eſt, quod cōſequi poſſunt, quemadmodū & homo: aut & ipſa multa, omnia antecedūt ad ipſū optimū conſequendū.

Aliud igitur habet optimum ipſum, & particeps eſt ipſius: aliud per pauca prope accedit, aliud per multa: aliud non aggreditur, ſed ſatis eſt prope ad ipſum vltimum peruenire. veluti ſi ſanitas eſt finis, aliud ſemper eſt ſanum, aliud macie affectum, aliud curſu facto in maciem deductum, aliud & aliquo quopiam acto ipſius gratia curſus: quare plures ipſius ſunt motiones. Eſt & id quod ad ſanitatem ipſam accedere nequit, ſed ad curſum ſolum, aut ad maciem: atque horum alterum, eſt ipſis finis. Nam maximè quidem eſt optimum omnibus, illum conſequi finem. Quòd ſi hoc non fiat, ſemper melius eſt, quanto optimo propinquius eſt. Et idcirco terra quidem non mouetur omnino, propinqua verò paucis motibus mouentur. Non enim ad vltimum ipſum perueniunt, ſed quouſque conſequi diuiniſſimum ipſum principium poſſunt. Primum autem cælum, continuò per vnum motum illud aſſequitur. At eæ, quæ ſunt in medio primi, ac vltimorum, perueniunt quidem, per plures tamen motiones perueniunt. Illud autem in prima quidem latione magnam copiam eſſe ſtellarum, cæterarum verò ſtellarum quamque ſeorſum proprias motiones habere, quod quidem dubitatio eſt ſecunda: ob vnum quidem primum quiſpiam cum ratione eſſe putabit. Primæ namque vitæ & principij cuiuſque primi, magnam ad cætera intelligere exceſſionem eſſe oportet. Hoc autem accidere per rationem videtur. Prima namque vna quidem eſt, multa autem diuinorum corporum mouet: cæteræ verò multæ quidem ſunt, vnum tamen quæque tantummodo mouet: vagarum enim ſtellarum quæque pluribus lationibus fertur. Hoc igitur pacto natura ipſa in æqualitatem hæc redigit, atque ordinem quendam facit, vni quidem lationi multa corpora, vni corpori lationes complures reddens. Et inſuper ob hoc vnum cæteræ ſphæræ corpus habent, quòd multa corpora mouent, & quæ ſunt ante vltimam, & quæ vnam poſſident ſtellam. In multis enim ſphæris, vltima ſphæra ligata fertur. Sphæra autem quæque corpus eſt. Illius igitur ipſum opus commune erit. Etenim cuiuſque propria natura latio. Ipſa autem quaſi adiacet, ad finitum verò, finiti corporis omnis potentia eſt. Sed de ſtellis quidem, quæ conuerſione feruntur, qualéſnam ſubſtantia ſint, atque figura, & de loco ipſarum, atque ordine, ſatis iam diximus.

CAPVT XIII.

Veterum ſententias expendit de terræ poſitione & ſitu, an moueatur an quieſcat, & de figura eius.

RESTAT autem de terra dicere, vbinam iaceat, & vtrùm ex hiſce ſit, quæ quieſcunt, an ex his, quæ mouentur, & de ipſius quoque figura. De ſitu itaque ipſius non eandem omnes opinionem habent: ſed plurimi quidem in medio iacere dicunt, qui totum cælum infinitum inquiunt eſſe; hi verò, qui Italiæ partem habitant, Pythagoricique vocantur, contrarium aſſerunt. Nam in medio quidem ignem eſſe aiunt, terram autem vnam eſſe ſtellarum, ferrique circa medium, atque hoc pacto noctem ac diem efficere. Aliam autem huic contrariam terram conficiunt, quam terram aduerſam vocant: non ad ea quæ videntur, rationes cauſaſque quærentes,

A τὸ μὲν οὖν ἔχει καὶ μετέχει τοῦ ἀρίστου, τὸ δ' ἀφικνεῖται ἐγγὺς δι' ὀλίγων, τὸ δὲ διὰ πολλῶν, τὸ δ' οὐδ' ἐγχειρεῖ, ἀλλ' ἱκανὸν εἰς τὸ ἐγγὺς τοῦ ἐσχάτου ἐλθεῖν. οἷον εἰ ὑγίεια τέλος· τὸ μὲν δὴ ἀεὶ ὑγιαίνει, τὸ δὲ ἰσχνανθὲν, τὸ δὲ δραμὸν καὶ ἰσχνανθὲν, τὸ δὲ καὶ ἄλλο τι πράξαν τοῦ δραμεῖν ἕνεκα· ὥστε πλείους αἱ κινήσεις· ἕτερον δὲ ἀδυνατεῖ πρὸς τὸ ὑγιαίνειν ἐλθεῖν, ἀλλὰ πρὸς τὸ δραμεῖν μόνον ἢ ἰσχνανθῆναι, καὶ τούτων θάτερον τέλος αὐτοῖς. μάλιστα μὲν γὰρ ἐκείνου τυχεῖν ἄριστον πᾶσι τοῦ τέλους· εἰ δὲ μὴ, ἀεὶ ἄμεινόν ἐστιν, ὅσῳ ἂν ἐγγύτερον ᾖ τοῦ ἀρίστου. καὶ διὰ τοῦτο ἡ μὲν γῆ ὅλως οὐ κινεῖται, τὰ δ' ἐγγὺς ὀλίγας κινήσεις. οὐ γὰρ B ἀφικνεῖται πρὸς τὸ ἔσχατον· ἀλλὰ μέχρι ὅτου δύναται τυχεῖν τῆς θειοτάτης ἀρχῆς. ὁ δὲ πρῶτος οὐρανὸς εὐθὺς τυγχάνει διὰ μιᾶς κινήσεως. τὰ δ' ἐν τῷ μέσῳ τοῦ πρώτου καὶ τῶν ἐσχάτων ἀφικνεῖται μὲν, διὰ πλειόνων δὲ ἀφικνεῖται κινήσεων. περὶ δὲ τῆς ἀπορίας, ὅτι μὲν * κατὰ τὴν πρώτην μίαν οὖσαν φορὰν πολὺ πλῆθος συνέστηκεν ἄστρων, τῶν δ' ἄλλων χωρὶς ἕκαστον εἴληφεν ἰδίας κινήσεις· δι' ἓν μὲν ἄν τις πρῶτον εὐλόγως οἰηθείη τοῦτ' ὑπάρχειν. νοῆσαι γὰρ δεῖ τῆς ζωῆς καὶ τῆς ἀρχῆς ἑκάστης πολλὴν ὑπεροχὴν εἶναι τῆς πρώτης πρὸς τὰς ἄλλας. εἴη δ' ἂν ὧδε συμβαίνουσα κατὰ λόγον· ἡ μὲν γὰρ πρώτη μία οὖσα, πολλὰ κινεῖ τῶν σωμάτων τῶν θείων· C αἱ δὲ πολλαὶ οὖσαι ἓν μόνον ἑκάστη· τῶν γὰρ πλανωμένων ἓν ὁτιοῦν, πλείους φορὰς φέρεται. ταύτῃ τε οὖν ἀνισάζει ἡ φύσις, καὶ ποιεῖ τινὰ τάξιν, τῇ μὲν μιᾷ φορᾷ πολλὰ ἀποδοῦσα σώματα, τῷ δὲ ἑνὶ σώματι πολλὰς φοράς. ἔτι διὰ τόδε ἓν ἔχουσι σῶμα αἱ ἄλλαι * φοραὶ, ὅτι πολλὰ σώματα κινοῦσιν αἱ πρὸ τῆς τελευταίας καὶ τῆς ἓν ἄστρον ἐχούσης. ἐν πολλαῖς γὰρ σφαίραις ἡ τελευταία σφαῖρα ἐνδεδεμένη φέρεται· ἑκάστη δὲ σφαῖρα σῶμα τυγχάνει ὄν. ἐκείνης ἂν οὖν κοινὸν εἴη τὸ ἔργον· αὐτῇ μὲν γὰρ ἑκάστῃ ἡ ἰδία φύσει φορά. αὕτη δὲ οἷον πρόσκειται. παντὸς δὲ πεπερασμένου σώματος πρὸς πεπερασμένον ἡ δύνα- D μίς ἐστιν. ἀλλὰ περὶ μὲν τῶν τὴν ἐγκύκλιον φερομένων κίνησιν ἄστρων, εἴρηται ὁποῖα ἄττα κατὰ τὴν οὐσίαν ἐστὶ, καὶ κατὰ τὸ σχῆμα, καὶ περὶ τῆς φορᾶς, καὶ τῆς τάξεως αὐτῶν.

* κ. μετὰ τὴν π.

* κ. σφαῖραι.

ΚΕΦΑΛ. ιγ'.

Αἱ τῶν παλαιῶν δόξαι περὶ τῆς θέσεως τῆς γῆς, καὶ πότερον ἠρεμεῖ ἢ οὔ· καὶ περὶ τοῦ σχήματος αὐτῆς.

ΛΟιπὸν δὲ περὶ τῆς γῆς εἰπεῖν, οὗ τε τυγχάνει κειμένη, καὶ πότερον τῶν ἠρεμούντων ἐστὶν ἢ τῶν κι- E νουμένων, καὶ περὶ τοῦ σχήματος αὐτῆς. περὶ μὲν οὖν τῆς θέσεως, οὐ τὴν αὐτὴν ἔχουσιν ἅπαντες δόξαν· ἀλλὰ τῶν πλείστων ἐπὶ τοῦ μέσου κεῖσθαι λεγόντων, ὅσοι τὸν ὅλον οὐρανὸν πεπερασμένον εἶναί φασιν, ἐναντίως οἱ περὶ τὴν Ἰταλίαν, καλούμενοι δὲ Πυθαγόρειοι, λέγουσιν· ἐπὶ μὲν γὰρ τοῦ μέσου πῦρ εἶναί φασι, τὴν δὲ γῆν ἓν τῶν ἄστρων οὖσαν, κύκλῳ φερομένην περὶ τὸ μέσον, νύκτα τε καὶ ἡμέραν ποιεῖν. ἔτι δ' ἐναντίαν ἄλλην ταύτῃ κατασκευάζουσι γῆν, ἣν ἀντίχθονα ὄνομα καλοῦσιν, οὐ πρὸς τὰ φαινόμενα τοὺς λόγους καὶ τὰς αἰτίας ζητοῦντες,

ἀλλὰ πρός τινας δόξας καὶ λόγους αὐτῶν τὰ φαινόμενα προσέλκοντες, καὶ πειρώμενοι συγκοσμεῖν. πολλοῖς δ' ἂν καὶ ἑτέροις συνδόξειε, μὴ δεῖν τῇ γῇ τὴν τοῦ μέσου χώραν ἀποδιδόναι, τὸ πιστὸν οὐκ ἐκ τῶν φαινομένων ἀθροῦσιν, ἀλλὰ μᾶλλον ἐκ τῶν λόγων. τῷ γὰρ τιμιωτάτῳ οἴονται προσήκειν τὴν τιμιωτάτην* ὑπάρχειν χώραν· εἶναι δὲ πῦρ μὲν γῆς τιμιώτερον, τὸ δὲ πέρας τῶν μεταξύ. τὸ δ' ἔσχατον καὶ τὸ μέσον, πέρας· ὥστε ἐκ τούτων ἀναλογιζόμενοι οὐκ οἴονται ἐπὶ τοῦ μέσου κεῖσθαι* τῆς σφαίρας αὐτήν, ἀλλὰ μᾶλλον τὸ πῦρ. ἔτι δ' οἵ γε Πυθαγόρειοι καὶ διὰ τὸ μάλιστα προσήκειν φυλάττεσθαι τὸ κυριώτατον τοῦ παντός· τὸ δὲ μέσον εἶναι τοιοῦτον· ὁ Διὸς φυλακὴν ὀνομάζουσι, τὸ ταύτην ἔχον τὴν χώραν πῦρ. ὥσπερ τὸ μέσον ἁπλῶς λεγόμενον, καὶ τὸ τοῦ μεγέθους μέσον, καὶ τοῦ πράγματος ὂν μέσον, καὶ τῆς φύσεως· καίτοι καθάπερ ἐν τοῖς ζώοις οὐ ταὐτὸ τοῦ ζώου καὶ τοῦ σώματος τὸ μέσον, οὕτως ὑποληπτέον μᾶλλον καὶ περὶ τὸν ὅλον οὐρανόν. διὰ μὲν οὖν ταύτην τὴν αἰτίαν οὐθὲν αὐτοὺς δεῖ θορυβεῖσθαι περὶ τὸ πᾶν, οὐδ' εἰσάγειν φυλακὴν ἐπὶ τὸ κέντρον, ἀλλ' ἐκεῖνο ζητεῖν τὸ μέσον, ποῖόν τι καὶ ποῦ πέφυκεν. ἐκεῖνο μὲν γὰρ ἀρχὴ τὸ μέσον καὶ τίμιον· τὸ δὲ τοῦ τόπου μέσον, ἔοικε τελευτῇ μᾶλλον ἢ ἀρχῇ· τὸ μὲν γὰρ ὁριζόμενον, τὸ μέσον· τὸ δὲ ὁρίζον, τὸ πέρας. τιμιώτερον δὲ τὸ περιέχον καὶ τὸ πέρας, ἢ τὸ περαινόμενον· τὸ μὲν γὰρ ὕλη, τὸ δὲ οὐσία τῆς συστάσεώς ἐστι. περὶ μὲν οὖν τοῦ τόπου τῆς γῆς, ταύτην ἔχουσί τινες τὴν δόξαν. ὁμοίως δὲ περὶ μονῆς καὶ κινήσεως· οὐ γὰρ τὸν αὐτὸν τρόπον πάντες ὑπολαμβάνουσιν· ἀλλ' ὅσοι μὲν μηδὲ ἐπὶ τοῦ μέσου κεῖσθαί φασιν αὐτήν, κινεῖσθαι δὲ κύκλῳ περὶ τὸ μέσον· οὐ μόνον δὲ ταύτην, ἀλλὰ καὶ τὴν ἀντίχθονα, καθάπερ εἴπομεν πρότερον. ἐνίοις δὲ δοκεῖ καὶ πλείω σώματα τοιαῦτα ἐνδέχεσθαι φέρεσθαι περὶ τὸ μέσον, ἡμῖν δὲ ἄδηλα, διὰ τὴν ἐπιπρόσθησιν τῆς γῆς. διὸ καὶ τὰς τῆς σελήνης ἐκλείψεις πλείους ἢ τὰς τοῦ ἡλίου γίνεσθαί φασι· τῶν γὰρ φερομένων ἕκαστον ἀντιφράττειν αὐτήν, ἀλλ' οὐ μόνον τὴν γῆν. ἐπεὶ γὰρ οὐκ ἔστιν ἡ γῆ κέντρον, ἀλλ' ἀπέχει τὸ ἡμισφαίριον αὐτῆς ὅλον, οὐθὲν κωλύειν οἴονται τὰ φαινόμενα συμβαίνειν ὁμοίως μὴ κατοικοῦσιν ἡμῖν ἐπὶ τοῦ κέντρου ὥσπερ κἂν εἰ ἐπὶ τοῦ μέσου ἦν ἡ γῆ· οὐθὲν γὰρ οὐδὲ νῦν ποιεῖν ἐπίδηλον, τὴν ἡμίσειαν* ἀπεχόντων τῆς διαμέτρου. ἔνιοι δὲ καὶ κειμένην ἐπὶ τοῦ κέντρου φασὶν αὐτὴν* ἴλλεσθαι περὶ τὸν διὰ παντὸς τεταμένον πόλον, ὥσπερ ἐν τῷ Τιμαίῳ γέγραπται. παραπλησίως δὲ καὶ περὶ τοῦ σχήματος ἀμφισβητεῖται· τοῖς μὲν γὰρ εἶναι δοκεῖ σφαιροειδής, τοῖς δὲ πλατεῖα, καὶ τὸ σχῆμα τυμπανοειδής· ποιοῦνται δὲ τεκμήριον, ὅτι δύνων καὶ ἀνατέλλων ὁ ἥλιος, εὐθεῖαν ἀλλ' οὐ περιφερῆ τὴν ἀπόκρυψιν φαίνεται ποιούμενος ὑπὸ τῆς γῆς· ὡς δέον εἴπερ ἦν σφαιροειδής, περιφερῆ γίνεσθαι καὶ τὴν ἀποτομήν· οὐ προσλογιζόμενοι τό, τε ἀπόστημα τοῦ ἡλίου πρὸς τὴν γῆν, καὶ τὸ τῆς περιφερείας μέγεθος, ὡς ἐν τοῖς φαινομένοις μικροῖς κύκλοις εὐθεῖα φαίνεται πόρρωθεν. διὰ μὲν οὖν ταύτην τὴν φαντασίαν, οὐθὲν αὐτοὺς ἀπιστεῖν δεῖ, μὴ κυκλοτερῆ τὸν ὄγκον εἶναι τῆς γῆς· ἀλλ' ἔτι προστιθέασι, καὶ φασὶ διὰ τὴν ἠρεμίαν ἀνάγκη τὸ σχῆμα τοῦτ' ἔχειν αὐτήν. καὶ γὰρ δὴ οἱ περὶ τῆς γῆς τῆς κινήσεως, καὶ τῆς μονῆς εἰρημένοι τρόποι, πολλοὶ τυγχάνουσι. τὸ μὲν οὖν ἀπορῆσαι πᾶσιν ἀναγκαῖον ἐπελθεῖν·

* γρ. τὸ

* γρ. τὴν σφαῖραν αὐτῆς,

* γρ. ἀπέχειν δὲ

* γρ. ἴλλεσθαι, ſicut etiã apud Platonem quidam ἰλλομένην non εἱλουμένην. vide Procli Com. in eum locum.

A ſed ad quaſdam ſuas rationes opinioneſque ea quę videntur, trahentes, atque ornare conantes. Compluribus etiam aliis non ex his quæ apparent, ſed ex rationibus potiùs ſumentibus fidem, locum reddere terræ medium non oportere, videri poteſt. Præſtabiliſſimum enim corpus, locum occupare præſtabiliſſimum oportere putant: atque ignem quidem præſtabiliorem terra, finem autem medii ipſis præſtabiliſſimum eſſe. Quare ex his ratiocinantes non ipſam in medio ſphæræ iacere, ſed potiùs ignem putant. Præterea Pythagorici, & quia maximè conſeruari oportet id quod eſt maximè præcipuum vniuerſi, medium verò eſt tale, ideo eum ignem, qui locum hunc occupat, cuſtodiam B Iouis appellant. Quaſi medium ſimpliciter diceretur, & medium magnitudinis; & rei medium eſſet, atque naturæ. Enimvero vt in animalibus non idem eſt animalis atque corporis medium, ſic eſt magis & circa ipſum totum cælum exiſtimandum. Igitur propter hanc cauſam non oportet ipſos circa vniuerſum turbari, neque cuſtodiam ad centrum adducere, ſed illud quærere, medium ipſum quale quid eſt, & vbi eſt aptum eſſe. Illud enim medium, principium eſt, ac pretioſum. Medium verò loci, ſimile eſt magis extremo, quàm principio. Medium enim terminatur: terminus autem eſt ipſe finis. Pretioſius autem eſt id, quod continet, & finis, quàm id, quod finitur. Hoc enim materies, illud ſubſtantia conſtitutionis eſt. De loco C igitur terræ hanc habent quidam opinionem, ſimiliter & de quiete, motúve. Non enim eodem modo omnes exiſtimant, ſed qui in medio ipſam non eſſe putant, circa medium moueri dicunt: atque non ſolum hanc, ſed etiam aduerſam terram, vti priùs eſt dictum. Quibuſdam etiam & plura talia corpora circa medium ferri poſſe videtur, nobis immanifeſta ob terræ obiectionem. Quocirca & Lunæ defectiones plures, quam Solis, fieri dicunt. Vnumquodque enim eorum, quæ feruntur, obiicere ſeſe Lunæ inquiunt, non ſolùm terram. Nam cùm terra centrum non ſit, ſed per ipſius totum hemiſphærium diſtet, nihil prohibere putant ea accidere, quæ videntur, ſimiliter non habitan- D tibus nobis in centro, ſicut ſi in medio etiam eſſet terra. Nihil enim neque nunc oſtendit, per dimidiam diametrum diſtantibus nobis. Quidam autem in centro ipſam iacentem volui, & circa ipſum polum per vniuerſum extenſum moueri dicunt, vt in Timæo eſt ſcriptum. Simili modo de figura quoque ipſius contenditur. Quibuſdam enim rotunda eſſe videtur, quibuſdam verò lata, vt tympanum: cui hoc indicium faciunt. Cùm occidit enim, atque oritur Sol, per rectam lineam, ſed non per curuam celari videtur: quippe cùm oporteret, ſi eſſet terra rotunda, diuiſionem fieri curuam: non animaduertentes diſtantiam Solis E ad terram, & circunferentiæ magnitudinem, quomodo in hiſce circulis, qui parui eminus videntur, linea recta apparet. Propter igitur hanc apparentiam, non oportet ipſos terræ molem credere rotundam non eſſe. Addunt inſuper, atque inquiunt, figuram hanc neceſſariò ipſam propter quietem habere. Etenim modi, qui de motione quietéve ſunt dicti, complures ſunt. Omnes igitur de hoc dubitaſſe neceſſarium eſt:

A forſitan enim mentis eſt vacantis ratione, non admirari, curnam parua quædam pars terræ, ſi eleuata dimittatur, fertur, quieſcereque non ſolet, maiórque ſemper celeriùs fertur: vniuerſa autem terra ſi quiſpiam ipſam ſublimem eleuatamque dimittat, ferri non poteſt, nunc verò tantum pondus quieſcit. At verò ſi quiſpiam etiam partes ipſius cùm feruntur, antequam cadant, auferat terram, deorſum ſanè ferentur, ſi nihil obſtiterit. Quare dubitare quidem omnibus ob philoſophiam euenit. Operam autem eos non dediſſe vt ſolutiones non magis abſurdæ, quàm dubitatio videantur, mirum cuipiam ſanè videbitur. Quidam enim ob hoc infinitam inferam terræ partem inquiunt eſſe, in infinitum ipſam radicatam eſſe dicentes, vt Xe- B nophanes Golophonius dixit, ne moleſtias habeant, cauſas quæritantes. Quocirca & Empedocles ſic increpauit: *Infinita ſiquidem eſt profunditas terræ copioſuſque æther, quæ per multa iam ora linguáſque dicta fruſtra ſunt effuſa hominum eorum qui perparum ipſius vniuerſi viderunt.* Quidam ſuper aquam iacere dicunt. Hanc enim ſententiam vetuſtiſſimam accepimus, quam Thaletem Mileſium dixiſſe ferunt, terram inquam, ideo quieſcere, perinde atque lignum, aut quippiam tale natat. Etenim nihil horum ſuper aërem manere eſt aptum, ſed ſuper aquam. Quaſi non eadem ſit de terra ratio, atque aqua, quæ terram vehit. Neque enim aqua ſublimis manere eſt apta, ſed ſuper aliquid ſemper eſt. C Præterea, vt aër leuior eſt aqua, ſic & aqua leuior eſt terra. Quare quónam modo, id quod eſt leuius, inferius eo quod grauius eſt natura, iacere putant? Præterea, ſi tota eſt apta ſuper aquam manere, patet & quamque partem ipſius identidem aptam eſſe. Nunc autem fieri non videtur, ſed pars in fundum, & celeriùs maior fertur. At enim vſque ad quendam terminum quærere videntur, ſed non quouſque dubitationis inquiſitio fieri poteſt. Eſt enim nobis hæc omnibus conſuetudo, non ad rem ipſam quæſtionem facere, ſed ad eum qui contraria dicit. Etenim in ſeipſo eouſque quærit, vltra quod ipſe contra ſeipſum dicere nequit. Quapropter bene quæſiturum, aptum idoneúmque D eſſe ad inferendas generi accommodatas inficiationes oportet. Eſt autem talis, qui vniuerſas differentias eſt contemplatus. Anaximenes autem, & Anaxagoras, & Democritus, latitudinem cauſam manendi ipſam inquiunt eſſe. Non enim diuidere, ſed operire aërem dicunt inferum: quod quidem latitudinem habentia corpora facere videntur. Hæc enim & à ventis cum difficultate moueri poſſunt, propter adhæſionem. Hoc idem igitur latitudine terram inquiunt ad aërem facere, hunc autem non habentem locum, ad quem migrabit, ſufficientem, ſimul infra quieſcere, perinde atque aqua in hiſce vaſis, quæ ſurripiunt aquam. Poſſe verò aërem pondus magnum, ſi com- E prehendatur, inferre, compluribus ſignis oſtendunt. Primum igitur, ſi non lata figura ſit terræ, propter hoc non quieſcet. Quietis tamen non latitudo ſola eſt cauſa ex hiſce quæ dicunt, ſed magnitudo magis: propter enim anguſtiam aëre tranſitum non habente, manet ob multitudinem. Aër autem eſt copioſus ex eo quia à magnitudine comprehenditur magna terræ. Quare hoc ipſum eſt, & ſi rotunda quidem eſt terra, tanta autem mole: ſententia enim illorum manebit. Omnino autem ad eos qui dicūt ita de motu, nō de partibus eſt cōtentio,

τάχα γὰρ ἀλογωτέρας διανοίας, τὸ μὴ θαυμάζειν, πῶς ποτε μικρὸν μὲν μόριον τῆς γῆς, ἐὰν μετεωρισθὲν ἀφεθῇ, φέρεται καὶ μένειν οὐκ ἐθέλει, καὶ τὸ πλεῖον ἀεὶ θᾶττον· πᾶσαν δὲ τὴν γῆν εἴ τις ἀφείη μετεωρισθεῖσαν, οὐκ ἂν φέροιτο· νῦν δ' ἠρεμεῖ τοσοῦτον βάρος. ἀλλὰ μὴν καὶ εἴ τις τῶν φερομένων μορίων αὐτῆς, πρὶν πεσεῖν, ὑφαιρέσειε τὴν γῆν, οἰσθήσεται κάτω μηδενὸς ἀντερείσαντος. ὥστε τὸ μὲν ἀπορεῖν εἰκότως ἐγένετο φιλοσόφημα πᾶσι· τὸ δὲ περὶ τὰς τούτου λύσεις μὴ μᾶλλον ἀτόπους εἶναι δοκεῖν τῆς ἀπορίας, θαυμάσειεν ἄν τις. οἱ μὲν γὰρ διὰ ταῦτα ἄπειρον τὸ κάτω τῆς γῆς εἶναί φασιν, ἐπ' ἄπειρον αὐτὴν ἐρριζῶσθαι λέγοντες, ὥσπερ Ξενοφάνης ὁ Κολοφώνιος, ἵνα μὴ πράγματ' ἔχωσι ζητοῦντες τὴν αἰτίαν· διὸ καὶ Ἐμπεδοκλῆς οὕτως ἐπέπληξεν, εἰπὼν ὡς Εἴπερ ἀπείρονα γῆς τε βάθη, καὶ δαψιλὸς αἰθήρ, Ὡς διὰ πολλῶν δὴ γλώσσης ῥηθέντα ματαίως Ἐκκέχυται στομάτων, ὀλίγον τοῦ παντὸς ἰδόντων. οἱ δὲ ἐφ' ὕδατος κεῖσθαι. τοῦτον γὰρ ἀρχαιότατον παρειλήφαμεν τὸν λόγον, ὅν φασιν εἰπεῖν τὸν Θαλῆν τὸν Μιλήσιον, ὡς διὰ τὸ πλωτὴν εἶναι μένουσαν ὥσπερ ξύλον ἤ τι τοιοῦτον ἕτερον. καὶ γὰρ τούτων ἐπ' ἀέρος μὲν οὐθὲν πέφυκε μένειν, ἀλλ' ἐφ' ὕδατος· ὥσπερ οὐ τὸν αὐτὸν λόγον ὄντα περὶ τῆς γῆς καὶ τοῦ ὕδατος τοῦ ὀχοῦντος τὴν γῆν. οὐδὲ γὰρ τὸ ὕδωρ πέφυκε μένειν μετέωρον, ἀλλ' ἐπί τινός ἐστιν. ἔτι δέ, ὥσπερ ἀὴρ ὕδατος κουφότερον, καὶ γῆς ὕδωρ. ὥστε πῶς οἴονται τὸ κουφότερον κατωτέρω κεῖσθαι τοῦ βαρυτέρου τὴν φύσιν; ἔτι δ', εἴπερ ὅλη πέφυκε μένειν ἐφ' ὕδατος, δῆλον ὅτι καὶ τῶν μορίων ἕκαστον αὐτῆς· νῦν δὲ οὐ φαίνεται τοῦτο γιγνόμενον, ἀλλὰ τὸ τυχὸν μόριον φέρεται εἰς βυθόν, καὶ θᾶττον τὸ μεῖζον. ἀλλ' ἐοίκασι μέχρι τινὸς ζητεῖν, ἀλλ' οὐ μέχρι περ οὗ δυνατὸν τῆς ἀπορίας. πᾶσι γὰρ ἡμῖν τοῦτο σύνηθες, μὴ πρὸς τὸ πρᾶγμα ποιεῖσθαι τὴν ζήτησιν, ἀλλὰ πρὸς τὸν τἀναντία λέγοντα· καὶ γὰρ αὐτὸς ἐν αὑτῷ ζητεῖ, μέχρι περ ἂν οὐ μηκέτι ἔχοι ἀντιλέγειν αὐτὸς αὑτῷ. διὸ δεῖ τὸν μέλλοντα καλῶς ζητήσειν, ἐνστατικὸν εἶναι διὰ τῶν οἰκείων ἐνστάσεων ἐν τῷ γένει. τοῦτο δ' ἐστὶν ἐκ τοῦ πάσας τεθεωρηκέναι τὰς διαφοράς. Ἀναξιμένης δὲ καὶ Ἀναξαγόρας καὶ Δημόκριτος τὸ πλάτος αἴτιον εἶναί φασι τοῦ μένειν αὐτήν. οὐ γὰρ τέμνειν, ἀλλ' ἐπιπωματίζειν τὸν ἀέρα τὸν κάτωθεν· ὅπερ φαίνεται τὰ πλάτος ἔχοντα τῶν σωμάτων ποιεῖν· ταῦτα γὰρ καὶ πρὸς τοὺς ἀνέμους ἔχει δυσκινήτως διὰ τὴν ἀντέρεισιν. ταὐτὸ δὴ τοῦτο ποιεῖν τῷ πλάτει φασὶ τὴν γῆν πρὸς τὸν ὑποκείμενον ἀέρα· τὸν δ' οὐκ ἔχοντα μεταστῆναι τόπον ἱκανόν, ἀθρόον τῷ κάτωθεν ἠρεμεῖν, ὥσπερ τὸ ἐν ταῖς κλεψύδραις ὕδωρ. ὅτι δὲ δύναται πολὺ βάρος φέρειν ἀπολαμβανόμενος, καὶ μένων ὁ ἀήρ, τεκμήρια πολλὰ λέγουσι. πρῶτον μὲν οὖν εἰ μὴ πλατὺ τὸ σχῆμα τῆς γῆς ἐστι, διὰ τοῦτο μὲν οὐκ ἂν ἠρεμοίη· καίτοι τῆς μονῆς οὐ τὸ πλάτος μόνον αἴτιόν ἐστιν, ἐξ ὧν λέγουσιν, ἀλλὰ τὸ μέγεθος μᾶλλον. διὰ γὰρ τὴν στενοχωρίαν οὐκ ἔχων τὴν πάροδον ὁ ἀήρ, μένει διὰ τὸ πλῆθος. πολὺς δέ ἐστιν ὁ ἀήρ, διὰ τὸ ὑπὸ μεγέθους πολλοῦ ἐναπολαμβάνεσθαι τοῦ τῆς γῆς· ὥστε τοῦτο μὲν ὑπάρξει, κἂν σφαιροειδὴς μὲν ἡ γῆ ᾖ, τηλικαύτη δὲ τὸ μέγεθος. μένει γὰρ κατὰ τὸν ἐκείνων λόγον. ὅλως δὲ πρὸς τοὺς οὕτω λέγοντας περὶ τῆς κινήσεως, οὐδὲ περὶ μερῶν ἐστιν ἡ ἀμφισβήτησις,

ἀλλὰ περὶ ὅλου τινὸς καὶ παντός. ἐξ ἀρχῆς γὰρ διοριστέον, πότερον ἔστι τις τοῖς σώμασι φύσει κίνησις, ἢ οὐδεμία· καὶ πότερον φύσει μὲν οὐκ ἔστι, βίᾳ δ' ἔστιν. ἐπεὶ δὲ περὶ τούτων διώρισται πρότερον, ὅσα κατὰ τὴν παροῦσαν δύναμιν εἴχομεν, χρηστέον ὡς ὑπάρχουσιν· εἰ γὰρ μηδεμία φύσει κίνησίς ἐστιν αὐτῶν, οὐδὲ βίαιος ἔσται· εἰ δὲ μή ἐστι μήτε φύσει μήτε βίᾳ, ὅλως οὐδὲν κινηθήσεται· περί τε γὰρ δὴ τούτων ὅτι ἀναγκαῖον συμβαίνειν, διώρισται πρότερον· καὶ πρὸς τούτοις, ὅτι οὐδὲ ἠρεμεῖν ἐνδέχεται. ὥσπερ γὰρ κίνησις ὑπάρχει ἢ βίᾳ, ἢ φύσει, οὕτω καὶ ἠρεμία· ἀλλὰ μὴν εἴ γε ἔστι κίνησίς τις κατὰ φύσιν, οὐκ ἂν ἡ βίαιος εἴη φορὰ μόνον οὐδ' ἠρέμησις· ὥστ' εἰ βίᾳ νῦν ἡ γῆ μένει, καὶ συνῆλθεν ἐπὶ τὸ μέσον φερομένη διὰ τὴν δίνησιν· ταύτην γὰρ τὴν αἰτίαν πάντες λέγουσιν ἐκ τῶν ἐν τοῖς ὑγροῖς φερομένων καὶ περὶ τὸν ἀέρα συμβαινόντων. ἐν τούτοις γὰρ ἀεὶ φέρεται τὰ μείζω, καὶ τὰ βαρύτερα, πρὸς τὸ μέσον τῆς δίνης. διὸ δὴ καὶ τὴν γῆν πάντες ὅσοι τὸν οὐρανὸν γεννῶσιν, ἐπὶ τὸ μέσον συνελθεῖν φασιν· ὅτι δὲ μένει ζητοῦσι τὴν αἰτίαν, καὶ λέγουσιν, οἱ μὲν τοῦτον τὸν τρόπον, ὅτι τὸ πλάτος καὶ τὸ μέγεθος αὐτῆς αἴτιον· οἱ δέ, ὥσπερ Ἐμπεδοκλῆς, τὴν τοῦ οὐρανοῦ φορὰν κύκλῳ περιθέουσαν καὶ θᾶττον φερομένην, τὴν τῆς γῆς φορὰν κωλύειν. καθάπερ τὸ ἐν τοῖς κυάθοις ὕδωρ· καὶ γὰρ τοῦτο κύκλῳ τοῦ κυάθου φερομένου πολλάκις κάτω τοῦ χαλκοῦ γινόμενον, ὅμως οὐ φέρεται κάτω πεφυκὸς φέρεσθαι διὰ τὴν αὐτὴν αἰτίαν· καίτοι μήτε τῆς δίνης κωλυούσης, μήτε τοῦ πλάτους, ἀλλ' ὑπελθόντος τοῦ ἀέρος, ποῖ ποτ' οἰσθήσεται; πρὸς μὲν γὰρ τὸ μέσον ἐκινεῖτο βίᾳ, καὶ μένει βίᾳ· κατὰ φύσιν δέ γε ἀναγκαῖον εἶναί τινα αὐτῆς φοράν. αὕτη οὖν πότερον ἄνω, ἢ κάτω, ἢ ποῦ ἐστιν; εἶναι μὲν γάρ τινα ἀναγκαῖον· εἰ δὲ μηδὲν μᾶλλον κάτω ἢ ἄνω, ὁ δ' ἄνω ἀὴρ μὴ κωλύει τὴν ἄνω φοράν, οὐδ' ἂν ὁ ὑπὸ τὴν γῆν κωλύοι τὴν κάτω· τὰ γὰρ αὐτὰ τῶν αὐτῶν ἀναγκαῖον αἴτια τοῖς αὐτοῖς. ἔτι δὲ πρὸς Ἐμπεδοκλέα κἀκεῖνό τις ἂν εἴποι. ὅτε γὰρ τὰ στοιχεῖα διειστήκει χωρὶς ὑπὸ τοῦ νείκους, τίς ἡ αἰτία τῇ γῇ τῆς μονῆς ἦν; οὐ γὰρ δὴ καὶ τότε αἰτιάσεται τὴν δίνην. ἄτοπον δὲ καὶ τὸ μὴ συννοεῖν, ὅτι πρότερον μὲν διὰ τὴν δίνησιν ἐφέρετο τὰ μόρια τῆς γῆς πρὸς τὸ μέσον· νῦν δὲ διὰ τίνα αἰτίαν πάντα τὰ βάρος ἔχοντα φέρεται πρὸς αὐτήν; οὐ γὰρ ἥ γε δίνησις πλησιάζει πρὸς ἡμᾶς· ἔτι δὲ καὶ τὸ πῦρ ἄνω φέρεται, διὰ τίνα αἰτίαν; οὐ γὰρ διά γε τὴν δίνην. εἰ δὲ τοῦτο φέρεσθαί που πέφυκε, δῆλον ὅτι καὶ τὴν γῆν οἰητέον. ἀλλὰ μὴν οὐδὲ τῇ δίνῃ τὸ βαρὺ καὶ τὸ κοῦφον ὥρισται· ἀλλὰ τῶν προτέρων ὑπαρχόντων βαρέων καὶ κούφων, τὰ μὲν εἰς τὸ μέσον ἔρχεται, τὰ δὲ ἐπιπολάζει διὰ τὴν κίνησιν. ἦν ἄρα καὶ πρὶν γενέσθαι τὴν δίνην, τὸ μὲν βαρύ, τὸ δὲ κοῦφον, * ἃ τίνι διώρισται, καὶ πῶς πέφυκε φέρεσθαι, ἢ ποῦ. ἀπείρου γὰρ ὄντος, ἀδύνατον εἶναι τὸ ἄνω καὶ τὸ κάτω· διώρισται δὲ τούτοις τὸ βαρὺ καὶ κοῦφον. οἱ μὲν οὖν πλεῖστοι περὶ τὰς αἰτίας ταύτας διατρίβουσιν· εἰσὶ δέ τινες, οἳ διὰ τὴν ὁμοιότητά φασιν αὐτὴν μένειν, ὥσπερ τῶν ἀρχαίων Ἀναξίμανδρος· μᾶλλον γὰρ οὐθὲν ἄνω ἢ κάτω, ἢ εἰς τὰ πλάγια φέρεσθαι προσήκει τὸ ἐπὶ τοῦ μέσου ἱδρυμένον, καὶ ὁμοίως πρὸς τὰ ἔσχατα ἔχον· ἅμα δ' ἀδύνατον εἰς τἀναντία ποιεῖσθαι τὴν κίνησιν·

* κἂν τίνι δ. ἢ πῶς π. φ. ἢ ποῦ.

A ſed de aliquo toto ac vniuerſo. A principio enim eſt determinatũ, vtrũ ſit quiſpiã motus natura corporib. cõpetens, an nullus ſit: & vtrũ naturalis quidem nullus ſit prorſus, violẽtus autẽ ſit. atque cùm de his ipſis priùs ſint definita, quæ pro facultate præſenti potuimus his, vti veris, vtamur nunc oportet. Nam ſi nullus natura motus cõpetit; neque violentus vllus erit profectò. Si verò neuter eſt, nihil omnino mouebitur. Priùs enim eſt definitũ, neceſſariò hæc euenire. Et inſuper neque quicquã quieſcere poteſt: nã vt & motus natura alius competit, alius eſt violentus, ſic & quies. at ſi motus quiſpiã eſt ſecundùm naturã, non violenta latio ſolùm, nec quies erit. Quare ſi terra, nunc vi quieſcit, violenta quoque latione ob conuerſionẽ ad medium ipſum B acceſſit. Omnes enim hanc cauſam dicũt, ex hiſce quæ in humidis feruntur, & circa aërem accidunt. In his enim maiora ſemper, grauioráque ad ipſum cõuerſionis mediũ pergũt. Idcirco & terrã omnes, qui cælum ortum aſſerunt eſſe, ad ipſum acceſſiſſe mediũ aiunt. Quia verò manet, cauſam quærunt: & dicunt partim hoc modo, latitudinem, inquam, ac magnitudinẽ cauſam ipſius eſſe: partim, vt Empedocles cenſet, cælum conuerſione ſua celeriore, quàm eſt terræ motio, lationẽ ipſius prohibere, vt fit in aqua, quæ in cyathis eſt. Hæc enim cùm cyathus orbe fertur, etſi ſæpe cyathus adeo vertitur, vt ſupra fundũ infra labra fiant, non fertur tamen deorſum, apta deorſum ferri, propter eandẽ cauſã C ſanè. at ſi neque conuerſio, neque latitudo prohibeat, quorſum inde, quæſo, aëre cedente, ac abeunte feretur? Ad mediũ enim vi lata eſt, viqué etiã in ipſo manet: lationẽ verò ipſius eſſe quandã ſecundùm naturam neceſſe eſt. Hæc igitur eſtne ea, qua ſurſum itur, an ea, qua itur deorſum, an alia quædã? aliquã enim eſſe, neceſſe eſt. Quòd ſi non magis eſt ea, quã ſupera loca petũtur, quàm ea, qua itur deorſum, aër verò ſuperior lationẽ eam non prohibet, qua pergitur ſurſum: neque is ſanè, qui eſt ſub terra eandẽ prohibere, qua itur deorſum, poteſt. Eaſdem enim cauſas eiſdem eorundẽ eſſe neceſſe eſt. Præterea illud etiã ad Empedoclem quiſpiam dixerit: Quando enim elementa diſcordiæ expertia erant, quænam cauſa terræ quietis erat? non enim tũc cõ- D uerſionẽ cauſam eſſe dicet. Abſurdũ eſt etiam non intelligere, priùs quidẽ terræ partes ob conuerſionem ad mediũ eſſe latas. Nunc autẽ quam ob cauſam vniuerſa, quæ põdus habent, ad ipſam ferũtur? Non enim cõuerſio nobis propinqua eſt. Præterea, quam ob cauſam ignis etiã ſurſum fertur? Nõ enim ob conuerſionẽ. Quòd ſi hic aptus eſt aliquẽ ad locum ferri, patet putandũ eſſe, terrã etiam identidẽ aptam eſſe definitum quendam petere locum. At verò neque conuerſione graue, leuéque eſt definitum, ſed eorum, quæ priùs erant grauia, leuiáque, alia in ipſum medium veniunt, alia ſuper cætera collocantur ob motũ. Erat ergo & antè quàm con- E uerſio fieret, aliud graue, & aliud leue. Quæ quidẽ quónam erant diſtincta, & quomodo, aut quorſum apta erant ferri? Nam ſi infinitũ eſt, ſuperus locus inferúſque eſſe non poteſt: graue autem atque leue hiſce ſunt definita. Plurimi igitur, circa cauſas haſce verſantur. Sunt autem qui manere ipſam ob ſimilitudinẽ dicunt: vt ex veteribus Anaximander dicebat. Id enim inquiunt, quod eſt in medio collocatum, & æquè ad extrema ſe habet, nõ ad ſupera magis, quàm ad infera, aut versùs latera ferri oportere, & ſimul ad contraria moueri non poſſe:

quare

quare neceſſariò illud manere dicunt. Hoc autem eleganter quidem, non verè tamen eſt dictum. Hac enim ſententia, omne, quod in medio ponetur, maneat in ipſo neceſſe eſt. Quare ignis quieſcet. Id enim, quod dictũ eſt, propriũ terræ non eſt. At verò neque neceſſarium eſt: non enim ſolùm in medio manere videtur, ſed ad medium etiam ferri. Quò enim quæuis ipſius pars fertur, eò totam etiam ferri neceſſe eſt: quò vero fertur ſecundùm naturam, ibi ſecundùm naturam etiam manet. Non ergo ſimiliter quia ſe habet ad extrema, ideo manet: hoc eſt enim vniuerſis commune. Ferri autem ad medium, proprium ipſius eſt terræ. Abſurdum eſt etiam hoc quidem quærere, curnam terra manet in medio: illud autem non quærere, cur ignis in extremo quieſcit. Nam ſi & illi locus extremus natura competit, patet & terræ locum aliquem natura competere, neceſſarium eſſe. Quod ſi hic locus natura terræ non competit, ſed ob ſimilitudinis neceſſitatem in ipſo manet, (vt ea ſententia aſſerit, quæ de capillo affertur, cùm vehementer quidem, ſimiliter autem intenditur vtraque ex parte: dicit enim illum non ruptum fore. Et item ea quæ de ſitiente vehementer, eſurientéque, dicuntur, cùm æquè ab his, quæ eduntur, atque bibuntur, diſtat: quieſcat enim neceſſe eſt) quærendum eſt ipſis de ignis vltimis in locis quiete. Mirabile autem eſt, & de quiete quidem ipſorum quærere, de latione verò non quærere. Quam ob cauſam alterum ſurſum, alterum deorſum ad ipſum medium, ſi nihil impediat, fertur. At verò neque verum eſt, quod dicitur, per accidens tamen hoc verum eſt, neceſſarium eſſe id omne in medio manere, cui non magis huc competit quàm illuc moueri, ſed propter hanc ſententiam non manebit, ſed mouebitur: non tamen totum, ſed diuulſum. Eadem enim & ad ignem accommodabitur ratio. Si enim poſitus in medio fuerit, maneat perinde atque terra neceſſe eſt. Similiter enim ad extremum quoduis punctorum ſeſe habebit: attamen à medio ipſo mouebitur, quemadmodum & ferri (niſi quippiam prohibeat) ad extremum ipſum videtur, verùm non totus ad vnum punctum feretur. Hoc enim ſolùm ex ratione, quæ de ſimilitudine fit, euenire neceſſe eſt, ſed pars ad extremi partem, eiuſdem numirum rationis: veluti quarta pars, ad quartam continentis ipſius partem. Nullum enim corpus eſt punctum. Vt autem ex magno minorem in locum mutari poteſt, ſi condenſetur: ſic & in magnum ex minore, ſi rareſcat. Quare & terra hoc à medio moueretur modo, per ipſius ſimilitudinis rationem, ſi non natura locus hic competeret terræ. Quæ igitur de figura, de loco, de quiete, de motu ipſius exiſtimantur, tot fere eſſe videntur.

CAPVT XIV

Quòd terra in medio ſita non moueatur circum polum in circulum, & quòd quieſcat, & de figura eius ſphærica.

NOs autem primò dicamus, vtrùm habeat motum, an maneat. Nam (vt diximus) quidam ipſam vnam ſtellarum inquiunt eſſe, quidam in medio poſitam volui, mouerique circa polum dicunt. Eſſe autem hoc impoſſibile, patet, hinc principio ſumpto. Si fertur, ſiue in medio ſit, ſiue extra medium, neceſſarium eſt, ipſam hoc motu vi ferri. Non enim ipſius terræ: etenim vnaquæque

A ὥστε ἐξ ἀνάγκης μένειν. τοῦτο δὲ λέγεται κομψῶς μὲν, οὐκ ἀληθῶς δέ· κατὰ γὰρ τοῦτον τὸν λόγον, ἀναγκαῖον ἅπαν, ὅ, τι ἂν τεθῇ ἐπὶ τοῦ μέσου, μένειν αὐτοῦ· ὥστε καὶ τὸ πῦρ ἠρεμήσει· τὸ γὰρ εἰρημένον οὐκ ἴδιόν ἐστι τῆς γῆς. ἀλλὰ μὴν οὐκ ἀναγκαῖον· οὐ γὰρ μόνον φαίνεται μένουσα ἐπὶ τοῦ μέσου, ἀλλὰ καὶ φερομένη πρὸς τὸ μέσον. ὅποι γὰρ ὁτιοῦν φέρεται μέρος αὐτῆς, ἀναγκαῖον ἐνταῦθα φέρεσθαι καὶ τὴν ὅλην· οὗ δὲ φέρεται κατὰ φύσιν, καὶ μένει ἐνταῦθα κατὰ φύσιν. οὐκ ἄρα διὰ τὸ ὁμοίως ἔχειν πρὸς τὰ ἔσχατα· τοῦτο μὲν γὰρ πάντων κοινόν· τὸ δὲ φέρεσθαι πρὸς τὸ μέσον, ἴδιον τῆς γῆς.
B ἄτοπον δὲ καὶ τοῦτο μὲν ζητεῖν, διὰ τί ποτε μένει ἡ γῆ ἐπὶ τοῦ μέσου· τὸ δὲ πῦρ μὴ ζητεῖν διὰ τί μένει ἐπὶ τοῦ ἐσχάτου. εἰ μὲν γὰρ κατὰ φύσιν τούτῳ ὁ ἔσχατος τόπος, δῆλον ὅτι καὶ τῇ γῇ ἀναγκαῖόν τινα εἶναι φύσει τόπον· εἰ δὲ μὴ ἔστιν αὐτῆς οὗτος ὁ τόπος, ἀλλὰ διὰ τὴν ἀνάγκην μένει τὴν τῆς ὁμοιότητος, (ὥσπερ ὁ περὶ τῆς τριχὸς λόγος τῆς ἰσχυρῶς μὲν, ὁμοίως δὲ πάντῃ τεινομένης, ὅτι οὐ διαρραγήσεται, καὶ τοῦ πεινῶντος καὶ διψῶντος σφόδρα μὲν, ὁμοίως δὲ, καὶ τῶν ἐδωδίμων καὶ ποτῶν ἴσον ἀπέχοντος· καὶ γὰρ τοῦτον ἠρεμεῖν ἀναγκαῖον) ζητητέον αὐτοῖς περὶ τῆς τοῦ πυρὸς μονῆς ἐπὶ τῶν ἐσχάτων. θαυμαστὸν δὲ καὶ τὸ περὶ μὲν τῆς
C μονῆς ζητεῖν, περὶ δὲ τῆς φορᾶς αὐτῶν μὴ ζητεῖν διὰ τίνα αἰτίαν τὸ μὲν ἄνω φέρεται, τὸ δὲ κάτω ἐπὶ τὸ μέσον, μηδενὸς ἐμποδίζοντος. ἀλλὰ μὴν οὐδ᾽ ἀληθές ἐστι τὸ λεγόμενον. κατὰ συμβεβηκὸς μέντοι τοῦτό γε ἀληθὲς, ὡς ἀναγκαῖον μένειν ἐπὶ τοῦ μέσου πᾶν, ᾧ μηθὲν μᾶλλον δεῦρο ἢ δεῦρο κινεῖσθαι προσήκει· ἀλλὰ διά γε τοῦτον τὸν λόγον οὐ μενεῖ, ἀλλὰ κινήσεται, οὐ μέντοι ὅλον, ἀλλὰ διεσπασμένον. ὁ γὰρ αὐτὸς ἁρμόσει λόγος καὶ ἐπὶ τοῦ πυρός· ἐπὶ τοῦ μέσου τεθὲν ἀναγκαῖον ὁμοίως μένειν ὥσπερ τὴν γῆν· ὁμοίως γὰρ ἕξει πρὸς τῶν σημείων τῶν ἐσχάτων ὁτιοῦν. ἀλλ᾽ ὅμως οἰσθήσεται ἀπὸ τοῦ μέσου, ὥσπερ καὶ φαίνε-* διεσπασμένον
D ται φερόμενον, ἂν μή τι κωλύῃ, πρὸς τὸ ἔσχατον· πλὴν οὐχ ὅλον πρὸς ἓν σημεῖον· τοῦτο γὰρ ἀναγκαῖον μόνον συμβαίνειν ἐκ τοῦ λόγου τοῦ περὶ τῆς ὁμοιότητος, ἀλλὰ τὸ ἀνάλογον μόριον πρὸς τὸ ἀνάλογον τοῦ ἐσχάτου. λέγω δ᾽ οἷον τὸ τέταρτον μέρος πρὸς τὸ τέταρτον τοῦ περιέχοντος. οὐδὲν γὰρ στιγμὴ τῶν σωμάτων ἐστίν. ὥσπερ δὲ κἂν ἐκ μείζονος συνέλθοι τόπου εἰς ἐλάττω τόπον, οὕτω κἂν ἐξ ἐλάττονος εἰς μείζω μανὸν γενόμενον. ὥστε καὶ ἡ γῆ ταύτην ἐκινήθη ἂν τὴν κίνησιν ἀπὸ τοῦ μέσου διά γε τὸν τῆς ὁμοιότητος λόγον, εἰ μὴ φύσει τῇ γῇ ὁ τόπος οὗτος ἦν. ὅσα μὲν οὖν ἐστι τὰ λεγόμενα περί τε τοῦ σχήματος αὐτῆς
E ὑπολαμβανόμενα, καὶ περὶ τοῦ τόπου, καὶ μονῆς καὶ κινήσεως, σχεδὸν τοσαῦτ᾽ ἐστί.

ΚΕΦΑΛ. ιδ΄.

Τὸ αὐτοῦ δόγμα περὶ τῆς αὐτῆς ἀποφαίνεται.

ΗΜεῖς δὲ λέγωμεν πρῶτον, πότερον ἔχει κίνησιν, ἢ μένει. καθάπερ γὰρ εἴπομεν, οἱ μὲν αὐτὴν ἓν τῶν ἄστρων ποιοῦσιν· οἱ δ᾽ ἐπὶ τοῦ μέσου θέντες, εἴλλεσθαι καὶ κινεῖσθαί φασι περὶ τὸν μέσον πόλον. ὅτι δ᾽ ἐστὶν ἀδύνατον, δῆλον λαβοῦσιν ἀρχήν, (ὡς εἰ φέρε) εἴτε ἐκτὸς οὖσα τοῦ μέσου, εἴτε ἐπὶ τοῦ μέσου, ἀναγκαῖον αὐτὴν βίᾳ κινεῖσθαι ταύτην τὴν κίνησιν. οὐ γὰρ αὐτῆς γε τῆς γῆς ἐστιν ἡ κίνησις· καὶ γὰρ ἂν τῶν μορίων

* ἕκαστον ταύτην εἶχε τὴν φοράν· νῦν δ' ἐπ' εὐθείας πάντα φέρεται πρὸς τὸ μέσον. διόπερ οὐχ οἷόν τ' ἀΐδιον εἶναι· βίαιος γὰρ οὖσα καὶ παρὰ φύσιν. ἡ δὲ γε τοῦ κόσμου τάξις ἀΐδιός ἐστιν. ἔτι πάντα τὰ φερόμενα τὴν φορὰν τὴν ἐγκύκλιον, ὑπολειπόμενα φαίνεται, καὶ κινούμενα πλείους μιᾶς φορᾶς ἔξω τῆς πρώτης σφαίρας. ὥστε καὶ τὴν γῆν ἀναγκαῖον, εἴτε περὶ τὸ μέσον, εἴτ' ἐπὶ τοῦ μέσου κειμένη φέρεται, δύο κινεῖσθαι φοράς. τούτου δὲ συμβαίνοντος, ἀναγκαῖον γίγνεσθαι παρόδους, καὶ τροπὰς τῶν ἐνδεδεμένων ἄστρων. τοῦτο δ' οὐ φαίνεται γιγνόμενον, ἀλλ' ἀεὶ τὰ αὐτὰ κατὰ τοὺς αὐτοὺς ἀνατέλλει τε καὶ δύεται τόπους αὐτῆς. ἔτι δὲ ἡ φορὰ τῶν μορίων, καὶ ἡ φορὰ ὅλης αὐτῆς ἡ κατὰ φύσιν, ἐπὶ τὸ μέσον τοῦ παντός ἐστι· διὰ τοῦτο γάρ,* καὶ κεῖται νῦν ἐπὶ τοῦ κέντρου. διαπορήσειε δ' ἄν τις, ἐπεὶ τὸ αὐτὸ ἀμφοτέρων ἐστὶ τὸ μέσον, πρὸς πότερον φέρεται τὰ βάρος ἔχοντα, καὶ τὰ μόρια τῆς γῆς κατὰ φύσιν· πότερον ὅτι τοῦ παντός ἐστι μέσον, ἢ ὅτι τῆς γῆς. ἀνάγκη δὴ πρὸς τὸ τοῦ παντός. καὶ γὰρ τὰ κοῦφα, καὶ τὸ πῦρ εἰς τοὐναντίον φερόμενα* τοῖς βαρέσι, πρὸς τὸ ἔσχατον φέρεται τοῦ περιέχοντος τόπου τὸ μέσον. συμβέβηκε δὲ ταὐτὸ μέσον εἶναι τῆς γῆς καὶ τοῦ παντός. φέρεται γὰρ καὶ ἐπὶ τὸ τῆς γῆς μέσον, ἀλλὰ κατὰ συμβεβηκός, ᾗ τὸ μέσον ἔχει ἐπὶ τῷ τοῦ παντὸς μέσῳ. ὅτι δὲ φέρεται καὶ πρὸς τὸ τῆς γῆς μέσον, σημεῖον, ὅτι τὰ φερόμενα βάρη ἐπὶ ταύτην, οὐ παρ' ἄλληλα φέρεται, ἀλλὰ πρὸς ὁμοίας γωνίας. ὥστε πρὸς ἓν τὸ μέσον φέρεται, καὶ τὸ τῆς γῆς. φανερὸν τοίνυν, ὅτι ἀνάγκη ἐπὶ τοῦ μέσου εἶναι τὴν γῆν, καὶ ἀκίνητον, διά τε τὰς εἰρημένας αἰτίας, καὶ διότι τὰ βίᾳ ῥιπτούμενα ἄνω βάρη, κατὰ στάθμην πάλιν φέρεται εἰς τὸ αὐτό, κἂν εἰς ἄπειρον ἡ δύναμις ἐκριπτῇ. ὅτι μὲν οὖν οὔτε κινεῖται οὔτ' ἐκτὸς κεῖται τοῦ μέσου, φανερὸν ἐκ τούτων. πρὸς δὲ τούτοις δῆλον ἐκ τῶν εἰρημένων τὸ αἴτιον τῆς μονῆς. εἰ γὰρ φύσει πέφυκε φέρεσθαι πρὸς τὸ μέσον πάντοθεν, ὥσπερ φαίνεται, καὶ τὸ πῦρ πάλιν ἀπὸ τοῦ μέσου πρὸς τὸ ἔσχατον, ἀδύνατον ἐνεχθῆναι ὁτιοῦν μόριον αὐτῆς ἀπὸ τοῦ μέσου, μὴ βιασθέν. μία γὰρ φορὰ τοῦ ἑνός, καὶ ἁπλῆ τοῦ ἁπλοῦ, ἀλλ' οὐχ αἱ ἐναντίαι· ἡ δὲ ἀπὸ τοῦ μέσου, τῇ ἐπὶ τὸ μέσον ἐναντία. εἰ τοίνυν ὁτιοῦν μόριον ἀδύνατον ἐνεχθῆναι ἀπὸ τοῦ μέσου, φανερὸν ὅτι καὶ τὴν ὅλην ἔτι ἀδυνατώτερον. εἰς ὃ γὰρ τὸ μόριον πέφυκε φέρεσθαι, καὶ τὸ ὅλον ἐνταῦθα πέφυκεν. ὥστ' εἴπερ ἀδύνατον κινηθῆναι μὴ ὑπὸ κρείττονος ἰσχύος, ἀναγκαῖον ἂν εἴη μένειν αὐτὴν ἐπὶ τοῦ μέσου. μαρτυρεῖ δὲ τούτοις καὶ τὰ παρὰ τῶν μαθηματικῶν λεγόμενα περὶ τὴν ἀστρολογίαν. τὰ γὰρ φαινόμενα συμβαίνει μεταβαλλόντων τῶν σχημάτων, οἷς ὥρισται τῶν ἄστρων ἡ τάξις, ὡς ἐπὶ τοῦ μέσου κειμένης τῆς γῆς. περὶ μὲν οὖν τοῦ τόπου, καὶ μονῆς, καὶ κινήσεως, ὃν τρόπον ἔχει, τοσαῦτα εἰρήσθω περὶ αὐτῆς. σχῆμα δ' ἔχειν σφαιροειδὲς ἀναγκαῖον αὐτήν. ἕκαστον γὰρ τῶν μορίων βάρος ἔχει μέχρι πρὸς τὸ μέσον, καὶ τὸ ἔλαττον ὑπὸ τοῦ μείζονος ὠθούμενον, οὐχ οἷόν τε κυμαίνειν, ἀλλὰ συμπιέζεσθαι μᾶλλον, καὶ συγχωρεῖν ἕτερον ἑτέρῳ, ἕως ἂν ἔλθῃ ἐπὶ τὸ μέσον. δεῖ δὲ νοῆσαι τὸ λεγόμενον ὥσπερ ἂν εἰ γιγνομένης τὸν τρόπον, ὃν καὶ τῶν φυσιολόγων λέγουσί τινες γενέσθαι. πλὴν ἐκεῖνοι μὲν τὴν βίαν αἰτιῶνται τῆς κάτω φορᾶς· βέλτιον δὲ τἀληθῆ

* Arg. & mss.

* [illegible]

A partium, hanc lationem haberet, nunc autem ad mediũ vniuerſæ rectà feruntur. Quocirca cùm violenta ſit, præterque naturam, impoſſibile eſt, perpetuam ipſam eſſe. Ordo autem Mundi perpetuus eſt. Præterea, cuncta, quæ conuerſione feruntur, poſt relinqui videntur, pluribúſque lationibus præter primam ſphæram moueri. Ergo & terram ſiue circa medium, ſiue in medio ſit collocata, duabus lationibus moueri neceſſe eſt. Quod ſi ſit, ſtationes fieri fixarum ſtellarum, regreſſioneſque neceſſe eſt. Hoc autem fieri non videtur, ſed eædem eiſdem in locis ipſius ſemper oriuntur, atque occidunt ſtellæ. Præterea, latio partium iſtius totius ſecundum naturam, ad ipſum eſt medium vni-

B uerſi. ob hoc enim & in ipſo centro nunc iacet. Dubitauerit autem quiſpiam, cùm idem ſit medium vtrorumque, ad vtrum ea, quæ pondus habent, parteſque terræ, ſecundùm naturam ferantur? Vtrùm quia eſt medium vniuerſi, an quia eſt terræ. Ad medium igitur vniuerſi ferantur, neceſſe eſt. Etenim leuia atque ignis, ad contrarium ponderibus terræ pergentia locum, ad vltimum eius loci, qui continet medium ipſum, feruntur. Accidit autem, idem terræ medium eſſe, ac vniuerſi: feruntur enim pondera, & ad medium terræ, ſed per accidens, ea ratione, qua terra medium ſuum habet in ipſo medio Vniuerſi. Ferri autem grauia & ad

C ipſum medium terræ, hoc indicium eſt: Pondera enim quæ ad hanc feruntur, non æquè diſtantia, ſed ad ſimiles angulos feruntur. Quare ad vnum medium vniuerſi terræque feruntur. Patet igitur neceſſario terram in medio eſſe, atque immobilem eſſe, & ob eas, quas diximus, cauſas. Et quia pondera quæ ſurſum iaciuntur, ad idem rurſus per rubricam feruntur, & ſi in infinitum vis illa proueniat. Neque igitur terram moueri, neque extra medium collocatam eſſe, per hæc dilucidum ſunt. Inſuper cauſa quietis ex his quæ dicta ſunt, patet. Nam ſi apta eſt ad medium vndique natura ferri, ſicut videtur, & ignis ad extremum e medio ſimili modo: fieri non poteſt vt vlla pars ipſius e medio feratur,

D vi non illata. Vna eſt enim vnius latio, & ſimplicis ſimplex: ſed non contrariæ. At ea quæ è medio pergitur, contraria eſt ei quæ ad medium itur. Si igitur fieri nõ poteſt vt vlla pars ipſius è medio feratur, patet magis fieri non poſſe vt ex eodem motu feratur. Quò enim pars apta eſt moueri, eodem & totum aptum eſt ferri. Quare ſi impoſſibile eſt ipſam moueri niſi à ſuperioribus viribus, in ipſo medio ipſam manere neceſſe eſt. Teſtes ſunt hiſce & ea quæ à mathematicis circa aſtrologiam dicuntur: eueniunt enim ea quæ apparent, cùm figuræ mutantur, quibus ordo ſtellarum eſt definitus: propterea quòd in medio terra eſt collocata. De loco igitur,

E & quiete, motúve terræ, quomodo ſeſe habent, tot à nobis ſint dicta. Figuram autem rotundam, ipſam habere neceſſe eſt. Vnaquæque enim partium, pondus ad ipſum medium habet: & minor ſi à maiori pellatur, egredi nõ poteſt, ſed premitur potiùs, ac alia alij cedit, donec ad mediũ ipſum perueniat. Intelligere autem oportet, id quod dicitur, perinde fieri atque ſi terra fieret eo modo quo Naturaliũ etiam quidam ipſam inquiunt ortam eſſe. Verùm illi quidem violentiam, lationis ad infera terræ cauſam eſſe dicunt. Præſtat autem veritatem pònere,

atque hoc ideo accidere dicere, quia naturam habet id quod pondus habet, ad ipſum medium ferri. Cùm igitur potentia congeries eſſet, ea quæ ſegregabãtur, vndique ſimiliter ad ipſum medium ferebantur. Siue igitur ſimiliter ab extremis partes diuiſæ ad medium ſunt congregatæ, ſiue alio modo ſeſe habentes, idem facient ſane. Patet igitur, id quod vndique ab extremis ſimiliter ad medium fertur, ſimili neceſſariò omni ex parte fieri mole. Si enim omni ex parte æquè fiat additio, æquè extremum à medio diſtare neceſſe eſt. Hæc autẽ figura, rotunda eſt. Nihil autem ad rationẽ refert, etſi partes ipſius nõ vndique ſimiliter ad mediũ ipſum cõcurrant. Maior enim ſemper minorem, quæ ante ſe eſt, impellat neceſſe eſt, vtriſque momentũ ad mediũ vſque habentibus, & grauiore minus põdus ad hoc impellente. Quod enim quiſpiam dubitauerit, eandem habet ſolutionem. Si enim multiplex pondus additum alteri hemiſphærio fuerit, terræ medium occupantis, atque rotundam habentis figuram, non idem ipſius totius, terræque medium erit. Quare aut non manebit in medio, aut ſi manebit, quieſcet & non habens medium, quo & nunc moueri eſt apta. Quod igitur dubitatur, id eſt. Videre autem non eſt difficile, ſi parum conſiderauerimus, ac diſtinxerimus, quomodo cẽſemus, quantamuis magnitudinem pondus habentem ad ipſum medium ferri. Patet enim non quouſque extremum tangat ipſum centrum, ſed maior pars vincat oportet, quouſque ſuo medio ipſum medium comprehendat: hucvſque enim habet momentum. Nihil igitur intereſt, hoc de gleba, & quauis parte, an de tota terra dicatur. Non enim ob paruitatem aut magnitudinem, id quod accidit, dictum eſt, ſed de omni eo quod ad medium habet momentum. Quare ſiue tota, ſiue per partes aliquo ex loco ferebatur terra, eò vſque ferri ipſam neceſſe eſt, donec vtique vndecumque ſimiliter ſumat medium, adæquatis minoribus à maioribus propulſione inclinationis. Siue igitur facta eſt, hoc neceſſarium factam eſſe modo: quare manifeſtum, quia ſphærica generatio ipſius, ſiue ingenita, ac ſemper manens, eodem modo habet, quo ſi oriretur, primùm orta fuiſſet. Et hac igitur ratione, figuram ipſius rotundam eſſe neceſſe eſt, & quia omnia grauia ſimiles ad angulos, ſed non diſtantia æquè feruntur. Hoc autem aptum eſt ad id quod natura rotundum eſt. Aut igitur eſt rotunda, aut natura rotunda. Vnumquodque autem tale dicere oportet, quale eſſe natura ſolet, & quod eſt, ſed non id quod violentia, & præter naturam eſt. Præterea, & per ea quæ ſenſu videntur. Lunæ namque defectiones, non diuiſiones tales haberent. Etenim nunc quidẽ in hiſce figuris, quæ per menſem efficiuntur, diuiſiones ſuſcipit omnes. Recta. n. fit, & vtraque ex parte curua & cõcaua. In defectionibus verò, ſemper curuam habet lineam, quæ diſtinguit. Quare cùm obiectu terræ deficiat, terræ ſanè circumferentia figuræ cauſa eſt. Præterea, per ea quæ videntur de ſtellis, patet non ſolùm rotundam eſſe, ſed etiam mole magnam non eſſe. Si parua enim migratio Meridiẽ verſùs ac Vrſam fiat; alius manifeſtè fit iſce qui terminat orbis: vt ſtellæ, quæ ſunt ſuper caput, mutationẽ habeãt magnam,

A καὶ φαίνεσθαι τοῦτο συμβαῖνον, διὰ τὸ φύσιν ἔχειν φέρεσθαι τὸ βάρος ἔχον πρὸς τὸ μέσον. ἐν δυνάμει οὖν ὄντος τοῦ μίγματος, τὰ διακρινόμενα ἐφέρετο ὁμοίως πάντοθεν πρὸς τὸ μέσον. εἴτ᾽ οὖν ὁμοίως ἀπὸ τῶν ἐσχάτων διῃρημένα τὰ μόρια συνῆλθε πρὸς τὸ μέσον, εἴτ᾽ ἄλλως ἔχοντα, ποιήσει ταὐτόν. ὅτι μὲν οὖν ὁμοίως πανταχόθεν ἀπὸ τῶν ἐσχάτων φερομένων πρὸς ἓν τὸ μέσον, ἀναγκαῖον ὅμοιον γίνεσθαι πάντῃ τὸν ὄγκον, φανερόν· ἴσου γὰρ πάντῃ προστιθεμένου, ἴσον ἀνάγκη ἀπέχειν τοῦ μέσου τὸ ἔσχατον. τοῦτο δὲ τὸ σχῆμα, σφαῖρά ἐστιν. οὐδὲν δὲ διοίσει B πρὸς τὸν λόγον, οὐδ᾽ εἰ μὴ πανταχόθεν ὁμοίως συνέλθοι πρὸς τὸ μέσον τὰ μόρια αὐτῆς. τὸ γὰρ πλεῖον ἀεὶ τὸ πρὸ αὐτοῦ ἔλαττον * προωθεῖν ἀναγκαῖον μέχρι τοῦ μέσου τὴν ῥοπὴν ἐχόντων ἀμφοῖν, καὶ τοῦ βαρυτέρου προωθοῦντος μέχρι τούτου, τὸ ἔλαττον βάρος. ὃ γὰρ ἄν τις ἀπορήσειε, τὴν αὐτὴν ἔχει ταύτῃ λύσιν· εἰ γὰρ οὔσης ἐπὶ τοῦ μέσου, καὶ σφαιροειδοῦς τῆς γῆς, πολλαπλάσιον βάρος ἐπιτεθείη πρὸς θάτερον ἡμισφαίριον, οὐκ ἔσται τὸ αὐτὸ μέσον τοῦ ὅλου, καὶ τὸ τῆς γῆς· ὥστε ἢ οὐ μενεῖ ἐπὶ τοῦ μέσου, ἢ εἴπερ ἠρεμήσει γε καὶ μὴ τὸ μέσον * ἔχουσα ἦ, πέφυκε κινεῖσθαι καὶ νῦν. τὸ μὲν οὖν ἀπορούμενον τοῦτ᾽ ἐστίν. ἰδεῖν δ᾽ οὐ χαλεπὸν C μικρὸν * ἐπιτείναντας, καὶ διελόντας, πῶς ἀξιοῦμεν ὁπηλικονοῦν μέγεθος πρὸς τὸ μέσον φέρεσθαι, βάρος ἔχον. δῆλον γὰρ, ὡς οὐ μέχρι τοῦ ἅψασθαι τοῦ κέντρου τὸ ἔσχατον. ἀλλὰ δεῖ κρατεῖν τὸ πλεῖον ἕως ἂν λάβῃ τῷ αὐτοῦ μέσῳ τὸ μέσον· μέχρι τούτου γὰρ ἔχει τὴν ῥοπήν. οὐδὲν τοίνυν τοῦτο διαφέρει λέγειν ἐπὶ τοῦ βώλου καὶ μορίου τοῦ τυχόντος, ἢ ἐπὶ ὅλης τῆς γῆς· οὐ γὰρ διὰ μικρότητα ἢ μέγεθος εἴρηται τὸ συμβαῖνον, ἀλλὰ κατὰ παντὸς τοῦ ῥοπὴν ἔχοντος ἐπὶ τὸ μέσον· ὥστε εἴτε ὅλη ποθὲν ἐφέρετο, εἴτε κατὰ μέρος, ἀναγκαῖον μέχρι D τούτου φέρεσθαι, ἕως ἂν πανταχόθεν ὁμοίως λάβῃ τὸ μέσον, ἀνισαζομένων τῶν ἐλαττόνων ὑπὸ τῶν μειζόνων τῇ προώσει τῆς ῥοπῆς. εἴτ᾽ οὖν ἐγένετο, τοῦτον ἀναγκαῖον γενέσθαι τὸν τρόπον· ὥστε φανερὸν, ὅτι σφαιροειδὴς ἡ γένεσις αὐτῆς, εἴτε ἀγένητος ἀεὶ μένουσα, τὸν αὐτὸν τρόπον ἔχειν, ὅνπερ κἂν εἰ γινομένη τὸ πρῶτον ἐγένετο. κατὰ τοῦτόν τε δὴ τὸν λόγον, ἀναγκαῖον εἶναι τὸ σχῆμα σφαιροειδὲς αὐτῆς. καὶ ὅτι πάντα φέρεται τὰ βαρέα πρὸς ὁμοίας γωνίας, ἀλλ᾽ οὐ παρ᾽ ἄλληλα· τοῦτο δὲ πέφυκε πρὸς τὸ φύσει σφαιροειδές. ἢ οὖν ἐστι σφαιροειδὴς, ἢ φύσει γε σφαιροειδής. δεῖ δὲ ἕκαστον λέγειν τοιοῦτον εἶναι, ὃ φύσει βούλεται εἶναι, καὶ ὃ * ὑπάρ- E χει ἀλλὰ μὴ ὃ βίᾳ, καὶ παρὰ φύσιν. ἔτι δὲ καὶ διὰ τῶν φαινομένων κατὰ τὴν αἴσθησιν· οὔτε γὰρ ἂν αἱ τῆς σελήνης ἐκλείψεις τοιαύτας ἂν εἶχον τὰς ἀποτομάς· νῦν μὲν γὰρ ἐν τοῖς κατὰ μῆνα σχηματισμοῖς, πάσας λαμβάνει τὰς διαιρέσεις. καὶ γὰρ εὐθεῖα γίνεται, καὶ ἀμφίκυρτος, καὶ κοίλη. περὶ δὲ τὰς ἐκλείψεις, ἀεὶ κυρτὴν ἔχει τὴν ὁρίζουσαν γραμμήν. ὥστ᾽ ἐπείπερ ἐκλείπει διὰ τὴν τῆς γῆς ἐπιπρόσθησιν, ἡ τῆς γῆς ἂν εἴη περιφέρεια τοῦ σχήματος αἰτία σφαιροειδὴς οὖσα. ἔτι δὲ διὰ τῆς τῶν ἄστρων φαντασίας, οὐ μόνον φανερὸν, ὅτι περιφερὴς, ἀλλὰ καὶ τὸ μέγεθος οὐκ οὖσα μεγάλη. μικρᾶς γὰρ γινομένης ἡμῖν μεταβάσεως πρὸς μεσημβρίαν καὶ ἄρκτον, ἐπιδήλως ἕτερος γίνεται ὁ ὁρίζων κύκλος· ὥστε τὰ ὑπὲρ τῆς κεφαλῆς ἄστρα μεγάλην ἔχειν τὴν μεταβολήν,

* γρ. προωθεῖ
* γρ. ἔχουσα, πέφ. κ.
* γρ. ἐπιτείναντας,
* γρ. ὑπάρχειν.

καὶ μὴ ταὐτὰ φαίνεσθαι πρὸς ἄρκτον τε καὶ μεσημβρίαν μεταβαίνουσιν. ἔνιοι γὰρ ἐν Αἰγύπτῳ μὲν ἀστέρες ὁρῶνται, καὶ περὶ Κύπρον· ἐν τοῖς πρὸς ἄρκτον δὲ χωρίοις οὐχ ὁρῶνται· καὶ τὰ διὰ παντὸς ἐν τοῖς πρὸς ἄρκτον φαινόμενα τῶν ἄστρων, ἐν ἐκείνοις τοῖς τόποις ποιεῖται δύσιν. ὥστ᾽ οὐ μόνον ἐκ τούτων δῆλον περιφερὲς ὂν τὸ σχῆμα τῆς γῆς, ἀλλὰ καὶ σφαίρας οὐ μεγάλης. οὐ γὰρ ἂν οὕτω ταχὺ ἐπίδηλον ἐποίει μεθισταμένοις οὕτω βραχύ. διὸ τοὺς ὑπολαμβάνοντας συνάπτειν τὸν περὶ τὰς Ἡρακλείους στήλας τόπον τῷ περὶ τὴν Ἰνδικήν, καὶ τοῦτον τὸν τρόπον εἶναι τὴν θάλατταν μίαν, μὴ λίαν ὑπολαμβάνειν ἄπιστα δοκεῖν· λέγουσι δὲ τεκμαιρόμενοι καὶ τοῖς ἐλέφασιν, ὅτι περὶ ἀμφοτέρους τοὺς τόπους τοὺς *ἐσχάτους ὄντας, τὸ γένος αὐτῶν ἐστιν, ὡς τῶν ἐσχάτων διὰ τὸ συνάπτειν ἀλλήλοις τοῦτο πεπονθότων. καὶ τῶν μαθηματικῶν ὅσοι τὸ μέγεθος ἀναλογίζεσθαι πειρῶνται) τῆς περιφερείας, εἰς τετταράκοντα λέγουσιν εἶναι μυριάδας *σταδίων. ἐξ ὧν τεκμαιρομένοις οὐ μόνον σφαιροειδῆ τὸν ὄγκον ἀναγκαῖον εἶναι τῆς γῆς, ἀλλὰ καὶ μὴ μέγαν πρὸς τὸ τῶν ἄλλων ἄστρων μέγεθος.

* γρ. ἐσχατεύοντας

* γρ. μυρ. inepte.

& non eadẽ videantur Meridiẽ versùs migrantibus atque Vrſam. Nonnullæ namque ſtellarum in Aegypto videntur, ac circa Cyprum, in locis autem versùs Vrſas non videntur. Et ſtellarum quæ ſemper in locis versùs Vrſam videntur, illis in locis occidunt. Quare perſpicuum eſt ex hiſce, terram non ſolùm rotundam eſſe, ſed etiam magnitudine non eſſe rotundæ. Non enim ſic citò mutationem faceret, migratione adeò breui facta. Quapropter qui locum eum qui circa columnas Herculeas eſt, coniunctum eſſe ei loco qui eſt circa Indicam regionem, exiſtimant, atque hoc modo vnum mare eſſe aſſerunt, non videntur incredibilia valde exiſtimare. Dicunt autem hoc, ex barris etiam coniectantes, genus ipſorum circa extrema vtraque loca eſſe, propterea quòd ipſa extrema ita ſunt ob coniunctionem affecta. Mathematicorũ etiam qui magnitudinem orbis terræ metiri conantur, quadringentis terram cingi ſtadiorum millibus dicunt. Ex quibus, ſi coniectura ſumatur, molem ipſius terræ non ſolùm rotundam eſſe, ſed etiam ad cæterarum ſtellarum magnitudinem magnam non eſſe neceſſe eſt.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ οὐρανοῦ τῶν εἰς Δ, τὸ Γ.

ΚΕΦΑΛ. α'.

Αἱ τῶν ἀρχαίων δόξαι περὶ γενέσεως καὶ φθορᾶς· καὶ ὡς ἐκ τῶν ἐπιπέδων σῶμα συντίθεσθαι ἀδύνατον.

ΠΕΡΙ μὲν οὖν τοῦ πρώτου οὐρανοῦ καὶ τῶν μερῶν, ἔτι δὲ περὶ τῶν ἐν αὐτῷ φερομένων ἄστρων, ἐκ τίνων τε συνεστᾶσι, καὶ ὁποῖ᾽ ἄττα τὴν φύσιν ἐστὶ, πρὸς δὲ τούτοις καὶ ὅτι ἀγένητα καὶ ἄφθαρτα, διεληλύθαμεν πρότερον. ἐπεὶ δὲ τῶν φύσει λεγομένων, τὰ μέν εἰσιν οὐσίαι, τὰ δ᾽ ἔργα καὶ πάθη τούτων (λέγω δὲ οὐσίας μὲν, τά τε ἁπλᾶ σώματα, οἷον πῦρ καὶ γῆν, καὶ ὅσα σύστοιχα τούτοις, καὶ ὅσα ἐκ τούτων, οἷον τόν τε σύνολον οὐρανὸν καὶ τὰ μόρια αὐτοῦ, καὶ πάλιν τά τε ζῷα καὶ τὰ φυτὰ, καὶ τὰ μόρια τούτων· πάθη δὲ καὶ ἔργα, τάς τε κινήσεις τὰς τούτων ἑκάστου καὶ τῶν ἄλλων, ὅσων ἐστὶν αἴτια ταῦτα τὰ στοιχεῖα κατὰ τὴν δύναμιν τὴν ἑαυτῶν· ἔτι δὲ τὰς ἀλλοιώσεις, καὶ τὰς εἰς ἄλληλα μεταβάσεις,) φανερὸν ὅτι τὴν πλείστην συμβαίνει *τῆς περὶ φύσεως ἱστορίας περὶ σωμάτων εἶναι· πᾶσαι γὰρ αἱ φυσικαὶ οὐσίαι, ἢ σώματα, ἢ μετὰ σωμάτων γίνονται καὶ μεγεθῶν. τοῦτο δὲ δῆλον ἔκ τε τοῦ διωρίσθαι τὰ ποῖά ἐστι φύσει, καὶ ἐκ τῆς καθ᾽ ἕκαστα θεωρίας. περὶ μὲν οὖν τοῦ πρώτου τῶν στοιχείων εἴρηται, καὶ ποῖόν τι τὴν φύσιν, καὶ ὅτι ἄφθαρτον καὶ ἀγένητον. λοιπὸν δὲ περὶ τοῖν δυοῖν εἰπεῖν· ἅμα δὲ συμβήσεται περὶ τούτων λέγουσι, καὶ περὶ γενέσεως καὶ φθορᾶς διασκέψασθαι. γένεσις γὰρ ἤτοι τὸ παράπαν οὐκ ἔστιν, ἢ μόνον ἐν τούτοις τοῖς στοιχείοις, καὶ τοῖς ἐκ τούτων ἐστίν. αὐτὸ δὲ τοῦτο πρῶτον ἴσως θεωρητέον, πότερόν ἐστιν ἢ οὐκ ἔστιν. οἱ μὲν οὖν πρότερον φιλοσοφήσαντες περὶ τῆς ἀληθείας, καὶ πρὸς οὓς νῦν λέγομεν ἡμεῖς λόγους, καὶ πρὸς ἀλλήλους διηνέχθησαν.

* γρ. τὴν τ. φ. ἱστορίαν π.

ARISTOTELIS STAGIRITÆ, DE CÆLO LIBER III.

CAPVT I.

Opiniones antiquorum quinque de generatione rerum atque interitu. Quòd corpus ex ſuperficiebus componi nequeat.

DE primo igitur cælo, ac partibus, & de ſtellis, quæ in ipſo feruntur, ex quibus conſtant, & qualia ſunt natura, & inſuper ingenita ac incorruptibilia eſſe, priùs iam pertractauimus. Cùm autem eorum quæ natura dicuntur eſſe, alia ſint ſubſtantiæ, alia harum opera affectúſve (atque ſubſtantias quidem dico, ſimplicia corpora, ignem, terram, & quæ eiuſdem ſunt ſeriei, & item ea quæ ex his conſtant, velVti totum cælum, ipſiúſque partes, & animalia, plantáſve, & horum partes: affectus autem, operáve, motiones horum cuiuſque, cæterorúmque, quorum hæc elementa vi ſua ſunt cauſæ, & alterationes) patet, plurimam de natura ſcientiam de corporibus eſſe. Omnes enim ſubſtantiæ naturales, aut corpora ſunt, aut cum corporibus ac magnitudinibus ſiunt. Hoc autem patet & ex definitione, qua emerſere, quæ ſunt natura, & ex ſingulorum etiam contemplatione. De primo igitur elementorum, & quale quid eſt natura, & incorruptibile, ac ingenerabile eſſe, ſatis iam diximus. Reſtat autem dicere de duobus. Quòd ſi de hiſce dicamus, ſiet & de generatione ſimul corruptionéve conſideratio. Generatio enim aut omnino non eſt, aut in hiſce duntaxat eſt elementis, atque in hiſce quæ ex his conſtant. Hoc autem ipſum primum eſt contemplandum, vtrùm ſit, an non ſit. Hi igitur, qui prius de veritate philoſophati ſunt, tam in hiſce ſermonibus, quos nunc nos dicimus, quàm inter ſeſe diſcordes fuere.

Quidam enim ipſorum, generationem è medio corruptionémve tollunt. Nihil enim eorum quæ ſunt, generari, aut corrumpi, ſed ſolùm ita nobis videri dicunt, vt Meliſſus, atque Parmenides: quós, etſi bene cætera dicunt, non naturaliter tamen dicere oportet putare. Eſſe namque rerum aliquas ingenitas, omninoque immobiles, ad aliam magis atque priorem, quàm ad naturalem conſiderationem ſpectat. Illi verò quia nihil aliud præter ſubſtantiam ſenſibilium, eſſe exiſtimabant, & quaſdam primi tales naturas intellexerunt, ſi cognitio aliqua aut prudẽtia erit, ad hæc illinc accommodatas ſententias traduxerunt. Alij verò, quaſi de induſtria, contrariam his habuerunt opinionem. Sunt enim qui nullas rerum ingenerabiles eſſe, ſed omnes fieri dicunt: generatas autem, partim permanere, partim corrumpi. Eſt autem ſententiæ talis maximè quidem Heſiodus, deinde cæterorum ij qui primi de natura dixerunt. Quidam autem, cætera quidem omnia fieri, fluereque dicunt, ac nihil prorſus ſtabile eſſe: vnum autem quid ſolum permanere, ex quo hæc vniuerſa transfigurari ſunt apta, quod quidem, cæterique complures, & Heraclitus Epheſius dicere velle videtur. Sunt & qui corpus omne generabile faciunt: componentes ipſum ex planis, ac diſſoluentes in plana. De cæteris igitur alius erit ſermo. Hiſce verò qui hoc dicunt modo, omniáque corpora ex planis conſtituunt, quod accidit contra ſcientias dicere mathematicas, perfacile eſt videre. Erat tamẽ æquum, aut non dimouere ipſas, aut credibilioribus rationibus, quàm ſuppoſitiones ſunt, dimouere. Deinde patet, eiuſdem eſſe ſententiæ, ſolida quidem ex planis, ex lineis autem plana, & has ex punctis componi. Quæ ſi ita ſint, non neceſſe eſt, partem lineæ lineam eſſe. Sed de hiſce, prius in ſermonibus de motu conſiderauimus. Demonſtrauimus enim, indiuiſibiles nullas longitudines eſſe. Quæ verò de naturalibus corporibus impoſſibilia accidit hiſce dicere, qui lineas indiuiſibiles faciunt, parumper nunc etiam contemplemur. Ea namque impoſſibilia, quæ in illis accidunt, & in naturalibus ſanè ſequentur. At non omnia quæ in his ſequuntur, in illis accident: propterea quòd mathematica quidem abſtractione dicũtur: naturalia verò additione. Complura autem ſunt, quæ indiuiſibilibus competere non poſſunt, naturalibus autem neceſſario competunt: ceu ſi quippiam indiuiſibile eſſe dixerimus. In indiuiſibili enim, diuiſibile eſſe non poteſt. Affectus autem omnes, diuiſibiles dupliciter ſunt: aut ſpecie, aut per accidens. Specie quidem, vt coloris, album & nigrum. Per accidens autem, ſi id, in quo eſt, diuiſibile ſit. Quare qui ſunt affectuum ſimplices, omnes hoc modo ſunt diuiſibiles. Quapropter impoſſibile ipſum in talibus eſt conſiderandum. Si igitur impoſſibile eſt, vtraque parte ponderis nihil habente, totum habere pondus, ſenſibilia verò corpora, aut omnia, aut aliqua pondus habent, ceu terra, & aqua, vt & ipſi etiam dixerint: ſi punctum nihil ponderis habet, patet neque lineas ipſas habere. Quòd ſi hæ non habent, neque plana etiam habent. Quare neque corpus vllum ipſum habet. At verò punctum pondus habere non poſſe, patet. Graue namque omne, grauius etiam, & leue leuius aliquo eſſe poteſt. Grauius autem aut leuius, fortaſſe non neceſſe eſt graue vel leue eſſe. Quemadmodum & magnum quidem eſt maius:

A οἱ μὲν γὰρ αὐτῶν ἀνεῖλον ὅλως γένεσιν καὶ φθοράν· οὐθὲν γὰρ οὔτε γίγνεσθαί φασιν, οὔτε φθείρεσθαι τῶν ὄντων, ἀλλὰ μόνον δοκεῖν ἡμῖν· οἷον οἱ περὶ Μέλισσόν τε καὶ Παρμενίδην, οὕς, εἰ καὶ τἆλλα λέγουσι καλῶς, ἀλλ' οὐ φυσικῶς γε δεῖ νομίσαι λέγειν· τὸ γὰρ εἶναι ἄττα τῶν ὄντων ἀγένητα, καὶ ὅλως ἀκίνητα, μᾶλλόν ἐστιν ἑτέρας καὶ προτέρας, ἢ τῆς φυσικῆς σκέψεως. ἐκεῖνοι δὲ διὰ τὸ μηθὲν μὲν ἄλλο παρὰ τὴν τῶν αἰσθητῶν οὐσίαν ὑπολαμβάνειν εἶναι, τοιαύτας δέ τινας νοῆσαι πρῶτοι φύσεις, εἴπερ ἔσται τις γνῶσις ἢ φρόνησις, οὕτω μετήνεγκαν ἐπὶ ταῦτα τοὺς ἐκεῖθεν λόγους. ἕτεροι δέ τινες ὥσπερ ἐπίτηδες τὴν ἐναντίαν B τούτοις* ἔσχον δόξαν. εἰσὶ γάρ τινες οἵ φασιν οὐθὲν ἀγένητον εἶναι τῶν πραγμάτων, ἀλλὰ πάντα γίγνεσθαι· γενόμενα δὲ, τὰ μὲν ἄφθαρτα διαμένειν, τὰ δὲ πάλιν φθείρεσθαι· μάλιστα μὲν οἱ περὶ τὸν Ἡσίοδον· εἶτα δὲ καὶ τῶν ἄλλων, οἱ πρῶτοι φυσιολογήσαντες. οἱ δὲ, τὰ μὲν ἄλλα πάντα γίγνεσθαί τε φασὶ, καὶ ῥεῖν, εἶναι δὲ παγίως οὐθέν· ἓν δέ τι μόνον ὑπομένειν, ἐξ οὗ ταῦτα πάντα μετασχηματίζεσθαι πέφυκεν· ὅπερ ἐοίκασι βούλεσθαι λέγειν ἄλλοι τε πολλοὶ, καὶ Ἡράκλειτος ὁ Ἐφέσιος. εἰσὶ δέ τινες, οἳ καὶ πᾶν σῶμα γενητὸν ποιοῦσι, συντιθέντες καὶ διαλύοντες εἰς ἐπίπεδα καὶ ἐξ ἐπιπέδων. περὶ μὲν οὖν τῶν ἄλλων, ἕτερος C ἔστω λόγος. τοῖς δὲ τοῦτον τὸν τρόπον λέγουσι, καὶ πάντα τὰ σώματα συνιστᾶσιν ἐξ ἐπιπέδων, ὅσα μὲν ἄλλα συμβαίνει λέγειν [ὑπεναντία] τοῖς μαθήμασιν, ἐξ ἐπιπολῆς ἐστιν ἰδεῖν· καίτοι δίκαιον ἢ μὴ κινεῖν, ἢ πιστοτέροις αὐτὰ λόγοις κινεῖν τῶν ὑποθέσεων. ἔπειτα δῆλον, ὅτι τοῦ αὐτοῦ λόγου ἐστὶ στερεὰ μὲν ἐξ ἐπιπέδων συγκεῖσθαι, ἐπίπεδα δὲ ἐκ γραμμῶν, ταύτας δὲ ἐκ στιγμῶν· οὕτω δὲ ἐχόντων, οὐκ ἀνάγκη τὸ τῆς γραμμῆς μέρος γραμμὴν εἶναι. περὶ δὲ τούτων ἐπέσκεπται πρότερον ἐν τοῖς περὶ κινήσεως λόγοις, ὅτι οὐκ ἔστιν ἀδιαίρετα μήκη. ὅσα δὲ περὶ τῶν φυσικῶν σωμάτων ἀδύνατα συμβαίνει λέγειν, τοῖς ποιοῦ- D σι τὰς ἀτόμους γραμμὰς, ἐπὶ μικρὸν θεωρήσωμεν καὶ νῦν· τὰ μὲν γὰρ ἐπ' ἐκείνων ἀδύνατα συμβαίνοντα, καὶ τοῖς φυσικοῖς ἀκολουθήσει· τὰ δὲ τούτοις, ἐπ' ἐκείνων οὐχ ἅπαντα, διὰ τὸ τὰ μὲν ἐξ ἀφαιρέσεως λέγεσθαι τὰ μαθηματικὰ, τὰ δὲ φυσικὰ ἐκ προσθέσεως. πολλὰ δέ ἐστιν, ἃ τοῖς ἀδιαιρέτοις οὐχ οἷόν τε ὑπάρχειν, τοῖς δὲ φυσικοῖς ἀναγκαῖον· οἷον εἴ τί ἐστιν ἀδιαίρετον· ἐν ἀδιαιρέτῳ γὰρ διαιρετὸν ἀδύνατον ὑπάρχειν. τὰ δὲ πάθη διαιρετὰ πάντα διχῶς· ἢ γὰρ κατ' εἶδος, ἢ κατὰ συμβεβηκός· κατ' εἶδος μὲν, οἷον χρώματος, τὸ λευκὸν καὶ τὸ μέλαν· κατὰ συμβεβηκὸς δὲ, ἂν ᾧ ὑπάρχει, ᾖ διαιρετόν· ὥστε ὅσα ἁπλᾶ τῶν παθημά- E των, πάντ' ἐστὶ διαιρετὰ τοῦτον τὸν τρόπον. διὸ τὸ ἀδύνατον ἐν τοῖς τοιούτοις ἐπισκεπτέον. εἰ δὴ τῶν ἀδυνάτων ἐστὶν ἑκατέρου μέρους μηδὲν ἔχοντος βάρος, τὰ ἄμφω ἔχειν βάρος, τὰ δ' αἰσθητὰ σώματα ἢ πάντα, ἢ ἔνια, βάρος* ἔχῃ, οἷον ἡ γῆ καὶ τὸ ὕδωρ, ὡς καὶ αὐτοὶ φαῖεν, εἰ ἡ στιγμὴ μηδὲν ἔχει βάρος, δῆλον ὅτι οὐδὲ αἱ γραμμαί· εἰ δὲ μὴ αὗται, οὐδὲ τὰ ἐπίπεδα· ὥστε οὐδὲ τῶν σωμάτων οὐθέν. ἀλλὰ μὴν ὅτι ἡ στιγμὴ οὐχ οἷόν τε βάρος ἔχειν, φανερόν. τὸ μὲν γὰρ βαρὺ, ἅπαν καὶ βαρύτερον, καὶ τὸ κοῦφον, καὶ κουφότερον ἐνδέχεται τινὸς εἶναι. τὸ δὲ βαρύτερον ἢ κουφότερον ἴσως οὐκ ἀνάγκη βαρὺ ἢ κοῦφον εἶναι· ὥσπερ καὶ τὸ μὲν μέγα, μεῖζον,

* [illegible]

* Vulgò ἔχει,

ὃ δὲ μεῖζον, οὐ πάντως μέγα ἀνάγκη· πολλὰ γάρ ἐστιν, ἃ μικρὰ ὄντα ἁπλῶς μείζω τινῶν ἑτέρων ἐστίν. Εἰ δὴ ὃ ἂν βαρὺ ὂν βαρύτερον ᾖ, ἀνάγκη μεῖζον εἶναι, καὶ τὸ βαρὺ ἅπαν διαιρετὸν ἂν εἴη. ἡ δὲ στιγμὴ ἀδιαίρετον ὑπόκειται. ἔτι, εἰ τὸ μὲν βαρὺ, πυκνόν τι· τὸ δὲ κοῦφον, μανόν τί ἐστι· τὸ δὲ πυκνὸν μανοῦ διαφέρει, τῷ ἐν ἴσῳ ὄγκῳ πλείω ἐνυπάρχειν. εἰ οὖν ἐστι στιγμὴ βαρεῖα καὶ κούφη, ἔσται καὶ πυκνὴ καὶ μανή. ἀλλὰ τὸ μὲν πυκνὸν, διαιρετόν· ἡ δὲ στιγμὴ, ἀδιαίρετος. εἰ δὲ πᾶν τὸ βαρὺ ἢ μαλακὸν ἢ σκληρὸν ἀνάγκη εἶναι, ῥᾴδιον ἐκ τούτων ἀδύνατόν τι συναγαγεῖν. μαλακὸν μὲν γὰρ, τὸ εἰς ἑαυτὸ ὑπεῖκον· σκληρὸν δὲ, τὸ μὴ* ὑπεῖκον. τὸ δὲ ὑπεῖκον, διαιρετόν. ἀλλὰ μὴν οὐδὲ ἐκ μὴ ἐχόντων βάρος, ἔσται βάρος. τό, τε γὰρ ἐπὶ πόσων συμβήσεται τοῦτο, καὶ ἐπὶ ποίων, πῶς διοριοῦσι μὴ βουλόμενοι πλάττειν; καὶ εἰ πᾶν μεῖζον βάρος βάρους βαρύ, συμβήσεται καὶ ἕκαστον τῶν ἀμερῶν βάρος ἔχειν· εἰ γὰρ αἱ τέτταρες στιγμαὶ βάρος ἔχουσι· τὸ δὲ ἐκ πλειόνων ἢ τοῦδε βαρέος ὄντος βαρύτερον· τὸ δὲ βαρέος βαρύτερον, ἀνάγκη βαρὺ εἶναι, ὥσπερ καὶ τὸ λευκοῦ λευκότερον, λευκόν. ὥστε τὸ μεῖζον μιᾷ στιγμῇ, βαρύτερον ἔσται ἀφαιρεθέντος τοῦ ἴσου. ὥστε καὶ ἡ μία στιγμὴ βάρος ἕξει. ἔτι, εἰ τὰ ἐπίπεδα μόνον κατὰ γραμμὴν ἐνδέχεται συντίθεσθαι, ἄτοπον· ὥσπερ γὰρ καὶ γραμμὴ πρὸς γραμμὴν ἀμφοτέρως συντίθεται, καὶ κατὰ μῆκος καὶ κατὰ πλάτος, δεῖ καὶ ἐπίπεδον ἐπιπέδῳ τὸν αὐτὸν τρόπον. γραμμὴ δὲ δύναται γραμμῇ συντίθεσθαι κατὰ γραμμὴν ἐπιτιθεμένην, οὐ μὴν προστιθεμένην. ἀλλὰ μὴν εἴγε καὶ κατὰ πλάτος ἐνδέχεται συντίθεσθαι, ἔσται τι σῶμα, ὃ οὔτε στοιχεῖον, οὔτε ἐκ τῶν στοιχείων συντιθέμενον ἐκ τῶν οὕτω συντιθεμένων ἐπιπέδων. ἔτι, εἰ μὲν πλήθει βαρύτερα τὰ σώματα τῶν ἐπιπέδων, ὥσπερ ἐν τῷ Τιμαίῳ διώρισται, δῆλον ὡς ἕξει καὶ ἡ γραμμὴ, καὶ ἡ στιγμὴ βάρος. ἀνάλογον γὰρ πρὸς ἄλληλα ἔχουσιν, ὥσπερ καὶ πρότερον εἰρήκαμεν. εἰ δὲ μὴ τοῦτον διαφέρει τὸν τρόπον ἀλλὰ τῷ τὴν μὲν γῆν εἶναι βαρεῖαν, τὸ δὲ πῦρ κοῦφον, ἔσται καὶ τῶν ἐπιπέδων, τὸ μὲν βαρὺ, τὸ δὲ κοῦφον. καὶ τῶν γραμμῶν δὴ καὶ τῶν στιγμῶν ὡσαύτως. τὸ γὰρ τῆς γῆς ἐπίπεδον ἔσται βαρύτερον, ἢ τὸ τοῦ πυρός. ὅλως δὲ συμβαίνει ἢ μηδέν ποτε εἶναι μέγεθος, ἢ δύνασθαί γε ἀναιρεθῆναι· εἴπερ ὁμοίως γ' ἔχει, στιγμὴ μὲν πρὸς γραμμὴν, γραμμὴ δὲ πρὸς ἐπίπεδον, τοῦτο δὲ πρὸς σῶμα· ἅπαντα γὰρ εἰς ἄλληλα ἀναλυόμενα, εἰς τὰ πρῶτα ἀναλυθήσεται· ὥστε ἐνδέχοιτ' ἂν στιγμὰς* μόνον εἶναι, σῶμα δὲ μηδέν. πρὸς δὲ τούτοις καὶ εἰ χρόνος ὁμοίως ἔχει, ἀναιροῖτ' ἄν ποτε, ἢ ἐνδέχοιτ' ἂν ἀναιρεθῆναι· τὸ γὰρ νῦν τὸ ἄτομον, οἷον στιγμὴ γραμμῆς ἐστι. τὸ δ' αὐτὸ συμβαίνει καὶ τοῖς ἐξ ἀριθμῶν συντιθεῖσι τὸν οὐρανόν· ἔνιοι γὰρ τὴν φύσιν ἐξ ἀριθμῶν συνιστᾶσιν, ὥσπερ καὶ τῶν Πυθαγορείων τινές. τὰ μὲν γὰρ φυσικὰ σώματα, φαίνεται βάρος ἔχοντα καὶ κουφότητα· τὰς δὲ μονάδας, οὔτε σῶμα ποιεῖν οἷόν τε συντιθεμένας, οὔτε βάρος ἔχειν.

* Vulgo ὑπεῖκον ἔστιν βάρος, inepte.

* χ. μόνας

A maius autem non omne magnum eſſe neceſſe eſt. Complura enim ſunt quæ abſolutè quidem ſunt parua, quibuſdam autem aliis ſunt maiora. Si igitur quod, cùm graue ſit, grauius eſt, id pondere maius eſſe neceſſe eſt: & omne graue diuiſibile ſane erit. Punctum autem indiuiſibile ſupponunt eſſe. Præterea, ſi graue quidem eſt denſum, leue autem rarum, &, denſum hoc à raro differt, quòd æquali in mole plura ipſi inſunt: ſi punctum ſit graue, ac leue, & denſum, nimirum & rarum erit. At denſum quidem eſt diuiſibile, punctum autem diuidi nequit. Quòd ſi omne graue, molle aut durum eſſe neceſſe eſt, impoſſibile aliquod ex his inferri facile poteſt. B Eſt enim id molle, quod in ſe ipſum cedit: durum autem id quod non cedit. At quod cedit, diuiſibile eſſe conſtat. At verò neque ex hiſce quæ ponderis expertia ſunt, pondus erit. In quot enim hoc, atque in qualibus accidet, aut quónam modo definient, ſi haud fingere volunt? Et ſi omne maius pondere, pondus pondere maius eſt: & vnumquodque ſanè partibus vacantium pondus habebit. Nam ſi puncta quatuor pondus habent, quod verò ex pluribus conſtat, quàm hoc, graui grauius eſt, atque quod grauius eſt, graue eſſe neceſſe eſt, perinde vt album eſt, quod albo albius eſt: id ſanè, quod maius eſt vno puncto, grauius erit æquali ablato. Quare & vnum punctum pondus habebit. Præterea, ſi plana C ſolùm vt lineæ componi poſſunt, abſurdum eſſe videtur. nam vt & linea ad lineam vtroque modo, & per longitudinem & latitudinem componitur, ſic & cum plano componi planum oportet: linea verò componi cum linea poteſt, ſi ſuperponatur, non ſolùm apponatur. At ſi per latitudinem etiam componi poſſunt, erit quippiam corpus, quod neque eſt elementum, neque ex elementis, ſi ex hoc pacto planis compoſitis componatur. Præterea ſi planorum multitudine corpora ſunt grauiora, vt in Timæo eſt definitum: patet & lineam & punctum pondus habere: ſubeunt enim inter ſeſe rationis ſimilitudinem, vt prius etiam diximus. Sin verò non hoc differunt modo, ſed ex eo quia D terra quidem eſt graue, ignis autem leue: erit & planorum aliud graue, aliud leue, & linearum ſimiliter & punctorum. Etenim terræ planum grauius erit, quàm ignis planum. Omnino autem accidit, aut nullam vnquam magnitudinem eſſe, aut tolli poſſe, ſi ſimiliter ſe habet punctum quidem ad lineam, linea verò ad planum, & hoc ad corpus: omnia enim, ſi reſoluantur, in ipſa reſoluentur nimirum prima. Quare fieri poteſt vt ſola ſint puncta, corpus autem nullum. Inſuper ſi tempus etiam ſimiliter ſeſe habet, tolletur aliquando, vel tolli poteſt. Ipſum enim nunc, indiuiduum eſt, perinde atque lineæ punctum. Idem & iis accidit qui ex nu- E meris cælum componunt. Quidam enim ex numeris Naturam conſtituunt, vt Pythagoricorum nonnulli. Corpora namque naturalia, pondus habere leuitatémque videntur. Vnitates autem, neque corpus facere compoſitæ, neque pondus habere poſſunt.

CAPVT II.

Quòd ſit neceſſe, ſimplicium corporum aliquem motum naturalem eſſe. Quod ſurſum aut deorſum mouetur, omnino eſſe leue, aut graue. Quòd motus quiſpiam naturalis ſit, & quòd aliquis violentus.

ESſe autem neceſſarium, corporibus ſimplicibus natura motum aliquem vniuerſis competere, ex hiſce dilucidum fiet. Nam cùm moueri videantur, vi nimirum ipſa moueri neceſſe eſt, ſi motum non habent. Idem verò eſt, vi moueri, & præter naturam. At ſi præter naturam eſt quiſpiam motus, & ſecundùm naturam eſſe neceſſe eſt, præter quam ille eſt. Et ſi multi ſunt ij qui præter naturam ſunt, vnum eum eſſe qui eſt ſecundùm naturam, neceſſe eſt. Vnumquodque enim ſecundùm quidem naturam ſimpliciter ſe habet, præter autem naturam multos habet motus. Præterea ex quiete hoc idem patet. Etenim aut vi aut ſecundùm naturam quieſcant, neceſſe eſt. Vi autem ibi manent, quò & vi feruntur: & ſecundùm naturam itidem ibi manēt, quò & ſecundùm naturam feruntur. Cùm igitur aliquid in medio manere videatur, ſi ſecundùm naturam, patet, & lationem qua huc fertur, ſecundùm naturam ipſi competere. Sin vi, quid eſt quod prohibet ferri? Si enim id quod prohibet ferri, quieſcit, eadem verba ſanè voluemus. Aut enim id quod primum quieſcit, ſecundùm naturam quieſcit, aut in infinitum abibitur: quod quidem eſt impoſſibile. Sin mouetur, vt Empedocles terram quieſcere dicit conuerſione, aliquem in locum ſanè moueretur, cùm impoſſibile ſit in infinitum ferri. Nullũ enim impoſſibile fit. Impoſſibile autē eſt, infinitum tranſire. Quare ſtet alicubi quod fertur, & illic non vi maneat, ſed ſecundùm naturam, neceſſe eſt. Quòd ſi eſt ſecundùm naturam quies, & motus erit ſecundùm naturam ea latio qua ad hunc itur locum. Quapropter & Leucippus dicat oportet, atque Democritus, qui prima corpora ſemper in vacuo infinitóve moueri dicunt, quonam motu mouentur, & quis eſt ipſorum ſecundùm naturam motus. Nam ſi elementorum aliud ab alio vi mouetur, & ſecundùm naturam etiam aliquem vniuſcuiuſque motum eſſe neceſſe eſt, præter quem eſt is qui violentus eſt: & id quod primum mouet, non vi ſed ſecundùm naturam mouere oportet. In infinitum enim abibitur, ſi nõ erit quicquam primum mouens ſecundùm naturã, ſed ſemper ipſum prius vi ſubiens motum mouebit. Hoc idem accidat neceſſe eſt, & ſi, vt in Timæo eſt ſcriptum, elementa inordinatè mouebantur antea, quàm Mundus ortus eſſet. Motum enim aut violētum, aut ſecũdùm naturam eſſe, neceſſe eſt. Quòd ſi ſecundùm naturam mouebantur, Mundum eſſe neceſſe eſt, ſi quiſpiam velit cum diligentia contemplari. Primum namque mouens mouere neceſſe eſt, ipſum ſecundùm naturam ſubiens motum: & ea quæ mouentur, non vi in ſuis quieſcentia locis, eum, quem nunc habent ordinem facere: ea quidem quæ pondus habent, ad medium: ea verò quæ leuitatem habent, à medio ſuopte pergentia nutu. Hunc autem ordinem Mundus habet. Præterea, tantùm quiſpiam interrogauerit, fierine poterit, an non poterit, vt inordinatè ſubeuntia motum, talibus etiam miſtionibus aliqua miſceantur, ex quibus ea corpora conſtant, quæ ſecundùm naturam conſtituuntur: oſſa, inquam, & caro, & iſtiuſmodi cætera, quemadmodum Empedocles in concordia fieri dicit: ait enim,

ΚΕΦΑΛ. Ϛ.

Ὅτι ἀναγκαῖον ὑπάρχειν κίνησιν τοῖς ἁπλοῖς σώμασι φυσικήν τινα πᾶσι· καὶ ὅτι ἔχει ἔνια ἀναγκαῖον ῥοπὴν βάρους καὶ κουφότητος· καὶ πῶς αἱ παρὰ φύσιν κινήσεις ἔχουσι.

ΟΤι δ' ἀναγκαῖον ὑπάρχειν κίνησιν τοῖς ἁπλοῖς σώμασι φυσικήν τινα πᾶσιν, ἐκ τῶνδε δῆλον. ἐπεὶ γὰρ κινούμενα φαίνεται, κινεῖσθαί γε ἀναγκαῖον βίᾳ, εἰ μὴ οἰκείαν ἔχει κίνησιν· τὸ δὲ βίᾳ, καὶ παρὰ φύσιν ταὐτόν. ἀλλὰ μὴν εἰ παρὰ φύσιν ἐστί τις κίνησις, ἀναγκαῖον εἶναι καὶ κατὰ φύσιν, B παρ' ἣν αὕτη· καὶ εἰ πολλαὶ αἱ παρὰ φύσιν, τὴν κατὰ φύσιν μίαν· κατὰ φύσιν μὲν γὰρ ἁπλῶς, παρὰ φύσιν δ' ἔχει πολλὰς ἕκαστον. ἔτι δὲ καὶ ἐκ τῆς ἠρεμίας δῆλον· καὶ γὰρ ἠρεμεῖν ἀναγκαῖον, ἢ βίᾳ, ἢ κατὰ φύσιν· βίᾳ δὲ μένει, οὗ καὶ φέρεται βίᾳ· καὶ κατὰ φύσιν, οὗ κατὰ φύσιν. ἐπεὶ οὖν φαίνεταί τι μένον ἐπὶ τοῦ μέσου, εἰ μὲν κατὰ φύσιν, δῆλον ὅτι καὶ ἡ φορὰ ἡ ἐνταῦθα κατὰ φύσιν αὐτῷ· εἰ δὲ βίᾳ, * τί τὸ φέρεσθαι κωλῦον; εἰ μὲν οὖν ἠρεμοῦν, τὸν αὐτὸν κυκλήσομεν λόγον· ἀνάγκη γὰρ ἢ κατὰ φύσιν εἶναι τὸ πρῶτον ἠρεμοῦν, ἢ εἰς ἄπειρον ἰέναι, ὅπερ ἀδύνατον· εἰ δὲ κινούμενον τὸ κωλῦον φέρεσθαι, καθάπερ φησὶν Ἐμ- C πεδοκλῆς, τὴν γῆν ὑπὸ τῆς δίνης ἠρεμεῖν, ποῦ ἂν ἐφέρετο; ἐπεὶ εἰς ἄπειρον ἀδύνατον· οὐδὲν γὰρ γίγνεται ἀδύνατον. τὸ δ' ἄπειρον διελθεῖν, ἀδύνατον. ὥστ' ἀνάγκη στῆναί που τὸ φερόμενον, κἀκεῖ μὴ βίᾳ μένειν, ἀλλὰ κατὰ φύσιν. εἰ δ' ἐστὶν ἠρεμία κατὰ φύσιν, ἔστι καὶ κίνησις κατὰ φύσιν ἡ εἰς τοῦτον γοῦν τὸν τόπον φορά. διὸ καὶ Λευκίππῳ καὶ Δημοκρίτῳ τοῖς λέγουσιν ἀεὶ κινεῖσθαι τὰ πρῶτα σώματα ἐν τῷ κενῷ καὶ τῷ ἀπείρῳ, λεκτέον τίνα κίνησιν, καὶ τίς ἡ κατὰ φύσιν αὐτῶν κίνησις. εἰ γὰρ ἄλλο ὑπ' ἄλλου κινεῖται βίᾳ τῶν στοιχείων, ἀλλὰ καὶ κατὰ φύσιν ἀνάγκη τινὰ εἶναι κίνησιν ἑκάστου, παρ' D ἣν ἡ βίαιός ἐστι· καὶ δεῖ τὴν πρώτην κινοῦσαν, μὴ βίᾳ κινεῖν, ἀλλὰ κατὰ φύσιν· εἰς ἄπειρον γὰρ εἶσιν, εἰ μή τι ἔσται κατὰ φύσιν κινοῦν πρῶτον, ἀλλ' ἀεὶ τὸ πρότερον βίᾳ κινούμενον κινήσει. τὸ αὐτὸ δὲ τοῦτο συμβαίνειν ἀναγκαῖον· κἂν εἰ καθάπερ ἐν τῷ Τιμαίῳ γέγραπται, πρὶν γενέσθαι τὸν κόσμον, ἐκινεῖτο τὰ στοιχεῖα ἀτάκτως· ἀνάγκη γὰρ ἢ βίαιον εἶναι τὴν κίνησιν, ἢ κατὰ φύσιν. εἰ δὲ κατὰ φύσιν ἐκινεῖτο, ἀνάγκη κόσμον εἶναι, ἐάν τις βούληται θεωρεῖν ἐπιστήσας. τό τε γὰρ πρῶτον κινοῦν ἀνάγκη κινεῖν αὐτό, κινούμενον κατὰ φύσιν· καὶ τὰ κινούμενα μὴ βίᾳ, ἐν τοῖς οἰκείοις ἠρεμοῦντα τόποις, ποιεῖν ἣν περ ἔχουσι E νῦν τάξιν· τὰ μὲν βάρος ἔχοντα, ἐπὶ τὸ μέσον· τὰ δὲ κουφότητα, ἀπὸ τοῦ μέσου· ταύτην δ' ὁ κόσμος ἔχει τὴν διάταξιν. ἔτι δὲ τοσοῦτον ἐπανέροιτ' ἄν τις, πότερον δυνατόν, ἢ οὐχ οἷόν τε ἦν κινούμενα ἀτάκτως, καὶ μίγνυσθαι τοιαύτας μίξεις ἐνίας, ἐξ ὧν συνίσταται τὰ κατὰ φύσιν συνιστάμενα σώματα· λέγω δέ, οἷον ὀστᾶ καὶ σάρκας, καθάπερ Ἐμπεδοκλῆς φησὶ γίνεσθαι ἐπὶ τῆς φιλότητος· λέγει γάρ,

* κ. τὸ τὸ φ. κωλῦον

* κ. πολλαί. ſed πολλῶν, etiam alibi legitur, vbi laudatur hic loc. 3, vt Dominica 3.6.

Ὡς* πολλῶν μὲν κόρσαι ἀναύχενες ἐβλάστησαν. Τοῖς δὲ ἄπειρα ἐν ἀπείρῳ τὰ κινούμενα ποιοῦσιν, εἰ μὲν ἓν τὸ κινοῦν, ἀνάγκη μίαν φέρεσθαι φοράν, ὥστ' οὐκ ἀτάκτως κινηθήσονται. εἰ δ' ἄπειρα τὰ κινοῦντα, καὶ τὰς φορὰς ἀναγκαῖον ἀπείρους εἶναι· εἰ γὰρ πεπερασμέναι, τάξις τις ἔσται· οὐ γὰρ τῷ μὴ φέρεσθαι εἰς τὸ αὐτὸ ἡ ἀταξία συμβαίνει. οὐδὲ γὰρ νῦν εἰς τὸ αὐτὸ φέρεται πάντα, ἀλλὰ τὰ συγγενῆ μόνον. ἔτι τὸ ἀτάκτως, οὐδέν ἐστιν ἕτερον, ἢ τὸ παρὰ φύσιν· ἡ γὰρ τάξις ἡ οἰκεία, τῶν αἰσθητῶν φύσις ἐστίν. ἀλλὰ μὴν καὶ τοῦτο ἄτοπον καὶ ἀδύνατον, τὸ, τὸ ἄπειρον ἄτακτον ἔχειν κίνησιν· ἔστι γὰρ ἡ φύσις ἐκείνη τῶν πραγμάτων, ἣν ἔχει τὰ πλεῖστα, καὶ τὸν πλείω χρόνον. συμβαίνει οὖν αὐτοῖς τοὐναντίον, τὴν μὲν ἀταξίαν εἶναι κατὰ φύσιν, τὴν δὲ τάξιν καὶ τὸν κόσμον παρὰ φύσιν. καίτοι οὐθὲν ὡς ἔτυχε γίγνεται τῶν κατὰ φύσιν. ἔοικε δὲ τοῦτό γε αὐτὸ καλῶς Ἀναξαγόρας ὑπολαβεῖν. ἐξ ἀκινήτων γὰρ ἄρχεται κοσμοποιεῖν. πειρῶνται δὲ καὶ οἱ ἄλλοι συγκρίνοντές πως πάλιν κινεῖν καὶ διακρίνειν. ἐκ διεστώτων δὲ καὶ κινουμένων, οὐκ εὔλογον ποιεῖν τὴν γένεσιν. διὸ καὶ Ἐμπεδοκλῆς παραλείπει τὴν ἐπὶ τῆς φιλότητος. οὐ γὰρ ἂν ἠδύνατο συστῆσαι τὸν οὐρανὸν ἐκ κεχωρισμένων μὲν κατασκευάζων, σύγκρισιν δὲ ποιῶν διὰ τὴν φιλότητα. ἐκ διακεκριμένων γὰρ συνέστηκεν ὁ κόσμος τῶν στοιχείων, ὥστε ἀναγκαῖον γενέσθαι ἐξ ἑνὸς, καὶ συγκεκριμένου. ὅτι μὲν οὖν ἐστι φυσική τις κίνησις ἑκάστου τῶν σωμάτων, ἣν οὐ βίᾳ κινοῦνται, οὐδὲ παρὰ φύσιν, φανερὸν ἐκ τούτων. ὅτι δ' ἔχειν ἔνια ἀναγκαῖον ῥοπὴν βάρους καὶ κουφότητος, ἐκ τῶνδε δῆλον. κινεῖσθαι μὲν γάρ φαμεν ἀναγκαῖον εἶναι· εἰ δὲ μὴ ἕξει φύσει ῥοπὴν τὸ κινούμενον, ἀδύνατον κινεῖσθαι ἢ πρὸς τὸ μέσον, ἢ ἀπὸ τοῦ μέσου. ἔστω γὰρ τὸ μὲν ἐφ' οὗ α ἀβαρές, τὸ δὲ ἐφ' οὗ β, βάρος ἔχον· κεκινήσθω δὲ τὸ ἀβαρές, τὴν γ δ, τὸ δὲ β, ἐν τῷ ἴσῳ χρόνῳ, τὴν γ ε· μεῖζον γὰρ οἰσθήσεται τὸ βάρος ἔχον. ἐὰν δὴ διαιρεθῇ τὸ σῶμα τὸ ἔχον βάρος ὡς ἡ γ ε, πρὸς τὴν γ δ· δύναται γὰρ οὕτως ἔχειν πρός τι τῶν ἐν αὐτῷ μορίων, εἰ τὸ ὅλον φέρεται τὴν ὅλην τὴν γ ε, τὸ μόριον ἀνάγκη ἐν τῷ αὐτῷ χρόνῳ τὴν γ δ φέρεσθαι. ὥστε ἴσον οἰσθήσεται τὸ ἀβαρὲς, καὶ τὸ βάρος ἔχον· ὅπερ ἀδύνατον. ὁ δ' αὐτὸς λόγος καὶ ἐπὶ κουφότητος. ἔτι δ', εἰ ἔσται τι σῶμα κινούμενον, μήτε κουφότητα μήτε βάρος ἔχον, ἀνάγκη τοῦτο βίᾳ κινεῖσθαι· βίᾳ δὲ κινούμενον, ἄπειρον ποιεῖν τὴν κίνησιν. ἐπεὶ γὰρ δύναμίς τις ἡ κινοῦσα, τὸ δὲ ἔλαττον καὶ κουφότερον ὑπὸ τῆς αὐτῆς δυνάμεως πλεῖον κινηθήσεται, κεκινήσθω, τὸ μὲν ἐφ' ᾧ τὸ α ἀβαρὲς, τὴν γ ε, τὸ δὲ ἐφ' ᾧ τὸ β, τὸ βάρος ἔχον, ἐν τῷ ἴσῳ χρόνῳ τὴν γ δ. διαιρεθέντος οὖν τοῦ βάρος ἔχοντος σώματος, ὡς ἡ γ ε, πρὸς τὴν γ δ, συμβήσεται τὸ ἀφαιρούμενον ἀπὸ τοῦ βάρος ἔχοντος σώματος, τὴν γ ε φέρεσθαι ἐν τῷ ἴσῳ χρόνῳ· ἐπείπερ τὸ ὅλον ἐφέρετο τὴν γ δ. τὸ γὰρ τάχος ἕξει τὸ τοῦ ἐλάττονος πρὸς τὸ τοῦ μείζονος, ὡς τὸ μεῖζον σῶμα πρὸς τὸ ἔλαττον. ἴσον ἄρα τὸ ἀβαρὲς οἰσθήσεται σῶμα, καὶ βάρος ἔχον ἐν τῷ αὐτῷ χρόνῳ. τοῦτο δ' ἀδύνατον· ὥστ' ἐπεὶ παντὸς τοῦ* προστεθέντος μεῖζον κινηθήσεται διάστημα τὸ ἀβαρὲς, ἄπειρον ἂν φέροιτο.

* κ. παντός.

Complura capita ſine collo ſunt orta.

A Apud autem eos qui infinita in infinito ea quæ mouentur, faciunt, ſi vnum eſt id quod mouet, vno moueantur motu neceſſe eſt: quare non ſine ordine mouebuntur. Sin verò ea quæ mouent, ſunt infinita, & lationes infinitas eſſe neceſſe eſt. Nam ſi finitæ ſint, ordo quidem erit. Non enim quia in idem non feruntur, inordinatio accidit. Neque enim nunc in idem vniuerſa feruntur, ſed ea tantùm quæ eiuſdem generis ſunt. Præterea, inordinatè quippiam fieri, nil aliud eſt quàm fieri præter naturam. Ordo enim proprius, ſenſibiliũ natura nimirum eſt. At verò & hoc abſurdum eſt, ac B impoſſibile, infinitum, inquam, inordinatum motum habere. Eſt enim ea natura rerum, quam plures, & pluri tempore habent. Contrarium igitur ipſis accidit, inordinationem quidem eſſe ſecundùm naturam, ordinem verò Mundúmve præter naturam: & tamen nihil eorum quæ ſunt ſecundùm naturam, fit forte fortuna. Videtur autem Anaxagoras hoc ipſum beneaccepiſſe. Ex immobilibus enim incipit conficere Mundum. Enituntur autem & cæteri congregantes, aliquo modo rurſus mouere, ac ſegregare. Ex diſtantibus autem ac ſubeuntibus motum generationem facere, non eſt conſonum rationi. Quapropter & Empedocles omittit eum motum, qui eſt in concordia.* Non C enim cęlum conſtituere potuiſſet, ex ſeparatis quidem extruens, ob concordiam autem faciens congregationem. Ex ſegregatis enim elementis Mundus eſt conſtitutus. Quare ex vno fiat, & congregato, neceſſe eſt. Naturalem igitur motum vniuſcuiuſque corporum eſſe, quo non vi mouētur, neque præter naturam, ex hiſce quæ diximus, patuit. Eſſe autem neceſſarium, ponderis nonnulla corpora momentum, ac leuitatis habere, ex his dilucidum fiet. Dicimus enim, neceſſarium eſſe moueri. Si verò id quod mouetur, momentum natura non habet: fieri non poteſt, vt aut è medio aut ad medium moueatur. Sit enim a quidem pondere carens, b D verò habeat pondus, atque tranſeat a quidem c d ſpatium, b verò æquali in tempore ſpatium c e: per maius enim ſpatium, id quod pondus habet, feretur. Si igitur corpus, quod habet pondus, ea ratione qua diuiſum eſt c e ſpatium, diuidatur, (poteſt enim ad partium ſuarum aliquam ſic ſe habere, vt c e ſe habet ad c d) ſi totum per totum c e fertur, pars eodem tempore per c d feratur, neceſſe eſt. Quare id quod pondere vacat, & id quod eſt ponderis particeps, per æquale ſpatium tempore eodem feretur: quod impoſſibile eſt. Eadem & in leuitate ratio fieri poteſt. Præterea, ſi quippiam corpus & ponderis expers, & leuitatis, motum ſubibit, vi moueatur neceſſe eſt. Si verò vi E moueatur, infinitum efficit motum. Nam cùm potentia quædam ſit ea quæ mouet, id autem quod eſt minus ac leuius, plus ab eadem potētia moueatur: ſit motum a quidem pondere carens per c e ſpatium, b verò pondus, æquali in tempore per c d. Si igitur diuiſum fuerit id quod pōdus habet, ea ratione quam c e ad c d habet, fiet vt id quod aufertur ab eo quod pondus habet, æquali in tempore per c e feratur, quoniam totum per c d mouebatur. Celeritas enim minoris ad celeritatē maioris ita ſeſe habebit, vt maius corpus ſe habet ad minus. Per æquale ergo ſpatium & id quod pōdere vacat, & id quod eſt ponderis particeps, tempore eodem feretur: quod quidem fieri nequit. Quare ſi omni quouis propoſito per maius ſpatium id mouebitur quod pondere caret, per infinitum vtique ferri poteſt.

Patet igitur, omne definitum corpus, pondus aut leuitatem habere. Cùm autem natura quidem id ſit principium motus, quod eſt in ipſo, potentia autem id quod eſt in alio, vt aliud eſt, atq; motus alius ſit ſecundùm naturam, alius violentus: naturalem quidem motum celeriorem faciet id quod potentia mouet, vt eum quo lapis deorſum fertur: eum autem qui eſt præter naturã, omnino potentia ipſa. Ad vtrumque autem vtitur aëre ipſo vt inſtrumento: eſt enim hic aptus, & leuis eſſe, & grauis. Lationem igitur eam qua ſurſum itur, faciet vti leuis, cùm pulſus fuerit, principiũmque ſumpſerit à potentia ipſa. Lationem autem eam qua deſcenditur, faciet vti grauis: potentia enim, quaſi vim impreſſam tradit vtrique. Quapropter & non ſequẽte eo, quod mouit, id fertur quod pręter naturam eſt motum. Si enim non tale quid corpus eſſet, violentus motus ſanè non eſſet. Motui quoque ſecundùm naturam cuiuſque, modo eodem conducit, ſuo ad mobilis terga concurſu. Omnẽ igitur corpus, leue eſſe, aut graue, & quomodo ſeſe habent in hiſce motus præter naturam, ex hiſce quę diximus, patet. Eſt autem manifeſtum ex dictis, neque omnium neque nullius ſimpliciter generationem corporis eſſe. Impoſſibile eſt enim, vniuerſi corporis generationem eſſe, ſi non & vacuum eſſe quid ſeparatum poteſt. Quo enim in loco id quod generatur, erit, cùm fuerit ortum, in hoc priùs vacuum eſſe, ſi nullum ſit corpus, neceſſe eſt. Aliud enim ex alio corpus fieri poteſt, velut ex aëre ignis: ſed omnino ex nulla alia antecedente magnitudine fieri impoſſibile eſt. Maximè enim ex potentia corpore, corpus actu fieri poteſt. Sed ſi id quod eſt potentia corpus, non eſt prius aliud corpus actu, ſeparatum vacuum erit.

A Φανερὸν δὴ, ὅτι ἀνάγκη πᾶν σῶμα βάρος ἔχειν, ἢ κουφότητα διωρισμένην. ἐπεὶ δὲ φύσις μὲν ἐστὶν ἡ ἐν αὐτῷ ὑπάρχουσα κινήσεως ἀρχή, δύναμις δ' ἡ ἐν ἄλλῳ, ᾗ ἄλλο, κίνησις δὲ, ἡ μὲν κατὰ φύσιν,* ἡ δὲ βίαιος πᾶσα· τὴν μὲν κατὰ φύσιν, οἷον τῷ λίθῳ τὴν κάτω, θᾶττον ποιήσει τὸ κατὰ δύναμιν· τὴν δὲ παρὰ φύσιν, ὅλως αὐτή. πρὸς ἀμφότερα δὲ ὥσπερ ὀργάνῳ χρῆται τῷ ἀέρι. πέφυκε γὰρ οὗτος, καὶ κοῦφος εἶναι καὶ βαρύς. τὴν μὲν οὖν ἄνω ποιήσει φοράν, ᾗ κοῦφος, ὅταν ὠσθῇ καὶ λάβῃ τὴν ἀρχὴν ἀπὸ τῆς δυνάμεως· τὴν δὲ κάτω πάλιν, ᾗ βαρύς. ὥσπερ γὰρ ἐναφάψασα, B παραδίδωσιν ἑκατέρῳ· διὸ καὶ οὐ παρακολουθοῦντος τοῦ κινήσαντος, φέρεται* τὸ βίᾳ κινηθέν. εἰ γὰρ μὴ τοιοῦτόν τι τὸ σῶμα ὑπῆρχεν, οὐκ ἂν ἦν* ἡ βίᾳ κίνησις. τὴν κατὰ φύσιν δὲ ἑκάστου κίνησιν, συνεπουρίζει τὸν αὐτὸν τρόπον. ὅτι μὲν οὖν ἅπαν ἢ κοῦφον, ἢ βαρὺ, καὶ πῶς αἱ παρὰ φύσιν κινήσεις ἔχουσιν ἐν τούτοις, φανερόν. ὅτι δὲ οὔτε πάντων ἐστὶ γένεσις, οὔθ' ἁπλῶς οὐδενός, δῆλον ἐκ τῶν εἰρημένων. ἀδύνατον γὰρ ἁπάντων σωμάτων εἶναι γένεσιν, εἰ μὴ καὶ κενὸν εἶναί τι δυνατὸν κεχωρισμένον. ἐν ᾧ γὰρ ἔσται τόπῳ τὸ γινόμενον,* εἰ ἐγένετο, ἐν τούτῳ πρότερον τὸ κενὸν ἀναγκαῖον εἶναι C σώματος μηδενὸς ὄντος. ἄλλο μὲν γὰρ ἐξ ἄλλου γίγνεσθαι σῶμα δυνατόν, οἷον ἐξ ἀέρος πῦρ. ὅλως δ' ἐκ μηδενὸς ἄλλου προϋπάρχοντος μεγέθους, ἀδύνατον. μάλιστα μὲν γὰρ ἐκ δυνάμει τινὸς ὄντος σώματος, ἐνεργείᾳ γένοιτ' ἂν σῶμα. ἀλλ' εἰ τὸ δυνάμει ὂν σῶμα, μηδέν ἐστιν ἄλλο σῶμα ἐνεργείᾳ πρότερον, κενὸν ἔσται κεχωρισμένον.

* γρ. ἡ δὲ βία

* γρ. ἡ παρὰ φύσιν

* γρ. ἡ βίαιος κ.

* γρ. ὅτι ἐστί.

CAPVT III.

Quibus corporibus generatio conueniat, cùm prima ſint corporum elementa: quid elementum, & quot, & qualia ſint. Vtrùm elementum ſit ſpecie indiuiſibile, vt volunt aliqui ponentes vnum ſolum.

D Reſtat autem dicere, quorum eſt corporum generatio, & quam ob cauſam eſt. Cùm igitur in omnibus cognitio ſit per prima: primą verò eorum quæ inſunt, ſint elementa: prius quænam, & cur ſunt talium corporum elementa, deinde quot & qualia ſunt, cǫnſiderandum eſſe videtur. Hoc autem dilucidum fuerit, ſi ſuppoſuerimus quænam ſit ipſius elementi natura. Sit igitur id corporum elementum, in quod cætera corpora diuiduntur, in quibus ineſt potentia, aut actu. Hoc enim vtro modo ſe habet, adhuc ambigitur. Ipſum autem eſt in forma diuerſa indiuiſibile. Tale quid enim omnes ipſum elementum, & in omnibus dicere volunt. E Quòd ſi id quod eſt dictum, eſt elementum, talia quædam corporum eſſe neceſſe eſt. In carne enim ac ligno, & ſimilibus, ineſt ignis potentia, atque terra. Manifeſtè enim ex illis hæc ſegregantur. In igne autem, caro aut lignum non ineſt, neque potentia, neque actu: ſi enim eſſet, ſegregaretur. Similiter neque ſi vnum quid ſolum ſit tale, in illo eſt: neque enim ſi caro, aut os, aut quoduis cæterorum erit, ineſſe potentia continuò eſt dicendum: ſed antea quiſnam ſit generationis modus, eſt contemplandum. Anaxagoras autem, de elementis contrario modo atque Empedocles dicit. Hic enim ignem & terram, cæteráque eiuſdem ſeriei corpora elementa corporũ eſſe, ac omnia ex hiſce cõſtare dicit. Anaxagoras verò contrarium aſſerit. Ea enim quæ ſunt ſimilium partium, ligna, (inquam) carnem, & os,

ΚΕΦΑΛ. γ'.

Ὅτι ἐστὶ στοιχεῖα, καὶ διὰ τί ἐστι.

D Λοιπὸν δὲ εἰπεῖν, τίνων τέ ἐστι σωμάτων γένεσις, καὶ διὰ τί ἐστιν. ἐπεὶ οὖν ἐν ἅπασιν ἡ γνῶσις διὰ τῶν πρώτων, πρῶτα δὲ τῶν ἐνυπαρχόντων τὰ στοιχεῖα, σκεπτέον ποῖα ἐστὶ τῶν τοιούτων σωμάτων στοιχεῖα, καὶ διὰ τί ἐστιν· ἔπειτα μετὰ ταῦτα, ὁπόσα τε καὶ ὁποῖα ἄττα. τοῦτο δ' ἔσται φανερὸν ὑποθεμένοις τίς ἐστιν ἡ τοῦ στοιχείου φύσις. ἔστω δὴ τὸ στοιχεῖον τῶν σωμάτων, εἰς ὃ τὰ ἄλλα σώματα διαιρεῖται, ἐνυπάρχον δυνάμει, ἢ ἐνεργείᾳ· τοῦτο γὰρ ποτέρως, ἔτι ἀμφισβητήσιμον. αὐτὸ δ' ἐστὶν ἀδιαίρετον εἰς ἕτερα τῷ εἴδει. τοιοῦτον γάρ τι τὸ στοιχεῖον πάντες καὶ ἐν ἅπασι βούλονται E λέγειν. εἰ δὴ τὸ εἰρημένον ἐστὶ στοιχεῖον, ἀνάγκη εἶναι ἄττα τοιαῦτα τῶν σωμάτων. ἐν μὲν γὰρ σαρκὶ, καὶ ξύλῳ, καὶ ἑκάστῳ τῶν τοιούτων ἔνεστι δυνάμει πῦρ καὶ γῆ· φανερὰ γὰρ ταῦτα ἐξ ἐκείνων ἐκκρινόμενα. ἐν δὲ πυρὶ σὰρξ, ἢ ξύλον οὐκ ἐνυπάρχουσιν, οὔτε κατὰ δύναμιν, οὔτε κατ' ἐνέργειαν. ἐξεκρίνετο γὰρ ἄν. ὁμοίως δ', οὐδ' εἰ ἕν τι μόνον εἴη τοιοῦτον, οὐδ' ἐν ἐκείνῳ· οὐδὲ γὰρ εἰ ἔσται σὰρξ, ἢ ὀστοῦν, ἢ τῶν ἄλλων ὁτιοῦν, οὔπω φατέον ἐνυπάρχειν δυνάμει. ἀλλὰ προσθεωρητέον, τίς ὁ τρόπος τῆς γενέσεως. Ἀναξαγόρας δ' ἐναντίον Ἐμπεδοκλεῖ λέγει περὶ τῶν στοιχείων. ὁ μὲν γὰρ πῦρ καὶ γῆν, καὶ τὰ σύστοιχα τούτοις στοιχεῖά φασιν εἶναι τῶν σωμάτων, καὶ συγκεῖσθαι πάντ' ἐκ τούτων· Ἀναξαγόρας δὲ τοὐναντίον. τὰ γὰρ ὁμοιομερῆ στοιχεῖα, λέγω δ', * οἷον σάρκα, καὶ ὀστοῦν,

* γρ. ξύλα, εἰ

καὶ τῶν τοιούτων ἕκαστον. ἀέρα δὲ καὶ πῦρ μῖγμα τούτων καὶ τῶν ἄλλων σπερμάτων πάντων. εἶναι γὰρ ἑκάτερον αὐτῶν ἐξ ἀοράτων ὁμοιομερῶν πάντων ἠθροισμένων. διὸ καὶ γίγνεσθαι πάντα ἐκ τούτων· τὸ γὰρ πῦρ καὶ τὸν αἰθέρα προσαγορεύει τὸ αὐτό. ἐπεὶ δὲ παντὸς τοῦ φυσικοῦ σώματός ἐστι κίνησις οἰκεία, τῶν δὲ κινήσεων, αἱ μὲν ἁπλαῖ, αἱ δὲ μικταί· καὶ αἱ μὲν μικταὶ τῶν μικτῶν, αἱ δὲ ἁπλαῖ τῶν ἁπλῶν εἰσί· φανερὸν ὅτι ἔσται ἄττα σώματα ἁπλᾶ· εἰσὶ γὰρ καὶ κινήσεις ἁπλαῖ. ὥστε δῆλον καὶ ὅτι ἐστὶ στοιχεῖα, καὶ διὰ τί ἐστί.

ΚΕΦΑΛ. δʹ.

Ὅτι οὐκ ἔστιν ἄπειρα τὰ στοιχεῖα.

Πότερον δὲ πεπερασμένα, ἢ ἄπειρα, καὶ εἰ πεπερασμένα, πόσα τὸν ἀριθμόν, ἐπόμενον ἂν εἴη σκοπεῖν. πρῶτον μὲν οὖν ὅτι οὐκ ἔστιν ἄπειρα (καθάπερ οἴονταί τινες) θεωρητέον, καὶ πρῶτον τοὺς πάντα τὰ ὁμοιομερῆ στοιχεῖα ποιοῦντας, καθάπερ Ἀναξαγόρας. οὐδεὶς γὰρ τῶν οὕτως ἀξιούντων, ὀρθῶς λαμβάνει τὸ στοιχεῖον· ὁρῶμεν γὰρ πολλὰ καὶ τῶν μικτῶν σωμάτων εἰς ὁμοιομερῆ διαιρούμενα· λέγω δέ, οἷον σάρκα καὶ ὀστοῦν, καὶ ξύλα καὶ λίθον. ὥστ' εἴπερ τὸ σύνθετον οὐκ ἔστι στοιχεῖον, οὐχ ἅπαν ἔσται τὸ ὁμοιομερὲς στοιχεῖον, ἀλλὰ τὸ ἀδιαίρετον εἰς ἕτερα τῷ εἴδει, καθάπερ εἴρηται πρότερον. ἔτι δὲ οὐδ' οὕτως λαμβάνοντας τὸ στοιχεῖον, ἀνάγκη ποιεῖν ἄπειρα· ἅπαντα γὰρ * ταῦτα ἀποδοθήσεται, καὶ πεπερασμένων ὄντων, ἐάν τις λάβῃ· τὸ γὰρ αὐτὸ ποιήσει, κἂν δύο ἢ τρία μόνον ἢ τοιαῦτα, καθάπερ ἐπιχειρεῖ καὶ Ἐμπεδοκλῆς. ἐπεὶ γὰρ καὶ ὡς αὐτοῖς συμβαίνει μὴ πάντα ποιεῖν ἐξ ὁμοιομερῶν (πρόσωπον γὰρ οὐκ ἐκ * προσώπων ποιοῦσιν, οὐδ' ἄλλο τῶν κατὰ φύσιν ἐσχηματισμένων οὐθέν.) φανερὸν ὅτι μακρῷ βέλτιον πεπερασμένας ποιεῖν τὰς ἀρχάς, καὶ ταύτας ὡς * ἐλαχίστας πάντων γε τῶν αὐτῶν μελλόντων δείκνυσθαι, καθάπερ ἀξιοῦσι καὶ οἱ ἐν τοῖς μαθήμασιν. ἀεὶ γὰρ τὰς πεπερασμένας λαμβάνουσιν ἀρχάς, ἢ τῷ εἴδει, ἢ τῷ ποσῷ. ἔτι εἰ σῶμα σώματος ἕτερον λέγεται κατὰ τὰς οἰκείας διαφοράς· αἱ δὲ τῶν σωμάτων διαφοραὶ πεπερασμέναι (διαφέρουσι γὰρ τοῖς αἰσθητοῖς· ταῦτα δὲ πεπέρανται)· δεῖ δὲ τοῦτο δειχθῆναι· φανερὸν ὅτι ἀνάγκη καὶ τὰ στοιχεῖα πεπερασμένα εἶναι. ἀλλὰ μὴν οὐδ' ὡς ἕτεροί τινες λέγουσιν, οἷον Λεύκιππός τε καὶ Δημόκριτος ὁ Ἀβδηρίτης, εὔλογα τὰ συμβαίνοντα· φασὶ γὰρ εἶναι τὰ πρῶτα μεγέθη, πλήθει μὲν ἄπειρα, μεγέθει δὲ ἀδιαίρετα· καὶ οὔτε ἐξ ἑνὸς πολλὰ γίγνεσθαι, οὔτε ἐκ πολλῶν ἕν· ἀλλὰ τῇ τούτων συμπλοκῇ, καὶ * περιπλέξει πάντα γεννᾶσθαι· τρόπον γάρ τινα καὶ οὗτοι πάντα τὰ ὄντα ποιοῦσιν ἀριθμούς, καὶ ἐξ ἀριθμῶν. καὶ γὰρ εἰ μὴ σαφῶς δηλοῦσιν, ὅμως τοῦτο βούλονται λέγειν. καὶ πρὸς τούτοις, ἐπεὶ διαφέρει τὰ σώματα σχήμασιν, ἄπειρα δὲ τὰ σχήματα, ἄπειρα καὶ τὰ ἁπλᾶ σώματά φασιν εἶναι. ποῖον δὲ καὶ τί ἑκάστου τὸ σχῆμα τῶν στοιχείων, * οὐθὲν ἐπιδιώρισαν· ἀλλὰ μόνον τῷ πυρὶ τὴν σφαῖραν ἀπέδωκαν· ἀέρα δὲ καὶ ὕδωρ] καὶ τἆλλα μεγέθει καὶ μικρότητι διεῖλον, ὡς οὖσαν αὐτῶν τὴν φύσιν, οἷον πανσπερμίαν πάντων τῶν στοιχείων. πρῶτον μὲν οὖν * ταὐτό, καὶ ἐν τούτοις ἁμάρτημα, τὸ μὴ πεπερασμένας λαβεῖν τὰς ἀρχάς, ἐξὸν ἅπαντα ταὐτὰ λέγειν. ἔτι δ', εἰ μὴ ἄπειροι τῶν * σωμάτων αἱ διαφοραί,

* Suprà li. 1. c. 3.
* ἢ ταῦτα
* ἢ προσώπων
* ἢ ἐλαχίστας
* ἢ ἐπαλλάξει
* οὐκέτι δ.
* ἢ ταὐτὸ δ' ἐπὶ ... ἀκολουθεῖν
* ἢ σχημάτων

A & quæque talium, elementa eſſe dicit: aërem autem, & ignem, horum ac cæterorum omnium ſeminum miſtum eſſe. Vtrumque enim ipſorum, ex vniuerſis inuiſibilibus ſimilium partium congregatis eſſe dicit. Quapropter & omnia ex his eſſe cenſet: ignem enim & æthere idem appellat. Cùm autem omnis naturalis corporis ſit proprius motus, motus autem partim ſimplices ſint, partim miſti, & miſtorum ſint miſti, ſimplicium ſimplices: patet, corpora ſimplicia quædam eſſe. Sunt enim & ſimplices motus. Quare & elementa eſſe, & cur elementa ſunt, conſtat.

CAPVT IV.

B *Non eſſe infinit a elementa ſimilarium partium, vt poſuit Anaxagoras. Neque rectè putare Democritum Abderiten, eiúſque ſectatorem Leucippum, de primis magnitudinibus, ex quibus gignunt omnia.*

Conſequens autem eſt, vtrùm ſint finita, an infinita, & ſi finita ſint, quem numerum ſubeāt, conſiderare, ac contemplari. Primùm igitur infinita non eſſe, vt quidam arbitrantur, contemplandum eſſe videtur. Et primùm eos, qui vniuerſa, quæ ſunt ſimilium partium, elementa faciunt, vt Anaxagoras, in medium afferamus. Nemo enim eorum qui ita cenſent, rectè accipit elementum. Videmus enim & multa miſtorum corporum, vt carnem, oſſa, lapidem, lignum, in ſimiles diuidi partes. Qua-
C re ſi compoſitum non eſt elementum, non omne quod eſt ſimilium partium, eſt elementum, ſed id quod in diuerſa ſpecie diuidi nequit, vt antea diximus. Præterea, neque ſic elementum ſumentes, facere infinita neceſſe eſt: omnia enim eadem, etſi quiſpiam ſumpſerit, finita reddentur. Idem enim faciet, etſi duo vel tria talia ſolùm ſint, vt & Empedocles facere conatur. Cùm enim ipſis & hoc pacto non omnia ex ſimiles partes habentibus facere accidit, (faciem enim non ex faciebus faciunt, nec aliud quicquam eorum quæ ſecundùm naturam ſunt figurata) patet longè melius eſſe, principia facere finita, & hæc quàm minima, ſi eadem omnia demonſtrari poſſint, quemadmodum & Mathema-
D tici cenſent. Semper enim aut forma aut quantitate, finita principia ſumunt. Prçterea, ſi corpus à corpore diuerſum propriis differentiis dicitur, corporum autem differentiæ ſint finitæ (ipſis enim ſenſibilibus differunt, atque hæc ſunt finita, quod quidem demonſtretur oportet) patet & elementa neceſſariò eſſe finita. Atverò neque, vt alij quidam dicunt, vt Leucippus, ac Abderites Democritus, ea quæ accidunt, conſentanea ſunt rationi. Primas enim magnitudines, multitudine quidem infinitas, magnitudine autem indiuiſibiles eſſe dicunt: & neque ex vna multa fieri, neque ex multis vnum, ſed harum complexione mutationéve, omnia ge-
E nerari. Et hi namque quodam modo numeros vniuerſa quæ ſunt, atque ex numeris faciunt. etſi enim non dilucidè dicunt, hoc tamen dicere volunt. Et inſuper cùm figuris corpora differant, figuræ verò ſint infinitæ, infinita & ipſa ſimplicia corpora eſſe dicunt. Quænam autem eſt vniuſcuiuſque elementi figura, nihil definierunt, ſed igni ſolùm rotundam tribuere figuram. Aërem verò, aquam, ac cætera, magnitudine paruitatéque diuiſère: quia natura ipſorum eſt, vt omnium ſemen elementorum. Primum igitur idem & ipſos error comitari videtur, non finita ipſa principia ſumere, cùm omnia eadem ipſis dicere liceret. Deinde ſi corporum differentiæ non ſint infinitæ,

pates elementa infinita non eſſe. Præterea indiuiſa corpora eſſe dicentes, Mathematicis ſcientiis aduerſentur, compluráque eorum quæ ſub opinionem omnium cadunt, & eorum quæ ſenſu videntur, è medio tollant, neceſſe eſt. de quibus antea diximus in hiſce quæ de tempore motúve ſunt dicta. Et inſuper contraria ipſos dicere ſibi ipſis neceſſe eſt. Impoſſibile eſt enim, ſi elemẽta ſint indiuidua, aërem, aquam, ac terram, magnitudine paruitateque differre. Eſt enim impoſſibile, ex ſeſe mutuò generari. Corpora namque maxima, ſi ſegregentur, ſemper deficient. At hoc pacto, terram, aquam, & aërem, viciſſim ex ſeſe fieri dicunt. Præterea, neque horum ſententia, infinita ipſa elementa fieri videbuntur: ſi corpora quidem figuris differunt, figuræ verò omnes ex pyramidibus conſtant; rectarũ quidem linearum, ex hiſce quæ ſunt rectarũ linearum: ſphæra autem, ex partibus octo. Sint enim aliqua principia figurarũ, neceſſe eſt. Quare ſiue ſit vnum, ſiue duo, ſiue plura, & ſimplicia corpora multitudinem tantam ſubibunt. Præterea, ſi cuiuſque quidẽ corporis motus eſt proprius quidam, ſimplicíſque corporis motus eſt ſimplex, ſimplices autem motus infiniti non ſunt, propterea quod neque ſimplices lationes plures quàm duæ ſunt, neque loca ſunt infinita, neque hoc pacto ſanè ipſa elementa infinita erunt.

CAPVT V

Opiniones antiquorum de elementis, atque earundem incommoda, & confutatio.

QVoniam autem finita eſſe neceſſe eſt, conſiderare reſtat vtrùm plura ſint an vnum. Quidam enim vnum ſolum eſſe ſupponunt: & horum alij aquam, alij aërem, alij ignem, alij aqua quidem ſubtilius, aëre verò denſius; quod quidem cælos vniuerſos, cùm ſit infinitum, inquiunt continere. Qui igitur hoc vnum aquam aut aërem faciunt, aut aqua quidem ſubtilius, aëre verò denſius, deinde ex hoc, raritate cætera denſitatéque generant, ij ſanè ignorant, aliquid aliud elemento ſe facere prius. Generatio enim ex elementis compoſitio eſt, vt dicunt: ad elementa verò profectio, diſſolutio. Quare & id quod eſt ſubtilium magis partium, natura prius eſſe neceſſe eſt. Cùm igitur omnium corporum ignem ſubtiliſſimum eſſe dicant, ignis natura corporum primum erit. nihil autem refert. Vnum enim quippiam cæterorum, & non medium ipſum, primum eſſe neceſſe eſt. Præterea, raritate ac denſitate cætera generare, & ſubtilitate, atque groſſitie, nihil differt. Subtile enim, rarum: groſſum autem, denſum eſſe volunt. Subtilitate rurſus, atque groſſitie, & magnitudine, ac paruitate idem eſt. Subtile eſt enim, quod paruarum: groſſum, quod magnarum partium eſt. Quod enim ad multum extenditur, id ſubtile eſt: tale autem id eſt, quod ex paruis partibus conſtat. Quare accidit, ipſos magnitudine ac paruitate ſubſtantias diuidere cæterorum. Accidit autem ita definientibus, vniuerſa ad aliquid dicere. Atque abſolutè non erit aliud ignis, aliud aqua, aliud aër: ſed idẽ eſt ad hoc ignis, ad aliquid aliud aër. Quod quidem & iis accidit, qui plura quidem elemẽta eſſe aiunt, magnitudine autem & paruitate differre dicunt. Nam cùm vnũquodque quãtitate ſit definitũ, aliqua ratio nimirũ inter ipſas magnitudines erit. Quare eorum,

A δῆλον ὅτι οὐκ ἔστι τὰ στοιχεῖα ἄπειρα. πρὸς δὲ τούτοις, ἀνάγκη μάχεσθαι ταῖς μαθηματικαῖς ἐπιστήμαις, ἄτομα σώματα λέγοντας· καὶ πολλὰ τῶν ἐνδόξων καὶ τῶν φαινομένων κατὰ τὴν αἴσθησιν ἀναιρεῖν, περὶ ὧν εἴρηται πρότερον ἐν τοῖς περὶ χρόνου καὶ κινήσεως. ἅμα δὲ καὶ ἐναντία λέγειν αὐτοὺς αὑτοῖς ἀνάγκη. ἀδύνατον γὰρ ἀτόμων ὄντων τῶν στοιχείων, μεγέθει καὶ σμικρότητι διαφέρειν ἀέρα, καὶ ὕδωρ, καὶ γῆν· οὐ γὰρ ἐνδέχεται ἐξ ἀλλήλων γίγνεσθαι· ἐπιλείψει γὰρ ἀεὶ τὰ μέγιστα σώματα ἐκκρινόμενα. φασὶ δ' οὕτω γίγνεσθαι ὕδωρ καὶ ἀέρα, καὶ γῆν ἐξ ἀλλήλων. ἔτι οὐδὲ κατὰ τὴν τούτων ὑπόληψιν
B δόξειεν ἂν ἄπειρα γίγνεσθαι τὰ στοιχεῖα, εἴπερ τὰ μὲν σώματα διαφέρει σχήμασι, τὰ δὲ σχήματα πάντα σύγκειται ἐκ πυραμίδων, τὰ μὲν εὐθύγραμμα ἐξ εὐθυγράμμων, ἡ δὲ σφαῖρα ἐξ ὀκτὼ μορίων· ἀνάγκη γὰρ εἶναί τινας ἀρχὰς τῶν σχημάτων. ὥστε εἴτε μία, εἴτε δύο, εἴτε πλείους, καὶ τὰ ἁπλᾶ σώματα τοσαῦτα ἔσται τὸ πλῆθος. ἔτι δ', εἰ ἑκάστῳ μὲν τῶν στοιχείων ἐστί τις οἰκεία κίνησις, καὶ ἡ τοῦ ἁπλοῦ σώματος ἁπλῆ· μὴ εἰσὶ δὲ αἱ ἁπλαῖ κινήσεις ἄπειροι διὰ τὸ μήτε τὰς ἁπλᾶς φορὰς πλείους εἶναι δυοῖν, μήτε τοὺς τόπους ἀπείρους, οὐκ ἂν εἴη οὐδ' οὕτως ἄπειρα τὰ στοιχεῖα.

C

ΚΕΦΑΛ. ε.

Ὅτι στοιχεῖα ἀνάγκη πλείω εἶναι.

Ἐπεὶ δ' ἀνάγκη πεπεράνθαι, σκέψασθαι, πότερον πλείω ἐστὶν, ἢ ἕν. ἔνιοι γὰρ ἓν μόνον ὑποτίθενται· καὶ τοῦτο, οἱ μὲν ὕδωρ, οἱ δ' ἀέρα, οἱ δὲ πῦρ, οἱ δ' ὕδατος μὲν λεπτότερον, ἀέρος δὲ πυκνότερον, ὃ περιέχειν φασὶ πάντας τοὺς οὐρανοὺς ἄπειρον ὄν. ὅσοι μὲν οὖν τὸ ἓν τοῦτο ποιοῦσιν ὕδωρ, ἢ ἀέρα, ἢ ὕδατος μὲν λεπτότερον, ἀέρος δὲ πυκνότε-
D ρον, εἶτ' ἐκ τούτου μανότητι καὶ πυκνότητι τἆλλα γεννῶσιν, οὗτοι λανθάνουσιν αὐτοὶ αὑτοὺς, ἄλλο τι πρότερον τοῦ στοιχείου ποιοῦντες. ἔστι γὰρ ἡ μὲν ἐκ τῶν στοιχείων γένεσις, σύνθεσις, ὥς φασιν· ἡ δ' εἰς τὰ στοιχεῖα, διάλυσις, ὥστ' ἀνάγκη πρότερον εἶναι τῇ φύσει τὸ λεπτομερέστερον. ἐπεὶ οὖν φασι πάντων τῶν σωμάτων τὸ πῦρ λεπτομερέστατον εἶναι, πρῶτον ἂν εἴη τῇ φύσει τὸ πῦρ. διαφέρει δ' οὐθέν. ἀνάγκη γὰρ ἕν τι τῶν ἄλλων εἶναι πρῶτον, καὶ μὴ τὸ μέσον. ἔτι δὲ, τὸ μὲν πυκνότητι καὶ μανότητι τἆλλα γεννᾶν, οὐθὲν διαφέρει ἢ λεπτότητι καὶ παχύτητι. τὸ μὲν γὰρ λεπτὸν, μανὸν· τὸ δὲ παχὺ βούλονται εἶναι πυκνόν. πάλιν δὲ τὸ λεπτότητι καὶ παχύτητι ταὐτὸν, καὶ τὸ
E μεγέθει καὶ μικρότητι. λεπτὸν μὲν γὰρ τὸ μικρομερὲς, παχὺ δὲ τὸ μεγαλομερές· τὸ γὰρ ἐπεκτεινόμενον ἐπὶ πολὺ λεπτόν. τοιοῦτον δὲ τὸ ἐκ μικρῶν μερῶν συνεστός. ὥστ' αὐτοῖς συμβαίνει μεγέθει καὶ μικρότητι διαιρεῖν τὴν τῶν ἄλλων οὐσίαν. οὕτω δὲ διοριζομένοις ἅπαντα συμβήσεται λέγειν πρός τι· καὶ οὐκ ἔσται ἁπλῶς τὸ μὲν πῦρ, τὸ δὲ ὕδωρ, τὸ δὲ ἀήρ· ἀλλὰ τὸ αὐτὸ πρὸς μὲν τόδε, πῦρ· πρὸς δέ τι ἄλλο, ἀήρ. ὅπερ συμβαίνει καὶ τοῖς πλείω μὲν τὰ στοιχεῖα λέγουσι, μεγέθει δὲ καὶ μικρότητι διαφέρειν φάσκουσιν. ἐπεὶ γὰρ τῷ ποσῷ διώρισται ἕκαστον, ἔσται τις λόγος πρὸς ἄλληλα τῶν μεγεθῶν. ὥστε τὰ τηλι-

A ἔχοντα τὸν λόγον πρὸς ἄλληλα, ἀνάγκη τὸ μὲν ἀέρα εἶναι, τὸ δὲ πῦρ, τὸ δὲ γῆν, τὸ δ' ὕδωρ, διὰ τὸ ἐνυπάρχειν ἐν τοῖς μείζοσι τοὺς τῶν ἐλαττόνων λόγους. ὅσοι δὲ πῦρ ὑποτίθενται τὸ στοιχεῖον, τοῦτο μὲν διαφεύγουσιν· ἀλλὰ δ' αὐτοῖς ἀναγκαῖον ἄλογα συμβαίνειν. οἱ μὲν γὰρ αὐτῶν, σχῆμα περιάπτουσι τῷ πυρί, καθάπερ οἱ τὴν πυραμίδα ποιοῦντες. καὶ τούτων οἱ μὲν ἁπλουστέρως λέγοντες, ὅτι τῶν μὲν σχημάτων, τμητικώτατον ἡ πυραμίς· τῶν δὲ σωμάτων, τὸ πῦρ· οἱ δὲ κομψοτέρως τῷ λόγῳ προσάγοντες, ὅτι τὰ μὲν σώματα πάντα σύγκειται ἐκ τοῦ λεπτομερεστάτου· τὰ δὲ σχήματα τὰ στερεά, ἐκ τῶν πυραμίδων. B ὥστ' ἐπεὶ τῶν μὲν σωμάτων τὸ πῦρ λεπτότατον, τῶν δὲ σχημάτων ἡ πυραμὶς μικρομερέστατον, καὶ πρῶτον· τὸ δὲ πρῶτον σχῆμα τοῦ πρώτου σώματος· πυραμὶς ἂν εἴη τὸ πῦρ. οἱ δὲ περὶ μὲν σχήματος οὐδὲν ἀποφαίνονται, λεπτομερέστατον δὲ* μόνον ποιοῦσιν. ἔπειτα ἐκ τούτου συντιθεμένου γίγνεσθαί φασι τἆλλα, καθάπερ ἂν εἰ συμφυσωμένου ψήγματος. ἀμφοτέροις δὲ ταὐτὰ συμβαίνει δυσχερῆ. εἰ μὲν γὰρ ἄτομον τὸ πρῶτον σῶμα ποιοῦσι, πάλιν ἥξουσιν οἱ πρότερον εἰρημένοι λόγοι πρὸς ταύτην τὴν ὑπόθεσιν. ἔτι οὐκ ἐνδέχεται τοῦτο λέγειν βουλομένοις φυσικῶς θεωρεῖν. εἰ γὰρ ἅπαν σῶμα σώματι C συμβλητὸν κατὰ τὸ ποσόν, ἔχει δ' ἀνάλογα τὰ μεγέθη, τά τε τῶν ὁμοιομερῶν πρὸς ἄλληλα, καὶ τὰ τῶν στοιχείων· οἷον τὰ τοῦ σύμπαντος ὕδατος, πρὸς τὸν ἅπαντα ἀέρα, καὶ τοῦ στοιχείου πρὸς τὸ στοιχεῖον· ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων· ὁ δ' ἀὴρ πλείων τοῦ ὕδατος, καὶ ὅλως τὸ λεπτομερέστερον τοῦ παχυμερεστέρου· φανερὸν ὅτι καὶ τὸ στοιχεῖον ἔλαττον ἔσται τὸ τοῦ ὕδατος, ἢ τὸ τοῦ ἀέρος. εἰ οὖν τὸ ἔλαττον μέγεθος ἐνυπάρχει* τῷ μείζονι, διαιρετὸν ἂν εἴη τὸ τοῦ ἀέρος στοιχεῖον. ὡσαύτως δὲ καὶ τὸ τοῦ πυρός, καὶ ὅλως τῶν λεπτομερεστέρων. εἰ δὲ διαιρετόν, τοῖς μὲν σχηματίζουσι τὸ πῦρ, συμβήσεται μὴ εἶναι τὸ τοῦ πυρὸς μέρος πῦρ, διὰ τὸ μὴ συγκεῖσθαι τὴν πυραμίδα ἐκ πυραμίδων· D ἔτι δὲ μὴ πᾶν σῶμα εἶναι ἢ στοιχεῖον ἢ ἐκ στοιχείων· τὸ γὰρ μέρος τοῦ πυρὸς οὔτε πῦρ, οὔτε ἕτερον στοιχεῖον οὐδέν. τοῖς δὲ τῷ μεγέθει διορίζουσι, πρότερόν τι τοῦ στοιχείου στοιχεῖον εἶναι, καὶ τοῦτ' εἰς ἄπειρον βαδίζειν, εἴπερ ἅπαν σῶμα διαιρετόν, καὶ τὸ μικρομερέστατον στοιχεῖον. ἔτι δὲ καὶ τούτοις συμβαίνει λέγειν, ὡς ταὐτὸ πρὸς τόδε μὲν πῦρ ἐστι, πρὸς ἄλλο δὲ ἀήρ, καὶ πάλιν ὕδωρ, καὶ γῆ. κοινὸν δὲ πᾶσιν ἁμάρτημα τοῖς ἓν τὸ στοιχεῖον ὑποτιθεμένοις, τὸ μίαν μόνην κίνησιν ποιεῖν φυσικήν, καὶ πάντων τὴν αὐτήν. ὁρῶμεν γὰρ πᾶν τὸ φυσικὸν σῶμα κινήσεως ἔχον ἀρχήν. E εἰ οὖν ἅπαντα τὰ σώματα ἕν τι, πάντων ἂν εἴη μία κίνησις· καὶ ταύτην ἀναγκαῖον ὅσῳ περ ἂν πλεῖον γίγνηται, κινεῖσθαι μᾶλλον, ὥσπερ καὶ τὸ πῦρ ὅσῳ ἂν πλεῖον γίγνηται, φέρεται θᾶττον ἄνω τὴν ἑαυτοῦ φοράν. συμβαίνει δὲ πολλὰ κάτω φέρεσθαι θᾶττον. ὥστε διά τε ταῦτα, καὶ πρὸς τούτοις ἐπεὶ διώρισται πρότερον, ὅτι πλείους αἱ φυσικαὶ κινήσεις, δῆλον ὅτι ἀδύνατον ἓν εἶναι τὸ στοιχεῖον. ἐπεὶ δ' οὔτε ἄπειρα, οὔτε ἕν, ἀνάγκη πλείω εἶναι, καὶ πεπερασμένα.

* χ. μόνον τὸ στοιχεῖον

* χ. τὸ ἔλαττον

A quæ hanc rationem habent, aliud aërem, aliud ignem, aliud terram, aliud aquam eſſe neceſſe eſt: propterea quòd in maioribus rationes minorum inſunt. Qui verò ignem elementum ipſum ſupponunt, hoc quidem euadunt: alia verò ipſis accidere abſurda, neceſſe eſt. Quidam enim ipſorum igni figuram adiungunt, vt ij qui pyramidem faciunt. Quorum quidam ſimpliciùs dicunt, pyramidem quidem dicentes id eſſe quod maximè figurarum incidere poteſt, ignem autem corporum. Quidam probabiliùs, corpora quidem vniuerſa ex eo compoſita eſſe, quod eſt omnino maximè ſubtilium partium, ſolidas verò figuras ex pyramidibus conſtare dicentes. Quare cùm corporum quidem ignis B ſit ſubtiliſſimum, figurarum verò pyramis maximè paruarum eſt partium, atque prima: primaque figura primi ſit corporis: ignis profectò pyramis erit. Quidam de figura quidem nihil dicunt: ſubtiliſſimarum autem partium ſolùm elementum ipſum faciunt, deinde ex hoc compoſitionem ſubeunte, cætera fieri dicunt: perinde vt auri arenæ conflantur. Vtriſque autem hæc difficilia accidunt. Nam ſi primum corpus indiuiduum faciunt, illæ ratiocinationes quas antea diximus, ad hanc eandem materiam, vt patet, redibunt. Præterea, ſi naturaliter contemplari volunt, hoc dicere nequeunt. Nam ſi omne corpus ad corpus quantitate comparabile C eſt, magnitudines autem ſimilitudinem ſubeunt rationis, & ſimilium partium inter ſe, & elementorum, velut vniuerſæ aquæ ad aërem vniuerſum, & elementi ad elementum, & in cæteris eodem modo, & aër maior eſt aqua, & omnino id quod ſubtiliorum eſt partium, eo quod eſt groſſiorum, patet, & elementum aquæ minus quàm aëris, eſſe. Si igitur magnitudo minor ineſt maiori, elementum ſanè aëris diuiſibile erit, & ignis identidem ipſius, & eorum omnino quæ ſubtiliorum partium ſunt. Sin diuiſibile faciunt ij qui igni figuram tribuunt, eueniet, partem ignis ignem non eſſe, propterea quòd pyramis non ex pyramidibus conſtat. Et item, non D omne corpus elementum eſſe, aut ex elementis conſtare. Pars enim ignis, nec ignis eſt, nec aliud elementum vllum. Hiſce verò, qui magnitudine definiunt, prius quid elemento, elementum eſſe, atque hoc in infinitũ abire, ſi omne corpus diuiſibile eſt, & quod paruarũ magis partium eſt elementum. Præterea, & his etiam accidit, idem ad hoc ignem eſſe dicere, ad aliud aërem & aquam rurſus, ac terram. Commune autem peccatum vniuerſis eſt, qui elementum vnum ſupponunt, vnum naturalem ſolum, omniúmque eundem facere motum. Omne namque naturale corpus, principium habere motus videmus. Si igitur omnia corpora vnum quid ſunt, vnus omnium motus erit. Et hoc eo magis E quodque moueri neceſſe eſt, quo maius ſit, quemadmodum & ignis quo maior ſit, eo ſua latione celeriùs fertur. accidit autem, multa deorſum celeriùs ferri. Quare propter hæc ipſa, & inſuper cùm definitum ſit prius, naturales plures eſſe motus, patet vnum elementum eſſe non poſſe. Cùm autem neque infinita ſint, neque vnum ſit elementum, plura eſſe profectò, atque finita eſſe neceſſe eſt.

A

CAPVT VI.

Quòd fieri nequeat vt elementa ſint æterna: nec eſſe commune quodpiam corpus diuerſum ab ipſis, è quo generentur.

CONſiderandum eſt autem primò, vtrùm ſempiterna ſint, an generentur, & corrumpantur. Quo demonſtrato, & quot, & qualia ſunt, patebit. Sempiterna igitur eſſe, impoſſibile eſt. Et ignem enim, & aquam, & vnumquodque ſimplicium corporum diſſolui videmus: diſſolutionem verò, aut infinitam eſſe, aut ſtare, neceſſe eſt. Si igitur infinita eſt, & diſſolutionis tempus infinitum erit, & tempus rurſus compoſitionis. Vnaquæque enim partium, in alio tempore diſſoluitur, atque componitur. Quare fiet vt extra tempus infinitum, tempus ſit aliud infinitum: quandoquidem & compoſitionis tempus eſt infinitum, & prius hoc diſſolutionis tempus, vt extra infinitum ſit infinitum: quod quidem impoſſibile eſt. Sin ſtabit alicubi diſſolutio, aut id corpus in quo diſſolutio ſtabit, indiuiduum erit: aut diuiſibile quidem erit, non tamen vnquam diuidetur, vt Empedocles velle videtur. Indiuiduum igitur non erit, propter rationes antea dictas. At neque diuiſibile quidem erit, nunquam autem diſſoluetur: minus enim corpus, faciliùs quàm maius, corrumpi poteſt. Si igitur & maius hac corruptione corrumpitur, vt in minora diſſoluatur, corpus minus id pati magis conſentaneum eſt rationi. Ignem autem duobus modis corrumpi videmus: nam & à contrario corrumpitur, cùm extinguitur, & ipſe à ſeipſo marceſcens. Hoc autem patitur minor à maiore, & eo celeriùs quo minor eſt. Quare corporum elementa corruptibilia & generabilia eſſe, neceſſe eſt. Cùm autem generabilia ſint, aut ex incorporeo, aut à corpore ipſorum generatio erit: & ſi ex corpore, aut ex alio aut ex ſeſe viciſſim ipſorum generatio erit. Is igitur qui ipſa dicit ex incorporeo generari, vacuū facit. Nam omne quod fit, in aliquo fit: & id in quo eſt generatio, aut incorporeum erit, aut habebit corpus, & ſi habebit corpus, duo corpora ſimul in eodem erunt, id (inquam) quod fit, & id quod præcedit. Sin incorporeum erit, vacuum eſſe definitum, neceſſe eſt: hoc autem impoſſibile eſſe, antea demonſtrauimus. At neque ex corpore quodam elementa fieri poſſunt: eueniet enim, aliud corpus elementis prius eſſe: atque hoc, ſi pondus, aut leuitatem habet, vnum quid erit elementorum. Si nullum habet momentum, immobile ac mathematicum erit: ſi tale autem eſt, in loco non erit. Quo enim in loco quieſcit, in eum & moueri poteſt. Et ſi vi quidem, præter naturam: ſin verò non vi, ſecundùm naturam. Si igitur in loco, atque alicubi erit, elementorum quippiam erit: ſin verò non erit in loco, neque quicquam ex ipſo erit. Id enim quod fit, & id ex quo fit, ſimul eſſe neceſſe eſt. Cùm autem neque ex incorporeo, neque ex alio corpore fieri poſſint, ex ſeſe mutuò fieri reſtat.

ΚΕΦΑΛ. ϛʹ.

Ὅτι γενητά ἐστι τὰ στοιχεῖα, καὶ ἐξ ἀλλήλων γίνεται.

Ἐπισκεπτέον δὲ πρῶτον, πότερον ἀΐδιά ἐστιν, ἢ γινόμενα [φθείρεται· τούτου γὰρ δειχθέντος, φανερὸν ἔσται, καὶ πόσα ἄττα καὶ ποῖά ἐστιν. ἀΐδια μὲν οὖν εἶναι ἀδύνατον· ὁρῶμεν γὰρ καὶ τὸ πῦρ, καὶ τὸ ὕδωρ, καὶ ἕκαστον τῶν ἁπλῶν σωμάτων διαλυόμενον. ἀνάγκη δὲ ἢ ἄπειρον εἶναι, ἢ ἵστασθαι τὴν διάλυσιν. εἰ μὲν οὖν ἄπειρον, ἔσται καὶ ὁ χρόνος ὁ τῆς διαλύσεως ἄπειρος· καὶ πά- B λιν ὁ τῆς συνθέσεως. ἕκαστον γὰρ ἐν ἄλλῳ χρόνῳ διαλύεται καὶ συντίθεται τῶν μορίων. ὥστε συμβήσεται ἔξω τοῦ ἀπείρου χρόνου, ἄλλον ἄπειρον εἶναι· ὅταν ὅ,τε τῆς συνθέσεως ἄπειρος ᾖ, καὶ ἔτι τούτου πρότερος ὁ τῆς διαλύσεως. ὥστε τοῦ ἀπείρου ἔξω γίνεσθαι ἄπειρον· ὅπερ ἀδύνατον. εἰ δὲ στήσεταί που ἡ διάλυσις, ἤτοι ἄτομον ἔσται τὸ σῶμα, ἐν ᾧ ἵσταται, ἢ διαιρετὸν μὲν, οὐ μέντοι διαιρεθησόμενον οὐδέποτε· καθάπερ ἔοικεν Ἐμπεδοκλῆς βούλεσθαι λέγειν· ἄτομον μὲν οὖν οὐκ ἔσται διὰ τοὺς πρότερον εἰρημένους λόγους· ἀλλὰ μὴν οὐδὲ διαιρετὸν μὲν, οὐδέποτε δὲ διαλυθησόμενον. τὸ γὰρ ἔλαττον σῶμα τοῦ μείζονος εὐφθαρτότερόν ἐστιν. εἴπερ οὖν καὶ τὸ πολὺ C φθείρεται κατὰ ταύτην τὴν φθορὰν, ὥστε διαλύεσθαι εἰς ἐλάττω· ἔτι μᾶλλον τοῦτο πάσχειν εὔλογον τὸ ἔλαττον. δύο δὲ τρόποις ὁρῶμεν φθειρόμενον τὸ πῦρ· ὑπό τε γὰρ τοῦ ἐναντίου φθείρεται σβεννύμενον, καὶ αὐτὸ ὑφ' ἑαυτοῦ μαραινόμενον. τοῦτο δὲ πάσχει τὸ ἔλαττον ὑπὸ τοῦ πλείονος, καὶ θᾶττον, ὅσῳ ἂν ᾖ ἔλαττον. ὥστ' ἀνάγκη φθαρτὰ καὶ γενητὰ εἶναι τὰ στοιχεῖα τῶν σωμάτων. ἐπεὶ δέ ἐστι γενητὰ, ἤτοι ἐξ ἀσωμάτου, ἢ ἐκ σώματος ἔσται ἡ γένεσις· καὶ εἰ σώματος, ἤτοι ἐξ ἄλλου, ἢ ἐξ ἀλλήλων. ὁ μὲν οὖν ἐξ ἀσωμάτου γεννῶν λόγος γενόμενον ποιεῖ κενόν. πᾶν γὰρ τὸ γινόμενον ἔν τινι γίνεται, καὶ ἤτοι ἀσώματον ἔσται ἐν ᾧ ἡ D γένεσις, ἢ ἕξει σῶμα· καὶ εἰ μὲν ἕξει σῶμα, δύο ἔσται σώματα ἅμα ἐν τῷ αὐτῷ, τό,τε γιγνόμενον καὶ τὸ προϋπάρχον· εἰ δὲ ἀσώματον, ἀνάγκη κενὸν εἶναι ἀφωρισμένον. τοῦτο δὴ ὅτι ἀδύνατον, δέδεικται καὶ πρότερον. ἀλλὰ μὴν οὐδὲ ἐκ σώματός τινος ἐγχωρεῖ γίνεσθαι τὰ στοιχεῖα· συμβήσεται γὰρ ἄλλο σῶμα πρότερον εἶναι τῶν στοιχείων. τοῦτο δὲ, εἰ μὲν ἕξει βάρος ἢ κουφότητα, τῶν στοιχείων ἔσται τι. μηδεμίαν δὲ ἔχον ῥοπὴν, ἀκίνητόν ἐστι καὶ μαθηματικόν· τοιοῦτο δὲ ὂν, οὐκ ἔσται ἐν τόπῳ. ἐν ᾧ γὰρ ἠρεμεῖ, ἐν τούτῳ καὶ κινεῖσθαι δυνατόν· καὶ εἰ μὲν βίᾳ, παρὰ φύσιν· εἰ δὲ μὴ βίᾳ, κατὰ φύσιν. εἰ μὲν οὖν ἔσται ἐν τόπῳ, καὶ E που, ἔσται τι τῶν στοιχείων· εἰ δὲ μὴ ἐν τόπῳ, οὐδέν τι ἐξ αὐτοῦ ἔσται. τὸ γὰρ γινόμενον, καὶ ἐξ οὗ γίνεται, ἀνάγκη ἅμα εἶναι. ἐπεὶ δ' οὔτε ἐξ ἀσωμάτου γίνεσθαι δυνατὸν, οὔτε ἐξ ἄλλου σώματος, λείπεται ἐξ ἀλλήλων γίνεσθαι.

CAPVT VII.

De mutua elementorum ex ſeipſis generatione.

RVrſus igitur cōſiderandū eſt quiſnā ſit mutuæ generationis ipſorū mod⁹, vtrùm vt Empedocles dicit, atq; Democritus, an vt ij qui in plana diſ-

ΚΕΦΑΛ. ζʹ.

Τίς ὁ τρόπος τῆς ἐξ ἀλλήλων γενέσεως.

Πάλιν οὖν ἐπισκεπτέον, τίς ὁ τρόπος τῆς ἐξ ἀλλήλων γενέσεως, πότερον ὡς Ἐμπεδοκλῆς λέγει καὶ Δημόκριτος, ἢ ὡς οἱ εἰς τὰ ἐπίπεδα διαλύοντες,

ἢ ἔστιν ἄλλος τις τρόπος παρὰ τούτους; οἱ μὲν οὖν περὶ Ἐμπεδοκλέα καὶ Δημόκριτον λανθάνουσιν αὐτοὶ ἑαυτοὺς οὐ γένεσιν ἐξ ἀλλήλων ποιοῦντες, ἀλλὰ φαινομένην γένεσιν· ἐνυπάρχον γὰρ ἕκαστον, ἐκκρίνεσθαί φασιν, ὥσπερ ἐξ ἀγγείου τῆς γενέσεως οὔσης, ἀλλ' οὐκ ἔκ τινος ὕλης, οὐδὲ γίγνεσθαι μεταβάλλοντος. ἔπειτα κἂν οὕτως, οὐδὲν ἧττον ἄλογα τὰ συμβαίνοντα. τὸ γὰρ αὐτὸ μέγεθος οὐ δοκεῖ συμπιληθὲν γίνεσθαι βαρύτερον. ἀνάγκη δὲ τοῦτο λέγειν τοῖς φάσκουσιν ἐκκρίνεσθαι τὸ ὕδωρ ἐκ τοῦ ἀέρος ἐνυπάρχον. ὅταν γὰρ ὕδωρ ἐξ ἀέρος γένηται, βαρύτερόν ἐστιν. ἔτι δὲ, τῶν μεμιγμένων σωμάτων οὐκ ἀνάγκη χωρισθὲν θάτερον ἀεὶ πλείω τόπον ἐπέχειν· ὅταν δὲ ἐξ ὕδατος ἀὴρ γένηται, πλείω καταλαμβάνει τόπον· τὸ γὰρ λεπτομερέστερον ἐν μείζονι τόπῳ γίνεται. φανερὸν δὲ τοῦτό γε καὶ ἐν τῇ μεταβάσει. διατμιζομένου γὰρ καὶ πνευματουμένου τοῦ ὑγροῦ, ῥήγνυται τὰ περιέχοντα τοὺς ὄγκους ἀγγεῖα, διὰ τὴν στενοχωρίαν. ὥστ', εἰ μὲν ὅλως μή ἐστι κενὸν, μηδὲ ἐπεκτείνεται τὰ σώματα, καθάπερ φασὶν οἱ ταῦτα λέγοντες, φανερὸν ὅτι ἀδύνατον. εἰ δ' ἐστὶ κενὸν καὶ ἐπέκτασις, ἄλογον τὸ ἐξ ἀνάγκης ἀεὶ πλείω τόπον ἐπιλαμβάνειν τὸ χωριζόμενον· ἀνάγκη δὲ καὶ ὑπολείπειν τὴν ἐξ ἀλλήλων γένεσιν, εἴπερ ἐν τῷ πεπερασμένῳ μεγέθει μὴ ἐνυπάρχει ἄπειρα μεγέθη πεπερασμένα· ὅταν γὰρ ἐκ γῆς ὕδωρ γένηται, ἀφῄρηταί τι τῆς γῆς, εἴπερ * ἐκκρίσει ἡ γένεσις· καὶ πάλιν ὅταν ἐκ τῆς ὑπολειπομένης, ὡσαύτως. εἰ μὲν οὖν ἀεὶ τοῦτ' ἔσται, συμβήσεται ἐν τῷ πεπερασμένῳ ἄπειρα ἐνυπάρχειν. ἐπεὶ δὲ τοῦτ' ἀδύνατον, οὐκ ἂν ἀεὶ γίγνοιτο ἐξ ἀλλήλων· ὅτι μὲν οὖν οὐκ ἔστι τῇ ἐκκρίσει ἡ εἰς ἄλληλα μετάβασις, εἴρηται. λείπεται δὴ εἰς ἄλληλα μεταβάλλοντα γίνεσθαι· τοῦτο δὲ διχῶς· ἢ γὰρ τῷ μετασχηματίζεσθαι, καθάπερ ἐκ τοῦ αὐτοῦ κηροῦ γένοιτ' ἂν σφαῖρα * καὶ κύβος· ἢ τῷ διαλύεσθαι τῷ εἰς τὰ ἐπίπεδα, καθάπερ ἔνιοί φασιν. εἰ μὲν οὖν τῷ μετασχηματίζεσθαι γὰρ, συμβαίνει ἐξ ἀνάγκης ἄτομα λέγειν τὰ σώματα. διαιρετῶν γὰρ ὄντων, οὐκ ἔσται τὸ τοῦ πυρὸς μέρος πῦρ, οὐδὲ τὸ τῆς γῆς γῆ, διὰ τὸ μὴ εἶναι μήτε τὸ τῆς πυραμίδος μέρος πάντως πυραμίδα, μήτε τὸ τοῦ κύβου κύβον· εἰ δὲ τῇ τῶν ἐπιπέδων διαλύσει, πρῶτον μὲν ἄτοπον, τὸ μὴ πάντα γεννᾶν ἐξ ἀλλήλων, ὅπερ ἀνάγκη λέγειν αὐτοῖς, καὶ μὴ λέγουσιν. οὔτε γὰρ εὔλογον ἓν μόνον ἄμοιρον γενέσθαι τῆς μεταβάσεως, οὔτε φαίνεται κατὰ τὴν αἴσθησιν· ἀλλ' ὁμοίως ἅπαντα * μεταβάλλειν εἰς ἄλληλα. συμβαίνει δὲ περὶ τῶν φαινομένων λέγουσι, μὴ ὁμολογούμενα λέγειν τοῖς φαινομένοις. τούτου δὲ αἴτιον τὸ μὴ καλῶς λαβεῖν τὰς πρώτας ἀρχὰς, ἀλλὰ πάντα βούλεσθαι πρός τινας δόξας ὡρισμένας ἀνάγειν· δεῖ γὰρ ἴσως τῶν μὲν αἰσθητῶν αἰσθητὰς, τῶν δὲ ἀϊδίων ἀϊδίους, τῶν δὲ φθαρτῶν φθαρτὰς εἶναι τὰς ἀρχὰς, ὅλως δὲ ὁμογενεῖς τοῖς ὑποκειμένοις. οἱ δὲ διὰ τὴν τούτων φιλίαν ταὐτὸ ποιεῖν ἐοίκασι τοῖς τὰς θέσεις ἐν τοῖς λόγοις διαφυλάττουσιν. ἅπαν γὰρ ὑπομένουσι τὸ συμβαῖνον, ὡς ἀληθεῖς ἔχοντες ἀρχάς· ὥσπερ οὐκ ἐνίας δέον κρίνειν ἐκ τῶν ἀποβαινόντων, καὶ μάλιστα ἐκ τοῦ τέλους. τέλος δὲ τῆς μὲν ποιητικῆς ἐπιστήμης, τὸ ἔργον· τῆς δὲ φυσικῆς, τὸ φαινόμενον ἀεὶ κυρίως κατὰ τὴν αἴσθησιν. συμβαίνει δ' αὐτοῖς τὴν γῆν μάλιστα εἶναι στοιχεῖον, καὶ μόνην ἄφθαρτον,

* γ. ἐκκρίσει

* γ. κῶνος.

* γ. μεταβάλλειν

A ſoluunt, an alius quiſpiam ſit præter hos modus. Empedoclem igitur & Democritum præterit, non generationem ſe mutuam, ſed apparentem facere generationem. Ineſſe enim quæque ac ſegregari dicunt, quaſi è vaſe ſit ipſa generatio, ſed non è materia quadam: neque generari per mutationem. Deinde ſi hoc etiam modo ſit generatio, non minùs ea quæ eueniunt, ſunt abſurda. Eadem enim magnitudo ſi denſetur, grauior fieri non videtur. At hoc dicant ij qui aquam ineſſe in aere, & inde ſegregari dicunt, neceſſe eſt: cùm enim aqua ex aere eſt orta, grauior eſt. Præterea, corporum miſtorum alterum ſeparatum, non neceſſe eſt locum ſemper occupare maiorem. At cùm oritur aer ex aqua, maiorem

B occupat locum. Quod enim ſubtiliorum eſt partium, id maiorem occupat locum. Patet autem hoc & in ipſa migratione. Euaporante enim humido, ſpiritúque turgente, ea vaſa quæ moles continent, ob anguſtiam rumpi videntur. Quare ſi vacuum omnino non eſt, nec extenduntur corpora, vt ij qui hæc dicunt, inquiunt, ipſum impoſſibile patet. Sin vacuum eſt, & extenſio, vacat hoc porrò ratione, id (inquam) quod ſeparatur, maiorem ſemper locum neceſſariò occupare. Generationem etiam mutuam deficere tandem neceſſe eſt, ſi finita in magnitudine infinita, finita non inſint. Cùm enim ex terra fit aqua, ex terra aliquid aufertur, ſi generatio eſt ſegrega-

C tio: & iterum cùm è reliqua ſimili modo oritur aqua. Si igitur hoc ſemper erit, eueniet in corpore finito ineſſe infinita. Cùm autem hoc impoſſibile ſit, non ſemper ex ſeſe mutuò generabuntur. Dictum eſt igitur, elementorum migrationem in ſeſe mutuam, ſegregationem non eſſe. Reſtat autem, ipſa mutationem ſubeuntia in ſeſe, mutuò generari. Atque hoc dupliciter. Aut enim transfiguratione, vt ex eadem cera pila fit teſſeráve. aut diſſolutione in plana, vt quidam aiunt. At ſi transfiguratione generantur, fit vt ipſa corpora neceſſariò indiuidua eſſe dicantur. Si enim diuiſibilia ſint, ignis pars, ignis non erit, neque terræ pars, terra, propterea quod pyramidis pars, pyramis non eſt, neque teſſeræ, teſſera. Sin diſſolutione

D planorum, primò quidem abſurdum eſt, non omnia ex ſeſe mutuò generare. Quod quidem ipſos dicere neceſſe eſt: atque non dicunt. Neque enim conſentaneum eſt rationi, vnam partem expertem eſſe migrationis, neque per ſenſum videtur, ſed omnia in ſeſe mutari videntur mutuò. Accidit autem eos de hiſce quæ apparent, dicentes, non conſentanea hiſce dicere, quæ apparent. Huius autem cauſa eſt, non bene prima principia capere, ſed omnia ad opiniones definitas quaſdam reducere velle. Senſibilium enim principia fortaſſe ſenſibilia ſint, perpetuorum perpetua, corruptibilium corruptibilia, & omnino ſub eodem

E ſint genere, ſub quo ſubiecta collocantur, oportet. Hi vero propter horum amorem idem facere videntur, quod ij faciunt qui poſitiones in rationibus conſeruant. Omne enim quod accidit, tolerant, vt habentes principia vera, perinde quaſi non ex hiſce quæ eueniunt nonnulla, maximéque ex fine diiudicare oporteret. Eſt autem finis effectiuæ quidem ſcientiæ, ipſum opus: naturalis autem, id quod ſemper propriè per ſenſus apparet. Accidit autem ipſis terram elemẽtum maximè eſſe, ſolámque incorruptibilem, ſi id quod indiſſolubile eſt,

incorruptibile eſt, ac elementum. Terra enim ſola in aliud corpus indiſſolubilis eſt. At verò neque in hiſce, quæ diſſoluuntur, triangulorum iuſta ſuſpenſio conſona eſt rationi. Fit autem & hoc in migratione, qua in ſeſe mutuò migrant, propterea quòd ex inæqualibus multitudine triangulis conſtat. Præterea, ij qui hæc dicunt, non è corpore faciant generationem neceſſe eſt. Cùm enim ex planis fuerit ortum, non è corpore erit ortum. Inſuper, non omne corpus diuiſibile ſit, ſed exactiſſimis ſcientiis aduerſentur, neceſſe eſt. Illæ enim & ipſum intelligibile, diuiſibile accipiunt. At hi neque omne ſenſibile diuiſibile eſſe concedunt, propterea quòd ſuppoſitionem ſuam ſeruare volunt. Qui namque figuram cuique tribuunt elemento, & hac ſubſtantias ipſorum diſtingunt, ij indiuiſibilia faciant ipſa neceſſe eſt. Pyramide enim, aut pila aliquo modo diuiſa, non erunt ea quæ reſtant, pyramis, aut pila. Quare aut pars ignis non ignis eſt, ſed erit quid elemento prius, propterea quòd omne corpus elementum eſt, aut ex elementis conſtat: aut non omne corpus diuiſibile eſt.

CAPVT VIII.

Quòd figuras præter rationem accommodent elementis, velut igni ſphæram, aut pyramidem, reliquis alias: quódque nec ob motum, neque aliam affectionem vllam ſint accommodandæ.

OMnino autem eniti ſimplicibus corporibus figuras tribuere, metas egreditur rationis. Primò quidem, quia accidet non repleri totum. In planis autem tres figuræ complere locum videntur, triangulus, quadratum, & ſex angulorum figura: in ſolidis autem duæ ſolæ, pyramis, atque teſſera. Plures autem hiſce ſumantur neceſſe eſt, quia plura faciunt elementa. Deinde corpora ſimplicia vniuerſa, figuram ſuſcipere in loco continenti videntur, & maximè aqua, & aër. Permanere igitur elementi figuram, impoſſibile eſt. Non enim totum tangeret omni ex parte id quod continet ipſum. At ſi in aliam vertetur figuram, non vlteriùs erit aqua, ſi ipſa differebat figura. Quare patet, figuras horum definitas non eſſe. Sed natura hoc ipſum nobis declarare videtur, quod & conſentaneum eſt rationi. Nam vt & in cæteris informe ſubiectum ipſum eſſe oportet, (maximè enim hoc pacto id quod omnia ſuſcipit, formari, figuráſque ſuſcipere poteſt, vt in Timæo eſt ſcriptum) ſic elementa, vt materiam compoſitorum eſſe, putare oportet. Quapropter & mutari in ſeſe mutuò poſſunt, cùm per affectus ipſorum differentiæ ſeparantur. Inſuper quonam modo generari caro, & os, aut quoduis compoſitorum corporum poteſt? Neque enim ex elementis ipſis, quia non fit ex compoſitione continuum, neque ex planis compoſitionem ſubeuntibus. Ipſa enim elementa compoſitione generantur: & non ea quæ ex elementis conſtant. Quare ſi quiſpiam exactè tales ſententias conſiderare voluerit, & non ſine exacta diſcuſſione probare, ac acceptare, generationem ex hiſce, quæ ſunt, haſce tollere profectò videbit. At verò & ad affectus, & potentias, atque motus, figuræ non ſunt accommodatæ corporibus, in quæ maximè reſpicientes, hoc pacto figuras ipſas diſtribuêre. Veluti cùm ignis facilè ſit mobilis, & calefaciat, ac vrat, quidã ſphæram, quidã pyramidem ipſum fecerunt.

A εἴπερ τὸ ἀδιάλυτον ἄφθαρτόν τέ ἐστι καὶ στοιχεῖον. ἡ γὰρ γῆ μόνη ἀδιάλυτος εἰς ἄλλο σῶμα. ἀλλὰ μὴν οὐδ' ἐν τοῖς διαλυομένοις ἡ τῶν τριγώνων παραίωρησις εὔλογος. συμβαίνει δὲ καὶ τοῦτο ἐν τῇ εἰς ἄλληλα μεταβάσει διὰ τὸ ἐξ ἀνίσων τῷ πλήθει συνεστάναι τριγώνων. ἔτι δὲ ἀνάγκη τοῖς ταῦτα λέγουσιν, οὐκ ἐκ σώματος ποιεῖν τὴν γένεσιν. ὅταν γὰρ ἐξ ἐπιπέδων γένηται, οὐκ ἐκ σώματος ἔσται γεγονός. πρὸς δὲ τούτοις ἀνάγκη μὴ πᾶν σῶμα εἶναι λέγειν διαιρετόν, ἀλλὰ μάχεσθαι ταῖς ἀκριβεστάταις ἐπιστήμαις· αἱ μὲν γὰρ καὶ τὸ νοητὸν λαμβάνουσι διαιρετόν, αἱ * μαθηματικαί· οἱ δὲ οὐδὲ τὸ αἰσθητὸν ἅπαν συγχω- * γρ. μαθητικαί.
B ροῦσι, διὰ τὸ βούλεσθαι σώζειν τὴν ὑπόθεσιν. ἀνάγκη γὰρ ὅσοι σχῆμα ποιοῦσιν ἑκάστου τῶν στοιχείων, καὶ τούτῳ διορίζουσι τὰς οὐσίας αὐτῶν, ἀδιαίρετα ποιεῖν αὐτά. τῆς γὰρ πυραμίδος ἢ τῆς σφαίρας διαιρεθείσης πως, οὐκ ἔσται τὸ λειπόμενον σφαῖρα ἢ πυραμίς. ὥστε ἢ τὸ τοῦ πυρὸς μέρος οὐ πῦρ, ἀλλ' ἔσται τι πρότερον τοῦ στοιχείου, διὰ τὸ πᾶν εἶναι ἢ στοιχεῖον, ἢ ἐκ στοιχείων, ἢ οὐχ ἅπαν σῶμα διαιρετόν.

ΚΕΦΑΛ. η'.

Ὅτι οὐ τοῖς σχήμασι διαφέρει τὰ στοιχεῖα.

C Ὅλως δὲ τὸ πειρᾶσθαι τὰ ἁπλᾶ σώματα σχηματίζειν, ἄλογόν ἐστι· πρῶτον μέν, ὅτι συμβήσεται μὴ ἀναπληροῦσθαι τὸ ὅλον. ἐν μὲν γὰρ τοῖς ἐπιπέδοις τρία σχήματα δοκεῖ συμπληροῦν τὸν τόπον, τρίγωνον καὶ τετράγωνον καὶ ἑξάγωνον· ἐν δὲ τοῖς στερεοῖς δύο μόνα, πυραμὶς καὶ κύβος. ἀνάγκη δὲ πλείω τούτων λαμβάνειν, διὰ τὸ πλείω τὰ στοιχεῖα ποιεῖν. ἔπειτα φαίνεται πάντα μὲν τὰ ἁπλᾶ σώματα σχηματιζόμενα τῷ περιέχοντι τόπῳ, μάλιστα δὲ τὸ ὕδωρ καὶ ὁ ἀήρ. διαμένειν μὲν οὖν τὸ τοῦ στοιχείου σχῆμα, ἀδύνατον· οὐ γὰρ ἂν ἥπτετο πάντῃ τοῦ περιέχοντος τὸ ὅλον. ἀλλὰ μὴν εἰ μεταρρυθμισθήσεται,
D οὐκ ἔτι ἔσται ὕδωρ, εἴπερ τῷ σχήματι διέφερεν. ὥστε φανερὸν ὅτι οὐκ ἔστιν ὡρισμένα τὰ σχήματα * αὐτῶν. ἀλλ' ἔοικεν * γρ. τούτων.
ἡ φύσις αὐτὴ τοῦτο σημαίνειν ἡμῖν, ὃ καὶ κατὰ λόγον ἐστίν. ὥσπερ γὰρ καὶ ἐν τοῖς ἄλλοις, ἀειδὲς καὶ ἄμορφον δεῖ τὸ ὑποκείμενον εἶναι. μάλιστα γὰρ ἂν οὕτω δύναιτο * μεταρρυθμίζεσθαι, καθάπερ ἐν τῷ Τιμαίῳ γέγραπται, τὸ πανδεχές. * γρ. ῥυθμίζεσθαι.
οὕτω καὶ τὰ στοιχεῖα δεῖ νομίζειν, ὥσπερ ὕλην εἶναι τοῖς συνθέτοις. διὸ καὶ δύναται μεταβάλλειν εἰς ἄλληλα, χωριζομένων τῶν κατὰ τὰ πάθη διαφορῶν. πρὸς δὲ τούτοις, πῶς ἐνδέχεται γενέσθαι σάρκα καὶ ὀστοῦν, ἢ ὁτιοῦν τῶν * συνεχῶν σωμάτων; οὔτε γὰρ ἐξ αὐτῶν τῶν στοιχείων * γρ. συνθέτων.
E ἐγχωρεῖ, διὰ τὸ μὴ γίνεσθαι συνεχὲς ἐκ τῆς συνθέσεως, οὔτε ἐκ τῶν ἐπιπέδων συντιθεμένων· τὰ γὰρ στοιχεῖα γίνεται τῇ συνθέσει, καὶ οὐκ ἐκ τῶν στοιχείων. ὥστε ἐάν τις ἀκριβολογεῖσθαι βούληται, καὶ μὴ ἐκ παρόδου τοὺς λόγους ἀποδέχεσθαι * τοὺς τοιούτους, ἀναιροῦντας ὄψεται * γρ. τῶν στοιχείων, ταῖς
τὴν γένεσιν ἐκ τῶν ὄντων. ἀλλὰ μὴν καὶ πρὸς τὰ πάθη γε, καὶ τὰς δυνάμεις, καὶ τὰς κινήσεις, ἀσύμφωνα τὰ σχήματα τοῖς σώμασιν, εἰς ἃ μάλιστα βλέψαντες οὕτω διένειμαν. οἷον, ἐπεὶ τὸ πῦρ εὐκίνητόν ἐστι, καὶ θερμαντικόν, καὶ καυστικόν, οἱ μὲν ἐποίησαν αὐτὸ σφαῖραν, οἱ δὲ πυραμίδα.

ταῦτα γὰρ εὐκινητότατα μὲν, διὰ τὸ ἐλαχίστων ἅπτεσθαι, καὶ ἥκιστα βεβηκέναι· θερμαντικώτατα δὲ καὶ καυστικώτατα, διότι τὸ μὲν ὅλον ἐστὶ γωνία, τὸ δὲ ὀξυγωνιώτατον· καίει δὲ καὶ θερμαίνει ταῖς γωνίαις [ὡς] φασί. πρῶτον μὲν οὖν κατὰ τὴν κίνησιν, ἀμφότεροι διημαρτήκασιν· εἰ γὰρ καὶ ἔστιν εὐκινητότατα ταῦτα τῶν σχημάτων, ἀλλ' οὐ τὴν τοῦ πυρὸς κίνησιν εὐκίνητα. ἡ μὲν γὰρ τοῦ πυρὸς ἄνω καὶ κατ' εὐθεῖαν. ταῦτα δὲ εὐκίνητα * κύκλου, τὴν καλουμένην κύλισιν. ἔπειτ', εἰ ἔστιν ἡ γῆ κύβος, διὰ τὸ βεβηκέναι καὶ μένειν· μένει δ' οὐχ ὃ ἔτυχεν, ἀλλ' ἐν τῷ αὐτῆς τόπῳ· ἐκ δὲ τοῦ ἀλλοτρίου φέρεται μὴ κωλυομένη· καὶ τὸ πῦρ δὲ καὶ τὰ ἄλλα ὡσαύτως· δῆλον ὅτι καὶ τὸ πῦρ, καὶ ἕκαστον τῶν στοιχείων, ἐν μὲν τῷ ἀλλοτρίῳ τόπῳ σφαῖρα ἔσται ἢ πυραμίς, ἐν δὲ τῷ οἰκείῳ κύβος. ἔτι δὲ, εἰ θερμαίνει καὶ καίει τὸ πῦρ διὰ τὰς γωνίας, πάντα τὰ στοιχεῖα ἔσται θερμαντικά· μᾶλλον δ' ἴσως ἕτερον ἑτέρου· πάντα γὰρ ἔχει γωνίας, οἷον, τὸ ὀκτάεδρον, καὶ τὸ δωδεκάεδρον. Δημοκρίτῳ δὲ καὶ ἡ σφαῖρα ὡς γωνία τις οὖσα καίει· ὥστε διοίσει τῷ μᾶλλον καὶ ἧττον. τοῦτο δ' ὅτι ψευδὲς, φανερόν. ἅμα δὲ συμβήσεται καὶ τὰ μαθηματικὰ σώματα καίειν καὶ θερμαίνειν· (ἔχει γὰρ κἀκεῖνα γωνίας, καὶ ἔνεισιν ἐν αὐτοῖς * ἄτομοι, καὶ σφαῖραι καὶ πυραμίδες·) ἄλλως τε καὶ εἰ ἔστιν ἄτομα μεγέθη, καθάπερ φασίν· εἰ γὰρ τὰ μὲν, τὰ δὲ μή, λεκτέον τὴν διαφοράν, ἀλλ' οὐχ ἁπλῶς οὕτω λεκτέον ὡς λέγουσιν. ἔτι, εἰ * τὸ καιόμενον πυροῦται, τὸ δὲ πῦρ σφαῖρά ἐστιν ἢ πυραμίς, ἀνάγκη τὸ καιόμενον γίγνεσθαι σφαίρας ἢ πυραμίδας. τὸ μὲν οὖν τέμνειν καὶ τὸ διαιρεῖν οὕτως, ἔστω κατὰ λόγον συμβαῖνον τῷ σχήματι· τὸ δ' ἐξ ἀνάγκης τὴν πυραμίδα πυραμίδας ποιεῖν, ἢ τὴν σφαῖραν σφαίρας, παντελῶς ἄλογον· καὶ ὅμοιον ὥσπερ εἴ τις ἀξιοίη τὴν μάχαιραν εἰς μαχαίρας διαιρεῖν, ἢ τὸν πρίονα εἰς πρίονας. ἔτι δὲ γελοῖον, πρὸς τὸ διαιρεῖν μόνον ἀποδοῦναι τὸ σχῆμα τῷ πυρί· δοκεῖ γὰρ μᾶλλον συγκρίνειν, καὶ συνορίζειν, ἢ διακρίνειν· διακρίνει μὲν γὰρ τὰ μὴ ὁμόφυλα, συγκρίνει δὲ τὰ ὁμόφυλα. καὶ ἡ μὲν σύγκρισις καθ' αὑτό ἐστι. τὸ γὰρ συνορίζειν καὶ ἑνοῦν, τοῦ πυρός· ἡ δὲ διάκρισις, κατὰ συμβεβηκός· συγκρῖνον γὰρ τὸ ὁμόφυλον * ἐξαιρεῖ τὸ ἀλλότριον. ὥστ' ἢ πρὸς ἄμφω ἐχρῆν ἀποδοῦναι, ἢ μᾶλλον ἐπὶ τὸ συγκρίνειν· πρὸς δὲ τούτοις, ἐπεὶ τὸ θερμὸν καὶ τὸ ψυχρὸν ἐναντία τῇ δυνάμει, ἀδύνατον ἀποδοῦναι τῷ ψυχρῷ σχήματι, διὰ τὸ δεῖν μὲν ἐναντίον εἶναι τὸ ἀποδιδόμενον, μηδὲν δὲ ἐναντίον εἶναι σχήματι. διὸ καὶ πάντες ἀπολείπουσι τοῦτο· καίτοι προσῆκεν ἢ πάντα ἀφορίσαι σχήμασιν, ἢ μηδέν. ἔνιοι δὲ περὶ τῆς δυνάμεως αὐτοῦ πειραθέντες εἰπεῖν, ἐναντία λέγουσιν αὐτοὶ ἑαυτοῖς. φασὶ γὰρ ψυχρὸν εἶναι τὸ μεγαλομερὲς διὰ τὸ συνθλίβειν καὶ μὴ διιέναι διὰ τῶν πόρων. δῆλον τοίνυν ὅτι καὶ τὸ θερμὸν ἂν εἴη τὸ διιόν. τοιοῦτον δ' ἂν εἴη τὸ λεπτομερές. ὥστε συμβαίνει μικρότητι καὶ μεγέθει διαφέρειν τὸ θερμὸν καὶ τὸ ψυχρὸν, ἀλλ' οὐ τοῖς σχήμασιν. ἔτι δ', εἰ ἄνισοι αἱ πυραμίδες, αἱ μεγάλαι ἂν εἶεν οὐ πῦρ, οὐδὲ αἴτιον τὸ σχῆμα τοῦ καίειν, ἀλλὰ τοὐναντίον. ὅτι μὲν οὖν οὐ τοῖς σχήμασι διαφέρει τὰ στοιχεῖα, φανερὸν ἐκ τῶν εἰρημένων. ἐπεὶ δὲ κυριώταται διαφοραὶ τῶν σωμάτων,

* γρ. κύκλῳ,

* γρ. ἄτ. οἱ κύβοι,

* γρ. τὰ καιόμενα,

* γρ. ἐξαίρει

A Hæc enim facillimè quidem mouentur, propterea quòd minima tangunt, miniméque ſtabilia ſunt: maximè verò calefaciunt, maximéque vrunt, quòd alterum totum angulus eſt, alterum acutiſſimum angulum habet. Angulis autem calefaciunt, vt aiunt, ac vrunt. Primùm igitur, vtrique de motu peccarunt. Nam tametſi figurarum hæ facillimè mobiles ſunt, non tamen ignis motu facilè mobiles ſunt. Motus enim ignis ad ſupera fit, atque recta: hæ verò facilè ea motione mobiles ſunt, quæ volutio nuncupatur. Deinde ſi terra ideo teſſera eſt, quia ſtabilis eſt, atque manet, non autem vbiuis, ſed ſuo in loco manet, ex alieno verò fertur, niſi prohibeatur: & ignis etiam, & cætera ſimili

B modo: patet, & ignem, & elementorum quodque in alieno quidem loco ſphæram, aut pyramidem quidem eſſe, in proprio verò cubum. Præterea, ſi ignis ob angulos calefacit, ac vrit, vniuerſa elementa calefaciunt ſanè, aliud tamẽ alio forſitan magis. Vniuerſa enim angulos habent, vt id quod duodecim ſedium eſt. Democriti verò ſententiâ ſphæra etiam vrit, quia quidam angulus eſt. Quare maiore different, minoréque gradu: hoc autem falſum eſſe patet. Simul etiam accidet, & mathematica corpora calefacere, vrereque (& illa namque angulos habent, & in ipſis indiuidua, & ſphæræ, & cubi, & pyramides inſunt) præſertim ſi ſint indiuiduæ magnitudines, vti dicunt. Nam ſi illa quidem vrunt,

C illa verò non vrunt, differentia eſt dicenda. Sed non ſic ſimpliciter dicendum eſt, vti dicunt. Præterea, ſi id quod vritur, ignitur, & ignis, aut ſphæra aut pyramis eſt: ea quæ comburuntur, pyramidem fieri, aut ſphæram, neceſſe eſt. Incidere igitur, atque diuidere, ſit accidens per rationem figuræ: pyramidem verò neceſſariò pyramides facere, vel ſphæram ſphæras, à metis penitus egreditur rationis: ſimileque eſt atque ſi quiſpiam gladium in gladios id quod diuidit, diuidere cenſeat, aut ſerram in ſerras. Præterea, ad diuidendum ſolùm igni figuram reddere, ridiculum eſſe videtur. Ignis enim congregare magis, fineſque in vnũ redigere, quàm ſegregare videtur. Segregat enim ea quæ non eiuſ-

D dem generis ſunt: congregat autem ea quæ ſub eodem genere collocantur. Et congregatio quidem per ſe eſt (fines enim in vnum cogere atque vnire, ignis ipſius eſt) ſegregatio verò, per accidens. Congregans enim id quod ſub eodem eſt genere, id quod alienum eſt, excipit. Quare aut ad vtrumque aut potiùs ad congregãdum, figuram igni reddere oportebat. Inſuper cum calidum frigidúmque potentia ſint contraria, reddere frigido figuram aliquam impoſſibile eſt, propterea quòd reddere quidem contrariam figuram oportet. Nihil autem cõtrarium eſt figuræ. Quapropter & omnes omittunt hoc: & tamen aut omnia figuris, aut nihil definire oportebat. Nonnulli autẽ de potentia ipſius dicere

E conati, ſibi ipſis contraria dicunt. Frigidũ enim id inquiunt eſſe quod magnarũ partiũ eſt, propterea quòd premit, & per meatus nõ tranſit. Patet igitur, & calidũ id eſſe, quod tranſit: tale autẽ id erit quod partiũ ſubtiliũ eſt. Quare fit vt paruitate magnitudineq; frigidũ differat, calidúmque, ſed nõ figuris. Præterea, ſi pyramides ſint inæquales, magnæ non ignis erũt, neq; figura erit vrẽdi cauſa, ſed cõtrariũ. Nõ differre igitur elemẽta figuris, ex iiſque diximꝰ, patuit. Cùm autẽ propriiſſimæ differentiæ corporũ

per affectus ſint, & operationes, atque potentias, (cuiuſque enim corporis naturalis opera, affectus potentiáſque dicimus eſſe) primùm de his eſt dicendum, vt poſt horum contemplationem; cuiuſque differentias ad vnumquodque ſumamus.

A αὐτὰ κατὰ τὰ πάθη, καὶ τὰ ἔργα, καὶ τὰς δυνάμεις (ἑκάστου γὰρ εἶναι* φαμὲν τῶν φύσει καὶ ἔργα, καὶ πάθη, καὶ δυνάμεις) πρῶτον ἂν εἴη περὶ τούτων λεκτέον, ὅπως θεωρήσαντες ταῦτα, λάβωμεν τὰς ἑκάστου πρὸς ἕκαστον διαφοράς. * Initio lib.

ARISTOTELIS STAGIRITÆ, DE CÆLO LIBER IV.

CAPVT I.

Quid ſit graue, & quid leue, & quæ vtriuſque natura.

DE graui autem atque leui, quid eſt vtrumque, & quænam eſt natura ipſorum, conſideremus oportet: & propter quam cauſam haſce potentias habent. Contemplatio enim de ipſis, ſermonibus eſt accommodata de motu. Graue enim & leue ex eo dicimus, quia aliquo modo naturaliter moueri poteſt: operationibus autem ipſorum nomina poſita non ſunt, niſi quiſpiam putet tale eſſe ipſum momentum. Quia verò naturalis tractatio eſt de motu, hæc autem motus quaſi fomenta quædam in ſe ipſis habent: ideo vniuerſi quidem potentiis ipſorum vtuntur: non tamen niſi pauci definiuêre. Viſis igitur hiſce primùm quæ ab aliis dicta ſunt, allátis etiam dubitationibus, quæ ad hanc conſiderationem ſunt neceſſariæ, id deinde dicamus quod nobis de ipſis videtur. Grauia leuiáque, partim ſimpliciter partim ad aliud dicũtur. Eorum enim quæ pondus habent, aliud leuius aliud grauius dicimus eſſe, vt æs, grauius dicimus ligno. De his igitur quæ abſolutè dicuntur, nihil à veteribus dictum eſt, ſed de hiſce quæ ad aliud dicuntur. Non enim dicunt quid eſt ipſum leue, ſed quid eſt ipſum grauius, & quid ipſum leuius in hiſce quæ pondus habent. Id autem, quod dicimus, magis dilucidum hoc pacto fiet. Quædam enim à medio ſemper, quædam ad medium ſemper apta ſunt ferri. Horum autem id quidem quod à medio fertur, ſurſum: id autem quod ad medium fertur, deorſum dicimus ferri. Abſurdum eſt enim, in cælo non exiſtimare aliquid ſupra, aliquid infra eſſe, quemadmodum quidam cenſent. Non enim eſſe aliud ſuperum, aliud inferum dicunt, ſi omni ex parte ſimile eſt, & vndique quiſque gradiens aduerſis ipſe ſibi pedibus erit. Nos autem ipſum vniuerſi extremum, ſupra dicimus, quod quidem & poſitione eſt ſupra, & ipſa natura primum. Cùm autem ipſius cæli & quid extremum & medium ſit, patet & ſupra eſſe, ac infra, quemadmodum & multi dicunt, verùm non ſatis. Huius autem cauſa eſt, cælum ipſos non omni ex parte ſimile eſſe, ſed vnum tantùm id hemiſphærium eſſe, quod ſupra nos eſt, putare. Quòd ſi ſumpſerunt cælum omni ex parte tale, & medium ad vniuerſum ſimiliter habere, illud quidem ſuperum, medium autem inferum eſſe dicent. Id igitur abſolutè dicimus leue, quod ſurſum ad extremúmque fertur: id graue, quod ſimpliciter deorſum atque ad medium fertur. Ad aliud autem leue ac leuius, id eſſe dicimus quod aliquò natura deorſum celerius fertur, vtriſque pondus habentibus, æqualémque molem.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ οὐρανοῦ τῶν εἰς Δ, τὸ Δ.

ΚΕΦΑΛ. α'.

B Τί τὸ βαρὺ καὶ τὸ κοῦφον.

ΠΕΡΙ δὲ βαρέος καὶ κούφου, τί τ' ἐστὶν ἑκάτερον, καὶ τίς ἡ φύσις αὐτῶν, σκεπτέον, καὶ διὰ τίνα αἰτίαν ἔχουσι τὰς δυνάμεις ταύτας. ἔστι γὰρ ἡ περὶ αὐτῶν θεωρία, τοῖς περὶ κινήσεως λόγοις οἰκεία. βαρὺ γὰρ καὶ κοῦφον τῷ δύνασθαι κινεῖσθαι φυσικῶς πως, λέγομεν· ταῖς δὲ ἐνεργείαις ὀνόματα αὐτῶν οὐ κεῖται· πλὴν εἴ τις οἴοιτο, τὴν ῥοπὴν εἶναι τοιοῦτον. διὰ δὲ τὸ τὴν φυσικὴν μὲν εἶναι πραγματείαν περὶ κινήσεως, ταῦτα δ' ἔχειν ἐν ἑαυτοῖς οἷον ζώπυρ' ἄττα κινήσεως, πάντες μὲν χρῶνται ταῖς δυνάμεσιν αὐτῶν· οὐ μὴν διωρίκασί γε, πλὴν ὀλίγοι. ἰδόντες οὖν πρῶτον τὰ παρὰ τῶν ἄλλων εἰρημένα, καὶ διαπορήσαντες ὅσα πρὸς τὴν σκέψιν ταύτην διελεῖν ἀναγκαῖον, οὕτω καὶ τὸ φαινόμενον ἡμῖν εἴπωμεν περὶ αὐτῶν. λέγεται δὴ τὸ μὲν ἁπλῶς βαρὺ καὶ κοῦφον, τὸ δὲ πρὸς ἕτερον· τῶν γὰρ ἐχόντων βάρος φαμὲν τὸ μὲν εἶναι κουφότερον, τὸ δὲ βαρύτερον, οἷον ξύλου χαλκόν. περὶ μὲν οὖν τῶν ἁπλῶς λεγομένων, οὐδὲν εἴρηται παρὰ τῶν πρότερον· περὶ δὲ τῶν πρὸς ἕτερον. οὐ γὰρ λέγουσι τί ἐστι τὸ βαρὺ, καὶ τί τὸ κοῦφον, ἀλλὰ τί τὸ βαρύτερον, καὶ τί τὸ κουφότερον ἐν τοῖς ἔχουσι βάρος. D μᾶλλον δ' ἔσται δῆλον τὸ λεγόμενον, ὧδε· τὰ μὲν γὰρ ἀεὶ πέφυκεν ἀπὸ τοῦ μέσου φέρεσθαι, τὰ δὲ, ἀεὶ πρὸς τὸ μέσον. τούτων δὲ τὸ μὲν ἀπὸ τοῦ μέσου φερόμενον, ἄνω* λέγω φέρεσθαι, κάτω δὲ, τὸ πρὸς τὸ μέσον. * γρ. λέγομεν ἄτοπον γὰρ τὸ μὴ νομίζειν εἶναί τι ἐν τῷ οὐρανῷ, τὸ μὲν ἄνω, τὸ δὲ κάτω, καθάπερ τινὲς ἀξιοῦσιν· οὐ γὰρ εἶναι τὸ μὲν ἄνω, τὸ δὲ κάτω φασὶν, εἴπερ πάντῃ ὅμοιός ἐστι, καὶ πάντοθεν ἀντίπους ἔσται, πορευόμενος ἕκαστος αὐτὸς αὐτῷ. ἡμεῖς δὲ τὸ τοῦ παντὸς ἔσχατον ἄνω λέγομεν, ὃ καὶ κατὰ τὴν θέσιν ἐστὶν ἄνω, καὶ τῇ φύσει πρῶτον. ἐπεὶ δέ ἐστί τι τοῦ οὐρανοῦ ἔσχατον καὶ μέσον, δῆλον ὅτι ἔσται καὶ ἄνω καὶ κάτω, ὥσπερ καὶ οἱ πολλοὶ λέγουσι, πλὴν οὐχ ἱκανῶς. τούτου δ' αἴτιον, E ὅτι νομίζουσιν οὐχ ὅμοιον εἶναι πάντῃ τὸν οὐρανὸν, ἀλλ' ἓν εἶναι μόνον τὸ ὑπὲρ ἡμᾶς ἡμισφαίριον. ἐπεὶ προσυπολαβόντες καὶ κύκλῳ τοιοῦτον, καὶ τὸ μέσον ὁμοίως ἔχειν πρὸς ἅπαν, τὸ μὲν ἄνω φήσουσιν εἶναι, τὸ δὲ μέσον, κάτω. ἁπλῶς μὲν οὖν κοῦφον λέγομεν τὸ ἄνω φερόμενον, καὶ πρὸς τὸ ἔσχατον· βαρὺ δὲ, τὸ ἁπλῶς κάτω, καὶ πρὸς τὸ μέσον· πρὸς ἄλλο δὲ κοῦφον, καὶ κουφότερον, ὃ δυοῖν ἐχόντων βάρος, καὶ τὸν ὄγκον ἴσον, κάτω φέρεται θάτερον φύσει θᾶττον.

ΚΕΦΑΛ. Ϛ.

Ἔλεγχος τῶν οὐκ ὀρθῶς περὶ βαρέος καὶ κούφου διωρισμένων.

Τῶν δὴ πρότερον ἐλθόντων ἐπὶ τὴν περὶ τούτων σκέψιν, σχεδὸν οἱ πλεῖστοι περὶ τῶν οὕτω βαρέων καὶ κούφων εἰρήκασι * μόνων, ὅσων, ἀμφοτέρων ἐχόντων βάρος, θάτερόν ἐστι κουφότερον. οὕτω δὲ * διελθόντες οἴονται διωρίσθαι καὶ περὶ τοῦ ἁπλῶς κούφου καὶ βαρέος· ὁ δὲ λόγος αὐτοῖς οὐκ ἐφαρμόττει. δῆλον δ' ἔσται τοῦτο μᾶλλον προελθοῦσι. λέγουσι γὰρ τὸ κουφότερον, καὶ βαρύτερον, οἱ μὲν, ὥσπερ ἐν τῷ Τιμαίῳ τυγχάνει γεγραμμένον, βαρύτερον μὲν, τὸ ἐκ πλειόνων τῶν αὐτῶν συνεστός· κουφότερον δὲ, τὸ ἐξ ἐλαττόνων, ὥσπερ μολύβδου μόλυβδος ὁ πλείων βαρύτερος, καὶ χαλκοῦ χαλκός. ὁμοίως δὲ καὶ τῶν ἄλλων τῶν ὁμοειδῶν ἕκαστον. τῇ ὑπεροχῇ γὰρ τῶν ἴσων μερῶν, βαρύτερον ἕκαστόν ἐστι. τὸν αὐτὸν δὴ τρόπον, καὶ ξύλου μόλυβδον φασίν· ἐκ τινῶν γὰρ τ' αὐτῶν εἶναι πάντα τὰ σώματα, καὶ μιᾶς ὕλης· ἀλλ' οὐ δοκεῖν. οὕτω δὲ διωρισμένων, οὐκ εἴρηται περὶ τοῦ ἁπλῶς κούφου καὶ βαρέος. νῦν γὰρ τὸ μὲν πῦρ ἀεὶ κοῦφον, καὶ ἄνω φέρεται· ἡ δὲ γῆ καὶ τὰ γεηρὰ πάντα, κάτω καὶ πρὸς τὸ μέσον. ὥστ' οὐ δι' ὀλιγότητα τῶν τριγώνων, ἐξ ὧν συνεστάναι φασὶν ἕκαστον αὐτῶν, τὸ πῦρ ἄνω φέρεσθαι πέφυκε· τό, τε γὰρ πλεῖον, ἧττον ἂν ἐφέρετο, καὶ βαρύτερον ἂν ἦν, ἐκ πλειόνων ὂν τριγώνων. νῦν δὲ φαίνεται τοὐναντίον· ὅσῳ γὰρ ἂν ᾖ πλεῖον, κουφότερόν ἐστι, καὶ ἄνω φέρεται θᾶττον· καὶ ἄνωθεν δὲ κάτω, τὸ ὀλίγον οἰσθήσεται θᾶττον πῦρ· τὸ δὲ πολὺ, βραδύτερον. πρὸς δὲ τούτοις, ἐπεὶ τὸ μὲν ἐλάττω ἔχον τὰ * ὁμοιογενῆ, κουφότερον εἶναί φασι· τὸ δὲ πλείω, βαρύτερον· ἀέρα δὲ καὶ πῦρ, καὶ ὕδωρ, ἐκ τῶν αὐτῶν εἶναι τριγώνων, ἀλλὰ διαφέρειν ὀλιγότητι, καὶ πλήθει· διὸ τὸ μὲν αὐτῶν εἶναι κουφότερον, τὸ δὲ βαρύτερον, ἔσται τι πλῆθος ἀέρος, ὃ βαρύτερον ὕδατος ἔσται. συμβαίνει δὲ πᾶν τοὐναντίον· ἀεί τε γὰρ ὁ πλείων ἀὴρ ἄνω φέρεται μᾶλλον, καὶ ὅλως ὁτιοῦν μέρος ἀέρος ἄνω φέρεται ἐκ τοῦ ὕδατος. οἱ μὲν οὖν τοῦτον τὸν τρόπον περὶ κούφου καὶ βαρέος διώρισαν. τοῖς δ' οὐχ ἱκανὸν ἔδοξεν οὕτω διελεῖν· ἀλλὰ καίπερ ὄντες ἀρχαιότεροι τῆς νῦν ἡλικίας, καινοτέρως ἐνόησαν περὶ τῶν νῦν λεχθέντων. φαίνεται γὰρ ἔνια τὸν ὄγκον μὲν ἐλάττω τῶν σωμάτων, ὄντα δὲ βαρύτερα. δῆλον οὖν, ὡς οὐχ ἱκανὸν τὸ φάσκειν ἐξ ἴσων συγκεῖσθαι τῶν πρώτων τὰ ἰσοβαρῆ· ἴσα γὰρ ἂν ἦν τὸν ὄγκον. τὰ δὲ πρῶτα καὶ ἄτομα, τοῖς μὲν ἐπίπεδα λέγουσιν, ἐξ ὧν συνέστηκε τὰ βάρος ἔχοντα τῶν σωμάτων, ἄτοπον τὸ φάναι· τοῖς δὲ στερεὰ, μᾶλλον ἐνδέχεται λέγειν, τὸ μεῖζον εἶναι βαρύτερον αὐτῶν. τῶν δὲ συνθέτων, ἐπειδήπερ οὐ φαίνεται τοῦτον ἔχειν ἕκαστον τὸν τρόπον, ἀλλὰ πολλὰ βαρύτερα ὁρῶμεν ἐλάττω τὸν ὄγκον ὄντα, καθάπερ ἐρίου χαλκὸν, ἕτερον τὸ αἴτιον οἴονταί τε καὶ λέγουσιν ἔνιοι. τὸ γὰρ κενὸν ἐμπεριλαμβανόμενον τὰ σώματα κουφίζειν φασὶ, καὶ ποιεῖν ἔστιν ὅτε τὰ μείζω κουφότερα· πλεῖον γὰρ ἔχειν κενόν. διὰ τοῦτο γὰρ καὶ τὸν ὄγκον εἶναι μείζω συγκείμενα πολλάκις ἐξ ἴσων στερεῶν ἢ ἐλαττόνων·

* γρ. μόνον.
* γρ. διελόντες
* γρ. ὁμογενῆ

A

CAPVT II.

Refutatio eorum quæ non rectè ab aliis de graui & leui dicta ſunt.

EOrum igitur qui priùs ad horum conſiderationem venerunt, plurimi penè de leuibus hoc pacto grauibúſque ſolis dixere: quorum alterum, vtriſque pondus habentibus, altero leuius eſt. De hoc autem pacto graui leuique facta conſideratione, de ſimpliciter etiam leui grauique determinatum à ſe fuiſſe putant. Sermo tamen ad ipſa non accommodatur. Hoc autem perſpicuum magis erit, ſi vlterius progrediamur. Quidam enim de leuiore grauioreque ſic dicunt, vt in Timæo eſt ſcriptum, Grauius quidem id eſſe, quod ex eiſdem pluribus conſtat: Leuius autem id quod ex eiſdem paucioribus conſtat: quemadmodum plumbo plumbum, & æs ære maius, grauius eſt. Similiter & vnumquodque cæterorum ſimilium forma. In exceſſione enim æqualium partium, quodque grauius eſt. Eodem modo, lignum & plumbum dicunt. Ex quibuſdam enim eiſdem omnia corpora, & vnâ materiâ eſſe aiunt, ſed non videri. Sic autem definitis, non dictum eſt de ſimpliciter leui ac graui. Nunc enim ignis quidem, ſemper eſt leuis, ſurſumque fertur: terra verò, ac terrea cuncta, deorſum, atque ad medium ipſum. Quare non ob triangulorum paucitatem, ex quibus quodque ipſorum conſtare dicunt, ignis aptus eſt ſurſum ferri. Maior enim minùs vtique moueretur, & grauior eſſet, cùm pluribus ex triangulis conſtet. Nunc autem contrarium ſanè videtur. Quo enim maior eſt, eo leuior eſt, & ſurſum celeriùs fertur. De ſupero etiam loco deorſum paruus ignis celeriùs, & tardiùs magnus fertur. Inſuper, cùm id quod pauciora habet ea quæ ſunt generis eiuſdem, leuius eſſe, id verò quod habet plura, grauius eſſe dicant; aërem autem, & ignem, ac aquam ex eiſdem aſſerant triangulis eſſe, ſed paucitate multitudineque differre, quapropter aliud ipſorum leuius, aliud grauius eſſe: aliqua ſanè multitudo aëris erit, quæ grauior erit aqua. At totum contrarium accidit. Semper enim maior aër, magis ſurſum fertur, & omnino pars quæuis aëris ſurſum ex aqua fertur. Quidam igitur ita de graui leuique definierunt. Quibuſdam autem non ſatis viſum eſt hoc pacto diuidere, ſed quamuis ætate vetuſtiores eſſent, de hiſce tamen quæ nunc ſunt dicta, modo magis nouo intellexerunt. Nonnulla namque corpora mole quidem minora, ſed grauiora eſſe videntur. Patet igitur, non ſatis eſſe, ex æqualibus ipſis primis ea quæ ſunt pōderis æqualis, dicere conſtare: eſſent enim æqualia mole. Maius autem ipſorum, grauius eſſe, abſurdū quidem eſt hiſce dicere, qui prima ipſa ac indiuidua, ex quibus ea corporum conſtant, quæ pondus habent, plana inquiunt eſſe: ij autem qui ſolida eſſe dicunt, magis dicere poſſunt. Compoſitorum verò quoniam ſingula non hoc modo ſeſe habere videntur, ſed multa grauiora minora mole eſſe videmus, quemadmodum æs, lana: aliam quidam cauſam & putant eſſe, & aiunt. Vacuum enim comprehenſum leuare corpora dicunt, & interdum maiora facere leuiora, cùm plus habeant, vt inquiunt, vacui. Propterea & molem habere maiorem ex æqualibus ſolidis perſæpe, aut ex minoribus compoſita, dicunt,

B C D E

Et omnino cuilibet leuiori plus ineſſe vacui, cauſam aiunt eſſe. dicunt igitur hoc modo de ipſis. Sed addant neceſſe eſt, qui hoc pacto definiunt, ſi ſit quippiam leuius, non ſolùm vacui plus, ſed & ſolidi minus habere. Si enim talem rationem excedet, leuius ſanè non erit. Ob id enim ipſum & ignem inquiunt leuiſſimum eſſe, quia vacui plurimum habet. Eueniet igitur, magnum aurum plus habens vacui, igne paruo leuius eſſe, niſi & ſolidum ipſum habuerit multiplex. Quare hoc eſt dicendum. Quidam igitur eorum qui non inquiunt vacuum eſſe, nihil de leui grauique determinarunt, vt Anaxagoras & Empedocles. Qui verò determinarunt quidem, non dicunt autem vacuum eſſe, nihil dixere cur alia corporum leuia, alia grauia ſunt, & alia ſurſum, alia deorſum ſemper feruntur. Nullam præterea de hoc mentionem fecerunt, nonnulla, inquam, corporum maiorem habentia molem, leuiora minoribus eſſe. Neque patet ex hiſce quæ dicta ſunt, quonam pacto fiet vt ipſi conſentanea dicant iis quæ apparent. Eos etiam qui leuitatis ignis cauſam vacui multitudinem inquiunt eſſe, eiſdem obnoxios difficultatibus eſſe neceſſe eſt. Minùs enim cæteris corporibus ſolidi, & vacui plus habebit. Attamen erit ignis aliqua multitudo, in qua ſolidum & plenum ea quæ continentur in aliqua parua terra, ſolida exuperabit. Quod ſi & vacui dixerint: quónam modo definient ipſum ſimpliciter graue? Aut enim hoc, quod plurima ſolidorum habet, aut hoc, quod vacui minus habet. Si igitur hoc dicent modo, erit quædam terra adeo parua, vt in illa minus ſit ſolidorum quàm magno in igne. Similiter ſi vacuo etiam definiant, erit quippiam eorum quæ ſemper deorſum feruntur, leuius eo quod ſimpliciter eſt leue, ſemperq; fertur ad ſupera loca. Quod quidem eſt impoſſibile. Id enim quod abſolute eſt leue, leuius eſt ſemper hiſce quæ pondus habet, ac deorſum feruntur. Id autem quod eſt leuius, non ſemper eſt leue: propterea quod & in hiſce quæ põdus habent, aliud alio leuius dicitur eſſe, vt aqua, terrâ. At verò neque hoc, vacuum, inquam, rationẽ ad plenum habere, ſufficiẽns ad ſoluendam dubitationem eſſe videtur. Accidet enim & hunc modum dicẽtibus, ipſum identidẽ impoſſibile. In maiore enim igne, atque minore, eandem ſolidum ad vacuum rationem habebit. at maior ignis, minore ſurſum celeriùs fertur: & maius aurum, plumbúmque, celeriùs deorſum mouetur, & cæterorũ quodque ſimili modo, quæ pondus habent. At hoc accidere profectò non oportebat, ſi hoc pacto graue leuéque eſt definitum. Abſurdum autem, etſi ob vacuum quidem ſurſum ferantur, vacuum autem ipſum non ſurſum feratur. At verò ſi vacuum quidem aptum eſt ſurſum ferri, plenũ verò deorſum: atque ob hoc vtriuſque lationis ſunt ceteris cauſæ: nihil de compoſitis conſiderare oportebat, cur alia corporum grauia, alia leuia ſunt: ſed de his ipſis dicere, cur leue alterum eſt, alterum pondus habet. Et inſuper, quænam eſt cauſa vt plenum vacuúmque non diſtent. Vacat autem ratione, & locum vacuo facere, quaſi ipſum locus quidam non ſit. Quòd ſi vacuum mouetur, eſſe quendam ipſius locum, è quo & ad quem mutatur, neceſſe eſt. Et inſuper, quidnam ipſius motus eſt cauſa? Non eſt enim vacuum ipſum. Non enim ſolùm ipſum,

A ὅλως δὲ καὶ πᾶσι τοῦ αἴτιον εἶναι τοῦ κουφοτέρου, τὸ πλεῖον ἐνυπάρχειν κενόν. λέγουσι μὲν οὖν τοῦτον τὸν τρόπον. ἀνάγκη δὲ προσθεῖναι τοῖς οὕτω διορίζουσι, μὴ μόνον τὶ κενὸν ἔχειν πλέον, ἂν ᾖ κουφότερον, ἀλλὰ καὶ τὸ στερεὸν ἔλαττον· εἰ γὰρ ὑπερέξει τῆς τοιαύτης ἀναλογίας, οὐκ ἔσται κουφότερον. διὰ γὰρ τοῦτο καὶ τὸ πῦρ εἶναί φασι κουφότατον, ὅτι πλεῖστον ἔχει κενόν. συμβήσεται οὖν μικροῦ πυρὸς, πολὺν χρυσὸν πλεῖον ἔχοντα τὸ κενὸν εἶναι κουφότερον, εἰ μὴ καὶ στερεὸν ἕξει πολλαπλάσιον· ὥστε τοῦτο λεκτέον. ἔνιοι μὲν οὖν τῶν μὴ φασκόντων εἶναι κενὸν, οὐδὲν διώρισαν περὶ κούφου καὶ βαρέος, B οἷον, Ἀναξαγόρας καὶ Ἐμπεδοκλῆς· οἱ δὲ διορίσαντες μὲν, μὴ φάσκοντες δὲ εἶναι κενὸν, οὐδὲν εἶπον, διὰ τί τὰ μὲν ἁπλῶς κοῦφα, τὰ δὲ βαρέα τῶν σωμάτων· καὶ φέρεται τὰ μὲν ἀεὶ ἄνω, τὰ δὲ κάτω· ἔτι δὲ περὶ τοῦ ἔνια μείζω τὸν ὄγκον ὄντα, κουφότερα τῶν ἐλαττόνων εἶναι σωμάτων οὐδὲν ἐπεμνήσθησαν· οὐδὲ δῆλον ὅπως ἐκ τῶν εἰρημένων ὁμολογούμενα τοῖς *φαινομένοις συμβήσεται λέγειν αὐτοῖς. ἀναγκαῖον δὲ καὶ τοῖς περὶ τῆς τοῦ πυρὸς κουφότητος αἰτιωμένοις, τὸ πολὺ κενὸν ἔχειν, σχεδὸν ἐν ταῖς αὐταῖς ἐνέχεσθαι δυσχερείαις. ἔλαττον μὲν γὰρ ἕξει στερεὸν τῶν ἄλλων σωμάτων, καὶ τὸ κενὸν πλεῖον· ἀλλ' ὅμως ἔσται τι πυρὸς C πλῆθος, ἐν ᾧ τὸ στερεὸν καὶ τὸ πλῆρες ὑπερβάλλει τῶν περιεχομένων στερεῶν, ἔν τινι μικρῷ πλήθει γῆς. ἐὰν δὲ φῶσι καὶ τὸ κενὸν, πῶς διορίζουσι τὸ ἁπλῶς βαρύ; ἢ γὰρ τῷ πλεῖον στερεὸν ἔχειν, ἢ τῷ ἔλαττον κενόν. εἰ μὲν οὖν τοῦτο φήσουσιν, ἔσται τι πλῆθος γῆς οὕτως ὀλίγον, ἐν ᾧ τὸ στερεὸν ἔσται ἔλαττον, ἢ ἐν πολλῷ πλήθει πυρός. ὁμοίως δὲ κἂν τῷ κενῷ διορίσωσιν, ἔσται τι κουφότερον τοῦ ἁπλῶς κούφου καὶ φερομένου ἀεὶ ἄνω, τὸ φερόμενον ἀεὶ κάτω. τοῦτο δὲ ἀδύνατον· τὸ γὰρ ἁπλῶς κοῦφον, ἀεὶ κουφότερον τῶν ἐχόντων βάρος, καὶ κάτω φερομένων· τὸ δὲ κουφότερον οὐκ ἀεὶ κοῦφον, διὰ τὸ λέγεσθαι D καὶ ἐν τοῖς ἔχουσι βάρος, ἕτερον ἑτέρου κουφότερον, οἷον ὕδωρ γῆς. ἀλλὰ μὴν οὐδὲ τῷ τὸ κενὸν ἀνάλογον ἔχειν πρὸς τὸ πλῆρες, ἱκανὸν λῦσαι τὴν λεγομένην νῦν ἀπορίαν. συμβήσεται γὰρ καὶ τοῦτον τὸν τρόπον λέγουσιν, ὡσαύτως τὸ ἀδύνατον. ἐν γὰρ τῷ πλείονι πυρὶ, καὶ ἐν τῷ ἐλάττονι, τὸν αὐτὸν ἕξει λόγον τὸ στερεὸν πρὸς τὸ κενόν. φέρεται δέ γε θᾶττον τὸ πλέον ἄνω πῦρ, τοῦ ἐλάττονος· καὶ κάτω δὲ πάλιν ὡσαύτως, ὁ πλείων χρυσὸς, καὶ ὁ μόλυβδος. ὁμοίως δὲ καὶ τῶν ἄλλων ἕκαστον τῶν ἐχόντων βάρος. οὐκ ἔδει δὲ τοῦτο συμβαίνειν, εἴπερ τούτῳ διώρισται τὸ βαρὺ καὶ τὸ κοῦφον. ἄτοπον δὲ καὶ εἰ διὰ τὸ E κενὸν μὲν ἄνω *φέρονται, τὸ δὲ κενὸν αὐτὸ, μή. ἀλλὰ μὴν εἴγε τὸ μὲν κενὸν ἄνω πέφυκε φέρεσθαι, κάτω δὲ τὸ πλῆρες, καὶ διὰ τοῦτο τοῖς ἄλλοις αἴτια τῆς φορᾶς ἑκατέρας, οὐδὲν περὶ τῶν συνθέτων ἔδει σκοπεῖν, διὰ τί τὰ μὲν βαρέα, τὰ δὲ κοῦφα τῶν σωμάτων· ἀλλὰ περὶ τούτων αὐτῶν εἰπεῖν, διὰ τί τὸ μὲν κοῦφον, τὸ δὲ ἔχει βάρος· ἔτι δὲ, τί τὸ αἴτιον τοῦ μὴ διεστάναι τὸ πλῆρες, καὶ τὸ κενόν. ἄλογον δὲ καὶ τὸ χώραν τῷ κενῷ ποιεῖν, ὥσπερ οὐκ αὐτὸ χώραν τινὰ οὖσαν. ἀναγκαῖον δὲ εἴπερ κινεῖται τὸ κενὸν, εἶναί τινα αὐτοῦ τόπον, ἐξ οὗ μεταβάλλει καὶ εἰς ὅν. πρὸς δὲ τούτοις τί τῆς κινήσεως τὸ αἴτιον; οὐ γὰρ δὴ τό γε κενόν. οὐ γὰρ αὐτὸ κινεῖται μόνον,

* χ. φερομένοις

* γρ. φέρεται

ἀλλὰ καὶ τὸ στερεόν. ὡσαύτως δὲ συμβαίνει, κἄν τις ἄλλως διορίζῃ, μεγέθει καὶ σμικρότητι ποιῶν βαρύτερα καὶ κουφότερα θάτερα τῶν ἑτέρων, κἂν ἄλλον ὁντιναοῦν τρόπον κατασκευάζων· μόνον δὲ τὴν αὐτὴν ὕλην ἁπάντων ἀποδιδοὺς, ἢ πλείους μὲν ἐναντίας δὲ [μόνον.] μιᾶς γὰρ [μὲν] οὔσης, οὐκ ἔσται τὸ ἁπλῶς βαρὺ καὶ κοῦφον, ὥσπερ τοῖς ἐκ τῶν τριγώνων συνιστᾶσιν· ἐναντίας δὲ, καθάπερ οἱ τὸ κενὸν καὶ τὸ πλῆρες, οὐκ ἔσται τὰ μεταξὺ τῶν ἁπλῶς βαρέων καὶ κούφων * διὰ τίνα αἰτίαν βαρύτερα καὶ κουφότερα ἀλλήλων, καὶ τῶν ἁπλῶν ἐστι. τὸ δὲ μεγέθει καὶ μικρότητι διορίζειν, πεπλασμένῳ μὲν ἔοικε μᾶλλον τῶν πρότερον. ὅτι δὲ ἐνδέχεται καθ' ἕκαστον ποιεῖν διαφορὰν τῶν τεττάρων στοιχείων, ἀσφαλεστέρως ἔχει πρὸς τὰς ἔμπροσθεν ἀπορίας. * τὸ δὲ μίαν ποιεῖν φύσιν τῶν τῷ μεγέθει διαφερόντων, ἀναγκαῖον ταὐτὸ συμβαίνειν τοῖς μίαν ποιοῦσιν ὕλην, καὶ μήτε ἁπλῶς εἶναι μηδὲ κοῦφον, μηδὲ φερόμενον ἄνω, ἀλλ' ἢ ὑστερίζομενον ἢ ἐκθλιβόμενον, καὶ πολλὰ μικρὰ ὀλίγων μεγάλων βαρύτερα εἶναι. εἰ δὲ τοῦτο ἔσται, συμβήσεται πολὺν ἀέρα καὶ πολὺ πῦρ ὕδατος εἶναι βαρύτερα, καὶ γῆς ὀλίγης. τοῦτο δ' ἐστὶν ἀδύνατον. τὰ μὲν οὖν παρὰ τῶν ἄλλων εἰρημένα, ταῦτα καὶ τοῦτον λέγεται τὸν τρόπον.

* γρ. αἰτίαν.

* γρ. [illegible]

ΚΕΦΑΛ. γ'.

Διὰ τί τὰ μὲν ἄνω φέρεται τῶν σωμάτων, τὰ δὲ κάτω, καὶ τὸ φέρεσθαι εἰς τὸν αὑτοῦ τόπον, τί ἐστι.

ΗΜεῖς δὲ πρῶτον λέγωμεν, διορίσαντες περὶ οὗ μάλιστα ἀποροῦσί τινες, διὰ τί τὰ μὲν ἄνω φέρεται, τὰ δὲ κάτω τῶν σωμάτων ἀεὶ κατὰ φύσιν, τὰ δὲ καὶ ἄνω καὶ κάτω. μετὰ δὲ ταῦτα, περὶ βαρέος καὶ κούφου, καὶ τῶν συμβαινόντων περὶ αὐτὰ παθημάτων, διὰ τίνα αἰτίαν ἕκαστα γίνεται. περὶ μὲν οὖν τοῦ φέρεσθαι εἰς τὸν ἑαυτοῦ τόπον ἕκαστον, ὁμοίως ὑποληπτέον, ὥσπερ καὶ περὶ τὰς ἄλλας γενέσεις καὶ μεταβολάς. ἐπεὶ γάρ εἰσι τρεῖς αἱ κινήσεις, ἡ μὲν κατὰ μέγεθος, ἡ δὲ κατ' εἶδος, ἡ δὲ κατὰ τόπον, ἐν ἑκάστῃ τούτων τὴν μεταβολὴν ὁρῶμεν γινομένην ἐκ τῶν ἐναντίων εἰς τὰ ἐναντία καὶ εἰς τὰ μεταξὺ, καὶ οὐκ εἰς τὸ τυχὸν τῷ τυχόντι μεταβολὴν οὖσαν· ὁμοίως δὲ οὐδὲ κινητικὸν καὶ τὸ τυχὸν τοῦ τυχόντος· ἀλλ' ὥσπερ τὸ ἀλλοιωτὸν καὶ τὸ αὐξητὸν ἕτερον, οὕτω καὶ τὸ ἀλλοιωτικὸν καὶ τὸ αὐξητικόν. τὸν αὐτὸν δὴ τρόπον ὑποληπτέον καὶ τὸ κατὰ τόπον κινητικὸν καὶ κινητὸν, οὐ τὸ τυχὸν εἶναι τοῦ τυχόντος. εἰ οὖν εἰς τὸ ἄνω καὶ τὸ κάτω * κινητικὸν μὲν τὸ βαρυντικὸν καὶ τὸ κουφιστικὸν, * κινητὸν δὲ τὸ δυνάμει βαρὺ καὶ κοῦφον· τὸ δὴ εἰς τὸν αὑτοῦ τόπον φέρεσθαι ἕκαστον, τὸ εἰς τὸ αὑτοῦ εἶδός ἐστι φέρεσθαι· καὶ ταύτῃ μᾶλλον ἄν τις ὑπολάβοι ὃ ἔλεγον οἱ ἀρχαῖοι, ὅτι τὸ ὅμοιον φέρεται πρὸς τὸ ὅμοιον. τοῦτο γὰρ οὐ συμβαίνει πάντως· οὐ γὰρ ἐάν τις μεταθῇ τὴν γῆν, οὗ νῦν ἡ σελήνη, οἰσθήσεται τῶν μορίων ἕκαστον πρὸς αὐτήν· ἀλλ' ὅπουπερ καὶ νῦν. ὅλως μὲν οὖν τοῖς ὁμοίοις καὶ ἀδιαφόροις ὑπὸ τῆς αὐτῆς κινήσεως ἀνάγκη τοῦτο συμβαίνειν. ὥστε ὅπου πέφυκεν ἕν τι φέρεσθαι μόριον, καὶ τὸ πᾶν. ἐπεὶ δὲ ὁ τόπος ἐστὶ τοῦ περιέχοντος πέρας· περιέχει γὰρ πάντα τὰ κινούμενα ἄνω καὶ κάτω, τό, τε ἔσχατον καὶ τὸ μέσον·

* γρ. κινητικά

* γρ. κινητόν

A ſed ſolidum etiam mouetur. Similiter abſurda accidunt, & ſi quiſpiam alter definit, magnitudine paruitatéque faciens grauiora leuioráque, vel alio quouis extruens modo, vniuerſis modò eadem materies aſſignetur, aut plures quidem, ſubcontrariæ tamen. Nam ſi vna ſit, non erit graue ſimpliciter atque leue, quemadmodum iis accidit qui ex triangulis conſtituunt elementa: Sin contrariæ ſint, vt ʺ qui vacuum plerumque dicunt: dici non poteſt quam ob cauſam ea quæ ſunt inter ſimpliciter grauia, leuiáque, grauiora leuioráque ſunt inter ſeſe, & ſimplicibus etiam ipſis. Magnitudine autem paruitatéque definire, figmento quidem magis quàm priora, eſt ſimile. Sed quia differentiam elementorum quodque facere poteſt, ſecuriùs ad an- B teriores dubitationes ſe habet. Et verò qui naturam vnam eorum facit quæ magnitudine differunt, idem accidere quæ hiſce accidunt, qui materiam faciunt vnam, neceſſe eſt, & neque leue quicquam ſimpliciter eſſe, néque ferri ſurſum, ſed aut poſteriùs ferri, aut extrudi: & multa parua paucis magnis grauiora eſſe. Quòd ſi hoc erit, accidet, magnum aërem, magnúmque ignem aqua terráque parua grauiorem eſſe: quod quidem fieri nequit. Ea igitur quæ ab aliis ſunt dicta, hæc ſunt, atque hoc modo dicuntur.

CAPVT III.

C *Quòd vnumquodque ſenſibilium ita in ſuum locum feratur, vt ad ſpeciem.*

NOs autem primùm id definiamus oportet, quo de maximè quidam dubitant: Cur alia corporum ſurſum, alia deorſum ſemper, alia ſurſum deorſúmque ſecundùm naturam ferantur. Deinde de graui leuique, atque affectibus hiſce qui circa ipſa accidunt, quam ob cauſam fiunt, dicamus. De hoc itaque, ferri (inquam) vnumquodque ſuum in locum, perinde atque de cæteris generationibus exiſtimandum eſſe videtur. Nam cùm tres ſint motus, alius in magnitudine, alius in forma, alius in loco: in horum quôque mutationem è contrariis in contraria, atque in media D fieri, & non in quoduis cuiuſuis mutationem eſſe videmus. Simili modo neque motiuum cuiuſuis quoduis, ſed vt alterabile, ac accreſcibile ſunt diuerſa, ſic & alteratiuum ac accreſcitiuum. Eodem modo & loco motiuum non quoduis cuiuſuis mobilis, exiſtimandum eſt eſſe. Ad ſuperum igitur locum ac inferum motiua quidem ſunt, id quod ponderis, & id quod leuitatis eſt effectiuum: mobile autem, id quod potentia graue eſt, atque leue. Ferri verò quodque ſuum in locum, nihil aliud eſt, quàm in ſuam formam ferri. Atque hoc pacto magis quiſpiam exiſtimauerit id quod antiqui dicebant, ſimile (inquam) in ſimile ferri: hoc E enim non omnino accidit. Non enim ſi quiſpiam terram eo in loco poſuerit vbi nunc eſt Luna, quæque partium ad ipſam feretur, ſed eum in locum vbi etiam nunc eſt collocata. Omnino igitur ſimilibus, & differentiam non ſubeuntibus, hoc accidat eodem motu neceſſe eſt. Quare quò pars vna quædam apta eſt ferri, eò & totum aptum eſt ferri. Cùm autem locus ipſius continentis ſit finis, extremum autem, atque medium omnia quæ ſurſum mouentur deorſúmque, contineat:

atque hoc forma eius quodammodo ſit quod continetur: ſuum in locum ferri nil aliud eſt, quàm in ſimile ferri. Ea enim quæ deinceps ſunt collocata, ſimilia ſunt. Aqua namque, aëri, & hic igni ſimilis eſt. Contrà verò dici in mediis quidem poteſt, in extremis verò non poteſt: velut aërem aquæ, & aquam terræ. Semper enim id, quod ſuperius eſt, ad id quod ſub ipſo collocatur, ſic ſe habet, vt ad materiam forma. Quærere verò cur ignis ad ſupera loca, & terra ad infera fertur, idem quod hoc eſt, cur ſanabile, ſi mouetur, atque mutatur, ea ratione qua eſt ſanabile, in ſanitatem, & non ad albedinem venit. Similiter & cætera alterabilia cuncta. At verò & accreſcibile cùm hoc mutatur, quo eſt accreſcibile, non in ſanitatem, ſed in exceſſionem magnitudinis venit. Similiter & horum vnumquodque, aliud in qualitate, aliud in quantitate mutatur: & in loco, leuia quidem ad ſupera, grauia verò ad infera loca proficiſcuntur: excipitur tamen hoc. Hæc enim, graue, inquam, ac leue, in ſeipſis mutationis principium habere videntur: illa verò non in ſeipſis, ſed foris, ceu ſanabile ac accreſcibile: quanquam & hæc interdum ex ſe ipſis mutantur, & paruo facto in externis motu, alterum in ſanitatem, alterum in incrementum accedit. Et cùm idem ſit ſanabile, ægritudiniſque ſuſceptiuum: ſi ea ratione qua ſanabile eſt, moueatur, in ſanitatem pergit: ſin hoc, quo ægrotabile eſt, in ægritudinem fertur. Magis tamen graue leuéque in ſe ipſis principium habere videntur, propterea quòd horum materia propinquiſſima ſubſtantiæ eſt. Signum cuius eſt, lationem abſolutorum eſſe, & vltimam motuum generatione. Quare motus hic ſubſtantia primus erit. Cùm igitur aër ex aqua fit, atque è graui leue, in ſuperum locum venit. Simul autem eſt leue, & non vlteriùs fit, ſed illic eſt. Patet igitur, cùm potentia ſit ad actum proficiſcens, venire illud & ad tantum, & ad tale, vbi eſt actus, & quanti, & qualis, & vbi. Eadem eſt cauſa, & vt terra ac ignis iam actu ad ſua loca nullo impediente moueantur. Etenim alimentum cùm prohibens, & ſanabile, cùm detinens ſublatum fuerit, continuò fertur: & mouet etiam & id quod initio fecit, & id quod ſubtraxit, aut id vnde reſiluit, vt priùs in ſermonibus, dictum eſt, in quibus definiebamus, nihil horum ipſum ſeipſum mouere. Dictum eſt igitur quam ob cauſam fertur quodque eorum quæ feruntur, & quid eſt, ſuum in locum ferri.

CAPVT IV.

Quòd ſit aliquod ſimpliciter graue, & leue ſimpliciter, & definitio horum. Quódque determinatum ſit medium, ad quod grauia ferantur, atque extremum ad quod leuia.

DIfferentias autem, & ea quæ accidunt circa ipſa, nunc dicamus oportet. Primum igitur ſit definitum, vt vniuerſis videtur, graue quidem ſimpliciter id eſſe, quod omnibus ſubſtat: leue autem id quod ſuper omnia natat. Simpliciter autem dico, in ipſum genus reſpiciens, & in ea in quibus ambo non inſunt. Ignis enim quæuis magnitudo, niſi fortè quippiam aliud prohibeat, ferri ſurſum videtur: & terræ etiam quæuis magnitudo, deorſum eodem modo: & celeriùs id fertur quod maius eſt. Alio verò modo grauia leuiáque ſunt ea

A τοῦτο δὲ τρόπον τινὰ λέγεται τὸ εἶδος τοῦ περιεχομένου. τὸ εἰς τὸν αὐτοῦ τόπον φέρεσθαι, πρὸς τὸ ὅμοιόν ἐστι φέρεσθαι. τὰ γὰρ ἐφεξῆς, ὅμοιά ἐστιν ἀλλήλοις, οἷον ὕδωρ ἀέρι, καὶ οὗτος πυρί. ἀνάπαλιν δὲ λέγειν τοῖς μέσοις ἔστι, τοῖς δ᾽ ἄκροις οὔ· οἷον, ἀέρα μὲν ὕδατι, ὕδωρ δὲ γῇ· ἀεὶ γὰρ τὸ * ἀνώτερον πρὸς τὸ ὑφ᾽ αὐτὸ, ὡς εἶδος πρὸς ὕλην, οὕτως ἔχει πρὸς ἄλληλα. τὸ δὲ ζητεῖν διὰ τί φέρεται τὸ πῦρ ἄνω, ἡ δὲ γῆ κάτω, τὸ αὐτό ἐστι καὶ διὰ τί τὸ ὑγιαστὸν ἂν κινῆται καὶ μεταβάλλῃ ᾗ ὑγιαστὸν, εἰς ὑγίειαν ἔρχεται, ἀλλ᾽ οὐκ εἰς λευκότητα. ὁμοίως δὲ καὶ τὰ ἄλλα πάντα τὰ ἀλλοιωτά. ἀλλὰ μὴν καὶ τὸ αὐξητὸν, ὅταν μεταβάλλῃ ᾗ αὐξητὸν, οὐκ εἰς ὑγίειαν ἔρχεται, ἀλλ᾽ εἰς μεγέθους ὑπεροχήν. ὁμοίως δὲ B καὶ τούτων ἕκαστον τὸ μὲν ἐν τῷ ποιῷ, τὸ δὲ ἐν τῷ ποσῷ μεταβάλλει, καὶ ἐν τόπῳ τὰ μὲν κοῦφα ἄνω, τὰ δὲ βαρέα κάτω· πλὴν ὅτι τὰ μὲν ἐν αὑτοῖς δοκεῖ ἔχειν ἀρχὴν τῆς μεταβολῆς. λέγω δὲ τὸ βαρὺ καὶ τὸ κοῦφον· τὰ δ᾽ οὔ, ἀλλ᾽ ἔξωθεν, οἷον τὸ ὑγιαστὸν ἢ τὸ αὐξητόν. καίτοι ἐνίοτε καὶ ταῦτα ἐξ αὑτῶν μεταβάλλει, καὶ μικρᾶς γενομένης ἐν τοῖς ἔξωθεν κινήσεως, τὸ μὲν εἰς ὑγίειαν ἔρχεται, τὸ δὲ εἰς αὔξησιν· καὶ ἐπεὶ ταὐτὸ τὸ ὑγιαστὸν, καὶ τὸ νόσου δεκτικὸν, ἐὰν μὲν κινηθῇ ᾗ ὑγιαστὸν, εἰς ὑγίειαν φέρεται· ἐὰν δὲ ᾗ νοσερὸν, εἰς νόσον. μᾶλλον δὲ τὸ βαρὺ καὶ κοῦφον τούτων ἐν ἑαυτοῖς ἔχειν φαίνεται τὴν ἀρχὴν, διὰ τὸ ἐγγύτατα τῆς οὐσίας εἶναι τὴν τούτων ὕλην· σημεῖον δ᾽, ὅτι ἡ C φορὰ τῶν ἀπολελυμένων ἐστὶ, καὶ γενέσει ὑστάτη τῶν κινήσεων· ὥστε πρώτη ἂν εἴη καὶ κατὰ τὴν οὐσίαν αὕτη κίνησις. ὅταν μὲν οὖν γίγνηται ἐξ ὕδατος ἀὴρ, καὶ ἐκ βαρέος κοῦφον, ἔρχεται εἰς τὸ ἄνω. ἅμα δ᾽ ἐστὶ κοῦφον, καὶ οὐκ ἔτι γίγνεται, ἀλλ᾽ ἐκεῖ ἐστι. φανερὸν δὴ ὅτι δυνάμει ὂν, εἰς ἐντελέχειαν ἰὸν, ἔρχεται ἐκεῖ, καὶ εἰς τοσοῦτον καὶ τοιοῦτον, οὗ ἡ ἐντελέχεια, καὶ ὅσου, καὶ οἵου, καὶ ὅπου. τὸ δ᾽ αὐτὸ αἴτιον καὶ τοῦ ἤδη ὑπάρχοντα καὶ ὄντα γῆν, καὶ πῦρ, κινεῖσθαι εἰς τοὺς αὑτῶν τόπους, μηδενὸς ἐμποδίζοντος. καὶ γὰρ ἡ τροφὴ, ὅταν τὸ κωλῦον, καὶ τὸ ὑγιαστὸν, ὅταν * τὸ ἐπισχὸν μὴ ᾖ, φέρεται εὐθύς· καὶ κινεῖ δὲ τό, τε ἐξ ἀρχῆς ποιῆσαν, καὶ τὸ ὑποσπάσαν, ἢ ὅθεν ἀπεπήδησε, καθάπερ εἴρηται ἐν τοῖς πρώτοις λόγοις, D ἐν οἷς διωρίζομεν, ὅτι οὐθὲν τούτων [αὐτὸ] ἑαυτὸ κινεῖ. διὰ τίνα μὲν οὖν αἰτίαν φέρεται τῶν φερομένων ἕκαστον, καὶ τὸ φέρεσθαι εἰς τὸν αὑτοῦ τόπον τί ἐστιν, εἴρηται.

* [illegible]

* [illegible]

ΚΕΦΑΛ. δ΄.

Τί τὸ βαρὺ ἁπλῶς, καὶ τὸ κοῦφον, καὶ ὅτι ἔστι μέσον πρὸς ὃ ἡ φορὰ τοῖς ἔχουσι βάρος, καὶ ἀφ᾽ οὗ τοῖς κούφοις.

E ΤΑς δὲ διαφορὰς καὶ τὰ συμβαίνοντα περὶ αὐτὰ νῦν λέγωμεν. πρῶτον μὲν οὖν διωρίσθω, καθάπερ φαίνεται πᾶσι, βαρὺ μὲν ἁπλῶς τὸ πᾶσιν ὑφιστάμενον· κοῦφον δὲ, τὸ πᾶσιν ἐπιπολάζον. ἁπλῶς δὲ λέγω, εἴς τε τὸ γένος βλέπων, καὶ ὅσοις μὴ ἀμφότερα ὑπάρχει· οἷον φαίνεται πυρὸς μὲν τὸ τυχὸν μέγεθος ἄνω φερόμενον, ἂν μή τι τύχῃ κωλῦον ἕτερον· γῆς δὲ κάτω· τὸν αὐτὸν δὲ τρόπον καὶ θᾶττον τὸ πλεῖον. ἄλλως δὲ βαρὺ καὶ κοῦφον,

οἷς ἀμφότερα ὑπάρχει. καὶ γὰρ ἐπιπολάζουσί τισι καὶ ὑφίστανται, καθάπερ ἀὴρ καὶ ὕδωρ. ἁπλῶς μὲν γὰρ * οὐδ' ἕτερον τούτων κοῦφον ἢ βαρύ· γῆς μὲν γὰρ ἄμφω κουφότερα. ἐπιπολάζει γὰρ αὐτῇ τὸ τυχὸν αὐτῶν μόριον. πυρὸς δὲ βαρύτερα· ὑφίσταται γὰρ αὐτῶν ὁπόσον ἂν ᾖ μόριον. πρὸς αὑτὰ δὲ ἁπλῶς, τὸ μὲν βαρὺ, τὸ δὲ κοῦφον· ἀὴρ μὲν γὰρ ὁπόσος ἂν ᾖ, ἐπιπολάζει ὕδατι· ὕδωρ δὲ ὁπόσον ἂν ᾖ, ἀέρι ὑφίσταται. ἐπεὶ δὲ καὶ τῶν ἄλλων, τὰ μὲν ἔχει βάρος, τὰ δὲ κουφότητα, δῆλον ὅτι τούτων μὲν αἰτία πάντων ἡ ἐν τοῖς ἀσυνθέτοις διαφορά. κατὰ γὰρ τὸ ἐκείνων τετυχηκέναι τὰ μὲν πλεῖον, τὰ δ' ἔλαττον, ἔσται τὰ μὲν κοῦφα, τὰ δὲ βαρέα τῶν σωμάτων. ὥστε περὶ ἐκείνων λεκτέον. τἆλλα γὰρ ἀκολουθεῖ τοῖς πρώτοις, ὅπερ ἔφαμεν χρῆναι ποιεῖν καὶ τοὺς διὰ τὸ πλῆρες τὸ βαρὺ λέγοντας, * καὶ διὰ τὸ κενὸν τὸ κοῦφον· συμβαίνει δὲ μὴ πανταχοῦ ταὐτὰ βαρέα δοκεῖν εἶναι καὶ κοῦφα, διὰ τὴν τῶν πρώτων διαφοράν. λέγω δὲ, οἷον ἐν μὲν ἀέρι βαρύτερον ἔσται ταλαντιαῖον ξύλον μολύβδου μναϊαίου, ἐν δὲ ὕδατι κουφότερον· αἴτιον δ', ὅτι πάντα βάρος ἔχει πλὴν πυρὸς, καὶ κουφότητα πλὴν γῆς. γῆν μὲν οὖν καὶ ὅσα γῆς ἔχει πλεῖστον, πανταχοῦ βάρος ἔχειν ἀναγκαῖον· ὕδωρ δὲ πανταχοῦ, πλὴν ἐν γῇ· ἀέρα δὲ, πλὴν ἐν ὕδατι καὶ γῇ. ἐν τῇ αὑτοῦ γὰρ χώρᾳ πάντα βάρος ἔχει πλὴν πυρὸς, καὶ ὁ ἀήρ. σημεῖον δ', ὅτι ἕλκει πλεῖον ὁ πεφυσημένος ἀσκὸς, τοῦ κενοῦ. ὥστ' εἴ τι ἀέρος ἔχει πλεῖον, ἢ γῆς, καὶ ὕδατος, ἐν μὲν ὕδατι ἐνδέχεται κουφότερον εἶναί τινος· ἐν δὲ ἀέρι, βαρύτερον. ἀέρι μὲν γὰρ οὐκ ἐπιπολάζει, τῷ δὲ ὕδατι ἐπιπολάζει. ὅτι δ' ἐστί τι ἁπλῶς βαρὺ καὶ ἁπλῶς κοῦφον, ἐκ τῶνδε ἐστὶ φανερόν. λέγω δὲ ἁπλῶς κοῦφον, ὃ ἀεὶ ἄνω· καὶ βαρὺ, ὃ ἀεὶ κάτω πέφυκε φέρεσθαι μὴ κωλυόμενον· τοιαῦτα γάρ ἐστί τινα, καὶ οὐχ ὥσπερ οἴονταί τινες, πάντ' ἔχει βάρος· βαρὺ μὲν γὰρ δοκεῖ τισιν εἶναι καὶ ἑτέροις, καὶ ἀεὶ φέρεσθαι πρὸς τὸ μέσον. ἔστι δ' ὁμοίως καὶ τὸ κοῦφον· ὁρῶμεν γὰρ, καθάπερ εἴρηται πρότερον, ὅτι τὰ γεηρὰ πᾶσιν ὑφίσταται, καὶ φέρεται πρὸς τὸ μέσον· ἀλλὰ μὴν ὥρισται τὸ μέσον. εἰ τοίνυν ἐστί τι, ὃ πᾶσιν ἐπιπολάζει, καθάπερ φαίνεται τὸ πῦρ, καὶ ἐν αὐτῷ τῷ ἀέρι ἄνω φερόμενον, ὁ δὲ ἀὴρ ἡσυχάζων· δῆλον ὅτι τοῦτο φέρεται πρὸς τὸ ἔσχατον. ὥστε βάρος οὐδὲν οἷόν τ' ἔχειν αὐτό· ὑφίσταιτο γὰρ ἂν ἄλλῳ· εἰ δὲ τοῦτο, εἴη ἄν τι ἕτερον, ὃ φέρεται πρὸς τὸ ἔσχατον, ὃ πᾶσι τοῖς φερομένοις ἐπιπολάζει. νῦν δὲ οὐθὲν φαίνεται. τὸ ἄρα πῦρ οὐδὲν ἔχει βάρος, οὐδὲ ἡ γῆ κουφότητα οὐδεμίαν, εἴπερ ὑφίσταται πᾶσι, καὶ τὸ ὑφιστάμενον φέρεται ἐπὶ τὸ μέσον. ἀλλὰ μὴν ὅτι γ' ἐστὶ μέσον, πρὸς ὃ ἡ φορὰ τοῖς ἔχουσι βάρος, καὶ ἀφ' οὗ τοῖς κούφοις, δῆλον πολλαχόθεν· πρῶτον μὲν τῷ εἰς ἄπειρον μὴ ἐνδέχεσθαι φέρεσθαι μηθέν. ὥσπερ γὰρ οὐκ ἔστιν οὐδὲν ἀδύνατον, οὕτως οὐδὲ γίνεται. ἡ δὲ φορὰ, γένεσις πόθεν ποί. ἔπειτα πρὸς ὁμοίας φαίνεται γωνίας, τὸ μὲν πῦρ ἄνω φερόμενον, ἡ δὲ γῆ κάτω, καὶ πᾶν τὸ βάρος ἔχον. ὥστ' ἀνάγκη φέρεσθαι πρὸς τὸ μέσον. τοῦτο δὲ πότερον συμβαίνει πρὸς τὸ τῆς γῆς μέσον, ἢ πρὸς τὸ τοῦ παντὸς, ἐπεὶ * ταὐτόν ἐστιν, ἄλλος λόγος. ἐπεὶ δὲ τὸ * πᾶσιν ὑφιστάμενον φέρεται πρὸς τὸ μέσον, ἀνάγκη τὸ πᾶσιν ἐπιπολάζον φέρεσθαι πρὸς τὸ ἔσχατον τῆς χώρας, ἐν ᾗ ποιοῦνται τὴν κίνησιν.

* γρ. οὐδέτερον
* κ. δ. τοῦ κενοῦ
* κ. τ. αὐτό ἐ.
* κ. τοῦ ὑφ.

A quibus vtrunque ineſt. Etenim natant ſuper aqua, & ſubſtant, vt aer & aqua. Abſolute namque neutrum horum leue eſt, aut graue: terra enim ambo ſunt leuiora. Quæuis enim pars ipſorum ſubſidet igni. Ad ſeipſa verò ſimpliciter aliud eſt graue, aliud eſt leue. Aër enim quantauis magnitudine, ſemper eſt ſuper aquam: aqua autem quantauis quantitate, ſubſidet aëri ſemper. Quoniam autem & cæterorum alia pondus habent, alia leuitatem, patet, eam differentiam, quæ in ſimplicibus eſt, horum omnium cauſam eſſe. Ex eo namque quia aliud plus, aliud minus illorum ſunt aſſecuta, alia corporum leuia, alia grauia erunt. Quare de illis dicendum eſt. Cætera enim illa prima ſequuntur. B Quod & eos oportere facere dicimus, qui ob plenum graue eſſe dicunt, & ob vacuum leue. Accidit igitur, eadem non vbique grauia leuiáque ob differentiam primorum videri. Lignum enim centum librarum, plumbo vnius libræ in aëre grauius, in aqua leuius erit. Cauſa autem eſt, omnia præter ignem pondus, & leuitatem præter terram, habere. Terram igitur, & quæ terræ plurimum habent, vbique grauitatem habere neceſſe eſt: aquam autem vbique præterquam in terra: & aërē ſimiliter, præterquam in aqua, ac terra. Suo enim in loco grauitatem habent omnia, præter ignem. Signum cuius eſt, vtrem inflatum plus ponderis, quàm vacuum habere. Quare ſi quid plus aëris habet, quàm terra, & aquæ, id in aqua quidem alio leuius, in aëre C verò grauius eſſe poteſt: nam non natat quidem ſuper aërem, natat autem ſuper aquam. Eſſe autem quippiam ſimpliciter graue, atque ſimpliciter leue, ex hiſce perſpicuum eſt. Atque leue ſimpliciter id dico, quod ſemper ſurſum aptum eſt, niſi prohibeatur: & graue id quod ſemper deorſum aptum eſt ferri. Sunt enim aliqua talia, & non omnia pondus habent, vt quidam putant. Nam & aliis quibuſdam graue eſſe videtur, ſemperque ad medium ferri. Eſt autem & leue ſimili modo. Videmus enim, vti dictum eſt prius, terrea ipſa ſub omnibus eſſe collocata, atque ad medium ferri. At verò, mediū ipſum eſt definitum. Si igitur eſt quippiam, quod ſuper omnia eminet, vt ignis in ipſo aëre ſurſum ferri vi- D detur, aëre quieſcente, patet hunc ad ipſum extremum ferri: quare nihil ipſe pōderis habere poteſt: ſub alio enim collocaretur. At ſi hoc eſſet, aliquid aliud eſſet profectò, quod ad ipſum extremum moueretur, quódque ſuper omnia, quæ feruntur, collocaretur. Nunc autem nihil eſſe videtur. Ignis igitur nullum pondus habet, neque etiam terra leuitatem vllam habet: ſiquidem ſubſidet vniuerſis, idque quod ſubſidet, ad ipſum medium fertur. At verò medium eſſe, ad quod latio fit eorū quæ pondus habent, & ex quo leuia ſurſum feruntur, ex multis patet. Primò quidem ex eo quia nihil ferri in infinitum poteſt: vt enim nihil eſt impoſ- E ſibile, ſic neque fit impoſſibile. Latio verò è quopiam in quippiam generatio eſt. Deinde ignis quidem ſurſum, terra verò, & quicquid pondus habet, deorſum, ſimiles ad angulos fertur. Quare ad medium ipſum feratur neceſſe eſt. Vtrùm autem ad terræ medium, an vniuerſi feratur, cùm idem medium ſit ipſorum, alia ratio eſt. Cùm autem id quod omnibus ſubſtat, ad medium ipſum feratur, id, quod ſuper omnia natat, ad vltimum capedinis, in qua ſit motus, feratur neceſſe eſt.

Sunt enim contraria, medium & extremum, & ſubſtare atque natare. Quapropter & cum ratione duo ſunt, graue & leue: & loca enim ſunt duo, medium ipſum, atque extremum. Eſt igitur quid & id quod eſt inter hæc, quod ad vtrunque ipſorum alterum dicitur. Id enim quod eſt inter, extremum aliquo modo, & medium eſt amborum: quocirca eſt quid & aliud graue & leue, ceu aër & aqua. Dicimus autem id quidem quod continet, formæ eſſe: id autem quod continetur, materiei. Atque hæc differentia, vniuerſis in generibus eſt. In qualitate enim & quantitate, eſt aliud vt forma magis, aliud vt materies: & in loco ſimili modo. Superum enim, eſt definiti: inferum materiei. Quare & in ipſa materia, quæ eſt ipſius grauis & leuis, quo quidem tale eſt potentia, eo grauis materies eſt: quo verò tale eſt, eo leuis materies eſt. Atque eadem quidem eſt, eſſe autem non idem eſt, quemadmodum & ægrotabile ac ſanabile, idem eſt, eſſe verò non idem eſt.

A ἐναντίον γάρ, τὸ μὲν μέσον τῷ ἐσχάτῳ,* τὸ δὲ ὑφιστάμενον ἀεὶ τῷ ἐπιπολάζοντι. διὸ καὶ εὐλόγως τὸ βαρὺ καὶ κοῦφον δύο ἐστί· καὶ γὰρ οἱ τόποι δύο, τὸ μέσον καὶ τὸ ἔσχατον. ἔστι δὲ δή τι καὶ τὸ μεταξὺ τούτων, ὃ πρὸς ἑκάτερον αὐτῶν λέγεται θάτερον· ἔστι γὰρ ὡς ἔσχατον καὶ μέσον ἀμφοτέρων τὸ μεταξύ. διὰ τοῦτο ἔστι τι καὶ ἄλλο βαρὺ καὶ κοῦφον, οἷον ὕδωρ καὶ ἀήρ· φαμὲν δὲ τὸ μὲν περιέχον εἶναι τοῦ εἴδους, τὸ δὲ περιεχόμενον τῆς ὕλης. ἔστι δὴ ἐν πᾶσι [τούτοις] τοῖς γένεσιν αὕτη ἡ διάστασις· καὶ γὰρ ἐν τῷ ποιῷ, καὶ ἐν τῷ ποσῷ, ἔστι τὸ μὲν ὡς εἶδος μᾶλλον, τὸ δὲ ὡς ὕλη. καὶ ἐν τοῖς κατὰ τόπον ὡσαύτως, τὸ μὲν ἄνω τοῦ ὡρισμένου· τὸ δὲ κάτω τῆς ὕλης. B ὥστε καὶ ἐν αὐτῇ τῇ ὕλῃ τῇ τοῦ βαρέος καὶ κούφου, ᾗ μὲν * τοιοῦτον δυνάμει, βαρέος ὕλη, ᾗ δὲ τοιοῦτον, κούφου· καὶ ἔστι μὲν ἡ αὐτή, τὸ δ' εἶναι οὐ ταὐτόν. ὥσπερ καὶ τὸ νοσερὸν καὶ τὸ ὑγιαστόν, τὸ δ' εἶναι οὐ ταὐτόν· διόπερ οὐδὲ τὸ νοσώδει εἶναι, ἢ ὑγιεινῷ.

* γρ. τὸ δ' ὑφιστάμενον ἀεὶ τῷ ἐπιπολάζειν.

* γρ. τοιοῦτο. & mox, ᾗ δὲ τοιόνδε.

CAPVT V.

Quòd neceſſe ſit eſſe elementa quatuor.

ID igitur quod talem materiam habet, leue eſt, ſempérque ſurſum fertur: id verò quod contrarium habet, graue eſt, ſempérque deorſum fertur. At ea quæ diuerſas quidem ab his habent, ſic verò inter ſeſe habentes vt hæ ſe habent, ſimpliciter & ſurſum & deorſum feruntur. Quapropter aër & aqua leuitatem habent, & pondus. Atque aqua quidem vniuerſis, terra excepta, ſubſtat. aër autem ſuper omnia eminet, igne excepto. Cùm autem vnum ſit ſolum, quod ſuper omnia natat, & vnum item, quod ſubſidet vniuerſis, duo alia eſſe neceſſe eſt, quæ & cuipiam ſubſtant, & ſuper aliquid collocantur. Quare & materias quot hæc ſunt, tot eſſe neceſſe eſt, quatuor, inquam, adeo verò quatuor, vt vna quidem ſit omnium communis, præſertim ſi ex ſeſe mutuò fiant: eſſe verò diuerſum ſit. Nihil enim vetat vt inter contraria vnum ſit, atque plura: quemamodum in coloribus. Multis enim modis dicitur id quod eſt inter, ac medium ipſum. Vnumquodque igitur eorum quæ pondus habent, leuitatémque, pondus habet ſuo in loco, leuitatem autem non habet, niſi in hiſce, ſuper quæ natat. Quapropter ſi ſubtrahatur, deorſum in id fertur, quod deinceps eſt collocatum. aër quidem in locum aquæ, aqua verò in locum terræ. Surſum autem in locum ignis, ſi ignis ipſe tollatur, aër non feretur niſi vi: ſicut & ipſa aqua trahitur, cùm ipſum planum fuerit vnũ: atque celeriùs quiſpiam traxerit aquam ſurſum, quàm ſit ea latio qua fertur ipſa deorſum. Neque aqua ſimiliter in aëris locum fertur, niſi vti nunc diximus. Terra autem hoc non patitur, quia planum non eſt vnum. Quapropter aqua quidem in vas ignitum trahitur, terra verò nõ trahitur. Vt autem terra non fertur ſurſum, ſic neque ignis deorſum fertur, ſi ſubtrahatur aër: nihil enim ponderis habet neque ſuo in loco, quemadmodum neque terra, vllius eſt particeps leuitatis. Feruntur autem duo deorſum, ſi infera ſubtrahantur: quia aliud eſt abſolutè graue, quod quidem omnibus ſubſidet: aliud ad aliquid graue, quod quidem ſuum in locum, aut in eorũ ſuper quæ natat, propter materiei ſimilitudinem, fertur. Eſſe autem neceſſarium, æquales facere differẽtias ipſis, patet.

ΚΕΦΑΛ. έ.

Ὅτι ἀνάγκη τέσσαρα εἶναι τὰ στοιχεῖα.

ΤΟ μὲν οὖν ἔχον τοιαύτην ὕλην, κοῦφον καὶ ἀεὶ ἄνω· τὸ δὲ τὴν ἐναντίαν, βαρύ, [καὶ] ἀεὶ κάτω· * τὸ δὲ ἑτέρας μὲν τούτων, ἐχούσας δὲ οὕτω C πρὸς ἀλλήλας, ὡς αὗται, ἁπλῶς, καὶ ἄνω καὶ κάτω φερομένας. διὸ ἀὴρ καὶ ὕδωρ ἔχουσι καὶ κουφότητα καὶ βάρος ἑκάτερον· καὶ ὕδωρ μὲν πλὴν γῆς, πᾶσιν ὑφίσταται· ἀὴρ δέ, πλὴν πυρός, πᾶσιν ἐπιπολάζει. ἐπεὶ δ' ἐστὶν ἓν μόνον ὃ πᾶσιν ἐπιπολάζει, καὶ ἓν ὃ πᾶσιν ὑφίσταται, ἀνάγκη δύο ἄλλα εἶναι, ἃ καὶ ὑφίσταταί τινι, καὶ ἐπιπολάζει τινί. ὥστε ἀνάγκη καὶ τὰς ὕλας τοσαύτας εἶναι, ὅσαπερ ταῦτα, τέτταρας. οὕτω δὲ τέτταρας, ὡς μίαν μὲν ἁπάντων τὴν κοινήν, * ἄλλως τε κἂν εἰ γίγνονται ἐξ ἀλλήλων, ἀλλὰ τὸ εἶναι ἕτερον. οὐδὲ γὰρ κωλύει τῶν ἐναντίων εἶναι μεταξὺ D καὶ ἓν καὶ πλείω, ὥσπερ ἐν χρώμασι· πολλαχῶς γὰρ λέγεται τὸ μεταξὺ καὶ τὸ μέσον. ἐν μὲν οὖν τῇ αὑτοῦ χώρᾳ τῶν ἐχόντων καὶ βάρος καὶ κουφότητα, ἕκαστον ἔχει βάρος· ἡ δὲ γῆ, ἐν ἅπασιν ἔχει βάρος, κουφότητα δ' οὐκ ἔχει, * ἢ μὴ ἐν οἷς ἐπιπολάζει. διὸ καὶ ὑποσπωμένων μέν, φέρεται εἰς τὸ ἐφεξῆς κάτω· ἀὴρ μέν, εἰς τὴν τοῦ ὕδατος χώραν· ὕδωρ δέ, εἰς τὴν τῆς γῆς. ἄνω δ' εἰς τὴν τοῦ πυρός, ἀναιρουμένου τοῦ πυρός, οὐκ οἰσθήσεται ὁ ἀήρ, ἀλλ' ἢ βίᾳ· ὥσπερ καὶ τὸ ὕδωρ σπᾶται, ὅταν γένηται τὸ ἐπίπεδον ἕν, καὶ θᾶττον σπάσῃ τις ἄνω τῆς φορᾶς, ἣν φέρεται τὸ ὕδωρ κάτω. οὐδὲ τὸ ὕδωρ εἰς τὴν τοῦ ἀέρος, ἀλλ' ἢ ὡς νῦν εἴρηται. ἡ γῆ E δὲ τοῦτο οὐ πάσχει, ὅτι οὐχ ἓν τὸ ἐπίπεδον. διὸ τὸ μὲν ὕδωρ εἰς τὸ ἀγγεῖον πυρωθέν, σπᾶται. ἡ δὲ γῆ, οὔ. ὥσπερ δὲ οὐδὲ ἡ γῆ ἄνω, οὐδὲ τὸ πῦρ κάτω εἰσίν, ὑφαιρουμένου τοῦ ἀέρος· οὐδὲ γὰρ ἔχει βάρος οὐδὲ ἐν τῇ αὑτοῦ χώρᾳ, ὥσπερ οὐδὲ ἡ γῆ κουφότητα. φέρεται δὲ κάτω τὰ δύο, ὑποσπωμένων· διότι τὸ μὲν ἁπλῶς βαρύ ἐστιν, ὃ πᾶσιν ὑφίσταται· τὸ δὲ πρός τι βαρὺ ὄν, εἰς τὴν αὑτοῦ χώραν, ἢ οἷς ἐπιπολάζει, δι' ὁμοιότητα τῆς ὕλης. ὅτι δ' ἀναγκαῖον ποιεῖν ἴσας τὰς διαφορὰς αὐτοῖς, δῆλον.

* Vetus interp. & Arg. τὰ δὲ ἑτ. & mox φέρεται pro φερομένας.

* γρ. ἀεὶ ἢ

Εἰ μὲν γὰρ μία ὕλη πάντων, οἷον ἢ τὸ κενὸν, ἢ τὸ πλῆρες, ἢ τὸ μέγεθος, ἢ τὰ τρίγωνα, ἢ πάντα ἄνω, ἢ πάντα κάτω, οἰσθήσεται· * ἡ δὲ ἑτέρα, φορὰ οὐκέτι ἔσται· ὥστ᾽ ἢ κοῦφον οὐδὲν ἔσται ἁπλῶς, εἰ πάντα ῥέπει μᾶλλον τῷ ἐκ μειζόνων εἶναι σωμάτων, ἢ ἐκ πλειόνων, ἢ ὅτι πλήρη. τοῦτο δὲ ὁρῶμέν τε, καὶ δέδεικται ὅτι ὁμοίως κάτω τε ἀεὶ καὶ πανταχοῦ φέρεται, καὶ ἄνω· ἐὰν δὲ τὸ κενὸν ἤ τι τοιοῦτον, ὃ ἀεὶ ἄνω, οὐκ ἔσται τὸ ἀεὶ κάτω. καὶ τῶν μεταξὺ δὴ ἔνια, ἔσται κάτω θᾶττον γῆς. ἐν γὰρ τῷ πολλῷ ἀέρι τρίγωνα πλείω, ἢ τὰ στερεὰ, ἢ τὰ μικρὰ ἔσται. οὐ φαίνεται δ᾽ οὐθὲν μόριον ἀέρος κάτω φερόμενον. ὁμοίως δὲ καὶ ἐπὶ τοῦ κούφου, ἐὰν ἐκεῖνο ποιήσῃ τις ὑπερέχον τῇ ὕλῃ. ἐὰν δὲ δύο τὰ μεταξὺ, πῶς ἔσται ποιοῦντα ἃ ποιεῖ ἀήρ τε καὶ ὕδωρ; οἷον εἴ τις φαίη εἶναι κενὸν, καὶ πλῆρες. τὸ μὲν οὖν πῦρ, κενόν· διὸ καὶ ἄνω· τὴν δὲ γῆν, πλῆρες· διὸ καὶ κάτω. ἀέρα δὲ πλεῖον πυρὸς ἔχειν, ὕδωρ δὲ γῆς· ἔσται γάρ τι ὕδωρ, ὃ πλεῖον ἕξει πῦρ ὀλίγου ἀέρος· καὶ ἀὴρ πολὺς, ὀλίγου ὕδατος γῆν πλείω. ὥστε δεήσει ἀέρος τι πλῆθος φέρεσθαι θᾶττον κάτω, ὕδατος ὀλίγου. τοῦτο δ᾽ οὐ φαίνεται οὐδαμοῦ οὐδέποτε. ἀνάγκη τοίνυν ὥσπερ καὶ τὸ πῦρ ἄνω, ὅτι τοδὶ ἔχει οἷον τὸ κενὸν τὰ δ᾽ ἄλλα οὔ. καὶ τὴν γῆν κάτω, ὅτι τὸ πλῆρες ἔχει· καὶ τὸν ἀέρα εἰς τὸν αὐτοῦ, καὶ ἀνώτερον, τοῦ ὕδατος, ὅτι τοδί τι ἔχει· καὶ τὸ ὕδωρ κάτω, ὅτι τοιόνδε. * εἰ δὲ ἓν τι ἄμφω ἢ δύο, ἄμφω δ᾽ ὑπάρξει ταῦτα ἑκατέρῳ, ἔσται τι πλῆθος ἑκατέρου, οὗ ὑπερέξει ὕδωρ τε ἀέρος ὀλίγου, τῷ ἄνω, καὶ ἀὴρ ὕδατος, τῷ κάτω, καθάπερ εἴρηται πολλάκις.

* γ. ἢ δι᾽ ἕτ. medotè

* γ. εἰ δὲ ἢ

ΚΕΦΑΑ. ϛʹ.

Ὅτι τὰ σχήματα οὐκ αἴτια τοῦ φέρεσθαι ἁπλῶς ἢ κάτω ἢ ἄνω, ἀλλὰ τοῦ θᾶττον ἢ βραδύτερον.

Τὰ δὲ σχήματα οὐκ αἴτια τοῦ φέρεσθαι ἁπλῶς, ἢ κάτω ἢ ἄνω, ἀλλὰ τοῦ θᾶττον ἢ βραδύτερον. δι᾽ ἃς δ᾽ αἰτίας, οὐ χαλεπὸν ἰδεῖν. ἀπορεῖται γὰρ νῦν, διὰ τί τὰ πλατέα σιδήρια, καὶ μόλυβδος ἐπιπλεῖ ἐπὶ τοῦ ὕδατος, ἄλλα δὲ ἐλάττω καὶ ἧττον βαρέα, ἂν ᾖ στρογγύλα ἢ μακρὰ, οἷον βελόνη, κάτω φέρεται. καὶ ὅτι ἔνια διὰ σμικρότητα ἐπιπλεῖ, οἷον τὸ ψῆγμα, καὶ ἄλλα γεώδη καὶ κονιορτώδη ἐπὶ τοῦ ἀέρος. περὶ δὴ τούτων ἁπάντων, τὸ μὲν νομίζειν αἴτιον εἶναι ὥσπερ Δημόκριτος, οὐκ ὀρθῶς ἔχει. ἐκεῖνος γάρ φησι τὰ ἄνω φερόμενα θερμὰ ἐκ τοῦ ὕδατος, ἀνακωχεύειν τὰ πλατέα τῶν ἐχόντων βάρος· τὰ δὲ στενὰ διαπίπτειν· ὀλίγα γὰρ εἶναι * τὰ ἀντικρούοντα αὐτοῖς. ἔδει δ᾽ ἐν τῷ ἀέρι ἔτι μᾶλλον τοῦτο ποιεῖν, ὥσπερ ἐνίσταται κἀκεῖνος αὐτός. ἀλλ᾽ ἐνστὰς, λύει μαλακῶς· φησὶ γὰρ οὐκ εἰς ἓν ὁρμᾶν τὸν σοῦν· λέγων σοῦν τὴν κίνησιν τῶν ἄνω φερομένων σωμάτων. ἐπεὶ δὲ ἐστὶ τὰ μὲν εὐδιαίρετα τῶν συνεχῶν τὰ δὲ ἧττον· καὶ διαιρετικὰ δὲ τὸν αὐτὸν τρόπον, τὰ μὲν μᾶλλον, τὰ δ᾽ ἧττον, ταύτας εἶναι νομιστέον αἰτίας. εὐδιαίρετον μὲν οὖν, τὸ εὐόριστον, καὶ μᾶλλον τὸ μᾶλλον. ἀὴρ δὲ μᾶλλον ὕδατος τοιοῦτον, ὕδωρ δὲ γῆς. καὶ τὸ ἔλαττον δὴ ἐν ἑκάστῳ γένει, εὐδιαιρετώτερον καὶ διασπᾶται ῥᾷον. τὰ μὲν οὖν ἔχοντα πλάτος διὰ τὸ πολὺ περιλαμβάνειν, ἐπιμένει, διὰ τὸ μὴ διασπᾶσθαι τὸ πλεῖον ῥᾳδίως.

* γ. τὰ ἀντικρούοντα

A Nam ſi vna ſit omnium materies, aut vacuum, aut plenum, aut magnitudo, aut trianguli, aut vniuerſa ſurſum, aut vniuerſa deorſum ferentur, alte[illegible] latio non erit. Quare nihil erit ſimpliciter [illegible] cuncta inclinantur magis deorſum, ex eo [illegible] ex maioribus ſunt corporibus, aut ex pluribus [illegible] quia ſunt plena. Hoc autem & videmus, & [illegible] ſtratum eſt, ſimiliter (inquam) deorſum ſemper, & vbique, ac ſurſum corpora ferri. Si verò vacuum ſit, aut quippiã tale, quod ſurſum ſemper feratur, non erit id quod ſemper deorſum fertur: & mediorum aliqua celeriùs deorſum, quàm terra, ferentur. Magno enim in aëre, trianguli plures erunt, aut ſolida aut plana: at nulla pars aëris deorſum ferri videtur.
B Similiter & in leui, ſi illud fecerit quiſpiam excedere materia. Sin verò duæ ſunt materiæ: veluti ſi quiſpiam dixerit eſſe vacuum, atque plenum, ipſa media, aër, inquam, & aqua, quónam pacto facient ea quæ faciunt? Ignem igitur vacuum eſſe dicunt, quapropter & ſurſum fertur: terram autem plenũ, quocirca deorſum fertur: aërem verò plus ignis habere, & aquam plus terræ. Erit itaque quædã aqua, quæ plus ignis habebit, quàm paruus aer: & aer magnus plus terræ quàm parua aqua. Quare magnam aliquam aeris partem aqua parua deorſum ferri celeriùs oportebit: hoc autem nuſquam vnquam fieri videtur. Vt igitur & ignẽ ideo ſurſum ferri neceſſe eſt, quia hoc habet, vacuũ, inquam, cætera verò nõ,
C & terrã ideo deorſum ferri, quia plenum habet: ſic & aerem ideo ſuum in locum ferri, ac ſuper aquam collocari neceſſe eſt, quia hoc habet: & aquã ideo deorſum ferri, ac ſub ipſo aere collocari, quia hoc habet. Si verò aut vnũ quid ambo ſint, aut duo, ambo verò inſint vtriq;, erit aliqua multitudo vtriuſq; qua quidem aerem aqua parum excedet ſupero, & aer aquam infero, quemadmodũ ſæpe eſt dictum.

CAPVT VI.

Quòd figura ſit cauſa, vt velocior, aut tardior ſit motus, non tamen efficiat vt ſurſum aut deorſum tendat.

Figuræ autem cauſæ non ſunt, vt aut ſurſum aut deorſum abſolutè ferantur: ſed vt celeriùs tardiúſque ferantur. Propter quas autem cauſas, non
D eſt difficile videre. Dubitatur enim nunc, cur latum ferrum plumbúmque ſuper aquam natat, alia verò minora, minúſque grauia, ſi rotunda ſint, aut longa, vt acus, deorſum feruntur: & nonnulla ob paruitatem, vt arena auri, aliáque terrea, pulueriſque ſimilia, ſuper aerem natant. Cauſam igitur omnium horum eſſe putare, vti Democritus cenſet, non rectè ſe habet. Ille enim dicit, ea calida quæ ſurſum ex aqua feruntur, grauium ea quæ lata ſunt, ſuſtinere, anguſta verò delabi: pauca enim ea eſſe quæ ipſa offendunt. In aere autem magis etiam id ipſum fieri oportebat, vt obiicit ille ipſe: obiectione verò allata, molliter ſoluit. Dicit enim
E non in vnum motionem eorum corporum fieri, quæ ſurſum feruntur. Cùm autem continuorum alia facilè alia minùs facilè diuidi poſſint: & diuiſiua modo eodem, alia magis, alia minùs: has eſſe cauſas eſt putandum. Id igitur facilè diuiſibile eſt, quod facilè terminos ſuſcipere poteſt: & id magis quod magis. Aer autem magis eſt tale, quàm aqua, & aqua magis quàm terra. Minus etiam quoque in genere corpus, magis facilè diuiditur, faciliúſque diſrumpitur. Ea igitur quæ latitudinem habent, quia multum comprehendunt, ideo ſupra manẽt, propterea quòd non facilè illud diſrũpitur.

Ea verò quæ contrario modo ſeſe habent figuris, quia parum comprehendunt, ideo deorſum feruntur, propterea quòd facilè illud diuidunt: & in aëre multo magis, quo faciliùs quàm aqua, diuiditur. Cùm autem & pondus aliquas habeat vires, quibus deorſum fertur, & continua ſimili modo vt non diſrumpantur, hæc inter ſeſe conferre oportet. Si vires enim ponderis, eas vires quæ in cõtinuo ſunt, ad diſruptionem diuiſionémque exuperent, vim inferet ipſum graue, celeriúſque deorſum feretur: ſin imbecilliores ſint, ſupra manebit, atque natabit. De graui igitur atque leui, & de hiſce quæ circa ipſa accidunt, à nobis hoc modo ſit definitum.

A τὰ δ' ἐναντίως ἔχοντα τοῖς σχήμασι, διὰ τὸ ὀλίγον περιλαμβάνειν, φέρεται κάτω, διὰ τὸ διαιρεῖν ῥᾳδίως· καὶ ἐν ἀέρι πολὺ μᾶλλον, ὅσῳ εὐδιαιρετώτερός ἐστιν ὕδατος. ἐπεὶ δὲ τό, τε βάρος ἔχει τινὰ ἰσχύν, καθ' ἣν φέρεται κάτω, καὶ τὰ συνεχῆ πρὸς τὸ μὴ * διασπᾶσθαι, ταῦτα δεῖ πρὸς ἄλληλα συμβάλλειν. ἐὰν γὰρ ὑπερβάλλῃ ἡ ἰσχὺς ἡ τοῦ βάρους τῆς ἐν τῷ συνεχεῖ, πρὸς τὴν διάσπασιν, καὶ τὴν διαίρεσιν, βιάσεται κάτω θᾶττον· ἐὰν δὲ ἀσθενεστέρα ᾖ, ἐπιπολάσει. περὶ μὲν οὖν βαρέος, καὶ κούφου, καὶ τῶν περὶ αὐτὰ συμβαινόντων, ἀφωρίσθω B τοῦτον ἡμῖν τὸν τρόπον.

* ἢ. διασπᾶσθαι

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ ΓΕΝΕΣΕΩΣ ΚΑΙ ΦΘΟΡΑΣ,

τῶν εἰς δύο τὸ Α.

ARISTOTELIS STAGIRITÆ, DE GENERATIONE ET CORRVPTIONE LIBER PRIMVS.

Franciſco Vatablo interprete.

CAPVT I.

De generatione & alteratione, Priſcorum ſententia.

De ortu autem ac interitu eorum quæ natura gignuntur intereúntque, vniuerſim de omnibus, tum cauſas tum rationes eorum diſtinguendo, dicamus oportet: præterea quid accretio quidque alteratio ſit: & eandémne alterationis atque generationis eſſe naturam exiſtimare liceat, an diuerſam, perinde vt ipſis quoque nominibus diſcretæ ſunt. Priſcorum igitur quidam generationem, ſimplicem abſolutámque alterationem eſſe inquiunt. Quidam, à generatione alterationem aliud eſſe. Nam qui vniuerſum ipſum aiunt vnum quippiam eſſe, & omnia ex vno oriri cenſent, ij generationem alterationem eſſe, & quod propriè generatur, id alterari dicant, eſt neceſſe. At qui plures quàm vnam eſſe materies aſtruunt, vti Empedocles, Anaxagogas & Leucippus: illas differre dicant oportet. quanquam Anaxagoras, ſuam profectò vocem ignorauit: quippe cùm oriri ac interire, idem eſſe quod alterari dicat. at multa eſſe rerum elementa, perinde atque alij, aſſerit. Nam Empedocles corporea quidem elementa, quatuor: omnia verò vnà cum hiſce quæ motu ciendi vim habent, numero ſex ait eſſe. Anaxagoras verò & Leucippus & Democritus, infinita. Etenim Anaxagoras ea facit elementa rerum, quæ ſimilaria ſunt, vt os, vt carnem, medullam, cæteráque, quorum cuiuſque pars eandem cum toto ſortita eſt appellationem. Democritus autem & Leucippus,

C

ΚΕΦΑΛ. α'.

Τῶν ἀρχαίων δόξαι περὶ γενέσεως καὶ φθορᾶς.

ΠΕΡΙ δὲ γενέσεως καὶ φθορᾶς τῶν φύσει γινομένων καὶ φθειρομένων, ὁμοίως κατὰ πάντων, τάς τε αἰτίας διαιρετέον, καὶ τοὺς λόγους αὐτῶν [διοριστέον] ἔτι δὲ περὶ αὐξήσεως καὶ ἀλλοιώσεως, τί ἑκάτερον, καὶ πότερον τὴν αὐτὴν ὑποληπτέον εἶναι φύσιν ἀλλοιώσεως καὶ γενέσεως, ἢ χωρίς, ὥσπερ διώρισται καὶ τοῖς ὀνόμασι. D τῶν μὲν οὖν ἀρχαίων, οἱ μὲν τὴν καλουμένην ἁπλῆν γένεσιν, ἀλλοίωσιν εἶναί φασιν· οἱ δ' ἕτερον ἀλλοίωσιν καὶ γένεσιν. ὅσοι μὲν γὰρ ἕν τι τὸ πᾶν εἶναι λέγουσι, καὶ πάντα ἐξ ἑνὸς γεννῶσι, τούτοις μὲν ἀνάγκη ἀλλοίωσιν τὴν γένεσιν φάναι, καὶ τὸ κυρίως γινόμενον ἀλλοιοῦσθαι· ὅσοι δὲ πλείω τὴν ὕλην ἑνὸς τιθέασιν, οἷον Ἐμπεδοκλῆς καὶ Ἀναξαγόρας, καὶ Λεύκιππος, τούτοις ἕτερον. καίτοι Ἀναξαγόρας γε τὴν οἰκείαν φωνὴν ἠγνόησε. * λέγει γοῦν ὡς τὸ γίνεσθαι, καὶ τὸ ἀπόλλυσθαι, ταὐτὸν καθέστηκε τῷ ἀλλοιοῦσθαι. E πολλὰ δὲ λέγει τὰ στοιχεῖα, καθάπερ καὶ ἕτεροι. Ἐμπεδοκλῆς μὲν γάρ, τὰ μὲν σωματικὰ τέτταρα, τὰ δὲ πάντα μετὰ τῶν κινούντων, ἓξ τὸν ἀριθμόν· Ἀναξαγόρας δέ, ἄπειρα, καὶ Λεύκιππος, καὶ Δημόκριτος. ὁ μὲν γὰρ τὰ ὁμοιομερῆ στοιχεῖα τίθησιν, οἷον ὀστοῦν, καὶ σάρκα, καὶ μυελόν, καὶ τῶν ἄλλων, ὧν ἑκάστου τὸ μέρος συνώνυμον ἐστί. Δημόκριτος δὲ καὶ Λεύκιππος,

* Phyſicor. lib. 1. cap. 4.

ἐκ σωμάτων ἀδιαιρέτων τἆλλα συγκεῖσθαί φασι· ταῦτα δ᾽ ἄπειρα, καὶ τὸ πλῆθος εἶναι, καὶ τὰς μορφάς. αὐτὰ δὲ πρὸς αὐτὰ διαφέρειν τούτοις, ἐξ ὧν εἰσὶ καὶ θέσει καὶ τάξει τούτων. ἐναντίως δὲ φαίνονται λέγοντες οἱ περὶ Ἀναξαγόραν τοῖς περὶ Ἐμπεδοκλέα. ὁ μὲν γάρ φησι πῦρ, καὶ ὕδωρ, καὶ ἀέρα, καὶ γῆν, στοιχεῖα τέσσαρα, καὶ ἁπλᾶ εἶναι μᾶλλον, ἢ σάρκα καὶ ὀστοῦν, καὶ τὰ τοιαῦτα τῶν ὁμοιομερῶν. οἱ δέ, ταῦτα μὲν ἁπλᾶ, καὶ στοιχεῖα· γῆν δέ, καὶ πῦρ, [καὶ ὕδωρ] καὶ ἀέρα, σύνθετα. πανσπερμίαν γὰρ εἶναι τούτων. τοῖς μὲν οὖν ἐξ ἑνὸς πάντα κατασκευάζουσιν, ἀναγκαῖον λέγειν τὴν γένεσιν καὶ τὴν φθοράν, ἀλλοίωσιν. ἀεὶ γὰρ μένειν τὸ ὑποκείμενον ταὐτὸ καὶ ἕν· τὸ δὲ τοιοῦτον, ἀλλοιοῦσθαί φαμεν· τοῖς δὲ τὰ γένη πλείω ποιοῦσι, διαφέρειν τὴν ἀλλοίωσιν τῆς γενέσεως. συνιόντων γὰρ καὶ διαλυομένων, ἡ γένεσις συμβαίνει καὶ ἡ φθορά. διὸ λέγει τὸν τρόπον τοῦτον καὶ Ἐμπεδοκλῆς, ὅτι

-- φύσις οὐδενός ἐστιν,
Ἀλλὰ μόνον μίξις τε διάλλαξίς τε μιγέντων.

ὅτι μὲν οὖν οἰκεῖος ὁ λόγος αὐτῶν τῇ ὑποθέσει οὕτω φάναι, δῆλον· καὶ ὅτι λέγουσιν τὸν τρόπον τοῦτον. ἀναγκαῖον δὲ καὶ τούτοις τὴν ἀλλοίωσιν εἶναι μέν τι φάναι παρὰ τὴν γένεσιν· ἀδύνατον μέντοι κατὰ τὰ ὑπ᾽ ἐκείνων λεγόμενα. τοῦτο δ᾽ ὅτι λέγομεν ὀρθῶς, ῥᾴδιον συνιδεῖν. ὥσπερ γὰρ ὁρῶμεν ἠρεμούσης τῆς οὐσίας, ἐν αὐτῇ μεταβολὴν κατὰ μέγεθος, τὴν καλουμένην αὔξησιν, καὶ φθίσιν, οὕτω καὶ ἀλλοίωσιν. οὐ μὴν ἀλλ᾽ ἐξ ὧν λέγουσιν * οἱ πλείους ἀρχὰς ποιοῦντες μιᾶς, ἀδύνατον ἀλλοιοῦσθαι. τὰ γὰρ πάθη, καθ᾽ ἅ φαμεν τοῦτο συμβαίνειν, διαφοραὶ τῶν στοιχείων εἰσί. λέγω δ᾽ οἷον θερμόν, ψυχρόν, λευκόν, μέλαν, ξηρόν, ὑγρόν, μαλακόν, σκληρόν, καὶ τῶν ἄλλων ἕκαστον, ὥσπερ καὶ φησὶν Ἐμπεδοκλῆς,

* γρ. εἶναι τὰ. ἀρ. ποιοῦντες μ.

Ἠέλιον μὲν λευκὸν ὁρᾶν καὶ θερμὸν ἁπάντῃ·
Ὄμβρον δ᾽ ἐν πᾶσι * δνοφόεντά τε ῥιγαλέον τε.

ὁμοίως δὲ διορίζει καὶ * ἐπὶ τῶν λοιπῶν. ὥστ᾽ εἰ μὴ δυνατὸν ἐκ πυρὸς * γενέσθαι ὕδωρ, μηδ᾽ ἐξ ὕδατος γῆν, οὐδ᾽ ἐκ λευκοῦ μέλαν ἔσται οὐδέν, οὐδ᾽ ἐκ μαλακοῦ σκληρόν. ὁ δ᾽ αὐτὸς λόγος καὶ περὶ τῶν ἄλλων. τοῦτο δ᾽ ἦν ἀλλοίωσις. ᾗ καὶ φανερὸν ὅτι μίαν ἀεὶ ὑποθετέον εἶναι τοῖς ἐναντίοις ὕλην, ἄν τε μεταβάλλῃ κατὰ τόπον, ἄν τε καὶ αὔξησιν καὶ φθίσιν, ἄν τε κατ᾽ ἀλλοίωσιν. ἔτι δ᾽ ὁμοίως ἀναγκαῖον εἶναι τοῦτο καὶ ἀλλοίωσιν. εἴτε γὰρ ἀλλοίωσίς ἐστι, καὶ τὸ ὑποκείμενον ἓν στοιχεῖον, καὶ μία ἡ πάντων ὕλη τῶν ἐχόντων εἰς ἄλληλα μεταβολήν, κἂν εἰ τὸ ὑποκείμενον ἕν, ἔστιν ἀλλοίωσις. Ἐμπεδοκλῆς μὲν οὖν ἔοικεν ἐναντία λέγειν, καὶ πρὸς τὰ φαινόμενα, καὶ πρὸς αὑτὸν αὐτός. ἅμα μὲν γὰρ οὔ φησιν ἕτερον ἐξ ἑτέρου γίνεσθαι τῶν στοιχείων οὐδέν, ἀλλὰ τἆλλα πάντα ἐκ τούτων. ἅμα δ᾽ ὅταν συναγάγῃ εἰς ἓν τὴν ἅπασαν φύσιν, πλὴν τοῦ νείκους, ἐκ τοῦ ἑνὸς γίνεσθαι πάλιν ἕκαστον. ὥστ᾽ ἐξ ἑνός τινος δηλονότι διαφοραῖς τισι χωριζομένων καὶ πάθεσιν, ἐγένετο τὸ μὲν ὕδωρ, τὸ δὲ πῦρ. καθάπερ λέγει τὸν μὲν ἥλιον λευκὸν καὶ θερμόν, τὴν δὲ γῆν, βαρὺ καὶ σκληρόν. ἀφαιρουμένων οὖν τούτων τῶν διαφορῶν (εἰσὶ γὰρ ἀφαιρεταί, γενόμεναί γε) δῆλον, ὡς ἀνάγκη γίνεσθαι καὶ γῆν ἐξ ὕδατος, καὶ ὕδωρ ἐκ γῆς. ὁμοίως δὲ καὶ τῶν ἄλλων ἕκαστον, οὐ τότε μόνον, ἀλλὰ καὶ νῦν, μεταβάλλοντά γε τοῖς πάθεσιν.

* γρ. ζοφόεντα
* γρ. ἀεὶ
* γρ. γίνεσθαι

A ex indiuiſibilibus corporibus, quæ & multitudine & formis infinita ſunt, cætera componi dicunt: atque hæc inter ſeſe differre per illa, nimirum ſitu ac ordine eorum ex quibus conſtant. Porrò Anaxagoras & Empedocles contrario dicere modo videntur. Ille enim terram, aquam, aërem, & ignem, elementa quatuor, eáque ſimplicia magis quàm carnem, os, & id genus ſimilaria. Hic verò hæc quidem, ſimplicia elementáque: illa verò, terram, inquam, aquam, aërémque & ignem, compoſita: vtpote quibus gignendis, illa præſtent ſemina. Igitur qui ex vno omnia conficiunt, generationem & corruptionem eſſe dicant alteratione, eſt neceſſe: nam ſubiectum ipſum, ſemper idem atque vnum mane-B re dicant oportet: quod autem tale eſt, id dicimus alterari. Qui verò plura genera ſtatuunt, à generatione alterationem differre cenſeant neceſſum eſt. cùm enim ea coëunt aut diſſoluuntur, generatio corruptióve fit. Quocirca & Empedocles ad hunc canit modum:

---nullius eſt natura, ſed ipſa
Miſtio miſtorúmque prius diuulſio ſolum.

Patet igitur, ſermonem eorum ſuppoſitioni eſſe accommodatum, cùm hoc pacto dicunt: ac eos ad hunc dicere modum. At neceſſarium & illis quoque eſt vt alterationem dicant à generatione quippiam eſſe diuerſum: fieri tamen haudquaquam po-C teſt, iuxta ea quę ab eis dicuntur. Quòd autem hoc rectè dicamus, facile eſt perſpicere: nam quieſcẽte ſubſtantia, vt in ea mutationem in magnitudine, quæ vocatur accretio & decretio; ita & alterationem. Verumenim fieri nequit vt alteratio fiat per ea quæ dicunt, qui plura vno principia faciunt. Siquidem affectus ipſi iuxta quos id accidere dicimus, differentiæ ſunt elementorum. quod genus ſunt, caliditas, frigiditas, albedo, nigredo, ariditas, humiditas, mollities, durities, & ceteræ aliæ, vti & Empedocles ait:

Albentem penitus ſolem, calidúmque videri:
Aſt imbrem inter cuncta nigrum ſimul atque rigentem.

D Similiter & de reliquis quoque definit, pronuntiátque. Quare ſi fieri nequeat vt ex igni oriatur aqua, aut ex aqua terra: neque profectò ex albo quicquam nigrum fiet, aut è molli durum. Eadem & de cæteris quoque ratio eſt. Hoc autem eſt alteratio. Anne etiam perſpicuũ eſt, oportere ſemper contrariis ipſis vnam ſubiicere materiam, ſiue loco, ſiue accretione decretionéve, ſiue alteratione mutatio fiat? Præterea ſimiliter & hoc alterationem eſſe eſt neceſſe. Etenim ſi alteratio ſit, & ſubiectum eſt elementum vnum, & omnium quæ in ſeſe viciſſim mutantur, vna eſt materia. & ſi ſubiectum vnum ſit, alteratio eſſe ſolet. Empedocles igitur & hiſce E quæ apparent, & ipſe ſibi contraria dicere videtur. Nam & elementorum nullum ex alio fieri, ſed ex eis cætera omnia: & cùm vniuerſam naturam in vnum coëgit præter diſcordiam, ex illo vno rurſus quodque fieri aſſerit. Quare ex vno quodam, vt patet, eorum quæ differentiis quibuſdam ac affectibus diſtincta ſeparatáq; ſunt, aliud aqua, aliud ignis factum eſt. Quemadmodum ſolem ait album & calidum, terram verò grauem atque duram. Detractis igitur hiſce differentiis (detrahi enim poſſunt, nam genitæ ſunt) tum ex aqua terram tum ex terra aquam neceſſariò fieri conſtat. Eodem pacto & cæterorum quodque, nec tum ſolùm, verùm etiam nunc, ſi modò mutentur iuxta affectus.

A Nam de numero eorum ſunt quæ adeſſe & abeſſe rurſus poſſe dixit: præſertim adhuc inter ſeſe pugnantibus diſcordia & concordia. Quocirca & tum ex vno orta ſunt ac genita. non enim vniuerſum ipſum ignis, aër, aqua & terra, cùm adhuc vnum eſſent, erat. Sed & id quoque nequaquam liquet, vtrùm ſcilicet ille ipſum vnum principium ſtatuere debeat, an ipſa multa, ignem inquam & terram, & quæ cum hiſce eiuſdẽ ſunt ſeriei. Nam quo ipſum vnum, vt materia ſubiicitur, ex quo mutatione (quę motionis opera fit) terra & ignis fiunt, elementum eſt: at quo, hoc quidem ex compoſitionę fit, coeuntibus inquam illis, illa verò ex diſſolutione, hoc elementi appellatione digniora ſunt, naturáque B priora.

ἔτι δὲ ἐξ ὧν εἴρηκε δυνάμενα προσγίνεσθαι, καὶ χωρίζεσθαι πάλιν, ἄλλως τε καὶ μαχομένων ἀλλήλοις ἔτι κατ' αὐτὸν τοῦ νείκους καὶ τῆς φιλίας. διόπερ καὶ τότε ἐξ ἑνὸς ἐγενήθησαν. οὐ γὰρ δὴ πῦρ γε καὶ ὕδωρ* καὶ γῆ, ἔτι ὄντα ἕν, ἦν τὸ πᾶν. ἄδηλον δὲ καὶ τὸ, πότερον ἀρχὴν αὐτῶν θετέον τὸ ἕν, ἢ τὰ πολλά. λέγω δὲ πῦρ, καὶ γῆν, καὶ τὰ σύστοιχα τούτων. ἧ μὲν γὰρ ὡς ὕλη ὑπόκειται, ἐξ οὗ μεταβάλλοντα διὰ τὴν κίνησιν* γίνονται γῆ, *καὶ πῦρ, τὸ ἓν στοιχεῖον· ἧ δὲ τοῦτο μὲν ἐκ συνθέσεως γίνεται, συνιόντων ἐκείνων, ἐκεῖνα δ' ἐκ διαλύσεως, στοιχειωδέστερα ἐκεῖνα, καὶ πρότερα τὴν φύσιν.

* γ. ἐξ ὧν εἶπεν, ὅτι ἓν ἦν τὸ πᾶν.

* γ. γίνεται

* γ. ἢ ὕδωρ & vetus interpr. fiunt ignis & terra & aqua.

CAPVT II.

Platonis poſitio, Democriti poſitione minus idonea.

ΚΕΦΑΛ. β΄.

Ὅτι ἀδύνατον εἶναι τὴν γένεσιν σύγκρισιν, οἵαν δή τινές φασι.

Omnino itaque de generatione & corruptione ſimplici abſolutáque, verùm ſit nécne, & quo pacto ſit, & de cæteris abſolutis motibus, verbi cauſa, de accretione & alteratione, dicendum eſt. Plato igitur, de generatione ac corruptione quomodo rebus ipſis competant, conſiderauit ſolùm: nec id quidem de omni, ſed elementorum. quomodo ve- C rò carnes, aut oſſa, aut quippiam aliud tale gignatur, nequaquam. Inſuper nec de alteratione, nec de accretione, quonam pacto rebus ipſis contingant. Ad ſummam, de nulla mutatione niſi ſuperficie tenus, quicquam vllus definiuit: præterquam Democritus, cui omnia fuiſſe curæ videntur, ſed in hoc nempe, quia via ac ratione fiant, iam diſcrepat. Nam nec de accretione quiſquam quicquam definiuit, ſicuti diximus, quod non vel quiuis dicat. Dixerunt enim, res ipſas acceſſu rei ſimilis augeri. id autem quonam pacto fiat, nihil præterea dixere. Nec de miſtione, nec de aliorum prope dixerim vllo, verbi cauſa, de actione & paſſione, quónam mo- D do aliud agat; aliud patiatur in actione naturali. Democritus autem & Leucippus figuras concinnant, ex quibus alterationem faciunt atque generationem: congregatione quidem & ſegregatione, generationem atque corruptionem: ordine verò & poſitu, alterationem. Cæterùm quoniam quæ apparent, ea vera eſſe putabant, contraria autem & infinita ſunt quæ apparent, infinitas fecère figuras: ita vt per compoſiti tranſmutationes idem contrarium videatur alii atque alii, tranſmutetúrque inſerta re puſilla, & omnino permutato vno quopiam diuerſum quid appareat, quandoquidem tragœdia & comœdia eiſdem fiunt literis. At cùm generatio & corruptio diuerſum quid eſſe E omnibus ferè videantur, & ea quæ ſunt congregatione atque ſegregatione oriri ac occidere, & de mutatione affectuum alterari: de his contemplentur, qui hoc inſtituti habent, oportet. Hæc autem & multas, & quæ rationis fines non egrediuntur, dubitationes habent. Nam ſi generatio, congregatio ſit, multa ex eorum numero quæ fieri nequeunt, euenire ſolent. Sunt autem rurſus aliæ rationes quæ vrgent, quæque haud facilè ſolui poſſunt: quòd fieri non poteſt, vt quicquam aliter ſeſe habeat, ſi generatio, congregatio non ſit: aut quòd omnino generatio non eſt, aut eadem alteratio eſt. Atque id, quanquam difficile, enitendum eſt ſoluere.

Ὅλως τε δὴ περὶ γενέσεως καὶ φθορᾶς τῆς ἁπλῆς λεκτέον, πότερόν ἐστιν, ἢ οὐκ ἔστι, καὶ πῶς ἐστι· καὶ περὶ τῶν ἄλλων ἁπλῶν κινήσεων, οἷον περὶ αὐξήσεως καὶ ἀλλοιώσεως. Πλάτων μὲν οὖν μόνον περὶ γενέσεως ἐσκέψατο καὶ φθορᾶς, ὅπως ὑπάρχει τοῖς πράγμασι· καὶ περὶ γενέσεως οὐ πάσης, ἀλλὰ τῆς τῶν στοιχείων. πῶς δὲ σάρκες, ἢ ὀστᾶ, ἢ τῶν ἄλλων τι τῶν τοιούτων, οὐδὲν ἔτι· οὐδὲ περὶ ἀλλοιώσεως, οὐδὲ περὶ αὐξήσεως, τίνα τρόπον ὑπάρχουσι τοῖς πράγμασιν. ὅλως δὲ παρὰ τὰ ἐπιπολῆς περὶ οὐδενὸς οὐδεὶς ἐπέστησεν, ἔξω Δημοκρίτου. οὗτος δ' ἔοικε μὲν περὶ ἁπάντων φροντίσαι, ἤδη δὲ ἐν τῷ πῶς, διαφέρει. οὔτε γὰρ περὶ αὐξήσεως οὐδεὶς οὐδὲν διώρισεν, ὥσπερ λέγομεν, ὅ τι μὴ, κἂν ὁ τυχὼν εἴπειεν, ὅτι προσιόντος αὐξάνονται τοῦ ὁμοίου· πῶς δὲ τοῦτο, οὐκέτι. οὐδὲ περὶ μίξεως, οὐδὲ περὶ τῶν ἄλλων, ὡς εἰπεῖν, οὐδενὸς οἷον, τοῦ ποιεῖν, ἢ τοῦ πάσχειν, τίνα τρόπον τὸ μὲν ποιεῖ, τὸ δὲ πάσχει τὰς φυσικὰς ποιήσεις. Δημόκριτος δὲ καὶ Λεύκιππος ποιήσαντες τὰ σχήματα, τὴν ἀλλοίωσιν καὶ τὴν γένεσιν ἐκ τούτων ποιοῦσι· διακρίσει μὲν καὶ συγκρίσει, γένεσιν καὶ φθοράν· τάξει δὲ καὶ θέσει, ἀλλοίωσιν. ἐπεὶ δ' ᾤοντο τὸ ἀληθὲς ἐν τῷ φαίνεσθαι, ἐναντία δὲ καὶ ἄπειρα τὰ φαινόμενα, τὰ σχήματα ἄπειρα ἐποίησαν· ὥστε ταῖς μεταβολαῖς τοῦ συγκειμένου τὸ αὐτὸ ἐναντίον δοκεῖν ἄλλῳ καὶ ἄλλῳ, καὶ μετακινεῖσθαι μικροῦ ἐμμιγνυμένου, καὶ ὅλως ἕτερον φαίνεσθαι ἑνὸς μετακινηθέντος. ἐκ τῶν αὐτῶν γὰρ τραγῳδία γίνεται καὶ κωμῳδία γραμμάτων. ἐπεὶ δὲ δοκεῖ σχεδὸν πᾶσιν ἕτερον εἶναι γένεσις καὶ ἀλλοίωσις, καὶ γίνεσθαι μὲν καὶ φθείρεσθαι συγκρινόμενα καὶ διακρινόμενα, ἀλλοιοῦσθαι δὲ μεταβαλλόντων τῶν παθημάτων· περὶ τούτων ἐπιστήσασι θεωρητέον. ἀπορίας γὰρ ἔχει ταῦτα καὶ πολλὰς καὶ εὐλόγους. Εἰ μὲν γάρ ἐστι σύγκρισις ἡ γένεσις, πολλὰ ἀδύνατα συμβαίνει. εἰσὶ δ' αὖ ἕτεροι λόγοι ἀναγκαστικοὶ, καὶ οὐκ εὔποροι διαλύειν, ὡς οὐκ ἐνδέχεται ἄλλως ἔχειν εἴτε μή ἐστι σύγκρισις ἡ γένεσις, ἢ ὅλως οὐκ ἔστι γένεσις, ἢ ἀλλοίωσις· ἢ εἰ καὶ τοῦτο διαλῦσαι* χαλεπὸν ὄν, πειρατέον.

* Vetus χαλεπῆς, πειρατέον.

ἀρχὴ δὲ τούτων ἁπάντων, πότερον οὕτω καὶ γίνεται καὶ ἀλλοιοῦται καὶ αὐξάνεται τὰ ὄντα, καὶ τἀναντία τούτοις πάσχει, τῶν πρώτων ὑπαρχόντων μεγεθῶν ἀδιαιρέτων, ἢ οὐθέν ἐστι μέγεθος ἀδιαίρετον. διαφέρει γὰρ τοῦτο πλεῖστον. καὶ πάλιν εἰ μεγέθη ἄτομα, πότερον, ὡς Δημόκριτος καὶ Λεύκιππος, σώματα ταῦτ' ἐστὶν, ἢ ὥσπερ ἐν τῷ Τιμαίῳ, ἐπίπεδα. τοῦτο μὲν οὖν αὐτὸ, καθάπερ καὶ ἐν ἄλλοις εἰρήκαμεν, ἄλογον μέχρι ἐπιπέδων διαλῦσαι. διὸ μᾶλλον εὔλογον, σώματα εἶναι ἀδιαίρετα. ἀλλὰ καὶ ταῦτα πολλὴν ἔχει ἀλογίαν. ὅμως δὲ τούτοις ἀλλοίωσιν καὶ γένεσιν ἐνδέχεται ποιεῖν, καθάπερ εἴρηται. *Τροπῇ καὶ διαθιγῇ μετακινοῦντα τὸ αὐτὸ καὶ ταῖς τῶν σχημάτων διαφοραῖς, ὅπερ ποιεῖ Δημόκριτος. διὸ καὶ χροιὰν οὔ φησιν εἶναι. τροπῇ γὰρ χρωματίζεσθαι. τοῖς δ' εἰς ἐπίπεδα διαιροῦσιν, οὐκ ἔτι. οὐδὲν γὰρ γίνεται πλὴν στερεὰ, συντιθεμένων. πάθος γὰρ οὐδ' ἐγχειροῦσι γεννᾶν οὐδὲν ἐξ αὐτῶν. αἴτιον δὲ τοῦ ἐπ' ἔλαττον δύνασθαι τὰ ὁμολογούμενα συνορᾶν, ἡ ἀπειρία. διὸ ὅσοι *συνῳκήκασι μᾶλλον ἐν τοῖς φυσικοῖς, μᾶλλον δύνανται ὑποτίθεσθαι τοιαύτας ἀρχὰς, αἳ ἐπὶ πολὺ δύνανται συνείρειν. οἱ δ' ἐκ τῶν πολλῶν λόγων ἀθεώρητοι τῶν ὑπαρχόντων ὄντες, πρὸς ὀλίγα *ἀποβλέψαντες, ἀποφαίνονται ῥᾷον. ἴδοι δ' ἄν τις καὶ ἐκ τούτων ὅσον διαφέρουσιν οἱ φυσικῶς καὶ λογικῶς σκοποῦντες. περὶ γὰρ τοῦ ἄτομα εἶναι μεγέθη, οἱ μέν φασιν ὅτι τὸ αὐτοτρίγωνον πολλὰ ἔσται. Δημόκριτος δ' ἂν φανείη οἰκείοις καὶ φυσικοῖς λόγοις πεπεῖσθαι. δῆλον δ' ἔσται ὃ λέγομεν, προϊοῦσιν. ἔχει γὰρ ἀπορίαν, εἴ τις θείη σῶμά τι εἶναι καὶ μέγεθος πάντῃ διαιρετὸν, καὶ τοῦτο δυνατόν. τί γὰρ ἔσται ὅπερ τὴν διαίρεσιν διαφεύξεται; εἰ γὰρ πάντῃ διαιρετὸν, καὶ τοῦτο δυνατὸν, κἂν ἅμα εἴη τοῦτο πάντῃ διῃρημένον, * εἰ μὴ ἅμα τοῦτο διῄρηται. κἂν εἰ τοῦτο γένοιτο, οὐδὲν ἂν εἴη ἀδύνατον. οὐκοῦν καὶ κατὰ τὸ μέσον ὡσαύτως. καὶ ὅλως δὲ εἰ πάντῃ πέφυκε διαιρετὸν, κἂν *διαιρεθῇ, οὐδὲν ἔσται ἀδύνατον γεγονός. ἐπεὶ οὐδ' ἂν εἰς μυρία μυριάκις διῃρημένα ᾖ, οὐδὲν ἀδύνατον, καίτοι ἴσως οὐδεὶς ἂν διέλοι. ἐπεὶ τοίνυν πάντῃ τοιοῦτόν ἐστι τὸ σῶμα, διῃρήσθω. τί οὖν ἔσται λοιπόν; μέγεθος; οὐ γὰρ οἷόν τε. *ἔσται γάρ τι οὐ διῃρημένον. ἦν δὲ πάντῃ διαιρετόν. ἀλλὰ μὴν εἰ μηδὲν ἔσται σῶμα μηδὲ μέγεθος, διαίρεσις δ' ἔσται, ἢ ἐκ στιγμῶν ἔσται, καὶ ἀμεγέθη ἐξ ὧν σύγκειται, ἢ οὐδὲν πάμπαν. ὥστε κἂν γίνοιτο ἐκ μηδενὸς, κἂν εἴη συγκείμενον, καὶ τὸ πᾶν δὴ οὐδὲν, ἀλλ' ἢ φαινόμενον. ὁμοίως δὲ κἂν ᾖ ἐκ στιγμῶν, οὐκ ἔσται ποσόν. *ὁπότε γὰρ ἥπτοντο καὶ ἓν ἦν μέγεθος, καὶ ἅμα ἦσαν, οὐδὲν ἐποίουν μεῖζον τὸ πᾶν. διαιρεθέντος γὰρ εἰς δύο καὶ πλείω, οὐδὲν ἔλαττον οὐδὲ μεῖζον τὸ πᾶν τοῦ *προτέρου. ὥστε κἂν πᾶσαι συντεθῶσιν, οὐδὲν ποιήσουσι μέγεθος. οὐ μὴν ἀλλὰ καὶ εἴ τι διαιρουμένου, οἷον ἐκπρίσμα γίνεται τοῦ σώματος,

* Vide Metaphyſic lib. 1. c. 4. & lib. 2. c. 2. & infra cap. 9.

* γρ. ἐνῳκήκασι

* γρ. βλέψαντες

* γρ. εἰ μὴ ἅμα, διῄρηται.

* γρ. διαιρεθείη,

* γρ. ἦν

* γρ. ὅτε γ. ἥπτοντο, & ἓν ἦν μ. & ἅμα ἦσαν,

* γρ. προτέρου.

A Principium autem horum omnium eſt, vtrùm ea quæ ſunt, generentur hoc pacto, accreſcant alterentúrque, & hiſce contrarias ſubeant mutationes, magnitudinibus primis nullam diuiſionem admittentibus: an nulla ſit magnitudo indiuiſibilis. Hoc enim intereſt quàm plurimùm. Et rurſum, ſi magnitudines ſint inſectiles, vtrùm hæ corpora ſint vt Democrito placet atque Leucippo: an plana, vt in Timæo ſcribitur. Hoc igitur ipſum, fieri inquam diſſolutionem ad plana vſque, cancellos egreditur rationis: id quod alio quoque loco iam diximus. Iccirco magis conſentaneum rationi fuerit, corpora non poſſe diuidi. Verùm & hæc quoque perab- B ſurda ſunt: ſed tamen hiſce alterationem generationemque, vti dictum eſt, facere, conuerſione & attactu atque figurarũ varietate permutando, idem contingit, quod ſanè Democritus facit. Quocirca non eſſe colorem aſſerit: nam res ipſas per conuerſionem colore tingi cenſet. at illis, qui in plana diuiſionem faciunt, minimè. Nihil enim planis compoſitis, præterquam ſolida fit: quando nulla ex eis qualitas affectuſve gigni poteſt. Sed cur parum valeant, quæ conſentanea ſunt perſpicere, cauſam habet ipſa experientiæ vacuitas. Quamobrem quotquot diutiùs circa rerum naturalium ſpeculationem verſati ſunt, ij eiuſmodi principia quæ inter ſe cohæreant conſentiántque quàmplurimum, ſup- C ponere magis poſſunt. At qui è multis rationibus quænam veræ ſint, haudquaquam expendere conſueuerunt, paucis inſpectis facilè pronunciãt. Porrò ex hiſce perpendere etiam quis poteſt, quàm inter eos intersit, qui naturaliter, quique via rationali quampiam exercent conſiderationem. Nam de eo quod eſt magnitudines eſſe indiuiſibiles, nonnulli quidem inquiunt: quod ipſe idealiſque triangulus, plures erit. At Democritus rationibus propriis, naturæque accommodatis perſuaſus eſſe profectò videbitur. Quod autem dicimus, in progreſſu euadet apertum. Nam res ipſa dubitationem habet, ſi quis corpus aliquod magnitudinemque omnino atque omni ex parte diuiſibilem eſſe ſtatuat, atque D fieri poſſe vt penitus diuidatur. Quid enim erit quod effugiat diuiſionem? Nam ſi omni ex parte atque omnino ſit diuiſibile, & ita diuidi queat, ſiue ſimul erit hoc omni ex parte diuiſum (& ſi non ſimul diuidatur) ſiue id fiat, nihil accidet impoſſibile. Igitur & ſecundùm medium haud ſecus. Et in ſumma, ſi omni ex parte ac omnino diuidi aptum ſit, ſi diuidatur, nullum emerget impoſſibile: quando ne vllum quidem oritur impoſſibile, ſi in decies millies dena millia diuiſum ſit, quamuis fortè nemo vnquam diuidet. Itaque cùm corpus ipſum omnino tale ſit, diuidatur. Quid ergo erit reliquũ? magnitudo? Id enim fieri non poteſt: eſſet enim E quippiam haud diuiſum: at erat omni ex parte, omninoq; diuiſibile. At verò ſi nec corpus nec magnitudo relinquatur, diuiſio tamen ſit: aut corpus ex punctis conſtabit, & ea ex quibus componitur, magnitudine carebunt, aut nihil omnino erit. Quare, ſiue factum ex nihilo, ſiue compoſitum ſit: profectò totum ipſum nihil præterquam apparens erit. Similiter ſi ex punctis conſtari dicatur, quantum non erit. Nam cùm vna in magnitudine ſeſe tangunt, & magnitudo vna perpetuaque eſt, atque illa ſimul ſunt, nihilo maius totum ipſum reddunt. quoniam ſi totum in duo aut plura diuidatur, nihilo ipſum minus quàm priùs euadit. Quia de re puncta etiamſi omnia coagmentata ſint, nullam efficiunt magnitudinem. Veruenimvero ſi quid tale inter diuidendum corpus fiat, quale eſt ramentum illud quod excidit dum quippiam ſerra ſecatur,

atque hoc pacto corpus aliquod è magnitudine abſcondat; idem ſermo recidit, quomodo inquam diuiſibile illud ſit. Quòd ſi id quod abſcedere ſolet, corpus non ſit, ſed forma quædam affectiúſve ſeparabilis, ſitque magnitudo ipſa puncta vel tactus ſic affecti: magnitudinem ex non magnitudinibus cõſtare incongruum atque abhorrẽs eſt. Adhæc puncta ipſa ſiue à motu vacent, ſiue eundem ſubeant, vbinam erunt? vnus enim ſemper duorum quorundam tactus eſt, tanquam re quapiam alia præter tactum punctúmque atque diuiſionem exiſtente. Si quis ergo quoduis aut quantumlibet corpus, eſſe omni ex parte atque omnino diuiſibile ponat, hæc accidunt vniuerſa. Præterea ſi lignũ aut quippiam aliud iam diuiſum rurſum componas: iterum æquabile pariter atque vnum euadit. Igitur ad hunc modum res ſeſe habet, vt patet etiam ſi illud quolibet in puncto incidat. Potentia ergo, omni ex parte ac omnino diuiditur. Quid igitur præter diuiſionem erit? Nam ſi eſt affectio quædam, at quonam pacto diſſoluitur in hæc, ſitque ex his, aut qualiter hæc ſeparari queunt? Itaque ſi fieri nequeat vt magnitudines ex punctis aut tactibus conſtent, indiuiſibilia ſint corpora magnitudineſque neceſſe eſt. At verò & iis quoque qui hæc aſtruunt, non minùs accidit impoſſibile: de quibus quanquam alias fuit à nobis conſideratum, tamen ea ipſa ſoluere eniti oportet. Quamobrem iterum ab initio dicenda dubitatio eſt. Igitur omne corpus ſenſibile, quouis in pũcto eſſe diuiſibile atque indiuiſibile, nihil eſt abſurdũ: potentia ſiquidẽ diuiſibile exiſtit, actu indiuiſibile. At vt ſimul ſit omni ex parte potentia diuiſibile, fieri non poſſe videatur. Nã ſi fieri poſſit, & fiat: haudquaquam ad hũc fiet modum vt ſimul ambo ſint actu, indiuiſibile inquam atque diuiſum, ſed quolibet in pũcto diuiſum. Nihil igitur erit reliquũ: atque corpus ipſum corruptione abibit in incorporeum, & rurſum, aut ex punctis, aut prorſus ex nihilo fiet. At id qui fieri poteſt? At verò quòd in ſeparabiles & ſubinde minores atque inter ſe diſtãtes ſeparatáſque magnitudines diuidatur corpus, certũ eſt. Itaque nec per partes diuidenti ſectio quæ in minutula fit, infinita occurret: nec inſuper continget, vt omni in ſigno (non enim eſt poſſibile) ſed quadantenus diuidatur. Indiuiduas igitur ineſſe magnitudines quæ oculi aciem fugiant, neceſſe eſt: & præſertim ſi generatio congregatione, & corruptio ſegregatione fieri debeat. Quæ igitur ratio magnitudines eſſe indiuiſibiles neceſſariò colligere videbatur, hæc eſt. Sed quòd clanculo peruerſa ratiocinatione vtatur, & quatenus lateat, exponamus oportet. Nam quia punctum puncto non hæret, magnitudines partim ſunt, & partim nõ ſunt omni ex parte diuiſibiles. Sed cùm hoc poſitum aſſertúmque eſt, punctum vbiuis ac omni in parte videtur eſſe: ita vt in puncta diuidi magnitudinem ſit neceſſe: quippe cùm omni in parte punctum ſit. quo fit vt ea vel tactibus vel punctis conſtet. At omni in parte diuiſibilis eſt: quia vbivbi vnum eſt, & omnia, vt ſingulum quodque. Vno autem plura non ſunt. non enim ſunt deinceps. Quare non omni in parte diuiſibilis eſt. Nam ſi per medium diuiſibilis ſit, & per punctum adhærens erit diuiſibilis. At id haudquaquam fit. ſiquidem nec ſignum ſigno, nec punctum puncto hæret. Hoc autem eſt, diuiſio & compoſitio. Quare tam congregatio quàm ſegregatio eſt: ſed non ex inſectilibus & in inſectilia (complura enim inde emergunt abſurda) nec hoc pacto vt omni ex parte fiat diuiſio (id enim eueniret, ſi punctum puncto hæreret)

A καὶ οὕτως ἐκ τοῦ μεγέθους * σῶμά τι ἀπέρχεται, ὁ αὐτὸς λόγος, ἐκεῖνο πῶς διαιρετόν. εἰ δὲ μὴ σῶμα ἀλλ' εἶδός τι χωριστὸν, ἢ πάθος ὃ ἀπῆλθε, καὶ ἔστι τὸ μέγεθος, * στιγμαὶ, ἢ ἁφαὶ τοδὶ παθοῦσαι, * ἄτοπον ἐκ μὴ μεγεθῶν μέγεθος εἶναι. ἔτι δὲ ποῦ ἔσονται καὶ ἀκίνητοι, ἢ κινούμεναι αἱ στιγμαί; ἁφή τε ἀεὶ μία, δυοῖν τινῶν, ὡς ὄντος τινὸς παρὰ τὴν ἁφὴν καὶ τὴν διαίρεσιν, καὶ τὴν στιγμήν. εἰ δή τις θήσεται ὁποιονοῦν, ἢ ὁπηλικονοῦν σῶμα εἶναι πάντη διαιρετόν, πάντα ταῦτα συμβαίνει. ἔτι ἐὰν διελὼν συνθῶ τὸ ξύλον, ἤ τι ἄλλο, πάλιν ἴσον τε καὶ ἕν. οὐκοῦν οὕτως ἔχει δηλονότι, κἂν τέμω τὸ ξύλον καθ' ὁποιονοῦν σημεῖον. B πάντη ἄρα διῄρηται δυνάμει. τί οὖν ἐστι παρὰ τὴν διαίρεσιν; εἰ γὰρ καὶ ἔστι τι πάθος, ἀλλὰ πῶς εἰς ταῦτα διαλύεται, καὶ γίνεται ἐκ τούτων; ἢ πῶς χωρίζεται ταῦτα; ὥστ' εἴπερ ἀδύνατον ἐξ ἁφῶν ἢ στιγμῶν εἶναι τὰ μεγέθη, ἀνάγκη εἶναι σώματα ἀδιαίρετα, καὶ μεγέθη. ἀλλὰ μὴν καὶ ταῦτα θεμένοις, οὐχ ἧττον συμβαίνει * ἀδύνατον. ἔσκεπται δὲ περὶ αὐτῶν ἐν ἑτέροις. ἀλλὰ ταῦτα πειρατέον λύειν· διὸ πάλιν ἐξ ἀρχῆς λεκτέον τὴν ἀπορίαν. τὸ μὲν οὖν ἅπαν σῶμα αἰσθητὸν εἶναι διαιρετὸν καθ' ὁποιονοῦν σημεῖον, καὶ ἀδιαίρετον, οὐδὲν ἄτοπον. τὸ μὲν γὰρ δυνάμει [διαιρετόν,] τὸ δ' ἐντελεχείᾳ ὑπάρξει. τὸ C δ' εἶναι ἅμα * πάντη δυνάμει, ἀδύνατον δόξειεν ἂν εἶναι. εἰ γὰρ δυνατὸν, κἂν γένοιτο, οὐχ ὥστε εἶναι ἅμα ἄμφω ἐντελεχείᾳ, ἀδιαίρετον καὶ διῃρημένον, ἀλλὰ διῃρημένον καθ' ὁποιονοῦν σημεῖον. οὐδὲν ἄρα ἔσται λοιπὸν, καὶ εἰς ἀσώματον ἐφθαρμένον τὸ σῶμα· καὶ γένοιτο δ' ἂν πάλιν, ἤτοι ἐκ στιγμῶν, ἢ ὅλως ἐξ οὐδενός. καὶ τοῦτο πῶς δυνατόν; ἀλλὰ μὴν ὅτι γε διαιρεῖται εἰς χωριστὰ, καὶ ἀεὶ εἰς ἐλάττω μεγέθη, καὶ εἰς ἀπέχοντα καὶ κεχωρισμένα, φανερόν. οὔτε δὴ κατὰ μέρος διαιροῦντι εἴη ἂν ἄπειρος ἡ θρύψις, οὔτε ἅμα οἷόν τε διαιρεθῆναι κατὰ πᾶν σημεῖον· οὐ γὰρ δυνατόν· ἀλλὰ D μέχρι του. ἀνάγκη ἄρα ἄτομα ἐνυπάρχειν μεγέθη ἀόρατα· ἄλλως τε καὶ εἴπερ ἔσται γένεσις καὶ φθορὰ, ἡ μὲν διακρίσει, ἡ δὲ συγκρίσει. ὁ μὲν οὖν ἀναγκάζειν λόγος δοκῶν εἶναι μεγέθη ἄτομα, οὗτός ἐστιν. ὅτι δὲ λανθάνει παραλογιζόμενος, καὶ ᾗ λανθάνει, λέγωμεν. ἐπεὶ γὰρ οὐκ ἔστι στιγμὴ στιγμῆς ἐχομένη, τὸ πάντη εἶναι διαιρετὸν, ἔστι μὲν ὡς ὑπάρχει τοῖς μεγέθεσιν, ἔστι δ' ὡς οὔ. δοκεῖ δὲ ὅταν τοῦτο τεθῇ, καὶ ὁπῃοῦν, καὶ πάντη στιγμὴν εἶναι· ὥστε ἀναγκαῖον εἶναι διαιρεθῆναι τὸ μέγεθος εἰς μηδέν. πάντη γὰρ εἶναι στιγμήν· ὥστε ἢ ἐξ ἁφῶν, ἢ ἐκ στιγμῶν εἶναι. τὸ δ' ἐστὶν, ὡς ὑπάρχει πάντη, ὅτι E μία ὁπῃοῦν ἐστι, καὶ πᾶσαι ὡς ἑκάστη, πλείους δὲ μιᾶς, οὐκ εἰσίν· ἐφεξῆς γὰρ οὐκ εἰσίν· ὥστ' οὐ πάντη. εἰ γὰρ κατὰ μέσον διαιρετὸν, καὶ κατ' ἐχομένην στιγμὴν ἔσται διαιρετόν. οὐ γάρ ἐστιν ἐχόμενον σημεῖον σημείου, ἢ στιγμὴ στιγμῆς. τοῦτο δ' ἐστὶ διαίρεσις καὶ σύνθεσις. ὥστε ἔστι καὶ σύγκρισις, καὶ διάκρισις. ἀλλ' οὔτε εἰς ἄτομα καὶ ἐξ ἀτόμων (πολλὰ γὰρ * τὰ ἄτοπα) οὔτε οὕτως, ὥστε πάντη διαιρεῖσθαι. εἰ γὰρ ἦν ἐχομένη στιγμὴ στιγμῆς, τοῦτ' ἂν ἦν·

* Vulgò σῶμά τι ἀπέρχεται, ὁ α. ineptè.
* χ. στιγμαί εἰ, ἢ
* χ. ἄτοπον μὲν τὸ ἐκ
* γρ. ἀδύνατα.
* γρ. πάντη διαιρετὸν.
* γρ. τὰ ἀδύνατα

ἀλλ' εἰς μικρὰ καὶ ἐλάττω ἐστὶ, καὶ σύγκρισις ἐξ ἐλαττόνων. ἀλλ' οὐχ ἡ ἁπλῆ καὶ τελεία γένεσις, συγκρίσει καὶ διακρίσει ὥρισται, ὥς τινές φασι. τὴν δ' ἐν τῷ συνεχεῖ μεταβολὴν, ἀλλοίωσιν. ἀλλὰ τοῦτ' ἐστὶν ἐν ᾧ σφάλλεται πάντα. ἔστι γὰρ γένεσις ἁπλῆ καὶ φθορὰ, οὐ συγκρίσει καὶ διακρίσει, ἀλλ' ὅταν μεταβάλλῃ ἐκ τοῦδε εἰς τόδε ὅλον. οἱ δὲ οἴονται ἀλλοίωσιν εἶναι πᾶσαν τὴν τοιαύτην μεταβολήν· τὸ δὲ διαφέρει. ἐν γὰρ τῷ ὑποκειμένῳ, τὸ μέν ἐστι κατὰ τὸν λόγον, τὸ δὲ κατὰ τὴν ὕλην. ὅταν μὲν οὖν ἐν τούτοις ᾖ ἡ μεταβολὴ, γένεσις ἔσται ἢ φθορά. ὅταν δ' ἐν τοῖς πάθεσι καὶ κατὰ συμβεβηκὸς, ἀλλοίωσις. διακρινόμενα δὲ καὶ συγκρινόμενα, εὔφθαρτα γίνεται. ἐὰν μὲν γὰρ εἰς ἐλάττω ὑδάτια διαιρεθῇ, θᾶττον ἀὴρ γίνεται· ἐὰν δὲ συγκριθῇ, βραδύτερον. μᾶλλον δ' ἔσται δῆλον ἐν τοῖς ὕστερον. νῦν δὲ τοσοῦτον διωρίσθω, ὅτι ἀδύνατον εἶναι τὴν γένεσιν, σύγκρισιν, οἵαν δή τινές φασι.

ΚΕΦΑΛ. γ'.

Ὅτι οὐδέν ἐστι γινόμενον ἁπλῶς καὶ φθειρόμενον, ἀεὶ δὲ ἔκ τινος.

Διωρισμένων δὲ τούτων, πρῶτον θεωρητέον, πότερόν ἐστί τι γινόμενον ἁπλῶς καὶ φθειρόμενον, ἢ κυρίως μὲν οὐδὲν, ἀεὶ δ' ἔκ τινος, καὶ τι. λέγω δὲ, οἷον ἐκ κάμνοντος ὑγιαῖνον, καὶ κάμνον ἐξ ὑγιαίνοντος· ἢ μικρὸν ἐκ μεγάλου, καὶ μέγα ἐκ μικροῦ. καὶ τἆλλα πάντα τοῦτον τὸν τρόπον. Εἰ γὰρ ἁπλῶς ἔσται γένεσις, ἁπλῶς ἂν γίνοιτο ἐκ μὴ ὄντος. ὥστ' ἀληθὲς ἂν εἴη λέγειν, ὅτι ὑπάρχει τισὶ τὸ μὴ ὄν. τὶς μὲν γὰρ γένεσις ἐκ μὴ ὄντος τινός· οἷον ἐκ μὴ λευκοῦ, ἢ μὴ καλοῦ· ἡ δὲ ἁπλῆ ἐξ ἁπλῶς μὴ ὄντος. τὸ δ' ἁπλῶς ἤτοι τὸ πρῶτον σημαίνει, καθ' ἑκάστην κατηγορίαν τοῦ ὄντος· ἢ τὸ καθόλου, καὶ τὸ πάντα περιέχον, εἰ μὲν οὖν τὸ πρῶτον, οὐσίας ἔσται γένεσις ἐκ μὴ οὐσίας. ᾧ δὲ μὴ ὑπάρχει οὐσία, μηδὲ τόδε, δῆλον ὡς οὐδὲ τῶν ἄλλων οὐδεμία * κατηγορειῶν, οἷον οὔτε ποιὸν, οὔτε ποσὸν, οὔτε * τὸ πού. χωριστὰ γὰρ ἂν εἴη τὰ πάθη τῶν οὐσιῶν. εἰ δὲ, τὸ μὴ ὂν ὅλως, ἀπόφασις ἔσται καθόλου πάντων· ὥστε ἐκ μηδενὸς ἀνάγκη γίνεσθαι τὸ γινόμενον. Περὶ μὲν οὖν τούτων ἐν ἄλλοις τε διηπόρηται, καὶ διώρισται τοῖς λόγοις ἐπὶ πλεῖον· συντόμως δὲ καὶ νῦν λεκτέον, ὅτι τρόπον μέν τινα ἐκ μὴ ὄντος ἁπλῶς γίνεται, τρόπον δὲ ἄλλον, ἐξ ὄντος ἀεί. τὸ γὰρ δυνάμει ὂν, ἐντελεχείᾳ δὲ μὴ ὂν, ἀνάγκη προϋπάρχειν λεγόμενον ἀμφοτέρως. ὃ δὲ καὶ τούτων διωρισμένων, ἔχει θαυμαστὴν ἀπορίαν, πάλιν ἐπαναποδιστέον, πῶς ἐστιν ἁπλῆ γένεσις, εἴτε ἐκ δυνάμει ὄντος οὖσα, εἴτε καὶ πως ἄλλως. ἀπορήσειε γὰρ ἄν τις ἆρ' ἐστὶν οὐσίας γένεσις, καὶ τοῦ τοῦδε, ἀλλὰ μὴ τοῦ τοιοῦδε, καὶ τοῦ τοσοῦδε, καὶ τοῦ πού. τὸν αὐτὸν τρόπον καὶ περὶ φθορᾶς. εἰ γάρ τι γίνεται, δῆλον, ὡς ἔσται δυνάμει τις οὐσία, ἐντελεχείᾳ δ' οὔ, ἐξ ἧς ἡ γένεσις ἔσται, καὶ εἰς ἣν ἀνάγκη μεταβάλλειν τὸ φθειρόμενον. πότερον οὖν ὑπάρξει τι τούτῳ τῶν ἄλλων ἐντελεχείᾳ; λέγω δ' οἷον ἆρ' ἔσται ποσὸν, ἢ ποιὸν, ἢ ποῦ τὸ δυνάμει μόνον τόδε καὶ ὂν, ἁπλῶς δὲ μὴ τόδε, μηδὲ ὄν;

* χ. κατηγορία,
* χ. πῶς.

A ſed ſegregatio in parua & minora, & congregatio ex minoribus fit. At ſimplex perfectáque generatio, congregatione & ſegregatione definita non eſt, quemadmodum nonnullis placet: qui & eam quæ in continuo fit mutationem, alterationem eſſe aſſerunt. Verùm id ipſum eſt, in quo prorſus errant. non enim generatio ſimplex atque corruptio, congregatione ſegregationeve fit: ſed cùm ex hoc in hoc mutatio fit. Alij verò omnem eiuſmodi mutationem, alterationem eſſe putant. At in hoc diſcrimen ſubit. nam hæc ratione, illa materia, in ſubiecto exiſtit. Igitur cùm in hiſce fuerit mutatio, generatio erit vel corruptio; cùm in affectibus, & iis quæ per B accidens alicui competunt, alteratio. Sed quæ congregantur, ægrè: quæ verò ſegregantur, facilè corruptioni redduntur obnoxia. Nam ſi aqua in minores aquæ particulas ſit diſcerpta, in aërem ocyus mutari ſolet: ſi verò collecta ſit, ſegniùs. quod in luce quæ poſteriùs dicentur, apertiùs fiet. Nunc verò ſit hactenus definitum, fieri non poſſe, vt generatio ſit eiuſmodi congregatio, qualem nonnulli eſſe aſſerunt.

CAPVT III.

An ſimpliciter aliquid generetur.

C His autem determinatis pertractatiſque, primò contemplari oportet verùm ſimpliciter quippiam, an propriè nihil generetur corrumpatúrve, ſemper autem ex quodam quiddam fiat. vt ex ægro ſanum, & ex ſano ægrum: aut puſillum è magno, & magnum è puſillo. & reliqua omnia, ad hũc modum. Nam ſi generatio ſimpliciter ſit, quippiã profecto è nõ ente ſimpliciter abſolutéque fiet. Quare verum erit dicere, quibuſdam non ens competere: quippe cùm generatio quædam è quodã non ente, ceu è non albo vel non bono fiat. At ſimplex generatio è nõ ente ſimpliciter, fit. Porrò ſimpliciter abſolutéque non ens, aut id quod, ex omnibus entis prædicamẽtis primũ eſt, aut quod eſt vniuerſale, & cuncta ambit cõtinétque, ſignificat. Igitur ſi primũ, D è non ſubſtantia erit ſubſtantiæ generatio. At cui ſubſtantia non cõpetit, nec ei cæterorũ prędicamẽtorum vllũ, velvti qualitatem, quantitatẽ, aut vbi, cõpetere poſſe palàm eſt. nam alioqui affectus ipſi à ſubſtantia ſeparari poſſent. Quod ſi ita res habeat, omnino ipſum nõ ens, vniuerſaliter omniũ erit abnegatio. Quare id quod generatur, ex nihilo gignatur erit neceſſe. Sed de hiſce in aliis libris latiùs addubitatũ, ſimul atque definitũ fuit: verùm compendioſè in præſentia quoque dicamus oportet, è non ente ſimpliciter aliquo modo fieri generationẽ, & alio ex ente ſemper. nãque ens potẽtia, ſed actu nõ ens, præexiſtat eſt neceſſe. quod ſanè, vt patet, vtro- E que dicitur modo. Determinatis autẽ hiſce, id rurſum exactè diſquiramus oportet, quod mirã habet ambiguitatẽ: quónã inquã pacto generatio ſimplex ſit, ſiue ex ente potẽtia, ſiue etiã alio quouis modo fiat. Dubitauerit nãque quiſpiã verùm ſubſtãtiæ ac rei huiuſce, ſed non qualitatis, quantitatis, aut vbi, generatio ſit. eodẽ modo & de corruptione. Nam ſi quid oriatur, quandã potentia, non actu ſubſtantiã eſſe, dilucidũ eſt: ex qua fiat generatio, & in quã id mutari neceſſe ſit quod corruptionẽ ſubit. Verùm igitur ex cæteris quæ actu ſunt, quippiã huic cõpetet? verùm inquã id quod potentia dũtaxat hoc aliquid atque ens eſt, ſimpliciter autẽ neque hoc aliquid neque ens, quãtitas erit, aut qualitas, aut vbi?

nam ſi actu nihil ſit, ſed omnia potentia, eueniet & id quod ita eſt nō ens, eſſe ſeparabile, & inſuper (id quod ſemper maximè ſunt veriti, qui primi in Philoſophia verſati ſunt) nihilo præexiſtente quippiam gigni. Quod ſi verum non ſit, hoc quidem ſubſtantiam & hoc aliquid eſſe, ſed è cæteris prædicamentis aliquid, continget (vt iā diximus) affectus ipſos à ſubſtantiis poſſe ſeparari. De hiſce igitur quo ad fieri poteſt, & quænam ſit cauſa cur generatio tam quæ ſimpliciter quàm quæ ſecundum partem fit, ſemper ſit, diſſerendum eſt. Sed cùm vna quidem cauſa ſit vnde motus eſſe principium dicimus, altera verò ipſa materies, de tali cauſa dicamus oportet. Nam de illa quidem priùs eſt dictum, cùm de motu ageremus: eſſe inquam aliud quod omni tempore perdurat immobile, & aliud quod in motu ſemper eſt. Sed de principio illo quod mutationi non eſt obnoxium, primæ philoſophiæ eſt determinare ac pertractare. At de eo quod cætera iccirco mouet, quia continuè moueatur: quidnam eorum quæ ſingularia vocantur eiuſmodi cauſa ſit, poſteriùs erit aſſignandum. Nunc autem eam quæ velut in materiæ ſpecie ſita eſt cauſam, per quam generatio & corruptio nunquam natura deficiūt, dicamus oportet. Nam ſimul forſitan & hoc emerget, & id quo de nuper dubitauimus: quónam inquam pacto de generatione & corruptione ſimplici dicere conueniat. Inueliit autem & id quoque magnum abunde dubium, quænam cauſa ſit vt generatio generationi ſemper cohæreat, & altera altera ſubinde ſequatur: ſi quidem quod corruptionem ſubit, ad id proficiſcitur quod nequaquam in ratione rerum exiſtit: quod autem in ratione rerum exiſtit, nihil eſt. Nam quod haud eſt, neque ſubſtantia eſt, neque qualitas, neque quantitas, neque vbi. Igitur ſi ſemper quippiam eorum quæ ſunt in ratione rerum abeat, cur non dudum vniuerſum ipſum conſumptum fuit atque inane euaſit: cùm id ex quo fit genitorum quodque finitū ſit? non enim propterea quòd id ex quo quid fit, infinitum ſit, non deficit. id enim eſſe nequit. nihil enim actu infinitum eſt, ſed potentia tantùm, nempe diuiſione ipſa. Quare hāc ſolam cauſam eſſe oportebat, cur numquam deficiat: quia ſemper quippiam fiat minus. nunc autem hoc fieri minimè cernimus. Ergo propterea quòd interitus huius alterius eſt ortus: & contrà ortus huius, alterius interitus: neceſſariò accidit vt mutatio irrequieta ſit, & ſubſiſtere nequeat. Cur igitur generatio & corruptio ſimiliter, ſemper ſit circa vnumquodque eorum quæ ſunt, hanc apud omnes cauſam ſatis eſſe putandum eſt. Sed quamobrem alia ſimpliciter, alia non ſimpliciter oriri ac interire dicantur, rurſum conſideremus oportet: ſiquidem idē eſt generatio huius & illius corruptio, atque huius corruptio & illius generatio. Id enim quandam poſtulat rationem. Dicimus enim quippiam ſimpliciter nūc, & non ſolùm hocce, corrumpi. atque hæc generatio, generatio ſimpliciter: & hæc corruptio, corruptio ſimpliciter eſt. Fit autem & hocce quidem aliquid, nō autem ſimpliciter: etenim eum qui diſcit, ſcientem fieri dicimus, non autē ſimpliciter fieri. Quia igitur quædam (id quod definiendo ſæpe diximus) hoc aliquid ſignificant, quædam, non: hac ſanè de cauſa, quod in quæſtione verſatur, euenit. Refert enim haud parum, in quod mutetur id quod mutationem ſubit. verbi cauſa, quæ ad ignem fit tranſitio, ea forſitan generatio ſimplex eſt, & alicuius, ceu terræ, corruptio. At terræ generatio, generatio quædam eſt: cæterùm generatio ſimpliciter non eſt, ſed corruptio ſimpliciter, puta ignis. ſicuti Parmenides aſſerit, qui duo, ens inquam & non ens, ignem & terram eſſe dicit.

A εἰ γὰρ μηδέν, ἀλλὰ πάντα δυνάμει, χωριστόν τε συμβαίνει * τὸ μὴ οὕτως ὂν καὶ ἔτι ὃ μάλιστα φοβούμενοι διετέλεσαν οἱ πρῶτοι φιλοσοφήσαντες, τὸ ἐκ μηδενὸς γίνεσθαι προϋπάρχοντος· εἰ δὲ τὸ μὲν εἶναι τόδε τι, ἢ οὐσίαν, οὐχ * ὑπάρξει, τῶν δ' ἄλλων τι τῶν εἰρημένων, ἔσται, καθάπερ εἴπομεν, χωριστὰ τὰ πάθη τῶν οὐσιῶν. περί τε τούτων οὖν ὅσον ἐνδέχεται πραγματευτέον, καὶ τίς αἰτία τοῦ γένεσιν ἀεὶ εἶναι, καὶ τὴν ἁπλῆν, καὶ τὴν κατὰ μέρος. οὔσης δ' αἰτίας μιᾶς μὲν, ὅθεν τὴν ἀρχὴν εἶναι φαμὲν τῆς κινήσεως, μιᾶς δὲ, τῆς ὕλης, τὴν τοιαύτην αἰτίαν λεκτέον. περὶ μὲν γὰρ ἐκείνης εἴρηται πρότερον ἐν τοῖς περὶ κινήσεως λόγοις, ὅτι ἐστὶ τὸ μὲν ἀκίνητον τὸν ἅπαντα χρόνον, τὸ δὲ κινούμενον ἀεί. τούτων δὲ περὶ μὲν τῆς ἀκινήτου ἀρχῆς, τῆς ἑτέρας καὶ προτέρας διελεῖν ἐστὶ φιλοσοφίας ἔργον· περὶ δὲ τοῦ διὰ τὸ συνεχῶς κινεῖσθαι τἄλλα κινοῦντος, ὕστερον ἀποδοτέον, τί τοιοῦτον τῶν καθ' ἕκαστα λεγομένων αἴτιόν ἐστι. νῦν δὲ τὴν ὡς ἐν ὕλης εἴδει τιθεμένην αἰτίαν, εἴπωμεν, δι' ἣν ἀεὶ φθορὰ καὶ γένεσις οὐχ ὑπολείπει τὴν φύσιν. ἅμα γὰρ ἂν ἴσως τοῦτο γένοιτο δῆλον, καὶ περὶ τοῦ νῦν ἀπορηθέντος, πῶς ποτε δεῖ λέγειν περὶ τῆς ἁπλῆς φθορᾶς καὶ γενέσεως. ἔχει δὲ ἀπορίαν ἱκανὴν, καὶ τί τὸ αἴτιον τοῦ συνείρειν τὴν γένεσιν, εἴπερ τὸ φθειρόμενον εἰς τὸ μὴ ὂν ἀπέρχεται, τὸ δὲ μὴ ὂν, μηδέν ἐστιν. οὔτε γὰρ τί, οὔτε ποιὸν, οὔτε ποσὸν, οὔτε πού τὸ μὴ ὄν. εἴπερ οὖν ἀεί τι τῶν ὄντων ἀπέρχεται, διὰ τί ποτ' οὐκ ἀνήλωται πάλαι καὶ φροῦδον τὸ πᾶν, εἴ γε πεπερασμένον ἦν, ἐξ οὗ γίνεται τῶν γινομένων ἕκαστον; οὐ γὰρ δὴ διὰ τὸ ἄπειρον εἶναι ἐξ οὗ γίνεται, οὐχ ὑπολείπει. τοῦτο γὰρ ἀδύνατον. κατ' ἐνέργειαν μὲν γὰρ οὐδέν ἐστιν ἄπειρον, δυνάμει δ' ἐπὶ τὴν διαίρεσιν. ὥστε ἔδει ταύτην εἶναι μόνην τὴν μὴ ὑπολείπουσαν τῷ γίνεσθαί τι ἀεὶ ἔλαττον. νῦν δὲ τοῦτο οὐχ ὁρῶμεν. * οὐκοῦν διὰ τὸ τὴν τοῦδε φθορὰν ἄλλου εἶναι γένεσιν, καὶ τὴν τοῦδε γένεσιν ἄλλου εἶναι φθορὰν, ἄπαυστον ἀναγκαῖον εἶναι τὴν μεταβολήν. περὶ μὲν οὖν τοῦ γένεσιν εἶναι καὶ φθορὰν, ὁμοίως [ἀεὶ] περὶ ἕκαστον τῶν ὄντων, ταύτην οἰητέον εἶναι πᾶσιν ἱκανὴν αἰτίαν. διὰ τί δέ ποτε, τὰ μὲν ἁπλῶς γίνεσθαι λέγεται καὶ φθείρεσθαι, τὰ δ' οὐχ ἁπλῶς, πάλιν σκεπτέον, εἴπερ τὸ αὐτό ἐστι γένεσις μὲν τουδὶ, φθορὰ δὲ τουδὶ, καὶ φθορὰ μὲν τουδὶ, γένεσις δὲ τουδί. ζητεῖ γάρ τινα τοῦτο λόγον. λέγομεν γὰρ, ὅτι φθείρεται νῦν ἁπλῶς, καὶ οὐ μόνον τοδί· καὶ αὕτη μὲν γένεσις ἁπλῶς, αὕτη δὲ φθορά. τοδὶ δὲ γίνεται μέν τι, γίνεται δ' ἁπλῶς οὔ. φαμὲν γὰρ τὸν μανθάνοντα γίνεσθαι μὲν ἐπιστήμονα, γίνεσθαι δ' ἁπλῶς οὔ. καθάπερ οὖν διορίζομεν πολλάκις λέγοντες, ὅτι τὰ μὲν τόδε τι σημαίνει, τὰ δ' οὔ, διὰ τοῦτο συμβαίνει τὸ ζητούμενον. διαφέρει γὰρ, εἰς ἃ μεταβάλλει τὸ μεταβάλλον. οἷον ἴσως ἡ μὲν εἰς πῦρ ὁδὸς, γένεσις μὲν * ἁπλῆ, φθορὰ δέ τινος, οἷον γῆς. ἡ δὲ γῆς γένεσις, τὶς γένεσις, γένεσις δ' οὐχ ἁπλῶς, φθορὰ δ' ἁπλῶς, οἷον πυρός· ὥσπερ Παρμενίδης λέγει δύο, τὸ ὂν καὶ τὸ μὴ ὂν εἶναι φάσκων, πῦρ καὶ γῆν.

* γ. τὸ μὴ ὄν.
* γ. ὑπάρχει.
* γ. ἆρ' οὖν
* γ. ἁπλῶς.

τὸ δὴ ταῦτα, ἢ τοιαῦτα ἕτερα ὑποτίθεσθαι, διαφέρει οὐδέν· τὸν γὰρ τρόπον ζητοῦμεν, ἀλλ' οὐ τὸ ὑποκείμενον. ἡ μὲν οὖν εἰς τὸ μὴ ὂν ἁπλῶς ὁδὸς, φθορὰ ἁπλῆ· ἡ δ' εἰς τὸ ἁπλῶς ὂν, γένεσις ἁπλῆ. οἷς οὖν διώρισται εἴτε πυρὶ καὶ γῇ, εἴτε ἄλλοις τισὶ, τούτων ἔσται τὸ μὲν ὄν, τὸ δὲ μὴ ὄν. ἕνα μὲν οὖν τρόπον ἐν τούτῳ διοίσει τὸ ἁπλῶς τι γίνεσθαι καὶ φθείρεσθαι, τοῦ μὴ ἁπλῶς. ἄλλον δὲ, τῇ ὕλῃ ὁποία τις ἂν ᾖ. ἧς μὲν γὰρ μᾶλλον αἱ διαφοραὶ τόδε τι σημαίνουσι, μᾶλλον οὐσία· ἧς δὲ στέρησιν, μὴ ὂν εἶναι, τὸ μὲν θερμὸν κατηγορία τις καὶ εἶδος· ἡ δὲ ψυχρότης, στέρησις. διαφέρουσι δὲ γῆ καὶ πῦρ καὶ ταύταις ταῖς διαφοραῖς. δοκεῖ δὲ μᾶλλον τοῖς πολλοῖς, τῷ αἰσθητῷ καὶ μὴ αἰσθητῷ διαφέρειν· ὅταν μὲν γὰρ εἰς αἰσθητὴν μεταβάλλῃ ὕλην, γίνεσθαί φασιν· ὅταν δ' εἰς ἀφανῆ, φθείρεσθαι. τὸ γὰρ ὂν καὶ τὸ μὴ ὂν, τῷ αἰσθάνεσθαι καὶ τῷ μὴ αἰσθάνεσθαι διορίζουσιν, ὥσπερ τὸ μὲν ἐπιστητὸν ὂν, τὸ δ' ἄγνωστον μὴ ὄν· ἡ γὰρ αἴσθησις ἐπιστήμης ἔχει δύναμιν. καθάπερ οὖν αὐτοὶ τῷ αἰσθάνεσθαι ἢ τῷ δύνασθαι καὶ ζῆν, καὶ εἶναι νομίζουσιν, οὕτω καὶ τὰ πράγματα, τρόπον τινὰ διώκοντες τἀληθὲς, αὐτὸ δὲ λέγοντες οὐκ ἀληθές. συμβαίνει δὴ κατὰ δόξαν, καὶ κατ' ἀλήθειαν ἄλλως, καὶ τὸ γίνεσθαί τε ἁπλῶς καὶ τὸ φθείρεσθαι· πνεῦμα γὰρ καὶ ἀὴρ, κατὰ μὲν τὴν αἴσθησιν ἧττόν ἐστι· διὸ καὶ τὰ φθειρόμενα ἁπλῶς, τῇ εἰς ταῦτα μεταβολῇ φθείρεσθαι λέγουσι· γίνεσθαι δ' ὅταν εἰς ἁπτὸν καὶ εἰς γῆν μεταβάλλῃ· κατ' ἀλήθειαν δὲ μᾶλλον τόδε τι καὶ εἶδος ταῦτα τῆς γῆς. τοῦ μὲν οὖν εἶναι, τὴν μὲν ἁπλῆν γένεσιν φθορὰν οὖσάν τινος, τὴν δὲ φθορὰν τὴν ἁπλῆν γένεσιν οὖσάν τινος, εἴρηται τὸ αἴτιον· * διὰ γὰρ τὸ τὴν ὕλην διαφέρειν, ἢ τῷ τὴν οὐσίαν εἶναι, ἢ τῷ μὴ, ἢ τῷ τὴν μὲν μᾶλλον, τὴν δὲ μὴ· ἢ τῷ τὴν μὲν μᾶλλον αἰσθητὴν εἶναι τὴν ὕλην ἐξ ἧς καὶ εἰς ἣν, τὴν δὲ ἧττον εἶναι. τοῦ δὲ, τὰ μὲν ἁπλῶς γίνεσθαι λέγεσθαι, τὰ δὲ τὶ μόνον, μὴ τῇ ἐξ ἀλλήλων γενέσει, καθ' ὃν εἴπομεν νῦν τρόπον· νῦν μὲν γὰρ τοσοῦτον διώρισται, τί δή ποτε πάσης γενέσεως φθορᾶς οὔσης ἄλλου, καὶ πάσης φθορᾶς οὔσης ἑτέρου τινὸς γενέσεως, οὐχ ὁμοίως ἀποδίδομεν τὸ γίνεσθαί τε καὶ τὸ φθείρεσθαι τοῖς εἰς ἄλληλα μεταβάλλουσι. τὸ δ' ὕστερον εἰρημένον, οὐ τοῦτο διαπορεῖ· ἀλλὰ τί δή ποτε τὸ μανθάνον μὲν οὐ λέγεται ἁπλῶς γίνεσθαι, ἀλλὰ γίνεσθαι ἐπιστῆμον· τὸ δὲ φυόμενον, γίνεσθαι. ταῦτα δὲ διώρισται ταῖς κατηγορίαις· τὰ μὲν γὰρ, τόδε τι σημαίνει, τὰ δὲ τοιόνδε, τὰ δὲ ποσόν. ὅσα οὖν μὴ οὐσίαν σημαίνει, οὐ λέγεται ἁπλῶς, ἀλλὰ τὶ γίνεσθαι. οὐ μὴν ἀλλ' ὁμοίως ἐν πᾶσι, γένεσις μὲν κατὰ τὰ ἐν τῇ ἑτέρᾳ συστοιχίᾳ λέγεται εἶναι· ἐν μὲν οὐσίᾳ, ἐὰν πῦρ, ἀλλ' οὐκ ἐὰν γῆ· ἐν δὲ τῷ ποιῷ, ἐὰν ἐπιστῆμον, ἀλλ' οὐχ ὅταν ἀνεπιστῆμον. περὶ μὲν οὖν τοῦ τὰ μὲν ἁπλῶς γίνεσθαι, τὰ δὲ μὴ, καὶ * ὅλως ἐν ταῖς οὐσίαις αὐταῖς, εἴρηται· καὶ διότι τοῦδε γένεσιν εἶναι συνεχῶς αἰτία ὡς ὕλη τὸ ὑποκείμενον, ὅτι μεταβλητικὸν εἰς τἀναντία, καὶ ἔστιν ἡ θατέρου γένεσις ἀεὶ, ἐπὶ τῶν οὐσιῶν ἄλλου φθορὰ, καὶ ἡ ἄλλου φθορὰ, ἄλλου γένεσις. ἀλλὰ μὴν οὐδ' ἀπορῆσαι δεῖ διὰ τί γίνεται ἀεὶ ἀπολλυμένων· ὥσπερ γὰρ καὶ τὸ φθείρεσθαι ἁπλῶς φασιν, ὅταν εἰς ἀναίσθητον ἔλθῃ καὶ τὸ μὴ ὂν, ὁμοίως καὶ γίνεσθαι ἐκ μὴ ὄντος φασὶν, ὅταν ἐξ ἀναισθήτου.

* γρ. ἄλλην γένεσιν τὴν

* γρ. ὅλως δὲ ἐν τ.

A Verùm hæc an alia eiuſmodi ſupponantur, intereſt nihil, quandoquidem modum quærimus, non ſubiectum. Quæ igitur ad non ens ſimpliciter fit migratio, corruptio ſimplex eſt. Quæ verò ad ens ſimpliciter, ſimplex generatio. Quibus igitur illæ, ſiue igni & terra, ſiue quibuſdam aliis definitæ ſunt: horum profectò alterum ens, alterum non ens erit. Vno igitur modo ſimpliciter quippiam generari ac corrumpi, & non ſimpliciter, hoc inter ſe differunt. Altero, materiæ qualitate conditionéve. Cuius enim differentiæ potiùs hoc aliquid ſignificant, ea magis ſubſtantia eſt. Contra, cuius differentiæ priuationem magis ſignificant, ea magis non ens eſt. Vt calor prædicamentum quoddam & ſpecies eſt: B frigiditas, priuatio: his autem differentiis, ignis & terra differunt. At pleriſque videtur, illa potiùs ſenſibili & inſenſibili differre. Nam cùm ad ſenſibilem materiam mutatio fit, tum gigni quippiam aiunt: cùm ad eam quæ ſub ſenſum non cadit, corrumpi. Quandoquidem ens & non ens, ſentiendo & non ſentiendo definiunt. quemadmodum quod ſcibile eſt, ens eſſe aſſerunt: quod ſciri non ſolet, non ens, quippe cùm ſenſus ipſe, ſcientiæ vim obtineat. Igitur hi veres ipſas viuere, quia ſentiant aut ſentire poſſint: itá eadem eſſe, quia ſub ſenſum cadant, arbitrantur: veritatem modo quodam ſectantes, ſed hoc falſi dicentes. Itaque generari quippiam C ſimpliciter, atque corrumpi, iuxta opinionem alio atque veritatem accidit modo. Nam ſpiritus & aër, ſenſu quidem minus ſunt. & proinde illi, quæ ſimpliciter corrumpuntur, mutatione ad illa tendente corrumpi dicunt: atque generari, cùm in rem tangibilem terrámque mutantur. Reuera verò hoc aliquid, & ſpecies, magis ſunt quàm ipſa terra. Cur igitur ſit aut non ſit ſimplex generatio, quæ eadem alicuius corruptio eſt, & corruptio ſimplex quæ itidem generatio alicuius eſt, cauſam diximus. Nam id ob materiæ diſcrimen euenit: nempe aut quòd ea ſubſtantia ſit, vel non ſit: aut quòd hæc magis, illa minùs: & non, quia materia ex qua mutatio venit, & ad quam proficiſcitur, alia magis, alia minùs D ſenſu percipi queat. Dicuntur autem quædam ſimpliciter, quædam ſolùm aliquid fieri: non ob mutuam generationem, ſed iuxta eum quem nuper diximus modum. Nam hoc tantùm nuper definitũ determinatúmq; fuit, curná cùm omnis generatio ſit alterius corruptio, & omnis corruptio cuiuſpiam alius generatio, tam oriri quàm interire nõ ſimiliter tribuamus hiſce quæ in ſeſe viciſſim mutari ſolent. At quod poſtremo loco fuit dictum, hoc idem minimè in quæſtionem reuocat: ſed quam ob rem quod diſcit, non ſimpliciter fieri, ſed fieri ſciens: quod verò naſcitur, fieri dicatur. Hæc autem prædicamentis diſtincta ſunt. Nam alia ſubſtantiam, E alia qualitatem, alia quantitatem, ſignificant. Quæcumque igitur ſubſtantiam non ſignificant, ea non ſimpliciter ſed quippiam fieri dicuntur. Verumenimvero in omnibus generatio ſimpliciter, iuxta ea quæ in altera ſunt ſerie, dicitur. vt in ſubſtantia, ſi ignis ſtat, ſed non ſi terra: & in qualitate, ſi ſcium, ſed non ſi inſcium. Quòd igitur quædam ſimpliciter oriantur, quædam non, etiam omnino in ipſis ſubſtantiis, dictum eſt: & quòd vt generatio continuè ſit, cauſa vt materia id quod ſubiicitur eſt, quia in contraria mutatiuum eſt, atque in ſubſtantiis ſemper vnius generatio, alterius eſt corruptio: & vnius corruptio, generatio alterius. at verò nec dubitaſſe conuenit, quam ob cauſam corruptis quibuſdam ſemper generatio fiat. Nam vt corrumpi ſimpliciter quippiam dicunt, cùm illud ad inſenſibile & id quod haud eſt, proficiſcitur: ſic & ortum ſubire ex eo quod haud eſt, cùm ex inſenſibili fit.

Siúe igitur ſubiecto quopiam exiſtente, ſiue non: ex eo fit quod haud eſt. Quare ſimili modo & ex eo quod haud eſt, generatur, & in id quod haud eſt, corrumpitur. Meritò igitur generatio non deficit: quippe cũ generatio, corruptio ſit eius quod haud eſt: atque corruptio, generatio eius quod haud eſt. Sed quæret aliquis, vtrùm hoc ipſum quod ſimpliciter non eſt, è contrariis ſit alterum? verbi cauſa: vtrùm non ens ſit terra, & id quod graue eſt; ens verò ignis & quod leue eſt: an non: ſed ens terra, non ens verò terræ materies atque ignis ſimiliter? Et vtrùm materies vtriuſque diuerſa ſit: an nec ex ſeſe mutuò fierent, nec ex contrariis: nam hiſce, igni, inquam, terræ, aquæ & aëri, contraria inſunt. An partim eſt eadem, partim diuerſa? quod enim aliquando cùm ſit, ſubiici ſolet, eſt idem: at ratio, non item eadem eſt. Sed de hiſce hactenus.

CAPVT IV.

Generationem & alterationem transformatione ꝫ eſſe diuerſas.

DE generatione autem atque alteratione, quo inter ſe diſcrepent, agendum: nam haſce mutationes inter ſeſe diuerſas eſſe dicimus. Cùm igitur ſubiectum quippiam ſit, & affectio atque qualitas quæ de ſubiecto nata eſt dici, ab eodem diuerſa ſit, ſitque vtriuſque horum mutatio: alteratio ſanè eſt, quando ſenſibile ſubiectum permanens, in ſuis mutatur affectibus, qui aut contrarij, aut inter contrarios medij ſunt, ſicuti corpus idem permanens viciſſim modò ſanum, modò ægrum eſt, atque æs, quanquam idem, aliàs teres atque rotundum eſt, aliàs anguli ſpeciem præ ſe fert. at cùm totum mutatur, nec ſenſibile quicquam vt ſubiectum, idem permanet, ſed perinde euenit vt cùm ex toto ſemine ſanguis, aut ex tota aqua aër, aut ex aëre toto aqua fit: iam quod eſt tale generatio huius eſt, & illius corruptio. Et maximè, ſi ex inſenſibili ad id quod aut tactu aut ſenſibus vniuerſis ſenſibile eſt, mutatio fiat, aut contrà, vt cùm ex aëre gignitur aqua, aut eadem in aërem corrumpitur: etenim aër propemodum inſenſibilis eſt. Cæterùm in hiſce ſi qua è contrarietate affectio eadem remaneat in eo quod ortum eſt, quæ priùs in eo quod interiit, erat: ceu ſi cùm ex aëre fit aqua, aëris perſpicuitas aut frigus in aqua, remaneat: affectionum alterutram eius eſſe in quod mutatio fiat, minimè oportet. Sin minùs, erit alteratio: verbi cauſa, muſicus homo corrumpitur, & homo non muſicus gignitur: homo verò, idem perſeuerat. Si ergo muſica, atque muſicę vacuitas non eſſet affectio per ſe hominis, generatio profectò foret alterius, & alterius corruptio. Quapropter hæc hominis quidem affectiones ſunt: hominis verò muſici, hominiſque non muſici, generatio atque corruptio. Nunc autem id eius quod permanet, affectus eſt. Proinde circa ea quæ eiuſmodi ſunt, alteratio exiſtit. Cùm igitur contrarietatis mutatio in quantitate eſt, accretio eſt atque decretio: cùm in loco, latio: cùm in affectu atque qualitate, alteratio. at cùm id non remanet, in quo affectuum alter aut omnino accidens exiſtit: tum generatio vnius eſt, & alius corruptio. Porrò ſubiectum ortus & interitus ſuſceptiuum, maximè quidem ac propriè materies eſt. quodam autem modo & id quoque quod cæteris aliis mutationibus ſubiici ſolet, propterea quòd ſubiecta omnia, quarundam cõtrarietatum ſuſceptiua ſunt. De generatione igitur ac corruptione, ſitne an non, & quo pacto ſit: item de alteratione, hoc modo ſit definitum atque determinatum.

A εἴτ' οὖν ὄντος τινὸς τοῦ ὑποκειμένου, εἴτε μή, γίνεται ἐκ μὴ ὄντος· ὥστε ὁμοίως καὶ γίνεται ἐκ μὴ ὄντος, καὶ φθείρεται εἰς τὸ μὴ ὄν. εἰκότως οὖν οὐχ ὑπολείπει· ἡ γὰρ γένεσις, φθορὰ τοῦ μὴ ὄντος· ἡ δὲ φθορά, γένεσις τοῦ μὴ ὄντος. ἀλλὰ τοῦτο τὸ μὴ ὂν ἁπλῶς, ἀπορήσειέ τις, πότερον τὸ ἕτερον τῶν ἐναντίων ἐστίν, οἷον γῆ καὶ τὸ βαρὺ μὴ ὄν, πῦρ δὲ καὶ τὸ κοῦφον τὸ ὄν, ἢ οὔ· ἀλλ' ἔστι καὶ γῆ * τὸ ὄν· τὸ δὲ μὴ ὄν, ὕλη ἡ τῆς γῆς, καὶ πυρὸς ὡσαύτως. καὶ ἆρά γε ἑτέρα ἡ ἑκατέρου ὕλη, ἢ οὐκ ἂν γίνοιτο ἐξ ἀλλήλων, οὐδ' ἐξ ἐναντίων; τούτοις γὰρ ὑπάρχει τἀναντία, πυρί, γῇ, ὕδατι, ἀέρι. ἢ ἔστι μὲν ὡς ἡ αὐτή, ἔστι δ' ὡς ἑτέρα· ὃ μὲν γάρ B ποτε ὄν, ὑπόκειται, τὸ αὐτό, τὸ δ' εἶναι οὐ τὸ αὐτό. περὶ μὲν οὖν τούτων ἐπὶ τοσοῦτον εἰρήσθω.

* γρ. ἐκεῖ.

ΚΕΦΑΛ. δ'.

Τίνι διαφέρουσι γένεσις καὶ ἀλλοίωσις.

ΠΕρὶ δὲ γενέσεως, καὶ ἀλλοιώσεως, λέγωμεν τί διαφέρουσι· φαμὲν γὰρ ἑτέρας εἶναι ταύτας τὰς μεταβολὰς ἀλλήλων. ἐπεὶ οὖν ἐστί τι τὸ ὑποκείμενον, καὶ ἕτερον τὸ πάθος, ὃ κατὰ τοῦ ὑποκειμένου λέγεσθαι πέφυκε, καὶ ἔστι μεταβολὴ ἑκατέρου τούτων· ἀλλοίωσις μέν ἐστιν, ὅταν ὑπομένοντος τοῦ ὑποκειμένου, αἰσθητοῦ ὄντος, C μεταβάλλῃ ἐν τοῖς αὐτοῦ πάθεσιν, ἢ ἐναντίοις οὖσιν, ἢ μεταξύ· οἷον τὸ σῶμα ὑγιαίνει, καὶ πάλιν κάμνει, ὑπομένον γε ταὐτό· καὶ ὁ χαλκὸς στρογγύλος, ὁτὲ δὲ γωνιοειδής, ὁ αὐτός γε ὤν. ὅταν δ' ὅλον μεταβάλλῃ, μὴ ὑπομένοντος αἰσθητοῦ τινος, ὡς ὑποκειμένου τοῦ αὐτοῦ, ἀλλ' οἷον ἐκ τῆς γονῆς αἷμα πάσης, ἢ ἐξ ὕδατος ἀήρ, ἢ ἐξ ἀέρος παντὸς ὕδωρ, γένεσις ἤδη τὸ τοιοῦτον, τοῦ δὲ φθορά· μάλιστα δέ, ἂν ἡ μεταβολὴ γίνηται ἐξ ἀναισθήτου εἰς αἰσθητόν, ἢ ἁφῇ, ἢ πάσαις ταῖς αἰσθήσεσιν· οἷον, ὅταν ὕδωρ γένηται, ἢ φθαρῇ εἰς ἀέρα· ὁ γὰρ ἀὴρ ἐπιεικῶς ἀναίσθητον. ἐν δὲ τούτοις ἐάν τι ὑπομένῃ πάθος τὸ αὐτὸ ἐναντιώσεως ἐν τῷ γενομένῳ καὶ ἐν D τῷ φθαρέντι· οἷον, ὅταν ἐξ ἀέρος ὕδωρ, εἰ ἄμφω διαφανῆ ἢ ψυχρά· οὐ δεῖ τούτου θάτερον πάθος εἶναι εἰς ὃ μεταβάλλει. εἰ δὲ μή, ἔσται ἀλλοίωσις· οἷον ὁ μουσικὸς ἄνθρωπος ἐφθάρη, ἄνθρωπος δὲ ἄμουσος ἐγένετο· ὁ δὲ ἄνθρωπος ὑπομένει τὸ αὐτό. εἰ μὲν οὖν τούτου μὴ πάθος ἦν καθ' αὑτό, ἡ μουσικὴ καὶ ἡ ἀμουσία, τοῦ μὲν γένεσις ἂν ἦν, τοῦ δὲ φθορά· διὸ ἀνθρώπου μὲν ταῦτα πάθη, ἀνθρώπου δὲ μουσικοῦ, καὶ ἀνθρώπου ἀμούσου, γένεσις καὶ φθορά· νῦν δὲ πάθος τοῦτο τοῦ ὑπομένοντος. διὸ ἀλλοίωσις τὰ τοιαῦτα. ὅταν μὲν οὖν κατὰ τὸ ποσὸν ᾖ ἡ μεταβολὴ τῆς ἐναντιώσεως, αὔξησις καὶ φθίσις· ὅταν δὲ κατὰ τόπον, φο- E ρά· ὅταν δὲ κατὰ πάθος καὶ τὸ ποιόν, ἀλλοίωσις· ὅταν δὲ μηδὲν ὑπομένῃ, οὗ θάτερον πάθος ἢ συμβεβηκὸς ὅλως, γένεσις· τὸ δέ, φθορά. ἔστι δὲ ὕλη, μάλιστα μὲν καὶ κυρίως τὸ ὑποκείμενον γενέσεως καὶ φθορᾶς δεκτικόν. τρόπον δέ τινα καὶ τὸ ταῖς ἄλλαις μεταβολαῖς, ὅτι πάντα δεκτικὰ τὰ ὑποκείμενα, ἐναντιώσεών τινων. περὶ μὲν οὖν γενέσεως καὶ φθορᾶς, εἴτε ἔστιν, εἴτε μή, καὶ πῶς ἔστι, καὶ περὶ ἀλλοιώσεως, τοῦτον διωρίσθω τὸν τρόπον.

ΚΕΦΑΛ. ε΄.

Τί διαφέρει αὔξησις γενέσεως καὶ ἀλλοιώσεως, καὶ πῶς αὐξάνεται τῶν αὐξανομένων ἕκαστον, καὶ φθίνει ὁτιοῦν τῶν φθινόντων.

ΠΕρὶ δὲ αὐξήσεως λοιπὸν εἰπεῖν, τί τε διαφέρει γενέσεως καὶ ἀλλοιώσεως, καὶ πῶς αὐξάνεται τῶν αὐξανομένων ἕκαστον, καὶ φθίνει ὁτιοῦν τῶν φθινόντων. σκεπτέον δὴ πρῶτον, πότερον μόνως ἐν τῷ περὶ ὅ ἐστιν αὐτῶν ἡ πρὸς ἄλληλα διαφορά, (οἷον ὅτι ἡ μὲν ἐκ τοῦδε εἰς τόδε μεταβολή, οἷον ἐκ δυνάμει οὐσίας εἰς ἐντελεχείᾳ οὐσίαν γένεσίς ἐστιν, ἡ δὲ περὶ μέγεθος, αὔξησις καὶ φθίσις, ἡ δὲ περὶ πάθος, ἀλλοίωσις· ἀμφότερα δὲ ἐκ τῶν δυνάμει ὄντων, εἰς ἐντελέχειαν μεταβολὴ τῶν εἰρημένων ἐστίν,) ἢ καὶ ὁ τρόπος διαφέρει τῆς μεταβολῆς· φαίνεται γάρ, τὸ μὲν ἀλλοιούμενον, οὐκ ἐξ ἀνάγκης μεταβάλλον κατὰ τόπον, οὐδὲ τὸ γινόμενον, τὸ δὲ αὐξανόμενον, καὶ τὸ φθῖνον ἄλλον δὲ τρόπον τοῦ φερομένου. τὸ μὲν γὰρ φερόμενον, ὅλον ἀλλάττει τὸν τόπον· τὸ δ' αὐξανόμενον, ὥσπερ τὸ ἐλαυνόμενον. τούτου γὰρ μένοντος, τὰ μόρια μεταβάλλει κατὰ τόπον, οὐχ ὥσπερ τὰ τῆς σφαίρας. τὰ μὲν γὰρ ἐν τῷ ἴσῳ τόπῳ μεταβάλλει, τοῦ ὅλου μένοντος. τὰ δὲ τοῦ αὐξανομένου ἀεὶ ἐπὶ πλείω τόπον, ἐπ' ἐλάττω δὲ τὰ τοῦ φθίνοντος. ὅτι μὲν οὖν ἡ μεταβολὴ διαφέρει οὐ μόνον περὶ ὅ, ἀλλὰ καὶ ὡς, τοῦ τε γινομένου, καὶ ἀλλοιουμένου, καὶ αὐξανομένου, δῆλον. περὶ δὲ ὅ ἐστιν ἡ μεταβολὴ τῆς αὐξήσεως καὶ τῆς φθίσεως, (περὶ μέγεθος δὲ δοκεῖ εἶναι τὸ αὐξάνεσθαι καὶ φθίνειν,) ποτέρως ὑποληπτέον, πότερον ἐκ δυνάμει μὲν μεγέθους καὶ σώματος, ἐντελεχείᾳ δὲ ἀσωμάτου καὶ ἀμεγέθους γίνεσθαι σῶμα καὶ μέγεθος, καὶ τούτου διχῶς ἐνδεχομένου λέγειν, ποτέρως ἡ αὔξησις γίνεται; πότερον ἐκ κεχωρισμένης αὐτῆς καθ' αὑτὴν τῆς ὕλης, ἢ ἐνυπαρχούσης ἐν ἄλλῳ σώματι, ἢ ἀδύνατον ἀμφοτέρως; χωριστὴ μὲν γὰρ οὖσα, ἢ οὐδένα καθέξει τόπον, ἢ οἷον στιγμή τις, ἢ κενὸν ἔσται, ἢ σῶμα οὐκ αἰσθητόν. τούτων δέ, τὸ μὲν οὐκ ἐνδέχεται, τὸ δὲ ἀναγκαῖον ἔν τινι εἶναι· ἀεὶ γάρ πού ἐστι τὸ γινόμενον ἐξ αὐτοῦ[*] ὥστε καὶ ἐκεῖνο, ἢ καθ' ἑαυτό, ἢ κατὰ συμβεβηκός. ἀλλὰ μήν, εἴ γε ἔν τινι ὑπάρξει, εἰ μὲν κεχωρισμένον οὕτως, ὥστε μὴ ἐκείνου καθ' ἑαυτὸ ἢ κατὰ συμβεβηκός τι εἶναι, συμβήσεται πολλὰ καὶ ἀδύνατα. λέγω δ', οἷον εἰ γίγνεται ἀὴρ ἐξ ὕδατος, οὐ τοῦ ὕδατος ἔσται μεταβάλλοντος, ἀλλὰ διὰ τὸ ὥσπερ ἐν ἀγγείῳ τῷ ὕδατι ἐνεῖναι τὴν ὕλην αὐτοῦ. ἀπείρους γὰρ οὐδὲν κωλύει ὕλας εἶναι· ὥστε καὶ γίγνεσθαι ἐντελεχείᾳ. ἔτι δέ, οὐδ' οὕτω φαίνεται γιγνόμενος ἀὴρ ἐξ ὕδατος, οἷον ἐξιὼν ὑπομένοντος. βέλτιον τοίνυν ποιεῖν πᾶσιν ἀχώριστον εἶναι τὴν ὕλην, ὡς οὖσαν τὴν αὐτὴν καὶ μίαν τῷ ἀριθμῷ, τῷ λόγῳ δὲ μὴ μίαν. ἀλλὰ μήν, οὐδὲ στιγμὰς θετέον, οὐδὲ γραμμὰς τὴν τοῦ σώματος ὕλην, διὰ τὰς αὐτὰς αἰτίας. ἐκεῖνο δέ, οὗ ταῦτα ἔσχατα, ἡ ὕλη [ἐστὶν] ἣν οὐδέποτε ἄνευ πάθους οἷόν τε εἶναι, οὐδὲ ἄνευ μορφῆς. γίγνεται μὲν οὖν ἁπλῶς ἕτερον ἐξ ἑτέρου, ὥσπερ καὶ ἐν ἄλλοις διώρισται, καὶ[*] ἀπό τινος δὲ ἐντελεχείᾳ ὄντος, ἢ ὁμογενοῦς, ἢ ὁμοειδοῦς, οἷον, πῦρ ὑπὸ πυρός, ἢ ἄνθρωπος ὑπὸ ἀνθρώπου, ἢ ὑπὸ ἐντελεχείας· σκληρὸν γάρ, οὐχ ὑπὸ σκληροῦ γίνεται. ἐπεὶ δ' ἐστὶ καὶ οὐσίας ὕλη σωματικῆς, σώματος δ' ἤδη τοιουδί·

[*] κ. ὥστε ἢ μηδ.

[*] κ. ὑπό τινος

CAPVT V.

An à cæteris motibus differat augmentatio.

REſtat de accretione dicamus, quónam à generatione & alteratione differat, & quo pacto vnumquodque eorum quæ ſuſcipiunt incrementum, augeatur, & quoduis eorum quæ decreſcunt, diminuatur. Primo itaque conſiderare oportet, vtrùm mutua earum inter ſe differentia in eo ſolùm ſita ſit, circa quod verſari ſolent: verbi gratia: vtrùm eo ſolùm inter ſe diſſideant, quòd ea mutatio quæ ex hoc in hoc tendit, puta ex ſubſtantia potentia, in ſubſtantiam actu, generatio ſit: quæ verò circa magnitudinem verſatur, accretio & decretio: quæ autem circa affectum, alteratio: atque earum quæ poſteriore loco dictæ ſunt, vtraque etiam ex hiſçe quę potentia ſunt, ad ea quæ ſunt actu, mutatio ſit, an etiam mutationis modus differat? Nam nec id quod alterationem ſubit, nec id quod generatur, neceſſariò mutari loco cernitur: quod autẽ accreſcit aut decreſcit, cernitur: at alio quàm quod fertur modo. quod enim fertur tota mole, locum mutat: quod autẽ accreſcit, perinde atque quod diſtẽdi producique ſolet. Hoc enim manente, partes aliò, non ſicuti globi partes, migrant, ſuúmque deſerunt locum. nam globi partes toto manente æquali in loco, locum ex loco mutãt: at partes eorũ quæ augentur, ſemper in ampliorem locum vergere ſolent: & eorum quæ decreſcunt, in minorem. Generationem igitur, alterationémque & accretionem, non ſolùm obiecto, ſed ipſo item mutationis modo differre perſpicuum eſt. Ad id autem circa quod accretio decretióve verſari ſolet (verſari autem videtur circa magnitudinem) vtro modo accretionem decretionémve ſubire exiſtimandũ eſt? vtrùm inquam ex potentia quidem magnitudine ac corpore, ſed actu nec corpore nec magnitudine, corpus fieri an non putandũ eſt? Atque cùm hoc bifariàm dici contingat, vtro modo fit accretio? vtrùm ex ſeparata ipſa per ſe materia: an exiſtente in alio corpore, an neutro modo fieri queat? Nam ſi ſeparata ſit, aut nullum occupabit locum, velut punctus quidam aut vacuum, vel corpus non ſenſibile erit. Horum autem alterum non contingit, alterum neceſſe eſt in aliquo eſſe. quod enim ex eo oritur, id ſemper alicubi erit: quare & illud aut per ſe aut per accidens. At verò ſi ſit in aliquo, & ita quidem ſeiunctum ſit vt nihil illius aut per ſe aut per accidens ſit, multa profectò vel quæ fieri nequeant, euenient. Dico autem, vt ſi ex aqua fiat aër: idem non erit, aqua mutationem ſubeunte, ſed quia in aqua vt in vaſe materies eius eſt. Nihil enim vetat, infinitas eſſe materias: quare & actu fieri. adde quod nec ita aër ex aqua oriri videtur, vt permanente aqua, aër inde egrediatur. Satius igitur fuerit, inſeparabilem omnibus materiam tribuere: vt pote quæ vna numero eadémque ſit, ratione non vna. at verò nec puncta, nec lineas, corporis materiam ponere iiſdem de cauſis oportet. ſed cuius vltima ſunt hæc, id materies eſt: quæ nec ſine affectu vnquam, nec ſine forma eſſe poteſt. Gignitur igitur abſolutè aliud ex alio: id quod alio quoque loco iam definitum eſt. atque ab aliquo actu exiſtente, quod eiuſdem ſit aut generis aut ſpeciei: vt ignis ab igni, aut ab homine homo. aut ab actu: durum enim à non duro fit. Cùm autem & corporeæ ſubſtantiæ materies ſit corporis iam talis,

(nullum enim eſt cõmune corpus) eadem & à magnitudine & ab affectu, ratione quidẽ non itẽ loco ſeparabilis eſt, niſi & ipſi quoque affectus ſeparabiles ſint. Patet igitur ex his quæ addubitauimus, accretionem non eſſe mutationem, è potentia quidem magnitudine, actu verò nullam habente magnitudinem. quandoquidem quod commune eſt, ſeparabile eſſet. hoc autem eſſe non poſſe, dictum iam eſt. Præterea talis mutatio, accretionis propria non eſt, ſed generationis. Nam accretio, magnitudinis quæ in quopiã ineſt, augmẽtatio eſt. decretio verò, eiuſdem diminutio. Quamobrem id quod accreſcit, magnitudinem quandam habeat oportet. Proinde nequaquam conuenit, accretionem è materia quæ magnitudinis ſit expers, ad actum magnitudinis eſſe: potiùs enim eſſet generatio corporis, non accretio. Potiùs itaque ſumamus oportet, quaſi tractantes ab initio quæſtionem, qualis accretio decretióve, cuius cauſas quærimus, exiſtat. Igitur eius quod accrementum ſuſcipit, pars quæuis augeri videtur; atque pari modo in decretione, minor euadere. præterea accedente quopiam accreſcere, & abeunte decreſcere. Itaque aut incorporeo aut corpore augeri illud neceſſe eſt. Si igitur incorporeo, quod commune eſt, ſeparabile erit. At à magnitudine materiam eſſe ſeparabilem, quemadmodum priùs eſt dictum, impoſſibile eſt. Sin verò corpore, duo corpora, id inquã quod augetur, & quod auget, in eodem erunt loco, quod etiam fieri nequit. At verò nec accretionem decretionémve perinde fieri, atque cùm ex aqua fit aër (tunc enim moles fieri maior aſſolet) dicere contingit. non enim id accretio, ſed eius quidem in quod mutatio fit, generatio, contrarij verò corruptio erit: neutrius autem accretio: immo aut nullius: aut ſi quid vtriſque, ei inquam quod oritur & ei quod interit, commune eſt, velvti corpus eius erit. Et nec aqua nec aër accreſcit, verùm illa interit, hic oritur: ſed corpus, ſi quid augeatur. at hoc quoque fieri nequit. Nam ea ſeruare oportet, quæ ei quod accreſcit, decreſcitve, ratione competunt. Hæc autem tria ſunt: quorum primum eſt, magnitudinis quæ accreſcit, partem quamlibet maiorem effici: verbi gratia, ſi caro, carnis. alterum, accedente quopiam: tertium, ſeruato pariter atque manente eo quod accretionem ſubit. Nam cùm quippiam ſimpliciter abſoluteque gignitur aut interit, non permanet. At cùm alteratur, aut accreſcit decreſcitve: quod alteratur aut incrementa ſuſcipit, id permanet. verùm illic affectio, hîc magnitudo eadem non manet. Quòd ſi mutatio illa quam diximus, eſſet accretio: contingeret profectò quippiam nulla re accedente permanentéve accreſcere, nullâque abeunte decreſcere, & id non manere quod ſuſcipit accretionem. At hoc ſeruare oportet: quippe cùm accretio talis eſſe ſupponatur. Sed quæret aliquis, quid eſt quod accreſcit, vtrùm id cui nonnihil additur? verbi cauſa: ſi quid crus augeat, crúſne maius euadit, quod autem incrementum præſtat, ipſum inquam alimentum, minime? Sed cur non ambo incrementa ſuſcipiunt? Nam tam quod additur, quàm cui additio fit, maius reddi aſſolet: haud ſecus atque cùm aquæ vinum miſcueris: pari enim ratione vtrũque maius eſt. An quia huius ſubſtantia maneat: illius verò, puta cibi, haudquaquam? Quando & illic quoque quod euincit ac ſuperat, in ipſa miſtione augeri dicitur, ceu vinum. Nam vniuerſa mixtura, vini non aquæ functionem exercet. In alteratione quoque ſimiliter, ſi caro & ſubſtantia ipſa maneat: eorum verò affectuum qui per ſe competunt, quiſpiam inſit, qui priùs non inerat, hoc ſane alteratum eſt.

A (σῶμα γὰρ κοινὸν οὐδέν) ἡ αὐτὴ καὶ μεγέθους καὶ πάθους ἐστί, τῷ μὲν λόγῳ χωριστή, τόπῳ δ' οὐ χωριστή, εἰ μὴ καὶ τὰ πάθη χωριστά. φανερὸν δ' ἐκ τῶν διηπορημένων, ὅτι οὐκ ἔστιν ἡ αὔξησις μεταβολὴ ἐκ δυνάμει μεγέθους, ἐντελεχείᾳ δὲ μηδὲν ἔχοντος μέγεθος· χωριστὸν γὰρ ἂν εἴη τὸ κοινόν. τοῦτο δ' ὅτι ἀδύνατον, εἴρηται ἐν ἑτέροις πρότερον. ἔτι δὲ ἡ τοιαύτη μεταβολή, οὐκ αὐξήσεως ἴδιον, ἀλλὰ γενέσεως· ἡ γὰρ αὔξησίς ἐστι τοῦ ἐνυπάρχοντος μεγέθους ἐπίδοσις· ἡ δὲ φθίσις, μείωσις. διὸ ἔχειν τι δεῖ μέγεθος τὸ αὐξανόμενον. ὥστε οὐκ ἐξ ἀμεγέθους ὕλης δεῖ εἶναι τὴν αὔξησιν εἰς ἐντελέχειαν μεγέθους· γένεσις γὰρ ἂν εἴη σώματος B μᾶλλον, οὐκ αὔξησις. ληπτέον δὴ μᾶλλον οἷον ἁπτομένοις τῆς ζητήσεως ἐξ ἀρχῆς, ποίου τινὸς ὄντος τοῦ αὐξάνεσθαι, ἢ τοῦ φθίνειν, τὰ αἴτια ζητοῦμεν. φαίνεται δὴ ὁτιοῦν τοῦ αὐξανομένου ὁτιοῦν μέρος ηὐξῆσθαι· ὁμοίως δὲ καὶ ἐν τῷ φθίνειν, ἔλαττον γεγονέναι. ἔτι δὲ προσιόντος τινὸς αὐξάνεσθαι, καὶ ἀπιόντος φθίνειν. * ἀνάγκη δὴ, ἢ ἀσωμάτῳ αὐξάνεσθαι, ἢ σώματι. εἰ μὲν οὖν ἀσωμάτῳ, ἔσται χωριστὸν * κοινόν· ἀδύνατον δὲ μεγέθους ὕλην εἶναι χωριστήν, ὥσπερ εἴρηται πρότερον. εἰ δὲ σώματι, δύο ἐν τῷ αὐτῷ σώματα τόπῳ ἔσται, τό, τε αὐξανόμενον, καὶ τὸ αὖξον. ἔστι δὲ καὶ τοῦτο ἀδύνατον. ἀλλὰ μὴν οὐδ' οὕτως ἐνδέχεται λέ- C γεσθαι τὴν αὔξησιν, καὶ τὴν φθίσιν, ὥσπερ ὅταν ἐξ ὕδατος ἀήρ· τότε γὰρ μείζων ὁ ὄγκος γέγονεν· οὐ γὰρ αὔξησις τοῦτο, ἀλλὰ γένεσις μὲν τοῦ εἰς ὃ μετέβαλεν, ἔσται· φθορὰ δὲ τοῦ ἐναντίου· αὔξησις δὲ, οὐδετέρου, ἀλλ' ἢ οὐδενός, ἢ εἴ τι κοινὸν ἀμφοῖν ὑπάρχει, τῷ γινομένῳ καὶ τῷ φθαρέντι, οἷον, εἰ σῶμα. τὸ δ' ὕδωρ οὐκ ηὔξηται, οὐδὲ ὁ ἀήρ· ἀλλὰ τὸ μὲν ἀπόλωλε, τὸ δὲ γέγονε· τὸ σῶμα δὲ εἴπερ ηὔξηται. ἀλλὰ καὶ τοῦτ' ἀδύνατον. δεῖ γὰρ σώζειν τῷ λόγῳ τὰ ὑπάρχοντα τῷ αὐξανομένῳ καὶ φθίνοντι. ταῦτα δὲ τρία ἐστίν· ὧν ἓν μέν ἐστι, τὸ ὁτιοῦν μέρος μεῖζον γίνεσθαι, τοῦ αὐξανομένου μεγέθους, οἷον εἰ σὰρξ τῆς σαρκός· καὶ προσιόν- D τος τινός· καὶ τρίτον σωζομένου τοῦ τε αὐξανομένου καὶ ὑπομένοντος. ἐν μὲν γὰρ τῷ γίνεσθαί τι ἁπλῶς, ἢ φθείρεσθαι, οὐχ ὑπομένει· ἐν δὲ τῷ ἀλλοιοῦσθαι ἢ αὐξάνεσθαι, ἢ φθίνειν, ὑπομένει τὸ αὐτὸ αὐξανόμενον, ἢ ἀλλοιούμενον· ἀλλ' ἔνθα μὲν τὸ πάθος, ἔνθα δὲ τὸ μέγεθος τὸ αὐτὸ * οὐ μένει. εἰ δὴ ἔσται ἡ εἰρημένη αὔξησις, ἐνδέχοιτ' ἂν μηδενός γε προσιόντος μηδὲ ὑπομένοντος αὐξάνεσθαι. καὶ μηδενὸς ἀπιόντος, φθίνειν, καὶ μὴ ὑπομένειν τὸ αὐξανόμενον. ἀλλὰ δεῖ τοῦτο σώζειν· ὑπόκειται γὰρ ἡ αὔξησις τοιοῦτον. ἀπορήσειε δ' ἄν τις καὶ τί ἐστι τὸ αὐξανόμενον, πότερον ᾧ προστίθεταί τι, οἷον, εἰ τὴν κνήμην αὐξάνει, αὕτη μείζων, E ᾧ δὲ αὐξάνει ἡ τροφή, οὔ. διὰ τί δὴ οὖν οὐκ ἄμφω ηὔξηται; μεῖζον γὰρ καὶ ὃ, καὶ ᾧ, ὥσπερ ὅταν μίξῃς οἶνον ὕδατι· ὁμοίως γὰρ πλέον ἑκάτερον. ἢ ὅτι τοῦ μὲν μένει ἡ οὐσία, τοῦ δ' οὔ, οἷον ἡ τῆς τροφῆς. ἐπεὶ καὶ ἐνταῦθα τὸ ἐπικρατοῦν λέγεται ἐν τῇ μίξει, οἷον, ὅτι οἶνος· ποιεῖ γὰρ τὸ τοῦ οἴνου ἔργον, ἀλλ' οὐ τὸ τοῦ ὕδατος τὸ σύνολον μῖγμα. ὁμοίως δὲ καὶ ἐπ' ἀλλοιώσεως, εἰ μένει σὰρξ οὖσα, καὶ τὸ τί ἐστι,* πάθος δέ τι ὑπάρχει τῶν καθ' αὑτό, ὃ πρότερον οὐχ ὑπῆρχεν, ἠλλοίωται τοῦτο·

* κ. κενόν.

* κ. ὑπομένον. ἢ δὲ ἢ

* κ. πάθος. ἢ ἦν mendoſé.

*γρ. πέπονθεν, οὐδ' ἠλλοίωται ἢ αὔξεται.

A ᾧ δ' ἠλλοίωται, ὁτὲ μὲν οὐδὲν * πέπονθεν, ὁτὲ δὲ κἀκεῖνο. ἀλλὰ τὸ ἀλλοιοῦν, καὶ ἡ ἀρχὴ τῆς κινήσεως, ἐν τῷ αὐξανομένῳ, καὶ τῷ ἀλλοιουμένῳ· ἐν τούτοις γὰρ τὸ κινοῦν. ἐπεὶ καὶ τὸ εἰσελθὸν, γένοιτ' ἄν ποτε μεῖζον, καὶ τὸ ἀπολαῦσαν αὐτοῦ σῶμα, οἷον εἰ εἰσελθὸν γένοιτο ἂν πνεῦμα. ἀλλ' ἔφθαρταί γε τοῦτο παθὸν, καὶ τὸ κινοῦν οὐκ ἐν τούτῳ. ἐπεὶ δὲ διηπόρηται περὶ αὐτῶν ἱκανῶς, δεῖ καὶ τῆς ἀπορίας πειρᾶσθαι λύσιν εὑρεῖν, σώζοντας τὸ ὑπομένοντός τε τοῦ αὐξανομένου καὶ προσιόντος τινὸς αὐξάνεσθαι, ἀπιόντος δὲ φθίνειν. ἔτι δὲ τὸ ὁτιοῦν σημεῖον αἰσθητὸν ἢ μεῖζον, ἢ ἔλαττον γεγονέναι, καὶ μήτε κενὸν εἶναι τὸ σῶμα, μήτε δύο ἐν τῷ αὐτῷ τόπῳ μεγέθη, μήτε ἀσωμάτῳ αὐξάνεσθαι. ληπτέον δὲ [τὸ αἴτιον] διορισαμένοις πρῶτον, ἓν μὲν, ὅτι τὰ ἀνομοιομερῆ αὐξάνεται, τῷ τὰ ὁμοιομερῆ αὐξάνεσθαι· σύγκειται γὰρ ἐκ τούτων ἕκαστον. ἔπειθ', ὅτι σὰρξ, καὶ ὀστοῦν, καὶ ἕκαστον τῶν τοιούτων μορίων ἐστὶ διττὸν, ὥσπερ καὶ τῶν ἄλλων τῶν ἐν ὕλῃ εἶδος ἐχόντων· καὶ γὰρ ἡ ὕλη λέγεται καὶ τὸ εἶδος, σὰρξ, ἢ ὀστοῦν. τὸ οὖν ὁτιοῦν μέρος αὐξάνεσθαι, καὶ προσιόντος τινὸς, κατὰ μὲν τὸ εἶδος ἐστὶν ἐνδεχόμενον, κατὰ δὲ τὴν ὕλην, οὐκ ἔστι. δεῖ γὰρ νοῆσαι, ὥσπερ εἴ τις μετροίη τῷ αὐτῷ τῷ μέτρῳ ὕδωρ· ἀεὶ γὰρ ἄλλο καὶ ἄλλο τὸ γινόμενον. οὕτω καὶ αὐξάνεται ἡ ὕλη τῆς σαρκὸς, καὶ οὐχ ὁτῳοῦν παντὶ προσγίνεται, ἀλλὰ τὸ μὲν ὑπεκρεῖ, τὸ δὲ προσέρχεται· τοῦ δὲ σχήματος καὶ τοῦ εἴδους, ὁτῳοῦν μορίῳ. ἐπὶ δὲ τῶν ἀνομοιομερῶν, τοῦτο μᾶλλον δῆλόν ἐστιν, οἷον χειρὸς, ὅτι ἀνάλογον ηὔξηται· ἡ γὰρ ὕλη ἑτέρα οὖσα, δήλη μᾶλλον τοῦ εἴδους ἐνταῦθα, ἢ ἐπὶ σαρκὸς καὶ τῶν ὁμοιομερῶν. διὸ καὶ τεθνεῶτος μᾶλλον ἂν δόξειεν εἶναι ἔτι σὰρξ καὶ ὀστοῦν, ἢ χεὶρ καὶ βραχίων. ὥστε, ἔστι μὲν ὡς ὁτιοῦν τῆς σαρκὸς ηὔξηται, ἔστι δ' ὡς οὔ. κατὰ μὲν γὰρ τὸ εἶδος ὁτῳοῦν προσελήλυθε, κατὰ δὲ τὴν ὕλην, οὔ. μεῖζον μέντοι τὸ ὅλον γέγονε, προσελθόντος μέν τινος, ὃ καλεῖται * τροφὴ, καὶ ἐναντίον, μεταβάλλοντος δὲ εἰς τὸ αὐτὸ εἶδος, οἷον εἰ ξηρῷ προσίοι ὑγρὸν, προσελθὸν δὲ μεταβάλλοι καὶ γένοιτο ξηρόν. ἔστι μὲν γὰρ ὡς τὸ ὅμοιον ὁμοίῳ αὐξάνεται, ἔστι δ' ὡς ἀνομοίῳ. ἀπορήσειε δ' ἄν τις, ποῖόν τι δεῖ εἶναι τὸ ᾧ αὐξάνεται. φανερὸν δὴ ὅτι δυνάμει ἐκεῖνο, οἷον * εἰ σὰρξ, δυνάμει σάρκα· ἐντελεχείᾳ ἕτερον ἄρα· φθαρὲν δὲ τοῦτο σὰρξ γέγονεν. οὐκοῦν * οὐκ αὐτὸ καθ' αὑτό· γένεσις γὰρ ἂν ἦν, οὐκ αὔξησις· ἀλλὰ τὸ αὐξανόμενον ἐν τούτῳ. τί οὖν παθὸν ὑπὸ τούτου ηὐξήθη, ἢ μιχθὲν, ὥσπερ οἴνῳ εἴ τις ἐπιχέοι ὕδωρ, ὁ δὲ δύναιτο οἶνον [τὸ ὕδωρ] ποιεῖν τὸ μιχθέν; καὶ ὥσπερ τὸ πῦρ ἁψάμενον τοῦ καυστοῦ, οὕτως ἐν τῷ αὐξανομένῳ καὶ ὄντι ἐντελεχείᾳ σαρκὶ, τὸ ἐνὸν αὐξητικὸν προσελθόντος δυνάμει σαρκὸς, ἐποίησεν ἐντελεχείᾳ σάρκα. οὐκοῦν ἅμα ὄντος· εἰ γὰρ χωρὶς, γένεσις. ἔστι μὲν γὰρ οὕτω πῦρ ποιῆσαι ἐπὶ τὸ ὑπάρχον ἐπιθέντα ξύλα. ἀλλ' οὕτω μὲν, αὔξησις· ὅταν δὲ αὐτὰ τὰ ξύλα ἀφθῇ, γένεσις. ποσὸν δὲ, τὸ μὲν καθόλου οὐ γίνεται, ὥσπερ οὐδὲ ζῷον, ὃ μήτ' ἄνθρωπος, μήτε τῶν καθ' ἕκαστα· ἀλλ' ὡς ἐνταῦθα τὸ καθόλου, καὶ ἐκεῖ τὸ ποσόν. σὰρξ δὲ καὶ ὀστοῦν, ἢ χεὶρ, ἢ νεῦρα, καὶ τούτων τὰ ὁμοιομερῆ, προσελθόντος μὲν δή τινος ποσοῦ,

*γρ. τροφή, ἢ ὅμοιον.

*γρ. εἰ σὰρξ δυνάμει, σάρκα ἐντελεχείᾳ ἄλλο ἄρα.

*γρ. οὐ τοῦτο αὐτό.

A Id autem quod alteratum eſt, interdum nihil patitur, interdum & illud quoque pati ſolet. Verùm quod alterat, atque motus principium, in eo eſt quod alteratur, & eo quod accreſcit. quod enim mouet, in hiſce eſt. Quandoquidem & quod ingeri ſolet, fieri aliquãdo maius poteſt, & corpus quod eo fruitur: vt ſi quod ingeritur, ſpiritus fiat. Verùm cùm hoc patitur, corrumpi ſolet, nec in eo eſt id quod mouendi vim obtinet. Cùm autem de hiſce ſit abundè addubitatum, dubitationis ſolutionem inuenire enitamur oportet, illud ſeruantes, permanente inquam eo quod augetur, atque adueniente aliquo, fieri accretionem, & abeũte, decretionem. B & inſuper, quodvis ſenſibile ſignum maius minúſve reddi, & neque corpus eſſe inane, neque eodem in loco duas eſſe magnitudines, neque incorporea re quicquã augeri. Sumenda autem erit cauſa vno quidem priùs à nobis definito: diſſimilaria inquam augeri, cùm ſimilaria accreſcũt. ex his enim quodque componitur. Deinde carnem, & os, & id genus partium quanque, perinde atque cæterarum quæ formam habẽnt in materia, duplicem eſſe. nam materies atque forma, caro dicitur aut os. Partem igitur quamlibet augeri, & accedente aliquo ſecundùm formam quidem, eſt poſſibile: at ſecundùm materiam, haudquaquam. Intelligere autem perinde oportet, atque ſi quis aquam menſura eaC dem metiatur. quod enim fit, aliud atque aliud ſemper eſt. Ad hunc itaque modum & carnis materies augetur: & non cuiuis parti eius quippiam additur, ſed alia dilabitur, alia accedit. At cuiuis figuræ ac formæ parti, fit acceſſio. Id autem magis conſtat in hiſce quæ diſſimilium ſunt partium, vt in manu, quòd iuxta proportionis rationem aucta ſit. quandoquidem materies cùm diuerſa eſt, faciliùs dignoſcitur hic quàm in carne, & hiſce quæ ſimilium ſunt partium. Iccirco & cùm mortuum eſt quippiam, magis adhuc caro & os quàm manus & brachiũ eſſe videtur. Quare partim augetur carnis quælibet particula, partim non augetur. Nam ſeD cundùm formam quidem, cuiuis parti quippiã adiungitur: ſecundũ materiam verò, haudquaquam. Totum tamen maius euadit, accedente quopiam, quod nutrimentum, atque contrarium, nominatur, & in eandem formam tranſeunte. vt ſi humidum ſicco accedat: & cùm iam acceſſerit, mutationem ſubeat, fiàtque ſiccum. Nam partim ſimile ſimili, partim diſſimile diſſimili accreſcit. Dubitauerit autem quiſpiam, quale id eſſe oporteat quo quid augetur. Palàm itaque eſt hoc, potentia illa quod augetur eſſe oportere. vt ſi caro accretionẽ ſubeat, id quo illa accreſcit, potentia carnem eſſe, actu autem aliud. quod ſanè vbi corrumpitur, caro fieri ſolet. Non igitur ipſum per ſe, ſolúmque eſt (nam E alioqui generatio eſſet, non accretio) ſed id quod augetur, cum eo eſt. Qualiter igitur hoc affecto, illud augeri ſolet, an miſtũ, haud ſecus atque ſi quis vino aquam infundat, & idem id quod admixtum eſt, efficere vinum poſſit? An ſicut ignis tactũ cremabile adurit, ſic & id cui augendi facultas delegata eſt, in eo exiſtens quod accreſcit, quódque actu caro eſt, quod acceſſit è potentia carne, actu carnem facere conſueuit? Illo igitur ſimul exiſtente, idipſum accidit. quoniam ſi ſeorſum eſſet, generatio ſanè foret. Nam ignem ad hunc facere modum contingit, videlicet iniectis in eum qui iam eſt lignis. Verùm ita quidem, accretio eſt: at cùm ligna ipſa incenduntur, generatio. Quantitas autem vniuerſalis nulla fit, ſicuti nec animal, quòd nec homo ſit, nec ſingularium aliquod. ſed vt hic vniuerſale, ſic & illic quantitas. Caro igitur & os & neruus & ſimilares partes, accedente quidem quanto aliquo,

ſed non carne quanta augeſcunt. Quo igitur potentia ſimul vtrunque exiſtit, videlicet caro quanta: hoc quidem auget. nam carnem quantam fieri oportet. Quo verò ſolùm caro, hoc alit. hoc enim nútritio & accretio ratione differunt. Quocirca quamdiu ſaluum manet animal, etiam ſi decretionem ſubeat, alitur: ſed non ſemper accreſcit. Atque nutritio idem quod accretio exiſtit: ratio tamen eſt diuerſa. Quo enim id quod adiungitur atque additur, potentia caro quanta eſt, hoc carnem augere poteſt: quo verò caro potentia ſolùm, hoc nutrire. Hoc autem forma ſine materia eſt: vt tibia, potentia quædam in materia eſt: ſimiliter & quoduis aliud inſtrumentum. Quòd ſi materies aliqua accedat, quæ potentia ſit tibia, & potentia quantitatem habeat: hæ tibiæ maiores euadent. Sin verò nihil preterea agere poſſit, ſed res perinde habeat vt cùm vino ſubinde plus aquæ immiſcetur, quæ tandem vinũ aqueum reddit, facitq; aquã: tum quantitatis decretio fit, forma autẽ remanet.

CAPVT VI.

De agere & pati, deque tactu.

CVm autem de materia, & hiſce quæ nuncupantur elementa, primò dicere oporteat, an ſint necne: & vtrùm vnumquodque eorum ſempiternum ſit, an ortum ſubeat aliquo pacto: & ſi generentur, vtrùm ex ſeſe mutuo generentur eodem modo omnia, an inter ipſa vnum aliquod primum ſit: priùs vtique de hiſce diſſeramus neceſſe eſt, de quibus nũc dicitur indefinite. Omnes enim, tã qui elementa ipſa, quàm qui ea quæ conſtant ex elemẽtis, generant, ſegregatione & congregatione, atque actione & paſſione vtuntur. Eſt autẽ congregatio, miſtio. Sed quónam pacto quippiã miſceri dicatur, planè ac dilucidè haud quaquam eſt definitum. At verò nec alterari quicquam, nec ſegregari congregarive, nullo patiente aut agẽte, poteſt. Etenim qui plura faciunt elementa, actione & paſſione mutua generationem fieri cẽſent. quanquam ex vno facta omnia dicant neceſſe eſt. atque hoc rectè quidem dicit Diogenes, niſi ex vno eſſent omnia, non poſſe viciſſim agere & pati: ceu calidum frigefieri, & idẽ rurſum calefieri. nõ enim calor & frigus in ſeſe mutuò tranſeunt, ſed ipſum (vt patet) ſubiectum mutationem ſuſcipit. Quare horũ quibus actio competit, vnam eſſe ſubiectam materiam neceſſe eſt. Dicere igitur vniuerſa eſſe eiuſmodi, non eſt verum: ſed ea quibus mutuò à ſeſe pati & agere inſitũ eſt. at verò ſi de actione paſſioneve, & de miſtione contemplãdum ſit, & de tactu ſpeculemur eſt neceſſe. Nam neque agere & pati ea poſsũt propriè, quæ ſe mutuò tangere nequeunt: neque fieri poteſt vt miſceantur, quæ non quodẽmodo ſeſe tangunt priùs. Quare de hiſce tribus, videlicet quid tactus, quid miſtio, & denique quid actio, determinandum videtur. Hinc autem ſumatur initium. Nam ex entibus ea quibus miſtio competit, eſſe apta vt ſeſe mutuò tangant, eſt neceſſe. atque ſi quid agat & aliud patiatur propriè, ſimili itidem modo atque illa afficientur. Quocirca de tactu priùs dicendum eſt. Ferè igitur vt & cætera quæque alia nomina pluribus dicuntur modis, & partim vniuocè, partim altera ab alteris prioribúſque: ſic & de tactu quoque res ſeſe habet. Sed tamen quod propriè dicitur, ad ea accommodari ſolet quæ ſitum habẽt. Situs autem hiſce, quibus & locus competit. etenim perinde, vt Mathematici, de tactu & loco reddam⁹ oportet, ſiue eorũ quodq; ſeparatũ ſit, ſiue alio modo habeat.

A ἀλλ' οὐ σαρκὸς ποσῆς. ᾗ μὲν οὖν δυνάμει τὸ συναμφότερον, οἷον ποσὴ σάρξ, ταύτῃ μὲν αὐξητικόν· καὶ γὰρ ποσὴν δεῖ * γενέσθαι καὶ σάρκα· ᾗ δὲ μόνον σάρξ, τροφή. ταύτῃ γὰρ διαφέρει τροφὴ καὶ αὔξησις τῷ λόγῳ. διὸ τρέφεται μὲν, ἕως ἂν σώζηται καὶ φθίνῃ, αὐξάνεται δ' οὐκ ἀεί. καὶ ἡ τροφὴ τῇ αὐξήσει τὸ αὐτὸ μὲν, τὸ δὲ εἶναι ἄλλο. ᾗ μὲν γάρ ἐστι τὸ προσιὸν δυνάμει ποσὴ σάρξ, ταύτῃ μὲν αὐξητικὸν σαρκός· ᾗ δὲ μόνον δυνάμει σάρξ, τροφή. τοῦτο δὲ τὸ εἶδος ἄνευ ὕλης, οἷον αὐλὸς δύναμίς τις ἐν ὕλῃ ἐστίν. ἐὰν δέ τις προσίῃ ὕλη, οὖσα δυνάμει αὐλὸς, ἔχουσα καὶ τὸ ποσὸν δυνάμει, οὗτοι ἔσονται μείζους αὐλοί. ἐὰν δὲ μηκέτι ποιεῖν B δύνηται, ἀλλ' οἷον ὕδωρ οἴνῳ ἀεὶ πλεῖον μιγνύμενον, τέλος ὑδαρῆ ποιεῖ, καὶ ὕδωρ· τότε φθίσιν * ποιεῖται τοῦ ποσοῦ, τὸ δ' εἶδος μένει.

* γ. γίνεσθαι

* γ. ποιεῖν

ΚΕΦΑΛ. ϛ'.

Περὶ ἁφῆς τῆς ἐν φυσικοῖς.

Ἐπεὶ δὲ πρῶτον δεῖ περὶ τῆς ὕλης καὶ τῶν καλουμένων στοιχείων εἰπεῖν, εἴτε ἔστιν, εἴτε μή, καὶ πότερον ἀΐδιον ἕκαστον, ἢ γίνεταί πως· καὶ εἰ γίνεται, πότερον ἐξ ἀλλήλων γίνεται πάντα τὸν αὐτὸν τρόπον, ἢ τι πρῶτον ἐν αὐτῶν ἐστιν· ἀνάγκη δὴ πρότερον εἰπεῖν περὶ ὧν C ἀδιορίστως λέγεται νῦν. πάντες γὰρ οἵ τε τὰ στοιχεῖα γεννῶντες, καὶ οἱ τὰ ἐκ τῶν στοιχείων, διακρίσει χρῶνται καὶ συγκρίσει, καὶ τῷ ποιεῖν καὶ πάσχειν. ἔστι δ' ἡ σύγκρισις μίξις. πῶς δὲ μίγνυσθαι λέγομεν, οὐ διώρισται σαφῶς. ἀλλὰ μὴν οὐδ' ἀλλοιοῦσθαι δυνατὸν, οὐδὲ διακρίνεσθαι καὶ συγκρίνεσθαι, μηδενὸς ποιοῦντος μηδὲ πάσχοντος. καὶ γὰρ οἱ πλείω τὰ στοιχεῖα ποιοῦντες γεννῶσι τῷ ποιεῖν καὶ πάσχειν ὑπ' ἀλλήλων, * καὶ τοῖς ἐξ ἑνὸς ἀνάγκη λέγειν τὴν ποίησιν. καὶ τοῦτ' ὀρθῶς λέγει Διογένης, ὅτι εἰ μὴ ἦν ἐξ ἑνὸς ἅπαντα, οὐκ ἂν ἦν τὸ ποιεῖν καὶ πάσχειν ὑπ' ἀλλήλων· οἷον τὸ θερμὸν ψύχεσθαι, καὶ τοῦτο θερ-D μαίνεσθαι πάλιν· οὐ γὰρ ἡ θερμότης μεταβάλλει καὶ ἡ ψυχρότης εἰς ἄλληλα, ἀλλὰ δῆλον ὅτι τὸ ὑποκείμενον. ὥστε ἐν οἷς τὸ ποιεῖν ἐστι καὶ τὸ πάσχειν, ἀνάγκη τούτων μίαν εἶναι τὴν ὑποκειμένην φύσιν. τὸ μὲν οὖν πάντα τοιαῦτα εἶναι φάσκειν, οὐκ ἀληθές, ἀλλ' ἐν ὅσοις τὸ ὑπ' ἀλλήλων ἐστίν. ἀλλὰ μὴν εἰ περὶ τοῦ ποιεῖν καὶ πάσχειν, καὶ περὶ μίξεως θεωρητέον, ἀνάγκη καὶ περὶ ἁφῆς. οὔτε γὰρ ποιεῖν ταῦτα καὶ πάσχειν δύναται κυρίως, ἃ μὴ οἷόν τε ἅψασθαι ἀλλήλων. οὔτε μὴ ἁψάμενα ἀλλήλων πως, ἐνδέχεται μιχθῆναι πρῶτον. ὥστε περὶ τριῶν τούτων διοριστέον, τί ἁφὴ, καὶ τί μίξις, καὶ τί ποίησις. ἀρχὴν δὲ E λάβωμεν τήνδε. ἀνάγκη γὰρ τῶν ὄντων ὅσοις ἐστὶ μίξις, εἶναι ταῦτ' ἀλλήλων ἁπτικά. κἂν εἴ τι ποιῇ, τὸ δὲ πάσχῃ κυρίως, καὶ τούτοις ὡσαύτως. διὸ πρῶτον λεκτέον περὶ ἁφῆς. σχεδὸν μὲν οὖν, ὥσπερ καὶ τῶν ἄλλων ὀνομάτων ἕκαστον λέγεται πολλαχῶς, καὶ τὰ μὲν ὁμωνύμως, τὰ δὲ θάτερα ἀπὸ τῶν ἑτέρων καὶ τῶν προτέρων· οὕτως ἔχει καὶ περὶ ἁφῆς. ὅμως δὲ τὸ κυρίως λεγόμενον ὑπάρχει τοῖς ἔχουσι θέσιν. θέσις δὲ οἷσπερ καὶ τόπος· καὶ γὰρ τοῖς μαθηματικοῖς ὁμοίως ἀποδοτέον ἁφὴν καὶ τόπον, εἴτε ἐστὶ κεχωρισμένον ἕκαστον αὐτῶν, εἴτε ἄλλον τρόπον.

* γ. ἢ πῶς

* Phyſic. l. 5. c. 3. Εἰ οὖν ἐστιν, ὥσπερ διωρίσθη * πρότερον, τὸ ἅπτεσθαι τὸ τὰ ἔσχατα ἔχειν ἅμα, ταῦτα ἂν ἅπτοιτο ἀλλήλων, ὅσα διωρισμένα μεγέθη καὶ θέσιν ἔχοντα, ἅμα ἔχει τὰ ἔσχατα. ἐπεὶ δὲ θέσις μὲν, ὅσοις καὶ τόπος ὑπάρχει· πρώτη δὲ διαφορὰ τόπου, τὸ ἄνω καὶ τὸ κάτω, καὶ τὰ τοιαῦτα τῶν ἀντικειμένων, ἅπαντα τὰ ἀλλήλων ἁπτόμενα βάρος ἂν ἔχοι ἢ κουφότητα, ἢ ἄμφω, ἢ θάτερον· τὰ δὲ τοιαῦτα παθητικὰ καὶ ποιητικά· ὥστε φανερὸν ὅτι ταῦτα ἅπτεσθαι πέφυκεν ἀλλήλων, ὧν διῃρημένων μεγεθῶν, ἅμα τὰ ἔσχατά ἐστιν, ὄντων κινητικῶν καὶ κινητῶν ὑπ' ἀλλήλων. ἐπεὶ δὲ τὸ κινοῦν οὐχ ὁμοίως κινεῖ τὸ κινούμενον, ἀλλὰ τὸ μὲν ἀνάγκη κινούμενον, καὶ αὐτὸ κινεῖν, τὸ δὲ ἀκίνητον ὄν, δῆλον ὅτι ἐπὶ τοῦ ποιοῦντος ἐροῦμεν ὡσαύτως· καὶ γὰρ τὸ κινοῦν ποιεῖν τί φασι, καὶ τὸ ποιοῦν κινεῖν. οὐ μὴν ἀλλὰ διαφέρει γε, καὶ δεῖ διορίζειν· οὐ γὰρ οἷόν τε πᾶν τὸ κινοῦν ποιεῖν, εἴπερ τὸ ποιοῦν ἀντιθήσομεν τῷ πάσχοντι. τοῦτο δ', οἷς ἡ κίνησις πάθος· πάθος δὲ καθ' ὅσον ἀλλοιοῦται μόνον, οἷον τὸ λευκὸν, καὶ τὸ θερμόν· ἀλλὰ τὸ κινεῖν, ἐπὶ πλέον τοῦ ποιεῖν ἐστιν. ἐκεῖνο δ' οὖν φανερὸν, ὅτι ἔστι μὲν ὡς τὰ κινοῦντα τῶν κινητῶν ἅπτοιτ' ἂν, ἔστι δ' ὡς οὔ. ἀλλ' ὁ διορισμὸς τοῦ ἅπτεσθαι, καθόλου μὲν, ὁ τῶν θέσιν ἐχόντων· καὶ τοῦ μὲν κινητικοῦ, τοῦ δὲ κινητοῦ. πρὸς ἄλληλα δὲ κινητικοῦ καὶ κινητοῦ, ἐν οἷς ὑπάρχει τὸ ποιεῖν καὶ τὸ πάσχειν. ἔστι μὲν οὖν ὡς ἐπὶ τὸ πολὺ τὸ ἁπτόμενον, ἁπτομένου ἁπτόμενον· καὶ γὰρ κινεῖ κινούμενα πάντα σχεδὸν τὰ ἐμποδὼν, ὅσοις ἀνάγκη καὶ φαίνεται τὸ ἁπτόμενον ἅπτεσθαι ἁπτομένου. ἔστι δ' ὡς ἐνίοτέ φαμεν, τὸ κινοῦν ἅπτεσθαι μόνον τοῦ κινουμένου· τὸ δ' ἁπτόμενον, μὴ ἅπτεσθαι ἁπτομένου· ἀλλὰ διὰ τὸ κινεῖν κινούμενα τὰ ὁμογενῆ, ἀνάγκη * δοκεῖ εἶναι, ἁπτομένου ἅπτεσθαι. ὥστε εἴ τι κινεῖ ἀκίνητον ὂν, ἐκεῖνο μὲν ἂν ἅπτοιτο τοῦ κινητοῦ, ἐκείνου δὲ οὐδέν. φαμὲν γὰρ ἐνίοτε τὸν λυποῦντα ἅπτεσθαι ἡμῶν, ἀλλ' οὐκ αὐτοὶ ἐκείνου. περὶ μὲν οὖν ἁφῆς τῆς ἐν τοῖς φυσικοῖς, διωρίσθω τοῦτον τὸν τρόπον.

* γ. ἔοικεν

ΚΕΦΑΛ. ζ.

Τί τὸ ποιεῖν καὶ πάσχειν ἐστὶ καὶ τίσιν ὑπάρχει, καὶ διὰ τί, καὶ πῶς.

* γ. προτέρων

* γ. ὑπάρχει

ΠΕρὶ δὲ τοῦ ποιεῖν καὶ πάσχειν, λεκτέον ἐφεξῆς· παρειλήφαμεν δὲ παρὰ τῶν * πρότερον ὑπεναντίους ἀλλήλοις λόγους. οἱ μὲν γὰρ πλεῖστοι τοῦτό γε ὁμονοητικῶς λέγουσιν, ὡς τὸ μὲν ὅμοιον ὑπὸ τοῦ ὁμοίου πᾶν ἀπαθές ἐστι, διὰ τὸ μηδὲν μᾶλλον ποιητικὸν ἢ παθητικὸν εἶναι θάτερον θατέρου· πάντα γὰρ ὁμοίως * ὑπάρχει ταὐτὰ τοῖς ὁμοίοις. τὰ δ' ἀνόμοια καὶ τὰ διάφορα, ποιεῖν καὶ πάσχειν εἰς ἄλληλα πέφυκε· καὶ γὰρ ὅταν τὸ ἔλαττον πῦρ ὑπὸ τοῦ πλείονος φθείρηται, διὰ τὴν ἐναντίωσιν τοῦτό φασι πάσχειν· ἐναντίον γὰρ εἶναι τὸ πολὺ τῷ ὀλίγῳ. Δημόκριτος δὲ παρὰ τοὺς ἄλλους ἔλεξε μόνος ἰδίως· φησὶ γὰρ τὸ αὐτὸ καὶ ὅμοιον εἶναι τό, τε ποιοῦν καὶ τὸ πάσχον· οὐ γὰρ ἐγχωρεῖν τὰ ἕτερα καὶ διαφέροντα πάσχειν ὑπ' ἀλλήλων· ἀλλὰ καὶ ἕτερα ὄντα ποιῇ τι εἰς ἄλληλα, οὐχ ᾗ ἕτερα, ἀλλ' ᾗ ταὐτόν τι ὑπάρχει, ταύτῃ τοῦτο συμβαίνειν αὐτοῖς. τὰ μὲν οὖν λεγόμενα τοιαῦτά ἐστιν,

A Si ergo tangere ſit, quemadmodum antea eſt definitum, extrema ſimul eſſe: ea profectò ſe mutuò tangent, quæ cùm diſcretas magnitudines ſitúmque habeant, extrema ſimul habent. Porro cùm ſitus omnibus quibus & locus competat: atque ſuprà & infrà & id genus oppoſita, prima loci differentia ſint: omnia ſanè quæ ſeſe mutuò tangunt, pondus leuitatémque, aut vtraque aut alterum habebunt: quæ autem talia ſunt, actiua ſunt & paſſiua. Vnde conſtat, ea ſuapte natura mutuo ſeſe tangere, quorum cùm viciſſim mobilia ſint atque motiua, diſcretis ſeparatiſque magnitudinibus extrema ſunt ſimul. Cæterùm cùm id quod mouet, nequaquam ſimiliter id moueat quod motũ ſubit,
B ſed neceſſe ſit vt idem aliud moueat motum & ipſum, aliud immobile perſiſtens: haud aliter de ipſo quoque agente dicendum eſſe in aperto eſt. Nam id quod mouet, agere quippiam: & contrà quod agit, mouere dicunt. Verùm differentiam ſubeunt: & proinde ea diſtinguamus oportet. Non enim fieri poteſt vt quoduis mouens agat ſi patienti agens opponamus. patiens autem ſit, cui motus ſecundùm affectum competit, affectus verò, ſecundùm quem ſolum alteratio fit: vt albedo & color. Sed mouere latiùs quàm agere patet. Illud igitur palam eſt, ea inquam quæ mouent, partim mobilia tangere, partim minimè. Verùm ea tangere vniuerſaliter definiuntur, quæ ſitum habent, &
C quorum alterum motiuum eſt, alterum mobile, idque viciſſim, quibus agere atque pati competit. Magna igitur ex parte id quod tangitur, id tangit à quo tangi ſolet. Etenim omnia ferè quæ apud nos ſunt cùm mouentur, mouent: per quæ eſſe neceſſe videtur, vt id quod tangitur, id tangat à quo tangi ſolet. Interdum autem dicimus mouens, ſolum tangere id quod motu cietur: & contrà quod tangitur, id non tangere à quo tangitur. Verùm quia quæ eiuſdem ſunt generis, cùm motum ſubeunt, mouent: vt quod tangitur, tangat, neceſſarium eſſe videtur. Quare ſi quid motus expers moueat, id profectò tanget mobile, nihil autem illud. Interdum enim dicimus eum qui nos moleſtia af-
D ficit, tangere nos, non nos illum. De tactu igitur rerum naturalium, hoc pacto determinatum ſit.

CAPVT VII.

De elementorum actione & paſſione opiniones diuerſæ.

DEinceps de actione & paſſione dicendum eſt, cùm de hiſce ſententias inter ſeſe ſubcontrarias à maioribus noſtris acceperimus. Plurimi enim vno ore hoc aſtruunt, à ſimili inquam ſimile nullum pati: quod neutrum altero potius actiuum ſit, aut paſſiuum, quippe cùm eadem omnia, ſimilibus ſimiliter inſint. At quæ diſſimilia differentiáque ſunt, ea mutuò agant patian-
E túrque, aptiſſima eſſe aſſerunt. Nam cùm minor ignis à maiori corrumpitur, ob contrarietatem illum id ipſum pati inquiunt. dicunt enim, multum pauco eſſe contrarium. Democritus verò, ſolus præ cæteris peculiariter dixit. Nam agens & patiens, idem ac ſimile eſſe aſſerit: non enim fieri poſſe arbitratur, vt differentia atque diuerſa à ſeſe viciſſim patiantur. Sed & ſi quæ diuerſa ſunt, quippiam in ſeſe mutuò agant: hoc illis euenire, non quo diuerſa ſunt, ſed quo idem quippiam habent. Quæ igitur dicuntur, talia ſunt.

Qui autem hoc pacto dicunt, ſubcontraria dicere videntur. Contradictionis verò cauſa eſt hæc: nam cùm totum quippiam contemplari oporteat, de parte quadam loquuntur vtrique. Nam quod ſimile eſt, & omni ex parte nullam prorſus habet differentiam, nihil à ſimili pati, rationi conſentaneum eſt. Cur enim potius alterum altero erit paſſiuum? Item ſi fieri queat vt quippiã patiatur à ſimili, illud quoq; à ſe pati poterit. Atqui his ad hunc modum ſeſe habentibus, nihil aut corruptibile aut mutationis expers fuerit, ſi quidem ſimile quatenus ſimile exiſtit, actiuum ſit. Nam corpus omne, ſeſe interno proprióque motu mouebit. Et quod prorſus B diuerſum & nullatenus idẽ eſt, ſimiliter: nam neq, albedo à linea, neque linea ab albedine quicquam patietur, niſi fortè per accidens: ceu ſi lineã eſſe albam aut nigram acciderit. Non enim ea quæ neq; contraria ſunt, neque ex contrariis conſtant, ſeſe extrudũt propelluntq; à natura. At cùm non quoduis agere ac pati natum ſit, ſed quæ aut contraria ſunt, aut habent contrarietatẽ: tam agẽs quam patiens genere quidem ſimile ac idẽ, ſed ſpecie diſſimile atque cõtrarium eſſe eſt neceſſe. Nam corpus à corpore, & ſapor à ſapore, & color à colore: & in ſumma quod eiuſdem eſt generis, ab eo quod eiuſdem itidem generis eſt, pati aptum eſt. Cuius cauſa C eſt, quòd contraria in eodem genere ſunt omnia. Contraria verò, inter ſeſe viciſſim agunt patiunturque. Quare & agens & patiens partim eadem ſint, partim diuerſa, atque inter ſeſe diſſimilia, neceſſe eſt. Cùm autem agens & patiens genere quidem eadem ſimiliaque ſint, ſpecie autem diſſimilia, contraria verò ſint eiuſmodi: tum contraria tum quæ inter ea media ſunt, inter ſe mutuo actiua & paſſiua eſſe conſtat. Etenim omnino generatio atque corruptio in hiſce conſiſtunt. Quamobrem & ignẽ calfacere, & frigidum frigefacere, & omnino actiuum id quod patitur ſibi ſimile reddere, iam rationi conſentaneum exiſtit. nam agens & patiens contraria ſunt: & generatio, in contrarium tendit. D Quare neceſſe eſt vt patiens in id mutetur, quod agendi vim obtinet. hoc enim pacto, in contrarium erit generatio. Itaque tametſi verbo tenus eadem non dicunt, vtroſque tamen naturam ipſam attingere contingit. Dicimus enim interdum ſubiectum ipſum pati, vt hominem ſanari & calefieri ac frigefieri, & cætera ad hunc modum, interdum verò frigidum calefieri, & ægrum ſanari. atque vtraque vera ſunt. Eodem modo & de agente dici ſolet. nam interdum hominem, interdum calidum, calfacere dicimus. Partim enim materies ipſa patitur, partim contrarium. Igitur qui ad illam reſpexerunt, agens & patiens quippiam idem habere E oportere putarunt, qui ad alterũ, contra. Cæterùm haud aliam eſſe rationẽ de ipſo agere ac pati, quam de ipſo mouere ac moueri, exiſtimandum eſt. Etenim ipſum quoque mouens, bifariam dicitur. Nã & id in quo motus principium ineſt, mouere videtur: quippe cùm principium prima cauſarum ſit: & rurſum quod vltimum eſt, ad id quod mouetur, & generationem. Simili modo de ipſo agente eſt dicendum. Nam & medicũ & vinũ, ſanare dicimus. Nihil igitur vetat in motu, quominus primum mouens immobile ſit. immo in nonnullis etiã neceſſarium exiſtit, at vltimum ſemper ſubeundo motum, moueat neceſſe eſt. In actione autem, ipſum quidẽ primum nihil patitur, vltimum verò patitur. Quæ cùm eandem materiam non habẽt, ea circa paſſionem agunt: ceu medendi ars. hæc enim ſanitatẽ efficit,

A ἐοίκασι δὲ οἱ τοῦτον τὸν τρόπον λέγοντες, ὑπεναντία φαίνεσθαι λέγειν. αἴτιον δὲ τῆς ἐναντιολογίας, ὅτι δέον ὅλον τι θεωρῆσαι, μέρος τι τυγχάνουσι λέγοντες ἀμφότεροι. τό, τε γὰρ ὅμοιον, καὶ τὸ πάντη πάντως ἀδιάφορον, εὔλογον μὴ πάσχειν ὑπὸ τοῦ ὁμοίου [μηδέν]. τί γὰρ μᾶλλον θάτερον ἔσται ποιητικὸν ἢ θάτερον; εἴτε ὑπὸ τοῦ ὁμοίου πάσχειν τι δυνατὸν καὶ αὐτὸ ὑφ᾽ αὑτοῦ. καίτοι τούτων οὕτως ἐχόντων, οὐδὲν ἂν εἴη οὔτε ἄφθαρτον, οὔτε ἀκίνητον, εἴπερ τὸ ὅμοιον, ᾗ ὅμοιον, ποιητικόν. αὐτὸ γὰρ ἑαυτὸ κινήσει πᾶν. τό, τε παντελῶς ἕτερον καὶ τὸ μηδαμῇ ταὐτὸν ὡσαύτως. οὐδὲν B γὰρ ἂν πάθοι λευκότης ὑπὸ γραμμῆς, ἢ γραμμὴ ὑπὸ λευκότητος, πλὴν εἰ μή που κατὰ συμβεβηκός, οἷον εἰ συμβέβηκε λευκὴν ἢ μέλαιναν εἶναι τὴν γραμμήν. οὐκ ἐξίστησι γὰρ ἄλληλα τῆς φύσεως, ὅσα μήτ᾽ ἐναντία, μήτ᾽ ἐξ ἐναντίων ἐστίν. ἀλλ᾽ ἐπεὶ οὐ τὸ τυχὸν πέφυκε πάσχειν καὶ ποιεῖν, ἀλλ᾽ ὅσα ἢ ἐναντία ἐστὶν, ἢ ἐναντίωσιν ἔχει, ἀνάγκη καὶ τὸ ποιοῦν καὶ τὸ πάσχον, τῷ γένει μὲν ὅμοιον εἶναι καὶ ταὐτὸ, τῷ δὲ εἴδει ἀνόμοιον καὶ ἐναντίον. πέφυκε γὰρ σῶμα μὲν ὑπὸ σώματος, χυμὸς δ᾽ ὑπὸ χυμοῦ, χρῶμα δ᾽ ὑπὸ χρώματος πάσχειν. ὅλως δὲ τὸ ὁμογενὲς ὑπὸ τοῦ ὁμογενοῦς. τού- C του δ᾽ αἴτιον ὅτι τἀναντία ἐν ταὐτῷ γένει πάντα. ποιεῖ δὲ καὶ πάσχει τἀναντία ὑπ᾽ ἀλλήλων. ὥστε ἀνάγκη, πὼς μὲν εἶναι ταὐτά, τό, τε ποιοῦν καὶ τὸ πάσχον, πὼς δ᾽ ἕτερα καὶ ἀνόμοια ἀλλήλοις. ἐπεὶ δὲ καὶ τὸ πάσχον καὶ τὸ ποιοῦν, τῷ μὲν γένει ταὐτὰ καὶ ὅμοια, τῷ δ᾽ εἴδει ἀνόμοια, τοιαῦτα δὲ τἀναντία, φανερὸν ὅτι παθητικὰ καὶ ποιητικὰ ἀλλήλων ἐστὶ, τά τ᾽ ἐναντία καὶ τὰ μεταξύ· καὶ γὰρ ὅλως φθορὰ καὶ γένεσις ἐν τούτοις. διὸ καὶ εὔλογον ἤδη, τό, τε πῦρ θερμαίνειν, καὶ τὸ ψυχρὸν * ψύχειν, καὶ ὅλως τὸ ποιητικὸν ὁμοιοῦν ἑαυτῷ τὸ πάσχον. τό, τε γὰρ ποιοῦν καὶ τὸ πάσχον ἐναντία ἐστὶ καὶ ἡ γένεσις, εἰς τοὐναντίον. ὥστ᾽ ἀνάγκη τὸ πάσχον D εἰς τὸ ποιοῦν μεταβάλλειν· οὕτω γὰρ ἔσται εἰς τοὐναντίον ἡ γένεσις. καὶ κατὰ λόγον δὴ τὸ μὴ ταὐτὰ * λέγοντας, ἀμφοτέρους ὅμως ἅπτεσθαι τῆς φύσεως· λέγομεν γὰρ πάσχειν, ὁτὲ μὲν τὸ ὑποκείμενον, οἷον ὑγιάζεσθαι τὸν ἄνθρωπον, καὶ θερμαίνεσθαι καὶ ψύχεσθαι, καὶ τἄλλα τὸν αὐτὸν τρόπον· ὁτὲ δὲ, θερμαίνεσθαι μὲν τὸ ψυχρόν, ὑγιάζεσθαι δὲ τὸ κάμνον. ἀμφότερα δὲ ἐστὶν ἀληθῆ. τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τοῦ ποιοῦντος· ὁτὲ μὲν γὰρ τὸν ἄνθρωπόν φαμεν θερμαίνειν, ὁτὲ δὲ τὸ θερμόν. ἔστι μὲν γὰρ ὡς ἡ ὕλη πάσχει, ἔστι δὲ ὡς τὸ ἐναντίον. οἱ μὲν οὖν εἰς ἐκεῖνο βλέψαντες, ταὐτόν τι δεῖν ᾠήθησαν, τὸ ποιοῦν ἔχειν καὶ τὸ πάσχον· οἱ δ᾽ εἰς θά- E τερα, τοὐναντίον. τὸν αὐτὸν δὲ λόγον ὑποληπτέον εἶναι περὶ τοῦ ποιεῖν καὶ πάσχειν, ὅνπερ καὶ περὶ τοῦ κινεῖσθαι καὶ κινεῖν. διχῶς γὰρ λέγεται καὶ τὸ κινοῦν. ἐν ᾧ τε γὰρ ἡ ἀρχὴ τῆς κινήσεως, δοκεῖ τοῦτο κινεῖν· ἡ γὰρ ἀρχὴ πρώτη τῶν αἰτίων. καὶ πάλιν τὸ ἔσχατον, πρὸς τὸ κινούμενον καὶ τὴν γένεσιν. ὁμοίως δὲ καὶ περὶ τοῦ ποιοῦντος. καὶ γὰρ τὸν ἰατρόν φαμεν ὑγιάζειν, καὶ τὸν οἶνον. τὸ μὲν οὖν πρῶτον κινοῦν, οὐδὲν κωλύει, * ἐν μὲν κινήσει, ἀκίνητον εἶναι· ἐπ᾽ ἐνίων δὲ καὶ ἀναγκαῖον. τὸ δ᾽ ἔσχατον, ἀεὶ κινεῖν κινούμενον. ἐπὶ δὲ ποιήσεως, τὸ μὲν πρῶτον ἀπαθές, τὸ δὲ ἔσχατον καὶ αὐτὸ πάσχον. ὅσα γὰρ μὴ ἔχει τὴν αὐτὴν ὕλην, ποιεῖ ἀπαθῆ ὄντα, οἷον ἡ ἰατρική· αὐτὴ γὰρ ποιοῦσα ὑγίειαν,

* γρ. ψυχρ. ἐναντία γὰρ ταῦτα. διὸ καὶ ποιητικὰ καὶ παθητικά ἐστι.

* κ. λέγοντας ἀμφοτέρους ὁμοίως ἅπτεσθαι

* κ. ἀκίν.

οὐδὲν πάσχει ὑπὸ τοῦ ὑγιαζομένου. ὁ δὲ σιτίον ὁ ποιῶν, καὶ αὐτὸ πάσχει τι· ἢ γὰρ θερμαίνεται, ἢ ψύχεται, ἢ ἄλλο τι πάσχει ἅμα ποιοῦν. ἔστι δέ, ἡ μὲν ἰατρικὴ ὡς ἀρχή· τὸ δὲ σιτίον, τὸ ἔσχατον καὶ ἁπτόμενον. ὅσα μὲν οὖν μὴ ἐν ὕλῃ ἔχει τὴν μορφήν, ταῦτα μὲν ἀπαθῆ τῶν ποιητικῶν· ὅσα δ' ἐν ὕλῃ, παθητικά. τὴν μὲν γὰρ ὕλην λέγομεν ὁμοίως, ὡς εἰπεῖν, τὴν αὐτὴν εἶναι, τῶν ἀντικειμένων ὁποτερουοῦν, ὥσπερ γένος ὄν. τὸ δὲ δυνάμενον θερμὸν εἶναι, παρόντος τοῦ θερμαντικοῦ καὶ πλησιάζοντος, ἀνάγκη θερμαίνεσθαι· διὸ καθάπερ εἴρηται, τὰ μὲν τῶν ποιητικῶν ἀπαθῆ, τὰ δὲ παθητικά· καὶ ὥσπερ ἐπὶ κινήσεως, τὸν αὐτὸν ἔχει τρόπον καὶ ἐπὶ τῶν ποιητικῶν. ἐκεῖ τε γὰρ τὸ πρώτως κινοῦν ἀκίνητον· καὶ ἐπὶ τῶν ποιητικῶν τὸ * πρῶτον ποιοῦν, ἀπαθές. ἔστι δὲ τὸ ποιητικὸν αἴτιον, ὡς ὅθεν ἡ ἀρχὴ τῆς κινήσεως. τὸ δ' οὗ ἕνεκα, οὐ ποιητικόν· διὸ ἡ ὑγίεια, οὐ ποιητικόν, εἰ μὴ κατὰ μεταφοράν· καὶ γὰρ τοῦ μὲν ποιοῦντος ὅταν ὑπάρχῃ, γίνεταί τι τὸ πάσχον· τῶν δ' ἕξεων παρουσῶν, οὐκ ἔτι γίνεται, ἀλλ' ἔστιν * ἤδη. τὰ δ' εἴδη καὶ τὰ τέλη, ἕξεις τινές. ἡ δ' ὕλη, ᾗ ὕλη, παθητικόν. τὸ μὲν οὖν πῦρ ἔχει ἐν ὕλῃ τὸ θερμόν. εἰ δέ τι εἴη χωριστὸν θερμόν, τοῦτο οὐδὲν ἂν πάσχοι. τοῦτο μὲν οὖν ἴσως ἀδύνατον εἶναι χωριστόν· εἰ δ' ἐστὶν ἔνια τοιαῦτα, ἐπ' ἐκείνων ἂν εἴη τὸ λεγόμενον ἀληθές. τί μὲν οὖν τὸ ποιεῖν καὶ πάσχειν ἐστί, καὶ τίσιν ὑπάρχει, καὶ διὰ τί, καὶ πῶς, διωρίσθω τοῦτον τὸν τρόπον.

* γρ. πρώτως
* γρ. εἴδη.

ΚΕΦΑΛ. η'.

Οἱ τρόποι καθ' οὓς τὰ μὲν ποιεῖν, τὰ δὲ πάσχειν λέγεται, καὶ αὐτῶν ἔλεγχοι.

Πῶς δὲ ἐνδέχεται τοῦτο συμβαίνειν, πάλιν λέγωμεν. τοῖς μὲν οὖν δοκεῖ πάσχειν ἕκαστον, διά τινων πόρων εἰσιόντος τοῦ ποιοῦντος ἐσχάτου καὶ κυριωτάτου. καὶ τοῦτον τὸν τρόπον καὶ ὁρᾶν, καὶ ἀκούειν ἡμᾶς φασι, καὶ τὰς ἄλλας αἰσθήσεις αἰσθάνεσθαι πάσας. ἔτι δὲ ὁρᾶσθαι, διά τε ἀέρος * καὶ ὕδατος, καὶ τῶν διαφανῶν, διὰ τὸ πόρους ἔχειν, ἀοράτους μὲν διὰ σμικρότητα, πυκνοὺς δὲ καὶ κατὰ * στίχον· καὶ μᾶλλον ἔχειν τὰ διαφανῆ μᾶλλον. οἱ μὲν οὖν ἐπί τινων οὕτως διώρισαν, ὥσπερ καὶ Ἐμπεδοκλῆς, οὐ μόνον ἐπὶ τῶν ποιούντων καὶ τῶν πασχόντων ἀλλὰ καὶ μίγνυσθαί φασιν, ὅσων οἱ πόροι σύμμετροι πρὸς ἀλλήλους εἰσίν. ὁδῷ δὲ μάλιστα καὶ περὶ πάντων ἑνὶ λόγῳ διωρίκασι Λεύκιππος καὶ Δημόκριτος, ἀρχὴν ποιησάμενοι κατὰ φύσιν, ἥπερ ἐστίν· ἐνίοις γὰρ ἔδοξε τῶν ἀρχαίων τὸ ὂν ἐξ ἀνάγκης ἓν εἶναι καὶ ἀκίνητον. τὸ μὲν γὰρ κενόν, * οὐκ ὄν· κινηθῆναι δ' οὐκ ἂν δύνασθαι, μὴ ὄντος κενοῦ κεχωρισμένου. οὐδ' αὖ πολλὰ εἶναι μὴ ὄντος τοῦ διείργοντος. τοῦτο δ' οὐδὲν * διαφέρειν, εἴ τις οἴεται μὴ συνεχὲς εἶναι τὸ πᾶν, ἀλλ' ἅπτεσθαι * διῃρημένον, τοῦ φάναι πολλὰ καὶ μὴ ἓν εἶναι καὶ κενόν. εἰ μὲν γὰρ πάντῃ διαιρετόν, οὐδὲν εἶναι ἕν· ὥστε οὐδὲ πολλά, ἀλλὰ κενὸν τὸ ὅλον. εἰ δὲ τῇ μέν, τῇ δὲ μή, πεπλασμένῳ τινὶ τοῦτ' ἐοικέναι· μέχρι πόσου γὰρ καὶ διὰ τί, τὸ μὲν οὕτως ἔχει τοῦ ὅλου, καὶ πλῆρές ἐστι, τὸ δὲ διῃρημένον;

* γρ. ὕδατός τε, καὶ τῶν δι.
* γρ. στοῖχον.
* γρ. κενόν, μὴ ὄν· τὸ δὲ πλῆρες ὄν.
* γρ. διαφέρει
* γρ. διῃρημένον

& nihil ab eo patitur quod ſanari ſolet. At cibus dum agit, ipſe quoque quippiam patitur. aut enim caleſit, aut frigeſit, aut aliud quippiam patitur, & ſimul agit. Eſt autem medendi ars, veluti principiū: cibus verò, vltimum ac tangens. Quæcūque igitur actiua, in materia formam non habent, ea pati nequeunt: quæcunque habent, queunt. Nos enim ſimiliter propè dixerim omnes oppoſitorum vtriuſvis eandem eſſe materiam, ſicuti genus vnum, dicimus. Atque quod calidum eſſe poteſt, id propius admoto præſentéque calefactiuo incaleſcat neceſſe eſt. Iccirco, ſicuti diximus, ex iis quæ agendi vim habent, quædam pati non ſolent, quædam pati ſolent. Atque quo modo in motione res ſeſe habet, ſic & in actione. Nam vt illic quod primo mouet, motus expers eſt: ita & hic quod primo agit, pati nequit. Nam cauſa, vt vnde principium motus exiſtit, actiua eſt. Cuius autem gratia cætera fiunt, actiua non eſt. Quapropter ſanitas ipſa non eſt actiua, niſi per tranſlationem. Etenim cùm ea, aliquo quidem agente, adeſt: patiens fit quippiam. ſed cùm habitus ipſi adſunt, nihil præterea fit, ſed iam eſt. formæ autem atque fines habitus quidam ſunt. At materies, vt materies, paſſiua eſt. Igitur ignis, in materia calorem habet. Quòd ſi calor ſeparabile quippiam eſſet is nimirum pateretur nihil. Sed fortaſſe fieri nequit vt is ſeparabilis ſit. Quòd ſi ſint nonnulla eiuſmodi, in eis profectò verum fuerit, quod dicimus. Quid igitur ſit agere ac pati, & quibus competat, & qua de cauſa, & quemadmodum, hoc pacto ſit definitum.

CAPVT VIII.

De modo agendi & patiendi, quatuor opiniones.

QVo autem pacto id euenire queat, dicamus rurſum. Quibuſdam igitur pati quodque videtur, vltimo principaliſſimoque agente per quoſdam meatus ſeſe intrudente; atque nos hoc pacto & videre & audire, cæteriſque aliis ſenſibus ſentire aiunt. Tum etiā per aerē & aquā & ea quæ perſpecta atque trāslucida ſunt, res ipſas videri: propterea quòd meatus habeāt inuiſibiles quidē ob paruitatem, ſed tamen frequētes, & ſerie quadam ac ordine diſpoſitos: & magis quæ magis perſpicua dilucidáq; ſunt. Quidam igitur, quemadmodū & Empedocles, hoc pacto in nonnullis definierunt, non ſolùm in agentibus patientibúſq;: ſed & ea miſceri aiunt, quorum pori atque meatus cōmenſiles inter ſeſe ſunt. Vna autē ratione ac via maximè de omnibus definiêre Leucippus & Democritus, principiū facientes, quod quidem ſecundùm naturam eſt. Nonnullis enim ex veteribus, id quod eſt, neceſſariò eſſe vnum atque immobile viſum eſt. Vacuum enim ipſum, non eſſe. Nihil autem moueri poſſe, ſi vacuum ſeparatum in ratione rerum non ſit. Nec rurſus eſſe multa, ſi ipſum non ſit id quod ea diſtinguit. Cæterùm putare vniuerſum ipſum non eſſe continuum, ſed ea quibus conſtat diuiſim ſeſe tangere, idem profectò eſſe atque ipſum multa, & non vnum eſſe & vacuum dicere. Nam ſi omni ex parte diuiſibile ſit, nullum vnum eſſe: quare nec multa, ſed vacuum, vniuerſum. Sin verò partim diuiſibile ſit, partim non diuiſibile, hoc figmento cuidam eſſe perſimile. Nam quatenus quamque ob cauſam pars alia vniuerſi hoc pacto ſeſe haberet plenáque eſſet, alia diuiſa?

Præterea ſic eſſe neceſſarium, motum non eſſe. Ob haſce igitur rationes nonnulli ſenſum prætereuntes deſpicientéſque, quaſi rationem ſequi ducem oporteat, vniuerſum ipſum vnum & immobile & infinitum eſſe aſſerunt. Nam alioqui (inquiunt) finis ad vacuum finiret. Quidam igitur ad hunc modum, & ob cauſas haſce, de ipſa veritate dixerunt. Sed cùm in rationibus hæc videantur euenire, in ipſis verò rebus minimè hoc pacto ſentire, inſaniæ perſimile exiſtit. nemo enim ex hiſce quos inſania malè habet, à mente eò vſque diſcedit, vt ignem & glaciem vnum eſſe putet, ſed ſolùm quæ bona honeſtáque ſunt, & quæ per conſuetudinem talia eſſe apparent, ea quibuſdam ob inſaniam nihil differre videntur. Leucippus verò rationes habere arbitratus eſt, quæ ſenſui conſentanea dicentes, nec generationem, nec corruptionem, nec motum, nec entium pluralitatem è medio tollant. Conſentaneè autem hiſce quæ apparent, hæc quidem locutus. Illis verò qui ipſum vnum conficiunt, quia ſine vacuo non ſit motus, & vacuum eſſe non ens, & eius quod eſt, nihil non ens eſſe ait. quod enim propriè eſt, plenum eſſe. ſed quod eſt eiuſmodi, non vnum eſſe, ſed numero infinita, & inuiſibilia ob molis paruitatem. Atque hæc in vacuo ferri, vacuum enim eſſe. Item cùm coaleſcunt coëúntque, generationem: cùm diſſoluuntur, corruptionem efficere. Atque agere & pati, quatenus ſeſe tangunt. nam eatenus non vnum eſſe. Et generare cùm componuntur complicantúrque. Et ex eo quod verè vnum eſt, non gigni multitudinem: neque ex hiſce quæ verè multa ſunt, vnum: ſed hoc eſſe impoſſibile. Sed quemadmodum Empedocles & quidam alij aiunt, per meatus pati: ſic omnem alterationem paſſionémque hoc fieri modo, cùm per vacuum fiat diſſolutio & corruptio: ſimiliter autem & accretio, intro ſubeuntibus ſolidis. Ferè autem perinde dicat Empedocles atque Leucippus ait, eſt neceſſe: eſſe inquam ſolida quædam, cæterùm indiuiſibilia, niſi meatus omni ex parte continui ſint. quod ſanè fieri nequit. Nam ſolidum nihil aliud præter poros, ſed totum vacuum eſſet. Quæ igitur ſeſe tangunt, indiuiſibilia eſſe, & quæ inter hæc media ſunt vacua, quos ille poros meatúſque appellat, eſt neceſſe. Ad hunc modum Leucippus de actione & paſſione dicit. Modi igitur quibus alia agunt, alia patiuntur, ferè dicuntur, & de hiſce quidem, & quo pacto dicant, perſpicuum eſt. Et ad poſitiones quibus ipſi vtuntur, ferè conſentaneè accidere videtur: cæteris autem minùs: verbi gratia: Empedocli qualiter generatio, corruptio, & alteratio fiant, nequaquam liquet. Nam his prima corpora indiuiſibilia ſunt, figura tantùm inter ſe diſcrepantia, ex quibus primis entia componuntur, & in quæ vltima diſſolui ſolent. Empedocli verò cætera quidem, vt patet, vſque ad elementa ipſa, generationem habent atque corruptionem. At horum ipſorum aceruata congeſtáque magnitudo, quo pacto oriatur ac intereat, neque perſpicuum eſt, neque fieri poteſt vt ipſe dicat, niſi & ipſius ignis elementū eſſe dixerit: ſimiliter & aliorum omnium, vti Plato in Timæo ſcripſit. Tantum enim abeſt vt eo quo Leucippus modo dicat: quòd hic ſolida, ille plana eſſe indiuiſibilia, & hic infinitis figuris, ille finitis, indiuiſibile quodque definiri aſſerit: quandoquidem indiuiſibilia vtrique, & figuris definita dicunt.

A ἔτι δ' ὁμοίως φάναι ἀναγκαῖον μὴ εἶναι κίνησιν. ἐκ μὲν οὖν τούτων τῶν λόγων, ὑπερβάντες τὴν αἴσθησιν καὶ παριδόντες αὐτὴν, ὡς τῷ λόγῳ δέον ἀκολουθεῖν, εἶναί φασι τὸ πᾶν ἓν, καὶ ἀκίνητον, καὶ ἄπειρον ἔνιοι· τὸ γὰρ πέρας περαίνειν πρὸς τὸ κενόν. οἱ μὲν οὖν οὕτως, καὶ διὰ ταύτας τὰς αἰτίας ἀπεφήναντο περὶ τῆς ἀληθείας. *ἐπεὶ δὲ ἐπὶ μὲν τῶν λόγων δοκεῖ ταῦτα συμβαίνειν, *ἐπὶ δὲ τῶν πραγμάτων μανίᾳ παραπλήσιον εἶναι τὸ δοξάζειν οὕτως· οὐδένα γὰρ τῶν μαινομένων ἐξεστάναι τοσοῦτον, ὥστε τὸ πῦρ ἓν εἶναι δοκεῖν, καὶ τὸν κρύσταλλον· ἀλλὰ μόνον τὰ καλὰ καὶ τὰ φαινόμενα διὰ τὴν συνήθειαν, ταῦτα ἐνίοις διὰ μανίαν, οὐδὲν * δοκεῖ διαφέρειν. Λεύκιππος δ'
B ἔχειν ᾠήθη λόγους, οἵτινες πρὸς τὴν αἴσθησιν ὁμολογούμενα λέγοντες, οὐκ ἀναιρήσουσιν, οὔτε γένεσιν, οὔτε φθορὰν οὔτε κίνησιν, καὶ τὸ πλῆθος τῶν ὄντων. ὁμολογήσας δὲ, ταῦτα μὲν τοῖς φαινομένοις, τοῖς δὲ τὸ ἓν κατασκευάζουσιν, ὡς οὔτε ἂν κίνησιν οὖσαν ἄνευ κενοῦ, τό, τε κενὸν μὴ ὂν, καὶ τοῦ ὄντος οὐθὲν μὴ ὄν φησιν εἶναι. *τὸ γὰρ κυρίως ὂν παμπληθὲς ὄν· ἀλλ' εἶναι τὸ τοιοῦτον, οὐχ ἕν, ἀλλ' ἄπειρα τὸ πλῆθος, καὶ ἀόρατα διὰ σμικρότητα τῶν ὄγκων. ταῦτα δ' ἐν τῷ κενῷ φέρεσθαι· κενὸν γὰρ εἶναι· καὶ συνιστάμενα μὲν, γένεσιν ποιεῖν· διαλυόμενα δὲ, φθοράν. ποιεῖν δὲ καὶ πάσχειν, ᾗ* τυγχάνουσιν ἁπτόμενα, ταύτῃ οὐχ ἓν εἶναι. καὶ συντιθέμενα δὲ, καὶ περιπλεκόμενα, γεννᾶν· ἐκ δὲ τοῦ
C κατ' ἀλήθειαν ἑνὸς, οὐκ ἂν γενέσθαι πλῆθος· οὐδ' ἐκ τῶν ἀληθῶς πολλῶν ἓν· ἀλλ' εἶναι τοῦτ' ἀδύνατον. ἀλλ' ὥσπερ Ἐμπεδοκλῆς καὶ τῶν ἄλλων τινές φασι πάσχειν διὰ τῶν πόρων, οὕτω πᾶσαν ἀλλοίωσιν, καὶ πᾶν τὸ πάσχειν, τοῦτον γίνεσθαι τὸν τρόπον, διὰ τοῦ κενοῦ γινομένης τῆς διαλύσεως καὶ τῆς φθορᾶς. ὁμοίως δὲ καὶ τῆς αὐξήσεως, * ὑπεισδυομένων στερεῶν. σχεδὸν δὲ καὶ Ἐμπεδοκλεῖ ἀναγκαῖον λέγειν, ὥσπερ καὶ Λεύκιππός φησιν· εἶναι γὰρ ἄττα στερεὰ, ἀδιαίρετα δέ, εἰ μὴ πάντῃ πόροι συνεχεῖς εἰσι· τοῦτο δὲ ἀδύνατον· οὐδὲν γὰρ ἔσται ἕτερον στερεὸν παρὰ τοὺς πόρους, ἀλλὰ πᾶν κενόν. ἀνάγκη ἄρα, τὰ μὲν ἁπτόμενα εἶναι ἀδιαίρετα, τὰ δὲ μεταξὺ αὐτῶν κενά, οὓς ἐκεῖνος λέγει πόρους. οὕτως δὲ καὶ Λεύ-
D κιππος λέγει περὶ τοῦ ποιεῖν καὶ πάσχειν. οἱ μὲν οὖν τρόποι καθ' οὓς τὰ μὲν ποιεῖ, τὰ δὲ πάσχει, σχεδὸν οὗτοι λέγονται. καὶ περὶ μὲν τούτων, καὶ πῶς λέγουσι, δῆλον. καὶ πρὸς τὰς αὐτῶν θέσεις αἷς χρῶνται, σχεδὸν ὁμολογουμένως φαίνεται συμβαῖνον· τοῖς δ' ἄλλοις ἧττον, οἷον Ἐμπεδοκλεῖ τίνα τρόπον ἔσται γένεσις, καὶ φθορὰ, καὶ ἀλλοίωσις, οὐ δῆλον· τοῖς μὲν γάρ ἐστιν ἀδιαίρετα τὰ πρῶτα τῶν σωμάτων, *σχήμασι διαφέροντα μόνον, ἐξ ὧν πρώτων σύγκειται, καὶ εἰς ἃ ἔσχατα διαλύεται. Ἐμπεδοκλεῖ δέ, τὰ μὲν ἄλλα φανερὸν, ὅτι μέχρι τῶν στοιχείων ἔχει τὴν γένεσιν,
E καὶ τὴν φθορὰν· αὐτῶν δὲ τούτων, πῶς γίνεται καὶ φθείρεται τὸ σωρευόμενον μέγεθος, οὔτε δῆλον, οὔτε ἐνδέχεται λέγειν αὐτῷ, μὴ λέγοντι καὶ τοῦ πυρὸς εἶναι στοιχεῖον. ὁμοίως δὲ καὶ τῶν ἄλλων ἁπάντων, ὥσπερ ἐν τῷ Τιμαίῳ γέγραφε Πλάτων· τοσοῦτον γὰρ διαφέρει τοῦ μὴ τὸν αὐτὸν τρόπον Λευκίππῳ λέγειν, ὅτι ὁ μὲν στερεά, ὁ δ' ἐπίπεδα λέγει τὰ ἀδιαίρετα. καὶ ὁ μὲν ἀπείροις ὡρίσθαι σχήμασι τῶν ἀδιαιρέτων στερεῶν ἕκαστον, ὁ δὲ ὡρισμένοις· ἐπεὶ ἀδιαίρετά γε ἀμφότεροι λέγουσι, καὶ ὡρισμένα σχήμασιν.

* γρ. ἔτι δὲ, & ita vetus ſed mi melius. perdet enim ſententia vſque ad illa Λεύκιπ.

* Interpr. ἐπὶ δὲ τ. π. ἐν μ. At vetus* legit vt eſt editum.

* γρ. δοκεῖν

* γρ. τὸ κυρίως ὂν πᾶν πλῆρες

* γρ. τυγχάνει

* γρ. ὑπεισδυομένων

* γ. σχήμασι

ἐκ δὴ τούτων αἱ γενέσεις καὶ διακρίσεις, Λευκίππῳ μὲν δύο τρόποι ἂν εἶεν, διά τε τοῦ κενοῦ, καὶ διὰ τῆς ἁφῆς· ταύτῃ γὰρ διαιρετὸν ἕκαστον· Πλάτωνι δέ, κατὰ τὴν ἁφὴν μόνον· κενὸν γὰρ οὐκ εἶναί φησι. καὶ περὶ μὲν τῶν ἀδιαιρέτων ἐπιπέδων εἰρήκαμεν ἐν τοῖς προτέροις λόγοις· περὶ δὲ τῶν ἀδιαιρέτων στερεῶν, τὸ μὲν ἐπὶ πλέον * θεωρῆσαι τὸ συμβαῖνον, ἀφείσθω τὸ νῦν. ὡς δὲ μικρὸν παρεκβᾶσιν εἰπεῖν, ἀναγκαῖον ἀπαθές τε ἕκαστον λέγειν τῶν ἀδιαιρέτων, (οὐ γὰρ οἷόν τε πάσχειν, ἀλλ' ἢ διὰ τοῦ κενοῦ) καὶ μηδενὸς ποιητικὸν πάθους· οὔτε γὰρ σκληρόν, οὔτε ψυχρὸν οἷόν τ' εἶναι. καίτοι γε τοῦτο ἄτοπον, τὸ μόνον ἀποδοῦναι τῷ περιφερεῖ σχήματι τὸ θερμόν· ἀνάγκη γὰρ καὶ τοὐναντίον, καὶ τὸ ψυχρὸν ἄλλῳ τινὶ προσήκειν τῶν σχημάτων. ἄτοπον δὲ κἂν εἰ ταῦτα μὲν ὑπάρχῃ. λέγω δὲ θερμότης καὶ ψυχρότης, βαρύτης δὲ καὶ κουφότης, καὶ σκληρότης καὶ μαλακότης μὴ ὑπάρξει. καίτοι βαρύτερόν γε κατὰ τὴν ὑπεροχήν φησιν εἶναι Δημόκριτος ἕκαστον τῶν ἀδιαιρέτων· ὥστε δῆλον ὅτι καὶ θερμότερον. τοιαῦτα δ' ὄντα μὴ πάσχειν ὑπ' ἀλλήλων, ἀδύνατον· οἷον ὑπὸ τοῦ πολὺ ὑπερβάλλοντος θερμοῦ, τὸ ἠρέμα θερμόν. ἀλλὰ μὴν εἰ σκληρόν, καὶ μαλακόν. τὸ δὲ μαλακὸν ἤδη τῷ πάσχειν τι λέγεται· τὸ γὰρ ὑπεικτικὸν μαλακόν. ἀλλὰ μὴν ἄτοπον καὶ εἰ μηδὲν ὑπάρχει, ἀλλ' ἢ μόνον σχῆμα· καὶ εἰ ὑπάρχει, ἓν δὲ μόνον, οἷον τὸ μὲν ψυχρόν, τὸ δὲ θερμόν· οὐδὲ γὰρ ἂν μία τις εἴη φύσις αὐτῶν. ὁμοίως δὲ ἀδύνατον καὶ εἰ πλείω τῷ ἑνί· ἀδιαίρετον γὰρ ὂν ἐν τῷ αὐτῷ ἕξει τὰ πάθη· ὥστε καὶ ἐὰν πάσχῃ ᾗπερ ψύχεται, ταύτῃ τι καὶ ἄλλο τι ποιήσει, ἢ καὶ πείσεται. τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἄλλων παθημάτων. τοῦτο γὰρ καὶ τοῖς στερεὰ καὶ τοῖς ἐπίπεδα λέγουσιν ἀδιαίρετα, συμβαίνει τὸν αὐτὸν τρόπον· οὔτε γὰρ μανότερα, οὔτε πυκνότερα οἷόν τε γίνεσθαι, κενοῦ μὴ ὄντος ἐν τοῖς ἀδιαιρέτοις. ἔτι δὲ ἄτοπον καὶ τὸ μικρὰ μὲν ἀδιαίρετα εἶναι, μεγάλα δὲ μή· νῦν μὲν γὰρ εὐλόγως τὰ μείζω θραύεται μᾶλλον τῶν μικρῶν· τὰ μὲν γὰρ διαλύεται ῥᾳδίως, οἷον τὰ μεγάλα· προσκόπτει γὰρ πολλοῖς· τὸ δὲ ἀδιαίρετον ὅλως, διὰ τί μᾶλλον ὑπάρχει τῶν μεγάλων τοῖς μικροῖς; ἔτι δέ, πότερον μία πάντων ἡ φύσις ἐκείνων τῶν στερεῶν, ἢ διαφέρει θάτερα τῶν ἑτέρων, ὥσπερ ἂν εἰ τὰ μὲν εἴη πύρινα, τὰ δὲ γήινα τὸν ὄγκον; (εἰ μὲν γὰρ μία φύσις ἐστὶν ἁπάντων, τί τὸ χωρίσαν;) ἢ διὰ τί οὐ γίνεται ἁψάμενα ἕν; ὥσπερ ὕδωρ ὕδατος ὅταν θίγῃ· οὐδὲν γὰρ διαφέρει τὸ ὕστερον τοῦ προτέρου. εἰ δ' ἕτερα, ποῖα ταῦτα; καὶ δῆλον ὡς ταῦτα θετέον ἀρχὰς καὶ αἰτίας τῶν συμβαινόντων μᾶλλον, ἢ τὰ σχήματα. ἔτι δὲ διαφέροντα τὴν φύσιν, κἂν ποιῇ, κἂν πάσχῃ θιγγάνοντα ἀλλήλων. ἔτι δέ, τί τὸ κινοῦν; εἰ μὲν γὰρ ἕτερον, * παθητικόν· εἰ δ' αὐτὸ αὑτὸ ἕκαστον, ἢ διαιρετὸν ἔσται, καθ' ἄλλο μὲν κινοῦν, κατ' ἄλλο δὲ κινούμενον, ἢ κατὰ ταὐτὸ τἀναντία ὑπάρξει· καὶ ἡ ὕλη οὐ μόνον ἀριθμῷ ἔσται μία, ἀλλὰ καὶ δυνάμει. ὅσοι μὲν οὖν διὰ τῆς τῶν πόρων κινήσεώς φασι τὰ πάθη συμβαίνειν, εἰ μὲν καὶ πεπληρωμένων τῶν πόρων, περίεργον οἱ πόροι· εἰ γὰρ ταύτῃ πάσχει τι τὸ πᾶν, κἂν μὴ πόρους ἔχον, ἀλλ' αὐτὸ συνεχὲς ὄν, πάσχοι τὸν αὐτὸν τρόπον. ἔτι δέ, πῶς ἐνδέχεται περὶ τοῦ διορᾶν συμβαίνειν ὡς λέγουσιν;

* γρ. θεωρεῖσθαι

* γρ. παθητικά.

A Ex his itaque generationes & ſegregationes fiunt. Nam Leucippo quidem duo modi eſſe poſſunt, & per vacuum,& per tactum. hac enim ratione diuiſibile quodque exiſtit. Platoni verò duntaxat per tactum. nam vacuum non eſſe inquit. Et de planis quidem indiuiſibilibus, in hiſce quæ priùs dicta ſunt, diximus. de ſolidis verò itidem indiuiſibilibus, quod præterea conſiderari poteſt, in præſentia omittatur. Vt autem paululum digredientes dicamus, quodque eorum quæ indiuiſibilia ſunt, impatibile eſſe (non enim fieri poteſt vt quicquam patiatur, niſi per vacuum) nullámque paſſionem efficere (nam vacuum, neque durum neque frigidum eſſe poteſt) neceſſe eſt. Atqui hoc abſurdum eſt,
B ſolum inquam rotundæ figuræ calorem tribuere. neceſſe enim eſt, & contrarium, frigus ſcilicet, alicui alij competere figuræ. Abſurdum etiam eſt, ſi hæc quidem, caliditas inquam & frigiditas, inſint, pondus autem ac leuitas & duritia mollitiéſque non inſint. Atqui Democritus, indiuiſibilium quodque per exceſſionem grauius eſſe aſſerit: quare, vt patet, & calidius. At fieri non poteſt, vt quæ talia ſunt, mutuò à ſeſe non patiantur. ceu à calore admodum exuperante, id quod lentè calidum eſt. At verò ſi durum, & molle. Molle autem dicitur, quia pati quippiam ſoleat: quod enim cedit, molle eſt. At verò & abſurdum quoque fuerit, ſi nihil niſi figura ſolùm inſit. item ſi quid inſit, ſed vnum ſo-
C lùm: vt ſi hoc durum ſit, illud calidum: neque enim eorum natura vna aliqua eſſe poteſt. Pari modo impoſſibile fuerit, & ſi plura vni inſint. nam cùm ſit indiuiſibile, in eodem affectus habebit. Quare ſi patitur quatenus frigeſit, eatenus nimirum & aliud quippiam aget aut etiam patietur. Ad hunc autem modum, de cæteris quoque paſſionibus eſt dicēdum. Siquidem hoc ipſum eodem modo accidit, tam iis qui ſolida, quàm qui plana eſſe indiuiſibilia dicunt. Nam ſi vacuum in hiſce quæ indiuiſibilia ſunt, non inſit: neque rariora neque dēſiora fieri poſſunt. Ad hæc illud quoque præter rationem exiſtit, parua inquam eſſe indiuiſibilia, magna verò minimè. Nunc enim haud ſine ratio-
D ne, quæ maiuſcula ſunt, faciliùs quàm quæ parua, frangi ſolent. hæc enim, magna ſcilicet, facilè diſſoluuntur: quippe quæ in multa impingāt. Sed quæ prorſus indiuiſibilia exiſtunt, cur paruis potiùs quā magnis competunt? Inſuper vtrùm illorum omniū ſolidorum vna ſit natura, an inter ſe differant, perinde atque ſi mole alia ignea, alia terrea eſſent: (nam ſi vna ſit omnium natura, quidnā id eſt quod ea diſtinxit ſeparauitque?) aut cur cùm ſe tangunt, non in vnum coaleſcunt, haud ſecus quàm aqua cùm aquam tangit? nihil enim poſterius à priori differt. Sin verò diuerſa, qualiánam hæc ſunt? Atque perſpicuum eſt, ea potiùs quàm figuras ipſas poni oportere principia, causáſque eorum quæ e-
E ueniunt. Præterea ſi natura differāt, & agent & patientur, cùm mutuò ſeſe tangent. Præterea quidnā eſt id quod mouet? Nam ſi aliud ſit, affectioni erunt obnoxia. Sin verò quodque ſeſe moueat, aut erit diuiſibile, ita vt altera parte moueat, altera moueatur: aut in eodē inerunt contraria, & materies non modò numero vna, ſed & potentia erit. Qui igitur ob meatuum motionē paſſiones accidere inquiūt, ſi oppletis quoque meatibus id euenire dicant, meatus ſuperuacanei ſunt. Nam ſi paſſio ad hunc fiat modum, vniuerſum ipſum etiam ſi foramina non habeat, ſed continuum ſit, eodem pati modo poteſt. Inſuper quî fieri poteſt, vt trāſpiciatur, vti aiunt?

Nâm neque ſecundùm tactus per perſpicua tranſitio fieri poteſt, neque per meatus ſi ſinguli pleni ſint. Quid enim meatus habere, an non, referet? totum enim ſimiliter erit plenum. At verò ſi & hæc quidem vacua ſint, ſed corpora in ſe neceſſariò habeant, idem rurſum accidet. Quòd ſi magnitudine tantilla ſint, vt nullum corpus admittere queant: putare quod paruum eſt, vacuum eſſe, quod magnum, non vacuum, ne quantulumcunque quidem: aut dicere, ſeſe putare vacuum eſſe quippiam aliud præter corporis locum, ridiculum eſt. Quare, vt patet, vacuum omni corpori mole æquabile erit. In ſumma, meatus facere, ſuperuacaneum. Nam ſi per tactum agat nihil, neque per meatus ſeſe inſinuando aget. Sin verò quippiam ex eo quia tangit, etiamſi meatus nulli ſint, eorum quæ inter ſe agere ac pati nata ſunt, alia agent, alia patientur. Perinde igitur meatus aſtruere, vt quidam exiſtimant, aut falſum eſſe, aut certè vanum, ex hiſce conſtat. Porrò cùm corpora omni ex parte diuiſibilia ſint, meatus facere ridiculum exiſtit. nam quo diuiſibilia ſunt, hoc ſeparari queunt.

A οὔτε γὰρ κατὰ τὰς ἁφὰς ἐνδέχεται διιέναι διὰ τῶν διαφανῶν, οὔτε διὰ τῶν πόρων, εἰ πλήρης ἕκαστος. τί γὰρ διοίσει τοῦ μὴ πόρους ἔχειν; πᾶν γὰρ ὁμοίως ἔσται πλῆρες. ἀλλὰ μὴν εἰ καὶ κενὰ μὲν ταῦτα, ἀνάγκη δὲ σώματα ἐν αὑτοῖς ἔχειν, ταὐτὸ συμβήσεται πάλιν. εἰ δὲ τηλικαῦτα τὸ μέγεθος, ὥστε μὴ δέχεσθαι σῶμα μηδέν, γελοῖον, τὸ μικρὸν μὲν οἴεσθαι κενὸν εἶναι, μέγα δὲ μή, μηδ' ὁπηλικονοῦν· ἢ τὸ κενὸν ἄλλο τι οἴεσθαι λέγειν, πλὴν χώραν σώματος. ὥστε δῆλον ὅτι παντὶ σώματι τὸν ὄγκον ἴσον ἔσται κενόν. ὅλως δὲ τὸ πόρους ποιεῖν, περίεργον. εἰ μὲν γὰρ μηδὲν ποιεῖ κατὰ τὴν ἁφήν, οὐδὲ διὰ τῶν πόρων ποιήσει διιόν· εἰ δὲ τῷ ἅπτεσθαι, καὶ μὴ πόρων ὄντων, τὰ B μὲν πείσεται, τὰ δὲ ποιήσει, τῶν πρὸς ἄλληλα τοῦτον τὸν τρόπον πεφυκότων. ὅτι μὲν οὖν οὕτως τοὺς πόρους λέγειν, ὥς τινες ὑπολαμβάνουσιν, ἢ ψεῦδος, ἢ μάταιον, φανερὸν ἐκ τούτων ἐστί. διαιρετῶν δ' ὄντων πάντῃ τῶν σωμάτων, πόρους ποιεῖν, γελοῖον· ᾗ γὰρ διαιρετά, δύναται χωρίζεσθαι.

CAPVT IX.

Actionis & paſſionis proprietates aliquot.

QVónam autem modo ea quæ ſunt, generent, agántque ac patiantur, ſumpto initio ſæpe iam dicto, declaremus oportet. Si enim aliud potentia, aliud actu tale eſt, atque natum eſt non partim pati, partim non pati: ſed vniuerſim quatenus eſt tale, magis autem & minùs quatenus magis & minùs tale eſt: ſic profectò meliùs quiſpiam meatus ineſſe dicet, ſicuti in metallicis venæ quædam rei affectui obnoxiæ porrigi ſolent. Continuum igitur quodque & vnum exiſtens affectionis expers eſt. Similiter & ea quæ tametſi agere & pati nata ſunt, tamen neque ſeſe tangunt, neque alia. Intelligi volo, vt ignis non modo cùm tangit, ſed etiam ſi procul ſit, calfacit. Nam ignis aerem, aer corpus excalfacit, cui vt agat patiatúrque, eſt inſitum. At fieri non poſſe vt quicquam parte altera patiatur, altera non patiatur: qui id ipſum initio definiêre, dicant oportet. Si enim magnitudo non omnino omníque ex parte ſit diuiſibilis, ſed corpus aut latitudo indiuiſibilis ſit: non erit profectò quicquam omni ex parte patibile, ſed ne continuum quidem. Quòd ſi hoc falſum eſt, & omne corpus eſt diuiſibile: diuiſúmne ſit, ſed tangat, an diuiſibile, nihil refert. Nam ſi per tactus ſegregari poſſit, perinde vt quidam affirmant: etiam ſi nondum ſit diuiſum, poterit tamen eſſe diuiſum. nullum enim emergit impoſſibile. Omnino autem generationem ad hunc fieri modum, nempe diſciſſis corporibus, cancellos egreditur rationis. Etenim ſermo iſte alterationem è medio tollit. At idem corpus, quanquam continuum, aliàs liquidum, aliàs concretum, videmus, non diuiſione aut compoſitione hoc paſſum, neque conuerſione aut attactu, ſicuti Democritus aſſerit. Nam neque tranſpoſitione neque naturæ demutatione, ex liquido concretum euadere ſolet. Neque nunc dura concretáque indiuiſibilia mole ſunt, ſed ex æquo quoduis, nunc liquidum, interdũ verò durum ac concretum exiſtit. Præterea fieri nõ poteſt vt accretio decretióve ſit. nõ enim quoduis fiet maius, ſi accretio adiectio ſit, & non totum mutetur, vel admiſto aliquo, vel ipſo per ſe mutato.

ΚΕΦΑΛ. θ'.

Τίνα τρόπον ὑπάρχει τοῖς οὖσι γεννᾶν, καὶ ποιεῖν καὶ πάσχειν.

Τίνα δὲ τρόπον ὑπάρχει τοῖς οὖσι γεννᾶν, καὶ ποιεῖν, καὶ πάσχειν, λέγωμεν λαβόντες ἀρχὴν τὴν πολλάκις C εἰρημένην. εἰ γάρ ἐστι τὸ μὲν δυνάμει, τὸ δ' ἐντελεχείᾳ τοιοῦτον, πέφυκε δ' οὐ τῇ μέν, τῇ δ' οὐ πάσχειν, ἀλλὰ πάντῃ καθ' ὅσον ἐστὶ τοιοῦτον· ἧττον δὲ καὶ μᾶλλον ᾗ τοιοῦτον μᾶλλόν ἐστι καὶ ἧττον· καὶ ταύτῃ πόρους ἄν τις λέγοι μᾶλλον, καθάπερ ἐν τοῖς μεταλλευομένοις διατείνουσι τοῦ παθητικοῦ φλέβες συνεχεῖς. συμφυὲς μὲν οὖν ἕκαστον καὶ ἓν ὂν ἀπαθές. ὁμοίως δὲ καὶ μὴ θιγγάνοντα, μήτε αὑτῶν, μήτ' ἄλλων, ἃ ποιεῖν πέφυκε καὶ πάσχειν. λέγω δέ, οἷον οὐ μόνον ἁπτόμενον θερμαίνει τὸ πῦρ, ἀλλὰ κἂν ἄποθεν ᾖ· τὸν μὲν γὰρ ἀέρα τὸ πῦρ, ὁ δ' ἀὴρ τὸ σῶμα θερμαίνει, * πεφυκὼς ποιεῖν καὶ πάσχειν. τὸ δὲ τῇ μὲν D οἴεσθαι πάσχειν, τῇ δὲ μή, διελομένους ἐν ἀρχῇ τοῦτο λεκτέον. εἰ μὲν γὰρ μὴ πάντῃ διαιρετὸν τὸ μέγεθος, ἀλλ' ἔστι σῶμα ἀδιαίρετον, ἢ πλάτος, οὐκ ἂν εἴη πάντῃ παθητικόν, ἀλλ' οὐδὲ συνεχὲς οὐδέν· εἰ δὲ τοῦτο ψεῦδος, καὶ πᾶν σῶμα διαιρετόν, οὐδὲν διαφέρει διῃρῆσθαι μέν, ἅπτεσθαι δέ, ἢ διαιρετὸν εἶναι· εἰ γὰρ διακρίνεσθαι δύναται κατὰ τὰς ἁφάς, ὥσπερ φασί τινες, κἂν μήπω ᾖ διῃρημένον, ἔσται διῃρημένον· δυνατὸν γὰρ διαιρεθῆναι. γίνεται γὰρ οὐδὲν ἀδύνατον. ὅλως δὲ τὸ τοῦτον τὸν τρόπον γίνεσθαι σχιζομένων τῶν σωμάτων, ἄτοπον· ἀναιρεῖ γὰρ ὁ λόγος οὗτος ἀλλοίωσιν. ὁρῶμεν E δὲ τὸ αὐτὸ σῶμα συνεχὲς ὄν, ὁτὲ μὲν ὑγρόν, ὁτὲ δὲ πεπηγός, οὐ διαιρέσει καὶ συνθέσει τοῦτο παθόν, οὐδὲ τροπῇ καὶ διαθιγῇ, καθάπερ * λέγει Δημόκριτος. οὔτε γὰρ μεταταχθέν, οὔτε μετατεθέν, οὔτε μεταβαλὸν τὴν φύσιν, πεπηγὸς ἐξ ὑγροῦ γέγονεν· * οὐδὲ νῦν ὑπάρχει τὰ σκληρὰ καὶ πεπηγότα, ἀδιαίρετα τοὺς ὄγκους· ἀλλ' ὁμοίως ἅπαν ὑγρόν· ὁτὲ δὲ σκληρόν, καὶ πεπηγός ἐστιν. ἔτι δ', οὐδ' αὔξησιν οἷόν τ' εἶναι καὶ φθίσιν. οὐ γὰρ ὁτιοῦν ἔσται γεγονὸς μεῖζον, εἴπερ ἔσται πρόσθεσις, καὶ μὴ πᾶν μεταβεβληκός, ἢ μιχθέντος τινός, ἢ καθ' αὑτὸ μεταβαλόντος.

* γρ. πεφυκὸς, minùs rectè.

* Suprà cap. 2.

* γρ. ὅτι δὲ ὑπάρχει

ὅτι μὲν οὖν ἔστι τὸ γεννᾶν, καὶ τὸ ποιεῖν, καὶ τὸ γίνεσθαί τε καὶ πάσχειν ὑπ' ἀλλήλων· καὶ τίνα τρόπον ἐνδέχεται, καὶ τίνα φασὶ μέν τινες, οὐκ ἐνδέχεται δὲ, διωρίσθω τοῦτον τὸν τρόπον.

ΚΕΦΑΛ. ι.

Ὅτι ἔστι μίξις, καὶ διὰ τί, καὶ ποῖα μικτὰ τῶν ὄντων.

Λοιπὸν δὲ θεωρητέον περὶ μίξεως, κατὰ τὸν αὐτὸν τρόπον τῆς μεθόδου· τοῦτο γὰρ ἦν τρίτον τῶν προτεθέντων ἐξ ἀρχῆς. σκεπτέον δὲ τί τέ ἐστιν ἡ μίξις, καὶ τί τὸ μικτὸν, καὶ τίσιν ὑπάρχει τῶν ὄντων, καὶ πῶς. ἔτι δὲ, πότερον ἔστι μίξις, ἢ τοῦτο ψεῦδος· ἀδύνατον γάρ ἐστι μιχθῆναί τι ἕτερον ἑτέρῳ, καθάπερ λέγουσί τινες. ὄντων μὲν γὰρ ἔτι τῶν μιχθέντων καὶ μὴ ἠλλοιωμένων, οὐδὲν μᾶλλον μεμῖχθαί φασι νῦν ἢ πρότερον, ἀλλ' ὁμοίως ἔχειν. θατέρου δὲ φθαρέντος, οὐ μεμῖχθαι· ἀλλὰ τὸ μὲν εἶναι, τὸ δ' οὐκ εἶναι· τὴν δὲ μίξιν ἐχόντων ὁμοίως εἶναι. τὸν αὐτὸν δὲ τρόπον, κἂν εἰ ἀμφοτέρων συνελθόντων ἔφθαρται τῶν μιγνυμένων ἑκάτερον· οὐ γὰρ εἶναι μεμιγμένα τά γε ὅλως οὐκ ὄντα. οὗτος μὲν οὖν ὁ λόγος ἔοικε ζητεῖν διορίσαι, τί διαφέρει μίξις γενέσεως καὶ φθορᾶς· καὶ τί τὸ μικτὸν τοῦ γεννητοῦ καὶ φθαρτοῦ. δῆλον γὰρ ὡς δεῖ διαφέρειν, εἴπερ ἔστιν. ὥστε τούτων ὄντων φανερῶν, τὰ διαπορηθέντα λύοιτ' ἂν. ἀλλὰ μὴν οὐδὲ τὴν ὕλην τῷ πυρὶ μεμῖχθαί φαμεν, οὐδὲ μίγνυσθαι καιομένην, οὔτε αὐτὴν αὑτῆς τοῖς μορίοις, οὔτε τῷ πυρί· ἀλλὰ τὸ μὲν πῦρ γίνεσθαι, τὴν δὲ φθείρεσθαι. τὸν αὐτὸν δὲ τρόπον, οὔτε τῷ σώματι τὴν τροφὴν, οὔτε τὸ σχῆμα * τὸ κηρῷ μιγνύμενον σχηματίζει τὸν ὄγκον· οὐδὲ τὸ σῶμα καὶ τὸ λευκὸν, οὐδ' ὅλως τὰ πάθη καὶ τὰς ἕξεις οἷόν τε μεμῖχθαι τοῖς πράγμασι· σωζόμενα γὰρ ὁρᾶται. ἀλλὰ μὴν οὐδὲ τὸ λευκόν γε καὶ τὴν ἐπιστήμην ἐνδέχεται μιχθῆναι, οὐδ' ἄλλο τῶν μὴ χωριστῶν οὐδέν. ἀλλὰ τοῦτο λέγουσιν οὐ καλῶς, οἱ πάντα ποτὲ ὁμοῦ καὶ φάσκοντες εἶναι, καὶ μεμῖχθαι· οὐ γὰρ ἅπαν ἅπαντι μικτὸν, ἀλλ' ὑπάρχειν δεῖ τι χωριστὸν ἑκάτερον τῶν μιχθέντων. τῶν δὲ παθῶν, οὐδὲν χωριστόν. ἐπεὶ δ' ἐστὶ, τὰ μὲν δυνάμει, τὰ δ' ἐνεργείᾳ τῶν ὄντων, ἐνδέχεται τὰ μιχθέντα εἶναί πως, καὶ μὴ εἶναι· ἐνεργείᾳ μὲν ἑτέρου ὄντος τοῦ γεγονότος ἐξ αὐτῶν· δυνάμει δέ τι ἑκατέρου, ἅπερ ἦσαν πρὶν μιχθῆναι, καὶ οὐκ ἀπολωλότα· τοῦτο γὰρ ὁ λόγος διηπόρει πρότερον· φαίνεται δὲ τὰ μιγνύμενα πρότερόν τε ἐκ κεχωρισμένων συνιόντα, καὶ δυνάμενα χωρίζεσθαι πάλιν. οὔτε διαμένουσιν οὖν ἐνεργείᾳ ὥσπερ τὸ σῶμα καὶ τὸ λευκόν, οὔτε φθείρονται, οὔτε θάτερον, οὔτε ἄμφω· σώζεται γὰρ ἡ δύναμις αὐτῶν. διὸ ταῦτα μὲν ἀφείσθω· τὸ δὲ συνεχὲς τούτοις ἀπόρημα διαιρετέον, πότερον ἡ μίξις πρὸς τὴν αἴσθησίν τί ἐστιν· ὅταν γὰρ οὕτως εἰς μικρὰ διαιρεθῇ τὰ μιγνύμενα, καὶ τεθῇ παρ' ἄλληλα τοῦτον τὸν τρόπον, ὥστε μὴ δῆλον ἕκαστον εἶναι τῇ αἰσθήσει, τότε μέμικται, ἢ οὔ· ἀλλ' ἔστιν ὥστε ὁτιοῦν παρ' ὁτιοῦν εἶναι μόριον τῶν μιχθέντων. λέγεται μὲν οὖν ἐκείνως, οἷον κριθὰς μεμῖχθαι πυροῖς, ὅταν ἡτισοῦν παρ' ὁντινοῦν τεθῇ. εἰ δ' ἐστὶ πᾶν σῶμα διαιρετὸν, εἴπερ καὶ ἔστι σῶμα σώματι μικτὸν ὁμοιομερὲς, ὁτιοῦν ἂν δέοι μέρος γίνεσθαι παρ' ὁτιοῦν.

* γ. τῷ κηρῷ

A Quòd igitur generare ac agere,& generari ac pati inter ſeſe mutuò ſit, & quónam pacto id fieri queat, & quónam quidam fieri dicant, non tamen fieri poſſit, hoc modo ſit definitum.

CAPVT X.

De miſtione ac miſcibili.

REſtat vt de miſtione contemplemur, iuxta eundem doctrinæ modum. nam ex hiſce quæ initio propoſuimus, hoc erat tertium. Conſiderandum autem eſt, quid miſtio, quid miſtile, quibus B entibus & quo pacto competat: & inſuper vtrùm ſit miſtio, an id falſum ſit. Nam fieri non poteſt, vt quid alterum alteri miſceatur, ſicuti quidam aiunt. Etenim cùm ea quæ miſta ſunt, adhuc ſint, nec alterationem ſubierint: non magis nunc quàm priùs eſſe miſta, ſed ſimiliter ſeſe habere dicunt. Porro ſi alterum ſit corruptum, non eſſe miſta: ſed alterum eſſe, alterum non eſſe. miſtionem autem, eorum eſſe quæ ſimiliter ſeſe habent. Eodem autem modo, etſi poſtea quàm in vnum ambo venerint, vtrumque eorum quæ miſcētur, corruptum ſit. non enim ea eſſe miſta, quæ omnino in ratione rerum nō ſunt. Hæc igitur ratio poſtulare videtur, vt quo miſtio à generatione & corruptione, & quo miſtile C à generabili & corruptibili differat, definiamus. Perſpicuum enim eſt, miſtionem, ſi quidem ſit, ab illis differre oportere. Quo fit vt hiſce cognitis, quæ addubitata fuerunt, ſolui queant. At verò neque materiam igni miſtam eſſe, neque miſceri dum comburitur aut ipſam ſuis partibus, aut igni: ſed ignem gigni, & materiam corrumpi, dicimus. Eodem autem modo neque corpori alimentum, neque figuram quæ ceræ molem efformat, ceræ miſceri dicimus. nec corpori albedinem, nec omnino affectus habitúſque rebus ipſis miſceri poſſibile eſt, quippe cùm ipſi ſalui cernantur. At verò nec albedinem & ſcientiam, nec aliud quicquam inſeparabile miſceri contingit. Quinimmo nec id probè D dicunt, qui omnia aliquando & ſimul eſſe & miſceri inquiunt. non enim omnibus omnia miſceri queunt, ſed eorum quæ miſcentur, vtrumque ſeparabile quid eſſe oportet: affectuum autem nullus ſeparabilis exiſtit. Cùm autem eorum quæ ſunt, alia actu ſint, alia potentia: quæ miſta ſunt, eſſe quodammodo & non eſſe contingit, actu quidem aliud exiſtente eo quod ex eis factum eſt, potentia verò quippiam vtriuſque eorum quæ erant antequam miſcerentur, & non perdita. id quod ratio priùs addubitabat. Nam quæ miſcentur, & priùs ex ſeparatis coiſſe, & poſſe rurſum ſeparari videmus. Igitur neque permanent actu, vti corpus & albedo: neque corrumpuntur, aut ambo, aut alterum. nam eorum virtus atque potentia, ſalua manet. E Idcirco hæc omittantur. Dubitationem autem hiſce continuā, ediſſeramus oportet: vtrùm miſtio quippiam ad ſenſum ſit. verbi gratia: cùm ea quæ miſcentur, ita in parua diuiſa fuerint, & hoc pacto iuxta ſeſe poſita, vt nullū ſenſu dignoſcatur, túncne miſta ſunt an nō? ſed fit vt eorū quæ miſta ſunt particula quælibet iuxta quālibet ſit? Illo igitur modo miſta eſſe dicuntur, vt ordeacea grana frumētaceis, cùm quodlibet iuxta quodlibet poſitū eſt. At ſi omne corpus ſit diuiſibile, ſi corpus corpori miſtū ſimilare ſit, partē quālibet ſecus quālibet eſſe opor-

teb4t. Atq; cùm fieri nequeat, vt in partes minimas diuiſio fiat, & cõpoſitio non idẽ ſit quod miſtio, ſed alitd: nõ oportere dicere, quæ miſcentur eſſe miſta ſecundùm partes exiguas quæ ſuã adhuc retineant naturam, perſpicuũ eſt: compoſitio enim eſſet, non tẽperatura aut miſtio: nec pars eandẽ cum toto haberet rationẽ. Dicimus autẽ ſi quid miſceri debeat, quod miſtũ eſt, ſimiliũ eſſe partiũ. & quemadmodũ aquæ pars aqua eſt: ita & temperati temperatum. Quòd ſi miſtio ſit cõpoſitio ſecundùm partes exiguas, nihil horũ accidet, ſed ſolùm eſſe miſta ad ſenſum. atq; idem huic quidẽ, ſi acutè non videat, eſſe miſtũ, Lynceo verò non eſſe miſtũ videbitur. Neq; diuiſione, adeò vt quæuis particula iuxta quamuis poſita ſit, miſtio ſit. nam fieri non poteſt vt corpora ſic diuidatur. Aut igitur non eſt miſtio, aut hoc rurſum eſt dicendum, quo pacto inquam fieri poſſit. Sunt itaque (vti diximus) eorum quæ ſunt, quædã actiua, quædã quæ ab hiſce pati ſolent. Quædã igitur conuertuntur, ſuntque inter ſe mutuo actiua & paſſiua: quorũ videlicet eadẽ eſt materies. Quædã vero agũt & non patiũtur, nimirũ quibus materies eadem non eſt. Horũ igitur non eſt miſtio. Quare nec medendi ſciẽtia ſanitatẽ, nec ſanitas eandẽ, miſta corporibus efficiunt. Eorũ vero actiuorũ & paſſiuorum quæ facilè diuiſibilia ſunt, multa quidẽ paucis, & magna paruis cõpoſita miſtionẽ non faciunt, ſed accretionem eiuſce quod euincit. Nam alterũ in id quod euincit, verti ſolet: vt gutta vini, decies millenis aquæ mẽſuris non miſcetur. etenim forma vini perit, atq; vinũ in totã aquã vertitur. Cùm vero potẽtias habẽt quodãmodo æqualeis, tũ vtrumq; è ſua quidẽ mutatur natura in id quod vincit ac ſuperat, nõ tamẽ ſit alterũ, ſed inter vtrumq; medium atque cõmune. Patet igitur ea eſſe miſtilia, quæ ſique ex agẽtibus cõtrarietatẽ habẽt. hæc enim inter ſe paſſiua ſũt. Parua autẽ dũ paruis admouẽtur, propẽſiùs miſceri ſolẽt. quippe cùm ea faciliùs celeriuſque ſeſe trãſmeent. At multũ tardiùs hoc idẽ efficit patitúrq; à multo. Icc irco ex hiſce quæ diuidi poſſunt, patique ſolent, quæ facilè terminos ſuſcipiũt, ea miſtilia ſũt: quippe quæ facilè in parua dirimantur. hæc enim eſt eius quod facilè terminatur, ratio. Verbi gratia; quæ liquida ſũt, inter corpora maximè miſtilia ſunt, cùm liquidũ maximè omniũ diuiſibiliũ facilè terminari poſſit, modò nõ ſit viſcoſũ atq; tenax. Hæc enim molẽ reddũt ampliorẽ, atq; maiorẽ. Cùm autẽ alterũ, duntaxat paſſiuũ fuerit, aut alterũ vehemẽter & alterũ admodum remiſſè, vel nihilo vel certè paulo maius euadet quod ex vtrinſq; miſtura cõſurgit. quod in ſtãno & ære accidit. Nõnulla enim entia inter ſe minùs diſcreta ſũt, ambigúntq;. vidẽtur enim quodãmodo & remiſſè miſceri: & quaſi alterũ ſuſceptiuũ, alterũ forma eſſe. quod quidẽ & in hiſce accidit. Nã ſtannũ quaſi affectio quædam ſine materia æris, penè euaneſcit, miſturæ toti colore ſolùm indito. quod idem & in aliis quoque vſuuenit. Patet igitur ex his quæ diximus, miſtionem eſſe, & quid ea ſit, & quam ob cauſam, & quænam entia miſtilia ſint. quandoquidem nonnulla ſunt eiuſmodi, quæ & pati inter ſe, & facilè terminari diuidique poſſunt. Hæc enim cùm miſta ſunt, non eſſe corrupta, nec vltrà eadem ſimpliciter eſſe, nec eorum miſtionem eſſe compoſitionem, nec ad ſenſum, neceſſe eſt. Sed miſtile quidem eſt, quando cùm facilè definiri queat, paſſiuum eſt & actiuum, & ei quod eſt eiuſmodi, miſtile. nam miſtile, ad cognomine dici ſolet. Miſtio verò, eſt miſtilium alteratorum vnio.

ἐπεὶ δ' οὐκ ἔστιν εἰς τὰ ἐλάχιστα διαιρεθῆναι, οὔτε σύνθεσις ταὐτὸ καὶ μῖξις, ἀλλ' ἕτερον, δῆλον ὡς οὔτε κατὰ μικρὰ σωζόμενα δεῖ τὰ μιγνύμενα φάναι μεμῖχθαι· σύνθεσις γὰρ ἔσται, καὶ οὐ κρᾶσις, οὐδὲ μῖξις· οὐδὲ ἕξει τὸν αὐτὸν λόγον τῷ ὅλῳ τὸ μόριον. φαμὲν δ', εἴπερ δεῖ μεμῖχθαί τι, τὸ μιχθὲν ὁμοιομερὲς εἶναι, καὶ ὥσπερ τοῦ ὕδατος τὸ μέρος ὕδωρ, οὕτω καὶ τοῦ κραθέντος. ἂν δ' ᾖ κατὰ μικρὰ σύνθεσις ἡ μῖξις, οὐδὲν συμβήσεται τούτων, ἀλλὰ μόνον μεμιγμένα πρὸς τὴν αἴσθησιν· καὶ ὁ αὐτὸς τῷ μὲν μεμιγμένον, ἐὰν μὴ βλέπῃ ὀξύ, τῷ Λυγκεῖ δ' οὐδὲν μεμιγμένον. οὔτε τῇ διαιρέσει, ὥστε ὁτιοῦν παρ' ὁτιοῦν μέρος· ἀδύνατον γὰρ οὕτω διαιρεθῆναι. ἢ οὖν οὐκ ἔστι μῖξις, ἢ λεκτέον τοῦτο πῶς ἐνδέχεται γίγνεσθαι, πάλιν. ἔστι δή, ὡς φαμέν, τῶν ὄντων, τὰ μὲν ποιητικά, τὰ δ' ὑπὸ τούτων παθητικά. τὰ μὲν οὖν ἀντιστρέφει, ὅσων ἡ αὐτὴ ὕλη ἐστί, καὶ ποιητικὰ ἀλλήλων, καὶ παθητικὰ ὑπ' ἀλλήλων. τὰ δὲ ποιεῖ ἀπαθῆ ὄντα, ὅσων μὴ ἡ αὐτὴ ὕλη. τούτων μὲν οὖν οὐκ ἔστι μῖξις· διὸ οὐδ' ἰατρικὴ ποιεῖ ὑγίειαν, οὐδ' ἡ ὑγίεια μιγνυμένη τοῖς σώμασι. τῶν δὲ ποιητικῶν καὶ παθητικῶν ὅσα εὐδιαίρετα, πολλὰ μὲν ὀλίγοις καὶ μεγάλα μικροῖς συντιθέμενα, οὐ ποιεῖ μῖξιν, ἀλλ' αὔξησιν τοῦ κρατοῦντος· μεταβάλλει γὰρ θάτερον εἰς τὸ κρατοῦν. σταλαγμὸς οἴνου μυρίοις χόασιν ὕδατος οὐ μίγνυται· λύεται γὰρ τὸ εἶδος, καὶ μεταβάλλει εἰς τὸ πᾶν ὕδωρ. ὅταν δὲ ταῖς δυνάμεσιν ἰσάζῃ πως, τότε μεταβάλλει μὲν ἑκάτερον εἰς τὸ κρατοῦν ἐκ τῆς αὑτοῦ φύσεως, οὐ γίνεται δὲ θάτερον, ἀλλὰ μεταξὺ καὶ κοινόν. φανερὸν οὖν, ὅτι ταῦτ' ἔστι μικτά, ὅσα ἐναντίωσιν ἔχει τῶν ποιούντων· ταῦτα γάρ ἐστιν ὑπ' ἀλλήλων παθητικά. καὶ μικρὰ δὲ μικροῖς παρατιθέμενα, μίγνυται μᾶλλον· ῥᾷον γὰρ καὶ θᾶττον ἄλληλα μεθίστησι. τὸ δὲ πολὺ καὶ ὑπὸ πολλοῦ χρονίως τοῦτο δρᾷ. διὸ τὰ εὐόριστα τῶν διαιρετῶν καὶ παθητικῶν μικτά· διαιρεῖται γὰρ εἰς μικρὰ ταῦτα ῥᾳδίως· τοῦτο γὰρ ἦν τὸ εὐορίστῳ εἶναι. οἷον τὰ ὑγρὰ μικτὰ μάλιστα τῶν σωμάτων. εὐόριστον γὰρ μάλιστα τὸ ὑγρὸν τῶν διαιρετῶν, ἐὰν μὴ γλίσχρον ᾖ· ταῦτα γὰρ μείζω δὴ καὶ πλείω ποιεῖ μόνον τὸν ὄγκον. ὅταν δὲ θάτερον μόνον παθητικὸν ᾖ σφόδρα, τὸ δὲ πάμπαν ἠρέμα, ἢ οὐδὲν πλεῖον τὸ μιχθὲν * ἐξ ἀμφοῖν, ἢ μικρόν· ὅπερ συμβαίνει περὶ τὸν κασσίτερον καὶ τὸν χαλκόν. ἔνια γὰρ ψελλίζεται πρὸς ἄλληλα τῶν ὄντων, καὶ ἐπαμφοτερίζει. φαίνεται γάρ πως καὶ μικτὰ ἠρέμα, καὶ ὡς θάτερον μὲν δεκτικόν, θάτερον δὲ εἶδος. ὅπερ καὶ ἐπὶ τούτων συμβαίνει. ὁ γὰρ κασσίτερος ὡς πάθος τι ὤν, ἄνευ ὕλης τοῦ χαλκοῦ, σχεδὸν ἀφανίζεται, καὶ μιχθεὶς ἄπεισι, χρωματίσας μόνον. ταὐτὸ δὲ τοῦτο συμβαίνει καὶ ἐφ' ἑτέρων. φανερὸν τοίνυν ἐκ τῶν εἰρημένων, καὶ ὅτι ἔστι μῖξις, καὶ τί ἐστι, καὶ διὰ τί, καὶ ποῖα μικτὰ τῶν ὄντων, ἐπειδὴ ἐστὶν ἔνια τοιαῦτα, οἷα παθητικά τε ὑπ' ἀλλήλων, καὶ εὐόριστα, καὶ εὐδιαίρετα. ταῦτα γὰρ οὔτ' ἐφθάρθαι ἀνάγκη μεμιγμένα, οὔτ' ἔτι ταὐτὰ ἁπλῶς εἶναι, οὔτε σύνθεσιν εἶναι τὴν μῖξιν αὐτῶν, οὔτε πρὸς τὴν αἴσθησιν· ἀλλ' ἔστι μικτὸν μέν, ὃ ἂν εὐόριστον ὂν παθητικὸν ᾖ καὶ ποιητικόν, καὶ τοιούτῳ μικτόν· πρὸς ὁμώνυμον γὰρ τὸ μικτόν· ἡ δὲ μῖξις τῶν μικτῶν ἀλλοιωθέντων ἕνωσις.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ γενέσεως καὶ φθορᾶς, τῶν εἰς δύο τὸ Β.

ΚΕΦΑΛ. α΄.

Πλάτωνος ἔλεγχος ποιοῦντος μίαν ὕλην παρὰ τὰ στοιχεῖα.

ΠΕΡΙ μὲν οὖν μίξεως καὶ ἁφῆς, καὶ τοῦ ποιεῖν, καὶ πάσχειν, εἴρηται, πῶς ὑπάρχει τοῖς μεταβάλλουσι κατὰ φύσιν. ἔτι δὲ, περὶ B γενέσεως καὶ φθορᾶς τῆς ἁπλῆς, πῶς καὶ τίνος ἐστὶ, καὶ διὰ τὴν αἰτίαν. ὁμοίως δὲ καὶ περὶ ἀλλοιώσεως εἴρηται, τί τὸ ἀλλοιοῦσθαι, καὶ τίνα ἔχει διαφορὰν αὐτῶν ἕκαστον. λοιπὸν δὲ θεωρῆσαι, περὶ τὰ καλούμενα στοιχεῖα τῶν σωμάτων. γένεσις μὲν γὰρ καὶ φθορὰ, πάσαις ταῖς φύσει συνεστώσαις οὐσίαις, οὐκ ἄνευ τῶν αἰσθητῶν σωμάτων. τούτων δὲ τὴν ὑποκειμένην ὕλην, οἱ μὲν φασὶ μίαν εἶναι, οἷον ἀέρα τιθέντες, ἢ πῦρ, ἢ τι τῶν μεταξὺ τούτων σῶμά τε ὂν καὶ χωριστόν· οἱ δὲ, πλείω τὸν ἀριθμὸν ἑνός· οἱ μὲν πῦρ καὶ γῆν, οἱ δὲ ταῦτά τε, καὶ ἀέρα τρίτον· οἱ δὲ καὶ ὕδωρ τούτων τέταρτον, ὥσπερ Ἐμπεδοκλῆς· ἐξ ὧν συγκρινομένων, καὶ διακρινομένων, ἢ C ἀλλοιουμένων, συμβαίνειν τὴν γένεσιν καὶ τὴν φθορὰν τοῖς πράγμασιν. ὅτι μὲν οὖν τὰ πρῶτα ἀρχαὶ καὶ στοιχεῖα καλῶς ἔχει λέγειν, ἔστω συνωμολογημένον· ἐξ ὧν μεταβαλλόντων, ἢ κατὰ σύγκρισιν καὶ διάκρισιν, ἢ κατ' ἄλλην [τινὰ] μεταβολὴν, συμβαίνει γένεσιν εἶναι καὶ φθοράν. ἀλλ' οἱ μὲν ποιοῦντες μίαν ὕλην παρὰ τὰ εἰρημένα, ταύτην δὲ σωματικὴν χωριστὴν, ἁμαρτάνουσιν. ἀδύνατον γὰρ ἄνευ ἐναντιώσεως εἶναι τὸ σῶμα τοῦτο αἰσθητὸν ὄν· ἢ γὰρ κοῦφον ἢ βαρὺ, ἢ ψυχρὸν ἢ θερμὸν ἀνάγκη εἶναι τὸ ἄπειρον τοῦτο, ὃ λέγουσιν εἶναί τινες τὴν ἀρχήν. ὡς δ' ἐν τῷ Τιμαίῳ γέγραπται, οὐδένα D ἔχει διορισμόν· οὐ γὰρ εἴρηκε σαφῶς τὸ πανδεχὲς, εἰ χωρίζεται τῶν στοιχείων. οὐδὲ χρῆται οὐδὲν, φήσας εἶναι ὑποκείμενον τοῖς καλουμένοις στοιχείοις πρότερον, οἷον χρυσὸν τοῖς ἔργοις τοῖς χρυσοῖς. καί τοι τοῦτο οὐ καλῶς λέγεται τοῦτον τὸν τρόπον λεγόμενον, ἀλλ' ὧν μὲν ἀλλοίωσις, οὕτως ἐστίν· ὧν δὲ γένεσις καὶ φθορὰ, ἀδύνατον ἐκεῖνα προσαγορεύεσθαι, ἐξ ὧν γέγονε. καί τοι γέ φησι, μακρῷ * ἀληθέστερον εἶναι χρυσὸν λέγειν ἕκαστον εἶναι· ἀλλὰ τῶν στοιχείων ὄντων στερεῶν, μέχρι ἐπιπέδων ποιεῖται τὴν ἀνάλυσιν. ἀδύνατον δὲ [τὴν τιθήνην,] τὴν ὕλην τὴν πρώτην, τὰ ἐπίπεδα εἶναι. ἡμεῖς δὲ φαμὲν ὕλην τινὰ τῶν σωμάτων E τῶν αἰσθητῶν· ἀλλὰ ταύτην οὐ χωριστὴν, ἀλλ' ἀεὶ μετ' ἐναντιώσεως, ἐξ ἧς γίνεται τὰ καλούμενα στοιχεῖα. διώρισται δὲ περὶ αὐτῶν ἐν ἑτέροις ἀκριβέστερον. οὐ μὴν ἀλλ' ἐπειδὴ καὶ τὸν τρόπον τοῦτον ἐστὶν ἐκ τῆς ὕλης τὰ σώματα τὰ πρῶτα, διοριστέον καὶ περὶ τούτων, ἀρχὴν μὲν καὶ πρώτην ὑποτιθεμένους εἶναι τὴν ὕλην, τὴν ἀχώριστον μὲν, ὑποκειμένην δὲ τοῖς ἐναντίοις· οὐ γὰρ τὸ θερμὸν ὕλη τῷ ψυχρῷ, οὐδὲ τοῦτο τῷ θερμῷ· ἀλλὰ τὸ ὑποκείμενον ἀμφοῖν. ὥστε πρῶτον μὲν, τὸ δυνάμει σῶμα αἰσθητὸν, ἀρχή·

* γλαφυρώτατον

ARISTOTELIS STAGIRITÆ, DE GENERATIONE & corruptione,

LIBER II.

CAPVT I.

De principio materiali Priſcorum opiniones aliquot.

DE miſtione igitur & tactu,& actione & paſſione,quo pacto hiſce competant quæ natura mutationem ſubeunt; & inſuper de ortu & occaſu B ſimplici abſolutóque, qualiter har[um] cuius ſit,& quam ob cauſam: tum etiam de alteratione, quid ſit alterari & quam quodque co[rum] habet differentiam, dictum eſt. Reſtat vt circa ea, quæ elementa corporum appellantur, contemplemur. Nam generatio & corruptio, ſubſtãtiis omnibus quæ natura conſtant, haud ſine ſenſibilibus corporibus competunt. Quorum ſubiectam materiam quidam vnam eſſe aiunt, eam aërem, aut ignem, aut quippiam inter hæc medium, quod & corpus ſit & ſeparabile, ponentes. Quidam numero plures vna. alij enim, ignem & terram: alij & hæc, & tertium aërem: alij & aquam inter hæc C quartam, vti Empedocles: ex quibus concretionem ſecretionemve aut alterationem ſubeuntibus, ortum atque occaſum rebus ipſis contingere dicunt. Quòd igitur prima ipſa principia elementáque probè dicantur, ſit in confeſſo: ex quibus ſi aut congregatione ſegregationéve, aut alia mutatione transmutentur, generationem fieri contingat atque corruptionem. Sed qui vnam vltra ea quæ ſunt dicta, materiam faciunt, eámque corpoream atque ſeparabilem, errant. Nam fieri non poteſt vt corpus hoc cùm ſenſibile ſit, ſine contrarietate exiſtat. Etenim infinitum hoc, quod nonnulli principium eſſe dicunt: aut leue aut graue, aut calidum aut frigidum ſit, neceſſe eſt. Quod D autem in Timæo eſt ſcriptum, nihil habet certi definitique. Nam nec ille planè dixit, an id quod omnia ſuſcipit, ab ipſis ſeparetur elementis: nec vllo vti ſolet, cùm tamen priùs dixerit, illud vocatis elementis, vt aurum aureis operibus, eſſe ſubiectum, quanquam id non rectè dicitur, ſi hoc dicatur modo. Sed quorum eſt alteratio, ea ita ſeſe habent: quorum verò generatio atque corruptio, ea ex nomine eorum ex quibus fiunt, appellari impoſſibile eſt. Atqui longè veriſſimum eſſe inquit dicere quodque aurum eſſe. Verùm cùm ſolida ipſa elementa ſint, ad plana vſque reſolutionem facit. At primam materiam eſſe plana ipſa, de numero eorum eſt quæ fieri nequeunt. Nos E autem ſenſibilium corporum quandam eſſe materiam dicimus, ſed eam ſeparari non poſſe, ſed ſemper eſſe cum contrarietate, ex qua elementa vocata fiunt. de quibus alibi exactiùs eſt definitum atque pertractatum. Verumenimvero cùm ad hunc modum ex materia corpora prima conſtent, de hiſce quoque determinemus oportet: ſupponentes materiam inſeparabilem quidem, ſed contrariis ſubiectam, principium atque primum eſſe. non enim calor frigori, nec frigus calori: ſed quod ſubiicitur, vtrique materia exiſtit. Quare primò, quod potẽtia ſenſibile corpus exiſtit, principiũ eſt:

Deinde contrarietates ipſæ, ceu calor & frigus. Poſtremò ignis & aqua, & quæ ſunt eiuſmodi. hæc enim in ſeſe tranſmutari ſolent. Nec res perinde habet, vt Empedocles & cæteri aſſerunt. non enim eſſet alteratio. At contrarietates ipſæ tranſmutari in ſe non ſolent. Verùm nihilominus & vt corporis ſunt, qualia & quot principia ſint, dicamus oportet. Nam cæteri ſuppoſitis vtuntur: nec cur talia ſint, aut tot numero, dicunt.

A δεύτερον δέ, αἱ ἐναντιώσεις· λέγω δέ, οἷον θερμότης καὶ ψυχρότης· τρίτον δὲ ἤδη πῦρ καὶ ὕδωρ, καὶ τὰ τοιαῦτα· ταῦτα μὲν γὰρ μεταβάλλει εἰς ἄλληλα, καὶ οὐχ ὡς Ἐμπεδοκλῆς καὶ ἕτεροι λέγουσιν· οὐδὲ γὰρ ἂν ἦν ἀλλοίωσις· αἱ δ' ἐναντιώσεις, οὐ μεταβάλλουσιν. ἀλλ' οὐδὲν ἧττον καὶ ὡς σώματος, ποίας καὶ πόσας λεκτέον ἀρχάς· οἱ μὲν γὰρ ἄλλοι ὑποθέμενοι χρῶνται, καὶ οὐθὲν λέγουσι, διὰ τί αὗται ἢ τοσαῦται.

CAPVT II.

De elementorum principiis & differentia.

B CVM igitur corporis ſenſibilis, hoc eſt, tangibilis, principia diſquiramus, ſenſibile autem ſit quod tactu ſenſum facit: conſtat, non corporis contrarietates, ſpecies & principia facere, ſed eas ſolùm quæ ſub tactum cadunt. Nam contrarietate, eâque tangibili, differunt. Quocirca nec albor nec nigror, nec dulcedo, nec amaritudo, nec item cæterarum quicquam contrarietatum, elementum facit. Atqui viſus tactu prior eſt, quare & quod ei obiicitur, prius erit. Verùm non eſt corporis tangibilis affectio, quatenus tangibile exiſtit, ſed per aliud: quanquam natura prius eſt. Porro ipſorum tangibilium qualesnam ſint primæ differentiæ & contrarietates, diſtinguamus oportet. Sunt autem tangibiles contrarietates hæ: calidum frigidum, C ſiccum humidum, graue leue, durum molle, viſcoſum aridum, ſcabrum glabrum, craſſum tenue. Ex quibus graue & leue neque actiua ſunt neque paſſiua. non enim quòd alterum quippiam agat, patiatúrve ab altero, dicuntur. At elementa ipſa inter ſe mutuò actiua ſint & paſſiua, oportet. nam miſcentur, & in ſeſe viciſſim mutantur. Calidum autem frigidúmque, & humidum ac ſiccum: illa quidem quod actiua ſint, hæc verò quòd paſſiua, dicuntur. Calidum enim eſt, quod ea congregat quæ eiuſdem ſunt generis. Nam ſegregare (id quod ignem facere aiunt) eſt, cognata & quæ eiuſdem ſunt generis, congregare: accidit enim vt aliena eximat. Frigidum verò, quod ex æquo cogit ac congregat, tam quæ eiuſdem ſunt generis, quàm quæ diuerſi. D Humidum autem, quod cùm facilè terminos ſuſcipiat, proprio non definitur. Siccum verò, quod proprio termino bellè definitur, alieno ægre. Tenue autem & craſſum, viſcoſum & aridum, durum & molle, & cæteræ differentiæ, ex hiſce ſunt. Nã cùm quod repletiuum exiſtit, ad humidum ex eo pertineat, quia non ſit definitum, ſed promptè terminari poſſit, & ſequatur id quod ipſum tangit, tenue autem ſit repletiuum (nam paruarum eſt partium: & quod eſt eiuſmodi, repletiuum eſt, totum enim totum tangit: tenue autem, maximè eſt tale) tenue ſub humido, & craſſum ſub ſicco fore, conſtat. Rurſum viſcoſum ab humido comprehendetur. nam E viſcoſum, humidum cum quadam affectione exiſtit, velut oleum. Aridum autem, à ſicco. Aridum enim eſt, quod perfectè ſiccum eſt, adeò vt ob humiditatis defectum etiam concreuerit. Inſuper molle, humidum comitari ſolet: & durum, ſiccum. Molle enim eſt, quod in ſeſe refugit ceditque, & non reſiſtit, id quod humidum facere aſſolet. Quãobrem & humidum molle non eſt. ſed molle ſub humido, & durum ſub ſicco collocatur. Durum ſiquidem eſt, quod concretum ſeu congelatum eſt. Quod autem eſt concretum, ſiccum eſt. Porro ſiccum & humidum, multis dicuntur modis.

ΚΕΦΑΛ. β'.

Ὅτι μόναι αἱ κατὰ τὴν ἁφὴν ἐναντιώσεις, σώματος εἴδη καὶ ἀρχὰς ποιοῦσι.

ΕΠεὶ οὖν ζητοῦμεν αἰσθητοῦ σώματος ἀρχάς, τοῦτο δ' ἐστὶν ἁπτοῦ, ἁπτὸν δὲ οὗ ἡ αἴσθησις ἁφή· φανερὸν ὅτι οὐ πᾶσαι αἱ ἐναντιώσεις σώματος εἴδη καὶ ἀρχὰς ποιοῦσιν, ἀλλὰ μόνον αἱ κατὰ τὴν ἁφήν, κατ' ἐναντίωσίν τε γὰρ διαφέρουσι, καὶ κατὰ τὴν ἁπτὴν ἐναντίωσιν. διόπερ οὔτε λευκότης οὔτε μελανία, οὔτε γλυκύτης καὶ πικρότης· ὁμοίως δὲ οὐδὲ τῶν ἄλλων τῶν αἰσθητῶν ἐναντιώσεων, οὐθὲν ποιεῖ στοιχεῖον. καίτοι * προτέρα ὄψις ἁφῆς· ὥστε καὶ τὸ ὑποκείμενον πρότερον. ἀλλ' οὐκ ἔστι σώματος ἁπτοῦ πάθος ᾗ ἁπτόν, ἀλλὰ καθ' ἕτερον, καὶ εἰ ἔτυχε τῇ φύσει πρότερον. αὐτῶν δὲ πρῶτον τῶν ἁπτῶν διαιρετέον, ποῖαι πρῶται διαφοραὶ καὶ ἐναντιώσεις. εἰσὶ δ' ἐναντιώσεις κατὰ τὴν ἁφὴν C αἵδε, θερμὸν ψυχρόν, ξηρὸν ὑγρόν, βαρὺ κοῦφον, σκληρὸν μαλακόν, γλίσχρον κραῦρον, τραχὺ λεῖον, παχὺ λεπτόν. τούτων δὲ βαρὺ μὲν καὶ κοῦφον, οὐ ποιητικά, οὐδὲ παθητικά· οὐ γὰρ τῷ ποιεῖν τι ἕτερον, οὐδὲ τῷ πάσχειν ὑφ' ἑτέρου λέγεται, δεῖ δὲ ποιητικὰ καὶ παθητικὰ εἶναι ἀλλήλων τὰ στοιχεῖα· μίγνυται γὰρ καὶ μεταβάλλει εἰς ἄλληλα. θερμὸν δὲ καὶ ψυχρόν, καὶ ξηρὸν καὶ ὑγρόν, τὰ μὲν τῷ ποιητικὰ εἶναι, τὰ δὲ τῷ παθητικὰ λέγεται· θερμὸν γάρ ἐστι, τὸ συγκρῖνον τὰ ὁμογενῆ· τὸ γὰρ διακρίνειν, ὅπερ φασὶ ποιεῖν τὸ πῦρ, συγκρίνειν ἐστὶ τὰ ὁμόφυλα· συμβαίνει γὰρ ἐξαιρεῖν τὰ ἀλλότρια. ψυχρὸν δὲ τὸ συνάγον καὶ συγκρῖνον ὁμοίως τά τε συγγενῆ καὶ τὰ μὴ ὁμόφυλα· ὑγρὸν δέ, τὸ D ἀόριστον οἰκείῳ ὅρῳ εὐόριστον ὄν. ξηρὸν δέ, τὸ εὐόριστον μὲν οἰκείῳ ὅρῳ, δυσόριστον δέ. τὸ δὲ λεπτὸν καὶ παχύ, καὶ γλίσχρον καὶ κραῦρον, καὶ σκληρὸν καὶ μαλακόν, καὶ αἱ ἄλλαι διαφοραί, ἐκ τούτων· ἐπεὶ γὰρ τὸ ἀναπληστικόν ἐστι τοῦ ὑγροῦ, διὰ τὸ μὴ ὡρίσθαι μέν, εὐόριστον δὲ εἶναι καὶ ἀκολουθεῖν τῷ ἁπτομένῳ· τὸ δὲ λεπτὸν ἀναπληστικόν (λεπτομερὲς γὰρ καὶ τὸ μικρομερές, ἀναπληστικόν· ὅλον γὰρ ὅλου ἅπτεται· τὸ δὲ λεπτόν, μάλιστα τοιοῦτον) φανερὸν ὅτι τὸ μὲν λεπτὸν ἔσται τοῦ ὑγροῦ, τὸ δὲ παχύ, τοῦ ξηροῦ. πάλιν δὲ τὸ μὲν γλίσχρον, τοῦ ὑγροῦ· τὸ γὰρ γλίσχρον, ὑγρὸν πεπονθός τί ἐστιν, οἷον τὸ ἔλαιον· τὸ δὲ κραῦρον τοῦ ξηροῦ· κραῦρον E γάρ, τὸ τελέως ξηρόν, ὥστε καὶ πεπηγέναι δι' ἔλλειψιν ὑγρότητος. ἔτι, τὸ μὲν μαλακόν, τοῦ ὑγροῦ· μαλακὸν γὰρ τὸ ὑπεῖκον εἰς ἑαυτό, καὶ μὴ ἀντιπεριϊστάμενον, ὅπερ ποιεῖ τὸ ὑγρόν· διὸ καὶ οὐκ ἔστι τὸ ὑγρὸν μαλακόν, ἀλλὰ τὸ μαλακόν, τοῦ ὑγροῦ· τὸ δὲ σκληρόν, τοῦ ξηροῦ· σκληρὸν γάρ ἐστι, τὸ πεπηγός· τὸ δὲ πεπηγός, ξηρόν. λέγεται δὲ ξηρὸν καὶ ὑγρὸν πλεοναχῶς·

* χ. πρότερον

ἀντίκειται γὰρ τῷ ξηρῷ καὶ τὸ ὑγρὸν καὶ τὸ διερόν· καὶ πάλιν τῷ ὑγρῷ καὶ τὸ ξηρὸν καὶ τὸ πεπηγός. ἅπαντα δὲ ἐστὶ ταῦτα τοῦ ὑγροῦ καὶ τοῦ ξηροῦ τῶν πρώτων λεχθέντων. ἐπεὶ γὰρ ἀντίκειται τῷ διερῷ τὸ ξηρόν· καὶ διερὸν μέν ἐστι, τὸ ἔχον ἀλλοτρίαν ὑγρότητα ἐπιπολῆς· βεβρεγμένον δὲ, τὸ εἰς βάθος· ξηρὸν δὲ, τὸ ἐστερημένον ταύτης. φανερὸν ὅτι τὸ μὲν διερὸν ἔσται τοῦ ὑγροῦ· τὸ δὲ ἀντικείμενον ξηρὸν, τοῦ πρώτου ξηροῦ. πάλιν δὲ τὸ ὑγρὸν καὶ τὸ πεπηγὸς ὡσαύτως· ὑγρὸν μὲν γάρ ἐστι, τὸ ἔχον οἰκείαν ὑγρότητα ἐν τῷ βάθει· πεπηγὸς δὲ, τὸ ἐστερημένον ταύτης. ὥστε καὶ τούτων ἔσται, τὸ μὲν ὑγροῦ, τὸ δὲ ξηροῦ. δῆλον τοίνυν ὅτι καὶ αἱ ἄλλαι πᾶσαι διαφοραὶ, ἀνάγονται εἰς τὰς πρώτας τέτταρας· αὗται δὲ, οὐκ ἔτι εἰς ἐλάττους· οὔτε γὰρ τὸ θερμὸν ὅπερ ὑγρὸν, ἢ ὅπερ ξηρόν· οὔτε τὸ ὑγρὸν ὅπερ θερμὸν, ἢ ὅπερ ψυχρόν· οὔτε τὸ ψυχρὸν καὶ τὸ ξηρὸν, οὔθ' ὑπ' ἄλληλα, οὔθ' ὑπὸ τὸ θερμὸν καὶ ὑγρόν εἰσιν· ὥστε ἀνάγκη τέτταρας εἶναι ταύτας.

ΚΕΦΑΛ. γ'.

Ὅτι τέτταρές εἰσιν αἱ τῶν στοιχείων συζεύξεις.

Ἐπεὶ δὲ τέτταρα στοιχεῖα, τῶν δὲ τεττάρων ἓξ συζεύξεις, τὰ δὲ ἐναντία οὐ πέφυκε συνδυάζεσθαι· θερμὸν γὰρ καὶ ψυχρὸν εἶναι τὸ αὐτὸ, καὶ πάλιν ξηρὸν καὶ ὑγρὸν, ἀδύνατον· φανερὸν ὅτι τέτταρες ἔσονται αἱ τῶν στοιχείων συζεύξεις, θερμοῦ καὶ ξηροῦ, καὶ θερμοῦ καὶ ὑγροῦ· καὶ πάλιν ψυχροῦ καὶ ξηροῦ, καὶ ψυχροῦ καὶ ὑγροῦ. καὶ ἠκολούθηκε κατὰ λόγον τοῖς ἁπλοῖς φαινομένοις σώμασι, πυρὶ, καὶ ἀέρι, καὶ ὕδατι, καὶ γῇ. τὸ μὲν γὰρ πῦρ, θερμὸν καὶ ξηρόν· ὁ δὲ ἀὴρ, θερμὸς καὶ ὑγρός· (οἷον, ἀτμὶς γὰρ ὁ ἀήρ) τὸ δὲ ὕδωρ, ψυχρὸν καὶ ὑγρόν· ἡ δὲ γῆ, ψυχρὰ, καὶ ξηρά· ὥστε εὐλόγως διανέμεσθαι τὰς διαφορὰς τοῖς πρώτοις σώμασι, καὶ τὸ πλῆθος αὐτῶν εἶναι κατὰ λόγον. ἅπαντες γὰρ οἱ τὰ ἁπλᾶ σώματα στοιχεῖα ποιοῦντες, οἱ μὲν ἓν, οἱ δὲ δύο, οἱ δὲ τρία, οἱ δὲ τέτταρα ποιοῦσιν. ὅσοι μὲν οὖν ἓν μόνον λέγουσιν, εἶτα πυκνώσει καὶ μανώσει τἆλλα γεννῶσι, τούτοις συμβαίνει δύο ποιεῖν τὰς ἀρχὰς, τό τε μανὸν καὶ τὸ πυκνὸν, ἢ τὸ θερμὸν καὶ τὸ ψυχρόν· ταῦτα γὰρ τὰ δημιουργοῦντα· τὸ δὲ ἓν ὑπόκειται καθάπερ ὕλη. οἱ δὲ εὐθὺς δύο ποιοῦντες, ὥσπερ Παρμενίδης, πῦρ καὶ γῆν, τὰ μεταξὺ μίγματα ποιοῦσι τούτων, οἷον ἀέρα καὶ ὕδωρ. ὡσαύτως δὲ καὶ οἱ τρία λέγοντες, καθάπερ Πλάτων ἐν ταῖς διαιρέσεσι· τὸ γὰρ μέσον μίγμα ποιεῖ, καὶ σχεδὸν ταὐτὰ λέγουσιν, οἵ τε δύο, καὶ οἱ τρία ποιοῦντες· πλὴν οἱ μὲν τέμνουσιν εἰς δύο τὸ μέσον, οἱ δὲ ἓν μόνον ποιοῦσιν. ἔνιοι δὲ εὐθὺς τέτταρα λέγουσιν, οἷον Ἐμπεδοκλῆς. συνάγει δὲ καὶ οὗτος εἰς τὰ δύο· τῷ γὰρ πυρὶ τἆλλα πάντα ἀντιτίθησιν. οὐκ ἔστι δὲ τὸ πῦρ, καὶ ὁ ἀὴρ, καὶ ἕκαστον τῶν εἰρημένων, ἁπλοῦν, ἀλλὰ μικτόν. τὰ δὲ ἁπλᾶ, τοιαῦτα μέν εἰσιν, οὐ μέντοι ταὐτά· * οἷον, εἴ τι τῷ πυρὶ τὸ ὅμοιον, πυροειδὲς, οὐ πῦρ· καὶ τὸ τῷ ἀέρι, ἀεροειδές· ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. τὸ δὲ πῦρ ἐστιν ὑπερβολὴ θερμότητος, ὥσπερ καὶ κρύσταλλος ψυχρότητος· ἡ γὰρ πῆξις, καὶ ἡ ζέσις, ὑπερβολαί τινές εἰσιν, ἡ μὲν ψυχρότητος, ἡ δὲ θερμότητος. εἰ οὖν ὁ κρύσταλλός ἐστι πῆξις ὑγροῦ καὶ ψυχροῦ, καὶ τὸ πῦρ ἔσται ζέσις θερμοῦ καὶ ξηροῦ.

* κ. τὸ π. πειόμ.

A nam & humidum & madens, ſicco aduerſantur: & rurſus ſiccum & concretum, humido. Hæc autem omnia ad humidum & ſiccum, quæ prima dicta ſunt, attinent. Nam cùm madenti ſiccum aduerſetur, & madens ſit quod ſuperficie tenus externam admiſit humiditatem, & humectum quod introrſus, ſiccum autem id quod hac vacat: madens ſub humido, & ei oppoſitum ſiccum, ſub primo ſicco fore conſtat. Rurſum humidum & concretum, eodem modo. Humidum enim eſt, quod in penitiore parte propriam habet humiditatem. Concretum verò, quod hac priuatum eſt. Et proinde ex hiſce alterum humidi, alterum ſicci erit. Conſtat igitur, cæteras omneis differentias ad qua- B tuor primas, & has, non ampliùs in pauciores reduci: neque enim calidum id eſt quod humidum, aut quod ſiccum eſt: neque humidum, quod calidum, aut quod frigidum eſt: neque frigidum & ſiccum ſubalterna ſunt, neque ſub calido & humido ſtruuntur. Quare quatuor eſſe has neceſſe eſt.

CAPVT III.

Quatuor eſſe elementa.

CVM autem elementa ſint quatuor, & eorum quæ ſunt quatuor, ſex ſint copulæ, contraria autem ſimul copulari non poſſint (calidum enim & frigidum, & rurſum ſiccum & humidum idem C eſſe, eſt impoſſibile) conſtat quòd elementorum copulæ quatuor erunt, nempe calidum & ſiccum, calidum & humidum, rurſum frigidum & ſiccum, frigidum & humidum, atque hæc, corpora ea quæ ſimplicia videntur eſſe, ignem inquam & aërem, aquam & terram, ſecundum rationem comitari ac ſequi ſolent. Nam ignis calidus ſiccúſque eſt: aër verò, frigidus & humidus (nam aër, velut vapor eſt:) aqua frigida humidáque: terra, frigida atque ſicca. Vnde fit vt differentiæ illæ non iniuria primis corporibus diſtribuantur, & iuxta rationem eorum numerus conſtet. Omnes enim & qui ſimplicia corpora elementa faciunt, alij vnum, alij duo, alij tria, alij quatuor eſſe volunt. Qui igi- D tur tantùm vnum eſſe dicunt, deinde denſitate & raritate cætera generant, hiſce duo principia facere, rarum inquam & denſum, aut calidum & frigidum accidit: hæc enim opificis munus obeunt: vnum autem ſubiici ſolet, ſicuti materies. Qui verò continuò duo, vt Parmenides, ignem & terram, faciunt: quæ inter hæc media ſunt, ceu aërem & aquam, horum miſturas eſſe aſtruunt. Eodem modo & qui eſſe tria inquiunt, quemadmodum Plato in diuiſionibus, medium ſiquidem, miſturam congeriemque facit. Atque eadem ferè dicunt, qui duo & qui tria faciunt: verùm illi medium in duo ſecant, hi vero vnum faciunt medium. Porrò non- E nulli ſtatim quatuor eſſe aiunt, vt Empedocles. Cogit autem & hic illa, in duo: nam igni, cætera omnia contraponit. Ignis autem & aër, & vnumquodque eorum quæ dicta ſunt, haudquaquam ſimplex eſt, ſed miſtum. Quæ verò ſunt ſimplicia, talia quidem ſunt, non tamen eadem, vt quod igni ſimile eſt, igneum, non ignis: & quod aëri, aëreum, non aër exiſtit. ſimili modo & de cæteris quoque dicendum eſt. Ignis etiam, caloris eſt exceſſus: perinde vt glacies, frigoris. Nam congelatio & feruor, exceſſiones quædam ſunt: illa quidem frigoris, hic vero caloris. Igitur ſi glacies, humidi & frigidi congelatio ſit: & ignis, calidi & ſicci feruor erit.

Quam-

Quamobrem nec ex glacie gigni quicquam, nec A ex igni poteſt. Cùm autem ſimplicia corpora ſint quatuor, è duobus vtrumque vtriuſque locorum eſt. Ignis enim & aër, eius qui ad ſuperficiem terminúmque vergit: terra verò & aqua, eius qui ad medium. Atque ignis & terra extrema quidem ſunt, & ſynceriora: aqua verò & aër, media & miſta magis. Et vtraque etiam vtriſque contraria ſunt. Nam igni aqua, aëri verò terra aduerſatur. hæc enim contrariis affectibus conſtant. Verumenimvero cùm ſimpliciter quatuor ſint, quodque vnius eſt. Terra ſiquidem, ſicci potiùs eſt quàm frigidi: aqua verò, frigidi magis quàm humidi: aer, humidi magis quàm calidi: ignis, calidi magis quàm ſicci. B

CAPVT IV.

De elementorum ad inuicem generatione, corruptione, tranſmutatione.

CVm autem priùs ſit definitum, ſimplicia corpora mutuam ſubire generationem, & ea inſuper gigni ad ſenſum videantur (nam alioqui non eſſet alteratio: quippe cùm ea in rerum tangibilium affectibus ſita ſit) quiſnam mutuæ generationis ſit modus, & vtrum quoduis ex quouis gigni poſſit, an aliqua & aliqua non dicendum videtur. Quod igitur vniuerſa in ſe inuicem tranſmutari C nata ſint, palàm eſt. Nam generatio in contrarium, & è contrario fit. Omnia autem elementa inter ſe contrarietatem ex eo habent, quia differentiæ ipſæ contrariæ ſunt. Nam aliis, ceu igni, & aquæ, ambæ ſunt contrariæ. ille enim calidus ſiccúſque eſt, hæc verò humida & frigida. Aliis verò, vt aëri & aquæ, altera ſolùm. nam ille quidem humidus calidúſque eſt, hæc vero frigida & humida. Quare in vniuerſum quidem patet, quoduis è quouis gigni natum eſſe. Iam vero quo pacto ex omnibus omnia fient, ſingulatim percipere haudquaquam eſt difficile. Different tamen. nam celeriùs & tardiùs, item faciliùs difficiliúſque alia aliis tráſmuta- D tionem ſubeunt. Quæ enim ſymbolum inter ſe habent, horum celeris eſt migratio: quæ vero non habent, tarda: quòd facilius ſit vnum quàm multa mutari. Verbi cauſa: ex igni fiet aër, altero mutationem ſubeunte. nam ille quidem calidus ſiccúſque eſt, hic vero calidus & humidus: quare ſi ſiccitas vincatur ab humiditate, orietur aër. Rurſum ex aere aqua fiet, ſi calorē frigus euincat: ſiquidem àer humidus calidúſque eſt, aqua vero frigida & humida: quare mutato calore, fiet aqua. Eodem modo ex aqua quoque fiet terra, & ex terra ignis. nam vtraque ad vtraque, ſymbola habent. aqua enim, humida frigidáque eſt: terra vero, frigida & ſicca. quare ſi humiditas vincatur, emerget terra. E Et rurſum cùm ignis calidus ſit & ſiccus, terra vero frigida & ſicca, ſi frigiditas intereat, ignis è terra fiet. Quare patet, circularem generationem ſimplicibus competere corporibus. Atque hic mutationis modus promptiſſimus eſt, propterea quod quæ deinceps ſunt, ſymbolum habent. Aqua autem ex igni, & terra ex aere, & rurſum ex aqua ignis, & aer ex terra gigni quidem poſſunt, ſed difficiliùs, quod plurium mutatio ſit. Nam ſi ex aqua oriatur, ignis, frigiditatem & humiditatem corrumpi priùs eſt neceſſe. Et rurſum frigiditatem & ſiccitatem, ſi ex terra fiat aer. Eodē modo & ſi ex igni & aere, aqua & terra fiant, vtraſque mutari qualitates eſt neceſſe.

A διὸ καὶ οὐδὲν οὔτε ἐκ κρυστάλλου γίγνεται, οὔτ᾽ ἐκ πυρός. ὄντων δὲ τεττάρων τῶν ἁπλῶν σωμάτων, ἑκάτερον τοῖν δυοῖν, ἑκατέρου τῶν τόπων ἐστί. πῦρ μὲν γὰρ καὶ ἀήρ, τοῦ πρὸς τὸν ὅρον φερομένου· γῆ δὲ καὶ ὕδωρ, τοῦ πρὸς τὸ μέσον. καὶ ἄκρα μὲν καὶ εἰλικρινέστατα, πῦρ καὶ γῆ, μέσα δὲ καὶ μεμιγμένα μᾶλλον, ὕδωρ καὶ ἀήρ· καὶ ἑκάτερα δὲ ἑκατέροις ἐναντία· πυρὶ μὲν γὰρ ἐναντίον ὕδωρ, ἀέρι δὲ γῆ. ταῦτα γὰρ ἐκ τῶν ἐναντίων παθημάτων συνέστηκεν. οὐ μὴν ἀλλ᾽ ἁπλῶς γε τέτταρα ὄντα ἑνὸς ἕκαστόν ἐστι· γῆ μὲν γὰρ ξηροῦ μᾶλλον, ἢ ψυχροῦ· ὕδωρ δὲ, ψυχροῦ μᾶλλον, ἢ ὑγροῦ· ἀὴρ δὲ, ὑγροῦ μᾶλλον, ἢ θερμοῦ· πῦρ B δὲ, θερμοῦ μᾶλλον, ἢ ξηροῦ.

ΚΕΦΑΛ. δ΄.

Ὅτι πᾶν ἐκ παντὸς γίνεται, καὶ πῶς.

ΕΠεὶ δὲ διώρισται πρότερον, ὅτι τοῖς ἁπλοῖς σώμασιν ἐξ ἀλλήλων ἡ γένεσις, ἅμα δὲ καὶ κατὰ τὴν αἴσθησιν φαίνεται γινόμενα (οὐ γὰρ ἂν ἦν ἀλλοίωσις· κατὰ γὰρ τὰ τῶν ἁπτῶν πάθη ἡ ἀλλοίωσίς ἐστι) λεκτέον τίς ὁ τρόπος τῆς εἰς ἄλληλα μεταβολῆς, καὶ πότερον ἅπαν ἐξ ἅπαντος γίγνεσθαι δυνατὸν, ἢ τὰ μὲν δυνατὸν, τὰ δ᾽ ἀδύνατον. ὅτι C μὲν οὖν ἅπαντα πέφυκεν εἰς ἄλληλα μεταβάλλειν, φανερόν· ἡ γὰρ γένεσις, εἰς ἐναντία, καὶ ἐξ ἐναντίων· τὰ δὲ στοιχεῖα πάντα, ἔχει ἐναντίωσιν εἰς ἄλληλα, διὰ τὸ τὰς διαφορὰς ἐναντίας εἶναι. τοῖς μὲν γὰρ ἀμφότεραι ἐναντίαι, οἷον πυρὶ καὶ ὕδατι. τὸ μὲν γὰρ ξηρὸν καὶ θερμόν, τὸ δὲ ὑγρὸν καὶ ψυχρόν· τοῖς δὲ, ἡ ἑτέρα μόνη, οἷον ἀέρι καὶ ὕδατι. τὸ μὲν γὰρ, ὑγρὸν καὶ θερμόν, τὸ δὲ, ψυχρὸν καὶ ὑγρόν. ὥστε καθόλου μὲν φανερὸν, ὅτι πᾶν ἐκ παντὸς γίνεσθαι πέφυκεν· ἤδη δὲ καθ᾽ ἕκαστον οὐ χαλεπὸν ἰδεῖν πῶς· ἅπαντα μὲν γὰρ ἐξ ἁπάντων ἔσται, διοίσει δὲ, τῷ θᾶττον καὶ βραδύτερον, καὶ τῷ D ῥᾷον καὶ χαλεπώτερον. ὅσα μὲν γὰρ ἔχει σύμβολον πρὸς ἄλληλα, ταχεῖα τούτων ἡ μετάβασις· ὅσα δὲ μὴ ἔχει, βραδεῖα, διὰ τὸ * ῥᾷον εἶναι τὸ ἓν, τὰ πολλὰ μεταβάλλειν. οἷον, ἐκ πυρὸς μὲν ἔσται ἀὴρ θατέρου μεταβάλλοντος· τὸ μὲν γὰρ ἦν θερμὸν καὶ ξηρόν· τὸ δὲ θερμὸν καὶ ὑγρόν. ὥστε ἂν κρατηθῇ τὸ ξηρὸν ὑπὸ τοῦ ὑγροῦ, ἀὴρ ἔσται. πάλιν δὲ ἐξ ἀέρος ὕδωρ, ἐὰν κρατηθῇ τὸ θερμὸν ὑπὸ τοῦ ψυχροῦ· τὸ μὲν γὰρ ἦν ὑγρὸν καὶ θερμόν, τὸ δὲ ψυχρὸν καὶ ὑγρόν. ὥστε μεταβάλλοντος τοῦ θερμοῦ, ὕδωρ ἔσται. τὸν αὐτὸν δὲ τρόπον καὶ ἐξ ὕδατος γῆ, καὶ ἐκ γῆς πῦρ. ἔχει γὰρ ἄμφω πρὸς ἄμφω σύμβολα· τὸ μὲν γὰρ ὕδωρ, ὑγρὸν καὶ ψυχρόν· ἡ δὲ γῆ, ψυχρὸν καὶ ξηρόν. ὥστε κρατηθέντος τοῦ ὑγροῦ, γῆ ἔσται. καὶ E πάλιν ἐπεὶ τὸ μὲν πῦρ ξηρὸν καὶ θερμόν, ἡ δὲ γῆ ψυχρὸν καὶ ξηρόν, ἐὰν φθαρῇ τὸ ψυχρόν, πῦρ ἔσται ἐκ γῆς. ὥστε φανερόν, ὅτι κύκλῳ τε ἔσται ἡ γένεσις τοῖς ἁπλοῖς σώμασι· καὶ ῥᾷστος οὗτος ὁ τρόπος τῆς μεταβολῆς διὰ τὸ σύμβολον ἐνυπάρχειν τοῖς ἐφεξῆς. ἐκ πυρὸς δὲ ὕδωρ, καὶ ἐξ ἀέρος γῆν, καὶ πάλιν ἐξ ὕδατος καὶ γῆς ἀέρα καὶ πῦρ, ἐνδέχεται μὲν γίνεσθαι, χαλεπώτερον δὲ, διὰ τὸ πλειόνων εἶναι τὴν μεταβολήν· ἀνάγκη γὰρ εἰ ἔσται ἐξ ὕδατος πῦρ, φθαρῆναι καὶ τὸ ψυχρὸν καὶ τὸ ὑγρόν· καὶ πάλιν εἰ ἐκ γῆς ἀήρ, φθαρῆναι καὶ τὸ ψυχρὸν καὶ τὸ ξηρόν. ὡσαύτως δὲ καὶ εἰ ἐκ πυρὸς καὶ ἀέρος ὕδωρ καὶ γῆ, ἀνάγκη ἀμφότερα μεταβάλλειν.

* κ. ῥᾷον ἐστὶ ἓν ἢ τὰ π. μ.

A αὕτη μὲν οὖν χρονιωτέρα ἡ γένεσις· ἐὰν δ' ἑκατέρου θάτερον φθαρῇ, ῥᾷον μὲν, οὐκ εἰς ἄλληλα δὲ ἡ μετάβασις· ἀλλ' ἐκ πυρὸς μὲν καὶ ὕδατος ἔσται γῆ καὶ ἀὴρ, ἐξ ἀέρος δὲ καὶ γῆς πῦρ καὶ ὕδωρ· ὅταν μὲν γὰρ τοῦ ὕδατος φθαρῇ τὸ ψυχρὸν, τοῦ δὲ πυρὸς τὸ ξηρὸν, ἀὴρ ἔσται· λείπεται γὰρ τοῦ μὲν τὸ θερμὸν, τοῦ δὲ τὸ ὑγρόν. ὅταν δὲ τοῦ μὲν πυρὸς τὸ θερμὸν, τοῦ δὲ ὕδατος τὸ ὑγρὸν, γῆ, διὰ τὸ λείπεσθαι τοῦ μὲν τὸ ξηρὸν, τοῦ δὲ τὸ ψυχρόν. ὡσαύτως δὲ καὶ ἐξ ἀέρος καὶ γῆς, πῦρ καὶ ὕδωρ· ὅταν μὲν γὰρ τοῦ ἀέρος φθαρῇ τὸ θερμὸν, τῆς δὲ γῆς τὸ ξηρὸν, ὕδωρ ἔσται· λείπεται γὰρ, τοῦ μὲν τὸ ὑγρὸν, τῆς δὲ τὸ ψυχρόν· ὅταν δὲ, B τοῦ μὲν ἀέρος τὸ ὑγρὸν, τῆς δὲ γῆς τὸ ψυχρὸν, πῦρ, διὰ τὸ λείπεσθαι τοῦ μὲν τὸ θερμὸν, τῆς δὲ τὸ ξηρὸν, ἅπερ ἦν πυρός. ὁμολογουμένη δὲ καὶ τῇ αἰσθήσει ἡ τοῦ πυρὸς γένεσις. μάλιστα μὲν γὰρ ἡ φλὸξ πῦρ· αὕτη δ' ἐστὶ καπνὸς καιόμενος· ὁ δὲ καπνὸς ἐξ ἀέρος καὶ γῆς. ἐν δὲ τοῖς ἐφεξῆς, οὐκ ἐνδέχεται φθαρέντος ἐν ἑκατέρῳ θατέρου τῶν στοιχείων γενέσθαι μετάβασιν εἰς οὐδὲν τῶν σωμάτων, διὰ τὸ λείπεσθαι ἐν ἀμφοῖν ἢ ταὐτὰ, ἢ τὰ ἐναντία. ἐξ οὐδετέρων δὲ ἐγχωρεῖ γίνεσθαι σῶμα· οἷον εἰ μὲν τοῦ πυρὸς * φθαρείη τὸ ξηρὸν, τοῦ δὲ ἀέρος τὸ ὑγρόν· λείπεται γὰρ ἐν ἀμφοῖν τὸ θερμόν. ἐὰν δ' ἐξ ἑκατέρου τὸ θερμὸν λείπεται τἀναντία, ξηρὸν καὶ ὑγρόν. ὁμοίως δὲ καὶ ἐν τοῖς ἄλλοις· ἐν C ἅπασι γὰρ * τοῖς τοιούτοις ἐνυπάρχει, τὸ μὲν ταὐτὸν, τὸ δ' ἐναντίον. ὥσθ' ἅμα δῆλον ὅτι τὰ μὲν ἐξ ἑνὸς εἰς ἓν μεταβαίνοντα, ἑνὸς φθαρέντος γίνεται· τὰ δ' ἐκ δυοῖν εἰς ἓν, πλειόνων. ὅτι μὲν οὖν ἅπαντα ἐκ παντὸς γίνεται, καὶ τίνα τρόπον εἰς ἄλληλα μετάβασις γίνεται, εἴρηται.

* γ. φθαρῇ

* γ. τοῖς ἴσοις ἐν.

ΚΕΦΑΛ. ε΄.

Ὅτι τέσσαρά ἐστι τὰ στοιχεῖα· καὶ ὅτι ἀδύνατον ἀρχὴν τινὰ εἶναι αὐτῶν.

D Οὐ μὴν ἀλλ' ἔτι καὶ ὧδε θεωρήσωμεν περὶ αὐτῶν. εἰ γάρ ἐστι τῶν φυσικῶν σωμάτων ὕλη, ὥσπερ καὶ δοκεῖ ἐνίοις, ὕδωρ καὶ ἀὴρ, καὶ τὰ τοιαῦτα, ἀνάγκη ἤτοι ἓν, ἢ δύο εἶναι ταῦτα, ἢ πλείω. ἓν μὲν δὴ πάντα οὐχ οἷόν τε· οἷον ἀέρα πάντα, ἢ ὕδωρ, ἢ πῦρ, ἢ γῆν, εἴπερ ἡ μεταβολὴ εἰς τἀναντία. εἰ γὰρ εἴη ἀὴρ, εἰ μὲν ὑπομένει, ἀλλοίωσις ἔσται, ἀλλ' οὐ γένεσις. ἅμα δ' οὐδ' οὕτω δοκεῖ, ὥστε ὕδωρ εἶναι ἅμα καὶ ἀέρα, ἢ ἄλλο ὁτιοῦν. ἔσται δή τις ἐναντίωσις καὶ διαφορὰ, ἧς ἕξει θάτερον μόριον τὸ πῦρ, οἷον θερμότητα· ἀλλὰ μὴν οὐκ ἔσται τό γε πῦρ ἀὴρ θερμός. ἀλλοίωσις γὰρ τὸ τοιοῦτον, καὶ οὐ φαίνεται. ἅμα δὲ πάλιν εἰ ἔσται ἐκ τοῦ πυρὸς ἀὴρ, E τοῦ θερμοῦ εἰς τοὐναντίον μεταβάλλοντος ἔσται. ὑπάρξει ἄρα τῷ ἀέρι τοῦτο, καὶ ἔσται ὁ ἀὴρ ψυχρόν τι. ὥστε ἀδύνατον τὸ πῦρ ἀέρα θερμὸν εἶναι· ἅμα γὰρ τὸ αὐτὸ θερμὸν καὶ ψυχρὸν ἔσται. * ἄλλο τι ἄρα παρ' ἀμφότερα τὸ αὐτὸ ἔσται, καὶ ἄλλη τις ὕλη κοινή. ὁ δ' αὐτὸς λόγος καὶ περὶ ἁπάντων, ὅτι οὐκ ἔστιν ἓν τούτων ἐξ οὗ τὰ πάντα. οὐ μὴν οὐδ' ἄλλο τι γε παρὰ ταῦτα. οἷον μέσον τι ἀέρος καὶ ὕδατος, ἢ ἀέρος καὶ πυρός· ἀέρος μὲν παχύτερον καὶ πυρὸς, τῶν δὲ ἄλλων λεπτότερον· ἔσται γὰρ ἀὴρ καὶ πῦρ ἐκεῖνο μετ' ἐναντιότητος· ἀλλὰ στέρησις τὸ ἕτερον τῶν ἐναντίων· ὥστ' οὐκ ἐνδέχεται μονοῦσθαι ἐκεῖνο οὐδέποτε, ὥσπερ φασί τινες τὸ ἄπειρον,

* γ. ἄλλο τι ἀήρ, ἅμα.

A Hæc igitur generatio tardior eſt. Sin vero vtriuſque altera qualitatum intereat, horum migratio facilius quidem, ſed non in ſeſe mutuo, fiet, ſed ex igni quidem & aqua, terra & aër: ex aëre vero & terra, ignis & aqua ortum ſubibunt. Cùm enim aquæ frigiditas fuerit corrupta, & ignis ſiccitas, fiet aër. nam huius quidem caliditas, illius vero ſimiliter humiditas relinquitur. At cùm calor ignis, & aquæ humiditas interierint, terra: propterea quòd huius frigiditas, & illius ſiccitas, remanent. eodem modo ex aëre terráque, ignis & aqua. nam cùm aëris calor & terræ ſiccitas interitum ſubierint, fiet aqua: quandoquidem illius humiditas, huius frigiditas relinquitur. cùm vero aëris quidem B humiditas, terræ vero frigiditas, ignis: quia illius caliditas remanet, huius ſiccitas; quæ nimirum igni competunt. Ignem autem gigni, etiam ſenſus ipſe approbat. maximè enim flamma, ignis eſt: hæc autem, eſt fumus ardens: fumus vero, ex aëre atque terra fit. Porro in hiſce quę ſunt deinceps, ſi in vtroque qualitas altera corrupta ſit: haudquaquam elementorum migratio in vllum corpus fieri poteſt, eo quod in vtriſque aut eadem aut contraria relinquantur, ex quibus nullum profectò corpus oriri poteſt. vt ſi ſiccitas ignis, & aëris humiditas ſit corrupta, calor in vtriſque remanet. Si vero ab vtroque calor abierit, contraria, ſiccum inquam & humi- C dum relinquuntur. Similiter autem & in cæteris. Nam in omnibus quæ ſunt eiuſmodi, qualitatum altera eadem, altera contraria ineſt. Vnde ſimul perſpicuum euadit, quæ ex vno in vnum mutantur, vno corrupto: quæ ex duobus in vnum, corruptis pluribus gigni. Quòd igitur ex omnibus omnia gignantur, & quónam pacto in ſeſe viciſſim commigrent, dictum eſt.

CAPVT V.

Elementa rerum naturalium non eſſe materiam, neque infinita.

D Attamen adhuc & hîc quoque de eis contemplemur. Si enim aqua & aër, & id genus naturalium corporum materies ſint, ſicuti nonnullis quoque placet: aut vnum, aut duo; aut plura eſſe hæc neceſſe eſt. Itaque vt vnum, ſcilicet aër, vel aqua, vel ignis, vel terra, omnia ſit, fieri nequit: ſi tranſmutatio in contraria ſit, atque id tranſmutetur. Nam ſi aër ſit, ſi remanet, alteratio erit, & non generatio. Inſuper nec ita videtur, vt ſimul aër, & ignis, aut quoduis aliud ſit. Eſſet enim aduerſantia quædam, differentiáque: cuius partem alteram, ceu calorem, ignis haberet. At vero nec ignis aër calidus erit. nam quod eſt eiuſmodi, alteratio eſt, & nō E generatio. Adhæc ſi ex igni aër oriatur, calore in cōtrarium mutato fiet. hoc ergo inerit aëri, eritque aër frigidū quid. Quare fieri non poteſt vt ignis aër calidus ſit. ſimul enim idem calidum eſſet, atq; frigidum. Erit ergo aliud quid præter vtrumque idē, & alia quædam communis materies. Eadem autem & de omnibus ratio eſt, non eſſe inquam inter hæc vnum ex quo vniuerſa ſint. Sed neque aliud quippiam præter hæc, veluti medium quoddam aëris & aquæ, aut aëris & ignis, aëre quidem & igni craſſius, ſed cæteris ſubtilius. Nam illud, aër & ignis, cum contrarietate eſſet. ſed è contrariis alterum, priuatio eſt. Quare fieri non poteſt vt illud vnquam per ſe ſit: quemadmodum quidam aiunt infinitum,

& id quod comprehendit atque continet. Similiter ergo horum quoduis, aut certè nullum. Si igitur nullum ſenſibile hiſce priuſ ſit, hæc profectò erunt prima. Aut igitur ea ſemper manere, & in ſeſe viciſſim tranſmutari non poſſe, aut poſſe, & aut omnia aut aliqua, & aliqua non, quemadmodũ in Timæo Plato prodidit, eſt neceſſe. Quod igitur neceſſe ſit ea inuicem in ſe mutari, demonſtratum eſt priùs. Quòd verò non æquè celeriter aliud ex alio naſcatur, quòd quæ communem nacta ſunt qualitatem, celeriùs ex ſeſe mutuò oriantur, quæ verò non ſunt nacta, tardiùs, dictum iam eſt. Ergo ſi vna ſit aduerſantia per quam mutationem ſubeant, duo ſint neceſſe eſt. nam inſenſibilis inſeparabiliſque materies, medium eſt. Porrò cùm plura eſſe videantur, duæ ad minimum contrarietates erunt. Sed cùm duæ ſint, eſſe tria non poſſunt, ſed quatuor, vt patet. Tot enim ſunt coniugationes. Nam cùm ſint ſex, duæ ex eis fieri non poſſunt. propterea quòd inter ſeſe contrariæ ſunt. Sed de hiſce diximus priùs. Cùm autem mutuò in ſeſe tranſmutentur, fieri nõ poſſe vt principium quoddam ſit eorum, vel in extremo vel in medio, ex hiſce palàm fiet. In extremis igitur non erit principium, quia ignis aut terra eſſent omnia. idémque ſermo eſt, atque ſi ex igni aut terra conſtare omnia dicamus. Præterea neque medium principium erit: ſicuti quidam aërem quidẽ & in ignem & in aquam, aquam verò & in aërem & in terram, vltima autem non ampliùs in ſeſe viciſſim tranſmutari putant. Nam ſtet hoc, nec in infinitum rectà vtraque ex parte abeat, oportet. in vno enim, contrarietates eſſent infinitæ. Sit t terra, l lympha ſeu aqua, a aër, i ignis. Itaque ſi a in i & l mutetur, vna erit contrarietas, nempe ipſorum a i. ſint hæc, albor & nigror. Rurſum ſi i in l & a mutetur, erit altera. non enim l & i idem ſunt. ſint autem ſiccitas & humiditas, s quidem ſiccitas, h verò humiditas. Igitur ſi albor maneat, humida & alba erit aqua: ſin minùs, nigra. quandoquidem in cõtraria mutatio eſt. Aquam igitur aut albam eſſe, aut nigram, neceſſe eſt. Sit primum. Pari ergo ratione s inerit i. Tranſmutabitur igitur & ipſe ignis in aquam contraria enim ſunt. nam ignis primò niger erat, & dèinde ſiccus: aqua verò humida, & poſtea alba. Liquet itaque, omnia in ſeſe viciſſim tranſmutari: atque etiam in hiſce, ipſi terræ reliqua duo ſymbola, nigrorem inquam & humiditatem, competere. hęc enim nećdum copulata fuere. Sed quòd fieri nequeat in infinitum abitio (quod quidem cùm eſſemus demonſtraturi, in hoc antè incidimus) ex hiſce emerget. Si enim rurſum i, id eſt, ignis, in aliud ceu in m tranſmutetur, nec regreſſio fiat, aduerſantia quædã ab hiſce quas diximus alia, i & m inerit. nam m, nulli ipſorum t l a i eſſe idem ſupponitur. Sit itaque κ ipſi i, & o ipſi m. κ itaque, omnibus t l a i inerit. nam ea in ſeſe mutuò tranſmutari ſolent. Sed hoc quidem nondum ſit oſtenſum. illud tamen in aperto eſt, quod ſi m in aliud rurſum tranſmutetur, alia in m & in i contrarietas inerit. atque ita ſemper primis cum ſequentibus aliqua inerit aduerſantia. Quare ſi infinita ſint, infinitæ quoque erunt in vno contrarietates. Quod ſi hoc ſit, nec finiri quicquam, nec oriri poterit. Nam ſi aliud ex alio fiet, tot & adhuc plures tranſire contrarietates oportebit. Quare in nonnulla tranſmutatio fiet nunquam, videlicet ſi intermedia infinita ſint. quod profectò neceſſario accidet, ſi infinita ſint elementa,

A καὶ τὸ περιέχον. ὁμοίως ἄρα ὁποιονοῦν* τούτων, ἢ οὐθέν. εἰ δὴ οὐδὲν αἰσθητόν γε πρότερον τούτων, ταῦτα ἂν εἴη πάντα. ἀνάγκη τοίνυν, ἢ ἀεὶ μένοντα καὶ ἀμετάβλητα εἰς ἄλληλα, ἢ μεταβάλλοντα καὶ ἢ πάντα, ἢ τὰ μὲν, τὰ δ' οὔ, ὥσπερ ἐν τῷ Τιμαίῳ Πλάτων ἔγραψεν. ὅτι μὲν τοίνυν μεταβάλλειν ἀνάγκη εἰς ἄλληλα, δέδεικται πρότερον· ὅτι δ' οὐχ ὁμοίως ταχέως ἄλλο ἐξ ἄλλου, εἴρηται πρότερον· ὅτι τὰ μὲν ἔχοντα σύμβολον, θᾶττον γίνεται ἐξ ἀλλήλων· τὰ δ' οὐκ ἔχοντα, βραδύτερον. εἰ μὲν τοίνυν ἡ ἐναντιότης μία ἐστὶ καθ' ἣν μεταβάλλουσιν, ἀνάγκη δύο εἶναι· ἡ γὰρ ὕλη τὸ μέσον ἀναίσθητος οὖσα, καὶ ἀχώριστος. B ἐπεὶ δὲ πλείω ὁρᾶται ὄντα, δύο ἂν εἶεν αἱ ἐλάχισται. δύο δ' ὄντων, οὐχ οἷόν τε τρία εἶναι, ἀλλὰ τέτταρα, ὥσπερ φαίνεται· τοσαῦται γὰρ αἱ συζυγίαι· ἓξ γὰρ οὐσῶν, τὰς δύο ἀδύνατον γενέσθαι, διὰ τὸ ἐναντίας εἶναι ἀλλήλαις. περὶ μὲν οὖν τούτων εἴρηται πρότερον. ὅτι δ' ἐπεὶ μεταβάλλουσιν εἰς ἄλληλα, ἀδύνατον ἀρχήν τινα εἶναι αὐτῶν, ἢ ἐπὶ τῷ ἄκρῳ, ἢ ἐπὶ τῷ μέσῳ, ἐκ τῶνδε δῆλον. ἐπὶ μὲν οὖν τοῖς ἄκροις οὐκ ἔσται, ὅτι πῦρ ἔσται, ἢ γῆ πάντα· καὶ ὁ αὐτὸς λόγος τῷ φάναι ἐκ πυρὸς, ἢ ἐκ γῆς εἶναι πάντα. ὅτι δ' οὐδὲ μέσον, ὥσπερ δοκεῖ τισιν, ἀὴρ μὲν καὶ εἰς πῦρ μεταβάλλειν καὶ εἰς ὕδωρ, ὕδωρ δὲ καὶ εἰς ἀέρα καὶ εἰς γῆν· τὰ δ' ἔσχατα, οὐκ ἔτι εἰς ἄλληλα. δεῖ μὲν γὰρ στῆναι, καὶ μὴ εἰς ἄπειρον τοῦτο ἰέναι C ἐπ' εὐθείας ἐφ' ἑκάτερα· ἄπειροι γὰρ αἱ ἐναντιότητες ἐπὶ τοῦ ἑνὸς ἔσονται. ἔστω γὰρ γῆ ἐφ' ᾧ γ, ὕδωρ ἐφ' ᾧ υ, ἀὴρ ἐφ' ᾧ α, πῦρ ἐφ' ᾧ π. εἰ δὲ τὸ α μεταβάλλει εἰς τὸ π, καὶ υ, καὶ ἐναντιότης ἔσται τῶν α π. ἔστω δὲ ταῦτα, λευκότης καὶ μελανία. πάλιν εἰ εἰς τὸ υ τὸ α, ἔσται ἄλλη· οὐ γὰρ τὸ αὐτὸ τὸ υ, καὶ π. ἔστω δὲ ξηρότης καὶ ὑγρότης, τὸ μὲν ξ, ξηρότης, τὸ δὲ υ, ὑγρότης. οὐκοῦν εἰ μὲν μένει τὸ λευκὸν, ὑπάρξει τὸ ὕδωρ ὑγρὸν καὶ λευκόν· εἰ δὲ μή, μέλαν ἔσται τὸ ὕδωρ· εἰς τἀναντία γὰρ ἡ μεταβολή. ἀνάγκη ἄρα ἢ λευκὸν ἢ μέλαν εἶναι τὸ ὕδωρ. ἔστω δὴ τὸ* πρότερον. ὁμοίως τοίνυν καὶ τῷ π τὸ ξ ὑπάρξει ἡ ξηρότης. ἔσται ἄρα καὶ τῷ π τῷ πυρὶ μεταβολὴ εἰς τὸ ὕδωρ· ἐναντία γὰρ D ὑπάρχει*· τὸ μὲν γὰρ πῦρ, τὸ πρῶτον μέλαν ἦν, ἔπειτα δὲ ξηρόν· τὸ δ' ὕδωρ ὑγρὸν, ἔπειτα δὲ λευκόν. φανερὸν δὴ ὅτι πᾶσιν ἐξ ἀλλήλων ἔσται ἡ μεταβολή, καὶ ἐπί γε τούτων, ὅτι καὶ ἐν τῷ γ τῇ γῇ ὑπάρξει τὰ λοιπὰ, καὶ δύο σύμβολα τὸ μέλαν καὶ τὸ ὑγρόν· ταῦτα γὰρ οὐ συνδεδύασταί πως. ὅτι δὲ εἰς ἄπειρον οὐχ οἷόν τ' ἰέναι, ὅπερ μελλήσαντες δεῖξαι, ἐπὶ τοῦτο ἔμπροσθεν ἤλθομεν, δῆλον ἐκ τῶνδε. εἰ γὰρ πάλιν τὸ πῦρ ἐφ' ᾧ π, εἰς ἄλλο μεταβαλεῖ καὶ μὴ ἀνακάμψει, οἷον εἰς τὸ ψ, ἐναντιότης τις* τῷ πυρὶ, καὶ τῷ ψ ἄλλη ὑπάρξει τῶν εἰρημένων· οὐθενὶ γὰρ τὸ αὐτὸ ὑπόκειται, τῶν γ υ α π τὸ ψ. ἔστω δὴ τῷ μὲν π, τὸ κ· τῷ δὲ ψ, τὸ φ. τὸ δὴ κ, πᾶσιν ὑπάρξει E τοῖς γ υ α π· μεταβάλλουσι γὰρ εἰς ἄλληλα. ἀλλὰ γὰρ τοῦτο μὲν ἔστω μήπω δεδειγμένον· ἀλλ' ἐκεῖνο δῆλον, ὅτι εἰ πάλιν τὸ ψ εἰς ἄλλο, ἄλλη ἔσται ἐναντιότης καὶ τῷ ψ ὑπάρξει, καὶ τῷ πυρὶ τῷ π. ὁμοίως δ' ἀεὶ μετὰ τοῦ προστιθεμένου ἐναντιότης τις ὑπάρξει τοῖς ἔμπροσθεν· ὥστ' εἰ ἄπειρα, καὶ ἐναντιότητες ἄπειροι, τῷ ἑνὶ ὑπάρξουσιν. εἰ δὲ τοῦτο, οὐκ ἔσται οὔτε ὁρίσασθαι οὐδὲν, οὔτε γενέσθαι. δεήσει γὰρ εἰ ἔσται ἄλλο ἐξ ἄλλου, τοσαύτας διεξελθεῖν ἐναντιότητας, καὶ ἔτι πλείους· ὥστε εἰς ἔνια μὲν οὐδέποτε ἔσται μεταβολή· οἷον εἰ ἄπειρα τὰ μεταξύ· ἀνάγκη δ' εἴπερ ἄπειρα τὰ στοιχεῖα.

* γρ. τούτων ἀρχή.
* γρ. πρότερον λευκόν.
* γρ. τὸ π γὰρ πῦρ.
* γρ. τῷ π, τῷ.

ἔτι δὲ, οὐδ' ἐξ ἀέρος εἰς πῦρ, εἴπερ ἄπειροι αἱ ἐναντιότητες. A γίνεται δὲ καὶ πάντα ἕν· ἀνάγκη γὰρ ἁπάσας ὑπάρχειν, τοῖς μὲν κάτω τοῦ Ω, τὰς τῶν ἄνωθεν· τούτοις δὲ, τὰς τῶν κάτωθεν· ὥστε πάντα ἓν ἔσται.

ΚΕΦΑΛ. ϛʹ.

Ἔλεγχος τῶν λεγόντων τὰ στοιχεῖα μὴ μεταβάλλειν εἰς ἄλληλα.

Θαυμάσειε δ' ἄν τις τῶν λεγόντων πλείω ἑνὸς τὰ στοιχεῖα τῶν σωμάτων, ὥστε μὴ μεταβάλλειν εἰς ἄλληλα, καθάπερ Ἐμπεδοκλῆς φησι, πῶς ἐνδέχεται B λέγειν αὐτοῖς εἶναι συμβλητὰ τὰ στοιχεῖα· καίτοι λέγει οὕτω· Ταῦτα γὰρ ἶσα πάντα. Εἰ μὲν οὖν κατὰ τὸ ποσὸν, ἀνάγκη ταὐτό τι εἶναι ὑπάρχον ἅπασι τοῖς συμβλητοῖς ᾧ μετροῦνται· οἷον εἰ ἐξ ὕδατος κοτύλης εἶεν κοτύλαι ἀέρος δέκα· τὸ αὐτό τι ἦν ἄρα ἄμφω, εἰ μετρεῖται τῷ αὐτῷ. εἰ δὲ μὴ οὕτω συμβλητὰ κατὰ τὸ ποσὸν, ὡς ποσὸν ἐκ ποσοῦ, ἀλλ' ὅσον δύναται, οἷον εἰ κοτύλη ὕδατος ἴσον δύναται ψύχειν, καὶ δέκα ἀέρος, καὶ οὕτως κατὰ τὸ ποσὸν οὐχ ᾗ ποσὸν συμβλητὰ, ἀλλ' ᾗ δύναταί τι. εἴη δ' ἂν καὶ μὴ τῷ τοῦ ποσοῦ μέτρῳ συμβάλλεσθαι τὰς δυνάμεις, ἀλλὰ κατ' C ἀναλογίαν· οἷον ὡς τόδε θερμὸν, τόδε λευκόν. τὸ δ' ὡς τόδε, σημαίνει ἐν μὲν ποιῷ, τὸ ὅμοιον· ἐν δὲ ποσῷ, τὸ ἴσον. ἄτοπον δὴ φαίνεται, εἰ τὰ σώματα ἀμετάβλητα ὄντα, μὴ ἀναλογίᾳ συμβλητά ἐστιν, ἀλλὰ μέτρῳ τῶν δυνάμεων, καὶ τῷ εἶναι ἴσον θερμὸν, ἢ ὅμοιον πυρὸς τοσονδὶ, καὶ ἀέρος πολλαπλάσιον. τὸ γὰρ αὐτὸ πλεῖον τῷ ὁμογενὲς εἶναι, τοιοῦτον ἕξει τὸν λόγον. ἀλλὰ μὴν οὐδ' αὔξησις ἂν εἴη κατ' Ἐμπεδοκλέα, ἀλλ' ἢ ἡ κατὰ πρόσθεσιν· πυρὶ γὰρ αὔξει τὸ πῦρ·

Αὔξει δὲ χθὼν μὲν σφέτερον γένος, αἰθέρα δ' αἰθήρ. D

ταῦτα δὲ προστίθεται. δοκεῖ δ' οὐχ οὕτως αὔξεσθαι τὰ αὐξανόμενα. πολὺ δὲ χαλεπώτερον ἀποδοῦναι περὶ γενέσεως τῆς κατὰ φύσιν· τὰ γὰρ γινόμενα φύσει, πάντα γίγνεται, ἢ ἀεὶ ὡδὶ, ἢ ὡς ἐπὶ τὸ πολύ· τὰ δὲ παρὰ τὸ ἀεὶ, καὶ ὡς ἐπὶ τὸ πολὺ, ἀπὸ ταὐτομάτου, καὶ ἀπὸ τύχης. τί οὖν τὸ αἴτιον τοῦ ἐξ ἀνθρώπου ἄνθρωπον; ἢ ἀεὶ, ἢ ὡς ἐπὶ τὸ πολὺ καὶ ἐκ τοῦ πυροῦ πυρὸν, ἀλλὰ μὴ ἐλαίαν, ἢ καὶ ἐὰν ὡδὶ συντεθῇ ὀστοῦν; οὐ γὰρ * ὡς ἔτυχε συνελθόντων οὐδὲν γίγνεται, καθάπερ ἐκεῖνός φησιν, ἀλλὰ λόγῳ τινί. τί οὖν τὸ τούτων αἴτιον; οὐ γὰρ E δὴ πῦρ γε, ἢ γῆ· ἀλλὰ μὴν οὐδ' ἡ φιλία καὶ τὸ νεῖκος· συγκρίσεως γὰρ μόνον, τὸ δὲ διακρίσεως αἴτιον. τοῦτο δ' ἐστὶν ἡ οὐσία ἡ γε ἑκάστου, ἀλλ' οὐ μόνον

-- μίξις τε διάλλαξίς τε μιγέντων

ὥσπερ ἐκεῖνός φησι. τύχη δ' ἐπὶ τούτων ὀνομάζεται, ἀλλ' οὐ λόγος. ἔστι δὲ μιχθῆναι ὡς ἔτυχε. τῶν γὰρ δὴ φύσει ὄντων αἴτιον, τὸ οὕτως ἔχειν, καὶ ἡ ἑκάστου φύσις, αὕτη περὶ ἧς οὐδὲν λέγει. οὐδὲν ἄρα περὶ φύσεως λέγει. ἀλλὰ μὴν καὶ τὸ εὖ τοῦτο καὶ ἀγαθόν. ὁ δὲ τὴν μίξιν μόνον ἐπαινεῖ. καίτοι γε τὰ στοιχεῖα διακρίνει, οὐ τὸ νεῖκος,

* γρ. ὅπως ἔτ.

Præterea neque ex aëre in ignẽ tranſmutatio fiet, ſi infinitæ ſint contrarietates. Fient etiam omnia vnum. nam omnes ſuperiorum contrarietates, his ce ineſſe quæ infra ı ſunt collocata, & contrà neceſſe eſt. Quare omnia vnum erunt.

CAPVT VI.

Contra Empedoclis, de elementis, augmentatione, generatione, motu, ſententiam.

Mirabitur porrò aliquis, eos qui elemẽta corporum vno plura eſſe dicunt, ita vt in ſe non tranſmutentur, ſicuti Empedocles inquit, quo pacto ipſi elementa eſſe comparabilia dicere queant. Atqui ille ad hunc modum ait: nam æqualia ſunt hæc omnia. Si igitur ſecundùm quantitatem, idem quid omnibus ineſſe comparabilibus quo metiantur, eſt neceſſe, vt ſi ex aquę ſextario vno, aëris decem fiant: ergo idem quid vtraque ſunt, ſi menſurantur eodem. Sin verò nõ hoc pacto ſecundùm quantitatem, vt è quanto quantum, ſed quantum poſſint: velut ſi aquæ ſextarius æquè frigefacere atque aëris decem poſſit, atque ita ſecundùm quantitatem, non quatenus quantitas eſt, ſed quatenus poſſunt aliquid, comparabilia ſunt: fiet ſanè, vt etiam non quantitatis menſurâ ſecundùm potẽtias atque vires, ſed proportione comparentur. verbi cauſa: vt hoc calidum, hoc album. ſed vt hoc, in qualitate quidem ſimilitudinem ſignificat, in quãtitate verò æqualitatẽ. Videtur itaque eſſe abſurdum, ſi corpora illa quæ tranſmutari nequeunt, proportione comparabilia non ſint, ſed potentiarũ menſura, & eo quod tantum ignis, æquale vel ſimile calidum ſit atque aëris multo plus. Idẽ namque cùm maius eſt, ex eo quia vnius eſt generis, hanc habebit rationem. At verò neque accretio fuerit ſecundùm Empedoclem, præterquam quæ additione fit. nam igni ignem augeri cenſet. inquit enim:

Auget terra quidem proprium genus æthcráque æther.

Hæc autem adiiciuntur, apponuntúrque. At ea quæ incrementa ſuſcipiunt, non ad hunc modum augeri videntur. Longè autem difficilius fuerit eidem, de generatione quę natura ſit, rationem aſſignaſſe. Nam omnia quæ natura gignũtur, aut ſemper ſic aut plerunque fiunt. Quę verò non ſemper aut plerunque fiunt, à caſu & fortuna fieri aſſolent. Quænam igitur cauſa eſt, vt ex homine homo, aut ſemper aut plerunque, & è tritico triticum, ſed non oliua, oriatur? An ſi ita componatur os? non enim vtcunque, quemadmodum inquit ille, ſed ratione quadam coeuntibus fit aliquid. Quænam igitur horum cauſa eſt? non enim ignis vel terra, cauſa exiſtit. At verò neque concordia aut diſcordia: etenim hæc ſegregationis, illa verò congregationis ſolùm cauſa eſt. Hoc autem eſt cuiuſque eſſentia, ſed non,

Miſtio miſtorúmque priùs diuulſio ſolùm:

quemadmodum inquit ille. In hiſce namque fortuna nominari ſolet, non ratio. fieri enim poteſt vt aliqua, vt contingit, ac temere, miſceantur. Itaque ſic ſeſe habere eorum quæ natura conſtant, cauſa exiſtit. atque cuiuſque natura hæc eſt, de qua nihil meminit. Nihil ergo de natura dicit. At verò hoc ipſum bonum exiſtit. Porrò ille ſolam miſtionem collaudat. Atqui diſcordia haudquaquam ſecernit elementa ipſa,

quæ natura deo priora ſunt: ſed concordia. dij autem & hæc quoque ſunt. Præterea de motu ſimpliciter dicit: non enim ſatis eſt dicere concordiã & diſcordiam mouere, niſi hæc concordiæ ratio ſit, motu inquam tali ciere, & diſcordiæ tali. Igitur aut definiuiſſe aut ſuppoſuiſſe, aut exactè vel molliter vel alio quolibet modo demõſtraſſe oportebat. Inſuper cùm vi & præter naturã moueri corpora videantur, per naturam quoque mouētur. vt ignis ad ſuperum quidē locum nõ vi, ſed ad inferũ vi fertur. Vi autem & natura cõtraria ſunt. Cõtingit autē vi moueri: ergo & natura quoq; motu cieri contingit. Concordia igitur illo motu mouet, aut non mouet. Nã terrã deorſum ferri, concordiæ contrariũ eſt, & ſegregationi ſimile exiſtit: potiuſque diſcordia naturalis motus cauſa eſt, quam concordia. Vnde fit vt omnino concordia potius præter naturã exiſtat. Simpliciter autem, niſi concordia aut lis moueat, ipſorum corporum nullus motus ſtatuſve eſt. At, hoc abſurdum eſt. Ad hæc videmus corpora motu cieri, nam diſcordia ſegregauit. Æther autē in ſublime ſubuectus non à diſcordia fuit, ſed interdum illum velut à fortuna ſublatum aſſerit: ſic dicens,

Nam plerumque aliter, ſed tum ſi forte cucurrit.

Interdum ignem ſurſum ferri aptiſſimum eſſe: inquit enim,

At æther longis ſub humum radicibus ibat.

Et inſuper ipſum quoque mundum ſimiliter hũc tempore diſcordiæ, vt prius tēpore concordiæ, habere dicit. Quid igitur mouens primum, motionisque cauſa exiſtit: non enim diſcordia & concordia, verùm hæc alicuius motus cauſæ ſunt. Quod ſi ſint, illa principium erit. Porrò abſurdum eſt, animam ex elementis conſtare, aut elementorum vnum aliquod eſſe. Quomodo enim animæ alterationes, ceu muſicum eſſe, & rurſum non muſicum, aut memoria, aut obliuio erunt. Perſpicuũ enim eſt, quòd ſi anima ignis ſit, eædem illi quæ igni, vt ignis eſt, affectiones competent. ſi verò ex elementorum miſtura conſtet, corporeæ. At harum nulla corporea exiſtit. Verum de hiſce conſiderare, alterius contemplationis eſt officium. De ipſis autem elementis, ex quibus corpora conſtant, iis quidem qui commune quid eſſe, aut ea inter ſe tranſmutari putant: ſi ex hiſce alterum, & alterum quoque cõtingat eſt neceſſe: qui verò generationem mutuam non faciunt, nec è ſingulis ſingula, ſed velut è muro lateres gigni volunt, abſurdum quid dicunt. Nam qui carnes, oſſa & cæterorũ quoduis ex illis erũt? Quod autē dicitur, dubitationem habet, etiam apud eos qui generationem mutuã aſtruunt, quonam pacto ex ipſis diuerſum quid ab eis oriatur. Verbi cauſa: ex igni aqua fit & ex aqua ignis. nã ſubiectum commune quid exiſtit: ſed & caro atque medulla ex eis fiunt: at hæc quomodo? Etenim illis qui perinde vt Empedocles dicunt, quiſnam erit modus? Nã compoſitionem eſſe quomodo è lateribus atque lapidibus fit murus, neceſſe eſt. & hæc miſtura ac congeries ex conſeruatis quidem, ſed ſecundùm exiguas portiones iuxta ſeſe compoſitis erit elementis. Ad hunc itaque modum, caro & cæterorum quodque fiet. Accidit autem, vt non ex qualibet carnis parte ignis & aqua gignantur (ſicuti ex cera, ex hac parte pila, ex aliqua alia meta fieri poteſt) ſed ex vtraque vtrunque fieri queat. Hæc itaque hoc gignuntur modo ex carne, ex quauis parte vtrunque. At hiſce qui illo modo dicunt, ex quauis vtrumque gigni non poteſt,

A ἀλλ' ἡ φιλία τῇ φύσει πρότερα τοῦ θεοῦ· θεοὶ δὲ καὶ ταῦτα. ἔτι δὲ περὶ κινήσεως ἁπλῶς λέγει· οὐ γὰρ ἱκανὸν εἰπεῖν, ὅτι ἡ φιλία καὶ τὸ νεῖκος κινεῖ, εἰ μὴ τοδὶ* φιλίᾳ εἶναι τὸ κινῆσαι τοιαδί, νείκει δὲ τὸ τοιαδί. ἔδει οὖν ἢ ὁρίσασθαι, ἢ ὑποθέσθαι, ἢ ἀποδεῖξαι, ἢ ἀκριβῶς, ἢ μαλακῶς, ἢ ἄλλως γέ πως. ἔτι ἐπεὶ φαίνεται καὶ βίᾳ, καὶ παρὰ φύσιν κινούμενα τὰ σώματα, καὶ κατὰ φύσιν, οἷον τὸ πῦρ, ἄνω μὲν οὐ βίᾳ, κάτω δὲ βίᾳ. τῷ δὲ βίᾳ τὸ κατὰ φύσιν ἐναντίον. ἔστι δὲ τὸ βίαιον, ἔστιν ἄρα καὶ τὸ κατὰ φύσιν κινεῖσθαι. ταύτην οὖν ἡ φιλία κινεῖ, ἢ οὔ; τοὐναντίον γὰρ τὴν γῆν* κάτω καὶ διακρίσει ἔοικε, καὶ μᾶλλον τὸ νεῖκος αἴτιον τῆς κατὰ φύσιν κινήσεως, ἢ ἡ φιλία. ὥστε καὶ ὅλως παρὰ φύσιν ἡ φιλία ἂν εἴη μᾶλλον. ἁπλῶς δὲ εἰ μὴ ἡ φιλία, ἢ τὸ νεῖκος κινοίη, αὐτῶν τῶν σωμάτων οὐδεμία κίνησίς ἐστιν, οὐδὲ μονή· ἀλλ' ἄτοπον. ἔτι δὲ φαίνεται κινούμενα· διέκρινε μὲν γὰρ τὸ νεῖκος, ἠνέχθη δ' ἄνω ὁ αἰθὴρ, οὐχ ὑπὸ τοῦ νείκους, ἀλλ' ὁτὲ μέν φησιν ὥσπερ ἀπὸ *τύχης·

Οὕτω γὰρ συνέκυρσε θέων τοτέ. πολλάκι δ' ἄλλως·

ὁτὲ δὲ φησὶ πεφυκέναι τὸ πῦρ, ἄνω φέρεσθαι· ὁ δ' αἰθήρ φησι,

-- μακρῇσι κατὰ χθόνα δύετο ῥίζαις.

ἅμα δὲ καὶ τὸν κόσμον ὁμοίως ἔχειν φησὶν ἐπί τε τοῦ νείκους νῦν, καὶ πρότερον ἐπὶ τῆς φιλίας. τί οὖν ἐστι τὸ κινοῦν πρῶτον καὶ αἴτιον τῆς κινήσεως; οὐ γὰρ δὴ ἡ φιλία καὶ τὸ νεῖκος, ἀλλὰ τινὸς κινήσεως ταῦτα αἴτια. εἰ δὲ ἐστιν, ἐκεῖνο ἀρχή. ἄτοπον δὲ, καὶ εἰ ἡ ψυχὴ ἐκ τῶν στοιχείων, ἢ ἕν τι αὐτῶν. αἱ γὰρ ἀλλοιώσεις αἱ τῆς ψυχῆς, πῶς ἔσονται, οἷον τὸ μουσικὸν εἶναι καὶ πάλιν ἄμουσον, ἢ μνήμη, ἢ λήθη; δῆλον γὰρ ὅτι εἰ μὲν πῦρ ἡ ψυχὴ, τὰ πάθη ὑπάρξει αὐτῇ ὅσα πυρὶ, ᾗ πῦρ· εἰ δὲ μικτὸν, τὰ σωματικά· τούτων δὲ οὐδὲν σωματικόν. ἀλλὰ περὶ μὲν τούτων, ἑτέρας ἔργον ἐστὶ θεωρίας. περὶ δὲ τῶν στοιχείων, ἐξ ὧν τὰ σώματα συνέστηκεν, ὅσοις μὲν δοκεῖ εἶναί τι κοινὸν, ἢ μεταβάλλειν εἰς ἄλληλα, ἀνάγκη εἰ θάτερον τούτων, καὶ θάτερον συμβαίνειν. ὅσοι δὲ μὴ ποιοῦσιν ἐξ ἀλλήλων γένεσιν, μηδ' ὡς ἐξ ἑκάστου, πλὴν ὡς ἐκ τοίχου πλίνθους, ἄτοπον· πῶς δὴ ἐξ *ἐκείνου ἔσονται σάρκες καὶ ὀστᾶ, καὶ τῶν ἄλλων ὁτιοῦν; ἔχει δὲ τὸ λεγόμενον ἀπορίαν, καὶ τοῖς ἐξ ἀλλήλων γεννῶσι, τίνα τρόπον γίγνεται ἐξ αὐτῶν ἕτερόν τι παρὰ ταῦτα. λέγω δ', οἷον ἔστιν ἐκ πυρὸς ὕδωρ, καὶ ἐκ τούτου γίγνεσθαι πῦρ. ἔστι γάρ τι κοινὸν τὸ ὑποκείμενον. ἀλλὰ δὴ καὶ σὰρξ ἐξ αὐτῶν γίγνεται καὶ μυελός. ταῦτα δὲ* πῶς γίγνεται; ἐκείνοις τε γὰρ τοῖς λέγουσιν ὥσπερ Ἐμπεδοκλῆς τίς ἔσται τρόπος; ἀνάγκη γὰρ σύνθεσιν εἶναι καθάπερ ἐκ πλίνθων καὶ λίθων τοῖχος. καὶ τὸ μῖγμα δὲ τοῦτο, ἐκ σωζομένων μὲν ἔσται τῶν στοιχείων, κατὰ μικρὰ δὲ παρ' ἄλληλα συγκειμένων. οὕτω δὴ σὰρξ, καὶ τῶν ἄλλων ἕκαστον. συμβαίνει δὴ μὴ ἐξ ὁτουοῦν μέρους σαρκὸς γίγνεσθαι πῦρ καὶ ὕδωρ· ὥσπερ [εἰ] ἐκ κηροῦ γένοιτ' ἂν, ἐκ μὲν τουδὶ τοῦ μέρους σφαῖρα, πυραμὶς δ' ἐξ ἄλλου τινός· ἀλλ' ἐνεδέχετό γε ἐξ ἑκατέρου ἑκάτερον γενέσθαι. τοῦτο μὲν δὴ τοῦτον γίνεται τὸν τρόπον ἐκ τῆς σαρκὸς ἐξ ὁτουοῦν ἄμφω· τοῖς δὲ ἐκείνως λέγουσιν οὐκ ἐνδέχεται,

* γρ. φιλίᾳ μὲν εἶναι τὸ κινῆσαι ... τὸ κινεῖσθαι.

* γρ. κάτω

* γρ. τύχης.

* γρ. ἐκείνων

* γρ. γίνεται πῶς.

ἀλλ' ὡς ἐκ τοίχου λίθος καὶ πλίνθος, ἑκάτερον ἐξ ἄλλου τόπου καὶ μέρους. τὸν αὐτὸν τρόπον δὲ, καὶ τοῖς ποιοῦσι μίαν αὐτῶν ὕλην, ἔχει τινὰ ἀπορίαν, πῶς ἔσται τι ἐξ ἀμφοτέρων, οἷον ψυχροῦ καὶ θερμοῦ, ἢ πυρὸς καὶ γῆς. εἰ γάρ ἐστιν ἡ σὰρξ ἐξ ἀμφοῖν, καὶ μηδέτερον ἐκείνων, μηδ' αὖ [σύνθεσις] σωζομένων, * τί λείπεται πλὴν ὕλην εἶναι τὸ ἐξ ἐκείνων; ἡ γὰρ θατέρου φθορὰ, ἢ θάτερον ποιεῖ, ἢ τὴν ὕλην. ἆρ' οὖν ἐπειδή ἐστι καὶ μᾶλλον καὶ ἧττον θερμὸν καὶ ψυχρὸν, ὅταν μὲν ἁπλῶς ᾖ θάτερον * ἐνδελεχείᾳ, δυνάμει θάτερον ἔσται· ὅταν δὲ μὴ παντελῶς, ἀλλ' ὡς μὲν θερμὸν ψυχρὸν, ὡς δὲ ψυχρὸν θερμὸν, διὰ τὸ μιγνύμενα φθείρειν τὰς ὑπεροχὰς ἀλλήλων, τότε οὔθ' ἡ ὕλη ἔσται, οὔτε ἐκείνων τῶν ἐναντίων ἑκάτερον * ἐνδελεχείᾳ ἁπλῶς, ἀλλὰ μεταξύ· κατὰ δὲ τὸ δυνάμει μᾶλλον εἶναι θερμὸν ἢ ψυχρὸν, ἢ τοὐναντίον, ἑκάτερον κατὰ τοῦτον τὸν λόγον διπλασίως θερμὸν δυνάμει ἢ ψυχρὸν, ἢ τριπλασίως, ἢ κατ' ἄλλον τρόπον τοιοῦτον. ἔσται δὲ μιχθέντων τἆλλα, ἐκ τῶν ἐναντίων, ἢ τῶν στοιχείων, καὶ τὰ στοιχεῖα ἐξ ἐκείνων δυνάμει πως ὄντων, οὐχ οὕτω δ' ὡς ἡ ὕλη, ἀλλὰ τὸν εἰρημένον τρόπον· καὶ ἔστιν οὕτω μὲν μίξις, ἐκείνως δὲ, ὕλη τὸ γινόμενον. ἐπεὶ δὲ καὶ πάσχει τὰ ἐναντία κατὰ τὸν ἐν τοῖς πρώτοις διορισμόν. ἔστι γὰρ τὸ ἐνεργείᾳ θερμὸν δυνάμει ψυχρὸν, καὶ τὸ ἐνεργείᾳ ψυχρὸν, δυνάμει θερμόν· ὥστε ἐὰν μὴ ἰσάζῃ, μεταβάλλει εἰς ἄλληλα. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων ἐναντίων. καὶ πρῶτόν γε οὕτω τὰ στοιχεῖα μεταβάλλει· ἐκ δὲ τούτων, σάρκες, καὶ ὀστᾶ, καὶ τὰ τοιαῦτα, τοῦ μὲν θερμοῦ γινομένου ψυχροῦ, τοῦ δὲ ψυχροῦ θερμοῦ, ὅταν πρὸς τὸ μέσον ἔλθῃ· ἐνταῦθα γὰρ * οὐθέτερον, τὸ δὲ μέσον πολὺ, καὶ οὐκ ἀδιαίρετον. ὁμοίως δὲ καὶ ξηρὸν καὶ ὑγρὸν, καὶ [πάλιν] τὰ τοιαῦτα κατὰ μεσότητα ποιοῦσι σάρκα καὶ ὀστᾶ, καὶ τἆλλα τὰ τοιαῦτα.

* γ. τί λείπεται πλὴν ὕλην εἶναι.
* γ. ἐντελεχείᾳ.
* γ. ἐντελεχείᾳ.
* γρ. οὐθέτερον, ſic ſæpe.

A ſed perinde ſit vt è muro lapis & later, ex alio loco ac parte vtrumque. Pari modo & hiſce qui ipſorum materiam vnam faciunt, dubitatio quædam obrepit, qualiter ex ambobus, calido inquam & frigido, aut igni & terra, quippiam erit. Nam ſi caro ex ambobus ſit, & neutrum illorum, nec rurſus ſeruatorum compoſitio, quid reſtat id eſſe præterquam materiam, quod ex illis conſtat? Nam corruptio alterius, aut alterũ facit, aut materiam. Igitur poſtquam calidum & frigidum intenſionem remiſſionemque ſuſcipiunt, cùm ſimpliciter alterum actu fuerit, tunc alterum erit potentia. Cùm verò non prorſus, ſed frigidum vt calidum, & calidum, vt frigidum fuerit, quòd quæ miſcentur, ſuas exuperan- B tias viciſſim corrumpunt: tunc neque materia erit, neque illorum contrariorum vtrumque, ſed intermedium actu ſimpliciter erit. Porrò quo potentia magis calidum eſt, quàm frigidum, aut contrà, hoc duplo, aut triplo, aut alio id genus mòdo magis calidum potentia quàm frigidum exiſtit. Alia itaque mixta ex contrariis erunt, aut elemẽtis, & elemẽta ex illis quodãmodo potẽtia exiſtentibus, non tamẽ ſic vt materia, ſed dicto modo. Atque hoc quidem pacto miſtio, illo verò materia, id quod gignitur, exiſtit. Præterea & ipſa contraria pati ſolent, quemadmodum antè præfinitum eſt. Etenim actu calidum, potentia frigidum eſt; & actu frigidum, po- C tentia calidum. Quare niſi ad æqualitatem redacta ſint, in ſe mutuò tranſmutantur. Simili modo & in cæteris contrariis. Atque primò quidem elementa ipſa ita tranſmutantur: deinde ex hiſce carnes & oſſa & eiuſmodi fiunt, cùm illa calido quidem in frigidum & frigido in calidum tranſeunte, ad mediocritatem venerint. hic enim neutrum eſt. mediocritas autem multiplex eſt, & nequaquam indiuiſibilis. Similiter humidum & ſiccum & talia, carnem oſſaque & cætera id genus mediocritate efficiunt.

ΚΕΦΑΛ. η.

Ὅτι ἅπαντα σώματα ἐξ ἁπάντων συνέστηκε τῶν ἁπλῶν.

Ἅπαντα δὲ τὰ μικτὰ σώματα ὅσα περὶ τὸν τοῦ μέσου τόπον ἐστὶ, ἐξ ἁπάντων σύγκειται τῶν ἁπλῶν. γῆ μὲν γὰρ ἐνυπάρχει πᾶσι, διὰ τὸ ἕκαστον εἶναι μάλιστα καὶ πλεῖστον ἐν τῷ οἰκείῳ τόπῳ· ὕδωρ δὲ, διὰ τὸ δεῖν μὲν ὁρίζεσθαι τὰ σύνθετα, μόνον δὲ εἶναι τῶν ἁπλῶν εὐόριστον τὸ ὕδωρ. ἔτι δὲ καὶ τὸ τὴν γῆν ἄνευ τοῦ ὑγροῦ μὴ δύνασθαι συμμένειν, ἀλλὰ τοῦτ' εἶναι τὸ συνέχον. εἰ γὰρ ἐξαιρεθείη τελέως ἐξ αὐτῆς τὸ ὑγρὸν, διαπίπτοι ἄν. γῆ μὲν οὖν καὶ ὕδωρ, διὰ ταύτας ἐνυπάρχουσι τὰς αἰτίας· ἀὴρ δὲ καὶ πῦρ, ὅτι ἐναντία ἐστὶ γῇ καὶ ὕδατι· γῆ μὲν ἀέρι, ὕδωρ δὲ πυρὶ ἐναντίον ἐστὶν ὡς ἐνδέχεται οὐσίαν οὐσίᾳ ἐναντίαν εἶναι. ἐπεὶ οὖν αἱ γενέσεις ἐκ τῶν ἐναντίων εἰσὶν, ἐνυπάρχει δὲ θάτερα ἄκρα τῶν ἐναντίων, ἀνάγκη καὶ * θάτερον ἐνυπάρχειν· ὥστε ἐν ἅπαντι τῷ συνθέτῳ πάντα τὰ ἁπλᾶ ἐνέσται. μαρτυρεῖν δὲ ἔοικε καὶ ἡ τροφὴ ἑκάστου· * ἅπαντα μὲν γὰρ τρέφεται τοῖς αὐτοῖς ἐξ ὧνπερ ἐστίν. ἅπαντα δὲ πλείοσι τρέφεται. καὶ γὰρ ὅσαπερ ἂν δόξειε μάλιστα μόνῳ ἑνὶ τρέφεσθαι, οἷον τῷ ὕδατι τὰ φυτὰ, πλείοσι τρέφεται· μέμικται γὰρ τῷ ὕδατι γῆ. διὸ καὶ οἱ γεωργοὶ πειρῶνται μίξαντες [χόρτον] ἄρδειν.

* γ. θάτερα.
* γ. ἑκάστων.

CAPVT VIII.

D *Quodlibet mixtum perfectum circa mundi medium exiſtens, ex elementorum concurrentia naſci.*

Omnia autem mixta corpora, quæ circa locum qui medio vniuerſi tribuitur, collocata ſunt, ex ſimplicibus conſtant omnibus. Nam terra quidem ideo cunctis ineſt, quòd vnumquodque maximè & vt plurimũm in proprio terræ loco exiſtit. Aqua verò, quòd compoſita finiri oporteat: & illa è ſimplicibus ſola bellè terminari queat. Præterea quòd & terra ſine humiditate conſiſtere non poſſit: ſed humiditas id ſit, quod continendi vim ac coercendi habeat. nam ſi humiditas à terra prorſus eximatur, ea diffluet profectò. Terra igitur & E aqua has ob cauſas inſunt. item aër & ignis, quòd terræ & aquæ contraria ſint. Nam aëri terra, & aqua igni contraria eſt: quantum ſubſtantiam ſubſtantiæ contrariam eſſe contingit. Cùm igitur generationes è contrariis ſint, & contrariorum extremum alterum inſit, alterum quoque ineſſe eſt neceſſe. Quare in omni compoſito ſimplicia omnia inerunt. Sed & id cuiuſque rei nutricatio comprobare videtur. omnia enim eiſdem aluntur, quibus conſtant. omnia ſiquidem pluribus aluntur. Nam quæcumque vno ſolo ali maximè videntur, vt plantæ aqua, pluribus aluntur. terra enim aquæ admixta eſt. Quamobrem ipſi quoque agricolæ miſcentes, irrigare conantur.

Cùm autem alimentum ad materiam pertineat, quod autem nutritionẽ ſuſcipit cum materia coniunctum, forma ſit atque ſpecies, rationi conſentaneum fuerit, ex omnibus ſimplicibus corporibus quæ mutua generatione oriuntur, ſolum ignem nutriri: quemadmodum & priores aiunt: quippe qui ſolus ac maximè formæ ſit: propterea quòd ſuapte natura ad terminum fertur vniuerſi. In ſuũ autem locum quodque ferri natum eſt. forma verò ſpeciéſque omnium in ipſis conſiſtit terminis. Quòd igitur corpora omnia ex ſimplicibus conſtent, dictum eſt.

A ἐπεὶ δ' ἐστὶν ἡ μὲν τροφὴ τῆς ὕλης, τὸ δὲ τρεφόμενον συνειλημμένον τῇ ὕλῃ, ἡ μορφὴ καὶ τὸ εἶδος, εὔλογον ἤδη τὸ μόνον τῶν ἁπλῶν σωμάτων τρέφεσθαι τὸ πῦρ, ἁπάντων ἐξ ἀλλήλων γινομένων, ὥσπερ καὶ οἱ πρότερον λέγουσι· μόνον γάρ ἐστι καὶ μάλιστα τοῦ εἴδους τὸ πῦρ, διὰ τὸ πεφυκέναι φέρεσθαι πρὸς τὸν ὅρον. ἕκαστον δὲ πέφυκεν εἰς τὴν ἑαυτοῦ φέρεσθαι χώραν· ἡ δὲ μορφὴ καὶ τὸ εἶδος ἁπάντων ἐν τοῖς ὅροις. ὅτι μὲν οὖν ἅπαντα τὰ σώματα ἐξ ἁπάντων συνέστηκε τῶν * ἁπλῶν, εἴρηται. γ. ἁπλῶν

CAPVT IX.

Generationis cauſa an materia, aut elementorum qualitates.

CVm autem nonnulla generabilia corruptibiliáque ſint, & generatio in eo qui circa mundi medium eſt loco ſit: de omni generatione ſimiliter, & quot & quę ſint eius principia, dicendum eſt. ſic enim faciliùs ſingularia contemplabimur, cùm de vniuerſalibus priùs ſumpſerimus. Sunt igitur tot numero, & genere eadem, quæ in æternis primiſque. Nam alterum vt materia, alterũ vt forma exiſtit. oportet autem & tertium inſuper adeſſe. Nam duo haudquaquàm ſatis ſunt ad generandum, ſicvti nec in ipſis primis. Igitur quod eſſe & non eſſe poteſt, generabilibus cauſa vt materies exiſtit. Nam quædam neceſſario ſunt, ceu æterna: quædam neceſſario non ſunt. Quorum illa quidem non eſſe, hæc verò eſſe eſt impoſſibile; eo quòd fieri non poſſit vt neceſſarium aliter ſeſe habeat. Nonnulla & eſſe poſſunt, & non eſſe, de quorum numero generabile exiſtit, atque corruptibile. hoc enim interdum eſt, interdum non eſt. Quare neceſſe eſt, vt generatio atque corruptio circa id ſit, quod eſſe & non eſſe poteſt. Quocirca & hoc cauſa, vt materies generabilibus exiſtit. At forma ſpeciéſque, vt cuius gratia. hæc autem eſt ſubſtantiæ cuiuſque ratio. Oportet autem & tertium quoque adeſſe, quod omnes quidem ſomniãt, nemo tamen dicit. Sed alij ſpecierum naturam cauſam eſſe ſufficientem ad generandum arbitrati ſunt, quemadmodũ in Phædone Socrates. Nam vbi ille cæteros increpuit, tanquam nihil locutos, eorũ quæ ſunt quædam ſpecies eſſe, quædam quæ ſpecies participent, & eorum quodque per ſpeciem eſſe dici, ſuſceptione verò oriri & abiectione interire ſupponit. Quare ſi hæc vera ſunt, ſpecies eſſe cauſas generationis & corruptionis neceſſariò putat. Alij ipſam materiam, nimirum à qua ſit motus. At neutri rectè dicunt. Nam ſi ſpecies cauſæ ſunt, cur non ſemper gignunt continenter, ſed quandoque & quandoque non, cùm ſemper tum ſpecies tum quæ eas participant, in ratione rerum ſint? Præterea in nonnullis aliam quandam eſſe cauſam ſpectamus. Nam medicus in corpore ſanitatem efficit, & ſcientiam ſciens, exiſtente & ipſa ſanitate, & ſcientia, & hiſce quæ eas participant: eodem modo & in cæteris, quæ facultate quadam fiunt. Quod ſi qui materiam ipſam ob motum generare dicant, naturaliùs profectò dixerint, quàm qui ita dicunt. Etenim quod alterat, quódque transfigurationem facit: cauſæ vt quippiam oriatur, rationem ſibi vendicat magis. Et in omnibus, ex æquo, tam hiſce quæ natura conſtant, quàm quæ ab arte proficiſcuntur, hoc agens dicere conſueuimus, quod mouendi vim obtinet.

ΚΕΦΑΛ. Θ'.

B Περὶ πάσης γενέσεως πόσαι τε καὶ τίνες αὐτῆς αἱ ἀρχαί.

ἘΠειδ' ἐστὶν ἔνια γεννητὰ καὶ φθαρτά, καὶ ἡ γένεσις τυγχάνει οὖσα ἐν τῷ περὶ τὸ μέσον τόπῳ, λεκτέον περὶ πάσης γενέσεως ὁμοίως, πόσαι τε, καὶ τίνες αὐτῆς αἱ ἀρχαί· ῥᾷον γὰρ οὕτω τὰ καθ' ἕκαστα θεωρήσομεν, ὅταν περὶ τῶν καθόλου λάβωμεν πρῶτον. εἰσὶν οὖν καὶ τὸν ἀριθμὸν ἴσαι, καὶ τῷ γένει αἱ αὐταί, αἵπερ ἐν τοῖς ἀϊδίοις τε καὶ πρώτοις· ἡ μὲν γάρ ἐστιν ὡς ὕλη, ἡ δ' ὡς μορφή. δεῖ δὲ καὶ τὴν τρίτην ἔτι προσυπάρχειν· οὐ γὰρ ἱκαναὶ C πρὸς τὸ γεννῆσαι αἱ δύο, καθάπερ οὐδ' ἐν τοῖς πρώτοις. ὡς μὲν οὖν ὕλη, τοῖς γεννητοῖς ἐστιν αἴτιον, τὸ δυνατὸν εἶναι καὶ μὴ εἶναι. τὰ μὲν γὰρ ἐξ ἀνάγκης ἐστίν, οἷον τὰ ἀΐδια· τὰ δ' ἐξ ἀνάγκης οὐκ ἔστι. τούτων δὲ τὰ μὲν ἀδύνατον μὴ εἶναι, τὰ δὲ ἀδύνατον εἶναι, διὰ τὸ μὴ ἐνδέχεσθαι παρὰ τὸ ἀναγκαῖον ἄλλως ἔχειν. ἔνια δὲ καὶ εἶναι, καὶ μὴ εἶναι δυνατά, ὅπερ ἐστὶ τὸ γεννητὸν καὶ φθαρτόν· ποτὲ μὲν γὰρ ἔστι τοῦτο, ποτὲ δ' οὐκ ἔστιν. ὥστ' ἀνάγκη γένεσιν εἶναι καὶ φθορὰν περὶ τὸ δυνατὸν εἶναι καὶ μὴ εἶναι. διὸ καὶ ὡς μὲν ὕλη, τοῦτ' ἐστὶν αἴτιον τοῖς γεννητοῖς· ὡς δὲ τὸ οὗ ἕνεκεν, ἡ μορφὴ καὶ τὸ εἶδος. τοῦτο δ' ἐστὶν ὁ λόγος ὁ τῆς ἑκάστου οὐσίας. D δεῖ δὲ προσεῖναι καὶ τὴν τρίτην, ἣν ἅπαντες μὲν ὀνειρώττουσι, λέγει δ' οὐδείς. ἀλλ' οἱ μὲν ἱκανὴν ᾠήθησαν αἰτίαν εἶναι πρὸς τὸ γίνεσθαι τὴν τῶν εἰδῶν φύσιν, ὥσπερ ὁ ἐν Φαίδωνι Σωκράτης. καὶ γὰρ ἐκεῖνος ἐπιτιμήσας τοῖς ἄλλοις, ὡς οὐδὲν εἰρηκόσιν, ὑποτίθεται ὅτι ἐστὶ τῶν ὄντων, τὰ μὲν εἴδη, τὰ δὲ μεθεκτικὰ τῶν εἰδῶν· καὶ ὅτι εἶναι μὲν ἕκαστον τοῦτον λέγεται κατὰ τὸ εἶδος, γίνεσθαι δὲ κατὰ τὴν μετάληψιν, καὶ φθείρεσθαι κατὰ τὴν ἀποβολήν. ὥστ' εἰ ταῦτα ἀληθῆ, τὰ εἴδη οἴεται ἐξ ἀνάγκης αἴτια εἶναι καὶ γενέσεως καὶ φθορᾶς. οἱ δ' αὐτὴν τὴν ὕλην· ἀπὸ ταύτης γὰρ εἶναι τὴν κίνησιν. οὐδέτεροι δὲ λέγουσι καλῶς. εἰ μὲν γάρ ἐστιν αἴτια τὰ εἴδη, διὰ τί οὐκ ἀεὶ γεννᾷ συνεχῶς, E ἀλλὰ ποτὲ μέν, ποτὲ δ' οὔ, ὄντων ἀεὶ καὶ τῶν εἰδῶν καὶ τῶν μεθεκτικῶν; ἔτι δ' ἐπ' ἐνίων θεωροῦμεν ἄλλ' ὂν τὸ αἴτιον· ὑγίειαν γὰρ ὁ ἰατρὸς ἐμποιεῖ, καὶ ἐπιστήμην ὁ ἐπιστήμων, οὔσης καὶ ὑγιείας αὐτῆς [καὶ ἐπιστήμης] καὶ τῶν μεθεκτικῶν. ὡσαύτως δὲ καὶ ἐπὶ τῶν ἄλλων τῶν κατὰ δύναμιν πραττομένων. εἰ δὲ τὴν ὕλην τις φήσει γεννᾶν διὰ τὴν κίνησιν, φυσικώτερον μὲν ἂν λέγοι τῶν οὕτω λεγόντων. τὸ γὰρ ἀλλοιοῦν καὶ τὸ μετασχηματίζον, αἰτιώτερόν τε τοῦ γεννᾶν, καὶ ἐν ἅπασιν εἰώθαμεν τοῦτο λέγειν τὸ ποιοῦν, ὁμοίως ἔν τε τοῖς φύσει καὶ ἐν τοῖς ἀπὸ τέχνης, ὃ ἂν ᾖ κινητικόν.

ὕλην. ἀλλὰ καὶ οὗτοι οὐκ ὀρθῶς λέγουσι· τῆς μὲν γὰρ ὕλης τὸ πάσχειν ἐστὶ καὶ τὸ κινεῖσθαι, τὸ δὲ κινεῖν, καὶ τὸ ποιεῖν, ἑτέρας δυνάμεως. δῆλον δὲ καὶ ἐπὶ τῶν τέχνῃ καὶ ἐπὶ τῶν φύσει γινομένων. οὐ γὰρ αὐτὸ ποιεῖ τὸ ὕδωρ ζῷον ἐξ αὑτοῦ, οὐδὲ τὸ ξύλον κλίνην, ἀλλ' ἡ τέχνη. ὥστε καὶ οὗτοι διὰ τοῦτο λέγουσιν οὐκ ὀρθῶς, καὶ ὅτι παραλείπουσι τὴν κυριωτέραν αἰτίαν. ἐξαιροῦσι γὰρ τὸ τί ἦν εἶναι, καὶ τὴν μορφήν. ἔτι δὲ καὶ τὰς δυνάμεις ἀποδιδόασι τοῖς σώμασι, δι' ἃς γεννῶσι λίαν ὀργανικῶς, ἀφαιροῦντες τὴν κατὰ τὸ εἶδος αἰτίαν. ἐπεὶ γὰρ πέφυκεν, ὥς φασι, τὸ μὲν θερμὸν διακρίνειν, τὸ δὲ ψυχρὸν συνιστάναι, καὶ τῶν ἄλλων ἕκαστον τὸ μὲν ποιεῖν, τὸ δὲ πάσχειν, ἐκ τούτων λέγουσι καὶ διὰ τούτων ἅπαντα τἆλλα γίγνεσθαι καὶ φθείρεσθαι.* φαίνεται δὲ καὶ τὸ πῦρ αὐτὸ κινούμενον καὶ πάσχον. ἔτι δὲ παραπλήσιόν τι ποιοῦσιν, ὥσπερ εἴ τις τῷ πρίονι καὶ ἑκάστῳ τῶν ὀργάνων ἀπονέμοι τὴν αἰτίαν τῶν γινομένων. ἀνάγκη γὰρ * πρίοντος διαιρεῖσθαι, καὶ ξέοντος λεαίνεσθαι, καὶ ἐπὶ τῶν ἄλλων ὁμοίως. ὥστ' εἰ ὅτι μάλιστα ποιεῖ καὶ κινεῖ τὸ πῦρ, ἀλλὰ πῶς κινεῖ * οὐχ ὁρῶσιν, ὅτι χεῖρον ἢ τὰ ὄργανα. ἡμῖν δὲ καθόλου τε πρότερον εἴρηται περὶ τῶν αἰτίων, καὶ νῦν διώρισται, περί τε τῆς ὕλης καὶ τῆς μορφῆς.

* γ. φαίνεται

* γ. πρίν τις

* γ. [illegible]

ΚΕΦΑΛ. Ι.

Ὅτι ἔστι γένεσις καὶ φθορὰ, καὶ διὰ τίν' αἰτίαν. καὶ τί τὸ γεννητικὸν καὶ φθαρτόν.

Ἔτι δὲ, ἐπεὶ ἡ κατὰ τὴν φορὰν [κίνησις] δέδεικται ὅτι ἀΐδιος, ἀνάγκη τούτων ὄντων, καὶ γένεσιν εἶναι συνεχῶς. ἡ γὰρ φορὰ ποιήσει τὴν γένεσιν ἐνδελεχῶς, διὰ τὸ προσάγειν καὶ ἀπάγειν τὸ γεννητικόν. ἅμα δὲ δῆλον, ὅτι καὶ τὸ * πρότερον καλῶς εἴρηται, τὸ πρώτην τῶν μεταβολῶν τὴν φορὰν, ἀλλὰ μὴ τὴν γένεσιν εἰπεῖν. πολὺ γὰρ εὐλογώτερον, τὸ ὂν τῷ μὴ ὄντι γενέσεως αἴτιον εἶναι, ἢ τὸ μὴ ὂν τῷ ὄντι τοῦ εἶναι. τὸ μὲν οὖν φερόμενον ἐστὶ, τὸ δὲ γινόμενον οὐκ ἔστι. διὸ καὶ ἡ φορὰ προτέρα τῆς γενέσεως. ἐπεὶ δ' ὑπόκειται καὶ δέδεικται συνεχὴς οὖσα τοῖς πράγμασι γένεσις καὶ φθορά. φαμὲν δὲ αἰτίαν εἶναι τὴν φορὰν τοῦ γίνεσθαι,* φανερὸν ὅτι μιᾶς μὲν οὔσης τῆς φορᾶς, οὐκ ἐνδέχεται γίνεσθαι ἄμφω, διὰ τὸ ἐναντία εἶναι. τὸ γὰρ αὐτὸ καὶ ὡσαύτως ἔχον ἀεὶ, τὸ αὐτὸ πέφυκε ποιεῖν. ὥστε ἤτοι γένεσις ἔσται ἀεὶ ἢ φθορά. δεῖ δὲ πλείους εἶναι τὰς κινήσεις καὶ ἐναντίας, ἢ τῇ φορᾷ, ἢ τῇ ἀνωμαλίᾳ· τῶν γὰρ ἐναντίων αἴτια τἀναντία. διὸ καὶ οὐχ ἡ πρώτη φορὰ αἰτία ἐστὶ γενέσεως καὶ φθορᾶς· ἀλλ' ἡ κατὰ τὸν λοξὸν κύκλον. ἐν ταύτῃ γὰρ καὶ τὸ συνεχές ἐστι, καὶ τὸ κινεῖσθαι δύο κινήσεις. ἀνάγκη γὰρ, εἴ γε ἀεὶ ἔσται συνεχὴς γένεσις καὶ φθορὰ, ἀεὶ μὲν τι κινεῖσθαι, ἵνα μὴ ἐπιλείπωσιν αὗται αἱ μεταβολαί. δύο δὲ, ὅπως μὴ θάτερον συμβαίνῃ μόνον. τῆς μὲν οὖν συνεχείας ἡ τοῦ ὅλου φορὰ αἰτία. τοῦ δὲ προσιέναι καὶ ἀπιέναι, ἡ ἔγκλισις. συμβαίνει γὰρ, ὁτὲ μὲν πόρρω γίνεσθαι, ὁτὲ δ' ἐγγύς. ἀνίσου δὲ τοῦ διαστήματος ὄντος, ἀνώμαλος ἔσται ἡ κίνησις. ὥστ' εἰ τῷ προσιέναι καὶ ἐγγὺς εἶναι γεννᾷ, καὶ τῷ ἀπιέναι καὶ πόρρω γίνεσθαι ταὐτὸ τοῦτο φθείρει. κἂν εἰ τῷ πολλάκις προσιέναι γεννᾷ, καὶ τῷ πολλάκις * ἀπελθεῖν, φθείρει. τῶν γὰρ ἐναντίων τὰ ἐναντία αἴτια. καὶ τῷ ἴσῳ χρόνῳ ἡ φθορὰ καὶ ἡ γένεσις ἡ κατὰ φύσιν.

* γ. πρότερον

* γ. φανερὸν ὅτι

* γ. ἀπιέναι,

A Verumenimvero & hi quoque non rectè dicunt. Pati namque & moueri, materiæ eſt, agere verò & mouere, alterius potentiæ. Palàm autem eſt, cùm in iis quæ arte, tum iis quæ natura fiunt. nam neque aqua ex ſe animal facit ſed natura: neque lignum lecticam, ſed ars. Quare & iſti ob id, & quia potiorem omittunt cauſam, haud rectè dicũt. quidditatem enim formamque exterminant. Præterea potentias atque vireis corporibus tribuunt, per quas admodum inſtrumentaliter generant, eam quæ à ſpecie ſumitur cauſam auferentes. Etenim quoniã, vt aiunt, calidum ſegregare, & frigidum congregare natum eſt: & cæterorum quodque, aliud agere, B aliud pati: ex his & per hæc gigni & corrumpi cætera omnia dicunt. At ipſe quoque ignis, moueri ac pati videtur. Præterea perinde faciunt, ac ſi quis ſerræ & inſtrumentorum cuique, eorum quæ generantur cauſam tribuat. Nam cùm quis ſerra ſecat, diuidi quippiam: & cùm corradit, leue fieri neceſſe eſt. & in cæteris ſimili modo. Quare ſi quàm maximè agit mouetque ignis, quomodo tamen moueat, non vltra contemplantur, nempe quòd deteriùs quàm ipſa inſtrumenta. Sed & priùs à nobis vniuerſaliter de cauſis dictum eſt, & nunc de materia & forma pertractatum atque determinatum.

CAPVT X.

C

Perpetuam eſſe generationis & corruptionis ſeriem.

Præterea cùm demonſtratum ſit, motum eum eſſe perpetuum, qui lationi accõmodatur: his exiſtentibus, & generationem quoque continenter eſſe neceſſe eſt. Latio namque continuè generationẽ ideo faciet, quia admouet & abmouet id quod gignendi vim obtinet.* Inſuper & priora eſſe dicta rectè, lationem, inquam, mutationum primam eſſe, & non generationem, dilucidum eſt. Nam multo magis conſonum eſt rationi, id quod eſt ei quod non eſt, vt naſcatur cauſam eſſe, quàm id quod non eſt ei quod eſt vt ſit. Sed quod lationem ſubit, eſt: D quod verò oritur, non eſt. Idcirco & latio generatione prior eſt. Cùm autem ſupponatur, & demonſtratum ſit, continuam rebus ipſis generationem corruptionémque competere, & lationem generationis cauſam eſſe dicamus: patet, quòd ſi vnica latio foret, fieri non poſſet vt ambæ fierent, propterea quòd contrariæ ſunt. Nam idem eodémque modo ſemper habens, idem facere natum eſt. Quare aut generatio ſemper eſſet, aut corruptio. Multos autem eſſe motus, contrarióſque aut latione aut inæqualitate conuenit: contrariorum enim, contrariæ ſunt cauſæ. Quocirca & prima latio, ortus ac interitus cauſa non eſt: ſed obliqui circuli latio. E ea namque & continua eſt, & duobus motibus fit. Nam ſi generatio corruptióve futura ſit ſemper cõtinua, ſemper quippiam quidẽ moueri neceſſe eſt, vt ne mutationes iſtæ deficiant: ſed duobus, vt ne altera duntaxat eueniat. Continuitatis igitur cauſa eſt, latio vniuerſi: acceſſus verò & receſſus, ipſa decliuitas. accidit enim vt interdũ procul, interdum propè exiſtat. Atq; cũ interuallũ ſit inęquale, motus erit inęqualis. Quare ſi ex eo generat, quia accedit & prope eſt: & quia abſcedit & procul exiſtit: hoc idẽ corrũpit. Atq; ſi quia ſæpenumero accedit, generat: & quia plerunq; recedit, corrũpit. contrariorum enim cauſę ſunt contrariæ. Et generatio atque corruptio ſecundùm naturã æquali in tẽpore fiũt.

Quocirca & cuiuſque tempus & vita numerũ habent, numeróque præfiniuntur. omnium enim ordo eſt. Et omne tempus ac vita circuitu menſuratur. verùm non eodem omnis, ſed alia minori, alia maiori menſuratur. alij ſiquidem annus, alij maior, alij minor circuitus, menſura eſt. Apparent autem & ad ſenſum, hiſce quæ dicimus conſentanea. Accedente namque ſole generationem fieri, & recedente, corruptionem, & in tempore æquali vtrumque videmus. Nam corruptionis & generationis naturalis tempus æquabile exiſtit. Sed plerunque accidit vt in minori corruptio fiat, ob mutuam inuicem conſpirationem. Si enim materies inæqualis ſit, nec omni ex parte eadem: generationes quoque inæquales, & quaſdam celeriores, quaſdã tardiores eſſe neceſſe eſt. Vnde fit vt ob horum generationem alia corrumpi accidat. Semper autem, ſicuti dictum eſt, generatio & corruptio continentes erunt, nec vnquam deficient, ob eam quam diximus cauſam: idque ratione optima euenit. Nam cùm in omnibus quod præſtabilius eſt natura ſemper expetere dicatur, præſtabilius autem ſit eſſe quàm non eſſe, & quot modis eſſe dicamus alibi dictum ſit, hoc verò in omnibus ineſſe impoſſibile ſit, propterea quòd longè ab ipſo principio diſtent: reliquo modo Deus ipſe vniuerſum compleuit, continua facta generatione. Nam ita maximè ipſum eſſe continenter erit, propterea quòd illud, ſemper inquam generationem fieri, ad ſubſtantiam proximè accedit. Cuius rei, vt ſæpe diximus, cauſa circularis latio eſt. ſola enim continens eſt. Quocirca & cætera alia quæ in ſeſe ſecundùm affectus atque vireis tranſmutari ſolent, ceu corpora ſimplicia circularem imitantur lationem. nam cùm ex aqua gignitur aër, & ex aëre ignis, & rurſum ex igni aër, & ex aëre aqua: in orbem ire generationem ideo dicimus, quia rurſum eòdem redit reciprocatúrq;. Quare & recta horum latio circularem imitata lationem continens exiſtit. Ad hæc ex hiſce colliquet id quod nonnulli addubitant: cur cùm corporum quodque ad ſuum feratur locum, in tempore infinito corpora diducta ſeparatáque non fuerunt. Nam mutua in ſeſe migratio, huiuſce rei cauſa exiſtit. Si enim in ſuo quodque loco manſiſſet, nec à vicino fuiſſet tranſmutatum: iam ſeparata forent atque diſcreta. Tranſmutantur igitur ob lationem, quæ duplex eſt. & quia tranſmutationem ſubeunt, fieri non poteſt vt ex ipſis vllum aliquo in loco ſtato maneat. Quòd igitur generatio ſit atque corruptio, & quam ob cauſam, & quid generabile & corruptibile, ex hiſce quę diximus manifeſtum eſt. Cùm autem ſit neceſſe, quippiam eſſe mouens, ſi futurum eſt vt ſit motus, quemadmodum antea dictum eſt in aliis, & ſi motus ſemper ſit, ſemper eſſe quippiam mouens, & ſi continuus, vnũ idemque & immobile, & ab alteratione generationéve immune: & ſi plures ſint motus circulares, plura quidem, ſed omnia hæc quodammodo ſub vno eſſe principio neceſſe ſit, & cùm tempus ſit continuum, motum eſſe continuum, ſiquidem fieri nequit vt ſit tempus ſine motu: tempus profectò continui cuiuſpiam numerus erit. Eius igitur qui in gyrum ſit, ſicuti in hiſce quæ initio diximus, præfinitum eſt. Sed vtrùm motus ideo ſit continuus, quia id quod motum ſubit, continuum ſit, an quia id in quo ſit motus, locus inquam aut affectus? palàm ſanè eſt, motum ideo continuum eſſe, quia id quod mouetur, continuum eſt. Nam quo pacto conti-

A διὸ καὶ οἱ χρόνοι καὶ οἱ βίοι ἑκάστων, ἀριθμὸν ἔχουσι, καὶ τούτῳ διορίζονται· πάντων γάρ ἐστι τάξις, καὶ ἅπας χρόνος καὶ βίος μετρεῖται περιόδῳ· πλὴν, οὐ τῇ αὐτῇ πάντες, ἀλλ' οἱ μὲν ἐλάττονι, οἱ δὲ πλείονι· τοῖς μὲν γὰρ ἐνιαυτὸς, τοῖς δὲ μείζων, * τοῖς δὲ ἐλάττων ἡ περίοδος ἐστὶ τὸ μέτρον. φαίνεται δὲ καὶ κατὰ τὴν αἴσθησιν ὁμολογούμενα τοῖς παρ' ἡμῶν λόγοις· ὁρῶμεν γὰρ ὅτι προσιόντος μὲν τοῦ ἡλίου, γένεσίς ἐστιν· ἀπιόντος δὲ, φθίσις· καὶ ἐν ἴσῳ χρόνῳ ἑκάτερον. ἴσος γὰρ ὁ χρόνος τῆς φθορᾶς, καὶ τῆς γενέσεως τῆς κατὰ φύσιν. ἀλλὰ συμβαίνει πολλάκις ἐν ἐλάττονι φθείρεσθαι, διὰ τὴν πρὸς ἄλ- B ληλα * σύγκρισιν. ἀνωμάλου γὰρ οὔσης τῆς ὕλης, καὶ οὐ πανταχοῦ τῆς αὐτῆς, ἀνάγκη καὶ τὰς γενέσεις ἀνωμάλους εἶναι, καὶ τὰς μὲν θάττους, τὰς δὲ βραδυτέρας. ὥστε συμβαίνει διὰ τὴν τούτων γένεσιν ἄλλοις γίνεσθαι φθοράν. ἀεὶ δ' ὥσπερ εἴρηται, συνεχὴς ἔσται ἡ γένεσις καὶ ἡ φθορὰ, καὶ οὐδέποτε ὑπολείψει δι' ἣν εἴπομεν αἰτίαν. τοῦτο δ' εὐλόγως συμβέβηκεν· ἐπεὶ γὰρ ἐν ἅπασιν ἀεὶ τοῦ βελτίονος ὀρέγεσθαί φαμεν τὴν φύσιν, βέλτιον δὲ τὸ εἶναι ἢ μὴ εἶναι· τὸ δὲ εἶναι ποσαχῶς λέγομεν, ἐν ἄλλοις εἴρηται· τοῦτο δ' ἐν ἅπασιν ἀδύνατον ὑπάρχειν, διὰ τὸ πόρρω τῆς ἀρχῆς ἀφίστασθαι· τῷ λειπο- C μένῳ τρόπῳ, συνεπλήρωσε τὸ ὅλον ὁ θεὸς, ἐντελεχῆ ποιήσας τὴν γένεσιν· οὕτω γὰρ ἂν μάλιστα συνείροιτο τὸ εἶναι, διὰ τὸ * ἐγγυτάτω εἶναι τῆς οὐσίας, τὸ γίνεσθαι ἀεὶ τὴν γένεσιν. τούτου δ', ὥσπερ εἴρηται πολλάκις, αἰτία ἡ κύκλῳ φορά· μόνη γὰρ συνεχής. διὸ καὶ τἆλλα ὅσα μεταβάλλει εἰς ἄλληλα, κατὰ τὰ πάθη καὶ τὰς δυνάμεις, οἷον τὰ ἁπλᾶ σώματα, μιμεῖται τὴν κύκλῳ φοράν. ὅταν γὰρ ἐξ ὕδατος ἀὴρ γένηται, καὶ ἐξ ἀέρος πῦρ, καὶ πάλιν ἐκ τοῦ πυρὸς ὕδωρ, κύκλῳ φαμὲν περιεληλυθέναι τὴν γένεσιν, διὰ τὸ πάλιν ἀνακάμπτειν. ὥστε καὶ ἡ εὐθεῖα τούτων φορὰ μι- D μουμένη τὴν κύκλῳ, συνεχής ἐστιν. ἅμα δὲ δῆλον ἐκ τούτων, ὃ τινες ἀποροῦσι, διὰ τί ἑκάστου τῶν σωμάτων εἰς τὴν οἰκείαν φερομένου χώραν, ἐν τῷ ἀπείρῳ χρόνῳ οὐ διεστᾶσι τὰ συνόντα σώματα· αἴτιον γὰρ τούτου ἐστὶν, ἡ εἰς ἄλληλα μετάβασις· εἰ γὰρ ἕκαστον ἔμενεν ἐν τῇ αὐτοῦ χώρᾳ, καὶ μὴ μετέβαλλεν ὑπὸ τοῦ πλησίον, ἤδη ἂν * διεστήκεσαν. μεταβάλλει μὲν οὖν διὰ τὴν φορὰν διπλῆν οὖσαν· διὰ δὲ τὸ μεταβάλλειν, οὐκ ἐνδέχεται μένειν οὐδὲν αὐτῶν, ἐν οὐδεμιᾷ χώρᾳ τεταγμένῃ. διότι μὲν οὖν ἐστι γένεσις καὶ φθορὰ, καὶ διὰ τίν' αἰτίαν, καὶ τί τὸ γενητὸν καὶ φθαρτὸν, φανερὸν ἐκ τῶν εἰρημένων. ἐπεὶ δ' ἀνάγκη E εἶναι τι τὸ κινοῦν, εἰ κίνησις ἔσται, ὥσπερ εἴρηται πρότερον ἐν ἑτέροις, καὶ εἰ ἀεὶ, ὅτι δεῖ τι εἶναι ἀεί· καὶ εἰ συνεχὴς, ἓν τὸ αὐτὸ, καὶ ἀκίνητον, καὶ ἀγένητον, καὶ ἀναλλοίωτον· καὶ εἰ πλείους εἶεν αἱ κύκλῳ κινήσεις, πλείους μὲν, πάσας δέ πως εἶναι ταύτας ἀνάγκη ὑπὸ μίαν ἀρχήν· συνεχοῦς δ' ὄντος τοῦ χρόνου, ἀνάγκη κίνησιν συνεχῆ εἶναι, εἴπερ ἀδύνατον χρόνον ἄνευ κινήσεως εἶναι. συνεχοῦς ἄρα τινὸς ἀριθμὸς ὁ χρόνος. τῆς κύκλῳ ἄρα, καθάπερ ἐν τοῖς ἐν ἀρχῇ λόγοις διώρισται. συνεχὴς δ' ἡ κίνησις πότερον τῷ τὸ κινούμενον συνεχὲς εἶναι, ἢ τῷ ἐν ᾧ κινεῖται, οἷον τὸν τόπον λέγω, ἢ τὸ πάθος; δῆλον δὴ ὅτι τῷ τὸ κινούμενον· πῶς γὰρ τὸ πάθος

* γρ. ἄλλοις δὲ

* γρ. σύγκρασιν.

* γρ. ἐγγύτατα

* διέστησαν.

συνεχὲς, ἀλλ' ἢ τῷ τὸ πρᾶγμα ᾧ συμβέβηκε, συνεχὲς εἶναι; εἰ δὲ καὶ τῷ ἐν ᾧ, μόνῳ τοῦτο τῷ τόπῳ ὑπάρχει· μέγεθος γάρ τι ἔχει. τούτου δὲ τὸ κύκλῳ μόνον συνεχὲς ὥστε αὐτὸ ἑαυτῷ ἀεὶ συνεχές. τοῦτο ἄρα ἐστὶν ὃ ποιεῖ συνεχῆ κίνησιν, τὸ κύκλῳ σῶμα φερόμενον· ἡ δὲ κίνησις, τὸν χρόνον.

A nuus eſt affectus, niſi quia res ea cui accidit, continua eſt? Si verò & quia id in quo, hoc ſoli loco competit: quippe qui magnitudinem quandam habeat: è magnitudinibus autem ſola circularis continua eſt, adeò vt ipſa ſibi ſemper continua ſit. Corpus igitur circulare quod ferri aſſolet, motum facit continuum: motus verò, tempus.

ΚΕΦΑΛ. ια'.

Ἀπορίαι τινὲς περὶ γενέσεως καὶ φθορᾶς.

Ἐπεὶ δ' ἐν τοῖς συνεχῶς κινουμένοις κατὰ γένεσιν, ἢ ἀλλοίωσιν, ἢ ὅλως μεταβολὴν, ὁρῶμεν τὸ ἐφεξῆς ὂν καὶ γινόμενον τόδε μετὰ τόδε, ὥστε μὴ διαλείπειν· σκεπτέον, πότερόν ἐστί τι ὃ ἐξ ἀνάγκης ἔσται, ἢ οὐδὲν, ἀλλὰ πάντα ἐνδέχεται μὴ γενέσθαι· ὅτι μὲν γὰρ ἔνια, δῆλον, καὶ εὐθὺς τὸ ἔσται, καὶ τὸ μέλλον ἕτερον διὰ τοῦτο. ὃ μὲν γὰρ ἀληθὲς εἰπεῖν ὅτι ἔσται, δεῖ τοῦτο εἶναί ποτε ἀληθὲς ὅτι ἔστιν· ὃ δὲ νῦν ἀληθὲς εἰπεῖν ὅτι μέλλει, οὐδὲν κωλύει μὴ γενέσθαι· μέλλων γὰρ ἂν βαδίζειν τις, οὐκ ἂν βαδίσειεν. ὅλως δ', ἐπεὶ ἐνδέχεται ἔνια τῶν ὄντων καὶ εἶναι καὶ μὴ εἶναι, δῆλον ὅτι καὶ τὰ γινόμενα οὕτως ἕξει, καὶ οὐκ ἐξ ἀνάγκης τοῦτ' ἔσται. πότερον οὖν ἅπαντα τοιαῦτα, ἢ οὔ; ἀλλ' ἔνια ἀναγκαῖον ἁπλῶς γίνεσθαι, καὶ ἔστιν ὥσπερ ἐπὶ τοῦ εἶναι, τὰ μὲν ἀδύνατα μὴ εἶναι, τὰ δὲ δυνατὰ· οὕτως καὶ περὶ τὴν γένεσιν· οἷον τροπὰς ἄρα ἀνάγκη γενέσθαι, * [καὶ] οὐχ οἷόν τε μὴ ἐνδέχεσθαι. εἰ δὴ τὸ πρότερον ἀνάγκη γενέσθαι, [καὶ] εἰ τὸ ὕστερον, ἔσται· οἷον εἰ οἰκία, θεμέλιον· εἰ δὲ τοῦτο, πηλόν. ἆρ' οὖν δὴ εἰ θεμέλιος γέγονεν, ἀνάγκη καὶ οἰκίαν γενέσθαι; ἢ οὐκέτι, εἰ μὴ κἀκεῖνο ἀνάγκη γενέσθαι ἁπλῶς; εἰ δὲ τοῦτο, ἀνάγκη καὶ θεμελίου γενομένου, γενέσθαι οἰκίαν. οὕτω γὰρ ἦν τὸ πρότερον ἔχον πρὸς τὸ ὕστερον. ὥστε εἰ ἐκεῖνο ἔσται, ἀνάγκη ἐκεῖνο πρότερον [γενέσθαι]. εἰ τοίνυν ἀνάγκη γενέσθαι τὸ ὕστερον, καὶ τὸ πρότερον ἀνάγκη· καὶ * εἰ τὸ πρότερον, καὶ τὸ ὕστερον τοίνυν ἀνάγκη. ἀλλ' οὐ δι' ἐκεῖνο, ἀλλ' ὅτι ὑπέκειτο ἐξ ἀνάγκης ἐσόμενον. ἐν οἷς ἄρα τὸ ὕστερον ἀνάγκη εἶναι, ἐν τούτοις ἀντιστρέφει. καὶ ἀεὶ τοῦ προτέρου γενομένου, ἀνάγκη γενέσθαι τὸ ὕστερον. εἰ μὲν οὖν εἰς ἄπειρον εἶσιν ἐπὶ τὸ κάτω, οὐκ ἔσται ἀνάγκη τὸ ὕστερον τόδε γενέσθαι ἁπλῶς, ἀλλ' οὐδ' ἐξ ὑποθέσεως· ἀεὶ γὰρ ἕτερον ἔμπροσθεν ἐξ ἀνάγκης ἔσται, δι' ὃ κἀκεῖνο ἀνάγκη γενέσθαι. ὥστε εἰ μὴ ἔστιν ἀρχὴ τοῦ ἀπείρου, οὐδὲ πρῶτον ἔσται οὐδὲν, δι' ὃ ἀναγκαῖον ἔσται γενέσθαι. ἀλλὰ μὴν οὐδ' ἐν τοῖς πέρας ἔχουσι τοῦτ' ἔσται εἰπεῖν ἀληθῶς, ὅτι ἁπλῶς ἀνάγκη γενέσθαι, οἷον οἰκίαν, ὅταν θεμέλιος γένηται· ὅταν γὰρ γένηται, εἰ μὴ ἀεὶ τοῦτο ἀνάγκη γίνεσθαι, συμβήσεται ἀεὶ εἶναι τὸ ἐνδεχόμενον μὴ ἀεὶ εἶναι. ἀλλὰ δεῖ τῇ γενέσει ἀεὶ εἶναι, εἰ ἐξ ἀνάγκης ἐστὶν αὐτοῦ ἡ γένεσις· τὸ γὰρ ἐξ ἀνάγκης καὶ ἀεὶ ἅμα· ὃ γὰρ εἶναι ἀνάγκη, οὐχ οἷόν τε μὴ εἶναι· ὥστ' εἰ ἔστιν ἐξ ἀνάγκης, ἀΐδιόν ἐστι· καὶ εἰ ἀΐδιον, ἐξ ἀνάγκης. καὶ εἰ ἡ γένεσις τοίνυν ἐξ ἀνάγκης, ἀΐδιος καὶ ἡ γένεσις τούτου· καὶ εἰ ἀΐδιος, ἐξ ἀνάγκης. εἰ ἄρα τινὸς ἐξ ἀνάγκης ἁπλῶς ἡ γένεσις, ἀνάγκη * περικυκλεῖν καὶ ἀνακάμπτειν. ἀνάγκη γὰρ ἤτοι πέρας

* κ. ἢ οὐχ οἷόν τε εἶναι μὴ γενέσθαι.

* καὶ εἰ τὸ πρότερον, ἀνάγκη καὶ τὸ ὕστερον. ἀλλ' οὐ δι' ἐκεῖνο,

* γρ. ἀνακυκλεῖν

CAPVT XI.

De generatione & tranſmutatione quæſtiones aliquot.

B Cvm autem in hiſce quæ per ortum alterationémve, aut omnino tranſmutationem continenter mouentur, hoc poſt hoc deinceps eſſe ac oriri in tantum vt non deficiant, videamus: vtrùm quippiam ſit, quod erit neceſſariò, an nihil, ſed omnia non fore contingat, conſiderandum eſt. palàm enim eſt, quòd nonnulla. Atque continuo fore & eſſe futurum, hac de cauſa diuerſa ſunt. Nam de quo verum eſt dicere ipſum fore, de eo tandem hoc, ipſum inquam eſſe, verum ſit oportet: de quo vero nunc verum eſt dicere, ipſum eſſe futurum, hoc non fore nihil vetat. Nam tametſi futurum eſt vt quiſpiam ambulet: tamen fieri poteſt vt non ambulet. Omnino autem cùm ex entibus nonnulla, &
C eſſe & non eſſe contingat: quod & ea quæ gigni ſolent, ita ſeſe habebunt, & non neceſſario erunt, apertum eſt. Vtrùm igitur vniuerſa ſint eiuſmodi, an non, ſed aliqua ſimpliciter fore neceſſarium ſit: & ſicut in ipſo eſſe fit vt quædam non poſſint non eſſe, quædam poſſint non eſſe: ſic & in ipſa quoque generatione. verbi gratia, ſolſtitia fore neceſſe eſt, nec fieri poteſt vt non contingant. Si igitur prius fore neceſſe eſt, ſi poſterius erit, vt ſi domus, fundamentum, ſi vero fundamentũ, lutum: nónne ergo ſi fundamentum factum eſt, domum quoque fore neceſſe eſt? an non adhuc, niſi & eam fore ſimpliciter neceſſe ſit? quòd ſi hoc ſit, facto fundamento fore domum neceſſe eſt. Nam ſic prius ſeſe ha-
D bet ad poſterius. Qua de cauſa ſi hoc erit, antè fore illud eſt neceſſe. Si itaque eſt neceſſe fore poſterius, prius quoque neceſſe eſt: & ſi prius, & poſterius. Verùm non ob illud, ſed quia neceſſariò futurum ſupponebatur. In quibus ergo poſterius eſſe neceſſe eſt, in hiſce recurrit: ſemperque ſi prius eſt factum, poſterius fore neceſſe eſt. Quòd ſi deorſum verſùs in infinitum abeant, haud quaquam ex poſterioribus hocce fore ſimpliciter, ſed ne ex ſuppoſitione quidem, erit neceſſe. nam ſemper aliud antè neceſſario erit, quocirca & illud fore, neceſſarium erit. Quare ſi infiniti non ſit pricipium: nec primum quicquam erit, ob quod fore erit neceſſa-
E rium. At verò nec in hiſce quidem quæ finem habent, atque terminum, hoc verè dici continget: ſimpliciter inquam fore quippiam, ceu domum, cùm factum fuerit fundamentum. Nam cùm fuerit factum: niſi ſemper eam fieri ſit neceſſe, ſemper id eſſe quod poteſt non eſſe, eueniet. At generatione ſemper ſit, eſt neceſſe: ſi ipſius generatio neceſſariò ſit. nam neceſſariò & ſemper, ſimul ſunt. quod enim eſſe eſt neceſſe, non poteſt non eſſe. Quare ſi quid neceſſariò eſt, ſempiternum eſt: & ſi ſempiternum eſt, neceſſariò eſt. Si itaque huiuſce generatio neceſſariò eſt, ſempiterna eſt: & ſi ſempiterna, neceſſariò. Si igitur generatio cuiuſpiam neceſſariò ſimpliciter ſit, in orbem eat eodémque reuertatur neceſſe eſt. Nam generationem aut ter-

minum habere, aut non habere, neceſſe eſt. Et ſi non habeat: aut in rectum, aut in circulum. Horum autem, ſi ſempiterna ſit, in rectum minimè poſſibile eſt: quia nequaquam ſit principium, neque deorſum vt in futuris accipimus, neque ſurſum vt in hiſce quæ iam facta ſunt. At eſſe principium, ſi finita non ſit, atque eam ſempiternam eſſe neceſſe eſt. Quocirca circularis ſit, eſt neceſſe. Igitur regreſſum fieri neceſſe erit. vt ſi hoc neceſſario ſit, ergo & prius. at vero ſi hoc, & poſterius fore erit neceſſe. Atque hoc ſemper continuè: nihil enim refert, per duo an plura hoc dicamus. Igitur neceſſario ſimpliciter circulari motui atque generationi competit. Et ſi in orbem fiat generatio, fore quodque & eſſe factum neceſſe eſt: & ſi neceſſe ſit, horum generatio circularis erit. Hęc itaque non ſine ratione accidunt, poſteaquam motus ille circularis atque cœleſtis perpetuus eſt. nam hæc neceſſario fiunt & erunt, quæcumque huiuſce motiones ſunt, & quæcumque propter hunc fiunt motum. Nam ſi id quod in orbem mouetur, aliqua ſemper moueat, eorum quoque motum circularem eſſe neceſſe eſt. vt ſi ſupera latio orbita ſit, ſol orbita mouetur. Quoniam autem hoc pacto mouetur, hac ſane de cauſa anni tempora in circulum fiunt, redeúntque. Quæ cùm ita fiant, omnia profectò quæ ſub ipſis ſunt, haud ſecus fient. Cúrnam igitur quędam ita fieri videntur, nempe circulatim oriri, vt pluuia & aër (nam ſi nubes erat, pluat etiam oportet: & ſi pluet, nubem quoque fore conuenit) homines verò & animalia in ſeſe non redeunt remeantque, ita vt idem rurſum oriatur? Non enim ſi pater ſit, te fore: ſed illum ſi tu ſis, neceſſe eſt. Hæc autem generatio in rectum proficiſci videtur. Rurſum autem hoc conſiderationis initium ſumatur: ſimiline modo vniuerſa redeant an non, ſed quædam numero, quædam ſpecie ſolùm? Quorum igitur ſubſtantia motum ſubiens incorruptibilis eſt, ea omnia, vt patet, etiam numero eadem redire ſolent. nam motus id comitari ſolet quod motu cietur. Quorum verò non, ſed corruptibilis: ſpecie, non item numero, reuerti neceſſe eſt, quocirca cùm ex aëre aqua fit, & ex aqua aër, aër ſpecie idem, non numero, redit. Quod ſi & eadem numero aliqua redeant, non tamen eá quorum ſubſtantia ortum ſubit, eiuſcemodi exiſtens, quæ non eſſe poſſit.

A ἔχειν τὴν γένεσιν, ἢ μή· καὶ εἰ μή, ἢ εἰς εὐθύ, * ἢ κύκλῳ. τούτων δ' εἴπερ ἔσται ἀΐδιος, οὐκ εἰς εὐθὺ οἷόν τε, διὰ τὸ μηδαμῶς εἶναι ἀρχήν· μήτ' ἂν κάτω, ὡς ἐπὶ τῶν ἐσομένων διαλαμβάνομεν· μήτε ἄνω, ὡς ἐπὶ τῶν γινομένων. ἀνάγκη δ' εἶναι ἀρχήν, μὴ πεπερασμένης οὔσης, καὶ ἀΐδιον εἶναι. διὸ ἀνάγκη κύκλῳ εἶναι. ἀντιστρέφειν ἄρα ἀνάγκη ἔσται· οἷον εἰ τόδε ἐξ ἀνάγκης εἶναι, καὶ τὸ πρότερον ἄρα· ἀλλὰ μὴν εἰ τοῦτο, καὶ τὸ ὕστερον ἀνάγκη γενέσθαι. καὶ τοῦτο ἀεὶ δὴ συνεχῶς· οὐδὲν γὰρ τοῦτο διαφέρει λέγειν, διὰ δύο ἢ πολλῶν. ἐν τῇ κύκλῳ ἄρα κινήσει καὶ γενέσει ἐστὶ τὸ ἐξ ἀνάγκης B ἁπλῶς· καὶ εἰ κύκλῳ, ἀνάγκη ἕκαστον γίνεσθαι καὶ γεγονέναι· καὶ εἰ ἀνάγκη, ἡ τούτων γένεσις κύκλῳ. Ταῦτα μὲν δὴ εὐλόγως, ἐπεὶ ἀΐδιος, καὶ ἄλλως ἐφάνη ἡ κύκλῳ κίνησις, καὶ ἡ τοῦ οὐρανοῦ, ὅτι ταῦτα ἐξ ἀνάγκης γίνεται, καὶ ἔσται, ὅσαι * ταύτης κινήσεις, καὶ ὅσαι διὰ ταύτην. Εἰ γὰρ τὸ κύκλῳ κινούμενον ἀεί τι κινεῖ, ἀνάγκη καὶ τούτων κύκλῳ εἶναι τὴν κίνησιν· οἷον τῆς ἄνω φορᾶς οὔσης, ὁ ἥλιος κύκλῳ ὡδί. ἐπεὶ δ' οὕτως αἱ ὧραι, διὰ τοῦτο κύκλῳ γίνονται καὶ ἀνακάμπτουσι. τούτων δ' οὕτω γινομένων, πάλιν τὰ ὑπὸ τούτων. τί οὖν δή ποτε τὰ μὲν οὕτω φαίνεται, οἷον ὕδατα καὶ ἀὴρ κύκλῳ γινόμενα (καὶ εἰ μὲν νέφος ἔσται, δεῖ καὶ ὗσαι· C καὶ εἰ ὕσει γε, δεῖ καὶ νέφος εἶναι·) ἄνθρωποι δὲ καὶ ζῷα οὐκ ἀνακάμπτουσιν εἰς ἑαυτούς, ὥστε πάλιν γίνεσθαι τὸν αὐτόν· οὐ γὰρ ἀνάγκη εἰ ὁ πατὴρ ἐγένετο, σὲ γενέσθαι· ἀλλ' εἰ σύ, ἐκεῖνον. εἰς εὐθὺ δὲ ἔοικεν εἶναι αὕτη ἡ γένεσις. ἀρχὴ δὲ τῆς σκέψεως πάλιν αὕτη, πότερον ὁμοίως ἅπαντα ἀνακάμπτει, ἢ οὔ; ἀλλὰ τὰ μὲν ἀριθμῷ, τὰ δὲ εἴδει μόνον. ὅσων μὲν οὖν ἄφθαρτος οὐσία ἡ κινουμένη, φανερὸν ὅτι καὶ ἀριθμῷ ταὐτὰ ἔσται· ἡ γὰρ κίνησις ἀκολουθεῖ τῷ κινουμένῳ. ὅσων δὲ μή, ἀλλὰ φθαρτή, ἀνάγκη τῷ εἴδει, ἀριθμῷ δὲ μή, ἀνακάμπτειν. διὸ ὕδωρ ἐξ ἀέρος, καὶ ἀὴρ ἐξ ὕδατος, εἴδει ὁ αὐτός, οὐκ ἀριθμῷ. Εἰ δὲ καὶ ταῦτα ἀριθμῷ, ἀλλ' οὐχ ὧν ἡ οὐσία γίνεται οὖσα τοιαύτη, οἵα ἐνδέχεσθαι μὴ εἶναι.

* κ. ἢ εἰς κύκλον.

* κ. ταύτης

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΜΕΤΕΩΡΟΛΟΓΙΚΩΝ ΤΩΝ εἰς Δ τὸ Α.

ARISTOTELIS STAGIRITÆ METEOROLOGICORVM LIBER I.

Franciſco Vatablo interprete.

ΚΕΦΑΛ. α'.

A

Σύνοψις ὅλης τῆς φυσικῆς πραγματείας, ἧς τὸ μὲν εἴρηται, τὸ δ' ἐν τοῖς ἑξῆς βιβλίοις ῥηθήσεται.

ΠΕΡΙ μὲν οὖν τῶν πρώτων αἰτίων τῆς φύσεως, καὶ περὶ πάσης κινήσεως φυσικῆς· ἔτι δὲ περὶ τῶν κατὰ τὴν ἄνω φορὰν διακεκοσμημένων ἄστρων, καὶ περὶ τῶν στοιχείων τῶν σωματικῶν, πόσα τε καὶ ποῖα, καὶ τῆς εἰς ἄλληλα μεταβολῆς, καὶ περὶ γενέσεως B καὶ φθορᾶς τῆς κοινῆς, εἴρηται πρότερον. λοιπὸν δ' ἐστὶ μέρος ταύτης τῆς μεθόδου ἔτι θεωρητέον, ὃ πάντες οἱ πρότεροι μετεωρολογίαν ἐκάλουν. ταῦτα δ' ἐστὶν ὅσα συμβαίνει κατὰ φύσιν μὲν, ἀτακτοτέραν μέντοι τῆς τοῦ πρώτου στοιχείου τῶν σωμάτων, περὶ τὸν γειτνιῶντα μάλιστα τόπον τῇ φορᾷ τῶν ἄστρων· οἷον περί τε γάλακτος, καὶ κομητῶν, καὶ τῶν ἐκπυρουμένων καὶ κινουμένων φασμάτων· ὅσα τε θείημεν ἂν ἀέρος εἶναι κοινὰ πάθη καὶ ὕδατος· ἔτι δὲ γῆς * ὅσα μέρη, καὶ εἴδη καὶ πάθη τῶν μερῶν· ἐξ ὧν περί τε πνευμάτων καὶ σεισμῶν θεωρήσαιμεν ἂν C τὰς αἰτίας· καὶ περὶ πάντων τῶν γινομένων κατὰ τὰς κινήσεις τὰς τούτων· ἐν οἷς, τὰ μὲν ἀποροῦμεν, τῶν δ' ἐφαπτόμεθά τινα τρόπον· ἔτι δὲ περὶ κεραυνῶν πτώσεως, καὶ * πρηστήρων, καὶ τυφώνων, καὶ τῶν ἄλλων τῶν ἐγκυκλίων, ὅσα διὰ πῆξιν συμβαίνει πάθη τῶν αὐτῶν τούτων σωμάτων. διελθόντες δὲ περὶ τούτων, θεωρήσομεν, εἴ τι δυνάμεθα κατὰ τὸν ὑφηγημένον τρόπον ἀποδοῦναι περὶ ζώων καὶ φυτῶν, καθόλου τε καὶ χωρίς· σχεδὸν γὰρ τούτων ῥηθέντων, τέλος ἂν εἴη γεγονὸς τῆς ἐξ ἀρχῆς ἡμῖν προαιρέσεως πάσης. ὧδε οὖν ἀρξάμενοι λέγωμεν περὶ αὐτῶν πρῶτον.

* γ. ὅσα εἴδη, καὶ μέρη, καὶ πάθη τῶν μερῶν.

* γ. καὶ πυρ. καὶ τ.

CAPVT I.

Eorum quæ hactenus dicta ſunt, & quæ deinceps deſcripturus eſt, complexio.

DE primis igitur naturæ cauſis, ac omni naturali motu, & inſuper de ſtellis ſupera in latione pulchrè ritéque diſpoſitis, nec non de corporeis elementis, quot & quæ ſint, & de mutua eorum tranſmutatione: item de ortu ac interitu communi, dictum eſt antea. Reſtat autem adhuc quædam huiuſce diſciplinæ portio contemplanda: quam priores vniuerſi Meteorologiam, id eſt, eorum quæ fiunt in ſublimi, ſcientiam, appellitabant. cuiuſmodi ſunt quæcumque per primi elementi corporum naturam quidem, ſed quæ tamen minùs ſibi conſtet, in eo potiſſimùm loco eueniunt qui in conuerſionis ſtellarum vicinia ſitus eſt: verbi cauſa, de lacteo circulo, cometis, oſtentis conflagrantibus diſcurrentibúſque, necnon de hiſce quæ aeri & aquæ promiſcuas eſſe affectiones affirmare poſſumus, & inſuper de hiſce quæ terræ ſpecies ac partes aut earumdem affectus exiſtunt, ex quibus ventorum ac terræmotuum cauſas contemplabimur, & omnium quæ dum ea mouentur, cooriri ſolent. inter quæ alia addubitamus, alia modo quodam attingimus. Super hæc, de fulminum caſu, typhonibus, preſteribus, ceteriſque circularibus affectibus qui corporum concretione eorumdem obueniunt. Quibus pertractatis, ſpeculabimur ſi quid de animalibus ac plantis tam vniuerſim quàm ſeorſim dicere, via & ratione qua cœptum eſt, queamus. Ferè enim his dictis, res vniuerſa, qua de agere ab initio inſtituimus, finem erit aſſecuta. Sic ergo ſumpto initio, de ipſis priùs dicamus.

CAPVT

A

CAPVT II.

De continentiæ inter cælum & terram diuerſitate.

CVm enim antea definitum ſit à nobis, vnum quidem principium de numero illorum corporum eſſe, ex quibus natura eorum conſtat quæ in orbem commeant: & alia corpora quatuor ob principia totidem eſſe: quorum duplicem eſſe motum, alterum à medio, alterum ad medium dicimus: atque cùm hæc ſint quatuor, nempe, ignis, B aër, aqua & terra: quod ſuper hæc omnia inuehitur eſſe ignem, quod ſubſidet, terram: duo etiam eſſe quæ perinde vt illa inter ſeſe habeant: (nam aër igni inter cætera proximus exiſtit, aqua terræ) totus profectò mundus terræ vndique incumbens, ex hiſce conſtat corporibus: circa quem quæ contingere ſolent affectiones, ſumi oportere cenſemus. Eſt autem neceſſariò mundus iſte ſupernis lationibus ferè continuus, vt inde vis eius vniuerſa regatur. Ea ſi quidem cauſa prima putanda omnibus eſt, vnde motus principium exiſtit. Ad hæc quæ perpetua eſt, nec motus finem ratione loci habet, ſed in fine ſemper eſt. Quinetiam hæc C omnia corpora certis diſcreta ſunt ſpatiis. quare ignem & terram, & quæ hiſce cognata ſunt, eorum quæ in inferiore mundo contingunt, vt in genere materiæ eorum quæ fiunt, cauſas exiſtimare addecet. quod enim ſubiicitur patitúrque, hoc nuncupare modo conſueuimus. Sed quod ita cauſa eſt, vt vnde principium motus, ad eorum vim, quæ aſſiduè mouentur, referendum eſt.

CAPVT III.

De igni & aëre quæſtiones aliquot.

D

REpetitis igitur poſitionibus definitionibúſque, quas priùs diximus: de lacteo circulo, cometis, & cæteris quæ hiſce cognata ſunt, ediſſeramus. Dicimus itaque, ignem, aërem, aquam & terram, ex ſeſe mutuò gigni: & eorum perinde quodque in quoque potentia ineſſe, vt & cæterorum, quibus vnum quippiam idémque ſubiicitur, in quod vltimum reſolui ſolent. Principio igitur addubitauerit quiſpiam de vocato aëre, quam eius naturam in mundo terræ circumfuſo ſumere oporteat, & quem ſibi ille vendicet ordinem ad reliqua, quæ elementa corporum nuncupantur. Siquidem quanta ſit terræ moles ad ambientes magni- E tudines, haudquaquam obſcurum eſt. Iam enim per ſideralis ſcientiæ theoremata deprehenſum à nobis eſt, terram eſſe multo item quàm ſtellas quaſdam minorem. Aquæ vero naturam nec congregatam in vnum ſequeſtratámque cernimus: nec fieri poteſt vt ab eo quod circa terram ſitum eſt, corpore ſeparetur, ſcilicet à manifeſtis maris partibus, fluminibus, & ſi qua eſt altitudo profunda quę nobis manifeſta non ſit. Itaque quod inter terram ſtellâſque in vltimo locatas interpatet, vtrùm vnũ quoddam eſſe natura corpus, an plura exiſtimandum eſt? Et ſi plura ſint, quótnam ſunt, & qua ſini locis diſterminata? De primo igitur elemento nobis priùs dictum eſt, quibus ſit viribus, & cur totus ille qui circa lationes ſupernas exiſtit mundus,

ΚΕΦΑΛ. β'.

Ὅτι ὅλου τοῦ περὶ τὴν γῆν κόσμου ἡ δύναμις κατὰ τὴν ἄνωθεν φορὰν κυβερνᾶται.

ΕΠεὶ γὰρ διώρισται πρότερον ἡμῖν, μία μὲν ἀρχὴ τῶν σωμάτων * ἐξ ὧν συνέστηκεν ἡ τῶν * ἐγκυκλίως φερομένων σωμάτων φύσις· ἄλλα δὲ τέτταρα σώματα διὰ τὰς τέτταρας ἀρχάς, ὧν δὴ τὴν εἶναι φαμὲν τὴν κίνησιν, τὴν μὲν ἀπὸ τοῦ μέσου, τὴν δ' ἐπὶ τὸ μέσον· τεττάρων δ' ὄντων τούτων, πυρὸς, καὶ ἀέρος, καὶ ὕδατος, καὶ γῆς· τὸ μὲν τούτοις πᾶσιν ἐπιπολάζον, εἶναι πῦρ· τὸ δ' ὑφιστάμενον, γῆν· δύο δ', ἃ πρὸς αὐτὰ, καὶ τοῖς ἀνάλογον ἔχει· ἀὴρ μὲν γὰρ πυρὸς ἐγγύτατον τῶν ἄλλων· ὕδωρ δὲ, γῆς· ὁ δὴ περὶ τὴν γῆν ὅλος κόσμος ἐκ τούτων συνέστηκε τῶν σωμάτων· * περὶ ὃν τὰ συμβαίνοντα πάθη φαμὲν εἶναι ληπτέον. ἔστι δ' ἐξ ἀνάγκης συνεχὴς πως οὗτος ταῖς ἄνω φοραῖς, ὥστε πᾶσαν αὐτοῦ τὴν δύναμιν κυβερνᾶσθαι ἐκεῖθεν· ὅθεν γὰρ ἡ τῆς κινήσεως ἀρχὴ πᾶσιν, ἐκείνην αἰτίαν νομιστέον πρώτην. πρὸς δὲ τούτοις, C ἡ μὲν ἀΐδιος καὶ τέλος οὐκ ἔχουσα τῷ τόπῳ τῆς κινήσεως, ἀλλ' ἀεὶ ἐν τέλει. ταῦτα δὲ τὰ σώματα πάντα πεπερασμένους διέστηκε τόπους ἀλλήλων· ὥστε τῶν συμβαινόντων περὶ αὐτὸν, πῦρ μὲν, καὶ γῆν, καὶ τὰ συγγενῆ τούτοις, ὡς ἐν ὕλης εἴδει, τῶν γιγνομένων αἴτια χρὴ νομίζειν· τὸ γὰρ ὑποκείμενον καὶ πάσχον, τοῦτο προσαγορεύομεν τὸν τρόπον. τὸ δ' οὕτως αἴτιον, ὡς ὅθεν ἡ τῆς κινήσεως ἀρχὴ, τὴν τῶν ἀεὶ κινουμένων αἰτιατέον δύναμιν.

ΚΕΦΑΛ. γ'.

Πῶς τέτακται ἀὴρ καὶ πῦρ πρὸς τὴν τοῦ πρώτου σώματος θέσιν καὶ διὰ τί ἐν αὐτῷ οὐ γίνεται νέφη, μηδ' εἰς ὕδωρ σύγκρισις.

ΑΝαλαβόντες οὖν τὰς ἐξ ἀρχῆς θέσεις καὶ τοὺς εἰρημένους πρότερον διορισμοὺς, λέγωμεν περί τε τῆς τοῦ γάλακτος φαντασίας καὶ περὶ κομητῶν, καὶ τῶν ἄλλων ὅσα τυγχάνει τούτοις ὄντα συγγενῆ. φαμὲν δὲ πῦρ, καὶ ἀέρα, καὶ ὕδωρ, καὶ γῆν γίνεσθαι ἐξ ἀλλήλων, καὶ ἕκαστον ἐν ἑκάστῳ ὑπάρχειν τούτων δυνάμει· ὥσπερ καὶ τῶν ἄλλων οἷς ἕν τι καὶ τὸ αὐτὸ ὑπόκειται, εἰς ὃ καὶ ἀναλύονται ἔσχατον. πρῶτον μὲν οὖν ἀπορήσειεν ἄν τις περὶ τὸν καλούμενον ἀέρα, τίνα τε χρὴ λαβεῖν αὐτοῦ τὴν φύσιν ἐν τῷ περιέχοντι κόσμῳ τὴν γῆν, καὶ πῶς ἔχει τῇ τάξει E πρὸς τἆλλα τὰ λεγόμενα στοιχεῖα τῶν σωμάτων. ὁ μὲν γὰρ τῆς γῆς ὄγκος, πηλίκος ἄν τις εἴη πρὸς τὰ περιέχοντα μεγέθη, οὐκ ἄδηλον· ἤδη γὰρ ὦπται διὰ τῶν ἀστρολογικῶν θεωρημάτων ἡμῖν, ὅτι πολὺ καὶ τῶν ἄστρων ἐνίων ἐλάττων ἐστίν. ὕδατος δὲ φύσιν συνεστηκυῖαν καὶ ἀφωρισμένην οὔθ' ὁρῶμεν, οὔτ' ἐνδέχεται κεχωρισμένην [εἶναι] τοῦ περὶ τὴν γῆν ἱδρυμένου σώματος· ἔστι τοῦ τε φανεροῦ, θαλαττίου καὶ ποταμίου, κἄν εἴ τι κατὰ βάθος ἄδηλον ἡμῖν ἐστι. τὸ δὲ δὴ μεταξὺ τῆς γῆς τε καὶ τῶν ἐσχάτων ἄστρων, πότερον ἕν τι νομιστέον εἶναι σῶμα τὴν φύσιν, ἢ πλείω, κἂν εἰ πλείω, πόσα, καὶ μέχρι ποῦ διώρισται τοὺς τόπους. ἡμῖν μὲν οὖν εἴρηται πρότερον περὶ τοῦ πρώτου στοιχείου, ποῖόν τι τὴν δύναμίν ἐστι, καὶ ὅτι πᾶς ὁ περὶ τὰς ἄνω φορὰς κόσμος,

ἐκείνου τοῦ σώματός πλήρης ἐστί. καὶ ταύτην τὴν δόξαν οὐ μόνον ἡμεῖς τυγχάνομεν ἔχοντες· φαίνεται δ᾽ ἀρχαία τις ὑπόληψις αὕτη καὶ τῶν πρότερον ἀνθρώπων. ὁ γὰρ λεγόμενος αἰθὴρ, παλαιὰν εἴληφε τὴν προσηγορίαν, ἣν * Ἀναξαγόρας μὲν τῷ πυρὶ ταὐτὸν ἡγήσασθαί μοι δοκεῖ σημαίνειν· τά τε γὰρ ἄνω πλήρη πυρὸς εἶναι· κἀκεῖνος τὴν ἐκεῖ δύναμιν, αἰθέρα καλεῖν ἐνόμισε· τοῦτο μὲν ὀρθῶς νομίσας· τὸ γὰρ ἀεὶ σῶμα θέον, ἅμα τε θεῖόν τι τὴν φύσιν ἐοίκασιν ὑπολαβεῖν, καὶ διώρισαν ὀνομάζειν αἰθέρα τὸ τοιοῦτον, ὡς ὂν οὐθενὶ τῶν παρ᾽ ἡμῖν τὸ αὐτό. οὐ γὰρ δὴ φήσομεν ἅπαξ, οὐδὲ δὶς, οὐδ᾽ ὀλιγάκις τὰς αὐτὰς δόξας ἀνακυκλεῖν γινομένας ἐν τοῖς ἀνθρώποις, ἀλλ᾽ ἀπειράκις. ὅσοι δὲ πῦρ καθαρὸν εἶναί φασι τὸ περιέχον, καὶ μὴ μόνον τὰ φερόμενα σώματα· τὸ δὲ μεταξὺ γῆς καὶ τῶν ἄστρων, ἀέρα, θεωρήσαντες ἂν τὰ νῦν δεικνύμενα διὰ τῶν μαθημάτων ἱκανῶς, ἴσως ἂν ἐπαύσαντο ταύτης τῆς παιδικῆς δόξης. λίαν γὰρ ἁπλοῦν τὸ νομίζειν μικρὸν τοῖς μεγέθεσιν εἶναι τῶν φερομένων ἕκαστον, ὅτι φαίνεται θεωροῦσιν ἐντεῦθεν ἡμῖν οὕτως. εἴρηται μὲν οὖν καὶ πρότερον ἐν τοῖς περὶ τὸν ἄνω τόπον θεωρήμασι· λέγωμεν δὲ τὸν αὐτὸν λόγον καὶ νῦν. εἰ γὰρ τά τε διαστήματα, πλήρη πυρὸς, καὶ τὰ σώματα συνέστηκεν ἐκ πυρὸς, πάλαι φροῦδον ἂν ἦν ἕκαστον τῶν ἄλλων στοιχείων. ἀλλὰ μὴν οὐδ᾽ ἀέρος γε μόνου πλήρη· πολὺ γὰρ ἂν ὑπερβάλλοι τὴν ἰσότητα τῆς κοινῆς ἀναλογίας πρὸς τὰ σύστοιχα σώματα, κἂν εἰ δύο στοιχείων πλήρης ὁ μεταξὺ γῆς καὶ οὐρανοῦ τόπος ἐστίν. οὐθὲν γὰρ, ὡς εἰπεῖν, μόριον ὁ τῆς γῆς ἐστιν ὄγκος, ἐν ᾧ συνείληπται πᾶν καὶ τὸ τοῦ ὕδατος πλῆθος πρὸς τὸ περιέχον μέγεθος. ὁρῶμεν δ᾽ οὐκ ἐν τοσούτῳ μεγέθει γινομένην τὴν ὑπεροχὴν τῶν ὄγκων, ὅταν ἐξ ὕδατος ἀὴρ γένηται διακριθέντος, ἢ πῦρ ἐξ ἀέρος. ἀνάγκη δὲ τὸν αὐτὸν λόγον ἔχειν ὃν ἔχει τὸ τοσονδὶ καὶ μικρὸν ὕδωρ πρὸς τὸν ἐξ αὐτοῦ γινόμενον ἀέρα, * καὶ τὸν πάντα πρὸς τὸ πᾶν ὕδωρ. διαφέρει δ᾽ οὐθὲν, οὐδ᾽ εἴ τις φησὶ μὲν μὴ γίνεσθαι ταῦτα ἐξ ἀλλήλων, ἴσα μέν τοι τὴν δύναμιν εἶναι· κατὰ τοῦτον γὰρ τὸν τρόπον ἀνάγκη τὴν ἰσότητα τῆς δυνάμεως ὑπάρχειν τοῖς μεγέθεσιν αὐτῶν, ὥσπερ κἂν εἰ γινόμενα ἐξ ἀλλήλων ὑπῆρχεν. ὅτι μὲν οὖν, οὔτε ἀὴρ οὔτε πῦρ συμπεπλήρωκε μόνον τὸν μεταξὺ τόπον, φανερόν ἐστι. λοιπὸν δὲ διαπορήσαντας εἰπεῖν πῶς τέτακται τὰ δύο πρὸς τὴν τοῦ πρώτου σώματος θέσιν· λέγω δὲ ἀέρα καὶ πῦρ. καὶ διὰ τὴν αἰτίαν ἡ θερμότης ἀπὸ τῶν ἄνωθεν ἄστρων γίνεται τοῖς περὶ τὴν γῆν τόποις. περὶ ἀέρος οὖν εἰπόντες πρῶτον, ὥσπερ ὑπεθέμεθα, λέγωμεν οὕτω καὶ περὶ τούτων πάλιν. εἰ δὴ γὰρ *ὕδωρ ἐξ ἀέρος, καὶ ἀὴρ ἐξ ὕδατος, διὰ τίνα ποτ᾽ αἰτίαν οὐ συνίσταται νέφη κατὰ τὸν ἄνω τόπον; προσῆκε γὰρ μᾶλλον ὅσῳ πορρώτερος ὁ τόπος τῆς γῆς καὶ ψυχρότερος, διὰ τὸ μήτε οὕτως πλησίον εἶναι τῶν ἄστρων θερμῶν ὄντων, μήτε τῶν ἀπὸ τῆς γῆς ἀνακλωμένων ἀκτίνων, αἳ κωλύουσι πλησίον τῆς γῆς συνίστασθαι, διακρίνουσαι τῇ θερμότητι τὰς συστάσεις. γίνονται γὰρ αἱ τῶν νεφῶν ἀθροίσεις, οὗ λήγουσιν ἤδη διὰ τὸ σχίζεσθαι εἰς ἀχανὲς αἱ ἀκτῖνες.

* De cœlo l. 1. c. 3. & alibi.

* γρ. ἢ τὸ πᾶν ὕδωρ πρὸς τὸν πάντα.

A illo corpore diſſertus eſt. Quæ opinio non modò noſtra eſt, ſed priſca quædam maiorúmque exiſtimatio eſſe videtur. Nam quem vocamus æthera, antiquam ſibi adoptauit appellationem, quam Anaxagoras idem quod ignis vocabulum ſignificare putaſſe mihi videtur. quippe qui & ſuperas mundi partes igni plenas eſſe, & vim quæ inibi eſſet, æthera vocare cenſuit: quod quidem adprobè fecit. Nam corpus quod aſſiduè currit, ſimul & diuinum natura exiſtimaſſe viſi ſunt: & quod eſſet eiuſmodi, æthera nuncupare, tanquam nulli eorum qui hic viſuntur, idem foret, definierunt. Non enim oportet opiniones mortalium eaſdem ſemel aut iterum, aut iuxta quempiam paruum numerum redire dicamus, ſed infinities. Qui B autem id quod ambit, & non corpora ſolùm quæ lationem ſubeunt, eſſe purum ignem aiunt, quod vero inter terram ſtellaſque intercedit, aerem: ij, ſi quæ nunc Mathematicis rationibus abundè demonſtramus, fuiſſent ſpeculati, forſitan ab hac puerili opinione deſtitiſſent. Eſt enim animi perquam ſimplicis, putare, ſingula quæ motu cientur, ideo puſilla eſſe magnitudine, quòd nobis hinc aſpicientibus appareant eiuſmodi. Ergo tametſi vel antea in de ſupero loco contemplationibus hac de re dictum ſit, eandem tamen rationem in præſentia quoque dicamus. Nam ſi & interualla ipſa forent opplera igni, & corpora ex eodem conſtarent, dudum cætera alia euanuiſſent periſſéntque elementa. At verò nec aëre ſolo C plena ſunt interualla. nam tum aër communis rationis æqualitatem ad corpora eiuſdem ſeriei, haud paruo exuperaret: etiamſi locus, qui inter cœlum terramque interhiat, elementis duobus ſit oppletus. quandoquidem terræ moles quæ totam etiam aquæ copiam complexa eſt, nullius (prope dixerim) particulæ rationem ſubit, ad ambientem magnitudinem. At molis exceſſum in tanta fieri magnitudine haudquaquam videmus, vbi ex aqua ſecretionem ſubeunte aer conſit, aut ex aëre ignis. Sed quam tantilla ac perexigua aquæ portio rationem habet ad aerem qui ex ea cooritur, eandem & tota aqua ad totum aerem habeat eſt neceſſe. Nihil autem intereſt, ſi quis D ea non ex ſeſe viciſſim gigni, æquas tamen vireis habere dicat. Nam hoc pacto virium æqualitatem magnitudinibus eorum competere perinde eſt neceſſe, atque ſi ex ſeſe mutuò gignerentur. Patet igitur, neque aerem ſolum, neque ignem interpatentem oppleuiſſe locum. Reliquum eſt autem, allatis antè dubitationibus dicamus, quónam pacto elementa duo, aer inquam ac ignis, ad primi corporis poſitum ſita ſint. Et quam ob cauſam calor à ſupernis ſtellis ad loca quæ ſunt circa terram, profluat. De aere igitur priùs locuti, ſicuti admonuimus, dicamus deinceps etiamnum de hiſce rurſum. Itaque ſi ex E aere aqua cooritur, & ex aqua aer, quánam de cauſa nubes ſupero in loco non conſiſtunt? Nam eo magis interibi nubes conſiſtere addecebat, quo longiùs à terra locus ille diſtat, & algidior eſt: propterea quòd neque adeò prope ſtellas exiſtat, quibus calorifica vis ineſt, neque prope radios à terra refractos, qui quòd feruore caloris conſtitutiones ſegregent, vapores in nubem cogi prope terram vetant. Etenim nubium aſtrictiones ibidem fieri ſolent, vbi iam radij propterea deſinunt, quòd in vaſtum aerem effundantur diſpergantúrque.

Igitur aut non ex quouis aëre aqua fieri aſſolet: aut ſi ex quouis ſimiliter fiat, qui circa terram eſt, non modò aër, ſed veluti vapor exiſtit, proinde in aquã rurſum cogitur. At vero ſi vniuerſus aer tantus exiſtens ſit vapor, aëris natura & aquæ multum excedere videbuntur, ſi ſupera interualla corpore quodam plena ſint, nec fieri poſſit vt igni, propterea quòd aſſiccata iam forent cætera omnia, ſed reliquum ſit vt aere oppleta ſint, & quòd telluri vndiquaque adiacet aqua. nam vapor, non niſi aquæ ſecretio exiſtit. Ad hunc igitur modum de hiſce addubitatum ſit. Nos autem quæ ſimul & ad mox dicenda, & ad nunc dicta conducant, definientes dicamus. Quod enim ſupero in loco conſiſtit, & ad lunæ globum vſque porrigitur, corpus eſſe diuerſum ab igni & aere dicimus. Verumenimvero in eo aliud magis, aliud minùs purum eſſe ac ſincerum, differentiáſque ſortiri, & imprimis qua deſinendo, ad aerem mundúmque terræ circunquaq; incumbentem pertingit. Cùm autem primum elementum, & corpora quæ in eo ſunt, in orbem feruntur, ſemper id quod ex infero mundo ac corpore illi continuum eſt, vi motus diſgregatum accenditur, atque calorem efficit. Sic autem mente concipiamus addecet, hinc item ſumpto exordio. Nã corpus quod ſuperæ conuerſioni ſubeſt, veluti materia quædam, quæ potentia ſit calida, frigida, arida, & humecta, cæteráſque alias omneis affectiones quæ has comitantur ſubeat, fit ac eſt eiuſmodi, ratione motus & immobilitatis, cuius cauſam principiúmque diximus antea. Grauiſſimum igitur corpus atque frigidiſſimum, terra inquam & aqua, in medio & circa medium ſegregata exiſtunt. Circa quæ illa quoque ſunt quæ hiſce hærent, aer ſcilicet, atque id quod quamuis ignem aſſueuimus appellare, ignis tamen haudquaquam eſt. Siquidem ignis, caloris exuperantia ac veluti feruor exiſtit. Verùm aduertere oportet, eius quod à nobis aer dicitur, vocatúrque, quod vaporem referat, terræque exhalationem habeat, partem vnam quæ circa terram eſt, veluti calentem humidámq; eſſe: alteram quæ ſuperior eſt, calidam iam eſſe atque aridam. Nam vaporis natura, humecta calidáque eſt: exhalationis, calida & arida. Eſtque vapor, potentia vt aqua: exhalatio, potentia vt ignis. Cur igitur nubes ſupero in loco non conſiſtant, hãc eſſe cauſam exiſtimandum eſt: inibi non aerem ſolùm, ſed potiùs ignem eſſe. Nihil autem vetat, per lationem quoque orbicularem præpediri nubes, quominus ſupero in loco conſiſtant. Nam circumfundens aer vniuerſus, quicunque non intra eam capitur circunferentiam quæ efficit vt tellus tota rotunda ſit: fluat eſt neceſſe. Videmus enim nunc quoque in ſtagnantibus terræ locis ventos cooriri, qui etiam montes altiſſimos haudquaquam tranſcendunt. Diffluit autem in orbem, prolabitúrque aer, quòd eum ipſius vniuerſi conuerſio ſecum trahat rapiatque. Nã ignis ſupero elemento, aer autem igni continens eſt. Ex quo etiam fit vt motus inhibeat, quo minus in aquam cõcreſcat aer. Verùm ſemper quæcunque aeris particula pondus habere cœperit, extruſo in ſuperum locũ calido, deorſum ruit. & alia in parte ſurſum, vnà cum exhalante igni emicat. ac ita continuè, aere aliud, aliud igni oppletũ perſeuerat: & eorũ quodque, aliud ſubinde atq; aliud euadit. Quòd igitur nec nubes ſupero in loco fiant, nec in aquam concretio, item quonam pacto de loco inter ſtellas terrámque medio ſentire oporteat,

A ἢ οὖν οὐκ ἐξ ἅπαντος τοῦ ἀέρος πέφυκεν ὕδωρ γίγνεσθαι,
ἢ εἰ ὁμοίως ἐξ ἅπαντος, ὁ περὶ τὴν γῆν οὐ μόνον ἀήρ
ἐστιν, ἀλλ' οἷον ἀτμὶς· διὸ πάλιν συνίσταται εἰς ὕδωρ.
ἀλλὰ μὴν εἰ τοσοῦτος ὢν ὁ ἀὴρ ἅπας ἀτμίς ἐστι· δόξειεν
ἂν πολὺ ὑπερβάλλειν ἡ τοῦ ἀέρος φύσις καὶ ἡ τοῦ ὕδατος.
εἴπερ, τά τε διαστήματα τῶν ἄνω πλήρη ἐστὶ σώματός τι-
νος· καὶ πυρὸς μὲν ἀδύνατον, διὰ τὸ κατεξηράνθαι ἂν
τἆλλα πάντα. λείπεται δ' ἀέρος, καὶ τοῦ περὶ τὴν γῆν
πᾶσαν, ὕδατος· ἡ γὰρ ἀτμὶς ὕδατος διάκρισίς ἐστι.
περὶ μὲν οὖν τούτων ἡ ἀπορία τοῦτον τὸν τρόπον. ἡμεῖς δὲ
λέγωμεν ἅμα πρός τε τὰ λεχθησόμενα διορίζοντες, καὶ
B πρὸς τὰ νῦν εἰρημένα· τὸ μὲν γὰρ ἄνω καὶ μέχρι τῆς
σελήνης, ἕτερον εἶναι σῶμα φαμὲν πυρός τε καὶ ἀέρος· οὐ
μὴν ἀλλ' ἐν αὐτῷ γε τὸ μὲν καθαρώτερον εἶναι, τὸ δ'
ἧττον εἰλικρινὲς, καὶ διαφορὰς ἔχειν καὶ μάλιστα ᾗ κα-
ταλήγει πρὸς τὸν ἀέρα καὶ πρὸς τὸν περὶ τὴν γῆν κό-
σμον. φερομένου δὲ τοῦ πρώτου στοιχείου κύκλῳ, καὶ τῶν
ἐν αὐτῷ σωμάτων, τὸ προσεχὲς ἀεὶ τοῦ κάτω κόσμου
καὶ σώματος, τῇ κινήσει διακρινόμενον ἐκπυροῦται,
καὶ * ποιεῖ τὴν θερμότητα. δεῖ δὲ νοεῖν οὕτως καὶ ἐντεῦ- * γρ. π. τὸ ἐκ-
θεν ἀρξαμένοις· τὸ γὰρ ὑπὸ τὴν ἄνω περιφορὰν σῶ- καυμα.
μα, οἷον ὕλη τις οὖσα, καὶ δυνάμει θερμὴ, καὶ ψυχρὰ,
καὶ ξηρὰ, καὶ ὑγρὰ, καὶ ὅσα ἄλλα τούτοις ἀκολουθεῖ πά-
C θη, γίγνεται τοιαύτη, καὶ ἔστιν ὑπὸ κινήσεώς τε καὶ ἀκι-
νησίας, ἧς τὴν αἰτίαν καὶ τὴν ἀρχὴν εἰρήκαμεν πρό-
τερον. ἐπὶ μὲν οὖν τοῦ μέσου καὶ περὶ τὸ μέσον τὸ βαρύ-
τατον ἐστὶ καὶ ψυχρότατον ἀποκεκριμένον, γῆ καὶ ὕδωρ.
περὶ δὲ ταῦτα, καὶ τὰ ἐχόμενα τούτων, ἀήρ τε καὶ ὃ διὰ
συνήθειαν καλοῦμεν πῦρ, οὐκ ἔστι δὲ πῦρ· ὑπερβολὴ γὰρ
θερμοῦ, καὶ οἷον ζέσις, ἐστὶ τὸ πῦρ. ἀλλὰ δεῖ νοῆσαι τοῦ λεγο-
μένου καὶ καλουμένου ὑφ' ἡμῶν ἀέρος· τὸ μὲν περὶ τὴν
γῆν, οἷον ὑγρὸν καὶ θερμὸν εἶναι, διὰ τὸ ἀτμίζειν τε καὶ ἀνα-
θυμίασιν ἔχειν γῆς· τὸ δ' ὑπὲρ τοῦτο, θερμὸν ἤδη καὶ ξη-
ρόν· ἔστι γὰρ ἀτμίδος μὲν φύσις, ὑγρὸν καὶ θερμόν· ἀναθυ-
D μιάσεως δὲ, θερμὸν καὶ ξηρόν. καὶ ἔστιν ἀτμὶς μὲν δυνά-
μει, οἷον ὕδωρ· ἀναθυμίασις δὲ δυνάμει, οἷον πῦρ. τοῦ μὲν
οὖν ἐν τῷ ἄνω τόπῳ μὴ συνίστασθαι νέφη, ταύτην ὑπο-
ληπτέον αἰτίαν εἶναι, ὅτι οὐκ ἔνεστιν ἀὴρ μόνον, ἀλλὰ μᾶλ-
λον οἷον πῦρ· οὐθὲν δὲ κωλύει καὶ διὰ τὴν κύκλῳ φορὰν
κωλύεσθαι συνίστασθαι νέφη ἐν τῷ ἄνω τόπῳ· ῥεῖν γὰρ
ἀναγκαῖον ἅπαντα τὸν κύκλῳ ἀέρα, ὃς μὴ ἐντὸς τῆς πε-
ριφερείας λαμβάνεται τῆς ἀπαρτιζούσης, ὥστε τὴν γῆν
σφαιροειδῆ εἶναι πᾶσαν· φαίνεται γὰρ καὶ νῦν ἡ τῶν ἀνέ-
μων γένεσις ἐν τοῖς λιμνάζουσι τόποις τῆς γῆς, καὶ οὐχ * ὑπερ- * γ. ὑπερβάλλ.
βάλλειν τὰ πνεύματα τῶν ὑψηλοτάτων ὀρῶν. ῥεῖ δὲ κύ-
E κλῳ, διὰ τὸ συνεφέλκεσθαι τῇ τοῦ ὅλου περιφορᾷ. τὸ μὲν
γὰρ πῦρ, τῷ ἄνω στοιχείῳ· τῷ δὲ πυρὶ, ὁ ἀὴρ συνεχής ἐστιν·
ὥστε καὶ διὰ τὴν κίνησιν κωλύεται συγκρίνεσθαι εἰς ὕδωρ· ἀλλ'
ἀεὶ ὅ,τι ἂν βαρύνηται μόριον αὐτοῦ ἐκθλιβομένου εἰς τὸν
ἄνω τόπον τοῦ θερμοῦ, κάτω φέρεται. ἄλλο δ' ἐν μέρει
συναναφέρεται τῷ ἀναθυμιωμένῳ πυρὶ, καὶ οὕτω συν-
εχῶς, τὸ μὲν ἀέρος διατελεῖ πλῆρες ὄν, τὸ δὲ πυρὸς καὶ ἀεὶ
ἄλλο καὶ ἄλλο γίγνεται ἕκαστον αὐτῶν. περὶ μὲν οὖν τοῦ μὴ γίγνε-
σθαι νέφη, μηδ' εἰς ὕδωρ σύγκρισιν, καὶ πῶς δεῖ λα-
βεῖν περὶ τοῦ μεταξὺ τόπου τῶν ἄστρων καὶ τῆς γῆς,

καὶ τίνος ἐστὶ σώματος πλήρης, τοσαῦτα εἰρήσθω. περὶ δὲ A τῆς γιγνομένης θερμότητος, ἣν παρέχεται ὁ ἥλιος, μᾶλλον μὲν καθ' αὑτὸ καὶ ἀκριβῶς ἐν τοῖς περὶ αἰσθήσεως προσήκει λέγειν· πάθος γάρ τι τὸ θερμὸν αἰσθήσεώς ἐστι. διὰ τίνα αἰτίαν δὲ γίνεται μὴ τοιούτων ὄντων ἐκείνων τὴν φύσιν, λεκτέον καὶ νῦν. ὁρῶμεν δὴ τὴν κίνησιν ὅτι δύναται διακρίνειν τὸν ἀέρα καὶ ἐκπυροῦν· ὥστε καὶ τὰ φερόμενα, τηκόμενα φαίνεσθαι πολλάκις. τὸ μὲν οὖν γίνεσθαι τὴν ἀλέαν καὶ τὴν θερμότητα, ἱκανή ἐστι παρασκευάζειν καὶ ἡ τοῦ ἡλίου φορὰ μόνον· ταχεῖάν τε γὰρ δεῖ καὶ μὴ πόρρω εἶναι. ἡ μὲν οὖν τῶν ἄστρων, ταχεῖα μὲν, πόρρω δέ· ἡ δὲ τῆς σελήνης, κάτω μὲν, βραδεῖα δέ. ἡ δὲ τοῦ B ἡλίου, ἄμφω ταῦτ' ἔχει ἱκανῶς. τὸ δὲ μάλιστα γίνεσθαι ἅμα τῷ ἡλίῳ αὐτῷ τὴν θερμότητα, εὔλογον, λαμβάνοντας τὸ ὅμοιον ἐκ τῶν παρ' ἡμῖν γιγνομένων. καὶ γὰρ ἐνταῦθα τῶν βίᾳ φερομένων ὁ πλησιάζων ἀὴρ μάλιστα γίνεται θερμός. καὶ τοῦτ' εὐλόγως συμβαίνει· μάλιστα γὰρ ἡ τοῦ στερεοῦ διακρίνει κίνησις αὐτόν. διά τε ταύτην οὖν τὴν αἰτίαν ἀφικνεῖται πρὸς τόνδε τὸν τόπον ἡ θερμότης· καὶ διὰ τὸ [τὸ] περιέχον πῦρ τὸν ἀέρα διαῤῥαίνεσθαι τῇ κινήσει πολλάκις, καὶ φέρεσθαι κάτω βίᾳ. σημεῖον δ' ἱκανὸν ὅτι ὁ ἄνω τόπος οὐκ ἔστι θερμὸς, οὐδὲ ἐκπεπυρωμένος, καὶ αἱ διαδρομαὶ τῶν ἄστρων. ἐκεῖ μὲν γὰρ οὐ γίνονται, κάτω δέ. καίτοι τὰ C μᾶλλον κινούμενα καὶ θᾶττον, [καὶ μᾶλλον] ἐκπυροῦται [καὶ] θᾶττον. πρὸς δὲ τούτοις ὁ ἥλιος, ὅσπερ μάλιστα εἶναι δοκεῖ θερμὸς, φαίνεται λευκὸς, ἀλλ' οὐ πυρώδης ὤν.

A & quonam ſit locus ille corpore diffarctus, tot dicta ſint. at de calore genito, quem ſol præſtare ſolet, magis quidem per ſe & exactè conuenit in commentario de ſenſu dicere. Nam calor, affectio quædam ſenſus exiſtit, ſed quam ob cauſam oriatur calor, cùm corpora illa cœleſtia haudquaquam eiuſmodi ſuapte natura ſint, dicendum nunc quoque. Videmus itaque motum poſſe aërem ſegregare, atque incendere in tantum, vt ſæpius & quæ motu cientur, liquefieri videantur. Vt igitur tepor gignatur atque calor, ſolis latio duntaxat ſatis eſt efficere. nam & celerem eſſe lationem, nec longiùs abeſſe oportet. Stellarum igitur latio celeris eſt, ſed abiuncta procul: lunæ verò deorſum B quidem eſt, pigra tamen. at ſolari lationi vtraque hæc abundè competunt. Porrò calorem vnà cum ipſo ſole potiſſimùm gigni, conſentaneum eſt rationi, ſumpta ab hiſce quæ hîc fiunt ſimilitudine. Etenim cùm quædam hîc vi feruntur, vicinus aër maximè calidus effici ſolet: id quod haud ſine ratione contingit. Nam ſolidæ rei motio aërem imprimis ſegregare poteſt. Igitur tum hanc ob cauſam caloris feruor ad hunc pertingere locum aſſolet: tum quòd ignis aërem complexus, motionis ratione crebriter ſegregetur diſſipetúrque, atque vi deorſum feratur. Quòd autem ſuperus locus nec calidus ſit, nec ignitus, vel ſtellarum diſcurſus ſufficienti ſunt indicio. illic enim non fiunt, ſed C infero in loco. quanquam quæ validiore motu cientur, vt ocyus, ita pleniùs igneſcere ſolent. Adhæc, ſol ipſe qui calidus cumprimis eſſe videtur, candidus apparet, non igneus.

ΚΕΦΑΛ. δ'.

Διὰ τίνα αἰτίαν αἵ τε φλόγες αἱ καιόμεναι φαίνονται περὶ τὸν οὐρανὸν, καὶ οἱ διᾴττοντες ἀστέρες, καὶ οἱ καλούμενοι ὑπό τινων δαλοὶ καὶ αἶγες.

Τούτων δὲ διωρισμένων, λέγωμεν διὰ τίνα αἰτίαν αἵ τε φλόγες αἱ καιόμεναι φαίνονται περὶ τὸν οὐρανὸν, καὶ οἱ διᾴττοντες ἀστέρες, καὶ οἱ καλούμενοι ὑπό τινων δαλοὶ καὶ αἶγες· ταῦτα γὰρ πάντ' ἐστὶ τὸ αὐτὸ, καὶ D διὰ τὴν αὐτὴν αἰτίαν· διαφέρει δὲ τῷ μᾶλλον καὶ ἧττον. ἀρχὴ δ' ἐστὶ τούτων καὶ πολλῶν ἄλλων, ἥδε. θερμαινομένης γὰρ τῆς γῆς ὑπὸ τοῦ ἡλίου, τὴν ἀναθυμίασιν ἀναγκαῖον γίνεσθαι, μὴ ἁπλῆν, ὥς τινες οἴονται, ἀλλὰ διπλῆν· τὴν μὲν ἀτμιδωδεστέραν, τὴν δὲ πνευματωδεστέραν· τὴν μὲν τοῦ ἐν τῇ γῇ, καὶ ἐπὶ τῇ γῇ ὑγροῦ ἀτμίδα, τὴν δ' αὐτῆς τῆς γῆς οὔσης ξηρᾶς, καπνώδη· καὶ τούτων, τὴν μὲν πνευματώδη ἐπιπολάζειν διὰ τὸ θερμὸν, τὴν δ' ὑγροτέραν ὑφίστασθαι, διὰ τὸ βάρος. καὶ διὰ ταῦτα τοῦτον τὸν τρόπον κεκόσμηται τὸ πέριξ· πρῶτον μὲν γὰρ ὑπὸ E τὴν ἐγκύκλιον φορὰν ἐστὶ τὸ θερμὸν καὶ ξηρὸν, ὃ λέγομεν πῦρ· ἀνώνυμον γὰρ τὸ κοινὸν ἐπὶ πάσης τῆς καπνώδους διακρίσεως· ὅμως δὲ διὰ τὸ μάλιστα πεφυκέναι τὸ τοιοῦτον ἐκκαίεσθαι τῶν σωμάτων, οὕτως ἀναγκαῖον χρῆσθαι τοῖς ὀνόμασιν. ὑπὸ δὲ ταύτην τὴν φύσιν ἀήρ. δεῖ δὲ νοῆσαι οἷον ὑπέκκαυμα τοῦτο ὃ νῦν εἴπομεν πῦρ, * περιτετάσθαι τῆς περὶ τὴν γῆν σφαίρας ἔσχατον· ὥστε μικρᾶς κινήσεως τυχὸν ἐκκαίεσθαι πολλάκις ὥσπερ τὸν καπνόν· ἔστι γὰρ ἡ φλὸξ πνεύματος ξηροῦ ζέσις.

* ... περιπεπῆχθαι

CAPVT IV.

Flammarum in ſummo aëre apparentium cauſa.

His autem pertractatis, quam ob cauſam flammæ ardentes, & ſtellæ diſcurrentes, & vocati à quibuſdam torres, & capræ circa cœlum viſantur, dicamus. hæc enim omnia idem ſunt, D atque eadem de cauſa, intenſione tamen ac remiſſione diſparantur. Horum autem & aliorum complurium principium eſt hoc. Incaleſcente namque à ſole terra, halitum fieri non ſimplicem, vti quidam putant, ſed geminum, neceſſarium eſt: alterum vaporoſum magis, alterum magis ſpiritoſum. humidi quidem halitum, quod in terra & ſuper terram exiſtit, vaporem: terræ verò præaridæ exiſtentis, anhelitum fumidum. è quibus qui ſpiritoſus eſt, eum caloris beneficio inuehi: qui verò humentior, ſubſidere ob grauitatem. Et propterea id omne quod à lunari ambitu terræ circumfunditur vndique, eleganter hoc pacto digeſtum eſt. E Nam ſtatim ſub ipſa cœli conuerſione ſitum eſt, quod calidum aridúmque eſt, quem nuncupamus ignem. ſiquidem nomine vacat, & cuilibet fumidæ ſecretioni competit. Attamen quia quod tale eſt, ex omni corporum genere maximè ſuccendi ac conflagrare ſuapte natura poteſt, ideo ſic vti nominibus eſt neceſſe. Sub hac verò natura collocatus eſt aër. Noſſe autem oportet hanc veluti ſuccenſionem, quam nunc ignem diximus, circa eius ſphæræ extremum, quæ terram ambit, extenſam eſſe. quo fit vt cùm exiguum forte fortuna motum nacta fuerit, ſæpe fumi modo inardeſcat. Nam flamma feruor eſt ſpiritus aridi.

Talis igitur conſtitutio, cùm à circulari motu aliquo pacto agitata fuerit: qua potiſſimùm parte ardori concipiendo idonea accommodáque eſt, eatenus ſuccenditur. Succenſionis itaque poſitu aut multitudine diſcrimen obuenire ſolet. Nam ſi longitudinem latitudinémque habeat ſuccenſio, ſæpius videtur flamma collucens, propemodum ita vt in aruis fit ſuccenſis calamis. Sin autem longitudinem dumtaxat habeat, tum fiunt quos vocant torres, necnon capræ & vagæ vtcunque ſtellæ. atque ſi in longitudinem magis quàm in latitudinem ſuccenſio porrigatur, cùm quaſdam veluti ſcintillas diſpuere videtur, & interim ardet: quod quidem ideo contingit, quia minutatim quidem, ſed priore parte ignem obiter excipit: id eſt quod capra nominatur: cùm verò hac affectione caret, torris. Sin verò exhalationis longitudo in multas ſimul & exiguas parteis diſſeminata ſit, & latitudo atque craſſitudo ſe conſimiliter habeant, tum fiunt quæ creduntur vulgò vagari ſtellæ. Interdum igitur exhalatio motionis opera deflagrans, ea ipſa gignit. Interdum ab aëre ob refrigerationem conſiſtente, calidum ſecernitur extruditurque. Vnde etiam fit vt eorum delatio proiectioni magis quàm incenſioni aſſimiletur. Dubitauerit enim quiſpiam vtrùm ſtellarum excurſus haud aliter proueniant, quam lucernæ ſubdita exhalatio è flamma ſupera inferam lucernam reaccendit (mira enim eſt eiuſce rei celeritas, ac iactui aſſimilis: nec perinde fieri videtur, quaſi alius ac alius ſubinde oriatur ignis) an corporis cuiuſpiam eiuſdem proiectiones exiſtant? Mihi ſanè videtur, eos propter vtrunque fieri. Nam & perinde fiunt, vt flammæ ardentis lucernæ per fumum in extinctam irruptio lucernam efficitur. & nonnulla quòd extrudantur, ideo proiici ſolent, ceu nuclei qui è digitis elabuntur diſſiliúntque: adeò vt in terram maréque deferri, tum noctu tum interdiu, cùm ſudum fuerit, videantur. Sed in partem elabuntur infernam, propterea quòd denſatio propellens, ea deorſum versùs excutiat. Proinde ipſa quoque fulmina in præceps ferri ſolent. hæc enim omnia ſecretio quæ extruſionis ratione committitur, non incenſio gignere ſolet: quippe cùm natura calidum omne inſitum habeat, vt ſurſum versùs feratur. Quæcunque igitur ſuperiore in loco conſiſtunt, conflagrante fiunt exhalatione. at quæcunque in inferiore, ſecretione exhalationis proueniunt: quòd ea cùm ſit humidiuſcula, frigeſiat atque coagmentetur. Nam hæc cùm coit ſpiſſatúrque deorſum vergendo, id propellit ac contorquet infernè, quod caloris eſt particeps. Ratione verò poſitus vtcunque exhalatio ſuo in ſitu forte fortuna latitudinem habuerit atque altitudinem: ita demum aut ſurſum, aut deorſum, aut ad latus commeat, ſed magna ex parte in obliquum, quòd duabus cieatur lationibus: vi quidem infernè, natura autem supernè. cuncta enim eiuſmodi per dimetientem lineam ferri ſolent. Quocirca & diſcurrentium ſtellarum delatio, magna ex parte obliqua redditur. Omnium igitur horum cauſa tanquam materia eſt, exhalatio. at tanquam mouens, interdum ſupera latio, interdum aëris concreſcentis coagulatio. Hæc autem omnia infra lunam fiunt. Argumento eſt ipſorum celeritas, eorum motui perſimilis quæ à nobis iaciuntur, lacertiſque noſtris contorquentur: quæ videntur planè multo ſtellis, luna, ſole meare celeriùs: quòd non procul à nobis diſtent.

A ᾗ ἂν τύχῃ μάλιστα εὐκράτως ἔχῃ ἡ τοιαύτη σύστασις, ὅταν ὑπὸ τῆς περιφορᾶς κινηθῇ πως ἐκκαίεται. διαφέρει δὲ ἤδη κατὰ τὴν τοῦ ὑπεκκαύματος θέσιν,* ἢ τὸ πλῆθος. ἂν μὲν γὰρ πλάτος ἔχῃ καὶ μῆκος τὸ ὑπέκκαυμα, πολλάκις ὁρᾶται καιομένη φλὸξ, ὥσπερ ἐν ἀρούρᾳ καιομένης καλάμης· ἂν δὲ κατὰ μῆκος μόνον, οἱ καλούμενοι δαλοὶ, καὶ αἶγες, καὶ ἀστέρες· καὶ ἐὰν μὲν πλέον τὸ ὑπέκκαυμα ᾖ κατὰ τὸ μῆκος ἢ τὸ πλάτος, ὅταν μὲν οἷον ἀποσπινθηρίζῃ, ἅμα καιόμενον, (τοῦτο δὲ γίνεται διὰ τὸ παρεκπυροῦσθαι, κατὰ μικρὰ μὲν, ἐπ' ἀρχὴν δὲ) αἲξ καλεῖται· ὅταν δ' ἄνευ τούτου τοῦ πάθους, δαλός. ἐὰν δὲ τὰ μήκη τῆς ἀναθυμιάσεως B κατὰ μικρά τε καὶ πολλαχῇ διεσπαρμένα ᾖ, καὶ ὁμοίως κατὰ πλάτος καὶ βάθος, οἱ δοκοῦντες ἀστέρες διάττειν, γίνονται. ὁτὲ μὲν οὖν ὑπὸ τῆς κινήσεως ἡ ἀναθυμίασις ἐκκαιομένη γεννᾷ αὐτά· ὁτὲ δὲ ὑπὸ τοῦ διὰ τὴν ψύξιν συνισταμένου ἀέρος ἐκθλίβεται καὶ ἐκκρίνεται τὸ θερμόν. διὸ καὶ ἔοικεν ἡ φορὰ ῥίψει μᾶλλον αὐτῶν, ἀλλ' οὐκ ἐκκαύσει. ἀπορήσειε γὰρ ἄν τις, πότερον ὥσπερ ἡ ὑπὸ τοῖς λύχνοις τιθεμένη ἀναθυμίασις ἀπὸ τῆς ἄνωθεν φλογὸς ἅπτει τὸν κάτωθεν λύχνον. θαυμαστὴ γὰρ καὶ τούτου ἡ ταχυτής ἐστι, καὶ ὁμοία ῥίψει, ἀλλ' οὐχ ὡς ἄλλου καὶ ἄλλου γιγνομένου πυρός· ἢ * ῥίψεις τοῦ αὐτοῦ σώματός εἰσιν αἱ διαδρομαί. ἔοι- C κε δὲ δι' ἄμφω· καὶ γὰρ οὕτως ὡς ἡ ἀπὸ τοῦ λύχνου γίνεται, καὶ ἔνια διὰ τὸ ἐκθλίβεσθαι ῥιπτεῖται, ὥσπερ οἱ ἐκ τῶν δακτύλων πυρῆνες· ὥστε καὶ εἰς θάλασσαν, καὶ εἰς γῆν φαίνεσθαι πίπτοντα, καὶ νύκτωρ καὶ μεθ' ἡμέραν αἰθρίας οὔσης. κάτω δὲ ῥιπτεῖται, διὰ τὸ τὴν πύκνωσιν εἰς τὸ κάτω ῥέπειν τὴν ἀπωθοῦσαν. διὸ καὶ οἱ κεραυνοὶ κάτω πίπτουσι. πάντων γὰρ τούτων ἡ γένεσις οὐκ ἔκκαυσις, ἀλλ' ἔκκρισις ὑπὸ τῆς ἐκθλίψεώς ἐστιν· ἐπεὶ κατὰ φύσιν γε τὸ θερμὸν, ἄνω πέφυκε φέρεσθαι πᾶν. ὁπόσα μὲν οὖν μᾶλλον ἐν τῷ ἀνωτάτῳ τόπῳ συνίσταται, ἐκκαιομένης γίνεται τῆς ἀναθυμιάσεως· ὅσα δὲ κατωτέ- D ρω, ἐκκρινομένης, διὰ τὸ συνιέναι καὶ ψύχεσθαι τὴν ὑγροτέραν ἀναθυμίασιν. αὕτη γὰρ συνιοῦσα καὶ κάτω ῥέπουσα ἀπωθεῖ πυκνουμένη, καὶ κάτω ποιεῖ τοῦ θερμοῦ τὴν ῥίψιν· διὰ δὲ τὴν θέσιν τῆς ἀναθυμιάσεως, ὅπως ἂν τύχοι κειμένη τοῦ πλάτους καὶ τοῦ βάθους, οὕτω φέρεται ἢ ἄνω, ἢ κάτω, ἢ εἰς τὸ πλάγιον· τὰ πλεῖστα δὴ εἰς τὸ πλάγιον, διὰ τὸ δύο φέρεσθαι φορὰς· βίᾳ μὲν κάτω· φύσει δ' ἄνω. πάντα γὰρ κατὰ τὴν διάμετρον φέρεται τὰ τοιαῦτα. διὸ καὶ τῶν διαθεόντων ἀστέρων ἡ πλείστη λοξὴ γίνεται φορά. E πάντων δὲ τούτων αἴτιον ὡς μὲν ὕλη ἡ ἀναθυμίασις, ὡς δὲ τὸ κινοῦν, ὁτὲ μὲν ἡ ἄνω φορὰ· ὁτὲ δὲ, ἡ τοῦ ἀέρος συγκρινομένου πῆξις. πάντα δὲ κάτω σελήνης ταῦτα γίνεται. σημεῖον δ' ἡ * φαινομένη αὐτῶν ταχυτὴς, ὁμοία οὖσα τοῖς ὑφ' ἡμῶν ῥιπτουμένοις· ἃ διὰ τὸ πλησίον εἶναι ἡμῶν, πολὺ δοκεῖ τῷ τάχει παραλλάττειν ἄστρα τε καὶ ἥλιον καὶ σελήνην.

* κ. ἢ κατὰ τὸ πλῆθος αὐτοῦ

* γρ. ῥίψεις

* κ. κινουμένη

ΚΕΦΑΛ. ε΄.

Τῶν ἐν οὐρανῷ νύκτωρ αἰθρίας οὔσης συνισταμένων φασμάτων αἴτιον, οἷον χασμάτων καὶ βοθύνων, καὶ αἱματωδῶν χρωμάτων.

A

Φαίνεται δέ ποτε συνιστάμενα νύκτωρ αἰθρίας οὔσης πολλὰ φάσματα ἐν τῷ οὐρανῷ· οἷον, χάσματά τε καὶ βόθυνοι, καὶ αἱματώδη χρώματα· αἴτιον δὲ καὶ ἐπὶ τούτων τὸ αὐτό. ἐπεὶ γὰρ φανερὸς ὅτι συνιστάμενος ὁ ἀὴρ ὁ ἄνω, ὥστ᾽ ἐκπυροῦσθαι, καὶ τὴν ἐκπύρωσιν ὅτε μὲν τοιαύτην γίγνεσθαι, ὥστε φλόγα δοκεῖν καίεσθαι· ὅτε δ᾽ οἷον δαλοὺς φέρεσθαι καὶ ἀστέρας, οὐδὲν ἄτοπον εἰ χρωματίζεται ὁ αὐτὸς οὗτος ἀὴρ συνιστάμενος παντοδαπὰς χρόας. B διά τε γὰρ πυκνοτέρου διαφαινόμενον ἔλαττον φῶς, καὶ ἀνάκλασιν δεχόμενος ὁ ἀὴρ, παντοδαπὰ χρώματα ποιήσει· μάλιστα δὲ φοινικοῦν, ἢ πορφυροῦν, διὰ τὸ ταῦτα μάλιστα ἐκ τοῦ πυρώδους καὶ λευκοῦ φαίνεσθαι μιγνυμένων κατὰ τὰς ἐπιπροσθήσεις· οἷον, αἴροντα τὰ ἄστρα, καὶ δυόμενα, ἐὰν ᾖ καῦμα, καὶ διὰ καπνοῦ φοινικᾶ φαίνεται· καὶ τῇ ἀνακλάσει δὲ ποιήσει, ὅταν τὸ ἔνοπτρον ᾖ τοιοῦτον, ὥστε μὴ τὸ σχῆμα, ἀλλὰ τὸ χρῶμα δέχεσθαι. τοῦ δὲ μὴ πολὺν χρόνον μένειν ταῦτα, ἡ σύστασις αἰτία, ταχεῖα οὖσα. τὰ δὲ χάσματα, ἀναρρηγνυμένου τοῦ φωτὸς ἐκ κυανέου καὶ μέλανος, ποιεῖ C τι βάθος ἔχειν δοκεῖν. πολλάκις δ᾽ ἐκ τῶν τοιούτων καὶ δαλοὶ ἐκπίπτουσιν, ὅταν συγκριθῇ μᾶλλον· συνιὸν δὲ τι χάσμα δοκεῖ. ὅλως δ᾽ ἐν τῷ μέλανι τὸ λευκὸν πολλὰς ποιεῖ τὰς ποικιλίας, οἷον ἡ φλὸξ ἐν τῷ καπνῷ. ἡμέρας μὲν οὖν ὁ ἥλιος κωλύει, νυκτὸς δ᾽ ἔξω τοῦ φοινικοῦ, τὰ ἄλλα δι᾽ * ὁμοιοχροίαν οὐ φαίνεται. περὶ μὲν οὖν τῶν διαθεόντων ἄστρων [καὶ] τῶν ἐκπυρουμένων, ἔτι δὲ καὶ τῶν ἄλλων τῶν τοιούτων φασμάτων ὅσα ταχείας ποιεῖται τὰς φαντασίας, ταύτας ὑπολαβεῖν δεῖ τὰς αἰτίας.

* γρ. ὁμόχροιαν

CAPVT V.

Phaſmatum cauſæ.

PORRO multa in cœlo quandoque phaſmata viſaque conſiſtere cernuntur, nec niſi nocte ſerena: velut, hiatus, foueæ, colores ſanguinei, quorum omnium eadem quoque cauſa exiſtit. Nam cùm palam ſuperus aër adeo conſiſtat, vt flagret & incendium quandoque emergat eiuſmodi vt flammam ardere, quandoque vt quaſi torres aut ſtellas procurrere arbitremur: nihil eſt abſurdi, ſi aër idem concreſcens varios præferat colores. Nam tam lumen minus per denſius tranſparens corpus, quàm aër refractionem ſuſcipiens, colorum varias ac multiplices faciet viſiones. In primis verò punicei & purpurei, quòd hi potiſſimùm miſtura ignei candidique altero alteri ſuperindito, temperari ſoleant. Indicio ſunt ſtellæ, quæ ſi oborientes occidenteſque per æſtum aut alioqui per fumum ſpectentur, puniceæ apparent. Idem quoque refractione efficient, cùm ſpeculum fuerit eiuſmodi, vt nequaquam figuram ſed colorem ſuſcipiat. Sed cur hæc paruo temporis ſpatio edurent, cõſtitutio quæ cito abſumitur, in cauſa eſt. Hiatus autem lumine interrupto, cærulei atrive coloris interuentu efficit vt aliqua videatur ineſſe profunditas. Atque ex eiuſmodi etiam torres frequenter excidunt, nimirum vbi ampliùs concreuerit, ſed cùm adhuc coit, hiatus viſionem ingerit. In ſumma atrum candido permiſtum, ceu flamma fumo, multas colorum varietates committit. Interdiu igitur ſol eos fieri prohibet. At noctu cæteri, præter puniceum, quia concolores ſint, viſum defugiunt. Igitur ſtellarum tranſcurrentium, eorum quæ incendio fiunt, & omnium inſuper oſtentorum quæ ſunt eiuſmodi vt repentinas ingerant viſiones, has eſſe cauſas putare operæpretium eſt.

ΚΕΦΑΛ. ϛ΄.

Ἔλεγχος τῶν παρὰ τῶν ἄλλων λεγομένων περὶ τῶν κομητῶν.

D

Περὶ δὲ τῶν κομητῶν καὶ τοῦ καλουμένου γάλακτος, λέγωμεν, διαπορήσαντες πρὸς τὰ παρὰ τῶν ἄλλων εἰρημένα πρότερον. Ἀναξαγόρας μὲν οὖν καὶ Δημόκριτός φασιν εἶναι τοὺς κομήτας, σύμφασιν τῶν πλανήτων ἀστέρων, ὅταν διὰ τὸ πλησίον ἐλθεῖν δόξωσι θιγγάνειν ἀλλήλων. τῶν δ᾽ Ἰταλικῶν τινες καὶ καλουμένων Πυθαγορείων, ἕνα λέγουσιν αὐτὸν εἶναι τῶν πλανήτων ἀστέρων, ἀλλὰ διὰ πολλοῦ τε χρόνου τὴν φαντασίαν αὐτοῦ εἶναι, καὶ τὴν ὑπερβολὴν ἐπὶ μικρόν, ὅπερ συμβαίνει καὶ περὶ τὸν τοῦ Ἑρμοῦ ἀστέρα. διὰ γὰρ τὸ μικρὸν ἐπαναβαίνειν, πολλὰς E ἐκλείπει φάσεις, ὥστε διὰ χρόνου * φαίνεσθαι πολλοῦ. παραπλησίως δὲ τούτοις καὶ οἱ περὶ τὸν Ἱπποκράτην τὸν Χῖον καὶ τὸν μαθητὴν αὐτοῦ Αἰσχύλον ἀπεφήναντο. πλὴν τήν γε κόμην οὐκ ἐξ αὐτοῦ φασιν ἔχειν, ἀλλὰ πλανώμενον διὰ τὸν τόπον ἐνίοτε λαμβάνειν, ἀνακλωμένης τῆς ἡμετέρας ὄψεως ἀπὸ τῆς ἑλκομένης ὑγρότητος ὑπ᾽ αὐτοῦ πρὸς τὸν ἥλιον. διὰ δὲ τὸ ὑπολείπεσθαι βραδύτατα τὸν χρόνον διὰ πλεῖστον χρόνου φαίνεσθαι τῶν ἄλλων ἄστρων, ὡς ὅταν ἐκ ταὐτοῦ φανῇ ὑπολελειμμένον ὅλον τὸν ἑαυτοῦ κύκλον

* γρ. φαίνεται

CAPVT VI.

Priſcorum de cometis opiniones aliquot, earumdémque ſolutiones.

PORRO de cometis & vocato lacte diſſeramus, allatis priùs ad ea quæ ab aliis dicta ſunt, dubitationibus. Anaxagoras igitur atque Democritus, cometas eſſe aſſerunt, ſtellarum errantium coapparitionem, cùm quia propiùs acceſſerint, ſeſe tangere mutuò videntur. At eorum nonnulli qui Italiam habitant, Pythagoreique vocitantur, cometen è ſtellis errantibus vnam eſſe dicunt: verùm, non niſi longo interpoſito tempore comparere in cœlo, & parum ab ſole digredi, id quod etiam Mercurij ſtellæ obuenit. Nam quia non admodum ab ſole recedit, ſæpe cùm ſe viſendam præſtare deberet, occultatur. Proinde non niſi longo tempore interiecto cerni ſolet. Hippocrates autem ille Chius, & eius diſcipulus Æſchylus, non ſecus quàm hi dixere: verùm non à ſeſe habere comam, ſed dum errat interdum, eam ratione loci aſſumere dicunt, nimirum cùm ab humore quem ad ſe attrahit, ſolem versùs aſpectus noſter refrangitur: quia verò inter cætera ſidera tardiſſima à ſole relinquitur, non niſi plurimo tempore interiecto, ita demum apparere, vt cum codẽ ex loco, toto ſuo circulo relictum ab ſole cernitur:

ac ipſum ab ſole deſeri, & ad auſtrum, & ad ſeptentrionem. In intermedio igitur tropicorum loco aquam ad ſeſe non attrahere, quòd ea ibi ob ſolis lationem feruore caloris abſumpta ſit: cùm verò ad auſtrum accedit, talis humoris copia perfrui. Verùm quia ſupera circuli portio parua eſt, infera longè maior, non poſſe aſpectum hominis refractum, ad ſolem peruenire, ſiue is auſtrino tropico propinquus feratur, ſiue in æſtiuo ſolſtitio exiſtat. Quocirca nec in hiſce quidem locis cometen ipſum gigni. At cùm ab ſole ad aquilonem digreſſus fuerit, comam accipere. quia circuli portio quæ ſupra horizontem eſt, magna ſit: quæ verò ſubter, exigua: tunc enim aſpectum hominis ad ſolem facilè pertingere. Hiſce autem omnibus euenit, quædam communiter, quædam ſeparatim impoſſibilia dicere. Primò igitur, qui cometen è ſtellis errantibus vnam eſſe aſtruunt, impoſſibilia dicunt. Nam ſtellæ vagæ omnes ab ſole in ſignifero relinquuntur. At cometæ non pauci extra ſigniferum viſi ſunt. Deinde & plures vno ſæpe ſimul facti ſunt. Adhæc ſi ob refractionem comam haberent, quemadmodum Hippocrates & Æſchylus aiunt: aliquando ſidus hoc etiam citra vllos crines apparere oportuit. quandoquidem & ad alia loca ab ſole digreditur, cæſariem autem non vbique geſtat. Nunc autem, præter quinque illas ſtellas, nulla in cælo viſa eſt. Sed hæ frequentes ſimul omnes ſupra horizontem eleuatæ viſuntur. Nec minùs cometæ, cùm omnes hæ quinque apparent, quàm cùm non apparent, ſed quædam ſolem ſubeunt, plerumque facti conſpiciuntur. At verò ne id quidem verum eſt, cometen ſub ipſo ſeptentrione ſolùm fieri: inſuper & ſole circa æſtiuum ſolſtitium exiſtente. Nam & magnus ille cometes qui haud ita multo antè factus eſt quàm Achaia terræ motu quateretur, & in eam maris inundatio introrumperet, ab occaſu æquinoctiali emicuit. Et in auſtrina cœli regione multi iam facti ſunt.

Porro magiſtratū gerente Athenis Eucleo, Molonis filio, menſe Ianuario, ſole circa ſolſtitium hybernum exiſtente in regione cœli ſub ſeptentrionibus, crinitum ſidus apparuit, quamuis & ipſi affirment fieri non poſſe vt tanta refractio fiat. Commune autem eſt hiſce & illis qui cometen ſtellarum errantium coniunctionem atque contactum eſſe aſtruunt, primò quidem, è numero ſtellarum cælo adhærentium nonnullas comam accipere. Qua in re non Ægyptiis modò præſtanda fides eſt (nam illi id aiunt) ſed & nos vidimus. Nam ſtella quædam ex hiſce quæ in caniculæ coxa ſunt, comam habuit, languidam tamen atque obſcuram. Qui enim eam intentis oculis aſpectabant, ſplendorem agnoſcebant exiguum: qui verò ſenſim conſpectum in eam quaſi obiter iactabant, maiuſculum. Adhæc quotquot noſtra tempeſtate viſi ſunt, ſine occaſu ſupra horizontem euanuerunt, paulatim ita emarceſcentes atque abſumpti, vt nec vnius ſtellæ corpus, nec plurium reliquerint. Nam & magnum illud ſidus, quo de ſuprà mentionem fecimus, tempore hyberno, rigente gelu, atque cœlo ſereno, veſperi, Ariſtæo prætore, apparuit. Ac prima quidem die viſum non eſt, quòd ante ſolis occaſum delituerit: poſtera autem apparuit. nam quàm minima fieri poteſt diſtantia, ſolem reliquit, & mox occubuit.

A ὑπολείπεσθαι δ' αὐτὸν καὶ πρὸς ἄρκτον, καὶ πρὸς νότον. ἐν μὲν οὖν τῷ μεταξὺ τόπῳ τῶν τροπικῶν, οὐχ ἕλκειν τὸ ὕδωρ πρὸς ἑαυτὸν, διὰ τὸ κεκαῦσθαι ὑπὸ τῆς τοῦ ἡλίου φορᾶς· πρὸς δὲ νότον ὅταν φέρηται, δαψίλειαν μὲν ἔχειν τῆς τοιαύτης νοτίδος. ἀλλὰ διὰ τὸ μικρὸν εἶναι τὸ* ὑπὲρ τὴν γῆν τμῆμα τοῦ κύκλου, τὸ δὲ κάτω πολλαπλάσιον, οὐ δύνασθαι τὴν ὄψιν τῶν ἀνθρώπων φέρεσθαι κλωμένην πρὸς τὸν ἥλιον· οὔτε τοῦ τροπικοῦ* τόπου πλησιάζοντος, οὔτ' ἐπὶ θεριναῖς τροπαῖς ὄντος τοῦ ἡλίου. διόπερ ἐν τούτοις μὲν τοῖς τόποις οὐδὲ γίγνεσθαι κομήτην αὐτόν. ὅταν δὲ πρὸς βορέαν ὑπολειφθεὶς τύχῃ,* λαμβάνειν κόμην, διὰ τὸ μεγάλην εἶναι τὴν περιφέρειαν B τὴν ἄνωθεν τοῦ ὁρίζοντος. τὸ δὲ κάτω μέρος τοῦ κύκλου μικρόν· ῥᾳδίως γὰρ τὴν ὄψιν τῶν ἀνθρώπων ἀφικνεῖσθαι τότε πρὸς τὸν ἥλιον. πᾶσι δὲ τούτοις τὰ μὲν κοινῇ συμπίπτει λέγειν ἀδύνατα, τὰ δὲ χωρίς. πρῶτον μὲν οὖν τοῖς λέγουσιν ὅτι τῶν πλανωμένων ἐστὶν εἷς ἀστέρων ὁ κομήτης· οἱ γὰρ πλανώμενοι πάντες ἐν τῷ κύκλῳ ὑπολείπονται τῷ τῶν ζωδίων. κομῆται δὲ πολλοὶ ὠμμένοι εἰσὶν ἔξω τοῦ κύκλου. εἶτα καὶ πλείους ἑνὸς ἅμα γεγένηνται πολλάκις. πρὸς δὲ τούτοις, εἰ διὰ τὴν ἀνάκλασιν τὴν κόμην ἔχουσι, καθάπερ φησὶν Αἰσχύλος καὶ Ἱπποκράτης, ἔδει ποτὲ φαίνεσθαι καὶ ἄνευ τῆς κόμης τὸν C ἀστέρα τοῦτον, ἐπειδήπερ ὑπολείπεται μὲν καὶ εἰς ἄλλους τόπους· τὴν δὲ κόμην ἔχει οὐ πανταχοῦ. νῦν δ' οὐδεὶς ὦπται παρὰ τοὺς πέντε ἀστέρας. οὗτοι δὲ πολλάκις ἅμα πάντες μετέωροι φαίνονται ὑπὲρ τοῦ ὁρίζοντος. καὶ φανερῶν δ' ὄντων αὐτῶν ἁπάντων καὶ μὴ φαινομένων πάντων, ἀλλ' ἐνίων ὄντων πρὸς τῷ ἡλίῳ, οὐδὲν ἧττον κομῆται φαίνονται γιγνόμενοι πολλάκις. ἀλλὰ μὴν οὐδὲ τοῦτο ἀληθὲς, ὅτι ἐν τῷ πρὸς ἄρκτον τόπῳ γίγνεται ὁ κομήτης μόνον,* ἅμα καὶ τοῦ ἡλίου ὄντος περὶ θεριναὶς τροπάς. ὅ,τε γὰρ μέγας κομήτης ὁ γενόμενος περὶ τὸν ἐν Ἀχαΐᾳ σεισμὸν καὶ τὴν τοῦ κύματος ἔφοδον, ἀπὸ δυσμῶν τῶν ἰσημερινῶν ἀνέσχε, καὶ πρὸς νότον ἤδη πολλοὶ γεγόνασιν. D Ἐπὶ δ' ἄρχοντος Ἀθήνησιν Εὐκλέους τοῦ Μόλωνος, ἐγένετο κομήτης ἀστὴρ πρὸς ἄρκτον, μηνὸς γαμηλιῶνος περὶ τροπὰς ὄντος τοῦ ἡλίου χειμερινάς. καίτοι τοσοῦτον ἀνακλασθῆναι καὶ αὐτοὶ τῶν ἀδυνάτων εἶναί φασι. κοινὸν δὲ καὶ τούτοις, καὶ τοῖς τὴν σύναψιν λέγουσι, πρῶτον μὲν, ὅτι καὶ τῶν ἀπλανῶν λαμβάνουσι κόμην τινές. καὶ τοῦτ' οὐ μόνον Αἰγυπτίοις πιστεῦσαι δεῖ, καίτοι κἀκεῖνοί φασιν, ἀλλὰ καὶ ἡμεῖς ἑωράκαμεν· τῶν γὰρ ἐν τῷ ἰσχίῳ τοῦ κυνὸς ἀστήρ τις ἔσχε κόμην, ἀμαυρὰν μέντοι· ἀτενίζουσι μὲν γὰρ εἰς αὐτὸν ἀμυδρὸν ἐγίγνετο τὸ φέγγος· πα-E ραβλέπουσι δ' ἠρέμα τὴν ὄψιν, πλεῖον. πρὸς δὲ τούτοις, ἅπαντες οἱ καθ' ἡμᾶς ὠμμένοι ἄνευ δύσεως ἠφανίσθησαν ἐν τῷ ὑπὲρ τοῦ ὁρίζοντος τόπῳ ἀπομαρανθέντες κατὰ μικρὸν οὕτως, ὥστε μήτε ἑνὸς ἀστέρος ὑπολειφθῆναι σῶμα, μήτε πλειόνων. ἐπεὶ καὶ ὁ μέγας ἀστὴρ περὶ οὗ πρότερον ἐμνήσθημεν, ἐφάνη μὲν χειμῶνος ἐν πάγοις καὶ αἰθρίαις ἀφ' ἑσπέρας, ἐπὶ * Ἀρισταίου ἄρχοντος. καὶ τῇ μὲν πρώτῃ οὐκ ὤφθη, ὡς προδεδυκὼς τοῦ ἡλίου· τῇ δ' ὑστεραίᾳ ὤφθη, ὅσον ἐνδέχεται· * ἐλάχιστον γὰρ ὑπελείφθη, καὶ εὐθὺς ἔδυ·

* γρ. ὑπὲρ τῆς γῆς
* γρ. νοτίῳ
* γρ. λαμβάνειν
* γρ. ἀπαχ.
* γρ. Ἀστείου
* γρ. προβεβηκὼς · ὡς ἐλάχιστον ὑπελείφθη.

τὸ δὲ φέγγος ἀπέτεινε μέχρι τοῦ τρίτου μέρους τοῦ οὐρανοῦ, οἷον ἅλμα· διὸ καὶ ἐκλήθη ὁδός. ἐπανῆλθε δὲ μέχρι τῆς ζώνης τοῦ Ὠρίωνος, καὶ * ἐνταῦθα διελύθη. καίτοι Δημόκριτός γε προσπεφιλονείκηκε τῇ δόξῃ αὑτοῦ· φησὶ γὰρ ὦφθαι διαλυομένων τῶν κομητῶν ἀστέρας τινάς. τοῦτο δ' οὐχ ὁτὲ μὲν ἔδει γίγνεσθαι, ὁτὲ δὲ οὔ· ἀλλ' ἀεί. πρὸς δὲ τούτοις καὶ οἱ Αἰγύπτιοί φασι, καὶ τῶν πλανητῶν, καὶ πρὸς αὐτοὺς καὶ πρὸς τοὺς ἀπλανεῖς γίνεσθαι συνόδους. καὶ αὐτοὶ ἑωράκαμεν τὸν τοῦ Διὸς ἀστέρα τῶν ἐν τοῖς διδύμοις συνελθόντα τινὶ δὶς ἤδη καὶ ἀφανίσαντα, ἀλλ' οὐ κομήτην γινόμενον. ἔτι δὲ καὶ ἐκ τοῦ λόγου φανερόν· οἱ γὰρ ἀστέρες κἂν εἰ μείζους κἂν ἐλάττους φαίνωνται, ἀλλ' ὅμως ἀδιαίρετοί γε καθ' ἑαυτοὺς εἶναι δοκοῦσιν. ὥσπερ οὖν καὶ εἰ ἦσαν ἀδιαίρετοι, ἁψάμενοι οὐθὲν ἂν ἐποίησαν μέγεθος μεῖζον· οὕτω καὶ ἐπειδὴ οὐκ εἰσὶ μέν, φαίνονται δὲ ἀδιαίρετοι καὶ συνελθόντες, οὐθὲν φανοῦνται μείζους τὸ μέγεθος ὄντες. ὅτι μὲν οὖν αἱ λεγόμεναι περὶ αὐτῶν αἰτίαι ψευδεῖς οὖσαι τυγχάνουσι, κἂν εἰ μὴ διὰ πλειόνων, ἀλλὰ καὶ διὰ τούτων ἱκανῶς δῆλόν ἐστιν.

* κ. ἐνταῦθα.

A Lumen verò ad tertiam vſque cœli partem, inſtar ſaltus porrigebatur: vnde & viæ nomen accepit. Porrò ad vſque balteum conſcendit Orionis, ibique diſſolutum fuit. Atqui Democritus opinionem ſuam aſtruere contendit. Nam poſt cometarum diſſolutionem, ſidera quædam fuiſſe conſpecta aſſeuerat. At hoc haudquaquam interdum fieri, interdum non fieri, ſed ſemper oportebat. Præterea ipſi quoque Ægyptij, ſtellas errantes, tam inter ſe quàm cum fixis coire aiunt. Atque ipſi iam ſemel atque iterum vidimus Iouis ſtellam in Geminis exiſtentem, quandam ſubiiſſe, ac eam occultaſſe: ſed cometen factum, nequaquam. Inſuper & ratione hoc ipſum patet. nam ſtellæ tametſi maiores minoréſve apparent, B attamen per ſe indiuiduæ videntur eſſe. Vt igitur ſi indiuiſibiles eſſent, ſuo contactu magnitudinem haudquaquam maiorem redderent: ſic etiam cùm indiuiſibiles non ſint, ſed appareant, ſuo coitu ac concurſu nihilo maiorem perferre molem videbuntur. Quas igitur de ipſis cauſas diximus, falſas eſſe, etiamſi non per plura, at per hæc, abundè perſpicuum eſt.

ΚΕΦΑΛ. ζ.

Περὶ κομητῶν.

Ἐπεὶ δὲ περὶ τῶν ἀφανῶν τῇ αἰσθήσει νομίζομεν ἱκανῶς ἀποδεδεῖχθαι κατὰ τὸν λόγον, ἐὰν εἰς τὸ δυνατὸν ἀναγάγωμεν, ἔκ τε τῶν νῦν φαινομένων ὑπολάβοι τις ἂν ὧδε περὶ τούτων μάλιστα συμβαίνειν. ὑπόκειται γὰρ ἡμῖν τοῦ κόσμου τοῦ περὶ τὴν γῆν, ὅσον ὑπὸ τὴν ἐγκύκλιόν ἐστι φοράν, εἶναι τὸ πρῶτον μέρος ἀναθυμίασιν ξηρὰν καὶ θερμήν, * αὐτή τε καὶ τοῦ συνεχοῦς ὑπ' αὐτὴν ἀέρος ἐπὶ πολὺ συμπεριάγεται περὶ τὴν γῆν ὑπὸ τῆς * φορᾶς καὶ τῆς κινήσεως τῆς κύκλῳ· φερομένη δὲ καὶ κινουμένη τοῦτον τὸν τρόπον, ᾗ ἂν τύχῃ εὔκρατος οὖσα, πολλάκις ἐκπυροῦται. διὸ φαμὲν γίνεσθαι καὶ τὰς τῶν σποράδων ἀστέρων διαδρομάς. ὅταν οὖν εἰς τὴν τοιαύτην πύκνωσιν ἐμπέσῃ διὰ τὴν τῶν ἄνωθεν κίνησιν ἀρχὴ πυρώδης, μήτε οὕτω πολλὴ λίαν, ὥστε ταχὺ καὶ ἐπὶ πολὺ ἐκκαίειν, μήθ' οὕτως ἀσθενής, ὥστ' ἀποσβεσθῆναι ταχύ, ἀλλὰ πλείων καὶ ἐπὶ πολύ· ἅμα δὲ κάτωθεν συμπίπτῃ ἀναβαίνειν εὔκρατον ἀναθυμίασιν, ἀστὴρ τοῦτο γίνεται κομήτης, ὅπως ἂν τὸ ἀναθυμιώμενον τύχοι ἐσχηματισμένον· ἐὰν μὲν γὰρ πάντῃ ὁμοίως, κομήτης· ἐὰν δ' ἐπὶ μῆκος, καλεῖται πωγωνίας. ὥσπερ δ' ἡ τοιαύτη φορά, ἀστέρος φορὰ δοκεῖ εἶναι, οὕτω καὶ ἡ μονὴ ἡ ὁμοία, ἀστέρος μονὴ δοκεῖ εἶναι· παραπλήσιον γὰρ τὸ γινόμενον, οἷον εἴ τις εἰς τὴν ἀχύρων θημωνιὰ καὶ πλῆθος ὥστε δαλόν, ἢ πυρὸς ἀρχὴν ἐμβάλοι μικράν· φαίνεται γὰρ ὁμοία καὶ ἡ τῶν ἀστρων διαδρομὴ τούτῳ· ταχὺ γὰρ διὰ τὴν εὐφυίαν τοῦ ὑπεκκαύματος διαδίδωσιν ἐπὶ μῆκος. εἰ δὴ τοῦτο διαμείνειε, καὶ μὴ καταμαρανθείη διϊόν, ᾗ μάλιστα ἐπύκνωσε τὸ ὑπέκκαυμα, γένοιτ' ἂν ἀρχὴ τῆς φορᾶς ἡ τελευτὴ τῆς διαδρομῆς. τοιοῦτος καὶ ὁ κομήτης ἐστὶν ἀστήρ, ὥσπερ διαδρομὴ ἀστέρος, ἔχων ἐν αὑτῷ πέρας καὶ ἀρχήν.

* Interp. etiam vetus. θερμήν, αὐτὴν δὲ κ. al. αὐτὴν τε. & mox συμπεριάγεσθαι.

* κ. σφαίρας

CAPVT VII.

De cometis, & eorundem diuerſitate.

C CVM autem de hiſce quæ ſenſui peruia non ſunt, ſatis eſſe iuxta rationem demonſtratum putemus, ſi ad id quod fieri poſſit, ea reduxerimus, ex hiſce quæ in præſentia dicuntur, exiſtimauerit quiſpiam de hiſce maximè ad hunc modum vſuuenire. Supponimus enim mundi terræ circunfuſi primam eam omnem partem, quæ orbiculari ſubeſt lationi, exhalationem eſſe calidam aridámque. Eam autem, & inſuper aëris, quem ſuo in ſinu fouet ac ambit, haud parum circularis latio ac motus ſecum circa terram raptat verſatque. At interim dum illa fertur ac mouetur hoc pacto, quà forte fortuna fuerit bene temperata, ſæpe incenditur: ob quod & illos ſparſorum ſiderum D diſcurſus fieri dicimus. Cùm igitur ob ſuperiorum corporum conuerſionem in eiuſmodi denſitatem igneum inciderit principium, neque tam vehementer multum vt continuo & diu exurere queat, neque porrò tam debile vt ſtatim extinguatur, ſed validius, & quod diutiùs poſſit permanere, ſimúlque contingat vt ſubvolet in eum locum probè temperata exhalatio, aptáque vt incendatur, tum id ſidus crinitum fit, quamcunque figuram ſurrecta exhalatio contraxerit. Nam ſi vndique ſimilis fuerit, cometes (id eſt, ſtella crinita, & comarum modo in vertice hiſpida) nuncupatur. Sin autem oblonga, pogonias (quaſi dicas barbata, & cui inferiore ex parte in ſpeciem E barbæ longæ promittitur iuba) vocitatur. Vt autem huiuſmodi latio, ſtellæ latio: ſic & ſtatio, ſtellæ ſtatio videtur eſſe. Idem enim propemodum fit, ac ſi quiſpiam torrem aut paruum ignis principium, in palearum cumulum aceruúmque immiſerit atque iniecerit. Nam & ſtellarum diſcurſus huic rei perſimilis apparet. Citò namque ob ſuccenſæ materiæ accommodantiam in longitudinem ſequela quadam ſerpit. Itaque ſi id edurarit, nec transeundo emarcuerit, qua potiſſimùm parte ſucceſſio denſet, lationis profectò initium, excurſionis fiet finis. Tale eſt & crinitum ſidus, vtpote quod non aliter quàm ſtellæ diſcurſus, principium in ſe finémq; habeat.

Cùm igitur conſtitutionis principium in ipſo inferiore loco exiſtit, per ſe cometes apparet. Cùm autem ſub aliqua ſtella aut errantium aut cælo affixarum, motionis opera conſtiterit exhalatio, tum ex hiſce quæpiam fit cometes. Nec enim coma ipſis adhæret ſtellis, ſed ſicuti coronæ circa ſolem ac lunam apparent, ſidera ipſa quamuis aliò demigrent, ſequentes, vbi aër adeò denſatus eſt, vt hæc affectio ſub ſolis itinere fieri queat, ſic & aſtris ipſis coma ceu corona exiſtit. Verùm corona tali colore ob refractionem inſignitur: at comæ colorem quem præferunt, in ſeſe habent. Cùm igitur iuxta ſtellam aliquam talis concretio facta fuerit, cometes eodem quo ſtella motu ferri videatur, eſt neceſſe: cùm verò per ſe conſtiterit, tum ſubſidens & relicta videtur. Nam latio mundi, qui circa terram eſt, agnoſcitur eiuſmodi. Hoc autem maximè inſinuat, cometen non eſſe perinde vt coronam, refractionem quandam quæ in ſuccenſione pura ac nitida ad ſidus ipſum, aut quemadmodum Hippocrates affirmat, ad ipſum ſolem fiat: quòd & plerumque cometes per ſe, & ſæpius quàm circa ſtellas quaſdam definitas fieri ſoleat. Sed de area, hoc eſt, corona, poſteriùs cauſam dicemus. Quòd autem ignea ſit cometarum conſtitutio, hinc coniectare licet. Nam ſi plures fiant, flatus & ſqualores portendunt. perſpicuum enim eſt eos ideo gigni, quòd eiuſmodi ſecretio redundet in tantùm, vt neceſſariò aër aridior efficiatur, & ſublatum humidum copia exhalationis feruidæ adeò diſcutiatur ac diſſoluatur, vt non facilè conſiſtere ac denſari in liquorem poſſit. Sed de hac item affectione dilucidiùs ſumus dicturi, cùm loquendi de flatibus tempus affuerit. Cùm igitur crebri ac plures apparent, ſicuti dicimus, aridus admodum & flatuoſus redditur annus. Cùm verò rariores, & magnitudine non perinde inſigni conſpiciuntur: haudquaquam ex æquo tale quippiam fieri ſolet. verumenimvero exceſſus quidam flatuum vel in duratione vel in magnitudine magna ex parte committitur. Quandoquidem & cùm lapis ille qui apud Ægopotamos oſtenditur, ex aëre cecidit: vento ſublatus excidit interdiu, comete quoque illis noctibus flagrante. atque circa id temporis quo magnum illud crinitum ſidus apparuit, ſicca fuit hyems & aquilonia. Nec non æſtus ille maris qui Achaiam inuaſit, ob flatuum contrarietatem factus eſt. Nam ſinum ipſum aquilo occuparat, & extrà ingens ſpirabat auſter. Præterea Nicomacho Athenis imperante, circa æquinoctialem circulum paucis diebus cometes apparuit, exortu ſuo nequaquam veſperi facto. quo adhuc regnante, ventum illum qui circa Corinthum debacchatus eſt, factum eſſe accidit. Cur autem plures non fiant cometæ, nec ſæpe, cúrque extra tropicos potiùs fiant quàm intra, in cauſa eſt ſolis aſtrorúmque latio: quæ non modò calidum ſecernit, verumetiam id ſegregat quod conſiſtit. In primis verò cauſa exiſtit, quòd in lactei circuli regionem, maxima exhalationum copia congregatur.

A ὅταν μὲν οὖν ἐν αὐτῷ τῷ κάτω τόπῳ ἡ ἀρχὴ τῆς συστάσεως ᾖ, καθ' ἑαυτὸν φαίνεται κομήτης· ὅταν δὲ ὑπὸ τῶν ἄστρων τινός, ἢ τῶν ἀπλανῶν, ἢ τῶν πλανητῶν, ὑπὸ τῆς κινήσεως συνιστῆται ἡ ἀναθυμίασις, τότε κομήτης γίγνεται τούτων τις· οὐ γὰρ πρὸς αὐτοῖς ἡ κόμη γίγνεται τοῖς ἄστροις· ἀλλ' ὥσπερ αἱ ἅλω περὶ τὸν ἥλιον φαίνονται καὶ τὴν σελήνην παρακολουθοῦσαι, καίπερ μεθισταμένων τῶν ἄστρων, ὅταν οὕτως ᾖ πεπυκνωμένος ὁ ἀήρ, ὥστε τοῦτο γίγνεσθαι τὸ πάθος ὑπὸ τὴν τοῦ ἡλίου πορείαν· οὕτω καὶ ἡ κόμη τοῖς ἄστροις οἷον ἅλως ἐστί. B πλὴν, ἡ μὲν γίγνεται δι' ἀνάκλασιν, τοιαύτη τὴν χρόαν· ἐκεῖ δ' ἐπ' αὐτῶν τὸ χρῶμα φαινόμενόν ἐστιν. ὅταν μὲν οὖν κατ' ἀστέρα γένηται ἡ τοιαύτη σύγκρισις, τὴν αὐτὴν ἀνάγκη φαίνεσθαι φορὰν κινούμενον τὸν κομήτην, ἥνπερ φέρεται ὁ ἀστήρ. ὅταν δὲ συστῇ καθ' αὑτόν, τότε ὑπολειπόμενοι φαίνονται. τοιαύτη γὰρ ἡ φορὰ τοῦ κόσμου τοῦ περὶ τὴν γῆν· τοῦτο γὰρ μάλιστα μηνύει μὴ εἶναι ἀνάκλασίν τινα τὸν κομήτην, ὡς τὴν ἅλω ἐν ὑπεκκαύματι καθαρῷ, πρὸς αὐτὸν τὸν ἀστέρα γιγνομένην, καὶ μὴ ὡς λέγουσιν οἱ περὶ Ἱπποκράτην, C πρὸς τὸν ἥλιον· ὅτι καὶ καθ' ἑαυτὸν γίγνεται κομήτης πολλάκις καὶ πλεονάκις, ἢ περὶ τῶν ὡρισμένων τινὰς ἀστέρων. περὶ μὲν οὖν τῆς ἅλω τὴν αἰτίαν* ὕστερον ἐροῦμεν· περὶ δὲ τοῦ πυρώδη τὴν σύστασιν αὐτῶν εἶναι, τεκμήριον χρὴ νομίζειν, ὅτι σημαίνουσι γιγνόμενοι πλείους πνεύματα καὶ αὐχμούς· δῆλον γὰρ ὅτι γίγνονται διὰ τὸ πολλὴν εἶναι τὴν τοιαύτην ἔκκρισιν. ὥστε ξηρότερον ἀναγκαῖον εἶναι τὸν ἀέρα, καὶ διακρίνεσθαι καὶ διαλύεσθαι τὸ διατμίζον ὑγρὸν ὑπὸ τοῦ πλήθους τῆς θερμῆς ἀναθυμιάσεως· ὥστε μὴ συνίστασθαι ῥᾳδίως εἰς ὕδωρ. σαφέστερον δ' ἐροῦμεν καὶ περὶ τούτου τοῦ πάθους, ὅταν D καὶ περὶ πνευμάτων λέγειν ᾖ καιρός. ὅταν μὲν οὖν πυκνοὶ καὶ πλείους φαίνωνται καθάπερ λέγομεν, ξηροὶ καὶ πνευματώδεις γίγνονται οἱ ἐνιαυτοὶ ἐπιδήλως· ὅταν δὲ σπανιώτεροι καὶ ἀμαυρότεροι τὸ μέγεθος, ὁμοίως μὲν οὐ γίγνεται τὸ τοιοῦτον· οὐ μὴν ἀλλ' ὡς ἐπὶ τὸ πολὺ γίγνεταί τις ὑπερβολὴ πνεύματος, ἢ κατὰ χρόνον, ἢ κατὰ μέγεθος· ἐπεὶ καὶ ὅτε ὁ ἐν Αἰγὸς ποταμοῖς ἔπεσε λίθος ἐκ τοῦ ἀέρος, ὑπὸ πνεύματος ἀρθεὶς ἐξέπεσε μεθ' ἡμέραν· ἔτυχε δὲ καὶ τότε κομήτης ἀστὴρ γενόμενος ἀφ' ἑσπέρας. καὶ περὶ τὸν μέγαν ἀστέρα τὸν κομήτην, ξηρὸς ἦν ὁ χειμὼν καὶ βόρειος, καὶ τὸ κῦμα δι' ἐναντίωσιν ἐγένετο πνευμάτων. ἐν E μὲν γὰρ τῷ κόλπῳ βορέας κατεῖχεν· ἔξω δὲ νότος ἔπνευσε μέγας. ἔτι δ' ἐπ' ἄρχοντος ἐγένετο Νικομάχου Ἀθήνησιν ὀλίγας ἡμέρας κομήτης, περὶ τὸν ἰσημερινὸν κύκλον οὐκ ἀφ' ἑσπέρας ποιησάμενος τὴν ἀνατολὴν, ἐφ' ᾧ τὸ περὶ Κόρινθον πνεῦμα γενέσθαι συνέπεσε. τοῦ δὲ μὴ γίνεσθαι πολλοὺς, μηδὲ πολλάκις κομήτας, καὶ μᾶλλον ἐκτὸς τῶν τροπικῶν ἢ ἐντὸς, αἴτιος ἥ τε τοῦ ἡλίου καὶ ἡ τῶν ἄστρων κίνησις, οὐ μόνον ἐκκρίνουσα τὸ θερμὸν, ἀλλὰ καὶ διακρίνουσα τὸ συνιστάμενον. μάλιστα δ' αἴτιον, ὅτι τὸ πλεῖστον εἰς τὴν τοῦ γάλακτος ἀθροίζεται χώραν.

* Lib. 3. c. 2. & 3.

A

ΚΕΦΑΛ. η'.

Περὶ τοῦ γάλακτος.

Ὅπως δὲ καὶ διὰ τίν' αἰτίαν γίγνεται, καὶ τί ἐστι τὸ γάλα, λέγομεν* ἤδη. προδιέλθωμεν δὲ καὶ περὶ τούτου τὰ παρὰ τῶν ἄλλων εἰρημένα πρῶτον. τῶν μὲν οὖν καλουμένων Πυθαγορείων φασί τινες ὁδὸν εἶναι ταύτην, οἱ μὲν τῶν ἐκπεσόντων τινὸς ἄστρων, κατὰ τὴν λεγομένην ἐπὶ Φαέθοντος φθοράν· οἱ δὲ τὸν ἥλιον, τοῦτον τὸν κύκλον φέρεσθαί ποτέ φασιν. οἷον οὖν διὰ τὸ κεκαῦσθαι τὸν τόπον τοῦτον, ἤ τι τοιοῦτον ἄλλο πεπονθέναι πάθος ὑπὸ τῆς φορᾶς αὐτῶν. ἄτοπον δὲ τὸ μὴ συννοεῖν, ὅτι εἴπερ τοῦτ' ἦν τὸ αἴτιον, ἔδει καὶ τὸν τῶν ζῳδίων κύκλον οὕτως ἔχειν, καὶ μᾶλλον ἢ τὸν τοῦ γάλακτος· ἅπαντα γὰρ ἐν αὐτῷ φέρεται τὰ πλανώμενα, καὶ οὐχ ὁ ἥλιος μόνος. δῆλος δ' ἡμῖν ἅπας ὁ κύκλος· ἀεὶ γὰρ αὐτοῦ φανερὸν τὸ ἡμικύκλιον τῆς νυκτός, ἀλλὰ πεπονθὸς οὐθὲν φαίνεται τοιοῦτον· πλὴν εἴ τι συνάπτει μόριον αὐτοῦ πρὸς τὸν τοῦ γάλακτος κύκλον. οἱ δὲ περὶ Ἀναξαγόραν καὶ Δημόκριτον, φῶς εἶναι τὸ γάλα λέγουσιν ἄστρων τινῶν· τὸν γὰρ ἥλιον ὑπὸ τὴν γῆν φερόμενον, οὐχ ὁρᾶν ἔνια τῶν ἄστρων. ὅσα μὲν οὖν *ὁρᾶται ὑπ' αὐτοῦ, τούτων μὲν οὐ φαίνεσθαι τὸ φῶς· κωλύεσθαι γὰρ ὑπὸ τῶν τοῦ ἡλίου ἀκτίνων. ὅσοις δ' ἀντιφράττει ἡ γῆ, ὥστε μὴ ὁρᾶσθαι ὑπὸ τοῦ ἡλίου, τὸ τούτων οἰκεῖον φῶς, φασὶν εἶναι τὸ γάλα. φανερὸν δέ, ὅτι καὶ τοῦτ' ἀδύνατον· τὸ μὲν γὰρ γάλα ἀεὶ τὸ αὐτό, ἐν τοῖς αὐτοῖς ἐστιν ἄστροις. φαίνεται γὰρ μέγιστος ὢν κύκλος· ὑπὸ δὲ τοῦ ἡλίου ἀεὶ ἕτερα τὰ οὐχ ὁρώμενα, διὰ τὸ μὴ ἐν ταὐτῷ * μένειν τόπῳ. ἔδει οὖν μεθισταμένου τοῦ ἡλίου, μεθίστασθαι καὶ τὸ γάλα· νῦν δ' οὐ φαίνεται τοῦτο γιγνόμενον. πρὸς δὲ τούτοις, εἰ καθάπερ δείκνυται [νῦν] ἐν τοῖς περὶ ἀστρολογίαν θεωρήμασιν, οὕτως ἔχει, καὶ τό, τε τοῦ ἡλίου μέγεθος μεῖζόν ἐστιν ἢ τὸ τῆς γῆς, καὶ τὸ διάστημα πολλαπλασίως μεῖζον τὸ τῶν ἄστρων πρὸς τὴν γῆν, ἢ τὸ τοῦ ἡλίου, καθάπερ τὸ τοῦ ἡλίου πρὸς τὴν γῆν ἢ τὸ τῆς σελήνης· οὐκ ἂν πόρρω που ἀπὸ τῆς γῆς ὁ κῶνος ὁ ἀπὸ τοῦ ἡλίου συμβάλλοι τὰς ἀκτῖνας· οὐδ' ἂν ἡ σκιὰ πρὸς τοῖς ἄστροις εἴη τῆς γῆς, ἡ καλουμένη νύξ. ἀλλ' ἀνάγκη πάντα τὸν ἥλιον τὰ ἄστρα περιορᾶν, καὶ μηθενὶ τὴν γῆν ἀντιφράττειν αὐτῶν. ἔτι δ', ἐστὶ τρίτη τις ὑπόληψις περὶ αὐτοῦ. λέγουσι γάρ τινες ἀνάκλασιν εἶναι τὸ γάλα τῆς ἡμετέρας ὄψεως πρὸς τὸν ἥλιον, ὥσπερ καὶ τὸν ἀστέρα τὸν κομήτην. ἀδύνατον δὲ καὶ τοῦτο· εἰ μὲν γὰρ τό, τε ὁρῶν ἠρεμοίη, καὶ τὸ ἔνοπτρον, καὶ τὸ ὁρώμενον ἅπαν ἐν τῷ αὐτῷ σημείῳ τοῦ ἐνόπτρου, τὸ αὐτὸ ἂν φαίνοιτο μέρος τῆς ἐμφάσεως. εἰ δὲ κινοῖτο τὸ ἔνοπτρον, καὶ τὸ ὁρώμενον, ἐν τῷ αὐτῷ μὲν ἀποστήματι πρὸς τὸ ὁρῶν καὶ ἠρεμοῦν, πρὸς ἄλληλα δὲ μήτε ἰσοταχῶς, μήτ' ἐν τῷ αὐτῷ ἀεὶ διαστήματι, ἀδύνατον τὴν αὐτὴν ἔμφασιν ἐπὶ τοῦ αὐτοῦ εἶναι μέρους τοῦ ἐνόπτρου. τὰ δ' ἐν τῷ τοῦ γάλακτος κύκλῳ φερόμενα ἄστρα κινεῖται, καὶ ὁ ἥλιος πρὸς ὃν ἡ ἀνάκλασις, μενόντων ἡμῶν, καὶ ὁμοίως καὶ ἴσον πρὸς ἡμᾶς ἀπέχοντα, αὐτῶν δ' οὐκ ἴσον· ὁτὲ μὲν γὰρ μέσων νυκτῶν ὁ δελφὶς ἀνατέλλει, ὁτὲ δ' ἕωθεν, τὰ δὲ μέρη τοῦ γάλακτος ταὐτὰ μένει ἐν ἑκάστῳ. καίτοι οὐκ ἔδει,

* γρ. ἤδη, προδιελθόντες δὲ π.

* γρ. περιορᾶται

* γρ. μένειν τὸν ἥλιον τ.

CAPVT VIII.

De lacteo circulo Priſcorum opiniones.

IAm verò qualiter & quam ob cauſam fiat lac, necnon quid ſit, dicendum eſt. Sed priùs quæ ab aliis de hoc quoque dicta fuère, percurramus. Quidam igitur ex iis quos Pythagoreos vocitant, viam eſſe hanc aiunt. Alij, cuiuſdam aſtri de cœlo lapſi, iuxta cœli conflagrationem, quam ſub Phaëthonte ferunt accidiſſe. Alij, Solis, qui per hunc circulum aliquando ferri dicunt. Hunc igitur locum veluti combuſtum, aut

B quampiam aliam id genus affectionem paſſum eſſe ab eorum latione volunt. At illud perabſurdum eſt non animaduertere, ſi ea foret cauſa, ſigniferum quoque, & quidem potiùs quàm lactis circulum, haud aliter affectum eſſe oportere. quippe cùm errones omnes, & non ſol duntaxat in eo ferantur. Totus autem circulus nobis eſt conſpicuus: ſemper enim eius ſemicirculus nocturno tempore apparet, ſed nihil id genus ſubiiſſe videtur, niſi ſi qua ipſius particula lacteo circulo ſeſe applicuerit. Anaxagoras verò atque Democritus, lac eſſe quorundam ſiderum lumen aſſerunt: ſolem enim dum ſub terra fertur, ex ſtellis quaſdam non aſpicere. Quæcunque igitur ab ſole aſpiciuntur, earum lumen non vide-

C ri. inhiberi enim à ſolis radiis. Quibuſcunque autem tellus ipſa obſiſtit quominus à ſole aſpiciantur, harum proprium lumen eſſe lac aiunt. Sed quòd impoſſibile ſit, patet. nam lac aſſiduè idem in eiſdem exiſtit aſtris. apparet enim maximus circulus. Quæ autem ſtellæ à ſole non aſpiciuntur, ſemper diuerſæ ſunt, propterea quòd ſol haudquaquam in eodem maneat loco. Oportebat igitur migrante ſole, transferri & ipſum lac. nunc verò hoc fieri minimè videmus. Ad hæc ſi quemadmodum in cœleſtium rerum contemplationibus demonſtratum eſt, ita res ſeſe habeat, & ſolis magnitudo maior ſit quàm terræ, & diſtantia ſtellarum à terra multiplicato maior ſit quàm ſo-

D lis ab eadem: quemadmodum ſolis à terra quàm lunæ maior eſt, alicubi non procul à terra turbo ille qui à ſole initium ſumit, radios committet coniungetque. nec terræ vmbra, quam noctem appellitant, ad aſtra pertinget: ſed ſolem ſidera omnia circumſpicere, & eorum nulli terram obſiſtere neceſſe eſt. Eſt autem præterea de lacte, tertia quædam opinio. Quidam enim lac ipſum perinde atque crinitum ſidus, eſſe refractionem noſtri aſpectus ad ſolem dicunt. Sed & hoc fieri nequit. Nam ſi & videns & ſpeculum, & totum id quod conſpectui obuiam eſt, quieſcant, in eadem ſpeculi parte eadem viſio-

E nis portio apparebit. Sin verò ſpeculum & res conſpecta in eadem ad id quod videt ac quieſcit diſtantia, ſed inter ſe nec æquè celeriter nec eodem ſemper interuallo moueantur, fieri profectò non poterit vt eadem viſio in eadem ſpeculi parte conſpiciatur. At ſtellæ quæ in lacteo circulo feruntur, & ſol quem versùs refractio fit, & ſimiliter & ex æquo à nobis diſtantes, à ſeipſis autem minimè, manentibus nobis mouentur. Interdum ſiquidem media nocte, interdum diluculo exoritur Delphin. Lactis autem partes eædem in vnaquaque manent. Atqui non oporteret,

ſi lac emphaſis atque viſio eſſet, imò ne in eis quidem locis hæc foret affectio. Præterea, noctu in aqua & id genus ſpeculis, lac ſpectantibus apparet. Sed quî fieri poteſt, vt tum aſpectus in aduerſum ſolem verſus refrangatur? Patet igitur ex hiſce, lacteum circulum neque meantium vllius viam, neque ſtellarum quæ non videntur iubar, neque refractionem eſſe. Hæc autem ſola ferè ſunt, quæ ad hoc vſque æui ab aliis tradita ſunt.

Nos verò reſumpto quod ſubiecimus principio, dicamus. Dictum enim eſt priùs, extremam aeris particulam vim ignis habere, vt aëre motus opera diſcreto, conſtitutio ſecernatur eiuſmodi, qualem crinita item ſidera eſſe dicimus. Operæpretium autem eſt intelligamus, tale quippiam fieri quod in illis, cùm ipſa talis ſecretio haudquaquam per ſe, ſed ſub aliqua ſtella aut cœlo adfixa, aut errante fuerit facta. Tum enim eiuſmodi cometæ cernuntur, propterea quòd ſtellarum lationem ſequatur, perinde atque ſolem talis ſecretio, in qua per refractionem apparere coronam dicimus, vbi fortè fortuna fuerit ita temperatus aër. Quod autem circa vnam ſtellam contingit, id circa totum cœlum, ſuperamque lationem vniuerſam, fieri accipiamus oportet. Nam ſi vnius ſtellæ motus ſuccendere queat, non etiam fuerit abſurdum, cunctarum lationem tale quid committere, ac ignem excitare: præſertim in qua cœli parte denſiſſimæ & plurimæ & maximæ ſunt ſtellæ. Igitur ſignifer ob ſolis & erronum lationem, huiuſmodi conſtitutionem tenuat ac diſſoluit. Proinde plerique cometæ extra tropicos fiunt. Præterea neque circa ſolem, neque circa lunam coma fieri ſolet. Nam ocyùs eiuſmodi concretionem diſcernunt, quàm vt conſiſtere queat. Ipſe autem circulus in quo lac ſpectantibus apparet, & maximus eſt, & ita ſitus vt poſitu tropicos haud parum excedat. Ad hæc locus ipſe maximis ſplendidiſſimiſque ſtellis & inſuper hiſce quas ſparſas nuncupant, oppletus eſt (quod & oculis cernere licet) adeò vt his de cauſis aſſiduè ac ſemper tota hæc coaceruetur concretio. Cuius rei ſignum eſt. Nam in huius circuli parte altera quæ candorem duplicato maiorem præfert, maius lumen eſt. in hac enim maiores denſioreſque ſtellæ ſunt, quàm in altera: quaſi non alia vlla de cauſa iubar, quàm ob ſtellarum lationem fiat. Nam ſi hoc in circulo fiat, in quo plurimæ ſunt ſtellæ, & huius ipſius circuli magis in ea parte quæ multis ac magnis ſtellis diſſarcta apparet: hanc eſſe cauſam affectionis familiariſſimam exiſtimare par eſt. Sed tum circulum, tum ſtellas quæ in eo ſunt, ex deſcriptione contemplemur. Quas autem ſparſas vocitant, non licet in pilam ad hunc intrudere modum, quòd nullam vlla vnquam habeat poſitionem quæ oculo notari poſſit. id quod in cœlum aſpectantibus dilucidum eſt. in hoc enim circulo ſolo, quæ inter latera iacent, ſtellis plena ſunt eiuſmodi. in aliis verò circulis, ſtellis (vt patet) huiuſmodi vacant. Quare, ſi cauſam cur cometæ appareant, quaſi mediocriter dictam recipiamus: & de lacteo candore haud aliter habere ſentiendum eſt. Quæ enim ibi affectio circa vnam ſtellam exiſtit, hanc eandem circa circulum quempiam effici contingit.

A εἰ ἦν ἔμφασις. ἀλλὰ μὴν ἐν αὐτοῖς ἔτι ἦν τοῦτο τὸ πάθος τοῖς τόποις. ἔτι δὲ νύκτωρ ἐν ὕδατι καὶ τοιούτοις ἐνόπτροις, τὸ μὲν γάλα ἐμφαίνεται θεωροῦσι· τὸ δὲ τὴν ὄψιν ἀνακλᾶσθαι πρὸς τὸν ἥλιον, πῶς δυνατόν; ὅτι μὲν οὖν οὔτε ὁδὸς τῶν πλανήτων ἐστὶν, οὔτε φῶς ἐστὶ τῶν μὴ ὁρωμένων ἄστρων, οὔτ' ἀνάκλασις, ἐκ τούτων φανερόν. σχεδὸν δὲ ταῦτ' ἐστὶ μόνα τά γε μέχρι τοῦ νῦν παραδεδομένα παρὰ τῶν ἄλλων. ἡμεῖς δὲ λέγωμεν ἀναλαβόντες τὴν ὑποκειμένην ἀρχὴν ἡμῖν· εἴρηται γὰρ πρότερον ὅτι τὸ ἔσχατον τοῦ λεγομένου ἀέρος, δύναμιν ἔχει πυρός. ὥστε τῇ κινήσει διακρινομένου τοῦ ἀέρος ἀποκρίνεσθαι B τὴν τοιαύτην σύστασιν, οἵας καὶ τοὺς κομήτας ἀστέρας εἶναί φαμεν. τοιοῦτον δὴ δεῖ νοῆσαι τὸ γιγνόμενον, ὅπερ ἐπ' ἐκείνων, ὅταν μὴ αὐτὴ καθ' αὑτὴν γένηται ἡ τοιαύτη ἔκκρισις, ἀλλ' ὑπό τινος τῶν ἄστρων ἢ τῶν ἐνδεδεμένων, ἢ τῶν πλανωμένων. τότε γὰρ οὗτοι φαίνονται κομῆται διὰ τὸ παρακολουθεῖν αὐτῶν τῇ φορᾷ, ὥσπερ τῷ ἡλίῳ τὴν τοιαύτην σύγκρισιν· ἀφ' ἧς διὰ τὴν ἀνάκλασιν τὴν ἅλω φαίνεσθαί φαμεν, ὅταν οὕτω τύχῃ κεκραμένος ὁ ἀήρ. ὃ δὴ καθ' ἕνα συμβαίνει τῶν ἀστέρων, τοῦτο δεῖ λαβεῖν γιγνόμενον περὶ ὅλον τὸν οὐρανὸν, καὶ τὴν ἄνω φορὰν ἅπασαν· εὔλογον γὰρ, εἴπερ ἡ ἑνὸς ἄστρου κίνησις ἀναπτεῖ, καὶ τὴν τῶν ἁπάντων ποιεῖν τι τοιοῦτον* καὶ ἐκριπίζειν. C καὶ πρὸς τούτοις ἔτι καθ' ὃν τόπον πυκνότατα, καὶ πλεῖστα, καὶ μέγιστα* τυγχάνει ὄντα τῶν ἄστρων. ὁ μὲν οὖν τῶν ζῳδίων τόπος, διὰ τὴν τοῦ ἡλίου φορὰν καὶ τῶν πλανητῶν, διαλύει τὴν τοιαύτην σύστασιν. διόπερ οἱ πολλοὶ τῶν κομητῶν ἐκτὸς γίνονται τῶν τροπικῶν. ἔτι δ' οὔτε περὶ τὸν ἥλιον, οὔτε περὶ τὴν σελήνην γίγνεται* κόμη· θᾶττον γὰρ διακρίνουσιν, ἢ ὥστε συστῆναι τοιαύτην σύγκρισιν. οὗτος δ' ὁ κύκλος ἐν ᾧ τὸ γάλα φαίνεται τοῖς ὁρῶσιν, [ὅ,τε] μέγιστος ὢν τυγχάνει, καὶ τῇ θέσει κείμενος οὕτως, ὥστε πολὺ τοὺς τροπικοὺς ὑπερβάλλειν. πρὸς δὲ τούτοις ἄστρων ὁ τόπος πλήρης ἐστὶ τῶν τε μεγίστων καὶ D λαμπροτάτων, καὶ ἔτι τῶν σποράδων καλουμένων. τοῦτο δ' ἐστὶ καὶ τοῖς ὄμμασιν ἰδεῖν φανερόν. ὥστε διὰ ταῦτα συνεχῶς καὶ ἀεὶ ταύτην πᾶσαν ἀθροίζεσθαι τὴν σύγκρισιν· σημεῖον δέ· καὶ γὰρ αὐτοῦ τοῦ κύκλου πλεῖον τὸ φῶς ἐστιν ἐν θατέρῳ ἡμικυκλίῳ τῷ τὸ δίπλωμα ἔχοντι· ἐν τούτῳ γὰρ πλείω καὶ πυκνότερά ἐστιν ἄστρα ἢ ἐν θατέρῳ· ὡς οὐ δι' ἑτέραν τινὰ αἰτίαν γιγνομένου τοῦ φέγγους, ἢ διὰ τὴν τῶν ἄστρων φοράν· εἰ γὰρ ἔν τε τῷ κύκλῳ τούτῳ γίνεται ἐν ᾧ τὰ πλεῖστα κεῖται τῶν ἄστρων, καὶ αὐτοῦ τοῦ κύκλου ἐν ᾧ μᾶλλον φαίνεται καταπεπυκνῶσθαι καὶ μεγέθει καὶ πλήθει ἀστέρων, ταύτην εἰκὸς ὑπολαβεῖν οἰκειοτάτην αἰτίαν (εἶ) τοῦ πάθους. θεωρείσθω E δὲ ὅ,τε κύκλος καὶ τὰ ἐν αὐτῷ ἄστρα ἐκ τῆς ὑπογραφῆς. * * τοὺς δὲ σποράδας καλουμένους, οὕτω μὲν εἰς τὴν σφαῖραν οὐκ ἔστι τάξαι διὰ τὸ μηδεμίαν διὰ τέλους ἔχειν φανερὰν ἕκαστον θέσιν. εἰς δὲ τὸν οὐρανὸν ἀναβλέπουσιν ἐστὶ δῆλον· ἐν μόνῳ γὰρ τούτῳ τῶν κύκλων τὰ μεταξὺ πλήρη τοιούτων* ἄστρων ἐστίν· ἐν δὲ τοῖς ἄλλοις διαλείπει φανερῶς. ὥστ' εἴπερ καὶ περὶ τοῦ φαίνεσθαι κομήτας ἀποδεχόμεθα τὴν αἰτίαν ὡς εἰρημένην μετρίως, καὶ περὶ τοῦ γάλακτος τὸν αὐτὸν ὑποληπτέον τρόπον ἔχειν. ὃ γὰρ ἐκεῖ περὶ ἕνα ἐστὶ πάθος ἡ κόμη, τοῦτο περὶ κύκλον τινὰ συμβαίνει γίγνεσθαι τὸ αὐτό.

* γρ. καὶ ἐκριπίζειν ἀέρα καὶ διακρίνειν, διὰ τὸ τοῦ κύκλου μέγεθος.

* γρ. τυγχάνουσιν

* γρ. κομῆται.

* Deſideratur hodie Ariſtotelica ὑπογραφή, quã variis modis effingũt interpretes.

* γρ. ἀστέρων ἀεί.

ἔοικε δὲ τὸ γάλα, ὡς εἰπεῖν, οἷον ἐξειλημμένη, ἡ τοῦ μεγίστου διὰ τὴν ἔκκρισιν κύκλου κόμη. διὸ καθάπερ πρότερον εἴπομεν, οὐ πολλοὶ, οὐδὲ πολλάκις γίγνονται κομῆται, διὰ τὸ συνεχῶς ἀποκεκρίσθαι τε καὶ ἀποκρίνεσθαι καθ' ἑκάστην περίοδον εἰς τοῦτον τὸν τόπον ἀεὶ τὴν τοιαύτην σύστασιν. περὶ μὲν οὖν τῶν γιγνομένων ἐν τῷ περὶ τὴν γῆν κόσμῳ τῷ συνεχεῖ * ταῖς φοραῖς, εἴρηται, περί τε μὲν τῆς διαδρομῆς τῶν ἄστρων, καὶ τῆς ἐμπιμπραμένης φλογός· ἔτι δὲ, περὶ τε κομητῶν καὶ τοῦ καλουμένου γάλακτος. σχεδὸν γὰρ ἔστι τοσαῦτα τὰ πάθη τὰ φαινόμενα περὶ τὸν τόπον τοῦτον.

* γρ. τ. ἄνω φ.

ΚΕΦΑΛ. θ.

Περὶ αἰτίας τοῦ ὑετοῦ καὶ πῶς διαφέρει νεφέλη καὶ ὁμίχλη.

ΠΕρὶ δὲ τοῦ τῇ θέσει μὲν δευτέρου τόπου μετὰ τοῦτον, πρώτου δὲ περὶ τὴν γῆν λέγωμεν (ἔστι γὰρ κοι-•νὸς ὕδατός τε τόπος καὶ ἀέρος,) καὶ τῶν συμβαινόντων περὶ τὴν ἄνω γένεσιν αὐτοῦ. ληπτέον δὲ καὶ τούτων τὰς ἀρχὰς καὶ τὰς αἰτίας πάντων ὁμοίως. ἡ μὲν οὖν ὡς κινοῦσα καὶ κυρία καὶ πρώτη τῶν ἀρχῶν ὁ κύκλος ἐστὶν ἐν ᾧ φανερῶς ἡ τοῦ ἡλίου φορὰ διακρίνουσα, καὶ συγκρίνουσα, τῷ γίγνεσθαι πλησίον ἢ πορρώτερον, αἰτία τῆς γενέσεως καὶ τῆς φθορᾶς ἐστι. *μενούσης δὲ τῆς γῆς, τὸ περὶ αὐτὴν ὑγρὸν ὑπὸ τῶν ἀκτίνων καὶ ὑπὸ τῆς ἄλλης τῆς ἄνωθεν θερμότητος ἀτμιδούμενον φέρεται ἄνω. τῆς δὲ θερμότητος ἀπολιπούσης τῆς ἀναγούσης αὐτό, καὶ τῆς μὲν διασκεδαννυμένης πρὸς τὸν ἄνω τόπον, τῆς δὲ καὶ σβεννυμένης διὰ τὸ μετεωρίζεσθαι πορρώτερον εἰς τὸν ὑπὲρ τῆς γῆς ἀέρα, συνίσταται πάλιν ἡ ἀτμὶς ψυχομένη διά τε τὴν ἀπόλειψιν τοῦ θερμοῦ, καὶ τὸν τόπον, καὶ γίγνεται ὕδωρ ἐξ ἀέρος· γενόμενον δὲ φέρεται πάλιν πρὸς τὴν γῆν. ἔστι δ' ἡ μὲν ἐξ ὕδατος ἀναθυμίασις, ἀτμίς· ἡ δ' ἐξ ἀέρος εἰς ὕδωρ, νέφος· ὁμίχλη δὲ νεφέλης περίττωμα τῆς εἰς ὕδωρ συγκρίσεως. διόπερ σημεῖον μᾶλλόν ἐστιν εὐδίας, ἢ ὑδάτων. * ἔστι γὰρ ἡ ὁμίχλη οἷον νεφέλη ἄγονος. ὁ δὲ κύκλος ἐστὶ μιμούμενος τὸν τοῦ ἡλίου κύκλον· ἅμα γὰρ ἐκεῖνος εἰς τὰ πλάγια μεταβάλλει, καὶ οὗτος ἄνω καὶ κάτω. δεῖ δὲ νοῆσαι τοῦτον ὥσπερ ποταμὸν ῥέοντα κύκλῳ ἄνω καὶ κάτω, κοινὸν ἀέρος καὶ ὕδατος· πλησίον μὲν γὰρ ὄντος τοῦ ἡλίου, ὁ τῆς ἀτμίδος ἄνω ῥεῖ ποταμός· ἀφισταμένου δὲ, ὁ τοῦ ὕδατος κάτω. καὶ τοῦτ' ἐνδελεχὲς ἐθέλει γίγνεσθαι κατά γε τὴν τάξιν· ὥστ' εἴπερ ᾐνίττοντο τὸν Ὠκεανὸν οἱ πρότερον, τάχ' ἂν τοῦτον τὸν ποταμὸν λέγοιεν τὸν κύκλῳ ῥέοντα περὶ τὴν γῆν. ἀναγομένου δὲ τοῦ ὑγροῦ ἀεὶ διὰ τὴν τοῦ θερμοῦ δύναμιν, καὶ πάλιν φερομένου κάτω διὰ τὴν ψύξιν πρὸς τὴν γῆν, οἰκείως τὰ ὀνόματα τοῖς πάθεσι κεῖται, καί τισι διαφοραῖς αὐτῶν· ὅταν μὲν γὰρ κατὰ μικρὰ φέρηται, ψακάδες· ὅταν δὲ κατὰ μείζω μόρια, ὑετὸς καλεῖται.

* γρ. μ. δὲ μένουσης γ.

* γρ. [illegible]

A Eſtque lac ipſum (vt ita dixerim) veluti deſinitum, facta per ſecretionem maximi circuli coma. Et proinde (vt iam dictum eſt) non multi, neque ſæpe fiunt cometæ, quòd talis conſtitutio in hunc ſemper locum, & continuè excreta ſit, & per ſingulas excernatur circuitiones. De hiſce igitur quæ in mundo terræ circunfuſo, qui ſupernis adhæret lationibus, fieri ſolent, de ſtellarum diſcurſu, flamma ardente, & inſuper de crinitis ſideribus, ac vocato lacte, dictum eſt. tot enim fere ſunt affectiones, quæ circa huncce locum apparent.

CAPVT IX.

B *De cauſis pluuiæ, nubiſque & caliginis differentia.*

DE loco verò ab iſto poſitione ſecundo, à terra verò primo (hic enim promiſcuus aquæ & aëris locus exiſtit) & hiſce quæ in ſuperiore eius parte contingunt, agendum eſt. Oportet autem & horum principia ſumamus, & cauſas omnium ſimiliter. Principium igitur vt mouens, præcipuúmque, & omnium primum, circulus ille eſt, in quo manifeſtè ſolis latio, quæ ſegregat congregátque, eo quod terræ propiùs remotiúſve fiat, generationis atque corruptionis cauſa exiſtit. Manente autem terra, humor qui circa eam eſt, in vaporem à C ſolis radiis & ab alio calore ſuperno conuerſus, in ſublime tendit. Calore verò, cuius opera ſurrigebatur, vaporem deferente, atque altero in ſuperum locum diſperſo, altero etiam extincto, quòd longius in aërem qui ſuper terram eſt, euehatur, vapor frigore contracto, ob caloris deſtitutionem atque loci naturam rurſum conſiſtit, & ex aëre fit aqua: quæ poſtea quàm genita eſt, rurſum in terram defertur. Eſt autem halitus, qui ex aqua ortum habet, vapor. qui verò ex aëre in aquam mutari ſolet, nubes. Nebula autem, nubis in aquam concretæ ſuperfluitas, proinde ſerenos dies potiùs quàm pluuios portendit: quippe quæ veluti nubes infœcunda, & ſemine exhauſta exiſtat. Circulus D autem iſte, ſolis circulum imitatur: ſimul enim ille ad latera, & iſte ſurſum & deorſum mouetur. Atque conſideraſſe oportet hunc veluti fluuium aëris & aquæ promiſcuum, in orbem ſurſum ac deorſum fluere. Nam cùm ſol prope terram fertur, vaporis fluuius in ſublime effluit: cùm verò ſe dimouit, aquæ fluuius in terram defluit: quod citra vllam intercapedinem haud abſque ordine fieri ſolet. Quare ſi priores Oceani nomine, inuolucri cauſa vtebantur, hunc fortaſſis fluuium dixerint, qui circa terram fluit. Humore autem ſemper in altum vi caloris ſcandente, & rurſus deorſum ad terram ob refrigerationem ruente, contingentibus affectibus & eorum quibuſdam differentiis, pro- E priè nomina poſita ſunt. Nam cùm minutatim deſcendit, ſtillæ: cùm per partes maiuſculas, pluuia nuncupari ſolet.

ΚΕΦΑΛ. ι.

Περὶ δρόσου καὶ πάχνης.

ΕΚ δὲ τῆς καθ' ἡμέραν ἀτμιζούσης ὅσον ἂν μὴ μετεωρισθῇ δι' ὀλιγότητα τοῦ ἀνάγοντος αὐτὸ πυρὸς πρὸς τὸ ἀναγόμενον ὕδωρ, πάλιν καταφερόμενον,

CAPVT X.

De roris & pruinæ cauſis.

EX eo autem quod interdiu euaporat, quantumcunque attolli in ſublime nequiuerit, ob caloris ipſum eleuantis ad vaporem qui ſurrigitur, paruitatem, cùm rurſum deſcendit, concepto,

A concepto per noctem frigore, ros & pruina vocitatur. pruina quidem, cùm vapor fuerit antè conglaciatus, quàm rurſum in aquam concreuerit. fit autem per hyemẽ, & potiſſimùm frigidioribus in locis. Ros verò cùm in aquam vapor fuerit denſatus, & nec tepor tantas vireis habuerit, vt quod ſublatum ſit, aſſiccare, nec itidem frigus, vt ipſum vaporem gelare, propter vel loci vel temporis naturam calentiorem quiuerit. Ros enim, per temperiem maximè, inque temperatioribus locis naſci ſolet. pruina, vti dictum eſt, contrà. Conſtat enim, vaporem, aqua eſſe calidiorem: quippe qui ſubleuantem adhuc ignem habeat. Quare pruinæ concretio, ad frigiditatem pertinet maiuſculam: fiunt autem am B bo, non niſi ſerena nocte, & à ventis ſilente. Nam neque cùm ſudum ſerenúmque non fuerit, attolletur quicquam, neque ſpirante vento conſiſtere poterit: quæ ideo fieri, quia vapor non longè à terra ſurrigatur, indicio eſt, pruinam in montibus non gigni. Huius rei duæ ſunt cauſæ. Vna hæc eſt, quòd è locis humilibus & aquoſis in ſublime attollitur. Proinde calor euehens, quaſi qui pondus ferat maius quàm ſuis congruat viribus, in locum admodum altum ſurrigere illud nequit, ſed haud procul à terra rurſum dimittit. Altera, quòd aër qui in locis editioribus eſt, maximè fluitat agitatúrque, atque conſtitutionem eiuſmodi diſſoluit ac diſſipat. C Fit autem vbique ros flante auſtro, non aquilone, præterquam in Ponto, vbi contrà vſu euenit. Nam ſpirante aquilone ros fieri ſolet, auſtro, non ſolet. Cauſa autem ſimiliter habet atque illud, quòd temperatis non hybernis temporibus ros gignitur. Etenim temperiem auſter importat, aquilo hyemem, algidus enim eſt: quare exhalationis calorem ſuo frigore extinguit. At in Ponto non tantam temperiem committit auſter, vt vapor cooriri queat. Sed aquilo frigore ſuo circumobſiſtens, calorem congregat: adeo vt calor maior, vehementiùs vaporem eliciat. Quod etiam extra Pontum fieri ſæpenumero cernere licet. Nam putei flante aquilone quàm auſtro largiùs vaporem euomunt. Verùm D aquilonij flatus antè calorem præfocant, quàm vt vlla vaporis copia conſiſtat, at auſtrini exhalationem aſtringi ſinunt. Porro aqua non perinde hic concreſcit, atque eo in loco qui nubes complectitur.

A ὅταν ψυχθῇ νύκτωρ, καλεῖται δρόσος καὶ πάχνη· πάχνη μὲν, ὅταν ἡ ἀτμὶς παγῇ πρὶν εἰς ὕδωρ συγκριθῆναι πάλιν. γίνεται δὲ χειμῶνος, καὶ μᾶλλον ἐν τοῖς χειμερινοῖς τόποις· δρόσος δὲ, ὅταν συγκριθῇ εἰς ὕδωρ ἡ ἀτμὶς, καὶ μήθ' οὕτως ἔχῃ ἡ ἀλέα, ὥστε ξηρᾶναι τὸ ἀναχθὲν μήθ' οὕτως ψῦχος, ὥστε παγῆναι τὴν ἀτμίδα αὐτὴν, διὰ τὸ ἢ τὸν τόπον ἀλεεινότερον, ἢ τὴν ὥραν εἶναι. γίνεται γὰρ μᾶλλον ἡ δρόσος ἐν εὐδίᾳ, καὶ ἐν τοῖς εὐδιεινοτέροις τόποις· ἡ δὲ πάχνη, καθάπερ εἴρηται, τοὐναντίον· δῆλον γὰρ ὅτι ἡ ἀτμὶς θερμοτέρα ὕδατος· ἔχει γὰρ τὸ ἀνάγον ἔτι πῦρ· ὥστε πλείονος ψυχρότητος αὐτὴν πῆξαι. γίνε- B ται δὲ ἄμφω αἰθρίας τε καὶ νηνεμίας· οὔτε γὰρ ἀναχθήσεται μὴ οὔσης αἰθρίας, οὔτε συστῆναι δύναιτ' ἂν ἀνέμου πνέοντος. σημεῖον δ' ὅτι γίνεται ταῦτα, διὰ τὸ μὴ πόρρω μετεωρίζεσθαι τὴν ἀτμίδα· ἐπὶ γὰρ τοῖς ὄρεσιν οὐ γίνεται πάχνη. αἰτία δὲ μία μὲν αὕτη, ὅτι ἀνάγεται ἐκ τῶν κοίλων καὶ ἐφύδρων τόπων· ὥστε καθάπερ φορτίον φέρουσα πλεῖον ἡ ἀνάγουσα θερμότης, ἢ καθ' αὑτὴν, οὐ δύναται μετεωρίζειν ἐπὶ πλεῖστον αὐτὴν τοῦ ὕψους, ἀλλ' ἐγγὺς ἀφίησι πάλιν. ἑτέρα δ', ὅτι καὶ ῥεῖ μάλιστα ὁ ἀὴρ ῥέων ἐν τοῖς ὑψηλοῖς, ὃς διαλύει τὴν τοιαύτην σύστασιν. γίνεται δ' ἡ δρόσος πανταχοῦ, νοτίοις, οὐ βορείοις, C πλὴν ἐν τῷ Πόντῳ. ἐκεῖ δὲ τοὐναντίον· βορείοις μὲν γὰρ γίνεται, νοτίοις δ' οὐ γίνεται. αἴτιον δ' ὁμοίως, ὅτι ὥσπερ εὐδίας μὲν γίνεται, χειμῶνος δ' οὔ· ὁ μὲν γὰρ νότος εὐδίαν ποιεῖ, ὁ δὲ βορέας χειμῶνα· ψυχρὸς γάρ· ὥστ' ἐκ τοῦ χειμῶνος τῆς ἀναθυμιάσεως σβέννυσι τὴν θερμότητα. ἐν δὲ τῷ Πόντῳ, ὁ μὲν νότος οὐχ οὕτως ποιεῖ εὐδίαν, ὥστε γίνεσθαι ἀτμίδα. ὁ δὲ βορέας διὰ τὴν ψυχρότητα ἀντιπεριϊστὰς τὸ θερμὸν ἀθροίζει, ὥστε πλεῖον ἀτμίζειν μᾶλλον. πολλάκις δὲ καὶ τοῦτο καὶ ἐν τοῖς ἔξω τόποις ἰδεῖν γινόμενόν ἐστιν· ἀτμίζει γὰρ τὰ φρέατα βορείοις μᾶλλον ἢ νοτίοις· ἀλλὰ τὰ μὲν βόρεια σβεννύουσι, πρὶν D συστῆναί τι πλῆθος· ἐν δὲ τοῖς νοτίοις ἐᾶται ἀθροίζεσθαι ἡ ἀναθυμίασις. αὐτὸ δὲ τὸ ὕδωρ οὐ πήγνυται, καθάπερ ἐν τῷ περὶ τὰ νέφη τόπῳ.

CAPVT XI.

Niuis cauſa, generatio, & accidentia.

TRia ſi quidem corpora conſiſtentia ob frigus, aqua, nix, grando, illinc venire ſolent: quorum duo pari ratione, ac eiſdem de cauſis, quibus ea quæ fiunt non procul à terra, effici aſſo- E lent: intenſione tamen ac remiſſione, multitudine & paucitate diſcrepãt. Nix namque & pruina, item pluuia & ros, ſunt idem. verùm illud, multum: hoc paucum exiſtit. Nam pluuia fit ex multo vapore frigeſcente. Cuius cauſa eſt tum loci, tum temporis amplitudo, in quo & ex quo colligitur. Ros verò paucum quid exiſtit. nam conſtitutio ſingulorum dierum, & locus paruus exiſtit: quod & ortus celeritas, & parua multitudo ſignificant. Conſimiliter pruina & nix ſeſe habent. Nam cùm nubes fuerit congelata, nix: cùm vapor, pruina emergit. Quocirca vel temporis vel regionis frigidæ indiciũ exiſtit. non enim, niſi frigus dominaretur, congelaſceret, cùm multam adhuc retineat caliditatem.

ΚΕΦΑΛ. ια'.

Περὶ χιόνος αἰτίων, καὶ συμβεβηκότων.

Ἐκεῖθεν γὰρ τρία φοιτᾷ σώματα συνιστάμενα διὰ τὴν ψύξιν, ὕδωρ, καὶ χιὼν, καὶ χάλαζα· τούτων δὲ τὰ μὲν δύο ἀνάλογον καὶ διὰ τὰς αὐτὰς αἰτίας γίνεται τοῖς κάτω, διαφέροντα τῷ μᾶλλον καὶ ἧττον, καὶ πλήθει καὶ ὀλιγότητι· χιὼν γὰρ καὶ πάχνη ταὐτὸν, καὶ ὑετὸς καὶ δρόσος. ἀλλὰ τὸ μὲν πολὺ, τὸ δ' ὀλίγον· ὁ μὲν γὰρ ὑετὸς ἐκ πολλῆς ἀτμίδος γίνεται ψυχομένης. τούτου δ' αἴτιον ὅ,τε τόπος πολὺς, καὶ ὁ χρόνος ὢν, ἐν ᾧ συλλέγεται, καὶ ἐξ οὗ. τὸ δ' ὀλίγον, ἡ δρόσος· ἐφήμερος γὰρ ἡ σύστασις καὶ ὁ τόπος μικρός· δηλοῖ δ' ἥ τε γένεσις οὖσα ταχεῖα, βραχὺ τὸ πλῆθος. ὁμοίως δὲ καὶ πάχνη καὶ χιών· ὅταν γὰρ παγῇ τὸ νέφος, χιών ἐστιν· ὅταν δ' ἡ ἀτμὶς, πάχνη. διὸ ἢ ὥρας ἢ χώρας σημεῖόν ἐστι ψυχρᾶς· οὐ γὰρ ἂν ἐπήγνυτο, ἔτι πολλῆς ἐνούσης θερμότητος, εἰ μὴ ἐπεκράτει τὸ ψῦχος.

ἐν γὰρ τῷ νέφει ἔνεστι πολὺ τὸ θερμὸν τὸ ὑπόλοιπον τοῦ ἐξατμίσαντος ἐκ τῆς γῆς τὸ ὑγρὸν πυρός. χάλαζα δὲ ἐκεῖ μὲν γίγνεται, ἐν δὲ τῷ πλησίον τῆς γῆς ἀτμίζοντι, τοῦτ' ἐλλείπει. καθάπερ γὰρ εἴπομεν, ὡς μὲν ἐκεῖ χιών, ἐνταῦθα γίγνεται πάχνη· ὡς δὲ ἐκεῖ ὑετός, ἐνταῦθα δρόσος· ὡς δὲ ἐκεῖ χάλαζα, ἐνταῦθα οὐκ ἀνταποδίδωσι τὸ ὅμοιον. τὸ δὲ αἴτιον, εἰποῦσι περὶ χαλάζης ἔσται δῆλον.

ΚΕΦΑΛ. ΙΒ.

Περὶ χαλάζης, πῶς γίνεται, καὶ πότε μᾶλλον.

Δεῖ δὲ λαβεῖν ἅμα καὶ τὰ συμβαίνοντα περὶ τὴν γένεσιν αὐτῆς, τά, τε μὴ παρακρούοντα, καὶ τὰ δοκοῦντα εἶναι παράλογα. ἔστι μὲν γὰρ ἡ χάλαζα, κρύσταλλος, πήγνυται δὲ τὸ ὕδωρ, τοῦ χειμῶνος· αἱ δὲ χάλαζαι, γίνονται ἔαρος μὲν καὶ μετοπώρου μάλιστα, εἶτα καὶ τῆς ὀπώρας, χειμῶνος δὲ ὀλιγάκις, καὶ ὅταν ἧττον ᾖ ψῦχος. καὶ ὅλως δὲ γίνονται χάλαζαι μὲν ἐν τοῖς εὐδιεινοτέροις τόποις, αἱ δὲ χιόνες ἐν τοῖς ψυχροτέροις. ἄτοπον δὲ καὶ τὸ πήγνυσθαι ὕδωρ ἐν τῷ ἄνω τόπῳ· οὔτε γὰρ παγῆναι δυνατὸν πρὶν γενέσθαι ὕδωρ, οὔτε τὸ ὕδωρ οὐδένα χρόνον οἷόν τε μένειν μετέωρον ὄν. ἀλλὰ μὴν οὐδ' ὥσπερ αἱ ψακάδες, ἄνω μὲν ὀχοῦνται διὰ μικρότητα, * ἐνδιατρίβουσι δὲ ἐπὶ τοῦ ἀέρος ὥσπερ καὶ ἐπὶ τοῦ ὕδατος γῆ καὶ χρυσὸς διὰ μικρομέρειαν πολλάκις ἐπιπλέουσιν· οὕτως ἐπὶ τοῦ ἀέρος τὸ ὕδωρ. συνελθόντων δὲ πολλῶν μικρῶν, μεγάλαι καταφέρονται ψακάδες. τοῦτο γὰρ οὐκ ἐνδέχεται γενέσθαι ἐπὶ τῆς χαλάζης. οὐ γὰρ συμφύεται τὰ πεπηγότα, ὥσπερ τὰ ὑγρά. δῆλον οὖν ὅτι ἄνω τοσοῦτον ὕδωρ ἔμεινεν· οὐ γὰρ ἂν ἐπάγη τοσοῦτον. τοῖς μὲν οὖν δοκεῖ τούτου τοῦ πάθους αἴτιον εἶναι τοῦτο καὶ τῆς γενέσεως, ὅταν ἀπωσθῇ τὸ νέφος εἰς τὸν ἄνω τόπον μᾶλλον ὄντα ψυχρὸν, διὰ τὸ λήγειν ἐκεῖ τὰς ἀπὸ τῆς γῆς τῶν ἀκτίνων ἀνακλάσεις, ἐλθὸν δὲ ἐκεῖ πήγνυσθαι τὸ ὕδωρ. διὸ καὶ θέρους μᾶλλον καὶ ἐν ταῖς ἀλεειναῖς χώραις γίνεσθαι τὰς χαλάζας, ὅτι ἐπὶ πλεῖον τὸ θερμὸν ἀπωθεῖ ἀπὸ τῆς γῆς τὰς νεφέλας. συμβαίνει δὲ ἐν τοῖς σφόδρα ὑψηλοῖς ἥκιστα γίνεσθαι * χάλαζαν. καίτοι ἔδει, ὥσπερ καὶ τὴν χιόνα ὁρῶμεν ἐπὶ τοῖς ὑψηλοῖς μάλιστα γιγνομένην. ἔτι δὲ πολλάκις ὦπται νέφη φερόμενα μετὰ ψόφου πολλοῦ παρ' αὐτὴν τὴν γῆν, ὥστε φοβερὸν εἶναι τοῖς ἀκούουσι καὶ ὁρῶσιν, ὡς ἐσομένου τινὸς μείζονος. ὅτε δὲ καὶ ἄνευ ψόφου τοιούτων ὀφθέντων νεφῶν, χάλαζα γίνεται πολλή, καὶ τὸ μέγεθος ἄπιστος, καὶ τοῖς σχήμασιν οὐ στρογγύλη, διὰ τὸ μὴ πολὺν χρόνον γίνεσθαι τὴν φορὰν αὐτῆς, ὡς * πλησίον γενομένης τῆς πήξεως τῆς γῆς, ἀλλ' οὐχ ὥσπερ ἐκεῖνοί φασιν. ἀλλὰ μὴν ἀναγκαῖον ὑπὸ τοῦ μάλιστ' αἰτίου τῆς πήξεως, μεγάλας γίνεσθαι χαλάζας· κρύσταλλος γὰρ ἡ χάλαζα, καὶ τοῦτο παντὶ δῆλον. μεγάλαι δ' εἰσὶν αἱ τοῖς σχήμασι μὴ στρογγύλαι. τοῦτο δὲ σημεῖον τοῦ παγῆναι πλησίον τῆς γῆς· αἱ γὰρ φερόμεναι πόρρωθεν, διὰ τὸ φέρεσθαι μακρὰν, περιθραυόμεναι γίνονται τό, τε σχῆμα περιφερεῖς, καὶ τὸ μέγεθος ἐλάττους. ὅτι μὲν οὖν οὐ τῷ ἀπωθεῖσθαι εἰς τὸν ἄνω τόπον τὸν ψυχρὸν ἡ πῆξις συμβαίνει, δῆλον. ἀλλ' ἐπεὶ ὁρῶμεν ὅτι γίνεται ἀντιπερίστασις τῷ θερμῷ καὶ τῷ ψυχρῷ ἀλλήλοις·

* γρ. ἐνδιατρίβειν φασί.

* γρ. χαλάζας.

* γρ. πλησίον τῆς πήξεως γιν. τῆς γ.

A In nube namque multus adhuc calor ineſt, qui ex eo ſupereſt igni, qui à tellure humorem in vaporem conuerſum ſuſtulit. At grando illic quidem fit: in quo autem loco vapores non longè à terra inuehuntur, hæc deficit. Nam (ſicuti diximus) vt illic nix, ita hîc pruina: item, vt illic pluuia, ita hîc ros enaſci aſſolet. Sed vt illic grando, ita hîc ſimile nullum è regione aſſignari poteſt. cuius cauſa, cùm de grandine dixerimus, erit perſpicua.

CAPVT XII.

De grandine.

B SVmere autem ſimul oportet, & quæ circa eius ortum contingant: & quæ haudquaquam ſeducant, quæque haud præter rationem eſſe videantur. Grando namque glacies eſt. concreſcit autem aqua per hyemem. Ipſæ verò grandines vere & autumno potiſſimùm fieri ſolent, deinde & æſtate, hyeme autem rarenter, & tum cùm non admodum magnum fuerit frigus. Atque in totum grandines, in locis temperatioribus fiunt: niues, frigidiuſculis. Metas autem egreditur rationis & illud, aquam ſupero in loco congelari. Nam neque fieri poteſt, vt aqua antè conglaciata ſit quàm ortum ſubierit, aut vt per vllum temporis ſpatium in ſublimi
C ſuſpenſa maneat. At verò neque prout ſtillæ ob paruitatem ſupernè inſident, atque in aëre verſantur, perinde vt ipſi quoque aquæ, ſæpe terra & aurum ob partium ſubtilitatem innatant: ſic in aëre pluuia inuehitur. Coëuntibus autem compluribus paruis, magnæ ſtillæ decidunt: quod grandini obuenire nequit. non enim concreta liquidorũ more, coaleſcere queunt. Quòd igitur aqua tanta in alto manſiſſet, liquet. nam alioqui haudquaquam tanta fuiſſet conglaciata. Sunt igitur, quibus huiuſce affectus ac generationis cauſa, hæc eſſe videatur: nubem, cùm in ſuperiorem locum, qui ideirco frigidior eſt, quòd ſolarium radiorum à terra refractio-
D nes inibi deſinant, fuerit propulſa, perueneritque illuc, in aquam denſari. Quocirca & æſtate, inque æſtuantibus locis, grandines gigni potiùs volunt, quòd tum calor longiùs à terra nubes ſurſum verſùs propellat. Contingit autem in locis admodum æditis, grandinem nequaquam fieri, quanquam illic fieri oportebat, vti & niuem in altis fieri locis maximè videmus. Præterea ſæpe viſæ ſunt nubes circa terram cum ingenti ſono ferri, adeò vt id terrorem incuteret hiſce qui audiebant videbántque, quaſi maius quippiam eſſet futurum. Interdum autem & poſteaquam eiuſmodi nubes abſque ſono apparuerunt, fit grando multa, & magnitudine incredili, & figura nequaquam globoſa. proptereà
E quòd eius delatio tempore paruo abſumatur, tanquam prope terram facta cõcretione, & non perinde vt illi aiunt. At verò neceſſarium eſt, potiſſimam concretionis cauſam magnas efficere grandines. ſiquidem grando glacies eſt, id quod cuiuis perſpicuum exiſtit. Magnæ autem ſunt, quæ nequaquam rotundam habent figurã, quod argumento eſt grãdines non procul à terra cõcreuiſſe. Nam quæ eminus decidunt, circumfractæ, quòd per longum ferãtur interuallũ, vt figura rotũdæ, ita magnitudine minores euadere ſolẽt. Patet igitur, cõcretionẽ nõ ideo euenire, quòd nubes in ſuperiorem locum, qui multo frigore riget, propellãtur. At cùm hîc mutua calidi ac frigidi pugna, antiperiſt... fieri videamus:

(ob quod, vt æſtuante tempore ſubterranea loca, frigida ſunt, ita gelāte, calida) hôc ipſum in ſupero quoque loco fieri putandum eſt. Proinde frigus tempore calidiuſculo, introrſum per antiperiſtaſin coactum ob circundantem calorem, interdum celeriter aquam è nube facit. Quocirca & multo maiores ſtillæ, & aquæ impetuoſiores æſtuantibus diebus, quàm hyberno tempore, fiunt. Impetuoſiores namque dicuntur, cùm denſiores ex alto ruunt. quod profectò euenire ſolet ob concretionis celeritatem. Hoc autem ipſum contrà fit, quàm Anaxagoras dicat. Is etenim nubem, cùm in frigidum aſcendit aërem, hoc pati aſſerit. Nos verò, vbi deſcendit in calidum: & tum maximè, cùm in maximè calidum. Cùm autem frigus adhuc magis in profundum coactum fuerit ab exteriore calore, quàm fecerit, aquam cōglaciat magis, emergitque grando: quod accidit, vbi aquæ in imum lationem congelatio anteuerterit. Nam ſi aqua tanto in tempore deſcendat, & frigus cùm ſit vehemens in minori conglaciauerit: nihil vetat, aquam cùm adhuc erat in ſublimi, fuiſſe gelatam, ſi gelatio breuiori quàm delatio tempore abſoluatur. Item quo propiùs ac repentè magis concretio facta fuerit, eo & aquæ impetuoſiores, & ſtillæ atque grandines maiores euadunt, quòd per breuem ferantur locum. Grandéſque ſtillæ, non denſæ, cadunt eadem de cauſa. Minùs autem grando æſtate, quàm vere aut autumno, magis tamen quàm hyeme fieri ſolet: quòd aër per æſtatem ſit aridior, verno tempore adhuc humidus, autumno iam humeſcat. Fiũt autem (quemadmodum diximus) grandines etiam circa æſtatis calcem, haud alia de cauſa. Nonnihil autem facit ad concretionis celeritatem, præcedens aquæ cōcalfactio. Quandoquidē quę priùs incaluit, ocyùs refrigerari aſſolet. Quocirca multi cùm calidā celeriùs refrigerare volunt, priùs inſolant. Item accolæ Ponti cùm ſupra glaciem domunculas extruunt, quo piſcium venatui incumbant (venantur enim interſciſſa glacie) aquā calidam arundinibus circunfundunt, quo celeriùs duretur in gelu. Nam glacie vt plumbo vtuntur, quo immotæ perſiſtant arundines. Conſiſtens autem aqua calida celeriter efficitur in feruidis regionibus, temporibúſque. Fiũt etiam circa Arabiam & Æthiopiam per æſtatem, & non per hyemem aquæ, eæque impetuoſæ, ac eodem die ſæpe eandem ob cauſam. Nam per antiperiſtaſin, quæ ob vehementem regionis æſtum committitur, cito riget. Sed de pluuia, rore, niue, pruina, grandine, quam ob cauſam fiant, quænam item ſit eorum natura, tot à nobis dicta ſint.

CAPVT XIII.

De ventis, fluuiiſque & fontibus.

DE ventis autem, flatibúſque omnibus, & inſuper de fluuiis ac mari, allatis priùs de hiſce aduerſus nosipſos dubitationibus, dicamus. Nam vt de cæteris aliis, ſic & de hiſce nihil eiuſcemodi à maioribus dictum accepimus, quod non vel quiuis dicere queat. Sunt autem qui aërem motum ſubeuntem, fluitantémque, eſſe ventum, & hunc eundem conſiſtentem nubem rurſum aquámque, tanquam eadem ſit flatus & aquæ natura, necnon ventum motionem aëris aſſerant. Quocirca & ex eorum numero qui doctè loqui volunt, quidā ventos omneis vnum eſſe ventum aiunt: quia omnem

A (ὥσπερ ἐν ταῖς ἀλέαις, ψυχρὰ τὰ κάτω τῆς γῆς, καὶ ἀλεεινὰ ἐν τοῖς πάγοις) τοῦτο ἀεὶ νομίζειν καὶ ἐν τῷ ἄνω γίνεσθαι τόπῳ. ὥστ' ἐν ταῖς ἀλεεινοτέραις ὥραις ἀντιπεριστάμενον εἴσω τὸ ψυχρὸν διὰ τὴν κύκλῳ θερμότητα, ὁτὲ μὲν* ταχὺ ὕδωρ ἐκ τοῦ νέφους ποιεῖ, ὁτὲ δὲ χάλαζαν. διὸ καὶ αἱ ψακάδες πολὺ μείζους ἐν ταῖς ἀλεειναῖς γίνονται ἡμέραις, ἢ ἐν τῷ χειμῶνι, καὶ ὕδατα λαβρότερα. λαβρότερα μὲν γὰρ λέγεται, ὅταν ἀθρούστερα· ἀθρούστερα δὲ διὰ τὸ τάχος τῆς πυκνώσεως. τοῦτο δὲ γίνεται αὐτὸ τοὐναντίον, ἢ ὡς Ἀναξαγόρας λέγει. ὁ μὲν γὰρ ὅταν εἰς τὸν ψυχρὸν ἀέρα ἐπανέλθῃ, φησὶ τοῦτο πάσχειν· ἡμεῖς δέ, ὅταν εἰς τὸν θερμὸν* κατέλθῃ, καὶ μάλιστα, ὅταν μάλιστα. ὅταν δ' ἔτι μᾶλλον ἀντιπεριστῇ ἐντὸς τὸ ψυχρὸν ὑπὸ τοῦ ἔξω θερμοῦ, ὕδωρ ποιῆσαν ἔπηξε, καὶ γίνεται χάλαζα. συμβαίνει δὲ τοῦτο, ὅταν θᾶττον ἢ ἡ πῆξις, ἢ ἡ τοῦ ὕδατος φορὰ ἡ κάτω. εἰ γὰρ φέρεται μὲν ἐν τοσῳδὶ χρόνῳ, ἡ δὲ ψυχρότης σφοδρὰ οὖσα ἐν ἐλάττονι ἔπηξεν, οὐθὲν κωλύει μετέωρον ὂν παγῆναι, ἐὰν ἡ πῆξις ἐν ἐλάττονι γίνηται χρόνῳ τῆς κάτω φορᾶς. καὶ ὅσῳ δὴ ἂν* ἐγγύτερον καὶ ἀθροώτερον γίνηται ἡ πῆξις, τά τε ὕδατα λαβρότερα γίνεται, καὶ αἱ ψακάδες, καὶ αἱ χάλαζαι μείζους, διὰ τὸ βραχὺν φέρεσθαι τόπον. καὶ οὐ πυκναὶ αἱ ψακάδες αἱ μεγάλαι πίπτουσι διὰ τὴν αὐτὴν αἰτίαν. ἧττον δὲ τοῦ θέρους γίνεται ἢ ἔαρος καὶ μετοπώρου, μᾶλλον μέντοι ἢ χειμῶνος, ὅτι ξηρότερος ὁ ἀὴρ τοῦ θέρους· ἐν δὲ τῷ ἔαρι, ἔτι ὑγρός· ἐν δὲ τῷ μετοπώρῳ ἤδη ὑγραίνεται. γίνονται δέ ποτε καθάπερ εἴρηται, καὶ τῆς ὀπώρας χάλαζαι, διὰ τὴν αὐτὴν αἰτίαν. συμβάλλεται δ' ἔτι πρὸς τὴν ταχυτῆτα τῆς πήξεως, τὸ προτεθερμάνθαι τὸ ὕδωρ· θᾶττον γὰρ ψύχεται. διὸ πολλοί, ὅταν τὸ ὕδωρ ψῦξαι ταχὺ βούλωνται, εἰς τὸν ἥλιον τιθέασι πρῶτον. καὶ οἱ περὶ τὸν Πόντον, ὅταν ἐπὶ τοῦ κρυστάλλου σκηνοποιῶνται πρὸς τὰς τῶν ἰχθύων θήρας (θηρεύουσι γὰρ διακόπτοντες τὸν κρύσταλλον) ὕδωρ θερμὸν περιχέουσι τοῖς καλάμοις, διὰ τὸ θᾶττον πήγνυσθαι· χρῶνται γὰρ τῷ κρυστάλλῳ ὥσπερ τῷ μολύβδῳ, ἵν' ἠρεμῶσιν οἱ κάλαμοι. θερμὸν δὲ γίνεται ταχὺ τὸ συνιστάμενον ὕδωρ ἔν τε χώραις καὶ ταῖς ὥραις ταῖς ἀλεειναῖς. γίνεται δὲ καὶ περὶ τὴν Ἀραβίαν καὶ περὶ τὴν Αἰθιοπίαν, τοῦ θέρους τὰ ὕδατα, καὶ οὐ τοῦ χειμῶνος, καὶ ταῦτα ῥαγδαῖα, καὶ τῆς αὐτῆς ἡμέρας πολλάκις, διὰ τὴν αὐτὴν αἰτίαν. ταχὺ γὰρ ψύχεται τῇ ἀντιπεριστάσει, ἣ γίνεται διὰ τὸ ἀλεεινὴν εἶναι τὴν χώραν ἰσχυρῶς. περὶ μὲν οὖν ὑετοῦ, καὶ δρόσου, καὶ νιφετοῦ, καὶ πάχνης, καὶ χαλάζης, διὰ τίνα αἰτίαν γίνεται, καὶ τίς ἡ φύσις αὐτῶν ἐστιν, εἰρήσθω τοσαῦτα.

* κ. παχὺ ὕ.
* κ. ὑποπέσῃ
* κ. ἐξωτέρω

ΚΕΦΑΛ. ιγ'.

Περὶ πνευμάτων, καὶ ποταμῶν, καὶ πηγῶν.

ΠΕρὶ δ' ἀνέμων καὶ πάντων πνευμάτων, ἔτι δὲ ποταμῶν καὶ θαλάττης, λέγωμεν, πρῶτον καὶ περὶ τούτων προδιαπορήσαντες πρὸς ἡμᾶς αὐτούς. ὥσπερ γὰρ καὶ περὶ ἄλλων, οὕτω καὶ περὶ τούτων, οὐθὲν παρειλήφαμεν λεγόμενον τοιοῦτον, ὃ μὴ κἂν ὁ τυχὼν εἴποι. εἰσὶ δέ τινες οἵ φασι τὸν καλούμενον ἀέρα, κινούμενον μὲν καὶ ῥέοντα, ἄνεμον εἶναι· συνιστάμενον δὲ τὸν αὐτὸν τοῦτον πάλιν, νέφος καὶ ὕδωρ, ὡς τῆς αὐτῆς φύσεως οὔσης ὕδατος καὶ πνεύματος, καὶ τὸν ἄνεμον εἶναι κίνησιν ἀέρος. διὸ καὶ τῶν σοφῶς βουλομένων λέγειν τινές, ἕνα φασὶν ἄνεμον πάντας τοὺς ἀνέμους,

ὅτι συμπέπτωκε καὶ τὸν ἀέρα τὸν κινούμενον ἕνα καὶ τὸν αὐτὸν * εἶναι πάντα. δοκεῖν δὲ διαφέρειν, οὐθὲν διαφέροντα διὰ τοὺς τόπους, ὅθεν ἂν τυγχάνῃ ῥέον ἑκάστοτε· παραπλησίως λέγοντες, ὥσπερ ἂν εἴ τις οἴοιτο καὶ τοὺς ποταμοὺς πάντας ἕνα εἶναι ποταμόν. διὸ βέλτιον οἱ πολλοὶ λέγουσιν ἄνευ ζητήσεως, τῶν μετὰ ζητήσεως οὕτω λεγόντων. εἰ μὲν γὰρ ἐκ μιᾶς ἀρχῆς ἅπαντες ῥέουσι, κἀκεῖ τὰ πνεύματα τὸν αὐτὸν τρόπον, τάχ' ἂν λέγοιεν ἄν τι οἱ λέγοντες οὕτως. εἰ δ' ὁμοίως ἐνταῦθα, κἀκεῖ, δῆλον ὅτι τὸ κομψευόμενον ἂν εἴη τοῦτο ψεῦδος. ἐπεὶ τοῦτό γε προσήκουσαν ἔχει σκέψιν, τί τ' ἐστὶν ὁ ἄνεμος, καὶ γίνεται πῶς, καὶ τί τὸ κινοῦν, καὶ ἡ ἀρχὴ αὐτῶν πόθεν· καὶ πότερον ἄρ' ὥσπερ ἐξ ἀγγείου δεῖ λαβεῖν ῥέοντα τὸν ἄνεμον, καὶ μέχρι τούτου ῥεῖν, ἕως ἂν κενωθῇ τὸ ἀγγεῖον, οἷον ἐξ ἀσκῶν ἀφιέμενον· ἢ καθάπερ καὶ οἱ γραφεῖς γράφουσιν, ἐξ αὐτῶν τὴν ἀρχὴν * ἀφίενται. ὁμοίως δὲ καὶ περὶ τῆς τῶν ποταμῶν γενέσεως δοκεῖ τισιν ἔχειν. τὸ γὰρ ἀναχθὲν ὑπὸ τοῦ ἡλίου ὕδωρ, πάλιν ὑόμενον ἀθροισθὲν ὑπὸ γῆν ῥεῖν ἐκ κοιλίας μεγάλης ἢ * πάντας ἐκ μιᾶς, ἢ ἄλλον ἄλλης· καὶ οὐ γίνεσθαι ὕδωρ οὐθὲν, ἀλλὰ τὸ συλλεχθὲν ἐκ τοῦ χειμῶνος εἰς τὰς τοιαύτας ὑποδοχὰς, τοῦτο γίνεσθαι τὸ πλῆθος τῶν ποταμῶν. διὸ καὶ μείζους ἀεὶ τοῦ χειμῶνος ῥεῖν ἢ τοῦ θέρους· καὶ τοὺς μὲν ἀενάους εἶναι, τοὺς δὲ οὐκ ἀενάους. ὅσων μὲν γὰρ διὰ τὸ μέγεθος τῆς κοιλίας πολὺ τὸ συλλεγόμενον ὕδωρ ἐστὶν, ὥστε διαρκεῖν καὶ μὴ προεξαναλίσκεσθαι πρὶν ἐπελθεῖν τὸ ὄμβριον ἐν τῷ χειμῶνι πάλιν, τούτους μὲν ἀενάους εἶναι διὰ τέλους· ὅσοις δ' ἐλάττους αἱ ὑποδοχαὶ, τούτους δὴ δι' ὀλιγότητα τοῦ ὕδατος φθάνειν ξηραινομένους, πρὶν ἐπελθεῖν τὸ ἐκ τοῦ οὐρανοῦ, κενουμένου τοῦ ἀγγείου. καίτοι φανερὸν εἴ τις βούλεται ποιήσας οἷον ὑποδοχὴν πρὸ ὀμμάτων τῷ καθ' ἡμέραν ὕδατι ῥέοντι συνεχῶς, νοῆσαι τὸ πλῆθος· ὑπερβάλλοι γὰρ ἂν τῷ μεγέθει τὸν τῆς γῆς ὄγκον, ἢ οὐ πολὺ ἂν ἐλλείποι τὸ δεχόμενον πᾶν τὸ ῥέον ὕδωρ εἰς τὸν ἐνιαυτόν. ἀλλὰ δῆλον ὅτι καὶ συμβαίνει πολλὰ τοιαῦτα πολλαχῇ τῆς γῆς. οὐ μὴν ἀλλ' ἄτοπον εἴ τις μὴ νομίζοι διὰ τὴν αὐτὴν αἰτίαν ὕδωρ ἐξ ἀέρος γίνεσθαι, δι' ἥνπερ ὑπὲρ γῆς, καὶ ἐν τῇ γῇ. ὥστ' εἴπερ κἀκεῖ διὰ ψυχρότητα συνίσταται ὁ ἀτμίζων ἀὴρ εἰς ὕδωρ, καὶ ὑπὸ τῆς ἐν τῇ γῇ ψυχρότητος τὸ αὐτὸ τοῦτο δεῖ νομίζειν συμβαίνειν, καὶ γίνεσθαι μὴ μόνον τὸ ἀποκεκριμένον ὕδωρ ἐν αὐτῇ, καὶ τοῦτο ῥεῖν, ἀλλὰ καὶ γίνεσθαι συνεχῶς. ἔτι δὲ τοῦ μὴ γινομένου, ἀλλ' ὑπαρχόντος ὕδατος καθ' ἡμέραν, μὴ τοιαύτην εἶναι τὴν ἀρχὴν τῶν ποταμῶν, οἷον ὑπὸ γῆν λίμνας τινὰς ἀποκεκριμένας, καθάπερ ἔνιοι λέγουσιν· ἀλλ' ὁμοίως ὥσπερ καὶ ἐν τῷ ὑπὲρ τῆς γῆς τόπῳ μικραὶ συνιστάμεναι ῥανίδες, καὶ πάλιν * αὗται ἑτέραις, τέλος μετὰ πλήθους καταβαίνει τὸ ὑόμενον ὕδωρ· οὕτω καὶ ἐν τῇ γῇ ἐκ μικρῶν συλλείβεσθαι τὸ πρῶτον, καὶ εἶναι οἷον * πιδώσης εἰς ἓν τῆς γῆς τὰς ἀρχὰς τῶν ποταμῶν. δηλοῖ δ' αὐτὸ τὸ ἔργον· οἱ γὰρ τὰς ὑδραγωγίας ποιοῦντες, ὑπονόμοις καὶ διώρυξι συνάγουσιν, ὥσπερ ἂν ἱδρούσης τῆς γῆς ἀπὸ τῶν ὑψηλῶν. διὸ καὶ τὰ ῥεύματα τῶν ποταμῶν ἐκ τῶν ὀρῶν φαίνεται ῥέοντα· καὶ πλεῖστοι καὶ μέγιστοι ποταμοὶ

* κ. εἶναι σ. διαφέρειν.
* κ. ἀφιέντας.
* κ. πάντα.
* γρ. αὗται.
* Vide Olympiodorum.

A aërem qui motum ſubeat, eundem atque vnum eſſe contingit. Sed cùm nullam ſubeat differentiam, videri tamen differre, propter loca vnde ſemper fluit: perinde dicentes, ac ſi quis omnia quoque flumina vnum eſſe flumen putet. Quocirca, plerique citra inquiſitionem meliùs dicunt, quàm qui diſquiſitione adhibita ad *hunc dicunt modum. Nam ſi tam amnes quàm flatus vniuerſi ab vno corriuarentur primordio, forſitan qui ita dicunt, quippiam dicerent. Sin verò hîc & ibi ſimiliter res habeat, lepidè quidem hoc dictum eſſe, non tamen verè perſpicuum exiſtit. Quandoquidem hoc congruam habet conſiderationem, nempe B quid ſit ventus, quo pacto naſcatur, quid ventum moueat, vndè ſit venti exordium, & vtrùm haud ſecus quàm è vaſe quodam effluere ventum accipere oporteat, idque tantiſper fieri dum vas ſit inanitum, quaſi ex vtre diſſilitet: an perinde vt ipſi quoque pictores ventos depingunt, ex ſeipſis flatus initium emittentes. De fluuiorum autem generatione haud diſſimilem quidam habent opinionem. Etenim aquam ſolaribus radiis leuatam in ſublime, cùm plurima rurſum aggregata congeſtáque fuerit in terræ viſceribus, tanquam ex aluo prægrādi erũpere, & aut fluuios omneis ex vna, aut alium ex alia ſcaturire, nec vllam gigni aquam, ſed quæ hybernis mēſibus in huiuſmodi conceptacula col- C lecta fuerit, hanc in amnium euadere multitudinem arbitrantur: & ob id putant maiores ſemper hyeme quàm æſtate profluere: & quoſdam perennes eſſe, quoſdam minimè. Quorum enim congeſta aqua ob conceptaculi magnitudinem adeò multa exiſtit vt ſufficiat, nec priùs abſumatur quàm tempore hyberno rurſum pluuia aqua ſuperueniat, abſque vlla intercapedine fluere dicunt. Contrà, qui minora habent conceptacula, hos ob aquæ paucitatem antè aſſiccari, euacuato nimirum vaſe, quàm cœleſtis ſuperueniat aqua. Atqui liquet, quòd ſi quis velit ficto antè conſpectum velvti ſuſceptaculo, quod per ſingulos dies fluentam conti- D nenter aquam capiat, aquæ multitudinem contemplari: tota quæ effluit in annum aqua recepta, magnitudine molem terræ exuperabit, aut certè parum deficiet. attamen complura eiuſmodi in pleriſque terræ partibus euenire conſtat. Verumenimvero abſurdum fuerit, ſi quis non putet, eandem ob cauſam ex aëre aquam etiam in terræ viſceribus naſci, ob quam ſupra terram fieri, aſſolet. Quare ſi hîc aër ad vaporis naturam accedens, ob frigus in aquam deſcendit: idem hoc ab ea quoque quæ in terra eſt frigiditate euenire ac fieri, & non ſolùm aquam eam quæ in illa ſequeſtrata ſit, fluere, ſed continuè fieri cenſeamus operæpretium eſt. Præterea, dato quòd aqua quotidie ortum non ſubeat, E ſed in ratione rerum ſit, haudquaquã tale eſſe fluuiorum exordium, nimirum ſtagna quædam ſub terra ſemota, vt quidam aiunt, oportet: ſed vt in eo quoque qui eſt ſupra terram loco, exiguæ aſpergines coagmentãtur, quæ rurſum aliis coëunt, & tandem copioſus imber decidit: ſic etiam in terra grãdiores guttas ex paruis factas ſtillare primùm, necnon fluuiorum principia eſſe quaſdam velvti ſcaturigines aquarum, quę in vnam aliquam terræ partem concurrant. quod experientia ipſa declarat. Nam qui aquæ ductus ſtruũt, ſcrobibus atque cuniculis aquam deducere, tanquam ab excelſis ſudãte terra, ſolent. Quocirca & amniũ fluxus, è mõtibus corriuari cernuntur: atq; plurimi & maximi amnes

è maximis defluunt montibus. Pari modo & montibus locíſque excelſis, vicini ſunt fontes plurimi: in planis verò latíſque campis, pauci admodum ſine fluuiis fiunt. Montana ſiquidem & edita loca, tanquam ſpongia quædam locis incumbentia humilibus, pauxillatim quidem, ſed multis ex partibus effundunt, ſtillántque aquam. Nam & magnam aquæ ex alto cadentis copiam intra ſe admittunt (quid enim intereſt, cõcauane ſit, & ſupina, an deuexa & prona montium circumferẽtia? vtroque enim pacto æqualem corporis molem amplectetur) & vaporem egredientem in ſublime frigefaciunt, rurſúmque in liquorem cogunt. Quocirca amnium maximi (ſicuti diximus) è maximis profluere montibus videntur. quod hiſce qui terræ ambitus contemplantur, perſpicuum exiſtit. Etenim vniuerſi quos non contingit dicentes eoſdem & ſpectatores fuiſſe, ex hiſce quæ à ſingulis percontando acceperunt, eos ad hunc deſcripſêre modum. In Aſia igitur, è monte Paropamiſo plurimi maximíque amnes defluere viſuntur. Cæterùm hic communi conſenſu omnium eorum maximus eſt, qui ad hybernum vertuntur orientem. Nam eo iam ſuperato, exterum mare cernitur: cuius finem qui citrà incolunt, haudquaquam habent perſpectum. Ex hoc itaque, inter cæteros amneis, Bactrus & Choaſpes & Araxes defluunt: à quo Tanais, quæ pars eius eſt, in Mæotim lacum corriuatur. Fluit etiam & Indus ex eo monte maximum ex omnibus fluminibus aquarum agmen euoluens. Ex Caucaſo verò, & plerique alij tam numero quàm mole exuperantes defluunt, & Phaſis. Caucaſus autem mons eſt, eorum qui ad æſtiuum ſolis exortum vergunt, multitudine pariter atque celſitudine maximus. Celſitudinis autem argumentum inde colligi poteſt. Nam, tum ab eo loco quem Bathea (hoc eſt, profunda) Ponti vocant, tum ab hiſce qui Mæotici lacus oſtium nauigio ſubeunt, cernitur. Præterea ſummæ eius partes noctu, mane inquam & veſperi, ad tertiam vſque partem radiis illuſtrantur ſolaribus. Multitudinis verò, quia cùm multas ſedes habeat, in quibus & populos multos inhabitare, & lacus magnos eſſe dicant, attamẽ eas omneis ad ſummum vſque cacumen cognitas eſſe aſſerunt. Porro ex Pyrenæo (hic autem mons eſt Celticæ regionis, æquinoctialem occaſum ſpectans) Iſter & Tarteſſus defluunt. hic, extra Herculis columnas, ille totam interfluens Europam in pontum effunditur Euxinum. Ex cęterorum autem amnium numero, plurimi ad ſeptentrionem è montibus Hercyniis profluunt, qui tam altitudine quàm multitudine maximi in hoc tractu habentur. Sub ipſo autem ſeptentrione vltra extremam Scythiam, montes Rhiphæi appellati, ſiti ſunt. de quorũ magnitudine fabuloſa admodum ſunt quæ feruntur. Plurimi igitur & cæterorum poſt Iſtrum fluuiorum maximi, inde (vt aiunt) effluunt. Simili autem modo in ipſa quoque Africa alij, Ægon atque Nyſes ex Æthiopum mõtibus defluunt: alij, qui inter celebratos maximi ſunt, amnis inquam Chremetes nomine, qui in exterum mare exoneratur, & Nili fluentum primum è monte cui Argenteo nomen eſt, ortum habent. Ex hiſce autem qui Græciam alluunt, Achelous è Pindo, vnde & Inachus, effluit. At Strymon, Neſtus, & Hebrus qui tres numero omnes ſunt, è Scombro ducunt originem. Multa item flumina ex Rhodope cooriuntur. atque ſimiliter cæteros quoque amneis fluere quiſpiam deprehendat;

A ῥέουσιν ἐκ τῶν μεγίστων ὀρῶν. ὁμοίως δὲ καὶ αἱ κρῆναι αἱ πλεῖσται ὄρεσι καὶ τόποις ὑψηλοῖς γειτνιῶσιν. ἐν δὲ τοῖς πεδίοις, ἄνευ ποταμῶν ὀλίγαι γίγνονται πάμπαν. οἱ γὰρ ὀρεινοὶ καὶ ὑψηλοὶ τόποι, οἷον σπόγγος πυκνὸς * ἐπικείμενος, κατὰ μικρὰ μὲν, πολλαχῇ δὲ διαπιδῶσι καὶ συλλείβουσι τὸ ὕδωρ· δέχονταί τε γὰρ τοῦ κατιόντος ὕδατος πολὺ πλῆθος· τί γὰρ διαφέρει κοίλην καὶ ὑπτίαν, ἢ ἀνεστραμμένην τὴν περιφέρειαν εἶναι καὶ κυρτήν; ἀμφοτέρως γὰρ τὸν ἴσον ὄγκον διὰ πυκνότητα περιλήψεται σώματος. καὶ τὴν ἀνιοῦσαν ἀτμίδα ψύχουσι, καὶ συγκρίνουσι πάλιν εἰς ὕδωρ. διόπερ καθάπερ εἴπομεν, οἱ μέγιστοι τῶν ποταμῶν B ἐκ τῶν μεγίστων φαίνονται ῥέοντες ὀρῶν. δῆλον δ' ἐστὶ τοῦτο θεωμένοις τὰς τῆς γῆς περιόδους· ταύτας γὰρ ἐκ τοῦ πυνθάνεσθαι παρ' ἑκάστων οὕτως ἀνέγραψαν, ὅσων μὴ συμβέβηκεν αὐτόπτας γενέσθαι τοῖς λέγουσι. ἐν μὲν οὖν τῇ Ἀσίᾳ πλεῖστοί τε ἐκ τοῦ * Παρνασοῦ καλουμένου φαίνονται ῥέοντες ὄρους καὶ μέγιστοι ποταμοί. τοῦτο δ' ὁμολογεῖται πάντων εἶναι μέγιστον ὄρος, τῶν πρὸς τὴν ἕω τὴν χειμερινήν· ὑπερβάντι γὰρ ἤδη τοῦτο φαίνεται ἡ ἔξω θάλαττα, ἧς τὸ πέρας οὐ δῆλον τοῖς ἐντεῦθεν. ἐκ μὲν οὖν τούτου ῥέουσιν ἄλλοι τε ποταμοὶ, καὶ ὁ Βάκτρος, καὶ ὁ Χοάσπης, καὶ ὁ Ἀράξης. τούτου C δ' ὁ Τάναϊς ἀποσχίζεται μέρος ὤν, εἰς τὴν Μαιῶτιν λίμνην. ῥεῖ δὲ καὶ ὁ Ἰνδὸς ἐξ αὐτοῦ, πάντων τῶν ποταμῶν ῥεῦμα πλεῖστον. ἐκ δὲ τοῦ Καυκάσου ῥέουσιν ἄλλοι τε πολλοὶ καὶ κατὰ πλῆθος, καὶ κατὰ μέγεθος ὑπερβάλλοντες, καὶ ὁ Φᾶσις. ὁ δὲ Καύκασος μέγιστον ὄρος τῶν πρὸς τὴν ἕω τὴν θερινήν ἐστι, καὶ πλήθει, καὶ ὕψει. σημεῖον δὲ, τοῦ μὲν ὕψους, ὅτι ὁρᾶται καὶ ἀπὸ τῶν καλουμένων Βαθέων, καὶ εἰς τὴν λίμνην εἰσπλεόντων. ἔτι δὲ ἡλιοῦται τῆς νυκτὸς αὐτοῦ τὰ ἄκρα μέχρι τοῦ τρίτου μέρους, ἀπό τε τῆς ἕω, καὶ πάλιν ἀπὸ τῆς ἑσπέρας· τοῦ δὲ πλήθους, ὅτι πολλὰς ἔχον ἕδρας, ἐν αἷς ἔθνη D τε κατοικεῖ πολλὰ, καὶ λίμνας εἶναί φασι μεγάλας· ἀλλ' ὅμως πάσας τὰς ἕδρας εἶναί φασι φανερὰς, μέχρι τῆς ἐσχάτης κορυφῆς. ἐκ δὲ τῆς Πυρήνης (τοῦτο δὲ ἐστιν ὄρος πρὸς δυσμὴν ἰσημερινὴν ἐν τῇ Κελτικῇ) ῥέουσιν ὅ, τε Ἴστρος καὶ ὁ Ταρτησσός. οὗτος μὲν οὖν, ἔξω στηλῶν· ὁ δὲ Ἴστρος, δι' ὅλης τῆς Εὐρώπης, εἰς τὸν Εὔξεινον πόντον. τῶν δ' ἄλλων ποταμῶν οἱ πλεῖστοι πρὸς ἄρκτον ἐκ τῶν ὀρῶν τῶν Ἀρκυνίων. ταῦτα δὲ καὶ πλήθει καὶ ὕψει μέγιστα περὶ τὸν τόπον τοῦτόν ἐστιν. ὑπ' αὐτὴν δὲ τὴν ἄρκτον ὑπὲρ τῆς ἐσχάτης Σκυθίας, αἱ καλούμεναι ῥῖπαι, περὶ ὧν τοῦ μεγέθους λίαν εἰσὶν οἱ λεγόμενοι λόγοι E μυθώδεις. ῥέουσι δ' οὖν οἱ πλεῖστοι καὶ μέγιστοι μετὰ τὸν Ἴστρον τῶν ἄλλων ποταμῶν, ἐντεῦθεν, ὥς φασιν. ὁμοίως δὲ καὶ περὶ τὴν Λιβύην, οἱ μὲν ἐκ τῶν Αἰθιοπικῶν ὀρῶν, ὅ, τε Αἰγὼν καὶ ὁ Νύσης· οἱ δὲ μέγιστοι τῶν ὀνομαζομένων, ὅ, τε Χρεμέτης καλούμενος, ὃς εἰς τὴν ἔξω ῥεῖ θάλατταν, καὶ τοῦ Νείλου τὸ ῥεῦμα τὸ πρῶτον, ἐκ τοῦ Ἀργυροῦ καλουμένου ὄρους· τῶν δὲ περὶ τὸν Ἑλληνικὸν τόπον, ὁ μὲν Ἀχελῷος ἐκ Πίνδου, καὶ ὁ Ἴναχος ἐντεῦθεν· ὁ δὲ Στρυμὼν καὶ * Νέσος, καὶ ὁ Ἕβρος, ἅπαντες τρεῖς ὄντες, ἐκ τοῦ Σκόμβρου· πολλὰ δὲ ῥεύματα καὶ ἐκ τῆς Ῥοδόπης ἐστίν. ὁμοίως δὲ καὶ τοὺς ἄλλους ποταμοὺς εὕροι τις ἂν ῥέοντας·

* γρ. ἐπικρεμάμενος.

* Voluit dicere Παροπαμισοῦ, vel Παρπαμισοῦ. nam eum montem quem intelligit, omnes ita vocant: & ita fortaſſe ſcripſerat Ariſtoteles. Quod autem interpretes quidam, aliique docti viri ex Dionyſio Periegeta proferunt de eodem monte κνημὶς ὑπὸ Παρνησοῖο, ſimili ratione fuiſſe deprauatum videtur, cùm antiqui codices & meliores Παροπαμισοῖο haberent, etiam Euſtath. teſte, vel Παρπανισοῖο, vt in alio eiuſdem verſu, Σατραΐδας θ', οἵ τε περὶ πτυχὶ Παρπανισοῖο.

* κ. ἰχ.

* γρ. Νέστος.

ἀλλὰ μαρτυρίας χάριν τούτους εἴπομεν. ἐπεὶ καὶ ὅσοι αὐτῶν ῥέουσιν ἐξ ἑλῶν, τὰ ἕλη ὑπ' ὄρη κεῖσθαι συμβαίνει πάντα σχεδὸν, ἢ τόπους ὑψηλοὺς ἐκ προσαγωγῆς. ὅτι μὲν οὖν οὐ δεῖ νομίζειν οὕτω γίνεσθαι τὰς ἀρχὰς τῶν ποταμῶν, ὡς ἐξ ἀφωρισμένων κοιλιῶν, φανερόν. οὔτε γὰρ ἂν ὁ τόπος ἱκανὸς ἦν ὁ τῆς γῆς, ὡς εἰπεῖν, ὥσπερ οὐδὲ ὁ τῶν νεφῶν· εἴπερ τὸ ὂν ἔδει ῥεῖν μόνον, ἀλλὰ μὴ τὸ μὲν ἀπῄει, τὸ δ' ἐγίνετο, ἀλλ' ἀεὶ ἀπὸ ὄντος ἐταμιεύετο. τό, τε ὑπὸ τοῖς ὄρεσιν ἔχειν τὰς πηγὰς μαρτυρεῖ, διότι τῷ συρρεῖν ἐπ' ὀλίγον καὶ κατὰ μικρὸν ἐκ πολλῶν νοτίδων διαδίδωσιν ὁ τόπος· καὶ γίνονται οὕτως αἱ πηγαὶ τῶν ποταμῶν. οὐ μὴν ἀλλὰ καὶ τοιούτους εἶναι τόπους ἔχοντας πλῆθος* ὕδατος, οἷον λίμνας, οὐδὲν ἄτοπον. πλὴν οὐ τηλικαύτας, ὥστε τοῦτο συμβαίνειν, οὐδὲν μᾶλλον, ἢ εἴ τις οἴοιτο τὰς φανερὰς εἶναι πηγὰς τῶν ποταμῶν. σχεδὸν γὰρ ἐκ κρηνῶν οἱ πλεῖστοι ῥέουσιν. ὅμοιον οὖν τὸ ἐκείνας, καὶ τὸ ταύτας νομίζειν εἶναι τὸ σῶμα τὸ τοῦ ὕδατος πᾶν. ὅτι δ' εἰσὶ τοιαῦται φάραγγες καὶ διαστάσεις τῆς γῆς, δηλοῦσιν οἱ καταπινόμενοι τῶν ποταμῶν. συμβαίνει δὲ τοῦτο πολλαχοῦ τῆς γῆς· οἷον τῆς μὲν Πελοποννήσου πλεῖστα τοιαῦτα περὶ τὴν Ἀρκαδίαν ἐστίν. αἴτιον δὲ, διὰ τὸ ὀρεινὴν οὖσαν μὴ ἔχειν ἐκροὰς ἐκ τῶν κοιλιῶν εἰς θάλατταν. πληρούμενοι γὰρ οἱ τόποι καὶ οὐκ ἔχοντες ἔκρυσιν, αὐτοὶ εὑρίσκονται τὴν δίοδον εἰς βάθος, ἀποβιαζομένου τοῦ ἄνωθεν ἐπιόντος ὕδατος. περὶ μὲν οὖν τὴν Ἑλλάδα μικρὰ τοιαῦτα παντελῶς ἐστι γινόμενα. ἀλλ' ἥ γε ὑπὸ τὸν Καύκασον λίμνη, ἣν καλοῦσιν οἱ ἐκεῖ θάλατταν [φανερά.] αὕτη γὰρ ποταμῶν πολλῶν καὶ μεγάλων εἰσβαλλόντων, οὐκ ἔχουσα ἔκρουν φανερὸν, ἐκδίδωσιν ὑπὸ γῆν κατὰ Κοραξοὺς, περὶ τὰ καλούμενα βαθέα τοῦ Πόντου. ταῦτα δ' ἐστὶν, ἄπειρόν τι τῆς θαλάττης βάθος· οὐδεὶς γοῦν πώποτε* καθεὶς ηὗρεν πέρας εὑρεῖν. ταύτῃ δὲ πόρρω τῆς γῆς σχεδὸν περὶ τριακόσια στάδια πότιμον ἀναδίδωσιν ὕδωρ ἐπὶ πολὺν τόπον· οὐ συνεχῶς δὲ, ἀλλὰ τριαχῇ. καὶ περὶ τὴν Λιγυστικὴν οὐκ ἐλάττων τοῦ Ῥοδανοῦ καταπίνεταί τις ποταμὸς, καὶ πάλιν ἀναδίδωσι κατ' ἄλλον τόπον· ὁ δὲ Ῥοδανὸς ποταμὸς ναυσιπέρατός ἐστι.

* λ. ἰδώτων,

* χ. μαθὼν

ΚΕΦΑΛ. ιδ'.

Διὰ τί οὐκ ἀεὶ οἱ αὐτοὶ τόποι τῆς γῆς οὔτ' ἔνυγροί εἰσι οὔτε ξηροὶ καὶ περὶ κατακλυσμῶν.

Οὐκ ἀεὶ δ' οἱ αὐτοὶ τόποι τῆς γῆς οὔτ' ἔνυγροί εἰσιν, οὔτε ξηροὶ, ἀλλὰ μεταβάλλουσι κατὰ τὰς τῶν ποταμῶν γενέσεις, καὶ τὰς ἀπολείψεις. διὸ καὶ τὰ περὶ τὴν ἤπειρον μεταβάλλει καὶ τὴν θάλατταν· καὶ οὐκ ἀεὶ τὰ μὲν γῆ, τὰ δὲ θάλαττα διατελεῖ πάντα τὸν χρόνον· ἀλλὰ γίνεται θάλαττα μὲν ὅπου χερσός· ἔνθα δὲ νῦν θάλαττα, πάλιν ἐνταῦθα γῆ. κατὰ μέντοι τινὰ τάξιν νομίζειν χρὴ ταῦτα γίνεσθαι καὶ περίοδον. ἀρχὴ δὲ τούτων καὶ αἴτιον, ὅτι καὶ τῆς γῆς τὰ ἐντὸς, ὥσπερ τὰ σώματα τὰ τῶν φυτῶν καὶ ζώων, ἀκμὴν ἔχει, καὶ γῆρας. πλὴν ἐκείνοις μὲν, οὐ κατὰ μέρος ταῦτα συμβαίνει πάσχειν, ἀλλ' ἅμα πᾶν ἀκμάζειν καὶ φθίνειν ἀναγκαῖον· τῇ δὲ γῇ τοῦτο γίνεται κατὰ μέρος, διὰ ψύξιν καὶ θερμότητα. ταῦτα μὲν οὖν αὔξεταί τε καὶ φθίνει διὰ τὸν ἥλιον καὶ τὴν περιφοράν.

A verùm teſtimonij gratia hoſce diximus. Quicunque enim amnes è paludibus fluere videntur, ex eiuſmodi profectò redduntur: quas ferè omneis ſub montibus, aut locis quæ molliter aſſurgunt, eſſe ſitas contingit. Quod igitur cenſendum non ſit, fluuiorum primordia haud ſecus quàm ex ſequeſtratis quibuſdam cauernis fieri, conſtat. Nec enim terræ locus, vt ita dixerim, ſufficeret: quemadmodum nec nubium, ſi eam duntaxat quæ eſt in ratione rerum, fluere oporteret: nec elaberetur vna quidem, & altera rurſum gigneretur, ſed ſemper ex ea quæ in rerum natura exiſtit *, promeretur. Item illud ad montium radices fonteis eſſe, teſtatur, locum B aquam propterea diſtributim reddere, quòd ea ad exiguum quid, ac paulatim ex multis confluat guttulis. Qua etiam ratione, amnium fontes effici conſueuere. Verumenimvero & talia eſſe loca ceu ſtagna, quæ aquarum multitudinem contineant, ſed non tanta vt illud accidere queat, haudquaquam magis fuerit abſurdum, quàm ſi quis fluuiorum fonteis manifeſtos eſſe putet. ferè enim è fontibus plurimi effluunt. Cenſere igitur ſtagna & itidem fontes, vniuerſum aquarum corpus eſſe, ſimile exiſtit. Quòd autem terra taleis habeat hiatus atque diſceſſiones, flumina ipſa quæ ſeſe condunt, declarant. quod quidem multis in locis terræ accidit, vt in Peloponneſo. plurima enim ſunt eiuſmodi circa C Arcadiam. Cauſa autem eſt. nam quia montoſa eſt, ex alueis in mare effluxum nullũ habet: oppleta nanque loca, & effluxum minimè habentia, amnibus tranſitum in imum inueniunt, vim afferente ea quæ ex alto aduenit aqua. In Græcia igitur parua admodum talia fiunt. At ſub monte Caucaſo ſtagnum exiſtit *, quod accolæ mare vocitant: id enim multis fluminibus, iiſque ingentibus receptis, manifeſtum non habens effluxum, terram ſubit: ac demum iuxta Coraxos circa vocata Bathea Ponti, acceptas euomit aquas. Hæc autem ſunt, immenſa quædam altitudo maris. nam nemo vnquam vadum demiſſo fune reperire quiuit. Hic itaque lon- D gè à continenti trecentis ferè ſtadiis, longo tractu, non tamen continuo, ſed tripartito, potulenta redditur aqua. Item amnis quidam haudquaquam Rhodano minor, in agro Liguſtico abſorbetur, rurſumque alio in loco emergit. Rhodanus autem fluuius eſt, qui non niſi nauigio tranſmitti poteſt.

CAPVT XIV.

De Cataclyſmis, & quare fluuiorum alij perennes, alij non.

POrro non ſemper eadẽ telluris loca vel aquoſa ſunt, vel arida ſed mutationem iuxta amnium ortum ac defectum ſubeunt. Et ideo quæ cõtinen- E ti vicina ſunt, & quæ mari, permutari ſolent. nec ſemper hæc, terra: illa, mare, omni permanent tempore, ſed vbi terra erat, illic mare naſcitur, & vbi nunc mare eſt, illic rurſum terra erit. ordine tamen quodam ac ambitu, fieri iſta exiſtimãdum eſt. Horum autem principium cauſaque exiſtit, quòd interiores quoque telluris partes, perinde atque animantium plantarúmque corpora, iuuentutem atque ſenectutem habeant. Verùm iſtis, hoc per partem ſubire nequaquam contingit, ſed ſimul totum iuueneſcat atque ſeneſcat neceſſe eſt. Terræ particulatim hoc idem, ob frigus atque calorem accidit. Hęc igitur accreſcere ſimul atq; decreſcere propter ſolis calorem conuerſionémque aſſolent.

Qua etiam de cauſa telluris quoque partes, vireis ſibi vendicant differentes. Proinde ad aliquod vſque tempus aquoſa permanere queunt, deinde aſſiccantur atque ſeneſcunt rurſum. Alia porro loca reuiuiſcunt, & ſecundùm partem aquoſa reddi ſolent. Sed cùm loca aridiora ſunt, fontes deleantur neceſſe eſt. quæ cùm accidũt, amnes primùm è magnis puſillos fieri, deinde tandem inareſcere oportet. Quinetiam cùm amnes aliò commigrant, & hinc quidem euaneſcunt, ſed aliis in locis pari magnitudine erumpunt, permutari mare neceſſariò accidit. Vbi enim mare fluuiorum auctu redundat, inibi cùm recedit, aridam committat neceſſarium exiſtit. contrà, vbi multis ſcatens fluxibus aſſiccatur, inibi rurſum, cùm accedit, ſtagnare. At quia omnis quæ circa terram fit generatio, non niſi ſucceſſione & tempore reſpectu vitæ noſtræ oppidoquam longo fieri ſolet, iſta nobis haudquaquam aduertentibus fiunt. Atque priùs gentes vniuerſę intereunt, pereúntque, quàm horum mutatio ab initio ad finem vſque memoria teneri queat. Maximas itaque celerrimáſque clades prælia aduehunt: alias, morbi: nonnullas, ſterilitates: & hæ quaſdam ſtatim magnas, quaſdam lentas adeò, vt talium quoque gentium tranſmigrationes nos lateant. propterea quòd alij regionem deſerunt: alij eò vſque ſuſtinent, quoad nullam ampliùs multitudinem alere regio queat. Inter primam igitur nouiſſimámque loci derelictionem, tempora interueniant adeò longa [illegible] eſt, vt nemo meminiſſe poſſit: immò incolumibus etiamnum hiſce qui remanſerint, longi temporis iniuria obliuio irrepſerit. Eodem autem modo latere quoque exiſtimandum eſt, quando primùm ſinguli populi quæ permutata eſſent, & arida è paluſtribus aquoſiſque facta, inhabitare cœperint. Hic enim incrementum paulatim multo in tempore fieri aſſolet, ita vt memoriam diffugiat, quinam primùm, quo tempore, & qualiter habentibus locis venerint. ſicvt & circa Ægyptum accidit. Etenim locus iſte totáque regio, quæ fluminis tantùm inuectu nata eſt, ſemper aridior effici videtur. At propterea quòd paulatim areſcentibus paludibus vicina loca incoli cœpere, temporis longitudo initium obliterauit. Omnia igitur Nili oſtia, præter vnum Canobicum, manu inſtituta, non ab amne facta videntur. Quinetiam antiquitus tota Ægyptus vrbe, quam Thebas vocant, conſtabat. id quod & Homerus declarat, qui non adeò multo (vt ita dixerim) poſt eiuſmodi mutationes floruit. Nam loci illius mentionem facit, tanquam necdum aut omnino, aut certè tanta exiſtente Memphi. Par eſt autem, id ad hunc contingere modum. Siquidem humilia loca mortales poſteriùs incolere cœperũt, quàm edita. Nam ea loca quæ cœno, quod amnis ſubinde conuehit, viciniora ſunt, diutiùs paluſtria ſint neceſſe eſt: propterea quòd ſemper extrema pleniùs allui ſolet. at id mutatur, atque rurſum in melius euadit. Nam quæ inareſcunt loca, ad bene habendum properant. At quæ priùs erant bene temperata, ſi inſuper aſſiccentur, tum deteriora fiunt. id quod Græciæ, & circa Argiuorum & Mycenæorum regionem vſu euenit. Etenim Troianis temporibus, Argiuorum regio, quòd paluſtris eſſet, pauculos alere poterat: contrà Mycenæorum ager pulchre habebat, ideóque honoratior habebatur. nunc autem è diuerſo, ob quam diximus cauſam. Nam hæc ſterilis facta eſt, atque admodum inaruit: illius quæ tunc erant ſterilia, quòd aquis eſſent obruta,

A διὰ δὲ ταῦτα, καὶ τὴν δύναμιν τὰ μέρη τῆς γῆς λαμβάνει διαφέρουσαν· ὥστε μέχρι τινὸς ἔνυδρα δύναται διαμένειν· εἶτα ξηραίνεται, καὶ γηράσκει πάλιν· ἕτεροι δὲ τόποι βιώσκονται, καὶ ἔνυδροι γίγνονται κατὰ μέρος. ἀνάγκη δὲ τῶν μὲν τόπων γιγνομένων ξηροτέρων, τὰς πηγὰς ἀφανίζεσθαι· τούτων δὲ συμβαινόντων, τοὺς ποταμοὺς πρῶτον μὲν ἐκ μεγάλων μικροὺς, εἶτα τέλος γίγνεσθαι ξηρούς. τῶν δὲ ποταμῶν μεθισταμένων, καὶ ἔνθεν μὲν ἀφανιζομένων, ἐν ἄλλοις δ' ἀνάλογον γιγνομένων, μεταβάλλειν τὴν θάλατταν. ὅπου μὲν γὰρ ἐξωθουμένη ὑπὸ τῶν ποταμῶν ἐπλεόναζεν ἀπιοῦσα, ξηρὰν ποιεῖν ἀναγκαῖον· ὅπου δὲ τοῖς ῥεύμασι πλη-
B θύνουσα, ἐξηραίνετο προσχουμένη, πάλιν ἐνταῦθα λιμνάζειν. ἀλλὰ διὰ τὸ γίγνεσθαι πᾶσαν τὴν φυσικὴν τὴν περὶ τὴν γῆν γένεσιν, ἐκ προσαγωγῆς καὶ ἐν χρόνοις παμμήκεσι πρὸς τὴν ἡμετέραν ζωὴν, λανθάνει ταῦτα γιγνόμενα. καὶ πρότερον ὅλων τῶν ἐθνῶν ἀπώλειαι γίγνονται καὶ φθοραὶ, πρὶν μνημονευθῆναι τὴν τούτων μεταβολὴν ἐξ ἀρχῆς εἰς τέλος. μέγισται μὲν οὖν φθοραὶ γίγνονται καὶ τάχισται ἐν τοῖς πολέμοις, ἄλλαι δὲ, νόσοις, αἱ δ', ἀφορίαις· καὶ τούταις αἱ μὲν μεγάλαι, αἱ δὲ κατὰ μικρόν. ὥστε λανθάνουσι τῶν γε τοιούτων ἐθνῶν καὶ αἱ μεταναστάσεις, διὰ τὸ τοὺς μὲν λείπειν τὰς χώρας, τοὺς δ' ὑπομένειν μέχρι τούτου, μέχρι περ ἂν
C μηκέτι δύνηται τρέφειν ἡ χώρα πλῆθος μηδέν. ἀπὸ τῆς πρώτης οὖν ἀπολείψεως εἰς * τὴν ἐσχάτην, εἰκὸς γίγνεσθαι χρόνους μακροὺς, ὥστε μηδένα μνημονεύειν· ἀλλὰ σωζομένων ἔτι τῶν ὑπομενόντων, ἐπιλελῆσθαι διὰ χρόνου πλῆθος. τὸν αὐτὸν δὲ τρόπον χρὴ νομίζειν καὶ τοὺς κατοικισμοὺς λανθάνειν πότε πρῶτον ἐγένοντο τοῖς ἔθνεσιν * ἑκάστοις εἰς τὰ μεταβάλλοντα καὶ γιγνόμενα ξηρὰ ἐξ ἑλωδῶν καὶ ἀνύδρων· καὶ γὰρ ἐνταῦθα κατὰ μικρὸν ἐν πολλῷ * γίγνεσθαι χρόνῳ ἡ ἐπίδοσις· ὥστε μὴ μνημονεύειν τίνες * πρῶτον, καὶ πότε, καὶ πῶς ἐχόντων ἦλθον τῶν τόπων. οἷον συμβέβηκε καὶ περὶ τὴν Αἴγυπτον· καὶ γὰρ οὗτος ἀεὶ ξηρότερος ὁ τόπος φαίνεται γιγνόμενος,
D καὶ πᾶσα ἡ χώρα τοῦ ποταμοῦ πρόσχωσις οὖσα τοῦ Νείλου· διὰ δὲ τὸ κατὰ μικρὸν ξηραινομένων τῶν ἑλῶν, τοὺς πλησίον εἰσοικίζεσθαι, τὸ τοῦ χρόνου μῆκος ἀφῄρηται τὴν ἀρχήν. φαίνεται δ' οὖν καὶ τὰ στόματα πάντα, πλὴν ἑνὸς τοῦ Κανωβικοῦ, χειροποίητα, καὶ οὐ τοῦ ποταμοῦ ὄντα. καὶ τὸ ἀρχαῖον ἡ Αἴγυπτος, Θῆβαι καλούμεναι. δηλοῖ δὲ καὶ Ὅμηρος, οὕτω πρόσφατος ὢν, ὡς εἰπεῖν, πρὸς τὰς τοιαύτας μεταβολάς· ἐκείνου γὰρ τοῦ τόπου ποιεῖται μνείαν, ὡς οὔπω Μέμφιδος οὔσης, ἢ ὅλως, ἢ οὐ τηλικαύτης. τοῦτο δ' εἰκὸς οὕτω συμβαίνειν. οἱ γὰρ κάτωθεν τόποι τῶν ἄνωθεν ὕστεροι ᾠκίσθησαν. ἑλωδεῖς γὰρ ἐπὶ πλείονα χρόνον ἀναγκαῖον εἶναι τοὺς ἐγγύτερον τῆς προσχώσεως,
E διὰ τὸ λιμνάζειν ἐν τοῖς ἐσχάτοις ἀεὶ μᾶλλον. μεταβάλλει δὲ τοῦτο, καὶ πάλιν εὐθηνεῖ. ξηραινόμενοι γὰρ οἱ τόποι ἔρχονται εἰς τὸ καλῶς ἔχειν· οἱ δὲ πρότερον εὐκρατεῖς, ὑπερξηραινόμενοι ποτὲ γίνονται χείρους. ὅπερ συμβέβηκε τῇ Ἑλλάδι, καὶ περὶ τὴν Ἀργείων καὶ Μυκηναίων χώραν. ἐπὶ μὲν γὰρ τῶν Τρωϊκῶν, ἡ μὲν Ἀργεία, διὰ τὸ ἑλώδης εἶναι, ὀλίγους ἠδύνατο τρέφειν· ἡ δὲ Μυκηναία, καλῶς εἶχε· διὸ ἐντιμοτέρα ἦν. νῦν δὲ τοὐναντίον διὰ τὴν * εἰρημένην αἰτίαν. ἡ μὲν γὰρ ἀργὴ γέγονε καὶ ξηρὰ πάμπαν· τῆς δὲ, τὰ τότε διὰ τὸ λιμνάζειν ἀργὰ,

* γρ. τὴν νῦν
* γρ. ἑκάστοις, ἀπὸ μετ.
* γρ. γίγνεται
* γρ. πρῶτοι
* γρ. προειρημένην

νῦν χρήσιμα γέγονεν. ὥσπερ οὖν ἐπὶ τούτου τοῦ τόπου συμβέβηκεν ὄντος μικροῦ, ταὐτὸ δεῖ νομίζειν τοῦτο συμβαίνειν καὶ περὶ μεγάλους τόπους καὶ χώρας ὅλας. οἱ μὲν οὖν βλέποντες ἐπὶ μικρὸν, αἰτίαν οἴονται τῶν τοιούτων παθημάτων εἶναι τὴν τοῦ ὅλου μεταβολήν, ὡς γινομένου τοῦ οὐρανοῦ. διὸ καὶ τὴν θάλατταν ἐλάττω γίγνεσθαί φασιν ὡς ξηραινομένην, ὅτι πλείους φαίνονται τόποι τοῦτο πεπονθότες νῦν ἢ πρότερον. ἔστι δὲ τούτων τὸ μὲν ἀληθές, τὸ δ' οὐκ ἀληθές. πλείους μὲν γάρ εἰσιν οἱ πρότερον ἔνυδροι, νῦν δὲ χερσεύοντες· οὐ μὴν ἀλλὰ, τοὐναντίον· πολλαχῇ γὰρ σκοποῦντες * εὑρήσουσιν ἐπεληλυθυῖαν τὴν θάλατταν. ἀλλὰ τούτου τὴν αἰτίαν, οὐ τὴν τοῦ κόσμου γένεσιν οἴεσθαι χρή· γελοῖον γὰρ διὰ μικρὰς καὶ ἀκαριαίας μεταβολὰς κινεῖν τὸ πᾶν. ὁ δὲ τῆς γῆς ὄγκος καὶ τὸ μέγεθος, οὐθέν ἐστι δήπου πρὸς τὸν ὅλον οὐρανόν· ἀλλὰ πάντων τούτων αἴτιον ὑποληπτέον, ὅτι γίγνεται διὰ χρόνων εἱμαρμένων, ὥσπερ ἐν ταῖς κατ' ἐνιαυτὸν ὥραις χειμών, οὕτω περιόδου τινὸς μεγάλης μέγας χειμὼν καὶ ὑπερβολὴ ὄμβρων. αὕτη δ' οὐκ ἀεὶ κατὰ τοὺς αὐτοὺς τόπους, ἀλλ' ὥσπερ ὁ καλούμενος ἐπὶ Δευκαλίωνος κατακλυσμός· καὶ γὰρ οὗτος περὶ τὸν Ἑλληνικὸν ἐγένετο μάλιστα τόπον, καὶ τούτου περὶ τὴν Ἑλλάδα τὴν ἀρχαίαν. αὕτη δ' ἐστὶν ἡ περὶ τὴν Δωδώνην καὶ τὸν Ἀχελῷον· οὗτος γὰρ πολλαχοῦ τὸ ῥεῦμα μεταβέβληκεν· ᾤκουν γὰρ οἱ Σελλοὶ ἐνταῦθα, καὶ οἱ καλούμενοι τότε μὲν Γραικοί, νῦν δὲ Ἕλληνες. ὅταν οὖν γένηται τοιαύτη ὑπερβολὴ ὄμβρων, νομίζειν χρὴ ἐπὶ πολὺν χρόνον διαρκεῖν, καὶ ὥσπερ νῦν τοῦ τοὺς μὲν ἀενάους εἶναι τῶν ποταμῶν, τοὺς δὲ μή, οἱ μὲν φασιν αἴτιον εἶναι τὸ μέγεθος τῶν ὑπὸ γῆν χασμάτων· ἡμεῖς δὲ, τὸ μέγεθος τῶν ὑψηλῶν τόπων καὶ τὴν πυκνότητα καὶ ψυχρότητα αὐτῶν· οὗτοι γὰρ πλεῖστον καὶ δέχονται ὕδωρ, καὶ στέγουσι, καὶ ποιοῦσιν. ὅσοις δὲ μικραὶ ἐπικρεμάμεναι συστάσεις τῶν ὀρῶν, ἢ σομφαὶ καὶ λιθώδεις καὶ ἀργιλώδεις, τούτοις δὴ προαπολείπειν· οὕτως οἴεσθαι * δεῖ τότε, ἐν οἷς ἂν γένηται ἡ τοιαύτη τοῦ ὑγροῦ φορά, οἷον ἀενάους ποιεῖν τὰς ὑγρότητας τῶν τόπων μᾶλλον. τῷ δὲ χρόνῳ ταῦτα ξηρὰ φαίνεται γιγνόμενα μᾶλλον, θάτερα δ' ἐλάττω * τὰ ἔνυδρα, ἕως ἂν ἔλθῃ πάλιν ἡ καταβολὴ τῆς περιόδου τῆς αὐτῆς. ἐπεὶ δ' ἀνάγκη τοῦ ὅλου γίγνεσθαι μέν τινα μεταβολήν, μὴ μέντοι γένεσιν καὶ φθοράν, εἴπερ μένει τὸ πᾶν, ἀνάγκη καθάπερ ἡμεῖς λέγομεν, μὴ τοὺς αὐτοὺς ἀεὶ τόπους ὑγρούς τ' εἶναι θαλάττῃ καὶ ποταμοῖς, καὶ ξηρούς. δηλοῖ δὲ τὸ γιγνόμενον· οὓς γάρ φαμεν ἀρχαιοτάτους εἶναι τῶν ἀνθρώπων Αἰγυπτίους, τούτων ἡ χώρα πᾶσα γεγονυῖα φαίνεται καὶ οὖσα τοῦ ποταμοῦ ἔργον. καὶ τοῦτο κατά τε τὴν χώραν αὐτὴν ὁρῶντι δῆλόν ἐστι, καὶ τὰ περὶ τὴν Ἐρυθρὰν θάλατταν, τεκμήριον ἱκανόν. ταύτην γὰρ τῶν βασιλέων τις ἐπειράθη διορύττειν· οὐ γὰρ μικρὰς εἶχεν αὐτοῖς ὠφελείας πλωτὸς ἅπας ὁ τόπος γενόμενος. λέγεται δὲ πρῶτος Σέσωστρις * ἐπιχειρῆσαι τῶν παλαιῶν· ἀλλ' εὗρεν ὑψηλοτέραν οὖσαν τὴν θάλατταν τῆς γῆς. διὸ ἐκεῖνός τε πρότερον, καὶ Δαρεῖος ὕστερον ἐπαύσατο διορύττων, ὅπως μὴ διαφθαρῇ τὸ ῥεῦμα τοῦ ποταμοῦ, συμμιγείσης τῆς θαλάττης. φανερὸν οὖν ὅτι θάλαττα μία ταῦτα πάντα συνεχὴς ἦν. διὸ καὶ τὰ περὶ τὴν Λιβύην τὴν Ἀμμωνίαν χώραν,

* χ. εὑρήσομεν

* χ. δεῖν

* χ. πάνυδρα,

* χ. ἐγχειρῆσαι

A nunc fertilia ſunt effecta. Quod igitur in illo loco qui paruus eſt, accidit, hoc idem etiam circa loca magna, regionéſque integras, accidere cenſeamus oportet. Sed qui pauca reſpiciunt, vniuerſi mutationem, quaſi cœlum ortum ſit, cauſam eſſe eiuſmodi affectuum arbitrantur. Quocirca & mare ipſum minus fieri, quatenus ſiccetur, aiũt: quòd nunc plura loca quàm priùs, ita ſeſe habere cernantur. At hoc partim verum eſt, partim non verum. Multa enim ſunt, quæ priùs erant aquoſa, nunc autem cõtinenti addita ſunt. Sed & contra res agitur. Nam ſi conſiderare velint, mare terram multis in locis occupaſſe comperient. Attamen huiuſce rei cauſa, ad mundi generationem haudquaquam referẽda eſt. B Ridiculum enim foret, ob paruas, breuéſque mutationes, vniuerſum moueri aſſerere. Porro terræ moles atque magnitudo, ad totum cœlum nihil profectò exiſtit. Verùm horum omnium cauſam exiſtimemus oportet, quòd vt elapſis certis temporum ſpatiis, inter anni tempora hyems: ita magno quodam circuitu hyems magna, & imbrium exceſſus fieri ſoleat. At hic non ſemper eiſdem in locis efficitur, ſed perinde vt vocatum diluuium, quod tempore Deucalionis accidit. Etenim hoc circa Græciam maximè, & eam potiſſimùm partem quam antiquam Hellada vocitant, factum eſt. hæc autem ea regio eſt, quæ circa Dodonem & Acheloum exiC ſtit. hic ſiquidem multis in locis defluxum mutauit. Habitabant etenim inibi Stelli: & qui tunc appellabantur Græci, nunc autem Hellenes. Cùm igitur talis imbrium exuperantia acciderit, ad longum tempus ſufficere cenſeamus oportet. Item, quemadmodum amplitudinem cauernarum, quæ ſub terra ſunt, cauſam eſſe affirmant, cur amnium alij perennes ſint, alij haudquaquam: ita nos ipſi excelſorum locorum magnitudinem, eorúmque denſitatem atque frigus, eiuſce rei cauſam eſſe dicimus. hæc enim aquæ plurimum receptant, tegunt, gignunt. Quibuſcumque autem fluuiis incumbentes montium productiones puſillæ ſunt, D aut fungoſæ, aut lapidoſæ, aut argilloſæ, hoſce hoc pacto antè deficere putemus oportet, quàm eos in quos humoris delatio fiat eiuſmodi, vt magis queat reddere perennes locorum humiditates. hi enim progreſſu temporis aſſiccari magis videntur: alteri nempe qui aquis abundant, minùs, quouſque circuitus eiuſdem conſtitutio redeat. Cùm autem ſit neceſſe quandam eſſe mutationem vniuerſi, non tamen ortum ac interitum, ſiquidem ipſum permaneat, neceſſarium eſt (ſicuti ipſi dicimus) non ſemper loca eadem mari aut amnibus humectari, atque ſicceſcere. quod re ipſa quæ fieri aſſolet, liquidò conſtat. Tota namque Ægyptiorum regio, quos hominũ antiquiſſimos eſſe diE cimus, facta, ac amnis opus eſſe, videtur: idque regionem ipſam diſpicienti palam eſt. Item quæ Rubro mari contermina ſunt, id abundè indicant. Nam quidam è regibus ex eo nauigabilem alueum perducere in Nilum tentauit. is enim, per totum quod inter flumen & Rubrum mare intereſt, ductus, non parua ipſis commoda adferret. quod primus veterum Seſoſtris aggreſſus fuiſſe memoratur: ſed excelſius mare Rubrum comperit, quàm terram Ægypti. Quamobrem ille priùs, & mox Darius fodere deſiit: vt ne immiſſo mari corrumperetur aqua Nili. Patet igitur hæc omnia vnum mare continuum fuiſſe. Quocirca & Libya regio illuſtrata Ammonis oraculo,

humilior videtur atque depreſſior, quàm ſubſidentis loci ratio poſtulet. Perſpicuum enim eſt, quòd quia limum aut quippiam eiuſmodi aquarum vis intulit, ſtagna facta ſunt, & tellus arida: quódque inibi relicta ſtagnánſque aqua ſucceſſu temporis aſſiccata, iam prorſus euanuit. At verò & quæ ad Mæoticum lacum pertingunt, amnium connectu in tantum excreuere, vt naues multo minores nunc quàm anno ab hinc ſexageſimo, quæſtus gratia ingrediantur. Quare ex hoc ratiocinari promptum eſt, quòd vt à prima ſtatim origine pleríque lacus, ita & hic quoque amnium opus ſit, quódque tandem vt totus aſſiccetur ſit neceſſe. Præterea Boſphorus aſſiduè fluit, quòd ille limo oppleatur. Atque quonam pacto hæc contingant, ipſis quoque oculis adhuc contueri licet. Nam poſtea quàm fluxus citra Aſiam littus fecerat, quod ab eo ad Aſiam interueniebat, paruum initio ſtagnum efficiebatur, mox inareſcebat: poſtea verò littus aliud citra littus illud, & citra ſtagnum emergebat, idque ſemper ad hunc modum eueniebat ſimiliter. Hoc autem cùm ſæpenumero fiat, neceſſe fuerit vt procedente tempore tanquam flumen euadat, quod tandem etiam exiccabitur. Patet igitur, cùm tempus nunquam deficiat, & vniuerſum ſempiternum ſit: nec amnem Tanaim, nec Nilum ſemper fluxiſſe: ſed loca vnde profluunt, fuiſſe olim arida. nam eorum opus, terminum habet, tempus non habet. Id quod ſimiliter & de cæteris quoque fluminibus dicere congruet. At verò ſi amnes ortum habeant atque occaſum, nec ſemper eadem terræ loca ſcateant aquis, ipſum quoque mare ſimili modo mutari oportet. quod cùm aſſiduè alia deſerat, alia inuadat: patet, non ſemper vniuerſæ terræ tractus eoſdem, hos mare, illos continentem eſſe, ſed tempore cuncta permutari. Igitur cur eædem telluris partes nec aridæ ſemper, nec iidem nauigabiles exiſtant, & quam ob cauſam iſta vſu eueniant, ſimiliter & cur amnium quidam perennes ſint, quidam haudquaquam, dictum eſt.

A ταπεινοτέρα φαίνεται καὶ κοιλοτέρα [ἢ κατὰ] λόγον, τῆς κατωθεν χώρας. δῆλον γὰρ ὡς ἐξικμαζομένων τῶν γινομένων, ἐγένοντο λίμναι καὶ χέρσος. χρόνου δὲ γιγνομένου τὸ ἐναποληφθὲν καὶ λιμνάσαν ὕδωρ ξηραινόμενον, ἐστιν ἤδη φθειρόμενον. ἀλλὰ μὴν καὶ τὰ περὶ Μαιῶτιν λίμνην ἐπιδέδωκε τῇ προσχώσει τῶν ποταμῶν τοσοῦτον, ὥστε πολλῷ ἐλάττω τὰ μεγέθη πλοῖα νῦν* εἰσπλεῖν πρὸς τὴν ἐργασίαν ἢ ἔτος ἑξηκοστόν. ὥστ' ἐκ τούτου ῥᾴδιον ἀναλογίσασθαι, ὅτι καὶ τὸ πρῶτον, ὥσπερ αἱ πολλαὶ τῶν λιμνῶν, καὶ αὕτη ἔργον ἐστὶ τῶν ποταμῶν. καὶ τὸ τελευταῖον πᾶσαν ἀνάγκη γίνεσθαι ξηράν. ἔτι δ' ὁ Βόσπορος ἀεὶ μὲν ῥεῖ διὰ τὸ προσ- B χοῦσθαι· καὶ ἔστιν ἔτι ταῦτα καὶ τοῖς ὄμμασιν ἰδεῖν ὅν τινα συμβαίνει. ἐποίησε γὰρ ἀπὸ τῆς Ἀσίας ἠιόνα ποιήσειν ὁ ῥοῦς, τὸ ὄπισθεν λίμνη ἐγίγνετο, σμικρὰ τὸ πρῶτον, εἶτ' ἐξηράνθη· μετὰ δὲ ταῦτα ἄλλη ἀπὸ ταύτης ἠιών, καὶ λίμνη ἀπ' αὐτῆς· καὶ τοῦτο ἀεὶ οὕτω συνέβαινεν ὁμοίως. τούτου δὲ γιγνομένου πολλάκις, ἀνάγκη τοῦ χρόνου προϊόντος ὥσπερ ποταμὸν γίγνεσθαι· τέλος δὲ καὶ τοῦτον ξηρόν. φανερὸν τοίνυν,* ἐπεὶ ὁ, τε χρόνος οὐχ* ὑπολείπει, καὶ τὸ ὅλον ἀΐδιον, ὅτι οὔτε ὁ Τάναϊς ποταμὸς, οὔτε ὁ Νεῖλος ἀεὶ ἔρρει· ἀλλ' ἦν ποτε ξηρὸς ὁ τόπος ὅθεν ῥέουσι· τὸ γὰρ ἔργον ἔχει αὐτῶν πέρας, ὁ δὲ χρόνος οὐκ ἔχει. ὁμοίως δὲ τοῦτο καὶ ἐπὶ C τῶν ἄλλων ἁρμόσει ποταμῶν λέγειν. ἀλλὰ μὴν εἴπερ οἱ ποταμοὶ γίγνονται καὶ φθείρονται, καὶ μὴ ἀεὶ οἱ αὐτοὶ τόποι τῆς γῆς ἔνυδροι, καὶ τὴν θάλατταν ἀνάγκη μεταβάλλειν ὁμοίως. τῆς δὲ θαλάττης, τὰ μὲν ἀπολειπούσης, τὰ δ' ἐπιούσης ἀεὶ, φανερὸν ὅτι τῆς πάσης γῆς οὐκ ἀεὶ τὰ αὐτὰ, τὰ μέν ἐστι θάλαττα, τὰ δ' ἤπειρος· ἀλλὰ μεταβάλλει τῷ χρόνῳ πάντα. διότι μὲν οὖν οὐκ ἀεὶ ταὐτὰ οὔτε χερσοῦται τῆς γῆς, οὔτε πλωτά ἐστι, καὶ διὰ τίν' αἰτίαν ταῦτα συμβαίνει, εἴρηται· ὁμοίως δὲ καὶ διότι, οἱ μὲν ἀέναοι, οἱ δ' οὔ, τῶν ποταμῶν εἰσί.

γρ. ἀκμὴν

γρ. ἐπεὶ ὁ, τε χρ.
γρ. ὑπολείψει,

D

ARISTOTELIS STAGIRITÆ, METEOROLOGICORVM

LIBER II.

CAPVT I.

Antiquorum de maris generatione opinionibus.

DE mari autem, & quænam ſit eius natura, & quam ob cauſam tam ingens aquarum copia ſalſa ſit, atque etiam de prima eius generatione, dicendum. Igitur veteres, quique diuina tractant, mari fonteis tribuunt, vt tam maris quàm terræ primordia radicéſque habeant. Sic enim fortaſſe quod dicitur, magis tragicum eſſe atque venerandum arbitrati ſunt: quaſi pars hæc haud parua quædam portio ſit vniuerſi; atque totum reliquum cœlum, locum hunc ambire dicunt: & ob id eum honorabiliſſimum eſſe, rationémque principij ſubire putant. At qui humana ſapientia antecellunt, ij mare ortum eſſe ſtatuunt. Aiunt enim, totum eum locum, qui circùm vndique terræ innititur, principio humidum, mox feruore ſolis reſiccatum fuiſſe, quod in vaporem tranſit, flatus

ΑΡΙΣΤΟΤΕΛΟΥΣ ΜΕΤΕΩΡΟΛΟΓΙΚΩΝ ΤΩΝ ΕΙΣ Δ ΤΟ Β.

ΚΕΦΑΛ. α'.

Περὶ γενέσεως θαλάττης δόξαι διάφοροι· καὶ ὅτι πηγὰς οὐκ ἔχει· τί τε ἐστὶ αὐτῆς· καὶ διὰ τίν' αἰτίαν οὕτως φαίνεται ῥέουσα.

ΠΕΡΙ δὲ θαλάττης, καὶ τίς ἡ φύσις αὐτῆς, καὶ διὰ τίν' αἰτίαν ἁλμυρὸν τοσοῦτόν ἐστιν ὕδατος πλῆθος, ἔτι δὲ περὶ τῆς E ἐξ ἀρχῆς γενέσεως λέγωμεν. οἱ μὲν οὖν ἀρχαῖοι καὶ διατρίβοντες περὶ τὰς θεολογίας, ποιοῦσιν αὐτῆς πηγὰς, ἵνα αὐτῆς ὦσιν ἀρχαὶ καὶ ῥίζαι γῆς καὶ θαλάττης· τραγικώτερον γὰρ οὕτω καὶ σεμνότερον ὑπέλαβον ἴσως εἶναι τὸ λεγόμενον, ὡς μέγα τι τοῦ παντὸς τοῦτο μέρος ὄν· καὶ τὸν λοιπὸν οὐρανὸν ὅλον περὶ τοῦτον συνεστάναι τὸν τόπον· καὶ τούτου χάριν ὡς ὄντα τιμιώτατον καὶ ἀρχήν. οἱ δὲ σοφώτεροι τὴν ἀνθρωπίνην σοφίαν ποιοῦσιν αὐτῆς γένεσιν· εἶναι γὰρ τὸ πρῶτον ὑγρὸν ἅπαντα τὸν περὶ τὴν γῆν τόπον· ὑπὸ δὲ τοῦ ἡλίου ξηραινόμενον, τὸ μὲν διατμίσαν πνεύματα

καὶ τροπὰς ἡλίου καὶ σελήνης φασὶ ποιεῖν· τὸ δὲ λειφθὲν, τοῦτ' εἶναι θάλατταν· διὸ καὶ ἐλάττω γίνεσθαι ξηραινομένην οἴονται, καὶ τέλος ἔσεσθαί ποτε πᾶσαν ξηράν. ἔνιοι δ' αὐτὴν οἷον ἱδρῶτα θερμαινομένης φασὶν ὑπὸ τοῦ ἡλίου τῆς γῆς, γίγνεσθαι· διὸ καὶ ἁλμυρὰν εἶναι· καὶ γὰρ ὁ ἱδρὼς ἁλμυρός. οἱ δὲ τῆς ἁλμυρότητος αἰτίαν τὴν γῆν εἶναι φασί· καθάπερ γὰρ τὸ διὰ τῆς τέφρας ἠθούμενον ἁλμυρὸν γίνεται, τὸν αὐτὸν τρόπον καὶ ταύτην ἁλμυρὰν εἶναι, μιχθείσης αὐτῇ τοιαύτης γῆς. ὅτι μὲν οὖν πηγὰς τῆς θαλάττης ἀδύνατον εἶναι, διὰ τῶν ὑπαρχόντων ἤδη θεωρεῖν δεῖ. τῶν γὰρ περὶ τὴν γῆν ὑδάτων, τὰ μὲν ῥυτὰ τυγχάνει ὄντα, τὰ δὲ στάσιμα. τὰ μὲν οὖν ῥυτὰ πάντα πηγαῖα. περὶ δὲ τῶν πηγῶν εἰρήκαμεν πρότερον, ὅτι δεῖ νοεῖν οὐχ ὡς ἀπ' ἐξ ἀγγείου ταμιευόμενον τὴν ἀρχὴν εἶναι πηγὴν, ἀλλ' εἰς ἣν ἀεὶ γινόμενον καὶ συρρέον * ἀπάντων πρότερον. τῶν δὲ στασίμων, τὰ μὲν συλλογιμαῖα καὶ ὑποστάσεις, οἷον τὰ τελματιαῖα, καὶ ὅσα λιμνώδη, πλήθει καὶ ὀλιγότητι διαφέροντα· τὰ δὲ πηγαῖα· ταῦτα δὲ πάντα χειρόκμητα· λέγω δ' οἷον τὰ φρεατιαῖα καλούμενα· πάντων γὰρ ἀνωτέραν δεῖ τὴν πηγὴν εἶναι τῆς ῥύσεως. διὸ τὰ μὲν αὐτόματα ῥεῖ τὰ κρηναῖα καὶ ποτάμια, ταῦτα δὲ τέχνης προσδεῖται τῆς ἐργασομένης. αἱ μὲν οὖν διαφοραὶ τοιαῦται καὶ τοσαῦται τῶν ὑδάτων εἰσί. τούτων δ' οὕτω διωρισμένων, ἀδύνατον πηγὰς εἶναι τῆς θαλάττης· ἐν οὐδετέρῳ γὰρ τούτων οἷόν τ' εἶναι τῶν γενῶν αὐτήν· οὔτε γὰρ ἀπόρρυτός ἐστιν, οὔτε χειροποίητος. τὰ δὲ πηγαῖα πάντα, τούτων θάτερον πέπονθεν. αὐτόματον δὲ στάσιμον τοσοῦτον πλῆθος οὐθὲν ὁρῶμεν πηγαῖον γιγνόμενον. ἔτι δ' ἐπεὶ πλείους εἰσὶ θάλατται πρὸς ἀλλήλας οὐ συμμιγνύουσαι κατ' οὐδένα τόπον, ὧν ἡ μὲν Ἐρυθρὰ φαίνεται κατὰ μικρὸν κοινωνοῦσα πρὸς τὴν ἔξω στηλῶν θάλατταν· ἡ δ' Ὑρκανία καὶ Κασπία κεχωρισμέναι τε ταύτης καὶ περιοικούμεναι κύκλῳ· ὥστ' οὐκ ἂν ἐλάνθανον αἱ πηγαὶ, εἰ κατά τινα τόπον αὐτῶν ἦσαν. ῥέουσα δ' ἡ θάλαττα φαίνεται κατὰ τὰς στενότητας, εἴ που διὰ τὴν περιέχουσαν γῆν εἰς μικρὸν ἐκ μεγάλου συνάγεται πελάγους· διὰ τὸ ταλαντεύεσθαι δεῦρο κἀκεῖσε πολλάκις. τοῦτο δ' ἐν μὲν πολλῷ πλήθει θαλάττης ἄδηλον. εἰ δὲ διὰ τὴν στενότητα τῆς γῆς ὀλίγον ἐπέχει τόπον, ἀναγκαῖον τὴν ἐν τῷ πελάγει μικρὰν ταλάντωσιν, ἐκεῖ φαίνεσθαι μεγάλην. ἡ δ' ἐντὸς Ἡρακλείων στηλῶν ἅπασα κατὰ τὴν τῆς γῆς κοιλότητα ῥεῖ, καὶ τῶν ποταμῶν τὸ πλῆθος. ἡ μὲν γὰρ Μαιῶτις εἰς τὸν Πόντον ῥεῖ, οὗτος δ' εἰς τὸν Αἰγαῖον. πάντα δ' ἤδη τὰ τούτων ἔξω πελάγη ἧττον ποιεῖ τοῦτο ἐπιδήλως. ἐκείνοις δὲ διὰ τὸ τῶν ποταμῶν πλῆθος συμβαίνει τοῦτο· (πλείους γὰρ εἰς τὸν Εὔξεινον ῥέουσι ποταμοὶ καὶ τὴν Μαιῶτιν, ἢ τὴν πολλαπλασίαν χώραν αὐτῆς) καὶ διὰ τὴν βραχύτητα τοῦ βάθους· ἀεὶ γὰρ ἐκεῖ βαθυτέρα φαίνεται οὖσα ἡ θάλαττα· καὶ τῆς μὲν Μαιώτιδος ὁ Πόντος, τούτου δ' ὁ Αἰγαῖος, τοῦ δ' Αἰγαίου ὁ Σικελικός· ὁ δὲ Σαρδονικὸς καὶ ὁ Τυρρηνικὸς, βαθύτατοι πάντων. τὰ δ' ἔξω στηλῶν, βραχέα μὲν διὰ τὸν πηλὸν, ἄπνοα δ' ἐστίν, ὡς ἐν κοίλῳ τῆς θαλάττης οὔσης. ὥσπερ οὖν καὶ κατὰ μέρος ἐκ τῶν ὑψηλῶν οἱ ποταμοὶ φαίνονται ῥέοντες, οὕτω καὶ τῆς ὅλης γῆς ἐκ τῶν ὑψηλοτέρων τῶν πρὸς ἄρκτον, τὸ ῥεῦμα γίνεται τὸ πλεῖστον. ὥστε τὰ μὲν διὰ τὴν ἔκχυσιν, οὐ βαθέα· τὰ δ' ἔξω πελάγη, βαθέα μᾶλλον.

* κ. ἀπαντᾷ & πρῶτον.

A conuerſionéſque ſolis ac lunæ efficere: quod ſupereſt, eſſe mare. Vnde etiam fit, vt mare minus reddi aſſiccatione putent, tandémque fore vt aliquando prorſus inareſcat. Inter quos nõnulli mare eſſe velvti ſudationem terræ, quæ ſole recaleſcit, ſalsúmq; proinde haberi aiunt. etenim ſudor ſalſus eſt. Alij ſalſedinis cauſam terræ tribuunt. nam vt aqua per cinerem tranſmiſſa, ſalſa redditur: ſic etiam mare, propter terram eiuſmodi ſibi admiſtam, ſalſum eſſe volunt. Verùm fieri non poſſe vt fonteis mare habeat, iam per ea quæ vera ſunt, cõtemplemur oportet. Aquarum enim quæ circa terram ſunt, aliæ ſunt fluitantes, aliæ ſtagnantes. Fluitantes quidem omnes è fontibus dimanant, de quibus antea diximus, B intelligi oportere fontem eſſe principium, non à quo quaſi è vaſe quodam promatur aqua, ſed in quod primum quæ aſſiduè fit eodémque fluit, concurrere atque coagmentari ſoleat. Stagnãtium verò aliæ ſunt collectitiæ atque ſubſidentes, vt paluſtres & lacuſtres, quæ multitudinis ac paucitatis ratione inter ſe diſcrepant: aliæ fontanæ, quæ omnes manu productæ ſunt: verbi cauſa, quæ puteales nuncupantur. omnium enim fontem, quàm fluxum ſubliniorem eſſe conuenit. Ex quo fit vt quædam ſponte fluant, vt fontanæ & fluuiatiles: quædam artis auxilium deſiderent. Igitur aquarum differentiæ tot numero taléſque habentur. Quibus C ad hunc modum definitis, vt mare fonteis ſortiatur, fieri nequaquam poteſt. nam mare in horum generum altero eſſe nequit: quippe cùm nec effluidum ſit, nec manu factum. At fontanæ omnes alterum ex his ſubire conſueuerunt. Nec vllam tantam aquæ fontanæ copiam ſponte ſua ſtare videmus. Adhæc, cùm plura ſint maria, quæ nullo ipſa in loco inter ſe copulari ſiue permiſceri ſoleant (quorum Rubrum quidem cum eo quod extra Herculis columnas iacet, parum communicare videtur: Hyrcanum verò & Caſpium, & ab extero mari ſeiuncta eſſe, & circumquaque accolas habere) fontes profectò haud quaquam latere D poſſent, ſi quo in loco ea haberent. In anguſtiis autem fluere mare videtur, ſicubi ratione terræ ambientis in arctum ex amplo coeat, propterea quòd vltro citróque ſæpe libratur: quod in magna æquorum vaſtitate deprehendi non poteſt. At ſi anguſto meatu ſit, quia non longè refugiant terræ: quæ in vaſto parua eſt, illic magna cernatur aquæ libratio neceſſe eſt. Totum autem id mare, quod intra Herculis columnas concluditur, ſectando terræ cauitates atque amnium multitudinem, profluere ſolet. Nam Mæotis, in Pontum influit: Pontus, in Ægæum. cætera verò ab iſtis maria id minùs apertè faciunt. Hoc autem illis accidere ſolet, tum ob amnium multitudinẽ (amnes enim plures Pontum Euxinum atque Mæotin ſubire ſolent, quàm maris E interni tractum multo maiorem) tum ob altitudinis breuitatem. Nam mare vt incedit, ſemper altius eſſe cernitur. ſiquidem Pontus Mæotide altior exiſtit, Ponto Ægæum, Ægæo Siculum: omnium altiſſima, Tyrrhenum atque Sardoum. At æquora extera, vt breuia ſunt ob lutum, ita flatibus non ſollicitantur, quòd mare in cauo ſit. Igitur vt per partes telluris è locis excelſis amnes fluere cernuntur: ita etiam è totius terræ locis editioribus, quæ ad ſeptentriones vergunt, plurimum aquarum agmen cooriri aſſolet. Quamobrem & extera maria quædam minimè alta ſunt, quòd aliò ſuas refundant aquas: quædam altiuſcula habentur.

Quòd autem ea terræ portio, quæ ad ſeptentriones poſita eſt, excelſa ſit, indicio vel id eſſe poteſt, quòd non pauci ex hiſce qui olim ſublimium rerum ſtudioſi fuere, ſolem non ſubter terram ferri, ſed circa eandem atque locum iſtum crediderunt. diſparere autem atque noctem committere, quoniam terra ad vrſam excelſa ſit. Igitur quòd fieri nequeat, vt mare fonteis habeat, & quam ob cauſam ita fluere videatur, tot ac talia nobis dicta ſint.

CAPVT II.

De loco maris, & quare à fluminibus ipſum ingredientibus non reddatur maius.

DE generatione verò ipſius, num quando ortum ſubierit, atque ſapore, quænam cauſa ſit ſalſitudinis & amaritudinis, dicendum eſt. Cauſa quæ maiores noſtros compulit vt mare vniuerſæ aquæ corpus atque originem eſſe putarent, hæc eſt. Videbitur enim conſonum eſſe rationi, vt totius aquæ corpus quoddam ſit, a quo cùm detrahitur, abſcedit, & cæteris admiſcetur, perinde ac cæterorum quoque elementorum congeſta moles eſt, atque initium quod multitudine conſtat: vt ignis, in ſublimi: aëris, in loco ab igni ſecundo: terræ, in eo circa quem omnia iſthæc apertè ſita ſunt. Quare eadem quoque ratione, vt patet, de aqua quæramus neceſſe eſt. Tale autem corpus, nimirum quod perinde vt cæterorum quoque elementorum corpora, alicubi vniuerſum iaceat, præter mare, nullum eſſe videtur. amnium enim corpus neque totum alicubi ſitum eſt, neque ſtabile eſt, ſed quotidie ſemper fieri videtur. Ex hac itaque dubitatione mare tum humoris, tum aquę vniuerſæ principium eſſe viſum eſt. Quam ob cauſam & amneis ipſos quidam non modò in mare delabi, verùm etiam è mari fluere aſſerunt: ſalſam enim aquam cùm percolatur, potui idoneam reddi aiunt. Huic autem opinioni alia dubitatio aduerſatur: cur nam videlicet hæc aqua quæ conſiſtit, potulenta non eſt, ſed ſalſa, ſi ea totius aquæ origo ſit atque principium? Cauſa autem, pariter & huiuſce dubitationis ſolutio erit, & primam de mari exiſtimationem rectè accipi efficiet. Cùm enim aqua terram ambiat, perinde vt aquam aër, & aërem ignis (hic enim omnium vltimus tam aliorum, qui plurimi ſunt, quàm noſtra ſententia exiſtit) atque ſoliſto feratur modo, ob idque mutatio proueniat, & ortus ſimul atque interitus: quantum profectò aquæ leuiſſimum ſit dulciſſimúmque, aſſiduè eximi, in vaporem conuerti, & denique in altum ſeuocari videtur. quo in loco vbi frigoris beneficio conſtiterit, rurſum ad terram delabitur: quod ſemper eo modo, quo dictum iam eſt, natura ſolet efficere. Quibus fit vt etiam priores omnes ridendi ſint, quotquot ſolem humore ali exiſtimarunt. Ob quod nonnulli ſolem etiam conuerti aiunt, vtpote cui non ſemper eadem loca nutrimentum parare queant. id quod ſoli accidere, aut eum corrumpi, eſſe neceſſe volunt. nam ignem illum quem videmus, tamdiu ardere quamdiu habuerit alimentum dicunt, & ei alimentum humorem tantùm eſſe: quaſi humor ille qui ſubducitur, vſque ad ſolem pertingat, aut non ſecus atque flamma quæ fit, in ſublime feratur: à qua, ſumpta ſimilitudine, de ſole quoque ad hunc ſenſere modum. At id haudquaquam ſimile eſt.

περὶ δὲ τοῦ τὰ πρὸς ἄρκτον εἶναι τῆς γῆς ὑψηλά, σημεῖόν τι καὶ τὸ πολλοὺς πεισθῆναι τῶν ἀρχαίων μετεωρολόγων, τὸν ἥλιον μὴ φέρεσθαι ὑπὸ γῆν, ἀλλὰ περὶ τὴν γῆν καὶ τὸν τόπον τοῦτον· ἀφανίζεσθαι δὲ καὶ ποιεῖν νύκτα διὰ τὸ ὑψηλὴν εἶναι πρὸς ἄρκτον τὴν γῆν. ὅτι μὲν οὖν οὔτε πηγὰς οἷόν τ' εἶναι τῆς θαλάττης, καὶ διὰ τίν' αἰτίαν οὕτω φαίνεται ῥέουσα, τοιαῦτα καὶ τοσαῦθ' ἡμῖν εἰρήσθω.

ΚΕΦΑΛ. β.

Περὶ τοῦ ὕδατος καὶ τῆς θαλάττης τόπου, καὶ διότι τελευτὴ μᾶλλον ὕδατος ἢ ἀρχή ἐστιν ἡ θάλαττα. καὶ διὰ τί τοσούτων καὶ τηλικούτων ποταμῶν εἰσρεόντων οὐκ αὔξεται.

ΠΕρὶ δὲ τῆς γενέσεως αὐτῆς, εἰ γέγονε, καὶ τοῦ χυμοῦ τίς ἡ αἰτία τῆς ἁλμυρότητος καὶ πικρότητος, λεκτέον. ἡ μὲν οὖν αἰτία ἡ ποιήσασα τοὺς πρότερον οἴεσθαι τὴν θάλατταν ἀρχὴν εἶναι καὶ σῶμα τοῦ παντὸς ὕδατος, ἥδ' ἐστί· δόξειε γὰρ ἂν εὔλογον εἶναι, καθάπερ καὶ τῶν ἄλλων στοιχείων ἐστὶν ἠθροισμένος ὄγκος, καὶ ἀρχὴ διὰ τὸ πλῆθος, ὅθεν μεταβάλλει τε μεριζόμενον, καὶ μίγνυται τοῖς ἄλλοις, οἷον πυρὸς μὲν ἐν τοῖς ἄνω τόποις, ἀέρος δὲ πλῆθος, τὸ μετὰ τὸν τοῦ πυρὸς τόπον· γῆς δὲ σῶμα, περὶ ὃ ταῦτα πάντα κεῖται φανερῶς, ὥστε δῆλον ὅτι κατὰ τὸν αὐτὸν λόγον καὶ περὶ ὕδατος ἀνάγκη ζητεῖν. τοιοῦτον δ' οὐδὲν ἄλλο φαίνεται σῶμα κείμενον ἀθρόον, ὥσπερ καὶ τῶν ἄλλων στοιχείων, πλὴν τὸ τῆς θαλάττης μέγεθος. τὸ γὰρ τῶν ποταμῶν οὔτ' ἀθρόον, οὔτε στάσιμον, ἀλλ' ὡς γιγνόμενον ἀεὶ φαίνεται καθ' ἡμέραν. ἐκ ταύτης δὴ τῆς ἀπορίας καὶ ἀρχὴ τῶν ὑγρῶν ἔδοξεν εἶναι καὶ τοῦ παντὸς ὕδατος, ἡ θάλαττα. διὸ καὶ τοὺς ποταμοὺς οὐ μόνον εἰς ταύτην, ἀλλὰ καὶ ἐκ ταύτης φασί τινες ῥεῖν. διηθούμενον γὰρ γίγνεσθαι τὸ ἁλμυρὸν πότιμον. ἀντίκειται δ' ἑτέρα πρὸς ταύτην τὴν δόξαν ἀπορία, τί δή ποτ' οὐκ ἔστι τὸ συνεστὸς ὕδωρ τοῦτο πότιμον, εἴπερ ἀρχὴ τοῦ παντός ἐστιν ὕδατος, ἀλλ' ἁλμυρόν; τὸ δ' αἴτιον, ἅμα ταύτης τε τῆς ἀπορίας λύσις ἔσται, καὶ περὶ θαλάττης τὴν πρώτην ὑπόληψιν ἀναγκαῖον ὀρθῶς. τοῦ γὰρ ὕδατος περὶ τὴν γῆν περιτεταμένου, καθάπερ περὶ τοῦτο ἡ τοῦ ἀέρος σφαῖρα, καὶ περὶ ταύτην ἡ λεγομένη πυρός· τοῦτο γάρ ἐστι * πάντων ἔσχατον, εἴθ' ὡς οἱ πλεῖστοι λέγουσιν, εἴθ' ὡς ἡμεῖς. φερομένου δὲ τοῦ ἡλίου τοῦτον τὸν τρόπον, καὶ διὰ ταῦτα τῆς μεταβολῆς καὶ γενέσεώς τε καὶ φθορᾶς οὔσης, τὸ μὲν λεπτότατον καὶ γλυκύτατον ἀνάγεται καθ' ἑκάστην ἡμέραν, καὶ φέρεται διακρινόμενον καὶ ἀτμίζον εἰς τὸν ἄνω τόπον. ἐκεῖ δὲ πάλιν συστὰν διὰ τὴν ψύξιν, κάτω φέρεται πάλιν πρὸς τὴν γῆν. καὶ τοῦτ' ἀεὶ βούλεται ποιεῖν ἡ φύσις οὕτω, καθάπερ εἴρηται * πρότερον. διὸ καὶ γελοῖοι πάντες ὅσοι τῶν πρότερον ὑπέλαβον τὸν ἥλιον τρέφεσθαι τῷ ὑγρῷ. καὶ διὰ τοῦτ' ἔνιοί γε καὶ φασὶ ποιεῖσθαι τὰς τροπὰς αὐτόν. οὐ γὰρ ἀεὶ τοὺς αὐτοὺς δύνασθαι τόπους παρασκευάζειν αὐτῷ τὴν τροφήν. ἀναγκαῖον δ' εἶναι τοῦτο συμβαίνειν περὶ αὐτόν, ἢ φθείρεσθαι· καὶ γὰρ τὸ φανερὸν πῦρ, ἕως ἂν ἔχῃ τροφήν, μέχρι τούτου ζῆν, τὸ δ' ὑγρὸν τῷ πυρὶ τροφὴν εἶναι μόνον, ὥσπερ ἀφικνούμενον μέχρι πρὸς τὸν ἥλιον τὸ ἀναγόμενον τοῦ ὑγροῦ, ἢ τὴν ἄνοδον τοιαύτην οὖσαν, οἵαν περ τῇ γιγνομένῃ φλογί. δι' ἧς τὸ εἰκὸς λαβόντες, οὕτω καὶ περὶ τοῦ ἡλίου ὑπέλαβον. τὸ δ' οὐκ ἔστιν ὅμοιον.

* γρ. πάντως

* Lib. 1. cap. 9.

ἡ μὲν γὰρ φλὸξ, διὰ συνεχοῦς ὑγροῦ καὶ ξηροῦ μεταβαλλόντων γίνεται, καὶ οὐ τρέφεται· οὐ γὰρ ἡ αὐτὴ οὖσα διαμένει οὐδένα χρόνον, ὡς εἰπεῖν. περὶ δὲ τὸν ἥλιον ἀδύνατον τοῦτο συμβαίνειν· ἐπεὶ τρεφομένου γε τὸν αὐτὸν τρόπον, καθάπερ ἐκεῖνοί φασι, δῆλον ὅτι καὶ ὁ ἥλιος, οὐ μόνον καθάπερ ὁ Ἡράκλειτός φησι, νέος ἐφ' ἡμέρῃ ἐστὶν, ἀλλ' ἀεὶ νέος συνεχῶς. ἔτι δὴ, ἡ ὑπὸ τοῦ ἡλίου ἀναγωγὴ τοῦ ὑγροῦ, ὁμοία τοῖς θερμαινομένοις ὕδασίν ἐστιν ὑπὸ πυρός. εἰ οὖν μηδὲ τὸ ὑποκαιόμενον τρέφεται πῦρ, οὐδὲ τὸν ἥλιον εἰκὸς ἦν ὑπολαβεῖν, οὐδ' εἰ πᾶν θερμαίνων ἐξατμίσειε τὸ ὕδωρ. ἄτοπον δὲ καὶ τὸ μόνον φροντίσαι τοῦ ἡλίου, τῶν δ' ἄλλων ἄστρων παριδεῖν αὐτοὺς τὴν σωτηρίαν, τοσούτων καὶ τὸ πλῆθος καὶ τὸ μέγεθος ὄντων. τὸ δ' αὐτὸ συμβαίνει καὶ τούτοις ἄλογον, καὶ τοῖς φάσκουσι τὸ πρῶτον ὑγρᾶς οὔσης τῆς γῆς, καὶ τοῦ κόσμου τοῦ περὶ τὴν γῆν ὑπὸ τοῦ ἡλίου θερμαινομένου, ἀέρα γενέσθαι, καὶ τὸν ὅλον οὐρανὸν αὐξηθῆναι, καὶ τοῦτον πνεύματά τε παρέχεσθαι, καὶ τὰς τροπὰς αὐτοῦ ποιεῖν. φανερῶς γὰρ ἀεὶ τὸ ἀναχθὲν ὁρῶμεν καταβαῖνον πάλιν ὕδωρ· κἂν μὴ κατ' ἐνιαυτὸν ἀποδιδῷ, καὶ καθ' ἑκάστην ὁμοίως χώραν, ἀλλ' ἔν γε τισὶ τεταγμένοις χρόνοις ἀποδίδωσι πᾶν τὸ ληφθὲν, ὡς οὔτε τρεφομένων τῶν ἄνωθεν, οὔτε τοῦ μὲν μένοντος ἀέρος ἤδη μετὰ τὴν γένεσιν, τοῦ δὲ γιγνομένου καὶ φθειρομένου πάλιν εἰς ὕδωρ· ἀλλ' ὁμοίως ἅπαντος διαλυομένου καὶ συνισταμένου πάλιν εἰς ὕδωρ. τὸ μὲν οὖν πότιμον καὶ γλυκὺ, διὰ κουφότητα πᾶν ἀνάγεται. τὸ δ' ἁλμυρὸν ὑπομένει διὰ βάρος οὐκ ἐν τῷ αὐτοῦ οἰκείῳ τόπῳ· τοῦτο γὰρ οἰητέον ἀπορηθῆναί τε προσηκόντως (ἄλογον γὰρ εἰ μή τις ἐστὶ τόπος ὕδατος ὥσπερ τῶν ἄλλων στοιχείων) καὶ ταύτην εἶναι τὴν λύσιν· ὃν γὰρ ὁρῶμεν κατέχουσαν τόπον τὴν θάλατταν, οὗτος οὐκ ἔστι θαλάττης, ἀλλὰ μᾶλλον ὕδατος. φαίνεται δὲ θαλάττης, ὅτι τὸ μὲν ἁλμυρὸν ὑπομένει διὰ τὸ βάρος· τὸ δὲ γλυκὺ καὶ πότιμον ἀνάγεται διὰ τὴν κουφότητα, καθάπερ ἐν τοῖς τῶν ζώων σώμασι. καὶ γὰρ ἐν τούτοις τῆς τροφῆς εἰσελθούσης γλυκείας, ἡ τῆς ὑγρᾶς τροφῆς ὑπόστασις καὶ τὸ περίττωμα φαίνεται πικρὸν ὂν καὶ ἁλμυρόν· τὸ γὰρ γλυκὺ καὶ πότιμον ὑπὸ τῆς ἐμφύτου θερμότητος ἑλκυσθὲν εἰς τὰς σάρκας, καὶ τὴν ἄλλην* σύστασιν ἦλθε τῶν μερῶν, ὡς ἕκαστον πέφυκεν. ὥσπερ οὖν κἀκεῖ ἄτοπον, εἴ τις τῆς ποτίμου τροφῆς μὴ νομίζοι τόπον εἶναι τὴν κοιλίαν, ὅτι ταχέως ἀφανίζεται, ἀλλὰ τοῦ περιττώματος, ὅτι τοῦθ' ὁρᾷ ὑπομένον, οὐκ ἂν ὑπολαμβάνοι καλῶς. ὁμοίως δὲ καὶ ἐν τούτοις· ἔστι μὲν γὰρ ὥσπερ λέγομεν, οὗτος ὁ τόπος ὕδατος. διὸ καὶ οἱ ποταμοὶ ῥέουσιν εἰς αὐτὸν πάντες, καὶ πᾶν τὸ γιγνόμενον ὕδωρ· εἰς τε γὰρ τὸ κοιλότατον ἡ ῥύσις, καὶ ἡ θάλαττα τὸν τοιοῦτον ἐπέχει τόπον τῆς γῆς. ἀλλὰ τὸ μὲν ἀναφέρεται ταχὺ διὰ τὸν ἥλιον ἅπαν· τὸ δ' ὑπολείπεται διὰ τὴν εἰρημένην αἰτίαν. τὸ δὲ ζητεῖν τὴν ἀρχαίαν ἀπορίαν, διὰ τί τοσοῦτον πλῆθος ὕδατος οὐδαμοῦ φαίνεται· καθ' ἑκάστην γὰρ ἡμέραν ποταμῶν ῥεόντων ἀναριθμήτων καὶ τὸ μέγεθος ἀπλέτων, οὐδὲν ἡ θάλαττα γίνεται πλείων· τοῦτο ἤδη μὲν ἄτοπον ἀπορῆσαι τινὰς, οὐ μὴν ἐπιβλέψαντι γε χαλεπὸν ἰδεῖν· τὸ γὰρ αὐτὸ πλῆθος ὕδατος εἰς πλάτος τε διαταθὲν καὶ ἀθρόον, οὐκ ἐν ἴσῳ χρόνῳ ἀναξηραίνεται.

* κενώσαι ἐξ εἰσελθ. μερ.

A nam flamma per continuam humidi in ſiccum mutationem fieri, non ali ſolet. nullo enim (propè dixerim) tempore eadem manet. Hoc autem ſoli accidere non poteſt. quoniam ſi perinde nutriatur, vt illi aiunt, non ſolùm (vt patet) in dies, ſicvti Heraclitus aſſerit, ſed continuè ſemper nouus erit. Præterea ſubductio illa humoris quæ à ſole fit, aquis ignis opera incaleſcentibus perſimilis habetur. Si ergo ignis aquæ ſubditus, ea non nutriatur, nec ſolem aqua ali putare par eſt, etiamſi totam in vaporem calfaciendo verterit. Abſurdum quoque eſt, eos ſolis tantummodo curam habuiſſe: reliquorum autem ſiderum, quæ tot tantàque B numero ac magnitudine habentur, ſalutem neglexiſſe. Eodem autem à ratione aberrant hi atque illi, qui cùm ab initio terra eſſet humecta, incaleſcente à ſole ea mundi portione quæ circa terram eſt, aërem ortum eſſe, totúmque cœlum incrementa ſuſcepiſſe, atque nunc eundem flatus ſuppeditare, cœlique conuerſiones efficere dicunt. Semper enim aquam quæ ſuperna petierit, rurſum in terram delabi apertè cernimus: etiamſi nō quotannis & in quaque regione ſimiliter reddatur. Attamen ratis quibuſdam temporibus quicquid humoris diluti fuerit aſſumptum, reddi ſolet: quaſi corpora ſuperna minimè alantur, nec humoris pars altera aër iam inde à generatione permaneat, C altera rurſum in aquam euadat corrumpatúrque, ſed ſimiliter totus diſſoluatur, ac denuò in aquam conſiſtat. Igitur pars aquæ potu idonea dulciſque, tota ſurſum ob leuitatem trahitur: ſalſa præ pondere, vt ſuo in loco, ſubſidet. Id enim & decenter fuiſſe addubitatum (abſurdum enim fuerit, aquam perinde vt cætera elementa, locum non habere) & hanc eius eſſe ſolutionem, putare oportet. Quem enim occupare locum mare cernimus, is maris locus non eſt, ſed potiùs aquæ. videtur tamen locus eſſe maris: quia quod ſalſum eſt, ratione ponderis in imo manet: quod potulentum eſt atque dulce exiſtit, in ſublime propter ſuam leuitatem, ſcandere aſſolet. quo modo in D animantis corpore fieri nouimus. Nam tametſi cibus omnis, qui in animalis corpus ingeritur, dulcorem præferat, humiditatem ſubſidens excrementitiáque materia, amara ſalſáque deprehenditur. pars enim dulcis potúque idonea, quam natiuus calor ad ſe trahit, in carnes aliámque partium conſtitutionem pro cuiuſque natura tranſire & abſumi ſolet. Igitur vt in animantis corpore, ſi quis ventrem putet non eſſe humidi alimenti locum, quod citò euaneſcat: ſed excrementi, quoniam hoc remanere cernatur, haudquaquam probè exiſtimauerit: ſic & de ipſius aquæ loco dicendum eſt. hic enim, mea quidem ſententia, aquæ locus eſt. E Vnde fit vt amnes vniuerſi, & quicquid aquæ gignitur, eò influant. Nam & ad id quod cauiſſimum eſt, fluxio effici ſolet: & terræ locum eiuſmodi mare occupat. Verùm ipſius aquæ pars altera tota feruore ſolis attolli ſolet, altera relinqui ob eam quæ dicta iam eſt cauſam. Porro veterem illam quæſtionem mouiſſe, curnam videlicet tanta aquarum copia nuſquam compareat, cùm innumeri immenſique amnes quotidie in mare defluant, nec ipſum vllatenus accreſcat: quanquam metas non egreditur rationis, ſi quis tamen intendere velit, eiuſce rei cauſam facilè agnoſcet. Nam aquæ menſura eadem, longè latéque diffuſa collectáque, haudquaquam æquabili tempore reſiccatur:

quin-

quinimo hoc an illo diſponatur modo tantopere refert, vt hæc diem integram edurare queat, illa perinde ac ſi quis aquæ cyathum vnum ſuper menſam ingentem extenderit, tota interim dum eam contemplantur, euaneſcat. quod amnibus etiam accidere ſolet. Nam cùm aſſiduè amnes toti ac vniuerſi fluant, ſemper ea aquarum portio, quæ ad locum immenſum latiſſimúmque peruenit, citò nec apertè coareſcit. Quod autem de mari & amnibus ſcriptum in Phædone eſt, fieri non poteſt. Inquit enim Socrates, pleraſque cauitates eſſe quæ omnes ſub terra ſibi inuicem obuiant irrumpúntque: eſſe verò aquarum omnium fontem atque principium, vocatum Tartarum, quandam nimirum circa medium aquarum multitudinem, à quo tam profluentes quàm ſtabiles aquæ omnes emanant. In ſingulos autem amnium riuos influere, propterea quòd aſſiduè quod primum eſt atque principium, fluctuet. Nam nec fundamentum habere, nec firmamentum, ſed ſemper circa medium ſpiras agere, atque cùm mouetur ſurſum deorſúmque, in amnium riuos exundare atque influere. Nonnullas item pleriſque in locis ſtagnare, cuiuſmodi noſtrum etiam mare eſſe. Omnes autem ad principium, vnde fluere cœperint, in orbem relabi, multas quidem, per partem eandem, quaſdam verò per contrariam, quàm elapſæ fuerint: verbi cauſa, ſi ab ima fluere cœperint, in ſuperam illabi, eſſe verò ad medium vſque deſcenſum. vlteriorem enim prolapſum, omnibus fore aſcenſum. porro aquam ſapores coloréſque retinere, pro terrarum qualitate per quas fluxerit. Fit autem hac ratione, vt amnes non ad eundem ſemper locum fluant. Si enim ad medium confluant, à quo ſanè effluunt, non potiùs infernè quàm ſupernè fluent: ſed ad vtramlibet partem Tartarus fluctuans inclinarit. Atqui ſi hoc contingat, id quod aiunt, eueniet, ſurſum versùs incedere flumina: quod fieri nequit. Præterea vndenam erit aqua quæ ortum ſubit, quæque ruſus in altum rapitur? totam enim eam eximere neceſſe eſt, ſi ſemper idem aquarum modus ſeruetur. Quantum enim aquæ effluit, tantumdem ad principium relabitur. Atqui flumina omnia quotquot in alia non influunt, in mare deſinere viſuntur: in terram, nullum: ſed quanquam ſeſe condunt, tamen ruſum emergere ſolent. Amnium autem ij magni euadunt, qui per caua longo itinere labuntur: multos enim amneis quorum vias loco ac longitudine intercipiunt, recipere ſolent. Quam ob rem Iſter & Nilus, amnium qui in hoc mare exeunt, maximi habentur. Atque de amnium cuiuſque fontibus alias alij cauſas aſtruunt: quoniam in eundem multi immittunt. Itaque hæc omnia effici non poſſe, apertum eſt: præſertim cùm etiam inde originem mare habeat. Quòd igitur locus iſte aquæ, non maris locus ſit, item quam ob cauſam pars altera, nempe quæ potui idonea eſt, haudquaquam niſi cùm fluit, manifeſta ſit, altera remaneat: denique cur mare aquæ finis potiùs quàm principium exiſtat, perinde vt in corporibus excrementa, nutrimenti omnis & maximè humidi, finis ſunt, tot nobis dicta ſint.

A ἀλλὰ διαφέρει ποσόν τι, ὥστε τὸ μὲν διαμεῖναι ἂν ὅ-
λην τὴν ἡμέραν, τὸ δὲ ὥσπερ εἴ τις ἐπὶ τράπεζαν με-
γάλην περιτείνειεν ὕδατος κύαθον, ἅμα διανοουμένοις
ἂν ἀφανισθείη πᾶν. ὃ δὴ καὶ περὶ τοὺς ποταμοὺς συμβαί-
νει· συνεχῶς μὲν γὰρ ῥεόντων ἀθρόον ἀεὶ τὸ ἀφικνούμε-
νον εἰς ἀχανῆ καὶ πλατὺν τόπον, ἀναξηραίνεται ταχὺ καὶ
ἀδήλως. τὸ δ' ἐν τῷ Φαίδωνι γεγραμμένον περί τε τῶν
ποταμῶν καὶ τῆς θαλάττης, ἀδύνατόν ἐστι· λέγεται γάρ,
ὡς ἅπαντα μὲν εἰς ἄλληλα συντέτρηται ὑπὸ γῆν·
ἀρχὴ δὲ πάντων εἴη καὶ πηγὴ τῶν ὑδάτων, ὁ καλούμε-
νος Τάρταρος, περὶ τὸ μέσον ὕδατός τι πλῆθος, ἐξ οὗ
B καὶ τὰ ῥέοντα καὶ τὰ μὴ ῥέοντα ἀναδίδωσι πάντα· τὴν δ'
ἐπίρρυσιν ποιεῖν * ἐφ' ἕκαστον τῶν ῥευμάτων, διὰ τὸ σα- * γρ. ἐφ' ἕκαστα τῶν ὑδάτων,
λεύειν ἀεὶ τὸ πρῶτον καὶ τὴν ἀρχήν. οὐκ ἔχειν γὰρ ἕ-
δραν, ἀλλ' ἀεὶ περὶ τὸ μέσον εἱλεῖσθαι· κινούμενον δ'
[ἀεὶ] ἄνω καὶ κάτω, ποιεῖν τὴν ἐπίχυσιν τοῖς ῥεύμασι·
τὰ δὲ, πολλαχοῦ μὲν λιμνάζειν, οἵαν καὶ τὴν παρ' ἡμῖν
εἶναι θάλατταν. πάντα δὲ πάλιν κύκλῳ περιάγειν εἰς τὴν
ἀρχήν, ὅθεν * ἤρξατο ῥεῖν· πολλὰ μὲν καὶ κατὰ τὸν αὐτὸν * γρ. ἤρξαντο
τόπον, τὰ δὲ καὶ καταντικρὺ τῇ θέσει τῆς ἐκροῆς· οἷον εἰ
ῥεῖν ἤρξατο κάτωθεν, ἄνωθεν εἰσβάλλειν. εἶναι δὲ μέχρι
τοῦ μέσου τὴν κάθεσιν· τὸ γὰρ λοιπὸν πρὸς ἄναντες ἤδη
πᾶσιν εἶναι τὴν φοράν. τοὺς δὲ χυμοὺς καὶ τὰς χρόας ἴσχειν
C τὸ ὕδωρ, δι' οἵας ἂν τύχωσι ῥέοντα γῆς. συμβαίνει δὲ τοὺς
ποταμοὺς ῥεῖν οὐκ ἐπὶ ταὐτὸν ἀεὶ κατὰ τὸν λόγον τοῦτον· ἐ-
πεὶ γὰρ εἰς τὸ μέσον εἰσρέουσιν, ἀφ' οὗπερ ἐκρέουσιν, οὐ-
θὲν μᾶλλον * ῥεύσονται * κάτωθεν ἢ ἄνωθεν, ἀλλ' ἐφ' ὁ- * γρ. ῥευσοῦνται
πότερ' ἂν ῥέψῃ κυμαίνων ὁ Τάρταρος. καί τοι τούτου * γρ. ἄνωθεν ἢ κάτωθεν,
συμβαίνοντος, γίνοιτ' ἂν τὸ λεγόμενον * ἄνω ποταμῶν * Eurip. Med.
ὅπερ ἀδύνατον. ἔτι τὸ γινόμενον ὕδωρ καὶ τὸ πάλιν ἀνα-
γόμενον πόθεν ἔσται; τοῦτο γὰρ ἐξαιρεῖν ὅλον ἀναγκαῖον,
εἴπερ ἀεὶ σώζεται τὸ ἴσον· ὅσον γὰρ ἔξω ῥεῖ, πάλιν ῥεῖ
πρὸς τὴν ἀρχήν. καίτοι πάντες οἱ ποταμοὶ φαίνονται
τελευτῶντες εἰς τὴν θάλατταν, ὅσοι μὴ εἰς ἀλλήλους·
D εἰς δὲ τὴν γῆν οὐδείς· ἀλλὰ κἂν ἀφανισθῇ, πάλιν ἀνα-
δύνουσι· μεγάλοι δὲ γίγνονται τῶν ποταμῶν, οἱ μα-
κρὰν ῥέοντες διὰ κοίλης. πολλῶν γὰρ δέχονται ῥεύμα-
τα ποταμῶν, ὑποτεμνόμενοι τῷ τόπῳ καὶ τῷ μήκει
τὰς ὁδούς. διόπερ ὅ, τε Ἴστρος καὶ ὁ Νεῖλος μέγιστοι τῶν πο-
ταμῶν εἰσὶ τῶν εἰς τήνδε τὴν θάλατταν ἐξιόντων. καὶ
περὶ τῶν πηγῶν ἄλλοι λέγουσιν ἑκάστου τῶν ποταμῶν
ἄλλας αἰτίας, διὰ τὸ πολλοὺς εἰς τὸν αὐτὸν ἐμβάλ-
λειν. ταῦτα δὴ πάντα φανερὸν ὡς ἀδύνατόν ἐστι
συμβαίνειν, ἄλλως τε καὶ τῆς θαλάττης ἐκεῖθεν τὴν
ἀρχὴν ἐχούσης. ὅτι μὲν οὖν ὕδατός τε τόπος οὗτός
E ἐστι καὶ οὐ θαλάττης, καὶ διὰ τίν' αἰτίαν τὸ μὲν πό-
τιμον, ἄδηλον, πλὴν ῥέον, τὸ δ' * ὑπομένον· καὶ * γρ. ὑπομένον
διότι τελευτὴ μᾶλλον ὕδατος ἢ ἀρχή ἐστιν ἡ θάλατ-
τα, καθάπερ τὸ ἐν τοῖς σώμασι περίττωμα τῆς τρο-
φῆς πάσης, καὶ μάλιστα τὸ τῆς ὑγρᾶς, εἰρήσθω το-
σαῦτ' ἡμῖν.

A

ΚΕΦΑΛ. γ'.

Ἡ ἁλμυρότης τῆς θαλάττης πόθεν γίγνεται.

Περὶ δὲ τῆς ἁλμυρότητος αὐτῆς λεκτέον, καὶ πότερον ἀεί ἐστιν ἡ αὐτή, ἢ οὔτ' ἦν, οὔτ' ἔσται, ἀλλ' ὑπολείψει· καὶ γὰρ οὕτως οἴονταί τινες. τοῦτο μὲν οὖν ἐοίκασι πάντες ὁμολογεῖν, ὅτι γέγονεν, εἴπερ καὶ πᾶς ὁ κόσμος· ἅμα γὰρ αὐτῆς ποιοῦσι τὴν γένεσιν. ὥστε δῆλον, ὡς εἴπερ ἀΐδιον τὸ πᾶν, καὶ περὶ τῆς θαλάττης οὕτως ὑποληπτέον. τὸ δὲ νομίζειν ἐλάττω τε γίγνεσθαι τὸ πλῆθος, ὥσπερ φησὶ Δημόκριτος, καὶ τέλος ὑπολείψειν, τῶν Αἰσώπου μύθων οὐθὲν διαφέρειν ἔοικεν ὁ πεπεισμένος οὕτως. καὶ γὰρ ἐκεῖνος ἐμυθολόγησεν, ὡς δὶς μὲν ἡ Χάρυβδις ἀναρροφήσασα, τὸ μὲν πρῶτον τὰ ὄρη ἐποίησε φανερά, τὸ δεύτερον τὰς νήσους· τὸ δὲ τελευταῖον ῥοφήσασα, * ξηρὰν ποιήσει πάμπαν. ἐκείνῳ μὲν οὖν ἥρμοττεν ὀργιζομένῳ πρὸς τὸν πορθμέα τοιοῦτον εἰπεῖν τὸν μῦθον· τοῖς δὲ τὴν ἀλήθειαν ζητοῦσιν, ἧττον· δι' ἣν γὰρ αἰτίαν ἔμεινε τὸ πρῶτον, εἴτε διὰ βάρος, ὥσπερ τινὲς καὶ * τούτων φασίν· ἐν προχείρῳ γὰρ τούτου τὴν αἰτίαν ἰδεῖν· εἴτε καὶ δι' ἄλλο τι· δῆλον ὅτι διὰ τοῦτο διαμένειν ἀναγκαῖον καὶ τὸν λοιπὸν χρόνον αὐτήν. ἢ γὰρ λεκτέον αὐτοῖς, ὅτι οὐδὲ τὸ ἀναχθὲν ὕδωρ ὑπὸ τοῦ ἡλίου ἥξει πάλιν· ἢ εἴπερ τοῦτ' ἔσται, ἀναγκαῖον ἤτοι ἀεί, ἢ μέχρι οὗπερ ἂν ᾖ τοῦτο, ὑπολείπεσθαι τὴν θάλατταν, καὶ πάλιν ἀναχθῆναι ἐκεῖνο πρότερον δεήσει τὸ πότιμον. ὥστε οὐδέποτε ξηρανθήσεται· πάλιν γὰρ * ἐκεῖνο φθήσεται καταβὰν εἰς τὴν αὐτὴν τὸ προανελθόν· διαφέρει γὰρ οὐθὲν ἅπαξ τοῦτ' εἰπεῖν, ἢ πολλάκις. εἰ μὲν οὖν τὸν ἥλιον παύσει τις τῆς φορᾶς, τί ἔσται τὸ ξηραῖνον; εἰ δὲ ἐάσει εἶναι τὴν περιφοράν, ἀεὶ πλησιάζων, τὸ πότιμον καθάπερ εἴπομεν, ἀνάξει· ἀφήσει δὲ πάλιν * ἀποχωρῶν. ἔλαβον δὲ ταύτην τὴν διάνοιαν κατὰ τῆς θαλάττης, ἐκ τοῦ πολλοῖς τόποις φαίνεσθαι ξηροτέρους [ὄντας, νῦν ἢ πρότερον· περὶ οὗ τὴν αἰτίαν * εἴπομεν, ὅτι τῶν κατά τινα χρόνον ὑπερβολῶν γιγνομένων, ὑδάτων τοῦτ' ἐστὶ τὸ πάθος· ἀλλ' οὐ διὰ τὴν τοῦ παντὸς γένεσιν, καὶ τῶν μορίων· καὶ πάλιν γ' ἔσται τοὐναντίον· καὶ ὅταν γένηται, ξηρανεῖται πάλιν· καὶ τοῦτ' οὕτω κατὰ κύκλον ἀναγκαῖον ἀεὶ βαδίζειν. μᾶλλον γὰρ οὕτως εὔλογον ὑπολαβεῖν, ἢ διὰ ταῦτα τὸν οὐρανὸν ὅλον μεταβάλλειν. ἀλλὰ περὶ μὲν τούτων πλείω τῆς ἀξίας ἐνδιατέτριφεν ὁ λόγος.

Περὶ δὲ τῆς ἁλμυρότητος, τοῖς μὲν ἅπαξ γεννήσασι καὶ ὅλως αὐτὴν γεννῶσιν, ἀδύνατόν ἐστιν ἁλμυρὰν ποιεῖν· εἴτε γὰρ ἀπὸ τοῦ ὑγροῦ περὶ τὴν γῆν ὄντος, καὶ ἀναχθέντος ὑπὸ τοῦ ἡλίου, τὸ ὑπολειφθὲν * γέγονε θάλασσα· εἴτ' ἐνυπῆρχε τοσοῦτος χυμὸς ἐν ὕδατι τῷ πολλῷ καὶ γλυκεῖ, διὰ τὸ συμμιχθῆναί τινα γῆν τοιαύτην, οὐθὲν ἧττον ἐλθόντος πάλιν τοῦ * διαμισθέντος ὕδατος, ἀνάγκη ἴσου γενομένου τῷ πλήθει, καὶ τὸ πρῶτον· ἢ εἰ δὲ μὴ τὸ πρῶτον, μηδ' ὕστερον ἁλμυρὰν αὐτὴν εἶναι. εἰ δὲ καὶ τὸ πρῶτον εὐθὺς ἦν, λεκτέον τίς ἡ αἰτία. καὶ ἅμα διὰ τί οὐκ εἰ καὶ τότε ἀνήχθη, καὶ νῦν πάσχει τὸ αὐτό. ἀλλὰ μὴν καὶ ὅσοι τὴν γῆν αἰτιῶνται τῆς ἁλμυρότητος· ἐμμιγνυμένην γὰρ ἔχειν φασὶ πολλοὺς χυμοὺς αὐτήν,

* γρ. ξηρὰ ποιήσει πάμπαν.

* γρ. τῶν

* γρ. ἐκεῖν' ἐφθήσεται

* γρ. ἀναχωρῶν

*Lib.1.cap.vlt.

* κ. [illegible]

* γρ. ἐξατμισθέντος

CAPVT III.

De maris ſalſedine.

DE maris autem ſalſitudine, & idémne ſemper mare ſit, an aliquando non fuerit, & aliquando non erit, ſed deficiet (ſic enim quidam opinantur) dicamus oportet. Id igitur omnes fateri videntur: nempe quòd factum ſit, ſi totus etiam mundus ortum habeat. pariter enim cum eo maris ortum faciunt. Quare perſpicuum exiſtit, ſi vniuerſum ſempiternum ſit, de mari quoque haud aliter eſſe ſentiendum. Qui autem mare decreſçere (ſicuti Democritus aſſerit) tandémque B defecturum cenſet, atque ita ſibi perſuaſit, nihil ab Æſopi fabulis diſſentire videtur. Is enim Charybdin, cùm bis aquas exorbuiſſet, primo quidē mōteis, mox inſulas aperuiſſe, & ad poſtremum vbi ſorbuerit, terram prorſus aſſiccatum iri commentus eſt. Verùm Æſopo in nautam irato, eiuſmodi fabulam dixiſſe congruebat: hiſce autem qui veritatem rimantur, minùs. Quam enim ob cauſam prius remanſit, ſiue hoc propter pondus acciderit, quomodo etiam quidam horum aiunt (in promptu enim eſt eiuſce rei cauſam perſpicere) ſiue etiam propter aliud quippiam, patet eſſe neceſſarium, vt eandem ob cauſam ipſum reliquo tempore permaneat. Dicant enim oportet, C aut quòd aqua à ſole ſublata nunquam deſcendet, aut ſi deſcendet, neceſſe erit vt vel ſemper, vel quandiu illud accidet, mare remaneat, rurſúmque illud quod potulentum, eſt priùs eſſe ſublatum oportebit: quare nunquam aſſiccabitur. quod enim in cœlum prius aſcendit, id in mare deſcendere anticipabit: nihil enim refert, ſemélne an pluries hoc fieri dicatur. Si quis igitur ſolis lationem interquieſcere ſtatuat: quidnam id erit quod vim habeat aſſiccandi? Sin verò eam eſſe ſinat, ſemper ille ſuo acceſſu partem potabilem (vti diximus) educet, rurſúmque ſuo receſſu dimittet. Hanc autem de mari ſententiam ex eo ſumpsêre quòd multa loca ſicciora nunc quàm priùs appareant. D Cuius rei cauſam diximus, nempe quòd hic affectus propter aquæ exuperantias, quæ ſtato quodam tempore obuenire ſolent, non propter vniuerſi partiúmve generationem accidit. Rurſúmque contrà eueniet, & cùm facta fuerit aqua, rurſum exiccabitur: atque id ita per circulum ſemper ire neceſſe eſt. ſic enim exiſtimare rationi magis conſentaneum eſt, quàm ob id, totum cœlum permutari. Sed de hiſce plura, quàm par erat, diximus.

De maris autem ſalſugine dicendum, fieri non poſſe, vt qui mare ſemel generarint, aut omnino ipſum generant, ſalſum eſſe ſtatuant. Nam ſiue mare reſiduum extet, omnis eius humoris qui circa terram exiſtit, & à ſole ſubuehi ſolet, ſiue in a- E qua multa & prædulci tanta vis ſaporis propter terræ cuiuſpiam eiuſmodi ammiſtionem inſit, non minus ipſum, vbi aqua in vaporem cōuerſa rurſum deſcenderit, quàm priùs ſalſum eſſe, cùm multitudo æquabilis habeatur, neceſſe eſt. & ſi non prius, nec poſterius quoque. Quòd ſi etiam priùs ſalſum erat mare, continuò erat dicendum quidnam in cauſa ſit: & inſuper, cur ſi tunc in altum aſcenderit, nunc quoque idem minimè patiatur. At verò & hiſce qui ſalſuginis cauſam terræ tribuunt (eam enim dū ammiſcetur, multos habere ſapores aiunt,

adeò vt ab omnibus conuecta mare ſalſum ob admiſtionem reddat) non item flumina ipſa ſalſa eſſe abſurdum exiſtit. Qui enim fieri poteſt vt eiuſmodi terræ miſtio, affectum adeo euidentem conſpicuúmque efficere in tanta aquarum multitudine queat, in quaque autem parte nequeat? Conſtat enim, mare, totam fluuiatilem aquam eſſe. nihil enim à fluuiis differre, niſi quòd ſalſum ſit, videtur. quod idem illis obuenit eo in loco, in quem confluunt vniuerſi. Pari etiam modo ridiculum fuerit, ſi quis cùm mare terræ ſudorem eſſe dixerit, dilucidum quippiam dixiſſe putet, perinde vt Empedocles. Is enim ita locutus, quoad poëſin, ſatis forſitan dixit (quippe cùm translatio poëtis amica ſit:) quo ad cognoſcendam naturam, non ſatis. Hic enim minimè conſtat apertúmve eſt, quonam pacto è dulci potu ſalſus ſudor proueniat, vtrùm abeunte quodam, ceu parte dulciſſima ſolummodo, an permiſto, quomodo in aquis per cinerem colatis euenit. Cauſa eadem & excrementorum generi, quod in veſicam colligi ſolet, competere videtur: quippe quod amarum ſalſúmque euadat, cùm tamen qui bibitur humor, & quem cibus continet, dulcis ſit. Itaque ſi vt aqua quæ per cinerem tranſmittitur, amara fit, ſic & vrina atque ſudor amarorem contrahunt: vrina quidem, quòd facultas eiuſmodi vna cum ea deſeratur, qualis eſt ſalſilago illa quæ etiam in vaſis ſubſidere videtur: ſudor verò, quia facultas illa pariter cum eo è carnibus ſequeſtretur, humore ſcilicet qui ſeſe foras promit, quod tale eſt, è corpore abluendo detrahente: perſpicuum eſt, quòd in ipſo quoque mari, quod in terra cum humore miſcetur, ſalſitudinis cauſa eſt. Verùm in corpore, tale eſt pars ea cibi quæ ſubſidet propter concoctionis vacuitatem. At in terra quonam pacto hoc ipſum inſit, dicendum erat, atque omnino qui fieri potuit, vt tanta aquarum copia è terra dum ſiccaretur calefieretque, excreta ſit. eam enim partem quandam eſſe exiguam, reſpectu eiuſce quæ in terra relicta eſt, conuenit. Præterea cur non etiam nunc terra, ſiue maior ſiue minor, ſudare cùm reſiccatur, ſoleat? humiditas enim & ſudor amara fiunt. Nam ſi tunc, & nunc quoque oportebat: at id nequaquam accidere videmus. immò terra cùm humida eſt, reſiccatur: cùm verò ſicca, nihil tale pati ſolet. Qui igitur fieri potuit, vt terra cùm circa primam ſui generationem humecta eſſet, ſudorem obareſcendo emiſerit? Quin potius par eſt (ſicuti nonnulli aiunt) humore plurimo abeunte, & ſolis beneficio in cœlum ſcandente, quod reliquum fuit, eſſe mare. Nam fieri non poteſt, vt tellus cùm humecta eſt, ſudet. Quæ igitur ſalſitudinis cauſæ narrantur, rationem videntur effugere.

Nos autem eodem quo & prius ſumpto initio dicamus. Cum enim halitum eſſe duplicem, alterum humidum, alterum ſiccum poſitum ſit, eum eiuſmodi affectuum principium eſſe arbitrari oportere conſtat. Quinimo & de quo quæſiſſe prius neceſſe, vtrum etiã mare permaneat ſemper eiſdẽ numero partibus conſtãs, an ſpecie & quantitate ſubinde mutans, perinde vt aër, aqua potabilis, ignis? horũ enim quodque aliud & aliud ſubinde euadit: multitudinis tamẽ eorũ ſpecies haud aliter ac flammæ, & profluentiũ aquarũ fluxus, manet. Hoc itaq; apertum atque probabile exiſtit: fieri inquam non poſſe, vt non eãdẽ hæc omnia habeant rationem,

A ὥσθ' ὑπὸ τῶν ποταμῶν συγκαταφερομένην διὰ τὴν μίξιν ποιεῖν ἁλμυράν· ἄτοπον δὲ τὸ μὴ καὶ τοὺς ποταμοὺς ἁλμυροὺς εἶναι) πῶς γὰρ δυνατὸν ἐν πολλῷ μὲν πλήθει ὕδατος ὄντι ἐπίδηλον οὕτω ποιεῖν τὴν μίξιν τῆς τοιαύτης γῆς, ἐν ἑκάστῳ δὲ μή; δῆλον γὰρ ὅτι ἡ θάλαττά ἐστιν ἅπαν τὸ ποτάμιον ὕδωρ· οὐθενὶ γὰρ* διέφερεν, ἀλλ' ἢ τῷ* ἁλμυρὰ εἶναι, τῶν ποταμῶν· τοῦτο δ' ἐν ἐκείνοις ἔρχεται εἰς τὸν τόπον εἰς ὃν ἀθρόοι ῥέουσιν. ὁμοίως δὲ γελοῖον κἂν εἴ τις εἰπὼν ἱδρῶτα τῆς γῆς εἶναι τὴν θάλατταν, οἴεταί τι σαφὲς εἰρηκέναι, καθάπερ Ἐμπεδοκλῆς· πρὸς ποίησιν μὲν γὰρ οὕτως εἰπὼν, ἴσως εἴρηκεν ἱκανῶς· (ἡ γὰρ μεταφορὰ ποιητικόν) πρὸς δὲ τὸ γνῶναι τὴν φύσιν, οὐχ ἱκανῶς· οὐ- *γρ. διαφέρει *γρ. ἁλμυρὸν

B δὲ γὰρ* ἐνταῦθα δῆλον, πῶς ἐκ γλυκέος τοῦ πόματος ἁλμυρὸς γίνεται ὁ ἱδρώς· πότερον ἀπελθόντος τινὸς μόνου οἷον τοῦ γλυκυτάτου· ἢ συμμιχθέντος, καθάπερ ἐν τοῖς διὰ τῆς τέφρας ἠθουμένοις ὕδασι. φαίνεται δὲ τὸ αἴτιον τὸ αὐτὸ καὶ περὶ τὸ εἰς τὴν κύστιν περίττωμα συλλεγόμενον. καὶ γὰρ ἐκεῖνο πικρὸν καὶ ἁλμυρὸν γίνεται, τοῦ πινομένου καὶ τοῦ ἐν τῇ τροφῇ ὑγροῦ, γλυκέος ὄντος. Εἰ δὴ ὥσπερ τὸ διὰ τῆς κονίας ἠθούμενον ὕδωρ γίνεται πικρόν· καὶ ταῦτα, τοῦ μὲν οὔρου συγκαταφερομένης τοιαύτης τινὸς δυνάμεως οἵα καὶ φαίνεται ὑφισταμένη ἐν τοῖς ἀγγείοις ἁλμυρὶς τοῦ δ' ἱδρῶτι συνεκκρινομένης ἐκ τῶν σαρκῶν, *γρ. ἐντεῦθεν

C οἷον καταπλυνόντος* τὸ τοιοῦτον ἐκ τοῦ σώματος, τοῦ ἐξιόντος ὑγροῦ· δῆλον ὅτι κἀν τῇ θαλάττῃ τὸ ἐκ τῆς γῆς συγκαταμιγνύμενον τῷ ὑγρῷ, αἴτιον τῆς ἁλμυρότητος. ἐν μὲν οὖν τῷ σώματι γίνεται τὸ τοιοῦτον ἡ τῆς τροφῆς ὑπόστασις διὰ τὴν ἀπεψίαν· ἐν δὲ τῇ γῇ, τίνα τρόπον ὑπῆρχε, λεκτέον. ὅλως δὲ, πῶς οἷόν τε τοσοῦτον ὕδατος πλῆθος ξηραινομένης καὶ θερμαινομένης ἐκκριθῆναι; πολλοστὸν γὰρ δεῖ μέρος αὐτὸ τοῦ λειφθέντος εἶναι ἐν τῇ γῇ. ἔτι δὲ διὰ τί καὶ νῦν ὅταν ξηραινομένη τύχῃ ἡ γῆ, εἴτε πλείων, εἴτε ἐλάττων,* ἰδίει; ἡ γὰρ ὑγρότης καὶ ὁ ἱδρὼς γίνεται πικρός· εἴπερ γὰρ καὶ τότε, καὶ νῦν ἐχρῆν. οὐ φαίνεται δὲ τοῦτο συμβαῖνον· ἀλλὰ ξηρὰ μὲν *γρ. τὸ τ. *γρ. ἰδρίει; *γρ. εἰ γὰρ ἡ ὑγρ.

D οὖσα, ὑγραίνεται· ὑγρὰ δ' οὖσα, οὐδὲν πάσχει τοιοῦτον. πῶς δ' οὖν οἷόν τε περὶ τὴν πρώτην γένεσιν, ὑγρᾶς οὔσης τῆς γῆς,* ἰδίειν ξηραινομένην; ἀλλὰ μᾶλλον εἰκὸς, ὥσπερ φασί τινες, ἀπελθόντος τοῦ πλείστου, καὶ μετεωρισθέντος τοῦ ὑγροῦ διὰ τὸν ἥλιον, τὸ λειφθὲν εἶναι θάλατταν· ὑγρὰν δὲ οὖσαν,* ἰδίειν ἀδύνατον. τὰ μὲν οὖν λεγόμενα τῆς ἁλμυρότητος αἴτια διαφεύγειν φαίνεται τὸν λόγον. *γρ. ἰδρίειν *γρ. ἰδρίειν

Ἡμεῖς δὲ λέγωμεν ἀρχὴν λαβόντες τὴν αὐτὴν ἣν καὶ πρότερον. ἐπεὶ γὰρ κεῖται διπλῆν εἶναι τὴν ἀναθυ-

E μίασιν, τὴν μὲν ὑγρὰν, τὴν δὲ ξηρὰν, δῆλον ὅτι ταύτην οἰητέον ἀρχὴν εἶναι τῶν τοιούτων. καὶ δὴ καὶ περὶ οὗ ἀπορῆσαι πρότερον ἀναγκαῖον, πότερον καὶ ἡ θάλαττα διαμένει ἀεὶ τῶν αὐτῶν οὖσα μορίων, ἀριθμῷ, ἢ τῷ εἴδει, καὶ τῷ ποσῷ, μεταβαλλόντων ἀεὶ τῶν μερῶν, καθάπερ ἀὴρ, καὶ τὸ πότιμον ὕδωρ, καὶ πῦρ; ἀεὶ γὰρ ἄλλο καὶ ἄλλο γίνεται τούτων ἕκαστον. τὸ δ' εἶδος τοῦ πλήθους ἑκάστου τούτων μένει, καθάπερ τὸ τῶν ῥεόντων ὑδάτων, καὶ τὸ τῆς φλογὸς ῥεῦμα. φανερὸν δὴ τοῦτο καὶ πιθανὸν, ὡς ἀδύνατον μὴ τὸν αὐτὸν εἶναι περὶ πάντων τούτων λόγον,

* Malim, μεταβολῆς· ἐπεὶ π.

* γρ. ταύτην.

* γρ. ἀεὶ δεῖν.
* γρ. πεπυρωμένων

* γρ. ὑετοῖς

* γρ. ἐναντίοις

* γρ. ὅσῳ
* γρ. ἐνυπάρχει

A καὶ διαφέρειν τῷ ταχυτῆτι καὶ βραδυτῆτι τῆς * μεταβολῆς ἐπὶ πάντων, καὶ φθορὰν εἶναι καὶ γένεσιν· ταῦτα μέντοι τεταγμένως συμβαίνειν πᾶσι δεῖ. τούτων δ' οὕτως ἐχόντων, πειρατέον ἀποδοῦναι τὴν αἰτίαν καὶ περὶ τῆς ἁλμυρότητος. φανερὸν δὲ διὰ πολλῶν σημείων, ὅτι γὰρ τοιοῦτος ὁ χυμὸς διά τινος σύμμιξίν τινος ἐστιν. ἐν μὲν γὰρ τοῖς σώμασι τὸ ἀπεπτότατον, ἁλμυρὸν καὶ πικρόν ἐστιν, ὥσπερ καὶ πρότερον εἴπομεν· ἀπεπτότατον γὰρ τὸ περίττωμα τῆς ὑγρᾶς τροφῆς· τοιαύτη δὲ πᾶσα μὲν ἡ ὑπόστασις· μάλιστα δὲ ἡ εἰς τὴν κύστιν. σημεῖον δέ, ὅτι λεπτότατον ἐστὶ· τὰ δὲ πεττόμενα πάντα συνίστασθαι πέφυκεν. ἔπειτα ὁ ἱδρὼς ἐν οἷς τὸ αὐτὸ σῶμα συνεκκρίνεται, B ὃ ποιεῖ τὸν χυμὸν * τοῦτον. ὁμοίως δὲ καὶ ἐν τοῖς καιομένοις. ὃ γὰρ ἂν μὴ κρατήσῃ τὸ θερμόν, ἐν μὲν τοῖς σώμασι γίγνεται περίττωμα, ἐν δὲ τοῖς καιομένοις, τέφρα. διὸ καὶ τὴν θάλατταν τινὲς ἐκ κατακεκαυμένης φασὶ γενέσθαι γῆς. τὸ δ' οὕτω μὲν εἰπεῖν, ἄτοπον· τὸ μέντοι ἐκ τοιαύτης, ἀληθές. ὥσπερ γὰρ καὶ ἐν τοῖς εἰρημένοις, οὕτω καὶ ἐν τῷ ὅλῳ, ἐκ τῶν φυομένων καὶ γιγνομένων κατὰ φύσιν, * ἀεὶ δεῖ νοεῖν, ὥσπερ ἐκ * πεπυρωμένων τὸ λειπόμενον τοιαύτην εἶναι τὴν γῆν, καὶ δὴ καὶ τὴν ἐν τῇ ξηρᾷ ἀναθυμιάσει πᾶσαν· αὕτη γὰρ καὶ παρέχεται τὸ πολὺ τοῦ πλήθους. μεμιγμένης δὴ οὔσης ὥσπερ εἴπομεν, τῆς τε ἀτμιδώδους ἀναθυμιάσεως C καὶ τῆς ξηρᾶς, ὅταν συνιστῆται εἰς νέφη καὶ ὕδωρ, ἀναγκαῖον ἐμπεριλαμβάνεσθαι τι πλῆθος ἀεὶ ταύτης τῆς δυνάμεως, καὶ συγκαταφέρεσθαι * πάλιν ἐν τοῖς ὑετοῖς καὶ τοῦτ' ἀεὶ γίγνεσθαι κατά τινα τάξιν, ὡς ἐνδέχεται μετέχειν τὰ ἐνταῦθα τάξεως. ὅθεν μὲν οὖν ἡ γένεσις ἔνεστι τοῦ ἁλμυροῦ ἐν τῷ ὕδατι, εἴρηται. καὶ διὰ τοῦτο τά τε νότια ὕδατα πλατύτερα, καὶ τὰ πρῶτα τῶν μετοπωρινῶν· ὅ τε γὰρ νότος καὶ τῷ μεγέθει καὶ τῷ πνεύματι θερμότατος ἀνέμων ἐστί, καὶ πνεῖ ἀπὸ τόπων καὶ ξηρῶν καὶ θερμῶν· ὥστε μετ' ὀλίγης ἀτμίδος. διὸ καὶ θερμός ἐστιν· εἰ γὰρ καὶ μὴ τοιοῦτος, ἀλλ' ὅθεν ἄρχεται πνεῖν, ψυχρός, οὐδὲν ἧττον προϊὼν διὰ D τὸ συμπεριλαμβάνειν πολλὴν ἀναθυμίασιν ξηρὰν ἐκ τῶν σύνεγγυς τόπων, θερμός ἐστιν. ὁ δὲ βορέας, ἅτε ἀφ' ὑγρῶν τόπων, ἀτμιδώδης, διὸ ψυχρός· τῷ δ' ἀπωθεῖν, αἴθριος ἐνταῦθα· ἐν δὲ τοῖς * ἐναντίοις ὑδατώδης. ὁμοίως δὲ καὶ ὁ νότος αἴθριος τοῖς περὶ τὴν Λιβύην. πολὺ οὖν ἐν τῷ καταφερομένῳ ὕδατι συμβάλλεται τὸ τοιοῦτον, καὶ τὰ μετοπωρινὰ πλατέα τὰ ὕδατα· ἀνάγκη γὰρ τὰ βαρύτερα πρῶτα [κάτω] φέρεσθαι. ὥστε ἐν ὅσοις ἔνεστι τῆς τοιαύτης γῆς πλῆθος, φέρεται τάχιστα κάτω ταῦτα. καὶ θερμὴ δὲ ἡ θάλαττα διὰ τοῦτό ἐστι· πάντα γὰρ ὅσα πεπύρωται, ἔχει δυνάμει θερμότητα ἐν αὐτοῖς. ὁρᾶν δ' ἔξεστι E καὶ τὴν κονίαν, καὶ τὴν τέφραν, καὶ τὴν ὑπόστασιν τῶν ζῴων καὶ τὴν ὑγρὰν καὶ τὴν ξηράν· καὶ τῶν θερμοτάτων γε κατὰ τὴν κοιλίαν ζῴων συμβαίνει θερμοτάτην εἶναι τὴν ὑπόστασιν. γίγνεται μὲν οὖν ἀεὶ ἁλμυρωτέρα διὰ ταύτην τὴν αἰτίαν. ἀνάγεται δ' ἀεί τι μέρος αὐτῆς μετὰ τοῦ γλυκέος· ἀλλ' ἔλαττον τοσούτῳ, * ὅσῳ καὶ ἐν τῷ ὑετῷ τὸ ἁλμυρὸν καὶ πλατὺ τοῦ γλυκέος ἔλαττον * ἐνυπάρχει, ὡς ἐπὶ τὸ πᾶν εἰπεῖν. ὅτι δὲ γίγνεται ἀτμίζουσα πότιμος, καὶ οὐκ εἰς θάλατταν συγκρίνεται, ὅταν συνιστῆται πάλιν,

A & mutationis celeritate tarditatéque inter ſe diſtent, gignantúrque, ac intereant: quod tamen non abſque certo quodam ordine, hiſce omnibus eueniat. Quæ cùm ita habeant, de ſalſore quoque cauſam reddere enitendum eſt. Itaque eiuſmodi ſaporem ob commixtionem quandam prouenire multis conſtat indiciis. Quod enim in corpore minimè concoctum eſt, id ſalſum amarúmque habere, quod idem etiam priùs diximus. Nam cibi humidi excrementum minimè concoctum eſt. Eiuſmodi ſunt ſedimenta omniā, ſed præcipuè illud quod in veſicam delabitur. Cuius rei indicium eſt, quòd tenuiſſimum ſit. quæ autem concoctionem admiſére, conſtant craſſaque ſunt. Deinde ſudor, in quibus B idem illud corpus quod hunc ſaporem parit, vnà cum ſuperuacaneo humore excernitur. Pari modo & in hiſce quæ exuruntur, res habet: quod enim calor non euicerit, id omne in corporibus excrementum fit, in exuſtis cinis. Quamobrem & mare è terra peruſta factum eſſe, nonnulli aſſerunt. Cæterùm ita quidem dicere abſurdum eſt: eſſe tamen ex tali factum, à veritate nequaquā abhorret. Nam vt & in hiſce quæ diximus, ita in ipſo quoque vniuerſo (quod ex iis quæ naſcuntur, atque per naturam fiunt, non aliter quàm ex iis quæ ignem ſenſiunt, relinqui ſolet) eſſe terram talem animaduertendum ſemper eſt. Quinimmo & omnem aridæ telluris halitum eſſe eiuſmodi, putandum eſt. ea C enim hanc ingentem halituum copiam ſuppeditat. Cum autem halitus vapidus cum arido permiſtus (vt diximus) in nubē & aquā cogitur, neceſſariò accidit vt ſemper quædā non parua huiuſce facultatis portio intercipiatur, & rurſum pariter cum pluuia deorſum feratur, idque ſemper fiat ordine quodam, quantū fieri poteſt vt quæ apud nos ſunt, ordinem participet. Vnde igitur in aqua ſalſitudo proueniat, dictū eſt. Ob idque imbres, tam quos auſter affert, quàm qui autumnaliū primi ſunt, ſalſiuſculi ſunt. auſter enim tam vehementia ſua quàm flatu æſtuoſiſſimus ventus eſt, & à calidis ſiccíſque locis ſpirat: quare parum vaporis ſibi aſciſcit, & proinde feruidus extat. Nam & ſi eiuſmodi nō ſit, ſed vnde D ſpirare incipit, frigidus habeatur: nihilo minus dū ſe longius protrahit, propterea quod multum ſicci halitus è vicinis locis ſecum rapit, calidus eſt. at aquilo, vt qui ab vliginoſis flare locis ſoleat, vapidus eſt: ideoque frigidus. Hic tamen, quòd nubes propellat, ſerenus eſt: in locis oppoſitis, pluuius. Pari modo & auſter Afris ſudus eſt, nobis pluuiam importat. Talis igitur facultatis non parum aqua quæ deorſum ruit, ſecum aduehit. atque per autumnum ſalſi imbres fiunt. quæ enim plus ponderis obtinent, ea priora deferantur neceſſe eſt. Quare quibus eiuſmodi terræ copia ineſt, ij celerrimè deſcendunt. ob idque mare calidum eſt. Nam aduſta omnia potentia in ſe aliquid E habent caliditatis: calcem, cinerem, ſedimenta animalium, humidum inquam ſimul & aridum intueri licet. Et animalium quæ ventres habent calidiſſimos, ſedimenta calidiſſima eſſe vſu euenit. Igitur mare hac de cauſa ſubinde ſalſius reddi ſolet. ſemper enim ipſius portio quædam vnà cum parte dulci attollitur. verùm tanto minor eſt quanto in ipſa quoq; pluuia, pars dulcis ſalsā exuperat. Ex quo fit vt ſemper æquale (quod in totū dixerim) habeatur. Quòd autem aqua maris quæ in vaporem conuertitur, potulenta euadat, quodque pars ea quæ naturam induit vaporis, cum rurſum concreuerit, nequaquā in liquorem cogatur, qui maris naturā retineat,

dicere conemur. Hoc idem in cæteris quoque aliis euenit. Nam & vinum & cætera ſuccorũ genera, quotquot in vaporem mutati, in humorem rurſum concreſcere ſolent, aqua fiunt. Affectus enim cæteri aquæ propter quandam commiſtionẽ competunt. & qualecunque id fuerit quod ei permiſcetur, talem in ea parere ſaporem aſſolet. Sed de hiſce aliàs, cùm opportunior dabitur occaſio, erit conſiderandum. Nunc eatenus dicamus oportet: nempe quòd cùm mare in rerum natura ſit, aſſiduè quippiam ab eo in altum ſcandit, potúque idoneum ac dulce redditur: quódque per imbreis ex alto in imum labitur, iam aliud effectum, nec id præterea exiſtens quod fuerat ſublatum: quod denique mare potulentæ parti ratione ponderis ſubſidet. Ob idque nec ipſum inſtar amnium deficere, niſi locorum ratione aſſolet: quod idem pari vtriſque modo accidere neceſſum eſt. Nec ſemper eædem, nec terræ, nec maris partes permanent, ſed tota dumtaxat moles. Etenim in hũc modum de ipſa quoque terra exiſtimare par eſt. Nam pars alia aſcẽdit, alia rurſum deſcẽdit. Quinetiam loca tommutant, quæ per ſumma innatare, quæque in ima rurſum deferri aſſolent. Porrò ſalſitudinem in rei cuiuſpiam admiſtione conſiſtere palàm eſt, non ex iis tantùm quæ dicta ſunt, verumetiam ſi quis vas è cera efformatum in mare demittat, obturato priùs re tali oſculo, vt nihil interhiet per quod mare introfluat. quæ enim ſeſe vaſi per cereos parietes inſinuat aqua, potulenta euadit. nam vt terrena portio, ita & quod ſalſitudinẽ ſua admiſtione committit, ſequeſtrari cùm percolatur aqua, aſſolet, id enim tum ponderis (ſalſa enim quàm dulcis grauior eſt) tum etiam craſſitudinis cauſa extat. Etenim aquæ craſſitudo corpulentiáque tantam afferre differentiam poteſt, vt nauigia æquo rerum quæ conuehũtur onere preſſa, in amnibus ferè demergi videantur, in mari modicè ſeſe atque ad nauigandum peropportunè habeant. Quamobrem nonnulli eorum qui in amnibus naueis onerarant, ob eam ipſam ignorationem damnum ſubière grauiſſimũ. Quòd autem quippiam admiſtum ſit, illud argumẽto eſſe poteſt, quod eius moles craſſiuſcula eſt. nam mare, propè quaſi lutum eſt, tantam rei corpulentæ copiam continet. ſi quis enim aquam indito ſale vehementer ſalſam fecerit, in ea oua, etiamſi plena ſint, innatant. Hoc idem circa ipſa quoque ſalſamenta moliri ſolent. Quòd ſi in Palæſtina ſit (vt quidam ferunt) lacus eiuſmodi, in quem ſi à quoquam homo vinctus aut iumentum iniciatur, per ſumma natat, nec in aquis mergitur: is profectò teſtimonio fuerit hiſce quæ iam dicta ſunt. aiũt enim adeò amarum ſalſumq; eſſe lacum, vt piſcis nullus innaſcatur: & veſtimenta purget, ſi quis madefacta concuſſerit. Quæ omnia eorum quæ diximus ſigna ſunt, nempe quòd corpulentum quiddam ſalſitudinem pariat, & quòd id quod ineſt, terrenum ſit. Etenim in Chaonia, fons quidam aquæ ſalſiuſculæ habetur, qui haud longè ab ortu in amnem dulcem quidem, at piſcibus vacantem influit. Nam vt aiunt incolæ, facta ab Hercule optandi poteſtate, cùm is ab Erythia vaccas abigẽs rediret, ſalẽ pro piſcibus elegerunt, qui ipſis è fonte fieri ſolet. huius enim aquæ portionem quandam poſtea quàm decoxere, quieſcere ſinũt: quæ frigefacta, vbi vnà cum calore humor euaporauit, in ſalẽ non denſum grumoſumque, ſed niuis modo laxũ atque ſubtilẽ verti ſolet.

A πεπειραμένοι λέγομεν· πάσχει δὲ καὶ τἆλλα ταὐτό· καὶ γὰρ οἶνος καὶ πάντες οἱ χυμοί, ὅσοι ἂν ἀτμίσαντες πάλιν εἰς ὑγρὸν συστῶσιν, ὕδωρ γίνονται· πάθη γὰρ τἆλλα * διά τινα σύμμιξιν τοῦ ὕδατός ἐστι, καὶ οἷον ἄν τι ᾖ τὸ συμμιχθὲν, τοιοῦτον ποιεῖ τὸν χυμόν. ἀλλὰ περὶ μὲν τούτων ἐν ἄλλοις καιρὸς * οἰκειοτέροις ποιητέον τὴν σκέψιν. νῦν δὲ τοσοῦτον λέγωμεν ὅτι τῆς θαλάττης ὑπαρχούσης, ἀεί τι ἀνάγεται καὶ γίνεται πότιμον, καὶ ἄνωθεν ἐν τοῖς ὄμβροις κατέρχεται ἄλλο γεγενημένον, οὐ τὸ ἀναχθὲν, καὶ διὰ τὸ βάρος ὑφίσταται τοῦ ποτίμου. καὶ διὰ τοῦτ' οὔτ' ἐπιλείπει, * ὥσπερ οἱ ποταμοὶ, ἀλλ' ἢ τοῖς τόποις. τοῦτο δ' B ἐπ' ἀμφοτέρων ἀνάγκη συμβαίνειν ὁμοίως· οὔτε ἀεὶ τὰ αὐτὰ μέρη διαμένει, οὔτε γῆς, οὔτε θαλάττης, ἀλλὰ μόνον ὁ πᾶς ὄγκος· καὶ γὰρ καὶ περὶ γῆς ὁμοίως δεῖ ὑπολαβεῖν· τὸ μὲν γὰρ ἀνέρχεται, τὸ δὲ πάλιν συγκαταβαίνει, καὶ τοῖς τόποις συμμεταβάλλει τά τ' ἐπιπολάζοντα, καὶ τὰ καθιόντα πάλιν. ὅτι δ' ἐστὶν ἐν μίξει τινὸς τὸ ἁλμυρὸν, δῆλον οὐ μόνον ἐκ τῶν εἰρημένων, ἀλλὰ καὶ ἐάν τις ἀγγεῖον πλάσας τι κήρινον εἰς τὴν θάλατταν περιδήσας τὸ στόμα τοιούτοις, ὥστε μὴ παρεγχεῖσθαι τῆς θαλάττης· τὸ γὰρ εἰσιὸν διὰ τῶν τοίχων τῶν κηρίνων γίνεται πότιμον ὕδωρ· ὥσπερ γὰρ C διηθούμενον τὸ γεῶδες ἀποκρίνεται, καὶ τὸ ποιοῦν τὴν ἁλμυρότητα διὰ τὴν σύμμιξιν· τοῦτο γὰρ αἴτιον καὶ τοῦ βάρους· πλεῖον γὰρ ἕλκει τὸ ἁλμυρὸν ἢ τὸ πότιμον· καὶ τοῦ πάχους· καὶ γὰρ τὸ πάχος διαφέρει τοσοῦτον, ὥστε τὰ πλοῖα ἀπὸ τοῦ αὐτοῦ τῶν ἀγωγίμων βάρους ἐν μὲν τοῖς ποταμοῖς * ὀλίγου καταδύειν, ἐν δὲ τῇ θαλάττῃ μετρίως ἔχειν καὶ πλωιστικῶς. διόπερ ἔνιοι τῶν ἐν τοῖς ποταμοῖς * γεμιζομένων τῶν πλοίων, διὰ τὴν ταύτην τὴν ἄγνοιαν ἐζημιώθησαν. τεκμήριον δὲ τοῦ μεμιγμένου τινὸς τὸ παχύτερον εἶναι τὸν ὄγκον· ἐὰν γάρ τις ὕδωρ ἁλμυρὸν ποιήσῃ σφόδρα, D μίξας ἅλας, ἐπιπλέουσι τὰ ᾠὰ, κἂν ᾖ πλήρη· σχεδὸν γὰρ ὥσπερ πηλὸς γίνεται· τοσοῦτον ἔχει σωματῶδες πλῆθος ἡ θάλαττα. ταὐτὸ δὲ τοῦτο δρῶσι καὶ περὶ τὰς ταριχείας. εἰ δ' ἔστιν ὥσπερ μυθολογοῦσί τινες ἐν Παλαιστίνῃ τι αὐτῇ λίμνη, εἰς ἣν ἐάν τις ἐμβάλλῃ συνδήσας ἄνθρωπον ἢ ὑποζύγιον, ἐπιπλεῖν, καὶ οὐ καταδύεσθαι κατὰ τοῦ ὕδατος, μαρτύριον ἂν εἴη τοῖς εἰρημένοις· λέγουσι γὰρ πικρὰν οὕτως εἶναι τὴν λίμνην καὶ ἁλμυρὰν, ὥστε μηδένα ἰχθὺν ἐγγίνεσθαι· τὰ δ' ἱμάτια ῥύπτειν, ἐάν τις διασείσῃ, βρέξας. ἔστι δὲ καὶ τὰ τοιαῦτα σημεῖα πάντα τῶν εἰρημένων, ὅτι τὸ ἁλμυρὸν ποιεῖ σῶμά τι, καὶ γεῶδές ἐστι τὸ ἐνυπάρχον· E ἔν τε γὰρ τῇ Χαονίᾳ κρήνη τις ἐστὶν ὕδατος πλατυτέρου· ἀπορρεῖ δ' αὕτη εἰς ποταμὸν πλησίον· γλυκὺν μὲν, ἰχθῦς δ' οὐκ ἔχοντα. εἵλοντο γὰρ δὴ, ὡς οἱ ἐκεῖ μυθολογοῦσιν, ἐξουσίας δοθείσης ὑπὸ τοῦ Ἡρακλέους, ὅτε ἦλθεν ἄγων ἐκ τῆς Ἐρυθείας τὰς βοῦς, ἅλας ἀντὶ τῶν ἰχθύων, οἳ γίνονται αὐτοῖς ἐκ τῆς κρήνης. τούτου γὰρ τοῦ ὕδατος ἀφέψοντές τι μέρος τιθέασι, καὶ γίνεται ψυχθὲν, ὅταν ἀπατμίσῃ τὸ ὑγρὸν ἅμα τῷ θερμῷ, ἅλες, οὐ χονδροὶ, ἀλλὰ χαῦνοι καὶ λεπτοὶ, ὥσπερ χιών.

* γρ. διά τινας σ.

* γρ. οἰκειοτέροις

* γρ. ὥσπερ ἐπὶ οἱ

* Malim ὀλίγου. hoc est, ὀλίγου δεῖν.

* γρ. γεμ. πλοίων sine τῶν. locus est ſuſpectus.

Εἰσὶ δὲ τὴν δύναμιν ἀσθενέστεροι τῶν ἄλλων καὶ πλείους ἡδύνουσιν ἐμβληθέντες, καὶ τὴν χρόαν οὐχ ὁμοίως λευκοί. τοιοῦτον δ' ἕτερον γίνεται καὶ ἐν Ὀμβρικοῖς· ἔστι γάρ τις τόπος ἐν ᾧ πεφύκασι κάλαμος καὶ σχοῖνος. τούτων οὖν κατακαίουσι, καὶ τὴν τέφραν ἐμβάλλοντες εἰς ὕδωρ ἀφέψουσιν· ὅταν δὲ * λίπωσί τι τοῦ ὕδατος, τοῦτο ψυχθὲν, ἁλῶν γίνεται πλῆθος. ὅσα δ' ἐστὶν ἁλμυρὰ ῥεύματα ποταμῶν ἢ κρηνῶν, τὰ πλεῖστα θερμά ποτε εἶναι δεῖ νομίζειν· εἶτα τὴν μὲν ἀρχὴν ἀποσβέννυσθαι τοῦ πυρός· δι' ἧς δὲ διηθοῦνται γῆς, ἔτι μένειν οὖσαν οἷον κονίαν καὶ τέφραν. εἰσὶ δὲ * πολλαχοῦ καὶ κρῆναι καὶ ῥεύματα ποταμῶν, παντοδαποὺς ἔχοντα χυμούς· ὧν πάντων αἰτιατέον τὴν ἐνοῦσαν ἢ ἐγγινομένην δύναμιν πυρός· καομένη γὰρ ἡ γῆ τῷ μᾶλλον καὶ ἧττον, παντοδαπὰς λαμβάνει μορφὰς * καὶ χρόας χυμῶν· στυπτηρίας γὰρ καὶ κονίας καὶ τῶν ἄλλων τῶν τοιούτων γίνεται πλήρης δυνάμεων, δι' ὧν τὰ ἠθούμενα ὕδατα, ὄντα γλυκέα, μεταβάλλει· καὶ τὰ μὲν ὀξέα γίνεται, καθάπερ ἐν τῇ Σικανικῇ τῆς Σικελίας· ἐκεῖ γὰρ ὀξάλμη γίνεται, καὶ χρῶνται καθάπερ ὄξει, πρὸς ἔνια τῶν ἐδεσμάτων αὐτῷ. ἔστι δὲ καὶ περὶ Λύγκον κρήνη τις ὕδατος ὀξέος· περὶ δὲ τὴν Σκυθικὴν, πικρά. τὸ δ' ἀπορρέον αὐτῆς, τὸν ποταμὸν εἰς ὃν εἰσβάλλει, ποιεῖ πικρὸν ὅλον. αἱ δὲ διαφοραὶ τούτων, ἐκεῖθεν δῆλαι. ποῖοι δὲ χυμοὶ ἐκ ποίων γίνονται κράσεων, εἴρηται περὶ αὐτῶν χωρὶς ἐν ἄλλοις. περὶ μὲν οὖν ὑδάτων καὶ θαλάττης, δι' ἃς αἰτίας ἀεί τε συνεχῶς εἰσὶ, καὶ τίς ἡ φύσις αὐτῶν· ἔτι δ' ὁπόσα πάθη κατὰ φύσιν αὐτοῖς συμβαίνει ποιεῖν ἢ πάσχειν, εἴρηται σχεδὸν ἡμῖν περὶ τῶν πλείστων.

* γρ. λ. τὸ μέρος τ.

* γρ. πολλαχῇ

* γρ. ἢ χρόαν ἢ χυμόν

A quod genus ſalis imbecilliorem quàm cætera virtutem obtinet, largiúſque adhibitum guſtum ingerit ſuauem: colore item non æquè candido exiſtit. Aliud huic rei proximum Vmbri moliuntur: quendam enim locum habent, in quo arundines & iunci enaſcuntur: quorum cinerem decoquere aqua ſoliti ſunt, donec exiguum ſuperſit humoris: qui vbi refrixit, in ſalis copiam euadere ſolet. Quicunque autem amnium fontiúmve fluxus ſalſi ſunt, eos maxima ex parte aliquando incaluiſſe, deinde ignis principium extinctum fuiſſe, cenſendum eſt. terram verò per quam tranſmiſſi colantur, cineris & calcis naturam adhuc retinere. Sunt etiam pleriſque in locis tam fontes quàm amnium B fluenta, quæ varia ſaporum genera præferunt. quorum omnium cauſam eſſe igneam virtutem, ſiue facultatem quæ in eis eſt aut innaſcitur, ſtatuendum eſt. Nam terra dum ignem ſentit, quòd plus minus id pati ſoleat, varias ſaporum colorúmque formas contrahit. quippe quæ aluminis, calcis, & cæterorum id genus virtutibus plena redditur: per quæ dum tranſmittitur aqua quæ dulcis eſt, permutari ſolet. Et quædam aceſcit: quo modo in Sicilia agro Sicanico euenire videmus. Inibi enim oxalme (quam acidam muriam interpretor) gignitur, qua vt aceto in quibuſdam epularum generibus vti ſolent. Eſt autem & circa Lyncon fons quidam, cuius aqua acida eſt. Circa Scythiam alius, C qui amaras euomit aquas, quæ vniuerſum amnem in quem incidunt, amarum reddunt. Horum differentiæ hinc apertæ ſunt. Sed qui ſapores ex quibus temperaturis exultent, ſeorſim per ſe alio loco dictum eſt. Igitur de aquis & mari, quas ob cauſas aſſiduè ſemper ſint, quænam ſit eorum natura, qua ratione ac via permutentur, tum etiam de plurimis affectibus quos committere aut pati per naturam ipſis accidit, propè diximus.

ΚΕΦΑΛ. δ'.

Περὶ αἰτιῶν καὶ γενέσεως πνευμάτων.

Περὶ δὲ πνευμάτων λέγωμεν, λαβόντες ἀρχὴν τὴν εἰρημένην ἡμῖν ἤδη πρότερον. ἔστι γὰρ δύο εἴδη τῆς ἀναθυμιάσεως, ὥς φαμεν· ἡ μὲν ὑγρὰ, ἡ δὲ ξηρά. καλεῖται δ' ἡ μὲν ἀτμὶς, ἡ δὲ τὸ μὲν ὅλον ἀνώνυμος. τῷ δ' ἐπὶ μέρους ἀνάγκη χρωμένους καθόλου, προσαγορεύειν αὐτὴν οἷον καπνόν. ἔστι δ' οὔτε τὸ ὑγρὸν ἄνευ τοῦ ξηροῦ, οὔτε τὸ ξηρὸν ἄνευ τοῦ ὑγροῦ· ἀλλὰ πάντα ταῦτα λέγεται κατὰ τὴν ὑπεροχήν. φερομένου δὲ τοῦ ἡλίου κύκλῳ, καὶ ὅταν μὲν πλησιάζῃ, τῇ θερμότητι ἀνάγοντος τὸ ὑγρὸν, πορρωτέρω δὲ γιγνομένου διὰ τὴν ψύξιν, συνισταμένης πάλιν τῆς ἀναχθείσης ἀτμίδος εἰς ὕδωρ· διὸ χειμῶνός τε μᾶλλον γίγνεται τὰ ὕδατα, καὶ νύκτωρ ἢ μεθ' ἡμέραν· ἀλλ' οὐ δοκεῖ, διὰ τὸ λανθάνειν τὰ νυκτερινὰ τῶν μεθ' ἡμέραν μᾶλλον. τὸ δὴ κατιὸν ὕδωρ διαδίδοται πᾶν εἰς τὴν γῆν· ὑπάρχει δ' ἐν τε τῇ γῇ πολὺ πῦρ, καὶ πολλὴ θερμότης, καὶ ὁ ἥλιος οὐ μόνον τὸ ἐπιπολάζον τῆς γῆς ὑγρὸν ἕλκει, ἀλλὰ καὶ τὴν γῆν αὐτὴν ξηραίνει θερμαίνων. τῆς δ' ἀναθυμιάσεως, ὥσπερ εἴρηται, διπλῆς οὔσης, τῆς μὲν ἀτμιδώδους, τῆς δὲ καπνώδους, ἀμφοτέρας ἀναγκαῖον γίγνεσθαι. τούτων δ' ἡ μὲν ὑγροῦ πλεῖον ἔχουσα πλῆθος ἀναθυμίασις, ἀρχὴ τοῦ ὑετίου ὕδατός ἐστιν, ὥσπερ εἴρηται πρότερον·

CAPVT IV.

Ventorum cauſa & generatio.

DE ventis autem initio quod iam priùs diximus ſumpto, dicamus. D Duæ enim ſunt noſtra quidem ſententia halitus ſpecies: alter humidus eſt, alter ſiccus. Ille vapor nuncupatur, hic in totum nomine caret. particulari tamen vtentes, vniuerſaliter eum, veluti fumum vocemus neceſſe eſt. Cæterùm nec humidum ſine arido, nec aridum ſine humido eſſe poteſt. verùm hæc omnia ita ſecundùm exuperationem vocari ſolent. Itaque cùm ſol ipſe orbita feratur, & vbi propiùs accedit, humorem vi caloris ſubuehat: vbi autem longiùs dimouet ſeſe, vapor qui ſublatus fuerat, rurſum in aquam refrigerationis beneficio concreſcat: qua de cauſa imbres hyeme potiùs quàm æſtate fiunt, & nocte quàm interdiu: ſed non videtur, E propterea quòd imbres nocturni magis quàm diurni lateant. aqua autem illa quæ ad ima deferri ſolet, tota in terram diſtribuitur. terra verò ipſa multum ignis atque caliditatis in ſeſe habet: atque ſol non ſolùm eum humorem qui per ſumma telluris reſidet, attrahit, verumetiam terram ipſam calfaciendo aſſiccat. cúmque halitus (id quod iam dictum eſt) duplex ſit, alter vapidus, alter fumidus, vtrunque profectò halitum fieri neceſſariũ eſt. quorum qui humorem continet largiorẽ, imbrium primordium (quemadmodũ antea dictum eſt) exiſtit:

qui aridus eſt, flatuum omnium principium atque natura. Hæc autem ad hunc eueniant modum eſſe neceſſe, ex ipſis etiam effectibus certū eſt. Etenim halitum differentiam recipere neceſſum eſt. Atque ſolem & terræ caliditatem ea ipſa efficere non modò poſſibile, verùm etiam neceſſarium exiſtit. Cùm autem ſpecies vtriuſque diuerſa ſit, patet quòd inter ſe diſcrepant. Nec venti eadem ac imbrium natura exiſtit, perinde vt quidam aiunt. eundem enim aerem ſi moueatur, ventum: ſi concreſcat, aquam eſſe volunt. Verùm ex hiſce aër (quemadmodum antea diximus) gigni ſolet. Vapor enim humidus algidúſque eſt. nam facilè terminos ſuſcipit, vt humidus: at quia aquæ eſt, ſuapte natura, vt aqua non calefacta, frigidus exiſtit: fumus verò, calidus & aridus. Quare ex hiſce tanquam ex ſymbolis conſtituitur aer, qui humidus calidúſque eſt. Etenim abſurdum fuerit, ſi aer iſte qui quemque ambit, dum motu cietur, flatus fiat, & vndeuis fuerit agitatus, ventus exultet: & non amneis eſſe exiſtimamus, non qualitercunque profluente aqua, etiamſi multa ſit: ſed quod profluit, id à fonte ortum ducat oportet. ſic de ipſis quoque ventis res habere dicatur. Nam ab aliqua ingenti ruina magna aeris copia, quæ nec principium habeat nec fontem, moueri poteſt. quæ autem fieri aſſolent, ea quæ diximus, approbant. Nam quia continuè quidem, ſed plus ac minus fieri, & maior minórve halitus aſſolet, ſemper nubes ac ſpiritus per ſingula anni tempora pro cuiuſque natura efficiuntur. At quia interdum vapidus, interdum ſiccus & fumidus altero longè amplior aſſurgit: aliquando pluuij & humecti redduntur anni: aliquando flatuoſi & ſqualibundi. Quandoque igitur ſqualores imbréſque multos ſimul & per magnum continuúmque tractum fieri, quandoque per parteis euenit. Sæpe enim regio quæ circumquaque adiacet, temporarios recipit imbres, aut etiam plureis, at in huiuſce parte aliqua ſqualor eſt. Quandoque è diuerſo res agitur. nam cùm tota quæ in circuitu eſt regio, aut modicis potiatur aquis, aut potiùs ſqualore fatiſcat, vna quædam portio immenſam aquarum copiam recipit. Cuius rei cauſa eſt, quòd magna ex parte eandem affectionem longè latéque diffundi ac ſerpere conſentaneum eſt, quia vicina loca ſitum ad ſolem retinent conſimilem, niſi peculiarem quandam ſortita ſint differentiam. At verò interdum hac in parte ſiccus anhelitus, in altera vapidus, vberior gigni ſolet: nonnunquam vice verſa accidit. Huius autem ipſius cauſa eſt, quòd halitus vterque in proximæ ſibique continuæ regionis halitum incidit: verbi cauſa, ſiccus per ſuam fluit regionem: humectus ſibi proximum inuadit, vel etiam ad locum quendam remotiorem vi ventorum propulſus accedit. Interdum ille manet: & idem qui ei contrarius eſt, agit. Atque ſæpenumero illud euenit, nempe quòd quemadmodum in corpore hominis, ſi aluus ſuperior ſicceat, inferior contrario habitu eſt: & è diuerſo ſi inferior ſicca ſit, ſuperior humecta frigidáque eſt: ſic & in ipſis quoque locis antiperiſtaſis fit, & exhalationum genera commutantur. Præterea vt poſt imbrem flatus magna ex parte oriri eo in loco ſoliti ſunt, in quo illum fieri contigerit: ita ſuperueniente imbre conſternuntur. Hæc enim propter principia quæ dicta ſunt, euenire neceſſum eſt. Nam ab imbribus terra dum calore tam ſuo quàm ſuperno reſiccatur,

A ἡ δὲ ξηρά, τῶν πνευμάτων ἀρχὴ καὶ φύσις πάντων. ταῦτα δ' ὅτι τοῦτον τὸν τρόπον ἀναγκαῖον συμβαίνειν, καὶ ἐξ αὐτῶν τῶν ἔργων δῆλον· καὶ γὰρ τὴν ἀναθυμίασιν διαφέρειν ἀναγκαῖον, καὶ τὸν ἥλιον, καὶ τὴν ἐν τῇ γῇ θερμότητα ταῦτα [πάντα] ποιεῖν οὐ μόνον δυνατόν, ἀλλὰ καὶ ἀναγκαῖόν ἐστιν. ἐπεὶ δ' ἑτέρως ἑκατέρας τὸ εἶδος, φανερὸν ὅτι διαφέρει· καὶ οὐχ ἡ αὐτή ἐστιν ἥ τε τῶν ἀνέμων φύσις, καὶ ἡ τοῦ ὑετίου ὕδατος, καθάπερ τινὲς λέγουσι· τὸν γὰρ αὐτὸν ἀέρα κινούμενον μὲν ἄνεμον εἶναι, συνιστάμενον δὲ πάλιν ὕδωρ. ὁ μὲν οὖν ἀήρ, καθάπερ ἐν τοῖς πρὸ τούτων λόγοις εἰρήκαμεν, ἐκ τούτων· ἡ μὲν γὰρ ἀτμίς, ὑγρὸν καὶ ψυχρόν· εὐόριστον μὲν γὰρ ὡς ὑγρόν, διὰ B δὲ τὸ ὕδατος εἶναι, ψυχρὸν τῇ οἰκείᾳ φύσει, ὥσπερ ὕδωρ μὴ θερμανθέν· ὁ δὲ καπνός, θερμὸν καὶ ξηρόν. ὥστε καθάπερ ἐκ συμβόλων, συνέστηκεν ὁ ἀήρ, ὑγρὸς καὶ θερμός· * καὶ γὰρ ἄτοπον εἰ ὁ περὶ ἑκάστους περιεχόμενος ἀήρ, * οὗτος κινούμενος, πνεῦμα· καὶ ὅθεν ἂν τύχῃ κινηθείς, ἄνεμος ἔσται· ἀλλ' οὐ καθάπερ τοὺς ποταμοὺς ὑπολαμβάνομεν οὐχ ὁπωσοῦν τοῦ ὕδατος εἶναι ῥέοντος, οὐδ' ἂν ᾖ πλῆθος, ἀλλὰ δεῖ πηγαῖον εἶναι τὸ ῥέον· οὕτω καὶ περὶ τῶν ἀνέμων ἔχει· κινηθείη γὰρ ἂν πολὺ πλῆθος ἀέρος ὑπό τινος μεγάλης πτώσεως, οὐκ ἔχον ἀρχὴν, οὐδὲ πηγήν. μαρτυρεῖ δὲ τὰ γινόμενα τοῖς εἰρημένοις· διὰ γὰρ τὸ συνεχῶς C μέν, μᾶλλον δὲ καὶ ἧττον, καὶ πλείω καὶ ἐλάττω γίνεσθαι τὴν ἀναθυμίασιν, ἀεὶ νέφη τε καὶ πνεύματα γίνεται κατὰ τὴν ὥραν ἑκάστην ὡς πέφυκε· διὰ δὲ τὸ ὁτὲ μὲν τὴν ἀτμιδώδη γίνεσθαι πολλαπλασίαν, ὁτὲ δὲ τὴν ξηρὰν καὶ καπνώδη, ὁτὲ μὲν ἔπομβρα τὰ ἔτη γίνεται καὶ ὑγρά, ὁτὲ δὲ ἀνεμώδη καὶ αὐχμώδη. ὁτὲ μὲν οὖν συμβαίνει καὶ τοὺς αὐχμοὺς καὶ τὰς ἐπομβρίας, πολλοὺς ἅμα καὶ κατὰ συνεχῆ γίνεσθαι χώραν· ὁτὲ δὲ καὶ κατὰ μέρη· πολλάκις γάρ, ἡ μὲν κύκλῳ χώρα λαμβάνει τοὺς ὡραίους ὄμβρους, ἢ καὶ πλείους· ἐν δέ τινι μέρει ταύτης, αὐχμός ἐστιν· ὁτὲ δὲ τοὐναντίον, τῆς κύκλῳ πάσης ἢ μετρίοις χρωμένης ὕδασιν, ἢ καὶ μᾶλλον αὐχμώσης, ἕν τι μόριον ὕδατος ἄφθονον D λαμβάνει πλῆθος. αἴτιον δ', ὅτι ὡς μὲν τὰ πολλά, τὸ αὐτὸ πάθος ἐπὶ πλεῖον διήκειν εἰκὸς χώραν, διὰ τὸ παραπλησίως κεῖσθαι πρὸς τὸν ἥλιον τὰ σύνεγγυς, ἐὰν μή τι διάφορον ἔχωσιν ἴδιον. οὐ μὴν ἀλλ' ἐνίοτε κατὰ τοδὶ μὲν [τὸ] μέρος ἡ ξηρὰ ἀναθυμίασις ἐγένετο πλείων· κατὰ δὲ τὸ ἄλλο, ἡ ἀτμιδώδης· ὁτὲ δὲ τοὐναντίον. καὶ * αὐτοῦ δὲ τούτου αἴτιον τὸ ἑκατέραν μεταπίπτειν εἰς τὴν τῆς ἐχομένης χώρας ἀναθυμίασιν· οἷον ἡ μὲν ξηρὰ κατὰ τὴν οἰκείαν ῥεῖ χώραν, ἡ δ' ὑγρὰ πρὸς τὴν γειτνιῶσαν, ἢ καὶ εἰς τὸν πόρρω τινὰ τόπον ἀπεώσθη ὑπὸ πνευμάτων· ὁτὲ δ' αὕτη μὲν ἔ- E μεινεν, ἡ δ' ἐναντία ταύτην ἐποίησεν. καὶ συμβαίνει τοῦτο πολλάκις, ὥσπερ ἐπὶ τοῦ σώματος, ἐὰν ἡ ἄνω κοιλία ξηρὰ ᾖ, τὴν κάτω ἐναντίως διακεῖσθαι, καὶ ταύτης ξηρᾶς οὔσης, ὑγρὰν εἶναι τὴν ἄνω καὶ ψυχράν· οὕτω καὶ περὶ τοὺς τόπους ἀντιπεριΐστασθαι καὶ μεταβάλλειν τὰς ἀναθυμιάσεις. ἔτι δὲ μετὰ τοὺς ὄμβρους ἄνεμος ὡς τὰ πολλὰ γίνεται ἐν ἐκείνοις τοῖς τόποις, καθ' οὓς ἂν συμβῇ γενέσθαι τοὺς ὄμβρους, καὶ τὰ πνεύματα παύεται, ὕδατος γενομένου. ταῦτα γὰρ ἀνάγκη συμβαίνειν, διὰ τὰς εἰρημένας ἀρχάς. ὅταν τε γὰρ ἡ γῆ ξηραίνηται ὑπό τε τοῦ ἐν αὐτῇ θερμοῦ,

* Vide Vicom. qui ſuſpicatur deeſſe ante hæc verba aliquid.

* γρ. ἐστι

* γρ. αὐτὸ

A καὶ ὑπὸ τῆς ἄνωθεν, ἀναθυμιᾶται. τοῦτο δ᾽ ἦν ἀνέμου σῶμα. καὶ ὅταν μὲν ἡ τοιαύτη ἀπόκρισις ᾖ, καὶ ἄνεμοι κατέχουσι· παυομένων δέ, διὰ τὸ ἀποκρίνεσθαι τὸ θερμὸν ἀεὶ καὶ ἀναφέρεσθαι εἰς τὸν ἄνω τόπον, συνίσταται ἡ ἀτμὶς ψυχομένη, καὶ γίνεται ὕδωρ. καὶ ὅταν εἰς ταὐτὸ συνωσθῶσι τὰ νέφη, καὶ ἀντιπεριστῇ εἰς αὐτὰ ἡ ψύξις, ὕδωρ γίνεται καὶ καταψύχει τὴν ξηρὰν ἀναθυμίασιν. παύουσί τε δὴ τὰ ὕδατα γινόμενα τοὺς ἀνέμους, καὶ παυομένων αὐτὰ γίνεται διὰ ταύτας τὰς αἰτίας. ἔτι δὲ τοῦ γίνεσθαι* μάλιστα πνεύματα ἀπ᾽ αὐτῆς τε τῆς ἄρκτου καὶ μεσημβρίας, τὸ αὐτὸ αἴτιον. πλεῖστοι γὰρ βορέαι καὶ νότοι γίνονται τῶν ἀνέμων· ὁ γὰρ ἥλιος τούτους μόνους οὐκ ἐπέρχεται τοὺς τόπους, ἀλλὰ πρὸς τούτους καὶ ἀπὸ τούτων· B ἐπὶ δυσμὰς δὲ καὶ ἐπὶ ἀνατολὰς ἀεὶ φέρεται. διὸ τὰ νέφη συνίστανται ἐν τοῖς πλαγίοις· καὶ γίνεται προσιόντος μὲν ἡ ἀναθυμίασις τοῦ ὑγροῦ, ἀπιόντος δὲ πρὸς τὸν ἐναντίον τόπον, ὕδατα καὶ χειμῶνες. διὰ μὲν οὖν τὴν φορὰν τὴν ἐπὶ τροπὰς καὶ ἀπὸ τροπῶν, θέρος τε γίνεται καὶ χειμών· καὶ ἀνάγεταί τε ἄνω τὸ ὕδωρ καὶ γίνεται πάλιν. ἐπεὶ δὲ πλεῖστον μὲν καταβαίνει ὕδωρ ἐν τοῖς τόποις τούτοις ἐφ᾽ οὓς τρέπεται, καὶ ἀφ᾽ ὧν (οὗτοι δ᾽ εἰσὶν ὅ,τε πρὸς ἄρκτον καὶ μεσημβρίαν,) ὅπου δὲ πλεῖστον ὕδωρ ἡ γῆ δέχεται, ἐνταῦθα πλείστην ἀναγκαῖον γίνεσθαι τὴν ἀναθυμίασιν παραπλησίως (ὥσπερ ἐκ χλωρῶν ξύλων καπνόν) ἡ δ᾽ ἀναθυμίασις αὕτη, ἄνεμός ἐστιν· C εὐλόγως δὴ ἂν ἐντεῦθεν γίνοιτο τὰ πλεῖστα καὶ κυριώτατα τῶν πνευμάτων. καλοῦνται δ᾽ οἱ μὲν ἀπὸ τῆς ἄρκτου, βορέαι· οἱ δ᾽ ἀπὸ τῆς μεσημβρίας, νότοι. ἡ δὲ φορὰ λοξὴ αὐτῶν ἐστι· περὶ γὰρ τὴν γῆν πνέουσιν εἰς ὀρθὸν γινομένης τῆς ἀναθυμιάσεως· ὅτι πᾶς ὁ κύκλῳ ἀὴρ, συνέπεται τῇ φορᾷ. διὸ καὶ ἀπορήσειεν ἄν τις, ποτέρωθεν ἡ ἀρχὴ τῶν πνευμάτων ἐστί· πότερον ἄνωθεν, ἢ κάτωθεν· ἡ μὲν γὰρ κίνησις ἄνωθεν, καὶ πρὶν πνεῖν ὁ δ᾽ ἀὴρ ἐπίδηλος, κἂν ᾖ νέφος, ἢ ἀχλύς· σημαίνει γὰρ *κινουμένην πνεύματος ἀρχήν, πρὶν φανερῶς ἐληλυθέναι τὸν ἄνεμον, ὡς ἄνωθεν αὐτῶν ἐχόντων τὴν ἀρχήν. ἐπεὶ δ᾽ ἐστὶν ἄνεμος, πλῆθός τι τῆς ἐκ γῆς ξηρᾶς ἀναθυμιάσεως κινούμενον περὶ τὴν D γῆν, δῆλον ὅτι τῆς μὲν κινήσεως ἡ ἀρχὴ ἄνωθεν· τῆς δ᾽ ὕλης καὶ τῆς γενέσεως, κάτωθεν· ἡ μὲν γὰρ ῥυήσεται τὸ ἀνιόν, ἐκεῖθεν τὸ αἴτιον· ἡ γὰρ φορὰ τῶν πορρωτέρω κυρία τῆς γῆς· καὶ ἅμα κάτωθεν μὲν εἰς ὀρθὸν ἀναφέρεται, καὶ πᾶν ἰσχὺς μᾶλλον ἐγγύς. ἡ δὲ τῆς γενέσεως ἀρχή, δῆλον ὡς ἐκ τῆς γῆς ἐστι. ὅτι δ᾽ ἐκ πολλῶν ἀναθυμιάσεων συνιουσῶν κατὰ μικρόν, ὥσπερ αἱ τῶν ποταμῶν ἀρχαὶ γίνονται νοτιζούσης τῆς γῆς, δῆλον καὶ ἐπὶ τῶν ἔργων· ὅθεν γὰρ ἕκαστοι πνέουσιν, ἐλάχιστοι πάντες εἰσί· προϊόντες δὲ καὶ πόρρω λαμπροὶ πνέουσιν. ἔτι δὲ καὶ τὰ περὶ τὴν ἄρκτον ἐν τῷ χειμῶνι νήνεμα καὶ ἄπνοα, κατ᾽ αὐτὸν ἐκεῖ- E νον τὸν τόπον, ἀλλὰ τὸ κατὰ μικρὸν ἀποπνέον καὶ λανθάνον, ἔξω προϊὸν ἤδη πνεῦμα λαμπρὸν γίνεται. τίς μὲν οὖν ἐστιν ἡ τοῦ ἀνέμου φύσις καὶ πῶς γίνεται, ἔτι δ᾽ αὐχμῶν τε πέρι καὶ ἐπομβριῶν, καὶ διὰ τί αἴτιον καὶ παύονται καὶ γίνονται μετὰ τοὺς ὄμβρους, καὶ διὰ τί βορέαι καὶ νότοι πλεῖστοι τῶν ἀνέμων εἰσίν, εἴρηται· περὶ δὲ τούτοις, καὶ περὶ τῆς φορᾶς αὐτῶν.

* γρ. μᾶλλον ἢ πι.

* γρ. κινουμένου

A halitum profundit, qui nimirũ venti materies eſſe ſolet. Atque vbi ſecretio eiuſmodi in rerum natura fuerit, obtinent venti: quibus ponentibus, propterea quòd pars calida ſeuocari atque ſuperum in locum efferri ſemper aſſolet, vapor refrigeratus conſiſtit ſpiſſeſcitque, atque in humorem vertitur. Quinetiam vbi eundem in locũ pulſæ nubes ſunt, & frigus intrò ſe colligens circumfuſo calori obluctatur, oritur aqua, cuius beneficio ſiccus anhelitus refrigerari ſolet. Ergo vt imbribus venti ſopiuntur, ita vbi venti deſiſtũt, imbres gigni propter has cauſas aſſolent. Adde quòd non aliud cauſæ eſt, cur à ſeptentrione & meridie flatus potiſſimùm oriantur. Omnium namque ventorum plurimi Aquilones & Auſtri ſpirare ſolent. Nam ſol hæc vna loca B non adit, ſed ad ea ſeſe applicat, ab eiſq; dimouet, ad occaſum verò & exortum aſſiduè fertur. Quamobrem nubes in curſus ſolis lateribus conſiſtere ſolent. atque ſole accedente, humor exhalat, aduerſam in partem abeunte, hyemes imbreſque excitantur. Itaque ob ſolis lationem qua ſolſtitia petuntur deſeruntúrque, æſtas hyemſque ſiunt, & aqua in altum rapi, rurſumque in imbrem conijcii ſolita eſt. At cùm aquæ plurimum in hiſce locis deſcẽdat, ad quæ ſol vergit, & à quibus ſeſe remouet (hæc autem ſunt, quæ ſeptentriones versùs atque meridiem poſita ſunt) atque vbi tellus aquas recipit vberrimas, ampliſſimam inibi halituum copiam fieri neceſſum ſit (perinde vt è viridi ligno fumum C depromi copioſiſſimum videmus) halitus autem ipſe ventus ſit: ratione euenit optima, vt inde flatuum plurimi principaliſſimique exoriantur. Qui autem à ſeptentrionibus mittuntur, Aquilones: qui à meridie, Auſtri dicuntur. Porrò ſpiritus tramite ferri obliquo aſſolent. nam circa terram ſpirant, cùm tamen halitus ipſe per directum feratur, quòd totus circumfundens aer flatuum lationem conſectetur. Quocirca quæret quiſpiam, vtro ex loco ſuperóne an infero flatibus initium ſit. Nam deſuper ventorum motio eſt, & antequam ſpirent, illuſtratur aer, ſi nubilus caliginoſúſve ſit: quippe cùm nubis motio, flatus initium priuſquam apertè ad nos venerit, portendat, tanquam flatu deſuper originẽ habente. Cùm autem ventus, quædam ſicci hali- D tus, quem tellus profundit, copia per terram currens ſit, motionis initium ab alto peruenire, materiei & ortus ab imo, planũ eſt. Nam qua parte quod aſcẽdebat, inclinarit, inde ſui curſus cauſam ſortitur. Nam latio eorum quæ à terra remotiora ſunt, potior ac domina exiſtit. Et inſuper exhalatio ab imo ſurſum versùs recta linea fertur, cunctaq; plus roboris habent, cùm in propinquo ſunt. At ortus principium ad terram referri debere in aperto eſt. Porro flatuum initia multis exhalationibus ſenſim coeuntibus exultare, quomodo amniũ fontes terra humorem fundente fiunt, experientia quoque ipſa conſtat. Omnes enim venti ibi minimi ſunt, vnde E ſinguli ſpirare cœperint. At vbi longiùs ſe protraxerint, ingenui venire ſolent. Præterea regio quæ ſeptentrionibus ſubdita eſt, per hyemem tranquillatur, nec vllum flatum ſentit. At quod paulatim expirat, atque eodem illo in loco latet, id vbi præterit, iam ſpiritus euadit illuſtris. Igitur natura venti quænam ſit, & quo pacto oriatur, tum etiam de ſqualore & imbrium abundantia: item quam ob cauſam poſt imbreis flatus & ſurgant & ſternantur, & cur Aquilo & Auſter ſæpiſſimè ſpirent, ad hæc de ventorum curſu, dictum iam eſt.

A

CAPVT V.

Ventorum ceſſationis & commotionis cauſæ: item quinque zonarum declaratio.

POrrò ſol & comprimit, & excitat flatus. Etenim exhalationes cùm imbecillæ ſunt atque paruæ, tabefacit: & ampliore ſuo calore, earum calorem qui minor eſt, diſcernit atque diſſipat. Adde quòd terram priùs aſiccat, quàm ſecretio vniuerſa orta ſit. haud aliter ac magnus ignis paruum cremabile, ſi quod inciderit, antequam fu- B mum edat, deurit. Ob has igitur cauſas, non minùs ſol flatus compeſcere, quàm quominus ab initio oriantur, obſiſtere ſolet: nam quia halitus emacerat, ventos ponere facit: quia celeriter terram aſſiccat, fieri prohibet. Quapropter circa Orionis exortum & ab eo vſque ad anniuerſarios & præuios aer maximè conſileſcit. Ad ſummam, venti tranquillitas duabus de cauſis prouenire ſolet. Nam aut quia exhalatio frigoris beneficio extinguitur (vt fit, cùm validum gelu coortum eſt) aut quia æſtus opera elangueſcit. Mediis autem temporibus creberrimè cœlum à ſpiritu ſilet: aut quia nondum quicquam exhalat, aut quia hali- C tus iam abiit, necdum alius affluit. At Orion & cùm oritur, & cùm occidit, incertus ac difficilis eſſe propterea videtur, quòd eius exortus & occaſus tum cùm tempora euariant commutantúrque, ille æſtate, hic hyeme, accidant, idque propter ſideris magnitudinem diebus edurat pluribus. Omnium autem mutationes turbulentæ propter varietatem exiſtunt. at anniuerſarij poſt ſolſtitium & caniculæ exortum, & non tum cùm ſol maximè accedit receditve, aſpirare ſolent: atque interdiu ſpirant, noctu deſiſtunt. Cauſa, quòd ſol cùm proximè eſt, terram priùs aſſiccat quàm vt vlla oriatur exhalatio. at cùm paululum receſſit, iam modicus exultat calor, adeò vt con- D glaciatæ aquæ deliqueſcant, & dum terra cùm ſuo tum ſolis calore inareſcit, in quendam veluti fumum & exhalationem tranſeant. Noctu verò deſinunt flare: quoniam tum congelata omnia liquefieri ceſſant, propter noctium frigus. Cæterùm, nec id quod gelu induratum eſt, nec id quod ſiccitatis habet nihil, exhalat: ſed quod cum ſiccitate coniunctam obtinet humiditatem, id cùm recaleſcit, anhelitum reddere ſolet. Nonnulli autem addubitant, quamobrem Aquilones conſtantiùs perflant poſt æſtiuum ſolſtitium, quos Eteſias (id eſt, anniuerſarios) vocant: Auſtri verò, poſt hybernum nequaquam. Hoc autem minimè alie- E num à ratione eſt. nam tempore oppoſito appellati Leuconoti fiunt, non tamen adeò continui. Iccirco latentes occaſionem præbent inquirendi. Cauſa, quòd Aquilo à locis ſub ſeptentrionibus poſitis veniat, quæ aquarum & niuis copioſa plena ſunt, quibus à ſole colliquatis poſt æſtiuum ſolſtitium potiùs quàm in ipſo ſolſtitiò anniuerſarij flare ſoliti ſunt. Nam & ipſi quoque æſtus ita fieri ſolent: non cùm ſol proximè ad ſeptentriones accedit, ſed cùm diutius concaleſecit, & adhuc in propinquo eſt. Pari etiam modo Auiculares (quos Græci Ornithias, ab aduentu auium, vocant) poſt hybernum æquinoctium ſpirare ſoliti ſunt. hi enim, anniuerſarij imbecilli ſunt, minores tamen atque tardius quàm anniuerſarij flare ſolet.

ΚΕΦΑΛ. ε'.

Διὰ τί τὰ πνεύματα ποτὲ μὲν πνεῖ, ποτὲ δὲ διαλείπει, καὶ πόθεν καὶ πότε πνέουσιν ἕκαστα τῶν ἀνέμων.

ὉΔ' ἥλιος, καὶ παύει καὶ συνεγείρει τὰ πνεύματα. ἀσθενεῖς μὲν γὰρ καὶ ὀλίγας οὔσας τὰς ἀναθυμιάσεις, μαραίνει τῷ πλείονι θερμῷ τὸ ἐν τῇ ἀναθυμιάσει ἔλαττον ὄν, καὶ διακρίνει. ἔτι δ' αὐτὴν τὴν γῆν φθάνει ξηραίνων, πρὶν γενέσθαι ἔκκρισιν ἀθρόαν, ὥσπερ εἰς τὸ B πολὺ πῦρ, ἐὰν ὀλίγον ἐμπέσῃ ὑπέκκαυμα, φθάνει πολλάκις, πρὶν καπνὸν ποιῆσαι, κατακαυθέν. Διὰ μὲν οὖν ταύτας τὰς αἰτίας καταπαύει τε τὰ πνεύματα, καὶ ἐξ ἀρχῆς γίνεσθαι κωλύει, τῇ μὲν μαράνσει καταπαύων, τῇ δὲ ταχυτῆτι τῆς ξηρότητος γίνεσθαι κωλύων. διὸ περὶ Ὠρίωνος ἀνατολὴν μάλιστα γίνεται νηνεμία, καὶ μέχρι τῶν ἐτησίων καὶ προδρόμων. ὅλως δὲ γίγνονται αἱ νηνεμίαι διὰ δύο αἰτίας· ἢ γὰρ διὰ ψῦχος ἀποσβεννυμένης τῆς ἀναθυμιάσεως, οἷον ὅταν γένηται πάγος ἰσχυρός· ἢ καταμαραινομένης ὑπὸ τοῦ πνίγους. αἱ δὲ πλεῖσται καὶ ἐν ταῖς C ἀνὰ μέσον ὥραις, ἢ τῷ μήπω ἀναθυμιᾶσθαι, ἢ τῷ ἤδη ἐξεληλυθέναι τὴν ἀναθυμίασιν, καὶ ἄλλην μήπω ἐπιρρεῖν. ἄκριτος δὲ καὶ χαλεπὸς ὁ Ὠρίων εἶναι δοκεῖ, καὶ δύνων, καὶ ἐπιτέλλων, διὰ τὸ ἐν μεταβολῇ ὥρας συμβαίνειν τὴν δύσιν καὶ τὴν ἀνατολήν, θέρους ἢ χειμῶνος, καὶ διὰ τὸ μέγεθος τοῦ ἄστρου, ἡμερῶν γίνεταί τι πλῆθος. αἱ δὲ μεταβολαὶ πάντων ταραχώδεις διὰ τὴν ἀοριστίαν εἰσίν. οἱ δ' ἐτησίαι πνέουσι μετὰ τροπὰς καὶ κυνὸς ἐπιτολήν, καὶ οὔτε τηνικαῦτα ὅτε πλησιάζει μάλιστα ὁ ἥλιος, οὔτε ὅτε πόρρω. καὶ τὰς μὲν ἡμέρας πνέουσι, τὰς δὲ νύκτας παύονται. αἴτιον δ', ὅτι πλησίον μὲν ὤν, D φθάνει ξηραίνων πρὶν γενέσθαι τὴν ἀναθυμίασιν· ὅταν δ' ἀπέλθῃ μικρόν, συμμετρὸς ἤδη γίνεται ἡ ἀναθυμίασις καὶ ἡ θερμότης, ὥστε τὰ πεπηγότα ὕδατα τήκεσθαι, καὶ τῆς γῆς ξηραινομένης ὑπό τε τῆς οἰκείας θερμότητος, καὶ ὑπὸ τῆς τοῦ ἡλίου, οἷον τύφεσθαι καὶ θυμιᾶσθαι. τῆς δὲ νυκτὸς λωφῶσι, διὰ τὸ τὰ πεπηγότα τηκόμενα παύεσθαι διὰ τὴν ψυχρότητα τῶν νυκτῶν. θυμιᾶται δ' οὔτε τὸ πεπηγός, οὔτε τὸ μηδὲν ἔχον ξηρόν. ἀλλ' ὅταν ἔχῃ τὸ ξηρὸν ὑγρότητα, τοῦτο θερμαινόμενον θυμιᾶται. ἀποροῦσι δέ τινες διὰ τί βορέαι μὲν γίνονται συνεχεῖς, οὓς καλοῦμεν ἐτησίας, μετὰ τὰς E θερινὰς τροπάς· νότοι δὲ οὕτως οὐ γίνονται μετὰ τὰς χειμερινάς. ἔχει δ' οὐκ ἀλόγως. γίνονται μὲν γὰρ οἱ καλούμενοι λευκόνοτοι τὴν ἀντικειμένην ὥραν, οὐχ οὕτω δὲ γίνονται συνεχεῖς. διὸ λανθάνοντες ποιοῦσιν ἐπιζητεῖν. αἴτιον δ', ὅτι ὁ μὲν βορέας ἀπὸ τῶν ὑπὸ τὴν ἄρκτον πνεῖ τόπων, οἳ πλήρεις ὕδατος καὶ χιόνος εἰσὶ πολλῆς· ὧν τηκομένων ὑπὸ τοῦ ἡλίου μετὰ τὰς θερινὰς τροπὰς μᾶλλον ἢ ἐπ' αὐταῖς, πνέουσιν οἱ ἐτησίαι· οὕτω γὰρ καὶ τὰ πνίγη γίνεται, οὐχ ὅταν μάλιστα πλησιάζῃ πρὸς ἄρκτον, ἀλλ' ὅταν πλείων μὲν ᾖ χρόνος θερμαίνοντι, ἔτι δ' ἐγγύς. ὁμοίως δὲ καὶ μετὰ τὰς χειμερινὰς τροπὰς πνέουσιν οἱ ὀρνιθίαι· καὶ γὰρ οὗτοι ἐτησίαι εἰσὶν ἀσθενεῖς· ἐλάττους δὲ καὶ ὀψιαίτεροι τῶν ἐτησίων πνέουσιν·

ἑβδομηκοστῇ γὰρ ἄρχονται πνεῖν, διὰ τὸ πόρρω ὄντα τὸν ἥλιον ἐλάττω ἰσχύειν. οὐ συνεχεῖς δ' ὁμοίως πνέουσι, διότι τὰ μὲν ἐπιπολῆς καὶ λεπτὰ, τότε ἀποκέκριται· τὰ δὲ μᾶλλον πεπηγότα, πλείονος δεῖται θερμότητος. διὸ διαλείποντες οὗτοι πνέουσιν, ἕως αἱ ἐπὶ τροπαῖς πάλιν ταῖς θεριναῖς, * πνέωσιν οἱ ἐτησίαι· ἐπεὶ βούλεταί γ' ὅτι μάλιστα συνεχῶς ἐντεῦθεν ἀεὶ πνεῖν ἄνεμος. ὁ δὲ νότος ἀπὸ τῆς θερινῆς τροπῆς πνεῖ, καὶ οὐκ ἀπὸ τῆς ἑτέρας ἄρκτου. δύο γὰρ ὄντων τμημάτων τῆς δυνατῆς οἰκεῖσθαι χώρας· τοῦ μὲν πρὸς τὸν ἄνω πόλον τὸν καθ' ἡμᾶς, τοῦ δὲ πρὸς τὸν ἕτερον καὶ πρὸς μεσημβρίαν, καὶ οὔσης οἷον τυμπάνου· (τοιοῦτον γὰρ σχῆμα τῆς γῆς) ἐκτέμνουσιν αἱ ἐκ τοῦ κέντρου αὐτῆς ἀγόμεναι γραμμαί, καὶ ποιοῦσι δύο κώνους, τὸν μὲν ἔχοντα βάσιν τὸν τροπικόν, τὸν δὲ τὸν διὰ παντὸς φανερόν, τὴν δὲ κορυφὴν ἐπὶ τοῦ μέσου τῆς γῆς, τὸν αὐτὸν δὲ τρόπον πρὸς τὸν κάτω πόλον ἕτεροι δύο κῶνοι, τῆς γῆς ἐκτμήματα ποιοῦσι. ταῦτα δ' οἰκεῖσθαι μόνα * δυνατά, καὶ οὔτ' ἐπέκεινα * τῶν τροπῶν· σκιὰ γὰρ οὐκ ἂν ἦν πρὸς ἄρκτον, νῦν δ' ἀοίκητοι πρότερον γίγνονται οἱ τόποι πρὶν ὑπολείπειν, ἢ μεταβάλλειν τὴν σκιὰν πρὸς μεσημβρίαν· τὰ θ' ὑπὸ τὴν ἄρκτον, ὑπὸ ψύχους ἀοίκητα. φέρεται δὲ καὶ ὁ στέφανος κατὰ τοῦτον τὸν τόπον· φαίνεται γὰρ ὑπὲρ κεφαλῆς γινόμενος ἡμῖν, ὅταν ᾖ κατὰ τὸν μεσημβρινόν. διὸ καὶ γελοίως γράφουσι νῦν τὰς περιόδους τῆς γῆς· γράφουσι γὰρ κυκλοτερῆ τὴν οἰκουμένην· τοῦτο δ' ἐστὶν ἀδύνατον κατά τε τὰ φαινόμενα, καὶ κατὰ τὸν λόγον. ὅ,τε γὰρ λόγος δείκνυσιν ὅτι ἐπὶ πλάτος μὲν ὥρισται, τὸ δὲ κύκλῳ συνάπτειν ἐνδέχεται διὰ τὴν κρᾶσιν· (οὐ γὰρ ὑπερβάλλει τὰ καύματα καὶ τὸ ψῦχος κατὰ μῆκος, ἀλλ' ἐπὶ πλάτος· ὥστ' εἰ μή που κωλύει θαλάττης πλῆθος, ἅπαν εἶναι πορεύσιμον.) καὶ κατὰ τὰ φαινόμενα περί τε τοὺς πλοῦς καὶ τὰς πορείας· πολὺ γὰρ τὸ μῆκος διαφέρει τοῦ πλάτους· τὸ γὰρ ἀπὸ Ἡρακλείων στηλῶν μέχρι τῆς Ἰνδικῆς, τοῦ ἐξ Αἰθιοπίας πρὸς τὴν Μαιῶτιν, καὶ τοὺς ἐσχατεύοντας τῆς Σκυθίας τόπους, πλέον ἢ πέντε πρὸς τρία τὸ μέγεθός ἐστιν, ἐάν τις τούς τε πλοῦς λογίζηται, καὶ τὰς ὁδούς, ὡς ἐνδέχεται λαμβάνειν τὴν πίστιν τῆς ἀκριβείας. καίτοι * ἐπὶ πλάτους μὲν μέχρι τῶν ἀοικήτων ἴσμεν τὴν οἰκουμένην· ἔνθα μὲν γὰρ διὰ ψῦχος οὐκέτι κατοικοῦσιν, ἔνθα δὲ διὰ τὴν ἀλέαν. τὰ δὲ τῆς Ἰνδικῆς ἔξω καὶ τῶν Ἡρακλείων στηλῶν, διὰ τὴν θάλατταν οὐ * φαίνονται συνείρειν, τῷ συνεχῶς εἶναι πᾶσαν τὴν οἰκουμένην. ἐπεὶ δ' ὁμοίως ἔχειν ἀνάγκη τόπον τινὰ πρὸς τὸν ἕτερον πόλον, ὥσπερ ὃν ἡμεῖς οἰκοῦμεν πρὸς τὸν ὑπὲρ ἡμῶν, δῆλον ὡς ἀνάλογον ἕξει τά τ' ἄλλα, καὶ τῶν πνευμάτων ἡ στάσις· ὥστε καθάπερ ἐνταῦθα βορέας ἐστί, κἀκείνοις ἀπὸ τῆς ἐκεῖ ἄρκτου τις ἄνεμος οὕτως [illegible] δεῦρο διικνεῖσθαι· ἐπεὶ οὐδ' ὁ β[illegible] τὴν ἐνταῦθα οἰκουμένην πᾶσάν ἐστ[illegible] ἀπόγειον τὸ πνεῦμα τὸ βόρειον, ἔ[illegible] ἐπὶ τὴν ἐνταῦθα οἰκουμένην πνεῖ. ἀλλὰ διὰ τὸ τὴν οἴκησιν κεῖσθαι ταύτην πρὸς ἄρκτον, πλεῖστοι βόρειοι πνέουσιν. ὅμως δὲ καὶ ἐνταῦθα ἐκλείπει, καὶ οὐ δύναται πόρρω διικνεῖν.

* γρ. πνεύσωσιν
* γρ. δυνατὰ,
* γρ. τῶν τροπικῶν
* γρ. ἐπὶ πλάτους
* γρ. φαίνεται

A nam ſeptuageſimo die aſpirare incipiunt: propterea quòd ſol cùm procul abeſt, roboris minus habeat. Non autem ſimiliter continui perflant. quoniam quæ in ſumma telluris parte iacent, [illegible] cillaque ſunt, ea per id tempus ſecerni atque [illegible] ſolent: quæ verò magis conglaciata ſunt, plus [illegible] loris deſiderant. Quamobrem hi intermi[illegible] flare tantiſper ſoliti ſunt, quoad rurſum anni[illegible] ſarij in ſolſtitio æſtatis ſpirent. quandoquidem ab eo tempore ſemper ventus quàm maximè conſtanter flare ſolet. Auſter autem ab æſtiuo ſolſtitio, & non ab altera vrſa ſpirat. Nam cum terræ habitabilis ſegmenta duo ſint, & altera ad ſublimiorem verticem qui apud nos eſt, altera ad alterum

B & meridiem poſita ſit, atque tympani ſpeciem præferat, talem profectò terræ figuram lineæ à centro ipſius ductæ diſſecant, atque turbines duos efficiunt: quorum alter apud tropicum, alter apud ſemper conſpectum verticem, baſin, ſed vterque in meditullio terræ mucronem o[illegible]. Eodem pacto ad inferiorem verticem, a[illegible] turbines telluris diſſectiones faciunt. h[illegible]bitari ſolæ queunt. Nec fieri poteſt vt quiſquam vltra ſolſtitium incolat. non enim in ſeptentrionem vmbræ iacerentur. nunc autem loca priùs inhabitabilia redduntur, quàm aut abſumantur vmbræ, aut mutent ſemet in meridiem. Pars autem orbis ſeptentrionibus ſubdita, præ rigore habita-

C ri nequit. Fertur etiam Corona quoque ipſa circa huncce locum. nam nobis ſupra verticem eſſe videtur, cùm ad meridiei lineam peruenit. Quo fit etiam vt hoc tempore telluris ambitus ridiculè depingant. Nam parti orbis terrarum habitatæ figuram tribuunt orbicularem. At hoc fieri non poſſe, ratione pariter atque experientia cognitum. Nam quòd in latitudinem definita ſit, circulum tamen continentem præferre per temperiem queat, tum ratio ipſa commonſtrat (quippe cùm non per longitudinem, ſed in latum nimio rigore atque incendio prematur, adeò vt niſi mare non nuſquam loci prohibeat, peruia tota ſit) tum ea quæ circa nauigationes & itinera videmus.

D Nam longitudo à latitudine haud parum differt. quod enim à columnis Herculis ad terram Indicam vſque porrigitur, eo quòd ab Æthiopia ad Mæotin vſque & extremas Scythiæ parteis pertingit, maius quàm quinque ad tria eſt: ſi quis tam nauigationes, quàm vias, quatenus talium certitudo ſumi poteſt, metiri velit. Atqui partem orbis terræ habitatam, in latum ad lo[illegible]a vſque inhabitata exploratam habemus. Nam hic præ frigore, illic præ æſtu habitari præterea nequit. Quæ verò vltra Indiam & columnas Herculis iacent, coniungi perinde quaſi continens foret tota telluris habitatæ portio, haudquaquam videntur. Cum autem neceſſe ſit vt locus quidam ad alterum po-

E lum ſimiliter ſeſe habeat, atque is quem incolimus, ad eum qui ſupra nos eſt, conſtat quod vt cætera alia, ita ſpirituum quoque ſtatio proportione reſpondebit. Quare quemadmodum nobis Aquilo, ſic & illis ventus quidam ab ea quæ inibi eſt vrſa ſpirat, quem huc penetrare haudquaquam poſſibile eſt: quando ne iſte quidem Aquilo totam quę apud nos eſt partem orbis terrarum habitatam peruadat. Aquilonius namque flatus, ceu abterraneus eſt. At quia hæc habitatio ad ſeptētriones poſita eſt, ideo Aquilo frequentiſſimè ſpirat: ſed tamē & apud nos deficit, & progredi longè non poteſt.

Quandoquidem circa mare Auſtrale, quod vltra Africam iacet, vt hic Aquilo & Auſter ſpirant, ſic illic Vulturnus & Fauonius viciſſim abſque intercapedine ſemper flare ſolent. Itaque Auſtrum ab altero polo non venire apertum eſt, quando ne ipſe quidem ab hyberno ſolſtitio ſpiret. nam alium ab æſtiuo venire oporteret: ſic enim proportionis ratio redderet. nunc autem inde nullus aſpirat. ſolus enim vnus ſpirare ex illis locis videtur. Quare neceſſariò fit, vt ventus qui ab exuſta terrarum parte ſpirat, Auſter ſit. Locus autem ille propter ſolis viciniam, nullum habet humorem aut pabulum, quod per liquefactionem flatus anniuerſarios committat. Verùm quia multo amplior exiſtit, atque longè latéque patet, Auſter vehementior, crebrior & magis æſtuoſus quàm Aquilo eſt. atque ille huc magis, quàm hic illuc penetrare ſolet. Quænam igitur Auſtri & Aquilonis cauſa ſit, & quonam pacto ſeſe alteruter ad alterum habeant, dictum eſt.

CAPVT VI.

Ventorum ſitus, natura, & complexiones.

DE ventorum autem ſitu, qui quibus aduerſentur, quos ſimul flare contingat, & quos non, tum etiam qui & quot ſint: adhæc de cæteris affectibus qui in Problematis particularibus dicti non ſunt, nunc agendum. Situs rationem ex deſcriptione contemplari oportet. Deſcribatur igitur, vt res ipſa clarior euadat, horizon circulus, & proinde rotundus. Intelligendum autem eſt alterum ipſius ſegmentum, quod ſub nobis eſt, habitari. nam & id ipſum ad eundem diuidere modum licebit. Supponatur autem primò, quæ plurimùm diſtant loco, loco contraria eſſe: quomodo quæ ſpecie plurimùm diſtant, ſpecie contraria ſunt. Diſtant autem plurimùm loco, quæ per dimetientem lineam è regione poſita ſunt. Sit igitur a, occidens æquinoctialis: b verò ei ex aduerſo reſpondens, oriens æquinoctialis. Sitque alia diameter quæ hanc ad rectos ſecet angulos: cuius pars altera quæ eſt g, ſit vrſa, altera è regione aduerſa, quæ eſt h, meridies. Item f, æſtiuus exortus: e, æſtiuus occaſus. Porrò d, hybernus exortus: c, hybernus occaſus. Ducatur autem diameter ab f, & c: item à d, ad e. Cùm igitur quæ plurimùm diſtant loco, contraria loco ſint, plurimùm autem diſtant quæ per diametrum: neceſſariò fit vt flatuum hi inter ſe contrarij ſint, quicunque per diametrum diſpoſiti ſunt. Flatus autem ipſi, iuxta locorum poſitum vocari hoc pacto ſolent. ab a, Fauonius. nam a, occidens æquinoctialis exiſtit. à b Subſolanus, huic contrarius. nam b, oriens æquinoctialis eſt. à g, Aquilo & Septentrio: quippe cùm hac in parte vrſa ſit. ab h Auſter, huic contrarius. nam & vnde ſpirat, meridies eſt: & h, & g, contraria ſunt, cùm per diametrum diſtent. ab f Cæcias. nam f æſtiuus exortus exiſtit. Contrarius autem ei eſt, non qui ab e ſpirat, ſed qui à c, nempe Africus. nam Africus ab occaſu brumali mittitur. hic autem illi contrarius eſt: nam ab eo per diametrum diſtat. à d Vulturnus: quippe qui ab exortu brumali venit, atque Auſtro vicinus eſt.

A ἐπεὶ περὶ τὴν ἔξω Λιβύης θάλατταν τὴν νοτίαν, ὥσπερ ἐνταῦθα οἱ βορέαι καὶ οἱ νότοι πνέουσιν, οὕτως ἐκεῖ εὖροι καὶ ζέφυροι διαδεχόμενοι συνεχεῖς ἀεὶ πνέουσιν. ὅτι μὲν οὖν ὁ νότος οὐκ ἔστιν ἀπὸ τοῦ ἑτέρου πόλου πνέων ἄνεμος, δῆλον. ἐπεὶ δ᾽ οὔτ᾽ ἐκεῖνος, οὔτε ὁ ἀπὸ χειμερινῆς τροπῆς· δέοι γὰρ ἂν ἄλλον ἀπὸ θερινῆς εἶναι τροπῆς· οὕτω γὰρ τὸ ἀνάλογον ἀποδώσει. νῦν δ᾽ οὐκ ἔστιν. εἷς γὰρ* μόνος φαίνεται πνέων ἐκ τῶν ἐκεῖθεν τόπων. ὥστ᾽ ἀνάγκη τὸν ἀπὸ τοῦ κατακεκαυμένου τόπου πνέοντα ἄνεμον εἶναι νότον. ἐκεῖνος δ᾽ ὁ τόπος διὰ τὴν τοῦ ἡλίου γειτνίασιν, οὐκ ἔχει ὕδατα καὶ νομάς, αἳ διὰ τὴν* πῆξιν ποιήσουσιν ἐτησίας. ἀλλὰ διὰ τὸ τὸν τόπον εἶναι πολὺ πλείω ἐκεῖνον καὶ B ἀναπεπταμένον, μείζων, καὶ πλείων καὶ μᾶλλον ἀλεεινὸς ἄνεμος ὁ νότος ἐστὶ τοῦ βορέου· καὶ διήκει μᾶλλον δεῦρο, ἢ οὗτος ἐκεῖ. τίς μὲν οὖν αἰτία τούτων ἐστὶ τῶν ἀνέμων, καὶ πῶς ἔχουσι πρὸς ἀλλήλους, εἴρηται.

* γρ. μόνον

* γρ. τάξιν

ΚΕΦΑΛ. ϛʹ.

Περὶ τῆς τῶν ἀνέμων θέσεως, καὶ τίνες εἰσὶν ἐναντίοι, καὶ ποίους ἅμα πνεῖν ἐνδέχεται καὶ ποίους οὔ. καὶ πόσοι τυγχάνουσιν ὄντες, καὶ περὶ ἄλλων τινῶν παθημάτων αὐτῶν, καὶ τῆς ἑκάστου φύσεως.

ΠΕρὶ δὲ θέσεως αὐτῶν, καὶ τίνες ἐναντίοι εἰσί, καὶ ποίους ἅμα πνεῖν ἐνδέχεται, καὶ ποίους οὔ· ἔτι δὲ τίνες καὶ πόσοι τυγχάνουσιν ὄντες καὶ πρὸς τούτοις περὶ τῶν ἄλλων C παθημάτων ὅσα μὴ συμβέβηκεν ἐν τοῖς προβλήμασιν εἰρῆσθαι τοῖς κατὰ μέρος, νῦν λέγωμεν. δεῖ δὲ περὶ τῆς θέσεως ἅμα τοῖς λόγοις ἐκ τῆς ὑπογραφῆς θεωρεῖν. Γέγραπται μὲν οὖν, τοῦ μᾶλλον εὐσήμως ἔχειν, ὁ τοῦ ὁρίζοντος κύκλος· διὸ καὶ στρογγύλος. δεῖ δὲ νοεῖν αὐτοῦ τὸ ἕτερον ἔκτμημα τὸ ὑφ᾽ ἡμῶν οἰκούμενον· ἔσται γὰρ κἀκεῖνο διελεῖν τὸν αὐτὸν τρόπον. ὑποκείσθω δὲ πρῶτον ἐναντία κατὰ τόπον εἶναι, τὰ πλεῖστον ἀπέχοντα κατὰ τόπον ὥσπερ κατ᾽ εἶδος ἐναντία, τὰ πλεῖστον ἀπέχοντα κατὰ τὸ εἶδος. πλεῖστον δ᾽ ἀπέχει κατὰ τόπον τὰ κείμενα πρὸς ἄλληλα κατὰ διάμετρον. ἔστω οὖν, τὸ μὲν ἐφ᾽ οὗ α, δυσμὴ ἰσημερινή· ἐναντίος δὲ τούτῳ τόπος, ἐφ᾽ οὗ τὸ β, ἀνατολὴ D ἰσημερινή· ἄλλη δὲ διάμετρος ταύτην πρὸς ὀρθὴν τέμνουσα, ἧς τὸ ἐφ᾽ οὗ η, ἔστω ἄρκτος· τούτῳ δ᾽ ἐναντίον ἐξ ἐναντίας, τὸ ἐφ᾽ οὗ θ, μεσημβρία· τὸ δ᾽ ἐφ᾽ οὗ ζ, ἀνατολὴ θερινή· τὸ δὲ ἐφ᾽ οὗ ε, δυσμὴ θερινή· τὸ δὲ ἐφ᾽ οὗ δ, ἀνατολὴ χειμερινή· τὸ δὲ ἐφ᾽ οὗ γ, δυσμὴ χειμερινή. ἀπὸ δὲ τοῦ ζ, ἤχθω διάμετρος ἐπὶ τὸ γ, καὶ ἀπὸ τοῦ δ ἐπὶ τὸ ε. ἐπεὶ οὖν τὰ μὲν πλεῖστον ἀπέχοντα κατὰ τόπον, ἐναντία κατὰ τόπον· πλεῖστον δ᾽ ἀπέχει τὰ κατὰ διάμετρον· ἀναγκαῖον καὶ τῶν πνευμάτων ταῦτα ἀλλήλοις ἐναντία εἶναι, ὅσα κατὰ διάμετρόν ἐστι. καλεῖται δὲ κατὰ τὴν θέσιν τῶν τόπων τὰ πνεύματα E ὧδε· ζέφυρος μὲν ἀπὸ τοῦ α. τοῦτο γὰρ δυσμὴ ἰσημερινή. ἐναντίος δὲ τούτῳ ἀπηλιώτης ἀπὸ τοῦ β· τοῦτο γὰρ ἀνατολὴ ἰσημερινή. βορέας δὲ καὶ ἀπαρκτίας ἀπὸ τοῦ η· ἐνταῦθα γὰρ ἡ ἄρκτος. ἐναντίος δὲ τούτῳ νότος, ἀπὸ τοῦ θ· μεσημβρία τε γὰρ αὕτη ἀφ᾽ ἧς πνεῖ· καὶ τὸ θ, τῷ η ἐναντίον· κατὰ διάμετρον γάρ. ἀπὸ δὲ τοῦ ζ, Καικίας· αὕτη γὰρ ἀνατολὴ θερινή· ἐναντίος γὰρ οὐχ ὁ ἀπὸ τοῦ ε πνέων, ἀλλ᾽ ὁ ἀπὸ τοῦ γ λίψ· οὗτος γὰρ ἀπὸ δυσμῆς χειμερινῆς πνεῖ· ἐναντίος γὰρ τούτῳ· κατὰ διάμετρον γὰρ κεῖται. ὁ δὲ ἀπὸ τοῦ δ εὖρος· οὗτος γὰρ ἀπ᾽ ἀνατολῆς χειμερινῆς πνεῖ, γειτνιῶν τῷ νότῳ.

διὸ καὶ πολλάκις εὐρόνοτοι λέγονται πνεῖν. ἐναντίος δὲ τούτῳ οὐχ ὁ ἀπὸ τοῦ η λίψ, ἀλλ' ὁ ἀπὸ τοῦ ε, ὃν καλοῦσιν οἱ μὲν Ἀργέστην, οἱ δὲ Ὀλυμπίαν, οἱ δὲ Σκίρωνα. οὗτος γὰρ ἀπὸ δυσμῆς θερινῆς πνεῖ, καὶ κατὰ διάμετρον αὐτῷ κεῖται μόνος. οὗτοι μὲν οὖν οἱ κατὰ διάμετρόν τε κείμενοι ἄνεμοι, καὶ οἷς εἰσὶν ἐναντίοι. ἕτεροι δ' εἰσί, καθ' οὓς οὐκ ἔστιν ἐναντία πνεύματα. ἀπὸ μὲν γὰρ τοῦ ι, ὃν καλοῦσι Θρασκίαν· οὗτος γὰρ μέσος Ἀργέστου καὶ Ἀπαρκτίου. ἀπὸ δὲ τοῦ κ, ὃν καλοῦσι * Μέσην· οὗτος γὰρ μέσος Καικίου καὶ Ἀπαρκτίου. ἡ δὲ * τοῦ κ ι διάμετρος, βούλεται μὲν κατὰ τὸν διὰ παντὸς εἶναι φαινόμενον, οὐκ ἀκριβοῖ δέ. ἐναντία δὲ τούτοις οὐκ ἔστι τοῖς πνεύμασιν, οὔτε τῷ Θρασκίᾳ, οὔτε τῷ Μέσῃ· ἔπνει γὰρ ἄν τις ἐφ' οὗ τὸ μ. τοῦτο γὰρ κατὰ διάμετρον σημεῖον· οὔτε τῷ ι, τῷ Θρασκίᾳ· ἔπνει γὰρ ἂν ἀπὸ τοῦ ν. τοῦτο γὰρ κατὰ διάμετρον τὸ σημεῖον, εἰ μὴ ἀπ' αὐτοῦ, καὶ ἐπ' ὀλίγον πνεῖ τις ἄνεμος, ὃν καλοῦσιν οἱ περὶ τὸν τόπον ἐκεῖνον, Φοινικίαν. Τὰ μὲν οὖν κυριώτατα καὶ διωρισμένα πνεύματα ταῦτά ἐστι, καὶ τοῦτον τέτακται τὸν τρόπον. τοῦ δὲ εἶναι πλείους ἀνέμους ἀπὸ τῶν πρὸς ἄρκτον τόπων, ἢ τῶν πρὸς μεσημβρίαν, αἴτιον, τό, τε τὴν οἰκουμένην ὑποκεῖσθαι πρὸς τοῦτον τὸν τόπον, καὶ ὅτι πολλῷ πλεῖον ὕδωρ καὶ χιὼν ἀπωθεῖται εἰς τοῦτο τὸ μέρος, διὰ τὸ ἐκεῖνα ὑπὸ τὸν ἥλιον εἶναι, καὶ τὴν ἐκείνου φοράν· ὧν τηκομένων εἰς τὴν γῆν, καὶ θερμαινομένων ὑπὸ τοῦ ἡλίου καὶ * τῆς γῆς, ἀναγκαῖον πλείω καὶ ἐπὶ πλείω τόπον γίγνεσθαι τὴν ἀναθυμίασιν * δι' αὐτὴν τὴν αἰτίαν. ἔστι δὲ τῶν εἰρημένων πνευμάτων, Βορέας μέν, ὅ, τε Ἀπαρκτίας κυριώτατα, καὶ Θρασκίας κοινὸς Ἀργέστου καὶ Μέσου· ὁ δὲ Καικίας κοινὸς Ἀπηλιώτου καὶ Βορέου· Νότος δέ, ὅ, τε ἰθαγενὴς ὁ ἀπὸ μεσημβρίας καὶ Λίψ· Ἀπηλιώτης δέ, ὅ, τε ἀπ' ἀνατολῆς ἰσημερινῆς, καὶ ὁ Εὖρος· ὁ δὲ Φοινικίας, κοινός· Ζέφυρος δέ, ὅ, τε ἰθαγενής, καὶ ὁ Ἀργέστης καλούμενος· ὅλως δὲ τὰ μὲν Βόρεια τούτων καλεῖται, τὰ δὲ Νότια. προστίθεται δὲ τὰ μὲν Ζεφυρικὰ τῷ Βορέᾳ· ψυχρότερα γὰρ διὰ τὸ ἀπὸ δυσμῶν πνεῖν. τῷ δὲ Νότῳ τὰ Ἀπηλιωτικά· θερμότερα γὰρ τῷ ἀπὸ ἀνατολῆς πνεῖν. διωρισμένων οὖν τῷ ψυχρῷ καὶ θερμῷ καὶ ἀλεεινῷ τῶν πνευμάτων, οὕτως ἐκάλεσαν. θερμότερα δὲ τὰ ἀπὸ τῆς ἕω τῶν ἀπὸ δυσμῆς, ὅτι πλείω χρόνον ὑπὸ τὸν ἥλιόν ἐστι τὰ ἀπ' ἀνατολῆς. * τὰ δ' ἀπὸ δυσμῆς, ἀπολείπει τε θᾶττον, καὶ πλησιάζει τῷ τόπῳ ὀψιαίτερον. οὕτω δὲ τεταγμένων τῶν ἀνέμων, δῆλον ὅτι ἅμα πνεῖν τοὺς μὲν ἐναντίους οὐχ οἷόν τε· κατὰ διάμετρον γάρ. ἅτερος οὖν παύσεται ἀποβιασθείς· τοὺς δὲ μὴ οὕτω κειμένους πρὸς ἀλλήλους οὐθὲν κωλύει· οἷον τὸ ζ καὶ δ. καὶ διὰ τοῦτο ἅμα πνέουσιν ἐνίοτε ἀμφότεροι οὔριοι, ἐπὶ τὸ αὐτὸ σημεῖον, οὐκ ἐκ τοῦ αὐτοῦ, οὐδὲ τῷ αὐτῷ πνεύματι· κατὰ δὲ τὰς ὥρας τὰς ἐναντίας οἱ ἐναντίοι μάλιστα πνέουσιν· οἷον περὶ ἰσημερίαν, τὴν μὲν ἐαρινὴν Καικίας, καὶ ὅλως τὰ ἐπέκεινα τροπῆς θερινῆς· περὶ δὲ τὴν μετοπωρινὴν οἱ Λίβες· περὶ δὲ τροπὰς θερινὰς μέν, Ζέφυρος, χειμερινὰς δ' Εὖρος. ἐπιπίπτουσι δὲ τοῖς ἄλλοις μάλιστα καὶ παύουσιν Ἀπαρκτίαι, καὶ Θρασκίαι, καὶ Ἀργέσται, διὰ τὸ ἐγγυτάτω τὴν ὁρμὴν αὐτῶν εἶναι. πολλοί τε καὶ ἰσχυροὶ πνέουσι μάλιστα οὗτοι· διὸ καὶ αἰθριώτατοί εἰσι τῶν ἀνέμων.

* γρ. Μέσεω
* γρ. τοῦ κ διάμ.
* γρ. τὴν γῆν.
* γρ. διὰ ταύτην
* γρ. τῶν δ.

A ob idque ſæpenumero Euronoti aſpirare dicuntur. Huic autem aduerſatur non qui à c, nomine Africus, ſed qui ab e ſpirare ſolet: quem alij Argeſtem, Olympiam alij, alij Seirona vocant. hic enim ab occaſu æſtiuo adflat, & ſolus Vulturno per diametrum reſpondet. Igitur venti, tum qui per diametrum diſpoſiti ſunt, tum qui contrarios obtinent, hi ſunt. Sunt item alij, quibus contrarij flatus nulli ſunt. Ab i, quem Thraſciam nuncupant: is enim media regione inter Corum & Septentrionem ſpirat. à k, quem Meſen vocant: hic enim inter Septentrionem & Cæciam eſt. Cæterùm diameter k, iuxta polum ſemper conſpectum eſſe ſolet, non tamen exactè ſub eo exiſtit. His autem flatibus contrarij nulli ſunt, B Meſæ videlicet (nam à puncto m ſpiraret aliquis. id enim per diametrum diſtat) atque Thraſciæ. flaret enim à puncto n: quippe cùm id ex aduerſo respondeat. Niſi ab eo puncto veniat, & non longè progrediatur quidam ventus, quem accolæ Phœnician vocant. Venti igitur principaliſſimi definitiq; hi ſunt, atque hoc digeri ordine aſſolent. Cur autẽ à ſeptentrionali plaga plures venti quàm de partibus meridianis prodeãt, cauſa eſt, quòd pars orbis terræ habitata, ad ſeptentriones poſita eſt: quódC que in eam partem plus aquarum & niuis, quàm auſtrinam, propterea quòd hæc ſub ſole atque eius curſu iacet, depellitur, quibus in terram liqueſcentibus, & à ſole ac terra incaleſcentibus, neceſſariò accidit vt exhalatio amplior & quæ latiùs diffundi queat, hac eadem de cauſa oriatur. Sunt autem è flatibus, quos iam diximus, Septentrio & Thraſcias principaliſſimè, Meſes, & Aquilo: Cæcias verò Subſolani & Aquilonis communis habetur. qui à meridie ſpirat, & Africus, Auſter. qui ab æquinoctiali exortu mittitur, atque Vulturnus, Subſolanus: Phœnicias verò, communiter ad Subſolanum & Auſtrum pertinet. Qui ab occaſu, & is quem Græci Argeſten, noſtri Corum vocant, Fauonius. D Omnino autem ex hiſce alij Aquilonij, Auſtrini alij nuncupari ſolent. Fauoniani aquiloni tribuuntur. frigidiuſculi enim ſunt, quòd ab occaſu veniãt. Subſolanij, auſtro. nam calidiuſculi ſunt, propterea quòd ab exortu aſpirant. Sumpta igitur à frigore & calore ac æſtu differentia, ſpiritus ad hunc nominarunt modum. ab ortu autem flantes calidiores ſunt ab occaſu flantibus. quia ſol diutiùs ſupra illos fertur, hos verò citiùs deſerit, tardiúſque eum ad locum accedit. Ventis hunc in modum diſpoſitis, conſtat fieri non poſſe vt aduerſi ſimul ſpirent. nam per dimetientem diſtant. Alter igitur alterius vi preſſus ceſſabit. At qui non ita fronte aduerſa E poſiti ſunt, eos ſimul flare nihil obſtat, vt f & d. atque ob id nonnunquam ſecundi ambo ad idem ſignum ſimul flare, non eodem ex loco, nec flatu eodem ſolent. Porrò contrariis temporibus flatus contrarij maximè ſpirant. Verbi cauſa, circa æquinoctium vernum Cæcias, & omnino qui vltra æſtiuum tropicum collocati ſunt: circa autumnale, Africus. Item circa ſolſtitium æſtiuum, Fauonius: circa hybernum, Vulturnus. Incidunt autem in alios maximè, atque compeſcunt, Septentrio, Thraſcias, & Corus: propterea quòd è propinquo veniunt. Quinetiam hi omnium maximè crebri ac validi ſpirare ſolent, & proinde inter reliquos maximè liquidi & illuſtres exiſtunt.

Nam cùm de prope maximè ſpirent, vi ſua reliquos flatus ſternunt, & diſcuſſis nubibus quæ coaleſcere cœperant, cœlum ſudum apertúmque reddunt. niſi fortè etiam impendiò frigidi ſint, tunc autem ſereni non ſunt. Nam ſi frigidi magis quàm vehementes fuerint, priùs nubes gelu indurant, quàm vt eas repellere poſſint. at Cæcias ſerenus nō eſt, quòd in ſe reflectatur: vnde & illud prouerbium dici ſolet: Vt Cæcias nubem, perinde ad ſe trahens. Porrò pro ſolis diſcurſu viciſſitudo ſpirituum agi, ipſis in ſibi proximos tranſeuntibus aſſolet: propterea quòd id quod primordio contiguum eſt, mouetur à ſole potiſſimùm: initium verò flatuum, vt ſol ambit. Flatus autem contrarij, aut idem, aut contrarium efficiunt. verbi gratia: humidi, Africus & Cæcias, quem aliqui vocant Helleſpontiam: ſicci, Corus & Vulturnus, quem Subſolanum. hic inter initia ſiccus eſt, ad poſtremum aquam mittit. niualis Meſes, & Septentrio maximè: nam hi frigidiſſimi ſunt. Grandines Septentrio importat, & Thraſcias, & Corus. Æſtuoſi Auſter, Fauonius & Vulturnus. Nubibus obducunt cœlum, denſioribus Cæcias, rarioribus Africus. Cæcias, quia & in ſe reciprocatur ac redit, & Aquilonis & Vulturni communis eſt. Quare, quia algidus eſt, vaporem compingendo nubes conſtituit. quia verò ratione loci Subſolanus eſt, multum materiæ ac vaporis quem propellat, habet. Sereni, Septentrio, Thraſcias, & Corus. Cauſa dicta priùs eſt. Fulgura præ cæteris aduehunt & hi quos diximus, & Meſes. Nam quia haudquaquam de longè veniunt, frigidi ſunt. Frigoris autem opera fulgur gignitur: coeuntibus ſiquidem nubibus excerni aſſolet. Quocirca & ex his ipſis nonnulli grandinem afferunt. citò enim in glaciem aquam vertunt. Procellæ autem (hoc eſt, venti, qui excuſſi nubibus ſæuiūt, Ecnephias Græci vocant) autumno maximè, mox vere, & præcipuè Septentrio, Thraſcias & Corus fieri ſolent. Cauſa verò, quòd procellæ potiſſimùm fiunt, cùm aliis flantibus ventis alij ingruunt. Id quod iſti maximè facere ſolent. cauſa etiam huiuſce rei antea dicta eſt. Porrò flatus anniuerſarij (qui vocantur à Græcis Eteſiæ) tranſire apud Occidentalis plagæ incolas ex Septentrionalibus in Thraſcias Coros & Fauonios (Septentrio nanque Fauonius eſt) conſueuere, incipientes ab vrſa, deſinentes autem in eos qui longè abſunt. Apud Orientaleis ad Subſolanum vſque ambire ſolent.

Sed de ventis, & primaria eorum generatione & eſſentia, atque affectibus tam priuatis quàm communibus, hactenus.

CAPVT VII.

Tres de terræ motu opiniones.

DE concuſſione autem ac motu terræ poſt hæc agèdum. Nam huiuſce affectionis cauſa huic eidem generi hæret. Quæ autē de eo ad hoc vſque temporis tradita ſunt, tria numero ſunt, & à totidem autoribus prodita. Nam Anaxagoras Clazomenius, & ante eum Anaximenes Mileſius, & poſt vtrunque Democritus Abderita, de terræmotu diſſeruere. Anaxagoras igitur, ætherem, qui ſurſum ferri aptiſſimus eſt, cùm ſe in venas & cauernas terræ condit, motitare terram affirmat. Nam ſuperas telluris partes coaleſcere imbriū beneficio aſſerit.

A πνέοντες γὰρ ἐγγύθεν μάλιστα ἀποβιαζόμενοι τἆλλα πνεύματα παύουσι, καὶ ἀποφυσῶντες τὰ συνιστάμενα νέφη, ποιοῦσιν αἰθρίας, ἂν μὴ ψυχροὶ σφόδρα τύχωσιν ἅμα ὄντες. τότε δ' οὐκ αἴθριοι· ἂν γὰρ ὦσι μᾶλλον ψυχροὶ ἢ μεγάλοι, φθάνουσι πηγνύντες ἢ προωθοῦντες. ὁ δὲ Καικίας οὐκ αἴθριος, ὅτι ἀνακάμπτει εἰς αὐτὸν ὅθεν καὶ λέγεται ἡ παροιμία, Ἕλκων ἐφ' αὐτὸν ὥσπερ Καικίας νέφος. αἱ δὲ μεταστάσεις γίνονται αὐτῶν καταπαυομένων εἰς τοὺς ἐχομένους κατὰ τὴν τοῦ ἡλίου μετάστασιν, διὰ τὸ κινεῖσθαι μάλιστα τὸ ἐχόμενον τῆς ἀρχῆς. ἡ δὲ ἀρχὴ οὕτω κινεῖται τῶν πνευμάτων, ὡς ὁ ἥλιος. οἱ ἐναντίοι δὲ, ἢ ταὐτὸ B ποιοῦσιν, ἢ ἐναντίον, οἷον ὑγροὶ, Λὶψ καὶ Καικίας, ὃν Ἑλλησποντίαν ἔνιοι καλοῦσι· καὶ Εὖρος, ὃν Ἀπηλιώτην. ξηροὶ δ' Ἀργέστης καὶ Εὖρος. ἀρχόμενος δ' οὗτος ξηρός· τελευτῶν δὲ, ὑδατώδης. νιφετώδης δὲ Μέσης καὶ Ἀπαρκτίας μάλιστα· οὗτοι γὰρ ψυχρότατοι. χαλαζώδης δ' ὁ Ἀπαρκτίας, καὶ Θρασκίας καὶ Ἀργέστης· καυματώδης δὲ Νότος, καὶ Ζέφυρος, καὶ Εὖρος. νέφεσι δὲ πυκνοῦσι τὸν οὐρανὸν, Καικίας μὲν σφόδρα, Λὶψ δ' ἀραιοτέροις· Καικίας μὲν διά τε τὸ ἀνακάμπτειν πρὸς αὐτὸν, καὶ διὰ τὸ κοινὸς εἶναι Βορέου καὶ Εὔρου. ὥστε διὰ μὲν τὸ ψυχρὸς εἶναι πηγνὺς τὸν ἀτμίζοντα ἀέρα, εἰς νέφη συνίστησι· διὰ δὲ τὸ τῷ τόπῳ C Ἀπηλιωτικὸς εἶναι, ἔχει πολλὴν ὕλην καὶ ἀτμίδα ἣν προωθεῖ. αἴθριοι δὲ, Ἀπαρκτίας, Θρασκίας, Ἀργέστης· ἡ δ' αἰτία εἴρηται πρότερον. *ἀστραπὰς δὲ ποιοῦσι μάλιστα οὗτοί τε καὶ ὁ Μέσης· διὰ μὲν γὰρ τὸ *ἐγγύθεν πνεῖν, ψυχροί εἰσι· διὰ δὲ τὸ ψυχρὸν, ἀστραπὴ γίνεται. ἐκκρίνεται γὰρ συνιόντων τῶν νεφῶν. διὸ καὶ ἔνιοι τῶν αὐτῶν τούτων, χαλαζώδεις εἰσί· ταχὺ γὰρ πηγνύουσιν. ἐκνεφίαι δὲ γίνονται μετοπώρου μὲν μάλιστα, εἶτ' ἔαρος, καὶ μάλιστα Ἀπαρκτίας, καὶ Θρασκίας, καὶ Ἀργέστης. αἴτιον δ', ὅτι οἱ ἐκνεφίαι γίνονται μάλιστα, ὅταν *ἄλλων ἐκπνεόντων ἐμπίπτωσιν ἕτεροι· οὗτοι δὲ μάλιστα ἐμπίπτουσι τοῖς ἄλλοις πνέουσιν. D ἡ δ' αἰτία εἴρηται καὶ τούτου πρότερον. οἱ δ' ἐτησίαι περιΐστανται τοῖς μὲν περὶ δυσμὰς οἰκοῦσιν, ἐκ τῶν Ἀπαρκτίων εἰς Θρασκίας, Ἀργέστας, καὶ Ζεφύρους· ὁ γὰρ Ἀπαρκτίας Ζέφυρός ἐστιν· ἀρχόμενοι μὲν ἀπὸ τῆς ἄρκτου, τελευτῶντες δὲ εἰς τοὺς πόρρω. τοῖς δὲ πρὸς ἕω περιΐστανται μέχρι τοῦ Ἀπηλιώτου.

* γρ. ἀστραπὰς δὲ μ. τ.
* γρ. ἐκεῖθεν
* γρ. τῶν μὲν ἄλ.

Περὶ μὲν οὖν ἀνέμων, τῆς τε ἐξ ἀρχῆς αὐτῶν γενέσεως, καὶ οὐσίας, καὶ τῶν συμβαινόντων κοινῇ καὶ καθ' ἕκαστον παθημάτων, τοσαῦθ' ἡμῖν εἰρήσθω.

ΚΕΦΑΛ. ζ'.

E Περὶ σεισμοῦ, τὰ Ἀναξαγόρᾳ καὶ Δημοκρίτῳ καὶ Ἀναξιμένει δεδογμένα.

ΠΕρὶ δὲ σεισμοῦ καὶ κινήσεως γῆς μετὰ ταῦτα λεκτέον. ἡ γὰρ αἰτία τοῦ πάθους ἐχομένη τούτου τοῦ γένους ἐστίν. ἔστι δὲ τὰ παρειλημμένα μέχρι γε τοῦ νῦν χρόνου τρία, καὶ παρὰ τριῶν. Ἀναξαγόρας τε γὰρ ὁ Κλαζομένιος, καὶ πρότερον Ἀναξιμένης ὁ Μιλήσιος ἀπεφήναντο, καὶ τούτων *ὕστερος Δημόκριτος ὁ Ἀβδηρίτης. Ἀναξαγόρας μὲν οὖν φησι τὸν αἰθέρα πεφυκότα φέρεσθαι ἄνω, ἐμπίπτοντα δ' εἰς τὰ κάτω τῆς γῆς καὶ τὰ κοῖλα, κινεῖν αὐτήν· τὰ μὲν γὰρ ἄνω συναλείφεσθαι διὰ τοὺς ὄμβρους·

* γρ. ὕστερον

ἐπεὶ φύσει γε πᾶσαν ὁμοίως εἶναι σομφὴν, ὡς ὄντος τοῦ μὲν ἄνω, τοῦ δὲ κάτω τῆς ὅλης σφαίρας· καὶ ἄνω μὲν τούτου ὄντος τοῦ μορίου, * ἐφ' ᾧ τυγχάνομεν οἰκοῦντες, κάτω δὲ θατέρου. πρὸς μὲν οὖν ταύτην τὴν αἰτίαν οὐθὲν ἴσως * δεῖ λέγειν, ὡς λίαν ἁπλῶς εἰρημένην. τό, τε γὰρ ἄνω καὶ τὸ κάτω νομίζειν οὕτως ἔχειν, ὥστε μὴ πρὸς τὴν γῆν πάντη φέρεσθαι τὰ βάρος ἔχοντα τῶν σωμάτων, ἄνω δὲ τὰ κοῦφα καὶ τὸ πῦρ, εὔηθες· καὶ ταῦθ', * ὁρῶντας τὸν ὁρίζοντα τὴν οἰκουμένην ὅσην ἡμεῖς ἴσμεν, ἕτερον ἀεὶ γιγνόμενον, μεθισταμένων, ὡς οὔσης κυρτῆς καὶ σφαιροειδοῦς· καὶ τὸ λέγειν μὲν ὡς διὰ τὸ μέγεθος ἐπὶ τοῦ ἀέρος μένει, σείεσθαι δὲ φάσκειν τυπτομένην κάτωθεν ἄνω δι' ὅλης. πρὸς δὲ τούτοις, οὐθὲν ἀποδίδωσι τῶν συμβαινόντων περὶ τοὺς σεισμούς· οὔτε γὰρ χῶραι, οὔτε ὧραι αἱ τυχοῦσαι μετέχουσι τούτου τοῦ πάθους. Δημόκριτος δέ φησι, πλήρη τὴν γῆν ὕδατος οὖσαν, καὶ πολὺ δεχομένην ἕτερον ὄμβριον ὕδωρ, ὑπὸ τούτου κινεῖσθαι· πλείονός τε γὰρ γινομένου, διὰ τὸ μὴ δύνασθαι δέχεσθαι τὰς κοιλίας ἀποβιαζόμενον ποιεῖν τὸν σεισμόν· καὶ ξηραινομένην, καὶ ἕλκουσαν εἰς τοὺς κενοὺς τόπους ἐκ τῶν πληρεστέρων τὸ μεταβάλλον ἐμπῖπτον κινεῖν. Ἀναξιμένης δέ φησι βρεχομένην τὴν γῆν καὶ ξηραινομένην ῥήγνυσθαι, καὶ ὑπὸ τούτων τῶν ἀπορρηγνυμένων κολωνῶν ἐμπιπτόντων σείεσθαι· διὸ καὶ γίγνεσθαι τοὺς σεισμοὺς ἔν τε τοῖς αὐχμοῖς, καὶ πάλιν ἐν ταῖς ἐπομβρίαις. ἔν τε γὰρ τοῖς αὐχμοῖς, ὥσπερ εἴρηται, ξηραινομένην ῥήγνυσθαι, καὶ ὑπὸ τῶν ὑδάτων ὑπερυγραινομένην διαπίπτειν. ἔδει δὲ τούτου συμβαίνοντος ὑπονοστοῦσαν πολλαχοῦ φαίνεσθαι τὴν γῆν. ἔτι δὲ διὰ τίν' αἰτίαν περὶ τόπους τινὰς πολλάκις γίνεται τοῦτο τὸ πάθος, οὐθεμιᾷ διαφέροντας ὑπερβολῇ τοιαύτῃ παρὰ τοὺς ἄλλους; καίτοι ἔχρην. ὅλως δὲ τοῖς οὕτως ὑπολαμβάνουσιν ἀναγκαῖον ἧττον ἀεὶ τοὺς σεισμοὺς φάναι γίγνεσθαι, καὶ τέλος παύσασθαί ποτε σειομένην· τὸ γὰρ σαττόμενον τοιαύτην ἔχει φύσιν. ὥστ' εἰ τοῦτ' ἀδύνατον, δῆλον ὅτι ἀδύνατον καὶ ταύτην εἶναι τὴν αἰτίαν.

* κ. ἐφ' ᾧ τ.
* γρ. οὔπω δ.
* κ. ὁρῶντα

A quandoquidem natura totam ſimiliter fungoſam laxámque eſſe terram prędicat: perinde quaſi totius pilæ pars altera ſupera, altera infera ſit: ac ſupera, in qua habitamus: infera, altera. Verùm aduerſus hanc cauſam, tanquam parum admodum conſideratè dictam, nihil dicere fortaſſe congruit. Nam ſtultum eſt arbitrari ſurſum ac deorſum ita habere, vt non corpora grauia ad terram vndique ferantur, & leuia ac ignis in ſuperum concedant locum: idque cùm cernamus circulum illum, quo pars orbis terrarum habitata, quanta nobis cognita eſt, definitur, nobis locum ex loco mutãtibus diuerſum ſubinde fieri, quia terra gibboſa ſit, & in ſphærę faciem conglobetur. B Dicere quoque ratione magnitudinis ſuſpenſam librari medio aëris tellurem: quati verò, cùm ab imo ſurſum versùs vi percuſſionis, quę per totam meet, impellitur. Præterea nihil meminerunt eorum quæ circa terræ motus contingere ſolent. non enim regiones quæuis, aut tempora, id ſentiũt affectionis. Democritus autem, terram cùm aqua referta eſt, & multam inſuper pluuiam aquã recipit, ab ea moueri dicit. nam vt quæ amplior aduenit vim afferendo, propterea quòd cauernis capi non poteſt, terram quatere: ita quæ locum demutat, atque aliò transfertur, irrumpendo terram agitare quæ aſſiccetur, atque è locis plenioribus in vacua trahat, aſſerit. Anaximenes verò, terram tam C cùm madet quàm cùm reſiccatur, rumpi, & ab hiſce fragmentis ingentibus quę incidere ſolent, quati dicit. Ideóque terræmotus per ſqualores, & rurſum tempore pluuio fieri. nam tellurem (vti diximus) per ſqualores ſiccẽtem rumpi, & per imbreis ab aquis præterea madefactam incidere affirmat. At ſi hoc accidat, humum refugere in ſeſe, pleriſq; in locis cerni oportuit. Præterea quam ob cauſam hæc affectio quibuſdam in locis ſæpenumero fieri ſolet, quæ ab aliis nullo tali exceſſu diſſident? Atqui ea diſſidere oportuit. Denique neceſſe eſt vt qui ita exiſtimant, ſemper minùs terræmotum fieri, tandemque aliquando terram quati deſituram dicant. quod enim decutitur, talem obtinet naturam. D Quare ſi id fieri nequeat, perſpicuum eſt fieri non poſſe vt terræmotus cauſa eiuſmodi habeatur.

ΚΕΦΑΛ. η'.

Περὶ σεισμῶν τὴν ἰδίαν δηλοῖ δόξαν, τίς τε ἡ φύσις αὐτῶν, καὶ διὰ τίνα αἰτίαν γίνονται· καὶ περὶ τῶν ἄλλων τῶν συμβαινόντων περὶ αὐτούς.

Ἀλλ' ἐπεὶ φανερὸν ὅτι ἀναγκαῖον καὶ ἀπὸ ὑγροῦ καὶ ἀπὸ ξηροῦ γίγνεσθαι ἀναθυμίασιν, ὥσπερ εἴπομεν ἐν τοῖς πρότερον, ἀνάγκη τούτων ὑπαρχόντων γίγνεσθαι τοὺς σεισμούς· ὑπάρχει γὰρ ἡ γῆ καθ' αὑτὴν μὲν ξηρά, διὰ δὲ τοὺς ὄμβρους, ἔχουσα ἐν αὑτῇ νοτίδα πολλήν· ὥσθ' ὑπό τε τοῦ ἡλίου καὶ τοῦ ἐν αὑτῇ πυρὸς θερμαινομένης, πολὺ μὲν ἔξω, πολὺ δ' ἐντὸς γίνεσθαι τὸ πνεῦμα· καὶ τοῦτο ὁτὲ μὲν συνεχὲς ἔξω ῥεῖ πᾶν· ὁτὲ δ' εἴσω πᾶν· ἐνίοτε δὲ καὶ μερίζεται. εἰ δὴ τοῦτ' ἀδύνατον ἄλλως ἔχειν, τὸ μετὰ τοῦτο σκεπτέον ἂν εἴη, ὁποῖον κινητικώτατον ἂν εἴη τῶν σωμάτων· ἀνάγκη γὰρ τὸ ἐπὶ πλεῖστόν τε πεφυκὸς ἰέναι καὶ σφοδρότατον, μάλιστα τοιοῦτον εἶναι. σφοδρότατον μὲν οὖν ἐξ ἀνάγκης τὸ τάχιστα φερόμενον· * τύπτει γὰρ μάλιστα διὰ τὸ τάχος.

* γρ. πνεῦσαι μὲν γὰρ

CAPVT VIII.

Terræmotus cauſæ & accidentia, itémque exhalationis ſigna.

Verùm cùm conſtet neceſſarium eſſe, vt ab humido & à ſicco halitus prodeat, id quod antea diximus: neceſſariò fit vt hiſce in rerum natura exiſtentibus terra intremiſcat. E Nam terra per ſe quidẽ arida exiſtit, at ratione imbriũ multũ in ſe continet humoris: adeo vt cùm ipſa tam feruore ſolis quàm ſuo incaleſcit, multũ ſpiritus intra extráque gignatur. Atque is interdum quidem extrà totus continenter effluit, interdum autem intrò influit, nonnunquam verò & in parteis diſtribui ſolet. Itaque ſi hoc aliter habere nequeat, quod conſequens eſt, conſiderandum fuerit, nempe qualénam ex omni corporum numero vim mouendi præcipuam obtineat. Neceſſe eſt enim, vt id quod longiſſimè progredi natum eſt, atque vehementiſſimum exiſtit, potiſſimùm tale ſit. Quod igitur celerrimè fertur, id neceſſariò vehementiſsimum exiſtit: quippe cùm præ celeritate maximè percutiat.

Quod verò tranſire per totum maximè poteſt, id longiùs progredi aptum eſt. eiuſmodi autem eſt, quod tenuiſſimum eſt. Quare ſi natura ſpiritus talis ſit, omnium corporum maximè ſpiritus facultatem obtinet mouendi. Etenim ignis vbi ſpiritui admiſcetur, fit flamma, atque celeriter fertur. Igitur neque aqua neque terra cauſa tremoris eſſe poteſt, ſed ſpiritus, vbi ſcilicet quod extrà exhalat, intrò fluit. Vnde fit vt plurimi maximique terræmotus cœlo tranquillo fiant. nam exhalatio quæ continens ac perpetua exiſtit, vtplurimum initij motum ſectari ſolet. quare tota ſimul aut intrò aut extrà contendit. Quod autem aliqui terræmotus flante etiam vento fiant, nihil abſurdum (nam interdum plureis ventos ſimul flare videmus: quorum vbi alter terram ſubierit, terræmotus ſpirante vento accidet) minores tamen euadunt hi, propterea quòd eorum cauſa atque principium diuiſum diſtractúmque ſit. Porrò noctu ſæpius validiúſque terra quatitur. Cùm autem interdiu, id circa meridiem accidere ſolet. nam vt plurimùm meridies partium diei tranquilliſſima exiſtit. quippe ſol cùm maximè euincit, exhalationem in terram diſſoluere ſolitus eſt. euincit autem maximè circa meridiem. Item noctes diebus tranquilliores, propter ſolis abſentiam exiſtunt. Quare rurſum intrò ſpiritus influit: quomodo aquarum influxus in contrariam atque effluxus partem fieri aſſolet. Et propinqua luce creberrimè. etenim ſpiritus tunc incipere flare nati ſunt. Si ergo flatuum initium intrò Euripi more commigret, propter copiam validiſſimum excitat terræmotum. Præterea validiſſimi terræmotus circa ea loca fiunt, vbi mare fluidum eſt, aut regio fungoſa eſt, atque ſubterraneis cauernis abundat. Quamobrem & circa Helleſpontum, Achaiam, Siciliam, & Eubœam, tellus vehementiſſimè quatitur. nam circa ea loca mare, terram fiſtulis veluti quibuſdam ſubire videtur. Quocirca & calidæ balneæ, quæ circa Ædepſum poſitæ ſunt, à tali cauſa prouenere. Circa prædicta autem loca terræmotus maximè fiunt ob anguſtiã. Nam ſpiritus vehementior factus qui profectò è terra efflare natus erat, in terram rurſum propelli, ob occurrentis maris copiam aſſolet. Atque regiones omnes quæ ſubterraneas parteis inaneis atque fiſtuloſas obtinent, cùm magnam ſpiritus copiam admittant, crebriùs mouentur. Et autumno ac vere maximè, item per imbreis & ſqualores haud alia de cauſa fiunt. Hæc enim inter anni tempora flatuoſiſſima ſunt. Nam æſtas & hyems, aëris immobilitatem: hæc rigoris cauſa, illa æſtus, aduehunt. etenim hyems, perquam algida eſt: æſtas, impendio arida. Atque per ſqualores aër ſpirantior eſt. nam tum demum ſqualor eſt, cùm ſiccus terræ halitus humido copioſior exultat. Tempore autem pluuio terra quatitur, tum quia exhalatio in terra amplior reddi ſolet: tum quia talis ſecretio vt loco anguſtiore capitur, ita minorem in locum protrudi, repletis nimirum aqua terræ cauernis, aſſolet. Cùm enim vincere cœperit, propterea quòd licet ampla ſit, in exiguum tamẽ locum impacta eſt, tum ventus fluens, ac terræ ſeſe applicans, eam validè motitat. Noſſe enim oportet, vt noſtro in corpore flatus incluſi vis tam tremorum quàm pulſuum cauſa exiſtit: ita & in ipſa quoque terra flatum ſimiles præſtare effectus: atque è terræ motibus alium eſſe veluti tremorem, alium veluti pulſum. Et qualia per corpus ſæpe contingere reddita vrina ſolent,

A ἐπὶ* πλεῖστον δὲ πέφυκε διιέναι τὸ διὰ παντὸς ἰέναι μάλιστα δυνάμενον. τοιοῦτον δὲ τὸ λεπτότατον. ὥστ᾽ εἴπερ ἡ τοῦ πνεύματος φύσις τοιαύτη, μάλιστα τῶν σωμάτων τὸ πνεῦμα κινητικόν· καὶ γὰρ τὸ πῦρ ὅταν μετὰ πνεύματος ᾖ, γίγνεται φλόξ, καὶ φέρεται ταχέως. οὐκ ἂν οὖν ὕδωρ, οὐδὲ γῆ αἴτιον εἴη, ἀλλὰ πνεῦμα τῆς κινήσεως, ὅταν ἔσω τύχῃ ῥυὲν τὸ ἔξω ἀναθυμιώμενον. διὸ γίγνονται νηνεμίᾳ οἱ πλεῖστοι καὶ μέγιστοι τῶν σεισμῶν. συνεχὴς γὰρ οὖσα ἡ ἀναθυμίασις, ἀκολουθεῖ ὡς ἐπὶ τὸ πολὺ τῇ ὁρμῇ τῆς ἀρχῆς· ὥστε ἢ ἔσω ἅμα, ἢ ἔξω ὁρμᾷ πᾶσα. τὸ δὲ ἐνίους γίνεσθαι σεισμούς, καὶ πνεύματος ὄντος, οὐδὲν ἄλογον· ὁρῶμεν γὰρ ἐνίοτε B ἅμα πλείους πνέοντας ἀνέμους· ὧν ὅταν εἰς τὴν γῆν ὁρμήσῃ θάτερον, ἔσται πνεύματος ὄντος ὁ σεισμός. ἐλάττους δὴ οὗτοι τὸ μέγεθος γίγνονται, διὰ τὸ διῃρῆσθαι τὴν ἀρχὴν καὶ τὴν αἰτίαν αὐτῶν. καὶ νύκτωρ δὲ οἱ πλείους καὶ μείζους γίγνονται τῶν σεισμῶν· οἱ δὲ τῆς ἡμέρας περὶ μεσημβρίαν· νηνεμώτατον γάρ ἐστιν ὡς ἐπὶ τὸ πολὺ τῆς ἡμέρας ἡ μεσημβρία· ὁ γὰρ ἥλιος ὅταν μάλιστα κρατῇ, *κατακλείει τὴν ἀναθυμίασιν εἰς τὴν γῆν· κρατεῖ δὲ μάλιστα περὶ τὴν μεσημβρίαν· καὶ αἱ νύκτες δὲ τῶν ἡμερῶν νηνεμώτεραι διὰ τὴν ἀπουσίαν τὴν τοῦ ἡλίου· ὥστε εἴσω γίγνεται πάλιν ἡ ῥύσις, ὥσπερ ἄμπωτις, εἰς τοὐναντίον τῆς ἔξωθεν C πλημμυρίδος· καὶ πρὸς ὄρθρον μάλιστα· τηνικαῦτα γὰρ καὶ τὰ πνεύματα πέφυκεν ἄρχεσθαι πνεῖν. ἐὰν οὖν εἴσω τύχῃ μεταβάλλουσα ἡ ἀρχὴ αὐτῶν, ὥσπερ Εὔριπος, διὰ τὸ πλῆθος ἰσχυρότερον ποιεῖ τὸν σεισμόν. ἔτι δὲ περὶ τόπους τοιούτους οἱ ἰσχυρότατοι γίνονται τῶν σεισμῶν, ὅπου ἡ θάλασσα ῥοώδης, ἢ ἡ χώρα σομφὴ καὶ ὕπαντρος. διὸ καὶ περὶ τὸν Ἑλλήσποντον, καὶ περὶ Ἀχαΐαν καὶ Σικελίαν, καὶ τῆς Εὐβοίας περὶ τούτους τοὺς τόπους. δοκεῖ γὰρ διαυλωνίζειν ὑπὸ τὴν γῆν ἡ θάλαττα. διὸ καὶ τὰ θερμὰ τὰ περὶ Αἴδηψον ἀπὸ τοιαύτης αἰτίας γέγονε. περὶ δὲ τοὺς εἰρημένους τόπους οἱ σεισμοὶ γίνονται μάλιστα διὰ τὴν στενότητα· τὸ γὰρ D ῥεῦμα γινόμενον σφοδρόν, διὰ τὸ πλῆθος τῆς θαλάττης πολλῆς προσφερομένης, ἀπωθεῖται πάλιν εἰς τὴν γῆν, τό γε πεφυκὸς ἀποπνεῖν* ἀπὸ τῆς γῆς. αἵ τε χῶραι ὅσαι σομφοὺς ἔχουσι τοὺς κάτω τόπους, πολὺ δεχόμεναι πνεῦμα, σείονται μᾶλλον. καὶ ἔαρος δέ, καὶ μετοπώρου μάλιστα, καὶ ἐν ἐπομβρίαις καὶ αὐχμοῖς γίνονται διὰ τὴν αὐτὴν αἰτίαν· αἱ γὰρ ὧραι αὗται πνευματωδέσταται· τὸ γὰρ θέρος καὶ ὁ χειμών, τὸ μὲν διὰ τὸν πάγον, τὸ δὲ διὰ τὴν ἀλέαν ποιεῖ τὴν ἀκινησίαν· τὸ μὲν γὰρ* ἄγαν ψυχρόν, τὸ δ᾽ ἄγαν ξηρόν ἐστι. καὶ ἐν μὲν τοῖς αὐχμοῖς, πνευματώδης ὁ ἀήρ· τοῦτο γὰρ αὐτό ἐστιν ὁ αὐχμός, ὅταν πλείων ἡ ἀναθυμίασις ξηρὰ E γίνηται τῆς ὑγρᾶς· ἐν δὲ ταῖς ἐπομβρίαις, πλείω τε ποιεῖ τὴν ἐντὸς ἀναθυμίασιν, καὶ τῷ ἐναπολαμβάνεσθαι ἐν στενοτέροις τόποις, καὶ ἀποβιάζεσθαι εἰς ἐλάττω τόπον τὴν τοιαύτην ἀπόκρισιν, πληρουμένων τῶν κοιλιῶν τῆς γῆς ὕδατος. ὅταν γὰρ ἄρξηται κρατεῖν διὰ τὸ πολὺ εἰς ὀλίγον πιληθεῖσαι τόπον, ἰσχυρῶς κινεῖ ῥέον ὁ ἄνεμος καὶ προσπίπτων. δεῖ γὰρ νοεῖν, ὅτι ὥσπερ ἐν τῷ σώματι ἡμῶν, καὶ τρόμων καὶ σφυγμῶν αἴτιόν ἐστιν ἡ τοῦ πνεύματος* ἐναπολαμβανομένου δύναμις, οὕτω καὶ ἐν τῇ γῇ τὸ πνεῦμα παραπλήσια ποιεῖν· καὶ τὸν μὲν τῶν σεισμῶν οἷον τρόμον εἶναι, τὸν δ᾽ οἷον σφυγμόν. καὶ καθάπερ συμβαίνει πολλάκις μετὰ τὴν οὔρησιν,

* γ. πλεῖστον

* γ. κατακλείει

* γ. ἐκ τῆς γ.

* γ. ἄγαν θερμὸν τὸ ξηρόν ἐστι.

* γ. ἐναπολαμβανομένου.

(διὰ τοῦ σώματος γὰρ γίνεται ὥσπερ τρόμος τις, ἀντιμεθισταμένου τοῦ πνεύματος ἔξωθεν εἴσω ἀθρόου) τοιαῦτα γίνεσθαι καὶ περὶ τὴν γῆν. ὅσην δ' ἔχει τὸ πνεῦμα δύναμιν, οὐ μόνον ἐκ τῶν ἐν τῷ ἀέρι δεῖ θεωρεῖν γιγνομένων· ἐν τούτῳ μὲν γὰρ διὰ τὸ μέγεθος ὑπολάβοι τις ἂν τοιαῦτα δύνασθαι ποιεῖν· ἀλλὰ καὶ ἐν τοῖς σώμασι τοῖς τῶν ζώων. οἵ τε γὰρ τέτανοι καὶ οἱ σπασμοὶ πνεύματος μέν εἰσι κινήσεις, τοσαύτην δ' ἔχουσιν ἰσχύν, ὥστε πολλοὺς ἅμα πειρωμένους ἀποβιάζεσθαι, μὴ δύνασθαι κρατεῖν τῆς κινήσεως τῶν ἀρρωστούντων. τὸ αὐτὸ δεῖ νοεῖν τὸ τοιοῦτον γινόμενον καὶ ἐν τῇ γῇ, ὡς εἰκάσαι πρὸς μικρὸν* μεῖζον. σημεῖα δὲ τούτων καὶ πρὸς τὴν ἡμετέραν αἴσθησιν πολλαχοῦ γέγονεν· ἤδη γὰρ σεισμὸς ἐν τόποις τισὶ γινόμενος, οὐ πρότερον ἔληξε, πρὶν ἐκρήξας εἰς τὸν ὑπὲρ τῆς γῆς τόπον, φανερῶς ὥσπερ ἐκνεφίας ἐξῆλθεν ὁ κινήσας ἄνεμος· οἷον καὶ περὶ Ἡράκλειαν ἐγένετο, τὴν ἐν τῷ Πόντῳ, νεωστί, καὶ πρότερον περὶ τὴν Ἱερὰν νῆσον· αὕτη δ' ἐστὶ μία τῶν Αἰόλου καλουμένων νήσων. ἐν ταύτῃ γὰρ ἐξανῳδεῖ τι τῆς γῆς, καὶ ᾔει λοφώδης ὄγκος μετὰ ψόφου· τέλος δὲ ῥαγέντος, ἐξῆλθε πνεῦμα πολύ, καὶ τὸν φέψαλον καὶ τὴν τέφραν* ἀνήνεγκε, καὶ τήν τε Λιπαραίων πόλιν οὖσαν οὐ πόρρω, πᾶσαν κατετέφρωσε, καὶ εἰς ἐνίας τῶν ἐν Ἰταλίᾳ πόλεων ἦλθε· καὶ νῦν ἔτι ὅπου τὸ ἀναφύσημα τοῦτο ἐγένετο, δῆλόν ἐστι. καὶ γὰρ δὴ τοῦ γινομένου πυρὸς ἐν τῇ γῇ ταύτην οἰητέον εἶναι τὴν αἰτίαν, ὅταν κοπτόμενος ἐκπρησθῇ πρότερον εἰς μικρὰ κερματισθέντος τοῦ ἀέρος. τεκμήριον δ' ἐστὶ τοῦ ῥεῖν ὑπὸ τὴν γῆν τὰ πνεύματα, καὶ τὸ γινόμενον περὶ ταύτας τὰς νήσους· ὅταν γὰρ ἄνεμος μέλλῃ πνευσεῖσθαι νότος, προσημαίνει πρότερον· ἠχοῦσι γὰρ οἱ τόποι, ἐξ ὧν γίνεται τὰ ἀναφυσήματα, διὰ τὸ τὴν θάλατταν μὲν προωθεῖσθαι ἤδη πόρρωθεν, ὑπὸ δὲ ταύτης τὸ ἐκ τῆς γῆς ἀναφυσώμενον ἀπωθεῖσθαι πάλιν εἴσω, ᾗπερ ἐπέρχεται ἡ θάλαττα ταύτῃ. ποιεῖ δὲ ψόφον ἄνευ σεισμοῦ, διά τε τὴν εὐρυχωρίαν τῶν τόπων· ὑποχεῖται γὰρ εἰς τὸ ἀχανὲς ἔξω· καὶ δι' ὀλιγότητα τοῦ ἀπωθουμένου ἀέρος. ἔτι δὲ γίνεσθαι τὸν ἥλιον ἀχλυώδη καὶ ἀμαυρότερον ἄνευ νέφους, καὶ πρὸ τῶν ὀρθρίων σεισμῶν ἐνίοτε, νηνεμίαν τε καὶ κρύος ἰσχυρόν, σημεῖον τῆς εἰρημένης αἰτίας ἐστί· τόν τε γὰρ ἥλιον ἀχλυώδη καὶ ἀμαυρὸν ἀναγκαῖον εἶναι, ὑπονοστεῖν ἀρχομένου τοῦ πνεύματος εἰς τὴν γῆν, τοῦ διαλύοντος τὸν ἀέρα καὶ διακρίνοντος, καὶ πρὸς τὴν ἕω, καὶ περὶ τοὺς ὄρθρους, νηνεμίαν τε καὶ ψῦχος. τὴν μὲν γὰρ νηνεμίαν ἀναγκαῖον ὡς ἐπὶ τὸ πολὺ συμβαίνειν, καθάπερ * εἴρηται καὶ πρότερον, οἷον ἀντιρροίας εἴσω γινομένης τοῦ πνεύματος. καὶ μᾶλλον πρὸ τῶν μειζόνων σεισμῶν· μὴ διασπώμενον γὰρ τὸ μὲν ἔξω, τὸ δ' ἐντός, ἀλλ' ἀθρόον φερόμενον, ἀναγκαῖον ἰσχύειν μᾶλλον. τὸ δὲ ψῦχος συμβαίνει διὰ τὸ τὴν ἀναθυμίασιν εἴσω ἀποτρέπεσθαι, φύσει θερμὴν οὖσαν καθ' αὑτήν. οὐ δοκοῦσι δ' οἱ ἄνεμοι εἶναι θερμοὶ διὰ τὸ κινεῖν τὸν ἀέρα πλήρη ψυχρᾶς ὄντα καὶ πολλῆς ἀτμίδος, ὥσπερ τὸ πνεῦμα τὸ διὰ τοῦ στόματος φυσώμενον· καὶ γὰρ τοῦτο ἐγγύθεν μέν ἐστι θερμόν, ὥσπερ καὶ ὅταν* ἀάζωμεν· ἀλλὰ δι' ὀλιγότητα οὐχ ὁμοίως ἐπίδηλον. πόρρωθεν δὲ ψυχρόν, διὰ τὴν αὐτὴν αἰτίαν τοῖς ἀνέμοις.* ὑπολιπούσης οὖν εἰς τὴν γῆν τῆς τοιαύτης δυνάμεως, συνιοῦσα διὰ ὑγρότητα ἡ ἀτμιδώδης* ἀπόρροια ποιεῖ τὸ ψῦχος·

* χ. μεῖζον.

* χ. ἀνῆκε.

* Sup. cap. 5.

* χ. ἀάζωμεν. perperam. vide Probl. ſect. 34. 7

* χ. ἐκλιπούσης.

* χ. ἀπόῤῥοια.

A (ſit enim veluti tremor quidam, nimirum vniuerſo ſpiritu extrinſecus intrò ſeſe condente) talia etiam circa terrā fieri. Sed quantas ſpiritus vireis habeat non ſolùm ex hiſce quæ in aere fiunt contemplari oportet (nam hìc ſpiritum ſua magnitudine talia committere poſſe exiſtimauerit quiſpiam) verùm etiam ex hiſce quæ in corporibus animantium fieri ſolent. Nam & conuulſiones & diſtentiones neruorum, ſpiritus motiones ſunt: tantum autem roboris habent, vt etiamſi multi ſimul conentur allata vi reprimere ægrotantium motum, tamen euincere nequeant.* Idem in terra quoque ipſa fieri (vt rem magnam paruæ conferam) intel-
B ligendum eſt. Harum autem rerum indicia, vel ad oculum pleriſque in locis facta fuêre. Iam enim motus terræ quibuſdam in locis factus, non antè deſiit, quàm ventus ille qui permouerat facta eruptione in locum terra ſublimiorem, apertè procellæ modo exierit. Id quod etiam circa Heracleam Ponti nuper accidit: & priùs circa Hieram inſulam, quæ vna eſt ex iis quas Æolias inſulas appellitant: in hac enim pars terræ intumeſcebat aſſurgebátque cum ſono in tumuli ſpeciem: quo tandem diſrupto multum ſpiritus prodiit, qui ſcintillam cineremque ſuſtulit, ac Liparæorum vrbem (quæ haud procul aberat) totam in cineres redegit, & ad quaſdam Italiæ vrbes acceſ-
C ſit. atque iſto etiamnum tempore vbi illa ignium euomitio contingit, apertum eſt. Etenim hanc eſſe cauſam ignium, qui in terra fieri ſolent, arbitrandum eſt: nempe ſpiritus colliſi incenſionem, diſcerpto priùs in exigua fruſta aëre. Quòd autem ſpiritus ſub terram fluant, argumento velid eſſe poteſt, quod circa haſce inſulas fieri ſolet. Cùm enim flaturus eſt auſter, priùs quàm cœperit,* denuntiat: nam loca ea è quibus illæ flammarum eructationes fiunt, reſonare ſolent: quòd è longinquo propelli iam mare cœperit, & ab eo id quod è terra efflaturum erat, rurſum intrò compellatur. Quà autem mare accedit, hac ſonum
D ſine motu facit, tum propter locorum amplitudinem (nam intro ſubiens in immenſum diffunditur) tum propter aëris repulſi exiguitatem. Præterea ſolis caligo & obſcuritas ſine nube perueniens, & venti tranquillitas atque frigus acre, quæ nonnunquam ante matutinos terræ motus accidere ſolent, cauſæ prædictæ indicio ſunt. Nam & ſolem caliginoſum obſcurúmque fieri, & cùm dies inſtat atque diluculum appetit, tranquillitatem atque frigus oboriri, incipiente condi in venas terræ ſpiritu, qui vim diſſoluendi diſcernendique aërem obtinet, neceſſum eſt. Quandoquidem trāquillitas parte plurima (quemadmodum etiam priùs diximus) accidit: quia
E ſpiritus intro veluti refluit. Et magis ante maiuſculos motus. nam cùm ſpiritus non partim intrò, partim extra diſtrahitur, ſed vniuerſam terram ſubit, neceſſariò plus roboris ac virium habere ſolet. frigus verò, propterea quòd exhalatio quæ per ſe ſuapte natura calida eſt, intrò conuertitur. Non videntur autem venti eſſe calidi, perinde vt neq; ſpiritus ille qui per eos efflari ſolet: quoniam aërem mouent, qui vapore frigido eóque multo refertus eſt. Is enim è propinquo quidē calidus eſt: qualis etiam eſt cùm exhalamus, verùm propter exiguitatem non æquè percipi poteſt. è longinquo verò frigidus, eadem qua venti cauſa. Deficiente igitur in terram tali virtute, vapida effluxio humiditatis ratione coiens, frigus importat

A In quibus locis eiuſmodi affectum fieri contingit. Hæc eadem etiam cauſa eſt & eius ſigni quod nonnunquam præcedere motu futuro conſueuit. aut enim interdiu, aut paulo poſt occaſum ſereno, ceu tenuis linea nubis in longum porrecta ſpatium viſitur: nimirum langueſcente ſpiritu propter demigrationem. Nec abſimile in ipſo quoque mari circa littora euenit. nam cùm mare fluctuoſum exundat, fluctus qui in littore frangi ſolent, admodum craſſi & obliqui reddũtur. cùm verò ſopitum eſt, propter exiguam ſecretionem, tenues ac recti. Quod igitur mare circa terram, id flatus circa caliginem quæ in aere eſt, efficit, adeò vt cùm cœlum tranquillum fuerit, nubes quæ velvti fluctus aëris exiſtit, modis B omnibus recta tenuiſque relinquatur. Hac eadem etiam de cauſa nonnumquam accidit, vt circa lunæ defectus terra quatiatur. Cùm enim iam terræ obiectus inſtat, & nondum prorſus lumen defecit, nec calor à ſole profectus ab aëre receſſit, ſed emarceſcere cœpit, tranquillitas oboritur, commigrante in terram ſpiritu, qui ante lunæ defectus motum terræ committit (nam venti quoque ſæpe ante lunæ defectus excitantur) initio quidem noctis, cùm defectus medio incipit noctis: medio verò, cùm mane. Id autem euenire propterea ſolet, quòd calor lunæ hebetatur, cùm curſus iam proximè eſt quo defectus exultet. Remiſſo C itaque calore quo retentus aër quieſcit, rurſum moueri ac ſpiritus reddi pro defectionis tarditate, tardiùs incipit. Cùm autem validus terræ extiterit motus, nec illico, nec funditus quatere deſinit, quinimmo non ante quadraginta dies ſiſtitur. plerumque & tardiùs, vtpote cùm quidam annuo & biennij ſpatio circa eadem loca vigeat duretque. Porro tam ſpiritus multitudo quàm forma cauernarum vel cuniculi per quem meat, magnitudinis terræ motus cauſa exiſtit. Qua enim ſpiritus reſultat, nec facilè penetrare poteſt, & maximè quatit, & in ſpecuum anguſtiis intercludatur aquæ modo quæ pertranſire non poteſt, neceſſariũ D exiſtit. Quocirca vt in corpore pulſus non repentè, nec ſubitò ſedari, ſed paulatim elangueſcente affectione ſolent: ita nec origo ipſa, à qua exhalatio prodiit. Quin in aperto quoque eſt ſpiritus delationem non protinus omnem abſumpſiſſe materiam, ex qua ventum illum concreauit, quem σεισμὸν, hoc eſt, terræ motum nuncupamus. Quoad igitur quantum ſpirituum ſupereſt, inſumptum ſit, terram quati, ſed leuiùs, & eò vſque dum id quod exhalat minus ſit, quàm vt ingenuè mouere queat, neceſſe eſt. Porro ſpiritus ſonos eos facit qui ſub terra fiunt, quique terræ motus præcedere ſolent. Quin & ſine motu iam alicubi ſub terra factus eſt ſonus. nam vt aër cùm flagellatur, E varios edit ſonos: ita etiam cùm ipſe percutit, multiplices ſonorum differentias affert. nihil enim intereſt, hoc an illo afficiatur modo: quippe cùm omne quod percutit, ſimul & ipſum percuti ſoleat. Præcedit verò motum ſonus: quoniam ſubtilis eſt, atque penetrare meliùs quàm ſpiritus poteſt. Cùm autem minor eſt quàm vt terra mouere propter ſuam tenuitatem queat, quia facilè percolatur tranſmittitúrque, mouere terram nequit: quia verò ferue contra ſolida cauáque corpora, & varias cauernarum figuras, varias edere voces aſſolet, adeò vt nonnunquam (id quod etiam portentorum ſcriptores aiunt) terra mugire videatur. Iam verò & aquę eruperunt, dum terra quateretur.

A ἐν οἷς συμβαίνει τόποις γίνεσθαι τοῦτο τὸ πάθος. τὸ δ' αὐτ' αἴτιον καὶ τοῦ εἰωθότος ἐνίοτε γίνεσθαι σημείου περὶ τοὺς σεισμούς· ἢ γὰρ μεθ' ἡμέραν, ἢ μικρὸν μετὰ δυσμάς, αἰθρίας οὔσης, νεφέλιον λεπτὸν φαίνεται διατεῖνον, καὶ μακρόν, οἷον γραμμῆς μῆκος εὐθύτητι διηκριβωμένον, τοῦ πνεύματος ἀπομαραινομένου διὰ τὴν μετάστασιν. τὸ δ' ὅμοιον συμβαίνει καὶ ἐν τῇ θαλάττῃ περὶ τοὺς αἰγιαλούς· ὅταν μὲν γὰρ κυμαίνουσα ἐκβάλλῃ, σφόδρα παχεῖαι καὶ σκολιαὶ γίνονται αἱ ῥηγμῖνες· ὅταν δὲ γαλήνη ᾖ, διὰ τὸ μικρὰν ποιεῖσθαι τὴν ἔκκρισιν, λεπταί εἰσι καὶ εὐθεῖαι. ὅπερ οὖν ἡ θάλαττα ποιεῖ περὶ τὴν γῆν, τοῦτο τὸ πνεῦμα περὶ τὴν ἐν B τῷ ἀέρι ἀχλύν. ὥσθ' ὅταν γένηται νηνεμία, πάμπαν εὐθεῖαν καὶ λεπτὴν καταλείπεσθαι, ὥσπερ ῥηγμῖνα οὖσαν ἀέρος τὴν νεφέλην. διὰ ταῦτα δὲ καὶ περὶ τὰς ἐκλείψεις ἐνίοτε τῆς σελήνης, συμβαίνει γίνεσθαι σεισμόν. ὅταν γὰρ ἤδη πλησίον ᾖ ἡ ἀντίφραξις, καὶ μήπω μὲν ᾖ παντελῶς ἀπολελοιπὸς τὸ φῶς, καὶ τὸ ἀπὸ τοῦ ἡλίου θερμὸν ἐκ τοῦ ἀέρος, ἤδη δ' ἀπομαραινόμενον, νηνεμία γίνεται, ἀντιμεθισταμένου τοῦ πνεύματος εἰς τὴν γῆν, ὃ ποιεῖ τὸν σεισμὸν πρὸ τῶν ἐκλείψεων. (γίνονται γὰρ καὶ ἄνεμοι πρὸ τῶν ἐκλείψεων πολλάκις) ἀκρόνυχοι μὲν πρὸ τῶν μεσονυκτίων ἐκλείψεων, μεσονύκτιοι δὲ πρὸ τῶν ἑῴων. C συμβαίνει δὲ τοῦτο, διὰ τὸ ἀμαυροῦσθαι τὸ θερμὸν τὸ ἀπὸ τῆς σελήνης, ὅταν πλησίον ἤδη γίγνηται ἡ φορὰ ἐν ᾧ γενομένων, ἔσται ἡ ἔκλειψις. ἀνιεμένου οὖν ᾧ κατείχετο ὁ ἀὴρ καὶ ἠρέμει, πάλιν κινεῖται καὶ γίγνεται πνεῦμα τῆς ὀψιαιτέρας ἐκλείψεως ὀψιαίτερον. ὅταν δ' ἰσχυρὸς γένηται σεισμός, οὐκ εὐθύς, οὐδ' εἰσάπαξ παύεται σείων· ἀλλὰ τὸ πρῶτον μὲν μέχρι περὶ τετταράκοντα σείει ἡμερῶν· ὕστερον δὲ καὶ ἐφ' ἕν, καὶ ἐπὶ δύο ἔτη ἐπισημαίνει κατὰ τοὺς αὐτοὺς τόπους. αἴτιον δὲ τοῦ μὲν μεγέθους, τὸ πλῆθος τοῦ πνεύματος, καὶ τῶν τόπων τὰ σχήματα δι' ὧν ἂν ῥυῇ. ᾗ γὰρ ἂν ἀντιτυπήσῃ, καὶ μὴ ῥᾳδίως διέλθῃ, μάλιστά τε σείει, καὶ ἐγκαταλείπεσθαι D ἀναγκαῖον ἐν ταῖς δυσχωρίαις, οἷον ὕδωρ οὐ δυνάμενον διεξελθεῖν. διὸ καθάπερ ἐν σώματι οἱ σφυγμοὶ οὐκ ἐξαίφνης παύονται, οὐδὲ ταχέως, ἀλλ' ἐκ προσαγωγῆς ἅμα καταμαραινομένου τοῦ πάθους, καὶ ἡ ἀρχὴ ἀφ' ἧς ἡ ἀναθυμίασις ἐγένετο, καὶ ἡ ὁρμὴ τοῦ πνεύματος, δῆλον ὅτι οὐκ εὐθὺς ἅπασαν ἀνάλωσε τὴν ὕλην, ἐξ ἧς ἐποίησε τὸν ἄνεμον, ὃν καλοῦμεν σεισμόν. ἕως ἂν οὖν ἀναλωθῇ τὰ ὑπόλοιπα τούτων, ἀνάγκη σείειν. * ἠρεμέστερον δὲ καὶ μέχρι τούτου, ἕως ἂν ἔλαττον ᾖ τὸ ἀναθυμιώμενον, ἢ ὥστε δύνασθαι κινεῖν ἐπιδήλως. ποιεῖ δὲ καὶ τοὺς ψόφους τοὺς ὑπὸ τὴν γῆν γινομένους τὸ πνεῦμα, καὶ τοὺς πρὸ τῶν E σεισμῶν. καὶ ἄνευ δὲ σεισμῶν, ἤδη που γεγόνασιν ὑπὸ τὴν γῆν· ὥσπερ γὰρ καὶ ῥαπιζόμενος ὁ ἀὴρ, παντοδαποὺς ἀφίησι ψόφους, οὕτως καὶ τύπτων αὐτός· οὐδὲν γὰρ διαφέρει· τὸ γὰρ τύπτον ἅμα καὶ αὐτὸ τύπτεται πᾶν. προέρχεται δ' ὁ ψόφος τῆς κινήσεως, διὰ τὸ λεπτομερέστερον εἶναι, καὶ μᾶλλον διὰ παντὸς ἰέναι τοῦ πνεύματος τὸν ψόφον. ὅταν δ' ἔλαττον ᾖ ἢ ὥστε κινῆσαι τὴν γῆν διὰ λεπτότητα, διὰ μὲν τὸ ῥᾳδίως διηθεῖσθαι, οὐ δύναται κινεῖν· διὰ δὲ τὸ προσπίπτειν στερεοῖς ὄγκοις καὶ κοίλοις, καὶ παντοδαποῖς σχήμασι, παντοδαπὰς ἀφίησι φωνάς· ὥστ' ἐνίοτε δοκεῖν, ὥσπερ λέγουσιν οἱ τερατολογοῦντες, μυκᾶσθαι τὴν γῆν. ἤδη δὲ καὶ ὕδατα ἀνερράγη γινομένων σεισμῶν·

* ἠρέμα καὶ ἧττον

ἀλλ' οὐ διὰ τοῦτο αἴτιον τὸ ὕδωρ τῆς κινήσεως, ἀλλ' ἂν ἢ ἐξ ἐπιπολῆς, ἢ κάτωθεν βιάζηται τὸ πνεῦμα, ἐκεῖνο τὸ κινοῦν ἐστιν, ὥσπερ τῶν κυμάτων οἱ ἄνεμοι, ἀλλ' οὐ τὰ κύματα τῶν ἀνέμων εἰσὶν αἴτια· ἐπεὶ καὶ τὴν γῆν οὕτως ἄν τις αἰτιῷτο τοῦ πάθους· ἀνατρέπεται γὰρ σειομένη, καθάπερ ὕδωρ. ἡ γὰρ ἔκχυσις ἀνάτρεψίς τίς ἐστιν. ἀλλ' αἴτια ταῦτα μὲν ἄμφω ὡς ὕλη· πάσχει γάρ, ἀλλ' οὐ ποιεῖ· τὸ δὲ πνεῦμα ὡς ἀρχή. ὅπου δ' ἅμα κῦμα σεισμῷ γέγονεν, αἴτιον, ὅταν ἐναντία γίγνηται τὰ πνεύματα. τοῦτο δὲ γίγνεται, ὅταν τὸ σεῖον τὴν γῆν πνεῦμα, φερομένην ὑπ' ἄλλου πνεύματος τὴν θάλατταν, ἀπῶσαι μὲν ὅλως μὴ δύνηται, προωθοῦν δὲ καὶ συστέλλον εἰς ταὐτόν, συναθροίσῃ πολλήν· τότε γὰρ ἀναγκαῖον ἡττηθέντος τούτου τοῦ πνεύματος, ἀθρόαν ὠθουμένην ὑπὸ τοῦ ἐναντίου πνεύματος ἐκρήγνυσθαι καὶ ποιεῖν τὸν κατακλυσμόν. ἐγένετο δὲ τοῦτο καὶ περὶ Ἀχαΐαν· ἔξω μὲν γὰρ ἦν νότος, ἐκεῖ δὲ Βορέας. νηνεμίας δὲ γενομένης, καὶ ῥυέντος εἴσω τοῦ ἀνέμου, ἐγένετο τό, τε κῦμα καὶ ὁ σεισμὸς ἅμα· καὶ μᾶλλον διὰ τὸ τὴν θάλατταν μὴ διδόναι διαπνοὴν τῷ ὑπὸ τὴν γῆν ὁρμηθέντι πνεύματι, ἀλλ' ἀντιφράττειν· ἀποβιαζόμενα γὰρ ἄλληλα, τὸ μὲν πνεῦμα τὸν σεισμὸν ἐποίησεν, ἡ δὲ ὑπόστασις τοῦ κύματος τὸν κατακλυσμόν. κατὰ μέρος δὲ γίγνονται οἱ σεισμοὶ τῆς γῆς, καὶ πολλάκις ἐπὶ μικρὸν τόπον· οἱ δ' ἄνεμοι οὐ κατὰ μέρος· κατὰ μέρος μέν, ὅταν αἱ ἀναθυμιάσεις αἱ κατὰ τὸν τόπον αὐτὸν καὶ τὸν γειτνιῶντα συνέλθωσιν εἰς ἕν, ὥσπερ καὶ τοὺς αὐχμοὺς ἔφαμεν γίγνεσθαι, καὶ τὰς ὑπερομβρίας τὰς κατὰ μέρος. καὶ οἱ μὲν σεισμοὶ γίγνονται διὰ τοῦτον τὸν τρόπον· οἱ δ' ἄνεμοι, οὔ. τὰ μὲν γὰρ ἐν τῇ γῇ τὴν ἀρχὴν ἔχει, ὥστ' ἐφ' ἕνα πάσας ὁρμᾶν· ὁ δ' ἥλιος οὐχ ὁμοίως δύναται, τὰς δὲ μετεώρους μᾶλλον, ὥστε * ῥεῖ, ὅταν ἀρχὴν λάβωσιν ἀπὸ τῆς τοῦ ἡλίου φορᾶς ἤδη κατὰ τὰς διαφορὰς τῶν τόπων ἐφ' ἕν. ὅταν μὲν οὖν ᾖ πολὺ τὸ πνεῦμα, κινεῖ τὴν γῆν, ὥσπερ ὁ τρόμος, ἐπὶ πλάτος μέν, γίγνεται δ' ὀλιγάκις καὶ κατά τινας τόπους, οἷον ὁ σφυγμός, ἄνω καὶ κάτωθεν· διὸ καὶ ἐλαττονάκις σείει τοῦτον τὸν τρόπον· οὐ γὰρ ῥᾴδιον οὕτω πολλὴν συνελθεῖν * ἀρχήν· ἐπὶ μῆκος γὰρ πολλαπλασία τῆς ἀπὸ τοῦ βάθους, ἡ διάκρισις. ὅπου δ' ἂν γένηται τοιοῦτος σεισμός, ἐπιπολάζει πλῆθος λίθων, ὥσπερ τῶν ἐν τοῖς λίκνοις ἀναβραττομένων· τοῦτον γὰρ τὸν τρόπον γενόμενος σεισμός, τὰ περὶ Σίπυλον ἀνέτρεψε, καὶ τὸ καλούμενον Φλεγραῖον πεδίον, καὶ τὰ περὶ τὴν Λιγυστικὴν χώραν. ἐν δὲ ταῖς νήσοις ταῖς ποντίαις ἧττον γίγνεται σεισμός, τῶν προσγείων. τὸ γὰρ πλῆθος τῆς θαλάττης καταψύχει τὰς ἀναθυμιάσεις, καὶ κωλύει τῷ βάρει, καὶ ἀποβιάζεται· ἔτι δὲ ῥεῖ, καὶ οὐ σείεται κρατουμένη ὑπὸ τῶν πνευμάτων. καὶ διὰ τὸ πολὺν ἐπέχειν τόπον, οὐκ εἰς ταύτην, ἀλλ' ἐκ ταύτης αἱ ἀναθυμιάσεις γίγνονται, καὶ ταύταις ἀκολουθοῦσιν αἱ ἐκ τῆς γῆς. αἱ δ' ἐγγὺς τῆς ἠπείρου νῆσοι, μόριόν εἰσι τῆς ἠπείρου· τὸ γὰρ μεταξὺ διὰ μικρότητα οὐδεμίαν ἔχει δύναμιν· τὰς δὲ πελαγίας οὐκ ἔστι κινῆσαι ἄνευ τῆς θαλάττης ὅλης, ὑφ' ἧς περιεχόμεναι τυγχάνουσι.

Περὶ μὲν οὖν σεισμῶν, καὶ τίς ἡ φύσις αὐτῶν, καὶ διὰ τίν' αἰτίαν γίγνονται, καὶ περὶ τῶν ἄλλων τῶν συμβαινόντων περὶ αὐτούς, εἴρηται σχεδὸν περὶ τῶν μεγίστων.

* γρ. ῥεῖν ἐφ' ἕν. quod mox ſequitur.

* γρ. τὴν ἀρχήν.

* γρ. Σίπυλον

A At nequaquam ob id aqua motionis cauſa exiſtit, ſed ſiue in ſumma telluris parte fit, ſiue ab imo vi ſpiritus efferatur, ſpiritus id eſt, quod mouet. quo modo venti, fluctuum, non fluctus, ventorum cauſæ ſunt. Quandoquidem vel ſic quiſpiam terram eſſe huiuſce affectionis cauſam dicere poſſet. Siquidem terra dũ quatitur, aquæ modo ſubuerti ſolet: aquæ namque effluxio, non niſi ſubuerſio quædam exiſtit. Verùm ambo iſthæc, terra inquam & aqua, cauſæ vt materies ſunt: patiuntur enim, non agunt; ſpiritus verò, vt principium. Vbi autem inundatio ſimul cum terræ motu accidit, ſpiritus ex aduerſo flãtes in cauſa ſunt. Id verò fit, cùm ſpiritus qui terram quatit, mare ab alio ſpiritu delatum repellere B nequit omnino: ſed propellendo ac in vnum contrahendo, magnam vim maris colligit: tunc enim hoc ſpiritu euicto, vniuerſum à cõtrario ſpiritu pulſum erumpere, ac diluuium facere neceſſe eſt. id quod circa ipſam quoque Achaiam accidit. Extra namque flabat Auſter, intra Aquilo. cùm autem facta fuit tranquillitas, & ventus intrò fluere cœpit, vna cum inundatione etiam terræ extitit motus. & eo præſertim, quòd mare nullum ſpiritui ſub terra debacchãti reſpiraculum, nullámque difflationem concedebat, immo obſtipabat interſepiebátque. nam ſe mutuò oppugnando ſpiritus motum terræ fecit, fluctus diluuiũ. Fiunt etiam particulares qui- C dam terræ motus, & plerumque non vltra paruum procedentes tractum: venti verò nulli. Particulares, inquam, cùm exhalationes proprij viciniquelo- ci in vnum coierint: quo modo ſqualores imbreiſque particulatim fieri diximus. Et quidem terræ motus ad hunc fieri modum ſolent, venti minimè. Nam ſubterranea principatum obtinent, vt ad locum vnum omnes contendant exhalationes. Sol verò non æquè facere poteſt vt omnes, ſed magis quæ ſuſpenſæ in aëre ſunt, cùm iam principium ſui curſus à ſole pro locorum differentia ceperint, in vnum fluant. Quoties igitur ſpiritus eſt multus, terram in latum tremoris inſtar mouet. Fit autem & quibuſdã in locis terræ motus, ſed raro, velvti pul- D ſus, cùm aſſurgens intumeſcit, alternóque motu reſidet. Quocirca & rariuſculè ad hunc quatit modũ. haud enim facilè fit, vt adeò multum coëat principium. quippe cùm exhalatio in lõgum multo plus, quàm in craſſitiem digeri ſoleat. Vbi autem motus terræ factus eſt eiuſmodi, copia lapidum eorum in morem qui in cribris emergunt, per ſumma telluris iacet. Siquidem terræ motu ad hunc modum facto, Sipylus, vocatus Phlegræus ager, & regio Liguſtica euerſa fuerunt. Porrò inſulæ procul in alto poſitæ, minùs quàm quæ continenti vicinæ ſunt, quati ſolent. Nam maris copia exhalationes refrigerat, nec non ſuo pondere obſtat quòminus quatiantur, E vimque infert. Prætereą mare flatibus euictum fluit, non quatitur. Item quia mare magnum occupat locum, haud ad hoc, ſed ex hoc veniunt exhalationes, quas quæ è terra oriuntur, comitari aſſolent. Inſulæ autem illæ quæ continenti vicinę ſunt, continentis portio ſunt, & proinde quati ſolent: quando mare, quod inſulas illas continentémque interiacet, præ ſua exiguitate vireis nullas habet. At quę ſunt in medio mari poſitę, nequaquam abſque toto mari quo ambiuntur, moueri poſſunt.

Igitur de terræ motibus, & quænam ſit eorum natura, & quam ob cauſam fiant, item de cæteris quæ circa ipſos accidunt, iiſque maximis, dictum eſt.

A

CAPVT IX.

De tonitru & fulgure opiniones aliquot veterum.

DE tonitru autem & fulgure, & inſuper de vortice, qui typhon vocatur, id eſt, vibratus: & turbine accenſo quem Græci preſtera nuncupant, & denique de fulminibus dicamus oportet. nam horum omnium idem eſſe principium exiſtimandum eſt. Cùm enim (vti diximus) duplex ſit exhalatio, altera humida, altera ſicca, cùmque ipſa concretio hæc ambo potentia habeat, & in nubem conſiſtat (quemadmodum dictum eſt) & inſuper cùm nubium conſtitutio apud ſupremum B finem denſior euadat (qua enim calor ſequeſtratus ſuperiorem in locum deficit, hac conſtitutionem denſiorem eſſe frigidioremque neceſſe eſt. quocirca & fulmina & procellæ, & omnia generis eiuſdem deorſum feruntur. atqui calidum omne in ſubl[illegible] ſuapte natura ſcandit. verùm expreſſionem fieri in contrariam denſitati partem, neceſſarium exiſtit: quo modo nuclei qui è digitis elabuntur, exprimi ſolent. hi enim quamuis pondus habeant, tamen ſurſum plerumque feruntur) calor profectò qui excernitur, in ſuperum ſpargi locum aſſolet. quantum autem aridæ exhalationis in mutatione frigeſcentis aëris intercipitur, id C coëuntibus nubibus excernitur. quod cùm vi feratur, & ambientibus nubibus incurrat, ictum facit, cuius ſonitus tonitru nuncupari ſolet. Efficitur autem ictus haud aliter (vt paruæ affectioni magnam conferam) quàm qui in flamma fit ſonus, quem alij Vulcani riſum, alij Veſtæ, nonnulli horum minas vocant. Fit autem, cùm exhalatio in flammam conuerſa, diſrumpentibus ſeſe lignis atque ſiccentibus exilit. Sic enim & ſpiritus ſecretio, quæ in ipſis nubibus fieri ſolet, cùm nubium denſitati ingruit, tonitru excitat. Varij autem ac multiformes ſoni fiunt, tum propter nubium inæqualitatem, tum propter cauernas, quę intermediæ ſunt, D qua denſitatis continentia deficit. Tonitru igitur id eſt, atque ex hac cauſa fit. Spiritus autem qui extinguitur, ferè cõflagrat tenui & imbecilli ardore. atque id eſt quod vocant fulgetrum, quo ceu tinctus excidens ſpiritus videri poteſt. Fit autem poſt ictum tonitruum, ſed priùs cerni quàm tonitruum audiri aſſolet. quoniam aſpectus auditum anteuertit. Id quod remigatio triremium declarat. cùm enim iam rurſum remos nautæ referunt, primus remigij ſonus ad aureis peruenit. Quanquam quidam aiunt, haudquaquam ignem intra nubes gigni. Hunc autem Empedocles quidem id eſſe inquit, quod è ſolis radiis intus circũuenitur coercetúrque. Anaxagoras verò, quod è ſuperno æthere, quem ille ignem vocat, deorſum è ſublimi de- E fertur. Itaque ſplẽdorem huiuſce ignis, fulgetrum: ſonitum verò atque ſtridorem quem facit, cùm intra nubes extinguitur, tonitru eſſe dicunt: tanquam, ſicut priùs fulgetrum fieri quàm tonitruum videtur, ita etiam priùs fiat. At illa ignis intercluſio vtroque quidem modo à ratione remota eſt, ſed magis ſuperni ætheris detractio. Nam dicenda cauſa eſt [illegible] quod rurſum ferri aptiſſimum eſt, deorſum feratur: & quamobrem id in cœlo fiat tantummodo cùm nubilum eſt. nec id tamen aſſiduè cùm ita eſt affectum: cœlo verò ſereno non fiat. ſiquidem illud leuiter dictum modis omnibus videtur.

ΚΕΦΑΛ. θʹ.

Περὶ ἀστραπῆς καὶ βροντῆς.

ΠΕρὶ δὲ ἀστραπῆς καὶ βροντῆς, ἔτι δὲ περὶ τυφῶνος, καὶ πρηστῆρος καὶ κεραυνῶν, λέγωμεν· καὶ γὰρ τούτων τὴν αὐτὴν ἀρχὴν* ὑπολαμβάνειν πάντων δεῖ. τῆς γὰρ ἀναθυμιάσεως, ὥσπερ εἴπομεν, οὔσης διττῆς, τῆς μὲν ὑγρᾶς, τῆς δὲ ξηρᾶς, καὶ τῆς συγκρίσεως ἐχούσης ἄμφω ταῦτα δυνάμει, καὶ συνισταμένης εἰς νέφος, ὥσπερ εἴρηται πρότερον· ἔτι δὲ πυκνοτέρας τῆς συστάσεως τῶν νεφῶν γιγνομένης πρὸς τὸ ἔσχατον πέρας· ᾗ γὰρ ἐκλείπει τὸ θερμὸν διακρινόμενον εἰς τὸν ἄνω τόπον, ταύτῃ πυκνοτέραν καὶ ψυχροτέραν ἀναγκαῖον εἶναι τὴν σύστασιν. διὸ καὶ οἱ κεραυνοί, καὶ οἱ ἐκνεφίαι, καὶ πάντα τὰ τοιαῦτα φέρεται κάτω· καίτοι πεφυκότος ἄνω τοῦ θερμοῦ* φέρεσθαι παντός, ἀλλ' εἰς τοὐναντίον τῆς πυκνότητος ἀναγκαῖον γίγνεσθαι τὴν ἔκθλιψιν· οἷον οἱ πυρῆνες οἱ ἐκ τῶν* δακτύλων πηδῶντες· καὶ γὰρ ταῦτα βάρος ἔχοντα, φέρεται πολλάκις ἄνω. ἡ μὲν οὖν ἐκκρινομένη θερμότης, εἰς τὸν ἄνω διασπείρεται τόπον. ὅση δ' ἐμπεριλαμβάνεται τῆς ξηρᾶς ἀναθυμιάσεως ἐν τῇ μεταβολῇ ψυχομένου τοῦ ἀέρος, αὕτη συνιόντων τῶν νεφῶν ἐκκρίνεται· βίᾳ δὲ φερομένη καὶ προσπίπτουσα τοῖς περιεχομένοις νέφεσι, ποιεῖ πληγήν, ἧς ὁ ψόφος καλεῖται βροντή. γίνεται δ' ἡ πληγὴ τὸν αὐτὸν τρόπον,* ὡς παρεικάσαι μείζονι μικρὸν πάθος, τῷ ἐν τῇ φλογὶ γινομένῳ ψόφῳ, ὃν καλοῦσιν οἱ μέν,* τὸν Ἥφαιστον γελᾶν, οἱ δέ, τὴν Ἑστίαν, οἱ δ', ἀπειλὴν τούτων. γίνεται δ', ὅταν ἡ ἀναθυμίασις εἰς τὴν φλόγα συνεστραμμένη φέρηται, ῥηγνυμένων καὶ ξηραινομένων τῶν ξύλων· οὕτως γὰρ καὶ ἐν τοῖς νέφεσι γιγνομένη ἡ τοῦ πνεύματος ἔκκρισις πρὸς τὴν πυκνότητα τῶν νεφῶν ἐμπίπτουσα ποιεῖ τὴν βροντήν. παντοδαποὶ δ' οἱ ψόφοι, διά τε τὴν ἀνωμαλίαν γίνονται τῶν νεφῶν, καὶ διὰ τὰς μεταξὺ κοιλίας, ᾗ τὸ συνεχὲς ἐκλείπει τῆς πυκνότητος. ἡ μὲν οὖν βροντὴ τοῦτ' ἔστι, καὶ γίνεται διὰ ταύτην τὴν αἰτίαν. τὸ δὲ πνεῦμα τὸ ἐκθλιβόμενον, τὰ πολλὰ μὲν ἐκπυροῦται λεπτῇ καὶ ἀσθενεῖ πυρώσει, καὶ τοῦτ' ἐστὶν ἣν καλοῦμεν ἀστραπήν· ᾗ ἂν ὥσπερ ἐκπῖπτον τὸ πνεῦμα χρωματισθὲν ὀφθῇ. γίνεται δὲ μετὰ τὴν πληγήν, καὶ ὕστερον τῆς βροντῆς· ἀλλὰ φαίνεται πρότερον, διὰ τὸ τὴν ὄψιν προτερεῖν τῆς ἀκοῆς. δηλοῖ δ' ἐπὶ τῆς εἰρεσίας τῶν τριήρων· ἤδη γὰρ ἀναφερόντων πάλιν τὰς κώπας, ὁ πρῶτος ἀφικνεῖται ψόφος τῆς κωπηλασίας. καίτοι τινὲς λέγουσιν ὡς ἐν τοῖς νέφεσιν ἐγγίνεται πῦρ· τοῦτο δ' Ἐμπεδοκλῆς μέν φησιν εἶναι, τὸ ἐμπεριλαμβανόμενον τῶν τοῦ ἡλίου ἀκτίνων· Ἀναξαγόρας δέ, τοῦ ἄνωθεν αἰθέρος, ὃ δὴ ἐκεῖνος καλεῖ πῦρ, κατενεχθὲν ἄνωθεν κάτω. τὴν μὲν οὖν διάλαμψιν τὴν τούτου πυρός, ἀστραπὴν εἶναι· τὸν δὲ ψόφον ἐναποσβεννυμένου καὶ τὴν σίξιν, βροντήν, ὡς καθάπερ φαίνεται καὶ γιγνόμενον, οὕτω καὶ πρότερον τὴν ἀστραπὴν οὖσαν τῆς βροντῆς. ἄλογος δὲ καὶ ἡ τοῦ πυρὸς ἐμπερίληψις, καὶ ἀμφοτέρως μέν, μᾶλλον δ' ἡ κατάσπασις τοῦ ἄνωθεν αἰθέρος. τήν τε γὰρ αἰτίαν φέρεσθαι τὸ πεφυκὸς ἄνω δεῖ λέγεσθαι τὴν αἰτίαν, καὶ διὰ τί ποτε τοῦτο γίνεται κατὰ τὸν οὐρανόν, ὅταν ἐπινέφελον ᾖ μόνον, ἀλλ' οὐχὶ συνεχῶς οὕτως· αἰθρίας δ' οὔσης οὐ γίγνεται. τοῦτο γὰρ πάνυ ἁπλῶς ἔοικεν εἰρῆσθαι προ-

*γρ. ὑπολαβεῖν

*γρ. φ. διὰ παντός

*Quidam, δακτύλων non recte: vetres ipſa & alij Ariſt. loci oſtendunt.

*γρ. ὥσπερ εἰκάσαι μ.

*Theophr. lib. De igne, ſub finem.

χεῖρας. ὁμοίως δὲ καὶ τὸ τὴν ἀπὸ τῶν ἀκτίνων θερμότητα φάναι τὴν ἀπολαμβανομένην ἐν τοῖς νέφεσιν εἶναι τούτων αἰτίαν, οὐ πιθανόν· καὶ γὰρ ἔστιν ὁ λόγος ἀπερριμμένως εἴρηται λίαν· ἀποκεκριμένον τε γὰρ ἀναγκαῖον εἶναι τὸ αἴτιον ἀεὶ καὶ ὡρισμένον, τό, τε τῆς βροντῆς καὶ ἀστραπῆς, καὶ τῶν ἄλλων τῶν τοιούτων, καὶ οὕτω γίνεσθαι· τοῦτο δὲ διαφέρει πλεῖστον· ὅμοιον γὰρ κἂν εἴ τις οἴοιτο τὸ ὕδωρ, καὶ τὴν χιόνα, καὶ τὴν χάλαζαν, ἐνυπάρχοντα πρότερον, ὕστερον ἐκκρίνεσθαι, καὶ μὴ γίνεσθαι, εἶναι ὑπὸ χεῖρα ποιούσης ἀεὶ τῆς συγκρίσεως ἕκαστον αὐτῶν. ὡσαύτως γὰρ ἐκεῖνά τε συγκρίσεις, καὶ ταῦτα διακρίσεις ὑποληπτέον εἶναι. ὥστ' εἰ θάτερα τούτων μὴ γίγνεται, ἀλλ' ἔστι, περὶ ἀμφοτέρων ὁ αὐτὸς ἁρμόσει λόγος. τὴν τε ἐναπόληψιν τί ἂν ἀλλοιότερον λέγοι τις, ἢ καθάπερ ἐν τοῖς πυκνοτέροις· καὶ γὰρ τὸ ὕδωρ ὑπὸ τοῦ ἡλίου καὶ τοῦ πυρὸς γίνεται θερμόν. ἀλλ' ὅμως ὅταν πάλιν συνίῃ καὶ ψύχηται τὸ ὕδωρ πηγνύμενον, οὐδεμίαν συμβαίνει γίνεσθαι τοιαύτην ἔκπτωσιν, οἵανπερ ἐκεῖνοι λέγουσι. καίτοι γ' ἐχρῆν κατὰ λόγον τοῦ μεγέθους. καὶ τὴν ζέσιν ποιεῖ τὸ ἐγγινόμενον πνεῦμα ὑπὸ τοῦ πυρός, ἣν οὔτε δυνατὸν ἐνυπάρχειν πρότερον, οὔτε ἐκεῖνοι τὸν ψόφον ζέσιν ποιοῦσιν, ἀλλὰ σίξιν· ἔστι δὲ ἡ σίξις, μικρὰ ζέσις· ᾗ γὰρ τὸ προσπίπτον κρατεῖ σβεννύμενον, ταύτῃ ζέον ποιεῖ τὸν ψόφον. εἰσὶ δέ τινες οἳ τὴν ἀστραπήν, ὥσπερ καὶ Κλείδημος, οὐκ εἶναί φασιν, ἀλλὰ φαίνεσθαι, παρεικάζοντες ὡς τὸ πάθος ὅμοιον ὄν, καὶ ὅταν τὴν θάλατταν τις ῥάβδῳ τύπτῃ· φαίνεται γὰρ τὸ ὕδωρ ἀποστίλβον τῆς νυκτός· οὕτως ἐν τῇ νεφέλῃ, ῥαπιζομένου τοῦ ὑγροῦ, τὴν φαντασίαν τῆς λαμπρότητος εἶναι τὴν ἀστραπήν. οὗτοι μὲν οὔπω συνήθεις ἦσαν ταῖς περὶ τῆς ἀνακλάσεως δόξαις· ὅπερ αἴτιον δοκεῖ τοῦ τοιούτου πάθους εἶναι· φαίνεται γὰρ τὸ ὕδωρ στίλβειν τυπτόμενον, ἀνακλωμένης ἀπ' αὐτοῦ τῆς ὄψεως πρός τι τῶν λαμπρῶν· διὸ καὶ γίνεται τοῦτο μᾶλλον νύκτωρ· τῆς γὰρ ἡμέρας οὐ φαίνεται, διὰ τὸ πλέον ὂν τὸ φέγγος τὸ τῆς ἡμέρας * ἀφανίζον. τὰ μὲν οὖν λεγόμενα περὶ βροντῆς καὶ ἀστραπῆς παρὰ τῶν ἄλλων, ταῦτ' ἐστί· τῶν μέν, ὅτι ἀνάκλασις ἡ ἀστραπή· τῶν δ', ὅτι πυρὸς μὲν ἡ ἀστραπή, διάλαμψις· ἡ δὲ βροντή, σβέσις, οὐκ ἐγγινομένου περὶ ἕκαστον πάθος τοῦ πυρός, ἀλλ' ἐνυπάρχοντος. ἡμεῖς δὲ φαμὲν τὴν αὐτὴν εἶναι φύσιν, ἐπὶ μὲν τῆς γῆς ἄνεμον, ἐν δὲ τῇ γῇ σεισμόν, ἐν δὲ τοῖς νέφεσι βροντήν· πάντα γὰρ εἶναι ταῦτα τὴν οὐσίαν ταὐτόν, ἀναθυμίασιν ξηράν· ἣ ῥέουσα μέν πως, ἄνεμός ἐστιν· ὡδὶ δὲ ποιεῖ τοὺς σεισμούς· ἐν δὲ τοῖς νέφεσι μεταβάλλουσα ἐκκρινομένη, συνιόντων καὶ συγκρινομένων αὐτῶν εἰς ὕδωρ, βροντάς τε καὶ ἀστραπάς, καὶ πρὸς τούτοις ἄλλα τὰ τῆς αὐτῆς φύσεως τούτοις ὄντα. καὶ περὶ μὲν βροντῆς καὶ ἀστραπῆς εἴρηται.

* γρ. ἀφανίζειν.

A Pari modo & illud quoque, dicere inquam radiorum ſolis calorem qui in nubibus inhibetur atque detinetur, eſſe harum rerum cauſam, haudquaquam probabile exiſtit. etenim hæc ratio oſcitanter admodum reddita eſt. Nam & à tonitru & fulgetro & cæteris generis eiuſdem cauſam ſemper eſſe diſcretam atque diſtinctam, & ſic illa fieri neceſſe eſt. At illud plurimum ab hoc diſcrepat. ſimile enim eſt, atque ſi quis putet, aquam, niuem & grandinem, cùm antè in nubibus eſſent, poſtea excerni, & non fieri, quaſi ad manum faciente ſemper concretione vnumquodque eorum. nam pari ratione hæc concretiones, illa ſecretiones eſſe exiſti- B mandum eſt, Quare ſi ex hiſce altera non fiant, ſed ſint, vtriſque eadem accommodabitur ratio. Item cur caloris in nubibus interceptionem diuerſiorem eſſe dixerit quiſpiam, quàm vt in hiſce quæ denſiuſcula ſunt? Atqui aqua à ſole & igni caleſit, ſed tamen cùm rurſum coit & inalgeſcendo denſeſcit, nullam talem fieri excidentiam contingit, qualem illi prædicant. quanquam eam fieri oportuit pro magnitudinis ratione: atque ſpiritum, ignis opera in aqua genitum feruorem facere, qui vt inſit priùs nec fieri poteſt, nec illi ſonitum feruorem eſſe ſtatuunt, ſed ſtridorem. At ſtridor non niſi paruus feruor eſt. quo enim id quod incidit, dum extinguitur, euincit ac ſuperat, C hoc feruendo ſonitum edit. Sunt etiam qui fulgur, quemadmodum & Clidemus, haud eſſe dicant, ſed apparere: per ſimilitudinem dicentes, quaſi affectio ſimilis ſit, vt mare cùm virga percutitur, noctu reſplendere videtur, ſic humorem cùm in nebula flagellatur, fulgoris apparentiam (quæ non niſi fulgetrum eſt) ingerere. Verùm hi nondum verſati fuerant in opinionibus quæ de refractione ſunt, quæ quidem eiuſmodi affectionis cauſa eſſe videtur. Nam aqua dum percutitur, fulgere videtur, refracto ab ea ad quippiam lucidum aſpectu. Quamobrem noctu magis quàm interdiu fulgurat. nam interdiu non apparet, propterea quòd D maius diei lumen illud offuſcat & hebetat. Igitur hæc ſunt, quæ de tonitru & fulgetro ab aliis dicuntur. Aliis fulgetrum quidem eſſe refractionem, aliis fulgorem dicentibus: tonitru verò extinctionem ignis, non qui per ſingulas affectiones nubibus innaſcatur, ſed qui inſit. Nos autem ſuper terram ventum, in terra terræmotum, in nubibus tonitru, eandem eſſe naturam dicimus. Nam hæc omnia idem eſſentia ſunt, nempe exhalatio arida: quæ cùm modo quodam fluit: ventus exiſtit: cùm autem iſto, motus terræ facere ſolet: cùm autem in nubibus mutationem ſubiens excernitur, coeuntibus ipſis & in aquam concreſcentibus, tonitrua & fulgura, & inſuper cætera alia quæ E eiuſdem cum hiſce naturæ ſunt. Atque de tonitru & fulgure dictum iam eſt.

ARISTOTELIS STAGIRITÆ, METEOROLOGICORVM LIBER III.

CAPVT I.

Ecnephiæ & typhonis cauſæ, eorúmque generatio & differentia, ac fulminum ſpecies.

DE reliquis autem ſecretionis huiuſce operibus, modo quo iam cœptum eſt, dicamus oportet. Nam flatus iſte qui excerni ſolet, cùm in parteis exiguas ſparſimque diffunditur, & ſæpe fit ac perflat, necnon ſubtilior eſt, tonitrua & fulgura edit. At ſi vniuerſus, & denſior, minùs autem ſubtilis expreſſus fuerit, procellam gignit, quæ vocatur à Græcis Ecnephias. Quo fit vt etiam vehemens exiſtat. nam excretionis celeritas robur aduehit. Cùm igitur magna & continens ſecretio fuerit conſecuta, tum profectò idem accidit, quod cùm rurſum aduerſam in partem halituum copia tenderit, euenire aſſolet. tum enim pluuia iugis multáque fit. Itaque hæc ambo in materia, potentia inſunt, & quidem cùm vtriuslibet facultatis principium factum eſt, quod è materia coëxcernitur, cuiuſcumque copia maior fuerit, abundantiùs ſubſequi aſſolet: fitque huius exhalationis pars altera imber, illius altera ecnephias. Cùm autem flatus qui in nube erat, excretus alteri incurrendo repercutitur, perinde vt cùm ex lato in anguſtum adigitur ventus in portis viiſque (nam repulſa prima corporis ad hunc modum fluentis parte, propterea quòd illa nequaquam cedant aut ob loci anguſtias, aut quòd in frontem aliquis alius offlet ſpiritus, in iſtiuſmodi locis flatus circulum vertiginémque fieri ſæpenumero accidit. ſiquidem aliud ne vlteriùs procedat arcet, aliud à tergo impellit. Quare cogitur in latus, qua nimirum parte non prohibetur ſeſe vertere: atque ita ſemper quod proximũ continuúmque eſt, quouſque vnus euadat. Hoc autem circulus eſt. cui enim figuræ vnica latio competit, eam ipſam circulum eſſe neceſſe eſt.) ob id profectò vertigines in terrà, & in nubibus ſimiliter, iuxta principium fiunt. Niſi quòd, quemadmodum cùm procella fit, ſemper nubes excernitur, atque continuus cooritur ventus: ita hic ſemper nubis continuitas ſubſequi ſolet. At ob nubis denſitatem impotens ab ipſa flatus ſecerni, in orbem primò conuertitur ob eam quam diximus cauſam. In præceps autem fertur, quia continuè nubes denſantur, qua parte calor excidit. Quare hæc affectio, ſi caloris expers fuerit, vocatur Typhon: qui quidem ventus eſt, velut ecnephias, inconcoctus. Non fit autem Aquiloniis Typhon, nec niue iacente Ecnephias: propterea quòd hæc omnia flatus exiſtunt. Flatus verò, non niſi calida ſiccáque exhalatio eſt. Igitur gelu atque frigus quia euincunt, principium ipſum cùm adhuc fit, ſtatim extinguunt. Quòd autem euincant dominenturque, palam eſt. non enim eſſet nix, neque partes ad Aquilonem poſitæ humerent: quippe cùm hæc vincente frigore accidant. Fit itaque Typhon, cùm ecnephias ſtatim ab ortu excerni è nube non poteſt.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΜΕΤΕΩΡΟΛΟΓΙΚΩΝ ΤΩΝ ΕΙΣ Δ ΤΟ Γ.

ΚΕΦΑΛ. α΄.

Περὶ ἐκνεφίου, πρηστήρων, τυφώνων, καὶ κεραυνῶν.

B ΠΕΡΙ δὲ τῶν ὑπολοίπων εἴπωμεν ἔργων τῆς ἐκκρίσεως ταύτης, τὸν ὑφηγημένον ἤδη τρόπον λέγοντες. τὸ γὰρ πνεῦμα τοῦτο ἐκκρινόμενον, κατὰ μικρὰ μὲν καὶ σποράδην διαχεόμενον, καὶ πολλάκις γιγνόμενον, καὶ διαπνέον, καὶ λεπτομερέστερον ὄν, βροντὰς ποιεῖ καὶ ἀστραπάς· ἂν δ᾽ ἀθρόον καὶ πυκνότερον, ἧττον δ᾽ ἐκκριθῇ λεπτόν, ἐκνεφίας ἄνεμος γίνεται· διὸ καὶ * βίαιος. τὸ γὰρ τάχος τῆς ἐκκρίσεως, ποιεῖ τὴν ἰσχύν. ὅταν μὲν οὖν συνακολουθήσῃ πολλὴ καὶ συνεχὴς ἔκκρισις, τὸν αὐτὸν γίνεται τρόπον, ὥσπερ ὅταν πάλιν εἰς τοὐναντίον ὁρμήσῃ· τότε γὰρ ὑετὸς καὶ ὕδατος C γίνεται πλῆθος. κατ᾽ ἀρχὴν μὲν οὖν ἄμφω δυνάμει ταῦτα κατὰ * τὴν ὕλην· ὅταν δ᾽ ἀρχὴ γένηται τῆς δυνάμεως ὁποτέρασοῦν, ἀκολουθεῖ συνεκκρινόμενον ἐκ τῆς ὕλης, ὁπότερον ἂν ᾖ πλῆθος ἐνυπάρχῃ πλέον· καὶ γίνεται τὸ μὲν ὄμβρος, τὸ δὲ τῆς ἑτέρας ἀναθυμιάσεως, ἐκνεφίας. ὅταν δὲ τὸ ἐκκρινόμενον πνεῦμα, τὸ ἐν τῷ νέφει ἑτέρῳ ἀντιτύπτῃ οὕτως, ὥσπερ ὅταν ἐξ εὐρέος εἰς στενὸν βιάζηται ὁ ἄνεμος, ἢ ἐν πύλαις, ἢ ὁδοῖς (συμβαίνει γὰρ πολλάκις ἐν τοῖς τοιούτοις ἀπωσθέντος τοῦ πρώτου μορίου τοῦ ῥέοντος * σώματος διὰ τὸ μὴ ὑπείκειν, ἢ διὰ στενότητα, ἢ διὰ τὸ ἀντιπνεῖν, D κύκλον καὶ δίνην γίνεσθαι τοῦ πνεύματος· τὸ μὲν γὰρ εἰς τὸ πρόσθεν κωλύει προϊέναι, τὸ δ᾽ ὄπισθεν ἐπωθεῖ· ὥστ᾽ ἀναγκάζεται εἰς τὸ πλάγιον, ᾗ οὐ κωλύεται, φέρεσθαι· καὶ οὕτως ἀεὶ τὸ ἐχόμενον, ἕως ἂν ἓν γένηται, τοῦτο δ᾽ ἐστὶ κύκλος· οὗ γὰρ μία φορὰ σχήματος, τοῦτο καὶ αὐτὸ ἀνάγκη κύκλον εἶναι) ἐπὶ τῆς γῆς οὖν διὰ ταῦτα γίγνονται οἱ δῖνοι, καὶ ἐν τοῖς νέφεσιν ὁμοίως κατὰ τὴν ἀρχήν. πλὴν ὅτι, ὥσπερ ὅταν ἐκνεφίας γίγνεται, ἀεὶ τὸ νέφος ἐκκρίνεται, καὶ γίνεται συνεχὴς ἄνεμος· οὕτως ἐνταῦθα ἀεὶ τὸ συνεχὲς ἀκολουθεῖ τοῦ νέφους. διὰ δὲ πυκνότητα οὐ δυνάμενον ἐκκριθῆναι τὸ πνεῦμα ἐκ τοῦ νέφους, στρέφεται μὲν κύκλῳ E τὸ πρῶτον διὰ τὴν εἰρημένην αἰτίαν· κάτω δὲ φέρεται, διὰ τὸ ἀεὶ τὰ νέφη πυκνοῦσθαι, ᾗ ἐκπίπτει τὸ θερμόν. καλεῖται δ᾽, ἂν ἀχρώματιστον ᾖ, τοῦτο τὸ πάθος τυφών, ἄνεμος ὤν, οἷον ἐκνεφίας ἄπεπτος. βορείοις δ᾽ οὐ γίγνεται τυφών, οὐδὲ νιφετῶν ὄντων, ἐκνεφίας· διὰ τὸ * πάντα ταῦτα εἶναι πνεύματα, τὸ δὲ πνεῦμα, ξηρὰν εἶναι καὶ θερμὴν ἀναθυμίασιν. ὁ οὖν πάγος καὶ τὸ ψῦχος, διὰ τὸ κρατεῖν σβεννύουσιν εὐθὺς γιγνομένην ἔτι τὴν ἀρχήν. ὅτι δὲ κρατεῖ, δῆλον· οὐ γὰρ ἂν ἦσαν νιφετοί, οὐδὲ βόρεια τὰ ὑγρά. ταῦτα γὰρ συμβαίνει κρατούσης εἶναι τῆς ψυχρότητος. γίνεται μὲν οὖν ὁ τυφών, ὅταν ἐκνεφίας γιγνόμενος μὴ δύνηται ἐκκριθῆναι τοῦ νέφους.

* γρ. βιαῖος.

* γρ. τ. ὕλην ὁ ἐκνεφίας ἐστίν.

* γρ. ἐ. δὲ ἂν μὴ ὑπείκει,

* γρ. πάντα εἶναι τὰ ὑγρὰ καὶ ψυχρά, τὸ δὲ π.

A ἔστι δὲ διὰ τὴν ἀντίκρουσιν τῆς δίνης, ὅταν ἐπὶ γῆν φέρηται ἡ ἕλιξ συγκατάγουσα τὸ νέφος, οὐ δυναμένη ἀπολυθῆναι. ᾗ δὲ κατ' εὐθυωρίαν ἐκπνεῖ, ταύτῃ τῷ πνεύματι κινεῖ, καὶ τῷ κύκλῳ κινούμενος στρέφει, καὶ ἀναφέρει ᾧ ἂν προσπέσῃ βιαζόμενον. ὅταν δὲ κατασπώμενον ἐκπυρωθῇ· τοῦτο δ' ἐστὶν, ἂν λεπτότερον τὸ πνεῦμα γίνηται· καλεῖται πρηστήρ· συνεμπιπρᾶσι γὰρ τὸν ἀέρα τῇ πυρώσει χρωματίζων. ἐὰν δ' ἐν αὐτῷ τῷ νέφει πολὺ καὶ λεπτὸν * ἐκθλιβῇ πνεῦμα, τοῦτο γίνεται κεραυνὸς, ἐὰν μὲν πάνυ λεπτὸν, οὐκ ἐπικαῖον, διὰ λεπτότητα, ὃν οἱ ποιηταὶ ἀργῆτα καλοῦσιν. ἐὰν δ' ἧττον, B ἐπικαῖον, ὃν ψολόεντα καλοῦσιν. ὁ μὲν γὰρ διὰ τὴν λεπτότητα φέρεται, διὰ δὲ τὸ τάχος, φθάνει διιὼν, πρὶν ἐκπυρῶσαι, καὶ ἐπιδιατρίψας μελᾶναι· ὁ δὲ βραδύτερος, ἔχρωσε μὲν, ἔκαυσε δ' οὒ, ἀλλ' ἔφθασε διιών. διὸ καὶ τὰ μὲν ἀντιτυπήσαντα πάσχει τι· τὰ δὲ μὴ, οὐδέν· οἷον ἀσπίδος ἤδη τὸ μὲν χάλκωμα ἐτάκη, τὸ δὲ ξύλον οὐθὲν ἔπαθε· διὰ γὰρ μανότητα, ἔφθασε τὸ πνεῦμα διηθηθὲν καὶ διελθόν· καὶ διὰ ἱματίων ὁμοίως οὐ κατέκαυσεν, ἀλλ' οἷον χνοῦς ἐποίησεν· ὥστε ὅτι γε πνεύματα ταῦτα πάντα, δῆλον καὶ ἐκ τῶν τοιούτων. ἔστι δ' ἐνίοτε καὶ τοῖς ὄμμασι θεωρεῖν, οἷον καὶ νῦν συνέβαινε C περὶ νεὼν τὸν ἐν Ἐφέσῳ καιόμενον· πολλαχῇ γὰρ ἡ φλὸξ ἐφέρετο συνεχὴς, ἀποσπωμένη χωρίς. ὅτι μὲν γὰρ ὁ καπνὸς πνεῦμα, καὶ καίεται ὁ καπνὸς, φανερὸν, καὶ εἴρηται ἐν ἑτέροις πρότερον. ὅταν δ' ἀθρόον χωρῇ, τότε φανερῶς δοκεῖ πνεῦμα εἶναι. ὅπερ οὖν ἐν ταῖς μικραῖς πυρκαϊαῖς φαίνεται, τοῦτο καὶ τότε πολλῆς ὕλης καιομένης ἐγίνετο πολλῷ ἰσχυρότερον. ῥηγνυμένων οὖν τῶν ξύλων, ὅθεν ἡ ἀρχὴ τοῦ πνεύματος ἦν, πολὺ ἐχώρει ἀθρόον, ᾗ ἐξέπνει, καὶ ἐφέρετο ἄνω πεπυρωμένον· ὥστε ἐφαίνετο ἡ φλὸξ φέρεσθαι, καὶ εἰσπίπτειν εἰς τὰς οἰκίας· ἀεὶ γὰρ οἴεσθαι δεῖ συνακολουθεῖν τοῖς κεραυνοῖς πνεῦμα D καὶ προϊέναι· ἀλλ' οὐχ ὁρᾶται, διὰ τὸ ἀχρώματον εἶναι. διὸ καὶ ᾗ μέλλει πατάξειν, κινεῖται πρὶν πληγῆναι, ἅτε πρότερον προσπίπτουσης τῆς ἀρχῆς τοῦ πνεύματος. καὶ αἱ βρονταὶ δὲ καὶ ἀστραπαὶ διϊστᾶσιν, οὐ τῷ ψόφῳ, ἀλλ' ὅτι ἅμα συνεκκρίνεται τὸ τὴν πληγὴν ποιῆσαν καὶ τὸν ψόφον πνεῦμα· ὃ ἐὰν πατάξῃ, διέστησεν· ἐπέκαυσε δ' οὔ.

Περὶ μὲν οὖν βροντῆς, καὶ ἀστραπῆς, καὶ ἐκνεφίου, ἔτι δὲ περὶ πρηστήρων τε, καὶ τυφώνων, καὶ κεραυνῶν, εἴρηται· καὶ ὅτι ταὐτὸ πάντα, καὶ τίς ἡ διαφορὰ πάντων αὐτῶν.

* γρ. ἐκθλιβείη

ΚΕΦΑΛ. Β'. E

Περὶ αἰτιῶν γενέσεως, καὶ συμβεβηκότων περὶ τὴν ἅλων.

ΠΕρὶ δὲ ἅλω καὶ ἴριδος, τί [illegible] καὶ διὰ τίν' αἰτίαν γίνεται, λέγωμεν, καὶ [illegible] ἡλίων καὶ ῥάβδων· καὶ γὰρ ταῦτα γίνεται πάντα διὰ [illegible] αἰτίας ἀλλήλοις. πρῶτον δὲ δεῖ λαβεῖν τὰ πάθη [illegible] συμβαίνοντα, περὶ ἕκαστον αὐτῶν. τῆς μὲν οὖν ἅλω φαίνεται [illegible] πολλάκις κύκλος ὅλος, καὶ γίνεται περὶ ἥλιον καὶ σελήνην, καὶ περὶ τὰ λαμπρὰ τῶν ἄστρων. ἔτι δ' οὐθὲν ἧττον [illegible] μεθ' ἡμέρας, καὶ περὶ

A Eſt autem ob vertiginis obluctationem, cùm ad terram conuolutio ipſa delabitur, quæ ſecum aliquid abreptum è nube defert, à quo abſolui non poteſt. Qua autem tramite directo procedit, ea flatu agitat: atque motu in circulum facto, cuicumque rei impetu violento ingruerit, eam contorquet ſorbétque in excelſum. At ſpiritus qui è nube detrahitur, ardens accenſúſque dum fuerit, quod quidem accidit ſi tenuior efficiatur, preſter vocatur, hoc eſt, incenſio: incendit enim ſimul aërem, adeò vt ardore ipſum inficiat. Quòd ſi ex ipſa nube multus ac tenuis expreſſus fuerit flatus, is fulmen exultat. quod ſi admodum tenue fuerit, ſed B præ tenuitate non adurat, illud eſt quod Poëtæ arges, (id eſt, clarum) vocant: ſi verò minùs adurat, quod pſoloën, quaſi dicas fumidum. Nam illud ob eſſentiæ tenuitatem fertur: at ob motus celeritatem antè penetrat, quàm vt adurat, & mora facta infuſcet. hoc autem cùm ſit tardius, inficit quidem, non autem adurit, ſed penetrare anticipat. Quocirca & quæ obſiſtunt, quippiam pati ſolent: quæ minimè, nihil. verbi cauſa iam æs quo ſcutum integebatur, liquatum fuit, lignum verò nihil ſuſtinuit. Nam propter ligni raritatem, prius ſpiritus percolatus fuit atque tranſmiſſus, quàm vt lignum affici vllo pacto quiuerit. Per veſteis quoque pari modo tranſiuit, quas non adußit, ſed C protriuit. Quare hæc omnia flatus eſſe, vel ex talibus conſtat. Licet autem oculis quoque ipſis interdum contemplari, id quod nuper fecimus in templi Epheſini conflagratione. tunc enim flamma ſeorſim refulſa, multas in parteis continua ferebatur. Fumum ſpiritum eſſe ac ardere, apertum eſt, & alio loco antea dictum. Cum autem vniuerſim abſcedit, tum eſſe flatus apertè videtur. Quod igitur in paruis rogis fieri videmus, hoc idem vel tunc, multa nimirum ardente materia, longè validiùs fiebat. Ruptis itaque lignis, vnde ſpiritus origo atque initium erat, multus qua parte afflabat vniuerſim ſecedebat, & ardens in ſublime ferebatur. Quare flamma ipſa ferri, & incidere D in domos videbatur. Semper enim ſpiritum fulmina præcedere comitarique putandum eſt, ſed non cerni, quia coloris expers ſit. Ideóque quati priùs omne & afflari, quàm percuti: vtpote cùm ſpiritus ocyor fulmine ſit. Quinetiam tonitrua ſindunt diſſipántque, non ſono, ſed ſpiritu. Nam ſpiritus tam ſonum quàm ictum efficiens, vnà cum illis excernitur: qui ſi percutiat, ſindere non vrere ſolet.

Verùm de tonitru, fulgure, & ecnephia, tum etiam de preſtere, typhone & fulmine, & quòd omnia idem ſint, & quænam ipſorum omnium inter ſe differentia ſit, dictum eſt.

E

CAPVT II.

Halonis ſiue areæ generatio, cauſa, accidentia.

DE Area autem, ſiue corona, & arcu cœleſti, & quid vtrumque ſit, & quam ob cauſam fiat, item de pareliis & bacillis dicamus: nam hæc omnia eiſdem de cauſis accidere ſolent. Primùm autem ſumamus oportet affectiones, & quæ circa vnumquodque ipſorum accidunt. Area igitur plerumque completa circuli forma cernitur, fitque circa ſolem lunámque, & ſplendida aſtra. Præterea non minùs noctu quàm interdiu, & horis

ntemeridianis quàm poſtmeridianis. mane verò, c circa ſolis obitum, rariùs. At arcus cœleſtis, nec nquam circulus euadit, nec maior quam dimidia irculi forma ſectio. Et occidente & oriente, mi- mi circuli maximus ambitus: cùm autem eleua- ur magis, circuli maioris minor ambitus. Poſt au- umni æquinoctium, die decreſcente, quacunque hora fit: æſtate verò, per meridiem non cernitur. Nec vnquam plures ſimul quàm duo fiunt. Horum autem quamuis vterque tricolor ſit, atque eoſdem parique numero ac reliquus colores habeat, tamen qui in exteriore ſunt, obſcuriores habentur atque ordine contrario poſiti. Nam arcus interior, primam quæ maxima eſt, circumferentiam, puniceam geſtat: exterior, vltimam quæ minima eſt, ſed illi proxima, atque reliquas proportionabiliter. Cæterùm colores hi ſunt, quos ferè ſolos facere pictores nequeunt. Hi enim quoſdam aliorum mixtura faciũt. at puniceus, viridis & purpureus, nequaquam hoc pacto fiũt: hos autem colores arcus habet. Qui autem puniceum & viridem interiacet, is plerunque flauus apparet. Parelij autem atque virgæ ex obliquo ſemper effici ſolent, & nec ſupra ſolem, nec infra prope terram, nec è regione, nec etiam noctu, ſed ſemper circa ſolem. Præterea aut aſcendente, aut deſcendente: occidente frequentiùs: cœli vmbilicum perreptante, raro, id quod in Boſphoro aliquando accidit. Nam coorti duo parelij, ab matutino tempore durauerunt in occaſum. Quæ igitur circa eorum quodque accidunt, hæc ſunt. Horum autem omnium vna eadémque cauſa eſt. nam hæc omnia refractio ſunt. differunt tamen modis, quibus fiant: & in hoc, nempe à quibus, & quomodo refractio ſolem versùs aut aliquid aliud lucidum fiat. Item arcus interdiu quidem fit, noctu verò à luna ſcilicet, veterum quidem ſententia minimè fiebat. Hoc autem illis accidit, propter raritatem. eos enim latebat. Fit tamen, ſed rarò. Cauſa, quòd colores in tenebris lateant, quódque alia multa concurrere, eáque omnia vna die menſis, oporteat. nam plenilunio fiat, ſi futurus ſit, neceſſe eſt: atque tunc, oriente aut occidente luna. Quamobrem in annis ſupra quinquaginta, bis tantum in eum incidimus. Quòd igitur vt ab aqua, ita etiam ab aëre cæteriſque omnibus quæ ſuperficie leui conſtant, refrangatur aſpectus, ex hiſce quæ circa aſpectum demonſtrantur, ſumenda fides eſt: quódque in quibuſdam ſpeculis non modò colores, verumetiam figuræ appareant, in quibuſdam verò colores ſolùm. Eiuſmodi autem ſunt quæcunque exigua ſunt, & ſenſilem diuiſionem nullam habent. Nam fieri non poteſt vt in hiſce figura appareat. videretur enim eſſe diuiſibilis. nam figura omnis ſimul & eſſe figura & omni ex parte diuidi poſſe videtur. At cùm quippiam in illis apparere ſit neceſſum, figuram autem impoſſibile ſit, reliquũ eſt profectò vt color ſolùm appareat. Porro ſplendidorum color, interdum ſplendidus apparet: interdum verò, aut quia cum ſpeculi colore permiſcetur, aut quia aſpectus infirmus eſt, alterius coloris ingerit phantaſiam. Sed de his, in hiſce quæ de ſenſibus demonſtrantur, ſit à nobis conſideratum. Proinde ex hiſce alia dicamus, aliis vti veris vtamur.

A μεσημβρίαν ἢ δείλην· ἕωθεν δὲ ἐλαττονάκις καὶ περὶ δύσιν. τῆς δὲ ἴριδος οὐδέποτε γίνεται κύκλος, οὐδὲ μεῖζον ἡμικυκλίου τμῆμα. καὶ δυόντος μὲν καὶ ἀνατέλλοντος, ἐλαχίστου μὲν κύκλου, μεγίστη δὲ ἡ ἁψίς. αἰρομένου δὲ μᾶλλον, κύκλου μὲν μείζονος, ἐλάττων δὲ ἡ ἁψίς. καὶ μετὰ μὲν τὴν μετοπωρινὴν ἰσημερίαν, ἐν ταῖς βραχυτέραις ἡμέραις, πᾶσαν ὥραν γίγνεται τῆς ἡμέρας· * ἐν δὲ ταῖς θεριναῖς οὐ γίνεται περὶ μεσημβρίαν. οὐδὲ δυεῖν πλείους ἴριδες γίνονται ἅμα. τούτων δὲ τρίχρως μὲν ἑκατέρα, καὶ τὰ χρώματα ταὐτὰ καὶ ἴσα τὸν ἀριθμὸν ἔχουσιν ἀλλήλαις· ἀμυδρότερα δὲ ἐν τῇ ἐκτὸς, καὶ ἐξ ἐναντίας κεί-
B μενα κατὰ τὴν θέσιν. ἡ μὲν γὰρ ἐντὸς, τὴν πρώτην ἔχει περιφέρειαν τὴν μεγίστην, φοινικῆν· ἡ δὲ ἔξωθεν, τὴν ἐλαχίστην μὲν, ἐγγύτατα δὲ πρὸς ταύτην καὶ τὰς ἄλλας ἀνάλογον. ἔστι δὲ τὰ χρώματα ταῦτα, ἅπερ μόνα σχεδὸν οὐ δύνανται ποιεῖν οἱ γραφεῖς· ἔνια γὰρ αὐτοὶ κεραννύουσι· τὸ δὲ φοινικοῦν, καὶ πράσινον, καὶ ἁλουργὸν, οὐ γίγνεται κεραννύμενον· ἡ δὲ ἶρις ταῦτ᾽ ἔχει τὰ χρώματα. τὸ δὲ μεταξὺ τοῦ φοινικοῦ καὶ πρασίνου, φαίνεται πολλάκις ξανθόν. παρήλιοι δὲ καὶ ῥάβδοι γίνονται ἐκ πλαγίας ἀεὶ καὶ οὔτε ἄνωθεν, οὔτε πρὸς τῇ γῇ, οὔτ᾽ ἐξ * ἐναντίας, οὐδὲ δὴ νύκτωρ, ἀλλ᾽ ἀεὶ περὶ τὸν ἥλιον ἤτοι δὴ ἢ αἰρομένου, ἢ κατα-
C φερομένου· τὰ πλεῖστα δὲ πρὸς δυσμάς. μεσουρανοῦντος δὲ, σπάνιόν τι γέγονεν, οἷον ἐν Βοσπόρῳ ποτὲ συνέπεσε. δι᾽ ὅλης γὰρ τῆς ἡμέρας συνανασχόντες δύο παρήλιοι διετέλεσαν μέχρι δυσμῶν. τὰ μὲν οὖν περὶ ἕκαστον αὐτῶν συμβαίνοντα, ταῦτ᾽ ἐστί. τὸ δὲ αἴτιον τούτων ἁπάντων, ταὐτό· πάντα γὰρ ἀνάκλασις ταῦτ᾽ ἐστί. διαφέρουσι δὲ τοῖς τρόποις καὶ ἀφ᾽ ὧν, καὶ ὡς συμβαίνει τὴν ἀνάκλασιν γίγνεσθαι πρὸς τὸν ἥλιον, ἢ πρὸς ἄλλο τι τῶν λαμπρῶν. καὶ μεθ᾽ ἡμέραν μὲν ἶρις γίγνεται, νύκτωρ δὲ ἀπὸ σελήνης, ὡς μὲν οἱ ἀρχαῖοι ᾤοντο, οὐκ ἐγίγνετο· τοῦτο δὲ ἔπαθον, διὰ τὸ σπάνιον· ἐλάνθανε γὰρ αὐτούς. γίνεται μὲν γὰρ, ὀλιγά-
D κις δὲ γίγνεται. τὸ δὲ αἴτιον, ὅτι τ᾽ ἐν τῷ σκότει λανθάνει τὰ χρώματα, καὶ ἄλλα πολλὰ δεῖ συμπεσεῖν καὶ ταῦτα πάντα ἐν ἡμέρᾳ μιᾷ τοῦ μηνός· ἐν τῇ πανσελήνῳ γὰρ ἀνάγκη γενέσθαι * τὸ μέλλον ἔσεσθαι καὶ τότε, ἀνατελλούσης, ἢ δυνούσης. διόπερ * ἐν ἔτεσιν ὑπὲρ τὰ ν΄, δὶς ἐνετύχομεν μόνον. ὅτι μὲν οὖν ἡ ὄψις ἀνακλᾶται ὥσπερ καὶ ἀπὸ ὕδατος, οὕτω καὶ ἀπὸ ἀέρος, καὶ πάντων τῶν ἐχόντων τὴν ἐπιφάνειαν λείαν, ἐκ τῶν περὶ τὴν ὄψιν δεικνυμένων δεῖ λαμβάνειν τὴν πίστιν· καὶ διότι τῶν ἐνόπτρων ἐν ἐνίοις μὲν καὶ τὰ σχήματα ἐμφαίνεται, ἐν ἐνίοις δὲ τὰ χρώματα μόνον. τοιαῦτα δὲ ἐστὶν, ὅσα μικρὰ τῶν ἐνόπτρων, καὶ
E μηδεμίαν αἰσθητὴν ἔχει διαίρεσιν· ἐν γὰρ τούτοις, τὸ μὲν σχῆμα ἀδύνατον ἐμφαίνεσθαι * δόξει γὰρ εἶναι διαιρετόν· πᾶν γὰρ σχῆμα ἅμα δοκεῖ σχῆμά τε εἶναι, καὶ διαίρεσιν ἔχειν. ἐπεὶ δὲ ἐμφαίνεσθαί τι ἀναγκαῖον, τοῦτο δὲ ἀδύνατον, λείπεται τὸ χρῶμα μόνον ἐμφαίνεσθαι. τὸ δὲ χρῶμα ὁτὲ μὲν λαμπρὸν φαίνεται τῶν λαμπρῶν· ὁτὲ δὲ, ἢ τῷ μίγνυσθαι τῷ τοῦ ἐνόπτρου, ἢ διὰ τὴν ἀσθένειαν τῆς ὄψεως, ἄλλου χρώματος ἐμποιεῖ φαντασίαν. * ἔστω δὲ περὶ τούτων ἡμῖν τεθεωρημένον ἐν τοῖς περὶ τὰς αἰσθήσεις δεικνυμένοις. διὸ τὰ μὲν λέγωμεν, τοῖς δὲ ὡς ὑπάρχουσι χρησώμεθα αὐτῶν.

* γρ. ἐν δὲ τ. θ. [illegible] μόνον [illegible] περὶ μεσ.

* γρ. [illegible]

* γρ. [illegible]

* γρ. ἐν ἔτεσι πεντήκοντα δ.

* γρ. δόξει γ.

* γρ. ἴσως δὲ π.

A

ΚΕΦΑΛ. γʹ.

Ὅτι ἡ ἅλως κυκλὸς ἐστὶ, καὶ τί σημαίνει.

ΠΡῶτον δὲ περὶ τῆς ἅλω τοῦ σχήματος εἴπωμεν, διότι τε κύκλος γίνεται, καὶ διότι περὶ τὸν ἥλιον ἢ τὴν σελήνην. ὁμοίως δὲ καὶ περὶ τι τῶν ἄλλων ἄστρων· ὁ γὰρ αὐτὸς ἐπὶ πάντων ἁρμόσει λόγος. γίνεται μὲν οὖν ἡ ἀνάκλασις τῆς ὄψεως, συνισταμένου τοῦ ἀέρος καὶ τῆς ἀτμίδος εἰς νέφος, ἐὰν ὁμαλὸς καὶ μικρομερὴς συνισταμένη τύχῃ. διὸ καὶ σημεῖον, ἡ μὲν σύστασις, ὕδατός ἐστιν· αἱ μέντοι διασπάσεις ἢ μαράνσεις, αὗται μὲν εὐδιῶν, αἱ δὲ διασπάσεις, πνεύματος. ἐὰν μὲν γὰρ μήτε καταμαρανθῇ, μήτε διασπασθῇ, ἀλλ' ἐαθῇ τὴν φύσιν *ἀπολαμβάνειν ἑαυτῆς, ὕδατος εἰκότως σημεῖον ἐστί· δηλοῖ γὰρ ἤδη γίνεσθαι τοιαύτην τὴν σύστασιν, ἐξ ἧς τὸ συνεχὲς λαμβανούσης τῆς πυκνώσεως, ἀναγκαῖον εἰς ὕδωρ ἐλθεῖν. διὸ καὶ μέλαιναι γίνονται τὴν χρόαν αὗται μάλιστα τῶν ἄλλων. ὅταν δὲ διασπασθῇ, πνεύματος σημεῖον· ἡ γὰρ διαίρεσις ὑπὸ πνεύματος γέγονεν, ἤδη μὲν ὄντος, οὔπω δὲ παρόντος. σημεῖον δὲ τούτου, διότι ἐντεῦθεν γίνεται ὁ ἄνεμος, ὅθεν ἂν ἡ κυρία γίγνηται διάσπασις. ἀπομαραινομένη δὲ, εὐδίας. εἰ γὰρ μὴ ἔχει πως οὕτως ὁ ἀὴρ, ὥστε κρατεῖν τοῦ ἐναπολαμβανομένου θερμοῦ, μηδ' ἔρχεσθαι εἰς πύκνωσιν ὑδατώδη, δῆλον, ὡς οὔπω ἡ ἀτμὶς ἀποκέκριται τῆς ἀναθυμιάσεως τῆς ξηρᾶς καὶ πυρώδους· τοῦτο δ' εὐδίας αἴτιον. πῶς μὲν οὖν ἔχοντος τοῦ ἀέρος γίνεται ἡ ἀνάκλασις, εἴρηται. ἀνακλᾶται δ' ἀπὸ τῆς συνισταμένης ἀχλύος περὶ τὸν ἥλιον ἢ τὴν σελήνην ἡ ὄψις. διὸ οὐκ ἐξ ἐναντίας ὥσπερ ἶρις φαίνεται. πάντοθεν δ' ὁμοίως ἀνακλωμένης, ἀναγκαῖον κύκλον εἶναι, ἢ κύκλου μέρος. ἀπὸ γὰρ τοῦ αὐτοῦ σημείου πρὸς τὸ αὐτὸ σημεῖον αἱ ἴσαι κλασθήσονται ἐπὶ κύκλου *γραμμῆς ἀεί. ἔστω γὰρ *ἀπὸ τοῦ σημείου, ἐφ' ᾧ τὸ α πρὸς τὸ β κεκλασμένη, ἥ τε τὸ α γ β, καὶ ἡ τὸ α ζ β, καὶ ἡ τὸ α δ β· ἴσαι δ' αὗταί τε αἱ α γ, α ζ, α δ, ἀλλήλαις· καὶ αἱ *πρὸς τὸ β, ἀλλήλαις, οἷον αἱ γ β, ζ β, δ β· καὶ ἐπεζεύχθω ἡ α ε β. ὥστε τὰ τρίγωνα ἴσα· καὶ γὰρ ἐπὶ ἴσης *τῆς α ε β. ἤχθωσαν δὲ κάθετοι ἐπὶ τὴν α ε β, ἐκ τῶν γωνιῶν· ἀπὸ μὲν τῆς γ, ἡ τὸ γ ε· ἀπὸ δὲ τῆς ζ, ἡ τὸ ζ ε, ἀπὸ δὲ τῆς δ, ἡ τὸ δ ε. ἴσαι δὲ αὗται· ἐν ἴσοις γὰρ τριγώνοις, καὶ ἐν ἑνὶ ἐπιπέδῳ πᾶσαι. πρὸς ὀρθὰς γὰρ πᾶσαι *τῇ α ε β, καὶ ἐφ' ἓν σημεῖον τὸ ε συνάπτουσι. κύκλος ἄρα ἔσται *ἡ γραφομένη· κέντρον δὲ τὸ ε. ἔστω δὲ τὸ μὲν β ὁ ἥλιος, τὸ δὲ α ἡ ὄψις· ἡ δὲ περὶ τὸ γ ζ δ περιφέρεια, τὸ νέφος, ἀφ' οὗ ἀνακλᾶται ἡ ὄψις πρὸς τὸν ἥλιον. δεῖ δὲ νοεῖν συνεχῆ τὰ ἔνοπτρα. ἀλλὰ διὰ σμικρότητα, ἕκαστον μὲν ἀόρατον· τὸ δ' ἐξ ἁπάντων ἓν εἶναι δοκεῖ διὰ τὸ ἐφεξῆς. φαίνεται δὲ τὸ μὲν λευκὸν, ὁ ἥλιος, κύκλῳ συνεχῶς ἐν ἑκάστῳ φαινόμενος τῶν ἐνόπτρων, καὶ μηδεμίαν ἔχων αἰσθητὴν διαίρεσιν· πρὸς δὲ τῇ γῇ μᾶλλον, διὰ τὸ νηνεμώτερον εἶναι. πνεύματος γὰρ ὄντος *οὐκ εἶναι στάσιν φανεράν. περὶ δὲ τοῦτο μέλαινα ἡ ἐχομένη περιφέρεια, διὰ τὴν ἐκείνου λευκότητα δοκοῦσα εἶναι μελαντέρα. πλεονάκις δὲ γίνονται αἱ ἅλῳ περὶ τὴν σελήνην,

* γρ. ἀπολαβεῖν αὐτῆς.
* γρ. γραμμαί.
* γρ. ἀπὸ τοῦ αὐτοῦ σημ.
* γρ. πρὸς τὸ ε.
* γρ. τῆς α ε β ἤχθωσαν δύο κάθετοι.
* γρ. τὴν α.
* γρ. γραφομένη γραμμή.
* γρ. οὐκ ἔστι τὸ σύμπαν φ.

CAPVT III.

Aream eſſe circulum, & quid denunciet.

PRimùm autem de areæ figura, & cur circulus euadat, & cur circa ſolem lunámque & conſimiliter circa aliquod aliud aſtrum cerni ſoleat, dicamus. nam omnibus eadem accommodabitur ratio. Fit igitur aſpectus refractio, cùm vapidus aër in nubem concreſcit, dummodo conſiſtens æquabilis ſit, ac partibus conſtet exiguis. Quamobrem cùm vapor conſiſtit, aquæ ſignum datur: cùm verò diſſipatur aut emarceſcit, minimè. Nam cùm

B diſſipatur, flatum: cùm verò emarceſcit, ſerenum indicat. Si enim vapor nec emarceſcat, nec diſſipetur, ſed ſuam ſortiri naturam ſinatur, merito aquæ ſignum exiſtit. Quando iam talem fieri conſiſtentiam indicat, ex qua ad aquam venire, denſatione continentiam accipiente, neceſſum ſit. Vnde etiam fit vt hi vapores omnium maximè colore atro ſint. At cùm diſſipatur, flatum portendit. (nam vaporis diductio à flatu fit, qui iam quidem eſt, nondum tamen apud nos exorrit. cuius rei indicium eſt, quòd vnde præcipua diſſipatio fit, hinc flatus accedit.) Cùm verò emarceſcit, ſerenitatem. nam ſi aër nullo pacto ita ſeſe ha-

C beat, vt quem in ſe continet calorem, euincat, & in pluuiam denſitatem veniat: conſtat exhalationis partem humentem ac frigidam, ab arida & ignea nondum eſſe ſequeſtratam, quod ſerenitatis cauſa exiſtit. Itaque quo pacto habente aëre refractio fiat, dictum eſt. Refrangitur autem aſpectus à caligine, quæ circa ſolem lunámve conſiſtit. Quocirca area non è regione, perinde vt arcus, apparet. Cùm autem æquo vndique modo refrangitur aſpectus, circulum exultare, aut certè circuli partem neceſſe eſt. Nam lineæ æquales ab eodem puncto ad idem punctum ductæ, ſemper ſupra circuli lineam frangentur. Sit enim à puncto a, versùs punctum b, fracta linea a c b, & linea a f b, &

D linea a d b, ſintque æquales inter ſe hæ, a c, a f, a d, & quæ ad b ſe conferunt, nempe c b, f b, d b, itidem inter ſe æquales, atque producatur linea a e b: quare trianguli æquales ſimiléſque ſunt, quippe qui ſuper æqualem lineam a e b cōſiſtunt. Ducantur autem ex angulis ad lineam a e b perpendiculares, ab angulo c, perpendicularis c e: ab angulo f, perpendicularis f e: ab angulo d, perpendicularis d e. Hæ itaque inter ſe æquales ſunt. nam in æqualibus triangulis, & vno in plano omnes conſtant. omnes enim ſeſe ad rectos angulos lineæ a e b, in vno puncto, ſcilicet e, iungunt. Igitur deſcripta linea circulus erit, centrum verò e. Sit autem b ſol,

E punctum a aſpectus, circumferentia c f d: nubes, à qua ſolem versùs refrangitur aſpectus. ſpecula etiam, continua intelligere oportet. Verùm ſingula ob paruitatem inuiſibilia ſunt. quod autem ex omnibus conſtat, vnum eſſe videtur: quia ita digeſta ſunt, vt vnum deinceps poſt alterum ſit collocatum. Quod autem cernitur albũ, ſol eſt, qui in vnoquoque ſpeculo per circulum cōtinenter apparet, nec vllam quæ ſenſui peruia ſit, recipit diuiſionem. Huic autem proxima continuáque ora, nigrat, ob illius alborem atrior apparens. Sed circa terram magis, quòd locus terræ vicinior magis vento careat. Nam fieri non poteſt vt flāte vento, ſtatio certa fiat. Porrò, circa lunam areæ ſæpiuſculè fiunt:

quia

A ...ia ſol cùm ſit calidior, ocyus aëris conſtitutiones diſſoluit. Circa aſtra autem, fiunt quidem eiſdem de cauſis: non tamen ex æquo portendunt, quòd conſtitutiones prorſus exiguas, & nondum fecundas ſignificent.

CAPVT IV.

De iridis accidentibus coloribúſque, item quot eiuſdem & areæ differentiæ.

QVòd autem arcus refractio quidem ſit, iam diximus. qualis autem, & quo pacto, quáque de cauſa ſingula quæ illi accidunt, fieri ſoleant, in præſentia dicendum. Igitur ab omnibus leuibus refrangi aſpectus videtur: de quorum numero eſt tam aër quàm aqua. Fit autem refractio ab aëre, cùm denſeſcit. At ob viſus imbecillitatem, frequenter vel ſine inſpiſſatione viſum refringere idem aſſolet. Id quod cuidam molliter, non acutè videnti, aliquando accidit. dum enim ambulabat, ſemper ſimulachrum aduerſa fronte præcedere videbatur. quod illi contingebat, quoniam viſio ad ipſum reflectebatur. nam præ languore adeò imbecilla tenuíſque modis omnibus erat, vt & propinquus aër ſpeculi vicem illi, perinde vt qui remotus denſúſque eſſet, præſtaret, & ab illa repelli nequiret. Quocirca & promontoria in mari, reuulſa, & Euro ſpirante omnia maiora videntur. Item quæ in caligine poſita ſunt, vt ſol & aſtra dum oriuntur & occidunt, potiùs quàm cùm cœli medium tenent. Ab aqua autem maximè viſus refrangitur, & adhuc ab ea quæ fieri incipit, meliùs quàm ab aëre. Etenim quamlibet partium è quibus conſiſtentibus roratio fit, potiùs quàm caliginem, ſpeculum eſſe neceſſe eſt. Cùm autem & apertum ſit, & iam dictum in huiuſcemodi ſpeculis colorem duntaxat, non etiam figuram apparere: neceſſariò accidit cùm pluere incipit, & iam quidem nubium aër in mollem pluuiam concreuit, nondum tamen pluit, ſi è regione ſit ſol, aut quippiam aliud quod adeò lucidum ſit vt nubes ſpeculum reddi queat, & refractio in corpus lucidum ex aduerſo fiat, coloris non figuræ apparitionem fieri, cùm ſpeculum quodque paruum ſit atque indiuiſibile. At cùm magnitudinis continentia quæ ex illis omnibus exultat, videri queat, magnitudinem perpetuam eundem prætendere colorem neceſſe eſt. nam ſpeculum quodque, ei quod ex omnibus coaleſcit, ſuum colorem tribuit. Quare cùm hæc accidere poſſint, quoties ſol & nubes ſeſe ad hunc modum habebunt, & nos ſolem inter & nubem erimus, apparitio quædam ob refractionem fiet. Quinimò & tunc, & non aliter habentibus illis, arcus in cœlo cernitur. Patet igitur, arcum eſſe refractionem viſionis in ſolem. Quamobrem & arcus niſi ſole aduerſo, area verò niſi circa ſolem non fit. Et quidem ambo, refractiones ſunt. verùm colorum varietas alterum à reliqua diſcriminat. nam alter ab aqua atróque, & è longinquo fieri ſolet: altera ab aëre, qui ſuapte natura candidior eſt, & è propinquo. Quod autem fulgidum eſt, per atrum aut in atro (nihil enim refert) puniceum apparet. Contueri autem poſſumus, ignem qui è virentibus lignis fit, rubram flammam habere: propterea quòd ignis qui fulgidus albúſque eſt, multo fumo admiſtus eſt.

A διὰ τὸ τὸν ἥλιον θερμότερον ὄντα, θᾶττον διαλύειν τὰς συστάσεις τοῦ ἀέρος. περὶ δὲ τοὺς ἀστέρας γίνονται μὲν διὰ τὰς αὐτὰς αἰτίας, οὐ σημειώδεις δὲ ὁμοίως, ὅτι μικρὰς παμπόλυ ἐπιδηλοῦσι τὰς συστάσεις καὶ οὔπω * γονίμους. * χ. κοινίοις.

ΚΕΦΑΛ. δʹ.

Περὶ ἴριδος, ποία τις ἀνάκλασίς ἐστι, καὶ πῶς, καὶ διὰ τί ἕκαστα γίνεται τῶν περὶ αὐτήν, οἷα χρώματα· καὶ πῶς τῆς ἅλω διαφέρει.

Ἡ δ' ἶρις ὅτι μέν ἐστιν ἀνάκλασις, εἴρηται πρότερον· ποία δέ τις ἀνάκλασις, καὶ πῶς, καὶ διὰ τὴν αἰτίαν ἕκαστα γίνεται τῶν συμβαινόντων περὶ ταύτην, B λέγωμεν νῦν. ἀνακλωμένη μὲν οὖν ἡ ὄψις ἀπὸ πάντων φαίνεται τῶν λείων· τούτων δ' ἐστὶ καὶ ἀὴρ καὶ ὕδωρ. γίνεται δ' ἀπὸ μὲν ἀέρος, ὅταν τύχῃ συνιστάμενος, διὰ δὲ τὴν τῆς ὄψεως ἀσθένειαν πολλάκις καὶ ἄνευ πυκνώσεως ποιεῖ ἀνάκλασιν· οἷόν ποτε συνέβαινέ τινι πάθος ἠρέμα καὶ οὐκ ὀξὺ βλέποντι· ἀεὶ γὰρ εἴδωλον ἐδόκει προηγεῖσθαι βαδίζοντι αὐτῷ, ἐξ ἐναντίας βλέπον πρὸς αὐτόν. τοῦτο δὲ ἔπασχε διὰ τὸ τὴν ὄψιν ἀνακλᾶσθαι πρὸς αὐτόν. οὕτω γὰρ ἀσθενὴς ἦν καὶ λεπτὴ πάμπαν ὑπὸ τῆς ἀρρωστίας, ὥστε ἔνοπτρον ἐγίνετο καὶ ὁ πλησίον ἀήρ, καὶ οὐκ ἠδύνατο ἀπωθεῖν, ὥσπερ ὁ πόρρω καὶ πυκνός. C διόπερ αἵ τ' ἄκραι ἀνασπώμεναι φαίνονται ἐν τῇ θαλάττῃ, καὶ μείζω τὰ μεγέθη πάντων, ὅταν εὖροι πνέωσι, καὶ τὰ ἐν ταῖς ἀχλύσιν, οἷον καὶ ἥλιος καὶ ἄστρα ἀνίσχοντα καὶ δύνοντα μᾶλλον ἢ μεσουρανοῦντα. ἀπὸ δ' ὕδατος μάλιστα ἀνακλᾶται, καὶ ἀπὸ ἀρχομένου γίνεσθαι μᾶλλον ἔτι, ἢ ἀπ' ἀέρος. ἕκαστον γὰρ τῶν μορίων ἐξ ὧν * γίνεται συνισταμένων ἡ ψεκὰς ἔνοπτρον ἀναγκαῖον εἶναι μᾶλλον τῆς ἀχλύος. ἐπεὶ δὲ καὶ δῆλον, * καὶ εἴρηται πρότερον, ὅτι ἐν τοῖς τοιούτοις ἐνόπτροις τὸ χρῶμα μόνον ἐμφαίνεται, τὸ δὲ σχῆμα ἄδηλον, ἀναγκαῖον ὅταν ἄρχηται ὕειν, καὶ ἤδη μὲν συνίστηται εἰς ψακάδας ὁ ἐν τοῖς νέφεσιν ἀήρ, μήπω D δ' ὕῃ, ἐὰν ἐξ ἐναντίας ᾖ ὁ ἥλιος, ἢ ἄλλο τι οὕτω λαμπρὸν, ὥστε γίγνεσθαι ἔνοπτρον τὸ νέφος, καὶ τὴν ἀνάκλασιν γίνεσθαι πρὸς τὸ λαμπρὸν ἐξ ἐναντίας, γίγνεσθαί τε ἔμφασιν χρώματος, οὐ σχήματος. ἑκάστου δὲ ὄντος τῶν ἐνόπτρων μικροῦ καὶ ἀοράτου, τῆς δ' ἐξ * ἁπάντων αὐτῶν συνεχείας τοῦ μεγέθους ὁρωμένης, ἀνάγκη συνεχὲς μέγεθος τοῦ αὐτοῦ φαίνεσθαι χρώματος· ἕκαστον γὰρ τῶν ἐνόπτρων τὸ αὐτὸ ἀποδίδωσι χρῶμα τῷ συνεχεῖ· ὥστ' ἐπεὶ ταῦτ' ἐνδέχεται συμβαίνειν, ὅταν τοῦτον ἔχῃ τὸν τρόπον ὅ, τε ἥλιος καὶ τὸ νέφος, καὶ ἡμεῖς ὦμεν μεταξὺ αὐτῶν, ἔσται διὰ τὴν ἀνάκλασιν ἔμφασίς τις. ἀλλὰ E μὴν καὶ φαίνεται τότε καὶ οὐκ ἄλλως ἐχόντων γιγνομένη ἡ ἶρις. ὅτι μὲν οὖν ἀνάκλασις ἡ ἶρις τῆς ὄψεως πρὸς τὸν ἥλιόν ἐστι, φανερόν· * διὸ καὶ ἐξ ἐναντίας ἀεὶ γίνεται. ἡ δ' ἅλως περὶ αὐτόν· καίτοι ἄμφω * ἀνακλάσεις. ἀλλ' ἥγε τῶν χρωμάτων ποικιλία διαφέρει· ἡ μὲν γὰρ ἀφ' ὕδατός τε καὶ μέλανος γίνεται ἀνάκλασις, καὶ πόρρωθεν· ἡ δ' ἐγγύθεν, καὶ ἀπὸ ἀέρος λευκοτέρου τὴν φύσιν. φαίνεται δὲ τὸ λαμπρὸν διὰ τοῦ μέλανος, ἢ ἐν τῷ μέλανι (διαφέρει γὰρ οὐδὲν) φοινικοῦν. ὁρᾶν δ' ἔξεστι τό γε τῶν χλωρῶν ξύλων πῦρ, ὡς ἐρυθρὰν ἔχει τὴν φλόγα, διὰ τὸ τῷ καπνῷ πολλῷ μεμῖχθαι τὸ πῦρ, λαμπρὸν ὂν καὶ λευκόν.

* χ. ὡς ἐρ.
* γρ. τ. τούτων κ. τ. μ. ὁρωμένων,
* γρ. ἀλλ' ἡ μὲν
* γρ. ἀνάκλασις.

καὶ δι' ἀχλύος καὶ καπνοῦ ὁ ἥλιος φαίνεται φοινικοῦς. διὸ ἡ μὲν τῆς ἴριδος ἀνάκλασις, ἡ μὲν πρώτη τοιαύτην ἔχειν φαίνεται τὴν χρόαν· ἀπὸ ῥανίδων γὰρ μικρῶν ἡ ἀνάκλασις· ἡ δὲ τῆς ἅλω, οὔ. περὶ δὲ τῶν ἄλλων χρωμάτων ὕστερον ἐροῦμεν. ἔτι δὲ περὶ αὐτὸν μὲν τὸν ἥλιον οὐ γίνεται διατελεῖν τοιαύτης συστάσεως, ἀλλ' ἢ ὕει, ἢ διαλύεται. ἐν δὲ τῷ ἐναντίῳ ἐν τῷ μεταξὺ τῆς τοῦ ὕδατος γενέσεως γίνεταί τις χρόνος. ἐπεί, εἰ μὲν ἐγίνετο, ἦν ἂν κεχρωματισμένη ἡ ἅλως, ὥσπερ ἡ ἶρις. νῦν δ', ὅλα μὲν οὐ γίνεται τοιαύτην ἔχοντα τὴν ἔμφασιν, οὐδὲ κύκλῳ, μικρὰ δὲ καὶ κατὰ μέρος, αἳ καλοῦνται ῥάβδοι. ἐπεὶ εἰ * συνίσταιτο τοιαύτη ἀχλύς, οἵα γένοιτ' ἂν ὕδατος, ἢ τινος ἄλλου μέλανος, καθάπερ ἐλέγομεν, ἐφαίνετο ἂν ἡ ἶρις ὅλη, ὥσπερ ἡ περὶ τοὺς λύχνους. περὶ γὰρ τούτους τὰ πλεῖστα νοτίων ὄντων, ἶρις γίνεται τοῦ χειμῶνος. μάλιστα δὲ δήλη γίνεται τοῖς ὑγροὺς ἔχουσι τοὺς ὀφθαλμούς· τούτων γὰρ ἡ ὄψις ταχὺ δι' ἀσθένειαν ἀνακλᾶται. γίνεται δ' ἀπό τε τῆς τοῦ ἀέρος ὑγρότητος, καὶ ἀπὸ λιγνύος τῆς ἀπὸ τῆς φλογὸς ἀπορρεούσης καὶ μιγνυμένης· τότε γὰρ γίνεται ἔνοπτρον, καὶ διὰ τὴν μελανίαν· καπνώδης γὰρ ἡ λιγνύς. τό, τε τοῦ λύχνου φῶς οὐ λευκόν, ἀλλὰ πορφυροῦν φαίνεται κύκλῳ καὶ ἰριῶδες· φοινικοῦν δ' οὔ· ἔστι γὰρ ἥ τε ὄψις ὀλίγη ἡ ἀνακλωμένη, καὶ μέλαν τὸ ἔνοπτρον. ἡ δ' ἀπὸ τῶν κωπῶν τῶν ἀναφερομένων ἐκ τῆς θαλάττης ἶρις, τῇ μὲν θέσει τὸν αὐτὸν γίνεται τρόπον τῇ ἐν τῷ οὐρανῷ, τὸ δὲ χρῶμα ὁμοιοτέρα τῇ περὶ τοὺς λύχνους· οὐ γὰρ * φοινικῆν, ἀλλὰ πορφυρᾶν ἔχουσα φαίνεται τὴν χρόαν. ἡ δ' ἀνάκλασις ἀπὸ τῶν μικροτάτων μέν, συνεχῶν δὲ γίνεται ῥανίδων· αὗται δ' ὕδωρ ἀποκεκριμένον εἰσὶν ἤδη παντελῶς. γίνεται δὲ κἄν τις λεπταῖς ῥανίσιν, εἰς τὸ τοιοῦτον χωρίον, ὃ τὴν θέσιν πρὸς τὸν ἥλιον ἐστραμμένον ἐστί, καὶ τῇ μὲν ὁ ἥλιος ἀλέᾳ, τῇ δὲ σκιάζει· ἐν τῷ τοιούτῳ γάρ, ἐάν εἴσω τις ῥαίνῃ τῷ ἔξω ἑστῶτι ἐκτός, * ᾗ ἐπαλλάττουσιν αἱ ἀκτῖνες, καὶ ποιοῦσι τὴν σκιάν, φαίνεται ἶρις. ὁ τρόπος δὲ καὶ ἡ χρόα ὁμοία, καὶ τὸ αἴτιον τὸ αὐτὸ τῇ ἀπὸ τῶν κωπῶν· τῇ γὰρ χειρὶ κώπῃ χρῆται ὁ ῥαίνων. ὅτι δὲ τὸ χρῶμα τοιοῦτον, ἅμα δῆλον ἔσται καὶ περὶ τῶν ἄλλων χρωμάτων τῆς φαντασίας, ἐκ τῶνδε. δεῖ γὰρ νοήσαντας ὥσπερ εἴρηται καὶ ὑποθεμένους πρῶτον μὲν ὅτι τὸ λαμπρὸν ἐν τῷ μέλανι ἢ διὰ τοῦ μέλανος, χρῶμα ποιεῖ φοινικοῦν. δεύτερον δ', ὅτι ἡ ὄψις ἀποτεινομένη, ἀσθενεστέρα γίνεται καὶ ἐλάττων. τρίτον δέ, ὅτι τὸ μέλαν οἷον ἀπόφασίς ἐστι· τῷ γὰρ ἐκλείπειν τὴν ὄψιν, φαίνεται μέλαν. διὸ τὰ πόρρω πάντα μελάντερα φαίνεται, διὰ τὸ μὴ διικνεῖσθαι τὴν ὄψιν. θεωρείσθω μὲν οὖν ταῦτα ἐκ τῶν περὶ τὰς αἰσθήσεις συμβαινόντων· ἐκείνων γὰρ ἴδιοι οἱ περὶ τούτων λόγοι. νῦν δ' ὅσον ἀνάγκη, τοσοῦτον περὶ αὐτῶν λέγωμεν. φαίνεται δ' οὖν διὰ ταύτην τὴν αἰτίαν τά τε πόρρω μελάντερα, καὶ ἐλάττω, καὶ λειότερα, καὶ τὰ ἐν τοῖς ἐνόπτροις, καὶ τὰ νέφη μελάντερα βλέπουσιν εἰς τὸ ὕδωρ, ἢ εἰς αὐτὰ τὰ νέφη. καὶ τοῦτο πάνυ ἐπιδήλως· διὰ γὰρ τὴν ἀνάκλασιν, ὀλίγῃ τῇ ὄψει θεωρεῖται. διαφέρει δὲ οὐδὲν τὸ ὁρώμενον μεταβάλλειν, ἢ τὴν ὄψιν· ἀμφοτέρως γὰρ ἔσται ταὐτόν. πρὸς δὲ τούτοις δεῖ μὴ λεληθέναι καὶ τόδε· συμβαίνει γὰρ ὅταν ᾖ τοῦ ἡλίου νέφος πλησίον, εἰς μὲν αὐτὸ βλέποντι μηδὲν φαίνεσθαι κεχρωματισμένον, ἀλλ' εἶναι λευκόν.

* γ. συνίσταιτο
* γ. φοινικοῦν
* γ. ἐπαλλάτ.

A Quinetiam ſol ipſe per caliginem & fumum, puniceus apparet. Quocirca arcus refractio prima, eiuſmodi colorem habere videtur, quippe cùm ea refractio, à paruis aſperginibus fiat. At areæ refractio minimè. De cæteris autem coloribus poſtea ſumus dicturi. Præterea talis conſtitutio circa ſolem ipſum permanere diu non poteſt, ſed aut pluit, aut diſſoluitur: dum tamen è contrariis aqua gignitur, tempus quoddam interuenit. Si enim illud eueniret, areæ modo arcus tinctæ forent. nunc autem integra quidem aut circularia nulla fiunt, quæ talem habeãt apparitionem, ſed exigua & per parteis: nempe qui vocantur bacilli, ſeu virgæ. Quando ſi caligo talis conſiſteret, qualis eſſet aquæ B aut cuiuſpiam alius atri, ſicuti iam diximus, arcus cœleſtis integer, perinde vt qui circa lucernas fit, appareret. Nam frequenter per hyemem flante auſtro circa lucernas fit iris: quam maximè vidẽt, qui oculos habent humidos. quoniam eorum aſpectus præ imbecillitate celeriter refrangitur. Fit autem tam ab aëris humiditate quàm à fuligine illa quæ à flamma defluit, atque cum aëre miſcetur. tũc enim ſpeculum vel propter nigrorem fieri aſſolet. Nam fuligo fumida exiſtit. at lucernæ lumen, non albũ, ſed purpureum, & flori ireos ſimile, non autem puniceũ, circulo apparet. nam & aſpectus qui refringitur, exiguus eſt: & ſpeculũ, atrum. At iris illa quæ à remis fieri ſolet qui è mari referuntur, ſitu quidẽ C eodem fit modo quo quæ in cœlo cernitur, colore tamen ſimilior ei eſt quæ circa lucernas apparet. non enim puniceum habere colorem videtur, ſed purpureum. Ipſa autem refractio à minutiſſimis quidem, ſed continuis aſperginibus fit, quæ non niſi aqua ſunt, quę iam prorſus diſcreta eſt. Fit autem etiam iris, ſi quis talem locum qui ſoli oppoſitus ſit, & hac quidem ſol faciem ſuam oſtentet, illac verò vmbram faciat, tenuibus conſpergat rorationibus. Nam in tali loco, ſi quis intrà irroret, ei qui foris ſtat, quà ſolis radij permutantur atque vmbrã efficiunt, iris apparere ſolet. Hæc autem modo locóque conſimili fit, & cauſa eadẽ qua quæ à remis efficitur. nam qui irrorat, manu vice remi vti ſolet. D Quòd autem iridis color talis ſit, ſimul & de cæterorum colorum apparitione, ex hiſce patebit. Intellexiſſe enim oportet, vti iam diximus, atq; ſuppoſuiſſe, primò quidem rem lucidam in nigro aut per nigrum, colorem efficere puniceum. Secundò, aſpectum qui ſe longè deducit, imbecilliorem minorémq; reddi. Tertiò, atrum eſſe veluti abnegationẽ. nam quia viſus deficit, atrum apparere ſolet. Quocirca quæ longè abſunt, nigriora omnia apparent, quia viſus ea minùs aſſequatur. Sed iſta ex hiſce quæ circa ſenſus accidunt, conſiderentur. nam quæ de hiſce rebus dicuntur, ad illa pertinent. nũc autem de ipſis dicamus, quantum nobis opus eſt. Hac igitur de cauſa tã quæ remota ſunt, quàm quæ in ſpeculis, nigriora minoráque ac leuiora apparẽt. E Quinetiam nubes hiſce qui in aquã, quàm qui in ipſas aſpiciũt, nigriores eſſe videntur: idque admodum inſigniter. nam aſpectu exiguo propter refractionem, ſpectantur. Nihil autẽ intereſt, cõſpectus dimoueatur, an res conſpectui obuia. fit enim ratione vtralibet vt idem eueniat. Adhæc nec id nos latere oportet: accidit enim vt nubes cùm prope ſolem fuerit, ſi quis in eam dirigat pupillæ aciem, nullo infecta colore, ſed alba appareat.

at ſi in aqua eandem ſpectet, colorem quendam arcus cœleſtis habere videatur. Patet igitur, quòd conſpectus fractus, vt præ imbecillitate quod nigrum eſt, magis nigrum, ita quod album eſt, minùs album apparere facit, atque ad nigrorem adducit. Validior igitur aſpectus, colorem album in puniceum, proximus ab illo in viridem, qui prætcrea imbecillior eſt, in purpureum, mutare aſſolet. Vltra hos autem colores nullus prætcrea apparet. ſed vt plurima quoque alia, ita & hi ternario definiti ſunt. Aliorum autem colorum mutatio, inſenſibilis eſt. Quocirca & arcus tricolor, vterque quidem, ſed oppoſito modo apparet. Primus igitur extimam ſupremámque circumferentiam puniceam habet. nam aſpectus a maxima circumferentia ſoli plurimus incurrit. extima autem, maxima eſt. Proxima verò & tertia, iuxta proportionem ſeſe habent. Quare ſi quæ de colorum apparitione diſſeruimus, probè dicta ſunt, irin & tricolorem eſſe, & hiſce ſolis coloribus tingi neceſſe eſt. Flauus autem color idcirco apparet, quia iuxtà poſiti colores ſpectantur. Nam color puniceus iuxta viridem, albus apparet. Cuius rei ſignum eſt: Nam in nube nigerrima, iris maximè pura ſinceráque fieri aſſolet. tunc enim accidit vt color puniceus flauior eſſe videatur. Flauum autem illud quod in arcu apparet, color eſt inter puniceum & viridem medius. Igitur ob nubis circunſtantis nigrorem, quicquid eius puniceum eſt, album apparet. nam puniceum ad illa, album eſt. Et rurſum emarceſcente proximè terram iride, cùm diſſoluitur puniceum, nebula alba iuxta viridem ſeſe applicans, in flauum tranſire ſolet. Hæc autem maximè indicat lunæ arcus: quippe qui albus omnino appareat. quod accidit, quia & in nube atra, & noctu ſpectari ſolet. Ergo vt ignis igni adiectus, ſic nigrum iuxta nigrum poſitum, quod remiſsè album eſt (id quod eſt puniceum) prorſus album apparere facit. Hæc autem affectio, vel in floribus perſpicua eſt. Nam in texturis & variegaturis, colores quidam iuxta alios & alios poſiti, apparitione ſupra quàm dici queat, differunt, vt purpurei in albis nigriſve lanis. prætcrea in ſplendore tali aut tali. Quocirca & qui variis filorum coloribus flores concinnant, cùm ad lucernam operantur, ſeſe frequenter errare, & imprudenter alios pro aliis accipere aiunt. Quòd igitur iris ſit tricolor, quódque hoſce colores tantummodo præferat, dictum eſt. Quæ autem ambit, ſecunda, & coloribus languidioribus eſt: quos item ſitu diuerſo atque prima, hac ipſa de cauſa habet. Nam aſpectus longiùs procurrens, vt quod remotius eſt, ita quod hîc eſt, videt. A ſuperiori igitur iride refractio imbecillior exultat: quia remotiore in loco fit. Quare cùm minor inuadat, colores apparere languidiores efficit. Item ordine conuerſo, propterea quòd ſeſe à minori ac interiori circumferentia ad ſolem maior trudit. Nam quæ viſio minùs diſtat, à propinquiſſima primæ iridi circumferentia refrangitur. minima autem exterioris iridis circumferentia propinquiſſima eſt. itaque ea puniceum colorem habebit, illi autem proxima, & tertia, iuxta proportionem. Exterior iris b, interior a: colores, c puniceus, d viridis, e purpureus. Pars autem illa quæ eſt f, flaua apparet.

A ἐν δὲ τῷ ὕδατι ταὐτὸ τοῦτο θεωροῦντι χρῶμά τι ἔχει τῆς ἴριδος. δῆλον τοίνυν ὅτι ἡ ὄψις ὥσπερ καὶ τὸ μέλαν κλωμένη δι' ἀσθένειαν μελάντερον ποιεῖ φαίνεσθαι, * καὶ τὸ λευκὸν ἧττον λευκόν, καὶ προσάγει πρὸς τὸ μέλαν. ἡ μὲν οὖν ἰσχυροτέρα ὄψις, εἰς φοινικοῦν χρῶμα μετέβαλεν· ἡ δ' ἐχομένη, εἰς τὸ πράσινον· ἡ δ' ἔτι ἀσθενεστέρα εἰς τὸ ἁλουργόν. ἐπὶ δὲ τὸ πλεῖον οὐκ ἔτι φαίνεται, ἀλλ' ἐν τοῖς τρισίν, ὥσπερ καὶ τῶν ἄλλων τὰ πλεῖστα, καὶ τούτων ἔχει τέλος· τῶν δ' ἄλλων ἀναίσθητος ἡ μεταβολή. διὸ καὶ ἡ ἶρις τρίχρως φαίνεται, ἑκατέρα μέν, ἐναντίως δέ. ἡ μὲν οὖν πρώτη, τὴν ἔξω φοινικῆν ἔχει· ἀπὸ B μεγίστης γὰρ περιφερείας πλείστη προσπίπτει ἡ ὄψις πρὸς τὸν ἥλιον· μεγίστη δ', ἡ ἔξω· ἡ δ' ἐχομένη, καὶ ἡ τρίτη, ἀνάλογον. ὥστ' εἰ τὰ περὶ τῶν χρωμάτων τῆς φαντασίας εἴρηται καλῶς, ἀνάγκη τρίχρων τε εἶναι αὐτήν, καὶ τούτοις τοῖς χρώμασι κεχρῶσθαι μόνοις. τὸ δὲ ξανθὸν φαίνεται, διὰ τὸ παρ' ἄλληλα φαίνεσθαι. τὸ φοινικοῦν γὰρ παρὰ τὸ πράσινον, λευκὸν φαίνεται. σημεῖον δὲ τούτου· ἐν γὰρ τῷ μελαντάτῳ νέφει μάλιστα ἀκραιφνὴς γίνεται ἡ ἶρις· συμβαίνει δὲ τότε ξανθότερον εἶναι δοκεῖν τὸ φοινικοῦν. ἔστι δὲ τὸ ξανθὸν ἐν τῇ ἴριδι χρῶμα μεταξὺ τοῦ τε φοινικοῦ καὶ πρασίνου χρώματος. διὰ τὴν μελανίαν οὖν τοῦ κύκλῳ νέφους, ὅλον αὐτῆς φαίνεται τὸ φοινι- C κοῦν, λευκόν· ἔστι γὰρ πρὸς * ἐκεῖνα λευκόν. καὶ πάλιν ἀπομαραινομένης τῆς ἴριδος ἐγγυτάτω, ὅταν λύηται τὸ φοινικοῦν· ἡ γὰρ νεφέλη λευκὴ οὖσα, προσπίπτουσα παρὰ τὸ πράσινον, * μεταπίπτει εἰς τὸ ξανθόν. μέγιστον δὲ σημεῖον * τούτων ἡ ἀπὸ τῆς σελήνης ἶρις· φαίνεται γὰρ λευκὴ πάμπαν. γίνεται δὲ τοῦτο, ὅτι ἔν τε τῷ νέφει ζοφερῷ ἐστι φαίνεται, καὶ ἐν νυκτί. ὥσπερ οὖν πῦρ ἐπὶ πῦρ, μέλαν παρὰ μέλαν, ποιεῖ τὸ ἠρέμα λευκὸν παντελῶς φαίνεσθαι λευκὸν (τοῦτο δ' ἐστὶ τὸ φοινικοῦν.) γίνεται δὲ τοῦτο τὸ πάθος καταφανὲς καὶ ἐπὶ τῶν ἀνθῶν. ἐν γὰρ τοῖς ὑφάσμασι καὶ ποικίλμασιν ἀμύθητον διαφέρει τῇ φαντασίᾳ, D ἄλλα παρ' ἄλλα τιθέμενα χρώματα· οἷον καὶ τὰ πορφυρᾶ ἐν λευκοῖς ἢ μέλασιν ἐρίοις. ἔτι δ' ἐν αὐγῇ τοιᾷδι ἢ τοιᾷδι. διὸ καὶ οἱ ποικιλταί φασι διαμαρτάνειν ἐργαζόμενοι πρὸς τὸν λύχνον πολλάκις τῶν ἀνθῶν, καὶ λανθάνειν λαμβάνοντες ἕτερα ἀντὶ ἑτέρων. διότι μὲν οὖν τρίχρως τε, καὶ ὅτι ἐκ τούτων φαίνεται τῶν χρωμάτων μόνων ἡ ἶρις, εἴρηται. διπλῆ δὲ καὶ ἀμαυροτέρα τοῖς χρώμασιν ἡ περιέχουσα, καὶ τῇ θέσει τὰς χρόας ἐξ ἐναντίας ἔχει κειμένας διὰ τὴν αὐτὴν αἰτίαν. * μακροτέρα γὰρ ἀποτεινομένη ἡ ὄψις, ὥσπερ τὸ πορρώτερον ὁρᾷ. καὶ τὸ ἐνταῦθα τὸν αὐτὸν τρόπον. ἀσθενεστέρα οὖν ἀπὸ τῆς ἔ- E ξωθεν ἡ ἀνάκλασις γίνεται, διὰ τὸ πορρώτερον ποιεῖσθαι τὴν ἀνάκλασιν. ὥστε ἐλάττων προσπίπτουσα, τὰ χρώματα ποιεῖ ἀμαυρότερα φαίνεσθαι. καὶ ἀντεστραμμένως δὴ διὰ τὸ πλεῖον ἀπὸ τῆς ἐλάττονος καὶ τῆς ἐντὸς περιφερείας προσπίπτειν πρὸς τὸν ἥλιον· ἐγγυτέρω γὰρ τῆς ὄψεως οὖσα ἀνακλᾶται ἀπὸ τῆς ἐγγυτάτω περιφερείας τῆς πρώτης ἴριδος. ἐγγυτάτω δ' ἐν τῇ ἔξωθεν ἴριδι, ἡ ἐλαχίστη περιφέρεια. ὥστε αὕτη ἕξει τὸ χρῶμα φοινικοῦν· ἡ δ' ἐχομένη καὶ ἡ τρίτη κατὰ λόγον. ἡ ἔξω ἶρις ἐφ' ᾧ τὸ β· ἡ ἔσω, ἐφ' ᾧ τὸ α. τὰ χρώματα δ', ἐφ' ᾧ τὸ γ, φοινικοῦν· ἐφ' ᾧ τὸ δ, πράσινον· ἐφ' ᾧ ε, ἁλουργόν· τὸ ξανθὸν δὲ φαίνεται ἐφ' οὗ τὸ ζ.

* χ. ἧττον λ.
* γρ. ἐκεῖνο
* γρ. μεταβάλλει
* γρ. τούτου
* γρ. μακρότερον

τρεῖς δ' οὐκέτι γίγνονται, οὐδὲ πλείους ἴριδες διὰ τὸ καὶ τὴν δευτέραν γίγνεσθαι ἀμαυροτέραν· ὥστε καὶ τὴν τρίτην ἀνάκλασιν παντελῶς ἀσθενῆ γίγνεσθαι καὶ ἀδυνατεῖν ἀφικνεῖσθαι πρὸς τὸν ἥλιον.

ΚΕΦΑΛ. ε΄.

Περὶ ἰδίων τινῶν τῇ ἴριδι.

Ὅτι δ' οὔτε κύκλον οἷόν τε γίγνεσθαι τῆς ἴριδος, οὔτε μεῖζον ἡμικυκλίου τμῆμα, καὶ περὶ τῶν ἄλλων τῶν συμβαινόντων περὶ αὐτὴν, ἐκ τοῦ διαγράμματος ἔσται θεωροῦσι δῆλον. ἡμισφαιρίου γὰρ ὄντος ἐπὶ τοῦ ὁρίζοντος κύκλου τοῦ ἐφ' ᾧ τὸ α· κέντρου δὲ τοῦ κ· ἄλλου δέ τινος ἀνατέλλοντος σημείου ἐφ' ᾧ τὸ η, ἐὰν αἱ ἀπὸ τοῦ κ γραμμαὶ κατὰ κῶνον *ἐμπίπτουσαι ποιῶσιν ὥσπερ ἄξονα τὴν ἐφ' ἧς η κ, καὶ ἀπὸ τοῦ κ ἐπὶ τὸ μ ἐπιζευχθεῖσαι ἀνακλασθῶσιν ἀπὸ τοῦ ἡμισφαιρίου ἐπὶ τὸ η, ἐπὶ τὴν μείζω γωνίαν πρὸς κύκλου περιφέρειαν, προσπεσοῦνται αἱ ἀπὸ τοῦ κ. καὶ ἐὰν μὲν ἐπ' ἀνατολῆς ἢ ἐπὶ δυσμαῖς τοῦ ἄστρου ἡ ἀνάκλασις γένηται, ἡμικύκλιον ἀπολειφθήσεται τοῦ κύκλου ὑπὸ τοῦ ὁρίζοντος τὸ ὑπὲρ γῆν γιγνόμενον· ἐὰν δ' ἐπάνω, ἔλαττον ἀεὶ ἡμικυκλίου. ἐλάχιστον δ', ὅταν ἐπὶ τοῦ μεσημβρινοῦ γένηται τὸ ἄστρον. ἔστω γὰρ ἐπ' ἀνατολῆς πρῶτον, οὗ τὸ η, καὶ ἀνακεκλάσθω ἡ κ μ ἐπὶ τὸ η, καὶ τὸ ἐπίπεδον ἐκβεβλήσθω ἐν ᾧ τὸ α, τὸ ἀπὸ τοῦ τριγώνου ἐν ᾧ τὸ η κ μ. κύκλος οὖν ἡ τομὴ ἔσται τῆς σφαίρας. ὁ μέγιστος ἔστω, ὁ ἐφ' ᾧ α. διοίσει γὰρ οὐθὲν, ἂν ὁποιονοῦν τῶν ἐπὶ τῆς η κ κατὰ τὸ τρίγωνον τὸ κ μ η, ἐκβληθῇ τὸ ἐπίπεδον. αἱ οὖν ἀπὸ τῶν η κ ἀγόμεναι γραμμαὶ ἐν τούτῳ τῷ λόγῳ οὐ συσταθήσονται τοῦ ἐφ' ᾧ α ἡμικυκλίου πρὸς ἄλλο καὶ ἄλλο σημεῖον. ἐπεὶ γὰρ τά τε η κ σημεῖα δέδοται, καὶ ἡ η κ δεδομένη ἂν εἴη, καὶ ἡ μ η· ὥστε καὶ ὁ λόγος τῆς μ η, πρὸς τὴν μ κ. δεδομένης οὖν περιφερείας ἐφάψεται τὸ μ. ἔστω δὴ αὕτη, ἐφ' ἧς τὰ ν μ. ὥστε ἡ τομὴ τῶν περιφερειῶν δέδοται· πρὸς ἄλλῃ δὲ τῇ πρὸς* τῇ μ ν περιφερείᾳ ἀπὸ τῶν αὐτῶν σημείων ὁ αὐτὸς λόγος ἐν τῷ αὐτῷ ἐπιπέδῳ οὐ συνίσταται. ἐκκείσθω οὖν τις γραμμὴ ἡ δ β καὶ τετμήσθω ὡς ἡ μ η πρὸς μ κ, ἡ δ πρὸς τὸ β. μείζων δὲ ἡ μ η, τῆς μ κ· ἐπείπερ ἐπὶ τὴν μείζω γωνίαν ἡ ἀνάκλασις τοῦ κώνου. ὑπὸ γὰρ τὴν μείζω γωνίαν ὑποτείνει τὴν* τοῦ μ κ η τριγώνου. μείζων ἄρα καὶ ἡ δ τῆς β. προσκείσθω οὖν πρὸς τὴν β, ἐφ' ἧς τὸ ζ· ὥστ' εἶναι ὅπερ τὴν δ πρὸς τὴν β, *τὴν β ζ πρὸς τὴν δ. εἶτα ὅπερ ἡ ζ πρὸς τὴν κ η, τὸ β πρὸς ἄλλην πεποιήσθω τὴν κ π, καὶ ἀπὸ τοῦ π ἐπὶ τὸ μ ἐπεζεύχθω ἡ τὸ π μ. ἔσται οὖν τὸ π πόλος τοῦ κύκλου, πρὸς ὃν αἱ ἀπὸ τοῦ κ γραμμαὶ προσπίπτουσιν. ἔσται γὰρ ὅπερ ἡ ζ πρὸς τὴν κ η, καὶ ἡ β πρὸς τὴν κ π, καὶ ἡ δ πρὸς τὴν π μ. μὴ γὰρ ἔστω, ἀλλ' ἢ πρὸς ἐλάττω, ἢ πρὸς μείζω τῆς π μ. οὐθὲν γὰρ διοίσει. ἔστω γὰρ πρὸς τὴν π ρ. τὸν αὐτὸν ἄρα λόγον αἱ η κ καὶ κ π, καὶ ἡ π ρ, πρὸς ἀλλήλας ἕξουσιν, ὅνπερ αἱ ζ β δ. αἱ δὲ ζ β δ, ἀνάλογον ἦσαν, ὅπερ ἡ δ πρὸς β, ἡ ζ β πρὸς δ. ὥστε ὅπερ ἡ π η πρὸς τὴν π ρ, ἡ τὸ π ρ πρὸς τὴν π κ. ἂν οὖν ἀπὸ τῶν κ η αἱ η ρ καὶ κ ρ, ἐπὶ τὸ ρ ἐπιζευχθῶσιν, αἱ ἐπιζευχθεῖσαι αὗται τὸν αὐτὸν ἕξουσι λόγον, ὅνπερ αἱ η π πρὸς τὴν π ρ·

* γρ. ἐκπίπτουσαι

* γρ. τῇ ν μ ἢ τῇ μ ν περιφερείᾳ. al. πρὸς ἄλλην δέ γε τῆς μ ν περιφέρειαν.

* γρ. τοῦ μ κ η.

* γρ. τὴν ζ β πρὸς τ.

A Cæterùm tres arcus aut plures facti ad hoc vſque æui nunquam fuerunt, quia ſecundus obſcurior euadat, adeò vt tertia refractio admodum infirma reddatur, nec ad ſolem peruenire queat.

CAPVT V.

Iridis proprietates aliquot.

Porrò arcum cœleſtem nec in circulum euadere poſſe, nec in portionem ſemicirculo maiorem, atque de cæteris quæ illi accidunt, ex deſcriptione fiet conſiderare volentibus apertum. Nam hemiſphærio ſupra terminantem circulum a exiſtente, centro autem κ, atque puncto quodam alio

B ceu g exoriente, ſi lineæ quæ à κ in turbinis ſpeciem procidunt, velut axem lineam g k faciant, & lineæ à k ad m productæ ab hemiſphærio ad g ſuper angulum maiorem refrangantur: lineæ profectò quæ à k egrediuntur, ſeſe circuli oræ applicabunt. atque ſi in aſtri exortu obitúve fiat refractio, dimidia circuli portio quæ ſupra terram ſit, excipi ab horizonte conſueuit. Si verò dum aſtrum ſupera in parte cœli exiſtit, refrangatur aſpectus, ſemper arcus minor dimidia circuli forma aſſumitur, minimus autem, dum illud circulum attingit meri-

C dianum. Sit enim primum in oriente g, & linea lz m in g refrangatur: atque planum e, quod à tergo trianguli g k m exiſtit, educatur. nihil enim referet, ſi quodlibet planum ex hiſce quæ ſupra lineam g k, iuxta triangulum lz m g conſiſtunt, eductum ſit. Orbis itaque ſectura circulus erit. Maximus ſit e. Lineæ igitur à punctis g lz hac ratione ductæ, haudquaquam in alio & alio, quàm ſemicirculi illius in quo e, pacto concurrent. Nam cùm & puncta g lz data ſint, & linea lz m data vtique erit, & linea m g. Quare & ratio lineæ m g ad lineam m lz. Datam igitur circumferentiam punctum m attinget. Sit itaque ea n m. quare circumferentiarũ

D ſectio data eſt. Ad aliam enim quàm n m circumferentiam ab eiſdem pũctis eadem ratio in eodem plano minimè conſiſtit. Extra deſcriptam igitur figuram linea quædam, nempe d b, ſeorſim iaceat, ſeceturque ad hunc modum, vt quomodo linea m g ad lineam m lz ſeſe habet, ita linea d ad lineã b ſeſe habeat. Maior autẽ eſt linea m g, quàm linea m lz, quandoquidem turbinis refractio ſuper maiorem angulum fit. ſub maiori enim angulo trianguli m lz g porrigitur: maior ergo eſt & linea d, linea b. Accedat igitur ad lineam b, linea f, vt quod eſt linea d ad lineã b, id linea b f ad lineã d ſit. deinde quod eſt linea f ad lineã lz g, id linea b ad aliã, puta lz q fiat, atque à puncto q ad punctum m pro-

E ducatur linea q m. Igitur punctum q circuli cui lineæ à lz profluentes ingruunt, vertex erit. Nã vt linea f ſeſe habet ad lineam lz g, & linea b ad lineã lz q, ita & linea d ad lineam q m ſeſe habebit. Ponamus enim non ita habere, ſed aut ad minorem, aut ad maiorem linea q m. Nihil enim referet, vtram dicamus. Sit ad lineam q r. Eandem igitur rationem lineæ g lz, & lz q, & q r inter ſe habebunt, quam lineæ f, b, d, habent. At lineæ f, b, d, rationum ſimilitudinem ſubeunt. nam quod eſt linea d ad lineam b, id linea f b ad lineam d. Quare ſicut ſe habet linea g q ad q r, ſic linea q r ad q lz. Si igitur à punctis g lz, ad punctum r protrahantur lineæ g r & lz r: hæ protractæ eandem ſeruabunt rationem, quam linea g q ad lineam q r.

Nam lineæ trianguli g q r, & trianguli k r q, circa eundem angulum q rationum ſimilitudinem ſubeunt. Quare & linea g r, ad lineam k r eandem habebit rationem, quam & linea g q ad lineam q r ſortita eſt. Eandem autem rationem habet linea m g, ad lineam m k, quam linea d, ad lineam b. Quare quæ à punctis g k, ducuntur, ambæ non modò apud circumferentiam m n concurrent, tametſi eandem habeant rationem, verùm etiam alibi. quod ſanè fieri nequit. Cùm igitur linea d, nec cum maiori, nec cum minori quàm q m (vtrunque enim ſimiliter oſtendetur) communem obtineat rationem, patet idem illi cum ipſa linea q m euenire. Quare quod eſt linea m q, ad lineam q k, id erit linea g q ad lineam q m. Igitur ſi circulus deſcriptus ſit qui vertice q, & interuallo q m vtatur, angulos omneis attinget, quos refractæ lineæ quæ à punctis k g prodeunt, efficere ſolent. Quod ſi non attinget, quæ alibi quàm in ſemicirculo coeunt: eandem habere rationem conſimiliter oſtendentur. quod fieri non poſſe, iam diximus. Si ergo ſemicirculum e circa diametrum g k q circumagas: quæ à punctis g k ad punctum m refrangi ſolent, omnibus in planis conſimiliter ſeſe habebunt, efficiéntque angulum æqualem, nempe k m g, & quem angulum lineæ k q & q m, ſuper lineam g k committent, ſemper æqualis erit. Igitur trianguli ſuper lineam g q conſtituti, triangulo g m q æquales ſunt. horum autem perpendicula in idem punctum lineæ g q cadent atque æqualia inter ſe erunt. cadant in o, igitur o circuli centrum exiſtit: cuius partem alteram, nempe eam quæ circa m e, horizon abſtulit. Rurſum, ſit horizon a c, ſupra quem iam ſubuectum ſit punctum g, ſitque nunc axis g q. Reliqua omnia haud ſecus atque priùs oſtendentur. Circuli enim vertex q ſub horizonte a c, eleuato puncto g erit. Vertex autem circuli & centrum tam circuli quàm eius qui nunc puncti eleuationem terminat (is enim eſt g q) in eadem linea ſunt. Cùm verò puncta k g ſupra diametrum a c ſint: circuli centrum, ſcilicet o, ſub priori terminante, nempe a c, in linea lz q erit. Quare portio quæ ſupra horizontem exiſtit, vt s t, ſole ſupra eundem eleuato, minor ſemicirculo erit. nam r s t ſemicirculus erat. nunc autem à terminante a c interſectus eſt. portio itaque r s minimè apparebit, at cùm idem in meridie exiſtit, minima. Nam quo punctum g ſuperius fuerit, eo circuli centrum & vertex inferius erunt. Cur autem ab æquinoctio autumnali die decreſcente quacunque hora fiat iris, & eo rurſus creſcente ab æquinoctio verno vſque ad alterum per meridiem non cernatur, ratio eſt, quod circulorum ſectiones quæ ab æquinoctiali ad ſeptentrionem vergere ſolent, omnes ſemicirculo maiores ſunt, atque ſubinde ſemper maiores euadunt. quod verò diſparet, paruum. Contrà quæ ab eodem ad meridiem ſpectant, minores (nam quæ ſupra terram extat, parua eſt: quæ autem infra, magna) & quæ longiùs abſunt, ſemper minores ſunt. Vnde fit vt diebus ſolſtitio æſtiuo vtrinque proximis ob ſectionis magnitudinem priuſquam punctum g

A περὶ γὰρ τὴν αὐτὴν γωνίαν τὴν π, ἀνάλογον αἵ τε τοῦ ηπρ τριγώνου, καὶ τοῦ κρπ. ὥστε καὶ ἡ ηρ πρὸς τὴν κρ τὸν αὐτὸν ἕξει λόγον, ὃν * καὶ ἡ ηπ πρὸς τὴν πρ. ἔχει δὲ καὶ ἡ μη πρὸς τὴν μκ τὸν αὐτὸν λόγον, ὅνπερ ἡ τὸ δ πρὸς τὴν β ἀμφότεραι. ὥστ᾽ ἀπὸ τῶν ηκ σημείων οὐ μόνον * πρὸς τὴν μν περιφέρειαν συσταθήσονται τὸν αὐτὸν ἔχουσαι λόγον, ἀλλὰ καὶ ἄλλοθι. ὅπερ ἀδύνατον. ἐπεὶ οὖν ἡ δ, οὔτε πρὸς ἐλάττω τῆς μπ, οὔτε πρὸς μείζω (ὁμοίως γὰρ δειχθήσεται)· δῆλον ὅτι πρὸς αὐτὴν ἂν εἴη τὴν ἐφ᾽ ἧ μπ. ὥστε ἔσται ὅπερ ἡ μπ πρὸς τὴν πκ, ἡ τὸ πη πρὸς τὴν μπ, καὶ λοιπὴ ἡ τὸ μη πρὸς τὴν μκ. ἂν οὖν τῷ ἐφ᾽ ᾧ τὸ π πόλῳ χρώμενος, διαστήματι δὲ τῷ ἐφ᾽ ᾧ μπ, κύκλος γραφῇ, ἁπασῶν ἐφάψεται τῶν γωνιῶν ἃς ἀνακλώμεναι ποιοῦσιν αἱ ἀπὸ τοῦ μη κύκλου· εἰ δὲ μή, ὁμοίως δειχθήσονται τὸν αὐτὸν ἔχουσαι λόγον αἱ ἄλλοθι καὶ ἄλλοθι τοῦ ἡμικυκλίου συνιστάμεναι· ὅπερ ἦν ἀδύνατον. ἂν οὖν περιαγάγῃς τὸ ἡμικύκλιον τὸ ἐφ᾽ ᾧ τὸ α περὶ τὴν ἐφ᾽ ἧ ηκπ διάμετρον, αἱ * ἀπὸ τοῦ ηκ ἀνακλώμεναι πρὸς τὸ ἐφ᾽ ᾧ τὸ μ, ἐν πᾶσι τοῖς ἐπιπέδοις ὁμοίως ἕξουσι, καὶ ἴσην ποιήσουσι γωνίαν τὴν κμη. καὶ ἣν * ποιοῦσι δὲ γωνίαν αἱ ηπ, καὶ μπ ἐπὶ τῆς ηπ, ἀεὶ ἴση ἔσται. τρίγωνα οὖν ἐπὶ τῆς ηπ, καὶ κπ, ἴσα τῷ ημπ, καὶ κμπ, συνεστήκασι. C τούτων δ᾽ αἱ κάθετοι ἐπὶ τὸ αὐτὸ σημεῖον πεσοῦνται τῆς ηπ, καὶ ἴσαι ἔσονται· πιπτέτωσαν ἐπὶ τὸ ο. κέντρον ἄρα τοῦ κύκλου τὸ ο, ἡμικύκλιον δὲ ὃ περὶ τὴν μν ἀφῄρηται ἀπὸ τοῦ ὁρίζοντος. τῇ μὲν γὰρ ἄνω τὸν ἥλιον οὐ κρατεῖν, τῶν δὲ πρὸς τῷ περιορίζεσθαι μᾶλλον κρατεῖν, καὶ διαχεῖν τὸν ἀέρα. καὶ διὰ τοῦτο τὴν ἶριν οὐ συμβαίνει τὸν κύκλον. γίνεται δὲ καὶ νύκτωρ ἀπὸ τῆς σελήνης ὀλιγάκις· οὔτε γὰρ ἀεὶ πλήρης, ἀσθενεστέρα τε τὴν φύσιν, ὥστε κρατεῖν τοῦ ἀέρος. μάλιστα δ᾽ ἵσταται ἡ ἶρις, ὅπου μάλιστα κρατεῖται ὁ ἥλιος· πλείστη γὰρ ἐν αὐτῇ ἡ ἰκμὰς ἐνέμεινε. πάλιν ἔστω ὁ ὁρίζων μὲν, ἐφ᾽ οὗ τὸ αβγ, ἐπανατεταλκέτω δὲ τὸ κ· ὁ δὲ ἄξων ἔστω νῦν, ἐφ᾽ ᾧ τὸ ηπ. τὰ μὲν οὖν ἄλλα πάντα ὁμοίως δειχθήσεται, ὡς D καὶ πρότερον. ὁ δὲ πόλος τοῦ κύκλου ὁ ἐφ᾽ ᾧ π, κάτω ἔσται τοῦ ὁρίζοντος τοῦ ἐφ᾽ ᾧ τὸ αγ, ἀρθέντος τοῦ ἐφ᾽ ᾧ * τὸ η σημείου. ἐπὶ δὲ τῆς αὐτῆς, ὅ, τε πόλος, καὶ τὸ κέντρον τοῦ κύκλου, καὶ τὸ τοῦ ὁρίζοντος νῦν τὴν ἀνατολήν· ἔστι γὰρ τοῦτ᾽, ἐφ᾽ ᾧ τὸ ηπ. ἐπεὶ δὲ ἐπάνω τῆς διαμέτρου τῆς αγ, τὸ κη, τὸ κέντρον εἴη ἂν ὑποκάτω τοῦ ὁρίζοντος πρότερον τοῦ ἐφ᾽ ᾧ τὸ αγ, ἐπὶ τῆς κπ γραμμῆς, ἐφ᾽ οὗ τὸ ο. ὥστε ἔλαττον ἔσται τὸ ἐπάνω τμῆμα ἡμικυκλίου τὸ ἐφ᾽ ᾧ ψυω· τὸ γὰρ ψυω ἡμικύκλιον ἦν· νῦν δ᾽ ἀποτέτμηται * ἀπὸ τοῦ αγ ὁρίζοντος. τὸ δὴ υω ἀφανὲς ἔσται, ἐπαρθέντος αὐτοῦ τοῦ ἡλίου ἐλάχιστον, ὅταν ἐπὶ μεσημβρίας E ᾖ· ὅσῳ γὰρ ἀνώτερον τὸ η, κατώτερος τε ὁ πόλος καὶ τὸ κέντρον τοῦ κύκλου ἔσται. ὅτι δ᾽ ἐν μὲν τῇ ἐλάττονι ἡμέρᾳ τῇ μετ᾽ ἰσημερίαν τὴν μετοπωρινὴν ἐνδέχεται ἀεὶ γίνεσθαι ἶριν· ἐν δὲ ταῖς μακροτέραις ἡμέραις ταῖς ἀπὸ ἰσημερίας τῆς ἑτέρας ἐπὶ τὴν ἰσημερίαν τὴν ἑτέραν, περὶ μεσημβρίαν οὐ γίνεται ἶρις· αἴτιον ὅτι τὰ μὲν πρὸς ἄρκτον τμήματα πάντα μείζω ἡμικυκλίου· καὶ ἀεὶ ἐπὶ μείζω ἡμικυκλίου· τὸ δ᾽ ἀφανὲς, μικρόν. τὰ δὲ πρὸς μεσημβρίαν τμήματα τοῦ ἰσημερινοῦ, τὸ μὲν ἄνω τμῆμα, μικρόν· τὸ δ᾽ ὑπὸ γῆν, μέγα. καὶ ἀεὶ δὴ τὰ πορρώτερω μείζω. ὥστε ἐν μὲν ταῖς πρὸς θερινὰς τροπὰς ἡμέραις, διὰ τὸ μέγεθος τοῦ τμήματος, πρὶν ἐπὶ τὸ μέσον ἐλθεῖν τοῦ τμήματος, καὶ ἐπὶ τὸ μεσημβρινὸν τὴν τὸ η,

* γρ. ὃν ἡ ηπ πρὸς τὴν πρ.
* γρ. τὴν μν περ.
* γρ. τῆς π. μ.
* γρ. ἀπὸ τῶν κ αἱ.
* γρ. ποιήσουσιν
* γρ. τὸ η κ σημ.
* γρ. ὑπὸ τοῦ

* χ. πάνυ

κάτω ἤδη* παντελῶς. αἴτιον δ' ὅτι, διὰ τὸ πόρρω ἀφεστάναι τῆς γῆς τὴν μεσημβρίαν, διὰ τὸ μέγεθος τοῦ τμήματος. ἐν δὲ ταῖς πρὸς τὰς χειμερινὰς τροπὰς ἡμέραις, διὰ τὸ μὴ πολὺ ὑπὲρ γῆς εἶναι τὰ τμήματα τῶν κύκλων, τοὐναντίον ἀναγκαῖον γίνεσθαι. βραχὺ γὰρ ἀρθείσης τῆς ἐφ' ᾧ τὸ Η, ἐπὶ τῆς μεσημβρίας γίνεται ὁ ἥλιος.

ΚΕΦΑΛ. ϛʹ.

Περὶ αἰτιῶν καὶ γενέσεως ῥάβδων καὶ παρηλίου.

Τὰς δ' αὐτὰς αἰτίας ὑποληπτέον εἶναι περὶ παρηλίου καὶ ῥάβδων ταῖς εἰρημέναις. γίνεται γὰρ ὁ παρήλιος μὲν, ἀνακλωμένης τῆς ὄψεως πρὸς τὸν ἥλιον ἀπό τινος· ῥάβδοι δὲ, διὰ τὸ προσπίπτειν τοιαύτην οὖσαν τὴν ὄψιν, οἵαν εἴπομεν ἀεὶ γίνεσθαι, ὅταν πλησίον ὄντων τοῦ ἡλίου νεφῶν, ἀπό τινος ἀνακλασθῇ τῶν ὑγρῶν πρὸς τὸ νέφος. φαίνεται γὰρ αὐτὰ μὲν ἀχρώματα τὰ νέφη κατ' εὐθυωρίαν ἐμβλέπουσιν· ἐν δὲ τῷ ὕδατι, ῥάβδων μεστὸν τὸ νέφος· πλὴν τότε μὲν ἐν τῷ ὕδατι δοκεῖ τὸ χρῶμα τοῦ νέφους εἶναι, ἐν δὲ ταῖς ῥάβδοις ἐπ' αὐτοῦ τοῦ νέφους. γίνεται δὲ τοῦτο ὅταν ἀνώμαλος ᾖ τοῦ νέφους ἡ σύστασις, καὶ τῇ μὲν πυκνοῦ, τῇ δὲ μανοῦ· καὶ τῇ μὲν ὑδατωδεστέρου, τῇ δὲ ἧττον· ἀνακλασθείσης γὰρ τῆς ὄψεως πρὸς τὸν ἥλιον, τὸ σχῆμα μὲν τοῦ ἡλίου οὐχ ὁρᾶται διὰ τὴν σμικρότητα τῶν ἐνόπτρων· τὸ δὲ χρῶμα, διὰ τὸ ἐν ἀνωμάλῳ φαίνεσθαι λαμπρὸν καὶ λευκὸν τὸν ἥλιον, πρὸς ὃν ἀνεκλάσθη ἡ ὄψις, τὸ μὲν φοινικοῦν φαίνεται, τὸ δὲ πράσινον ἢ ξανθόν. διαφέρει γὰρ οὐθὲν, διὰ τοιούτων ὁρᾶν ἢ ἀπὸ τοιούτων ἀνακλωμένην· ἀμφοτέρως γὰρ φαίνεται τὴν χρόαν ὅμοιον· ὥστε εἰ κἀκείνως φοινικοῦν, καὶ οὕτως. αἱ μὲν οὖν ῥάβδοι γίνονται δι' ἀνωμαλίαν τοῦ ἐνόπτρου οὐ τῷ σχήματι, ἀλλὰ τῷ χρώματι· ὁ δὲ παρήλιος, ὅταν ὅτι μάλιστα ὁμαλὸς ᾖ ὁ ἀὴρ, καὶ πυκνὸς ὁμοίως· διὸ φαίνεται λευκός· ἡ μὲν γὰρ ὁμαλότης τοῦ ἐνόπτρου ποιεῖ χρόαν μίαν τῆς ἐμφάσεως· ἡ δ' ἀνάκλασις ἀθρόας τῆς ὄψεως, διὰ τὸ ἅμα προσπίπτειν πρὸς τὸν ἥλιον ἀπὸ πυκνῆς οὔσης τῆς ἀχλύος, καὶ οὔπω μὲν οὔσης ὕδωρ, ἐγγὺς δ' ὕδατος, τὸ ὑπάρχον τῷ ἡλίῳ ἐμφαίνεσθαι χρῶμα ποιεῖ, ὥσπερ ἀπὸ χαλκοῦ λείου κλωμένης διὰ τὴν πυκνότητα. ὥστ' ἐπεὶ τὸ χρῶμα τοῦ ἡλίου λευκὸν, καὶ ὁ παρήλιος φαίνεται λευκός. διὰ δὲ τὸ αὐτὸ τοῦτο μᾶλλον ὕδατος σημεῖον ὁ παρήλιος, τῶν ῥάβδων· μᾶλλον γὰρ συμβαίνει τὸν ἀέρα εὐφυῶς ἔχειν πρὸς γένεσιν ὕδατος. ὁ δὲ νότιος, τοῦ βορείου μᾶλλον, ὅτι μᾶλλον ὁ νότιος ἀὴρ εἰς ὕδωρ μεταβάλλει τοῦ πρὸς ἄρκτον. γίνονται δ' ὥσπερ εἴπομεν περί τε τὰς δυσμὰς καὶ περὶ τὰς ἀνατολὰς, καὶ οὔτ' ἄνωθεν οὔτε κάτωθεν, ἀλλ' ἐκ τῶν πλαγίων καὶ ῥάβδοι καὶ παρήλιοι· καὶ οὔτ' ἐγγὺς τοῦ ἡλίου λίαν, οὔτε πόρρω παντελῶς· ἐγγὺς μὲν γὰρ ὄντος ὁ ἥλιος διαλύει τὴν σύστασιν· πόρρω δ' ὄντος, ἡ ὄψις οὐκ ἀνακλασθήσεται· ἀπὸ γὰρ μικροῦ ἐνόπτρου πόρρω ἀποτεινομένη, ἀσθενὴς γίνεται. διὸ καὶ* αἱ ἅλω οὐ γίνονται ἐξ ἐναντίας τοῦ ἡλίου. ἄνω μὲν οὖν ἐὰν γίνηται καὶ ἐγγὺς, διαλύσει ὁ ἥλιος· ἐὰν δὲ πόρρω, ἐλάττων ἡ ὄψις οὖσα ἢ ὥστε ποιεῖν ἀνάκλασιν, οὐ προσπεσεῖται.

* χ. αἱ ἅλως

A ad ſectionis medium meridianámque lineam perueniat, τ prorſus deorſum exiſtat. propterea quòd meridies à terra procul ob ſectionis magnitudinem abeſt. at diebus ſolſtitium hybernum ſtipantibus, propterea quòd circulorum ſectiones non admodum ſupra terram ſunt, contra accidere neceſſum eſt. Nam paululum eleuato puncto g, ſol in meridie conſiſtit.

CAPVT VI.

Virgarum & pareliorum cauſa ac generatio.

B De geminato autem ſole (quem Græci parelium vocant) & virgis ſiue bacillis, eaſdem cum iis quas diximus cauſſas eſſe exiſtimandum eſt. Nam tum parelius fieri aſſolet, cùm ſolem versùs refrangitur aſpectus. Virgæ autem, propterea quòd aſpectus talis, qualem ſemper fieri diximus, quoties nubibus propè ſolem conſiſtentibus ab aliquo humido refrangitur, ad nubem ſeſe applicat. Nam nubes cùm per aſpectum ſpectantur, coloris expertes eſſe videntur: cùm verò in aqua, plenæ virgarum apparent. Verùm tunc, nempe cùm in aqua ſpectantur, color eſſe nubis videtur. at cùm virgæ in cælo fiunt, idem in ipſa nube apparet. Hoc autem fit, cùm nubis conſtitutio inæquabilis eſt, & nubes partim denſa, C partim rara, & vna in parte aquoſa magis, in altera minùs exiſtit. nam refracto in ſolem aſpectu, ſolis figura non cernitur, ſed color. at quia ſol lucidus & albus exiſtens, quem versùs refrangitur aſpectus, in re apparet inæquabili, aliud puniceum, aliud viride aut flauum apparet. Nihil enim refert per talia videre, an à talibus refringi aſpectum dicamus: vtroque enim modo colore ſimili apparet. Quare ſi illo modo puniceum: & hoc quoque, tale apparebit. Virgæ igitur propter ſpeculi inæquabilitatem, non figura, ſed colore fiunt. Parelius autem fit, cùm aër quam maximè æquabilis & ex æquo denſus eſt, & proinde albus apparet. Nam ſpeculi æquabilitas apparitionis colorem vnum D reddit: at aſpectus vniuerſi refractio, quòd à caligine quæ denſa eſt, & necdum quidem aqua eſt, ſed propè eſt vt aqua ſit, ad ſolem concurrat: colorem qui in ſole eſt apparere perinde facit, vt cùm ab ære leui ob eius denſitatem frangitur aſpectus. Quare cùm ſolis color albus ſit, parelius quoque apparet. Ob id ipſum autem parelius, quàm virgæ, certior aquæ futuræ index exiſtit: quippe qui aërem gignendis imbribus procliuem eſſe magis indicat. Et cùm in Auſtrina cœli regione conſtiterit, magis quàm cùm in Aquilonia: quoniam auſtrinus aër quàm ſeptentrionalis, meliùs in aquam mutari ſolet. Fiunt etiam tam parelij quàm virgæ, vti diximus, in oriente & occidente: & nec ſupra ſolem E nec infra, ſed ex lateribus: nec propè admodum, nec procul omnino. Nam ſi illa aëris concreſcentis ſoliditas propè ſit, reſoluetur à ſole: ſi procul, aſpectus refrangi non poterit: cùm enim longe de paruo ſpeculo remeet, imbecillis redditur. Quamobrem areæ quoque fieri non poſſunt è regione. Quòd ſi ſupra & in propinquo inchoëtur, à ſolis feruore diſſoluetur: ſin procul, aſpectus minor, quàm vt refractionem facere queat, ſolem haudquaquam inuadet.

Sed in latere fieri poteſt vt ſpeculum ita diſtet, vt nec ſolis feruore abſumi poſſit, & aſpectus vniuerſus recurrat. nam ſi in terram quaſi per immenſum ſparſus feratur, deuenire ad ſolem non poteſt. Sub ſole etiam fieri non poteſt. quia ſi prope terram extiterit, conſumetur feruore: ſi autem ſupra cœlo in medio, aſpectus diſtrahetur & euaneſcet. Denique nec è latere quidem effici illa poteſt, cùm ſol cœli vmbilicum perreptat. nam aſpectus nequaquam fertur in terram. Itaque exiguus ad ſpeculum venit, & refractus omnino imbecillus recedit. Quæ igitur opera in locis quæ ſupra terram ſunt, ſecretionem exhibere contingat, tot ferè numero taliaque ſunt. Quæ autem in terra ipſa, eadem in terræ partibus occluſa efficiat, dicendum. Duas enim corporum differentias, quoniam & ipſa quoque duplex eſt, ibi perinde vt in ſublimi efficere aſſolet. Nam vt halitus duo ſunt (vti diximus) alter vapidus, alter fumidus: ita & eorum quæ in terra fieri ſolent, genera duo ſunt. etenim alia foſſilia ſunt, alia metallica. Igitur exhalatio arida ſuo calore foſſilia omnia (verbi cauſa, tam illiquabilia lapidum genera, quàm ſandaracam, ochram, minium, ſulfur, cæteráque generis eiuſdem) efficit. Plurima autem foſſilium partim coloratus puluis ſunt, partim lapis è tali conſiſtentia factus, vt cinnabari. at quæcunque metallica ſunt, & aut fuſilia ſunt aut ductilia, vt ferrum, æs, aurum, ad vapidam pertinent exhalationem. Vapida autem exhalatio, cùm includitur, & in lapidibus potiſſimùm ob eorum ſiccitatem conſtringitur in arctius, denſeſcitque roris aut pruinæ modo cùm excernitur, ea omnia committit. ſed inibi, ea priùs quàm illa excernatur, gigni ſolent. Vnde fit vt partim aqua ſint, partim minimè. nam eorum materies potentia quidem aquæ erat, nondum tamen eſt. Nec ex aqua, quæ per affectionem quampiam ſaporum in morem fiat, conſtant. non enim ad hunc modum hoc æs, illud aurum euadit: ſed horum ſingula, concreta priùs exhalatione quàm ortum ſubeant, fiunt. Quocirca & terram continent in ſe, & vruntur omnia, quòd ſiccam exhalationem habeant. at aurum vnum omnium nequaquam vri ſolet. Sed de his omnibus, communiter quidem à nobis dictum eſt. propriè autem ij conſiderent oportet, qui generis cuiuſque determinationem ſuſcipiunt.

A ἐν δὲ τοῖς πλαγίοις ὑπὸ τὸν ἥλιον ἔστι τοσοῦτον ἀποσχόντα τὸ ἔνοπτρον, ὥστε μήτε τὸν ἥλιον διαλύσαι τήν τε ὄψιν ἀθροισθεῖσαν ἐλθεῖν, διὰ τὸ πρὸς τὴν γῆν φερομένην, μὴ διασκεδάννυσθαι ὥσπερ δι' ἀχανοῦς φερομένην. ὑπὸ δὲ τὸν ἥλιον οὐ γίγνεται, διὰ τὸ πλησίον μὲν τῆς γῆς διαλύεσθαι ἂν ὑπὸ τοῦ ἡλίου· ἄνω δὲ μεσουρανοῦντος διασπᾶσθαι τὴν ὄψιν. καὶ ὅλως οὐδ' ἐκ* πλαγίας μεσουρανοῦντος γίγνεται· ἡ γὰρ ὄψις οὐχ ὑπὸ τὴν γῆν φέρεται· ὥστε ὀλίγη ἀφικνεῖται πρὸς τὸ ἔνοπτρον, καὶ ἡ ἀνακλωμένη γίγνεται παντελῶς ἀσθενής. ὅσα μὲν οὖν ἔργα συμβαίνει ἀποτελεῖσθαι τῆς ἐκκρίσεως ἐν τοῖς τόποις τοῖς* ὑπὲρ τὴν γῆν, σχεδόν ἐστι τοσαῦτα καὶ τοιαῦτα. B ὅσα δ' ἐν αὐτῇ τῇ γῇ, ἐγκατακλειομένη τοῖς τῆς γῆς μέρεσιν ἀπεργάζεται, λεκτέον. ποιεῖ γὰρ δύο διαφορὰς σωμάτων, διὰ τὸ διπλῆν πεφυκέναι καὶ αὐτήν, καθάπερ καὶ ἐν τῷ μετεώρῳ. δύο μὲν γάρ αἱ ἀναθυμιάσεις, ἡ μὲν ἀτμιδώδης, ἡ δὲ καπνώδης, ὥς φαμεν. εἰσὶ δύο δὲ καὶ τὰ εἴδη τῶν ἐν τῇ γῇ γιγνομένων· τὰ μὲν ὀρυκτά, τὰ δὲ μεταλλευτά. ἡ μὲν οὖν ξηρὰ ἀναθυμίασίς ἐστιν, ἥτις ἐκπυροῦσα ποιεῖ τὰ ὀρυκτὰ πάντα, οἷον λίθων τε γένη τὰ ἄτηκτα, καὶ* σανδαράχην, καὶ ὤχραν, καὶ μίλτον, καὶ θεῖον, καὶ τἄλλα τὰ τοιαῦτα. τὰ δὲ πλεῖστα τῶν ὀρυκτῶν ἐστι, τὰ μὲν κονία κεχρωματισμένη, τὰ C δὲ λίθος ἐκ τοιαύτης γεγονὼς συστάσεως, οἷον τὸ κιννάβαρι. τῆς δ' ἀναθυμιάσεως τῆς ἀτμιδώδους, ὅσα μεταλλεύεται, καὶ ἔστιν ἢ χυτὰ ἢ ἐλατά, οἷον σίδηρος, χρυσός, χαλκός. ποιεῖ δὲ ταῦτα πάντα ἡ ἀναθυμίασις ἡ ἀτμιδώδης, ἐγκατακλειομένη· καὶ μάλιστα ἐν τοῖς λίθοις, διὰ ξηρότητα εἰς ἓν* συνθλιβομένη, καὶ πηγνυμένη, οἷον δρόσος ἢ πάχνη, ὅταν ἀποκριθῇ. ἐνταῦθα δὲ πρὶν ἀποκριθῆναι γεννᾶται ταῦτα. διὸ ταῦτα, ἔστι μὲν ὡς ὕδωρ, ἔστι δ' ὡς οὔ· δυνάμει μὲν γὰρ ἡ ὕλη ὕδατος ἦν, ἔστι δ' οὐκέτι, οὐδ' ἐξ ὕδατος γενομένου διά τι πάθος, ὥσπερ οἱ χυμοί· οὐ γὰρ οὕτω γίγνεται, τὸ μὲν χαλκός, τὸ δὲ χρυσός, ἀλλὰ πρὶν γενέσθαι παγείσης τῆς ἀναθυμιά- D σεως ἕκαστα τούτων ἐστί. διὸ καὶ πυροῦται πάντα, καὶ γῆν ἔχει· ξηρὰν γὰρ ἔχει ἀναθυμίασιν· ὁ δὲ χρυσὸς μόνος οὐ πυροῦται. κοινῇ μὲν οὖν εἴρηται περὶ πάντων αὐτῶν, * ἰδίᾳ δ' ἐπισκεπτέον προχειριζομένοις * περὶ ἕκαστον γένος.

* γρ. πλαγίου

* κ. ὑπ. τῆς γῆς.

* γ. σανδαράκην.

* κ. ο. ἐγκατακλειομένη, ἐν τῇ.

* His verbis ſpem facit nobis Ariſtoteles libri quo ſigillatim omnes τῶν ὀρυκτῶν & μεταλλευτῶν ſpecies (mineras vocãt) explicētur: qui profectò liber, vel quòd ab eo ſcriptus non fuerit, nec editus, vel quòd interierit cum aliis multis, hodie nullus extat. grauiter enim falluntur interpretes, qui ſequenti libro exſequi putant Ariſtotelem, quod huius tertij fine polliceri videtur. Quare etiã librum ſequentē nõ poſſe niſi ὁμωνύμως inſcribi Μετεωρολογικῶν meritò dixeris. Sanè interpretibus inter ipſos de ordine & loco quem ſequens liber in opere phyſico obtinere debet, non conuenit.

* γρ. περὶ ἑκάστου

ARISTOTELIS STAGIRITÆ, METEOROLOGICORVM

LIBER IV.

CAPVT I.

Qualitatum quæ actiuæ, quæ paſſiuæ.

CVM autem elementorum cauſas quatuor eſſe à nobis definitum ſit, & iuxta coniugationes harum ipſa quoque elementa eſſe quatuor acciderit, è quibus duæ quidem, calor inquam & frigus, agere ſolent: duæ verò, ariditas videlicet & humiditas, pati: (cuius rei fides

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΜΕΤΕΩρολογικῶν τῶν εἰς Δ τὸ Δ.

ΚΕΦΑΛ. α'.

E Ὅτι τέτταρα διώρισται αἴτια τῶν στοιχείων· τούτων δὲ κατὰ τὰς συζυγίας καὶ τὰ στοιχεῖα τέτταρα συμβέβηκεν εἶναι· ὧν τὰ μὲν δύο ποιητικά, τὰ δὲ δύο παθητικά· καὶ περὶ γενέσεως καὶ φθορᾶς.

ΕΠΕΙ δὲ τέτταρα διώρισται αἴτια τῶν στοιχείων, τούτων δὲ κατὰ τὰς συζυγίας καὶ τὰ στοιχεῖα τέτταρα συμβέβηκεν εἶναι, ὧν τὰ μὲν δύο ποιητικά, τὸ θερμὸν καὶ τὸ ψυχρόν· τὰ δὲ δύο, παθητικά, τὸ ξηρὸν καὶ τὸ ὑγρόν· (ἡ δὲ πίστις τούτων, ἐκ

A ἐκ τῆς ἐπαγωγῆς· φαίνεται γὰρ ἐν πᾶσιν, ἡ μὲν θερμότης καὶ ψυχρότης ὁρίζουσαι, καὶ συμφύουσαι, καὶ μεταβάλλουσαι τὰ ὁμογενῆ καὶ μὴ ὁμογενῆ· καὶ ὑγραίνουσαι, καὶ ξηραίνουσαι καὶ σκληρύνουσαι, καὶ μαλάττουσαι· τὰ δὲ ξηρὰ καὶ ὑγρὰ ὁριζόμενα καὶ τἆλλα τὰ εἰρημένα πάθη πάσχοντα αὐτά τε καθ᾽ αὑτά, καὶ ὅσα κοινὰ * ἐξ ἀμφοῖν σώματα καθέστηκεν. * ἐπὶ δ᾽ ἐκ τῶν λόγων δῆλον, οἷς ὁριζόμεθα τὰς φύσεις αὐτῶν. τὸ μὲν γὰρ θερμὸν καὶ ψυχρὸν, ὡς ποιητικὰ λέγομεν· τὸ γὰρ συγκριτικὸν ὥσπερ ποιητικόν τι ἐστί· τὸ δὲ ὑγρὸν καὶ ξηρὸν, παθητικόν· τὸ γὰρ εὐόριστον καὶ δυσόριστον, τῷ πάσχειν τι λέγεται τὴν φύσιν αὐτῶν. ὅτι μὲν οὖν τὰ μὲν ποιητικὰ, τὰ δὲ παθητικὰ, B φανερόν.) διωρισμένων δὲ τούτων, ληπτέον ἂν εἴη τὰς ἐργασίας αὐτῶν, αἷς ὅπως ἐργάζονται τὰ ποιητικὰ, καὶ τῶν παθητικῶν τὰ εἴδη. πρῶτον μὲν οὖν καθόλου ἡ ἁπλῆ γένεσις, καὶ ἡ φυσικὴ μεταβολὴ, τούτων τῶν δυνάμεών ἐστιν ἔργον, καὶ ἡ ἀντικειμένη φθορὰ κατὰ φύσιν· αὗται μὲν οὖν τοῖς τε φυτοῖς ὑπάρχουσι, καὶ ζῴοις, καὶ τοῖς μέρεσιν αὐτῶν. ἔστι δ᾽ ἡ ἁπλῆ καὶ φυσικὴ γένεσις μεταβολὴ ὑπὸ τούτων τῶν δυνάμεων, ὅταν ἔχωσι λόγον ἐκ τῆς ὑποκειμένης ὕλης ἑκάστῃ φύσει· αὗται δ᾽ εἰσὶν αἱ εἰρημέναι δυνάμεις παθητικαί. γεννῶσι δὲ τὸ θερμὸν καὶ ψυχρὸν, κρατοῦντα τῆς ὕλης. ὅταν δὲ μὴ κρατῇ, κατὰ μέρος μὲν, μόλυνσις καὶ ἀπεψία γίνεται. τῇ δ᾽ ἁπλῇ γενέσει τὸ ἐναντίον μάλιστα κοινὸν, C σῆψις· πᾶσα γὰρ ἡ κατὰ φύσιν φθορὰ, εἰς τοῦθ᾽ ὁδός ἐστιν, οἷον γῆρας καὶ αὔανσις. τέλος δὲ τῶν ἄλλων ἁπάντων τούτων, σαπρότης, ἂν μή τι βίᾳ φθαρῇ τῶν φύσει συνεστώτων· ἔστι γὰρ καὶ σάρκα, καὶ ὀστοῦν, καὶ ὁτιοῦν κατακαῦσαι· ὧν τὸ τέλος τῆς κατὰ φύσιν φθορᾶς, σῆψίς ἐστι. διὸ ὑγρὰ πρῶτον, εἶτα ξηρὰ, τέλος γίνεται τὰ σηπόμενα· ἐκ τούτων γὰρ ἐγένετο καὶ ὡρίσθη τῷ ὑγρῷ τὸ ξηρὸν ἐργαζομένων τῶν ποιητικῶν. γίνεται δ᾽ ἡ φθορὰ, ὅταν κρατῇ τοῦ ὁρίζοντος τὸ ὁριζόμενον διὰ τὸ περιέχον. οὐ μὴν ἀλλὰ ἰδίως γε λέγεται σῆψις ἐπὶ τῶν κατὰ μέρος φθειρομένων, ὅταν χωρισθῇ τῆς φύσεως. διὸ καὶ σήπεται πάντα τὰ ἄλλα, πλὴν πυρός· καὶ γὰρ γῆ, καὶ ὕδωρ, καὶ D ἀὴρ σήπεται· πάντα γὰρ ὕλη τῷ πυρί ἐστι ταῦτα. σῆψις δ᾽ ἐστὶ φθορὰ τῆς ἐν ἑκάστῳ ὑγρῷ οἰκείας καὶ κατὰ φύσιν θερμότητος, ὑπ᾽ ἀλλοτρίας θερμότητος· αὕτη δ᾽ ἐστὶν ἡ τοῦ περιέχοντος. ὥστ᾽ ἐπεὶ κατ᾽ ἔνδειαν πάσχει θερμοῦ, τὸ δὲ ἐνδεὲς ὂν τοιαύτης δυνάμεως ψυχρὸν πᾶν, ἄμφω ἂν αἴτια εἴη, καὶ κοινὸν τὸ πάθος ἡ σῆψις, ψυχρότητός τε οἰκείας καὶ θερμότητος ἀλλοτρίας. διὰ τοῦτο γὰρ καὶ ξηρότερα γίνεται τὰ σηπόμενα πάντα, καὶ τέλος γῆ καὶ κόπρος· ἐξιόντος γὰρ τοῦ οἰκείου θερμοῦ, συνεξατμίζει τὸ κατὰ φύσιν ὑγρὸν, καὶ τὸ ἀνάγον τὴν ὑγρότητα, οὐκέτ᾽ ἐστίν· E ἐπάγει γὰρ ἕλκουσα ἡ οἰκεία θερμότης, καὶ ἐν τοῖς ψύχεσι δὲ ἧττον σήπεται, ἢ ἐν ταῖς ἀλέαις. ἐν μὲν γὰρ τῷ χειμῶνι, ὀλίγον ἐν τῷ περιέχοντι ἀέρι καὶ ὕδατι τὸ θερμόν· ὥστε οὐδὲν ἰσχύει· ἐν δὲ τῷ θέρει πλέον· καὶ οὔτε τὸ πεπηγός· μᾶλλον γὰρ ψυχρὸν ἢ ὁ ἀὴρ θερμός, οὐκ οὖν κρατεῖται, τὸ δὲ κινοῦν κρατεῖ· οὔτε τὸ ζέον ἢ θερμόν· ἐλάττων γὰρ ἡ ἐν τῷ ἀέρι θερμότης τῆς ἐν τῷ πράγματι.

* γρ. ἐξ ἀ. σωμάτων

* Fort. ἔτι δ᾽. intelligit libros De gener. & corrupt.

A ex inductione ſumi poteſt. nam in omnibus calor & frigus, tam quæ vnius quam quæ diuerſi ſunt generis definire, copulare, tranſmutare, humectare, areſacere, indurare, & mollificare videntur: arida verò & humida, tum ipſa per ſe, tum communia corpora quæcunque conſtant ex vtriſque, definiri, & cæteros quos diximus affectus pati. præterea & hoc quoque rationibus ipſis quibus eorum naturas definimus, perſpicuum exiſtit. Nam calidum & frigidum, vti actiua dicimus. quod enim congregandi vim habet, id velut actiuum quid exiſtit, humidum verò & aridum, paſſiua. Nam promptè & ægre terminabile, quo eorum natura quippiam ſuſtinet, dicuntur. Eſſe igitur alia actiua, alia paſſiua, in aperto eſt.) Cùm hæc inquam definita ſint, eas profectò B operationes, quas quę actiua ſunt, exhibeant, atque paſſiuorum ſpecies ſumere oportebit. Principio igitur vniuerſaliter ſimplex abſolutáque & naturalis generatio, atque ei oppoſita per naturam corruptio, ab hiſce potentiis effici aſſolent. Ipſæ ergo in plantis, animantibúſque, & eorum partibus inſunt. Eſt autem ſimplex naturaliſque generatio, tranſmutatio quæ ab hiſce fit potentiis, vbi ex ſubiecta materia ad quanque naturam rationem obtinent. ea autem ſunt paſſiuæ illæ potentiæ, quas diximus. Porrò tum calor & frigus gignere ſolent, cùm materiam euincunt: cùm verò non euincunt, particulariter quidem inquinatio & inconcoctio effici ſolet. Simplici autẽ generationi contrarium C maximè cõmune, putrefactio eſt. Omnis enim corruptio quæ natura fit, ceu ſenectus & areſactio, ad eam ducit. Nam horum omnium finis marcor eſt, niſi quid ex hiſce quæ natura conſtant, vi corrumpatur. Nam & carnem & os, & quoduis eorum cremare licet, quorum finis eius quæ natura fit corruptionis, putrefactio exiſtit. Idcirco quæ putrent, primò humida, poſtea tandem ſicca euadunt. Nam ex hiſce facta ſunt, definitúmque eſt humido ſiccum, operantibus hiſce quibus agendi facultas eſt tributa. Corruptio autem fit, cùm id quod definitur, ob id quod ambit continétque, dominantius eo fuerit quod definit. Verùm putrefactio de hiſce quæ particulatim corruptionem ſubeunt, cùm à ſua receſſerunt natura, peculiariter dici ſolet. Quo- D circa & reliqua omnia, præter ignem, putrent. etenim terra & aqua & aër putreſcunt. nam hæc omnia igni materia ſunt. Eſt autem putrefactio, proprij naturaliſque caloris in vnoquoque humido exiſtentis, ab extraria caliditate corruptio. hæc autem eſt, quæ in eo quod circunfunditur ac continet, exiſtit. Quare cùm caloris defectu patiatur frigidum omne, quatenus eiuſmodi potentiam deſiderat, ambo vtique putrefactionis cauſæ erunt, & putrefactio frigiditatis propriæ & caliditatis peregrinæ communis affectio. Ob id enim & quæ putreſiunt, ſicciora redduntur omnia, & tandem fimus ac terra fieri aſſolent. Abeunte ſiquidem ca- E lore proprio, naturalis humiditas vnà cum illo difflatur, atque euaporat, nec ampliùs id quod humorem inuehere ſolet, in ratione rerum exiſtit. Nam calor proprius trahendo, humorem inuehit adducitque. Atque in frigore minùs quàm tepore, res putreſcunt. Nam tempore hyberno, circundans aër & aqua parum caloris retinent, & ideo nullas vireis habent: æſtate verò plus. Item nec id putredinem ſentit, quod concretum eſt. Nam magis frigidum eſt, quàm calidus ſit aër. non euincitur igitur. At id quod mouet, vincit. Nec id quod feruet, aut calidum eſt. calor enim qui in aëre eſt, minor eo eſt qui in re ipſa exiſtit.

Quare nec dominatur, nec mutationem vllam committit. Simili modo & illud quod motu cietur ac fluit, minùs eo quod quietem agit, immotúmque manet, putrilagine tangitur. Nam motus ille qui ab aëris calore prouenit, imbecillior eo efficitur, qui in re ipſa etiam antè inerat. Quare facere non poteſt vt quicquam mutetur. Eadem cauſa eſt, & cur multum minùs quàm paucum putreſcere ſoleat. Nam in re maiore maior eſt caliditas propria atque frigiditas, quàm vt potentiæ quæ in circumfuſo aëre ſunt, euincant. Vnde etiam fit vt mare inparteis quidem diſtractum celeriter putreat, ſed integrum ac totum haudquaquam, & reliquæ aquæ pari modo. Quinetiam in hiſce quæ putreſiunt, animalia gigni ſolent: quòd calor, qui naturalis eſt, dum educitur, quæ ſegregata ſunt, conſiſtere faciat. Igitur quid ſit generatio, & quid corruptio, dictum eſt.

A ὥστ' οὐ κρατεῖ, οὔτε ποιεῖ μεταβολὴν οὐδεμίαν. ὁμοίως δὲ καὶ τὸ κινούμενον, καὶ ῥέον, ἧττον σήπεται τοῦ ἀκινητίζοντος. ἀσθενεστέρα γὰρ γίνεται ἡ ὑπὸ τῆς ἐν τῷ ἀέρι θερμότητος κίνησις, τῆς ἐν τῷ πράγματι προϋπαρχούσης. ὥστε οὐθὲν ποιεῖ μεταβάλλειν. ἡ δ' αὐτὴ αἰτία καὶ τοῦ τὸ πολὺ ἧττον τοῦ ὀλίγου σήπεσθαι· ἐν γὰρ τῷ πλείονι πλεῖόν ἐστι πῦρ οἰκεῖον καὶ ψυχρόν, ἢ ὥστε κρατεῖν τὰς ἐν τῷ περιεστῶτι δυνάμεις. διὸ καὶ ἡ θάλαττα κατὰ μέρος μὲν διαιρουμένη, ταχὺ σήπεται· ἅπασα δέ, οὔ. καὶ τἆλλα ὕδατα ὡσαύτως. καὶ ζῷα ἐγγίνεται τοῖς σηπομένοις διὰ τὸ τὴν * ἀποκεκριμένην θερμότητα φυσικὴν οὖσαν συνιστάναι τὰ ἐκκριθέντα. B τί μὲν οὖν ἐστι γένεσις, καὶ τί φθορά, εἴρηται.

* γρ. ἀποκεκρινομένην

CAPVT II.

De ſpeciebus digeſtionis & indigeſtionis.

Reſtat iam dicamus conſequentes ſpecies, quas ex ſubiectis quæ natura conſtant, dictæ vires efficiunt. Eſt itaque caloris quidem concoctio, & concoctionis maturatio, elixatio, aſſatio. Frigoris verò, inconcoctio, & huius, cruditas, inquinatio, excaldatio. Hæc autem nomina haudquaquam propriè dici exiſtimandum eſt: non enim in vniuerſum rebus ſimilibus nomina poſita ſunt. Quare non has, ſed taleis eſſe ſpecies quas diximus, putare oportet. Sed quid ipſarum quæque ſit, dicamus. Concoctio igitur, perfectio eſt quæ à naturali proprióque calore ex oppoſitis fit paſſiuis, quæ ſua cuique materies exiſtunt. Nam cùm quid concoctum eſt, perfectum eſt ac genitum, atque perfectionis exordium à natiuo calore prouenit (quamuis aliquo externorum adminiculo ad calcem vſque perduci ſoleat) quomodo alimentum per balnea, & id genus alia concoquitur. Verùm principij vicem internus calor occupat. Porrò concoctionis finis aliis natura exiſtit: natura autem eſt, quam veluti formam eſſentiámque dicimus. aliis, ad quandam ſubiectam formam contendit, vbi ſcilicet humor, qui torrebatur, vel elixabatur, vel putrefiebat, vel alio quouis modo incaleſcebat, talis tantúſque euaſit. tunc enim & vtilis eſt, & concoctionem recepiſſe dicitur, vt muſtū, & quæ in tuberculis collecta ſunt, cùm ad ſuppurationem peruenere: & lacrymæ, cùm ſordes in oculis obortæ ſunt, & cætera ſimili modo. Hoc autem omnibus obtingit, cùm materies atque humiditas ipſa victa fuerit. hæc autem eſt, quæ ab ea caliditate quæ in ipſa natura eſt, definiri ſolet. nam hoc tandiu natura eſt, dum in ea ratio ipſa inſit. Quocirca & eiuſmodi & vrinæ & alui ſedimenta, & omnino corporis excrementa ſanitatis indicia ſunt, & concocta dicuntur, quòd humorem à calore vinci ſignificent. Quæ verò concoquuntur, craſſiora euadant atque calidiora eſt neceſſe. Nam ei quod concoquitur, ampliorem molem calor tribuit, & craſſius illud aridiúſque reddit. Igitur concoctio hoc exiſtit. at inconcoctio, imperfectio eſt quæ proprij caloris penuria accidit: caloris verò penuria, frigus eſt. Atque imperfectio ad oppoſita paſſiua pertinet, quæ profectò natura cuique materies exiſtunt. Hoc igitur pacto concoctio atque inconcoctio definitæ ſunt.

ΚΕΦΑΛ. β'.

Περὶ πέψεως καὶ ἀπεψίας.

Λοιπὸν δ' εἰπεῖν τὰ ἐχόμενα εἴδη, ὅσα αἱ εἰρημέναι δυνάμεις ἐργάζονται ἐξ ὑποκειμένων τῶν φύσει συνεστώτων ἤδη. ἔστι δὴ θερμοῦ μὲν πέψις, πέψεως δὲ πέπανσις, ἕψησις, ἔτι ὄπτησις· ψυχρότητος δέ, ἀπεψία. ταύτης δέ, ὠμότης, μώλυνσις, στάτευσις. δεῖ δ' ὑπολαμβάνειν μὴ κυρίως ταῦτα λέγεσθαι τὰ ὀνόματα τοῖς C πράγμασιν, ἀλλ' οὐ κεῖται καθόλου τοῖς ὁμοίοις. ὥστε οὐ ταῦτα, ἀλλὰ τοιαῦτα δεῖ νομίζειν εἶναι τὰ εἰρημένα εἴδη. εἴπωμεν δ' αὐτῶν ἕκαστον τί ἐστι. πέψις μὲν οὖν ἐστι τελείωσις ὑπὸ τοῦ φυσικοῦ καὶ οἰκείου θερμοῦ ἐκ τῶν * ἀντικειμένων παθητικῶν. ταῦτα δ' ἐστὶν, ἡ οἰκεία ἑκάστῳ ὕλη· ὅταν γὰρ πεφθῇ, τετελείωταί τε καὶ γέγονε· καὶ ἡ ἀρχὴ τῆς τελειώσεως ὑπὸ θερμότητος τῆς οἰκείας συμβαίνει, (κἂν διά τινος τῶν ἐκτὸς βοηθείας συνεπιτελεσθῇ,) οἷον ἡ τροφὴ συμπέπτεται διὰ λουτρῶν καὶ ἄλλων τοιούτων. ἀλλ' ἥ γε ἀρχὴ ἡ ἐν αὐτῷ θερμότης ἐστί· τὸ δὲ τέλος, τοῖς μὲν ἡ D φύσις ἐστί. φύσις δὲ ἣν λέγομεν ὡς εἶδος καὶ οὐσίαν. τοῖς δὲ εἰς ὑποκειμένην τινὰ μορφὴν τὸ τέλος ἐστὶ τῆς πέψεως, ὅταν τοιονδὶ γένηται καὶ τοσονδὶ τὸ ὑγρὸν ἢ ὀπτώμενον, ἢ ἑψόμενον, ἢ σηπόμενον, ἢ ἄλλως πως θερμαινόμενον· τότε γὰρ χρήσιμόν ἐστι, καὶ πεπέφθαι φαμὲν ὥσπερ τὸ γλεῦκος καὶ τὰ ἐν τοῖς * φύμασι συνιστάμενα, ὅταν γένηται πύον καὶ τὸ δάκρυον, ὅταν γένηται λήμη. ὁμοίως δὲ καὶ τἆλλα. συμβαίνει δὲ τοῦτο πάσχειν ἅπασιν, ὅταν κρατηθῇ ἡ ὕλη καὶ ἡ ὑγρότης· αὕτη γάρ ἐστιν ἡ ὁριζομένη ὑπὸ τῆς ἐν τῇ φύσει θερμότητος. ἕως γὰρ ἂν ἐνῇ ἐν αὐτῇ ὁ λόγος, φύσις τοῦτ' ἐστί. διὸ καὶ ὑγιείας σημεῖα τὰ τοιαῦτα, καὶ οὖρα, καὶ E ὑποχωρήσεις, καὶ ὅλως τὰ περιττώματα. καὶ λέγεται πεπέφθαι, ὅτι δηλοῖ κρατεῖν τὴν θερμότητα τὴν οἰκείαν τοῦ ὑγροῦ. ἀνάγκη δὲ τὰ πεττόμενα παχύτερα καὶ θερμότερα εἶναι· τοιοῦτον γὰρ ἀποτελεῖ τὸ θερμὸν εὐογκότερον καὶ παχύτερον, καὶ ξηρότερον. πέψις μὲν οὖν τοῦτό ἐστιν· ἀπεψία δὲ ἀτέλεια δι' ἔνδειαν τῆς οἰκείας θερμότητος· ἡ δ' ἔνδεια τῆς θερμότητος, ψυχρότης ἐστίν· ἡ δ' ἀτέλεια ἐστὶ τῶν ἀντικειμένων παθητικῶν, ἅπερ ἐστὶν ἑκάστῃ φύσει ὕλη. πέψις μὲν οὖν καὶ ἀπεψία διαιρείσθω τοῦτον τὸν τρόπον.

* γρ. εἰρημένων

* γρ. φυσήμασι, mendosè.

ΚΕΦΑΛ. γ'.

Περὶ τῶν πέψεως καὶ ἀπεψίας εἰδῶν, πεπάνσεως καὶ ὠμότητος, ἑψήσεως καὶ μωλύνσεως, ὀπτήσεως καὶ στατεύσεως.

Πέπανσις δ' ἐστὶ πέψις τις. ἡ γὰρ τῆς ἐν τοῖς περικαρπίοις τροφῆς πέψις, πέπανσις λέγεται. ἐπεὶ δ' ἡ πέψις τελείωσίς τις, τότε ἡ πέπανσις τελεία ἐστίν, ὅταν τὰ ἐν τῷ περικαρπίῳ σπέρματα δύνηται ἀποτελεῖν τοιοῦτον ἕτερον οἷον αὐτό· καὶ γὰρ ἐπὶ τῶν ἄλλων τὸ τέλειον* οὕτω λέγομεν. περικαρπίου μὲν οὖν αὕτη πέπανσις. λέγεται δὲ καὶ ἄλλα πολλὰ πέπονα τῶν πεπεμμένων, κατὰ μὲν τὴν αὐτὴν ἰδέαν· μεταφορᾷ δέ, διὰ τὸ μὴ κεῖσθαι, καθάπερ εἴρηται καὶ πρότερον, ὀνόματα καθ' ἑκάστην τελείωσιν περὶ τὰ ὁριζόμενα ὑπὸ τῆς φυσικῆς θερμότητος καὶ ψυχρότητος. ἔστι δὲ ἡ φυμάτων, καὶ φλέγματος, καὶ τῶν τοιούτων πέπανσις, ἡ ὑπὸ τοῦ φυσικοῦ θερμοῦ τοῦ ἐνόντος ὑγροῦ πέψις· ἀδύνατον γὰρ ὁρίζειν μὴ κρατοῦν. ἐκ μὲν οὖν τῶν πνευματικῶν, ὑδατώδη· ἐκ δὲ τῶν τοιούτων, τὰ γεηρὰ συνίσταται. καὶ ἐκ λεπτῶν ἀεὶ παχύτερα γίγνεται πεπαινόμενα πάντα. καὶ τὰ μὲν εἰς αὑτὴν* ἡ φύσις ἄγει κατὰ τοῦτο, τὰ δ' ἐκβάλλει. πέπανσις μὲν οὖν εἴρηται τί ἐστιν. ὠμότης δ' ἐστὶ τὸ ἐναντίον· ἐναντίον δὲ πεπάνσει ἀπεψία τῆς ἐν τῷ περικαρπίῳ τροφῆς· αὕτη δ' ἐστὶν ἡ ἀόριστος ὑγρότης. διὸ ἡ πνευματική, ἢ ὑδατώδης, ἢ τῶν ἐξ ἀμφοῖν ἐστιν ἡ ὠμότης. ἐπεὶ δ' ἡ πέπανσις, τελείωσίς τις ἐστίν, ἡ ὠμότης ἀτέλεια ἔσται. γίγνεται δ' ἀτέλεια δι' ἔνδειαν τοῦ φυσικοῦ θερμοῦ, καὶ ἀσυμμετρίαν πρὸς τὸ ὑγρὸν τὸ πεπαινόμενον. οὐδὲν δὲ ὑγρὸν αὐτὸ καθ' αὑτὸ πεπαίνεται ἄνευ ξηροῦ· ὕδωρ γὰρ οὐ παχύνεται μόνον τῶν ὑγρῶν. συμβαίνει δὲ τοῦτο, ἢ τῷ τὸ θερμὸν ὀλίγον εἶναι, ἢ τῷ τὸ ὁριζόμενον πολύ. διὸ καὶ λεπτοὶ οἱ χυμοὶ τῶν ὠμῶν, καὶ ψυχροὶ μᾶλλον ἢ θερμοί, καὶ ἄβρωτοι καὶ ἄποτοι. λέγεται δὲ καὶ ἡ ὠμότης ὥσπερ καὶ ἡ πέπανσις πολλαχῶς· διὸ καὶ οὖρα, καὶ ὑποχωρήσεις, καὶ κατάρροι ὠμοὶ λέγονται διὰ τὸ αὐτὸ αἴτιον· τῷ γὰρ μὴ κεκρατῆσθαι ὑπὸ τῆς θερμότητος, μηδὲ συνεστάναι, ὠμὰ τὰ πάντα προσαγορεύεται. πόρρω δὲ προϊόντων, καὶ κέραμος ὠμός, καὶ γάλα ὠμόν, καὶ ἄλλα πολλὰ λέγεται, ἐὰν δυνάμενα μεταβάλλειν καὶ συνίστασθαι ὑπὸ θερμότητος ἀπαθῆ ᾖ. διὸ τὸ ὕδωρ, ἑφθὸν μὲν λέγεται, ὠμὸν δὲ οὔ, ὅτι οὐ παχύνεται. πέπανσις μὲν οὖν καὶ ὠμότης, εἴρηται τί ἐστι, καὶ διὰ τί ἐστιν ἑκάτερον αὐτῶν. ἕψησις δ' ἐστί, τὸ μὲν ὅλον πέψις ὑπὸ θερμότητος ὑγρᾶς τοῦ ἐνυπάρχοντος ἀορίστου ἐν τῷ ὑγρῷ. λέγεται δὲ τοὔνομα κυρίως μόνον ἐπὶ τῶν ἑψομένων. τοῦτο δ' ἂν εἴη, ὥσπερ εἴρηται, πνευματῶδες ἢ ὑδατῶδες. ἡ δὲ πέψις γίνεται ἀπὸ τοῦ ἐν τῷ ὑγρῷ πυρός· τὸ γὰρ ἐπὶ τῶν τηγάνων ὀπτᾶται· ὑπὸ γὰρ τοῦ ἔξωθεν θερμοῦ πάσχει. ἐν ᾧ δ' ἐστὶν ὑγρῷ, ποιεῖ ἐκεῖνο μᾶλλον ξηρόν, εἰς αὑτὸ ἀναλαμβάνον· τὸ δὲ ἑψόμενον, τοὐναντίον ποιεῖ· ἐκκρίνεται γὰρ ἐξ αὐτοῦ τὸ ὑγρόν, ὑπὸ τῆς ἐν τῷ ἔξω ὑγρῷ θερμασίας. διὸ ξηρότερα τὰ ἑφθὰ τῶν ὀπτῶν· οὐ γὰρ ἀνασπᾷ εἰς αὑτὰ τὸ ὑγρὸν τὰ ἑψόμενα·

* γρ. πάντα λέγ.

* γρ. ἡ φ. ἄγ. ὅσαι ὁρίζονται κατὰ ταῦτα,

A

CAPVT III.

De maturatione, elixatione, aſſatione, & contrariis.

Maturatio verò, concoctio quædam exiſtit. Nam eius alimoniæ quæ in arborum fructibus eſt concoctio, maturatio nuncupatur. Cùm autem concoctio, perfectio quædam ſit, tunc maturatio perfecta eſt, cùm ſemina quæ in fructuum genere ſunt, aliud eiuſmodi quale ipſum eſt, efficere valent. Nam & in cæteris perfectum ita dicimus. Hæc igitur maturatio, fructus arborum eſt. at mul-
B ta quoque alia ex hiſce quæ concocta ſunt, eadem quidem forma, ſed tralatione matura dicuntur: propterea quòd nomina (quemadmodum etiam priùs dictum eſt) cuique perfectioni circa ea quæ à natiuo calore ac frigore definiri ſolent, haudquaquam indita ſunt. Tuberculorum autem, puris, & cæterorum id genus maturatio, contenti humoris concoctio, quam natiuus calor efficere aſſolet, exiſtit. nihil enim niſi præualeat ac ſuperet, determinare quicquam poteſt. Quæ igitur matureſcunt, omnia ex aëreis aquea, ex aqueis terrea conſiſtendo fiunt, & è tenuibus ſubinde craſſiora reddi aſſolent. Atque hoc pacto natura, quædam ad maturationem adducit, quædam ab ea ſubmouet repellitque. Dictum eſt igitur quid ſit maturatio.
C Huic autem cruditas aduerſatur. maturationi verò contraria eſt eiuſce alimenti, quod in arborum fructu continetur, inconcoctio. hoc autem eſt humor non definitus. Quamobrem cruditas vel aërea, vel aquea, vel eorum quæ ex vtriſque conſtant, exiſtit. Cùm autem maturatio, perfectio quædam ſit: cruditas, imperfectio erit. Imperfectio verò ob caloris naturalis defectum atque commenſum humori ad maturitatem pergenti minimè reſpondentem, fieri aſſolet. Porro nullum humidum per ſe, ſine arido maturum fit. Etenim aqua ex humidis ſola non craſſeſcit. quod ideo euenire ſolet, quia vel exiguum calorem, vel magnā humoris qui definitur, copiam habeat. Et proinde crudorum ſuccus præ-
D tenuis eſt & gelidus potiùs quàm tepidus, & eſu ac potu inutilis. Cæterùm ipſa quoque cruditas perinde vt maturatio, multifariàm dicitur. Vnde & diſtillationes & vrinæ & alui ſedimina cruda dici eadem de cauſa ſolent: ex eo nanque cruda nuncupantur omnia, quòd à calore nec vincantur, nec conſiſtant. Quòd ſi longiùs progredi velimus, & fictile & lac & multa alia cruda dicuntur, ſi cùm à calore tranſmutari ac conſiſtere poſſint, inaffecta permaneant. Quocirca elixa dicitur aqua, ſed cruda minimè, quòd craſſa non euadat. Quid igitur ſit maturatio atque cruditas: & cur vtraque ſit, dictum eſt. Elixatio autem in vniuerſum quidem, eſt inde-
E finiti in humore exiſtentis concoctio ab humido calore facta. Sed vocabulum de elixis ſolùm propriè dici ſolet. Hoc autem, nempe quod indefinitū eſt, aëreum, vti diximus, vel aqueúm eſſe poteſt. Fit autem elixatio ab igni, qui in humore eſt. Quod enim in ſartagine igni admouetur, torreri aſſolet. nam ab externo calore patitur: humorem autem illum in quo eſt, pleniùs aridum ad ſe trahendo reddit. quod autem elixatur, contrà efficit. Nam calor quem externus humor habet, ab eo humorem foras pellit. Quamobrem elixa, aſſis aridiora ſunt. nō enim quæ elixantur, ad ſe humorem attrahunt:

quando externus calor internum vincit. Quòd ſi præualeret internus, humorem ad ſe traheret profectò. Porrò non omne corpus elixabile eſt. nam neque id in quo nihil eſt humoris, ceu lapis, neque id in quo humor quidem ineſt, ſed denſitatis ratione vinci non poteſt, vt lignum, elixari poteſt. Sed è corporibus ea duntaxat elixari ſolent, quæ humiditatem habent eiuſmodi, vt ab igni, qui in humore exiſtit, pati queant. At aurum, lignum, & pleraque alia, elixari dicuntur: forma quidem non eadem, ſed tralatione. non enim differẽtiis propria indita ſunt vocabula. Liquida quoque ceu lac atque muſtum elixari dicimus: vbi circundans & forinſecus excalfaciẽs ignis ſaporem, qui in humore conſiſtit, in aliam quandam ſaporis ſpeciem tranſmutat. Quare modo quodam ſimile quippiam dictæ elixationi committit. Finem autem non eundem nacta ſunt omnia, nec quæ elixantur, nec quæ concoquuntur: ſed aliorum finis in eſitatione, aliorum in ſorbitione, aliorum in alio vſu conſiſtit: quandoquidem vel medicamenta ipſa elixari dicimus. Quare elixabilia omnia ſunt, quæcunque craſſiora vel minora, vel grauiora: aut eorum quædam eiuſmodi, quædam diuerſa fieri poſſunt, propterea quòd eorum quæ diſgregantur, alia craſſa ſunt, alia tenuia. quomodo lac in ſerum atque caſeum diſtribui aſſolet. Oleum autem ipſum per ſe non elixatur, quòd horum nihil ſubeat. Igitur concoctio ea quæ elixatio nuncupatur, id eſt: nihilque intereſt, inſtrumentis arte an natura paratis fiat: eadem enim de cauſa fient omnia. Inquinatio autem inconcoctio quidem, at elixationi aduerſa exiſtit. Fuerit autem, cùm ei qua de priore loco diſſeruimus, aduerſari dicatur, inconcoctio infiniti in corpore exiſtentis, quam caloris humoris circumfuſi penuria committit. Quod autem caloris penuria frigus habeat ammiſtum, dictum eſt. per alium tamen quàm frigus, motum fieri ſolet. nam calor ille, cui coquendi officium delegatum eſt, depellitur ac offuſcatur. Atque penuria illa, copia frigoris in humore circumiacente, vel eo quod elixatur exiſtentis, prouenire ſolet. Tunc enim euenit vt calor qui eſt in humore, amplior ſit quàm vt non moueat, ſed minor quàm vt æquabilitatem afferre atque concoquere poſſit. Vnde fit vt inquinata, elixis duriora ſint, & humida ſiccentibus magis definita. Quid igitur & cur elixatio ſit, atque inquinatio, dictum eſt. Aſſatio verò concoctio eſt, quæ ab arido & alieno calore efficitur. Ea de cauſa cùm quis elixare quippiam nititur, ſi id non ab humoris caliditate, ſed ab igneo calore mutari ac concoqui faciat: vbi perfectum eſt, aſſum fit non elixum, & exuperantia inſuper aduſtum eſſe dicitur. Vbi autem perfectum ſiccius euadit, à calore ſicco fit. Quo fit vt partes extimæ, intimis fiant aridiores. id quod in elixis contrà euenit. Atque in hiſce quæ manuum beneficio confici ſolent, plus aſſatio negotij quàm elixatio inuehere ſolet. quippe cùm ſummas & internas rei partes æquabiliter excalfacere, perarduum ſit. nam quæ igni viciniores ſunt, ſemper ocyus ſiccent, quare & impenſiùs. Cùm igitur foramina illa quæ extrà prominent, coeunt adductantúrque, contentus humor exprimi non poteſt, ſed intercluditur, vbi meatus conniuent. Igitur aſſatio & elixatio, arte quidem efficiuntur, ſed & natura quoque, ſicut dicimus, ſpecies vniuerſaliter eædem fiunt. Nam affectus qui fieri aſſolent, tametſi nomine careant, haudquaquam tamen diſſimiles exiſtunt, cùm ars naturæ æmula ſit.

A κρατεῖ γὰρ ἡ ἔξωθεν θερμότης τῆς ἐντός. εἰ δὲ ἐκράτει ἡ ἐντός, εἷλκεν ἂν εἰς ἑαυτήν. ἔστι δὲ οὐ πᾶν σῶμα ἑψητόν· οὔτε γὰρ ἐν ᾧ μηθέν ἐστιν ὑγρόν, οἷον ἐν λίθοις· οὔτε ἐν οἷς ἔνεστι μέν, ἀλλ' ἀδύνατον κρατηθῆναι διὰ πυκνότητα, οἷον ἐν τοῖς ξύλοις· ἀλλ' ὅσα τῶν σωμάτων ἔχει ὑγρότητα παθητικὴν ὑπὸ τῆς ἐν τῷ ὑγρῷ πυρώσεως. λέγεται δὲ καὶ χρυσὸς ἕψεσθαι, καὶ ξύλον, καὶ ἄλλα πολλά, κατὰ μὲν τὴν ἰδέαν οὐ τὴν αὐτήν· μεταφορᾷ δέ· οὐ γὰρ κεῖται ὀνόματα ἄρτια ταῖς διαφοραῖς. καὶ τὰ ὑγρὰ δὲ ἕψεσθαι λέγομεν, οἷον γάλα, καὶ γλεῦκος, ὅταν ὁ ἐν τῷ ὑγρῷ χυμὸς εἰς εἶδός τι μεταβάλλῃ ὑπὸ τοῦ κύκλῳ καὶ ἔξωθεν πυρὸς θερμαίνοντος· ὥστε τρόπον τινὰ παραπλή-
B σιον τῇ εἰρημένῃ ἑψήσει ποιεῖ. τέλος δὲ οὐ τὸ αὐτὸ πᾶσιν, οὔτε ἑψομένοις, οὔτε πεττομένοις, ἀλλὰ τοῖς μὲν πρὸς ἐδωδήν, τοῖς δὲ πρὸς ῥόφησιν, τοῖς δὲ πρὸς ἄλλην χρείαν· ἐπεὶ καὶ τὰ φάρμακα ἕψειν λέγομεν. ὥστε ὅσα παχύτερα δύναται γίγνεσθαι, ἢ ἐλάττω, ἢ βαρύτερα, ἢ τὰ μὲν αὐτῶν τοιαῦτα, τὰ δὴ ἐναντία, διὰ τὸ διακρινόμενα τὰ μὲν παχύνεσθαι, τὰ δὲ λεπτύνεσθαι, ὥσπερ τὸ γάλα εἰς ὀρρὸν καὶ πιτύαν, πάντα ἑψητά ἐστι. τὸ δὴ ἔλαιον οὐχ ἕψεται αὐτὸ καθ' αὑτό, ὅτι τούτων οὐθὲν πάσχει. ἡ μὲν οὖν κατὰ τὴν ἕψησιν λεγομένη πέψις, τοῦτ' ἐστί· καὶ οὐθὲν διαφέρει ἐν ὀργάνοις τεχνικοῖς ἢ φυσικοῖς, ἐὰν γίγνηται· διὰ τὴν αὐτὴν γὰρ αἰτίαν πάν-
C τα ἔσται. μώλυνσις δέ, ἀπεψία μέν, ἐναντία δ' ἑψήσει· εἴη δ' ἐναντία * ἡ τῇ πρώτῃ λεχθείσῃ ἀπεψία τοῦ ἐν τῷ σώματι ἀορίστου δι' ἔνδειαν τῆς ἐν τῷ ὑγρῷ τῷ πέριξ θερμότητος. ἡ δ' ἔνδεια μετὰ ψυχρότητος ὅτι ἐστίν, εἴρηται· γίγνεται δὲ διὰ κίνησιν ἄλλην· ἐκκρούεται γὰρ ἡ * πέττουσα, καὶ ἡ ἔνδεια δὲ ἢ διὰ τὸ πλῆθος τῆς ἐν τῷ ὑγρῷ ψυχρότητος, ἢ διὰ τὸ ἐν τῷ ἑψομένῳ πλῆθος. τότε γὰρ συμβαίνει τὴν ἐν τῷ ὑγρῷ θερμότητα πλείω μὲν εἶναι ἢ ὥστε μὴ κινῆσαι, ἐλάττω δὲ ἢ ὥστε ὁμαλῦναι καὶ συμπέψαι. διὸ σκληρότερα μὲν τὰ μεμολυσμένα γίγνεται τῶν ἑφθῶν· τὰ δ' ὑγρὰ διωρισμένα μᾶλλον. ἕψησις μὲν οὖν καὶ μώλυνσις εἴρηται, καὶ τί ἐστι, καὶ διὰ
D τί ἐστιν. ὄπτησις δ' ἐστὶ πέψις ὑπὸ θερμότητος ξηρᾶς καὶ ἀλλοτρίας. διὸ τοῦτο κἂν ἕψων τις ποιῇ μεταβάλλειν καὶ πέττεσθαι, μὴ ὑπὸ τῆς τοῦ ὑγροῦ θερμότητος, ἀλλ' ὑπὸ τῆς τοῦ πυρός, ὅταν τελεσθῇ, ὀπτὸν γίνεται, καὶ οὐχ ἑφθόν, καὶ τῇ ὑπερβολῇ προσκεκαῦσθαι λέγεται· ὑπὸ ξηρᾶς δὲ θερμότητος * γίνεται, ὅταν ξηρότερον γίγνηται ἐπιτελεσθέν. διὸ καὶ τὰ ἐκτὸς ξηρότερα τῶν ἐντός· τὰ δὲ ἑφθὰ τοὐναντίον. καὶ ἔργον ἐπὶ τῶν χειροκμήτων τὸ ὀπτῆσαι μεῖζον ἢ ἑψῆσαι· χαλεπὸν γὰρ τὰ ἐντὸς καὶ τὰ ἐκτὸς ὁμαλῶς θερμαί-
E νειν· ἀεὶ γὰρ τὰ ἐγγύτερα τοῦ πυρὸς ξηραίνεται θᾶττον· ὥστε καὶ μᾶλλον. συνιόντων οὖν τῶν ἔξω πόρων, οὐ δύναται ἐκκρίνεσθαι τὸ ἐνυπάρχον ὑγρόν, ἀλλ' ἐγκατακλείεται, ὅταν οἱ πόροι μύσωσιν. ὄπτησις μὲν οὖν καὶ ἕψησις, γίγνονται μὲν τέχνῃ· ἔστι δέ, ὥσπερ λέγομεν, τὰ εἴδη καθόλου * ταὐτὰ καὶ φύσει· ὅμοια γὰρ τὰ γιγνόμενα πάθη, ἀλλ' ἀνώνυμα· μιμεῖται γὰρ ἡ τέχνη τὴν φύσιν.

* γ. ἡ τῇ προτέρᾳ λ. vide Vicom.

* γ. πιέζουσα.

* γ. λείπεται.

* γ. ταῦτα. alij ſic, τὰ εἴδη κ. ταῦτα, καὶ φύσει ὅμοια τὰ γιγνόμενα πάθη.

ἐπεὶ καὶ τῆς ἑψήσεως ἐν τῷ σώματι πέψις, ὁμοία ἑψήσει ἐστί· καὶ γὰρ ἐν ὑγρῷ καὶ θερμῷ ὑπὸ τῆς τοῦ σώματος θερμότητος γίνεται. καὶ ἀπεψίαι ἔνιαι ὅμοιαι τῇ μολύνσει. καὶ ζῷα οὐκ ἐγγίνεται ἐν τῇ πέψει, ὥσπερ τινές φασιν, ἀλλ' ἐν τῇ ἀποκρίσει σηπομένῃ ἐν τῇ κάτω κοιλίᾳ, εἶτ' ἐπανέρχεται ἄνω· πέττεται μὲν γὰρ ἐν τῇ ἄνω κοιλίᾳ, σήπεται δὲ ἐν τῇ κάτω τὸ ἀποκριθέν. δι' ἣν δ' αἰτίαν, εἴρηται ἐν ἑτέροις. ἡ μὲν οὖν μόλυνσις τῇ ἑψήσει ἐναντίον· τῇ δὲ ὡς ὀπτήσει λεγομένῃ πέψει ἔστι μέν τι ἀντικείμενον ὁμοίως, ἀνωνυμώτερον δέ. εἴη δ' ἂν ὅμοιον, εἰ γίνοιτο στάτευσις, ἀλλὰ μὴ ὄπτησις, δι' ἔνδειαν θερμότητος, ἢ συμβαίη ἂν ἢ δι' ὀλιγότητα τοῦ ἔξω πυρὸς, ἢ διὰ τὸ πλῆθος τοῦ ἐν τῷ ὀπτωμένῳ ὕδατος· τότε γὰρ πλείων μὲν ἐστίν, ἢ ὥστε μὴ κινῆσαι, ἐλάττων δ' ἢ ὥστε πέψαι.

Τί μὲν οὖν ἐστι πέψις καὶ ἀπεψία, καὶ πέπανσις, καὶ ὠμότης, καὶ ἕψησις καὶ ὄπτησις, καὶ τὰ ἐναντία τούτοις, εἴρηται.

A Quandoquidem & cibi in corpore concoctio elixationi perſimilis habetur. (quippe cùm in calido & humido à corporis calore fiat) & inconcoctio inquinationi. Nec in ipſa concoctione naſcuntur vermes, ſicuti quidam aiunt, ſed in excrementis quæ in aluo putrent inferiore, geniti, in ſublime poſtea ſeſe attollunt. Nam in ſuperiore ventriculo, concoctio effici ſolita eſt: at quod ſecreuit natura, id in inferiore putreſcit. quam autem ob cauſam, dictum aliàs eſt. Inquinatio igitur elixationi aduerſatur. At ei concoctioni quæ aſſatio vocitatur, quippiam oppoſitum pari modo exiſtit: ſed eiuſmodi vt difficiliùs ſibi quàm illa nomenclaturam inueniat. Fuerit autem perinde, vt ſi excaldatio B fiat, non aſſatio, propter caloris indigentiam, quæ ſanè aut exterioris ignis paucitate, aut in re aſſanda humoris diluti copia accidere poteſt. Nam calor tum maior eſt, quàm vt motum non exciter: minor, quàm vt concoquere queat.

Quid igitur ſit concoctio & inconcoctio, maturatio & cruditas, elixatio, & aſſatio, & hiſce contraria, dictum eſt.

ΚΕΦΑΛ. δ′.

Περὶ ξηροῦ καὶ ὑγροῦ, καὶ τῶν ἑπομένων αὐτοῖς παθῶν ἐν τοῖς μικτοῖς, σκληροῦ καὶ μαλακοῦ.

Τῶν δὲ παθητικῶν, τοῦ ὑγροῦ καὶ τοῦ ξηροῦ, λεκτέον τὰ εἴδη. εἰσὶ δ' αἱ μὲν ἀρχαὶ τῶν σωμάτων αἱ παθητικαὶ, ὑγρὸν καὶ ξηρόν· τὰ δ' ἄλλα, μικτὰ μὲν ἐκ τούτων· ὁποτέρου δὲ μᾶλλον, τούτου μᾶλλον τὴν φύσιν ἐστίν· οἷον, τὰ μὲν ξηροῦ μᾶλλον, τὰ δ' ὑγροῦ. πάντα δὲ, τὰ μὲν ἐντελεχείᾳ, τὰ δὲ ἐν τῷ ἀντικειμένῳ. ἔχει δ' οὕτω τῆξις πρὸς τὸ τηκτόν. ἐπεὶ δ' ἐστὶ, τὸ μὲν ὑγρὸν εὐόριστον, τὸ δὲ ξηρὸν δυσόριστον, ὅμοιόν τι τῷ ὄψῳ καὶ τοῖς ἡδύσμασι πρὸς ἄλληλα πάσχουσι· τὸ γὰρ ὑγρὸν τῷ ξηρῷ αἴτιον τοῦ ὁρίζεσθαι, καὶ ἑκάτερον ἑκατέρῳ οἷον κόλλα γίγνεται· ὥσπερ καὶ Ἐμπεδοκλῆς ἐποίησεν ἐν τοῖς φυσικοῖς, Ἄλφιτον ὕδατι κολλήσας. καὶ διὰ τοῦτ' ἐξ ἀμφοῖν ἐστὶ τὸ ὡρισμένον σῶμα. λέγεται δὲ τῶν στοιχείων ἰδιαίτατα, ξηρὸν μὲν, γῆς· ὑγρὸν δὲ, ὕδατος. διὰ τοῦτο δ' ἅπαντα τὰ ὡρισμένα σώματα ἐνταῦθα, οὐκ ἄνευ γῆς καὶ ὕδατος· ὁποτέρου δὲ πλεῖον, κατὰ τὴν δύναμιν τούτου ἕκαστον φαίνεται. καὶ ἐν γῇ, καὶ ἐν ὕδατι ζῷα μόνον ἐστίν· ἐν ἀέρι δὲ καὶ πυρὶ οὐκ ἔστιν· ὅτι τῶν σωμάτων ὕλη ταῦτα. τῶν δὲ σωματικῶν παθημάτων ταῦτα πρῶτα ἀνάγκη ὑπάρχειν τῷ ὡρισμένῳ, σκληρότητα, ἢ μαλακότητα· ἀνάγκη γὰρ τὸ ἐκ ξηροῦ καὶ ὑγροῦ, ἢ σκληρὸν εἶναι ἢ μαλακόν. ἔστι δὲ σκληρὸν μὲν, τὸ μὴ ὑπεῖκον εἰς αὑτὸ κατὰ τὸ ἐπίπεδον. μαλακὸν δὲ τὸ ὑπεῖκον τῷ μὴ ἀντιπεριΐστασθαι. τὸ γὰρ ὕδωρ οὐ μαλακόν· οὐ γὰρ ὑπείκει τῇ θλίψει τὸ ἐπίπεδον εἰς βάθος, ἀλλ' ἀντιπεριΐσταται. ἁπλῶς μὲν οὖν σκληρὸν ἢ μαλακὸν, τὸ ἁπλῶς τοιοῦτον. πρὸς ἕτερον δὲ, τὸ πρὸς ἐκεῖνο τοιοῦτον. πρὸς μὲν οὖν ἄλληλα, ἀόριστά ἐστι, τῷ μᾶλλον καὶ ἧττον. ἐπεὶ δὲ πρὸς τὴν αἴσθησιν πάντα κρίνομεν τὰ αἰσθητὰ, δῆλον ὅτι καὶ τὸ σκληρὸν καὶ τὸ μαλακὸν ἁπλῶς πρὸς τὴν ἁφὴν ὡρίκαμεν, ὡς μεσότητι χρώμενοι τῇ ἁφῇ. διὸ τὸ μὲν ὑπερβάλλον αὐτῆς, σκληρὸν· τὸ δ' ἐλλεῖπον, μαλακὸν εἶναί φαμεν.

CAPVT IV.

Paſsionum, humidorum & ſiccorum, ſpecies.

C PAſſiuorum autem, aridi inquam & humidi, ſpecies dicamus oportet. Sunt autem paſſiua corporum primordia, humidum atque ſiccum, cætera verò ex hiſce temperata quidem ſunt, ſed magis huius per naturam ſunt, ex quo largiùs. verbi gratia: alia magis ſicci, alia humidi. Hæc autem omnia partim actu erunt, partim potentia, quæ actui aduerſatur. quo pacto eliquatio & eliquabile ſeſe habent. Cùm autem humidum facilè, & ſiccum ægrè definiantur, haud aliter ſeſe quàm obſonium & condimenta viciſſim habent. Nam humidum arido, vt definiatur, cauſa eſt: & alterutrum alteri glutinis inſtar exiſtit. id quod & ipſe quoque Empedocles in naturalibus aſſeruit, farinam aqua agglutinans. Et ea de cauſa definitum corpus vtro- D que conſtat. Porro ex omni elementorum genere peculiariſſimè terræ quidem ſiccum, aquæ autem humidum tribuitur. Eam ob rem omnia iſta definita corpora, non ſine terra & aqua conſiſtunt. ſed potentia quodque huius eſſe videtur, cuius plus habuerit. Quinetiam animantes in terra & aqua ſolùm ſunt, in aere autem & igni minimè: propterea quòd terra & aqua, corporum materies exiſtunt. Ex corporeis autem affectibus hi, duritia inquam aut mollities, primi definitæ rei competant, eſt neceſſe. Nam quod ex arido conſtat & humido, durum aut molle neceſſariò euadit. Eſt autem durum, quod per ſumma in ſeſe non refugit: molle verò, quod in ſeſe non obluctando refugit: aqua nam- E que haudquaquam mollis eſt. quippe cuius pars ſumma compreſſu intro minimè cedat, ſed circum obſiſtat. Igitur abſolutè durum aut molle eſt, quod abſolutè eſt eiuſmodi: ad aliud verò durum aut molle, quod reſpectu illius tale eſt. Hæc ergo inter ſeſe viciſſim collata, indefinita ſunt: quòd magis atque minùs dura molliáve ſint. Sed cùm ſenſilia cuncta ſenſu diiudicentur, nos tam durum quàm molle ſimpliciter tactu eodem, veluti mediocritate quadam vtentes, definiuiſſe conſtat. Quocirca rem omnem quæ tactum edomat, duram: quæ verò ſubterfugit, mollem eſſe dicimus.

CAPVT V.

De corpore terminato, & aliis.

CORpus autem omne ſuo definitum termino, durum ſit aut molle neceſſe eſt. nam aut in ſeſe cedit, aut nequaquam. Adhæc concretum ſit oportet. hac enim re definitur. Quare cùm res omnis definita atque conſiſtens, vel mollis vel dura ſit, concretioniſque opera euadat eiuſmodi: nulla profectò compoſita definitaque corpora, ſine concretione eſſe queunt. ergo de concretione diſſerendum. Duæ itaque ſunt cauſæ quæ circa materiam verſari ſolent, id inquam quod agendi facultatem obtinet, & affectus ipſe. hic, vt ſpecies, ac forma: illud, vt id a quo proficiſcitur pendetque motus. Quare & concretionis & diſſolutionis & aſſiccationis & humectationis cauſæ totidem erunt. Porrò ipſum agens duplici potentia agit, & patiens duabus itidem patitur affectionibus, vti dictum eſt. nam agens calore agit atque frigore: at caloris frigoriſve præſentia aut abſentia, paſſionem fieri conſtat. Sed cum concretio, fermè aſſiccatio ſit, de hac priùs dicamus. Quod itaque patitur, aut humidum aut aridum, aut ex vtroque conflatum exiſtit. Atque aquam, humidi: terram, ſicci corpus eſſe ſtatuimus. quippe quæ inter humida & ſicca maximè paſſiua ſint. Quocirca & frigus, paſſiuorum magis exiſtit: in his enim eſt: quandoquidem terram & aquã frigere ſupponimus. at frigus actiuum eſt, quatenus corrumpere, aut aliud quippiam per accidens efficere poteſt, quemadmodum antea eſt dictum. nam interdum & vrere & excalfacere dicitur: non tamen perinde vt calor, ſed quia calorem cogit, & in vnum contrahit, aut eidem circumobſiſtit. Quæ autem aqua & aquæ ſpecies ſunt, aut aquam ſiue aduentitiam ſiue inſitam habent, ſicceſcunt. aduentitiam eam voco, quæ in lanam ſeſe inſinuat: inſitam, quam lacteus humor habet. aquæ verò ſpecies ſunt huiuſmodi: vinum, vrina, ſerum, & omnino quæcumque nullum aut certè paucum ſedimen, nec id tenacitatis ratione habent. nam tenacitas in cauſa eſt vt quibuſdam nihil ſubſideat: id quod oleo & pici accidit. Siccent autem omnia, dum aut calefiunt aut refrigerantur: vtrumque tamen calor vel internus, vel externus committere aſſolet. Etenim quæ frigore ſiccent, perinde vt veſtis, ſi cùm humida eſt ſeorſim ipſa per ſe maneat, ab interiori calore humorem ſecum educente reſiccari ſolent, ſi humor exiguus ſit, calore ob circumfuſum frigus egrediente. Siccent igitur vniuerſa, dum vel calefiunt, vel refrigerantur. quæ omnia calore vel interno vel externo humorem ſecum educente fiunt: externo, vt elixa: interno, vt cùm humor à calore quem in ſeſe continet, reſpirante, eximitur abſumiturque. Dictum eſt igitur de aſſiccatione.

A

ΚΕΦΑΛ. έ.

Ὅτι ἀνάγκη σκληρὸν ἢ μαλακὸν εἶναι καὶ πεπηγὸς πᾶν τὸ ὡρισμένον σῶμα. καὶ περὶ πήξεως, καὶ αἰτιῶν αὐτῆς.

ΑΝάγκη δὲ σκληρὸν ἢ μαλακὸν εἶναι τὸ ὡρισμένον σῶμα οἰκείῳ ὅρῳ· ἢ γὰρ ὑπείκειν, ἢ μή· ἐπὶ πεπηγὸς εἶναι· τούτῳ γὰρ ὁρίζεται. ὥστ' ἐπεὶ πᾶν μὲν τὸ ὡρισμένον καὶ συνεστηκὸς, ἢ μαλακὸν, ἢ σκληρόν· ταῦτα δὲ πήξει ἐστίν· ἄπαντ' ἂν εἴη τὰ σώματα καὶ τὰ συνθετά τε καὶ ὡρισμένα οὐκ ἄνευ πήξεως. πήξεως οὖν πέρι ῥητέον. ἔστι δὲ τὰ αἴτια *τὰ περὶ τὴν ὕλην δύο,
B τό, τε ποιοῦν, καὶ τὸ πάθος· τὸ μὲν ποιοῦν, ὡς ὅθεν ἡ κίνησις· τὸ δὲ πάθος, * ὡς εἶδος. ὥστε καὶ πήξεως καὶ διαχύσεως, καὶ τοῦ ξηραίνεσθαι καὶ τοῦ ὑγραίνεσθαι. ποιεῖ δὲ τὸ ποιοῦν δυσὶ δυνάμεσι, καὶ πάσχει τὸ πάσχον παθήμασι δυσὶν, ὥσπερ εἴρηται· ποιεῖ μὲν θερμῷ καὶ ψυχρῷ, τὸ δὲ πάθος ἡ παρουσία ἢ ἀπουσία θερμοῦ ἢ ψυχροῦ. ἐπεὶ δὲ τὸ πήγνυσθαι ξηραίνεσθαί πώς ἐστι, περὶ τούτου εἴπωμεν πρῶτον. τὸ δὴ πάσχον, ἢ ὑγρὸν, ἢ ξηρὸν, ἢ ἐκ τούτων. τίθεμεν δὲ ὑγροῦ σῶμα, ὕδωρ· ξηροῦ δὲ γῆν. ταῦτα γὰρ τῶν ὑγρῶν καὶ τῶν ξηρῶν παθητικά. διὸ καὶ τὸ ψυχρὸν τῶν παθητικῶν μᾶλλον·
C ἐν τούτοις γάρ ἐστι· καὶ γὰρ ἡ γῆ καὶ τὸ ὕδωρ, ψυχρὰ ὑπόκειται. ποιητικὸν δὲ τὸ ψυχρὸν, ὡς φθαρτικὸν, ἢ ὡς κατὰ συμβεβηκὸς, καθάπερ εἴρηται πρότερον· ἐνίοτε γὰρ καὶ * καίειν λέγεται καὶ θερμαίνειν τὸ ψυχρὸν, οὐχ ὡς τὸ θερμὸν, ἀλλὰ τῷ συνάγειν, ἢ ἀντιπεριιστάναι τὸ θερμόν. ξηραίνεται δὲ ὅσα ἐστὶν ὕδωρ καὶ ὕδατος εἴδη· ἢ ἔχει ὕδωρ εἴτε ἐπακτὸν, εἴτε συμφυές. λέγω δὲ ἐπακτὸν μὲν, οἷον ἐν ἐρίῳ· σύμφυτον δὲ, οἷον ἐν γάλακτι. ὕδατος δ' εἴδη τὰ τοιάδε, οἶνος, οὖρον, ὀῤῥὸς, καὶ ὅλως ὅσα μηδεμίαν ἢ βραχεῖαν ἔχει ὑπόστασιν, μὴ διὰ γλισχρότητα. ἐνίοις μὲν γὰρ αἴτιον τοῦ
D μὴ ὑφίστασθαι μηθὲν, ἡ γλισχρότης, ὥσπερ ἐλαίῳ, ἢ πίττῃ. ξηραίνεται δὲ πάντα, ἢ θερμαινόμενα ἢ ψυχόμενα· ἀμφότερα δὲ θερμῷ, καὶ ὑπὸ τῆς ἐντὸς θερμότητος, ἢ τῆς ἐκτός. καὶ γὰρ τὰ τῷ ψύχει ξηραινόμενα, ὥσπερ ἱμάτιον, ἐὰν ᾖ κεχωρισμένον αὐτὸ καθ' αὑτὸ τὸ ὑγρὸν, ὑπὸ τοῦ ἐντὸς θερμοῦ συνεξατμίζοντος τὸ ὑγρὸν, ξηραίνεται, ἂν ὀλίγον ᾖ τὸ ὑγρὸν, ἐξιούσης τῆς θερμότητος ὑπὸ τοῦ περιεστῶτος ψυχροῦ. ξηραίνεται μὲν οὖν, ὥσπερ εἴρηται, ἅπαντα, ἢ θερμαινόμενα, ἢ ψυχόμενα· καὶ πάντα θερμῷ, ἢ τῷ ἐντὸς, ἢ τῷ ἐκτὸς συνεξατμίζοντι τὸ ὑγρόν. λέγω δὲ ἐκτὸς μὲν, ὥσπερ
E τὰ ἑψόμενα· ἐντὸς δὲ, ὅταν ἀφαιρεθέντος τοῦ ὑγροῦ ὑφ' ἧς ἔχει θερμότητος ἀναλωθῇ ἀποπνεούσης. περὶ μὲν οὖν τοῦ ξηραίνεσθαι, εἴρηται.

* Quidam, τὰ περὶ τὴν ὕλην.
* κ. αἰτίων διξ...
* κ. καίειν

CAPVT VI.

Coagulabilium alia eſſe aquam aut aquæ ſpecies, alia aquæ & terræ.

AT humectatio, vno quidem modò accidere ſolet, cùm quid in aquam conſiſtit: altero, cùm id eliquatur, quod priùs concreuerat. Horum autem eſt ſpiritus, qui in aquam frigore denſatur.

ΚΕΦΑΛ. ϛ.

Ὅσα πήγνυται, ἢ ὕδατος εἶναι, ἢ γῆς καὶ ὕδατος· καὶ περὶ διαφορᾶς τούτων τοῦ πήξαι καὶ λύειν.

ΤΟ δὴ ὑγραίνεσθαί ἐστιν, ἓν μὲν, τὸ ὕδωρ γίνεσθαι συνιστάμενον· ἓν δὲ, τὸ τήκεσθαι τὸ πεπηγός. τούτων δὲ συνίσταται μὲν εἰς ὕδωρ ψυχόμενον τὸ πνεῦμα.

περὶ δὲ τήξεως ἅμα καὶ πήξεως ἔσται δῆλον. πήγνυται δὲ ὅσα πήγνυται, ἢ ὕδατος ὄντα, ἢ γῆς καὶ ὕδατος· καὶ *ταῦτα, ἢ ψυχρῷ, ἢ θερμῷ, ἢ ξηρῷ. διὸ καὶ λύεται τοῖς ἐναντίοις, ὅσα λύεται τὰ ὑπὸ θερμοῦ παγέντα ἢ ὑπὸ ψυχροῦ. τὰ μὲν γὰρ ὑπὸ θερμοῦ ξηροῦ παγέντα, ὑπὸ ὕδατος λύεται, ὅ ἐστιν ὑγρὸν ψυχρόν. τὰ δὲ ὑπὸ ψυχροῦ παγέντα, ὑπὸ πυρὸς λύεται, ὅ ἐστι θερμόν. πήγνυσθαι δ' ἔνια δόξειεν ἂν ὑπὸ ὕδατος, οἷον τὸ μέλι τὸ ἑφθόν. πήγνυται δ' οὐχ ὑπὸ τοῦ ὕδατος, ἀλλ' ὑπὸ τοῦ ἐν αὐτῷ ψυχροῦ. ὅσα μὲν οὖν ὕδατος, οὐ πήγνυται ὑπὸ πυρός. λύεται γὰρ ὑπὸ πυρός. τὸ δ' αὐτὸ τῷ αὐτῷ κατὰ ταὐτὸ οὐκ ἔστιν αἴτιον τοῦ ἐναντίου. ἔτι τῷ ἀπιέναι τὸ θερμὸν πήγνυται· ὥστε δῆλον ὅτι τῷ εἰσιέναι λυθήσεται· ὥστε ποιοῦντος τοῦ ψυχροῦ, πήγνυται. διὸ οὐ παχύνεται τὰ τοιαῦτα πηγνύμενα. ἡ γὰρ πάχυνσις ὑγροῦ μὲν ἀπιόντος γίνεται, τοῦ ξηροῦ δὲ συνισταμένου· ὕδωρ δὲ τῶν ὑγρῶν οὐ παχύνεται μόνον. ὅσα δὲ κοινὰ γῆς καὶ ὕδατος, καὶ ὑπὸ τοῦ πυρὸς πήγνυται, καὶ ὑπὸ τοῦ ψυχροῦ, παχύνεται δὲ ὑπ' ἀμφοῖν, ἔστι μὲν ὡς τὸν αὐτὸν τρόπον, ἔστι δ' ὡς ἄλλως· ὑπὸ μὲν θερμοῦ τὸ ὑγρὸν ἐξάγοντος· ἐξατμίζοντος γὰρ τοῦ ὑγροῦ, παχύνεται τὸ ξηρόν, καὶ συνίσταται· ὑπὸ δὲ τοῦ ψυχροῦ τὸ θερμὸν ἐκθλίβοντος, μεθ' οὗ τὸ ὑγρὸν συναπέρχεται συνεξατμίζον. ὅσα μὲν οὖν μαλακά, ἀλλὰ μὴ ὑγρά, οὐ παχύνεται, ἀλλὰ πήγνυται ἐξιόντος τοῦ ὑγροῦ, οἷον ὁ ὀπτώμενος κέραμος. ὅσα δὲ ὑγρὰ τῶν μικτῶν, καὶ παχύνεται, οἷον γάλα. πολλὰ δὲ καὶ ὑγραίνεται πρῶτον, ὅσα ἢ παχέα, ἢ σκληρὰ ὑπὸ ψυχροῦ προϋπῆρχεν ὄντα, ὥσπερ καὶ ὁ κέραμος τὸ πρῶτον ὀπτώμενος ἀτμίζει, καὶ μαλακώτερος γίνεται· διὸ καὶ διαστρέφεται ἐν ταῖς καμίνοις. ὅσα μὲν οὖν ὑπὸ ψυχροῦ πήγνυται, τῶν κοινῶν γῆς καὶ ὕδατος, πλεῖον δὲ ἐχόντων γῆς, τὰ μὲν τῷ τὸ θερμὸν ἐξεληλυθέναι πηγνύμενα, ταῦτα τήκεται θερμῷ, εἰσιόντος πάλιν τοῦ θερμοῦ, οἷον ὁ πηλός, ὅταν παγῇ. ὅσα δὲ διὰ ψῦξιν, καὶ τοῦ θερμοῦ συνεξατμίσαντος ἅπαντος, ταῦτα δὲ ἄλυτα μὴ ὑπερβαλλούσῃ θερμότητι, ἀλλὰ μαλάττεται, οἷον σίδηρος καὶ κέρας. τήκεται δὲ καὶ ὁ εἰργασμένος σίδηρος, ὥστε ὑγρὸς γίνεσθαι, καὶ πάλιν πήγνυσθαι, καὶ τὰ στομώματα ποιοῦσιν οὕτως· ὑφίσταται γάρ, καὶ ἀποκαθαίρεται κάτω ἡ σκωρία. ὅταν δὲ πολλάκις πάθῃ καὶ καθαρὸς γένηται, τοῦτο στόμωμα γίνεται. οὐ ποιοῦσι δὲ πολλάκις αὐτό, διὰ τὸ ἀπουσίαν γίνεσθαι πολλήν, καὶ τὸν σταθμὸν ἐλάττω ἀποκαθαιρομένου. ἔστι δ' ἀμείνων σίδηρος ὁ ἐλάττω ἔχων ἀποκάθαρσιν. τήκεται δὲ καὶ ὁ λίθος ὁ πυρίμαχος, ὥστε στάζειν καὶ ῥεῖν. τὸ δὲ πηγνύμενον ὅταν ῥυῇ, πάλιν γίνεται σκληρόν. καὶ αἱ μύλαι τήκονται, ὥστε ῥεῖν. τὸ δὲ ῥέον πηγνύμενον, τὸ μὲν χρῶμα μέλαν, ὅμοιον δὲ γίνεται τῇ τιτάνῳ. τήκεται δὲ καὶ ὁ πηλός, καὶ ἡ γῆ. ὅσα δὲ ὑπὸ θερμοῦ ξηροῦ πήγνυται, τὰ μὲν ἄλυτα, τὰ δὲ λυτὰ ὑγρῷ. κέραμος μὲν οὖν, καὶ λίθων ἔνια γένη, ὅσα ὑπὸ πυρὸς τῆς γῆς συγκαυθείσης γίνονται, οἷον αἱ μύλαι, ἄλυτα. *νίτρον δὲ καὶ ἅλες, λυτὰ ὑγρῷ· οὐ παντὶ δέ, ἀλλὰ ψυχρῷ.

* γρ. ἢ ψυχρῷ ἢ ξηρῷ ἢ θερμῷ ἅμα καὶ ξηρῷ.

* Vide Mercurial. Var. lib. 4. cap. 9.

A De eliquatione autem pariter atque concretione perſpicuum euadet. Quæcumque autem concreſcunt, cùm aut ad aquam, aut ad terram & aquam ſpectent, concreſcere, idque vel frigore vel calore vel ſicco aſſolent. Quocirca & quæcumque calore vel frigore concreta ſoluuntur, contrariis ſolui ſolent. Nam quæ calore ſicco concreuere, aqua ſoluuntur, quæ humor algidus eſt: quæ verò frigore, igni, qui calidus exiſtit. At nonnulla aquæ beneficio concreſcere videntur, quod genus eſt mel decoctum: verùm id non ab aqua, ſed à frigore aquæ indito prouenit. Quæ igitur ad aquam ſpectant, feruore ignis concreſcere nequeunt: nam ab igni B ſoluuntur. Idem autem eidem ſecundùm idem contrarij cauſa non eſt. Adhæc quia calor egreditur, res concreſcere ſolent. Vnde fit vt quia ingreditur, reſolutionem fore conſtet. quare agente frigore res concreſcunt coguntúrque. Quocirca eiuſmodi omnia cùm concreſcunt, haudquaquam ſpiſſari ſolent. Nam cùm partes humidæ euaneſcunt, & ſiccæ coagmentantur, ſpiſſatio oboritur. Sola autem ex humidorum genere aqua non ſpiſſatur. At quæ telluri & aquæ communia ſunt, tam igni quàm frigore concreſcunt, atque ab vtroque ſpiſſantur: quod partim eodem modo, partim diuerſo fieri ſolet. A calore quidem, qui humorem educit. nam euaporante humore pars arida ſpiſſa-C tur atque conſiſtit. A frigore verò, quod calorem exprimit diſcutitque, quo cum, dum euaporat, ſimul humor abit. Quæcumque igitur mollia ſunt, ſed non liquida, abeunte humore non ſpiſſantur, ſed concreſcunt, vt fictile coctum. At è miſtorum numero quæcumque liquida ſunt, ceu lac, ſpiſſantur. Pleraque autem & humefiunt priùs, nimirum quæ frigus antè ſpiſſa duráve reddiderat. quemadmodum & fictile dum coquitur, primùm euaporat atque molliuſculum redditur: ob idque in furnis peruerti aſſolet. Igitur ex hiſce quæ cùm terræ & aquæ communia ſint, plus tamen terræ habeant, frigoris opera concreſcunt: quæ ideo concreſcere ſolent, quòd calor egrediatur: ea calore liquefieri, D eodem ſcilicet rurſum ingrediente, aſſolent. velvti cœnum, vbi in gelu concreuit. Quæ autem ob refrigerationem, & quia ſimul vniuerſus calor euaporauit, concreſcunt, ea ſolui non niſi caloris exuperantiâ queunt, ſed molleſcere ſolent, vt cornu atque ferrum. Liquefit autem & ipſum quoque elaboratum ferrum, adeò vt liquidum reddatur & rurſum concreſcat. Nec ſecus chalybem facere conſueuere. ferri namque fex ſubſidet, atque in imum ſecernitur. Vbi autem ſæpe defęcatum fuit, ac purum mundúmque euaſit, fit chalybs. Sed id nequaquam ſępe agunt, propterea quòd dum repurgatur, ſubſtantiæ plurimum defluit, libramentúmque E minus efficitur. At ferrum eo præſtantius eſt, quo minus habet excrementi. Item & lapillus ille quem Pyrimachum vocant, in tantum eliquari, vt ſtillet fluátque, aſſolet. Quod autem concreuerat, vbi fluxerit, rurſum dureſcere ſolet. Quinetiam lapides molares, adeò colliqueſcunt, vt diffluant. Cæterùm dum id quod concreuerat fluit: tametſi calore eſt atro, calcis tamen in modum albicat. Porrò tam tellus quàm cœnum liquefieri poſſunt. Eorum autem quæ colore arido coguntur, quædam humoris vi ſolui nequeunt, quædam queunt. Fictile igitur & nonnulla lapidum genera, qui terra feruori ignis deuſta fiunt, velvti molæ ſolutionem haudquaquam admittunt. at ſal, atque nitrum, humore ſoluuntur, non tamen quolibet, ſed algido.

Et ideo aqua & aquæ generibus omnibus, præterquam oleo eliquari conſueuere. nam calori arido frigus humidum aduerſatur.* Ergo ſi alterum coegit, reſoluet alterum. Ita enim contrariorum effectuum contrariæ erunt cauſæ.

CAPVT VII.

Salium qui aqua aut terra plurimum communicent.

QVæ igitur plus aquæ habent quàm terræ, igni ſolummodo ſpiſſari poſſunt: quæ verò terræ, concreſcere. Quocirca, nitrum, ſal, fictile, lapis ad terram potiùs quàm ad aquam ſpectãt. Olei autem natura perquam ambigua exiſtit. Nam ſi plus haberet aquæ, vt à frigore glaciei modo cogeretur, oporteret: ſin verò terræ, ab igni, perinde vt fictile. nunc autem à neutro cogi, ſed è regione ab vtroque ſpiſſari videtur. Cuius rei cauſa eſt, quòd aëre refertum ſit. Quapropter & aquæ per ſumma inſidet. etenim aër quem continet, ſurſum verſus effertur. Frigus igitur, dũ è ſpiritu qui inter oleum eſt, aquã elicit, oleũ ſpiſſeſcere facit. ſemper enim vbi aqua & oleum permiſta fuerint, quippiam vtroque ſpiſſius oriri aſſolet. Ab igni autem tractúque temporis albeſcit craſſeſcitque. albeſcit quidem, aqueo humore, ſi quis inſit, euaporante: craſſeſcit verò, quòd marceſcente calore, aër in aquæ vicem tranſeat. Vtraque igitur ex parte, atque eandem ob cauſam, verùm non eodem modo, eadem oritur affectio. Ergo operâ vtriuſque ſpiſſari aſſolet, à neutro tamen aſſiccatur. ſiquidem neque ſolis calor, neque frigus oleum aſſiccare poteſt: non modò quòd tenax lentúmque ſit, ſed etiam quòd aëreæ ſortis exiſtat. Aqua verò, ab igni nec aſſiccatur nec decoquitur: quòd tenacitatis ratione in fumum euaneſcere nequeat. Quæ autem terra temperantur & aqua, ea iuxta vtriuſque copiam nuncupentur oportet. eſt enim vini genus quoddam quod decoquitur atque concreſcit, ceu muſtum. Humor autem aqueus ab omnibus eiuſmodi, dum inareſcũt, exire ſolitus eſt. quòd autem aqua inſit, indicium eſt. nam vapor in aquam conſiſtit, ſi quis colligere velit. Quare quibuſcumque quippiam remanet, id profectò terrenę ſortis exiſtit. Porrò ex huiſce nonnulla frigoris etiam vehementia (vti diximus) craſſeſcunt, aſſiccantúrque. frigus ſiquidem non modò cogit & deſiccat, verumetiam incraſſat. nam aquam quidẽ aſſiccat: aërem autẽ cùm aquam ex eo elicit, craſſeſcere facit. Concretionem verò aſſiccationẽ quandam eſſe diximus. Quæ igitur frigore ſpiſſari nequeunt, ſed concreſcere, ad aquam potiùs ſpectant. quod genus ſunt, vinum, vrina, acetum, lixiuium, ſerũ. At eorum quæ quamuis non euaporent, feruore tamen ignis craſſeſcunt ſpiſſantúrque: quædã terrena ſunt, quædam cõmuniter ad aërem & aquam pertinent. Mel quidem ad terram: oleũ verò ad aërem & aquam. At lac & ſanguis vtrique, aquæ & terræ communia ſunt. ſed magna ex parte plus terræ continent: perinde vt & humores, illi vnde ſal atque nitrum fiunt. ex quibuſdam autẽ talibus lapides conſtitui ſolent. Quocirca ſerum niſi ſequeſtratum ſit, cùm decoctionẽ ſubit, calore ignis deuritur: terrena verò portio, ſi quis aliquantulum decoxerit, vti medici ingeſto coagulo faciũt, vi quoque coaguli in caſeũ denſari conſueuit. atque ad hunc modũ à caſeo ſerũ ſequeſtratur. Cùm verò ſequeſtratum eſt, haudquaquam præterea craſſeſcit, ſed aquæ modo deuritur.

A διὸ ὕδατι, καὶ ὅσα ὕδατος εἴδη, τήκονται· ἔλαιον δ' οὐ τήκεται. τῷ γὰρ ξηρῷ θερμῷ ἐναντίον ψυχρὸν ὑγρόν. εἰ οὖν ἔπηξε θάτερον, θάτερον λύσει· οὕτω γὰρ τὰ ἐναντία ἔσται αἴτια τῶν ἐναντίων.

ΚΕΦΑΛ. ζ.

Πάλιν, ὅτι τὰ μὲν ὑπὸ πυρὸς, τὰ δ' ὑπὸ ψυχροῦ παχύνεται, καθόσον ἢ ὕδατος ἢ γῆς πλέον ἔχει.

ΠΑχύνεται μὲν οὖν ὑπὸ τοῦ πυρὸς μόνον, ὅσα ὕδατος πλέον ἔχει ἢ γῆς· πήγνυται δὲ, ὅσα γῆς. B διὸ καὶ τὸ νίτρον καὶ οἱ ἅλες γῆς εἰσὶ μᾶλλον, καὶ λίθος, καὶ κέραμος. ἀπορώτατα δ' ἔχει ἡ τοῦ ἐλαίου φύσις· εἰ μὲν γὰρ ὕδατος ἔχει πλέον, ἔδει πήγνυσθαι ὑπὸ ψυχροῦ, ὡς οἱ πάγοι· εἰ δὲ γῆς πλεῖον, ὑπὸ πυρὸς, ὡς ὁ κέραμος. νῦν δὲ πήγνυται μὲν ὑπ' οὐδετέρου· παχύνεται δὲ πάλιν ὑπ' ἀμφοῖν. αἴτιον δ' ἐστὶν, ὅτι ἀέρος ἐστὶ πλήρες. διὸ καὶ ἐν τῷ ὕδατι ἐπιπολάζει. καὶ γὰρ ὁ ἀὴρ φέρεται ἄνω. τὸ μὲν οὖν ψυχρὸν ἐκ τοῦ ἐνόντος πνεύματος ὕδωρ ποιοῦν παχύνει· ἀεὶ γὰρ, ὅταν μιχθῇ ὕδωρ καὶ ἔλαιον, ἀμφοῖν γίνεται παχύτερον. ὑπὸ δὲ πυρὸς καὶ χρόνου παχύνεται καὶ λευκαίνεται· λευκαίνεται μὲν ἐξα- C τμίζοντος εἴ τι ἐνῆν ὕδατος· παχύνεται δὲ, διὰ τὸ μαραινομένου τοῦ θερμοῦ ἐκ τοῦ ἀέρος, γίνεσθαι ὕδωρ. ἀμφοτέρως μὲν οὖν τὸ αὐτὸ γίνεται πάθος, καὶ διὰ τὸ αὐτὸ ἀλλ' οὐχ ὡσαύτως. παχύνεται μὲν οὖν ὑπ' ἀμφοτέρων· ξηραίνεται δὲ ὑπ' οὐδετέρου· οὔτε γὰρ ὁ ἥλιος, οὔτε τὸ ψῦχος ξηραίνει· οὐ μόνον διότι γλισχρὸν, ἀλλὰ καὶ διότι ἀέρος ἐστίν. οὐ ξηραίνεται δὲ * τὸ ὕδωρ, οὐδὲ ἐξέψεται ὑπὸ πυρὸς, ὅτι οὐκ ἀτμίζει διὰ γλισχρότητα. ὅσα δὲ μικτὰ ὕδατος καὶ γῆς, κατὰ τὸ πλῆθος ἑκατέρου ἄξιον λέγεσθαι· οἶνος γάρ τις καὶ πήγνυται, καὶ ἕψεται, οἷον τὸ γλεῦκος. ἀπέρχεται δὲ ἀπὸ πάντων τῶν τοιούτων ξηραι- D νομένων, τὸ ὕδωρ. σημεῖον δ' ὅτι τὸ ὕδωρ· ἡ γὰρ ἀτμὶς συνίσταται εἰς ὕδωρ, ἐάν τις βούληται συλλέγειν. ὥστε ὅσοις λείπεταί τι, τοῦτο γῆς. ἔνια δὲ τούτων καὶ ὑπὸ ψυχροῦ ὥσπερ εἴρηται, παχύνεται καὶ ξηραίνεται· τὸ γὰρ ψυχρὸν οὐ μόνον πηγνύει καὶ ξηραίνει, ἀλλὰ καὶ παχύνει· ξηραίνει μὲν τὸ ὕδωρ, παχύνει δὲ τὸν ἀέρα, ὕδωρ ποιοῦν. ἡ δὲ πῆξις εἴρηται ξηρασία τις οὖσα. ὅσα μὲν οὖν μὴ παχύνεται ὑπὸ τοῦ ψυχροῦ, ἀλλὰ πήγνυται, ὕδατος ἐστὶ μᾶλλον, οἷον οἶνος, καὶ οὖρον, καὶ ὄξος, καὶ κονία, καὶ ὀρρός. ὅσα δὲ παχύνεται, μὴ ἐξατμιζόντα ὑπὸ πυρὸς, τὰ μὲν γῆς, τὰ δὲ κοινὰ ὕδατος καὶ ἀέρος· μέλι μὲν γῆς· ἔλαιον δὲ, ἀέρος, καὶ E ὕδατος. ἔστι δὲ καὶ τὸ γάλα καὶ τὸ αἷμα, ἀμφοῖν μὲν κοινὰ καὶ ὕδατος καὶ γῆς· μᾶλλον δὲ τὰ πολλὰ, γῆς, ὥσπερ καὶ ἐξ ὅσων ὑγρῶν νίτρον γίνεται καὶ ἅλες. καὶ λίθοι δ' ἐκ τινῶν συνίστανται τοιούτων. διὸ ἐὰν μὴ χωρισθῇ ὁ ὀρρὸς, ἐκκαίεται ὑπὸ τοῦ πυρὸς ἑψόμενος. τὸ δὲ γεῶδες συνίσταται καὶ ὑπὸ τοῦ ὀποῦ, ἐάν πως ἕψῃ τις, οἷον οἱ ἰατροὶ ὀπίζοντες. οὕτω δὲ χωρίζεται ὁ ὀρρὸς καὶ ὁ τυρός. ὁ δὲ χωρισθεὶς ὀρρὸς, οὐκέτι παχύνεται, ἀλλ' ἐκκαίεται ὥσπερ ὕδωρ.

* γ. τὸ ἐν ἐλαίῳ ὕδωρ.

εἰ δέ τι μὴ ἔχει τυροῦ γάλα, ἢ ὀλίγον, τοῦτο μᾶλλον ὕδατος καὶ ἄτροφον. καὶ τὸ αἷμα ὁμοίως· πήγνυται γὰρ τῷ ξηραίνεσθαι ψυχόμενον. ὅσα δὲ μὴ πήγνυται, οἷον τὸ τῆς ἐλάφου, τὰ τοιαῦτα ὕδατος μᾶλλον, καὶ ψυχρότερα ταῦτα. διὸ καὶ οὐκ ἔχει ἶνας· αἱ γὰρ ἶνές εἰσι γῆς καὶ στερεόν. ὥστε καὶ ἐξαιρεθεισῶν, οὐ πήγνυται. τοῦτο δ' ἐστίν, ὅτι οὐ ξηραίνεται· ὕδωρ γὰρ τὸ λοιπόν, ὥσπερ τὸ γάλα τοῦ τυροῦ ἐξαιρεθέντος. σημεῖον δὲ καὶ ὅτι τὸ νοσῶδες αἷμα οὐ θέλει πήγνυσθαι· ἰχωροειδὲς γάρ, τοιοῦτον δὲ φλέγμα καὶ ὕδωρ, διὰ τὸ ἄπεπτον εἶναι, καὶ ἀκράτητον ὑπὸ τῆς φύσεως. ἔτι δέ, τὰ μὲν λυτά ἐστιν, οἷον νίτρον, τὰ δὲ ἄλυτα, οἷον κέραμος, καὶ λίθος. καὶ τούτων τὰ μὲν μαλακτά, οἷον κέρας· τὰ δὲ ἀμάλακτα, οἷον κέραμος καὶ λίθος. αἴτιον δέ, ὅτι τὰ ἐναντία τῶν ἐναντίων αἴτια. ὥστ' εἰ πήγνυται δυοῖν, ψυχρῷ καὶ ξηρῷ, λύεσθαι ἀνάγκη θερμῷ καὶ ὑγρῷ. διὸ πυρὶ καὶ ὕδατι· ταῦτα γὰρ ἐναντία· ὕδατι μέν, ὅσα πυρὶ μόνῳ· πυρὶ δέ, ὅσα ψυχρῷ μόνῳ· ὥστ' εἰ ὑπ' ἀμφοῖν συμβαίνει πήγνυσθαι, ταῦτα ἄλυτα μάλιστα. γίγνεται δὲ τοιαῦτα, ὅσα θερμανθέντα ἔπειτα τῷ ψυχρῷ πήγνυται· συμβαίνει γάρ, ὅταν τὸ θερμὸν ἐξικμάσῃ ἐξιόν, τὸ πλεῖστον ὑγρὸν συνθλίβεσθαι πάλιν ὑπὸ τοῦ ψυχροῦ, ὥστε μηδ' ὑγρῷ διδόναι δίοδον. καὶ διὰ ταῦτα, οὔτε τὸ θερμὸν λύει· ὅσα γὰρ ὑπὸ ψυχροῦ πήγνυται μόνου, ταῦτα λύει· οὔθ' ὑπὸ ὕδατος· ὅσα γὰρ ὑπὸ ψυχροῦ πήγνυται, οὐ λύει, ἀλλ' ὅσα ὑπὸ θερμοῦ ξηροῦ μόνον. ὁ δὲ σίδηρος τακεὶς ὑπὸ θερμοῦ, ψυχεὶς πήγνυται. ὥστε πρὸς τὴν πῆξιν ἀμφοτέρων δεῖται· διὸ ἄλυτον. τὰ δὲ ξύλα ἐστὶ γῆς καὶ ἀέρος· διὸ καυστά, καὶ οὐ τηκτά, οὐδὲ μαλακτά· καὶ ἐπὶ τῷ ὕδατι ἐπιπλεῖ, πλὴν ἐβένου. αὕτη δ' οὔ· τὰ μὲν γὰρ ἄλλα ἀέρος ἔχει πλεῖον· ἐκ δὲ τῆς ἐβένου τῆς μελαίνης διαπέπνευκεν ὁ ἀήρ· καὶ ἔστι πλεῖον ἐν αὐτῇ γῆς· κέραμος δὲ γῆς μόνης, διὰ τὸ ξηραινόμενος παγῆναι κατὰ μικρόν· οὔτε γὰρ τὸ ὕδωρ εἰσόδους ἔχει, δι' ὧν μόνον πνεῦμα ἐξῆλθεν· οὔτε πῦρ· ἔπηξε γὰρ αὐτό. τί μὲν οὖν ἐστι πῆξις, καὶ τῆξις, καὶ διὰ πόσα, καὶ ἐν πόσοις ἐστίν, εἴρηται.

ΚΕΦΑΛ. η'.

Περὶ τῶν ἐν τοῖς τελείοις μικτῶν παθῶν· ἅπερ ἐστὶν ἐννεακαίδεκα τῆς ἕξεως, καὶ ἄλλα τοσαῦτα τῆς στερήσεως· καὶ πάλιν περὶ πηκτοῦ καὶ ἀπήκτου, καὶ τηκτοῦ καὶ ἀτήκτου.

Ἐκ δὲ τούτων φανερόν, ὅτι ὑπὸ θερμοῦ καὶ ψυχροῦ συνίσταται τὰ σώματα· ταῦτα δὲ* καὶ παχύνοντα καὶ πηγνύντα, ποιεῖται τὴν ἐργασίαν αὐτῶν. διὰ δὲ τὸ ὑπὸ τούτων δημιουργεῖσθαι, ἐν ἅπασι μέν ἐστι θερμότης· ἐνίοις δὲ καὶ ψυχρότης ᾗ ἐκλείπει. ὥστ' ἐπεὶ ταῦτα μὲν ὑπάρχει διὰ τὸ ποιεῖν, ὑγρὸν δὲ καὶ ξηρὸν διὰ τὸ πάσχειν, μετέχει αὐτῶν τὰ κοινὰ πάντων. ἐκ μὲν οὖν ὕδατος καὶ γῆς τὰ ὁμοιομερῆ σώματα συνίσταται, καὶ ἐν φυτοῖς, καὶ ἐν ζῴοις, καὶ τὰ μεταλλευόμενα, οἷον χρυσὸς, καὶ ἄργυρος, καὶ ὅσα ἄλλα τοιαῦτα ἐξ αὐτῶν τε καὶ τῆς ἀναθυμιάσεως τῆς ἑκατέρου ἐγκατακλειομένης, ὥσπερ εἴρηται ἐν ἄλλοις.

* γρ. ἢ διαξηραίνοντα ἢ παχ.

A Quòd ſi lac aliquod nihil aut parum habeat caſei, ad aquam potiùs ſpectat, atque nullatenus alit. Sanguis quoque haud ſecus habere ſeſe videtur. nam quòd frigore ſicceat, cogitur. At qui cogi nequit, vt ceruorum, is ad aquam magis pertinet atque opidoquam frigidus habetur. Et iccirco fibras nullas habet: quippe cùm fibræ ad terram ſpectent, atque quod ſtabile ac firmum exiſtit. Quare ſi etiam illæ adimantur, ſanguis concreſcere non poteſt. quod ideo accidit, quia non ſiccet. quod enim ſupereſt, id perinde atque lac caſeo iam exempto, aqua exiſtit. Signum autem eſt. Nam ſanguis vitiatus concreſcere non ſolet. quippe qui ſaniem præ ſe ferat, quæ non niſi pituitoſus humor & aqueus eſt, quòd B cruda incoctáque, & à natura non victa ſit. Præterea quædam ſolubilia ſunt, vt nitrum: quædam inſolubilia, vt fictile. atque ex hiſce alia molleſcunt, ceu cornu: alia minimè, veluti fictile atque lapis. Cauſa autem eſt: quia contrariorum, contrariæ cauſæ ſunt. Quare ſi res duobus frigore ac ſiccitate concreſcant cogantúrque, calore & humore ſoluantur eſt neceſſe. Vnde fit vt igni & aqua ſoluuntur. ea enim contraria ſunt. aqua quidem quæ igni ſolo: igni verò, quæ frigore. Quare ſi qua ab ambobus cogi contingat, ea maximè inſolubilia ſunt. Talia autem euadunt, quæcunque concalfacta priùs, frigore poſtea coguntur. vſu enim euenit, vt vbi ca- C lor excundo exhauſtus eſt, rurſum humoris plurimum frigoris opera inculcetur, adeò vt ne humori quidem tranſitum frigus concedat. Atque ob eam cauſam nec calor ea ſoluit. quæ enim frigore ſolo concreſcunt, hæc calor ſoluit. Nec itidem aqua ſoluere poteſt. nam quæ frigus cogit, aqua ſoluere non poteſt, ſed quæ vi caloris aridi ſolummodo concreuere, poteſt. At ferrum caloris feruore colliquatum, frigore concreſcit. Quare vtroque vt concreſcat indigere conſpicitur. Vnde fit vt ſolui nequeat. Ligna verò, terræ ſunt & aëris. Quare colliquari aut molleſcere nequeunt, vri queunt. Item ſuper aquam innatant omnia, præterquam ebenus, D quæ minimè inuehitur. Nam cætera aëris plurimum continent. at aër ex ebeno atra reſpirauit, in qua & terræ maior quàm aëris portio ineſt. Fictile verò, ad terram ſolummodo ſpectat, quod ſiccendo paulatim concreuerit. Quare nec aqua illud ſoluit: non enim aqua ingredi per foramina illa valet, per quæ ſpiritus ſolùm exiuit. Nec itidem ignis. nam eius opera, concretio illius prouenit. Quid igitur concretio & eliquatio, quótque ob cauſas eueniant, & quibus competere poſſint, dictum eſt.

CAPVT VIII.

Ennmeratio paſſionum mixtorum perfectorum.

E Ex his autem per calorem ac frigus conſiſtere corpus omne, in aperto eſt. hæc autem, ſpiſſando & cogendo ſuo fungi munere ſolét. Atque propterea quòd ab hiſce cætera conficiuntur, omnibus in rebus calor ineſt: in quibuſdã etiam frigus, quatenus ille deficit. Quare cùm calor ac frigus quòd agant, & humor atque ariditas quòd patiantur, corporibus inſint: quæ communia ſunt, hæc omnia participant. Similaria igitur corpora, tam in plantis quàm animantibus, terra & aqua conſtant. Item metallica, ceu aurum, argentũ, & cætera id genus, tum ipſis, tum exhalatione, quæ ab vtroque dimanat, intercluſa, vt aliàs diximus, conſtant.

Porrò hæc omnia, & peculiari affectione quæ ad ſenſus pertineat, & agendi quippiam facultate inter ſe diſcrepant. Nam candidum, odorum, ſonorum, dulce, calidum & frigidum, quòd ſenſum mouere ac irritare queant, in ratione rerum ſunt. Quæ verò ex eo nomen ſortita ſunt quòd patiantur, ceu eliquabile, concretile, flexile, & reliqua id genus omnia, per alias magis peculiareis affectiones exiſtunt: cuncta namque eiuſmodi perinde atque humidum aridúmque, paſſiua ſunt. Itaque os, caro, neruus, lignum, cortex, lapis, & cætera alia corpora ſimilaria quidem, ſed naturalia, hiſce diſcrimen ſubeunt. Primò autem dicamus numerum eorum, quæ iuxta potentiam & potentiæ priuationem dici ſolent. Sunt autem hæc: Concretile, inconcretile: Eliquabile, ineliquabile: Mollificabile, immollificabile: Humectatile, inhumectatile: Flexile, inflexile: Fractile, infractile: Friabile, infriabile: Impreſſile, inimpreſſile: Formatile, informatile: Preſſatile, impreſſatile: Tractile, intractile: Ductile, inductile: Fiſſile, infiſſile: Sectile, inſectile: Tenax, remittens: Denſatile, indenſatile: Combuſtile, incombuſtile: Exhalabile, inexhalabile. Plurima igitur corporum, his fermè differunt affectibus. Quam autem quodque horum vim habeat, ediſſeramus. Igitur de concretili & inconcretili, & eliquabili, & ineliquabili, tametſi priùs generatim dictum eſt, tamen & nunc quoque dicere aggrediamur. Nam ex corporibus quæ concreſcunt atque durent, quædam feruore caloris, quædam frigore, illo quidem humorem aſſiccante, hoc verò calorem extrudente, ita affici ſolent. Quare alia humoris abſentiâ, alia caloris, hocce patiuntur: aquea quidem, caloris: terrea verò, humoris. Quæ igitur humoris abſentiâ, ea liquefacere humor poteſt: niſi adeò ſeſe collegerint coierintque, vt minora partibus aquæ, foramina relicta ſint: id quod fictili accidit. Quæcumque autem non ita coierunt, humore liquantur, ceu nitrum, ſal, terra è cœno orta. At quæ caloris priuatione, calore deliqueſcunt: vt cryſtallus, plumbum, æs. Quæ ergo ſint concretilia, & eliquabilia, & ineliquabilia, dictum eſt. Inconcretilia autem ſunt, quæcumque nec humorem habent aquoſum, nec aquæ ſortis ſunt, ſed terræ plus caloriſque continent, vti mel atque vinum paſſum: quippe quæ velvti feruentia ſint. Item, quæcumque aqua quidem ſunt, ſed aëris plus continent. perinde vt oleum, argentum viuum: & ſi quid tenax lentúmque eſt, velvti viſcum, atque pix.

CAPVT IX.

De reliquis paſſionibus.

MOllificabilia autem ſunt, quæcumque concreta non ex aqua conſtãt, vt glacies: (omnis enim glacies, aquæ eſt) ſed quæcumque ad terram potiùs ſpectant, & nec eorum humor vniuerſus, perinde vt in ſale nitróve aſſiccatus eſt, nec inæquabiliter, vt in fictili ſeſe habet, ſed tractilia ſunt & non humectatilia, aut ductilia & non aquea, atque ignis opera ac feruore mollificabilia, vt ferrum, cornu, lignum. Et eliquabilium & ineliquabilium, quædam humectatilia ſunt, quędam inhumectatilia. Verbi cauſſa, æs, inhumectatile eſt, cùm eliquabile ſit: lana verò & terra, humectatilis. nam madefieri aſſolet. Et quidem æs colliquabile eſt:

A Ταῦτα δὲ διαφέρει ἀλλήλων τοῖς τε πρὸς τὰς αἰσθήσεις ἰδίοις ἅπαντα, καὶ τῷ ποιεῖν τι δύνασθαι. λευκὸν γὰρ, καὶ εὐῶδες, καὶ ψοφητικὸν, καὶ γλυκὺ, καὶ θερμὸν, καὶ ψυχρὸν, τῷ ποιεῖν τι [δύνασθαι] αἴσθησιν ἐστι, καὶ ἄλλοις οἰκειοτέροις πάθεσιν, ὅσα τῷ πάσχειν λέγονται. λέγω δὲ, οἷον τὸ τηκτὸν, καὶ τὸ πηκτὸν, καὶ καμπτὸν, καὶ ὅσα ἄλλα τοιαῦτα. πάντα γὰρ τὰ τοιαῦτα παθητικὰ, ὥσπερ τὸ ὑγρὸν καὶ τὸ ξηρόν. τούτοις δὴ ἤδη διαφέρει ὀστοῦν, καὶ σὰρξ, καὶ νεῦρον, καὶ ξύλον, καὶ φλοιὸς, καὶ λίθος, καὶ τῶν ἄλλων ἕκαστον τῶν ὁμοιομερῶν μὲν, φυσικῶν δὲ σωμάτων. εἴπωμεν δὲ πρῶτον τὸν ἀριθμὸν αὐτῶν, ὅσα κατὰ δύναμιν B καὶ ἀδυναμίαν λέγεται· ἔστι δὲ τάδε· πηκτὸν, ἄπηκτον· τηκτὸν, ἄτηκτον· μαλακτὸν, ἀμάλακτον· τεγκτὸν, ἄτεγκτον· καμπτὸν, ἄκαμπτον· κατακτὸν, ἀκάτακτον· θραυστὸν, ἄθραυστον· θλαστὸν, ἄθλαστον· πλαστὸν, ἄπλαστον· πιεστὸν, ἀπίεστον· ἑλκτὸν, ἀνέλκτον· ἐλατὸν, ἀνέλατον· σχιστὸν, ἄσχιστον· τμητὸν, ἄτμητον· γλίσχρον, ψαθυρόν· πιλητὸν, ἀπίλητον· καυστὸν, ἄκαυστον· θυμιατὸν, ἀθυμίατον. τὰ μὲν οὖν πλεῖστα σχεδὸν τῶν σωμάτων τούτοις διαφέρει τοῖς πάθεσι. τίνα δὲ ἕκαστον τούτων ἔχει δύναμιν, εἴπωμεν. περὶ μὲν οὖν πηκτοῦ καὶ ἀπήκτου, καὶ τηκτοῦ καὶ ἀτήκτου, εἴρηται μὲν καθόλου πρότερον. ὅμως C δὲ ἐπέλθωμεν καὶ νῦν. τῶν γὰρ σωμάτων ὅσα πήγνυται καὶ σκληρύνεται, τὰ μὲν ὑπὸ θερμοῦ πάσχει τοῦτο, τὰ δὲ ὑπὸ ψυχροῦ, ὑπὸ μὲν τοῦ θερμοῦ ξηραίνοντος τὸ ὑγρὸν, ὑπὸ δὲ τοῦ ψυχροῦ ἐκθλίβοντος τὸ θερμόν. ὥστε τὰ μὲν ὑγροῦ ἀπουσίᾳ, τὰ δὲ θερμοῦ, τοῦτο πάσχει. ὅσα μὲν ὕδατος, θερμοῦ· ὅσα δὲ γῆς, ὑγροῦ. τὰ μὲν οὖν ὑγροῦ ἀπουσίᾳ, ὑπὸ ὑγροῦ διατήκεται, ἂν μὴ οὕτω συνέλθῃ, ὥστε ἐλάττους τοὺς πόρους λειφθῆναι τῶν τοῦ ὕδατος ὄγκων, οἷον ὁ κέραμος· ὅσα δὲ μὴ οὕτω, ταῦτα ὑγρῷ τήκεται, οἷον νίτρον, ἅλες, καὶ γῆ ἡ ἐκ πηλοῦ. τὰ δὲ θερμοῦ στερήσει, ὑπὸ θερμοῦ τήκεται, οἷον κρύσταλλος,* μό- D λυβδος, χαλκός. ποῖα μὲν οὖν πηκτὰ, καὶ τηκτὰ εἴρηται, καὶ ποῖα ἄτηκτα. ἄπηκτα δὲ, ὅσα μὴ ἔχει ὑγρότητα ὑδατώδη, μηδὲ ὕδατός ἐστιν, ἀλλὰ πλεῖον θερμοῦ καὶ γῆς, οἷον μέλι καὶ γλεῦκος· ὥσπερ ζέοντα γάρ ἐστι. καὶ ὅσα ὕδατος μὲν ἔχει, ἔστι δὲ πλεῖον ἀέρος, ὥσπερ τὸ ἔλαιον, καὶ ἄργυρος χυτὸς, καὶ εἴ τι γλίσχρον, οἷον ἰξὸς καὶ πίσσα.

* γρ. μόλιβδος

ΚΕΦΑΛ. θʹ.

Περὶ τῶν λοιπῶν παθῶν, μαλακτοῦ, τεγκτοῦ, καμπτοῦ, κατακτοῦ, θραυστοῦ, θλαστοῦ, πλαστοῦ, πιεστοῦ, ἑλκτοῦ, ἐλατοῦ, σχιστοῦ, τμητοῦ, γλίσχρου, ψαθυροῦ, πιλητοῦ, καυστοῦ, θυμιατοῦ, καὶ τῶν ἐναντίων.

E Μαλακτὰ δὲ ἐστι τῶν πεπηγότων, ὅσα μὴ ἐξ ὕδατος, οἷον κρύσταλλος. πᾶς γὰρ κρύσταλλος, ὕδατος· ἀλλ' ὅσα γῆς μᾶλλον. καὶ μήτ' ἐξικμάσται πᾶν τὸ ὑγρὸν, ὥσπερ ἐν νίτρῳ ἢ ἁλσί· μήτ' ἔχει ἀνωμάλως, ὥσπερ ὁ κέραμος. ἀλλ' εἰσὶν ἑλκτὰ μὴ ὄντα διαντὰ, ἢ ἐλατὰ μὴ ὄντα ὕδατος. καὶ μαλακτὰ πυρὶ, οἷον σίδηρος καὶ κέρας καὶ ξύλα. ἔστι δὲ καὶ τῶν τηκτῶν καὶ τῶν ἀτήκτων, τὰ μὲν τεγκτὰ, τὰ δὲ ἄτεγκτα· οἷον χαλκὸς ἄτεγκτον, τηκτὸν ὄν· ἔριον δὲ καὶ γῆ τεγκτόν· βρέχεται γάρ. καὶ χαλκὸς μὲν δὴ τηκτὸν,

οὐχ ὑπὸ ὕδατος δὲ τηκτόν· ἀλλὰ καὶ τῶν ὑπὸ ὕδατος τηκτῶν, ἔνια ἄτεγκτα, οἷον νίτρον καὶ ἅλες· οὐδὲν γὰρ ἄλλο τεγκτὸν τούτων, ὃ μὴ μαλακώτερον γίνεται βρεχόμενον. ἔνια δὲ τεγκτὰ ὄντα, οὐ τηκτά ἐστιν, οἷον ἔριον καὶ οἱ καρποί. ἔστι δὲ τεγκτὰ μὲν, ὅσα γῆς ὄντα ἔχει τοὺς πόρους μείζους τῶν τοῦ ὕδατος ὄγκων, ὄντα δὲ σκληρότερα τοῦ ὕδατος. τηκτὰ δὲ ὕδατι, ὅσα δι' ὅλου. διὰ τί δὲ ἡ μὲν γῆ καὶ τήκεται καὶ τέγγεται ὑπὸ τοῦ ὑγροῦ· τὸ δὲ νίτρον, τήκεται μὲν, τέγγεται δ' οὔ; ὅτι ἐν μὲν τῷ νίτρῳ δι' ὅλου οἱ πόροι· ὥστε διαιρεῖται εὐθὺς ὑπὸ τοῦ ὕδατος τὰ μόρια· ἐν δὲ τῇ γῇ καὶ ἐναλλάξ εἰσιν οἱ πόροι. ὥστε ὁποτέρως ἂν δέξηται, διαφέρει τὸ πάθος. ἔστι δὲ καὶ τὰ μὲν τῶν σωμάτων καμπτὰ καὶ εὐθυντά, οἷον κάλαμος, καὶ λύγος· τὰ δὲ ἄκαμπτα τῶν σωμάτων, οἷον κέραμος καὶ λίθος. ἔστι δὲ καμπτὰ μὲν καὶ εὐθυντά, ὅσων σωμάτων τὸ μῆκος δύναται εἰς εὐθύτητα ἐκ περιφερείας, καὶ ἐξ εὐθύτητος εἰς περιφέρειαν μεταβάλλειν· καὶ τὸ κάμπτεσθαι καὶ τὸ εὐθύνεσθαί ἐστι τὸ εἰς εὐθύτητα ἢ περιφέρειαν μεθίστασθαι ἢ κινεῖσθαι. καὶ γὰρ τὸ ἀνακαμπτόμενον καὶ τὸ κατακαμπτόμενον κάμπτεται. ἡ μὲν οὖν εἰς κυρτότητα ἢ κοιλότητα κίνησις, τοῦ μήκους σωζομένου κάμψις ἐστίν. εἰ γὰρ καὶ εἰς τὸ εὐθὺ, εἴη ἂν ἅμα κεκαμμένον καὶ εὐθύ· ὅπερ ἀδύνατον, τὸ εὐθὺ κεκάμφθαι. καὶ εἰ κάμπτεται πᾶν, ἢ ἀνακάμπτει, ἢ κατακάμπτει· τούτων δὲ, τὸ μὲν εἰς τὸ κυρτὸν, τὸ δ' εἰς τὸ κοῖλον μετάβασις· οὐκ ἂν εἴη καὶ εἰς τὸ εὐθὺ κάμψις, ἀλλ' ἔστι κάμψις καὶ εὔθυνσις, ἄλλο καὶ ἄλλο. καὶ ταῦτά ἐστι καμπτὰ καὶ εὐθυντά, καὶ ἄκαμπτα καὶ ἀνεύθυντα. καὶ τὰ μὲν κατακτὰ, καὶ θραυστὰ, ἅμα ἢ χωρίς· οἷον ξύλον, κατακτὸν μὲν ὄν, θραυστὸν δ' οὔ· κρύσταλλος δὲ καὶ λίθος θραυστὸν, κατακτὸν δ' οὔ· κέραμος δὲ καὶ θραυστὸν, καὶ κατακτόν. διαφέρει δὲ, ὅτι κάταξις μέν ἐστιν εἰς μεγάλα μέρη διαίρεσις καὶ *χωρισμός. θραῦσις δὲ, ἡ εἰς τὰ τυχόντα, καὶ πλείω δυοῖν. ὅσα μὲν οὖν οὕτω πέπηγεν, ὥστε πολλοὺς ἔχειν παραλλάττοντας πόρους, θραυστά· μέχρι γὰρ τούτου διίσταται· ὅσα δ' εἰς πολὺ, κατακτά· ὅσα δ' ἄμφω, ἀμφότερα. καὶ τὰ μὲν θλαστὰ, οἷον χαλκὸς καὶ κηρός· τὰ δὲ ἄθλαστα, οἷον κέραμος καὶ ὕδωρ. ἔστι δὲ θλάσις μὲν ἐπιπέδου, κατὰ μέρος εἰς βάθος μετάστασις, ὤσει ἢ πληγῇ· τὸ δ' ὅλον, ἁφῇ. ἔστι δὲ τὰ τοιαῦτα καὶ μαλακτὰ, οἷον κηρὸς μένοντος τοῦ ἄλλου ἐπιπέδου κατὰ μέρος μεθίσταται· καὶ σκληρὰ, οἷον χαλκός· καὶ ἄθλαστα καὶ σκληρὰ, οἷον κέραμος· οὐ γὰρ ὑπείκει εἰς βάθος τὸ ἐπίπεδον· καὶ ὑγρὰ* οἷον ὕδωρ, ὑπείκει μὲν, ἀλλ' οὐ κατὰ μέρος, ἀλλ' ἀντιμεθίσταται. τῶν δὲ θλαστῶν ὅσα μένει θλασθέντα, καὶ εὔθλαστα χειρὶ, ταῦτα μὲν πλαστὰ, τὰ δὲ ἢ μὴ εὔθλαστα, ὥσπερ λίθος ἢ ξύλον, ἢ εὔθλαστα μὲν, μὴ μένει δὲ ἡ θλάσις, ὥσπερ ἐρίου, ἢ σπόγγου, οὐ πλαστὰ, ἀλλὰ πιεστὰ ταῦτ' ἐστίν. ἔστι δὲ πιεστὰ, ὅσα ὠθούμενα, εἰς αὑτὰ συνιέναι δύναται, εἰς βάθος τοῦ ἐπιπέδου παραλλάττοντος, οὐ διαιρουμένου, καὶ μὴ μεθισταμένου ἄλλου ἄλλῳ μορίου, οἷον τὸ ὕδωρ ποιεῖ. τοῦτο γὰρ ἀντιμεθίσταται. ἔστι δὲ ὦσις, ἡ κίνησις ὑπὸ τοῦ κινοῦντος, ἡ γιγνομένη ἀπὸ τῆς ἁφῆς· πληγὴ δὲ, ὅταν ἀπὸ τῆς φορᾶς.

* γρ. χώρισις.

* γρ. οἷον ὕδωρ. τὸ γὰρ ὕδωρ ὑπεῖκον.

non tamen ab aqua colliquari poteſt. Sed & eorum quæ aqua liquari queunt, nonnulla inhumectatilia ſunt, ceu nitrum, atque ſal: nec enim quicquam humectatile eſt, quod cùm aqua inſpergitur, molliuſculum non fiat. Nonnulla autem, cùm humectatilia ſint, eliquabilia non ſunt: vt lana atque fructus. Cæterùm humectatilia quidem ſunt, quæ cùm terrena ſint & aqua duriora exiſtant, meatus ampliores quàm partium aquæ moles contineant. Liquabilia verò aqua, quæcumque illos per totum commeantes poſſident. Cur igitur terra humore eliquari, atque humectari: nitrum verò eliquari, non humectari poteſt? Nimirum, quòd in nitro foramina continuata totum penetrant: vnde fit vt aqua partes continuò diſpeſcat. At in terra foramina euariant, nec inter ſeſe reſpondent: quare quoquo pacto aquam exceperit, diuerſa oritur affectio. Porro corporum alia flexilia atque directilia ſunt, vt arundo ac vimen: alia inflexilia, vt fictile atque lapis. Flexilia autem atque directilia corpora ſunt, quorum lõgitudo ex ambitu in rectum, & cõtrà è recto in ambitum permutari valet. Atque flecti & dirigi, in rectum aut ambitum migrare atque tranſire exiſtit: etenim tam quod reflectitur quàm quod inflectitur, flectitur curuatúrque. Flexio igitur eſt, ad deuexitatem aut concauitatem ſeruata longitudine motio. Si enim flexio ad rectitudinem quoque tranſitio eſſet, idem ſimul flexum rectúmque foret: quod profectò, rectum inquam flexum eſſe, fieri nequit. Quòd ſi omnino vel reflexu, vel inflexu res flecti ſoleant, quorum alterum ad conuexum, alterum ad concauum, migratio eſt, flexio ſanè ad rectum profectio eſſe non poteſt: ſed aliud flexio, aliud directio exiſtit. atque hæc ſunt, flexilia & directilia, & inflexilia & indirectilia. Item alia fractilia & infriabilia, ſimul & ſeorſim exiſtunt. verbi cauſa: lignum fractile eſt, non friabile: glacies autem & lapis, friabilis, non fractilis: at fictile, & fractile, & friabile. Differunt tamen. nam fractio, in magnas partes diuiſio atque diſtractio exiſtit: friatio verò, in quaſuis ſine diſcrimine, & quæ duabus plures ſint. Quæcumque igitur ita concreuêre vt multis ſcateant foraminibus, quæ directim poſita non ſint, friabilia ſunt: hac enim fini inter ſeſe diſtant. Quæ verò longè porrecta habẽt foramina, fractilia. Quibus autem vtrumque competit, ea tam friabilia quàm fractilia ſunt. Porro alia impreſſilia ſunt, vt æs, cera: alia minimè, vt fictile, aqua. Eſt autem impreſſio, partis eius quæ per ſumma reſidet, introrſum migratio, quæ pulſione aut ictu, ſed in totum tactu accidit. Sũt autem eiuſmodi, tam mollia, ceu cera, quæ alia ſuperficiei parte immota partim ſuffugit: quàm dura, vt æs. Item quæ impreſſionem defugiunt, tum dura ſunt vt fictile (non enim ſuperficies refugit) tum liquida, velvt aqua quæ cedit, at non ſecundùm partẽ, ſed ad rei prementis latera reſilit. Impreſſiliũ verò, quæcumque facilè manu imprimi queũt, manẽntque impreſſa, ea quidẽ formacilia ſunt. at quæ difficilè lapidis more vel ligni imprimuntur, aut facilè quidẽ, ſed impreſſio ceu lanæ, aut ſpongiæ, non remanet, hęc formatilia non ſunt, ſed preſſatilia. Preſſatilia autẽ ſunt, quæ pulſa colligere ſeſe poſſunt intro recedente ſuperficie, nõ diſtracta. nec aliò demigrãte parte alia: id quod aqua facit, quippe quæ in ſublime reſilire ſoleat. Pulſio autẽ, motio eſt ab eo quod mouet, orta, quæ per tactionem efficitur. Ictus verò, quæ per delationem.

A Preſſantur autem, quæcumque cognati corporis vacuos meatus obtinent. Atque preſſatilia ea ſunt quæ in ſua coire vacua foraminave poſſunt (interdum enim foramina in quæ coeãt, inania non ſunt) idquod in madefacta ſpongia euenit. nam ſua foramina inhibito humore diſtenduntur. At ea quorum meatus corpore molliori quàm idipſum quod ſuapte natura in eos coire poteſt, referti fuerint, preſſatilia quidem ſunt: vt ſpongia, lana, cera, caro. Impreſſatilia verò, quæ pulſione in ſua coire foramina per naturam nequeunt, quòd vel nulla habeant, vel re duriore oppleta gerant. Ferrum namque, lapis, aqua, & liquidum quodcumque, impreſſatilia ſunt. Tractilia verò ſunt, quorum ſuperfi- B cies in latus porrigi poteſt. Trahi enim eſt, ſuperficiem perpetuam exiſtentem verſus idipſum porrigi, quod facultatem mouendi obtinet. Sunt autem quædam tractilia, vt pilus, lorum, neruus, maſſa triticea, viſcum: quædam intractilia, vt lapis atque aqua. Igitur quædam tractilia & preſſatilia eadem ſunt, vt lana: quædam non ſunt: verbi cauſſa: pituita preſſatilis non eſt, ſed tractilis, & ſpongia preſſatilis, ſed non tractilis. Sunt porrò etiam quædam ductilia, vt æs: quædam non ductilia, vt lapis atque lignum. Ductilia autem ſunt, quorum ſuperficies non tota in latum pariter atque profundum migrare eodem ictu poteſt: non ductilia verò, quorum nõ C poteſt. Porro ductilia omnia, etiam impreſſilia ſunt, at non omnia impreſſilia, ductilia, ceu lignum, quod tamen, vt in vniuerſum dixerim, recurrit. Sed preſſatilium quædam ductilia ſunt, quædam minimè. cera quidem atque cœnum, ductilia ſunt: lana autem atque aqua, haudquaquam. Sunt & quædam fiſſilia, ceu lignum: quædam infiſſilia, vt fictile. Eſt autem fiſſile, quod ampliorẽ quàm quæ ab eo quod diuidit fiat, diuiſionẽ ſubire poteſt. Nam cum quippiam finditur, cùm diuiſionem quam corpus diuidens adferat, maiorem admittit, atque diuiſio ipſa, quod facultatem obtinet diuidendi, anteuertit: id quod in ſectione minimè euenit. Infiſſilia verò ſunt, quæcumque iſtud pati nequeunt. Porrò fiſſile nul- D lum, molle exiſtit. de hiſce autem loquor, quæ abſolutè & non ad alia, mollia ſunt. ad hunc enim modum, vel ferrũ ipſum molle foret. Nec dura omnia, fiſſilia ſunt. ſed quæcumque nec liquida, nec impreſſilia, nec friabilia exiſtunt. Talia autem ſunt, quæcumque meatus quibus inter ſe partes cohærent, in longum porrectos, ſed non in latum, habẽt. Sectilia autem ſunt ex hiſce, quæ dura conſtant, molliáve ſunt, quæcumque nec diuiſionem neceſſariò anticipare, nec comminui cùm diuiduntur, poſſunt. Inſectilia verò, quæcumque aut eiuſmodi, aut liquida ſunt. Nonnulla autem & ſectilia & fiſſilia eadem ſunt, velvti lignum. verùm parte plurima, quod per longitudinem fiſſile eſt, per latitudinem E ſectile exiſtit. Cùm enim in plura quodque diuidatur, quo longitudines multæ vna ſunt, eo fiſſile eſt: ſed quo plures latitudines in vnam conflantur, eo ſectile exiſtit. Tenacia autem ſiue lenta ſunt, quæ cùm liquida molliáve ſint, protrahi poſſunt. Talia autem permutatione fiunt, quæcumque corpora catenarum modo componuntur. ea enim diſtendi multùm, & rurſum contrahi queunt. Quæ verò non ſunt eiuſmodi, remittentia exiſtunt. At denſatilia ſunt, quæcumque preſſatilium ſtabilem fixámque habent preſſationem. Indenſatilia verò, quæcumque vel impreſſatilia ſunt, aut preſſationem obtinent inconſtantem. Quinetiam quædam combuſtilia ſunt, quædam incombuſtilia. verbi cauſſa, lignum, oſſa, lana, cõbuſtilia ſunt: lapis atque glacies, minimè.

πιέζεται δὲ, ὅσα πόρους ἔχει κενοὺς συγγενοῦς σώματος· καὶ πιεστὰ ταῦτα, ὅσα δύναται εἰς τὰ ἑαυτῶν κενὰ συνιέναι, ἢ εἰς τοὺς ἑαυτῶν πόρους· ἐνίοτε γὰρ οὐ κενοί εἰσιν, εἰς οὓς συνέρχεται, οἷον ὁ βεβρεγμένος σπόγγος· πλήρεις γὰρ αὐτοῦ οἱ πόροι· ἀλλ᾽ ὧν ἂν οἱ πόροι πλήρεις ὦσι μαλακωτέρων, ἢ αὐτὸ τὸ πεφυκὸς συνιέναι εἰς αὐτά. πιεστὰ μὲν οὖν ἐστιν, οἷον σπόγγος, κηρὸς, σάρξ· ἀπίεστα δὲ, τὰ μὴ πεφυκότα συνιέναι* ὤσει εἰς τοὺς ἐν αὑτοῖς πόρους, διὰ τὸ ἢ μὴ ἔχειν, ἢ σκληροτέρων ἔχειν πλήρεις. ὁ γὰρ σίδηρος ἀπίεστος, καὶ λίθος, καὶ ὕδωρ, καὶ πᾶν ὑγρόν. ἑλκτὰ δέ ἐστιν, ὅσων δυνατὸν εἰς τὸ πλάγιον μεθίστασθαι τὸ ἐπίπεδον. τὸ γὰρ ἕλκεσθαί ἐστι, τὸ ἐπὶ τὸ κινοῦν μεθίστασθαι τὸ ἐπίπεδον συνεχὲς ὄν. ἔστι δὲ, τὰ μὲν ἑλκτὰ, οἷον θρὶξ, ἱμὰς, νεῦρον, σταὶς, ἰξός· τὰ δὲ ἄνελκτα, οἷον ὕδωρ καὶ λίθος. τὰ μὲν οὖν ταὐτά ἐστιν ἑλκτὰ καὶ πιεστὰ, οἷον ἔριον· τὰ δ᾽ οὐ ταὐτὰ, οἷον φλέγμα πιεστὸν μὲν οὐκ ἔστι, ἑλκτὸν δέ· καὶ ὁ σπόγγος, πιεστὸν μὲν, οὐχ ἑλκτὸν δέ. ἔστι δὲ καὶ τὰ μὲν ἐλατὰ, οἷον χαλκός· τὰ δὲ ἀνήλατα, οἷον λίθος καὶ ξύλον. ἔστι δὲ ἐλατὰ μὲν, ὅσα τῇ αὐτῇ πληγῇ δύναται ἅμα καὶ εἰς πλάτος καὶ εἰς βάθος τὸ ἐπίπεδον μεθίστασθαι κατὰ μέρος· ἀνήλατα δὲ, ὅσα ἀδύνατα. ἔστι δὲ τὰ μὲν ἐλατὰ ἅπαντα καὶ θλαστά· τὰ δὲ θλαστὰ οὐ πάντα ἐλατὰ, οἷον ξύλον, ὡς μέντοι ἐπὶ τὸ πολὺ εἰπεῖν, ἀντιστρέφει. τῶν δὲ πιεστῶν, τὰ μὲν ἐλατὰ, τὰ δ᾽ οὔ, κηρὸς μὲν καὶ πηλὸς ἐλατὰ, ἔριον δ᾽ οὔ, οὐδὲ ὕδωρ. ἔστι δὲ καὶ τὰ μὲν σχιστὰ, οἷον ξύλον· τὰ δὲ ἄσχιστα, οἷον κέραμος. ἔστι δὲ σχιστὸν, τὸ δυνάμενον διαιρεῖσθαι ἐπὶ πλέον ἢ τὸ διαιροῦν διαιρεῖ· σχίζεται γὰρ, ὅταν ἐπὶ πλέον διαιρῆται, ἢ τὸ διαιροῦν διαιρεῖ, καὶ προηγῆται ἡ διαίρεσις· ἐν δὲ τῇ τμήσει οὐκ ἔστι τοῦτο. ἄσχιστα δὲ, ὅσα μὴ δύναται τοῦτο πάσχειν. ἔστι δ᾽ οὔτε μαλακὸν οὐδὲν σχιστόν· λέγω δὲ τῶν ἁπλῶς μαλακῶν, καὶ μὴ πρὸς ἄλληλα· οὕτω μὲν γὰρ καὶ σίδηρος ἔσται μαλακός· οὔτε τὰ σκληρὰ πάντα ἐστὶ σχιστά· ἀλλ᾽ ὅσα μήθ᾽ ὑγρά ἐστι, μήτε θλαστὰ, μήτε θραυστά. τοιαῦτα δ᾽ ἐστὶν, ὅσα κατὰ μῆκος ἔχει τοὺς πόρους, καθ᾽ οὓς προσφύεται ἀλλήλοις· ἀλλὰ μὴ κατὰ πλάτος. τμητὰ δ᾽ ἐστὶ τῶν συνεστώτων τῶν σκληρῶν, ἢ μαλακῶν, ὅσα δύναται μήτ᾽ ἐξ ἀνάγκης προηγεῖσθαι τῆς διαιρέσεως, μήτε θραύεσθαι διαιρούμενα· *ὅσα δὲ ἢ ὑγρὰ, ἢ τοιαῦτα, ἄτμητα. ἔνια δ᾽ ἐστὶ ταὐτὰ καὶ τμητὰ καὶ σχιστὰ, οἷον ξύλον· ἀλλ᾽ ὡς ἐπὶ τὸ πολὺ, σχιστὸν μὲν κατὰ τὸ μῆκος, τμητὸν δὲ κατὰ τὸ πλάτος. ἐπεὶ γὰρ διαιρεῖται ἕκαστον εἰς πολλὰ, ᾗ μὲν μήκη πολλὰ τὸ ἕν, σχιστὸν ταύτῃ· ᾗ δὲ πλάτη πολλὰ τὸ ἕν, τμητὸν ταύτῃ. γλίσχρον δ᾽ ἐστὶν, ὅταν ἑλκτὸν ᾖ, ὑγρὸν ὂν, ἢ μαλακόν. τοιοῦτον δὲ γίνεται τῇ ἐπαλλάξει, ὅσα ὥσπερ αἱ ἁλύσεις σύγκειται τῶν σωμάτων· ταῦτα γὰρ ἐπὶ πολὺ δύναται ἐκτείνεσθαι καὶ συνιέναι. ὅσα δὲ μὴ τοιαῦτα, ψαθυρά. πιλητὰ δὲ, ὅσα τῶν πιεστῶν μόνιμον ἔχει τὴν πίεσιν· ἀπίλητα δὲ, ὅσα ἢ ὅλως ἀπίεστα, ἢ μὴ μόνιμον ἔχει τὴν πίεσιν. καὶ τὰ μὲν καυστά ἐστι, τὰ δὲ ἄκαυστα, οἷον ξύλον μὲν καυστὸν, καὶ ἔριον καὶ ὀστοῦν· λίθος δὲ καὶ κρύσταλλος, ἄκαυστον.

* γρ. ὠθεῖ εἰς τοὺς ἑαυτῶν.

* γρ. ὅσα δὲ μὴ ὑγρὰ, τὰ πλεῖστα τμητά.

ἔστι δὲ καυστὰ, ὅσα ἔχει πόρους δεκτικοὺς πυρὸς, καὶ ὑγρότητα ἐν τοῖς κατ' εὐθυωρίαν πόροις ἀσθενεστέραν πυρός. ὅσα δὲ ἢ μὴ ἔχει, ἢ ἰσχυροτέραν, οἷον κρύσταλλος καὶ τὰ σφόδρα χλωρὰ, ἄκαυστα. θυμιατὰ δ' ἐστὶ τῶν σωμάτων, ὅσα ὑγρότητα ἔχει μὲν, οὕτω δ' ἔχει, ὥστε μὴ ἐξατμίζειν πυρουμένων χωρίς. ἔστι γὰρ ἀτμὶς ἡ ὑπὸ θερμοῦ καυστικοῦ εἰς ἀέρα καὶ πνεῦμα ἔκκρισις ἐξ ὑγροῦ διαντική. τὰ δὲ θυμιατὰ χρόνῳ εἰς ἀέρα ἐκκρίνεται, καὶ τὰ μὲν ἀφανιζόμενα, ξηρὰ τὰ δὲ γῆ γίνεται. διαφέρει δ' αὕτη ἡ ἔκκρισις, ὅτι οὔτε διαίνει, οὔτε πνεῦμα γίνεται. ἔστι δὲ πνεῦμα, ῥύσις συνεχὴς ἐπὶ μῆκος ἀέρος. θυμίασις δὲ ἐστὶν, ἡ ὑπὸ θερμοῦ καυστικοῦ κοινὴ ἔκκρισις ξηροῦ καὶ ὑγροῦ ἀθρόως. διὸ οὐ διαίνει, ἀλλὰ χρωματίζει μᾶλλον. ἔστι δ' ἡ μὲν ξυλώδους σώματος θυμίασις καπνός. λέγω δὲ καὶ ὀστᾶ καὶ τρίχας, καὶ πᾶν τὸ τοιοῦτον ἐν ταὐτῷ· οὐ γὰρ κεῖται ὄνομα κοινὸν, ἀλλὰ κατ' ἀναλογίαν ὅμως ἐν ταὐτῷ πάντ' ἐστὶν, ὥσπερ καὶ Ἐμπεδοκλῆς φησι,

Ταὐτὰ τρίχες καὶ φύλλα καὶ οἰωνῶν πτερὰ πυκνὰ,
Καὶ λεπίδες γίγνονται ἐπὶ στιβαροῖσι μέλεσσιν.

ἡ δὲ πίονος θυμίασις, λιγνύς· ἡ δὲ λιπαροῦ, κνῖσα. διὰ τοῦτο δὲ ἔλαιον οὐχ ἕψεται, οὐδὲ παχύνεται, ὅτι θυμιατόν ἐστιν, ἀλλ' οὐκ ἀτμιστόν· ὕδωρ δ' οὐ θυμιατὸν, ἀλλ' ἀτμιστόν. οἶνος δὲ, ὁ μὲν γλυκὺς θυμιᾶται· πίων γὰρ καὶ γὰρ ταὐτὰ ποιεῖ τῷ ἐλαίῳ· οὔτε γὰρ ὑπὸ ψύχους πήγνυται, καίεταί τε. ἔστι δὲ ὀνόματι οἶνος, ἔργῳ δ' οὐκ ἔστιν· οὐ γὰρ οἰνώδης ὁ χυμός. διὸ καὶ οὐ μεθύσκει. ὁ τυχὼν δ' οἶνος μικρὰν ἔχει ἀναθυμίασιν. διὸ καὶ ἀνίησι φλόγα. καυστὰ δὲ δοκεῖ εἶναι, ὅσα εἰς τέφραν διαλύεται τῶν σωμάτων. πάσχει δὲ τοῦτο πάντα ὅσα πήγνυται ἢ ὑπὸ θερμοῦ, ἢ ὑπ' ἀμφοῖν, ψυχροῦ καὶ θερμοῦ· ταῦτα γὰρ φαίνεται κρατούμενα ὑπὸ τοῦ πυρός. ἥκιστα δὲ τῶν λίθων ἡ σφραγὶς, ὁ καλούμενος ἄνθραξ. τῶν δὲ καυστῶν, τὰ μὲν φλογιστὰ, τὰ δὲ ἀφλόγιστα· τούτων δ' ἔνια ἀνθρακευτά. φλογιστὰ μὲν οὖν, ὅσα φλόγα παρέχεσθαι δύναται· ὅσα δ' οὐ δύναται, ἀφλόγιστα. ἔστι δὲ φλογιστὰ, ὅσα μὴ ὑγρὰ ὄντα, θυμιατά ἐστι. πίττα δὲ, ἢ ἔλαιον, ἢ κηρὸς, μᾶλλον μετ' ἄλλων ἢ καθ' αὑτὰ φλογιστά. μάλιστα δὲ ὅσα καπνὸν ἀνίησιν. ἀνθρακευτὰ δὲ, ὅσα τῶν τοιούτων γῆς πλέον ἔχει, ἢ καπνοῦ. ἔτι δ' ἔνια τηκτὰ ὄντα, οὐ φλογιστά ἐστιν, οἷον χαλκός. καὶ φλογιστὰ, οὐ τηκτὰ, οἷον ξύλον· τὰ δ' ἀμφω, οἷον λιβανωτός. αἴτιον δὲ, ὅτι τὰ μὲν ξύλα ἀθρόον ἔχει τὸ ὑγρὸν, καὶ δι' ὅλου συνεχὲς, ὥστε διακαίεσθαι· ὁ δὲ χαλκὸς παρ' ἕκαστον μὲν μέρος, οὐ συνεχὲς δὲ, καὶ ἔλαττον ἢ ὥστε φλόγα ποιῆσαι. ὁ δὲ λιβανωτὸς, τῇ μὲν οὕτως, τῇ δ' ἐκείνως ἔχει. φλογιστὰ δ' ἐστὶ τῶν θυμιατῶν, ὅσα μὴ τηκτά ἐστι, διὰ τὸ μᾶλλον εἶναι γῆς. τὸ ξηρὸν γὰρ ἔχει κοινὸν τῷ πυρί. τοῦτο οὖν θερμὸν ἂν γένηται τὸ ξηρὸν, πῦρ γίγνεται. διὰ τοῦτο ἡ φλὸξ, πνεῦμα ἢ καπνὸς ἐστὶ καιόμενος. ξύλων μὲν οὖν ἡ θυμίασις, καπνός· κηροῦ δὲ καὶ λιβανωτοῦ καὶ πίττης καὶ τῶν τοιούτων, καὶ ὅσα ἔχει πίτταν ἢ τοιαῦτα, λιγνύς·

A Combuſtilia autem ſunt, quæcumque meatus habent eiuſmodi, vt ignem introrſum admittant, atque in hiſce meatibus qui per rectum diſpoſiti ſũt, minùs valentem quàm ignem continent humorem. At quæ nullum habent aut valentiorem, ceu glacies, & quæ vehementer virent, incombuſtilia ſunt. Exhalabilia autem ſunt quæcumque corpora humorem habent, ſic tamen habent, vt euaporare niſi ignitis addantur, non poſſint. Eſt enim vapor, ab humido in ſpiritum aërémque vi caloris vrentis facta ſecretio: quæ madefacere queat. Ea autem in aërem temporis ſpatio ſecernuntur: atque euaneſcendo, alia arida, alia terra fiunt. Sed hæc ſecretio B in hoc diſcrimen nacta eſt, quòd neque madefacit, neque ſpiritus efficitur. Eſt autem ſpiritus, fluxus aëris in longitudinem continuus. Exhalatio verò, communis ſicci & humidi ſecretio, quæ vniuerſim caloris vſtiui operâ fieri ſolet. Proindéque non madefacit, ſed calorem potiùs admouet. Eſt autem lignoſi quidem corporis exhalatio, fumus. Eodem nomine, & oſſa, & pilos, & quicquid eſt eiuſmodi appello. nam tametſi commune nomen inditum non eſt, omnia tamen ſub eodem proportionis lege comprǽhenduntur. quemadmodum & Empedocles inquit:

Iſta, pili, ſquamæ, frondes, & denſa volucrum
Pluma, ſolent fieri, quis viuida membra teguntur.

C Pinguis autem, fuligo, oleoſi verò, nidor. Ea de cauſa oleum nec decoquitur, nec craſſeſcit: quòd exhalabile, nõ euaporabile ſit. at aqua haudquaquam exhalabilis eſt, ſed euaporabilis. Vinum autem paſſum, vtpote quod pingue ſit, exhalat; atque idem quod oleum facit. nam frigore cogi nequit, atque deuri aſſolet. Eſt autem voce vinũ, re nequaquam. etenim eius ſapor, vini ſaporem non refert. Quocirca nec homines reddere ebrios aſſolet, vinum autem quodcumque aſſolet. Sed exhalationem habet exiguam. vnde fit, vt etiam flammam emittere queat. Combuſtilia autem eſſe videntur, quæcumque corpora in cinerem reſoluuntur. id quod omnibus obuenit, quæ vel calore, vel vtroque, calore & fri- D gore, coguntur. nam hęc ab igni euinci conſpiciuntur: at è lapillis gemma illa, quem carbunculum nuncupamus, minimè eum ſentire videtur. Porro combuſtilium alia quidem flammatilia ſunt, alia verò inflammatilia, atque horum nonnulla carbonatilia. Flammatilia igitur ſunt, quæ flammam emittere queunt. Inflãmatilia verò, quæ nequeunt. Quæ autem cùm liquida nõ ſint, exhalare poſſunt, ea flammatilia ſunt, pix tamen & oleum & cera flammatilia ſunt, ſed magis cum aliis quàm per ſe. maximè verò, cum hiſce quæ fumum eiaculantur. Carbonatilia autẽ ſunt, quæeque eiuſmodi, terræ plus quàm fumi continent. Præterea nõnulla cùm E liquabilia ſint, flammatilia non ſunt, velvti æs. nonnulla item flammatilia, non liquabilia, ceu lignum. alia vtraque, vt thus. Cuius rei cauſa eſt: nam ligna compactum & vbique continuum, ita vt deuratur, humorem gerunt. æs, per ſingulas partes diſperſum non continuum, & pauciorem, quàm vt queat flammam producere. Thus partim hoc pacto, partim illo habet. Planè exhalabilium flammatilia ea ſunt quæ iccirco colliqueſcere nequeũt, quòd ad terram magis ſpectent. partem enim aridam, cum igni habent communem. Hæc igitur pars arida, ſi calefiat, ignis oriri ſolet. Eam ob rem flamma, ſpiritus vel fumus ardens exiſtit. Verùm lignorum exhalatio fumus dicitur: ceræ verò, thuris, picis, cæterorúmque id genus, & quæ picem continent, aut quippiam eiuſmodi, fuligo:

at olei, & eorum quæ proximè ad olei naturam accedunt, quæque ſola ideò minimè ardent, quòd aridi parum habeant,per quod fit in ignem migratio, ſed cum alio celerrimè (hoc enim eſt ſiccum pingue, aut oleoſum) nidor. Ergo è liquidis, quæ exhalare queunt, ad humiditatem magis pertinent: quæ verò ardere,ad ſiccitatem.

CAPVT X.

De homæomeris ſiue ſimilaribus partibus.

HIs autem affectionibus atque differentiis ſimilaria corpora ſecundùm tactum, vti diximus, & inſuper odore, ſapore, & colore, inter ſe diſtant. Similaria dico,vt metallica, aurum inquam, æs,argentum, ſtannum, ferrum,lapides,& cætera id genus,& quæ per ſecretionem ex hiſce fiunt, necnon quæ in animantibus inſunt,vt carnem,oſſa,neruos, cutem,viſcus,pilos,fibras,venas. ex quibus tandem diſſimilaria conſtant,ceu facies,manus,pes,cæteraque generis eiuſdem. item quæ in plantis: vt lignum,corticem,frondes,radicem, & quæcumque ſunt iſtiuſmodi. Cùm autem ſimilaria alia ratione ac via,quàm quæ diſſimilium ſunt partium, conſtitui ſoleant, & ex quibus ea fiant, ſint materies quidem aridum & humidum, & proinde terra & aqua (horum enim vtrumque, vtriuſque potentiam habet euidentiſſimam) agentia verò calor atque frigus(hæc enim ex illis ſimilaria corpora conſtituunt compingúntque) ex ſimilaribus quæ terræ, quæ aquæ, quæ denique vtriuſque communes ſint ſpecies, ſumamus. Itaque è concreatis corporibus alia liquida ſunt, alia mollia, alia dura. Horum autem quæ mollia,aut dura concretionis ratione exiſtant, dictum eſt priùs. Liquidorum igitur quæcumque euaporare queunt,ad aquam ſpectant: quæ nequeunt,vel ad terram,vel ad terram & aquam communiter ſpectant, ceu lac: vel ad terram & aërem, vti mel: vel ad aquam & aërem, vt oleum. Et quæ quidem feruore caloris ſpiſſantur,communia ſunt. At inter ea quæ liquida ſunt,de vino quiſpiam ambigat. Nam & euaporare poteſt, & ſpiſſari aſſolet, vt quod recens eſt. Cauſa autem eſt,quòd vini plures ſunt ſpecies, & aliud alio habet modo. nã quod recens eſt, magis quàm quod vetus, terroſum exiſtit. Quo fit etiam vt calore potiſſimùm craſſeſcat, & frigore minùs cogatur,quoniam caloris multum ac terræ contineat. velvt Arcadicum, quod vtribus inditum fumo adeò aſſiccari ſolet, vt cùm depromitur,concreſcat. Quòd ſi vinum omne fecem habeat, pro fecis copia,vtriuslibet vel terræ vel aquæ exiſtit. Quæ autem frigore craſſeſcunt, terræ. Quæ verò vtroque, plurium communia ſunt. vt oleum, mel, prædulce vinum. Sed ex hiſce quę conſiſtunt, quæ frigore concreuere,aquæ. vt glacies,nix,grando, pruina. quæ calore terræ. vt fictile, caſeus, nitrum, ſal. quæ vtroque (cuiuſmodi ſunt, quæ refrigeratione coagulata ſunt. hæc autem ſunt,quæ priuatione vtriuſque , caloris inquam atque humoris vnà cum calore abeuntis concreuere. Nam ſal & quæ terra ſincera conſtant, ſolius humoris: glacies autem, ſolius caloris priuatione concreſcunt) ea profectò vtriuſque ſunt. Quocirca vt vtrunque ſortita ſunt,ita ab vtroque cogi aſſolent. Quorũ igitur vniuerſus humor exudauit, ea omnia terrenæ ſortis exiſtunt,ceu fictile atque ſuccinum. etenim ſuccinum & quæcunque ſibi lacrymę nomen vſurparunt,vti myrrha,thus,gummi,refrigeratione fieri ſolent.

A ἐλαίου δὲ καὶ ὅσα ἐλαιώδη, καίονται· καὶ ὅσα ἥκιστα καίεται μόνα, ὅτι ὀλίγον ξηρὸν ἔχει. ἡ δὲ μετάβασις διὰ τούτου· μετὰ δ' ἑτέρου τάχιστα· τοῦτο γάρ ἐστι τὸ πῖον ξηρὸν λιπαρόν. τὰ μὲν οὖν ἐκθυμιώμενα τῶν ὑγρῶν, ὑγροῦ μᾶλλον, ὡς ἔλαιον καὶ πίττα· τὰ δὲ καιόμενα, ξηροῦ.

ΚΕΦΑΛ. Ι.

Περὶ τῶν ὁμοιομερῶν.

B Τούτοις δὲ τοῖς παθήμασι καὶ ταύταις ταῖς διαφοραῖς τὰ ὁμοιομερῆ τῶν σωμάτων, ὥσπερ εἴρηται, διαφέρει ἀλλήλων κατὰ τὴν ἁφήν, καὶ ἔτι ὀσμαῖς καὶ χυμοῖς καὶ χρώμασι. λέγω δ' ὁμοιομερῆ, οἷον τά τε μεταλλευόμενα, οἷον χρυσόν, χαλκόν, ἄργυρον, καττίτερον, σίδηρον, λίθον, καὶ τἆλλα τὰ τοιαῦτα, καὶ ὅσα ἐκ τούτων γίνεται ἐκκρινόμενα· καὶ τὰ ἐν τοῖς ζῴοις, καὶ φυτοῖς, οἷον σάρκες, ὀστᾶ, νεῦρον, δέρμα, σπλάγχνον, τρίχες, ἶνες, φλέβες. ἐξ ὧν ἤδη συνέστηκε τὰ ἀνομοιομερῆ, οἷον πρόσωπον, χείρ, πούς, καὶ τἆλλα τὰ τοιαῦτα· καὶ ἐν τοῖς φυτοῖς ξύλον, φλοιός, φύλλον, ῥίζα, καὶ ὅσα τοιαῦτα. ἐπεὶ δὲ ταῦτα μὲν ὑπ' ἄλλης αἰτίας συνέστηκεν, ἐξ ὧν

G δὲ ταῦτα, ὕλη μὲν τὸ ξηρὸν καὶ ὑγρόν, ὥστε ὕδωρ καὶ γῆ· ταῦτα γὰρ προφανεστάτην ἔχει τὴν δύναμιν, ἑκάτερον ἑκατέρου· τὰ δὲ ποιοῦντα, τὸ θερμὸν καὶ τὸ ψυχρόν. ταῦτα γὰρ συνίστησι καὶ πήγνυσιν ἐξ ἐκείνων ἐκ δία λάβωμεν τῶν ὁμοιομερῶν ποῖα γῆς εἴδη, καὶ ποῖα ὕδατος, καὶ ποῖα κοινά. ἔστι δὴ τῶν σωμάτων τῶν δεδημιουργημένων, τὰ μὲν ὑγρά, τὰ δὲ μαλακά, τὰ δὲ σκληρά· τούτων δὲ ὅσα μαλακὰ ἢ σκληρὰ πήξει ἐστίν, εἴρηται πρότερον. τῶν μὲν οὖν ὑγρῶν, ὅσα μὲν ἐξατμίζεται ὕδατος· ὅσα δὲ μή, ἢ γῆς· ἢ κοινὰ γῆς καὶ ὕδατος, οἷον γάλα· ἢ γῆς καὶ ἀέρος, οἷον ξύλον· ἢ ὕδατος καὶ ἀέρος, οἷον ἔλαιον· καὶ ὅσα μὲν ὑπὸ θερμοῦ πα-

D χύνεται, κοινά. ἀπορήσειε δ' ἄν τις περὶ οἴνου, τῶν ὑγρῶν. τοῦτο γὰρ καὶ ἐξατμισθείη ἄν, καὶ παχύνεται ὥσπερ ὁ νέος. αἴτιον δέ, ὅτι οὔτε ἑνὶ εἴδει λέγεται ὁ οἶνος, καὶ ὅτι ἄλλος ἄλλως. ὁ γὰρ νέος μᾶλλον γῆς ἢ ὁ παλαιός· διὸ καὶ παχύνεται τῷ θερμῷ μάλιστα, καὶ πήγνυται ἧττον ὑπὸ τοῦ ψυχροῦ· ἔχει γὰρ καὶ θερμὸν πολὺ καὶ γῆς· ὥσπερ ἐν Ἀρκαδίᾳ οὕτως ἀναξηραίνεται ὑπὸ τοῦ καπνοῦ ἐν τοῖς ἀσκοῖς, ὥστε ξυόμενος πίνεσθαι. εἰ δὲ πᾶς ἰλὺν ἔχει, οὕτως ἑκατέρου ἐστὶν ἢ γῆς, ἢ ὕδατος, ὡς ταύτης ἔχει πλῆθος. ὅσα δὲ ὑπὸ ψυχροῦ παχύνεται, γῆς· ὅσα δ' ὑπ' ἀμφοῖν, κοινὰ πλειόνων, οἷον ἔλαιον καὶ μέλι καὶ ὁ γλυκὺς οἶνος. τῶν δὲ

E συνεστώτων, ὅσα μὲν πέπηγεν ὑπὸ ψυχροῦ, ὕδατος, οἷον κρύσταλλος, χιών, χάλαζα, πάχνη· ὅσα δ' ὑπὸ θερμοῦ, γῆς, οἷον κέραμος, τυρός, νίτρον, ἅλες· ὅσα δ' ὑπ' ἀμφοῖν, (τοιαῦτα δ' ἐστὶν ὅσα ψύξει· ταῦτα δ' ἐστίν, ὅσα ἀμφοῖν στερήσει, θερμοῦ καὶ ὑγροῦ συνεξιόντος τῷ θερμῷ· οἱ μὲν γὰρ ἅλες ὑγροῦ μόνου στερήσει πήγνυνται, καὶ ὅσα εἰλικρινῆ γῆς. ὁ δὲ κρύσταλλος θερμοῦ μόνου·) ταῦτα δ' ἀμφοῖν. διὸ καὶ ὑπ' ἀμφοῖν καὶ εἶχεν ἄμφω. ὅσων μὲν οὖν ἅπαν ἐξικμάσθη, οἷον κέραμος, ἢ ἤλεκτρον· καὶ γὰρ τὸ ἤλεκτρον, καὶ ὅσα λέγεται ὡς δάκρυα, ψύξει ἐστίν, οἷον σμύρνα, λιβανωτός, κόμμι.

A καὶ τὸ ἤλεκτρον δὲ τούτου τοῦ γένους ἔοικε, καὶ πήγνυται. ἐμπεριειλημμένα γοῦν ζῷα ἐν αὐτῷ φαίνεται. ὑπὸ δὲ τοῦ ποταμοῦ τὸ θερμὸν ἐξιὸν ὥσπερ τοῦ ἑψομένου μέλιτος, ὅταν εἰς ὕδωρ ἀφεθῇ, ἐξατμίζει τὸ ὑγρόν. ταῦτα πάντα γῆς. καὶ τὰ μὲν ἄτηκτα καὶ ἀμάλακτα, οἷον τὸ ἤλεκτρον, ἢ λίθοι ἔνιοι, ὥσπερ οἱ πῶροι οἱ ἐν τοῖς σπηλαίοις· καὶ γὰρ οὗτοι ὁμοίως γίγνονται τούτοις. καὶ οὐχ ὡς ὑπὸ πυρὸς, ἀλλ᾽ ὡς ὑπὸ τοῦ ψυχροῦ διεξιόντος τοῦ θερμοῦ, συνεξέρχεται τὸ ὑγρὸν ὑπὸ τοῦ ἐξ αὐτοῦ ἐξιόντος θερμοῦ· ἐν δὲ τοῖς ἑτέροις ὑπὸ τοῦ ἔξωθεν πυρός. ὅσα δὲ μὴ ὅλα, γῆς μὲν ἐστὶ μᾶλλον, μαλακτὰ δὲ, οἷον σίδηρος B καὶ κέρας, λιβανωτὸς δὲ, καὶ τὰ τοιαῦτα, παραπλησίως τοῖς ξύλοις ἀτμίζει. ἐπεὶ οὖν τηκτά γε θετέον, καὶ ὅσα τήκεται ὑπὸ τοῦ πυρὸς, ταῦτ᾽ ἐστὶν ὑδατωδέστερα. ἔνια δὲ καὶ κοινά, οἷον κηρός· ὅσα δὲ ὑπὸ ὕδατος, ταῦτα δὲ γῆς· ὅσα δὲ μηδ᾽ ὑφ᾽ ἑτέρου, ταῦτα ἢ γῆς, ἢ ἀμφοῖν. εἰ οὖν ἅπαντα μὲν ἢ ὑγρὰ, ἢ πεπηγότα· τούτων δὲ τὰ ἐν τοῖς εἰρημένοις πάθεσι, καὶ οὐκ ἔστι μεταξὺ, ἅπαντ᾽ ἂν εἴη εἰρημένα, οἷς διαγνωσόμεθα, πότερον γῆς, ἢ ὕδατος, ἢ πλειόνων κοινόν. καὶ πότερον ὑπὸ τοῦ πυρὸς συνέστηκεν, ἢ ψυχροῦ, ἢ ἀμφοῖν. χρυσὸς μὲν δὴ καὶ ἄργυρος, καὶ χαλκὸς, καὶ καττίτερος, καὶ * μόλυβδος, καὶ ὕαλος, καὶ λίθοι πολλοὶ ἀνώνυμοι, ὕδατος· C πάντα γὰρ ταῦτα τήκεται θερμῷ. ἔτι οἶνοι ἔνιοι, καὶ οὖρον, καὶ ὄξος, καὶ κονία, καὶ ὀρρὸς, καὶ ἰχὼρ, ὕδατος· πάντα γὰρ πήγνυται ψυχρῷ. σίδηρος δὲ, καὶ κέρας, καὶ ὄνυξ, καὶ ὀστοῦν, καὶ νεῦρον, καὶ ξύλον, καὶ τρίχες, καὶ φύλλα, καὶ φλοιὸς, γῆς μᾶλλον. ἔτι ἤλεκτρον, σμύρνα, λίβανος, καὶ πάντα τὰ δάκρυα λεγόμενα, καὶ πῶρος, καὶ οἱ καρποὶ, οἷον τὰ χέδροπα, καὶ σῖτος· τὰ τοιαῦτα γὰρ, τὰ μὲν σφόδρα, τὰ δὲ ἧττον μὲν τούτων, ὅμως δὲ γῆς· τὰ μὲν γὰρ μαλακτὰ, τὰ δὲ θυμιατὰ, καὶ ψύξει γεγενημένα. ἔτι νίτρον, ἅλες, λίθων γένη, ὅσα D μήτε ψύξει, μήτε τηκτά. αἷμα δὲ, καὶ γονὴ, κοινὰ γῆς, καὶ ὕδατος, καὶ ἀέρος· τὸ μὲν ἔχον ἶνας αἷμα, μᾶλλον γῆς· διὸ καὶ ψύξει πήγνυται, καὶ ὑγρῷ τήκεται. τὰ δὲ μὴ ἔχοντα ἶνας, ὕδατος· διὸ καὶ οὐ πήγνυται. γονὴ δὲ πήγνυται ψύξει ἐξιόντος τοῦ ὑγροῦ μετὰ τοῦ θερμοῦ.

* καὶ μόλιβδος καὶ ὕαλος

ΚΕΦΑΛ. ια΄.

Περὶ κεκραμένων ἐν τοῖς μικτοῖς, ποῖα θερμὰ, ἢ ψυχρὰ, καὶ πῶς.

E Ποῖα δὲ θερμὰ ἢ ψυχρὰ τῶν πεπηγότων, ἢ τῶν ὑγρῶν, ἐκ τῶν εἰρημένων δεῖ μεταδιώκειν. ὅσα μὲν οὖν ὕδατος, ὡς ἐπὶ τὸ πολὺ ψυχρὰ, ἐὰν μὴ ἀλλοτρίαν ἔχῃ θερμότητα, οἷον κονία, οὖρον, οἶνος· ὅσα δὲ γῆς, ὡς ἐπὶ τὸ πολὺ θερμὰ, διὰ τὴν τοῦ θερμοῦ δημιουργίαν, οἷον τίτανος καὶ τέφρα. δεῖ δὲ λαβεῖν τὴν ὕλην ψυχρότητά τινα εἶναι· ἐπεὶ γὰρ τὸ ξηρὸν καὶ τὸ ὑγρὸν ὕλη· ταῦτα γὰρ παθητικά· τούτων δὲ σώματα μάλιστα γῆ καὶ ὕδωρ ἐστί· ταῦτα δὲ ψυχρότητι ὥρισται· δῆλον ὅτι πάντα τὰ σώματα ὅσα ἑκατέρου ἁπλῶς τοῦ στοιχείου, ψυχρὰ μᾶλλόν ἐστιν, ἂν μὴ ἔχῃ ἀλλοτρίαν θερμότητα· οἷον τὸ ζέον ὕδωρ, ἢ τὸ διὰ τέφρας ἠθημένον· καὶ γὰρ τοῦτο ἔχει τὴν ἐκ τῆς τέφρας θερμότητα.

A Huius autem generis ſuccinum quoque videtur eſſe, concreſcitque. nam occluſa in eo animalia conſpiciuntur. Fluminis autem rigore calor ſucci perinde egrediens, vt decocti mellis cùm in aquam fuerit demiſſum, euaporare humorẽ facit. Quin etiam quædam illiquabilia ſunt & immollificabilia, velvti ſuccinum, & lapides nonnulli, ceu porii qui in ſpeluncis gigni ſolent. etenim hi non ſecus ortum ac illa ſubeũt, nec caloris facultate efficiuntur, ſed frigoris. nam cùm calor dimanat, humor pariter cum calore qui à ſe diſcedit, egreditur. aliis autem in rebus, calor externus humorem diſcutit. At quorum non vniuerſus humor exudauit: ea terræ potiùs ſunt, ſed molleſcere valent, vt ferrum at-B que cornu. Thus tamen & eiuſmodi, perinde vt ligna euaporant. Cùm igitur liquabilia poni oporteat: quæ igni colliquantur, aquaſiora ſunt: nonnulla etiam communia, vt cera. quæ aqua, terrea: quæ neutro, aut terrea, aut ex vtroque conſtant. Si igitur vel liquida vel concreta ſunt omnia, & quæ dictis affectibus obnoxia ſint, de eorum numero ſint, nec inter ea quippiam interueniat, dicta ſunt vniuerſa: quibus terræne an aquæ vel plurium quippiam commune ſit, & an igni an frigore an vtroque conſtiterit, diiudicemus. Itaque aurum, argentum, æs, ſtannum, plumbum, vitrum, & lapides multi nomine vacãtes, aqueæ ſortis ſunt, quip-C pe cùm ea omnia feruore caloris deliqueſcere ſolita ſint, nonnulla præterea vini genera, vrina, acetum, lixiuium, ſerum, ſanies, nam frigore cuncta gelant. At ferrum, cornu, vnguis, oſſa, nerui, pili, lignum, cortex, folia, potiùs terrea ſunt. adhæc ſuccinum, myrrha, thus, omnia quæ lacrymæ nomen nacta ſunt, & porus, id eſt, tofus lapis, nec non fructus vt legumina frumentúmque. nam ex hiſce quę talia ſunt, tametſi quædam magis, quædam minùs, omnia tamen terrena exiſtunt. eorum enim, alia mollificabilia ſunt, alia exhalabilia atque frigore genita. inſuper ſal, nitrum & ea lapidum genera quæ neque rigore fiunt, neque eliquari queunt. D Sanguis verò ac genitura, ad terram, aquam & aërem communiter ſpectant. Nam ſanguis qui quaſdam velvti fibras habet, magis terrenus exiſtit. & proinde vt refrigeratione cogitur, ſic humore deliqueſcit. Qui verò nullas habet, aqueus: ideóque concreſcere neſcit. At genitura quod vnà cum tepore humor decedat, refrigeratione coagulatur.

CAPVT XI.

Aqueas plerumque eſſe frigida, vt terrea calida.

E Ex concretis autem liquidiſve, quænam tepida aut frigida ſint, ex hiſce quæ iã diximus, perſequi decet. Quæ igitur ad aquã pertinent, magna ex parte frigida ſunt, niſi calorem externũ habeãt, ceu lixiuiũ, vrina, vinum. Quæ ad terrã, magna ex parte calida, ob vim teporis effectricem, vt calx atque cinis. Porro quædã quantũ ad materiam attinet, perquã algida eſſe ſumamus oportet. Nam cùm ſiccũ & humidũ ſint materia (paſſiua enim ſunt) atque horum corpora maximè terra & aqua, hæc autẽ frigore definita ſint: palã eſt quòd corpora omnia, quę vtriuslibet elemẽti abſolutè fuerint, frigida magis ſunt, niſi calorem externum habeant, velvti aqua quæ efferuet, aut quæ per cinerem trãſmiſſa atque percolata fuit. etenim ea à cinere teporẽ contraxit.

nam in omnibus quæ igné ſenſere, largiùs parciúſque tepor ineſt. Quocirca & in marcidis vermes inaſci aſſolent. nam in eis tepor quidam ineſt, qui ſuum cuiuſque calorem diſperdat abſumátque. Quæ autem communia ſunt, ea calorem poſſident. plurima ſiquidem, vi caloris eiuſce qui concoctionem peregit, conſtitêre: quædam verò, ceu colliquamenta, non niſi putrefactio exiſtunt. Vnde fit vt cùm ſuam retinent naturam, calida ſint: vt ſanguis, genitale profluuium, medulla, coagulum, & reliqua id genus omnia. Cùm autem corrumpuntur, & à natura ſua recedunt, non ampliùs. etenim materies quæ terra eſt aut aqua, remanet. Quocirca vtrumque quibuſdam placet, & ea alij frigida eſſe, alij calida dicunt. quoniam ea videant cùm in ſua natura ſunt, calida eſſe: cùm autem ab ea receſſere, concreta. Æs igitur perinde omnino habet, vt definitum eſt. Nam in quibus aquæ plurimum materies eſt, ea frigida ſunt. ſiquidem aqua, igni potiſſimùm aduerſatur. in quibus verò terræ aut aëris, calidiuſcula.* Contingit autem interdum, vt eadem frigidiſſima & calidiſſima externo tepore fiant. etenim quæ maximè concreuêre, & oppidoquàm ſolida firmáque ſunt, ea vt frigida maximè euadunt, ſi ſuo priuentur calore: ita deurunt maximè, ſi ignis opera concaluerint. quomodo aqua quàm fumus, & lapis quàm aqua vehementiùs vrit.

CAPVT XII.

Homæomera ex elementis conſtare.

CVm autem de hiſce ſingulatim definitum ſit, quid caro, aut os, aut quodlibet cæterorum quæ ſimilium ſunt partium, edifferamus. Nam ex quibus ſimilarium natura conſtet, eorum genera, cuius quodque generis ſit, ex ortu ipſo colliqueſcit. Nam ex elemẽtis ſimilaria conſtant: ex ſimilaribus autem vt materia, integra naturæ opera conficiuntur. Atque omnia ſunt, vt è materia quidem, ex hiſce quæ dicta ſunt: vt autem ſecundùm eſſentiam, ratione. Hoc autem ſemper magis apertum in poſterioribus eſt, & omnino hiſce quæ vt inſtrumenta ſunt, & alicuius gratia. Nam quòd emortuus homo æquiuocè homo ſit, conſtat magis. Perinde ergo emortui hominis manus æquiuocè manus dicitur, atque ſi vel lapideæ tibiæ dicantur. nam & eæ quoque, velut inſtrumenta quædam eſſe videntur. At eiuſmodi in carne & oſſe minùs aperta ſunt, & adhuc in igne & aqua minùs. Nam vbi materiæ plurimum exiſtit, ibi id gratia cuius quippiam factum ſit, minimè conſtat. Perinde enim euenit, atque ſi extrema ſumantur. nam materies nihil aliud eſt quàm materies: eſſentia, quàm ratio. quæ inter hæc media ſunt, vt quodque prope eſt: quando & horum quodlibet, alicuius gratia exiſtit. Quin etiam non quouis modo habet, aqua aut ignis: ſicuti nec caro, nec viſcera. adhuc autem magis, manus & facies. Sed ſuo munere ac officio definita ſunt vniuerſa. nam quæ ſuo fungi munere queunt, ſingula verè ſunt: vt oculus ſi cernat. quæ verò nequeunt, æquiuocè: vt emortuus lapideúſve oculus: non enim ſerra lignea, præterquam ſerræ imago ac effigies exiſtit. Sic & caro: verùm eius officium minus quàm linguæ, dilucidum eſt. Sic & ignis: ſed adhuc forſitan minùs eius quã carnis officium naturaliter innoteſcit. Sic & plãtarum partes, & inanima, vt æs atque argentum. Cuncta namque

A ἐν ἅπασι γάρ ἐστι θερμότης, ἢ πλείων, ἢ ἐλάττων, τοῖς πεπυρωμένοις. διὸ καὶ ἐν τοῖς σαπροῖς ζῷα ἐγγίγνεται· ἔνεστι γὰρ θερμότης ἡ φθείρασα τὴν ἑκάστου οἰκείαν θερμότητα. ὅσα δὲ κοινά, ἔχει θερμότητα· * συνέστηκε γὰρ τὰ πλεῖστα ὑπὸ θερμότητος πεψάσης. ἔνια δὲ σήψεις ἐστίν, οἷον τὰ * συντήκτα. ὥστε ἔχοντα μὲν τὴν φύσιν, θερμά, οἷον αἷμα καὶ γονὴ καὶ μυελὸς, καὶ ὀπὸς, καὶ πάντα τὰ τοιαῦτα. φθειρόμενα δὲ καὶ ἐξιστάμενα τῆς φύσεως, οὐκέτι· λείπεται γὰρ ἡ ὕλη, γῆ ὅσα ἢ ὕδωρ. διὸ ἀμφότερα δοκεῖ τισί· καὶ οἱ μὲν ψυχρά, οἱ δὲ θερμὰ ταῦτά φασιν εἶναι, ὁρῶντες ὅταν μὲν ἐν τῇ φύσει ὦσι, θερμά· ὅταν δὲ χωρισθῶσι, * πηγνύμενα. ἔχει μὲν οὖν οὕτως, * ὅμως δὲ ὥσπερ διώρισται, ἐν οἷς μὲν ἡ ὕλη ὕδατος τὸ πλεῖστον, ψυχρά· ἀντίκειται γὰρ τοῦτο μάλιστα τῷ πυρί· ἐν οἷς δὲ γῆς ἢ ἀέρος, θερμότερα. συμβαίνει δέ ποτε τὰ αὐτὰ γίνεσθαι ψυχρότατα καὶ θερμότατα ἀλλοτρίᾳ θερμότητι. ὅσα γὰρ μάλιστα πέπηγε, καὶ στερεώτατά ἐστι, ταῦτα ψυχρά τε μάλιστα, ἐὰν στερηθῇ θερμότητος, καὶ καίει μάλιστα, ἐὰν πυρωθῇ· οἷον ὕδωρ καπνοῦ, καὶ λίθος ὕδατος καίει μᾶλλον.

* γρ. συνίστη
* γρ. συντήματα
* γρ. πηγνύμενα, ψυχρά.
* γρ. ὅλως

ΚΕΦΑΛ. ιβ΄.

C Περὶ τῶν ὁμοιομερῶν καθ' ἕκαστον, οἷον σαρκὸς, ὀστοῦ, καὶ ἄλλων· καὶ ὅτι ἐκ τῶν στοιχείων σύγκειται· καὶ ὅτι τὰ ἐξ αὐτῶν μέλη ἢ ὄργανα γνωριμώτερα αὐτῶν ἐστι.

ΕΠεὶ δὲ περὶ τούτων διώρισται, καθ' ἕκαστον λέγωμεν τί σάρξ, ἢ ὀστοῦν, ἢ τῶν ἄλλων τῶν ὁμοιομερῶν. ἔχομεν γὰρ ἐξ ὧν ἡ τῶν ὁμοιομερῶν φύσις συνέστηκε, τὰ γένη αὐτῶν, τίνος ἕκαστον γένους, διὰ τῆς γενέσεως. ἐκ μὲν γὰρ τῶν στοιχείων, τὰ ὁμοιομερῆ· ἐκ τούτων δὲ ὡς ὕλης τὰ ὅλα ἔργα τῆς φύσεως. ἔστι δὲ ἅπαντα ὡς μὲν ἐξ ὕλης, ἐκ τῶν εἰρημένων· ὡς δὲ κατ' οὐσίαν, τῷ λόγῳ. D ἀεὶ δὲ μᾶλλον δῆλον ἐπὶ τῶν ὑστέρων καὶ ὅλως ὅσα οἷον ὄργανα, καὶ ἕνεκά του. μᾶλλον γὰρ δῆλον, ὅτι ὁ νεκρὸς, ἄνθρωπος ὁμωνύμως. οὕτω τοίνυν καὶ χεὶρ τελευτήσαντος ὁμωνύμως, καθάπερ καὶ αὐλοὶ λίθινοι λεχθείησαν. οἷον γὰρ καὶ ταῦτα ὄργανα * ἄττα ἔοικεν εἶναι. ἧττον δὲ ἐπὶ σαρκὸς καὶ ὀστοῦ τὰ τοιαῦτα δῆλα. ἔτι δὲ ἐπὶ πυρὸς καὶ ὕδατος, [καὶ] γῆς ἧττον· τὸ γὰρ οὗ ἕνεκα, ἥκιστα ἐνταῦθα δῆλον, ὅπου πλεῖστον τῆς ὕλης. ὥσπερ γὰρ εἰ τὰ ἔσχατα ληφθείη, ἡ μὲν ὕλη οὐθὲν ἄλλο παρ' αὐτήν, ἡ δὲ οὐσία οὐθὲν ἄλλο ἢ ὁ λόγος· τὰ δὲ μεταξὺ ἀνάλογον, ὡς ἐγγὺς εἶναι ἕκαστον. E ἐπεὶ καὶ τούτων ὁτιοῦν ἐστιν ἕνεκά του, καὶ οὐ πάντως ἔχον ὕδωρ, ἢ πῦρ· ὥσπερ οὐδὲ σὰρξ οὐδὲ σπλάγχνον. τοῦτο δὲ ἔτι μᾶλλον πρόσωπον, καὶ χείρ. ἅπαντα δέ ἐστιν ὡρισμένα τῷ ἔργῳ· τὰ μὲν γὰρ δυνάμενα ποιεῖν τὸ αὐτῶν ἔργον, ἀληθῶς ἐστιν ἕκαστα· οἷον ὁ ὀφθαλμὸς εἰ ὁρᾷ· τὸ δὲ μὴ δυνάμενον, ὁμωνύμως· οἷον ὁ τεθνεὼς, ἢ ὁ λίθινος· οὐδὲ γὰρ πρίων ὁ ξύλινος, ἀλλ' ἢ ὡς ἡ εἰκών. οὕτω τοίνυν καὶ σάρξ· ἀλλὰ τὸ ἔργον αὐτῆς ἧττον δῆλον, ἢ τὸ τῆς γλώττης. ὁμοίως δὲ καὶ πῦρ· ἀλλ' ἔτι ἧττον ἴσως * δῆλον φυσικῶς, ἢ τὸ τῆς σαρκὸς ἔργον. ὁμοίως δὲ καὶ τὰ ἐν τοῖς φυτοῖς, καὶ τὰ ἄψυχα, οἷον χαλκὸς καὶ ἄργυρος· πάντα γὰρ

* γρ. ταῦτ' ἂν
* Vicom. ἢ τὸ πρὸς ἡ.

δυνάμει τινί ἐστιν, ἢ τοῦ ποιεῖν ἢ τοῦ πάσχειν, ὥσπερ καὶ σὰρξ καὶ νεῦρον· ἀλλ' οἱ λόγοι αὐτῶν οὐκ ἀκριβεῖς. ὥστε πότε ὑπάρχει, καὶ πότε οὔ, οὐ ῥᾴδιον διιδεῖν, ἂν μὴ σφόδρα ἐξίτηλα ᾖ, καὶ τὰ σχήματα μόνα ἢ λοιπά· οἷα καὶ τὰ τῶν παλαιουμένων νεκρῶν σώματα ἐξαίφνης τέφρα γίνεται ἐν ταῖς θήκαις· καὶ καρποὶ παλαιοὶ μόνον τῷ σχήματι, τῇ δ' αἰσθήσει οὐ φαίνονται* παλαιούμενοι σφόδρα· καὶ τὰ ἐκ τοῦ γάλακτος πηγνύμενα. τὰ μὲν οὖν τοιαῦτα μόρια θερμότητι, καὶ ψυχρότητι, καὶ* ταῖς τούτων κινήσεσιν ἐνδέχεται γίγνεσθαι, πηγνύμενα τῷ θερμῷ καὶ τῷ ψυχρῷ. λέγω δ' ὅσα ὁμοιομερῆ, οἷον σάρκα, ὀστοῦν, τρίχα, νεῦρα, καὶ ὅσα τοιαῦτα· πάντα γὰρ διαφέρει ταῖς πρότερον εἰρημέναις διαφοραῖς, τάσει, ἕλξει, θραύσει, σκληρότητι, μαλακότητι, καὶ ταῖς ἄλλαις ταῖς τοιαύταις. ταῦτα δὲ ὑπὸ ψυχροῦ καὶ θερμοῦ καὶ τῶν κινήσεων γίνεται μιγνυμένων. τὰ δὲ ἐκ τούτων συνεστῶτα οὐθενὶ ἂν δόξειε, τὰ ἀνομοιομερῆ, οἷον κεφαλή, ἢ χείρ, ἢ πούς. ἀλλ' ὥσπερ καὶ τοῦ χαλκὸν μὲν ἢ ἄργυρον γίνεσθαι, αἰτία* ψυχρότητος καὶ θερμότητος κίνησις· τοῦ δὲ πρίονα, ἢ φιάλην, ἢ κιβώτιον, οὐκ ἔτι· ἀλλ' ἐνταῦθα μὲν τέχνη, ἐκεῖ δὲ φύσις, ἢ ἄλλη τις αἰτία. ἐπεὶ οὖν ἔχομεν, τίνος γένους ἕκαστον τῶν ὁμοιομερῶν, ληπτέον καθ' ἕκαστον τί ἐστιν· οἷον τί αἷμα, ἢ σὰρξ, ἢ σπέρμα, καὶ τῶν ἄλλων ἕκαστον· οὕτω γὰρ ἴσμεν ἕκαστον διὰ τί, καὶ τί ἐστιν, ἐὰν τὴν ὕλην, ἢ τὸν λόγον ἔχωμεν· μάλιστα δ', ὅταν ἄμφω τῆς τε γενέσεως καὶ φθορᾶς, καὶ πόθεν ἡ ἀρχὴ τῆς κινήσεως. δηλωθέντων δὲ τούτων, ὁμοίως τὰ [μὴ] ὁμοιομερῆ θεωρητέον· καὶ τέλος, τὰ ἐκ τούτων συνεστῶτα, οἷον ἄνθρωπον, φυτόν, καὶ τἆλλα τὰ τοιαῦτα.

* γρ. παλαιούμενα

* γρ. ταῖς ὑπὸ τούτων

* γρ. ψυχρότης, θερμότης, κίνησις.

A facultate quadam aut agendi aut patiendi ſunt, vti caro ac neruus: ſed rationes eorum nequaquam ad vnguem perſpectæ ſunt. Quare quando ſint, & quando non ſint, non eſt facile diſcernere: niſi admodum deprauata ſint, & figura ſola reliqua ſit. Cuiuſmodi ſunt vetuſta illa cadauera, quæ in capſulis adſeruata, in cinerem ſubitò vertuntur: nec non fructus admodum inueterati, qui figura tantummodo, non etiam ſenſu fructus eſſe videntur: item quæ lacte coacto conſtant. Tales igitur partes calore ac frigore, & eorum motionibus fieri contingit, cùm caloris vi atque frigoris cogantur. eas autem intelligo, quæ ſimilares ſunt: vt carnem, oſſa, pilos, neruos, & quæcumq; ſunt eiuſmodi, omnes enim differentiis hiſce quas priùs diximus, tenſione B ſcilicet, tractione, comminutione, duritia, mollitie & cæteris id genus diſtant. Tales inquam partes calore & frigore, & miſtis motibus fiunt. at diſſimilares, quale eſt caput, aut manus, aut pes, ex illis conſtitutæ nemini videbuntur. ſed ſicuti frigoris & caloris motio, vt æs argentumve fiat, cauſa eſt, at vero ſerra aut phiala, aut arca, nō itē, ſed hic ars, illic autem natura, aut alia quædam cauſa eſt: ſic & vt illæ fiant, in cauſa eſſe putabitur. Cùm igitur iam ſit oſtenſum cuius ſimilarium quodque generis ſit, de vnoquoque quid ſit, verbi cauſa, quid ſanguis, aut caro, aut genitale ſemen, & aliorum quodque ſumamus oportet. Tunc enim cur quodque ſit & C quid ſit, ſcimus, cùm materiam aut rationem, ſed maximè cùm vtramque, & vnde ſit motionis exordium, cognoſcimus. Quibus elucidatis, pari modo de diſſimilaribus, & denique hiſce quę ex eis conſtant, vt homine, planta, & cæteris id genus, contemplandum videtur.

* γρ. Ἀριστοτέλους πρὸς Ἀλέξανδρον ἐπιστολὴ περὶ τοῦ παντός.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ ΚΟΣΜΟΥ, ΠΡΟΣ ΑΛΕΞΑΝΔΡΟΝ.

ARISTOTELIS LIBER DE MVNDO, AD ALEXANDRVM, MACEDONIÆ REGEM.

Gulielmo Budæo interprete.

ΚΕΦΑΛ. α'.

Πρόλογος πρὸς Ἀλέξανδρον, εἰς ἔπαινον φιλοσοφίας, ἄλλως τε, καὶ τῆς τὸν κόσμον θεωρούσης.

ΠΟΛΛΑΚΙΣ μὲν ἔμοιγε θεῖόν τι καὶ δαιμόνιον ὄντως χρῆμα, ὦ Ἀλέξανδρε, ἡ φιλοσοφία ἔδοξεν εἶναι, μάλιστα δὲ, ἐν οἷς μόνη διαραμένη πρὸς τὴν τῶν ὄντων θέαν, ἐσπούδασε γνῶναι τὴν ἐν αὐτοῖς ἀλήθειαν. καὶ τῶν ἄλλων ταύτης ἀποστάντων,

D

CAPVT I.

Præfatio ad Alexandrum de laudibus philoſophiæ, eius potiſſimùm quæ in naturæ cognitione verſatur.

MIhi quidem ſæpe diuina quædam res, Alexander, admirationeque digna viſa eſt, philoſophia: præcipuè verò ea in parte, in qua ſola ipſa ſublimè ſeſe tollens ad contēplandas rerum naturas, magno illic ſtudio contendit exiſtētem in eis veritatē pernoſcere. Et cùm cæteri quidem mortales altitudine ipſa rei, atque

atque magnitudine deterriti, eo inſtituto abſceſſiſſent: dignum id inceptũ eſſe duxit philoſophia, quod intrepidè ipſa, nec dubitãter, aggrederetur. Earũ etiã rerum diſciplinam ſibi tum cognatiſſimam, tum maximè decoram arbitrata eſt. Siquidem cùm per rerũ naturã negatum hoc eſſet homini, cæleſtẽ vt in locũ corpore ſe cõferret, vtque veluti è terra peregrè proficiſcẽs, locum illũ oculis perluſtraret, id quod ſtolidi illi Aloidæ quondã facere inſtiterũt: eo factũ eſt, animus vt humanus huius viæ ducem nactus intellectũ, peregrinabundus illuc importaretur. Ex quo euênit, viam cùm inueniſſet philoſophia laſſitudinis vacuam atque laboris, res vt inter ſe ſitu longiſſimè ſeiunctas, vna intelligentia complecteretur, facile nimirum eas res noſcitans, queis cum ſibi naturalis intercedit neceſſitudo. Eadẽ etiam cùm diuino animæ oculo diuinarum rerum naturam comprehendiſſet: hominibus ſubinde eas interpretari cœpit, quasique antiſtitis officio perfungi. Id enim libens philoſophia faciẽdum ſuſceperat, vt quas res cunque præcipuæ commendationis eſſe exiſtimaſſet, eas quoad eius fieri poſſet, inter homines erogaret: quibus vtique ipſis abũdè atq; prolixè conſultũ ipſa cupiebat. Quapropter iſtos miſerari quiuis iure poſſit, vt puſilli animi ſcriptores, res quaslibet vulgóq; expoſitas ſumma admiratione proſecutos, qui nobis vnius loci naturam, aut vrbis cuiuſdam formam ſitúmque, aut magnitudinem fluminis, aut denique amœni montis aſpectũ deſcribere inſtituerũt, cùm interim magnificè de ſemetipſis ſentiant ob exilem quampiam naturæ perceptionẽ: cuiuſmodi nonnulli magno illi quidẽ ſtudio fecerũt, accurata vt dictione deſcriberẽt, hic Oſſam montẽ, ille Niſã: alij Coryceum ſpecum, alij quiduis eorum quæ inter orbis particulas cẽſentur. Id quod ideo euenit, quòd illis maiora vidiſſe non contigit: mundum ſcilicet & præcipuas eius partes. Haudquaquam enim illi tantopere quælibet admirarentur, ſi hiſce contemplandis incubuiſſent legitima contentione, omnia verò & parua & flocciſacienda duxiſſent, dumtaxat præ vt extat horum excellentia. Proinde dicere ipſi aggrediamur de iis omnibus vniuerſim collectis, quàmque fieri poteſt maximè theologica commẽtatione ediſſerere, quænam ſit cuiuſque horum natura, ſitus, motus.

Tibi verò, vtpote imperatorum præſtantiſſimo, hoc quoque decorum conſentaneúmque eſſe arbitror, cùm maximarum rerum commentationem animo conſectari, tum verò ex philoſophiæ ſtudio nihil iam non grande animo agitare: optimates etiam viros iis rebus inuitare, quibus rebus ipſi ab eadem munificè prædito eſſe contingit.

CAPVT II.

De mundo ſuperiore ſiue cælo, & partibus eius, ac ſideribus.

MVndus eſt compages è cœlo terráque coagmentata, atque ex iis naturis quæ intra ea continentur. Dicitur etiam aliter mundus, ordo & digeſtio vniuerſorum, quæ à Deo & per Deum aſſeruatur. Huius ſitum medium immotum & ſtabilem, terra vitæ fœcunditate prædita, ſortita eſt: animantium quidem illa omnifariàm diſtinctarum ſedes & parens. Huius vniuerſitatis ſuprema pars omnis, omnem in partem finita eſt & terminata: cuius id quod in celſiſſimo loco ſitum eſt, Cælum dicitur, dei domicilium. Hoc cùm diuinis corporibus plenum ſit, quæ Sidera nos appellare ſolemus: motúque ſempiterno agatur vno circumactu, orbiſque ductu eodem: perenni vtique in æuum tenore rapta ſecum illa circumagit corpora, ad numerum in morémque præſultoris. Vniuerſi autem mundi cælique globoſa (vt dictum eſt) forma compacti, iugique vertigine exagitati, duo eſſe puncta neceſſe eſt inter ſe è regione obuerſa, itidẽ atque ſi globus in torno circũagatur:

A διὰ τὸ ὕψος καὶ τὸ μέγεθος, αὕτη τὸ πρᾶγμα οὐκ ἔδεισεν, οὐδ' αὑτὴν τῶν καλλίστων ἀπηξίωσεν, ἀλλὰ καὶ συγγενεστάτην ἑαυτῇ, καὶ μάλιστα πρέπουσαν ἐνόμισεν εἶναι τὴν ἐκείνων μάθησιν. ἐπειδὴ γὰρ οὐχ οἷόν τε ἦν τῷ σώματι εἰς τὸν οὐράνιον ἀφικέσθαι τόπον, καὶ τὴν γῆν ἐκλιπόντα, τὸν οὐράνιον ἐκεῖνον χῶρον κατοπτεῦσαι, καθάπερ οἱ ἀνόητοί ποτε ἐπενόουν Ἀλωάδαι· ἡ γοῦν ψυχὴ διὰ φιλοσοφίας λαβοῦσα ἡγεμόνα τὸν νοῦν, ἐπεραιώθη καὶ ἐξεδήμησεν, ἀκοπίατόν τινα ὁδὸν εὑροῦσα, καὶ τὰ πλεῖστον ἀλλήλων ἀφεστῶτα τοῖς τόποις, τῇ διανοίᾳ συνεφρόνησε, ῥᾳδίως οἶμαι τὰ συγγενῆ γνωρίσασα, καὶ θείῳ ψυχῆς ὄμματι τὰ θεῖα καταλαβοῦσα, τοῖς τε B ἀνθρώποις προφητεύουσα. τοῦτο δὲ ἔπαθε, καθ' ὅσον οἷόν τε ἦν, πᾶσιν ἀφθόνως μεταδοῦναι βουληθεῖσα τῶν παρ' αὐτῆς τιμίων. διὸ καὶ τοὺς μετὰ σπουδῆς διαγραψάντας ἡμῖν ἑνὸς τόπου φύσιν, ἢ μιᾶς σχῆμα πόλεως, ἢ ποταμοῦ μέγεθος, ἢ ὄρους κάλλος, οἷά τινες ἤδη πεποιήκασι, φράζοντες, οἱ μὲν, τὴν Ὄσσαν· οἱ δὲ, τὴν *Νύσσαν· οἱ δὲ, τὸ Κωρύκειον ἄντρον· οἱ δὲ, ὁποῖον ἔτυχε τῶν ἐπὶ μέρους, οἰκτίσειεν ἄν τις τῆς μικροψυχίας, τὰ τυχόντα ἐκπεπληγμένους, καὶ μέγα φρονοῦντας ἐπὶ θεωρίᾳ μικρᾷ. τοῦτο δὲ πάσχουσι, διὰ τὸ ἀθεά- C τους τῶν κρειττόνων εἶναι· λέγω δὲ, κόσμου, καὶ τῶν ἐν κόσμῳ μεγίστων. οὐδέποτε γὰρ ἂν τούτοις γνησίως ἐπιστήσαντες, ἐθαύμαζόν τι τῶν ἄλλων, ἀλλὰ πάντα αὐτοῖς τὰ ἄλλα, μικρὰ κατεφαίνετο ἂν, καὶ οὐδενὸς ἄξια πρὸς τὴν τούτων ὑπεροχήν. λέγωμεν δὴ ἡμεῖς, καὶ καθόσον ἐφικτὸν, θεολογῶμεν περὶ τούτων συμπάντων, ὡς ἕκαστον ἔχει φύσεως, καὶ θέσεως, καὶ κινήσεως. *γ. Νύσαν

Πρέπειν δέ οἶμαί γε καὶ σοὶ ἡγεμόνων ὄντι ἀρίστῳ, τὴν τῶν μεγίστων ἱστορίαν μετιέναι, φιλοσοφίᾳ τε μηδὲν μικρὸν ἐπινοεῖν, ἀλλὰ τοῖς ταύτης δώροις δεξιοῦσθαι τοὺς ἀρίστους.

D

ΚΕΦΑΛ. β'.

Περὶ κόσμου ἤτοι οὐρανοῦ, καὶ τῶν αὐτοῦ μερῶν καὶ ἀστέρων.

ΚΟσμος μὲν οὖν, ἐστὶ σύστημα ἐξ οὐρανοῦ καὶ γῆς καὶ τῶν ἐν τούτοις περιεχομένων φύσεων. λέγεται δὲ καὶ ἑτέρως κόσμος, ἡ τῶν ὅλων τάξις τε καὶ διακόσμησις, ὑπὸ θεοῦ τε καὶ διὰ θεὸν φυλαττομένη. ταύτης δὲ τὸ μὲν μέσον, ἀκίνητόν τε ὂν καὶ ἑδραῖον, ἡ φερέσβιος *εἴληχε γῆ, παντοδαπῶν ζῴων ἑστία τε οὖσα, καὶ μήτηρ. τὸ δ' ὕπερθεν αὐτῆς, πᾶν τε καὶ πάντῃ πεπε- *γ. εἴληφε, minùs rectè. E ρατωμένον· οὗ τὸ ἀνωτάτω θεοῦ οἰκητήριον, οὐρανὸς ὠνόμασται· πλήρης δὲ ὢν σωμάτων θείων, ἃ δὴ καλεῖν ἄστρα εἰώθαμεν, κινούμενος κίνησιν ἀΐδιον, μιᾷ περιαγωγῇ καὶ κύκλῳ συναναχορεύει πᾶσι τούτοις ἀπαύστως δι' αἰῶνος. τοῦ δὲ σύμπαντος οὐρανοῦ τε καὶ κόσμου σφαιροειδοῦς ὄντος, καὶ κινουμένου, καθάπερ εἶπον, ἐνδελεχῶς, δύο ἀκίνητα ἐξ ἀνάγκης ἐστὶ σημεῖα, καταντικρὺ ἀλλήλων, καθάπερ τῆς ἐν τόρνῳ κυκλοφορουμένης σφαίρας,

στερεὰ μένοντα, καὶ συνέχοντα τὴν σφαῖραν· περὶ ἃ ὁ πᾶς κόσμος κινεῖται. ὁ μὲν οὖν κόσμος, ἐν κύκλῳ περιστρέφεται· καλοῦνται δ' οὗτοι πόλοι· δι' ὧν εἰ νοήσαιμεν ἐπεζευγμένην εὐθεῖαν, ἥν τινες ἄξονα καλοῦσι, διάμετρος ἔσται τοῦ κόσμου, μέσην μὲν ἔχουσα τὴν γῆν, τοὺς δὲ δύο πόλους, πέρατα. τῶν δὲ ἀκινήτων πόλων τούτων, ὁ μὲν ἀεὶ φανερός ἐστιν ὑπὲρ κορυφὴν ὢν, κατὰ τὸ βόρειον κλίμα, ἀρκτικὸς καλούμενος· ὁ δὲ ὑπὸ γῆν ἀεὶ κατακέκρυπται, κατὰ τὸ νότιον, ἀνταρκτικὸς καλούμενος. οὐρανοῦ δὲ, καὶ ἄστρων, οὐσίαν μὲν, αἰθέρα καλοῦμεν, οὐχ ὥς τινες, διὰ τὸ πυρώδη οὖσαν, αἴθεσθαι, πλημμελοῦντες περὶ τὴν πλεῖστον πυρὸς ἀπηλλαγμένην δύναμιν· ἀλλὰ διὰ τὸ ἀεὶ θεῖν κυκλοφορουμένην, στοιχεῖον οὖσαν ἕτερον τῶν τεττάρων, ἀκήρατόν τε καὶ θεῖον. τῶν γε μὴν ἐμπεριεχομένων ἄστρων, τὰ μὲν ἀπλανῆ, τῷ σύμπαντι οὐρανῷ συμπεριστρέφονται, τὰς αὐτὰς ἔχοντα ἕδρας· ὧν μέσος ὁ ζῳοφόρος καλούμενος κύκλος, ἐγκάρσιος διὰ τῶν τροπικῶν διέζωσται, κατὰ μέρος διῃρημένος εἰς δώδεκα ζῳδίων χώρας. τὰ δὲ, πλανητὰ ὄντα, οὔτε τοῖς προτέροις * ὁμοταχῶς κινεῖσθαι πέφυκεν, οὔτε ἀλλήλοις, ἀλλ' ἐν ἑτέροις καὶ ἑτέροις κύκλοις· ὥστε αὐτῶν, τὸ μὲν, προσγειότερον εἶναι· τὸ δὲ, ἀνώτερον. τὸ μὲν οὖν τῶν ἀπλανῶν πλῆθος, ἐστὶν ἀνεξεύρετον ἀνθρώποις, καίπερ ἐπὶ μιᾶς κινουμένων ἐπιφανείας τῆς τοῦ σύμπαντος οὐρανοῦ. τὸ δὲ τῶν πλανήτων, εἰς ἑπτὰ μέρη κεφαλαιούμενον, ἐν τοσούτοις ἐστὶ κύκλοις ἐφεξῆς κειμένοις· ὥστε ἀεὶ τὸν ἀνώτερω, μείζω τοῦ ὑποκάτω εἶναι, τούς τε ἑπτὰ ἐν ἀλλήλοις περιέχεσθαι, πάντας γε μὴν ὑπὸ τῆς τῶν ἀπλανῶν σφαίρας περιειλῆφθαι. συνεχῆ δὲ ἔχει ἀεὶ * ταύτῃ τὴν θέσιν, ὁ τοῦ Φαίνοντος ἅμα καὶ Κρόνου καλούμενος κύκλος· ἐφεξῆς δὲ, ὁ τοῦ Φαέθοντος, Διὸς λεγόμενος· εἶθ' ὁ Πυρόεις, Ἡρακλέους τε καὶ Ἄρεος προσαγορευόμενος· ἑξῆς δὲ ὁ Στίλβων, ὃν ἱερὸν Ἑρμοῦ καλοῦσιν ἔνιοι· τινὲς δὲ, Ἀπόλλωνος· μεθ' ὃν ὁ τοῦ Φωσφόρου, ὃν Ἀφροδίτης· οἱ δὲ, Ἥρας προσαγορεύουσιν, εἶτα, ὁ ἡλίου· καὶ τελευταῖος, ὁ τῆς σελήνης, μέχρι τῆς γῆς ὁρίζεται· ὁ δὲ αἰθὴρ, τά τε θεῖα ἐμπεριέχει σώματα, καὶ τὴν τῆς κινήσεως τάξιν. μετὰ δὲ τὴν αἰθέριον καὶ θείαν φύσιν, ἥν τινα τεταγμένην ἀποφαίνομεν, ἔτι δὲ ἄτρεπτόν τε καὶ ἀνετεροίωτον καὶ ἀπαθῆ, συνεχής ἐστιν ἡ δι' ὅλων παθητή τε καὶ τρεπτὴ, καὶ τὸ σύμπαν εἰπεῖν, φθαρτή τε καὶ ἐπίκηρος. ταύτης δὲ αὐτῆς, πρώτη μὲν ἐστὶν ἡ λεπτομερὴς, καὶ φλογώδης οὐσία, ὑπὸ τῆς αἰθερίου φύσεως πυρουμένη διὰ τὸ μέγεθος αὐτῆς, καὶ τὴν ὀξύτητα τῆς κινήσεως. ἐν δὲ τῇ πυρώδει καὶ ἀτάκτῳ λεγομένῃ, τά τε σέλα διάττει, καὶ φλόγες ἀκοντίζονται καὶ δοκίδες, καὶ βόθυνοι, καὶ κομῆται λεγόμενοι, στηρίζονται, καὶ σβέννυνται πολλάκις. ἑξῆς δὲ ταύτης ὁ ἀὴρ ὑποκέχυται, ζοφώδης ὢν, καὶ παγετώδης τὴν φύσιν· ὑπὸ δὲ κινήσεως λαμπόμενος ἅμα καὶ διακαιόμενος, λαμπρότερός τε γίνεται καὶ ἀλεεινός. ἐν δὲ τούτῳ καὶ αὐτῷ τῆς παθητῆς ὄντι δυνάμεως, καὶ παντοδαπῶς ἀλλοιουμένῳ, νέφη τε συνίσταται, καὶ ὄμβροι καταράσσουσι, χιόνες τε καὶ πάχναι,

* χ᾽ ὁμοταχῶς

* Vulgò τούτῳ

A ſtabilia quidem illa, globúmque continentia: circa quæ mundus vniuerſus vertitur. Hos vertices appellant, aut cardines. Per quos ſi lineam rectam ab vno ad alterum porrectam intellexeris, quam nonnulli Axem vocitant: erit hæc vtique mundo linea dimetiens: ita vt terram in medio, ambos autem cardines habeat pro terminis. Qui quum ipſi fixi ſint, & immoti: alter eorum ſemper ſublimis apparet ſuper verticem, ad tractum cæli Aquilonarem, ab Vrſa appellatus Arcticus. at infra terram alter ſemper conditus circa tractum Auſtralem, Antarcticus dictus eſt, vt contrarius Arctico. Cæli porrò ſiderúmque ſubſtantiam appellamus ætherem: non quidem ideo quòd ignita flagret ipſa, vt aliqui cenſuerunt, planB mùm vtique aberrantes circa potentiam illam maximè ab ignea natura abhorrentem: origine v[illegible] vocabuli inde ducta, quòd ſemper æther c[illegible] tu circumductili: cùm ſit illud elementum à [illegible] illis diuerſum: tum diuinum, tum interitu[illegible]. Eorum verò ſiderum, quæ intus cohibentu[illegible] errationis neſcia ſunt, cum cælo circunferu[illegible] dem vtique ſedes, poſitúſque eoſdem tene[illegible]. Quorum medius circulus (cui Signifero no[illegible]) duos per orbes transverſus cælum cingit: qu[illegible] uerſionibus ipſis Solis, Tropici, quaſi conuerſionales appellati ſunt in duodecim ille quidem regiones totidem ſignorum diuiſus. at verò quæ erratica dicuntur: nec eadem ipſa celeritate cum prioribus moueri C ſuapte natura comparata ſunt, nec inter ſe inuicem, ſed in aliis atque aliis orbibus, ita vt orbium ipſorum partim propius terram accedant, partim ſublimè ferantur. Et ſtatariorum quidem numerus iniri prorſus nequit ab hominibus: tametſi omnia eadem in ſuperficie moueantur, quæ vnica eſt totius cæli. at verò errabundorum numerus ſeptenario collectus, in totidem orbibus ſitus eſt deinceps ſubſtitutis: ita vt ſubinde inferior ſuperiore minor ſit, ſeptémque orbes ſeſe complectentes inuicem atque coercentes, à globo denique ſiderum inerrantium comprehendantur. Huic porrò globo contiguam habet ſemper poſituram, Phænontis ſimul & Saturni circus dictus. Cui proximus eſt Phaethontis: qui & Iouis appellatur. D Poſt hunc ſequitur Pyrois: Herculis idem Martíſque appellatus. Ab hoc ruſus eſt Stilbon: qui ſacer Mercurio eſſe creditur: à nonnullis etiam Apollini. Secundùm quem Luciferi orbis eſt: quem Veneris nonnulli orbem, quidam Iunonis vocant. ab eo eſt orbis Solis: & denique Lunæ, nobis citimus, ad terram vſque fines ſuos proferens. Æther verò cùm diuina contineat corpora, ratas etiam vices motuum complectitur. at verò ætheree diuinæque naturæ, quam certa lege conſtare demonſtrauimus, conſtitutiſque vicibus, mutabilitatis etiam immunem, atque in aliam aliámque ſpeciem conuerſionis: confinis eſt natura patibilis prorſus & vertibilis, atque (vt in vniuerſum dicam) ſolubilis, & obnoxia. Cuius etiam E ipſius principia obtinet ſubſtantia tenuitate particularum prædita flammuliſque ignita: quas ætherea natura magnitudine ſua excitat, & motus celeritate. Iam verò in natura ipſa ignita, eadémque incondita appellata atque incõpoſita, tum fulgores emicant, & iacula traiciuntur flagrantia, tũ trabeculæ, foueæ, & crinitæ fixæ viſuntur: & ſæpe reſtinguũtur. Hanc naturã excipit aër illi ſubſtratus: ſuopte ille quidẽ ingenio caligine & gelu permixtus, cæterùm illuſtratus agitatione atque ſuccẽſus, vnde calorẽ cõcipit, & claritatẽ. In hoc autẽ ipſo vim patibilẽ ſortito, omnifariãq; in aliã aliãq; naturã cõmeare natura cõparato, nubes cõcreſcũt: imbres cũ ſtrepitu decidũt, niues, pruine

& grandines: flatus etiam ventorum tempeſtatúmque cientur: ſimul tonitrua & fulgetra exiſtunt: fulmina inde caſitant: ſexcentæ denique ibidem conflictationes aëriæ opacitatis fiunt.

CAPVT III.

De terra & maris natura ac ſitu.

AB aëria porrò natura, Terra protinus & Mare ſitum habent fixum & affirmatum: ſtirpibus illa quidem animantibúſque ſcatens: fontibus etiã & fluminibus, partim per ipſam lapſus ſuos implicantibus, partim aquas ſuas in mare eructantibus. Inſuper ipſa diſtincta ſimul innumerarum herbarũ indidem enaſcentium varietate, fructificantiúmque ſimul montiũ verticibus, nemorũ opacitatibus, vrbiúmq; frequẽtia, quas animantes ſapiẽtiæ participes, homines ſcilicet, condiderunt: inſupérque inſulis maritimis, atque cõtinentibus. Orbẽ verò terrarum hominum ferè ſermo in inſulas diuiſit, & continentes ſcilicet ignorantiam, vniuerſam ipſam terram inſulam eſſe vnicam, Atlantici maris ambitu circundatam. Multas autẽ & alias longè quidem illas ſummotas, ſed tamen veluti dirimente freto huic ipſi eſſe obuerſas, non abſimile veri eſt, partim hac maiores, partim etiã minores: ſed quarum nulla præter eam ſub proſpectũ noſtrum ſita ſit. Nam quod inſulis noſtris accidit, vndique vt noſtra maria eas alluant: idem orbi quoq; huic contigit, rationem inſulæ, vt obtineat, Atlantico mari cinctæ. Complures item alij terrarum orbes eadem poſitura conſtantes, inſulæ naturam habent in vniuerſo mari ſitæ, quod latiſſimè patet: eorúmque nonnulli prægrandibus quoque ipſis maribus circumfuſis. Enimvero humoris vniuerſi naturam finitimã meritò eſſe cenſeas naturæ animabili & aëriæ: ita vt ipſa innatabunda exiſtere terram faciat per quaſdã ſaxoſas eminentias, quas habitabiles vocamus: poſtquã protinus in imis mundi partibus & ſummerſis, atque in medio maximè mundi, vniuerſa iam terra ſtabiliter defixa compreſſáque ita conſtitit, vt immota permaneat atque illabefactabilis. atque hæc eſt mũdi vniuerſitas, quam infernam appellamus. Quinq; igitur hæc elemẽta in regionibus totidẽ globoſe incubantia, mundum ipſum ita totum coagmentarunt, minor vt deinceps atq; minor regio à maiore cohibeatur: terra (verbi gratia) vt ab aquæ globo, aqua ab aëris, hic ab ignis, ab ætheris denique globo ignis coerceatur: cùm interim ſupremam regionem, Deorum fecerint domicilium: infimam, animaliũ in diem victitantiũ. Huius porrò id quod liquore cõſtat, flumina & ſcaturigines & maria vocare conſueuimus: quod aridum eſt, terrã & continẽtes inſuláſq; nominamus. Iam inſularum nonnullæ grandes ſunt, veluti hęc cuncta habitabilis à nobis iam dicta eſt, aliæque, quas ingentia maria vndis ambiunt circumfluis: aliæ minores, nobis notæ, & inteſtinæ. Quarum rurſus quædam memorabiles, vt Sicilia, Sardinia, Cyrnus, Creta, Eubœa, Cyprus, & Lesbos: quædam longè exiliores, tum Cyclades, tum Sporades, tum aliæ aliis nominibus nuncupatæ.

Porrò autẽ pelagus quod extra orbẽ nobis habitatũ fuſum eſt, & Atlanticũ dicitur, & Oceanus, à quo ipſi circũluimur: qui in faucib⁹ ipſe anguſtis, quæ vergũt ad occidentẽ, veluti via patefacta, qua parte Herculis colũnæ vocitatę ſunt: eliſo fluxu irrumpẽs, mare interius efficit: fermè vt dicere cum poſſis in portũ ſe recipere. Senſim deinde amplior infunditur: ſinus interea ingentes complectens inter ſe contingentes:

A καὶ χάλαζαι, πνοαί τε ἀνέμων καὶ τυφώνων. ἔτι τε βρονταί, καὶ ἀστραπαί, καὶ πτώσεις κεραυνῶν, μυρίων τε γνόφων συμπληγάδες.

ΚΕΦΑΛ. γ'.

Η τῆς γῆς καὶ τῆς θαλάττης φύσις καὶ θέσις.

Ἑξῆς δὲ τῆς ἀερίου φύσεως, γῆ τε καὶ θάλασσα ἐρήρεισται, φυτοῖς βρύουσα καὶ ζώοις, πηγαῖς τε καὶ ποταμοῖς, τοῖς μὲν, ἀνὰ γῆν ἑλιττομένοις· τοῖς δὲ, ἀνερευγομένοις εἰς θάλασσαν. πεποίκιλται δὲ καὶ χλόαις B μυρίαις, ὄρεσί τε ὑψηλοῖς, καὶ βαθυξύλοις δρυμοῖς, καὶ πόλεσιν, ἃς τὸ σοφὸν ζῶον ὁ ἄνθρωπος ἱδρύσατο· νήσοις τε ἐναλίαις, καὶ ἠπείροις. τὴν μὲν οὖν οἰκουμένην ὁ πολὺς λόγος, εἴς τε νήσους καὶ ἠπείρους διεῖλεν, ἀγνοῶν ὅτι καὶ ἡ σύμπασα, μία νῆσός ἐστιν, ὑπὸ τῆς Ἀτλαντικῆς καλουμένης θαλάσσης περιρρεομένη. πολλὰς δὲ καὶ ἄλλας εἰκὸς τῆσδε ἀντιπόρθμους ἄποθεν κεῖσθαι, τὰς μὲν, μείζους αὐτῆς· τὰς δὲ, ἐλάττους· ἡμῖν δὲ πάσας, πλὴν τῆσδε, ἀοράτους. ὅπερ γὰρ αἱ παρ' ἡμῖν νῆσοι πρὸς ταυτὶ τὰ πελάγη πεπόνθασι, τοῦτο ἥδε ἡ οἰκουμένη πρὸς τὴν Ἀτλαντικὴν θάλασσαν· πολλαί C τε ἕτεραι πρὸς σύμπασαν τὴν θάλασσαν· καὶ γὰρ αὗται μεγάλαι τινές εἰσι νῆσοι, μεγάλοις τισὶ περικλυζόμεναι πελάγεσιν. ἡ δὲ σύμπασα τοῦ ὑγροῦ φύσις ἐπιπολάζουσα, κατά τινας τῆς γῆς σπίλους τὰς καλουμένας ἀναπεφυκυῖα οἰκουμένας, ἑξῆς ἂν εἴη τῆς ἀερίου μάλιστα φύσεως. μετὰ δὲ ταύτην, ἐν τοῖς βυθοῖς κατὰ τὸ μεσαίτατον τοῦ κόσμου συνερηρεισμένη γῆ πᾶσα, καὶ πεπιεσμένη συνέστηκεν, ἀκίνητος, καὶ ἀσάλευτος· καὶ τοῦτ' ἔστι τοῦ κόσμου τὸ μέρος, ὃ καλοῦμεν κάτω. πέντε δὴ στοιχεῖα ταῦτα, ἐν πέντε χώραις σφαιρικῶς ἐγκείμενα, περιεχομένης ἀεὶ τῆς ἐλάττονος τῇ μείζονι· λέγω δὲ, γῆς μὲν ἐν ὕδατι, ὕδατος ἐν ἀέρι, ἀέρος ἐν πυρὶ, πυρὸς δὲ ἐν D αἰθέρι, τὸν κόσμον ὅλον* συνεστήσατο· καὶ τὸ μὲν, ἄνω θεῶν ἀπέδειξεν οἰκητήριον· τὸ κάτω δὲ, ἐφημέρων ζώων. αὐτοῦ γε μὴν τούτου, τὸ μὲν, ὑγρόν ἐστιν· ὃ καλεῖν ποταμοὺς, καὶ νάματα, καὶ θαλάσσας εἰθίσμεθα· τὸ δὲ, ξηρὸν, ὃ γῆν τε, καὶ ἠπείρους, καὶ νήσους ὀνομάζομεν. Τῶν δὲ νήσων, αἱ μὲν, εἰσὶ μεγάλαι, καθάπερ ἡ σύμπασα ἥδε, οἰκουμένη λέλεκται· πολλαί τε ἕτεραι περιρρεόμεναι μεγάλοις πελάγεσιν· αἱ δὲ, εἰσὶν ἐλάττους· φανεραὶ δὲ ἡμῖν καὶ ἐντὸς οὖσαι. καὶ τούτων, αἱ μὲν, ἀξιόλογοι, Σικελία, καὶ Σαρδὼ, καὶ Κύρνος, καὶ Κρήτη, καὶ Εὔβοια, καὶ Κύπρος, καὶ Λέσβος· αἱ δὲ, E ὑποδεέστεραι· ὧν, αἱ μὲν, Σποράδες· αἱ δὲ, Κυκλάδες· αἱ δὲ, ἄλλως ὀνομάζονται.

Πέλαγος δὲ, τὸ μὲν ἔξω τῆς οἰκουμένης, Ἀτλαντικὸν καλεῖται καὶ ὁ Ὠκεανὸς, περιρρέων ἡμᾶς. ἐν δὲ τῷ πρὸς δύσιν στενοπόρῳ στόματι* διανεῳγὼς, κατὰ τὰς Ἡρακλείους λεγομένας στήλας, τὸν εἴσρουν εἰς τὴν ἔσω θάλατταν, ὡς ἂν εἰς λιμένα, ποιεῖται· κατὰ μικρὸν δὲ ἐπιπλατυνόμενος ἀναχεῖται, μεγάλους περιλαμβάνων κόλπους ἀλλήλοις συναφεῖς.

* γρ. συνεστήσατο.

* γρ. διανεῳγώς.

πῇ μὲν κατὰ στενοπόρους αὐχένας ἀνεστομωμένος, πῇ δὲ πάλιν πλατυνόμενος. πρῶτον μὲν οὖν λέγεται ἐγκεκολπῶσθαι ἐν δεξιᾷ εἰσπλέοντι τὰς Ἡρακλείους στήλας, διχῶς, εἰς τὰς καλουμένας Σύρτεις, ὧν τὴν μὲν, μεγάλην· τὴν δὲ μικρὰν καλοῦσιν· ἐπὶ θάτερα δὲ, οὐχ ὁμοίως ἀποκολπούμενος, τρία ποιεῖ πελάγη, τό, τε Σαρδόνιον, καὶ τὸ Γαλατικὸν καλούμενον, καὶ Ἀδρίαν. ἑξῆς δὲ τούτων, ἐγκάρσιον τὸ Σικελικὸν· μετὰ δὲ τοῦτο, τὸ Κρητικόν· συνεχὲς δὲ αὐτῷ, τῇ μὲν, τὸ Αἰγύπτιόν τε, καὶ Παμφύλιον, καὶ Σύριον· τῇ δὲ, τὸ Αἰγαῖόν τε καὶ Μυρτῷον. ἀντιπαρήκει δὲ τοῖς εἰρημένοις πολυμερέστατος ὢν ὁ Πόντος· οὗ, τὸ μὲν μυχαίτατον, Μαιῶτις καλεῖται· τὸ δὲ ἔξω πρὸς τὸν Ἑλλήσποντον, συνεστόμωται τῇ καλουμένῃ Προποντίδι. πρός γε μὴν ταῖς ἀνασχέσεσι τοῦ ἡλίου, πάλιν εἰσρέων ὁ Ὠκεανὸς, τόν Ἰνδικόν τε καὶ Περσικὸν διανοίξας κόλπον, ἀναφαίνει συνεχῆ τὴν Ἐρυθρὰν θάλασσαν διειληφώς. ἐπὶ θάτερον δὲ κέρας κατὰ στενόν τε καὶ ἐπιμήκη διήκων αὐχένα, πάλιν ἀνευρύνεται, τὴν Ὑρκανίαν τε καὶ Κασπίαν ὁρίζων· τὸ δὲ ὑπὲρ ταύτην, βαθὺν ἔχει τὸν ὑπὲρ τὴν Μαιῶτιν λίμνην τόπον. εἶτα κατ' ὀλίγον ὑπὲρ τοὺς Σκύθας καὶ Κελτικὴν, σφίγγει τὴν οἰκουμένην, πρός τε τὸν Γαλατικὸν κόλπον, καὶ τὰς προειρημένας Ἡρακλείους στήλας, ὧν ἔξω περιρρεῖ τὴν γῆν ὁ Ὠκεανός. ἐν τούτῳ γε μὴν, νῆσοι μέγισταί τε τυγχάνουσιν οὖσαι δύο, Βρεττανικαὶ λεγόμεναι, Ἀλβίον καὶ Ἰέρνη, τῶν προϊστορημένων μείζους, ὑπὲρ τοὺς Κελτοὺς κείμεναι. τούτων δὲ οὐκ ἐλάττους, ἥτε Ταπροβάνη, πέραν Ἰνδῶν, λοξὴ πρὸς τὴν οἰκουμένην, καὶ ἡ Φεβὸλ καλουμένη, κατὰ τὸν Ἀρραβικὸν κειμένη κόλπον. οὐκ ὀλίγαι δὲ μικραὶ περὶ τὰς Βρεττανικὰς καὶ τὴν Ἰβηρίαν, κύκλῳ περιεστεφάνωνται τὴν οἰκουμένην ταύτην, ἣν δὴ νῆσον εἰρήκαμεν. ἧς πλάτος μέν ἐστι κατὰ τὸ βαθύτατον τῆς ἠπείρου, βραχὺ ἀποδέον τετρακισμυρίων σταδίων, ὥς φασιν οἱ εὖ γεωγραφήσαντες· μῆκος δὲ, περὶ ἑπτακισμυρίους μάλιστα. διαιρεῖται δὲ εἴς τε Εὐρώπην, καὶ Ἀσίαν, καὶ Λιβύην.

Εὐρώπη μὲν οὖν ἐστιν, ἧς ὅροι κύκλῳ, στῆλαί τε Ἡρακλέους καὶ μυχοὶ Πόντου, θάλαττά τε Ὑρκανία, καθ' ἣν στενότατος ἰσθμὸς εἰς τὸν Πόντον διήκει. τινὲς δὲ ἀπὸ τοῦ ἰσθμοῦ Τάναϊν ποταμὸν εἰρήκασιν. Ἀσία δέ, ἐστὶ τὸ ἀπὸ τοῦ εἰρημένου ἰσθμοῦ, τοῦ τε Πόντου, καὶ τῆς Ὑρκανίας θαλάσσης, μέχρι θατέρου ἰσθμοῦ, ὃς μεταξὺ κεῖται Ἀρραβικοῦ κόλπου, καὶ τῆς ἔσω θαλάσσης, περιεχόμενος ὑπό τε ταύτης, καὶ τοῦ πέριξ Ὠκεανοῦ. τινὲς δέ, τὸ ἀπὸ Τανάιδος μέχρι Νείλου στομάτων τίθενται τὸν τῆς Ἀσίας ὅρον. Λιβύη δέ, τὸ ἀπὸ τοῦ Ἀρραβικοῦ ἰσθμοῦ, ἕως Ἡρακλέους στηλῶν· οἱ δέ, ἀπὸ τοῦ Νείλου φασὶν, ἕως ἐκείνων. τὴν δὲ Αἴγυπτον, ὑπὸ τῶν τοῦ Νείλου στομάτων περιρρεομένην, οἱ μὲν, τῇ Ἀσίᾳ· οἱ δέ, τῇ Λιβύῃ, προσάπτουσι· καὶ τὰς νήσους, οἱ μὲν, ἐξαιρέτους ποιοῦσιν· οἱ δέ, προσνέμουσι ταῖς γείτοσιν ἀεὶ μοίραις.

Γῆς μὲν δὴ καὶ θαλάττης φύσιν, καὶ θέσιν, ἣν δή τινα καλεῖν εἰώθαμεν οἰκουμένην, τοιάνδε τινὰ ἱστορήκαμεν.

A angustis etiam ceruicibus in fauces ſeſe comprimens, viciſsimque latiùs expatians. Ac primùm quidem inſinuari dicitur dextrorſus ab Herculis columnis intrò nauigantibus, circa vtramque Syrtim (alteram earum magnam, paruam alteram vocant.) at verò in alteram partem non tam itidem ſinuoſus inundans, efficit tria maria, Sardoum, Gallicum, & Hadriam. A quibus continuò Siculum ſequitur porrectum in obliquum: quod & ipſum excipitur à Cretico. Cretico coniuncta ſunt parte altera Ægyptium, Pamphylium, Syrium: altera Ægæum & Myrtoum. at Pontus velut antedictis obiectus, atque ex aduerſo protenſus, multis partibus conſtat. Pars eius in intima penetrans, Mæotis appellatur. Quæ autem ad B Helleſpontum vergit, in fauces contracta eſt, quam Propontidem vocant. Rurſus ab ortu Solis in orbem terræ exundans Oceanus infert ſeſe velut in medium procedens, Indico ſinu Perſicóque per[...] nitimum mare Rubrum intercipiens. ad alter[...]tem cornu ſimul atque oblonga ceruice angu[...] penetrauit, rurſus amplificans, Hyrcaniæ ſin[...]ſpiæque amplectitur. Mare verò quod ſuper H[...]niam eſt, vaſtum illum obtinet locum, qui eſt [...] Mæotim paludem. Tum autem qua parte S[...] Celtáſque complectitur, ſenſim aſtringit orbem [...]rarum, aduſque ſinum Gallicum, ſupradictáſque columnas: extra quas Oceanus terram fluctibus ſuis oberrat. Quo ipſo in mari inſulæ duæ ſitæ ſunt quàm C maximæ, quas Britannicas appellant, Albion & Ierna: iis etiam maiores, quas commemorauimus ſupra Celtas iacentes. Queis tamen ipſis magnitudine nec Taprobane cedit, nec ea cui Phebol nomen eſt. Illa ſuper Indos poſita, ſitu ad terrarum orbem inflexo: hæc ad Arabicum ſinum. Sunt etiam non paucæ, ſed exiguæ, circa Britannicas & Iberiam, quæ quaſi corona cingunt hunc orbem, hominum domicilium, quem ſuperiùs inſulam eſſe diſſeruimus. Huius orbis latitudo, quà continens eſt ampliſſima, paulò minùs quadraginta millia ſtadiorum patet: vt quidem perhibuerunt authores rectæ & exquiſitæ geographiæ: longitudo ad ſeptuaginta millia. Diuiditur porro in Europam, Aſiam, & Aphricam.

D Europa his finibus circumſcribitur: Herculis cippis, Ponti receſſu, Hyrcano mari: ſecundùm quam anguſtiæ Iſthmi ſimiles ad Pontum vſque pertinent. Nonnulli tamen ab illo Iſthmo Tanaim fluuium, Europæ terminum eſſe dixerunt. Aſia eſt quicquid terræ ſitum eſt ab Iſthmo iam dicto à Ponto Hyrcanóque mari, ad Iſthmum vſque alterum, qui Arabicum ſinum interiacet, & mare interius, illum quidem cohibitum ab eo mari, & ab Oceano, qui eum complectitur ambitu. Sunt qui fines Aſiæ ſtatuant ſpatium quod à Tanai protenditur ad Nili vſque oſtia. Africa ab Arabico Iſthmo ad colũnas Herculis porrecta eſt: vel, vt alij cenſuerunt, ab Nilo. Nam Ægypti quicquid Nili oſtiis ſeptum E eſt, alij Aphricæ, alij attribuunt Aſiæ. Inſuláſque tribus terræ partibus adiacentes, ſcriptorum partim vt exemptiles ab orbe terrarum recenſuêre: partim vt contributas iis partibus, quibus earum quæque vicinitate coniuncta eſt. Proinde terræ mariſque naturam ac ſitum huiuſcemodi prodenda cenſuimus: quem habitatum orbem appellare conſueuimus.

A

CAPVT IV.

De præcipuis quibuſque quæ cùm in orbe tum circa eum exiſtere contingit.

QVas res autem tum in eo orbe tum circa eum exiſtere contingit, quibus ille rebus quodammodo afficiatur: earum ipſarum rerum, vt quæque maximè commemorandæ videbuntur, dicere porrò aggrediamur, ſummam quandam colligentes eorum quæ ſunt neceſſaria. Duas igitur exhalationes ab eo ſurſum ferri nouimus in aëra nobis impendentem: tenues illas quidem omnino, nec nobis conſpicuas: niſi ſiquid eſt huiuſcemodi ad tractus B Orientales, & prætereà quæ ex amnibus & locis irriguis ſublimia ferri videntur. Earum autem exhalationum altera ſicca eſt, in fumúmque conformata, è terra manans: altera humida, roſidæ expirationis plena, ab humida natura exhalata. Ex hac nebulæ, rores, & gelu omne genus, nubes, pluuiæ, niues & grandines oriuntur. A ſicca autem illa venti & flatuum differentiæ exoriuntur, tonitrúſque & fulgura, turbines & fulmina, aliáque his cognata. Nebula eſt expiratio quædam roſida, aquæ nequaquam genitrix: vt aëre craſſior ipſa, ſic nube rarior. Gignitur vel ex nubis primordiis rareſcentibus: vel ex reliquiis nubis. Huius aduerſaria vt eſt, ita eſſe dicitur ſerenitas, nihil aliud ipſa exiſtens, quàm aer nubibus nebu- C liſque vacuus. Ros eſt humidum quid è ſerenitate concretum, minutímque delabens. Glacies eſt aqua conferta à ſerenitate compactilis. Pruina, ros eſt concretus. Droſopachne cõpoſito nomine dicta eſt, ros ſemiconcretus, quaſi ros pruinoſus. Nubes eſt craſſamentum exhalationum conuolutum, vim habens aquæ gignendæ. Imber fit expreſſione nubis magnoperè addenſatæ: tot habens differentias, quotuplex eſt nubis compreſſio: quippe quæ remiſſa ſi fuerit, molles ſtirias diſpergat: ſin vehemens, pleniores. Hócque appellamus pluuiam, imbris contorta ſtillicidia, cùm maiuſcula ipſa, tum verò iugi tenore caſitantia. at verò nix gignitur denſitate nubium friatili: quæ ſimul ac in aquam D verti cœptæ ſunt, in minuta contunduntur, cum eo, vt illa contuſio ſpeciem ſpumæ, exactúmque candorem: humoris autem qui ineſt, concretio, quique nondum fuſus eſt, nec rarefactus, rigorem efficiat. Hæc impetu & confertim decidens, Niphetos appellatur. Quo genere volutim contorto, libramentúmque ex compreſſu capiente ad celeriorem lapſum, fit quæ grando vocatur: cùm interea pro fragmentorum magnitudine quæ abrumpuntur, tum corpuſcula maiora grandinis, tum delapſus violentiores fiant. Atque hæc quæ hactenus dicta ſunt, naturæ vi ab humida expiratione euenire comparatum eſt.

A ſicca verò tum ventus oriri ſolet, cùm à fri- E gore, ita vt fluat, illa truditur, nihil vt aliud ventus ſit niſi aer multus fluctuans & coactus, qui etiam ſpiritus appellatur; quum alioqui ſpiritus appelletur ſubſtantia animata, & genitalis in ſtirpibus atque in animantibus exiſtens, per omniáque pertinens, de qua nunc diſſerere nihil neceſſe fuit. Flatus verò qui in aere ſpirant, ventos, auras, expirationes dicimus quæ ex humore prodeunt. Venti qui è terra vliginoſa & humefacta prodeunt, Apogæi, quaſi è terra oriundi: qui è ſinibus proſiliunt, Encolpiæ, quaſi ſinuales, vocantur:

ΚΕΦΑΛ. δʹ.

Περὶ τῶν ἀξιολογωτάτων ἐν τῇ οἰκουμένῃ, καὶ περὶ τῶν οἰκουμένων παθῶν.

ΠΕρὶ δὲ τῶν ἀξιολογωτάτων ἐν αὐτῇ, καὶ περὶ αὐτὴν παθῶν, νῦν λέγωμεν, αὐτὰ τὰ ἀναγκαῖα ἀνακεφαλαιούμενοι. δύο γὰρ δή τινες ἀπ᾽ αὐτῆς ἀναθυμιάσεις ἀναφέρονται συνεχῶς εἰς τὸν ὑπὲρ ἡμᾶς ἀέρα, λεπτομερεῖς καὶ ἀόρατοι παντάπασιν, εἰ τι μὴ κατὰ τὰς ἑῴας ἐστὶν· αἵ τε διὰ ποταμῶν τε καὶ ναμάτων ἀναφερόμεναι θεωροῦνται. τούτων δὲ, ἡ μὲν, ἐστὶ ξηρὰ καὶ καπνώδης, ἀπὸ τῆς γῆς ἀπορρέουσα· ἡ δὲ, νοτερὰ καὶ ἀτμώδης, ἀπὸ τῆς ὑγρᾶς ἀναθυμιωμένη φύσεως. γίνονται δὲ, ἀπὸ μὲν ταύτης, ὀμίχλαι, καὶ δρόσοι, καὶ πάγων ἰδέαι, νέφη τε καὶ ὄμβροι, καὶ χιόνες, καὶ χάλαζαι· ἀπὸ δὲ τῆς ξηρᾶς, ἄνεμοί τε καὶ πνευμάτων διαφοραὶ, βρονταί τε καὶ ἀστραπαὶ, καὶ πρηστῆρες, καὶ κεραυνοὶ, καὶ τὰ ἄλλα ἃ δὴ τούτοις ἐστὶ σύμφυλα. ἔστι δὲ, ὀμίχλη μὲν, ἀτμώδης ἀναθυμίασις τις, ἄγονος ὕδατος, ἀέρος μὲν παχυτέρα, νέφους δὲ ἀραιοτέρα. γίνεται δὲ, ἤτοι ἐξ ἀρχῆς ἀραιώσεως νέφους, ἢ ἐξ ὑπολείμματος. ἀντίπαλος δὲ αὐτῇ λέγεταί τε καὶ ἐστὶν, αἰθρία, οὐδὲν ἄλλο οὖσα, πλὴν ἀὴρ ἀνέφελος καὶ ἀνόμιχλος. δρόσος δέ ἐστιν ὑγρὸν ἐξ αἰθρίας κατὰ σύστασιν λεπτὸν φερόμενον. κρύσταλλος δὲ, ἀθρόον ὕδωρ ἐξ αἰθρίας πεπηγός. πάχνη δὲ, δρόσος πεπηγυῖα. δροσοπάχνη δὲ, ἡμιπαγὴς δρόσος· νέφος δὲ, ἐστὶ πάχος ἀτμῶδες συνεστραμμένον, γόνιμον ὕδατος. ὄμβρος δὲ, γίνεται μὲν κατ᾽ ἐκπιεσμὸν νέφους εὖ μάλα πεπαχυσμένου· διαφορὰς δὲ ἴσχει τοσαύτας, ὅσας καὶ ἡ τοῦ νέφους θλίψις· ἠπία μὲν γὰρ οὖσα, μαλακὰς ψεκάδας διασπείρει· σφοδρὰ δὲ, ἀδροτέρας· καὶ τοῦτο καλοῦμεν ὑετὸν, ὄμβρου μείζω, καὶ συνεχῆ συστρέμματα ἐπὶ γῆς φερόμενα. χιὼν δὲ γίνεται κατὰ νεφῶν πεπυκνωμένων ἀποθραυσιν *περὶ τῆς εἰς ὕδωρ μεταβολῆς ἀνακοπέντων· ἐργάζεται δὲ, ἡ μὲν κοπὴ, τὸ ἀφρῶδες καὶ ἔκλευκον· ἡ δὲ σύμπηξις, τοῦ ἐνόντος ὑγροῦ τὴν ψυχρότητα οὔπω χυθέντος, οὐδὲ ἠραιωμένου. σφοδρὰ δὲ αὕτη καὶ ἀθρόα καταφερομένη, νιφετὸς ὠνόμασται. χάλαζα δὲ γίνεται, νιφετοῦ συστραφέντος, καὶ βρῖθος ἐκ πιλήματος εἰς καταφορὰν ταχυτέραν λαβόντος· παρὰ δὲ τὰ μεγέθη τῶν ἀπορρηγνυμένων θραυσμάτων, οἵ τε ὄγκοι μείζους, αἵ τε καταφοραὶ γίνονται βιαιότεραι. ταῦτα μὲν οὖν ἐκ τῆς ὑγρᾶς ἀναθυμιάσεως πέφυκε συμπίπτειν.

Ἐκ δὲ τῆς ξηρᾶς, ὑπὸ ψύχους μὲν ὠσθείσης, ὥστε ῥεῖν, ἄνεμος ἐγένετο· οὐδὲν γάρ ἐστιν οὗτος, πλὴν ἀὴρ πολὺς ῥέων καὶ ἀθρόος· ὅστις ἅμα καὶ πνεῦμα λέγεται. λέγεται δὲ καὶ ἑτέρως πνεῦμα, ἥ τε ἐν φυτοῖς, καὶ ζῴοις, καὶ διὰ πάντων διήκουσα, ἔμψυχός τε καὶ γόνιμος οὐσία, περὶ ἧς λέγειν νῦν οὐκ ἀναγκαῖον. τὰ δὲ ἐν ἀέρι πνέοντα πνεύματα, καλοῦμεν ἀνέμους· αὔρας δὲ, τὰς ἐξ ὑγροῦ φερομένας ἐκπνοάς· τῶν δ᾽ ἀνέμων, οἱ μὲν ἐκ νενοτισμένης γῆς πνέοντες, ἀπόγαιοι λέγονται· οἱ δὲ ἐκ κόλπων διεξάττοντες, ἐγκολπίαι.

* Quidā περὶ, pro πρὸ. minùs rectè. Apuleius, *priuſquam in aquam defluant.*

Τούτοις δὲ ἀνάλογόν τι ἔχουσιν, οἱ μὲν, ἐκ ποταμῶν καὶ λιμνῶν· οἱ δὲ, κατὰ ῥῆξιν νέφους γινόμενοι, καὶ ἀνάλυσιν τοῦ πάχους πρὸς ἑαυτοὺς ποιούμενοι, ἐκνεφίαι καλοῦνται· μεθ' ὕδατος δὲ ἐκραγέντος ἀθρόως, ἐξυδρίαι λέγονται. καὶ οἱ μὲν ἀπὸ ἀνατολῆς συνεχεῖς, εὖροι κέκληνται· βορέαι δὲ, οἱ ἀπὸ ἄρκτου· ζέφυροι δὲ, οἱ ἀπὸ δύσεως· νότοι δὲ, οἱ ἀπὸ μεσημβρίας. τῶν γε μὴν εὔρων, καικίας μὲν λέγεται, ὁ ἀπὸ τοῦ περὶ τὰς θερινὰς ἀνατολὰς τόπου πνέων ἄνεμος· ἀπηλιώτης δὲ, ὁ ἀπὸ τοῦ περὶ τὰς ἰσημερίας· εὖρος δὲ, ὁ ἀπὸ τοῦ περὶ τὰς χειμερινάς. καὶ τῶν ἐναντίων ζεφύρων, ἀργέστης μὲν, ὁ ἀπὸ τῆς θερινῆς δύσεως, ὅν τινες καλοῦσιν ὀλυμπίαν, οἱ δὲ ἰάπυγα· ζέφυρος δὲ, ὁ ἀπὸ τῆς ἰσημερινῆς· λίψ δὲ, ὁ ἀπὸ τῆς χειμερινῆς. καὶ τῶν βορέων ἰδίως, ὁ μὲν ἑξῆς τῷ καικίᾳ, καλεῖται βορέας· ἀπαρκτίας δὲ, ὁ ἐφεξῆς ἀπὸ τοῦ πόλου κατὰ τὸ μεσημβρινὸν πνέων. θρασκίας δὲ, ὁ ἑξῆς πνέων τῷ ἀργέστῃ, ὃν ἔνιοι καικίαν καλοῦσι. καὶ τῶν νότων, ὁ μὲν ἀπὸ τοῦ ἀφανοῦς πόλου φερόμενος ἀντίπαλος τῷ ἀπαρκτίᾳ, καλεῖται νότος· εὐρόνοτος δὲ, ὁ μεταξὺ εὔρου καὶ νότου. τὸν δὲ ἐπὶ θάτερα, μεταξὺ λιβὸς καὶ νότου, οἱ μὲν, λιβόνοτον· οἱ δὲ, λιβοφοίνικα καλοῦσι. τῶν δὲ ἀνέμων, οἱ μὲν, εἰσὶν εὐθύπνοοι, ὁπόσοι διεκπνέουσι πρόσω κατ' εὐθεῖαν· οἱ δὲ, ἀνακαμψίπνοοι, καθάπερ ὁ καικίας λεγόμενος. καὶ οἱ μὲν, χειμῶνος, ὥσπερ οἱ νότοι δυναστεύοντες· οἱ δὲ, θέρους, ὡς οἱ ἐτησίαι λεγόμενοι, μῖξιν ἔχοντες τῶν τε ἀπὸ τῆς ἄρκτου φερομένων, καὶ ζεφύρων· οἱ δὲ ὀρνιθίαι καλούμενοι, ἐαρινοί τινες ὄντες ἄνεμοι, βορέαι εἰσὶ τῷ γένει. τῶν γε μὴν βιαίων πνευμάτων, καταιγὶς μέν ἐστι, πνεῦμα ἄνωθεν τύπτον ἐξαίφνης· θύελλα δὲ, πνεῦμα βίαιον, καὶ ἄφνω προσαλλόμενον. λαῖλαψ δὲ καὶ στρόβιλος, πνεῦμα εἰλούμενον κάτωθεν ἄνω. ἀναφύσημα δὲ γῆς, πνεῦμα ἄνω φερόμενον κατὰ τὴν ἐκ βυθοῦ τινος ἢ ῥήγματος ἀνάδοσιν· ὅταν δὲ εἰλούμενον πολὺ φέρηται, πρηστὴρ χθόνιός ἐστιν. εἰληθὲν δὲ πνεῦμα ἐν νέφει παχεῖ τε καὶ νοτερῷ, καὶ ἐξωθὲν δι' αὐτοῦ, ῥηγνύον βιαίως τὰ συνεχῆ πιλήματα τοῦ νέφους, βρόμον καὶ πάταγον ἀπειργάσατο μέγαν, βροντὴν λεγόμενον· ὥσπερ ἐν ὕδατι πνεῦμα σφοδρῶς ἐλαυνόμενον. κατὰ δὲ τὴν τοῦ νέφους ἔκρηξιν πυρωθὲν τὸ πνεῦμα καὶ λάμψαν, ἀστραπὴ λέγεται· ὃ δὴ πρότερον τῆς βροντῆς * προέπεσεν, ὕστερον γινόμενον· ἐπεὶ τὸ ἀκουστὸν ὑπὸ τοῦ ὁρατοῦ πέφυκε φθάνεσθαι, τοῦ μὲν, καὶ πόρρωθεν ὁρωμένου· τοῦ δὲ, ἐπειδὰν ἐμπελάσῃ τῇ ἀκοῇ· καὶ μάλιστα, ὅταν, τὸ μὲν, τάχιστον ᾖ τῶν ὄντων, λέγω δὲ τὸ πυρῶδες· τὸ δὲ, ἧττον ταχὺ, ἀερῶδες ὄν, ἐν τῇ πλήξει πρὸς ἀκοὴν ἀφικνούμενον. τὸ δὲ ἀστράψαν, ἀναπυρωθὲν, βιαίως ἄχρι τῆς γῆς διεκθέον, κεραυνὸς καλεῖται· ἐὰν δὲ ἡμίπυρον ᾖ, σφοδρὸν δὲ ἄλλως καὶ ἀθρόον, πρηστήρ· ἐὰν δὲ ἄπυρον ᾖ παντελῶς, τυφῶν. ἕκαστον δὲ τούτων, * κατασκῆψαν εἰς τὴν γῆν, σκηπτὸς ὀνομάζεται. τῶν δὲ κεραυνῶν, οἱ μὲν αἰθαλώδεις, ψολόεντες λέγονται· οἱ δὲ ταχέως διᾴττοντες, ἀργῆτες· ἑλικίαι δὲ, οἱ * γραμμοειδῶς φερόμενοι.

* γρ. προέπιπτεν,

* γρ. γινομένου.

* γρ. κατασκήψαν

* γρ. γραμματοειδῶς

A inter quos ipſos,cóſque qui è fluminibus erumpũt,ex aquiſque ſtagnãtibus,intercedit nonnihil proportionis. Ecnephiæ appellantur qui in fractura nubis,reſoluendáque eius craſſitudine, colliduntur inter ſe, quaſi quidam nubigenæ. Exhydriæ quaſi aquatores dicuntur,qui cum pluuiis aquis graſſantur,impetu & confertim effuſis. Et ij quidem qui ab Oriente iugi tenore perflãt, Euri & Vulturni:qui ab Vrſa, Boreæ & Aquilones vocantur. Zephyri & Fauonij, qui ab occaſu:qui à meridie, Noti dicũtur & Auſtri. Vulturnorum porrò is Cæcias dictus eſt,qui naſcitur ad ortum ſolſtitialem: Subſolanus,ad æquinoctialẽ : ad brumalem, Vulturnus. At eorũ qui ex obuerſa parte prodeunt,quos Fauonios vocamus, Argeſtes & Corus ab occaſu ſolſtitiali:qui etiam Olympias ab aliquibus

B dictus eſt,& ab aliis Iapyx. Fauonius ab æquinoctiali: Africus ab hyberno oritur. at verò Aquilonum is qui Cæciæ coniũctus eſt, peculiariter appellatur Aquilo. Qui autem hũc à vertice ſtatim excipit per Meridianum ſpirans, Septentrio dicitur. Thraſcias deinceps Coro ſpirat:quem nonnulli Cæciã appellarũt. Rurſus ex Auſtris is qui à vertice nobis cõdito ſeſe infert ex aduerſo Septentrionis, Auſter, nominis prærogatiua, dicitur: Qui inter hũc & Vulturnum eſt, Euronotus eſt vocitatus, quaſi dicas Vulturnauſter. At qui ſpirat altrinſecus inter Aphricum & Auſtrum, hunc alij Libonotum,quaſi Africauſtrum, alij Libophœnicem vocant. Ventorum porrò quidam flatus rectos, quidam reflexos habẽt. Rectos habent ij qui lineis

C rectis ſemper graſſari ſolent: reflexos & refractos, vt is quem Cæciam nuncupant. Rurſus quidam hyeme pollent, vt Auſtri: quidam æſtate, vt Eteſiæ qui dicũtur, id eſt, anniuerſarij, cimum quendam conficientes Septentrionum atque Subſolanorum. Ornithiæ, quaſi Auiarij, venti quidam dicti ſunt ex Aquilonio genere, verno tempore inualeſcẽtes. Cæterùm è genere violentiorum flatuum, Catægis nomen eſt flatus ingruentis supernè, repentéque euerberãtis: Thyella flatus eſt præualens qui repentè proſilit. Lælaps & Strobilus nũcupatur, qui infernè ſurſum versùs repentè conuoluitur. Anaphyſema quaſi efflatus terræ, dicitur ventus ſublimem ſeſe rapiens, cùm aut è ſpecu altiùs depreſſo flatus emicuerit, aut è terra in hiatum diſcedente: qui Turbo terreſtris eſt tum, cùm multus

D ac contortus ferri cœptus eſt. Flatus verò in nube implicitus, & craſſa & humida, continuatũ nobis ſpiſſamentũ violenta eruptione perfringens, mugitũ edere cum ingẽti fragore ſolet, qui Tonitru dicitur: modo haud abſimili ſpiritus vehementer in aqua impulſi. Fulgetra eſt ſpiritus ignitus & coruſcãs, dũ nubes dirũpitur: quæ tonitru antecedere ſolet cùm tamẽ poſt ipſum fiat. Siquidem quod oculis percipitur, ei quod auribus obiectum eſt, anteuertere natura comparatũ eſt: quippe illo è longinquo aſpectabili: hoc tum demũ exaudibili, quum auribus appulſum ſit: præſertim quando alterũ omnium naturarũ celeritate maxima

E præditum eſt ignita ſcilicet natura: alterũ, minùs volucre, quod eſt naturæ ſpirabilis & aëreæ, non antequam aures pepulerit, ad auditum peruenit. at verò quod fulſerit, ſi ad terrã vſque curſim illiſum ſit, Fulmen vocatur. ſin ſemiuſtũ quidẽ, ſed vniuerſum tamen violentúmque incubuerit, Preſter, hoc eſt, accẽſus turbo, dicitur. Quòd ſi prorſus ignis nihil interim conceperit, Typhon vocatur: qui eſt vortex procelloſus & euerberans. Horum quicquid in terram impetu decubuerit, Sceptos, id eſt, Fulmen, nominatur: qui Pſolois dicitur, cùm fuliginẽ contraxerit: Arges, ſi raptim emicuerit: Elicias, ſi lineari ſpecie cõformat° eſt.

Scepti dicuntur quæcunque fulmina, in quiduis illiſa ſint.

Ad ſummam, eorum quæ in aëre apparent, alia ſpecie tenus exiſtunt: alia etiam habent naturæ ſubſtantiam. Specie tantùm exhibent arcus cæleſtes, & virgulæ, aliaque huiuſmodi. Subſtantia etiam apparent fulgores cæleſtes, & quos emicantes vocamus: & crinitæ ſtellæ, & iis ſimilia. Arcus eſt ſpecies ſegmenti ſolaris vel lunaris, edita in nube humida, & caua & perpetua: quam velut in ſpeculo intuemur, imagine relata in ſpeciem circularis ambitus. Virga eſt arcus cæleſtis exhibitio in directum conformata. Area eſt edita imago ſidereæ claritatis vndique illuſtrata, hactenus ab arcu differens, quod ille è regione Solis ac Lunæ viſendum ſe exhibet, quum area ſidus totum ambitu cingere orbiculari ſoleat. Fulgor eſt ignis collectio, qui in aëre exarſit: per cælum ille quidem aut iaculari ſpecie tranſmeans, aut vno loco fixus. At eiaculatio, ignis eſt enatus, attritu in aëre, pernici motu inuehens, ob eámque pernicitatem oblongam formam ſimulans. Fulgor fixus eſt extenſio longè porrecta, & loco permanens, & tanquam profluuium ſideris. Quod ſi in alteram partem dilatetur, Crinita ſtella vocatur. Sæpenumero autem euenit vt fulgores tempore multo maneant: ſæpe vt confeſtim extinguantur. Complures item & aliæ rerum formæ cernuntur in cælo apparentium: vt quæ Faces, quæ Trabeculæ, quæ Dolia, quæ Scrobes nuncupantur: omnia ab earum rerum ſimilitudine appellata, vnde nomina mutuata ſunt. Eáque partim in Occidua mundi parte, partim in Oriente cernuntur: partim etiam ambiguo in vtranque partem editu: rarò vel Septentrionali, vel Auſtrino. Cæterùm omnia incerta. Quippe nihil huiuſcemodi hactenus proditum eſt memoriæ ita fuiſſe conſtabilitum raro ſitu & conſtituto, vt ſemper conſpicuum fuerit. Atque huiuſcemodi ſunt quæ in natura animabili aëriáque fiunt.

Iam verò Terra continet etiam ipſa in ſe, vt aquæ, ita ſpiritus ignisque ſcaturigines, quarum quædam ſub terra latent, oculis humanis ſubductæ, multæ ſpiracula habent, emiſſariáque vaporis: vt Lipara, vt Ætna, vt Æoliæ inſulæ, quæ quidem ſæpe & ipſæ fluminum more fluunt, ignitáſque ferri glebas euomunt. Nonnullæ verò huiuſmodi ſcatebræ ſecundùm fontes ſitæ, aquas inde manantes calefaciunt, aliquæ inde vt tepentes, efferuefactæ aliæ, quædam modicè temperatæ vt emittantur. Multis etiam in locis Orbis, exitus ſpirituum pari ratione patefacti ſunt. Quorum partim fanatico furore afficiunt homines propiùs accedenteis, partim tabifica vi abſumunt, partim fatidicos efficiunt, vt Delphici & Lebadici: ſunt & qui prorſus enecent, vt in Phrygia. Frequēter fit etiam vt congenitus ſpiritus in terra conditus, cùm aberrans, inſinuarit in abſtruſos quoſdam eius atque cæcos meatus, quaſi ſedibus ſuis erumpens, multis in locis vibrantem motum cieat. Eſt etiam, nec rarò, cùm flatus aduena, introrſus in terræ caua irrumpens, deinde exitu omni excluſus, intus ſeſe verſando, ingēti vi terram quatiat, nequicquam exitum inde quæritans: ex quo fit naturæ facinus, quod vocamus Terræmotum. Terræmotuum autem ij qui ad angulos acutos in obliquum quatiunt, Epiclintæ appellantur, quaſi in tranſuerſum ſe agentes. Surſum verò deorſumque ad angulos rectos iactantes, Braſtæ vocantur, à ſimilitudine aquæ efferueſcentis. At qui labes terræ relinquunt in caua ſubſidentis, ab hiatu Chaſmatiæ nominati ſunt: Quem hiatum ij qui vi eruptione facta patefaciunt, Rhectæ, id eſt, effractores, dicti ſunt.

A σκηπτοὶ δὲ, ὅσοι κατασκήπτουσιν εἴς τι.

Συλλήβδην δὲ, τῶν ἐν ἀέρι φαντασμάτων, τὰ μὲν, ἐστὶ κατ᾽ ἔμφασιν· τὰ δὲ καθ᾽ ὑπόστασιν. κατ᾽ ἔμφασιν μὲν, ἴριδες, καὶ ῥάβδοι, καὶ τὰ τοιαῦτα· καθ᾽ ὑπόστασιν δὲ, σέλα τε, καὶ διάττοντες, καὶ κομῆται, καὶ τὰ τούτοις παραπλήσια. ἶρις μὲν οὖν, ἐστὶν ἔμφασις ἡλίου τμήματος, ἢ σελήνης, ἐν νέφει νοτερῷ, καὶ κοίλῳ, καὶ συνεχεῖ, πρὸς φαντασίαν ὡς ἐν κατόπτρῳ θεωρουμένη κατὰ κύκλου περιφέρειαν. ῥάβδος δὲ, ἐστὶν ἴριδος ἔμφασις εὐθεῖα.* ἅλως δὲ, ἐστὶν ἔμφασις λαμπρότητος ἄστρου περιαυγής. διαφέρει δὲ ἴριδος, ὅτι ἡ μὲν ἶρις B ἐξ ἐναντίας φαίνεται ἡλίου τε καὶ σελήνης· ἡ δὲ ἅλως, κύκλῳ παντὸς ἄστρου. σέλας δὲ, ἐστὶ πυρὸς ἀθρόου ἔξαψις ἐν ἀέρι. τῶν δὲ σελάων, ἃ μὲν, ἀκοντίζεται· ἃ δὲ στηρίζεται. ὁ μὲν οὖν ἐξακοντισμὸς, ἐστὶ πυρὸς γένεσις ἐκ παρατρίψεως, ἐν ἀέρι φερομένου ταχέως, καὶ φαντασίαν μήκους ἐμφαίνοντος διὰ τὸ τάχος· ὁ δὲ στηριγμὸς, ἐστὶ χωρὶς φορᾶς προμήκης ἔκτασις, καὶ οἷον ἄστρου ῥύσις· πλατυνομένη δὲ κατὰ θάτερον, κομήτης καλεῖται. πολλάκις δὲ, τῶν σελάων, τὰ μὲν, ἐπιμένει πλείονα χρόνον· τὰ δὲ, παραχρῆμα σβέννυται. πολλαὶ δὲ καὶ ἄλλαι* φαντασμάτων ἰδέαι θεωροῦνται, λαμπάδες τε καλούμεναι, καὶ δοκίδες,* καὶ πίθοι, καὶ βόθυνοι, κατὰ C τὴν πρὸς ταῦτα ὁμοιότητα ὧδε προσαγορευθεῖσαι. καὶ τὰ μὲν τούτων, ἑσπέρια· τὰ δὲ, ἑῷα· τὰ δὲ * ἀμφιφανῆ θεωρεῖται· σπανίως δὲ, βόρεια καὶ νότια. πάντα δὲ, ἀβέβαια· οὐδέποτε γὰρ τι τούτων ἀεὶ φανερὸν ἱστόρηται κατεστηριγμένον. τὰ μὲν τοίνυν ἀέρια, τοιαῦτα.

Ἐμπεριέχει δὲ καὶ πολλὰς ἡ γῆ ἐν αὐτῇ καθάπερ ὕδατος, οὕτω καὶ πνεύματος καὶ πυρὸς πηγάς. τούτων δὲ, αἱ μὲν ὑπὸ γῆν, εἰσὶν ἀόρατοι· πολλαὶ δὲ ἀναπνοὰς ἔχουσι καὶ ἀναφυσήσεις, ὥσπερ Λιπάρα τε καὶ Αἴτνη, καὶ τὰ ἐν Αἰόλου νήσοις· αἳ δὴ καὶ ῥέουσι πολλάκις ποταμῶν δίκην, καὶ μύδρους ἀναρριπτοῦσι D διαπύρους. ἔνιαι δὲ ὑπὸ γῆν οὖσαι, πλησίον πηγαίων ὑδάτων, θερμαίνουσι ταῦτα· καὶ τὰ μὲν, χλιαρὰ τῶν ναμάτων ἀνιᾶσι· τὰ δὲ, ὑπέρζεστα· τὰ δὲ, εὖ ἔχοντα κράσεως. ὁμοίως δὲ καὶ τῶν πνευμάτων πολλὰ πολλαχοῦ γῆς στόμια ἀνέῳκται· ὧν, τὰ μὲν, ἐνθουσιᾶν ποιεῖ τοὺς ἐμπελάζοντας· τὰ δὲ, ἀτροφεῖν· τὰ δὲ, χρησμῳδεῖν, ὥσπερ τὰ ἐν Δελφοῖς, καὶ τὰ ἐν Λεβαδίᾳ· τὰ δὲ, καὶ παντάπασιν ἀναιρεῖ, καθάπερ τὰ ἐν Φρυγίᾳ. πολλάκις δὲ καὶ συγγενὲς πνεῦμα εὔκρατον ἐν γῇ * παρεξωσθὲν εἰς μυχίους σύριγγας αὐτῆς, ἔξεδρον γενόμενον ἐκ τῶν οἰκείων τόπων, πολλὰ μέρη συνεE κράδανε. πολλάκις δὲ πολὺ γενόμενον ἔξωθεν, ἐγκατειλήφθη τοῖς ταύτης κοιλώμασι, καὶ ἀποκλεισθὲν ἐξόδου, μετὰ βίας αὐτὴν συνετίναξε, ζητοῦν ἔξοδον ἑαυτῷ, καὶ ἀπειργάσατο πάθος τοῦτο, ὃ καλεῖν εἰώθαμεν σεισμόν· τῶν δὲ σεισμῶν, οἱ μὲν εἰς πλάγια σείοντες κατ᾽ ὀξείας γωνίας, ἐπικλίνται καλοῦνται· οἱ δὲ ἄνω ῥιπτοῦντες, καὶ κάτω κατ᾽ ὀρθὰς γωνίας, βράσται· οἱ δὲ συνιζήσεις ποιοῦντες εἰς * τὰ κοῖλα, χασματίαι· οἱ δὲ χάσματα ἀνοίξαντες, καὶ γῆν ἀναρρήγνυντες, ῥῆκται καλοῦνται.

*Mirè hunc locum eſt interpretatus Apuleius: *Halyſis eſt catena quædã luminis clarioris per ſolis ambitum in ſe reuertens. Inter hanc & irida illud intereſt, quòd iris multicolor eſt, & ſemicirculo figurata, procul à ſole atque luna: catena clarior eſt, aſtrúmque ambit orbe incolumi, corona non diſcolore:* quaſi legiſſet ἅλυσις vtroque loco, pro ἅλως, nã ſcripſiſſe Apuleium, *Halos eſt corona*, vix dici poteſt. Notabis apud Stob. περίαυγος legi pro περιαυγής.

γρ. φασμάτων: Apud Stob. & πυγρίαι. & β.

Apud Stob. ἀμφιφανῆ

γρ. παρωσθὲν

γρ. τὰ κοιλώματα,

τούτων δὲ, οἱ μὲν, καὶ πνεῦμα συνεξαναβάλλουσι· οἱ δὲ πέτρας· οἱ δὲ, πηλόν· οἱ δὲ, πηγὰς φαίνουσι τὰς πρότερον οὐκ οὔσας· τινὲς δὲ, ἀναστρέφοντες κατὰ μίαν πρόωσιν, οὓς καλοῦσιν ὤστας· οἱ δὲ ἀναπάλλοντες, καὶ ταῖς εἰς ἑκάτερον ἐγκλίσεσι καὶ ἀναπάλσεσι διορθοῦντες ἀεὶ τὸ σειόμενον, παλματίαι λέγονται, τρόμῳ πάθος ὅμοιον ἀπεργαζόμενοι. γίνονται δὲ καὶ μυκητίαι σεισμοὶ, σείοντες τὴν γῆν μετὰ βρόμου. πολλάκις δὲ χωρὶς σεισμοῦ γίνεται μύκημα γῆς, ὅταν τὸ πνεῦμα, σείειν μὲν μὴ ᾖ αὔταρκες· ἐνειλούμενον δὲ ἐν αὐτῇ, κόπτηται μετὰ ῥοθίου βίας. σωματοποιεῖται δὲ τὰ εἰσιόντα πνεύματα καὶ ὑπὸ τῶν* ἐν τῇ γῇ ὑγρῶν κεκρυμμένων.

* Fort. τῇ γῇ ἐναποκειμένων. nam ita ferè Stob.

Τὰ δὲ ἀνάλογα συμπίπτει τούτοις καὶ ἐν θαλάσσῃ. χάσματά τε γὰρ τῆς θαλάσσης, καὶ ἀναχωρήματα πολλάκις, καὶ κυμάτων ἐπιδρομαὶ, ποτὲ μὲν, ἀντανακοπὴν ἔχουσαι· ποτὲ δὲ, * πρόωσιν μόνην, ὥσπερ ἱστορεῖται περὶ Ἑλίκην τε καὶ Βοῦραν. πολλάκις δὲ καὶ ἀναφυσήματα τοῦ πυρὸς ἐν τῇ θαλάσσῃ, καὶ πηγῶν ἀναβλύσεις, καὶ ποταμῶν ἐκβολαὶ, καὶ δένδρων ἐκφύσεις· ῥοαί τε, καὶ δῖναι, ταῖς τῶν πνευμάτων ἀνάλογον, αἱ μὲν, ἐν μέσοις πελάγεσιν· αἱ δὲ, κατὰ τοὺς εὐρίπους τε καὶ πορθμούς. πολλαὶ δὲ ἀμπώτεις λέγονται, καὶ κυμάτων ἀρσεις συμπεριοδεύειν ἀεὶ τῇ σελήνῃ, κατά τινας ὡρισμένους καιρούς.

* Stob. περιθεῖν.

Ὡς δὲ τὸ πᾶν εἰπεῖν, τῶν στοιχείων ἐγκεκραμένων ἀλλήλοις, ἐν ἀέρι τε, καὶ γῇ, καὶ θαλάσσῃ, κατὰ τὸ εἰκὸς, αἱ τῶν παθῶν ὁμοιότητες συνίστανται, τοῖς μὲν, ἐπὶ μέρους φθορὰς καὶ γενέσεις φέρουσαι· τὸ δὲ σύμπαν, ἀνώλεθρόν τε καὶ ἀγένητον φυλάττουσαι.

ΚΕΦΑΛ. ε΄.

Διὰ τί ὁ κόσμος ἐκ τῶν ἐναντίων ἀρχῶν συνεστηκὼς οὐ διαφθείρεται.

Καίτοι γέ τις * ἐθαύμασε, πῶς ποτε εἰ ἐκ τῶν ἐναντίων ἀρχῶν συνέστηκεν ὁ κόσμος, λέγω δὲ ξηρῶν τε καὶ ὑγρῶν, ψυχρῶν τε καὶ θερμῶν, οὐ πάλαι διέφθαρται καὶ ἀπόλωλεν· ὡς κἂν εἰ πόλιν τινὲς θαυμάζοιεν, * ὅπως διαμένει, συνεστηκυῖα ἐκ τῶν ἐναντιωτάτων ἐθνῶν, πενήτων λέγω, καὶ πλουσίων· νέων, καὶ γερόντων· ἀσθενῶν, ἰσχυρῶν· πονηρῶν, χρηστῶν· ἀγνοοῦσι δὲ, ὅτι τοῦτ' ἦν πολιτικῆς ὁμονοίας τὸ θαυμασιώτατον. λέγω δὲ, * ὅτι ἐκ πολλῶν μίαν, καὶ ὁμοίαν ἐξ ἀνομοίων, ἀποτελεῖ διάθεσιν, ὑποδεχομένην καὶ πᾶσαν φύσιν, καὶ τύχην. ἴσως δὲ καὶ τῶν ἐναντίων ἡ φύσις γλίχεται, καὶ ἐκ τούτων ἀποτελεῖ τὸ σύμφωνον, οὐκ ἐκ τῶν ὁμοίων· ὥσπερ ἀμέλει τὸ ἄρρεν συνήγαγε πρὸς τὸ θῆλυ, καὶ οὐχ ἑκάτερον πρὸς τὸ ὁμόφυλον, καὶ τὴν πρώτην ὁμόνοιαν διὰ τῶν ἐναντίων συνῆψεν, οὐ διὰ τῶν ὁμοίων. ἔοικε δὲ καὶ ἡ τέχνη τὴν φύσιν μιμουμένη, τοῦτο ποιεῖν· ζωγραφία μὲν γὰρ, λευκῶν τε καὶ μελάνων, ὠχρῶν τε καὶ ἐρυθρῶν χρωμάτων ἐγκερασαμένη φύσεις, τὰς εἰκόνας τοῖς προηγουμένοις ἀπετέλεσε συμφώνους· μουσικὴ δὲ, ὀξεῖς ἅμα καὶ βαρεῖς, μακρούς τε καὶ βραχεῖς φθόγγους μίξασα, ἐν διαφόροις φωναῖς μίαν ἀπετέλεσεν ἁρμονίαν·

* γ. ἐθαύμαζε.

* γ. διαμένει συνεστηκυῖα ἐκ τ.

* γ. τὸ μίαν ἐκ π. καὶ ἐ. ἐξ α. ἀποτελεῖ δ. ὑποδεχομένην π. & ita in simili loco c.6.

A Iam horum aliqui flatum ſecum erupturum rapiunt: alij ſaxa, alij cœnum. Sunt qui fontium ſcatebras edidere, quæ antea non erant. Oſtas, id eſt, truſores, vocant, qui vno obnixu ſubuertunt quod impulerunt. Sunt etiam qui quaſſabundi, atque vtroque declinantes vibranteſque, quod mouerint, ſemper erigunt: ob id Palmatiæ, hoc eſt, vibratores, dicti: efficiúntque terræmotum tremoris non diſſimilem. appellantur etiam Mycetiæ, terræmotus qui cum mugitu quatiunt: indito ob id nomine: quanquam ſæpe terræ mugitus abſque terræmotu contigerit: id quod aſſolet, quum ſpiritus impar quatiendæ terræ fuerit, intúſque cohibitus ac conuolutus arietarit impetu vehementi. adde quòd flatus qui terram ſubierint, corroboratiores fiunt à liquoribus B terrenis, qui intus conditi ſunt.

Proportione his reſpondent ea quæ in mari eueniunt. Nam & hiatus fiunt maris, & receſſus, vndarúmque excurſiones, interdum reciprocantes, interdum eluuie retro non recurrente: id quod proditum eſt circa Buram Helicémque contigiſſe. Sæpenumero etiam in mari euaporationes ignis exiſtunt, fontes exſcaturiunt, oſtia fluuiorum aperiuntur, arbores naſcuntur, fluxiones & vortices exiſtunt, inſtar eorum habentes quæ à flatibus deſignari dictum eſt, non in medio mari modò, ſed etiam in euripis & in fretis. Aiunt etiam multos æſtus vndarúmque ſublationes ſtatis quibuſdam temporibus cum Luna circumagi.

C Atque vt in vniuerſum dicam, cùm elementa in aere, in terra, & in mari, commoda inter ſe temperatura mixta ſint, nimirum affectionum quoque ſimilitudines iiſdem conſtant in ipſis: in ſingulis illæ quidem naturis ortus alternantes & interitus: vniuerſitatem verò aſſeruantes generationis immunem, atque corruptionis.

CAPVT V.

Qui fiat, ſi mundus ex contrariis conſtitit principiis, vt non iamdiu diſſolutus fuerit.

Tametſi extiterunt, qui ſeſe admirari addubitabundi dicerent, qui fieri tandem poſſet, ſi è D principiis contrariis mundus conſtitit, ſiccis dico & humidis, frigidis & calidis, vt iamdiu non diſſolutus fuerit atque interierit. Perinde quaſi mirari quiſquã debeat, quonam pacto ciuitas incolumis perduret, quæ è gentibus contrariis compoſita ſit, egenis inquam & diuitibus, iuuenibus & ſenio confectis, infirmis & valentibus, prauis atque innocentibus. Ignorantia eſt iſta vtique hominum, hoc eſſe in concordia ciuili non videntium longè admirabiliſſimum, quòd ex multis ipſa vnum efficit affectum, & è diſſimilibus ſimilem: omnis illa quidem naturæ ſuſceptrix & fortunæ. Atque haud ſcio an etiam contrariorum appetens ſit natura: ex E eiſque conſona, non item è ſimilibus conficiat. Sic certè ipſa marem cum fœmina coniunxit, non etiam cum ſuo horum vtrunque ſexu. Quin primam etiam concordiam per contraria, non per ſimilia deuinxit. Adde quòd ars naturæ æmulatrix hoc idem facit. Siquidem pictura, alborum nigrorúmque colorum, luteorúmque & rubrorum naturas inter ſe attemperans, effigies rerum efficit conſonas exemplaribus. Muſica acutis & grauibus ſonis, longiſque & breuibus vnà permixtis in diuerſis vocibus, vnum ex illis concentum abſolutum reddidit,

Grammatica, ex elementis vocalibus & mutis inuenta temperatura artem omnem literaturæ ex illis compoſitam reliquit. Hócque nimirum illud eſt, quod apud Heraclitum legitur, (Scotinum ab obſcuritate cognominatum.) *Criſpa* (inquit) *& minime criſpa vnà vinxeris, conſentiens & diſſentiens, conſonans & diſſonans: vnum etiam ex omnibus, omniaque ex vno.*

Itaque vniuerſorum coagmentationẽ, cæli inquam & terræ, & vniuerſi mundi, cinno quodam principiorum ſummè contrariorum commodè attemperato, natura ipſa digeſſit vna eadémq; concinna cohærentia: quippe ſiccum humido, calidũ frigido, graui leue mixtum, & rectum orbiculari. Terram etiam omnẽ, omne mare, ætherem, Solem, Lunã, & poſtremò totũ cælum, vis vna per omnia pertinens, certo ordine deſcripſit, concinnéque digeſſit: è diuerſis ipſa naturis atque impermixtis, aëre, terra, igne, & aqua, mũdum architectata. Quúmq; eum etiam globoſa ſuperficie comprehendiſſet: naturas quàm maximè contrarias, veluti edicta concordia & imperata, adſtrinxit ad cõſenſum mutuúmque commercium: cuiuſmodi rerũ molitione vniuerſitati ipſi ſalutem machinata eſt. Huius autem rei cauſa eſt concordia elementorum. Concordiæ porrò cauſa eſt æquabilitas, & quòd alterum altero non plus pollet: ad æquilibrium enim adæquant grauia cum leuibus, calida cum iis quæ ipſis oppoſita ſunt: natura vtique nos docente, in maioribus, æqualitatem tutricem eſſe concordiæ & ſeruatricem, concordiam autem, mundi eſſe ſalutem, rerũ omnium parentis, ac longè omnibus præſtantis pulchritudine. Nam quæ tandem natura præſtabilior ipſo? Quam enim dixeris cunque, eius vtique ipſius mundi pars erit. Nam quicquid pulchritudine præditum eſt, id quaſi gentile mundi, habet cum eo nominis ſocietatem: adeo quod rectè atque ordine conſtitutum eſt, id à mundi nomine concinnè digeſtum Græco ſermone, conſentaneáque partium compoſitione ſpecioſum eſſe ſignificatur. Ecquidnam eſt autem ſingularum partium, quod cum eo æquiparari poſſit ordine, quo cæleſtis motus temperatus eſt & conſtitutus? Sole vtique & luna, reliquis itẽ ſideribus intra ſpatia ſe mouentibus exquiſitiſſimè emodulata à ſeculo in ſeculum alterum. age ecquæ tandem vices tam ratæ eſſe poſſunt, quàm eſt exactè cõparatus à natura tempeſtatum anni tenor in orbem redeuntium? omnium ille quidem rerum fœcunditate præditus: æſtates deinceps hyemeſque referens temporibus deſtinatis: ſimul dies & noctes inoffenſis vicibus alternantes: è quibus menſes annúſque conficitur. ac magnitudine quidem ambitum longè ſummum cõplexus, motu perniciſſimo circũagitur: claritate ſynceriſſima præditus, vi etiam potentiáque fretus exorte vt ſenij, ſic interitus. Hic omnium animantium naturas, tum aquatilium, tum pedeſtrium, tum etiam in elemento ſpirabili victitãtium, ſegregat: iiſque ſpatia vitæ ſuis admetitur motibus. Ex hoc animam ducunt omnia: ab hoc animam habent animantia: ex hoc denique miracula rerum nouarum exiſtunt, quæ ſtatis temporibus efficiuntur. Vis ventorum omniuaga in ſeipſa conflictatur: Fulmina è cœlo cadunt: Pluuiæ procelloſæ atq; ſtupẽdæ ſubitos fragores edũt. Vnde fit, vt & vi humoris expreſſa, & vi ignea difflata conſtituatur vniuerſi concordia. Iam verò terra omni genere veſtita ſtirpium fruticantium, riguiſq; exuberãs largè erũmpentibus, trita veſtigiis animãtium, quæ in ea paſſim circumferuntur: omnia tempeſtiuè proferens ex ſeſe & vegetans, hoſpitaliq; ſinu excipiens, cùm innumeras ipſas rerũ formas perferat, ab eiſq; multipliciter afficiatur, nihilo ſeciùs tamẽ naturã aſſeruat indomitã ſenectute, quãlibet ipſa motibus contremefacta, vndis ſuperfluentibus proluta, incendiis denique inflammata, modo hac modò illa parte ſui.

A γραμματική δὲ, ἐκ φωνηέντων καὶ ἀφώνων γραμμάτων κρᾶσιν ποιησαμένη, τὴν ὅλην τέχνην ἀπ' αὐτῶν συνεστήσατο. ταὐτὸ δὲ τοῦτο ἦν καὶ τὸ παρὰ τῷ σκοτεινῷ λεγόμενον Ἡρακλείτῳ· συνάψιας οὖλα, καὶ οὐχὶ οὖλα· συμφερόμενον, καὶ διαφερόμενον· συνᾷδον, καὶ διᾷδον· καὶ ἐκ πάντων ἕν, καὶ ἐξ ἑνὸς πάντα.

Οὕτως οὖν καὶ τὴν τῶν ὅλων σύστασιν, οὐρανοῦ λέγω, καὶ γῆς, τοῦ τε σύμπαντος κόσμου, διὰ τῆς τῶν ἐναντιωτάτων ἀρχῶν κράσεως * μία διεκόσμησεν ἁρμονία· ξηρὸν γὰρ ὑγρῷ, θερμὸν δὲ ψυχρῷ, βαρεῖ τε κοῦφον μιγὲν, καὶ ὀρθὸν περιφερεῖ, γῆν τε πᾶσαν καὶ θάλασσαν, αἰθέρα τε, καὶ ἥλιον, καὶ σελήνην, καὶ τὸν ὅλον οὐρανὸν διεκόσμησε μία διὰ B πάντων διήκουσα δύναμις, ἐκ τῶν ἀμίκτων καὶ ἑτεροίων, ἀέρος τε καὶ γῆς, καὶ πυρὸς καὶ ὕδατος, τὸν σύμπαντα κόσμον δημιουργήσασα, καὶ μιᾷ διαλαβοῦσα σφαίρας ἐπιφανείᾳ, τάς τε ἐναντιωτάτας ἐν αὐτῷ φύσεις ἀλλήλαις ἀναγκάσασα ὁμολογῆσαι, καὶ ἐκ τούτων, μηχανησαμένη τῷ παντὶ σωτηρίαν· αἰτία δὲ, ταύτης μὲν, ἡ τῶν στοιχείων ὁμολογία· τῆς δὲ ὁμολογίας, ἡ ἰσομοιρία, καὶ τὸ μηδὲν αὐτῶν πλέον ἕτερον ἑτέρου δύνασθαι· τὴν γὰρ ἴσην * ἀντίστασιν ἔχει τὰ βαρέα πρὸς τὰ κοῦφα, καὶ τὰ θερμὰ πρὸς τὰ θάτερα, τῆς φύσεως ἐπὶ τῶν μειζόνων δι- C δασκούσης, ὅτι τὸ ἴσον σωστικόν πως ἐστὶν ὁμονοίας· ἡ δὲ ὁμόνοια τοῦ πάντων γενετῆρος καὶ περικαλλεστάτου κόσμου. τίς γὰρ ἂν εἴη φύσις τοῦδε κρείττων; ἣν γὰρ ἂν εἴποι τις, μέρος αὐτοῦ ἐστι. τό, τε καλὸν πᾶν, ἐπώνυμόν ἐστι τούτου· καὶ τὸ τεταγμένον, ἀπὸ τοῦ κόσμου λεγόμενον κεκοσμῆσθαι. τί δὲ τῶν ἐπὶ μέρους, δύναιτ' ἂν ἐξισωθῆναι τῇ κατ' οὐρανὸν τάξει τε καὶ φορᾷ ἄστρων, ἡλίου τε καὶ σελήνης, κινουμένων ἐν ἀκριβεστάτοις μέτροις, ἐξ αἰῶνος εἰς ἕτερον αἰῶνα. τίς δὲ γένοιτ' ἂν ἀψεύδεια τοιάδε, ἥντινα φυλάττουσιν αἱ καλαὶ καὶ γόνιμοι τῶν ὅλων ὧραι, θέρη τε καὶ χειμῶνας ἐπάγουσαι τεταγμένως, ἡμέρας τε καὶ νύκτας, D εἰς μηνὸς ἀποτέλεσμα, καὶ ἐνιαυτοῦ; καὶ μὴν, μεγέθει μὲν, ὁ αὐτὸς πανυπέρτατος· κινήσει δὲ, ὀξύτατος· λαμπρότητι δὲ, * εὐαγέστατος· δυνάμει δὲ, ἀγήρως τε καὶ ἄφθαρτος. οὗτος ἐνύδρων ζώων, καὶ πεζῶν, καὶ ἀερίων φύσεις ἐχώρισε, καὶ βίους ἐμέτρησε ταῖς ἑαυτοῦ κινήσεσιν. ἐκ τούτου πάντα ἐμπνεῖ τε καὶ ψυχὴν ἴσχει τὰ ζῷα. τούτου καὶ αἱ παράδοξοι νεοχμώσεις τεταγμένως ἀποτελοῦνται, συναρασσόντων μὲν ἀνέμων παντοίων, πιπτόντων δὲ ἐξ οὐρανοῦ κεραυνῶν, ῥηγνυμένων δὲ χειμώνων ἐξαισίων. διὰ δὲ τούτων τὸ νοτερὸν ἐκπιεζόμενον, τό, τε πυρῶδες διαπνεόμενον, εἰς ὁμόνοιαν ἄγει τὸ πᾶν καὶ καθίστη- E σιν. ἥ τε γῆ φυτοῖς κομῶσα παντοδαποῖς, νάμασί τε περιβλύζουσα, καὶ περιοχουμένη ζῴοις, κατὰ καιρὸν ἐκφύουσά τε πάντα καὶ τρέφουσα καὶ δεχομένη, μυρίας τε φέρουσα ἰδέας καὶ πάθη, τὴν ἀγήρω φύσιν ὁμοίως τηρεῖ, καί τοι καὶ σεισμοῖς τινασσομένη, καὶ πλημμυρίσιν ἐπικλυζομένη, πυρκαϊαῖς τε κατὰ μέρος φλογιζομένη.

* κ. μιᾷ δ. ἁρμονίᾳ.

* γρ. ἀντίτασιν, apud Stob. non ineptè.

* Scribe πολυαυγέστατος. Apuleius, *ſplendore perlucidus.* & ita etiam in Stobæi codicibus.

ταῦτα δὲ πάντα ἔοικεν αὐτῇ πρὸς ἀγαθοῦ γινόμενα, τὴν δι' αἰῶνος σωτηρίαν παρέχειν. σειομένης τε γὰρ, διεξάττουσιν αἱ τῶν πνευμάτων παρεμπτώσεις, κατὰ τὰ ῥήγματα τὰς ἀναπνοὰς ἴσχουσαι, καθὰ ἄνω λέλεκται. *καθαιρομένης τε ὄμβροις ἀποκλύζεται πάντα τὰ νοσώδη. περιπνεομένης δ' αὔραις, τά τε ὑπ' αὐτὴν, καὶ τὰ ὑπὲρ αὐτὴν εἰλικρινεῖται. καὶ μὴν, αἱ φλόγες μὲν τὸ παγετῶδες παραλύουσιν· οἱ πάγοι δὲ, τὰς φλόγας ἀνιᾶσι. καὶ τῶν ἐπὶ μέρους, τὰ μὲν γίνεται· τὰ δὲ, ἀκμάζει· τὰ δὲ, φθείρεται. καὶ αἱ μὲν γενέσεις, *ἐπαναστέλλουσι τὰς φθοράς· αἱ δὲ φθοραὶ, κουφίζουσι τὰς γενέσεις. μία δὲ ἐκ πάντων περαινομένη σωτηρία διὰ τέλους, ἀντιπαρεξισταμένων ἀλλήλοις· *καὶ τοτὲ μὲν, κρατούντων· τοτὲ δὲ, κρατουμένων, φυλάττει τὸ σύμπαν ἄφθαρτον δι' αἰῶνος.

* κ. καθαιρομένης, & mox περιπνεομένη, etiam apud Stob.

* Stobæi cod. ἀνασώζουσι.

* Stobæi cod. καὶ τὸ μὲν περικρατοῦν, τὸ δὲ περικρατούμενον φυλ.

ΚΕΦΑΛ. ϛ'.

Περὶ τῆς τῶν ὅλων συνεκτικῆς αἰτίας.

Λοιπὸν δὴ περὶ τῆς τῶν ὅλων συνεκτικῆς αἰτίας κεφαλαιωδῶς εἰπεῖν, ὃν τρόπον καὶ περὶ τῶν ἄλλων· πλημμελὲς γὰρ, περὶ κόσμου λέγοντας, εἰ καὶ μὴ δι' ἀκριβείας, ἀλλ' οὖν γε ὡς εἰς τυπώδη μάθησιν, τὸ τοῦ κόσμου κυριώτατον παραλιπεῖν. ἀρχαῖος μὲν οὖν τις λόγος καὶ πάτριός ἐστι πᾶσιν ἀνθρώποις, ὡς ἐκ θεοῦ τὰ πάντα, καὶ διὰ θεοῦ ἡμῖν συνέστηκεν. οὐδεμία δὲ φύσις, αὐτὴ καθ' ἑαυτὴν αὐτάρκης, ἐρημωθεῖσα τῆς ἐκ τούτου σωτηρίας. διὸ καὶ τῶν παλαιῶν εἰπεῖν τινὲς προήχθησαν, ὅτι ταῦτά ἐστι πάντα θεῶν πλέα τε, καὶ δι' ὀφθαλμῶν ἰνδαλλόμενα ἡμῖν, καὶ δι' ἀκοῆς, καὶ πάσης αἰσθήσεως· τῇ μὲν θείᾳ δυνάμει πρέποντα καταβαλλόμενοι λόγον, οὐ μὴν τῇ γε οὐσίᾳ. σωτὴρ μὲν γὰρ ὄντως ἁπάντων ἐστὶ, καὶ γενέτωρ τῶν ὁπωσδήποτε κατὰ τόνδε τὸν κόσμον συντελουμένων, ὁ θεός· οὐ μὴν αὐτουργοῦ καὶ ἐπιπόνου ζώου κάματον ὑπομένων, ἀλλὰ δυνάμει χρώμενος ἀτρύτῳ, δι' ἧς καὶ τῶν πόρρω δοκούντων εἶναι, περιγίνεται. τὴν μὲν οὖν ἀνωτάτω καὶ πρώτην ἕδραν αὐτὸς ἔλαχεν, ὕπατός τε διὰ τοῦτο ὠνόμασται, καὶ κατὰ τὸν ποιητὴν, *ἀκροτάτῃ κορυφῇ τοῦ σύμπαντος ἐγκαθιδρυμένος οὐρανοῦ· μάλιστα δέ πως αὐτοῦ τῆς δυνάμεως ἀπολαύει τὸ πλησίον αὐτοῦ σῶμα· καὶ ἔπειτα, τὸ μετ' ἐκεῖνο· καὶ ἐφεξῆς οὕτως, ἄχρι τῶν καθ' ἡμᾶς τόπων. διὸ γῆ τε καὶ τὰ ἐπὶ τῆς γῆς, ἔοικεν ἐν ἀποστάσει πλείστῃ τῆς ἐκ θεοῦ ὄντα ὠφελείας, ἀσθενῆ καὶ ἀκατάλληλα εἶναι, καὶ πολλῆς μεστὰ ταραχῆς. οὐ μὴν ἀλλὰ καὶ, καθόσον ἐπὶ πᾶν διικνεῖσθαι πέφυκε τὸ θεῖον, καὶ τὰ καθ' ἡμᾶς ὁμοίως συμβαίνει, τά τε ὑπὲρ ἡμᾶς, κατὰ τὸ ἐγγύς τε καὶ πορρωτέρω θεοῦ εἶναι, μᾶλλον δὲ καὶ ἧττον ὠφελείας μεταλαμβάνοντα. κρεῖττον οὖν ὑπολαβεῖν, ὃ καὶ πρέπον ἐστὶ, καὶ θεῷ μάλιστα ἁρμόζον, ὡς ἡ ἐν οὐρανῷ δύναμις ἱδρυμένη, καὶ τοῖς πλεῖστον ἀφεστηκόσιν, ὡς ἐνί γε εἰπεῖν, καὶ σύμπασιν αἴτιος γίνεται σωτηρίας, μᾶλλον, ἢ ὡς διήκουσα καὶ φοιτῶσα ἔνθα μὴ καλὸν μηδὲ εὔσχημον, αὐτουργεῖν τὰ ἐπὶ γῆς.

* Ιλιάδ. α.

A Quinetiam illa ipſa omnia cenſeri meritò poſſint incolumitatis eius cauſa commodè euenire, ſalutémq; illi ſempiternam præſtare. Siquidē ea motu quaſſata, continuò proſiliunt venti qui introrſus inſinuarant: vtique ſpiraculis terrarū diſceſſibus patefactis, vt ſuperiùs dictū eſt. Imbribus etiā tum expurgatur, cùm omnia peſtifera in ea abluuntur: ad ſynceriorémque conſtitutionē ſuper ſubterque tum reducitur, quum auris perſpiratur. Et cōflagrationes quidē quod concretius eſt terræ, cōcoquunt: congelationes itē quod inflammatum eſt, id attemperāt ipſæ atque remittūt. Ac ſingularum quidem rerum aliæ oriuntur, aliæ vegetantur, & aliæ occidūt: cùm interim ortus compeſcant graſſanteis interitus, rurſúſque interitus rerum B leuent ortus exuberanteis. Vnica verò ex omnibus conflata incolumitas permanet ipſa in æuum: cùm inter ſe rebus ex aduerſo obſiſtentibus, & cedentibus viciſſim atque præualentibus, vniuerſitas conſeruetur in ſempiternum, noxam nullam contrahens.

CAPVT VI.

De deo, ſiue cauſa quæ cunctarum rerum vim habet tutricem & continentem.

Reſtat vt ſummatim de cauſa diſſeramus, quæ cunctarum ipſa rerum vim habet tutricem & continentē: quemadmodum cætera perſtrinximus. Flagitij enim inſtar eſſet, cùm de mundo dicere inſtituerim, tractatu ſi minùs exquiſito fortaſſe, at certè qui ſit eſſe poſſit ad formulam doctrinæ craſſiorem, intactā præcipuam mundi partem principémque præterire. C Vetus igitur ſermo eſt, à maioribúſque proditus inter omnes homines, vniuerſa tū ex Deo tum per Deum conſtituta fuiſſe, atque coagmentata: nullámq; naturam ſatis inſtructam ad ſalutem eſſe poſſe, quæ citra Dei præſidium ſuæ ipſa demum tutelæ permiſſa ſit. Quocirca veterum nonnulli eouſque prouecti ſunt, vt hæc omnia dictitarent Deorum eſſe plena, hauririque eorū ſpectra ab hominibus oculis & auribus, reliquiſque ſenſibus: ſententiæ illi quidē fundamenta iacientes diuinæ fortaſſe potentiæ, non item diuinæ naturæ congruentis. Etenim cunctorū quæ rerum natura complectitur, cùm ſeruator eſt Deus: tum verò quæcunque in hoc mundo quo quo modo perficiuntur, eorum omnium idem genitor eſt: non ſic tamen D ipſe vt opificis in morem, animaliſq; laſſitudinē ſentientis, labore affici poſſit: vt qui ea facultate vtatur, quæ nulli cedat difficultati: cuius ipſe vi facultatis omnia in poteſtate continet: nec minùs etiam quæ lōgiùs ab ipſo vidētur eſſe ſummota. Summam igitur & primam ſedem mundi ſortitus, ea de cauſa Hypatus, quaſi ſupremus appellatus eſt: & (vt inquit Poëta) in ſummo culmine vniuerſi cæli ſuum habet ipſe domicilium ſitum & collocatum. Maximè verò vim eius ſentit numinéque eius ante omnia fruitur id corpus, quod proximè eum ſitum eſt: tum quod ſecundū ab hoc ſitum habet: & vnumquodq; deinceps, prout ſituum ordo ad noſtrum vſque locum natura conſtitu- E tus eſt. Quo fit vt terra & terrena omnia, quàm lōgiſſimè ab diuinitatis adminiculatione abſcedunt, tam infirmitate ſumma ſint ipſa, concinnitatiſque ſibi cōſentaneæ maximè expertia: atque ideo multo tumultu exagitata. Atqui cùm ita ſit numen diuinum natura ſua comparatum, quoquò vt versùs permeet: nimirum ea in quibus ipſi verſamur, ac nobis ſuperiora, pro eo quantus eſt acceſſus ad Deum, vel abſceſſus ab eo eius opitulationem quoque ſentiunt. Proinde id præſtabilius eſſe cenſemus, Deóque tum decētius, tum magis conſentaneum, ita de eo opinari, vt dicamus, poteſtatem illam in cœlo ſedes ſuas habentem, incolumitatis cauſam rebus vniuerſis præſtare, iis quoque quæ longiùs ab ea remota ſunt. nec illis aſſentiri, qui eam ipſam poteſtatem per omnia pertendentem, & ventitantem ad ea quoque quæ nec adire ipſam honeſtum eſt, nec dictu ſpecioſum, ſua illic opera efficere contendunt, réſque terrenas adminiſtrare.

A atqui ne ex hominũ quidẽ principum dignitate eſſe dixeris, cuilibet operi incũbere: vt (verbi gratia) exercitus ducis, aut vrbis præfecti, atque etiã domus primarij diſpenſatoris, ſi faſciculũ ſarcinariũ componere, aut viliorẽ aliquã operã obire vſu venerit vt neceſſe ſit, cuiuſmodi munera, magni Regis tempore, ne quoduis quidẽ mãcipiũ eius facilè obiuiſſet. Quippe (vt proditur) viſenda quædã ſpecies Cãbyſis, Xerxis, & Darij regnantiũ, in exquiſitũ maieſtatis faſtigiũ exornata erat, compoſitáq; magnificè, omnibúſque numeris venerationis auguſta. Et quidẽ (vt fama eſt) Suſis ipſe aut Ecbatanis ſedibus collocatis, procul hominũ cõſpectu regiã ſanè admirandã obtinebat, ambitu ſeptã auro, electro eboréque fulgẽti: cui veſtibula multa erãt atriaque cõtinentia: multæ verò ianuæ, B multorũ ſtadiorũ interſtitiis ita dimenſæ inter ſe atq; diremptæ, vt aditus æneis foribus muriſque magnis obſtructi atque muniti eſſent. Tum autem viri principes & lectiſſimi in ſtationes digeſti erãt, atque decuriati rectè atque ordine: pars munere ſtipantiũ regẽ ipſum fungentes, eique famulantium: pars cuſtodes circa ſepta regiæ appoſiti, (ianitores emiſſarióſq; appellabãt) cùm interim Rex ipſe, qui idẽ Dominus Deúſq; vocitabatur, omnia & videret & audiret. Ab his itẽ erãt alij vectigaliũ quæſtores obuentionúmque cõſtituti: alij duces tũ bellici, tũ venatores: alij coactores munerarij: alij denique munerũ reliquorũ curatores, prout vſus ratióque adminiſtrandarũ rerũ ferebat. Tũ autẽ vniuerſum Aſiæ imperiũ, Helleſpõto quidẽ ab occidentis partibus terminatũ, India autẽ ab Orientis, C tegũt pro poteſtate Prætores, Præfecti, & Reguli, ſerui regis ipſius qui magnus appellatur. Curſores etiã, exploratoréſq;, ſtatores, & cuſtodes ſtationarij, & denique ſpecularij excubitores. Quorum erat ipſorũ is apparatus, ea deſcriptæ collocationis ratio: tam rato ordine vices munerum conſtitutæ: & præſertim eorũ qui ignes edere prænũcios, & tollere è ſpeculis ſoliti ſunt, deinceps in aliam illi quidẽ ex alia dantes accipientéſque ſignũ in orbẽ: ab vſque finibus imperij adVſque Suſa & Ecbatana, quicquid rerũ nouarũ quiſquã in Aſia moliretur aut inceptaret, Rex vt ipſe vno die reſciſceret. atqui ſtatuere nos oportet, magni ipſi° Regis faſtigiũ, præ vt quidẽ eſt Dei eminẽtia, qui pro poteſtate Mundum tanquam prouinciam obtinet, tã eſſe infimũ, quàm eſſet ſummũ hoc ipſum Regis fa- D ſtigiũ, ſi cum animãte quodã viliſſimo atque infirmiſſimo componeretur. Quapropter ſi è dignitate regis haudquaquã eſſet, Xerxẽ functione propria adminiſtrare omnia & abſoluere quæcunque facta cuperet, ne ipsũ quidẽ operib° faciẽdis inſtantẽ, curatoris operũ officio perfũgi: lõgè id nimirũ minùs Deo cõuenit.

Quare auguſtius id decentiúſque exiſtimandũ eſt, Deũ ſummo in loco ita eſſe collocatũ, numinis vt tamẽ eius vis per vniuersũ mundũ pertinẽs, tũ Solẽ Lunámque moueat, tũ cœlũ omne circũagat: ſimúlque causã præbeat eorũ quæ in terra sũt, ſalutis atque incolumitatis. Neque verò illi ipſi itidẽ vt principibus E mortaliũ, op° eſt, aut artificioſa molitione, aut alieno miniſterio: quãdo ij propria infirmitate præditi, operarum decurias rebus conficiendis & numeroſas manus adhibent. Illud autem diuinitati maximè conſentaneum, vt formas rerum omnium citra difficultatem ſimplicique motu abſoluat: non ſecus atque illi machinatores ſolent, qui inſtrumento vno demittendo multos & varios effectus edunt: aut vt illi præſtigiatores faciunt, quos Neuroſpaſtas ob id appellant, quòd imagũculas animatas eſſe fidiculis ductitãdis emẽtiuntur: qui cùm funiculũ ipſi aut neruum adduxerunt, cieri ceruicem & manum quaſi animantis ſimulachri, humerúmque itidem & oculum faciunt:

A τοῦτο μὲν γὰρ οὐδὲ ἀνθρώπων ἡγεμόσιν ἁρμόττει, παντὶ καὶ τῷ τυχόντι ἐφίστασθαι ἔργῳ· οἷον, στρατιᾶς ἄρχοντι, ἢ πόλεως, ἢ οἴκου· καὶ εἰ χρεὼν στρωματόδεσμον εἴη δῆσαι, καὶ εἴ τι φαυλότερον ἀποτελεῖν ἔργον. ὃ ἐπὶ τοῦ μεγάλου βασιλέως, οὐκ ἂν τὸ τυχὸν ἀνδράποδον ποιήσειεν. ἀλλ' ὡς ἱστορεῖται τὸ Καμβύσου, Ξέρξου τε καὶ Δαρείου πρόσχημα, εἰς σεμνότητος καὶ ὑπεροχῆς ὕψος μεγαλοπρεπῶς διεκεκόσμητο· αὐτὸς μὲν γάρ, ὡς λόγος, ἵδρυτο ἐν Σούσοις ἢ Ἐκβατάνοις, παντὶ ἀόρατος, θαυμαστὸν ἐπέχων βασίλειον οἶκον, καὶ περίβολον χρυσῷ καὶ ἠλέκτρῳ καὶ ἐλέφαντι ἀστράπτοντα· πυλῶνες δὲ πολλοὶ καὶ συνεχεῖς, πρόθυρά τε συχνοῖς εἰργόμενα σταδίοις ἀπ' ἀλλήλων· B θύραις τε χαλκαῖς, καὶ τείχεσι μεγάλοις ὠχύρωτο. ἔξω δὲ τούτων, ἄνδρες οἱ πρῶτοι καὶ δοκιμώτατοι διεκεκόσμηντο, οἱ μὲν, ἀμφ' αὐτὸν βασιλέα, δορυφόροι τε καὶ θεράποντες· οἱ δέ, ἑκάστου περιβόλου φύλακες, πυλωροί τε καὶ ὠτακουσταὶ λεγόμενοι· ὡς ἂν ὁ βασιλεὺς αὐτὸς δεσπότης καὶ θεὸς ὀνομαζόμενος, πάντα μὲν βλέποι, πάντα δὲ ἀκούοι. χωρὶς δὲ τούτων, ἄλλοι καθειστήκεσαν προσόδων ταμίαι, καὶ στρατηγοὶ πολέμων καὶ κυνηγεσίων, δώρων τε ἀποδεκτῆρες, τῶν τε λοιπῶν ἔργων ἕκαστοι κατὰ τὰς χρείας ἐπιμεληταί. τὴν δὲ σύμπασαν ἀρχὴν τῆς Ἀσίας, περατουμένην, Ἑλλησπόντῳ μὲν, ἐκ τῶν πρὸς ἑσπέραν μερῶν· *Ἰν- C δῶν δέ, ἐκ τῶν πρὸς ἕω, διειλήφεσαν κατὰ ἔθνη στρατηγοὶ καὶ σατράπαι καὶ βασιλεῖς, δοῦλοι τοῦ μεγάλου βασιλέως, ἡμεροδρόμοι τε καὶ σκοποί, καὶ ἀγγελιαφόροι, καὶ φύλακες, φρυκτωριῶν τε ἐποπτῆρες. τοσοῦτος δὲ ἦν ὁ κόσμος, καὶ μάλιστα τῶν φρυκτωριῶν, κατὰ διαδοχὰς πυρσευόντων ἀλλήλοις ἐκ περάτων τῆς ἀρχῆς μέχρι Σούσων καὶ Ἐκβατάνων, ὥστε τὸν βασιλέα γινώσκειν αὐθημερὸν πάντα τὰ ἐν τῇ Ἀσίᾳ καινουργούμενα. νομιστέον δὴ τὴν τοῦ μεγάλου βασιλέως ὑπεροχὴν, πρὸς τὴν τοῦ τὸν κόσμον ἐπέχοντος θεοῦ, τοσοῦτον καταδεεστέραν, ὅσον τῆς ἐκείνου, τὴν τοῦ φαυλοτάτου τε καὶ D ἀσθενεστάτου ζώου. ὥστε, εἴπερ ἄσεμνον ἦν αὐτὸν, αὑτὸν δοκεῖν Ξέρξην αὐτουργεῖν ἅπαντα καὶ διατελεῖν ἃ βούλοιτο, καὶ ἐφιστάμενον διοικεῖν, πολὺ μᾶλλον ἀπρεπὲς ἂν εἴη τοῦτο θεῷ.

Σεμνότερον δὲ καὶ πρεπωδέστερον, αὐτὸν μὲν ἐπὶ τῆς ἀνωτάτω χώρας ἱδρῦσθαι, τὴν δὲ δύναμιν διὰ τοῦ σύμπαντος κόσμου διήκουσαν, ἥλιόν τε κινεῖν καὶ σελήνην, καὶ τὸν πάντα οὐρανὸν περιάγειν, αἴτιόν τε γίνεσθαι τῆς ἐπὶ τῆς γῆς σωτηρίας· οὐδὲν γὰρ ἐπιτεχνήσεως αὐτῷ δεῖ, καὶ ὑπηρεσίας τῆς παρ' ἑτέρων, ὥσπερ τοῖς παρ' ἡμῖν ἄρχουσι τῆς πολυχειρίας διὰ τὴν E ἀσθένειαν. ἀλλὰ τοῦτο ἦν τὸ θειότατον, τὸ μετὰ ῥᾳστώνης καὶ ἁπλῆς κινήσεως παντοδαπὰς ἀποτελεῖν ἰδέας, ὥσπερ ἀμέλει δρῶσιν * οἱ μεγαλότεχνοι διὰ μιᾶς ὀργάνου σχαστηρίας, πολλὰς καὶ ποικίλας ἐνεργείας ἀποτελοῦντες. ὁμοίως δὲ καὶ οἱ νευροσπάσται, μίαν μήρινθον ἐπισπασάμενοι, ποιοῦσι καὶ αὐχένα κινεῖσθαι, καὶ χεῖρα τοῦ ζώου, καὶ ὦμον, καὶ ὀφθαλμόν·

* κ. Ἰνδῶν δὲ, & ita legendũ vel τῶν δ' Ἰνδῶν, nam ita Apuleius, *Sed omne antiquũ* vulgò (*Atticum* ineptiſſimè) *ab occidente Helleſpontus terminabat, ab ortu gens inchoabat Indorũ.*

* Corruptus locus. Scrib. *οἱ μηχανοποιοί.* Apuleius vertit, *machinatores fabricarum.*

ἔστι δ' ὅτε πάντα τὰ μέρη, μετά τινος εὐρυθμίας. οὕτως A δὲ καὶ ἡ θεία φύσις ἀπό τινος ἁπλῆς κινήσεως τοῦ πρώτου, τὴν δύναμιν εἰς τὰ συνεχῆ δίδωσι, καὶ ἀπ' ἐκείνων πάλιν εἰς τὰ πορρωτέρω, μέχρις ἂν διὰ τοῦ παντὸς διεξέλθῃ. κινηθὲν γὰρ ἕτερον ὑφ' ἑτέρου, καὶ αὐτὸ πάλιν ἐκίνησεν ἄλλο σὺν κόσμῳ, δρώντων μὲν πάντων οἰκείως ταῖς σφετέραις κατασκευαῖς, οὐ τῆς αὐτῆς δὲ ὁδοῦ πᾶσιν οὔσης, ἀλλὰ διαφόρου καὶ ἑτεροίας. ἔστι δὲ οἷς καὶ ἐναντίας, καίτοι τῆς πρώτης οἷον ἐνδόσεως εἰς κίνησιν * μιᾶς ἀποδοθείσης· ὥσπερ ἂν εἴ τις ἐξ ἀγγείου ὁμοῦ ῥίψειε σφαῖραν, καὶ κύβον, καὶ κῶνον, καὶ κύλινδρον· ἕκαστον γὰρ αὐτῶν κατὰ τὸ ἴδιον κινηθήσεται σχῆμα· ἢ εἴ τις ὁμοῦ ζῷον ἔνυδρόν τε, καὶ B χερσαῖον, καὶ πτηνὸν ἐν τοῖς κόλποις ἔχων ἐκβάλοι· δῆλον γὰρ ὅτι, τὸ μὲν νηκτὸν, ἀλλόμενον, εἰς τὴν ἑαυτοῦ δίαιταν ἐκνήξεται· τὸ δὲ χερσαῖον,* εἰς τὰ σφέτερα ἤθη καὶ νομοὺς διεξερπύσει· τὸ δὲ ἀέριον ἐξαρθὲν ἐκ γῆς μετάρσιον οἰχήσεται πετόμενον, μιᾶς τῆς πρώτης αἰτίας πᾶσιν ἀποδούσης τὴν οἰκείαν εὐμάρειαν. οὕτως ἔχει καὶ ἐπὶ κόσμου· διὰ γὰρ ἁπλῆς τοῦ σύμπαντος οὐρανοῦ περιαγωγῆς ἡμέρᾳ καὶ νυκτὶ περατουμένης, ἀλλοῖαι πάντων διέξοδοι γίνονται, καίτοι ὑπὸ μιᾶς σφαίρας περιεχομένων, τῶν μὲν θᾶττον, τῶν δὲ, σχολαιότερον κινουμένων, παρά τε τὰ τῶν διαστημάτων μήκη, καὶ τὰς ἰδίας ἑκάστων κατασκευάς. C σελήνη μὲν γὰρ, ἐν μηνὶ τὸν ἑαυτῆς διαπεραίνεται κύκλον, αὐξομένη τε, καὶ μειουμένη, καὶ φθίνουσα. ἥλιος δὲ, ἐν ἐνιαυτῷ· καὶ οἱ τούτου ἰσόδρομοι, ὅ, τε Φωσφόρος, καὶ ὁ Ἑρμῆς λεγόμενος. ὁ δὲ Πυρόεις, ἐν διπλασίονι τούτων χρόνῳ· ὁ δὲ Διὸς, ἐν ἑξαπλασίονι τούτου· καὶ τελευταῖος, ὁ τοῦ Κρόνου λεγόμενος, ἐν διπλασίονι καὶ ἡμίσει τοῦ ὑποκάτω. μία δὲ ἐκ πάντων ἁρμονία συναδόντων καὶ χορευόντων κατὰ τὸν οὐρανὸν, ἐξ ἑνός τε γίνεται, καὶ εἰς ἓν ἀπολήγει. κόσμον δ' ἐτύμως τὸ σύμπαν, ἀλλ' οὐκ ἀκοσμίαν, ὀνομάσαις ἄν.

Καθάπερ δὲ ἐν χορῷ, κορυφαίου κατάρξαντος, συνεπηχεῖ πᾶς ὁ χορὸς ἀνδρῶν, ἔσθ' ὅτε καὶ γυναικῶν, ἐν D διαφόροις φωναῖς ὀξυτέραις καὶ βαρυτέραις μίαν ἁρμονίαν ἐμμελῆ κεραννύντων· οὕτως ἔχει καὶ ἐπὶ τοῦ τὸ σύμπαν διέποντος θεοῦ· κατὰ γὰρ τὸ ἄνωθεν ἐνδόσιμον ὑπὸ τοῦ φερωνύμως ἂν κορυφαίου προσαγορευθέντος, κινεῖται μὲν τὰ ἄστρα ἀεὶ, καὶ ὁ σύμπας οὐρανός. πορεύεται δὲ διττὰς πορείας ὁ παμφαὴς ἥλιος· τῇ μὲν, ἡμέραν καὶ νύκτα διορίζων, ἀνατολῇ καὶ δύσει· τῇ δὲ, τὰς τέσσαρας ὥρας ἄγων τοῦ ἔτους, πρόσω τε βόρειος, καὶ ὀπίσω νότιος διεξέρπων. γίνονται δὲ ὑετοὶ κατὰ καιρὸν, καὶ ἄνεμοι, καὶ δρόσοι, τά τε πάθη τὰ ἐν τῷ περιέχοντι συμβαίνοντα, διὰ τὴν πρώτην καὶ ἀρχέγονον αἰτίαν. ἕπονται δὲ τούτοις, ποταμῶν E ἐκροαί, θαλάσσης ἀνοιδήσεις, δένδρων ἐκφύσεις, καρπῶν πεπάνσεις, γοναὶ ζῴων, ἐκτροφαί τε πάντων, καὶ ἀκμαί, καὶ φθίσεις, συμβαλλομένης πρὸς ταῦτα καὶ τῆς ἑκάστου κατασκευῆς, ὡς ἔφην. ὅταν οὖν ὁ πάντων ἡγεμών τε καὶ γενέτωρ, ἀόρατος ὢν ἄλλως, πλὴν λογισμῷ, σημήνῃ πάσῃ φύσει μεταξὺ οὐρανοῦ τε καὶ γῆς φερομένῃ,

* Fort. μιᾶς. ſed & μία ferri poteſt.

* Apuleius, *illa inter agros legibus & inſtituis ſuis naturali lege aggregabuntur.* parum ſcitè profectò, vt alia nonnulla.

A interdum etiam omnia membra: idque quadam cum venuſtate atque æquabilitate motus. Hoc igitur modo natura diuina ab vno eodémque ſimplici motu primo vim ſuam immittit in ea quæ ſunt primò continentia: ab illiſque ſubinde in ea quæ longiùs atque longiùs abſunt, quoad permeauerit per vniuerſa. Quippe alterum ab altero motum, rurſus ipſum quoque aliud mouet cum mundo: quum vnumquodque interim agat conuenienter conſtitutioni ſuæ; nec tamen eadem ſit via omnibus, ſed diuerſa, nonnullis etiam contraria: tametſi primus illis velut ad concentum atque æquabilitatem auſpicatus, natura ſit comparatus ad vnum motum: ſimiliter atque ſi quis ex eodem vaſe ſimul iaciat globum, teſſeram, turbinem, B & columellam: nempe vnumquodque eorum accommodatè ſuæ formæ mouebitur. Aut ſi quis animal vnum aquatile, aliúdque terreſtre, & aliud volucre, è ſinu ſuo emittat: planum eſt enim quòd natatile eò proſiliens enatauerit, vbi ei commodum victitare: terreſtre, ad ſuas ſedes paſcuáque ſua [illegible] pſerit: at äërium è terra ſublimè raptum euolauerit, vna vtique eadémque prima cauſa propriam eorum vnicuique aptitudinem reddente. Eadémque ratio eſt in mundo. Si quidem ab vna cæli vniuerſi conuerſione, quæ die noctúque finitur, aliæ atque aliæ permeationes fiunt. Quúmque vno omnia coerceantur globo, pars tamen celeriùs, pars mouetur tardiùs: nimirum interuallorum longitudine & ſingulorum C opificio eam differentiam efficiente. Et Luna quidem menſe ſuum peragit orbem, augeſcens viciſſim imminutáque & tabeſcens. Sol anni ſpatio ſuum orbem metitur, & qui eum æquant curſu Lucifer & Mercurius: Pyrois ſpatio altero tanto maiore: Iouis ſtella ſpatio Pyroëntis ſexcuplici: Vltima, Saturni quæ dicitur, tempore ſeſquiplo maiore quàm quantū eſt id quo circumagitur illa quæ infra ipſam eſt proximè. Qui verò ex omnibus concentus exiſtit conſonantibus in cælo, chorúmque conficientibus, vt ex vno ille quidem oritur, ita in vnum deſinit. Vniuerſúmque ipſum commodiùs Coſmon nominaueris, id eſt, compagem rerum compoſitam, concinnóque ordine digeſtam: quàm acoſmiam, id eſt, congeriem confuſam & inconditam.

D Quemadmodum porrò fit in choro, vt auſpicanti præſuli aut præcentori accinat omnis chorus, è viris interdū fœminiſque cōpoſitus, qui diuerſis ipſi vocibus, grauibus ſcilicet & acutis, concentum attemperant: eandem ipſi rationē ſtatuimus & in Deo, qui vniuerſum mundum moderatur & regit. Et ſidera enim ſemper, & vniuerſum ipſum cælum, eos ad numeros mouentur, quos Deus ſurſum quaſi auſpicando præcinendóque emodulatur, quem à ſimilitudine ſanè congrua Coryphæum mundi rectè appellaueris, quaſi preſultorem ipſum, huiúſque chori magiſtrum. Geminis autem itineribus Sol ingreditur, lumine ſuo cuncta quoquoverſus colluſtrans: diem noctémque E altero itinere diſterminans, ortu ſuo ſcilicet, & occaſu: altero quatuor anni tempora ſecum ductitans, vltro citróque per cælum perreptando, nunc Aquilonius ipſe, nunc Auſtrinus. Quid dicam pluuias tempeſtiuè exiſtentes, ventos & rores, omneiſque permotiones quæ in aëre eueniunt à principe rerum cauſa atque primordiali? adde fluminum lapſus, maris æſtus intumeſcentis, enaſcentium arborum incremēta, frugum maturitates, fœturas animalium: denique vegetationes rerum omnium adoleſcentium primùm, deinde tabeſcentium, eôdem accedentibus cauſis (vt dictum eſt) à conſtitutionibus ſingulis rerum atque opificiis. Itaque ille omnium princeps paréntque, animi tantùm ſenſu ſpectabilis, ſimul ac ſignum naturis dedit inter cælum terrámque vehentibus

earum

earum vnaquæque in orbibus ſuis iugi motu cieatur, atque intra ſuos limites, alternis condita atque apparens: ſexcentas illas formas eodem à principio exhibens, viciſsimque ſubducens. Quod verò in hiſce rebus agitur, magnopere ſimile eſt iis quæ belli tempore inter homines factitantur. Namque ſtatim vt claſſicum exaudiri in exercitu cœptum eſt: alios ipſe videas ſcuta ſibi aptantes: loricam alios induentes: alios ocreas vel galeam ſumere, vel balteo ſe cingere feſtinanteis. Rurſus videas qui frenatos equos admittant: alios qui currus conſcendant: qui denique teſſeram per explicatam aciem prodant. Tum manipuli ductor, ad manipulum: centurio excurrit ad centuriam. Poſtremò equites ad cornu: velites ad ſtationem quiſque ſuā feſtinant: cùm interim ſub vno ductore omnia moueantur: qui imperia & ipſe ſignificanda accepit ab eo apud quem ſumma eſt imperij. Eodem nos & ipſos modo cenſere conuenit de vniuerſo. Quum enim ab vna vi impultrice cieantur omnia: fit vtique quod cuique commodum eſt & conueniens. Nec verò ſi ea vis ipſa nec cerni ab hominibus, nec apparere poteſt: quoquo pacto id obſtat, aut illi ad ea quæ diximus agenda, aut nobis ad fidem hiſce rebus accommodandam. Nam & anima ipſa qua viuimus, qua vrbes, qua domos habitamus: cùm haudquaquam ſub aſpectum noſtrum ſita ſit, operibus tamen ipſis videtur: omniſque vitæ cultus nitórque vt ab ea inuentus eſt & deſcriptus, ita ex ea tenorem ſuum ſuum ſeruat: Terræ cultura & conſitio, artium excogitationes, vſus legum, Reipubl. rectè atque ordine conſtitutæ ratio, adminiſtrationes ciuiles, bellum extra fines patriæ, & rurſus pax in ea.

Proinde hęc etiam de Deo ſentienda nobis ſunt: illo quidem, ſi vim ſpectes, valētiſſimo: ſi decorem, formoſiſſimo: ſi vitam, immortali: denique ſi virtutem, præſtantiſſimo. Quapropter cùm ſit inconſpicabilis naturæ omni interituræ, ipſis nihilo ſecius ipſe cernitur ab operibus. Atque ea quidem quæ in aëre fiunt quoquo modo affecto, quæ in terra, quæ in aqua, ea certè Dei opera eſſe meritò dixerimus: Dei inquam opera, cum imperio ſummo Mundum ac pro poteſtate obtinentis. Ex quo Deo, vt inquit Empedocles phyſicus,

Omnia quotquot erunt, quot ſunt præſentia, quótque
Orta fuère antehac, ſtirpes, hominéſque, feræque,
Inde etiam volucres, piſcéſque humoris alumni.

Enimvero non tam abſurda quàm puſilla comparatio (vt opinor) fuerit, ſi Mundum cum illis lapidibus componamus, qui in operibus fornicatis, forficis in modum diſpanſi conformatis ſtructura ſeſe interſecante, vmbilici vocantur. Etenim ij lapides in medio collocati, qua parte ſcilicet vtroque verſus ſtructura arcuata pandatur, quaſique oneri cedit: in cohærentia continent, atque in conſtructione ordinata totam formam operis, immobilémque aſſeruant. Fama eſt etiam Phidiam illum ſtatuarium, quum Mineruam illam quæ eſt in arce, coagmentaret, in medio eius ſcuto faciem ſuam expreſſiſſe, oculóſque fallenti artificio ita deuinxiſſe ſimulachro, eximere inde vt ipſam ſiquis cuperet, minimè poſſet, aliter quidem certè, quàm vt ipſum ſolueret ſimulachrum, opúſque eiuſmodi compactile confunderet. Hanc eandem igitur rationem Deus habet in mundo, vtpote qui vniuerſorum coagmentationem cohærentem cohibeat & coarctet, incolumitatémque vniuerſitatis conſeruet: niſi quatenus non medio ille loco, in terra ſcilicet, vbi turbida regio eſt: ſed in excelſo ſitus eſt, purus ipſe in puro loco. Quem locum tum Vranon ab origine vocis dicimus, quaſi terminum extimum ſupremorum corporum: tum etiam Olympum,

κινεῖται πᾶσα ἐνδελεχῶς ἐν κύκλοις καὶ πέρασιν ἰδίοις· ποτὲ μὲν, ἀφανιζομένη· ποτὲ δὲ, φαινομένη, μυρίας ἰδέας ἀναφαίνουσά τε καὶ πάλιν ἀποκρύπτουσα ἐκ μιᾶς ἀρχῆς. ἔοικε δὲ κομιδῆ τὸ δρώμενον, τοῖς ἐν πολέμου καιροῖς μάλιστα γινομένοις, ἐπειδὰν ἡ σάλπιγξ σημαίνῃ τῷ στρατοπέδῳ· τότε γὰρ τῆς φωνῆς ἕκαστος ἀκούσας, ὁ μὲν, ἀσπίδα ἀναιρεῖται· ὁ δὲ, θώρακα ἐνδύεται· ὁ δὲ, κνημῖδας, ἢ κράνος, ἢ ζωστῆρα περιτίθεται· καὶ ὁ μὲν, ἵππῳ χαλινοῖ· ὁ δὲ, συνωρίδα ἀναβαίνει· ὁ δὲ, σύνθημα παρεγγυᾷ. καθίσταται δὲ εὐθέως, ὁ μὲν λοχαγὸς, εἰς λόχον· ὁ δὲ ταξίαρχος, εἰς τάξιν· ὁ δὲ ἱππεὺς, ἐπὶ κέρας· ὁ δὲ ψιλὸς, εἰς τὴν ἰδίαν* ἐκτρέχει χώραν· πάντα δὲ ὑφ' ἕνα σημαντῆρα κινεῖται κατὰ πρόσταξιν τοῦ τὸ κράτος ἔχοντος ἡγεμόνος. οὕτω χρὴ καὶ περὶ τοῦ σύμπαντος φρονεῖν· ὑπὸ γὰρ μιᾶς ῥοπῆς ὀτρυνομένων ἁπάντων, γίνεται τὰ οἰκεῖα, καὶ ταύτης ἀοράτου καὶ ἀφανοῦς· ὅπερ οὐδαμῶς ἐστὶν ἐμπόδιον, οὔτε ἐκείνῃ πρὸς τὸ δρᾶν, οὔτε ἡμῖν πρὸς τὸ πιστεῦσαι· καὶ γὰρ ἡ ψυχὴ, δι' ἣν ζῶμέν τε, καὶ πόλεις καὶ οἴκους ἔχομεν, ἀόρατος οὖσα, τοῖς ἔργοις αὐτοῖς ὁρᾶται· πᾶς γὰρ ὁ τοῦ βίου διάκοσμος, ὑπὸ ταύτης εὕρηται, καὶ διατέτακται, καὶ συνέχεται· γῆς ἄροσις, καὶ φύτευσις· τέχνης ἐπίνοιαι, χρῆσις νόμων, κόσμος πολιτείας, ἔνδημοι πράξεις, ὑπερόριος πόλεμος, εἰρήνη.

* κ. ἐπέχει

Ταῦτα χρὴ καὶ περὶ θεοῦ διανοεῖσθαι, δυνάμει μὲν ὄντος ἰσχυροτάτου, κάλλει δὲ εὐπρεπεστάτου, ζωῇ δὲ ἀθανάτου, ἀρετῇ δὲ κρατίστου· διότι πάσῃ θνητῇ φύσει γενόμενος ἀθεώρητος, ἀπ' αὐτῶν τῶν ἔργων θεωρεῖται· τὰ γὰρ πάθη, καὶ τὰ δι' ἀέρος ἅπαντα, καὶ τὰ ἐπὶ γῆς, καὶ τὰ ἐν ὕδατι, θεοῦ λέγοιτ' ἂν ὄντως ἔργα εἶναι, τοῦ τὸν κόσμον ἐπέχοντος· ἐξ οὗ κατὰ τὸν φυσικὸν Ἐμπεδοκλέα,

Πάνθ' ὅσα τ' ἦν, ὅσα τ' ἐστὶν, ἰδ' ὅσσα τε ἔσται ὀπίσσω, — Metaphyſ. li.2. cap.4.
Δένδρεά τ' ἐβλάστησε καὶ ἀνέρες ἠδὲ γυναῖκες,
Θῆρές τ' οἰωνοί τε καὶ ὑδατοθρέμμονες ἰχθῦς.

ἔοικε δὲ ὄντως, εἰ καὶ μικρότερον, παραβάλλειν τὸν κόσμον τοῖς ὀμφαλοῖς λεγομένοις τοῖς ἐν ταῖς ψαλίσι λίθοις, οἳ μέσοι κείμενοι κατὰ τὴν εἰς ἑκάτερον μέρος ἔνδεσιν, ἐν ἁρμονίᾳ τηροῦσι καὶ ἐν τάξει τὸ πᾶν* σχῆμα τῆς ψαλίδος καὶ ἀκίνητον. Φασὶ δὲ καὶ τὸν ἀγαλματοποιὸν Φειδίαν κατασκευαζόμενον τὴν ἐν ἀκροπόλει Ἀθηνᾶν, ἐν μέσῃ τῇ ταύτης ἀσπίδι, τὸ ἑαυτοῦ πρόσωπον ἐντυπώσασθαι, καὶ συνδῆσαι τῷ ἀγάλματι διά τινος ἀφανοῦς δημιουργίας· ὥστε ἐξ ἀνάγκης, εἴ τις βούλοιτο αὐτὸ περιαιρεῖν, τὸ σύμπαν ἄγαλμα λύειν τε καὶ συγχεῖν. τοῦτον οὖν ἔχει τὸν λόγον ὁ θεὸς ἐν κόσμῳ, συνέχων τὴν τῶν ὅλων ἁρμονίαν τε καὶ σωτηρίαν· πλὴν οὔτε μέσος ὤν, ἔνθα ἡ γῆ τε καὶ ὁ θολερὸς οὗτος τόπος, ἀλλ' ἄνω, καὶ καθαρὸς ἐν καθαρῷ χώρῳ βεβηκώς, ὃν ἐτύμως καλοῦμεν, οὐρανὸν μὲν, ἀπὸ τοῦ ὅρον εἶναι τῶν ἄνω· ὄλυμπον δὲ,

* κ. χῆμα

A τῷ ὁλολαμπεῖ, καὶ πάσης ζόφου καὶ ἀτάκτου κινήματος κεχωρισμένον, οἷα γίνεται παρ' ἡμῖν διὰ χειμῶνος καὶ ἀνέμων βίας, ὥσπερ ἔφη καὶ ὁ ποιητὴς Ὅμηρος·

Odyſſ. ζ. Οὔλυμπόνδ', ὅθι φασὶ θεῶν ἕδος ἀσφαλὲς αἰεὶ
Ἔμμεναι, οὔτ' ἀνέμοισι τινάσσεται, οὔτε ποτ' ὄμβρῳ
Δεύεται, οὔτε χιὼν ἐπιπίλναται· ἀλλὰ μάλ' αἴθρη
Πέπταται ἀνέφελος, λευκὴ δ' ἐπιδέδρομεν αἴγλη.

συνεπιμαρτυρεῖ δὲ καὶ ὁ βίος ἅπας, τὴν ἄνω χώραν ἀποδοὺς θεῷ· καὶ γὰρ πάντες οἱ ἄνθρωποι ἀνατείνομεν τὰς χεῖρας εἰς τὸν οὐρανὸν, εὐχὰς ποιούμενοι. καθ' ὃν λόγον οὐ κακῶς κἀκεῖνο ἀναπεφώνηται·

B Iliad. ο. Ζεὺς δ' ἔλαχ' οὐρανὸν εὐρὺν ἐν αἰθέρι καὶ νεφέλῃσι.

διὸ καὶ τῶν αἰσθητῶν τὰ τιμιώτατα, τὸν αὐτὸν ἐπέχει τόπον, ἄστρα τε καὶ ἥλιος καὶ σελήνη· μόνα τε τὰ οὐράνια διὰ τοῦτο ἀεὶ τὴν αὐτὴν σῴζοντα τάξιν διακεκόσμηται, καὶ οὔποτε ἀλλοιωθέντα μετεκινήθη, καθάπερ τὰ ἐπὶ τῆς γῆς εὔτρεπτα ὄντα, πολλὰς ἑτεροιώσεις καὶ πάθη ἀναδέδεκται. σεισμοί τε γὰρ ἤδη βίαιοι, πολλὰ μέρη τῆς γῆς ἀνέρρηξαν· ὄμβροι τε κατέκλυσαν, ἐξαίσιοι καταρραγέντες· ἐπιδρομαί τε κυμάτων, καὶ ἀναχωρήσεις πολλάκις καὶ ἠπείρους ἐθαλάττωσαν, καὶ θαλάττας ἠπείρωσαν· βίαι τε πνευμάτων καὶ τυφώνων, ἔστιν ὅτε πόλεις ὅλας ἀνέτρεψαν· πυρκαϊαί τε καὶ φλόγες, αἱ μὲν, ἐξ οὐρανοῦ

C γενόμεναι πρότερον, ὥσπερ φασὶν, ἐπὶ Φαέθοντος, τὰ πρὸς ἕω μέρη κατέφλεξαν· αἱ δὲ πρὸς ἑσπέραν ἐκ γῆς ἀναβλύσασαι καὶ ἐκφυσήσασαι, καθάπερ τῶν ἐν Αἴτνῃ κρατήρων ἀναρραγέντων, καὶ ἀνὰ τὴν γῆν φερομένων χειμάρρου δίκην· ἔνθα καὶ τὸ τῶν εὐσεβῶν γένος ἐξόχως ἐτίμησε τὸ δαιμόνιον, περικαταληφθέντων ὑπὸ τοῦ ῥεύματος, διὰ τὸ βαστάζειν γέροντας ἐπὶ τῶν ὤμων γονέας, καὶ σῴζειν· πλησίον γὰρ αὐτῶν γενόμενος ὁ τοῦ πυρὸς ποταμὸς ἐξεσχίσθη, παρέτρεψέ τε, τὸ μὲν, ἔνθα· τὸ δ', ἔνθα· καὶ ἐτήρησεν ἀβλαβεῖς ἅμα τοῖς γονεῦσι τοὺς νεανίσκους. καθόλου δὲ, ὅπερ ἐν νηὶ κυβερνήτης, ἐν ἅρματι δὲ ἡνίοχος,

D ἐν χορῷ δὲ κορυφαῖος, ἐν πόλει δὲ νόμος, ἐν στρατοπέδῳ δὲ ἡγεμὼν, τοῦτο θεὸς ἐν κόσμῳ· πλὴν καθ' ὅσον, τοῖς μὲν, καματηρὸν τὸ ἄρχειν, πολυκίνητόν τε, καὶ πολυμέριμνον· τῷ δὲ, ἄλυπον, ἄπονόν τε, καὶ πάσης κεχωρισμένον σωματικῆς ἀσθενείας· ἐν ἀκινήτῳ γὰρ ἱδρυμένος, πάντα κινεῖ, καὶ περιάγει, ὅπου βούλεται, καὶ ὅπως, ἐν διαφόροις τε ἰδέαις καὶ φύσεσιν· ὥσπερ ἀμέλει καὶ ὁ τῆς πόλεως νόμος, ἀκίνητος ὢν, ἐν ταῖς τῶν χρωμένων ψυχαῖς, πάντα οἰκονομεῖ τὰ κατὰ τὴν πολιτείαν. ἑπόμενοι γὰρ αὐτῷ, δηλονότι ἐξίασιν, ἄρχοντες μὲν, ἐπὶ τὰ ἀρχεῖα· θεσμοθέται

E δὲ, εἰς τὰ οἰκεῖα δικαστήρια· βουλευταὶ δὲ καὶ ἐκκλησιασταὶ, εἰς συνέδρια τὰ προσήκοντα· καὶ ὁ μέν τις, εἰς τὸ πρυτανεῖον βαδίζει σιτησόμενος· ὁ δὲ, πρὸς τοὺς δικαστὰς, ἀπολογησόμενος· ὁ δὲ, εἰς τὸ δεσμωτήριον, ἀποθανούμενος. γίνονται δὲ καὶ δημοθοινίαι νόμιμοι, καὶ πανηγύρεις ἐνιαύσιοι, θεῶν τε θυσίαι, καὶ ἡρώων θεραπεῖαι, καὶ χοαὶ κεκμηκότων·

A vt vſquequaque lucidum, ab omni caligine ſecretum, motúque omni incondito, cuiuſmodi ſunt qui apud nos venti ſunt & tempeſtates. Id quod his verbis ſignificat Homerus:

Eſſe ſolum diuis ſubnixum ſemper Olympum
Fama eſt, haud ventis tremefactum, haud imbribus vdum,
Ac procul à niuibus ſubductum: nubibus illinc
Splendida ſummotis candénſque expanditur æthra.

Huius autem rei elogium eſt mortalium conſenſus, regionem mundi ſummam non dubiè Deo tribuentium. Quam ob cauſam ipſi manus tollimus ſurſum inter vota concipienda. Qua ratione nec

B malè illud quoque ab eodem poëta pronuntiatum:

Cælum ſorte tulit, ſimul æthera Iuppiter altum.

Quinetiam quæ maximè eximia ſunt inter res ſenſu perceptas, eundem illa locum obtinent: vt ſidera, vt Sol & Luna. Vnde fit vt cœleſtia concinno ordine digeſta, ſuas ipſa vices conſeruent perenne conſtitutas, nullique obnoxias mutationi: longè illa ſecus atque terrena, quæ ita natura comparata ſunt, ipſa in alias vt ex aliis affectiones tranſeunt, fierique identidem altera atque altera non recipiunt. Certè contigiſſe aliquando conſtat, vt terræmotus violentia, terra ipſa multis in locis diſceſſerit, ipſique hiatus extiterint, vt imbres vi maiores ruentes diluuium in terram intulerint, vt excurſiones vndarum

C receſſúſque tum continentes mari obruerint ſæpenumero, tum rurſus maris alueos adiecerint continentibus, vt vis flatuum & vorticum oppida funditus diſturbarit: denique vt incendia atque inflammationes aliquæ supernè delapſantes, partes orbis exuſſerint verſas ad Orientem, vt Phaëthontis tempore contigiſſe dicitur: quædam etiam vtè terra erumpentes, velvti expirabundæ idem fecerint: vt quum crateres Ætnæ abrupta terra patefacti, conflagrationem emiſerunt inſtar torrentis per terram, graſſabundam. Quo tempore quiè mortalium genere pietate erant imbuti, ij à numine diuino eximio honore ingentíque affecti ſunt. Siquidem iuuenes & robore valentes, cùm paren-

D tes ſuos ætate iam confectos humeris ſuſtuliſſent, igneo flumine iamiam opprimendi, in eo erant ipſi vt interirent: cùm ecce flumen ipſum ita ſe ſcidit, vt huc & illuc diuerſi fluctus digrederentur, iuuenéſque intactos cum ſenibus tranſmitterent. Vt verò ſummatim iam loquamur: quod in naui gubernator eſt, quod in curru agitator, quod in choro præcentor, quod denique lex in ciuitate, & dux in exercitu: hoc Deus eſt in mundo. Niſi ſi hactenus intereſt, quòd labor, & motus multiplex illos exercet, & curæ angunt variæ: cùm huic illaborata ſuccedant omnia, omnis moleſtiæ expertia, citráque corporis infirmitatem: quippe cui in loco ſtabili

E immotóque collocato, omnia mouere & circumagere pro arbitratu liceat, quò libitum eſt cumque, & quo modo libitum eſt, idque diuerſis in formis ſimul atque naturis. Id autem ratione ſimili facit ille, atque lex ciuilis: quæ immobilis ipſa exiſtens in vtentium animis, regit omnia ad Remp. pertinentia. Et ciues quidem quaſi eius aſſeclæ in medium prodeunt: qui autem Principes vocantur, ad prætorium ſe conferunt: Legiſlatores ad propria tribunalia: Senatores denique, & qui Concionatores dicuntur, ad conſeſſus ſibi contributos conueniunt. Rurſus is in Prytaneũ it, cui ſcilicet id datũ eſt, in eo vt publico victu epuletur: alter rapitur ad iudicium, causã vt ibi dicat: in carcerẽ alius cõpingitur, vt ſupplicio afficiatur illic. Tum verò epulones in ciuitate celebres ad epulas legitimáſque conueniunt. Iam verò aguntur dies feſti, iam ludicra ſolemnia: iam anniuerſaria ſacrificia fiunt diuis, heroëſque ritu ſuo coluntur: poſtremò inferiæ mortuis inferuntur.

Sic alia ab aliis facta vno vel imperio, vel legis vna authoritate, aſſeruant eum qui obtemperat.

Sic vrbs ſimul plena eſt vaporibus ſacris,
Reſonátque cantibus piis ac luctibus.

Hoc idem de vrbe quoque maiore, de hoc inquam mundo, exiſtimare debemus. Deus enim nobis lex eſt: in omnem illa quidem partem ad æquilibrium vergens: nullam correctionem admittens, nullam varietatem, quippe quæ potior ſit illis legibus, & ſtabilior, quæ in tabulis perſcriptæ ſunt. Eius enim auſpiciis perenniter & compoſitè præeuntis, vniuerſus hic cæli ordo regitur atque adminiſtratur, numeros omnes cõcinnitatis habens: in omneis ipſe naturas partitus pro vniuerſitate ſeminum, in ea quæ hærent ſolo, atque in animantia: quæ etiam ſuis ipſa generibus formiſque diſtincta ſunt. *Nam & vites ſiunt & palmæ, & perſeæ, ficúsque dulces, & oliuæ:* vt inquit Poëta: Tum quæ fructus expertes, alios vſus præſtant, platani, pinus, buxi, alni, populus etiam nigra & cupreſſus odorata: Tum quæ autumni tempore fructum ſuauem fundunt, ſed conditu difficilem, pyri, punicæ, mali. At verò animantium aliæ feræ ſunt, & aliæ cicures: tum in aëre, tum humi, tum in aqua victitantes: oriunturque & inualeſcunt & deinde intereunt, legibus obtemperantes diuinis atque cedentes. Omne enim reptile (vt inquit Heraclitus) terram depaſcitur atque poſſidet.

A ἄλλα δὲ ἄλλοις ἐνεργούμενα, κατὰ μίαν πρόσταξιν, ἢ νομίμου ἐξουσίαν, σώζει τὸ τοῦ ποιητοῦ ὄντως,

Πόλις δ' ὁμοῦ μὲν θυμιαμάτων γέμει, * Sophocles initio Oedipi Tyranni.
Ὁμοῦ δὲ παιάνων τε καὶ στεναγμάτων·

οὕτως ὑποληπτέον καὶ ἐπὶ τῆς μείζονος πόλεως, λέγω δὴ τοῦ κόσμου· νόμος μὲν γὰρ ἡμῖν ἰσοκλινὴς, ὁ θεὸς, οὐδεμίαν* ἐπιδεχόμενος διόρθωσιν, ἢ μετάθεσιν, κρείττων * κ. ἐπιδεχόμενος δὲ, οἶμαι, καὶ βεβαιότερος τῶν ἐν κύρβεσιν ἀναγεγραμμένων. ἡγουμένου δὲ ἀκινήτως αὐτοῦ καὶ ἐμμελῶς, ὁ σύμπας οἰκονομεῖται διάκοσμος οὐρανοῦ καὶ γῆς, μεμερισμένος κατὰ τὰς φύσεις πάσας διὰ τῶν οἰκείων σπερμάτων, εἴς τε B τὰ φυτὰ καὶ ζῶα, κατὰ γένη τε καὶ εἴδη· καὶ γὰρ ἄμπελοι, καὶ φοίνικες, καὶ περσαῖαι, συκέαι τε γλυκεραὶ, καὶ ἐλαῖαι, ὥς φησιν ὁ ποιητὴς, τά τε ἄκαρπα μὲν, ἄλλας δὲ παρεχόμενα χρείας, πλάτανοι, καὶ πίτυες, καὶ πύξοι,

Κλήθρη τ', αἴγειρός τε, καὶ εὐώδης κυπάρισσος· Odyſſ. η

αἵ τε καρπὸν ὀπώρας ἡδὺν, ἄλλως δὲ δυσθησαύριστον φέρουσαι,

Ὄγχναι, καὶ ῥοιαὶ, καὶ μηλέαι ἀγλαόκαρποι· * Odyſſ.

τῶν τε ζώων τά τε ἄγρια καὶ ἥμερα, τά τε ἐν ἀέρι καὶ ἐπὶ γῆς καὶ ἐν ὕδατι βοσκόμενα γίνεται, καὶ ἀκμάζει, καὶ φθείρεται, τοῖς τοῦ θεοῦ πειθόμενα θεσμοῖς· πᾶν γὰρ ἑρπετὸν, τὴν C γῆν νέμεται, ὥς φησιν Ἡράκλειτος.

CAPVT VII.

De dei nominibus variis.

VNus porrò Deus cùm ſit, pluribus nominibus appellatus eſt: ab iis vtique ſuis omnibus affectibus denominatus, quorum ſpecimen edere ipſe ſolet. Atque eum quidem tum Zena, tum Dia vocant, inter ſe compoſitis vtentes nominibus, atque è regione collocatis, tanquam duabus his vocibus ſignificare velint, per quem viuimus. Is Crono, id eſt, Saturno, & Chrono, id eſt, tẽpore, ortus eſſe dicitur, nimirum ab æuo ſempiterno ad alterũ æuum pertinens. Vocatur & Fulgurator, & Altitonans, & Ætherius, & Fulminator, & Pluuius: à pluuiis vtique & fulminibus, aliiſque operibus, è quibus vocabula ipſa deducta ſunt. Quin & Frugipotens & cuſtos vrbium vocitatur, & Natalitius, Septitius, Cortalis, Gentilitius & Patrius: videlicet à communione quæ diuino ipſi numini iis cum rebus intercedit. Ad hæc Sodalitius & amicitiæ præſes, tum Hoſpitalis, Caſtrenſis, Trophæalis, Expiator, Sanguinarius, & ſupplex & placabilis, vt poetę loquuntur: denique Seruator dicitur & Aſſertor: &, vt ſemel omnia cõplectar, Cæleſtis & terrenus: ab omni natura ſortéque nomen adeptus, vtpote qui omniũ E rerum author ſit. Quamobrem quæ de ipſo in Orphicis carminibus dicta ſunt, haudquaquam perperam dicta ſunt. Equidem neceſſitatem ipſam etiam nihil aliud quàm Deum dici cenſuerim & intelligi: cui Anance ex eo nomen eſt, quòd natura quędam ſit immobilis. Eundémque Imarmenen, id eſt, fatum, dictum à ſerie rerum conſerta, inoffenſóque tenore procedente, quod alio nomine Pepromenen ideo appellauerunt, quòd ab eo omnia terminata ſunt, ac nihil in rerum natura infinitum eſt.

ΚΕΦΑΛ. ζ'.

Περὶ τῶν τοῦ Θεοῦ ὀνομάτων.

Εἷς δὲ ὢν, πολυώνυμός ἐστι, κατονομαζόμενος τοῖς πάθεσι πᾶσιν, ἅπερ αὐτὸς νεοχμοῖ. καλοῦσι δὲ αὐτὸν καὶ Ζῆνα, καὶ Δία, παραλλήλως χρώμενοι τοῖς ὀνόμασιν, ὡς κἂν εἰ λέγοιμεν, δι' ὃν ζῶμεν. Κρόνου δὲ καὶ Χρόνου λέγεται, διήκων ἐξ αἰῶνος ἀτέρμονος εἰς ἕτερον αἰῶνα· ἀστραπαῖός τε καὶ βρονταῖος, καὶ αἴθριος καὶ αἰθέριος, κεραύνιός D τε καὶ ὑέτιος, ἀπὸ τῶν ὑετῶν καὶ κεραυνῶν, καὶ τῶν ἄλλων καλεῖται· καὶ μὴν ἐπικάρπιος μὲν, ἀπὸ τῶν καρπῶν· πολιεὺς δὲ, ἀπὸ τῶν πόλεων ὀνομάζεται· γενέθλιός τε καὶ ἑρκεῖος, καὶ ὁμόγνιος, καὶ πατρῷος, ἀπὸ τῆς πρὸς ταῦτα κοινωνίας· ἑταιρεῖός τε καὶ φίλιος, καὶ ξένιος, καὶ στράτιος, καὶ τροπαιοῦχος, καθάρσιός τε, καὶ παλαμναῖος, καὶ ἱκέσιος καὶ μειλίχιος, ὥσπερ οἱ ποιηταὶ λέγουσι· σωτήρ τε καὶ ἐλευθέριος, ἐτύμως· ὡς δὲ τὸ πᾶν εἰπεῖν, οὐράνιός τε καὶ χθόνιος, πάσης ἐπώνυμος ὢν φύσεώς τε καὶ τύχης, ἅτε πάντων αὐτὸς αἴτιος ὤν· διὸ καὶ ἐν τοῖς Ὀρφικοῖς οὐ κακῶς* λέγεται, * κ. ἄλ. λέγεται

Ζεὺς πρῶτος γένετο, Ζεὺς ὕστατος* ἀρχικέραυνος· * γρ. ἀργικέραυνος
E Ζεὺς κεφαλὴ, Ζεὺς μέσσα· Διὸς δ' ἐκ πάντα τέτυκται,
Ζεὺς πυθμὴν γαίης τε καὶ οὐρανοῦ ἀστερόεντος·
Ζεὺς ἄρσην γένετο, Ζεὺς ἄμβροτος ἔπλετο νύμφη.
Ζεὺς πνοιὴ πάντων, Ζεὺς ἀκαμάτου πυρὸς ὁρμή.
Ζεὺς πόντου ῥίζα, Ζεὺς ἥλιος, ἠδὲ σελήνη.
Ζεὺς βασιλεὺς, Ζεὺς ἀρχὸς ἁπάντων* ἀρχικέραυνος. * γρ. ἐριβρεμέτης
Πάντας γὰρ κρύψας αὖθις φάος ἐς πολυγηθὲς,
Ἐξ ἱερῆς κραδίης ἀνενέγκατο μέρμερα ῥέζων.

οἶμαι δὲ καὶ τὴν Ἀνάγκην οὐκ ἄλλο τι λέγεσθαι, πλὴν τοῦτον, οἱονεὶ ἀκίνητον οὐσίαν ὄντα· Εἱμαρμένην δὲ, διὰ τὸ εἴρειν τε καὶ χωρεῖν ἀκωλύτως. Πεπρωμένην δὲ, διὰ τὸ πεπερατῶσθαι πάντα, καὶ μηδὲν ἐν τοῖς οὖσιν ἄπειρον εἶναι.

καὶ Μοίρας μὲν, ἀπὸ τοῦ μεμερίσθαι· Νέμεσιν δὲ, ἀπὸ A τῆς ἑκάστῳ διανεμήσεως· Ἀδράστειαν δὲ, ἀναπόδραστον αἰτίαν οὖσαν κατὰ φύσιν· Αἶσαν δὲ, ἀεὶ οὖσαν. τὰ δὲ περὶ τὰς μοίρας καὶ τὸν ἄτρακτον, εἰς ταῦτό πως νεύει. τρεῖς μὲν γὰρ αἱ μοῖραι, κατὰ τοὺς χρόνους μεμερισμέναι, νῆμα δὲ ἀτράκτου, τὸ μὲν, ἐξειργασμένον· τὸ δὲ μέλλον, τὸ δὲ, περιστρεφόμενον· τέτακται δὲ, κατὰ μὲν τὸ γεγονὸς, μία τῶν μοιρῶν, Ἄτροπος, ἐπεὶ τὰ παρελθόντα πάντα, ἄτρεπτά ἐστι. κατὰ δὲ τὸ μέλλον, Λάχεσις· εἰς πάντα γὰρ ἡ κατὰ φύσιν μένει λῆξις· κατὰ δὲ τὸ ἐνεστὼς, Κλωθὼ, συμπεραίνουσά τε καὶ κλώθουσα ἑκάστῳ τὰ οἰκεῖα. περαίνεται δὲ B καὶ ὁ μῦθος οὐκ ἀτάκτως. ταῦτα δὲ πάντα ἐστὶν, οὐκ ἄλλο τι, πλὴν ὁ θεὸς, καθάπερ καὶ ὁ γενναῖος Πλάτων φησίν. ὁ μὲν δὴ θεὸς, ὥσπερ ὁ παλαιὸς λόγος, ἀρχήν τε, καὶ τελευτὴν, καὶ μέσα τῶν ὄντων ἁπάντων ἔχων, εὐθείᾳ περαίνει κατὰ φύσιν πορευόμενος· τῷ δὲ, ἀεὶ ξυνέπεται δίκη, τῶν ἀπολειπομένων τοῦ θείου νόμου τιμωρός· ἧς ὁ εὐδαιμονήσειν μέλλων, μακάριός τε καὶ εὐδαίμων, ἐξ ἀρχῆς εὐθὺς μέτοχος εἴη.

A Quin & Mœran, id eſt, ſortem, appellatum eundem Deum à partitione rerũ dixerim: & Nemeſin, quaſi poteſtatem diuinam, eius quod viſum eſt cuique diſtributricem. Adraſtiam etiam quaſi cauſam quãdam natura comparatam, quam fallere nemo queat aut vitare. Æſan denique dictum, quaſi ſemper exiſtentem. Iam quod de Parcis, & de fuſo proditum eſt earum, eôdem id etiam quodammodo pertinet. Siquidem tres Parcas priſci tria in tempora partiti ſunt: filúmque fuſi partim iam peractum, partim futurum, partim iam intorqueri dixerunt: earum vnam ſtatuentes in eo quod iam profligatum eſt: quam Atropon ideo nuncuparunt, quo-B niam ea quæ iam preteriêre, retrorſus agi nequeũt. At Lacheſis functio futuris deſtinata eſt: omnium enim quæ ſecundùm naturam ſunt, ſors ſua quodque manet. Præſentibus autem rebus atq; inſtantibus Clothus opera attributa eſt, quæ netu vnicuique conficit quod ſuum eſt. Hócque fabulamentum rectè atque ordine compoſitum eſt. Proinde hæc omnia non aliud quicquam quàm Deum eſſe, planũ eſt, vt eximius Plato cenſuit. Enimverò Deus (vt eſt vetuſto verbo proditum) principium & finem, & media rerum omnium tenens, rectâ perlinea incedens, operatur ille quidem ſecundùm naturam, è veſtigio comitem habens iuſtitiæ præſidem, quam Dicen nominauerunt diuinæ legis vindicem, ſimul vt quicquam ſanctionum eius prętermiſſum eſt. Cuius vt ſit particeps numinis, iam inde oportet ab initio, qui ad vitam beatam euaſurus eſt atque fælicem.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ ΨΥΧΗΣ ΤΟ Α.

ARISTOTELIS DE ANIMA LIBER I.

Iul. Pacio interprete.

De dignitate, vtilitate, & difficultate ſcientiæ de anima.

Cap. I.

Τῶν καλῶν καὶ τιμίων τὴν εἴδησιν C ὑπολαμβάνοντες, μᾶλλον δ' ἑτέραν ἑτέρας ἢ κατ' ἀκρίβειαν, ἢ τῷ βελτιόνων τε καὶ θαυμασιωτέρων εἶναι, δι' ἀμφότερα ταῦτα * τὴν τῆς ψυχῆς ἱστορίαν εὐλόγως ἂν ἐν πρώτοις τιθείημεν. 2 Δοκεῖ δὲ καὶ πρὸς ἀλήθειαν ἅπασαν ἡ γνῶσις αὐτῆς μεγάλα συμβάλλεσθαι· μάλιστα δὲ πρὸς τὴν φύσιν· ἔστι γὰρ οἷον ἀρχὴ τῶν ζώων. 3 Ἐπιζητοῦμεν δὲ θεωρῆσαι καὶ γνῶναι τήν τε φύσιν αὐτῆς, καὶ τὴν οὐσίαν· εἶθ' ὅσα συμβέβηκε περὶ αὐτήν. ὧν τὰ μὲν * ἴδια πάθη τῆς ψυχῆς εἶναι δοκεῖ, τὰ δὲ * κοινὰ καὶ τοῖς ζώοις δι' ἐκείνην ὑπάρχειν. 4 Πάντη δὲ καὶ πάντως ἐστὶ τῶν χαλεπωτάτων λαβεῖν τινὰ πίστιν περὶ αὐ-

* ἢ· τὴν περὶ ψ.
* ἢ· ἰδία
* ἢ· κοινά

Cum in rerum honeſtarum & honorabilium *numero* cognitionem *eſſe* exiſtimemus: magis autem alteram alterà, vel quòd exquiſitior, vel quod *rerum* præſtantiorum & admirabiliorum ſit: propter vtraque hæc hiſtoriam de anima inter primas meritò collocare poſſumus. 2 Videtur autem & ad omnem veritatem cognitio eius magnópere conferre: præſertim ad naturam: eſt enim tamquam principium animalium. 3 Quærimus autem ſpectare & cognoſcere naturam eius & eſſentiam: deinde quæcumque circa ipſam accidunt: quorum alia propriæ affectiones ipſius animæ eſſe videntur, alia verò communia, & animalibus propter illam ineſſe. 4 Sed penitus & omnino difficillimum eſt, aliquam de ea fidem ſumere.

Cùm enim quæſtio ſit multis quoque aliis *rebus* A communis: *quæſtio* (inquam) de eſſentia & quid *res* ſit: fortaſſe alicui videri poſſit vna quædam eſſe methodus de iis omnibus quorum volumus eſſentiam cognoſcere: vt & propriorum accidentium *vna eſt methodus, nimirum* demonſtratio. quare quærenda erit hæc methodus. Sin autem non eſt vna & communis quædam methodus de *quæſtione* quid eſt: adhuc difficilior ſit tractatio. oportebit enim in quaque re ſumere quis *ſit* modus. 6 Cùm autem perſpicuum fuerit, ſitne demonſtratio quædam, an diuiſio, an aliqua alia methodus: adhuc multas dubitationes & errores *hoc* habet ex quibus oporteat quærere. alia namque *ſunt* aliarum B rerum principia: quemadmodum numerorum, & planorum. 7 Initio fortaſſe neceſſe *eſt* diſtinctè explicare, in quo genere, & quid ſit: vtrùm (inquam) *ſit* hoc aliquid & ſubſtantia, an qualitas an quantitas, an alia quæpiam ex diſtinctis categoriis. 8 Præterea vtrùm ſit *in* earum rerum *numero*, quæ poteſtate ſunt, an potiùs actus quidam. intereſt enim non parum. 9 Conſiderandum quoque eſt, vtrùm ſit partibilis, an impartibilis. 10 Et vtrùm omnis anima *ſit* eiuſdem ſpeciei, an non. quòd ſi non *ſit* eiuſdem ſpeciei, vtrùm *animæ* ſpecie differant, an genere. nunc enim qui loquuntur & quęrunt de anima, humanam ſolam videntur conſiderare. 11 Cæterùm cauendum *eſt*, C ne nos lateat; vtrùm vna ſit eius definitio, quemadmodum animalis: an in ſingulis diuerſa, vt equi, canis, hominis, Dei: animal autem, quod eſt vniuerſale, aut nihil eſt, aut poſterius. ſimiliter autem, & ſi quid aliud commune attribuatur. 12 Præterea ſi non *ſunt* multæ animæ, ſed partes: vtrùm oportet priùs quærere totam animam, an partes. 13 Difficile etiam *eſt* definire, quænam *harum partium* ſuapte natura inter ſe differant. 14 Et vtrùm partes quærere primùm oporteat, an opera ipſarum: vt intelligere, an intellectum: & ſentire, an ſenſitiuum. Similiter autem & in aliis. 15 Quòd ſi opera priùs *ſunt quærenda*: D rurſus dubitare aliquis poſſit, vtrùm obiecta priùs quàm hæc quæri debeant: velvti ſenſibile priùs quàm ſenſitiuum: & intelligibile priùs quàm intellectiuum. 16 Videtur autem non ſolùm cognitio quid eſt, vtilis eſſe ad inſpiciendas cauſas eorum quæ ſubſtantiis per ſe accidunt: vt in mathematicis *cognoſcere* quid ſit rectum & quid inflexum, aut quid linea & planum, *confert* ad vidēdum, quòd rectis anguli trianguli *ſint æquales*: ſed & contrà accidentia magnopere conferunt ad cognoſcendum quid eſt. cùm enim poſſumus conuenienter iis quæ apparent, ſtatuere de accidentibus aut omnibus, aut pleriſque: tunc etiam de eſſentia poterimus aliquid dicere quàm optimè. omnis enim E demonſtrationis principium *eſt cognitio* quid eſt. Quapropter ex quibuſcumque definitionibus non contingit accidentia notificare: immo ne quidem aliquid de ipſis facilè conicere: patet omnes dialecticè & inaniter traditas eſſe. 17 Sed & affectiones animæ dubitationem habent, vtrùm omnes ſint etiam animam habenti communes, an ſit aliqua ipſius animæ propria. hoc enim ſumere, *eſt* quidem neceſſarium, non tamen facile. 18 Videtur autem plurima neque pati neque facere ſine corpore, vt iraſci, confidere, cupere, & omnino ſentire. maximè autem proprium videtur intelligere. quòd ſi hoc eſt phantaſia quædam, aut non ſine phantaſia: *certè* neque hoc poteſt eſſe ſine corpore.

5 Καὶ γὰρ ὄντος κοινοῦ τοῦ ζητήματος καὶ πολλοῖς ἑτέροις, λέγω δὲ * τοῦ περὶ τὴν οὐσίαν, καὶ τοῦ τί ἐστι, τάχ' ἄν τῳ δόξειε μία τις εἶναι μέθοδος κατὰ πάντων περὶ ὧν βουλόμεθα γνῶναι τὴν οὐσίαν, ὥσπερ καὶ τῶν κατὰ συμβεβηκὸς ἰδίων ἀπόδειξις. ὥστε ζητητέον ἂν εἴη τὴν μέθοδον ταύτην. εἰ δὲ μή ἐστι μία καὶ κοινή τις μέθοδος περὶ τὸ τί ἐστιν, ἔτι χαλεπώτερον γίνεται τὸ πραγματεύεσθαι· δεήσει γὰρ λαβεῖν περὶ ἕκαστον τίς ὁ τρόπος. 6 * Ὅταν δὲ φανερὸν ᾖ, πότερον ἀπόδειξίς τίς ἐστιν, ἢ διαίρεσις, ἢ καί τις ἄλλη μέθοδος· ἔτι πολλὰς ἀπορίας * ἔχει καὶ πλάνας, ἐκ τίνων δεῖ ζητεῖν. ἄλλαι γὰρ ἄλλων ἀρχαί, καθάπερ ἀριθμῶν καὶ ἐπιπέδων. 7 Πρῶτον δ' ἴσως ἀναγκαῖον διελεῖν ἐν τίνι τῶν γενῶν, καὶ τί ἐστι· λέγω δὲ πότερον τόδε τι, καὶ οὐσία, ἢ ποιόν, ἢ ποσόν, ἢ καί τις ἄλλη τῶν διαιρεθεισῶν κατηγοριῶν. 8 Ἔτι δὲ πότερον τῶν ἐν δυνάμει ὄντων, ἢ μᾶλλον ἐντελέχειά τις. διαφέρει γὰρ οὔ τι σμικρόν. 9 Σκεπτέον δέ, καὶ εἰ μεριστή, ἢ ἀμερής. 10 Καὶ πότερον ὁμοειδὴς ἅπασα ἡ ψυχή, ἢ οὔ· εἰ δὲ μὴ ὁμοειδής, πότερον εἴδει διαφέρουσιν, ἢ γένει. νῦν μὲν γὰρ οἱ λέγοντες καὶ ζητοῦντες περὶ ψυχῆς, περὶ τῆς ἀνθρωπίνης μόνης ἐοίκασιν ἐπισκοπεῖν. 11 Εὐλαβητέον δέ, ὅπως μὴ λανθάνῃ, πότερον εἷς ὁ λόγος αὐτῆς ἐστι, καθάπερ ζῴου, ἢ καθ' ἕκαστον ἕτερος, οἷον ἵππου, κυνός, ἀνθρώπου, θεοῦ· τὸ δὲ ζῷον τὸ καθόλου, ἤτοι οὐδέν ἐστιν, ἢ ὕστερον. ὁμοίως δὲ κἂν εἴ τι κοινὸν ἄλλο κατηγοροῖτο. 12 Ἔτι δὲ εἰ μὴ πολλαὶ ψυχαί, ἀλλὰ μόρια, πότερον δεῖ ζητεῖν πρότερον τὴν ὅλην ψυχήν, ἢ τὰ μόρια. 13 Χαλεπὸν δὲ καὶ τούτων διορίσαι ποῖα πέφυκεν ἕτερα ἀλλήλων. 14 Καὶ πότερον τὰ μόρια δεῖ ζητεῖν πρότερον, ἢ τὰ ἔργα αὐτῶν, οἷον τὸ νοεῖν, ἢ τὸν νοῦν· καὶ τὸ αἰσθάνεσθαι, ἢ τὸ αἰσθητικόν· ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. 15 Εἰ δὲ τὰ ἔργα πρότερον, πάλιν ἄν τις ἀπορήσειεν, εἴ τε τὰ ἀντικείμενα πρότερον τούτων ζητητέον, οἷον τὸ αἰσθητὸν τοῦ αἰσθητικοῦ, καὶ τὸ νοητὸν τοῦ νοητικοῦ. 16 Ἔοικε δὲ οὐ μόνον τὸ τί ἐστι γνῶναι χρήσιμον εἶναι πρὸς τὸ θεωρῆσαι τὰς αἰτίας τῶν συμβεβηκότων ταῖς οὐσίαις, ὥσπερ ἐν τοῖς μαθήμασι τί τὸ εὐθύ, καὶ τί τὸ καμπύλον ἢ τί γραμμὴ καὶ ἐπίπεδον, πρὸς τὸ κατιδεῖν πόσαις ὀρθαῖς αἱ τοῦ τριγώνου γωνίαι ἴσαι· ἀλλὰ καὶ ἀνάπαλιν τὰ συμβεβηκότα συμβάλλεται μέγα μέρος πρὸς τὸ εἰδέναι τὸ τί ἐστιν· ἐπειδὰν γὰρ ἔχωμεν ἀποδιδόναι κατὰ τὴν φαντασίαν περὶ τῶν συμβεβηκότων, ἢ τῶν πάντων, ἢ τῶν πλείστων, τότε καὶ περὶ τῆς οὐσίας ἕξομέν τι λέγειν ὅτι κάλλιστα· πάσης γὰρ ἀποδείξεως ἀρχὴ τὸ τί ἐστιν. ὥστε καθ' ὅσους τῶν ὁρισμῶν μὴ συμβαίνει τὰ συμβεβηκότα γνωρίζειν, ἀλλὰ μηδ' εἰκάσαι περὶ αὐτῶν εὐμαρές, δῆλον ὅτι διαλεκτικῶς εἴρηνται καὶ κενῶς ἅπαντες. 17 Ἀπορίαν δὲ ἔχει καὶ τὰ πάθη τῆς ψυχῆς πότερόν ἐστι πάντα κοινὰ καὶ τοῦ ἔχοντος· ἢ ἔστι τι καὶ τῆς ψυχῆς ἴδιον αὐτῆς· τοῦτο γὰρ λαβεῖν μὲν ἀναγκαῖον, οὐ ῥᾴδιον δέ. 18 Φαίνεται δὲ τῶν πλείστων οὐδὲν ἄνευ σώματος πάσχειν, οὐδὲ ποιεῖν, οἷον ὀργίζεσθαι, θαρρεῖν, ἐπιθυμεῖν, ὅλως αἰσθάνεσθαι. μάλιστα δ' ἔοικεν ἴδιον τὸ νοεῖν. Εἰ δέ ἐστι καὶ τοῦτο φαντασία τις, ἢ μὴ ἄνευ φαντασίας, οὐκ ἐνδέχοιτ' ἂν οὐδὲ τοῦτο ἄνευ σώματος εἶναι.

* γρ. περὶ τ. τ. ἐ. ἢ τί ἦν
* γρ. ἴσως δὴ
* γρ. ἔχει

19 Εἰ μὲν οὖν ἐστί τι τῶν τῆς ψυχῆς ἔργων ἢ παθημάτων ἴδιον, ἐνδέχοιτ' ἂν αὐτὴν χωρίζεσθαι· εἰ δὲ μηθέν ἐστιν ἴδιον αὐτῆς, οὐκ ἂν εἴη χωριστή· ἀλλὰ καθάπερ τῷ εὐθεῖ, ᾗ εὐθύ, πολλὰ συμβαίνει, οἷον, ἅπτεσθαι τῆς χαλκῆς σφαίρας κατὰ στιγμήν· οὐ μέντοι γε ἅψεται τοῦτο χωρισθὲν τὸ εὐθύ. ἀχώριστον γὰρ, εἴπερ ἀεὶ μετὰ σώματός τινός ἐστιν. 20 Ἔοικε δὲ καὶ τὰ τῆς ψυχῆς πάθη πάντα εἶναι μετὰ σώματος, θυμὸς, πραότης, φόβος, ἔλεος, θάρσος, ἔτι χαρὰ, καὶ τὸ φιλεῖν τε καὶ μισεῖν· ἅμα γὰρ τούτοις πάσχει τι τὸ σῶμα. μηνύει δὲ τὸ, ποτὲ μὲν ὑπὸ ἰσχυρῶν καὶ ἐναργῶν παθημάτων συμβαινόντων μηδὲν παροξύνεσθαι, ἢ φοβεῖσθαι· ἐνίοτε δὲ καὶ ὑπὸ μικρῶν καὶ ἀμαυρῶν κινεῖσθαι, ὅταν ὀργᾷ τὸ σῶμα, καὶ οὕτως ἔχῃ, ὥσπερ ὅταν ὀργίζηται. ἔτι δὲ τοῦτο μᾶλλον φανερόν· μηθενὸς γὰρ φοβεροῦ συμβαίνοντος, ἐν τοῖς πάθεσι γίνονται τοῖς τοῦ φοβουμένου. εἰ δ' οὕτως ἔχει, δῆλον ὅτι καὶ τὰ πάθη λόγοι ἔνυλοί εἰσιν. 21 Ὥστε οἱ ὅροι τοιοῦτοι, οἷον τὸ ὀργίζεσθαι, κίνησίς τις τοῦ τοιουδὶ σώματος, ἢ μέρους, ἢ δυνάμεως ὑπὸ τοῦδε, καὶ ἕνεκα τοῦδε. 22 Καὶ διὰ ταῦτα ἤδη φυσικοῦ τὸ θεωρῆσαι περὶ ψυχῆς, ἢ πάσης, ἢ τῆς τοιαύτης. 23 Διαφερόντως δ' ἂν ὁρίσαιτο ὁ φυσικός τε καὶ διαλεκτικὸς ἕκαστον αὐτῶν, οἷον ὀργὴ τί ἐστιν. ὁ μὲν γὰρ, ὄρεξιν ἀντιλυπήσεως, ἤ τι τοιοῦτο· ὁ δὲ, ζέσιν* τοῦ περὶ καρδίαν αἵματος, ἢ θερμοῦ. τούτων δὲ ὁ μὲν τὴν ὕλην ἀποδίδωσιν· ὁ δὲ, τὸ εἶδος, καὶ τὸν λόγον· ὁ μὲν γὰρ λόγος εἶδος τοῦ πράγματος. 24 Ἀνάγκη δ' εἶναι τοῦτον ἐν ὕλῃ τοιαδὶ, εἰ ἔσται· ὥσπερ οἰκίας, ὁ μὲν λόγος τοιοῦτος ἂν εἴη, ὅτι σκέπασμα κωλυτικὸν φθορᾶς ὑπ' ἀνέμων, καὶ ὄμβρων, καὶ καυμάτων· ὁ δὲ φήσει λίθους, καὶ πλίνθους, καὶ ξύλα· ἕτερος δ', ἐν τούτοις τὸ εἶδος, ἕνεκα τωνδί. τίς οὖν ὁ φυσικὸς τούτων; πότερον ὁ περὶ τὴν ὕλην, τὸν δὲ λόγον ἀγνοῶν· ἢ ὁ περὶ τὸν λόγον μόνον· ἢ μᾶλλον ὁ ἐξ ἀμφοῖν; 25 Ἐκείνων δὲ, τίς ἑκάτερος; ἢ οὐκ ἔστι τις ὁ περὶ τὰ πάθη τῆς ὕλης τὰ μὴ χωριστὰ, μηδ' ᾗ χωριστά· ἀλλ' ὁ φυσικὸς περὶ ἅπανθ' ὅσα τοῦ τοιουδὶ σώματος, καὶ τῆς τοιαύτης ὕλης ἔργα, καὶ πάθη· ὁπόσα δὲ μὴ ᾗ τοιαῦτα, ἄλλος· καὶ περὶ τινῶν μὲν τεχνίτης, ἐὰν τύχῃ, οἷον τέκτων, ἢ ἰατρός. τῶν δὲ μὴ χωριστῶν μὲν, ᾗ δὲ μὴ τοιούτου σώματος πάθη καὶ ἐξ ἀφαιρέσεως, ὁ μαθηματικός· ᾗ δὲ κεχωρισμένα, ὁ πρῶτος φιλόσοφος. 26 Ἀλλ' ἐπανιτέον ὅθεν ὁ λόγος. ἐλέγομεν δὲ ὅτι τὰ πάθη τῆς ψυχῆς ἀχώριστα τῆς φυσικῆς ὕλης τῶν ζῴων, ᾗ γε τοιαῦθ' ὑπάρχει, θυμὸς καὶ φόβος, καὶ οὐχ ὥσπερ γραμμὴ καὶ ἐπίπεδον.

* γρ. τοῦ περικαρδίου αἵ[ματος].

A 19 Ergo ſi eſt aliqua animæ operatio, vel affectio propria: poteſt ipſa anima ſeparari *à corpore*. quòd ſi nulla eius propria eſt, certè non erit ſeparabilis: ſed quemadmodum recto, quà rectum *eſt*, multa accidunt: vt tangere æneam ſphæram puncto: non tamen rectam ſeparatam eam attinget: inſeparabile enim *eſt*, ſiquidem ſemper cum corpore aliquo eſt. 20 videntur etiam animæ affectiones omnes eſſe cum corpore, ira, manſuetudo, metus, miſericordia, fiducia: præterea gaudium, & amare, & odiſſe. nam corpus, ſimulátque hæc adſunt, patitur aliquid. Indicio eſt, quòd interdum à vehementibus & euidentibus affectionibus, quæ accidunt, nihil irritamur, aut terremur: B interdum autem vel ab exiguis & obſcuris commouemur, quando *ſcilicet* corpus turget, atque ita habet, vt cùm aliquis iraſcitur. Inſuper hoc magis perſpicuum *eſt*: quia cùm nihil terribile accidat, *tamen* iis perturbationibus afficiuntur, quibus ij qui metuunt. quod ſi ita eſt, conſtat, affectiones eſſe rationes materiales. 21 Quare definitiones eiuſmodi *ſunt*, vt putà iraſci *eſt* motus quidam huius corporis, vel partis, vel facultatis, ab hoc & gratia huius. 22 Ac proptereà phyſici *eſt* conſiderare de anima, aut omni, aut tali. 23 Diuerſo autem modo phyſicus ac dialecticus definirent horum C vnumquodque: velvti quid ſit ira: alter enim *diceret eſſe* appetitum mutui doloris *inferendi*, aut tale quidpiam: alter verò *eſſe* feruorem ſuffuſi cordi ſanguinis, aut calidi. quorum hic materiam tradit, ille autem formam & rationem. nam ratio *eſt* forma rei. 24 Sed neceſſe *eſt* hanc eſſe in tali materia, ſi erit. Vtputà domus, alia definitio talis erit, integumentum propulſans corruptionem à ventis, & imbribus, & æſtibus: alia verò dicet lapides, & lateres, & ligna: alia autem in his formam gratiâ horum. quænam igitur harum eſt phyſica? eáne, quæ in materia *cernitur*, & rationem ignorat? an quæ in D ratione tantùm? an potiùs quæ ex vtriſque *conſtat*? 25 Iam verò illarum vtraque cuia eſt? An nòn eſt aliquis *alius præter phyſicum*, qui in affectionibus materiæ, quæ non *ſunt* ſeparabiles, & quà non ſeparabiles, *verſetur*: ſed phyſicus in omnibus *verſatur*, quæ ſunt eiuſmodi corporis & eiuſmodi materiæ opera & affectiones. *In iis* verò quæ talia non ſunt, alius, & in quibuſdã quidem *verſatur* artifex, ſi fors tulerit, vt faber, aut medicus. quæ verò non *ſunt* quidem ſeparabilia, quà tamen non eiuſmodi corporis affectiones ſunt, & ex abiunctione *ſpectantur*: in his verſatur mathematicus. ſed quà ſunt ſeparata, primus philoſophus. 26 Sed *eò eſt* redeundum, vnde *digreſſa eſt* oratio. dicebamus autem affectiones animæ *eſſe* inſeparabiles à naturali materia animalium, quatenus talia ſunt ira ac metus, non vt linea & planum.

Veterum opiniones de anima. Cap. II.

E Ἐπισκοποῦντας δὲ περὶ ψυχῆς ἀναγκαῖον ἅμα διαπορουμένους περὶ ὧν εὐπορεῖν δεῖ, προελθόντας τὰς τῶν προτέρων δόξας, συμπαραλαμβάνειν ὅσοι τι περὶ αὐτῆς ἀπεφήναντο, ὅπως τὰ μὲν εἰρημένα καλῶς λάβωμεν· εἰ δέ μή τι καλῶς, τοῦτ' εὐλαβηθῶμεν. 2 Ἀρχὴ δὲ τῆς ζητήσεως, προθέσθαι τὰ μάλιστα δοκοῦνθ' ὑπάρχειν αὐτῇ κατὰ φύσιν. τὸ ἔμψυχον δὴ τοῦ ἀψύχου δυοῖν μάλιστα διαφέρειν δοκεῖ, κινήσει τε καὶ τῷ αἰσθάνεσθαι. παρειλήφαμεν δὲ καὶ παρὰ τῶν

E Conſiderantes autem de anima, neceſſe *eſt*, vt dubitantes de iis quæ, cùm progreſſi erimus, in promptu nobis eſſe oportet, ſimul antiquorum opiniones comprehendamus, quicumque aliquid de ea pronuntiarunt: vt ea, quæ ſcitè dicta ſunt, ſumamus: ſi quid verò inſcitè, id vitemus. 2 Principium verò inquiſitionis *erit ea* priùs ponere, quæ maximè videntur ipſi ineſſe ſecundùm naturam. Animatum igitur ab inanimato duobus maximè differre videtur, motu & ſenſu. ferè autem à maioribus quoque

accepimus duo hæc de anima. 3 Aiunt enim quidam, & maximè & primùm animam eſſe id quod mouet, putantes autem, id, quod non mouetur, non poſſe mouere alterum, ita exiſtimarunt animam eſſe aliquid eorum quæ mouentur. 4 Vnde inquit Democritus eam eſſe ignem quendam & calorem. cùm enim infinitæ ſint figuræ & atomi: eas, quæ ſunt rotundæ, ignem & animam *eſſe* dicit. cuiuſmodi *ſunt* in aëre, quæ vocantur ramenta, quæ cernuntur in radiis per feneſtras *immiſſis*: quorum farraginem dicit *eſſe* elementa totius naturæ. Similiter etiam Leucippus *ſtatuit*. 5 Harum autem eas quæ *ſunt* rotundæ, *eſſe* animam: quoniam huiuſmodi figuræ maximè poſſunt per vniuerſum permeare, & reliqua mouere, cùm & ipſæ moueantur. *Sic ergo dixerunt Democritus & Leucippus*, exiſtimantes animam eſſe, quod præbet animalibus motum. 6 Idcirco & viuendi terminum eſſe reſpirationem. cùm enim id, quod ambit, corpora comprimat, atque eas figuras elidat, quæ præbet animalibus motum, eò quòd ipſa numquam quieſcunt: opem ferri, extrinſecus ingredientibus eiuſmodi aliis, dum reſpiratur: hæc enim prohibere, quominus etiam ea quæ in animalibus inſunt, excernantur, vnà propulſantia quod comprimit & coërcet. viuere autem *animalia*, quandiu poſſunt hoc facere. 7 Videtur autem, & quod à Pythagoreis dicitur, eandem habere ſententiam. quidam enim eorum dicebant animam eſſe ramenta illa, quæ *ſunt* in aëre. alij verò, id quod hæc mouet. ac de his dictum eſt: quia videntur continenter moueri, etiam ſi ſit ſumma tranquillitas. 8 Eôdem feruntur etiam, quicumque dicunt animam *eſſe* id quod ſeipſum mouet. nam omnes hi videntur exiſtimaſſe, motum maximè proprium eſſe animæ, & cætera quidem omnia per animam moueri, ipſam verò à ſemetipſa: quia nihil videbant mouere, quod non & ipſum moueatur. 9 Similiter etiam Anaxagoras animam eſſe inquit eam quæ mouet. ac ſi quis alius dixit, mentem vniuerſum mouiſſe. 10 Non tamen omnino vt Democritus. is enim *aſſeruit* ſimpliciter idem *eſſe* animam & mentem. verè enim eſſe, quod videtur. Idcirco ſcitè ceciniſſe Homerum, quòd Hector iaceret inops mentis. Non ergo vtitur mente, vt facultate quadam, quæ circa veritatem *verſetur*: ſed idem *eſſe* ait animam & mentem. Anaxagoras verò minùs dilucidè de his diſſerit. ſæpe enim dicit mentem *eſſe* cauſam eius quod ſcitè & rectè *ſe habet*, alibi verò *inquit* idem eſſe mentem & animam: in omnibus namque eam ineſſe animalibus, tam magnis quàm paruis, tam honeſtioribus quam vilioribus. Sed non videtur mens, quæ ſecundùm prudentiam dicitur, æquè cunctis ineſſe animalibus, immo ne quidem cunctis hominibus. 11 Quicumque igitur ad motum animati reſpexerunt, hi exiſtimarunt animam *eſſe* id quod maximè mouendi vim habet. 12 Quicumque autem ad cognitionem & ſenſum eorum quæ ſunt, hi dicunt animam *eſſe* principia, alij plura principia facientes, alij vnum hoc. 13 Vt Empedocles ex elementis omnibus: eſſe autem vnumquodque horum animam, ſic inquiens,

Nam terra quidem terram videmus: aqua verò aquam:
Æthere autem æthera diuinum: ſed igne ignem exitioſum:
Amore autem amorem: & contentionem, contentione triſti.

παρειλήφαμεν σχεδὸν δύο ταῦτα περὶ ψυχῆς. 3 Φασὶ γὰρ ἔνιοι, καὶ μάλιστα, καὶ πρώτως ψυχὴν εἶναι τὸ κινοῦν. οἰηθέντες δὲ τὸ μὴ κινούμενον αὐτὸ, μὴ ἐνδέχεσθαι κινεῖν ἕτερον, τῶν κινουμένων τι τὴν ψυχὴν ὑπέλαβον εἶναι. 4 Ὅθεν Δημόκριτος μὲν πῦρ τι καὶ θερμόν φησιν αὐτὴν εἶναι. ἀπείρων γὰρ ὄντων σχημάτων, καὶ ἀτόμων, τὰ σφαιροειδῆ πῦρ καὶ ψυχὴν λέγει, οἷον ἐν τῷ ἀέρι τὰ καλούμενα ξύσματα, ἃ φαίνεται ἐν ταῖς διὰ τῶν θυρίδων ἀκτῖσιν, ὧν τὴν πανσπερμίαν, στοιχεῖα λέγει τῆς ὅλης φύσεως. ὁμοίως δὲ καὶ Λεύκιππος. 5 Τούτων δὲ τὰ σφαιροειδῆ [πῦρ καὶ] ψυχὴν, διὰ τὸ μάλιστα διὰ παντὸς δύνασθαι διαδύνειν τοὺς τοιούτους ῥυσμοὺς, καὶ κινεῖν τὰ λοιπὰ, κινούμενα καὶ αὐτὰ, ὑπολαμβάνοντες τὴν ψυχὴν εἶναι τὸ παρέχον τοῖς ζώοις τὴν κίνησιν. 6 Διὸ καὶ τοῦ ζῆν ὅρον εἶναι τὴν ἀναπνοήν· συνάγοντος γὰρ τοῦ περιέχοντος τὰ σώματα, καὶ ἐκθλίβοντος τῶν σχημάτων τὰ παρέχοντα τοῖς ζώοις τὴν κίνησιν, διὰ τὸ μηδ' αὐτὰ ἠρεμεῖν μηδέποτε, βοήθειαν γίγνεσθαι θύραθεν, ἐπεισιόντων ἄλλων τοιούτων ἐν τῷ ἀναπνεῖν· κωλύειν γὰρ ταῦτα, καὶ τὰ ἐνυπάρχοντα ἐν τοῖς ζώοις ἐκκρίνεσθαι, συνανείργοντα τὸ συνάγον καὶ πηγνύον. καὶ ζῆν δὲ ἕως ἂν δύνωνται τοῦτο ποιεῖν. 7 Ἔοικε δὲ καὶ τὸ παρὰ τῶν Πυθαγορείων λεγόμενον, τὴν αὐτὴν ἔχειν διάνοιαν. ἔφασαν γάρ τινες αὐτῶν, ψυχὴν εἶναι τὰ ἐν τῷ ἀέρι ξύσματα· οἱ δὲ, τὸ ταῦτα κινοῦν. περὶ δὲ τούτων εἴρηται, διότι συνεχῶς φαίνεται [ταῦτα] κινούμενα, κἂν ᾖ νηνεμία παντελής. 8 Ἐπὶ ταὐτὸ δὲ φέρονται καὶ ὅσοι λέγουσι τὴν ψυχὴν τὸ αὑτὸ κινοῦν· ἐοίκασι γὰρ οὗτοι πάντες ὑπειληφέναι τὴν κίνησιν οἰκειότατον εἶναι τῇ ψυχῇ· καὶ τὰ μὲν ἄλλα πάντα κινεῖσθαι διὰ τὴν ψυχήν· ταύτην δ' ὑφ' ἑαυτῆς, διὰ τὸ μηδὲν ὁρᾷν κινοῦν, ὃ μὴ καὶ αὐτὸ κινεῖται. 9 Ὁμοίως δὲ καὶ Ἀναξαγόρας ψυχὴν εἶναι λέγει τὴν κινοῦσαν, καὶ εἴ τις ἄλλος εἴρηκεν, ὡς τὸ πᾶν ἐκίνησε νοῦς. 10 Οὐ μὴν παντελῶς γε, ὥσπερ Δημόκριτος. ἐκεῖνος μὲν γὰρ ἁπλῶς ταὐτὸ ψυχὴν καὶ τὸν νοῦν· τὸ γὰρ ἀληθὲς εἶναι τὸ φαινόμενον· διὸ καλῶς ποιῆσαι τὸν Ὅμηρον, ὡς Ἕκτωρ κεῖτ' ἀλλοφρονέων. οὐ δὴ χρῆται τῷ νῷ, ὡς δυνάμει τινὶ περὶ τὴν ἀλήθειαν, ἀλλὰ ταὐτὸ λέγει ψυχὴν καὶ νοῦν. Ἀναξαγόρας δὲ, ἧττον διασαφεῖ περὶ αὐτῶν· πολλαχοῦ μὲν γὰρ τὸ αἴτιον τοῦ καλῶς καὶ ὀρθῶς, τὸν νοῦν λέγει· ἑτέρωθι δὲ, τὸν νοῦν εἶναι τὸν αὐτὸν τῇ ψυχῇ· ἐν ἅπασι γὰρ ὑπάρχειν αὐτὸν τοῖς ζώοις, καὶ μεγάλοις, καὶ μικροῖς, καὶ τιμίοις καὶ ἀτιμοτέροις. οὐ φαίνεται δὲ ὅ γε κατὰ φρόνησιν λεγόμενος νοῦς, πᾶσιν ὁμοίως ὑπάρχειν τοῖς ζώοις, ἀλλ' οὐδὲ τοῖς ἀνθρώποις πᾶσιν. 11 Ὅσοι μὲν οὖν ἐπὶ τὸ κινεῖσθαι τὸ ἔμψυχον ἀπέβλεψαν, οὗτοι τὸ κινητικώτατον ὑπέλαβον τὴν ψυχήν. 12 Ὅσοι δὲ ἐπὶ τὸ γινώσκειν, καὶ τὸ αἰσθάνεσθαι τῶν ὄντων, οὗτοι δὴ λέγουσι τὴν ψυχὴν τὰς ἀρχάς, οἱ μὲν πλείους ποιοῦντες τὰς ἀρχάς, οἱ δὲ μίαν ταύτην. 13 Ὥσπερ Ἐμπεδοκλῆς μὲν ἐκ τῶν στοιχείων πάντων εἶναι δὲ καὶ ἕκαστον ψυχὴν τούτων, οὕτω λέγων,

Γαίῃ μὲν γὰρ γαῖαν ὀπώπαμεν, ὕδατι δ' ὕδωρ,
Αἰθέρι δ' αἰθέρα δῖον, ἀτὰρ πυρὶ πῦρ ἀΐδηλον,
Στοργῇ δὲ στοργήν, νεῖκος δέ τε νείκεϊ λυγρῷ.

14 Τὸν αὐτὸν δὲ τρόπον ἐν τῷ Τιμαίῳ Πλάτων τὴν ψυχὴν ἐκ τῶν στοιχείων ποιεῖ· γινώσκεσθαι γὰρ τῷ ὁμοίῳ τὸ ὅμοιον· τὰ δὲ πράγματα ἐκ τῶν ἀρχῶν εἶναι. 15 Ὁμοίως δὲ καὶ ἐν * τοῖς περὶ φιλοσοφίας λεγομένοις διωρίσθη, αὐτὸ μὲν τὸ ζῷον ἐκ τῆς τοῦ ἑνὸς ἰδέας, καὶ τοῦ πρώτου μήκους, καὶ πλάτους, καὶ βάθους· τὰ δ' ἄλλα ὁμοιοτρόπως. 16 Ἔτι δὲ καὶ ἄλλως, νοῦν μὲν τὸ ἕν, ἐπιστήμην δὲ τὰ δύο· μοναχῶς γὰρ ἐφ' ἕν· τὸν δὲ τοῦ ἐπιπέδου ἀριθμόν, δόξαν· αἴσθησιν δέ, τὸν τοῦ στερεοῦ· οἱ μὲν γὰρ ἀριθμοί, τὰ εἴδη αὐτὰ καὶ αἱ ἀρχαὶ τῶν ὄντων ἐλέγοντο· εἰσὶ δὲ ἐκ τῶν στοιχείων. κρίνεται δὲ τὰ πράγματα, τὰ μὲν νῷ, τὰ δὲ ἐπιστήμῃ, τὰ B δὲ δόξῃ, τὰ δὲ αἰσθήσει· * εἴδη δ' οἱ ἀριθμοὶ οὗτοι τῶν πραγμάτων. 17 Ἐπεὶ δὲ καὶ κινητικὸν ἐδόκει * ψυχὴ εἶναι καὶ γνωριστικόν, οὕτως ἔνιοι συνέπλεξαν ἐξ ἀμφοῖν, ἀποφηνάμενοι τὴν ψυχὴν ἀριθμὸν κινοῦνθ' ἑαυτόν. 18 Διαφέρονται δὲ περὶ τῶν ἀρχῶν, τίνες καὶ πόσαι· μάλιστα μὲν οἱ σωματικὰς ποιοῦντες τοῖς * ἀσωμάτοις· τούτοις δὲ οἱ μίξαντες καὶ ἀπ' ἀμφοῖν τὰς ἀρχὰς ἀποφηνάμενοι. διαφέρονται δὲ καὶ * περὶ τὸ πλῆθος. οἱ μὲν γὰρ μίαν, οἱ δὲ πλείους λέγουσιν. ἑπομένως δὲ τούτοις καὶ τὴν ψυχὴν ἀποδιδόασι· τό, τε γὰρ κινητικὸν τὴν φύσιν, τῶν πρώτων ὑπειλήφασιν, οὐκ ἀλόγως. C 19 Ὅθεν ἔδοξέ τισι πῦρ εἶναι· καὶ γὰρ τοῦτο λεπτομερέστατόν τε, καὶ μάλιστα τῶν στοιχείων ἀσώματον. ἔτι δὲ κινεῖταί τε καὶ κινεῖ τὰ ἄλλα πρώτως. 20 Δημόκριτος δὲ καὶ γλαφυρωτέρως εἴρηκεν ἀποφηνάμενος, διὰ τί τούτων ἑκάτερον· ψυχὴν μὲν γὰρ εἶναι ταὐτὸ καὶ νοῦν. τοῦτο δ' εἶναι ἐκ τῶν πρώτων καὶ ἀδιαιρέτων σωμάτων· κινητικὸν δὲ διὰ μικρομέρειαν καὶ τὸ σχῆμα· τῶν δὲ σχημάτων εὐκινητότατον, τὸ σφαιροειδὲς λέγει· τοιοῦτον δ' εἶναι τόν τε νοῦν, καὶ τὸ πῦρ. 21 Ἀναξαγόρας δ' ἔοικε μὲν ἕτερον λέγειν ψυχήν τε καὶ νοῦν, ὥσπερ εἴπομεν καὶ πρότερον. χρῆται δ' ἀμφοῖν ὡς μιᾷ φύσει· πλὴν ἀρχήν γε τὸν νοῦν τίθεται μά-D λιστα πάντων. μόνον γοῦν φησιν αὐτὸν τῶν ὄντων ἁπλοῦν εἶναι, καὶ ἀμιγῆ τε καὶ καθαρόν. ἀποδίδωσι δ' ἄμφω τῇ αὐτῇ ἀρχῇ, τό, τε γινώσκειν καὶ τὸ κινεῖν, λέγων νοῦν κινῆσαι τὸ πᾶν. 22 Ἔοικε δὲ καὶ Θαλῆς ἐξ ὧν ἀπομνημονεύουσι, κινητικόν τι τὴν ψυχὴν ὑπολαμβάνειν, εἴπερ τὸν λίθον ἔφη ψυχὴν ἔχειν, ὅτι τὸν σίδηρον κινεῖ. 23 Διογένης δ' ὥσπερ καὶ ἕτεροί τινες, ἀέρα τοῦτον οἰηθεὶς πάντων λεπτομερέστατον εἶναι, καὶ ἀρχήν· καὶ διὰ τοῦτο γινώσκειν τε καὶ κινεῖν τὴν ψυχήν, ᾗ μὲν πρῶτόν ἐστι, καὶ ἐκ τούτου τὰ λοιπὰ γινώσκειν· ᾗ δὲ λεπτομερέστατον, κινητικὸν εἶναι. 24 Καὶ Ἡράκλειτος δὲ τὴν ἀρχὴν εἶναί φησι τὴν ψυχήν, E εἴπερ τὴν ἀναθυμίασιν ἐξ ἧς τἆλλα συνίστησι· καὶ γὰρ ἀσωματώτατον δὴ καὶ ῥέον ἀεί· τὸ δὲ κινούμενον κινουμένῳ * γινώσκεσθαι. ἐν κινήσει δ' εἶναι τὰ ὄντα, κἀκεῖνος ᾤετο καὶ οἱ πολλοί. 25 Παραπλησίως δὲ τούτοις καὶ Ἀλκμαίων ἔοικεν ὑπολαβεῖν περὶ ψυχῆς· φησὶ γὰρ αὐτὴν ἀθάνατον εἶναι, διὰ τὸ ἐοικέναι τοῖς ἀθανάτοις. τοῦτο δ' ὑπάρχειν αὐτῇ, ὡς ἀεὶ κινουμένῃ· κινεῖσθαι γὰρ καὶ τὰ θεῖα πάντα συνεχῶς ἀεί, σελήνην, ἥλιον, ἀστέρας, καὶ τὸν οὐρανὸν ὅλον. 26 Τῶν δὲ φορτικωτέρων, καὶ ὕδωρ τινὲς ἀπεφήναντο, καθάπερ Ἵππων.

* κ. τ. π. φιλοσοφίαι λόγοις δ.
* κ. αἰσθ.
* γρ. ψυχ.
* γρ. ἀσωμάτοις
* γρ. π. τὸ πλῆθος
* γρ. γινώσκεται.

A 14 Eodem modo etiam Plato in Timæo animam ex elementis efficit. ſimile enim ſimili cognoſci, ac res ex principiis eſſe. 15 Similiter etiam in iis quæ de Philoſophia dicuntur, definitum eſt, ipſum quidem animal ex vnius idea & prima longitudine & latitudine & altitudine, cetera verò ſimili modo. 16 Præterea etiam aliter, intellectum quidem *eſſe* vnum: ſcientiam verò, duo: (vno enim modo *eſt* ad vnum) plani verò numerum *eſſe* opinionem: ſolidi verò *numerum eſſe* ſenſum. Numeri namque *eſſe* ipſæ formæ & principia entium dicebantur. conſtant autem ex principiis. ac res iudicantur partim intellectu, partim B ſcientiâ, partim opinione, partim ſenſu. hi verò numeri ſunt formæ rerum. 17 Quoniam autem anima videtur & habere vim mouendi, & cognoſcendi: ſic nonnulli coniunxerunt ex ambobus, pronuntiantes animam *eſſe* numerum qui ſe ipſum mouet. 18 Diſſentiunt autem de principiis, quænam, & quot *ſint*: maximè quidem qui corporea faciunt, ab iis qui incorporea: & ab his *vtriſque* ij qui miſcent, & ex ambobus principia ſtatuunt. diſſentiunt etiam de numero: alij namque vnum, alij plura *eſſe* dicunt. his verò conſequenter etiam animam explicant, quod enim ſuâ naturâ habet vim mouendi, inter prima *eſſe collocandum* exiſtimarunt non ſine ratione. C 19 Vnde quibuſdam videtur eſſe ignis. Etenim hoc ſubtiliſſimis partibus conſtat & eſt elementorum maximè incorporeum. præterea, & mouetur & mouet alia primùm. 20 Democritus verò elegantiùs locutus eſt, explicans quamobrem *ſit* horum vtrumque. animam enim & intellectum eſſe idem. hoc autem eſſe ex primis & indiuiduis corporibus, aptum autem ad mouendum propter exiguitatem partium & figuram. figurarum autem *eam* dicit *eſſe* maximè mobilem, quæ *eſt* rotunda: cuiuſmodi eſſe *ait* mentem & ignem. 21 Anaxagoras verò videtur quidem diuerſum ſtatuere animam & mentem, vt & antea diximus: vtitur tamen vtriſque, quaſi vnâ naturâ: D præterquam quòd ponit mentem maximè omnium *eſſe* principium. nam inter ea quæ ſunt, hanc ſolam ait eſſe ſimplicem, & non mixtam, & puram. tribuit autem vtraque eidem principio, cognitionem *ſcilicet*, ac motum, inquiens mentem mouiſſe vniuerſum. 22 Videtur etiam Thales ex iis quæ memorantur, exiſtimare animam *eſſe* quiddam ad mouendum aptum: ſiquidem dixit lapidem illum habere animam, quia ferrum mouet. 23 Diogenes autem, vt & alij nonnulli, *cenſuit eſſe* aërem, cùm putaret hunc eſſe omnium ſubtiliſſimum, & principium. ideóque animam cognoſcere & mouere, quatenus eſt E primum, & ex hoc reliqua cognoſcere. quatenus autem ſubtiliſſimis partibus *conſtat*, eſſe ad mouendum aptum. 24 Sed & Heraclitus ait animam eſſe principium: ſiquidem *ait eſſe* exhalationem, ex qua reliqua conſtituit. *eſſe* enim rem maximè incorpoream, & ſemper fluentem. quod autem mouetur, eo cognoſci quòd mouetur: entia verò eſſe in motu, & is putauit, & *alij* multi. 25 Pariter ac hi, videtur Alcmæon exiſtimaſſe de anima: inquit enim eam eſſe immortalem, quoniam aſſimilatur immortalibus: hoc autem ipſi ineſſe, vt *pote* ei quæ ſemper mouetur: moueri autem & diuina omnia continenter *ac* ſemper, Lunam, Solem, ſidera, & cœlum totum. 26 Eorum verò, qui ſunt magis importuni, etiam aquam nonnulli pronuntiarunt, vt Hippo.

adducti autem videntur vt *id* crederent, ex genitura, quia omnium *genitura eſt* humida. nam & eos reprehendit, qui dicunt animam *eſſe* ſanguinem, quia genitura non *eſt* ſanguis, hanc verò eſſe primam animam. 27 Alij verò ſanguinem, vt Critias, exiſtimantes ſentire maximè proprium *eſſe* animæ, hoc verò ineſſe propter ſanguinis naturam. 28 Omnia namque elementa ſortita ſunt aliquem à quo eligerentur, excepta terra: ſed hanc nemo ſtatuit, niſi ſi quis dixit eam eſſe ex omnibus elementis, aut omnia *elementa*. 29 Iam verò omnes animam tribus (penè dixerim) definiunt, motu, ſenſu, & corporis vacuitate: quorum vnumquodque refertur ad principia. 30 Quapropter & hi qui cognitione eam definiunt, eam aut elementum, aut ex elementis faciunt, ſimilia inter ſe loquentes, vno excepto. inquiunt enim, ſimile ſimili cognoſci. cùm enim anima omnia cognoſcat, eam conſtituunt ex omnibus principiis. 31 Quicumque igitur vnam aliquam cauſam & vnum elementum eſſe dicunt, *ij* etiam animam ponunt *eſſe* vnum: puta ignem, aut aërem. qui verò plura dicunt *eſſe* principia, animam quoque dicunt *eſſe* plura. 32 Solus Anaxagoras ait mentem eſſe paſſionis expertem, nec habere quicquam commune cum vlla alia re: Cùm autem talis ſit, quomodo cognoſcat, & quam ob cauſam, nec ille dixit, nec ex iis quæ dicta ſunt, perſpicuum eſt. 33 Quicumque verò contrarietates in principiis ponunt, etiam animam ex contrariis conſtituunt. alij autem alterum contrariorum *ſumunt*, vt calidum, aut frigidum, aut aliquid aliud tale: ac ſimiliter ponunt animam eſſe vnum quidpiam ex his. 34 Idcirco & nomina ſequuntur: alij quidem dicentes animam vocari calidum: quia propterea etiam ζῆν, *id eſt*, *viuere*, eſt nominatum: alij verò *appellari* frigidum, propter reſpirationem, & refrigerationem. 35 Quæ igitur tradita ſunt de anima, & quas ob cauſas ita dicunt, hæc ſunt, *quæ expoſuimus*.

A πεισθῆναι δ' ἐοίκασιν ἐκ τῆς γονῆς, ὅτι πάντων ὑγρά. καὶ γὰρ ἐλέγχει τοὺς αἷμα φάσκοντας τὴν ψυχήν, ὅτι ἡ γονὴ οὐχ αἷμα· ταύτην δ' εἶναι τὴν πρώτην ψυχήν. 27 Ἕτεροι δ' αἷμα, καθάπερ Κριτίας, τὸ αἰσθάνεσθαι τῆς ψυχῆς οἰκειότατον ὑπολαμβάνοντες, τοῦτο δ' ὑπάρχειν διὰ τὴν τοῦ αἵματος φύσιν. 28 Πάντα γὰρ τὰ στοιχεῖα κριτὴν εἴληφε, πλὴν τῆς γῆς· ταύτην δ' οὐδεὶς ἀποπέφανται, πλὴν εἴ τις αὐτὴν εἴρηκεν ἐκ πάντων εἶναι τῶν στοιχείων, ἢ πάντα. 29 Ὁρίζονται δὲ πάντες τὴν ψυχὴν τρισίν, ὡς εἰπεῖν, κινήσει, αἰσθήσει, τῷ ἀσωμάτῳ· B τούτων δ' ἕκαστον* ἀνάγεσθαι πρὸς τὰς ἀρχάς. *κ. ἀνάγεται

30 Διὸ καὶ οἱ τῷ γινώσκειν ὁριζόμενοι αὐτήν, ἢ στοιχεῖον, ἢ ἐκ τῶν στοιχείων ποιοῦσι, λέγοντες παραπλησίως ἀλλήλοις, πλὴν ἑνός· φασὶ γὰρ γινώσκεσθαι καὶ τὸ ὅμοιον τῷ ὁμοίῳ· ἐπεὶ γὰρ ἡ ψυχὴ πάντα γινώσκει, συνιστᾶσιν αὐτὴν ἐκ πασῶν τῶν ἀρχῶν. 31 Ὅσοι μὲν οὖν μίαν τινὰ λέγουσιν αἰτίαν, καὶ στοιχεῖον ἕν, καὶ τὴν ψυχὴν ἓν τιθέασιν, οἷον πῦρ, ἢ ἀέρα· οἱ δὲ πλείω λέγοντες τὰς ἀρχάς, καὶ τὴν ψυχὴν πλείω λέγουσιν. 32 Ἀναξαγόρας δὲ μόνος ἀπαθῆ φησιν εἶναι τὸν νοῦν, καὶ κοινὸν οὐθὲν C οὐδενὶ τῶν ἄλλων ἔχειν. τοιοῦτος δ' ὤν, πῶς γνωριεῖ, καὶ διὰ τίν' αἰτίαν, οὔτ' ἐκεῖνος εἴρηκεν, οὔτ' ἐκ τῶν εἰρημένων *συμφανές ἐστιν. 33 Ὅσοι δ' ἐναντιώσεις ποιοῦσιν ἐν ταῖς ἀρχαῖς, καὶ τὴν ψυχὴν ἐκ τῶν ἐναντίων συνιστᾶσιν· οἱ δὲ θάτερον τῶν ἐναντίων, οἷον θερμόν, ἢ ψυχρόν, ἤ τι τοιοῦτον ἄλλο· καὶ τὴν ψυχὴν ὁμοίως ἕν τι τούτων εἶναι τιθέασιν. 34 Διὸ καὶ τοῖς ὀνόμασιν ἀκολουθοῦσιν, οἱ μὲν τὸ θερμὸν λέγοντες, ὅτι διὰ τοῦτο καὶ τὸ ζῆν ὠνόμασται· οἱ δὲ τὸ ψυχρόν, διὰ τὴν ἀναπνοὴν καὶ τὴν κατάψυξιν καλεῖσθαι ψυχήν. 35 Τὰ μὲν οὖν παραδεδομένα περὶ ψυχῆς, καὶ δι' ἃς αἰτίας λέγουσιν οὕτω, ταῦτά ἐστιν. *κ. ἐμφανές

Diſputatio contra eos qui animam per motum definiuerunt. Cap. III.

PRimùm autem conſiderandum *eſt* de motu. fortaſſis enim non ſolùm falſum eſt, eſſentiam eius talem eſſe, qualem aſſerunt, qui dicunt animam eſſe id quod ſe ipſum mouet, vel mouere poteſt: ſed *eſt* vnum ex iis quæ fieri nequeunt, vt ei motus inſit. 2 Non eſſe igitur neceſſe, vt id quod mouet, ipſum quoque moueatur, antea dictum fuit. 3 Cùm autem duobus modis moueatur quicquid *mouetur*: aut enim *mouetur* per alterum, aut per ſe (per alterum autem *moueri* dicimus, quæcumque ideo mouentur, quia ſunt in eo quod mouetur: vt nauigantes: non enim ſimiliter mouentur ac nauis: quoniam hæc per ſe mouetur: illi verò, quia ſunt in eo quod mouetur, *quod* quidem manifeſtum *eſt* in partibus: quandoquidem proprius motus pedum eſt inceſſus, atque hic *eſt* etiam hominum, ſed tum temporis non adeſt nauigantibus) cùm ergo duobus modis moueri dicatur, nunc de anima conſideramus, an per ſe moueatur, & particeps ſit motus. 4 Cùm autem quatuor motus ſint: latio, variatio, deminutio, accretio: certè aut vno horum mouebitur, aut pluribus, aut omnibus. Quòd ſi mouetur non ex accidenti, naturâ inerit ei motus.

D Ἐπισκεπτέον δὲ πρῶτον μὲν περὶ κινήσεως. ἴσως γὰρ οὐ μόνον ψεῦδός ἐστι τὸ τὴν οὐσίαν αὐτῆς τοιαύτην εἶναι, οἵαν φασὶν οἱ λέγοντες εἶναι τὴν ψυχὴν τὸ κινοῦν αὑτό, ἢ δυνάμενον κινεῖν· ἀλλ' ἕν τι τῶν ἀδυνάτων, τὸ ὑπάρχειν αὐτῇ κίνησιν. 2 Ὅτι μὲν οὖν οὐκ ἀναγκαῖον τὸ κινοῦν καὶ αὐτὸ κινεῖσθαι, πρότερον εἴρηται. 3 Διχῶς δὲ κινουμένου παντός· ἢ γὰρ καθ' ἕτερον, ἢ καθ' αὑτό· καθ' ἕτερον δὲ λέγομεν, ὅσα κινεῖται τῷ ἐν κινουμένῳ εἶναι, οἷον πλωτῆρες· οὐ γὰρ ὁμοίως κινοῦνται τῷ πλοίῳ· τὸ μὲν γὰρ καθ' αὑτὸ κινεῖται, οἱ δὲ τῷ ἐν κινουμένῳ εἶναι. δῆλον δ' ἐπὶ τῶν μορίων· οἰκεία μὲν γάρ ἐστι κίνησις, ποδῶν βάσις· αὕτη δὲ καὶ ἀνθρώπων· οὐχ ὑπάρχει δὲ τοῖς E πλωτῆρσι τότε· * διχῶς οὖν λεγομένου τοῦ κινεῖσθαι, νῦν ἐπισκοποῦμεν περὶ τῆς ψυχῆς, εἰ καθ' αὑτὴν κινεῖται, καὶ μετέχει κινήσεως. 4 Τεσσάρων δὲ κινήσεων οὐσῶν, φορᾶς, ἀλλοιώσεως, φθίσεως, αὐξήσεως, ἢ μίαν τούτων κινοῖτ' ἄν, ἢ πλείους, ἢ πάσας. εἰ δὲ κινεῖται μὴ κατὰ συμβεβηκός, φύσει ἂν ὑπάρχοι κίνησις αὐτῇ. *κ. δ. διχ.

εἰ δὲ τοῦτο, καὶ τόπος· πᾶσαι γὰρ αἱ λεχθεῖσαι κινήσεις ἐν τόπῳ. 5 Εἰ δ᾽ ἐστὶν ἡ οὐσία τῆς ψυχῆς τὸ κινεῖν ἑαυτήν, οὐ κατὰ συμβεβηκὸς τὸ κινεῖσθαι αὐτῇ ὑπάρξει, ὥσπερ τῷ λευκῷ, ἢ τῷ τριπήχει. κινεῖται γὰρ καὶ ταῦτα, ἀλλὰ κατὰ συμβεβηκός. ᾧ γὰρ ὑπάρχουσιν, ἐκεῖνο κινεῖται, τὸ σῶμα. διὸ καὶ οὐκ ἔστι τόπος αὐτῶν· τῆς δὲ ψυχῆς ἔσται, εἴπερ φύσει κινήσεως μετέχει. 6 Ἔτι δ᾽, εἰ φύσει κινεῖται, κἂν βίᾳ κινηθείη· κἂν εἰ βίᾳ, καὶ φύσει. τὸν αὐτὸν δὲ τρόπον ἔχει καὶ περὶ ἠρεμίας· εἰς ὃ γὰρ κινεῖται φύσει, καὶ ἠρεμεῖ ἐν τούτῳ φύσει. ὁμοίως δὲ καὶ εἰς ὃ κινεῖται βίᾳ, καὶ ἠρεμεῖ ἐν τούτῳ βίᾳ. ποῖαι δὲ βίαιοι τῆς ψυχῆς κινήσεις ἔσονται καὶ ἠρεμίαι, οὐδὲ πλάττειν βουλομένοις ῥᾴδιον ἀποδοῦναι. 7 Ἔτι δ᾽, εἰ μὲν ἄνω κινήσεται, πῦρ ἔσται· εἰ δὲ κάτω, γῆ· τούτων γὰρ τῶν σωμάτων αἱ κινήσεις αὗται. ὁ δ᾽ αὐτὸς λόγος καὶ περὶ τῶν μεταξύ. 8 Ἔτι δ᾽, ἐπεὶ φαίνεται κινοῦσα τὸ σῶμα, ταύτας εὔλογον κινεῖν τὰς κινήσεις ἃς καὶ αὐτὴ κινεῖται. εἰ δὲ τοῦτο, καὶ ἀντιστρέψασιν εἰπεῖν, ἀληθές, ὅτι ἣν τὸ σῶμα κινεῖται, ταύτην καὶ αὐτή. τὸ δὲ σῶμα κινεῖται φορᾷ· ὥστε καὶ ἡ ψυχὴ μεταβάλλοι ἂν κατὰ τὸ σῶμα καὶ αὐτή, ἢ ὅλη, ἢ κατὰ μόρια μεθισταμένη. εἰ δὲ τοῦτ᾽ ἐνδέχεται, καὶ ἐξελθοῦσαν εἰσιέναι πάλιν ἐνδέχοιτ᾽ ἄν· τούτῳ δ᾽ ἕποιτ᾽ ἂν τὸ ἀνίστασθαι τὰ τεθνεῶτα τῶν ζῴων. 9 Τὴν δὲ κατὰ συμβεβηκὸς κίνησιν, κἂν ὑφ᾽ ἑτέρου κινοῖτο· ὠσθείη γὰρ ἂν βίᾳ τὸ ζῷον. οὐ δεῖ δὲ ᾧ τὸ ὑφ᾽ ἑαυτοῦ κινεῖσθαι ἐν τῇ οὐσίᾳ, τοῦτο ὑπ᾽ ἄλλου κινεῖσθαι, πλὴν εἰ μὴ κατὰ συμβεβηκός· ὥσπερ οὐδὲ τὸ καθ᾽ αὑτὸ ἀγαθόν, ἢ δι᾽ αὑτό, τὸ μὲν δι᾽ ἄλλο εἶναι, τὸ δ᾽ ἑτέρου ἕνεκα. τὴν δὲ ψυχὴν μάλιστα φαίη τις ἂν ὑπὸ τῶν αἰσθητῶν κινεῖσθαι, εἴπερ κινεῖται. 10 Ἀλλὰ μὴν καὶ εἰ κινεῖ γε αὐτὴ ἑαυτήν, καὶ αὐτὴ κινοῖτ᾽ ἄν. ὥστε εἰ πᾶσα κίνησις ἔκστασίς ἐστι τοῦ κινουμένου ᾗ κινεῖται, καὶ ἡ ψυχὴ ἐξίσταιτο ἂν ἐκ τῆς οὐσίας, εἰ μὴ κατὰ συμβεβηκὸς αὑτὴν κινεῖ, ἀλλ᾽ ἔστιν ἡ κίνησις τῆς οὐσίας αὐτῆς καθ᾽ αὑτήν. 11 Ἔνιοι δὲ καὶ κινεῖν φασι τὴν ψυχὴν τὸ σῶμα ἐν ᾧ ἐστιν, ὡς αὐτὴ κινεῖται, οἷον Δημόκριτος, παραπλησίως λέγων Φιλίππῳ τῷ* κωμῳδοδιδασκάλῳ. φησὶ γὰρ τὸν Δαίδαλον κινουμένην ποιῆσαι τὴν ξυλίνην Ἀφροδίτην, ἐγχέαντα ἄργυρον χυτόν. ὁμοίως δὲ καὶ Δημόκριτος λέγει· κινουμένας γάρ φησι τὰς ἀδιαιρέτους σφαίρας, διὰ τὸ πεφυκέναι μηδέποτε μένειν, συνεφέλκειν καὶ κινεῖν τὸ σῶμα πᾶν. ἡμεῖς δ᾽ ἐρωτήσομεν, εἰ καὶ ἠρέμησιν ποιεῖ τοῦτ᾽ αὐτό. πῶς δὲ ποιήσει τοῦτο, χαλεπόν, ἢ καὶ ἀδύνατον εἰπεῖν. ὅλως δὲ οὐχ οὕτω φαίνεται κινεῖν ἡ ψυχὴ τὸ ζῷον, ἀλλὰ διὰ προαιρέσεώς τινος καὶ νοήσεως. 12 Τὸν αὐτὸν δὲ τρόπον καὶ ὁ Τίμαιος φυσιολογεῖ τὴν ψυχὴν κινεῖν τὸ σῶμα· τῷ γὰρ κινεῖσθαι αὐτήν, καὶ τὸ σῶμα κινεῖν, διὰ τὸ συμπεπλέχθαι πρὸς αὐτό. συνεστηκυῖαν γὰρ ἐκ τῶν στοιχείων, καὶ μεμερισμένην κατὰ τοὺς ἁρμονικοὺς ἀριθμούς, ὅπως αἴσθησίν τε καὶ σύμφυτον ἁρμονίαν ἔχῃ, καὶ τὸ πᾶν φέρηται συμφώνους φοράς, τὴν εὐθυωρίαν εἰς κύκλον κατέκαμψε· καὶ διελὼν ἐκ τοῦ ἑνὸς κύκλου δύο κύκλους διαχῇ συνημμένους, πάλιν τὸν ἕνα διεῖλεν εἰς ἑπτὰ κύκλους, ὡς οὔσας τὰς τοῦ οὐρανοῦ φοράς, τὰς τῆς ψυχῆς κινήσεις. 13 Πρῶτον μὲν οὖν, οὐ καλῶς τὸ λέγειν τὴν ψυχὴν μέγεθος εἶναι.

* γρ. κωμῳδοποιῷ.

A ſin hoc, etiam locus: omnes enim motus, qui dicti ſunt, in loco *fiunt*. 5 Quòd ſi animæ eſſentia eſt mouere ſe ipſam: moueri, ei non inerit ex accidenti, vt albo, aut tricubitô: mouentur enim hæc quoque, ſed ex accidenti: quoniam id mouetur, cui inſunt, *nempe* corpus. ideóque non eſt locus ipſorum. ſed animæ *locus* erit, ſiquidem natura eſt motionis particeps. 6 Præterea ſi naturâ mouetur, etiam vi moueri poterit: & ſi vi, etiam naturâ. eodem modo *res* habet etiam de quiete. ad quod enim mouetur naturâ, etiam in eô quieſcit naturâ. Similiter etiam ad quod mouetur vi, etiam in eo quieſcit vi. quales autem erunt violenti animæ motus & quietes, ne
B quidem fingere volentibus facile *eſt* explicare. 7 Præterea ſi ſurſum mouebitur, ignis erit: ſi deorſum, terra. hi namque *ſunt* horum corporum motus. Eadem ratio *eſt* etiam de *corporibus* interiectis. 8 Præterea quia videtur mouere corpus: rationi conſentaneum *eſt*, eam mouere iiſdem motibus quibus & ipſa mouetur. quod ſi ita *eſt*, etiam conuerſione factâ verè dicetur, quo motu corpus mouetur, ipſam quoque moueri. atqui corpus mouetur latione, quare etiam anima mutabitur, perinde atque corpus, ipſa quoque *hoc motus*, vel tota, vel ſecundùm partes tranſlata. ſed ſi fieri hoc poteſt, fieri etiam poterit,
C vt egreſſa ingrediatur rurſus. cui conſequens erit, vt animalia mortua reſurgant. 9 Iam verò motu qui ex accidenti *fit*, etiam ab altero moueri poſſet: vi namque impelli poteſt animal. ſed non oportet, vt in cuius eſſentia *eſt* moueri à ſeipſo, id ab alio moueatur. præterquam ex accidenti: ſicuti neque quod *eſt* bonum per ſe, aut propter ſe, id eſt bonum propter aliud, vel alterius gratia. animam verò maximè dicere aliquis poſſit à ſenſibilibus moueri, ſi quidem mouetur. 10 At verò ſi ipſa ſemet ipſam mouet, etiam ipſa mouebitur. quare ſi omnis motus eſt receſſus eius quod mouetur quatenus mouetur: etiam anima recedet à *ſua* eſſentia, ſi non ex accidenti ſe
D ipſam mouet, ſed eſt motus ipſius eſſentiæ per ſe. 11 Quidam verò aiunt etiam animam mouere corpus in quo eſt, ſicut ipſa mouetur: vt Democritus, qui ſimiliter loquitur ac Philippus comicus: inquit enim Dædalum feciſſe ligneam illam Venerem, quæ moueretur, infuſo argento fuſili. ſimiliter autem & Democritus aſſerit: nam dicit indiuiduos orbes, dum mouentur, eò quòd ſunt eâ naturâ præditi vt numquam conſiſtant, ſimul trahere ac mouere corpus vniuerſum. Nos autem rogabimus, an hoc ipſum etiam quieſcere faciet. ſed quomodo hoc faciet, difficile *eſt*, aut etiam impoſſibile dictu. & omnino
E anima non ita videtur mouere animal, ſed ex prælectione quadam & intellectione. 12 Eodem modo etiam Timæus de natura diſſerens, inquit animam mouere corpus: eò namque quòd ipſa moueatur, mouere etiam corpus, quia cum ipſo eſt connexa. conſtantem enim ex elementis, ac diſtinctam ſecundùm numeros harmonicos, vt ſenſum & inſitum concentum habeat, & vniuerſum feratur conſonis lationibus, rectitudinem in circulum flexit; ac diuiſione vnius circuli facta in duos circulos bifariàm coniunctos, rurſus vnum diuiſit in ſeptem circulos; tamquam animæ motus ſint cœli lationes. 13 Primùm igitur non rectè dicitur animam eſſe magnitudinem.

conſtat enim *eum* vniuerſi animam talem eſſe velle, qualis eſt qui vocatur intellectus: nõ enim qualis *eſt anima* ſenſitiua, nec qualis *eſt* concupiſcitiua: quoniam harum motus non *eſt* conuerſio. 14 Intellectus verò *eſt* vnus & continuus, quemadmodum & intellectio: intellectio vero, *vt* intelligibilia. atqui hæc *ſunt vnum*, quia deinceps *ſunt*, vt numerus, non vt magnitudo. quare nec intellectus *eſt* ita continuus: ſed aut impartibilis, aut nõ vt magnitudo aliqua continuus. 15 Nam quomodo, cùm ſit magnitudo, quâuis ſuarum partium intelliget, partium inquam aut ſecundùm magnitudinem, aut ſecundùm punctum, ſi *tamen* oportet etiam hoc appellare partem. Ergo ſi ſecundùm punctum, hæc verò *ſunt* infinita: patet, eum numquam pertranſiturum. ſin autem ſecundùm magnitudinem, ſæpius vel infinities intelliget eandem rem. ſed videtur & ſemel fieri poſſe. Si verò ſufficit tangere quauis partẽ, quid opus eſt circulo moueri, aut omnino magnitudinem habere? Quòd ſi neceſſe eſt vt toto circulo tangens intelligat, quis eſt tactus qui partibus *fit*? 16 Præterea quomodo intelliget partibile impartibili? & impartibile partibili? 17 Iam verò neceſſe *eſt* intellectum eſſe circulum hunc. intellectus enim motus *eſt* intellectio: circuli verò, conuerſio. ſi igitur intellectio *eſt* conuerſio: etiam intellectus erit circulus ille, cuius conuerſio talis, *eſt* intellectio. 18 Ergo ſemper aliquam rem intelliget. oportet enim ſiquidem conuerſio *eſt* ſempiterna. nam effectiuarum aut actiuarum intellectionum ſunt termini: quoniam omnes* *ſunt* alterius gratiâ. contemplatiuæ autem ſimiliter rationibus terminantur: omnis verò ratio aut *eſt* definitio, aut demonſtratio. ſed demonſtrationes & à principio *proficiſcuntur*, & habent aliquo modo finem, *id eſt*, ſyllogiſmum ſeu concluſionem. quòd ſi non terminantur, tamen non reflectuntur rurſus ad principium: ſed aſſumentes ſemper medium & extremum, rectà progrediuntur: circulus verò ad principium rurſus reflectitur. omnes autem definitiones *ſunt* finitæ. 19 Præterea ſi eadem conuerſio ſæpius *fit*, oportebit ſæpius intelligere eandem rem. 20 Inſuper intellectio ſimilis eſt cuidam quieti & ſtatui, potiùs quàm motui, eodémque modo ſyllogiſmus. 21 Quin nec beatum eſt, quod non eſt facile, ſed violentum. quòd ſi motus non eſt eius eſſentia, præter naturam mouebitur. 22 Item laborioſum *eſt*, eſſe commixtum cum corpore, nec poſſe ab *eo* ſolui: & inſuper fugiendum. ſiquidem *eſt* melius intellectui eſſe ſine corpore, ſicuti dici ſolet, & pleriſque concorditer videtur. 23 Incerta *eſt* etiam cauſa cur cœlum circumferatur: quia nec animæ eſſentia *eſt* cauſa cur circumferatur, ſed ex accidenti ſic mouetur: nec corpus *eſt* cauſa: ſed illi potiùs anima. 24 At verò ne quidem dicitur quia melius. atqui oportebat Deum ideo facere vt animæ circulo moueretur, quia melius ei *ſit* moueri, quàm ſtare: & ita moueri, quàm aliter. Sed quia eiuſmodi conſideratio aliarum diſputationum eſt magis propria, eam in præſentia dimittamus.

25 Iam verò illud abſurdum accidit & huic ſermoni, & pleriſque eorum qui de anima *haberi ſolent*: quia compingunt & immittunt animam in corpus: cùm nihil præterea definiant, quam ob cauſam, & quomodo ſe habente corpore *id fiat*. atqui videatur hoc neceſſarium eſſe: quoniam propter communionem aliud facit, aliud patitur, & aliud mouetur, aliud mouet: quo-

A τὴν γὰρ τοῦ παντός, δῆλον ὅτι τοιαύτην εἶναι βούλεται, οἷόν ποτ' ἐστὶν ὁ καλούμενος νοῦς· οὐ γὰρ δὴ οἷόν γε ἡ αἰσθητική, οὐδ' οἷον ἡ ἐπιθυμητική· τούτων γὰρ ἡ κίνησις, οὐ κυκλοφορία. 14 Ὁ δὲ νοῦς εἷς καὶ συνεχής, ὥσπερ καὶ ἡ νόησις· ἡ δὲ νόησις, τὰ νοήματα· ταῦτα δὲ τῷ ἐφεξῆς ἕν, ὡς ὁ ἀριθμός, ἀλλ' οὐχ ὡς τὸ μέγεθος. διόπερ οὐδὲ ὁ νοῦς οὕτω συνεχής, ἀλλ' ἤτοι ἀμερής, ἢ οὐχ ὡς μέγεθός τι συνεχής. 15 Πῶς γὰρ δὴ καὶ νοήσει μέγεθος *ὢν ὁποιῳοῦν τῶν μορίων τῶν αὐτοῦ. [* γρ. ὁτῳοῦν.] μορίων δέ, ἤτοι κατὰ μέγεθος, ἢ κατὰ στιγμήν, εἰ δεῖ καὶ τοῦτο μόριον εἰπεῖν.
B Εἰ μὲν οὖν κατὰ στιγμήν, αὗται δ' ἄπειροι, δῆλον ὡς οὐδέποτε διέξεισιν. εἰ δὲ κατὰ μέγεθος, πολλάκις ἢ ἀπειράκις νοήσει τὸ αὐτό. φαίνεται δὲ καὶ ἅπαξ ἐνδεχόμενον. εἰ δὲ ἱκανὸν θιγεῖν ὁποιῳοῦν τῶν μορίων, τί δεῖ * κύκλῳ κινεῖσθαι, ἢ καὶ ὅλως μέγεθος ἔχειν; [* γρ. κυκλικῶς] εἰ δ' ἀναγκαῖον νοῆσαι τῷ ὅλῳ κύκλῳ θιγόντα, τίς ἐστιν ἡ τοῖς μορίοις θίξις; 16 Ἔτι δὲ πῶς νοήσει τὸ μεριστὸν ἀμερεῖ, καὶ τὸ ἀμερὲς μεριστῷ; ἀναγκαῖον δὲ τὸν νοῦν εἶναι τὸν κύκλον τοῦτον. νοῦ μὲν γὰρ κίνησις, νόησις· κύκλου δέ, περιφορά. εἰ οὖν ἡ νόησις περιφορά, καὶ νοῦς ἂν εἴη ὁ κύκλος, οὗ ἡ τοιαύτη περιφορὰ νόησις. 18 Ἀεὶ δὲ δή τι νοήσει· δεῖ γάρ, εἴπερ ἀΐδιος ἡ
C περιφορά. τῶν μὲν γὰρ ποιητικῶν ἢ πρακτικῶν νοήσεων, ἔστι πέρατα· πᾶσαι γὰρ ἑτέρου χάριν. αἱ δὲ θεωρητικαὶ τοῖς λόγοις ὁμοίως ὁρίζονται. λόγος δὲ πᾶς, ἢ ὁρισμός, ἢ ἀπόδειξις· αἱ δ' ἀποδείξεις, καὶ ἀπ' ἀρχῆς, καὶ ἔχουσί πως τέλος τὸν συλλογισμόν, ἢ τὸ συμπέρασμα. εἰ δὲ μὴ περατοῦνται, ἀλλ' οὐκ ἀνακάμπτουσί γε πάλιν ἐπ' ἀρχήν. προσλαμβάνουσαι δ' ἀεὶ μέσον, καὶ ἄκρον, εὐθυποροῦσιν. ἡ δὲ περιφορὰ πάλιν ἐπ' ἀρχὴν ἀνακάμπτει· οἱ δ' ὁρισμοὶ πάντες, πεπερασμένοι. 19 Ἔτι εἰ αὐτὴ περιφορὰ πολλάκις, δεήσει πολλάκις νοεῖν τὸ αὐτό. 20 Ἔτι δὲ καὶ
D ἡ νόησις ἔοικεν ἠρεμήσει τινί, καὶ ἐπιστάσει μᾶλλον ἢ κινήσει. τὸν αὐτὸν δὲ τρόπον καὶ ὁ συλλογισμός. 21 Ἀλλὰ μὴν οὐδὲ μακάριόν γε τὸ μὴ ῥᾴδιον, ἀλλὰ βίαιον. εἰ δ' ἐστὶν ἡ κίνησις αὐτῆς μὴ οὐσία, παρὰ φύσιν κινοῖτ' ἄν. 22 Ἐπίπονον δὲ καὶ τὸ μεμῖχθαι τῷ σώματι, μὴ δυνάμενον ἀπολυθῆναι· καὶ προσέτι φευκτόν, εἴπερ βέλτιον τῷ νῷ μὴ μετὰ σώματος εἶναι, καθάπερ εἴωθέ τε λέγεσθαι, καὶ πολλοῖς συνδοκεῖ. 23 Ἄδηλος δὲ καὶ τοῦ κύκλῳ φέρεσθαι τὸν οὐρανὸν ἡ αἰτία· οὔτε γὰρ τῆς ψυχῆς ἡ οὐσία, αἰτία τοῦ κύκλῳ φέρεσθαι, ἀλλὰ κατὰ συμβεβηκὸς οὕτω κινεῖται· οὔτε τὸ σῶμα αἴτιον,
E ἀλλ' ἡ ψυχὴ μᾶλλον ἐκείνῳ. 24 Ἀλλὰ μὴν οὐδ' ὅτι βέλτιον λέγεται. καίτοι γ' ἐχρῆν τὸν θεὸν διὰ τοῦτο κύκλῳ ποιεῖν φέρεσθαι τὴν ψυχήν, ὅτι βέλτιον αὐτῇ τὸ κινεῖσθαι τοῦ μένειν, κινεῖσθαι δὲ οὕτως ἢ ἄλλως. ἐπεὶ δ' ἐστὶν ἡ τοιαύτη σκέψις ἑτέρων λόγων οἰκειοτέρα, ταύτην μὲν ἀφῶμεν τὸ νῦν. 25 Ἐκεῖνο δὲ ἄτοπον συμβαίνει καὶ τούτῳ τῷ λόγῳ, καὶ τοῖς πλείστοις τῶν περὶ ψυχῆς· συνάπτουσι γὰρ καὶ τιθέασιν εἰς σῶμα τὴν ψυχήν, οὐθὲν προσδιορίσαντες διὰ τίν' αἰτίαν, καὶ πῶς ἔχοντος τοῦ σώματος. καίτοι δόξειεν ἂν τοῦτο ἀναγκαῖον εἶναι· διὰ γὰρ τὴν κοινωνίαν, τὸ μὲν ποιεῖ, τὸ δὲ πάσχει· καὶ τὸ μὲν κινεῖται, τὸ δὲ κινεῖ. τού-

των δὲ οὐθὲν ὑπάρχει πρὸς ἄλληλα τοῖς τυχοῦσιν. οἱ δὲ μόνον ἐπιχειροῦσι λέγειν, ποῖόν τι ἡ ψυχή· περὶ δὲ τοῦ δεξομένου σώματος, οὐθὲν ἔτι προσδιορίζουσιν, ὥσπερ ἐνδεχόμενον κατὰ τοὺς Πυθαγορικοὺς μύθους, τὴν τυχοῦσαν ψυχὴν εἰς τὸ τυχὸν ἐνδύεσθαι σῶμα· δοκεῖ γὰρ ἕκαστον ἴδιον ἔχειν εἶδος καὶ μορφήν. παραπλήσιον δὲ λέγουσιν, ὥσπερ εἴ τις φαίη τὴν τεκτονικὴν εἰς αὐλοὺς ἐνδύεσθαι. δεῖ γὰρ τὴν μὲν τέχνην χρῆσθαι τοῖς ὀργάνοις, τὴν δὲ ψυχὴν, τῷ σώματι.

A rum nullum quibuslibet inter ſe ineſt. ſed illi tantùm dicere aggrediuntur, quale quid *ſit* anima. de corpore autem eam ſuſcepturo, nihil præterea definiunt, quaſi fieri poſſit ſecundùm Pythagoricas fabulas, vt quæuis anima ingrediatur in quoduis corpus. videtur enim vnumquodque habere propriam ſpeciem & formam. ſimiliter autem loquuntur, ac ſi quis diceret artem fabrilem in tibias ingredi: oportet enim artem quidem vti inſtrumentis, animam autem corpore.

Animam non eſſe harmoniam. Cap. IV.

Καὶ ἄλλη δέ τις δόξα παραδέδοται περὶ ψυχῆς, B πιθανὴ μὲν πολλοῖς, καὶ οὐδεμιᾶς ἧττον τῶν λεγομένων· λόγους δὲ ὥσπερ εὐθύνας δεδωκυῖα καὶ ἐν τοῖς ἐν κοινῷ γινομένοις λόγοις. ἁρμονίαν γάρ τινα αὐτὴν τινὲς λέγουσι· καὶ γὰρ τὴν ἁρμονίαν, κρᾶσιν καὶ σύνθεσιν τινὰ ἐναντίων εἶναι, καὶ τὸ σῶμα συγκεῖσθαι ἐξ ἐναντίων. 2 Καί τοι γε ἡ μὲν ἁρμονία λόγος τίς ἐστι τῶν μιχθέντων ἢ σύνθεσις, τὴν δὲ ψυχὴν οὐδέτερον τούτων εἶναι οἷόν τε. 3 Ἔτι δὲ τὸ κινεῖν οὐκ ἔστιν ἁρμονίας, ψυχῇ δὲ τοῦτο ἀπονέμουσι πάντες μάλισθ' ὡς * εἰπεῖν. C 4 Ἁρμόζει δὲ μᾶλλον καθ' ὑγιείας λέγειν ἁρμονίαν, καὶ ὅλως τῶν σωματικῶν ἀρετῶν, ἢ κατὰ ψυχῆς. 5 Φανερώτερον δ' εἴ τις ἀποδιδόναι πειραθείη τὰ πάθη, καὶ τὰ ἔργα τῆς ψυχῆς ἁρμονίᾳ τινί· χαλεπὸν γὰρ ἐφαρμόζειν. 6 Ἔτι δὲ εἰ λέγομεν τὴν ἁρμονίαν, εἰς δύο ἀποβλέποντες, κυριώτατα μὲν τῶν μεγεθῶν ἐν τοῖς ἔχουσι κίνησιν καὶ θέσιν τὴν σύνθεσιν αὐτῶν, ἐπειδὰν οὕτω συναρμόζωσιν, ὥστε μηδὲν συγγενὲς παραδέχεσθαι· ἐντεῦθεν δὲ καὶ τὸν τῶν μεμιγμένων λόγον· οὐδετέρως μὲν οὖν εὔλογον. ἡ δὲ σύνθεσις τῶν τοῦ σώματος μερῶν λίαν εὐεξέταστος· πολλαί τε γὰρ αἱ συνθέσεις τῶν μερῶν, καὶ πολ- D λαχῶς. τίνος οὖν ἢ πῶς ὑπολαβεῖν χρὴ τὸν νοῦν σύνθεσιν εἶναι, ἢ καὶ τὸ αἰσθητικὸν, ἢ ὀρεκτικόν; ὁμοίως δὲ ἄτοπον, καὶ τὸν λόγον τῆς μίξεως εἶναι τὴν ψυχήν· οὐ γὰρ τὸν αὐτὸν ἔχει λόγον ἡ μίξις τῶν στοιχείων, καθ' ἣν σὰρξ, καὶ καθ' ἣν ὀστοῦν. συμβήσεται οὖν πολλάς τε ψυχὰς ἔχειν, καὶ κατὰ πᾶν τὸ σῶμα, εἴπερ πάντα μὲν ἐκ τῶν στοιχείων μεμιγμένων. ὁ δὲ τῆς μίξεως λόγος, ἁρμονία καὶ ψυχή. 7 Ἀπαιτήσειε δ' ἄν τις τοῦτό γε καὶ παρ' Ἐμπεδοκλέους· ἕκαστον γὰρ αὐτῶν ἐν λόγῳ τινί φησιν εἶναι. πότερον οὖν λόγος ἐστὶν ἡ ψυχή, ἢ μᾶλλον ἕτερόν τι E οὖσα ἐγγίνεται τοῖς μέλεσιν; ἔτι δὲ, πότερον ἡ φιλία τῆς τυχούσης αἰτία μίξεως, ἢ τῆς κατὰ τὸν λόγον· καὶ αὕτη πότερον ὁ λόγος ἐστὶν, ἢ παρὰ τὸν λόγον ἕτερόν τι; ταῦτα μὲν οὖν ἔχει τοιαύτας ἀπορίας. 8 Εἰ δ' ἐστὶν ἕτερον ἡ ψυχὴ τῆς μίξεως, τί δή ποτε ἅμα τῷ σαρκὶ εἶναι ἀναιρεῖται καὶ τῷ τοῖς ἄλλοις μορίοις τοῦ ζῴου; Πρὸς δὲ τούτοις, εἴπερ μὴ ἕκαστον τῶν μορίων ψυχὴν ἔχει, εἰ μή ἐστιν ἡ ψυχὴ ὁ λόγος τῆς μίξεως, τί ἐστιν ὃ φθείρεται τῆς ψυχῆς ἀπολιπούσης; 9 Ὅτι μὲν οὖν οὔθ' ἁρμονίαν οἷόν τε εἶναι τὴν ψυχὴν, οὔτε κύκλῳ περιφέρεσθαι, δῆλον ἐκ τῶν εἰρημένων. κατὰ συμβεβηκὸς δὲ κινεῖσθαι καθάπερ εἴπομεν,

* γ. κινεῖν.

B Alia quoque opinio tradita eſt de anima, probabilis quidem multis, ac nulla earum quæ datæ ſunt, deterior: quæ tamen, velut ij qui magiſtratu abierunt, rationes reddidit etiam diſputationibus in communi factis. nonnulli enim aſſerunt, eam eſſe harmoniam quandam: etenim harmoniam eſſe temperationem & compoſitionem quandam contrariorum: corpus autem componi ex contrariis. 2 Atqui harmonia eſt ratio quædam mixtorum, vel compoſitio: anima verò neutrum horum eſſe poteſt. 3 Præterea mouere non eſt harmoniæ: omnes autem (penè dixerim) ma- C ximè hoc animæ attribuunt. 4 Magis autem quadrat de ſanitate dicere harmoniam, & omnino de corporeis virtutibus, quàm de anima. 5 Sed magis perſpicuum fiet, ſi quis tentauerit harmoniâ quadam explicare affectiones & opera animæ: difficile *eſt* enim accommodare. Præterea ſi dicamus harmoniam, ad duo reſpicientes, præcipuè quidem in iis magnitudinibus quæ motum & poſitionem habent, earum compoſitionem, cùm ita ſunt coaptatæ, vt nihil eiuſdem generis admittant: hinc verò etiam mixtorum rationem: neutro ſanè modo eſt rationi conſentaneum. Compoſitio autem partium corporis facilè admodum D refellitur: quia multæ ſunt compoſitiones partium, & multis modis. cuius igitur, aut quomodo compoſitionem eſſe, oportet exiſtimare intellectum, aut etiam ſenſitiuum, aut appetitiuum? Similiter etiam *eſt* abſurdum, animam eſſe rationem mixtionis: quia non habet eandem rationem mixtio elementorum, ſecundùm quam *eſt* caro, & ſecundùm quam *eſt* os. accidet igitur multas animas habere, & *quidem* per vniuerſum corpus: ſiquidem omnes *partes* ſunt ex elementis mixtis: ac mixtionis ratio *eſt* harmonia & anima. 7 Poſtulare autem aliquis hoc poſſit etiam ab Empedocle: E quoniam vnamquãque earum in ratione quadam eſſe ait. vtrùm igitur anima eſt ratio, an potiùs, cùm ſit aliud quiddam, membris accidit? præterea vtrùm amicitia eſt cauſa cuiuſcumque mixtionis, an eius tantùm quæ in ratione conſiſtit? & ipſa vtrùm eſt ratio quędam, an à ratione diuerſum quidpiam? Hęc igitur habẽt eiuſmodi dubitationes. 8 Quòd ſi anima eſt res diuerſa à mixtione, cur tandẽ vnà cũ eſſentia carnis & aliarũ animalis partium tollitur? Ad hæc, niſi quæque pars habet animam, ſi anima non eſt mixtionis ratio illa, quid eſt quod perit animâ abſcedente? 9 Animã igitur non poſſe harmoniã eſſe, aut in orbem ferri, patet ex iis quæ dicta ſunt. Ex accidenti autẽ moueri poteſt, vt diximus,

& mouere ſemetipſam: vt putà moueri quidem id in quo eſt, hoc autem moueri ab anima. aliter verò ea ſecundùm locum moueri nequit.

A ἐστι καὶ κινεῖν ἑαυτήν· οἷον κινεῖσθαι μὲν, ἐν ᾧ ἐστι, τοῦτο δὲ κινεῖσθαι ὑπὸ τῆς ψυχῆς· ἄλλως δ' οὐχ οἷόν τε κινεῖσθαι κατὰ τόπον αὐτήν.

Animam aliis præter localem motibus non moueri. Cap. V.

PRobabiliùs autem de ea dubitare aliquis poſſit, quaſi moueatur, ad eiuſmodi argumenta reſpiciens: quia dicimus animam dolere, lætari, confidere, metuere: præterea iraſci, ſentire, ratiocinari: quæ omnia videntur eſſe motus. vnde putare aliquis poſſit eam moueri. 2 Sed hoc non eſt neceſſarium. nam ſi vel maximè dolere, aut lætari, aut ratiocinari, ſint motus, & horum vnumquodque ſit moueri: tamen moueri eſt ab anima: vt puta iraſci, vel timere, quia cor ita mouetur. ratiocinari autem aut *eſt* tale, aut fortaſſe aliud quiddam. 3 Horum autem alia fiunt quibuſdam ſecundùm locum motis: alia quibuſdam variatis. Qualia verò hæc ſint, & quomodo, alia diſputatio *eſt*. 4 Dicere autem animam iraſci, perinde *eſt*, ac ſi quis diceret animam texere, aut ædificare. melius enim fortaſſe *eſt*, non dicere animam miſereri, vel diſcere, vel ratiocinari, ſed hominem anima: idque, non quaſi in illa ſit motus, ſed aliquando vſque ad illam, quandoque ab illa: vt ſenſus *eſt* ab his: recordatio autem ab illa *eſt* ad eas motiones vel manſiones quæ *ſunt* in ſenſuum inſtrumentis. 5 Intellectus autem videtur accedere, cùm ſit ſubſtantia quædam, neque corrumpi. maximè enim corrumperetur ab hebetatione illa, quæ fit in ſenectute: nunc autem vt in ſenſoriis accidit: etenim ſi ſenex nanciſceretur oculum talem, videret ſanè vt iuuenis. quapropter ſenectus non *eſt*, quia anima aliquid patiatur, ſed quia *id patitur* in quo *eſt anima*, ſicut euenit in ebrietatibus, & morbis. Itaque intelligere, & contemplari lãgueſcit, alio quodam intus corrupto: ipſum autem eſt impatibile. ratiocinari verò, & amare, vel odiſſe, non ſunt illius affectiones, ſed huius, quod habet illud, quatenus illud habet. ideóque hoc corrupto, neque recordatur, neque amat: quia non erat illius, ſed communis, quod periit. ceterùm intellectus fortaſſe diuinius quiddam & impatibile eſt. 6 Non poſſe igitur animam moueri, perſpicuum ex his *eſt*. quòd ſi omnino non mouetur: patet, eam nec à ſe ipſa *moueri*.

B Εὐλογώτερον δ' ἀπορήσειεν ἄν τις περὶ αὐτῆς, ὡς κινουμένης, εἰς τὰ τοιαῦτα ἀποβλέψας· φαμὲν γὰρ τὴν ψυχὴν λυπεῖσθαι, χαίρειν, θαρρεῖν, φοβεῖσθαι· ἔτι δὲ ὀργίζεσθαι καὶ αἰσθάνεσθαι, καὶ διανοεῖσθαι. ταῦτα δὲ πάντα, κινήσεις εἶναι δοκοῦσιν. ὅθεν οἰηθείη τις ἂν αὐτὴν κινεῖσθαι. 2 Τὸ δ' οὐκ ἔστιν ἀναγκαῖον· εἰ γὰρ καὶ ὅτι μάλιστα τὸ λυπεῖσθαι, ἢ χαίρειν, ἢ διανοεῖσθαι κινήσεις εἰσί, καὶ ἕκαστον κινεῖσθαι τούτων· τὸ δὲ κινεῖσθαί ἐστιν ὑπὸ τῆς ψυχῆς, οἷον τὸ ὀργίζεσθαι, ἢ φοβεῖσθαι, τὴν καρδίαν ὡδὶ κινεῖσθαι· τὸ δὲ διανοεῖσθαι, ἢ τοιοῦτον, ἴσως δὲ ἕτερόν τι. 3 Τούτων δὲ συμβαίνει, τὰ μὲν κατὰ φορὰν τινῶν κινουμένων, τὰ δὲ κατ' ἀλλοίωσιν. ποῖα δὲ καὶ πῶς, ἕτερος ἐστὶ λόγος. C 4 Τὸ δὲ λέγειν ὀργίζεσθαι τὴν ψυχὴν, ὅμοιον κἂν εἴ τις λέγοι τὴν ψυχὴν ὑφαίνειν, ἢ οἰκοδομεῖν. βέλτιον γὰρ ἴσως μὴ λέγειν τὴν ψυχὴν ἐλεεῖν, ἢ μανθάνειν, ἢ διανοεῖσθαι, ἀλλὰ τὸν ἄνθρωπον τῇ ψυχῇ. τοῦτο δὲ μὴ ὡς ἐν ἐκείνῃ τῆς κινήσεως οὔσης· ἀλλ' ὅτι ὁτὲ μὲν μέχρις ἐκείνης, ὁτὲ δὲ ἀπ' ἐκείνης· οἷον, ἡ μὲν αἴσθησις ἀπὸ μὲν τωνδί, ἡ δὲ ἀνάμνησις ἀπ' ἐκείνης, ἐπὶ τὰς ἐν τοῖς αἰσθητηρίοις κινήσεις ἢ μονάς. ὁ δὲ νοῦς ἔοικεν ἐγγίνεσθαι, οὐσία τις οὖσα, καὶ οὐ φθείρεσθαι. μάλιστα γὰρ ἐφθείρετ' ἂν ὑπὸ τῆς ἐν τῷ γήρᾳ ἀμαυρώσεως. νῦν δ' ὥσπερ ἐπὶ τῶν αἰσθητηρίων συμβαίνει. εἰ γὰρ λάβοι ὁ πρεσβύτης ὄμμα τοιονδί, βλέποι ἂν, ὥσπερ καὶ ὁ νέος. ὥστε τὸ γῆρας, D οὐ τῷ τὴν ψυχὴν πεπονθέναι τι, ἀλλ' ἐν ᾧ, καθάπερ ἐν μέθαις καὶ νόσοις. καὶ τὸ νοεῖν δὴ καὶ τὸ θεωρεῖν μαραίνεται, ἄλλου τινὸς ἔσω φθειρομένου· αὐτὸ δὲ ἀπαθές ἐστι. τὸ δὲ διανοεῖσθαι, καὶ φιλεῖν, ἢ μισεῖν, οὐκ ἔστιν ἐκείνου πάθη, ἀλλὰ τουδὶ τοῦ ἔχοντος ἐκεῖνο, ᾗ ἐκεῖνο ἔχει. διὸ καὶ τούτου φθειρομένου, οὔτε μνημονεύει, οὔτε φιλεῖ· οὐ γὰρ ἐκείνου ἦν, ἀλλὰ τοῦ κοινοῦ, ὃ ἀπόλωλεν. ὁ δὲ νοῦς ἴσως θειότερόν τι καὶ ἀπαθές ἐστιν. 6 ὅτι μὲν οὖν οὐχ οἷόν τε κινεῖσθαι τὴν ψυχὴν, φανερὸν ἐκ τούτων· εἰ δ' ὅλως μὴ κινεῖται, δῆλον ὡς οὐδ' ὑφ' ἑαυτῆς.

Animam non eſſe numerum ſeipſum mouentem. Cap. VI.

SEd multò magis quàm ea quæ dicta ſunt, à ratione diſtat, dicere animam eſſe numerum mouentem ſemetipſum. his enim adſunt impoſſibilia, primùm quæ ex ipſo moueri eueniunt, deinde peculiaria ex eo quòd dicunt eam *eſſe* numerum. 2 Nam quomodo intelligere oportet vnitatem moueri? & à quo? & quomodo? cùm ſit impartibilis & indifferens? Etenim ſi eſt motiua & mobilis, eam differre oportet. 3 Præterea quoniam dicunt motam lineam efficere planum, & motum punctum *efficere* lineam: *profecto* etiam vnitatum motus erunt lineæ: quia punctum eſt vnitas poſitionem habens: animæ autem numerus iam alicubi eſt, & poſitionem habet.

E Πολὺ δὲ τῶν εἰρημένων ἀλογώτατον, τὸ λέγειν ἀριθμὸν εἶναι τὴν ψυχὴν κινοῦνθ' ἑαυτόν· ὑπάρχει γὰρ αὐτοῖς ἀδύνατα, πρῶτα μὲν τὰ ἐκ τοῦ κινεῖσθαι συμβαίνοντα· ἴδια δὲ ἐκ τοῦ λέγειν αὐτὴν ἀριθμόν. 2 πῶς γὰρ χρὴ νοῆσαι μονάδα κινουμένην, καὶ ὑπὸ τίνος, καὶ πῶς, ἀμερῆ καὶ ἀδιάφορον οὖσαν; εἰ γὰρ ἐστι κινητικὴ, καὶ κινητὴ, διαφέρειν δεῖ. 3 ἔτι δ' ἐπεί φασι κινηθεῖσαν γραμμὴν ἐπίπεδον ποιεῖν, στιγμὴν δὲ γραμμὴν· καὶ αἱ τῶν μονάδων κινήσεις, γραμμαὶ ἔσονται· ἡ γὰρ στιγμὴ, μονάς ἐστι θέσιν ἔχουσα. ὁ δ' ἀριθμὸς τῆς ψυχῆς, ἤδη πού ἐστι, καὶ θέσιν ἔχει.

4 ἔτι δ' ἀριθμοῦ μὲν ἐὰν ἀφέλῃ τις ἀριθμὸν ἢ μονάδα, λείπεται ἄλλος ἀριθμός. τὰ δὲ φυτὰ, καὶ τῶν ζῴων πολλὰ διαιρούμενα, ζῇ, καὶ δοκεῖ τὴν αὐτὴν ψυχὴν ἔχειν τῷ εἴδει. 5 δόξειε δ' ἂν οὐδὲν διαφέρειν, μονάδας λέγειν, ἢ σωμάτια σμικρά. καὶ γὰρ ἐκ τῶν Δημοκρίτου σφαιρίων, ἐὰν γίνωνται στιγμαὶ, μόνον δὲ μένῃ τὸ ποσὸν, ἔσται τι ἐν αὐτῷ τὸ μὲν κινοῦν, τὸ δὲ κινούμενον, ὥσπερ ἐν τῷ μεγέθει. οὐ γὰρ διὰ τὸ μεγέθει διαφέρειν ἢ σμικρότητι, τοῦτο συμβαίνει τὸ λεχθὲν, ἀλλ' ὅτι ποσόν. διὸ ἀναγκαῖον εἶναί τι τὸ κινῆσον τὰς μονάδας. εἰ δ' ἐν τῷ ζῴῳ τὸ κινοῦν ἡ ψυχὴ, καὶ ἐν τῷ ἀριθμῷ· ὥστε οὐ τὸ κινοῦν καὶ τὸ κινούμενον ἡ ψυχὴ, ἀλλὰ τὸ κινοῦν μόνον. * 6 ἐνδέχεται δὲ πῶς μονάδα ταύτην εἶναι; δεῖ γὰρ ὑπάρχειν αὐτῇ διαφορὰν πρὸς τὰς ἄλλας· στιγμῆς δὲ μοναδικῆς τίς ἂν εἴη διαφορὰ, πλὴν θέσις; εἰ μὲν οὖν εἰσιν ἕτεραι αἱ ἐν τῷ σώματι μονάδες, ἢ στιγμαὶ, ἐν τῷ αὐτῷ ἔσονται αἱ μονάδες· καθέξει γὰρ χώραν στιγμῆς. καί τοι τί * κωλύει ἐν τῷ αὐτῷ εἶναι, εἰ δύο καὶ ἀπείρους; ὧν γὰρ ὁ τόπος ἀδιαίρετος, καὶ αὐτά. εἰ δ' αἱ ἐν τῷ σώματι στιγμαί εἰσιν ὁ ἀριθμὸς ὁ τῆς ψυχῆς, ἢ εἰ ὁ ἐκ τῶν ἐν τῷ σώματι στιγμῶν ἀριθμὸς ἡ ψυχὴ, διὰ τί οὐ πάντα ψυχὴν ἔχουσι τὰ σώματα; στιγμαὶ γὰρ ἐν ἅπασι δοκοῦσιν εἶναι καὶ ἄπειροι. ἔτι δὲ, πῶς οἷόν τε χωρίζεσθαι τὰς ψυχὰς καὶ ἀπολύεσθαι τῶν σωμάτων, εἴ γε μὴ διαιροῦνται αἱ γραμμαὶ εἰς τὰς στιγμάς; 7 συμβαίνει δὲ καθάπερ εἴπομεν, τῇ μὲν ταὐτὸ λέγειν τοῖς σῶμά τι λεπτομερὲς αὐτὴν τιθεῖσι· τῇ δ', ὥσπερ Δημόκριτος κινεῖσθαί φησιν ὑπὸ τῆς ψυχῆς, ἴδιον τὸ ἄτοπον· εἴπερ γάρ ἐστιν ἡ ψυχὴ ἐν παντὶ τῷ αἰσθανομένῳ σώματι, ἀναγκαῖον ἐν τῷ αὐτῷ δύο εἶναι σώματα, εἰ σῶμά τι ἡ ψυχή· τοῖς δ' ἀριθμὸν λέγουσιν, ἐν τῇ μιᾷ στιγμῇ πολλὰς στιγμὰς, ἢ πᾶν σῶμα ψυχὴν ἔχειν, εἰ μὴ διαφέρων τις ἀριθμὸς ἐγγίνεται, καὶ ἄλλος τις τῶν ὑπαρχουσῶν ἐν τῷ σώματι στιγμῶν. συμβαίνει τε κινεῖσθαι τὸ ζῷον ὑπὸ τοῦ ἀριθμοῦ, καθάπερ καὶ Δημόκριτον ἔφαμεν αὐτὸ κινεῖν· τί γὰρ διαφέρει σφαίρας λέγειν μικρὰς, ἢ μονάδας μεγάλας, ἢ ὅλως μονάδας φερομένας; ἀμφοτέρως γὰρ ἀναγκαῖον κινεῖν τὸ ζῷον, τῷ κινεῖσθαι αὐτάς. 8 τοῖς δὴ συμπλέξασιν εἰς τὸ αὐτὸ κίνησιν καὶ ἀριθμὸν, ταῦτά τε συμβαίνει, καὶ πολλὰ ἕτερα τοιαῦτα· οὐ γὰρ μόνον ὁρισμὸν ψυχῆς ἀδύνατον τοιοῦτον εἶναι, ἀλλὰ καὶ συμβεβηκός. δῆλον δ' εἴ τις ἐπιχειρήσειεν ἐκ τοῦ λόγου τούτου τὰ πάθη καὶ τὰ ἔργα τῆς ψυχῆς ἀποδιδόναι, οἷον λογισμοὺς, αἰσθήσεις, ἡδονὰς, λύπας, καὶ ὅσα ἄλλα τοιαῦτα· ὥσπερ γὰρ εἴπομεν πρότερον, οὐδὲ μαντεύσασθαι ῥᾴδιον ἐξ αὐτῶν.

* γ. ὑπ. ἐνδέχ.

* γ. κωλύσει

A 4 Præterea ſi quis à numero detrahat numerum vel vnitatem, relinquitur alius numerus: plantæ verò & animalium pleraque ſecta viuunt, & videntur eandem ſpecie animam habere. 5 Videri autem poſſit nihil referre, *ſiue* vnitates dicantur, ſiue parua corpuſcula. nam & ex Democriti ſphærulis ſi fiant puncta, modo maneat quantitas, erit aliquid in ipſa quod moueat, & quod moueatur, vt in magnitudine. non enim quia magnitudine differat aut paruitate, accidit quod dictum eſt. ſed quia *eſt* quantum. idcirco neceſſe *eſt* eſſe aliquid, quod moueat vnitates. quòd ſi anima *eſt* id quod mouet in animali; *certè* etiam in numero. quapropter anima non erit id quod mouet, & quod mouetur, ſed B quod mouet dumtaxat. 6 Sed qui fieri poteſt vt ea ſit vnitas? oportet enim eſſe eius differentiam ab aliis: puncti autem monadici quænam differentia eſſe poteſt niſi poſitio? Ergo ſi vnitates vel puncta, quæ *ſunt* in corpore, ſunt diuerſa: vnitates in eodem erunt: quia locum puncti obtinebunt. atqui ſi in eodem ſint duo puncta, quid prohibet etiam eſſe infinita? quorum enim locus *eſt* indiuiduus, ipſa quoque *ſunt indiuidua.* 4 Sin autem puncta quæ ſunt in corpore, ſunt numerus ille animæ, vel ſi, anima *eſt* numerus ille punctorum quæ ſunt in corpore: cur non omnia corpora animam habebunt? quandoquidem puncta in omnibus C eſſe videntur, *eaque* infinita. Præterea quomodo poterunt animæ ſeparari & ſolui à corporibus, ſiquidem lineæ non diuiduntur in puncta? 7 Accidit autem, vt diximus, partim vt idem dicant, quod ij qui eam ſtatuunt eſſe corpus quoddam ex ſubtilibus partibus conſtans: partim, vt Democritus moueri ait ab anima, peculiaris abſurditas. nam ſi anima eſt in vniuerſo corpore ſentiente: neceſſe *eſt* in eodem eſſe duo corpora, ſi anima *eſt* corpus quoddam: his verò qui dicunt eſſe numerum, accidit vt in vno puncto ſint multa puncta: vel omne corpus animam habeat, niſi differens quidam nu- D merus intus fiat ac diuerſus à punctis quæ ſunt in corpore. Accidit autem moueri animal à numero, quemadmodum & Democritum diximus ipſum mouere. quid enim refert, *ſiue*, dicatur paruas ſphæras, ſiue, magnas vnitates, aut omnino vnitates quæ ferantur, *mouere*? vtroque enim modo neceſſe *eſt eas* mouere animal, quia ipſæ mouentur. 8 His igitur, qui ſimul coniunxerunt motum & numerum, hæc accidunt, & multa alia eiuſmodi *abſurda.* non ſolùm enim impoſſibile *eſt* definitionem animæ talem eſſe, ſed etiam accidens. quod manifeſtum *fiet*, ſi quis aggrediatur ex hac definitione affectiones & opera animæ explicare, veluti cogitationes, ſenſus, voluptates, dolores, & quæ- E cumque alia eiuſmodi *ſunt.* vt enim antea diximus, ne quidem diuinare ex his facile *eſt.*

Animam non conſtare ex elementis. Cap. VII.

Τριῶν δὲ τρόπων παραδεδομένων, καθ' οὓς ὁρίζονται τὴν ψυχὴν, οἱ μὲν τὸ κινητικώτατον ἀπεφήναντο, τῷ κινεῖν ἑαυτό· οἱ δὲ, σῶμα τὸ λεπτομερέστατον, ἢ τὸ ἀσωματώτατον τῶν ἄλλων. ταῦτα δὲ τίνας ἀπορίας τε καὶ ὑπεναντιώσεις ἔχει, διεληλύθαμεν σχεδόν.

Cvm autem tres modi traditi ſint, quibus animam definiunt, alij pronunciarunt *eam eſſe* id quod maximè vim habet mouendi, quia ſe ipſam mouet: alij verò *eſſe* corpus ex ſubtiliſſimis partibus conſtans, vel quod ceteris eſt magis incorporeum. Quas verò dubitationes & repugnantias hæc habeant, ferè perſecuti ſumus.

reſtat igitur, vt conſideremus, quomodo dicatur eam conſtare ex elementis. *hoc* enim ideo inquiunt, vt ſentiat ea quæ ſunt, & quamcumq; rem cognoſcat. 2 Neceſſe autẽ *eſt* huic ſententiæ accidere multa, eáque impoſſibilia. ponunt enim *animam* ſimili cognoſcere ſimile, perinde ac ſi animam ponerent *eſſe* res *ipſas*. atqui non ſunt hæc ſola, ſed & multa alia, immo fortaſſe infinita numero, quæ ex his conſtant. Eſto igitur animam cognoſcere ac ſentire ea ex quibus vnumquodque horum conſtat. ſed quonam totum cognoſcet, aut ſentiet? velvti quid *ſit* Deus, aut homo, aut caro, aut os, & ſimiliter quoduis aliud compoſitum. non enim horum vnumquodque *eſt* elementa quoquo modo *ſe* habentia, ſed ratione quadam & compoſitione, quemadmodum etiam Empedocles ait *eſſe* os: inquit enim,

In patulis cepit tellus fornacibus alma
Splendoris liquidi geminas ex partibus octo,
Quattuor aſt ignis: ſunt oſſa hinc candida facta.

Nihil igitur prodeſt eſſe elementa in anima, niſi inſint etiam rationes, & compoſitio: nam ſimile quamque rem cognoſcet: nihil autem *cognoſcet* os, aut hominem, niſi hæc inſint. ſed hoc *eſſe* impoſſibile, ne quidem dicere oportet. quis enim dubitet, an inſit in anima lapis, vel homo? itidemque bonum, & non bonum? Eodem modo & in aliis *res habet*. 3 Præterea cùm ens multis modis dicatur, (ſignificat enim partim hoc aliquid, partim quantitatem, vel qualitatem, vel aliquam aliam ex diſtinctis categoriis) vtrùm ex omnibus erit anima, an non? ſed non videntur communia omnium eſſe elementa. an igitur ex iis tantùm *eſt*, quæ ſunt ſubſtantiarum *elementa*? quomodo ergo cognoſcit etiam quamuis aliam rem? an dicent cuiuſque generis eſſe elementa & principia propria, ex quibus anima conſtet? erit igitur & quantitas, & qualitas, & ſubſtantia. ſed *eſt* impoſſibile, ex quantitatis elementis eſſe ſubſtantiam, & non quantitatem. Iis igitur qui ex omnibus *elementis animam conſtare* dicunt, hæc & huiuſmodi alia eueniunt. 4 Abſurdè etiam dicitur, ſimile non pati à ſimili, ſimile tamen ſentire id quod eſt ſimile, & ſimili cognoſcere ſimile. ſentire autem ponunt *eſſe* quiddam pati ac moueri. ſimilitérque intelligere, & cognoſcere.
5 Cùm autem multas dubitationes ac difficultates habeat, ſi quis dicat, vt Empedocles, corporeis elementis ſingula cognoſci, & ad ſimile: id teſtatur etiam, quod nunc dicetur: quæcunque enim inſunt in animalium corporibus, ſimpliciter terreſtria, vt oſſa, nerui, pili, nullam rem ſentire videntur. quare nec res ſimiles *ſentiunt*. atqui oporteret. 6 Præterea cuique principio plus inerit ignorantiæ, quàm cognitionis: vnumquodque enim rem vnam cognoſcet, multas verò ignorabit, nempe omnes alias. 7 Accidit etiam Empedocli, Deum eſſe inſipientiſſimum: quippe qui ſolus non cognoſcet vnum elementum, *id eſt*, contentionem: mortalia verò cognoſcunt omnia, quia vnumquodque ex omnibus conſtat. 8 Omnino autem quamobrem non omnia entia animam habent? quandoquidem quicquid eſt, aut *eſt* elementum, aut ex elemento vno, aut ex pluribus, vel omnibus: neceſſe enim *eſt*, vnum quidpiam cognoſcere, vel aliqua, vel omnia. 9 Dubitare etiam aliquis poſſit, quid tandem ſit, quod ea vnum efficiat. nã elementa aſſimilantur materiæ: illud autẽ

A λείπεται δὲ ἐπισκέψασθαι, πῶς λέγεται τὸ ἐκ τῶν στοιχείων αὐτὴν εἶναι. λέγουσι μὲν γὰρ, ἵν᾽ αἰσθάνηταί τε τῶν ὄντων, καὶ ἕκαστον γνωρίζῃ. 2 ἀναγκαῖον δὲ συμβαίνειν πολλὰ καὶ ἀδύνατα τῷ λόγῳ· τιθένται γὰρ γνωρίζειν ὁμοίῳ τὸ ὅμοιον, ὥσπερ ἂν * εἰς τὴν ψυχὴν τὰ πράγματα τιθέντες. οὐκ ἔστι δὲ μόνα ταῦτα, πολλὰ δὲ καὶ ἕτερα. μᾶλλον δὲ ἴσως, ἄπειρα τὸν ἀριθμὸν, τὰ ἐκ τούτων. ἐξ ὧν μὲν οὖν ἐστιν ἕκαστον τούτων, ἔστω γινώσκειν τὴν ψυχὴν καὶ αἰσθάνεσθαι. ἀλλὰ τὸ σύνολον τίνι γνωριεῖ, ἢ αἰσθήσεται, οἷον τί θεὸς, ἢ ἄνθρωπος, ἢ σὰρξ, ἢ ὀστοῦν. ὁμοίως δὲ καὶ ὁτιοῦν ἄλλο τῶν συνθέτων· οὐ γὰρ ὁπωσοῦν ἔχοντα τὰ στοιχεῖα τούτων ἕκαστον, ἀλλὰ λόγῳ τινὶ B καὶ συνθέσει, καθάπερ φησὶ καὶ Ἐμπεδοκλῆς, τὸ ὀστοῦν.

Ἡ δὲ χθὼν ἐπίηρος ἐν εὐστέρνοις χοάνοισι,
Τὰ δύο τῶν ὀκτὼ * μοιρῶν λάχε νήστιδος αἴγλης,
Τέσσαρα δ᾽ Ἡφαίστοιο· τὰ δ᾽ ὀστέα λευκὰ γένοντο.

οὐθὲν οὖν ὄφελος εἶναι τὰ στοιχεῖα ἐν τῇ ψυχῇ, εἰ μὴ καὶ οἱ λόγοι ἐνέσονται, καὶ ἡ σύνθεσις· γνωριεῖ γὰρ ἕκαστον τὸ ὅμοιον· τὸ δ᾽ ὀστοῦν ἢ τὸν ἄνθρωπον, οὐθὲν, εἰ μὴ ταῦτ᾽ ἐνέσται. τοῦτο δ᾽ ὅτι ἀδύνατον, οὐθὲν δεῖ λέγειν· τίς γὰρ ἂν ἀπορήσειεν, εἰ ἔνεστιν ἐν τῇ ψυχῇ λίθος, ἢ ἄνθρωπος; ὁμοίως δὲ καὶ τὸ ἀγαθὸν καὶ τὸ μὴ ἀγαθόν. τὸν C αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἄλλων. 3 ἔτι δὲ πολλαχῶς λεγομένου τοῦ ὄντος· σημαίνει γὰρ τὸ μὲν τόδε τι, τὸ δὲ ποσὸν, ἢ ποιὸν, ἢ καί τινα ἄλλην τῶν διαιρεθεισῶν κατηγοριῶν; πότερον ἐξ ἁπάντων ἔσται ἡ ψυχὴ, ἢ οὔ; ἀλλ᾽ οὐ δοκεῖ κοινὰ πάντων εἶναι στοιχεῖα. ἆρ᾽ οὖν ὅσα τῶν οὐσιῶν, ἐκ τούτων μόνον; πῶς οὖν γινώσκει, ὅτι καὶ τῶν ἄλλων ἕκαστον, ἢ φήσουσιν ἑκάστου γένους εἶναι στοιχεῖα καὶ ἀρχὰς ἰδίας, ἐξ ὧν τὴν ψυχὴν συνεστάναι; ἔσται ἄρα καὶ ποσὸν, καὶ ποιὸν, καὶ οὐσία. ἀλλ᾽ ἀδύνατον ἐκ τῶν τοῦ ποσοῦ στοιχείων οὐσίαν εἶναι, καὶ μὴ ποσόν. τοῖς δὴ λέγουσιν ἐκ πάντων, ταῦτά τε καὶ τοιαῦθ᾽ ἕτερα συμβαίνει.
D 4 ἄτοπον δὲ καὶ τὸ φάναι μὲν ἀπαθὲς εἶναι τὸ ὅμοιον ὑπὸ τοῦ ὁμοίου· αἰσθάνεσθαι δὲ τὸ ὅμοιον τοῦ ὁμοίου, καὶ γινώσκειν τῷ ὁμοίῳ τὸ ὅμοιον. τὸ δ᾽ αἰσθάνεσθαι πάσχειν τι καὶ κινεῖσθαι τιθέασιν· ὁμοίως δὲ καὶ τὸ νοεῖν τε καὶ γινώσκειν. 5 πολλὰς δὲ ἀπορίας καὶ δυσχερείας ἔχοντος τοῦ λέγειν, καθάπερ Ἐμπεδοκλῆς, ὡς τοῖς σωματικοῖς στοιχείοις ἕκαστα γνωρίζεται καὶ πρὸς τὸ ὅμοιον, μαρτυρεῖ τὸ νῦν λεχθέν· ὅσα γὰρ ἔνεστιν ἐν τοῖς τῶν ζῴων σώμασιν, ἁπλῶς γῆς· οἷον ὀστᾶ, νεῦρα, τρίχες, οὐθενὸς αἰσθάνεσθαι δοκεῖ· ὥστε οὐδὲ τῶν ὁμοίων. καίτοι προσῆκεν. 6 ἔτι δ᾽ ἑκάστῃ τῶν ἀρχῶν ἄγνοια πλέον E ἢ σύνεσις ὑπάρξει· γνώσεται μὲν γὰρ ἓν ἕκαστον, πολλὰ δ᾽ ἀγνοήσει· πάντα γὰρ τὰ ἄλλα. 7 συμβαίνει δὲ Ἐμπεδοκλεῖ γε καὶ ἀφρονέστατον εἶναι τὸν θεόν. μόνος γὰρ τῶν στοιχείων ἓν οὐ γνωριεῖ τὸ νεῖκος. τὰ δὲ θνητὰ πάντα· ἐκ πάντων γὰρ ἕκαστον. 8 ὅλως δὲ διὰ τίν᾽ αἰτίαν οὐχ ἅπαντα ψυχὴν ἔχει τὰ ὄντα; ἐπειδὴ πᾶν ἢ στοιχεῖον, ἢ ἐκ στοιχείου ἑνὸς, ἢ ἐκ πλειόνων, ἢ πάντων· ἀναγκαῖον γὰρ ἐστιν ἕν τι γινώσκειν, ἢ τινὰ, ἢ πάντα. 9 ἀπορήσειε δ᾽ ἄν τις καὶ τί ποτέ ἐστι τὸ ἑνοποιοῦν αὐτά· * ὕλη γὰρ ἔοικε τά γε στοιχεῖα· κυριώτατον γὰρ

* γρ. ἐν τῇ ψ.
* γρ. μοιράων
* γρ. ὕλῃ γὰρ ἔοικε τὰ στοιχεῖα εἶναι.

ἐκεῖνο δ' συνέχον ὅ, τί ποτ' ἐστί· τῆς δὲ ψυχῆς εἶναί τι κρεῖττον καὶ ἄρχον, ἀδύνατον· ἀδυνατώτερον δ' ἔτι, τοῦ νοῦ· εὐλογώτατον γὰρ εἶναι * τοῦτον προγενέστατον καὶ κύριον κατὰ φύσιν. τὰ δὲ στοιχεῖά φασι πρῶτα τῶν ὄντων εἶναι. 10 πάντες δὲ καὶ οἱ διὰ τὸ γνωρίζειν καὶ αἰσθάνεσθαι τὴν ψυχὴν τὰ ὄντα, ἐκ τῶν στοιχείων λέγοντες αὐτήν, καὶ οἱ τὸ κινητικώτατον, οὐ περὶ ἁπάσης λέγουσι ψυχῆς. οὔτε γὰρ τὰ αἰσθανόμενα πάντα κινητικά. φαίνεται γὰρ εἶναί τινα μόνιμα τῶν ζώων κατὰ τόπον. καί τοι δοκεῖ γε ταύτην μόνην τῶν κινήσεων κινεῖν ἡ ψυχὴ τὸ ζῶον. ὁμοίως δὲ καὶ ὅσοι τὸν νοῦν καὶ τὸ αἰσθητικὸν ἐκ τῶν στοιχείων ποιοῦσι· φαίνεται γὰρ τά τε φυτὰ ζῆν, οὐ μετέχοντα φορᾶς οὐδ' αἰσθήσεως, καὶ τῶν ζώων πολλὰ διάνοιαν οὐκ ἔχειν. 11 εἰ δέ τις καὶ ταῦτα παραχωρήσειε, καὶ θείη τὸν νοῦν μέρος τι τῆς ψυχῆς, ὁμοίως δὲ καὶ τὸ αἰσθητικόν, οὐδ' ἂν οὕτω λέγοιεν καθόλου περὶ πάσης ψυχῆς, οὐδὲ περὶ ὅλης, οὐδὲ περὶ μιᾶς. 12 τοῦτο δὲ πέπονθε καὶ ὁ ἐν τοῖς Ὀρφικοῖς καλουμένοις ἔπεσι λόγος· φησὶ γὰρ τὴν ψυχὴν ἐκ τοῦ ὅλου εἰσιέναι, ἀναπνεόντων φερομένην ὑπὸ τῶν ἀνέμων. οὐχ οἷόν τε δὴ τοῖς φυτοῖς τοῦτο συμβαίνειν, οὐδὲ τῶν ζώων ἐνίοις, εἴπερ μὴ πάντα ἀναπνέουσι. τοῦτο δὲ λέληθε τοὺς οὕτως ὑπειληφότας. 13 εἴπερ δὲ δεῖ τὴν ψυχὴν ἐκ τῶν στοιχείων ποιεῖν, οὐθὲν δεῖ ἐξ ἁπάντων· ἱκανὸν γὰρ θάτερον μέρος τῆς ἐναντιώσεως, ἑαυτό τε κρίνειν, καὶ τὸ ἀντικείμενον. καὶ γὰρ τῷ εὐθεῖ καὶ αὐτὸ καὶ τὸ καμπύλον γινώσκομεν· κριτὴς γὰρ ἀμφοῖν ὁ κανών. τὸ δὲ καμπύλον οὔθ' ἑαυτοῦ, οὔτε τοῦ εὐθέος.

* γ. πάντων πρεσβύτατον.

A maximè dominatur, quod continet, quicquid tandem illud ſit. ſed impoſſibile *eſt* eſſe aliquid anima præſtantius, & ei dominans: & adhuc impoſſibilius, intellectu: nam rationi *eſt* maximè conſentaneum, hunc eſſe antiquiſſimum & dominum ſecundùm naturam. tamen inquiunt, elementa eſſe prima entium. 10 Iam verò omnes, qui ex eo quòd anima entia cognoſcit ac ſentit, eam ex elementis conſtare dicunt: & qui *eam id eſſe inquiunt*, quod maximè vim habet mouendi, non de omni anima loquuntur. non enim quæcunque ſentiendi vi ſunt prædita, mouendi vim habent: quia nonnulla animalia videntur manere in eodem loco: cùm anima hoc ſolo motu videatur mouere animal. B Similiter *aiunt*, quicunque intellectum ac ſenſitiuum ex elementis faciunt. videntur enim plantæ viuere, cùm non ſint lationis, aut ſenſus participes: & animalium pleraque rationem non habere. 11 Quod ſi quis hæc admiſerit, ac poſuerit, intellectum *eſſe* quandam partem animæ, & ſimiliter ſenſitiuum: ne ſic quidem vniuerſaliter loquetur de omni anima, nec *de* tota, nec de vna.

12 Hoc etiam accidit ſententiæ in carminibus, quæ Orphica vocantur, expreſſæ: inquit enim animam ex vniuerſo ingredi, *animalibus* reſpirantibus, delatam à ventis. Itaque hoc plantis accidere non poteſt: nec animalibus quibuſdam, ſiquidem non omnia reſpirant. ſed hoc eos fugit, qui ſic exiſtimarunt. C 13 Quòd ſi oportet animam ex elementis facere, nihil opus eſt ex omnibus: ſufficit enim altera pars contrarietatis ad ſe iudicandam, & oppoſitum: etenim recto & ipſum, & obliquum cognoſcimus: norma enim *eſt* vtriuſque iudex: obliquum autem nec ſui ipſius, nec recti *iudex eſt*.

Animam non eſſe rebus omnibus permixtam. Cap. VIII.

Καὶ ἐν τῷ ὅλῳ δέ τινες αὐτὴν μεμῖχθαί φασιν. ὅθεν ἴσως καὶ Θαλῆς ᾠήθη πάντα πλήρη θεῶν εἶναι. 2 τοῦτο δ' ἔχει τινὰς ἀπορίας· διὰ τίνα μὲν γὰρ αἰτίαν ἐν τῷ ἀέρι ἢ ἐν τῷ πυρὶ οὖσα ἡ ψυχή, οὐ ποιεῖ ζῶον· ἐν δὲ τοῖς μικτοῖς· καὶ ταῦτα, βελτίων ἐν τούτοις εἶναι δοκοῦσα. ἐπιζητήσειε γὰρ ἄν τις, καὶ διὰ τίνα αἰτίαν ἡ ἐν τῷ ἀέρι ψυχή, τῆς ἐν τοῖς ζώοις βελτίων ἐστὶ καὶ ἀθανατωτέρα. συμβαίνει δὲ ἀμφοτέρως ἄτοπον καὶ παράλογον· καὶ γὰρ τὸ λέγειν ζῶον τὸ πῦρ, ἢ τὸν ἀέρα, τῶν παραλογωτέρων ἐστί· καὶ μὴ λέγειν ζῶα, ψυχῆς ἐνούσης, ἄτοπον. 3 ὑπολαβεῖν δὲ ἐοίκασι τὴν ψυχὴν εἶναι ἐν τούτοις, ὅτι τὸ ὅλον τοῖς μορίοις ὁμοειδές. ὥστ' ἀναγκαῖον αὐτοῖς λέγειν καὶ τὴν ψυχὴν ὁμοειδῆ τοῖς μορίοις εἶναι, εἰ τῷ ὑπολαβεῖν τι τοῦ περιέχοντος ἐν τοῖς ζώοις, ἔμψυχα τὰ ζῶα γίνεται. εἰ δ' ὁ μὲν ἀὴρ διασπώμενος ὁμοειδής, ἡ δὲ ψυχὴ ἀνομοιομερής, τὸ μέν τι αὐτῆς ὑπάρξει, δῆλον ὅτι, τὸ δ' οὐχ ὑπάρξει. ἀναγκαῖον οὖν αὐτὴν ἢ ὁμοιομερῆ εἶναι, ἢ μὴ ἐνυπάρχειν ἐν ὁτῳοῦν μορίῳ τοῦ παντός. 4 φανερὸν οὖν ἐκ τῶν εἰρημένων ὡς οὔτε τὸ γινώσκειν ὑπάρχει τῇ ψυχῇ διὰ τὸ ἐκ τῶν στοιχείων εἶναι, οὔτε τὸ κινεῖσθαι αὐτὴν καλῶς, οὐδ' ἀληθῶς λέγεται.

D At verò in vniuerſo quidam eam permixtam eſſe aiunt. vnde fortaſſis etiam Thales putauit omnia eſſe Deorum plena. 2 Sed hoc habet aliquas dubitationes. nam quamobrem in aëre, aut in igne ſi ſit anima, non facit animal, in mixtis autem *facit*? præſertim cùm præſtantior in illis eſſe videatur. Quærere etiam aliquis poſſit, quamobrem anima, quæ *eſt* in aëre, ſit præſtantior, & magis immortalis, quàm ea quæ *eſt* in animalibus. vtroque autem modo euenit abſurdum & à ratione alienum: etenim dicere, ignem aut aërem *eſſe* animal, maximè à ratione abhorret: ac negare *hæc eſſe* animalia, cùm anima inſit, abſurdum *eſt*. 3 Videntur autem exiſtimaſſe in his eſſe animam: quia E totum *eſt* eiuſdem ſpeciei, cuius ſunt partes. quare neceſſe *eſt*, vt dicant animam quoque eiuſdem eſſe ſpeciei, cuius ſunt partes, ſi eò quòd pars aliqua corporis ambientis decerpitur in animalibus, animalia fiunt animata. quòd ſi aër diſcerptus *conſtat* partibus ſimilaribus, anima verò diſſimilaribus: profectò alia eius pars inerit, alia non inerit. Neceſſe igitur *eſt*, vel eam conſtare ex partibus ſimilaribus, vel non ineſſe in quauis parte vniuerſi.

4 Perſpicuum igitur ex dictis *eſt*, neque cognitionem animæ ineſſe eo quòd ex elementis conſtet, neque ſcitè aut verè dici eam moueri.

De animæ vnitate, & operationibus. Cap. IX.

QVia verò animæ eſt cognoſcere, & ſentire, & opinari, præterea cupere, & conſultare, & omnino appetitus, quin etiam motus ſecundùm locum fit animalibus ab anima, præterea & auctio, & ſtatus, & deminutio; vtrùm toti animæ vnumquodque horum ineſt, & vniuerſâ intelligimus ac ſentimus, & vnumquodque aliorum facimus, ac patimur, an partibus aliis alia? 2 Et viuere eſtne in harum aliqua, an pluribus, an in omnibus, an alia quædam *eſt* cauſa? 3 Aiunt autem nonnulli eam eſſe partibilem, & alia *parte* intelligere, alia cupere. 4 Quid igitur tandem continet animam, ſi ſuâ naturâ eſt partibilis: profectò non corpus: nam potiùs è contrario videtur anima continere corpus; vnde eâ egreſſâ, euaneſcit, & putreſcit. quare ſi aliud quidpiam eam vnam facit, máxime anima illud erit. oportebit autem rurſus de eo quærere, vtrùm *ſit* vnum, an multipertitum. nam ſiquidem vnum *ſit*, cur non ſtatim etiam *cenſendum eſt* animam eſſe vnum. ſed ſi *ſit* partibile, rurſus ratio quæret, quid ſit, quod illud contineat. atque ita procedit in infinitum. 5 Dubitare etiam aliquis poſſit de eius partibus, quam vim quæque habeat in corpore. nam ſi tota anima continet vniuerſum corpus: conſentaneum eſt vt etiam vna quæque pars contineat aliquam partem corporis. ſed hoc videtur impoſſibile: quam enim partem, aut quomodo intellectus continebit, etiam fingere difficile *eſt*. 6 Videntur etiam plantæ diſſectæ viuere, nec non animalia quædam inſecta, tamquam habeant eandem animam ſpecie, quamuis non eandem numero. vtraque igitur pars habet ſenſum, & mouetur ſecundùm locum ad aliquod tempus. 7 Quòd ſi non perſeuerant, nihil *eſt* abſurdi: quia non habent organa, quibus naturam ſeruent: ſed nihilominus in vtraque parte inſunt omnes partes animæ: ſúntque eiuſdem ſpeciei inter ſe, cum tota *anima*. inter ſe, vtpote quæ non ſunt ſeparabiles. cum tota autem anima, vt pote quæ eſt diuidua. 8 Porrò & principium quod *eſt* in plantis, videtur eſſe anima quædam: hoc enim ſolum commune eſt & animalibus & plantis: atque hoc quidem ſeparatur à principio ſenſitiuo, ſed nihil ſine hoc ſenſum habet.

Ἐπειδὴ δὲ τὸ γινώσκειν ψυχῆς ἐστι, καὶ τὸ αἰσθάνεσθαί τε, καὶ δοξάζειν· ἔτι δὲ τὸ ἐπιθυμεῖν, καὶ βουλεύεσθαι, καὶ ὅλως ὀρέξεις· γίνεται δὲ καὶ ἡ κατὰ τόπον κίνησις τοῖς ζῴοις ὑπὸ ψυχῆς· ἔτι δὲ αὔξησίς τε, καὶ ἀκμὴ, καὶ φθίσις, πότερον ὅλῃ τῇ ψυχῇ τούτων ἕκαστον ὑπάρχει, καὶ πάσῃ νοοῦμέν τε, καὶ αἰσθανόμεθα, [καὶ κινούμεθα] καὶ τῶν ἄλλων ἕκαστον ποιοῦμέν τε καὶ πάσχομεν, ἢ μορίοις ἑτέροις ἕτερα. 2 καὶ τὸ ζῆν δὲ πότερον ἔν τινι τούτων ἐστὶν ἑνὶ, ἢ καὶ ἐν πλείοσιν, ἢ καὶ ἐν πᾶσιν, ἢ καὶ ἄλλο τι αἴτιον. 3 λέγουσι δέ τινες μεριστὴν αὐτὴν εἶναι, καὶ ἄλλῳ μὲν νοεῖν, ἄλλῳ δὲ ἐπιθυμεῖν. 4 τί οὖν δή ποτε συνέχει τὴν ψυχὴν, εἰ μεριστὴ πέφυκεν; οὐ γὰρ δὴ γε τὸ σῶμα· δοκεῖ γὰρ τοὐναντίον μᾶλλον ἡ ψυχὴ τὸ σῶμα συνέχειν. ἐξελθούσης οὖν διαπνεῖται καὶ σήπεται. εἰ οὖν ἕτερόν τι μίαν αὐτὴν ποιεῖ, ἐκεῖνο μάλιστα ἂν εἴη ἡ ψυχή. δεήσει δὲ πάλιν κἀκεῖνο ζητεῖν, πότερον ἓν, ἢ πολυμερές. εἰ μὲν γὰρ ἓν, διὰ τί οὐκ εὐθὺς καὶ τὴν ψυχὴν ἓν εἶναι; εἰ δὲ μεριστὸν, πάλιν ὁ λόγος ζητήσει, τί τὸ συνέχον ἐκεῖνο, καὶ οὕτω δὴ πρόεισιν ἐπὶ τὸ ἄπειρον. 5 ἀπορήσειε δ' ἄν τις καὶ περὶ τῶν μορίων αὐτῆς, τίνα δύναμιν ἔχει ἕκαστον ἐν τῷ σώματι· εἰ γὰρ ὅλη ἡ ψυχὴ πᾶν τὸ σῶμα συνέχει, προσήκει καὶ τῶν μορίων ἕκαστον συνέχειν τι τοῦ σώματος. τοῦτο δ' ἔοικεν ἀδυνάτῳ· ποῖον γὰρ μόριον ἢ πῶς ὁ νοῦς συνέξει, χαλεπὸν καὶ πλάσαι. 6 Φαίνεται δὲ καὶ τὰ φυτὰ διαιρούμενα ζῆν· καὶ τῶν ζῴων ἔνια τῶν ἐντόμων, ὡς τὴν αὐτὴν ἔχοντα ψυχὴν τῷ εἴδει, εἰ καὶ μὴ ἀριθμῷ. ἑκάτερον γοῦν τῶν μορίων αἴσθησιν ἔχει, καὶ κινεῖται κατὰ τόπον ἐπί τινα χρόνον. 7 Εἰ δὲ μὴ διατελοῦσιν, οὐδὲν ἄτοπον· ὄργανα γὰρ οὐκ ἔχουσιν ὥστε σώζειν τὴν φύσιν. ἀλλ' οὐδὲν ἧττον ἐν ἑκατέρῳ τῶν μορίων ἅπαντα ἐνυπάρχει τὰ μόρια τῆς ψυχῆς· καὶ ὁμοειδῆ εἰσιν ἀλλήλοις, καὶ τῇ ὅλῃ· ἀλλήλων μὲν, ὡς οὐ χωριστὰ ὄντα· τῆς δὲ ὅλης ψυχῆς, ὡς διαιρετῆς οὔσης. 8 ἔοικε δὲ καὶ ἡ ἐν τοῖς φυτοῖς ἀρχὴ ψυχή τις εἶναι. μόνης γὰρ ταύτης κοινωνεῖ καὶ ζῷα καὶ φυτά. καὶ αὕτη μὲν χωρίζεται τῆς αἰσθητικῆς ἀρχῆς· αἴσθησιν δὲ οὐδὲν ἄνευ ταύτης ἔχει.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΨΥΧΗΣ ΤΟ Β.

ARISTOTELIS, DE ANIMA LIBER SECVNDVS,

Iul. Pacio interprete.

Animæ definitio prima. Cap. I.

A Τὰ μὲν δὴ ὑπὸ τῶν προτέρων παραδεδομένα περὶ ψυχῆς εἰρήσθω. πάλιν δὲ ὥσπερ ἐξ ὑπαρχῆς ἐπανίωμεν, πειρώμενοι διορίσαι τί ἐστι ψυχή, καὶ τίς ἂν εἴη κοινότατος λόγος αὐτῆς. 2. λέγομεν δὴ ἕν τι γένος τῶν ὄντων, τὴν οὐσίαν. 3. ταύτης δὲ τὸ μὲν ὡς ὕλην, ὃ καθ' αὑτὸ μὲν οὐκ ἔστι τόδε τι· ἕτερον δὲ, μορφὴν καὶ εἶδος, καθ' ἣν ἤδη λέγεται τόδε τι· καὶ τρίτον, τὸ ἐκ τούτων· ἔστι δὲ ἡ μὲν ὕλη, δύναμις· τὸ δὲ εἶδος, ἐντελέχεια. 4. καὶ τοῦτο, διχῶς· τὸ μὲν ὡς ἐπιστήμη, τὸ δὲ ὡς τὸ θεωρεῖν. 5. οὐσίαι δὲ μάλιστα εἶναι δοκοῦσι τὰ σώματα· καὶ τούτων τὰ φυσικά· ταῦτα γὰρ τῶν ἄλλων ἀρχαί. B 6. τῶν δὲ φυσικῶν, τὰ μὲν ἔχει ζωὴν, τὰ δὲ οὐκ ἔχει· ζωὴν δὲ λέγομεν τὴν δι' αὑτοῦ τροφήν τε, καὶ αὔξησιν, καὶ φθίσιν. 7. ὥστε πᾶν σῶμα φυσικὸν μετέχον ζωῆς, οὐσία ἂν εἴη· οὐσία δὲ οὕτως ὡς συνθέτη. 8. ἐπεὶ δὲ ἐστι σῶμα τοιόνδε, ζωὴν γὰρ ἔχον· οὐκ ἂν εἴη τὸ σῶμα ψυχή· οὐ γάρ ἐστι τῶν καθ' ὑποκειμένου τὸ σῶμα· μᾶλλον δὲ ὡς ὑποκείμενον καὶ ὕλη. 9. ἀναγκαῖον ἄρα τὴν ψυχὴν οὐσίαν εἶναι, ὡς εἶδος σώματος C φυσικοῦ δυνάμει ζωὴν ἔχοντος. 10. ἡ δὲ οὐσία ἐντελέχεια. τοιούτου ἄρα σώματος ἐντελέχεια. 11 αὕτη δὲ λέγεται διχῶς· ἡ μὲν ὡς ἐπιστήμη, ἡ δὲ ὡς τὸ θεωρεῖν. φανερὸν οὖν ὅτι ὡς ἐπιστήμη· ἐν γὰρ τῷ ὑπάρχειν τὴν ψυχὴν, ὕπνος καὶ ἐγρήγορσίς ἐστιν. ἀνάλογον δ' ἡ μὲν ἐγρήγορσις τῷ θεωρεῖν· ὁ δ' ὕπνος, τῷ ἔχειν καὶ μὴ ἐνεργεῖν. προτέρα δὲ τῇ * γενέσει ἐπὶ τοῦ αὐτοῦ, ἡ ἐπιστήμη. διὸ ψυχή ἐστιν ἐντελέχεια ἡ πρώτη σώματος φυσικοῦ ζωὴν ἔχοντος δυνάμει. 12. τοιοῦτον δὲ, ὃ ἂν ᾖ ὀργανικόν. ὄργανα δὲ καὶ τὰ τῶν φυτῶν D μέρη· ἀλλὰ παντελῶς ἁπλᾶ, οἷον τὸ φύλλον περικαρπίου σκέπασμα· τὸ δὲ περικάρπιον, καρποῦ. αἱ δὲ ῥίζαι τῷ στόματι ἀνάλογον· ἄμφω γὰρ ἕλκει τὴν τροφήν. 13. Εἰ δέ τι κοινὸν ἐπὶ πάσης ψυχῆς δεῖ λέγειν, εἴη ἂν ἡ πρώτη ἐντελέχεια σώματος φυσικοῦ ὀργανικοῦ. 14. διὸ καὶ οὐ δεῖ ζητεῖν, εἰ ἓν ἡ ψυχὴ καὶ τὸ σῶμα, ὥσπερ οὐδὲ τὸν κηρὸν καὶ τὸ σχῆμα, οὐδ' ὅλως τὴν ἑκάστου ὕλην καὶ τὸ οὗ ἡ ὕλη· τὸ γὰρ ἓν καὶ τὸ εἶναι ἐπεὶ πλεοναχῶς λέγεται, τὸ κυρίως ἡ ἐντελέχειά ἐστι.

*γενέσει, ἐπὶ τ.

A QVÆ igitur à prioribus tradita ſunt de anima, dicta ſunto. rurſus autem tamquam ab initio reuertamur, conantes definire quid ſit anima, & quæ ſit eius maximè communis definitio. 2 Dicimus igitur ſubſtantiam *eſſe* vnum quoddam entium genus. 3 Huius autem aliud *eſſe* vt materiam, quod per ſe nō eſt hoc aliquid: aliud verò formam & ſpeciem, ex qua iam dicitur hoc aliquid: ac tertium, quod ex his conſtat. iam verò materia eſt poteſtas: forma eſt actus. 4 Atque hæc bifariàm *ſumitur*: partim ſcili-B cet vt ſcientia, partim vt contemplari. 5 Maximè autem corpora videntur eſſe ſubſtantiæ: & ex his, *ea quæ ſunt* naturalia: quoniam hæc *ſunt* aliorum principia. 6 Naturalium verò *corporum* alia vitam habent, alia non habent. vitam autem dicimus nutritionem & auctionem, & deminutionem quæ per ſe ipſum fit. 7 Quapropter omne corpus naturale vitæ particeps, erit ſubſtantia: & ita ſubſtantia, vt compoſita. 8 Quoniam autem eſt corpus tale: vitā enim habet: certè corpus non poteſt eſſe anima: quia corpus non eſt *in* eorum *numero* quæ de ſubiecto *dicuntur*, ſed potiùs vt ſubiectum & materia. 9 Neceſſe *eſt* igitur animam eſſe ſubſtantiā, C tamquam formam corporis naturalis poteſtate vitam habentis. 10 Hæc autem ſubſtantia *eſt* actus: talis igitur corporis actus. 11 Hic autem bifariàm dicitur: partim ſcilicet vt ſcientia, partim vt contemplari. perſpicuum igitur *eſt animam eſſe* vt ſcientiam. nam eò quòd ineſt anima, eſt ſomnus & vigilia: proportione verò reſpondet, vigilia contemplationi, ſomnus autem habitui ſine operatione. ſed ortu in eodem prior eſt ſcientia. proinde anima eſt actus primus corporis naturalis vitam habentis poteſtate. 12 Tale autem *eſt*, quod eſt organicum, ac partes quoque plantarum *ſunt* organa, ſed D omnino ſimplicia. vt folium *eſt* integumentum corticis fructum obducentis: ille autem cortex *eſt integumentum* fructus: radices autem ori proportione *reſpondent*: ambo namque trahunt alimentum. 13 Quòd ſi commune aliquid de anima dicere oportet: erit vtique primus actus corporis naturalis organici. 14 Ideóque non oportet quærere, an anima & corpus ſint vnum: quemadmodum nec *quærere oportet* de cera & figura, aut omnino de cuiuſque rei materia & eo cuius *eſt* materia. cùm enim vnum, & eſſe, multipliciter dicatur: quod propriè *dicitur*, actus eſt.

15 Vniuerſaliter igitur dictum eſt quid ſit anima: A *eſt* enim eſſentia, quæ in ratione *conſiſtit*. hæc vero eſt quidditas corporis eiuſmodi: quemadmodum ſi inſtrumentum aliquod eſſet corpus naturale, veluti ſecuris. etenim eſſentia ſecuris eſſet eius ſubſtantia, & anima *illud* ipſum *eſſet*. hac enim ſeparatâ, non eſſet ampliùs ſecuris, niſi homonymωs. nunc verò eſt ſecuris: quoniam anima non *eſt* quidditas & ratio corporis huiuſmodi, ſed *corporis* naturalis eiuſmodi, quod in ſe habet principium motus & ſtatus. 16 Sed in partibus quoque diſpicere oportet, quod dictum fuit. nam ſi oculus eſſet animal: vtique aſpectus eſſet eius anima: hic B enim *eſt* eſſentia oculi, quæ in ratione *conſiſtit*: oculus verò *eſt* materia aſpectus: quo deficiente non eſt oculus, niſi homonymωs, quemadmodum lapideus, & pictus. quod igitur in parte *dictum eſt*, *id* oportet accipere, in toto corpore viuente. proportione enim *ſe* habet, vt pars ad partem, *ſic* totus ſenſus ad totum corpus ſenſitiuum, quà tale eſt. 17 Porrò non quod animam abiecit, ſed quod habet, eſt id quod poteſtatem habet ad viuendum. ſemen autem & fructus *eſt* poteſtate corpus tale. 18 Vt igitur ſectio & viſio, ita etiam vi- C gilia *eſt* actus. vt autem aſpectus & vis organi, *ita eſt* anima. corpus verò *eſt*, quod poteſtate eſt. ſed ſicut oculus eſt pupilla & aſpectus, ita illic animal eſt anima & corpus. 19 Animam igitur non eſſe ſeparabilem à corpore, aut partes quaſdam eius, ſi ſuâ naturâ eſt partibilis, non eſt obſcurum. quarundam enim actus eſt ipſarum partium. Verumtamen quaſdam *ſeparabiles eſſe*, nihil prohibet, quia nullius corporis ſunt actus. Præterea incertum eſt, an anima ita ſit actus corporis, vt nauta nauis. 20 Typo igitur ſic de anima definitum ac deſcriptum eſto.

A 15. καθόλου μὲν οὖν εἴρηται τί ἐστιν ἡ ψυχή· οὐσία γὰρ ἡ κατὰ τὸν λόγον. τοῦτο δὲ τὸ τί ἦν εἶναι τῷ τοιῳδὶ σώματι, καθάπερ εἴ τι τῶν ὀργάνων φυσικὸν ἦν σῶμα, οἷον πέλεκυς· ἦν γὰρ ἂν τὸ πελέκει εἶναι ἡ οὐσία αὐτοῦ, καὶ ἡ ψυχὴ τοῦτο· χωρισθείσης γὰρ ταύτης, οὐκ ἂν ἔτι πέλεκυς ἦν, ἀλλ' ἢ ὁμωνύμως. νῦν δ' ἐστὶ πέλεκυς· οὐ γὰρ τοιούτου σώματος τὸ τί ἦν εἶναι καὶ ὁ λόγος ἡ ψυχή· ἀλλὰ φυσικοῦ τοιουδὶ ἔχοντος ἀρχὴν κινήσεως καὶ στάσεως ἐν αὐτῷ. 16. θεωρεῖν δὲ καὶ ἐπὶ τῶν μερῶν δεῖ τὸ λεχθέν. εἰ γὰρ ἦν ὁ ὀφθαλμὸς ζῶον, ψυχὴ ἂν αὐτοῦ ἦν ἡ ὄψις· αὕτη B γὰρ οὐσία ὀφθαλμοῦ ἡ κατὰ τὸν λόγον. ὁ δ' ὀφθαλμὸς, ὕλη ὄψεως· ἧς ἀπολιπούσης, οὐκ ἔστιν ὀφθαλμὸς, πλὴν ὁμωνύμως, καθάπερ ὁ λίθινος καὶ γεγραμμένος. δεῖ δὴ λαβεῖν τὸ ἐπὶ μέρους ἐφ' ὅλου τοῦ ζῶντος σώματος· ἀνάλογον γὰρ ἔχει ὡς τὸ μέρος πρὸς τὸ μέρος, ἡ ὅλη αἴσθησις πρὸς τὸ ὅλον σῶμα τὸ αἰσθητικὸν, ᾗ τοιοῦτο. 17. ἔστι δὲ οὐ τὸ ἀποβεβληκὸς τὴν ψυχὴν, τὸ δυνάμει ὂν ὥστε ζῆν, ἀλλὰ τὸ ἔχον. τὸ δὲ σπέρμα καὶ ὁ καρπὸς, τὸ δυνάμει C τοιονδὶ σῶμα. 18. ὡς μὲν οὖν ἡ τμῆσις καὶ ἡ ὅρασις, οὕτω καὶ ἡ ἐγρήγορσις, ἐντελέχεια. ὡς δὲ ἡ ὄψις καὶ ἡ δύναμις τοῦ ὀργάνου, ἡ ψυχή· τὸ δὲ σῶμα, τὸ δυνάμει ὄν. ἀλλ' ὥσπερ ὁ ὀφθαλμὸς ἡ κόρη καὶ ἡ ὄψις, κἀκεῖ ἡ ψυχὴ καὶ τὸ σῶμα, τὸ ζῶον. 19. ὅτι μὲν οὖν οὐκ ἔστιν ἡ ψυχὴ χωριστὴ τοῦ σώματος, ἢ μέρη τινὰ αὐτῆς, εἰ μεριστὴ πέφυκεν, οὐκ ἄδηλον· ἐνίων γὰρ ἡ ἐντελέχεια τῶν μερῶν ἐστιν αὐτῶν. οὐ μὴν ἀλλ' ἔνιά γε οὐθὲν κωλύει, διὰ τὸ μηθενὸς εἶναι σώματος ἐντελεχείας. ἔτι δὲ ἄδηλον, εἰ οὕτως ἐντελέχεια τοῦ σώματος ἡ ψυχὴ, ὥσπερ πλωτὴρ πλοίου. 20. τύπῳ μὲν οὖν ταύτῃ διωρίσθω καὶ ὑπογεγράφθω περὶ ψυχῆς.

Animæ definitio altera.

QVia verò ex iis quæ ſunt quidem obſcura, D magis tamen ſunt perſpicua, efficitur quod eſt manifeſtum, & ſecundùm rationem notius: conandum rurſus *eſt*, ita de ea diſſerere. non ſolùm enim oportet orationem definitiuam declarare quòd *ſit*, vt pleræque definitiones aiunt, ſed etiam cauſam ineſſe, & in *ea* apparere. nunc verò orationes definitiuæ ſunt tanquam concluſiones. verbi gratiâ: quid eſt tetragoniſmus? rectangulum æquilaterum eſſe æquale ei quod eſt altera parte longius. talis autem definitio rationem habet concluſionis. ſed quæ dicit tetragoniſmum eſſe inuentionem *lineæ* mediæ, cauſam rei dicit. 2 Dicamus igitur, principio conſiderationis accepto, animatum ab inanimato diſtingui eo quòd viuit. 3 Cùm autem viuere multis modis dicatur: etiam ſi vnum E quidpiam horum tantùm inſit, dicimus ipſum viuere, vt intellectus, ſenſus, motus & ſtatus ſecundùm locum: præterea motus ſecundùm nutritionem & deminutionem & auctionem. 4 Idcirco & omnia quæ ex terra oriuntur, viuere videntur. nam videntur in ſe habere vim ac principium tale, per quod auctionem & deminutionem accipiunt ſecundùm locos contrarios: non enim ſurſum quidem augentur, deorſum verò minimè, ſed æquè in ambas *partes*, & vſquequaque aluntur, ac viuunt vſque ad finem,

Cap. II.

D Ἐπεὶ δ' ἐκ τῶν ἀσαφῶν μὲν, φανερωτέρων δὲ [ἡμῖν] γίγνεται τὸ σαφὲς καὶ κατὰ τὸν λόγον γνωριμώτερον, πειρατέον πάλιν οὕτως ἐπελθεῖν περὶ αὐτῆς· οὐ γὰρ μόνον τὸ ὅτι δεῖ τὸν ὁριστικὸν λόγον δηλοῦν, ὥσπερ οἱ πλεῖστοι τῶν ὅρων λέγουσιν, ἀλλὰ καὶ τὴν αἰτίαν ἐνυπάρχειν καὶ ἐμφαίνεσθαι. νῦν δὲ ὥσπερ συμπεράσματα οἱ λόγοι τῶν ὅρων εἰσίν· οἷον τί ἐστι τετραγωνισμός, τὸ ἴσον ἑτερομήκει ὀρθογώνιον εἶναι ἰσόπλευρον. ὁ δὲ τοιοῦτος ὅρος λόγος τοῦ συμπεράσματος. ὁ δὲ λέγων ὅτι ἐστὶ τετραγωνισμὸς μέσης * εὕρεσις, τοῦ πράγματος λέγει τὸ αἴτιον. 2. λέγομεν οὖν ἀρχὴν λαβόντες τῆς σκέψεως, διωρίσθαι τὸ ἔμψυχον E τοῦ ἀψύχου τῷ ζῆν. 3. πλεοναχῶς δὲ τοῦ ζῆν λεγομένου, κἂν ἕν τι τούτων ὑπάρχῃ μόνον, ζῆν λέγομεν αὐτὸ, οἷον νοῦς, αἴσθησις, κίνησις, καὶ στάσις ἡ κατὰ τόπον· ἔτι δὲ κίνησις ἡ κατὰ τροφὴν, καὶ φθίσιν τε, καὶ αὔξησιν. 4 διὸ καὶ τὰ φυόμενα πάντα δοκεῖ ζῆν· φαίνεται γὰρ ἐν αὐτοῖς ἔχοντα δύναμιν καὶ ἀρχὴν τοιαύτην, δι' ἧς αὔξησίν τε καὶ φθίσιν λαμβάνουσι κατὰ τοὺς ἐναντίους τόπους· οὐ γὰρ ἄνω μὲν αὔξεται, κάτω δὲ οὔ. ἀλλ' ὁμοίως ἐπ' ἄμφω καὶ * πάντῃ ὅσα ἀεὶ τρέφεται καὶ ζῇ διὰ τέλους,

* γρ. εὑρήσεις

* γρ. πάντα

ἕως ἂν δύνηται λαμβάνειν τροφήν. 5 χωρίζεσθαι δὲ τοῦτο μὲν τῶν ἄλλων δυνατόν, τὰ δ' ἄλλα τούτου ἀδύνατον ἐν τοῖς θνητοῖς. φανερὸν δὲ ἐπὶ τῶν φυομένων· οὐδεμία γὰρ αὐτοῖς ὑπάρχει δύναμις ἄλλη ψυχῆς. 6 τὸ μὲν οὖν ζῆν, διὰ τὴν ἀρχὴν ταύτην ὑπάρχει τοῖς ζῶσι. 7 τὸ δὲ ζῶον, διὰ τὴν αἴσθησιν πρώτως· καὶ γὰρ τὰ μὴ κινούμενα μηδ' ἀλλάττοντα τόπον, ἔχοντα δ' αἴσθησιν, ζῶα λέγομεν, καὶ οὐ ζῆν μόνον. 8 αἰσθήσεως δ' ὑπάρχει πρῶτον πᾶσιν, ἁφή. καὶ ὥσπερ τὸ θρεπτικὸν δύναται χωρίζεσθαι τῆς ἁφῆς καὶ πάσης αἰσθήσεως, οὕτως καὶ ἡ ἁφὴ τῶν ἄλλων αἰσθήσεων. 9 θρεπτικὸν δὲ λέγομεν τὸ τοιοῦτον μόριον τῆς ψυχῆς, οὗ καὶ τὰ φυτὰ μετέχει. τὰ δὲ ζῶα πάντα φαίνεται τὴν ἁπτικὴν αἴσθησιν ἔχοντα· δι' ἣν δ' αἰτίαν ἑκάτερον τούτων συμβέβηκεν, ὕστερον ἐροῦμεν. νῦν δ' ἐπὶ τοσοῦτον εἰρήσθω μόνον, ὅτι ἡ ψυχὴ τούτων ἐστὶν ἀρχὴ τῶν εἰρημένων, καὶ τούτοις ὥρισται, θρεπτικῷ, αἰσθητικῷ, διανοητικῷ, κινήσει. 10 πότερον δὲ τούτων ἕκαστόν ἐστι ψυχή, ἢ μόριον ψυχῆς· καὶ εἰ μόριον, πότερον οὕτως ὥστ' εἶναι χωριστὸν λόγῳ μόνον, ἢ καὶ τόπῳ; 11 περὶ μὲν τινῶν οὐ χαλεπὸν ἰδεῖν· ἔνια δὲ ἀπορίαν ἔχει. ὥσπερ γὰρ ἐπὶ τῶν φυτῶν ἔνια διαιρούμενα φαίνεται ζῶντα, καὶ χωριζόμενα ἀπ' ἀλλήλων, ὡς οὔσης τῆς ἐν αὐτοῖς ψυχῆς, ἐντελεχείᾳ μὲν μιᾶς ἐν ἑκάστῳ φυτῷ, δυνάμει δὲ πλειόνων· οὕτω καὶ περὶ τὰς ἄλλας διαφορὰς τῆς ψυχῆς ὁρῶμεν συμβαῖνον ἐπὶ τῶν ἐντόμων ἐν τοῖς τεμνομένοις· καὶ γὰρ αἴσθησιν ἑκάτερον τῶν μερῶν ἔχει, καὶ κίνησιν τὴν κατὰ τόπον. εἰ δ' αἴσθησιν, καὶ φαντασίαν, καὶ ὄρεξιν· ὅπου μὲν γὰρ αἴσθησις, λύπη τε καὶ ἡδονὴ παρακολουθεῖ· ὅπου δὲ ταῦτα, ἐξ ἀνάγκης καὶ ἐπιθυμία. περὶ δὲ τοῦ νοῦ καὶ τῆς θεωρητικῆς δυνάμεως, οὐδέπω φανερόν· ἀλλ' ἔοικε ψυχῆς γένος ἕτερον εἶναι· καὶ τοῦτο μόνον ἐνδέχεται χωρίζεσθαι, καθάπερ τὸ ἀΐδιον τοῦ φθαρτοῦ. τὰ δὲ λοιπὰ μόρια τῆς ψυχῆς, φανερὸν ἐκ τούτων, ὅτι οὐκ ἔστι χωριστά, καθάπερ φασί τινες. 12 τῷ δὲ λόγῳ ὅτι ἕτερα, φανερόν· αἰσθητικῷ γὰρ εἶναι καὶ δοξαστικῷ ἕτερον, εἴπερ καὶ τὸ αἰσθάνεσθαι τοῦ δοξάζειν· ὁμοίως δὲ καὶ τῶν ἄλλων ἕκαστον τῶν εἰρημένων. 13 * ἔτι δ' ἐνίοις μὲν τῶν ζώων ἅπανθ' ὑπάρχει * ταῦτα, τισὶ δέ τινα τούτων, ἑτέροις δὲ ἓν μόνον· τοῦτο δὲ ποιεῖ διαφορὰν τῶν ζώων· δι' ἣν δ' αἰτίαν, σκεπτέον ὕστερον. 14 παραπλήσιον δὲ καὶ περὶ τὰς αἰσθήσεις συμβέβηκε· τὰ μὲν γὰρ ἔχει πάσας, * τὰ δὲ τινάς, τὰ δὲ μίαν τὴν ἀναγκαιοτάτην, ἁφήν. 15 ἐπεὶ δὲ ᾧ ζῶμεν καὶ αἰσθανόμεθα, διχῶς λέγεται, καθάπερ ᾧ ἐπιστάμεθα· λέγομεν δὲ τὸ μὲν ἐπιστήμην, τὸ δὲ ψυχήν· ἑκατέρῳ γὰρ τούτων φαμὲν ἐπίστασθαι· ὁμοίως δὲ καὶ ᾧ ὑγιαίνομεν, τὸ μὲν ὑγιείᾳ, τὸ δὲ μορίῳ τινὶ τοῦ σώματος, ἢ καὶ ὅλῳ. τούτων δ' ἡ μὲν ἐπιστήμη καὶ ὑγίεια, μορφὴ καὶ εἶδός τι, καὶ λόγος, καὶ οἷον ἐνέργεια τοῦ δεκτικοῦ· ἡ μὲν τοῦ ἐπιστημονικοῦ, ἡ δὲ τοῦ ὑγιαστικοῦ· δοκεῖ γὰρ ἐν τῷ πάσχοντι καὶ διατιθεμένῳ ἡ τῶν ποιητικῶν ὑπάρχειν ἐνέργεια. 16 ἡ ψυχὴ δὲ, τοῦτο ᾧ ζῶμεν, καὶ αἰσθανόμεθα, καὶ διανοούμεθα πρώτως· ὥστε λόγος τις ἂν εἴη καὶ εἶδος, ἀλλ' οὐχ ὡς ὕλη καὶ τὸ ὑποκείμενον. 17 τριχῶς γὰρ λεγομένης τῆς οὐσίας, καθάπερ εἴπομεν,

A quandiu poſſunt ſumere alimentum. 5 Separari autem hoc quidem ab aliis, *eſt* poſſibile: alia verò ab hoc, impoſſibile in mortalibus. quod quidem perſpicuum *eſt* in plantis: quia nulla eis ineſt alia facultas animæ. 6 Viuere igitur propter hoc principium ineſt omnibus viuentibus. 7 Animal autem *eſt* propter ſenſum primò. nam & quæ non mouentur neque mutant locum, habent tamen ſenſum, *ea* dicimus *eſſe* animalia, non ſolùm viuere. 8 Ex ſenſibus autem ineſt primùm omnibus tactus. & quemadmodum nutritiuum poteſt ſeparari à tactu, & omni ſenſu: ita etiam tactus *ſeparari poteſt* ab aliis ſenſibus. 9 Nutritiuum autem *principium* dicimus eiuſmodi partem animæ, cuius & plantæ ſunt participes. omnia verò ani-B malia videntur habere ſenſum tactus. ſed quam ob cauſam vtrumque horum eueniat, poſteriùs dicemus. nunc verò in tantum dictum eſto duntaxat: quoniam anima eſt horum quæ dicta ſunt, principium, & his definitur, nutritiuo, ſenſitiuo, dianoëtico, motu. 10 Vtrùm autem horum quodque eſt anima, an pars animæ? & ſi *eſt* pars, vtrùm ita *eſt*, vt ſit ſeparabilis ratione tantùm, an etiam loco? 11 Sanè de quibuſdam non eſt difficile videre. ſed nonnulla dubitationem habent. ſicut enim in plantis quædam diuiſa & à ſe inuicem ſeparata viuere videntur, tanquam anima, quæ in ipſis *ineſt*, actu quidem vna ſit in quaque planta, poteſtate verò plures: ita etiam circa alias animæ differentias videmus accidere in inſectis, C quæ inciduntur: nam vtraque pars habet ſenſum & motum ſecũdum locum. quòd ſi ſenſum *habet*, *certè* & phantaſiam & appetitum *habet*: vbi namque *eſt* ſenſus, *ibi* & dolor & voluptas conſequitur: & vbi hæc ſunt, neceſſariò *eſt* etiam cupiditas. verùm de intellectu & contemplatiua facultate nondum *eſt* perſpicuum: ſed videtur eſſe aliud quoddam genus animæ, atque hoc ſolùm poſſe ſeparari, quemadmodum æternum ab eo quod eſt interitui obnoxium. reliquas verò animæ partes ex his patet non eſſe ſeparabiles, vt quidam aiunt. 12 Ratione autem diuerſas *eſſe* apparet: quoniam ſenſitiui & opinatiui eſſentia diuerſa *eſt*: ſiquidem & ſentire atque opinari *differunt*. Itidemque v-D numquodque aliorum quæ dicta ſunt. 13 Præterea nonnullis animalibus hæc omnia inſunt, quibuſdam verò aliqua, aliis vnum tantùm. hoc autem facit differentias animalium. ſed quam ob cauſſam, conſiderandum poſteriùs *erit*. 14 Simile quid in ſenſibus accidit: alia namque habent omnes *ſenſus*, alia quoſdam, alia vnum maximè neceſſarium, *nempe* tactum. 15 Quia verò *id* quo viuimus & ſentimus, bifariàm dicitur, quemadmodum *id* quo ſcimus: horum autem alterum dicimus *eſſe* ſcientiam, alterum verò animam: (vtroque enim horum dicimus ſcire) ſimiliterque *id* quo ſani ſumus, partim *enim ſani* E *ſumus* ſanitate, partim aliqua parte corporis, aut etiam toto corpore: ſanè ex his ſcientia & ſanitas eſt forma & ſpecies quædam ac ratio, & tamquam actus eorum quæ ſuſcipiendi vim habent, illa ſcilicet eius quod ſcire, hæc verò eius quod ſanum eſſe poteſt. videtur enim in eo quod patitur & afficitur, eorum quæ efficiendi vim habent, actus ineſſe. 16 Anima verò *eſt* id quo viuimus, & ſentimus, & intelligimus primò. quocirca eſt ratio quædam & forma, non vt materia & ſubiectum. 17 Cùm enim tribus modis dicatur ſubſtãtia, ſicut diximus:

quorum aliud *eſt* forma, aliud materia, aliud ex vtriſque *compoſitum*: ex his materia *eſt* potentia, forma verò actus. quoniam autem quod ex vtriſque *conſtat*, animatum *eſt*: *profectò* non corpus eſt actus animæ, ſed ipſa corporis cuiuſdam. 18 Ideóque rectè exiſtimant, quibus videtur anima nec ſine corpore, nec aliquod corpus eſſe. non eſt enim corpus, ſed aliquid corporis. 19 Ideóque in corpore ineſt, & *quidem* in corpore tali, non vt priores in corpus eam aptabant: cùm nihil antea definiuiſſent in quo & quali *corpore*: quamuis non videatur quodlibet recipere quodlibet. ſic verò fit ſecundùm rationem: quippe natura comparatum eſt, vt cuiuſque rei actus in eo inſit quod eſt poteſtate & *in* propria materia. 20 Eſſe igitur actum quendam & rationem eius quod habet poteſtatem vt tale ſit, ex his *eſt* perſpicuum.

A ὧν τὸ μὲν εἶδος, τὸ δὲ ὕλη, τὸ δ' ἐξ ἀμφοῖν· τούτων δ' ἡ μὲν ὕλη δύναμις, τὸ δὲ εἶδος ἐντελέχεια· ἐπεὶ δὲ τὸ ἐξ ἀμφοῖν ἔμψυχον, οὐ τὸ σῶμά ἐστιν ἐντελέχεια ψυχῆς, ἀλλ' αὐτὴ σώματός τινος. 18 καὶ διὰ τοῦτο καλῶς ὑπολαμβάνουσιν, οἷς δοκεῖ μήτε ἄνευ σώματος εἶναι, μήτε σῶμά τι ψυχή. σῶμα μὲν γὰρ οὐκ ἔστι, σώματος δέ τι. 19 καὶ διὰ τοῦτο ἐν σώματι ὑπάρχει, καὶ ἐν σώματι τοιούτῳ, καὶ οὐχ ὥσπερ οἱ πρότερον εἰς σῶμα ἐνήρμοζον αὐτήν, οὐθὲν προσδιορίζοντες ἐν τίνι καὶ ποίῳ· καίπερ οὐδὲ φαινομένου τοῦ τυχόντος δέχεσθαι τὸ τυχόν. οὕτω δὲ B *γίνεται καὶ κατὰ λόγον· ἑκάστου γὰρ ἡ ἐντελέχεια, ἐν τῷ δυνάμει ὑπάρχοντι, καὶ τῇ οἰκείᾳ ὕλῃ πέφυκε γίνεσθαι. 20 ὅτι μὲν οὖν ἐντελέχειά τίς ἐστι, καὶ λόγος τοῦ δύναμιν ἔχοντος τοιοῦδ' εἶναι, φανερὸν ἐκ τούτων.

* γρ. γίνεσθαι

De facultatibus animæ. Cap. III.

FAcultates autem animæ quæ dictæ ſunt, quibuſdam inſunt omnes, vt *antea* diximus, quibuſdam nonnullæ earum, quibuſdam vna tantùm. facultates autem diximus, nutritiuum, ſenſitiuum, appetitiuum, motiuum ſecundùm locum, *&* dianoëticum. 2 Ac plantis quidem ineſt nutritiuum ſolum. 3 Aliis verò & ipſum *ineſt*, & ſenſitiuum. quòd ſi ſenſitiuum, *certè ineſt* etiam appetitiuum: appetitus enim eſt cupiditas & ira & voluntas. cuncta verò animalia vnum habent ſenſum, *id est, tactum*. cui autem ſenſus ineſt, ei voluptas quoque ac dolor, nec non iucundum & moleſtum *ineſt*: ſed quibus hæc *inſunt*, etiam cupiditas *ineſt*: quandoquidem hæc eſt appetitus iucundi. 4 Præterea alimenti ſenſum habent. nam tactus alimenti *eſt* ſenſus: omnia namque animalia ſiccis & humidis, nec non calidis & frigidis aluntur: horum autem ſenſus eſt tactus: aliorum verò ſenſilium *eſt* ex accidenti: quia nihil ad alimentum confert ſonus, neque color, neque odor. ſapor autem eſt vnum quiddam ex iis quæ ſub tactum cadunt. fames verò & ſitis *eſt* cupiditas: nempe fames, calidi & ſicci: ſitis autē humidi & frigidi: ſapor verò eſt veluti quoddam horum condimentum. verùm poſtea de his dilucidiùs tradendum erit. nunc eatenus definitū eſto, quòd iis animalibus quæ tactum habēt, etiam appetitus ineſt. 5 De phantaſia verò non conſtat: ſed poſteriùs conſiderandum erit. 6 Nonnullis autem præter hæc ineſt motiuum ſecundùm locū. 7 Aliis verò etiam dianoëticū & intellectus vt hominibus, & ſi quid aliud eſt tale, aut etiam præſtantius. 8 Patet igitur, eodem modo vnam eſſe poſſe definitionem animæ & figuræ. neque enim illic eſt figura præter triangulum & figuras quæ deinceps ſunt, neque hìc *eſt* anima præter eas quæ commemoratæ fuerunt. fieri tamen poteſt & in figuris definitio communis, quæ conueniet omnibus, nec propria erit vllius figuræ: & ſimiliter in dictis animabus. Idcirco ridiculum *eſt* omiſſa eiuſmodi definitione quærere cùm in his tum in aliis definitionem communem, quæ nullius entis ſit propria definitio, neque *ſit* ſecundùm propriam & indiuiduam ſpeciem. 9 Similiter autem res habet in figuris & in anima: ſemper enim in eo quod eſt deinceps, poteſtate *illud* ineſt quod *eſt* prius, tam in figuris, quàm in animatis:

C ΤΩν δὲ δυνάμεων τῆς ψυχῆς αἱ λεχθεῖσαι, τοῖς μὲν ἐνυπάρχουσι πᾶσαι, καθάπερ εἴπομεν· τοῖς δὲ τινὲς αὐτῶν, ἐνίοις δὲ μία μόνη. δυνάμεις δὲ εἴπομεν, θρεπτικόν, αἰσθητικόν, ὀρεκτικόν, κινητικὸν κατὰ τόπον, διανοητικόν. 2 ὑπάρχει δὲ τοῖς μὲν φυτοῖς τὸ θρεπτικὸν μόνον. 3 ἑτέροις δὲ αὐτό τε καὶ τὸ αἰσθητικόν· εἰ δὲ τὸ αἰσθητικόν, καὶ τὸ ὀρεκτικόν· ὄρεξις μὲν γὰρ ἐπιθυμία, καὶ θυμός, καὶ βούλησις. τὰ δὲ ζῷα πάντα μίαν *ἔχει τῶν αἰσθήσεων, τὴν ἁφήν. ᾧ δ' αἴσθησις ὑπάρχει, τούτῳ ἡδονή τε καὶ λύπη, καὶ τὸ ἡδύ τε καὶ λυπηρόν. οἷς δὲ ταῦτα, καὶ ἡ ἐπιθυμία· τοῦ γὰρ ἡδέος ὄρεξίς ἐστιν αὕτη. 4 ἔτι δὲ τῆς τροφῆς αἴσθησιν ἔχουσιν· ἡ γὰρ ἁφή, τῆς τροφῆς αἴσθησις· ξηροῖς γὰρ καὶ ὑγροῖς, καὶ θερμοῖς καὶ ψυχροῖς, τρέφεται τὰ ζῷα πάντα. τούτων δὲ αἴσθησις, ἁφή· τῶν δὲ ἄλλων αἰσθητῶν κατὰ συμβεβηκός· D οὐδὲν γὰρ εἰς τροφὴν συμβάλλεται ψόφος, οὐδὲ χρῶμα, οὐδὲ ὀσμή. ὁ δὲ χυμός, ἕν τι τῶν ἁπτῶν ἐστι. πεῖνα δὲ καὶ δίψα, ἐπιθυμία· καὶ ἡ μὲν πεῖνα, θερμοῦ καὶ ξηροῦ· ἡ δὲ δίψα, ψυχροῦ καὶ ὑγροῦ· ὁ δὲ χυμός, οἷον ἥδυσμά τι τούτων ἐστι. διασαφητέον δὲ περὶ αὐτῶν ὕστερον. νῦν δ' ἐπὶ τοσοῦτον εἰρήσθω, ὅτι τῶν ζώων τοῖς ἔχουσιν ἁφὴν καὶ ὄρεξις ὑπάρχει. 5 περὶ δὲ φαντασίας, ἄδηλον. ὕστερον δ' ἐπισκεπτέον. 6 ἐνίοις δὲ πρὸς τούτοις ὑπάρχει καὶ τὸ κατὰ τόπον κινητικόν. 7 ἑτέροις δὲ καὶ τὸ διανοητικόν τε καὶ νοῦς, οἷον ἀνθρώποις, καὶ εἴ τι τοιοῦτόν ἐστιν ἕτερον, ἢ καὶ τιμιώτερον. 8 δῆλον οὖν ὅτι τὸν αὐτὸν τρόπον εἷς ἂν εἴη λόγος ψυχῆς τε καὶ σχήματος· οὔτε γὰρ E ἐκεῖ σχῆμα παρὰ τὸ τρίγωνόν ἐστι καὶ τὰ ἐφεξῆς, οὔτε ἐνταῦθα ψυχὴ παρὰ τὰς εἰρημένας. γένοιτο δ' ἂν καὶ ἐπὶ τῶν σχημάτων λόγος κοινός, ὃς ἐφαρμόσει μὲν πᾶσιν, ἴδιος δὲ οὐδενὸς ἔσται σχήματος. ὁμοίως δὲ καὶ ἐπὶ ταῖς εἰρημέναις ψυχαῖς. διὸ γελοῖον ζητεῖν τὸν κοινὸν λόγον καὶ ἐπὶ τούτων καὶ ἐφ' ἑτέρων· ὃς οὐδενὸς ἔσται τῶν ὄντων ἴδιος λόγος, οὐδὲ κατὰ τὸ οἰκεῖον καὶ ἄτομον εἶδος, ἀφέντας τὸν τοιοῦτον. 9 παραπλησίως δ' ἔχει τῷ περὶ τῶν σχημάτων καὶ τὰ περὶ τὴν ψυχήν· ἀεὶ γὰρ ἐν τῷ ἐφεξῆς ὑπάρχει δυνάμει, τὸ πρότερον, ἐπί τε τῶν σχημάτων, καὶ τῶν ἐμψύχων

* γρ. ἔχουσιν

ἔστιν ἐν τετραγώνῳ μὲν, τρίγωνον· ἐν αἰσθητικῷ δὲ, τὸ θρεπτικόν. ὥστε καθ᾽ ἕκαστον ζητητέον, τίς ἑκάστου ψυχή· οἷον τίς φυτοῦ, καὶ τίς ἀνθρώπου, ἢ θηρίου. διὰ τίνα δ᾽ αἰτίαν τῷ ἐφεξῆς οὕτως ἔχουσι, σκεπτέον. 10 ἄνευ μὲν γὰρ τοῦ θρεπτικοῦ τὸ αἰσθητικὸν οὐκ ἔστι. τοῦ δ᾽ αἰσθητικοῦ χωρίζεται τὸ θρεπτικὸν ἐν τοῖς φυτοῖς. πάλιν δ᾽, ἄνευ μὲν τοῦ ἁπτικοῦ τῶν ἄλλων αἰσθήσεων οὐδεμία ὑπάρχει· ἁφὴ δὲ ἄνευ τῶν ἄλλων ὑπάρχει· πολλὰ γὰρ τῶν ζώων οὔτε ὄψιν, οὔτε ἀκοὴν ἔχουσιν, οὔτε ὀσμῆς ὅλως αἴσθησιν· καὶ τῶν αἰσθητικῶν, τὰ μὲν ἔχει τὸ κατὰ τόπον κινητικὸν, τὰ δ᾽ οὐκ ἔχει· τελευταῖον δὲ καὶ τὸ ἐλάχιστον, λογισμὸν καὶ διάνοιαν· οἷς μὲν γὰρ ὑπάρχει λογισμὸς τῶν φθαρτῶν, τούτοις καὶ τὰ λοιπὰ πάντα· οἷς δὲ ἐκείνων ἕκαστον, οὐ πᾶσι λογισμός· ἀλλὰ τοῖς μὲν οὐδὲ φαντασία· τὰ δὲ ταύτῃ μόνον ζῶσι. περὶ δὲ τοῦ θεωρητικοῦ νοῦ ἕτερος λόγος. 11 ὅτι μὲν οὖν ὁ περὶ τούτων ἑκάστου λόγος οὗτος οἰκειότατος καὶ περὶ ψυχῆς, δῆλον.

A vt in quadrato quidem *ineſt* triangulus, in ſenſitiuo autem nutritiuum. Quapropter ſingillatim quærendum *eſt*, quæ *ſit* cuiuſque anima: veluti quæ *ſit anima* plantæ, & quæ hominis, vel beſtiæ. quam autem ob cauſam ita deinceps *ſe* habeant, conſiderandum *erit*. 10 Etenim ſine nutritiuo non eſt ſenſitiuum: à ſenſitiuo autem nutritiuum ſeparatur in plantis. Rurſus ſine tactiuo nullus alius ſenſus ineſt: tactus autem ſine aliis ineſt: multa namque animalia nec aſpectum nec auditum habent, nec omnino odoris ſenſum. inter ſenſitiua quoque alia motiuum ſecundum locum habent, alia non habent: B vltimum autem & minimum ratiocinationem & dianœam: quibus enim ineſt ratiocinatio, cùm ſint interitui obnoxia, his & reliqua omnia *inſunt*: quibus verò vnumquodque illorum *ineſt*, non omnibus *ineſt* ratiocinatio: ſed quibuſdam nec phantaſia quidem *ineſt*: quædam verò hac ſolùm viuunt. de contemplatiuo autem intellectu alia *eſt* ratio. 11 Quæ igitur definitio de his ſingulis *affertur*, hanc de anima quoque *eſſe* maximè propriam, manifeſtum *eſt*.

De facultate vegetatiua. Cap. IV.

Ἀναγκαῖον δὲ τὸν μέλλοντα περὶ τούτων σκέψιν ποιεῖσθαι, λαβεῖν τί ἐστιν * ἕκαστον αὐτῶν· εἶθ᾽ οὕτως περὶ τῶν ἐχομένων. εἰ δὲ χρὴ λέγειν τί ἕκαστον αὐτῶν, οἷον τὸ νοητικὸν, ἢ τὸ αἰσθητικὸν, ἢ τὸ θρεπτικὸν, πρότερον ἔτι λεκτέον τί τὸ νοεῖν, καὶ τί τὸ αἰσθάνεσθαι· πρότεραι γάρ εἰσι τῶν δυνάμεων αἱ ἐνέργειαι καὶ αἱ πράξεις κατὰ τὸν λόγον· εἰ δ᾽ οὕτως, τούτων δ᾽ ἔτι πρότερα τὰ ἀντικείμενα δεῖ τεθεωρηκέναι, περὶ ἐκείνων πρῶτον ἂν δέοι διορίσασθαι διὰ τὴν αὐτὴν αἰτίαν, οἷον * ἐπὶ τροφῆς, καὶ αἰσθητοῦ, καὶ νοητοῦ. 2 ὥστε πρῶτον περὶ τροφῆς καὶ γεννήσεως λεκτέον· ἡ γὰρ θρεπτικὴ ψυχὴ καὶ τοῖς ἄλλοις ὑπάρχει, καὶ πρώτη καὶ κοινοτάτη δύναμίς ἐστι ψυχῆς, καθ᾽ ἣν ὑπάρχει τὸ ζῆν ἅπασιν, ἧς ἐστιν ἔργα γεννῆσαι καὶ τροφῇ χρήσασθαι· φυσικώτατον γὰρ τῶν ἐν τοῖς ζῶσιν ἔργων, ὅσα τέλεια, καὶ μὴ πηρώματα, ἢ τὴν γένεσιν αὐτόματον ἔχει, τὸ ποιῆσαι ἕτερον οἷον αὐτὸ, ζῶον μὲν ζῶον, φυτὸν δὲ φυτὸν, ἵνα τοῦ ἀεὶ καὶ τοῦ θείου μετέχωσιν, ᾗ δύνανται· πάντα γὰρ ἐκείνου ὀρέγεται, κἀκείνου ἕνεκα πράττει ὅσα κατὰ φύσιν πράττει. τὸ δὲ οὗ ἕνεκα, διττόν· τὸ μὲν οὗ, τὸ δὲ ᾧ. ἐπεὶ οὖν κοινωνεῖν ἀδυνατεῖ τοῦ ἀεὶ καὶ τοῦ θείου τῇ συνεχείᾳ, διὰ τὸ μηδὲν ἐνδέχεσθαι τῶν φθαρτῶν τὸ αὐτὸ, καὶ ἓν ἀριθμῷ διαμένειν, ᾗ μετέχειν δύναται ἕκαστον, ταύτῃ κοινωνεῖ, τὸ μὲν μᾶλλον, τὸ δὲ ἧττον· καὶ διαμένει οὐκ αὐτὸ ἀλλ᾽ οἷον αὐτό· ἀριθμῷ μὲν οὐχ ἕν, εἴδει δὲ * ἕν. 3 ἔστι δὲ ἡ ψυχὴ τοῦ ζῶντος σώματος αἰτία καὶ ἀρχή. ταῦτα δὲ πολλαχῶς λέγεται. ὁμοίως δ᾽ ἡ ψυχὴ κατὰ τοὺς διῃρημένους τρόπους τρεῖς, αἰτία· καὶ γὰρ ὅθεν ἡ κίνησις αὐτὴ, καὶ τὸ οὗ ἕνεκα, καὶ ὡς ἡ οὐσία τῶν ἐμψύχων σωμάτων, ἡ ψυχὴ αἰτία. 4 ὅτι μὲν οὖν ὡς οὐσία, δῆλον· τὸ γὰρ αἴτιον τοῦ εἶναι πᾶσιν ἡ οὐσία· τὸ δὲ ζῆν τοῖς ζῶσι, τὸ εἶναί ἐστιν. αἰτία δὲ καὶ ἀρχὴ τούτων ἡ ψυχή. 5 ἔτι δὲ τοῦ δυνάμει ὄντος λόγος, ἡ ἐντελέχεια.

* χ. ἕκαστος

* κ. περὶ τροφῆς.

* γρ. ἓν. διότι τὸ ἓν σπέρμα τῶν ζώων καὶ φυτῶν, ὀργανικόν ἐστι

C Neceſſe autem *eſt*, eum, qui de his eſt conſideraturus, ſumere quid ſingula ſint: ſic deinde *agere* de iis quæ ſunt conſequentia. quòd ſi dicere oportet quid horum vnumquodque ſit, veluti intellectiuum, aut ſenſitiuum, aut nutritiuum: adhuc prius dicendum, quid ſit intelligere, & quid ſentire. nam priores facultatibus ſunt actus & operationes ſecundum rationem. quod ſi ita *eſt*, adhuc autem his priora obiecta contemplari oportet: profectò de illis primùm opus eſt definire ob eandem cauſam: veluti de alimento & ſenſibili & intelligibili. 2 Quapropter primùm de alimento & generatione dicendum *eſt*. nam anima nutritiua etiã D aliis ineſt, atque eſt prima & maximè communis facultas animæ, ſecundum quam omnibus viuere ineſt: cuius opera ſunt generare & alimento vti: quandoquidem inter opera viuentium, quæcumque perfecta, nec mutila *ſunt*, aut ſponte ſua naſcuntur, maximè naturale *eſt* efficere aliud quale ipſum *eſt*, animal quidem animal, plantã vero plantam: vt æternitatem & diuinitatem participent, quatenus poſſunt. omnia namque illud appetunt, & illius gratia agunt quæcumque ſecundum naturam agunt. ceterùm id cuius gratiâ, duplex *eſt*: alterum enim *eſt* quod *expetitur*, alterum vero cui *expetitur*. quoniam igitur non poſſunt æternitatem ac diuinitatem participare continuatione, propterea quod nulla res interitui obnoxia poteſt vna & eaE dem numero permanere: *idcirco* quatenus vnumquodque particeps fieri poteſt, eatenus participat, aliud quidem magis, aliud vero minus: ac permanet non ipſum, ſed quale ipſum *id eſt* numero quidem non vnum, ſed ſpecie vnum. 3 Iam vero anima eſt corporis viuentis cauſa & principium. hæc autem multis modis dicuntur: ſed anima tribus diſtinctis modis *eſt* cauſa: etenim anima eſt cauſa vnde ipſe motus *proficiſcitur*, & *eſt* id cuius gratia, & vt eſſentia corporum animatorum. 4 Patet igitur *eam eſſe* vt eſſentiam: omnibus enim eſſentia *eſt*, *quod eſt* cauſſa cur ſint. Viuere autem, viuentibus eſt eſſe: horum autem cauſa & principium *eſt* anima. 5 Præterea actus eſt ratio eius quod eſt poteſtate.

A 6 Patet etiam animam *eſſe* cauſam vt id cuius gratiâ. ſicut enim intellectus gratiâ alicuius facit: ita etiam natura: idque eſt ipſi finis. eiuſmodi autem in animalibus anima eſt ſecundùm naturam: omnia namque corpora naturalia *ſunt* animæ inſtrumenta, vt *corpora* animalium, ſic etiam plantarum, tamquam animæ gratiâ ſint. bifariàm autem *dicitur* id cuius gratiâ: nempe id quod *appetitur*, & id cui. 7 Quinetiam anima *eſt*, id vnde primùm motus ſecundùm locum *procedit*. ſed non omnibus viuentibus ineſt hæc facultas. 8 ſed & variatio & auctio eſt ſecundùm animam. videtur enim ſenſus eſſe variatio quædam: nihil autem ſentire, quod animam non habeat. 9 Similiter autem & de auctione & de deminutione *res ſe* habet: nihil etiam deminuitur, aut augetur naturaliter
B quod non alatur: nihil autem alitur, quod non ſit vitæ particeps. 10 Empedocles verò non rectè hoc dixit, adiiciens auctionem, plantis accidere, deorſum quidem, dum radices emittunt, quia terra ſic fertur ſecundùm naturam, ſurſum autem propter ignem ſimili ratione. neque enim ſuperum & inferum rectè accipit: quia non eſt idem omnibus ſuperum atque inferum, & vniuerſo: ſed vt caput animalium *ſe habet*, ita radices plantarum, ſi oportet *ex* officiis inſtrumenta dicere eadem & diuerſa. 11 Ad hæc, quid *eſt* quod continet ignem & terram, quæ in contrarias partes feruntur? diſtrahentur enim, niſi quid fuerit quod ſit impeditu-
C rum. ſi verò fuerit, *certe* hoc eſt anima, & cauſa cur *res augeantur* & alantur. 12 Quibuſdam autem videtur ignis natura eſſe ſimpliciter cauſa alimenti, & auctionis: ipſe enim ſolus inter corpora, ſiue elementa, videtur ali & augeri. quare & in plantis & in animalibus exiſtimare aliquis poſſit hunc eſſe qui operetur. 13 Hic autem eſt quidem aliquo modo concauſa, non tamen ſimpliciter cauſa: ſed potiùs anima. nam ignis auctio in infinitum *procedit*, donec ſit res combuſtibilis: eorum verò quæ natura conſtant, terminus eſt & ratio magnitudinis & auctionis: atque hæc *ſunt* animæ, non ignis, & potiùs rationis quàm materiæ. 14 Quoniam au-
D tem eadem facultas animæ *eſt* nutritiua & generatiua: neceſſe *eſt* de alimento primùm definire: hoc enim opere ſeiungitur ab aliis facultatibus.

15 Porrò alimentum eſſe videtur contrarium contrario: non tamen quoduis cuiuis, ſed quæcumque contraria non ſolùm ex ſe inuicem gignuntur, ſed etiam augentur: multa namq; ex ſe viciſſim fiunt: non tamen omnia *fiunt* quanta. vt ſanum ex ægrotante. quin immo ne illa quidem videntur eodem modo ſibi inuicem eſſe alimenta: ſed igni quidem aqua *eſt* alimentum: ignis verò non alit aquam. in ſimplicibus itaque corporibus hæc maximè eſſe videntur: hoc quidem, alimẽtum: illud verò, id quod
E alitur. 16 Exiſtit autem dubitatio: quia nonnulli inquiunt ſimile ſimili ali, quemadmodum & augeri. 17 Contrà quibuſdam videtur, vt diximus, contrarium *ali* contrario: tamquam ſimile non poſſit pati à ſimili: alimentum autem mutetur, & concoquatur: mutatio verò in omnibus *eſt* in id quod *eſt* oppoſitum, aut quod *eſt* interiectum. 18 Præterea alimentum patitur aliquid ab eo quod alitur, non hoc ab alimento: quemadmodum nec faber *patitur* à materia, ſed hæc ab illo. faber autem tantùm mutatur ab otio ad negotium. 19 Intereſt autem, vtrùm alimentum ſit id quod vltimũ accedit,

A 6 Φανερὸν δ' ὡς καὶ οὗ ἕνεκα, αἰτία ἡ ψυχή· ὥσπερ γὰρ ὁ νοῦς ἕνεκά του ποιεῖ, τὸν αὐτὸν τρόπον καὶ ἡ φύσις. καὶ τοῦτ' ἐστὶν αὐτῇ τέλος. τοιοῦτον δ' ἐν τοῖς ζῴοις ἡ ψυχὴ κατὰ φύσιν· πάντα γὰρ τὰ φυσικὰ σώματα, τῆς ψυχῆς ὄργανα καθάπερ τὰ τῶν ζῴων, οὕτω καὶ τὰ τῶν φυτῶν, ὡς ἕνεκα τῆς ψυχῆς ὄντα. διττῶς δὲ τὸ οὗ ἕνεκα· τό, τε οὗ, καὶ τὸ ᾧ. 7 ἀλλὰ μὴν καὶ ὅθεν πρῶτον ἡ κατὰ τόπον κίνησις, ἡ ψυχή· οὐ πᾶσι δ' ὑπάρχει τοῖς ζῶσιν ἡ δύναμις αὕτη. 8 ἔστι δὲ καὶ ἀλλοίωσις καὶ αὔξησις κατὰ ψυχήν. ἡ μὲν γὰρ αἴσθησις ἀλλοίωσίς τις εἶναι δοκεῖ· *αἰσθάνεσθαι δ' οὐδὲν, ὃ μὴ ψυχὴν ἔχει. 9 ὁμοίως δὲ καὶ περὶ αὐξήσεως καὶ φθίσεως ἔχει· οὐδὲν γὰρ φθίνει, οὐδ'
B αὐξάνεται φυσικῶς μὴ τρεφόμενον. τρέφεται δ' οὐδὲν ὃ μὴ κοινωνεῖ ζωῆς. 10 Ἐμπεδοκλῆς δ' οὐ καλῶς εἴρηκε τοῦτο, προστιθεὶς αὔξησιν συμβαίνειν τοῖς φυτοῖς, κάτω μὲν ῥιζουμένων, διὰ τὸ τὴν γῆν οὕτω φέρεσθαι κατὰ φύσιν· ἄνω δὲ διὰ τὸ πῦρ ὡσαύτως· οὔτε γὰρ τὸ ἄνω καὶ τὸ κάτω καλῶς λαμβάνει· οὐ γὰρ ταὐτὸ πᾶσι τὸ ἄνω καὶ τὸ κάτω, καὶ τῷ παντί. ἀλλ' ὡς ἡ κεφαλὴ τῶν ζῴων, οὕτως αἱ ῥίζαι τῶν φυτῶν, εἰ χρὴ τὰ ὄργανα ἕτερα λέγειν, καὶ ταὐτὰ τοῖς *ἔργοις. 11 πρὸς δὲ τούτοις τί τὸ συνέχον εἰς τἀναντία φερόμενα, τὸ πῦρ καὶ τὴν
C γῆν· διασπασθήσεται γάρ, εἰ μή τι ἔσται τὸ κωλῦσον· εἰ δ' ἔστι, τοῦτ' ἔστιν ἡ ψυχή, καὶ τὸ αἴτιον τοῦ αὐξάνεσθαι, καὶ τρέφεσθαι. 12 δοκεῖ δέ τισιν ἡ τοῦ πυρὸς φύσις ἁπλῶς αἰτία τῆς τροφῆς καὶ τῆς αὐξήσεως εἶναι· καὶ γὰρ αὐτὸ φαίνεται μόνον τῶν σωμάτων, ἢ τῶν στοιχείων τρεφόμενον καὶ αὐξανόμενον. διὸ καὶ ἐν τοῖς φυτοῖς καὶ ἐν τοῖς ζῴοις ὑπολάβοι τις ἂν τοῦτο εἶναι τὸ ἐργαζόμενον. 13 τὸ δὲ, συναίτιον πως μέν ἐστιν, οὐ μὴν ἁπλῶς γε αἴτιον, ἀλλὰ μᾶλλον ἡ ψυχή· ἡ μὲν γὰρ τοῦ πυρὸς αὔξησις εἰς ἄπειρον, ἕως ἂν ᾖ τὸ καυστόν. τῶν δὲ φύσει συνισταμένων πάντων ἔστι πέρας καὶ λόγος μεγέθους καὶ αὐξήσεως· ταῦτα δὲ ψυχῆς, ἀλλ' οὐ πυρός, καὶ λόγου μᾶλλον ἢ ὕλης. 14 ἐπεὶ
D δ' ἡ αὐτὴ δύναμις τῆς ψυχῆς θρεπτικὴ καὶ γεννητικὴ, περὶ τροφῆς ἀναγκαῖον διωρίσθαι πρῶτον· ἀφορίζεται γὰρ πρὸς τὰς ἄλλας δυνάμεις τῷ ἔργῳ τούτῳ. 15 δοκεῖ δ' εἶναι ἡ τροφὴ, τὸ ἐναντίον τῷ ἐναντίῳ· οὐ πᾶν δὲ παντί. ἀλλ' ὅσα τῶν ἐναντίων μὴ μόνον γένεσιν ἐξ ἀλλήλων *ἔχει, ἀλλὰ καὶ αὔξησιν· γίνεται γὰρ πολλὰ ἐξ ἀλλήλων, ἀλλ' οὐ πάντα ποσά· οἷον ὑγιὲς ἐκ κάμνοντος. φαίνεται δ' οὐδ' ἐκεῖνα τὸν αὐτὸν τρόπον ἀλλήλοις εἶναι τροφή· ἀλλὰ τῷ πυρὶ μὲν, τὸ ὕδωρ τροφή, τὸ δὲ πῦρ οὐ τρέφει τὸ ὕδωρ. ἐν μὲν οὖν τοῖς ἁπλοῖς σώμασι ταῦτ' εἶναι δοκεῖ μάλιστα, τὸ μὲν τροφή, τὸ δὲ τρεφόμενον.
E 16 ἀπορίαν δὲ ἔχει· φασὶ γὰρ οἱ μὲν τὸ ὅμοιον τῷ ὁμοίῳ τρέφεσθαι, καθάπερ καὶ αὐξάνεσθαι. 17 τοῖς δ' ὥσπερ εἴπομεν, τοὔμπαλιν δοκεῖ, τὸ ἐναντίον τῷ ἐναντίῳ, ὡς ἀπαθοῦς ὄντος τοῦ ὁμοίου [ὑπὸ τοῦ ὁμοίου] τὴν δὲ τροφὴν μεταβάλλειν καὶ πέττεσθαι· ἡ δὲ μεταβολὴ πᾶσιν, εἰς τὸ ἀντικείμενον, ἢ τὸ μεταξύ. 18 ἔτι ἡ τροφὴ πάσχει τι ὑπὸ τοῦ τρεφομένου, ἀλλ' οὐ τοῦτο ὑπὸ τῆς τροφῆς, ὥσπερ οὐδ' ὁ τέκτων ὑπὸ τῆς ὕλης, ἀλλ' ὑπ' ἐκείνου αὕτη· ὁ δὲ τέκτων μεταβάλλει μόνον εἰς ἐνέργειαν ἐξ ἀργίας. 19 πότερον δ' ἐστὶν ἡ τροφὴ τὸ τελευταῖον προσγινόμενον,

* γ. αἰσθάνεσθαι

* γ. ἔργοις. τὸ δ' αὐτὸ λέγειν ὄργανον, ᾧ αὖ ἢ τὸ αὐτὸ ἔργον.

* γ. ἔχειν

ἡ δ' ὕστερον, ἔχει διαφοράν. εἰ δ' ἄμφω, ἀλλ' ἡ μὲν ἄπεπτος, ἡ δὲ πεπεμμένη, ἀμφοτέρως ἂν ἐνδέχοιτο τὴν τροφὴν λέγειν· ᾗ μὲν γὰρ ἄπεπτος, τὸ ἐναντίον τῷ ἐναντίῳ τρέφεται· ᾗ δὲ πεπεμμένη, τὸ ὅμοιον τῷ ὁμοίῳ. ὥστε φανερὸν, ὅτι λέγουσί τινα τρόπον ἀμφότεροι, καὶ ὀρθῶς καὶ οὐκ ὀρθῶς. 20 ἐπεὶ δὲ οὐθὲν τρέφεται μὴ μετέχον ζωῆς, τὸ ἔμψυχον ἂν εἴη σῶμα τὸ τρεφόμενον, ᾗ ἔμψυχον. ὥστε καὶ ἡ τροφὴ πρὸς ἔμψυχόν ἐστι, καὶ οὐ κατὰ συμβεβηκός. 21 ἔστι δ' ἕτερον τροφῇ καὶ αὐξητικῷ εἶναι· ᾗ μὲν γὰρ ποσόν τι τὸ ἔμψυχον, αὐξητικόν· ᾗ δὲ τόδε τι καὶ οὐσία, τροφή· σώζει γὰρ τὴν οὐσίαν, καὶ μέχρι τούτου ἐστὶν ἕως ἂν τρέφηται· καὶ γενέσεως ποιητικόν, οὐ τοῦ τρεφομένου, ἀλλ' οἷον τὸ τρεφόμενον· ἤδη γὰρ ἔστιν αὐτὴ ἡ οὐσία· γεννᾷ δ' οὐθὲν αὐτὸ ἑαυτό, ἀλλὰ σώζει. 22 ὥσθ' ἡ μὲν τοιαύτη τῆς ψυχῆς ἀρχὴ, δύναμίς ἐστιν, οἵα σώζειν τὸ ἔχον αὐτὴν ᾗ τοιοῦτον. ἡ δὲ τροφὴ παρασκευάζει ἐνεργεῖν. διὸ στερηθὲν τροφῆς, οὐ δύναται εἶναι. 23 ἐπεὶ δὲ ἐστὶ τρία, τὸ τρεφόμενον, καὶ ᾧ τρέφεται, καὶ τὸ τρέφον· τὸ μὲν τρέφον ἐστὶν ἡ πρώτη ψυχή· τὸ δὲ τρεφόμενον, τὸ ἔχον αὐτὴν σῶμα· ᾧ δὲ τρέφεται, ἡ τροφή. 24 ἐπεὶ δὲ ἀπὸ τοῦ τέλους ἅπαντα προσαγορεύειν δίκαιον· τέλος δὲ τὸ γεννῆσαι οἷον αὐτό· εἴη ἂν ἡ πρώτη ψυχὴ γεννητικὴ, οἷον αὐτό. 25 ἔστι δὲ ᾧ τρέφεται διττόν, ὥσπερ ᾧ κυβερνᾷ, ἡ χεὶρ, καὶ τὸ πηδάλιον· τὸ μὲν κινοῦν καὶ κινούμενον, τὸ δὲ κινοῦν μόνον. 26 πᾶσαν δ' ἀναγκαῖον τροφὴν δύνασθαι πέττεσθαι· ἐργάζεται δὲ τὴν πέψιν τὸ θερμόν. διὸ πᾶν ἔμψυχον ἔχει θερμότητα. τύπῳ μὲν οὖν τί ἐστιν ἡ τροφὴ, εἴρηται· διασαφητέον δ' ἐστὶν ὕστερον περὶ αὐτῆς ἐν τοῖς οἰκείοις λόγοις.

A an quod primum. quòd ſi vtrumque *eſt alimentum*, ſed illud *eſt* crudum, hoc verò, concoctum: profectò vtroque modo alimentum dici poteſt. quatenus enim *eſt* crudum, contrarium contrario alitur. quatenus verò *eſt* concoctum, ſimile *alitur* ſimili. quare perſpicuum *eſt*, vtroſque quodammodo & rectè & non rectè dicere. 20 Quia verò nihil alitur, quod non ſit vitæ particeps: certè id quod alitur, eſt corpus animatum, quatenus animatum. Quare & alimentum ad animatum refertur, & *quidem* non ex accidenti. 21 Iam verò alia eſt alimẽti, alia auctiui eſſentia: quatenus enim animatum *eſt* quantum quiddam, *hoc* habet vim augendi: quatenus verò *illud eſt* hoc aliquid & ſubſtantia, *hoc eſt* B alimentum: conſeruat enim ſubſtantiam: ac tamdiu eſt, quamdiu alitur. & generationis *eſt* effectiuum, non huius quod alitur, ſed quale *eſt* quod alitur: quoniam hæc ſubſtantia iam eſt, nihil autem ſe ipſum generat, ſed conſeruat. 22 Quapropter eiuſmodi principium anima eſt facultas apta ad conſeruandum id quod eam habet qua tale eſt. alimentum verò ſuppeditat *ipſi in quod* poſſit agere. idcirco alimento priuatum, non poteſt eſſe. 23 Cùm autem tria ſint, *nimirum* quod alitur, & quo alitur, & quod alit: certè quod alit, eſt prima anima: quod verò alitur, *eſt* corpus ea præditum: quo autem alitur, *eſt* alimentum. 24 Quia verò æquum *eſt* omnia denominare à fine, finis verò *eſt* C generare cuiuſmodi *eſt* ipſum *generans*: profectò erit prima anima, generatiua *eius quod tale eſt*, quale ipſum *generans*. 25 Duplex autem eſt id quo alitur: ſicut *duplex eſt*, quo *nauta* gubernat *nauim*, manus ac temo: *quorum* alterum *eſt* mouens & motum, alterum, motum dumtaxat. 26 Iam verò neceſſe *eſt*, omne alimentum poſſe concoqui: concoctionem autem operatur calor. vnde omne animatum habet calorem. 27 Typo igitur, quid ſit alimentum, dictum eſt: poſteriùs autem propriis ſermonibus *eſt* dilucidandum.

De ſenſu. Cap. V.

Διωρισμένων δὲ τούτων, λέγωμεν κοινῇ περὶ πάσης αἰσθήσεως. 2 ἡ δὲ αἴσθησις ἐν τῷ κινεῖσθαί τε καὶ πάσχειν συμβαίνει, καθάπερ εἴρηται· δοκεῖ γὰρ ἀλλοίωσίς τις εἶναι. 3 φασὶ δέ τινες καὶ τὸ ὅμοιον ὑπὸ τοῦ ὁμοίου πάσχειν. τοῦτο δὲ πῶς δυνατὸν ἢ ἀδύνατον, εἰρήκαμεν καὶ ἐν τοῖς καθόλου λόγοις περὶ τοῦ ποιεῖν καὶ πάσχειν. 4 ἔχει δὲ ἀπορίαν, διὰ τί οὐ καὶ τῶν αἰσθήσεων αὐτῶν γίνεται αἴσθησις, καὶ διὰ τί ἄνευ τῶν ἔξω οὐ ποιοῦσιν αἴσθησιν, ἐνόντος πυρὸς καὶ γῆς, καὶ τῶν ἄλλων στοιχείων, ὧν ἐστὶν ἡ αἴσθησις καθ' αὑτά, ἢ τὰ συμβεβηκότα τούτοις. δῆλον οὖν ὅτι τὸ αἰσθητικὸν οὐκ ἔστιν ἐνεργείᾳ, ἀλλὰ δυνάμει μόνον. διόπερ οὐκ αἰσθάνεται· καθάπερ τὸ καυστὸν οὐ καίεται αὐτὸ καθ' αὑτὸ ἄνευ τοῦ καυστικοῦ· ἔκαιε γὰρ ἂν ἑαυτό, καὶ οὐδὲν ἐδεῖτο τοῦ ἐντελεχείᾳ πυρὸς ὄντος. 5 ἐπεὶ δὲ τὸ αἰσθάνεσθαι λέγομεν διχῶς· τό, τε γὰρ δυνάμει ἀκοῦον καὶ ὁρῶν, ἀκούειν καὶ ὁρᾶν λέγομεν, κἂν τύχῃ καθεῦδον· καὶ τὸ ἤδη ἐνεργοῦν· διχῶς ἂν λέγοιτο καὶ ἡ αἴσθησις· ἡ μὲν ὡς δυνάμει, ἡ δὲ ὡς ἐνεργείᾳ. ὁμοίως δὲ καὶ τὸ αἰσθάνεσθαι, τό, τε δυνάμει ὂν, καὶ τὸ ἐνεργείᾳ. 6 πρῶτον μὲν οὖν ὡς τοῦ αὐτοῦ ὄντος τοῦ πάσχειν, καὶ τοῦ κινεῖσθαι, καὶ τοῦ ἐνεργεῖν, λέγωμεν.

D HIS definitis, dicamus communiter de omni ſenſu. 2 Senſus accidit, eò quòd aliquid mouetur & patitur, ſicuti dictum fuit: videtur enim eſſe variatio quædam. 3 Inquiunt autem nonnulli etiam ſimile pati à ſimili. hoc verò quomodo ſit poſſibile, vel impoſſibile, diximus in ſermonibus vniuerſalibus de agendo & patiendo. 4 Exiſtit autem dubitatio, cur non fiat ſenſus etiam ipſorum ſenſuum, & cur ſine externis non faciant ſenſum, cùm inſit ignis, ac terra, & cetera elementa, quorum eſt ſenſus per ſe, vel *per* ea quæ ipſis accidunt. Patet igitur, ſenſitiuum non eſſe actu, ſed poteſtate tantum. proinde non ſentit: quemadmodum combuſtibile non comburitur ipſum per ſe ſine combuſtiuo: B combureret enim ſeipſum, nec quicquam egeret eius quod actu ſit ignis. 5 Cùm autem ſentire dicamus bifariàm: nã & quod poteſtate audit & videt: dicimus audire & videre, etiamſi fortè dormiat, & quod iam actu operatur: bifariàm quoque dicetur ſenſus: alter ſcilicet, vt poteſtate: alter, vt actu. Similiter autem *dicitur* & ſentire: *nempe* & quod eſt poteſtate, & quod actu. 6 Primùm igitur ſic loquimur, quaſi idem ſit pati ac moueri & operari.

Etenim

A Etenim motus quoque eſt actus quidam, ſed imperfectus, vt in aliis *libris* dictum fuit. 7 Omnia verò patiuntur & mouentur ab eo quod efficiendi vim habet & actu eſt. idcirco partim à ſimili patiūtur, partim à diſſimili, ſicuti diximus: patitur enim, quod eſt diſſimile: cùm autem paſſum eſt, ſimile eſt. 9 Diſtinguendum porrò eſt & de poteſtate, & de actu: nunc enim de his ſimpliciter loquimur. eſt enim aliquid ita ſciens, vt ſi dicamus hominem ſcientem, quoniam homo eſt *in* eorum *numero* quæ ſciūnt & habent ſcientiam: eſt præterea *ſciens*, ſicut iam dicimus eum ſcientē, qui nouit grammaticam. horum autem vterque non eodem modo poteſtate B *ſciendi* præditus eſt: ſed ille, quia tale *eſt* genus, & materia: hic verò, quia, cùm voluerit, contemplari poterit, niſi quid externū impediet. *alius* verò cùm ſit actu & propriè ſciens, iam contemplatur hoc α. ambo igitur priores poteſtate ſcientes ſunt: ſed alter per diſciplinam variatus, & ſæpius ex contrario habitu mutatus: alter verò ex eo quòd ſenſum vel grammaticam ſine operatione habeat, in operantem *mutatus eſt* alio modo. 9 Quin nec pati eſt ſimplex: ſed aliud eſt *vt* interitus quidam à contrario: aliud verò potiùs *vt* ſalus eius quod eſt poteſtate, ab eo quod eſt actu & ſimili, quemadmodum poteſtas *ſe* habet ad actum. *id* enim quod ſcientiam habet, contemplans euadit: quod quidem aut non C eſt variari, (quoniam acceſſio in ipſum *eſt*, & in actum) aut eſt alterum genus variationis. Idcirco non rectè dicitur, *id* quod prudentis munere fungitur, quando ſapit, variari: ſicuti nec ædificatorem, quando ædificat. quod ergo in actum ducit ex eo quod eſt poteſtate, quantum ad *id*, quod intelligit & prudentis munere fungitur, non doctrinam *vocari*, ſed aliam appellationem habere par *eſt*. quod autem cùm ſit poteſtate, diſcit & accipit ſcientiam ab eo quod eſt actu & docendi vim habet, vel dicendum *eſt* non pati, ſicut dictū fuit, vel duos eſſe modos variationis, *id eſt*, mutationē in priuatiuas diſpoſitiones, & mutationem in habitus ac naturam. 10 Senſitiui autem prima quidem mutatio fit à gene- D rante, cùm autem genitum fuerit, iam habet ſenſum, veluti ſcientiam. ſed & *ſentire* actu itidem dicitur atque contemplari. 11 Differunt autem: quoniam ea quæ hūnc (*id eſt ſenſum*) ad actum deducendi vim habent, extrà ſunt, vt aſpectabile, & audibile, itidémque cetera ſenſibilia. cauſa *eſt*: quia ſenſus qui *eſt* actu, ſingularium *eſt*: ſcientia verò *eſt* vniuerſalium, quæ ſunt quodammodo in ipſa anima. 12 Idcirco ipſius poteſtate *eſt*, vt intelligat quādo velit: ſentire autem non *eſt* in ipſius poteſtate, quia neceſſe *eſt* adeſſe rem ſenſibilem. Similiter autem hoc habet etiam in ſciētiis rerum ſenſibilium, & ob eandem cauſam, quia ſenſibilia ſunt *in* rerum ſingularium & externarum *numero*. 13 Sed de his E quidem dilucidiùs agendi occaſio iterum dabitur: nunc in tantum definita ſunto: quia cùm id quod dicitur poteſtate, non ſit ſimplex, ſed partim vt ſi dicamus puerum poſſe exercitum ducere, partim vt ſi dicamus eum qui *eſt* ætate *idonea*: ita etiam ſe habet ſenſitiuum. Quia verò eorum differentia nomine caret, expoſitúmque eſt *ea eſſe* diuerſa, & quomodo *ſint* diuerſa: neceſſe *eſt* igitur, his pati & variari, quaſi propriis nominibus vti. 14 Porrò ſenſitiuum, *tale* eſt poteſtate, quale *eſt* ſenſibile iam actu, quemadmodum dictum fuit. patitur ergo, cùm non ſit ſimile. cùm autem perpeſſum eſt, ſimile eſt factum, & quale eſt illud.

καὶ γάρ ἐστιν ἡ κίνησις ἐνέργειά τις, ἀτελὴς μέντοι, καθάπερ ἐν ἑτέροις εἴρηται. 7 Πάντα δὲ πάσχει καὶ κινεῖται ὑπὸ τοῦ ποιητικοῦ καὶ ἐνεργείᾳ ὄντος. διὸ ἔστι μὲν ὡς ὑπὸ τοῦ ὁμοίου πάσχει, ἔστι δὲ ὡς ὑπὸ τοῦ ἀνομοίου, καθάπερ εἴπομεν· πάσχει μὲν γὰρ τὸ ἀνόμοιον ὄν, πεπονθὸς δὲ ὅμοιόν ἐστι. 8 Διαιρετέον δὲ καὶ περὶ δυνάμεως καὶ ἐντελεχείας· νῦν γὰρ ἁπλῶς λέγομεν περὶ αὐτῶν. ἔστι μὲν γὰρ οὕτως ἐπιστῆμόν τι, ὡς ἂν εἴποιμεν ἄνθρωπον ἐπιστήμονα, ὅτι ὁ ἄνθρωπος τῶν ἐπιστημόνων καὶ τῶν ἐχόντων ἐπιστήμην. ἔστι δὲ ὡς ἤδη λέγομεν ἐπιστήμονα τὸν ἔχοντα τὴν γραμματικήν· ἑκάτερος δὲ τούτων οὐ τὸν αὐτὸν τρόπον δυνατός ἐστιν· ἀλλ᾽ ὁ μὲν, ὅτι τὸ γένος τοιοῦτον καὶ ἡ ὕλη· ὁ δὲ, ὅτι βουληθεὶς δυνατὸς θεωρεῖν, ἂν μή τι κωλύσῃ τῶν ἔξωθεν. ὁ δ᾽ ἤδη θεωρῶν, ἐντελεχείᾳ ὢν καὶ κυρίως ἐπιστάμενος, τόδε τὸ α. ἀμφότεροι μὲν οὖν οἱ πρῶτοι κατὰ δύναμιν ἐπιστήμονες, ἀλλ᾽ ὁ μὲν διὰ μαθήσεως ἀλλοιωθεὶς, καὶ πολλάκις ἐξ ἐναντίας μεταβαλὼν ἕξεως· ὁ δὲ ἐκ τοῦ ἔχειν τὴν αἴσθησιν ἢ τὴν γραμματικὴν, μὴ ἐνεργεῖν δὲ, εἰς τὸ ἐνεργεῖν ἄλλον τρόπον. 9 Οὐκ ἔστι δὲ ἁπλοῦν οὐδὲ τὸ πάσχειν, ἀλλὰ τὸ μὲν φθορά τις ὑπὸ τοῦ ἐναντίου, τὸ δὲ σωτηρία μᾶλλον τοῦ δυνάμει ὄντος, ὑπὸ τοῦ ἐντελεχείᾳ ὄντος καὶ ὁμοίου, οὕτως ὡς δύναμις ἔχει πρὸς ἐντελέχειαν. θεωροῦν γὰρ γίνεται τὸ ἔχον τὴν ἐπιστήμην, ὅπερ ἢ οὐκ ἔστιν ἀλλοιοῦσθαι (εἰς αὐτὸ γὰρ ἡ ἐπίδοσις καὶ εἰς ἐντελέχειαν) ἢ ἕτερον γένος ἀλλοιώσεως. διὸ οὐ καλῶς ἔχει λέγειν τὸ φρονοῦν, ὅταν φρονῇ, ἀλλοιοῦσθαι· ὥσπερ οὐδὲ τὸν οἰκοδόμον ὅταν οἰκοδομῇ. τὸ μὲν οὖν εἰς ἐντελέχειαν ἄγον ἐκ δυνάμει ὄντος, κατὰ τὸ νοοῦν καὶ φρονοῦν, οὐ διδασκαλίαν, ἀλλ᾽ ἑτέραν ἐπωνυμίαν ἔχειν δίκαιον. τὸ δ᾽ ἐκ δυνάμει ὄντος μανθάνον καὶ λαμβάνον ἐπιστήμην ὑπὸ τοῦ ἐντελεχείᾳ ὄντος καὶ διδασκαλικοῦ, ἤτοι οὐδὲ πάσχειν φατέον, ὥσπερ εἴρηται· ἢ δύο τρόπους εἶναι ἀλλοιώσεως, τήν τε ἐπὶ τὰς στερητικὰς διαθέσεις μεταβολὴν, καὶ τὴν ἐπὶ τὰς ἕξεις καὶ τὴν φύσιν. 10 Τοῦ δὲ αἰσθητικοῦ, ἡ μὲν πρώτη μεταβολὴ γίνεται ὑπὸ τοῦ γεννῶντος. ὅταν δὲ γεννηθῇ, ἔχει ἤδη ὥσπερ ἐπιστήμην, καὶ τὸ αἰσθάνεσθαι. καὶ τὸ κατ᾽ ἐνέργειαν δὲ, ὁμοίως λέγεται τῷ θεωρεῖν. 11 Διαφέρει δὲ, ὅτι τοῦ μὲν τὰ ποιητικὰ τῆς ἐνεργείας, ἔξωθεν, τὸ ὁρατὸν, καὶ τὸ ἀκουστόν· ὁμοίως δὲ καὶ τὰ λοιπὰ τῶν αἰσθητῶν. αἴτιον δὲ, ὅτι τῶν καθ᾽ ἕκαστον ἡ κατ᾽ ἐνέργειαν αἴσθησις, ἡ δ᾽ ἐπιστήμη τῶν καθόλου. ταῦτα δὲ ἐν αὐτῇ πως ἐστὶ τῇ ψυχῇ. 12 Διὸ νοῆσαι μὲν ἐπ᾽ αὐτῷ, ὁπόταν βούληται· αἰσθάνεσθαι δὲ, οὐκ ἐπ᾽ αὐτῷ· ἀναγκαῖον γὰρ ὑπάρχειν τὸ αἰσθητόν. ὁμοίως δὲ τοῦτ᾽ ἔχει κἂν ταῖς ἐπιστήμαις ταῖς τῶν αἰσθητῶν, καὶ διὰ τὴν αὐτὴν αἰτίαν, ὅτι τὰ αἰσθητὰ τῶν καθ᾽ ἕκαστα καὶ τῶν ἔξωθεν. 13 Ἀλλὰ περὶ μὲν τούτων διασαφῆσαι, καιρὸς γένοιτ᾽ ἂν καὶ εἰσαῦθις. νῦν δὲ διωρίσθω τοσοῦτον, ὅτι οὐχ ἁπλοῦ ὄντος τοῦ δυνάμει λεγομένου, ἀλλὰ τοῦ μὲν, ὥσπερ ἂν εἴποιμεν τὸν παῖδα δύνασθαι στρατηγεῖν, τοῦ δὲ, ὡς τὸν ἐν ἡλικίᾳ ὄντα· οὕτως ἔχει τὸ αἰσθητικόν. ἐπεὶ δ᾽ ἀνώνυμος αὐτῶν ἡ διαφορά, διώρισται δὲ περὶ αὐτῶν ὅτι ἕτερα, καὶ πῶς ἕτερα· χρῆσθαι δ᾽ ἀναγκαῖον τῷ πάσχειν καὶ ἀλλοιοῦσθαι, ὡς κυρίοις ὀνόμασι. 14 Τὸ δ᾽ αἰσθητικὸν, δυνάμει ἐστὶν, οἷον τὸ αἰσθητὸν ἤδη ὡς ἐντελεχείᾳ, καθάπερ εἴρηται· πάσχει μὲν οὖν οὐχ ὅμοιον ὄν, πεπονθὸς δὲ ὡμοίωται, καὶ ἔστιν οἷον ἐκεῖνο.

Diſtinctio ſenſibilium. Cap. VI.

A Λεκτέον δὲ καθ' ἑκάστην αἴσθησιν περὶ τῶν αἰσθητῶν πρῶτον. 2 Λέγεται δὲ τὸ αἰσθητὸν τριχῶς, ὧν δύο μὲν καθ' αὑτά φαμεν αἰσθάνεσθαι, τὸ δὲ ἓν, κατὰ συμβεβηκός. τῶν δὲ δύο, τὸ μὲν ἴδιόν ἐστιν ἑκάστης αἰσθήσεως, τὸ δὲ κοινὸν πασῶν. 3 Λέγω δ' ἴδιον μὲν, ὃ μὴ ἐνδέχεται ἑτέρᾳ αἰσθήσει αἰσθάνεσθαι, καὶ περὶ ὃ μὴ ἐνδέχεται ἀπατηθῆναι, οἷον ὄψις χρώματος, καὶ ἀκοὴ ψόφου, καὶ γεῦσις χυμοῦ. ἡ δ' ἁφὴ, πλείους μὲν ἔχει διαφοράς· ἀλλ' ἑκάστη γε κρίνει περὶ τούτων, καὶ οὐκ ἀπατᾶται ὅτι χρῶμα, οὐδ' ὅτι ψόφος, ἀλλὰ τί τὸ κεχρωσμένον, ἢ ποῦ, ἢ τί τὸ ψοφοῦν, ἢ ποῦ. τὰ μὲν οὖν τοιαῦτα λέγεται B ἴδια ἑκάστου. 4 Κοινὰ δὲ, κίνησις, ἠρεμία, ἀριθμὸς, σχῆμα, μέγεθος· τὰ γὰρ τοιαῦτα οὐδεμιᾶς ἐστιν ἴδια, ἀλλὰ κοινὰ πάσαις· καὶ γὰρ καὶ ἁφῇ κίνησίς ἐστί τις αἰσθητὴ, καὶ ὄψει. καθ' αὑτὰ μὲν οὖν ἐστιν αἰσθητὰ ταῦτα. 5 Κατὰ συμβεβηκὸς δὲ λέγεται αἰσθητὸν, οἷον εἰ τὸ λευκὸν* εἴη Διάρους υἱός· κατὰ συμβεβηκὸς γὰρ τούτου αἰσθάνεται, ὅτι τῷ λευκῷ συμβέβηκε τοῦτο οὗ αἰσθάνεται. 6 Διὸ καὶ οὐδὲν πάσχει ᾗ τοιοῦτον ὑπὸ τοῦ αἰσθητοῦ. τῶν δὲ καθ' αὑτὰ αἰσθητῶν, τὰ ἴδια κυρίως ἐστὶν αἰσθητὰ, καὶ πρὸς ἃ ἡ οὐσία πέφυκεν ἑκάστης αἰσθήσεως.

* γ. εἶν Διάρης κ. vtramque lectionem agnoſcit Themiſt. annotat Philoponus.

A Dicendum autem eſt in vnoquoque ſenſu primùm de ſenſibilibus. 2 Dicitur autem ſenſibile tribus modis: quorum duo dicimus per ſe ſentiri, vnum ex accidenti. illorum autem duorum alterum eſt proprium cuiuſque ſenſus, alterũ commune omnibus. 3 Proprium appello quod non poteſt alio ſenſu ſentiri, & circa quod non contingit decipi: vt aſpectus *eſt* coloris: & auditus, ſoni: & guſtus, ſaporis: tactus verò plures habet differentias. ſed vnuſquiſque *ſenſus* de his iudicat: nec decipitur, quòd *ſit* color, vel quòd *ſit* ſonus: ſed quid *ſit*, quod *eſt* coloratum, vel vbi *ſit*: aut quid *ſit* quod ſonat, vel vbi *ſit*. Quæ igitur ſunt eiuſmodi, dicun- B tur propria cuiuſque ſenſus. 4 Communia verò ſunt, motus, quies, numerus, figura, magnitudo. nam quæ *ſunt* eiuſmodi, nullius ſenſus *ſunt* propria, ſed communia omnibus. Etenim tactu quoque motus aliquis eſt ſenſibilis, & aſpectu: hæc igitur ſunt per ſe ſenſibilia. 5 Ex accidenti autem ſenſibili dicitur: veluti ſi album ſit Diaris filius: ex accidenti enim hoc ſentimus, quoniam albo, quod ſentimus, hoc accidit. 6 Ideóque nihil patitur à ſenſibili, quatenus *eſt* tale. Inter ea verò quæ *ſunt* per ſe ſenſibilia, ea propriè ſunt ſenſibilia, quæ propria *ſunt*, & ad quæ eſſentia cuiuſque ſenſus ſuapte naturâ refertur.

De aſpectabili, & aſpectu. Cap. VII.

ΟΥ μὲν οὖν ἐστιν ἡ ὄψις, τοῦτ' ἐστὶν ὁρατόν· ὁρατὸν C δ' ἐστὶ, χρῶμά τε, καὶ ὃ λόγῳ μέν ἐστιν εἰπεῖν, ἀνώνυμον δὲ τυγχάνει ὄν. δῆλον δὲ ἔσται ὃ λέγομεν προελθοῦσι μάλιστα. 3 Τὸ γὰρ ὁρατὸν ὃ λεγόμενον, ἐστι χρῶμα. τοῦτο δὲ ἐστι τὸ ἐπὶ τοῦ καθ' αὑτὸ ὁρατοῦ· καθ' αὑτὸ δὲ, οὐ τῷ λόγῳ, ἀλλ' ὅτι ἐν ἑαυτῷ ἔχει τὸ αἴτιον τοῦ εἶναι ὁρατόν. 4 Πᾶν δὲ χρῶμα κινητικόν ἐστι τοῦ κατ' ἐνέργειαν διαφανοῦς. καὶ τοῦτ' ἐστιν αὐτοῦ ἡ φύσις. 5 Διόπερ οὐχ ὁρατὸν ἄνευ φωτὸς, ἀλλὰ πάντως ἕκαστον χρῶμα ἐν φωτὶ ὁρατόν. 6 Διὸ περὶ φωτὸς πρῶτον λεκτέον τί ἐστιν. 7 Ἔστι δή τι διαφανές. 8 Διαφανὲς δὲ λέγω, ὃ ἐστι μὲν ὁρατὸν, οὐ καθ' αὑτὸ δὲ ὁρατὸν, ὡς ἁπλῶς εἰπεῖν, D ἀλλὰ δι' ἀλλότριον χρῶμα. 9 Τοιοῦτον δέ ἐστιν ἀὴρ, καὶ ὕδωρ, καὶ πολλὰ τῶν στερεῶν. οὐ γὰρ ᾗ ὕδωρ, οὐδ' ᾗ ἀὴρ, διαφανές· ἀλλ' ὅτι ἐστὶ φύσις ἐνυπάρχουσα ἡ αὐτὴ ἐν τούτοις ἀμφοτέροις, καὶ ἐν τῷ ἀϊδίῳ τῷ ἄνω σώματι. 10 Φῶς δέ ἐστιν ἡ τούτου ἐνέργεια τοῦ διαφανοῦς ᾗ διαφανές. 11 Δυνάμει δὲ ἐν οἷς τοῦτό ἐστι, καὶ τὸ σκότος. 12 Τὸ δὲ φῶς, οἷον χρῶμά ἐστι τοῦ διαφανοῦς, ὅταν ᾖ ἐντελεχείᾳ διαφανὲς ὑπὸ πυρὸς, ἢ τοιούτου, οἷον τὸ ἄνω σῶμα. καὶ γὰρ τούτῳ τι ὑπάρχει ἓν καὶ ταὐτόν. 13 Τί μὲν οὖν τὸ διαφανὲς, καὶ τί τὸ φῶς, εἴρηται· ὅτι οὔτε πῦρ, οὔθ' ὅλως σῶμα, οὔτε ἀποῤῥοὴ σώματος οὐδενός· εἴη γὰρ ἂν σῶμά τι καὶ οὕτως· ἀλλὰ πυρὸς ἢ τοιούτου τινὸς παρουσία ἐν τῷ διαφανεῖ·

C Cuius igitur eſt aſpectus, id eſt aſpectabile. 2 Aſpectabile autem eſt & color, & quod oratione quidem dici poteſt, ſed nomine vacat. verùm in *ſermonis* progreſſu manifeſtũ maximè erit, quod dicimus. 3 Aſpectabile enim quod dicimus, eſt color. hic autẽ eſt, qui in eo ineſt, quod per ſe eſt aſpectabile: per ſe autem *dico*, non ratione, ſed quia in ſe ipſo habet cauſam cur ſit aſpectabile. Omnis autẽ color eſt motiuus eius quod actu eſt perlucidũ. atque hæc eſt eius natura. 5 Idcirco non *eſt* aſpectabilis ſine lumine, ſed omnino quilibet color in lumine cerni poteſt. 6 Quare priùs dicendum *eſt* quid ſit lumen. 7 Eſt igitur aliquid perlucidum. 8 Perlucidum autem voco, quod eſt quidem aſpe- D ctabile. verùm, vt ſimpliciter dicam, nõ eſt aſpectabile per ſe, ſed per alienum colorem. 9 Eiuſmodi verò eſt aër, & aqua, & ſolidorum complura. non enim perlucidum *eſt*, quatenus *eſt* aqua, nec quatenus *eſt* aër: ſed quia natura quædam in his vtriſque eadem ineſt, & in æterno illo ſupero corpore. 10 Lumen autem eſt huius actus, *nimirum* perlucidi, quatenus *eſt* perlucidum. 11 Poteſtate autem in quibus hoc ineſt, etiam tenebræ *inſunt*. 12 Porrò lumen eſt quaſi color perlucidi, quãdo eſt actu perlucidum ab igne, aut eiuſmodi *alio*, quale *eſt* ſuperũ corpus: nam huic quoque aliquid ineſt vnum & idem. 11 Quid igitur *ſit* perlucidum, & quid lumẽ, dictum eſt: quia nec *eſt* ignis, nec omnino corpus, nec effluxio corporis alicuius: quandoquidem ſic quoque eſſet corpus quiddam: verùm *eſt* ignis vel talis cuiuſpiã præsẽtia in eo quod eſt perlucidũ.

Etenim eſt impoſſibile duo corpora ſimul in eodem eſſe. 14 Iam verò lumen videtur eſſe contrarium tenebris. ſunt autem tenebræ, priuatio eiuſmodi habitus *abſentis* à corpore perlucido: Quocirca manifeſtum *eſt*, huius habitus præſentiam eſſe lumen. 15 Nec rectè Empedocles, aut ſi quis alius ita locutus eſt, quaſi lumen feratur & protendatur aliquando inter terram & *cælum* ambiens, nos autem lateat. hoc enim eſt præter rationis veritatem, & præter ea quæ apparent. in paruo enim interuallo latere poſſet: ſed ab ortu ad occaſum latere, magnum admodum eſt poſtulatum. 16 Eſt autem coloris ſuſceptiuum, id quod colore vacat: & ſoni, quod ſono caret. colore autem vacat perlucidum, & quod videri nequit, aut quod vix cernitur, cuiuſmodi videtur, quod eſt tenebroſum. tale autem *eſt* quidem, quod eſt perlucidum, non tamen quando eſt actu perlucidum, ſed quando *eſt* poteſtate. nam eadem natura modò eſt tenebræ, modò lumen. 17 Non omnia verò in lumine cerni poſſunt, ſed tantùm cuiuſque *rei* proprius color. quædam enim in lumine non videntur, in tenebris autem efficiunt ſenſum: velvti quæ ignea videntur & ſplendent, hæc autem vno *communi* nomine carent: vt fungus, cornu, capita piſcium, & ſquammæ, & oculi: ſed harum rerum proprius color nõ cernitur. Quam igitur ob cauſam hæc videantur, alia *eſt* diſputatio: nunc hactenus perſpicuum eſt, *id*, quod in lumine cernitur, *eſſe* colorem. 18 Idcirco nec videtur ſine lumine: hæc enim erat eſſentia coloris, motiuum eſſe eius quod *eſt* actu perlucidum: actus autem eius quod *eſt* perlucidum, eſt lumen. 19 Huius rei ſignum perſpicuum *eſt*. ſi quis enim id quod colorem habet, in aſpectum ponat, non videbit. ſed color mouet perlucidum, vt aërem: ab hoc autem quod eſt continuum, mouetur ſenſorium. 20 Non enim ſcitè hoc inquit Democritus, putans, ſi id, quod *eſt* interiectum, fieret inane, exquiſitè viſum iri: etiam ſi formica in cœlo eſſet. nam hoc eſt impoſſibile: quia ſenſorio patiente, aſpectus fit. atqui impoſſibile *eſt*, vt ſenſitiuum *patiatur* à colore qui cernitur: ſed relinquitur vt patiatur ab intermedio. quare neceſſe *eſt*, eſſe aliquid interiectum. quod ſi inane fieret, non modò non exquiſitè, ſed omnino nihil videretur. 21 Quam igitur ob cauſam neceſſe *eſt* colorem in lumine videri, dictum eſt. 22 Ignis autem in vtriſque cernitur, & tenebris, & in lumine: idque neceſſariò: quia perlucidum ab hoc fit perlucidum. 23 Eadem ratio eſt de ſono, & odore: nihil enim horum, tangendo ſenſorium, efficit ſenſum: ſed ab odore & ſono intermedium mouetur: ab hoc autem vtrumque ſenſorium. ſi quis autem in ipſum ſenſorium imponat id quod ſonat, vel olet, nullum ſenſum faciat. 24 De tactu autem & guſtu *res* quidem ſimiliter habet, non tamẽ apparet. quam verò ob cauſam, poſteriùs erit manifeſtum. 25 Intermedium verò ſoni quidem eſt aër: odoris autem, *quiddam* nomine vacans. eſt enim communis quædam affectio in aëre & aqua. vt *igitur* colori, perſpicuum: ita habenti odorem, *id interiectum eſt*, quod in his vtriſque ineſt. videntur enim animalia quoque aquatilia habere ſenſum odoris, ſed homo, & quæcumque terreſtria reſpirant, nequeunt olfacere, niſi reſpirant. ac de his quoque cauſa poſteriùs reddetur.

οὐδὲ γὰρ δύο σώματα ἅμα δυνατὸν ἐν τῷ αὐτῷ εἶναι. 14 Δοκεῖ δὲ τὸ φῶς ἐναντίον εἶναι τῷ σκότει· ἔστι δὲ ὁ σκότος, στέρησις τῆς τοιαύτης ἕξεως ἐκ διαφανοῦς. ὥστε δῆλον, ὅτι καὶ ἡ τούτου παρουσία τὸ φῶς ἐστί. 15 Καὶ οὐκ ὀρθῶς Ἐμπεδοκλῆς, οὐδ᾽ εἴ τις ἄλλος οὕτως εἴρηκεν, ὡς φερομένου τοῦ φωτὸς, καὶ * γιγνομένου ποτὲ μεταξὺ τῆς γῆς καὶ τοῦ περιέχοντος, ἡμᾶς δὲ λανθάνοντος· τοῦτο γάρ ἐστι καὶ παρὰ τὴν ἐν τῷ λόγῳ ἀλήθειαν, καὶ παρὰ τὰ φαινόμενα. ἐν μικρῷ μὲν γὰρ διαστήματι λάθοι ἄν· ἀπ᾽ ἀνατολῆς δὲ ἐπὶ δυσμὰς, τὸ λανθάνειν μέγα λίαν τὸ αἴτημα. 16 Ἔστι δὲ χρώματος μὲν δεκτικὸν τὸ ἄχρουν, ψόφου δὲ τὸ ἄψοφον. ἄχρουν δὲ ἐστι τὸ διαφανὲς, καὶ τὸ ἀόρατον, ἢ τὸ μόλις ὁρώμενον, οἷον δοκεῖ τὸ σκοτεινόν. τοιοῦτον δὲ τὸ διαφανὲς μὲν, ἀλλ᾽ οὐχ ὅταν ᾖ ἐντελεχείᾳ διαφανὲς, ἀλλ᾽ ὅταν δυνάμει. ἡ γὰρ αὐτὴ φύσις, ὁτὲ μὲν σκότος, ὁτὲ δὲ φῶς ἐστιν. 17 Οὐ πάντα δὲ ὁρατὰ ἐν φωτί ἐστιν, ἀλλὰ μόνον ἑκάστου τὸ οἰκεῖον χρῶμα. ἔνια γὰρ ἐν μὲν τῷ φωτὶ οὐχ ὁρᾶται, ἐν δὲ τῷ σκότει ποιεῖ αἴσθησιν· οἷον τὰ πυρώδη φαινόμενα καὶ λάμποντα· ἀνώνυμα δέ ἐστι ταῦτα ἑνὶ ὀνόματι, οἷον μύκης, κέρας, κεφαλαὶ ἰχθύων, καὶ λεπίδες, καὶ ὀφθαλμοί· ἀλλ᾽ οὐδενὸς ὁρᾶται τούτων τὸ οἰκεῖον χρῶμα. δι᾽ ἣν μὲν οὖν αἰτίαν ταῦτα ὁρᾶται, ἄλλος λόγος. νῦν δὲ ἐπὶ τοσοῦτον φανερόν ἐστιν, ὅτι τὸ μὲν ἐν φωτὶ ὁρώμενον, χρῶμα. 18 Διὸ καὶ οὐχ ὁρᾶται ἄνευ φωτός· τοῦτο γὰρ ἦν αὐτῷ τὸ χρώματι εἶναι, τὸ κινητικῷ εἶναι τοῦ κατ᾽ ἐνέργειαν διαφανοῦς· ἡ δ᾽ ἐντελέχεια τοῦ διαφανοῦς φῶς ἐστί. 19 Σημεῖον δὲ τούτου φανερόν· ἐὰν γάρ τις θῇ, τὸ ἔχον χρῶμα ἐπ᾽ αὐτὴν τὴν ὄψιν, οὐκ ὄψεται· ἀλλὰ τὸ μὲν χρῶμα κινεῖ τὸ διαφανὲς, οἷον τὸν ἀέρα· ὑπὸ τούτου δὲ συνεχοῦς ὄντος, κινεῖται τὸ αἰσθητήριον. 20 Οὐ γὰρ καλῶς τοῦτο λέγει Δημόκριτος, οἰόμενος, εἰ γένοιτο κενὸν τὸ μεταξὺ, ὁρᾶσθαι ἂν ἀκριβῶς, καὶ εἰ μύρμηξ ἐν τῷ οὐρανῷ εἴη· τοῦτο γάρ ἐστιν ἀδύνατον· πάσχοντος γὰρ τοῦ αἰσθητικοῦ γίνεται τὸ ὁρᾶν. ὑπ᾽ αὐτοῦ μὲν οὖν τοῦ ὁρωμένου χρώματος, ἀδύνατον. λείπεται δὲ ὑπὸ τοῦ μεταξύ. ὥστ᾽ ἀναγκαῖόν τι εἶναι μεταξύ. κενοῦ δὲ γενομένου, οὐχ ὅτι ἀκριβῶς, ἀλλ᾽ ὅλως οὐδὲν ὀφθήσεται. 21 Δι᾽ ἣν μὲν οὖν αἰτίαν τὸ χρῶμα ἀναγκαῖον ἐν φωτὶ ὁρᾶσθαι, εἴρηται. 22 Πῦρ δὲ ἐν ἀμφοῖν ὁρᾶται, καὶ ἐν σκότει, καὶ ἐν φωτί· καὶ τοῦτο ἐξ ἀνάγκης. τὸ γὰρ διαφανὲς ὑπὸ τούτου γίνεται διαφανές. 23 Ὁ δ᾽ αὐτὸς λόγος καὶ περὶ ψόφου καὶ ὀσμῆς ἐστιν· οὐθὲν γὰρ αὐτῶν ἁπτόμενον τοῦ αἰσθητηρίου ποιεῖ τὴν αἴσθησιν, ἀλλ᾽ ὑπὸ μὲν ὀσμῆς καὶ ψόφου τὸ μεταξὺ κινεῖται, ὑπὸ δὲ τούτου τῶν αἰσθητηρίων ἑκάτερον. ὅταν δὲ ἐπ᾽ αὐτό τις ἐπιθῇ τὸ αἰσθητήριον τὸ ψοφοῦν ἢ τὸ ὄζον, οὐδεμίαν αἴσθησιν ποιήσει. 24 Περὶ δὲ ἁφῆς καὶ γεύσεως, ἔχει μὲν ὁμοίως, οὐ φαίνεται δέ. δι᾽ ἣν δ᾽ αἰτίαν, ὕστερον ἔσται δῆλον. 25 Τὸ δὲ μεταξὺ, ψόφων μὲν, ἀήρ· ὀσμῆς δὲ, ἀνώνυμον· κοινὸν γὰρ δή τι πάθος ἐπ᾽ ἀέρος καὶ ὕδατός ἐστιν. ὥσπερ τὸ διαφανὲς χρώματι, οὕτω τῷ ἔχοντι ὀσμὴν ὃ ἐν ἀμφοτέροις ὑπάρχει τούτοις. φαίνεται γὰρ καὶ τὰ ἔνυδρα τῶν ζώων ἔχειν αἴσθησιν ὀσμῆς. ἀλλ᾽ ὁ μὲν ἄνθρωπος καὶ τῶν πεζῶν ὅσα ἀναπνεῖ, ἀδυνατεῖ ὀσμᾶσθαι μὴ ἀναπνέοντα. ἡ δ᾽ αἰτία καὶ περὶ τούτων ὕστερον λεχθήσεται.

* κ. τεινομένου

De ſono & auditu.

Νῦν δὲ πρῶτον περὶ ψόφου καὶ ἀκοῆς διορίσωμεν. 2 Ἔστι δὲ διττὸς ὁ ψόφος· ὁ μὲν γὰρ* ἐνέργειά τις, ὁ δὲ, δύναμις· τὰ μὲν γὰρ οὔ φαμεν ἔχειν ψόφον, οἷον σπόγγον, ἔρια· τὰ δ' ἔχειν, οἷον* χαλκὸν, καὶ ὅσα στερεὰ, καὶ λεῖα, ὅτι δύναται ψοφῆσαι. τοῦτο δ' ἐστὶν αὐτοῦ μεταξὺ καὶ τῆς ἀκοῆς, ἐμποιῆσαι ψόφον ἐνεργείᾳ. 3 Γίνεται δὲ ὁ κατ' ἐνέργειαν ψόφος, ἀεί τινος πρός τι καὶ ἔν τινι· πληγὴ γάρ ἐστιν ἡ ποιοῦσα. διὸ καὶ ἀδύνατον ἑνὸς ὄντος γενέσθαι ψόφον· ἕτερον γὰρ τὸ τύπτον, καὶ τὸ τυπτόμενον· ὥστε τὸ ψοφοῦν πρός τι ψοφεῖ. πληγὴ δ' οὐ γίνεται ἄνευ φορᾶς. 4 Ὥσπερ δ' εἴπομεν, οὐ τῶν τυχόντων πληγὴ ὁ ψόφος· οὐθένα γὰρ ψόφον ποιεῖ ἔρια παταχθέντα ἢ πλῆγμα, ἀλλὰ χαλκὸς, καὶ ὅσα λεῖα καὶ κοῖλα· ὁ μὲν χαλκὸς, ὅτι λεῖος· τὰ δὲ κοῖλα, τῇ ἀνακλάσει πολλὰς ποιεῖ πληγὰς μετὰ τὴν πρώτην, ἀδυνατοῦντος ἐξελθεῖν τοῦ κινηθέντος. 5 Ἔτι ἀκούεται ἐν ἀέρι καὶ ὕδατι, ἀλλ' ἧττον. οὐκ ἔστι δὲ ψόφου κύριος ὁ ἀὴρ, οὐδὲ τὸ ὕδωρ· ἀλλὰ δεῖ στερεῶν πληγὴν γενέσθαι πρὸς ἄλληλα, καὶ πρὸς τὸν ἀέρα. 6 Τοῦτο δὲ γίνεται, ὅταν ὑπομένῃ πληγεὶς ὁ ἀὴρ, καὶ μὴ* διαχυθῇ. διὸ ἐὰν ταχέως καὶ σφοδρῶς πληγῇ, ψοφεῖ· δεῖ γὰρ φθάσαι τὴν κίνησιν τοῦ ῥαπίζοντος τὴν θρύψιν τοῦ ἀέρος, ὥσπερ ἂν εἰ σωρὸν ἢ ὁρμαθὸν ψάμμου τύπτοι τις φερόμενον ταχύ. 7 Ἠχὼ δὲ γίνεται, ὅταν ἀπὸ τοῦ ἀέρος ἑνὸς γενομένου διὰ τὸ ἀγγεῖον τὸ διορίσαν καὶ κωλῦσαν θρυφθῆναι, πάλιν ὁ ἀὴρ ἀπωσθῇ, ὥσπερ σφαῖρα. 8 Ἔοικε δὲ ἀεὶ γίνεσθαι ἠχὼ, ἀλλ' οὐ σαφής· ἐπεὶ συμβαίνει γε ἐπὶ τοῦ ψόφου, καθάπερ καὶ ἐπὶ τοῦ φωτός· καὶ γὰρ τὸ φῶς ἀεὶ ἀνακλᾶται· οὐ γὰρ ἂν ἐγίνετο πάντῃ φῶς, ἀλλὰ σκότος ἔξω τοῦ ἡλιουμένου· ἀλλ' οὐχ οὕτως ἀνακλᾶται, ὥσπερ ἀφ' ὕδατος, ἢ χαλκοῦ, ἢ καί τινος ἄλλου τῶν λείων, ὥστε σκιὰν ποιεῖν, ᾗ τὸ φῶς ὁρίζομεν. 9 Τὸ δὲ κενὸν ὀρθῶς λέγεται κύριον τοῦ ἀκούειν. δοκεῖ γὰρ εἶναι κενὸν ὁ ἀήρ. οὗτος δέ ἐστιν ὁ ποιῶν ἀκούειν, ὅταν κινηθῇ συνεχὴς καὶ εἷς. ἀλλὰ διὰ τὸ ψαθυρὸς εἶναι, οὐ γεγωνεῖ, ἂν μὴ λεῖον ᾖ τὸ πληγέν. τότε δὲ εἷς γίνεται ἅμα, διὰ τὸ ἐπίπεδον· ἓν γὰρ τὸ τοῦ λείου ἐπίπεδον. 10 Ψοφητικὸν μὲν οὖν, τὸ κινητικὸν ἑνὸς ἀέρος συνεχείᾳ μέχρις ἀκοῆς· ἀκοῇ δὲ συμφυὴς ἀέρι· διὰ δὲ τὸ ἐν ἀέρι εἶναι, κινουμένου τοῦ ἔξω, τὸ εἴσω* κινεῖ. 11 Διόπερ οὐ πάντῃ τὸ ζῷον ἀκούει, οὐδὲ πάντῃ διέρχεται ὁ ἀήρ· οὐ γὰρ πάντῃ ἔχει ἀέρα τὸ κινησόμενον μέρος καὶ ἔμψυχον, ὥσπερ ἡ κόρη τὸ ὑγρόν. 12 Αὐτὸ μὲν δὴ ἄψοφον ὁ ἀήρ, διὰ τὸ εὔθρυπτον. ὅταν δὲ κωλυθῇ θρύπτεσθαι, ἡ τούτου κίνησις ψόφος. 13 Ὁ δ' ἐν τοῖς ὠσὶν ἐγκατῳκοδόμηται πρὸς τὸ ἀκίνητος εἶναι, ὅπως ἀκριβῶς αἰσθάνηται πάσας τὰς διαφορὰς τῆς κινήσεως. 14 Διὰ ταῦτα δὲ καὶ ἐν ὕδατι ἀκούομεν, ὅτι οὐκ εἰσέρχεται πρὸς αὐτὸν τὸν συμφυῆ ἀέρα· ἀλλ' οὐδὲ εἰς τὸ οὖς, διὰ τὰς ἕλικας. ὅταν δὲ τοῦτο συμβῇ, οὐκ ἀκούει. 15 Οὐδ' ἂν ἡ μῆνιγξ κάμῃ, ὥσπερ τὸ ἐπὶ τῇ κόρῃ δέρμα, ὅταν κάμῃ. 16 Ἀλλὰ καὶ σημεῖον τοῦ ἀκούειν ἢ μὴ, τὸ ἠχεῖν ἀεὶ τὸ οὖς ὥσπερ τὸ κέρας· ἀεὶ γὰρ οἰκείαν τινὰ κίνησιν κινεῖται ὁ ἀὴρ, ὁ ἐν τοῖς ὠσίν· ἀλλ' ὁ ψόφος ἀλλότριος καὶ οὐκ ἴδιος.

* κ. ἐνεργείᾳ & δυνάμει.

* κ. χαλκός.

* κ. θλιβῇ.

* κ. κινεῖται.

Cap. VIII.

A Nvnc definiamus primùm de ſono atque auditu. 2 Duplex autem eſt ſonus: alter enim *eſt* actus quidam: alter, poteſtas. nam alia dicimus non habere ſonum, vt ſpongiam, lanas: alia verò habere, vt æs, & quæcumque ſunt ſolida ac læuia, quia poſſunt ſonum edere. hoc autem eſt, inter ipſum & auditum efficere ſonum actu. 3 Sonus porrò, qui *eſt* actu, fit ſemper alicuius, ad aliquid, & in aliquo. etenim ictus *eſt*, qui facit *ſonum*. ideóque cùm vnum eſt, ſonus fieri nequit: quippe diuerſum *eſt*, quod verberat, & quod verberatur. quare quod ſonat, ad aliquid ſonat. ictus autem non fit ſine latione. 4 Vt autem diximus, ſonus non *eſt* ictus quorumcumque *corporum*: quia B nullum ſonum edunt lanæ ſiue percutientes, ſiue percuſſæ: ſed æs, & quæcumque ſunt læuia & concaua: æs quidem, quia *eſt* læue: concaua autem refractione multos ictus poſt primum efficiunt, cùm id, quod motum eſt, non poſſit exire. 5 Præterea auditur in aëre, & in aqua, ſed minùs. nõ eſt autem ſoni poteſtas penes aërem, vel aquam, ſed oportet ictum fieri ſolidorum inter ſe, & erga aërem. 6 Hoc autem fit, quando aër percuſſus permanet, nec diſſipatur. idcirco ſi celeriter & vehementer percutiatur, ſonum edit, nam opus eſt, vt motus percutientis anticipet diſſipationem aëris, perinde ac ſi quis aceruum ſeu cumulum arenæ delatum celeriter C percutiat. 7 Echo autem fit, quando ab aëre, qui propter vas terminans ac friari prohibens, vnus effectus eſt, rurſus aër repellitur quaſi pila. 8 Videtur autem ſemper fieri echo, quamuis non perſpicua, quia contingit in ſono, vt etiam in lumine. etenim lumẽ ſemper reflectitur, alioquin non fieret vbique lumen, ſed *eſſent* tenebræ extra *locum* à Sole illuſtratum, ſed non ita reflectitur, vt ab aqua, aut ære, aut aliquo alio *corpore* læui. quocirca facit vmbram, qua lumen terminamus. 9 Rectè autem dicitur penes inane eſſe poteſtatem audiendi, aër namque videtur eſſe inane, atque hic eſt, qui audire facit, quando mouetur continuus & vnus. ſed quia friabilis eſt, non perſonat, niſi læue ſit quod percutitur. tunc D autem fit vnus ſimul propter planitiem, quoniam vna *eſt* planities *rei* læuis. 10 vim igitur ſonandi habet, quod habet vim impellendi aërem vnum continuatione vſque ad auditum. auditui verò *eſt* natiuus aër. & quia in aëre eſt, moto externo mouetur internum. 11 Quare non omni *parte* animal audit, nec quouis permeat aër. quia non vbique habet aërem pars mota & animata, quemadmodum pupilla humorem. 12 Ipſe igitur aër ſoni eſt expers, quia facilè diſſipatur. cùm autem diſſipari prohibetur, eius motus eſt ſonus. 13 Hic autem in auribus conditus eſt, ad hoc vt ſit immobilis, vt exquiſitè ſentiat omnes differentias motus. 14 Propterea & E in aqua audimus, quia nõ ingreditur ad ipſum connaturalem aërem, immo nec in aurem, propter anfractus. cùm autẽ hoc acciderit, non audit. 15 Nec ſi membrana ægrotauerit, quemadmodum *non videtur*, cùm pellis quæ eſt in pupilla, ægrotauerit. 16 Quin etiam ſignum audiendi vel non audiendi *eſt*, cùm auris ſonat vt cornu. ſemper enim proprio quodam motu mouetur aër, qui *eſt* in auribus, ſed ſonus *eſt motus* alienus non proprius.

Ideóque aiunt nos audire inani & eo quod ſonat, quoniam audimus eo quod habet terminatum aërem. vtrùm autem ſonat, quod percutitur, an quod percutit? an vtrumque, ſed diuerſo modo? ſonus enim eſt motus eius quod poteſt moueri eo modo, quo mouentur ea quæ reſiliunt à læuibus corporibus, cùm aliquis impulerit. 19 Vt igitur dictum fuit, non quiduis percuſſum & percutiens ſonat: velvti ſi acus acum percuſſerit: ſed oportet, id quod percutitur, planum eſſe, vt aër confertim reſiliat & quatiatur. 20 Differentiæ verò eorum quæ ſonant, in ſono, qui actu eſt, patefiunt. vt enim ſine lumine colores non cernuntur, ita ſine ſono acutum & graue *non percipitur*. 21 Hæc autem dicuntur per translationem ab iis quæ ſub tactum cadunt. acutum enim breui tempore multùm mouet ſenſum: graue autem longo tempore parum. non igitur acutum *eſt* velox: & graue, tardum: ſed illius propter celeritatem fit motus talis: huius autem, propter tarditatem. ac videntur proportione reſpondere acuto & obtuſo, quod in tactu *cernitur*. acutū enim quaſi pungit: obtuſum verò quaſi pellit: quoniam alterum breui, alterum longo *tempore* mouet. vnde fit, vt alterum ſit velox, alterum tardū. 22 De ſono igitur hæc definita ſunto. 23 Vox autem eſt ſonus quidam animati. nullum enim inanimatum vocem emittit: ſed per ſimilitudinem dicitur vocem edere, vt tibia, & lyra, & quęcumque alia inanimata extenſionem habent & melos & locutionem: *ſic* enim videtur, quia & vox hæc habet. 24 Sed multa animalia non edunt vocem: vt exſanguia, & inter ſanguine prædita piſces. idque rationi *eſt* conſentaneum: ſiquidem ſonus eſt motus aëris. 25 Sed qui dicuntur vocem edere, vt piſces in Acheloo flumine, branchiis ſonum faciunt, aut alio aliquo eiuſmodi *organo*: vox autem eſt ſonus animalis, & *quidem* non quauis parte factus. ſed quia quoduis ſonum edit percutiente aliquo, & aliquid, & in aliquo: hoc autem eſt aër: meritò hæc ſola vocem emittunt, quæ aërem ſuſcipiunt. 26 Iam enim ſpiritus abutitur natura ad duo officia, quemadmodum lingua ad guſtum & locutionem: quorum quidem guſtus eſt res neceſſaria: ideóque pluribus ineſt: interpretatio verò vt bene ſit. ita etiam ſpiritu ad calorem internum *vtitur* tamquam rem neceſſariam, (cauſſa verò in aliis *libris* dicetur) & ad vocem, vt bene ſit. 27 Inſtrumentum autem reſpirationis *eſt* guttur, cuius verò cauſſa eſt etiam hæc pars, *id eſt*, pulmo: hac enim parte *animalia* terreſtria plurimum caloris habent præ ceteris. eget etiam reſpiratione locus qui primus eſt circa cor. idcirco neceſſe *eſt*, intus reſpirante *animali* ingredi aërem. 28 Quapropter ictus aëris per reſpirationem ducti, *factus* ab anima *quæ* in his *eſt* partibus, ad eam quæ vocatur arteria, *hic (inquam) ictus* eſt vox. non enim quiuis animalis ſonus eſt vox, quemadmodum diximus: licet enim lingua ſonum edere, vt qui tuſſiunt: ſed oportet animatum eſſe id quod percutit. & cum phantaſia quadam: nam vox eſt ſonus quidam ſignificandi vim habens. 29 Nec *eſt* aëris ſpiritu ducti, vt tuſſis: ſed hoc aërem qui eſt in arteria, ad ipſam percutit. *cuius rei* ſignum *eſt*, quòd nemo poteſt vocem emittere, dum ſpiritum ducit, aut reddit, ſed dum continet: hoc enim mouet, qui continet.
30 Perſpicuum enim *eſt*, & cur piſces *ſint* muti: quia *ſcilicet* non habent guttur. hanc autem partem *ideo* non habent, quia non ſuſcipiunt aërem,

A 17 Καὶ διὰ τοῦτό φασιν ἀκούειν τῷ κενῷ καὶ ἠχοῦντι, ὅτι ἀκούομεν τῷ ἔχοντι ὡρισμένον τὸν ἀέρα. 18 Πότερον δὲ ψοφεῖ τὸ τυπτόμενον, ἢ τὸ τύπτον, ἢ καὶ ἄμφω, τρόπον δ' ἑτέρως; ἔστι γὰρ ὁ ψόφος κίνησις τοῦ δυναμένου κινεῖσθαι τὸν τρόπον τοῦτον, ὅνπερ τὰ ἀφαλλόμενα ἀπὸ τῶν λείων, ὅταν τις κρούσῃ. 19 Οὐ δὴ πᾶν, ὥσπερ εἴρηται, ψοφεῖ τυπτόμενον καὶ τύπτον, οἷον ἐὰν πατάξῃ βελόνη βελόνην· ἀλλὰ δεῖ τὸ τυπτόμενον ὁμαλὸν εἶναι, ὥστε τὸν ἀέρα ἀθροῦν ἀφάλλεσθαι καὶ σείεσθαι. 20 Αἱ δὲ διαφοραὶ τῶν ψοφούντων, ἐν τῷ κατ' ἐνέργειαν ψόφῳ δηλοῦνται. ὥσπερ γὰρ ἄνευ φωτὸς οὐχ ὁρᾶται τὰ χρώματα, B οὕτως οὐδ' ἄνευ ψόφου τὸ ὀξὺ καὶ τὸ βαρύ. 21 Ταῦτα δὲ λέγεται κατὰ μεταφορὰν, ἀπὸ τῶν ἁπτῶν. τὸ μὲν γὰρ ὀξὺ κινεῖ τὴν αἴσθησιν ἐν ὀλίγῳ χρόνῳ ἐπὶ πολύ· τὸ δὲ βαρὺ, ἐν πολλῷ ἐπ' ὀλίγον. καὶ οὐ δὴ ταχὺ τὸ ὀξὺ, τὸ δὲ βαρὺ βραδὺ, ἀλλὰ γίνεται τοῦ μὲν, διὰ τὸ τάχος ἡ κίνησις τοιαύτη· τοῦ δὲ, διὰ βραδυτῆτα. καὶ ἔοικεν ἀνάλογον ἔχειν τῷ περὶ τὴν ἁφὴν ὀξεῖ καὶ ἀμβλεῖ. τὸ μὲν γὰρ ὀξὺ οἷον κεντεῖ, τὸ δ' ἀμβλὺ οἷον ὠθεῖ, διὰ τὸ κινεῖν, τὸ μὲν ἐν ὀλίγῳ, τὸ δὲ ἐν πολλῷ. ὥστε συμβαίνει τὸ μὲν ταχὺ, τὸ δὲ βραδὺ εἶναι. 22 Περὶ μὲν οὖν ψόφου, ταύτῃ διωρίσθω. 23 Ἡ δὲ φωνὴ ψόφος τίς ἐστιν ἐμψύχου· τῶν γὰρ C ἀψύχων οὐθὲν φωνεῖ, ἀλλὰ καθ' ὁμοιότητα λέγεται φωνεῖν, οἷον αὐλὸς, καὶ λύρα, καὶ ὅσα ἄλλα τῶν ἀψύχων, ἀπότασιν ἔχει, καὶ μέλος, καὶ διάλεκτον· ἔοικε γὰρ ὅτι καὶ ἡ φωνὴ ταῦτα ἔχει. 24 Πολλὰ δὲ τῶν ζῴων οὐκ ἔχουσι φωνὴν, οἷον τά τε ἄναιμα, καὶ τῶν ἐναίμων, οἱ ἰχθύες. καὶ τοῦτ' εὐλόγως, εἴπερ ἀέρος κίνησίς ἐστιν ὁ ψόφος. 25 Ἀλλ' οἱ λεγόμενοι φωνεῖν, οἷον ἐν τῷ Ἀχελῴῳ ἰχθύες, ψοφοῦσι τοῖς βραγχίοις, ἢ τινι ἑτέρῳ τοιούτῳ. φωνὴ δέ ἐστι ζῴου ψόφος, καὶ οὐ τῷ τυχόντι μορίῳ. ἀλλ' ἐπεὶ πᾶν ψοφεῖ τύπτοντός τινος, καὶ τί, καὶ ἔν τινι· τοῦτο δ' ἐστὶν ἀήρ· εὐλόγως ἂν φωνοίη ταῦτα μόνα ὅσα δέχεται τὸν ἀέρα. 26 Ἤδη γὰρ D τῷ ἀναπνεομένῳ καταχρῆται ἡ φύσις ἐπὶ δύο ἔργα, καθάπερ τῇ γλώττῃ ἐπὶ τὴν γεῦσιν καὶ τὴν διάλεκτον· ὧν ἡ μὲν γεῦσις ἀναγκαῖον· διὸ καὶ πλείοσιν ὑπάρχει· ἡ δ' ἑρμηνεία ἕνεκα τοῦ εὖ. οὕτω καὶ τῷ πνεύματι, πρός τε τὴν θερμότητα τὴν ἐντὸς, ὡς ἀναγκαῖον. τὸ δ' αἴτιον ἐν ἑτέροις εἰρήσεται· καὶ πρὸς τὴν φωνὴν, ὅπως ὑπάρχῃ τὸ εὖ. 27 Ὄργανον δὲ τῇ ἀναπνοῇ, ὁ φάρυγξ· οὗ δ' ἕνεκα καὶ τὸ μόριον ἐστι τοῦτο, πνεύμων· τούτῳ γὰρ τῷ μορίῳ πλεῖστον ἔχει τὸ θερμὸν τὰ πεζὰ τῶν ἄλλων. δεῖται δὲ τῆς ἀναπνοῆς καὶ ὁ περὶ τὴν καρδίαν τόπος πρῶτος. διὸ ἀναγκαῖον εἴσω ἀναπνεομένου, εἰσιέναι τὸν ἀέρα. 28 Ὥστε ἡ E πληγὴ τοῦ ἀναπνεομένου ἀέρος ὑπὸ τῆς ἐν τούτοις τοῖς μορίοις ψυχῆς πρὸς τὴν καλουμένην ἀρτηρίαν, φωνή ἐστιν. οὐ γὰρ πᾶς ζῴου ψόφος, φωνὴ, καθάπερ εἴπομεν· ἔστι γὰρ τῇ γλώττῃ ψοφεῖν, ὥσπερ οἱ βήττοντες· ἀλλὰ δεῖ ἔμψυχόν τε εἶναι τὸ τύπτον, καὶ μετὰ φαντασίας τινός· σημαντικὸς γάρ τις ψόφος ἐστὶν ἡ φωνή. 29 Καὶ οὐ τοῦ ἀναπνεομένου ἀέρος, ὥσπερ ἡ βήξ· ἀλλὰ τούτῳ τύπτει τὸν ἐν τῇ ἀρτηρίᾳ πρὸς αὐτήν. σημεῖον δὲ, τὸ μὴ δύνασθαι φωνεῖν ἀναπνέοντα, μηδ' ἐκπνέοντα, ἀλλὰ κατέχοντα· κινεῖ γὰρ τοῦτο ὁ κατέχων. 30 Φανερὸν δὲ καὶ διότι οἱ ἰχθύες ἄφωνοι· οὐ γὰρ ἔχουσι φάρυγγα. τοῦτο δὲ τὸ μόριον οὐκ ἔχουσιν, ὅτι οὐ δέχονται τὸν ἀέρα,

οὐδ' ἀναπνέουσιν. ἀλλ' οἱ λέγοντες, ὅτι [illegible] οἱ ἰχθύες, διαμαρτάνουσιν. δι' ἣν μὲν οὖν αἰτίαν, ἕτερός ἐστι λόγος.

A nec reſpirant. quocirca errant, qui piſces reſpirare aiunt. quam verò ob cauſſam, alia eſt diſputatio.

De odore, & odorabili. Cap. IX.

B Περὶ δὲ ὀσμῆς καὶ ὀσφραντοῦ, ἧττον εὐδιόριστόν ἐστι τῶν εἰρημένων· οὐ γὰρ δῆλον, ποῖόν τι ἐστὶν ὀσμή, οὕτως ὡς ὁ ψόφος, ἢ τὸ φῶς, ἢ τὸ χρῶμα. αἴτιον δ', ὅτι τὴν αἴσθησιν ταύτην οὐκ ἔχομεν ἀκριβῆ, ἀλλὰ χείρω πολλῶν ζῴων· φαύλως γὰρ ἄνθρωπος ὀσμᾶται, καὶ οὐθενὸς * αἰσθάνεται τῶν ὀσφραντῶν, ἄνευ τοῦ λυπηροῦ ἢ τοῦ ἡδέος, * οὐκ ὄντος ἀκριβοῦς τοῦ αἰσθητηρίου. 2 Εὔλογον δ' οὕτω καὶ τὰ σκληρόφθαλμα τῶν χρωμάτων αἰσθάνεσθαι, καὶ μὴ διαδήλους αὐτοῖς εἶναι τὰς διαφορὰς τῶν χρωμάτων, πλὴν τῷ φοβερῷ καὶ ἀφόβῳ. οὕτω δὲ καὶ τὰς ὀσμὰς τὸ τῶν ἀνθρώπων γένος. 3 Ἔοικε γὰρ ἀνάλογον ἔχειν πρὸς τὴν γεῦσιν καὶ ὁμοίως τὰ εἴδη τῶν χυμῶν τοῖς τῆς ὀσμῆς. ἀλλ' C ἀκριβεστέραν ἔχομεν τὴν γεῦσιν, διὰ τὸ αὐτὴν εἶναι ἁφήν τινα. ταύτην δὲ ἔχειν τὴν αἴσθησιν τὸν ἄνθρωπον ἀκριβεστάτην. ἐν μὲν γὰρ ταῖς ἄλλαις λείπεται πολλῶν τῶν ζῴων, κατὰ δὲ τὴν ἁφὴν, πολλῷ τῶν ἄλλων διαφερόντως ἀκριβοῖ. διὸ καὶ φρονιμώτατόν ἐστι τῶν ζῴων. σημεῖον δὲ τὸ καὶ ἐν τῷ γένει τῶν ἀνθρώπων παρὰ τὸ αἰσθητήριον τοῦτο εἶναι εὐφυεῖς καὶ ἀφυεῖς, παρ' ἄλλο δὲ μηδέν· οἱ μὲν γὰρ σκληρόσαρκοι, ἀφυεῖς τὴν διάνοιαν· οἱ δὲ μαλακόσαρκοι, εὐφυεῖς. 4 Ἔστι δ' ὥσπερ χυμός, ὁ μὲν γλυκύς, ὁ δὲ πικρός, οὕτω καὶ ὀσμαί. ἀλλὰ τὰ μὲν ἔχουσι τὴν ἀνάλογον ὀσμὴν, καὶ χυμόν, τὰ δὲ τοὐναντίον· λέγω δέ, οἷον γλυκεῖαν ὀσμὴν καὶ γλυκὺν χυμόν. ὁμοίως δὲ καὶ δριμεῖα, καὶ αὐστηρὰ καὶ ὀξεῖα, D καὶ λιπαρά ἐστιν ὀσμή. ἀλλ' ὥσπερ εἴπομεν, διὰ τὸ μὴ σφόδρα διαδήλους εἶναι τὰς ὀσμάς, ὥσπερ τοὺς χυμούς, ἀπὸ τούτων * εἴληφε τὰ ὀνόματα καθ' ὁμοιότητα τῶν πραγμάτων· ἡ μὲν γὰρ γλυκεῖα, ἀπὸ τοῦ κρόκου καὶ τοῦ μέλιτος· ἡ δὲ δριμεῖα, ἀπὸ τοῦ θύμου καὶ τῶν τοιούτων· τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἄλλων. 5 Ἔτι δ', ὥσπερ ἀκοὴ καὶ ἑκάστη τῶν αἰσθήσεων, ἡ μὲν τοῦ ἀκουστοῦ καὶ ἀνηκούστου, ἡ δὲ τοῦ ὁρατοῦ καὶ ἀοράτου· καὶ ἡ ὄσφρησις, τοῦ ὀσφραντοῦ καὶ ἀνοσφράντου. 6 Ἀνόσφραντον δέ, τὸ μὲν παρὰ τὸ ὅλως ἔχειν ἀδύνατον ὀσμήν· τὸ δέ, μικρὰν ἔχον καὶ φαύλην. ὁμοίως δὲ καὶ τὸ γευστὸν καὶ τὸ ἄγευστον λέγεται. 7 Ἔστι δὲ καὶ ἡ ὄσφρησις διὰ τοῦ μεταξύ, οἷον ἀέρος ἢ ὕδατος· καὶ γὰρ E τὰ ἔνυδρα δοκοῦσιν ὀσμῆς αἰσθάνεσθαι. ὁμοίως δὲ καὶ τὰ ἔναιμα, καὶ τὰ ἄναιμα, ὥσπερ καὶ τὰ ἐν τῷ ἀέρι· καὶ γὰρ τούτων ἔνια πόρρωθεν ἀπαντᾷ πρὸς τὴν τροφὴν ὕποσμα γινόμενα. 8 Διὸ καὶ ἄπορον φαίνεται, εἰ πάντα μὲν ὁμοίως ὀσμᾶται· ὁ δὲ ἄνθρωπος ἀναπνέων μέν, μὴ ἀναπνέων δέ, ἀλλ' ἐκπνέων, ἢ κατέχων τὸ πνεῦμα, οὐκ ὀσμᾶται, οὔτε πόρρωθεν, οὔτε ἐγγύθεν, οὐδ' ἂν ἐπὶ τοῦ μυκτῆρος ἐντὸς τεθῇ. καὶ τὸ μὲν ἐπ' αὐτῷ τιθέμενον τῷ αἰσθητηρίῳ, ἀναίσθητον εἶναι, κοινὸν πάντων· ἀλλὰ τὸ ἄνευ τοῦ ἀναπνεῖν μὴ αἰσθάνεσθαι, ἴδιον ἐπὶ τῶν ἀνθρώπων· δῆλον δὲ πειρωμένοις. ὥστε τὰ ἄναιμα, ἐπεὶ οὐκ ἀναπνέουσιν, ἑτέραν ἄν τινα αἴσθησιν ἔχει παρὰ τὰς λεγομένας. ἀλλὰ ἀδύνατον, εἴπερ τῆς ὀσμῆς αἰσθάνεται· ἡ γὰρ τοῦ ὀσφραντοῦ αἴσθησις,

* γρ. ὀσφραίνεται
* γρ. ὡς οὐκ
* γρ. [illegible]

B De odore autem & odorabili difficilius eſt definire, quàm de iis quæ dicta ſunt: quia non conſtat, quale quid ſit odor, ſicuti ſonus, aut lumen, aut color. cauſſa *eſt*: quia hunc ſenſum non habemus exquiſitum, ſed deteriorem quàm multa animalia: exiliter enim homo olfacit, & nihil odorabile ſentit ſine dolore, aut voluptate, quia exquiſitum non eſt hoc ſenſorium. 2 Rationi autem *eſt* conſentaneum, etiam animalia duris oculis prædita colores ita ſentire, nec manifeſtas eis fieri differentias colorum, niſi cum metu, & metus vacuitate: ſicque hominum genus *ſentire* odores. 3 Enimverò ſaporum ſpecies proportione ac ſimiliter videntur ſe habere ad guſtum, vt *ſpecies* odoris *ad odoratum*. ſed exquiſitiorem habemus guſtum: quo- C niam eſt tactus quidam: nunc verò ſenſum homo habet exquiſitiſſimum: nam aliis ſuperatur à multis animalibus: quod verò ad tactum, longè præſtantiùs quàm cætera, ſuo munere fungitur. ideóque eſt animalium prudentiſſimum. argumento *eſt*: quia & in hominum genere propter hoc ſenſorium ſunt ingenioſi, & tardo ingenio, nec ob vllum aliud. nam qui duras habent carnes, ſunt obtuſo ingenio: qui verò molles, ingenioſi. 4 Vt autem ſapor alius eſt dulcis, alius amarus: ita etiam odores. ſed alia habent proportionalem odorem & ſaporem, verbi gratia, dulcem odorem & dulcem ſaporem: alia contrà. Similiter etiam eſt acer & auſterus, & acidus, & pinguis odor. Sed, vt di- D ximus, quia odores non ſunt admodum manifeſti vt ſapores, *idcirco* ab his ſumpta ſunt *illorum* nomina ſecundùm rerum ſimilitudinem: dulcis nimirum à croco & melle: acer autem à thymo, ac talibus: & eodem modo in ceteris. 5 Præterea ſicvt auditus & quilibet ſenſus eſt, ille quidem *rei* audibilis & inaudibilis, alius verò *rei* viſibilis & inuiſibilis: ita etiam odoratus *eſt rei* odorabilis & inodorabilis. 6 Inodorabile autem *dicitur*, aliud, quia omnino habere odorem non poteſt: aliud, quod exiguum & malum odorem habet. ſimiliter etiam guſtabile & inguſtabile dicitur. 7 Porrò etiam olfactus fit per *medium* interiectum, vt aërem, vel aquam. nam & aquatilia animalia videntur odorem ſentire: pariterque ſanguine E prædita, & exſanguia: ſicut & ea, quæ in aëre *degunt*: nam & eorum nonnulla è longinquo accurrunt ad cibum, odore illecta. 8 Ideóque dubitatio exiſtit, an omnia ſimiliter olfaciant. homo quidem reſpirans *olfacit*: cùm autem non reſpirat, ſed reddit, aut cohibet ſpiritum, non olfacit, nec è longinquo, nec è propinquo, ne quidem ſi intra nares *odorabile* ponatur. ac ipſi quidem ſenſorio obiectum appoſitum ſentiri non poſſe, commune *eſt* omnium: ſed abſque reſpiratione non ſentire, proprium *eſt* in hominibus: quod experiendo perſpicuum *fit*. Quapropter exſanguia, cùm non reſpirent, alium quendam ſenſum habent præter eos qui commemorantur. ſed *hoc eſt* impoſſibile, ſiquidē ſentiunt odorem. nam ſenſus *rei* odorabilis,

tam fœtidæ quàm bene olentis, eſt odoratus. præ- A terea & corrumpi videntur à vehemẽtibus odoribus, à quibus *homo* corrumpitur: vt bituminis & ſulphuris, & aliarum eiuſmodi rerum. odorari igitur neceſſe *eſt*, ſed non reſpirando. 9 Videtur autem *in* hominibus differre hoc ſenſorium à ſenſoriis aliorum animalium: ſicut oculi *differunt* ab oculis eorum quæ eos duros habent: illi namque ſeptum habent & quaſi velamen, *nimirum* palpebras: quas qui non mouerit, nec aperuerit, non ridet: *animalia* verò duris oculis prædita nihil tale habent, ſed illico vident quæ fiunt in perlucido. ſic igitur & odoratiuum ſenſorium *in* aliis *videtur* eſſe detectum, vt oculus: *in* iis autem quæ aërem ſuſcipiunt, habere B operimentum, quod *in* reſpirantibus detegitur, dilatatis venulis & meatibus. 10 Idcirco ea quæ reſpirant, non olfaciunt in humido: quia neceſſe *eſt* vt olfaciant, reſpirando: quod in humido fieri nequit. 11 Odor autem *eſt* ſicci, ſicut ſapor eſt humidi. odoratiuum autem ſenſorium, poteſtate *eſt* tale.

A καὶ δυσώδους καὶ εὐώδους ὄσφρησίς ἐστιν. ἔτι δὲ καὶ φθειρόμενα φαίνεται ὑπὸ τῶν ἰσχυρῶν ὀσμῶν, ὑφ' ὧνπερ ἄνθρωπος· οἷον ἀσφάλτου, καὶ θείου, καὶ τῶν τοιούτων. ὀσφραίνεσθαι μὲν οὖν ἀναγκαῖον, ἀλλ' οὐκ ἀναπνέοντα. 9 Ἔοικε δὲ τοῖς ἀνθρώποις διαφέρειν τὸ αἰσθητήριον τοῦτο, πρὸς τὰ τῶν ἄλλων ζῴων, ὥσπερ τὰ ὄμματα πρὸς τὰ τῶν σκληροφθάλμων. τὰ μὲν γὰρ ἔχει φράγμα καὶ ὥσπερ ἔλυτρον, τὰ βλέφαρα· ἃ μὴ κινήσας, μηδ' ἀνασπάσας, οὐχ ὁρᾷ· τὰ δὲ σκληρόφθαλμα, οὐδὲν ἔχει τοιοῦτον, ἀλλ' εὐθὺς ὁρᾷ τὰ γινόμενα ἐν τῷ διαφανεῖ. οὕτως οὖν καὶ τὸ ὀσφραντικὸν αἰσθητήριον, τοῖς μὲν ἀκαλυφὲς εἶναι, ὥσπερ τὸ ὄμμα· τοῖς δὲ B τὸν ἀέρα δεχομένοις ἔχειν ἐπικάλυμμα, ὃ ἀναπνεόντων ἀποκαλύπτεσθαι, διευρυνομένων τῶν φλεβίων καὶ τῶν πόρων. 10 Καὶ διὰ τοῦτο τὰ ἀναπνέοντα οὐκ ὀσμᾶται ἐν τῷ ὑγρῷ· ἀναγκαῖον γὰρ ὀσφρανθῆναι ἀναπνεύσαντα. τοῦτο δὲ ποιεῖν ἐν τῷ ὑγρῷ ἀδύνατον. 11 Ἔστι δ' ἡ ὀσμὴ τοῦ ξηροῦ, ὥσπερ ὁ χυμὸς τοῦ ὑγροῦ· τὸ δὲ ὀσφραντικὸν αἰσθητήριον, δυνάμει τοιοῦτον.

De guſtu, & guſtabili. Cap. X.

GVſtabile verò eſt tactile quiddam. atque hæc C *eſt* cauſſa cur non ſit ſenſibile per intermedium, quod ſit alienum corpus: quia nec tactus *eſt talis*. 2 Et corpus guſtabile, in quo *eſt* ſapor, *conſiſtit* in humido tamquam materia. hoc autem *eſt* tactile quiddam. 3 Ideóque ſi in aqua eſſemus, ſentiremus dulce *aliquid* iniectum: nec eſſet nobis ſenſus per intermediũ, ſed quia *dulce* miſceretur humido, quemadmodum in potione. color autem non ita cernitur, *nempe* quia miſceatur, nec effluxionibus. Nihil igitur eſt tamquam intermedium: ſed vt aſpectabile *eſt* color, ita guſtabile *eſt* ſapor. 4 Nihil autem facit ſenſum ſaporis ſine humiditate: ſed habet actu vel poteſtate humiditatem: vt ſalſum, quod & facilè liquefieri poteſt, & colliquefacien- D dæ linguæ vim habet. 5 Sicut autem aſpectus eſt *rei* viſibilis, & inuiſibilis: (nam tenebræ ſunt inuiſibiles: & has quoque diiudicat aſpectus) prætereà eius quod *eſt* valde ſplendidum: (nam hoc quoque *eſt* inuiſibile, ſed alio modo quàm tenebræ: & ſimiliter auditus *eſt* ſoni & ſilentij (quorum alterum *eſt* audibile: alterum, non audibile) & magni ſoni, quemadmodum aſpectus rei ſplendidæ: (vt enim paruus ſonus *eſt* inaudibilis aliquo modo, *ita* etiam magnus, & violentus. Inuiſibile autem dicitur partim omnino, vt & in aliis, quod *eſt* impoſſibile: partim quod cùm naturâ habere poſſit, non habet, aut malè *habet: ſicut* ἄπουν *&* ἀπύρηνον, *quaſi dicas expes, & ex-* E *nucleũ id eſt, quod pedibus, vel nucleo caret.* ſic igitur & guſtus *dicitur* & *rei* guſtabilis, & inguſtabilis. hæc autem *eſt*, quæ exiguum & exilem ſaporem habet, aut vim habet corrumpendi guſtus. 6 videtur autem potabile & impotabile eſſe principium. nam vtrumque *eſt* guſtus quidam: ſed alterum *eſt principium* prauum & habens vim corrumpendi guſtus: alterum verò *eſt* ſecundùm naturam. Porrò potabile *eſt* obiectum commune tactus & guſtus. 7 Quoniam autem guſtabile *eſt* humidum: neceſſe *eſt*, vt ſenſorium eius nec ſit humidum actu, nec impoſſibile vt humectetur. patitur enim aliquid guſtus à guſtabili, quatenus *eſt* guſtabile. ergo neceſſe *eſt* humectari, quod poteſt humectari, ita vt ſeruetur, non tamẽ *eſt* humidum, *videlicet* guſtatiuũ illud ſenſorium.

C ΤΟ δὲ γευστόν ἐστιν ἁπτόν τι· καὶ τοῦτ' αἴτιον τοῦ μὴ εἶναι αἰσθητὸν διὰ τοῦ μεταξὺ ἀλλοτρίου ὄντος σώματος· οὐδὲ γὰρ ἡ ἁφή. 2 Καὶ τὸ σῶμα δέ, ἐν ᾧ ὁ χυμός, τὸ γευστὸν ἐν ὑγρῷ ὡς ὕλῃ· τοῦτο δ' ἁπτόν τι. 3 Διὸ κἂν εἰ ἐν ὕδατι ἦμεν, ᾐσθανόμεθα ἂν ἐμβληθέντος τοῦ γλυκέος· οὐκ ἦν δ' ἂν ἡ αἴσθησις ἡμῖν διὰ τοῦ μεταξύ, ἀλλὰ τῷ μιχθῆναι τῷ ὑγρῷ, καθάπερ ἐπὶ τοῦ ποτοῦ. τὸ δὲ χρῶμα οὐχ οὕτως ὁρᾶται τῷ μίγνυσθαι, οὐδὲ ταῖς ἀπορροίαις. ὡς μὲν οὖν τὸ μεταξύ, οὐδέν ἐστιν· ὡς δὲ χρῶμα τὸ ὁρατόν, οὕτω τὸ γευστὸν ὁ χυμός. 4 Οὐθὲν δὲ ποιεῖ αἴσθησιν χυμοῦ ἄνευ ὑγρότητος, ἀλλ' ἔχει ἐνεργείᾳ ἢ δυνάμει ὑγρότητα· οἷον, τὸ D ἁλμυρόν· εὔτηκτόν τε γὰρ αὐτὸ καὶ συντηκτικὸν γλώσσης. 5 Ὥσπερ δὲ καὶ ἡ ὄψις ἐστὶ τοῦ τε ὁρατοῦ, καὶ τοῦ ἀοράτου (τὸ γὰρ σκότος ἀόρατον, κρίνει δὲ καὶ τοῦτο ἡ ὄψις) ἔτι τε τοῦ λίαν λαμπροῦ· καὶ γὰρ τοῦτο ἀόρατον· ἄλλον δὲ τρόπον τοῦ σκότους. ὁμοίως δὲ καὶ ἡ ἀκοὴ ψόφου τε καὶ σιγῆς, ὧν τὸ μὲν ἀκουστόν, τὸ δὲ οὐκ ἀκουστὸν καὶ μεγάλου ψόφου, καθάπερ ἡ ὄψις τοῦ λαμπροῦ· ὥσπερ γὰρ ὁ μικρὸς ψόφος ἀνήκουστος τρόπον τινά, καὶ ὁ μέγας τε καὶ ὁ βίαιος. ἀόρατον δὲ τὸ μὲν ὅλως λέγεται, ὥσπερ καὶ ἐπ' ἄλλων τὸ ἀδύνατον· τὸ δ', ἐὰν πεφυκὸς μὴ ἔχῃ, ἢ φαύλως, ὥσπερ τὸ ἄπουν, καὶ τὸ ἀπύρηνον· οὕτω δὴ καὶ ἡ γεῦσις τοῦ γευστοῦ τε καὶ ἀγεύστου· τοῦτο E δὲ τὸ μικρὸν καὶ φαῦλον ἔχον χυμόν, ἢ φθαρτικὸν τῆς γεύσεως. 6 Δοκεῖ δ' εἶναι ἀρχὴ τὸ ποτὸν καὶ ἄποτον· γεῦσις γάρ τις ἀμφότερα· ἀλλὰ τὸ μὲν φαύλη καὶ φθαρτικὴ τῆς γεύσεως, τὸ δὲ κατὰ φύσιν. ἔστι δὲ κοινὸν ἁφῆς καὶ γεύσεως τὸ ποτόν. 7 Ἐπεὶ δ' ὑγρὸν τὸ γευστόν, ἀνάγκη τὸ αἰσθητήριον αὐτοῦ μήτε ὑγρὸν εἶναι ἐντελεχείᾳ, μήτε ἀδύνατον ὑγραίνεσθαι· πάσχει γάρ τι ἡ γεῦσις ὑπὸ τοῦ γευστοῦ, ᾗ γευστόν. ἀναγκαῖον ἄρα ὑγρανθῆναι τὸ δυνάμενον ὑγραίνεσθαι σωζόμενον, μὴ ὑγρὸν δέ, τὸ γευστικὸν αἰσθητήριον.

A 8 Σημεῖον δὲ, τὸ μήτε κατάξηρον οὖσαν τὴν γλῶτταν αἰσθάνεσθαι, μήτε λίαν ὑγράν· αὕτη γὰρ ἁφὴ γίνεται τοῦ πρώτου ὑγροῦ, ὥσπερ ὅταν προγευματίσας τις ἰσχυροῦ χυμοῦ, γεύηται ἑτέρου· καὶ οἷον τοῖς κάμνουσι πικρὰ πάντα φαίνεται, διὰ τὸ τὴν γλῶτταν πλήρη τοιαύτης ὑγρότητος αἰσθάνεσθαι. 9 Τὰ δὲ εἴδη τῶν χυμῶν, ὥσπερ καὶ ἐπὶ τῶν χρωμάτων, ἁπλᾶ μὲν τἀναντία, τὸ γλυκὺ καὶ τὸ πικρόν· ἐχόμενα δὲ, τοῦ μὲν τὸ λιπαρὸν, τοῦ δὲ τὸ ἁλμυρόν· μεταξὺ δὲ τούτων, τό, τε δριμὺ καὶ αὐστηρὸν, στρυφνὸν καὶ ὀξύ· σχεδὸν γὰρ αὗται δοκοῦσιν εἶναι διαφοραὶ χυμῶν. ὥστε τὸ γευστικόν ἐστι, τὸ δυνάμει τοιοῦτον· γευστὸν δὲ, τὸ ποιητικὸν ἐντελεχείᾳ αὐτοῦ.

8 Argumento eſt, quòd lingua, neque cùm eſt præarida, neque *cùm eſt* valde humida, ſentit: hic enim tactus fit primi humidi: ſicuti cùm quiſpiam præguſtato vehementi ſapore, guſtet alium *ſaporem*: & vt ægrotantibus amara omnia videntur, quia lingua referta huiuſmodi humiditate ſentit. 9 Species autem ſaporum, vt etiam colorum, ſimplices ſunt eæ quæ *ſunt* contrariæ, *nempe* dulce & amarum: proximæ verò ſunt ab illo pingue: ab hoc, ſalſum: his autem interiecta *ſunt* acre & auſterum, necnon acerbum & acidum. ferè enim hæ videntur eſſe differentiæ ſaporum. Quapropter guſtatiuum eſt, quod *eſt* poteſtate tale. guſtabile autem *eſt*, quod vim habet efficiendi illud actu.

De tactu, & tactili. Cap. XI.

B Περὶ δὲ τοῦ ἁπτοῦ καὶ ἁφῆς ὁ αὐτὸς λόγος· εἰ γὰρ ἡ ἁφὴ μὴ μία ἐστὶν αἴσθησις, ἀλλὰ πλείους, ἀναγκαῖον καὶ τὰ ἁπτὰ πλείω αἰσθητὰ εἶναι. ἔχει δ' ἀπορίαν, πότερον πλείους εἰσὶν, ἢ μία, καὶ τί τὸ αἰσθητήριον τὸ τοῦ ἁπτοῦ ἁπτικὸν, πότερον ἡ σὰρξ καὶ ἐν τοῖς ἄλλοις τὸ ἀνάλογον, ἢ οὔ. ἀλλὰ τοῦτο μὲν ἐστὶ τὸ μεταξύ· τὸ δὲ πρῶτον αἰσθητήριον ἄλλο τι ἐστὶν ἐντός. 2 Πᾶσά τε γὰρ αἴσθησις, μιᾶς ἐναντιώσεως εἶναι δοκεῖ, οἷον ὄψις, λευκοῦ καὶ μέλανος· καὶ ἡ ἀκοὴ, ὀξέος καὶ βαρέος· καὶ γεῦσις, πικροῦ καὶ γλυκέος. ἐν δὲ τῷ ἁπτῷ πολλαί εἰσιν ἐναντιώσεις, θερμὸν ψυχρὸν, ξηρὸν ὑγρὸν, σκληρὸν μαλακὸν, καὶ τῶν ἄλλων ὅσα τοιαῦτα. 3 Ἔχει δέ τινα λύσιν C πρός γε ταύτην τὴν ἀπορίαν, ὅτι καὶ ἐπὶ τῶν ἄλλων αἰσθήσεων εἰσὶν ἐναντιώσεις πλείους, οἷον ἐν φωνῇ οὐ μόνον ὀξύτης καὶ βαρύτης, ἀλλὰ καὶ μέγεθος καὶ μικρότης, καὶ λειότης καὶ τραχύτης φωνῆς, καὶ τοιαῦθ' ἕτερα. εἰσὶ δὲ καὶ περὶ χρῶμα διαφοραὶ τοιαῦται ἕτεραι. 4 Ἀλλὰ τί τὸ ὑποκείμενον, ὥσπερ ἀκοῇ ψόφος, οὕτω τῇ ἁφῇ, οὐκ ἔστιν ἔνδηλον. 5 Πότερον δ' ἐστὶ τὸ αἰσθητήριον ἐντὸς, ἢ οὔ, ἀλλ' εὐθέως ἡ σὰρξ, οὐδὲν δοκεῖ σημεῖον εἶναι, τὸ γίνεσθαι τὴν αἴσθησιν ἅμα θιγγανομένων. καὶ γὰρ εἴ τις περὶ τὴν σάρκα περιτείνειεν, οἷον ὑμένα ποιήσας, ὁμοίως τὴν αἴσθησιν εὐθέως ἁψάμενος D ἂν ἐνσημαίνοι· καίτοι δῆλον, ὡς οὐκ ἔστιν ἐν τούτῳ τὸ αἰσθητήριον· εἰ δὲ καὶ συμφυὲς γένοιτο, θᾶττον ἔτι διικνοῖτ' ἂν ἡ αἴσθησις. 6 Διὸ καὶ τὸ τοιοῦτον μόριον τοῦ σώματος ἔχειν οὕτως ἔοικεν, ὥσπερ ἂν εἰ κύκλῳ ἡμῖν περιεπεφύκει ὁ ἀήρ· ἐδοκοῦμεν γὰρ ἂν ἑνί τινι αἰσθάνεσθαι καὶ ψόφου, καὶ χρώματος, καὶ ὀσμῆς· καὶ μία τις αἴσθησις εἶναι ὄψις καὶ ἀκοὴ καὶ ὄσφρησις. νῦν δὲ διὰ τὸ διωρίσθαι δι' οὗ γίνονται αἱ κινήσεις, φανερὰ τὰ εἰρημένα αἰσθητήρια ἕτερα ὄντα. ἐπὶ δὲ τῆς ἁφῆς τοῦτο νῦν ἄδηλον· ἐξ ἀέρος μὲν γὰρ ἢ ὕδατος, ἀδύνατον συστῆναι τὸ ἔμψυχον σῶμα· δεῖ γάρ τι στερεὸν εἶναι. λείπεται δὴ μικτὸν ἐκ γῆς καὶ τούτων εἶναι, οἷον βούλεται ἡ σὰρξ καὶ τὸ ἀνάλογον· [* ἡ γὰρ πᾶσα αἴσθησις διὰ τοῦ μεταξὺ καὶ ἡ ἁφή.] ὥστε ἀναγκαῖον καὶ τὸ σῶμα εἶναι μεταξὺ τοῦ ἁπτικοῦ προσπεφυκὸς, δι' οὗ γίνονται αἱ αἰσθήσεις πλείους οὖσαι. 7 Δηλοῖ δ' ὅτι πλείους ἡ ἐπὶ τῆς γλώττης ἁφή· ἁπάντων γὰρ τῶν ἁπτῶν αἰσθάνεται, κατὰ τὸ αὐτὸ μόριον, καὶ χυμοῦ. εἰ μὲν οὖν ἡ ἄλλη σὰρξ ᾐσθάνετο τοῦ χυμοῦ, ἐδόκει ἂν ἡ αὐτὴ καὶ μία εἶναι αἴσθησις ἡ γεῦσις καὶ ἡ ἁφή·

* Incluſa abſunt à ſcriptis codd. & vetere interpr. & videntur vel tollenda, vel emẽdanda. leguntur autem in paraph. Themiſtij. Conſule Philop.

DE tactili autem ac tactu eadem *eſt* ratio. nam ſi tactus non eſt vnus ſenſus, ſed plures: neceſſe *eſt*, etiam tactilia eſſe plura ſenſibilia: ſed eſt dubitatio vtrùm ſint plures, an vnus: & quod*nam* ſit ſenſorium, quod habet vim tangendi rem tactilem: vtrùm ſit caro, & in aliis id quod ei proportione reſpondet: annon: ſed hoc eſt intermedium: primum verò ſenſorium eſt aliud quiddam internum. 2 Omnis enim ſenſus vnius contrarietatis eſſe videtur: vt aſpectus, albi & nigri: & auditus, acuti & grauis: & guſtus, amari & dulcis: in tactili verò multæ ſunt contrarietates, calidum frigidum, ſiccum humidum, durum molle, & quæcumque alia *ſunt* eiuſmodi. 3 Eſt autem ſolutio quædam huius dubitationis: quia & in aliis ſenſibus ſunt plures contrarietates: vt in voce non ſolùm *eſt* acumen & grauitas, ſed etiam magnitudo & paruitas, necnon lenitas & aſperitas vocis, & eiuſmodi alia. in colore quoque ſunt aliæ tales differentiæ. 4 Sed quid *ſit* ſubiectum, vt auditui ſonus, ita etiam tactui, non eſt manifeſtum. 5 vtrùm autem ſenſorium *ſit* internum, an non, ſed protinus *ſit* caro, nullo videtur argumento eſſe, quòd ſenſus fit, ſimulatque *res* tanguntur. nam & ſi quis ad carnem *aliquid* in ſpeciem membranæ extendat: ſimiliter *re* tacta confeſtim imprimet ſenſum. atqui patet, in hoc non eſſe ſenſorium. ſi verò hoc etiam coaleſceret, vtique celeriùs ſenſus penetraret. 6 Ideóque eiuſmodi pars corporis ita *ſe* habere videtur, vt ſi vndique aër eſſet nobis connatus: videremur enim vno quodam *ſenſorio* ſentire & ſonum, & colorem, & odorem: atque aſpectus & auditus & odoratus eſſe vnus quidam ſenſus. nunc verò, quia ſeiunctum eſt *id* per quod fiunt motus, apparet, ea ſenſoria, quæ commemorata ſunt, eſſe diuerſa. ſed in tactu hoc *eſt* nunc obſcurum: quoniam ex aëre aut aqua corpus animatum conſtare nequit: quandoquidem oportet eſſe ſolidum quiddam. relinquitur ergo vt mixtum ex terra & his ſit, cuiuſmodi debet *eſſe* caro, & quod ei proportione reſpondet. nam ſi omnis ſenſus *ſit* per intermedium, etiam tactus *ita ſit*: quare neceſſe *eſt*, etiam tactiuo interiectum eſſe corpus connatum, per quod fiunt ſenſus, cùm plures ſint. 7 Plures autem eſſe indicat tactus qui in lingua fit: quoniam hac parte ſentit omnia tactilia, & ſaporem. itaque ſi alia caro ſentiret ſaporem, guſtus & tactus viderētur vnus & idem ſenſus:

nunc verò duo *apparent*, quia non reciprocantur. 8 Dubitare autem quiſpiam poſſit, ſi omne corpus altitudinem habet: atque hæc eſt tertia magnitudo: quibus autem duobus corporibus interiectum eſt corpus aliquod, fieri nequit vt hæc ſe mutuò tangant: humidum autem non eſt ſine corpore, neque madidum: ſed neceſſe *eſt* eſſe aquam, vel habere aquam: quæ verò ſe inuicem in aqua tangunt, cùm extremitates non ſint ſiccæ, neceſſe eſt habere aquam interiectam, qua extremitates *ſunt* plenæ. quod ſi verum *eſt*, impoſſibile *eſt* vt aliud ab alio tangatur in aqua. Eodémque modo in aëre: æquè enim ſe habet aër ad ea quæ in ipſo *ſunt*, & aqua ad ea quæ ſunt in ipſa aqua: ſed magis nos latet: ſicut latet animalia quæ ſunt in aqua, an madidum à madido tangatur. 9 Vtrùm igitur omnium ſimiliter eſt ſenſus, an aliarum rerum aliter, quemadmodum nunc videtur? guſtus enim & tactus *ſiunt* eo quòd *res* tanguntur: alij verò *ſenſus* è longinquo. ſed hoc non *ita* eſt: verùm & durum, & molle per alia ſentimus: vt & quod ſonandi vim habet, & aſpectabile, & odorabile. 10 Sed alia eminus, alia cominus *ſentiuntur*. idcirco latet: cùm ſentiamus omnia per medium, ſed in his lateat. Atqui, quemadmodum & ſuperiùs diximus, etiamſi per membranam ſentiremus omnia tactilia, ignorantes eam dirimere, ſimiliter affecti eſſemus, vt & nunc in aqua & aëre: videmur enim ipſas res tangere, & nihil eſſe in medio.

11 Verùm differt tactile ab aſpectabilibus & iis quæ ſonandi vim habent: quoniam hæc ſentimus, eo quòd intermedium agit aliquid in nos: tactilia verò *ſentimus*, non ab intermedio, ſed vnà cum intermedio, ſicuti qui per clypeum percuſſus eſt: non enim clypeus percuſſus percuſſit, ſed accidit vt ambo percuterentur. 12 Omnino autem videtur caro & lingua, ſicut aër & aqua ad aſpectum & auditum & odoratum ſe habet, ita ſe habere ad ſenſorium, *videlicet* vt illorum vnumquodque. cùm autem ipſum ſenſorium tangit, neque ibi, neque hîc ſenſus fieri poteſt: velvti ſi quis corpus aliquod album extremum in oculo ponat. vnde apparet ſenſorium rei tactilis eſſe internum: ſic enim eueniet vt in aliis ſenſibus. nam *ſenſus* ſenſorio impoſita non ſentit: carni autem impoſita ſentit. Quare caro *eſt medium* tactiuo interiectum. 13 Tactilia igitur ſunt differentiæ corporis, quà *eſt* corpus. Dico autem differentias, quæ diſtinguunt elementa, *nimirum* calidum, frigidum, ſiccum, humidum, de quibus antea diximus in *libris* de elementis. 14 Horum autem ſenſorium eſt *id* quod tangendi vim habet, & in quo primo ineſt ſenſus qui vocatur tactus, id eſt, *pars* quæ poteſtate *eſt* talis. nam ſentire eſt quoddam pati. quapropter quod facit quale ipſum eſt actu, tale illud facit quod eſt poteſtate. 15 Idcirco æquè calidum aut frigidum, aut durum & molle non ſentimus: verùm exſuperantia *ſentimus*: tamquam ſenſus ſit medietas quædam contrarietatis in rebus ſenſibilibus *conſtitutæ*. ac propterea iudicat ſenſibilia: medium enim vim habet iudicandi: quoniam ad vtrumque *comparatum*, fit vtrumque extremum. & quemadmodum quod ſenſurum eſt album & nigrum, neutrum eorum debet eſſe actu, ſed poteſtate ambo: ita etiam in aliis, & in tactu neque calidum neque frigidum. 16 Præterea ſicut *rei* viſibilis & inuiſibilis erat aliquo modo aſpectus: itidémque reliqui *ſenſus erant* oppoſitorum:

A νῦν δὲ δύο, διὰ τὸ μὴ ἀντιστρέφειν. 8 Ἀπορήσειε δ' ἄν τις, εἰ πᾶν σῶμα βάθος ἔχει· τοῦτο δ' ἐστὶ τὸ τρίτον μέγεθος· ὧν δ' ἐστὶ δύο σωμάτων μεταξὺ σῶμά τι, οὐκ ἐνδέχεται ταῦτα ἀλλήλων ἅπτεσθαι. τὸ δὲ ὑγρὸν οὐκ ἔστιν ἄνευ σώματος, οὐδὲ τὸ διερόν· ἀλλ' ἀναγκαῖον ὕδωρ εἶναι, ἢ ἔχειν * ὕδωρ. τὰ δὲ ἁπτόμενα ἀλλήλων ἐν τῷ ὕδατι, μὴ ξηρῶν τῶν ἄκρων ὄντων, ἀναγκαῖον ὕδωρ ἔχειν μεταξύ, οὗ ἀνάπλεα τὰ ἔσχατα. εἰ δὲ τοῦτο ἀληθές, ἀδύνατον ἅψασθαι ἄλλο ἄλλου ἐν ὕδατι. τὸν αὐτὸν δὲ τρόπον καὶ ἐν τῷ ἀέρι· ὁμοίως γὰρ ἔχει ὁ ἀὴρ πρὸς τὰ ἐν αὐτῷ, καὶ τὸ ὕδωρ πρὸς τὰ ἐν αὐτῷ τῷ ὕδατι. λανθάνει δὲ B μᾶλλον ἡμᾶς, ὥσπερ καὶ τὰ ἐν τῷ ὕδατι ζῶα, εἰ διερὸν διεροῦ ἅπτεται. 9 Πότερον οὖν ἁπάντων ὁμοίως ἐστὶν ἡ αἴσθησις, ἢ ἄλλων ἄλλως, καθάπερ νῦν δοκεῖ; ἡ μὲν γὰρ γεῦσις καὶ ἡ ἁφὴ τῷ ἅπτεσθαι, αἱ δὲ ἄλλαι ἄποθεν. τὸ δ' οὐκ ἔστιν, ἀλλὰ καὶ τὸ σκληρὸν καὶ τὸ μαλακὸν δι' ἑτέρων αἰσθανόμεθα· ὥσπερ καὶ τὸ ψοφητικόν, καὶ τὸ ὁρατόν, καὶ τὸ ὀσφραντόν. 10 Ἀλλὰ τὰ μὲν πόρρωθεν, τὰ δ' ἐγγύθεν. διὸ λανθάνει· ἐπεὶ αἰσθανόμεθά γε πάντων διὰ τοῦ μέσου· ἀλλ' ἐπὶ τούτων λανθάνει. καίτοι καθάπερ εἴπομεν καὶ πρότερον, κἂν εἰ δι' ὑμένος αἰσθανοίμεθά γε τῶν ἁπτῶν ἁπάντων λανθάνοντος ὅτι C διείργει, ὁμοίως ἂν ἔχοιμεν ὥσπερ καὶ νῦν ἐν τῷ ὕδατι καὶ τῷ ἀέρι· δοκοῦμεν γὰρ αὐτῶν ἅπτεσθαι, καὶ οὐδὲν εἶναι διὰ μέσου. 11 Ἀλλὰ διαφέρει τὸ ἁπτὸν τῶν ὁρατῶν καὶ τῶν ψοφητικῶν, ὅτι ἐκείνων μὲν αἰσθανόμεθα, τῷ τὸ μεταξὺ ποιεῖν τι ἡμᾶς· τῶν δὲ ἁπτῶν, οὐχ ὑπὸ τοῦ μεταξύ, ἀλλ' ἅμα τῷ μεταξύ, ὥσπερ ὁ δι' ἀσπίδος πληγείς· οὐ γὰρ ἡ ἀσπὶς πληγεῖσα ἐπάταξεν, ἀλλ' ἄμφω συνέβη πληγῆναι. 12 Ὅλως δὲ ἔοικεν ἡ σὰρξ καὶ ἡ γλῶσσα, ὡς ὁ ἀὴρ καὶ τὸ ὕδωρ πρὸς τὴν ὄψιν καὶ τὴν ἀκοὴν καὶ τὴν ὄσφρησιν ἔχουσιν, οὕτως ἔχειν πρὸς τὸ αἰσθητήριον, ὥσπερ ἐκείνων ἕκαστον. αὐτοῦ δὲ τοῦ αἰσθητηρίου ἁπτομένου, οὔτ' D ἐκεῖ, οὔτε ἐνταῦθα γένοιτ' ἂν αἴσθησις· οἷον εἴ τις σῶμα * τὸ λευκὸν ἐπὶ τοῦ ὄμματος θείη τὸ ἔσχατον· ᾗ καὶ δῆλον ὅτι τὸ ἐντὸς τοῦ ἁπτοῦ * αἰσθητήριον. οὕτως γὰρ ἂν συμβαίνοι, ὥσπερ ἐπὶ τῶν ἄλλων· ἐπιτιθεμένων γὰρ ἐπὶ τὸ αἰσθητήριον, οὐκ αἰσθάνεται· ἐπὶ δὲ τὴν σάρκα ἐπιτιθεμένων αἰσθάνεται· ὥστε τὸ μεταξὺ τοῦ ἁπτικοῦ, ἡ σάρξ. 13 Ἁπταὶ μὲν οὖν εἰσιν αἱ διαφοραὶ τοῦ σώματος ᾗ σῶμα· λέγω δὲ διαφοράς, * αἳ τὰ στοιχεῖα διορίζουσι, θερμόν, ψυχρόν, ξηρόν, ὑγρόν, περὶ ὧν εἰρήκαμεν πρότερον ἐν τοῖς περὶ στοιχείων. 14 Τὸ δὲ αἰσθητήριον αὐτῶν τὸ ἁπτικόν, καὶ ἐν ᾧ ἡ καλουμένη ἁφὴ ὑπάρχει πρώτῳ, τὸ δυνάμει τοιοῦτόν ἐστι μό- E ριον· τὸ γὰρ αἰσθάνεσθαι, πάσχειν τι ἐστίν. ὥστε τὸ ποιοῦν οἷον αὐτὸ ἐνεργείᾳ, τοιοῦτον ἐκεῖνο ποιεῖ δυνάμει ὄν. 15 Διὸ τοῦ ὁμοίως θερμοῦ ἢ ψυχροῦ, ἢ σκληροῦ καὶ μαλακοῦ, οὐκ αἰσθανόμεθα· ἀλλὰ τῶν ὑπερβολῶν, ὡς τῆς αἰσθήσεως οἷον μεσότητός τινος οὔσης τῆς ἐν τοῖς αἰσθητοῖς ἐναντιώσεως. καὶ διὰ τοῦτο κρίνει τὰ αἰσθητά. τὸ γὰρ μέσον, κριτικόν· γίνεται γὰρ πρὸς ἑκάτερον αὐτῶν θάτερον τῶν ἄκρων· καὶ δεῖ ὥσπερ τὸ μέλλον αἰσθήσεσθαι λευκοῦ καὶ μέλανος, μηδέτερον αὐτῶν ἐνεργείᾳ εἶναι, δυνάμει δ' ἄμφω. οὕτω δὴ καὶ ἐπὶ τῶν ἄλλων, καὶ ἐπὶ τῆς ἁφῆς μήτε θερμὸν μήτε ψυχρόν. 16 Ἔτι δ' ὥσπερ ὁρατοῦ καὶ ἀοράτου ἦν πως ἡ ὄψις· ὁμοίως δὲ καὶ αἱ λοιπαὶ τῶν ἀντικει-

* γρ. ὕδατι.

* γρ. ἀλλ.

* γρ. αἰσθητικόν.

* γρ. αἷς τὰ ς.

μένων· οὕτω καὶ ἡ ἁφὴ τοῦ ἁπτοῦ καὶ ἀναπτοῦ. ἀναπτὸν δ' ἐστι, τό, τε ἔχον πάμπαν μικρὰν διαφορὰν τῶν ἁπτῶν, οἷον πέπονθεν ὁ ἀήρ· καὶ τῶν ἁπτῶν αἱ ὑπερβολαί, ὥσπερ τὰ φθαρτικά. καθ' ἑκάστην μὲν οὖν τῶν αἰσθήσεων, εἴρηται τύπῳ.

A ita etiã tactus *eſt rei* tactilis & intactilis. intactile autem eſt, & quod habet omnino exiguam differentiam *rerum* tactilium, quomodo affectus eſt aër: necnon tactilium exſuperantiæ, vt ea quæ interimendi vim habent. 17 De ſingulis ergo ſenſibus dictum eſt typo.

Communia de ſenſibus externis. Cap. XII.

Καθόλου δὲ περὶ πάσης αἰσθήσεως δεῖ λαβεῖν, ὅτι ἡ μὲν αἴσθησίς ἐστι τὸ δεκτικὸν τῶν αἰσθητῶν εἰδῶν ἄνευ τῆς ὕλης· οἷον ὁ κηρὸς τοῦ δακτυλίου ἄνευ τοῦ σιδήρου καὶ τοῦ χρυσοῦ δέχεται τὸ σημεῖον. λαμβάνει δὲ τὸ χρυσοῦν ἢ τὸ χαλκοῦν σημεῖον, ἀλλ' οὐχ ᾗ χαλκὸς, ἢ χρυσός. ὁμοίως δὲ καὶ ἡ αἴσθησις ἑκάστου ὑπὸ τοῦ ἔχοντος χρῶμα, ἢ χυμὸν, ἢ ψόφον, πάσχει· ἀλλ' οὐχ ᾗ ἕκαστον ἐκείνων λέγεται, ἀλλ' ᾗ τοιονδὶ, καὶ κατὰ τὸν λόγον. 2 Αἰσθητήριον δὲ πρῶτον, ἐν ᾧ ἡ τοιαύτη δύναμις. ἔστι μὲν οὖν ταὐτόν. τὸ δ' εἶναι ἕτερον· μέγεθος μὲν γὰρ ἄν τι εἴη τὸ αἰσθανόμενον· οὐ μὴν* τό γε αἰσθητικῷ εἶναι, οὐδ' ἡ αἴσθησις μέγεθός ἐστιν, ἀλλὰ λόγος τις καὶ δύναμις ἐκείνου. 3 Φανερὸν δ' ἐκ τούτων καὶ διὰ τί ποτε τῶν αἰσθητῶν αἱ ὑπερβολαὶ φθείρουσι τὰ αἰσθητήρια· ἐὰν γὰρ ᾖ ἰσχυροτέρα τοῦ αἰσθητηρίου ἡ κίνησις, λύεται ὁ λόγος. τοῦτο δ' ἦν ἡ αἴσθησις, ὥσπερ καὶ ἡ συμφωνία καὶ ὁ τόνος κρουομένων σφόδρα τῶν χορδῶν. 4 Καὶ διὰ τί ποτε τὰ φυτὰ οὐκ αἰσθάνεται, ἔχοντά τι μόριον ψυχικὸν, καὶ πάσχοντά τι ὑπὸ τῶν ἁπτῶν· καὶ γὰρ ψύχεται καὶ θερμαίνεται. αἴτιον γὰρ, τὸ μὴ ἔχειν μεσότητα, μηδὲ τοιαύτην ἀρχὴν, οἵαν δέχεσθαι τὰ εἴδη τῶν αἰσθητῶν, ἀλλὰ πάσχειν μετὰ τῆς ὕλης. 5 Ἀπορήσειε δ' ἄν τις εἰ πάθοι ἄν τι ὑπὸ τῆς ὀσμῆς τὸ ἀδύνατον ὀσφρανθῆναι, ἢ ὑπὸ χρώματος τὸ μὴ δυνάμενον ἰδεῖν· ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. 6 Εἰ δὲ τὸ ὀσφραντὸν, ὀσμὴ, εἴ τι ποιεῖ τὴν ὄσφρησιν, ἡ ὀσμὴ ποιεῖ. ὥστε τῶν ἀδυνάτων ὀσφρανθῆναι, οὐθὲν οἷόν τε πάσχειν ὑπ' ὀσμῆς· ὁ δ' αὐτὸς λόγος καὶ ἐπὶ τῶν ἄλλων· οὐδὲ τῶν δυνατῶν, ἀλλ' ᾗ αἰσθητικὸν ἕκαστον. 7 Ἅμα δὲ δῆλον καὶ οὕτως· οὔτε γὰρ φῶς καὶ σκότος, οὔτε ψόφος, οὔτε ὀσμὴ, οὐδὲν ποιεῖ τὰ σώματα, ἀλλ' ἐν οἷς ἐστιν· οἷον ἀὴρ ὁ μετὰ βροντῆς διΐστησι τὸ ξύλον. ἀλλὰ τὰ ἁπτὰ καὶ οἱ χυμοὶ ποιοῦσιν· εἰ γὰρ μὴ,* ὑπὸ τίνος ἂν πάσχοι τὰ ἄψυχα καὶ ἀλλοιοῖτο; 8 Ἆρ' οὖν κἀκεῖνα ποιήσει, ἢ οὐ πᾶν σῶμα παθητικὸν ὑπὸ ὀσμῆς καὶ ψόφου· καὶ τὰ πάσχοντα ἄπειρα, καὶ οὐ μένει οἷον ἀήρ; ὄζει γὰρ ὥσπερ παθών τι. 9 Τί οὖν ἐστι τὸ ὀσμᾶσθαι παρὰ τὸ πάσχειν τι, ἢ τὸ μὲν ὀσμᾶσθαι, αἰσθάνεσθαι· ὁ δ' ἀὴρ παθὼν, ταχέως αἰσθητὸς γίνεται;

* γρ. τό γε

* γρ. ὑπό τινος, ſine interrog.

B Vniuerſaliter autem de omni ſenſu oportet ſumere, ſenſum eſſe id quod eſt capax ſenſibilium ſpecierum ſine materia, vt cera recipit ſignum annuli ſine ferro & auro: accipit autem aureum aut æneum ſignum, non tamen quatenus eſt æs, vel aurum. Similiter etiam ſenſus cuiuſque *rei* patitur ab eo quod habet colorem, aut ſaporem, aut ſonum: non tamen quatenus vnumquodque illorum dicitur, ſed quatenus *eſt* tale, & ſecundùm rationem. 2 Senſorium autem primum *eſt*, in quo *eſt* talis facultas. eſt igitur idem: ſed eſſentia *eſt* diuerſa. nam magnitudo quædam fuerit id quod ſentit: ſed neque eſſentia ſenſitiui, neque ſenſus eſt magnitudo, ſed C *eſt* ratio quædam & facultas eius. 3 Perſpicuum etiam ex his *eſt*, cur aliquãdo ſenſibilium exuperantiæ corrumpunt ſenſoria. nam ſi fortior ſit motus ſenſorio, diſſoluitur ratio: hoc autem erat ſenſus: vt *diſſoluitur* concentus ac tonus, fidibus vehementer percuſſis. 4 Et cur quandoque plantæ non ſentiant, cùm habeant partem aliquam animæ, & patiantur aliquid à tactilibus: nam & refrigerantur, & calefiunt. cauſſa enim *eſt*, quia non habent mediocritatem, nec tale principium, quod recipiat ſpecies ſenſibilium, ſed patiuntur cum materia. 5 Iam verò dubitare quiſpiam poſſit, an id quod olD facere nequit, ab odore aliquid patiatur: vel quod non poteſt videre, à colore. ſimiliter autem & in aliis. 6 Sanè ſi odorabile *eſt* odor: ſi quid facit odoratum, odor facit. quare nihil eorum quæ olfacere nequeunt, pati poteſt ab odore: (eadem ratio *eſt* etiam in aliis) immo & nihil eorum quæ poſſunt olfacere, niſi quatenus ſentiendi vim habent. 7 Item ſic quoque manifeſtum *eſt*: quia nec lumen & tenebræ, nec ſonus, nec odor afficiunt corpora: ſed *ea* in quibus *ſunt*: vt aër, qui *eſt* cum tonitru, E ſcindit lignum. verùm tactilia & ſapores afficiunt: alioquin à quo paterentur inanimata, & variarentur? 8 Ergone etiam illa afficient? An non omne corpus patibile *eſt* ab odore & ſono: & quæ patiuntur, ſine carent, neque permanent, vt aër? redolet enim, tamquam paſſus aliquid. 9 Quid igitur eſt olfacere, præter pati quiddam? an olfacere *eſt* ſentire: aër verò paſſus citò ſenſibilis fit?

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ ΨΥΧΗΣ ΤΟ Γ.

ARISTOTELIS DE ANIMA LIBER III.

Iul. Pacio interprete.

De numero ſenſuum externorum.

NOn eſſe autem alium ſenſum præter quinque illos (nempe hos, aſpectum, auditum, odoratum, guſtum, tactum) ex his credere quiſpiam poſſit. 2 Nam ſi omnis *rei*, cuius ſenſus eſt tactus, etiam nunc habemus ſenſum: (omnis enim rei ſenſibilis, quatenus *eſt* ſenſibilis, paſſiones tactu nobis ſenſibiles ſunt,) ac neceſſe *eſt*, ſi deeſt aliquis ſenſus, etiam ſenſorium aliquod nobis deeſſe: & quæcumque ipſi tangentes ſentimus, *ea* ſunt ſenſibilia tactu, quo ſumus præditi: quæcumque verò per intermedia, non ipſa tangentes *ſentimus, ea ſunt ſenſibilia* ſimplicibus interuallis, verbi gratiâ, aëre & aqua: ſic autem *res* habet, vt ſi per vnum ſint multa ſenſibilia, inter ſe genere diuerſa, neceſſe *ſit*, eum, qui habet tale ſenſorium, habere vim vtrumque ſentiendi: (velvti ſi ex aëre ſit ſenſorium, atque aër ſit tam ſoni quàm coloris:) ſi verò plura *ſint* eiuſdem *obiecti ſenſoria*, (vt coloris tam aër quàm aqua: ambo namque ſunt perlucida) etiam is qui alterum eorum ſolùm habet, *id* ſentiet quod per ambo *ſentiri poteſt*: inter ſimplicia verò corpora duo tantùm ſunt, ex quibus ſunt ſenſoria: *nempe ſunt* ex aëre, & aqua (Etenim pupilla *eſt* aquæ: auditus, aëris: odoratus autem, alterius horũ. ſed ignis aut *eſt* nullius, aut omnium communis, quia nihil ſenſitiuum *eſt* ſine calore, terra verò aut *eſt* nullius, aut maximè propriè in tactu commiſcetur. ideo relinquitur nullum eſſe ſenſorium extra aquam & aërem.) atqui animalia nonnulla etiam nunc hæc habent: omnes igitur ſenſus habentur ab animalibus non imperfectis, neque mutilis: quoniam etiam talpa ſub pelle oculos habere videtur. Quocirca ſi non eſt aliquod aliud corpus, & affectio, quæ non ſit alicuius ex iis corporibus *quæ* hîc *ſunt*: certè nullus ſenſus deeſſe poteſt. 3 At verò neque communium poteſt eſſe aliquod ſenſorium proprium, quæ quolibet ſenſu ſentiamus ex accidenti: vt motus, ſtatus, figuræ, magnitudinis, numeri, vnius. nam hæc omnia motu ſentimus: vt magnitudinem motu: proinde & figuram: nam & figura *eſt* magnitudo quædam. id verò quod quieſcit, eò quòd non moueatur: numerus autẽ negatione continui, & propriis: ſinguli enim ſenſus ſentiunt vnum. quare manifeſtum eſt fieri non poſſe, vt cuiuſuis horum ſit proprius ſenſus, velvti motionis. ſic enim erit, vt nunc aſpectu ſentimus dulce: nimirum quia amborum habemus ſenſum, quo, cùm concurrunt, cognoſcimus.

Cap. I.

A ΟΤΙ δ' οὐκ ἔστιν αἴσθησις ἑτέρα παρὰ τὰς πέντε· λέγω δὲ ταύτας, ὄψιν, ἀκοήν, ὄσφρησιν, γεῦσιν, ἁφήν· ἐκ τῶνδε πιστεύσειεν ἄν τις. 2 Εἰ γὰρ παντὸς οὗ ἐστιν αἴσθησις, ἁφή, καὶ νῦν ἔχομεν* αἴσθησιν· πάντα γὰρ τὰ τοῦ ἁπτοῦ ᾗ ἁπτὸν πάθη, τῇ ἁφῇ ἡμῖν αἰσθητά ἐστιν· ἀνάγκη τε, εἴπερ ἐκλείπει τις αἴσθησις, καὶ αἰσθητήριόν τι ἡμῖν ἐκλείπειν· καὶ ὅσων μὲν αὐτοὶ ἁπτόμενοι αἰσθανόμεθα, τῇ ἁφῇ αἰσθητά ἐστιν, ἣν τυγχάνομεν ἔχοντες· ὅσα δὲ διὰ τῶν μεταξὺ, καὶ μὴ αὐτῶν ἁπτόμενοι τοῖς ἁπλοῖς διαστήμασι· λέγω δ' οἷον ἀέρι
B καὶ ὕδατι. ἔχει δ' οὕτως, ὥστε εἰ μὲν δι' ἑνὸς πλείω αἰσθητὰ ἕτερα ἀλλήλων ὄντα τῷ γένει, ἀνάγκη τὸν ἔχοντα τὸ τοιοῦτον αἰσθητήριον, ἀμφοῖν αἰσθητικὸν εἶναι· οἷον εἰ ἐξ ἀέρος ἐστὶ τὸ αἰσθητήριον, καὶ ἔστιν ὁ ἀὴρ καὶ ψόφου καὶ χρόας. εἰ δὲ πλείω τοῦ αὐτοῦ, οἷον χρόας,* καὶ ἀὴρ καὶ ὕδωρ· ἄμφω γὰρ διαφανῆ· καὶ ὁ θάτερον αὐτῶν ἔχων μόνον, αἰσθήσεται τοῦ δι' ἀμφοῖν. τῶν δὲ ἁπλῶν ἐκ δύο τούτων αἰσθητήρια μόνον ἐστὶν, ἐξ ἀέρος καὶ ὕδατος· ἡ μὲν γὰρ κόρη, ὕδατος· ἡ δ' ἀκοή, ἀέρος· ἡ δ' ὄσφρησις, θατέρου τούτων. τὸ δὲ πῦρ, ἢ οὐδενός, ἢ κοινὸν πάντων· οὐδὲν γὰρ ἄνευ θερμό-
C τητος αἰσθητικόν. ἡ δὲ γῆ, ἢ οὐδενός, ἢ ἐν τῇ ἁφῇ μάλιστα μέμικται ἰδίως. διὸ λείποιτ' ἂν μηδὲν εἶναι αἰσθητήριον ἔξω ὕδατος καὶ ἀέρος. ταῦτα δὲ καὶ νῦν* ἔχει ἔνια ζῷα. πᾶσαι ἄρα αἱ αἰσθήσεις ἔχονται ὑπὸ τῶν μὴ ἀτελῶν, μηδὲ πεπηρωμένων· φαίνεται γὰρ καὶ ἡ ἀσπάλαξ ὑπὸ τὸ δέρμα ἔχουσα τοὺς ὀφθαλμούς· ὥστε εἰ μή τι ἕτερόν ἐστι σῶμα, καὶ πάθος, ὃ μηδενός ἐστι τῶν ἐνταῦθα σωμάτων, οὐδεμία ἂν ἐκλίποι αἴσθησις. 3 Ἀλλὰ μὴν οὐδὲ τῶν κοινῶν οἷόν τε εἶναι αἰσθητήριόν τι ἴδιον, ὧν ἑκάστῃ αἰσθήσει αἰσθανόμεθα
D *κατὰ συμβεβηκός· οἷον κινήσεως, στάσεως, σχήματος, μεγέθους, ἀριθμοῦ, ἑνός· ταῦτα γὰρ πάντα κινήσει αἰσθανόμεθα, οἷον μέγεθος κινήσει· ὥστε καὶ τὸ σχῆμα· μέγεθος γάρ τι καὶ τὸ σχῆμα· τὸ δ' ἠρεμοῦν, τῷ μὴ κινεῖσθαι· ὁ δὲ ἀριθμός, τῇ ἀποφάσει τοῦ συνεχοῦς καὶ τοῖς ἰδίοις· ἑκάστη γὰρ* ἓν αἰσθάνεται αἴσθησις. ὥστε δῆλον, ὅτι ἀδύνατον ὁτουοῦν ἰδίαν αἴσθησιν εἶναι τούτων, οἷον κινήσεως· οὕτω γὰρ ἔσται, ὥσπερ νῦν τῇ ὄψει τὸ γλυκὺ αἰσθανόμεθα. τοῦτο δ' ὅτι ἀμφοῖν ἔχοντες τυγχάνομεν αἴσθησιν, ἡ ὅταν συμπέσωσι, γνωρίζομεν,

* γρ. αἴσθησιν, πάντως ἑκάστου [illegible] ληφθήσεται οὗτινος [illegible] οἰκεῖον ᾖ.
* γρ. [illegible] μεταξὺ ὁ ἀ.
* γρ. ἔχουσι.
* γρ. εἰ μὴ κατ' ἡ.

εἰ δὲ μή, οὐδαμῶς ἄν, ἀλλ' ἢ κατὰ συμβεβηκὸς ᾐσθανόμεθα, οἷον τὸν Κλέωνος υἱόν, οὐχ ὅτι Κλέωνος υἱός, ἀλλ' ὅτι λευκός. τούτῳ δὲ συμβέβηκεν υἱῷ Κλέωνος εἶναι. τῶν δὲ κοινῶν ἔχομεν αἴσθησιν ἤδη κοινήν, * οὐ κατὰ συμβεβηκός· οὐκ ἄρα ἐστὶν ἰδία· οὐδαμῶς γὰρ ἂν ᾐσθανόμεθα, ἀλλ' οὕτως, ὥσπερ εἴρηται, τὸν Κλέωνος υἱὸν ἡμᾶς ὁρᾶν.

* γρ. τῶν κατὰ συμβεβηκός, εἴπερ ἴδια· οὐδαμῶς γάρ.

4 Τὰ δ' ἀλλήλων ἴδια κατὰ συμβεβηκὸς αἰσθάνονται αἱ αἰσθήσεις, οὐχ ᾗ αἱ αὐταί, ἀλλ' ᾗ μία, ὅταν ἅμα ἡ αἴσθησις ἐπὶ τοῦ αὐτοῦ γένηται εἶναι, ὅτι ἡ χολὴ πικρὰ καὶ ξανθή· οὐ γὰρ δὴ ἑτέρας γε τὸ εἰπεῖν, ὅτι ἄμφω ἕν· διὸ καὶ ἀπατᾶται, καὶ ἐὰν ᾖ ξανθόν, χολὴν οἴεται εἶναι. 5 Ζητήσειε δ' ἄν τις, τίνος ἕνεκα πλείους ἔχομεν αἰσθήσεις, ἀλλ' οὐ μίαν μόνην. ἢ ὅπως μὴ λανθάνῃ τὰ ἀκολουθοῦντα καὶ κοινά, οἷον κίνησις, καὶ μέγεθος, καὶ ἀριθμός; εἰ γὰρ ἦν ὄψις μόνη, καὶ αὕτη λευκοῦ, ἐλάνθανεν ἂν μᾶλλον, κἂν ἐδόκει ταὐτὸ εἶναι πάντα, διὰ τὸ ἀκολουθεῖν ἀλλήλοις ἅμα χρῶμα καὶ μέγεθος. νῦν δ' ἐπεὶ ἐν ἑτέρῳ αἰσθητῷ τὰ κοινὰ ὑπάρχει, δῆλον ποιεῖ ὅτι ἄλλο τι ἕκαστον αὐτῶν. 6 Ἐπεὶ δ' αἰσθανόμεθα ὅτι ὁρῶμεν καὶ ἀκούομεν, ἀνάγκη ἢ τῇ ὄψει αἰσθάνεσθαι ὅτι ὁρᾷ, ἢ ἑτέρᾳ. 7 Ἀλλὰ καὶ ἡ αὐτὴ ἔσται τῆς ὄψεως, καὶ τοῦ ὑποκειμένου χρώματος. ὥστε ἂν δύο τοῦ αὐτοῦ ἔσονται, ἢ αὐτὴ αὑτῆς. 8 Ἔτι δ', εἰ καὶ ἑτέρα εἴη τῆς ὄψεως αἴσθησις, ἢ εἰς ἄπειρον εἶσιν, ἢ αὐτή τις ἔσται αὑτῆς. ὥστε ἐπὶ τῆς πρώτης τοῦτο ποιητέον. 9 Ἔχει δ' ἀπορίαν· εἰ γὰρ τὸ τῇ ὄψει αἰσθάνεσθαί ἐστιν ὁρᾶν, ὁρᾶται δὲ χρῶμα ἢ τὸ ἔχον, εἰ ὄψεταί τις τὸ ὁρῶν, καὶ χρῶμα ἕξει τὸ ὁρῶν πρῶτον. 10 Φανερὸν τοίνυν, ὅτι οὐχ ἓν τὸ τῇ ὄψει αἰσθάνεσθαι· καὶ γὰρ ὅταν μὴ ὁρῶμεν, τῇ ὄψει κρίνομεν καὶ τὸ σκότος καὶ τὸ φῶς, ἀλλ' οὐχ ὡσαύτως. 11 Ἔτι δὲ καὶ τὸ ὁρῶν ἐστιν ὡς κεχρωμάτισται· τὸ γὰρ αἰσθητήριον, δεκτικὸν τοῦ αἰσθητοῦ ἄνευ τῆς ὕλης ἕκαστον. διὸ καὶ ἀπελθόντων τῶν αἰσθητῶν, ἔνεισιν αἱ αἰσθήσεις καὶ φαντασίαι ἐν τοῖς αἰσθητηρίοις. 12 Ἡ δὲ τοῦ αἰσθητοῦ ἐνέργεια καὶ τῆς αἰσθήσεως, ἡ αὐτὴ μέν ἐστι καὶ μία· τὸ δὲ εἶναι αὐταῖς οὐ ταὐτόν. λέγω δέ, οἷον ψόφος ὁ κατ' ἐνέργειαν, καὶ ἀκοὴ ἡ κατ' ἐνέργειαν· ἔστι γὰρ ἀκοὴν ἔχοντα μὴ ἀκούειν· καὶ τὸ ἔχον ψόφον, οὐκ ἀεὶ * ψοφεῖν. ὅταν δ' ἐνεργῇ τὸ δυνάμενον ἀκούειν, καὶ ψοφῇ τὸ δυνάμενον ψοφεῖν, τότε ἡ κατ' ἐνέργειαν ἀκοὴ ἅμα γίνεται καὶ ὁ κατ' ἐνέργειαν ψόφος. ὥστε καὶ φήσειεν ἄν τις, τὸ μὲν εἶναι ἄκουσιν, τὸ δὲ ψόφησιν. 13 Εἰ δὲ ἔστιν ἡ κίνησις καὶ ἡ ποίησις καὶ τὸ πάθος ἐν τῷ ποιουμένῳ, ἀνάγκη καὶ τὸν ψόφον καὶ τὴν ἀκοὴν τὴν κατ' ἐνέργειαν, ἐν τῇ κατὰ δύναμιν εἶναι. ἡ γὰρ τοῦ ποιητικοῦ καὶ κινητικοῦ ἐνέργεια ἐν τῷ πάσχοντι ἐγγίνεται. διὸ οὐκ ἀνάγκη τὸ κινοῦν κινεῖσθαι. ἡ μὲν οὖν τοῦ ψοφητικοῦ ἐνέργεια, ἐστὶ ψόφος, ἢ ψόφησις· ἡ δὲ τοῦ ἀκουστικοῦ, ἀκοή, ἢ ἄκουσις· διττὴ γὰρ ἡ ἀκοή, καὶ διττὸς ὁ ψόφος. 14 Ὁ δ' αὐτὸς λόγος καὶ ἐπὶ τῶν ἄλλων αἰσθήσεων καὶ αἰσθητῶν. ὥσπερ γὰρ ἡ ποίησις καὶ ἡ πάθησις ἐν τῷ πάσχοντι, καὶ οὐκ ἐν τῷ ποιοῦντι, οὕτω καὶ ἡ τοῦ αἰσθητοῦ ἐνέργεια ἐν τῷ αἰσθητικῷ. 15 Ἀλλ' ἐπ' ἐνίων μὲν ὠνόμασται, οἷον ἡ ψόφησις καὶ ἡ ἄκουσις. ἐπὶ δ' ἐνίων ἀνώνυμον θάτερον· ὅρασις γὰρ λέγεται ἡ τῆς ὄψεως ἐνέργεια, ἡ δὲ τοῦ χρώματος, ἀνώνυμος· καὶ γεῦσις, ἡ τοῦ γευστικοῦ·

* γρ. ψοφεῖ.

alioquin nullo modo ſentimus niſi ex accidenti: vt Cleonis filium, non quòd *ſit* Cleonis filius, ſed quòd *ſit* albus: huic autem accidit, vt ſit filius Cleonis. atqui communium iam habemus ſenſum communem non ex accidenti. non eſt igitur *ſenſus* proprius: quia nullo modo ſentiremus, niſi vt dictum eſt nos videre Cleonis filium. 4 Ex accidenti autem ſenſus ſentiunt alter alterius propria obiecta, non quatenus ipſi, ſed quatenus vnus, quando ſimul in eodem ſit ſenſus: veluti bilem eſſe amaram & flauam. non enim alterius *eſt* dicere ambo eſſe vnum. ideóque decipitur, &, ſi ſit flauum, bilem eſſe putat. 5 Iam verò quærere quiſpiam poſſit, cuius gratia plures habeamus ſenſus, non vnum tantùm. An ne lateant ea quæ ſunt conſequentia, & communia, vt motus, & magnitudo, & numerus? nam ſi eſſet tantùm aſpectus, atque hic *eſſet* candoris, magis nos latere poſſent, ac videri idem eſſe omnia: quia ſe mutuò conſequuntur ſimul color & magnitudo. nunc verò quia communia inſunt in alio ſenſibili, hoc indicat vnumquodque ipſorum *eſſe* quiddam diuerſum.

6 Quia verò ſentimus nos videre & audire: neceſſe eſt vt vel aſpectu ſentiamus *ipſum aſpectum* videre, vel alio *ſenſu*. 7 Sed idem erit ſenſus & ipſius aſpectus & ſubiecti coloris. quare vel duo erunt ſenſus eiuſdem obiecti, vel idem *erit ſenſus* ſui ipſius. 8 Præterea ſi & alius ſit ſenſus ipſius aſpectus, aut in infinitum *res* abibit, aut aliquis *ſenſus* erit idem ſui ipſius. quapropter hoc & in primo *eſt* faciendum. 9 Eſt autem dubitatio. nam ſi aſpectu ſentire eſt videre: videtur autem color, aut quod habet *colorem*: certè ſi viderit quiſpiam id quod videt, etiam colorem habebit id quod primum videt. 10 Perſpicuum igitur *eſt*, non vnum *eſſe quod dicitur* aſpectu ſentire. nam & quando non videmus, tamen aſpectu diiudicamus & tenebras & lucem, non tamen eodem modo. 11 Præterea quod videt, quodammodo coloratur. nam vnumquodque ſenſorium vim habet ſuſcipiendi ſenſibilis ſine materia: ideóque abſcedentibus ſenſilibus inſunt ſenſus & phantaſiæ in ſenſoriis. 12 Iam verò actus ipſius ſenſibilis & ipſius ſenſns eſt quidem vnus & idem: ſed eorum eſſentia non *eſt* eadem: verbi gratia, ſonus qui *eſt* actu, & auditus qui *eſt* actu. nam fieri poteſt vt habens auditum non audiat: & quod habet ſonum, non ſemper ſonat. cùm autem operatur quod poteſt audire, & ſonat quod poteſt ſonare: tunc ſimul fit actu auditus & actu ſonus: adeo vt dicere aliquis poſſit alterum eſſe auditionem: alterum ſonationem. 13 Quòd ſi motus & effectio & paſſio ſunt in eo quod fit: neceſſe *eſt*, etiam ſonum & auditum qui *eſt* actu, eſſe in eo quod *eſt* poteſtate. nam actus eius quod efficiendi & mouendi vim habet, in eo fit quod patitur. quare non *eſt* neceſſe vt mouens moueatur. actus igitur eius quod ſonandi vim habet, eſt ſonus vel ſonatio: *actus* verò eius quod audiendi vim habet, eſt auditus vel auditio. nam duplex *eſt* auditus, & duplex ſonus. 14 Eadem ratio *eſt* etiam in aliis ſenſibus, & ſenſilibus. ſicut enim effectio & paſſio *eſt* in eo quod patitur, non in eo quod efficit: ita etiam actus ipſius ſenſibilis *eſt* in ſenſitiuo. 15 Sed in quibuſdam quidem etiam nomina poſita ſunt, vt ſonatio & auditio: in quibuſdam verò alterum nomine caret. nam actus ipſius viſus dicitur viſio: *actus* autem coloris nomine vacat: & *actus* guſtatiui *appellatur* guſtus:

ſed

ſed *actus* ſaporis nomine caret. 16 Quoniam autem viſus eſt actus tam ſenſibilis quàm ſenſitiui, eſſentia verò *eſt* diuerſa: neceſſe eſt vt auditus & ſonus ita accepti ſimul intereant & ſeruentur. ſic igitur & ſapor & guſtus, & reliqua ſimiliter. Quæ verò ſecundùm poteſtatem dicuntur, non *eſt* neceſſe *vt ſimul intereant vel conſeruentur.* Sed veteres qui de natura diſſeruerunt, hoc non rectè dixerunt, exiſtimantes nihil eſſe aut album aut nigrum ſine aſpectu, nec *eſſe* ſaporem ſine guſtu. partim enim rectè dixerunt, partim non rectè. quia cùm duobus modis dicatur ſenſus & ſenſibile, *id eſt*, alia poteſtate, alia actu: in his quidem accidit quod dictum eſt, in aliis verò non accidit. ſed illi B ſimpliciter locuti ſunt de iis quæ non ſimpliciter dicuntur. 17 Quòd ſi concentus eſt vox quædam, vox autem & auditus partim eſt vnum, partim non vnum, ſeu non idem: conceptus verò *eſt* ratio: *certè* neceſſe *eſt*, vt etiam auditus ſit ratio quædam.

18 Ideóque vnumquodque, tam acutum quàm graue; exſuperans corrumpit auditum: ſimiliter etiam in ſaporibus guſtum, & in coloribus aſpectum *labefactat*, quod *eſt* valde ſplendidum, aut tenebroſum: & in olfactu vehemens odor, tam dulcis, quàm amarus: tamquam ſenſus ſit ratio quædam. 19 Idcirco etiam iucunda *ſunt ea, quæ* cùm ſint ſyncera & non mixta, adducuntur ad rationem: vt acutum, aut dulce, aut ſalſum: tunc enim *ſunt* iucunda. & omnino quod *eſt* mixtum, magis *eſt* concentus quàm acutum aut graue. C tactui autem, quod vim habet calefaciendi, vel refrigerandi. Enimvero ſenſus *eſt* ratio. *illa obiecta* autem exſuperantia, vel dolorem afferunt, vel corrumpunt.

A ἡ δὲ τοῦ χυμοῦ, ἀνώνυμος. 16 ἐπεὶ δὲ μία μέν ἐστιν ἐνέργεια ἡ τοῦ αἰσθητοῦ καὶ τοῦ αἰσθητικοῦ, τὸ δ' εἶναι ἕτερον, ἀνάγκη ἅμα φθείρεσθαι καὶ σώζεσθαι τὴν οὕτω λεγομένην ἀκοὴν καὶ ψόφον, καὶ χυμὸν δή, καὶ γεῦσιν, καὶ τὰ ἄλλα ὁμοίως· τὰ δὲ κατὰ δύναμιν λεγόμενα, οὐκ ἀνάγκη. ἀλλ' οἱ πρότερον φυσιολόγοι τοῦτο οὐ καλῶς ἔλεγον, οὐθὲν οἰόμενοι οὔτε λευκὸν, οὔτε μέλαν εἶναι ἄνευ ὄψεως, οὐδὲ χυμὸν ἄνευ γεύσεως· τῇ μὲν γὰρ ἔλεγον ὀρθῶς, τῇ δ' οὐκ ὀρθῶς· διχῶς γὰρ λεγομένης τῆς αἰσθήσεως καὶ τοῦ αἰσθητοῦ, τῶν μὲν κατὰ δύναμιν, τῶν δὲ κατ' ἐνέργειαν, ἐπὶ B τούτων μὲν συμβαίνει τὸ λεχθέν, ἐπὶ δὲ τῶν ἑτέρων οὐ συμβαίνει. ἀλλ' ἐκεῖνοι ἁπλῶς ἔλεγον περὶ τῶν λεγομένων οὐχ ἁπλῶς. 17 εἰ* δ' ἡ συμφωνία φωνή τίς ἐστιν, ἡ δὲ φωνὴ καὶ ἀκοὴ ἔστιν ὡς ἕν ἐστι, καὶ ἔστιν ὡς οὐχ ἓν τὸ αὐτό, λόγος δ' ἡ συμφωνία, ἀνάγκη καὶ τὴν ἀκοὴν λόγον τινὰ εἶναι. 18 καὶ διὰ τοῦτο καὶ φθείρει ἕκαστον ὑπερβάλλον, καὶ τὸ ὀξὺ, καὶ τὸ βαρὺ, τὴν ἀκοήν· ὁμοίως δὲ καὶ ἐν χυμοῖς τὴν γεῦσιν, καὶ ἐν χρώμασι τὴν ὄψιν, τὸ σφόδρα λαμπρὸν, ἢ τὸ ζοφερόν· καὶ ἐν ὀσφρήσει ἡ ἰσχυρὰ ὀσμή, καὶ γλυκεῖα, καὶ πικρά, ὡς λόγου τινὸς ὄντος τῆς αἰσθήσεως. 19 διὸ καὶ ἡδέα μὲν, ὅταν ἀγόμενα, εἰλικρινῆ καὶ ἀμιγῆ ὄντα [ἄγηται] εἰς τὸν λόγον· οἷον τὸ ὀξὺ, ἢ γλυκὺ, ἢ ἁλμυρόν· ἡδέα γὰρ τότε. ὅλως δὲ μᾶλλον C τὸ μικτὸν, συμφωνία, ἢ τὸ ὀξὺ καὶ βαρύ. *ἁφῇ δὲ τὸ θερμαντικὸν, ἢ ψυκτικόν· ἡ δ' αἴσθησις, ὁ λόγος· ὑπερβάλλοντα δὲ, ἢ λυπεῖ, ἢ φθείρει.

* Philoponus, non δ' ἡ, ſed ᾗ vult legi: eum vide.

*1 Philoponus legit, ἀφῇ δὲ τὸ θερμαντικὸν ἢ ψυκτικόν, eum vide.

De ſenſu communi. Cap. II.

D VNuſquiſque igitur ſenſus eſt ſubiecti ſenſibilis, cùm ſit in ſenſorio quà *eſt* ſenſorium: ac diſcernit ſubiecti ſenſibilis differentias: vt album & nigrum aſpectus: dulce autem & amarum guſtus. ſimiliter autem hoc *ſe* habet etiam in aliis. 2 Quoniam autem & album & dulce & quodlibet ſenſibile cum quolibet comparamus, aliquo autem etiam ſentimus hæc differre neceſſe, *eſt* igitur *hoc fieri* ſenſu: quia ſunt ſenſibilia. 3 Quare manifeſtum *eſt* carnem non eſſe vltimum ſenſorium: quia neceſſe eſſet vt id quod diſcerneret *obiectum*, tangendo ipſum diſcerneret. 4 Fieri ergo non poteſt, vt ſeparatis diiudicetur eſſe diuerſum dulce ab albo; (ſed oportet vni alicui eſſe vtraque manifeſta.) nam *ſi* ita *eſſet*, *profectò* etiamſi alterum ego, alterum tu ſentires, conſtare poſſet *ea* eſſe inter ſe diuerſa. ſed opus eſt, vt vnum dicat eſſe diuerſum: diuerſum enim eſt dulce ab albo. E idem ergo dicit. quare vt dicit, ita & intelligit, & ſentit. Non poſſe igitur ſeparatis diſcerni ſeparata, manifeſtum *eſt*. 5 Sed neque in ſeparato tempore *diſcerni poſſe*, hinc *patet*. ſicut enim idem ait diuerſa eſſe bonum & malum: ita etiam quando dicit alterum eſſe diuerſum, *tunc dicit* etiam alterum: nec ex accidenti *eſt* illud quando. verbi gratia, nunc dico eſſe diuerſum, non tamen eſſe nunc diuerſum. ſed ita & nunc dico, & eſſe nunc. *ſunt* igitur ſimul. Quare eſt inſeparabile, & in inſeparabili tempore. 6 At verò impoſſibile *eſt*, idem ſimul moueri contrariis motibus, quatenus *eſt* indiuiduũ,

D Ἑκάστη μὲν οὖν αἴσθησις, τοῦ ὑποκειμένου αἰσθητοῦ ἐστίν, ὑπάρχουσα ἐν τῷ αἰσθητηρίῳ ᾗ αἰσθητήριον, καὶ κρίνει τὰς τοῦ ὑποκειμένου αἰσθητοῦ διαφοράς· οἷον λευκὸν μὲν καὶ μέλαν, ὄψις· γλυκὺ δὲ καὶ πικρὸν, γεῦσις. ὁμοίως δ' ἔχει τοῦτο καὶ ἐπὶ τῶν ἄλλων. 2 ἐπεὶ δὲ καὶ τὸ λευκὸν, καὶ τὸ γλυκὺ, καὶ ἕκαστον τῶν αἰσθητῶν πρὸς ἕκαστον *κρίνομεν, τινὶ δὲ καὶ αἰσθανόμεθα ὅτι διαφέρει· ἀνάγκη δὴ αἰσθήσει· αἰσθητὰ γάρ ἐστιν. 3 ᾗ καὶ δῆλον, ὅτι ἡ σὰρξ οὐκ ἔστι τὸ ἔσχατον αἰσθητήριον· ἀνάγκη γὰρ ἂν ἦν ἁπτόμενον αὐτοῦ, κρίνειν τὸ κρῖνον. 4 οὔτε δὴ κεχωρισμένοις ἐνδέχεται *κρίνειν, ὅτι ἕτερον τὸ γλυκὺ τοῦ λευκοῦ· ἀλλὰ δεῖ ἑνί τινι ἄμφω δῆλα εἶναι. *οὕτω μὲν, εἰ κἂν τοῦ μὲν ἐγώ, τοῦ δὲ σὺ αἴσθοιο, δῆλον ἂν εἴη ὅτι E ἕτερα ἀλλήλων. δεῖ δὲ τὸ ἓν λέγειν, ὅτι ἕτερον· ἕτερον γὰρ τὸ γλυκὺ τοῦ λευκοῦ. λέγει ἄρα τὸ αὐτό. ὥστε ὡς λέγει, οὕτω καὶ νοεῖ, καὶ αἰσθάνεται. ὅτι μὲν οὖν οὐχ οἷόν τε κεχωρισμένοις κρίνειν τὰ κεχωρισμένα, δῆλον. 5 ὅτι δ' οὐδ' ἐν κεχωρισμένῳ χρόνῳ, ἐντεῦθεν. ὥσπερ γὰρ τὸ αὐτὸ λέγει ὅτι ἕτερον τὸ ἀγαθὸν καὶ τὸ κακόν, οὕτω καὶ ὅτε θάτερον λέγει ὅτι ἕτερον, καὶ θάτερον, οὐ κατὰ συμβεβηκὸς τὸ ὅτε. λέγω δὲ, οἷον νῦν λέγω ὅτι ἕτερον, οὐ μέντοι ὅτι νῦν ἕτερον. ἀλλ' οὕτω λέγει, καὶ νῦν, καὶ ὅτι νῦν· ἅμα ἄρα. ὥστε ἀχώριστον, καὶ ἐν ἀχωρίστῳ χρόνῳ. 6 ἀλλὰ μὴν ἀδύνατον ἅμα τὰς ἐναντίας κινήσεις κινεῖσθαι τὸ αὐτὸ ᾗ ἀδιαίρετον,

* γρ. κρίνομεν τινί, ἐστι.

* γρ. κρίνειν τὸ κρῖνον.

* γρ. οὕτω μὲν γὰρ ἐ-κἂν εἰ τοῦ μὲν ἐ-γώ.

καὶ ἐν ἀδιαιρέτῳ χρόνῳ. εἰ γὰρ τὸ γλυκύ, ὡδὶ κινεῖ τὴν αἴσθησιν, ἢ τὴν νόησιν· τὸ δὲ πικρόν, ἐναντίως· καὶ τὸ λευκόν, ἑτέρως. 7 ἆρ' οὖν ἅμα μὲν καὶ ἀριθμῷ ἀδιαίρετον, καὶ ἀχώριστον τὸ κρῖνον, τῷ εἶναι δὲ κεχωρισμένον; ἔστι μὲν δὴ πως ὡς τὸ διαιρετὸν τῶν διῃρημένων αἰσθάνεται, ἔστι δ' ὡς ᾗ ἀδιαίρετον· τῷ εἶναι μὲν γὰρ διαιρετόν, τόπῳ δὲ καὶ χρόνῳ, καὶ ἀριθμῷ ἀδιαίρετον. 8 ἢ οὐχ οἷόν τε; δυνάμει μὲν γὰρ τὸ αὐτὸ διαιρετὸν καὶ ἀδιαίρετον, καὶ τἀναντία· τῷ δὲ εἶναι οὔ, ἀλλὰ τῷ ἐνεργεῖσθαι διαιρετόν. καὶ οὐχ οἷόν τε ἅμα λευκὸν καὶ μέλαν εἶναι. ὥστ' οὐδὲ τὰ εἴδη πάσχειν αὐτῶν, εἰ τοιοῦτον ἡ αἴσθησις καὶ ἡ νόησις. 9 ἀλλ' ὥσπερ ἣν καλοῦσί τινες στιγμήν, ᾗ μία καὶ ᾗ δύο, ταύτῃ καὶ διαιρετή. ᾗ μὲν οὖν ἀδιαίρετον, ἓν τὸ κρῖνόν ἐστι καὶ ἅμα· ᾗ δὲ διαιρετὸν ὑπάρχει, οὐχ ἕν· δὶς γὰρ τῷ αὐτῷ χρῆται σημείῳ ἅμα. ᾗ μὲν οὖν δυσὶ χρῆται, τῷ πέρατι δύο κρίνει, καὶ κεχωρισμένα ἐστίν, ὡς * κεχωρισμένων· ᾗ δ' ἕν, ἑνὶ καὶ ἅμα. 10 περὶ μὲν οὖν τῆς ἀρχῆς ᾗ φαμὲν τὸ ζῷον αἰσθητικὸν εἶναι, διωρίσθω τὸν τρόπον τοῦτον.

* χ. κεχωρισμένως.

A & in indiuiduo tempore. nam ſi dulce ſic mouet ſenſum, aut intellectum; amarum verò contrario modo: etiam album mouebit alio modo. 7 Numquid ergo id quod diſcernit, ſimul *eſt* numero indiuiduum, ac tempore inſeparabile, eſſentiâ verò ſeparatum? partim igitur vt diuiduum diuiſa ſentit: partim vt indiuiduum. eſſentia namque *eſt* diuiduum: loco autem, & tempore, & numero indiuiduum. 8 An hoc fieri nequit? poteſtate enim idem *eſt* diuiduum & indiuiduum, & ſimul contraria: eſſentia verò minimè. ſed eo quod actu patitur, diuiduum *eſt*. nec poteſt ſimul eſſe album & nigrum. quare nec ſenſus vel intellectus, ſi tale *eſt*, B ſpecies ipſorum recipere *poteſt*. 9 Sed veluti quod nonnulli vocant punctum, partim *eſt* vnum, partim duo, & hac *ratione eſt* diuiduum. quatenus ergo id quod diſcernit, *eſt* indiuiduum, *eatenus* eſt vnum & ſimul. quatenus autem eſt diuiduum, non eſt vnum: quia bis vtitur eodem ſigno ſimul. Quatenus igitur *pro* duobus vtitur termino, duo diſcernit, & ſeparati ſunt, vtpote ſeparatorum. quatenus verò *eſt* vnum, vno & ſimul *diſcernit*. 10 De principio igitur, quo dicimus animal ſenſitiuum eſſe, definitum ſit hoc modo.

Diſtinctio intellectus & ſenſus, nec non phantaſiæ & exiſtimationis. Cap. III.

Ἐπεὶ δὲ δύο διαφοραῖς ὁρίζονται μάλιστα τὴν ψυχήν, κινήσει τε τῇ κατὰ τόπον, καὶ τῷ νοεῖν [καὶ τῷ κρίνειν] καὶ * αἰσθάνεσθαι· δοκεῖ δὲ τὸ νοεῖν καὶ τὸ φρονεῖν ὥσπερ αἰσθάνεσθαί τι εἶναι· ἐν ἀμφοτέροις γὰρ τούτοις κρίνει τι ἡ ψυχὴ καὶ γνωρίζει τῶν ὄντων. 2 καὶ οἵ γε ἀρχαῖοι τὸ φρονεῖν καὶ τὸ αἰσθάνεσθαι ταὐτὸν εἶναί φασιν, ὥσπερ καὶ Ἐμπεδοκλῆς εἴρηκε,

Πρὸς παρεὸν γὰρ μῆτις ἀέξεται ἀνθρώποισι.

καὶ ἐν ἄλλοις,

– ὅθεν σφίσιν αἰεὶ
Καὶ τὸ φρονεῖν ἀλλοῖα παρίσταται.

τὸ δ' αὐτὸ βούλεται τούτοις καὶ τὸ τοῦ Ὁμήρου,

Τοῖος γὰρ νόος ἐστὶν ἐπιχθονίων ἀνθρώπων,
Οἷον ἐπ' ἦμαρ ἄγησι πατὴρ ἀνδρῶν τε θεῶν τε.

πάντες γὰρ οὗτοι τὸ νοεῖν σωματικὸν ὥσπερ καὶ τὸ αἰσθάνεσθαι ὑπολαμβάνουσι· καὶ αἰσθάνεσθαί τε καὶ φρονεῖν τῷ ὁμοίῳ τὸ ὅμοιον, ὥσπερ καὶ ἐν τοῖς κατ' ἀρχὰς λόγοις διωρίσαμεν. 3 καίτοι ἔδει ἅμα καὶ περὶ τοῦ ἠπατῆσθαι αὐτοὺς λέγειν· οἰκειότερον γὰρ τοῖς ζῴοις, καὶ πλείω χρόνον ἐν τούτῳ διατελεῖ ἡ ψυχή. 4 διὸ ἀνάγκη, ἤτοι ὥσπερ ἔνιοι λέγουσι, πάντα τὰ φαινόμενα εἶναι ἀληθῆ, ἢ τὴν τοῦ ἀνομοίου θίξιν ἀπάτην εἶναι· τοῦτο γὰρ ἐναντίον τῷ τὸ ὅμοιον τῷ ὁμοίῳ γνωρίζειν. 5 δοκεῖ δὲ καὶ ἡ ἀπάτη καὶ ἡ ἐπιστήμη τῶν ἐναντίων ἡ αὐτὴ εἶναι. 6 ὅτι μὲν οὖν οὐ ταὐτόν ἐστι τὸ αἰσθάνεσθαι καὶ τὸ φρονεῖν, φανερόν· τοῦ μὲν γὰρ πᾶσι μέτεστι, τοῦ δὲ ὀλίγοις τῶν ζῴων. 7 ἀλλ' οὐδὲ τὸ νοεῖν, ἐν ᾧ ἐστι τὸ ὀρθῶς, καὶ τὸ μὴ ὀρθῶς· τὸ μὲν ὀρθῶς, φρόνησις, καὶ ἐπιστήμη, καὶ δόξα ἀληθής· τὸ δὲ μὴ ὀρθῶς, τἀναντία τούτων· οὐδὲ τοῦτό ἐστι ταὐτὸ τῷ αἰσθάνεσθαι· ἡ μὲν γὰρ αἴσθησις τῶν ἰδίων, ἀεὶ ἀληθής, καὶ πᾶσιν ὑπάρχει τοῖς ζῴοις· διανοεῖσθαι δ' ἐνδέχεται καὶ ψευδῶς, καὶ οὐδενὶ ὑπάρχει ᾧ μὴ καὶ λόγος.

* Quidam poſt hanc vocem, ex Argyropylo quædam adiici volunt: tu vide Philoponum. ſcripti codd. nihil variãt. Metaphyſ. l. 3. c. 5.

Odyſ. σ.

C CVm autem duabus differentiis maximè definiãt animam, motu *ſcilicet* ſecundùm locum, & eo quod intelligit & prudentis munere fungitur & ſentit: vtique tam intelligere quàm prudentis munere fungi, videtur eſſe vt ſentire quiddam: his enim vtriſque anima iudicat & cognoſcit entium aliquid. 2 Ac veteres idem eſſe inquiunt prudentis munere fungi, ac ſentire: ſicut & Empedocles ait,

Ad præſens enim ſapientia augetur hominibus.

& alibi,

– vnde ipſis ſemper
Etiam prudentis munere fungi, varia exhibet.

D Hoc idem *ſibi* vult etiam illud Homeri,

Talis eſt mens terreſtrium hominum,
Qualem in dies tribuit pater hominumque deorumque.

Hi namque omnes exiſtimant, intelligere *eſſe* corporeum, vt & ſentire: ac *quemque* ſimile ſimili ſentire & *ſapere*, vt & in primis ſermonibus definiuimus. 3 Atqui oportebat ſimul etiam de deceptione eos dicere: quia magis *eſt* propria animalibus, & plus temporis in his verſatur anima. 4 Idcirco neceſſe *eſt*, vel (vt nonnulli dicunt) omnia quæ videntur, eſſe vera, vel diſſimilis E tactum, eſſe deceptionem. hoc enim *eſt* contrarium ei *cognitioni*, *quâ* ſimile ſimili cognoſcitur. 5 Videtur autem & deceptio & ſcientia, contrariorum eadem eſſe. 6 Ergo non eſſe idem ſentire & prudentis munere fungi, perſpicuum *eſt*. nam alterum omnia, alterum pauca animalia participant. 7 Sed neque intelligere, in quo ineſt rectitudo & non rectitudo (quod enim rectè *percipit*, *eſt* prudentia, & ſcientia, & opinio vera. quod verò non rectè, his contraria) neque hoc, inquam, eſt idem quod ſentire: quia ſenſus propriorum *obiectorum* ſemper *eſt* verus, & omnibus ineſt animalibus: ratiocinari verò contingit etiam falsò, nec vlli ineſt, cui non *inſit* etiam ratio.

8 Phantaſia namque eſt res diuerſa & à ſenſu & à ratiocinatione. 9 Atque hæc non fit ſine ſenſu: & ſine hac non *eſt* exiſtimatio. 10 Non eſſe autem eandem, phantaſiam & exiſtimationem, perſpicuum *eſt*: hæc enim affectio in nobis eſt, quando volumus: licet enim ob oculos ponere, vt *ij faciunt* qui in memoriæ locis collocant & imagines faciunt: opinari autem non *eſt* in nobis, quia neceſſe *eſt* aut verè aut falsò *opinari*. 11 Præterea cùm opinamur aliquid moleſtum vel terribile, confeſtim ſimul patimur: itidémque ſi ſit aliquid quod fiduciam afferat: ſed quod ad phantaſiam, eodem modo affecti ſumus, quo ij qui in pictura aſpiciunt res moleſtas & fiduciam afferentes. 12 Sunt porrò & ipſius exiſtimationis *hæ* differentiæ, ſcientia, & opinio, & prudentia, & quæ *ſunt* his contraria: de quorum diſcrimine alia erit diſputatio.

A 8 φαντασία γὰρ ἕτερον καὶ αἰσθήσεως καὶ διανοίας. 9 αὕτη τε οὐ γίγνεται ἄνευ αἰσθήσεως, καὶ ἄνευ ταύτης οὐκ ἔστιν ὑπόληψις. 10 ὅτι δ' οὐκ ἔστιν ἡ αὐτὴ φαντασία καὶ ὑπόληψις, φανερόν· τοῦτο μὲν γὰρ τὸ πάθος ἐφ' ἡμῖν ἐστιν, ὅταν βουλώμεθα· πρὸ ὀμμάτων γὰρ ἔστι ποιήσασθαι, ὥσπερ οἱ ἐν τοῖς μνημονικοῖς τιθέμενοι καὶ εἰδωλοποιοῦντες. δοξάζειν δ' οὐκ ἐφ' ἡμῖν· ἀνάγκη γὰρ ἢ ψεύδεσθαι, ἢ ἀληθεύειν. 11 ἔτι δὲ, ὅταν μὲν δοξάσωμεν δεινόν τι ἢ φοβερὸν, εὐθὺς συμπάσχομεν, ὁμοίως δὲ κἂν ᾖ θαρραλέον. κατὰ δὲ τὴν φαντασίαν ὡσαύτως ἔχομεν, ὥσπερ ἂν οἱ θεώμενοι ἐν γραφῇ τὰ δεινὰ ἢ θαρραλέα. 12 Εἰσὶ δὲ καὶ αὐτῆς τῆς ὑπολήψεως διαφοραὶ, ἐπιστήμη, καὶ δόξα, καὶ φρόνησις, καὶ τὰ ἐναντία B τούτων, περὶ ὧν τῆς διαφορᾶς ἕτερος ἔστω λόγος.

De phantaſia.

QVod verò ad intelligere: quoniam eſt aliud quàm ſentire: & partim videtur eſſe phantaſia, partim exiſtimatio: cùm de imaginatione definiuerimus, ſic de altero dicendum erit. 2 Ergo ſi phantaſia eſt, ſecundùm quam dicimus in nobis fieri aliquod phantaſma, non ſi quid per tranſlationem dicimus: eſtne vna aliqua facultas vel habitus ex his quibus diſcernimus, ac verum vel falſum percipimus? hæc autem ſunt, ſenſus, opinio, intellectus, & ſcientia. 3 Phantaſiam igitur non eſſe ſenſum, ex his patet: quia ſenſus vel *eſt* poteſtas, vel actus; vt viſus & viſio: aliquid autem *phantaſiæ* videtur, etiam cùm neutrum horum ineſt, vt ea quæ in ſomnis videntur. 4 Deinde ſenſus quidem ſemper adeſt: phantaſia verò minimè. 5 Quòd ſi actu idem eſſet, omnibus beſtiis phantaſia ineſſe poſſet: videtur autem non *ineſſe omnibus*, vt formicæ, aut api, aut vermi. 6 Deinde illi quidem ſunt ſemper veri: phantaſiæ verò pleræque fiunt falſæ. 7 Deinde cùm exquiſitè operamur circa ſenſile, non dicimus nobis videri hoc eſſe hominem: ſed potiùs quando non euidenter ſentimus, túncque *ſenſus eſt* aut verus aut falſus. 8 Et quod antea dicebamus, etiam clauſis oculis *ipſi phantaſiæ* videntur res aſpectabiles. 9 At verò nec eſt aliquid ex iis quæ ſemper verum percipiunt, vt ſcientia, vel intellectus: eſt enim phantaſia etiam falſa. 10 Reſtat ergo vt videamus, an *ſit* opinio. fit enim opinio & vera & falſa. 11 Sed opinioni conſequens eſt fides: quia fieri nequit vt aliquis non habeat fidem iis quæ opinatur: nulli autem beſtiæ fides ineſt, ſed phantaſia multis. 12 Præterea omnem opinionem conſequitur fides, fidem autem *conſequitur* eſſe perſuaſum, perſuadet autem ratio: ſed quibuſdam beſtiis phantaſia ineſt, ratio verò non *ineſt*. 13 Perſpicuum igitur *eſt*, neque opinionem cum ſenſu, neque per ſenſum, neque coniunctionem opinionis & ſenſus, eſſe poſſe phantaſiam: idque propter hæc *quæ dicta fuerant, eſt perſpicuum*. 14 Et manifeſtum *eſt*, non eſſe aliam quandam opinionem, ſed eſſe eius, cuius *eſt* etiam ſenſus. verbi gratiâ connexio ex albi opinione & ſenſu eſt phantaſia. non eſt enim ex opinione boni, & ſenſu albi. Itaque *phantaſiæ* videri, eſt opinari id quod ſentit, non ex accidenti. 15 Porrò videntur etiam falſa, de quibus ſimul exiſtimationem veram *aliquis* habet:

Cap. IV.

ΠΕρὶ δὲ τοῦ νοεῖν, ἐπεὶ ἕτερον τοῦ αἰσθάνεσθαι, τούτου δὲ τὸ μὲν φαντασία δοκεῖ εἶναι, τὸ δὲ ὑπόληψις, περὶ φαντασίας διορίσαντας, οὕτω περὶ θατέρου λεκτέον. 2 εἰ δή ἐστιν ἡ φαντασία καθ' ἣν λέγομεν φάντασμά τι ἡμῖν γίνεσθαι καὶ μὴ, εἴ τι κατὰ μεταφορὰν λέγομεν, μία τις ἐστὶ τούτων δύναμις ἢ ἕξις, καθ' ἣν C κρίνομεν, καὶ ἀληθεύομεν ἢ ψευδόμεθα. τοιαῦται δ' εἰσὶν αἴσθησις, δόξα, νοῦς, ἐπιστήμη. 3 ὅτι μὲν οὖν οὐκ ἔστιν αἴσθησις ἡ φαντασία, δῆλον ἐκ τῶνδε· αἴσθησις μὲν γὰρ, ἤτοι δύναμις, ἢ ἐνέργεια, οἷον ὄψις καὶ ὅρασις. φαίνεται δέ τι καὶ μηδετέρου τούτων ὑπάρχοντος· οἷον τὰ ἐν τοῖς ὕπνοις. 4 εἶτα αἴσθησις μὲν, ἀεὶ πάρεστι, φαντασία δ' οὔ. 5 εἰ δὲ τῇ ἐνεργείᾳ τὸ αὐτὸ, πᾶσιν ἂν ἐνδέχοιτο τοῖς θηρίοις φαντασίαν ὑπάρχειν. δοκεῖ δ' οὔ, οἷον μύρμηκι, ἢ μελίττῃ, ἢ σκώληκι. 6 εἶτα αἱ μὲν ἀληθεῖς ἀεὶ, αἱ δὲ φαντασίαι γίνονται αἱ πλείους ψευδεῖς. 7 ἔπειτα, οὐδὲ λέγομεν ὅταν ἐνεργῶμεν ἀκριβῶς περὶ τὸ αἰσθητὸν, ὅτι D φαίνεται ἡμῖν τοῦτ' ἄνθρωπος· ἀλλὰ μᾶλλον ὅταν μὴ ἐναργῶς αἰσθανώμεθα, τότε ἢ ἀληθὴς ἢ ψευδής. 8 καὶ ὅπερ δὴ ἐλέγομεν πρότερον, φαίνεται γὰρ μύουσιν ὁράματα. 9 ἀλλὰ μὴν οὐδὲ τῶν ἀεὶ ἀληθευόντων οὐδεμία ἔσται, οἷον ἐπιστήμη, ἢ νοῦς. ἔστι γὰρ φαντασία καὶ ψευδής. 10 λείπεται ἄρα ἰδεῖν, εἰ δόξα· γίνεται γὰρ δόξα καὶ ἀληθὴς καὶ ψευδής. 11 ἀλλὰ δόξῃ μὲν ἕπεται πίστις· οὐκ ἐνδέχεται γὰρ δοξάζοντα οἷς δοκεῖ μὴ πιστεύειν. τῶν δὲ θηρίων οὐθενὶ ὑπάρχει πίστις, φαντασία δὲ πολλοῖς. 12 ἔτι, πάσῃ μὲν δόξῃ ἀκολουθεῖ πίστις, πίστει δὲ τὸ πεπεῖσθαι, πειθοῖ δὲ λόγος· τῶν δὲ θηρίων ἐνίοις φαντασία μὲν ὑπάρχει, λόγος δὲ οὔ. 13 φανερὸν τοίνυν, ὅτι οὐδὲ ἡ δόξα μετ' αἰσθή- E σεως, οὐδὲ δι' αἰσθήσεως, οὐδὲ συμπλοκὴ δόξης καὶ αἰσθήσεως, φαντασία ἂν εἴη· διά τε ταῦτα. 14 καὶ δῆλον ὅτι οὐκ ἄλλου τινός ἐστιν ἡ δόξα, ἀλλ' ἐκείνου ἐστὶν οὗ καὶ αἴσθησις· λέγω δὲ, ἐκ τῆς τοῦ λευκοῦ δόξης, καὶ αἰσθήσεως ἡ συμπλοκὴ φαντασία ἐστίν· οὐ γὰρ δὴ ἐκ τῆς * δόξης μὲν τῆς τοῦ ἀγαθοῦ, αἰσθήσεως δὲ τῆς τοῦ λευκοῦ. τὸ οὖν φαίνεσθαι, ἐστὶ τὸ δοξάζειν ὅπερ αἰσθάνεται, μὴ κατὰ συμβεβηκός. 15 φαίνεται δὲ καὶ ψευδῆ, περὶ ὧν ἅμα ὑπόληψιν ἀληθῆ ἔχει·

* κ. δ. μ. τ. λευκοῦ, αἰσθήσεως δὲ τῆς τοῦ ἀγαθοῦ.

A δὲ φαίνεται μὲν ὁ ἥλιος ποδιαῖος. πεπίστευται δὲ εἶναι μείζων τῆς οἰκουμένης· συμβαίνει οὖν, ἤτοι ἀποβεβληκέναι τὴν ἑαυτοῦ ἀληθῆ δόξαν, ἣν εἶχε σωζομένου τοῦ πράγματος, μὴ ἐπιλαθόμενον, μηδὲ μεταπεισθέντα· ἢ εἰ ἔτι ἔχει, ἀνάγκη τὴν αὐτὴν ἀληθῆ εἶναι καὶ ψευδῆ. ἀλλὰ ψευδὴς ἐγένετο, ὅτε λάθοι μεταπεσὸν τὸ πρᾶγμα. οὐκ ἄρα ἕν τι τούτων ἐστὶν, οὐδ' ἐκ τούτων ἡ φαντασία. 16 ἀλλ' ἐπειδή ἐστι κινηθέντος τουδὶ κινεῖσθαι ἕτερον ὑπὸ τούτου· ἡ δὲ φαντασία, κίνησίς τις δοκεῖ εἶναι, καὶ οὐκ ἄνευ αἰσθήσεως γίνεσθαι, ἀλλ' αἰσθανομένοις, καὶ ὧν αἴσθησίς ἐστι· ἔστι δὲ γίνεσθαι κίνησιν ὑπὸ τῆς ἐνεργείας τῆς αἰσθήσεως, καὶ ταύτην ὁμοίαν ἀνάγκη εἶναι τῇ αἰσθήσει· εἴη ἂν αὕτη ἡ κίνησις οὔτε ἄνευ αἰσθήσεως ἐνδεχομένη, οὔτε μὴ αἰσθανομένοις ὑπάρχειν. 17 καὶ πολλὰ κατ' αὐτὴν καὶ ποιεῖν καὶ πάσχειν τὸ ἔχον. 18 καὶ εἶναι καὶ ἀληθῆ καὶ ψευδῆ. τοῦτο δὲ συμβαίνει διὰ τάδε· ἡ αἴσθησις τῶν μὲν ἰδίων ἀληθής ἐστιν, ἢ* ὅτι ὀλίγιστον ἔχουσα τὸ ψεῦδος. δεύτερον δὲ, τοῦ συμβεβηκέναι ταῦτα· καὶ ἐνταῦθα ἤδη ἐνδέχεται διαψεύδεσθαι. ὅτι μὲν γὰρ λευκὸν, οὐ διαψεύδεται· εἰ δὲ τοῦτο τὸ λευκὸν ἢ ἄλλο τι, ψεύδεται. τρίτον δὲ, τῶν κοινῶν καὶ ἑπομένων τοῖς συμβεβηκόσιν, οἷς ὑπάρχει τὰ ἴδια· λέγω δὲ, οἷον κίνησις καὶ μέγεθος, ἃ συμβέβηκε τοῖς αἰσθητοῖς, περὶ ἃ μάλιστα ἤδη ἐστὶν ἀπατηθῆναι κατὰ τὴν αἴσθησιν. 19 ἡ δὲ κίνησις ἡ ὑπὸ τῆς ἐνεργείας γινομένη, διοίσει τῆς αἰσθήσεως τῆς ἀπὸ τούτων τῶν τριῶν αἰσθήσεων. καὶ ἡ μὲν πρώτη, παρούσης τῆς αἰσθήσεως ἀληθής· αἱ δ' ἕτεραι, καὶ παρούσης, καὶ ἀπούσης, εἶεν ἂν ψευδεῖς, καὶ μάλιστα, ὅταν πόρρω* τὸ αἰσθητήριον ᾖ. 20 εἰ οὖν μηδὲν μὲν ἄλλο ἔχει τὰ εἰρημένα, ἢ μὴ φαντασίαν· τοῦτο δ' ἐστὶ τὸ λεχθέν· ἡ φαντασία ἂν εἴη κίνησις ὑπὸ τῆς αἰσθήσεως τῆς κατ' ἐνέργειαν γιγνομένης. 21 ἐπεὶ δὲ ἡ ὄψις μάλιστα αἴσθησίς ἐστι, καὶ τὸ ὄνομα ἀπὸ τοῦ φάους εἴληφεν, ὅτι ἄνευ φωτὸς οὐκ ἔστιν ἰδεῖν. 22 καὶ διὰ τὸ ἐμμένειν καὶ ὁμοίας εἶναι ταῖς αἰσθήσεσι, πολλὰ κατ' αὐτὰς πράττει τὰ ζῷα, τὰ μὲν διὰ τὸ μὴ ἔχειν νοῦν, οἷον τὰ θηρία· τὰ δὲ διὰ τὸ ἐπικαλύπτεσθαι τὸν νοῦν ἐνίοτε D πάθει, ἢ νόσοις, ἢ ὕπνῳ, οἷον οἱ ἄνθρωποι. 23 περὶ μὲν οὖν φαντασίας, τί ἐστι, καὶ διὰ τί ἐστιν, εἰρήσθω ἐπὶ τοσοῦτον.

* γρ. [illegible]

* γρ. τὸ αἰσθητόν

A vt puta videtur Sol eſſe vnius pedis: ſed perſuaſum eſt, *eum* eſſe orbe terrarum maiorem. accidit igitur, vt vel abiecerit ſuam opinionem, quam veram habebat, ſalua re, non oblitus, nec diſſuaſus: vel ſi adhuc habet, neceſſe *eſt* eandem opinionem eſſe veram & falſam. ſed falſa fit, cùm res mutata latuerit. ergo phantaſia nec eſt vnum quiddam horum, nec ex his. 16 Sed cùm hoc moto poſſit alterum ab hoc moueri: phantaſia verò videatur eſſe motus quidam, & ſine ſenſu non fieri, ſed ſentientibus, & quarum rerum ſenſus ſunt: poſſit autem fieri motus ab actu ſenſus: & neceſſe *ſit* hunc *motum* eſſe ſimilem ſenſui: profectò hic motus nec poteſt eſſe ſine ſenſu, nec ineſſe iis quæ non ſentiunt. 17 Et *hinc fit vt* quod *eum* habet, multa B ſecundùm eum & faciat & patiatur. 18 Et *vt* ſit & verus & falſus. hoc autem propter hæc accidit: Senſus propriorum quidem obiectorum eſt verus, aut quàm minimum habet falſitatis. ſecundò autem *ſenſus eſt* eius cui hæc accidunt: atque hic iam poteſt eſſe falſus. nam quòd album *ſit*, non fallitur: ſed vtrùm album illud, *ſit* hoc, an aliud quidpiam, fallitur. tertiò eſt communium & conſequentium accidentia, quibus inſunt propria. verbi gratia, motus & magnitudo accidunt *rebus* ſenſibilibus, in quibus iam maximè fit deceptio ſecundùm ſenſum. 19 Iam verò motus qui ab actu fit, *id eſt* ab his tribus ſenſibus, differt à ſenſu. & primus quidem præſente ſenſu eſt verus: alij au-C tem *eo* & præſente & abſente poſſunt eſſe falſi, maximè cùm ſenſibile eſt procul. 20 Si igitur nihil aliud habet ea quæ dicta ſunt, quàm phantaſia: hoc autem eſt quod dictum fuit: phantaſia vtique erit motus factus à ſenſu qui eſt ſecundùm actum. 21 Quoniam autem aſpectus eſt maximè ſenſus, etiam nomen *phantaſia* ſumſit ἀπὸ τοῦ φάους, *id eſt*, *à lumine*, quia ſine lumine non poteſt videri. 22 Et quia immanent & ſimiles ſunt ſenſibus, multa ſecundùm eas agunt animalia: alia quidem, quia non habent intellectum, vt beſtiæ, alia verò, quia intellectus interdum obruitur perturbatione, aut morbo, aut ſomno, vt homines. 23 Itaque de phantaſia, quid ſit, & quamobrem ſit, hactenus di-D ctum eſto.

De intellectu patiente. Cap. V.

Περὶ δὲ τοῦ μορίου τοῦ τῆς ψυχῆς, ᾧ γινώσκει τε ἡ ψυχὴ καὶ φρονεῖ, εἴτε χωριστοῦ ὄντος, εἴτε καὶ μὴ χωριστοῦ κατὰ μέγεθος, ἀλλὰ κατὰ λόγον, σκεπτέον τίν' ἔχει διαφορὰν, καὶ πῶς ποτὲ γίνεται τὸ νοεῖν. 23 εἰ δή ἐστι τὸ νοεῖν ὥσπερ τὸ αἰσθάνεσθαι, ἢ πάσχειν τι ἂν εἴη E ὑπὸ τοῦ νοητοῦ, ἤ τι τοιοῦτον ἕτερον. 3 ἀπαθὲς ἄρα δεῖ εἶναι, δεκτικὸν δὲ τοῦ εἴδους, καὶ δυνάμει τοιοῦτον· ἀλλὰ μὴ τοῦτο· καὶ ὁμοίως ἔχειν, ὥσπερ τὸ αἰσθητικὸν πρὸς τὰ αἰσθητὰ, οὕτω τὸν νοῦν πρὸς τὰ νοητά. 4 ἀνάγκη ἄρα, ἐπεὶ πάντα νοεῖ, ἀμιγῆ εἶναι, ὥσπερ φησὶν Ἀναξαγόρας, ἵνα κρατῇ· τοῦτο δ' ἐστὶν, ἵνα γνωρίζῃ· παρεμφαινόμενον γὰρ κωλύει τὸ ἀλλότριον, καὶ ἀντιφράττει. 5 ὥστε μηδ' αὐτοῦ εἶναι φύσιν τινὰ μηδεμίαν, ἀλλ' ἢ ταύτην, ὅτι δυνατόν. ὁ ἄρα καλούμενος τῆς ψυχῆς νοῦς·

De parte autem animæ, qua cognoſcit anima & prudentis munere fungitur, ſiue ſeparabilis ſit, ſiue non ſeparabilis magnitudine, ſed ratione, conſiderandum *eſt* quam habeat differentiam, & quonam modo fiat, intelligere. 2 Ergo ſi intelligere eſt vt ſentire: aut pati quiddam fuerit ab E intelligibili, aut aliquid aliud eiuſmodi. 3 Impatibile igitur eſſe oportet, ſed aptum ad recipiendam ſpeciem: & poteſtate tale, non tamen hoc: & ſimiliter habere, vt ſenſitiuum ad ſenſibilia, ita intellectum ad intelligibilia. 4 Neceſſe *eſt* igitur, *eum* quia omnia intelligit, eſſe non mixtum, ſicut ait Anaxagoras, vt ſuperet: hoc autem eſt, vt cognoſcat. quod enim intus apparet, prohibet alienum, atque obſtruit. 5 Adeo vt non ſit eius vlla alia natura, quàm hæc, vt ſit poſſibilis. Qui igitur vocatur animæ intellectus,

(is, inquam, intellectus, quo anima ratiocinatur & exiſtimat) nihil actu eſt eorum quæ ſunt antequam intelligat. 6 Idcirco non eſt rationi conſentaneum, eum eſſe mixtum cum corpore: quia fieret qualis quidam, *vt* calidus aut frigidus: & poſſet eſſe aliquod eius inſtrumentum, vt ſenſitiuo: nunc verò nullum *eius inſtrumentum* eſt. 7 Rectè igitur inquiunt, qui dicunt animam eſſe locum ſpecierum: præterquam quod nec tota, ſed intellectiua: nec actu, ſed poteſtate *eſt* ſpecies illæ. 8 Porrò non eſſe ſimilem impatibilitatem ſenſitiui & intellectiui, perſpicuum *eſt* in ſenſoriis & ſenſu. nam ſenſus non poteſt ſentire poſt vehemens ſenſibile: (vt ſonum poſt magnos ſonos: nec poſt vehementes odores, vel colores, aut videre, aut olfacere) ſed intellectus cùm intellexerit aliquid valde intelligibile, nihilominus intelligit inferiora, immo etiam magis: quia ſenſitiuum non *eſt* ſine corpore: intellectus autem *eſt* ſeparabilis. 9 Quando autem ſic factus eſt ſingula, vt ſciens dicitur, qui actu *ſcit*: (hoc autem euenit, cùm poteſt per ſe operari) tunc quoque ſimiliter eſt quodammodo poteſtate, non tamen eodem modo, vt antequam diſceret, vel inueniret: & ipſe ſeipſum tunc poteſt intelligere.

10 Cùm autem aliud ſit magnitudo, & magnitudinis eſſentia, necnon aqua & aquæ eſſentia: eodémve modo in multis aliis *res habeat*: non tamen in omnibus: in quibuſdam enim idem eſt eſſentia carnis & caro: aut alio, aut aliter habente intellectus diiudicat. nam caro non eſt ſine materia, ſed, vt ſimum, *eſt* hoc in hoc. ſenſitiuo igitur diſcernit calidum, & frigidum, & quorum ratio quædam eſt caro: alio autem (vel ſeparabili vel vt linea inflexa ſe habet ad ſe ipſam cùm extenſa fuerit) eſſentiam carnis diſcernit. 11 Rurſus in iis quæ in abiunctione conſiſtunt, rectum *eſt* vt ſimum: quoniam *eſt* cum continuo. quidditatem autem, ſi aliud eſt recti eſſentia & rectum alio *diſcernit*. Eſto namque dualitas. alio igitur, vel aliter habente diſcernit. omnino igitur vt res *ſunt* ſeparabiles à materia, ita etiam intellectus. 12 Dubitare autem quiſpiam poſſit, ſi intellectus eſt *quid* ſimplex, & impatibile, & nihil cum quoquam commune habet, vt inquit Anaxagoras, quomodo intelliget, ſi intelligere eſt pati quiddam. nam quatenus aliquid vtriſque commune eſt, alterum videtur facere, alterum pati.

13 Præterea an ipſe quoque ſit intelligibilis. aut enim etiam aliis intellectus inerit, ſi ipſe non eſt per aliud intelligibilis, intelligibile autem *eſt* vnũ quiddã ſpecie: aut mixtum aliquid habebit, quod faciat eum intelligibilẽ, vt cetera. 14 An pati quidem *eſt* ſecundùm aliquid commune. idcirco dictum eſt antea, intellectum poteſtate quodammodo eſſe intelligibilia, ſed actu nullum *eorum eſſe*, antequam intelligat. Sic autem oportet, vt in codice, in quo nihil ſit actu ſcriptum. quod quidem euenit in intellectu. 15 Ipſe quoque eſt intelligibilis, vt intelligibilia. nam in iis quæ ſunt ſine materia, idem eſt intelligens & quod intelligitur. ſcientia namque contemplatiua, & ſcibile, idem eſt. cur autem non ſemper intelligat, cauſſa *eſt* conſideranda. ſed in iis quæ habent materiam, ſingula intelligibilia ſunt tantùm poteſtate. Quapropter iis non inerit intellectus: quoniam talium intellectus eſt poteſtas ſine materia. ei verò intelligibile inerit.

A (λέγω δὲ νοῦν, ᾧ διανοεῖται καὶ ὑπολαμβάνει ἡ ψυχή) οὐδέν ἐστιν ἐνεργείᾳ τῶν ὄντων πρὶν νοεῖν. 6 διὸ οὐδὲ μεμῖχθαι εὔλογον αὐτὸν τῷ σώματι· ποιός γὰρ ἄν τις γίγνοιτο, θερμὸς ἢ ψυχρός, κἂν ὀργανόν τι εἴη, ὥσπερ τῷ αἰσθητικῷ· νῦν δὲ οὐδέν ἐστι. 7 καὶ εὖ δὴ οἱ λέγοντες τὴν ψυχὴν εἶναι τόπον εἰδῶν, πλὴν ὅτι οὔτε ὅλη, ἀλλ' ἡ νοητική, οὔτε ἐντελεχείᾳ, ἀλλὰ δυνάμει τὰ εἴδη. 8 ὅτι δ' οὐχ ὁμοία ἡ ἀπάθεια τοῦ αἰσθητικοῦ καὶ τοῦ νοητικοῦ, φανερὸν ἐπὶ τῶν αἰσθητηρίων καὶ τῆς αἰσθήσεως. ἡ μὲν γὰρ αἴσθησις οὐ δύναται αἰσθάνεσθαι ἐκ τοῦ σφόδρα αἰσθητοῦ, οἷον ψόφου ἐκ τῶν μεγάλων ψόφων, οὐδ' ἐκ τῶν ἰσχυρῶν ὀσμῶν καὶ χρωμάτων, οὔτε ὁρᾶν οὔτε ὀσμᾶσθαι. ἀλλ'
B ὁ νοῦς ὅταν τι νοήσῃ σφόδρα νοητόν, οὐχ ἧττον νοεῖ τὰ ὑποδεέστερα, ἀλλὰ καὶ μᾶλλον· τὸ μὲν γὰρ αἰσθητικὸν οὐκ ἄνευ σώματος, ὁ δὲ νοῦς χωριστός. 9 ὅταν δ' οὕτως ἕκαστα γένηται, ὡς ἐπιστήμων λέγεται ὁ κατ' ἐνέργειαν· τοῦτο δὲ συμβαίνει, ὅταν δύνηται ἐνεργεῖν δι' αὑτοῦ. ἔστι μὲν ὁμοίως, καὶ τότε δυνάμει πως· οὐ μὴν ὁμοίως, καὶ πρὶν μαθεῖν ἢ εὑρεῖν· καὶ αὐτὸς δὲ αὑτὸν τότε δύναται νοεῖν.

10 ἐπεὶ δ' ἄλλο ἐστὶ τὸ μέγεθος καὶ τὸ μεγέθει εἶναι, καὶ ὕδωρ καὶ τὸ ὕδατι εἶναι· οὕτω δὲ καὶ ἐφ' ἑτέρων πολλῶν, ἀλλ' οὐκ ἐπὶ πάντων· ἐπ' ἐνίων γὰρ ταὐτόν ἐστι τὸ σαρκὶ εἶναι καὶ
C σάρκα, ἢ ἄλλῳ, ἢ ἄλλως ἔχοντι* κρίνει· ἡ γὰρ σὰρξ οὐκ ἄνευ τῆς ὕλης· ἀλλ' ὥσπερ τὸ σιμόν, τόδε ἐν τῷδε. τῷ μὲν οὖν αἰσθητικῷ τὸ θερμὸν καὶ τὸ ψυχρὸν κρίνει, καὶ ὧν λόγος τις ἡ σάρξ· ἄλλῳ δὲ ἤτοι χωριστῷ, ἢ ὡς ἡ κεκλασμένη ἔχει πρὸς αὑτὴν ὅταν ἐκταθῇ· τὸ γὰρ σαρκὶ εἶναι, καὶ κρίνει. 11 πάλιν δ' ἐπὶ τῶν ἐν ἀφαιρέσει ὄντων, τὸ εὐθὺ ὡς τὸ σιμόν· μετὰ συνεχοῦς γάρ· τὸ δὲ τί ἦν εἶναι, εἰ ἔστιν ἕτερον τὸ εὐθεῖ εἶναι, καὶ τὸ εὐθὺ ἄλλῳ· ἔστω γὰρ δυάς. ἑτέρῳ ἄρα, ἢ ἑτέρως ἔχοντι κρίνει. καὶ ὅλως ἄρα ὡς χωριστὰ τὰ πράγματα τῆς ὕλης, οὕτω καὶ τὰ περὶ τὸν νοῦν.

12 ἀπορήσειε δ' ἄν τις εἰ ὁ νοῦς ἁπλοῦν ἐστι, καὶ ἀπαθές,
D καὶ μηδενὶ μηδὲν ἔχει κοινόν, ὥσπερ φησὶν Ἀναξαγόρας, πῶς* νοήσειεν, εἰ τὸ νοεῖν πάσχειν τί ἐστιν. ᾗ γάρ τι κοινὸν ἀμφοῖν ὑπάρχει, τὸ μὲν ποιεῖν δοκεῖ, τὸ δὲ πάσχειν.

13 ἔτι δ' εἰ νοητὸς καὶ αὐτός· ἢ γὰρ καὶ τοῖς ἄλλοις ὁ νοῦς ὑπάρξει, εἰ μὴ κατ' ἄλλο αὐτὸς νοητός. ἓν δέ τι τὸ νοητὸν εἴδει, ἢ μεμιγμένον τι ἕξει, ὃ ποιεῖ νοητὸν αὐτὸν ὥσπερ τὰ ἄλλα. 14 ἢ τὸ μὲν πάσχειν κατὰ κοινόν τι. διὸ διῄρηται πρότερον, ὅτι δυνάμει πως ἐστὶ τὰ νοητὰ ὁ νοῦς· ἀλλ' ἐντελεχείᾳ οὐδέν, πρὶν ἂν μὴ νοῇ. δεῖ δ' οὕτως, ὥσπερ ἐν γραμματείῳ ᾧ μηδὲν ὑπάρχει ἐντελεχείᾳ γεγραμμένον. ὅπερ συμβαίνει ἐπὶ τοῦ νοῦ. 15 καὶ αὐτὸς δὲ νοητός
E ἐστιν, ὥσπερ τὰ νοητά. ἐπὶ μὲν γὰρ τῶν ἄνευ ὕλης, τὸ αὐτό ἐστι τὸ νοοῦν, καὶ τὸ νοούμενον· ἡ γὰρ ἐπιστήμη ἡ θεωρητική, καὶ τὸ ἐπιστητὸν τὸ αὐτό ἐστι. τοῦ δὲ μὴ ἀεὶ νοεῖν τὸ αἴτιον ἐπισκεπτέον. ἐν δὲ τοῖς ἔχουσιν ὕλην, δυνάμει μόνον ἕκαστόν ἐστι τῶν νοητῶν. ὥστ' ἐκείνοις μὲν οὐχ ὑπάρξει νοῦς. ἄνευ γὰρ ὕλης δύναμίς ἐστιν ὁ νοῦς τῶν τοιούτων. ἐκείνῳ δὲ τὸ νοητὸν ὑπάρξει.

* γρ. κρίνει ὁ νοῦς.

* γρ. νοήσει.

De intellectu agente. Cap. VI.

A ἘΠεὶ δ' ὥσπερ ἐν ἁπάσῃ τῇ φύσει ἐστί τι, τὸ μὲν ὕλη ἑκάστῳ γένει· τοῦτο δέ, ὅτι πάντα, δυνάμει ἐκεῖνα· ἕτερον δὲ τὸ αἴτιον καὶ ποιητικόν, τῷ ποιεῖν πάντα, οἷον ἡ τέχνη πρὸς τὴν ὕλην πέπονθεν, ἀνάγκη καὶ ἐν τῇ ψυχῇ ὑπάρχειν ταύτας τὰς διαφοράς· καὶ ἔστιν ὁ μὲν τοιοῦτος νοῦς, τῷ πάντα γίνεσθαι· ὁ δέ, τῷ πάντα ποιεῖν, ὡς ἕξις τις, οἷον τὸ φῶς· τρόπον γάρ τινα καὶ τὸ φῶς ποιεῖ τὰ δυνάμει ὄντα χρώματα ἐνεργείᾳ χρώματα. 2 καὶ οὗτος ὁ νοῦς χωριστός, καὶ ἀμιγής, καὶ ἀπαθὴς τῇ οὐσίᾳ ὢν ἐνεργείᾳ. ἀεὶ γὰρ τιμιώτερον τὸ ποιοῦν τοῦ πάσχοντος, καὶ ἡ ἀρχὴ τῆς ὕλης. B 3 τὸ αὐτὸ δέ ἐστιν ἡ κατ' ἐνέργειαν ἐπιστήμη τῷ πράγματι· ἡ δὲ κατὰ δύναμιν, χρόνῳ προτέρα ἐν τῷ ἑνί. ὅλως δέ, οὐδὲ χρόνῳ· ἀλλ' οὐχ ὁτὲ μὲν νοεῖ, ὁτὲ δὲ οὐ νοεῖ. 4 χωρισθεὶς δέ ἐστι μόνον τοῦθ' ὅπερ ἐστί, καὶ τοῦτο μόνον ἀθάνατον καὶ ἀΐδιον. 5 οὐ μνημονεύομεν δέ, ὅτι τοῦτο μὲν ἀπαθές, ὁ δὲ παθητικὸς νοῦς, φθαρτός, καὶ ἄνευ τούτου οὐθὲν νοεῖ.

QVoniã autẽ vt in vniuerſa natura eſt aliquid, quod *eſt* materia cuique generi *ſubiecta*, (idque quia poteſtate *eſt* omnia illa) alterum verò, quod *eſt* cauſſa, & vim habet efficiendi, quia facit omnia (vt ars ad materiam affecta eſt) neceſſe *eſt* etiam in anima ineſſe has differentias. atque alter eſt talis intellectus, quia omnia fit: alter, quia omnia facit, tamquam habitus quidam, velut lumen: nam quodammodo etiam lumen eos qui ſunt poteſtate colores, facit actu colores. 2 Atque hic intellectus *eſt* ſeparabilis, & non mixtus, & impatibilis, cùm eſſentialiter ſit actus. ſemper enim præſtantius eſt efficiens patiente, & principium materia. 3 Porrò idem eſt ſcientia actu, quod res. *ſcientia* verò quæ *eſt* poteſtate, tempore prior in vno *eſt*: omnino autem ne quidem tempore, ſed non quandoque intelligit, quandoque non intelligit. 4 Separatus autem eſt, ſolùm hoc *ipſum* quod eſt. & hoc ſolùm *eſt* immortale & æternum. 5 Non recordamur autem: quoniam hoc *eſt* quidem impatibile: ſed patibilis intellectus eſt interitui obnoxius, ac ſine hoc nihil intelligit.

De duplici operatione intellectus. Cap. VII.

C ἩΜὲν οὖν τῶν ἀδιαιρέτων νόησις ἐν τούτοις, περὶ ἃ οὐκ ἔστι τὸ ψεῦδος· ἐν οἷς δὲ τὸ ψεῦδος καὶ τὸ ἀληθές, σύνθεσίς τις ἤδη νοημάτων, ὥσπερ ἓν ὄντων. 2 καθάπερ Ἐμπεδοκλῆς ἔφη,

ᾗ πολλῶν μὲν κόρσαι ἀναύχενες ἐβλάστησαν·

ἔπειτα συντίθεσθαι τῇ φιλίᾳ· οὕτω καὶ ταῦτα κεχωρισμένα συντίθεται, οἷον τὸ ἀσύμμετρον, καὶ ἡ διάμετρος. 3 ἂν δὲ γενομένων ἢ ἐσομένων, τὸν χρόνον προσεννοῶν, καὶ συντιθείς· τὸ γὰρ ψεῦδος ἐν συνθέσει ἀεί· καὶ γὰρ ἂν τὸ λευκὸν μὴ λευκόν, τὸ μὴ λευκὸν συνέθηκεν. ἐνδέχεται δὲ καὶ διαίρεσιν φάναι πάντα. ἀλλ' οὖν ἔστι γε οὐ μόνον τὸ ψεῦδος ἢ ἀληθές, ὅτι λευκὸς Κλέων ἐστίν, ἀλλὰ καὶ D ὅτι ἦν, ἢ ἔσται. τὸ δὲ ἓν ποιοῦν, τοῦτο ὁ νοῦς ἕκαστον.

4 τὸ δὲ ἀδιαίρετον ἐπεὶ διχῶς, ἢ δυνάμει, ἢ ἐνεργείᾳ, οὐθὲν κωλύει νοεῖν τὸ ἀδιαίρετον, ὅταν νοῇ τὸ μῆκος· ἀδιαίρετον γὰρ ἐνεργείᾳ, καὶ ἐν χρόνῳ ἀδιαιρέτῳ· ὁμοίως γὰρ ὁ χρόνος διαιρετός, καὶ ἀδιαίρετος τῷ μήκει. οὔκουν ἔστιν εἰπεῖν, ἐν τῷ ἡμίσει τί ἐνοεῖν ἑκατέρῳ· οὐ γὰρ ἔστιν, ἂν μὴ διαιρεθῇ, ἀλλ' ἢ δυνάμει. χωρὶς δὲ ἑκάτερον τῶν ἡμίσεων νοῶν, διαιρεῖ καὶ τὸν χρόνον ἅμα· τότε δὲ οἱονεὶ μήκη. εἰ δὲ ὡς ἐξ ἀμφοῖν, καὶ ἐν τῷ χρόνῳ τῷ ἐπ' ἀμφοῖν. E 5 τὸ δὲ μὴ κατὰ ποσὸν ἀδιαίρετον, ἀλλὰ τῷ εἴδει νοεῖ ἐν ἀδιαιρέτῳ χρόνῳ, καὶ ἀδιαιρέτῳ τῆς ψυχῆς. 6 κατὰ συμβεβηκὸς δέ, καὶ οὐχ ᾗ ἐκεῖνα διαιρετά, ὃ νοεῖ καὶ ἐν ᾧ χρόνῳ, ἀλλ' ᾗ ἀδιαίρετα· ἔνεστι γὰρ κἀν τούτοις τι ἀδιαίρετον, ἀλλ' ἴσως οὐ χωριστόν, ὃ ποιεῖ ἕνα τὸν χρόνον καὶ τὸ μῆκος,

INdiuiduorum igitur intellectio in iis *ſpectatur*, in quibus non eſt falſitas. in quibus autem eſt falſitas & veritas, iam *eſt* compoſitio quædam conceptuum, quaſi vnum ſint. 2 Quemadmodum Empedocles ait,

Certè multorum capita ſine ceruicibus pullularunt,

deinde componi amicitia: ita etiam hæc ſeparata componuntur, vt aſymmetrum & diameter.
3 Quòd ſi præteritorum aut futurorum *intellectio ſit*, tempus inſuper intelligit & componit. falſitas enim ſemper in compoſitione *conſiſtit*. nam & ſi *aſſerat* album non *eſſe* album, illud non album compoſuit. licet autem & diuiſionem omnia dicere. verum enimvero non ſolùm falſum aut verum eſt, Cleonem eſſe album, ſed etiam fuiſſe, aut fore. quod verò quæque vnum facit, id *eſt* intellectus.
4 Indiuiduum autem cùm bifariàm *dicatur, id eſt*, vel poteſtate vel actu: nihil prohibet quominus *intellectus* intelligat indiuiduum, quando intelligit longitudinem. quoniam eſt indiuiduum actu: & in tempore indiuiduo, quia ſimiliter tempus *eſt* diuiduum & indiuiduum, vt longitudo. non licet igitur dicere, quid in vtraque dimidia parte intelligat: quandoquidem ſi non diuidatur, non eſt niſi poteſtate. ſeparatim verò cùm vtrumque dimidium intelligit, ſimul etiam diuidit tempus: ſed tunc *intelligit* quaſi longitudines. quòd ſi *intelligat* quaſi *compoſitum* ex vtriſque, *profectò intelliget* etiam eo tempore quod *eſt* in vtriſque. 5 Quod autem *eſt* indiuiduum, non quantitate, ſed forma, intelligit in indiuiduo tempore, & indiuiduâ parte animæ. 6 Ex accidenti autem: nec quatenus ea ſunt diuidua, quod intelligit, & quo tempore; ſed quatenus indiuidua. ineſt enim etiam in his aliquid indiuiduum, ſed fortaſſe non ſeparabile, quod efficit vt tempus ſit vnum, & longitudo *vna*.

atque hoc ſimiliter eſt in omni continuo & tempore & longitudine. 7 Punctum verò, & omnis diuiſio, & quod ita *eſt* indiuiduum, notificatur vt priuatio. ſimilisque ratio eſt in aliis: veluti quomodo malum cognoſcit aut nigrum: nam contrario quodammodo cognoſcit. 8 Oportet autem, vt id quod cognoſcit, poteſtate ſit, & vnum ſit in ipſo. ſi cui verò non eſt contrarium in cauſſa, ipſum ſe ipſum cognoſcit & actu eſt, atque ſeparabile. 9 Porrò dictio eſt aliquid de aliquo, vt affirmatio: & omnis *eſt* vera aut falſa. intellectus autem non omnis, ſed intellectus ipſius quid eſt, ſecundùm quidditatem *eſt* verus, non aliquid de aliquo. ſed vt aſpectus proprij *obiecti eſt* verus: an autem album illud *ſit* homo nec ne, non *eſt* ſemper verus: ita *etiam* ſe habent, quæcumque materia vacant.

A καὶ τοῦτο ὁμοίως ἐν ἅπαντι ἐστὶ τῷ συνεχεῖ καὶ χρόνῳ, ἐν μήκει. 7 ἡ δὲ στιγμὴ, καὶ πᾶσα διαίρεσις, καὶ τὸ οὕτως ἀδιαίρετον, δηλοῦται, ὥσπερ ἡ στέρησις. καὶ ὅμοιος ὁ λόγος ἐπὶ τῶν ἄλλων· οἷον, πῶς τὸ κακὸν γνωρίζει, ἢ τὸ μέλαν. τῷ ἐναντίῳ γάρ πως γνωρίζει. 8 δεῖ δὲ δυνάμει εἶναι τὸ γνωρίζον, καὶ ἓν εἶναι ἐν αὐτῷ. εἰ δέ τινι μή ἐστιν ἐναντίον τῶν αἰτίων, αὐτὸ ἑαυτὸ γινώσκει, καὶ ἐνέργειά ἐστι καὶ χωριστόν. 9 ἔστι δὴ ἡ μὲν φάσις τι κατά τινος, ὥσπερ ἡ κατάφασις, καὶ ἀληθὴς ἢ ψευδὴς πᾶσα· ὁ δὲ νοῦς οὐ πᾶς, ἀλλ' ὁ τοῦ τί ἐστι κατὰ τὸ τί ἦν εἶναι ἀληθὴς, καὶ οὐ τὶ κατά τινος· ἀλλ' ὥσπερ τὸ ὁρᾶν τοῦ ἰδίου ἀληθές. εἰ δ' ἄνθρωπος τὸ λευκὸν ἢ μὴ, οὐκ ἀληθὲς ἀεί· οὕτω δὲ ἔχει ὅσα ἄνευ τῆς ὕλης.

De intellectu practico, & eius diſtinctione à contemplatiuo. Cap. VIII.

IAm verò ſcientia quæ *eſt* actu, idem eſt quod res. ſed quæ *eſt* poteſtate, tempore prior eſt in vno. omnino autem ne quidem tempore: nam quæcumque fiunt, ex eo ſunt quod eſt actu.* 2 Apparet autem, ſenſibile ex eo quod poteſtate *eſt* ſenſitiuum, efficere actu *ſenſitiuum*: non enim patitur, nec variatur. quapropter hæc *eſt* alia ſpecies motus: quandoquidem motus erat actus imperfecti: actus verò qui ſimpliciter *eſt*, alius *eſt*, *nempe is qui eſt* perfecti. 3 Ergo ſentire *eſt* ſimile dictioni ſoli, & intellectioni. cùm autem iucundum aut moleſtum *percepit*; quaſi affirmaſſet aut negaſſet, perſequitur vel fugit. 4 Ac voluptate & dolore affici *nihil aliud* eſt, *quàm* operari ſenſitiua medietate erga bonum vel malum, quà ſunt talia. & fuga igitur & appetitio quæ eſt actu, hoc *ipſum eſt*: nec diuerſa ſunt appetitiuum & fugitiuum, nec inter ſe, nec à ſenſitiuo: ſed eſſentia alia *eſt*. 5 Animæ verò dianoëticæ phantaſmata ſunt, veluti ſenſibilia. cùm autem malum aut bonum affirmarit vel negarit, fugit aut perſequitur. Quapropter numquam hæc anima intelligit ſine phantaſmate. 6 Porrò ſicut aër pupillam talem fecit, hæc verò aliud: ſic etiam auditus. vltimum verò *eſt* vnum, & vna medietas: ſed eſſentia ipſius eſt plura. quo autem diſcernit, quatenus differant dulce & calidum, dictum quidem & antea fuit, ſed nunc quoque dicendum eſt. nam eſt vnum quiddam, ſic autem vt terminus. 7 Atque hæc ſunt vnum proportione & numero, quem habent ad vtrumque, vt illa inter ſe. quid enim refert hoc dubitare, quomodo homogenea iudicat, ſeu contraria, vt album & nigrum? Eſto igitur vt α, *id eſt* album, ad β *id eſt* nigrum, ita γ ad δ, vt (*inquam*) illa inter ſe. quapropter etiam commutato ordine. ſi igitur γ δ vni inſint: ita *ea* habebit vnum & idem, vt α β: ſed eſſentia non *eſt* eadem. & illud ſimiliter. Eadem ratio *eſt*, etiam ſi α ſit dulce, ac β album. 8 Species igitur intellectiuum in phantaſmatibus intelligit. & vt in illis definitum ei eſt, *quod eſt* perſequendum & fugiendum, etiam quod eſt extra ſenſum, quando eſt in phantaſmatibus, mouetur. vt ſentiens facem, *ſenſu* communi cognoſcit eſſe ignem: & videns *eam* moueri, *cognoſcit* eſſe hoſtem. quandoque verò in phantaſmatibus ſeu conceptibus qui *ſunt* in anima, quaſi cernens, ratiocinatur & conſultat de futuris, *reſpiciens* ad præſentia. & cùm dixerit: vt illic *eſt* iucundum aut moleſtum, *ita* hîc fugit aut perſequitur, & omnino in actione *eſt*.

B Τὸ αὐτὸ δ' ἐστὶν ἡ κατ' ἐνέργειαν ἐπιστήμη τῷ πράγματι. ἡ δὲ κατὰ δύναμιν, χρόνῳ προτέρα ἐν τῷ ἑνί. ὅλως δὲ οὐδὲ χρόνῳ· ἔστι γὰρ ἐξ ἐντελεχείας ὄντος πάντα τὰ γιγνόμενα. 2 φαίνεται δὲ τὸ μὲν αἰσθητὸν, ἐκ δυνάμει ὄντος τοῦ αἰσθητικοῦ, ἐνεργείᾳ ποιοῦν· οὐ γὰρ πάσχει, οὐδ' ἀλλοιοῦται. διὸ ἄλλο εἶδος τοῦτο κινήσεως· ἡ γὰρ κίνησις, τοῦ ἀτελοῦς ἐνέργεια ἦν. ἡ δ' ἁπλῶς ἐνέργεια ἑτέρα ἡ τοῦ τετελεσμένου. 3 τὸ μὲν οὖν αἰσθάνεσθαι, ὅμοιον τῷ φάναι μόνον, καὶ νοεῖν. ὅταν δὲ ἡδὺ ἢ λυπηρὸν, οἷον καταφᾶσα, ἢ ἀποφᾶσα, διώκει ἢ φεύγει. 4 καὶ ἔστι τὸ ἥδεσθαι καὶ λυπεῖσθαι, τὸ ἐνεργεῖν τῇ αἰσθητικῇ C μεσότητι πρὸς τὸ ἀγαθὸν ἢ κακὸν, ᾗ τοιαῦτα. καὶ ἡ φυγὴ δὴ καὶ ἡ ὄρεξις τοῦτο ἡ κατ' ἐνέργειαν· καὶ οὐχ ἕτερον τὸ ὀρεκτικὸν καὶ φευκτικὸν, οὔτε ἀλλήλων, οὔτε τοῦ αἰσθητικοῦ· ἀλλὰ τὸ εἶναι ἄλλο. 5 τῇ δὲ διανοητικῇ ψυχῇ τὰ φαντάσματα οἷον αἰσθήματα ὑπάρχει. ὅταν δὲ ἀγαθὸν ἢ κακὸν φήσῃ ἢ ἀποφήσῃ, φεύγει ἢ διώκει. διὸ οὐδέποτε νοεῖ ἄνευ φαντάσματος ἡ ψυχή. 6 ὥσπερ δὲ ὁ ἀὴρ τὴν κόρην τοιανδὶ ἐποίησεν, αὕτη δὲ ἕτερον, καὶ ἡ ἀκοὴ ὡσαύτως· τὸ δὲ ἔσχατον ἕν, καὶ μία μεσότης· τὸ δ' εἶναι αὐτῇ πλείω. τίνι δ' ἐπικρίνει,* ᾗ διαφέρει γλυκὺ καὶ θερμὸν, εἴρηται μὲν καὶ πρότερον, λεκτέον δὲ καὶ νῦν. D ἔστι γὰρ ἕν τι· οὕτω δὲ καὶ ὡς ὅρος. 7 καὶ ταῦτα ἓν τῷ ἀνάλογον καὶ τῷ ἀριθμῷ, ὃ ἔχει πρὸς ἑκάτερον, ὡς ἐκεῖνα πρὸς ἄλληλα· τί γὰρ διαφέρει τὸ ἀπορεῖν, πῶς τὰ ὁμογενῆ κρίνει, ἢ τἀναντία, οἷον λευκὸν καὶ μέλαν; ἔστω δὴ ὡς τὸ α τὸ λευκὸν, πρὸς τὸ β τὸ μέλαν, τὸ γ πρὸς τὸ δ, ὡς ἐκεῖνα πρὸς ἄλληλα· ὥστε καὶ ἐναλλάξ. εἰ δὴ τὰ γ δ ἑνὶ εἴη ὑπάρχοντα, οὕτως ἕξει ὥσπερ καὶ τὰ α β, τὸ αὐτὸ μὲν καὶ ἓν, τὸ δ' εἶναι οὐ τὸ αὐτό, κἀκεῖνο ὁμοίως. ὁ δ' αὐτὸς λόγος, κἂν εἰ μὲν τὸ α τὸ γλυκὺ εἴη, τὸ δὲ β τὸ λευκόν. 8 τὰ μὲν οὖν εἴδη τὸ νοητικὸν ἐν τοῖς φαντάσμασι νοεῖ, καὶ ὡς ἐν ἐκείνοις ὥρισται αὐ- E τῷ τὸ διωκτὸν καὶ φευκτὸν, καὶ * ἐκτὸς τῆς αἰσθήσεως, ὅταν ἐπὶ τῶν φαντασμάτων ᾖ, κινεῖται, οἷον αἰσθανόμενος τὸ * φευκτὸν, ὅτι πῦρ τῇ * κινήσει γνωρίζει, ὁρῶν κινούμενον, ὅτι πολέμιος· ὁτὲ δ' ἐν τοῖς ἐν τῇ ψυχῇ φαντάσμασιν ἢ νοήμασιν, ὥσπερ ὁρῶν λογίζεται καὶ βουλεύεται τὰ μέλλοντα πρὸς τὰ παρόντα· καὶ ὅταν εἴπῃ, ὡς ἐκεῖ τὸ ἡδὺ ἢ λυπηρὸν, ἐνταῦθα φεύγει ἢ διώκει, καὶ ὅλως ἐν πράξει.

* γρ. ᾧ τί δ.
* κ. ἀπὸς
* γρ. φρυκτὸν.
* κοινῇ

A 9 καὶ τὸ ἄνευ δὲ πράξεως, καὶ τὸ ἀληθὲς, καὶ τὸ ψεῦδος ἐν τῷ αὐτῷ γένει ἐστὶ, τῷ ἀγαθῷ καὶ κακῷ. 10 ἀλλὰ τῷ γε ἁπλῶς διαφέρει, καὶ τινί. 11 τὰ δὲ ἐν ἀφαιρέσει λεγόμενα, νοεῖ, ὥσπερ ἂν εἰ τὸ σιμὸν, ᾗ μὲν σιμὸν, οὐ κεχωρισμένως· ᾗ δὲ κοῖλον, εἴ τις ἐνόει ἐνεργείᾳ, ἄνευ τῆς σαρκὸς ἂν ἐνόει ἐν ᾗ τὸ κοῖλον. οὕτω τὰ μαθηματικὰ οὐ * κεχωρισμένα ὡς κεχωρισμένα νοεῖ, ὅταν νοῇ ἐκεῖνα. 12 ὅλως δὲ ὁ νοῦς ἐστιν ὁ κατ' ἐνέργειαν τὰ πράγματα * νοῶν. 13 ἆρα δὲ ἐνδέχεται τῶν κεχωρισμένων τι νοεῖν, ὄντα αὐτὸν μὴ κεχωρισμένον μεγέθους, ἢ οὔ, σκεπτέον ὕστερον.

* κεχωρισμένα ὄντα.

9 Quinetiam & verum & falſum, quod *eſt* ſine actionē, eſt in eodem genere, in quo bonum & malum. 10 Sed *eo* differunt: quòd *alterum* eſt ſimpliciter, *alterum* alicui. 11 Sed *& ea*, quæ in abiunctione dicuntur, intelligit, quemadmodum ſi intelligat ſimum, quatenus eſt ſimum, non ſeparatim *intelligit*. ſi quid autem, quatenus curuum, actu intelligat: ſine carne intelligit, in qua eſt curuum. ſic mathematica, *quæ non ſunt* ſeparata, veluti ſeparata intelligit, cùm illa intelligit. 12 Et omnino intellectus actu eſt, qui res intelligit. 13 Vtrùm autem fieri poſſit, vt ſeparatorum aliquid intelligat, cùm ipſe non eſt ſeparatus à magnitudine, an non, conſiderandum *erit* poſteriùs.

Collatio intellectus cum ſenſu, & cum phantaſia. Cap. IX.

B Νῦν δὲ περὶ ψυχῆς τὰ λεχθέντα συγκεφαλαιώσαντες, εἴπωμεν πάλιν, ὅτι ἡ ψυχὴ τὰ ὄντα πώς ἐστι πάντα· ἢ γὰρ αἰσθητὰ τὰ ὄντα, ἢ νοητά. ἔστι δ' ἡ ἐπιστήμη μὲν, τὰ ἐπιστητά πως· ἡ δ' αἴσθησις, τὰ αἰσθητά. 2 πῶς δὲ τοῦτο, δεῖ ζητεῖν. τέμνεται οὖν ἡ ἐπιστήμη καὶ ἡ αἴσθησις εἰς τὰ πράγματα, ἡ μὲν δυνάμει εἰς τὰ δυνάμει· ἡ δ' ἐντελεχεία, εἰς τὰ ἐντελεχεία. τῆς δὲ ψυχῆς τὸ αἰσθητικὸν, καὶ τὸ ἐπιστημονικὸν, δυνάμει ταῦτά ἐστι, τὸ μὲν ἐπιστητὸν, τὸ δὲ αἰσθητόν· ἀνάγκη δ' ἢ αὐτὰ, ἢ τὰ εἴδη εἶναι· αὐτὰ μὲν γὰρ δὴ οὔ· οὐ γὰρ ὁ λίθος ἐν τῇ ψυχῇ, ἀλλὰ τὸ εἶδος· ὥστε ἡ ψυχὴ ὥσπερ ἡ χείρ ἐστι· C καὶ γὰρ ἡ χεὶρ ὄργανόν ἐστιν ὀργάνων· καὶ ὁ νοῦς δὲ, εἶδος εἰδῶν· καὶ ἡ αἴσθησις, εἶδος αἰσθητῶν. 3 ἐπεὶ δὲ οὐδὲ πρᾶγμα οὐθέν ἐστι παρὰ τὰ μεγέθη, ὡς δοκεῖ, τὰ αἰσθητὰ, κεχωρισμένον, ἐν τοῖς εἴδεσι τοῖς αἰσθητοῖς τὰ νοητά ἐστι, τά τε ἐν ἀφαιρέσει λεγόμενα, καὶ ὅσα τῶν αἰσθητῶν, ἕξεις καὶ πάθη· καὶ διὰ τοῦτο οὔτε μὴ αἰσθανόμενος μηθὲν, οὐθὲν ἂν μάθοι, οὐδὲ ξυνίοι. 4 ὅταν δὲ θεωρῇ, ἀνάγκη ἅμα φάντασμά τι θεωρεῖν· τὰ γὰρ φαντάσματα, ὥσπερ αἰσθήματά ἐστι, πλὴν ἄνευ ὕλης. 5 ἔστι δ' ἡ φαντασία, ἕτερον φάσεως καὶ ἀποφάσεως· συμπλοκὴ γάρ ἐστι νοημάτων τὸ ἀληθὲς ἢ ψεῦδος. 6 τὰ δὲ πρῶτα νοήματα, τίνι διοίσει τοῦ μὴ D φαντάσματα εἶναι; ἢ οὐδὲ τἆλλα φαντάσματα, ἀλλ' οὐκ ἄνευ φαντασμάτων;

Nunc autem ea quæ de anima dicta ſunt, ſummatim complectentes, dicamus rurſus, animam quodammodo eſſe omnia entia. nam entia vel ſunt ſenſibilia vel intelligibilia: ac ſcientia quidē eſt quodāmodo ſcibilia: ſenſus verò, ſenſibilia. 2 Quomodo autem hoc *ſit*, oportet quærere. ſecatur igitur ſciētia & ſenſus in res: nempe *qui* quæ *ve eſt* poteſtate, in ea quæ *ſunt* poteſtate: *qui* quæve *eſt* actu, in ea quæ *ſunt* actu. animæ autem pars ſenſitiua, & pars ſcientialis poteſtate eſt hæc: *id eſt*, altera, ſcibile: altera, ſenſibile. iam verò neceſſe *eſt* vel eſſe *res* ipſas, vel ſpecies. atqui non *ſunt* ipſæ *res*: quoniam lapis non *eſt* in anima, ſed ſpecies. Quapropter anima eſt veluti manus. etenim manus eſt inſtrumentum inſtrumentorum: & intellectus *eſt* speciēs ſpecierum: & ſenſus *eſt* ſpecies ſenſibilium. 3 Quia verò res nulla eſt præter magnitudines (vt videtur) ſenſibiles, ſeparata: in ſpeciebus ſenſibilibus ſunt intelligibilia, tam ea quæ in abiunctione dicuntur, quàm ea quæ ſunt ſenſibilium habitus & affectiones. ideóque *is* qui nihil ſentit, nihil diſcere aut intelligere poteſt. 4 Cùm autem contemplatur, neceſſe *eſt* ſimul phantaſma aliquod contemplari. nam phantaſmata ſunt vt ſenſibilia, prætterquam *quòd ſunt* ſine materia. 5 Porrò phantaſia differt ab affirmatione & negatione. nam verum aut falſum eſt complexio mentis conceptuum. 6 Primi autem mentis conceptus quo different, vt non ſint phantaſmata? an ne hæc quidem ſunt phantaſmata, ſed non ſunt ſine phantaſmatibus?

Dubitationes de facultate motrice. Cap. X.

Ἐπεὶ δὲ ἡ ψυχὴ κατὰ δύο ὥρισται δυνάμεις, ἡ τῶν ζῴων, τῷ τε κριτικῷ, (ὃ διανοίας ἔργον ἐστὶ καὶ αἰσθήσεως·) καὶ ἔτι τῷ κινεῖν τὴν κατὰ τόπον κίνησιν, περὶ μὲν αἰσθήσεως καὶ νοῦ, διωρίσθω τοσαῦτα. E περὶ δὲ τοῦ κινοῦντος τί ποτέ ἐστι τῆς ψυχῆς, σκεπτέον, πότερον ἕν τι μόριον αὐτῆς χωριστὸν ὂν, ἢ μεγέθει, ἢ λόγῳ· ἢ πᾶσα ἡ ψυχή· κἂν εἰ [ἢ] μόριόν τι, πότερον ἴδιόν τι παρὰ τὰ εἰωθότα λέγεσθαι, καὶ τὰ εἰρημένα, ἢ τούτων ἕν τι. 2 ἔχει δὲ ἀπορίαν εὐθὺς, πῶς τε δεῖ μόρια ψυχῆς λέγειν, καὶ πόσα. τρόπον γάρ τινα ἄπειρα φαίνεται, καὶ οὐ μόνον ἅ τινες λέγουσι,

Cvm autem animalium anima duabus poteſtatibus definita ſit, *nempe* iudicandi, (quod eſt munus dianœæ, & ſenſus) & præterea loco mouendi: de ſenſu quidē & intellectu tot expoſita ſunto: de *facultate* autem mouente, quid tandem ſit animæ, conſiderandum *eſt*: vtrùm ſit vna quædam eius pars ſeparata vel magnitudine vel ratione, an ſit tota anima: & ſi ſit pars quædam, vtrùm ſit propria quædam *pars*, præter eas quæ dici ſolent, & quæ commemoratæ ſunt, an harum vna quæpiam. 2 Sed oritur ſtatim dubitatio, quomodo dicere oporteat partes animæ, & quot. nam quodāmodo infinitæ videntur: nec ſolùm quas nonnulli dicunt,

diſtinguentes facultatem ratiocinandi & iraſcendi & cupiendi: alij verò, ratione præditam & rationis expertem. etenim ſecundùm differentias, per quas ſeiungunt has *partes*, etiam aliæ partes videntur his de quibus & nunc dictum fuit, magis diſtantes: *nimirum* & nutritiua, (quæ tam plantis ineſt, quàm omnibus animalibus) & ſenſitiua: (quam nec vt rationis expertem, nec vt rationis participem, ponere aliquis facilè poſſit) inſuper phantaſtica: (quæ quidem eſſentiâ differt ab omnibus: ſed cum qua harum ſit eadem, vel diuerſa, magna eſt dubitatio, ſi quis partes animæ ſeparatas poſuerit) ad hæc, appetitiua: (quæ & ratione & poteſtate videri poteſt ab omnibus diuerſa: & abſurdum *eſt* eam diuellere: quoniam & in *facultate* ratiocinandi fit voluntas, & in *facultate* rationis experte cupiditas & ira. quòd ſi anima eſt tria, in vnoquoque erit appetitus) item *ea*, de qua nunc diſputatio eſt inſtituta, *videlicet* quid ſit quod loco mouet animal.

3 Motu nàmque auctionis & deminutionis, qui *motus* omnibus inſunt, id videri poteſt mouere quod omnibus ineſt, *nempe* facultas gignendi & alendi. de reſpiratione autem & expiratione, & ſomno & vigilia poſteriùs *erit* conſiderandũ: quoniam hæc quoque habent magnam dubitationem. ſed de motu ſecundùm locum, quid ſit quod moueat animal motu inceſſus, conſiderandum *eſt*.

4 Non *eſſe* igitur facultatem nutritiuam *quæ moueat*, manifeſtum eſt: quia ſemper hic motus eſt alicuius gratiâ: & vel cum phantaſia, vel cum appetitu: nihil enim, quod non appetat aut fugiat, mouetur, niſi vi. 5 Præterea etiam plantæ hoc motu eſſent præditæ, & haberent aliquam partem organicam ad hunc motum *ciendum*. 6 Similiter nec ſenſitiuum. multa enim ſunt animalia, quæ ſenſum quidem habent, ſed ſtabilia ſunt, & immutabilia perpetuò. 7 Si igitur natura nec facit quicquam fruſtra, nec omittit aliquid neceſſarium, niſi in iis quæ ſunt mutila & imperfecta: eiuſmodi verò animalia ſunt perfecta, non mutila: (cuius rei ſignum *eſt*, quòd gignendi vim, & ætatis florem ſeu ſtatum habent ac decrementum) haberent igitur etiam organicas partes inceſſus. 8 Quin ne ratiocinatiua quidem *pars* & qui vocatur intellectus, eſt qui mouet. nam contemplatiuus nihil intelligit quod ſub actionem cadat, nec *aliquid* dicit de fugiendo & de perſequendo: hic verò motus ſemper eſt aut fugientis aliquid aut perſequentis. 9 Sed neque cùm tale aliquid contemplatur, iam iubet aliquid fugere aut perſequi. vt putà ſæpe intelligit aliquid formidoloſum aut iucundum: non tamen iubet metuere: ſed cor mouetur. ſi verò *eſt* iucundum: alia quædam pars *mouetur*. 10 Præterea etiam iubente intellectu & monente dianœa fugere aliquid aut perſequi, tamen non mouetur, ſed ſecundùm cupiditatem agit, vt *faciunt* incontinentes. 11 Denique videmus eum qui medicinam tenet, non mederi, tamquàm penes aliud quiddam ſit poteſtas ſecundùm ſcientiam agendi, non penes ſcientiam.

12 Quin nec penes appetitum *eſt* poteſtas huius motus. nam continentes, cùm appetant & cupiant, *tamen* non faciunt *ea* quæ appetunt, ſed obtemperant intellectui.

διαιροῦντες, λογιστικὸν, καὶ θυμικὸν, καὶ ἐπιθυμητικόν· οἱ δὲ τὸ λόγον ἔχον, καὶ τὸ ἄλογον. κατὰ γὰρ τὰς διαφορὰς, δι᾽ ἃς ταῦτα χωρίζουσι, καὶ ἄλλα * φαίνεται μόρια μείζω διάστασιν ἔχοντα τούτων, περὶ ὧν καὶ νῦν εἴρηται, τό, τε θρεπτικὸν, ὃ καὶ τοῖς φυτοῖς ὑπάρχει, καὶ πᾶσι τοῖς ζώοις· καὶ τὸ αἰσθητικὸν, * οὔτε ὡς ἄλογον, οὔτε ὡς λόγον ἔχον, θείη ἄν τις ῥᾳδίως. ἔτι δὲ τὸ φανταστικὸν, ὃ τῷ μὲν εἶναι πάντων ἕτερον, τίνι δὲ τούτων ταὐτὸν, ἢ ἕτερον, ἔχει πολλὴν ἀπορίαν, εἴ τις θήσει κεχωρισμένα μόρια τῆς ψυχῆς. πρὸς δὲ τούτοις τὸ ὀρεκτικὸν, ὃ καὶ λόγῳ καὶ δυνάμει ἕτερον ἂν δόξειεν εἶναι πάντων· καὶ ἄτοπον δὴ τοῦτο διασπᾶν. ἔν τε τῷ λογιστικῷ γὰρ ἡ βούλησις γίνεται, καὶ ἐν τῷ ἀλόγῳ ἡ ἐπιθυμία καὶ ὁ θυμός· εἰ δὲ τρία ἡ ψυχὴ, ἐν ἑκάστῳ ἔσται ὄρεξις. καὶ δὴ καὶ περὶ οὗ νῦν ὁ λόγος ἐνέστηκε, τί τὸ κινοῦν κατὰ τόπον τὸ ζῷόν ἐστι.

3 τὴν μὲν γὰρ κατ᾽ αὔξησιν καὶ φθίσιν κίνησιν, αἳ πᾶσιν ὑπάρχουσι, τὸ πᾶσιν ὑπάρχον δόξειεν ἂν κινεῖν, τὸ γεννητικὸν καὶ θρεπτικόν. περὶ δὲ ἀναπνοῆς καὶ ἐκπνοῆς, καὶ ὕπνου καὶ ἐγρηγόρσεως, ὕστερον ἐπισκεπτέον· ἔχει γὰρ καὶ ταῦτα πολλὴν ἀπορίαν. ἀλλὰ περὶ τῆς κατὰ τόπον κινήσεως, τί τὸ κινοῦν τὸ ζῷον τὴν πορευτικὴν κίνησιν, σκεπτέον. 4 ὅτι μὲν οὖν οὐχ ἡ θρεπτικὴ δύναμις, δῆλον· ἀεὶ γὰρ ἕνεκά του ἡ κίνησις αὕτη, καὶ ἢ μετὰ φαντασίας, ἢ ὀρέξεώς ἐστιν· οὐθὲν γὰρ μὴ ὀρεγόμενον ἢ φεῦγον κινεῖται, ἀλλ᾽ ἢ βίᾳ. 5 ἔτι κἂν τὰ φυτὰ κινητικὰ ἦν, κἂν εἶχέ τι μόριον ὀργανικὸν πρὸς τὴν κίνησιν ταύτην. 6 ὁμοίως δὲ οὐδὲ τὸ αἰσθητικόν· πολλὰ γάρ ἐστι τῶν ζῴων, ἃ αἴσθησιν μὲν ἔχει, μόνιμα δέ ἐστι καὶ ἀκίνητα διὰ τέλους. 7 εἰ οὖν μήτε μηδὲν ἡ φύσις ποιεῖ μάτην, μήτε ἀπολείπει τῶν ἀναγκαίων, πλὴν ἐν τοῖς πηρώμασι καὶ τοῖς ἀτελέσι· τὰ δὲ τοιαῦτα τῶν ζῴων τέλεια, οὐ πηρώματά ἐστι· σημεῖον δὲ, ὅτι γεννητικὰ καὶ ἀκμὴν ἔχει καὶ φθίσιν· ὥστε εἶχεν ἂν καὶ τὰ ὀργανικὰ μέρη τῆς πορείας. 8 ἀλλὰ μὴν οὐδὲ τὸ λογιστικὸν καὶ ὁ καλούμενος νοῦς, ἐστὶν ὁ κινῶν· ὁ μὲν γὰρ θεωρητικὸς οὐθὲν νοεῖ πρακτόν· οὐδὲ λέγει περὶ φευκτοῦ καὶ διωκτοῦ οὐθέν. ἀεὶ δὲ ἡ κίνησις, ἢ φεύγοντός τι, ἢ διώκοντός ἐστιν. 9 ἀλλ᾽ οὐδ᾽ ὅταν θεωρῇ τι τοιοῦτον, ἤδη κελεύει φεύγειν, ἢ διώκειν· οἷον πολλάκις διανοεῖται φοβερόν τι ἢ ἡδύ· οὐ κελεύει δὲ φοβεῖσθαι· ἡ καρδία δὲ κινεῖται. ἂν δὲ ἡδὺ, ἕτερόν τι μόριον. 10 ἔτι καὶ ἐπιτάττοντος τοῦ νοῦ, καὶ λεγούσης τῆς διανοίας φεύγειν τι ἢ διώκειν, οὐ κινεῖται, ἀλλὰ κατὰ τὴν ἐπιθυμίαν πράττει, οἷον οἱ ἀκρατεῖς. 11 καὶ ὅλως δὲ ὁρῶμεν, ὅτι ὁ ἔχων τὴν ἰατρικὴν, οὐκ ἰᾶται, ὡς ἑτέρου τινὸς κυρίου ὄντος τοῦ ποιεῖν κατὰ τὴν ἐπιστήμην, ἀλλ᾽ οὐ τῆς ἐπιστήμης. 12 ἀλλὰ μὴν οὐδ᾽ ἡ ὄρεξις ταύτης κυρία τῆς κινήσεως· οἱ γὰρ ἐγκρατεῖς ὀρεγόμενοι καὶ ἐπιθυμοῦντες, οὐ πράττουσιν ὧν ἔχουσι τὴν ὄρεξιν, ἀλλ᾽ ἀκολουθοῦσι τῷ νῷ.

* χ. φαίνεται

* [illegible]

Quæ ſit cauſſa inceſſus.

Φαίνεται δέ γε δύο ταῦτα κινοῦντα, ἢ ὄρεξις, ἢ νοῦς, εἴ τις τὴν φαντασίαν τιθείη ὡς νόησίν τινα· πολλοὶ γὰρ παρὰ τὴν ἐπιστήμην ἀκολουθοῦσι ταῖς φαντασίαις, καὶ ἐν τοῖς ἄλλοις ζώοις οὐ νόησις οὐδὲ λογισμός ἐστιν, ἀλλὰ φαντασία. ἄμφω ἄρα ταῦτα κινητικὰ κατὰ τόπον, νοῦς καὶ ὄρεξις. 2 νοῦς δὲ ὁ ἕνεκά του λογιζόμενος, καὶ ὁ πρακτικός· διαφέρει δὲ τοῦ θεωρητικοῦ τῷ τέλει. καὶ ἡ ὄρεξις ἕνεκά του πᾶσα. 3 οὗ γὰρ ἡ ὄρεξις αὕτη, ἀρχὴ τοῦ πρακτικοῦ νοῦ· τὸ δὲ ἔσχατον, ἀρχὴ τῆς πράξεως. ὥστε εὐλόγως δύο ταῦτα φαίνεται τὰ κινοῦντα, ὄρεξις καὶ διάνοια πρακτική· τὸ ὀρεκτὸν γὰρ κινεῖ, καὶ διὰ τοῦτο ἡ διάνοια κινεῖ, ὅτι ἀρχὴ αὐτῆς ἐστι τὸ ὀρεκτόν. καὶ ἡ φαντασία δὲ ὅταν κινῇ, οὐ κινεῖ ἄνευ ὀρέξεως. 4 ἓν δή τι τὸ κινοῦν πρώτως τὸ ὀρεκτόν· εἰ γὰρ δύο, νοῦς καὶ ὄρεξις, ἐκίνουν, κατὰ κοινὸν ἄν τι εἶδος ἐκίνουν. νῦν δὲ ὁ μὲν νοῦς οὐ φαίνεται κινῶν ἄνευ ὀρέξεως. ἡ γὰρ βούλησις, ὄρεξις. ὅταν δὲ κατὰ τὸν λογισμὸν κινῆται, καὶ κατὰ βούλησιν κινεῖται. ἡ δὲ ὄρεξις κινεῖ παρὰ τὸν λογισμόν· ἡ γὰρ ἐπιθυμία ὄρεξίς τίς ἐστι. 5 νοῦς μὲν οὖν πᾶς ὀρθός ἐστι· ὄρεξις δὲ καὶ φαντασία καὶ ὀρθὴ, καὶ οὐκ ὀρθή. διὸ ἀεὶ μὲν κινεῖ τὸ ὀρεκτὸν, ἀλλὰ τοῦτ' ἐστὶν ἢ τὸ ἀγαθὸν, ἢ τὸ φαινόμενον ἀγαθόν· οὐ πᾶν δὲ, ἀλλὰ τὸ πρακτὸν ἀγαθόν. πρακτὸν δ' ἐστὶν ἀγαθὸν, τὸ ἐνδεχόμενον καὶ ἄλλως ἔχειν. ὅτι μὲν οὖν ἡ τοιαύτη δύναμις κινεῖ τῆς ψυχῆς ἡ καλουμένη ὄρεξις, φανερόν. 6 τοῖς δὲ διαιροῦσι τὰ μέρη τῆς ψυχῆς, ἐὰν κατὰ τὰς δυνάμεις διαιρῶσι καὶ χωρίζωσι, πάμπολλα γίνεται, θρεπτικὸν, αἰσθητικὸν, νοητικὸν, βουλευτικὸν, ἔτι δὲ ὀρεκτικόν· ταῦτα γὰρ πλεῖον διαφέρει ἀλλήλων, ἢ τὸ ἐπιθυμητικὸν καὶ θυμικόν. 7 ἐπεὶ δὲ αἱ ὀρέξεις γίνονται ἐναντίαι ἀλλήλαις (τοῦτο δὲ συμβαίνει, ὅταν ὁ λόγος καὶ ἡ ἐπιθυμία ἐναντίαι ὦσι· γίνεται δὲ ἐν τοῖς χρόνου αἴσθησιν ἔχουσιν· ὁ μὲν γὰρ νοῦς διὰ τὸ μέλλον, ἀνθέλκειν κελεύει, ἡ δὲ ἐπιθυμία διὰ τὸ ἤδη· φαίνεται γὰρ τὸ ἤδη ἡδὺ, καὶ ἁπλῶς ἡδὺ, καὶ ἀγαθὸν ἁπλῶς, διὰ τὸ μὴ ὁρᾶν τὸ μέλλον.) εἴδει μὲν ἓν ἂν εἴη τὸ κινοῦν τὸ ὀρεκτικὸν, ᾗ ὀρεκτικόν. πρῶτον δὲ πάντων * τὸ ὀρεκτικόν· τοῦτο γὰρ κινεῖ καὶ οὐ κινούμενον, τῷ νοηθῆναι, ἢ φαντασθῆναι· ἀριθμῷ δὲ πλείω τὰ κινοῦντα. 8 ὄντων δὲ τριῶν, ἑνὸς μὲν τοῦ κινοῦντος, δευτέρου δὲ ᾧ κινεῖ, ἔτι τρίτου τὸ κινούμενον· τὸ δὲ κινοῦν, διττὸν, τὸ μὲν ἀκίνητον, τὸ δὲ κινοῦν καὶ κινούμενον. ἔστι δὲ τὸ μὲν ἀκίνητον, τὸ πρακτὸν ἀγαθόν· τὸ δὲ κινοῦν καὶ κινούμενον, τὸ ὀρεκτικόν· κινεῖται γὰρ τὸ ὀρεγόμενον, ᾗ ὀρέγεται· καὶ ἡ ὄρεξις κίνησίς τίς ἐστιν, ἢ ἐνέργεια. τὸ δὲ κινούμενον ἐστὶ τὸ ζῶον· ᾧ δὲ κινεῖ ὀργάνῳ ἡ ὄρεξις, ἤδη τοῦτο σωματικόν ἐστι. διὸ ἐν τοῖς κοινοῖς σώματος καὶ ψυχῆς ἔργοις, θεωρητέον * περὶ αὐτοῦ. νῦν δὲ, ὡς ἐν κεφαλαίῳ εἰπεῖν, τὸ κινοῦν ὀργανικῶς, ὅπου ἀρχὴ καὶ τελευτὴ τὸ αὐτό, οἷον ὁ * γιγγλισμός· ἐνταῦθα γὰρ τὸ κυρτὸν καὶ κοῖλον τὸ μὲν τε-

* γρ. τὸ ὀρεκτόν.

* γρ. π. αὐτῶ.

* γρ. γιγγλυμὸς & γίγγλυμος.

Cap. XI.

A Videntur autem hæc duo mouentia *eſſe*, vel appetitus, vel intellectus, ſi quis phantaſiam ponat tanquam intellectionem quandam. in multis enim poſthabitâ ſcientiâ ſequuntur phantaſias: & in aliis animalibus non eſt intellectio nec ratio, ſed phantaſia. ambo igitur hæc vim loco mouendi habent, *nimirum* intellectus & appetitus. 2 Intellectus, inquam, qui alicuius cauſſa ratiocinatur, & qui eſt actiuus, fine autem differt à contemplatiuo. & appetitus omnis eſt alicuius gratiâ. 3 Cuius enim *eſt* appetitus, id principium *eſt* actiui intellectus. quod autem *eſt* poſtremum, *eſt* principium actionis. Quapropter meritò duo hæc mouentia videntur, appetitus, & dianœa actiua. etenim appe-B titiuum mouet. ideóque dianœa mouet: quia quod *eſt* appetibile, eſt huius principium. quinetiam phantaſia, quando mouet, non mouet ſine appetitu. 4 Vnum igitur quiddam *eſt*, quod mouet primò, *nempe* appetibile. nam ſi duo, *videlicet* intellectus & appetitus, mouerent, ſecundùm communem aliquam formam mouerent. nunc autem intellectus quidem non videtur mouere ſine appetitu (nam voluntas *eſt* appetitus: cùm autem ratione mouetur, etiam voluntate mouetur) ſed appetitus mouet ſine ratione: quoniam cupiditas eſt appetitus quidam. 5 Omnis igitur intellectus eſt rectus: appetitus autem & phantaſia *ſunt* & recta & non recta. idcircò ſemper quidem appetibile C mouet: ſed hoc eſt vel bonum vel quod videtur bonum: non tamen omne bonum, ſed quod ſub actionem cadit. ſub actionem verò cadit bonum, quod poteſt etiam aliter ſe habere. huiuſmodi igitur animæ facultatem mouere, quæ vocatur appetitus, perſpicuum *eſt*. 6 Iis autem qui diuidunt partes animæ, ſi ſecundùm poteſtates diuidant ac ſeparent, permultæ fiunt, *videlicet* nutritiua, ſenſitiua, intellectiua, deliberatiua, præterea etiam appetitiua. hæ namque magis differunt inter ſe, quàm vis cupiendi & vis iraſcendi. 7 Cùm autem appetitus fiant inter ſe contrarij (quod quidem accidit, cùm ratio & cupiditas contrarij *appetitus* ſunt: ac fit in iis, quæ temporis ſenſum habent: intelle-D ctus enim propter *id* quod *eſt* futurum, reluctari iubet: cupiditas autem *eſt* propter id quod iam *eſt*: quia quod iam *eſt* iucundum, videtur & ſimpliciter iucundum, & ſimpliciter bonum, propterea quòd non videt quod eſt futurum) ſpecie quidem vnum fuerit id quod mouet, *id eſt* appetitiuum, quatenus *eſt* appetitiuum: primum vero omnium *eſt* appetibile: (hoc enim mouet non motum, quia intellectu vel phantaſia apprehenditur) numero autem plura *ſunt*, quæ mouent. 8 Cùm autem tria ſint: vnum, quod mouet: ſecundum, quo mouet: & præterea tertium, *id* quod mouetur: quod autem mouet duplex ſit, alterum immobile, alterum mouens & motum: immobile quidem eſt bonum illud E quod ſub actionem cadit: mouens verò & motum *eſt* ipſum appetitiuum: (mouetur enim, quod appetit, quatenus appetit: & appetitus eſt motus quidam, quatenus *eſt* actus) quod verò mouetur, eſt animal: quo autem organo appetitus mouet, hoc iam corporeum eſt. idcirco in communibus corporis & animæ muneribus diſpiciendum de his eſt. nunc verò vt ſummatim dicamus, illud *eſt quod* mouet organicè, vbi idem *eſt* principium & finis: veluti cardo: hic enim conuexum & concauum, alterum fi-

nis,alterum principium eſt. vnde alterum quieſcit, A alterum mouetur: cùm ratione quidem differant, ſed magnitudine non ſeparentur. omnia namque pulſu ac tractu mouentur. proinde oportet, vt in circulo, aliquid manere, & inde motum incipere. 9 Omnino igitur (vt dictum eſt) animal quatenus *eſt* appetitiuum, eatenus *eſt* ſui motiuum, appetitiuum autem non *eſt* ſine phantaſia. omnis verò phantaſia vel *eſt* ratiocinatiua, vel ſenſitiua: atque hanc etiam reliqua animalia participant. 10 Conſiderandũ autem *eſt* etiã de *animalibus* imperfectis, quid ſit quod *ea* mouet, quibus ſenſus tactus tãtùm ineſt, vtrùm fieri poſſit vt phantaſia & cupiditas iis inſint, an non. 11 Videtur enim dolor & voluptas *iis* ineſſe. quòd ſi hæc *inſunt*, neceſſe *eſt ineſſe* etiam B cupiditatẽ. 12 Phantaſia verò quomodo ineſſe poteſt? an ſicuti mouentur indefinitè, ita etiã hæc *ipſis* inſunt quidem, ſed indefinitè inſunt? 13 Ergo ſenſitiua phantaſia (ſicuti dictum eſt) etiam brutis animalibus ineſt: deliberatiua autem in iis *dumtaxat*, quæ ſunt ratione prædita. vtrùm enim faciet hoc an hoc, rationis iam eſt munus. 14 Ac neceſſe *eſt* ſemper vno metiri: perſequitur enim quod eſt maius. Quapropter poteſt vnum ex multis phantaſmatibus facere. 15 Atque hæc *eſt* cauſſa, cur *appetitus* non videatur habere opinionẽ: quia *ſcilicet* eam non habet, quæ ex ſyllogiſmo *proficiſcitur*. hæc autẽ illũ *habet*. 16 Idcirco deliberãdi vim appetitus non habet. vincit autem interdũ ac mouet voluntatem: quandoque autem illa hunc, ſicuti ſphæra, C appetitus *ſcilicet* appetitum, quando incontinentia fit. naturaliter verò ſemper facultas ſuperior *eſt* potior & mouet. adeo vt tribus lationibus iam moueatur. 17 Scientiale verò non mouet, ſed permanet. 18 Quia verò altera *eſt* exiſtimatio & ratio *rei* vniuerſalis, altera *rei* ſingularis: (illa enim inquit opus eſſe, vt *qui eſt* talis, hoc tale faciat: hæc verò *ait* hoc *eſſe* tale, & me *eſſe* talem) iam hæc opinio mouet, non illa vniuerſalis: aut ambo *mouent*, ſed illa magis quieſcens, hæc verò minimè.

λευτὴ, τὸ δὲ ἀρχή· διὸ, τὸ μὲν ἠρεμεῖ, τὸ δὲ κινεῖται, λόγῳ μὲν ἕτερα ὄντα, μεγέθει δὲ ἀχώριστα· πάντα γὰρ ὤσει καὶ ἕλξει κινεῖται. διὸ δεῖ ὥσπερ ἐν κύκλῳ μένειν τι, καὶ ἐντεῦθεν ἄρχεσθαι τὴν κίνησιν. 9 ὅλως μὲν οὖν ὥσπερ εἴρηται, ᾗ ὀρεκτικὸν τὸ ζῷον, ταύτῃ ἑαυτοῦ κινητικόν· ὀρεκτικὸν δὲ οὐκ ἄνευ φαντασίας· φαντασία δὲ πᾶσα, ἢ λογιστικὴ, ἢ αἰσθητική. ταύτης μὲν οὖν καὶ τὰ ἄλλα ζῷα μετέχει. 10 σκεπτέον δὲ καὶ περὶ τῶν ἀτελῶν, τί τὸ κινοῦν ἐστιν, οἷς ἁφὴ μόνον ὑπάρχει αἴσθησις, πότερον ἐνδέχεται φαντασίαν ὑπάρχειν τούτοις, ἢ οὔ, καὶ ἐπιθυμίαν. 11 φαίνεται γὰρ λύπη καὶ ἡδονὴ ἐνοῦσα. εἰ δὲ ταῦτα, καὶ ἐπιθυμίαν ἀνάγκη. 12 φαντασία δὲ* πῶς ἂν ἐνείη; ἢ ὥσπερ καὶ κινεῖται* ἀόριστος, καὶ ταῦτα ἔνεστι μὲν, ἀορίστως δὲ ἔνεστιν. 13 ἡ μὲν οὖν αἰσθητικὴ φαντασία, ὥσπερ εἴρηται, καὶ ἐν τοῖς* ἄλλοις ζῴοις ὑπάρχει· ἡ δὲ βουλευτικὴ, ἐν τοῖς λογιστικοῖς· πότερον γὰρ πράξει τόδε ἢ τόδε, λογισμοῦ ἤδη ἐστὶν ἔργον. 14 καὶ ἀνάγκη ἀεὶ ἑνὶ μετρεῖν· τὸ μεῖζον γὰρ διώκει. ὥστε δύναται ἓν ἐκ πλειόνων φαντασμάτων ποιεῖν. 15 καὶ αἴτιον τοῦτο, τὸ δόξαν μὴ δοκεῖν ἔχειν, ὅτι τὴν ἐκ συλλογισμοῦ οὐκ ἔχει, αὕτη δὲ ἐκείνην. 16 διὸ τὸ βουλευτικὸν οὐκ ἔχει ἡ ὄρεξις. νικᾷ δὲ ἐνίοτε καὶ κινεῖ τὴν βούλησιν· ὁτὲ δὲ ἐκείνη ταύτην, ὥσπερ σφαῖρα, ἡ ὄρεξις τὴν ὄρεξιν, ὅταν ἀκρασία γένηται. φύσει δὲ ἀεὶ ἡ ἄνω ἀρχικωτέρα καὶ κινεῖ, ὥστε τρεῖς φορὰς ἤδη κινεῖσθαι. 17 τὸ δὲ ἐπιστημονικὸν οὐ κινεῖ, ἀλλὰ μένει. 18 ἐπεὶ δὲ ἡ μὲν τοῦ καθόλου ὑπόληψις καὶ λόγος, ἡ δὲ τοῦ καθ᾽ ἕκαστον (ἡ μὲν γὰρ λέγει, ὅτι δεῖ τὸν τοιοῦτον τὸ τοιόνδε πράττειν, ἡ δὲ ὅτι τόδε τοιόνδε, κἀγὼ δὲ τοιόσδε·) ἤδη αὕτη κινεῖ ἡ δόξα, οὐχ ἡ καθόλου, ἢ ἄμφω, ἀλλ᾽ ἡ μὲν ἠρεμοῦσα μᾶλλον, ἡ δὲ οὔ.

* γρ. πῶς ἂν αὐτῇ

* γρ. ἀορίστως. & mox iterum.

* γρ. ἀλόγοις ζ. quæ varietas ſæpe reperitur.

Collatio animæ vegetatiuæ, ſenſitiuæ, & intellectiuæ. Cap. XII.

NEceſſe *eſt* igitur, vt quicquid viuit & animam D habet, nutritiuam animam habeat ab ortu vſque ad interitum: quia neceſſe *eſt*, vt quod eſt factum, auctionem habeat & ſtatum & deminutionem: quæ quidem ſine alimento habere, impoſſibile *eſt*: neceſſe *eſt* igitur ineſſe nutritiuam facultatem in iis omnibus quæ oriuntur & occidunt. 2 Senſum verò non neceſſe *eſt* in omnibus viuentibus *ineſſe*. nec enim *ea*, quorum corpus eſt ſimplex, tactum habere poſſunt, (neque ſine hoc poteſt eſſe vllum animal) nec quæcumque non ſunt apta ad recipiendas ſpecies ſine materia. 3 Animal verò neceſſe *eſt* vt ſenſum habeat, ſi nihil fruſtra natura facit. quæcumque enim natura conſtant, *vel* ſunt alicuius gratiâ, vel caſus eorum quæ *ſunt* ali- E cuius gratiâ. Ergo ſi quoduis corpus incedendi vi præditum, non habens ſenſum, interiret, vtique non perueniret ad finem, qui eſt naturæ opus. quomodo enim aletur? 4 Iis enim quæ ſtabilia *ſunt*, hoc *ibi* ineſt, vnde orta ſunt. 5 Fieri autem nequit, vt corpus habeat animam & intellectum iudicandi vi præditum, ſenſu tamen careat, *corpus* (*inquã*) quod nõ eſt ſtabile, ſed generabile. quamobrẽ enim non habebit? vel enim animæ *eſſet* melius,

ΤΗν μὲν οὖν θρεπτικὴν ψυχὴν ἀνάγκη πᾶν ἔχειν ὅ, τί περ ἂν ζῇ, καὶ ψυχὴν ἔχει ἀπὸ γενέσεως μέχρι φθορᾶς· ἀνάγκη γὰρ τὸ γενόμενον αὔξησιν ἔχειν, καὶ ἀκμὴν, καὶ φθίσιν. ταῦτα δὲ ἄνευ τροφῆς ἔχειν ἀδύνατον· ἀνάγκη ἄρα ἐνεῖναι τὴν θρεπτικὴν δύναμιν ἐν πᾶσι τοῖς φυομένοις καὶ φθίνουσιν. 2 αἴσθησιν δὲ οὐκ ἀναγκαῖον ἐν ἅπασι* τοῖς ζῶσιν. οὔτε γὰρ ἂν ὅσων τὸ σῶμα ἁπλοῦν, ἁφὴν ἐνδέχεται ἔχειν, οὔτε ἄνευ ταύτης ἐνδέχεται οὐδὲν εἶναι ζῷον· οὔτε δὲ ὅσα μὴ δεκτικὰ τῶν εἰδῶν ἄνευ τῆς ὕλης. 3 τὸ δὲ ζῷον, ἀναγκαῖον αἴσθησιν ἔχειν, εἰ μηθὲν μάτην ποιεῖ ἡ φύσις· ἕνεκά του γὰρ ἅπαντα ὑπάρχει τὰ φύσει, ἢ συμπτώματα ἔσται τῶν ἕνεκά του. * Εἰ οὖν πᾶν σῶμα πορευτικὸν μὴ ἔχον αἴσθησιν, φθείροιτο ἂν, καὶ εἰς τέλος οὐκ ἂν ἔλθοι, ὅ ἐστι φύσεως ἔργον· πῶς γὰρ θρέψεται; 4 τοῖς μὲν γὰρ μονίμοις ὑπάρχει τοῦτο ὅθεν πεφύκασιν. 5 οὐχ οἷόν τε δὲ σῶμα ἔχειν μὲν ψυχὴν, καὶ νοῦν κριτικὸν· αἴσθησιν δὲ μὴ ἔχειν, μὴ μόνιμον ὄν, γεννητὸν δέ. 6 ἀλλὰ μὴν οὐδὲ ἀγέννητον· διὰ τί γὰρ οὐχ ἕξει; ἢ γὰρ τῇ ψυχῇ βέλτιον,

* Legitur & τοῖς ζῴοις ait Philoponus.

* γρ. ἄρ᾽ οὖν.

ἢ τῷ σώματι. νῦν δὲ οὐδέτερον· ἡ μὲν γὰρ οὐ μᾶλλον νοήσει· τὸ δὲ οὐδὲν ἔσται μᾶλλον δι' ἐκεῖνο. οὐθὲν ἄρα ἔχει ψυχὴν σῶμα μὴ μόνιμον ἄνευ αἰσθήσεως. ἀλλὰ μὴν εἴ γε αἴσθησιν ἔχοι, ἀνάγκη τὸ σῶμα εἶναι ἢ ἁπλοῦν ἢ μικτόν. οὐχ οἷόν τε δὲ ἁπλοῦν· ἁφὴν γὰρ οὐχ ἕξει. ἔστι δὲ ἀνάγκη ταύτην ἔχειν. 7 τοῦτο δὲ ἐκ τῶνδε δῆλον. ἐπεὶ γὰρ τὸ ζῷον σῶμα ἔμψυχόν ἐστι, σῶμα δὲ ἅπαν ἁπτόν, ἁπτὸν δὲ τὸ αἰσθητὸν ἁφῇ, ἀνάγκη καὶ τὸ τοῦ ζῴου σῶμα ἁπτικὸν εἶναι, εἰ μέλλει σῴζεσθαι τὸ ζῷον. αἱ γὰρ ἄλλαι αἰσθήσεις, δι' ἑτέρων αἰσθάνονται, οἷον ὄσφρησις, ὄψις, ἀκοή. ἁπτόμενον δέ, εἰ μὴ ἕξει αἴσθησιν, οὐ δυνήσεται τὰ μὲν φεύγειν, τὰ δὲ λαβεῖν. εἰ δὲ τοῦτο, ἀδύνατον ἔσται σῴζεσθαι τὸ ζῷον. 8 διὸ καὶ ἡ γεῦσίς ἐστιν ὥσπερ ἁφή τις· τροφῆς γάρ ἐστιν· ἡ δὲ τροφή, τὸ σῶμα τὸ ἁπτόν. ψόφος δέ, καὶ χρῶμα, καὶ ὀσμή, οὐ τρέφει, οὐδὲ ποιεῖ οὔτε αὔξησιν, οὔτε φθίσιν. ὥστε καὶ τὴν γεῦσιν ἀνάγκη ἁφὴν εἶναί τινα, διὰ τὸ τοῦ ἁπτοῦ καὶ θρεπτικοῦ αἴσθησιν εἶναι. αὗται μὲν οὖν ἀναγκαῖαι τῷ ζῴῳ· καὶ φανερὸν ὅτι οὐχ οἷόν τε ἄνευ ἁφῆς εἶναι ζῷον. 9 αἱ δὲ ἄλλαι τοῦ τε εὖ ἕνεκα, καὶ γένει ζῴων ἤδη, οὐ τῷ τυχόντι ἀλλά τισιν, οἷον τῷ πορευτικῷ * ἀνάγκη ὑπάρχειν· εἰ γὰρ μέλλει σῴζεσθαι, οὐ μόνον δεῖ ἁπτόμενον αἰσθάνεσθαι, ἀλλὰ καὶ ἄποθεν. τοῦτο δ' ἂν εἴη, εἰ διὰ τοῦ μεταξὺ αἰσθητικὸν εἴη, τῷ ἐκεῖνο μὲν ὑπὸ τοῦ αἰσθητοῦ πάσχειν καὶ κινεῖσθαι, αὐτὸ δ' ὑπ' ἐκείνου.

* γρ. αἱ. ὑπάρχειν ἢ γένει μόνον τῶν ζῴων. οὐ μὴν δὲ αὐτῶν.

10 ὥσπερ γὰρ τὸ κινοῦν κατὰ τόπον, μέχρι του μεταβάλλειν ποιεῖ, καὶ τὸ ὦσαν ἕτερον ποιεῖ, ὥστε ὠθεῖν· καὶ ἔστι διὰ μέσου ἡ κίνησις· καὶ τὸ μὲν δὴ τὸ πρῶτον κινοῦν ὠθεῖ οὐκ ὠθούμενον· τὸ δὲ ἔσχατον μόνον ὠθεῖται οὐκ ὦσαν· τὸ δὲ μέσον, ἄμφω. πολλὰ δὲ μέσα. οὕτως ἐπὶ ἀλλοιώσεως, πλὴν ὅτι μένοντα ἐν τῷ αὐτῷ τόπῳ ἀλλοιοῖ. 11 οἷον, εἰ εἰς κηρὸν βάψειέ τις, μέχρι τούτου ἐκινήθη, ἕως ἔβαψε· λίθος δὲ οὐδέν, ἀλλ' ὕδωρ μέχρι πόρρω· ὁ δὲ ἀὴρ ἐπὶ πλεῖστον κινεῖται, καὶ ποιεῖ καὶ πάσχει, ἐὰν μένῃ, καὶ εἷς ᾖ. 12 διὸ καὶ περὶ ἀνακλάσεως βέλτιον ἢ τὴν ὄψιν ἐξιοῦσαν ἀνακλᾶσθαι, τὸν ἀέρα πάσχειν ὑπὸ τοῦ χρώματος καὶ τοῦ σχήματος, μέχρι περ οὗ ἂν εἷς ᾖ. ἐπὶ δὲ τοῦ λείου ἐστὶν εἷς· διὸ πάλιν καὶ οὗτος τὴν ὄψιν κινεῖ, ὥσπερ ἂν εἰ τὸ ἐν τῷ κηρῷ σημεῖον διεδίδοτο μέχρι τοῦ πέρατος. 13 ὅτι δ' οὐχ οἷόν τε ἁπλοῦν τὸ τοῦ ζῴου σῶμα εἶναι, φανερόν· λέγω δὲ οἷον πύρινον, ἢ ἀέρινον. ἄνευ μὲν γὰρ ἁφῆς οὐδεμίαν ἄλλην αἴσθησιν ἐνδέχεται ἔχειν· τὸ γὰρ σῶμα ἁπτικόν, τὸ ἔμψυχον πᾶν, ὥσπερ εἴρηται. τὰ δὲ ἄλλα ἔξω γῆς, αἰσθητήρια μὲν ἂν γένοιτο· πάντα δὲ τῷ δι' ἑτέρου αἰσθάνεσθαι, ποιεῖ τὴν αἴσθησιν καὶ διὰ τῶν μεταξύ. ἡ δ' ἁφή, τῷ αὐτῶν ἅπτεσθαι ἐστί· διὸ καὶ τοὔνομα τοῦτο ἔχει. καίτοι καὶ τὰ ἄλλα αἰσθητήρια ἁφῇ αἰσθάνεται, ἀλλὰ δι' ἑτέρου· αὕτη δὲ δοκεῖ μόνη δι' αὑτῆς. ὥστε τῶν μὲν τοιούτων στοιχείων οὐθὲν ἂν εἴη σῶμα τοῦ ζῴου. 14 οὐδὲ δὴ γήϊνον. πάντων γὰρ ἡ ἁφὴ τῶν ἁπτῶν ἐστιν, ὥσπερ μεσότης, καὶ δεκτικὸν τὸ αἰσθητήριον, οὐ μόνον ὅσαι διαφοραὶ γῆς εἰσιν, ἀλλὰ καὶ θερμοῦ καὶ ψυχροῦ, καὶ τῶν ἄλλων ἁπτῶν ἁπάντων. 15 καὶ διὰ τοῦτο τοῖς ὀστοῖς, καὶ ταῖς θριξί, καὶ τοῖς τοιούτοις μορίοις οὐκ αἰσθανόμεθα, ὅτι γῆς ἐστί. 16 καὶ τὰ φυτὰ διὰ τοῦτο οὐδεμίαν ἔχει αἴσθησιν, ὅτι γῆς ἐστίν.

vel corpori: nunc verò neutrum *eſt*: illa namque non magis intelliget: hoc verò ob id non magis erit. nullum igitur corpus non ſtabile habet animam ſine ſenſu. 6 At verò ſi ſenſum habeat, neceſſe eſt vt corpus ſit vel ſimplex vel mixtum: ſed fieri nequit, vt *ſit* ſimplex: quoniam tactum non habebit: neceſſe autem *eſt* hunc habere.

7 Hoc autem ex his manifeſtum *eſt*: quia cùm animal ſit corpus animatum, omne autem corpus *ſit* tactile, tactile verò *ſit*, quod *eſt* ſenſibile tactu: neceſſe *eſt* etiam animalis corpus habere vim tangendi, ſi futurum eſt vt animal conſeruetur. alij namque ſenſus per alia ſentiunt, veluti odoratus, aſpectus, auditus. quod verò tangitur, niſi habeat ſenſum, non poterit alia vitare, alia ſumere. quod ſi *ita eſt*, fieri nequit vt animal conſeruetur.

8 Idcirco & guſtus eſt veluti tactus quidam: quoniam eſt alimenti: alimentum verò *eſt* corpus tactile. ſonus autem & color & odor non alit, nec efficit vel auctionem vel deminutionem. Quapropter & guſtum neceſſe *eſt* eſſe tactum quendam: quia eſt ſenſus rei tactilis & nutritiuæ. Ergo hi *ſenſus* neceſſarij ſunt animali: ac perſpicuum eſt non poſſe ſine tactu eſſe animal. 9 Alij verò ſenſus *inſunt*, vt bene ſit: ac neceſſe eſt vt inſint generi animalium, non cuiuis, ſed quibuſdam, vt ei quod vim habet incedendi. etenim ſi futurum eſt vt conſeruetur, non ſolum opus eſt, vt cùm tangit, ſentiat, ſed etiam eminus: hoc autem erit, ſi vim ſentiendi habeat per intermedium, eo quòd illud à ſenſibili patitur ac mouetur, ipſum autem ab illo. 10 Sic vt enim quod loco mouet, vſque ad aliquid mutationem facit: & pellens alterum, facit vt *illud* pellat: ac per medium eſt motus: & primùm quidem mouens pellit non pulſum: vltimum autem tantùm pellitur, cùm *ipſum* non pellat: medium verò vtraque: multa autem media *eſſe poſſunt*: ita etiam in variatione *res habet*, præterquam quòd manentia in eodem loco variant. 11 Veluti ſi quis in ceram mergat *aliquid*, eò vſque mota eſt, quò vſque *merſit*: lapis autem nihil *mouetur*: ſed aqua ad longiorem diſtantiam. aër verò ad maximam diſtantiam mouetur, & facit ac patitur, ſi maneat & vnus ſit.

12 Quocirca & de refractione rectiùs, quàm aſpectum egredientem reflecti, *dicitur* aërem pati à colore & figura, quò vſque vnus eſt, in læui autem eſt vnus. idcóque rurſus hic aſpectum mouet, perinde ac ſi in cera ſigillum tranſmitteretur vſque ad *extremum* terminum. 13 Porrò fieri non poſſe vt corpus animalis ſit ſimplex, perſpicuum *eſt*: verbi gratia, igneum, aut aëreum. quoniam ſine tactu nullus alius ſenſus haberi poteſt: omne enim corpus animatum habet vim tangendi, vt dictum fuit. reliqua autem *elementa*, præter terram, poſſunt quidem fieri ſenſoria, ſed omnia, quia per aliud ſentitur, efficiunt ſenſum, ac per intermedia. tactus verò eſt, eo quòd ipſa *obiecta* tãgit: vnde etiam hoc nomen habet. Atqui etiam alia ſenſoria tactu ſentiunt: ſed per alia: hic verò ſolus per ſe. Quare nullum eiuſmodi elementum poteſt eſſe corpus animalis. 14 Nec terreſtre: quia tactus eſt omnium tactilium, vt pote mediocritas: ac ſenſorium ſuſcipere poteſt non ſolùm quaſcunque differentias terræ, ſed etiam calidi & frigidi, & omnium aliorum tactilium. 15 Idcóque oſſibus, & pilis, & eiuſmodi partibus non ſentimus, quia ex terra conſtant. 16 Plantæ quoque propterea nullũ habent ſenſum, quia terreſtres ſunt.

17 Sine

17 Sine tactu autem fieri nequit vt alius *ſenſus* inſit, A ſed hoc ſenſorium nec eſt terræ, nec alicuius alius elementi. 18 Perſpicuum igitur *eſt*, neceſſe *eſſe* vt hoc ſolo ſenſu priuata animalia moriantur: quia nec fieri poteſt vt non animal habeat hunc ſenſum: neque id quod eſt animal, neceſſe eſt habere alium ſenſum præter hunc. 19 Quamobrem alia ſenſibilia ſi exſuperent, non perimunt animal (vt color, & ſonus, & odor) ſed tantùm ſenſoria: (niſi ſit ex accidenti: veluti ſi ſimul cum ſono fiat pulſus & plaga: & ab aſpectabilibus atque odore alia moueantur, quæ tactu interimant. quin & ſapor, quatenus ſimul accidit vt ſit res tactilis, hactenus interimit) ſed tactilium exſuperantia (vt calidorum, & frigidorum, & durorum) interimit animal. nam cu- B iuſuis ſenſibilis exſuperantia perimit ſenſorium: quapropter & tactile tactum: hoc verò definitur vita: quia ſine tactu oſtenſum eſt non poſſe eſſe animal. Idcirco tactilium exſuperantia non tantùm perimit ſenſorium, ſed etiam animal: quia neceſſe tantùm *eſt* hunc ſenſum animalia habere. reliquos verò ſenſus habet animal, ſicuti dictum fuit, non vt ſit, ſed vt bene *ſit*: vt purà aſpectum, quia in aere & aqua *verſatur*, vt videat, & omnino quia in perlucido *verſatur*: guſtum autem, propter iucundum & moleſtum, vt ſentiat quod *eſt* in alimento, & cupiat, & moueatur: auditum verò, vt *aliud* ipſi aliquid ſignificet; lingua autem, vt ſignificet aliquid alteri.

A 17 Ἄνευ δὲ ἁφῆς οὐδεμίαν οἷόν τε ἄλλην ὑπάρχειν. τοῦτο δὲ τὸ αἰσθητήριον, οὐκ ἔστιν οὔτε γῆς οὔτε ἄλλου τῶν στοιχείων οὐδενός. 18 Φανερὸν τοίνυν, ὅτι ἀνάγκη μόνης ταύτης στερισκόμενα τῆς αἰσθήσεως τὰ ζῷα, ἀποθνήσκειν· οὔτε γὰρ ταύτην ἔχειν οἷόν τε μὴ ζῷον, οὔτε ζῷον ὄν, ἄλλην ἔχειν ἀνάγκη πλὴν ταύτης. 19 Καὶ διὰ τοῦτο τὰ μὲν ἄλλα αἰσθητὰ ταῖς ὑπερβολαῖς οὐ διαφθείρει τὸ ζῷον, οἷον χρῶμα, καὶ ψόφος, καὶ ὀσμή, ἀλλὰ μόνον τὰ αἰσθητήρια, ἂν μὴ κατὰ συμβεβηκός. οἷον ἂν ἅμα τῷ ψόφῳ ὦσις γένηται καὶ πληγή· καὶ ὑπὸ ὁραμάτων καὶ ὀσμῆς ἕτερα κινεῖται, ἃ τῇ ἁφῇ φθείρει. καὶ ὁ χυμὸς δὲ ᾗ B ἅμα συμβαίνει ἁπτικὸν εἶναι, ταύτῃ φθείρει. ἡ δὲ τῶν ἁπτῶν ὑπερβολή, οἷον θερμῶν, καὶ ψυχρῶν, καὶ σκληρῶν, ἀναιρεῖ τὸ ζῷον· παντὸς μὲν γὰρ * αἰσθητοῦ ὑπερβολὴ ἀναιρεῖ τὸ αἰσθητήριον· ὥστε καὶ τὸ ἁπτὸν τὴν ἁφήν, ταύτῃ δὲ ὥρισται τὸ ζῆν· ἄνευ γὰρ ἁφῆς δέδεικται ὅτι ἀδύνατον εἶναι τὸ ζῷον. διὸ ἡ τῶν ἁπτῶν ὑπερβολὴ οὐ μόνον τὸ αἰσθητήριον φθείρει, ἀλλὰ καὶ τὸ ζῷον, ὅτι ἀνάγκη μόνον ἔχειν ταύτην τὰ ζῷα. τὰς δὲ ἄλλας αἰσθήσεις ἔχει τὸ ζῷον, ὥσπερ εἴρηται, οὐ τοῦ εἶναι ἕνεκα, ἀλλὰ τοῦ εὖ. οἷον ὄψιν, ἐπεὶ ἐν ἀέρι καὶ ὕδατι, ὅπως ὁρᾷ· ὅλως δ' ἐπεὶ ἐν διαφανεῖ· γεῦσιν δέ, διὰ τὸ ἡδὺ καὶ λυπηρόν, ἵνα αἰσθάνηται τὸ ἐν τροφῇ, καὶ ἐπιθυμῇ καὶ κινῆται· ἀκοὴν δέ, ὅπως * σημαίνῃ τι αὐτῷ· γλῶτταν δέ, ὅπως σημαίνῃ τι ἑτέρῳ.

* γρ. αἰσθητικοῦ

* γρ. σημαίνηται

* γρ. περὶ αἰσθητηρίων ἢ αἰ.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ ΑΙΣΘΗΣΕΩΣ ΚΑΙ ΑΙΣΘΗΤΩΝ.

ARISTOTELIS STAGIRITÆ, DE SENSV ET SENSILI, LIBER.

Franciſco Vatablo interprete.

ΚΕΦΑΛ. α'.

Ὑπόθεσις πάντων τῶν ἐφεξῆς λεκτέων, ἅπερ ἀπὸ ψυχῆς τῷ σώματι κοινωνοῦνται, καὶ πῶς κοινωνοῦνται

A

ΕΠΕΙ δὲ περὶ ψυχῆς καθ' αὑτὴν διώρισται πρότερον, καὶ περὶ τῶν δυνάμεων ἑκάστης κατὰ μόριον αὐτῆς, ἐχόμενόν ἐστι ποιήσασθαι τὴν ἐπίσκεψιν περὶ τῶν ζώων, καὶ τῶν ζωὴν ἐχόντων ἁπάντων, B τίνες εἰσὶν ἴδιαι, καὶ τίνες κοιναὶ πράξεις αὐτῶν. τὰ μὲν οὖν εἰρημένα περὶ ψυχῆς ὑποκείσθω. περὶ δὲ τῶν λοιπῶν λέγωμεν, καὶ πρῶτον περὶ τῶν πρώτων. Φαίνεται δὲ τὰ μέγιστα, καὶ τὰ κοινά, καὶ ἴδια τῶν ζώων, κοινὰ τῆς τε ψυχῆς ὄντα καὶ τοῦ σώματος, οἷον αἴσθησις, καὶ μνήμη, καὶ θυμός, *καὶ ἐπιθυμία, καὶ ὅλως ὄρεξις· καὶ πρὸς τούτοις, ἡδονὴ καὶ λύπη· καὶ γὰρ ταῦτα σχεδὸν ὑπάρχει πᾶσι τοῖς ζώοις. πρὸς δὲ τούτοις, τὰ μὲν πάντων ἐστὶ τῶν μετεχόντων ζωῆς κοινά, τὰ δὲ τῶν ζώων ἐνίοις. τυγχάνουσι δὲ τούτων τὰ μέγιστα τέσσαρες οὖσαι συζυγίαι τὸν ἀριθμὸν C μόναι, οἷον ἐγρήγορσις καὶ ὕπνος, καὶ νεότης καὶ γῆρας, καὶ ἀναπνοὴ καὶ ἐκπνοή, καὶ ζωή, καὶ θάνατος· περὶ ὧν θεωρητέον, τί τε ἕκαστον αὐτῶν, καὶ διὰ τίνας αἰτίας συμβαίνουσι. Φυσικοῦ δὲ καὶ περὶ ὑγιείας καὶ νόσου τὰς πρώτας ἰδεῖν ἀρχάς. οὔτε γὰρ ὑγίειαν οὔτε νόσον οἷόν τε γίνεσθαι τοῖς ἐστερημένοις ζωῆς. διὸ σχεδὸν τῶν τε περὶ φύσεως οἱ πλεῖστοι, καὶ τῶν ἰατρῶν οἱ φιλοσοφωτέρως τὴν τέχνην μετιόντες, οἱ μὲν τελευτῶσιν εἰς τὰ περὶ ἰατρικῆς, οἱ δ' ἐκ τῶν περὶ φύσεως ἄρχονται περὶ ἰατρικῆς. ὅτι δὲ πάντα τὰ λεχθέντα κοινὰ τῆς τε ψυχῆς ἐστὶ καὶ τοῦ σώματος, D οὐκ ἄδηλον· πάντα γάρ, τὰ μὲν μετ' αἰσθήσεως συμβαίνει, τὰ δὲ δι' αἰσθήσεως· ἔνια δέ, τὰ μὲν πάθη ταύτης ὄντα τυγχάνει, τὰ δὲ ἕξεις, τὰ δὲ φυλακαὶ καὶ σωτηρίαι, τὰ δὲ φθοραὶ καὶ στερήσεις. ἡ δ' αἴσθησις ὅτι διὰ σώματος γίνεται τῇ ψυχῇ, δῆλον διὰ τοῦ λόγου καὶ τοῦ λόγου χωρίς. ἀλλὰ περὶ μὲν αἰσθήσεως καὶ τοῦ αἰσθάνεσθαι, καὶ διὰ τί συμβαίνει τοῖς ζώοις τοῦτο τὸ πάθος, εἴρηται ἐν τοῖς περὶ ψυχῆς. τοῖς δὲ ζώοις ᾗ μὲν ζῶον ἕκαστον, ἀναγκαῖον ὑπάρχειν αἴσθησιν· τούτῳ γὰρ τὸ ζῶον εἶναι καὶ μὴ ζῶον εἶναι διορίζομεν.

* Infrà De vita & morte, in fine.

CAPVT I.

De animæ & corpori communibus, primúmque de viſu.

CVm de anima in ſe, & de ſingulis eius potentiis, particulatim definitum iam ſit, proximum eſt vt de cunctis tã animantibus quàm hiſce quæ vitam ſortita ſunt, quænam actiones eorum propriæ ſint, & quæ- B nam communes, conſideremus. Igitur ſuppoſitis hiſce quæ de anima dicta ſunt: de reliquis, exorſi à primis, ediſſeramus. Planè tam communia quàm propria animantibus ceu ſenſus, memoria, ira, cupiditas, denique appetitus, & inſuper voluptas & dolor (etenim hæc animantibus ferè omnibus competunt) promiſcua corpori & animæ maximè videntur eſſe. Ad hæc quædam omnibus quæ vita participant, communia ſunt: quædam, animantium nonnullis. Horum autem copulæ quatuor numero præcipuè exiſtunt: nempe vigilia & ſomnus, iuuentus & ſenectus, reſpiratio & expiratio, vita & C mors. De quibus contemplari oportet, & quidnam eorum quodque ſit, & quibus de cauſis eueniant. Cæterùm ad naturalem quoque ſpectat, prima ſanitatis & ægritudinis principia cognoſcere. etenim fieri non poteſt vt quæ vita deſtituta ſunt, ſana ſint & ægra. Iccirco ferè tam naturalium plurimi, quàm medicorum ii qui doctiuſculè artem ipſam perſequi ac tractare ſtudent, alteri, in iis quæ ad artem medicinalem pertinent, ſuæ conſiderationi finem imponunt: alteri ab iis quæ ad contemplationem naturæ ſpectant, medendi ſcientiam auſpicantur. Quòd autem ea omnia quæ D diximus, ad corpus & animam communiter attineant, haud obſcurum eſſe videtur. Nam ex eis quædam cum ſenſu eueniunt, quædã per ſenſum. Item alia affectus eiuſdem ſunt, habitus alia: alia porrò tutelæ atque conſeruationes, alia corruptiones atque priuantiæ. Senſum verò per corpus animæ competere, per rationem & abſque ratione conſtat. Ipſis autem animalibus ſenſum ineſſe, qua nimirũ ratione quodque animal eſt, neceſſe eſt. nã hoc ipſo, eſſe animal, & non eſſe, definimus. Verùm de ſenſu & ſentiẽdo quis ſit, & cur hęc affectio animantibus accidat, in libris de Anima diximus.

Nunc autem priuatim de ſingulis ſenſibus agendum eſt. Tactus & guſtus animalia omnia neceſſariò comitantur. tactus, ob eam quam in libris de Anima explicauimus, cauſam: guſtus, ob alimentum. nam guſtus, quòd voluptate afficit, quódque dolore in alimento diſcernit ac diiudicat, adeò vt hoc fugiat, illud perſequatur: atque omnino ſapor, partis altricis affectio exiſtit. At ſenſus illi, qui intercedente aliquo extrinſecus medio fiunt, olfactus, inquam, auditus & viſus, ex animātium numero inceſſilibus omnibus, eos quidem habentibus, tutelæ ac ſalutis gratia adiuncti ſunt: vt præſentientes alimentum perſequantur, & quæ praua ſunt atque exitialia, fugiant. Sed iis quæ prudentiæ quoque participes ſunt, gratia cuiuſpiā commodi melioris acceſſere. nā auditus & viſus multas adnunciāt differētias, quibus rerū tam intellectiliū quàm quę ſub actionē cadere ſolent, peritia comparetur. Horum ipſorum ad ea quæ vitæ neceſſaria ſunt magis, vel per ſe, viſus conducit: ad cultum ingenij capeſſendum, per accidens auditus. Nam viſus complures variáſque differētias aduehit, quòd corpora omnia colore participent. Quare & hoc ſenſu maximè communia ſentimus. Communia dico, figuram, magnitudinem, motum, ſtatum, numerum. At auditus ſoni tantummodo diſcrimina, paucis etiam vocis renuntiat. Sed per accidens magnum adfert adiumentum ad acquirendam ſapientiam prudentiámque. nam ſermo, cùm ſit audibilis, diſciplinæ cauſa non per ſe, ſed per accidens exiſtit. conſtat enim ex nominibus. ſingula autem nomina quarumdam notionum ſymbola ſunt. Quamobrem ex iis qui iam inde ab ortu naturæ vtroque ſenſu priuati ſunt, qui cæci ſunt, hiſce qui muti ſurdíque ſunt, ſapientiores euadunt atque prudentiores. De virtute igitur ac facultate, quam quiſque ſenſuum habeat, diximus.

CAPVT II.

De ſenſuum organis, & quòd oculus ſit aqueus.

Corporea autem ſenſoria, in quibus iidem fieri apti ſunt, nonnulli quidem iuxta elementa corporum diſquirunt atque inueſtigant: ſed cùm nequeant quinque ſenſus ad quatuor elementa reducere, cui quintus accommodari debeat, hæſitant. Omnes autem viſum igni tribuunt, quòd cuiuſdam affectionis cauſam ignorent. nam preſſo agitatóque oculo, igneus fulgor apparet. At hoc in tenebris euenire natum eſt, aut cùm palpebræ oculos integunt. nam tum quoque tenebræ oboriri ſolent. Habet autem hoc aliam quoque dubitationem. Nam cùm fieri non poſſit vt quempiam lateat ſe ſentire ac videre rem quampiam conſpectui obuiam, neceſſum eſt, vt oculus ipſe ſeipſum videat. cur igitur idipſum quieſcenti oculo non euenit? Cauſa huiuſce & dubitationis, & denique quamobrem viſus ex igni conſtare videatur, hinc ſumenda eſt. Nam quæ leuia ſunt, fulgere in tenebris, non tamen illuſtrare inſitum habent. oculi autem pars nigra mediáque leuis eſt. Ea verò cùm mouetur oculus, apparet. propterea quòd tum accidit vt res vna vt duæ ſit. id quod motionis celeritas efficit. adeò vt aliud eſſe videatur id quod videt: & aliud id quod videtur. Iccirco etiam non fit, niſi celeriter, & in tenebris oculi motio fiat. nam quod leue eſt, in tenebris ſuapte natura collucet, ceu quorumdam piſcium capita,

A ἰδίᾳ δὲ καθ' ἕκαστον, ἡ μὲν ἁφὴ καὶ γεῦσις ἀκολουθεῖ πᾶσιν ἐξ ἀνάγκης· ἡ μὲν ἁφὴ, διὰ τὴν εἰρημένην αἰτίαν ἐν τοῖς περὶ ψυχῆς· ἡ δὲ γεῦσις, διὰ τὴν τροφήν· τὸ γὰρ ἡδὺ διακρίνει αὕτη καὶ τὸ λυπηρὸν περὶ τὴν τροφὴν, ὥστε τὸ μὲν φεύγειν, τὸ δὲ διώκειν. καὶ ὅλως ὁ χυμός ἐστι τοῦ* θρεπτικοῦ μορίου πάθος. αἱ δὲ διὰ τῶν ἔξωθεν αἰσθήσεις, τοῖς πορευτικοῖς αὐτῶν, οἷον ὄσφρησις, καὶ ἀκοὴ, καὶ ὄψις, πᾶσι μὲν τοῖς ἔχουσι, σωτηρίας ἕνεκα ὑπάρχουσιν, ὅπως διώκωσί τε προαισθανόμενα τὴν τροφὴν, καὶ τὰ φαῦλα καὶ τὰ φθαρτικὰ φεύγωσι· τοῖς δὲ καὶ φρονήσεως τυγχάνουσι, τοῦ εὖ ἕνεκα·

B πολλὰς γὰρ εἰσαγγέλλουσι διαφορὰς, ἐξ ὧν ἥτε τῶν νοητῶν ἐγγίνεται φρόνησις, καὶ ἡ τῶν πρακτῶν. αὐτῶν δὲ τούτων πρὸς μὲν τὰ ἀναγκαῖα, κρείττων ἡ ὄψις καὶ καθ' αὑτήν· πρὸς δὲ νοῦν, κατὰ συμβεβηκὸς ἡ ἀκοή. διαφορὰς γὰρ πολλὰς εἰσαγγέλλει καὶ παντοδαπὰς ἡ τῆς ὄψεως δύναμις, διὰ τὸ πάντα σώματα μετέχειν χρώματος. ὥστε καὶ τὰ κοινὰ διὰ ταύτης αἰσθάνεσθαι μάλιστα. λέγω δὲ κοινὰ, σχῆμα, μέγεθος, κίνησιν, στάσιν, ἀριθμόν. ἡ δ' ἀκοὴ, τὰς τοῦ ψόφου διαφορὰς μόνον· ὀλίγοις δὲ, καὶ τὰς τῆς φωνῆς. κατὰ συμβεβηκὸς δ' εἰς φρόνησιν πλεῖστον ἡ ἀκοὴ συμβάλλεται μέρος. ὁ γὰρ

C λόγος αἴτιός ἐστι τῆς μαθήσεως, ἀκουστὸς ὢν, οὐ καθ' ἑαυτὸν, ἀλλὰ κατὰ συμβεβηκός· ἐξ ὀνομάτων γὰρ σύγκειται· τῶν δ' ὀνομάτων ἕκαστον, σύμβολόν ἐστι. διόπερ φρονιμώτεροι τῶν ἐκ γενετῆς ἐστερημένων εἰσὶν ἑκατέρας αἰσθήσεως οἱ τυφλοὶ τῶν ἐνεῶν καὶ κωφῶν. περὶ μὲν οὖν τῆς δυνάμεως, ἣν ἔχει τῶν αἰσθήσεων ἑκάστη, πρότερον εἴρηται.

* κ. χυμοῦ. al. τοῦ γευστικοῦ θρεπτικοῦ. vide Alex.

ΚΕΦΑΛ. β'.

Περὶ τῶν πέντε αἰσθήσεων, πῶς τῇ τῶν τεττάρων στοιχείων φύσει προσάπτονται.

D Τοῦ δὲ σώματος ἐν οἷς πέφυκε γίγνεσθαι αἰσθητηρίοις, ἔνιοι μὲν ζητοῦσι κατὰ τὰ στοιχεῖα τῶν σωμάτων· οὐκ εὐποροῦντες δὲ πρὸς τέτταρα πέντε οὔσας συνάγειν, γλίχονται περὶ τῆς πέμπτης. ποιοῦσι δὲ πάντες τὴν ὄψιν πυρὸς, διὰ τὸ πάθους τινὸς ἀγνοεῖν τὴν αἰτίαν· θλιβομένου γὰρ καὶ κινουμένου τοῦ ὀφθαλμοῦ, φαίνεται πῦρ ἐκλάμπειν· τοῦτο δ', ἐν τῷ σκότει πέφυκε συμβαίνειν, ἢ τῶν βλεφάρων ἐπικεκαλυμμένων· γίνεται γὰρ καὶ τότε ἐν σκότει. ἔχει δ' ἀπορίαν τοῦτο καὶ ἑτέραν· εἰ γὰρ μή ἐστι λανθάνειν αἰσθανόμενον καὶ ὁρῶντα ὁρώμενόν τι, ἀνάγκη ἄρα

E αὐτὸν ἑαυτὸν ὁρᾶν τὸν ὀφθαλμόν. διὰ τί οὖν ἠρεμοῦντι τοῦτο οὐ συμβαίνει; τὰ δ' αἴτια τούτου, καὶ τῆς ἀπορίας, καὶ τοῦ δοκεῖν πῦρ εἶναι τὴν ὄψιν, ἐντεῦθεν ληπτέον· τὰ γὰρ λεῖα πέφυκεν ἐν τῷ σκότει λάμπειν, οὐ μέντοι φῶς γε ποιεῖν· τοῦ δ' ὀφθαλμοῦ τὸ καλούμενον μέλαν καὶ μέσον, λεῖον φαίνεται. φαίνεται δὲ τοῦτο κινουμένου τοῦ ὄμματος, διὰ τὸ συμβαίνειν ὥσπερ δύο γίνεσθαι τὸ ἕν. τοῦτο δ' ἡ ταχυτὴς ποιεῖ τῆς κινήσεως, ὥστε δοκεῖν ἕτερον εἶναι τὸ ὁρῶν καὶ τὸ ὁρώμενον. διὸ καὶ οὐ γίνεται, ἐὰν μὴ ταχέως καὶ ἐν τῷ σκότει τοῦτο συμβαίνῃ· τὸ γὰρ λεῖον ἐν τῷ σκότει πέφυκε λάμπειν, οἷον κεφαλαὶ ἰχθύων τινῶν,

καὶ ὁ τῆς σηπίας θολός· καὶ βραδέως μεταβάλλοντος τοῦ ὄμματος, οὐ συμβαίνει ὥστε δοκεῖν ἅμα δύο καὶ ἓν εἶναι, τό, τε ὁρῶν καὶ τὸ ὁρώμενον. ἐκείνως δ' αὐτὸς αὑτὸν ὁρᾷ ὁ ὀφθαλμός, ὥσπερ καὶ ἐν τῇ ἀνακλάσει· ἐπεὶ εἴγε πῦρ ἦν, καθάπερ Ἐμπεδοκλῆς φησι, καὶ ἐν τῷ Τιμαίῳ γέγραπται, καὶ συνέβαινε τὸ ὁρᾶν, ἐξιόντος ὥσπερ ἐκ λαμπτῆρος τοῦ φωτός, διὰ τί οὐ καὶ ἐν τῷ σκότει ἑώρα ἂν ἡ ὄψις; τὸ δ' ἀποσβέννυσθαι φάναι ἐν τῷ σκότει ἐξιοῦσαν, ὥσπερ ὁ Τίμαιος λέγει, κενόν ἐστι παντελῶς· τίς γὰρ ἀπόσβεσις φωτός ἐστι; σβέννυται γὰρ ἢ ἐν ὑγρῷ ἢ ψυχρῷ τὸ θερμὸν καὶ ξηρόν· οἷον δοκεῖ τό, τε ἐν τοῖς ἀνθρακώδεσιν εἶναι πῦρ καὶ ἡ φλόξ, ὧν τῷ φωτὶ οὐδέτερον φαίνεται * ὑπάρχον. εἰ δ' ἄρα ὑπάρχει μέν, ἀλλὰ διὰ τὸ ἠρέμα λανθάνει ἡμᾶς, ἔδει μεθ' ἡμέραν τε καὶ τῷ ὕδατι ἀποσβέννυσθαι τὸ φῶς, καὶ ἐν τοῖς πάγοις μᾶλλον γίνεσθαι σκότος. ἡ γοῦν φλὸξ καὶ τὰ πεπυρωμένα σώματα, πάσχει τοῦτο· νῦν δ' οὐδὲν συμβαίνει τοιοῦτον. Ἐμπεδοκλῆς δὲ ἔοικε νομίζοντι, ὁτὲ μὲν ἐξιόντος τοῦ φωτός, ὥσπερ εἴρηται πρότερον, βλέπειν· λέγει γοῦν οὕτως·

* γρ. ὑπάρχειν.

Ὡς δ' ὅτε τις πρόοδον νοέων ὡπλίσσατο λύχνον,
Χειμερίην διὰ νύκτα πυρὸς σέλας αἰθομένοιο,
Ἅψας παντοίων ἀνέμων λαμπτῆρας * ἀμοργούς,
Οἵ τ' ἀνέμων μὲν πνεῦμα διασκιδνᾶσιν ἀέντων·
Φῶς δ' ἔξω διαθρῷσκον, ὅσον ταναώτερον ἦεν,
Λάμπεσκεν κατὰ βηλὸν ἀτειρέσιν ἀκτίνεσσιν·
Ὣς δὲ τότ' ἐν μήνιγξιν ἐεργμένον ὠγύγιον πῦρ,
Λεπτῇσιν ὀθόνῃσιν ἐχεύατο κύκλοπα κούρην·
Αἳ δ' ὕδατος μὲν βένθος ἀπέστεγον ἀμφινάοντος·
Πῦρ δ' ἔξω διαθρῷσκον, ὅσον ταναώτερον ἦεν.

* γρ. ἀμοργούς.

ὁτὲ μὲν οὖν οὕτως ὁρᾶν φησιν· ὁτὲ δὲ ταῖς ἀπορροίαις ταῖς ἀπὸ τῶν ὁρωμένων. Δημόκριτος δὲ ὅτι μὲν ὕδωρ εἶναι φησι, λέγει καλῶς· ὅτι δ' οἴεται τὸ ὁρᾶν εἶναι τὴν ἔμφασιν, οὐ καλῶς· τοῦτο γὰρ συμβαίνει, ὅτι τὸ μὲν ὄμμα λεῖον, καὶ ἔστιν οὐκ ἐν ἐκείνῳ, ἀλλ' ἐν τῷ ὁρῶντι· ἀνάκλασις γὰρ τὸ πάθος. ἀλλὰ καθόλου περὶ τῶν ἐμφαινομένων καὶ ἀνακλάσεως, οὐδέπω δῆλον ἦν αὐτῷ, ὡς ἔοικεν. ἄτοπον δὲ καὶ τὸ μὴ ἐπελθεῖν αὐτῷ ἀπορῆσαι, διὰ τί ὁ ὀφθαλμὸς ὁρᾷ μόνον, τῶν δὲ ἄλλων οὐδέν, ἐν οἷς ἐμφαίνονται τὰ εἴδωλα. τὸ μὲν οὖν τὴν ὄψιν εἶναι ὕδατος, ἀληθὲς μέν· οὐ μέντοι συμβαίνει τὸ ὁρᾶν ᾗ ὕδωρ, ἀλλ' ᾗ διαφανές· ὃ καὶ ἐπὶ τοῦ ἀέρος κοινόν ἐστιν. ἀλλ' εὐφυλακτότερον καὶ εὐπιλητότερον τὸ ὕδωρ τοῦ ἀέρος· διόπερ ἡ κόρη καὶ τὸ ὄμμα ὕδατός ἐστι. τοῦτο δὲ καὶ ἐπ' αὐτῶν τῶν ἔργων δῆλον· φαίνεται γὰρ ὕδωρ τὸ ἐκρέον διαφθειρομένων τῶν ὀφθαλμῶν· καὶ ἔν γε τοῖς πάμπαν ἐμβρύοις, τῇ λαμπρότητι ὑπερβάλλον ἐστί, καὶ τῇ στιλπνότητι· καὶ τὸ λευκὸν τοῦ ὄμματος ἐν τοῖς ἔχουσιν αἷμα, πῖον καὶ λιπαρόν· ὅπερ διὰ τοῦτό ἐστι, πρὸς τὸ διαμένειν τὸ ὑγρὸν ἄπηκτον. καὶ διὰ τοῦτο τοῦ σώματος ἀρριγότατον ὁ ὀφθαλμός ἐστιν. οὐδεὶς γάρ πω τὸ ἐντὸς τῶν βλεφάρων ἐρρίγωσε. τῶν δὲ ἀναίμων σκληρόδερμοι οἱ ὀφθαλμοί εἰσι· καὶ τοῦτο ποιεῖ τὴν σκέπην. ἄλογον δὲ ὅλως τὸ ἐξιόντι τινὶ τὴν ὄψιν ὁρᾶν, καὶ ἀποτείνεσθαι μέχρι τῶν ἄστρων, ἢ μέχρι τινὸς ἐξιοῦσαν συμφύεσθαι, καθάπερ λέγουσί τινες. τούτου μὲν γὰρ βέλτιον τὸ ἐν ἀρχῇ συμφύεσθαι τοῦ ὄμματος· ἀλλὰ καὶ τοῦτο εὔηθες· τί γὰρ συμφύεσθαι τί ἐστι φωτὶ πρὸς φῶς;

A & ſepiæ atramentum. & cùm lentè commouetur oculus, nequaquam euenit vt ſimul duo eſſe videatur, quod vnum eſt: nempe videns & viſum. Illo autem modo oculus ipſe ſeipſum videt, quomodo & in refractione agitur. Nam ſi oculus conſtaret ex igni, vt Empedocli placet, & in Timæo ſcriptum eſt, acerideretque videre egrediente velvti è laterna lumine, cur non etiam in tenebris aſpectus videret? Dicere autem, viſum cùm egrediatur, in tenebris extingui, vt Timæus aſtruit, inane modis omnibus exiſtit. Quænam enim eſſe poteſt luminis extinctio? nam aut frigido extingui, aut humido aſſolet, quod calidum ſiccúmque eſt: qualis eſt & prunarum ignis, & flamma ipſa. quorum neutrum lumini B ineſſe videtur. Quòd ſi ſint quidem, ſed quia remiſsè inſunt, nos lateant, oportebat interdiu & ſuperueniente pluuia lumen extingui, ac tempore glaciali potiſſimùm tenebras fieri. nam flamma ipſa & conflagrantia corpora idipſum patiuntur. Nunc verò nihil tale lumini accidit. Empedocles autem interdum exiſtimare videtur, egrediente lumine id quod priùs diximus, nos cernere. inquit enim ad hunc modum:

Vt cum quis meditatus iter noctem per opacam,
Aſſolet ardentem faculam lychnúmve parare,
Addens laternam quæ flatus arceat omneis:
Diſſipat iſta quidem flantis ſpiramina venti:
C *At lux egrediens quantum ſe fundere poſſit,*
Colluſtratque viam radiis, vincitque tenebras:
Sic tunicis clauſus validis ſubtilibus ampliùs,
Ignis natiuus pupillarem impetit orbem,
Hæ magnam latices vim qui circumfluit arcent,
Diſſilit ille foras quantum ſe fundere poſſit.

Interdum inquam nos hoc pacto cernere aſſerit: interdum defluxibus & exuuiis à re conſpecta miſſis. Democritus verò, quatenus viſum eſſe aquam aſſerit, rectè dicit: quatenus viſionem eſſe emphaſin, id eſt, apparitionem, ſiue apparentiam, non rectè. Id enim euenit, quia oculus leuis eſt. Atque emphaſis nequaquam in re viſa, ſed in vidente exi-D ſtit: quippe cùm ea affectio, refractio ſit. Verùm nec dum illi quicquam (vt videtur) de apparentibus & refractione apertum erat. Abſurdum etiam & illud eſt, non ſuccurriſſe inquã ei, vt dubitaret, cur ſolus videat oculus, & cæterorum nullũ in quibus ſimulachra appareant. Conſpectũ igitur eſſe aqueũ, veritati quidem conſonũ eſt: non tamen viſio fit, vt eſt aqua, ſed vt translucet. quod & aëri commune eſt. Verùm aqua faciliùs quàm aër cõprehendit atque retineri poteſt. Idcirco pupilla & oculus ex aqua conſtãt. Quod quidẽ & experientia ipſa latè patet. nam quod ſauciatis oculis effluere aſſolet, videtur eſſe aqua. Quin & in fœtibus nuper afformatis oculi ſupramodum ſplendent, refulgéntque. Atque in E ſanguinariis albida portio oculi, opima pinguiſque ob id eſt, vt humor perſiſtat incongelabilis. Et ob id oculus minimè omniũ partium corporis, rigere ſolet. nemo enim vnquã interna parte oculi friguit. Exanguium verò oculos tunica dura ambire ſolet, quæ illos ab iniuria frigoris tuetur atque defendit. Porro illud omnino metas egreditur rationis: nempe conſpiciendi vim exeunte quopiam videre, & aut ad aſtra vſque deduci, aut cùm ad vſque certum quoddã ſpacium proceſſerit, cum lumine externo vniri, atque coniungi, ſicuti quidam aiunt. Nam iſto præſtabilius id erat, nimirũ coniunctionẽ in oculi principio fieri. Quamquã & id quoque ſtultum eſt. quid enim eſt lumen lumini coniungi?

aut quonam pacto id eſſe poteſt? non enim quoduis cuiuis ſine diſcrimine coniungitur. Item qui internum lumen externo coniungetur, cùm membrana ipſa inter illa media ſit? De hoc igitur, videlicet quòd ſine lumine non videatur, alibi diximus. Verùm ſiue lumen ſiue aër id ſit, quod oculum & rem conſpectam interiacet; motio ipſa quæ per eũ fit, viſionem efficit. Atque ratione euenit optima, vt interna oculi portio aquea ſit. nam aqua perſpicua eſt. Vt autem extrà non ſine lumine videtur, ſic & intrà. Perſpicuum ergo eſſe oculũ oportet, eundémque aquam eſſe neceſſe eſt: quando aër non eſt. non enim anima ipſa, aut animæ ſenſorium in oculi extremo, ſed in parte, vt patet, interna exiſtit. Quamobrem neceſſe eſt, vt pars oculi interior, perlucida & luminis exceptiua ſit. Atque etiam hoc ex hiſce quæ contingere ſolẽt, apertum eſt. Iam enim quidam accepto in prælio circa tempora vulnere adeò profundo, vt pori oculi & meatus fuerint excĩſi, ſeſe tenebris offundi, quaſi extincta lucerna, putarunt, propterea quòd perlucida pars oculi, & vocata pupilla, abſciſſa, ceu laterna quædam fuit. Quare ſi in hiſce perinde euenit, vt diximus, palàm eſt hoc modo aſſignare oportere, & accommodare vnumquodque ſenſorium vni elemento. Oculi enim partem cui videndi facultas data eſt, ex aqua conſtare exiſtimandum eſt: ex aëre, id quod ſonos percipit: olfactum, ex igni. nam quod olfaciendi vim obtinet, id potentia eſt, quòd olfactus, actu. ſenſile enim ſenſum agere facit. Quare neceſſe eſt eũdem ſenſum potentia priùs eſſe. Odor autem non niſi fumida quædam exhalatio exiſtit, quæ profectò ignea eſt. Quocirca & peculiare ſenſorium olfactus in cerebro ſitum eſt. nam rei frigidæ materia potentia calida eſt. Atque oculi generatio ad hunc ſeſe habet modum. nam oculus à cerebro conſtitutus eſt, quod omnium partium corporis humidiſſimum frigidiſſimúmque exiſtit. Cui autem tangendi tributa eſt autoritas, ex terra: cui guſtandi, ſpecies quædam tactus eſt. Et ob id ſenſorium eorum, guſtus inquam & tactus, haud procul à corde eſt. nam cor cerebro ex aduerſo iacet, & omnium partium corporis calidiſſimum eſt. Ac de ſenſoriis quidem corporis partibus hoc pacto definitum ſit.

CAPVT III.

Senſuum vnumquodque dupliciter dici: deque colore.

DE ſenſilibus autem cuiuſque ſenſorij, verbi cauſa, de colore, ſono, odore, ſapore, & tactili, quodnam ſit eorum munus atque officium, & quænam ſit cuiuſque ſenſorij actio, vniuerſaliter quidem in libris de Anima dictum eſt: quidnam verò ſit quodlibet eorum, ceu quid color, quid ſonus, quid odor, quid ſapor, & ſimiliter quid tactile, conſiderandum eſt. Et primò quidem de colore agendum videtur. Vnumquodque igitur bifariàm dici ſolet: actu ſcilicet & potentia. Verùm quónam pacto color & ſonus actu, ſenſibus actu, viſui ſcilicet & auditui, idem ſint & aliud, in commentariis de Anima dictum iam eſt. Quid autem exiſtens eorum quodque ſenſum actionemque faciat, nunc dicamus. Vt igitur ibi de lumine dictum eſt, quod perſpicui color per accidens ſit, ita hic quoque dicendum. nam corporis ignei præſentia in perſpicuo lumen eſt; priuatio, tenebræ. Quod autem

ἢ πῶς ἔσται τι ἐντὸς ἀρχῇ τοῦτο; οὐ γὰρ τῷ τυχόντι συμφύεται τὸ τυχόν. τό, τε ἐντὸς τῷ ἐκτὸς πῶς; ἡ γὰρ μῆνιγξ μεταξύ ἐστι. περὶ μὲν οὖν τοῦ ἄνευ φωτὸς μὴ ὁρᾶν, εἴρηται ἐν ἄλλοις· ἀλλ' εἴτε φῶς, εἴτε ἀήρ ἐστι τὸ μεταξὺ τοῦ ὁρωμένου καὶ τοῦ ὄμματος, ἡ διὰ τούτου κίνησίς ἐστιν ἡ ποιοῦσα τὸ ὁρᾶν. καὶ εὐλόγως τὸ ἐντός ἐστιν ὕδατος· διαφανὲς γὰρ τὸ ὕδωρ. ὁρᾶται δὲ ὥσπερ καὶ ἔξω οὐκ ἄνευ φωτός, οὕτω καὶ ἐντός. διαφανὲς γὰρ ἄρα δεῖ εἶναι, καὶ ἀναγκαῖον ὕδωρ εἶναι, ἐπειδὴ οὐκ ἀήρ. οὐ γὰρ ἐπὶ τοῦ ἐσχάτου ὄμματος ἡ ψυχή, ἢ τῆς ψυχῆς τὸ αἰσθητήριόν ἐστιν, ἀλλὰ δῆλον ὅτι ἐντός. διόπερ ἀνάγκη διαφανὲς εἶναι, καὶ δεκτικὸν φωτὸς τὸ ἐντὸς τοῦ ὄμματος. καὶ τοῦτο καὶ ἐπὶ τῶν συμβαινόντων δῆλον. ἤδη γάρ τισι πληγεῖσιν ἐν πολέμῳ παρὰ τὸν κρόταφον οὕτως ὥστε ἐκτμηθῆναι τοὺς πόρους τοῦ ὄμματος, ἔδοξε γενέσθαι σκότος, ὥσπερ λύχνου ἀποσβεσθέντος, διὰ τὸ οἷον λαμπτῆρά τινα ἀποτμηθῆναι τὸ διαφανές, καὶ τὴν καλουμένην κόρην. ὥστε εἴπερ ἐπὶ τούτων συμβαίνει, καθάπερ λέγομεν, φανερὸν ὡς δεῖ τοῦτον τὸν τρόπον ἀποδιδόναι καὶ προσάπτειν ἕκαστον τῶν αἰσθητηρίων ἑνὶ τῶν στοιχείων. τοῦ μὲν ὄμματος τὸ ὁρατικὸν, ὕδατος ὑποληπτέον, ἀέρος δὲ, τὸ τῶν ψόφων αἰσθητικόν· πυρὸς δὲ, τὴν ὄσφρησιν. ὃ γὰρ ἐνεργείᾳ ἡ ὄσφρησις, τοῦτο δυνάμει τὸ ὀσφραντικόν. τὸ γὰρ αἰσθητὸν ἐνεργεῖν ποιεῖ τὴν αἴσθησιν. ὥσθ' ὑπάρχειν ἀναγκαῖον αὐτὴν, δυνάμει πρότερον. ἡ δ' ὀσμή, καπνώδης τίς ἐστιν ἀναθυμίασις· ἡ δ' ἀναθυμίασις ἡ καπνώδης, ἐκ πυρός. διὸ καὶ τῷ περὶ τὸν ἐγκέφαλον τόπῳ τὸ τῆς ὀσφρήσεως αἰσθητήριόν ἐστιν ἴδιον. δυνάμει γὰρ θερμὴ ἡ τοῦ ψυχροῦ ὕλη ἐστί. καὶ ἡ τοῦ ὄμματος γένεσις τὸν αὐτὸν ἔχει τρόπον. ἀπὸ τοῦ ἐγκεφάλου γὰρ συνέστηκεν· οὗτος γὰρ ὑγρότατος καὶ ψυχρότατος τῶν ἐν τῷ σώματι μορίων ἐστί. τὸ δ' ἁπτικόν, γῆς· τὸ δὲ γευστικόν, εἶδός τι ἁφῆς ἐστί. καὶ διὰ τοῦτο πρὸς τῇ καρδίᾳ τὸ αἰσθητήριον αὐτῶν, τῆς τε γεύσεως καὶ τῆς ἁφῆς. ἀντίκειται γὰρ τῷ ἐγκεφάλῳ αὕτη, καὶ ἔστι θερμοτάτη τῶν μορίων. καὶ περὶ μὲν τῶν αἰσθητικῶν τοῦ σώματος μορίων, ἔστω τοῦτον τὸν τρόπον διωρισμένα.

* κ. δ. τῆς ψυχῆς δυνάμεις αἰσθητικῆς. vide Alex.

ΚΕΦΑΛ. γ'.

Περὶ τῶν εἰρημένων ἐν τοῖς περὶ ψυχῆς, καὶ τῶν [illegible] λεκτέων. καὶ πρῶτον περὶ χρώματος, πῶς γίνεται τὰ μέσα χρώματα.

ΠΕρὶ δὲ τῶν καθ' ἕκαστον αἰσθητήριον αἰσθητῶν, λέγω δὲ χρώματος, καὶ ψόφου, καὶ ὀσμῆς, καὶ χυμοῦ, καὶ ἁφῆς, καθόλου μὲν εἴρηται ἐν τοῖς περὶ ψυχῆς, τί τὸ ἔργον αὐτῶν, καὶ τί τὸ ἐνεργεῖν καθ' ἕκαστον τῶν αἰσθητηρίων. τί δέ ποτε δεῖ λέγειν ὁτιοῦν αὐτῶν, οἷον, τί τὸ χρῶμα, ἢ τί τὸν ψόφον, ἢ τί τὴν ὀσμήν, ἢ χυμόν, ὁμοίως δὲ καὶ περὶ ἁφῆς σκεπτέον· καὶ πρῶτον περὶ χρώματος. ἔστι μὲν οὖν ἕκαστον διχῶς λεγόμενον, τὸ μὲν ἐνεργείᾳ, τὸ δὲ δυνάμει. τὸ μὲν οὖν ἐνεργείᾳ χρῶμα καὶ ὁ ψόφος, πῶς ἐστι τὸ αὐτὸ ἢ ἕτερον ταῖς κατ' ἐνέργειαν αἰσθήσεσιν, οἷον ὁράσει καὶ ἀκούσει, εἴρηται ἐν τοῖς περὶ ψυχῆς. τί δὲ ὂν ἕκαστον αὐτῶν ποιήσει τὴν αἴσθησιν καὶ τὴν ἐνέργειαν, νῦν λέγωμεν. ὥσπερ οὖν εἴρηται περὶ φωτὸς ἐν ἐκείνοις, ὅτι ἐστὶ χρῶμα τοῦ διαφανοῦς κατὰ συμβεβηκός· ὅταν γὰρ ἐνῇ τι πυρῶδες ἐν διαφανεῖ, ἡ μὲν παρουσία φῶς, ἡ δὲ στέρησις ἐστὶ σκότος. ὃ δὲ

A λέγομεν διαφανὲς, οὐκ ἔστιν ἴδιον ἀέρος, ἢ ὕδατος, οὐδ' ἄλλου τῶν οὕτω λεγομένων σωμάτων, ἀλλά τις ἐστὶ κοινὴ φύσις καὶ δύναμις, ἣ χωριστὴ μὲν οὐκ ἔστιν, ἐν τούτοις δὲ ἐστὶ, καὶ τοῖς ἄλλοις σώμασιν ἐνυπάρχει, τοῖς μὲν μᾶλλον, τοῖς δὲ ἧττον. ὥσπερ οὖν καὶ τῶν σωμάτων ἀνάγκη τι εἶναι ἔσχατον, καὶ ταύτης. ἡ μὲν οὖν τοῦ φωτὸς φύσις ἐν ἀορίστῳ διαφανεῖ ἐστί. τοῦ δ' ἐν τοῖς σώμασι διαφανοῦς τὸ ἔσχατον, ὅτι μὲν εἴη, πάντι δῆλον· ὅτι δὲ τοῦτ' ἐστὶ τὸ χρῶμα, ἐκ τῶν συμβαινόντων φανερόν. τὸ γὰρ χρῶμα ἢ ἐν τῷ πέρατί ἐστιν, ἢ πέρας. διὸ καὶ οἱ Πυθαγόρειοι τὴν ἐπιφάνειαν χροιὰν ἐκάλουν. ἔστι μὲν γὰρ ἐν τῷ τοῦ σώματος πέρατι, ἀλλ' οὐ τὸ τοῦ σώματος πέρας· ἀλλὰ τὴν αὐτὴν φύσιν δεῖ νομίζειν, ἥπερ καὶ ἔξω χρωματίζεται, ταύτην καὶ ἐντός. φαίνεται δὲ καὶ ἀὴρ καὶ ὕδωρ χρωματιζόμενα. καὶ γὰρ ἡ αὐγὴ τοιοῦτόν ἐστιν. ἀλλ' ἐκεῖ μὲν διὰ τὸ ἐν ἀορίστῳ, οὐ τὴν αὐτὴν ἐγγύθεν καὶ προσιοῦσι, καὶ πόρρωθεν ἔχει χροιάν, οὔθ' ὁ ἀὴρ, οὔθ' ἡ θάλαττα. ἐν δὲ τοῖς σώμασιν ἐὰν μὴ τὸ περιέχον ποιῇ τὸ μεταβάλλειν, ὥρισται καὶ ἡ φαντασία τῆς χρόας. δῆλον ἄρα, ὅτι τὸ αὐτὸ κἀκεῖ καὶ ἐνθάδε δεκτικὸν τῆς χρόας ἐστί. τὸ ἄρα διαφανὲς καθ' ὅσον ἐνυπάρχει τοῖς σώμασιν (ὑπάρχει δὲ μᾶλλον καὶ ἧττον) ἐν πᾶσι χρώματος ποιεῖ μετέχειν. ἐπεὶ δὲ ἐν πέρατί τινι ἡ χρόα, τούτου ἂν ἐν πέρατί τι εἴη. ὥστε τὸ χρῶμα ἂν εἴη τοῦ διαφανοῦς ἐν σώματι ὡρισμένῳ πέρας. καὶ αὐτῶν δὲ τῶν διαφανῶν, οἷον ὕδατος καὶ εἴ τι ἄλλο τοιοῦτον, καὶ ὅσοις φαίνεται χρῶμα ἴδιον ὑπάρχειν, κατὰ τὸ ἔσχατον, ὁμοίως πᾶσιν ὑπάρχει. ἔστι μὲν οὖν ἐνεῖναι ἐν τῷ διαφανεῖ τοῦθ' ὅπερ καὶ ἐν τῷ ἀέρι ποιεῖ φῶς. ἔστι δὲ μὴ, ἀλλ' ἐστερῆσθαι. ὥσπερ οὖν ἐκεῖ, τὸ μὲν φῶς, τὸ δὲ σκότος, οὕτως ἐν τοῖς σώμασιν ἐγγίνεται τὸ λευκὸν καὶ τὸ μέλαν. περὶ δὲ τῶν ἄλλων χρωμάτων ἤδη διελομένοις, ποσαχῶς ἐνδέχεται γίνεσθαι λεκτέον. ἐνδέχεται μὲν γὰρ καὶ παρ' ἄλληλα τιθέμενα τὸ λευκὸν καὶ τὸ μέλαν, ὥστε ἑκάτερον μὲν ἀόρατον εἶναι διὰ σμικρότητα, τὸ δ' ἐξ ἀμφοῖν ὁρατὸν, οὕτω γίνεσθαι. τοῦτο γὰρ οὔτε λευκὸν, οὔτε μέλαν οἷόν τε γίνεσθαι. ἐπεὶ δὲ ἀνάγκη ἔχειν μέν τι χρῶμα, τούτων δ' οὐδέτερον δυνατὸν, ἀνάγκη μικτόν τι εἶναι, καὶ εἶδός τι χρόας ἕτερον. ἔστι μὲν οὖν οὕτως ὑπολαβεῖν πλείους εἶναι χρόας παρὰ τὸ λευκὸν καὶ τὸ μέλαν, πολλὰς δὲ τῷ λόγῳ· τρία γὰρ πρὸς δύο, καὶ τρία πρὸς τέτταρα, καὶ κατ' ἄλλους ἀριθμούς ἐστι παρ' ἄλληλα κεῖσθαι. τὰ δ' ὅλως κατὰ μὲν λόγον μηδένα, καθ' ὑπεροχὴν δέ τινα καὶ ἔλλειψιν ἀσύμμετρον· καὶ τὸν αὐτὸν δὴ τρόπον ἔχειν ταῦτα ταῖς συμφωνίαις. τὰ μὲν γὰρ ἐν ἀριθμοῖς εὐλογίστοις χρώματα, καθάπερ ἐκεῖ τὰς συμφωνίας, τὰ ἥδιστα τῶν χρωμάτων εἶναι δοκοῦντα, οἷον τὸ ἁλουργὸν καὶ φοινικοῦν, καὶ ὀλίγα ἄττα τοιαῦτα, δι' ἥνπερ αἰτίαν αἱ συμφωνίαι ὀλίγαι. τὰ δὲ μὴ ἐν ἀριθμοῖς τὰ ἄλλα χρώματα, ἢ καὶ πάσας τὰς χρόας ἐν ἀριθμοῖς εἶναι, τὰς μὲν τεταγμένας, τὰς δὲ ἀτάκτους, καὶ αὐτὰς ταύτας, ὅταν μὴ καθαραὶ ὦσι, διὰ τὸ μὴ ἐν ἀριθμοῖς εἶναι, τοιαύτας γίνεσθαι. εἷς μὲν οὖν τρόπος τῆς τῶν χρωμάτων γενέσεως οὗτος· εἷς δὲ, τὸ φαίνεσθαι δι' ἀλλήλων, οἷον ἐνίοτε οἱ γραφεῖς ποιοῦσιν, ἑτέραν χρόαν ἐφ' ἑτέραν ἐναργεστέραν * ἐπαλείφοντες, ὥσπερ ὅταν ἐν ὕδατί τι ἢ ἀέρι βούλωνται ποιῆσαι φαινόμενον, καὶ οἷον ὁ ἥλιος, καθ' αὑτὸν μὲν λευκὸς φαίνεται, διὰ δ' ἀχλύος καὶ καπνοῦ, φοινικοῦς.

* χ. ἐπαλείφουσιν.

perſpicuitatem nuncupamus, id non aëri aut aquæ aut vlli elementorum proprium eſt: ſed eſt facultas quædam & natura communis, quæ ſeparabilis quidem non eſt: ſed in illis eſt, atque cæteris corporibus, aliis plùs, aliis minùs ineſt. Quemadmodum igitur neceſſe eſt corporum aliquod eſſe extremum, ita & huius. Luminis itaque natura in perſpicuo indefinito eſt. Quòd autem perſpicuitatis corporibus inſertæ extremitas aliqua ſit, certum eſt: quòd verò ea color ſit, ex hiſce quæ eueniunt, patere poteſt. Nam color aut in termino reſidet, aut terminus eſt. Quocirca & Pythagorei ſuperficiem ipſam colorem appellabant. etenim B color in termino corporis inhabitat, ſed nequaquam terminus corporis eſt: quanquam eandem eſſe naturam quæ extra & intra coloratur, putare oportet. Porrò aër & aqua colorata apparent. etenim aura talis eſt. Cæterùm nec aër, nec mare eundem cominus & eminus colorem ſortiuntur, quòd ibi color in indefinito ſit. At in corporibus ipſis (niſi id quod ea continet ac ambit, mutationem aliquam afferat) coloris apparitio definita eſt. Idem igitur hic & illic coloris ſuſceptiuum eſſe conſtat. Ergo perſpicuitas quatenus corporibus ineſt (ineſt autem plùs & minùs) omnibus vt colore participent, in cauſa eſt. Cùm autem color in termino ſit, perſpicuitatis profectò terminus quidam C erit. Quare color perſpicuitatis in corpore definito terminus erit. Sed & perſpicuis ipſis vt aquæ, & ſi quid aliud eiuſmodi eſt, atque hiſce quæ colorem proprium habere videntur, in extremitate omnibus ſimiliter ineſt. In ipſa igitur perſpicuitate interdum id ineſt, quod in ipſo quoque aëre lux efficere ſolet: interdum non ineſt, ſed perſpicuitas eo deſtituta eſt. Ergo, quemadmodum in aëre modò lumen, modò tenebræ inſunt, ita in ipſis corporibus albor & nigror innaſci aſſolent. De cæteris autem coloribus diſtinguendo quot modis fieri poſſint, iam diſſerendum eſt. Fieri enim poſſunt hoc pacto: albo & nigro iuxta ſeſe poſitis, ita vt vtrum- D que inuiſibile ſit ob paruitatem, quod ex ambobus reſilit, viſibile reddatur. hoc enim nec album fieri, nec nigrum poteſt. At cùm neceſſe ſit colorem quendam eſſe, & neuter horum eſſe poſſit, miſtum quemdam colorem, & coloris ſpeciem quandam aliam eſſe, neceſſum eſt. Igitur plures eſſe colores, præter album & nigrum, ad hunc putes modum. Ac plurimos quidem proportione. nam fieri poteſt, vt tria ad duo, & tria ad quatuor, & ita per alios numeros iuxta ſeſe ponantur. Alios verò nulla penitus proportione, ſed exceſſu quodam ac defectu incommenſili. Atque illos eodem vtique quo concinentiæ modo ſeſe habere. Qui enim ſunt in numeris proportionis genus eximium ſeruanti- E bus, eos eſſe qui conſonantiarum modo, omnium ſuauiſſimi videntur: ceu purpureus & puniceus, atque eiuſmodi paucos eſſe, eadem qua concentus pauci ſunt cauſa. qui verò non ſunt in numeris, reliquos eſſe. At etiam colores omnes tam certos quàm incertos in numeris eſſe, atque hos ipſos cùm puri ſincerique non ſunt, quia non ſint in numeris, tales euadere. Vnus igitur generationis colorum modus hic eſt. ſecundus quando alter per alterum apparet. vt nonnunquam pictores faciunt, colorem alterum alteri clariori ſuperlinentes: ſicuti cùm facere volunt vt quippiam in aëre aut aqua eſſe videatur. & vt ſol per ſe apparet albus, per caliginem & fumum puniceus.

A Atque ita multi colores ad eundem, qui priùs dictus eſt, modum erunt. nam ratio quædam ſuperiorum ad inferiores erit: alij nulla penitus ratione conſtabunt. Porro dicere, perinde vt antiqui, colores eſſe defluuia, & tali de cauſa videri, abſurdum eſt. nam ipſis neceſſarium eſt vt attactu ſentiri omnia ſtatuant. Quare continuò præſtat dicamus, ſenſum fieri, quòd à ſenſibili medium moueatur, quàm attactu & defluxibus. In illis igitur qui iuxta ſeſe poni ſolent, vt inuiſibilem accipere magnitudinem: ita inſenſibile tempus neceſſe eſt, vt motionum acceſſiones nos fugiant: & quia ipſi ſimul apparent, vnus eſſe videantur. At in hiſce nulla neceſſitas: ſed color B ille qui in ſuperficie extat, cùm ſit immobilis, & moueatur ab eo qui ſubſternitur, motionem pariet diſſimilem. quocirca & diuerſus apparebit, & non albus aut niger. Atque iſto pacto nihil obſtat quin color quidam communis appareat iis qui procul abſunt. Quare ſi fieri nequeat vt vlla magnitudo ſit inuiſibilis, ſed omnis ex quodam ſpatio viſibilis habeatur: quænam erit hæc colorum miſtio? quòd enim nulla magnitudo ſit inuiſibilis, poſt hæc conſiderabimus. Quòd ſi corporum miſtio aliqua ſit, non ſolùm perinde ſit vt quidam putant: videlicet minimis, ſed nobis per ſenſum incognitis, iuxta ſeſe poſitis, ſed prorſus C omnino confuſis: quemadmodum in de miſtione commentario vniuerſim de omnibus diximus. Illo enim modo ea ſolùm miſcentur, quæ in minima diſtribui poſſunt, vt homines, equi, ſemina. quandoquidem hominum homo minimum eſt: equorum, equus. Quare horum iuxta poſitione compoſitorum multitudo miſta eſt: vnum autem hominem vni equo miſtum eſſe nequaquam dicimus. At quæcumque in minima diuidi nequeunt: quæ ipſa profectò vt miſceantur, aptiſſima ſunt, fieri non poteſt vt eorum miſtio ad hunc fiat modum, ſed fit quia prorſus miſceantur. quod qua via ac ratione fieri queat, dictum eſt antea, vbi de miſtione agebamus. Cæterùm qua neceſſitate D eueniat, vt cùm miſcentur illa, colores quoque miſceantur, atque hanc eſſe principem cauſam cur colores multi ſint: & non ſuperpoſitionem aut iuxta poſitionem, perſpicuum eſt. non enim è longinquo quidem, non autem in propinquo, miſtorum color vnus apparet, ſed vndelibet. At complures ideo colores erunt, quòd quæ inter ſeſe miſcentur, ea multis miſceri rationibus contingit. Atque alij in numeris: alij in exuperatione ſolùm, & cætera ad eum ipſum modum, quem in iuxta poſitis ſuperpoſitiſve coloribus dicere contingit. Ac de hiſce quidem quæ miſceantur, alibi quoque determinatum fuit. Quam autem ob E cauſam colorum ſpecies, item ſaporum ſonorúmque finitæ ſint, & non infinitæ, poſtea docebimus.

A πολλαὶ δὲ καὶ οὕτως ἔσονται χρόαι τὸν αὐτὸν τρόπον τῷ πρότερον εἰρημένῳ· λόγος γὰρ ἂν εἴη τις τῶν ἐπιπολῆς πρὸς τὰ ἐν βάθει· τὰ δὲ καὶ ὅλως οὐκ ἐν λόγῳ. τὸ μὲν οὖν ὥσπερ οἱ ἀρχαῖοι, λέγειν, ἀπορροίας εἶναι τὰς χρόας, καὶ ὁρᾶσθαι διὰ τοιαύτην αἰτίαν, ἄτοπον· ἀπάντων γὰρ δι᾽ ἁφῆς ἀνάγκη ποιεῖν τὴν αἴσθησιν αὐτοῖς. ὥστ᾽ εὐθὺς κρεῖττον φάναι τῷ κινεῖσθαι τὸ μεταξὺ τῆς αἰσθήσεως ὑπὸ τοῦ αἰσθητοῦ, γίνεσθαι τὴν αἴσθησιν, ἢ ἁφῇ καὶ ταῖς ἀπορροίαις. ἐπὶ μὲν οὖν τῶν παρ᾽ ἄλληλα κειμένων, ἀνάγκη ὥσπερ καὶ μέγεθος λαμβάνειν ἀόρατον, οὕτω καὶ χρόνον ἀναίσθητον, ἵνα λάθωσιν αἱ B κινήσεις ἀφικνούμεναι, καὶ ἓν δοκῇ εἶναι, διὰ τὸ ἅμα φαίνεσθαι. ἐνταῦθα δὲ οὐδεμία ἀνάγκη, ἀλλὰ τὸ ἐπιπολῆς χρῶμα ἀκίνητον ὂν καὶ κινούμενον ὑπὸ τοῦ ὑποκειμένου, οὐχ ὁμοίαν ποιήσει τὴν κίνησιν. διὸ καὶ ἕτερον φαίνεται, καὶ οὔτε λευκὸν, οὔτε μέλαν. ὥστ᾽ εἰ μὴ ἐνδέχεται μηδὲν εἶναι μέγεθος ἀόρατον, ἀλλὰ πᾶν ἔκ τινος διαστήματος ὁρατὸν, καὶ αὕτη τις ἂν εἴη χρωμάτων μίξις. κἀκείνως οὐδὲν κωλύει φαίνεσθαί τινα χρόαν κοινὴν τοῖς πόρρωθεν· ὅτι γὰρ οὐδέν ἐστι μέγεθος ἀόρατον, ἐν τοῖς ὕστερον ἐπισκεπτέον. Εἰ δ᾽ ἐστὶ μίξις τῶν σωμάτων μὴ μόνον τὸν τρόπον τοῦτον, ὥσπερ οἴον- C ταί τινες, παρ᾽ ἄλληλα τῶν ἐλαχίστων τιθεμένων, ἀδήλων δ᾽ ἡμῖν διὰ τὴν αἴσθησιν, ἀλλ᾽ ὅλως πάντη πάντως, ὥσπερ ἐν τοῖς περὶ μίξεως εἴρηται καθόλου περὶ πάντων. ἐκείνως μὲν γὰρ μίγνυται ταῦτα μόνον, ὅσα ἐνδέχεται διελεῖν εἰς ἐλάχιστα, καθάπερ ἀνθρώπους, ἵππους, ἢ τὰ σπέρματα· τῶν μὲν γὰρ ἀνθρώπων, ἄνθρωπος ἐλάχιστος· τῶν δ᾽ ἵππων, ἵππος· ὥστε τῇ τούτων * παρ᾽ ἄλληλα θέσει τὸ πλῆθος μέμικται τῶν συναμφοτέρων· ἄνθρωπον δὲ ἕνα ἑνὶ ἵππῳ οὐ λέγομεν μεμῖχθαι. ὅσα δὲ μὴ διαιρεῖται εἰς τὸ ἐλάχιστον, τούτων οὐκ ἐνδέχεται μίξιν γενέσθαι τὸν τρόπον D τοῦτον. ἀλλὰ τῷ πάντη μεμῖχθαι ἅπερ καὶ μάλιστα πέφυκε μίγνυσθαι. πῶς δὲ τοῦτο μάλιστα γίνεσθαι δυνατὸν, ἐν τοῖς περὶ μίξεως εἴρηται πρότερον. ἀλλ᾽ ὅτι ἀνάγκη μιγνυμένων καὶ τὰς χρόας μίγνυσθαι, δῆλον. καὶ ταύτην τὴν αἰτίαν εἶναι κυρίαν τοῦ πολλὰς εἶναι χρόας, ἀλλὰ μὴ τὴν ἐπιπόλασιν, μηδὲ τὴν παρ᾽ ἄλληλα θέσιν· οὐ γὰρ πόρρωθεν μὲν, ἐγγύθεν δ᾽ οὔ, φαίνεται μία χρόα τῶν μιγνυμένων, ἀλλὰ πάντοθεν. πολλαὶ δ᾽ ἔσονται χρόαι διὰ τὸ κατὰ πολλοὺς λόγους ἐνδέχεσθαι μίγνυσθαι ἀλλήλοις τὰ μιγνύμενα· καὶ τὰ μὲν ἐν ἀριθμοῖς, τὰ δὲ καθ᾽ ὑπεροχὴν μόνον. καὶ τἆλλα E δὴ τὸν αὐτὸν τρόπον, ὃν ἐπὶ τῶν παρ᾽ ἄλληλα τιθεμένων χρωμάτων, ἢ ἐπιπολῆς ἐνδέχεται λέγειν. καὶ περὶ μὲν τῶν μιγνυμένων, καὶ ἐν ἄλλοις διώρισται· διὰ τίνα δ᾽ αἰτίαν εἴδη χρωμάτων ἐστὶν ὡρισμένα καὶ οὐκ ἄπειρα, καὶ χυμῶν, καὶ ψόφων, ὕστερον ἐροῦμεν.

* γρ. παρ᾽ ἀλλήλ.

ΚΕΦΑΛ. δ'.

Περὶ χυμῶν.

Τί μὲν οὖν ἐστι χρῶμα, καὶ διὰ τίνα αἰτίαν πολλαὶ χροιαί εἰσιν, εἴρηται· περὶ δὲ ψόφου καὶ φωνῆς εἴρηται πρότερον ἐν τοῖς περὶ ψυχῆς. περὶ δὲ ὀσμῆς καὶ χυμοῦ νῦν λεκτέον. σχεδὸν γάρ ἐστι ταὐτὸ πάθος, οὐκ ἐν τοῖς αὐτοῖς δ' ἐστὶν ἑκάτερον αὐτῶν. ἐναργέστερον δ' ἡμῖν ἐστι τὸ τῶν χυμῶν γένος, ἢ τὸ τῆς ὀσμῆς. τούτου δ' αἴτιον, ὅτι χείριστην ἔχομεν τῶν ἄλλων ζῴων ταύτην τὴν αἴσθησιν, καὶ τῶν ἐν ἡμῖν αὐτοῖς αἰσθήσεων· τὴν δ' ἁφὴν, ἀκριβεστάτην τῶν ἄλλων ζῴων. ἡ δὲ γεῦσις, ἁφή τις ἐστίν. ἡ μὲν οὖν τοῦ ὕδατος φύσις βούλεται ἄχυμος εἶναι. ἀνάγκη δὲ ἢ ἐν αὐτῷ τὸ ὕδωρ ἔχειν τὰ γένη τῶν χυμῶν ἀναίσθητα διὰ σμικρότητα, καθάπερ Ἐμπεδοκλῆς φησιν, ἢ ὕλην τοιαύτην ἐνεῖναι οἷον πανσπερμίαν χυμῶν, καὶ ἅπαντα μὲν ἐξ ὕδατος γίνεσθαι, ἄλλα δ' ἐξ ἄλλου μέρους, ἢ μηδεμίαν ἔχοντος διαφορὰν τοῦ ὕδατος τὸ ποιοῦν αἴτιον εἶναι, οἷον εἰ τὸ θερμὸν καὶ τὸν ἥλιον φαίη τις. τούτων δ', ὡς μὲν Ἐμπεδοκλῆς λέγει, λίαν εὐσύνοπτον τὸ ψεῦδος· ὁρῶμεν γὰρ μεταβάλλοντας ὑπὸ τοῦ θερμοῦ τοὺς χυμοὺς, ἀφαιρουμένων τῶν περικαρπίων εἰς τὸν ἥλιον καὶ πυρουμένων, ὡς οὐ τῷ ἐκ τοῦ ὕδατος ἕλκειν τοιούτους γινομένους, ἀλλ' ἐν αὐτῷ τῷ περικαρπίῳ μεταβάλλοντας, καὶ ἐξικμαζομένους δὲ καὶ κειμένους διὰ τὸν χρόνον, αὐστηροὺς ἐκ γλυκέων, καὶ πικροὺς, καὶ παντοδαποὺς γινομένους, καὶ *ἑψομένους, εἰς πάντα τὰ γένη τῶν χυμῶν μεταβάλλοντας, ὡς εἰπεῖν. ὁμοίως δὲ καὶ τὸ πανσπερμίαν εἶναι τὸ ὕδωρ ὕλην, ἀδύνατον· ἐκ τοῦ αὐτοῦ γὰρ ὁρῶμεν ὡς ἐκ τῆς αὐτῆς τροφῆς γινομένους ἑτέρους χυμούς. λείπεται δὴ τῷ πάσχειν τι τὸ ὕδωρ μεταβάλλειν. ὅτι μὲν οὖν οὐχ ὑπὸ τῆς τοῦ θερμοῦ μόνον δυνάμεως, λαμβάνει ταύτην τὴν δύναμιν ἣν καλοῦμεν χυμὸν, φανερόν. λεπτότατον γὰρ πάντων τῶν ὑγρῶν τὸ ὕδωρ ἐστὶ, καὶ αὐτοῦ ἐλαίου. ἀλλ' ἐπεκτείνεται ἐπὶ πλέον τοῦ ὕδατος τὸ ἔλαιον διὰ τὴν γλισχρότητα. τὸ δὲ ὕδωρ ψαθυρόν ἐστι. (διὸ καὶ χαλεπώτερον φυλάξαι ἐν τῇ χειρὶ τὸ ὕδωρ, ἢ τὸ ἔλαιον.) ἐπεὶ δὲ θερμαινόμενον οὐδὲν φαίνεται παχυνόμενον τὸ ὕδωρ αὐτὸ μόνον, δῆλον ὅτι ἑτέρα τις ἂν εἴη αἰτία. οἱ γὰρ χυμοὶ πάντες πάχος ἔχουσι μᾶλλον. τὸ δὲ θερμὸν, συναίτιον. φαίνονται δ' οἱ χυμοὶ ὅσοιπερ καὶ ἐν τοῖς περικαρπίοις, οὗτοι ὑπάρχοντες καὶ ἐν τῇ γῇ. διὸ καὶ πολλοί φασι τῶν ἀρχαίων φυσιολόγων τοιοῦτον εἶναι τὸ ὕδωρ δι' οἵας ἂν περαίνηται γῆς. καὶ τοῦτο δῆλόν ἐστιν ἐπὶ τῶν ἁλμυρῶν ὑδάτων μάλιστα· οἱ γὰρ ἅλες γῆς τι εἶδός εἰσι. διὸ τὰ διὰ τῆς τέφρας διηθούμενα πικρᾶς οὔσης, πικρὸν ποιεῖ τὸν χυμόν. καὶ τὰ διὰ τῶν ἄλλων ὁμοίως. εἰσί τε κρῆναι πολλαὶ, αἱ μὲν πικραὶ, αἱ δ' ὀξεῖαι, αἱ δὲ παντοδαποὺς ἔχουσαι χυμοὺς ἄλλας. διὸ εὐλόγως ἐν τοῖς φυομένοις τὸ τῶν χυμῶν μάλιστα γίνεται γένος. πάσχει γὰρ τὸ ὑγρὸν ὥσπερ καὶ τἆλλα, ὑπὸ τοῦ ἐναντίου· ἐναντίον δὲ τὸ ξηρόν. διὸ καὶ ὑπὸ τοῦ πυρὸς πάσχει τι· ξηρὰ γὰρ ἡ τοῦ πυρὸς φύσις. ἀλλ' ἴδιον τοῦ πυρὸς τὸ θερμόν ἐστι, γῆς δὲ τὸ ξηρὸν, ὥσπερ εἴρηται ἐν τοῖς περὶ στοιχείων. ᾗ μὲν οὖν πῦρ ἢ ᾗ γῆ, οὐδὲν πέφυκε ποιεῖν ἢ πάσχειν, οὐδ' ἄλλο οὐδέν· ἀλλ' ᾗ ὑπάρχει ἐν ἑκάστοις ἐναντιότης, ταύτῃ πάντα ποιοῦσι καὶ πάσχουσιν.

* γρ. ἑψομένους.

CAPVT IV.

De ſapore ac eius ſpeciebus.

A Qvid igitur ſit color, & quamobrem colores ſint multi, explicatum iam eſt. De Sono autem & voce tractauimus priùs in libris de Anima. De odore verò & ſapore nunc agendum. nam eadem fermè affectio eſt, ſed non in eiſdem vterque exiſtit. Porro ſaporum genus quàm odorum nobis euidentius eſt. Cuius cauſa eſt nos habere olfactum cæterorum animalium olfactu inferiorem, & omnium ſenſum qui in nobis ipſis ſunt ſtupidiſſimum, tactum verò ſuperiorem, & omnium exactiſſimum: guſtatum autem tactum quendam B eſſe. Igitur aqua ſuapte natura inſipida eſt. Neceſſe autem eſt aut aquam in ſe omnia ſaporum genera ob exiguitatem inſenſibilia (vti Empedocles aſſerit) continere: aut in aqua talem materiam ineſſe, quæ quaſi ſemina gignendis ſaporum generibus ſuppeditet: & omnia ex ea generari: ſed alia ex alia parte, aut ſi aqua nullam ſubeat differentiam, cauſam agentem ſoli & calori tribuere. Cæterùm ex hiſce illud eſſe falſum quod Empedocles affirmat, perquam facilè deprehendatur. Nam ſapores calore immutari videmus ſi fructus ex arbore decerpti ſoli exponantur aut igni: vt intelligatur, eoſdem non quòd ab aqua quippiam contrahant, ſed quòd in ipſis fructibus in alios vertantur, C tales effici. Item quoties cauſa temporis diluta pars exhalatur, ex dulcibus auſteros, & amaros, & omnimodos fieri, necnon vbi decoquuntur, in omnia propè dixerim ſaporum genera tranſmutari. Conſimiliter & illud, aquam eſſe materiam, quæ gignendis ſaporibus ſemina præſtet, de numero eorum eſt, quæ fieri nequeunt. videmus enim ex eadem re, ceu ex eodem cibo, ſapores diuerſos fieri. Reliquũ itaque eſt ſapores ideo permutari, quòd aqua quippiam patiatur. Sed quòd aqua non vi ſola caloris facultatem eam imbibat, quam ſaporem vocamus, hinc patere poteſt. Nam cùm aqua liquidorum omnium tenuiſſima ſit, atque ipſum etiam oleum te-D nuitate ſuperet, quanquã oleũ plus quàm aqua diſtendi poteſt, quòd oleum lentum viſcoſumque ſit, aqua verò remittens & fragilis (qua ratione fit, vt ægriùs aqua manu quàm oleum contineri ſoleat) & ea ipſa ſola dum caleſit, minimè craſſeſcere videatur: certum eſt ſopores alteram quandam cauſam habituros eſſe, quòd omnes craſſiuſculi exiſtant, cum qua calori cauſæ nuncupatio communis habeatur. Porro quotquot ſapores in fructibus ſunt, iidem in ipſa quoque terra ineſſe videntur. Quapropter & plurimi veterum naturæ interpretum dixere, talem eſſe aquam, qualis eſt terra per quã meat. Idque in aquis ſalſis maximè ſpectari poteſt. nam ſal ſpecies quædã terræ exiſtit. Quocirca E quæ per cinerem qui amarus eſt, tranſmittuntur, ſaporem ingerunt amarum: & quæ per alia, alium. Necnon è fontibus quidã ſunt amari, nonnulli acidi, alij variis aliis ſaporibus præditi. Quapropter rationi conſonum eſt vt ſaporum genus in plantis præcipuè gignatur. nam humidũ perinde vt cætera, pati à ſuo contrario natum eſt: ſiccum autem ei contrarium eſt. Vnde fit vt etiam ab igni quippiam patiatur. ſiquidem ignis natura ſiccus eſt. Quanquam calidum igni peculiare eſt, ſiccum terræ, vti in commentatione de elemẽtis diximus. Nihil itaque quatenus ignis ſit, aut aqua, aut quippiã aliud, agere aut pati natum eſt: ſed omnia, quatenus contrarietatem ſubeunt, eatenus agunt patiunturque.

Vt igitur quæ colores ſuccóſve in aqua eluunt, talem reddere aquam aſſolent: ſic ipſa quoque natura cùm in humore partem ſiccam terrenámque diluit, aut per eandem humorem percolat, & calore incoquit, humori qualitatem quampiam inſerit. Quæ non niſi ſapor eſt, id eſt, affectio, quæ à prædicto ſicco in humore genita, guſtatum qui in poteſtate ſit, ad actum demutat. nam ſentiendi vim, quæ priùs poteſtate erat, eòdem perducit: cùm ſenſio non diſciplinæ, ſed contemplationi reſpondeat. Cæterùm ſapores non cuiuſuis ſicci, ſed eius quod alere poſſit, aut affectiones eſſe aut priuationes, hinc ſumendum: quòd nec ſiccum ſine humido ſit, nec contrà humidum ſine ſicco. neutrum enim horum animantibus aut plantis ipſis cibus eſſe poteſt, ſed quod ex vtriſque miſtura conſurgit. Quin etiam in genere cibi quem animalia ingerunt, quæ è ſenſilibus tactilia ſunt, ea incrementum faciunt atque decrementum. Etenim id quod ingeritur, horum cauſa eſt, quatenus calidum eſt aut frigidum. nam calor & frigus auctionem efficiunt atque decretionem. Alit autem quatenus guſtabile eſt. omnia namque dulci aluntur, vel ſimplici vel commiſto. Sed de hiſce in libris de Generatione definiendum eſt: nunc tamen quantum neceſſe ſit, ea tangamus oportet. Nam calor, vt auget, ita etiam alimentum præparat, atque quod leue eſt, attrahit: quod verò ſalſum amarúmque, ratione ponderis relinquit. Quod itaque exterior calor in extraneis corporibus efficit, hoc idem interior in animantium plantarúmque natura efficere ſolet. Vnde fit vt ea dulci ſapore alantur. Cæteri tamen ſapores, perinde vt ſalſus & acutus, pro condimento cibis admiſceri ſolent: at iſti, vt retrahant. quia quod dulce eſt & innatat, nimiùm alit. Porro quemadmodum colores ex albo & nigro commiſtis proueniunt, ſic & ſapores permiſtione dulcis & amari exultant. Quin & ſecundùm proportionem quòd plus minúſve adſit, ſinguli producuntur, ſiue ſecundùm numeros quoſdam miſtionis & motus, ſiue etiam indefinitè. Qui verò voluptatem important demiſti hi ſoli in numeris ſunt. Pinguis igitur ſapor ſpecie dulcis eſt: ſalſus verò & amarus, idem ferè ſunt: acris, auſterus, acerbus, & acidus, intermedij. Quandoquidem ſaporum & colorum ſpecies ferè numero pares ſunt. nam vtrorumque ſpecies, ſeptem habentur: ſi quis, vti conſentaneum eſt, fuſcum colorem non alium quàm nigrum poſuerit. Reliquum enim eſt vt flauus color ad album, ſicuti ſapor dulcis ad pinguem, pertineat. Puniceus verò, purpureus, viridis, & cæruleus, album & nigrum interiacent: cæteri ex horum miſtura gignũtur. Item quemadmodum nigrum albi in diaphane, id eſt, translucido corpore, priuatio eſt: ita ſalſum & amarum, dulcis, in humore, qui alere poſſit. Vnde fit vt etiam cinis deuſtorum omnium, amarus ſentiatur: vtpote à quibus id quod potui idoneum erat, exactum ſit. At Democritus, & è naturæ interpretibus qui de ſenſu diſſeruere plurimi, abſurdiſſimum quippiam committunt. nam ſenſibilia omnia, tactilia faciunt. Quamquam ſi hoc ita ſit: certum eſt omneis alios ſenſus tactum quendam eſſe. quod fieri non poſſe, nequaquam difficile eſt internoſcere. Præterea ſenſilibus hiſce quæ ſenſibus omnibus communia ſunt, tanquam propriis vtuntur. etenim magnitudo, & figura, & aſperitas & læuor, & acuties & obtuſitas, quæ moli competit, ſenſibus communia ſunt:

A ὥσπερ οὖν οἱ ἐναποπλύνοντες ἐν τῷ ὑγρῷ τὰ χρώματα, καὶ τοὺς χυμούς, τοιοῦτον ποιοῦσιν ἔχειν τὸ ὕδωρ, οὕτω καὶ ἡ φύσις * τὸ ξηρὸν καὶ τὸ γεῶδες, καὶ διὰ τοῦ ξηροῦ καὶ τοῦ γεώδους διηθοῦσα καὶ κινοῦσα τῷ θερμῷ, ποιόν τι τὸ ὑγρὸν παρασκευάζει. καὶ ἔστι τοῦτο χυμὸς τὸ γιγνόμενον ὑπὸ τοῦ εἰρημένου ξηροῦ πάθος ἐν τῷ ὑγρῷ τῆς γεύσεως τῆς κατὰ δύναμιν ἀλλοιωτικὸν εἰς ἐνέργειαν. ἄγει γὰρ τὸ αἰσθητικὸν εἰς τοῦτο δυνάμει προϋπάρχον· οὐ γὰρ κατὰ τὸ μανθάνειν, ἀλλὰ κατὰ τὸ θεωρεῖν ἐστὶ τὸ αἰσθάνεσθαι. ὅτι δ᾽ οὐ παντὸς ξηροῦ, ἀλλὰ τοῦ τροφίμου οἱ χυμοί, ἢ πάθος εἰσίν, ἢ στέρησις, δεῖ

*γρ. τὸ ξ. ἀναπλύνει τῷ ὑγρῷ.

B λαβεῖν ἐντεῦθεν, ὅτι οὔτε τὸ ξηρὸν ἄνευ τοῦ ὑγροῦ, οὐδὲ τὸ ὑγρὸν ἄνευ τοῦ ξηροῦ· τροφὴ γὰρ οὐχ ἓν μόνον ἐν τοῖς ζώοις, οὐδὲ αὖθις φυτοῖς, ἀλλὰ τὸ μιγνύμενον. καὶ ἔστι τῆς προσφερομένης τροφῆς τοῖς ζώοις τὰ μὲν ἁπτὰ τῶν αἰσθητῶν, αὔξησιν ποιοῦντα καὶ φθίσιν. τούτων μὲν γὰρ αἴτιον ᾗ θερμὸν καὶ ψυχρὸν τὸ προσφερόμενον· ταῦτα γὰρ ποιεῖ καὶ αὔξησιν καὶ φθίσιν. τρέφει δὲ ᾗ γευστὸν τὸ προσφερόμενον· πάντα γὰρ τρέφεται τῷ γλυκεῖ, ἢ ἁπλῶς, ἢ μεμιγμένως. δεῖ μὲν οὖν διορίζειν περὶ τούτων ἐν τῷ περὶ γενέσεως· νῦν δ᾽ ὅσον ἀναγκαῖον, ἅψασθαι αὐτῶν· τὸ γὰρ θερμὸν αὔξει, καὶ δημι-

C ουργεῖ τὴν τροφήν· καὶ τὸ μὲν κοῦφον ἕλκει, τὸ δὲ ἁλμυρὸν καὶ πικρὸν καταλείπει διὰ τὸ βάρος. ὃ δὴ ἐν τοῖς ἔξω σώμασι ποιεῖ τὸ ἔξω θερμόν, τοῦτο ἐν τῇ φύσει τῶν ζώων καὶ φυτῶν· διὸ τρέφεται τῷ γλυκεῖ. συμμίγνυνται δ᾽ οἱ ἄλλοι χυμοὶ εἰς τροφὴν τὸν αὐτὸν τρόπον, τῷ ἁλμυρῷ καὶ ὀξεῖ, ἀντὶ ἡδύσματος. ταῦτα δὲ διὰ τὸ ἀντισπᾶν τῷ λίαν τρόφιμον εἶναι τὸ γλυκύ, καὶ τὸ ἐπιπολαστικόν. ὥσπερ δὲ τὰ χρώματα ἐκ τῆς τοῦ λευκοῦ καὶ μέλανός ἐστι μίξεως, οὕτως καὶ οἱ χυμοὶ ἐκ γλυκέος καὶ πικροῦ. καὶ κατὰ λόγον δὴ τῷ μᾶλλον καὶ ἧττον ἕκαστοί εἰσιν, εἴτε κατ᾽ ἀριθμούς τινας τῆς μίξεως καὶ κινήσεως, εἴτε

D καὶ ἀορίστως. οἱ δὲ τὴν ἡδονὴν ποιοῦντες, μιγνύμενοι οὗτοι ἐν ἀριθμοῖς μόνον. ὁ μὲν οὖν λιπαρὸς τοῦ γλυκέος ἐστὶ χυμός· τὸ δὲ ἁλμυρὸν καὶ πικρόν, σχεδὸν ταὐτό. ὁ δὲ δριμύς, καὶ αὐστηρός, καὶ στρυφνός, καὶ ὀξύς, ἀνὰ μέσον· σχεδὸν γὰρ ἴσα καὶ τὰ τῶν χυμῶν εἴδη καὶ τὰ τῶν χρωμάτων ἐστίν. ἑπτὰ γὰρ ἀμφοτέρων εἴδη, ἄν τις θείη, ὥσπερ εὔλογον, τὸ φαιὸν μέλαν τι (εἶναι). λείπεται γὰρ τὸ ξανθὸν μὲν τοῦ λευκοῦ (εἶναι), ὥσπερ τὸ λιπαρὸν τοῦ γλυκέος· τὸ φοινικοῦν δέ, καὶ ἁλουργόν, καὶ πράσινον, καὶ κυανοῦν, μεταξὺ τοῦ λευκοῦ καὶ τοῦ μέλανος. τὰ δὲ ἄλλα μικτὰ ἐκ τούτων. καὶ ὥσπερ τὸ μέλαν στέρησις ἐν τῷ διαφανεῖ τοῦ λευ-

E κοῦ, οὕτω τὸ ἁλμυρὸν καὶ τὸ πικρὸν τοῦ γλυκέος ἐν τῷ τροφίμῳ ὑγρῷ. διὸ καὶ ἡ τέφρα τῶν κατακαιομένων πικρὰ πάντων· ἐξικμάσθαι γὰρ τὸ πότιμον ἐξ αὐτῶν. Δημόκριτος δὲ καὶ οἱ πλεῖστοι τῶν φυσιολόγων, ὅσοι λέγουσι περὶ αἰσθήσεως, ἀτοπώτατόν τι ποιοῦσι· πάντα γὰρ τὰ αἰσθητά, ἁπτὰ ποιοῦσι. καίτοι εἰ καὶ τοῦτο οὕτως ἔχει, δῆλον ὅτι καὶ τῶν ἄλλων αἰσθήσεων ἑκάστη ἁφή τις ἐστί. τοῦτο δὲ ὅτι ἐστὶν ἀδύνατον, οὐ χαλεπὸν συνιδεῖν. ἔτι δὲ τοῖς κοινοῖς τῶν αἰσθήσεων πασῶν χρῶνται ὡς ἰδίοις. μέγεθος γὰρ καὶ σχῆμα, καὶ τὸ τραχὺ καὶ τὸ λεῖον, ἔτι δὲ τὸ ὀξὺ καὶ τὸ ἀμβλὺ τὸ ἐν τοῖς ὄγκοις κοινὰ τῶν αἰσθήσεών ἐστι·

εἰ δὲ μὴ πασῶν, ἀλλ' ὄψεώς γε καὶ ἁφῆς. διὸ καὶ περὶ μὲν τούτων ἀπατῶνται· περὶ δὲ τῶν ἰδίων οὐκ ἀπατῶνται· οἷον ὄψις περὶ χρώματος, καὶ ἀκοὴ περὶ ψόφων. οἱ δὲ τὰ ἴδια εἰς ταῦτα ἀνάγουσιν, ὥσπερ Δημόκριτος. τὸ γὰρ λευκὸν καὶ τὸ μέλαν, τὸ μὲν τραχύ φησιν εἶναι, τὸ δὲ λεῖον· εἰς δὲ τὰ σχήματα ἀνάγει τοὺς χυμούς. καίτοι ἢ οὐδεμιᾶς, ἢ μᾶλλον τῆς ὄψεως τὰ κοινὰ γνωρίζειν. εἰ δ' ἄρα τῆς γεύσεως μᾶλλον, τὰ γοῦν ἐλάχιστα τῆς ἀκριβεστάτης ἐστὶν αἰσθήσεως διακρίνειν περὶ ἕκαστον γένος· ὥστε ἐχρῆν τὴν γεῦσιν καὶ τῶν ἄλλων κοινῶν μάλιστα αἰσθάνεσθαι, καὶ τῶν σχημάτων εἶναι κριτικωτάτην. ἔτι, τὰ μὲν αἰσθητὰ πάντα ἔχει ἐναντίωσιν, οἷον ἐν χρώματι τῷ μέλανι τὸ λευκόν, καὶ ἐν χυμοῖς τὸ γλυκὺ τῷ πικρῷ. σχῆμα δὲ σχήματι οὐ δοκεῖ εἶναι ἐναντίον· τίνι γὰρ τῶν πολυγώνων τὸ περιφερὲς ἐναντίον; ἔτι ἀπείρων ὄντων τῶν σχημάτων, ἀναγκαῖον καὶ τοὺς χυμοὺς εἶναι ἀπείρους· διὰ τί γὰρ ὁ μὲν τὴν χυμῶν αἴσθησιν ποιήσει, ὁ δ' οὐκ ἂν ποιήσειε; καὶ περὶ μὲν τοῦ χυμοῦ καὶ γευστοῦ εἴρηται· τὰ γὰρ ἄλλα πάθη τῶν χυμῶν οἰκείαν ἔχει τὴν σκέψιν ἐν τῇ φυσιολογίᾳ τῇ περὶ τῶν φυτῶν.

ΚΕΦΑΛ. ε'.

Περὶ ὀσμῆς καὶ ὀσφρήσεως.

Τὸν αὐτὸν δὲ τρόπον δεῖ νοῆσαι καὶ περὶ τὰς ὀσμάς· ὅπερ γὰρ ποιεῖ ἐν τῷ ὑγρῷ τὸ ξηρόν, τοῦτο ποιεῖ ἐν ἄλλῳ γένει τὸ ἔγχυμον ὑγρόν, ἐν ἀέρι καὶ ὕδατι ὁμοίως. κοινὸν δὲ κατὰ τούτων νῦν μὲν λέγομεν τὸ διαφανές. ἔστι δ' ὀσφραντόν, οὐχ ᾗ διαφανές, ἀλλ' ᾗ πλυντικὸν καὶ ῥυπτικὸν ἐγχύμου ξηρότητος. οὐ γὰρ μόνον ἐν ἀέρι, ἀλλὰ καὶ ἐν ὕδατι, τὸ τῆς ὀσφρήσεώς ἐστι. δῆλον δ' ἐπὶ τῶν ἰχθύων καὶ τῶν ὀστρακοδέρμων. φαίνονται γὰρ ὀσφραινόμενοι, οὔτε ἀέρος ὄντος ἐν τῷ ὕδατι· ἐπιπολάζει γὰρ ἀήρ, ὅταν ἐγγένηται· οὔτ' αὐτοὶ ἀναπνέοντες. εἰ οὖν τις θείη καὶ τὸν ἀέρα καὶ τὸ ὕδωρ ἄμφω ὑγρά, εἴη ἂν ἡ ἐν ὑγρῷ τοῦ ἐγχύμου ξηροῦ φύσις ὀσμή, καὶ ὀσφραντὸν τὸ τοιοῦτον. ὅτι δὲ ἀπὸ ἐγχύμου ἐστὶ τὸ πάθος, δῆλον ἐκ τῶν ἐχόντων καὶ μὴ ἐχόντων ὀσμήν· τά τε γὰρ στοιχεῖα, ἄοσμα ἐστί, πῦρ, ἀήρ, ὕδωρ, γῆ, διὰ τὸ τά τε ξηρὰ αὐτῶν καὶ τὰ ὑγρὰ ἄχυμα εἶναι, ἐὰν μή τι μιγνύμενον ποιῇ. διὸ καὶ ἡ θάλαττα ἔχει ὀσμήν· ἔχει γὰρ χυμὸν καὶ ξηρότητα. καὶ ἅλες μᾶλλον νίτρου ὀσμώδεις. δηλοῖ δὲ τὸ ἐξικμαζόμενον ἐξ αὐτῶν ἔλαιον· τὸ δὲ νίτρον γῆς ἐστι μᾶλλον. ἔτι δέ, λίθος μὲν ἄοσμος· ἄχυμος γάρ. τὰ δὲ ξύλα ὀσμώδη· ἔγχυμα γάρ. καὶ τούτων τὰ ὑδατώδη ἧττον. ἔτι τῶν μεταλλευομένων, χρυσὸς ἄοσμος· ἄχυμος γάρ· ὁ δὲ χαλκὸς καὶ ὁ σίδηρος, ὀσμώδη. ὅταν δὲ ἐκκαυθῇ τὸ ὑγρόν, ἀοσμότεραι αἱ σκωρίαι γίνονται πάντων. ἄργυρος δὲ καὶ καττίτερος, τῶν μὲν μᾶλλον ὀσμώδη, τῶν δὲ ἧττον· ὑδατώδη γάρ. δοκεῖ δ' ἐνίοις ἡ καπνώδης ἀναθυμίασις εἶναι ὀσμή, οὖσα κοινὴ γῆς καὶ ἀέρος. καὶ πάντες ἐπιφέρονται ἐπὶ τοῦτο περὶ ὀσμῆς. διὸ καὶ Ἡράκλειτος οὕτως εἴρηκεν, ὡς εἰ πάντα τὰ ὄντα καπνὸς γίνοιτο, ῥῖνες ἂν διαγνοῖεν. ἐπὶ δὲ τὴν ὀσμὴν πάντες ἐπιφέρονται, οἱ μὲν ὡς ἀτμίδα, οἱ δ' ὡς ἀναθυμίασιν, οἱ δὲ καὶ ἄμφω ταῦτα.

A quòd ſi non omnibus, ſaltem tamen viſui & tactui. Quapropter & circa hæc falluntur: circa propria verò, ceu viſus circa colores, & auditus circa ſonos, nequaquam errare ſolent. Sunt etiam qui propria redigunt ad iſta, ſicuti Democritus. Is enim candorem quidem læuitatem, & nigrorem ſcabritiem eſſe affirmat: ſapores autem figuris tribuit. Atqui cognoſcere communia, aut ad nullum ſenſum, aut ad viſum potiùs ſpectat. Si ergo ad guſtum potiùs ſpectaret, cùm exactiſſimi ſenſus ſit in ſingulis generibus tenuiſſima quæque diſcernere, oporteret ſanè guſtum cùm cætera communia maximè ſentire, tum figurarum arbitrum eſſe perſpicaciſſimum. B Ad hæc ſenſilia omnia, cõtrarietatem ſortita ſunt. nam in coloribus, albus nigro contrarius eſt: in ſaporibus, dulcis amaro. Figura verò, figuræ non videtur eſſe contraria. cui enim è multangulis rotunda contraria eſt? Præterea cùm figuræ ſint innumeræ, ſapores quoque innumeros eſſe neceſſe eſt: quod eſt impoſſibile. cur enim è ſaporibus, quidam ſentiretur, quidam minimè? Ac de ſapore quidem & guſtabili diximus. cæteræ namque ſaporum affectiones, in commentatione de plantis propriam nacta ſunt conſiderationem.

CAPVT V.

C *Odoris ſpecies, ac eiuſdem cum ſapore cognatio.*

Eodem modo & circa odores intelligamus oportet. Quod enim ſiccitas in humido facit, hoc in alio genere itidem facit, in aëre inquam & aqua: de quibus nunc pellucidum communi ratione dicitur. Olfactile tamen eſt non quatenus pellucet, ſed quatenus ſapidæ ſiccitatis diluendæ ac diffundendæ vim ſortitur. nam non in aëre modò, ſed etiã in aqua olfactio fit. Id autẽ tam in piſcibus quàm in teſtaceo animaliũ genere palàm eſt. nam piſces olfacere videntur, quamuis nec aër in aqua ſit (nam ſimul ac aër in aqua gignitur, emergere D aſſolet) nec ipſi reſpirent. Si quis igitur vtraque, aërem ſcilicet & aquam humida poſuerit, ſaporoſæ profectò ſiccitatis natura in humido exiſtens, odor erit. & quod tale fuerit, olfactile. Quòd autem affectio ipſa, à re ſapida pẽdeat, per ea quæ odorem habent, & quę odoris expertia ſunt, patere poteſt. Ipſa etenim elementa, ceu ignis, aër, aqua, terra, inodora ſunt, propterea quòd ſuo tam ſicca quàm humida ſapore carent, niſi miſturam recipiant. Qua etiam de cauſa mare odorem habet. iam enim ſaporis & ſiccedinis quippiam imbibit. Et ſal nitro odoratior eſt: id quod oleo, quod è ſale exprimi cõſueuit, declaratur. nitrum verò terroſius. Lapides quoque inodori ſunt, quia inſipidi. Ligna contrà odora, E quia ſaporem continent. at inter hæc quæ aquoſa ſunt, ea minùs odorata ſunt. Item è genere metallico aurum inolidum eſt. nullum enim ſaporem obtinet. æs autem & ferrum olida. at vbi humor pẽr vſtionem abſumptus eſt, recrementa omnium (Græci ſcorias vocant) inodoratiora redduntur. Argentum verò & ſtannum, his quidem magis odora ſunt, illis verò minùs. aquoſa enim ſunt. Cæterùm nonnulli fumidam exhalationem quæ terræ & aëri communis eſt, odorem eſſe putant. Atque hi omnes de odore in hãc eunt ſententiam. Et ob id Heraclitus hoc dixiſſe videtur, quòd ſi omnia quæ sũt, euaderẽt in fumũ, nares ea dignoſcerent. Ad odorem autem vniuerſi accedũt, dicentes eum eſſe, alij vaporem, alij exhalationẽ, alij vtrunque.

Eſt autem vapor humiditas quædam. Fumida verò exhalatio, vti iam diximus, communis aeri & terræ eſt. Et ex illo quidem, fit aqua: ex hac verò, ſpecies quædam terræ. At neutrum horum, odor eſſe videtur. Nam vapor ad aquam pertinet, fumida exhalatio in aqua fieri nequit. Odorantur autem & quæ ſunt in aqua, vti dictum iam eſt. Præterea exhalatio perinde dicitur, atque defluxio. ſi ergo iſta non probè dicitur odor, nec illa. Quòd igitur humor tum aëris (nam & aër ſuapte natura humectus eſt) tum aquæ, recipere ac pati quippiam à ſapida ſiccitate poſſit, haud obſcurum eſt. Præterea ſi diluta quaſi ſiccitas perinde in humidis agat atque in aëre, palam eſt, oportere odores ſaporibus eſſe proportionales. Immo verò iam hoc in quibuſdam accidit. Nam odores acres ſunt, & dulces, & auſteri, & acerbi, & pingues. Quin & putidos amaris ſaporibus analogos dicas. Quocirca quemadmodum ſapores amari ægrè deglutiuntur: ita odores putidi non ſine faſtidio hauriri naribus aſſolent. Clarum itaque eſt, quod ſapor in aqua eſt, id odorem in aëre & aqua eſſe. Ob idque frigus & concretio, vt ſapores hebetant, ita odores abolent. quippe quæ calorem illum deleant, qui mouendi vim obtinet, atque creandi. Porrò olfactilis duæ ſunt ſpecies. non enim non ſunt, vt quidam aiunt, ſed ſunt. determinandum autem eſt, quomodo ſunt, & quomodo non ſunt. Nam odorum alij ſaporibus reſpondent, vt diximus, & per accidens cum oblectatione aut faſtidio ſentiuntur. nam quia ſapores ſunt affectiones partis altricis, eorum odores eſurientibus ſuaues occurrunt, repletis verò & nihil deſiderantibus, nõ ſuaues. quo tempore ne cibus quidem ille, qui odoribus differtus eſt, ſuauis habetur. Quare iſti quidẽ, vt diximus, ex accidenti commotionem voluptatis aut doloris afferunt. vnde fit vt omnibus communes animalibus ſint. Alij per ſe voluptifici ſunt: nẽpe qui è floribus ſpirantur. nihilo enim magis minúſve ad edendum prouocant, nec quicquam ad cibi cupiditatem excitandam conferunt. quin potiùs obſunt. Nam illud verum eſt, quod ait Stratis, Euripidem taxans,

Ne admiſceas vnguentum, vbi lentem coquis.

At qui nũc tales facultates potionibus demiſcent, ij conſuetudine voluptatem ipſam tantiſper vrgẽt, quoad è duobus ſenſibus oblectatio quaſi vna & vno proueniens exultet. Hoc igitur olfactile homini peculiare eſt. illud verò quod ſaporum generi reſpondet, cæteris quoque animãtibus promiſcuũ, vt antè retulimus. Atque illud in ſpecies ſecundùm ſapores diuiditur, quod per accidens delectationem afferat: hoc minimè, quòd eius natura per ſe iucunda ſit, aut moleſta. Cauſa quamobrem talis odor familiaris ac proprius homini ſit, à cerebri refrigeratione petẽda eſt. Nam cùm cerebrum ſuapte natura frigidũ ſit, & ſanguis qui circa ipſum in venulis habetur, tenuis quidem & purus ſed facilè refrigerabilis ſit (qua de cauſa & cibi diuaporatio ratione loci refrigerata, fluxiones morbidas committit) hominibus auxilio, vt ſanitatem tueantur, talis ſpecies odoris exiſtit. eius enim nulla alia quàm hæc functio habetur: hanc autẽ apertè exercet. Nã cibus tã ſiccus quàm humidus delectabilis exiſtens plerumq; morbos excitat. at qui pręodore, qui per ſe bene oleat, delectabilis eſt, is vtcũq; homines habeãt, ſemper propè dixerim vtilis aduenit.

A ἔστι δ᾽ ἡ μὲν ἀτμὶς ὑγρότης τις, ἡ δὲ καπνώδης ἀναθυμίασις, ὥσπερ εἴρηται, κοινὴ ἀέρος καὶ γῆς. καὶ συνίσταται ἐκ μὲν ἐκείνης, ὕδωρ· ἐκ δὲ ταύτης, γῆς τι εἶδος. ἀλλ᾽ οὐδέτερον τούτων ἔοικεν. ἡ μὲν γὰρ ἀτμὶς ἐστὶν ὕδατος, ἡ δὲ καπνώδης ἀναθυμίασις ἀδύνατος γενέσθαι ἐν ὕδατι. ὀσμᾶται δὲ καὶ τὰ ἐν ὕδατι, καθάπερ εἴρηται πρότερον. ἔτι ἡ ἀναθυμίασις ὁμοίως λέγεται ταῖς ἀπορροίαις. εἰ οὖν μήτ᾽ ἐκείνη καλῶς, μήτ᾽ αὕτη καλῶς. ὅτι μὲν οὖν ἐνδέχεται ἀπολαβεῖν τὸ ὑγρὸν, καὶ τὸ ἐν τῷ πνεύματι, καὶ τὸ ἐν τῷ ὕδατι, καὶ πάσχειν τι ὑπὸ τῆς ἐγχύμου ξηρότητος, οὐκ ἄδηλον· καὶ γὰρ ὁ ἀὴρ, ὑγρὸν τὴν φύσιν ἐστίν. ἔτι δὲ, εἰ B ὁμοίως ἐν τοῖς ὑγροῖς ποιεῖ, καὶ ἐν τῷ ἀέρι, οἷον ἀποπλυνόμενον τὸ ξηρὸν, φανερὸν ὅτι δεῖ ἀνάλογον εἶναι τὰς ὀσμὰς, τοῖς χυμοῖς. ἀλλὰ μὴν τοῦτό γε ἐπ᾽ ἐνίων συμβέβηκε· καὶ γὰρ δριμεῖαι καὶ γλυκεῖαί εἰσιν ὀσμαὶ, καὶ αὐστηραὶ, καὶ στρυφναὶ, καὶ λιπαραὶ· καὶ * τοῖς πικροῖς τὰς σαπρὰς ἄν τις ἀνάλογον εἴποι. διὸ ὥσπερ ἐκεῖνοι δυσκατάποτοι, τὰ σαπρὰ δυσανάπνευστά ἐστι. δῆλον ἄρα, ὅτι ὅπερ ἐν τῷ ὕδατι χυμὸς, τοῦτ᾽ ἐν τῷ ἀέρι καὶ ὕδατι ἡ ὀσμή. καὶ διὰ τοῦτο τὸ ψυχρὸν καὶ ἡ πῆξις καὶ τοὺς χυμοὺς ἀμβλύνει, καὶ τὰς ὀσμὰς ἀφανίζει. τὸ γὰρ θερμὸν τὸ κινοῦν καὶ δημιουργοῦν ἀφανίζουσιν ἡ ψύξις καὶ ἡ πῆξις. εἴδη δὲ τοῦ ὀσφραντοῦ, C δύο ἐστίν· οὐ γὰρ ὥσπερ φασί τινες, οὐκ ἔστιν εἴδη τοῦ ὀσφραντοῦ, ἀλλ᾽ ἔστι. διοριστέον δὲ, καὶ πῶς ἐστι καὶ πῶς οὐκ ἔστι. τὸ μὲν γάρ ἐστι κατὰ τοὺς χυμοὺς τεταγμένον αὐτῶν, ὥσπερ εἴπομεν, καὶ τὸ ἡδὺ καὶ τὸ λυπηρὸν κατὰ συμβεβηκὸς ἔχουσι. διὰ γὰρ τὸ τῆς θρεπτικοῦ εἶναι πάθος, ἐπιθυμούντων μὲν ἡδεῖαι ὀσμαὶ τούτων εἰσί. πεπληρωμένοις δὲ καὶ μηδὲν δεομένοις οὐχ ἡδεῖαι οὔθ᾽ αἱ ὀσμαὶ καὶ ἡ τροφὴ ἡ ἔχουσα τὰς ὀσμὰς, οὐχ ἡδεῖα οὐδὲ τούτοις. ὥστε αὗται μὲν, ὥσπερ εἴπομεν, κατὰ συμβεβηκὸς ἔχουσι τὸ ἡδὺ καὶ τὸ λυπηρόν· διὸ καὶ πάντων εἰσὶ κοιναὶ τῶν ζῴων· αἱ δὲ καθ᾽ αὑτὰς ἡδεῖαι τῶν ὀσμῶν εἰσιν, οἷον αἱ τῶν ἀνθῶν· οὐδὲν γὰρ μᾶλλον D οὐδ᾽ ἧττον πρὸς τὴν τροφὴν παρακαλοῦσιν, οὐδὲ συμβάλλεται πρὸς ἐπιθυμίαν οὐδὲν, ἀλλὰ τοὐναντίον μᾶλλον· ἀληθὲς γὰρ ὅπερ Εὐριπίδην εἶπε σκώπτων Στράτις,

Ὅταν φακῆν ἕψηται, μὴ ἐπιχεῖν μύρον.

οἱ δὲ νῦν μιγνύντες εἰς τὰ πόματα τὰς τοιαύτας δυνάμεις, βιάζονται τῇ συνηθείᾳ τὴν ἡδονὴν, ἕως ἂν ἐκ δύο αἰσθήσεων γένηται τὸ ἡδὺ, ὡς ἓν, καὶ ἀπὸ μιᾶς. τοῦτο μὲν οὖν τὸ ὀσφραντὸν, ἴδιον ἀνθρώπου ἐστίν· ἡ δὲ κατὰ τοὺς χυμοὺς τεταγμένη, καὶ τῶν ἄλλων ζῴων, ὥσπερ εἴρηται πρότερον. κἀκείνων μὲν, διὰ τὸ κατὰ συμβεβηκὸς ἔχειν τὸ ἡδὺ, διῄρηται τὰ εἴδη κατὰ τοὺς χυμούς. ταύτης δ᾽ οὐκέτι, διὰ τὸ τὴν E φύσιν αὐτῆς καθ᾽ αὑτὴν εἶναι ἡδεῖαν ἢ λυπηράν. αἴτιον δὲ τοῦ ἴδιον εἶναι ἀνθρώπου τὴν τοιαύτην ὀσμὴν, διὰ τὴν ψύξιν τὴν περὶ τὸν ἐγκέφαλον· ψυχροῦ γὰρ ὄντος τὴν φύσιν τοῦ ἐγκεφάλου, καὶ τοῦ αἵματος τοῦ περὶ αὐτὸν ἐν τοῖς φλεβίοις ὄντος, λεπτοῦ μὲν καὶ καθαροῦ, εὐψύκτου δὲ (διὸ καὶ ἡ τῆς τροφῆς ἀναθυμίασις ψυχομένη διὰ τὸν τόπον, τὰ ῥευματικὰ νοσήματα ποιεῖ) τοῖς ἀνθρώποις πρὸς βοήθειαν ὑγιείας γέγονε τὸ τοιοῦτον εἶδος τῆς ὀσμῆς· οὐδὲν γὰρ ἄλλο ἔργον ἐστὶν αὐτῆς, ἢ τοῦτο. τοῦτο δὲ ποιεῖ φανερῶς· ἡ μὲν γὰρ τροφὴ ἡδεῖα οὖσα, καὶ ἡ ξηρὰ, καὶ ἡ ὑγρὰ, πολλάκις νοσώδης ἐστίν. ἡ δὲ ἀπὸ τῆς ὀσμῆς τῆς καθ᾽ ἑαυτὴν εὐώδους ἡδεῖα, ὁπωσοῦν ἔχουσιν, ὠφέλιμος, ὡς εἰπεῖν, ἀεί.

* Quid. τοῖς πικροῖς. vel τὰ σαπρά.

καὶ διὰ τοῦτο γίνεται διὰ τῆς ἀναπνοῆς, οὐ πᾶσιν, ἀλλὰ τοῖς ἀνθρώποις, καὶ τῶν ἐναίμων, οἷον τοῖς τετράποσι, καὶ ὅσα μετέχει τῆς τοῦ ἀέρος μᾶλλον φύσεως· ἀναφερομένων γὰρ τῶν ὀσμῶν πρὸς τὸν ἐγκέφαλον, διὰ τὴν ἐν αὐταῖς τῆς θερμότητος κουφότητα, ὑγιεινοτέρως ἔχει τὰ περὶ τὸν τόπον τοῦτον· ἡ γὰρ τῆς ὀσμῆς δύναμις, θερμὴ τὴν φύσιν ἐστί. καταχρῆται δ' ἡ φύσις τῇ ἀναπνοῇ ἐπὶ δύο, ὡς ἔργῳ μὲν, ἐπὶ τὴν εἰς τὸν θώρακα βοήθειαν· ὡς παρέργῳ δ', ἐπὶ τὴν ὀσμήν· ἀναπνέοντος γὰρ ὥσπερ ἐκ παρόδου ποιεῖται διὰ τῶν μυκτήρων τὴν κίνησιν. ἴδιον δὲ τῆς τοῦ ἀνθρώπου φύσεώς ἐστι τὸ τῆς ὀσμῆς τῆς τοιαύτης γένος, διὰ τὸ πλεῖστον καὶ ὑγρότατον ἐγκέφαλον ἔχειν τῶν ζώων ὡς κατὰ μέγεθος· διὰ γὰρ τοῦτο καὶ μόνον, ὡς εἰπεῖν, αἰσθάνεται τῶν ζώων ἄνθρωπος, καὶ χαίρει ταῖς τῶν ἀνθῶν καὶ ταῖς τῶν τοιούτων ὀσμαῖς· σύμμετρος γὰρ ἡ θερμότης αὐτῶν καὶ ἡ κίνησις, πρὸς τὴν ὑπερβολὴν τῆς ἐν τῷ τόπῳ ὑγρότητος καὶ ψυχρότητός ἐστι· τοῖς δὲ ἄλλοις ὅσα πνεύμονα ἔχει, διὰ τὸ ἀναπνεῖν τοῦ ἑτέρου γένους τῆς ὀσμῆς τὴν αἴσθησιν ἀποδέδωκεν ἡ φύσις, ὅπως μὴ δύο αἰσθητήρια ποιῇ· ἀπόχρη γὰρ, ἐπείπερ καὶ ὡς ἀναπνέουσιν, ὥσπερ ἐν τοῖς ἀνθρώποις ἀμφοτέρων τῶν ὀσφραντῶν, τούτοις τῶν ἑτέρων μόνον ὑπάρχουσα ἡ αἴσθησις. τὰ δὲ μὴ ἀναπνέοντα, ὅτι μὲν ἔχει αἴσθησιν τοῦ ὀσφραντοῦ, φανερόν· καὶ γὰρ ἰχθύες, καὶ τὸ τῶν ἐντόμων γένος πᾶν, ἀκριβῶς καὶ πόρρωθεν αἰσθάνεται, διὰ τὸ θρεπτικὸν εἶδος τῆς ὀσμῆς, ἀπέχοντα πολὺ τῆς οἰκείας τροφῆς· οἷον αἵ τε μέλιτται ποιοῦσι πρὸς τὸ μέλι, καὶ τὸ τῶν * μικρῶν μυρμήκων γένος, οὓς καλοῦσί τινες κνῖπας· καὶ τῶν θαλαττίων αἱ πορφύραι, καὶ πολλὰ τῶν ἄλλων τῶν τοιούτων ζώων, ὀξέως αἰσθάνεται τῆς τροφῆς διὰ τὴν ὀσμήν. ὅτῳ δὲ αἰσθάνεται, οὐχ ὁμοίως φανερόν. διὸ κἂν ἀπορήσειέ τις, τίνι αἰσθάνονται τῆς ὀσμῆς, εἴπερ ἀναπνέουσι μὲν, γίνεται τὸ ὀσμᾶσθαι μοναχῶς· (τοῦτο γὰρ φαίνεται ἐπὶ τῶν ἀναπνεόντων συμβαῖνον πάντων·) ἐκείνων δ' οὐδὲν ἀναπνεῖ· αἰσθάνεται δὲ μέντοι, εἰ μή τις παρὰ τὰς πέντε αἰσθήσεις ἑτέρα· τοῦτο δὲ ἀδύνατον· τοῦ γὰρ ὀσφραντοῦ, ὄσφρησις. ἐκεῖνα δὲ τούτου αἰσθάνονται, ἀλλ' οὐ τὸν αὐτὸν ἴσως τρόπον· ἀλλὰ τοῖς μὲν ἀναπνέουσι τὸ πνεῦμα ἀφαιρεῖ τὸ ἐπικείμενον ὥσπερ πῶμά τι. διὸ οὐκ αἰσθάνεται μὴ ἀναπνέοντα, τοῖς δὲ μὴ ἀναπνέουσιν ἀφῄρηται τοῦτο· καθάπερ ἐπὶ τῶν ὀφθαλμῶν, τὰ μὲν ἔχει βλέφαρα τῶν ζώων, ὧν μὴ ἀνακαλυφθέντων οὐ δύναται ὁρᾶν· τὰ δὲ σκληρόφθαλμα οὐκ ἔχει. διόπερ οὐ προσδεῖται οὐδενὸς τοῦ ἀνακαλύψοντος, ἀλλ' ὁρᾷ ἐκ τοῦ δυνατοῦ ὁρᾶν αὐτῷ εὐθύς. ὁμοίως δὲ καὶ τῶν ἄλλων ζώων οὐδὲν δυσχεραίνει τῶν καθ' αὑτὰ δυσωδῶν τὴν ὀσμὴν, ἂν μή τι τύχῃ φθαρτικὸν ὄν. ὑπὸ τούτων δ' ὁμοίως φθείρεται, καθάπερ καὶ οἱ ἄνθρωποι ὑπὸ τῆς τῶν ἀνθράκων ἀτμίδος καρηβαροῦσι, καὶ φθείρονται πολλάκις· οὕτως ὑπὸ τῆς τοῦ θείου δυνάμεως, καὶ τῶν ἀσφαλτωδῶν φθείρεται τἆλλα ζῷα, καὶ φεύγει διὰ τὸ πάθος. αὐτῆς δὲ τῆς καθ' αὑτὴν δυσωδίας οὐδὲν φροντίζουσι. καίτοι πολλὰ φυόμενα, δυσώδεις ἔχοι τὰς ὀσμὰς, ἂν μή τι συμβάλληται πρὸς τὴν γεῦσιν, ἢ τὴν ἐδωδὴν αὐτοῖς. ἔοικε δ' ἡ αἴσθησις ἡ τοῦ ὀσφραίνεσθαι περιττῶν οὐσῶν τῶν αἰσθήσεων, καὶ τοῦ ἀριθμοῦ ἔχοντος μέσον τοῦ περιττοῦ, καὶ αὐτὴ μέση εἶναι τῶν τε ἁπτικῶν,

* γ. μακρῶν

A Ob idq; ſenſus eius per reſpirationē non omnibus, ſed hominibus, & è ſanguineo genere quadrupedibus, ac iis quæ vberiùs aëris naturam participant, fieri videtur. Cùm enim odores propter leuitatem caloris qui in eis eſt, ad cerebrum aſcendunt, locus iſte incolumiùs habere ſolet: quando vis odoris per naturam calida eſt. Natura autem reſpiratione abvtitur ad duo: ex inſtituto, ad opitulandum internis partibus pectoris: præter inſtitutum, ad odores excipiendos. nam ſpirante homine, natura quaſi obiter per nares motum facit. Eiuſmodi verò odoris genus, naturæ hominis proprium eſt: quòd homo inter animantia maximum proportione cor- B poris humidiſſimumque cerebrum habeat. ob id enim & è cunctis animantibus vnus florum taliumque rerum odores ſentit & eiſdem gaudet. Nam calor eorum ac motio exuperationi humiditatis & frigiditatis loci illius commenſu quodam reſpondet: cæteris autem pulmone præditis, per reſpirationem ſenſum alterius generis odoris, natura conceſſit, vt ne duo ſenſoria faceret. vnum enim ſufficit. quandoquidem vt homines vtrumque olfactile reſpirando olfaciunt: ita hæc alterum ſolùm. Quæ verò non ſpirant, olfactilis ſenſum habere in aperto eſt. Etenim piſces totúmque inſectorum genus, exactè vel eminus, etiam ſi multùm diſtent, cibum ſibi peculiarem ſentiſcunt propter alimen- C tariam ſpeciem odoris: vt mel apes, & paruarum formicarum genus, quas quidam culices dictos muliones appellant, & è marinis, purpuræ, & pleraque alia id genus animalia, ſuum cibum propter odorem acriter ſentiunt: quo verò ſentiant, non perinde manifeſtum eſt. Quocirca dubitauerit quiſpiam quo percipiant odorem, ſi reſpirantia quidem vnico ſimplicique modo odorentur (id enim in omnibus quæ ſpirant, contingere videtur) ex illis autem nullum reſpiret, tametſi odorari ſoleant: niſi quidam alius præter illos quinque ſenſus habeatur. At hoc fieri nequit. nam ipſius olfactilis olfactus eſt. Illa verò hoc ſentiunt, ſed forſitan non eodem modo. ſed reſpirantibus quidem, ſpiritus id D quod inſtar operculi cuiuſdam ſuperpoſitum eſt, aufert. vnde fit vt quando non reſpirant, nullum odorem ſentiant. non reſpirantibus autem, hoc natura denegauit. Et quidem hac in re perinde atque in oculis euenit. nam ex animantibus quædam palpebras habent, quibus non apertis, cernere nequeũt: quædam, nempe quibus duri ſunt oculi, eiſdem carent. Quocirca nullo indigent, quod eas aperiat: ſed protinus ex quo ſpatio fieri poteſt vt videant, vident. Conſimiliter & è cæteris animantibus quodlibet, neque odorem rerum per ſe grauiter olentiũ auerſatur, niſi quid fortè occurrat, quod illi perniciem afferre poſſit. ab his autem, perinde E vt homines exanimatur. Et quemadmodum homines halitu prunarum grauedinem capitis cõtrahunt, & plerumque ſuffocantur: ita & illa vi ſulfuris bituminoſarúmque rerum fugitãt, quòd malè afficiantur, & interdũ extingui ſolẽt. Neque ipſam per ſe graueolentiã perſequitur, quãuis ſtirpes plurimæ grauiter oleant: niſi quid illi ad iritandam gulam cibúmve ſumẽdum, conferat. Videtur autem & ipſe ſenſus olfactus, cùm ſenſus numero concludantur impari, & numerus impar mediũ obtineat, eſſe medius inter eos qui tangendo ſuo munere fungũtur,

quales

quales ſunt tactus & guſtus: & eos qui intercedente aliquo ſentiunt. cuiuſmodi ſunt viſus & auditus. Quapropter & ipſum olfactile, affectio quædam nutritiuorũ eſt. hæc autem in eodem genere ſunt. quam & audibilis, & viſilis. Vnde fit vt animantia, tũ in aëre tum in aqua odorentur. Quare ipſum olfactile, his vtriſque commune quippiam exiſtit: quod & tangibili, & audibili atque perſpicuo ineſt. Quo etiam fit vt non abs re per ſimilitudinem quandam dicta ſit eſſe quaſi tinctura quædam & collutio ſiccitatis in humido & fluido. Quomodo igitur olfactilis ſpecies dicere conueniat, & quomodo non conueniat, hactenus dictum ſit. Quod autem quidam Pythagorei dicunt, aſſerentes nonnulla odoribus ali, haudquaquam rationi conſonum eſt. Nam primò quidem videmus, oportere cibum eſſe compoſitum. etenim ea quæ aluntur, ſimplicia non ſunt. Quocirca & è cibo ſuperuacanea quædam gignuntur: aut intra illa, aut extra, quomodo plantis accidit. Deinde nec aqua ipſa per ſe & incommiſta alere ſolet, cùm oporteat id quod ex aliquo conſtituatur, corpulentum eſſe. Sed & adhuc multo minùs conſentaneum eſt, aërem corporari. Præterea omnibus animalibus locus ineſt, qui cibum recipiat: à quo ipſum corpus alimoniam attrahit: at olfactilis ſenſorium in capite ſitum eſt. Item illud vnà cum ſpiritoſa exhalatione ingreditur. quare ad ſpirandi officinam commeabit. Quòd igitur olfactile, quatenus olfactile, nihil ad nutricationem conferat, certum eſt. ſed quòd ad ſanitatem, & per ſenſum, & per ea quæ diximus, pateſcit. Quare quod eſt ſapor in nutritiuo, & ad ea quæ nutriuntur: id eſt olfactile ad ſanitatem. Per ſingula igitur ſenſoria definitum ſit atque pertractatum hoc modo.

CAPVT VI.

Qualitates ſenſibiles quomodo diuiſibiles.

DVbitauerit autem quiſpiam, quærétque, ſi corpus omne in infinita diuidatur, ſenſiléſne etiam affectiones, ceu color, ſapor, odor, ſonus, grauitas, leuitas, frigiditas, caliditas, durities & mollities, in infinita diuidẽtur, an id fieri nequeat? Quoniam ſingula quæque ſenſilis affectio ſenſum facere poteſt: cùm ex eo quod pellere ſenſum irritaréque poſſit, hoc nominis ſortita ſit. Quare neceſſarium eſſet, ipſum quoque ſenſum in infinita diuidi, necnon ſenſibile omne magnitudine præditum eſſe. quandoquidem fieri non poteſt vt quis quod album quidem ſit, ſed nõ quantum, cernere queat. Nam ſi ita non ſit, continget corpus aliquod eſſe, quod neque colorem habeat, neque grauitatem, neque aliam vllam id genus affectionem; quare neque ſenſile prorſus erit. etenim illæ ſenſilia ipſa ſunt. Senſile ergo non è ſenſilibus compoſitum erit. At neceſſarium eſt, ipſum è ſenſilibus compoſitum eſſe. non enim è mathematicis componitur. Præterea qua parte agnoſcemus ea atque diiudicabimus? an mente, ſiue intellectu? At intellectilia non ſunt. non enim intellectus externa ea quæ ſub ſenſum minimè cadunt, intelligit. At ſi hæc ita ſeſe habeant, aſtipulari videntur hiſce qui magnitudines faciunt indiuiſibiles: ad hunc enim modum ratio ipſa diſſoluatur. Verùm hæc impoſſibilia ſunt, dictum eſt autem de ipſis, in diſſertatione de motu. Eorum autem ſolutio pariter emerget,

A οἷον ἁφῆς καὶ γεύσεως, καὶ τῶν δι᾽ ἄλλου αἰσθητικῶν, οἷον ὄψεως καὶ ἀκοῆς. διὸ καὶ τὸ ὀσφραντὸν τῶν θρεπτικῶν ἐστι πάθος τι. ταῦτα δ᾽ ἐν τῷ αὐτῷ γένει, καὶ τοῦ ἀκουστοῦ δὲ καὶ τοῦ ὁρατοῦ. διὸ καὶ ἐν ἀέρι καὶ ὕδατι ὀσμᾶνται. ὥστε ἐστὶ τὸ ὀσφραντὸν κοινόν τι τούτων ἀμφοτέρων, ὃ καὶ τῷ ἁπτῷ ὑπάρχει, καὶ τῷ ἀκουστῷ καὶ διαφανεῖ. διὸ καὶ εὐλόγως ἀπείκασται ξηρότητος ἐν ὑγρῷ καὶ χυτῷ, οἷον βαφή τις εἶναι καὶ πλύσις. πῶς μὲν οὖν εἴδη δεῖ λέγειν, καὶ πῶς οὐ δεῖ τοῦ ὀσφραντοῦ, ἐπὶ τοσοῦτον εἰρήσθω. ὃ δὲ λέγουσί τινες τῶν Πυθαγορείων, οὐκ ἔστιν εὔλογον· τρέφεσθαι γάρ φασιν ἔνια ζῷα ταῖς ὀσμαῖς. πρῶτον μὲν γὰρ ὁρῶμεν B ὅτι τὴν τροφὴν δεῖ εἶναι σύνθετον· καὶ γὰρ τὰ τρεφόμενα οὐχ ἁπλᾶ ἐστι. διὸ καὶ περιττώματα γίνεται τῆς τροφῆς, ἢ ἐν αὐτοῖς, ἢ ἔξω, ὥσπερ τοῖς φυτοῖς. ἔτι δ᾽, οὐδὲ τὸ ὕδωρ ἐθέλει αὐτὸ μόνον ἄμικτον ὄν, τρέφειν· σωματῶδες γάρ τι εἶναι δεῖ τὸ συστησόμενον. ἔτι πολὺ ἧττον εὔλογον τὸν ἀέρα σωματοῦσθαι. πρὸς δὲ τούτοις, ὅτι πᾶσίν ἐστι τοῖς ζῴοις τόπος δεκτικὸς τῆς τροφῆς, ὅθεν ἐλθοῦσαν λαμβάνει τὸ σῶμα. τοῦ δ᾽ ὀσφραντοῦ ἐν τῇ κεφαλῇ τὸ αἰσθητήριον, καὶ μετὰ πνευματώδους εἰσέρχεται ἀναθυμιάσεως. ὥστ᾽ εἰς τὸν ἀναπνευστικὸν ἂν βαδίζοι τόπον. ὅτι μὲν οὖν οὐ συμβάλλεται εἰς τὴν τροφὴν τὸ ὀσφραντὸν, ᾗ ὀσφραντὸν, δῆλον. ὅτι μέντοι C εἰς ὑγίειαν καὶ ἐκ τῆς αἰσθήσεως, καὶ ἐκ τῶν εἰρημένων, φανερόν. ὥστε ὅπερ ὁ χυμὸς ἐν τῷ θρεπτικῷ, καὶ πρὸς τὰ τρεφόμενα, τοῦτ᾽ ἐστὶ πρὸς ὑγίειαν τὸ ὀσφραντόν. καθ᾽ ἕκαστον μὲν οὖν αἰσθητήριον διωρίσθω τὸν τρόπον τοῦτον.

ΚΕΦΑΛ. ϛ΄.

• Ἆρα τὰ παθήματα τὰ αἰσθητὰ εἰς ἄπειρον διαιρεῖται.

Ὅτι ἔνια μεγέθη καὶ πάθη λανθάνει ὥστ᾽ ἐνεργείᾳ μὲν αἰσθητὰ μὴ εἶναι, δυνάμει δέ. Ὅτι ἡ μὲν ὀσμὴ καὶ ὁ ψόφος πρότερον ἐνεργοῦσιν εἰς τὸ μέσον, ἢ εἰς τὴν αἴσθησιν· τὸ δὲ ὁρατόν, οἷον φῶς, οὐχ ὁμοίως, ἀλλ᾽ ἅμα.

Ἀπορήσειε δ᾽ ἄν τις, εἰ πᾶν σῶμα εἰς ἄπειρον διαι- D ρεῖται, ἆρα καὶ τὰ παθήματα τὰ αἰσθητά, οἷον χρῶμα, καὶ χυμὸς, καὶ ὀσμὴ, καὶ ψόφος, καὶ βάρος, καὶ * ψυχρὸν καὶ θερμὸν, καὶ κοῦφον, καὶ σκληρὸν καὶ μαλακόν; ἢ ἀδύνατον; ποιητικὸν γάρ ἐστιν ἕκαστον αὐτῶν τῆς αἰσθήσεως· τῷ δύνασθαι γὰρ κινεῖν αὐτὴν λέγεται πάντα. ὥστ᾽ ἀνάγκη, εἰ ἡ δύναμις, καὶ τὴν αἴσθησιν εἰς ἄπειρα διαιρεῖσθαι, καὶ πᾶν εἶναι μέγεθος αἰσθητόν· ἀδύνατον γὰρ λευκὸν μὲν ὁρᾶν, μὴ ποσὸν δέ. Εἰ γὰρ μὴ οὕτως, ἐνδέχοιτ᾽ ἂν εἶναί τι σῶμα μηδὲν ἔχον χρῶμα, μηδὲ βάρος, μηδὲ ἄλλο τι τοιοῦτον πάθος. ὥστ᾽ οὐδ᾽ αἰσθητὸν ὅλως· ταῦτα γὰρ τὰ αἰσθητά. τὸ ἄρα αἰσθητὸν ἔσται E συγκείμενον οὐκ ἐξ αἰσθητῶν, ἀλλὰ ἀναγκαῖον· οὐ γὰρ ἔκ γε τῶν μαθηματικῶν. ἔτι, τίνι κρινοῦμεν ταῦτα καὶ γνωσόμεθα; ἢ τῷ νῷ; ἀλλ᾽ οὐ νοητὰ, οὐδὲ νοεῖ ὁ νοῦς τὰ ἐκτὸς μὴ μετ᾽ αἰσθήσεως ὄντα, ἅμα δέ. ἀλλ᾽ εἰ ταῦτα ἔχει οὕτως, ἔοικε * μαρτυρεῖν τοῖς τὰ ἄτομα ποιοῦσι μεγέθη· οὕτω γὰρ ἂν λύοιτο ὁ λόγος. ἀλλ᾽ ἀδύνατα. εἴρηται δὲ περὶ αὐτῶν ἐν τοῖς λόγοις τοῖς περὶ κινήσεως. περὶ δὲ τῆς λύσεως αὐτῶν, ἅμα δῆλον ἔσται, καὶ διὰ τί πεπέρανται τὰ εἴδη

* κ. ψυχρὸν

* γρ. μαρτυρεῖν

καὶ χρώματος, καὶ χυμοῦ, καὶ φθόγγων, καὶ τῶν ἄλλων αἰσθητῶν. ὧν μὲν γάρ ἐστιν ἔσχατα, ἀνάγκη πεπεράνθαι τὰ ἐντός· τὰ δ' ἐναντία, ἔσχατα· πᾶν δὲ τὸ αἰσθητὸν ἔχει ἐναντίωσιν, οἷον ἐν χρώματι λευκὸν καὶ μέλαν, ἐν χυμοῖς γλυκὺ καὶ πικρόν· καὶ ἐν τοῖς ἄλλοις δὴ πᾶσίν ἐστιν ἔσχατα ἐναντία. τὸ μὲν οὖν συνεχὲς εἰς ἄπειρα τέμνεται ἄνισα, εἰς δὲ ἴσα πεπερασμένα· τὸ δὲ μὴ καθ' αὑτὸ συνεχὲς, εἰς πεπερασμένα εἴδη. ἐπεὶ οὖν τὰ μὲν πάθη ὡς εἴδη λεκτέον, ὑπάρχει δὲ συνέχεια ἀεὶ ἐν τούτοις, ληπτέον ὅτι τὸ δυνάμει καὶ τὸ ἐνεργείᾳ, ἕτερον. καὶ διὰ τοῦτο τὸ μυριοστημόριον λανθάνει τῆς κέγχρου ὁρώμενον, καίτοι ἡ ὄψις ἐπελήλυθε, καὶ ὁ ἐν τῇ διέσει φθόγγος λανθάνει, καὶ τοῦ συνεχοῦς ὄντος ἀκούει τοῦ μέλους παντός. τὸ δὲ διάστημα τὸ τοῦ μεταξὺ πρὸς τοὺς ἐσχάτους λανθάνει. ὁμοίως δὲ καὶ ἐν τοῖς ἄλλοις αἰσθητοῖς τὰ μικρὰ πάνυ· δυνάμει γὰρ ὁρατά· ἐνεργείᾳ δὲ, ὅταν μὴ χωρισθῇ· καὶ γὰρ ἐνυπάρχει δυνάμει ἡ ποδιαία τῇ διπόδει, ἐνεργείᾳ δ' ἤδη διαιρεθεῖσα. χωριζόμεναι δ' αἱ τηλικαῦται ὑπεροχαὶ εὐλόγως μὲν ἂν διαλύοιντο εἰς τὰ περιέχοντα, ὥσπερ εἰ καὶ ὁ ἀκαριαῖος χυμὸς εἰς τὴν θάλατταν ἐκχυθείη. οὐ μὴν ἀλλ' ἐπεὶ ἡ τῆς αἰσθήσεως ὑπεροχὴ οὐ καθ' αὑτὴν αἰσθητή, οὐδὲ χωριστή· δυνάμει γὰρ ἐνυπάρχει ἐν τῇ ἀκριβεστέρᾳ ἡ ὑπεροχή· οὐδὲ τὸ τηλικοῦτον αἰσθητὸν χωρισθὲν ἔσται ἐνεργείᾳ αἰσθέσθαι, ἀλλ' ὅμως ἔσται αἰσθητόν. δυνάμει τε γάρ ἐστιν ἤδη, καὶ ἐνεργείᾳ ἔσται προσγενόμενον. ὅτι μὲν οὖν ἔνια μεγέθη καὶ πάθη λανθάνει, καὶ διὰ τὴν αἰτίαν, καὶ πῶς αἰσθητὰ, καὶ πῶς οὔ, εἴρηται. ὅταν δὲ ἤδη ἐνυπάρχῃ τοιαῦτα, ὥστε καὶ ἐνεργείᾳ αἰσθητὰ εἶναι, καὶ μὴ μόνον ἐν τῷ ὅλῳ, ἀλλὰ καὶ χωρὶς ἢ πεπερασμένα, ἀνάγκη εἶναι τὸν ἀριθμὸν, καὶ χρώματα, καὶ χυμοὺς, καὶ φθόγγους. ἀπορήσειε δ' ἄν τις, ἆρ' ἀφικνοῦνται ἢ τὰ αἰσθητὰ, ἢ αἱ κινήσεις αἱ ἀπὸ τῶν αἰσθητῶν, ὁποτέρως ποτὲ ἡ αἴσθησις, ὅταν ἐνεργῶσιν εἰς τὸ μέσον πρῶτον, οἷον ἥ τε ὀσμὴ φαίνεται ποιοῦσα καὶ ὁ ψόφος; πρότερον γὰρ ὁ ἐγγὺς αἰσθάνεται τῆς ὀσμῆς, καὶ ὁ ψόφος ὕστερον ἀφικνεῖται τῆς πληγῆς. ἆρ' οὖν οὕτω καὶ τὸ ὁρώμενον καὶ τὸ φῶς; καθάπερ καὶ Ἐμπεδοκλῆς φησιν ἀφικνεῖσθαι πρότερον τὸ ἀπὸ τοῦ ἡλίου φῶς εἰς τὸ μεταξὺ, πρὶν πρὸς τὴν ὄψιν, ἢ ἐπὶ τὴν γῆν. δόξειε δ' εὐλόγως τοῦτο συμβαίνειν. τὸ γὰρ κινούμενον κινεῖταί ποθέν ποι. ὥστε ἀνάγκη εἶναί τινα χρόνον, ἐν ᾧ κινεῖται ἐκ θατέρου πρὸς θάτερον. ὁ δὲ χρόνος πᾶς διαιρετός. ὥστε ἦν ὅτε οὔπω ἑωρᾶτο, ἀλλ' ἔτ' ἐφέρετο ἡ ἀκτὶς ἐν τῷ μεταξύ. καὶ εἰ ἅπαν ἀκούει ἅμα καὶ ἀκήκοε, καὶ ὅλως αἰσθάνεται καὶ ᾔσθηται, καὶ μὴ ἔστι γένεσις αὐτῶν, ἀλλ' εἰσὶν ἄνευ τοῦ γίνεσθαι, ὅμως οὐδὲν ἧττον, ὥσπερ καὶ ὁ ψόφος ἤδη γεγενημένης τῆς πληγῆς οὔπω πρὸς τῇ ἀκοῇ. δηλοῖ δὲ τοῦτο καὶ ἡ τῶν γραμμάτων μετασχηματίσεις, ὡς γινομένης τῆς φορᾶς ἐν τῷ μεταξύ· οὐ γὰρ τὸ λεχθὲν φαίνονται ἀκηκοότες, διὰ τὸ μετασχηματίζεσθαι φερόμενον τὸν ἀέρα. ἆρ' οὖν οὕτω καὶ τὸ χρῶμα, καὶ τὸ φῶς. οὐ γὰρ δὴ τῷ πὼς ἔχειν, τὸ μὲν ὁρᾷ, τὸ δὲ ὁρᾶται, ὥσπερ ἴσα ἐστίν· οὐδὲν γὰρ ἔδει που ἑκάτερον εἶναι· τοῖς γὰρ ἴσοις γινομένοις οὐδὲν διαφέρει, ἢ ἐγγὺς, ἢ πόρρω ἀλλήλων εἶναι.

A & cur ſpecies & coloris, & ſaporis, & ſonorum, & cæterorum ſenſilium finitæ ſint. Nam quæ extrema obtinēt, eorum intranea finita ſint neceſſe eſt: ipſa porro contraria, extrema ſunt. omne [illegible] ſenſile contrarietatem poſſidet: verbi cauſa, [illegible] album & nigrum: ſapor, dulce & amarum, [illegible] qua omnia ad hunc modum. Ipſum igitur continuum in infinita quidem inæqualia, in finita verò æqualia ſecatur. quod autem non per ſe continuum eſt, in finitas ſpecies. Cùm igitur affectiones ipſæ, ſpecies appellandæ ſint, atque in hiſce continuitas ſemper inſit: ſumendum eſt, eſſe potentia & actu, differre. Ob idque decies milleſimam milij partem viſam latere, quamuis aſpectus **B** ſeſe applicet ad milium: & ſonum in dieſi itidem latere, quamuis auditus totum continentem modulum exaudiat. Nam interuallum illud quod ſeſe ab intermedio ad extremos porrigit, latere ſolet. Conſimiliter & in cæteris ſenſilibus illa quæ admodum exigua ſunt. vbi enim ſeparata fuerint, potentia viſibilia ſunt, actu minimè. etenim linea pedalis actu iam diuiſa, bipedali potentia ineſt. Tantillæ autem exuperantiæ ſeparatæ, ratione optima in continentia ipſa diſſoluentur, non aliter quàm ſi quis modicum ſuccum in mare effundat. Verumenimvero cùm exuperantia ſenſus nec per ſe ſenſilis ſit, nec ſeparata (ea enim in ſenſu exactiore potentia ineſt) neque tantillum ſenſile ſeparatum **C** ſentiri actu poterit, attamen ſenſile erit. iam enim potentia ſenſile eſt, & actu erit vbi toti acceſſerit. Nonnullas igitur magnitudines affectionéſque latere, & quam ob cauſam, item quomodo ſenſiles ſint, & quomodo non ſint, dictum eſt. Vbi verò adeo tot iam inſunt, vt actu ſenſiles ſint, & non ſolùm in ipſo toto, ſed etiam ſeorſim: & colores, & ſapores, & ſonos numero finitos eſſe neceſſe eſt. Dubitauerit porrò quiſpiam, vtrùm aut ſenſilia ipſa, aut motiones ab eis profectæ, vtrouis modo ſenſio fiat, vbi operantur, priùs ad medium deueniant. quod tam odor quàm ſonus agere videtur. qui enim in propinquo eſt, is priùs odorem ſentire ſolet: atque ſonus diutinè poſt ictum ad aureis peruenit. Num **D** ergo ſic de eo quod videtur & lumine ſentiendum, quemadmodum & Empedocles aſſerit: dicens, lumen quod à ſole profluit, priùs ad medium quàm ad ipſum oculum aut ad terram deuenire? id quod etiam ratione optima contingere videatur. Nam id quod cietur, alicunde aliquo cieri ſolet. Quare neceſſe eſt, tempus aliquod exultet, in quo ab altero ad alterum cieatur. at tempus omne diuiſibile eſt. Quare erat, quando nondum videbatur, ſed adhuc ferebatur in medio radius. Et quamuis omnia audiant ſimul & audierint, & omnino ſentiant & ſenſerint, atque ſenſionum nulla ſit generatio, ſed abſque generatione exiſtant: tamen nihilominus illa perinde ha- **E** bebunt, atque ſonus qui ictu iam facto nondum apud auditum eſt. Hoc autem & ipſa literarum afformatio declarat: quaſi latio in medio fiat. non enim audiuiſſe videmur, id quod dictum ſit, quia aër motum ſubiens afformetur. Nunquid igitur & color & lumen, hoc idem factitant? non enim ex iis quæ æquabili interuallo diſtant, alterum cernit, alterum cernitur, eo quòd modo quodam ſeſe habeāt, cùm minimè oporteat vtrunq; certo loco eſſe. quoniam in iis quæ intercapedini æquabili diſiūgūtur, nihil refert, ſiue propè, ſiue procul à ſeſe ſint.

A An ſono & odori hoc ipſum euenire conſentaneũ eſt? nam perinde vt aër & aqua, continũa quidem ſunt, ſed tamen motio vtriuſque partita eſt. Quocirca tum idem, tum non idem, primus & nouiſſimus audiunt olfaciúntque. Videtur autem quibuſdam hoc quoque difficultatem habere. Quidam enim aiunt eſſe impoſſibile, vt alius idem quod alius audiat, aut videat, olfaciátve. quandoquidem fieri non poteſt vt vnum multi & ſeorſim exiſtentes audiant, aut olfaciant. idem enim ſeiunctum à ſeſe, ſeparatúmque eſſet. An quod primò quidem mouit, ceu tintinabulum, aut thus, aut ignem, vnũ & idem numero omnes ſentiunt: quod autem iam proprium eſt, numero aliud, ſpecie verò idẽ? Quocirca plures ſimul vident, & odorantur, & audiunt. B Cæterùm hæc neque ſunt corpora, ſed affectio & motio quædam (alioqui nequaquam iſtud eueniret) neque ſine corpore. De lumine verò alia ratio eſt. nam lumen eſſentia quædam, & non motio exiſtit. In ſumma non perinde in alteratione res habet atque in latione. Nam lationes iure optimo priùs in medium perueniunt. Videtur autem ſonus eſſe motio cuiuſpiam quod lationem ſubeat. Quæ verò alterantur, neutiquam ſimiliter faciunt. contingit enim quippiam vniuerſim alterari, & non dimidium priùs: ceu aquam omnem ſimul concreſcere. Sed enim nonnunquam, dum calefit aut cõcreſcit, pars alteri proxima ab ea cui hæret, afficitur: prima verò ab ipſo alterante immutari aſſolet. C nec neceſſe eſt eam ſimul & vniuerſim alterari. Porrò ſi in humore degeremus, ſapor vt odor eſſet, & adhuc longiore interuallo antequam eum tangeremus, ſentiretur. Ratione quoque optima euenit, vt ſenſoria quæ non niſi aliquo intercedente medio functiones ſuas exercent, non ſimul patiantur: præterquam in lumine, propter id quod dictum. Idem etiam de viſione ſentiendum eſt: nam lumen ipſum viſionem efficit.

A ἢ περὶ μὲν τὸν ψόφον καὶ ὀσμὴν τοῦτο συμβαίνειν εὔλογον; ὥσπερ γὰρ ὁ ἀὴρ καὶ τὸ ὕδωρ, συνεχῆ μὲν, ἀλλ᾽ ὅμως μεμέρισται ἀμφοτέρων ἡ κίνησις. διὸ καὶ ἔστι μὲν ὡς τὸ αὐτὸ ἀκούει ὁ πρῶτος καὶ ὁ ὕστερος, καὶ ὀσφραίνεται, ἔστι δ᾽ ὡς οὔ. δοκεῖ δέ τισιν εἶναι ἀπορία καὶ περὶ τούτων· ἀδύνατον γάρ φασί τινες ἄλλον ἄλλῳ τὸ αὐτὸ ἀκούειν, ἢ ὁρᾶν καὶ ὀσφραίνεσθαι· οὐ γὰρ οἷόν τε εἶναι πολλοὺς καὶ χωρὶς ὄντας ἀκούειν καὶ ὀσφραίνεσθαι· τὸ γὰρ ἓν χωρὶς ἂν αὐτὸ αὑτοῦ ἦν. ἢ τοῦ μὲν κινήσαντος πρώτου, οἷον * τοῦ κώδωνος, ἢ λιβανωτοῦ, ἢ πυρὸς, τοῦ αὐτοῦ καὶ ἑνὸς ἀριθμῷ αἰσθάνονται πάντες· τοῦ δὲ ἤδη ἰδίου, ἑτέρου ἀριθμῷ, εἴδει B δὲ τοῦ αὐτοῦ. διὸ πολλοὶ ἅμα ὁρῶσι, καὶ ὀσμῶνται, καὶ ἀκούουσιν. ἔστι δ᾽ οὔτε σώματα ταῦτα, ἀλλὰ πάθος καὶ κίνησίς τις· οὐ γὰρ ἂν συνέβαινε τοῦτο· οὔτε ἄνευ σώματος. περὶ δὲ τοῦ φωτὸς ἄλλος λόγος· τῷ εἶναι γάρ τι φῶς ἐστιν, ἀλλ᾽ οὐ κίνησίς τις. ὅλως δὲ οὐδὲ ὁμοίως ἐπί τε ἀλλοιώσεως ἔχει καὶ φορᾶς· αἱ μὲν γὰρ φοραὶ εὐλόγως εἰς τὸ μεταξὺ πρῶτον ἀφικνοῦνται, δοκεῖ δὲ ὁ ψόφος εἶναι φερομένου τινὸς κίνησις· ὅσα δὲ ἀλλοιοῦται, οὐκέτι ὁμοίως· ἐνδέχεται γὰρ ἀθρόον ἀλλοιοῦσθαι, καὶ μὴ τὸ ἥμισυ πρότερον, οἷον τὸ ὕδωρ ἅμα πήγνυσθαι. οὐ μὴν ἀλλ᾽ ἂν ᾖ πολὺ τὸ θερμαινόμενον, ἢ πηγνύμενον, τὸ ἐχόμενον C ὑπὸ τοῦ ἐχομένου πάσχει. τὸ δὲ πρῶτον ὑπ᾽ αὐτοῦ τοῦ ἀλλοιοῦντος μεταβάλλει, καὶ οὐκ ἀνάγκη ἅμα ἀλλοιοῦσθαι καὶ ἀθρόον. ἦν δ᾽ ἂν καὶ τὸ γεύεσθαι ὥσπερ ἡ ὀσμὴ, εἰ ἐν ὑγρῷ ἦμεν πορρωτέρω. ἔτι πρὶν θιγεῖν αὐτοῦ ᾐσθανόμεθα. εὐλόγως δὲ ὧν ἐστι μεταξὺ τοῦ αἰσθητηρίου, οὐχ ἅμα πάσχει, πλὴν ἐπὶ τοῦ φωτὸς, διὰ τὸ εἰρημένον. διὰ τὸ αὐτὸ δὲ καὶ περὶ τοῦ ὁρᾶν· τὸ γὰρ φῶς ποιεῖ τὸ ὁρᾶν.

* γρ. τῆς κώδ.

CAPVT VII.

Omne quod ſentitur, diuiſibile eſſe: ipſúmque indiuiſibile ſenſibile non eſſe.

D Est autem & alia quædam talis circa ſenſus dubitatio: vtrùm contingat duos ſimul ſentire in eodem & indiuiduo tempore, necne. Planè ſi ſemper validior motus debiliorem elidat (ex quo fit vt quæ ob oculos diuerſantur, non percipiant, qui fortè vehementer quippiam meditantur, aut trepidant aut ingentem ſonitum exaudiunt. hoc itaque conſtitutum ſit, & illud, nempe ſingula meliùs ſentiri ſimplicia quàm commiſta, vt colorem, mel, & vinum meracum, quàm temperatum, & neten ſolam quàm in conſonantia diapaſon, quòd ſeſe viciſſim offundant. id quod factitare ſolent ea ex quibus vnum quoddam diſſultat) ſi ſemper E inquam valentior motus infirmiorem depellat, neceſſe eſt ſi ſimul ſint, etiam illum minùs ſenſilem eſſe quàm ſi ſolus eſſet, cùm ab eo minor intermiſtus quippiam detrahat ſi ſimplicia omnia probiùs ſentiantur. Si ergo motus æquales ſint ac diuerſi, neutrius erit ſenſio. nam alter alterum offuſcat, nec ſimpliciter ſentiri poſſunt. Quare aut nulla erit ſenſio, aut ex vtriſque alia emerget. quòd etiam effici videtur ex hiſce quæ confunduntur, in quodcunque miſta fuerint. Cùm igitur ex nonnullis quippiam fiat, ex nonnullis non fiat,

ΚΕΦΑΛ. ζ.

Πότερον ἐνδέχεται τὸν αὐτὸν ἅμα δύο δύνασθαι αἰσθάνεσθαι ἐν τῷ αὐτῷ χρόνῳ, ἢ οὔ. Ὅτι οὐδείς ἐστι χρόνος ἀναίσθητος· καὶ πᾶν τὸ αἰσθητὸν, διαιρετόν.

Ἔστι δὲ ἀπορία καὶ ἄλλη τις τοιάδε περὶ τὰς αἰσθήσεις, πότερον ἐνδέχεται ἅμα δύο δύνασθαι αἰσθάνεσθαι ἐν τῷ αὐτῷ καὶ ἀτόμῳ χρόνῳ, ἢ οὔ; εἰ δὲ, ἀεὶ ἡ μείζων κίνησις τὴν ἐλάττω ἐκκρούει (διὸ ὑποφερομένων ὑπὸ τὰ ὄμματα οὐκ αἰσθάνονται, ἂν τύχωσι σφόδρα τι ἐννοοῦντες, ἢ φοβούμενοι, ἢ ἀκούοντες πολὺν ψόφον. τοῦτο δὴ ὑποκείσθω, καὶ ὅτι ἑκάστου μᾶλλόν ἐστιν αἰσθάνεσθαι ἁπλοῦ ὄντος, ἢ κεκραμένου, οἷον οἴνου ἀκράτου, ἢ κεκραμένου, καὶ μέλιτος, καὶ χρόας, καὶ τῆς νήτης μόνης, ἢ ἐν τῇ διὰ πασῶν, διὰ τὸ ἀφανίζειν E ἄλληλα. τοῦτο δὲ ποιεῖ ἐξ ὧν ἕν τι γίνεται.) Εἰ δὴ ἡ μείζων τὴν ἐλάττω κίνησιν ἐκκρούει, ἀνάγκη ἂν ἅμα ὦσι, καὶ ταύτην ἧττον αἰσθητὴν εἶναι, ἢ εἰ μόνη ἦν. ἀφαιρεῖται γάρ τι ἡ ἐλάττων μιγνυμένη, εἴπερ ἅπαντα τὰ ἁπλᾶ μᾶλλον αἰσθητά ἐστιν. ἂν δ᾽ ἄρα ἴσαι ὦσιν ἕτεραι οὖσαι, οὐδ᾽ ἑτέρας ἔσται αἴσθησις· ἀφανιεῖ γὰρ ἡ ἑτέρα ὁμοίως τὴν ἑτέραν. ἁπλῆς δὲ οὐκ ἔστιν ὁμοίως αἰσθάνεσθαι. ὥστε ἢ οὐδεμία ἔσται αἴσθησις, ἢ ἄλλη ἐξ ἀμφοῖν. ὅπερ καὶ γίνεσθαι δοκεῖ ἐκ τῶν * κεραννυμένων, ἐν ᾧ ἂν μιχθῶσιν. ἐπεὶ οὖν ἐκ μὲν ἐνίων γίνεταί τι, ἐκ δὲ ἐνίων οὐ γίνεται.

* γρ. κεκραμένων

A πάντα δὲ τὰ ὑφ' ἑτέραν αἴσθησιν· μίγνυται γὰρ ὧν τὰ ἔσχατα ἐναντία· οὐκ ἔστι δ' ἐκ λευκοῦ καὶ ὀξέος ἓν γενέσθαι, ἀλλ' ἢ κατὰ συμβεβηκός, ἀλλ' οὐχ ὡς ἐξ ὀξέος καὶ βαρέος συμφωνία. οὐκ ἄρα οὐδὲ αἰσθάνεσθαι ἐνδέχεται αὐτῶν ἅμα. ἴσαι μὲν γὰρ οὖσαι αἱ κινήσεις, ἀφανίζουσιν ἀλλήλας, ἐπεὶ οὐ μία γίνεται ἐξ αὐτῶν. ἐὰν δὲ ἄνισοι, ἡ κρείττων αἴσθησιν ἐμποιεῖ. ἔτι μᾶλλον ἅμα δυοῖν αἰσθάνοιτο ἂν ἡ ψυχὴ τῇ μιᾷ αἰσθήσει ὧν μία αἴσθησις, οἷον ὀξέος καὶ βαρέος· μᾶλλον γὰρ ἅμα ἡ κίνησις τῆς μιᾶς αὐτῆς αὐτῆς, ἢ τοῖν δυοῖν, οἷον ὄψεως καὶ ἀκοῆς. τῇ μιᾷ δὲ ἅμα δυοῖν οὐκ ἔστιν αἰσθάνεσθαι ἂν μὴ μιχθῇ· τὸ γὰρ μίγμα ἓν βούλεται εἶναι, τοῦ δὲ ἑνὸς, B μία αἴσθησις· ἡ δὲ μία ἅμα αὐτῇ. ὥστ' ἐξ ἀνάγκης τῶν μεμιγμένων ἅμα αἰσθάνεται, ὅτι μιᾷ αἰσθήσει κατ' ἐνέργειαν αἰσθάνεται· ἑνὸς μὲν γὰρ ἀριθμῷ, ἡ κατ' ἐνέργειαν μία· εἴδει δὲ ἡ κατὰ δύναμιν μία. καὶ εἰ μία τοίνυν ἡ αἴσθησις ἡ κατ' ἐνέργειαν, ἓν ἐκεῖνα ἐρεῖ. μεμῖχθαι ἄρα ἀνάγκη αὐτά. ὅταν ἄρα μὴ ᾖ μεμιγμένα, δύο ἔσονται αἰσθήσεις αἱ κατ' ἐνέργειαν. ἀλλὰ κατὰ μίαν δύναμιν καὶ ἄτομον χρόνον, μίαν ἀνάγκη εἶναι τὴν ἐνέργειαν. μιᾶς γὰρ ἡ εἰσάπαξ μία χρῆσις καὶ κίνησις· μία δὲ ἡ δύναμις. οὐκ ἄρα ἐνδέχεται δυοῖν ἅμα αἰσθάνεσθαι τῇ μιᾷ αἰσθήσει. ἀλλὰ μὴν* εἰ τὰ ὑπὸ τὴν αὐτὴν αἴσθησιν ἅμα ἀδύνατον, C ἐὰν ᾖ δύο, δῆλον ὅτι ἧττον ἔτι τὰ κατὰ δύο αἰσθήσεις ἐνδέχεται ἅμα αἰσθάνεσθαι, οἷον λευκὸν καὶ γλυκύ. φαίνεται γὰρ τὸ μὲν τῷ ἀριθμῷ ἓν ἡ ψυχὴ οὐδενὶ ἑτέρῳ λέγειν, ἀλλ' ἢ τῷ ἅμα. τὸ δὲ τῷ εἴδει ἓν, τῇ κρινούσῃ αἰσθήσει, καὶ τῷ τρόπῳ. λέγω δὲ τοῦτο, ὅτι ἴσως τὸ λευκὸν καὶ τὸ μέλαν, ἕτερον τῷ εἴδει ὄν, ἡ αὐτὴ κρίνει, καὶ τὸ γλυκὺ καὶ τὸ πικρὸν ἡ αὐτὴ μὲν *ἑαυτῇ, ἐκείνης δὲ ἄλλη, ἀλλ' ἑτέρως ἑκάτερον τῶν ἐναντίων. ὡς δ' αὔτως ἑαυτοῖς τὰ σύστοιχα, οἷον ὡς ἡ γεῦσις τὸ γλυκύ, οὕτως ἡ ὄψις τὸ λευκόν· ὡς δ' αὕτη τὸ μέλαν, οὕτως ἐκείνη τὸ πικρόν. ἔτι, εἰ αἱ τῶν ἐναντίων κινήσεις ἐναντίαι, ἅμα δὲ τὰ ἐναντία D ἐν τῷ αὐτῷ καὶ ἀτόμῳ οὐκ ἐνδέχεται ὑπάρχειν, ὑπὸ δὲ τὴν αἴσθησιν τὴν μίαν ἐναντία ἐστίν, οἷον γλυκὺ καὶ πικρόν, τούτων οὐκ ἐνδέχοιτ' ἂν αἰσθάνεσθαι ἅμα. ὁμοίως δὲ δῆλον ὅτι οὐδὲ τὰ μὴ ἐναντία. τὰ μὲν γὰρ τοῦ λευκοῦ, τὰ δὲ τοῦ μέλανος ἐστί· καὶ ἐν τοῖς ἄλλοις ὁμοίως· οἷον τῶν χυμῶν, οἱ μὲν τοῦ γλυκέος, οἱ δὲ τοῦ πικροῦ. οὐδὲ τὰ μεμιγμένα ἅμα· λόγοι γάρ εἰσιν ἀντικειμένων, οἷον τὸ διὰ πασῶν, καὶ τὸ διὰ πέντε, ἐὰν μὴ ὡς ἓν αἰσθάνηται. οὕτως δὲ εἷς λόγος ὁ τῶν ἄκρων γίνεται, ἄλλως δ' οὔ· ἔσται γὰρ ἅμα, ὁ μὲν πολλοῦ πρὸς ὀλίγον, ἢ περιττοῦ πρὸς ἄρτιον· ὁ δὲ ὀλίγου πρὸς πολύ, ἢ ἀρτίου πρὸς περιττόν. εἰ οὖν πλεῖον ἀπέχει ἔτι E ἀλλήλων καὶ διαφέρει τὰ σύστοιχα μὲν λεγόμενα, ἐν ἄλλῳ δὲ γένει τῶν ἐν τῷ αὐτῷ γένει· λέγω δὲ, οἷον τὸ γλυκὺ καὶ τὸ λευκὸν καλῶ σύστοιχα, γένει δὲ ἕτερα· τὸ γλυκὺ δὲ τοῦ μέλανος πλεῖον ἔτι τῷ εἴδει διαφέρει ἢ τὸ λευκόν· ἔτι ἂν ἧττον ἅμα ἐνδέχοιτο αὐτὰ αἰσθάνεσθαι, ἢ τὰ τῷ γένει ταὐτά. ὥστε εἰ μὴ ταῦτα, οὐδ' ἐκεῖνα. ὃ δὲ λέγουσί τινες τῶν περὶ τὰς συμφωνίας, ὅτι οὐχ ἅμα μὲν ἀφικνοῦνται οἱ ψόφοι, φαίνονται δὲ, καὶ λανθάνει, ὅταν ὁ χρόνος ᾖ ἀναίσθητος· πότερον ὀρθῶς λέγεται, ἢ οὔ;

* γρ. ἢ μὴν εἰ

* γρ. ἑαυτῆς

A talia autem ſint quæ diuerſis ſubiiciuntur ſenſibus: (nam ea miſceri ſolent, quorum extrema ſunt contraria. at ex albo & acuto, vnum fieri nequaquam contingit: niſi per accidens, & non vti ex acuto & graui concentus exultat) nullatenus profectò contingit ea ſimul ſentiri. Nam ſi motus ipſorum ſint æquales, mutuò ſeſe obliterabunt, cùm ex eis vnus non fiat. ſi verò inæquales, præſtantior ſenſum efficiet. Præterea anima potiùs ſimul duo, quorum vnus eſt ſenſus, ceu acutum & graue, vno ſenſu ſentiret, quia motio vnius ſenſus, eadem inquam eiuſdem, potiùs ſimul fiat: quàm duorum, ceu viſus & auditus. At fieri non poteſt vt ea vno ſenſu duo ſimul ſentiat, niſi miſta fuerint. nam mi-B ſtura ipſa, eſſe vnum aſſolet. vnius autem vnus eſt ſenſus: vnus verò ſenſus, ſimul ipſe ſit. Quare anima neceſſariò ſimul ſentit commiſta, quod ea vno ſenſu actu ſentiet. nam vnius numero quidem eſt, qui actu vnus eſt: ſpecie verò, qui potentia. Si itaque ſenſus actu vnus ſit, illa vnum dicet. neceſſe eſt igitur, ea eſſe miſta. Vbi ergo miſta non fuerint, ſenſus qui actu fiant, duo erunt. At ſecundùm vnam potentiam, & tempus impartibile, vnum eſſe actum neceſſe eſt. vnius enim potentiæ vnus eſt vſus, qui ſemel fiat, ac motus. potentia autem vna eſt. Nequaquam ergo contingit, vno ſenſu duo ſimul ſentire animam. At verò ſi quæ ſub eundem ſenſum cadunt, anima ſimul ſentire non poſſit, ſi C duo ſint: certum eſt, eam minùs poſſe ſimul ſentire, quæ ſub duos cadunt, ceu album & dulce. Etenim anima id quod numero vnum eſt, non aliter quàm ſimul, dicere videtur: quod autem ſpecie vnum eſt, iudicante ſenſu, & modo quodam. Hoc autē dico, quia fortaſſe album & nigrum quæ ſpecie differunt, idem ſenſus iudicat: & dulce & amarū idem quidem ipſe, ab illo autem alius: ſed contrariorum vtrumque diuerſo modo. Conſimiliter & quæ ſibiipſis conſocialia ſunt. nam quemadmodum guſtus dulce, ita viſus album: & contrà quemadmodum viſus nigrum, ita guſtus amarum diſcernit atque diiudicat. Præterea ſi contrariorum motiones contrariæ ſint, atque fieri non poſſit vt contra-D ria in eodem ac indiuiduo ſimul inſint, ſed ſub vno ſenſu ſint, veluti dulce & amarum: nequaquam profectò continget, contraria ſimul ſentiri. Pari quoque modo conſtat, nec ea quæ contraria non ſunt, ſimul ſentiri poſſe: quando alia ad album, ad nigrum alia pertinent. id quod etiam in cæteris ſimiliter euenit, vt in ſaporibus: quorum ad dulcem alij, alij ad amarum redigi ſolent. nec ea quæ commiſta ſunt (quippe quæ ſint rationes oppoſitorum: ceu diapaſon & diapente) niſi vt vnum ſentiantur. ſic autem extremorum ratio vna ſit, aliàs non. erunt enim ſimul altera multi ad paucum, aut imparis ad parem: altera pauci ad multum, aut paris ad imparem. Si ergo plus adhuc diſtant E inter ſe, ac differunt, quæ per conſociationem quidem ſeu coordinationem dicuntur, ſed in alio genere ſunt, quàm quæ quidem genus habent: verbi gratia, dulce & album conſociata quidem, ſiue coordinata voco: genere autem diuerſa: dulce verò plus adhuc ab atro ſpecie differt quàm ab albo: adhuc profectò minùs ea ſimul ſentiri continget, quàm quæ genere eadem ſunt. quare ſi non hæc, neque illa. Quod autem quidam ex eis qui circa conſonantias verſantur, aſſerunt, nēpe ſonos non ſimul quidē peruenire, ſed videri, ac tēpus nos latere vbi inſēſibile fuerit; probène dicitur an nō?

Fortè enim quiſpiam nunc quoque iuxta illud dicat, videri cuilibet ſe ſimul contueri aut exaudire quæpiam, quod intermedia tempora obliteſcant. An id verum non eſt: nec fieri poteſt, vt tempus vllum ſit inſenſibile, aut lateat: ſed omne ſentiri contingit? Nam ſi quando quis ſeipſum idem aut alium in continuo tempore ſentit, non contingit tunc latere ſe eſſe, eſt autem aliquid in continuo etiam tantum quantum prorſus inſenſibile eſt: certum eſt, quod tunc eundem lateret ſe eſſe, & videre, & denique ſe ſentire, et ſi ſentit. Præterea nec tempus nec res vlla erit quam quis ſentit, aut in quo ſentit, quam aut in quo non ſentiat, quod in illius aliquo aut illius aliquid videat: perinde ac ſi dicas illum totam terram videre, quòd hanc eius partem videat: & in annum ambulare, quod in hac parte eius ambulet: ſi magnitudo aliqua tum temporis, tum rei, præ exiguitate inſenſibilis omnino habeatur. Nam ſi tota die videt, ac toto eodem iugi tempore ſentit, non eo quod in huius aliquo ſentiat, auferatur portio c b in qua non ſentiat. Non igitur in huius aliquo, aut huius aliquid ſentit. At verò in parte c b nihil ſentit. Eo ergo quod in huius, puta a b, aliquo ſentit, totum ac tota ſentire dicitur. Eadem quoque ratio eſt in a c, ſemper enim in aliquo & aliquid ſentit, totum autem ſentire non contingit. Omnia igitur ſenſibilia ſunt, ſed non quanta ſunt, apparent. ſolarem enim magnitudinem quadricubitamque eminus videt: at non quanta ſit apparet, ſed interdum indiuiſibilis, videt tamen non indiuiſibilem. Huius rei cauſa in prioribus dicta eſt. Nullum igitur eſſe tempus inſenſibile, per hæc conſtat. De dubitatione verò quam prius dixi, ſcrutandum eſt: vtrùm contingat ſentire plura ſimul, necne. dico ſimul, in vno ac indiuiduo tempore inter ſe. Primùm igitur vtrùm ſic contingat, videlicet ſimul quidem, ſed alio animæ & non indiuiſibili, ſic tamen indiuiſibili, vt toto exiſtente continuo? An dicendum imprimis, quæ ſub vnum ſenſum cadunt, ceu viſum, ea ſimul ſentiri poſſe: ſi alio alium colorem ſentiat, pluresque partes habeat ſpecie eaſdem: etenim quæ ſentit, in eodem genere ſunt. At ſi quis dicat nihil prohibere, quin vt oculi duo ſunt, ita & in anima res habeat: dicendum quòd forte ex illis quidem vnum quid fit, & actus eorum vnus eſt: hic verò, ſi quod ex ambobus conſtet, vnum ſit, id quod ſentit, illud erit. ſin verò illa ſeorſum maneant, haud ſimiliter habebit. Præterea ſenſiones ipſæ plures erunt, perinde ac ſi quis ſcientias differentes dicat: quando nec actus, ſine potentia ſibi reſpondente: nec ſenſio ſine actu eſſe poteſt. Quòd ſi hæc anima in vno & indiuiduo ſentiat, palàm eſt quòd & alia ſentit. quippe cùm potius ea plura ſimul ſentire contingat, quàm quæ genere diuerſa ſunt. Itaque ſi alia parte dulce, alia album ſentiat: aut quod ex iſtis partibus reſilit, vnum eſt, aut non vnum. At neceſſe eſt eſſe vnum: quandoquidem pars ſenſitiua vnum quippiam eſt. Cuius igitur illud vnius erit? nam ex dulci & albo nullum vnum fit. Neceſſe ergo eſt, vnum quid animæ eſſe quo omnia ſentiat, quemadmodum priùs dictum eſt: ſed aliud genus, per aliud. Num igitur id quod dulce & album ſentiat, quatenus indiuiſibile quippiam actu eſt, vnum eſt: vbi verò diuiſibile actu euaſit, aliud?

A πάγχυ γὰρ ἂν φαίη τις καὶ νῦν τὸ δοκεῖν ἅμα ὁρᾶν καὶ ἀκούειν εἶναι, ὅτι οἱ μεταξὺ χρόνοι λανθάνουσιν. ἢ τοῦτ' οὐκ ἀληθές, οὐδ' ἐνδέχεται χρόνον εἶναι ἀναίσθητον οὐδένα, οὐδὲ λανθάνειν, ἀλλὰ παντὸς ἐνδέχεται αἰσθάνεσθαι; εἰ γὰρ ὅτε αὐτός τις αὑτοῦ αἰσθάνεται ἢ ἄλλου ἐν συνεχεῖ χρόνῳ, μὴ ἐνδέχεται τότε λανθάνειν ὅτι ἔστιν, ἔστι δέ τις ἐν τῷ συνεχεῖ καὶ τοσοῦτος ὥστε ὅλως ἀναίσθητος εἶναι, δῆλον ὅτι τότε λανθάνοι ἂν εἰ ἔστιν αὐτὸς αὑτόν, καὶ εἰ ὁρᾷ καὶ αἰσθάνεται· καὶ εἰ αἰσθάνεται, ἔτι οὐκ ἂν εἴη οὔτε χρόνος οὔτε πρᾶγμα οὐθέν, ὃ αἰσθάνεται, ἢ ἐν ᾧ ὁρᾷ, εἰ μὴ οὕτως, ὅτι ἐν τούτου τινί, ἢ ὅτι τούτου τι ὁρᾷ, εἴπερ ἐστί τι μέγεθος καὶ χρόνου καὶ πράγματος ἀναίσθητον ὅλως διὰ μικρότητα· εἰ γὰρ τὴν ὅλην ὁρᾷ, καὶ αἰσθάνεται τὸν ὅλον αὐτὸν συνεχῆ χρόνον, οὐχ ὅτι ἐν τούτου τινί, ἢ ὅτι τούτου τι ὁρᾷ, εἴπερ ἐστί τι μέγεθος, ἀφῃρήσθω τὸ γβ, ἐν ᾧ οὐκ ᾐσθάνετο. οὐκοῦν ἐν ταύτης τινί, ἢ ταύτης τι, ὥσπερ τὴν γῆν ὁρᾷ ὅλην, ὅτι τοδὶ αὐτῆς, καὶ ἐν τῷ ἐνιαυτῷ βαδίζει, ὅτι ἐν τῷδε τῷ μέρει αὐτοῦ. ἀλλ' ἐν μὲν τῷ βγ οὐθὲν αἰσθάνεται· τῷ ἄρα ἐν τούτου τινὶ τῆς αβ αἰσθάνεσθαι, λέγεται τὸ ὅλον αἰσθάνεσθαι καὶ τὴν ὅλην. ὁ δ' αὐτὸς λόγος καὶ ἐπὶ τῆς αγ· ἀεὶ γὰρ ἐν τινὶ καὶ τινός, ὅλου δ' οὐκ ἔστιν αἰσθάνεσθαι. ἅπαντα μὲν οὖν αἰσθητά ἐστιν, ἀλλ' οὐ φαίνεται ὅσα ἐστί. τὸ γὰρ ἡλίου μέγεθος ὁρᾷ, καὶ τὸ τετράπηχυ πόρρωθεν, ἀλλ' οὐ φαίνεται ὅσον, ἀλλ' ἐνίοτε ἀδιαίρετον, ὁρᾷ δ' οὐκ ἀδιαίρετον. ἡ δ' αἰτία εἴρηται ἐν τοῖς ἔμπροσθεν περὶ τούτου. ὅτι μὲν οὖν οὐκ ἔστι χρόνος ἀναίσθητος, ἐκ τούτων φανερόν. περὶ δὲ τῆς πρότερον λεχθείσης ἀπορίας, σκεπτέον, πότερον ἐνδέχεται ἅμα πλειόνων αἰσθάνεσθαι, ἢ οὐκ ἐνδέχεται. τὸ δ' ἅμα λέγω ἐν ἑνὶ καὶ ἀτόμῳ χρόνῳ πρὸς ἄλληλα. πρῶτον μὲν οὖν, ἆρ' ὧδ' ἐνδέχεται, ἅμα μέν, ἑτέρῳ δὲ τῆς ψυχῆς αἰσθάνεσθαι, καὶ οὐ τῷ ἀτόμῳ, ὡς ἀτόμῳ ὄντι τῷ παντὶ συνεχεῖ. ἢ ἐπὶ πρῶτον μὲν τὰ κατὰ τὴν μίαν αἴσθησιν, οἷον λέγω ὄψιν, εἰ ἑτέρῳ μὲν αἰσθάνεται ἄλλου καὶ ἄλλου χρώματος, πλείω τε μέρη ἕξει ὁμοειδῆ ταὐτά, καὶ γὰρ ἃ αἰσθάνεται, ἐν τῷ αὐτῷ γένει ἐστίν. εἰ δὲ καὶ ὅτι ὡς ὄμματα δύο φαίη τις, οὐθὲν κωλύει, οὕτω καὶ ἐν ψυχῇ, ὅτι ἴσως ἐκ μὲν τούτων ἕν τι γίνεται, καὶ μία ἡ ἐνέργεια αὐτῶν. ἐκεῖ δέ, εἰ μὲν ἕν τι τὸ ἐξ ἀμφοῖν, ἐκεῖνο τὸ αἰσθανόμενον ἔσται· εἰ δὲ χωρίς, οὐχ ὁμοίως ἕξει. ἔτι αἰσθήσεις αἱ αὐταὶ πλείους ἔσονται, ὥσπερ εἴ τις ἐπιστήμας διαφόρους φαίη· οὔτε γὰρ ἡ ἐνέργεια ἄνευ τῆς καθ' αὑτὴν ἔσται δυνάμεως, οὔτε ἄνευ ταύτης αἴσθησις ἔσται. εἰ δὲ τούτων ἐν ἑνὶ καὶ ἀτόμῳ αἰσθάνεται, δῆλον ὅτι καὶ τῶν ἄλλων· μᾶλλον γὰρ ἐνδέχεται τούτων ἅμα πλειόνων, ἢ τῶν τῷ γένει ἑτέρων. εἰ δὲ δή, ἄλλῳ μὲν γλυκέος, ἄλλῳ δὲ λευκοῦ αἰσθάνεται ἡ ψυχὴ μέρει, ἤτοι τὸ ἐκ τούτων ἕν ἐστιν, ἢ οὐχ ἕν. ἀλλὰ ἀνάγκη ἕν. ἓν γάρ τι τὸ αἰσθητικόν ἐστι μέρος. τίνος οὖν ἐκεῖνο ἑνός; οὐθὲν γὰρ ἐκ τούτων ἕν. ἀνάγκη ἄρα ἕν τι εἶναι τῆς ψυχῆς, ᾧ ἅπαντα αἰσθάνεται, καθάπερ εἴρηται πρότερον, ἄλλο δὲ γένος δι' ἄλλου. ἆρ' οὖν ᾗ μὲν ἀδιαίρετον τι κατ' ἐνέργειαν, ἕν τι ἐστὶ τὸ αἰσθητικὸν γλυκέος καὶ λευκοῦ, ὅταν δὲ διαιρετὸν γένηται κατ' ἐνέργειαν, ἕτερον;

ἢ ὥσπερ ἐπὶ τῶν πραγμάτων αὐτῶν ἐνδέχεται, οὕτω καὶ ἐπὶ τῆς ψυχῆς; τὸ γὰρ αὐτὸ καὶ ἓν ἀριθμῷ λευκὸν καὶ γλυκύ ἐστι, καὶ ἄλλα πολλά· εἰ γὰρ μὴ χωριστὰ τὰ πάθη ἀλλήλων, ἀλλὰ τὸ εἶναι ἕτερον ἑκάστῳ. ὁμοίως τοίνυν θετέον καὶ ἐπὶ τῆς ψυχῆς τὸ αὐτὸ καὶ ἓν εἶναι ἀριθμῷ τὸ αἰσθητικὸν πάντων. τῷ μέντοι εἶναι ἕτερον καὶ ἕτερον τῶν μὲν γένει, τῶν δὲ εἴδει. ὥστε καὶ αἰσθάνοιτ' ἂν ἅμα τῷ αὐτῷ καὶ ἑνί, λόγῳ δὲ οὐ τῷ αὐτῷ. ὅτι δὲ πᾶν αἰσθητὸν πᾶν ἐστι μέγεθος, καὶ οὐκ ἔστιν ἀδιαίρετον αἰσθητόν, δῆλον· ἔστι γὰρ ὅθεν μὲν οὐκ ἂν ὀφθείη, ἄπειρον τὸ ἀπόστημα· ὅθεν δὲ ὁρᾶται, πεπερασμένον. ὁμοίως δὲ καὶ ὀσφραντὸν καὶ ἀκουστὸν καὶ ὅσων μὴ ἁπτόμενοι αἰσθάνονται. ἔστι δή τι ἔσχατον τοῦ ἀποστήματος ὅθεν οὐχ ὁρᾶται, καὶ πρῶτον ὅθεν ὁρᾶται. τοῦτο δὴ ἀνάγκη ἀδιαίρετον εἶναι, οὗ ἐν μὲν τῷ ἐπέκεινα οὐκ ἐνδέχεται αἰσθάνεσθαι ὄντος, ἐν δὲ τῷ ἐπὶ τάδε ἀνάγκη αἰσθάνεσθαι. εἰ δή τι ἔστιν ἀδιαίρετον αἰσθητόν, ὅταν τεθῇ ἐπὶ τῷ ἐσχάτῳ ὅθεν ἐστίν, ἔσχατον μὲν οὐκ αἰσθητόν, πρῶτον δὲ αἰσθητόν, ἅμα συμβήσεται ὁρατὸν εἶναι καὶ ἀόρατον. τοῦτο δὲ ἀδύνατον.

Περὶ μὲν οὖν τῶν αἰσθητηρίων καὶ τῶν αἰσθητῶν τίνα τρόπον ἔχει, καὶ κοινῇ, καὶ καθ' ἕκαστον αἰσθητήριον, εἴρηται. τῶν δὲ λοιπῶν πρῶτον σκεπτέον περὶ μνήμης καὶ τοῦ μνημονεύειν.

A An quemadmodum in rebus ipſis euenit (idem enim ac vacuum numero, album eſt & dulce, & pleraque alia) ita & in anima euenire cenſendum eſt: nam etſi affectiones ſeparabiles à ſeſe non ſint, ſingulis tamen ratio diuerſa competit. Conſimiliter ergo ſtatuendum eſt in ipſa quoque anima, id quod omnia ſentiat, idem eſſe ac vnum numero: rationem tamẽ aliam & aliam eſſe, horum quidem genere, illorum verò ſpecie. Quare & anima ſimul eodem ac vno ſentiet, ratione non eodem. Quòd autem omne ſenſibile magnitudine præditum ſit, nec id ſentire contingat, quod ſit indiuiſibile, hinc manifeſtum euadet. Nam vnde viſibile non videatur, infinita diſtantia eſt: vnde videatur, finita. conſimiliter de olfactili, & audibili, B & iis omnibus quæ ſine attactu ſentiuntur, dicendum eſt. Eſt itaque aliquid vltimum diſtantiæ, vnde non videtur, & primum diſtantiæ, vnde videtur. Hoc ergo indiuiſibile ſit neceſſe eſt, vltra quod quicquid iaceat, ſentire non contingit: citra verò, ſentire neceſſe eſt. Si ergo aliquod ſenſibile indiuiſibile ſit, vbi poſitum fuerit in extremo illo, vnde eſt vltimum quidem non ſenſibile, primum autem ſenſibile, accidet illud ſimul eſſe viſibile & inuiſibile, quod impoſſibile eſt.

De ſenſoriis igitur, & ſenſilibus quo pacto ſeſe habeant, & communiter, & per ſingula ſenſoria dictum eſt. Ex reliquis primò de memoria & reminiſcentia conſiderandum videtur.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΜΝΗΜΗΣ ΚΑΙ ΑΝΑΜΝΗΣΕΩΣ.

ARISTOTELIS STAGIRITÆ, DE MEMORIA ET REMINISCENTIA, LIBER.

Franciſco Vatablo interprete.

ΚΕΦΑΛ. α'.

Τί ἐστι μνήμη καὶ τὸ μνημονεύειν, καὶ διὰ τίνα αἰτίαν γίνεται· καὶ τίνι τῶν τῆς ψυχῆς μορίων τοῦτο συμβαίνει τὸ πάθος.

Π ΕΡΙ μνήμης καὶ τοῦ μνημονεύειν, λεκτέον τί ἐστι, καὶ διὰ τίνα αἰτίαν γίγνεται, καὶ τίνι τῶν τῆς ψυχῆς μορίων τοῦτο συμβαίνει τὸ πάθος, καὶ τὸ ἀναμιμνήσκεσθαι. οὐ γὰρ οἱ αὐτοί εἰσι μνημονικοὶ, καὶ ἀναμνηστικοί, ἀλλ' ὡς ἐπὶ τὸ πολὺ, μνημονικώτεροι μὲν οἱ βραδεῖς· ἀναμνηστικώτεροι δὲ, οἱ ταχεῖς καὶ εὐμαθεῖς. πρῶτον μὲν οὖν * ληπτέον ποῖά ἐστι τὰ μνημονευτά· πολλάκις γὰρ ἐξαπατᾷ τοῦτο. οὔτε γὰρ τὸ μέλλον ἐνδέχεται μνημονεύειν· ἀλλ' ἔστι δοξαστὸν καὶ ἐλπιστόν·

* γρ. σκεπτέον

C

CAPVT I.

Memoriam & reminiſcentiam, quemadmodum & memorari & reminiſci, non eſſe eadem.

Q VID ſit memoria & meminiſſe, quàque de cauſa fiat, & ad quam partem animæ iſthæc affectio referenda ſit, necnon quid reminiſcentia & reminiſci, explicandum eſt. Quippe cùm non iidem memoria præcellant, & facilè reminiſcantur: ſed magna ex parte qui tardo hebetique ſunt ingenio, memorioſiores ſint: qui celeri ac docili, reminiſcentiores. Ac primum quidem quæ ſint ea quæ memoriæ ſubiiciuntur, conſideremus addecet: cùm ſoleat in hoc error intercidere. Nam neque futura meminiſſe poſſumus: ſed opinari, vel ſperare,

quo etiam in genere ſcientia præſagandi habetur, quam nonnulli diuinationem appellant. Neque inſtantia memoria complecti ſolemus: ſed ſenſu: nã ſenſu neque futura, neque præterita cognoſcimus, ſed duntaxat præſentia. Præterita verò mandari memoriæ queunt. Quod autem præſens eſt, cuimadeſt, vt hoc album, cùm cernitur oculis, nemo ſe meminiſſe dixerit: ſed nec quod contemplatur, cùm quid animo verſat ſpeculaturque. ſed alterum ſentire ſolùm, alterum diſcere ac meditari. At cùm ſcientiam ſenſúmve ſine actione tenet, tum demum meminiſſe quippiam creditur, ceu angulos trianguli duobus rectis pares eſſe: tum quia id aliquando ſpeculatus eſt, aut audiuit: tum quia ita accepit, aut vidit, aut cuiuſpiam ſenſus opera deprehendit: ſemper enim cùm quis aliquid meminit, ſecum dicat oportet, hoc ſe antea aliquando audiuiſſe, aut ſenſiſſe, aut denique intellexiſſe. Eſt igitur memoria, neque ſenſus, neque exiſtimatio: ſed alicuius horum habitus aut affectio, cùm iam aliquantiſper inſederit. Præſentium verò in tempore præſenti memoria non eſt, quemadmodum diximus: ſed eorundem ſenſus eſt, futurorum ſpes, præteritorum memoria. Quamobrem memoria omnis non niſi elapſo quodam temporis curriculo exultat. Hinc fit vt quæ animalia temporis ſenſum habeant, ea ſola meminiſſe poſſint: & eadem animæ particula, qua illud ſentiant. Sed cùm de imaginatione retro dictum ſit in libris de Anima, & fieri non poſſe vt ſine phantaſmate quicquam intelligatur (intelligenti enim euenit, cùm quid intelligit, quod nobis, cùm figuram quampiam delineamus. nam quamuis nullus nobis vſus ſit præfinitæ magnitudinis, deſcribimus tamen triangulum conſtituta certáque quantitate: pari quoque modo & ille, quamuis quod quantum non ſit, intelligat, quantum tamen proponit ſibi, & quaſi ſubiicit oculis, ſed non vt quantum intelligit. quòd ſi ſuapte natura quantum ſit, infinitum tamen indeterminatumque, ſibi quantum finitum quidem atque determinatum præſentat, intelligit verò vt quantum ſolùm. cæterùm quam ob cauſam quæ ſub tempore non ſunt, ſine mole & tempore intelligi non poſſint, alio quidem loco dicendum eſt. neceſſe autem eſt eadem nos amplitudinem & motum parte cognoſcere, qua & tempus. vnde conſtat, horum notitiam ad primarium illum principemque ſenſum pertinere) atque phantaſma communis ſenſus affectio ſit, memoria verò ea quæ de intellectilibus rebus eſt non, ſine phantaſmate habeatur: memoria profectò ipſa per ſe quidem in ſenſu principe conſtituenda eſt, per accidens autem in ipſo intellectu. Quo fit vt non modo hominibus, & iis animalibus quibus opinatio & prudentia tributa eſt, ſed nonnullis item aliis memoria inſit. Quod ſi in parte aliqua intellectus ſtatuenda eſſet memoria, neutiquam multis e brutorum genere contingeret, immo fortè nulli mortali. Quando ne nunc quidem omnibus ea competit, quod non omnia temporis ſenſum habeant. ſemper enim, vt etiam ante retulimus, cùm quis meminit, præterea ſentit ſe priùs id vidiſſe, aut audiuiſſe, aut didiciſſe. at prius & poſterius, in tempore ſunt. Liquet igitur, in ea parte animæ poſitam eſſe memoriam, in qua collocata imaginatio ſit: & ea per ſe memoriæ ſubiici, quæ poſſunt ſub imaginationem cadere: per accidens, quæ non poſſunt ſine imaginatione intelligi. Sed quærat aliquis, quî fieri poſſit vt affectione ſola præſente, abſentis rei meminerimus? Nam, vt conſtat, ſcire oportet, affectionem quandam quæ picturæ ſimilis habeatur, per ſenſum in anima,

A εἴη δ' ἂν καὶ ἐπιστήμη τις ἐλπιστική, καθάπερ τινές φασι τὴν μαντικήν· οὔτε τοῦ παρόντος, ἀλλ' αἴσθησις· ταύτῃ γὰρ οὔτε τὸ μέλλον, οὔτε τὸ γενόμενον γνωρίζομεν, ἀλλὰ τὸ παρὸν μόνον. ἡ δὲ μνήμη, τοῦ γενομένου· τὸ δὲ παρὸν ὅτε πάρεστιν, οἷον τόδε τὸ λευκὸν ὅτε ὁρᾷ, οὐδεὶς ἂν φαίη μνημονεύειν, οὐδὲ τὸ θεωρούμενον, ὅτε θεωρῶν τυγχάνει καὶ νοῶν· ἀλλὰ τὸ μὲν αἰσθάνεσθαί φησι, τὸ δ' ἐπίστασθαι μόνον. ὅταν δ' ἄνευ τῶν ἐνεργειῶν ἔχῃ τὴν ἐπιστήμην καὶ τὴν αἴσθησιν, οὕτω μέμνηται τὰς τοῦ τριγώνου, ὅτι * δύο ὀρθαῖς ἴσαι, τὸ μὲν ὅτι ἔμαθεν ἢ ἐθεώρησε, τὸ δὲ, ὅτι ἤκουσεν, * ἢ εἶδεν, ἢ ὅτι τοιοῦτον· ἀεὶ γὰρ ὅταν ἐνεργῇ

B κατὰ τὸ μνημονεύειν, οὕτως ἐν τῇ ψυχῇ λέγει, ὅτι πρότερον τοῦτο ἤκουσεν, ἢ ᾔσθετο, ἢ ἐνόησεν. ἔστι μὲν οὖν ἡ μνήμη οὔτε αἴσθησις, οὔτε ὑπόληψις, ἀλλὰ τούτων τινὸς ἕξις, ἢ πάθος, ὅταν γένηται χρόνος. τοῦ δὲ νῦν ἐν τῷ νῦν οὐκ ἔστι μνήμη, καθάπερ εἴρηται· ἀλλὰ τοῦ μὲν παρόντος, αἴσθησις· τοῦ δὲ μέλλοντος, ἐλπίς· τοῦ δὲ γενομένου, μνήμη. διὸ μετὰ χρόνου πᾶσα μνήμη. ὥσθ' ὅσα χρόνου αἰσθάνεται, ταῦτα μόνα τῶν ζῴων μνημονεύει, καὶ τούτῳ ᾧ αἰσθάνεται. ἐπεὶ δὲ περὶ φαντασίας εἴρηται πρότερον ἐν τοῖς περὶ ψυχῆς, καὶ νοεῖν οὐκ ἔστιν ἄνευ φαντάσματος· συμβαίνει γὰρ τὸ αὐτὸ πάθος ἐν τῷ νοεῖν, ὅπερ καὶ ἐν τῷ διαγρά-

C φειν· ἐκεῖ τε γὰρ οὐδὲν προσχρώμενοι τῷ τὸ ποσὸν * ὡρισμένον εἶναι τὸ τριγώνου, ὅμως γράφομεν ὡρισμένον κατὰ τὸ ποσόν· καὶ ὁ νοῶν ὡσαύτως, κἂν μὴ ποσὸν νοῇ, τίθεται πρὸ ὀμμάτων ποσόν· νοεῖ δὲ, οὐχ ᾗ ποσόν. ἂν δ' ἡ φύσις ᾖ τῶν ποσῶν, ἀορίστων δὲ, * τίθεται μὲν ποσὸν ὡρισμένον· νοεῖ δὲ, ᾗ ποσὸν μόνον. διὰ τίνα μὲν οὖν αἰτίαν οὐκ ἐνδέχεται νοεῖν οὐδὲν ἄνευ τοῦ συνεχοῦς, οὐδ' ἄνευ χρόνου τὰ μὴ ἐν χρόνῳ ὄντα, ἄλλος λόγος. μέγεθος δ' ἀναγκαῖον γνωρίζειν, καὶ κίνησιν ᾧ καὶ χρόνον, καὶ τὸ φάντασμα τῆς κοινῆς αἰσθήσεως πάθος ἐστίν. ὥστε φανερὸν ὅτι τῷ πρώτῳ αἰσθητικῷ τούτων ἡ γνῶσίς ἐστιν· ἡ δὲ μνήμη καὶ ἡ τῶν νοητῶν,

D οὐκ ἄνευ φαντάσματός ἐστιν. ὥστε τοῦ νοουμένου κατὰ συμβεβηκὸς ἂν εἴη, καθ' αὑτὸ δὲ τοῦ πρώτου αἰσθητικοῦ. διὸ καὶ ἑτέροις τισὶν ὑπάρχει τῶν ζῴων, καὶ οὐ μόνον ἀνθρώποις, καὶ τοῖς ἔχουσι δόξαν, ἢ φρόνησιν. εἰ δὲ τῶν νοητικῶν τι μορίων ἦν, οὐκ ἂν ὑπῆρχε πολλοῖς τῶν * ἄλλων ζῴων· ἴσως δ' οὐδενὶ τῶν θνητῶν, ἐπεὶ οὐδὲ νῦν πᾶσι, διὰ τὸ μὴ πάντα χρόνου αἴσθησιν ἔχειν. ἀεὶ γὰρ ὅταν ἐνεργῇ τῇ μνήμῃ, καθάπερ καὶ πρότερον εἴπομεν, ὅτι εἶδε τοῦτο, ἢ ἤκουσεν, ἢ ἔμαθε, προσαισθάνεται ὅτι πρότερον· τὸ δὲ πρότερον καὶ ὕστερον, ἐν χρόνῳ ἐστί. τίνος μὲν οὖν τῶν τῆς ψυχῆς ἐστιν ἡ μνήμη, φανερὸν, ὅτι οὗπερ καὶ ἡ φαντασία· καὶ ἔστι μνη-

E μονευτὰ καθ' αὑτὰ μὲν, * ὧν ἐστι φαντασία, κατὰ συμβεβηκὸς δὲ, ὅσα μὴ ἄνευ φαντασίας. ἀπορήσειε δ' ἄν τις, πῶς ποτε τοῦ μὲν πάθους παρόντος, τοῦ δὲ πράγματος ἀπόντος, * μνημονεύεται τὸ μὴ παρόν. δῆλον γὰρ ὅτι δεῖ νοῆσαι τοιοῦτον τὸ γινόμενον διὰ τῆς αἰσθήσεως ἐν τῇ ψυχῇ,

καὶ τῷ μορίῳ τοῦ σώματος τῷ ἔχοντι αὐτήν, οἷον ζωγράφημά τι τὸ πάθος, οὗ φαμεν τὴν ἕξιν εἶναι μνήμην· ἡ γὰρ γινομένη κίνησις ἐνσημαίνεται, οἷον τύπον τινὰ τοῦ αἰσθήματος, καθάπερ οἱ σφραγιζόμενοι τοῖς δακτυλίοις. διὸ καὶ τοῖς ἐν κινήσει πολλῇ διὰ πάθος ἢ δι' ἡλικίαν οὖσιν οὐ γίνεται μνήμη, καθάπερ ἂν εἰς ὕδωρ ῥέον ἐμπιπτούσης τῆς κινήσεως καὶ τῆς σφραγῖδος· τοῖς δὲ διὰ τὸ ψήχεσθαι, καθάπερ τὰ παλαιὰ τῶν οἰκοδομημάτων, καὶ διὰ σκληρότητα τοῦ δεχομένου τὸ πάθος, οὐκ ἐγγίνεται ὁ τύπος. διόπερ οἵ τε σφόδρα νέοι καὶ οἱ γέροντες ἀμνήμονές εἰσι· ῥέουσι γὰρ οἱ μὲν διὰ τὴν αὔξησιν, οἱ δὲ διὰ τὴν φθίσιν. ὁμοίως δὲ καὶ οἱ λίαν ταχεῖς καὶ οἱ λίαν βραδεῖς· οὐδέτεροι γὰρ φαίνονται μνήμονες· οἱ μὲν γάρ εἰσιν ὑγρότεροι τοῦ δέοντος, οἱ δὲ σκληρότεροι· τοῖς μὲν οὖν οὐ μένει τὸ φάντασμα ἐν τῇ ψυχῇ, τῶν δ' οὐχ ἅπτεται. ἀλλ' εἰ δή ἐστι τοιοῦτον τὸ συμβαῖνον περὶ τὴν μνήμην, πότερον τούτου μνημονεύει τοῦ πάθους, ἢ ἐκείνου ἀφ' οὗ ἐγένετο; εἰ μὲν γὰρ τούτου, τῶν ἀπόντων οὐδὲν ἂν μνημονεύοιμεν· εἰ δ' ἐκείνου, πῶς αἰσθανόμενοι τούτου μνημονεύομεν οὗ μὴ αἰσθανόμεθα, τὸ ἀπόν; εἴτ' ἐστὶν ὅμοιον ὥσπερ τύπος ἢ γραφὴ ἐν ἡμῖν, τούτου αὐτοῦ ἡ αἴσθησις διὰ τί ἂν εἴη μνήμη ἑτέρου, ἀλλ' οὐκ αὐτοῦ τούτου; ὁ γὰρ ἐνεργῶν τῇ μνήμῃ θεωρεῖ τὸ πάθος τοῦτο καὶ αἰσθάνεται τούτου. πῶς οὖν τὸ μὴ παρὸν μνημονεύσει; εἴη γὰρ ἂν καὶ ὁρᾶν τὸ μὴ παρὸν καὶ ἀκούειν. ἢ ἔστιν ὡς ἐνδέχεται καὶ συμβαίνει τοῦτο; οἷον γὰρ τὸ ἐν πίνακι γεγραμμένον ζῷον καὶ ζῷόν ἐστι καὶ εἰκών, καὶ τὸ αὐτὸ καὶ ἓν τοῦτ' ἐστὶν ἄμφω, τὸ μέντοι εἶναι οὐ ταὐτὸν ἀμφοῖν, καὶ ἔστι θεωρεῖν καὶ ὡς ζῷον καὶ ὡς εἰκόνα· οὕτω καὶ τὸ ἐν ἡμῖν φάντασμα δεῖ ὑπολαβεῖν καὶ αὐτό τι καθ' αὑτὸ εἶναι θεώρημα, καὶ ἄλλου φάντασμα. ᾗ μὲν οὖν καθ' αὑτό, θεώρημα ἢ φάντασμά ἐστιν· ᾗ δ' ἄλλου, οἷον εἰκὼν καὶ μνημόνευμα. ὥστε καὶ ὅταν ἐνεργῇ ἡ κίνησις αὐτοῦ, ἂν μὲν ᾗ καθ' αὑτό ἐστι, ταύτῃ αἰσθάνηται ἡ ψυχὴ αὐτοῦ, οἷον νόημά τι ἢ φάντασμα φαίνεται ἐπελθεῖν· ἂν δ' ᾗ ἄλλου, καὶ ὥσπερ ἐν τῇ γραφῇ ὡς εἰκόνα θεωρεῖ, καὶ μὴ ἑωρακὼς τὸν Κορίσκον, ὡς Κορίσκου, ἐνταῦθά τε ἄλλο τὸ πάθος τῆς θεωρίας ταύτης, καὶ ὅταν ὡς ζῷον γεγραμμένον θεωρῇ, ἔν τε τῇ ψυχῇ τὸ μὲν γίνεται ὥσπερ νόημα μόνον, τὸ δ' ὡς ἐκεῖ ὅτι εἰκών, μνημόνευμα. καὶ διὰ τοῦτο ἐνίοτ' οὐκ ἴσμεν, ἐγγινομένων ἡμῖν ἐν τῇ ψυχῇ κινήσεων τοιούτων ἀπὸ τοῦ αἰσθέσθαι πρότερον, εἰ κατὰ τὸ ᾐσθῆσθαι συμβαίνει, καὶ εἰ ἔστι μνήμη ἢ οὔ, διστάζομεν· ὁτὲ δὲ συμβαίνει ἐννοῆσαι καὶ ἀναμνησθῆναι ὅτι ἠκούσαμέν τι πρότερον ἢ εἴδομεν. τοῦτο δὲ συμβαίνει ὅταν θεωρῶν ὡς αὐτὸ μεταβάλλῃ καὶ θεωρῇ ὡς ἄλλου. γίνεται δὲ καὶ τοὐναντίον, οἷον συνέβη Ἀντιφέροντι τῷ Ὠρείτῃ καὶ ἄλλοις ἐξισταμένοις· τὰ γὰρ φαντάσματα ἔλεγον ὡς γενόμενα, καὶ ὡς μνημονεύοντες. τοῦτο δὲ γίνεται ὅταν τις τὴν μὴ εἰκόνα ὡς εἰκόνα θεωρῇ. αἱ δὲ μελέται τὴν μνήμην σώζουσι τῷ ἐπαναμιμνήσκειν. τοῦτο δ' ἐστὶν οὐδὲν ἕτερον ἢ τὸ θεωρεῖν πολλάκις,

* γρ. [illegible]

* γρ. [illegible]

* γρ. [illegible]

* Suprà Meteo-rolog. l.3.c.4.

A aut certè in parte corporis eam habente [illegible] habitum memoriam eſſe dicimus. ſiquidem [motus] ille qui fit, quandam veluti figuram ſenſionis imprimit, haud ſecus atque qui anulis ſigillant. [illegible] circa & in hiſce quos pro affectione aliq[ua] te multiplex motus exercet, memoria non [fit], motus & ſigillum in amnem profluum [incidit]: aliis vero ne impreſſio quidem afformatur, [illegible] que, ob partis quæ affectionem excipere debet, rigorem (inolgeſcit enim veterum ædificiorum more) duritiemque. Proinde tam pueri quàm ſenes immemores ſunt: propterea quod alteri ob accretionem in quodam quaſi fluxu ſunt: alteri, ob decretionem. Pari quoque modo carere memoria [videntur],
B tum qui præceleres & impendio veloces ſunt, tum qui admodum tardi ſtupidique. nam illi quidem humidiores ſunt quàm par ſit, illi vero duriores. Primi ergo, viſorum impreſſionem [illegible] ac retinere non poſſunt: alteri, recipere. At ſi memoria ſtat, ſciendum ita ſit, vtrùm huiuſce affectionis meminimus, an illius vnde hæc profecta eſt. Nam ſi huius, nihil quod abſens ſit, meminiſſe poſſumus: ſi illius, qui fieri poteſt vt hanc ſentiendo, eius meminerimus, quod non ſentimus, quódque abſtractum remotumque à nobis eſt? Item ſi ex ipſius ſenſione quaſi quædam pictura ac impreſſio in nobis hæc fit, cur eam alterius, & non huius ipſius, memoriam [eſſe dicimus]? nam qui meminit, hanc affectionem
C ſpectat ſentitque. Quonam igitur pacto meminiſſe poteſt eius, quod præſens non ſit? hoc enim modo cernere etiam & audire abſentia liceret. An fieri poteſt, vt hoc ipſum contingat, eueniatque? Vt enim animal depictum in tabula, & animal eſt & imago, & cùm vnum idemque ſit, vtrunque eſt, ſed tamen eorum ratio diuerſa exiſtit, conſiderarique poteſt & vt animal eſt & vt imago: ſic & de phantaſmate quod in nobis eſt, cenſere oportet, & ipſum quippiam in ſe, & alterius ſimulachrum eſſe. nam quatenus in ſe ſeorſumque ſpectatur, ſpectrum aut viſum eſt: quatenus vero aliud refert, imago & monimentum. Quare etiam cùm idem animum
D vellicat ac laceſſit, ſi quis ipſum in ſe, & vt ſui quippiam generis eſt, animo percipiat, quædam veluti conceptio aut viſum ſuccurriſſe videtur. ſin vero quatenus alterius eſt, & vti in pictura accidit, tanquam ſimulachrum & imitationem contempletur, cuicunque tametſi anteà nunquam Coriſcum viderit, tanquam Coriſci imaginem conſideret: tum ſanè conſiderationis huiuſce conditio atque natura longè alia eſt quàm cùm tanquam animal depictum in animo ſpectat. hic enim mera conceptio euadit: illic quod ſimulachrum alterius ſit, monimentum. Et ob id cùm ſenſio quæ præceſſit, tales motus in animo noſtro excitat, plerunque neſci-
E mus ſenſione an alia ratione idipſum proueniat, & nonnunquam hæſitamus ſi ſit memoria necne. Interdum autem euenit, vt cogitando ſcrutandoque recordemur priùs à nobis quippiam auditum, aut viſum fuiſſe. Quod euenit, quoties qui phantaſma aliquod ita conſiderabat, vt nihil præterea niſi ipſum illud in ſe contemplaretur, mutata ſententia, vt ſimulachrum alterius eſt, ſpeculatur. Eſt quando & contrà accidat: quemadmodum Antipheronti Oreitæ cęteriſque qui exceſſu mentis tentabantur, contigit. nam quę imaginabantur, tanquam facta & geſta narrabant, & ita vt qui meminiſſent. Atque hoc fit, vbi quis id quod non eſt imago, ſpeculatur vt imaginẽ. Porrò meditationes recolendo memoriam cõſeruant, incolumémque reddunt. Recolere autẽ nihil aliud eſt, quàm crebrò phantaſmata,

vt imagines,non vt in ſe ſpectra ſunt, reſpicere. Dictum eſt igitur quid ſit memoria, quid meminiſſe: habitus ſcilicet phantaſmatis, vt imaginis eiuſce rei quæ imaginationi ſubditur. necnon cui earum quæ ſunt in nobis animæ partium tribui debeat: nempe illi, quæ ſibi primariam ſentiendi poteſtatem vendicat, quæque nobis ſenſum notitiámque temporis inuehit.

CAPVT II.

De reminiſcentia, & quid à memoria differat.

Reliquum eſt, vt de reminiſcentia ſiue recordatione dicamus. Primùm igitur quæ in aggreſſoriis ſermonibus vera ſunt, ea pro veris habeamus oportet: reminiſcentiam ſcilicet non eſſe reſumptionem memoriæ, neque item aſſumptioné. Nam cùm quis primùm diſcit, aut notitia rei imbuitur, neque reſumit memoriam vllam (nulla enim antegreſſa eſt) neque de integro aſſumit. quia tum demum memoria dicitur eſſe, cùm iam factus corroboratúſque fuerit habitus, aut certè affectus. Vnde fit vt memoria non ſimul cum affectu fiat. Item cùm primùm affectio facta eſt, in vltimo illo momento, affectio quidem & ſcientia (ſi tamen affectionem aut habitum ſcientiam appellare liceat) in re affecta iam ineſt, memoria verò haudquaquam. Nihil tamen vetat quominus quædam ex iis quæ ſcimus, per accidẽs meminiſſe dicamur. Quanquam meminiſſe per ſe non poſſumus, antequam ſpatium aliquod temporis interlapſum ſit. ſiquidem nunc eius rei memini, quam priùs audiui, aut vidi, aut aliquo ſenſu cognoui: & non quam nunc ſenſi, eius nunc memini. Præterea manifeſtũ eſt fieri vt qui nunc non reminiſcitur, meminerit, ſi denuo ſentiat, aut doceatur quod ſit oblitus. at quoties quam priùs tenebat ſcientiam, aut ſenſum, aut denique quoduis aliud, cuius habitum eſſe memoriam diximus, iam penè interlitum obſoletúmque recolendo inſtaurat, & quaſi poſtliminio reuerſum tractat verſátque: tum & hoc quoque alicuius eorum quæ dicta ſunt reminiſci eſt. accidit tamen vt reminiſcentiam memoria, & reminiſci meminiſſe comitetur. Neque continuò fit vt ſimpliciter illa, ſcientiam dico, ſenſum, & ſi quid eſt eiuſmodi, ſi priùs in animo fuerint, rurſus in mentem redire & inſtaurari debeant: ſed contrà, quandoque reſtituuntur animo, quandoque ab eodem perpetuò exulant. nam & vt iterum diſcat, & iterum inueniat idem eandem ſcientiam, vulgò contingere ſolet. Reminiſcentiam igitur, ab inuentione & diſciplina differre oportet: & qui reminiſcitur, maius principiũ intus habere, quàm qui diſcit aut inuenit. Fit autem reminiſcentia, cùm motus animæ ita ſe habent, vt alter ſubinde poſt alterum fieri natus ſit. nam ſi neceſſariò vnus alterum conſequio trahat, palam eſt, ſimul atque ille mouerit eam, hunc moturum. ſi verò non neceſſariò, ſed ex conſuetudine alter inſequatur, maiori ex parte mouebit. Contingitque, vt quidam ſemel permoti magis aſſueſcant, quàm alij ſæpius. Et idcirco quorundam quæ ſemel viderimus, faciliùs quàm aliorũ quæ ſæpiuſculè, meminiſſe ſolemus. Cùm ergo reminiſcimur, quibuſdam antegreſſis motibus mouemur, quouſque eo moueamur, poſt quem ille ſequi conſueuit. Quocirca & ex hoc nunc, aut alio quodam initio ſeriem ſequelámque venamur: & à ſimili, aut contrario, aut finitimo. Et ob id recordatio fieri aſſolet. motus enim quorundam ex his iidem ſunt, quorundam ſimul fiunt, quorundam alter alterius partem obtinent, connexique ſunt adeò, vt reliqua pars quæ illam ſequatur, exigua ſit. Ad hunc igitur modum inueſtigare ſolemus. Sed & interim nobis non ita inquirentibus reminiſci accidit, cùm recordatio motum alterum continuò excipit, ſubſequitúrque.

ὡς εἰκόνα, καὶ μὴ ὡς καθ' αὑτό. τί μὲν οὖν ἐστι μνήμη καὶ τὸ μνημονεύειν, εἴρηται, ὅτι φαντάσματος, ὡς εἰκόνος οὗ φάντασμα, ἕξις· καὶ τίνος μορίου τῶν ἐν ἡμῖν, ὅτι τοῦ πρώτου αἰσθητικοῦ, καὶ ᾧ χρόνου αἰσθανόμεθα.

ΚΕΦΑΛ. β'.

Περὶ ἀναμνήσεως.

Περὶ δὲ τοῦ ἀναμιμνήσκεσθαι, λοιπὸν εἰπεῖν. πρῶτον μὲν οὖν ὅσα ἐν τοῖς ἐπιχειρηματικοῖς λόγοις ἐστὶν ἀληθῆ, δεῖ τιθέναι ὡς ὑπάρχοντα· οὔτε γὰρ μνήμης ἐστὶν ἀνάληψις ἡ ἀνάμνησις, οὔτε λῆψις· ὅταν γὰρ τὸ πρῶτον ἢ μάθῃ, ἢ πάθῃ, οὔτε ἀναλαμβάνει μνήμην οὐδεμίαν· οὐδεμία γὰρ προγέγονεν, οὔτ' ἐξ ἀρχῆς λαμβάνει. ὅταν δὲ γένηται * ἡ ἕξις, ἢ τὸ πάθος· τότε γὰρ μνήμη ἐστίν· ὥστε μετὰ τοῦ πάθους ἐγγινομένου, οὐκ ἐγγίνεται. ἔτι δ', ὅτε τὸ πρῶτον ἐγγέγονε ἐν τῷ ἀτόμῳ καὶ ἐσχάτῳ, τὸ μὲν πάθος ἐνυπάρχει ἤδη τῷ παθόντι, καὶ ἡ ἐπιστήμη, εἰ δεῖ καλεῖν ἐπιστήμην τὴν ἕξιν, ἢ τὸ πάθος. οὐθὲν δὲ κωλύει κατὰ συμβεβηκὸς καὶ μνημονεύειν ἔνια ὧν ἐπιστάμεθα. τὸ δὲ μνημονεύειν καθ' αὑτὸ οὐχ ὑπάρχει πρὶν χρονισθῆναι. μνημονεύει γὰρ νῦν, ὃ εἶδεν, ἢ ἔπαθε πρότερον, οὐχ ὃ νῦν ἔπαθε, νῦν μνημονεύει. ἔτι δὲ φανερὸν ὅτι μνημονεύειν ἐστὶ μὴ νῦν ἀναμνησθέντα, ἀλλ' ἐξ ἀρχῆς * αἰσθανόμενον, ἢ παθόντα· ἀλλ' ὅταν ἀναλαμβάνῃ ἣν πρότερον εἶχεν ἐπιστήμην ἢ αἴσθησιν, ἢ οὗ ποτε τὴν ἕξιν ἐλέγομεν μνήμην, τοῦτ' ἐστὶ, καὶ τότε τὸ ἀναμιμνήσκεσθαί ἐστι τῶν εἰρημένων τι. * τὸ δὲ μνημονεύειν συμβαίνει, καὶ μνήμην ἀκολουθεῖ. οὐδὲ δὴ ταῦτα ἁπλῶς, ἐὰν ἔμπροσθεν ὑπάρξαντα, πάλιν ἐγγίνεται· ἀλλ' ἔστιν ὡς, ἔστι δ' ὡς οὔ· δὶς γὰρ μαθεῖν καὶ εὑρεῖν ἐνδέχεται τὸν αὐτὸν τὸ αὐτό. δεῖ οὖν διαφέρειν τὸ ἀναμιμνήσκεσθαι τούτων, καὶ ἐνούσης πλείονος ἀρχῆς, ἢ ἐξ ἧς μανθάνουσιν ἀναμιμνήσκεσθαι. συμβαίνουσι δ' αἱ ἀναμνήσεις, ἐπειδὴ πέφυκεν ἡ κίνησις ἥδε γενέσθαι μετὰ τήνδε· εἰ μὲν ἐξ ἀνάγκης, δῆλον ὡς ὅταν ἐκείνη κινηθῇ, τήνδε κινηθήσεται· εἰ δὲ μὴ ἐξ ἀνάγκης, ἀλλ' ἔθει, ὡς ἐπὶ τὸ πολὺ κινηθήσεται. συμβαίνει δ' ἐνίοις ἅπαξ ἐθισθῆναι μᾶλλον, ἢ * ἄλλους πολλάκις κινουμένους. διὸ ἔνια ἰδόντες ἅπαξ μᾶλλον μνημονεύομεν, ἢ ἕτερα πολλάκις. ὅταν οὖν ἀναμιμνησκώμεθα, κινούμεθα τῶν προτέρων τινὰ κινήσεων, ἕως ἂν κινηθῶμεν, μεθ' ἣν ἐκείνη εἴωθε. διὸ καὶ τὸ ἐφεξῆς θηρεύομεν νοήσαντες ἀπὸ τοῦ νῦν, ἢ ἄλλου τινὸς, καὶ ἀφ' ὁμοίου, ἢ ἐναντίου, ἢ τοῦ σύνεγγυς. διὰ τοῦτο γίνεται ἡ ἀνάμνησις· αἱ γὰρ κινήσεις τούτων, τῶν μὲν αἱ αὐταὶ, τῶν δ' ἅμα, τῶν δὲ μέρος ἔχουσιν· ὥστε τὸ λοιπὸν μικρὸν ὃ ἐκινήθη μετ' ἐκεῖνο. ζητοῦσι μὲν οὖν οὕτω, καὶ μὴ ζητοῦντες δ' οὕτως * ἀναμιμνήσκονται, ὅταν μεθ' ἑτέραν κίνησιν ἐκείνη γένηται.

* γ. ἡ ἕξις.
* γ. αἰσθόμενον
* γ. τῷ δὲ μ. ἢ μ. ἀκολουθεῖν
* γρ. [illegible]
* γ. ἀναμιμνήσκεσθαι.

ὡς δὲ τὰ πολλά, ἑτέρων γινομένων κινήσεων οἵων εἴπομεν, ἐγένετο ἐκείνη. οὐδὲν δὲ δεῖ σκοπεῖν τὰ πόρρω, πῶς μεμνήμεθα, ἀλλὰ τὰ σύνεγγυς· δῆλον γὰρ ὡς ὁ αὐτός ἐστι* ζήτησις πως· λέγω δέ πως τὸ ἐφεξῆς, οὐ προζητήσας, οὐδ' ἀναμνησθείς· τῷ γὰρ ἔθει ἀκολουθοῦσιν αἱ κινήσεις ἀλλήλαις, ἥδε μετὰ τήνδε. καὶ ὅταν τοίνυν ἀναμιμνήσκεσθαι βούληται, τοῦτο ποιήσει· ζητήσει λαβεῖν ἀρχὴν κινήσεως, μεθ' ἣν ἐκείνη ἔσται. διὸ τάχιστα καὶ κάλλιστα γίνονται ἀπ' ἀρχῆς αἱ ἀναμνήσεις· ὡς γὰρ ἔχει τὰ πράγματα πρὸς ἄλληλα τῷ ἐφεξῆς, οὕτω καὶ αἱ κινήσεις. καὶ ἔστιν εὐμνημόνευτα, ὅσα τάξιν τινὰ ἔχει, ὥσπερ τὰ μαθήματα· τὰ δέ, φαύλως καὶ χαλεπῶς. καὶ τούτῳ διαφέρει τὸ ἀναμιμνήσκεσθαι τοῦ πάλιν μανθάνειν, ὅτι δυνήσεταί πως δι' αὑτοῦ κινηθῆναι ἐπὶ τὸ μετὰ τὴν ἀρχήν. ὅταν δὲ μή, ἀλλὰ δι' ἄλλου, οὐκ ἔτι μέμνηται· πολλάκις δ' ἤδη μὲν ἀδυνατεῖ ἀναμνησθῆναι.* ζητεῖν δὲ δύναται, καὶ εὑρίσκει. τοῦτο δὲ γίνεται κινοῦντι πολλά, ἕως ἂν τοιαύτην κινήσῃ κίνησιν, ᾗ ἀκολουθήσει τὸ πρᾶγμα. τὸ γὰρ μεμνῆσθαί ἐστι τὸ ἐνεῖναι δύναμιν τὴν κινοῦσαν. τοῦτο δέ, ὥστε ἐξ αὑτοῦ, καὶ ὧν ἔχει κινήσεων κινηθῆναι, ὥσπερ εἴρηται. δεῖ δὲ λαβέσθαι ἀρχῆς. διὸ ἀπὸ τόπων δοκοῦσιν ἀναμιμνήσκεσθαι ἐνίοτε. τὸ δ' αἴτιον, ὅτι ταχὺ ἀπ' ἄλλου ἐπ' ἄλλο ἔρχονται· οἷον ἀπὸ γάλακτος ἐπὶ λευκόν, ἀπὸ λευκοῦ δὲ ἐπ' ἀέρα, καὶ ἀπὸ τούτου ἐφ' ὑγρόν· ἀφ' οὗ ἐμνήσθη μετοπώρου, ταύτην ἐπιζητῶν τὴν ὥραν. ἔοικε δὲ τὸ καθόλου, ἀρχὴ καὶ τὸ μέσον πάντων· εἰ γὰρ μὴ πρότερον, ὅταν ἐπὶ τοῦτ' ἔλθῃ, μνησθήσεται, ἢ οὐκ ἔτι, οὐδὲ ἄλλοθεν, οἷον εἴ τις νοήσειεν, ἐφ' ὧν, α β γ δ ε ζ η θ. εἰ γὰρ* μὴ ἐπὶ τὸ ε μέμνηται, ἐπὶ τοῦ θ ἐμνήσθη· ἐντεῦθεν γὰρ ἐπ' ἄμφω κινηθῆναι ἐνδέχεται, καὶ ἐπὶ τὸ δ, καὶ ἐπὶ τὸ ε. εἰ δὲ μὴ τούτων τι ἐπιζητεῖ, ἐπὶ τὸ γ ἐλθὼν μνησθήσεται, εἰ τὸ η, ἢ τὸ ζ ἐπιζητεῖ. εἰ δὲ μή, ἐπὶ τὸ α. καὶ οὕτως ἀεί. τοῦ δ' ἀπὸ τοῦ αὐτοῦ ἐνίοτε μὲν μνησθῆναι, ἐνίοτε δὲ μή, αἴτιον, ὅτι ἐπὶ πλείω ἐνδέχεται κινηθῆναι ἀπὸ τῆς αὐτῆς ἀρχῆς· οἷον ἀπὸ τοῦ γ ἐπὶ τὸ ζ, ἢ τὸ δ. ἐὰν οὖν μὴ διὰ παλαιοῦ κινῆται, ἐπὶ τὸ συνηθέστερον κινεῖται· ὥσπερ γὰρ φύσις ἤδη τὸ ἔθος. διὸ ἃ πολλάκις ἐννοοῦμεθα, ταχὺ ἀναμιμνησκόμεθα· ὥσπερ γὰρ φύσει τόδε μετὰ τόδε ἐστίν, οὕτω καὶ ἐνεργείᾳ. τὸ δὲ πολλάκις φύσιν ποιεῖ. ἐπεὶ δ' ὥσπερ γὰρ ἐν τοῖς φύσει, καὶ παρὰ φύσιν, καὶ ἀπὸ τύχης, ἔτι μᾶλλον ἐν τοῖς δι' ἔθος, οἷς ἡ φύσις μὴ ὁμοίως ὑπάρχει· ὥστε κινηθῆναι ἐνίοτε κἀκεῖ καὶ ἄλλως· ἄλλως τε καὶ ὅταν ἀφέλκῃ ἐκεῖθεν, αὐτόσε πη. καὶ διὰ τοῦτο ὅταν δέῃ ὄνομα μνημονεῦσαι, παρόμοιον μέν, εἰς δ' ἐκεῖνο σολοικίζομεν. τὸ μὲν οὖν ἀναμιμνήσκεσθαι, τοῦτον συμβαίνει τὸν τρόπον. τὸ δὲ μέγιστον, γνωρίζειν δεῖ τὸν χρόνον, ἢ μέτρῳ, ἢ ἀορίστως. ἔστι δέ τι ᾧ κρίνει τὸν πλείω καὶ τὸν ἐλάττω·

* γ. ἔστιν, πῶς λέγω τὸ ἐφ.

* γ. ζητεῖν

* γ. μὴ ἐπὶ τοῦ θ ε μέ.

A Cæterum illa ferè fit, antegreſſis aliis motibus quos dixi. Nec id ſpectandum eſt, quomodo quæ remota ſunt, meminimus: & quomodo quæ propinqua, negligendum. quandoquidem vnum eundemque modum eſſe, liquidò conſtat. dico autem eum, quo quis ea quæ in ſeriem digeſta ſunt, nulla antecedente inquiſitione recordationeve recenſet. conſequuntur enim ſeſe quadam conſuetudine, motus. Quoties itaque reminiſci volet, id faciet: ac motus initium capere ſtudebit, quem hic, id eſt, reminiſcentia, ſequitur. Quamobrem omnis reminiſcentia ex principio pulcherrimè ac ſumma celeritate corriuatur. nam quo res inter ſe ordine diſpoſitæ ſunt, eum quoque motus earundem obtinent. B Et ea item facilè memoria continentur, quæ quodam ordine conſtant, vt Mathematica. at quæ prauè diſpoſita ſunt, ægrè cuſtodiuntur. Atque hoc intereſt inter reminiſci, & iterum diſcere: quòd qui reminiſcitur, ab ipſo ſe moueri quodammodo poteſt, ad id quod poſt principium eſt. at cùm per ſe non poteſt, ſed alterius ceu præceptoris auxilium deſiderat, non ampliùs meminiſſe videtur. Sæpe verò iam quidem reminiſci non poteſt, quærendo tamen poteſt, ac inuenit. Quod homini contingere ſolet, dum tantiſper varia mouet, quoad in motionem eam inciderit, poſt quam res ſequatur. Eſt enim meminiſſe, mouentem quandam facultatem intus poſſidere. ſed tamen eiuſmo- C di, vt animus ex ſeipſo, & motibus quos habet, moueri queat, vt dictum eſt. ac principium quidem ſumi debet. Quocirca nonnunquam videtur ex locorum diſpoſitione reminiſci. cauſa autē eſt, quòd citò ex alio in aliud veniat: vt ex lacte in candorem, ex candore in aërem, ex aëre in humorem, ex humore in autumni memoriam, cùm hanc partem anni ſatagit inuenire. Videtur autem vniuerſaliter in omni genere, quod medium eſt, vicem principij obtinere. Nam ſi non priùs, ſaltem cùm ad id quod in meditullio eſt, peruenerit, res veſtigata ſuccurret, aut nunquam prætere, nec aliunde. verbi gratia, aſcribantur literæ ſeptem a c d e D f g h, per quas mentis cogitatio itura ſit. Si enim non continuò vbi ventum eſt ad e, meminit; ſimulatque ad h appulerit, meminiſſe dicetur. nam ab e, in vtranque partem, & in d & in f diſcurrere poteſt. Quòd ſi ex his nullam diſquirat, in c profecta meminerit, ſi d aut e veſtiget: quemadmodum in g profecta meminerit, ſi g aut f perquirat. ſin minùs, in a; & ita ordine perpetuò. Cur autem ab eodem principio interim meminiſſe queat, interim nō queat, cauſa eſt, quòd ex eodem principio in multas parteis ire contingat: veluti ex e in f, aut in d. Si igitur non per vetera ſimulachra diſcurrat, ad id rapi ſolet, quod ſibi familiarius propter conſuetudinem reddidit. iam enim E conſuetudo ipſa in quandam naturam commigrauit. Quapropter quæ frequenter cogitamus, citò reminiſcimur. nam vt natura vnum alterum ſequitur, ita & operatione. quinimo frequens multúſque vſus naturam facit. Quoniam autem ſicut in naturalibus errata quædam naturæ & fortuita euenire ſolent, adhuc magis in conſuetis, quibus natura non perinde ineſt, peccata quædam intercidunt: hinc ſanè fit vt nonnunquam animus huc illuc impellatur, præſertim cùm à certo quodam initio auſpicatus, quóuis alio deuius fertur. Propterea contingere ſolet vt cùm alicuius nominis meminiſſe volumus, in alterum conſimile, non in illud, quaſi ſolœciſmum committentes, incidamus. Ad hunc igitur modum reminiſci accidit. Sed enim notitia temporis, ſiue illud certum conſtitutúmque habeatur, ſiue incertum & infinitum, quàm maximè neceſſaria exiſtit. Eſt autem aliquid, quod de pluri minorique tempore iudicamus.

conſentaneúmque eſt, vt quippiam in nobis ſit, quod ſicut magnitudines, ita & tempus internoſcat. Porro magnitudines ampliſſimas, & quæ à nobis procul abſunt, intelligere ſolet, non quòd intelligentia ipſa (Græci dianœan vocant) procedat foras, atque ad eas ſeſe applicet, quemadmodum quidam de viſu dixerunt (nam etiamſi non ſint, ex æquo tamen intelliget) ſed per motum qui proportione quadam illis reſpondeat. habet enim in ſe motus effigieſque, rebus quas intelligit, perſimiles. Quo igitur differat, cùm maiores intelligit? An quod & minores intelligat? quæcunque enim ambiuntur, interioráque ſunt, minora ſunt: & eis, quæ continent & extima ſunt, proportione quadam reſpondent. Atque fortaſſe qualis proportio inter ſimulachra ipſa, ſed adiuncto tempore, capi poteſt: talis & in ipſis quoque interuallis diſtātiiſq; reperiatur. Nā qui lineas a b & b e confecit, lineas a c & c d confeciſſe videtur: quando hæ cum illis proportionis nexu iūctæ ſunt. Sed cur potiùs lineas a c d, quàm lineas a f & f g? An ſicut refertur linea a c ad a b, ita linea κ h ad lineā κ m? Qui ergo lineam k m tranſegit, ſimul lineam k h tranſegerit oportet. Si verò intellexiſſe velit lineas a f & f g, lineas quidem a b & b e, ſimiliter intelligit: at è regione lineæ k m, lineam k l. Nam hæc ad illam ita ſeſe habet, vt lineam f a ad lineam b a ſe habere videmus. Quando igitur negotium & tempus ſimul animum inuadunt excitántque, tum meminiſſe ſolet. quòd ſi ſe coniungere vtrunque putet, non tamen coniungat, ſe meminiſſe autumat. nihil enim obſtat quin fallatur aliquis, & ſe meminiſſe, cum non meminit, putet. quanquam fieri non poteſt vt qui meminit, ſe meminiſſe non aduertat, ſed id eum lateat. nam meminiſſe, idipſum eſt. At ſi negotium abſque tempore, aut contra tempus abſque negotio iacentem animum extimularit, haudquaquam meminit. Cæterum tempus illud duplex eſt. nam interdum quis certum tempus non adhibet, vt cum ſe feciſſe non pridie, ſed aliquando meminit: interdum etiam adhibet. Verum meminiſſe dicitur, etiamſi certum tempus minimè adhibeat. nam vulgo dici ſolet, equidem memini factum, ſed quando non memini, cum de tempore facti non conſtat. Quibus præcipua ineſt memoria, non eiſdem & reminiſcentiam ineſſe eximiam, diximus ſuprà.

Diſtat verò memoria à reminiſcentia, non ſolum ratione temporis, ſed in eo quoque, quòd & complures aliæ animantes memoria participant: reminiſcentia nulli ex omnium animalium numero, quorum natura comperta exploratáque habeatur, præterquam homini conceſſa ſit. Cauſa cur ita, eſt, quòd reminiſcentia velvti ſyllogiſmus quidam, id eſt, ratiocinatio, exiſtit. nam qui reminiſcitur, quod prius audierit, viderit, aut quippiam id genus fecerit, ratiocinari aſſolet. Item quaſi diſquiſitio quædam. diſquiſitionem verò iis ſolis natura tribuit, quibus conſultandi deliberandíque ratio competit. etenim conſultatio ſiue deliberatio, ratiocinatio quædam eſt. Porro affectionem ipſam corporalem eſſe: & reminiſcentiam diſquiſitionem in tali viſo, indicium eſt, quod nonnulli obturbari ſolent, & cum reminiſci non poſſunt, & cum cogitationem reprimunt, conantúrque non vltra reminiſci, & potiſſimum quos atra bilis exercet. hos enim maximè phantaſmata mouent. Cauſa vero, cur reminiſcentia in poteſtate eorum non ſit, eſt: quod ſicut qui iaculatur emiſſum telum, non vltrà ſiſtere poteſt: ita qui reminiſci & veſtigare aliquid contendit, neſcio quid corporeum mouet, cui affectio hæc conſignatur. Maximè autem adagitari ſolent, quibus humoris copia circa ſenſoriam ſedem redundat:

A ἄλογον δέ, ὥσπερ τὰ μεγέθη· νοεῖ γὰρ τὰ μεγάλα καὶ πόῤῥω, οὐ τῷ ἀποτείνειν ἐκεῖ τὴν διάνοιαν, ὥσπερ τὴν ὄψιν φασί τινες· καὶ γὰρ μὴ ὄντων ὁμοίως νοήσει· ἀλλὰ τῇ ἀνάλογον κινήσει. ἔστι γὰρ ἐν αὐτῇ τὰ ὅμοια σχήματα καὶ αἱ κινήσεις. Τίνι οὖν διοίσει, ὅταν τὰ μείζω νοῇ· ἢ ὅτι ἐκεῖνα νοεῖ, ἢ τὰ ἐλάττω; πάντα γὰρ τὰ ἐντὸς ἐλάττω, ὥσπερ ἀνάλογον καὶ τὰ ἐκτός. ἔστι δ' ἴσως ὥσπερ καὶ τοῖς εἴδεσιν ἀνάλογον λαβεῖν, ἀλλ' ἐν αὐτῷ, οὕτω καὶ τοῖς ἀποστήμασιν. ὥσπερ οὖν εἰ τὴν α β, β ε κινεῖται, ποιεῖ* τὴν γ δ· ἀνάλογον γὰρ ἡ α γ, καὶ ἡ γ δ. τί οὖν μᾶλλον τὴν γ δ, ἢ τὴν ζ η ποιεῖ; ἢ ὡς ἡ α γ πρὸς τὴν α β ἔχει, οὕτως ἡ θ ι* πρὸς τὴν μ ἔχει. ταύτας οὖν ἅμα καὶ κινεῖται. B ἂν δὲ τὴν ζ η βούληται νοῆσαι, τὴν μὲν β ε, ὁμοίως νοεῖ. ἀντὶ δὲ τῆς θ ι, τὰς κ λ νοεῖ· αὗται γὰρ ἔχουσιν, ὡς ζ α, πρὸς β α. ὅταν οὖν ἅμα ἥ τε τοῦ πράγματος γίνηται κίνησις, καὶ ἡ τοῦ χρόνου, τότε τῇ μνήμῃ ἐνεργεῖ. ἂν δ' οἴηται μὴ ποιῶν, οἴεται μνημονεύειν· οὐδὲν γὰρ κωλύει διαψευσθῆναί τινα, καὶ δοκεῖν μνημονεύειν μὴ μνημονεύοντα· ἐνεργοῦντα δὲ τῇ μνήμῃ, μὴ οἴεσθαι, ἀλλὰ λανθάνειν μεμνημένον, οὐκ ἔστι· τοῦτο γὰρ ἦν αὐτὸ τὸ μεμνῆσθαι. ἀλλ' ἐὰν ἡ τοῦ πράγματος γίνηται χωρὶς τῆς τοῦ χρόνου, ἢ αὕτη ἐκείνης, οὐ μέμνηται. ἡ δὲ τοῦ χρόνου διττή ἐστιν· ὁτὲ μὲν γὰρ μέτρῳ οὐ μέμνηται* αὐτό, οἷον ὅτι τρίτην ἡμέραν· ὅτι μὲν τοι ποτὲ ἐποίησεν· ὁτὲ δὲ καὶ μέτρῳ· ἀλλὰ μέμνη- C ται καὶ ἐὰν μὴ μέτρῳ. εἰώθασι δὲ λέγειν, ὅτι μέμνηνται μέν, πότε δὲ οὐκ ἴσασιν, ὅταν μὴ γνωρίζωσι τοῦτο, πότε τὸ ποσὸν μέτρῳ. ὅτι μὲν οὖν οὐχ οἱ αὐτοὶ μνημονικοὶ καὶ ἀναμνηστικοί, ἐν τοῖς πρότερον εἴρηται.

Διαφέρει δὲ τὸ μνημονεύειν τοῦ ἀναμιμνήσκεσθαι, οὐ μόνον κατὰ τὸν χρόνον, ἀλλ' ὅτι τοῦ μὲν μνημονεύειν καὶ τῶν ἄλλων ζώων μετέχει πολλά· τοῦ δ' ἀναμιμνήσκεσθαι, οὐδέν, ὡς εἰπεῖν, τῶν* γνωριζομένων ζώων, πλὴν ἄνθρωπος. αἴτιον δ', ὅτι τὸ ἀναμιμνήσκεσθαί ἐστιν οἷον συλλογισμός τις· ὅτι γὰρ πρότερον εἶδεν, ἢ ἤκουσεν, ἤ τι τοιοῦτον ἔπαθε, συλλογίζεται ὁ ἀναμιμνησκόμενος, καὶ ἔστιν οἷον ζήτησίς τις. τοῦτο δ' οἷς καὶ τὸ βουλευτικὸν ὑπάρχει, φύσει D μόνοις συμβέβηκε· καὶ γὰρ τὸ βουλεύεσθαι, συλλογισμός τίς ἐστιν. ὅτι δὲ σωματικόν τι τὸ πάθος, καὶ ἡ ἀνάμνησις ζήτησις ἐν τοιούτῳ φαντάσματι, σημεῖον τὸ παρενοχλεῖν ἐνίους· ἐπεὶ δ' ἂν μὴ δύνωνται ἀναμνησθῆναι, καὶ πάνυ ἐπέχοντας τὴν διάνοιαν, κἂν οὐκ ἔτι ἐπιχειροῦντας ἀναμιμνήσκεσθαι, οὐδὲν ἧττον, καὶ μάλιστα τοὺς μελαγχολικούς· τούτους γὰρ φαντάσματα κινεῖ μάλιστα. αἴτιον δὲ τοῦ μὴ ἐπ' αὐτοῖς εἶναι τὸ ἀναμιμνήσκεσθαι, ὅτι καθάπερ τοῖς βάλλουσιν* οὐκ ἔτι ἐπ' αὐτοῖς τὸ στῆσαι, οὕτω καὶ ὁ ἀναμιμνησκόμενος καὶ θηρεύων, σωματικόν E τι κινεῖ, ἐν ᾧ τὸ πάθος. μάλιστα δ' ἐνοχλοῦνται, οἷς ἂν ὑγρότης τύχῃ ὑπάρχουσα περὶ τὸν αἰσθητικὸν τόπον.

* γρ. τὴν α δ.

* γρ. πρὸς ἡ μ.

* γρ. αὐτοῦ, apud Themiſt. eſt, ἢ μέμνηται αὐτό.

* γρ. γνωρίμων

* γρ. ἐκεῖ

* γρ. ἐπανέλθῃ

* γρ. ὅταν κατασταθῶσιν,

οὐ γὰρ ῥᾳδίως παύεται κινηθεῖσα, ἕως ἂν * ἐπέλθῃ τὸ ζητούμενον, καὶ εὐθυπορήσῃ ἡ κίνησις. διὸ καὶ ὀργαὶ καὶ φόβοι, * ὅταν τι κινήσωσιν. ἀντικινούντων πάλιν τούτων, οὐ καθίστανται, ἀλλ' ἐπὶ τὸ αὐτὸ ἀντικινοῦσι. καὶ ἔοικε τὸ πάθος τοῖς ὀνόμασι, καὶ μέλεσι, καὶ λόγοις, ὅταν διὰ στόματος αὐτῶν τι γένηται σφόδρα· παυσαμένοις γὰρ καὶ οὐ βουλομένοις, ἐπέρχεται πάλιν ᾄδειν ἢ λέγειν. εἰσὶ δὲ καὶ οἱ τὰ ἄνω μείζω ἔχοντες, καὶ οἱ νανώδεις, ἀμνημονέστεροι τῶν ἐναντίων, διὰ τὸ πολὺ βάρος ἔχειν ἐπὶ τῷ αἰσθητικῷ, καὶ μήτ' ἐξ ἀρχῆς τὰς κινήσεις δύνασθαι ἐμμένειν, ἀλλὰ διαλύεσθαι, μήτ' ἐν τῷ ἀναμιμνήσκεσθαι ῥᾳδίως εὐθυπορεῖν. οἱ δὲ πάμπαν νέοι καὶ λίαν γέροντες, ἀμνήμονες διὰ τὴν κίνησιν· οἱ μὲν γὰρ ἐν φθίσει, οἱ δ' ἐν αὐξήσει πολλῇ εἰσίν. ἔτι δὲ τά γε παιδία, καὶ νανώδη ἐστὶ μέχρι πόρρω τῆς ἡλικίας.

Περὶ μὲν οὖν μνήμης καὶ τοῦ μνημονεύειν, τίς ἡ φύσις αὐτῶν, καὶ τίνι τῶν τῆς ψυχῆς μνημονεύει τὰ ζῷα, καὶ περὶ τοῦ ἀναμιμνήσκεσθαι τί ἐστι, καὶ πῶς γίγνεται, καὶ διὰ τίνα αἰτίαν, εἴρηται.

A non enim facilè tranquillatur, motu ſemel inito, quovſque id quod quæritur, occurrat, & motio ipſa recto inceſſu procedens ad metam vſque perueniat. Quamobrem & metus & iræ, ſimul atque commotæ ſunt, ſedari quamlibet repugnantibus illis non poſſunt, ſed eodem contra nituntur. Atque perinde euenit atque iis qui paulò contentius validiúſque nomina aliquot orationémve recenſuere, aut cantionem aliquam emodulati ſunt. nam vbi ceſſarunt, iterum, etiam inuitis, canere ac loqui ſubit.

Cæterùm illi quibus ſuperiora proportione reliqui corporis ſunt vaſta, quique forma pumilionis B degenerant, minùs memoria valent, quàm qui contrario ſunt habitu, quòd ipſa ſentiendi vis pondere grauiore opprimatur: quódque nec initio inhærere ac deſiſtere formæ rerum poſſint, ſed diſſiliant, nec cùm reminiſci volunt, recto itinere ſequantur reddantúrque. Sanè impendio pueri, & admodum ſenes, immemores ſunt, propter motum quem ſuſtinent. nam hi valde minuuntur, illi verò magnum ſubeunt incrementum. adde etiam, quòd vſque ad ætatem prouectam, ſimiles nanis ſunt.

* Ergo quid ſit memoria, quid meminiſſe, qua facultate animalia meminerint. item quid reminiſcentia, quid reminiſci, quemadmodum fiat, & quam ob cauſam, dictum eſt.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΥΠΝΟΥ ΚΑΙ ΕΓΡΗΓΟΡΣΕΩΣ.

ARISTOTELIS STAGIRITÆ, DE SOMNO ET VIGILIA, LIBER.

Nicolao Leonico interprete.

ΚΕΦΑΛ. α'.

Ὑπόθεσις τῶν ἐφεξῆς λεκτέων· ὅτι τοῦ αὐτοῦ μέρους αἰσθητικοῦ ἥτε ἐγρήγορσις ὑπάρχει καὶ ὁ ὕπνος· καὶ ὅτι οὔτε ψυχῆς ἴδια, οὔτε τοῦ σώματος, κοινὰ δέ· καὶ ὅτι ἐν μέρει πᾶσι τοῖς ζῴοις ὑπάρχει, οὐδέτερον δ' ἀεί, οὐδ' οὐδέποτε. καὶ ὅτι φυτῶν οὐδέν.

C ΠΕΡΙ δὲ ὕπνου καὶ ἐγρηγόρσεως [ἐπισκεπτέον,] τίνα τε τυγχάνει ὄντα, καὶ πότερον ἴδια τῆς ψυχῆς, ἢ τοῦ σώματος, ἢ κοινά· κἂν ᾖ κοινά, τίνος D μορίου τῆς ψυχῆς, ἢ τοῦ σώματος· καὶ διὰ τίνα αἰτίαν ὑπάρχει τοῖς ζῴοις· καὶ πότερον ἅπαντα κεκοινώνηκεν αὐτῶν ἀμφοτέρων, ἢ τὰ μὲν, ὕπνου τὰ δὲ θατέρου μόνον· ἢ τὰ μὲν οὐδετέρου, τὰ δὲ ἀμφοτέρων. πρὸς δὲ τούτοις, τί ἐστι τὸ ἐνύπνιον, καὶ διὰ τίνα αἰτίαν καθεύδοντες, ὁτὲ μὲν ὀνειρώττουσιν, ὁτὲ δὲ οὔ·

CAPVT I.

De ſomno & vigilia quæ ſint quærenda ſummatim explicat: deinde ad rem aggrediens, pertinere ea ad eandem animalis partem docet: nec corpori nec animæ eſſe propria, ſed vtrique communia: omnibus animalibus commune eſſe, vt modo dormiant, modo vigilent, non aut ſemper aut nunquam. plantas nec dormire nec vigilare.

DE ſomno & vigilia hæc conſideremus oportet, primùm quòd ſint: & vtrùm animæ an corpori propria ſint, an vtriſque communia: &, ſi communia ſint, cui parti tam animæ quàm corporis credita: &, cur tributa animalibus ſint. & vtrùm vtrumque omnibus communicatum ſit: an alteris hoc, illud alteris ſolùm: an aliis neutrum, aliis vtrumque. tum etiam quid ſit inſomnium: & quamobrem dormientes modò ſomnient, modò non ſomnient:

aut ſomnient quidem ſemper ſed non meminerint.& hoc ſi fit,quam ob cauſam fiat.Item poſsintne futura præuideri, necne: & ſi poſſint, qua ratione præſentiri queant. & vtrùm ea ſolùm quæ agantur ab homine, an etiam quorum cauſa ſit Deus, & natura, fiant, temeritatéve aliqua. Ac primùm quidem illud conſtare arbitror; ad eandem animalis partem ſomnum & vigiliam pertinere: quandoquidem oppoſita inuicem ſunt, & ille vt priuatio quædam huius habetur. nam ſemper extrema tam in aliis quàm in hiſce quæ à natura dependent, in eodem recipi, & eiuſdem affectiones eſſe videntur: vt ſanitas & morbus, pulchritudo & fœditas, robur & imbecillitas, viſus & cæcitas, auditus & ſurditas. Item & ex iis quæ ſequuntur, palam fiet. nam quo vigilare aliquem cognoſcimus, eodem & dormire deprehendimus. qui enim ſentit, eundem vigilare cenſemus. Atque vigilantem omnem cognoſcimus, aut quia externum motum aliquem ſentiat, aut quia inteſtino aliquo feriatur. Si ergo vigilia ipſa in alio nullo quàm in ſentiendo conſiſtat, certum eſt, quæ vigilant ac dormiũt, eodem vigilare ac dormire, quo ſentiant. Cùm autem ſentire ipſum neque animæ neque corporis proprium ſit (nam ad idem actus & potentia pertinent. ſenſus autẽ actu, eſt motio quædam animæ, interuentu corporis proueniens) manifeſtum eſt affectionem hanc, dico ipſum vigilare, nec propriam animæ eſſe, neque item corporis, cùm corpus inanime ſentire non poſſit. Porro cùm de particulis animæ alibi iam retro definitum ſit, cúmque vegetatrix ſeiuncta à reliquis habeatur, reliquæ ſine hac ſubſiſtere non poſſint: clarum eſt, quæ augentur ſolùm & minuuntur, vt ſtirpes ac plantæ, ſomno & vigilia deſtitui ſolere, quòd ſenſu careant: ſiue ſeparabilis ille quidem ſit, ſiue non ſit. nã potentia, & ratione ſeparabilis eſt. Pari quoq; modo conſtat, nullum eſſe animal quod aut ſemper dormiat, aut ſemper vigilet, ſed vtrumque eidem tributum à natura eſſe. non enim ſi quod animal eſt ſenſu præditum, neque dormire id, neque vigilare contingit, quando vterque hic affectus circa ſenſum primi ſenſitiui accidere ſolet. Fieri autem non poteſt vt alter horum eidem ſemper inſit: verbi gratia, vt genus aliquod animalis aut ſemper dormiat, aut ſemper vigilet. Nam fieri nequit vt vllum ſemper vigilet. quando quæcumque munia aliquã naturæ obeunt, ſimul ac temporis modum exceſſerint, in quantum ſufficere operi poterant, laſſeſcant ſuccumbántque, & à muneribus quæque ſuis deſiſtant oportet: vt oculi, manus, & quicquid aliud functionem aliquam exercere ſolet. Itaque ſi quid ſentiendi officio fungatur, ſpatio exacto quo continenter gerere & adminiſtrare poteſt, fatiſcet, nec prætereà operari valebit. Cùm ergo vigilia exolutione ſenſus finiatur, & contrariorum ſi alterum adſit, alterum abeſſe oporteat: vigilia verò ſomno contraria ſit, ſitque neceſſarium cuilibet alterum ineſſe: ſequitur, vt ea dormire oporteat. Igitur ſi talis affectio ſomnus eſt, ſomnus verò impotentia, quam vigiliæ exceſſus committit; vigiliæ autem exceſſus interim ab ægritudine pendet, interim circa ægritudinem accidit: vnde fit, vt quemadmodum exolutio duplex eſt, ita & impotentia duplex haberi poſſit: neceſſarium eſt vt quicquid vigilat, dormire aliquãdo contingat, quia vt ſemper agat, fieri non poteſt. Conſimiliter fieri nequit, vt ſemper dormiat:

A ἢ συμβαίνει μὲν ἀεὶ καθεύδουσιν ἐνυπνιάζειν, ἀλλ' οὐ μνημονεύουσι· κἂν εἰ τοῦτο γίνεται, διὰ τίνα αἰτίαν γίνεται, καὶ πότερον ἐνδέχεται τὰ μέλλοντα προορᾷν, ἢ οὐκ ἐνδέχεται, καὶ τίνα τρόπον εἰ ἐνδέχεται· καὶ πότερον τὰ μέλλοντα ὑπ' * ἀνθρώπου [μόνον] προορᾶσθαι, ἢ καὶ ὧν τὸ δαιμόνιον ἔχει τὴν αἰτίαν καὶ φύσει γίνεται, ἢ ἀπὸ ταὐτομάτου. πρῶτον μὲν οὖν τοῦτό γε φανερόν, ὅτι ἐν τῷ αὐτῷ τοῦ ζώου ἥ τε ἐγρήγορσις ὑπάρχει καὶ ὁ ὕπνος· ἀντίκειται γάρ, καὶ φαίνεται στέρησίς τις ὁ ὕπνος τῆς ἐγρηγόρσεως· ἀεὶ γὰρ τὰ ἐναντία καὶ ἐπὶ τῶν ἄλλων, καὶ ἐν τοῖς φυσικοῖς, ἐν τῷ αὐτῷ δεκτικῷ φαίνεται γινόμενα, καὶ τοῦ αὐτοῦ
B ὄντα * πάθη· λέγω δέ, οἷον ὑγίεια καὶ νόσος, καὶ κάλλος καὶ αἶσχος, καὶ ἰσχὺς καὶ ἀσθένεια, καὶ ὄψις καὶ τυφλότης, καὶ ἀκοὴ καὶ κωφότης. ἔτι δὲ καὶ ἐκ τῶνδε δῆλον· ᾧ γὰρ τὸν ἐγρηγορότα γνωρίζομεν, τούτῳ καὶ τὸν ὑπνοῦντα· τὸν γὰρ αἰσθανόμενον, τοῦτον ἐγρηγορέναι νομίζομεν, καὶ τὸν ἐγρηγορότα πάντα, ἢ τῶν ἔξωθέν τινος αἰσθάνεσθαι, ἢ τῶν ἐν αὐτῷ τινὸς κινήσεων. εἰ τοίνυν τὸ ἐγρηγορέναι ἐν μηδενὶ ἄλλῳ ἐστὶν ἢ τῷ αἰσθάνεσθαι, δῆλον ὅτι ᾧπερ αἰσθάνεται, τούτῳ ἐγρήγορε τὰ ἐγρηγορότα, καὶ καθεύδει τὰ καθεύδοντα. ἐπεὶ δ' οὔτε τῆς ψυχῆς ἴδιον τὸ αἰσθάνεσθαι, οὔτε τοῦ σώματος· (οὗ γὰρ ἡ δύναμις, τούτου καὶ ἡ ἐνέργεια· ἡ δὲ λεγομένη αἴσθησις, ὡς
C ἐνέργεια, κίνησίς τις διὰ τοῦ σώματος τῆς ψυχῆς ἐστί) φανερὸν ὡς οὔτε τῆς ψυχῆς τὸ πάθος ἴδιον, οὔτ' ἄψυχον σῶμα δυνατὸν αἰσθάνεσθαι. διωρισμένων δὲ πρότερον ἐν ἑτέροις περὶ τῶν λεγομένων ὡς μορίων τῆς ψυχῆς, καὶ τοῦ μὲν θρεπτικοῦ * χωριζομένου τῶν * ἄλλων, τῶν δ' ἄλλων οὐδενὸς ἄνευ τούτου ὄντος, δῆλον ὡς ὅσα μὲν αὐξήσεως καὶ φθίσεως μετέχει * μόνον ζώντων, ὅτι τούτοις οὐχ ὑπάρχει ὕπνος, οὐδ' ἐγρήγορσις, οἷον τοῖς φυτοῖς· οὐ γὰρ ἔχει τὸ αἰσθητικὸν μόριον, οὔτε εἰ χωριστόν ἐστιν, οὔτε εἰ μὴ χωριστόν· τῇ γὰρ δυνάμει καὶ τῷ εἶναι χωριστόν ἐστιν. ὁμοίως δέ, καὶ ὅτι οὐδέν ἐστιν, ὃ ἀεὶ ἐγρήγορεν, ἢ ἀεὶ καθεύδει· ἀλλὰ τοῖς αὐ-
D τοῖς ὑπάρχει τῶν ζώων ἀμφότερα τὰ πάθη ταῦτα· οὔτε γὰρ * εἰ ἔστι ζῶον ἔχον αἴσθησιν, τοῦτ' ἐνδέχεται οὔτε καθεύδειν οὔτε ἐγρηγορέναι· ἄμφω γάρ ἐστι τὰ πάθη ταῦτα περὶ αἴσθησιν τοῦ πρώτου αἰσθητικοῦ. οὐκ ἐνδέχεται δὲ οὐδὲ θάτερον τούτων ἀεὶ ὑπάρχειν τῷ αὐτῷ· * οἷον τι γένος ζώων ἀεὶ καθεύδειν, ἢ ἀεὶ ἐγρηγορέναι. ἔτι ὅσων ἔργων τι κατὰ φύσιν ἐστὶν ὅταν ὑπερβάλλῃ τὸν χρόνον * ἐν ὅσῳ δύναταί τι ποιεῖν, ἀνάγκη ἀδυνατεῖν, οἷον τὰ ὄμματα ὁρῶντα, καὶ παύεσθαι τοῦτο ποιοῦντα. ὁμοίως δὲ καὶ χεῖρα, καὶ ἄλλο πᾶν, οὗ ἐστί τι ἔργον. εἰ δή τινός ἐστιν ἔργον τὸ αἰσθάνεσθαι, καὶ τοῦτο ἂν ὑπερβάλλῃ, ὅσον ἦν χρόνον δυνάμενον αἰ-
E σθάνεσθαι συνεχῶς, ἀδυνατήσει, καὶ οὐκ ἔτι τοῦτο ποιήσει. εἰ τοίνυν τὸ ἐγρηγορέναι, ὥρισται τῷ λελύσθαι τὴν αἴσθησιν, τῶν δ' ἐναντίων, τὸ μὲν ἀνάγκη [θάτερον ἀεὶ] παρεῖναι, τὸ δ' οὔ· τὸ δὲ ἐγρηγορέναι τῷ καθεύδειν ἐναντίον, καὶ ἀναγκαῖον παντὶ θάτερον ὑπάρχειν· ἀναγκαῖον ἂν εἴη καθεύδειν. εἰ οὖν τὸ τοιοῦτον πάθος ὕπνος, (τοῦτο δ' ἐστὶν ἀδυναμία δι' ὑπερβολὴν τοῦ ἐγρηγορέναι· ἡ δὲ τοῦ ἐγρηγορέναι ὑπερβολή, ὁτὲ μὲν νοσώδης, ὁτὲ δ' ἄνευ νόσου γίνεται· ὥστε καὶ ἡ ἀδυναμία, καὶ ἡ διάλυσις ὡσαύτως ἔσται·) ἀνάγκη πᾶν τὸ ἐγρηγορὸς ἐνδέχεσθαι καθεύδειν. ἀδύνατον γὰρ ἀεὶ ἐνεργεῖν. ὁμοίως δ' οὐδὲ καθεύδειν οὐδὲν ἀεὶ ἐνδέχεται·

* γρ. ἀνθρώπων
* γρ. πάθη.
* γρ. κεχωρισμένου
* γρ. ἄλλων ἐν τοῖς ἔχουσι σῶμα, τ.
* γρ. μόνον τῶν ἄλλων ζώντων.
* κ. ἐστὶ ἐ.
* γρ. οἷον ἀεί τι γ. ζ. ε. ἢ ἀεί τι ἐ.
* γρ. ἐπεὶ ἂν δύναται τι χρόνον ποιεῖν. al. ἢ

ὁ γὰρ ὕπνος, πάθος τι τοῦ αἰσθητικοῦ μορίου ἐστὶν, οἷον δεσμὸς, A καὶ ἀκινησία τις. ὥστ᾽ ἀνάγκη πᾶν τὸ καθεῦδον ἔχειν τὸ αἰσθητικὸν μόριον. αἰσθητικὸν δὲ, τὸ δυνατὸν αἰσθάνεσθαι κατ᾽ ἐνέργειαν. ἐνεργεῖν δὲ τῇ αἰσθήσει κυρίως, καὶ ἁπλῶς, ἀδύνατον καθεύδοντα ἅμα· διὸ ἀναγκαῖον ὕπνον πάντα ἐγερτὸν εἶναι. τὰ μὲν οὖν ἄλλα σχεδὸν ἅπαντα δῆλα κοινωνοῦντα ὕπνου, καὶ πλωτὰ, καὶ πτηνὰ, καὶ πεζά· καὶ γὰρ τὰ τῶν ἰχθύων γένη πάντα, καὶ τὰ τῶν μαλακίων ὦπται καθεύδοντα, καὶ ἄλλα πάντα ὅσα ἔχει ὀφθαλμούς· καὶ γὰρ τὰ σκληρόφθαλμα * φανερὸν, καὶ τὰ ἔντομα κοιμώμενα· βραχύυπνα δὲ τὰ τοιαῦτα πάντα. διὸ καὶ λάθοι ἄν τινα πολλάκις, πότερον μετέχει τοῦ καθεύδειν, ἢ οὔ. τῶν δ᾽ ὀστρακοδέρμων, κατὰ μὲν τὴν αἴσθησιν, οὐδέπω γέγονε φανερὸν, εἰ καθεύδει. εἰ δέ τῳ πιθανὸς ὁ λεχθεὶς λόγος, τούτῳ πεισθήσεται. ὅτι μὲν οὖν ὕπνου * κοινωνεῖ τὰ ζῶα πάντα, φανερὸν ἐκ τούτων. τῷ γὰρ αἴσθησιν ἔχειν ὥρισται τὸ ζῶον. τῆς δὲ αἰσθήσεως τρόπον μέν τινα τὴν ἀκινησίαν, καὶ οἷον δεσμὸν τὸν ὕπνον εἶναι φαμέν· τὴν δὲ λύσιν καὶ τὴν ἄνεσιν, ἐγρήγορσιν. τῶν δὲ φυτῶν οὐδὲν οἷόν τε κοινωνεῖν οὐδετέρου τούτων τῶν παθημάτων. ἄνευ μὲν γὰρ αἰσθήσεως, οὐχ ὑπάρχει οὔτε ὕπνος, οὔτε ἐγρήγορσις. οἷς δ᾽ αἴσθησις ὑπάρχει, καὶ τὸ λυπεῖσθαι καὶ τὸ χαίρειν· οἷς δὲ ταῦτα, καὶ ἐπιθυμία. τοῖς δὲ φυτοῖς οὐδὲν ὑπάρχει τούτων. σημεῖον δ᾽ ὅτι καὶ τὸ ἔργον τὸ αὑτοῦ ποιεῖ τὸ θρεπτικὸν μόριον, ἐν τῷ καθεύδειν μᾶλλον ἢ ἐν τῷ ἐγρηγορέναι· τρέφεται γὰρ καὶ αὐξάνεται τότε μᾶλλον, ὡς οὐδὲν προσδεόμενα πρὸς ταῦτα τῆς αἰσθήσεως.

* Quid. φανερά,

* γρ. κοινωνοῦσι.

ΚΕΦΑΛ. β΄.

Διὰ τί καθεύδει τὰ ζῶα καὶ ἐγρήγορε, καὶ διὰ ποίαν τινὰ αἴσθησιν, ἢ ποίας.

ΔΙὰ τί δὲ καθεύδει καὶ ἐγρήγορε, καὶ διὰ ποίαν τιν᾽ αἴσθησιν, ἢ ποίας, εἰ διὰ πλείους, σκεπτέον. ἐπεὶ δ᾽ ἔνια μὲν τῶν ζώων ἔχει τὰς αἰσθήσεις πάσας, ἔνια δ᾽ οὐκ ἔχει, οἷον ὄψιν, ἀκοήν· τὴν δ᾽ ἁφὴν, καὶ τὴν γεῦσιν, ἅπαντα ἔχει, πλὴν εἴ τι τῶν ζώων ἀτελές· εἴρηται δὲ περὶ αὐτῶν ἐν τοῖς περὶ ψυχῆς· ἀδύνατον δ᾽ ἐστὶν ἁπλῶς, ὁποιανοῦν αἴσθησιν αἰσθάνεσθαι τὸ καθεῦδον ζῶον· φανερὸν ὅτι πᾶσιν ἀναγκαῖον ὑπάρχειν τὸ αὐτὸ πάθος ἐν τῷ καλουμένῳ ὕπνῳ· εἰ γὰρ τῇ μὲν, τῇ δὲ μὴ, ταύτῃ καθεῦδον αἰσθήσεται. τοῦτο δ᾽ ἀδύνατον. ἐπεὶ δ᾽ ὑπάρχει καθ᾽ ἑκάστην αἴσθησιν, τὸ μέν τι ἴδιον, τὸ δέ τι κοινόν· (ἴδιον μὲν, οἷον τῇ ὄψει τὸ ὁρᾶν, τῇ δ᾽ ἀκοῇ τὸ ἀκούειν, καὶ ταῖς ἄλλαις κατὰ τὸν αὐτὸν * τρόπον· ἔστι δέ τις καὶ κοινὴ δύναμις ἀκολουθοῦσα πάσαις, ᾗ καὶ ὁρᾷ, καὶ ἀκούει, καὶ αἰσθάνεται· οὐ γὰρ δὴ τῇ γε ὄψει ὁρᾷ, ὅ,τι ὁρᾷ. καὶ κρίνει δὴ καὶ δύναται κρίνειν, ὅτι ἕτερα τὰ γλυκέα τῶν λευκῶν, οὔτε γεύσει, οὔτε ὄψει, οὔτ᾽ ἀμφοῖν, ἀλλά τινι κοινῷ μορίῳ τῶν αἰσθητηρίων ἁπάντων· ἔστι μὲν γὰρ μία αἴσθησις, καὶ τὸ κύριον αἰσθητήριον ἕν· τὸ δ᾽ εἶναι αἰσθήσει τοῦ γένους ἑκάστου ἕτερον, οἷον ψόφου καὶ χρώματος. τοῦτο δ᾽ ἅμα τῷ ἁπτικῷ μάλιστα ὑπάρχει· τοῦτο μὲν γὰρ χωρίζεται τῶν ἄλλων αἰσθητηρίων, τὰ δ᾽ ἄλλα τούτου ἀχώριστα. εἴρηται δὲ περὶ αὐτῶν ἐν τοῖς περὶ ψυχῆς θεωρήμασι·) φανερὸν τοίνυν, ὅτι τούτου ἐστὶ πάθος ἡ ἐγρήγορσις καὶ ὁ ὕπνος·

* γρ. λόγον.

A nam ſomnus, affectio quædam ſenſoriæ partis, quaſi vinculum quoddam & immobilitas exiſtit. Ex quo ſequitur, quicquid dormit, ſenſitiuam partem habere. Senſitiuum autem eſt, quod ſentire actu poteſt. ſentire verò actu ſimpliciter & proprie, nemo per quietem poteſt. Nullus igitur ſomnus eſt, qui expergiſcibilis non ſit. Cætera ferè omnia, pedeſtria, volatilia, natatilia, ſomno participant. etenim cuncta piſcium genera, & ea quæ molli cruſta integuntur, & præterea quæcumque oculos habent, ſoporari cernuntur. nam & quibus oculi duri, & inſecta, dormire palam eſt, quãquam iſthæc omnia, ſomno exiguo contenta ſunt. vnde fit etiam, vt ſæpenumero quempiam lateat, vtrùm obdormi- B ſcant necne. Vtrùm verò teſtacea ſopore offundantur, nondum ſenſu quidem cognitum fuit: ſed ratione tamen ea quam prædiximus, ſi cui probabilis videatur, perſuaderi id poteſt. Somnum igitur animalibus communicatum omnibus eſſe, hac ratione pateſcit. nam animal eo finiri ſolet, quod ſenſum habeat. ſenſus verò immobilitatem quandam, & quaſi nodum & vinculum, ſomnum eſſe dicimus: contrà, exolutionem atque relaxationem, vigiliam. At plantis neutra harum affectionum communicari poteſt. quippe cùm citra ſenſum neque ſomnus eſſe neque vigilia poſſit. At quibus ſenſus ineſt, eiſdem & dolor & voluptas concedi C debet: quibus verò dolor & voluptas, eiſdem & cupiditas. Plantis autem nihil horum tribui poteſt. argumento, quòd facultas quæ nutrit & vegetat, munus ſuum meliùs conſopitis quàm vigilantibus animalibus abſoluat. tunc enim probiùs & aluntur & augentur, vt quæ nihil ad ea ope ſenſus egeant.

CAPVT II.

Somni & vigiliæ vſus ac neceſſitas.

CVr autem dormiant & vigilent, & per quem ſenſum, aut per quos, ſi per plures id eueniat, D conſiderandum eſt. Cùm animalium quibuſdam ſenſus omnes inſint, quibuſdam nõ omnes, vt viſus: ſed cunctis, tactus & guſtus, niſi quid imperfectum laceſſitúmque ſit: de quibus omnibus in libris de Anima dictum eſt: fieri autẽ ſimpliciter non poſſit, vt dormiens animal vllo ſenſu abuti queat: patet, neceſſarium eſſe in ſomno eandẽ omnia ſubire cõditionem. nam ſi partim eodem modo afficiantur, partim diuerſo: hac nimirum ratione fiet, vt per quietem animal ſentiat, id quod impoſſibile eſt. Porro cùm natura ſingulis ſenſibus proprium quid iniunxerit, & in omnes commune quid ſparſerit (proprium, vt viſui videre, auditui audire, & reliquis ad eundem modum: commune, vim quan- E dam promiſcuam, quæ omneis comitatur, qua animal & videre & audire ſe ſentit: non enim viſu ſe videre videt, nec viſu aut guſtu iudicat, iudicaréve poteſt, diſtare dulce ab albo: neque ſeorſum, neque ſimul vtroque: ſed particula quadam communi, quæ adiuncta ſenſibus omnibus ſit, nam ſenſus vnus eſt, & etiam principale ſenſorium vnum: ratio tamen ſenſioni cuiuſque generis, vt ſoni & coloris non vna, ſed alia & alia. hæc autem cum tactu maximè coniuncta eſt. nam tactus à cæteris ſenſibus diuelli poteſt, ab hoc cæteri non poſſunt. quæ omnia in commentariis de Anima explicata ſunt) hinc profectò conſtat, ſomnum & vigiliam, affectionem huius eſſe.

Ideóque animalibus cunctis ineſt. etenim tactum vnum omnia poſſident. Nam ſi ſopor irrepat, quia ſenſus omnes afficiantur, abſurdum ſanè fuerit, eos ſimul feriari & immobiles perſiſtere, quos neque neceſſe eſt neque poſſibile quodammodo ſimul in opera eſſe ac pelli, cùm magis conſentaneum videatur, vt ſimul operentur, quam vt ſimul quieſcant. Quod autem nunc de hiſce dicimus, rationi conſonum eſt. nam cùm ſenſus qui cæteris aliis præeſt, & quò cæteri ſeſe conferunt, afficitur, neceſſariò & reliqui omnes conſentiunt. at ſi quiſpiam ex iſtis elangueſcat, & impotens ſentiendi reddatur, non continuò neceſſe eſt illum flacceſcere & viribus deſtitui. Conſtat autem multis argumentis, ſomnum non ea re conſiſtere quòd otioſi ſenſus ſint, nec eis vtatur animal, quódque ſentire non poſſint. Nam cùm quis animo linquitur, tale quid euenire conſtat: quando defectus animæ, non niſi nexus quidam, & impotentia ſenſuum eſt. Idem & in deliriis quibuſdam contingere poteſt. Præterea quibus venæ iugulares apprehenduntur, aſtringunturque, eripi ſenſus aſſolent. Verùm impotentia ſentiendi, ſi non quacumque de cauſa obueniat, neq; in quouis ſenſu ſit, ſed ſicvti nuper dixi, in primo ſenſu quo animal omnia percipit, ſomnus eſt. nam cùm iſte laſſatur, neceſſariò & cęteri ſenſus actus ſuos exercere non poſſunt. Contrà, ſi quis ex illis impotens reddatur, non protinus neceſſe eſt idem huic euenire. Sed qualis affectio ſomnus ſit, & quam item ob cauſam dormire animalia contingat, dicendum eſt: quando complura haberi cauſarum genera, certum eſt. Nam & id cuius gratia quippiam ſit, & id vnde motus origo pendeat, & materiam, & rationem, cauſas appellitare ſolemus. Ac primùm quidem, cùm naturam ſemper agere gratia alicuius, id eſt, boni, dicamus, quietem verò vtilem eſſe, atque adeò neceſſariam iis omnibus quæ moueri quidem nata ſunt, ſed ſemper & continuè moueri cum voluptate nequeunt, cúmque ob veritatem ipſam translatio hæc vulgò recepta ſit, vt ſomnus quietis nomine deſignetur: ſomnus profectò ad ſalutē iunctus animalibus fuit. Vigilatio verò, rationem finis obtinet. nam ſentire & [illegible]ere, finis omnibus eſt, quibus alterum eorum cōpetit. hæc enim optima ſunt, finis autem optimus eſſe ſolet. Item ſomnus animali cuique neceſſarius eſt, non quidem ſimpliciter, ſed ex ſuppoſito & adiunctione. nam ſi animal naturam ſuam ſeruare ac tueri debeat, neceſſariò quædā adeſſe ei oportet, quibus poſitis alia ſubinde adiungēda ſunt. Poſt hæc reſtat dicendum, quo motu actionéve corporū antegreſſa, dormire animalibus obueniat, aut etiā vigilare. Planè cætera animalia, quæ nimirum ſanguine carent, eandem quam quæ prædita ſanguine ſunt, aut proportionalem cauſam ſomni habere, ſanguinea verò eam ipſam quam homines, arbitrari addecet. Quare per hæc de omnibus contemplemur oportet. Principium ſenſus eadem parte oriri, quā & principium motus, definitum ſuprà alibi eſt. hoc autem è tribus determinatis diſtinctiſque locis, in eo contineri ſolet, qui inter caput & aluum medius ſit. Principium igitur mouendi, in iis quæ ſanguinem habent, partem eam quæ circum cor eſt, obtinet. nam quæcumque ſanguinem habent, habent & cor, à quo motus ſenſuſque principis origo atque initium pendet. Motus igitur & ſpiritus, & omnino refrigerationis principium, in corde (vt patet) collocatum eſt.

δεῖ καὶ πᾶσιν ὑπάρχει τοῖς ζώοις· καὶ γὰρ ἡ ἀφὴ μόνη πᾶσιν. εἰ γὰρ τῷ πάσας τι πεπονθέναι τὰς αἰσθήσεις ἐγίνετο τὸ καθεύδειν, ἄτοπον, εἰ ἃς οὔτ' ἀνάγκη, οὔτε δυνατόν ἐστί πως ἅμα ἐνεργεῖν, ἀνάγκη ταύτας ἀναγκαῖον ἀργεῖν, ἅμα καὶ ἀκινητίζειν· τοὐναντίον γὰρ εὐλογώτερον συνέβαινεν ἂν αὐταῖς, τὸ μὴ ἅμα ἠρεμεῖν. ὡς δὲ νῦν λέγομεν, εὐλόγως ἔχει καὶ περὶ τούτων. τοῦ γὰρ κυρίου τῶν ἄλλων πάντων * αἰσθητηρίου καὶ πρὸς ὃ συντείνει τὰ ἄλλα πεπονθότος τι, συμπάσχειν * ἀναγκαῖον καὶ τὰ λοιπὰ πάντα. ἐκείνων δὲ τινος ἀδυνατοῦντος, οὐκ ἀνάγκη τοῦτ' ἀδυνατεῖν. φανερὸν δ' ἐκ πολλῶν,

B ὅτι οὐκ ἐν τῷ τὰς αἰσθήσεις ἀργεῖν, καὶ μὴ χρῆσθαι αὐταῖς ὁ ὕπνος, οὐδ' ἐν τῷ μὴ δύνασθαι αἰσθάνεσθαι. καὶ γὰρ ἐν ταῖς λειποψυχίαις τοιοῦτον συμβαίνει ἀδυναμία γὰρ αἰσθήσεων ἡ λειποψυχία, γίνονται δὲ καὶ ἔκνοιαί τινες τοιαῦται. ἔτι δ' οἱ τὰς ἐν τῷ αὐχένι φλέβας καταλαμβανόμενοι, ἀναίσθητοι γίνονται. ἀλλ' ὅταν ἡ ἀδυναμία τῆς χρήσεως, μήτ' ἐν τῷ [τυχόντι] αἰσθητηρίῳ, μήτε δι' ἣν ἔτυχεν αἰτίαν, ἀλλὰ καθάπερ εἴρηται νῦν, ἐν τῷ πρώτῳ ᾧ αἰσθάνεται πάντων. ὅταν μὲν γὰρ τοῦτ' ἀδυνατήσῃ, ἀνάγκη καὶ τοῖς αἰσθητηρίοις πᾶσιν ἀδυνατεῖν * αἰσθέσθαι· ὅταν δ' ἐκεί-

C νων τινί, οὐκ ἀνάγκη τούτῳ. δι' ἣν δ' αἰτίαν συμβαίνει τὸ καθεύδειν, καὶ ποῖόν τι τὸ πάθος ἐστί, λεκτέον. ἐπεὶ δὲ τρόποι πλείους τῆς αἰτίας· καὶ γὰρ τὸ τίνος ἕνεκα, καὶ ὅθεν ἡ ἀρχὴ τῆς κινήσεως, καὶ τὴν ὕλην, καὶ τὸν λόγον αἴτιον εἶναι φαμέν· πρῶτον μὲν οὖν ἐπεὶ λέγομεν τὴν φύσιν ἕνεκά του ποιεῖν, τοῦτο δ' ἀγαθόν τι· τὴν δ' ἀνάπαυσιν παντὶ τῷ πεφυκότι κινεῖσθαι, μὴ δυναμένῳ δ' ἀεὶ καὶ συνεχῶς κινεῖσθαι, μεθ' ἡδονῆς ἀναγκαῖον εἶναι καὶ ὠφέλιμον τὴν ἀνάπαυσιν. τῷ δ' ὕπνῳ, αὐτῇ τῇ ἀληθείᾳ προσάπτουσι τὴν μεταφορὰν ταύ-

D την, ὡς ἀναπαύσει ὄντι. ὥστε σωτηρίας ἕνεκα τῶν ζώων, ὑπάρχει. ἡ δ' ἐγρήγορσις, τέλος· τὸ γὰρ αἰσθάνεσθαι καὶ τὸ φρονεῖν, πᾶσι τέλος οἷς ὑπάρχει θάτερον αὐτῶν· βέλτιστα γὰρ ταῦτα. τὸ δὲ τέλος βέλτιστον. ὥστε ἀναγκαῖον ἑκάστῳ τῶν ζώων ὑπάρχειν τὸν ὕπνον. λέγω δὲ τὴν ἐξ ὑποθέσεως ἀνάγκην, ὅτι εἰ ζῷον ἔσται ἔχον τὴν αὑτοῦ φύσιν, ἐξ ἀνάγκης τινὰ ὑπάρχειν αὐτῷ δεῖ· καὶ τούτων ὑπαρχόντων, ἕτερα ὑπάρχειν. ἔτι δέ, ποίας κινήσεως καὶ πράξεως, ἐν τοῖς σώμασι * γιγνομένης, συμβαίνει τό, τε ἐγρηγορέναι, καὶ τὸ καθεύδειν τοῖς ζώοις, μετὰ ταῦτα λεκτέον. τοῖς μὲν οὖν ἄλλοις ζώοις καθάπερ τοῖς ἐναίμοις, ὑποληπτέον εἶ-

E ναι τὰ αἴτια τοῦ πάθους, ἢ τὰ αὐτά, ἢ ἀνάλογον· τοῖς δ' ἐναίμοις, ἅπερ τοῖς ἀνθρώποις· ὥστ' ἐκ τούτων * πάντων θεωρητέον. ὅτι μὲν οὖν ἡ τῆς αἰσθήσεως ἀρχὴ γίνεται ἀπὸ τοῦ αὐτοῦ μέρους τοῖς ζώοις, ἀφ' οὗπερ καὶ ἡ τῆς κινήσεως, διώρισται πρότερον ἐν ἑτέροις. αὕτη δ' ἐστὶ τριῶν διωρισμένων τόπων, ὁ μέσος κεφαλῆς καὶ τῆς κάτω κοιλίας. τοῖς μὲν οὖν ἐναίμοις τοῦτ' ἐστὶ τὸ περὶ τὴν καρδίαν μέρος· πάντα γὰρ τὰ ἔναιμα, καρδίαν ἔχει· καὶ ἡ ἀρχὴ τῆς αἰσθήσεως καὶ τῆς κινήσεως τῆς κυρίας, ἐντεῦθεν ἐστί. τῆς μὲν οὖν κινήσεως φανερὸν ὅτι καὶ ἡ τοῦ πνεύματος ἀρχή, καὶ ὅλως ἡ τῆς καταψύξεώς ἐστιν ἐνταῦθα.

* γρ. αἰσθητηρίων
* γρ. ἀνάγκη
* γρ. ἀδυνατεῖ
* γρ. γινομένοις
* γρ. πάντα

καὶ τὰ ἀναπνέοντα, καὶ τὰ τῷ ὑγρῷ καταψυχόμενα πρός γε τὴν σωτηρίαν τῆς ἐν τούτῳ τῷ μορίῳ θερμότητος, ἡ φύσις πεπόρικε. ῥηθήσεται δὲ περὶ αὐτῆς ὕστερον καθ᾽ αὑτήν. τοῖς δ᾽ ἀναίμοις, καὶ τοῖς ἐντόμοις, καὶ τοῖς μὴ δεχομένοις πνεῦμα, ἐν τῷ ἀνάλογον, * τὸ σύμφυτον πνεῦμα ἀναφυσώμενον, καὶ συνιζάνον φαίνεται. δῆλον δὲ τοῦτο ἐπὶ τῶν ὁλοπτέρων, οἷον σφηκῶν, καὶ μελιττῶν, καὶ ἐν ταῖς μυίαις, καὶ ὅσα τοιαῦτα. ἐπεὶ δὲ κινεῖν μέν τι ἢ ποιεῖν ἄνευ ἰσχύος ἀδύνατον· ἰσχὺν δὲ ποιεῖ ἡ τοῦ πνεύματος κάθεξις, τοῖς μὲν εἰσφερομένοις, ἡ θύραθεν· τοῖς δὲ μὴ ἀναπνέουσιν, ἡ σύμφυτος. διὸ καὶ βομβοῦντα φαίνεται τὰ πτερωτά, ὅταν κινῆται τῇ τρίψει τοῦ πνεύματος προσπίπτοντος πρὸς τὸ ὑπόζωμα τῶν ὁλοπτέρων. κινεῖται δὲ πᾶν, αἰσθήσεώς τινος γινομένης, ἢ οἰκείας, ἢ ἀλλοτρίας, ἐν τῷ πρώτῳ αἰσθητηρίῳ. εἰ δή ἐστιν ὁ ὕπνος καὶ ἡ ἐγρήγορσις πάθη τοῦ μορίου τούτου, ἐν ᾧ μὲν τόπῳ, καὶ ἐν ᾧ μορίῳ πρώτῳ γίνεται ὁ ὕπνος καὶ ἡ ἐγρήγορσις, φανερόν. κινοῦνται δ᾽ ἔνιοι καθεύδοντες, καὶ ποιοῦσι πολλὰ ἐγρηγορικά· οὐ μέντοι ἄνευ φαντάσματος καὶ αἰσθήσεώς τινος· τὸ γὰρ ἐνύπνιόν ἐστιν, αἴσθημα τρόπον τινά. λεκτέον δὲ περὶ * αὐτῶν ὕστερον. διότι δὲ τὰ μὲν ἐνύπνια μνημονεύουσιν ἐγερθέντες, τὰς δ᾽ ἐγρηγορικὰς πράξεις οὐ μνημονεύουσιν, ἐν τοῖς προβληματικοῖς εἴρηται.

* γρ. τὸ γὰρ

* γρ. αὐτοῦ

ΚΕΦΑΛ. γ΄.

Τίνων γινομένων καὶ πόθεν ἡ ἀρχὴ τοῦ τ᾽ ἐγρηγορέναι καὶ τοῦ καθεύδειν γίνεται.

Ἐχόμενον δὲ τῶν εἰρημένων ἐστὶν ἐπελθεῖν, τίνων γινομένων, καὶ πόθεν ἡ ἀρχὴ τοῦ πάθους γίνεται τοῦ τε ἐγρηγορέναι καὶ τοῦ καθεύδειν. φανερὸν δή, ὅτι ἐπεὶ ἀναγκαῖον τῷ ζῴῳ ὅταν αἴσθησιν ἔχῃ, τότε πρῶτον τροφήν τε λαμβάνειν, καὶ αὔξησιν· τροφὴ δ᾽ ἐστὶ πᾶσιν ἡ ἐσχάτη, τοῖς μὲν ἐναίμοις, ἡ τοῦ αἵματος φύσις· τοῖς δὲ ἀναίμοις, τὸ ἀνάλογον. τόπος δὲ τοῦ αἵματος, αἱ φλέβες· τούτων δ᾽ ἀρχὴ ἡ καρδία. φανερὸν δὲ τὸ * λεχθὲν ἐκ τῶν ἀνατομῶν. τῆς μὲν οὖν θύραθεν τροφῆς εἰσιούσης εἰς τοὺς δεκτικοὺς τόπους, γίνεται ἡ ἀναθυμίασις εἰς τὰς φλέβας· ἐκεῖ δὲ μεταβάλλουσα ἐξαιματοῦται, καὶ πορεύεται ἐπὶ τὴν ἀρχήν. εἴρηται δὲ περὶ τούτων ἐν τοῖς περὶ τροφῆς. νῦν δὲ ἀναληπτέον ὑπὲρ αὐτῶν, τούτου χάριν, ὅπως τὰς ἀρχὰς τῆς κινήσεως θεωρήσωμεν· καὶ τί πάσχοντος τοῦ μορίου τοῦ αἰσθητικοῦ, συμβαίνει ἡ ἐγρήγορσις καὶ ὁ ὕπνος· οὐ γάρ ἐστιν ὁ ὕπνος ἡτισοῦν ἀδυναμία τοῦ αἰσθητικοῦ, καθάπερ εἴρηται· καὶ γὰρ * ἔκνοια καὶ πνιγμός τις, καὶ λιποψυχία, ποιεῖ τὴν τοιαύτην ἀδυναμίαν. ἤδη δὲ γεγένηταί τισι καὶ φαντασία λιποψυχήσασιν ἰσχυρῶς. τοῦτο μὲν οὖν ἔχει τινὰ ἀπορίαν· εἰ γὰρ ἐνδέχεται καταδαρθεῖν τὸν λιποψυχήσαντα, ἐνδέχοιτ᾽ ἂν ἐνύπνιον εἶναι καὶ τὸ φάντασμα. πολλὰ δ᾽ ἐστίν, ἃ λέγουσιν οἱ σφόδρα λιποψυχήσαντες καὶ δόξαντες τεθνάναι· περὶ ὧν τὸν αὐτὸν λόγον ὑποληπτέον εἶναι πάντων. ἀλλὰ γὰρ ὥσπερ εἴπομεν, οὐκ ἔστιν ὁ ὕπνος ἀδυναμία πᾶσα τοῦ αἰσθητικοῦ, ἀλλ᾽ ἐκ τῆς περὶ τὴν τροφὴν ἀναθυμιάσεως γίνεται τὸ πάθος τοῦτο· ἀναγκαῖον γὰρ τὸ ἀναθυμιώμενον,

* γρ. λεγόμενον

* γρ. ἄνοια

A Quin & ipſa natura tam parteis eas quæ ſpirationi deſtinatæ ſunt, quàm quæ refrigerio quod ab humore peti ſolet, ad calorem partis huius ſeruandum tutandúmque concinnaſſe videtur. Sed de refrigeratione infrà ſuo dicemus volumine. Iis verò quæ carent ſanguine, & inſectis, & iis quæ ſpirare non ſolent, facultatis motricis regia in eo eſt, quod vice cordis ſubrogatur. nam ea in parte ſpiritus quidam inſitus attolli vicibus & ſubſidere cernitur, quod facilè deprehendi poteſt in totipennibus, qualia ſunt veſpæ, apes, muſcæ, & cætera generis eiuſdem. Quoniam autem animalia nec mouere quicquam, nec agere ſine intenſione virium poſ- B ſunt: intenduntur autem vires retentione ſpiritus, iis quidem quæ ſpirant, extrinſecus accerſiti, iis verò quæ non ſpirant, inſiti: hinc profectò euenit vt totipennia ipſa quoties ſe mouent, attritu ſpiritus ad ſeptum tranſuerſum offendentis, bombos illos edant. Mouentur autem omnia ſenſu quodam, ſiue familiari ſiue peregrino, in primo ſenſorio facto. Quòd ſi ſomnus & vigilia partis huius affectiones ſint, quo in loco & qua primùm particula contingere ſoleant, apertum eſt. Sunt etiam qui dormientes reſurgunt, & pleraque agunt, qualia cùm vigilant, ſolent: quod tamen ſine viſione aliqua aut ſenſu contingere non poteſt. nam ſomnium quodammodo ſenſum eſt. Sed de ſomnio, inferius C differetur. Cur autem expergefacti inſomnia meminerint, quæ verò per ſomnum quaſi vigilantes geſſerint, non meminerint, explicatum in Problematis eſt.

CAPVT III.

Somnus ac vigilia quid, & vnde.

PRoximum ab iis quæ diximus, eſt, vt quibus factis, & vnde affectionis huius origo, ſomni inquam & vigiliæ, proueniat, tractetur exponatúrque. Sanè cùm animal vbi ſenſum habet, tum primùm ali & creſcere oporteat, ſitque alimentum D nouiſſimum ſanguineis ſanguis, exanguibus quod ſanguini proportione reſpondet, atque venæ conceptacula ſanguinis ſint, venarum autem initium cor, id quod ex diſſectionibus perſpici poteſt: cibum vtique illum qui per os ingeri ſolet, in loca ſua receptum euaporari in venas, inibique mutatum in ſanguinem verti, & mox principium ipſum adire cõſtat. Quæ quamquam in libro de Alimento dicta ſunt, nunc tamen repeti oportet, ad hoc vt principia motionis contemplemur, ecquid ſuſtinente parte ſenſitiua ſomnus & vigilia contingat. Nec enim ſomnus quæcumque impotentia ſenſuum eſt, vt diximus. nam & dementia, & præ- E focatio, & animi defectus, talem impotentiam adferre poteſt. Iam verò accidit vt & quidam per forte animi deliquium quippiam imaginarentur. Hoc igitur aliquam habet controuerſiam. Nam ſi defectum animo dormire contingat, continget etiam vt imaginatio illa inſomnium ſit. Porro multa dicunt qui ita vehementer tentantur, quique extinctorum ſpeciem præferunt. De quibus omnibus eandem eſſe rationem putandum eſt. Sed enim (vti iam diximus) non omnis impotentia ſentiendi ſomnus eſt, ſed ea ſolùm, quam diſpoſitio committit alimenti. quod enim ſurſum halat,

quadantenus attolli, deinde regredi ac refluere inſtar Euripi neceſſe eſt. nam animantis cuiuſque calidum in ſublime natura fertur. at vbi eò loci ſubuectum eſt, mox vniuerſum reciprocat ac deſcendit. Quamobrem ſomnus maximè poſt cibum fieri ſolet. tunc enim copioſus humor & corpulentus ſurſum commeat. Qui cùm conſiſtit, caput aggrauat, & addormiſcere facit. cùm verò iam deſcendit, & reciprocando calorem repulit: tum ſomno ſepultum iacet, dormitque animal. Hæc autem vel ſomnifica ipſa indicant. omnia enim, ſiue poculenta ſint, ſiue eſculenta, grauedinem capiti adferunt: vt papauer, mandragoras, temetum, lolium. Ad hunc item modum affecti videntur, qui ſoporantur, dormitántque: quia nec caput erigere, nec palpebras attollere queunt. Et maximè à cibis ſomnus talis extat: tunc enim multa exhalatio conficit. præterea à fatigationibus nonnullis: nam fatigatio colliquandi vim obtinet. colliquamentum autem, vicem incocti alimenti, niſi frigidum ſit, præſtare ſolet. Quidam enim morbi hoc idem faciunt qui ab humido & calido excremento proueniunt: quemadmodum in febre & lethargo euenit. Item prima ætas. nam pueri alto ſopore premuntur: quia alimentum omne ſurſum reſpirat. Cuius rei ſignum eſt, quòd per id ætatis, ſuperiora proportione inferiorum maxima ſunt, quia incrementum illo contendat. Nec alia de cauſa morbo comitiali obnoxij ſunt. is enim morbus perſimilis ſomno eſt. Et iccirco huiuſce peſtis exordium, pleriſque per quietem accidit. qui poſtea dum dormiunt, ea corripi ſolent: dum vigilant, non ſolent. Cùm enim larga ſpiritus copia in ſublime effertur, vbi ſurſum deſcendit, venas extumefacit & inflat, quibus meatum ſpirabilem comprimit atque intercludit. Hinc vinum pueris vtile non eſt, nec etiam nutricibus (nihil enim fortè intereſt, nutrices an pueri ebibãt) niſi dilutum & modicum hauriatur. nam vinum ſpiritoſum eſt, præſertim atrum. Et vſque adeò ſuperiora pueri plena cibo continẽt, vt quinque menſium ſpatio collum obuertere nequeant. quippe cùm illis, haud ſecus quàm ebriis, multus vapor ſurſum ad caput feratur. Quam affectionem, cauſam eſſe cur initiis fœtus intra matris vterum quieſcant, rationi conſonum eſt. Atque in totum ſomniculoſi ſunt, qui cõditas venas habẽt, & qui forma pumilionis, & capite prægrandi ſunt. Nam ij quorum conditæ ſunt venæ, eas graciles & anguſtas habent, adeò vt humor ægrè decidat & refluat. Pumiliones verò, & quorum vaſta ſunt capita, multam diuaporationem atque effluentiam, quæ ad parteis ſuperas viam capeſſit. At qui venas gerunt editas, propter amplitudinem & latitudinem meatuum, ſomnolenti non ſunt, niſi quam aliam contrariam ebiberint affectionem. Neque item melancholici. nam locus interior refrigeratus eſt. Quare in eis euaporatio multa non fit: ob ídque edaci auiditate laborant, cùm ſint aridi. nam eorum corpora ita affecta ſunt, quaſi re nulla fruantur. Porro bilis atra quæ naturaliter frigida eſt, altricem officinam refrigerat, & alias parteis in quibus recrementum hoc potentia ineſt. Quare ex iis quæ dicta ſunt, apertum eſt, ſomnum eſſe coitum quendam caloris ad intima refugiẽtis, & naturalem antiperiſtaſin circũobſiſtentiãque, propter eã quam diximus cauſam. Quocirca qui ſomno premitur, in motu & agitatu vario eſt. Vnde & deficit, & refrigeratur: atque ob frigus palpebræ decidunt:

A μέχρι που ὠθεῖσθαι, εἶτ' ἀντιστρέφειν, καὶ μεταβάλλειν, καθάπερ εὔριπον. τὸ δὲ θερμὸν ἑκάστου τῶν ζώων πρὸς τὸ ἄνω πέφυκε φέρεσθαι. ὅταν δ' ἐν τοῖς ἄνω τόποις γένηται, ἀθρόον πάλιν ἀντιστρέφει, καὶ* καταφέρεται. διὸ μάλιστα γίνονται ὕπνοι ἀπὸ τῆς τροφῆς· ἀθρόον γὰρ πολὺ τότε ὑγρὸν καὶ σωματῶδες ἀναφέρεται. ἱστάμενον μὲν οὖν βαρύνει καὶ ποιεῖ νυστάζειν· ὅταν δὲ ῥέψῃ κάτω, καὶ* ἀντιστρέψαν ἀπώσῃ τὸ θερμὸν, τότε γίνεται ὁ ὕπνος, καὶ τὸ ζῶον καθεύδει. σημεῖον δὲ τούτων καὶ τὰ ὑπνωτικά· πάντα γὰρ* καρηβαρίαν ποιεῖ, καὶ τὰ ποτὰ, καὶ τὰ* βρωτὰ, μήκων, μανδραγόρας, οἶνος, αἶραι. καὶ καταφερό-

B μενοι καὶ νυστάζοντες τοῦτο δοκοῦσι πάσχειν, καὶ ἀδυνατοῦσιν αἴρειν τὴν κεφαλὴν, καὶ τὰ βλέφαρα. καὶ μετὰ τὰ σιτία μάλιστα τοιοῦτος ὁ ὕπνος· πολλὴ γὰρ* ἡ ἀπὸ τῶν σιτίων ἀναθυμίασις. ἔτι δὲ καὶ ἐκ κόπων ἐνίων· ὁ μὲν γὰρ κόπος, συντηκτικόν· τὸ δὲ σύντηγμα γίνεται, ὥσπερ τροφὴ ἄπεπτος, ἂν μὴ ψυχρὸν ᾖ. καὶ νόσοι δέ τινες τὸ αὐτὸ τοῦτο ποιοῦσιν, ὅσαι ἀπὸ περιττώματος ὑγροῦ καὶ θερμοῦ, οἷον συμβαίνει τοῖς πυρέττουσι, καὶ ἐν τοῖς ληθάργοις. ἔτι δ' ἡ πρώτη ἡλικία· τὰ γὰρ παιδία καθεύδει σφόδρα, διὰ τὸ τὴν τροφὴν ἄνω φέρεσθαι πᾶσαν. σημεῖον δὲ, τὸ ὑπερβάλλειν τὸ μέγεθος τῶν ἄνω πρὸς τὰ κάτω κατὰ τὴν

C πρώτην ἡλικίαν, διὰ τὸ ἐπὶ ταῦτα γίνεσθαι τὴν αὔξησιν. διὰ ταύτην δὲ τὴν αἰτίαν καὶ ἐπιληπτικὰ γίνεται· ὅμοιον γὰρ ὁ ὕπνος ἐπιλήψει, καὶ ἔστι τρόπον τινὰ ὁ ὕπνος ἐπίληψις· διὸ καὶ συμβαίνει πολλοῖς ἡ ἀρχὴ τούτου τοῦ πάθους, καθεύδουσι· καὶ καθεύδοντες μὲν ἁλίσκονται, ἐγρηγορότες δ' οὔ. ὅταν γὰρ πολὺ φέρηται τὸ πνεῦμα ἄνω καὶ καταβαῖνον πάλιν, τὰς φλέβας ὀγκοῖ, αἷς συνθλίβει τὸν πόρον, δι' οὗ ἡ ἀναπνοὴ γίνεται. διὸ τοῖς παιδίοις οὐ συμφέρουσιν οἱ οἶνοι, οὐδὲ ταῖς τίτθαις· διαφέρει γὰρ ἴσως οὐδὲν αὐτὰ πίνειν, ἢ τὰς τίτθας· ἀλ-

D λὰ δεῖ πίνειν ὑδαρῆ, καὶ ὀλίγον· πνευματώδης γὰρ ὁ οἶνος· καὶ τούτου μᾶλλον ὁ μέλας. οὕτω δὲ τὰ ἄνω πλήρη τῆς τροφῆς τοῖς παιδίοις, ὥστε πέντε μηνῶν οὐδὲ στρέφουσι* τὸν αὐχένα· ὥσπερ γὰρ τοῖς σφόδρα μεθύουσιν, ὑγρότης ἀναφέρεται πολλή. εὔλογον δὲ τοῦτ' εἶναι τὸ πάθος αἴτιον, καὶ τοῦ ἠρεμεῖν ἐν ταῖς μήτραις τὰ ἔμβρυα τὸ πρῶτον. καὶ τὸ ὅλον δὲ φίλυπνοι οἱ ἀδηλόφλεβοι καὶ νανώδεις, καὶ μεγαλοκέφαλοι· τῶν μὲν γὰρ αἱ φλέβες στεναὶ, ὥστ' οὐ ῥᾴδιον* καταρρεῖν κατιὸν τὸ ὑγρόν. τοῖς δὲ νανώδεσι καὶ μεγαλοκεφάλοις ἡ ἄνω ὁρμὴ πολλὴ καὶ ἀναθυμίασις. οἱ δὲ φλεβώδεις οὐχ ὑπνωτικοὶ δι' εὔροιαν τῶν* φλεβῶν, ἂν μή τι ἄλλο πάθος ἔχωσιν ὑπε-

E ναντίον. οὐδ' οἱ μελαγχολικοί· κατέψυκται γὰρ ὁ εἴσω τόπος. ὥστ' οὐ γίνεται αὐτοῖς πλῆθος ἀναθυμιάσεως· διὰ τοῦτο γὰρ καὶ βρωτικοὶ σκληροὶ ὄντες· ὥσπερ γὰρ οὐδὲν ἀπολελαυκότα διάκειται τὰ σώματα* αὐτοῖς. ἡ δὲ μέλαινα χολὴ φύσει ψυχρὰ οὖσα, καὶ τὸν θρεπτικὸν τόπον ψυχρὸν ποιεῖ, καὶ τὰ ἄλλα μόρια, ὅπου ἂν ὑπάρχῃ δυνάμει τὸ τοιοῦτον περίττωμα. ὥστε φανερὸν ἐκ τῶν εἰρημένων, ὅτι ὁ ὕπνος ἐστὶ σύνοδός τις τοῦ θερμοῦ εἴσω καὶ ἀντιπερίστασις φυσικὴ διὰ τὴν εἰρημένην αἰτίαν. διὸ πολλὴ κίνησις τοῦ* ὑπνοῦντος. ὅθεν δὲ ἐκλείπει, καταψύχεται, καὶ διὰ ψύξιν καταπίπτει τὰ βλέφαρα.

* γρ. μεταφέρεται.
* γρ. ἀποστρέψαν.
* γρ. καρηβαρεῖν.
* γρ. βρώματα.
* γρ. κἀπὶ τ.
* γρ. τοῖς αὐχένα.
* γρ. διαρρεῖν.
* γρ. πόρων.
* γρ. αὐτοῖς.
* γρ. κινοῦντος.

καὶ τὰ μὲν ἄνω καταψύχεται, καὶ τὰ ἔξω, τὰ δ' ἐντὸς καὶ τὰ κάτω, θερμά, οἷον τὰ περὶ τοὺς πόδας, καὶ τὰ εἴσω. καίτοι τις ἀπορήσειεν ἄν, ὅτι μετὰ τὰ σιτία ἰσχυρότατος ὁ ὕπνος γίνεται, καὶ ἔστιν ὑπνωτικὸν ὁ οἶνος, καὶ ἄλλα * θερμότητα ἔχοντα τοιαῦτα. ἔστι δὲ οὐκ εὔλογον, τὸν μὲν ὕπνον εἶναι κατάψυξιν, τὰ δ' αἴτια τοῦ καθεύδειν, θερμά. πότερον οὖν τοῦτο συμβαίνει, ὅτι ὥσπερ ἡ κοιλία κενὴ μὲν οὖσα, θερμή ἐστιν· ἡ δὲ πλήρωσις αὐτὴν καταψύχει διὰ τὴν κίνησιν· οὕτω καὶ οἱ ἐν τῇ κεφαλῇ πόροι, καὶ τόποι, καταψύχονται ἀναφερομένης τῆς ἀναθυμιάσεως; ἢ ὥσπερ τοῖς προσχεομένοις τὸ θερμὸν ἐξαίφνης φρίκη γίνεται· κἀκεῖ ἀνιόντος τοῦ θερμοῦ, ἀθροιζόμενον τὸ ψυχρὸν καταψύχει, καὶ τὸ κατὰ φύσιν θερμὸν ποιεῖ ἐξαδυνατεῖν καὶ ὑποχωρεῖν; ἔτι δὲ πολλῆς ἐμπιπτούσης τροφῆς, ἣν ἀνάγει τὸ θερμόν, ὥσπερ τὸ πῦρ καταψύχεται ἐπιτιθεμένων τῶν ξύλων, ἕως ἂν καταπεφθῇ. γίνεται γὰρ ὁ ὕπνος, ὥσπερ εἴρηται, ἀναφερομένου τοῦ σωματώδους ὑπὸ τοῦ θερμοῦ διὰ τῶν φλεβῶν πρὸς τὴν κεφαλήν. ὅταν δὲ μηκέτι δύνηται, ἀλλὰ τῷ πλήθει ὑπερβάλλῃ τὸ ἀναχθέν, πάλιν ἀνταπωθεῖται, καὶ κάτω ῥεῖ. διὸ καταπίπτουσί τε, ὑποσπωμένου * τοῦ ἀνάγοντος θερμοῦ, οἱ ἄνθρωποι (μόνον γὰρ ὀρθὸν * τῶν ζῴων,) καὶ ἐπιπεσὸν μὲν, ἔκνοιαν ποιεῖ· ὕστερον δὲ, φαντασίαν. ἢ αἱ μὲν νῦν λεγόμεναι λύσεις, ἐνδεχόμεναι μέν εἰσι τοῦ γίνεσθαι τὴν κατάψυξιν· οὐ μὴν ἀλλὰ * κύριός γ' ἐστὶν ὁ τόπος ὁ περὶ τὸν ἐγκέφαλον, ὥσπερ ἐν ἄλλοις εἴρηται. πάντων δέ ἐστι τῶν ἐν τῷ σώματι ψυχρότατον ὁ ἐγκέφαλος· τοῖς δὲ μὴ ἔχουσι, τὸ ἀνάλογον τοῦτο μόριον. ὥσπερ οὖν τὸ ἀπατμίζον ὑγρὸν ὑπὸ τῆς τοῦ ἡλίου θερμότητος, ὅταν ἔλθῃ εἰς τὸν ἄνω τόπον, διὰ τὴν ψυχρότητα αὐτοῦ καταψύχεται, καὶ συστὰν καταφέρεται γενόμενον πάλιν ὕδωρ· οὕτως ἐν τῇ ἀναφορᾷ τοῦ θερμοῦ τῇ πρὸς τὸν ἐγκέφαλον, ἡ μὲν περιττωματικὴ ἀναθυμίασις, εἰς φλέγμα * συνέρχεται. διὸ καὶ οἱ κατάρροι φαίνονται γιγνόμενοι ἐκ τῆς κεφαλῆς· ἡ δὲ τρόφιμος καὶ μὴ νοσώδης, καταφέρεται συνισταμένη, καὶ καταψύχει τὸ θερμόν. πρὸς δὲ τὸ καταψύχεσθαι, καὶ μὴ δέχεσθαι ῥᾳδίως τὴν ἀναθυμίασιν, συμβάλλεται καὶ ἡ λεπτότης καὶ ἡ στενότης τῶν περὶ τὸν ἐγκέφαλον φλεβῶν. τῆς μὲν οὖν καταψύξεως τοῦτ' ἐστὶν αἴτιον, καίπερ τῆς ἀναθυμιάσεως ὑπερβαλλούσης τῇ θερμότητι. ἐγείρεται δ', ὅταν πεφθῇ, καὶ κρατήσῃ ἡ συνεωσμένη θερμότης ἐν ὀλίγῳ πολλὴ ἐκ τοῦ περιεστῶτος· καὶ διακριθῇ, τό, τε * σωματωδέστατον αἷμα, καὶ τὸ καθαρώτατον. ἔστι δὲ λεπτότατον μὲν αἷμα καὶ καθαρώτατον, τὸ ἐν τῇ κεφαλῇ· παχύτατον δὲ καὶ θολερώτατον, τὸ ἐν τοῖς κάτω μέρεσι. πάντος δὲ τοῦ αἵματος ἀρχή, ὥσπερ εἴρηται καὶ ἐνταῦθα, καὶ ἐν ἄλλοις, ἡ καρδία. τῶν δ' ἐν τῇ καρδίᾳ, ἑκατέρας τῆς θαλάμης κοινὴ ἡ μέση· ἐκείνων δ' ἑκατέρα δέχεται ἐξ ἑκατέρας τῆς φλεβός, τῆς τε μεγάλης καλουμένης, καὶ τῆς ἀορτῆς. ἐν δὲ τῇ μέσῃ, γίνεται ἡ διάκρισις. ἀλλὰ τὸ μὲν διορίζειν περὶ τούτων ἑτέρων * ἐστὶ λόγων οἰκειότερον. διὰ δὲ τὸ γίνεσθαι τὸ αἷμα μάλιστα μετὰ τὴν τῆς τροφῆς προσφορὰν ἀδιακριτώτερον, ὁ ὕπνος γίνεται, ἕως ἂν διακριθῇ τοῦ αἵματος, τὸ μὲν καθαρώτατον εἰς τὰ ἄνω, τὸ δὲ θολερώτατον εἰς τὰ κάτω. ὅταν δὲ τοῦτο συμβῇ, ἐγείρονται ἀπολυθέντα τοῦ ἐκ τῆς τροφῆς βάρους. τί μὲν οὖν τὸ αἴτιον τοῦ καθεύδειν εἴρηται,

* γρ. θερμότητα ἔχοντα.
* γρ. τοῦ θερμοῦ ἀνάγοντος.
* γρ. τῶν ἄλλων ζ.
* γρ. κυρίως.
* γρ. συνίσταται.
* γρ. σωματωδέστερον, & καθαρώτερον.

A quinetiam partes ſuperiores & extimæ frigēt: contrà inferiores & intimæ, vt pedes & quæ intrinſecus continentur, incaleſcunt. Quanquam cur ita, dubitabit aliquis, quòd à cibo profundiſſimus ſomnus obrepat, & vina ſoporifera ſint, & cetera quibus conſimilis caliditas adeſt. nec rationi conſonum eſſe videatur, vt ſomnus refrigeratio ſit, & cauſæ ſomni calidæ. Vtrùm igitur hoc eo accidit, quòd quemadmodum venter inanis calidus eſt, ſed cùm oppletur, motionis ratione refrigeſcit: ita meatus & loci in capite poſiti, euaporamento commeante refrigerantur? An quemadmodum aqua calida perfuſi, repentè inhorreſcimus: ita illic frigus aſcendente calore collectum, parteis eas refrigerat, & calorem naturalem debilitat, ac ſubterfugere cogit? B Præterea an quemadmodum congeſtu lignorum ignis reſtinguitur: ita multa alimonia, quam calor ſubuehit, ſuperioribus ſe immiſcente, calor naturalis elangueſcit, donec vtique illa concocta perfectáque ſit? Fit enim ſomnus, ſicuti dictum iam eſt, corpulēto quopiam vi caloris in ſublime per venas euecto: quod cùm diutius eo loci perſiſtere non poteſt, ſed copia exuperante aggrauatur; rurſum depelli, & ad ima fluere ſolet. quapropter & ipſi homines corruunt (animalium enim homo vnus erectus eſt) calore qui eleuandi munere fungebatur, ſubtracto. atque ſimul ac cor incidit, C mentem aufert, deinde imaginationes & viſa ſuggerit. An ſolutiones, quas modò dixi, cauſas continent, propter quas refrigeratio fieri poſſit, ſed tamen locus ille, qui circiter cerebrum habetur in ea re committenda principatum obtinet, vti alio loco diximus? Nam cerebrum, partium omnium corporis frigidiſſimum eſt: in iis verò quæ carent cerebro, id quod vicem eius tenet. Quemadmodum igitur cùm humor exhalat, & calore ſolis in ſublime fertur, vbi ſupernum aëris locum ſubierit, præ rigore loci refrigeratus cōſiſtit, ac denuo in aquam conuerſus in terram defluit: ita cùm calor ad cerebrum eleuatur, excrementitia diuaporatio in pituitam & ſaniem concreſcit (quamobrem & fluxiones ex capite oriri videmus) D alimentaria & non morbida conſiſtit deſcenditque, & feruorem cordis delapſa refrigerat atque moderatur. Ad refrigerationem verò & difficilem ſuſceptionem euaporationis, gracilitas & anguſtia venarum cōducit, quæ circa cerebrū ſunt. Hæc igitur cauſa eſt cur euaporatio etiam ſi immodicè caleat, refrigeretur. Expergiſcitur animal, quando abſoluta concoctio eſt, & calor qui ambientis frigoris opera ex amplo in arctum coierit, euicit, atque ſanguinem feculentum à ſyncero diſcernit. Eſt autem tenuiſſimus & puriſſimus ſanguis, qui in capite continetur: contrà craſſiſſimus & turbidiſſimus, qui partibus com- E mittitur inferioribus. Omnis autem ſanguinis origo, cor eſt: quemadmodum tum hîc tum alibi diximus. Ex tribus porro ventriculis qui habentur in corde, is qui in medio eſt, vtrique extremo communis exiſtit, atq; extremi ſpecus, ſanguinem ab vtraque vena, maiore & aorta, recipiunt: in medio autem ſinu, diſcriminatio illius fit. Sed de his aptius alio loco definitur, atque determinatur. Quoniam autem ſanguis maximè poſt ingeſtos cibos indiſcretus fit, tum ſomnus obrepit, & tandiu edurat quoad ſanguis purus ad parteis ſuperas, turbulentus ad inferas ſequeſtratus delegatuſque ſit: quo facto animantes ab onere cibi abſoluti, excitantur. Dictum eſt quæ cauſa dormiendi ſit.

inſiti ſcilicet corporis vniuerſim ad primum ſenſorium confugientis antiperiſtaſis, quæ corpulenti vaporis à natiuo calore ſubuecti opera prouenit: cum etiam quid ſit ſomnus, nempe nexus & vinculum primi ſenſorij, vt ſuo fungi munere non poſſit. Id quod neceſſariò quidem fit (nam animal eſſe non poteſt, niſi ea contingant, quibus ipſum perficiatur) at ſalutis gratia, quoniam quies animal tuetur atque conſeruat.

A ὅτι ἡ ἀπὸ τοῦ σωματώδους τοῦ ἀναφερομένου ὑπὸ τοῦ συμφύτου θερμοῦ ἀντιπερίστασις ἀθρόως ἐπὶ τὸ πρῶτον αἰσθητήριον· καὶ τί ἐστιν ὕπνος, καὶ ὅτι τοῦ πρώτου αἰσθητηρίου κατάληψις πρὸς τὸ μὴ δύνασθαι ἐνεργεῖν, ἐξ ἀνάγκης μὲν γινόμενον (οὐ γὰρ ἐνδέχεται ζῷον εἶναι, μὴ συμβαινόντων τῶν ἀπεργαζομένων αὐτό.) ἕνεκα δὲ σωτηρίας· σώζει γὰρ ἡ ἀνάπαυσις.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ ΕΝΥΠΝΙΩΝ.

ARISTOTELIS STAGIRITÆ, DE INSOMNIIS, LIBER.

Franciſco Vatablo interprete.

CAPVT I.

Cuinam animæ parti aſciſcendum inſomnium.

Poſt hæc de inſomniis quærendum eſt: ac primò quidem, qua vi animæ percipiantur: & vtrùm hæc affectio mentis ac intellectus, an ſenſus ſit. his enim viribus vnis earum quæ in nobis ſunt cognitionem rerum notitiámque aſſequimur. Ergo ſi functio aſpectus viſio eſt, & auditus auditio, & omnino ſenſus ſenſio: communia autem ſenſilia ſunt figura, motus, magnitudo, & cætera id genus, propria verò color, ſonus, & ſapor: nec fieri poteſt vt vllum animal clauſis oculis dormienſq; cernat, aut alio ſenſu percipiat: nos in ſomnô nihil ſentire certum eſt. Vnde fit, vt inſomnia nullo ſenſu noſcantur. Sed neque opinione comprehendi illa poſſunt. nam in ſomno non equum modò & hominem eſſe id quod ad nos accedit, pronuntiamus, ſed etiam album & pulchrum: quorum nullum opinio abſque ſenſu nec verè nec falsò dixerit. At animam hoc idem facere contingit. ex æquo enim hominem & album eum eſſe qui occurrit, diſcernere videmur. Ad hæc, præter inſomnia, aliud quiddam intelligere ſolemus. Quemadmodum enim vigilando ſentientes aliquid, plerumque etiam aliud de re quæ ſenſum ferit, conſideramus, ita dormiendo, præter viſa, interdum alia quædam mens noſtra cogitat. Quod facilè patebit, ſi quis mentem ad ſomnia conuertat, & recurrere ea quoties exurgit, enitatur. Immò iam quidam inſomnia experti ſunt eiuſmodi: nimirum qui præceptionem colendæ memoriæ ſequentes, pronuntiata quibuſdam locis conſtituere ſibi videbantur: eis enim ſæpenumero accidit, vt aliud quiddam præter ſomnium, nempe viſum phãtaſmaque aliquod, in comparato diſpoſitóq; loco ante conſpectũ collocarent. Vnde

ΚΕΦΑΛ. α΄.

B Ὅτι τὰ ἐνύπνια οὐκ ἔστι πάθος τοῦ αἰσθητικοῦ μέρους, ἁπλῶς, οὐδὲ τοῦ νοητικοῦ, ἀλλὰ τοῦ αἰσθητικοῦ ἢ φανταστικοῦ ἐστι.

Μετὰ δὲ ταῦτα, περὶ ἐνυπνίου ἐπιζητητέον, καὶ πρῶτον τίνι τῶν τῆς ψυχῆς φαίνεται· καὶ πότερον τοῦ νοητικοῦ τὸ πάθος ἐστὶ τοῦτο, ἢ τοῦ αἰσθητικοῦ· τούτοις γὰρ μόνοις τῶν ἐν ἡμῖν γνωρίζομέν τι· εἰ δὲ χρῆσις ὄψεως, ὅρασις· καὶ ἀκοῆς τὸ ἀκούειν, καὶ ὅλως αἰσθήσεως τὸ αἰσθάνεσθαι· κοινὰ δ' ἐστὶ τῶν αἰσθήσεων, οἷον σχῆμα, καὶ κίνησις, καὶ μέγεθος, καὶ τἆλλα τὰ τοιαῦτα· ἴδια δὲ, οἷον χρῶμα, ψόφος, χυμός· ἀδύνατεῖ δὲ πάντα μύοντα καὶ καθεύδοντα ὁρᾶν, ὁμοίως δὲ καὶ ἐπὶ τῶν λοιπῶν· ὥστε δηλονότι καὶ οὐκ αἰσθανόμεθα οὐδὲν ἐν τοῖς ὕπνοις. οὐκ ἄρα γε τῇ αἰσθήσει τὸ ἐνύπνιον αἰσθανόμεθα. ἀλλὰ μὴν οὐδὲ τῇ δόξῃ· οὐ γὰρ μόνον τὸ προσιόν φαμεν ἄνθρωπον ἢ ἵππον εἶναι, ἀλλὰ καὶ λευκὸν ἢ καλόν· ὧν ἡ δόξα ἄνευ αἰσθήσεως, οὐδὲν ἂν φήσειεν, οὔτ' ἀληθῶς, οὔτε ψευδῶς. ἐν δὲ τοῖς ὕπνοις συμβαίνει τὴν ψυχὴν τοῦτο ποιεῖν. ὁμοίως γὰρ ὅτι ἄνθρωπος, καὶ ὅτι λευκὸς ὁ προσιὼν, δοκοῦμεν ὁρᾶν. ἔτι παρὰ τὸ ἐνύπνιον ἐννοοῦμεν ἄλλο τι, καθάπερ ἐν τῷ ἐγρηγορέναι αἰσθανόμενοί τι· περὶ οὗ γὰρ αἰσθανόμεθα, πολλάκις καὶ διανοούμεθά τι. οὕτω καὶ ἐν τοῖς ὕπνοις παρὰ τὰ φαντάσματα, ἐνίοτε ἄλλα ἐννοοῦμεν. φανείη δ' ἄν τῳ τοῦτο, εἴ τις προσέχοι τὸν νοῦν, καὶ πειρῷτο μνημονεύειν ἀναστάς. ἤδη δέ τινες καὶ ἑωράκασιν ἐνύπνια τοιαῦτα, οἷον οἱ δοκοῦντες κατὰ τὸ μνημονικὸν παράγγελμα τίθεσθαι τὰ προβαλλόμενα· συμβαίνει γὰρ αὐτοῖς πολλάκις, ἄλλο τι παρὰ τὸ ἐνύπνιον τίθεσθαι πρὸ ὀμμάτων εἰς τὸν τόπον φάντασμα. ὥστε

A δῆλον ὅτι οὔτε ἐνύπνιον πᾶν τὸ ἐν ὕπνῳ φάντασμα, καὶ ὅτι ὃ ἐννοοῦμεν, τῇ δόξῃ δοξάζομεν. δῆλον δὲ καὶ περὶ τούτων ἁπάντων [εἰς] τοσοῦτον, ὅτι τὸ αὐτό ᾧ καὶ ἐγρηγορότες ἐν ταῖς νόσοις ἀπατώμεθα· ὅτι τοῦτ' αὐτὸ καὶ ἐν τῷ ὕπνῳ ποιεῖ τὸ πάθος. καὶ ὑγιαίνουσι δὲ καὶ εἰδόσιν, ὅμως ὁ ἥλιος ποδιαῖος εἶναι δοκεῖ. * ἀλλ' εἴτε τὸ αὐτό, εἴθ' ἕτερον τὸ φανταστικὸν τῆς ψυχῆς καὶ τὸ αἰσθητικόν, οὐδὲν ἧττον οὐ γίνεται ἄνευ τοῦ ὁρᾶν καὶ αἰσθάνεσθαί τι. τὸ γὰρ παρορᾶν καὶ παρακούειν, ὁρῶντος ἀληθές τι καὶ ἀκούοντος, τοῦτο δ' οὐχ ὃ οἴεται. ἐν δὲ τῷ ὕπνῳ ὑπόκειται μήτε ὁρᾶν, μήτ' ἀκούειν, μήθ' ὅλως αἰσθάνεσθαι. B ἆρ' οὖν τὸ μὲν μηδὲν ὁρᾶν ἀληθές· τὸ δὲ μηδὲν πάσχειν τὴν αἴσθησιν, οὐκ ἀληθές. ἀλλ' ἐνδέχεται καὶ τὴν ὄψιν πάσχειν τι, καὶ τὰς ἄλλας αἰσθήσεις· ἕκαστον δὲ τούτων, ὥσπερ ἐγρηγορότος προσβάλλει μέν πως τῇ αἰσθήσει· οὐχ οὕτω δὲ ὥσπερ ἐγρηγορότος. καὶ ὁτὲ μὲν ἡ δόξα λέγει ὅτι ψεῦδος τὸ ὁρώμενον, ὥσπερ * ἐγρηγορόσιν· ὁτὲ δὲ κατέχεται καὶ ἀκολουθεῖ τῷ φαντάσματι. ὅτι μὲν οὖν οὐκ ἔστι τοῦ δοξάζοντος, οὐδὲ τοῦ διανοουμένου τὸ πάθος τοῦτο, ὃ καλοῦμεν ἐνυπνιάζειν, φανερόν· ἀλλ' οὐδὲ τοῦ αἰσθανομένου ἁπλῶς· ὁρᾶν γὰρ ἂν [ἦν] καὶ ἀκούειν ἁπλῶς. ἀλλὰ πῶς * δεῖ καὶ τίνα τρόπον, ἐπισκεπτέον. C ὑποκείσθω μὲν οὖν ὅπερ ἐστὶ καὶ φανερόν, ὅτι τοῦ αἰσθητικοῦ τὸ πάθος, εἴπερ καὶ ὁ ὕπνος· οὐ γὰρ ἄλλῳ μέν τινι τῶν ζῴων ὑπάρχει ὁ ὕπνος, ἄλλῳ δὲ τὸ ἐνυπνιάζειν, ἀλλὰ τῷ αὐτῷ. ἐπεὶ δὲ περὶ φαντασίας ἐν τοῖς περὶ ψυχῆς εἴρηται, καὶ ἔστι μὲν τὸ αὐτὸ τῷ αἰσθητικῷ τὸ φανταστικόν, τὸ δ' εἶναι φανταστικῷ καὶ αἰσθητικῷ ἕτερον· ἔστι δὲ φαντασία, ἡ ὑπὸ τῆς κατ' ἐνέργειαν αἰσθήσεως γινομένη κίνησις· τὸ δ' ἐνύπνιον φάντασμά τι φαίνεται εἶναι· τὸ γὰρ ἐν ὕπνῳ φάντασμα, ἐνύπνιον λέγομεν, εἴθ' ἁπλῶς, εἴτε τρόπον τινὰ γινόμενον· D φανερὸν ὅτι τοῦ αἰσθητικοῦ μέν ἐστι τὸ ἐνυπνιάζειν, τούτου δὲ ᾗ τὸ φανταστικόν.

* γρ. [illegible]

* For. ἐγρηγορότως vt modò niſi ἁπλῶς dictum velit.

* γρ. δεῖ

ΚΕΦΑΛ. β΄.

Ὅτι τὰ ἐνύπνια ἐξ εἰσόδου ποτὲ γνώσεως τῶν αἰσθητῶν ἐγγίνεται· καὶ ὅτι ταχὺ τὰ αἰσθητήρια καὶ μικρᾶς διαφορᾶς αἰσθάνεται· ἔτι ὅτι οὐ μόνον πάσχει ἡ ὄψις, ἀλλὰ καὶ ποιεῖ τι, καὶ ἔξω ἀφίησι. καὶ ὅτι ῥᾳδίως ἀπατώμεθα περὶ τὰς αἰσθήσεις ἐν τοῖς πάθεσιν ὄντες ψυχῆς τε καὶ σώματος.

Τί δ' ἐστὶ τὸ ἐνύπνιον, καὶ πῶς γίνεται, ἐκ τῶν περὶ τὸν ὕπνον συμβαινόντων μάλιστ' ἂν * θεωρήσαιμεν· E τὰ γὰρ αἰσθητὰ καθ' ἕκαστον αἰσθητήριον, ἡμῖν ἐμποιοῦσιν αἴσθησιν· καὶ τὸ γινόμενον ὑπ' αὐτῶν πάθος, οὐ μόνον ἐνυπάρχει ἐν τοῖς αἰσθητηρίοις, ἐνεργουσῶν τῶν αἰσθήσεων, ἀλλὰ καὶ ἀπελθουσῶν. παραπλήσιον γὰρ τὸ πάθος ἐπί τε τούτων καὶ ἐπὶ τῶν * φερομένων ἔοικεν εἶναι. καὶ γὰρ ἐπὶ τῶν φερομένων τοῦ κινήσαντος οὐκέτι θιγγάνοντος κινεῖται· τὸ γὰρ κινῆσαν, ἐκίνησεν ἀέρα τινά, καὶ πάλιν οὗτος κινούμενος ἕτερον. καὶ τοῦτον δὴ τὸν τρόπον, μέχριπερ ἂν οὗ στῇ, ποιεῖται τὴν κίνησιν καὶ ἐν ἀέρι, καὶ ἐν τοῖς ὑγροῖς. ὁμοίως δὲ ὑπολαβεῖν τοῦτο δεῖ καὶ ἐπὶ ἀλλοιώσεως. τὸ γὰρ θερμανθὲν ὑπὸ τοῦ θερμοῦ, τὸ πλησίον θερμαίνει, καὶ τοῦτο διαδίδωσιν ἕως

* γρ. γνωριεῖμεν.

* γρ. φερομένων.

liquere arbitror, non quicquid in ſomno videmus, inſomnium eſſe: & nos intelligere, quæ opinione opinamur. Porro de his omnibus illud conſtat, hoc idem quo ægri in vigilia fallimur, facere vt in ſomno decipiamur. Sed & nobis quanquam ſani ſumus, atque adeo videntes, tamen ſol pedaneus eſſe videtur. Cæterùm ſiue imaginandi vis animæ eadem ad numerum cum ſenſoria ſit, ſiue diuerſa habeatur, nihilominus hoc ſine viſione aut ſenſione aliqua non ſit. nam hallucinari & obaudire dicitur, qui verum quidem aliquid videt & audit, non tamen, id quod ſe videre & audire putat. At in ſomno poſitū eſt, neque videri quicquam, neque audiri, neq; omnino ſentiri. Num igitur quāuis nihil tunc cerni atque ſentiri verum ſit, tamē nullo modo ſenſum affici verum non eſt: ſed & viſum & cæteros ſenſus pati aliquid cōtingit? Nam ſinguli horum, in ſomno principem ſenſum haud magnopere ſecius atque in vigilia, non ſic autem vt in illa, formis ſenſilibus appetunt, feriūt, laceſſunt. Quin etiam interdum opinio ipſa, quæ viſa ſunt, ea falſa eſſe, vt in vigilia, dicit: interdum obligatur, & ſpectra quaſi vera ſint, proſequi aſſolet. Conſtat igitur, hanc affectionem quam ſomniare dicimus, neque ad opinantem, neque ad intelligentem pertinere. Sed ne ad ſentientem quidem ſimpliciter. nam alioqui videre ſimpliciter & audire eſſet. Cæterùm quomodo & qualiter ad iſtum referri queat, conſiderandum eſt. Ponamus igitur, id quod etiam clariſſimum eſt, inſomnium ſenſoriæ partis affectionem eſſe. nam & ſomnus ad eandem pertinet. nec enim animantium alteri ſomnus, inſomnium alteri, ſed eidem vtrumque competit. Cùm verò de imaginatione & phantaſia tractatum in libris de Anima ſit, & imaginandi vis eadem numero ſit cum potentia ſentiendi, quamuis eſſentia ratioréque differant, imaginatio autem ſit motio à ſenſu, actu proueniens, inſomnium verò ſpectrum quoddam & phantaſma eſſe videatur (nam viſum ipſum quod in ſomno apparet, inſomnium dicimus, ſiue illud ſimpliciter, ſiue quodammodo contingat) palam vtique eſt, inſomnia ſenſoriæ partis eſſe, ſed quatenus imaginaria eſt.

CAPVT II.

Vt doceat quid ſit inſomnium & quomodo fiant inſomnia, hypotheſes quaſdam priùs ponit ac pluribus explicat, quas mox ad inſtitutam quæſtionem accommodabit.

QVid autem ſit inſomnium, & qua ratione fiat: ex iis maximè cognoſci poteſt, quæ in ſomno accidunt. Etenim ſenſilia ipſa in nobis, per ſingula ſenſoria ſenſionem efficiunt: & affectio quam ea inuehunt, non modò in ſenſoriis ineſt, cùm ſenſus agunt, ſed etiam cùm ab opera diſceſſere. nam perinde hîc, atque in iis quæ lationem ſubeūt, euenire videtur. etenim quæ lationē ſubeunt, eo quod propulit, non ampliùs tangente, ciētur. quod enim mouendi officio functum eſt, quandam aëris particulam propulit: quæ cùm mouetur, ſubinde aliam ciet. atque hoc vtique pacto, donec quieſcant, moueri aër & aqua ſolēt. Conſimiliter & hoc quoque in alteratione fieri putandum eſt. illud enim quod calentis rei opera incaluit, quod ſibi vicinum eſt, calefacit; penetrátq; ſucceſſio hæc ad id vſque

quod primum calefieri poteſt. Quare & ei cui ſentiendi facultas commiſſa eſt, hoc idem accidere neceſſe eſt: cùm ſenſum, qui in actu conſtitutus ſit, alterationem eſſe quandam conſtet. Quocirca affectio ipſa, in opificus ſenſuum, nõ modò ſentientibus illis, ſed etiam quieſcentibus, tam per ſumma quàm in imo ſeruari ſolet: id quod quoties continenter quippiã ſentimus, liquidò percipi poteſt. Nã ſi ſenſum ipſum ab eo ad aliud, vt de ſole in opacũ conuertamus, comitatur eum affectio. euenit enim vt nihil cernat: proptereà quòd commotio, quæ à lumine profecta eſt, oculos adhuc poſſideat. Item ſi quod albũ aut viride diutius aſpexerimus, ad quodcumque aſpectum noſtrum deflectamus, concolor illi videtur. Sed & ſi oculos contra ſolem, aut aliquid aliud quod fulgeat, intẽderimus, deinde conniueamus: per rectam lineam qua aſpectum cernere contingit, primùm tale obſeruantibus apparet, quale reuera eſt: tum ſe in puniceum conuertit, proximè in purpureum, donec ad atrum perueniat, exoleſcatque. Quinetiã ſi qui obtutus ſuos ab hiſce quæ mouentur: vt ab amnibus, præſertim ocyſſimè labentibus, aliò transferant: quæ ſtant, moueri videntur. Iidem porrò ab ingentibus ſonis ſurdaſtri redduntur, & ab odoribus vehementibus ægerrimè olfaciunt: atque ita in ſimilibus ſtatuendum eſt. Quæ omnia apertè hoc eueniunt modo. Quòd autem celeriter ſenſoria ipſa vel tenues differentias ſentiant, indicio eſt, id quod in ſpeculis fieri ſolet: de cuius ratione ſeorſim dicato opere, conſiderare quis & addubitare poſſit. Et inſuper ex eodem facilè conſtat, viſum vt pati, ita etiam agere aliquid ſolere. Nam cùm mulieres tempore menſium à ſpeculis admodum nitidis aliquod inſpectant, tunc ſuperficies ſpeculi quadam velyti nebula ſanguinis obducitur: atque ſi nouitium ſpeculum ſit, haud facile eſt eiuſmodi maculam abſtergere: ſin pervetus, facile. Cauſa autem eſt, ſicuti iam diximus, quòd non ſolùm ab aëre viſus quippiam patitur, ſed etiam in aërem quippiam agit, atque eundem mouet, perinde atque ſplendida. nam viſus, de genere ſplendidorum & habentium colorem eſt. Hoc igitur tempore quo menſes profluũt, eodem modo oculos, quo quamlibet aliam corporis particulam affici, ratione optima euenit. quandoquidem ſuapte natura venulenti ſunt. Quocirca tempore menſtrualis profluuij, quod commotione & inflammatione ſanguinis prouenit, diſcrimen in oculis habetur, quod quamuis nobis incuidens ſit (eſt enim natura ſeminis & menſium eadem) reuera tamen in eiſdem eſt. Ab ipſis autem menſibus qui ad oculos penetrarunt, aër mouetur & inficitur: aër infectus, alium aërem qui ſpeculo proximus eſt, ſibi hærentem inficit, & talem qualis ipſe eſt, reddit à quo poſtremùm, ſpeculo eluuiecula quædam allinitur. Nam ſpecula, haud ſecus quàm mundiſſimæ veſtes, celerrimè notam aliquam contrahunt. quod enim mundum eſt atque purum, exactè commonſtrat quicquid exceperit, & potiſſimùm minimos motus: æs verò, quod leue terſúmque ſit, qualemcumque tactum maximè ſentit. Scire autem oportet, tactum, aëris eſſe quandam veluti attritionem, deterſionémque & ablutionem, atque eundem, quantuluſcumque ſit, conſpicuum propter ſpeculi puritatem reddi. Cur verò maculæ nouis ſpeculis inductæ difficilè eluantur, cauſa eſt, quòd ea pura ſunt & terſa. nam maculæ ſeſe per talia & in profundum, & in omnes partes diffundunt. in profundum, quòd pura ſint: in omnes partes, quòd terſa. In vetuſtis autem maculæ non permanent, quia non tam altè figuntur,

A τῆς ἀρχῆς. ὥστε καὶ ἐν ᾧ τὸ αἰσθάνεσθαι, ἐπειδὴ ἐστὶν ἀλλοίωσίς τις ἡ κατ' ἐνέργειαν αἴσθησις, ἀνάγκη τοῦτο συμβαίνειν. διὸ τὸ πάθος * οὐκ ἐν μόνον ἐν αἰσθανομένοις τοῖς αἰσθητηρίοις,* ἀλλὰ καὶ ἐν πεπαυμένοις, καὶ ἐν βάθει, καὶ ἐπιπολῆς. φανερὸν δὲ, ὅταν συνεχῶς αἰσθανώμεθά τι· μεταφερόντων γὰρ τὴν αἴσθησιν, ἀκολουθεῖ τὸ πάθος, οἷον ἐκ τοῦ ἡλίου εἰς τὸ σκότος· συμβαίνει γὰρ μηδὲν ὁρᾶν, διὰ τὴν ἔτι ὑπάρχουσαν κίνησιν ἐν τοῖς ὄμμασιν ὑπὸ τοῦ φωτός. κἂν πρὸς [ἓν] χρῶμα πολὺν χρόνον * βλέψωμεν ἢ λευκὸν ἢ χλωρὸν, τοιοῦτον φαίνεται * ἐφ' ὅπερ ἂν τὴν ὄψιν μεταβάλλωμεν. κἂν πρὸς τὸν ἥλιον * βλέψαντες, ἢ ἄλλο B τι λαμπρὸν μύσωμεν, * παρατηροῦσι φαίνεται κατ' εὐθυωρίαν, ᾗ συμβαίνει τὴν ὄψιν ὁρᾶν, πρῶτον μὲν τοιοῦτον τὴν χρόαν, εἶτα μεταβάλλει εἰς φοινικοῦν, κἄπειτα πορφυροῦν, ἕως ἂν εἰς τὴν μέλαιναν ἔλθῃ χρόαν, καὶ ἀφανισθῇ. * καὶ ἀπὸ τῶν κινουμένων δὲ, μεταβάλλουσιν, οἷον ἀπὸ τῶν ποταμῶν, μάλιστα δὲ ἀπὸ τῶν τάχιστα ῥεόντων. φαίνεται γὰρ τὰ ἠρεμοῦντα κινούμενα. γίνονται δὲ καὶ ἀπὸ τῶν μεγάλων ψόφων δύσκωφοι, καὶ ἀπὸ τῶν ἰσχυρῶν ὀσμῶν δυσοσμοὶ, καὶ ἐπὶ τῶν ὁμοίων. ταῦτα δὲ φανερῶς συμβαίνει τοῦτον τὸν τρόπον. ὅτι δὲ ταχὺ τὰ αἰσθητήρια καὶ μικρᾶς διαφορᾶς αἰσθάνεται, σημεῖον τὸ ἐπὶ τῶν ἐνόπτρων γινό- C μενον· περὶ οὗ κἂν καθ' αὐτὸν ἐπιστήσας, σκέψαιτό τις ἅμα καὶ διαπορήσειεν. ἅμα δὲ ἐξ αὐτοῦ δῆλον, ὅτι ὥσπερ καὶ ἡ ὄψις πάσχει, οὕτω καὶ ποιεῖ τι. ἐν γὰρ τοῖς ἐνόπτροις τοῖς σφόδρα * καθαροῖς, ὅταν τῶν καταμηνίων ταῖς γυναιξὶ γινομένων, ἐμβλέψωσιν εἰς τὸ κάτοπτρον, γίνεται τὸ ἐπιπολῆς τοῦ ἐνόπτρου, οἷον νεφέλη αἱματώδης. κἂν μὲν καινὸν ᾖ τὸ κάτοπτρον, οὐ ῥᾴδιον ἐκμάξαι τὴν τοιαύτην κηλῖδα, ἐὰν δὲ παλαιὸν, ῥᾷον. αἴτιον δὲ, ὥσπερ εἴπομεν, ὅτι οὐ μόνον πάσχει τι ἡ ὄψις ὑπὸ τοῦ ἀέρος, ἀλλὰ καὶ ποιεῖ τι καὶ κινεῖ, ὥσπερ καὶ τὰ λαμπρά· καὶ γὰρ ἡ ὄψις τῶν λαμπρῶν, καὶ ἐχόντων χρῶμα. τὰ μὲν οὖν ὄμματα εὐλόγως, ὅταν ᾖ τὰ κα- D ταμήνια, διάκειται, ὥσπερ καὶ ἕτερον μέρος ὁτιοῦν [σώματος·] καὶ γὰρ φύσει τυγχάνουσι φλεβώδεις ὄντες. διὸ γινομένων τῶν καταμηνίων, διὰ ταραχὴν καὶ φλεγμασίαν αἱματικὴν, ἡμῖν μὲν ἡ ἐν τοῖς ὄμμασι διαφορὰ ἄδηλος, ἔνεστι δέ· ἡ γὰρ αὐτὴ φύσις σπέρματος καὶ καταμηνίων. ὁ δὲ ἀὴρ κινεῖται ὑπ' αὐτῶν, καὶ τὸν ἀπὸ τῶν κατόπτρων ἀέρα συνεχῆ ὄντα, ποιόν τινα ποιεῖ, καὶ τὸ τοιοῦτον οἷον αὐτὸς πάσχει· ὁ δὲ τοῦ κατόπτρου τὴν ἐπιφάνειαν. ὥσπερ δὲ τῶν ἱματίων τὰ μάλιστα καθαρὰ τάχιστα κηλιδοῦται. τὸ γὰρ καθαρὸν ἀκριβῶς δηλοῖ ὅ,τι ἂν δέξηται, καὶ μάλιστα τὰς ἐλαχίστας κινήσεις. ὁ δὲ χαλκὸς, διὰ μὲν τὸ E λεῖος τὸ εἶναι, ὁτιοῦν ἁφῆς αἰσθάνεται μάλιστα. δεῖ δὲ νοῆσαι οἷον τρίψιν οὖσαν τὴν τοῦ ἀέρος ἁφὴν, καὶ ὥσπερ ἐκμάξιν καὶ ἀνάπλυσιν. διὰ δὲ τὸ καθαρὸν, ἔκδηλος γίνεται ὁπηλικονοῦν οὖσα. τοῦ δὲ μὴ ἐξιέναι ταχέως ἐκ τῶν καινῶν κατόπτρων, αἴτιον, τὸ καθαρὸν εἶναι καὶ λεῖον· διαδύεται γὰρ διὰ τῶν τοιούτων καὶ εἰς βάθος, καὶ πάντῃ· διὰ μὲν τὸ καθαρὸν, εἰς βάθος· διὰ δὲ τὸ λεῖον, πάντῃ. ἐν δὲ τοῖς παλαιοῖς οὐκ ἐμμένει, ὅτι οὐχ ὁμοίως εἰσδύεται ἡ κηλὶς,

* Vulgò, οὐκ ἐνόντος, ἐν μ. temerè in cõtextum admiſſa, falſiſſima & ineptiſſima gloſſa. vide Themiſt.

* χ. ἀλλὰ & πεπαυμένοις.

* χ. βλέψωμεν.

* χ. [illegible] apud Themiſt. [illegible]

* χ. βλέψαντες.

* χ. [illegible]

* χ. [illegible] & Themiſt. [illegible] μεταβάλλει.

* χ. φανεροῖς, non rectè.

ἀλλ' ἐπιπολαιότερον. ὅτι μὲν οὖν καὶ ἀπὸ τῶν μικρῶν διαφορῶν γίνεται ἡ κίνησις, [ἔτι δὲ] καὶ ὅτι ταχεῖα ἡ αἴσθησις, καὶ ὅτι οὐ μόνον πάσχει, ἀλλὰ καὶ ἀντιποιεῖ τὸ τῶν χρωμάτων αἰσθητήριον, φανερὸν ἐκ τούτων. μαρτυρεῖ δὲ τοῖς εἰρημένοις καὶ τὰ περὶ τοὺς οἴνους καὶ τὴν μυρεψίαν συμβαίνοντα· τὸ γὰρ παρασκευασθὲν ἔλαιον ταχέως λαμβάνει τὰς τῶν πλησίον ὀσμάς, καὶ οἱ οἶνοι ταὐτὸ τοῦτο πάσχουσιν· οὐ γὰρ μόνον τῶν ἐμβαλλομένων ἢ ἀποκιρναμένων, ἀλλὰ καὶ τῶν πλησίον τοῖς ἀγγείοις τιθεμένων, ἢ πεφυκότων ἀναλαμβάνουσι τὰς ὀσμάς. πρὸς δὲ τὴν ἐξ ἀρχῆς σκέψιν, ὑποκείσθω, ἓν μέν, ὅπερ ἐκ τῶν εἰρημένων φανερόν, ὅτι καὶ ἀπελθόντος τοῦ θύραθεν αἰσθητοῦ ἐμμένει τὰ αἰσθήματα αἰσθητὰ ὄντα. πρὸς δὲ τούτοις, ὅτι ῥᾳδίως ἀπατώμεθα περὶ τὰς αἰσθήσεις ἐν τοῖς πάθεσιν ὄντες· ἄλλοι δ' ἐν ἄλλοις, οἷον ὁ δειλὸς ἐν φόβῳ, ὁ δ' ἐρωτικὸς ἐν ἔρωτι· ὥστε δοκεῖν ἀπὸ μικρᾶς ὁμοιότητος, τὸν μὲν τοὺς πολεμίους ὁρᾶν, τὸν δὲ τὸν ἐρώμενον· καὶ ταῦτα ὅσῳ ἂν ἐμπαθέστερος ᾖ, τοσούτῳ ἀπ' ἐλάττονος ὁμοιότητος φαίνεται. τὸν αὐτὸν δὲ τρόπον καὶ ἐν ὀργαῖς, καὶ ἐν πάσαις ἐπιθυμίαις, εὐαπάτητοι γίνονται πάντες, καὶ μᾶλλον ὅσῳ ἂν μᾶλλον ἐν τοῖς πάθεσιν ὦσι. διὸ καὶ τοῖς πυρέττουσιν ἐνίοτε φαίνεται ζῷα ἐν τοῖς τοίχοις, ἀπὸ μικρᾶς ὁμοιότητος τῶν γραμμῶν συντιθεμένων. καὶ ταῦτ' ἐνίοτε συνεπιτείνει τοῖς πάθεσιν οὕτως, ὥστ' ἂν μὲν μὴ σφόδρα κάμνωσι, μὴ λανθάνειν ὅτι ψεῦδος, ἂν δὲ μεῖζον ᾖ τὸ πάθος, καὶ κινεῖσθαι πρὸς αὐτά. αἴτιον δὲ τοῦ συμβαίνειν ταῦτα, τὸ μὴ κατὰ τὴν αὐτὴν δύναμιν κρίνειν τό τε κύριον, καὶ ἐν ᾧ τὰ φαντάσματα γίνεται. τούτου δὲ σημεῖον, ὅτι φαίνεται μὲν ὁ ἥλιος ποδιαῖος. ἀντίφησι δὲ πολλάκις ἕτερόν τι πρὸς τὴν φαντασίαν. καὶ τῇ ἐπαλλάξει τῶν δακτύλων τὸ ἓν δύο φαίνεται· ἀλλ' ὅμως οὔ φαμεν δύο. κυριωτέρα γὰρ τῆς ἁφῆς ἡ ὄψις. εἰ δ' ἦν ἡ ἁφὴ μόνη, κἂν ἐκρίνομεν τὸ ἓν δύο. τοῦ δὲ * διεψεῦσθαι αἴτιον, ὅτι οὐ μόνον τοῦ αἰσθητοῦ κινουμένου φαίνεται ἅ δή ποτε, ἀλλὰ καὶ τῆς αἰσθήσεως κινουμένης αὐτῆς, ἐὰν ὡσαύτως κινῆται, ὥσπερ ὑπὸ τοῦ αἰσθητοῦ. λέγω δὲ οἷον ἡ γῆ δοκεῖ τοῖς πλέουσι κινεῖσθαι, κινουμένης τῆς ὄψεως ὑπ' ἄλλου.

γρ. διαψεύδεσθαι

ΚΕΦΑΛ. Δ.

Ὅτι οὐ μόνον ἐγρηγορότων αἱ κινήσεις αἱ ἀπὸ τῶν αἰσθημάτων γινόμεναι, ἀλλὰ καὶ ἐν ὕπνῳ φαίνονται· καὶ ὅτι διὰ σφοδρὰν ἐξ ἀναθυμιάσεως πνεύματος ἢ αἵματος κίνησιν, ἢ οὐ φαίνεται ἐνύπνιον, ἢ τεταραγμένον· ἠρεμίας δὲ οὔσης, καθαρόν. Ἔτι πῶς ἀπατῶνται διὰ τὰ ἐνύπνια οἱ καθεύδοντες. Ἐνύπνιον, τί. Διὰ τί οἱ μὲν μηδέποτε κατὰ τὸν βίον, οἱ δὲ προελθοῦσιν ἤδη τῆς ἡλικίας, οὔ ποτε πρότερον ἑωρακότες ἐνύπνια, ὁρῶσιν.

Ἐκ δὴ τούτων φανερόν, ὅτι οὐ μόνον ἐγρηγορότων αἱ κινήσεις αἱ ἀπὸ τῶν αἰσθημάτων γινόμεναι τῶν τε θύραθεν, καὶ τῶν ἐκ τοῦ σώματος ἐνυπαρχουσῶν, ἀλλὰ καὶ ὅταν γένηται τὸ πάθος τοῦτο, ὃ καλεῖται ὕπνος, καὶ μᾶλλον τότε φαίνονται. μεθ' ἡμέραν μὲν γὰρ ἐκκρούονται, ἐνεργουσῶν τῶν αἰσθήσεων καὶ τῆς διανοίας, καὶ ἀφανίζονται ὥσπερ παρὰ πολὺ πῦρ ἔλαττον καὶ λῦπαι καὶ ἡδοναὶ μικραὶ παρὰ μεγάλας. παυσαμένων δέ, ἐπιπολάζει καὶ τὰ μικρά. νύκτωρ δέ, δι' ἀργίαν τῶν κατὰ μόριον αἰσθήσεων, καὶ ἀδυναμίαν τοῦ ἐνεργεῖν,

A ſed eminentiuſculè. Tenues igitur differentias excitare, vellicaréque ſenſum, & celeriter ab eodem internoſci, item non modò pati ſenſorium quo natura colorum percipitur, ſed etiam viciſſim agere, ex hiſce conſtat. Iis quæ diximus aſtipulatur, quod circa vina & vnguenta accidere videmus. Nam oleum quod vnguento additur, celeriter odores earum rerum quæ in propinquo ſunt, ebibit. Vina quoque hoc idem faciunt: quippe quæ non modò earum rerum quæ induntur admiſcentúrque odores in ſe trahant, ſed etiam earum rerum quæ prope dolia aut locantur aut naſcuntur. Ad eam verò conſiderationem quæ nobis initio inſtituta
B eſt, vnum ſupponatur, quod & patêre poteſt ex iis quæ dicta ſunt, abeuntibus externis ſenſilibus, ſenſa quæ & ipſa quoque ſenſilia ſunt, remanere. Item facilè decipi circa ſenſus, homines in aliquo affectu poſitos, atque alios in alio, vt meticuloſum in metu, amatorem in amore, adeo vt ex tenui ſimilitudine, alter hoſtes ſe videre putet, alter quem amat. Et quo quis vtique arctiùs ipſo affectu poſſidetur, eo leuiori ſimilitudine talia ſeſe illi offerunt. Eodem modo & qui ira, & qui demum quacumque alia cupiditate rapiuntur, facilè circumſcribi ſolet: ac tanto quidem procliuiùs, quanto magis libidine ipſa ducuntur. Vnde etiam fit vt febrientes interdum animalia quædam in parietinis videre videan-
C tur, exigua ſimilitudine permoti, quam lineamenta quædam congeſta prætendunt. Atque hic error quandoque vnà cum morbo inualeſcit, ita vt cùm leuiter ægrotant, ſe falſos haberi agnoſcant: cùm verò grauiùs, minimè, ſed ipſis quoque viſis ducantur. Cauſa verò quamobrem hæc fiant, ea eſt: quòd id quod primatū obtinet, & id in quo phātaſmata fiunt, non eadem vi iudicant. Cuius rei ſignum eſt, quòd cùm ſol appareat pedalis, ſępe aliud quippiam phantaſiæ contradicit. Item perplexis digitis, quamuis quòd vnum eſt, duo appareat, tamen eſſe duo neutiquam dicimus: quia viſus, ſuperior optimatiórque tactu eſt. Quòd ſi ſolus ta-
D ctus eſſet, duo eſſe quod vnum eſt iudicaremus. Cauſa autem circumuentionis ea eſt, quoniam non tantùm quoties ſenſile mouetur, quælibet apparere ſolent: ſed etiam quoties ſenſus ipſe mouetur, ſi eodem modo moueatur quo ſolet a ſenſili moueri, ſic littus videtur nauigantibus moueri, dum viſus ab alio mouetur.

CAPVT III.

Superiores hypotheſes propoſito accommodat, & quid ſint inſomnia, quomodóque fiant, & cur aliis alii, item cur quibuſdam vel nunquam, vel prouectâ demum ætate inſomnia videantur, fuſè explicat.

E

EX his itaque patêre arbitror, nō modò vigilantibus nobis motiones illas quæ per eos ſenſus accipiuntur, qui foras proſpectant, & in parte corporis exteriore iacent, ſentiri ſolere, ſed etiam cùm affectio ea ſuborta eſt, quam ſomnum vocamus: atque tunc impenſiùs. Nam interdiu, operantibus quidem ſenſibus ac mente, eliduntur atque vaneſcunt: quo modo exiguus ignis apud ingētem offuſcari ſolet: & dolores voluptatéſque modicæ, acceſſu immodicarum offundi. quieſcentibus verò, minima quæque emergunt. Noctu autem quia particulares ſenſus feriuntur, & agere nequeunt,

A propterea quòd calor exteris partibus relictis in viſcera ſe condit: ad initium ſenſus originémque delabuntur, & obturbatione ſedata manifeſtæ fiunt. Porrò exiſtimare oportet, haud aliter motionem quamque fieri, quàm paruas illas vertigines per ſumma amnium decurrentes: quæ interim ſimiles euadunt, interim quòd aquæ aliò retorqueantur, in alias ſubinde formas ſoluuntur diuelluntúrque. Quamobrem ſtatim à cibo non ſomniant animalia, neque cùm edita nuperrimè in lucem ſunt, vt infantes. nam multa tum agitatio motióque eſt, propter alimentarium calorem. Quare quemadmodum humore vehementer commoto quandoque nulla redditur effigies: quandoque redditur quidem aliqua, ſed diſtorta penitus, adeò vt alia videatur eſſe quàm ſit: quieſcente verò ſemper aliqua redditur, quæ etiam nulla ex parte affecta eſt, ſed pura & expreſſa: ita & inter dormiendum interim viſa, & motiones quæ per ſenſus hauſtæ ſuperſunt, præ maiore illo motu qui dictus eſt, prorſus obliterantur exoleſcúntque: interim præpoſteræ, & monſtroſæ viſiones apparent, & ingrata ſomnia, qualia melancholicis & vinolentis & febrientibus accidunt. omnes enim iſtiuſmodi affectus, cùm ſpiritoſi ſint, commotionem & perturbationem plurimam afferunt. Simulac autem recedit & diſcretus ſanguis eſt in iis quæ ſanguinem obtinent, incolumes ſenſorum motiones quæ à ſingulis ſenſibus tranſmittuntur, grata ſomnia faciunt, & apparere quippiam, ac videri per ea quæ à viſu deferuntur, videre, per ea quæ ab auditu, audire, & pari modo per ea quæ à cæteris ſenſuum officinis mandantur, ſentire. eo enim quòd motiones à ſenſibus ad principium ſentiendi perueniunt, videri videre, audire & ſentire neceſſe eſt. Quinetiam quia conſpectus non moueri videtur, cùm tamen in motu ſit, vt dicimus, & quia tactus duos motus adnuntiat: quod vnum eſt, duo eſſe videtur. nam ſentiendi principium, quicquid à ſingulis ſenſibus afferatur, aſtruit: niſi aliqua alia virtus potior contraueniat. Semper igitur apparet: ſed non omne quod apparet, etiam videtur, niſi vis illa arbitra manus dederit, aut non moueatur motu vernaculo & ſuo. Quemadmodum verò diximus, alios ob alium affectum facilè decipi: ita & de dormientibus ſtatuendum eſt, qui propter ſomnum, & eo quòd ſenſoria ipſa moueantur, & cætera quæ per ſenſum contingunt, procliues ad labendum ſunt. Quare quod tenuem alicuius rei ſimilitudinem referat, eis ipſa planè res eſſe apparet. nam cùm dormientibus illis, plurima ſanguinis copia ad ſenſum principem delabitur, vna & motiones illæ deſcendunt, quæ in ea materia continentur, aliæ potentia, aliæ actu. Sic autem ſeſe habent, vt ex eis vna aliqua prior ſe afferat, moueatque. qua abſumpta, alia ſubinde comparet. Et perinde ſuo quæque ordine ſequuntur, atque ranæ è ſubere, aut quauis alia materia factæ, quæ colliquato ſale quo erant oblitæ, in aqua emergunt. Ad hunc modum potentia inſunt. reiecto autem eo quod impedimento erat, actu ſunt. Atque ſolutæ in exiguo illo reliquo ſanguine qui in ſenſoriis habetur, ſimilitudinem rerum, quæ ſenſus extimulare ſolent, præferunt: non aliter quàm portiones illæ nubium, quæ cùm modò effigiem hominis aut centauri referant, mox ſe tranſitu ocyſſimo in alias ſubinde formas conuertunt. Vnumquodque autem harum, vt dictum eſt, reliquiæ & veſtigium ſenſi actu eſt. Et digreſſo ſenſili, verè dicere poſſumus,

A διὰ τὸ ἐκ τῶν ἔξω εἰς τὸ ἐντὸς γίνεσθαι τὴν τοῦ θερμοῦ παλίρροιαν, ἐπὶ τὴν ἀρχὴν τῆς αἰσθήσεως καταφέρονται, καὶ γίνονται φανεραὶ καθισταμένης τῆς ταραχῆς. δεῖ δ' ὑπολαβεῖν ὥσπερ τὰς μικρὰς δίνας τὰς ἐν τοῖς ποταμοῖς * ἀναφερομένας, οὕτω τὴν κίνησιν ἑκάστην γίνεσθαι συνεχῶς, πολλάκις μὲν ὁμοίως, πολλάκις δὲ διαλυομένας εἰς ἄλλα σχήματα, διὰ τὴν ἀντίκρουσιν. διὸ καὶ μετὰ τὴν τροφὴν, καὶ πάμπαν νέοις οὖσιν, οἷον τοῖς παιδίοις, οὐ γίνεται ἐνύπνια· πολλὴ γὰρ ἡ κίνησις, διὰ τὴν ἀπὸ τῆς τροφῆς θερμότητα. ὥστε καθάπερ ἐν ὑγρῷ, ἐὰν σφόδρα κινῇ τις, ὁτὲ μὲν οὐδὲν φαίνεται εἴδωλον ὁτὲ δὲ, φαίνεται B μὲν, διεστραμμένον δὲ πάμπαν, ὥστε φαίνεσθαι ἀλλοῖον, ἢ οἷόν ἐστιν· ἠρεμήσαντος δὲ καθαρὰ καὶ φανερά, οὕτω καὶ ἐν τῷ καθεύδειν τὰ φαντάσματα, καὶ αἱ ὑπόλοιποι κινήσεις, αἱ συμβαίνουσαι ἀπὸ τῶν αἰσθημάτων, ὁτὲ μὲν ὑπὸ μείζονος οὔσης τῆς εἰρημένης κινήσεως, ἀφανίζονται πάμπαν· ὁτὲ δὲ τεταραγμέναι φαίνονται αἱ ὄψεις καὶ τερατώδεις, καὶ οὐκ * ἐρρωμένα τὰ ἐνύπνια, οἷον τοῖς μελαγχολικοῖς καὶ πυρέττουσι, καὶ οἰνωμένοις· πάντα γὰρ τὰ τοιαῦτα πάθη πνευματώδη ὄντα, πολλὴν * ποιεῖ κίνησιν καὶ ταραχήν. καθισταμένου δὲ καὶ διακρινομένου τοῦ αἵματος ἐν τοῖς ἐναίμοις, σωζομένη C τῶν αἰσθημάτων ἡ κίνησις ἀφ' ἑκάστης τῶν αἰσθήσεων, ἐρρωμένα τε ποιεῖ τὰ ἐνύπνια, καὶ φαίνεσθαί τι καὶ δοκεῖν, διὰ μὲν τὰ ἀπὸ τῆς ὄψεως καταφερόμενα, ὁρᾶν· διὰ δὲ τὰ ἀπὸ τῆς ἀκοῆς, ἀκούειν. ὁμοιοτρόπως δὲ καὶ ἀπὸ τῶν ἄλλων αἰσθητηρίων· τῷ μὲν γὰρ ἐκεῖθεν ἀφικνεῖσθαι τὴν κίνησιν πρὸς τὴν ἀρχὴν, καὶ ἐγρηγορὼς ὁρᾶν δοκεῖ, καὶ ἀκούειν, καὶ αἰσθάνεσθαι· καὶ διὰ τὸ τὴν ὄψιν ἐνίοτε κινεῖσθαι δοκεῖν, οὐ κινουμένην, ὁρᾶν φαμέν· καὶ τῷ τὴν ἁφὴν δύο κινήσεις εἰσαγγέλλειν, * τὸ ἓν δύο δοκεῖν· ὅλως γὰρ τὸ ἀφ' ἑκάστης αἰσθήσεως φησὶν ἡ ἀρχὴ, ἐὰν μὴ ἑτέρα κυριωτέρα ἀντιφῇ. φαίνεται μὲν D οὖν πάντως· δοκεῖ δὲ οὐ πάντως τὸ φαινόμενον· ἀλλ' ἐὰν τὸ * ἐπικρῖνον μὴ κατέχηται, εἰ μὴ κινῆται τὴν οἰκείαν κίνησιν. ὥσπερ δ' εἴπομεν, ὅτι ἄλλοι δι' ἄλλο πάθος εὐαπάτητοι, οὕτως ὁ καθεύδων διὰ τὸν ὕπνον, καὶ τὸ κινεῖσθαι τὰ αἰσθητήρια, καὶ τὰ ἄλλα τὰ συμβαίνοντα περὶ τὴν αἴσθησιν. ὥστε τὸ μικρὰν ἔχον ὁμοιότητα, φαίνεται ἐκεῖνο· ὅταν γὰρ καθεύδῃ, κατιόντος τοῦ πλείστου αἵματος ἐπὶ τὴν ἀρχὴν, συγκατέρχονται αἱ ἐνοῦσαι κινήσεις, αἱ μὲν δυνάμει, αἱ δὲ ἐνεργείᾳ. οὕτω δ' * ἔχουσιν, * ὥστε ἐν τῇ κινήσει τηδὶ, ἥδε ἐπιπολάσει ἐξ αὐτῆς ἡ κίνησις· ἂν δ' αὕτη φθαρῇ, ἥδε. καὶ πρὸς ἀλλήλας δὲ οὕ- E τως ἔχουσιν, ὥσπερ οἱ πεπλασμένοι βάτραχοι, οἱ ἀνιόντες ἐν τῷ ὕδατι τηκομένου τοῦ ἁλὸς, οὕτως ἔνεισι δυνάμει, * αἰρομένου δὲ τοῦ κωλύοντος, ἐνεργοῦσι· καὶ λυόμεναι ἐν ὀλίγῳ τῷ λοιπῷ αἵματι τῷ ἐν τοῖς αἰσθητηρίοις, κινοῦνται ἔχουσιν ὁμοιότητα ὥσπερ τὰ ἐν τοῖς νέφεσιν, ἃ παρεικάζουσιν ἀνθρώποις καὶ κενταύροις ταχέως μεταβάλλοντα. τούτων δὲ ἕκαστόν ἐστιν, ὥσπερ εἴρηται, ὑπόλειμμα τοῦ ἐν τῇ ἐνεργείᾳ αἰσθήματος· καὶ ἀπελθόντος τοῦ αἰσθήματος τοῦ ἀληθοῦς, ἔνεστι καὶ ἀληθὲς * λέγειν,

* γρ. φερομ.
* γρ. ἐρρωμένα, inepte.
* γρ. ποιεῖται
* γρ. τῷ ἓν
* γρ. ἐπικρινόμενον
* γρ. ἔχει,
* γρ. ὥστε ἐάν τι κινῇ τὸ αἷμα, ἥδε ἐπιπ.
* γρ. αἰρομένου
* γρ. εἰπεῖν,

ὅτι τοῦτον ἐστὶ Κορίσκος, ἀλλ' οὐ Κορίσκος· ὅτε δὲ ᾐσθάνετο, οὐκ ἔλεγε Κορίσκον τὸ κύριον καὶ τὸ ἐπικρῖνον, ἀλλὰ διὰ τοῦτο ἐκεῖνον Κορίσκον τὸν ἀληθινόν. ὃ δὴ καὶ αἰσθανόμενον λέγει τοῦτο, ἐὰν μὴ παντελῶς κατέχηται ὑπὸ τοῦ αἵματος, ὥσπερ μὴ αἰσθανόμενον τοῦτο, κινεῖται ὑπὸ τῶν κινήσεων τῶν ἐν τοῖς αἰσθητηρίοις, καὶ δοκεῖ τὸ ὅμοιον αὐτὸ εἶναι ἀληθές. καὶ τοσαύτη τοῦ ὕπνου ἡ δύναμις, ὥστε ποιεῖν τοῦτο λανθάνειν. ὥσπερ οὖν εἴ τινα λανθάνει, ὑποβαλλόμενος ὁ δάκτυλος τῷ ὀφθαλμῷ, οὐ μόνον φανεῖται, ἀλλὰ καὶ δόξει εἶναι δύο τὸ ἕν· ἂν δὲ μὴ λανθάνῃ, φανεῖται μὲν, οὐ * δόξει δέ, οὕτω καὶ ἐν τοῖς ὕπνοις, ἂν μὲν αἰσθάνηται ὅτι καθεύδει, καὶ τοῦ πάθους ἐν ᾧ ἡ αἴσθησις τοῦ ὑπνωτικοῦ, φαίνεται μὲν, λέγει δέ τι ἐν αὐτῷ ὅτι φαίνεται μὲν Κορίσκος, οὐκ ἔστι δὲ ὁ Κορίσκος. πολλάκις γὰρ καθεύδοντος λέγει τι ἐν τῇ ψυχῇ, ὅτι ἐνύπνιον τὸ φαινόμενον· ἐὰν δὲ λανθάνῃ ὅτι καθεύδει, οὐδὲν ἀντίφησι τῇ φαντασίᾳ. ὅτι δ' ἀληθῆ λέγομεν, καὶ εἰσὶ κινήσεις φανταστικαὶ ἐν τοῖς αἰσθητηρίοις, δῆλον, ἐάν τις προσέχων πειρᾶται μνημονεύειν ἃ πάσχομεν καταφερόμενοί τε καὶ ἐγειρόμενοι. ἐνίοτε γὰρ τὰ φαινόμενα εἴδωλα καθεύδοντι, φωράσει ἐγειρόμενος κινήσεις οὔσας ἐν τοῖς αἰσθητηρίοις· ἐνίοις γὰρ τῶν νεωτέρων καὶ πάμπαν διαβλέπουσιν, ἐὰν ᾖ σκότος, φαίνεται εἴδωλα πολλὰ κινούμενα, ὥστ' ἐγκαλύπτεσθαι πολλάκις φοβουμένους. ἐκ δὴ τούτων ἁπάντων δεῖ συλλογίζεσθαι, ὅτι ἐστὶ τὸ ἐνύπνιον φάντασμα μέν τι, καὶ ἐν ὕπνῳ· τὰ γὰρ ἄρτι λεχθέντα εἴδωλα, οὐκ ἔστιν ἐνύπνια, οὐδ' εἴ τι ἄλλο λελυμένων τῶν αἰσθήσεων φαίνεται· οὐδὲ τὸ ἐν ὕπνῳ φάντασμα πᾶν. πρῶτον μὲν γὰρ ἐνίοις συμβαίνει καὶ αἰσθάνεσθαί πῃ, καὶ ψόφων, καὶ φωτὸς, καὶ χυμοῦ, καὶ ἁφῆς· ἀσθενικῶς μέντοι, καὶ οἷον πόρρωθεν. ἤδη γὰρ ἐν τῷ καθεύδειν ὑποβλέποντες, καὶ [εὐθὺς ἐγερθέντες] * οἳ ἠρέμα ἑώρων φῶς τοῦ λύχνου καθεύδοντες, ὡς ᾤοντο, ἐγερθέντες εὐθὺς ἐγνώρισαν τὸ τοῦ λύχνου ὂν· καὶ ἀλεκτρυόνων καὶ κυνῶν φωνὴν ἠρέμα ἀκούοντες, ἐγερθέντες σαφῶς ἐγνώρισαν. ἔνιοι δὲ καὶ ἀποκρίνονται ἐρωτώμενοι. ἐνδέχεται γὰρ καὶ * τὸ ἐγρηγορέναι καὶ καθεύδειν ἁπλῶς, θατέρου ὑπάρχοντος, θάτερον πῃ ὑπάρχειν. ὧν οὐδὲν ἐνύπνιον φατέον. οὐδ' ὅσαι δὴ ἐν τῷ ὕπνῳ γίνονται ἀληθεῖς ἔννοιαι, παρὰ τὰ φαντάσματα. ἀλλὰ τὸ φάντασμα τὸ ἀπὸ τῆς κινήσεως τῶν αἰσθημάτων, ὅταν ἐν τῷ καθεύδειν ᾖ, ᾗ καθεύδει, τοῦτ' ἐστὶν ἐνύπνιον. ἤδη δέ τισι συμβέβηκεν, ὥστε μηδὲν ἐνύπνιον ἑωρακέναι κατὰ τὸν βίον. σπάνιον μὲν τὸ τοιοῦτόν ἐστι, συμβαίνει δ' ὅμως. καὶ τοῖς μὲν ὅλως διετέλεσεν, ἐνίοις δὲ προελθούσης τῆς ἡλικίας ἐγένετο, πρότερον οὐδὲν ἐνύπνιον ἑωρακόσι. τὸ δ' αἴτιον τοῦ μὴ γίνεσθαι, παραπλήσιόν τι δεῖ νομίζειν, ὅτι οὐδὲ μετὰ τὴν τροφὴν καθυπνώσασιν, οὐδὲ τοῖς παιδίοις γίνεται ἐνύπνιον· ὅσοις γὰρ τοῦτον τὸν τρόπον συνέστηκεν ἡ φύσις, ὥστε πολλὴν ἀναφέρεσθαι ἀναθυμίασιν πρὸς τὸν ἄνω τόπον, ἣ πάλιν καταφερομένη ποιεῖ πλῆθος κινήσεως, εὐλόγως τούτοις οὐδὲν φαίνεται φάντασμα. προϊούσης δὲ τῆς ἡλικίας, οὐδὲν ἄτοπον φανῆναι ἐνύπνιον. μεταβολῆς γάρ τινος γινομένης, ἢ καθ' ἡλικίαν, ἢ κατὰ τὸ πάθος, ἀναγκαῖον συμβῆναι τὴν ἐναντίωσιν ταύτην.

* ἀ. δόξει

* κ. εὐ.

* γρ. τὸ ἐγρ.

A hoc eſſe tale qualis Coriſcus eſt. At cùm vis illa ſuperior & arbitra ſentit hoc, nequaquam dicit eſſe Coriſcum: ſed per hoc, verum illum Coriſcũ intelligit. Ea itaque virtus quæ ſentiendo hoc eſſe Coriſcum aſſeuerat, ſi non penitus ſanguine obruta ſit, ſentientis more exercetur à motionibus quę in ſenſoriis ſunt, atque commouetur, & tum ſimilitudo rei videtur ipſa res eſſe. & tãta vis ſomni eſt, vt id latêre nos efficiat. Quemadmodũ igitur ſi quis oculum digito ſupprimat, neque animaduertat digitũ ita admotum, non modò apparebit, ſed etiam videbitur eſſe duo quod vnum eſt: ſi verò animaduertat, apparebit quidem, ſed non videbitur: ita & in B ſomno ſi quis ſe dormire intelligat, & affectionem eam ſentiat cui ſenſus ſenſoriæ partis addictus eſt, apparebit quidem ei quod ſomniat, ſed ſecum dicet, quanquam apparet hoc Coriſcus eſſe, non tamen eſt Coriſcus. nã ſæpe euenit, vt quis dormiendo in animo ſuo dicat, ſomnium eſſe quod videt. Quòd ſi dormire ſe neſciat, nihil imaginationi cõtradicet. Quòd autem vera ſint quæ dicimus, quódque motiones imaginariæ in ſenſuum officinis diuerſentur, certum apertúmque eſt, ſi quis adhibito animo conetur meminiſſe eorum quæ nobis obdormiſcentibus, & excitatis expergefactiſque, accidunt. Interdũ enim qui à ſomno recèns excuſſus ſit, deprehendet, ſimulachra quæ ſe illi per quietem C obtulerant, eſſe motiones quæ in ſenſoriis ſunt. nam pueris nonnullis vel planè vigilantibus aſpectantibúſque, quamuis tenebricoſus ſit locus, tamẽ multæ imagines apparent quæ moueri videntur, ita vt illi ſe præ metu ſæpe intra ſtragulum occulant. Ex his itaque omnibus colligi debet, ſomnium eſſe viſum quidem aliquod, ſed quod in ſomno ſeſe offerat. nam neque ſimulachra ea, de quibus paulo antè diximus, inſomnia ſunt: neque aliud quicquã, quod ſolutis ſenſibus appareat. Sed neque quicquid in ſomno ſe præſentat, inſomnium eſt. Nam primò quidem nonnullis euenit, vt ſomnum & lucem, & ſaporem, & contrectationem quodammodo ſentiat: ſed languidè tamen, & quaſi de longin- D quo. iam enim qui inter quieſcendum cernebant, & mox excitati fuere, lumen lucernæ quod dormientes (vt rebantur) exiliter videbant, protinus vbi expergefacti fuerunt, verum lucernæ lumen fuiſſe deprehendere. Sed & qui canum & gallinaceorum voces debiliter exaudire ſibi videbantur, mox experrecti veras voces fuiſſe apertè cognouerunt. Nonnulli etiam ad interrogata reſpondent. Fieri enim poteſt vt ſi alterum horum, vigilare dico & dormire, non ſimpliciter adeſt, alterum quodammodo adſit: quorum nihil ſomnium vocari debet: neque ſi quæ præter viſa in ſomno veræ intelligentiæ fiant. Sed viſum quod à ſenſorum motu ortum, E per quietem animalibus occurrit in eo quod dormiunt, hoc ſomnium eſt. Iam verò quibuſdam accidit, vt nunquam quicquam ſomniarint in vita. quod quanquam rarum eſt, interdum tamen contingit. Atque alij per totam vitam in eo affectu perſtitêre: alij accedente ætate ſomniarunt, qui priùs nullum ſomnium viderant. Cauſa verò quamobrem non ſomnient, perſimilis ei videtur quæ facit vt ſtatim à cibo, & in ætate infantili, nullum penitus contrahatur ſomnium. Nam quorum ita natura conſtat, vt in ſuperiorem locum diuaporatio multa concedat, quæ ſuo regreſſu ad ima commotiones afferat plurimas, haud ab re nullum his phantaſma viſúmque apparet. Procedente verò ætate ſomnia illis reſtitui, nihil abſurdi eſt. nam immutatione aliqua, vel per ætatem vel per affectum accepta, neceſſarium eſt hanc quoque rerum contrariarum viciſſitudinem accidere.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΤΗΣ ΚΑΘ' ΥΠΝΟΝ ΜΑΝΤΙΚΗΣ.

ARISTOTELIS STAGIRITÆ, DE DIVINATIONE PER SOMNVM, LIBER.

Franciſco Vatablo interprete.

CAPVT I.

Somniorum alia pro ſignis, quædam pro cauſis eorum quæ eueniunt, habenda: pleráque caſu euenire, ac temerè.

Divinationem aliquam eſſe quæ in ſomno fiat, & prouenire dicatur ab inſomniis: neque contemnere facile eſt, neque credere. Nam quòd omnes aut plurimi arbitrantur inſomnia ſignificare aliquid, argumento eſt, id præ experientia aſſeri ſolere. Item de nonnullis rebus ad diuinationem fidem quandam haberi inſomniis, indignum creditu non eſt, cùm ratione aliqua nitatur. Vnde fit, vt de cæteris quoque ſomniis haud ſecus cenſere quis poſſit. Contrà; cùm nulla rationabilis cauſa videatur, per quam iſthæc diuinatio proueniat: efficitur vt fides abrogetur. Nam ſi dicatur, Deum eſſe qui ſomnia mittat, præter alia multa & hoc quoque ſubabſurdum eſt, non optimis ſapientiſſimiſque, ſed quibuſvis ſine diſcrimine mitti. Sublata autem cauſa quæ ad Deum referatur, nulla præterea alia videtur conſentanea eſſe: quandoquidem originem eius inuenire quod dicitur, quoſdam eſſe in Boryſthene & iuxta columnas Herculis, qui futura præſentiant: captum ingenij noſtri excedere videatur. Neceſſe igitur eſt ſomnia eſſe aut cauſas eorum quæ fiunt, aut ſigna, aut fortuita, aut omnia, aut duo ex his, aut vnum ſolum. Cauſam voco: verbi gratia, deliquij ſolaris, lunam: febris, defatigationem. Signum deliquij, cùm luna ſubire incipit: febris, ſcabritiem linguæ. Rem fortuitam, inambulante aliquo ſolem delinquere. nam neque cauſa, neque ſignum deliquij, inambulatio eſt: aut deliquium, inambulationis. Quapropter res fortuitæ neque ſemper, neque maiori ex parte fiunt. Súntne igitur ſomniorum alia cauſæ, alia ſigna, videlicet eorum quæ in corpore accidunt? Nam & qui è Medicorum ſchola paulo peritiores habentur, inſomnia diligenter attendenda dicunt. Nec ab re ita exiſtimant, artifices alioqui, ſed qui tamen meditari aliquid philoſophari que ſolent. Nam motiones quæ interdiu contingunt, niſi magnæ admodum fortéſque ſint, maioribus illis quæ ſecundùm vigiliam fiunt, offunduntur.

A ΚΕΦΑΛ. α'.

Ὅτι τῶν ἐνυπνίων τὰ μὲν σημεῖα τῶν γινομένων, τὰ δὲ καὶ αἴτια, τὰ πλεῖστα δὲ συμπτώματα μόνον.

Περὶ δὲ τῆς μαντικῆς τῆς ἐν τοῖς ὕπνοις γινομένης, καὶ λεγομένης συμβαίνειν ἀπὸ τῶν ἐνυπνίων· οὔτε καταφρονῆσαι ῥᾴδιον, οὔτε πεισθῆναι. τὸ μὲν
B γὰρ πάντας ἢ πολλοὺς ὑπολαμβάνειν ἔχειν τι σημεῖον τὰ ἐνύπνια, παρέχεται πίστιν, ὡς ἐξ ἐμπειρίας λεγόμενον. καὶ τὸ περὶ ἐνίων εἶναι τὴν μαντικὴν ἐν τοῖς ἐνυπνίοις, οὐκ ἄπιστον· ἔχει γάρ τινα λόγον. διὸ καὶ περὶ τῶν ἄλλων ἐνυπνίων ὁμοίως ἄν τις οἰηθείη. τὸ δὲ μηδεμίαν αἰτίαν εὔλογον ὁρᾶν, καθ' ἣν ἂν γίνοιτο, τοῦτο διαπιστεῖν ποιεῖ· τό, τε γὰρ θεὸν εἶναι τὸν πέμποντα, πρὸς τῇ ἄλλῃ ἀλογίᾳ, καὶ τὸ μὴ τοῖς βελτίστοις καὶ φρονιμω-
C τάτοις, ἀλλὰ τοῖς τυχοῦσι πέμπειν, ἄτοπον. ἀφαιρεθείσης δὲ τῆς ἀπὸ τοῦ θεοῦ αἰτίας, οὐδεμία τῶν ἄλλων εὔλογος εἶναι φαίνεται αἰτία· τὸ γὰρ περὶ τῶν ἐφ' Ἡρακλείαις στήλαις, ἢ τῶν ἐν Βορυσθένει, προορᾶν τινας, ὑπὲρ τὴν ἡμετέραν εἶναι δόξειεν ἂν σύνεσιν, εὑρεῖν τούτων τὴν ἀρχήν. ἀνάγκη δ' οὖν τὰ ἐνύπνια, ἢ αἴτια εἶναι, ἢ σημεῖα τῶν γινομένων, ἢ συμπτώματα, ἢ πάντα, ἢ ἔνια τούτων, ἢ ἓν μόνον. λέγω δ' αἴτιον μὲν, οἷον τὴν σελήνην τοῦ ἐκλείπειν τὸν ἥ-
D λιον, καὶ τὸν κόπον τοῦ πυρετοῦ. σημεῖον δὲ τῆς ἐκλείψεως, τὸ τὸν ἀστέρα εἰσελθεῖν· τὴν δὲ τραχύτητα τῆς γλώττης, τοῦ πυρέττειν· * σύμπτωμα δὲ τοῦ βαδίζοντος, ἐκλείπειν τὸν ἥλιον· οὔτε γὰρ σημεῖον τοῦ ἐκλείπειν τοῦτ' ἐστιν, οὔτε αἴτιον· οὔθ' ἡ ἔκλειψις τοῦ βαδίζειν. διὸ τῶν συμπτωμάτων οὐδὲν οὔτε ἀεὶ γίνεται, οὔθ' ὡς ἐπὶ τὸ πολύ. ἆρ' οὖν ἐστι τῶν ἐνυπνίων, τὰ μὲν αἴτια, τὰ δὲ σημεῖα, οἷον τῶν περὶ τὸ
E σῶμα συμβαινόντων. λέγουσι γοῦν καὶ τῶν ἰατρῶν οἱ χαρίεντες, ὅτι δεῖ σφόδρα προσέχειν τοῖς ἐνυπνίοις· εὔλογον δ' οὕτως ὑπολαβεῖν, καὶ [μὴ ἀπιστεῖν] τοῖς τεχνίταις μὲν, σκοπουμένοις δέ τι καὶ φιλοσοφοῦσιν· αἱ γὰρ μεθ' ἡμέραν γινόμεναι κινήσεις, ἂν μὴ σφόδρα μεγάλαι ὦσι καὶ ἰσχυραὶ, λανθάνουσι παρὰ μείζους τὰς ἐγρηγορικὰς κινήσεις.

* κ. ε. δὲ τὸ σ.

ἐν δὲ τῷ καθεύδειν, τοὐναντίον· καὶ γὰρ αἱ μικραὶ μεγάλαι δοκοῦσιν εἶναι. δῆλον δὲ ἐπὶ τῶν συμβαινόντων κατὰ τοὺς ὕπνους πολλάκις. οἴονται γὰρ κεραυνοῦσθαι καὶ βροντᾶσθαι, μικρῶν ἤχων ἐν τοῖς ὠσὶ γινομένων· καὶ μέλιτος καὶ γλυκέων χυμῶν ἀπολαύειν, ἀκαρεαίου φλέγματος * καταῤῥέοντος· καὶ βαδίζειν διὰ πυρὸς, καὶ θερμαίνεσθαι σφόδρα, μικρᾶς θερμασίας περί τινα μέρη γινομένης. ἐπεγειρομένοις δὲ ταῦτα φανερὰ τοῦτον ἔχοντα τὸν τρόπον. ὥστ' ἐπεὶ μικραὶ πάντων αἱ ἀρχαὶ, δῆλον ὅτι καὶ τῶν νόσων, καὶ τῶν ἄλλων παθημάτων, τῶν ἐν τοῖς σώμασι μελλόντων γίνεσθαι. φανερὸν οὖν, ὅτι ἀναγκαῖον ταῦτα ἐν τοῖς ὕπνοις εἶναι καταφανῆ μᾶλλον, ἢ ἐν τῷ ἐγρηγορέναι. ἀλλὰ μὴν καὶ ἔνιά γε τῶν καθ' ὕπνον φαντασμάτων, αἴτια εἶναι τῶν οἰκείων ἑκάστῳ πράξεων, οὐκ ἄλογον· ὥσπερ γὰρ μέλλοντες * πράττειν, καὶ ἐν ταῖς πράξεσιν ὄντες, ἢ πεπραχότες, πολλάκις εὐθυονειρίᾳ τούτοις συνεσμὲν καὶ πράττομεν. αἴτιον δ', ὅτι προωδοποιημένη τυγχάνει ἡ κίνησις ἀπὸ τῶν μεθ' ἡμέραν ἀρχῶν· οὕτω πάλιν ἀναγκαῖον καὶ τὰς καθ' ὕπνον κινήσεις πολλάκις ἀρχὴν εἶναι τῶν μεθ' ἡμέραν πράξεων, τῷ προωδοποιῆσθαι πάλιν καὶ τούτων τὴν διάνοιαν ἐν τοῖς φαντάσμασι τοῖς νυκτερινοῖς. οὕτω μὲν οὖν ἐνδέχεται τῶν ἐνυπνίων ἔνια σημεῖα καὶ αἴτια εἶναι. τὰ δὲ πολλὰ συμπτώμασιν * ἔοικε· μάλιστα δὲ τά τε ὑπερβατὰ πάντα καὶ ὧν μὴ ἐν αὐτοῖς ἡ ἀρχή· ἀλλὰ περὶ ναυμαχίας, καὶ τῶν πόῤῥω συμβαινόντων ἐστί. περὶ γὰρ τούτων τὸν αὐτὸν τρόπον ἔχειν εἰκὸς, οἷον ὅταν μεμνημένῳ τινὶ περί τινος τύχῃ τοῦτο γινόμενον. τί γὰρ κωλύει καὶ ἐν τοῖς ὕπνοις οὕτω; μᾶλλον δ' εἰκὸς πολλὰ τοιαῦτα συμβαίνειν. ὥσπερ οὖν οὐδὲ τὸ μεμνῆσθαι περὶ τοῦδε, σημεῖον οὐδ' αἴτιον τοῦ παραγενέσθαι αὐτὸν, οὕτως οὐδ' ἐκεῖ τοῦ ἀποβῆναι μετὰ τὸ ἐνύπνιον τῷ ἰδόντι, οὔτε σημεῖον, οὔτ' αἴτιον, ἀλλὰ σύμπτωμα. διὸ καὶ πολλὰ τῶν ἐνυπνίων οὐκ ἀποβαίνει· τὰ γὰρ συμπτώματα οὔτ' ἀεὶ, οὔθ' ὡς ἐπὶ τὸ πολὺ γίνεται.

* γ. ἀπορρέοντος.

* γ. πρᾶξαι,

* γ. δ. μάλιστα δὲ τ.

ΚΕΦΑΛ. β'.

Ὅτι τὰ ἐνύπνια οὐ θεόπεμπτα μὲν, δαιμόνια μέντοι· καὶ οὐκ εἴδωλα οὐδὲ ἀποῤῥοαὶ κατὰ τὸν Δημόκριτον, ἀλλὰ κίνησίς τις καὶ αἴσθησις ἀφικνουμένη πρὸς τὰς ψυχὰς τὰς ἐνυπνιαζούσας. καὶ πότε, καὶ τίσι, καὶ πῶς αὐτὰ γίνεται. ἔτι δὲ, τίς ἄριστος ὀνείρων κριτής.

ΟΛως δ' ἐπεὶ καὶ τῶν ἄλλων ζώων ὀνειρώττει τινὰ, θεόπεμπτα μὲν οὐκ ἂν εἴη τὰ ἐνύπνια, οὐδὲ γέγονε τούτου χάριν. δαιμόνια μέντοι· ἡ γὰρ φύσις δαιμονία, ἀλλ' οὐ θεία. σημεῖον δέ· πάνυ γὰρ * ἀγεννεῖς ἄνθρωποι προορατικοί εἰσι, καὶ εὐθυόνειροι, ὡς οὐ θεοῦ πέμποντος· ἀλλ' ὅσων ὥσπερ ἂν εἰ ἡ φύσις λάλος ἐστὶ, καὶ μελαγχολική, παντοδαπὰς ὄψεις ὁρῶσι. διὰ δὲ τὸ πολλὰ καὶ παντοδαπὰ κινεῖσθαι, ἐπιτυγχάνουσι ὁμοίοις θεωρήμασιν ἐπιτυχεῖς ὄντες, ἐν τούτοις, ὥσπερ ἔνιοι ἄρτια * μερίζοντες ἁρπάζουσιν. ὥσπερ γὰρ λέγεται, ἂν πολλὰ βάλλῃς, ἄλλοτ' ἀλλοῖον βαλεῖς, καὶ ἐπὶ τούτων τοῦτο συμβαίνει. ὅτι δ' οὐκ ἀποβαίνει πολλὰ τῶν ἐνυπνίων, οὐδὲν ἄτοπον· οὐδὲ γὰρ τῶν ἐν τοῖς σώμασι σημείων, καὶ τῶν οὐρανίων,

* γ. εὐτελεῖς

* γρ. ἰσάζοντες, apud Themiſtiũ.

A At in ſomno contra fit. tunc enim quæ paruæ ſunt, eſſe magnæ creduntur. Id quod facilè conſtat ex iis quæ in ſomno contingere ſolent. ſæpe enim accidit, vt dormientes, modico ſtrepitu exaudito, fulminare & tonare putemus: & tenui pituita diſtillante, melle aut dulci alio ſapore frui: & exiguo calore in quibuſdam corporis partibus exorto, ſuper prunas ambulare, & vehementer calefieri. Excitati verò, iſthæc hoc habere modo deprehendimus. Quare cùm exordia omnium parua ſint, certum eſt & principia morborum & cæterarum affectionum, quæ in corpore perficiendæ ſunt, imbecilla eſſe oportere. Patet igitur, neceſſariò hæc in ſomnis euidentiora eſſe, quàm in vigilia. Sed & quæ-B dam ex viſis illis quæ per ſomnum apparent, cauſas eſſe ſuorum cuiuſque actuum, à ratione minimè abhorret. Vt enim qui acturi aliquid ſunt, aut qui nunc id agunt, aut qui iam egerunt, plerunque hoc idem per ſomnia contuentur & adminiſtrant: quia diurna initia ad talem motum quaſi viam quandã præparauere: ita è conuerſo neceſſarium eſt, vt plerunque motiones quæ ſe per ſomnum offerunt, principia ſint eorum quæ interdiu gerimus, quia è contrario & hæc antea inter nocturna viſa mens noſtra concepit. Ad hunc igitur modum, è ſomniis nonnulla tum ſigna, tum cauſas eſſe contingit. At complura perſimilia habentur iis, quæ temerè ac vice fortuita proueniunt: præſertim extre-C ma illa, ſupráque omnem fidem hominis poſita, & ea quorum origo in nobis non eſt, ſed de nauali pugna ſunt, & iis quæ procul à nobis geruntur. Nam de his eo modo ſtatuendum eſt, quo ſtatuitur, cùm id fortè fortuna euenit, quo de quis mentionem faciebat. Quid enim prohibet, quominus idẽ in ſomno contingat? immò verò multa eiuſmodi contingere par eſt. Quemadmodum igitur mentio de quopiam, neque ſignum, neque cauſa fuiſſe poteſt, cur idem ad nos acceſſerit: ita neque ſomnium, ſignum aut cauſa dicendum, quamobrem ſic prorſus euenerit vt ſomnianti apparuerat, ſed fortuitum quid, temerariúmque. Vnde etiam fit vt plurima ſomniorum minimè euadant. nam quæ D fortuita ſunt, neque ſemper, neque maiori ex parte accidunt.

CAPVT II.

Somnia non eſſe à Deo ſed à natura: Democritum falſò de iis ſtatuiſſe: item alia de iiſdem & de optimo eorum interprete.

AD ſummam, cùm è cæteris quoque animantibus aliqua ſomnient, haudquaquam inſomnia à Deo miſſa veniunt, aut ad eum finem nobis adiuncta fuere. dæmonia tamen haberi debent. nam & natura, dæmonia eſt, non diuina. Cuius rei indicio eſt, quòd degeneres admodum & gregarij E homines futura præuident, & ita vt res habet, ſomniant, tanquam non delegante ſomnia Deo. Verùm prout quiſque natura locutuleius eſt, aut vicio bilis atræ laborat, ita multifarias viſiones experitur. Quia verò plurimis & variis ſpectris feriuntur, aliquando inſomnia illa quibus euentus quidam reſpondet, incidunt. ſicuti nonnulli, cùm totum diem certant, interim præmiũ capiunt. Nam quod in prouerbio eſt, *Si ſæpe iacias, alium aliàs ferieris*: idem & inſomniis contingere ſolet. Nec verò abſurdum eſt, plurima non euadere. Nam neque ea ſigna quæ in corpore viſuntur, aut in cælo,

vt quæ imbreis aut flatus prætendunt, ſemper eueniunt. ſi enim alius vehementior motus ingruat, quàm ſit iſte futurus à quo illa fiant, tum ex ſigno nihil ſequi ſolet. Sed & plurima agendorum, de quibus conſilium optima ratione inieris, ſuperuenientibus initiis aliis grauioribus, in irritum decidunt. nec enim prorſus omne fit, quod futurum erat: neque idem eſt, fore, & eſſe futurum. Sed dicendum eſt, & principia eſſe à quibus nihil emergat, & ſigna quæ nullus approbet effectus. De ſomniis verò quæ eiuſmodi principia non habent, qualia diximus, ſed ab hiſce qui ſomniant aut temporibus aut locis, aut magnitudine abiuncta ſunt, aut eiſdem vicinitate aliqua adiuncta ſunt, non tamen principia eorum continent, niſi temerè futura præſentiantur, ſic ſtatuendum vt ſequitur, potiùs eſt, quàm vt Democritus aſſerit, ſomnia ſimulachris & defluxibus accepta referens. Nam quemadmodum ſiquis aquam aut aërem propellat, pars commota ſubinde aliam commouet, ceſſanteque illo accidit talem motum quadantenus progredi, autore etiamnum abſente: ita nihil obſtat, motus quoſdam & ſenſus ad animas ſomniantes peruenire ab iis rebus, à quibus ille exuuias & imagines mitti affirmat: & quocunque peruenerint, impenſiùs noctu ſentiri, quia interdiu delati diſſoluantur. (eſt enim aër noctis ab omni turba liberior: quòd noctes vento minus infeſtentur,) & in corpore facere ſenſum, ratione ſomni: quòd motiunculas interiores dormientes meliùs quàm vigilantes ſentiſcant. Porrò hi motus viſa dormientibus afferunt, per quæ vaticinari futura de rebus ipſis aſſolent. Et ob id quibuſuis ſine lege vlla, non prudentiſſimis, præſagire contingit. nam ſi Deus ſomnia mitteret, præſagia interdiu fierent, & ſapientibus darentur. Sic autem ſtolidiſſimos quoſque præuidere par eſt. mens enim omnium id genus hominum curis referta non eſt, ſed quaſi deſerta, & cogitationibus vacua: ſed & cùm mouetur, id quod eam mouet, ſequi ſolet. Quoſdam verò eſſe, qui in exceſſu mentis futura præſentiant, id cauſæ eſt: quòd vernaculi motus illos non infeſtent, ſed procul ab eis ſummoueantur. ex quo fit, vt peregrinos maximè ſentiant. Eſſe item aliquos qui certiſſima ſomnient, & de neceſſariis & amicis ſuis potiſſimùm quemque futura præuidere, hinc euenit, quòd neceſſarij de ſe mutuò impensè ſoliciti ſunt: vt enim de longinquo ſe maximè agnoſcunt & ſentiunt, ita & ſuos quoque motus, quandoquidem rerum notiorum motiones, notiores habentur. Melancholici verò propter naturæ ſuæ vehementiam, eminus iaculatorum modo collimant: necnon propter mobilitatem ocyſſimè quod conſequens annexumque ſit, imaginantur. Nam quemadmodum qui furore perciti ſunt, poëmata Philægidæ, ſerie quadam cõſimili conſtantia, dicere ac meditari, vt Venerem, & ita ad finem vſque promere ſolent: ita melancholici viſa, quæ perinde colligata ſint, celeriter recurrunt. Præterea tanta concitatione rapi ſolent, vt motus eorum ab alio motu elidi aut retorqueri non poſſit. Artificioſiſſimus ſomniorum interpres haberi debet, qui ſimilitudines perſpicere poſſit, nam recta claraque ſomnia interpretari, cuiuſuis eſt. Dico ſimilitudines, quoniam vt etiam præmonui, ſpectra ſimilia cadunt ſimulachris, quæ in torrente apparent, vbi ſi multa commotio fiat, nullæ apparitiones aut ſimulachra veris rebus ſimilia redduntur.

A οἷον τὰ τῶν ὑδάτων καὶ τὰ τῶν πνευμάτων· ἂν γὰρ ἄλλη κυριωτέρα ταύτης συμβῇ κίνησις, ἀφ' ἧς * μελλούσης ἐγένετο, τὸ σημεῖον οὐ γίνεται· καὶ πολλὰ βουλευθέντα καλῶς τῶν πραχθῆναι δεόντων, διελύθη δι' ἄλλας κυριωτέρας ἀρχάς· ὅλως γὰρ, οὐ πᾶν γίνεται τὸ μελλῆσαν· οὐδὲ ταὐτὸ τὸ ἐσόμενον, καὶ τὸ μέλλον. ἀλλ' ὅμως ἀρχάς γέ τινας λεκτέον εἶναι, ἀφ' ὧν οὐκ ἐπετελέσθη, καὶ σημεῖα πέφυκε ταῦτα τινῶν οὐ γενομένων. περὶ δὲ τῶν μὴ τοιαύτας ἐχόντων τὰς ἀρχὰς ἐνυπνίων οἵας εἴπομεν, ἀλλ' ὑπερορίας, ἢ τοῖς χρόνοις, ἢ τοῖς τόποις, ἢ τοῖς μεγέθεσιν, ἢ τούτων μὲν μηδὲν, μὴ μέντοι ἐν αὑτοῖς B ἐχόντων τὰς ἀρχὰς τῶν ἰδόντων τὸ ἐνύπνιον, εἰ μὴ γίνεται τὸ προορᾶν ἀπὸ τοῦ συμπτώματος, τοιάδ' ἂν εἴη μᾶλλον, ἢ ὥσπερ λέγει Δημόκριτος εἴδωλα καὶ ἀπορροίας αἰτιώμενος· ὥσπερ γὰρ ὅταν κινήσῃ τις τὸ ὕδωρ, ἢ τὸν ἀέρα, τοῦθ' ἕτερον ἐκίνησε· καὶ παυσαμένου δὴ ἐκείνου, συμβαίνει τὴν τοιαύτην κίνησιν προϊέναι μέχρι τινὸς, τοῦ κινήσαντος οὐ παρόντος· οὕτως οὐδὲν κωλύει κίνησίν τινα καὶ αἴσθησιν ἀφικνεῖσθαι πρὸς τὰς ψυχὰς τὰς ἐνυπνιαζούσας, ἀφ' ὧν ἐκεῖνος τὰ εἴδωλα ποιεῖ καὶ τὰς ἀπορροίας· καὶ ὅπῃ δὴ ἔτυχεν ἀφικνουμένας, μᾶλλον αἰσθητὰς εἶναι νύκτωρ, διὰ τὸ μεθ' ἡμέραν φερομένας διαλύεσθαι· ἀκυμαντότερος γὰρ [μᾶλλον] ὁ ἀὴρ τῆς C νυκτὸς, διὰ τὸ νηνεμωτέρας εἶναι τὰς νύκτας. καὶ ἐν τῷ σώματι ποιεῖν αἴσθησιν, διὰ τὸν ὕπνον· διὰ τὸ καὶ τῶν μικρῶν κινήσεων τῶν ἐντὸς αἰσθάνεσθαι καθεύδοντας μᾶλλον, ἢ ἐγρηγορότας. αὗται δ' αἱ κινήσεις φαντάσματα ποιοῦσιν, ἐξ ὧν προορῶσι τὰ μέλλοντα περὶ τῶν τοιούτων. καὶ διὰ ταῦτα συμβαίνει τὸ πάθος τοῦτο τοῖς τυχοῦσι, καὶ οὐ τοῖς φρονιμωτάτοις· μεθ' ἡμέραν γὰρ ἐγίνετ' ἂν καὶ τοῖς σοφοῖς, εἰ θεὸς ἦν ὁ πέμπων. οὕτω δ' εἰκὸς τοὺς τυχόντας προορᾶν· ἡ γὰρ διάνοια τῶν τοιούτων οὐ φροντιστικὴ, ἀλλ' ὥσπερ ἔρημος καὶ κενὴ πάντων, D καὶ κινηθεῖσα κατὰ τὸ κινοῦν ἄγεται. τοῦ δ' ἐνίους τῶν ἐκστατικῶν προορᾶν, αἴτιον ὅτι αἱ οἰκεῖαι κινήσεις οὐκ ἐνοχλοῦσιν, ἀλλ' * ἀπορραπίζονται· τῶν ξενικῶν οὖν μάλιστα αἰσθάνονται. τὸ δὲ τινὰς εὐθυονείρους εἶναι, καὶ τὸ τοὺς γνωρίμους περὶ τῶν γνωρίμων μάλιστα προορᾶν, συμβαίνει διὰ τὸ μάλιστα τοὺς γνωρίμους ὑπὲρ ἀλλήλων φροντίζειν· ὥσπερ γὰρ πόρρω ὄντων μάλιστα γνωρίζουσι καὶ αἰσθάνονται, οὕτω καὶ τῶν κινήσεων· αἱ γὰρ τῶν γνωρίμων γνωριμώτεραι κινήσεις. οἱ δὲ μελαγχολικοὶ, διὰ τὸ σφόδρα, ὥσπερ βάλλοντες πόρρωθεν, εὔστοχοί εἰσι· καὶ E διὰ τὸ μεταβλητικὸν, ταχὺ τὸ ἐχόμενον φαντάζονται αὐτοῖς· ὥσπερ γὰρ τὰ Φιλαιγίδου ποιήματα καὶ οἱ ἐμμανεῖς ἐχόμενα τοῦ ὁμοίου λέγουσι, καὶ διανοοῦνται, οἷον Ἀφροδίτην· καὶ οὕτω συνείρουσιν εἰς τὸ πρόσω. ἔτι δὲ καὶ διὰ τὴν σφοδρότητα οὐκ ἐκκρούεται αὐτῶν ἡ κίνησις ὑφ' ἑτέρας κινήσεως. τεχνικώτατος δ' ἐστὶ κριτὴς ἐνυπνίων, ὅστις δύναται τὰς ὁμοιότητας θεωρεῖν· τὰς γὰρ εὐθυονειρίας κρίνειν παντός ἐστι. λέγω δὲ, τὰς ὁμοιότητας, ὅτι παραπλήσια συμβαίνει φαντάσματα τοῖς ἐν τοῖς ὕδασιν εἰδώλοις, καθάπερ καὶ πρότερον εἴπομεν. ἐκεῖ δὲ, ἂν πολλὴ γίνηται ἡ κίνησις, οὐδὲν ὁμοία γίνεται ἡ ἔμφασις, καὶ τὰ εἴδωλα τοῖς ἀληθινοῖς.

* Apud Themiſtium eſt μελλούσης. & ſic leg. vel mutata diſtinct. ſic ἀφ' ἧς μελλ[illegible] plano ſenſu.

* χ. ἀπορρίπτ.

δεινὸς δὲ τὰς ἐμφάσεις κρίνειν ἱκανῶς εἴη ἂν ὁ δυνάμενος ταχὺ συνορᾶν καὶ διαγινώσκεσθαι τὰ διαπεφορημένα καὶ διεστραμμένα τῶν εἰδώλων, ὅτι ἐστὶν ἀνθρώπου, ἢ ἵππου, ἢ ὁτουδήποτε. κἀκεῖ δὴ ὁμοίως τί δύναται τὸ ἐνύπνιον τοῦτο. ἡ γὰρ κίνησις ἐκκρούει τὴν εὐθυονειρίαν.

Τί μὲν οὖν ἐστιν ὁ ὕπνος καὶ ἐνύπνιον, καὶ διὰ τίνα αἰτίαν ἑκάτερον αὐτῶν γίνεται· ἔτι δὲ, περὶ τῆς ἐκ τῶν ἐνυπνίων μαντικῆς εἴρηται. * [περὶ δὲ τῆς κοινῆς κινήσεως τῶν ζῴων λεκτέον.]

A Acerrimus verò apparitionum conie&ctor eſt, qui celeriter perſpicere & diſcernere poteſt, ſimulachra, diſtorta alioqui & incondita, hominem aut equum aut aliud quodcunque id ſit, referre. Et ſomniorum itaque conie&ctor optimus eſt, qui ſimile quippiam internoſcere poteſt: cùm motio ſynceritatem ſomniorum interturbare ſoleat.

Sed quid ſit ſomnus, & quid inſomnium, & qua de cauſa vtrunque fiat, item de diuinatione quæ ab inſomniis oriatur, dictum iam eſt.

* Incluſa quidã non agnoſcũt, & ſequentes libros aliter diſponunt. extãt verò etiam in Themiſtij paraphraſi e ſcriptis codd. vt neque de iis neque de libro qui hunc debet ſequi, dubitari queat.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΤΗΣ ΚΟΙΝΗΣ ΤΩΝ ΖΩΩΝ ΚΙΝΗΣΕΩΣ.

ARISTOTELIS STAGIRITÆ, DE ANIMALIVM MOTIONE, LIBER.

Nicolao Leonico interprete.

ΚΕΦΑΛ. α'.

Ὑπόθεσις τῆς βίβλου. Ὅτι κινεῖσθαι τὰ ζῷα ἀδύνατον, μηδενὸς ἠρεμοῦντος ἐν αὐτοῖς τοῖς ζῴοις.

ΠΕΡΙ δὲ κινήσεως τῆς τῶν ζῴων, ὅσα μὲν περὶ ἕκαστον αὐτῶν ὑπάρχει γένος, καὶ τίνες διαφοραὶ, καὶ τίνες αἰτίαι τῶν καθ' ἕκαστον συμβεβηκότων αὐτοῖς, ἐπισκέπτεον περὶ ἁπάντων ἐν ἑτέροις. ὅλως δὲ περὶ τῆς κοινῆς αἰτίας τοῦ κινεῖσθαι κίνησιν ὁποιανοῦν (τὰ μὲν γὰρ πτήσει κινεῖται, τὰ δὲ νεύσει, τὰ δὲ πορείᾳ τῶν ζῴων, τὰ δὲ κατ' ἄλλους τρόπους τοιούτους) ἐπισκεπτέον νῦν. ὅτι μὲν οὖν ἀρχὴ τῶν ἄλλων κινήσεων, τὸ αὐτὸ ἑαυτὸ κινοῦν, * τούτου δὲ τὸ ἀκίνητον, καὶ ὅτι τὸ πρῶτον κινοῦν ἀναγκαῖον ἀκίνητον εἶ), διώρισται πρότερον, ὅτε καὶ περὶ κινήσεως ἀϊδίου, πότερον ἔστιν ἢ οὐκ ἔστι, καὶ εἰ ἔστι, τίς ἐστι. δεῖ δὲ τοῦτο μὴ μόνον τῷ λόγῳ καθόλου λαβεῖν, ἀλλὰ καὶ ἐπὶ τῶν καθ' ἕκαστα καὶ τῶν αἰσθητῶν, δι' ἅπερ καὶ τοὺς καθόλου ζητοῦμεν λόγους, καὶ ἐφ' ὧν ἐφαρμόττειν * οἰόμεθα δεῖν αὐτούς. φανερὸν γὰρ καὶ ἐπὶ τούτων, ὅτι ἀδύνατον κινεῖσθαι μηδενὸς ἠρεμοῦντος, πρῶτον μὲν ἐν αὐτοῖς τοῖς ζῴοις. δεῖ γὰρ, ἂν κινῆταί τι τῶν μορίων, ἠρεμεῖν τι· καὶ διὰ τοῦτο αἱ καμπαὶ τοῖς ζῴοις εἰσίν. ὥσπερ γὰρ κέντρῳ χρῶνται ταῖς καμπαῖς, καὶ γίνεται τὸ ὅλον μέρος, ἐν ᾧ ἐστιν ἡ καμπὴ, καὶ ἓν καὶ δύο, καὶ εὐθὺ καὶ κεκαμμένον, μεταβάλλον δυνάμει καὶ ἐνεργείᾳ διὰ τὴν καμπήν. καμπτομένου δὲ καὶ κινουμένου, τὸ μὲν κινεῖται σημεῖον, τὸ δὲ μένει ἐν ταῖς καμπαῖς.

* Interpres, [illegible]

* γρ. εἰώμεθα.

B

CAPVT I.

Docet, omnia quæ mouentur animalia neceſſariò in ſe habere aliquid quod quieſcat.

DE animalium autem motione, quæcunque illis per genera inſunt, & quæ differentiæ, quæve eorum cauſæ quæ illis ſingillatim accidunt, de omnibus in aliis eſt conſiderandum. Omnino autem de communi cuiuſcunque motionis cauſa (nam alia quidem volatu mouentur, alia natatu, nonnulla C progreſſione, alia per alios eiuſmodi motus) in præſentia eſt pertractandum. Quòd igitur aliarum initium eſt motionum, id quod ſeipſum mouet, illius autem id quod eſt immobile: præterea quòd primum mouens neceſſariò omni vacat motu, determinatũ eſt priùs, cùm de ſempiterno motu, vtrùm ſit necne, & ſi ſit, quidnam ſit, conſtitutum eſt. Hoc autem non ſolùm vniuerſali ratione accipere oportet, ſed in ſingulis etiam & ſenſilibus, quorum gratia vniuerſales quærimus rationes, & quibus oportere illas accommodari exiſtimamus. Etenim in iis manifeſtum eſt non poſſe quicquam D moueri, niſi aliquid quieſcat. Ac primùm quidem in animalibus. Oportet, namque ſi aliqua mouetur pars, quieſcere quippiam: & hanc ob cauſam articulorum flexus animalibus inſunt. His enim vtuntur flexibus, vt centro quodam, fitque totum membrum in quo articuli eſt flexus, vnum & duo, nec non rectum & curuum, inflexus gratia cùm actu tum poteſtate commutatum. Cùm mouetur autem & inflectitur alia quidẽ mouetur nota, alia verò in ipſo inflexu quieſcat.

quemadmodum ſi diametri a & d quieſcat, b verò moueatur, & fiat a c. Verùm hoc in loco impartibile omnino videtur eſſe centrum. In illis enim motiones fingunt. Mathematicorum namque mouetur nullum. In articulorum autem curuaturis poteſtate & actu modò quidem fit vnum, modò autem partibile. Verùm initium eiuſmodi eſt, quieſcit inferiori parte mota. vt brachio quidem moto, cubitus: toto autem membro, humerus. & tibia quidem mota, genu: toto verò crure, coxa. Quod igitur vnumquodque in ſeipſo quieſcens quippiam habere oportet, vnde motionis eſt initium, & ad quod innixum totum ſimul mouebitur, & per partes, manifeſtum eſt.

CAPVT II.

Quod, vt moueantur animalia extrinſecus etiam, aliud ab ipſis eſſe oportet quod quieſcat.

VEruntamen omnis in ipſo minus efficax eſt quies, niſi extrinſecus aliquid fuerit ſimpliciter quieſcens, & omnino carens motu. Operæpretium autem eſt, accuratè æſtimantes, de eo quod dictum eſt, perſcrutari. Contemplationem enim quandam habet non ſolum ad animalia, verum ad ipſius etiam vniuerſi motum & lationem pertinentem. Quemadmodum enim in ipſo immobile quiddam eſſe oportet, ſi debet moueri: ita etiam magis extra ipſum animal quippiam eſſe oportet immobile, ad quod innixum quod motum eſt, mouetur. Si enim ſemper ceſſerit, vt muribus per terram aut arenam progredientibus, non ſanè progredietur, neque certè vllus erit progreſſus, niſi ſtet terra: neque volatus, aut natatio, niſi aer aut mare reſiſtant. Hoc autem aliud ab eo eſſe quod mouetur, neceſſe eſt, & totum à toto, nullamque rei motæ eſſe portionem, quod ſic eſt immobile. Sin ſecus fuerit, non mouebitur. Huic autem rei teſtimonio eſſe poteſt id, de quo ambigi ſolet, cur ſi quis nauigium extrà propellat conto ad malum innixus, vel ad aliam illius partem, paruo negotio illud mouet. contrà ſi in ipſo ſit nauigio, & idipſum facere contendat, minimè illud mouere poſſit, neque, ſi Tityus ipſe aut Boreas ex ipſo ſufflent nauigio: ſi quidem eo ſufflare quenquam contingat modo, quo pictores faciunt, cum ex ſeipſo quempiam ſpiritum emittentem pingunt. Siue enim leuiter ſpiritum, ſiue ita vehementer emittat, vt maximum efficiat ventum, ſiue aliud ſit quod proiiciatur, vel impellatur: neceſſe eſt primum ad ſuarum quampiam partium quieſcentem innixum propellere, deinde hanc ipſam partem, aut cuiuſuis contingit eſſe pars, ad externum quiddam innixam quieſcere. Qui autem nauigium propellit: cum ipſe in nauigio ſit, nulliſque innitatur, rationabiliter nauigium non mouet, quoniam id cui innititur, manere neceſſe eſt. Accidit autem ipſi idem, & quod mouetur, & cui innititur. Qui autem extra propellit, vel trahit, ſanè mouet. Nulla enim nauigij pars eſt terra.

ὥσπερ ἂν εἰ τῆς διαμέτρου, ἡ μὲν ἀδ μένοι, ἡ δὲ β κινοῖτο, καὶ γίνοιτο ἡ ἀγ. ἀλλ' ἐνταῦθα πάντως ἀδιαίρετον δοκεῖ εἶναι τὸ κέντρον· καὶ γὰρ τὸ κινεῖσθαι πλάττουσιν ἐπ' αὐτῶν, ὥς φασι· οὐ γὰρ κινεῖται τῶν μαθηματικῶν οὐδέν. τὰ δ' ἐν ταῖς καμπαῖς δυνάμει καὶ ἐνεργείᾳ γίνεται ὁτὲ μὲν ἕν, ὁτὲ δὲ διαιρετά. ἀλλ' οὖν ἡ ἀρχὴ ἀεί, ᾗ ἀρχή, ἠρεμεῖ κινουμένου τοῦ μορίου τοῦ κάτωθεν· οἷον τοῦ βραχίονος μὲν κινουμένου, τὸ ὠλέκρανον· ὅλου δὲ τοῦ κώλου, ὁ ὦμος· καὶ τῆς μὲν κνήμης, τὸ γόνυ· ὅλου δὲ τοῦ σκέλους, τὸ ἰσχίον. ὅτι μὲν οὖν καὶ ἐν αὐτῷ ἕκαστον δεῖ τι ἔχειν ἠρεμοῦν, ὅθεν ἡ ἀρχὴ τοῦ κινουμένου ἔσται, καὶ πρὸς ὃ ἀπερειδόμενον, καὶ ὅλον ἀθρόον κινηθήσεται καὶ κατὰ μέρος, φανερόν.

ΚΕΦΑΛ. β'.

Ὅτι καὶ ἔξωθεν τῶν ζώων ἠρεμοῦν τι ἀναγκαῖον, ἕτερον ὂν αὐτοῦ, εἰ μέλλει τὸ κινεῖσθαι κύριον ἔσεσθαι.

Ἀλλὰ πᾶσα ἡ ἐν αὐτῷ ἠρεμία ἀκυροτέρα, ἂν μή τι ἔξωθεν ᾖ ἁπλῶς ἠρεμοῦν καὶ ἀκίνητον. ἄξιον δ' ἐπιστήσαντας ἐπισκέψασθαι περὶ τοῦ λεχθέντος. ἔχει γὰρ τὴν θεωρίαν οὐ μόνον ἐπὶ τὰ ζῷα συντείνουσαν, ἀλλὰ καὶ πρὸς τὴν τοῦ παντὸς κίνησιν καὶ φοράν. ὥσπερ γὰρ [καὶ] ἐν αὐτῷ δεῖ τι ἀκίνητον εἶναι, εἰ μέλλει κινεῖσθαι, οὕτως ἔτι μᾶλλον ἔξω δεῖ τι εἶναι τοῦ ζῴου ἀκίνητον, πρὸς ὃ ἀπερειδόμενον κινεῖται τὸ κινούμενον. εἰ γὰρ ὑποδιώσεται ἀεί, οἷον τοῖς μυσὶ τοῖς ἐν τῇ γῇ, ἢ τοῖς ἐν τῇ ἄμμῳ πορευομένοις, οὐ πρόεισιν, οὐδ' ἔσται οὔτε πορεία, εἰ μὴ ἡ γῆ μένοι, οὔτε πτῆσις ἢ νεῦσις, εἰ μὴ ὁ ἀὴρ ἢ ἡ θάλαττα ἀντερείδοι. ἀνάγκη δὲ ἕτερον εἶναι τοῦτο τοῦ κινουμένου, καὶ ὅλον ὅλου, καὶ μόριον μηδὲν εἶναι τοῦ κινουμένου τὸ οὕτως ἀκίνητον. εἰ δὲ μή, οὐ κινηθήσεται. μαρτύριον δὲ τούτου τὸ ἀπορούμενον, διὰ τί ποτε τὸ πλοῖον μὲν ἔξωθεν, ἄν τις ὠθῇ τῷ κοντῷ τὸν ἱστὸν, ἢ τι ἄλλο προσβάλλων μόριον, κινεῖ ῥᾳδίως· ἐὰν δ' ἐν αὐτῷ τις ὢν τῷ πλοίῳ, τοῦτο πειρᾶται ποιεῖν, οὐκ ἂν κινήσειεν, οὐδ' ἂν ὁ Τιτυὸς οὐδ' ὁ Βορέας πνέων ἔσωθεν ἐκ τοῦ πλοίου, εἰ τύχοι πνέων τὸν τρόπον ὅνπερ οἱ γραφεῖς ποιοῦσιν. ἐξ αὐτοῦ γὰρ τὸ πνεῦμα ἀφιέντα γράφουσιν. ἐάν τε γὰρ ἠρέμα ῥίψῃ τὸ πνεῦμα, ἐάν τε ἰσχυρῶς, οὕτως ὥστε ἄνεμον ποιεῖν τὸν μέγιστον, κἂν τι ἄλλο ᾖ τὸ ῥιπτούμενον ἢ ὠθούμενον, ἀνάγκη πρῶτον μὲν πρός τι ἠρεμοῦν τῶν αὐτοῦ μορίων ἀπερειδόμενον ὠθεῖν, εἶτα πάλιν τοῦτο τὸ μόριον, ἢ αὐτὸ ἢ οὗ τυγχάνει μόριον ὄν, πρός τι τῶν ἔξωθεν ἀπερειδόμενον μένειν. ὁ δὲ τὸ πλοῖον ὠθῶν, ἐν τῷ πλοίῳ αὐτὸς ὤν, καὶ ἀπερειδόμενος εἰς τὸ πλοῖον, εὐλόγως οὐ κινεῖ τὸ πλοῖον, διὰ τὸ ἀναγκαῖον εἶναι μένειν πρὸς ὃ ἀπερείδεται. συμβαίνει δ' αὐτῷ τὸ αὐτό, ὅ τε κινεῖ, καὶ πρὸς ὃ ἀπερείδεται. ἔξωθεν δὲ ὠθῶν, ἢ ἕλκων, κινεῖ. οὐθὲν γὰρ μέρος ἡ γῆ τοῦ πλοίου.

ΚΕΦΑΛ. γ'.

Ὅτι ἀδύνατον κινεῖσθαι τὸν οὐρανὸν ὑπό τινος τῶν ἐντός.

Ἀπορήσειε δ' ἄν τις, ἆρ' εἴ τι κινεῖ τὸν ὅλον οὐρανόν, εἶναί τε δεῖ ἀκίνητον, καὶ τοῦτο μηθὲν εἶναι τοῦ οὐρανοῦ μόριον, μηδ' ἐν τῷ οὐρανῷ. εἴτε γὰρ αὐτὸ κινούμενον κινεῖ αὐτόν, ἀνάγκη τινὸς ἀκινήτου θιγγάνον κινεῖν, καὶ τοῦτο μηδὲ εἶναι μόριον τοῦ κινοῦντος· εἴτ' εὐθὺς ἀκίνητόν ἐστι τὸ κινοῦν, ὁμοίως οὐθὲν ἔσται τοῦ κινουμένου μόριον. καὶ τοῦτό γ' ὀρθῶς λέγουσιν οἱ λέγοντες, ὅτι κύκλῳ φερομένης τῆς σφαίρας οὐδ' ὁτιοῦν μένει μόριον. ἢ γὰρ ὅλην μένειν ἀναγκαῖον ἂν ἦν, ἢ διασπᾶσθαι τὸ συνεχὲς αὐτῆς. ἀλλ' ὅτι τοὺς πόλους οἴονταί τινα δύναμιν ἔχειν, οὐθὲν ἔχοντας μέγεθος, ἀλλ' ὄντας ἔσχατα καὶ στιγμάς, οὐ καλῶς. πρὸς γὰρ τῷ μηδεμίαν οὐσίαν εἶναι τῶν τοιούτων μηθενός, καὶ κινεῖσθαι μίαν κίνησιν ὑπὸ δυοῖν, ἀδύνατον. τοὺς δὲ πόλους δύο ποιοῦσιν. ὅτι μὲν οὖν ἔχει τι καὶ πρὸς τὴν ὅλην φύσιν οὕτως, ὥσπερ ἡ γῆ πρὸς τὰ ζῷα, καὶ τὰ κινούμενα δι' αὐτῶν, ἐκ τῶν τοιούτων ἄν τις διαπορήσειεν.* οἱ δὲ μυθικοὶ τὸν Ἄτλαντα ποιοῦντες ἐπὶ τῆς γῆς ἔχοντα τοὺς πόδας, δόξαιεν ἂν ἀπὸ διανοίας εἰρηκέναι τὸν μῦθον, ὡς τοῦτον ὥσπερ διάμετρον ὄντα, καὶ στρέφοντα τὸν οὐρανὸν περὶ τοὺς πόλους. τοῦτο δ' ἂν συμβαίνοι κατὰ λόγον, διὰ τὸ τὴν γῆν μένειν. ἀλλὰ τοῖς ταῦτα λέγουσιν ἀναγκαῖον φάναι, μηθὲν εἶναι μόριον αὐτὴν τοῦ παντός. πρὸς δὲ τούτοις δεῖ τὴν ἰσχὺν ἰσάζειν τοῦ κινοῦντος, καὶ τὴν τοῦ μένοντος. ἔστι γάρ τι πλῆθος ἰσχύος καὶ δυνάμεως, καθ' ἣν μένει τὸ μένον. ὥσπερ καὶ καθ' ἣν κινεῖ τὸ κινούμενον· καὶ ἔστι τις ἀναλογία ἐξ ἀνάγκης, ὥσπερ τῶν ἐναντίων κινήσεων, οὕτω καὶ τῶν ἠρεμιῶν. καὶ αἱ μὲν ἴσαι, ἀπαθεῖς ὑπ' ἀλλήλων, κρατοῦνται δὲ κατὰ τὴν ὑπεροχήν. διόπερ εἴτε Ἄτλας, εἴτε τι τοιοῦτόν ἐστιν ἕτερον τὸ κινοῦν τῶν ἐντός, οὐθὲν μᾶλλον* ἀντηρεῖν δεῖ τῆς μονῆς ἣν ἡ γῆ τυγχάνει μένουσα· ἢ κινηθήσεται ἡ γῆ ἀπὸ τοῦ μέσου, καὶ ἐκ τοῦ αὑτῆς τόπου. ὡς γὰρ τὸ ὠθοῦν ὠθεῖ, οὕτω τὸ ὠθούμενον ὠθεῖται· καὶ ὁμοίως κατ' ἰσχύν. κινεῖ δὲ τὸ ἠρεμοῦν πρῶτον· ὥστε μᾶλλον καὶ πλείων ἡ ἰσχύς, ἢ ὁμοία καὶ ἴση τῆς ἠρεμίας. ὡσαύτως δὲ καὶ ἡ τοῦ κινουμένου μέν, μὴ κινοῦντος δέ. τοσαύτην οὖν δεήσει τὴν δύναμιν εἶναι τῆς γῆς ἐν τῷ ἠρεμεῖν, ὅσην ὅ τε πᾶς οὐρανὸς ἔχει, καὶ τὸ κινοῦν αὐτόν. εἰ δὲ τοῦτο ἀδύνατον, ἀδύνατον καὶ τὸ κινεῖσθαι τὸν οὐρανὸν ὑπό τινος τοιούτου τῶν ἐντός.

* χ. οἱ δὲ μυθικῶς

* Quid. ἀντερείδειν

ΚΕΦΑΛ. δ'.

Ἀπορίαι περὶ τὰς κινήσεις τῶν τοῦ οὐρανοῦ μορίων, καὶ τὰς τῶν ζῴων καὶ τῶν ἀψύχων.

Ἔστι δέ τις ἀπορία περὶ τὰς κινήσεις τῶν τοῦ οὐρανοῦ μορίων, ἣν ὡς οὖσαν οἰκείαν τοῖς εἰρημένοις, ἐπισκέψαιτ' ἄν τις. ἐὰν γάρ τις ὑπερβάλλῃ τῇ δυνάμει τῆς κινήσεως τὴν τῆς γῆς ἠρεμίαν, δῆλον ὅτι κινήσει αὐτὴν ἀπὸ τοῦ μέσου. καὶ ἡ ἰσχὺς δὲ ἀφ' ἧς αὕτη ἡ δύναμις, ὅτι οὐκ ἄπειρος, φανερόν.

CAPVT III.

Quærit quodnam ſit mouens ipſum cœlum. Refutatio veteris fabulæ de Atlante.

Sed dubitare ſanè poterit aliquis: an ſi quid vniuerſum mouet cœlum, & omni carere motu, & nullam cœli eſſe partem, neque in cœlo eſſe oporteat. Siue enim ipſum motum, cœlum mouet, aliquod ſanè non motum attingens neceſſe eſt ipſum mouere: id autem nullam mouentis eſſe partem: ſiue continuò non motum eſt id quod mouet, nulla itidem motæ rei erit pars. Et hoc ſanè rectè dicere videntur, quicunque aſſerunt quòd circulo latæ ſphæræ nulla omnino manet pars. aut enim totam ſtare neceſſe eſſet, aut illius continuũ diuelli. Verùm quoniam polos potentiam habere quandam arbitrantur, cùm nullam habeant magnitudinem, ſed vltima & puncta exiſtant: id ſanè non rectè. Ad hoc enim quòd nulla illorum eſt eſſentia, fieri non poteſt vt vnicus à duobus agatur motus. Polos porro duos faciunt. Quòd igitur ad vniuerſam naturam quiddam ſic ſe habet, vt terra ad animalia & ad ea quæ per ſe mouentur, ex huiuſmodi quiſpiam dubitare poterit. Verùm ij qui in fabulis verſantur, & Atlantem pedes in terra habere faciunt, non ſine mente hanc fabulam dixiſſe videri poſſunt: perinde ac ille diameter ſit, cœlumque circum polos torqueat, id autem ratione contingere videtur, quoniam manet terra. Verùm huiuſmodi rei aſſertoribus concedere eſt neceſſe, illam vniuerſi nullam eſſe partem. Præterea mouentis robur & quieſcentis, æquabiliter ſe habere oportet. eſt enim magnitudo roboris & potentiæ, qua ſic manet quod quieſcit, ſicut qua motor mouet. Et profectò quædam neceſſariò eſt proportio, vt contrariorum motuum, ſic etiam ipſarum quietum. Et quæcunque ſunt æquales, à ſe inuicem non patiuntur, per exuperantiam autem vincuntur. Quamobrem ſiue Atlas, ſiue aliud quippiam ſit quod mouet, ex iis quæ intrà continentur, nihilo magis excellere debet quietem qua terra manet, vel de medio, ſuóque ipſius loco mouebitur terra. Vt enim impellens impellit, ſic impulſum impellitur, & ſimiliter vt eſt robur. Mouet autem primum quieſcens, iccirco maius & valentius robur, aut ſimile & æquale quieti. Eodemque modo rei motæ, quæ tamen non mouet. Tantam igitur in quieſcendo terræ facultatem eſſe oportebit, quantam tum vniuerſum habet cœlum, tum illius motor. Quod ſi hoc fieri non poteſt, neque vt cœlum à quopiam quod intus ſit moueatur, fieri poterit.

CAPVT IV.

Dubitationes aliquot de motu cæli: item de motu animalium & rerum inanimatarum.

Est autem dubitatio quædam de partium cœli motibus: quæ quoniam iis quæ dicta ſunt eſt cognata, non ab re hoc in loco perſcrutari poterit. Nam ſi quis motionis potentia terræ quietem excelſerit, manifeſtum ſanè eſt, quòd illam mouebit è medio. Quòd autem robur, à quo illi iſthæc ineſt potentia, non eſt infinitum, etiam me-

A neque enim infinita eſt ipſa terra: quamobrem neque illius grauitas. Quoniam autem impoſſibile multipliciter dicitur (non enim eodem modo impoſſibile eſſe dicimus, vocem videri à nobis, & illos qui in orbe ſunt lunæ: cùm alterum ex neceſſitate ſit, alterum autem quamuis natum ſit videri, non tamen videbitur) cœlum verò incorruptibile & non diſſolubile, arbitramur quidem ex neceſſitate eſſe, hac verò ratione non ex neceſſitate contingit. Natus etenim eſt, & contingit fieri motus maior, quàm à quo quieſcit terra, & à quo ignis & ſupremum corpus mouetur. Itaque ſi exuperantes fuerint motiones, iſthæc a ſe inuicem diſſoluentur. Sin verò tales quidem non fuerint, illas autem eſſe contigerit (infinitum enim non B contingit, quoniam neque infinitum eſſe contingit corpus) continget ſanè diſſolui cœlum. Quid enim prohibet hoc accidere poſſe, ſiquidem non eſt impoſſibile? Non eſt autem impoſſibile, niſi contrarium fuerit neceſſarium. Verùm de huiuſmodi dubitatione alius ſanè erit ſermo. Vtrùm autem oporteat extra id quod mouetur, immotum quiddam eſſe & quieſcens, quod nulla illius exiſtat pars: an ſecus? Et hoc vtrùm ita ſe habere in ipſo vniuerſo eſt neceſſarium? Fortaſſe enim videri poterit inconueniens eſſe, ſi motionis principium intus ſit. Quamobrem ita exiſtimantibus, videri poterit rectè ab Homero fuiſſe dictum: C

Sed vobis nunquam cœlo deducere ab alto
Ad terram dabitur ſummumque ſciumque Tonantem:
Non ſi peruigili ſtudio, multoque labore,
Diique deæque omnes pariter trahere inde velitis.

Quod enim omnino immobile eſt, à nullo moueri contingit. Vnde etiam iam dicta ſoluitur difficultas, an contingit cœli compoſitionem diſſolui, vel non contingit. Siquidem ex immobili dependet principio. In animalibus autem non modò ita immobile quiddam eſſe oportet, ſed in iis etiam quæ per locum mouentur, quæcunque ſeipſa mouent. illorum enim aliud quidem moueri, D aliud autem quieſcere oportet, ad quod innixum motum mouebitur, vt ſi aliqua partium moueat. innititur enim altera, ceu ad quieſcentem alteram. De iis verò quæ carent anima, quæcunque mouentur, dubitare quiſpiam poterit, vtrùm omnia in ſe habeant & quieſcens, & mouens, & ad quippiam extra quieſcentium neceſſario innitantur: an impoſſibile, vt ignis vel terra, vel aliquid aliud quod anima caret, ſed à quibus primis hæc mouentur. Inanima namque omnia ab alio mouentur. Omnium autem ita motorum principium ſunt, quæ ſeipſa mouent. Verùm de eiuſmodi in animalibus quidem dictum eſt. Hæc E namque omnia & in ſeipſis habere quieſcens neceſſe eſt & extrà ad quod innitantur. Si autem aliquid eſt ſuperius & primum mouens, non eſt manifeſtum, & de huiuſmodi principio alius eſt ſermo. omnia verò quæ mouentur, ad ea quæ extrà ſunt innixa mouentur, & cùm ſpirant, & cùm expirant. Nihil enim refert, magnum prouocare pondus, an paruum: quod ſanè faciunt qui deſpuunt, & qui tuſſiunt, & expirant.

A οὐδὲ γὰρ ἡ γῆ ἄπειρος ὥστε οὐδὲ τὸ βάρος αὐτῆς. ἐπεὶ δὲ τὸ ἀδύνατον λέγεται πλεοναχῶς· (οὐ γὰρ ὡσαύτως τήν τε φωνὴν ἀδύνατόν φαμεν εἶναι ὁραθῆναι, καὶ τοὺς ἐπὶ τῆς σελήνης ὑφ' ἡμῶν· τὸ μὲν γὰρ ἐξ ἀνάγκης, τὸ δὲ πεφυκὸς ὁρᾶσθαι, οὐχ ὀφθήσεται) τὸν δὲ οὐρανὸν ἄφθαρτον εἶναι καὶ ἀδιάλυτον, οἰόμεθα μὲν ἐξ ἀνάγκης εἶναι, συμβαίνει δὲ κατὰ τοῦτον τὸν λόγον, οὐκ ἐξ ἀνάγκης. πέφυκε γὰρ καὶ ἐνδέχεται εἶναι κίνησιν μείζω, καὶ ἀφ' ἧς ἠρεμεῖ ἡ γῆ, καὶ ἀφ' ἧς κινοῦνται τὸ πῦρ καὶ τὸ ἄνω σῶμα. εἰ μὲν οὖν εἰσὶν αἱ ὑπερέχουσαι κινήσεις, διαλυθήσονται ταῦτα ὑπ' ἀλλήλων. εἰ δὲ μὴ εἰσὶ μὲν, ἐνδέ- B χεται δ' εἶναι (ἄπειρον γὰρ οὐκ ἐνδέχεται, διὰ τὸ μηδὲ σῶμα ἐνδέχεσθαι ἄπειρον εἶναι) ἐνδέχοιτ' ἂν διαλυθῆναι τὸν οὐρανόν. τί γὰρ κωλύει τοῦτο συμβῆναι, εἴπερ μὴ ἀδύνατον; οὐκ ἀδύνατον δὲ, εἰ μὴ τὸ ἀντικείμενον ἀναγκαῖον. ἀλλὰ περὶ μὲν τῆς ἀπορίας ταύτης ἕτερος ἔστω λόγος. ἆρα δὲ δεῖ [ἀεὶ καὶ] ἀκίνητόν τι εἶναι, καὶ ἠρεμοῦν ἔξω τοῦ κινουμένου, μηδὲν ὂν ἐκείνου μόριον, ἢ οὔ; καὶ τοῦτο, πότερον καὶ ἐπὶ τοῦ παντὸς οὕτως ὑπάρχειν ἀναγκαῖον; ἴσως γὰρ ἂν δόξειεν ἄτοπον εἶναι, εἰ ἡ ἀρχὴ τῆς κινήσεως ἐντός. διὸ δόξειεν ἂν τοῖς οὕτως ὑπολαμβάνουσιν, εὖ εἰρῆσθαι Ὁμήρῳ,

C Ἀλλ' οὐκ ἂν ἐρύσαιτ' ἐξ οὐρανόθεν πεδίονδε, Iliad. 8.
Ζῆν' ὕπατον μήστωρ', οὐδ' εἰ μάλα πολλὰ κάμοιτε,
Πάντες δ' ἐξάπτεσθε θεοὶ, πᾶσαί τε θέαιναι.

τὸ μὲν ὅλως ἀκίνητον, ὑπ' οὐδενὸς ἐνδέχεται κινηθῆναι (ὅθεν λύεται καὶ ἡ πάλαι λεχθεῖσα ἀπορία, πότερον ἐνδέχεται, ἢ οὐκ ἐνδέχεται διαλυθῆναι τὴν τοῦ οὐρανοῦ σύστασιν, εἰ ἐξ ἀκινήτου ἤρτηται ἀρχῆς) ἐπὶ δὲ τῶν ζῴων οὐ μόνον τὸ οὕτως ἀκίνητον δεῖ ὑπάρχειν, ἀλλὰ καὶ ἐν αὐτοῖς τοῖς κινουμένοις κατὰ τόπον, ὅσα κινεῖ αὐτὰ αὑτά. δεῖ γὰρ αὐτῶν, τὸ μὲν κινεῖσθαι, τὸ δὲ ἠρεμεῖν, πρὸς ὃ ἀπερειδόμενον τὸ κινούμενον κινήσεται. οἷον ἄν τι κινῇ τῶν D μορίων.* ἀπερείδεται γὰρ θάτερον ὡς * πρὸς μένον θάτερον. Περὶ δὲ τῶν ἀψύχων ὅσα κινεῖται, διαπορήσειεν ἄν τις, πότερον ἅπαντ' ἔχει ἐν ἑαυτοῖς καὶ τὸ ἠρεμοῦν καὶ τὸ κινοῦν, καὶ πρὸς τῶν ἔξω τι ἀπερείδεσθαι ἠρεμούντων, ἀνάγκη καὶ ταῦτα, ἢ ἀδύνατον. οἷον πῦρ, ἢ γῆν, ἢ τῶν ἀψύχων τι ἄλλ', ὑφ' ὧν ταῦτα κινεῖται πρώτων. πάντα γὰρ ὑπ' ἄλλου κινεῖται τὰ ἄψυχα. ἀρχὴ δὲ πάντων τῶν οὕτως κινουμένων, τὰ αὐτὰ αὑτὰ κινοῦντα. τῶν δὲ τοιούτων, περὶ μὲν τῶν ζῴων εἴρηται. τὰ γὰρ τοιαῦτα πάντα, ἀνάγκη καὶ ἐν αὑτοῖς ἔ- E χειν τὸ ἠρεμοῦν, καὶ ἔξω πρὸς ὃ ἀπερείδεται. Εἰ δέ τι ἔστιν ἀνωτέρω καὶ πρῶτον κινοῦν, ἄδηλον, καὶ ἄλλος λόγος περὶ τῆς τοιαύτης ἀρχῆς. τὰ δὲ ζῷα ὅσα κινεῖται, πάντα πρὸς τὰ ἔξω ἀπερειδόμενα κινεῖται, καὶ ἀναπνέοντα, καὶ ἐκπνέοντα. οὐδὲ γὰρ διαφέρει μέγα ῥῖψαι βάρος ἢ μικρόν· ὅπερ ποιοῦσιν οἱ πτύοντες, καὶ οἱ βήττοντες, καὶ οἱ εἰσπνέοντες καὶ ἐκπνέοντες.

* κ. ἀπερείδεται
* κ. πρὸς ἠρεμοῦν?

ΚΕΦΑΛ. ε.

Πότερον ἐπὶ τῶν αὐτὰ κινούντων κατὰ τόπον μόνον δεῖ τι μένειν, ἢ καὶ ἐπὶ τῶν ἀλλοιουμένων αὐτῶν ὑφ' αὑτοῦ καὶ αὐξανομένων.

Πότερον δ' ἐπὶ τοῦ αὐτὸ κινοῦντος κατὰ τόπον, * μόνον δεῖ τι μένειν, ἢ καὶ ἐπὶ τοῦ ἀλλοιουμένου αὐτοῦ ὑφ' αὑτοῦ καὶ αὐξανομένου; περὶ δὲ γενέσεως τῆς ἐξ ἀρχῆς καὶ τῆς φθορᾶς ἄλλος λόγος: εἰ γάρ ἐστιν ἥνπερ φαμὲν πρώτη κίνησις, γενέσεως καὶ φθορᾶς αὕτη αἰτία ἂν εἴη, καὶ τῶν ἄλλων δ' ἴσως κινήσεων πασῶν. ὥσπερ δ' ἐν τῷ ὅλῳ, καὶ ἐν τῷ ζῴῳ κίνησις πρώτη αὕτη, ὅταν τελεωθῇ· ὥστε καὶ αὐξήσεως, εἴ ποτε γίγνεται, αὐτὴ αὐτῷ αἰτία καὶ ἀλλοιώσεως, εἰ δὲ μή, οὐκ ἀνάγκη. αἱ δὲ πρῶται αὐξήσεις καὶ ἀλλοιώσεις ὑπ' ἄλλου γίγνονται, καὶ δι' ἑτέρων· γενέσεως δὲ καὶ φθορᾶς, οὐδαμῶς οἷόν τε αὐτὸ αἴτιον εἶναι αὐτῷ οὐθέν. προϋπάρχειν γὰρ δεῖ τὸ κινοῦν τοῦ κινουμένου, καὶ τὸ γεννῶν τοῦ γεννωμένου· αὐτὸ δ' αὑτοῦ πρότερον οὐθέν ἐστι.

* γρ. μόνον

ΚΕΦΑΛ. ϛ.

Περὶ ψυχῆς, πῶς κινεῖ τὸ σῶμα· καὶ τίς ἀρχὴ τῆς τοῦ ζῴου κινήσεως. Τί ὅμοιον, τί δὲ διαφέρει τῆς τοῦ οὐρανοῦ καὶ τῆς τῶν ζῴων κινήσεως.

Περὶ μὲν οὖν ψυχῆς, εἴτε κινεῖται ἢ μή, καὶ εἰ κινεῖται, πῶς κινεῖται, πρότερον εἴρηται ἐν τοῖς διωρισμένοις περὶ αὐτῆς. ἐπεὶ δὲ τὰ ἄψυχα πάντα κινεῖται ὑφ' ἑτέρου, (περὶ μὲν τοῦ πρώτου κινουμένου, καὶ ἀεὶ κινουμένου, τίνα τρόπον κινεῖται, καὶ πῶς κινεῖ τὸ πρῶτον κινοῦν, διώρισται πρότερον ἐν τοῖς περὶ τῆς πρώτης φιλοσοφίας.) λοιπὸν δ' ἐστὶ θεωρῆσαι πῶς ἡ ψυχὴ κινεῖ τὸ σῶμα, καὶ τίς ἀρχὴ τῆς τοῦ ζῴου κινήσεως. τῶν γὰρ ἄλλων παρὰ τὴν τοῦ ὅλου κίνησιν, τὰ ἔμψυχα αἴτια τῆς κινήσεως, ὅσα μὴ κινεῖται ὑπ' ἀλλήλων, διὰ τὸ προσκρούειν ἀλλήλοις. διὸ καὶ πέρας ἔχουσιν αὐτῶν πᾶσαι αἱ κινήσεις· καὶ γὰρ καὶ αἱ τῶν ἐμψύχων. πάντα γὰρ τὰ ζῷα καὶ κινεῖ καὶ κινεῖται ἕνεκά τινος, ὥστε τοῦτ' ἔστιν αὐτοῖς πάσης [τῆς] κινήσεως πέρας, τὸ οὗ ἕνεκα. ὁρῶμεν δὲ τὰ κινοῦντα τὸ ζῷον διάνοιαν, [καὶ αἴσθησιν,] καὶ φαντασίαν, καὶ προαίρεσιν, καὶ βούλησιν, [καὶ θυμόν,] καὶ ἐπιθυμίαν. ταῦτα δὲ πάντα ἀνάγεται εἰς νοῦν καὶ ὄρεξιν. καὶ γὰρ ἡ φαντασία καὶ ἡ αἴσθησις, τὴν αὐτὴν τῷ νῷ χώραν ἔχουσι. κριτικὰ γὰρ πάντα. διαφέρουσι δὲ κατὰ τὰς εἰρημένας ἐν ἄλλοις διαφοράς. βούλησις δέ, καὶ θυμός, καὶ ἐπιθυμία, πάντα ὀρέξεις. ἡ δὲ προαίρεσις, κοινὸν διανοίας καὶ ὀρέξεως. ὥστε κινεῖ πρῶτον τὸ ὀρεκτὸν καὶ τὸ διανοητόν. οὐ πᾶν δὲ τὸ διανοητόν, ἀλλὰ τὸ τῶν πρακτῶν τέλος. διὸ τὸ τοιοῦτόν ἐστι τῶν ἀγαθῶν τὸ κινοῦν, ἀλλ' οὐ πᾶν τὸ καλόν. ᾗ γὰρ ἕνεκα τούτου ἄλλο, καὶ ᾗ τέλος ἐστὶ τῶν ἄλλου τινὸς ἕνεκα ὄντων, ταύτῃ κινεῖ. δεῖ δὲ τιθέναι καὶ τὸ φαινόμενον ἀγαθόν, ἀγαθοῦ χώραν ἔχειν, καὶ τὸ ἡδύ. φαινόμενον γάρ ἐστιν ἀγαθόν. ὥστε δῆλον ὅτι ἔστι μὲν ᾗ ὁμοίως κινεῖται τὸ ἀεὶ κινούμενον,

A

CAPVT V.

Vtrùm in iis quæ per locum mouentur, aliquid extra quieſcere oporteat necne: & an eodem modo in iis etiam quæ augentur & alterantur, fieri contingat.

VTrùm autem in eo ſolùm quod ſeipſum per locum mouet, quippiam quieſcere oportet, an etiam in iis quæ ex ſeipſis alterantur, & augeſcunt. Namque de prima generatione & corruptione alius eſt ſermo. Si enim eſt is quem diximus primus motus, generationis & corruptionis profectò is erit cauſa, necnon aliarum fortaſſe omnium motionum. B Quemadmodum autem in vniuerſo, ita in ipſo animali prima iſthæc motio, poſtquam fuerit abſolutum. Quamobrem & augmenti, ſi quid eſt, ſibiipſi erit cauſa, & alterationis: ſin ſecus, non eſt neceſſarium. Prima autem augmentationes & alterationes ab alio, & per alia fiunt: generationis autem & corruptionis minimè ſibi ipſi quippiam cauſa eſſe poteſt. Præcurrere enim debet motor id quod mouetur, & genitum generans, nihil autem ſeipſo eſt prius.

CAPVT VI.

C *Quonam modo corpora moueat anima: quæ ſit differentia inter motum cœli & animalium.*

DE anima autem, ſiue moueatur, ſiue non: & ſi mouetur, quo moueatur modo, priùs dictum eſt in iis in quibus de illa eſt pertractatum. Quoniam verò inanima omnia ab aliis mouentur (nam de primo quidem & perpetuo mobili, quonam moueatur modo, quove pacto moueat primum mouens, in primis philoſophiæ commentatis determinatum eſt prius.) Reliquum eſt contemplari quomodo anima corpus mouet, & quodnam animalium motionis ſit principium. Animata enim præterquam ipſius vniuerſi motionis, D aliorum ſanè motus ſunt cauſæ, quæcunque à ſe inuicem non mouentur, quoniam ſe inuicem impellunt. Quapropter omnes illorum motiones finem habent: nam & illæ animatorum ſunt eiuſmodi. Omnia enim animalia cùm mouent, tum mouentur alicuius gratiâ: quapropter id illis omnium motionum eſt finis, cuius videlicet gratiâ. Animaduertimus autem, cogitationem, phantaſiam, ſelectionem, voluntatem, & cupiditatem animal mouere: hæc autem omnia ad mentem referuntur, & appetitionem. phantaſia enim & ſenſus cum mente eundem habent locum, cùm iudicandi habeant facultatem. Attamen iis diſtant, quæ in aliis dictæ ſunt, differentiis. Voluntas E verò & ira & cupiditas omnia cum appetitione faciunt. Selectio autem communis eſt cogitationis & appetitionis, quapropter & ipſum quod ſeligi poteſt. Non autem omne excogitabile, ſeligibile eſt, ſed rerum agendarum finis. Quamobrem tale eſt bonorum id quod mouet, ſed non omne pulchrum. Vt enim huius gratiâ eſt aliud, & vt eſt finis, cùm alia alicuius gratiâ exiſtant, eatenus mouet. Oportet autem conſtituere, id quod apparet bonum, boni etiam locum obtinere, & ipſum iucundum, quandoquidem apparet bonū. Quare planum eſt, quòd cōtingit quidē, id quod ſemper mouetur,

à ſemper mouente ſimiliter moueri, vt ſingula animalia. contingit autem vt alio modo, & idcirco illud quidem ſemper mouetur, animalium autem motus terminum habet. Sempiternum autem pulchrum, & id quod vere & primò eſt bonum, neque modò quidem eſt, modò vero non eſt: diuinius profectò honorabiliuſque eſt, quam vt illo quicquam ſit prius. Primum igitur immotum mouet: appetitio autem, & id quod appetibile eſt, mota mouent. Vltimum autem eorum quæ mouentur, quòd aliud moueat, nulla eſt neceſſitas. Manifeſtũ etiam ex iis eſt, quod rationabiliter localis motus vltimus eſt factorum in iis quæ fiunt. Mouetur enim & ingreditur animal appetitione, vel ſelectione: alteratione tamen facta aliqua per ſenſum, aut phantaſiam.

CAPVT VII.

De duplicis intellectus practici & theorici affectu, & quid differant.

QVomodo autẽ intelligens alias quidem operatur, alias verò non operatur? & mouetur interdum, interdum non mouetur? Eodem ſane modo contingere videtur, quo ea quæ immota ſunt, cogitatione ratiocinationeque comprehenduntur. Verùm in illis quidem contemplatio eſt finis. Cùm enim duas intellexerit propoſitiones, concluſionẽ ſanè intellexit & coniunxit. Hic autẽ ex duabus propoſitionibus concluſio fit operatio. verbi gratia: cùm nouerit, quoniam omni deambulandum eſt homini, ipſe eſt homo, illico deambulat. Si autem quòd nulli nunc incedendum eſt homini, ipſe autem homo confeſtim quieſcit: & vtrũque facit, niſi à quopiam prohibeatur, aut cogatur. Commoda res eſt mihi facienda, domus commoda eſt, domum confeſtim facit. Integumento corporis indigeo, tunica eſt corporis integumentum, tunica indigeo. quo indigeo, id mihi faciendum: tunica indigeo: tunica eſt mihi facienda. Et ea concluſio, tunica mihi facienda, operatio eſt. Operatur autem à principio: Si tunica eſſe debet, neceſſarium eſt eſſe primum. Si autem illud, & aliud: & id illico operatur. Quòd quidem operatio fit concluſio, manifeſtum. Propoſitiones autem factitiæ ex duobus conſtant generibus, ex bono ſcilicet, & eo quod fieri poteſt. Quemadmodum autem qui interrogant, ſic propoſitionum alteram, manifeſtam ſcilicet, cogitatio haudquaquam inſiſtẽs conſiderat: vt ſi homini deambulare eſt bonum, quòd ipſe ſit homo, non immoratur, iccircò quæcunque alia nulla ratiocinatione agimus, celeriter agimus. Quãdo enim aut ſenſu operatur ad id cuius gratia, aut phantaſia, aut intellectu, quod appetit, confeſtim facit. Interrogationis namq; aut notionis loco, appetitionis fit operatio. Bibendum eſſe mihi dictat cupiditas, hoc autem eſſe poculentum ſenſus vel phantaſia vel mens affirmat, confeſtim bibitur. Ita ſanè ad motum & operationem animalia excitantur, cùm vltima motionis cauſa ſit appetitio: quæ tamen vel per ſenſum, vel per phantaſiam & notionem efficitur. Quæcunque autem quippiam facere appetunt, partim quidem cupiditate aut ira, partim verò appetitione aut voluntate faciunt & agunt. Quemadmodum autem ſpontaneæ appellatæ machinæ parua motione facta mouentur, laxatis ſeque mutuò impellentibus vertebris: & curriculus qui à ſe quidẽ vectũ rectè mouet,

A ὑπὸ τοῦ ἀεὶ κινουμένου, καὶ τῶν ζώων ἕκαστον· ἔστι δ' ἢ ὡς ἄλλως, διὸ καὶ τὸ μὲν ἀεὶ κινεῖται, ἡ δὲ τῶν ζώων κίνησις ἔχει πέρας. τὸ δὲ ἀΐδιον, καλὸν, καὶ τὸ * ἀληθῶς καὶ πρώτως ἀγαθὸν, καὶ μὴ ποτὲ μὲν, ποτὲ δὲ μή, θειότερον καὶ τιμιώτερον, ἢ ὥστ' εἶναι [τι] πρότερον. τὸ μὲν οὖν πρῶτον, οὐ κινούμενον κινεῖ· ἡ δ' ὄρεξις καὶ τὸ ὀρεκτικὸν, κινούμενον κινεῖ. τὸ δὲ τελευταῖον τῶν κινουμένων, οὐκ ἀνάγκη κινεῖν οὐδέν. φανερὸν δ' ἐκ τούτων, καὶ ὅτι εὐλόγως ἡ φορὰ τελευταία τῶν γινομένων ἐν τοῖς γινομένοις. κινεῖται γὰρ καὶ πορεύεται τὸ ζῷον ὀρέξει ἢ προαιρέσει, ἀλλοιωθέντος τινὸς κατὰ τὴν αἴσθησιν ἢ τὴν φαντασίαν. B

* κ.

ΚΕΦΑΛ. ζ.

Ὅτι νοῶν ποτὲ μὲν πράττει, ποτὲ δὲ οὐ πράττει· καὶ κινεῖται, ποτὲ δὲ οὐ κινεῖται, καὶ πῶς τοῦτο γίνεται.

ΠΩς δὲ νοῶν, ὁτὲ μὲν πράττει, ὁτὲ δ' οὐ πράττει, καὶ κινεῖται, ὁτὲ δ' οὐ κινεῖται; ἔοικε δὲ παραπλησίως συμβαίνειν καὶ περὶ τῶν ἀκινήτων διανοουμένοις καὶ συλλογιζομένοις. ἀλλ' ἐκεῖ μὲν θεώρημα τὸ τέλος (ὅταν γὰρ τὰς δύο προτάσεις νοήσῃ, τὸ συμπέ-
C ρασμα ἐνόησε καὶ συνέθηκεν) ἐνταῦθα δ' ἐκ τῶν δύο προτάσεων τὸ συμπέρασμα γίνεται ἡ πρᾶξις. οἷον ὅταν νοήσῃ, ὅτι παντὶ βαδιστέον ἀνθρώπῳ, αὐτὸς δ' ἄνθρωπος, βαδίζει εὐθέως. ἂν δ' ὅτι οὐδενὶ βαδιστέον νῦν ἀνθρώπῳ, αὐτὸς δ' ἄνθρωπος, εὐθὺς ἠρεμεῖ. καὶ ταῦτα ἄμφω πράττει, ἂν μή τι κωλύῃ, ἢ ἀναγκάζῃ. ποιητέον μοι ἀγαθόν· οἰκία δ' ἀγαθόν· ποιεῖ οἰκίαν εὐθύς. σκεπάσματος δέομαι· ἱμάτιον δὲ σκέπασμα· ἱματίου δέομαι· οὗ δέομαι, ποιητέον· ἱματίου δέομαι· ἱμάτιον ποιητέον. καὶ τὸ συμπέρασμα, τὸ ἱμάτιον ποιητέον, πρᾶξίς ἐστι. πράττει δ' ἀπ' ἀρχῆς. εἰ ἱμάτιον ἔ-
D σται, ἀνάγκη εἶναι τὸ πρῶτον. εἰ δὲ τόδε, τόδε· καὶ τοῦτο πράττει εὐθύς. ὅτι μὲν οὖν ἡ πρᾶξις τὸ συμπέρασμα, φανερόν. αἱ δὲ προτάσεις αἱ ποιητικαὶ, διὰ δύο εἰδῶν γίνονται, διά τε τοῦ ἀγαθοῦ, καὶ διὰ τοῦ δυνατοῦ. ὥσπερ δὲ τῶν ἐρωτώντων ἔνιοι, οὕτω τὴν ἑτέραν πρότασιν τὴν δήλην, οὐδ' ἡ διάνοια ἐφιστᾶσα, σκοπεῖ οὐδέν. οἷον, εἰ τὸ βαδίζειν ἀγαθὸν ἀνθρώπῳ, ὅτι αὐτὸς ἄνθρωπος, οὐκ ἐνδιατρίβει. διὸ καὶ ὅσα ἄλλα μὴ λογισάμενοι πράττομεν, ταχὺ πράττομεν. ὅταν γὰρ ἐνεργήσῃ, ἢ τῇ αἰσθήσει πρὸς τὸ οὗ ἕνεκα, ἢ τῇ φαντασίᾳ, ἢ τῷ νῷ, οὗ ὀρέγεται, εὐθὺς ποιεῖ. ἀντ' ἐρωτήσεως γὰρ ἢ νοήσεως, ἡ τῆς
E ὀρέξεως γίνεται ἐνέργεια. ποτέον μοι, ἡ ἐπιθυμία λέγει· τοδὶ δὲ ποτόν, ἡ αἴσθησις εἶπεν, ἢ ἡ φαντασία ἢ ὁ νοῦς· εὐθὺς πίνει. οὕτως μὲν οὖν ἐπὶ τὸ κινεῖσθαι καὶ πράττειν τὰ ζῷα ὁρμῶσι, τῆς μὲν ἐσχάτης αἰτίας τοῦ κινεῖσθαι ὀρέξεως οὔσης· ταύτης δὲ γινομένης ἢ δι' αἰσθήσεως, ἢ διὰ φαντασίας καὶ νοήσεως. τῶν δ' ὀρεγομένων πράττειν, τὰ μὲν, δι' ἐπιθυμίαν ἢ θυμόν· τὰ δὲ, δι' ὄρεξιν ἢ βούλησιν· τὰ μὲν ποιοῦσι, τὰ δὲ πράττουσιν. ὥσπερ δὲ τὰ αὐτόματα κινεῖται, μικρᾶς κινήσεως γινομένης, λυομένων τῶν στρεβλῶν, καὶ * κρουόντων ἀλλήλας τὰς στρέβλας· καὶ τὸ ἁμάξιον, ὅπερ ὀχούμενον αὐτὸ, κινεῖ εὐθύ, ἐπὶ τὰ

* Interpr. κρούουσιν ἀ. τὰς στρέβλας,

καὶ πάλιν κύκλῳ κινεῖται, τῷ ἀνίσους ἔχειν τοὺς τροχούς· A (ὁ γὰρ ἐλάττων, ὥσπερ κέντρον γίνεται, καθάπερ ἐν τοῖς κυλίνδροις) οὕτω καὶ τὰ ζῷα κινεῖται. ἔχει γὰρ ὄργανα τοιαῦτα, τήν τε τῶν νεύρων φύσιν καὶ τὴν τῶν ὀστῶν. τὰ μὲν γὰρ, ὡς ἐκεῖ τὰ ξύλα καὶ ὁ σίδηρος· τὰ δὲ νεῦρα, ὡς αἱ στρέβλαι· ὧν λυομένων καὶ ἀνιεμένων, κινοῦνται. ἐν μὲν οὖν τοῖς αὐτομάτοις καὶ ἁμαξίοις, οὐκ ἔστιν ἀλλοίωσις· ἐπεὶ, εἰ ἐγίνοντο ἐλάττους οἱ ἐντὸς τροχοὶ, καὶ πάλιν μείζους, κἂν κύκλῳ τὸ αὐτὸ ἐκινεῖτο. ἐν δὲ τῷ ζῴῳ δύναται τὸ αὐτὸ, καὶ μεῖζον καὶ ἔλαττον γίνεσθαι, καὶ τὰ σχήματα μεταβάλλειν, αὐξανομένων τῶν μορίων διὰ θερμότητα, καὶ πάλιν συστελλομένων διὰ ψύξιν καὶ ἀλλοιουμένων. ἀλλοιοῦσι δ' αἱ φαντασίαι καὶ αἱ αἰσθήσεις καὶ αἱ ἔννοιαι. B αἱ μὲν γὰρ αἰσθήσεις, εὐθὺς ὑπάρχουσιν ἀλλοιώσεις τινὲς οὖσαι· ἡ δὲ φαντασία καὶ ἡ νόησις, τὴν τῶν πραγμάτων ἔχουσι δύναμιν. *τρόπον γάρ τινα τὸ εἶδος τὸ νοούμενον τὸ τοῦ θερμοῦ ἢ ψυχροῦ, ἢ ἡδέος ἢ φοβεροῦ, τοιοῦτον τυγχάνει ὂν, οἷόν περ καὶ τῶν πραγμάτων ἕκαστον· διὸ καὶ φρίττουσι καὶ φοβοῦνται, νοήσαντες μόνον. ταῦτα δὲ πάντα πάθη καὶ ἀλλοιώσεις εἰσίν. ἀλλοιουμένων δ' ἐν τῷ σώματι, τὰ μὲν μείζω· τὰ δὲ, ἐλάττω γίνεται. ὅτι δὲ μικρὰ μεταβολὴ γινομένη ἐν ἀρχῇ, μεγάλας καὶ πολλὰς ποιεῖ διαφορὰς ἄποθεν, οὐκ ἄδηλον· ὥσπερ τοῦ οἴακος ἀκαριαῖόν τι μεθισταμένου, πολλὴ ἡ τῆς πρῴρας γίνεται μετάστασις. ἔτι δὲ κατὰ C θερμότητα ἢ ψύξιν, ἢ κατ' ἄλλο τοιοῦτον πάθος. ὅταν γὰρ γίνηται ἀλλοίωσις περὶ τὴν καρδίαν, εἰ καὶ ἐν ταύτῃ κατὰ μέγεθος ἐν ἀναισθήτῳ μορίῳ, πολλὴν ποιεῖ τοῦ σώματος διαφορὰν, ἐρυθήμασι καὶ ὠχρότησι, καὶ φρίκαις καὶ τρόμοις, καὶ τῶν τοιούτων ἐναντίων.

* De anima lib. 3. cap. 8.

ΚΕΦΑΛ. η'.

Ὅτι ἀρχὴ τῆς κινήσεως τὸ ἐν τῷ πρακτῷ διωκτὸν καὶ φευκτόν. καὶ ὅτι ἐξ ἀνάγκης ἀκολουθεῖ τῇ νοήσει καὶ τῇ φαντασίᾳ αὐτῶν θερμότης καὶ ψύξις.

Ἀρχὴ μὲν οὖν (ὥσπερ εἴρηται) τῆς κινήσεως, τὸ ἐν τῷ πρακτῷ διωκτὸν καὶ φευκτόν· ἐξ ἀνάγκης δὲ ἀκολουθεῖ τῇ νοήσει καὶ τῇ φαντασίᾳ αὐτῶν θερμότης καὶ ψύξις. D τὸ μὲν γὰρ λυπηρὸν, φευκτόν· τὸ δ' ἡδὺ, διωκτόν. ἀλλὰ λίαν λανθάνει περὶ τὰ μικρὰ τοῦτο συμβαῖνον. ἔστι δὲ τὰ λυπηρὰ καὶ ἡδέα πάντα σχεδὸν μετὰ ψύξεώς τινος καὶ θερμότητος. τοῦτο δὲ δῆλον ἐκ τῶν παθημάτων. *θάρρη γὰρ καὶ φόβοι, καὶ ἀφροδισιασμοὶ, καὶ τἆλλα σωματικὰ λυπηρὰ καὶ ἡδέα, τὰ μὲν, κατὰ μόριον μετὰ θερμότητος ἢ ψύξεώς ἐστι· τὰ δὲ, καθ' ὅλον τὸ σῶμα. μνῆμαι δὲ καὶ ἐλπίδες, οἷον εἰδώλοις χρώμεναι τοῖς τοιούτοις, ὁτὲ μὲν ἧττον, ὁτὲ δὲ μᾶλλον, αἴτιαι τῶν αὐτῶν εἰσιν. ὥστ' εὐλόγως ἤδη δημιουργεῖται τὰ ἐντὸς, καὶ περὶ τὰς ἀρχὰς τῶν ὀργανικῶν μορίων μεταβάλλοντα, E ἐκ πεπηγότων ὑγρὰ, καὶ ἐξ ὑγρῶν πεπηγότα· καὶ μαλακὰ καὶ σκληρὰ, ἐξ ἀλλήλων. τούτων δὲ συμβαινόντων τὸν τρόπον τοῦτον, καὶ ἔτι τοῦ παθητικοῦ καὶ ποιητικοῦ τοιαύτην ἐχόντων τὴν φύσιν, ἣν πολλαχοῦ εἰρήκαμεν, ὁπότε συμβῇ, ὥστ' εἶναι τὸ μὲν ποιητικὸν, τὸ δὲ παθητικὸν, καὶ μηδὲν ἀπολείπειν αὐτῶν ἑκάτερον τῶν ἐν τῷ λόγῳ, εὐθὺς τὸ μὲν ποιεῖ, τὸ δὲ πάσχει. διὰ τοῦτο δὲ ἅμα (ὡς εἰπεῖν) νοεῖ ὅτι πορευτέον,

* γ. θάῤῥαι

A ipſe autem rurſum circulo mouetur, quoniam inæquales habet rotas: minor enim veluti centrum fit, vt in cylindris: ita & animalia mouentur. Inſtrumenta namque eiuſmodi habent cùm neruorum tum oſſium naturam: & hæc quidem tanquam ibi ligna & ferrum, neruos autem vt vertebras, quibus ſolutis & relaxatis mouentur. Verumtamen in ſpontaneis quidem illis & curriculis non eſt alteratio, quoniam ſi fierent etiam minores interni orbes, & rurſus maiores, nihilominus idem circulo moueretur. In animali autem idem poteſt & maius & minus fieri, figuraſque permutare auctis partibus ob caliditatem, & rurſus contractis propter frigiditatem, & omnino alteratis. Alterant autem imaginationes & ſenſus & cogitationes. B Senſus enim ſtatim alterationes quædam ſunt: imaginatio autem & cogitatio rerum habent poteſtatem. Cogitata enim ſpecies calidi ſiue frigidi, ſiue ſuauis, aut formidabilis, quodammodo id exiſtit qualis vnaquæque eſt res; & iccirco ſola cogitatione perhorreſcunt & expaueſcunt. Omnia autem iſta perturbationes ſunt, & alterationes. Cùm autem in corpore alterantur, aliæ quidem maiores fiunt, aliæ verò minores. Quòd autem parua mutatio in ipſo facta principio, multiplices & magnas in extremo faciat differentias, non eſt obſcurum: vt temone paululum tranſlato, magna proræ fit tranſpoſitio. Caliditate quinetiam vel frigiditate, vel alia eiuſmodi affectione cùm in corde facta fuerit alteratio, etiam ſi in exigua & non C ſenſili illius particula, multa ſanè in corpore fit differentia, cùm ruboribus & palloribus, tum horroribus & tremoribus, aliiſque huiuſmodi contrariis.

CAPVT VIII.

Quòd principium motionis in agendi genere ſit id quod eſt vel optabile vel fugiendum, quodque calor & frigus eorum cogitationem conſequantur.

PRincipium igitur (vt dictum eſt) motionis in agendi genere id ſanè eſt, quod conſectandum aut declinandum eſt. Calor autem aut frigus eo- D rum cogitationem & imaginationem neceſſariò conſequuntur. Triſtificum namque declinandum, iucundum autem conſectandum. Verùm iſthuc in exiguis valde eſt obſcurum. Sunt autem triſtifica & iucunda ferè omnia cum frigiditate & caliditate, quod profectò ex affectionibus eſt manifeſtum. Confidentiæ enim & pauores, & venerei motus, reliquáque in corpore triſtifica & iucunda, alia quidem in partibus cum caliditate aut frigiditate ſunt, alia verò in vniuerſo corpore. Memoria autem & ſpes tanquam ſimulachris vtentes, iis ipſis aliàs quidem minùs, aliàs verò magis, eorum ſunt cauſæ. Quapropter rectâ ratione conſtructa ſunt E quæ intrinſecus iacent, & ad initia inſtrumentalium partium, vt commutentur, & ex compactis mollia fiant, & ex mollibus compacta, & ex ſe viciſſim cùm leuia, tum aſpera. Quæ cùm hoc contingant modo, & cùm actiuum & patibile talem habeant naturam, qualem ſæpe diximus, quando certè contigerit vt aliud quidem patibile ſit, aliud verò actuoſum, neutrique deſit aliquid, quod ad eorum definitionem requiratur, confeſtim aliud quidem agit, aliud verò patitur. Quamobrem ſimul (vt ita dicatur) intelligit quòd incedendum eſt,

& incedit, niſi quippiam obſtiterit. Et organicas quidem partes conuenienter affectiones præparant: appetitio autem affectiones: porrò appetitionem imaginatio. Hæc autem vel cogitatione, vel ſenſu efficitur. Simul verò & celeriter, quoniam patibile & actiuum eorum de numero ſunt, quæ ad ſe inuicem mutuam habent naturam. Primum autem mouens animal, in aliquo eſſe principio neceſſe eſt. Quòd autem flexus alterius quidem initium eſt, alterius verò finis, iam dictum eſt. Quamobrem contingit quidem vt vno, contingit autem vt duobus naturam illo vti. Cùm enim alicunde mouetur, aliud quidem extremorum punctorum quieſcere, aliud verò moueri neceſſe eſt: quandoquidem quòd adquieſcens quippiam inniti debeat motor, dictum eſt priùs. Mouetur igitur, & non mouet extrema brachij pars: eius autem qui in cubito eſt flexus, hoc quidem mouetur quòd ſanè in toto eſt commoto: neceſſe autem eſt, etiam non motum eſſe quiddam: quod ſanè dicimus poteſtate quidem vnum eſſe punctum, actu autem duo fieri. Quamobrem ſi animal eſſet brachium, hîc ſanè primum animæ eſſet mouens. Et quoniam contingit ad manum quippiam ita ſe habere inanime, vt ſi quis baculum in manu moueret: manifeſtum ſanè eſt, in neutro extremorum conſiſtere animam, neque in extrema rei motæ parte, neque in altero principio. Lignum enim & principium & finem habet ad manum. Itaque hanc ob cauſam ſi non ineſt baculo mouens animæ principium, neque in ipſa manu. Eodem enim ſe habet modo extremum manus ad ipſius carpi iuncturam: vt hæc ipſa pars ad cubitum. Nihil enim differunt quæ ſunt annexa, ab iis quæ non ſunt. Fit namque vt ſeparabilis pars ipſe baculus. Neceſſe igitur eſt, in nullo eſſe principio quod alterius eſt finis: neque ſi quippiam eſt aliud illo extimum magis, vt extremi baculi in manu principium, huius autem in carpi iunctura. Quòd ſi neque in manu, quoniam ſuperiùs adhuc principium, neque certè hîc. Adhuc enim quieſcente cubito, totum mouetur quod infrà eſt continuum.

CAPVT IX.

Quòd oporteat in medio corporis eſſe principium animæ mouentis.

QVoniam autem eodem ſe habet modo cùm à dextris, tum à ſiniſtris, & ſimul per contraria mouetur: vt non eo quòd quieſcat dextrum, moueatur ſiniſtrum: neque rurſus quia hoc, illud: ſemper autem in ſuperiori vtrorumque eſt principium: neceſſe profectò eſt, in medio mouentis eſſe principium animæ. Vtrorumq; enim extremorum medium eſt vltimum. Simili autem ſe habet modo hoc ad ſupernas infernáſque motiones, vt eas quæ ſunt à capite, iis quæ ſunt à ſpina, in illis quæ habent ſpinam. Et profectò rectâ hoc accidit ratione. ſenſitiuum etenim hîc eſſe aſſerimus: idcirco alterato per ſenſum loco, qui circa principium eſt, & immutato, continuæ ſimul cùm extenſæ tum contractæ tranſmutantur partes, vt neceſſariò hanc ob cauſam in animalibus eueniat motus. Mediam autem corporis partem poteſtate quidem vnam, actu verò plura effici neceſſe eſt. Simul etenim mouentur à principio membra, & altero quieſcente mouetur alterum: verbi gratia: in a b c ipſum b mouetur, mouet autem a. ſed profectò aliquid quie-

A καὶ προέρχεται, ἂν μή τι ἐμποδίζῃ ἕτερον. τὰ μὲν [γὰρ] ὀργανικὰ μέρη παρασκευάζει ἐπιτηδείως τὰ πάθη· ἡ δ' ὄρεξις τὰ πάθη, τὴν δὲ ὄρεξιν ἡ φαντασία. αὕτη δὲ γίνεται, ἢ διὰ νοήσεως, ἢ δι' αἰσθήσεως. ἅμα δὲ καὶ ταχὺ διὰ τὸ ποιητικὸν καὶ παθητικὸν, τῶν πρὸς ἄλληλα τὴν φύσιν. τὸ δὲ* κινοῦν πρῶτον τὸ ζῷον, ἀνάγκη εἶναι ἔν τινι ἀρχῇ. ἡ δὲ καμπὴ, ὅτι μὲν ἐστὶ τοῦ μὲν ἀρχὴ, τοῦ δὲ τελευτὴ, εἴρηται. διὸ καὶ ἔστι μὲν ὡς ἕν, ἔστι δ' ὡς δυσὶ χρῆται ἡ φύσις αὐτῇ. ὅταν μὲν γὰρ κινῆται ἐντεῦθεν, ἀνάγκη τὸ μὲν ἠρεμεῖν τῶν σημείων τῶν ἐσχάτων, τὸ δὲ κινεῖσθαι. ὅτι γὰρ πρὸς ἠρεμοῦν δεῖ ἀπερείδεσθαι τὸ κινοῦν, εἴρηται πρότερον. B κινεῖται μὲν οὖν, καὶ οὐ κινεῖ τὸ ἔσχατον τοῦ βραχίονος. τῆς δ' ἐν τῷ ὠλεκράνῳ κάμψεως τὸ μὲν κινεῖται τὸ ἐν αὐτῷ τῷ ὅλῳ κινουμένῳ. ἀνάγκη δ' εἶναί τι καὶ ἀκίνητον· ὃ δὴ φαμὲν, δυνάμει μὲν ἓν εἶναι σημεῖον, ἐνεργείᾳ δὲ γίνεσθαι δύο· ὥστ' εἰ τὸ ζῷον ἦν βραχίων, ἐνταῦθα ἄν που ἦν ἡ ἀρχὴ τῆς ψυχῆς ἡ κινοῦσα. ἐπεὶ δ' ἐνδέχεται καὶ πρὸς τὴν χεῖρα* ἔχοντι οὕτως τῶν ἀψύχων, οἷον εἰ κινοίη τὴν βακτηρίαν ἐν τῇ χειρὶ, φανερὸν ὅτι οὐκ ἂν ἦν ἐν οὐδετέρῳ ἡ ψυχὴ τῶν ἐσχάτων, οὔτε ἐν τῷ ἐσχάτῳ τοῦ κινουμένου, οὔτε ἐν τῇ ἑτέρᾳ ἀρχῇ. καὶ γὰρ τὸ ξύλον ἔχει καὶ ἀρχὴν καὶ τέλος πρὸς τὴν χεῖρα. ὥστε διά γε τοῦτο, εἰ μὴ ἐν τῇ βακτηρίᾳ ἡ κινοῦ- C σα ἀπὸ τῆς ψυχῆς ἀρχὴ ἔνεστιν, οὐδ' ἐν τῇ χειρί. ὁμοίως γὰρ ἔχει καὶ τὸ ἄκρον τῆς χειρὸς πρὸς τὸν καρπόν· καὶ τοῦτο τὸ μέρος πρὸς τὸ ὠλέκρανον. οὐδὲν γὰρ διαφέρει τὰ προσπεφυκότα τῶν μή. γίνεται γὰρ ὥσπερ ἀφαιρετὸν μέρος ἡ βακτηρία. ἀνάγκη ἄρα ἐν μηδεμιᾷ εἶναι ἀρχῇ, ἥ ἐστιν ἄλλου τελευτή· μηδ' εἴ τι ἔστιν ἕτερον ἐκείνου ἐξωτέρω· οἷον, τοῦ μὲν τῆς βακτηρίας ἐσχάτου, ἐν τῇ χειρὶ ἡ ἀρχὴ, τούτου δὲ ἐν τῷ καρπῷ. εἰ δὲ μηδ' ἐν τῇ χειρὶ, ὅτι ἀνωτέρω ἔτι, ἡ ἀρχὴ οὐδ' ἐνταῦθα. ἔτι γὰρ τοῦ ὠλεκράνου μένοντος, κινεῖται ἅπαν τὸ κάτω συνεχές.

D

ΚΕΦΑΛ. θ'.

Ὅτι ἀνάγκη ἐν τῷ μέσῳ τοῦ σώματος εἶναι τὴν ἀρχὴν τῆς ψυχῆς τῆς κινούσης.

ΕΠεὶ δ' ὁμοίως ἔχει ἀπὸ τῶν ἀριστερῶν, καὶ ἀπὸ τῶν δεξιῶν, καὶ ἅμα τὰ ἐναντία κινεῖται, ὥστε μὴ εἶναι τῷ ἠρεμεῖν τὸ δεξιὸν, κινεῖσθαι τὸ ἀριστερὸν,* μηδ' αὐτῷ τοῦτο ἐκεῖνο· ἀεὶ δ' ἐν τῷ ἀνωτέρῳ ἀμφοτέρων ἡ ἀρχὴ, ἀνάγκη ἐν τῷ μέσῳ εἶναι τὴν ἀρχὴν τῆς ψυχῆς τῆς κινούσης. ἀμφοτέρων γὰρ τῶν ἄκρων, τὸ μέσον ἔσχατον. ὁμοίως δ' ἔχει πρὸς τὰς κινήσεις τοῦτο, καὶ τὰς ἀπὸ τοῦ ἄνω καὶ κάτω· οἷον τὰς E ἀπὸ τῆς κεφαλῆς ταῖς ἀπὸ τῆς ῥάχεως τοῖς ἔχουσι ῥάχιν. καὶ εὐλόγως δὲ τοῦτο συμβέβηκε. καὶ γὰρ τὸ αἰσθητικὸν ἐνταῦθα εἶναι φαμὲν· ὥστ' ἀλλοιουμένου διὰ τὴν αἴσθησιν τοῦ τόπου τοῦ περὶ τὴν ἀρχὴν, καὶ μεταβάλλοντος, τὰ ἐχόμενα* συμμεταβάλλει, ἐκτεινόμενά τε καὶ συναγόμενα τὰ μόρια. ὥστ' ἐξ ἀνάγκης γίνεσθαι διὰ ταῦτα τὴν κίνησιν τοῖς ζῴοις. τὸ δὲ μέσον τοῦ σώματος μέρος, δυνάμει μὲν ἓν, ἐνεργείᾳ δὲ ἀνάγκη γίνεσθαι πλείω. καὶ γὰρ ἅμα κινεῖται τὰ κῶλα ἀπὸ τῆς ἀρχῆς, καὶ θατέρου ἠρεμοῦντος, θάτερον κινεῖται. λέγω δὲ οἷον, ἐπὶ τῆς α β γ, τὸ β κινεῖται, κινεῖ δὲ τὸ α. ἀλλὰ μὴν δεῖ γέ τι

* γρ. κινοῦν ὃ πρῶτον ζῷον.
* Scrib. ἔχει τῷ vel ἔχειν
* Fort. μηδ' αὐτῷ τοῦτο ἐκεῖνο.
* γρ. συμμεταβάλλειν.

ἠρεμεῖν, εἰ μέλλει τὸ μὲν κινεῖσθαι, τὸ δὲ κινεῖν. ἓν ἄρα δυνάμει ὂν τὸ α, ἐνεργείᾳ δύο ἔσται. ὥστ᾽ ἀνάγκη μὴ στιγμὴν, ἀλλὰ μέγεθός τι εἶναι. ἀλλὰ μὴν ἐνδέχεται τὸ γ τῷ β ἅμα κινεῖσθαι. ὥστ᾽ ἀνάγκη ἀμφοτέρας τὰς ἀρχὰς τὰς ἐν τῷ α κινουμένας κινεῖν. δεῖ τι ἄρα εἶναι παρὰ ταύτας ἕτερον τὸ κινοῦν καὶ μὴ κινούμενον. ἀπερείδονται μὲν γὰρ ἀεὶ τὰ ἄκρα καὶ * αἱ ἀρχαὶ, αἱ πρὸς ἀλλήλας ἐν τῷ α κινουμέναι, ὥσπερ ἂν εἴ τινες τὰ νῶτα ἀντερείδοντες, κινοῖεν τὰ σκέλη. ἀλλὰ τὸ κινοῦν ἄμφω, ἀναγκαῖον εἶναι. τοῦτο δ᾽ ἐστὶν ἡ ψυχὴ, ἕτερον μὲν οὖσα τοῦ μεγέθους τοῦ τοιούτου, ἐν τούτῳ δ᾽ οὖσα.

* Interpr. αἱ ἀρχαὶ αἱ πρὸς ἀλλήλας.

ΚΕΦΑΛ. ι.

Ὅτι ἡ ὄρεξίς ἐστι τὸ κατὰ τὸν λόγον μέσον, ὃ κινεῖ κινούμενον. περὶ τοῦ συμφύτου πνεύματος, τῆς τε ἰσχύος, καὶ τόπου αὐτοῦ ἐν τῷ μέσῳ τοῦ σώματος· καὶ τῆς φύσεως αὐτοῦ τῆς εἰς τὸ ἕλκειν καὶ ὠθεῖν ἐπιτηδειοτάτης.

ΚΑτὰ μὲν οὖν τὸν λόγον τὸν λέγοντα τὴν αἰτίαν τῆς κινήσεως, ἔστιν ἡ ὄρεξις τὸ μέσον, ὃ κινεῖ κινούμενον. ἐν δὲ τοῖς ἐμψύχοις σώμασι δεῖ τι εἶναι σῶμα τοιοῦτον. τὸ μὲν οὖν κινούμενον μὲν, μὴ πεφυκὸς δὲ κινεῖν, δύναται πάσχειν, κατ᾽ ἀλλοτρίαν δύναμιν· τὸ δὲ κινοῦν, ἀναγκαῖον ἔχειν τινὰ δύναμιν καὶ ἰσχύν. πάντα δὲ φαίνεται τὰ ζῷα, καὶ ἔχοντα πνεῦμα σύμφυτον, καὶ ἰσχύοντα τούτῳ. τίς μὲν οὖν ἡ σωτηρία τοῦ συμφύτου πνεύματος, εἴρηται ἐν ἄλλοις. τοῦτο δὲ πρὸς τὴν ἀρχὴν τὴν ψυχικὴν ἔοικεν ὁμοίως ἔχειν, ὥσπερ τὸ ἐν ταῖς καμπαῖς σημεῖον, τὸ κινοῦν καὶ κινούμενον, πρὸς τὸ ἀκίνητον. ἐπεὶ δ᾽ ἡ ἀρχὴ τοῖς μὲν ἐν τῇ καρδίᾳ, τοῖς δὲ ἐν τῷ ἀνάλογον, διὰ τοῦτο καὶ τὸ πνεῦμα τὸ σύμφυτον ἐνταῦθα φαίνεται ὄν. πότερον μὲν οὖν τὸ πνεῦμα ταὐτόν ἐστιν ἀεὶ, ἢ γίνεται ἀεὶ ἕτερον, ἔστω λόγος ἄλλος. ὁ αὐτὸς γάρ ἐστι καὶ περὶ τῶν ἄλλων μορίων. φαίνεται δ᾽ εὐφυῶς ἔχον πρὸς τὸ κινητικὸν εἶναι, καὶ παρέχειν ἰσχύν. τὰ δ᾽ ἔργα τῆς κινήσεως, ὦσις καὶ ἕλξις. ὥστε δεῖ τὸ ὄργανον αὐξάνεσθαί τε δύνασθαι, καὶ συστέλλεσθαι. τοιαύτη δ᾽ ἐστὶν ἡ τοῦ πνεύματος φύσις. καὶ γὰρ ἀβιάστως συστελλομένη, καὶ ἑλκτικὴ καὶ ὠστικὴ διὰ τὴν αὐτὴν αἰτίαν, καὶ ἔχει καὶ βάρος πρὸς τὰ πυρώδη, καὶ κουφότητα πρὸς τὰ ἐναντία. δεῖ γὰρ τὸ μέλλον κινεῖν, μὴ ἀλλοιώσει τοιοῦτον εἶναι. κρατεῖ γὰρ κατὰ τὴν ὑπεροχὴν τὰ φυσικὰ σώματα ἀλλήλων· τὸ μὲν κοῦφον, κάτω ὑπὸ τοῦ βαρυτέρου ἀπονικώμενον· τὸ δὲ βαρὺ, ἄνω ὑπὸ τοῦ κουφοτέρου. ᾧ μὲν οὖν κινεῖ κινουμένῳ μορίῳ ἡ ψυχὴ, εἴρηται, καὶ δι᾽ ἣν αἰτίαν. ὑποληπτέον δὲ συνεστάναι τὸ ζῷον, ὥσπερ πόλιν εὐνομουμένην. ἔν τε γὰρ τῇ πόλει, ὅταν ἅπαξ στῇ ἡ τάξις, οὐδὲν δεῖ κεχωρισμένου μονάρχου, ὃν δεῖ παρεῖναι παρ᾽ ἕκαστον τῶν γινομένων· ἀλλ᾽ αὐτὸς ἕκαστος ποιεῖ τὰ αὑτοῦ, ὡς τέτακται· καὶ γίνεται τόδε μετὰ τόδε διὰ τὸ ἔθος· ἔν τε τοῖς ζῴοις τὸ αὐτὸ τοῦτο διὰ τὴν φύσιν γίνεται. καὶ τῷ πεφυκέναι ἕκαστον οὕτω συστάντων, ποιεῖν τὸ ἑαυτοῦ ἔργον· ὥστε μηδὲν δεῖν ἐν ἑκάστῳ εἶναι τὴν ψυχὴν· ἀλλ᾽ ἔν τινι ἀρχῇ τοῦ σώματος οὔσης, τὰ ἄλλα ζῆν μὲν τῷ προσπεφυκέναι· ποιεῖν δὲ τὸ ἔργον τὸ αὑτῶν, διὰ τὴν φύσιν.

A ſcere oportet, ſi aliud quidem debet moueri, aliud verò mouere. Vnum igitur poteſtate exiſtens a, actu ſanè duo erit. Quamobrem non eſſe punctum, ſed magnitudinem quandam neceſſe eſt. Verumenimuero contingit c ſimul cum b moueri: quamobrem vtraque principia quæ ſunt in a mota, mouere neceſſe eſt. Quiddam igitur oportet eſſe præter hæc aliud, quod moueat non motum. Innitentur ergo extrema & principia ad ſe inuicem in a motorum: vt ſi qui dorſa contra ſe appellentes, moueant crura. Verùm quod vtrunque mouet, neceſſe eſt eſſe: & hoc ſanè eſt anima, aliud quidem ab eiuſmodi magnitudine exiſtens, in ea autem collocata.

B

CAPVT X.

Quòd appetitus ſit medium illud quod mouet motum. De connato ſpiritu, & vi eius ſedéque in medio corporis, & reliquis eius facultatibus.

PEr eam igitur rationem quæ cauſam dicit motus: appetitio medium eſt, quod mouet motum. In animatis autem corporibus aliquid eiuſmodi corpus eſſe oportet. Quod igitur mouetur quidem, non eſt autem natum mouere, alienas pati poteſt vires: ipſum autem mouens potentiam habere quandam & robur, neceſſe eſt. Omnia autem C videntur animalia cùm ſpiritum habere connatum, tum ab illo robur capere. Quæ autem connati ſpiritus ſit conſeruatio, in aliis dictum eſt locis. Is autem ad animale principium ſimili ſe habere videtur modo, vt in flexionibus punctum quod mouet & mouetur ad ipſum immobile. Quoniam autem principium aliis quidem eſt in corde, aliis verò in parte proportione reſpondente: eapropter connatus ſpiritus eò loci apparet. Vtrùm igitur ſemper idem ſit ſpiritus, an ſemper diuerſus efficiatur, alius eſt ſermo. Idem de aliis etiam eſt partibus. Videtur autem percommodè ſe habere vt mouere poſſit, & robur præſtare. Motionum namque opera ſunt, impulſus & tractus: idcirco in- D ſtrumentum tum augeri tum contrahi poſſe oportet. Talis autem ſpiritus eſt natura. Et eandem ob cauſam ſine vi contracta, cùm attractiua, tum impulſoria eſt: grauitatémque etiam ad ignea, & leuitatem ad contraria habet. Quod autem mouere debet, non per alterationem huiuſmodi eſſe oportet. Vincunt enim ſe inuicem per exuperantiam naturalia corpora: leue quidem deorſum, à grauiore vi deductum: graue verò ſurſum, à leuiore. Qua igitur moueat parte, commota tamen, anima, & quam ob cauſam, dictum eſt. Et exiſtimandum profectò eſt conſtare animal, vt ciuitatem bene legibus inſtitutam. In hac etenim poſtquam ſemel ordo conſtiterit, nihil opus eſt ſecreto duce, quem E ſingulis quæ geruntur intereſſe oporteat: ſed quiſque vt mandatum eſt, quod ad ſe pertinet, agit, & aliud poſt aliud conſuetudine efficitur. In animalibus autem hoc ipſum natura efficitur: & quoniam vnum quodque ſic conſtitutorum ad ſua exequenda munia natum eſt, vt nihil opus ſit vnicuique animam intereſſe, ſed cùm illa in certo corporis conſiſtat principio, alia quidem viuere, quia ſunt annexa, proprium autem opus efficere per naturam.

CAPVT XI.

De motione coacta & non voluntaria.

QVonam igitur modo voluntariis motibus mouentur animalia, & quas ob cauſas, dictum eſt: ſed inuoluntariis etiam quibuſdam motionibus quædam mouentur partes, plurimis autem non voluntariis. Inuoluntarios autem dico motus, vt cordis, & pudendorum. Apparente namque ſæpenumero re aliqua, quanquam mens nihil decernat, mouentur. Non voluntarios verò, vt ſomnum, & vigiliam, & reſpirationem, & quicunque alij eius generis ſunt motus. Horum enim nullius ſimpliciter phantaſia aut appetitio domina eſt. Verùm quoniam alterari animalia naturali alteratione neceſſe eſt, partibus autem alteratis alias quidem augeſcere, alias verò minui, vt iam moueantur & commutentur per mutationes ſe mutuò ſequi natas, cauſæ autem motionum naturales: necnon ipſi præter rationem dictarum partium facti motus interueniente ſanè fiunt alteratione. Cogitatio namque ſanè & imaginatio (vt dictum eſt prius) agentes adducunt affectiones. nam agentium ſpecies repræſentant. Id autem præcipuè illæ declarant partes, quoniam vtraque earum tanquam ſeiunctum eſt animal. Cuius ſanè rei cauſa eſt, quia vitalem continent humiditatem: cor quidem, manifeſtum eam ob cauſam quòd principia habet ſenſuum: genitale autem membrum, quoniam huiuſmodi eſt ſignum: ex illo etenim tanquam animal quoddam genitalis ſeminis virtus prodit. Motiones autem principio quidem à partibus, partibus verò à principio ratione accidunt, & ad ſe inuicem hoc contendunt modo. Oportet enim intelligere a principium: motiones igitur pro cuiuſque deſcriptorum elementorum ratione ad principium veniunt: & à principio moto & commutato: quandoquidem poteſtate eſt multa, principium quidem b ad b: quod autem eſt c, ad c: quod verò eſt vtrorumque, ad vtrumque. à b autem, ad c. quod verò ab ipſo b ad a pergit, vt ad principium: ab ipſo autem a ad c, vt à principio. Præterea alias quidem eadem cogitantibus fit motus, qui præter rationem eſt in membris: alias verò non. In cauſa autem eſt, quòd aliquando quidem patibilis ſubeſt materia, aliquando verò non tanta, aut non talis.

De partibus quidem ſingulorum animalium, & de anima, de ſenſu quinetiam, & memoria, & ſomno, necnon de communi motu, cauſas diximus: reliquum verò de generatione pertractare.

ΚΕΦΑΛ. ια′.

Περὶ τῶν ἀκουσίων, καὶ τῶν οὐχ ἑκουσίων.

ΠΩς μὲν οὖν κινεῖται τὰς ἑκουσίους κινήσεις τὰ ζῷα, καὶ διὰ τίνας αἰτίας, εἴρηται. τινὰς δὲ καὶ ἀκουσίους κινεῖται ἔνια τῶν μερῶν, τὰς δὲ πλείστας οὐχ ἑκουσίους. λέγω δ' ἀκουσίους μὲν, οἷον τήν τε τῆς καρδίας καὶ τὴν τοῦ αἰδοίου. φανέντος γὰρ πολλάκις τινὸς, οὐ μέντοι κελεύσαντος τοῦ νοῦ, κινοῦνται. οὐχ ἑκουσίους δὲ, οἷον ὕπνον καὶ ἐγρήγορσιν καὶ ἀναπνοὴν, καὶ ὅσαι ἄλλαι τοιαῦταί εἰσιν. οὐθενὸς γὰρ τούτων κυρία ἁπλῶς ἐστιν, οὔθ' ἡ φαντασία, οὔθ' ἡ ὄρεξις. ἀλλ' ἐπεὶ ἀνάγκη ἀλλοιοῦσθαι τὰ ζῷα φυσικὴν ἀλλοίωσιν, ἀλλοιουμένων δὲ τῶν μερῶν, τὰ μὲν αὐξάνεσθαι, τὰ δὲ φθίνειν, ὥστε μὲν ἤδη κινεῖσθαι καὶ μεταβάλλειν τὰς πεφυκυίας ἔχεσθαι μεταβολὰς ἀλλήλων. αἰτίαι δὲ τῶν κινήσεων [θερμότητές τε καὶ ψύξεις, αἵ τε θύραθεν καὶ αἱ ἐντὸς ὑπάρχουσαι] φυσικαί. καὶ αἱ παρὰ τὸν λόγον δὲ γινόμεναι κινήσεις τῶν ῥηθέντων μερῶν, ἀλλοιώσεως συμπεσούσης γίνονται. ἡ γὰρ νόησις, καὶ ἡ φαντασία, ὥσπερ εἴρηται πρότερον, τὰ ποιητικὰ τῶν παθημάτων προσφέρουσι. τὰ γὰρ εἴδη τῶν ποιητικῶν προσφέρουσι. μάλιστα δὲ τῶν μερῶν ταῦτα ποιεῖ ἐπιδήλως, διὰ τὸ ὥσπερ ζῷον κεχωρισμένον ἑκάτερον εἶναι τῶν μερῶν. τούτου δ' αἴτιον, ὅτι ἔχει ὑγρότητα ζωτικήν. ἡ μὲν οὖν καρδία, φανερὸν δι' ἣν αἰτίαν. τὰς ἀρχὰς ἔχει τῶν αἰσθήσεων. τὸ δὲ μόριον τὸ γεννητικὸν ὅτι τοιοῦτόν ἐστι, σημεῖον· καὶ γὰρ ἐξέρχεται ἐξ αὐτοῦ, ὥσπερ ζῷόν τι, ἡ τοῦ σπέρματος δύναμις. αἱ δὲ κινήσεις τῇ τε ἀρχῇ ἀπὸ τῶν μερῶν, καὶ τοῖς μέρεσιν ἀπὸ τῆς ἀρχῆς, εὐλόγως συμβαίνουσι, καὶ πρὸς ἀλλήλας οὕτως ἀφικνοῦνται. δεῖ γὰρ νοῆσαι τὸ α, ἀρχήν. αἱ οὖν κινήσεις, καθ' ἕκαστον στοιχεῖον τῶν ἐπιγεγραμμένων, ἐπὶ τὴν ἀρχὴν ἀφικνοῦνται, καὶ ἀπὸ τῆς ἀρχῆς κινουμένης, καὶ μεταβαλλούσης· ἐπεὶ πολλὰ δυνάμει ἐστὶν, ἡ μὲν τοῦ β ἀρχὴ, ἐπὶ τὸ β, ἡ δὲ τοῦ γ, ἐπὶ τὸ γ, ἡ δ' ἀμφοῖν, ἐπ' ἄμφω. ἀπὸ δὲ τοῦ β, ἐπὶ τὸ γ, τῷ δ' ἀπὸ τοῦ β ἐπὶ τὸ α ἐλθεῖν, ὡς ἐπ' ἀρχήν. ἀπὸ δὲ τοῦ α ἐπὶ τὸ γ, ὡς ἀπ' ἀρχῆς. Ἔτι δὲ ὅτε μὲν ταὐτὰ νοησάντων, γίνεται ἡ κίνησις, ἡ παρὰ τὸν λόγον ἐν τοῖς μορίοις ὅτε δὲ, οὔ. αἴτιον δὲ, τὸ ὅτε μὲν ὑπάρχειν τὴν παθητικὴν ὕλην, ὅτε δὲ μὴ τοσαύτην ἢ τοιαύτην.

Περὶ μὲν οὖν τῶν μορίων ἑκάστου τῶν ζῴων, καὶ περὶ ψυχῆς, ἔτι δὲ καὶ περὶ αἰσθήσεως καὶ μνήμης, καὶ ὕπνου, καὶ τῆς κοινῆς κινήσεως, εἰρήκαμεν τὰς αἰτίας. λοιπὸν δὲ περὶ γενέσεως εἰπεῖν.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ ΜΑΚΡΟΒΙΟΤΗΤΟΣ ΚΑΙ ΒΡΑΧΥΒΙΟΤΗΤΟΣ.

ARISTOTELIS STAGIRITÆ, DE LONGITVDINE ET BREVITATE VITÆ, LIBER.

Franciſco Vatablo interprete.

ΚΕΦΑΛ. α'.

Ἀνάμνησις τῶν προειρημένων, καὶ τῶν μελλόντων λέγεσθαι πρόθεσις.

ΠΕΡΙ δὲ τοῦ τὰ μὲν εἶναι μακρόβια τῶν ζώων, τὰ δὲ βραχύβια, καὶ περὶ τῆς ζωῆς ὅλως μήκους καὶ βραχύτητος, ἐπισκεπτέον τὰς αἰτίας. ἀρχὴ δὲ τῆς σκέψεως ἀναγκαία πρῶτον, ἐκ τοῦ διαπορῆσαι περὶ αὐτῶν. οὐ γάρ ἐστι δῆλον πότερον ἕτερον ἢ τὸ αὐτὸ αἴτιον πᾶσι τοῖς ζώοις καὶ φυτοῖς τοῦ, τὰ μὲν εἶναι B μακρόβια, τὰ δὲ, βραχύβια. καὶ γὰρ τῶν φυτῶν, τὰ μὲν ἐπέτειον, τὰ δὲ πολυχρόνιον ἔχει τὴν ζωήν. ἔτι δὲ πότερον τὰ αὐτὰ μακρόβια καὶ τὴν φύσιν ὑγιεινὰ τῶν φύσει συνεστώτων, ἢ κεχώρισται καὶ τὸ βραχύβιον, καὶ τὸ νοσῶδες· ἢ κατ' ἐνίας μὲν νόσους ἐπαλλάττει τὰ νοσώδη τὴν φύσιν σώματα τοῖς βραχυβίοις, κατ' ἐνίας δ' οὐδὲν κωλύει νοσώδεις εἶναι μακροβίους ὄντας. περὶ μὲν οὖν ὕπνου καὶ ἐγρηγόρσεως, εἴρηται πρότερον· περὶ δὲ ζωῆς καὶ θανάτου λεκτέον ὕστερον. ὁμοίως δὲ καὶ περὶ νόσου καὶ ὑγιείας, ὅσον ἐπὶ τῇ φυσικῇ φιλοσοφίᾳ. νῦν δὲ περὶ τῆς αἰ-C τίας, τοῦ τὰ μὲν εἶναι μακρόβια, τὰ δὲ βραχύβια, καθάπερ εἴρηται πρότερον, θεωρητέον. ἔστι δ' ἔχοντα τὴν διαφορὰν ταύτην, ὅλα τε πρὸς ὅλα γένη, καὶ τῶν ὑφ' ἓν εἶδος, ἕτερα πρὸς ἕτερα. λέγω δὲ κατὰ γένος μὲν διαφέρειν, οἷον ἄνθρωπον πρὸς ἵππον. μακροβιώτερον γὰρ τὸ τῶν ἀνθρώπων γένος, ἢ τὸ τῶν ἵππων. κατ' εἶδος δὲ ἀνθρώπους πρὸς ἀνθρώπους. εἰσὶ γὰρ ἄνθρωποι, οἱ μὲν μακρόβιοι, οἱ δὲ βραχύβιοι, ἕτεροι καθ' ἑτέρους τόπους διεστῶτες. τὰ μὲν γὰρ ἐν τοῖς θερμοῖς τῶν ἐθνῶν, μακροβιώτερα· τὰ δ' ἐν τοῖς ψυχροῖς, βραχυβιώτερα. καὶ τῶν τὸν αὐτὸν δὲ τόπον οἰκούντων, διαφέρουσιν ὁμοίως τινὲς ταύτην πρὸς ἀλλήλους τὴν διαφοράν. D

ΚΕΦΑΛ. β'.

Τί τὸ εὔφθαρτον καὶ μὴ ἐν τοῖς φύσει συνεστῶσι.

ΔΕῖ δὲ λαβεῖν, τί τὸ εὔφθαρτον ἐν τοῖς φύσει συνεστῶσι, καὶ τί τὸ οὐκ εὔφθαρτον. πῦρ γὰρ καὶ ὕδωρ, καὶ τὰ τούτοις συγγενῆ, οὐκ ἔχοντα τὴν αὐτὴν δύναμιν, τυγχάνει γενέσεως καὶ φθορᾶς αἴτια ἀλλήλοις·

A

CAPVT I.

Animalium alia breuis, alia longæ vitæ, eiuſdemque cauſæ.

CVR autem animantium aliæ plus temporis, aliæ minùs viuant, atque omnino cur vita longa ſit aut breuis, cauſas conſideremus addecet. Sed enim ita ordiendum eſt, vt contemplationis initium ſumatur, dubitando de his (non enim certum eſt vtrùm diuerſa ſit an eadem cunctis animantibus ac plantis cau-B ſa: cur illarum quædam diu, quædam parum viuāt, & harum aliæ annua, aliæ diuturniore vita fruantur. Præterea, vtrùm natura conſtantium eadē ſint longæua & natura incolumia, an diſtincta ſint. Et vtrùm eadem ſint vitæ breuis, & valetudinaria: an per aliquos quidem morbos corpora, quæ natura valetudinaria ſunt, ad eorum naturam accedant quæ breuiore vita frui ſolent: per aliquos verò valetudinaria eſſe, quæ longæua ſunt, nihil obſtet. De ſomno igitur & vigilia, dictum eſt priùs: de vita verò & morte, ſimiliter & de morbo & ſanitate, quod quidem ad naturalem attineat Philoſophiam, dicendum poſteriùs. Nunc autem de cauſa cur altera C longam, altera breuem vitam agat, quemadmodum iam diximus, tractandum eſt. Sunt hæ differentiæ genera tota à totis generibus: & eorum quæ ſub vna ſpecie collocantur, alia ab aliis differunt. Generatim differre dico, vt hominē ab equo: nam genus hominum viuacius eſt, quàm equorum. Specie verò, vt hominem ab homine. eorum enim hominum qui locorum intercapedine ſeiuncti ſunt, alij vita ſunt longiore, alij breuiore. qui enim in calidis degunt regionibus, diutiùs: qui in algidis, minùs viuere aſſolent. Quinimmo ex hiſce qui eundem tenent locum, nonnulli pari modo ea ipſa in-D ter ſe diſcrepant differentia.

CAPVT II.

Quid ſit è rebus naturalibus facilè corruptioni obnoxium, quid minus.

POrrò ſumere cōuenit, quid ſit inter ea quæ natura conſtāt quod facilè corrumpatur, & quid quod ægrè. Nam ignis & aqua & quæ his cognata ſunt, cùm eandem facultatē minimè habeant, ſibi mutuò cauſæ ſunt generationis atq; corruptionis.

A Proinde ſingula quoque alia, quæ ex hiſce ſunt atque conſtant, & non ex multis per congeriem, vti domus, eorum naturam participent, ratio congrua exiſtit. Sed de cæteris alia ratio eſt. Plurimis enim ex hiſce quæ ſunt, peculiares competũt corruptiones: ceu ſciẽtiæ, ſanitati, morbo, & eiuſmodi: quippe quæ corrumpi ſoleant, etiam non corruptis ſuſceptiuis, ſed ſeruatis. quandoquidem ignorãtiam, reminiſcentia atque diſciplina corrumpere ſolent: ſcientiam, obliuio & deceptio. Per accidens tamen cæterorum corruptiones rerum naturalium interitus ſequuntur. nam cùm animalia ipſa intereunt, eorundem & ſanitas & ſcientia corrumpitur. Quocirca & de anima per hæc ratiocinari quiſpiã profectò poteſt. Nam ſi anima haudquaquam natura B ſubſiſtat, ſed vt ſcientia in anima, ſic & anima in corpore ſit: erit nimirum ipſius quædam etiam alia corruptio, præter eam qua cùm corpus interit, corrumpi ſolet. Quare cùm nulla talis eſſe videatur, alio ſanè pacto cum corpore iniit ſocietatem.

CAPVT III.

Nihil quod ſit natura ſua corruptioni obnoxium, poſſe vllo in loco incorruptum manere.

SEd fortaſſe quæret quiſpiam, idque optima ratione, vtrùm quod corruptibile eſt, id alicubi à corruptione vindicari queat, ceu ignis ſupero in C loco, vbi contrarium nullum eſt. Quæ enim contrariis inſunt, per accidens corrumpi ſolent, eo quòd illa intereant. tolluntur enim contraria à ſeſe. At contrariorum quæ in ſubſtãtiis ſunt, nullum per accidens corrumpi poteſt, propterea quòd ſubſtantia de nullo ſubiecto prædicatur. Quare fieri non poterit vt id corrumpatur quod contrario caret, aut in eo loco eſt, vbi nullum eſt contrarium. Quid enim erit quod vim habeat corrumpendi, ſiquidem à contrariis vnis corrumpi quicquam contingit, contrarium autem non inſit, aut omnino, aut hîc? An hoc partim verum eſt, partim non verum? Fieri enim nequit, vt ei quod materiam habeat, non inſit modo quodam contrarium. nam vt D omnino inſit caliditas, aut rectitudo, aut albor, fieri poteſt: vt alicubi ſit, non poteſt. alioquin affectus eſſent ſeparati. Si igitur quando actiuum & patibile ſimul ſunt, ſemper alterum agit, alterum patitur: fieri non poteſt quin fiat mutatio. Præterea & excrementa fieri neceſſe eſt. at excrementũ contrarij rationem ſubit. ſemper enim mutatio è contrario fit. excrementum autem reliquiæ prioris eſt. Quòd ſi quicquid actu contrarium eſt, abigeretur, eſſetne vel hîc incorruptibile, an non, ſed ab eo quod continet, corrumperetur? Si ergo id quod continet, ſit ſatis committendæ corruptioni, numero eorũ quæ dicta ſunt, adſcribatur: ſin minùs, ineſſe quippiam quod ſit actu contrarium, & excrementitiam mate- E riam aggigni, ſuppoſuiſſe operæpretium eſt. Quãobrem minor flãma à maiore per accidẽs deuritur: quòd pabulum, fumum ſcilicet, quod illa non niſi longo tẽpore abſumere poteſt, hæc ocyus inſumat. Quapropter omnia ſemper in motu sũt, & ortũ aut obitũ ſubeunt: cui rei id quod continendi munere fungitur, vel conferre vel obeſſe ſolet. Et ob id, quæ locum demutãt, ea tempore quidem longiore breuioréve quàm ſua ferat natura, edurãt: ſed ſempiterna nuſquam ſunt, quibuſcũque cõtraria adſint.

A ὥστε καὶ τῶν ἄλλων ἕκαστον ἐκ τούτων ὄντα καὶ συνεστῶτα, μετέχειν τῆς τούτων φύσεως εὔλογον, ὅσα μὴ σύνθετα ἐκ πολλῶν ἐστιν, οἷον οἰκία. περὶ μὲν οὖν τῶν ἄλλων ἕτερος λόγος. εἰσὶ γὰρ ἴδιαι φθοραὶ πολλοῖς τῶν ὄντων, οἷον ἐπιστήμη, καὶ ὑγιείᾳ καὶ νόσῳ· ταῦτα γὰρ φθείρεται, καὶ μὴ φθειρομένων τῶν δεκτικῶν, ἀλλὰ σωζομένων, οἷον ἀγνοίας μὲν φθορά, ἀνάμνησις, καὶ μάθησις· ἐπιστήμης δέ, λήθη καὶ ἀπάτη. κατὰ συμβεβηκὸς δ' ἀκολουθοῦσι τοῖς φυσικοῖς αἱ τῶν ἄλλων φθοραί. φθειρομένων γὰρ τῶν ζῴων, φθείρεται καὶ ἡ ἐπιστήμη, καὶ ἡ ὑγίεια ἡ ἐν τοῖς ζῴοις. διὸ καὶ περὶ ψυχῆς συλλογίσαιτ' ἄν τις ἐκ τούτων· Εἰ γὰρ ἔστι μὴ φύσει, ἀλλ' ὥσπερ B ἡ ἐπιστήμη ἐν ψυχῇ, οὕτω καὶ ψυχὴ ἐν σώματι, εἴη ἄν τις αὐτῆς καὶ ἄλλη φθορὰ παρὰ τὴν φθορὰν ἣν φθείρεται, φθειρομένου τοῦ σώματος. ὥστ' ἐπεὶ οὐ φαίνεται οὖσα τοιαύτη, ἄλλως ἂν ἔχοι πρὸς τὴν τοῦ σώματος κοινωνίαν.

ΚΕΦΑΛ. γ.

Ὅτι φθαρτὸν οὐδὲν οὐδαμοῦ ἄφθαρτον ἔσται.

ΙΣως δ' ἄν τις ἀπορήσειεν εὐλόγως, * ἆρ' ἔστιν οὗ ἄφθαρτον ἔσται τὸ φθαρτόν, οἷον τὸ πῦρ ἄνω, οὗ μὴ C ἔστι τὸ ἐναντίον· φθείρεται γὰρ τὰ μὲν ὑπάρχοντα τοῖς ἐναντίοις κατὰ συμβεβηκός, τῷ ἐκεῖνα φθείρεσθαι· ἀναιρεῖται γὰρ τὰ ἐναντία ὑπ' ἀλλήλων· κατὰ συμβεβηκὸς δ' οὐδὲν τῶν ἐν ταῖς οὐσίαις ἐναντίων φθείρεται, διὰ τὸ μηδενὸς ὑποκειμένου κατηγορεῖσθαι τὴν οὐσίαν· ὥστε ᾧ μὴ ἔστιν ἐναντίον, καὶ ὅπου μὴ ἔστιν, ἀδύνατον ἂν εἴη φθαρῆναι. τί γὰρ ἔσται τὸ φθεροῦν; εἴπερ ὑπ' ἐναντίων μὲν φθείρεσθαι συμβαίνει μόνον, * τοῦτο δὲ μὴ ὑπάρχει, ἢ ὅλως, ἢ ἐνταῦθα; ἢ τοῦτο, τῇ μὲν ἀληθές ἐστι, τῇ δ' οὔ; ἀδύνατον γὰρ τῷ ὕλην ἔχοντι, μὴ ὑπάρχειν πως D τὸ ἐναντίον. πάντῃ μὲν γὰρ ἐνεῖναι τὸ θερμόν, ἢ τὸ εὐθὺ ἐνδέχεται. πᾶν δὲ ἀδύνατον εἶναι, ἢ θερμόν, ἢ εὐθύ, ἢ λευκόν. ἔσται γὰρ τὰ πάθη κεχωρισμένα. εἰ οὖν ὅταν ἅμα εἴη τὸ ποιητικὸν καὶ τὸ παθητικόν, ἀεὶ τὸ μὲν ποιεῖ, τὸ δὲ πάσχει, ἀδύνατον μὴ μεταβάλλειν. ἔτι καὶ εἰ ἀνάγκη περίττωμα ποιεῖν, τὸ δὲ περίττωμα ἐναντίον· ἐξ ἐναντίου γὰρ ἀεὶ ἡ μεταβολή· τὸ δὲ περίττωμα, ὑπόλειμμα τοῦ προτέρου. Εἰ δὲ πᾶν ἐξελαύνοιτο ἐνεργείᾳ ἐναντίον, κἂν ἐνταῦθα, ἄφθαρτον ἂν εἴη ἢ οὔ; ἀλλ' ὑπὸ τοῦ περιέχοντος φθείρεται. εἰ μὲν οὖν ἱκανόν, ἐκ τῶν εἰρημένων ἔστω. Εἰ δὲ E μή, ὑποθέσθαι δεῖ, ὅτι ἔνεστί τι ἐνεργείᾳ ἐναντίον, καὶ περίττωμα γίνεται. διὸ ἡ ἐλάττων φλὸξ κατακάεται ὑπὸ τῆς πολλῆς, κατὰ συμβεβηκός· ὅτι ἡ τροφὴ ἣν ἐκείνη ἐν πολλῷ χρόνῳ, ἀναλίσκει τὸν καπνόν, ταύτην ἡ πολλὴ φλὸξ ταχύ. διὸ πάντα ἀεὶ ἐν κινήσει ἐστί, καὶ γίνεται, ἢ φθείρεται. τὸ δὲ περιέχον, ἢ συμπράττει, ἢ ἀντιπράττει. καὶ διὰ τοῦτο μεταπίπτοντα, πολυχρονιώτερα μὲν γίνεται καὶ ὀλιγοχρονιώτερα τῆς φύσεως· ἀΐδια δὲ ὅσοις ἐναντία ἐστίν, οὔ·

* κ. ἄρ' ἔστιν, ὃ ἄ. mendosè.

* κ. τοῦτο

εὐθὺς γὰρ ἡ ὕλη τὸ ἐναντίον ἔχει. ὥστ' εἰ μὲν τοῦ ποῦ, κατὰ A τόπον μεταβάλλει· εἰ δὲ τοῦ ποσοῦ, κατ' αὔξησιν καὶ φθίσιν· εἰ δὲ πάθους, ἀλλοιοῦται.

ΚΕΦΑΛ. δ'.

Ἡ μακροβιότης ἐν ποίοις τῶν ζῴων γένεσι μᾶλλον ἢ ἧττον εὑρίσκεται.

ΕΣτι δ' οὔτε τὰ μέγιστα ἀφθαρτότερα· ἵππος γὰρ ἀνθρώπου βραχυβιώτερον· οὔτε τὰ μικρά· ἐπέτεια γὰρ τὰ πολλὰ τῶν ἐντόμων. οὔτε τὰ φυτὰ ὅλως τῶν ζῴων· ἐπέτεια γὰρ ἔνια τῶν φυτῶν. οὔτε τὰ B ἔναιμα· μέλιττα γὰρ πολυχρονιώτερον ἐνίων ἐναίμων· οὔτε τὰ ἄναιμα· τὰ γὰρ μαλάκια, ἐπέτεια μέν, ἄναιμα δέ. οὔτε τὰ ἐν τῇ γῇ· καὶ γὰρ φυτὰ ἐπέτειά ἐστι, καὶ ζῷα πεζά. οὔτε τὰ ἐν τῇ θαλάττῃ· καὶ γὰρ ἐκεῖ βραχύβια, καὶ τὰ ὀστρακηρά, καὶ τὰ μαλάκια. ὅλως δὲ τὰ μακροβιώτατα ἐν τοῖς φυτοῖς ἐστιν, οἷον ὁ φοῖνιξ. εἶτ' ἐν τοῖς ἐναίμοις ζῴοις μᾶλλον ἢ ἐν τοῖς ἀναίμοις, καὶ πεζοῖς, ἢ ἐν τοῖς ἐνύδροις. ὥστε καὶ συνδυασθέντων ἐν τοῖς ἐναίμοις καὶ πεζοῖς τὰ μακροβιώτατα τῶν ζῴων ἐστίν, οἷον ἄνθρωπος καὶ ἐλέφας. καὶ δὴ καὶ τὰ C μείζω, ὡς ἐπὶ τὸ πολὺ εἰπεῖν, τῶν ἐλαττόνων μακροβιώτερα· καὶ γὰρ τοῖς ἄλλοις συμβέβηκε τοῖς μακροβιωτάτοις τὸ μέγεθος, ὥσπερ καὶ τοῖς εἰρημένοις.

ΚΕΦΑΛ. ε'.

Μακροβιότητος αἰτία.

ΤΗν δ' αἰτίαν περὶ τούτων ἁπάντων, ἐντεῦθεν ἄν τις θεωρήσειε. δεῖ γὰρ λαβεῖν ὅτι τὸ ζῷόν ἐστι φύσει ὑγρὸν καὶ θερμόν, καὶ τὸ ζῆν τοιοῦτον· τὸ δὲ γῆρας, ψυχρὸν καὶ ξηρὸν καὶ τὸ τεθνηκός· φαίνεται γὰρ οὕτως. ὕλη D δὲ τῶν σωμάτων τοῖς οὖσι, ταῦτα τὸ θερμὸν καὶ τὸ ψυχρόν, καὶ τὸ ξηρὸν καὶ τὸ ὑγρόν. ἀνάγκη τοίνυν* γηράσκοντας ξηραίνεσθαι. διὸ καὶ μὴ εὐξήραντον δεῖ εἶναι τὸ ὑγρόν. καὶ διὰ τοῦτο τὰ λιπαρὰ ἄσηπτα. αἴτιον δ' ὅτι ἀέρος· ὁ δ' ἀὴρ πρὸς τἄλλα πῦρ· πῦρ δ' οὐ γίνεται σαπρόν. οὐδ' αὖ ὀλίγον δεῖ εἶναι τὸ ὑγρόν· εὐξήραντον γὰρ καὶ τὸ ὀλίγον. διὸ καὶ τὰ μεγάλα καὶ ζῷα, καὶ φυτά, ὡς ὅλως εἰπεῖν, μακροβιώτερα, καθάπερ ἐλέχθη πρότερον· εὔλογον γὰρ τὰ μείζω πλεῖον ἔχειν ὑγρόν· οὐ μόνον δὲ διὰ τοῦτο* μακροβιώτερα· δύο γὰρ τὰ αἴτια, τό, τε ποσὸν, καὶ τὸ ποιόν. ὥστε δεῖ μὴ μόνον πλῆθος εἶναι ὑγροῦ, ἀλλὰ τοῦτο καὶ θερμόν, E ἵνα μήτε εὔπηκτον, μήτε εὐξήραντον ᾖ. καὶ διὰ τοῦτο ἄνθρωπος, μακρόβιοι μᾶλλον ἐνίων μειζόνων· μακροβιώτερα γὰρ τὰ λειπόμενα τῷ πλήθει τοῦ ὑγροῦ, ἐὰν πλείονι λόγῳ ὑπερέχῃ κατὰ τὸ ποιόν, ἢ λείπηται κατὰ τὸ ποσόν. ἔστι δ' ἐνίοις μὲν τὸ θερμὸν, τὸ λιπαρὸν ὃ ἅμα ποιεῖ, τό, τε μὴ εὐξήραντον, καὶ τὸ μὴ εὔψυκτον· ἐνίοις δ' ἄλλον ἔχει χυμόν. ἔτι δεῖ τὸ μέλλον εἶναι μὴ εὔφθαρτον, μηδὲ περιττωματικὸν εἶναι. ἀναιρεῖ γὰρ τὸ τοιοῦτον, ἢ νόσῳ, ἢ φύσει·

* γρ. γηράσκοντα

* γρ. μακροβιώτατα.

A nam materies protinus contrarium habet. Quare ſi ſit de prædicamento loci, lationem ſubeunt: ſi vero quantitatis, accreſcunt aut decreſcunt: ſi denique qualitatis, alterantur.

CAPVT IV.

De humidi vitalis conditionibus.

AT neque maxima, corruptioni minùs obnoxia ſunt: equus enim, minus temporis quàm homo viuit. neque puſilla: nam inſectorum plurima non vltra annum ætatem extendunt. Neque plan- B tæ omnino minùs quàm animalia corruptioni patent: cùm nonnullæ vita ſint annua. Neque ſanguinaria: ſiquidem apis, longiore tempore, quàm ſanguinea quædam, viuit. neque exanguia: quod mollia, annua ſint, quamuis ſanguine careant. Neque terreſtria. ſunt enim tum e plantis tum e pedeſtri animantium genere, quæ in anni ſpatium dumtaxat ætatem protrahunt. Neque marina. etenim in mari, tam teſtacea quàm mollia parum viuunt. Sed in totum quæ diutiſſimè viuant, ea in ſtirpium genere continentur, vt palma & cupreſſus. mox in ſanguineo genere animalium potiùs, quàm exangui: & in pedeſtri, quàm in aquatili. Quare & illis C duobus iunctis, in iis quæ ſanguinea pariter & pedeſtria ſunt, ea haberi ſolent quæ inter animalia longiſſimè viuunt, vt homo atque elephas. Quin & vaſtiora, quod maiori ex parte dixerim, diutiùs quàm minora viuunt. nam & cæteris quæ viuaciora ſunt, perinde atque iis quæ modò retuli, magnitudo adiuncta eſt.

CAPVT V.

Cauſa vitæ longioris.

HOrum omnium cauſam hinc intueri licet. Intelligendum enim eſt, animal natura humidum calidúmque eſſe, cuiuſmodi vita quoque ipſa habetur. at ſenectus, & quod emortuum eſt, obare- D ſcit algétque: ſic enim habere cernitur. Hæc etiam, calidum, inquam, frigidum, humidum & ſiccum, materiam corporibus quæ in rerũ naturã ſunt, ſuppeditant. neceſſe eſt itaque, ea, dum ſeneſcunt, inareſcere. Quocirca & humidum eſſe tale conuenit, vt non facilè ſiceſcat. Et ob id pinguia putreſcere non ſolent. Cuius rei cauſa eſt, quòd ea ſunt aëris. aër autem ad reliqua ignis eſt, qui haudquaquam putris reddi poteſt. Rurſum non paucum eſſe humidum oportet. quod enim paucum eſt, facilè exareſcit. Ideóque magnæ & animantes & plantæ, vt in vniuerſum dixerim, plus temporis viuere cõſueuerunt, quemadmodum dictum eſt antea. nam ra- E tione optima euenit, vt quæ maiora ſunt, plus habeant humidi. At non ſolùm propter hoc vita ſunt longiore. duæ enim ſunt cauſæ, quantitas & qualitas, id eſt, modus & genus. Proinde nõ ſolùm oportet humidum eſſe multum, ſed etiã calidum, vt ne facilè aut congelaſcat, aut reſiccetur. Hac de cauſa diutiùs homo, quàm maiuſcula quædam animalia, viuit. nam quæ humidi copia vincuntur, ſi maiore proportione per qualitatem ſuperent, quàm per quantitatem vincantur, ea ſanè viuaciora ſunt. Calidum autem ipſum, in nonnullis pingue habetur, quæ res ſimul efficit, vt neque facilè inareſcat neque facilè refrigeretur. in nonnullis alio ſucco præditum eſt. Præterea oportet, vt quod haud facilè corruptibile ſit, nequaquam excremẽtis abundet. quod n. tale eſt, aut vi morbi, aut ſuapte natura interimitur.

nam excrementorum virtus atque facultas, vicem ſubit contrarij: atque interdum naturam ipſam, interdum partem corrumpit. Quapropter quæ ſalacia ſunt, & ſemine redundant, ocyſſimè ſeneſcunt. nam ſemen, excrementum eſt: & inſuper cùm prodit, aſſiccat. Ob idque mulus equo & aſino, ex quibus procreatus eſt, plus temporis viuit: & fœminæ maribus, ſi mares ſalaces ſint. Quocirca & in paſſerum genere, mares breuiorem quàm fœminæ vitam obtinent. Adde etiam, quod quicunque mares laborioſi ſunt, ampliùs (laboris nomine) ſeneſcere ſolent. labor enim exiccat: ſenectus autem ſicca eſt. Naturâ tamen mares, vt in vniuerſum dixerim, viuaciores fœminis ſunt. Cuius rei cauſa eſt, quòd mas fœmina calidior ſit. Eadem etiam animalia tepidis locis plus temporis, quàm frigidis, illa ipſa cauſa, qua quæ maiore ſunt corpore, viuunt. & eorum maximè quæ natura frigida ſunt, magnitudo conſpectior redditur atque inſignior. Quapropter & calidis locis ſerpentes, lacerti, & corticata, necnon in mari Rubro teſtacea omnia, mira quadam magnitudine augentur. calida nanque humiditas, vitæ ac incrementi cauſa exiſtit. Locis autem prægelidis, humiditas animantibus indita, aquoſior eſt. quamobrem facilè congelaſcere poteſt. Quare in ſeptentrionali plaga, ex animalibus quæ parum ſanguinis obtinent, aut eodem vacant, quædam nullo pacto, ſiue pedeſtria in terra, ſiue aquatilia in mari, gignuntur: quædam gignuntur quidem, ſed minora ſunt, vitæque breuioris. nam gelida cœli conſtitutio ea increſcere non ſinit. Cùm autem alimentum non recipiunt tam animalia quàm plantæ, interire ſolent. idem enim ſeipſum emacerat. nam quemadmodum flamma magna paruam exurit corrumpitque, propterea quòd alimentum eius abſumat: ſic calor naturalis cui primaria concoquendi vis ineſt, materiam in qua ſit, conſumit. Porro aquatilia pedeſtribus minùs viuacia, non quòd humida ſimpliciter ſed quòd aquoſa ſint. Tale autem humidum, corruptioni opportunum eſt: quia frigidum ſit, & promptè congelabile. Item exanguia ſanguineis, eandem ob cauſam, niſi magnitudine vindicentur. nam neque pinguitudinem præ ſe ferunt, neq; dulcorem, cùm in animali pingue ipſum dulce ſit. Quamobrem apes diutiùs quàm quædam alia maiuſcula animalia viuunt.

A ἐναντία γὰρ ἡ τοῦ περιττώματος δύναμις, καὶ φθαρτικὴ ἡ μὲν τῆς φύσεως, ἡ δὲ μορίου. διὸ τὰ ὀχευτικὰ καὶ πολύσπερμα γηράσκει ταχύ· τὸ γὰρ σπέρμα, περίττωμα, καὶ ἔτι ξηραίνει ἀπιόν. καὶ διὰ τοῦτο ἡμίονος μακροβιώτερος ἵππου καὶ ὄνου, ἐξ ὧν ἐγένετο· καὶ τὰ θήλεα τῶν ἀρρένων, ἐὰν ὀχευτικὰ ᾖ τὰ ἄρρενα. διὸ καὶ οἱ στρουθοὶ οἱ ἄρρενες, βραχυβιώτεροι τῶν θηλειῶν. ἔτι δὲ καὶ ὅσα πονητικὰ τῶν ἀρρένων, καὶ διὰ τὸν πόνον γηράσκει μᾶλλον· ξηραίνει γὰρ ὁ πόνος· τὸ δὲ γῆρας ξηρόν ἐστι. φύσει δὲ, καὶ, ὡς ἐπὶ τὸ πᾶν εἰπεῖν, τὰ ἄρρενα τῶν θηλειῶν μακροβιώτερα. αἴτιον δὲ, ὅτι B θερμότερον ζῷον τὸ ἄρρεν ἐστὶ, τοῦ θήλεος. τὰ δ' αὐτὰ ἐν τοῖς ἀλεεινοῖς μακροβιώτερά ἐστιν, ἢ ἐν τοῖς ψυχροῖς τόποις διὰ τὴν αὐτὴν αἰτίαν, δι' ἥνπερ τὰ μείζω. καὶ μάλιστ' ἐπίδηλον τὸ μέγεθος τῶν τὴν φύσιν ψυχρῶν ζῴων· διὸ οἵ τε ὄφεις, καὶ αἱ σαῦραι, καὶ τὰ φολιδωτὰ, μεγάλα ἐν τοῖς θερμοῖς τόποις· καὶ ἐν τῇ θαλάττῃ τῇ Ἐρυθρᾷ, τὰ ὀστρακόδερμα. τῆς τε γὰρ αὐξήσεως, ἡ ὑγρὰ θερμότης, αἰτία, καὶ τῆς ζωῆς. ἐν δὲ τοῖς ψυχροῖς τόποις, ὑδατωδέστερον τὸ ὑγρὸν τὸ ἐν τοῖς ζῴοις ἐστί. διὸ εὔπηκτον. ὥστε τὰ μὲν οὐ γίνεται ὅλως τῶν ζῴων τῶν ὀλιγαίμων ἢ ἀναίμων, ἐν τοῖς πρὸς τὴν C ἄρκτον τόποις, οὔτε τὰ πεζὰ ἐν τῇ γῇ, οὔτε τὰ ἔνυδρα ἐν τῇ θαλάττῃ. τὰ δὲ γίνεται μὲν, ἐλάττω δὲ καὶ βραχυβιώτερα· ἀφαιρεῖται γὰρ ὁ πάγος τὴν αὔξησιν. τροφὴν δὲ μὴ λαμβάνοντα καὶ τὰ φυτὰ καὶ τὰ ζῷα φθείρεται· συντήκει γὰρ αὐτὸ αὑτό. ὥσπερ γὰρ ἡ πολλὴ φλὸξ κατακαίει καὶ φθείρει τὴν ὀλίγην, τῷ τὴν τροφὴν ἀναλίσκειν· οὕτω τὸ φυσικὸν θερμὸν, τὸ πρῶτον πεπτικὸν, ἀναλίσκει τὴν ὕλην ἐν ᾗ ἐστίν. τὰ δ' ἔνυδρα τῶν πεζῶν ἧττον μακρόβια, οὐχ ὅτι ὑγρὰ ἁπλῶς, ἀλλ' ὅτι ὑδατώδη. τὸ δὲ τοιοῦτον ὑγρὸν, εὔφθαρτον, ὅτι ψυχρὸν D καὶ εὔπηκτον. καὶ τὸ ἄναιμον διὰ τὸ αὐτὸ, ἐὰν μὴ μεγέθει ἀπαμύνηται· οὔτε γὰρ λίπος, οὔτε γλυκὺ ἔχει· ἐν γὰρ τῷ ζῴῳ τὸ λιπαρὸν γλυκύ. διὸ αἱ μέλιτται, μακροβιώτεραι ἑτέρων μειζόνων ζῴων.

CAPVT VI.

Cur quædam plantæ longioris quàm animalia durationis.

QVæ autem diutiſſimè viuunt, in plantis reperiri aſſoleſt: idque potiùs quàm in animantibus. Primò, quòd plantæ minùs in ſe diluti humoris contineant. vnde fit vt non facilè congelentur. Deinde, quòd pinguitudinem lentoremque habeant: & quamquam aridæ ſunt atque terrenæ, tamen non facilè ſiccabilem poſſideant humiditatem. Sed cur natura arborum longo temporis ſpacio duret, cauſam ſumpſiſſe conuenit. eam enim peculiarem ſibi præ omnibus animantibus, præterquam inſectis, obtinet. Semper enim ſtirpes iuueneſcunt. ideóque longæuæ ſunt. nam aſſiduè germina alia enaſcuntur, alia ſeneſcunt, & radices pari modò & non ſimul, ſed interdum ſolùm caudex & rami pereunt: alij verò rami adnaſcuntur. Cùm autem hæc affectio radicibus euenit, aliæ ex eo quod supereſt oriri ſolent. Atque ita perpetuò aliud corrumpitur, aliud gignitur: quocirca & illæ longo tempore viuunt.

ΚΕΦΑΛ. ϛ'.

Περὶ τῆς ἐν τοῖς φυτοῖς τῆς μακροβιότητος διαφορᾶς.

ΕΝ δὲ τοῖς φυτοῖς ἐστὶ τὰ μακροβιώτατα, καὶ μᾶλλον ἢ ἐν τοῖς ζῴοις. πρῶτον μὲν, ὅτι ἧττον ὑδατώδη· ὥστ' οὐκ εὔπηκτα. εἶτα ἔχει λιπαρότητα καὶ γλι- E σχρότητα· καὶ ξηρὰ καὶ γεώδη ὄντα, ὅμως οὐκ εὐξήραντον ἔχει τὸ ὑγρόν. περὶ δὲ τοῦ πολυχρόνιον εἶναι τὴν τῶν δένδρων φύσιν, δεῖ λαβεῖν τὴν αἰτίαν· ἔχει γὰρ ἴδιον πρὸς τὰ ζῷα, πλὴν πρὸς τὰ ἔντομα· νέα γὰρ ἀεὶ τὰ φυτὰ γίνεται. διὸ πολυχρόνια· ἀεὶ γὰρ ἕτεροι οἱ πτόρθοι, οἱ δὲ γηράσκουσι. καὶ αἱ ῥίζαι ὁμοίως, ἀλλ' οὐχ ἅμα, ἀλλ' ὅτε μὲν μόνον τὸ στέλεχος καὶ οἱ κλάδοι ἀπώλοντο, ἕτεροι δὲ παρεφύησαν. ὅταν δὲ οὕτως ὦσιν, αἱ ῥίζαι ἄλλαι ἐκ τοῦ ὑπάρχοντος γίνονται, καὶ οὕτως ἀεὶ διατελεῖ, τὸ μὲν φθειρόμενον, τὸ δὲ γινόμενον· διὸ καὶ μακρόβια.

ἔοικε δὲ τὰ φυτὰ τοῖς ἐντόμοις, ὥσπερ εἴρηται πρότερον· διαιρούμενα γὰρ ζῇ, καὶ δύο καὶ πολλὰ γίνεται ἐξ ἑνός. τὰ δ' ἔντομα, μέχρι μὲν τοῦ ζῆν ἦλθεν· οὐ δύναται δὲ πολὺν χρόνον· οὐ γὰρ ἔχει ὄργανα· οὐδὲ δύναται ποιεῖν αὐτὰ ἡ ἀρχὴ ἡ ἐν ἑκάστῳ. ἡ δ' ἐν τοῖς φυτοῖς δύναται· πανταχῇ γὰρ ἔχει καὶ ῥίζαν καὶ καυλὸν δυνάμει. διὸ ἀπὸ ταύτης ἀεὶ προέρχεται, τὸ μὲν νέον, τὸ δὲ γηράσκον, μικρόν τι διαφέροντα τῷ εἶναι μακρόβια, ὥσπερ τὰ * ἀποφυτευόμενα. καὶ γὰρ ἐν τῇ ἀποφυτείᾳ τρόπον τινὰ φαίη ἄν τις ταὐτὸ συμβαίνειν· μόριον γάρ τι τὸ ἀποφυτευθέν. ἐν μὲν οὖν τῇ ἀποφυτείᾳ, χωριζομένων, συμβαίνει τοῦτο· ἐκεῖ δὲ διὰ τοῦ συνεχοῦς. αἴτιον δέ, ὅτι ἐνυπάρχει πάντῃ ἡ ἀρχὴ δυνάμει ἐνοῦσα. συμβαίνει δὲ ταὐτὸ ἐπί τε τῶν ζῴων καὶ τῶν φυτῶν. ἔν τε γὰρ τοῖς ζῴοις τὰ ἄρρενα μακροβιώτερα ὡς ἐπὶ τὸ πολύ· τούτων δὲ τὰ ἄνω μείζω ἢ τὰ κάτω· νανωδέστερον γὰρ τοῦ θήλεος τὸ ἄρρεν. ἐν δὲ τῷ ἄνω τὸ θερμόν, καὶ τὸ ψυχρὸν ἐν τῷ κάτω. καὶ τῶν φυτῶν τὰ κεφαλοβαρῆ μακροβιώτερα. τοιαῦτα δὲ τὰ μὴ ἐπέτεια, ἀλλὰ δενδρώδη. τὸ γὰρ ἄνω τοῦ φυτοῦ καὶ κεφαλή, ἡ ῥίζα ἐστί. τὰ δὲ ἐπέτεια ἐπὶ τὰ κάτω λαμβάνει καὶ τοὺς καρπούς, καὶ τὴν αὔξησιν.

Ἀλλὰ περὶ μὲν τούτου, καὶ καθ' αὐτὰ ἐν τοῖς περὶ φυτῶν διορισθήσεται· νῦν δὲ περὶ τῶν ἄλλων ζῴων εἴρηται τὸ αἴτιον περί τε μήκους ζωῆς, καὶ βραχυβιότητος. λοιπὸν δ' ἡμῖν θεωρῆσαι περὶ νεότητος καὶ γήρως, καὶ ζωῆς καὶ θανάτου· τούτων γὰρ διορισθέντων τέλος ἂν ἡ περὶ τῶν ζῴων ἔχοι μέθοδος.

* καταφυτευόμενα

A Aſſimilantur autem plantæ inſectis, vt iam diximus. nam plantæ, diuiſæ ſeiunctæque viuunt: & duæ ex vna, atque etiam plures procreantur. Inſecta vero, viuunt quidem, ſed longo tempore viuere nequeunt. nam nec inſtrumenta poſſident, nec principium illud quod ſingulis ineſt, ea efficere poteſt. At illud quod plantis innatum eſt, poteſt: quippe cùm plantæ vbique tam radicem quàm caulem potentia habeant. Quapropter ab eo ſemper aliud recens, aliud ſenectum prouenit: quæ pauxillum inter ſe vitæ longitudine differunt, perinde vt ea quę auulſu ſeruntur. etenim in ea ſatione, quæ auulſo ſurculo effici ſolet, idem quodammodo euenire di-B cat. id enim quod auulſione ſeritur, particula quædam eſt. Verùm hoc in ſatione, quæ auulſu fit, ſeiunctis contingit: ibi, cōtinuis. Cauſa, quòd principium ipſum potentia vbique ineſt. Porrò idem in plātis & animalibus euenit. Nam in animalium genere, mares diutiùs magna ex parte viuūt: quorum partes ſupernæ maiores ſunt, quàm infernæ. nam mas, fœmina magis formā gerit pomilionis. ſuperna verò calor, & inferna frigus occupat. & in plantarum genere, quæ caput prægraue ac ponderoſum geſtant, longiùs vitæ curſum protrahunt. cuiuſmodi ſunt non annuæ, ſed quæ figura ſunt arboris. ſi-C quidem radix, plantarum pars ſupera atque caput eſt. quæ autem ſunt annuæ, parte infera & augentur, & ſuos fructus effundunt.

Sed de hoc ſeorſum per ſe in libris de Plantis tractabitur: nunc autem de cæteris, nempe de animalibus, cauſa quamobrem alia longum vitæ ſpatium obtineant, alia breue, explicata eſt. Reſtat, vt de iuuenture & ſenectute & vita & morte contemplemur. his enim præfinitis, determinatiſque, animalium doctrina finem erit aſſecuta.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ
ΝΕΟΤΗΤΟΣ ΚΑΙ ΓΗΡΩΣ, ΠΕΡΙ ζωῆς καὶ θανάτου.

ARISTOTELIS STAGIRITÆ, DE IVVENTVTE ET SENECTVTE, VITA ET MORTE, LIBER.

Franciſco Vatablo interprete.

ΚΕΦΑΛ. α'.

Τί ἡ ψυχὴ καὶ ποῦ. καὶ περὶ τοῦ ἔμπροσθεν καὶ ὄπισθεν ἐν τοῖς ζῴοις. καὶ τοῦ ἄνω καὶ κάτω ἐν τοῖς ζῴοις ἅμα καὶ φυτοῖς.

ΠΕΡΙ δὲ νεότητος καὶ γήρως, καὶ περὶ ζωῆς καὶ θανάτου, λεκτέον νῦν· ἅμα δὲ καὶ περὶ ἀναπνοῆς ἀναγκαῖον ἴσως τὰς αἰτίας εἰπεῖν· ἐνίοις γὰρ τῶν ζῴων διὰ τοῦτο συμβαίνει τὸ ζῆν καὶ μὴ ζῆν. ἐπεὶ δὲ περὶ ψυχῆς ἐν ἑτέροις διώρισται, καὶ δῆλον ὅτι οὐχ οἷόν τε εἶναι σῶμα τὴν οὐσίαν αὐτῆς, ἀλλ' ὅμως ὅτι γε ἔν τινι τοῦ σώματος ὑπάρχει μορίῳ, φανερὸν καὶ ἐν τούτῳ τινὶ τῶν ἐχόντων δύναμιν ἐν τοῖς μορίοις. τὰ μὲν οὖν ἄλλα τῆς ψυχῆς ἢ μόρια, ἢ δυνάμεις,

D CAPVT I.

Animalium viuentium vnam eandémque eſſe qua viuunt partem. De anterioribus & poſterioribus animalium partibus: item de ſupera & infera tam animalium quàm plantarum parte.

DE Iuuentute & ſenectute, vita & morte, nunc agendum, fortè autem ſimul & de ſpiratione cauſas dicere neceſſarium eſt, quòd ob eam animantibus nonnullis viuere & non viuere contingat. Cùm iam alibi de Anima tractatum ſit, quanquam conſtat fieri non poſſe vt animæ ſubſtantia corpus ſit, eam tamen eſſe in aliqua corporis particula, & ea quidē quæ inter reliquas vi quadam polleat, apertum eſt. Cæteris igitur animæ aut partibus aut potentiis

(vtrouis modo appellandæ ſint) in præſentia dimiſſis, eorum omnium quæ animalia dicuntur, & viuere in hiſce quidem quibus vtraque iſta, eſſe animal inquam ac viuere, comperiūt, vnam & eandem eſſe partem neceſſe eſt, qua viuunt ſimul, & animalis nuncupationem ſortiuntur. Fieri enim nequit, vt animal, qua animal eſt, non viuat. at qua viuit, hac eſſe animal, haudquaquam neceſſe eſt. nam plantæ viuunt quidem, ſed ſenſu carent. ipſa autem ſentiendi facultate animal à non animali interſtinguitur. Hanc ergo partem numero vnam eandémque, ratione plureis ac diuerſas eſſe neceſſe eſt. neque enim idem eſt eſſe animal, quod viuere. Cùm igitur propria ſenſoria vnum aliquod commune ſenſorium nacta ſint, quo neceſſe ſit ſenſus actu concurrere, hoc autem inter partem priorem & poſteriorem medium ſit (nam pars prior dicitur, in qua ſenſum gerimus: poſterior, quæ è regione illius ſita eſt) & inſuper præciſis viuentibus omnium pars altera ſupera ſit, altera infera: omnia enim partem ſuperam inferámque poſſident, quare & ipſæ plantæ vegetandi principium inter eas habebunt. nam partem qua cibus ingreditur, ſuperam nuncupamus, ipſam ſpectantes, & non totum illud quod nos ambit: qua vacans materia primùm egeritur, inferam. Cæterùm illa in plantis è contrariò quàm in animalibus ſita eſt. Nam ex animantibus, homini maximè pars ſuperior ad vniuerſi ſupremum erecta eſt: cæteris, media inter ſupremum ac imū haberi ſolet. At plātis cùm ſtabiles ſint, cibumque ex imo capiant, ea pars neceſſario infrà poſita ſemper eſt. quam enim habet rationem in animalibus vocatum os, eam ſubeunt in plantis radices. nam illa ore cibum è terra capiunt, hæ radicibus.

CAPVT II.

Probat principium nutritiuæ facultatis in medio ſuperæ & inferæ partis eſſe.

CVmque tribus exiſtentibus partibus, in quas perfecta animalia diuiduntur, vna qua cibum capiunt: altera, qua excrementum emittunt, tertia, quæ inter illas media eſt: hæc in maximis animalibus pectus nuncupetur, in cæteris porportionale, in quibuſdam autem magis quàm in aliis articulata diſcretáque ſit: & ex eorum numero quæcumque inceſſilia ſunt, ea parteis ad id muneris accommodatas, crura ſcilicet pedéſque, & ea quibus conſimilis facultas adeſt, adiunctas poſſideant, quibus totus alueus feratur: vegetalis profectò animæ principium in medio illarum trium partium haberi tum viſu, tum etiam ratione deprehenditur. Pleraque enim animalia, adempta vtrauis parte, id eſt, aut ea quæ vocatur caput, aut eà quæ ingeſtos continet cibos, cum quacumque ea ſit quæ media eſt, viuere ſolent. Id quod apertè in inſectis, vt veſpis & apibus, vſu venit. Sed & plurima quæ inſecta non ſunt, præciſa, ob vegetandi principium viuere queunt: quippe quæ partem hanc actu ſimplicem, potentia multiplicem habeant. Eodem enim quo plantæ modo conſtant. etenim plantæ præſectæ ſeorſim viuunt, multæque arbores ab vno fiunt principio. Cæterùm quam ob cauſam plantarum aliæ diuiſæ ſeiunctæque viuere nequeant, aliæ auulſione ſerantur, alio explicabitur loco. quanquam in hoc plantæ, & inſectorum genus ſimiliter ſeſe habent.

A ὁποτέρως ποτὲ δεῖ καλεῖν, ἀφείσθω τὰ νῦν. ὅσα δὲ ζῷα λέγεται * καὶ ζῆν, ἐν μὲν τοῖς ἀμφοτέρων τούτων τετυχηκόσι· λέγω δ' ἀμφοτέρων, τοῦ τε ζῷον εἶναι, καὶ τοῦ ζῆν, ἀναγκαῖον ταὐτὸ εἶναι, καὶ ἓν μόριον καθ' ὅ, τε ζῇ, καὶ καθ' ὃ προσαγορεύομεν αὐτὸ ζῷον. τὸ μὲν γὰρ ζῷον ᾗ ζῷον, ἀδύνατον μὴ ζῆν· ᾗ δὲ ζῇ, ταύτῃ ζῷον ὑπάρχειν οὐκ ἀναγκαῖον. τὰ γὰρ φυτὰ ζῇ μὲν, οὐκ ἔχει δὲ αἴσθησιν. τῷ δὲ αἰσθάνεσθαι τὸ ζῷον πρὸς τὸ μὴ ζῷον διορίζομεν. ἀριθμῷ μὲν οὖν ἀναγκαῖον ἓν εἶναι καὶ ταὐτὸ τοῦτο μόριον, τῷ δ' εἶναι πλείω καὶ ἕτερα. οὐ γὰρ ταὐτὸ τό, ζῷόν τε εἶναι καὶ τὸ ζῆν. ἐπεὶ οὖν τῶν ἰδίων αἰσθητηρίων, ἕν τι κοινόν ἐστιν αἰσθητήριον, εἰς ὃ B τὰς κατ' ἐνέργειαν αἰσθήσεις ἀναγκαῖον ἀπαντᾶν· τοῦτο δ' ἂν εἴη μέσον τοῦ πρόσθεν καλουμένου καὶ ὄπισθεν· ἔμπροσθεν μὲν γὰρ λέγεται, ἐφ' ὅ ἐστιν ἡμῖν αἴσθησις, ὄπισθεν δὲ, τὸ ἀντικείμενον. ἔτι δὲ διῃρημένου τοῦ σώματος, τῶν μὲν ζώντων πάντων τῷ τε ἄνω καὶ τῷ κάτω· πάντα γὰρ ἔχει τὸ ἄνω καὶ τὸ κάτω, ὥστε καὶ τὰ φυτά· δῆλον ὅτι τὴν θρεπτικὴν ἀρχὴν ἔχοι ἂν ἐν μέσῳ τούτων. καθ' ὃ μὲν γὰρ εἰσέρχεται μόριον ἡ τροφὴ, ἄνω καλοῦμεν, πρὸς αὐτὸ βλέποντες, ἀλλ' οὐ πρὸς τὸ περιέχον ὅλον· κάτω δὲ, καθ' ὃ τὸ περίττωμα ἀφίησι τὸ πρῶτον. ἔχει δ' ἐναντίως τοῖς φυτοῖς τοῦτο καὶ τοῖς ζῴοις· τῷ μὲν γὰρ ἀνθρώπῳ διὰ τὴν ὀρθότητα, C μάλιστα ὑπάρχει τοῦτο τῶν ζῴων, τὸ ἔχειν τὸ ἄνω μόριον πρὸς τὸ τοῦ παντὸς ἄνω· τοῖς δ' ἄλλοις, μεταξύ· τοῖς δὲ φυτοῖς ἀκινήτοις οὖσι καὶ λαμβάνουσιν ἐκ τῆς γῆς τὴν τροφὴν, ἀναγκαῖον ἀεὶ κάτω τοῦτ' ἔχειν τὸ μόριον. ἀνάλογον γάρ εἰσιν αἱ ῥίζαι τοῖς φυτοῖς, καὶ τὸ καλούμενον στόμα τοῖς ζῴοις, δι' οὗ τὴν τροφὴν, τὰ μὲν ἐκ τῆς γῆς λαμβάνει, τὰ δὲ δι' αὐτῶν.

* γρ. ἢ ζῶντα,

ΚΕΦΑΛ. β'.

Ὅτι ἡ ἀρχὴ τῆς θρεπτικῆς ψυχῆς ἐν τῷ μέσῳ ἄνω καὶ κάτω· καὶ ὅτι τὸ τοιοῦτον μόριον ἐνεργείᾳ μὲν ἕν, δυνάμει δὲ πλείω.

D ΤΡιῶν δὲ μερῶν ὄντων, εἰς ἃ διαιρεῖται τὰ τέλεια πάντα τῶν ζῴων, ἑνὸς μὲν, ᾗ δέχεται τὴν τροφὴν· ἑνὸς δὲ, ᾗ τὸ περίττωμα προΐεται· τρίτου δὲ, τοῦ μέσου τούτων, τοῦτο ἐν μὲν τοῖς μεγίστοις τῶν ζῴων, καλεῖται στῆθος· ἐν δὲ τοῖς ἄλλοις, τὸ ἀνάλογον· διήρθρωται δὲ μᾶλλον ἑτέροις ἑτέρων. ὅσα δ' αὐτῶν ἐστι πορευτικὰ, προσκεῖται καὶ μόρια τὰ πρὸς ταύτην τὴν ὑπηρεσίαν, οἷς τὸ σῶμα οἴσουσι πᾶν, σκέλη τε καὶ πόδες, καὶ τὰ ταύτην ἔχοντα τὴν αὐτὴν δύναμιν. ἀλλ' ἥ γε τῆς θρεπτικῆς ἀρχὴ ψυχῆς, ἐν τῷ μέσῳ τῶν τριῶν μορίων, καὶ κατὰ τὴν αἴσθησιν οὖσα φαίνεται, καὶ κατὰ τὸν λόγον· πολλὰ γὰρ ζῷα ἀφαιρουμένων ἑκατέρων τῶν μορίων, τῆς τε καλουμένης E κεφαλῆς, καὶ τοῦ δεκτικοῦ τῆς τροφῆς, ζῇ μεθ' * οὗ περ ἂν ᾖ τὸ μέσον. δῆλον δ' ἐπὶ τῶν ἐντόμων, οἷον σφηκῶν τε καὶ μελιττῶν, τοῦτο συμβαῖνον· καὶ τῶν μὴ ἐντόμων δὲ πολλὰ διαιρούμενα, δύναται ζῆν, διὰ τὸ θρεπτικόν. τὸ δὲ τοιοῦτον μόριον ἐνεργείᾳ μὲν ἔχει ἕν, δυνάμει δὲ πλείω· τὸν αὐτὸν γὰρ συνέστηκε τοῖς φυτοῖς τρόπον· καὶ γὰρ τὰ φυτὰ διαιρούμενα, ζῇ χωρὶς, καὶ γίνεται πολλὰ ἀπὸ μιᾶς ἀρχῆς δένδρα. δι' ἣν δ' αἰτίαν τὰ μὲν οὐ δύναται διαιρούμενα ζῆν, τὰ δ' ἀποφυτεύεσθαι τῶν φυτῶν, ἕτερος ἔσται λόγος. ἀλλ' ὁμοίως ἔχει κατά γε τοῦτο, τά τε φυτὰ, καὶ τὸ τῶν ἐντόμων γένος.

ἀνάγκη δὲ καὶ θρεπτικὴν ψυχήν, ἐνεργείᾳ μὲν ἐν τοῖς ἔχουσιν εἶναι μίαν, δυνάμει δὲ πλείους. ὁμοίως δὲ καὶ τὴν αἰσθητικὴν ἀρχήν· φαίνεται γὰρ ἔχοντα αἴσθησιν τὰ διαιρούμενα αὐτῶν, ἀλλὰ πρὸς τὸ σώζεσθαι τὴν φύσιν, τὰ μὲν φυτὰ δύναται, ταῦτα δ' οὐ δύναται, διὰ τὸ μὴ ἔχειν ὄργανα πρὸς σωτηρίαν, ἐνδεᾶ τε εἶναι, τὰ μὲν τοῦ ληψομένου, τὰ δὲ τοῦ δεξαμένου τὴν τροφήν, τὰ δ' ἄλλων τε, καὶ τούτων ἀμφοτέρων. ἐοίκασι γὰρ τὰ τοιαῦτα τῶν ζώων, πολλοῖς ζώοις συμπεφυκόσι. τὰ δ' ἄριστα συνεστηκότα, τοῦτ' οὐ πάσχει τῶν ζώων, διὰ τὸ εἶναι τὴν φύσιν αὐτῶν ὡς ἐνδέχεται μάλιστα μίαν. διὸ καὶ μικρὰν αἴσθησιν ἔνια ποιεῖ διαιρούμενα τῶν μορίων, ὅτι ἔχει τι ψυχικὸν πάθος· χωριζομένων γὰρ τῶν σπλάγχνων, ποιεῖται κίνησιν ἔτι καὶ αἱ χελῶναι, τῆς καρδίας ἀφῃρημένης.

ΚΕΦΑΛ. γʹ.

Ἔτι περὶ τοῦ αὐτοῦ, ἐκ τῶν τῇ αἰσθήσει φαινομένων περὶ τὰ σπέρματα καὶ ὄζους καὶ τὴν καρδίαν καὶ περὶ τῆς συμφύτου πᾶσι τοῖς ζῴοις θερμότητος.

ΕΤι δ' ἐστί τε τῶν φυτῶν δῆλον, καὶ τῶν ζώων· τῶν μὲν φυτῶν τήν τε ἐκ τῶν σπερμάτων γένεσιν ἐπισκοποῦσι, καὶ τὰς ἐμφυτείας τε καὶ τὰς ἀποφυτείας. ἥ τε γὰρ τῶν σπερμάτων γένεσις συμβαίνει πᾶσιν ἐκ τοῦ μέσου· διθύρων γὰρ ὄντων πάντων, ᾗ συμπέφυκεν, ἔχεται, καὶ τὸ μέσον ἐστὶν ἑκατέρου τῶν μορίων· ἐντεῦθεν γὰρ ὅ, τε καυλὸς ἐκφύεται, καὶ ἡ ῥίζα τῶν φυομένων. ἡ δ' ἀρχή, τὸ μέσον αὐτῶν ἐστίν. ἔν τε ταῖς ἐμφυτείαις καὶ ταῖς ἀποφυτείαις συμβαίνει τοῦτο μάλιστα περὶ τοὺς ὄζους· ἔστι γὰρ ἀρχή τις ὁ ὄζος τοῦ κλάδου, ἅμα δὲ καὶ μέσον. ὥστε ἢ τοῦτο ἀφαιροῦσιν, ἢ εἰς τοῦτο ἐμβάλλουσιν, ἵνα ἢ ὁ κλάδος, ἢ αἱ ῥίζαι ἐκ τούτων γίνωνται, ὡς οὔσης τῆς ἀρχῆς ἐκ τοῦ μέσου καυλοῦ καὶ ῥίζης. καὶ τῶν ζώων τῶν ἐναίμων ἡ καρδία γίνεται πρῶτον. τοῦτο δὲ δῆλον, ἐξ ὧν ἐν τοῖς ἐνδεχομένοις ἔτι γιγνομένοις ἰδεῖν, τεθεωρήκαμεν. ὥστε καὶ ἐν τοῖς ἀναίμοις, ἀναγκαῖον ἀνάλογον τῇ καρδίᾳ γίνεσθαι πρῶτον. ἡ δὲ καρδία ὅτι ἐστὶν ἀρχὴ τῶν φλεβῶν, καὶ ἐν τοῖς περὶ τὰ μέρη τῶν ζώων, εἴρηται πρότερον· καὶ ὅτι τὸ αἷμα τοῖς ἐναίμοις ἐστὶ τελευταία τροφή, ἐξ οὗ γίνεται τὰ μόρια. φανερὸν τοίνυν ὅτι μίαν μέν τινα ἐργασίαν ἡ τοῦ στόματος λειτουργεῖ δύναμις, ἑτέραν δέ, ἡ τῆς κοιλίας περὶ τὴν τροφήν. ἡ δὲ καρδία κυριωτάτη, καὶ τὸ τέλος ἐπιτίθησιν. ὥστ' ἀνάγκη καὶ τῆς αἰσθητικῆς καὶ τῆς θρεπτικῆς ψυχῆς ἐν τῇ καρδίᾳ τὴν ἀρχὴν εἶναι τοῖς ἐναίμοις· τὰ γὰρ τῶν ἄλλων μορίων ἔργα περὶ τὴν τροφήν, τοῦ ταύτης ἔργου χάριν ἐστί. δεῖ μὲν γὰρ τὸ κύριον πρὸς ὃ οὗ ἕνεκα διατελεῖν, ἀλλ' οὐκ ἐν τοῖς τούτου ἕνεκα, οἷον ἰατρὸς πρὸς τὴν ὑγίειαν. ἀλλὰ μὴν τό γε κύριον τῶν αἰσθήσεων, ἐν ταύτῃ τοῖς ἐναίμοις πᾶσιν· ἐν τούτῳ γὰρ ἀναγκαῖον εἶναι τὸ πάντων τῶν αἰσθητηρίων κοινὸν αἰσθητήριον. δύο δὲ φανερῶς ἐνταῦθα συντεινούσας ὁρῶμεν, τήν τε γεῦσιν καὶ τὴν ἁφήν. ὥστε καὶ τὰς ἄλλας ἀναγκαῖον· ἐν τούτῳ μὲν γὰρ τοῖς ἄλλοις αἰσθητηρίοις ἐνδέχεται ποιεῖσθαι τὴν κίνησιν. ταῦτα δ' οὐδὲν συντείνει πρὸς τὸν ἄνω τόπον. χωρὶς δὲ τούτων, εἰ τὸ ζῆν ἐν τούτῳ τῷ μορίῳ πᾶσίν ἐστι, δῆλον ὅτι καὶ τὴν αἰσθητικὴν ἀρχὴν ἀναγκαῖον· ᾗ μὲν γὰρ ζῷον, ταύτῃ καὶ ζῆν φαμέν· ᾗ δὲ αἰσθητικόν, ταύτῃ τὸ σῶμα ζῷον εἶναι λέγομεν.

A Neceſſe autem eſt, vt anima vegetatrix in habentibus actu ſimplex vnaquæ ſit, potentia multiplex ac plures. Nec ſecus de ſentiendi quoque principio dicendum. nam quæ ex eis diuiſa ſunt, ea ſenſum habere cernuntur (verùm plantæ vt naturâ ſeruetur efficere poſſunt, hæc non poſſunt: quòd inſtrumenta ad naturæ tutelam ſalutémque commoda non habeant, careántque alia eo quod cibum trahit, alia eo quod recipit, alia tum aliis, tum etiam horum vtroque.) Huiuſmodi enim animalia, animalibus multis natura cohærentibus aſſimilantur (at quæ optimè conſtant, haudquaquam: quod eorum natura quàm maximè fieri B poteſt, vna ſimpléxque habeatur. Quo fit, vt partes nonnullæ diuiſæ parum ſentiant: quòd affectio quædam animæ illata ſit.) Detractis enim viſceribus, cientur. id quod etiam teſtudinibus exempto corde euenit.

CAPVT III.

Probat idem aliis argumentis.

PRæterea illud tam in plantis quàm in animalibus patêre poteſt. In plantis quidem, ſi generationem quæ fieri ſemine ſolet, & inſitiones auulſionéſque conſideremus. Nam generatio ea quæ ſemine fit, omnibus è medio prouenit. cùm enim C biualuia ſint ſemina omnia, quà cohærent, médiúmque partis vtriuſque habetur, hinc vnà cum caule radix etiam eorum quæ naſcuntur, erumpit, principiúmque medium ipſorum eſt. Hoc etiam in inſitionibus auulſionibúſque, circa nodos maximè euenit. nodus enim principium quoddam ſurculi eſt, & inſuper medij rationem obtinet. Quare aut nodum auferunt, aut in eum quippiam indunt: vt vel radix vel ſurculus ex eo naſcatur, quaſi principium caulis & radicis è medio ſit. Quinetiam cor animantium ſanguine præditorum, primum gignitur. quod etiam per ea conſtat, quæ fuimus ſpeculati in hiſce quæ dum adhuc fierent, nobis vidiſſe contigit. Quare & in iis quæ D ſanguine carent, id primum fieri neceſſe eſt, quod vice cordis ſubrogatur. Quod autem cor venarum principium ſit, quódque in ſanguineis ſanguis ſit vltimum alimentum, ex quo partes efficiuntur, in libris de Partibus animalium dictum iam eſt. Conſtat itaque, oris facultatem alteram operam cibo conficiendo præſtare, ventris alteram: cor verò potiſſimum eſſe, atque finem imponere. Quare vt ſentientis, ita etiam vegetantis animæ originem, ſanguinariis in corde haberi neceſſe eſt. nam cæterarum partium officia circa cibum, officij cordis gratia ſunt. Oportet enim vt principale ad id cuius cauſa, properet, & non E in iis quæ huius cauſa, ſubſiſtat, perinde atque medicus ad ipſam ſanitatem. At verò ſenſuum principatus, in corde ſanguinariis omnibus eſt. nam in corde omnium ſenſoriorum commune ſenſorium haberi neceſſe eſt. Duos autem, id eſt tangendi & guſtandi ſenſus, eò apertè tendere cernimus: quare & reliquos eôdem proficiſci neceſſe eſt. in hoc enim cætera ſenſoria motum facere contingit. hæc autem nequaquam ad locum ſuperiorem tendunt. Præterea ſi vita hac in parte omnibus collocata ſit, eſſe neceſſe vt ſentiendi quoque principium in ea ipſa ſedem habeat, perſpicuum eſt. quo enim corpus animal eſt, eo etiam viuere: quo verò ſenſitiuum, eo eſſe animal dicimus.

Cæterùm cur ſenſuum alij apertè in cor penetrẽt, A alij in capite poſiti ſint (quamobrem nõnulli etiam vim ſentiendi ſitam in cerebro arbitrantur) cauſa ſeorſum alio loco explicata iam eſt. Sentiendi igitur principium, & alendi & augendi, in hac trium partium, & in corporis meditullio ſitum eſſe, viſu quidem ex hiſce quæ dicta ſunt, conſtat.

CAPVT IV.

Quid ſit mors: & quòd duplex ſit.

RAtione verò, quòd natura in omnibus ex iis quæ fieri poſſunt, facere videtur quod optimũ B ſit. Cùm autem ſubſtantiæ medium principium vtrumque occupat, tum pars vtraque, tam ea quæ vltimum perficit alimentum, quàm ea quæ ipſum recipit, ſuo fungi munere maximè poteſt. ita enim fit vt iuxta vtrumque eorum pars vtraque ſita ſit. Item eiuſmodi medij locus, eius quod principatum obtinet, locus eſt. Præterea id quod vtitur, & id quo quid vtitur differant inter ſe oportet: perinde vt tibiæ, & id quod eas mouet, videlicet manus. Si ergo animal definitum eſt eo, quòd ſentiendi principiũ habeat: hoc principium ſanguineis in corde, exanguibus in parte vicaria haberi neceſſe eſt. Porro animaliũ partes omnes, totumque corpus, calorem quendam naturalem inſitum habent. Quocirca C dum viuunt, calida apparent: dum mortua ſunt atque vita deſtituta, contrà. Neceſſarium autem eſt, vt eius caloris principium ſanguineis in corde, exãguibus in proportionali habeatur: cibum enim naturali calore conficiunt, atque cõcoquunt omnia, ſed imprimis id quod potiſſimum eſt, nempe cor, aut quod ei proportione reſpondet. Quamobrem cæterarũ partium calore frigefacto, vita remanet: cordis, prorſus interit, quòd omnibus inde caloris principium pendeat, & anima quaſi ignita ſit in hiſce partibus, ſanguineorum in corde, exanguium in parte proportionali. Neceſſum itaque eſt, vitam & incolumitatem huiuſce caloris, item mortem & D eiuſdem corruptionem, ſimul eſſe.

CAPVT V.

De ignis corruptionibus.

AT verò ignis duas eſſe corruptiones videmus: marcorem & extinctionem. Eam quæ à ſeipſo prouenit, marcorem appellitamus: quæ verò à contrariis, extinctionem: & illam quidem, ſenectutem, hanc autem violentiam. Vtramque tamen corruptionem eadem de cauſa fieri accidit. ſubſidento etenim cibo, quòd calor cum accipere nequeat, corrumpitur ignis. nam contra- E rium ipſum concoctionem intercipiens, quominus ille nutriatur, impedit. Eſt etiam quando ignem marceſcere contingit, ampliori calore ob id collecto, quia neque ſpiraminis quicquam habeat, neque refrigerij. ita enim calor plurimus ſeſe intercolligens, alimentum celerrimè abſumit: idque priùs facit, quàm vt vlla reſpiratio adhiberi queat. Quocirca non modò minor ignis, maioris acceſſu marceſcit, verumetiam ipſa per ſe lucernæ flamma maiori flammæ indita advritur, haud aliter quàm quoduis aliud cremabile. Cuius rei cauſa eſt, quòd flamma maior, minoris alimentum priùs occupat quàm aliud ſuperueniat.

διὰ τί δ' αἱ μὲν τῶν αἰσθήσεων φανερῶς συντείνουσι πρὸς τὴν καρδίαν, αἱ δ' εἰσὶν ἐν τῇ κεφαλῇ (διὸ καὶ δοκεῖ τισιν αἰσθάνεσθαι τὰ ζῷα διὰ τὸν ἐγκέφαλον) τὸ αἴτιον τούτων ἐν ἑτέροις εἴρηται χωρίς. κατὰ μὲν οὖν τὰ φαινόμενα δῆλον ἐκ τῶν εἰρημένων, ὅτι ἐν τούτῳ τε καὶ ἐν τῷ μέσῳ τοῦ σώματος τῶν τριῶν μορίων, ἥ τε τῆς αἰσθητικῆς ἀρχὴ ψυχῆς ἐστι, καὶ ἡ τῆς αὐξητικῆς, καὶ ἡ τῆς θρεπτικῆς.

ΚΕΦΑΛ. δ.

Τί ἐστι θάνατος, καὶ ὅτι διττός.

ΚΑτὰ δὲ τὸν λόγον, ὅτι τὴν φύσιν ὁρῶμεν ἐν πᾶσιν ἐκ τῶν δυνατῶν ποιοῦσαν τὸ κάλλιστον. ἐν τῷ μέσῳ δὲ τῆς οὐσίας τῆς ἀρχῆς οὔσης ἑκατέρας, μάλιστα μὲν ἀποτελεῖ τῶν μορίων ἑκάτερον τὸ αὐτοῦ ἔργον, τό, τε κατεργαζόμενον τὴν ἐσχάτην τροφὴν καὶ τὸ δεκτικόν· πρὸς ἑκάτερον γὰρ αὐτῶν οὕτως ἔσται. καὶ ἔστιν ἡ τοῦ τοιούτου μέση χώρα, ἄρχοντος χώρα. ἔτι τὸ χρώμενον καὶ ᾧ χρῆται, δεῖ διαφέρειν. ὥσπερ δὲ τὴν δύναμιν, οὕτως αἱ εἰ δέχονται καὶ τὸν τόπον, ὥσπερ οἱ τ' αὐλοὶ, καὶ τὸ κινοῦν τοὺς αὐλούς, ἡ χείρ. εἴπερ οὖν τὸ ζῷον ὥρισται τῷ τὴν αἰσθητικὴν ἔχειν ψυχήν, τοῖς μὲν ἐναίμοις ἀναγκαῖον ἐν τῇ καρδίᾳ ταύτην ἔχειν τὴν ἀρχήν· τοῖς δ' ἀναίμοις ἐν τῷ ἀνάλογον μορίῳ. πάντα δὲ τὰ μόρια, καὶ πᾶν σῶμα τῶν ζῴων ἔχει τινὰ σύμφυτον θερμότητα φυσικήν. διὸ ζῶντα μὲν φαίνεται θερμά, τελευτῶντα δὲ καὶ στερισκόμενα τοῦ ζῆν, τοὐναντίον. ἀναγκαῖον δὴ ταύτης τὴν ἀρχὴν τῆς θερμότητος ἐν τῇ καρδίᾳ τοῖς ἐναίμοις εἶναι· τοῖς δ' ἀναίμοις, ἐν τῷ ἀνάλογον· ἐργάζεται γὰρ καὶ πέττει τῷ φυσικῷ θερμῷ πάντα τὴν τροφήν, μάλιστα δὲ τὸ κυριώτατον, ἡ καρδία, ἢ τὸ ἀνάλογον. διὸ τῶν μὲν ἄλλων μορίων ψυχομένων, ὑπομένει τὸ ζῆν· τοῦ δ' ἐν ταύτῃ, φθείρεται πάμπαν, διὰ τὸ τὴν ἀρχὴν ἐντεῦθεν τῆς θερμότητος ἠρτῆσθαι πᾶσι, καὶ τῆς ψυχῆς, ὥσπερ ἐμπεπυρευμένης ἐν τοῖς μορίοις τούτοις, τῶν μὲν ἀναίμων ἐν τῷ ἀνάλογον, ἐν δὲ τῇ καρδίᾳ τῶν ἐναίμων. ἀνάγκη τοίνυν ἅμα τό, τε ζῆν ὑπάρχειν, καὶ τὴν τοῦ θερμοῦ τούτου συντήρησιν, καὶ τὸν καλούμενον θάνατον εἶναι τὴν τούτου φθοράν.

ΚΕΦΑΛ. ε.

Περὶ μαράνσεως.

ΑΛλὰ μὴν πυρός γε δύο ὁρῶμεν φθοράς, μάρανσίν τε καὶ σβέσιν· καλοῦμεν δὲ τὴν μὲν * ἀφ' ἑαυτοῦ, μάρανσιν· τὴν δ' ὑπὸ τῶν ἐναντίων, σβέσιν· τὴν μὲν γῆρας, τὴν δὲ βίαιον. συμβαίνει δ' ἀμφοτέρας * δι' αὐτὸ γίνεσθαι τὰς φθοράς· ὑπολειπούσης γὰρ τῆς τροφῆς, οὐ δυναμένου λαμβάνειν τοῦ θερμοῦ τὴν τροφήν, φθορὰ γίνεται τοῦ πυρός. τὸ μὲν γὰρ ἐναντίον παῦον τὴν πέψιν, κωλύει τρέφεσθαι. ὅτε δὲ μαραίνεσθαι συμβαίνει, πλείονος ἀθροιζομένου θερμοῦ διὰ τὸ μὴ ἀναπνεῖν, μηδὲ καταψύχεσθαι· ταχὺ γὰρ καὶ οὕτω καταναλίσκει τὴν τροφὴν πολὺ συναθροιζόμενον τὸ θερμὸν καὶ φθάνει καταναλίσκον, πρὶν ἐπιστῆναι τὴν ἀναθυμίασιν. διόπερ οὐ μόνον μαραίνεται τὸ ἔλαττον παρὰ τὸ πλεῖον πῦρ, ἀλλὰ καὶ αὐτὴ καθ' αὑτὴν ἡ τοῦ λύχνου φλὸξ ἐντιθεμένη πλείονι φλογὶ, κατακαίεται, καθάπερ ὁποιονοῦν ἄλλο τῶν καυστῶν. αἴτιον δ', ὅτι τὴν μὲν οὖσαν ἐν τῇ φλογὶ τροφὴν φθάνει λαμβάνουσα ἡ μείζων φλὸξ πρὶν ἐπελθεῖν ἑτέραν,

* γ. ὑφ' ἑ.

* Scrib. διὰ ταὐτό

τὸ δὲ πῦρ ἀεὶ διατελεῖ γινόμενον καὶ ῥέον, ὥσπερ ποταμός, ἀλλὰ λανθάνει διὰ τὸ τάχος. δῆλον τοίνυν, ὡς εἴπερ δεῖ σώζεσθαι τὸ θερμόν· τοῦτο δ' ἀναγκαῖον, εἴπερ μέλλει ζῆν· δεῖ γίνεσθαί τινα τοῦ θερμοῦ τοῦ ἐν τῇ ἀρχῇ κατάψυξιν. παράδειγμα δ' ἐκ τούτου λαμβάνειν δεῖ τὸ συμβαῖνον ἐπὶ τῶν καταπνιγομένων ἀνθράκων· ἂν μὲν γὰρ ὦσι περιπεπωμασμένοι τῷ καλουμένῳ πνιγεῖ συνεχῶς, ἀποσβέννυνται ταχέως· ἂν δὲ παραλλὰξ τις ποιῇ πυκνὰ τὴν ἀφαίρεσιν καὶ τὴν ἐπίθεσιν, μένουσι πεπυρωμένοι πολὺν χρόνον. ἡ δὲ κρύψις σώζει τὸ πῦρ· οὔτε γὰρ ἀποπνεῖν κωλύεται διὰ τὴν μανότητα τῆς τέφρας· ἀντιφράττει τε τῷ πέριξ ἀέρι, πρὸς τὸ μὴ σβεννύναι τῷ πλήθει τῆς ἐνυπαρχούσης αὐτῷ θερμότητος. ἀλλὰ περὶ μὲν τῆς αἰτίας ταύτης, ὅτι τὸ ἐναντίον συμβαίνει τῷ ἐγκρυπτομένῳ καὶ καταπνιγομένῳ πυρί· τὸ μὲν γὰρ μαραίνεται, τὸ δὲ διαμένει πλείω χρόνον· εἴρηται καὶ ἐν τοῖς προβλήμασιν.

ΚΕΦΑΛ. ϛʹ.

Ἐκ τίνων ποιεῖται ζῷα τὴν κατάψυξιν.

Ἐπεὶ δὲ πᾶν* ζῷον ἔχει ψυχήν, αὕτη δ' οὐκ ἄνευ φύσεως ὑπάρχει θερμότητος, ὥσπερ εἴπομεν, τοῖς μὲν φυτοῖς ἡ διὰ τῆς τροφῆς καὶ τοῦ περιέχοντος ἱκανὴ γίνεται βοήθεια, πρὸς τὴν τοῦ φυσικοῦ θερμοῦ σωτηρίαν. καὶ γὰρ ἡ τροφὴ ποιεῖ κατάψυξιν εἰσιοῦσα, καθάπερ καὶ τοῖς ἀνθρώποις τὸ πρῶτον εἰσενεγκαμένοις· αἱ δὲ νηστεῖαι θερμαίνουσι, καὶ δίψας ποιοῦσιν· ἀκίνητος γὰρ ὢν ὁ ἀήρ, ἀεὶ θερμαίνεται· τῆς δὲ τροφῆς εἰσιούσης καταψύχεται κινούμενος, ἕως ἂν λάβῃ τὴν πέψιν. ἂν δὲ ἢ τὸ περιέχον ὑπερβάλλῃ ψυχρότητι διὰ τὴν ὥραν, ἰσχυρῶν γινομένων τῶν πάγων, ἐξαυαίνεται· ἢ τοῦ θέρους ἰσχυρὰ συμβαίνῃ καύματα, καὶ μὴ δύνηται τὸ ἀνώμενον ἐκ τῆς γῆς ὑγρὸν καταψύχειν, φθείρεται μαραινόμενον τὸ θερμόν· καὶ λέγεται σφακελίζειν καὶ ἀστρόβλητα γίνεσθαι τὰ δένδρα, κατὰ τοὺς καιροὺς τούτους. διὸ καὶ γένη τινὰ λίθων ταῖς ῥίζαις ὑποβάλλουσι, καὶ ὕδωρ ἐν ἀγγείοις, ὅπως αἱ ῥίζαι ψύχωνται τῶν φυτῶν. τῶν δὲ ζῴων, ἐπεὶ τὰ μὲν ἔνυδρά ἐστι, τὰ δὲ ἐν τῷ ἀέρι ποιεῖται τὴν δίαιταν, ἐκ τούτων καὶ διὰ τούτων ποιεῖται τὴν κατάψυξιν, τὰ μὲν τῷ ὕδατι, τὰ δὲ τῷ ἀέρι. τίνα δὲ τρόπον καὶ πῶς λεκτέον, ἐπιστήσασι τὸν λόγον.

* γ. ζῶν

ΠΕΡΙ ΑΝΑΠΝΟΗΣ.

ΚΕΦΑΛ. αʹ.

Ὅσα ζῷα ἀναπνεῖ, καὶ ποῖα μᾶλλον.

Περὶ γὰρ ἀναπνοῆς, ὀλίγοι μέν τινες τῶν πρότερον φυσικῶν εἰρήκασι· τίνος μέντοι χάριν ὑπάρχει τοῖς ζῴοις, οἱ μὲν οὐδὲν ἀπεφήναντο· οἱ δὲ εἰρήκασι μέν, οὐ καλῶς δέ· ἀλλ' ἀπειροτέρως τῶν συμβαινόντων. ἔτι δὲ πάντα τὰ ζῷά φασιν ἀναπνεῖν· τοῦτο δὲ οὐκ ἔστιν ἀληθές. ὥστ' ἀναγκαῖον περὶ τούτων πρῶτον ἐπελθεῖν, ὡς ἂν μὴ δοκῶμεν ἀπόντων κενῶς κατηγορεῖν. ὅτι μὲν οὖν ὅσα πνεύμονα ἔχει τῶν ζῴων, ἀναπνεῖ πάντα, φανερόν.

A ignis autem, fluminis inſtar perpetuò gignitur atque fluit. verum id pręceleritate nos latet. Clarum itaque eſt, ſi ſeruari calorem oporteat, quod ſane neceſſarium eſt ſi animal victurum ſit, quãdam ſieri caloris in ſua origine refrigerationem oportere. Cuius rei exemplum ſumere licet, id quod in hiſce carbonibus qui præfocantur, euenit. nam ſi continuè obturati ſint eo quod ſuffocatorium vocant, celeriter extinguũtur: ſi verò mutatis vicibus quiſpiam crebrò operculum auferat, apponátque, longo tempore ignem retinere ſuum aſſolent. At occultatio, ignem conſeruat. nec enim quominus diſſlet, impeditur, propter cineris raritatem: & circumfuſo aëri, ne extinguatur ab eo, copia ſui caloris B reſiſtit. Verùm cauſa quamobrem igni intecto aliter accidat, aliter præfocato (hic enim emarceſcit, ille longo temporis ſpatio edurat) dicta eſt in Problematibus.

CAPVT VI.

Animalia ex quibus refrigerationem ſibi concilient.

CVm autem omnia viuentia animã ſortita ſint, quæ nequaquam abſque naturali calore eſſe poteſt, vt diximus: plantis quidem ſubſidium illud quod per alimentum & ambientem aërem para- C tur, ſat eſt ad caloris naturalis tutelam atque ſalutem. Etenim alimentum refrigerationem ingrediendo facit, qualis hominibus cùm primùm quippiam ſumpſerunt cibi, euenire ſolet. Ieiunia verò calefaciunt, ſitimque mouent. nam aër cùm motu vacat, ſemper calefit: cùm verò mouetur, ingrediẽte cibo, refrigerari ſolet, quoad concoctionem admiſerit. At ſi aut continens, frigore exuperet ob temporis conſtitutionem, vigente nimirum valido gelu, obareſcunt; aut per æſtatem vehementes æſtus accidant, neque humor qui è terra trahitur, refrigerare poſſit, calor earum marcore corrumpitur. atque per id tempus arbores ſphaceliſmum (id eſt, D morbum radicis, ſiue radicationem) ſentire, atque ſiderari dicuntur. Quamobrem & lapidum genera quædam, & aquam in vaſculis ſubdere radicibus conſueuere, vt ſtirpium radices refrigerentur. Animantium autem cùm quædam in aqua, quædam in aere degant, ex his & per hæc refrigerationem ſibi conciliant, aliæ aqua, aliæ aëre. Quonam vero pacto, & qualiter, inſtituto ſermone explicandum eſt.

DE RESPIRATIONE

E

CAPVT I.

Quæ reſpirent animantia, & quæ magis.

NAm de ſpiratione quanquã à prioribus naturæ interpretibus nonnulli, iiq; admodũ pauci determinauere: tamen cuius gratiã animãtibus adiũcta ſit, alij nihil dixerunt, alij dixerũt quidẽ aliquid, ſed haudquaquã rectè, immo præter eorũ quę contingere ſolent, experientiã. Ad hæc, omnia animalia ſpirare prodiderunt: quod remotum à veritate eſt. Quare de hiſce priùs agendum eſt, vt ne abſentes immeritò accuſare videamur. Igitur animalia quæ pulmonẽ habeant, ſpirare omnia, dilucidũ eſt.

Sed de his ipſis, quotquot exanguem fungoſumque gerunt, ſpiratione minùs indigent. Vnde fit, vt ſine ea diutilè pro corporis viribus perſiſtere queãt. Fungoſum autem pulmonem ouipera omnia poſſident, vt ranarum genus, prætereà mures amnici, atque teſtudines: diuque aquam demerſa tolerant, quòd pulmo eorum parum caloris retineat, cum ſanguinis inops habeatur. Qui vbi inflatur, motu ſuo refrigerat, efficitque vt longo temporis ſpatio edurent. Cæterùm ſi quis ea vi diutiùs in humore detineat, præfocatur, intereuntque omnia: nullum enim è talibus aquam, piſcium more, admittit. Quotquot autem ſanguinem obtinent, ſpiratione magis indigent, propter caloris abundantiam. Cætera verò quęcumque pulmone vacant ſpirare non ſolent.

CAPVT II.

Democriti, Diogenis & Anaxagoræ expenſa ſententia.

DEmocritus igitur ille Abderitanus, nonnullique alij qui de ſpiratione tractarunt, nihil de cæteris animantibus præfinivere: dixiſſe tamen videntur, quaſi omnia ſpirandi vſum haberent. At Anaxagoras & Diogenes, ſimul ac cuncta ſpirare dixerunt, de piſcibus & oſtreis quonam modo ſpirẽt, ſubdidêre. Ac Anaxagoras quidem, piſces, cum per branchias humorem reddunt, aërem illum trahendo qui ſuo in ore ſit, quod nihil inane habeatur, ſpirare tradidit. Diogenes verò, eoſdem, cum aquam per branchias euomunt, ex eo humore qui ori circumquaque adiacet, aërem opera vacui in ore exiſtentis trahere aſſerit. quaſi quidam aër eſſet in aqua. Hæc autem impoſſibilia ſunt. Nã primò quidem illi negotij partem alteram adimunt, quia id quod commune eſt, de altero ſolo enunciant. id enim vocatur ſpiratio. Spirationis autem pars altera inſpiratio, altera exſpiratio. de qua, quo pacto tales animantes expirent, nihil dicunt. Nec verò dicere quicquam poſſunt. nam quoties illæ reſpirant, quà reſpirarint, hac rurſum exſpirent, & hoc ſemper alternatim factitent, oportet. Vnde accidit vt ſimul ore aquam excipiant, & ſpiritum reddant. at neceſſe eſt occurſantia, alterũ alterum impedire. Deinde cùm aquam reijciunt, tunc per os aut per brãchias expirant. Quare accidit, vt ſimul expirent & reſpirent. dicunt enim tunc reſpirare ipſas. Cæterùm fieri non poteſt, vt quicquã ſimul exſpiret & reſpiret. Quare ſi neceſſe ſit, quæ reſpirant, expirare & inſpirare, fieri verò non poſſit vt vlla earum exſpiret: patet, neque fieri poſſe vt ex eis aliqua reſpirandi munere fungatur.

CAPVT III.

Neque piſces neque vlla alia animalia quæ pulmone careant, reſpirare.

PRæterea quod dicunt piſces trahere aërem ex ore ſuo, aut ex aqua per os, fieri nequit. non enim habent arteriam, quòd pulmone vaceant: ſed à ſitu oris continuo venter eſt. Quare neceſſarium eſſet, vt ventre piſces eundẽ traherent: hoc autẽ cętera quoq; animalia factitarent. nunc verò minimè factitant. Sed & illi cùm extra aquam ſunt, apertè hoc idẽ facerent. at hoc nullatenus facere videtur.

ἀλλὰ καὶ τούτων αὐτῶν ὅσα μὲν ἄναιμα ἔχει τὸν σομφὸν πνεύμονα, ἧττον δέονται τῆς ἀναπνοῆς. διὸ πολὺν χρόνον δύνανται διαμένειν, ὡς πρὸς τὴν τοῦ σώματος ἰσχύν. ὁ δὲ πνεύμων σομφὸς ἔχει πάντα τὰ ᾠοτοκοῦντα, οἷον τὸ τῶν βατράχων γένος. ἔτι δὲ αἱ* ἐμύδες τε καὶ χελῶναι πολὺν χρόνον μένουσιν ἐν τοῖς ὑγροῖς. ὁ γὰρ πνεύμων ἔχει ὀλίγην θερμότητα· ὀλίγαιμον γὰρ ἔχουσιν αὐτόν· ἐμφυσώμενος οὖν αὐτὸς τῇ κινήσει, καταψύχει, καὶ ποιεῖ διαμένειν πολὺν χρόνον. ἐὰν μέντοι βιάζηταί τις λίαν κατέχων πολὺν χρόνον, ἀποπνίγονται πάντα. οὐδὲν γὰρ τῶν τοιούτων δέχεται τὸ ὕδωρ, ὥσπερ οἱ ἰχθύες. τὰ δὲ ἔναιμον ἔχοντα τὸν πνεύμονα πάντα μᾶλλον δεῖται τῆς ἀναπνοῆς διὰ τὸ πλῆθος τῆς θερμότητος. τῶν δὲ ἄλλων οὐδὲν, μὴ ἔχον πνεύμονα, ἀναπνεῖ.

* χελῶναι, etiã alibi apud philoſophum. al. [illegible]

ΚΕΦΑΛ. β.

Δόξαι Δημοκρίτου, Διογένους καὶ Ἀναξαγόρου περὶ ἀναπνοῆς καὶ ἔλεγχος αὐτῶν.

ΔΗμόκριτος μὲν οὖν ὁ Ἀβδηρίτης, καί τινες ἄλλοι τῶν περὶ ἀναπνοῆς εἰρηκότων, οὐδὲν περὶ τῶν ἄλλων διωρίκασι ζῴων· ἐοίκασι μέντοι λέγειν, ὡς πάντων ἀναπνεόντων. Ἀναξαγόρας δὲ καὶ Διογένης, πάντα φάσκοντες ἀναπνεῖν, περὶ τῶν ἰχθύων καὶ τῶν ὀστρείων λέγουσι τίνα τρόπον ἀναπνέουσι. καί φησιν Ἀναξαγόρας μὲν, ὅταν ἀφῶσι τὸ ὕδωρ διὰ τῶν βραγχίων, τὸν ἐν τῷ στόματι γινόμενον ἀέρα ἕλκοντας ἀναπνεῖν τοὺς ἰχθῦς· οὐ γὰρ εἶναι κενὸν οὐδέν. Διογένης δὲ ὅταν ἀφῶσι τὸ ὕδωρ διὰ τῶν βραγχίων, ἐκ τοῦ περὶ τὸ στόμα περιεστῶτος ὕδατος ἕλκειν τῷ κενῷ τῷ ἐν τῷ στόματι τὸν ἀέρα, ὡς ἐνόντος ἐν τῷ ὕδατι ἀέρος. ταῦτα δὲ ἐστὶν ἀδύνατα. πρῶτον μὲν γὰρ τὸ ἥμισυ τοῦ πράγματος ἀφαιροῦσι, διὰ τὸ τὸ κοινὸν ἐπὶ θάτερον λέγεσθαι μόνον· ἀναπνοὴ γὰρ καλεῖται. ταύτης δὲ τὸ μέν ἐστιν ἐκπνοή, τὸ δ' εἰσπνοή· περὶ ἧς οὐδὲν λέγουσι, τίνα τρόπον ἐκπνέουσι τὰ τοιαῦτα τῶν ζῴων. οὐδ' ἐνδέχεται αὐτοῖς εἰπεῖν. ὅταν γὰρ ἀναπνεύσωσι, ταύτῃ πάλιν δεῖ ἐκπνεῖν, καὶ τοῦτο ποιεῖν ἀεὶ παραλλάξ. ὥστε συμβαίνει ἅμα τὸ ὕδωρ δέχεσθαι κατὰ τὸ στόμα, καὶ ἐκπνεῖν τὸν ἀέρα. ἀνάγκη δὲ ἀντιπίπτειν ἀλλήλοις ταῦτα. εἶτα ὅταν ἀφῶσι τὸ ὕδωρ, τότε ἐκπνέουσι κατὰ τὸ στόμα, ἢ κατὰ τὰ βράγχια. ὥστε συμβαίνει ἅμα καὶ ἐκπνεῖν καὶ ἀναπνεῖν· τότε γάρ φασιν αὐτὰ ἀναπνεῖν. ἅμα δὲ ἀναπνεῖν καὶ ἐκπνεῖν ἀδύνατον. ὥστ' εἰ ἀνάγκη τὰ ἀναπνέοντα ἐκπνεῖν καὶ εἰσπνεῖν, ἐκπνεῖν δὲ μὴ ἐνδέχεται μηδὲν αὐτῶν, φανερὸν ὡς οὐδ' ἀναπνεῖ τούτων οὐδέν.

ΚΕΦΑΛ. γ.

Ὅτι οὔτε ἰχθύες οὔτ' ἄλλα ὅσα ἄνευ πνεύμονος ζῷα ἀναπνεῖ.

ΕΤι δὲ τὸ φάναι τὸν ἀέρα ἕλκειν ἐκ τοῦ στόματος, ἢ ἐκ τοῦ ὕδατος διὰ τοῦ στόματος, ἀδύνατον. οὐ γὰρ ἔχουσιν ἀρτηρίαν, διὰ τὸ πνεύμονα μὴ ἔχειν, ἀλλ' εὐθὺς ἡ κοιλία πρόσκειται τῷ στόματι. ὥστ' ἀναγκαῖον τῇ κοιλίᾳ ἕλκειν. τοῦτο δὲ κἂν τἆλλα ἐποίει ζῷα· νῦν δ' οὐ ποιοῦσι. κἂν ἐκεῖνα δὲ ἔξω τοῦ ὑγροῦ ὄντα, ἐπιδήλως ἂν αὐτὸ ἐποίει. φαίνεται δὲ οὐ ποιοῦντ' αὐτό.

A ἔτι πάντων ἀναπνεόντων καὶ ἑλκόντων τὸ πνεῦμα, ὁρῶμεν γινομένην κίνησίν τινα τοῦ μορίου τοῦ ἕλκοντος· ἐπὶ δὲ τῶν ἰχθύων οὐ συμβαῖνον· οὐδὲν γὰρ φαίνονται κινοῦντες τῶν περὶ τὴν κοιλίαν, ἀλλ' ἢ τὰ βράγχια μόνον, καὶ ἐν τῷ ὑγρῷ, καὶ εἰς τὸ ξηρὸν ἐκπεσόντες, ὅταν ἀσπαρίζωσιν. ἔτι ὅταν ἀποθνήσκῃ πνιγόμενα ἐν τοῖς ὑγροῖς πάντα τὰ ἀναπνέοντα, γίνονται πομφόλυγες τοῦ πνεύματος ἐξιόντος βιαίως· οἷον ἐάν τις βιάζηται χελώνας, ἢ βατράχους, ἢ ἄλλο τι τῶν τοιούτων γενῶν. ἐπὶ δὲ τῶν ἰχθύων οὐ συμβαίνει πειρωμένοις πάντα τρόπον, ὡς οὐκ ἔχουσι πνεῦμα θύραθεν μηδέν. B ὃν δὲ τρόπον λέγουσι γίνεσθαι τὴν ἀναπνοὴν αὐτοῖς, ἐνδέχεται καὶ τοῖς ἀνθρώποις οὖσιν ἐν τῷ ὑγρῷ συμβαίνειν. εἰ γὰρ καὶ οἱ ἰχθύες ἕλκουσιν ἐκ τοῦ πέριξ ὕδατος ἐν τῷ στόματι, διὰ τί τοῦτο οὐκ ἂν* ποιοῖεν καὶ οἱ ἄνθρωποι καὶ τἆλλα ζῷα, καὶ ἐκ τοῦ στόματος δὴ* ἀέρα ἕλκοιεν ὁμοίως τοῖς ἰχθύσιν; ὥστ' εἴπερ κἀκεῖνα ἦν δυνατά, καὶ ταῦτ' ἂν ἦν· ἐπεὶ δ' οὐκ ἔστιν, δῆλον ὡς οὐδ' ἐπ' ἐκείνων ἐστί. πρὸς δὲ τούτοις, διὰ τίν' αἰτίαν ἐν τῷ ἀέρι ἀποθνήσκουσι, καὶ φαίνονται ἀσπαρίζοντα ὥσπερ τὰ πνιγόμενα, εἴπερ ἀναπνέουσιν; οὐ γὰρ δὴ τροφῆς γε ἐνδείᾳ τοῦτο πάσχουσιν. ἣν γὰρ λέγει Διογένης αἰτίαν, εὐήθης· φησὶ γὰρ ὅτι πολὺν ἀέρα ἕλκουσιν ἐν τῷ ἀέρι, ἐν δὲ C τῷ ὕδατι μέτριον, καὶ διὰ τοῦτο ἀποθνήσκουσιν. καὶ γὰρ ἐπὶ τῶν πεζῶν ἔδει δυνατὸν εἶναι τοῦτο συμβαίνειν· νῦν δ' οὐδὲν τῷ σφόδρα ἀναπνεῦσαι ἀποπνίγεται πεζὸν ζῷον. ἔτι δ', εἰ πάντα ἀναπνεῖ, δῆλον ὅτι καὶ τὰ ἔντομα τῶν ζῴων ἀναπνεῖ. φαίνεται δ' αὐτῶν πολλὰ διατεμνόμενα ζῆν, οὐ μόνον εἰς δύο μέρη, ἀλλὰ καὶ εἰς πλείω, οἷον αἱ καλούμεναι σκολόπενδραι, ἃ πῶς, ἢ τίνι ἐνδέχεται ἀναπνεῖν; αἴτιον δὲ μάλιστα τοῦ μὴ λέγεσθαι περὶ αὐτῶν καλῶς, τό τε τῶν μορίων ἀπείρους εἶναι τῶν ἐντός, καὶ τὸ μὴ λαμβάνειν ἕνεκά τινος τὴν φύσιν πάντα ποιεῖν. ζητοῦντες γὰρ τίνος ἕνεκα ἡ ἀναπνοὴ τοῖς ζῴοις ὑπάρχει, καὶ ἐπὶ τῶν μορίων τοῦτ' D ἐπισκοποῦντες, οἷον ἐπὶ βραγχίων καὶ πνευμόνων, εὗρον ἂν θᾶττον τὴν αἰτίαν.

* γ. ποιοῦσι
* γ. ἕλκουσι

ΚΕΦΑΛ. δ.

Κατὰ Δημοκρίτου λέγοντος τὴν ἀναπνοὴν κωλύειν ἐκθλίβεσθαι τὴν ψυχήν.

Δημόκριτος δ' ὅτι μὲν ἐκ τῆς ἀναπνοῆς συμβαίνει τι τοῖς ἀναπνέουσι λέγει, φάσκων κωλύειν ἐκθλίβεσθαι τὴν ψυχήν· οὐ μέντοι ὡς τούτου γ' ἕνεκα πεποιηκυῖαν τοῦτο τὴν φύσιν, οὐθὲν εἴρηκεν. ὅλως γὰρ ὥσπερ καὶ οἱ ἄλλοι φυσικοί, καὶ οὗτος οὐθὲν ἅπτεται τῆς τοιαύτης αἰτίας. λέγει δ' ὡς ἡ ψυχὴ καὶ τὸ θερμὸν ταὐτόν, τὰ πρῶτα σχήματα τῶν σφαιροειδῶν. E συγκρινομένων οὖν αὐτῶν ὑπὸ τοῦ περιέχοντος ἐκθλίβοντος, βοήθειαν γίνεσθαι τὴν ἀναπνοήν φησιν. ἐν γὰρ τῷ ἀέρι πολὺν ἀριθμὸν εἶναι τῶν τοιούτων, ἃ καλεῖ ἐκεῖνος νοῦν καὶ ψυχήν. ἀναπνέοντος οὖν καὶ εἰσιόντος τοῦ ἀέρος, συνεισιόντα ταῦτα, καὶ ἀνείργοντα τὴν θλῖψιν, κωλύειν τὴν ἐνοῦσαν ἐν τοῖς ζῴοις διιέναι ψυχήν. καὶ διὰ τοῦτο ἐν τῷ ἀναπνεῖν καὶ ἐκπνεῖν εἶναι τὸ ζῆν καὶ τὸ ἀποθνήσκειν. ὅταν γὰρ κρατῇ τὸ περιέχον συνθλῖβον, καὶ μηκέτι θύραθεν εἰσιὸν δύνηται ἀνείργειν, μὴ δυναμένου ἀναπνεῖν, τότε συμβαίνειν τὸν θάνατον τοῖς ζῴοις. εἶναι γὰρ τὸν θάνατον τὴν τῶν τοιούτων σχημάτων ἐκ τοῦ σώματος ἔξοδον ἐκ τῆς τοῦ περιέχοντος ἐκθλίψεως.

A Item cùm ſpirabilia omnia reſpirant, ſpiritúmque trahunt: motionem quandam particulæ trahentis ſuboriri cernimus: id quod in piſcibus nequaquam euenit. nullam enim ventris partem motitare videntur, ſed branchias ſolummodo, ſiue in humore degant, ſiue in aridam inciderint, quo tempore palpitant. Adde quòd cùm ea quæ ſpirant, in aqua ſuffocata moriuntur, bullæ fiunt, ſpiritu violenter exeunte, ceu ſi quis teſtudines, aut ranas, aut aliquod aliud ſimile genus vi ſub aquis detineat. At in piſcibus tale quid, etiam ſi nihil inexpertum relinquas, minimè contingit: vt intelligatur, nullum ſpiritum illos deforis habere. Porro illo eodem pa-B cto quo piſces reſpirare dicunt, ipſi quoque homines demerſi reſpirare poſſent. Nam ſi piſces aërem è circunfuſo humore in os attrahant, cur nō idem facerent & homines, & cætera animalia, & aërem qui ab ore proueniat, haud ſecus quàm piſces traherent? Quare ſi illa fieri poſſent, & hæc quoque. at quoniam hæc fieri non poſſunt, certum eſt neque illa fieri poſſe. Ad hæc ſi reſpirant, cur in aëre intereunt, & inſtar eorum quæ præfocantur, palpitare videntur? nō enim alimenti inopia hoc illis euenit. Quam verò cauſam Diogenes aſtruit, (dicit enim eos in aëre, aërem nimiū trahere: in aqua, modicum: obidque emori) ſtulta eſt. Etenim in pedeſtri genere hoc idem contingere poſſe oportebat. C nunc autem nullum pedeſtre animal ſuffocari videtur, eo quòd vehementer reſpiret. Præterea ſi omnia reſpirant, clarum eſt & inſecta quoque animalia reſpirare. at plurima ex eis diuiſa non modò in duas parteis, ſed etiam in plureis, viuere cernuntur, ceu ſcolopendræ, quas centipedas nuncupant: quæ, qualiter, aut quo fieri poteſt vt reſpirēt? at verò nec partium interiorum experientiam habuiſſe, nec accepiſſe cuncta naturam moliri alicuius gratia: cauſa potiſſimum fuit, quamobrem haud rectè de ipſis dixerint. inueſtigando enim cuius gratiâ reſpiratio animalibus adiuncta ſit, & in partibus hoc idem vt in branchiis & pulmone inſpiciendo, D ocyus vtique cauſam ipſam inueniſſent.

CAPVT IV.

Democriti ſententiam iterum examinat.

CÆterùm Democritus, quæ ſpirant, ex reſpiratione quippiam conſequi aſſeruit, inquiens eã prohibere ne animus extrudatur: non tamen quaſi natura id huiuſce gratia fecerit, quicquam dixit. in plenum enim, vt cæteri naturales, ita & hic quoque huiuſmodi cauſam minimè attigit. Sed primas illas rotūdas figuras, calorem & animam eſſe dicit. Quæ E vbi periclitari occipiunt, ne continente exprimente foras protrudantur, ſuccurſum auxiliúmque reſpiratione fieri. in aëre enim grandem numerum talium eſſe, quę ille mentem animámque appellat. ac reſpirante quidem animali, & aëre ingrediente, ea pariter ingredi: & compreſſioni reſiſtendo animam quæ in eo eſt, egredi prohibere. atque obid in reſpirando & expirando, vitam & mortem conſiſtere. nam cùm id quod nos ambit, comprimendo euincit ac ſuperat, nec ei præterea id quod deforis ingreditur, reſiſtere poteſt, cùm animal ſpirare nequeat: tum accidere, morte animal occupari. mortem enim eſſe, eiuſmodi figurarum è corpore digreſſū, qui exprimēte eo quod cōtinet, proueniat.

Cauſam

Cauſam verò quamobrem neceſſarium ſit cuncta emori, non tamen quouis tempore ſine lege vlla, ſed ſecundùm naturam, ſenectute; præter naturam, violentia, nequaquam declarauit. Atque explicuiſſe oportuit, cùm alias id fieri videatur, aliàs non videatur, verùm cauſa extrinſecus petenda ſit, an intrinſecus. Sed nec de ſpirationis primordio quænam cauſa ſit, interiórne an exterior, quicquam dixit. non enim mens ea quæ foris inſecus ſit, præſidium illud ſeruare poteſt: ſed ſpirationis motuſque initium intrinſecus ortum habet, quaſi id quod continet, vim nullam adſerat. Abſurdum quoque & illud eſt, ſimul quod ambit comprimere, & quod ingreditur, dilatare. Quæ igitur ille dixit, & quomodo, ferè hæc ſunt. At ſi vera eſſe quæ priùs dicta ſunt, & non omnia animalia ſpirare arbitrari oporteat: non de qualibet morte cauſam hanc dictam eſſe, ſed iis ſolùm quæ ſpirandi vſum habeant, accommodari debere, exiſtimandum eſt. Sed ne his quidem rectè. Id autem liquido conſtat, per ea quæ contingunt, & eiuſmodi quorum experientiam omnes habere videntur. Nam per æſtum calidiores effecti, vt reſpiratione magis indigent, ita crebriùs ſpirant. Contra cùm circunfuſus aër algidus eſt, & corpus contrahit atque condenſat, tunc accidit ſpiritum retineri. Atqui oportebat tunc aërem deforis ingreſſum, compreſſione prohibere. Nunc verò contra res agitur. Quoties enim non expirantibus hominibus caloris magna vis collecta fuerit, tunc reſpiratione indigent. neceſſarium autem eſt, vt inſpirando reſpirent. Porro æſtuantes ſæpius reſpirare ſolent, quaſi id agant refrigerij gratia quo tempore fit, vt (quod dici ſolet) ignis ad ignem addatur.

CAPVT V.

Aduerſus Platonis de reſpiratione ſententiam.

Illa verò circularis pulſio, quæ in Timæo ſcripta eſt, de cæteris animantibus nihil definiuit, quo pacto, eadémne an alia quadam ratione ipſa ſuum calorem tueantur atque conſeruent. Nam ſi ſolis pedeſtribus ſpiratio adiuncta ſit, cauſa dici debuit cur ſolis competat. ſi verò etiam aliis inſit, ſed modus differat: & de hoc quoque determinandum fuit, ſi cuncta ſpirare poſſint. Præterea modus cauſæ fictitius eſt. nam cùm calor foras per os egreditur, circumfuſum nobis aërem pelli aſſerit, & latione concepta eodem per carnes quæ raræ ſolutæque ſunt, interlabi, vnde calor interior exiuit, propterea quod nihil vacuum ſit, cùm ſibi mutuò circumobſiſtant. vbi verò calefactus ſit, rurſum egredi per eundem locum, & intrò per os repellere calidum illum aërem qui priùs foras exiuit, atque id reſpirando & expirando continuè ſemper fieri. Eueniunt autem hiſce qui ſic arbitrantur, expirationem priùs fieri quàm inſpirationem: argumento, quod hæ alternatim fiant. At morientes expirant. Quare neceſſarium eſt, inſpirationem vicem ſubire principij. Item cuius gratia iſthæc, reſpiratio inquam & expiratio, animalibus tributa à natura ſint, non dixêre qui in hunc modum loquuntur, ſed ſolùm quaſi de re aliqua temeraria, & quæ caſu conſiſtat, enunciauere. Atqui iſta principatum vitæ & necis obtinere videmus. tunc enim accidit, vt quæ reſpirandi vſum habent, intereant, cùm reſpirare non poſſint. Ad hæc abſurdum eſt, caloris quidem per os egreſſum,

τὴν δ' αἰτίαν διὰ τί ποτε πᾶσι μὲν ἀναγκαῖον ἀποθανεῖν, οὐ μέντοι ὅτε ἔτυχεν, ἀλλὰ κατὰ φύσιν μὲν γήρᾳ, βίᾳ δὲ παρὰ φύσιν, οὐδὲν δεδήλωκε· καίτοι ἐχρῆν, ἐπεὶ ὁτὲ μὲν φαίνεται τοῦτο γινόμενον, ὁτὲ δ' οὐ φαίνεται, πότερον τὸ αἴτιον ἔξωθεν ἐστὶν ἢ ἐντός. οὐ λέγει δὲ οὐδὲ περὶ τῆς ἀρχῆς τοῦ ἀναπνεῖν, τί τὸ αἴτιον, πότερον ἔσωθεν ἢ ἔξωθεν· οὐδὲ γὰρ ὁ θύραζεν νοῦς τηρεῖ τὴν βοήθειαν, ἀλλ' ἔσωθεν ἡ ἀρχὴ τῆς ἀναπνοῆς γίνεται καὶ τῆς κινήσεως, οὐχ ὡς βιαζομένου τοῦ περιέχοντος. ἄτοπον δὲ καὶ τὸ ἅμα τὸ περιέχον συνθλίβειν, καὶ εἰσιὸν διϊστάναι. ἃ μὲν οὖν εἴρηκε καὶ ὡς, σχεδὸν ταῦτά ἐστιν. Εἰ δὲ δεῖ νομίζειν ἀληθῆ εἶναι τὰ πρότερον λεχθέντα, καὶ μὴ πάντα τὰ ζῷα ἀναπνεῖν, οὐ περὶ παντὸς θανάτου τὴν αἰτίαν ὑποληπτέον εἰρῆσθαι ταύτην, ἀλλὰ μόνον ἐπὶ τῶν ἀναπνεόντων. οὐ μὴν οὐδ' ἐπὶ τούτων καλῶς. δῆλον δ' ἐκ τῶν συμβαινόντων, καὶ τῶν τοιούτων ὧν ἔχομεν πάντες πεῖραν. ἐν γὰρ ταῖς ἀλέαις θερμαινόμενοι μᾶλλον, καὶ τῆς ἀναπνοῆς μᾶλλον δεόμενοι, καὶ πυκνότερον ἀναπνέομεν πάντες. ὅταν δὲ τὸ περιέχον ᾖ ψυχρὸν, καὶ συνάγῃ καὶ συμπηγνύῃ τὸ σῶμα, κατίσχειν συμβαίνει τὸ πνεῦμα. καίτοι ἐχρῆν τὸν θύραθεν εἰσιόντα κωλύειν τὴν συνθλίψιν. νῦν δὲ γίνεται τοὐναντίον. ὅταν γὰρ πολὺ λίαν ἀθροισθῇ τὸ θερμὸν, καὶ μὴ ἐκπνέωσι, τότε δέονται τῆς ἀναπνοῆς· ἀναγκαῖον δ' εἰσπνεύσαντας ἀναπνεῖν· ἀναζέοντες δὲ πολλάκις ἀναπνέουσιν, ὡς ἀναψύξεως χάριν ἀναπνέοντες, ὅτε, τὸ λεγόμενον, ποιεῖ πῦρ ἐπὶ πῦρ.

ΚΕΦΑΛ. ε.

Ἔλεγχος τῶν ἐν τῷ Τιμαίῳ γεγραμμένων περὶ ἀναπνοῆς.

Ἡ δ' ἐν τῷ Τιμαίῳ γεγραμμένη περίωσις, περί τε τῶν ἄλλων ζῴων οὐδὲν διώρικε, τίνα τρόπον αὐτοῖς ἡ τοῦ θερμοῦ γίνεται σωτηρία, πότερον τὸν αὐτὸν, ἢ δι' ἄλλην τινὰ αἰτίαν. εἰ μὲν γὰρ μόνοις τὸ τῆς ἀναπνοῆς ὑπάρχει τοῖς πεζοῖς, λεκτέον τὴν αἰτίαν τί μόνοις. εἰ δὲ καὶ τοῖς ἄλλοις, ὁ δὲ τρόπος ἄλλος, καὶ περὶ τούτου διοριστέον, εἴπερ δυνατὸν ἀναπνεῖν πᾶσιν. ἔτι δὲ καὶ πλασματώδης ὁ τρόπος τῆς αἰτίας. ἐξιόντος γὰρ ἔξω τοῦ θερμοῦ διὰ τοῦ στόματος, τὸν περιέχοντα ὠθούμενον ἀέρα φερόμενον ἐμπίπτειν εἰς τὸν αὐτὸν τόπον φησὶ διὰ μανῶν οὐσῶν τῶν σαρκῶν, ὅθεν τὸ ἐντὸς ἐξῄει θερμόν, διὰ τὸ μηδὲν εἶναι κενὸν, ἀντιπεριισταμένων ἀλλήλοις· θερμανθέντα δὲ πάλιν ἐξιέναι κατὰ τὸν αὐτὸν τόπον, καὶ περιωθεῖν εἴσω διὰ τοῦ στόματος τὸν ἀέρα τὸν ἐκπεσόντα θερμόν· καὶ τοῦτο δὴ διατελεῖν ἀεὶ ποιοῦντας, ἀναπνέοντάς τε καὶ ἐκπνέοντας. συμβαίνει δὲ τοῖς οὕτως οἰομένοις πρότερον τὴν εἰσπνοὴν γίνεσθαι τῆς ἐκπνοῆς. σημεῖον δέ· ταῦτα μὲν γὰρ ἀλλήλοις ταῦτα παραλλάξ, τελευτῶντες δὲ ἐκπνέουσιν. ὥστ' ἀναγκαῖον εἶναι τὴν ἀρχὴν * εἰσπνοήν. ἔτι δὲ τούτου ἕνεκα ταῦθ' ὑπάρχει τοῖς ζῴοις, λέγω δὲ τό, τε ἀναπνεῖν καὶ τὸ ἐκπνεῖν, οὐδὲν εἰρήκασιν οἱ τοῦτον τὸν τρόπον λέγοντες, ἀλλ' ὡς περὶ συμπτώματός τινος ἀποφαίνονται λόγον· καίτοι κύριον ταῦθ' ὁρῶμεν τοῦ ζῆν καὶ τελευτᾶν. ὅταν μὲν γὰρ ἀναπνεῖν μὴ δύνωνται, τότε συμβαίνει γίνεσθαι τὴν φθορὰν τοῖς ἀναπνέουσιν. ἔτι δ' ἄτοπον τὸ τὴν μὲν τοῦ θερμοῦ διὰ τοῦ στόματος ἔξοδον

* Vulgò ἐκπνοὴν mendosè.

A καὶ πάλιν εἴσοδον μὴ λανθάνειν ἡμᾶς· τὴν δ' εἰς τὸν θώρακα τοῦ πνεύματος εἴσοδον, καὶ πάλιν θερμανθέντος ἔξοδον, λανθάνειν. ἄτοπον δὲ καὶ τὸ τοῦ θερμοῦ τὴν ἀναπνοὴν εἴσοδον εἶναι· φαίνεται γὰρ τοὐναντίον· τὸ μὲν γὰρ ἐκπνεόμενον ἐστι θερμόν, τὸ δ' εἰσπνεόμενον, ψυχρόν. ὅταν δὲ θερμὸν ᾖ, ἀσθμαίνοντες ἀναπνέουσι· διὰ γὰρ τὸ μὴ καταψύχειν ἱκανῶς τὸ εἰσιόν, πολλάκις συμβαίνει τὸ πνεῦμα σπᾶν.

ΚΕΦΑΛ. ϛ.

Ὅτι τροφῆς χάριν οὐκ ἔστιν ἡ ἀναπνοή.

B Ἀλλὰ μὴν οὐδὲ τροφῆς γε χάριν ὑποληπτέον γίνεσθαι τὴν ἀναπνοήν, ὡς τρεφομένου τῷ πνεύματι τοῦ ἐντὸς πυρός, καὶ ἀναπνεόντων μὲν ὥσπερ ἐπὶ πῦρ ὑπέκκαυμα ὑποβάλλεσθαι· τραφέντος δὲ τοῦ πυρὸς γίνεσθαι τὴν ἐκπνοήν. ταὐτὰ γὰρ ἐροῦμεν πάλιν καὶ πρὸς τοῦτον τὸν λόγον, ἅπερ καὶ πρὸς τοὺς ἔμπροσθεν. καὶ γὰρ ἐπὶ τῶν ἄλλων ζώων ἐχρῆν τοῦτο συμβαίνειν, ἢ τὸ ἀνάλογον τούτῳ· πάντα γὰρ ἔχει θερμότητα ζωτικήν. ἔπειτα καὶ τὸ γίνεσθαι τὸ θερμὸν ἐκ τοῦ πνεύματος, πῶς χρὴ τοῦτον λέγειν, πλασματῶδες· μᾶλλον γὰρ ἐκ τῆς τροφῆς τοῦτο γινόμενον ὁρῶμεν. συμβαίνει δὲ κατὰ τοῦτο δέχεσθαι τὴν τροφήν, καὶ τὸ περίττωμα ἀφιέναι· τοῦτο δ' ἐπὶ τῶν C ἄλλων οὐχ ὁρῶμεν γινόμενον.

ΚΕΦΑΛ. ζ.

Ἔλεγχος τῆς τοῦ Ἐμπεδοκλέους δόξης περὶ ἀναπνοῆς.

Λέγει δὲ περὶ ἀναπνοῆς καὶ Ἐμπεδοκλῆς· οὐ μὴν τίνος γε ἕνεκα, οὐδὲ περὶ πάντων τῶν ζώων οὐδὲν ποιεῖ δῆλον, εἴτε ἀναπνέουσιν, εἴτε μή. καὶ περὶ τῆς διὰ τῶν μυκτήρων ἀναπνοῆς λέγων, οἴεται καὶ περὶ τῆς κυρίας λέγειν ἀναπνοῆς. ἔστι γὰρ καὶ διὰ τῆς ἀρτηρίας ἐκ τοῦ στήθους ἀναπνοή, καὶ ἡ διὰ τῶν μυκτήρων. αὐτοῖς δὲ χωρὶς ἐκείνης οὐκ ἔστιν ἀναπνεῖν τοῖς μυκτῆρσι· καὶ τῆς μὲν D διὰ τῶν μυκτήρων γινομένης ἀναπνοῆς στερισκόμενα τὰ ζῷα, οὐδὲν πάσχουσι· τῆς δὲ κατὰ τὴν ἀρτηρίαν, ἀποθνήσκουσι. καταχρῆται γὰρ ἡ φύσις ἐν παρέργῳ τῇ διὰ τῶν μυκτήρων ἀναπνοῇ, πρὸς τὴν ὄσφρησιν ἐνίοις τῶν ζώων. διόπερ ὀσφρήσεως μὲν σχεδὸν μετέχει πάντα τὰ ζῷα. ἔστι δ' οὐ πᾶσι τὸ αὐτὸ αἰσθητήριον. εἴρηται δὲ περὶ αὐτῶν ἐν ἑτέροις σαφέστερον. γίνεσθαι δέ φησι τὴν ἀναπνοὴν καὶ ἐκπνοήν, διὰ τὸ φλέβας εἶναί τινας, ἐν αἷς ἔνεστι μὲν αἷμα, οὐ μέντοι πλήρεις εἰσὶν αἵματος. ἔχουσι δὲ πόρους εἰς τὸν ἔξω ἀέρα, τῶν μὲν * τοῦ σώματος μορίων ἐλάττους, τῶν δὲ τοῦ ἀέρος μείζους. διὸ τοῦ αἵματος κινεῖσθαι ἄνω καὶ κάτω πεφυκότος, κάτω μὲν φερομένου, εἰσρεῖν τὸν ἀέρα, καὶ γίνεσθαι ἀναπνοήν· ἄνω δ' ἰόντος, ἐκπίπτειν θύραζε, καὶ γίνεσθαι τὴν ἐκπνοήν, παρεικάζων τὸ συμβαῖνον ταῖς κλεψύδραις,

* Lego τῶ αἵματος. Nam hoc eſt quod ait Empedocles illis verbis, ὥστε φόνον μὲν κεύθειν, αἰθέρι δ', &c.

Ὧδε δ' ἀναπνεῖ πάντα καὶ ἐκπνεῖ· πᾶσι λίφαιμοι
Σαρκῶν σύριγγες πύματον κατὰ σῶμα τέτανται,
Καί σφιν ἐπὶ στομίοις πυκιναῖς τέτρηνται ἄλοξι
Ῥινῶν ἔσχατα * τέρθρα διαμπερές, ὥστε * φόνον μὲν
Κεύθειν, αἰθέρι δ' εὐπορίαν διόδοισι τετμῆσθαι.
Ἔνθεν ἔπειθ' ὁπότ' ἂν μὲν ἀπαΐξῃ τέρεν αἷμα,

* κ. πέλεα, mendoſè.
* κ. φόνον, malè omnino.

A & rurſum ingreſſum nos minimè latere: ſpiritus verò in pectus ingreſſum, & rurſus eiuſdem calefacti egreſſum latere. Abſurdum etiam & illud eſt, reſpirationem eſſe caloris ingreſſum. E cõuerſo enim rem habere videmus, nempe, quod expiratur eſſe calidum, quod inſpiratur, frigidum. Cùm verò hoc calidum eſt, anhelantes reſpiramus. nam quia id quod ingreditur, nos ſatis refrigerare non poteſt; euenit, vt ſæpius trahamus ſpiritum.

CAPVT VI.

Reſpirationem non eſſe nutricationis cauſa.

B At verò neque nutricationis gratiâ reſpirationem fieri exiſtimandum eſt, quaſi ignis interior alatur ſpiritu: & reſpirante quidem homine, ceu igni materiam incendio aptiſſimam adiici: alito verò igni, expirationem fieri. Eadem enim & ad hunc quoque ſermonem rurſum dicemus, quæ ad priores adducta ſunt. etenim in cæteris animantibus hoc idem euenire oportebat, aut quod ei proportione reſpondeat, cùm omnia calore vitali prædita ſint. Deinde & quo dicere modo oporteat, calorem e ſpiritu gigni, figmento perſimile eſt. potiùs enim hunc e cibo fieri videmus. iuxta quod euenit, vt animal cibum capiat, & excrementum C emittat. Hoc autem in aliis fieri haudquaquam cernimus.

CAPVT VII.

Empedoclis de reſpiratione ſententia.

Diſſerit autem de reſpiratione & Empedocles: ſed tamen cuius gratia animalibus data ſit, ſilentio præterit. neque de omnibus animantibus ſi reſpirent necne, quicquam certum reddidit. atque vbi de ea ſpiratione quæ per nares fit, locutus eſt, de principe quoque dixiſſe putauit. Fit autem ſpiratio, & per arteriam è pectore, & per nares. cæterum animalia ſpirare per nares abſque illa non D poſſunt. & cùm ea deſtituuntur quæ per nares fit, nullum damnum ſentiunt: cùm autem ea quæ per arteriam, commoriuntur. natura enim obiter abutitur ad olfactum in quibuſdam animalibus ſpiratione illa, quæ per nares fit. Quocirca olfactum quidem omnia ferè animalia participant, ſed ſenſorium non idem omnia obtinent. Verùm de his dictum planiùs alibi eſt. Porro reſpirationem & expirationem fieri aſſerit, propterea quòd venæ quædam habeantur, in quibus ineſt quidem ſanguis, non tamen plenæ ſunt eodem, ſed meatus extra prominentes obtinent, corporis quidem partibus anguſtiores, aeris verò ampliores. Ideóque cùm E ſanguis aptus ſua natura ſit ſurſum & deorſum moueri, quando deorſum fertur, aerem effluere & reſpirationem fieri: quando verò ſurſum commeat, aerem influere, & expirationem committi prædicat. quod ibi euenit, ei quod in vaſis accidit, quæ clepſydras vocamus, aſſimilans. inquit enim:

Hoc trahitur pacto cunctis, & redditur aer.
Nam partim exangues ad corporis vltima venæ
Tendunt, quarum extrema caua ſub nare fatiſcunt
Oſcillis, adeò vt cruor occultetur, & auræ
Inceſſum facilem valeant præſtare meatus.
Hinc vbi commotus repetit tener intima ſanguis,

Tunc aer feruendo ſubit permultus eôdem.
Aſt vbi ſe ille effert, tum rurſum redditur iſte:
Vt cùm clepſydra virguncula ludit ahena:
Quando tubum properat formoſa claudere dextra,
Et mox inſit aquæ mollis quæ corpore conſtat:
Nondum in vas penetrat demerſum lympha, ſed ipſam
Aeris ingreſſi per denſa foramina moles
Arcet, dum ſtrictam illa viam patefecerit, at mox
Aere decedente, ſubintrat limpidus humor.
Contrà cum fundum vaſis tenet humor aheni,
Et iam virgo manu tubuli percluſit hiatum:
Tunc imbrem retinet vergens introrſus aer,
Adſtrepere portæ iſthmus ſupremo tenendo,
Dum manus abſcedat. tum contra quàm priùs, intrò
Aere prerumpente, ſubiſſluit imber amœnus:
Sic tener ille liquor motu per membra cruoris,
Quando pedem referens ſubit intima, protinus alter
Aeris influxus demittitur agmine magno.
At cum ſeſe effert, tum rurſum expirat abundè.

Hæc ille de reſpiratione prodidit. At quæ per arteriam apertè reſpirant, per os ſimul & per nares reſpirare ſolent, vt diximus. Quare ſi de hac reſpiratione loquatur, ſcrutari neceſſe eſt, quo pacto illi dicta cauſa accommodari poſſit. nam è contrario agi videtur. Siquidem homines, locum, cui reſpirandi munus delegatum eſt, perinde vt folles in officinis ferrariis, attollendo, reſpirant. quanquam conſentaneum erat, vt calor attolleret, & ſanguis caloris locum occuparet. eundem verò, vt vbi folles deprimendo atque præfocando, expirant. Verum folles, non per eundem locum aërem excipiunt & regerunt, reſpirantes verò per eundem. Si verò de illa reſpiratione ſolùm quæ per nares fit, plurimùm aberrauit. non enim reſpiratio naribus peculiaris eſt: ſed per tractum illum conuallis, quæ columellæ adiacet, qua parte palatum definit, perforatis naribus ſpiritus pars altera excurrit, altera per os, egrediens pariter & ingrediens. Quæ igitur ab aliis de ſpiratione dicta ſunt, tot taleſque videntur habere difficultates.

CAPVT VIII

Caloris & refrigerationis in animali vis.

CVm verò antea dictum ſit, vitam & animam calore quodam contineri (non enim concoctio, per quam animantes capiunt alimentum, ſine anima & calore abſolui poteſt, quandoquidem omnes igni cibum conficiunt) iccirco in quo primo corporis loco, & in qua prima huius loci particula eiuſmodi principium eſſe neceſſarium ſit, ibidem & animam vegetalem quæ prima omnium eſt, haberi neceſſe eſt. Hic autem locus is eſt qui medius eſt inter eum qui cibum recipit, & eum quo excrementum emittitur. Ea igitur particula in exanguibus nomine vacat, in ſanguineis cor dici ſolet. Alimentum enim, ex quo iam partes animalium fiunt, natura ſanguinis eſt: ſanguinis autem & venarum generis idem eſſe principium, neceſſe eſt. nam alterum alterius gratia eſt, nempe quaſi vas & conceptaculum. Porro venarum principium in ſanguineis, cor eſt.

Αἰθὴρ παφλάζων καταΐσσεται οἴδματι μάργῳ. * γ. καταδύεται
Εὖτε δ' ἀναθρώσκει, πάλιν ἐκπνεῖ. ὥσπερ ὅταν παῖς
Κλεψύδραις παίζουσα διειπετέος χαλκοῖο·
Εὖτε μὲν αὐλοῦ πορθμὸν ἐπ' εὐειδεῖ χερὶ θεῖσα,
Εἰς ὕδατος βάπτῃσι τέρεν δέμας ἀργυφέοιο,
Οὐδεὶς ἐς ἄγγος δ' ὄμβρος ἐσέρχεται, ἀλλά μιν εἴργει
Ἀέρος ὄγκος ἔσωθε πεσὼν ἐπὶ τρήματα πυκνά,
Εἰσόκ' ἀποστεγάσῃ πυκινὸν ῥόον· αὐτὰρ ἔπειτα,
Πνεύματος ἐλλείποντος, ἐσέρχεται * αἴσιμον ὕδωρ. * γ. αὔξησει
Ὣς δ' αὔτως ὅθ' ὕδωρ μὲν ἔχῃ κατὰ βένθεα χαλκοῦ
Πορθμοῦ χωσθέντος βροτέῳ χροΐ, ἠδὲ πόροιο·
Αἰθὴρ δ' ἐκτὸς ἔσω λελιημένος ὄμβρον ἐρύκει
Ἀμφὶ πύλας ἰσθμοῖο δυσηχέος, ἄκρα κρατύνων,
Εἰσόκε χειρὶ μεθῇ· τότε δ' αὖ πάλιν ἔμπαλιν ἢ πρίν,
Πνεύματος ἐμπίπτοντος, ὑπεκθέει αἴσιμον ὕδωρ.
Ὣς δ' αὔτως τέρεν αἷμα κλαδασσόμενον * δι' ἠγυῶν. * γ. δι' ἀγυιῶν, Ineptè.
Ὁππότε μὲν παλίνορσον ἐπαΐξειε μυχόνδε,
Θάτερον εὐθὺς ῥεῦμα κατέρχεται οἴδματι θῦον.
Εὖτε δ' ἀναθρώσκει, πάλιν ἐκπνεῖ ἶσον ὀπίσσω.

λέγει μὲν οὖν ταῦτα περὶ τοῦ ἀναπνεῖν. ἀναπνεῖ δ', ὥσπερ εἴπομεν, τὰ φανερῶς ἀναπνέοντα, διὰ τῆς ἀρτηρίας, διά τε τοῦ στόματος ἅμα, καὶ τῶν μυκτήρων. ὥστ' εἰ μὲν περὶ ταύτης λέγει τῆς ἀναπνοῆς, ἀναγκαῖον ζητεῖν, πῶς ἐφαρμόσει ὁ εἰρημένος λόγος τῆς αἰτίας. φαίνεται γὰρ τοὐναντίον συμβαῖνον· αἴροντες μὲν γὰρ τὸν τόπον, καθάπερ τὰς φύσας ἐν τοῖς χαλκείοις, ἀναπνέουσιν. αἴρειν δὲ τὸ θερμὸν, εὔλογον ἐστί· τὸ δ' αἷμα τὴν τοῦ θερμοῦ χώραν· συνιζόντες δὲ καὶ καταπνίγοντες, ὥσπερ ἐκεῖ τὰς φύσας ἐκπνέουσι. πλὴν, ἐκεῖ μὲν οὐ κατὰ ταυτὸν εἰσδέχονταί τε τὸν ἀέρα, καὶ πάλιν ἀφιᾶσιν· οἱ δὲ ἀναπνέοντες, κατὰ ταυτόν. εἰ δὲ περὶ τῆς κατὰ τοὺς μυκτῆρας λέγει μόνης, πολὺ διημάρτηκεν· οὐ γάρ ἐστιν ἡ ἀναπνοὴ μυκτήρων ἴδιος, ἀλλὰ παρὰ τὸν αὐλαῖα τὸν περὶ τὸν γαργαρεῶνα, ᾗ τὸ ἔσχατον τοῦ ἐν τῷ στόματι οὐρανοῦ, συντετρημένων τῶν μυκτήρων χωρεῖ, καὶ τὸ μὲν ταύτῃ τοῦ πνεύματος, τὸ δὲ διὰ τοῦ στόματος, ἐξιόν τε ὁμοίως καὶ εἰσιόν. τὰ μὲν οὖν παρὰ τῶν ἄλλων εἰρημένα περὶ τοῦ ἀναπνεῖν, τοιαύτας τε καὶ τοσαύτας ἔχει δυσχερείας.

ΚΕΦΑΛ. θ'.

Ὅτι ἀναγκαῖον γίνεσθαι καὶ τὴν ψύξιν πρὸς τὴν τοῦ ζώου συντηρίαν.

ΕΠεὶ δ' εἴρηται πρότερον, ὅτι τὸ ζῆν, καὶ ἡ τῆς ψυχῆς ἕξις, μετὰ θερμότητός τινός ἐστιν· οὐδὲ γὰρ ἡ πέψις, δι' ἧς ἡ τροφὴ γίνεται τοῖς ζώοις, οὔτε ἄνευ ψυχῆς, οὔτε ἄνευ θερμότητός ἐστι· πυρὶ γὰρ ἐργάζεται πάντα. διόπερ ἐν ᾧ πρώτῳ τόπῳ τοῦ σώματος, καὶ ἐν ᾧ πρώτῳ τοῦ τόπου μορίῳ, τὴν ἀρχὴν ἀναγκαῖον εἶναι τὴν τοιαύτην, ἐνταῦθα καὶ τὴν πρώτην θρεπτικὴν ψυχὴν ἀναγκαῖον ὑπάρχειν. οὗτος δ' ἐστὶν ὁ μέσος τόπος τοῦ δεχομένου τὴν τροφὴν, καὶ καθ' ὃν ἀφίησι τὸ περίττωμα. τοῖς μὲν οὖν ἀναίμοις, ἀνώνυμον· τοῖς δὲ ἐναίμοις, ἡ καρδία τοῦτο τὸ μόριόν ἐστιν· ἡ τροφὴ μὲν γὰρ ἐξ ἧς ἤδη γίνεται τὰ μόρια τοῖς ζώοις, ἡ τοῦ αἵματος φύσις ἐστί. τοῦ δ' αἵματος καὶ τῶν φλεβῶν, τὴν αὐτὴν ἀρχὴν ἀναγκαῖον εἶναι. θατέρου γὰρ ἕνεκα θάτερόν ἐστιν, ὡς ἀγγεῖον, καὶ δεκτικόν· ἀρχὴ δὲ τῶν φλεβῶν τοῖς ἐναίμοις, ἡ καρδία.

οὐ γὰρ διὰ ταύτης, ἀλλ' ἐκ ταύτης ἠρτημέναι πᾶσαι τυγχάνουσι· δῆλον δ' ἡμῖν τοῦτ' ἐκ τῶν διαιρέσεων. τῶν μὲν οὖν ἄλλας δυνάμεις τῆς ψυχῆς, ἀδύνατον ὑπάρχειν ἄνευ τῆς θρεπτικῆς. (δι' ἣν δ' αἰτίαν, εἴρηται πρότερον ἐν τοῖς περὶ ψυχῆς.) ταύτην δ' ἄνευ τοῦ φυσικοῦ πυρός· ἐν τούτῳ γὰρ ἡ φύσις ἐμπεπύρευκεν αὐτήν. φθορὰ δὲ πυρός, ὥσπερ εἴρηται πρότερον, σβέσις καὶ μάρανσις. σβέσις μὲν ἡ ὑπὸ τῶν ἐναντίων· διόπερ ἀθρόον τε ὑπὸ τῆς τοῦ περιέχοντος ψυχρότητος, καὶ θᾶττον ὅτι σβέννυται διεσπασμένον. αὕτη μὲν οὖν ἡ φθορὰ βίαιος ὁμοίως ἐστὶ τῶν ἀψύχων καὶ τῶν ἐμψύχων ἐστί· καὶ γὰρ ὀργάνοις διαιρουμένου τοῦ ζῴου, καὶ πηγνυμένου διὰ ψύξεως ὑπερβολήν, ἀποθνήσκουσιν· ἡ δὲ μάρανσις, διὰ πλῆθος θερμότητος· καὶ γὰρ ἂν ὑπερβάλλῃ τὸ πέριξ θερμόν, καὶ τροφὴν ἂν μὴ λαμβάνῃ, φθείρεται τὸ πυρούμενον, οὐ ψυχόμενον, ἀλλὰ μαραινόμενον. ὥστε ἀνάγκη γίνεσθαι κατάψυξιν, εἰ μέλλει τεύξεσθαι σωτηρίας. τοῦτο γὰρ βοηθεῖ πρὸς ταύτην τὴν φθοράν.

ΚΕΦΑΛ. θ'.

Διὰ τί ἔνια τῶν ζῴων οὐκ ἀναπνεῖ.

Ἐπεὶ δὲ τῶν ζῴων τὰ μὲν ἔνυδρα, τὰ δ' ἐν γῇ ποιεῖται τὴν διατριβήν, τούτων τοῖς μὲν μικροῖς πάμπαν καὶ τοῖς ἀναίμοις, ἡ γινομένη ἐκ τοῦ περιέχοντος, ἢ ὕδατος, ἢ ἀέρος ψύξις ἱκανὴ πρὸς τὴν βοήθειαν τῆς φθορᾶς ταύτης· μικρὸν γὰρ ἔχοντα τὸ θερμόν, μικρᾶς δέονται τῆς βοηθείας. διὸ καὶ βραχύβια πάντα σχεδὸν ταῦτ' ἐστίν· ἐπ' ἀμφότερα γὰρ μικρᾶς οὔσης τυγχάνει ῥοπῆς. ὅσα δὲ μακροβιώτερα τῶν ἐντόμων (ἄναιμα γὰρ ἐστὶ πάντα τὰ ἔντομα) τούτοις ὑπὸ τὸ διάζωμα διέσχισται, ὅπως διὰ λεπτοτέρου ὄντος τοῦ ὑμένος ψύχηται· μᾶλλον γὰρ ὄντα θερμά, πλείονος δεῖται τῆς καταψύξεως, οἷον αἱ μέλιτται· τῶν γὰρ μελιττῶν ἔνιαι ζῶσι καὶ ἑπτὰ ἔτη, καὶ τἆλλα δὲ ὅσα βομβεῖ, οἷον σφῆκες, καὶ μηλολόνθαι, καὶ τέττιγες· καὶ γὰρ τὸν ψόφον ποιοῦσι πνεύματι, οἷον ἀσθμαίνοντα· ἐν αὐτῷ γὰρ τῷ ὑποζώματι, τῷ συμφύτῳ πνεύματι αἴροντι καὶ συνίζοντι, συμβαίνει πρὸς τὸν ὑμένα γίνεσθαι τρῖψιν· κινοῦσι γὰρ τὸν τόπον τοῦτον, ὥσπερ τὰ ἀναπνέοντα τὸν ἔξωθεν τῷ πνεύμονι, καὶ οἱ ἰχθύες τοῖς βραγχίοις. παραπλήσιον γὰρ συμβαίνει, κἂν εἴ τις πνίγοι τῶν ἀναπνεόντων τι, ἐπιλαβὼν τὸ στόμα· καὶ γὰρ ταῦτα ποιεῖ τῷ πνεύμονι τὴν ἄρσιν ταύτην. ἀλλὰ τούτοις μὲν οὐχ ἱκανὴ ἡ κίνησις αὕτη ποιεῖν κατάψυξιν, ἐκείνοις δ' ἱκανή. καὶ τῷ τρίβειν τῷ ὑμένι ποιοῦσι τὸν βόμβον, ὥσπερ λέγομεν, οἷον διὰ τῶν καλάμων τῶν τετρυπημένων τὰ παιδία, ὅταν ἐπιθῶσιν ὑμένα λεπτόν. διὰ γὰρ τοῦτο καὶ τῶν τεττίγων οἱ ᾄδοντες ᾄδουσι· θερμότεροι γάρ εἰσι, καὶ ἐσχισμένοις ὑπὸ τὸ ὑπόζωμα· τοῖς δὲ μὴ ᾄδουσι τοῦτ' ἔστιν ἄσχιστον. καὶ τῶν ἐναίμων δέ, καὶ πνεύμονα ἐχόντων, ὀλίγαιμον δ' ἐχόντων καὶ σομφόν, ἔνια διὰ τοῦτο πολὺν χρόνον δύναται ἄπνευστα ζῆν, ὅτι ὁ πνεύμων αἴρεσιν ἔχει πολλήν, ὀλίγον ἔχων τὸ αἷμα καὶ τὸ ὑγρόν· ἡ γὰρ οἰκεία κίνησις, ἐπὶ πολὺν χρόνον διαρκεῖ καταψύχουσα. τέλος δ' οὐ δύναται, ἀλλ' ἀποπνίγεται μὴ ἀναπνέοντα, καθάπερ εἴρηται καὶ πρότερον· τῆς γὰρ μαράνσεως ἡ διὰ τὸ μὴ ψύχεσθαι φθορά, καλεῖται πνῖξις·

A non enim per hoc tendunt, ſed ex hoc omnes dependent: quod nobis facilè conſtat ex diſſectionibus. Cæteræ igitur vires animæ, ſine vegetali eſſe nequeunt. (quam ob rem, dictum iam eſt in libro de Anima.) Vegetalis verò, ſine igni naturali: in hac enim parte natura eam igniuit. Corrumpitur autem ignis, vt antea dictum eſt, aut marcore, aut extinctu. Extinctu quidem, a contrariis. Quamobrem & vniuerſus, & ocyus adhuc diſtractus, ambiente frigore extingui conſueuit. Hæc igitur corruptio, violenta ex æquo in inanimis & animatis eſt. etenim animal, cùm gladiis ſecatur, & nimio frigore concreſcit, emoritur. marcore autē, copia caloris. Si enim circumfuſus aer immodice caleat, B & ignis non capiat alimentum: tum igni obuenit, vt non à frigore ſuperatus, ſed marcore debilitatus aboleatur. Quare neceſſarium eſt, vt refrigeratio adhibeatur, ſi ſeruari debeat. ea enim contra hanc corruptionem auxilio eſt.

CAPVT IX.

Cur quædam animalia non reſpirent.

Sed cùm animalium alia aquatilia ſint, alia in terra degant, inter hæc quæ parua admodum ſunt, quæque ſanguine carent, ea continente vel C aere vel aqua ſatis refrigerari poſſunt ad hanc corruptionem euitandam. nam cùm calorem habeant exiguum, modico egent auxilio. Quamobrem & his ferè omnibus vita breui temporis ſpatio præſcribitur. vtróque enim, quòd parua ſint, vergere ſolent. Quæcunque autem ex inſectorum genere viuaciora ſunt (inſecta enim omnia ſanguine carent) his corpus ſub ſepto tranſuerſo præcinctum diſtinguitur, vt per membranam ſubtiliuſculam refrigerentur. nam quæ calidiora ſunt, ampliori refrigeratione indigent, vt apes: quædam enim apes, ſeptenos annos viuunt. Et etiam cætera, quæcunque bombos elidunt: vt veſpæ, ſcarabei, & cicadæ. D nam murmur illud, ſpiritu, dum quaſi anhelant, ciere ſolent. eo enim ſpiritu, qui in ipſo ſepto tranſuerſo inſitus eſt, dum ſeſe attollit, ac per vices ſubſidet, attritum ad membranam fieri contingit. ſiquidem ea ad hūc locum mouent, ſicut quæ ſpiritum extrinſecus trahunt, pulmone thoracem, & piſces branchiis caput agitant. haud enim magnopere ſecius euenit, atque ſi quis aliquid ex iis quæ ſpirant, ſuffocare nitatur ore compreſſo obturatóque. etenim hæc pulmonis opera pectus attollent. Verùm eiuſmodi motu hæc ſatis refrigerari non poſſunt, illa poſſunt. Atque attritu ſpiritus ad membranam ſtrepitum edunt, ſicut diximus, haud diſſimilem E ei quem pueri per arundines perforatas ſuperpoſita tenui membrana emittunt. ob id enim & cicadæ illæ quæ canunt, canere ſolent. ſunt enim calidiores, & ſub præcinctu diuiduæ: quæ autem non canunt, indiuiduæ. Quinetiam è ſanguineis & pulmonem quidem habentibus, ſed parum ſanguinis nactum fungoſúmque, nonnulla irreſpiranter longo temporis ſpatio viuere poſſunt: quòd eorum pulmo multùm attollatur, cùm parum ſanguinis ac humoris contineat. quandoquidē propria pulmonis agitatio, ad longum tempus ſatis refrigerare poſſet. Tandem verò non poſſunt, ſed ſuffocantur non reſpirando, quemadmodum etiam antè diximus. Ea enim corruptio, quæ marcore ob refrigerationis penuriam fit, ſuffocatio vocari ſolet:

& quæ ita intereunt, ea ſuffocari dicimus. Porro inſecta non ſpirare, dictum quidem eſt etiam priùs: ſed hoc apertum vel in puſillis eſt, vt muſcis & apibus: quippe quæ diu in humore ſupernatant, niſi frigidus admodum aut calidus ſit. Atqui quæ vireis habent exiguas, crebriorem ſibi requirunt ſpirationem. Verùm ſimul ac venter aqua oppletur, & humor corrumpitur, quem ſeptum tranſuerſum continet, ea intereunt, & ſuffocari dicuntur. Vnde etiam fit vt ſi diutiùs cinere operiantur, poſtea reſurgant reuiuiſcántque. Quinetiam è genere aquatili, quæ ſanguine carent, ea diutiùs in aëre viuunt, quàm quæ ſanguine prædita mare recipiunt, vt piſces. nam quia parum caloris obtinent, aëre ſatis ad longum tempus refrigerantur, vt cruſtacea, & polypi. Non tamen ad poſtremum viuere ſufficiunt, propterea quòd exiguum calorem habeant. quandoquidem & piſcium plurimi in terra, ſed immobiles viuunt & defoſſi reperiuntur. quæ enim nullum protſus, aut certè exanguem habent pulmonem, ea refrigeratione minùs indigent.

CAPVT X.

Quæ ſint animalia quæ ſpirent, & cur nullum animal habeat pulmonem & branchias.

DE iis igitur quæ ſanguine carent, aliis continentem aërem, aliis humorem auxilio eſſe, vt vitam tueantur & conſeruent, dictum eſt. At ex iis quæ ſanguine prædita ſunt, & cor habent, quæ pulmonem ſortiuntur, omnia aërem recipiunt, & ſpiritum trahendo reddendóque refrigerantur. Pulmonem autem habent, & viuipera intra ſe, & non ſolùm foris (nam chartilaginea, viuipera quidem ſunt, ſed non intra ſe) & ouiperorum tam alata vt aues, quàm corticata vt teſtudines, lacerti, ſerpentes. Verùm illa pulmonem habent ſanguineum, horum verò plurima fungoſum. Quamobrem & ſpiratione rariùs vtuntur, quemadmodum dictum iam eſt. Vtuntur autem & omnia, quæcunque verſantur, victúmque ſumunt in aquis: vt hydrorum genus (quas quidam boas nuncupant) & mures aquatiles, & ranæ, & crocodili, & teſtudines tam marinæ quàm terreſtres: & vituli marini, quos Græci vocant phocas: nam hæc & cætera id genus omnia, & pariunt in terra, & dormiunt aut in terra, aut in humore, roſtro emerſo ſpirandi cauſa. Quæcunque verò branchias obtinent, omnia accipiendo aquam refrigerantur: branchias autem obtinent, quæ genere chartilagineo continentur, & cætera quæ pedibus carent: caret autem pedibus genus omne piſcium. nam quæ pedes habere videntur, eos pinnis ſimiles gerunt. At è pedatis quæ nouimus, vnum tantummodo branchiatum eſt, cordulus nomine. Cæterùm ſimul & pulmonem & branchias habere, nullum vnquam viſum eſt. Cauſa cur ita, quòd pulmo quidem refrigerationis eiuſce gratia fit, quæ ſpiritu fiat (videtur enim vocatus eſſe πνεύμων propter πνεύματος, id eſt, ſpiritus, receptionem) branchiæ verò ob eam refrigerationem, quæ ab humore proueniat. porro vnum inſtrumentum ad vnum vtile eſt, & omnibus vna refrigeratio ſufficit. Quare cùm natura nihil fruſtra agere cernatur, ſi verò eſſent duo, alterum fruſtra foret: ideo alia branchias habent, alia pulmonem, nullum vtrumque.

καὶ τὰ οὕτω φθειρόμενα, ἀποπνίγεσθαί φαμεν. ὅτι δ' οὐκ ἀναπνεῖ τὰ ἔντομα τῶν ζώων, εἴρηται μὲν καὶ πρότερον· φανερὸν δὲ καὶ ἐπὶ μικρῶν ἐστὶ ζώων, οἷον μυιῶν καὶ μελιττῶν· ἐν γὰρ τοῖς ὑγροῖς, πολὺν χρόνον ἀνανήχεται, ἂν μὴ λίαν ᾖ ψυχρὸν, ἢ θερμόν. καίτοι τὰ μικρὰν ἔχοντα δύναμιν, πυκνότερον ζητεῖ ἀναπνεῖν. ἀλλὰ φθείρεται ταῦτα καὶ λέγεται ἀποπνίγεσθαι πληρουμένης τῆς κοιλίας, καὶ φθειρομένου τοῦ ἐν τῷ ὑποζώματι ὑγροῦ. διὸ καὶ ἐν τῇ τέφρᾳ χρονισθέντα, ἀνίστανται. καὶ τῶν ἐν τῷ ὑγρῷ δὲ ζώντων ὅσα ἄναιμα, πλείω χρόνον ζῇ ἐν τῷ ἀέρι τῶν ἐναίμων καὶ δεχομένων τὴν θάλατταν, οἷον τῶν ἰχθύων. διὰ γὰρ τὸ ὀλίγον ἔχειν τὸ θερμὸν, ὁ ἀὴρ ἱκανός ἐστιν ἐπὶ πολὺν χρόνον καταψύχειν, οἷον τοῖς τε μαλακοστράκοις, καὶ τοῖς πολύποσιν. οὐ μὴν εἰς τέλος γε διαρκεῖ πρὸς τὸ ζῆν, διὰ τὸ ὀλιγόθερμα εἶναι. ἐπεὶ καὶ τῶν ἰχθύων οἱ πολλοὶ ζῶσιν ἐν τῇ γῇ, ἀκινητίζοντες μέντοι, καὶ εὑρίσκονται ὀρυττόμενοι. ὅσα γὰρ μὴ ὅλως ἔχει πνεύμονα, ἢ ἄναιμον, ἐλαττόνως δεῖται καταψύξεως.

ΚΕΦΑΛ. ι'.

Πόσα ἀναπνεῖ τῶν ζώων, καὶ διὰ τί πνεύμονα ὁμοῦ καὶ βράγχια ζῷον οὐδὲν ἔχει.

ΠΕρὶ μὲν οὖν τῶν ἀναίμων, ὅτι τοῖς μὲν ὁ περιέχων ἀὴρ, τοῖς δὲ τὸ ὑγρὸν βοηθεῖ πρὸς τὴν ζωὴν, εἴρηται. τοῖς δ' ἐναίμοις καὶ τοῖς ἔχουσι καρδίαν, ὅσα μὲν ἔχει αὐτῶν πνεύμονα, πάντα δέχεται τὸν ἀέρα, καὶ τὴν κατάψυξιν ποιεῖται διὰ τοῦ ἀναπνεῖν καὶ ἐκπνεῖν. ἔχει δὲ πνεύμονα, τά τε ζωοτοκοῦντα ἐν αὐτοῖς, καὶ μὴ θύραζε μόνον (τὰ γὰρ σελάχη, ζωοτοκεῖ μὲν, ἀλλ' οὐκ ἐν αὐτοῖς.) καὶ τῶν ᾠοτοκούντων, τά τε πτερυγωτὰ, οἷον ὄρνιθες· καὶ τὰ φολιδωτὰ, οἷον χελῶναι, καὶ σαῦραι, καὶ οἱ ὄφεις. ἐκεῖνα μὲν οὖν ἔναιμον· τούτων δὲ τὰ πλεῖστα, τὸν πνεύμονα ἔχει σομφόν. διὸ καὶ τῇ ἀναπνοῇ χρῆται μανοτέρως, ὥσπερ εἴρηται καὶ πρότερον. χρῆται δὲ πάντα καὶ ὅσα διατρίβει καὶ ποιεῖται τὸν βίον ἐν τοῖς ὕδασιν, οἷον τό τε τῶν ὕδρων γένος, καὶ βατράχων, καὶ κροκοδείλων, καὶ * αἱ μύδαι, καὶ αἱ χελῶναι αἱ θαλάττιαι, καὶ αἱ χερσαῖαι, καὶ αἱ φῶκαι. πάντα γὰρ ταῦτα καὶ τὰ τοιαῦτα, καὶ τίκτει ἐν τῷ ξηρῷ, καὶ καθεύδει, ἢ ἐν τῷ ξηρῷ, ἢ ἐν τῷ ὑγρῷ, ὑπερέχοντα τὸ στόμα διὰ τὴν ἀναπνοήν. ὅσα δὲ βράγχια ἔχει, πάντα καταψύχεται δεχόμενα τὸ ὕδωρ. ἔχει δὲ βράγχια τό τε τῶν καλουμένων σελαχῶν γένος, καὶ τῶν ἄλλων ἀπόδων. ἄποδες δὲ ἰχθύες πάντες· καὶ γὰρ ἃ ἔχουσι, καθ' ὁμοιότητα τῶν πτερυγίων ἔχουσι. τῶν δὲ πόδας ἐχόντων, ἓν ἔχει βράγχιον μόνον τῶν τεθεωρημένων, ὁ καλούμενος κορδύλος. ἅμα δὲ πνεύμονα καὶ βράγχια οὐδὲν ὦπταί πως ἔχον. αἴτιον δ', ὅτι ὁ μὲν πνεύμων, τῆς διὰ τοῦ πνεύματος καταψύξεως ἕνεκέν ἐστιν. ἔοικε δὲ καὶ τὸ ὄνομα εἰληφέναι ὁ πνεύμων διὰ τὴν τοῦ πνεύματος ὑποδοχήν· τὰ δὲ βράγχια, πρὸς τὴν ἀπὸ τοῦ ὕδατος κατάψυξιν. ἓν δὲ ἐφ' ἓν ὄργανον χρήσιμον, καὶ μία κατάψυξις, ἱκανὴ πᾶσιν. ὥστ' ἐπεὶ μάτην οὐδὲν ὁρῶμεν οὐδὲν ποιοῦσαν τὴν φύσιν, δυοῖν δὲ ὄντοιν, θάτερον ἂν ἦν μάτην. διὰ τοῦτο τὰ μὲν ἔχει βράγχια, τὰ δὲ πνεύμονα, ἀμφότερα δ' οὐδὲν,

* καὶ αἱ μύδαι. vide ſuprà cap. 1.

A

ΚΕΦΑΛ. ια'.

Περὶ τοῦ στόματος.

Ἐπεὶ δὲ πρὸς μὲν τὸ ζῆν, τροφῆς δεῖται πᾶν ζῷον ἔχειν, πρὸς δὲ τὴν σωτηρίαν, τῆς καταψύξεως, τῷ αὐτῷ ὀργάνῳ χρῆται πρὸς ἄμφω ταῦτα ἡ φύσις, καθάπερ ἐνίοις τῇ γλώττῃ πρός τε τοὺς χυμοὺς, καὶ πρὸς τὴν ἑρμηνείαν, οὕτω τοῖς ἔχουσι τὸν πνεύμονα τῷ καλουμένῳ στόματι πρός τε τὴν τῆς τροφῆς ἐργασίαν, καὶ τὴν ἐκπνοὴν, καὶ τὴν ἀναπνοήν. Τοῖς δὲ μὴ ἔχουσι πνεύμονα μηδὲ ἀναπνέουσι, τὸ μὲν στόμα πρὸς τὴν ἐργασίαν τῆς τροφῆς, πρὸς δὲ τὴν κατάψυξιν τοῖς δεομένοις καταψύξεως, ἡ τῶν βραγχίων ὑπάρχει φύσις. Τίνα μὲν οὖν τρόπον ἡ τῶν εἰρημένων ὀργάνων δύναμις ποιεῖ κατάψυξιν, ὕστερον ἐροῦμεν. πρὸς δὲ τὸ τὴν τροφὴν μὴ διακωλύειν, παραπλησίως τοῖς τε ἀναπνέουσι συμβαίνει, καὶ τοῖς δεχομένοις τὸ ὑγρόν. οὔτε γὰρ ἀναπνέοντες ἅμα καταδέχονται τὴν τροφήν. εἰ δὲ μὴ, συμβαίνει πνίγεσθαι παρεισιούσης τῆς τροφῆς, ἢ τῆς ὑγρᾶς ἢ τῆς ξηρᾶς ἐπὶ τὸν πνεύμονα διὰ τῆς ἀρτηρίας. πρότερον γὰρ κεῖται ἡ ἀρτηρία τοῦ οἰσοφάγου, δι' οὗ ἡ τροφὴ πορεύεται εἰς τὴν καλουμένην κοιλίαν. Τοῖς μὲν οὖν τετράποσι καὶ ἐναίμοις, ἔχει ἡ ἀρτηρία οἷον πῶμα τὴν ἐπιγλωττίδα. τοῖς δ' ὄρνισι καὶ τῶν τετραπόδων τοῖς ᾠοτόκοις οὐκ ἔνεστιν, ἀλλὰ τῇ συναγωγῇ τὸ αὐτὸ ποιοῦσι. δεχόμενα γὰρ τὴν τροφὴν, τὰ μὲν συνάγει, τὰ δὲ ἐπιτίθησι τὴν ἐπιγλωττίδα. παρελθούσης δὲ, ταῦτα μὲν ἐπαίρει, τὰ δὲ *διάγει, καὶ καταδέχεται τὸ πνεῦμα πρὸς τὴν κατάψυξιν. τὰ δ' ἔχοντα βράγχια, ἀφέντα διὰ τούτων τὸ ὑγρὸν, διὰ τοῦ στόματος καταδέχεται τὴν τροφήν. ἀρτηρίαν μὲν γὰρ οὐκ ἔχει, ὥστε ταύτῃ μὲν οὐδὲν ἂν βλάπτοιτο ὑπὸ τῆς τοῦ ὑγροῦ παρεμπτώσεως, ἀλλ' εἰς τὴν κοιλίαν εἰσιόντος. διὰ ταχείας ποιεῖται τὴν ἄφεσιν καὶ τὴν λῆψιν τῆς τροφῆς, καὶ τοὺς ὀδόντας ὀξεῖς ἔχει, καὶ καρχαρόδοντα σχεδὸν πάντ' ἐστίν. οὐ γὰρ ἐνδέχεται λεαίνειν τὴν τροφήν.

* Fort. διοίγει, vt alibi in eadē re. De partib. 3.3.

B

C

D

ΚΕΦΑΛ. ιβ'.

Ἀπορία περὶ τὰ κητώδη τῶν ἐνύδρων.

Περὶ δὲ τὰ κητώδη τῶν ἐνύδρων, ἀπορήσειεν ἄν τις. ἔχει δὲ κἀκεῖνα κατὰ λόγον. οἷον περί τε τοὺς δελφῖνας, καὶ τὰς φαλαίνας, καὶ τῶν ἄλλων ὅσα ἔχει τὸν καλούμενον αὐλόν. ταῦτα γὰρ ἄποδα μέν ἐστιν, ἔχοντα δὲ πνεύμονα, δέχεται τὴν θάλατταν. αἴτιον δὲ τούτου τὸ νῦν εἰρημένον. οὐ γὰρ καταψύξεως ἕνεκεν δέχεται τὸ ὑγρόν. τοῦτο μὲν γὰρ γίνεται αὐτοῖς ἀναπνέουσιν. ἔχουσι γὰρ πνεύμονα. διὸ καὶ καθεύδουσιν ὑπερέχοντα τὸ στόμα, καὶ ῥέγχουσιν οἵ γε δελφῖνες. ἔτι δὲ κἂν ληφθῶσι τοῖς δικτύοις, ταχὺ ἀποπνίγονται, διὰ τὸ μὴ ἀναπνεῖν. καὶ ἐπιπολάζοντα φαίνεται διὰ τὸ αὐτὰ ἐπὶ τῆς θαλάττης, διὰ τὴν ἀναπνοήν. ἀλλ' ἐπεὶ ἀναγκαῖον ποιεῖσθαι τὴν τροφὴν ἐν τῷ ὑγρῷ, ἀναγκαῖον δεχόμενα τὸ ὑγρὸν ἀφιέναι. καὶ διὰ τοῦτ' ἔχει πάντα τὸν αὐλόν. δεξάμενα γὰρ τὸ ὕδωρ, ὥσπερ ἰχθύες κατὰ τὰ βράγχια, ταῦτα κατὰ τὸν αὐλὸν, ἀναφυσᾷ τὸ ὕδωρ. σημεῖον δὲ καὶ ἡ θέσις τοῦ αὐλοῦ. πρὸς οὐδὲν γὰρ περαίνει τῶν ἐναίμων,

E

CAPVT XI.

De ore.

CVm autem quodque animal vt ſit, cibo indigeat: vt conſeruetur, refrigeratione; ad hoc vtrunque natura eodem vtitur inſtrumento. Etenim vt in quibuſdam lingua & ad percipiendos ſapores, & ad formandum ſermonem vti ſolet: ſic in iis quæ habent pulmonem, ore tam ad cibum conficiendum, quàm ad trahendum reddendúmque ſpiritum. In iis vero quæ neque pulmonem, neque ſpirandi vſum habent, os quidem cibi conficiendi cauſa habetur, branchiæ vero ad refrigerationem, quibus ea ipſa opus eſt. Sed quo pacto vis eorum quæ modo dixi inſtrumentorum refrigeratione faciat, dicemus poſt. Plane ne quod obſtaculum cibo ingerendo ingruat, ſimiliter & ſpirantibus & ſuſcipientibus humorem accidit. non enim reſpirando ſimul cibum admittunt. alioqui cibo vel ſicco vel humido per arteriam in pulmonem dilabente, ſtrangulari animal accidit. nam arteria ante gulam poſita eſt, per quam cibus meat in ventriculum. Igitur quæ quadrupedes ſunt, & ſanguine redundant, iis minor lingua ſiue ligula eſt, qua ceu operculo arteria clauditur. At ouiparis, quadrupedibus atque auibus, eadem illa adiuncta non eſt: verùm idem contractione efficitur. nam cùm cibus ingeritur, hæc arteriam contrahunt, illa ligulam gutturi ſuperponunt: cùm vero prætergit, hæc ligulam attollunt, illa guttur diducunt, atque refrigerationis gratia ſpiritum recipiunt. At quæ branchiis prædita ſunt, cibum per os recipere ſolent, humore tantùm per branchias emiſſo. nullam enim habent arteriam. Quare catenus quidem nullum ſentiunt incommodum, ab humoris interlapſu: ſed quatenus aqua in ventrem ingreditur. Quocirca raptim, ſummáque celeritate cibum ingerunt atque tranſmittunt. Quinetiam ea penè omnia, acutis ſerratiſque dentibus ſunt. non enim in molendo cibo commorari poſſunt.

CAPVT XII.

Humor quatenus refrigerationis cauſa à quibuſdam recipiatur.

CÆterùm ambigat quiſpiam de aquatilibus, quæ cetacei ſunt generis (nam & ea ſeſe iuxta proportionem habent) verbi cauſa de delphinis, balenis, & reliquis quæ fiſtulam gerunt. hæc enim tametſi pedibus careant, tamen pulmonem habent, & mare excipiunt. Cuius rei cauſa in eo eſt, quod modo dixi. non enim refrigerationis cauſa humorem admittunt, cùm ſpirando refrigerari ſoleant, vt quæ pulmone prædita ſint. Quamobrem & talia exerto ore dormiunt, ſtertúntque ipſi quidem delphini: qui etiam retibus apprehenſi, breui tempore ſtrangulantur, quod ſpirandi facultatem amiſerint. & per ſumma pelagi fluitare viſuntur, vt ſpirent. Sed enim cùm neceſſarium ſit vt in humore cibum capiant, humorem quem ore accipiunt, emittant neceſſe eſt. Ob idque fiſtula data omnibus eſt. admiſſum enim humorem vt piſces per branchias, ſic cete per fiſtulam reſpuere ſolent. Huius rei argumento vel fiſtulæ ſitus eſt: quæ in nulla parte ſanguinatia deſinit,

ſed ante cerebrum ſita eſt, & aquam emittit. Nec alia de cauſa tam mollia, quàm cruſtata, vt locuſtæ & cancri, aquam excipiunt. nullum enim eorum refrigeratione eget, quod parum caloris habeat, & exangue ſit, vſque adeò vt a continente humore ſatis refrigeretur. Sed ratione cibi: qui quoties ore capitur, fieri non poteſt quin ſimul aliquid humoris admittatur. Igitur quæ cruſta integuntur, videlicet tam cancri quàm locuſtæ, per applicamina iuxta hirtiuſcula aquam egerunt. Sepiæ verò & polypi, per cauum illud quod ſupra alueum, quem caput appellant, poſitum eſt. Sed de his exactiùs in Commentatione, hoc eſt, Hiſtoria animalium, ſcripſimus. Humorem igitur excipi ſolere refrigerationis cauſa, & quia animantia aquatilia pro ſorte naturæ exiſtentia, cibum ex humore capiant, dictum eſt.

CAPVT XIII.

De refrigerationis modo in animalibus.

DE refrigeratione verò, quonam pacto fiat tam iis quæ ſpirant, quàm iis quæ branchias obtinent, poſt hæc dicendum. Igitur animalia quæ pulmonem habeant, ſpirare omnia, ſuprà diximus. Quamobrem autem nonnulla particulam hanc obtineant, & quamobrem quæ obtinent, ſpiratione indigeant, agendum eſt. Cauſa cur obtineant, ea eſt: quòd quæ inter animalia honoratiora ſunt, plus caloris ſortita ſint. nam ſimul & animam ſortita eſſe honoratiorem, neceſſe eſt. honoratiora enim ſunt hæc plantis. Quocirca & quod pulmonem maiore copia refertum ſanguinis & caloris habet, ei magnitudo corporis maior eſt: & quod plurimi & puriſſimi ſanguinis compos eſt, vt homo, id ex omnibus animalibus erectiſſimum incedit, atque partem ſuperiorem ad vniuerſi ſupremum erectam obtinet, propterea quòd hanc particulam talem habeat. Quare & ea particula, perinde vt quælibet alia, cauſa eſſentiæ huius & reliquorum ſtatui debet. Ob id igitur pulmo haberi ſolet. Cur autem neceſſario moueatur, hanc eſſe cauſam arbitrandum eſt: quòd talia animalia ſic conſtant, vt multa non ita conſtent. nam alia ex terra ampliore facta ſunt, vt genus plantarum: alia ex aqua, vt aquatilium: volatilium verò & pedeſtrium, altera ex aëre, altera ex igni. Porro ſingula ea ſuis in locis diſpoſita ſunt.

CAPVT XIV.

Rationem Empedoclis, cur animalium alia ſint terreſtria, alia aquatilia, exagitat.

AT verò Empedocles improbè hoc dixit, aſſerens animalium calidiſſima præcipuè, & copioſiſſimum nacta feruorem, aquatilia eſſe, natiui caloris exceſſum fugientia: vt cùm frigoris & humoris defectum ſuſtineant, contrario in loco ſeruentur, quòd aqua minùs quàm aër calida ſit. Nam omnino abſurdum eſt: quî fieri poſſit, vt ſingula ea in arido genita, ſeſe mutatis ſedibus in humorem conferant, cùm eorum pars penè maxima expes ſit? At ille primam eorum conſtitutionem referens, orta quidem in ſic-

A ἀλλὰ περὶ τὸν ἐγκέφαλον τὴν θέσιν ἔχει, καὶ ἀφίησι τὸ ὕδωρ. διὰ ταὐτὸ δὲ τοῦτο, δέχεται καὶ τὰ μαλάκια τὸ ὕδωρ, καὶ τὰ μαλακόστρακα· λέγω δὲ, οἷον τὰς καράβους καὶ τοὺς καρκίνους. καταψύξεως μὲν γὰρ αὐτῶν οὐδὲν τυγχάνει δεόμενον· ὀλιγόθερμον γάρ ἐστι καὶ ἄναιμον ἕκαστον αὐτῶν. ὥστε ἱκανῶς καταψύχεται ὑπὸ τοῦ περιέχοντος ὑγροῦ· ἀλλὰ διὰ τὴν τροφὴν, ὅπως μὴ ἅμα δεχομένοις, εἰσρέῃ τὸ ὑγρόν. τὰ μὲν οὖν μαλακόστρακα, οἷον οἵ τε καρκίνοι καὶ οἱ κάραβοι, παρὰ τὰ δασέα ἀφιᾶσι τὸ ὕδωρ διὰ τῶν ἐπιπτυγμάτων. σηπίαι δὲ καὶ πολύποδες, διὰ τοῦ κοίλου τοῦ ὑπὲρ τῆς καλουμένης κεφαλῆς. γέγραπται δὲ περὶ αὐτῶν δι' ἀκριβείας μᾶλλον ἐν ταῖς περὶ ζῴων ἱστορίαις. B περὶ μὲν οὖν τοῦ δέχεσθαι τὸ ὑγρὸν, εἴρηται ὅτι συμβαίνει διὰ κατάψυξιν, καὶ διὰ τὸ δεῖν δέχεσθαι τὴν τροφὴν ἐκ τοῦ ὑγροῦ, τὰ κατὰ τὴν φύσιν ὄντα τῶν ζῴων ἔνυδρα.

ΚΕΦΑΛ. ιϐ΄.

Διὰ τί πνεύμονα ἔχουσιν ἔνια· καὶ ὅτι τὰ ἔχοντα, τῆς ἀναπνοῆς δεῖται, διὰ θερμότητα.

ΠΕρὶ δὲ τῆς καταψύξεως, τίνα τρόπον γίγνεται τοῖς τ' ἀναπνέουσι καὶ τοῖς ἔχουσι βράγχια, μετὰ ταῦτα λεκτέον. ὅτι μὲν οὖν ἀναπνέουσιν ὅσα πνεύμονα τῶν ζῴων ἔχει, πρότερον εἴρηται. C διὰ τί δὲ τοῦτο τὸ μόριον ἔχει ἔνια, καὶ διὰ τί τὰ ἔχοντα δεῖται τῆς ἀναπνοῆς, αἴτιον τοῦ μὲν ἔχειν, ὅτι τὰ τιμιώτερα τῶν ζῴων πλείονος τετύχηκε τῆς θερμότητος· ἅμα γὰρ ἀνάγκη καὶ ψυχῆς τετυχηκέναι τιμιωτέρας· τιμιώτερα γὰρ τὰ τοιαῦτα τῆς φύσεως τῶν φυτῶν. διὸ καὶ τὰ μάλιστα ἔναιμον ἔχοντα τὸν πνεύμονα καὶ θερμὸν, μείζονά τε τοῖς μεγέθεσι, καὶ τό γε καθαρωτάτῳ καὶ πλείστῳ κεχρημένον αἵματι τῶν ζῴων, ὀρθότατόν ἐστιν ὁ ἄνθρωπος. καὶ τὸ ἄνω πρὸς τὸ τοῦ ὅλου ἄνω ἔχει μόνον, διὰ τὸ τοιοῦτον ἔχειν τοῦτο τὸ μόριον. ὥστε καὶ τῆς οὐσίας τοῦτο καὶ τοῖς ἄλλοις θετέον αἴτιον αὐτὸ, καθάπερ D ὁτιοῦν ἄλλο τῶν μορίων. ἔχει μὲν οὖν ἕνεκα τούτου. * τὴν δ' ἐξ ἀνάγκης καὶ τῆς κινήσεως αἰτίαν καὶ τὰ τοιαῦτα νομίζειν συνεστάναι τὰ ζῷα, καθάπερ καὶ μὴ τοιαῦτα πολλὰ συνέστηκε. τὰ μὲν γὰρ ἐκ τῆς πλείονος γέγονεν, οἷον τὸ τῶν φυτῶν γένος· τὰ δ' ἐξ ὕδατος, οἷον τὸ τῶν ἐνύδρων. τῶν δὲ πτηνῶν καὶ πεζῶν, τὰ μὲν ἐξ ἀέρος, τὰ δ' ἐκ πυρός. ἕκαστα δ' ἐν τοῖς οἰκείοις τόποις ἔχει τὴν τάξιν αὐτῶν.

* Locus ſuſpectus.

ΚΕΦΑΛ. ιδ΄.

E *Ὅτι οὐ διὰ θερμότητα τῆς φύσεως τὰ μὲν ἔνυδρά ἐστι τῶν ζῴων, τὰ δὲ πεζά.*

ΕΜπεδοκλῆς δὲ οὐ καλῶς τοῦτ' εἴρηκε, φάσκων τὰ * θερμότατα καὶ πῦρ ἔχοντα μάλιστα πλεῖστον τῶν ζῴων ἔνυδρα εἶναι, φεύγοντα τὴν ὑπερβολὴν τῆς ἐν τῇ φύσει θερμότητος, ὅπως ἐπειδὴ τοῦ ψυχροῦ καὶ ὑγροῦ ἐλλείπει, κατὰ τὸν τόπον * ἀνισάζῃ ἐναντία ὄντα· θερμὸν γὰρ εἶναι τὸ ὑγρὸν ἧττον τοῦ ἀέρος. ὅλως μὲν οὖν, ἄτοπον πῶς ἐνδέχεται γενόμενον ἕκαστον αὐτῶν ἐν τῷ ξηρῷ, μεταβάλλειν τὸν τόπον εἰς τὸ ὑγρόν· σχεδὸν γὰρ ἄποδα τὰ πλεῖστα αὐτῶν ἐστιν. ἐκεῖνος δὲ τὴν ἐξ ἀρχῆς αὐτῶν σύστασιν λέγων, γενέσθαι μὲν ἐν τῷ

* γρ. θερμότατα

* γρ. ἀνισάζονται

ξηρὰ φησί, φεύγοντα δ' ἐλθεῖν εἰς τὸ ὑγρόν. ἔτι δέ, οὔτε φαίνεται θερμότερα ὄντα τῶν πεζῶν· τὰ μὲν γὰρ ἄναιμα πάμπαν, τὰ δὲ ὀλίγαιμα αὐτῶν ἐστι. ἀλλὰ ποῖα μὲν λέγειν δεῖ θερμὰ καὶ ψυχρὰ καθ' αὑτά, τὴν ἐπίσκεψιν *εἴληφε· περὶ δὲ ἧς αἰτίας εἴρηκεν Ἐμπεδοκλῆς, τῇ μὲν ἔχει τι ζητούμενος λόγον· οὐ μὴν ὅ γε φησὶν ἐκεῖνος, ἀληθές. τὰς μὲν γὰρ ἕξεις τὰς ὑπερβολὰς *ἔχοντας οἱ ἐναντίοι τόποι καὶ ὧραι σώζουσιν· ἡ δὲ φύσις ἐν τοῖς οἰκείοις μάλιστα σώζεται τόποις· οὐ γὰρ ταὐτὸν ἡ ὕλη τῶν ζώων ἐξ ἧς ἐστιν ἕκαστον, καὶ αἱ ἕξεις καὶ διαθέσεις αὐτῆς· λέγω δ' οἷον εἴ τι ἐκ κηροῦ συστήσει φύσις, οὐκ ἂν ἐν θερμῷ θεῖσα διέσωσεν, οὐδ' εἴ τι ἐκ κρυστάλλου· ἐφθάρη γὰρ ἂν ταχὺ διὰ τὸ ἐναντίον· τήκει γὰρ τὸ θερμὸν τὸ ὑπὸ τοῦ ἐναντίου συστάν. οὐδ' εἴ τι ἐξ ἁλὸς ἢ νίτρου συνέστησεν, οὐκ ἂν εἰς ὑγρὸν φέρουσα κατέθηκε· φθείρει γὰρ τὰ ὑπὸ θερμοῦ καὶ ξηροῦ συστάντα τὸ ὑγρόν. Εἰ οὖν ὕλη πᾶσι τοῖς σώμασι τὸ ὑγρὸν καὶ τὸ ξηρόν, εὐλόγως τὰ μὲν ἐξ ὑγροῦ καὶ ψυχροῦ συστάντα, ἐν ὑγροῖς ἐστι· καὶ εἰ ψυχρά, ἔσται ἐν ψυχρῷ· τὰ δ' ἐκ ξηροῦ, ἐν ξηρῷ. διὰ τοῦτο τὰ δένδρα οὐκ ἐν ὕδατι φύεται, ἀλλ' ἐν γῇ. καί τοι, τοῦ αὐτοῦ λόγου ἐστὶν εἰς τὸ ὕδωρ, διὰ τὸ εἶναι αὐτὰ ὑπέρξηρα, ὥσπερ τὰ ὑπέρπυρά φησιν ἐκεῖνος· οὐ γὰρ διὰ τὸ ψυχρὸν ἦλθεν ἂν εἰς αὐτό, ἀλλ' ὅτι ὑγρόν. αἱ μὲν οὖν φύσεις τῆς ὕλης, ἐν οἵῳπερ τόπῳ εἰσί, τοιαῦται οὖσαι τυγχάνουσιν, αἱ μὲν ἐν ὕδατι ὑγραί, αἱ δ' ἐν τῇ γῇ ξηραί, αἱ δ' ἐν τῷ ἀέρι θερμαί. αἱ μέντοι ἕξεις, αἱ μὲν ὑπερβάλλουσαι θερμότητι, ἐν ψυχρῷ· αἱ δὲ τῇ ψυχρότητι, ἐν θερμῷ τιθέμεναι σώζονται μᾶλλον· ἐπανισοῖ γὰρ εἰς τὸ μέτριον ὁ τόπος τὴν τῆς ἕξεως ὑπερβολήν. τοῦτο μὲν οὖν δεῖ ζητεῖν ἐν τοῖς οἰκείοις τόποις ἑκάστης ὕλης, [καὶ] κατὰ τὰς μεταβολὰς τῆς κοινῆς ὥρας· τὰς μὲν γὰρ ἕξεις ἐνδέχεται τοῖς τόποις ἐναντίας εἶναι, τὴν δ' ὕλην ἀδύνατον. ὅτι μὲν οὖν οὐ διὰ θερμότητα τῆς φύσεως, τὰ μὲν ἔνυδρα, τὰ δὲ πεζὰ τῶν ζώων ἐστί, καθά φησιν Ἐμπεδοκλῆς, τοσαῦτα εἰρήσθω, καὶ διότι τὰ μὲν ἔχει πνεύμονα, τὰ δὲ οὐκ ἔχει.

* Fort. εἴληχε.

* Videtur vox ἐχ. otioſa, niſi legas. [illegible] aut alio modo emendes.

ΚΕΦΑΛ. ιε'.

Διὰ τί τὰ ἔχοντα πνεύμονα, ἀναπνεῖ, καὶ μάλιστα αὐτῶν τὰ ἔναιμον ἔχοντα.

Διὰ τί δὲ τὰ ἔχοντα δέχεται τὸν ἀέρα, καὶ ἀναπνέουσι, καὶ μάλιστ' αὐτῶν ὅσα ἔχει ἔναιμον, αἴτιον τοῦ μὲν ἀναπνεῖν ὁ πνεύμων σομφὸς ὢν καὶ συρίγγων πλήρης· καὶ *ἀναιμότατον δὴ μάλιστα τοῦτο τὸ μόριον τῶν καλουμένων σπλάγχνων. ὅσα δὴ ἔχει ἔναιμον αὐτό, ταχείας μὲν δεῖται τῆς καταψύξεως, διὰ τὸ μικρὰν εἶναι τὴν ῥοπὴν τοῦ ψυχικοῦ πυρός· εἴσω δ' εἰσιέναι διὰ παντός, διὰ τὸ πλῆθος τοῦ αἵματος καὶ τῆς θερμότητος. ταῦτα δ' ἀμφότερα, ὁ μὲν ἀὴρ δύναται ῥᾳδίως ποιεῖν. διὰ γὰρ τὸ λεπτὴν ἔχειν τὴν φύσιν, διὰ παντός τε καὶ ταχέως διαδυόμενος διαψύχει· τὸ δὲ ὕδωρ τοὐναντίον. καὶ διότι δὴ μάλιστα *ἀναπνεῖ τὰ ἔχοντα τὸν πνεύμονα ἔναιμον, ἐκ τούτου δῆλον· τό, τε γὰρ θερμότερον πλείονος δεῖται τῆς καταψύξεως. ἅμα δὲ καὶ πρὸς τὴν ἀρχὴν τῆς θερμότητος τῆς ἐν τῇ καρδίᾳ, πορεύεται τὸ πνεῦμα ῥᾳδίως.

* ἴσ. ἐναιμότατον

* ἴσ. ἀναπνέουσι

A eo eſſe dicit, ſed fugiendo in humorem veniſſe. Præterea non videntur eſſe calidiora pedeſtribus. nam ex eis quædam nullum prorſus, quædam paucum ſanguinem habent. Attamen qualia dici debeant calida & frigida per ſe, conſiderationem ſumpſerat. Cæterùm cauſa ea quam idem reddidit, aliquo modo quæſitam continet rationem, non tamen id quod ille dicit, verum eſt. Nam contraria loca & tempora, quæ habituum exuperantias exceperint, ſeruandi facultatem obtinent. natura verò, ſuis in locis potiſſimùm ſeruatur. non enim idem ſunt, materia ex qua ſingula animalia conſtant, & eius habitus diſpoſitionéſve. Hoc autem ita accipio. ſi quid è cera aut glacie B natura conſtituerit, haudquaquam in calido poſitum ſeruabit: corrumpetur enim celeriter ob contrarium: quòd calor quicquid à ſuo contrario conſtiterit, eliquare ſoleat. Item ſi quid è ſale aut nitro conſtituerit, nequaquam id in humorem transferet, deponétque: cùm humor, quæ à calido & ſicco conſtitere, diſperdat. Si igitur humidum & ſiccum materiam corporibus ſuggerunt omnibus, ratione optima euenit, vt quæ ex humido conſtant, in humido ſint, quæ ex ſicco, in ſicco. Ob id arborum genera non in aqua naſci ſolent, ſed in terra. Atqui eadem ratione in aquam veniſſent, quòd præarida ſint, qua ille præferuida veniſſe affirmat. non enim veniſſent in eam C quòd frigida ſit, ſed quòd humida. Natura igitur materiæ tales eſſe ſolent, qualis eſt locus in quo ſunt. quæ in aqua ſunt, humidæ: quæ in terra, ſiccæ: quæ in aëre, calidæ. Habituum tamen ij qui calore excellunt, in frigido poſiti meliùs ſeruantur: contrà qui frigore, in calido. natura enim loci, habitus exceſſum ad mediocritatem reducit. Hoc igitur quæri debet in propriis locis cuiuſque materiæ, iuxta communis temporis varietates. nam vt habitus locis contrarij ſint, fieri poteſt: vt materia, non poteſt. Quòd igitur non propter calorem naturæ animalium alia aquatilia ſint, alia pedeſtria, quemadmodum Empedocles aſſerit: nec non cur quædam pulmonem habeant, quædam D non habeant, hactenus dictum ſit.

CAPVT XV.

Quare pulmone prædita ſpirent.

CVr autem quæ pulmone prædita ſunt, aërem excipiant, ſpirentque, & præſertim quæ illum ſanguinolentum obtinent, dicendum eſt. Cauſa ſpirandi pulmo eſt, fungoſus exiſtens, & fiſtulis plenus: qui etiam omnium maximè partium quæ viſcera appellantur, ſanguine refertus eſt. Quæ itaque ſanguineum habent, ea celeri refrigeratione indigent, quòd calor animalis paululum E deuergat: & penetratione, quæ per totum eat ob ſanguinis caloriſque copiam. quod vtrunque aër committere facilè poteſt. nam quia natura tenui eſt, & celeriter & per totum ſubit atque refrigerat. at aqua, non poteſt. Item cur ea potiſſimùm ſpirent, quæ pulmonem habent ſanguinarium, ex hoc liquere poteſt. Nam quod calidius eſt, id refrigeratione indiget vberiori. Adde etiam quòd ſpiritus ad originem caloris cordi inditi, facilè commeat.

CAPVT XVI.

Cordis ſitus, & mortis cauſa.

VErùm quemadmodum cor ad pulmonem foraminibus peruium ſit, tum ex diſſectionibus, tum ex hiſtoriis quæ de animalibus ſcriptæ ſunt, contemplari oportet. Omnino igitur animantium natura refrigerationem deſiderat, ob animæ in corde incendium. eam autem per reſpirationem moliri ſolent animalia, quæ non tantùm cor habent, ſed etiam pulmonem. At quæ cor habent, ſed pulmone vacant, vti piſces: aqua per branchias refrigerantur, quòd eorum natura aquatilis ſit. Qualiter autem ſitus cordis ad branchias ſeſe habeat, ad oculum per diſſectiones ſpectari debet exactè per hiſtorias. Vt autem vel nunc ſummatim dicatur, ſeſe ad hunc habet modum. Cor enim pedeſtribus animantibus & piſcibus non ſimilem ſitum tenere videatur, ſimilem tamen obtinet. Nam quo piſcium capita eminent, eodem cordis mucro ſpectat. at cùm capita nequaquam eodem proſpectent, tam pedeſtribus quàm piſcibus cor ſuum mucronem ad os iactitat. Ac fiſtula venæ & nerui faciem repræſentans, de cordis extremo ad medium illud tendit, vbi branchiæ omnes inter ſe coeunt, copulantúrque. hæc igitur ampliſſima eſt. Sed & aliæ de vtraque parte cordis ad branchiarum extrema ſingularum tendunt, per quas in cor refrigeratio penetrat, diſcurſatice ſemper aqua per branchias. Porro quemadmodum branchiæ piſcibus: ſic reſpirantibus thorax, crebrò ſurſum deorſúmque mouetur, cùm ea ſpiritum accipiunt reddúntque. Item quæ ſpirant, in pauco & eodem aëre: quæ vero aquatilia ſunt, in pauca eadémque aqua ſtrangulari ſolent. nam eorum vtrumque celeriter calidum redditur. calefacit enim vtrumque contactus ſanguinis, qui cùm calidus eſt, refrigerationem præpedit. Quin etiam cùm ſpirantia pulmonem, aquatilia branchias mouere non poſſunt, ob affectionem ſenúmve, tum ea mori contingit.

CAPVT XVII.

De vita ac morte, eorumdémque cauſis.

VT igitur ortus animalibus communis omnibus eſt, ita mors: ſed modi eius, ſpecie diſcrepant. non enim corruptio ipſa differentiarum expers eſt: quanquam quippiam commune habet. nam mors altera violenta eſt, altera naturalis. Violenta, cùm principium extrinſecus aduenit: Naturalis, cùm idem in ipſo animali eſt, & particulæ conſtitutio talis eſt, qualis ab initio erat, nec affectio vlla ſuperuenit. Hæc igitur in plantis, ariditas appellatur: in animantibus, ſenecta. Fit autem mors & corruptio, perfectis omnibus eodem modo: imperfectis verò conſimiliter quidem, ſed alio modo. Imperfecta voco, vt oua, & ea plantarum ſemina quæ radice carent. Omnibus igitur corruptio obuenit, ob caloris defectum: ſed perfectis, in eo in quo eſſentiæ principium habetur. hoc autem id eſt, vt antè diximus, in quo ſuperum & inferum coeunt:

A

ΚΕΦΑΛ. ιϛ'.

Τῆς καρδίας θέσις καὶ τοῦ τέλους τὸ αἴτιον.

ΟΝ δὲ τρόπον ἡ καρδία τὴν σύντρησιν ἔχει πρὸς τὸν πνεύμονα, δεῖ θεωρεῖν, ἔκ τε τῶν ἀνατεμνομένων, καὶ ἐκ τῶν ἱστοριῶν τῶν περὶ τὰ ζῷα γεγραμμένων. καταψύξεως μὲν οὖν ὅλως ἡ τῶν ζώων δεῖται φύσις, διὰ τὴν ἐν τῇ καρδίᾳ τῆς ψυχῆς ἐμπύρωσιν. ταύτην δὲ ποιεῖται διὰ τῆς ἀναπνοῆς, ὅσα μὴ μόνον ἔχουσι καρδίαν, ἀλλὰ καὶ πνεύμονα, τῶν ζώων. τὰ δὲ καρδίαν μὲν ἔχοντα, πνεύμονα δὲ μή, καθάπερ ἰχθύες, διὰ τὸ ἔνυδρον αὐτῶν τὴν φύσιν εἶναι, B τῷ ὕδατι ποιοῦνται τὴν κατάψυξιν διὰ τῶν βραγχίων. ὡς δὴ ἡ θέσις ἔχει τῆς καρδίας πρὸς τὰ βράγχια, πρὸς μὲν τὴν ὄψιν ἐκ τῶν ἀνατομῶν δεῖ θεωρεῖν· πρὸς δὲ ἀκρίβειαν, ἐκ τῶν ἱστοριῶν· ὡς δὴ ἐν κεφαλαίοις εἰπεῖν καὶ νῦν, ἔχει τόνδε τὸν τρόπον· δόξειε μὲν γὰρ οὐχ ὡσαύτως ἔχειν τὴν θέσιν ἡ καρδία τοῖς τε πεζοῖς τῶν ζώων καὶ τοῖς ἰχθύσιν. ἔχει δ' ὡσαύτως· ᾗ γὰρ νεύουσι τὰς κεφαλάς, ἐνταῦθα ἡ καρδία τὸ ὀξὺ ἔχει. ἐπεὶ δὲ οὐχ ὡσαύτως αἱ κεφαλαὶ νεύουσι τοῖς τε πεζοῖς τῶν ζώων καὶ τοῖς ἰχθύσι, πρὸς τὸ στόμα ἡ καρδία τὸ ὀξὺ ἔχει. τείνει δ' ἐξ ἄκρου τῆς καρδίας αὐλὸς φλεβονευρώδης εἰς τὸ μέσον, ᾗ συνάπτουσιν ἀλλήλοις πάντα τὰ βράγχια. C μέγιστος μὲν οὖν οὗτός ἐστιν. ἔνθεν δὲ καὶ ἔνθεν τῆς καρδίας μὲν ἕτεροι τείνουσιν εἰς ἄκρον ἕκαστον τῶν βραγχίων, δι' ὧν ἡ κατάψυξις γίνεται πρὸς τὴν καρδίαν, διαυλωνίζοντος ἀεὶ τοῦ ὕδατος διὰ τῶν βραγχίων. ὡσαύτως δὲ καὶ τοῖς ἀναπνέουσιν ὁ θώραξ ἄνω καὶ κάτω κινεῖται πολλάκις, δεχομένων τὸ πνεῦμα καὶ ἐξιέντων, ὡς τὰ βράγχια τοῖς ἰχθύσι· καὶ τὰ μὲν ἀναπνέοντα, ἐν ὀλίγῳ ἀέρι καὶ τῷ αὐτῷ ἀποπνίγονται· ταχέως γὰρ ἑκάτερον αὐτῶν γίνεται θερμόν· θερμαίνει γὰρ ἡ τοῦ αἵματος θίξις ἑκάτερον. θερμὸν δ' ὂν τὸ αἷμα, κωλύει τὴν κατάψυξιν· καὶ μὴ δυναμένων κινεῖν, τῶν μὲν ἀναπνεόντων, τὸν πνεύμονα, τῶν δ' ἐνύδρων, τὰ βράγχια διὰ πάθος ἢ διὰ γῆρας, τότε D * συμβαίνει τὴν τελευτήν.

* Quidam ε. γίνεται τὴν τ. vel συμβαίνει ἡ τελευτή.

ΚΕΦΑΛ. ιζ'.

Περὶ θανάτου καὶ τῶν αὐτοῦ τρόπων καὶ αἰτιῶν.

ΕΣτι μὲν οὖν πᾶσι τοῖς ζῴοις κοινόν, γένεσις καὶ θάνατος. οἱ δὲ τρόποι διαφέρουσι τῷ εἴδει· οὐδὲ γὰρ ἀδιάφορος ἡ φθορά, ἀλλ' ἔχει τι κοινόν. θάνατος δ' ἐστίν, ὁ μὲν βίαιος, ὁ δὲ κατὰ φύσιν· βίαιος μέν, ὅταν ἡ ἀρχὴ ἔξωθεν ᾖ· κατὰ φύσιν δ', ὅταν ἐν αὐτῷ, καὶ ἡ τοῦ μορίου σύστασις ἐξ ἀρχῆς τοιαύτης, ἀλλὰ μὴ ἐπίκτητόν τι πάθος. E τοῖς μὲν οὖν φυτοῖς αὔανσις· ἐν δὲ τοῖς ζῴοις καλεῖται τοῦτο γῆρας. ἔστι δὲ θάνατος καὶ ἡ φθορὰ πᾶσιν ὁμοίως τοῖς μὴ ἀτελέσι. τούτοις δὲ παρομοίως μέν, ἄλλον δὲ τρόπον· ἀτελῆ δὲ λέγω, οἷον τά τε ᾠά, καὶ τὰ σπέρματα τῶν φυτῶν, ὅσα ἄρριζα. πᾶσι μὲν οὖν ἡ φθορὰ γίνεται διὰ θερμότητος ἔκλειψιν· τοῖς δὲ τελείοις, ἐν ᾧ τῆς οὐσίας ἡ ἀρχή. αὕτη δ' ἐστίν, ὥσπερ εἴρηται πρότερον, ἐν ᾧ τό τε ἄνω καὶ τὸ κάτω συνάπτει·

τοῖς μὲν φυτοῖς μέσον βλαστοῦ καὶ ῥίζης· τῶν δὲ ζῴων, τοῖς μὲν ἐναίμοις, ἡ καρδία· τοῖς δ' ἀναίμοις, τὸ ἀνάλογον. τούτων δ' ἔνια δυνάμει πολλὰς ἀρχὰς ἔχει, οὐ μὴν τῇ γε ἐνεργείᾳ. διὸ καὶ τῶν ἐντόμων ἔνια διαιρούμενα ζῇ, καὶ τῶν ἐναίμων ὅσα μὴ ζωτικὰ λίαν εἰσί, πολὺν χρόνον ζῶσιν ἐξῃρημένης τῆς καρδίας, οἷον αἱ χελῶναι· καὶ κινοῦνται τοῖς ποσὶν, ἔτι ὄντων τῶν χελωνίων, διὰ τὸ μὴ συγκεῖσθαι τὴν φύσιν αὐτῶν εὖ, παραπλησίως δ' ἐν τοῖς ἐντόμοις. ἡ δ' ἀρχὴ τῆς ζωῆς ἐκλείπει τοῖς ἔχουσιν, ὅταν μὴ καταψύχηται τὸ θερμὸν τὸ κοινωνοῦν αὐτῆς· καθάπερ γὰρ εἴρηται πολλάκις, συντήκεται αὐτὸ ὑφ' αὑτοῦ. ὅταν οὖν τοῖς μὲν ὁ πνεύμων, τοῖς δὲ τὰ βράγχια κατασκληρύνηται, διὰ χρόνου μῆκος ξηραινομένων, τοῖς μὲν τῶν βραγχίων, τοῖς δὲ τοῦ πνεύμονος, καὶ γινομένων γεηρῶν, οὐ δύναται ταῦτα τὰ μόρια κινεῖν, οὐδ' αἴρειν καὶ συνάγειν· τέλος δὲ γινομένης ἐπιτάσεως, καταμαραίνεται τὸ πῦρ. διὸ καὶ μικρῶν παθημάτων ἐπιγενομένων ἐν τῷ γήρᾳ, ταχέως τελευτῶσι· διὰ γὰρ τὸ ὀλίγον εἶναι τὸ θερμὸν, ἅτε τοῦ πλείστου διαπεπνευκότος ἐν τῷ πλήθει τῆς ζωῆς, * ἥτις ἂν ἐπίτασις γένηται τοῦ μορίου, ταχέως ἀποσβέννυται· ὥσπερ γὰρ ἀκαριαίας καὶ μικρᾶς ἐν αὐτῷ φλογὸς ἐνούσης διὰ μικρὰν κίνησιν ἀποσβέννυται. διὸ καὶ ἄλυπός ἐστιν ὁ ἐν τῷ γήρᾳ θάνατος· οὐδενὸς γὰρ βιαίου πάθους αὐτοῖς συμβαίνοντος τελευτῶσιν, ἀλλ' ἀναισθήτως ἡ τῆς ψυχῆς ἀπόλυσις γίνεται παντελῶς. καὶ τῶν νοσημάτων ὅσα ποιοῦσι τὸν πνεύμονα σκληρὸν, ἢ φύμασιν, ἢ περιττώμασιν, ἢ θερμότητος νοσηματικῆς ὑπερβολῇ, καθάπερ ἐν τοῖς πυρετοῖς, πυκνὸν τὸ πνεῦμα ποιοῦσι, διὰ τὸ μὴ δύνασθαι τὸν πνεύμονα μακρὰν αἴρειν ἄνω, καὶ συνιζάνειν. τέλος δ', ὅταν μηκέτι δύνωνται κινεῖν, τελευτῶσιν ἀποπνεύσαντες.

* χ. ἥτις ἂν ἐπίτασις γ.

A plantis, quod inter germen & radicem [illegible] eſt; animalium ſanguinariis cor, exangui[illegible] portionale. Cæterùm ex hiſce nonnulla, [illegible] multa principia, non tamen actu, co[illegible]. Quamobrem & inſecta quædam præciſa [illegible]. Quin & ſanguineorum quæcunque viuaci[illegible] dum non ſunt, exempto corde longo tempo[illegible] ſpatio viuunt, vt teſtudines, & inambulant, ſi ad-huc puſillæ ſint, quòd eorum natura non benè compoſita ſit, perinde atque inſecta. Porrò vitæ principium in quibus habetur, deficere ſolet, cùm calor vitalis non refrigeratur. tunc enim idem, quod ſæpe diximus, ſeipſum conſumit. Quoties igitur aliis pulmo, aliis branchiæ obdureſcunt, præ temporis longitudine reſiccatis, his quidem branchiis, illis verò pulmone, & terroſioribus redditis has particulas mouere, hoc eſt, attollere & comprimere, non poſſunt. ac tandem accedente intenſione, calor ille obſoleſcit. Quocirca & paruis affectibus in ſenectute ſubortis, animalia [illegible] commoriuntur. nam quia calor exiguus eſt, vt qui plurimus per vitam quæ longa fuit, diſſlarit, ſi qua intenſio parti illi ſuperueniat, celeriter extinguitur, quemadmodum cùm tenuis & exigua flamma in eo ineſt, parui motus opera extingui ſolet. Quapropter & mors ea quæ in ſenecta accidit, dolori obnoxia non eſt. tunc enim animalia mortem obeunt, etiam ſi nullo violento affectu tententur: imò verò, citra vllum penitus ſenſum anima ipſa recedit. Quinetiam in morbis illis qui durum reddunt pulmonem, aut tuberculis, aut vacante materia, aut caloris morbidi exceſſu, vt in febribus accidit: ſpiritus frequens efficitur, propterea quòd pulmo multum attolli ac ſubſidere nequeat: tandémque vbi præterea moueri non poteſt, expirando vita cum morte commutatur.

ΚΕΦΑΛ. ιη'.

Ὁρισμοὶ γενέσεως, ζωῆς, νεότητος, γήρως, ἀκμῆς, καὶ τελευτῆς.

* Quid. ἐν τῷ θ.

Γένεσις μὲν οὖν ἐστιν ἡ πρώτη μέθεξις * ἐν τῷ θερμῷ τῆς θρεπτικῆς ψυχῆς· ζωὴ δ' ἡ μονὴ ταύτης. νεότης δ' ἐστὶν, ἡ τοῦ πρώτου καταψυκτικοῦ μορίου αὔξησις· γῆρας δ' ἡ τούτου φθίσις· ἀκμὴ δὲ, τὸ τούτων μέσον. τελευτὴ δὲ καὶ φθορὰ βίαιος μὲν, ἡ τοῦ θερμοῦ σβέσις καὶ μάρανσις· φθαρείη γὰρ ἂν δι' ἀμφοτέρας ταύτας τὰς αἰτίας. ἡ δὲ κατὰ φύσιν τοῦ αὐτοῦ τούτου μάρανσις διὰ χρόνου μῆκος γινομένη καὶ τελεότητα. τοῖς μὲν οὖν φυτοῖς αὔανσις, ἐν δὲ τοῖς ζῴοις καλεῖται θάνατος. τούτου δ' ὁ μὲν ἐν γήρᾳ θάνατος, μάρανσις τοῦ μορίου διὰ ἀδυναμίαν τοῦ καταψύχειν ὑπὸ γήρως. τί μὲν οὖν ἐστι γένεσις, καὶ ζωὴ, καὶ θάνατος, καὶ διὰ τίνας αἰτίας ὑπάρχουσι τοῖς ζῴοις, εἴρηται.

CAPVT XVIII.

Quid ſit ortus, vita, iuuenta, ſenectus, ſiue conſtans ætas, quid denique obitus.

Eſt igitur ortus quidem, prima vegetatricis animæ cum calore participatio. Vita verò, mora eius. Iuuenta, primæ refrigerabilis particulæ auctio. Senecta, eiuſdem decretio. Status autem ſiue ætas adulta, quod horum medium eſt. Obitus verò atque corruptio, violenta quidem caloris extinctio aut marcor (his enim vtriſque de cauſis calor extingui poteſt) naturalis verò, eiuſdem marcor ob temporis tranſacti longitudinem proueniens. verùm in plantis, ariditas: in animalibus, mors nuncupari ſolet. Cæterùm ea quæ in ſenili ætate obuenit, marcor partis illius eſt, qui quòd eam refrigerare animal præ ſenio non poſſit, committitur. Quid ſit ortus, & quid vita, & quid mors, & quas ob res animantibus iuncta ſint, dictum eſt.

A

CAPVT XIX.

Cur quæ ſpirant animantia, in aqua ſuffocentur, piſces in aëre.

PAtet etiam ex hiſce, & qua de cauſa animalibus quæ ſpirant, in humore præfocari contingat, piſcibus in aëre: hi enim aqua, illa aëre refrigerari ſolent. quibus vtraque deſtituuntur, mutatis ſedibus. Cauſa itaque cur hi branchias, illa pulmonem moueant, quibus aſſurgentibus & reſidentibus illa inſpirant & expirant, hi humorem accipiunt redduntque, & inſuper inſtrumenti conſtitutio, ad hunc ſeſe habet modum.

B

CAPVT XX.

De palpitatione, pulſu, reſpiratione, cordi accidentibus.

POrrò quæ cordi accidere ſolent, ea tria ſunt: quæ eandem habere naturam videntur, quamuis eandem non habeant, videlicet palpitatio, pulſus, reſpiratio. Palpitatio igitur eſt, caloris in corde exiſtentis compulſio, ob refrigerationem, quæ à materia excreſcente atque inutili, aut alio quopiam tabifico proueniat: vt in eo morbo accidit, quem tremorem vocant, & aliis, & metu. etenim C metuentibus, partes ſuperiores refrigerantur. Calor autem defugiens, ſeque contrahens, motum facit: vbi in anguſtum adeò compellitur, vt animantes interdum præ metu aut morbo extinguantur. At pulſatio, quam cor perpetuò facere videtur, ei motioni perſimilis eſt, quam tubercula cum dolore efficiunt, quòd ſanguini mutatio ipſa præter naturam ſit. ea verò fit, vſque dum ſanguis concoctus ſit, & in pus conuerſus. Hæc etiam affectio feruori ſimilis eſt. fit enim feruor, cùm humor caloris opera inflatur. nam humor propterea ſeſe attollit, quod in molem aſſurgat ampliorem. Cæterùm quies in tuberculis agitur, ſi putrefactio non perſpiret, humore craſſiuſculo reddito, feruor verò D reſidet, ſi per labra vaſculi humor excidat. In ipſo autem corde tumefactio humoris, qui ſemper è cibo accedit, vltimam cordis tunicam eleuantis, pulſum facit: atque hoc ſemper ſine vlla intermiſſione fit. nam ſemper humor, ex quo natura ſanguinis oritur, continuè influit. primùm enim in corde gignitur: id quod in prima generatione liquidò conſtat. nam venis nondum diſtinctis, ſanguinem habere cernitur. Et ob id iunioribus magis quàm ſenioribus pulſat: vtpote quibus diuaporatio maior fiat. Quinetiam venæ omnes & ſimul inter ſe pulſare aſſolent: quia omnes ex corde ſua initia trahunt, cor autem ſemper mouet. Quare & illæ ſemper mouent, & ſimul inter ſe cùm illud E mouet. Palpitatio igitur eſt, compellentis frigoris repulſio. Pulſatio verò, humoris concaleſcentis inflatio.

CAPVT XXI.

De reſpiratione & quomodo fit.

REſpiratio autem fit, calore augeſcente in ea parte vbi vegetale principium habetur. nam quemadmodum cæteræ partes alimento indi-

ΚΕΦΑΛ. ιθʹ.

Διὰ τί τὰ μὲν ἀναπνέοντα τῶν ζῴων ἀποπνίγεται ἐν τῷ ὑγρῷ, οἱ δ' ἰχθύες ἐν τῷ ἀέρι.

ΔΗλον δ' ἐκ τούτων, καὶ διὰ τίν' αἰτίαν αἰτίαν τοῖς μὲν ἀναπνέουσι τῶν ζῴων ἀποπνίγεσθαι συμβαίνει ἐν τῷ ὑγρῷ, τοῖς δ' ἰχθύσιν ἐν τῷ ἀέρι. τοῖς μὲν γὰρ διὰ τοῦ ὕδατος ἡ κατάψυξις γίνεται, τοῖς δὲ διὰ τοῦ ἀέρος· ὧν ἑκάτερα στερίσκεται μεταβάλλοντα τοὺς τόπους. ἡ δ' αἰτία τῆς κινήσεως, τοῖς μὲν τῶν βραγχίων, τοῖς δὲ τοῦ B πνεύμονος, ὧν αἰρομένων καὶ συνιζόντων, τὰ μὲν ἐκπνέουσι καὶ εἰσπνέουσι, τὰ δὲ δέχονται τὸ ὑγρὸν, καὶ ἐξιᾶσιν. ἔτι δ' ἡ σύστασις τοῦ ὀργάνου, τοῦτον ἔχει τὸν τρόπον.

ΚΕΦΑΛ. κʹ.

Ὅτι τρεῖς περὶ τὴν καρδίαν κινήσεις, πήδησις, σφύξις καὶ ἀναπνοή· καὶ πρῶτον περὶ πηδήσεως καὶ σφύξεως.

ΤΡία δ' ἐστὶ τὰ συμβαίνοντα περὶ τὴν καρδίαν, ἃ δοκεῖ τὴν αὐτὴν φύσιν ἔχειν, ἔχει δ' οὐ τὴν αὐτὴν, πήδησις, καὶ σφυγμὸς, καὶ ἡ τῆς ἀναπνοῆς. πήδησις μὲν οὖν ἐστι σύνωσις τοῦ θερμοῦ τοῦ ἐν αὐτῇ, διὰ κατάψυξιν περιττωματικὴν, ἢ συντηκτικὴν, οἷον ἐν τῇ νόσῳ τῇ καλουμένῃ παλμῷ, καὶ ἐν ἄλλαις δὲ νόσοις, καὶ ἐν τοῖς φό- C βοις δέ· καὶ γὰρ οἱ φοβούμενοι καταψύχονται τὰ ἄνω, τὸ δὲ θερμὸν ὑποφεῦγον, καὶ συστελλόμενον, ποιεῖ τὴν κίνησιν, εἰς μικρὸν συνωθούμενον οὕτως, ὥστε ἐνίοτε ἀποσβέννυσθαι τὰ ζῷα, καὶ ἀποθνήσκειν διὰ φόβον, καὶ διὰ πάθος νοσηματικόν. ἡ δὲ συμβαίνουσα σφύξις τῆς καρδίας, * ἣν ἀεὶ φαίνεται ποιουμένη συνεχῶς, ὁμοία φύμασί ἐστιν, ἣν ποιοῦνται κίνησιν μετ' ἀλγηδόνος, διὰ τὸ παρὰ φύσιν εἶναι τῷ αἵματι τὴν μεταβολήν. γίνεται δὲ μέχρις ἂν πυωθῇ πεφθέν. ἔστι δ' ὅμοιον ζέσει τοῦτο τὸ πάθος. ἡ γὰρ ζέσις γίνεται, πνευματουμένου τοῦ ὑγροῦ ὑπὸ τοῦ θερμοῦ. αἴρεται γὰρ, διὰ τὸ πλείω γίνεσθαι τὸν ὄγκον· παῦλα δ', ἐν μὲν D τοῖς φύμασιν, ἐὰν μὴ διαπνεύσῃ, παχυτέρου * γινομένου τοῦ ὑγροῦ, σῆψις· τῇ δὲ ζέσει ἡ * ἔκπτωσις, διὰ τῶν ὁριζόντων. ἐν δὲ τῇ καρδίᾳ, ἡ τοῦ ἀεὶ προσιόντος ἐκ τῆς τροφῆς ὑγροῦ διὰ τῆς θερμότητος ὄγκωσις, ποιεῖ σφυγμὸν, αἴροντος τὸν ἔσχατον χιτῶνα τῆς καρδίας. καὶ τοῦτ' ἀεὶ γίνεται συνεχῶς· ἐπιρρεῖ γὰρ ἀεὶ τὸ ὑγρὸν συνεχῶς, ὅθεν γίνεται ἡ τοῦ αἵματος φύσις· πρῶτον γὰρ ἐν τῇ καρδίᾳ δημιουργεῖται. δῆλον δ' ἐν τῇ γενέσει ἐξ ἀρχῆς· οὔπω γὰρ διωρισμένων τῶν φλεβῶν, φαίνεται ἔχουσα αἷμα· καὶ διὰ τοῦτο σφύζει μᾶλλον τοῖς νεωτέροις, τῶν πρεσβυτέρων· γίνεται γὰρ ἡ ἀναθυμίασις πλείων τοῖς νεωτέροις. καὶ σφύζουσιν αἱ φλέ- E βες πᾶσαι, καὶ ἅμα ἀλλήλαις, διὰ τὸ ἠρτῆσθαι ἐκ τῆς καρδίας· κινεῖ δ' ἡ καρδία ἀεὶ, ὥστε κἀκεῖναι ἀεὶ, καὶ ἅμα ἀλλήλαις ὅτε κινεῖ. ἀναπήδησις μὲν οὖν ἐστιν ἡ γινομένη ἀντωσις πρὸς τὴν τοῦ ψυχροῦ σύνωσιν· σφύξις δὲ ἡ τοῦ ὑγροῦ θερμαινομένου πνευμάτωσις.

* χ. ἢ ἀεὶ

* χ. περιεχομένου. al. παχυτέρα περιεχομένη.

* χ. ἔμπτωσις,

ΚΕΦΑΛ. καʹ.

Περὶ ἀναπνοῆς καὶ πῶς γίνεται.

ΗΔ' ἀναπνοὴ γίνεται, αὐξανομένου τοῦ θερμοῦ, ἐν ᾧ ἡ ἀρχὴ ἡ θρεπτική. καθάπερ γὰρ καὶ τἆλλα δεῖται τρο-

φύσις, κἀκεῖνο, καὶ τὴν αἴσθησιν μᾶλλον· καὶ γὰρ τοῖς ἄλλοις A ἐκείνου τῆς ἕξεως βελτίονος, ἀναγκαῖον πλείονι γινομένου αἴρειν τὸ ὄργανον. δεῖ δ' ὑπολαβεῖν τὴν σύστασιν τοῦ ὀργάνου, παραπλησίαν εἶναι ταῖς φύσαις ταῖς ἐν τοῖς χαλκείοις· οὐ πόρρω γὰρ οὐδ' ὁ πλεύμων, οὐδ' ἡ καρδία πρὸς τὸ δέξασθαι σχῆμα τοιοῦτον· διπλοῦν δ' εἶναι τὸ τοιοῦτον· δεῖ γὰρ ἐν τῷ μέσῳ τὸ θρεπτικὸν εἶναι τῆς φυσικῆς δυνάμεως. αἴρεται οὖν πλεῖον γινόμενον, αἰρομένου δέ, ἀνάγκη καὶ αἴρεσθαι καὶ τὸ περιέχον αὐτὸ μόριον. ὅπερ φαίνονται ποιεῖν οἱ ἀναπνέοντες· αἴρουσι γὰρ τὸν θώρακα, διὰ τὸ τὴν ἀρχὴν τὴν ἐνοῦσαν αὐτῷ τοῦ τοιούτου μορίου ταὐτὸ τοῦτο ποιεῖν· αἰρομένου γάρ, καθάπερ εἰς B τὰς φύσας, ἀναγκαῖον εἰσφέρειν τὸν ἀέρα τὸν θύραθεν, καὶ ψυχρὸν ὄντα καὶ καταψύχοντα, σβεννύναι τὴν ὑπερβολὴν τοῦ πυρός. ὥσπερ δ' αὐξανομένου ᾔρετο τοῦτο τὸ μόριον, φθίνοντος ἀναγκαῖον συνίζειν, καὶ συνίζοντος, ἐξιέναι τὸν ἀέρα τὸν εἰσελθόντα πάλιν, εἰσιόντα μὲν ψυχρόν, ἐξιόντα δὲ θερμόν, διὰ τὴν ἁφὴν τοῦ θερμοῦ τοῦ ὄντος ἐν τῷ μορίῳ τούτῳ, καὶ μάλιστα τοῖς τὸν πλεύμονα ἔναιμον ἔχουσιν· εἰς πολλοὺς γὰρ τοὺς αὐλῶνας, τὰς σύριγγας ἐμπίπτειν, τοῖς ἐν τῷ πλεύμονι, ὧν παρ' ἑκάστην παρατέτανται φλέβες, ὥστε δοκεῖν ὅλον εἶναι τὸν πλεύμονα πλήρη αἵματος. καλεῖται δ' ἡ μὲν εἴσοδος τοῦ ἀέρος, ἀναπνοή· ἡ δὲ ἔξοδος, ἐκ- C πνοή. καὶ ἀεὶ δὲ τοῦτο γίνεται συνεχῶς, ἕως ἂν ζῇ καὶ κινῇ τοῦτο τὸ μόριον συνεχῶς· καὶ διὰ τοῦτ' ἐν τῷ ἀναπνεῖν καὶ ἐκπνεῖν ἐστι τὸ ζῆν. τὸν δ' αὐτὸν τρόπον καὶ τοῖς ἰχθύσιν ἡ κίνησις γίνεται τῶν βραγχίων· αἰρομένου γὰρ τοῦ θερμοῦ τοῦ ἐν τῷ αἵματι διὰ τῶν μορίων, αἴρονται καὶ τὰ βράγχια, καὶ διιᾶσι τὸ ὕδωρ· καταπίπτοντος δὲ πρὸς τὴν καρδίαν διὰ τῶν πόρων, καὶ καταψυχομένου, συνίζουσι, καὶ ἀφιᾶσι τὸ ὕδωρ. ἀεὶ δ' αἰρομένου τοῦ ἐν καρδίᾳ, ἀεὶ δέχεται πάλιν καταψυχομένου. διὸ κἀκείνοις τοῦ ζῆν καὶ μὴ ζῆν τὸ τέλος ἐστὶν ἐν τῷ ἀναπνεῖν· καὶ τούτοις ἐν τῷ δέχεσθαι τὸ ὑγρόν. Καὶ περὶ μὲν οὖν ζωῆς καὶ θανάτου, καὶ τῶν D συγγενῶν ταύτης τῆς σκέψεως, σχεδὸν εἴρηται περὶ πάντων. περὶ δὲ ὑγιείας καὶ νόσου, οὐ μόνον ἐστὶν ἰατροῦ, ἀλλὰ καὶ φυσικοῦ μέχρι τοῦ τὰς αἰτίας εἰπεῖν. ᾗ δὲ διαφέρουσι, καὶ ᾗ διαφέροντα θεωροῦσιν, οὐ δεῖ λανθάνειν· ἐπεὶ ὅτι γε σύνορος ἡ πραγματεία μέχρι τινός ἐστι, μαρτυρεῖ τὸ γινόμενον· τῶν τε γὰρ ἰατρῶν ὅσοι κομψοὶ ἢ περίεργοι, λέγουσί τι περὶ φύσεως, καὶ τὰς ἀρχὰς ἐκεῖθεν ἀξιοῦσι λαμβάνειν· καὶ τῶν περὶ φύσεως πραγματευθέντων οἱ χαριέστατοι σχεδὸν τελευτῶσιν εἰς τὰς ἀρχὰς τὰς ἰατρικάς.

Suprà de ſenſu & ſen. c.1.

A gent: ita & illa quoque: immo magis quàm cæteræ. quippe quæ cæteris nutricationis cauſa ſit. Neceſſe itaque eſt, vt cùm amplior efficitur, inſtrumentum attollat. Exiſtimare autẽ oportet, inſtrumenti conſtitutionem ſimilem eſſe follibus, qui in officinis ferrariis habentur (parum enim abeſt, quin pulmo & cor ſibi formam talem vendicent) geminum autem eſſe quod tale eſt, cùm eam naturalem potentiam cui nutriendi officium delegatum eſt, in medio conſiſtere oporteat. Medium igitur cùm amplius redditur, eleuari ſolet: cùm verò eleuatur, & eam quoque partem, quæ illud ambit, eleuari neceſſe eſt. Id quod in reſpirantibus fieri cernitur. quandoquidem pectus attollitur, propterea quod B eiuſmodi partis principium in eo contentum, hoc idem efficit. cùm enim attollitur, eodem perinde vt in folles aërem externum algidúmque influere, & refrigerando ignis exuperantiam reſtinguere neceſſum eſt. Quemadmodum autem cùm augetur, hæc pars attolli ſolet: ita & cùm decreſcit, eandem reſidere neceſſe eſt, atque ea reſidente, aerem ingreſſum rurſum egredi: aerem inquam, qui dum ingreditur, frigidus eſt, dum egreditur, calidus, propter contactum caloris hac in parte contenti, & potiſſimum in iis quæ ſanguinolentum habent pulmonem. Eum ſiquidem introrumpere oportet in multos quaſi tubos & fiſtulas pulmonis: quarum ſingulis venæ adiunctæ ſunt, adeo vt totus C pulmo ſanguine plenus videatur. Aeris autem ingreſſus, reſpiratio vocatur: egreſſus, expiratio. Idque ſemper continuè fit, quandiu animalia viuunt, & hanc particulam continuè mouent. Et ob id in reſpirando & expirando vita conſiſtit. Ad hunc modum & piſcibus branchiæ mouentur. nam cùm calor ſanguini inditus, per particulas in ſublime ſcandit, attolluntur & branchiæ, & aquam admittunt: cùm deſcendit ad cor per meatus, & refrigeratus eſt, reſident, & aquam emittunt. Cùm autem ſemper ſanguis in corde contentus efferatur, ſemper cor eundẽ refrigeratum rurſus excipit. Ex quo etiam fit, vt illis in reſpirando, & his in ad- D mittendo humore, finis viuendi & non viuẽdi conſiſtat. De vita igitur ac morte, & iis penè omnibus quæ huic conſiderationi affinia ſunt, dictum eſt. De ſanitate verò morboque, non ſolùm Medici, ſed & Phyſici eſt, cauſas quadantenus referre. Quatenus verò hi differant, & quatenus diuerſa contemplentur, ignorare non conuenit. Equidem quòd confinis ſit quadantenus hæc Medici Phyſicique tractatio, res ipſa teſtatur. Nam & Medici, quicunque paulo elegantiores ac diligentiores ſunt, de natura dicunt, & artis ſuæ principia inde ſumere dignantur. & Phyſici omnes ferè, quicunque concinnitatis aliquid habent, tractatio- E nem naturæ vſque ad medicinæ principia proſequuntur.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΖΩΩΝ ΠΟΡΕΙΑΣ.

ARISTOTELIS STAGIRITÆ, DE ANIMALIVM INCESSV, LIBER.

Nicolao Leonico Thomæo interprete.

CAPVT I.

Synopſis eorum quæ hoc libello ſunt tractanda.

A DE commodis autem animalium partibus ad illam quæ per locum eſt, motionem, perſcrutandum eſt: quamnam ob cauſam illarum quæque huiuſmodi exiſtat, cuiúſve gratia inſint illis: de differentiis quinetiam quas vnius & eiuſdem animalis ad ſe B inuicem habent partes, quáſve habent ad illas quæ aliorum ſunt, & genere diſtinctorum. Priùs autem conſtituamus de quibus à nobis eſt conſiderandum: quorum primum eſt, quotnam paucioribus animalia mouentur notis: poſtea quamobrem ſanguine quidem prædita, quaternis, exanguia verò, pluribus: & ad ſummam, quam ob cauſam ex animalium numero alia quidem pedibus ca- C rent, alia verò bipeda aut quadrupeda aut multipeda exiſtant: & cur quæcunque illorum pedes habent, eos habeant pares: & omnino eæ notæ quibus mouentur, pares exiſtunt. Præter hæc etiam quam ob cauſam homo & volucrum genus bipes, piſces verò pedibus carent. Et inflexus quidem crurum homo & volucris, cùm ſint bipedes, contrarios habent. Homo namque ad ambitum crus inflectit: volucris verò ad cauum: ipſe quinetiam homo contrario ad ſeipſum modo crura inflectit & brachia. hæc enim ad cauum, genua autem ad ambitum inflectit. Et quadrupe- D da quæ, animal pariunt, contrario ad homines & ſibi ipſis crura inflectunt modo. priora namque crura ad circumferentiæ ambitum inflectunt: poſteriora verò ad cauum. Præterea ex quadrupedum genere illa quæ non animal, ſed ouum pariunt, proprio quodam modo in latus inflectunt. Ad hæc etiam quam ob cauſam quadrupeda omnia per diametrum mouentur. De omnibus certè iis, & quæcunque iſtis ſunt cogna- E ta, perſcrutandæ ſunt cauſæ. Quòd enim hoc contingat modo, ex naturali palàm eſt hiſtoria: quam ob cauſam autem, nunc eſt inueſtigandum.

ΚΕΦΑΛ. α'.

Ἡ τῆς βίβλου περιοχὴ, καὶ εἰς κεφάλαια διαίρεσις.

A ΠΕΡΙ δὲ τῶν χρησίμων μορίων τοῖς ζῴοις, πρὸς τὴν κίνησιν τὴν κατὰ τόπον, ἐπισκεπτέον διὰ τίνα αἰτίαν τοιοῦτόν ἐστιν ἕκαστον αὐτῶν, καὶ τίνος ἕνεκεν ὑπάρχουσιν αὐτοῖς· ἔτι δὲ περὶ τῶν διαφορῶν, B τῶν τε πρὸς ἄλληλα τοῖς τοῦ αὐτοῦ καὶ ἑνὸς ζῴου μορίοις, καὶ πρὸς τὰ τῶν ἄλλων τῶν τῷ γένει διαφερόντων. πρῶτον δὲ λάβωμεν, περὶ ὅσων ἐστὶν ἐπισκεπτέον. Ἔστι δὲ πρῶτον μὲν, πόσοις ἐλαχίστοις κινεῖται τὰ ζῷα σημείοις· ἔπειτα, διὰ τί τὰ μὲν ἔναιμα τέτταρσι, τὰ δ᾽ ἄναιμα, πλείοσι· καὶ καθόλου δὴ, διὰ τὴν αἰτίαν τὰ μὲν ἄποδα, C τὰ δὲ δίποδα, τὰ δὲ τετράποδα, τὰ δὲ πολύποδα τῶν ζῴων ἐστί. καὶ διὰ τί πάντα ἀρτίους ἔχει τοὺς πόδας, ὅσαπερ ἔχει πόδας αὐτῶν· ὅλως δ᾽ οἷς κινεῖται σημείοις, ἄρτια ταῦτά ἐστιν. ἔτι δὲ διὰ τὴν αἰτίαν ἄνθρωπος καὶ ὄρνις δίποδα, οἱ δὲ ἰχθύες ἄποδές εἰσι· καὶ τὰς καμψεις ὅ,τε ἄνθρωπος καὶ ὄρνις, δίποδες ὄντες, ἐναντίας ἔχουσι τῶν σκελῶν. ὁ μὲν γὰρ ἄνθρωπος, ἐπὶ τὴν περιφέρειαν κάμπτει τὸ σκέλος· ὁ δ᾽ ὄρνις, ἐπὶ τὸ κοῖλον. καὶ ὁ ἄνθρωπος δ᾽ αὐτὸς, ἐναντίως αὐτῷ τὰ σκέλη καὶ τοὺς βραχίονας. τοὺς μὲν γὰρ, ἐπὶ τὸ κοῖλον· τὰ δὲ γόνατα, D ἐπὶ τὴν περιφέρειαν κάμπτει· καὶ τὰ τετράποδα τὰ ζωοτόκα, τοῖς τε ἀνθρώποις ἐναντίως κάμπτουσι, καὶ αὐτὰ αὑτοῖς. τὰ μὲν γὰρ πρόσθια σκέλη, ἐπὶ τὸ κυρτὸν τῆς περιφερείας κάμπτουσι, τὰ δ᾽ ὀπίσθια ἐπὶ τὸ κοῖλον. ἔτι δὲ τῶν τετραπόδων ὅσα μὴ ζωοτοκεῖ, ἀλλ᾽ ᾠοτοκεῖ, ἰδίως καὶ εἰς τὸ πλάγιον κάμπτουσι. πρὸς δὲ τούτοις, διὰ τὴν αἰτίαν τὰ τετράποδα κινεῖται κατὰ E διάμετρον. περὶ δὴ πάντων τούτων, καὶ ὅσα ἄλλα συγγενῆ τούτοις, τὰς αἰτίας θεωρητέον. ὅτι μὲν γὰρ οὕτω συμβαίνει, δῆλον ἐκ τῆς ἱστορίας τῆς φυσικῆς· διότι δὲ, νῦν σκεπτέον.

ΚΕΦΑΛ. β'.

Ὑποθέσεις πρὸς τὰ ἑξῆς. Ὅτι ἡ φύσις μάτην οὐδὲν ποιεῖ. Ὅτι διαστάσεις ἕξ. Ὅτι ὦσις καὶ ἕλξις ἀρχαὶ τῶν κατὰ τόπον κινήσεων.

Ἀρχὴ δὲ τῆς σκέψεως, ὑποθεμένοις ὡς εἰώθαμεν χρῆσθαι πολλάκις πρὸς τὴν μέθοδον τὴν φυσικὴν, λαβεῖν τὰ τοῦτον ἔχοντα τὸν τρόπον, ἐν πᾶσι τοῖς τῆς φύσεως ἔργοις. τούτων δὲ ἓν μέν ἐστιν, ὅτι ἡ φύσις οὐδὲν ποιεῖ μάτην· ἀλλ' ἀεὶ ἐκ τῶν ἐνδεχομένων τῇ οὐσίᾳ περὶ ἕκαστον γένος ζώου τὸ ἄριστον. διόπερ εἰ βέλτιον ὡδὶ, οὕτως ἔχει καὶ κατὰ φύσιν. ἔτι τὰς διαστάσεις τοῦ μεγέθους, πόσαι καὶ ποῖαι ποίοις ὑπάρχουσι, δεῖ λαβεῖν. εἰσὶ γὰρ διαστάσεις μὲν ἕξ, συζυγίαι δὲ τρεῖς. μία μὲν, τὸ ἄνω καὶ κάτω· δευτέρα δὲ, τὸ ἔμπροσθεν καὶ τὸ ὄπισθεν· τρίτη δὲ, τὸ δεξιὸν καὶ τὸ ἀριστερόν. πρὸς δὲ τούτοις, ὅτι τῶν κινήσεων τῶν κατὰ τόπον ἀρχαὶ, ὦσις καὶ ἕλξις. καθ' αὑτὰς μὲν οὖν αὗται· κατὰ συμβεβηκὸς δὲ κινεῖται τὸ φερόμενον ὑπ' ἄλλου. οὐ γὰρ αὐτὸ δοκεῖ κινεῖν αὐτὸ, ἀλλ' ὑπ' ἄλλου κινεῖσθαι, τὸ ὑπό τινος φερόμενον.

ΚΕΦΑΛ. γ'.

Ὅτι τρόποι καθ' οὓς κινεῖται τὰ ζῶα· καὶ ὅτι τὸ κινούμενον δυσὶν ἐλαχίστοις χρῆται ὀργανικοῖς μέρεσι.

Τούτων δὲ διωρισμένων, λέγωμεν τὰ τούτων ἐφεξῆς. τῶν δὴ ζώων ὅσα μεταβάλλει κατὰ τόπον, τὰ μὲν ἀθρόῳ παντὶ τῷ σώματι μεταβάλλει, καθάπερ τὰ ἀλλόμενα· τὰ δὲ μορίοις, καθάπερ τῶν πορευομένων ἕκαστον. ἐπ' ἀμφοτέραις δὲ ταῖς μεταβολαῖς ταύταις, ἀεὶ μεταβάλλει τὸ κινούμενον, ἀποστηριζόμενον πρὸς τὸ ὑποκείμενον αὐτῷ. διόπερ ἄν τε ὑποφέρηται τοῦτο θᾶττον, ἢ ὥστε ἔχειν ἀπερείσασθαι τὸ ποιούμενον ἐπ' αὐτοῦ τὴν κίνησιν· ἐάν θ' ὅλως μηδεμίαν ἔχῃ τοῖς κινουμένοις ἀντέρεισιν, οὐθὲν ἐπ' αὐτοῦ δύναται κινεῖν ἑαυτό. καὶ γὰρ τὸ ἀλλόμενον καὶ πρὸς αὐτὸ ἀπερειδόμενον * τὸ ἄνω καὶ πρὸς τὸ ὑπὸ τοὺς πόδας, ποιεῖται τὴν ἅλσιν· ἔχει γὰρ τινα ἀντέρεισιν πρὸς ἄλληλα τὰ μόρια ἐν ταῖς καμπαῖς. καὶ ὅλως πρὸς τὸ πιεζόμενον, τὸ πιέζον. διὸ καὶ οἱ πένταθλοι ἅλλονται πλεῖον, ἔχοντες τοὺς ἁλτῆρας, ἢ μὴ ἔχοντες· καὶ οἱ θέοντες, θᾶττον θέουσι, παρασείοντες τὰς χεῖρας· γίνεται γάρ τις ἀπέρεισις ἐν τῇ διατάσει, πρὸς τὰς χεῖρας καὶ τοὺς καρπούς. ἀεὶ δὲ τὸ κινούμενον δυσὶν ἐλαχίστοις χρώμενον ὀργανικοῖς μέρεσι, ποιεῖται τὴν μεταβολήν, τῷ μὲν ὡσπερανεὶ θλίβοντι, τῷ δὲ θλιβομένῳ. τὸ γὰρ μένον, θλίβεται, διὰ τὸ φέρειν· τὸ δ' αἰρόμενον, τείνεται τῷ φέροντι τὸ φορτίον. διόπερ ἀμερὲς οὐδὲν οὕτω κινηθῆναι δυνατόν. οὐ γὰρ ἔχει τήν τε τοῦ πάσχοντος καὶ τοῦ ποιοῦντος * ἐν αὐτῷ διάληψιν.

* κ. τὸ ἄνω

Probl. ſect. 5.8.

* κ. ἐν ταυτῷ

A

CAPVT II.

Præmunit futuram diſputationem tribus hypotheſibus. Prima eſt, Naturam nihil fruſtra facere: Altera, Dimenſiones magnitudinum eſſe ſex: Tertia, Motionum per locum initium eſſe impulſum & tractum.

PErſcrutationis autem principium eſt, ſupponentibus illa nobis quibus vti ſæpenumero in phyſico negotio ſoliti ſumus, accipere ſcilicet ea quæ in omnibus naturæ operibus eodem ſe habent modo. Illorum autem vnum eſt, naturam nihil fruſtra facere, ſed ſemper ex iis quæ cuique animalium generis eſſentiæ contingunt, id quod optimum eſt. B Quamobrem ſi meliùs hoc modo, ita natura ſe habet. Præterea magnitudinum dimenſiones quot qualéſve qualibus inexiſtunt, ſumere oportet. Sunt enim dimenſiones quidem ſex, paria verò tria: vnum quidem ſummum & imum: alterum ante & retro: tertium autem dextrum & ſiniſtrum. Ad hæc autem quòd motionum per locum initia ſunt impulſus, & tractus. hæc enim per ſe ſunt: ex accidenti autem mouetur quod ab alio fertur. non enim ipſum ſemet mouere videtur, ſed ab alio moueri, quod fertur ab alio.

CAPVT III.

C

Exponit modos quibus animalia in ea quæ per locum eſt motione, vtuntur. Deinde monet, omne quod mouetur, duabus minimùm organicis partibus ad motionem vti.

IIS autem conſtitutis, quæ deinceps ſunt, dicamus. Animalium profectò quæcunque loco mouentur, alia quidem toto ſimul corpore mouentur, vt illa quæ ſaltu locum mutant: alia verò per partes, vt quæcunque progreſſibus vtuntur. In vtriſque autem huiuſmodi mutationibus ſemper mutatur id quod mouetur, innisum ad id quod illi ſubiacet. Quamobrem ſiue id citiùs dilabatur quàm vt inniti poſſit id quod ſuper eum D mouetur: ſiue nullum omnino motis præbeat firmamentum, nihil ſuper illud ſe ipſum mouere poterit. Etenim quod ſaltu mouetur, & ad ſe ipſum quod ſupra eſt innisum, & ad id quod pedibus ſubiacet, ſaltum planè facit. Reniſus enim quoſdam ad ſe inuicem habent partes in ipſis flexuris, & omnino ad depreſſum id quod deprimit. Quamobrem pentathli plus ſaliunt ſi halteras habuerint, quàm ſi non habuerint: & qui currunt, citiùs currunt ſi manus commouerint. Niſus namque fit quidam in extenſione ad manus & articulos. Semper autem illud quod mouetur, duabus ad minus organicis vtens partibus mutationem efficit, vt altera quaſi comprimat, altera verò E comprimatur. quod enim ſtat, comprimitur, quoniam fert. quod autem eleuatur, extenditur ad id quod pondus ſuſtinet. Quare nullum carens membris, hoc moueri poteſt modo. Non enim habet cùm agentium tum patientium in ſe partium diſtinctionem.

CAPVT IV.

Explicat quanam ex viuentium numero omnes ſex habent dimenſiones, & quæ illarum quatuor, item quæ duo tantum: & de harum dimenſionum coniugationibus.

QVoniam autem dimenſiones numero quidem ſunt ſex, ex quibus diſtermінari omne natum eſt animal, ſummum videlicet & imum: antè & retro: præterea dextrum & ſiniſtrum: ſummum certè & imum omnia habent viuentia, quoniam non ſolùm in animalibus eſt ſummum & imum, ſed etiam in ſtirpibus. Diſterminantur autem opere, & non ſolum poſitura, quæ ad terram ſcilicet ſit, aut ad cælum. Vnde enim alimenti ſingulis eſt diſtributio, & incrementi acceſſus, ſummum id ſane eſt: quò autem iſthuc vltimò pergit, id eſt imum. Hoc enim initium eſt quoddam, illud verò eſt finis. Initium autem eſt id quod eſt ſummum. Atqui ſtirpibus quidem proprium videri poterit magis id quod eſt imum. Non ſimiliter enim poſitura ſe habent ſummum & imum in iis, & in animalibus. Ad vniuerſum namque non ſimili ſe habent modo: ſecundùm opus autem, ſimiliter. Radices enim ſummum habent in ſtirpibus. namque inde diſtribuitur alimentum iis quæ terra naſcuntur, & illis id accipiunt, vt ore animalia. Quæcunque autem non ſolùm viuunt, ſed animalia etiam ſunt, huiuſmodi omnibus antè & retro inſunt. Senſum etenim iſthæc omnia habent: per ante autem & retro diſterminantur. In quo enim natus eſt eſſe ſenſus, & vnde eſt ſingulis, anteriora huiuſcemodi exiſtunt: iis autem oppoſita, poſteriora. Quæcunque verò animalium non ſolùm ſenſu ſunt prædita, ſed mouere etiam poſſunt ſeſe ea quæ per locum eſt mutatione, in iis ad ea quæ dicta ſunt, ſiniſtrum & dextrum diſterminantur ſimili modo vt illa quæ dicta ſunt priùs, cùm opere ſcilicet & non poſitura eorum vtrumque ſit ſeiugatum. Vnde enim mutationis per locum corporis naturaliter eſt initium, id vnicuique dextrum eſt: oppoſitum verò & quod hoc conſequi natum eſt, ſiniſtrum. Hoc autem in aliis quidem magis, in aliis verò minùs diſtinctum eſt. Quæcunque enim inſtrumentalibus vtentia partibus, pedibus inquam aut alis, aut id generis alio quopiam, ſupradictam efficiunt mutationem, in illis profectò diſtinctum eſt magis quod dictum eſt. Quæcunque verò non iis partibus, ſed ipſo diſtantias facientia corpore progrediuntur, cuiuſmodi nonnulla ſunt quæ pedibus carent, vt ſerpentes, & erucarum genus, & illa etiam quæ terræ vocant inteſtina, iis certè omnibus ineſt quod dictum eſt: verùm ſimiliter non eſt manifeſtum. Quòd autem à dextris motionis eſt initium, indicium eſt, omnes ferre onera in ſiniſtris. Sic enim moueri contingit illud quod fert, cùm abſolutum ſit ipſum mouens. Quamobrem qui ſubſultim vno mouentur pede, faciliùs id in ſiniſtris faciunt. Mouere etenim natum eſt dextrum: moueri autem ſiniſtrum. Quapropter onus non in mouentem partem, ſed in motam inſidere oportet. Si enim in ipſo mouente & motionis principio imponatur, aut non mouebit penitus, aut difficiliùs mouebit. Signum autem quod à dextris motionis ſit initium, ipſæ pedum ſunt proiectiones. Omnes enim quæ ſiniſtra ſunt, proiiciunt.

ΚΕΦΑΛ. δ'.

Περὶ τῶν ἓξ διαστάσεων καὶ ὅτι πᾶσαι ἐν τοῖς ζῴοις διῄρηνται, ἐν δὲ τοῖς φυτοῖς τὸ ἄνω καὶ κάτω μόνον.

ΕΠεὶ δ' εἰσὶν αἱ διαστάσεις τὸν ἀριθμὸν ἕξ, αἷς ὁρίζεσθαι πέφυκε τὰ ζῷα, τό τε ἄνω καὶ τὸ κάτω, καὶ τὸ ἔμπροσθεν καὶ τὸ ὄπισθεν, ἔτι δὲ δεξιὸν καὶ ἀριστερόν· τὸ μὲν ἄνω καὶ κάτω μόριον, πάντα ἔχει τὰ ζῶντα. οὐ μόνον γὰρ ἐν τοῖς ζῴοις ἐστὶ τὸ ἄνω καὶ κάτω, ἀλλὰ καὶ ἐν τοῖς φυτοῖς. διείληπται δ' ἔργῳ, καὶ οὐ θέσει μόνον τῇ πρός τε τὴν γῆν καὶ τὸν οὐρανόν. ὅθεν μὲν γὰρ ἡ τῆς τροφῆς διάδοσις, καὶ αὔξησις ἑκάστοις, ἄνω τοῦτ' ἐστί· πρὸς ὃ δὲ ἔσχατον αὕτη περαίνει, τοῦτο κάτω. τὸ μὲν γὰρ ἀρχή τις, τὸ δὲ πέρας. ἀρχὴ δὲ τὸ ἄνω. καίτοι δόξειεν ἂν τοῖς φυτοῖς οἰκεῖον εἶναι τὸ κάτω μᾶλλον. οὐχ ὁμοίως γὰρ ἔχει τῇ θέσει τὸ ἄνω καὶ κάτω, τούτοις καὶ τοῖς ζῴοις. ἔχει δὲ πρὸς μὲν τὸ ὅλον οὐχ ὁμοίως· κατὰ δὲ τὸ ἔργον, ὁμοίως. αἱ γὰρ ῥίζαι, εἰσὶ τὸ ἄνω τοῖς φυτοῖς. ἐκεῖθεν γὰρ ἡ τροφὴ διαδίδοται τοῖς φυομένοις, καὶ λαμβάνει ταύταις αὐτήν, καθάπερ τὰ ζῷα τοῖς στόμασιν. ὅσα δὲ μὴ μόνον ζῇ, ἀλλὰ καὶ ζῷά εἰσι, τοῖς τοιούτοις ὑπάρχει, τό τε ἔμπροσθεν καὶ τὸ ὄπισθεν. αἴσθησιν γὰρ ἔχει πάντα ταῦτα· ὁρίζεται δὲ κατὰ ταύτην τό τε ἔμπροσθεν καὶ τὸ ὄπισθεν. ἐφ' ᾧ μὲν γὰρ ἡ αἴσθησις πέφυκε, καὶ ὅθεν ἐστὶν ἑκάστοις, ἔμπροσθεν ταῦτ' ἐστί· τὰ δ' ἀντικείμενα τούτοις, ὄπισθεν. Ὅσα δὲ τῶν ζῴων μὴ μόνον αἰσθήσεως κοινωνεῖ, ἀλλὰ δύναται ποιεῖσθαι τὴν κατὰ τόπον αὐτὰ δι' αὑτῶν μεταβολήν, ἐν τούτοις διώρισται πρὸς τοῖς λεχθεῖσι, τό τ' ἀριστερὸν καὶ τὸ δεξιόν, ὁμοίως τοῖς πρότερον εἰρημένοις, ἔργῳ τινί, καὶ οὐ θέσει διωρισμένον ἑκάτερον αὐτῶν. ὅθεν μὲν γὰρ ἡ τοῦ σώματος τῆς κατὰ τόπον μεταβολῆς ἀρχὴ φύσει, τοῦτο μὲν δεξιὸν ἑκάστῳ· τὸ δ' ἀντικείμενον, καὶ τούτῳ πεφυκὸς ἀκολουθεῖν, ἀριστερόν. τοῦτο δὲ διηρθρῶσθαι μᾶλλον ἑτέροις ἑτέρων. ὅσα μὲν γὰρ ὀργανικοῖς μέρεσι χρώμενα (λέγω δ' οἷον ποσίν, ἢ πτέρυξιν, ἢ τινι ἄλλῳ τοιούτῳ) τὴν εἰρημένην μεταβολὴν ποιεῖται, περὶ μὲν τὰ τοιαῦτα μᾶλλον διηρθρῶσθαι τὸ λεχθέν· ὅσα δὲ μὴ τοιούτοις μορίοις, αὐτῷ δὲ τῷ σώματι διαλήψεις ποιούμενα, προέρχεται, καθάπερ ἔνια τῶν ἀπόδων, (οἷον οἵ τε ὄφεις καὶ τὸ τῶν καμπῶν γένος· καὶ πρὸς τούτοις ἃ καλοῦσι γῆς ἔντερα) ὑπάρχει μὲν καὶ ἐν τούτοις τὸ λεχθέν, οὐ μὴν διασεσάφηταί γ' ὁμοίως. ὅτι δ' ἐκ τῶν δεξιῶν ἡ ἀρχὴ τῆς κινήσεώς ἐστι, σημεῖον καὶ τὸ φέρειν τὰ φορτία πάντας ἐπὶ τοῖς ἀριστεροῖς. οὕτως γὰρ ἐνδέχεται κινεῖσθαι τὸ φέρον, λελυμένου τοῦ κινήσοντος. διὸ καὶ ἀσκωλιάζουσι ῥᾷον ἐπὶ τοῖς ἀριστεροῖς. κινεῖν γὰρ πέφυκε τὸ δεξιόν, κινεῖσθαι δὲ τὸ ἀριστερόν. ὥστε καὶ τὸ φορτίον οὐκ ἐπὶ τῷ κινήσοντι, ἀλλ' ἐπὶ τῷ κινησομένῳ δεῖ ἐπικεῖσθαι. ἂν δ' ἐπὶ τῷ κινοῦντι καὶ τῇ ἀρχῇ τῆς κινήσεως ἐπιτεθῇ, ἢ ὅλως οὐ κινήσεται, ἢ χαλεπώτερον. σημεῖον δ' ὅτι ἀπὸ τῶν δεξιῶν ἡ ἀρχὴ τῆς κινήσεως, καὶ αἱ προβολαί. πάντες γὰρ τὰ ἀριστερὰ προβάλλονται.

καὶ ἑστῶτες προβεβλήκασι τὰ ἀριστερὰ μᾶλλον, ἂν μὴ ἀπὸ τύχης συμβῇ. οὐ γὰρ τῷ* προβεβληκότι κινοῦνται, ἀλλὰ τῷ ἀποβεβληκότι καὶ ἀμύνονται τοῖς δεξιοῖς. διὰ ταύτην δὲ τὴν αἰτίαν καὶ τὰ δεξιὰ, τὰ αὐτά ἐστι πάντων. ὅθεν μὲν γὰρ ἡ ἀρχὴ τῆς κινήσεως, τὸ αὐτὸ πᾶσι καὶ ἐν τῷ αὐτῷ τὴν θέσιν ἔχει πᾶσι κατὰ φύσιν. δεξιὸν δ' ἐστὶν, ὅθεν ἡ ἀρχὴ τῆς κινήσεώς ἐστι. καὶ διὰ τοῦτο τὰ στρομβώδη τῶν ὀστρακοδέρμων, δεξιὰ πάντα ἐστίν. οὐ γὰρ ἐπὶ τὴν ἕλικα κινεῖται, ἀλλ' ἐπὶ τὸ καταντικρὺ πάντα προέρχεται· οἷον πορφύραι καὶ κήρυκες. κινουμένων οὖν πάντων ἀπὸ τῶν δεξιῶν, κἀκείνων ἐπὶ ταὐτὰ κινουμένων αὐτοῖς, ἀνάγκη πάντα δεξιὰ εἶναι ὁμοίως. ἀπολελυμένα δ' ἔχουσι τὰ ἀριστερὰ, τῶν ζῴων μάλιστα ἄνθρωποι, διὰ τὸ κατὰ φύσιν ἔχειν μάλιστα τῶν ζῴων· φύσει δὲ βέλτιόν τε τὸ δεξιὸν τοῦ ἀριστεροῦ, καὶ κεχωρισμένον. διὸ καὶ τὰ δεξιὰ ἐν τοῖς ἀνθρώποις μάλιστα δεξιά ἐστι. διωρισμένων δὲ τῶν δεξιῶν, εὐλόγως τὰ ἀριστερὰ ἀκινητότερά ἐστι, καὶ ἀπολελυμένα μάλιστα ἐν τούτοις. καὶ αἱ ἄλλαι δὲ ἀρχαὶ μάλιστα κατὰ φύσιν διωρισμέναι ὑπάρχουσι, τό, τε ἄνω καὶ τὸ ἔμπροσθεν.

* ἢ προβεβλημένῳ κι. τῷ ἀποβεβλημένῳ.

ΚΕΦΑΛ. ε'.

Περὶ τοῦ ἔμπροσθεν καὶ ὄπισθεν, καὶ ἄνω καὶ κάτω.

Οἷς μὲν οὖν τὸ ἄνω καὶ τὸ ἔμπροσθεν διώρισται, καθάπερ τοῖς ἀνθρώποις καὶ τοῖς ὄρνισι, ταῦτα μὲν δίποδα· τῶν δὲ τεττάρων τὰ δύο σημεῖα, τοῖς μὲν πτέρυγες· τοῖς δὲ, χεῖρες καὶ βραχίονές εἰσιν. ὅσα δὲ ἐπὶ τὸ αὐτὸ τὸ πρόσθεν ἔχει καὶ τὸ ἄνω, τετράποδα, καὶ πολύποδα, καὶ ἄποδα. καλῶ γὰρ πόδα, μέρος ἐπὶ σημείῳ πεζῷ κινητικῷ κατὰ τόπον. καὶ γὰρ τὸ ὄνομα ἐοίκασιν εἰληφέναι ἀπὸ τοῦ πέδου οἱ πόδες. ἔνια δὲ ἐπὶ τὸ αὐτὸ ἔχει καὶ τὸ ὄπισθεν, καὶ τὸ πρόσθεν· οἷον τά τε μαλάκια, καὶ τὰ στρομβώδη τῶν ὀστρακοδέρμων. εἴρηται δὲ περὶ αὐτῶν πρότερον ἐν ἑτέροις. Τριῶν δ' ὄντων τόπων, τοῦ ἄνω, καὶ μέσου καὶ κάτω, τὰ μὲν δίποδα τὸ ἄνω πρὸς τὸ τοῦ ὅλου ἔχει ἄνω· τὰ δὲ πολύποδα, ἢ ἄποδα, πρὸς τὸ μέσον· τὰ δὲ φυτὰ, πρὸς τὸ κάτω. αἴτιον δ', ὅτι τὰ μὲν, ἀκίνητα· πρὸς τὴν τροφὴν δὲ τὸ ἄνω· ἡ δὲ τροφὴ ἐκ τῆς γῆς. τὰ δὲ τετράποδα, ἐπὶ μέσον, καὶ τὰ πολύποδα καὶ ἄποδα, διὰ τὸ μὴ ὀρθὰ εἶναι. τὰ δὲ δίποδα πρὸς τὸ ἄνω, διὰ τὸ ὀρθὰ εἶναι· μάλιστα δ' ὁ ἄνθρωπος. μάλιστα γὰρ κατὰ φύσιν ἐστὶ δίπους. Εὐλόγως δὲ καὶ αἱ ἀρχαί εἰσιν ἀπὸ τούτων τῶν μορίων. ἡ μὲν γὰρ ἀρχὴ, τίμιον· τὸ δ' ἄνω, τοῦ κάτω· καὶ τὸ πρόσθεν, τοῦ ὄπισθεν· καὶ τὸ δεξιὸν, τοῦ ἀριστεροῦ τιμιώτερον. καλῶς δὲ ἔχει καὶ τὸ ἀνάπαλιν λέγειν περὶ αὐτῶν, ὡς διὰ τὸ τὰς ἀρχὰς ἐν τούτοις εἶναι, ταῦτα τιμιώτερα τῶν ἀντικειμένων μορίων ἐστίν.

ΚΕΦΑΛ. ϛ'.

Ὅτι τὸ ἄνω καὶ κάτω καὶ δεξιὸν καὶ ἀριστερὸν τῇ αὐτῇ ἀρχῇ καὶ κοινῇ συνήρτηται πρὸς ἄλληλα, τῇ τῆς κινήσεως χρείᾳ· καὶ διὰ τί τοῦτο.

Ὅτι μὲν οὖν ἐκ τῶν δεξιῶν ἡ τῆς κινήσεως ἐστὶν ἀρχὴ, φανερὸν ἐκ τῶν εἰρημένων. ἐπεὶ δ' ἀνάγ-

A Stantes quinetiam ſiniſtra protendunt magis, niſi quid aliter fortè contingat. Non enim à proiecta mouentur parte, ſed ab ea quæ eſt abducta: eóque etiam modo dextra tuentur. Ac propterea eædem in omnibus dextræ ſunt partes. Vnde enim initium eſt motus, idem eſt omnibus, & in eodem omnibus naturaliter ſitum habet. Dextrum autem eſt vnde initium eſt motus. Et eam ob rem in oſtreaceo genere quæcunque ſunt turbinata, vndique dextra ſunt. non enim ad vertiginem mouentur, ſed aduerſum omnia procedunt, vt purpuræ, & buccini. Cùm enim omnia à dextris moueantur, huiuſmodi autem ad eadem ſibiipſis ſemper moueri videantur, omnia ſimiliter eſſe dextra B neceſſe eſt. Abſoluta autem maximè habent ſiniſtra inter reliqua animalia homines, quoniam maximè ſecundùm naturam inter animalia ſe habent reliqua. Melius autem natura dextrum eſt ſiniſtro, & ſeiugatum: iccirco dextra in hominibus maximè ſunt talia. Diſcretis autem dextris, rationabiliter ſiniſtra & ad motum pigriora ſunt, & abſoluta maximè in iſtis. Et alia ſanè initia ſecundùm naturam maximè ſunt diſcreta, ſummum videlicet, & ante.

CAPVT V.

De partibus anterioribus & poſterioribus: item ſuperioribus & inferioribus.

C IN quibus igitur ſummum & ante ſunt diſcreta, vt in hominibus, & auibus, hæc certè ſunt bipeda. Ex quatuor autem duo ſunt notæ, iis quidem alæ, illis verò manus & brachia. Quæcunque autem ad idem, ſummum habent & ante, quadrupeda & multipeda, & apeda. Pedem autem appello partem illam quæ ad pedeſtrem eſt notam, motricem per locum. Nomen namque videntur à pedo, hoc eſt, ſolo, deduxiſſe pedes. Nulla autem priorem & poſteriorem partem in idem habent: vt ex piſcibus mollia, & turbinata ex oſtreaceis. Dictum eſt autem de eiuſmodi priùs in aliis. Cùm autem tria ſint loca, ſummum, medium, & imum: bi- D peda quidem ſummum habent ad id quod in vniuerſo eſt ſummum: multipeda verò & apeda ad medium: ſtirpes autem ad imum. Cauſa autem ea eſt, quoniam illæ quidem non mouentur: ad alimentum autem eſt id quod ſummum eſt: alimentum verò iis è terra eſt. Quadrupeda autem ad medium, & multipeda, & apeda, quia non ſunt erecta: bipeda autem ad id quod ſummum eſt, quoniam erecta ſunt, maximè autem homo, quoniam maximè ſecundùm naturam eſt bipes. Rationabiliter autem initia ab huiuſmodi dicuntur partibus. Initium namque nobile eſt. Summum verò imo, & prius poſteriori, & dextrum ſiniſtro ſunt nobi- E liora. Bene autem ſe habet commutato etiam ordine de illis aſſeuerare. Nam quoniam in illis initia ſunt partibus, iccirco nobiliores iſtas oppoſitis eſſe partibus.

CAPVT VI.

Probat ſummum & imum, necnon dextrum & ſiniſtrum eodem & communi ad ſe inuicem eſſe copulata principio, vnde ſit motus.

QVòd igitur à dextris motionis eſt initium, ex dictis eſt manifeſtum. Quoniam autem eſt

neceſſe in omni continuo, cuius hoc quidem mouetur, illud verò quieſcit, cùm vniuerſum moueri poſſit ſtante altero, aut ambo mouentur per contrarios motus, quiddam eſſe commune ad quod iſthæc ad ſe inuicem ſunt copulata, & eo loci ineſſe motionis principium vtriuſque membri, & ſimiliter ſtatus: manifeſtum eſt quòd ſecundùm quaſcunque dictarum oppoſitionum peculiaris extiterit motus vtrarumque contrariarum partium, omnia hæc commune habent principium ſecundùm dictam partium coniunctionem. Dico autem dextrarum & ſiniſtrarum, ſummarúmque & infimarum, necnon poſteriorum & priorum. Secundùm ante igitur & retro, in eo quod ſe ipſum mouet, nulla talis eſt diſtinctio, quoniam nulli retroverſus naturalis eſt motio: neque diſterminationem id quod mouetur habet vllam per quam ad horum vtrumque efficiat mutationem: ſecundùm dextrum autem & ſiniſtrum, ſummúmq; & imum, reperitur. Quamobrem ex animalibus quæcunque membris vtentia organicis progrediuntur, anterioris & poſterioris diſcrimine non ſunt diſterminata, ſed duobus reliquis, in primis verò illo quod ſecundùm dextrum ſeparatur & ſiniſtrum: quoniam hoc quidem in duobus ſtatim ineſſe neceſſe eſt, illud verò in quatuor primis. Quoniam igitur ſummum & imum, necnon dextrum & ſiniſtrum eodem & communi ad ſe inuicem ſunt copulata principio: (dico autem illud quod motionis eſt princeps:) oportet autem in omni quod à quocunque decenter efficere debet motum, terminari quodam modo, & interuallis ordinariis, ſcilicet quæ ad prædicta ſunt principia, ſiue contrario ſeu eodem ordine ſe habentia eorum quæ in illis ſunt membris: id quod motionum eſt cauſa omnium. Hoc autem eſt, à quo communi principio in animali cùm dextrorſum, tum ſiniſtrorſum, tum ſimiliter ſurſum & deorſum eſt motio. Id autem vnicuique habere, quemadmodum ſimiliter ſe habet ad ſingula principia quæ in prædictis ſunt partibus.

CAPVT VII.

Quòd nullum animal ſanguine præditum pluribus quatuor notis moueatur. & contrà, quodcunque animal quatuor notis tantùm mouetur, id habere neceſſariò ſanguinem. Cur quædam ſanguinem ac pedes multos habentia, diuiſa vitam retineant. De reliquis animantibus quæ & ipſa quatuor notis mouentur.

MAnifeſtum igitur quòd aut ſolis, aut iis maximè animalibus per locum ineſt motio, quæ duabus aut quatuor efficiunt notis eam quæ per locum eſt, mutationem. Quamobrem cùm id ferè ſanguine præditis contingat maximè, palàm eſt quod pluribus quàm quatuor notis animalium ſanguine præditorum moueri poteſt nullum: & ſi quid quatuor ſolummodo moueri natum eſt notis, iſthuc ſanguine præditum eſſe neceſſe eſt. Atteſtantur autem iis quæ dicta ſunt, ea quę animalibus contingere videntur. Nullum enim ex ſanguine præditis animal in fruſta diſſectum, tempore (vt ita dicatur) viuere poteſt aliquo: mutationiſque per locum, qua mouebatur adhuc integrum & non ſectum, haudquaquam eſt particeps. Exanguia autem, & ex multipedum genere nõnulla diſſecta,

A καὶ πρώτως συνεχοῦς, οὗ τὸ μὲν κινεῖται, τὸ δ' ἠρεμεῖ, ὅλου δυναμένου κινεῖσθαι ἑστῶτος θατέρου, ἢ ἄμφω κινεῖται ἐναντίας κινήσεις, εἶναί τι κοινὸν καθ' ὃ συνεχῆ ταῦτ' ἐστὶν ἀλλήλοις, καὶ ἐν ᾧ ὑπάρχει τὴν ἀρχὴν τῆς ἑκατέρου τῶν μερῶν κινήσεως· ὁμοίως δὲ καὶ τῆς στάσεως. δῆλον ὅτι, καθ' ὅσας τῶν λεχθεισῶν ἀντιθέσεων ἰδία κίνησις ὑπάρχει τῶν ἀντικειμένων μερῶν ἑκατέρων, πάντα ταῦτα κοινὴν ἀρχὴν ἔχει κατὰ τὴν τῶν εἰρημένων μερῶν σύμφυσιν· λέγω δὲ τῶν τε δεξιῶν καὶ ἀριστερῶν, καὶ τῶν ἄνω καὶ κάτω, καὶ τῶν ὄπισθεν καὶ τῶν ἔμπροσθεν. κατὰ μὲν οὖν τὸ ἔμπροσθεν καὶ ὄπισθεν διάληψις οὐκ ἔστι τοιαύτη, περὶ τὸ κινοῦν ἑαυτό, διὰ τὸ μηδενὶ φυσικὴν B ὑπάρχειν κίνησιν εἰς τὸ ὄπισθεν, μηδὲ διορισμὸν ἔχειν τὸ κινούμενον, καθ' ὃ τὴν ἐφ' ἑκάτερα τούτων μεταβολὴν ποιεῖται. κατὰ δὲ τὸ δεξιόν τε καὶ ἀριστερόν, καὶ τὸ ἄνω καὶ τὸ κάτω ἐστί. διὸ τῶν ζῴων ὅσα μέρεσιν ὀργανικοῖς χρώμενα πορεύεται, τῇ μὲν τοῦ πρόσθεν καὶ ὄπισθεν διαφορᾷ οὐκ ἔστι διωρισμένα ταῦτα. ταῖς δὲ λοιπαῖς, ἀμφοτέραις μέν, προτέρᾳ δὲ τῇ κατὰ τὸ δεξιὸν καὶ ἀριστερὸν διεζευγμένη, διὰ τὸ ταύτην μὲν ἐν τοῖς δυσὶν εὐθέως ἀναγκαῖον εἶναι ὑπάρχειν, ἐκείνην δὲ ἐν τοῖς τέτταρσι πρώτοις. ἐπεὶ οὖν τὸ ἄνω καὶ κάτω, καὶ δεξιὸν καὶ ἀριστερόν, C τῇ αὐτῇ ἀρχῇ καὶ κοινῇ συνήρτηται πρὸς αὑτά, (λέγω δὲ ταύτην τὴν τῆς κινήσεως κυρίαν) δεῖ δὴ ἐν ἅπαντι τῷ μέλλοντι κατὰ τρόπον ποιεῖσθαι τὴν ἀφ' ἑκάστου κίνησιν, ἀφωρίσθαι πως καὶ τετάχθαι ταῖς ἀποστάσεσι ταῖς πρὸς τὰς ῥηθείσας ἀρχάς, τάς τε ἀντιστοίχους, καὶ τὰς συστοίχους τῶν ἐν τοῖς μέρεσι τούτοις, ὃ τῶν λεχθεισῶν κινήσεων ἁπασῶν αἴτιον. αὕτη δέ ἐστιν, ἀφ' ἧς ἀρχῆς κοινῆς τῶν ἐν τῷ ζῴῳ, ἥ τε τοῦ δεξιοῦ καὶ ἀριστεροῦ κίνησίς ἐστιν· ὁμοίως δὲ καὶ ἡ τοῦ ἄνω καὶ κάτω. ταύτην δ' ἔχειν ἑκάστῳ, ἢ παραπλησίως ἔχει πρὸς ἑκάστην τῶν ἐν τοῖς ῥηθεῖσι μέρεσιν ἀρχῶν.

D

ΚΕΦΑΛ. α'.

Ὅτι πλείοσι τεττάρων σημείοις οὐδὲν οἷόν τε κινεῖσθαι τῶν ἐναίμων. κἂν εἴ τι τέτταρσι σημείοις πέφυκε μόνον κινεῖσθαι, ἀναγκαῖον τοῦτ' εἶναι ἔναιμον. Διὰ τί τῶν ἐναίμων καὶ πολυπόδων ἔνια διῃρημένα δύναται ζῆν. Ὅτι καὶ τὰ ἄποδα τῶν ἐναίμων, καὶ τῶν ἐνύδρων τὰ τὴν μορφὴν ὀφιώδη τέτταρσι κινεῖται σημείοις.

ΔΗλον οὖν ὡς ἢ μόνοις, ἢ μάλιστα τούτοις ὑπάρχει τῶν ζῴων ἡ κατὰ τόπον κίνησις, ἃ δυσὶν ἢ τέτταρσι E ποιεῖται σημείοις τὴν μεταβολὴν τὴν κατὰ τόπον. ὥστ' ἐπεὶ σχεδὸν τοῖς ἐναίμοις τοῦτο μάλιστα συμβέβηκε, φανερὸν ὅτι πλείοσί τε σημείοις τεττάρων, οὐδὲν οἷόν τε κινεῖσθαι τῶν ἐναίμων ζῴων. κἂν εἴ τι τέτταρσι σημείοις πέφυκε μόνον κινεῖσθαι, ἀναγκαῖον τοῦτ' εἶναι ἔναιμον. ὁμολογεῖ δὲ τοῖς λεχθεῖσι καὶ τὰ συμβαίνοντα περὶ τὰ ζῷα. τῶν μὲν γὰρ ἐναίμων οὐδὲν εἰς πλείω διαιρούμενον δύναται ζῆν οὐθένα χρόνον, ὡς εἰπεῖν τῆς τε κατὰ τόπον κινήσεως, καθ' ἣν ἐκινεῖτο συνεχὲς ὂν καὶ μὴ διῃρημένον, οὐ δύναται κοινωνεῖν. τῶν δ' ἐναίμων τε καὶ πολυπόδων ἔνια διαιρούμενα,

δύναται ζῆν πολὺν χρόνον ἑκάστῳ τῶν μερῶν, καὶ κινεῖσθαι τὴν αὐτὴν ἥνπερ καὶ πρὶν διαιρεθῆναι κίνησιν· οἷον αἵ τε καλούμεναι σκολόπενδραι, καὶ ἄλλα τῶν ἐντόμων καὶ προμηκῶν. πάντων γὰρ τούτων καὶ τὸ ὄπισθεν μέρος ἐπὶ τὸ αὐτὸ ποιεῖται τὴν πορείαν τῷ ἔμπροσθεν. αἴτιον δὲ τοῦ διαιρούμενα ζῆν, ὅτι καθάπερ ἂν εἴ τι συνεχὲς ἐκ πολλῶν ἦν ζώων συγκείμενον, οὕτως ἕκαστον αὐτῶν συνέστηκε. φανερὸν δὲ τοῦτο ἐκ τῶν πρότερον εἰρημένων, διότι τοῦτον ἔχει τὸν τρόπον. δυσὶ γὰρ ἢ τέτταρσι σημείοις πέφυκε κινεῖσθαι τὰ μάλιστα συνεστηκότα κατὰ φύσιν. ὁμοίως δὲ καὶ ὅσα τῶν ἐναίμων ἄποδά ἐστι. καὶ γὰρ ταῦτα κινεῖται τέτταρσι σημείοις, δι' ὧν τὴν κίνησιν ποιεῖται. δυσὶ γὰρ χρώμενα προέρχεται καμπαῖς κατὰ τὸ πλεῖστον. τὸ γὰρ δεξιὸν καὶ ἀριστερὸν, καὶ τὸ πρόσθιον καὶ τὸ ὀπίσθιον, ἐν τῷ πλάτει ἐστὶ, ἐν ἑκατέρᾳ τῇ καμπῇ αὐτοῖς· ἐν μὲν τῷ πρὸς τὴν κεφαλὴν μέρει, τὸ πρόσθιον σημεῖον δεξιὸν καὶ ἀριστερόν· ἐν δὲ τῷ πρὸς τὴν οὐρὰν, τὰ ὀπίσθια σημεῖα. δοκεῖ δὲ δυσὶ σημείοις κινεῖσθαι, τῇ τ' ἔμπροσθεν ἀφῇ, καὶ τῇ ὕστερον. αἴτιον δὲ, ὅτι στενὰ κατὰ πλάτος ἐστὶν, ἐπεὶ καὶ ἐν τούτοις τὸ δεξιὸν ἡγεῖται, καὶ ἀνταποδίδωσι κατὰ τὸ ὄπισθεν, ὥσπερ ἐν τοῖς τετράποσι. τῶν δὲ καμψέων αἴτιον τὸ μῆκος. ὥσπερ γὰρ οἱ μακροὶ τῶν ἀνθρώπων λορδοὶ βαδίζουσι, καὶ τοῦ δεξιοῦ ὤμου εἰς τὸ πρόσθεν ἡγουμένου, τὸ ἀριστερὸν ἰσχίον εἰς τὸ ὄπισθεν μᾶλλον ἀποκλίνει, καὶ τὸ μέσον κοῖλον γίνεται καὶ λορδόν· οὕτω δεῖ νοεῖν καὶ τοὺς ὄφεις κινουμένους ἐπὶ τῆς γῆς, λορδοῖς σημείοις. τὸ δ', ὅτι ὁμοίως κινεῖται τοῖς τετράποσιν. ἐν μέρει γὰρ μεταβάλλουσι τὸ κοῖλον καὶ τὸ κυρτόν. ὅταν γὰρ πάλιν τὸ ἀριστερὸν τῶν προσθίων ἡγήσηται, ἐξ ἐναντίας πάλιν τὸ κοῖλον γίνεται. τὸ γὰρ δεξιὸν ἐντὸς γίνεται πάλιν. σημεῖον δεξιὸν πρόσθιον, ἐφ' οὗ α. ἀριστερὸν, ἐφ' οὗ β. ὀπίσθιον δεξιὸν ἐφ' οὗ γ· ἀριστερὸν, ἐφ' οὗ δ. οὕτω δὲ κινοῦνται, τῶν μὲν χερσαίων οἱ ὄφεις, τῶν δ' ἐνύδρων αἱ ἐγχέλυες, καὶ οἱ γόγγροι, καὶ αἱ μύραιναι, καὶ τῶν ἄλλων ὅσα ἔχει τὴν μορφὴν ὀφιωδεστέραν. πλὴν ἔνια μὲν τῶν ἐνύδρων τοιούτων οὐδὲν ἔχει πτερύγια, οἷον αἱ μύραιναι· ἀλλὰ χρῆται τῇ θαλάττῃ, ὥσπερ οἱ ὄφεις τῇ γῇ καὶ τῇ θαλάττῃ· νέουσι γὰρ οἱ ὄφεις ὁμοίως, καὶ ὅταν κινῶνται ἐπὶ τῆς γῆς. τὰ δὲ δύο ἔχει πτερύγια μόνον, οἷον οἵ τε γόγγροι καὶ ἐγχέλυες, καὶ γένος τι κεστρέων, οἳ γίνονται ἐν τῇ λίμνῃ τῇ ἐν Σίφαις. καὶ διὰ τοῦτο ταῖς καμπαῖς ἐλάττοσι κινοῦνται ἐν τῷ ὑγρῷ καὶ ἐν τῇ γῇ, τὰ ζῆν εἰωθότα ἐν τῇ γῇ, καθάπερ τὸ τῶν ἐγχέλεων γένος· οἱ δὲ δύο πτέρυγας ἔχοντες τῶν κεστρέων, τῇ καμπῇ ἀνισάζουσιν ἐν τῷ ὑγρῷ τὰ τέτταρα σημεῖα.

ΚΕΦΑΛ. η'.

Τί τοῖς ὄφεσιν αἴτιον τῆς ἀποδίας. Ὅτι ἅπαν τὸ ὑπόπουν, ἐξ ἀνάγκης ἀρτίους ἔχει τοὺς πόδας.

Τοῖς δ' ὄφεσιν αἴτιον τῆς ἀποδίας, τό, τε τὴν φύσιν μηδὲν ποιεῖν μάτην, ἀλλὰ πάντα πρὸς τὸ ἄριστον ἀποβλέπουσαν ἑκάστῳ τῶν ἐνδεχομένων, καὶ διασῴζουσαν ἑκάστου τὴν ἰδίαν οὐσίαν, καὶ τὸ τί ἦν εἶναι αὐτῷ· ἔτι δὲ καὶ τὸ πρότερον ἡμῖν εἰρημένον, τὸ τῶν ἐναίμων μηθὲν οἷόν τ' εἶναι πλείοσι σημείοις κινεῖσθαι

extenſo tempore ſingulis viuere poſſunt partibus: iis quinetiam agitari motionibus quibus antequam receiſa eſſent, mouebantur: vt eæ quæ vocantur ſcolopendræ, & alia inſectorum & prælongorum genera. In huiuſmodi namque omnibus poſterior pars eodem tendere videtur, quo prior. Cauſa autem eſt quòd iſthæc diſſecta viuant, quòd perinde illorum quodcunque eſt conſtitutum, ac ſi quippiam ex multis compoſitum coniunctúmque eſſet animalibus. Cur autem hoc ſe habent modo, palam eſt ex iis quæ dicta ſunt priùs. Duabus enim aut quatuor notis moueri nata ſunt quæ natura conſtant maximè. Similique modo quæcunque ſanguine prædita pedibus carent. iſthæc enim omnia quaternis mouentur notis, per quas loco ſe commouent. duobus namque vt plurimùm vtentia flexibus procedunt. Dextrum enim & ſiniſtrum, priùs & poſteriùs in latitudine exiſtunt: & in vtroque illorum inflexu, in parte quidem ad caput vergente anterior eſt nota, cùm dextra tum ſiniſtra: in illa autem quæ ad caudam ſpectat, poſteriores ſunt notæ. Videntur autem iſthæc duabus moueri notis, per priorem ſcilicet contactum, & per poſteriorem. Cauſa autem eſt, quoniam anguſtum eſt latitudine id animalium genus. Namque in iis etiam dextrum præcedit, viciſſimque redditur poſterius, vt in quadrupedibus. Inflexionum autem cauſa eſt longitudo. Quemadmodum enim valde proceri homines gradiuntur incurui, & dextro humero in priorem partem vergente, ſiniſtra coxa ad poſteriorem magis recedit, mediúmque concauum fit & incuruum: ita intelligere oportet ſerpentes incuruis notis ſupra terram ſe mouere, & quòd ſimiliter mouentur vt quadrupedes. viciſſim enim commutant concauum & curuum. Quando verò rurſus ſiniſtrum anteriùs procedit, ex contrario rurſus concauum fit. Dextrum enim interius fit denuo. Prior dextra nota vbi a, ſiniſtra vbi b. Dextra poſterior vbi c, ſiniſtra vbi d. Sic autem mouentur ex terreſtribus quidem ſerpentes, ex aquatilium verò genere anguillæ, & congri, & murænæ, & alia prætereà quæcunque ſerpentium formam referunt. Verùm ex aquatilibus quædam pinnas non habent, vt ſunt murænæ, ſed mari perinde vtuntur vt terra ſerpentes & mari. Natant enim eodem ſerpentes modo, quo in terra mouentur. Nonnulla autem duas ſolùm habent pinnulas, vt congri ſunt & anguillæ, & mugilum genus qui in Sipharum lacu naſcuntur. Quamobrem paucioribus mouentur inflexibus in humore & in terra, quæcunque in terra viuere aſſueta ſunt, vt anguillarum eſt genus. Ex mugilum verò genere quicunque duas habent pinnas, corporum inflexione quaternas in humore exæquant notas.

CAPVT VIII.

Cur ſerpentes pedes non habeant: cur omne pedes habens animal, eos pares habeat.

Cauſa autem cur ſerpentes pedibus carent, eſt, tum quòd nihil fruſtra efficit natura, ſed omnia ad optimum reſpiciens vnicuique ex iis quæ fieri poſſunt, ſingulíſque peculiarem conſeruat eſſentiam, & quod quid erat ipſi: tum ob id quod à nobis priùs eſt dictum, nullum ſcilicet ſanguine præditum pluribus quàm quatuor moueri

poſſe notis. Ex iis enim manifeſtum eſt quòd ex ſanguine præditis quæcunque ob longitudinem ad reliquam corporis naturam ſunt enormia, vt ſerpentes, haudquaquam pedeſtria eſſe poſſe. Plures enim quàm quatuor pedes illa habere non eſt poſſibile: exanguia namque eſſent. Si verò duos aut quatuor haberent pedes, immobilia ferè penitus eſſent: adeo neceſſe eſſet illorum motum eſſe tardum, & vſui ineptum. Omne autem pedeſtre animal pares neceſſariò habet pedes. Quæcunque enim ſolo ſaltu eam quæ per locum eſt, faciunt mutationem, nihil ſanè pedibus ad huiuſmodi indigent motum. Quæcunque verò ſaltu quidem vtuntur, ipſis autem is ſufficiens non eſt motus, ſed progreſſu etiam indigent: certum eſt quòd iis quidem melius, illis verò impoſſibile penitus progredi, quoniam omne animal pares habere pedes neceſſe eſt. Cùm enim talis per partes ſit mutatio, & non toto ſimul corpore, vt eſt ſaltus: neceſſe eſt has quidem commutatis pedibus manere, illas verò moueri, & oppoſitis vtrunque horum præſtare, commutans à motis partibus pondus ad illas quæ permanent. Quamobrem neque tribus vtens, neque vno, vllum ingredi poteſt animal. Hoc enim nullum penitus habet fulcrum quo corporis ſuſtineat pondus: illud verò in altera oppoſitionum laborat: quare neceſſe eſt ipſum ita ſe mouere tentans, ruere. Quæcunque autem ſunt multipeda, vt ſcolopendræ, hæc certò imparibus progredi poſſunt pedibus, quemadmodum moueri conſpiciuntur ſi illorum quiſpiam vnum decurtauerit pedem: quoniam contraſtantium mutilationi pedum, illorum frequentiâ qui in alia ſtant parte, ſuccurritur. Fit enim in illis vt mutilati membri tractus ab aliis, & non progreſſio. Attamen manifeſtum eſt quòd melius iſthæc ipſa mutationem efficerent ſi pares haberent pedes, nulloque deficiente contra ſe ſtantes omnes haberent pedes. Ita enim magis æquari poterit pondus neque in alteram partem declinare, ſi contra ſe ſtantia habuerint fulcra, nullúmque oppoſitorum vacuum locum. Procedit autem ab vtraque ſui parte alternatim id quod ingreditur. Ita enim ad eum qui in principio fuit ſitum ſit reſtitutio. Quòd igitur pares habent omnia pedes, & quam ob cauſam, dictum eſt.

CAPVT IX.

Probat, omnem motum qui ſit per locum, quieſcentibus quibuſdam, quibuſdam motis partibus fieri.

QVòd autem niſi quippiam quieſceret, non ſanè eſſet flexus, neque directio, ex iis manifeſtum. Eſt enim flexus ex recto ad curuum aut ad angulum mutatio: directio verò, ex alterutro horum ad rectum. In omnibus autem dictis mutationibus ad vnum neceſſe eſt ſignum rectitudinem fieri. Verumenimvero flexu non exiſtente, neque progreſſio, neque volatus, neq; natatus ſanè erunt. Etenim habentia pedes, quoniam ſuper vtrumque oppoſitorum crurum viciſſim ſtant, pondúſque ſuſtinent, neceſſe habêt altero progrediente inflectere alterum. æqualia namque longitudine nata ſunt habere oppoſita membra: & quod ponderi ſubſtat, rectum eſſe oportet, vt perpendiculum ad

A ἢ τέτταρσιν. ἐκ τούτων γὰρ φανερόν, ὅτι τῶν ἐναίμων ὅσα κατὰ μῆκος ἀσύμμετρά εἰσι πρὸς τὴν ἄλλην τοῦ σώματος φύσιν, καθάπερ οἱ ὄφεις, οὐθὲν οἷόν τε αὐτῶν ὑπόποδα εἶναι. πλείους μὲν γὰρ τεττάρων οὐχ οἷόν τε αὐτὰ πόδας ἔχειν, ἄναιμα γὰρ ἂν ἦν. ἔχοντα δὲ δύο πόδας, ἢ τέτταρας, σχεδὸν ἂν ἀκίνητα * πάντη. οὕτω βραδεῖαν ἀναγκαῖον εἶναι καὶ ἀνωφελῆ τὴν κίνησιν. ἅπαν δὲ τὸ ὑπόπουν ἐξ ἀνάγκης ἀρτίους ἔχει τοὺς πόδας. ὅσα μὲν γὰρ ἅλσει χρώμενα, μόνον ποιεῖται τὴν κατὰ τόπον μεταβολὴν, οὐθὲν ποδῶν πρός γε τὴν τοιαύτην δεῖται κίνησιν· ὅσα δὲ χρῆται μὲν ἅλσει, μὴ ἔστι δ' αὐτοῖς αὐτάρκης αὕτη ἡ κίνησις, ἀλλὰ καὶ πορείας προσδεῖται, δῆλον B ὡς τοῖς μὲν βέλτιον, τοῖς δ' ὅλως ἀδύνατον πορεύεσθαι. διότι πᾶν ζῷον ἀναγκαῖον ἀρτίους ἔχει τοὺς πόδας. οὔσης γὰρ τῆς τοιαύτης μεταβολῆς κατὰ μέρος, ἀλλ' οὐκ ἀθρόως παντὶ τῷ σώματι, καθάπερ τῆς ἅλσεως· ἀναγκαῖον ἐστι τοὺς μὲν, μένειν, μεταβαλλόντων τῶν ποδῶν· τοὺς δὲ κινεῖσθαι· καὶ τοῖς ἀντικειμένοις, τούτων ποιεῖν ἑκάτερον, μεταβάλλον ἀπὸ τῶν κινουμένων ἐπὶ τὰ μένοντα τὸ βάρος. διόπερ τρισὶ μὲν οὐδὲν οὐδενὶ χρώμενον βαδίζειν οἷόν τε. τὸ μὲν γὰρ οὐδὲν ὅλως ὑπόστημα ἔχει, ἐφ' ᾧ τὸ τοῦ σώματος ἔσται βάρος· τὸ δὲ κατὰ τὴν ἑκατέραν ἀντίθεσιν, πονεῖ. ὥστε ἀναγκαῖον, ἂν οὕτως ἐπιχειρῶσι κινεῖσθαι, πίπτειν. ὅσα δὲ πολύποδά ἐστιν, οἷον σκολόπεν- C δραι, τούτοις δύναται μὲν ἀπὸ περιττῶν ποδῶν πορείαν γίνεσθαι, καθάπερ φαίνεται κινούμενα καὶ νῦν, ἐάν τις αὐτῶν ἕνα πηρώσῃ τῶν ποδῶν, διὰ τὸ τὴν τῶν ἀντιστοίχων ποδῶν χώλανσιν ἰᾶσθαι τῷ λοιπῷ πλήθει τῶν ἐφ' ἑκάτερα ποδῶν. γίνεται γὰρ τούτοις οἷον ἔφελξις τοῦ πεπηρωμένου μέρους τοῖς ἄλλοις, ἀλλ' οὐ βάδισις. οὐ μὴν ἀλλὰ φανερὸν ὅτι βέλτιον ἂν καὶ ταῦτα ποιοῖτο τὴν μεταβολὴν, ἀρτίους ἔχοντα τοὺς πόδας, καὶ μηδενὸς ἐλλείποντος, ἀλλ' ἀντιστοίχους ἔχοντα τοὺς πόδας· οὕτω γὰρ αὐτῶν μᾶλλον ἀνισάζειν τε δύναιντο τὸ βάρος, καὶ μὴ ταλαντεύειν ἐπὶ θάτερα μᾶλλον, εἰ ἀντίστοιχα ἐρείσματα ἔχοι, καὶ μὴ κενὴν τὴν χώραν τῶν ἀντικειμένων. προβαίνει D δὲ ἀφ' ἑκατέρου τῶν μερῶν ἐναλλὰξ τὸ πορευόμενον. οὕτω γὰρ εἰς ταὐτὸ τῷ ἐξ ἀρχῆς σχήματι γίνοιτο ἡ κατάστασις. Ὅτι μὲν οὖν ἀρτίους πόδας ἔχει πάντα, καὶ διὰ τίνα αἰτίαν, εἴρηται.

* κ. πάμπα.

ΚΕΦΑΛ. θ'.

Ὅτι εἰ μηδὲν ἦν ἠρεμοῦν, οὐκ ἂν ἦν κάμψις, οὐδ' εὔθυνσις καὶ ἔκτασις· ὥστε οὐδὲ πορεία, ἢ πτῆσις, ἢ νεῦσις.

ὍΤι δὲ εἰ μηδὲν ἦν ἠρεμοῦν, οὐκ ἂν ἦν κάμψις, [οὐδὲ νεῦσις,] οὐδ' εὔθυνσις, ἐκ τῶνδε δῆλον. ἔστι γὰρ κάμψις μὲν, ἡ ἐξ εὐθέος εἰς περιφερὲς, ἢ εἰς γω- E νίαν μεταβολή. εὔθυνσις δὲ, * ἡ ἐκ θατέρου τούτων εἰς τὸ εὐθύ, ἐν ἁπάσαις δὲ ταῖς εἰρημέναις μεταβολαῖς ἀνάγκη πρὸς ἓν σημεῖον [τὴν κάμψιν ἢ] τὴν εὔθυνσιν γίνεσθαι. ἀλλὰ μὴν κάμψεώς [γε] μὴ οὔσης, οὔτ' ἂν πορεία, οὔτε πτῆσις, οὔτε νεῦσις ἦν. τὰ μὲν γὰρ ὑπόποδα ἐπὶ ἑκατέρου τῶν ἀντικειμένων σκελῶν ἐν μέρει ἵσταται, καὶ τὸ βάρος ἴσχει, ἀναγκαῖον θατέρου προβαίνοντος, θατέρου ποιεῖσθαι τὴν κάμψιν. ἴσα τε γὰρ πέφυκεν ἔχειν τῷ μήκει τὰ ἀντίστοιχα κῶλα. καὶ ὀρθὸν δὲ δεῖ εἶναι τὸ ὑφεστὸς τῷ βάρει, οἷον κάθετον πρὸς

* κ. ἢ ἱκανήν

τὴν γῆν. ὅταν δὲ προβαίνῃ, γίνεται ὑποτείνουσα καὶ δυναμένη τὸ μένον μέγεθος καὶ τὴν μεταξύ. ἐπεὶ δὲ ἴσα τὰ κῶλα, ἀνάγκη κάμψαι τὸ μένον, ἢ ἐν τῷ γόνατι, ἢ ἐν τῇ συγκάμψει· οἷον εἰ ἀγόνατόν τι εἴη τῶν βαδιζόντων. σημεῖον δ᾽ ὅτι οὕτως ἔχει. εἰ γάρ τις ἐν γῇ βαδίζοι παρὰ τοῖχον, ἡ γραφομένη ἔσται οὐκ εὐθεῖα, ἀλλὰ σκολιά, διὰ τὸ ἐλάττω μὲν κάμπτοντος γίνεσθαι τὴν γραφομένην· μείζω δέ, ἑστῶτος καὶ ἐξαιροῦντος. ἐνδέχεται μέντοι καὶ μὴ ἔχοντας καμπὴν τὸ σκέλος κινεῖσθαι, ὥσπερ τὰ παιδία ἕρπουσι· καὶ περὶ τῶν ἐλεφάντων ὁ παλαιὸς ἦν λόγος τοιοῦτος, οὐκ ἀληθὴς ὤν. κινεῖται δὲ καὶ τὰ τοιαῦτα κάμψεως γινομένης ἐν ταῖς ὠμοπλάταις, ἢ τῷ ἰσχίῳ· ἀλλ᾽ ὀρθὸν οὐδὲν δύναιτ᾽ ἂν πορευθῆναι συνεχῶς καὶ ἀσφαλῶς. κινηθείη δ᾽ ἄν, οἷον ἐν ταῖς παλαίστραις οἱ διὰ τῆς κόνεως προϊόντες ἐπὶ τῶν γονάτων. πολὺ γὰρ τὸ ἄνω μέρος· ὥστε δεῖ καὶ μακρὸν εἶναι τὸ κῶλον. εἰ δὲ τοῦτο, κάμψιν ἀναγκαῖον εἶναι. * ἐπεὶ γὰρ ἕστηκε πρὸς ὀρθήν, ἢ καταπεσεῖται, ἐλάττονος τῆς ὀρθῆς γενομένης, ἢ οὐ προβήσεται. εἰ γὰρ ὀρθοῦ ὄντος θατέρου σκέλους, θάτερον ἔσται προβεβηκός, μεῖζον ἔσται, ἴσον ὄν. δυνήσεται γὰρ τοῦτο τό, τε ἠρεμοῦν καὶ τὴν ὑποτείνουσαν. ἀναγκαῖον ἄρα κάμπτεσθαι τό, τε προϊόν, καὶ κάμψαν ἅμα ἐκτείνειν θάτερον, [ἐκκλίνειν τε καὶ διαβεβηκέναι, καὶ ἐπὶ τῆς καθέτου μένειν.] ἰσοσκελὲς γὰρ γίνεται τρίγωνον τὰ κῶλα, καὶ ἡ κεφαλὴ γίνεται κατωτέρω, ὅταν κάθετος ᾖ ἐφ᾽ ἧς βέβηκε. τὰ δὲ ἄποδα, τὰ μὲν κυματιζόμενα προέρχεται. τοῦτο δὲ διττῶς συμβαίνει· τὰ μὲν γάρ, ἐπὶ τῆς γῆς, καθάπερ οἱ ὄφεις, τὰς καμπὰς ποιεῖται· τὰ δέ, εἰς τὸ ἄνω, ὥσπερ αἱ κάμπαι. ἡ δὲ κύμανσις, κάμψις ἐστί. τὰ δέ, ἰλυσπαστικῶς χρώμενα, καθάπερ τὰ καλούμενα γῆς ἔντερα καὶ βδέλλαι. ταῦτα γὰρ τῷ μὲν ἡγουμένῳ προέρχεται, τὸ δὲ λοιπὸν σῶμα πᾶν πρὸς τοῦτο συνάγουσι, καὶ τοῦτον τὸν τρόπον εἰς τόπους ἐκ τόπων μεταβάλλουσι. φανερὸν δ᾽ ὅτι εἰ μὴ αἱ δύο τῆς μιᾶς μείζους ἦσαν, οὐκ ἂν ἠδύνατο κινεῖσθαι τὰ κυματιζόμενα τῶν ζῴων. ἐκταθείσης γὰρ τῆς καμπῆς, εἰ ἴσην κατεῖχεν, οὐδὲν ἂν προῄεσαν. νῦν δ᾽ ὑπερβάλλει ἐκταθεῖσα, καὶ ἠρεμήσαντος τούτου, ἐπάγει τὸ λοιπόν. ἐν πάσαις δὲ ταῖς λεχθείσαις μεταβολαῖς, τὸ κινούμενον ὁτὲ μὲν ἐκτεινόμενον εἰς εὐθὺ προέρχεται, ὁτὲ δὲ συγκαμπτόμενον τοῖς μὲν ἡγουμένοις μέρεσιν εὐθὺ γινόμενον, τοῖς δ᾽ ἑπομένοις συγκαμπτόν. ποιεῖται δὲ καὶ τὰ ἁλλόμενα πάντα κάμψιν ἐν τῷ ὑποκειμένῳ μέρει τοῦ σώματος, καὶ τοῦτον τὸν τρόπον ἔχοντα ἅλλεται. καὶ τὰ πετόμενα δὲ καὶ τὰ νέοντα, τὰ μὲν τὰς πτέρυγας εὐθύνοντα καὶ κάμπτοντα πέτεται· τὰ δέ, τὰ πτερύγια· καὶ τούτων τὰ μὲν τέτταρσι, τὰ δὲ δυσίν, * ὅσα προμηκέστερα τὴν μορφήν· οἷον τὸ τῶν ἐγχελύων γένος. τὴν δὲ λοιπὴν κίνησιν, ἀντὶ τῶν δύο πτερύγων τῷ λοιπῷ σώματι καμπτόμενα ἀναπληροῖ, καθάπερ εἴρηται πρότερον. οἱ δὲ πλατεῖς τῶν ἰχθύων, τῷ μὲν τῷ πλάτει χρῶνται τοῦ σώματος ἀντὶ τῶν πτερύγων, τοῖς δὲ πτερυγίοις δυσί. τὰ δὲ πάμπαν πλατέα, καθάπερ ὁ βάτος, αὐτοῖς τοῖς πτερυγίοις, καὶ ταῖς ἐσχάταις τοῦ σώματος περιφερείαις, εὐθύνοντα καὶ κάμπτοντα, ποιεῖται τὴν νεῦσιν.

* κ. ἐπεὶ γὰρ ἕστηκε πρὸς ὀρθήν, ἢ ἀναγκαῖόν ἐστι τὸ κινούμενον εἰς τὸ πρόσθεν, ἢ καταπεσεῖται ἐκτὸς τῆς καθέτου γενομένης, ἢ οὐ προβήσεται.

Alcyonius hãc lectionem eſt ſequutus.

* κ. ὅσα μὴ πρ. mendosè.

A terram. Quando autem progreditur, fit hypotenuſa valens manentem magnitudinem, & eam quæ interiacet. Quoniam autem æqualia ſunt membra, neceſſe eſt inflecti id quod manet, aut in poplite, aut in conflexione: vt ſi quippiam eorum quæ progrediuntur, genibus careat. Signum autem quòd hoc ita ſe habeat, id eſt: Si quis enim iuxta parietem per terram ambulet, quæ deſignatur linea, non eſt recta, ſed obtorta, quoniam minorem quidem flectentis fieri deſcriptam neceſſe eſt, ſtantis autem & erecti maiorem. Contingit autem ſanè crure inflexum non habente moueri, quemadmodum infantes reptant: & de elephantis antiquus huiuſmodi erat ſermo, haudquaquam verus: quippe cùm id B genus omne moueatur inflexione in humeris facta aut coxis. Verùm rectum progredi nullum poteſt continuè & firmiter: moueri autem poterit, vt in palæſtra ij qui per puluerẽ genibus reptant. Ampla eſt enim ſuperior pars, quamobrem magnum etiã debet eſſe membrum. Si autem hoc, flexum eſſe neceſſe eſt. Quoniam enim ſtat ad rectum, vel concidet recto minore effecto, vel non progredietur. Si enim altero crure recto progreditur, alterum maius erit, cùm ſit æquale. Hoc namque poterit & id quod quieſcit, & ipſam hypotenuſam. Neceſſe igitur eſt & inflectere id quod procurrit, & inflexum ſimul alterum extendere. Membra enim æquilaterum trigonum efficiuntur, capútque fit C inferius vbi perpendiculum fuerit in quo firmatur. Quæcunque verò pedibus carent, alia quidem vndoſo procedunt motu. Id autem bifariàm accidit. nam alia quidem ſuper terram, vt ſerpentes, inflectuntur: alia verò supernè curuantur, vt erucæ. Vndoſus autem ille motus, inflexus eſt. Alia verò attractu vtuntur, vt lumbrici, qui terræ inteſtina appellantur, & hirudines. iſthæc etenim parte quidem priore procedunt, reliquúmque corpus ad illam trahunt, illóque modo loca commutant. Manifeſtum autem quòd niſi duæ maiores vna eſſent, animalia illa quæ vndoſo procedunt inflexu, minimè moueri poſſent. Flexu enim extenſo ſi æqualem occuparet, nihil ſanè proceſſiſ- D ſent: verùm extenſus ſuperat: & quieſcente iſto quod reliquum eſt, adducit. In omnibus autem dictis mutationibus id quod mouetur, tum extenſum ad rectum, tum incuruatum progreditur. partibus quidem prioribus rectum factum, poſterioribus verò incuruum. Quæcunque etiam ſaltu vtuntur animalia, flexum in inferna corporis parte faciunt, & hoc ſaliunt modo. Volantia quinetiam & natantia omnia, illa quidem alas tum dirigentia, tum inflectentia volant. Hæc autem id pinnis faciunt. Et in iis alia quidem quatuor, alia verò duabus, quæcunque corpore ſunt oblongiore, vt anguillarum eſt genus. Nam reliquam pro duabus pinnis motionem reſidua corporis parte incuruata perficiunt, quemadmodum dictum eſt priùs. Plani E autem piſces tum pinnarum loco corporis vtuntur latitudine, tum verò pinnulis duabus. Qui autem omnino ſunt plani, qualis eſt raia, tum ipſis natant pinnulis, tum extremo corporis ambitu, illum dirigentes viciſſim & inflectentes.

A

CAPVT X.

Dubitatio de volucrum genere: quomodo aues quatuor notis moueri queant: & de ratione volatus earum.

DVbitare autem quis ſanè poſſet quonam modo aues quaternis moueantur notis, vel dum volant, vel dum ambulant, quaſi dictum ſit quòd ſanguine prædita omnia quatuor mouentur notis. At hoc dictum non eſt, ſed quòd non pluribus. Verumenimvero neque volare poterunt membris ablatis, neque ambulare alis detractis. Nam neque ipſe niſi commotis humeris ambulat homo. Verùm omnia (quemadmodum eſt prædictum) mutationem inflexu & extenſione faciunt. omnia enim in ſuppoſito & quaſi cedente quodamtenus progrediuntur. Quamobrem neceſſe eſt, niſi in alia inflexus fiat parte, at ſaltem vnde eſt principium, iis quidem quæ membranaceas habent alas, ipſius membranæ: auibus autem, ipſarum alarum: cæteris verò, earum partium quæ iſtis proportione reſpondent, vt piſcibus. Nonnullis autem, vt ſunt ſerpentes, in corporum curuaturis inflexionis ineſt principium. Vropygium autem volatili ineſt generi ad dirigendos volatus, vt nauigiis gubernacula: quod neceſſe eſt etiam in ipſa inflecti adhæſione. Quamobrem & illa quæ ex membrana integras habent alas, & illa quæ pennis quidem diſcretas eas habent, verùm vropygium ad eiuſmodi vſum illis eſt ineptum, (vt pauones exiſtunt, & gallinacei, & omnino quæ volacia non ſunt) haudquaquam directè volare poſſunt. Ex iis etenim quæ ex membrana integras habent alas, nulla omnino vropygium habent: quamobrem, vt gubernaculo carens nauigium, feruntur quocunque fors tulerit vnumquodque impactum. Similique modo vaginipenna, vt ſcarabæi, & melolonthæ, & ea quæ nullo inuolucro recondunt pennas, vt apes, & veſpæ. Præterea etiam ex volucrum genere illa quibus inutile eſt vropygium, vt porphyriones, & erodij, & omnes aquaticæ volucres vropygij vice extenſis volant cruribus, illiſque ad dirigendos volatus vtuntur pro vropygio. Vaginipenno autem generi tardus & imbecillis eſt volatus, quoniam ad corporis pondus non ex proportione alarum habent naturam: ſed illud quidem grande eſt, alæ verò paruæ & imbecilles. Quemadmodum igitur ſi quis onerariam nauim remis tentet propellere, ſimili iſthæc modo volatu vtuntur: & alarum naturæque imbecillitas ad id nonnihil facere videtur. Inter aues autem pauoni quidem vropygium quandoque ob magnitudinem nulli vſui eſt: quandoque verò, quoniam decidit, nihil iuuare poteſt. Contrario autem ſe habent modo aues in alarum natura, ad ea quæ integras ex membrana habent alas: maximè autem quæ ex eis ſunt præpetes. Huiuſmodi verò ſunt quæ incuruos habent vngues. Harum namque volandi pernicitas vitæ vſui eſt. Apta autem ad peculiarem illis motum cætera corporis videntur eſſe membra. omnibus enim paruum eſt caput, collum craſſum, pectus cùm validum, tum acutum: & acutum quidem, vt bene viam paret, quaſi lembi prora: validum verò carnis obeſitate, vt incurſantem propellere poſſit aërem, idque ex facili, & nullo labore. Quæ verò retro ſunt, leuia, & in anguſtum rurſus coëuntia,

ΚΕΦΑΛ. Ι.

Ἀπορία· πῶς οἱ ὄρνιθες τέτταρσι σημείοις κινοῦνται, ἢ πορευόμενοι, ἢ πετόμενοι· καὶ περὶ τῆς ὀρνίθων πτήσεως.

ΑΠορήσειε δ' ἄν τις πῶς κινοῦνται τέτταρσι σημείοις οἱ ὄρνιθες, ἢ πετόμενοι, ἢ πορευόμενοι, ὡς εἰρημένου, ὅτι πάντα κινεῖται τὰ ἔναιμα τέτταρσιν. οὐκ εἴρηται δὲ, ἀλλ' ὅτι οὐ πλείοσιν. οὐ μὴν ἀλλ' οὔτ' ἂν πέτεσθαι δύναιντο, ἀφαιρεθέντων τῶν κώλων· οὔτε πορεύεσθαι, τῶν πτερύγων ἀφαιρεθεισῶν· ἐπεὶ οὐδ' ἄνθρωπος βαδίζει μὴ κινῶν B τοὺς ὤμους. ἀλλὰ πάντα γε (καθάπερ εἴρηται) ποιεῖται τὴν μεταβολὴν κάμψει καὶ ἐκτάσει. ἅπαντα γὰρ εἰς τὸ ὑποκείμενον ἐρείδει πως, καὶ οἷον εἰς ὑπεῖκον προέρχεται. ὥστ' ἀναγκαῖον, εἰ μὴ καὶ κατ' ἄλλο μέρος γίνεται ἡ κάμψις, ἀλλ' ὅθεν γε ἡ ἀρχή· τοῖς μὲν ὁλοπτέροις, τοῦ πτεροῦ· τοῖς δ' ὄρνισι, τῆς πτέρυγος· τοῖς δ' ἄλλοις, τοῦ ἀνάλογον μορίου, καθάπερ τοῖς ἰχθύσι. τοῖς δ', ὥσπερ οἱ ὄφεις, ἐν ταῖς καμπαῖς τοῦ σώματός ἐστιν ἡ ἀρχὴ τῆς κάμψεως. τὸ δ' ὀρροπύγιον ἐστὶ τοῖς πτηνοῖς πρὸς τὸ κατευθύνειν τὴν πτῆσιν, καθάπερ τὰ πηδάλια τοῖς πλοίοις. ἀναγκαῖον δὲ καὶ ταῦτα ἐν τῇ προσφύσει κάμπτειν. C διόπερ τά τε ὁλόπτερα καὶ τοῖς σχιζοπτέροις, οἷς τὸ ὀρροπύγιον ἀφυῶς ἔχει πρὸς τὴν εἰρημένην χρῆσιν (οἷον τοῖς τε ταῷς, καὶ τοῖς ἀλεκτρυόσι καὶ ὅλως τοῖς μὴ πτητικοῖς) οὐκ εὐθυποροῦσι· τῶν μὲν γὰρ ὁλοπτέρων οὐδὲν ἁπλῶς ἔχει ὀρροπύγιον· ὥστε καθάπερ ἀπηδάλιον πλοῖον φέρεται, ὅπου ἂν τύχῃ ἕκαστον αὐτῶν προσπίπτον· ὁμοίως τά τε κουλεόπτερα, οἷον κάνθαροι, καὶ μηλολόνθαι· καὶ τὰ ἀνέλυτρα, οἷον μέλιτται καὶ σφῆκες· καὶ τοῖς πτητικοῖς, οἷς ἀχρεῖον τὸ ὀρροπύγιόν ἐστι, οἷον τοῖς τε πορφυρίωσι καὶ ἐρωδιοῖς, καὶ πᾶσι τοῖς πλωτοῖς, ἀντὶ τοῦ ὀρροπυγίου πέτονται τοὺς πόD δας ἀποτείναντα, καὶ χρῶνται ἀντ' ὀρροπυγίου τοῖς σκέλεσι, πρὸς τὸ κατευθύνειν τὴν πτῆσιν. βραδεῖα δὲ ἡ πτῆσις τῶν κουλεοπτέρων ἐστὶ καὶ ἀσθενής, διὰ τὸ μὴ κατὰ λόγον ἔχειν τὴν τῶν πτερῶν φύσιν, πρὸς τὸ τοῦ σώματος βάρος, ἀλλὰ τὸ μὲν πολύ, τὰ δὲ μικρὰ καὶ ἀσθενῆ· ὥσπερ οὖν, εἰ ὁλκάδι καὶ πλοῖον ἐπιχειροίη κώπαις ποιεῖσθαι τὸν πλοῦν, οὕτω ταῦτα τῇ πτήσει χρῆται, καὶ ἡ ἀσθένεια αὐτῶν τε τῶν πτερῶν, καὶ ἡ ἐκ τῆς φύσεως συμβάλλεταί τι πρὸς τὸ λεχθέν. τῶν δ' ὀρνίθων τῷ μὲν ταῷ τὸ ὀρροπύγιον, ὁτὲ μὲν ἄχρηστον διὰ τὸ μέγεθος, ὁτὲ δὲ διὰ τὸ ἀποβάλλειν, οὐδὲν ὠφελεῖ. ὑπε-E ναντίως δὲ ἔχουσιν οἱ ὄρνιθες τοῖς ὁλοπτέροις τὴν τῶν πτερῶν φύσιν. μάλιστα δὲ οἱ τάχιστα αὐτῶν πετόμενοι. τοιοῦτοι δὲ οἱ γαμψώνυχες. τούτοις γὰρ ἡ ταχυτὴς τῆς πτήσεως χρήσιμος εἰς τὸν βίον. ἀκόλουθα δὲ αὐτῶν ἔοικεν εἶναι καὶ τὰ λοιπὰ τοῦ σώματος μέρη πρὸς τὴν οἰκείαν κίνησιν. κεφαλὴ μὲν ἁπάντων μικρά, καὶ αὐχὴν οὐ παχύς, στῆθος ἰσχυρὸν καὶ ὀξύ. ὀξὺ μέν, πρὸς τὸ εὔπορον εἶναι, καθάπερ ἂν εἰ πλοίου πρῷρα λεμβώδους· ἰσχυρὸν δὲ τῇ περιφύσει τῆς σαρκός, ἵν' ἀπωθεῖν δύνηται τὸν προσπίπτοντα ἀέρα* καὶ τοῦτον ῥᾳδίως, καὶ μὴ μετὰ πόνου. τὰ δ' ὄπισθεν, κοῦφα καὶ συνήκοντα πάλιν εἰς στενόν,

* κ. ὁ ἀπὸ τῶν πτερῶν.

ἵνα ἐπακολουθῇ τοῖς ἔμπροσθεν, μὴ σύροντα τὸν ἀέρα διὰ τὸ πλάτος. Καὶ περὶ μὲν τούτων διωρίσθω τὸν τρόπον τοῦτον.

ΚΕΦΑΛ. ια'.

Ὅτι τὸ μέλλον ὀρθὸν βαδίζεσθαι, δίπουν τε ἀναγκαῖον ἐστὶν εἶναι, καὶ τὰ μὲν ἄνω κουφότερα ἔχειν, τὰ δὲ κάτω βαρύτερα. Οἱ ὄρνιθες διὰ τί δίποδες.

ΤΟ δὲ μέλλον ζῷον ὀρθὸν βαδίζεσθαι, ὅτι δίπουν τε ἀναγκαῖον ἐστὶν εἶναι, καὶ τὰ μὲν ἄνω τοῦ σώματος μέρη κουφότερα ἔχειν, τὰ δὲ ὑφεστῶτα τούτοις βαρύτερα, δῆλον. μόνως γὰρ ἂν οὕτως ἔχον, οἷόν τ' εἴη φέρειν ἑαυτὸ ῥᾳδίως. διόπερ ἄνθρωπος ὀρθὸς μόνον τῶν ζῴων ὤν, τὰ σκέλη [κατὰ λόγον] ἔχει πρὸς τὰ ἄνω τοῦ σώματος, μέγιστα τῶν ὑποπόδων, καὶ ἰσχυρότατα. δῆλον δὲ ποιεῖ τοῦτο καὶ τὸ συμβαῖνον τοῖς παιδίοις. οὐ γὰρ δύνανται βαδίζειν ὀρθά, διὰ τὸ πάντα νανώδη εἶναι, καὶ μείζω καὶ ἰσχυρότερα ἔχειν ἢ κατὰ λόγον, τὰ ἄνω μέρη τοῦ σώματος τῶν κάτω. προϊούσης δὲ τῆς ἡλικίας, αὔξησιν λαμβάνει τὰ κάτω μᾶλλον, μέχρι ἂν λάβωσι τὸ προσῆκον μέγεθος, καὶ ποιοῦνται τότε τοῖς σώμασι τὴν βάδισιν ὀρθήν. οἱ δ' ὄρνιθες, κοῦφοι ὄντες, δίποδές εἰσι, διὰ τὸ ὄπισθεν αὐτοῖς τὸ βάρος εἶναι, καθάπερ ἐργάζονται τοὺς ἵππους τοὺς χαλκοῦς, τοὺς τὰ πρόσθια ἠρκότας τῶν σκελῶν. αἴτιον δὲ μάλιστα τοῦ δίποδας ὄντας δύνασθαι ἑστάναι, τὸ ἔχειν τὸ ἰσχίον ὅμοιον μηρῷ, καὶ τηλικοῦτον ὥστε δοκεῖν δύο μηροὺς ἔχειν, τόν τ' ἐν τῷ σκέλει πρὸ τῆς καμπῆς, καὶ τὸν πρὸς τοῦτο τὸ μέρος ἀπὸ τῆς ἕδρας· ἔστι δ' οὐ μηρός, ἀλλὰ ἰσχίον. εἰ γὰρ μὴ τηλικοῦτον ἦν, οὐκ ἂν ἦν ὄρνις δίπους. ὥσπερ γὰρ τοῖς ἀνθρώποις καὶ τοῖς τετράποσι ζῴοις, εὐθὺς ἂν ἦν ἀπὸ βραχέος ὄντος τοῦ ἰσχίου, ὁ μηρὸς καὶ τὸ ἄλλο σκέλος. λίαν οὖν ἂν ἦν τὸ σῶμα προπετὲς αὐτῶν. νῦν δὲ μακροῦ ὄντος, μέχρι πρὸς μέσην παρατείνει τὴν γαστέρα· ὥστ' ἐντεῦθεν τὰ σκέλη ὑπηρειδόμενα φέρει τὸ σῶμα πᾶν. φανερὸν δ' ἐκ τούτων, καὶ ὅτι ὀρθὸν οὐκ ἐνδέχεται τὸν ὄρνιθα εἶναι ὥσπερ τὸν ἄνθρωπον. ἡ γὰρ τῶν πτερύγων φύσις, ὡς ἔχουσα τὸ σῶμα νῦν οὕτως, εὐθὺς χρήσιμός ἐστιν. ὀρθοῖς δ' οὖσιν, ἄχρηστος ἂν ἦν, ὥσπερ γράφουσι τοὺς ἔρωτας ἔχοντας πτέρυγας. ἅμα γὰρ τοῖς εἰρημένοις δῆλον, ὅτι οὐδ' ἄνθρωπον, οὐδ' ἄλλο τι τῶν τοιούτων τὴν μορφὴν δυνατόν ἐστιν εἶναι πτερωτόν· οὐ μόνον ὅτι πλείοσι σημείοις κινήσεται ἢ τέτταρσιν ἔναιμον ὄν, ἀλλ' ὅτι ἄχρηστος αὐτοῖς ἡ τῶν πτερύγων ἕξις, κατὰ φύσιν κινουμένοις. ἡ δὲ φύσις οὐδὲν ποιεῖ παρὰ φύσιν.

ΚΕΦΑΛ. ιβ'.

Διὰ τί ὁ ἄνθρωπος τοὺς μὲν βραχίονας κάμπτει ἐπὶ τὰ κοῖλα, τὰ δὲ σκέλη ἐπὶ τὸ κυρτόν. οἱ δὲ ὄρνιθες καὶ τὰ τετράποδα ἐναντίως.

ὍΤι μὲν οὖν εἰ μὴ κάμψις ἦν ἐν τοῖς σκέλεσιν, ἢ ἐν τοῖς ὠμοπλάταις καὶ ἰσχίοις, οὐδὲν οἷόν τ' ἦν τῶν ἐναίμων καὶ ὑποπόδων προβαίνειν, εἴρηται πρότερον, καὶ ὅτι κάμψις οὐκ ἂν ἦν, μηδενὸς ἠρεμοῦντος. ὅτι τε ἐναντίως οἱ ἄνθρωποι δίποδες ὄντες, καὶ οἱ ὄρνιθες, τὴν [τῶν] σκελῶν ποιοῦνται κάμψιν. ἔτι τε τὰ τετράποδα ὑπεναντίως καὶ αὐτοῖς καὶ τοῖς ἀνθρώποις.

A vt priora conſequi poſſint, latitudine aërem non trahentia. Et de iis quidem hoc determinatum ſit modo.

CAPVT XI.

Docet, neceſſe eſſe vt animalia quæ recta debeant incedere, bipeda ſint, & partes inferiores corporis grauiores, ſuperiores autem leuiores habeant.

QVòd autem erectum ambulare debet animal, quod quidem neceſſariò ſit bipes, & ſupernas corporis habeat partes leuiores, grauiores B autem eas quæ illis ſubſtant, eſt manifeſtum. Eo enim ſolùm ſe habens modo ſe ipſum facilè ferre poterit. Quamobrem ſolus inter animalia homo erectus exiſtens crura habet ad ſupernas corporis partes ex pedeſtribus maxima & firmiſſima. Quod ſanè palàm facit id quod infantibus accidit: non enim erecti ambulare poſſunt, quoniam omnes ſunt pumiliones, maioreſque & valentiores quàm dictet ratio ſummas inis corporis habent partes: procedente verò ætate infima maius accipiunt incrementum, donec ad iuſtam perueniant magnitudinem: túmque erecti ambulare poſſunt. Aues autem cùm ſint leues, bipedes exiſtunt, quoniam retro verſus illis eſt onus, ceu æneos faciunt equos qui priora ſurſum elata habent crura. Cauſa au- C tem cur maximè bipedes exiſtentes aues ſtare valeant, eſt quoniam habent clunem femori ſimilem, talémque, vt duo videantur habere femora, id ſcilicet quod eſt in crure antè inflexum: & illud quod à ſedis loco ad hanc tendit partem. Eſt autem non femur, ſed clunis. Niſi enim eſſet tanta, auis ſanè bipes non eſſet. Quemadmodum enim hominibus, & quadrupedum generi, ſi ab exigua ſtatim coxa eſſet femur & reliquum crus, valde profectò ad lapſus pronum illarum eſſet corpus. Nunc autem longa exiſtens ad medium vſque protenditur ventrem. Quamobrem ibidem ſuffulta crura vniuerſum geſtant corpus. Manifeſtúmque etiam ex iis eſt quòd erectæ perinde ac homines nequeunt eſſe aues. Alarum enim natura ita ſe D habente corpore, illis eſt vtilis. Quòd ſi erectæ eſſent, ad nullum ſanè eſſet vſum: quales alatos pingunt Amores. Simúlque ex iis quæ dicta ſunt, palàm eſt neque hominem neque aliud quippiam tali figura alatum eſſe poſſe: non ſolùm quoniam pluribus quàm quatuor moueretur notis ſanguine præditum animal, ſed quoniam is alarum habitus illis naturaliter motis nulli vſui eſſe poſſet. Natura autem nihil contra naturam facit.

CAPVT XII.

E *Cur homines brachia quidem ad cauum, crura verò ad conuexum flectant: aues autem & quadrupeda animalia contrario modo.*

QVòd igitur niſi inflexus eſſet in cruribus, aut humeris, aut coxis, nullum ſanguine pedibuſque præditum progredi poſſet animal, priùs eſt dictum, ſimilique modò quòd nullo quieſcente nullus eſſe poſſet inflexus: & quòd homines, cùm ſint bipedes, & aues contrariis crurum vtuntur inflexibus. Quinetiam quòd quadrupedes contrario ad ſe ipſos & ad homines inflectant modo.

Homines etenim brachia quidem ad concauum inflectunt: crura verò ad conuexum: quadrupedes autem priora quidem crura ad conuexum: poſteriora verò ad concauum: ſimilique modo aues. Cauſa autem eſt, quoniam (vt dictum eſt priùs) nihil temerè efficit natura, ſed omnia ex iis quæ fieri contingunt, ad id quod eſt melius. Cùm igitur omnibus quibus pedum opera naturaliter ineſt is qui per locum eſt motus, ſtante quidem vnoquoque pondus illic eſt, motis autem in ante, præuium ſitu pedem oportet eſſe leuem: continuata verò progreſſione, rurſum in illum pondus reſumere, manifeſtum eſt id eſſe neceſſarium, eo quòd tum crus inflectitur, tum rurſum rectum efficitur manente ſecundùm protenſum pedem ſigno & tibia ipſa. Hoc autem ſimul contingere, & progredi animal. Quòd ſi præcedens quidem crus flexum in ante habuerit, fieri poteſt: ſi retro, non eſt poſſibile. Sic enim antè lato corpore cruris erit extenſio: illo autem modo, ſi retro feratur. Præterea etiam flexu retro verſus exiſtente duobus fieret motibus ipſa pedum poſitura ſibi inuicem contrariis: altera quidem retro: altera verò ante. Neceſſarium enim eſt in cruris inflexione, femoris quidem extremum retrorſum deducere: tibiam verò ab inflexu pedum in ante mouere. Quòd ſi in ante inflexus fuerit, neque contrariis motibus, & vno qui in ante eſt, prædicta continget progreſſio. Et homo quidem bipes exiſtens, locáque naturaliter cruribus permutans, ob retro dictam cauſam in ante flectit crura: brachia verò non ſine ratione ad concauum. Contrario enim inflexa modo inutilia ſanè eſſent cùm ad manuum vſum, tum ad aſſumendos cibos. Quadrupedes autem quæ animal pariunt, priora quidem crura, quoniam progreſſioni illorum ſunt præuia, & in priori eadem corporis ſunt parte, neceſſariò ad curuum inflectunt, ea de cauſa qua homines. In hoc enim ſimili ſe habent modo: quamobrem & ipſi in ante flectunt quadrupedes quo dictum eſt modo. Ita enim inflexu facto multùm attollere poterunt crura. Contrario autem flectentes modo, modicum à terra illa attollere poterunt, quoniam & totum femur, & inflexus ille cui adhæret tibia, progrediente illo ſub ventre dantur. Poſteriorum verò crurum ſiquidem eſſet in ante inflexio, pedum certè eleuatio ſimiliter ſe haberet vt in prioribus. Ad modicum enim illorum eſſet elatio, cùm femur, inflexióque ipſa ſub ventris caderent locum. Si autem retrouerſus, vt nunc inflectunt, nulli illis ad progreſſionem ſunt impedimento in huiuſmodi pedum motu. Præterea earum ex numero quæ fœtus lacte nutriunt, ad talem operam vel neceſſe vel melius eſt crura ſic inflecti. non enim facile iis eſſet, ſi intrinſecus crura inflecterent, ſub ſe habere ſobolem, & fouere.

A οἱ γὰρ ἄνθρωποι τοὺς μὲν βραχίονας κάμπτουσιν ἐπὶ τὰ κοῖλα, τὰ δὲ σκέλη ἐπὶ τὸ κυρτόν· τὰ δὲ τετράποδα, τὰ μὲν πρόσθια σκέλη ἐπὶ τὸ κυρτόν, τὰ δ' ὀπίσθια, ἐπὶ τὸ κοῖλον· ὁμοίως δὲ καὶ οἱ ὄρνιθες. αἴτιον δ', ὅτι ἡ φύσις οὐδὲν δημιουργεῖ μάτην, ὥσπερ εἴρηται πρότερον, ἀλλὰ πάντα πρὸς τὸ βέλτιστον ἐκ τῶν ἐνδεχομένων. ὥστ' ἐπεὶ πᾶσιν ὅσοις ὑπάρχει κατὰ φύσιν ἡ κατὰ τόπον μεταβολὴ τοῖν σκελοῖν, ἑστῶτος μὲν ἑκάστου, τὸ βάρος ἐν τούτῳ ἐστί· κινουμένοις δὲ εἰς τὸ πρόσθεν, δεῖ τὸν πόδα τὸν ἡγούμενον τῇ θέσει κοῦφον εἶναι· συνεχοῦς δὲ τῆς πορείας γινομένης, αὖθις ἀναλαμβάνειν ἐν τούτῳ τὸ βάρος. B δῆλον ὡς ἀναγκαῖον ἐκ τοῦ κεκάμφθαι τὸ σκέλος αὖθίς τε εὐθὺ γίνεσθαι μένοντος, τοῦ τε κατὰ τὸν προωσθέντα πόδα σημείου καὶ τῆς κνήμης. τοῦτο δὲ συμβαίνειν ἅμα καὶ προϊέναι τὸ ζῷον, εἰς τὸ ἔμπροσθεν μὲν ἔχοντος τὴν καμπὴν τοῦ ἡγουμένου σκέλους, δυνατόν· εἰς τοὔπισθεν δὲ, ἀδύνατον. οὕτω μὲν γὰρ προενεχθέντος τοῦ σώματος, ἡ ἔκτασις τοῦ σκέλους ἔσται, ἐκείνως δὲ ἀνενεχθέντος. ἔτι δὲ εἰς τὸ ὄπισθεν μὲν τῆς καμπῆς οὔσης, διὰ δύο κινήσεων ἐγίγνετ' ἂν ἡ τοῦ ποδὸς θέσις ὑπεναντίως τε αὐταῖς, καὶ τῆς μὲν εἰς τὸ ὄπισθεν, τῆς δὲ εἰς τὸ ἔμπροσθεν· ἀναγκαῖον γὰρ ἐν τῇ συγκάμψει τοῦ σκέλους, τοῦ μὲν μηροῦ τὸ ἔσχατον εἰς τὸ ὄπισθεν προσάγειν, τὴν δὲ κνήμην C ἀπὸ τῆς καμπῆς εἰς τὸ ἔμπροσθεν τὸν πόδα κινεῖν. εἰς τὸ ἔμπροσθεν δὲ τῆς καμπῆς οὔσης, οὔτε ὑπεναντίαις κινήσεσι, μιᾷ τε τῇ εἰς τὸ ἔμπροσθεν, ἡ λεχθεῖσα πορεία συμβήσεται. ὁ μὲν οὖν ἄνθρωπος, δίπους ὤν, καὶ τὴν κατὰ τόπον μεταβολὴν κατὰ φύσιν τοῖς σκέλεσι ποιούμενος, διὰ τὴν εἰρημένην αἰτίαν κάμπτει εἰς τὰ ἔμπροσθεν τὰ σκέλη· τοὺς δὲ βραχίονας, ἐπὶ τὸ κοῖλον· εὐλόγως· ἄχρηστοι γὰρ ἦσαν καμπτόμενοι εἰς τοὐναντίον, πρός τε τὴν τῶν χειρῶν χρῆσιν, καὶ πρὸς τὴν τῆς τροφῆς λῆψιν. τὰ δὲ τετράποδα καὶ ζῳοτόκα, τὰ [μὲν] ἔμπροσθεν σκέλη, ἐπεὶ ἡγεῖταί τε τῆς πορείας αὐτῶν, καὶ D ἔστι ταῦτ' ἐν τῷ μέρει τῷ ἔμπροσθεν τοῦ σώματος, ἀνάγκη κάμπτειν ἐπὶ τὴν περιφέρειαν, διὰ τὴν αὐτὴν αἰτίαν, ὥσπερ καὶ οἱ ἄνθρωποι. κατὰ γὰρ τοῦτο ὁμοίως ἔχουσι. διόπερ καὶ τὰ τετράποδα κάμπτει εἰς τὰ πρόσθεν τὸν εἰρημένον τρόπον. καὶ γὰρ οὕτως μὲν τῆς κάμψεως αὐτῶν γινομένης, ἐπὶ πολὺ δυνήσονται τοὺς πόδας μετεωρίζειν. ἐναντίως δὲ κάμπτοντες, μικρὸν ἀπὸ τῆς γῆς ἂν αὐτοὺς ἐμετεώριζον, διὰ τό τόν τε μηρὸν ὅλον καὶ τὴν καμπὴν, ἐφ' ἧς ἡ κνήμη πέφυκεν, ὑπὸ τῇ γαστρὶ γίγνεσθαι προϊόντος αὐτοῦ. τῶν δ' ὄπισθεν σκελῶν, εἰ μὲν ἦν εἰς τὸ ἔμπροσθεν ἡ κάμψις, ὁ τῶν ποδῶν ἂν μετεωρισμὸς ὁμοίως αὐτοῖς εἶχε τοῖς προσθίοις. ἐπὶ βραχὺ E γὰρ ἂν ἐγίγνετο καὶ τούτοις κατὰ τὴν ἄρσιν τῶν σκελῶν, τοῦ τε μηροῦ καὶ τῆς καμπῆς, ἀμφοτέρων ὑπὸ τὸν τῆς γαστρὸς τόπον ὑποπιπτόντων. εἰ δ' εἰς τὸ ὄπισθεν καθάπερ καὶ νῦν κάμπτουσιν, οὐδὲν ἐμπόδιον αὐτοῖς γίγνεται πρὸς τὴν πορείαν, ἐν τῇ τοιαύτῃ κινήσει τῶν ποδῶν. ἔτι τοῖς γε θηλαζομένοις αὐτῶν καὶ πρὸς τὴν τοιαύτην λειτουργίαν ἀναγκαῖον, ἢ βέλτιόν γ', οὕτω κεκάμφθαι τὰ σκέλη. οὐ γὰρ ῥᾴδιον τὴν κάμψιν ποιουμένων ἐντὸς, ὑφ' αὑτὰ ἔχειν τὰ τέκνα καὶ σκεπάζειν.

A

ΚΕΦΑΛ. ιγ'.

Ποῖον ζῷον ποίῳ κάμπτεται τῆς κάμψεως τρόπῳ.

ΟΝτων δὲ τεττάρων τρόπων τῆς κάμψεως κατὰ τὰς συνδέσεις (ἀνάγκη γὰρ κάμπτειν, ἢ ἐπὶ τὸ κοῖλον καὶ τὰ πρόσθια καὶ ὀπίσθια, καθάπερ ἐφ' οἷς α· ἢ ἐπὶ τοὐναντίον ἐπὶ τὸ κυρτόν, ἐφ' οἷς β· ἢ ἀντεστραμμένως μὴ ἐπὶ τὰ αὐτά, ἀλλὰ τὰ μὲν πρόσθια ἐπὶ τὸ κυρτόν, τὰ δ' ὀπίσθια ἐπὶ τὸ κοῖλον, καθάπερ ἐφ' οἷς τὸ γ· ἢ τοὐναντίον τούτοις, τὰ μὲν κυρτὰ πρὸς ἄλληλα· τὰ δὲ κοῖλα ἐκτός, καθάπερ ἔχει ἐφ' οἷς τὸ δ·) ὡς μὲν ἔχει ἐφ' οἷς τὸ α ἢ τὸ β, οὐθὲν κάμπτει οὔτε τῶν διπόδων, οὔτε τῶν τετραπόδων· ὡς δὲ τὸ γ, τὰ τετράποδα· ὡς δὲ τὸ δ, τῶν μὲν τετραπόδων οὐδέν, πλὴν ὁ ἐλέφας· ὁ δ' ἄνθρωπος τούς τε βραχίονας καὶ τὰ σκέλη. τοὺς μὲν γὰρ ἐπὶ τὸ κοῖλον κάμπτει, τὰ δὲ σκέλη ἐπὶ τὸ κυρτόν· ἀεὶ δ' ἐναλλὰξ ἐναντίως ἔχει τὰ κῶλα τὰς κάμψεις τοῖς ἀνθρώποις, οἷον τὸ ἀλέκρανον ἐπὶ τὸ κοῖλον· ὁ δὲ καρπὸς τῆς χειρὸς ἐπὶ τὸ κυρτόν· καὶ πάλιν ὁ ὦμος ἐπὶ τὸ κυρτόν. ὡσαύτως δὲ καὶ τῶν σκελῶν, ὁ μηρὸς ἐπὶ τὸ κοῖλον· τὸ δὲ γόνυ, ἐπὶ τὸ κυρτόν· ὁ δὲ πούς, τοὐναντίον ἐπὶ τὸ κοῖλον. καὶ τὰ κάτω δὴ πρὸς τὰ ἄνω, φανερὸν ὅτι ἐναντίως· ἡ γὰρ ἀρχὴ ὑπεναντίως· ὁ μὲν ὦμος, ἐπὶ τὸ κυρτόν· ὁ δὲ μηρός, ἐπὶ τὸ κοῖλον· καὶ τὸ μὲν ἀλέκρανον, ἐπὶ τὸ κοῖλον· τὸ δὲ γόνυ, ἐπὶ τὸ κυρτόν· ὁ δὲ πούς, τοὐναντίον, ἐπὶ τὸ κοῖλον· αἱ μὲν οὖν κάμψεις τῶν σκελῶν τοῦτον τὸν τρόπον ἔχουσι, καὶ διὰ ταύτας τὰς αἰτίας.

CAPVT XIII.

De quatuor inflexionum modis qui in organicis animalium membris fiunt.

CVm autem quatuor inflexionum in iuncturis ſint modi, (neceſſe eſt enim inflectere vel ad concauum tam priora quàm poſteriora crura, vt in a: vel contrario modo ad curuum, vt in b: aut conuerſo modo, & non ad eadem, ſed priora quidem ad curuum, poſteriora verò ad concauum, vt in c: aut modo contrario, curua quidem ad ſe inuicem, concaua autem extra, vt d ſe habet:) certè B vt ſe habent a & b, bipedum aut quadrupedum inflectit nullum: vt autem c, quadrupedes: vt verò d, quadrupedum quidem nullum, elephanto excepto: homo autem brachia & crura. Brachia namque ad concauum flectit, crura verò ad curuũ. Semper autem in hominibus commutatim contrarios membra habent inflexus, vt cubitus ad concauum: manus autem carpus ad curuum: rurſúſque humerus ad curuum. Similique modo in cruribus femur ad concauum, genu verò ad curuum: pes autem contrario modo ad concauum. Et inferiora profectò ad ſuperiora manifeſtum eſt contrario ſe habere modo: principia namque contraria: humerus quidem ad curuum: femur autem ad C concauum: & cubitus ſanè ad concauum: genu verò ad curuum: pes verò contrario modo, ad concauum. Et crurum quidem inflexus tales ob cauſas hoc ſe habent modo.

ΚΕΦΑΛ. ιδ'.

Διὰ τί τὰ τετράποδα κατὰ διάμετρον κινεῖ τοὺς πόδας, καὶ ἵσταται. καὶ ὅτι ὁμοίως κινεῖται τὰ πολύποδα.

ΚΙνεῖται δὲ τὰ ὀπίσθια πρὸς τὰ ἔμπροσθεν κατὰ διάμετρον. μετὰ γὰρ τὸ δεξιὸν τῶν ἔμπροσθεν, τὸ ἀριστερὸν τῶν ὄπισθεν κινοῦσιν· εἶτα τὸ ἀριστερὸν τῶν ἔμπροσθεν· μετὰ δὲ τοῦτο, τὸ δεξιὸν τῶν ὄπισθεν. αἴτιον δ', ὅτι εἰ μὲν τὰ ἔμπροσθεν ἅμα * καὶ πρῶτον, διέσπαστο ἄν, ἢ καὶ προπετὴς ἐγίνετο ἡ βάδισις, οἷον ἐφελκομένοις τοῖς ὄπισθεν τῇ πάσῃ· ἔτι δ' οὐ πορεία, ἀλλὰ ἅλσις τὸ τοιοῦτον. χαλεπὸν δὲ συνεχῆ ποιεῖσθαι τὴν μεταβολήν, ἀλλόμενον. σημεῖον δέ· ταχὺ γὰρ ἀπαγορεύουσι καὶ νῦν τῶν ἵππων ὅσοι τὸν τρόπον * τοιοῦτον ποιοῦνται τὴν κίνησιν, οἷον οἱ πομπεύοντες. χωρὶς μὲν οὖν τοῖς ἔμπροσθεν καὶ ὄπισθεν, διὰ ταῦτα οὐ ποιοῦνται τὴν κίνησιν. εἰ δὲ τοῖς δεξιοῖς ἀμφοτέροις πρώτοις, ἔξω ἂν ἐγίγνοντο τῶν ἐρεισμάτων καὶ ἂν ἔπιπτον. εἰ δὴ ἀνάγκη μέν, ἢ τούτων τῶν τρόπων ὁποτερονοῦν ποιεῖσθαι τὴν κίνησιν, ἢ κατὰ διάμετρον, μὴ ἐνδέχεται δὲ ἐκείνων μηδέτερον, ἀνάγκη κινεῖσθαι κατὰ διάμετρον. οὕτω γὰρ κινούμενα ὥσπερ εἴρηται, οὐδέτερα τούτων οἷόν τε πάσχειν. καὶ διὰ τοῦτο οἱ ἵπποι καὶ ὅσα τοιαῦτα, ἵσταται) προβεβηκότα κατὰ διάμετρον, καὶ οὐ τοῖς δεξιοῖς ἢ τοῖς ἀριστεροῖς ἀμφοτέροις ἅμα. τὸν αὐτὸν δὲ τρόπον καὶ ὅσα πλείους ἔχει πόδας τεττάρων, ποιεῖται τὴν κίνησιν. ἀεὶ γὰρ ἐν τοῖς τέτταρσι τοῖς ἐφεξῆς τὰ ὀπίσθια πρὸς τὰ ἔμπροσθεν κινεῖται κατὰ διάμετρον. δῆλον δ' ἐπὶ τοῖς βραδέως κινουμένοις.

* γρ. ἢ ὄπισθεν,

* γρ. τοῦτον

CAPVT XIV.

Cur omnes quadrupedes per diametrum moueantur, & quòd non quadrupedes ſolùm, ſed omnia etiam pedeſtria animalia ſic moueantur.

MOuentur autem poſteriora ad priora per diametrum. Poſt enim dextrum prius, D ſiniſtrum mouet poſterius. Ita ſiniſtrum prius, poſt illud autem dextrum poſterius. Cauſa autem eſt, quoniam ſi priora ſimul & prius, diſtraheretur ſanè, aut procidua eſſet ambulatio, & quaſi tractis extenſione poſterioribus. Præterea etiam non progreſſus huiuſmodi eſſet, ſed ſaltus. Difficile autem eſt mutationem continuam facere ſalientem. Huius autem rei ſignum, quòd citò laſſeſcunt equi illi qui hoc mouentur modo: vt ij qui in pompis agitantur, ſeorſum quidem prioribus poſterioribúſve ob hoc non mouentur. Si autem vtriſque dextris primis, extrà ſanè fulcrorum fierent ſuſtentacula, rueréntque. Si igitur eſt neceſſe aut iſtorum v- E trouis modorum motionem fieri, aut per diametrum, neutro autem illorum contingit modorum, per diametrum motionem effici neceſſe eſt. Hoc enim mota modo, illorum neutrum pati poterunt. Et hanc ob rem equi, iſtiuſmodique cætera, ſtant ſecundùm diametrum protendentia, & non dextris aut ſiniſtris vtriſque ſimul. Eodem etiam modo quæcunque plures quaternis habent pedes, motionem faciunt. Semper enim in quatuor deinceps poſitis poſteriores ad priores per diametrum mouent. Palam autem hoc eſt in iis quæ tardè mouentur.

Cancri

Cancri quinetiam eodem mouētur modo: ex multipedum nāque ſunt genere. ij etenim ſemper per diametrum mouentur quò progredi contendunt. Peculiari nāque modo id progreditur animal. Solum enim ex animalium numero non in ante mouetur, ſed in latus. Verùm quoniam oculis id quod ante eſt, diſterminatur, eos natura commodos effecit, qui crura conſequi poſſent. In latus enim illi mouentur.* Quamobrem cancros etiam in ante quodammodo moueri contingit.

CAPVT XV.

Docet, aues crura ſua inflectere ad concauam circuli circumferentiam, ſicut & quadrupedes poſteriora crura. Quodque volantium omnium & aquatilium pinnas gerentibus, hæc motus inſtrumenta ipſorum in latus & obliquum naturaliter exeunt.

AVes autem vt quadrupedes crura inflectunt ſua. illarum namque natura ſimili ferè ſe habet modo. Auibus enim alæ priorum vicem habent crurum, quamobrem eodem inflexæ ſunt modo, vt illis priora ſunt crura. namque iis in eo qui ambulationis eſt motu, ab alis iſthæc originem habet mutatio. Volatus enim eſt harum peculiaris motio: quapropter illis ablatis neque ſtare neque progredi vlla ſanè poteſt auis. Præterea cùm bipes auium ſit genus, neque erectum, & priores corporis partes leuiores habeat: aut neceſſarium eſt, aut certè melius, vt ſtare poſſint, ſubiectum ſic habere femur, retrouerſus dico connatum. Verumenimuero ſi hoc oportebat ſe habere modo, crurum etiam inflexus ad concauum fieri neceſſe erat, ſicut in poſterioribus quadrupedum eſt cruribus, eandem ob cauſam quam de iis quæ animal pariunt, quadrupedibus, retro adduximus. Omnino autem aues omnes, & ex eo volatili genere quæcumque ex membrana integras gerunt alas: tum verò illa quæ in humore natant, inſtrumentiſque quibuſdam in humore iter faciunt, non difficile eſt animaduertere, melius ſanè illis eſſe membrorum huiuſmodi ex obliquo exortus habere, quales nunc illis ineſſe cōſpiciuntur: vt in auibus, & iis quæ membranaceas habent alas: idque ipſum in piſcibus. Auibus namque alæ, aquatilibus autem pinnæ, membranaceas autem habentibus alas membranulæ ex obliquo adhæreſcunt. Ita enim cùm celerrime, tum valentiſſimè diuidentia hæc quidem aërem, illa verò humorem, motum efficere poterunt. In ante namque & retrouerſus corporis conſequi poterunt partes, in cedenti ſcilicet tranſlatæ cùm humore, tum aërē.* Ex quadrupedum verò genere quæ cauernas ſubeunt, & oua pariunt, quales crocodili ſunt, & lacertæ, & ſtelliones, necnon lutariæ teſtudines & terreſtres, omnia iſthæc ex obliquo crura habent annexa, & humi extenſa, in obliquúmque illa inflectunt, ob ſubintrandi facilitatem, & ad ouorum incubitum & cuſtodiam. Cùm verò extra ſunt, neceſſe eſt vt protenſis femoribus & ſub ſe datis corpus attollant. Hoc autem facto illa nō aliter quàm extrinſecus inflectere poſſunt.

καὶ οἱ καρκίνοι γὰρ τὸν αὐτὸν τρόπον κινοῦνται· τῶν πολυπόδων γάρ εἰσιν. ἀεὶ γὰρ ὅπη κατὰ διάμετρον κινοῦνται, ἐφ' ὅπερ ἂν ποιῶνται τὴν πορείαν. ἰδίως γὰρ τοῦτο τὸ ζῷον ποιεῖται τὴν κίνησιν. μόνον γὰρ οὐ κινεῖται ἐπὶ τὸ πρόσθεν τῶν ζῴων, ἀλλ' ἐπὶ τὸ πλάγιον. ἀλλ' ἐπεὶ τοῖς ὄμμασι διώρισται τὸ πρόσθεν, ἡ φύσις πεποίηκεν ἀκολουθεῖν δυναμένοις τοῖς ὀφθαλμοῖς τοῖς κώλοις. κινοῦνται γὰρ εἰς τὸ πλάγιον αὐτοῖς· ὥστε τρόπον τινὰ καὶ τοῖς καρκίνοις κινεῖσθαι διὰ τοῦτο ἐπὶ τὸ ἔμπροσθεν.

ΚΕΦΑΛ. ιε΄.

Διὰ τί οἱ ὄρνιθες τὰ κῶλα καθάπερ τὰ τετράποδα κάμπτουσι. Διὰ τί τινὰ ζῷα τὰ τῆς κινήσεως ὄργανα ἐκ τοῦ πλαγίου ἔχουσι.

ΟΙ δ' ὄρνιθες τὰ σκέλη, καθάπερ τὰ τετράποδα κάμπτουσι. τρόπον γάρ τινα παραπλησίως ἡ φύσις αὐτῶν ἔχει. τοῖς γὰρ ὄρνισιν αἱ πτέρυγες ἀντὶ τῶν προσθίων σκελῶν εἰσι· διὸ κεκαμμέναι τὸν αὐτὸν εἰσὶ τρόπον, ὥσπερ ἐκείνοις τὰ πρόσθια σκέλη· ἐπεὶ τῆς ἐν τῇ πορείᾳ κινήσεως τούτοις ἀπὸ τῶν πτερύγων ἡ κατὰ φύσιν ἀρχὴ τῆς μεταβολῆς. πτῆσις γάρ ἐστιν ἡ τούτων οἰκεία κίνησις. διόπερ ἀφαιρεθέντων τούτων, οὔθ' ἑστάναι, οὔτε προϊέναι δύναιτ' ἂν οὐθεὶς ὄρνις. ἔτι δίποδος ὄντος καὶ οὐκ ὀρθοῦ, καὶ τὰ ἔμπροσθεν μέρη τοῦ σώματος κουφότερα ἔχοντος, ἢ ἀναγκαῖον, ἢ βέλτιον πρὸς τὸ ἑστάναι δύνασθαι τὸν μηρὸν οὕτως ὑποκείμενον ἔχειν. λέγω δ' ὅτι εἰς τὸ ὄπισθεν πεφυκότα. ἀλλὰ μὴν εἰ ἔδει τοῦτον ἔχειν τὸν τρόπον, ἀνάγκη τὴν κάμψιν ἐπὶ τὸ κοῖλον γίνεσθαι τοῦ σκέλους, καθάπερ τοῖς τετράποσιν ἐπὶ τῶν ὀπισθίων διὰ τὴν αὐτὴν αἰτίαν, ἥνπερ εἴπομεν ἐπὶ τῶν τετραπόδων καὶ ζῳοτόκων. ὅλως δὲ οἵ τε ὄρνιθες καὶ τὰ ὁλόπτερα τῶν πετομένων, καὶ τὰ ἐν τῷ ὑγρῷ νευστικά, ὅσα αὐτῶν δι' ὀργάνων ποιεῖται τὴν ἐπὶ τοῦ ὑγροῦ πορείαν, οὐ χαλεπὸν ἰδεῖν, ὅτι βέλτιον ἐκ πλαγίου τὴν τῶν εἰρημένων μερῶν πρόσφυσιν ἔχειν, καθάπερ καὶ φαίνεται νῦν ὑπάρχειν αὐτοῖς, ἐπί τε τῶν ὀρνίθων καὶ τῶν ὁλοπτέρων. ταὐτὸ δὲ τοῦτο καὶ ἐπὶ τῶν ἰχθύων. τοῖς μὲν γὰρ ὄρνισιν αἱ πτέρυγες, τοῖς δ' ἐνύδροις τὰ πτερύγια. τὰ δὲ πτίλα τοῖς ὁλοπτέροις ἐκ τοῦ πλαγίου προσπέφυκεν. οὕτω γὰρ αἱ τάχιστα καὶ ἰσχυρότατα διαστέλλοντα, τὰ μὲν τὸν ἀέρα, τὰ δὲ τὸ ὑγρόν, ποιοῖτο τὴν κίνησιν. εἰς γὰρ τὸ ἔμπροσθεν καὶ τὸ ὄπισθεν τὰ μόρια τοῦ σώματος ἐπακολουθοίη ἂν ὑπείκοντι φερόμενα, τὰ μὲν ἐν τῷ ὑγρῷ, τὰ δ' ἐν τῷ ἀέρι. τὰ δὲ τρωγλοδυτικὰ τῶν τετραπόδων καὶ ᾠοτόκων, οἷον οἵ τε κροκόδειλοι, καὶ σαῦροι, καὶ ἀσκαλαβῶται, * αἱ μύδες τε καὶ χελῶναι, πάντα ἐκ τοῦ πλαγίου προσπεφυκότα τὰ σκέλη ἔχει, καὶ ἐπὶ τῇ γῇ κατατεταμένα, καὶ κάμπτει εἰς τὸ πλάγιον, διά τε τὴν τῆς ὑποδύσεως ῥᾳστώνην, καὶ πρὸς τὴν ἐπὶ τοῖς ᾠοῖς ἐφεδρείαν καὶ φυλακήν. ἔξω δ' ὄντων αὐτῶν, ἀναγκαῖον τοῖς μηροῖς προστέλλοντα καὶ ὑποτιθέμενα ὑφ' ἑαυτά, τὸν μετεωρισμὸν τοῦ σώματος ποιεῖσθαι. τούτου δὲ γινομένου κάμπτειν αὐτὰ οὐχ οἷόν τε ἄλλως, ἢ ἔξω.

* γρ. μύδες. vide De reſpiratione cap. 1.

A

ΚΕΦΑΛ. ιϛ'.

Αἴτιον τῆς θέσεως τῶν ποδῶν τῶν ἀναίμων πεζοπόδων.

Τὰ δ' ἄναιμα τῶν πεζοπόδων, ὅτι μὲν πολύποδά ἐστι, καὶ οὐθὲν αὐτῶν ἐστι τετράπουν, πρότερον ἡμῖν εἴρηται. διότι δ' αὐτῶν ἀναγκαῖον ἦν, πλὴν τῶν ἐσχάτων, ἔκ τε τοῦ πλαγίου προσπεφυκέναι, καὶ εἰς τὸ ἄνω τε τὰς καμπὰς ἔχειν, καὶ αὐτὰ ὑποβλαισὰ εἶναι εἰς τοὔπισθεν, φανερόν. ἁπάντων γὰρ τῶν τοιούτων ἀναγκαῖον ἐπὶ τὰ μέσα τῶν σκελῶν καὶ ἡγούμενα εἶναι καὶ ἑπόμενα. εἰ οὖν τοῦτ' αὐτοῖς ἔνεστιν, ἤδη αὐτὰ καὶ εἰς τὸ ἔμπροσθεν καὶ εἰς τοὔπισθεν τὴν κάμψιν ἔχειν, διὰ μὲν τὸ ἡγεῖσθαι, εἰς τὸ ἔμπροσθεν· διὰ δὲ τὸ ἀκολουθεῖν, εἰς τὸ ὄπισθεν. ἐπεὶ δ' ἀμφότερα συμβαίνει ἀμφοῖν αὐτοῖς, διὰ τοῦτο βεβλαισῶσθαί τε καὶ εἰς τὸ πλάγιον ἔχει τὰς καμπάς, πλὴν τῶν ἐσχάτων. ταῦτα δ' ὥσπερ πέφυκε μᾶλλον, τὰ μὲν ὡς ἑπόμενα, τὰ δ' ὡς ἡγούμενα. ἔτι δὲ κέκαμπται τὸν τρόπον τοῦτον, καὶ διὰ τὸ πλῆθος τῶν σκελῶν. ἧττον γὰρ οὕτως ἂν ἐν τῇ πορείᾳ ἐμποδίζοι τε αὐτὰ αὐτοῖς εἴη καὶ προσκρούοι. ἥ τε βλαισότης αὐτῶν ἐστι, διὰ τὸ τρωγλοδυτεῖν ἢ πάντα, ἢ τὰ πλεῖστα. οὐ γὰρ δεῖ τε ὑψηλὰ εἶναι [τὰ ζῷα] πρὸς τὸν βίον τοῦτον. οἱ δὲ καρκίνοι τῶν πολυπόδων περιττότατοι πεφύκασιν. οὐ γὰρ εἰς τὸ πρόσθεν ποιοῦνται τὴν πορείαν· πλὴν (ὥσπερ εἴρηται πρότερον) πολλούς τε τοὺς ἡγουμένους ἔχουσι μόνοι τῶν ζῴων. τούτου δ' αἴτιον ἡ σκληρότης τῶν ποδῶν, καὶ ὅτι χρῶνται οὐ νεύσεως χάριν αὐτοῖς, ἀλλὰ πορείας· πεζεύουσι γὰρ διατελοῦσι. πάντων μὲν οὖν τῶν πολυπόδων εἰς τὸ πλάγιον αἱ καμπαί, ὥσπερ καὶ τῶν τετραπόδων ὅσα τρωγλοδυτεῖ. τοιαῦτα δ' ἐστίν, οἱ σαῦροι καὶ κροκόδειλοι, καὶ τὰ πολλὰ τῶν ᾠοτοκούντων· αἴτιον δ', ὅτι τρωγλοδυτεῖ, τὰ μὲν τοῖς τόκοις, τὰ δὲ καὶ τὸν βίον πάντα. ἀλλὰ τῶν μὲν ἄλλων βλαισοῦται τὰ κῶλα, διὰ τὸ μαλακὰ εἶναι· τῶν δὲ καράβων ὄντων σκληροδέρμων, οἱ πόδες εἰσὶν ἐπὶ τὸ νεῖν, καὶ οὐ τοῦ βαδίζειν χάριν. τῶν δὲ καρκίνων ἡ κάμψις εἰς τὸ πλάγιον. καὶ ἐπιβεβλαίσωται ὥσπερ τοῖς ᾠοτόκοις, καὶ τοῖς ἐναίμοις καὶ πολύποσι, διὰ τὸ σκληρόδερμα εἶναι τὰ κῶλα καὶ ὀστρακώδη, ὅτι οὐ νευστικὰ καὶ τρωγλοδυτεῖ· πρὸς τῇ γῇ γὰρ ὁ βίος. καὶ σφαιροειδὴς δὲ τὴν μορφήν, καὶ οὐκ ἔχων ὀρροπύγιον, ὥσπερ ὁ κάραβος. πρὸς τὴν νεῦσιν γὰρ τοῖς καράβοις χρήσιμον· ὁ δ', οὐ νευστικός. καὶ ὅμοιον δὲ τῷ ὄπισθεν τὸ πλάγιον ἔχει μέρος, διὰ τὸ πολλοὺς ἔχειν τοὺς ἡγεμόνας πόδας. τούτου δ' αἴτιον, ὅτι οὐ κάμπτει εἰς τὸ πρόσθεν, οὐδὲ βεβλαίσωται. τοῦ δὲ βεβλαισῶσθαι τὸ αἴτιον, εἴρηται πρότερον, ἡ σκληρότης, καὶ τὸ ὀστρακῶδες τοῦ δέρματος. ἀνάγκη δὴ διὰ ταῦτα, πάντα τε προηγεῖσθαι, καὶ εἰς τὸ πλάγιον. εἰς μὲν τὸ πλάγιον, ὅτι εἰς τὸ πλάγιον* ἡ κάμψις· πάντα δέ, ὅτι ἐνεπόδιζον ἂν οἱ ἠρεμοῦντες πόδες τοῖς κινουμένοις. οἱ δὲ * ψηττώδεις τῶν ἰχθύων, ὥσπερ οἱ ἑτερόφθαλμοι βαδίζουσιν, οὕτω νέουσι· διέστραπται γὰρ αὐτῶν ἡ φύσις. οἱ δὲ στεγανόποδες τῶν ὀρνίθων νέουσι τοῖς ποσί, διὰ μὲν τὸ τὸν ἀέρα δέχεσθαι καὶ ἀναπνεῖν, δίποδές εἰσι· διὰ δὲ τὸ ἔχειν ἔνυγρον τὸν βίον,

* κ. ἡ κάμψις πλαγία. αἴτιον δὲ ὅτι [illegible]

* κ. ψηττώδεις

CAPVT XVI.

Inflexionum modos circa organica membra in multipedum genere explicat.

Ex pedeſtribus autem, quæcumque ſanguine carent, & quidem multipeda ſint, nullúmque eorum ſit quadrupes, à nobis dictum eſt prius. Quamobrem verò in illis neceſſe eſt pedes præterquam extremos ex obliquo eſſe connatos, & cùm ſurſum verſus inflexiones habere, tum ipſos obliquos retrorſum vergere, palam certè eſt. Omnium enim talium media certè crura cùm præ-B cedere, tum ſubſequi neceſſe eſt. Quod ſi hoc illis ineſt, in anteriorem profectò partem, & in poſteriorem inflexum habere oportet: quoniam quidem præcedunt, in priorem: quoniam verò ſubſequuntur, in poſteriorem. Quoniam autem ambo illi hæc illi contingere neceſſe eſt, eam ob rem torqueri, & in obliquum exire pedum inflexus neceſſe eſt, præterquàm extremorum. illi enim vt nati ſunt magis, ij quidem vt præcedant, illi verò vt ſubſequantur. Præterea hoc etiam inflectunt modo propter crurum multitudinem. Minùs enim ita in progreſſione ſibiipſis ſunt impedimento, & minùs offendunt. Eorúmque etiam ideo eſt diſtortio, quoniam cauernas ſubeant, vel omnia, vel plurima. non enim C elata hoc eſſe modo poſſunt. Cancri autem inter multipeda maximè ſunt ſpectabiles. non enim in ante progrediuntur, niſi vt dictum eſt prius: ſolique animalium multos habent præuios pedes. Huiuſce autem rei cauſa eſt tum pedum ipſorum durities, tum quòd ipſis non ad natatus vtuntur, ſed ad progreſſus. pedeſtrem enim degunt vitam. Omnium igitur multipedum in obliquum ſunt inflexus, quemadmodum ex quadrupedibus ea quæ cauernas ſubeunt, qualia ſunt lacertæ, crocodili, multaque præterea huiuſmodi quæ oua pariunt. Cauſa autem eſt, quoniam hæc quidem cauernas ſubeunt D partus tempore: alia verò per omnem vitam. Verùm aliorum quidem propter mollitudinem obtorta vacciáque fiunt crura: carabi autem cùm duri ſint tergoris, pedes ad natandum, non ad progrediendum aptos habent. Cancrorum autem inflexus in obliquum agitur: & etiam eſt obtortus & vaccius, vt ouiparis, & ſanguine præditis, & multipedibus, quoniam prædura ſunt & oſtreacea eiuſmodi membra, cùm neque natent, & cauernas ſubeant. Iuxta terram namque illis eſt vita. Rotundæ quinetiam figuræ eſt cancer, neque caudam habet, quemadmodum carabus. Ad natandum namque carabis vtilis eſt cauda. is autem non eſt natatilis: ſimilémque poſtremæ parti obliquã habet par-E tem, quoniam multos præuios habet pedes. Cuius rei cauſa eſt, quoniam neque in ante inflectit, neque obtorquetur. Cauſa autem cur torqueatur, dicta eſt prius, durities ſcilicet, & oſtreaceum tergus. Propter hæc igitur omnes habere præuios, & in obliquum neceſſe eſt. In obliquum quidem, quoniam inflexio eſt in obliquum: omnes autem præuios, quoniam quieſcentes pedes, iis qui mouentur, impedimento ſanè eſſent. Piſces autem ij qui paſſerina ſunt figura, eodem modo natant quo monoculi ambulant. Diſtorta etenim illorum eſt natura: auium autem planipedes pedibus natant. Quæ quoniam aërem admittunt, & reſpirant, bipedes ſunt. Quia verò in humore vitam agunt,

planipedes ſunt. Pro pinnis enim vſui illis ſunt pedes eiuſmodi exiſtentes. Crura autem habent non vt aliæ in medio, ſed retrorſum magis. Cùm enim breuia habeant crura, ſi retrouerſus illa fuerint, ad natatum ſunt commoda. Breuibus autem ſunt cruribus eiuſmodi aues: quoniam quod crurum longitudini dempſit natura, pedibus appoſuit, & pro longitudine cruribus craſſitudinem, & pedibus latitudinem dedit. Vſui enim magis craſſa ſunt quàm longa ad propellendum humorem cùm natant.

CAPVT XVIII.

De conuenientia quæ eſt inter organica membra piſcium atque auium.

Recta etiam ratione volucres quidem pedes habent, piſces verò illis carent. Volucribus enim vita in ſicco eſt, ſublimes autem ſemper manere haudquaquam poſſunt: quamobrem vt pedes habeant, neceſſe eſt. Piſcibus autem in humore vita eſt, & aquam admittunt, non aërem. Pinnæ igitur illis ad natandum commodæ, pedes verò inutiles. Quòd ſi vtraque haberent, ſanguine certè carerent. Aues autem quodammodo & piſces ſimiliter ſe habent. Auibus namque alę in ſuperiori ſunt parte, illis verò pinnæ duæ parte prona. Et auibus quidem in ſupina corporis parte ſunt pedes: illis verò in ſupinis iuxta pronas pinnæ ſunt pluribus. Et aues prętereà vropygium habent, illi verò caudam.

CAPVT XIX.

Quæſtio de motu oſtreaceorum, & eiuſdem ſolutio.

De oſtreaceis autem ambigere quiſpiam ſanè poſſet, quiſnam illorum ſit motus: & ſi neque dextrum habent, neque ſiniſtrum, vnde moueri incipiant. Videntur autem moueri. An vt mutilum vniuerſum iſtuc ſtatuere oportet genus, & eo moueri modo ac ſi quis pedeſtrium crura decurtauerit, vt vitulus marinus, & veſpertilio. Iſthæc enim quadrupeda ſunt, ſed peruersè. Oſtreacea autem mouentur quidem, verùm præter naturam mouentur. non enim mobilia ſunt: ſed vt ſubſtantia quidem & hærentia, mobilia: vt progredientia verò, ſtare videntur: cancri quinetiam perperam dextras habent partes, habent tamen. Indicio autem eſt brachium. Maius enim & robuſtius eſt dextrum, ceu ſiniſtra à dextris diſterminari cupiant. De partibus igitur cùm aliis, tum iis quæ ad inceſſum animalium faciunt, necnon ad omnem per locum mutationem, hoc ſe habet modo. His autem ſic determinatis proximum eſt de anima contemplari.

A στεγανόποδες. ἀντὶ πτερυγίων γὰρ χρήσιμοι οἱ πόδες αὐτοῖς, τοιοῦτοι ὄντες· ἔχουσι δὲ τὰ σκέλη οὐχ ὥσπερ οἱ ἄλλοι κατὰ μέσον, ἀλλ᾽ ὄπισθεν μᾶλλον. βραχυσκελῶν γὰρ αὐτῶν ὄντων, ὄπισθεν ὄντα πρὸς τὴν νεῦσιν χρήσιμα. βραχυσκελῆ δ᾽ εἰσὶν οἱ τοιοῦτοι, διότι ἀπὸ τοῦ μήκους τῶν σκελῶν ἀφελοῦσαν τὴν φύσιν, προστεθεῖναι εἰς τοὺς πόδας, καὶ ἀντὶ τοῦ μήκους πάχος ἀποδεδωκέναι τοῖς σκέλεσι, καὶ πλάτος τοῖς ποσί. χρήσιμοι γὰρ παχεῖς ὄντες μᾶλλον ἢ μακροὶ πρὸς τὸ ἀποβιάζεσθαι τὸ ὑγρὸν, ὅταν νέωσιν.

ΚΕΦΑΛ. ιη'.

Διὰ τί τὰ μὲν πτηνὰ πόδας ἔχει, οἱ δ᾽ ἰχθύες ἄποδες, καὶ περὶ τῆς τούτων ἀναλογίας.

B Εὐλόγως δὲ καὶ τὰ μὲν πτηνὰ πόδας ἔχει, οἱ δ᾽ ἰχθύες ἄποδες. τοῖς μὲν γὰρ ὁ βίος ἐν τῷ ξηρῷ· μετέωρον δ᾽ ἀεὶ μένειν ἀδύνατον· ὥστ᾽ ἀνάγκη πόδας ἔχειν. τοῖς δ᾽ ἰχθύσιν ἐν τῷ ὑγρῷ ὁ βίος, καὶ τὸ ὕδωρ δέχονται, οὐ τὸν ἀέρα. τὰ μὲν οὖν πτερύγια χρήσιμα πρὸς τὸ νεῖν, οἱ δὲ πόδες ἄχρηστοι. εἰ δ᾽ ἄμφω εἶχον, ἄναιμοι ἂν ἦσαν. ὁμοίως δ᾽ ἔχουσιν οἱ ὄρνιθες τρόπον τινὰ τοῖς ἰχθύσι. τοῖς μὲν γὰρ ὄρνισιν, ἄνω αἱ πτέρυγές εἰσι· τοῖς δὲ, πτερύγια δύο ἐν τῷ πρανεῖ. καὶ τοῖς μὲν ἐν τοῖς ὑπτίοις οἱ πόδες· τοῖς δ᾽, ἐν τοῖς ὑπτίοις, καὶ ἐγγὺς τῶν πρανῶν πτερύγια τοῖς πλείστοις. καὶ οἱ μὲν, ὀρροπύγιον ἔχουσιν· οἱ δ᾽, οὐραῖον. C

ΚΕΦΑΛ. ιθ'.

Ἀπορία περὶ τῶν ὀστρακοδέρμων, τίς ἡ κίνησις, καὶ εἰ μὴ ἔχουσι δεξιὸν καὶ ἀριστερὸν, πόθεν κινοῦνται.

Περὶ δὲ τῶν ὀστρακοδέρμων ἀπορήσειεν ἄν τις, τίς ἡ κίνησις, καὶ εἰ μὴ ἔχουσι δεξιὸν καὶ ἀριστερὸν, πόθεν κινοῦνται. φαίνονται δὲ κινούμενα. ἢ ὥσπερ ἀνάπηρον δεῖ τιθέναι πᾶν τὸ τοιοῦτο γένος, καὶ κινεῖσθαι ὁμοίως, οἷον εἴ τις τῶν ὑποπόδων ἀποκόψειε τὰ σκέλη· ὥσπερ ἡ φώκη καὶ ἡ νυκτερίς. καὶ γὰρ ταῦτα, τετράποδα, κακῶς δ᾽ ἐστί. τὰ δ᾽ ὀστρακόδερμα κινεῖται μὲν, κινεῖται δὲ παρὰ φύσιν. οὐ γάρ ἐστι κινητικά· ἀλλ᾽ ὡς μόνιμα καὶ προσπεφυκότα, κινητικά· ὡς δὲ πορευτικὰ, μόνιμα. ἔχουσι δὲ φαύλως καὶ οἱ καρκίνοι τὰ δεξιὰ, ἐπεὶ ἔχουσι. δηλοῖ δ᾽ ἡ χηλή. μείζων γὰρ ἰσχυροτέρα ἡ δεξιὰ, ὡς βουλομένων διορίζεσθαι τῶν ἀριστερῶν καὶ τῶν δεξιῶν. περὶ μὲν οὖν μορίων, τῶν τ᾽ ἄλλων αὐτῶν, καὶ τῶν περὶ τὴν πορείαν, τῶν ζώων, καὶ περὶ πᾶσαν τὴν κατὰ τόπον μεταβολὴν, τοῦτον ἔχει τὸν τρόπον. τούτων δὲ διωρισμένων, ἐχόμενόν ἐστι θεωρῆσαι περὶ ψυχῆς.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ ΠΝΕΥΜΑΤΟΣ.

ARISTOTELIS STAGIRITÆ, DE SPIRITV LIBER.

Incerto interprete.

ΚΕΦΑΛ. α'.

A

Τίς ἡ τοῦ συμφύτου πνεύματος διαμονή, καὶ τίς ἡ αὔξησις. πότερον διὰ τῆς κατὰ τὴν τροφῆς προσφορὰν πέψεως.

ΤΙΣ ἡ τοῦ ἐμφύτου πνεύματος διαμονή, καὶ τίς ἡ αὔξησις; ὁρῶμεν γὰρ ὅτι πλέον καὶ ἰσχυρότερον γίνεται, καὶ καθ' ἡλικίας μεταβολὴν, καὶ διάθεσιν σώματος. ἢ ὡς τἆλλα μέρη, προσγινομένου τινός; προσγίνεται δὲ τροφὴ τοῖς ἐμψύχοις. ὥστε ταύτην σκεπτέον ποία τε καὶ πόθεν. δύο δὴ τρόποι δι' ὧν γίνεται, ἢ διὰ τῆς ἀναπνοῆς, ἢ διὰ τῆς κατὰ τὴν τῆς τροφῆς προσφορὰν πέψεως, καθάπερ τοῖς ἄλλοις. τούτων ἴσως οὐχ ἧττον ἂν [* οὐχ οὕτω] δόξειεν ἡ διὰ τῆς τροφῆς. σῶμα γὰρ ὑπὸ σώματος τρέφεται· τὸ δὲ πνεῦμα, σῶμα. τίς οὖν ὁ τρόπος, ἢ δῆλον ὡς ἐκ τῆς φλεβὸς ὁλκῇ τινι καὶ πέψει; τὸ γὰρ αἷμα ἡ ἐσχάτη τροφή, καὶ ἡ αὐτὴ ἐστὶ πᾶσιν. ὥσπερ οὖν καὶ εἰς τὸ ἀγγεῖον αὐτοῦ, καὶ εἰς τὸ περιεχόμενον λαμβάνει τροφὴν εἰς τὸ θερμόν. ἀλλὰ δὴ ὁ ἀὴρ τὴν ἐνέργειαν ποιῶν, τήν τε πεπτικὴν αὐτὸς αὑτῷ προστιθεὶς αὔξει καὶ τρέφει; οὐδὲν δὴ ἴσως ἄτοπον αὐτό γε τοῦτο, ἀλλὰ γίνεσθαι τὸ πρῶτον ἐκ τῆς τροφῆς. καθαρώτερον γὰρ τὸ τῇ ψυχῇ συμφυές· εἰ μὴ καὶ τὴν ψυχὴν ὕστερον λέγει γίνεσθαι, διακρινομένων τῶν σπερμάτων, καὶ εἰς φύσιν ἰόντων. ἔτι τε περίττωμα πάσης τροφῆς ἐστί, ποία διαπέμπεται τούτων; κατὰ μὲν γὰρ τὴν ἐκπνοὴν οὐκ εὔλογον· ἀντιλαμβάνει γὰρ εὐθύς. λοιπὸν δὲ δηλονότι διὰ τῶν τῆς ἀρτηρίας πόρων. τὸ δὴ ἐκκρινόμενον, ἤτοι λεπτότερον, ἢ παχύτερον. ἀμφοτέρως δὴ ἄτοπον, εἰ τοῦτο πάντων ἐστὶ καθαρώτατον· εἰ δὲ παχύτερον, ἔσονταί τινες πόροι μείζους. εἰ δὴ ἄρα κατὰ τοὺς αὐτοὺς λαμβάνει καὶ ἐκπέμπει τοῦτ'. αὕτη μὲν οὖν ἐκ τῆς τροφῆς αὔξησις καὶ διαμονὴ σχεδὸν ταῦτα.

* Inclusa videntur abundare: ſed & alia multa toto hoc libello leguntur valde deprauata in quibus interpres Latinus non tam, vt videtur, certas emendationes quam ſuas coniecturas & iudicium ſuum, eſt ſecutus.

CAPVT I.

Quanam ſpiritus natiui duratio ſit, & quæ ipſius auctio, an concoctio cibi aſſumpti ſit cauſa.

QVænam ſpiritus natiui duratio eſt, & quæ ipſius auctio? Nam liquidò experimur, quòd tum pro ætatis mutatione, tum pro conſtitutione corporis, & auctior fieri conſueuit, & fortior. An ne, vt & partes cæteræ foris accidente quopiam? B Sic alimentum his appoſitum, quæ animam habent, cõſeruat ipſa, & maiora reddit. Conſiderandum itaque hîc eſt, quale id ſit, & vnde accedat. Et ſunt modi duo, in quos referri queat. Aut enim reſpiratione iſtud fit, aut concoctione cibi aſſumpti, vt in partibus quoque cæteris. Et ex his minimè alienus videtur modus ille, quem cibi eſſe perhibent. Vt enim corporum cæterorum alitionem auctionemque, omnino è materia corporea fieri videmus, ita ſpiritus quoque auctio & alitio in corpus referetur aptiſſimè: nam & ipſe corpus eſt. Quis autem modus hic fuerit? An ne palàm eſt attractione quapiam è venis facta, & C concoctione iſtud fieri? quando ſanguis extremum atque idem vniuerſis eſt alimentum. Vt igitur ad vaſorum, & eorum quæ continentur, atque omnino ad calidi alitionem quippiam attrahitur, quod aër diſtribuit, efficaciam præbens, ſibique ipſe concoquendi vim apponens, auget nutritque: ſic hunc ipſum ſpiritum incrementum durationemque accipere, fortaſſis haud fuerit abſurdum. at quod primum eſt aliorum, & tam animæ cognatum, & fortaſſis generatione, per quam ſemina in partes fingendas ſecernuntur, & in cuiuſque naturã abeunt, ea ipſa prius eſt: id ex alimento ortum habere, abſurdũ videri queat. tale enim ſyncerius eſſe, quàm vt ita naſcatur, par fuerit. Deinde ſi omnis alimenti excremẽtum ſit aliquod, cuiuſmodi ab his aut quo pacto excretio fiat? Nam expiratione fieri, rationi conſentaneum non eſt: nam ſtatim aërem recipit. Reliquum igitur eſt, vt per arteriæ meatus. Sed tum quod excernitur, aut tenuius erit, aut craſſius: & vtrumuis abſurdum eſt. Siquidem enim hic omnium ſynceriſſimus ſit, quomodo excrementum erit tenuius? Et ſi ſit craſſius, tum fuerint meatus omnino maiores aliqui, niſi per eoſdem attractio fiat, & excrementi expulſio. Spiritus itaque ipſius auctio, & duratio ex alimento facta, hiſce ferè modis eſſe queat.

A

CAPVT II.

An reſpiratione incrementum & durationem ſpiritus accipiat.

QVòd autem reſpiratione incrementum & durationẽ ſpiritus accipiat, vt & Ariſtogenes eſt arbitratus, ex aëre in pulmone cõcocto, & per vaſa diſtributo, excremẽtis autem foras expulſis, id plures dubitationes habet. Primùm enim concoctio hæc à quo fiat? Ac par eſt, ab eo ipſo, vt & cæterorum. Idipſum verò abſurdũ quoque eſt, niſi ab exteriore differat aëre: quomodo calor concoqueret. Sed & ſpiſſiorem eundem eſſe rationi eſt conſentaneum, vaſorum ſcilicet & moli totius humiditate coniuncta. proinde incorpulentum quippiam abibit. at ſi tenuius fiat excrementum, rurſus præter fidem eſt. Deinde concoctionis quoque celeritas præter rationem eſt: nam inſpirationẽ illico ſequitur expiratio. Quid igitur tam velociter mutare, & alterare queat? Et putarit quiſpiam maximè calidũ eſſe, adſtipulante ipſo etiam ſenſu: nam qui expiratur aër, calidus eſt. Præterea ſi in pulmone, & arteria ſit, quod concoquitur, tum calidi quoque vis in iiſdem erit: id quod non aiunt illi, ſed ſpiritu moto agitatóque excalfieri aiunt. Quòd ſi aliunde attrahatur, aut mouente quopiam, impellẽtéve excipitur, admiratione tum maiore, inquiſitionéve id dignum eſt. Simul autem, non id erit, quod primum moueat. Poſtremò inſpiratio, vltra pulmonem non pergit, vt ipſi quoque affirmant. ac ſpiritus innatus per vniuerſum eſt animalis corpus. Quòd ſi è pulmone tum ad infernas tũ ad partes cæteras diſtribuatur, quonam modo tam velox eſſe queat cõcoctio? Id enim admirandũ omnino, minimé que vulgare eſt: neque enim ad infimas partes ſubitò demittet concoctum aërem. atqui neceſſariò id ſecuturum videtur, ſi & concoctio in pulmone fiat, & quæ infima ſunt, reſpiratione participent. Et tanto obſcurius id eſſe magiſque præter opinionẽ videbitur, quòd tranſitu, & velut contactu quodã, ſola concoctio ſic fiet. Sed & hoc præter rationem eſſe, & magis adhuc, quàm ſuperiora, videtur, vt alimẽti excrementique eadem ratio ſit. Sin per aliud quodpiam eorum quæ in animali habentur, tũc rationes ſuperiores redibunt: niſi quis reſpondeat, vt neque plantis, ita non cuiuſuis alimenti, aut partis excrementũ eſſe. Quòd ſi hoc quoq; tollas, & omnino eadem ratio partiũ ſit, ſupereſt vt conſtituatur vaſorũ eandẽ eſſe auctionem, quæ cæterarũ eſt partiũ. diſtentis autẽ his, & maius interuallũ capiẽtibus, maior quoque aëris copia influat, & effluat, quomodo tãdem auctior fiat innatus ſpiritus. Ex hiſce itaque modis omnibus quis vero propior ſit, & neceſſitatẽ demonſtratiuã habeat maiorẽ, inquirendũ proponitur. Nã hoc peracto, & demõſtrato, quis ſit innatus ſpiritus, & quo pacto is in animalibus ſpirãtibus auctior fiat, manifeſtum euadet. at in nõ ſpirãtibus, quæ alitio, & quæ auctio huiuſce fuerit? neq; enim in his quoque foris eſſe, rectè affirmabitur. Quòd ſi intus ſit, tũ è cõmuni alimento in his quoq; eſſe, cõſentaneum rationi eſt: quãdo ex iiſdẽ ſimilia fiãt, & eodem modo. Niſi fortaſſis etiã in illis acceſſionem alimenti huiuſce foris eſſe quomodo odores ſentiãt affirmare quis volet. Sed nõ reſpiratio, hic modus eſt: quãuis dubitare quiſpiã in hoc quoque poſſit, an prorſus non ſpirent, tum ex hoc ipſo ſignum ducens, tum quia dum cibum attrahãt, aërem quoq; vnà hauriãt, neceſſe ſit. Deinde quia & ipſa refrigeratione indigeãt, quę nõ aliter quàm aëris attractione fieri poſſit.

ΚΕΦΑΛ. β'.

Ὅτι τὸ σύμφυτον πνεῦμα οὐκ αὔξεται ἐκ τῆς ἀναπνοῆς.

ἩΔ᾽ ἐκ τῆς ἀναπνοῆς, ὥσπερ Ἀριστογένης οἴεται, καὶ τὸ πνεῦμα πεττόμενον, οὐ τοῦ ἀέρος ἐν τῷ πνεύμονι· τοῦτο δὲ εἰς τὰ ἀγγεῖα διαδίδοσθαι, τὸ περίττωμα πάλιν ἐκπέμπεσθαι, πλείους ἔχει τὰς ἀπορίας. ἥ τε γὰρ πέψις ὑπὸ τίνος; εἰκὸς μὲν γὰρ ὑπ᾽ αὐτοῦ, καθάπερ καὶ τῶν ἄλλων. αὐτὸ δὲ τοῦτ᾽ ἄτοπον, εἰ μὴ διαφέρει τοῦ ἔξω
B ἀέρος. οὕτω δ᾽ ἡ θερμότης ἂν πέττοι. καὶ μὴν καὶ παχύτερον αὐτὸν εὔλογον εἶναι, μεθ᾽ ὑγρότητος τῆς ἀπὸ τῶν ἀγγείων ὄντα, καὶ τῶν ὅλων ὄγκων. ὥστε ἡ πέψις ἂν εἰς τὸ σωματῶδες εἴη. τὸ δὲ περίττωμα, εἴπερ γὰρ λεπτότερον, οὐ πιθανόν. ἄλογος δὲ καὶ ἡ ταχυτὴς τῆς πέψεως. εὐθὺς γὰρ μετὰ τὴν εἰσπνοὴν ἡ ἐκπνοή. τί οὖν τὸ οὕτω ταχὺ μεταβάλλον καὶ ἀλλοιοῦν; ὑπολάβοι γὰρ ἄν τις μάλιστα τὸ θερμόν· καὶ μαρτυρεῖ οὕτως ἡ αἴσθησις· ὁ γὰρ ἐκπνεόμενος θερμός. ἔτι δ᾽, εἰ μὲν ἐν τῷ πνεύμονι καὶ τῇ ἀρτηρίᾳ τὸ πεττόμενον, ἡ τοῦ θερμοῦ δύναμις ἐν τούτοις· ὅπερ οὔ φασιν, ἀλλ᾽ ἐν τῇ κινήσει τῇ τοῦ πνεύματος ἐκθερμαίνεσθαι τὴν τροφήν. εἰ
C δ᾽ ἐξ ἑτέρου τινὸς δεῖ ἐπισπᾶται, ἢ καὶ κινοῦντος δέχεται, τοῦτ᾽ ἔστι θαυμασιώτερον. ἅμα δὲ καὶ οὐκ αὐτὸ τὸ πρῶτον κινοῦν. ἔτι δὲ ἡ μὲν ἀναπνοὴ μέχρι τοῦ πνεύμονος, ὥσπερ λέγουσιν αὐτοί· τὸ δὲ πνεῦμα, δι᾽ ὅλου τὸ σύμφυτον. εἰ δ᾽ ἀπὸ τούτου διαδίδοται, καὶ πρὸς τὰ κάτω καὶ πρὸς τὰ ἄλλα, πῶς ἡ πέψις οὕτω ταχεῖα; θαυμασιώτερον γὰρ τοῦτο καὶ μεῖζον· οὐ γὰρ διαπέμπει τοῦτο γ᾽ εὐθὺς πεπεμμένον τὸν ἀέρα τοῖς κάτω. καίτοι τὸ μὲν δόξει ἀναγκαῖον εἶναι τῆς πέψεως τούτου γινομένης ἐν τῷ πνεύμονι, τῆς τ᾽ ἀναπνοῆς κοινωνούντων καὶ τῶν κάτω. μεῖζον δ᾽ οὕτω καὶ παραδοξότερον τὸ συμβαῖνον· δεῖ γὰρ διαδόσει καὶ θίξει γὰρ μόνον ἡ πέψις. ἄλο-
D γον δὲ καὶ ἔτι καὶ ἀλογωδέστερον, εἰ ὁ αὐτὸς λόγος τῆς τροφῆς καὶ τοῦ περιττώματος. εἰ δὲ δι᾽ ἄλλου τινὸς τῶν ἐντός, οἱ αὐτοὶ λόγοι οἱ καὶ πρότερον· εἰ μὴ τοῦτο λέγοι τις, ὡς οὐ πάσης τῆς τροφῆς, οὐδὲ πᾶσι γίνεται περίττωμα, καθάπερ οὐδὲ τοῖς φυτοῖς· ἐπεὶ οὐδὲ τῶν τοῦ σώματος μερῶν ἑκάστου καθόλου ἐστίν. εἰ δὲ μὴ ὅτι γε πάντως, ἀλλ᾽ ἄρα γε ἡ μὲν ἀγγείων αὔξησις, ἡ αὐτὴ καὶ τῶν ἄλλων μερῶν. εὐρυνομένων δὲ καὶ διισταμένων τούτων, πλείων ὁ ἀὴρ ὁ εἰσρέων καὶ ἐκρέων. εἰ δέ τι ἀναγκαῖον συμπίπτει, τοῦτο αὐτὸ ζητεῖται τίς ὁ τρόπος· καὶ πῶς ἐστι πλείων ὑγιῶς, ἐν τούτοις φανερὸν ἂν εἴη. τοῖς δὲ δὴ μὴ ἀναπνέουσι, τίς ἡ τροφὴ
E τοῦ συμφύτου, καὶ τίς ἡ αὔξησις; οὐ γὰρ ἔτι τούτοις ἀπὸ τοῦ ἔξωθεν. εἰ δ᾽ ἀπὸ τῶν ἐντὸς καὶ τῆς κοινῆς τροφῆς, εὔλογον κἀκείνοις· ἀπὸ γὰρ τῶν αὐτῶν τὰ ὅμοια, καὶ ὡσαύτως. εἰ μὴ ἄρα καὶ τούτοις ἀπὸ τοῦ ἐκτός, ὥσπερ καὶ τῶν ὀσμῶν αἰσθάνονται. ἀλλ᾽ οὔτι γε δὴ ἀναπνοή γε. περὶ οὗ κἂν ἀπορήσειέ τις, εἰ κατ᾽ ἀλήθειάν ἐστιν, αὐτό τι τοῦτο προσφέρων, καὶ τὴν ἐπίσπασιν τῆς τροφῆς. ὁλκὴ γὰρ ἅμα πνεύματος. ἔτι δ᾽ ὑπὲρ τῆς καταψύξεως ἂν τις λέγοι, ὡς κἀκείνων δεομένων.

A

εἰ δὲ διὰ τοῦ ὑποζώματος αὐτοῖς γίνεται, τοιαύτη δή τις ἔστι καὶ ἡ τοῦ ἀέρος εἴσοδος· ὥσθ' ὁμοιόν τι τῇ ἀναπνοῇ. πλὴν οὐκ ἀφορίζεται τίς ὁλκή, καὶ ὑπὸ τίνος. ἢ εἰ μὴ ὁλκή, πῶς ἡ εἴσοδος; εἰ μὴ ἄρα αὐτομάτως. τοῦτο μὲν οὖν ἔχει καὶ αὐτὸ καθ' αὑτὸ σκέψιν. τίς δὲ δὴ ἐνύδροις, τίς ἡ τροφὴ καὶ αὔξησις τοῦ συμφύτου; χωρὶς γὰρ τοῦ μὴ ἀναπνεῖν, οὐδ' ἐνυπάρχειν ὅλως ἐν τῷ ὑγρῷ φαμὲν ἀέρα, ὅτι διὰ τῆς τροφῆς ἡ τοῦ πνεύματος γένεσις. λοιπὸν ἄρα διὰ τῆς τροφῆς, ὡς οὐχ ὁμοίως πᾶσιν, ἢ κἀκεῖνα διὰ τῆς τροφῆς τὰ ἔνυγρα. τριῶν γὰρ τούτων ἀναγκαῖον ἕν. καὶ ταῦτα μὲν ὡς περὶ τὴν αὔξησιν καὶ τροφὴν τοῦ πνεύματος.

Quòd ſi per diaphragmatis loca refrigerentur, per eam ipſam quoque partem aër ingrediatur: vnde reſpirationi ſimile quidpiam accidat. Quanquam hîc non definiatur quænam hæc attractio ſit, & à quo fiat: aut ſi attractio nõ ſit, quo pacto fiat ingreſſus. Hæc enim adhuc latebant, niſi fortè nullo nec attrahente, nec impellente, ſed ſponte aër introeat. Hoc itaque per ſeſe peculiarem exigit contemplationem. Eorum inſuper, quæ in aquis degunt, quænam eſt alitio, & auctio innati ſpiritus? Nam, præterquam quòd hæc non ſpirant, ne omnino quidẽ ſub aquis aërem contineri, neque è puro latice ſpiritum gigni poſſe, affirmamus: reliquum igitur eſt, vt ex alimento ſit. Proinde aut non in omnibus idẽ modus generationis huiuſce erit, aut etiam illa ex alimento ſpiritus generationem ſortientur. Nam ex tribus his, vnus omnino neceſſarius eſt modus. Et de ſpiritus quidem tum auctione, tum alitione hæc dicta ſint.

B

ΚΕΦΑΛ. γ.

Περὶ ἀναπνοῆς.

Περὶ δὲ ἀναπνοῆς, οἱ μὲν οὐ λέγουσι τίνος χάριν, ἀλλὰ μόνον ὃν τρόπον γίνεται, καθάπερ Ἐμπεδοκλῆς καὶ Δημόκριτος. οἱ δὲ οὐδὲ τὸν τρόπον αὐτῆς λέγουσιν, ἀλλ' ὡς φανερῷ χρῶνται. δεῖ δὲ καί, εἰ καταψύξεως χάριν, αὐτὸ τοῦτο διασαφῆσαι. εἰ γὰρ ἐν τοῖς ἄνωθεν θερμόν, οὐκ ἂν ἔτι οἱ κάτω. τὸ δὲ σύμφυτον πνεῦμα δι' ὅλου, καὶ ἀρχὴ ἀπὸ τοῦ πνεύμονος. δοκεῖ δὲ καὶ τὰ τῆς ἀναπνοῆς εἰς πάντα διαδίδοσθαι κατὰ συνέχειαν. ὥστε τοῦτο δεικτέον ὡς οὐκ ἔστιν. ἄτοπον δέ, εἰ μὴ δεῖταί τινος κινήσεως καὶ οἷον τροφῆς. εἰ δὲ διαπνεῖ περὶ πᾶν, οὐκέτι καταψύξεως εἴη χάριν. ἀλλὰ μὴν καὶ ἡ διάδοσις ἄλλως τε ἀναίσθητος, καὶ τὸ τάχος αὐτῆς. καὶ πάλιν τὸ τῆς παλιρροίας, εἴπερ ἀπὸ πάντων, θαυμαστὸν πλὴν εἰ ἄλλον τρόπον ἀπὸ τῶν ἐσχάτων. τὸ δὲ πρώτως καὶ κυρίως, ἀπὸ τῶν περὶ τὴν καρδίαν. ἐν πολλοῖς δ' οὕτω τῶν ὀργάνων καὶ τῶν δυνάμεων. ἄτοπον οὖν ὅμως εἰ καὶ εἰς τὸ στόμα διαδίδοται. καὶ γὰρ δὴ τοῦτο φανερὸν ἐξ ἀρτηριῶν. διό, καθάπερ εἴρηται, σκεπτέον περὶ ἀναπνοῆς, καὶ τίνος ἕνεκα, καὶ ποίοις μέρεσι, καὶ πῶς. ἔτι δὲ οἷον ἐπιφορὰ τῆς τροφῆς φέρεται πᾶσι δι' ἀρτηριῶν, οἷον αὐτοῖς τε τοῖς ἀγγείοις καὶ ἄλλοις τισὶ τῶν μερῶν. ζῇ δὲ τὰ φυτὰ καὶ τρέφεται. ταῦτα μὲν οἰκειότερά πως τῷ περὶ τὰς φθοράς.

CAPVT III.

De reſpiratione.

De reſpiratione verò, alij non dicũt, cuius gratiâ fiat, ſed id ſolùm, quo pacto fiat, dicunt, vt Empedocles, & Democritus. Alij ne id quidẽ nec modum eius aſſignant, ſed tãquam manifeſtus ſit, eo vtuntur. Atqui ſi refrigerationis gratia fiat, idipſum exponendum eſt. Calidum itaque ſi in ſupremis tantùm ſit partibus, tum inferiora refrigeratione nulla indigent. ſed non eſt in ſupremis tantùm. Nam ſpiritus per vniuerſum corpus eſt, & initium reſpirationis à pulmone eſt. Quo pacto itaque qui in extremis eſt calor, refrigerabitur? Et dicet quiſpiam refrigerationem reſpiratione factã in omnes partes diſtribui per continuitatem. Sic proximas pulmoni partes ab aëre attracto frigefieri, deinde vicinas frigefacere, & ita deinceps vſque ad extrema. Sed oſtendendum id eſt, fieri non poſſe. Quis itaque modus extremorum erit? Abſurdum eſt. n. omnino ſtatuere ea agitatione quapiam, & velut alimento non indigere. Quòd ſi dicas perſpirationem totius eſſe aliquam, quæ ſcilicet agitationem ſpiritibus præbeat totius, tũ quis erit finis reſpirationis? non enim refrigeratio erit, ſi eam perſpiratio efficiat. Et in vniuerſum, ambiguum negotium hoc totum eſt. Siue enim refrigerationem extremorum in reſpirationem referas, tum ad ea vſque diſtributionis ipſius celeritas quomodo ſenſum effugiet? ſiue perſpirationem conſtituas, quæ calorem in ambitu totius exiſtentem foueat, tum præterquam quòd reſpirationis hic finis eſſe ampliùs non poſſit, ſiquidem perſpiratione illum conſequi liceat, mirabilis quoque erit profectò omnium inter ſe partium fluxio & refluxio perſpiratione facta. Niſi dicas eundem in vtroque rectè finem cenſeri, & qui in ambitu totius calor ſit non ita plenus, & auctus perſpiratione ſufficienter foueri poſſit; qui verò in corde, & vicinis illi partibus ſit, vehementiſſimus, maiore refrigeratione opus habere, vt in primis ob hunc ipſum inſtituta fuiſſe reſpiratio videri queat: & proinde maiorem quoque vim aëris eò attrahi oportere, ob quam inſtrumenta capaciora, & actio quædam magis conſpicua, à Natura fuerint conſtructa. Permulta enim eiuſmodi in cæteris quoque actionibus facultatibúſque contingunt. adhuc tamen abſurdum eſt, ſi ad os quoque diſtributio fiat: id quod ex arteriis eſt manifeſtum. Ob hæc itaque, vt dictum fuit, de reſpiratione perquam diligens conſideratio eſt habenda, cuiuſnam gratia fiat, & quibus partibus communis ſit, & quomodo ſit. Præterea, nec alimentum omnibus per arterias adfertur, veluti tum vaſis ipſis, tum aliis partibus quibuſdam. Viuunt autem plantæ quoque, & aluntur. Sed hæc ad ea pertinent quæ de interitu rerum traduntur.

C

A

CAPVT IV.

De tribus motionibus ſpiritus in arteria contenti.

CVm autem motiones in arteria contenti ſpiritus, tres ſint, reſpiratio, pulſus: & tertia, alimẽti aduectio elaboratióque: de quaque harum dicẽdum eſt, & vbi, & quo pacto ſit, & cuius gratia fiat. Pulſus itaque motio qua parte ſit, ſenſui quoque eſt manifeſtum, quamuis ſcilicet animalis partem tangẽtibus. Sed reſpirationis motus, in qua ſit parte, aliquouſque manifeſtum quidem ſenſu quoque eſt. Potior tamen illius cognitio ratione habetur. at alimenti motus vniuerſus ferè, ratione eſt inquirendus. Quæ tamen ab accidentibus de eo ſit in- B quiſitio, ipſa quoque à ſenſu initium habet. Quòd igitur reſpiratio, intus habeat initium, manifeſtum ſanè eſt, ſiue ea facultas animæ ſit, ſiue anima ipſa ſit dicenda, ſiue alia quæpiam corporum miſcella, quæ per ea talem attractionem efficiat. at facultas qua animal alitur, tota ſibi ipſi reſpondet, & ſimilis eſt, tanquam eadem per vniuerſum ſit corpus. Et ſi ſi fortè non ſit, at corpus tamen vniuerſum æquabiliter iuxta tempus ſe habet in tali motu. Quòd ſi non ſtatim ſit obuium, num aliqua ſit differentia, inſpectione partium omnium eſt cognoſcendum. Pulſus autem peculiaris quiſpiam, præter hos motus eſt, & quadantenus accidentarius eſſe, nec finem habere videtur, ob quem fuerit inſtitutus. Et vt calore vehemente in humidum agente, neceſſe eſt quæ in flatum reſoluuntur partes ob verſationem bullas excitare, ita pulſum quoque fieri in ani- C malis corpore par eſt: ſtatimque per initia primùm conſiſtit pulſus: nam iis quæ prima ſunt, coæuus calor eſt. Et fortaſſe actionem caloris in materiem, quæ generationi animalis ſubſternitur, idipſum cõſequi eſt neceſſe. Quòd autem reſpirationi pulſus non reſpondeat, ſignum hoc eſt. Siue enim frequens, ſiue æqualis, & ſiue magna ſit, ſiue leuis reſpiratio, pulſus ſimilis, idémque ſemper manet, ſed inæqualis ſit, & intenditur, tum pro corporis affectionibus variis, tum animæ, velut timore, ſpe, agonia. Sed an in arteriis pulſus eundem tenorem ſeruet, aut æqualitatem, conſiderandum eſt. Et videtur non ſeruare, ad partes lõgè inter ſe diſſitas animum aduertentibus. Cæterùm quod dictũ eſt, non finis cuiuſpiam gratia fieri, ſed actionis neceſſitatẽ ſequi, caloris ipſius ſcilicet in humidum, id omni- D no ita habere videtur. at inſpirationis & expirationis motus ſiue eundem finem habet vterque, & diuerſus alter ab altero ſit, ſiue alium, neque ſibi mutuò reſpondeant, ob finem tamen omnino aliquem fieri rationabiliter vidẽtur. Porrò de his tribus motibus ambigi rectè poteſt, an ſint coæui: & ſi nõ ſint, quis horum primus ſit: & an ſit rationabile, pulſum

ΚΕΦΑΛ. Δ'.

Περὶ τριῶν τοῦ ἐν τῇ ἀρτηρείᾳ πνεύματος κινήσεων.

ΕΠεὶ δὲ τρεῖς αἱ κινήσεις τοῦ ἐν τῇ ἀρτηρείᾳ πνεύματος, ἀναπνοή, σφυγμός· τρίτη δ', ἡ τὴν τροφὴν ἐπάγουσα καὶ κατεργαζομένη· λεκτέον περὶ ἑκάστης, καὶ ποῦ, καὶ πῶς, καὶ τίνος χάριν. τούτων δὲ ἡ μὲν τοῦ σφυγμοῦ, καὶ τῇ αἰσθήσει φανερὰ καθ' ὁποιονοῦν μέρος ἁπτομένοις· ἡ δὲ τῆς ἀναπνοῆς, μέχρι μέν του φανερά· τὸ δὲ πλέον, κατὰ λόγον. ἡ δὲ τῆς τροφῆς, ἅπασα κατὰ λόγον, ὡς εἰπεῖν· ὡς ἐκ τῶν συμβαινόντων δὲ, κατὰ τὴν αἴσθησιν. ἡ B μὲν οὖν ἀναπνοὴ δῆλον ὡς ἀπὸ τοῦ ἐντὸς ἔχει τὴν ἀρχήν· εἴτε ψυχῆς δύναμις, εἴτε ψυχὴν δεῖ λέγειν ταύτην, εἴτε καὶ ἄλλην τινὰ σωμάτων μῖξιν, ἡ δι' αὐτῶν ποιεῖ τὴν τοιαύτην ὁλκήν. ἡ δὲ θρεπτικὴ ἀνταποδίδοται, καὶ ὁμοία πως ἀληθεῖ. εἰ δὲ μή, πάντη ὁμαλίζει τοῖς χρόνοις τὸ σῶμα κατὰ τὴν τοιαύτην κίνησιν. ἢ εἰ μηδὲν διαφέρει τὸ ἅμα, πάντα τὰ μέρη σκεπτέον. ὁ δὲ σφυγμός, ἴδιός τις παρὰ ταύτας, τῇ μὲν ἂν δόξειεν εἶναι κατὰ συμβεβηκός· εἶναι γάρ, ὅταν ἐν ὑγρῷ πλῆθος ᾖ θερμότητος, ἀνάγκη τὸ ἐκπνευματούμενον διὰ τὴν ἀναπόλησιν ποιεῖν σφυγμόν. ἐν τῇ ἀρχῇ δὲ καὶ πρῶτον· εἶναι γὰρ τοῖς πρώτοις σύμφυτον. τάχα δὲ πρὸς τὴν ὑποκειμένην οὐσίαν τοῦ ζῴου τοῦ ἐκ τῆς ἐνεργείας, ἀνάγκη τοῦτο παρακολουθεῖν. ὅτι δ' οὐδὲν πρὸς τὴν ἀναπνοὴν ὁ σφυγμός, σημεῖον. ἐάν τε C γὰρ πυκνόν, ἐάν τε ὁμαλόν, ἐάν τε σφοδρόν, ἢ πρᾶον ἀναπνέῃ τις, ὅ, τε σφυγμὸς ὅμοιος καὶ ὁ αὐτός. ἀλλ' ἡ ἀνωμαλία γίνεται καὶ ἐπίτασις ἔν τε σωματικοῖς τισὶ πάθεσι, καὶ ἐν τοῖς τῆς ψυχῆς φόβοις, ἐλπίσιν, ἀγωνίαις. εἰ δὲ καὶ ἐν ταῖς ἀρτηρείαις ὁ σφυγμός, καὶ ὁ αὐτὸς ὢν ῥυθμῷ καὶ ὁμαλὸς ᾖ, σκεπτέον. οὐκ ἔοικε δέ γε τοῖς μακρὰν ἀπηρτημένοις. ἥκιστα δὲ ἕνεκά του φαίνεται γίνεσθαι, καθάπερ εἴρηται. τὸ γὰρ αὖ τῆς ἀναπνοῆς καὶ τῆς ἐπαγωγῆς, εἴτε ὡς ἕτερον σύμπτωμ' ἀλλήλων, εἴθ' ὡς θάτερον πρὸς θάτερον, ἕνεκά του φαίνεται, καὶ ἔχει τινὰ λόγον. τριῶν δ' οὐσῶν, πότερον εὔλογον εἶναι τήν τε σφυγμώδη, καὶ τὴν ἀναπνευστικήν. ἡ γὰρ τροφὴ προϋπάρχοντος, ἢ οὔ. τὸ μὲν D γὰρ ἀναπνεῖν, ὅταν ἀπολυθῇ τῆς κυήσεως· ἡ δ' ἐπιφορὰ καὶ τροφή, καὶ συνισταμένου καὶ συνεστηκότος· ὁ δὲ σφυγμός, εὐθὺς ἐν τῇ ἀρχῇ συνισταμένης τῆς καρδίας, καθάπερ ἐν τοῖς ᾠοῖς γίνεται φανερόν. ὥστε αὕτη πρώτη, καὶ ἔοικεν ἐνεργείᾳ τινί, καὶ οὐκ ἐν ἀπολήψει πνεύματος· εἰ μὴ ἄρα τοῦτο πρὸς τὴν ἐνέργειαν.

reſpiratione priorem ſtatui. Nam alitio priùs quàm totũ animal ſit perfectum, eſt, & poſtquam perfectum eſt animal. attractio enim menſtrui humoris ad formationem fœtus, & partium delineatarum auctio, nutricis facultatis opus eſt: quemadmodum deſignatio partium ex ſemine, formatricis. Iuxta quem ordinem, reſpirationis motus poſtremus fuerit. Nam tum primùm reſpirat, vbi in lucem editus fuerit partus: eáque propter poſtremus hic motus eſt. Nam alimenti attractio elaboratióque non ſolùm pòſt, ſed & priùs quàm integris ſui partibus animal ſit abſolutum, in vtero peragitur. Reſpirationem itaque hic motus præcedit. at pulſus per initia ſtatim in conſtitutione cordis emergit: id, quod in ſectione viuorum, & pulli formatione ex ouo, deprehendere liceat. Sed &, vt ſuprà quoque dictum eſt, in prima partium delineatione, quæ per actionem calidi in humidum ſit, feruorem hunc, & pulſus agitationem cieri par fuerit: quare primus hic erit motus. Qua ratione quoque actioni cuipiam ſimilis eſſe videtur potiùs, quàm aëris attractioni: niſi & hic ad actionem faciat aliquid.

ΚΕΦΑΛ. ε'.

A

Πότερον τὸ ἐκ τῆς ἀναπνοῆς πνεῦμα φέρεται εἰς τὴν κοιλίαν, καὶ ὅπως τρέφει τὰ ζῷα. Ἀπορία περὶ τὴν ἀρτηρίαν, καὶ τὴν αἴσθησιν αὐτῆς, πῶς γίνεται· καὶ ἕτερα ἄττα.

ΤΟ δὲ πνεῦμα τὸ ἐκ τῆς ἀναπνοῆς φέρεται μὲν εἰς τὴν κοιλίαν· ἀλλὰ ἄτοπον εἶναι παρὰ τὴν ὀσφύν, δι' οὗ τῇ ἀναπνοῇ φέρεσθαι τὸ πνεῦμα ἐκ τοῦ βραγχίου εἰς τὴν κοιλίαν, καὶ πάλιν ἔξω. τοῦτο δὲ τῇ αἰσθήσει φανερόν. Ἔχει δ' ἀπορίας καὶ τὰ περὶ τὴν αἴσθησιν. εἰ γὰρ ἡ ἀρτηρία μόνον αἰσθάνεται, πότερον τῷ πνεύματι τῷ δι' αὐτῆς, ἢ τῷ ὄγκῳ, ἢ τῷ σώματι; ἤ, εἴπερ ὁ ἀὴρ πρῶτον ὑπὸ τὴν ψυχήν, τῷ κυριωτέρῳ τε καὶ προτέρῳ; τί οὖν ἡ ψυχή; δύναμιν φασὶ τὴν αἰτίαν τῆς κινήσεως ταύτης. ἢ δῆλον ὡς οὐκ ὀρθῶς ἐπιτιμήσεις τοῖς τὸ λογικὸν καὶ θυμικόν· καὶ γὰρ οὗτοι ὡς δυνάμει λέγουσιν. ἀλλ' εἰ δὴ ἡ ψυχὴ ἐν τῷ ἀέρι τούτῳ, οὗτός γε κοινός, ἢ πάσχων γέ τι καὶ ἀλλοιούμενος, εὐλόγως ἂν ἔμψυχον ἡ ψυχή, πρὸς τὸ συγγενὲς φέρεται, καὶ τῷ ὁμοίῳ τὸ ὅμοιον αὔξεται, ἢ οὔ; τὸ γὰρ ὅλον οὐκ ἀήρ, ἀλλὰ συμβαλλόμενόν τι πρὸς ταύτην τὴν δύναμιν ὁ ἀήρ, ἢ οὐ τὸ ταύτην ποιοῦν, καὶ τὸ ποιῆσαν τοῦτο ἀρχὴ καὶ ὑπόθεσις. τοῖς δὴ μὴ ἀναπνέουσιν, ἆρα ἀνεπίμικτος τῷ ἔξω, ἢ οὔ, ἀλλὰ κατ' ἄλλον τρόπον μιγνύμενος; τίς οὖν ἡ διαφορὰ τοῦ ἐν τῇ ἀρτηρίᾳ πρὸς τὸν ἔξω; διαφέρειν γὰρ εὔλογον. τάχα δὲ καὶ ἀναγκαῖον λεπτότητι. ἀλλ' ἔτι δὴ καθ' ἑαυτὸν θερμός, ἢ ὑφ' ἑτέρου; φαίνεται γὰρ ὁ ἔσω καθάπερ ὁ ἔξω· βοηθεῖται δὲ τῇ καταψύξει. πότερον δέ; ἔξω μὲν γάρ, περιεὶς ἐμπεριληφθεὶς δὲ, πνεῦμα, καθάπερ πυκνωθεὶς καὶ διαθλιβείς πως· ἢ μίξιν τινὰ ἀνάγκη λαμβάνειν, ἐν ὑγρότητι τε καὶ σωματικοῖς ὄγκοις ἀναστρεφόμενον; οὐκ ἄρα λεπτότερος, εἴπερ μέμικται. καὶ μὴν εὔλογόν γε τὸ πρῶτον δεκτικὸν ψυχῆς εἰ μὴ ἄρα καὶ ἡ ψυχὴ τοιοῦτον, καὶ οὐ καθαρόν τι καὶ ἀμιγές. τὴν ἀρτηρίαν μόνον εἶναι δεκτικὴν πνεύματος, τὸ δὲ νεῦρον οὔ. διαφέρει δέ, ᾗ ὅτι τὸ μὲν νεῦρον, ἔχει τάσιν· ἡ δ' ἀρτηρία ταχὺ διαρρήγνυται, καθάπερ καὶ ἡ φλέψ. τὸ δὲ δέρμα, ἐκ φλεβὸς καὶ νεύρου καὶ ἀρτηρίας. ἐκ φλεβὸς μέν, ὅτι κεντηθέν, αἷμα ἀναδίδωσιν· ἐκ νεύρου δέ, ὅτι τάσιν ἔχει· ἐξ ἀρτηρίας δέ, ὅτι διαπνοὴν ἔχει. μόνον γὰρ δεκτικὸν πνεύματος ἡ ἀρτηρία. τὰς δὲ φλέβας ἔχειν πόρους, ἐν αἷς τὸ θερμὸν ὥσπερ ἐν χαλκείοις, θερμαίνειν τὸ αἷμα· φύσει γὰρ οὐκ εἶναι θερμόν, ἀλλ' ὥσπερ ταύτῃ καταδιαχεῖσθαι· καὶ διὰ τοῦτο πήγνυσθαι τὴν ἀρτηρίαν, καὶ ἔχειν ὑγρότητα, καὶ ἐν αὐτῇ, καὶ τοῖς χιτῶσι τοῖς περιέχουσι τὸ κοίλωμα, φανερὸν ἔκ τε τῶν ἀνατομῶν εἶναι. καὶ ὅτι εἰς τὸ ἔντερον, καὶ εἰς τὴν κοιλίαν αἵ τε φλέβες καὶ ἡ ἀρτηρία συνάπτουσιν· ἃς εἰκὸς εἶναι τὴν τροφὴν ἕλκειν. ἐκ δὲ τῶν φλεβῶν εἰς τὰς σάρκας διαδίδοσθαι τὴν τροφήν, οὐ κατὰ τὰ πλάγια, ἀλλὰ κατὰ τὸ στόμα, καθάπερ σωλῆνας. ἀποτείνει γὰρ ἐκ τῶν πλαγίων φλεβῶν, φλεβία λεπτὰ ἐκ τῆς μεγάλης φλεβὸς καὶ τῆς ἀρτηρίας παρ' ἑκάστην πλευράν, καὶ φλέβα, καὶ ἀρτηρίας παρακεῖσθαι. καὶ τὰ ὀστέα δὲ καθάπτειν τὰ νεῦρα καὶ τὰς φλέβας εἰς τὰς συμβολὰς καὶ εἰς μέγα τῆς κεφαλῆς· δι' ὧν τὴν τροφὴν δέχεσθαι τοὺς ἰχθύας καὶ ἀναπνεῖν. εἰ δὲ μὴ ἀνέπνεον, ἐξαιρεθέντας ἂν ἐκ τοῦ ὑγροῦ εὐθὺς ἀποθνήσκειν. τὰς δὲ φλέβας καὶ τὰς ἀρτηρίας συνάπτειν εἰς ἀλλήλας, καὶ τῇ αἰσθήσει φανερόν

CAPVT V.

Dubitatio de arteria & modo quo ipſa ſentiat: item alia quædam.

HAbetur autem & de ſenſu difficultas. Nam ſi arteria ſentit ſolùm, num ſpiritu, qui per eam fertur, an mole ipſa, an toto corpore: aut ſi quidem aër primus animæ ſubeſt, eo ipſo tanquam potiore cauſa, ac priore? quid igitur in animæ potentiam, huiuſce motionis cauſam referunt? quemadmodum illi quoque faciunt, qui partem rationalem, animalémque inter cauſas referunt, & B pro illorum ſententia reprehendendi non fuerint, cùm & ipſi cauſam rogati, potentiam animæ aſſignent. at in non ſpirantibus num immiſtus externo eſt? an non eſt, ſed miſtus quidem at alio quodam modo eſt? Quæ itaque differentia eius fuerit, qui arteria continetur, ad eum, qui foris eſt? Nam vt inter hos differentia ſtatuatur, prorſus ratio poſtulat, & fortaſſis tenuitate neceſſariò differat. at rurſus, aut à ſeipſo aut ab alio, quoniam calidus eſt. De hoc enim ita ſentiendum videtur, vt de eo qui foris eſt. Nam de his, quæ in corpore fiunt, ita videtur ratiocinandum eſſe, vt de hiſce quæ foris eueniunt. Et à refrigeratione auxilium C omnino quoddam accipit ipſe qui intus eſt aër. Num igitur ſic res habet, vt qui foris tenuiore ſubſtantia eſt aër, vbi intro hauſtus fuerit, & in anguſta vaſa intruſus, compingatur quodam modo, ac denſetur? aut miſtionem neceſſariò accipit aliquam, dum per humores, & cæterarum animalis partium molem verſatur? Sed tum non fuerit tenuior, ſiquidem miſtionem ſic accipiat. at ratio tamen dictabat, quod primum animæ ſuſceptiuum ſit, omnino cæteris ſubſtantia tenuius eſſe: niſi animam quoque ipſam talem eſſe, nec purum quidpiam, & miſtionis omnino expertem ſtatuamus. Porro autem arteriam ſolam ſpiritum ſuſcipere, re- D cipiendum eſt, neruum non ſuſcipere. Differunt tamen inter ſe, quatenus neruus tendi poteſt, arteria non poteſt, ſed ſtatim rumpitur, vt & vena. Cutis tribus hiſce, vena, arteria & neruo conſtat: vena quidem, nam dum pungitur, ſanguinem emittit: è neruo autem, quia tendi poteſt: ex arteria quoque. perſpirationem enim habet. nam ſola arteria ſpiritum ſuſcipit. Præterea venas habere meatus, in quibus tanquam officina quapiam ęraria calidum latitans ſanguinem calefaciat. Neque enim natura calidum eſſe, ſed illac veluti diffundi: eáque propter arteriam concreſcere, & humiditatem continere tum in ſeſe, tum in tunicis cauum ipſum ambientibus. quæ omnia è ſectione E manifeſto deprehendere liceat. Eodem modo ad inteſtina & ad ventrem, venas arteriáſque committi, quas par ſit alimentum attrahere, è venis in carnes mox diſtribuendum, non per obliquum, ſed per venarum oſcula, fiſtularum ſcilicet more. Nam è lateribus venæ magnæ, & arteriæ: exiles venæ vtrinque deriuantur, per obliquum ſcilicet, & venæ cuilibet arteria ſua eſt adiuncta. Ad oſſa quoque qua ſcilicet committuntur inter ſe, & ad magnum capitis os, venæ, ac nerui finiunt. Hac parte cibum capiunt piſces, & reſpirant: qui ſi non ſpirarent, tum ex aqua profectò exempti, morerentur illico. Quòd autem venæ, & arteriæ, inter ſe committantur, ſenſu quoque ipſo manifeſtum

eſt. Id ſanè non foret, niſi & humor ſpiritu, & ſpiritus humore opus haberet, quòd & in neruo, & arteria, & vena, vis caloris ingens ſit. Cæterùm qui in neruo habetur calor vehementiſſimus, naturæ eius qui in venis eſt, plurimum habet. Non igitur calor ſpiritus regioni conuenit tum alias ob cauſas, tum autem ob refrigerationem. at ſi actiones efficiat, & velvti excitet, tum calido id fiat. Eorum prætereа omnium, quæ innatum quodammodo calorem obtinuere, nullo ſeſe obijciente, neque refrigerante vllo, duratio eſt. Quòd enim omnia refrigeratione opus habeant, ferè eſt manifeſtum. Quòd ſanguis in vena calorem detineat, & veluti concludat, ſignum fuerit, quia dum effluit ille, hic quoque diſſipatur, & mors ſequitur, quòd hepar nullam habeat arteriam.

A εἶ). τοῦτο δ' οὐκ ἂν συμβαίνοι, εἰ μὴ ἐδεῖτο καὶ τὸ ὑγρὸν πνεύματος, καὶ τὸ πνεῦμα ὑγροῦ, τὸ θερμὸν εἶ) ἐν νεύρῳ καὶ ἀρτηρίᾳ καὶ φλεβί. θερμότατον δὲ καὶ εἶ) φλεβωδέστατον τὸ ἐν τῷ νεύρῳ. ἄτοπον οὖν τῇ τοῦ πνεύματος χώρᾳ τὸ θερμόν, ἄλλως τε καὶ καταψύξεως χάριν. εἰ δὲ ποιεῖ, καὶ εἶ) ἀναζωπυρεῖ θερμῷ, γίγνοιτ' ἄν. ἔτι πάντων τῶν ἐχόντων θερμότητα, σύμφυτόν πως ἡ διαμονή, μηδενὸς ἀντικειμένου μηδὲ καταψύχοντος. ὅτι γὰρ πάντα δεῖται καταψύξεως, σχεδὸν φανερόν, τὸ δ' αἷμα κατέχειν ἐν τῇ φλεβὶ τὸ θερμὸν εἶ) σημεῖον. διὸ καὶ ὅταν ἐκρυῇ, μεθίεσθαί τε καὶ ἀποθνήσκειν, τὸ δ' ἧπαρ B οὐκ ἔχειν οὐδεμίαν ἀρτηρίαν.

CAPVT VI.

De ſemine quæſtio, & vtrùm nerui ab oſſibus alimentum capiant, an contra.

DE ſemine prætereà quæſtio haberi poteſt, num per arteriam feratur, & an compreſſione id quadam fiat, & dum emittitur ſolùm. Quo loco mutatio quoque, per quam ſanguis in ſolidarum partium naturam abit, pulcherrimam de ſe inquiſitioni occaſionem præbet, & euidentiam. Item de neruorum nutritione, num ex oſſibus ſit: videtur enim minimè diſſimilis amborum modus eſſe. Aut num id verum non ſit, cùm non ſolùm ex oſſibus ſuſpenſi in totius animalis mole, ſed & in corde viſantur, qui nullis oſſibus commiſſi ſint nerui, neque in alio vllo cum cæteris coëunt, ſed in carnem finiunt. an hoc nil impediat, quominus iis qui ab oſſibus pendent, indidem alimentum accedat, an potiùs ab his ipſis oſſa alantur? Sed & hoc abſurdum eſt, neque ſenſum adſtipulantem habet. Nam ſiccus natura, & nullum meatum humectum habens, per ſectiones neruus viſitur. atqui haberet, ſi per eum, alimentum, quod eſt humidum, ad oſſa veheretur. Quapropter diligens hîc eſt inſtituenda inquiſitio. Etſi omnino in oſſe initium conſtituatur: vt ex hoc potiùs neruus, quàm è neruo os ipſum, alimentum capiat, quomodo igitur ad oſſa tandem alimentum aduehetur, aut meatus è vena arteriave ad ipſum tendens quis erit? Id enim in pleriſque obſcurum erit, tum ad ſpinam maximè quiſnam deriuetur. Deinde quæ ab oſſibus ad latera committuntur, quomodo è ventre deriuentur, & attractio quo pacto fiat? an plura habentur abſque cartilagine, veluti ſpina? ſed non vt motum exerceant, hæc ſunt, magiſque continuationis gratia. Sed & ſi è neruo os alatur, nerui alimentum nouiſſe oportet. Cæterùm nos affirmamus è muco illis adhærente, eoſdem ali. Sed rurſus vnde hic, & quo pacto ſit, exponendum erat. Carnem è vena atque arteria ali id confirmat, quòd dum pungitur, ſanguinem reddit: quãuis in cæteris animalibus veluti volucribus, & ſerpentum, ac piſcium, & vniuerſo ouiparorum genere non viſatur: ſed ſanguine multo præditis peculiare habetur. Nam & volucrum pectora inciſa, ſaniem emittunt, non ſanguinem. Vnguem Empedocles per congelationem è neruo conſtitiſſe ait: anne igitur eandem rationem ad carnem cutim ipſam obtinere dicemus? Itidem difficultas habetur de teſtatis, quæque molli teſta conteguntur animalibus, quomodo cibus iis foris accedat. Contrà enim, intus magis, quàm foris, aduenire videtur. Inſuper autem quale in illis ſit, & qua parte eijciatur ventris onus. Item reditus ad carnem quàm ſit præ-

ΚΕΦΑΛ. ϛ'.

Περὶ σπέρματος ὀλίγα· καὶ πότερον τὰ νεῦρα ἀπὸ τῶν ὀστῶν τρέφεται, ἢ τοὐναντίον.

ΠΟτερον δὲ τὸ σπέρμα διὰ τῆς ἀρτηρίας ὡς καὶ συνθλιβόμενον, καὶ ἐν τῇ προέσει μόνον; ἐν οἷς δὴ φαίνεται καὶ ἡ ἐξ αἵματος μεταβολή, τὸ τὰ νεῦρα ἀπὸ τῶν ὀστῶν τρέφεσθαι· καθάπερ γὰρ αὐτά. C ἢ οὔτε τοῦτο ἀληθές. καὶ γὰρ ἐν τῇ καρδίᾳ νεῦρον καὶ νεῦρα δὲ ἐκ τῶν ὀστῶν ἠρτημένα. οὐ συνάπτει δὲ ἐν ἑτέρῳ, ἀλλ' εἰς σάρκα ἀποτελευτᾷ καὶ τοῦτό γ' οὐθέν. εἴη γὰρ ἂν οὐδὲν ἧττον ἀπὸ τοῦ ὀστοῦ ἡ τροφή. αὖθις δ' ἀπὸ τοῦ νεύρου τοῖς ὀστοῖς μᾶλλον τὴν τροφήν. ἄτοπον γὰρ καὶ τοῦτο ξηρὸν φύσει, καὶ οὐκ ἔχον πόρους ὑγρούς· ἡ τροφὴ δ' ὑγρόν. σκεπτέον δέ, πότερον, εἴπερ ἀπὸ τῶν ὀστῶν τις ἡ τοῦ ὀστοῦ τροφή, ἢ φέρουσι πόροι, καὶ ἐκ τῆς φλεβὸς καὶ ἐκ τῆς ἀρτηρίας εἰς αὐτόν· καὶ ἐν πολλοῖς μὲν ἄδηλον, μάλιστα δ' εἰς τὴν ῥάχιν. τὰς δ' ἀπὸ τῶν ὀστῶν γίνεσθαι συνεχεῖς, ὥσπερ ταῖς πλευραῖς· τούτοις D δ' ἀπὸ τῆς κοιλίας τίνα τρόπον ἢ πῶς τῆς ὁλκῆς γινομένης· ἔτι τὰ πολλὰ ἄχονδρα, καθάπερ ἡ ῥάχις· ἀλλ' οὔτι πρὸς τὴν κίνησιν, ἢ συναφείας χάριν. δεῖ δέ, εἰ καὶ ἀπὸ τοῦ νεύρου τὸ ὀστοῦν τρέφεται, τὴν τοῦ νεύρου τροφὴν εἰδέναι. ἡμεῖς δὲ φαμὲν ἐκ τῆς ὑγρότητος γλισχρᾶς οὔσης τῆς περὶ τὸ αὐτό. πόθεν δ' αὐτή, καὶ πῶς, λεκτέον. τὸ ἐκ τῆς φλεβὸς καὶ ἀρτηρίας τὴν σάρκα· ὅτι πολλαχόθεν αἷμα τῇ κεντήσει, ψεῦδος. ἐπί γε τῶν ἄλλων ζῴων, οἷον ὀρνίθων καὶ ὄφεων καὶ ἰχθύων, ἢ ὅλως τῶν ᾠοτόκων· ἀλλὰ τῶν πολυαίμων τοῦτ' ἴδιον· ἐπεὶ καὶ τῶν ὀρνίθων γε κατατεμνομένων τὸ στῆθος ἰχώρ, οὐχ αἷ- E μα. Ἐμπεδοκλῆς δὲ ἐκ νεύρου τὸν ὄνυχα τῇ πήξει. ἆρ' οὖν οὕτω καὶ δέρμα πρὸς σάρκα; ἀλλὰ τοῖς ὀστρακοδέρμοις καὶ μαλακοστράκοις πῶς ἀπὸ τῶν ἐκτὸς ἡ τροφή; τοὐναντίον γὰρ δοκεῖ μᾶλλον ἀπὸ τῶν ἐντὸς ἢ τῶν ἐκτός. ἔτι δὲ ποία, καὶ διὰ τίνων ἡ τῆς κοιλίας διέξοδος; καὶ πάλιν ἡ ἐκείνων ἀναστροφὴ πρὸς τὴν σάρκα, καθάπερ ἀλλ-

ρος ἐστι. πολὺ γὰρ τι θαυμαστὸν φαίνεται καὶ ἀδύνατον ὅλως. ἆρα γε ἄλλοις ἄλλη τροφή, καὶ οὐ πᾶσι τροφὴ τὸ αἷμα· πλὴν ἐκ τούτου τἄλλα.

ΚΕΦΑΛ. ζʹ.

Ἡ τῶν ὀστῶν φύσις.

Τὴν τῶν ὀστῶν φύσιν ἆρα σκεπτέον, ἢ πρὸς κίνησιν, ἢ πρὸς ἔρεισμα, καὶ πρὸς τὸ στέγειν καὶ περιέχειν. ἔτι δ' εἰ ὥσπερ ἀρχαί εἰσι, καθάπερ ὁ πόλος. λέγω δὲ πρὸς μὲν κίνησιν, οἷον χειρός, ἢ ποδός, ἢ σκέλους, ἢ ἀγκῶνος, ὁμοίως τήν τε καμπτικὴν, καὶ τὴν κατὰ τόπον. οὐδὲ γὰρ τὴν τοπικὴν οἷόν τε ἄνευ καμπτικῆς. σχεδὸν δὲ καὶ τὰ ἐρείσματα ἐν τούτοις. τὴν δὲ τοῦ στέγειν καὶ περιέχειν, οἷον τὰ ἐν τῇ κεφαλῇ τὸν ἐγκέφαλον, * καὶ ὅσοι δὴ τὸν μυελὸν ἀρχήν. αἱ δὲ πλευραί, τὸ συγκλείειν. ἀρχὴ δὲ καὶ μόνον ἡ ῥάχις, ἀφ' ἧς καὶ αἱ πλευραὶ πρὸς τὴν σύγκλεισιν. ἀναγκαῖον γὰρ εἶναί τι τοιοῦτον. ἅπαν γὰρ τὸ κινούμενον ἐξ ἠρεμοῦντος. ἅμα δὲ καὶ δεῖ γὰρ εἶναι τὸ οὗ ἕνεκα. ἐν ᾧ δὴ καὶ τὴν ἀρχὴν ἔνιοι, τόν τε ῥαχίτην καὶ τὸν ἐγκέφαλον. ἔτι δὲ πρὸς ἄλλοις τοῦτ' ἐπὶ συναφῆς καὶ συγκλείσεως χάριν, οἷον ἡ κλείς· ὅθεν ἴσως καὶ τοὔνομα. πρὸς δὲ τὴν χρείαν ἕκαστον καλῶς. οὔτε γὰρ ἡ κάμψις, οὔτε τοῦ ὅλου, οὔτε τῶν μερῶν, εἰ μὴ τοιαῦτα· οἷον ῥάχις, πούς, ἀγκών. εἴσω γὰρ δεῖ τὴν κάμψιν πρὸς τὴν χρείαν. ὁμοίως δὲ καὶ τὴν τοῦ ποδὸς καὶ τῶν ἄλλων τοιαύτην. πάντα δὲ ἕνεκά του, καὶ τὰ ἐν τούτοις ὀστᾶ. οἷον ἡ ἐν τῷ ἀγκῶνι κερκίς, ἕνεκα τῆς στροφῆς τοῦ ἀγκῶνος καὶ τῆς χειρός. οὐ γὰρ ἐδυνάμεθα πρηνῆ καὶ ὑπτίαν ταύτην κινεῖν ἄνευ ταύτης, οὐδὲ τοὺς πόδας ἐπαίρειν καὶ κάμπτειν, εἰ μὴ δύο αἱ ἐν τῇ κνήμῃ κερκίδες. ὡσαύτως δὲ καὶ τὰ ἄλλα σκεπτέον· οἷον ἡ τοῦ τραχήλου κίνησις, εἰ ἐν τῷ ὀστῷ. δεῖ δὲ καὶ ὅσα πρὸς κατάληψιν ἢ σύνδεσμον· οἷον ἡ μύλη ἡ ἐπὶ τῷ γόνατι. ἀλλὰ καὶ διὰ τί τοῖς ἄλλοις οὔ. ὅσα μὲν οὖν κινητικά, πάντα μετὰ νεύρων. ἴσως δ' ὅσα πρακτικὰ μάλιστα· οἷον τὰ περὶ ἀγκῶνα καὶ σκέλη καὶ χεῖρας καὶ πόδας. τὰ δ' ἄλλα συνδέσμου χάριν, καὶ ὅσα δεῖται. ἐνίοις γὰρ οὐδέν, ἢ ἐπ' ὀλίγον ἴσως. οἷον ἡ ῥάχις· ἀλλ' ἡ κάμψις. καὶ γὰρ ἡ πρὸς ἄλληλα κόλλησις, ἰχώρ ἐστι καὶ ὑγρότης μυξώδης. τὰ δὲ καὶ συνδεῖται νεύροις, οἷον τὰ περὶ τὰ ἄρθρα.

* Quid. [illegible]

A ter rationem. Admirabilis enim & omnino impoſſibilis eſſe videtur. Sanè omnino aliis aliud alimẽtum eſt, neque omnibus ſanguis eſſe poteſt: verùm ex hoc cætera ſunt.

CAPVT VII.

De natura oſſium.

DE natura quoque oſſium conſideratio eſt inſtituenda, an triplicis functionis cauſa ſic extiterint, & alia ad motum, alia ad fulciendum, alia vt contegant, capiántque. Et an quartum quoque inter hæc genus ſit quod tãquam principium motus ſit, velvt poli. Ad motum itaque inſtituta fuiſſe dico manus oſſa, & pedis, & tibiæ, & cubiti: & id bifariàm, flectendi ſcilicet, & ambulandi: neque enim ambulatio abſque flexione fieri poteſt. Sed & fulcimenta quoque in his ipſis ferè conſiſtũt. Contegunt autem, & capiunt, velvti quæ in capite ſunt oſſa, cerebrum ipſum, & quæcumque medullam in ſeſe habent. Laterum oſſa, functionem habent vt claudant. Initium autem cæterorum, & velvt immotum quiddam, ſpina eſt, à qua laterum quoque oſſa originem ducunt, partes vtrinque claudentia. Et neceſſe erat omnino vt talis aliqua pars eſſet: nam quod mouetur, id è quieſcente eſt. Simul autem eſſe aliquid oportet, cuius gratia: in quo genere ſanè prima ſtatuerunt, nucam & cerebrum. Prçterea verò aliud quoque genus habetur, ad committendas claudendáſque partes cæteras factum, velvti claues ſunt, ex hoc ipſo tale nomen ſortitæ. Cæterùm ad vſum idoneum vnaquæque harũ partium aptiſſimè ſic eſt comparata. Neque enim flexio ſiue totius, ſiue partium fiat, ſi talia nõ ſint, pes, inquam, ſpina, cubitus. Nã flexus introrſum, vſum habet perquam neceſſarium, vt & pedis, & aliarum partium conſimilis motio: vniuerſæ enim alicuius gratia ſic inſtitutæ fuere, vt & oſſa, quæ in eiſdem viſuntur. Sic quod in cubitu habetur facile, ad vertendum quoquo verſus cubitum & manum facit: nam abſque hoc ſupinam manum mouere, aut pronam non licebat: & nec pedes leuari, aut flecti potuiſſent abſque binis focilibus, hunc motum efficientibus. Eodem modo autem cæteræ quoque partes ſunt inſpiciendæ, velvt colli motus an ab vno oſſe ſit. Item quæ comprehendunt cætera, ac vinciunt, velvt patella eſt genu impoſita. Et quam ob rem aliis quædam ex hiſce non adſint. Quæ igitur motum perficiunt, vniuerſa neruos adhærentes habent: & fortaſſis quæcumque multam actionem obeunt, velvt quæ in cubitu habẽtur, & crure, manibúſque, ac pedibus. Cætera, quæ præter neruos oſſibus adhæreſcere videntur, ligãdi gratia adiecta ſunt, non motus. Quod genus aliæ quoque partes habent, quaſcumque vinciri oportebat. Neque enim in omnibus neceſſe id erat, aut parum admodum, quæcumque ſcilicet non operoſas motiones faciunt, velvti ſpina eſt, quæ ſolummodo flectitur. Talium itaque inter ſe nexus, ſanies eſt, & humor quidam mucoſus. Cætera neruis quoque vinciuntur, vt quæ in articulis ſunt.

D

ΚΕΦΑΛ. ηʹ.

Ὅτι οὐ κινήσεως ἕνεκα τὰ ὀστᾶ, ἀλλὰ μᾶλλον τὰ νεῦρα· περὶ χρείας τῶν ποδῶν.

Πάντων δ' ἐστὶ λόγος ὁ βέλτιον ὡς καὶ νῦν ζητεῖν· ἀλλὰ τὰς ἀρχὰς ἐφ' ἱκανόν, ὧν χάριν, σκεπτέον.* οὐκ ἂν δόξειε κινήσεως ἕνεκα τὰ ὀστᾶ, ἀλλὰ μᾶλλον τὰ νεῦρα, ἢ τὰ ἀνάλογον, ἐν ᾧ πρώτῳ τὸ πνεῦμα τὸ κινητικόν

CAPVT VIII.

De neruis & oſſibus eorúmque muneribus, déque alijs motus inſtrumentis in variis animalibus.

DE hiſce omnibus nulla inquiſitionis ratio cõmodior inſtitui queat, quàm quæ nunc eſt propoſita. Quo ſanè loco quæ verè initia cuiuſque functionis ſtatui queant, & cuius gratia vnumquodque ipſorum ſit, perquam diligenter inſpicere conuenit: velvt vtrùm rectiùs in oſſa referatur motus, & num huius gratia hæc ſint: an in neruos, & quæ hiſce proportione reſpõdent partes aliç quorũdã animaliũ, vt pote in quibus ſpiritus motiuus primis ineſt:

A quando & venter mouetur, & cor quoque, quorum neutrum os habet, ſed è neruis texuntur ambo, & cordis ſubſtantia neruos habet. Vſus itaque horum non quidem omnibus neceſſarius erat futurus, quę animalia vocarētur, ſed quæ motum quoque exercēre poſſent. Eſt itaque inter principia iſtud recipiendum, quòd animalibus omnibus, quæ motum erant exercitura, ad hunc ipſum vſum aut neruos, aut quæ his proportione reſpondent, partem aliam Natura adnexuit. Deinde ad motum cuique peculiarem, ſua quoque rurſus inſtrumenta affinxit: vel vt pedeſtribus futuris, pedes: & rectè incedentibus, binos: at per terram omnino gradientibus plures, quibus ſcilicet materia terreſtris magis, & frigidior contigit. Quædam pedibus omninò vt carerēt, accidit: nam vi totius molis erant mouenda. Sic volucribus quoque alæ ſunt adiectæ, & forma naturæ ipſorum idonea. Sed & inter hæc ipſa quoque dif- B ferentia habeatur, prout magis aut minus ſunt volucres. Pedes verò his quoque additi, tum alimenti gratia, tum vt rectè ſtarent, excepta veſpertilione: nam huic ſoli his opus non erat, cùm ex aëre alimentum habeat, nec quiete indigeat. Atqui pedum vſus nullus alius eſt. Ex aquatilibus animalibus ſola, quæ teſtata ſunt, pedes habent, ob grauitatem ſcilicet eorum. nam alioqui per loca volui, & impelli propria vi nequibant. Hæc itaque communia ſunt illis. Sed pro cuiuſque vſu idoneo, ſingulis ſua priuatim inſtituta fuere: ad quæ omnia animaduertendum ſcilicet eſt, ita vt nihil ex hiſce prætereatur, quòd hæc inquiſitio non teneret. Sic ea quoque, quæ obuia non ſunt, ſed inter cæteras cauſas latent, vel vt quamobrem multipeda, tardiſſima ſint, cùm tamen quadrupeda ſint celeriora bipedibus: ánne quòd toto corpore ſuper terra gradiuntur, aut quia natura frigidiore cùm ſint, difficiliùs moueri queant: aut ob aliam cauſam?

A ἐπεὶ καὶ ἡ κοιλία κινεῖται, καὶ ἡ καρδία ἰδίαν ἔχει· τὰ δ' οὐ πᾶσιν, ἀλλ' ἐνίοις, ἀνάγκη καὶ πρὸς ἰδίαν τὴν κίνησιν ἰδίᾳ ἔχειν, ἢ εἰς τὸ * ὁ γὰρ πολὺ ποιεῖ ἐπεὶ ἐλλιπῶς καὶ κακῶς βαδίζει. δεῖ γὰρ τοῦτο λαβεῖν ὥσπερ ἀρχήν, ὅτι πᾶσιν, ἢ ἄλλου τινὸς χάριν· ἀλλὰ πρὸς τὴν κίνησιν τὴν οἰκείαν εἶναι τοῖς μὲν πεζοῖς πόδας· καὶ τούτοις τοῖς μὲν ὀρθοῖς, δύο· τοῖς δὲ παντελῶς ἐπὶ τῆς γῆς, πλείους, ὅσοις ἡ ὕλη γεωδεστέρα καὶ ψυχροτέρα. τὰ δὲ καὶ ἄποδα ὅλως ἐξ ἀνάγκης. βίᾳ γὰρ οὕτω κινεῖσθαι. τοῖς πτηνοῖς πτέρυγας, καὶ ταύτας τὴν μορφὴν οἰκείαν τῇ φύσει. διαφορὰ δὲ τοῖς πτητικωτέροις, καὶ βραχυτέροις. πόδας δὲ τῆς τροφῆς χάριν καὶ * διαστάσεως, πλὴν τῆς νυκτερίδος. ταύτῃ δὲ καὶ τὴν τροφὴν ἐκ τοῦ ἀέρος καὶ μὴ δεῖσθαι διαναπαύσεως. οὐ δέονται γὰρ δι' ἄλλων. τὰ δὲ ὀστρακόδερμα B τῶν ἐνύδρων, ὥσπερ πόδα, διὰ τὸ βάρος καὶ ταύτης τῆς πρὸς τὴν κατὰ τόπον ἀλλαγήν. ἴσα δὲ πρὸς τὰς τῶν ἄλλων χρείας, ὥσπερ ὑφηγεῖται, καὶ ἑκάστου τὰ ἴδια, καὶ εἴ τι μὴ προφανές ἐστι, ζητεῖν. ἐπεὶ καὶ τὰ πολύποδα διὰ τί βραδύτατα, καίτοι τὰ τετράποδα θάττω τῶν δίποδων· πότερον ὅτι ἐπὶ τῆς γῆς ὅλῳ τῷ σώματι; ἢ ὅτι φύσει ψυχρὰ καὶ δυσκίνητα; ἢ δι' ἄλλην αἰτίαν.

γ. ἀναπαύσεως

CAPVT IX.

De calore qui eſt in animalium corporibus & de eius effectibus: Item de differentia partium corporis cùm in iiſdem animalibus, tum in diuerſis.

QVi affirmant, non calorem eſſe, qui in corporibus animalium agat: & quòd vna ſola latio ignis ſit, aut facultas, ſecandi videlicet, non rectè dicunt. Neque enim in corporibus inanimatis omnibus idem efficit, ſed alia denſat, alia rarefacit, liquefacit alia, alia cogit. quare in animatis quoque idem effici exiſtimandum eſt. Quæ itaque caloris vis ſit in fabrica operum naturæ, comparatione ad artem facta, inquiretur aptiſſimè. Et in arte aliud efficit aurifabri ignis, quàm fabri ærarij, aut quàm loci ignis: vt nec ipſorum quidem ignes idem efficiunt, & cæterorum quoque inter ſe artificum. Proindè veriùs fortaſſe affirmabitur, quòd & artes hoc vtantur tanquam inſtrumento, mollientes, liquefacientesque, & arefacientes, ac nonullis quoque modum, ac proportionem addentes: & naturam quoque idipſum facere, vnde rerum inter ſe multiplices differentiæ proficiſcantur. Ineptum itaque & ridiculum prorſus fuerit, leui inſpectione eorum, quæ foris apparent, iudicium de hiſce rebus ferre priùs, quàm intrò penetraris, & in alto latentes cauſas attigeris. Siue igitur ſeparatio ſit, ſiue attenuatio, ſiue aliud quodcunque ſint calefactio, & ignitio, differentiam certè ſortirentur opera, pro modo tali calore vtentium. Differentia tamen artis ad naturam eſt: nam illa tanquam inſtrumento, calore vtitur: hæc, & vt inſtrumento, & vt materia. Qui enim ab arte ad opus adhibetur ignis, ipſius operis pars nō eſt: at qui in natura habetur calor, diffuſus per ipſū opus eſt, atque vna cū cæteris ſubſtantiā eius explet. Et nulla in hoc difficultas eſt: ſed magis in illo eſt, quo pacto natura hoc inſtrumētū ita regat, & affectiones quibuſq; rebus ſuas, ac modum omnino reliquū indat, vt planè cognoſcere ſcilicet, & ratione quadā vti videatur. Neque enim abſque ratiocinio & cognitione hæc peragi poſſe videntur. Neque quo pacto naturæ vis co-

ΚΕΦΑΛ. Θ'.

C Περὶ τοῦ ἐν τοῖς τῶν ζώων σώμασι θερμοῦ· ἔτι πῶς τὰ τῶν ζώων μέρη ἔν τε διαφόροις ζώοις, καὶ ἐν τοῖς αὐτοῖς ἀλλήλων διαφέρει.

ΟΙ ἀφαιροῦντες ὡς οὐ τὸ θερμὸν τὸ ἐργαζόμενον ἐν τοῖς σώμασιν, ἢ ὅτι μία τις φορὰ καὶ δύναμις ἡ τμητικὴ τοῦ πυρός, οὐ καλῶς λέγουσιν. οὐδὲ γὰρ ὅλα τοῖς ἀψύχοις ταὐτὰ ποιεῖ πᾶσιν· ἀλλὰ τὰ μὲν ἐκπυκνοῖ, τὰ δὲ μανοῖ, καὶ τήκει τὰ δὲ πήγνυσιν. ἐν δὲ τοῖς ἐμψύχοις οὕτως ὑποληπτέον, ὥσπερ φύσεως πῦρ ζητοῦντι, καθάπερ τέχνης. καὶ γὰρ ἐν ταῖς τέχναις, ἕτερον τὸ χρυσοχοϊκὸν καὶ τὸ χαλκευτικόν, καὶ τὸ τεκτονικὸν πῦρ ἀποτελεῖ, καὶ τὸ μαγειρικόν. ἴσως δ' ἀληθέστερον, ὅτι αἱ τέχναι χρῶνται ὥσπερ ὀργάνῳ, μαλάττουσαι καὶ τήκου- D σαι καὶ ξηραίνουσαι, ἔτι δὲ καὶ ῥυθμίζουσαι. τὸ αὐτὸ δὴ τοῦτο καὶ αἱ φύσεις. ἔχει δὴ καὶ πρὸς ἄλληλα διαφοράς. διὸ γελοῖον πρὸς τὸ ἔξω κρίνειν· εἴτε γὰρ διάκρισιν, εἴτε λέπτυνσιν, εἴθ' ὅτι δή ποτ' ἐστὶ τὸ θερμαίνεσθαι καὶ πυροῦσθαι, διαφορὰν ἕξει τὰ ἔργα τοῖς χρωμένοις. ἀλλ' αἱ μὲν τέχναι, ὡς ὀργάνῳ χρῶνται, ἡ δὲ φύσις, ἅμα καὶ ὡς ὕλῃ, οὐ δὴ τοῦτο χαλεπόν, ἀλλὰ μᾶλλον τὸ τὴν φύσιν αὐτὴν νοῆσαι τὴν χρωμένην, ἥτις ἅμα τοῖς αἰσθητοῖς πάθεσι, καὶ τὸν ῥυθμὸν

ἀποδοῦναι. τοῦτο γὰρ οὐκέτι πυρὸς οὐδὲ πνεύματος. τού-τοις δὴ καταμεμῖχθαι τοιαύτην δύναμιν, θαυμαστόν. ἔτι δὲ τούτου θαυμαστὸν ταὐτὸν καὶ περὶ ψυχῆς. ἐν τούτοις γὰρ ὑπάρχει. διόπερ οὐ κακῶς εἰς ταὐτὸν, ἢ ἁπλῶς ἢ μόριόν τι τὸ δημιουργοῦν, καὶ τὸ τὴν κίνησιν ἀεὶ τὴν ὁμοίαν ὑπάρχει ἐνέργειαν· καὶ γὰρ ἡ φύσις, ἀφ' ἧς καὶ ἡ γένεσις. ἀλλὰ δὴ τίς ἡ διαφορὰ τοῦ καθ' ἕκαστον θερμοῦ, εἴθ' ὡς ὀργάνου, εἴθ' ὡς ὕλης, εἴθ' ὡς ἀμφοῖν. πυρὸς γὰρ διαφοραὶ κατὰ τὸ μᾶλλον καὶ ἧττον. τοῦτο δὲ σχεδὸν ὥσπερ ἐν μίξει καὶ ἀμιξίᾳ· τὸ γὰρ καθαρώτερον μᾶλλον. ὁ αὐτὸς δὲ λόγος καὶ ἐπὶ τῶν ἄλλων ἁπλῶν. ἀνάγκη γὰρ, ἐπείπερ ἕτερον ὀστοῦν καὶ σὰρξ ἡ ἵππου καὶ ἡ βοὸς, ἢ τῷ ἐξ ἑτέρων εἶναι, ἢ τῇ χρήσει διαφέρειν. εἰ μὲν οὖν ἕτερα, τίνες αἱ διαφοραὶ ἑκάστου τῶν ἁπλῶν; [καὶ τίς;] ταύτας γὰρ ζητοῦμεν. εἰ δὲ ταὐτὰ τοῖς ἐν τοῖς ἄλλοις. ἀνάγκη γὰρ δυοῖν θάτερον, καθάπερ ἐν τοῖς ἄλλοις. οἴνου μὲν γὰρ καὶ μέλιτος κρᾶσιν, διὰ τὸ ὑποκείμενον· οἴνου δ' αὐτοῦ, εἴπερ ἕτερα, διὰ τὸν λόγον. διὸ καὶ Ἐμπεδοκλῆς αἰτίαν ἁπλῶς τὴν τοῦ ὀστοῦ φύσιν· εἴπερ ἅπαντα τὸν αὐτὸν λόγον ἔχει τῆς μίξεως, ἀδιάφορα ἐχρῆν ἵππου καὶ λέοντος καὶ ἀνθρώπου εἶναι. νῦν δὲ διαφέρει σκληρότητι καὶ μαλακότητι τοῖς ἄλλοις. ὁμοίως δὲ καὶ σὰρξ καὶ τὰ ἄλλα μόρια. ἔτι τὰ ἐν τῷ αὐτῷ ζῴῳ διαφέρουσι πυκνότητι καὶ μανότητι καὶ τοῖς ἄλλοις. ὥστ' οὐχ ἡ αὐτὴ κρᾶσις. παχὺ μὲν γὰρ καὶ λεπτὸν, καὶ μέγα καὶ μικρὸν εἴη ἐν τῷ ποσῷ· σκληρὸν δὲ καὶ πυκνὸν, καὶ τὰ ἐναντία τούτοις, ἐν τῷ ποιῷ τῷ τῆς μίξεως. ἀναγκαῖον δὲ τοῖς οὕτω λέγουσι, πῶς τὸ δημιουργοῦν ἕτερον ἂν εἴη· καίτοι τοῦτο πλέον ἢ ἔλαττον εἶναι, καὶ τῷ καθ' αὑτὸ καὶ τῷ μεμιγμένον, ἢ ἐν ἄλλῳ πυροῦσθαι καθάπερ τὰ ἑψόμενα καὶ ὀπτώμενα. ὅπερ ἴσως ἀληθές. ἅμα γὰρ ἐγκαταμίγνυται, καὶ ποιεῖ τὸ τῆς φύσεως. ἄρα ὁ αὐτὸς καὶ περὶ σαρκὸς λόγος. καὶ γὰρ αἱ αὐταὶ διαφοραὶ σχεδὸν καὶ περὶ φλεβὸς καὶ ἀρτηρίας, καὶ τῶν λοιπῶν. ὥστε δυοῖν θάτερον, ἢ οὐχ εἷς ὁ λόγος τούτων κατὰ τὴν μῖξιν, ἢ οὐ σκληρότητι καὶ πυκνότητι καὶ τοῖς ἐναντίοις τοὺς λόγους ἀποληπτέον.

A gnoſcẽdi tribui queat, ſatis apparet: atqui in ignem ſolùm, & naturam ſpirituum hoc artificium referri non poteſt: at vim quampiam talem hiſce admiſtã eſſe, omnem admirationem vincit. Eadem de anima quoque admiratio ſubit: nam in iiſdem conſiſtit. Non igitur ineptè aut in idem referetur ſimpliciter, aut in partem quampiam eandem vis formatrix. Et cur motus perpetuò ſimilis actio ſit: nam & natura, à qua fit, eadem eſt, & generatio itidem. At quæ differentia fuerit caloris cuiuſque? ſiue vt organum is habetur, ſiue vt materia, ſiue amborum vicem præſtat. Nam ignis differẽtiæ, iuxta id quod magis ac minùs eſt, ſumuntur. Hæc autem ferè in eo, vt miſtus ſit, aut immiſtus, conſiſtit: nam hic purior erit, & proinde intenſior gradus, ille admiſtio-

B ne contrarij remiſſior. Eadem ratio in aliis quoque ſimplicibus habetur. Siquidem .n. alia ſint, os, & caro, quæ equi eſt, & quæ bouis, aut ob id alia eſſe, quia è diuerſis conſtituta ſint, aut vſu ipſo differre eſt neceſſe. Si itaque ſint diuerſæ inter partes ſimplices, quænam cuiuſque earum erunt differentiæ? Sin eædem ſint, cum iis quæ in aliis habentur: neceſſe eſt enim alterum è duobus hîc eſſe, vt in cæteris quoque rebus. Nam vini & mellis temperamentum, per ſubiecta differre dicimus. vini autem ipſius ſi differentia, per rationem. Quare Empedocles ſimpliciter huiuſce diuerſitatis cauſam, oſſis naturam aſſignat. Siquidem enim vniuerſa eãdem miſtionis rationem ſortirentur, non differre inter

C ſe oportebat, equi, leonis, atque hominis partes. At nunc duritie mollitieque, tum inter ſeſe, tum à cæteris differunt. Sed & quæ in eodem animali habentur partes, tum denſitate, tum raritate, tum cæteris quoque affectionibus pluſculum inter ſe differre videntur. Quapropter non eadem temperatio omnium eſt. Nam craſſities, & tenuitas, magnitudo, & exiguitas, in quanto: durum autem, & denſum, & quæ hiſce contraria ſunt, in quali miſtionis conſiſtunt. Cæterùm qui ita ſentiunt, exponant oportet quo pacto vis, quæ artificio præeſt, alia ſit. Etenim hãc auctiorem eſſe, aut omninò minorem ſic eueniet, & per ſeipſam, & per miſtionem: aut certè ab alio intendi, quemadmodum quæ elixantur, aſſantúrve: id quod vero fortaſſe propius eſt: ſimul enim miſcet, ac fingit natura. Porrò eadem quoque de carne ratio eſt: nam & eædem propemodum differentiæ ſunt. Ita de vena, & arteria, ac cæteris. Eáque propter alterum è duobus neceſſarium ſit, aut vt ratio horum iuxta miſtionem non ſit eadem, aut non è duritie & denſitate ab hiſce contrariis paſſionibus rationes ducendas eſſe.

THEODORI GAZÆ THESSALONICENSIS, IN LIBROS ARISTOTELIS DE ANIMALIBVS.

PRAEFATIO.

LYCVRGVM Lacedæmonium, qui leges ciuibus ſuis conſtituit, reprehendunt nonnulli, Pontifex Sixte quarte, quòd ita tulerit leges, vt belli potiùs quàm pacis rationem habuiſſe videretur. Numam verò Pompilium regem Romanum laudant maiorem in modum, quòd pacis adeo ſtudioſus fuerit, vt nulla cauſa moueri ad bellum pateretur. quorum ſententiam etſi aliàs probo, vt debeo (nihil enim pace commodius, nihil ſanctius) tamen cùm vita hominum ita ferat, vt bella vitari interdum nequeant, ſic cenſeo præfiniendum conſulendúmque, vt & bellum interdum ſit ſuſcipiendum, ſi res vrget: & pax ſeruanda ſit ſemper, ſi fieri poteſt: nec belli ratio vnquam probanda ſit, niſi vt demum rebus compoſitis, quieto tranquilloque animo viuamus. Non enim ad pugnam & homicidia, non ad diſcordias & bella nati ſumus, ſed ad concordiam & humanitatem. Itaque principis inſtitutum atque officium id eſſe reor, vt pacem ſumma opera petat, ſeruet, & colat. Quod cùm Romanos Pontifices ferè omnes feciſſe quoad potuerint, intelligam, laudo illorum animum, quòd neque ab inſtituto naturæ bonæ receſſerint, & præceptum autoris diuini ſeruarint, quòd ſæpiſſimè pacem conciliarint, & commendarint. Sed vſum nonnullorum auſim reprehendere. Pace enim, quam deſiderant ad literarum & artium bonarum ſtudia, & virtutum officia, illi quidem ad voluptates parum honeſtas abuſi ſunt. quod cùm omni hominum ordini ſit turpe, tum Pontificis perſonæ turpiſſimum eſt. Fuerunt tamen & qui rectè pace vterentur, & Pontificatum magna cum laude gererent, quibus te ſimilem video planè ſucceſſiſſe: præſtas enim doctrina & moribus. Quo fit, vt nomen tuum immortalitati mandandum cenſeas, ſtudio potiùs literarum, quæ nunquam pereunt, quàm vel ædificiorum, quæ breui tempore delentur, vel theſauri gemmarum, & auri, cuius hæredes inimici plerunque ſuccedunt: vtque voluptates quæ animi lumen extinguunt, reſpuas, vnámque literarum voluptatem, quæ animum illuſtrare poteſt, expetas, atque in ea requieſcas. Itaque omnes Pontificem talem habuiſſe lætamur, & quiſque ſiue ciuis, ſiue peregrinus, ſtudet pro viribus rem afferre, qua & virtutum tuarum laudem, & animi tui voluptatem augeat. Quem enim ob eius merita non ſolùm veneramur, & obſeruamus, ſed etiam perinde ac patrem amamus, ei perlibenter opera ſtudiorum noſtrorum dedicanda putamus. Alij igitur alia: ego tibi libros Ariſtotelis philoſophi, quos de natura animalium ſcripſerat, conuertere in Latinum ſermonem volui, exiſtimans rem tibi gratam me facturum, ſi hi libri Latinis literis mea induſtria mandarentur, & cultiùs atque integriùs, quàm actum ab alijs adhuc eſt, exponerentur. Videbam per multa errâſſe interpretes, tum imperitia linguæ, tum Ariſtotelicæ diſciplinæ inſcitia. Itaque officium eſſe putaui, vt ſi quid facultatis in me eſſet, qua præſtare hæc poſſem meliora, rem aggrederer, & pro viribus dignius quicquam efficere conarer. Laboraui equidem hac in re vehementer, quoniam nihil adiumenti ab iis qui eadem interpretari voluere, capere poteram. Aut enim Græcè illi dixerunt, quæ Latinè audire homines Latini deſiderant, aut rerum aliarum nomina aliis impropriè tribuerunt, aut noua ipſi ineptè finxerunt. Sententiam verò autoris paſſim adeò deprauarunt, vt argumento quidem interpretationis eorum nemo tam indoctus ſit, qui non rectiùs iudicare de rebus naturæ, quàm Ariſtoteles, poſſe videatur. Locutionis etiam genus ne tale quidem quod legi poſſet, non modo non Ariſtotelis eloquentia dignum, adhibere potuerunt. Quod ſi quid præ ſua facillima cognitione peruerti ab omni veritate non potuit, id etiam propter incultum, horridum, & ineptum ſermonem interpretis vix intelligi poteſt. Afferrem hoc loco ſcripta illorum interpretum, erroréſque ſingulatim enumerando reprehenderem, niſi longior eſſem in re non dubia, præſertim apud te, Princeps doctiſſime, qui vt antè doctor pro tuo ſingulari iudicio ſemper damnaſti illorum interpretationem, melioremque deſideraſti, ſic nunc factus Princeps accuratiùs agis, vt hæc aliquando explanentur, & viſa cum ſui autoris ſententia lucem Latinæ linguæ recipiant. Vtinam tantum facultatis in me eſſet, Princeps ſapientiſſime, vt hoc meum interpretandi genus, eſſe optimum illud quod quæris, confirmare poſſem. Sed quoniam hoc plus eſt, quàm vt vel homo modeſtus de ſe polliceri debeat, vel meæ vires attingere poſſint, nihil ego tale de me: illud verò dicere licet, hanc eſſe omnibus quæ adhuc factæ ſunt, horum librorum interpretatione, & philoſophis ad eloquendũ commodiorem, & eloquentibus ad diſputandum vtiliorem, & vtriſque ad Ariſtotelis ſenſum percipiendum aptiorem. Nec acta equidem egi, ſed à malè conuerſis primus ego Latinis hominibus aperui, quæ his libris Ariſtoteles ſcripſerat. Sed illuc redeo: Me plurimùm elaboraſſe in his libris interpretandis fateor, cùm nihil à primis interpretibus illis iuuari poſſem, ſed omnia ex codicibus veterum autorum petere neceſſe haberem, lectione longa, notationeque varia. Plinium, Cornelium, Columellam, Varronem, Catonem, M. Tullium, Apuleium, Gellium, Senecam, complures alios linguæ Latinæ autores euoluere diligentiùs oportuit, quorum libros vel ſemel accuratè legiſſe laborioſum eſt, nedum ad vſum interpretandi accommodaſſe. Non enim ita vſum verborum accipit interpres, vt ſuo arbitratu rem diſponat, mandetque elocutioni: ſed totidem ferè verbis ſenſus alienos accommodatè exprimere cogitur, quod perdifficile eſt. Accedit ad hæc altera cauſa laboris, quòd exemplaria Græca,

libros hos de animalibus dico, mendoſa admodum habemus, vel librariorum culpa, vel eo caſu, quem apud Strabonem geographum legimus. In his enim emendandis elaborare interpres ſine dubio debet, ne ipſe erraſſe in conuertendo videatur. Ita enim plerique iudicant, vt ſi quid benè ab interprete dicitur, id autori operis tribuant: ſi quid malè, id interpreti vitio aſcribant. de iis interpretibus loquor, qui non minùs laudis merentur in conuertendis aliorum libris, quàm illi qui eos magna cum laude ediderunt: non de iis, qui & ſibi & autori, quem interpretantur, dedecus pariunt. Quid autem? cùm vel ipſa Latina exemplaria quorum ope iuuari nitimur, non minùs ſint emendanda quàm Græca. Quæ enim vtilitas librorum Plinii ſatis interpreti afferretur, niſi emendarentur & corrigerentur. Iam ante ætatem noſtram ſeculis multis iacuit inutile opus eius autoris, quod de hiſtoria naturali inſcribitur, ſcilicet propter innumeros librariorum errores. Quamuis enim autoritate, tum ſcriptoris, tum rerum ſcriptarum peteretur, & à pluribus ſcriberetur, tamen legi ne à doctiſſimis quidem viris poterat, vſqueadeo mendoſum corruptumque habebatur. Caruerunt certè diu Latini homines magno fructu eorum librorum: quanquam nunc doctrina inſigni ſingularique induſtria Ioannis Andreæ præſulis Halerienſis, facilis facta eſt & lectio eorum librorum & imitatio: hic enim primus hos libros emendauit, atque vtiles reddidit. Quod munus, ſi in cæteris quoque libris corrigendis hic ſubiiſſet, labor ſanè aut nullus, aut longe minor ſcriptoribus interpretibus relinqueretur. Sed quoniam hunc virum alia munera tui feliciſſimi principatus, & reipubl. à literarum ſtudiis priuatis diuerterint, accidit res cuique proculdubio difficilior. Mihi autem vel illa difficultas laborem accumulat, quæ non ad eos interpretes ſpectat, qui res difficiles Græcè dicant, faciles verò Latinis verbis impropriis peruertant: ſed ad eos qui ne ea quidem inconſiderata relinquunt, quæ antiqui autores negligentia quadam non facilè excuſanda prætermiſerunt. qualis quæſtio de thoe quadrupede, & panthera, de daſypode, de lynce, de aliis pleriſque occurrit. Sed an ego dignum quicquam vel meo tanto labore, vel tuo deſiderio efficere potuerim, tu mihi eris & iudex, & cenſor. Fuit quidem ſtudium mihi certandi non cum interpretibus illis, quos vincere nullum negotium eſt, ſed cum Ariſtotele ipſo, vt libros quos ille Alexandro regi ſuo principi non minori induſtria quàm doctrina conſcripſerat, hos ego tibi principi meo Latinos redderem non deteriores. ſed an effecerim quod mihi ſtatueram, tu videris. Habes verò in hoc codice libros duodeuiginti: ſcilicet nouem de hiſtoria animalium, quatuor de partibus, quinque de generatione. Hiſtoria primum obtinet locum, atque vt nomen ipſum ſignificat, expoſitionem continet rei, quod eſt, ſiue vt ſit: quod ſcholæ philoſophorum noſtræ ætatis, quia eſt, dicere ſolent. Mox libri de partibus, ac de generatione, cauſam cur ita ſit, declarant: alteri finalem præcipuè, alteri agentem. Cùm enim rem cuius cauſam reddere volumus, exploratam cognitione quod eſt, habere debeamus, rectè & ſcribitur hiſtoria animalium, & præcedit in edocendis cauſis, vndénam, aut quem ad finem, ſiue cuius gratia condita quæque ſunt à natura, præcipuè, in quam finalem agentémque cauſam. Nam obiter quidem materialis quoque paſſim pro rei deſiderio exponitur, vt ſimul aut neceſſitatis notæque melioris ratio declaretur, aut ex quo vndéque conſiſtant quæque, demonſtretur. Sed quanquam libris nouem interpretatio hæc hiſtoriarum conſummatur, tamen qui nonus in exemplari Græco continetur, hunc ego ſeptimum collocaui: nec id temerè factum exiſtimo. Agitur enim in eo de hominis generatione: quam rem Ariſtot. continuò à generatione cæterorum animalium pollicetur explicaturum. Itaque cùm quinto & ſexto libro cæterorum animalium generationem expoſuiſſet, nulli dubio eſſe debet, quin ille ſeptimum hunc collocarit. Sed Appellicon Teius, de quo Strabo plura, vt alia permulta in exſcribendis Ariſtotelicis libris deprauauit, ſic id permutaſſe videtur, exiſtimans vltimum eſſe totius hiſtoriæ collocandum: quoniam cùm Ariſtoteles agere de generatione inciperet, vltimo loco de homine dicturum pollicitus eſt. At ille non vltimo totius hiſtoriæ dixit, ſed eius loci, quem de generatione tractaret. quod patet ex iis quæ in ſexto, qui ſecundus de generatione eſt, locum cum abſoluens, ſcribit. Sequitur, inquit, vt pari modo de iis quæ in terreſtrium genere animal pariunt, atque etiam de homine diſſeramus. Tertius igitur hic à primo de generatione collocandus eſt: quo fit, vt idem ſeptimus totius ordinis hiſtoriæ habeatur. Sunt etiam exemplaria tum Græca tum verò Latina, quæ habeant fragmentum quoddam hiſtoriis additum: ſed id cauſas quaſdam materiales agentéſque generationis humanæ exponit, non hiſtoriam complectitur: itaque non inter hiſtoriæ libros hoc ego ponendum duxi: ſed ſi collocandum vſpiam eſt, libris de generatione, meo quidem iudicio, coniungendum eſt. Inſpicere ſingulos hos libros ac legere velis ſumme Princeps, quoad tuæ occupationes patientur: vt re explorata iudicare, & ſi quid voluptatis eſt in legendis naturæ operibus, oblectari poſſis. Non enim me offenſurum tuas aures puto, quanquam non Græco mihi patrio, ſed peregrino vtor ſermone. Non quod ab interprete dicitur, id ex Græco exemplari intelligere deſiderabis. Ipſa Latina oratio ſenſum Ariſtot. ita explicabit, vt minimè Græcam deſideres. Nihil miſcet, nihil inculcat, nominat vſu veterum probatiſſimorum autorum genera animalium. Si quid noui imponit, ita inſerit, vt familiare cognatumque id quoque videri poſſit. Si quid Græcè appellat, id non durum occurrit. aut enim vſitatum, &, vt ita dixerim, vagum Latinis eſt, quale eſt nomen delphini, cameli, elephantis, crocodili, ichneumonis, aſpidis, ſalamandræ, & reliquorum generis eiuſdem: aut ita ſonat, vt non minùs Latinum eſſe, quàm Græcum videatur. Cur enim tetricem auem, aut crecem, aut clerum, non eodem hoc nomine vocem, ſi non comperio Latinum, cùm, quaſi Latinum ſit, ita congruat? Quis attacem ambiguam illam belluam, aut balerum, fluuiatilem piſcem ita nominans, peregrinum ſonare videbitur? Nec verò contemnendum vulgus interdum eſt, ſi quid nondum à literarum profeſſoribus nuncupatum, ſuo ipſum nomine appellat, vt bruchum genus locuſtæ terreſtris, quod Græci attelabum vocant. aut martam genus muſtelæ ruſticæ, quod Græci ictida dicunt, quamuis plura eius genera ſint. Nec temerè actum dixerim, ſi quis viuerræ nomine ea complectitur: planiùs enim ita docebimus, ſi id martã,

aut viuerram vocemus: muſtelæ autem nomen in eo tantùm remaneat, quod Græci galem appellant. eodémque modo, ſi locuſtæ illius terreſtris alterum genus locuſtam, alterum brucum nuncupemus. Sed enim ſufficit lingua Latina ſingulis Græcæ orationis, ſiue vocabulis, ſiue ſententiis: quanquam nonnulli, quæ Latinè exprimere nequeunt, hæc inopiæ linguæ tribuunt Latinæ, ſuámque pauperiem vitio dare linguæ locupletiſſimæ audent: quos ſatis conuinci à M. Tullio puto, cùm ille linguam Romanam ne copia quidem verborum à Græca ſuperari autumet. Exclamat ille aliquantulum quidem importunè, O inopem interdum linguam Græcam, ſed non ſine cauſa, quando nonnulli ita contendunt, vt Græcis nihil deeſſe, Latinis permulta deſiderari pronuncient. Sed de his hactenus. Ariſtotelis verò laudem, quamuis mos interpretum ſit, eum quem interpretantur autorem, vberiùs laudare, tamen ſi latiùs perſequar, vereor ne mihi idem obiiciatur, quod illi qui apud Lacedæmonios de Herculis laudibus agere voluit: Quis Herculem vituperet, aut minùs bene de eo ſentiat? Quis illum non inter deos immortales enumeret, colat, obſeruet, vt tu laudare velis? Lacedæmonij ſubdiderunt. Tanta eſt enim Ariſtotelis exiſtimatio, tanta autoritas iam apud omnes mortales, vt fruſtra quis prædicet, quo ingenio, qua doctrina hic fuerit, quo artificio rem quamcunque explicandam ſibi ſtatuerit, tractet: quanta vis in hoc differendi, quanta in cognoſcendis exponendiſque rebus diligentia. Hunc & Latij decus M. Tullius ita laudat, vt, excepto Platone, facilè philoſophorum principem appellet. Excipit ille quem amat, laudat verò, quem doctiſſimum eſſe iudicat. Miſſa hæc facio. Librorum quos interpretatus ſum, fructum, quãtus ſit, explicaſſe quoad poſſum, & locus hic patitur, non ab re fuerit fortaſſe. Omnis enim philoſophandi ratio naturalis, vbi à primis illis naturæ initiis, materiam dico, formam, finem, agens, & motum (vt ita loquar) emerſerit, hic verſatur, ac diutiſſimè immoratur, hic ſuas vires exercet, atque multiplicem, variam & admirabilem rerum conſtitutionem ampliſſimè explicat. Perſequitur ordine diſcrimina omnia, quibus natura ſuas animantes differre inter ſe voluit: colligit ſumma genera, reliqua ſigillatim exponit: partitur in ſpecies genera: & ſingula, quæ circiter quingenta numero in his continentur libris, deſcribit: pergit quæque explanans, quemadmodum oriantur, ſiue terreſtria, ſiue aquatica: quibusnam conſtent membris, quibus veſcantur alimentis, quibus afficiantur rebus, quibus moribus prædita ſint, quantum viuendi ſpatium datum cuique eſt, quanta corporis magnitudo, quod maximum eſt, quod minimum eſt: quæ forma, quis color, quæ vox, quæ ingenia, quæ officia: denique nihil omittit, quod in animalium genere natura gignat, alat, augeat, & tueatur. Quæ omnia eò ſpectant, vt (quod ſanctiſſimus quoque autor ille, quem Deus ſibi veluti ſupellectilem quandam precioſam elegerat, admonet) ex iis quæ à natura proueniunt, Deum immortalem, ex quo ipſa pendet natura, intelligamus, admiremur, atque colamus: qua re nihil pulchrius, nihil grauius, nihil dignius homini eſſe poteſt. Tantus fructus horum librorum eſt. Nec audiendi ſunt, qui inquiunt: Multa Ariſtot. de muſca, de apicula, de vermiculo: pauca de Deo. Permulta enim de Deo is tractat, qui doctrina rerum conditarum exquiſitiſſima, conditorem ipſum declarat. nec verò muſca, nec vermiculus omittendus eſt, vbi de naturæ mira ſolertia agitur. Vt enim artificis cuiuſuis, ſic naturæ ingenium in minutiſſimis potiùs contemplandum eſt. Quinetiam cùm rerum cauſas cognoſcere pulcherrimũ ſit (hac enim vna cognitione, homo perfici abſoluique poteſt, vt Deo immortali ſimilis quoad eius fieri poteſt, euadat) his ſanè libris plenè docemur, cur quæque res in animalium genere ita ſit: planéque felicitatem aſſequimur illam nobiliorem, quæ in actione animi conſiſtit: quam ſapiens quoque poëta prædicans, *Felix*, inquit, *qui rerum potuit cognoſcere cauſas.* Quid de anima loquar, de qua toties publicè priuatimque diſputatur? Nuſquam ſuorum librorum tam apertè philoſophus hic ſuam opinionem exponit, quàm in his libris, quid anima ſit, vndéque in corpus recipitur. Ad hæc, mores illi, & virtutum officia, quibus virum appellamus bonum, laudéque proſequimur, longe meliùs hinc accipi poſſunt, quàm vel à rhetore, quem Græci ſophiſtam vocant, vel à prædicatore, homine iam trito Latinis auribus: iis enim ſæpenumero vita diſcrepat à præceptis, & meliùs hortantur alios, quàm ipſi officio fungantur: vt interdum fruſtra illa virtutis egregia laus recitata ſit, prolixáque eorum præceptio vacet, & iaceat, cùm exempla deſiderentur vitæ præceptoris, & autoritas, quam qui reſpicit, faciliùs & mouetur ad virtutem, & in officio tenetur. At verò in contemplandis animalium moribus exempla ſuppetunt omnium officiorum, & effigies offeruntur virtutum, ſumma cum autoritate naturæ omnium parentis, non ſimulatæ, non commentitiæ, non inconſtantes & labiles, ſed verè ingenuæ atque perpetuæ. Quis enim tam peruerſa natura hoſtis ſui generis eſt, quin emendetur & mitigetur, cùm nullum animal occidi à ſui generis beſtia videatur? Quis tam in parentes impius, ne cùm ciconiæ auis, aut meropis pietatem erga parentes intelligat, pientior efficiatur? Quis adeò inhumanus illiberaliſque eſt, quem oſſifragæ benignitas in pullos aquilæ, non faciat benigniorem? Quis tam piger, iners, & ſegnis eſt, quin excitetur ad vitæ munera, cùm formicarum aut apum labores atque induſtriam intuetur? Quem non pudeat per metum peccare, cùm non ſolùm leonis animum inuictum cogitat, ſed etiam reguli auiculæ, quæ cum aquila pugnat, certátque de imperio? Quis principem bonum non colat atque obſeruet, cùm ſi rex apum in itinere aberrauerit, omnes eum inquirere, odoratúque ſagaci perſequi, donec inuenerint, cognitum habeant: geſtari etiam regem à plebe cùm volare non poteſt, & ſi perierit, omnes diſcedere? Nunquid parum exempli ad boni principis ſiue deſiderium, ſiue obſeruantiam datur? Quis princeps non ad clementiam facilè inuitetur, cùm reges apum armari quidem aculeo, ſed eo nunquam vti intelligat? Quæ fides, quis amor in canibus? Quanta in elephantis manſuetudo? Quæ in anſere verecundia? Quantum ſtudium ornatus ac polituræ in pauone? Quanta opera vocis amœnæ ſuauiſque in luſcinia? Quid de iuſtitia apum dicam, quæ colligunt quidem ex iis, quibus aliquid dulcedinis ineſt, ſed ſine vllo fructuum detrimento? Quid de caſtitate elephantis, qui quam impleuerit coitu, eam rurſus non tangit? Aut columbæ, quæ neque coire cum pluribus patitur, neque coniugium iam inde à primo ortu initum deſerit, niſi vidua, aut cœlebs? Diſciplina autem

& eruditio elephanti, quem non faciat ſtudioſiorem? Omnino nulla pars vitæ humanæ eſt, quæ non ſuorum officiorum exempla commodiſſimè hinc accipiat. Nam, vt omittam artes illiberales, quæ & ipſæ ingeniis animalium non parum iuuantur, valetudinis exempla quæſo vnde commodiùs peti, quàm ex animalibus poſſint? Loca pro temporis conditione ſolent illa mutare: non plus edunt, aut bibunt, quàm ſibi ſalubre ſit: non diutiùs dormiunt, quàm ratio valetudinis poſtulat: modum mouendi quieſcendique ſeruant: nouit ſua quodque medicamenta: viuit ſua quodque ſorte contentum, & gaudet. hæc latè à medicis præcipiuntur. At verò exempla in quibus vis maior quam in præceptis eſt, ab animalibus certiora præbentur. Addo vtilitatem, quæ in dicendi facultate ex hac animalium ratione afferri poteſt. Comparationes enim, aſſimilationeſque illæ, quas Græci parabolas vocant, quæ plurimùm orationem exornant, auditorémque tenent, hinc variè, copioſè, aptiſſiméque accipi poſſunt: vt ſiue oras, ſiue communem partiris cum aliis ſermonem, eloquens, aptus ſuauiſque eſſe poſſis. Poeta verò vndenam pulchriùs ſua illa rara & mira accipiat, quàm ex his libris, qui naturæ arcana rimantur, enarrant, aperiunt? Medicus autem, quod fatetur ſe ſua inde ordiri, vbi philoſophus deſinit, nuſquam pleniùs quàm hic viderit. Quódque à Galeno medicorum principe traditur, Ariſtotelem primam anatomen, hoc eſt, membrorum diſſectionem ſcripſiſſe, hic agnoſcet: & quod idem & primus, & optimus fuerit autor, percipiet. Iam & philoſophi noſtræ ætatis, qui quadrifariam rerum cauſam ex prima illa librorum naturalis auſcultationis inſtitutione, accipiunt quidem communi quadam ratione: ſed quemadmodum his natura vtatur, in conſtitutione generationéque animalium parum, autore Ariſtotele, vident, inopia ſcilicet exemplaris Ariſtotelici, quod legere poſſint, hic vidiſſe aliquando gaudebunt, & phyſici, quos ſe appellant, digniùs de cætero profitebuntur. Rationes enim ideo quærimus vniuerſales, vt demum res particulares & ſenſiles teneamus. Accedit ad hæc voluptas, qua iuuari ac perfici quamuis actionem Ariſtoteles ait, quam in contemplandis rebus naturæ auidiſſimè capimus. Nam ſi pictor nos vehementer obiectat, cùm animal ſcitè pinxerit: quanto vehementiùs natura ipſa afficiet voluptate, cùm eius tam multa & varia animalia, mira membrorum conuenientia, inauditáque moderatione & elegantia facta cernamus? Cùm hos legimus libros, contemplamur profectò quàm varius ac pulcherrimus fructus horum librorum, & vtilitas amplior, quàm vt verbis exprimi poſſit. Sed quorſum hæc? Vt ſi in traducendis his tam neceſſariis, tamque commodis, & amœniſſimis libris, ſatis ego interpretis munere functus ſum, tu ſententiam feras Princeps doctiſſime, ædaſque in vſum publicum opus, quod ego ſine tua autoritate ædere nec poſſum, nec debeo. Si quid etiam dignum ex meo ingeniolo exit, quod in ea bibliotheca ponatur, quam magnificè conſulens hominum communi vtilitati, condere ſtatuiſti: ſi quid inquam tale effici mea opera potuit, cenſeas ea ipſa bibliotheca tanquam ciuitate donari hunc codicem, nondum cognitum, aut vllam in ſedem receptum. Non ego primus te conſtituo iudicem: iampridem conſenſu omnium doctorum virorum habitus es exiſtimator, & architectus eorum qui in ſtudiis liberalibus elaborant. Facit enim tua illuſtris doctrina, tuúmque ſummum ingenium, vt nemo te vel iudicio grauior, vel autoritate locupletior habeatur. Principem etiam ſummum te nuper quidem habuimus: ſed, quod optauimus, talem habemus, vt facilè temporibus his tuis ſperare poſſimus publicam illam felicitatem, quam Plato vir doctiſſimus futuram confirmat, cùm aut philoſophi regnant, aut reges philoſophantur. Tu enim & philoſophus es illuſtris, & fortuna ſummi imperij virtuti tuæ coniuncta eſt. Lege igitur Princeps ſapientiſſime, & iudica, an ego rem tibi non repudiandam attulerim: & ſi bene, vt ſpero, ceſſerit, age pro tua liberalitate, vt pari ſtudio laborem ſuſcipere alterum, pluráque in dies afferre huiuſmodi opera poſſim.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΖΩΩΝ ΙΣΤΟΡΙΑΣ ΤΟ Α.

ARISTOTELIS STAGIRITÆ, DE HISTORIA ANIMALIVM LIBER I.

Theodoro Gaza interprete.

CAPVT I. A / ΚΕΦΑΛ. α.

In quibus animalia inter ſe differant, quibúſve conueniant, eorumdemque naturæ diuerſitas.

ANIMALIVM partes, aut incompoſitæ ſunt, quæ ſcilicet in ſimiles ſibi partes diuiduntur, vt caro in carnes, & ob eam rem ſimilares appellentur: aut compoſitæ, quæ aptæ ſecari in partes diſſimiles ſint, non in ſimiles: vt manus, non in manus B ſecatur, aut facies in facies: quapropter eas diſſimilares nominemus. Quo in genere partium ſunt, quæ non modò partes, verùm etiam membra appellentur: videlicet quæ cùm ipſæ totius integritate deſcribantur, habeant tamen intra ſe partes diuerſas, ſuique generis opificia, vt caput, vt pes, vt manus, vt totum brachium, aut pectus: quippe quæ & ipſa partes ſint totæ, & ex partibus conſtent diuerſis. Quæque autem pars diſſimilaris ex ſimilaribus conſtat, vt manus ex carne, oſſibus, neruis. Habent verò animalia partes, aut eaſdem ſibi omnes, aut diuerſas. Partes eaſdem vel C ſpecie intelligi volo, vt hominis naſus, aut oculus, ſpecie cum naſo aut oculo hominis alterius conuenit, & caro cum carne, & os cum oſſe: quod idem de equo, & cæteris quæ ſpecie inter ſe conſentire ſtatuimus, intelligi debet. Vt enim totum ſe habet ad totum, ſic partes ſingulæ ſeſe ad ſingulas habeant neceſſe eſt. Vel genere, quanquam exceſſu defectúve inter ſe differant. De iis loquor, quorum idem eſt genus; verbi gratia, auis, aut piſcis: id enim vtrumque differentiis conſumitur generis. Et ſpecies complures tum piſcium, tum etiam auium habentur. Differunt verò inter ſe D partes penè plurimæ eorum contraria affectuum qualitate, vt coloris, aut figuræ, eo quòd aliæ magis, aliæ minùs affectæ iis ipſis qualitatibus ſint.

Ζώων διαίρεσις.

ΤΩΝ ἐν τοῖς ζώοις μορίων, τὰ μὲν ἐστὶν ἀσύνθετα, ὅσα διαιρεῖται εἰς ὁμοιομερῆ, οἷον σάρκες εἰς σάρκας· τὰ δὲ σύνθετα, ὅσα εἰς ἀνομοιομερῆ, οἷον ἡ χεὶρ οὐκ εἰς χεῖρας διαιρεῖται, οὐδὲ B τὸ πρόσωπον εἰς πρόσωπα. τῶν δὲ τοιούτων ἔνια, οὐ μόνον μέρη, ἀλλὰ καὶ μέλη καλεῖται. τοιαῦτα δ' ἐστὶν, ὅσα τῶν μερῶν ὅλα ὄντα ἕτερα μέρη ἔχει ἐν αὐτοῖς * ἴδια· Gaz. & τὰ αὐτοῖς ἔργα. οἷον κεφαλὴ, καὶ σκέλος καὶ χεὶρ, καὶ ὅλος ὁ βραχίων, καὶ ὁ θώραξ. ταῦτα γὰρ αὐτά τε ἐστὶ μέρη ὅλα, καὶ ἔστιν αὐτῶν ἕτερα μόρια. πάντα δὲ τὰ ἀνομοιομερῆ σύγκειται ἐκ τῶν ὁμοιομερῶν· οἷον χεὶρ ἐκ σαρκὸς, νεύρων, καὶ ὀστῶν. ἔχει δὲ τῶν ζώων ἔνια μὲν, πάντα τὰ μόρια ταὐτὰ ἀλλήλοις, ἔνια δ' ἕτερα. ταὐτὰ δὲ τὰ μὲν εἴδει τῶν C μορίων ἐστίν· οἷον αἱ ἀνθρώπου ῥὶς καὶ ὀφθαλμὸς, αἱ ἀνθρώπου ῥινὶ καὶ ὀφθαλμῷ, καὶ σαρκὶ σὰρξ, καὶ ὀστῷ ὀστοῦν. τὸν αὐτὸν δὲ τρόπον καὶ ἵππων καὶ τῶν ἄλλων ζώων, ὅσα τῷ εἴδει ταὐτὰ λέγομεν αὐτοῖς. ὁμοίως γὰρ ὥσπερ τὸ ὅλον ἔχει πρὸς τὸ ὅλον, καὶ τῶν μορίων ἔχει ἕκαστον πρὸς ἕκαστον. τὰ δὲ, ταὐτὰ μὲν ἐστὶ, διαφέρει δὲ καθ' ὑπεροχὴν καὶ ἔλλειψιν, ὅσων τὸ γένος ἐστὶ ταὐτόν. λέγω δὲ γένος, οἷον ὄρνιθα καὶ ἰχθύν. τούτων γὰρ ἑκάτερον ἔχει διαφορὰν κατὰ τὸ γένος, καὶ πρὸς τὸ γένος, καὶ ἔστιν εἴδη πλείω ἰχθύων καὶ ὀρνίθων. διαφέρει δὲ D σχεδὸν τὰ πλεῖω τῶν μορίων ἐν αὐτοῖς, παρὰ τὰς τῶν παθημάτων ἐναντιώσεις, οἷον χρώματος, καὶ σχήματος, τῷ τὰ μὲν μᾶλλον αὐτὰ πεπονθέναι, τὰ δὲ ἧττον·

ἔτι δὲ πλήθει καὶ ὀλιγότητι, καὶ μεγέθει καὶ σμικρότητι, καὶ ὅλως ὑπεροχῇ καὶ ἐλλείψει. τὰ μὲν γάρ ἐστι * μαλακόστρακα αὐτῶν, τὰ δὲ ὀστρακόδερμα· καὶ τὰ μὲν, μακρὸν ἔχει τὸ ῥύγχος, ὥσπερ αἱ γέρανοι, τὰ δὲ, βραχύ· καὶ τὰ μὲν, πολύπτερα, τὰ δ' ὀλιγόπτερά ἐστιν. οὐ μὴν ἀλλ' ἔνια γε καὶ ἐν τούτοις ἕτερα ἑτέροις μόρια ὑπάρχει· οἷον τὰ μὲν ἔχει πλῆκτρα, τὰ δ' οὔ· καὶ τὰ μὲν λόφον ἔχει, τὰ δ' οὔ. ἀλλ' ὡς εἰπεῖν, τὰ πλεῖστα καὶ ἐξ ὧν ὁ ὄγκος ὁ πᾶς συνέστηκεν, ἢ ταὐτά ἐστιν, ἢ διαφέρει τοῖς ἐναντίοις καὶ τῇ καθ' ὑπεροχὴν καὶ ἔλλειψιν. τὸ γὰρ μᾶλλον καὶ ἧττον, ὑπεροχὴν ἄν τις καὶ ἔλλειψιν θείη. ἔνια δὲ τῶν ζώων, οὔτε τῷ εἴδει τὰ μόρια ταὐτὰ ἔχει, οὔτε καθ' ὑπεροχὴν καὶ ἔλλειψιν, ἀλλὰ κατ' ἀναλογίαν· οἷον πέπονθεν ὀστοῦν πρὸς ἄκανθαν, καὶ ὄνυξ πρὸς ὁπλὴν, καὶ χεὶρ πρὸς χηλὴν, καὶ πρὸς πτερὸν λεπίς· ὃ γὰρ ἐν ὄρνιθι πτερὸν, τοῦτο ἐν ἰχθύϊ ἐστὶ λεπίς. τὰ μὲν οὖν μόρια, ἃ ἔχουσιν ἕκαστα τῶν ζώων, τοῦτόν τε τὸν τρόπον ἕτερά ἐστι καὶ ταὐτὰ, καὶ ἔτι τῇ θέσει τῶν μερῶν. πολλὰ γὰρ τῶν ζώων ἔχει μὲν ταὐτὰ μέρη, ἀλλὰ κείμενα οὐχ ὡσαύτως· οἷον μαστοὺς, τὰ μὲν ἐν τῷ στήθει, τὰ δὲ ἐν τοῖς μηροῖς. ἔστι δὲ τῶν ὁμοιομερῶν τὰ μὲν, μαλακὰ καὶ ὑγρὰ, τὰ δὲ ξηρὰ καὶ στερεά. ὑγρὰ μὲν, ἢ ὅλως, ἢ ἕως ἂν ᾖ ἐν τῇ φύσει, οἷον αἷμα, ἰχὼρ, πιμελὴ, στέαρ, μυελὸς, γονὴ, χολὴ, γάλα ἐν τοῖς ἔχουσι, σὰρξ τε, καὶ τὰ τούτοις ἀνάλογα. ἔτι ἄλλον τρόπον τὰ περιττώματα, οἷον φλέγμα, καὶ τὰ ὑποστήματα τῆς κοιλίας καὶ κύστεως. ξηρὰ δὲ καὶ στερεὰ, οἷον νεῦρον, δέρμα, φλὲψ, θρὶξ, ὀστοῦν, χόνδρος, ὄνυξ, κέρας· ὁμώνυμον γὰρ πρὸς τὸ μέρος, ὅταν τῷ σχήματι καὶ τὸ ὅλον λέγηται κέρας. ἔτι ὅσα ἀνάλογα τούτοις. αἱ δὲ διαφοραὶ τῶν ζώων εἰσὶ, κατά τε τοὺς βίους καὶ τὰς πράξεις, καὶ τὰ ἤθη, καὶ τὰ μόρια. περὶ ὧν τύπῳ μὲν εἴπωμεν πρῶτον, ὕστερον δὲ περὶ ἕκαστον γένος ἐπιστήσαντες ἐροῦμεν. εἰσὶ δὲ διαφοραὶ κατὰ τοὺς βίους καὶ τὰς πράξεις, καὶ τὰ ἤθη. αἵδε, ἢ τὰ μὲν ἔνυδρα αὐτῶν ἐστι, τὰ δὲ χερσαῖα. ἔνυδρα [δὲ] διχῶς, τὰ μὲν, ὅτι τὸν βίον καὶ τὴν τροφὴν ποιεῖται ἐν τῷ ὑγρῷ, καὶ δέχεται τὸ ὑγρὸν καὶ ἀφίησι, τούτου δὲ στερισκόμενα, οὐ δύναται ζῆν· οἷον πολλοῖς συμβαίνει τῶν ἰχθύων. τὰ δὲ, τὴν μὲν τροφὴν ποιεῖται καὶ τὴν διατριβὴν ἐν τῷ ὑγρῷ, οὐ μέντοι δέχεται τὸ ὕδωρ, ἀλλὰ τὸν ἀέρα, καὶ γεννᾷ ἔξω. πολλὰ δ' ἐστὶ τοιαῦτα καὶ πεζὰ, ὥσπερ ἐνυδρὶς, καὶ λάταξ, καὶ κροκόδειλος· καὶ πτηνὰ, οἷον αἴθυια καὶ κολυμβὶς· καὶ ἄποδα, οἷον ὕδρος. ἔνια δὲ τὴν μὲν τροφὴν ἐν τῷ ὑγρῷ ποιεῖται, καὶ οὐ δύναται ζῆν ἐκτὸς, οὐ μέντοι δέχεται οὔτε τὸν ἀέρα, οὔτε τὸ ὑγρὸν, οἷον ἀκαλήφη, καὶ τὰ ὄστρεα. τῶν δὲ ἐνύδρων, τὰ μέν ἐστι θαλάττια, τὰ δὲ λιμναῖα, τὰ δὲ ποτάμια, τὰ δὲ τελματιαῖα, οἷον βάτραχος, καὶ * κορδύλος. [καὶ] τῶν θαλαττίων τὰ μὲν, πελάγια, τὰ δὲ, αἰγιαλώδη, τὰ δὲ πετραῖα. τῶν δὲ χερσαίων τὰ μὲν, δέχεται τὸν ἀέρα καὶ ἀφίησιν, ὃ καλεῖται ἀναπνεῖν καὶ ἐκπνεῖν· οἷον ἄνθρωπος, καὶ πάντα ὅσα πνεύμονα ἔχει τῶν χερσαίων. τὰ δὲ, τὸν ἀέρα μὲν * οὐ δέχεται, ζῇ δὲ καὶ τὴν τροφὴν ἔχει ἐν τῇ γῇ· οἷον σφὴξ, καὶ μέλιττα, καὶ τὰ ἄλλα ἔντομα. καλῶ δ' ἔντομα, ὅσα ἔχει κατὰ τὸ σῶμα ἐντομὰς, ἢ ἐν τοῖς ὑπτίοις, ἢ ἐν τούτοις τε καὶ τοῖς πρανέσι. καὶ τῶν μὲν χερσαίων πολλὰ,

* κ. μαλακόστρακα αὐτῶν, τὰ δ' ὀστρακόδερμα.

* κ. κορδύλοι.

* ... negatio ... nõ habet, ... necessitatem.

A Multitudine etiam, & paucitate, & magnitudine, paruitateque, & omnino exceſſu defectúque diſcrepant, cùm aliis cruſta, aliis teſta pro tegmine habeatur: & aliis roſtrum porrectius ſit, vt gruibus: aliis breue. Penna item aliis vberiùs, aliis parciùs data eſt. Sed tamen in iis quoque ratio partium nonnullarum diuerſa eſt, cùm alia calcari, aut aliquo armentur aculeo, alia nihil eiuſmodi habeant: & aliis apex in capite ſit, aliis deſit. Sed enim, quod prope dixerim, partes plurimæ, & ex quibus tota moles compacta eſt, aut eædem ſunt, aut ratione contrariorum, & per exceſſum defectúmque differunt. Pluris enim minoriſque rationem, referri ad exceſſum defectúmque, putauerim oportere. Non B deſunt quibus partes nec ſpecie ſint eædem, neque exceſſu, defectúve, ſed proportione conueniant: quomodo os cum ſpina, & vnguem cum ſolida vngula, & manum cum forcipato pedis, & pennam cum ſquama conuenire animaduertimus. Quod enim penna in auium genere eſt, idem ſquama in piſcibus habetur. Partes, quas ſingula animalia habent hunc in modum diuerſas, eaſdémve intelligimus, atque etiam ſitu contemplamur. Sunt enim complura, quæ eaſdem habeant partes, ſed non ſitu eodem: verbi cauſa, mammas alia in pectore habent, alia in fœminibus. Partes autem ſimilares, aut molles ac humidæ ſunt: aut ſiccæ, & ſolidæ. Molles, inquam, vel omnino, vel quamdiu in ſede C maneant naturali: vt ſanguis, ſanies, adeps, ſeuum, medulla, ſemen genitale, fel, lac, vbi haberi id poteſt, caro, & quæ iis proportione reſpondeant. item excrementa omnia, modo tamen diuerſo, vt pituita, & ſedimenta alui, atque veſicæ. Siccas ac ſolidas intelligi volo, neruum, cutem, venam, pilum, os, cartilaginem, vnguem, cornu: æquiuoce enim ad genus appellamus, cùm cornu tum figura tum toto dicimus. Item quæ iis proportione reſpondent. Animalium verò differentias, aut per vitas, aut per actiones, aut per mores, aut per partes conſtitui dignum eſt. Quibus de rebus primùm formula quadam agendum, deinde generatim diſcuſſione diligentiore differendum cenſemus. Profectò differentiæ, quæ in morum, victuum, actionúm- D que ratione verſantur, colligi debent, eo quòd alia ſunt aquatilia, alia terreſtria. Et aquatilium ordo duplex: alia enim in fluido degunt, victúmque petunt ex humore: quem etiam humorem per vices accipiunt, & reddunt, nec viuere poſſunt, niſi verſentur in humore: quod plurimæ piſcium parti euenire apertum eſt. Alia degunt quidem in fluido, victúmque inde emoliuntur: ſed aerem, non humorem recipiunt, & foris parere ſolent. Complura huius generis ſunt partim greſſilia, vt lutris, latax, crocodilus: partim volucres, vt mergi, vt vrinatrices. Quinetiam quæ nullis pedibus innitantur, vt natrix. Nonnulla cùm victum E in humore exerceant, nec foris viuere queant, nihil vel aëris, vel humoris recipiunt, vt vrticæ, vt oſtrea. Aquatilis autem generis alia marina, alia fluuialia, alia lacuſtria, alia paluſtria, vt rana, vt cordula. Terreſtrium verò animantium alia accipiunt, redduntque aerem, (quæ reſpiratio nominatur) vt homo, & quæcunque terreſtria habent pulmonem. Alia quamuis aërem recipiant, tamen ſedem in terra perpetuò tenent, & victum indidem capiunt, vt veſpæ, apes, & reliqua inſecta. Quo nomine ea appello, quorum corpus inciſuris præcingitur, aut parte tantùm ſupina, aut etiam prona. Sed cùm terreſtrium plura,

re dictum eſt, cibum ab aquis petant, nullum generis aquatilis eſt, quod & aquam recipiat, & terram cibi cauſa petat. Sunt porrò quæ primùm viuant in humore, deinde forma immutata, foris vitam incipiant agere, vt culices paluſtres: ex iis enim aſili proueniunt. Ad hæc, alia ſede ſtabili degunt, alia mutabili, & vaga. Sedes ſtabilis in humore tantummodo eſt. Terreſtrium nulla ſtatu immutabili viuunt. At aquatilium plura ſaxis affixa vitam omnem traducunt: vt conchæ genera complura. Quinetiam ſpongia ſenſum habere aliquem creditur argumento, quod multo difficilius abſtrahuntur, niſi clanculum agatur, vt referunt auulſores. Sunt item quæ & adhærere ſoleant, & quoties libuit, abſoluant: genus quoddam enim, quam vrticã vocamus: quippe cùm nonnullæ ex iis noctu abſolutæ paſcantur. Non deſunt complura, quæ cùm ſint abſoluta, mouere tamen ſe nequeant, vt oſtreæ, & quæ tota ſimplici nitidoque teſta operta, vertibula appellantur, & calli, aut tubera. Vis item aliis natandi tributa eſt, vt piſcibus, vt mollibus, vt cruſtatis, vel cruſtis. Quædam ambulare poſſunt, vt genus cancrorum: quippe quod, quanquam ſuapte natura aquatile eſt, tamen habet vim ambulandi. Terreſtrium verò, alia volucres ſunt, vt aues, vt apes, quæ modo inter ſe quodam alio diſtant. Alia pedeſtria: quorum item alia greſſilia, alia reptilia, alia tractilia ſunt. Animal, quod volucre tantum ſit, vt piſcis natatile ſolummodo eſt, nullum nouimus. Nam & quæ pennis cuteis volant, ingredi poſſunt. Vnde veſpertilioni etiam pedes ſunt, & vitulus marinus pedes habet minutos. Sic nonnullæ aues depedes ſunt, quæ ob eam rem apedes, à paruitate pedum nuncupatur: quod genus auiculæ pennis plurimùm valet: ſicut cætera quoque propè ſimilia, vt pennis præualere, ſic pedibus degenerare videtur, vt hirundo, & falcula, ſiue riparia: hæc enim omnia & moribus, & volatu, & ſpecie proxima inter ſe conſpiciuntur. Apparet apes omnibus anni temporibus. Riparia æſtate tantùm, cùm imber inceſſit: tunc enim & apparet, & capitur: denique rara hæc auicula eſt. At verò quæ greſſilia, eademq; natatilia ſunt, complura reperiuntur, necnon differentias illas vitæ, actioneſque animantium continet. Sunt enim aliæ gregales, aliæ ſolitariæ, tum volucres, tũ nantes, tum etiam pedeſtres. Vitam aliæ ancipitem degunt, vt eædem modo ſocietate, modo ſolitudine gaudeant. Item aliæ ciuiles, aliæ inciuiles, tum ex gregalibus, tum etiam ex ſolitariis ſunt: gregales in volucrum genere, columbi, grues, olores. Nullum, cui vngues adunci, gregatile eſſe perpẽdimus. Complura etiam inter nantes piſcium genera gregatim degere ſcimus, vt quos curſores vocant, & thunnos, & limoſas, & hamias. Hominis naturã ancipitem ſocietatis ac ſolitudinis eſſe, apertum eſt. Ciuiles appello animantes, quæ labori cõmunicant eidem, quarum opus commune efficitur opera, munuſque idem omni eſt: quod non omnibus gregalibus competit. Ciuilis generis eſt homo, apis, veſpa, formica, grus. Quarum aliæ ſub duce degunt, vt grues, vt apes: aliæ nulli ſubditæ imperio ſunt, vt formicæ, & alia innumera penè genera. Sunt item tam ex gregalibus, quàm ex ſolitariis, aliæ, quæ ſedem nunquam mutent: aliæ quæ mutare ſtato tẽpore ſoleant. Et aliæ quæ carne veſcantur, aliæ, quę frugibus, aliæ quæ omnia attingant. Non deſunt, quæ cibo ſui generis vtantur, vt apes, vt aranei. apes enim melle, & quibuſdam aliis dulcibus aluntur:

A ὕδατος γίνεται, ἐν τῷ ξηρῷ τὴν τροφὴν πορίζεται. τῶν δ' ἐνύδρων καὶ δεχομένων τὴν θάλατταν, οὐθὲν ἐκ τῆς γῆς. ἔνια δ' ἐστὶ τῶν ζῴων, ἃ τὸ μὲν πρῶτον ζῇ ἐν τῷ ὑγρῷ, ἔπειτα δὲ μεταβάλλει εἰς ἄλλην μορφὴν, καὶ ζῇ ἔξω, οἷον ἐπὶ τῶν ἐν τοῖς ποταμοῖς ἐμπίδων· * γίνεται δ' ἐξ αὐτῶν ὁ οἶστρος. ἔτι τὰ μὲν ἐστὶ μόνιμα τῶν ζῴων, τὰ δὲ, μεταβλητικά. ἔστι δὲ τὰ μόνιμα, ἐν τῷ ὑγρῷ· τῶν δὲ χερσαίων οὐθὲν μόνιμόν ἐστιν. ἐν δὲ τῷ ὑγρῷ πολλὰ τῷ προσπεφυκέναι ζῇ, οἷον γένη ὀστρέων πολλά. δοκεῖ δὲ καὶ ὁ σπόγγος ἔχειν τινὰ αἴσθησιν. σημεῖον δὲ, ὅτι χαλεπώτερον ἀποσπᾶται, ἂν μὴ λανθάνῃ γενομένη ἡ κίνησις, ὥς
B φασι. τὰ δὲ καὶ προσφύεται, καὶ ἀπολύεται· οἷον ἐστὶ γένος τι τῆς καλουμένης ἀκαλήφης. τούτων γάρ τινες νύκτωρ ἀπολυόμεναι νέμονται. πολλὰ δ' ἀπολελυμένα μέν ἐστιν, ἀκίνητα δὲ, οἷον ὄστρεα καὶ τὰ καλούμενα * ὁλοθούρια. τὰ δὲ νευστικὰ, οἷον ἰχθύες, καὶ τὰ μαλάκια, καὶ τὰ μαλακόστρακα, οἷον κάραβοι. τὰ δὲ, πορευτικὰ, οἷον τὸ τῶν καρκίνων γένος. τοῦτο γὰρ ἔνυδρον ὂν τὴν φύσιν, πορευτικόν ἐστι. τῶν δὲ χερσαίων ἐστὶ τὰ μὲν, πτηνὰ, ὥσπερ ὄρνιθες καὶ μέλιτται· καὶ ταῦτα ἄλλον τρόπον διαφέροντα ἀλλήλων· τὰ δὲ, πεζά. καὶ τῶν πεζῶν τὰ μὲν, πορευτικά· τὰ δὲ, ἑρπυστικά· τὰ δὲ, ἰλυσπαστικά. πτηνὸν δὲ μόνον οὐ-
C δέν ἐστιν, ὥσπερ νευστικὸν μόνον ἐστὶν ἰχθύς. καὶ γὰρ τὰ δερμόπτερα πεζεύει, καὶ νυκτερὶς δίποδές εἰσι, καὶ τῇ φώκῃ κεκολοβωμένοι πόδες. καὶ τῶν ὀρνίθων εἰσί τινες κακόποδες, οἳ διὰ τοῦτο καλοῦνται ἄποδες. ἔστι δὲ εὔπτερον τοῦτο τὸ ὀρνίθιον. σχεδὸν δὲ καὶ τὰ ὅμοια αὐτῷ, εὔπτερα μὲν, κακόποδα δ' ἐστὶν, οἷον χελιδὼν καὶ δρεπανίς. ὁμοιότροπά τε γὰρ καὶ ὁμοιόπτερα ταῦτα πάντα, καὶ τὰς ὄψεις ἐγγὺς ἀλλήλων. φαίνεται δ' ὁ μὲν ἄπους, πᾶσαν ὥραν· ἡ δὲ δρεπανὶς, ὅταν ὕσῃ τοῦ θέρους. τότε γὰρ καὶ ὁρᾶται καὶ ἁλίσκεται. ὅλως δὲ σπάνιόν ἐστι τοῦτο τὸ ὄρνεον. πορευτικὰ δὲ καὶ νευστικὰ, πολλὰ τῶν ζῴων ἐστίν. εἰσὶ δὲ καὶ αἱ τοιαίδε δια-
D φοραὶ κατὰ τοὺς βίους, καὶ τὰς πράξεις. τὰ μὲν γὰρ αὐτῶν, ἐστὶν ἀγελαῖα· τὰ δὲ, μοναδικὰ, καὶ πεζὰ, καὶ πτηνὰ, καὶ πλωτά· τὰ δ', ἐπαμφοτερίζει. καὶ τῶν ἀγελαίων καὶ τῶν μοναδικῶν, τὰ μὲν, πολιτικά· τὰ δὲ, σποραδικά ἐστιν. ἀγελαῖα μὲν οὖν, οἷον ἐν τοῖς πτηνοῖς, τὸ τῶν περιστερῶν γένος, καὶ γέρανος, καὶ κύκνος. γαμψώνυχον δ' οὐδὲν ἀγελαῖον. καὶ τῶν πλωτῶν, πολλὰ γένη τῶν ἰχθύων, οἷον οὓς καλοῦσι δρομάδας, θύννοι, πηλαμίδες, ἀμίαι. ὁ δ' ἄνθρωπος, ἐπαμφοτερίζει. πολιτικὰ δ' ἐστὶν, ὧν ἕν τι καὶ κοινὸν γίνεται πάντων τὸ ἔργον· ὅπερ οὐ πάντα ποιεῖ τὰ ἀγελαῖα. ἔστι δὲ τοιοῦτον, ἄνθρωπος, μέλιττα, σφὴξ,
E μύρμηξ, γέρανος. καὶ τούτων τὰ μὲν, ὑφ' ἡγεμόνα ἐστί· τὰ δ', ἄναρχα· οἷον, γέρανος, καὶ τὸ τῶν μελιττῶν γένος, ὑφ' ἡγεμόνα· μύρμηκες δὲ, καὶ μυρία ἄλλα, ἄναρχα. καὶ τὰ μὲν, ἐπιδημητικὰ, καὶ τῶν ἀγελαίων καὶ τῶν μοναδικῶν· τὰ δὲ, ἐκτοπιστικά. καὶ τὰ μὲν, σαρκοφάγα· * τὰ δὲ, ποηφάγα· τὰ δὲ, καρποφάγα· τὰ δὲ, ἰδιότροφα· οἷον τὸ τῶν μελιττῶν γένος, καὶ τὸ τῶν ἀραχνῶν. τὰ μὲν γὰρ, μέλιτι καὶ τισιν ἄλλοις ὀλίγοις τῶν γλυκέων χρῆται τροφῇ·

* γρ. γίνεται δ' ἐξ [illegible]

De partib. animalium l. 4. c. 5: poſt vocem ὁλ. legiſſe videtur G. ἢ τήθυα.

* γρ. τὰ δὲ καρποφάγα· τὰ δὲ παμφάγα.

οἱ δ' ἀράχναι, ἀπὸ τῆς τῶν μυιῶν θήρας ζῶσι· τὰ δ', ἰχθύσι χρῆσθαι ἔσπευσε. καὶ τὰ μὲν, θηρευτικά· τὰ δὲ, θησαυριστικὰ τῆς τροφῆς ἐστι, τὰ δ' οὔ. καὶ τὰ μὲν, οἰκητικά· τὰ δὲ, ἄοικα. οἰκητικὰ μὲν, οἷον ἀσπάλαξ, μῦς, μύρμηξ, * μέλιττα· ἄοικα δὲ, πολλὰ τῶν ἐντόμων, καὶ τῶν τετραπόδων. ἔτι τοῖς τόποις τὰ μὲν, τρωγλοδυτικά, οἷον σαῦραι, ὄφις· τὰ δ', ὑπέργεια, οἷον ἵππος, κύων. καὶ τὰ μὲν, τρηματώδη· τὰ δ', ἀτρημάτιστα. καὶ τὰ μὲν, νυκτερόβια, οἷον γλαὺξ, νυκτερίς· τὰ δ', ἐν τῷ φωτὶ ζῇ. ἔτι τὰ μὲν, ἥμερα· τὰ δὲ, ἄγρια. καὶ τὰ μὲν ἀεὶ, οἷον ἄνθρωπος καὶ ὀρεὺς ἀεὶ ἥμερα. καὶ ἄγρια, ὥσπερ πάρδαλις καὶ λύκος· τὰ δὲ, καὶ ἡμεροῦσθαι δύναται ταχὺ, οἷον, ἐλέφας. ἔτι ἄλλον τρόπον. * πάντα γὰρ ὅσα ἥμερά ἐστι γένη, καὶ ἄγρια ἐστίν. οἷον * ἵπποι, βόες, ὕες, ἄνθρωποι, πρόβατα, αἶγες, κύνες. καὶ * τὰ μὲν, ψοφητικά· τὰ δὲ, ἄφωνα· τὰ δὲ, φωνήεντα. καὶ τούτων τὰ μὲν, διάλεκτον ἔχει· τὰ δὲ, ἀγράμματα. καὶ τὰ μὲν, κωτίλα, τὰ δὲ, σιγηλά, * τὰ δὲ, λάλα· τὰ δ', ᾠδικά, τὰ δ', ἄνῳδα. πάντων δὲ κοινὸν, τὸ περὶ τὰς ὀχείας μάλιστα ᾄδειν καὶ λαλεῖν. καὶ τὰ μὲν, ἀγροῖκα, ὥσπερ φάττα· τὰ δ', ὄρεια, ὥσπερ ἔποψ· τὰ δὲ, συνανθρωπίζει, οἷον περιστερά. καὶ τὰ μὲν, ἀφροδισιαστικά, οἷον τὸ τῶν περδίκων καὶ ἀλεκτρυόνων γένος· τὰ δ', ἁγνευτικά, οἷον τὸ τῶν κορακοειδῶν ὀρνίθων γένος· ταῦτα γὰρ σπανίως τὴν ὀχείαν ποιεῖται. [καὶ τῶν θαλαττίων τὰ μὲν, πελάγια· τὰ δὲ, αἰγιαλώδη· τὰ δὲ, πετραῖα.] ἔτι τὰ μὲν, ἀμυντικά· τὰ δὲ, φυλακτικά. ἔστι δὲ ἀμυντικὰ μὲν, ὅσα ἢ ἐπιτίθεται, ἢ ἀδικούμενα ἀμύνεται. φυλακτικὰ δὲ, ὅσα πρὸς τὸ μὴ παθεῖν τι, ἔχει ἐν αὐτοῖς ἀλεωρήν. διαφέρουσι δὲ ταῖς τοιαῖσδε διαφοραῖς κατὰ τὸ ἦθος· τὰ μὲν γάρ ἐστι πρᾶα καὶ δύσθυμα, καὶ οὐκ ἐνστατικά, οἷον βοῦς· τὰ δὲ, θυμώδη καὶ ἐνστατικά, καὶ ἀμαθῆ, οἷον ὗς ἄγριος· τὰ δὲ, φρόνιμα καὶ δειλά, οἷον ἔλαφος, [καὶ] λαγὼς, δασύπους· τὰ δὲ, ἀνελεύθερα καὶ ἐπίβουλα, οἷον οἱ ὄφεις· τὰ δὲ, ἐλεύθερα, καὶ ἀνδρεῖα καὶ εὐγενῆ, οἷον λέων. τὰ δὲ, γενναῖα καὶ ἄγρια καὶ ἐπίβουλα, οἷον λύκος. * εὐγενὲς μὲν γάρ ἐστι τὸ ἐξ ἀγαθοῦ γένους· γενναῖον δὲ, τὸ μὴ ἐξιστάμενον ἐκ τῆς αὐτοῦ φύσεως. καὶ τὰ μὲν, πανοῦργα καὶ κακοῦργα, οἷον ἀλώπηξ· τὰ δὲ, θυμικὰ, καὶ φιλητικὰ καὶ θωπευτικὰ, οἷον κύων· τὰ δὲ, πρᾶα καὶ τιθασευτικὰ, οἷον ἐλέφας· τὰ δὲ, αἰσχυντηλὰ καὶ φυλακτικὰ, οἷον χήν· τὰ δὲ, φθονερὰ καὶ φιλόκαλα, οἷον ταώς. βουλευτικὸν δὲ καὶ μόνον, οἷον ἄνθρωπός ἐστι τῶν ζώων. * καὶ μνήμης μὲν καὶ διδαχῆς πολλὰ κοινωνεῖ· ἀναμιμνήσκεσθαι δὲ καὶ οὐδὲν ἄλλο δύναται, πλὴν ἄνθρωπος. περὶ ἕκαστον δὲ τῶν γενῶν, τὰ περὶ τὰ ἤθη καὶ τοὺς βίους ὕστερον λεχθήσεται, καὶ δι' ἀκριβείας μᾶλλον.

* κ. μῦα, μέλ. & ... ita G.

* De part. l. 1. c. 1

* [illegible]

* Gaza aliter legisse videtur.

Rhetoricorum lib. 2. cap. 5.

Lib. De memoria & remin. cap. 2.

ΚΕΦΑΛ. Β.

Τίνα τῶν ζώων κοινὰ μόρια, τίνα δ' οὔ.

ΠΑντων δ' ἐστὶ τῶν ζώων κοινὰ μόρια, ᾧ δέχεται τὴν τροφὴν, καὶ εἰς ὃ δέχεται. ταῦτα δ' ἐστὶ τὰ αὐτὰ καὶ ἕτερα κατὰ τοὺς εἰρημένους τρόπους, ἢ κατ' εἶδος, ἢ καθ' ὑπεροχὴν, ἢ κατ' ἀναλογίαν, ἢ τῇ θέσει

A araneí muſcarum venatu viuunt: nonnulla piſcibus veſci natura voluit. Adhæc, aliæ aut vim habent venandi, aut ingenio recondendi cibi dotatæ ſunt. Aliæ nec ad venandum aptæ, nec ad recondendũ. Item aliæ domicilia ſibi parant, vt talpa, mus, formica, muſca, apis. Aliç nullis ſe includere caſis patiuntur, vt plures tam inſecti generis quàm quadrupedis. Quinetiam locis diſcrimẽ aliud exiſtit: quippe cùm aliæ cauernas ſubeant, vt lacerti, vt ſerpentes: aliæ per ſumma telluris degant, vt canis, vt equus: ac aliæ foramina ſibi excauent, aliæ nunquam eo munere fungantur: & aliæ noctu vagentur, vt noctua, veſpertilio: aliæ interdiu tantùm. Addo etiam, alias eſſe cicures, alias feras: & alias perpetuò cicures, vt hominem, vt mulum: alias perpetuò feras, vt
B pantheram, vt lupum: nonnullas etiam facilè poſſe manſueſcere, vt elephantos. Sed quin aliter partiendum eſt. Genera enim quæcunque placida ſunt, hæc eadem fera quoque poſſunt reperiri, vt ſues, equi, homines, oues, capræ, canes, boues. Item aliæ mutæ omnino ſunt, aliæ ſtrepitum tantùm edunt, aliæ vocem etiam formant: quarum aliæ loqui poſſunt, aliæ vocem ſolam nullis exprimendam litteris reddunt. Atque aliæ loquaces, aliæ taciturnæ, aliæ oſcines, aliæ inoſcines. Omnium vocalium animantium communis mos eſt, vt ſui initus tempore potiſſimùm canant, & blaterent. Aliæ præterea camporum incolæ ſunt, vt palumbes: aliæ
C montis, vt vpupæ: aliæ cum hominibus degere ſolent, vt columbi. Item aliæ copia libidinis gaudent, vt perdicum genus, & gallinaceorum. Aliæ minùs Venere valent, vt quæ coruinam ſpeciem gerunt: quippe quæ rarò ſoleant coire. Marinarum etiam animantium aliæ pelagicæ, aliæ litorales, aliæ ſaxatiles ſunt. ad hæc, aliis data vis eſt dimicandi, aliis ingenium cauendi & euitandi. Viribus pollent, quæ iniuriam vel inferant aliis, vel illatam ſibi propulſent, ſeque defendant. Cautæ & prouidæ ſunt, quæ aliquid in ſe ipſis præſidij habent contra inferendam iniuriam. Differunt præterea moribus. Nam aliæ mites, remiſſæ, & minimè peruicaces
D ſunt, vt boues. aliæ animoſæ, peruicaces, brutæ omnino, vt ſues ſyluestres. aliæ ingenioſæ, ac timidç, vt cerui, lepores, cuniculi. aliæ illiberales, perfidæ, inſidioſæque, vt ſerpentes. aliæ liberales, fortes, & nobiles, vt leones. aliæ generoſæ, feroces, inſidioſæ, vt lupi. Nobile enim id eſt, quod ex bono prodiit genere: generoſum autem, quod non à ſua natura degenerarit. Et aliæ aſtutæ, malitioſæ, callidæ, vt vulpes. aliæ animoſæ, & amatrices, & aſſentatrices: vt canes. aliæ mites & manſuetudini addictæ, vt elephantes. aliæ verecundæ & cautæ, vt anſeres. aliæ inuidæ, & ornatus ac polituræ ſtudioſæ, vt pauones. Homo vnus ex numero animalium omniũ vim obtinet cogitandi. Et cùm memoriæ, atq; di-
E ſciplinæ complures animantes eſſe participes poſſint, nulla tamen præter hominem poteſt reminiſci. Sed de moribus, vitaque generis cuiuſque diligentiùs poſt.

CAPVT II.

Quæ corporis partes animalibus communes, quæ item propriæ ſint.

OMnium autem partes communes animalium ſunt, qua cibus recipitur, & in quam deuoratur. Quas quidem partes & eaſdem eſſe, & diuerſas, nihil prædictis rationibus prohibet. Aut enim ſpecie, aut exceſſu, aut proportione, aut ſitu

[de]terminandum eſt. Ab iis aliæ communes plurimorum animalium partes habentur, & qua cibi excrementum emittitur. Non enim hæc omnibus data eſt. Partem, qua cibus recipitur, os appellamus. [I]n quam deuoratur, ventriculum. Reliqua pars [mu]ltiplici nomine ſignificatur. Sed cùm duplex [ſi]t excremẽtum, hoc eſt, ſiccum ac humidum, quæ [pa]rtem illam humidi excrementi capientem habent, hæc ſicci receptaculum continent. Quæ verò [h]oc habent, non illud etiã habere omnia nouimus. Quamobrem quæ veſicam habent, aluum eadem etiam obtinent. At verò quæ aluum habent, non omnia & veſicã poſſident. Humidi nanq. excremẽti conceptaculum, veſicam: ſicci, aluum nominamus.

CAPVT III.

Quomodo animalia inter ſe differant in ſeminis prolifici emiſſione.

RElíquis magna ex parte tum eæ quas enumerauimus, partes tributæ ſunt, tum etiam qua ſemen genitale mittatur. Quæ modo gignere animal poſſint, aut in ſe ipſa ſemen prolificum mittunt, aut in alterum. Fœmina, quod in ſe mittit, appellatur. Mas, quod in alterum. Sed in nonnullis diſcrimen id fœminæ & maris non eſt. Species quoque partium, quæ ad ipſam pertinent procreationem, diuerſa eſt, cùm alia vuluam habeant, alia quod vuluæ proportione reſpondeat. Partes hæ ſunt, quæ neceſſariæ vel omnibus, vel plurimis datæ animalibus ſunt. Omnibus verò ſenſus vnus, tactus ineſt communis. Itaque pars, qua ſentiendi vis iſta contineatur, nomine vacat: aliis enim eadem, aliis ex proportione habetur.

CAPVT IV.

Humorem quodque animal habere, aliter tamen vel huic vel illi ineſſe.

HVmorem item genus quodque animalium continet, quo ſi aut per vim, aut per naturam ipſam priuetur, in perniciem agatur neceſſe eſt. Habent etiam id diuerſum in quo humor ille & fiat, & contineatur. Sunt hæc in aliis ſanguis, & vena: in aliis, quod iis proportione reſpondeat: quæ quidem imperfecta ſunt, atque alterum fibra, alterum ſanies dicitur. Tactus itaque in parte corporis ſimilari conſiſtit, vt in carne, aut in aliqua generis eiuſdem: denique in parte ſanguinea, aut in ea quæ ex proportione vice illius habeatur. Omnibus tamen parte ſimilari ſenſum hunc contineri certum eſt: ſicut è contrario potentias agentes partibus diſſimilaribus tributas eſſe apertum eſt: vt ori, ciborum confectionem: pedibus aut alis, aut quibuſuis proportione accommodatis, officium incedendi. Ad hæc, animalium alia ſanguinem habent, vt homo, equus: denique omnia, quæ aut perfecta pedibus carent, aut binis quaterníſve pedibus conſtant. Alia exanguia ſunt, vt apes: vt veſpæ: atque inter marina, ſepia, locuſta: denique omnia quæ pedibus plus quàm quaternis innitantur.

A διαφέρουσι. μετὰ δὲ ταῦτα, ἄλλα κοινὰ μόρια ἔχει τὰ πλεῖστα τῶν ζῴων πρὸς τούτοις, ᾗ ἀφίησι τὸ περίττωμα τῆς τροφῆς,] καὶ ᾗ λαμβάνει. οὐ γὰρ πᾶσιν ὑπάρχει τοῦτο. καλεῖται δὲ, * ᾧ μὲν λαμβάνει, στόμα· εἰς ὃ δὲ δέχεται, κοιλία. τὸ δὲ λοιπὸν, πολυώνυμόν ἐστι. τοῦ δὲ περιττώματος ὄντος διττοῦ, ὅσα μὲν ἔχει δεκτικὰ μόρια τοῦ ὑγροῦ περιττώματος, ἔχει καὶ τῆς ξηρᾶς τροφῆς· ὅσα δὲ ταύτης, ἐκείνου οὐ πάντα. διὸ ὅσα κύστιν ἔχει, καὶ κοιλίαν ἔχει· ὅσα δὲ κοιλίαν ἔχει, οὐ πάντα κύστιν ἔχει. ὀνομάζεται γὰρ τὸ μὲν τῆς ὑγρᾶς περιττώσεως δεκτικὸν μόριον, κύστις· κοιλία δὲ, τὸ τῆς ξηρᾶς.

* γρ. ᾧ μὲν λ.

B
ΚΕΦΑΛ. γʹ.

Πῶς διαφέρει τὰ ζῷα τῇ τοῦ σπέρματος ἀφέσει.

ΤΩν δὲ λοιπῶν πολλοῖς ὑπάρχει ταῦτά τε τὰ μόρια, καὶ ἔτι ᾗ τὸ σπέρμα * ἀφιᾶσι. καὶ τούτων ἐν οἷς μὲν ὑπάρχει γένεσις ζῴων, τὸ μὲν, εἰς αὐτὸ ἀφιὲν, τὸ δὲ, εἰς ἕτερον. καλεῖται δὲ τὸ μὲν εἰς αὐτὸ ἀφιὲν, θῆλυ· τὸ δ' εἰς τοῦτο, ἄρρεν. ἐν ἐνίοις δ' οὐκ ἔστι τὸ ἄρρεν καὶ θῆλυ. ἢ καὶ τῶν μορίων τῶν πρὸς τὴν δημιουργίαν ταύτην, διαφέρει τὸ εἶδος. τὰ μὲν γὰρ, ἔχει ὑστέραν· τὰ δὲ, τὸ ἀνάλογον. / ὅσα μὲν οὖν ἀναγκαῖα ὄντα μόρια τοῖς ζῴοις,
C τὰ μὲν, πᾶσιν ἔχειν συμβέβηκεν· τὰ δὲ, τοῖς πλείστοις, ταῦτ' ἐστί. * πᾶσι δὲ τοῖς ζῴοις αἴσθησις μία ὑπάρχει κοινὴ μόνη ἡ ἁφή. ὥστε καὶ αὐτὴ ἐν ᾧ μορίῳ γίνεσθαι πέφυκεν, ἀνώνυμόν ἐστι. τοῖς μὲν γὰρ ταὐτὸ, τοῖς δὲ τὸ ἀνάλογόν ἐστι.

* γρ. ἀφίησι.

De anima lib. 3. c. 12. & alibi.

ΚΕΦΑΛ. δʹ.

Περὶ ζῴων ὑγρότητος.

ΕΧει δὲ καὶ ὑγρότητα πᾶν ζῷον· ἧς στερισκόμενον, ἢ φύσει ἢ βίᾳ, φθείρεται. ἔτι ἐν ᾧ γίνεται, τοῦτ' ἄλλο. ἔστι δὲ τοῦτο, * τοῖς μὲν αἷμα καὶ φλέψ, τοῖς δὲ τὸ ἀνάλο-
D γον τούτων. ἔστι δ' ἀτελῆ ταῦτα· οἷον, * τὸ μὲν ἲς, τὸ δὲ ἰχώρ. ἡ μὲν οὖν ἁφὴ, ἐν ὁμοιομερεῖ γίνεται μέρει, οἷον ἐν σαρκὶ, ἢ τοιούτῳ τινί· καὶ ὅλως ἐν τοῖς αἱματικοῖς, ὅσα ἔχει αἷμα· τοῖς δὲ τὸ ἀνάλογον. πᾶσι δὲ [ἐν] τοῖς ὁμοιομερέσιν αἴσθησιν ταύτην εἶναι, δῆλον. αἱ δὲ ποιητικαὶ δυνάμεις, ἐν τοῖς ἀνομοιομερέσιν· οἷον τῆς τροφῆς ἐργασία, ἐν στόματι· καὶ ἡ τῆς κινήσεως τῆς κατὰ τόπον, ἐν ποσὶν, ἢ πτέρυξιν, ἢ τοῖς ἀνάλογον. πρὸς δὲ τούτοις, τὰ μὲν, ἔναιμα τυγχάνει ὄντα, οἷον ἄνθρωποι, καὶ ἵπποι, καὶ πάνθ' ὅσα ἢ ἄποδά ἐστι τέλεια ὄντα, ἢ δίποδα, ἢ τε-
E τράποδα· τὰ δ', ἄναιμα, οἷον μέλιττα καὶ σφὴξ, καὶ τῶν θαλαττίων, σηπία καὶ κάραβος, καὶ πάνθ' ὅσα πλείους ἔχει τεττάρων πόδας.

* Vulgò, τοῖς μὲν αἷμα, τοῖς δὲ φλ. ineptè.

Scrib. τὸ μὲν ἲς, τὸ δ' ἰχ. vel ἴνες. vide De partibus li. 2. c. 4.

ΚΕΦΑΛ. ε'.

Τίνα ζωοτόκα τῶν ζώων, ἢ ᾠοτόκα, ἢ σκωληκοτόκα· καὶ πῶς βαδίζει.

Καὶ τὰ μὲν, ζωοτόκα· τὰ δὲ, ᾠοτόκα· τὰ δὲ, σκωληκοτόκα. ζωοτόκα μὲν, οἷον ἄνθρωπος καὶ ἵππος, καὶ φώκη, καὶ τὰ ἄλλα ὅσα ἔχει τρίχας· καὶ τῶν ἐνύδρων τὰ κητώδη, οἷον δελφὶς, καὶ τὰ καλούμενα σελάχη. τούτων δὲ τὰ μὲν, αὐλὸν ἔχει, βράγχια δ' οὐκ ἔχει, οἷον δελφὶς, καὶ φάλαινα. ἔχει δὲ ὁ μὲν δελφὶς τὸν αὐλὸν διὰ τοῦ νώτου, ἡ δὲ φάλαινα ἐν τῷ μετώπῳ. τὰ δὲ ἀκάλυπτα βράγχια, οἷον τὰ σελάχη, γαλεοί τε καὶ βάτοι. καλεῖται δ' ᾠὸν μὲν, τῶν κυημάτων τῶν τελείων, ἐξ οὗ γίνεται τὸ γινόμενον ζῶον, ἐκ μορίου τὴν ἀρχὴν· τὸ δ' ἄλλο, τροφὴ τῷ γινομένῳ ἐστί. σκώληξ δ' ἐστὶν, ἐξ οὗ ὅλου [ὅλον] ζῶον, διαρθρουμένου καὶ αὐξανομένου τοῦ κυήματος. τὰ μὲν οὖν ἐν αὑτοῖς ᾠοτοκεῖ τῶν ζωοτόκων, οἷον τὰ σελάχη· τὰ δὲ, ζωοτοκεῖ ἐν αὑτοῖς, οἷον ἄνθρωπος καὶ ἵππος. εἰς δὲ τὸ φανερὸν, τῶν μὲν, τελεωθέντος τοῦ κυήματος, ζῶον ἐξέρχεται· τῶν δ', ᾠόν· τῶν δὲ, σκώληξ. τῶν δ' ᾠῶν τὰ μὲν, ὀστρακόδερμά ἐστι καὶ δίχροα, οἷον τὰ τῶν ὀρνίθων· τὰ δὲ, μαλακόδερμα, καὶ μονόχροα, οἷον τὰ τῶν σελαχῶν. καὶ τῶν σκωλήκων οἱ μὲν, εὐθὺς κινητικοί· οἱ δὲ, ἀκίνητοι. ἀλλὰ περὶ μὲν τούτων ἐν τοῖς περὶ γενέσεως δι' ἀκριβείας ὕστερον ἐροῦμεν. ἔτι δὲ τῶν ζώων τὰ μὲν, ἔχει πόδας, τὰ δ', ἄποδα. καὶ τῶν ἐχόντων τὰ μὲν, δύο πόδας ἔχει, οἷον ἄνθρωπος καὶ ὄρνις μόνα· τὰ δὲ, τέτταρας, οἷον σαῦρα, καὶ κύων· τὰ δὲ, πλείους, οἷον σκολόπενδρα καὶ μέλιττα. * πάντα δ' ἀρτίους ἔχει πόδας. τῶν δὲ νευστικῶν ὅσα ἄποδα, τὰ μὲν, πτερύγια ἔχει, ὥσπερ ἰχθύες· καὶ τούτων οἱ μὲν τέτταρα πτερύγια, δύο μὲν ἄνω ἐν τοῖς πρανέσι, δύο δὲ κάτω ἐν τοῖς ὑπτίοις, οἷον χρύσοφρυς, καὶ λάβραξ· τὰ δὲ, δύο μόνον, ὅσα παραμήκη καὶ λεῖα, οἷον ἔγχελυς, καὶ γόγγρος. τὰ δ', ὅλως οὐκ ἔχει, οἷον σμύραινα, ἀλλὰ χρῆται τῇ θαλάττῃ ὥσπερ καὶ οἱ ὄφεις τῇ γῇ, καὶ ἐν τῷ ὑγρῷ ὁμοίως * νέουσι. τῶν δὲ σελαχῶν ἔνια μὲν, οὐκ ἔχει πτερύγια, οἷον τὰ πλατέα καὶ κερκοφόρα, ὥσπερ βάτος καὶ τρυγών, ἀλλ' αὐτοῖς νεῖ τοῖς πλάτεσι· βάτος δ' ἔχει, καὶ ὅσα τὸ πλάτος μὴ ἔχει ἀπολελεπτυσμένον. ὅσα δὲ δοκεῖ πόδας ἔχειν, καθάπερ καὶ τὰ μαλάκια, τούτοις νεῖ, καὶ τοῖς πτερυγίοις, καὶ θᾶττον ἐπὶ τοῖς τοιούτοις τὸ κύτος τούτων ἑκατέρων, οἷον σηπία, καὶ τευθὶς, καὶ πολύπους. βαδίζει δὲ τὰ τῶν ἑκατέρων, ὥσπερ πολύπους· τὰ δὲ σκληρόδερμα, οἷον κάραβος, τοῖς οὐραίοις * νεῖ τάχιστα. τὰ δ' ἐπὶ τὴν κέρκον, τοῖς ἐν ἐκείνῃ πτερυγίοις· καὶ * ὁ κορδύλος τοῖς ποσὶ καὶ τῷ οὐραίῳ· ἔχει δ' ὅμοιον γλανεῖ τὸ οὐραῖον, ὡς μικρὸν εἰκάσαι μεγάλῳ. τῶν δὲ πτηνῶν τὰ μὲν πτερωτά ἐστιν, οἷον ἀετὸς καὶ ἱέραξ· τὰ δὲ, πτιλωτὰ, οἷον μέλιττα καὶ μηλολόνθη· τὰ δὲ, δερμόπτερα, οἷον ἀλώπηξ καὶ νυκτερίς. πτερωτὰ μὲν οὖν ἐστιν, ὅσα ἔναιμα· καὶ δερμόπτερα ὡσαύτως· πτιλωτὰ δὲ, ὅσα ἄναιμα οἷον τὰ ἔντομα. ἔστι δὲ τὰ μὲν πτερωτὰ, καὶ δερμόπτερα, δίποδα [δὲ] ἅπαντα, ἢ ἄποδα. λέγονται γὰρ εἶναί τινες ὄφεις τοιοῦτοι περὶ Αἰθιοπίαν.

* γρ. ... ſic Gaza: vide lib. 1. c. 13.

De inceſſu animal. c. 8.

* Vulgò [Greek illegible] perperam: vide De inceſſu animal. c. 7.

* γρ. ... ἐπὶ τὴν κέρκον, τ. quã lectionem ſequitur Gaza. * γρ. ... minùs rectè.

CAPVT V.

Quæ animalia perfectum animal, quæ oua, quæ vermem gignant, quove ritu quæque incedant.

Item alia animal gignunt perfectum, alia ouum, alia vermem. Procreant animal, homo, equus, vitulus marinus, & reliqua quæ pilis teguntur: atque in genere aquatili, quæ cete appellamus, vt delphini: & quæ cartilaginea vocantur. Quorum alteris fiſtula data eſt, branchiæ deſunt, vt delphinus & balænis. Habent delphini fiſtulam à dorſo, balænæ à fronte. Alteris branchiæ detectæ, vt muſtelo, raiæ, reliquiſque generis eiuſdem. Ouum id ex fœtibus perfectis vocamus, cuius ex parte principio animal conſiſtit: reliquum vero alimento ei, quod gignitur, eſt. Vermis id eſt, ex quo toto animal totum per ſubiecti fœtus formationem incrementúmque gignitur. Animalium ergo, quæ animal generant, aut oua intra ſe priùs conficiūt, vt cartilaginea: aut illico animal intra ſe formant, vt homo, vt equus, at vero in lucem fœtu perfecto, aut animal editur, aut ouum, aut vermis. Ouum ipſum, aut putamine continetur teſtaceo, & bicolor eſt, quale auium eſſe videmus: aut cute molli obducitur, vnicolórque eſt, quale cartilaginea verméſque pariunt. Vermes item, aut continuò mobiles ſunt aut immobiles. Sed de his accuratiùs poſt, cùm de generatione agetur, diſſeremus. Nunc animalium reliquas differentias addimus. Enimvero aliis pedes Natura dedit, aliis negauit. Et quæ obtinēt pedes, aut binos habent, vt homines, atque aues, duo hæc tantummodo genera, aut quaternos, vt lacerti, vt canes. aut plures, vt centipedes, & apes. Verùm quæcunque ambulant, omnia pedes pari numero poſſident. Quæ autem in genere natante pedibus carent, hæc aut pinnis natant, vt piſces: (quorum alij quaternas, binas ſcilicet parte prona, & binas ſupina habent: vt aurata, vt lupus. alij binas tantùm, qui longi, læuéſque ſunt, vt anguillæ, vt congri) aut nullas omnino habent, vt muræna: ſed ita mari vtuntur, vt terra ſerpentes, modóque ſimili repunt in humore. Cartilaginei quoque generis aliqua pinnis carent, videlicet quæ plana ſunt, & caudam habent, vt raia, & paſtinaca, ſuáque ipſâ latitudine natant. Raiam tamen pinnas habere videmus, & quæcunque ſuam latitudinem non colligunt in mucronem. Quæ autem pedes habere putantur, vt mollia, tum pedibus ipſis, tum pinnis natant, & quidem his celeriùs, iners autem alueus ducitur: vt ſepia, loligo, polypus. Verùm ambulare polypus poteſt, ſepia & loligo nequeunt. Cruſta intecta, vt locuſtæ, ſuis caudis natant, celerriméque retrorſum, pinnarum caudæ adiunctarum beneficio. Cordula etiam pedibus natat, & cauda, quam ſimilem ſiluro habet, quoad paruum magno licet conferre. Volucrum autem aliæ penna volant, vt aquila, vt accipiter: aliæ membrana ſicca, vt apes, vt ſcarabei: aliæ cute, vt vulpecula, vt veſpertilio. Volant pennis aut cute, quæ habent ſanguinem, membranis ſiccis, quæ ſanguine carent, vt inſecta. Sunt porrò quæ vel pennis, vel membranis volant, omnia bipeda aut apeda. angues enim circa Æthiopiam tales volare narrantur.

Genus pennatum, auem appellamus: reliqua duo A genera nomine carent communi: Volucris autem generis exanguis, aliis pennarum tutelæ cruſta ſuperuenit, vt vaginipennes poſſint nuncupari: velut ſcarabeis: aliis pennæ nulla cruſta integuntur, quorum alia bipennes ſunt, alia quadripennes. Gerunt pennas quaternas, quæ aut grandiora ſunt, aut aculeo in aluo armantur. Vaginipennis illius ordinis nullum eſt, quod aculeum gerat. Bipeda anteriore parte aculeos gerunt, vt muſca, tabanus, aſilus, culex. Omnia, quæ ſanguine carent, minùs, quàm quæ habent ſanguinem, adoleſcunt, paucis marinis exceptis, vt mollium nonnullis: quæ quidem genera grandiora locis tepidis redduntur, & mari potiùs, aut dulcibus aquis, quàm terra. Omnia, quæ ſe B mouent, aut quaternis notis mouentur, aut pluribus. Quaternis tantùm, quæ habent ſanguinem: vt homines binis manibus, binisque pedibus: aues binis alis & binis pedibus: quadrupedes pedibus quaternis: piſces pinnis quaternis. Nam & quæ pinnis, aut non ampliùs binis, aut nullis, vt ſerpentes, vtuntur, quaternis ea quoque notis nihilo minus mouentur: flexus enim quaterni his aguntur, aut bini cum pinnis binis. At verò quæ ſanguine vacua pedibus ſe pluribus moueant, ſiue volucres ſunt, ſeu pedeſtres, iis certè motus per notas plures exercetur: vt animal, quod à vita die vno deſcribenda ephemerum appellatum eſt, pedibus quatuor, pennisque totidem mouetur: quippe quod non ſolùm C vitæ ſuæ ratione proprium id meritò habeat, ſed etiam cùm quadrupes ſit, volucre quoque eſt. Omnia porro tam quadrupeda, quàm multipeda, modo ſimili moueri ſolita ſunt: cunctis enim motus per diametrum agitur. Verùm cùm cætera ducibus binis pedibus incedant, cancer vnus quaternis regi ſolitus eſt.

ὃ μὲν οὖν πτερωτὸν γένος τῶν ζῴων, ὄρνις καλεῖται· τὰ δὲ λοιπὰ δύο, ἀνώνυμα ἑνὶ ὀνόματι. τῶν δὲ πτηνῶν μὲν, ἀναίμων δὲ, τὰ μὲν, κολεόπτερά ἐστιν· ἔχει γὰρ ἐν ἐλύτρῳ τὰ πτερά, οἷον αἱ μηλολόνθαι καὶ οἱ κάνθαροι· τὰ δ᾽, ἀνέλυτρα· καὶ τούτων τὰ μὲν, δίπτερα, τὰ δὲ, τετράπτερα. τετράπτερα μὲν, ὅσα μέγεθος ἔχει, ἢ ὅσα ὀπισθόκεντρά ἐστι. * δίπτερα δὲ, ὅσα ἢ μέγεθος μὴ ἔχει, ἢ ἐμπροσθόκεντρά ἐστι. τῶν δὲ κολεοπτέρων, οὐδὲν ἔχει κέντρον. τὰ δὲ δίπτερα, ἐμπροσθόκεντρα ἔχει τὰ κέντρα, οἷον μυῖα, καὶ μύωψ, καὶ οἶστρος, καὶ ἐμπίς. πάντα δὲ τὰ ἄναιμα, ἐλάττω τὰ μεγέθη ἐστὶ τῶν ἐναίμων ζῴων· πλὴν B ὀλίγα ἐν τῇ θαλάσσῃ μείζονα ἄναιμά ἐστιν, οἷον τῶν μαλακίων ἔνια. μέγιστα δὲ γίνεται ταῦτα τὰ γένη αὐτῶν ἐν τοῖς ἀλεεινοτέροις, καὶ ἐν τῇ θαλάττῃ μᾶλλον, ἢ ἐν τῇ γῇ καὶ ἐν τοῖς γλυκέσιν ὕδασι. * κινεῖται δὲ πάντα τὰ κινούμενα τέτταρσι σημείοις, ἢ πλείοσι· τὰ μὲν ἔναιμα, τέτταρσι μόνον, οἷον ἄνθρωπος μὲν χερσὶ δυσὶ, καὶ ποσὶ δυσί· τὰ δὲ τετράποδα καὶ ἰχθύες, τὰ μὲν, τέτταρσι ποσὶν, ὄρνις δὲ πτέρυξι δυσὶ, καὶ ποσὶ δυσίν· οἱ δὲ, τέτταρσι πτερυγίοις. ὅσα δὲ δύο ἔχει πτερύγια, ἢ ὅλως μὴ, οἷον ὄφις, τέτταρσι σημείοις οὐδὲν ἧττον (αἱ γὰρ καμπαὶ, τέτταρες) ἢ δύο [σὺν] τοῖς πτερυγίοις. ὅσα δ᾽ ἄναιμα ὄντα πλείους πόδας ἔχει, εἴτε πτηνὰ, εἴτε πεζὰ, σημείοις κι- C νεῖται πλείοσιν, οἷον τὸ καλούμενον ζῷον ἐφήμερον, τέτταρσί τε ποσὶ καὶ πτερύξι. * τοῦτο γὰρ οὐ μόνον κατὰ τὸν βίον συμβαίνει τὸ ἴδιον, ὅθεν καὶ τὴν ἐπωνυμίαν ἔχει, ἀλλ᾽ ὅτι καὶ πτηνόν ἐστι, τετράπουν. * πάντα δὲ κινεῖται ὁμοίως, καὶ τὰ τετράποδα, καὶ πολύποδα· κατὰ διάμετρον γὰρ κινεῖται. τὰ μὲν οὖν ἄλλα ζῷα, δύο τοὺς ἡγεμόνας ἔχει πόδας· ὁ δὲ καρκίνος, μόνος τῶν ζῴων, τέτταρας.

Gaza hanc periodum ſequenti poſtponit, nihil tamen mutandum videtur.

De inceſſu animalium c. 7.

Lego, τοῦτο γὰρ οὐ μόνον κατὰ τὸν βίον συμβαίνει τὸ ἴδιον, coniectura certiſſima.

De inceſſu animal. c. 14.

CAPVT VI.

Quæ animalia habeant ſanguinem, quæve eadem careant.

SVmma verò animalium genera, in quæ ſingula D digerantur, redigantúrque animalia, quib. ſcilicet illa conſummentur, & conſtent, hæc ſunt, auis, piſcis, cetus: quæ quidem omnia habent ſanguinem. Ad hæc genus teſta intectum eſt, quod oſtreum ſiue concham appellamus, & cruſta incluſum aliud, quod nomine vacat communi, vt locuſtarum, & cancrorum, & gammarorum genera: aliud item molle, vt loligines, vt lolij, vt ſepiæ. adde genus inſectorum: quæ omnia genera ſanguine carent. Et quorum natura pedes habere patitur, multis hæc pedibus conſtant. Sed inſectorum vel aliquá volucres eſſe apertum eſt. Reliquorum animantium genera nulla præterea ampla intelliguntur. Vnum enim, quod plura genera contineat, nullum eſt: ſed aut ſimplex E eſt, nullis ipſum ſpecificis euarians diſcriminibus: vt homo: aut diuidi quidem poteſt in ſpecies, ſed nullis nominibus diſtinctas. Quæ enim genere quadrupede non pennato continentur, ſanguinem quidem omnia habent: ſed alia animal pariunt, alia ouum. Dixerim hæc ouipara, illa viuipara. Quæ igitur animal generant, pilos nõ omnia habent: quæ autẽ oua pariunt, cortice omnia muniuntur. Cortex hic loco ſquamæ ſimilis poteſt appellari. Pedeſtre ſanguineum, quod pedibus careat, ex natura, genus ſerpentum eſt: idque intectum cortice eſt. Verùm cùm cæteræ ſerpentes oua pariant, vipera vna animal gignit.

ΚΕΦΑΛ. ϛʹ.

Γένη μέγιστα τῶν ζῴων εἰς ἃ διαιρεῖται τἄλλα ζῷα.

ΓΕίδη δὲ, * τὰ μέγιστα τῶν ζῴων, εἰς ἃ διαιρεῖται τἄλλα ζῷα, τάδ᾽ ἐστίν· ἓν μὲν ὀρνίθων, ἓν δ᾽ ἰχθύων, ἄλλο δὲ κήτους. ταῦτα μὲν οὖν πάντα ἔναιμά ἐστιν. ἄλλο δὲ γένος ἐστὶ, τὸ τῶν ὀστρακοδέρμων, ὃ καλεῖται ὄστρεον· ἄλλο, τὸ τῶν μαλακοστράκων, ἀνώνυμον ἑνὶ ὀνόματι, οἷον κάραβοι, καὶ γένη τινὰ καρκίνων καὶ ἀστακῶν· ἄλλο, τὸ τῶν μαλακίων, οἷον τευθίδες τε, καὶ τεῦθοι, καὶ σηπίαι· ἕτερον, τὸ τῶν ἐντόμων. ταῦτα δὲ πάντα μὲν ἐστὶν ἄναιμα· ὅσα δὲ πόδας ἔχει, πολύποδα. τῶν δ᾽ ἐντόμων ἔνια, καὶ πτηνά ἐστι. τῶν δὲ λοιπῶν ζῴων * οὐκέτι τὰ γένη μεγάλα. οὐ γὰρ περιέχει πολλὰ εἴδη ἓν εἶδος, ἀλλὰ τὸ μέν ἐστιν ἁπλοῦν αὐτὸ, οὐκ ἔχον διαφορὰν τὸ E εἶδος, οἷον ἄνθρωπος· τὰ δ᾽ ἔχει μὲν, ἀλλ᾽ ἀνώνυμα τὰ εἴδη. ἔστι γὰρ τὰ τετράποδα εἴδη, καὶ μὴ πτερωτὰ, ἔναιμα μὲν πάντα, ἀλλὰ τὰ μὲν ζῳοτόκα, τὰ δ᾽ ᾠοτόκα αὐτῶν. ὅσα μὲν οὖν ζῳοτόκα, οὐ πάντα τρίχας ἔχει· ὅσα δ᾽ ᾠοτόκα, φολίδας ἔχει. ἔστι δ᾽ ἡ φολὶς ὅμοιον χώρᾳ λεπίδος. ἄπουν δὲ φύσει ἐστὶν, ἔναιμον πεζὸν, τὸ τῶν ὄφεων γένος. ἔστι δὲ τοῦτο φολιδωτόν. ἀλλ᾽ οἱ μὲν ἄλλοι ᾠοτοκοῦσιν ὄφεις, ἡ δ᾽ ἔχιδνα μόνη ζῳοτοκεῖ.

* γ. εἰ μ. finita periodo poſt ζῷα.

* γρ. οὐκέτι

τὰ μὲν γὰρ ζωοτοκοῦντα, οὐ πάντα τρίχας ἔχει· καὶ γὰρ τῶν ἰχθύων τινὲς ζωοτοκοῦσιν. ὅσα μέντοι ἔχει τρίχας, ἅπαντα ζωοτοκεῖ. τριχῶν γάρ τι εἶδος θετέον καὶ τὰς ἀκανθώδεις τρίχας, οἵας οἱ χερσαῖοι ἔχουσιν ἐχῖνοι, καὶ οἱ ὕστριχες. τριχὸς γὰρ χρείαν παρέχουσι, ἀλλ' οὐ ποδῶν, ὥσπερ αἱ τῶν θαλαττίων. τοῦ δὲ γένους τῶν τετραπόδων ζώων, καὶ ζωοτόκων, εἴδη μὲν εἰσι πολλά, ἀνώνυμα δέ· ἀλλὰ καθ' ἕκαστον αὐτῶν, ὡς εἰπεῖν, ὥσπερ ἄνθρωπος εἴρηται, * λέων, ἔλαφος, ἵππος, κύων, καὶ τἆλλα τοῦτον τὸν τρόπον. ἐπεὶ ἔστιν ἕν τι γένος καὶ ἐπὶ τοῖς ἔχουσι χαίτην λοφουροῖς καλουμένοις, οἷον ἵππῳ, καὶ ὄνῳ, καὶ ὀρεῖ, καὶ γίννῳ, καὶ ἴννῳ, καὶ ταῖς ἐν Συρίᾳ καλουμέναις ἡμιόνοις, αἳ καλοῦνται ἡμίονοι δι' ὁμοιότητα, οὐκ οὖσαι ἁπλῶς τὸ αὐτὸ εἶδος, καὶ γὰρ ὀχεύονται καὶ γεννῶνται ἐξ ἀλλήλων. διὸ καὶ χωρὶς λαμβάνοντας, ἀναγκαῖον θεωρεῖν ἑκάστου τὴν φύσιν αὐτῶν. ταῦτα μὲν οὖν τοῦτον τὸν τρόπον εἴρηται νῦν, ὡς ἐν τύπῳ, γεύματος χάριν. περὶ ὅσων καὶ ὅσα θεωρητέον, δι' ἀκριβείας ὕστερον ἐροῦμεν, ἵνα πρῶτον τὰς ὑπαρχούσας διαφορὰς, καὶ τὰ συμβεβηκότα πᾶσι λαμβάνωμεν. μετὰ δὲ τοῦτο, τὰς αἰτίας τούτων πειρατέον εὑρεῖν. οὕτω γὰρ κατὰ φύσιν ἐστὶ ποιεῖσθαι τὴν μέθοδον, ὑπαρχούσης [τῆς] ἱστορίας τῆς περὶ ἕκαστον. περὶ ὧν τε γὰρ, καὶ ἐξ ὧν εἶναι δεῖ τὴν ἀπόδειξιν, ἐκ τούτων γίνεται φανερόν. ληπτέον δὲ πρῶτον τὰ μέρη τῶν ζώων ἐξ ὧν συνέστηκε. κατὰ γὰρ ταῦτα μάλιστα καὶ πρῶτα διαφέρει καὶ τὰ ὅλα, ἢ τῷ τὰ μὲν ἔχειν, τὰ δὲ μὴ ἔχειν, ἢ τῇ θέσει καὶ τῇ τάξει, ἢ καὶ κατὰ τὰς εἰρημένας πρότερον διαφορὰς, εἴδει καὶ ὑπεροχῇ, καὶ ἀναλογίᾳ, καὶ τῶν παθημάτων ἐναντιότητι. πρῶτον δὲ τὰ τοῦ ἀνθρώπου μέρη ληπτέον. ὥσπερ γὰρ τὰ νομίσματα πρὸς τὸ αὐτοῖς ἕκαστοι γνωριμώτατον δοκιμάζουσιν, οὕτω δὴ καὶ ἐν τοῖς ἄλλοις. ὁ δ' ἄνθρωπος τῶν ζώων γνωριμώτατον ἡμῖν ἐξ ἀνάγκης ἐστί.

* [illegible]

Τῇ μὲν οὖν αἰσθήσει οὐκ ἄδηλα τὰ μόρια. ὅμως δ' ἕνεκεν τοῦ μὴ παραλιπεῖν τε τὸ ἐφεξῆς, καὶ τοῦ λόγον ἔχειν μετὰ τῆς αἰσθήσεως, λεκτέον τὰ μέρη, πρῶτον τὰ ὀργανικά, εἶτα τὰ ὁμοιομερῆ.

ΚΕΦΑΛ. ζ'.

Μέγιστα τῶν μερῶν τοῦ ἀνθρωπίνου σώματος.

Μέγιστα μὲν οὖν ἐστὶ τάδε τῶν μερῶν, εἰς ἃ διαιρεῖται τὸ σῶμα τὸ σύνολον, κεφαλὴ, αὐχὴν, θώραξ, βραχίονες δύο, σκέλη δύο, τὸ ἀπ' αὐχένος μέχρι αἰδοίων κύτος, ὃ καλεῖται θώραξ. κεφαλῆς μὲν οὖν μέρη, τὸ μὲν τετριχωμένον, κρανίον καλεῖται. τούτου δὴ μέρη, τὸ μὲν πρόσθιον, βρέγμα, ὑστερογενές· τελευταῖον γὰρ τῶν ἐν τῷ σώματι πήγνυται ὀστῶν. τὸ δ' ὀπίσθιον, ἰνίον. μέσον δ' ἰνίου καὶ βρέγματος, κορυφή. ὑπὸ μὲν οὖν τὸ βρέγμα, ὁ ἐγκέφαλός ἐστι· τὸ δ' ἰνίον, κενόν ἐστι. τὸ δὲ κρανίον ἅπαν, ἀραιὸν ὀστοῦν, στρογγύλον, ἀσάρκῳ δέρματι περιεχόμενον. ἔχει ῥαφάς, τὸ μὲν γυναικῶν, μίαν κύκλῳ· τὸ δ' ἀνδρῶν, τρεῖς εἰς ἓν συναπτούσας, ὡς ἐπὶ τὸ πολύ. ἤδη δ' ὦπται κεφαλὴ ἀνδρὸς οὐδεμίαν ἔχουσα ῥαφήν.

A Non enim pilos omnia habent, quæ animal generant: quippe cùm nonnulli ex piſcibus animal procreent. Quæ tamẽ pilos ſortita ſunt, animal omnia progignunt. Nam pilos quòque effigie aculei ſpiculatos, genus quoddam eſſe pilorum putandum eſt, quales herinacei, atq. hyſtrices gerunt: vicem enim villorum, non pedum, vt echinorũ aculei, præſtant. Generis quadrupedum, quæ animal gignunt, plures quidem ſpecies intelliguntur, ſed nullis ferè notæ nominibus. Singulorum enim nomina habentur, vt hominis, leonis, equi, cerui, canis, reliquorumque ad hunc modum. Nullis fere inquam, quoniam genus vnũ, vel ſuper iis omnibus, quę iumenta nominamus, eſt, vt equo, aſino, mulo, ginno, inno B & mulis, quas terra Syria fert, quæ ſimilitudine quadam nomen mularum acceperunt, quanquam non omnino eadem qua mulæ ſpecie continentur. Coeunt enim, & mutua inter ſe ratione progenerant. Naturam itaque eorũ, quæ minus genere certo continentur, ſeorſum ſingillatim conſideremus neceſſe eſt. Hæc ita impræſentiarum formula exposuiſſe quadam prægustandi gratia placuit, videlicet, vt quibus de rebus tractandum, & quatenus eſſet perſequendũ intelligeretur: poſt accuratius de iiſdem diſſeremus, vt primùm differentias, atq. accidentia, quæ iuncta cuique ſunt, accipiamus: deinde ad eorũ comperiẽdas cauſas enitamur. Ita enim effici poteſt, vt via rationeque docendi vtamur Na- C turæ congrua, cùm commentatio ſingulorũ antecedat. Hinc enim aperitur, quibuſnam de rebus, & ex quibus effici demonſtrationẽ oporteat. Primùm itaque partes animalium, ex quibus conſtant, enumeraſſe par eſt. His enim potiſſimùm, atque in primis tota quoque ipſa inter ſe differunt: videlicet, aut eo quod alia habeant, alia careant: aut ſitu, & ordine, aut differẽtiis, quas antehac expoſuimus, id eſt, ſpecie, exceſſu, proportione, & affectuũ contrarietate. Sed primùm partes hominis explicare debemus. Vt enim numos ad id quod ſibi quiſque exploratũ certumq. habeat, probare ſolet: ita cæteris quoque in rebus agendum eſt. At homo animaliũ maximè omnium notum nobis neceſſariò eſt.

D Partes igitur hominis exteriores etſi non ſenſum effugiunt, tamen ne ſequela & ſeries continuanda doctrinæ prætermittatur, atque etiam vt ſenſum ratio comitetur, partes primùm enumerabimus officiales, ſiue inſtrumentales, deinde ſimilarium ordinem proſequemur.

CAPVT VII.

De ſummis in hominis corpore partibus, & quid caput, quid item thorax ſit.

SVmmæ igitur partes, in quas primas totum diuiditur corpus, hæ ſunt: caput, collum, thorax, brachium duplex, crus duplex. Thoracem eam partem appello, quæ à collo ad pudenda vſque trunca pertendit. Capitis autem pars, quæ capil- E lis intecta eſt, calua appellatur: cuius pars prior ſinciput, nouiſſimè conſiſtere ſolita: omnium enim oſſium corporis vltimum id concreſcit, & induratur. Poſterior, occiput eſt. Media inter occiput & ſinciput, vertex. Cerebrum ſincipiti ſubditum eſt. occiput inane. Calua ipſa ſanè tota, os rarum, rotundum, cute gracilenta obductum eſt. Habet ſuturas, quæ mulieris eſt, vnam in orbem: quæ autem viri, tres in idem magna ex parte coeuntes. Iam viſum etiam ſine vlla ſutura caput viri eſt.

Verticem

verticem caluæ, medium diſcrimen, & æquamentum capillorum vocamus. quod nonnullis geminum eſt: ſunt enim qui facti à natura bivertices ſint, verùm non oſſe ſed capillorum æquamento.

CAPVT VIII.

Quid facies in homine.

FAciem, partem eam nominamus dumtaxat in homine, quæ caluæ ſubiecta eſt. Nam piſcis aut bouis faciem dicere non ſolemus. Partes faciei, frons: quæ ſub ſincipite poſita, inter idipſum & oculos eſt. Quibus hæc magna, ſegnes: quibus parua, mobiles: quibus lata, mente moueri idonei: quibus rotunda, iracundi.

CAPVT IX.

De ſuperciliis, oculis, palpebris, ciliis, pupilla, nigro, candido, angulis: & de iis animalibus, quæ oculis careant.

SVpercilia ſub fronte bipartitò diſtincta, quæ ſi in rectum porrigûtur, mollem ſubeſſe animum ſignificant: ſi iuxta naſum inflexa ſunt, auſterum notant, & acerbum: ſed ſi iuxta tempora inflectuntur, deriſorem diſſimulatorémque indicant: ſi verò in totum demiſſa, notam inuidiæ habent. Oculi his ſubiacent duo, legitimo ſcilicet naturæ officio: quorum partes ſuperius inferiúſque tegentes, palpebrę appellantur. Pilos, qui extremo palpebrarum ambitui adhærent, cilium nominamus. Humor oculi interior, quo videmus, pupilla eſt: quod eam ambit, nigrum dicitur: quod poſtremò nigrum circumdat, candidum, ſiue albugo. Pars communis ſuperioris inferiorîſque palpebræ, angulus eſt: quem duplicem vterque oculus habet, alterum iuxta naſum, alterum iuxta tempora. Qui ſi iuſtò ſunt longiores, notam morum maleficorum præbent: ſi carnoſi more pectunculorum ſunt, qui naribus iunguntur, malitiam præferunt. Habent profectò oculos, tum cætera animaliũ genera omnia, præterquam teſta intecta, & ſi quid imperfectum aliud eſt: tum ea quæ animal generant, omnia, pręter talpam, quam modo quodam habere dixerim, cùm tamen omnino habere negem: quippe cùm omnino quidem nec videat, nec perſpicuos habeat oculos: verùm ſi quis prætentam membranam detrahit, locus oculorum apparet, & pars nigra eorũdem: ſitus denique, & deſcriptio eadem quam legitimam conſpicui oculi obtinent: vtpote cùm obducta cute oculi preſſi, confuſi oblæſique eſſent dum crearentur.

CAPVT X.

De oculorum varietate in quibuſque animantibus.

CAndidũ oculi magna ex parte ſimile in omnibus eſt: at quod nigrum dicitur, variat: aliis enim atrum, aliis admodum cæſium, aliis fuluum, aliis caprinum, quod morum optimorum indicium eſt, & ad cernendi claritatem primatũ obtinet. Solus ergo potiſſimùm animalium homo numeroſa oculorũ varietate notatur, cùm cæteris in ſuo ſingulis genere, color ſit idẽ, equis exceptis, qui interdum oculis proueniunt cæſiis. Sunt oculorum, alij grandiores, alij parui, alij modici, qui optimi habẽtur: item alij nimiùm prominentes, alij conditi, alij modicè ſiti. Qui conditi ſunt, clariſſimè cernere in genere quoque brutorum animalium poſſunt.

A τοῦ δὲ κρανίου, κορυφὴ καλεῖται τὸ μέσον καὶ* λύσιμα τῶν τριχῶν. τοῦτο δ' ἐνίοις διπλοῦν ἐστι· γίνονται γάρ τινες δικόρυφοι, οὐ τῷ ὀστῷ, ἀλλὰ τῇ τριχῶν λύσει.

* Quidam, λεῖμμα, & λείμμα mox.

ΚΕΦΑΛ. η.

Περὶ προσώπου.

ΤΟ δ' ὑπὸ τὸ κρανίον, ὀνομάζεται πρόσωπον ἐπὶ μόνου τῶν ἄλλων ζώων ἀνθρώπου. ἰχθύος γὰρ καὶ βοὸς, οὐ λέγεται πρόσωπον. προσώπου δὲ, τὸ μὲν ὑπὸ τὸ βρέγμα, μεταξὺ τῶν ὀμμάτων, μέτωπον. B τοῦτο [δὲ] οἷς μὲν μέγα, βραδύτεροι· οἷς δὲ μικρὸν, εὐκίνητοι. καὶ οἷς μὲν πλατὺ, ἐκστατικοί· οἷς δὲ περιφερὲς, θυμικοί.

ΚΕΦΑΛ. θ'.

Περὶ ὀφρύων καὶ τῶν μερῶν τῶν ὀφθαλμῶν.

ΥΠὸ δὲ τῷ μετώπῳ, ὀφρύες διφυεῖς· ὧν αἱ μὲν εὐθεῖαι, μαλακοῦ ἤθους σημεῖον· αἱ δὲ πρὸς τὴν ῥῖνα τὴν καμπυλότητα ἔχουσαι, στρυφνοῦ· αἱ δὲ πρὸς τοὺς κροτάφους, μώμου καὶ εἴρωνος· αἱ δὲ κατεσπασμέναι, φθόνου. ὑφ' αἷς, ὀφθαλμοί. οὗτοι κατὰ φύσιν δύο. τούτων C μέρη ἑκατέρου, βλέφαρον, τὸ ἄνω καὶ κάτω· τούτου τρίχες [αἱ] ἔσχαται, βλεφαρίδες. τὸ δ' ἐντὸς τοῦ ὀφθαλμοῦ, τὸ μὲν ὑγρὸν, ᾧ βλέπει, κόρη· τὸ δὲ περὶ τοῦτο, μέλαν· τὸ δ' ἐκτὸς τούτου, λευκόν. κοινὸν δὲ τῆς βλεφαρίδος μέρος τῆς ἄνω καὶ κάτω, κανθοὶ δύο, ὁ μὲν πρὸς τῇ ῥινὶ, ὁ δὲ πρὸς τοῖς κροτάφοις· οἳ ἂν μὲν ὦσι μακροὶ, κακοήθεις σημεῖον· ἂν δ' οἷον οἱ κτένες κρεώδεις ἔχωσι τὸ πρὸς τῷ μυκτῆρι, πονηρίας. τὰ μὲν οὖν ἄλλα γένη πάντων τῶν ζώων, πλὴν τῶν ὀστρακοδέρμων, καὶ εἴ τι ἄλλο ἀτελὲς, ἔχει ὀφθαλμούς· τὰ δὲ ζωοτόκα πάντα, πλὴν ἀσπάλακος. τοῦτον δὲ, τρόπον μέν τινα ἔχειν ἂν θείη D τις, ὅλως δ' οὐκ ἔχει. ὅλως μὲν γὰρ οὔθ' ὁρᾷ, οὔτ' ἔχει εἰς τὸ φανερὸν δήλους ὀφθαλμούς. ἀφαιρεθέντος δὲ τοῦ δέρματος, ἔχει τήν τε χώραν τῶν ὀμμάτων, καὶ τῶν ὀφθαλμῶν τὰ μέλανα κατὰ τὸν τόπον καὶ τὴν χώραν τὴν φύσει τοῖς ὀφθαλμοῖς ὑπάρχουσαν ἐν τῷ ἐκτὸς, ὡς ἐν τῇ γενέσει πηρουμένων, καὶ ἐπιφερομένου τοῦ δέρματος.

ΚΕΦΑΛ. ι.

Ὀφθαλμῶν διαφοραί.

E ΟΦθαλμοῦ δὲ τὸ μὲν λευκὸν, ὅμοιον, ὡς ἐπὶ τὸ πολὺ, πᾶσι. τὸ δὲ καλούμενον μέλαν, διαφέρει. τοῖς μὲν γάρ ἐστι μέλαν, τοῖς δὲ σφόδρα γλαυκὸν, τοῖς δὲ χαροπὸν, ἐνίοις δὲ αἰγωπόν. τοῦτο ἤθους βελτίστου σημεῖον, καὶ πρὸς ὀξύτητα ὄψεως κράτιστον. μόνον δὲ μάλιστα, ἢ μᾶλλον τῶν ζώων ἄνθρωπος, πολύχροος τὰ ὄμματά ἐστι· τῶν δ' ἄλλων, ἓν εἶδος. ἵπποι δὲ γίνονται γλαυκοὶ ἔνιοι. τῶν δ' ὀφθαλμῶν οἱ μὲν, μεγάλοι· οἱ δὲ, μικροί· οἱ δὲ μέσοι· [οἱ δὲ μέσοι] βέλτιστοι· καὶ ἢ ἐκτὸς σφόδρα, ἢ ἐντὸς, ἢ μέσως τούτων. οἱ δ' ἐντὸς μάλιστα, ὀξυωπέστατοι ἐπὶ παντὸς ζώου·

τὸ δὲ μέσον, ἤθους βελτίστου σημεῖον. καὶ ἢ σκαρδαμυκτικοί, ἢ ἀτενεῖς, ἢ μέσοι. βελτίστου δὲ ἤθους [σημεῖον] οἱ μέσοι· ἐκείνων δ' ὁ μὲν, ἀναιδής· ὁ δὲ, ἀβέβαιος.

Modicus tamen ſitus, nota morum eſt optimorũ. Et, aut nimiùm conniuent, aut rigidi intentique conſtant, aut modice nutant. Notam morum laudabilium habent, qui mediocriter conniuent. Reliquorum alteri impudentiæ, alteri inconſtantiæ indices ſunt.

ΚΕΦΑΛ. ια'.

Περὶ ὠτὸς, καὶ ῥινὸς, καὶ κροτάφων, καὶ σιαγόνων, καὶ χειλῶν, στόματός τε καὶ τῶν αὐτοῦ μερῶν.

CAPVT XI.

De aure, naſo, temporibus, maxillis, labris, gingiuis, dentibus, lingua, palato, columella, eorumque in quibuſque animantibus differentiis.

Ἔστι δὴ κεφαλῆς μόριον, δι' οὗ ἀκούει, ἄπνουν, τὸ οὖς. * Ἀλκμαίων γὰρ οὐκ ἀληθῆ λέγει, φάμενος ἀναπνεῖν τὰς αἶγας κατὰ τὰ ὦτα. ὠτὸς δὲ μέρος, τὸ μὲν, ἀνώνυμον· τὸ δὲ, λοβός. ὅλον δὲ ἐκ χόνδρου καὶ σαρκὸς σύγκειται. εἴσω δὲ τὴν μὲν φύσιν ἔχει, οἷον οἱ στρόμβοι· τὸ δ' ἔσχατον ὀστοῦν, ὅμοιον τῷ ὠτί, εἰς ὃ, ὥσπερ ἀγγεῖον ἔσχατον, ἀφικνεῖται ὁ ψόφος. τοῦτο δ' εἰς μὲν τὸν ἐγκέφαλον οὐκ ἔχει πόρον, εἰς δὲ τὸν τοῦ στόματος οὐρανόν· καὶ ἐκ τοῦ ἐγκεφάλου, φλὲψ τείνει εἰς αὐτό. περαίνουσι δὲ καὶ οἱ ὀφθαλμοὶ εἰς τὸν ἐγκέφαλον, καὶ κεῖται ἐπὶ φλεβίου ἑκάτερος. ἀκίνητον δὲ τὸ οὖς ἄνθρωπος ἔχει μόνος τῶν ἐχόντων τοῦτο τὸ μόριον. τῶν γὰρ ἐχόντων ἀκοὴν, τὰ μὲν, ἔχει ὦτα, τὰ δ', οὐκ ἔχει, ἀλλὰ τὸν πόρον φανερὸν, οἷον ὅσα πτερωτὰ, ἢ φολιδωτά. ὅσα δὲ ζῳοτοκεῖ, ἔξω φώκης τε καὶ δελφῖνος, καὶ τῶν ἄλλων ὅσα γε κητώδη, πάντα ἔχει τὰ ὦτα· ζῳοτοκεῖ γὰρ καὶ τὰ σελάχη. ἀλλὰ μόνον ἄνθρωπος οὐ κινεῖ. ἡ μὲν οὖν φώκη, πόρους ἔχει φανεροὺς, ᾗ ἀκούει· ὁ δὲ δελφὶς, ἀκούει μὲν, οὐκ ἔχει δὲ ὦτα. τὰ δ' ἄλλα κινεῖ πάντα. κεῖται δὲ τὰ ὦτα ἐπὶ τῆς αὐτῆς περιφερείας τοῖς ὀφθαλμοῖς, καὶ οὐχ ὥσπερ ἐνίοις τῶν τετραπόδων, ἄνωθεν. ὤτων δὲ, τὰ μὲν, ψιλά· τὰ δὲ, δασέα· τὰ δὲ, μέσα. βέλτιστα δὲ τὰ μέσα πρὸς ἀκοὴν, ἦθος δ' οὐδὲν σημαίνει. καὶ ἢ μεγάλα, ἢ μικρὰ, ἢ μέσα· ἢ ἐπανεστηκότα σφόδρα, ἢ οὐθὲν, ἢ μέσον. τὰ δὲ μέσα, βελτίστου ἤθους σημεῖον· τὰ δὲ μεγάλα, καὶ ἐπανεστηκότα, μωρολογίας καὶ ἀδολεσχίας. τὸ δὲ μεταξὺ ὀφθαλμοῦ καὶ ὠτὸς καὶ κορυφῆς, καλεῖται κρόταφος. ἔτι προσώπου μέρος, τὸ μὲν ἐν τῷ πνεύματι πόρος, ῥίς· καὶ γὰρ ἀναπνεῖ καὶ ἐκπνεῖ ταύτῃ, καὶ ὁ πταρμὸς διὰ ταύτης γίνεται, πνεύματος ἀθρόου ἔξοδος, σημεῖον οἰωνιστικὸν καὶ * ἱερὸν μόνον τῶν πνευμάτων. ἀλλὰ δὴ ἀνάπνευσις καὶ ἔκπνευσις γίνεται εἰς τὸ στῆθος, καὶ ἀδύνατον χωρὶς τοῖς μυκτῆρσιν ἀναπνεῦσαι ἢ ἐκπνεῦσαι, διὰ τὸ ἐκ στήθους εἶναι τὴν ἀναπνοὴν καὶ ἐκπνοὴν κατὰ τὸν γαργαρεῶνα, καὶ μὴ ἐκ τῆς κεφαλῆς τινι μέρει. ἐνδέχεται δὲ καὶ μὴ χρώμενον ταύτῃ ζῆν. ἡ δ' ὄσφρησις γίνεται διὰ τούτου τοῦ μέρους. αὕτη δ' ἐστὶν ἡ αἴσθησις ὀσμῆς. εὐκίνητος δ' ὁ μυκτὴρ, καὶ οὐχ ὥσπερ τὸ οὖς ἀκίνητος κατ' ἰδίαν. μέρος δ' αὐτοῦ, τὸ μὲν διάφραγμα, χόνδρος· τὸ δ' ὀχέτευμα, κενόν. ἔστι γὰρ ὁ μυκτὴρ δίπορος. τοῖς δὲ ἐλέφασιν ὁ μυκτὴρ γίνεται μακρὸς καὶ ἰσχυρὸς, καὶ χρῆται αὐτῷ ὥσπερ χειρί. προσάγεταί τε γὰρ καὶ λαμβάνει τούτῳ, καὶ εἰς τὸ στόμα προσφέρεται τὴν τροφὴν, καὶ τὴν ὑγρὰν καὶ τὴν ξηρὰν, μόνον τῶν ζῴων. ἔτι δὲ σιαγόνες δύο· τούτων τὸ πρόσθιον, γένειον· τὸ δ' ὀπίσθιον, γένυς.

* Quidam Ἀρχέλαος, ex Varrone. Victorius Varr. 36. 9. Et Mercurialis Var. 2. 10. ſed nihil eſt mutandum. Archelaus enim quē Varro ſæpe laudat poſt Ariſtotelē, Ptolemæorum regum temporibus vixit. Alcmæon quē citat Ariſt. antiquiſſimus fuit phyſicus. Nihil igitur neque in Ariſt. neque in Varrone mutandum.

* Probl. ſect. 23. 7.

* De reſpiratione, cap. 3.

Avris, pars capitis, qua audimus, eſt, ita vt nulla ſpiratio deſideretur. Errat enim Alcmæon, qui capras ſpirare per aures credidit. Auris pars exterior, cui nomen auriculæ, parte conſtat ſuperiore, pinna: inferiore, fibra. Tota autem ipſa ex cartilagine carneque conſtituta eſt. at pars inferior forma anfractui cochleæ ſimilis deſinit in os, quod auriculam plane imitatur; in quod quaſi nouiſſimum vaſculum ſtrepitus deuenit. Hinc meatus ad cerebrum nullus eſt. at in oris palatum vſque ſemita pertendit, & vena de cerebro deſcendit eòdem. Oculi quoque in cerebrum finiunt, & vterque poſitus ſuper venula eſt. Aures homini tantùm immobiles: nam eorum, quæ ſenſum obtinent audiendi, aliis auriculæ ſunt, aliis deſunt, meatuſque patent ipſi audiendi, vt iis, quæ penna, aut cortice ſquamave teguntur. at ea, quæ animal generant, omnia auriculas habent, excepto vitulo marino, & delphino, & reliquis item cetariis. Nam & quæ cartilaginea appellauimus, animal pariunt. Verùm homo vnus, aurem non mouet. Vitulus ergo marinus meatus continet manifeſtos, quà audit: at delphinus audit quidem, ſed nullis cauernis, quæ vicem præſtent aurium. Cætera ſuas auriculas omnia mouent. Situm aures hominis eũdem in orbe, quo oculi, obtinent: non vt quadrupedum nonnullis poſitæ ſuperiùs ſunt. aurium aliæ læues, aliæ piloſæ, aliæ medium tenent, quæ quidem ad audiẽdum aptiſſimæ ſunt. Morum hinc præſcita nulla habentur. Item aliæ maiores, aliæ paruæ, aliæ mediocres, & aut minimum, aut parum, aut mediocriter arrectæ. Notam morum optimorum habent quæ mediocres: at quæ magnæ, arrectæque vltra modum, ſtultitiæ indices ſunt, aut loquacitatis. Partẽ inter vtrumlibet oculum & aurem, & verticem poſitam, tempora appellamus. Item pars faciei naſus, quæ meatum præbet ſpiritui: aërem enim ea parte reddimus, & accipimus. Sternutamentum quoque eadem agitur parte: quod flatus vniuerſi eruptio eſt, ſignum augurale, & vnum ex ſpirituum omnium generibus ſanctum, & ſacrum. Tum etiam ſpiritum trahi in pectus, & inde reddi neceſſe eſt: quod fieri non poteſt, niſi naribus ſpiremus, cùm reciprocatio ſpiritus de pectore per gurguliopem, non de capite parte aliqua actitetur, ſed datur viuendi facultas etiamſi deſit ſpiratio. Olfactus quoque, id eſt, ſenſus odoris, hac eadem parte ſubminiſtratur. Mobiles eſſe nares natura voluit, nec ſicut aures, immobiles ſua compage. Partem naſi, quæ cartilaginea nares diſcriminat, interſeptũ vocamus: meatum vero vtrumque, inane: naſus enim bipartito diſtinctus eſt tramite. Elephantis prolixa validáque naris augetur: eiúſque vſus idẽ, qui manus: ea namque cibos tam ſiccos quàm humidos colligunt, capiunt, & in os admouent ſoli animantium omnium. Eſt præterea maxilla duplex; cuius pars prior mentum, poſterior mandibula eſt.

Mouēt animalia omnia maxillam inferiorem, crocodilo fluuiatili excepto: is enim vnus ſuperiorem mouet. Labra mox à naſo habentur, caro permobilis. Quod autem intra maxillas & labra deſcribitur, os eſt, cuius partes, palatum, & fauces. Ineſt pars ſentiens ſaporem, lingua: vim iſtam ſentiendi præcipuè obtinens parte ſui primore: nam ſi interiore tangat, minùs ſentiet. Omnia præterea, quæ caro ſentire poteſt, lingua etiam poteſt, vt durum, calidum, frigidum, ſua quauis parte, ſicut & ſaporem. Hæc aut lata eſt, aut anguſta, aut mediocris, quæ quidem optima & explanatiſſima eſt. Item aut ſoluta, aut conſtricta, qualis tortorum, balborumque eſt. Carne ſoluta, rara, fungoſa, lingua conſtat. Eius pars quædam ligula eſt. Bifida oris compago, tonſillæ: multifida, gingiuæ appellantur: carne hæ conſtant, intúſque dentes oſſei cohærent. Parte vero penitiore, particula pendet, alia vuigera, venæ applicata, columella nomine, quæ ſi immodice humefacta intumeſcat, inflammetúrque, nomine vue vocatur, & ſtrangulat.

CAPVT XII.

De collo, pectore, eorumque partibus.

Collum, quod inter pectus, & faciem eſt, cuius pars prior guttur, poſterior gula: quantúmque colli ipſius cartilagineum priorem obtinens ſitum, vocem tranſmittit & halitum, id arteria nominatum eſt: at vero quantum interius carneum ſpinæ prætiacet, gula dicitur. Pars autem poſterior colli extima, ceruix appellata eſt. Partes thorace tenus diſpoſitæ, hæ ſunt. Thorax ipſe parte priore poſterioréque conſtat. Mox à collo pectus priorem obtinet ſitum bipartitum, in mammam parte ſui vtraque extuberans. Mammis laxior contextus corporis eſt, iuncta papilla per quam fœminis lac tranſmiſſum elicitur. In maribus etiam lac fieri poteſt: verùm caro iis ſpiſſa, mulieribus fungoſa, foraminulentaque eſt.

CAPVT XIII.

De ventre, inferioribúſque, vſque ad ſeminale membrum.

Venter infra pectus eſt parte priore, eiúſque radix vmbilicus eſt. Cui radici pars ſubiecta in latus vtrumque, ilia dicitur. Quæ autem rectè ſubiungitur, ſumen eſt, ſiue abdomen: cuius poſtremum, aqualiculus. Sed ſuper vmbilicum hypochondrium eſt, à cartilagine quaſi ſubcartilagium denominatum. Cauum autem commune ſubcartilagii, & ilium, cholago eſt. Partem poſteriorem lumbi pari ſtructura præcingunt, vnde nomen oſphis inditum eſt. Partis vero excretoriæ, quod ſubditum quaſi ſtragulum eſt, nates appellatur. In quo autem femur verſatur, coxa, & acetabulum. Pars fœminæ propria, vterus, aut vulua eſt. Maris, penis, foras poſtremo thorace propendens: parte ſui prima, carne propemodum conſtans, & æquabili facie turbinata. Nomen à glande pars hæc mutuata eſt: quam quæ integit cutis, vacat nomine: quæ vulnere obducto coaleſcere nequit ſicut nec gene, aut palpebræ præciſæ reduci ad vnitatem queunt. Totum tamen, quod ex ea cute glandéque conſtat, præputium eſt. Reliqua pars cartilaginea eſt,

κινεῖ δὲ πάντα τὰ ζῷα τὴν κάτω σιαγόνα, πλὴν τοῦ ποταμίου κροκοδείλου. οὗτος γὰρ τὴν ἄνω μόνον. μετὰ δὲ τὴν ῥῖνα χείλη δύο, σὰρξ εὐκίνητος. τὸ δ' ἐντὸς στόμα, σιαγόνων καὶ χειλῶν. τούτου μέρη, τὸ μὲν, ὑπερῷον, τὸ δὲ, φάρυγξ. τὸ δ' αἰσθητικὸν χυμοῦ, γλῶττα. ἡ δ' αἴσθησις ἐν τῷ ἄκρῳ. ἐὰν δὲ ἐπὶ τὸ πλατὺ ἐπιτεθῇ, ἧττον. αἰσθάνεται δὲ καὶ ὧν ἡ ἄλλη σὰρξ πάντων, οἷον σκληροῦ, θερμοῦ, καὶ ψυχροῦ καθ' ὁτιοῦν μέρος, ὥσπερ καὶ χυμοῦ. αὕτη δὲ ἡ πλατεῖα, ἡ στενή, ἡ μέση. ἡ μέση δὲ* βελτίστη καὶ σαφεστάτη, ἡ καὶ λελυμένη, ἡ καταδεδεμένη, ὥσπερ τοῖς ψελλοῖς καὶ τοῖς τραυλοῖς. ἔστι δὲ ἡ γλῶττα σὰρξ μανὴ καὶ σομφή. ταύτης τι μέρος, ἐπιγλωττίς. καὶ τὸ μὲν διφυὲς τοῦ στόματος, παρίσθμιον· τὸ δὲ πολυφυές, οὖλον. σαρκώδη δὲ ταῦτα. ἐν τούτοις δ' ὀδόντες ὀστώδεις. ἐντὸς δ' ἄλλο μόριον σταφυλοφόρον, κίων ἐπίφλεβος· ὃς ἐὰν ἐξυγρανθεὶς φλεγμήνῃ, σταφυλὴ καλεῖται, καὶ πνίγει.

* χ. αἰσθητικὴ, σαφεστάτη, ἡ κ...

ΚΕΦΑΛ. ιβ'.

Περὶ αὐχένος, στήθους, καὶ τῶν μερῶν αὐτῶν.

Αὐχὴν δὲ τὸ μεταξὺ προσώπου καὶ θώρακος. καὶ τούτου τὸ μὲν πρόσθιον μέρος, λάρυγξ· τὸ δὲ ὀπίσθιον, στόμαχος. τούτου δὲ τὸ μὲν χονδρῶδες καὶ πρόσθιον, δι' οὗ καὶ ἡ φωνὴ καὶ ἀναπνοή, ἀρτηρία. τὸ δὲ σαρκῶδες, στόμαχος, ἐντὸς πρὸ τῆς ῥάχεως. τὸ δ' ὀπίσθιον αὐχένος μέρος, ἐπωμίς. ταῦτα μὲν οὖν τὰ μόρια μέχρι τοῦ θώρακος. θώρακος δὲ μέρη, τὰ μὲν, πρόσθια, τὰ δ', ὀπίσθια. πρῶτον μὲν μετὰ τὸν αὐχένα ἐν τοῖς προσθίοις στῆθος, διφυὲς μαστοῖς. τούτων ἡ θηλὴ διφυής, δι' ἧς ταῖς θηλείαις τὸ γάλα διηθεῖται· ὁ δὲ μαστός, μανός. ἐγγίνεται δὲ καὶ ἐν τοῖς ἄρρεσι γάλα· ἀλλὰ πυκνὴ ἡ σὰρξ τοῖς ἄρρεσι, ταῖς δὲ γυναιξὶ σομφή, καὶ πόρων μεστή.

ΚΕΦΑΛ. ιγ'.

Περὶ γαστρὸς καὶ αἰδοίου καὶ τῶν μεταξύ.

Μετὰ δὲ τὸν θώρακα, ἐν τοῖς προσθίοις γαστήρ· καὶ ταύτης ῥίζα, ὀμφαλός. ὑπόρριζον δέ, τὸ μὲν διφυές, λαγών· τὸ δὲ μονοφυές, τὸ μὲν ὑπὸ τὸν ὀμφαλόν, * ἦτρον. τούτου δὲ τὸ ἔσχατον, ἐπίσιον. τὸ δ' ὑπὲρ τὸν ὀμφαλόν, ὑποχόνδριον. τὸ δὲ * κοινὸν ὑποχονδρίου καὶ λαγόνος, χολάς. τῶν δ' ὄπισθεν, διάζωμα μὲν, ἡ ὀσφύς, ὅθεν καὶ τοὔνομα ἔχει· δοκεῖ γὰρ * εἶναι τις ὀσφύς. τοῦ δὲ διεξοδικοῦ, τὸ μὲν * οἷον ἐφ' ἕδραν ὄν, γλουτός· τὸ δὲ ἐν ᾧ στρέφεται ὁ μηρός, κοτυληδών. τοῦ δὲ θήλεος ἴδιον μέρος, ὑστέρα· καὶ τοῦ ἄρρενος, αἰδοῖον, ἔξωθεν ἐπὶ τέλει τοῦ θώρακος, * διμερές. τὸ μὲν ἄκρον, σαρκῶδες καὶ λεῖον, ὡς εἰπεῖν, ἴσον· ὃ καλεῖται βάλανος. τὸ δὲ περὶ αὐτὴν ἀνώνυμον δέρμα· ὃ ἐὰν διακοπῇ, οὐ συμφύεται, οὐδὲ γνάθος, οὐδὲ βλεφαρίς. κοινὸν δὲ τούτου καὶ τῆς βαλάνου, ἀκροποσθία. τὸ δὲ λοιπὸν μέρος, χονδρῶδες,

* χ. ἦτρον.

* χ. κοινὸν.

* Scrib. ἰσοφυής, ex Grammaticis Græcis, qui locum hūc ita proferunt: & veteribus interpr. Latinis, qui pariformitatem vertunt, Gaza, ... rectè.

* χ. βλεφαρίς.

αὐξάνεσθαί τε καὶ ἐξέρχεσθαι καὶ εἰσέρχεσθαι ἐναντίως ἢ τοῖς λοφούροις. τοῦ δ' αἰδοίου ἀποκάτω ὄρχεις δύο. τὸ δὲ περὶ τὸ δέρμα, ὃ καλεῖται * ὀσχὰς. οἱ δ' ὄρχεις, οὔτε ταὐτὸ σαρκὶ, οὔτε πόρρω σαρκός. ὃν τρόπον δ' ἔχουσιν, ὕστερον δι' ἀκριβείας λεχθήσεται καθόλου περὶ πάντων τῶν τοιούτων μορίων.

* Scrib. ὄσχεος vel ὄσχεα

ΚΕΦΑΛ. ιδ'.

Περὶ τοῦ τῆς γυναικὸς αἰδοίου.

Τὸ δὲ τῆς γυναικὸς αἰδοῖον, ἐξ ἐναντίας τῷ τῶν ἀρρένων· κοῖλον γὰρ τὸ ὑπὸ τὴν ἥβην καὶ οὐχ ὥσπερ τὸ τοῦ ἄρρενος ἐξέχον. καὶ οὐρήθρα ἔξω τῶν ὑστερῶν, διοδὸς τῷ σπέρματι τοῦ ἄρρενος, τῷ δ' ὑγρῷ περιττώματι, ἀμφοῖν ἔξοδος. κοινὸν δὲ μέρος αὐχένος καὶ στήθους, σφαγή· πλευρᾶς δὲ καὶ βραχίονος καὶ ὤμου, μασχάλη· μηροῦ δὲ καὶ * ἥτρου, βουβών. μηροῦ δὲ καὶ γλουτοῦ τὸ ἐντός, περίνεος· μηροῦ δὲ καὶ γλουτοῦ τὸ ἔξω, ὑπογλουτίς. θώρακος δὲ τὰ ἔμπροσθεν εἴρηται.

* γρ. ἰσχίου

ΚΕΦΑΛ. ιε'.

Περὶ νώτου καὶ βραχιόνων καὶ σκελῶν, καὶ τῶν τούτων μερῶν.

Τὸ δὲ ὄπισθεν, τὸ ὄπισθεν, νῶτον. Νώτου δὲ μέρη, ὠμοπλάται δύο, καὶ ῥάχις. * ὑποκάτω δὲ κατὰ τὴν γαστέρα τοῦ θώρακος, ὀσφύς. κοινὰ δὲ τοῦ ἄνω καὶ κάτω, πλευραί, ἑκατέρωθεν ὀκτώ. περὶ γὰρ * λιγύων τῶν καλουμένων ἑπταπλεύρων οὐδενός πω ἀξιοπίστου ἀκηκόαμεν. ἔχει δ' ὁ ἄνθρωπος καὶ τὸ ἄνω καὶ τὸ κάτω, καὶ τὸ ἔμπροσθεν καὶ ὄπισθεν, καὶ δεξιὰ καὶ ἀριστερά. τὰ μὲν οὖν δεξιὰ καὶ ἀριστερὰ ὅμοια σχεδὸν ἐν τοῖς μέρεσι, καὶ ταὐτὰ πάντα, πλὴν ἀσθενέστερα τὰ ἀριστερά. τὰ δ' ὄπισθεν τοῖς ἔμπροσθεν ἀνόμοια, καὶ τὰ κάτω τοῖς ἄνω, πλὴν ὧδε ὅμοια τὰ κάτω τῷ ὑπὸ τὴν γαστέρα τὸ πρόσωπον, ἢ σαρκῶδες ἢ ἄσαρκον· καὶ τὰ σκέλη πρὸς τοὺς βραχίονας ἀντίκειται. καὶ οἷς βραχεῖς οἱ ἀγκῶνες, καὶ οἱ μηροὶ ὡς ἐπὶ τὸ πολύ· καὶ οἷς οἱ πόδες μικροί, καὶ αἱ χεῖρες. κώλου δὲ τὸ μὲν διφυές, βραχίων. βραχίονος δέ, ὦμος, ἀγκών, ὠλέκρανον, πῆχυς, χείρ. χειρὸς δέ, θέναρ, δάκτυλοι πέντε. δακτύλου δὲ τὸ μὲν καμπτόμενον, κόνδυλος· τὸ δ' ἄκαμπτον, φάλαγξ. δάκτυλος δ' ὁ μὲν μέγας, μονοκόνδυλος, οἱ δ' ἄλλοι, δικόνδυλοι. ἡ δὲ κάμψις καὶ τοῦ βραχίονος καὶ τοῦ δακτύλου εἴσω πᾶσι γίνεται. κάμπτεται δὲ βραχίων κατὰ τὸ ὠλέκρανον. χειρὸς δέ, τὸ μὲν ἐντός, θέναρ, σαρκῶδες, καὶ διηρθρωμένον ἄρθροις, τοῖς μὲν μακροβίοις ἑνὶ ἢ δυσὶ δι' ὅλου, τοῖς δὲ βραχυβίοις δυσί, καὶ μὴ δι' ὅλου. ἄρθρον δὲ χειρὸς καὶ βραχίονος, καρπός. τὸ δ' ἔξω τῆς χειρός, νευρῶδες καὶ ἀνώνυμον. κώλου δ' ἄλλο διμερές, σκέλος. σκέλους δὲ τὸ μὲν ἀμφίκρανον, μηρός· τὸ δ' ἐπιπολῆς, μύλη· τὸ δὲ δίοστεον, κνήμη· καὶ ταύτης τὸ μὲν ἔμπροσθεν, ἀντικνήμιον· τὸ δ' ὄπισθεν, γαστροκνημία, σὰρξ νευρώδης [ἢ φλεβώδης], τοῖς μὲν ἀνεσπασμένη ἄνω πρὸς τὴν ἰγνύν, ὅσοι μεγάλα τὰ ἰσχία ἔχουσι· τοῖς δ' ἐναντίως κατεσπασμένη. τὸ δ' ἔσχατον ἀντικνημίου, σφυρόν, διφυὲς ἐν ἑκατέρῳ τῷ σκέλει.

* γρ. ὑποκάτω δὲ

* Gaza, λιγύων

A & augeri ampliter poteſt, & ingredi atque egredi, contra quàm iumentorum. Subiacent membro genitali teſtes gemini, cute obducti, quod ſcrotum nominamus. Teſtes ipſi nec eiuſdem naturæ ſunt, cuius caro, nec multùm à carne diſſident. Sed quemadmodum hæc ſe habeant, ac omnino de cęteris huiuſcemodi partibus, poſtea accuratiùs diſſeremus.

CAPVT XIV.

De varietate genitalis membri, viri, & mulieris.

MVlieris autem genitale contra quàm viri formatum eſt. Cauum enim ſubditum pubi B eſt: non ſicut maris propenſum, ac prominens. Ceruix ab vtero effertur, acceſſum prolifico maris ſemini præbens. Exitum humidi excrementi ſuo ſexus vterque genitali habet ſubminiſtrandum. Communis colli & pectoris pars, iugulum eſt. Coſtæ, brachij, & humeri, ala. Femoris, & imi ventris, inguen. Pars item interior femoris & natis communis, coles: exterior, ſubnatale. Thoracis iam partes omnes priores diximus.

CAPVT XV.

De dorſo, cæteriſque partibus poſterioribus.

C DOrſum ponè pectus eſt, cuius partes ſcapulæ, & ſpina: infraque è regione ventris, lumbi habentur. Communes autem partis ſuperioris, inferiorisque, coſtæ octonæ. Nam de hominibus gentis Tordulorum, quos ſeptenis coſtis ferũt creari, nullius idonei authoris teſtimonio conſtat. Habet ſane homo ſuas partes ita diſpoſitas, vt in eo & ſuperius ſit, & inferius, & prius & poſterius, & dextrum & ſiniſtrum. Conſtat ſanè, dextrum & ſiniſtrum ex ſimilibus fere partibus, atque eiſdẽ. Verum ſiniſtra omnia ſunt imbecilliora. At poſteriora prioribus, & ſuperiora inferioribus diſcrepant, præterquã quod inferiora ſimilitudinem ſuperiorum præferre ea di- D xerim ratione, qua venter imus reſpondere ſolet, faciei, in corpulentia, vel gracilitate: & crura cum brachiis communem ineunt rationem. Itaque quibus cubiti breues, iis etiam femora magna ex parte breuia ſunt: & quibus pedes exigui, iis manus quoque paruæ habentur. Membri vero ſuperioris bipartitam compactionem, brachium, ſiue vlnam appellamus. Cuius partes, lacertus, agilis, gibber, cubitus, manus. *Partes manus, palma, & digiti quinque numero. Digiti pars, quà ſe inflectit, nodus, ſiue articulus eſt: quæ rigida conſtat, internodiũ dicitur. Digitus pollex nuncupatus, vno inflectitur nodo, cæteri binis adſtruuntur. Inflexus vero tũ bra- E chij, tum digitorum omniũ, agitur in interiora. Brachium ad gibberum appellatũ inflectitur. Nodum, quo cum brachio manus iungitur coarctaturque, brachiale vocamus. Pars interior manus vola dicitur: carnoſa eſt, ſciſſuris vitæ indicibus diſtincta: longioris ſcilicet vitæ ſingulis aut binis ductis per totam, breuioris binis, quæ non longitudinem totam deſignent. Exterior neruoſa eſt, & nomine carens. Membri inferioris bipartita cõpactio, crus eſt: huius femur, quod biceps. Mola, quod locum orbiculatum foris adiectũ habet. Tibia, quod gemino oſſe ſubiacet: cuius pars prior ocrea, poſterior ſura, caro neruoſa, venoſave: aliis retracta à poplite, quibus nates ſunt pleniores, aliis detracta, quibus graciliores.

Poſtremum cruris, malleolus geminus vtrique partitus lateri eſt. Pes autem, quod multiplici fiſſu conſtat: cuius pars poſterior calx, prior diuiſa in digitos quinque eſt: media plantæ nomine explicatur, cuius quod carnoſum inferius, ſolum attingit. Veſtigium eſt, quod ſuperius pronam conijcit partem, neruoſum: & nominis adhuc indigum eſt. Hæret ſummis digitis vnguis, & nodus interuenit: ſed non niſi vno inflexu adducuntur. Quibus pars interior plantæ non caua, ſed ita plenitiuſcula eſt, vt ſolum toto attingat veſtigio, ij verſuti ſunt & fraudulenti. Commune femoris, & tibiæ genu, poples que eſt. Partes maris ac fœminæ communes hæ ſunt: quarum ſitus quemadmodum ad ſuperius, inferius, prius, poſterius, ſiniſtrum, dextrum ſe habeat, tametſi per corporis ſumma viſu exploratur, ac patet: deſcribendus tamen is quoque, recitandúſque eſt eadem illa de cauſa, qua ſuperiora enumerauimus omnia, ſcilicet vt ſeries commentandi ſeruetur perpetua, dum ordinem perſequimur omnium, quo minùs lateant ea quæ non modo eodem homines, quo cætera animalia poſſident. Ergo ſuperiora inferiuſque hominem omnium maximè animalium habere, ratione locorum naturalium intelligimus. Eius enim partes tam ſuperiores quàm inferiores ad ſitum orbis vniuerſi ſuperiorem inferioremque, diſpoſitæ ſunt. Itidem quæ priores poſterioreſque, atque etiam dextræ ſiniſtræque habentur: cum cæterorum animalium genus, vel omnino reſpectu eiuſmodi careat, vel confuſius ita conſtet. Caput itaque cæteris omnibus ſuperiorem obtinet ſitum, corporis ſui ratione: at homo, quoniam (vt modò diximus) ad vniuerſi orbis habitum inſtitutus eſt, idcirco partem etiam iſtam habet reſpondentem parti ſublimi vniuerſi. Caput, ceruices & collum, excipiunt tum pectus, & dorſum, alterum prius, alterum poſterius eſt. Subiacent iis, venter, & lumbi, genitale, & nates, mox femur, & tibiæ: poſtremò pedes. Crura verò anteflectunt, eodem ſcilicet, quo & incedunt. Pedis etiam pars mobilior eodem ſe flectit. Calx è tergo poſitus eſt. Malleoli, ſitum imitantur aurium: quippe qui latera teneant imi cruris, quomodo aures iunctæ lateribus capitis habentur. Brachia ex latere corporis ſiniſtro dextroque dependent, atque ſe introflectunt, ita vt homini potiſſimum deuexa crurum & brachiorum aduerſa inter ſe ſint. Senſus autem, parteſque eorum ſenſorias, oculos dico, nares, linguã, eodem, ſcilicet priorem in partem, ſpectantes habemus: at auditum, eiuſque partem ſenſoriam, id eſt, aures, à latere, eodem in orbe quo oculos. Diſtant oculi hominis ſibi interuallo, proportione magnitudinis reſpectu cæterorum animalium, minimo. Tactus è ſenſibus homini exquiſitiſſimus, deinde guſtus: reliquis ſuperatur à multis.

CAPVT XVI.

Cum quibus animantibus hominis cerebrum, gula, arteria, & venter, conueniant.

Ita partes exteriores collocatæ, atque diſpoſitæ ſunt, nominanturque præcipuè, & cognitæ per vſum ſitúmque euidentiorem habentur. At verò interiores contrà: ſunt enim hominum in primis incertæ, atque incognitæ. Quamobrem ad cæterorum animalium partes, quarum ſimiles ſint humanæ, referentes, eas contemplari debemus.

τὸ δὲ πολύσχιστον τοῦ σκέλους, πούς. τούτου δὲ τὸ μὲν ὀπίσθιον μέρος, πτέρνα. τὸ δ' ἔμπροσθεν τοῦ ποδὸς τὸ μὲν ἐσχισμένον, δάκτυλοι πέντε. τὸ δὲ σαρκῶδες κάτωθεν, στῆθος. τὸ δ' ἄνωθεν ἐπὶ τὰ πρανῆ νευρῶδες καὶ ἀνώνυμον. δακτύλου δὲ τὸ μὲν ὄνυξ, τὸ δὲ καμπή. πάντων δὲ ὁ ὄνυξ ἐπ' ἄκρων· μονοκαμπεῖς δὲ πάντες οἱ ἐν ποσὶ δάκτυλοι. τοῦ δὲ ποδὸς ὅσοις μὲν τὸ ἐντὸς παχὺ καὶ μὴ κοῖλον, ἀλλὰ βαίνουσιν ὅλῳ, οὗτοι πανοῦργοι. κοινὸν δὲ μηροῦ καὶ κνήμης, γόνυ, καμπή. ταῦτα μὲν οὖν τὰ μέρη, κοινὰ καὶ θήλεος καὶ ἄρρενος. ἡ δὲ θέσις τῶν μερῶν πρὸς τὸ ἄνω καὶ κάτω, καὶ πρὸς τὸ πρόσθιον καὶ ὀπίσθιον, καὶ δεξιὸν καὶ ἀριστερὸν, ὡς ἔχει, φανερὰ μὲν ἂν εἶναι δόξειε τὰ ἔξωθεν κατὰ τὴν αἴσθησιν. οὐ μὴν ἀλλὰ διὰ τὴν αὐτὴν αἰτίαν λεκτέον, δι' ἥνπερ καὶ τὰ πρότερον εἰρήκαμεν, ἵνα περαίνηται τὸ ἐφεξῆς, καὶ τῷ ἀριθμεῖσθαι, ὅπως ἧττον λανθάνῃ τὰ μὴ τὸν αὐτὸν ἔχοντα τρόπον, ἐπί τε τῶν ἄλλων ζῴων, καὶ ἐπὶ τῶν ἀνθρώπων. μάλιστα δ' ἔχει διωρισμένα πρὸς τοὺς κατὰ φύσιν τόπους τὰ ἄνω καὶ κάτω, ἄνθρωπος τῶν ἄλλων ζῴων. τά τε γὰρ ἄνω καὶ κάτω, πρὸς τὰ τοῦ παντὸς ἄνω καὶ κάτω τέτακται. τὸν αὐτὸν δὲ τρόπον καὶ τὰ πρόσθια, καὶ τὰ ὀπίσθια, καὶ τὰ δεξιὰ καὶ τὰ ἀριστερὰ κατὰ φύσιν ἔχει. τῶν δ' ἄλλων ζῴων, τὰ μὲν οὐκ ἔχει, τὰ δ' ἔχει μὲν, συγκεχυμένα δὲ μᾶλλον. ἄνω μὲν οὖν ἡ κεφαλὴ πᾶσι πρὸς τὸ σῶμα τὸ αὐτῶν. ὁ δ' ἄνθρωπος μόνος, ὥσπερ εἴρηται, πρὸς τὸ τοῦ ὅλου τετελειωμένος, ἔχει τοῦτο τὸ μόριον. μετὰ δὲ τὴν κεφαλήν, ἐστὶν ὁ αὐχήν, εἶτα στῆθος καὶ νῶτον, τὸ μὲν ἐκ τοῦ πρόσθεν, τὸ δ' ἐκ τοῦ ὄπισθεν. ἐχόμενα δὲ τούτων, γαστὴρ, καὶ ὀσφῦς, καὶ αἰδοῖον, καὶ ἰσχίον, εἶτα μηρὸς καὶ κνήμη, τελευταῖον δὲ πόδες. εἰς τὸ πρόσθεν δὲ καὶ τὰ σκέλη τὴν κάμψιν ἔχει, ἐφ' ἅπερ καὶ ἡ πορεία· καὶ τῶν ποδῶν τὸ κινητικώτερον μέρος, καὶ ἡ κάμψις. ἡ δὲ πτέρνα [ἐκ] ἐκ τοῦ ὄπισθεν, τῶν δὲ σφυρῶν ἑκάτερον, κατὰ τὸ οὖς. ἐκ δὲ τῶν πλαγίων, τῶν δεξιῶν καὶ τῶν ἀριστερῶν, οἱ βραχίονες, τὴν κάμψιν ἔχοντες εἰς τὸ ἐντός, * ὥστε τὰ κυρτὰ τῶν σκελῶν καὶ τῶν βραχιόνων πρὸς ἄλληλα εἶναι, ἐπ' ἀνθρώπου μάλιστα. τὰς δ' αἰσθήσεις καὶ τὰ αἰσθητήρια, ὀφθαλμοὺς, καὶ μυκτῆρας, καὶ γλῶτταν, ἐπὶ τὸ αὐτὸ, καὶ εἰς τὸ πρόσθεν ἔχει. τὴν δ' ἀκοὴν καὶ τὸ αἰσθητήριον αὐτῆς, τὰ ὦτα, ἐκ τῶν πλαγίων μὲν, ἐπὶ τῆς αὐτῆς δὲ περιφερείας τοῖς ὄμμασιν. τὰ δ' ὄμματα ἐλάχιστον κατὰ τὸ μέγεθος διέστηκεν ἀνθρώπου τῶν ζῴων. ἔχει δὲ ἀκριβεστάτην ἄνθρωπος τῶν αἰσθήσεων τὴν ἁφὴν, δευτέραν δὲ γεῦσιν. ἐν δὲ ταῖς ἄλλαις, λείπεται πολλῶν.

* De inceſſu animal. lib. 11.

ΚΕΦΑΛ. ιϛʹ.

Τὰ περὶ τὸν ἐγκέφαλον, καὶ τὸν στόμαχον, καὶ τὴν κοιλίαν πῶς ἔχει.

Τὰ μὲν οὖν μόρια τὰ πρὸς τὴν ἔξω ἐπιφάνειαν, τοῦτον τέτακται τὸν τρόπον, καὶ καθάπερ ἐλέχθη, ὠνόμασταί τε μάλιστα, καὶ γνώριμα διὰ τὴν συνήθειάν ἐστι. τὰ δ' ἐντὸς τοὐναντίον. ἄγνωστα γάρ ἐστι [μάλιστα] τὰ τῶν ἀνθρώπων. ὥστε δεῖ πρὸς τὰ τῶν ἄλλων μόρια ζῴων ἀνάγοντας σκοπεῖν, οἷς ἔχει παραπλησίαν τὴν φύσιν.

[illegible]

*Sylburgius, [illegible]

A Primum igitur cerebrum capitis priorem obtinet ſitum, non modò in homine, verùm in cæteris etiã animalibus, quibus ea pars data eſt. Omnibus autem in iis eſt, quæ ſanguinem obtinent, & ob eam rem ſanguinea appellantur: atque etiam quæ mollia nomine ſpeciali nuncupantur. Sed homo plurimum cerebri proportione magnitudinis, ac humidiſſimum habet. Continent id membranæ duæ, altera oſſi adhærens, valida: altera ipſum cerebrum attingẽs, infirmior. Bipartitum omnium cerebrum eſt, poſtremumque iungitur, quod cerebellum appellatur: quod certè & tactu, & ſpecie formam habet diuerſam. Pars verò poſterior capitis, inanis, & caua omnibus eſt, prout in ſingulis magnitudine variatur. Quibuſdam enim caput grande, facies B ſubiecta capiti parua, vt quæ rotunda ſunt facie. Aliis caput paruum, maxillæ longæ, vel vt generi omni iumentorum. Cerebrum omnibus priuatum ſanguine eſt, nec venam intra ſe vllam continet, & ad tactum frigidum per naturam eſt. Habet ſuo in medio plerique omnibus cauum quoddam exiguum membrana obſiſtente venoſa, circicularique obducitur. Oſſe poſtremò continetur tenuiſſimo infirmiſſimoque omnium capitis oſſium, cui nomen occipiti. Meatus ab oculis terni ad cerebrũ pertinent ita vt maximi & mediocres ad cerebellũ tendant, minimi ipſum cerebrum adeant. Minimi iſunt, qui propiores naribus oriuntur: maximi porro illi æquidiſtant, nec vſquam coire poſſunt. Me- C diocres coeunt: quod præcipuè in genere piſcium patet: & cerebro ſunt ii propiores, quàm magni. Minimi perquam laxo inter ſe diſtant interuallo, & nunquam ob eam rem poſſunt coire. Gula inter collum eſt, ab anguſtia & longitudine nuncupata: cui comes arteria iungitur, priorem obtinens ſitum in omnibus iis quæ eam habere Naturæ placuerat. Habent autem omnia, quibus pulmo eſt. Natura cartilaginis arteria conſtat, & ſanguinis perquam exigui compos eſt, venulis complexa tenuibus. Quod ad ſuperiora, id eſt, oris habitũ, pertinet, è regione poſita eſt foraminibus narium, quæ in oris partem pateſcunt. Vnde fit, vt quoties inter bibendum humor retrahitur, effluat ex ore per na- D res. Iungitur linguæ poſtremæ, quæ ligula nominata eſt, [illegible] inter ea, quæ modo dixi, foramina: videlicet apta, quæ per vices arteriæ foramentum quod ad os ſpectat, operiat. Arteria altero ſui extremo, cum lingua ima coniungitur, altero ad pulmonis intercapedinem deſcendit, tum in vtramque ſinditur partem pulmonis. Eſſe namque bipartitus pulmo omnium expetit. Verùm in iis quæ animal generant, diſtinctio non æquè apparet, minimèque in homine. Eſt præterea hominis pulmo ſimplicior, nec ita multifidus, vt nonnullorum animal procreantium eſt: nec læuis, ſed inæquabilis eſt. at in ouiparo genere, vt auibus, & quadrupedibus, quorum partus oui primordio inchoari ſolitus eſt, pars altera pulmonis multum diſciſſa ab altera eſt, ita vt binos habere pulmones videantur. atque à ſingulari arteria partes in vtrumque pulmonis latus duæ dependent. Venæ quoque maiori, ac alteri, cui nomen eſt aortæ, pulmo connectitur. *Spiritus* verò, quoties inflatur arteria, caua ſubit pulmonis. Hæc mucronata ſpecie cartilagineis diducuntur corpuſculis, de quibus foramina quoquouerſus per diminutiones, arctioribus ſubinde amplioria excipientibus, transmittuntur. Cor etiam arteriæ iungitur, obeſis cartilagineis fibroſiſque vinculis:

& quà annectitur, cauum eſt. Spiritus, dum arteria inflatur, an ſubeat cor, minùs in nonnullis conſtat; ſcilicet minutis. at in grandioribus animalium, ſpiritum cor ſubire ipſum, apertum eſt. Arteria ita ſe habet: & accipiendi reddendique tantummodò ſpiritus officio fungitur. Nihil etenim aliud vel ſiccum, vel humidum pati ipſa videtur: ſed vbi in eā tale quid deerrauerit, tamdiu torquetur, dum excutiat quod delapſum eſt. Gula ab ore & ipſa dependet, continua tum ſpinæ, tum arteriæ nexu fibrarum: & per ſeptum tranſuerſum in ventriculum finit, carnis ſpeciem referens, & pariter diſtendi in longum latumque habilis. Ventriculus autem humanus canino ſimilis eſt, quippe qui nō multo amplior ſit, quam inteſtinum, ſed quaſi inteſtino ſimilis ampliori. Tum inteſtinum ſimplex flexuoſis orbibus eſt, à quo proximum inteſtinum admodum amplum. Aluus autem ipſa ſuillæ ſimilis eſt, quippe quæ & ampla ſit, & quod vſque in ſedem porrigitur, breue id corpulentumque tranſmittat. Omentum medio à ventre dependet, quod non niſi pinguis membrana eſt, ſicut etiam in cæteris animantibus, quæ vnum continent ventrem, & vtraque parte oris dentata ſunt. Lactes ſuper inteſtina poſitæ ſunt, qui & ipſi latiore conſtant membrana, & pingueſcunt: pendent ex vena maiore, atque aortæ, venaſque permultas frequenti concurſu deferunt ex parti illo venarum grandium ad inteſtina, de ſummis ad ima vſque ſpargentes. Gula, arteria, venter, ita ſe habent.

CAPVT XVII.

De corde, iecinore, liene, felle, renibus, veſica, & membris genitalibus.

COr ſinum triplicem continet: iacet paulo pulmone ſuperius ad arteriæ fiſſuram, opertum membranæ inuolucro pingui & corpulento, qua venæ maiori adnectitur, & aortæ. Iungitur cum aorta ſuo mucronato culmine, in pectuſque parte eadem vergit omnium pariter quæ pectus ſortiuntur. Omnibus verò tam pectore conſtitutis quàm ea ipſa parte carentibus, cor æque ſuo mucrone in partem vergit priorem: verùm latere ſæpius poteſt, quoniam diſſecto animante dimouetur. at parte ſui ampliore, & gibba, ſuperiora corporis ſpectat. Habet maiorem partem ſui mucronis carnoſam, & ſpiſſam, & neruulos ſuis in cauis continet. Situm cæteris animalibus in medio pectore eſt, in quibus ſcilicet pectus ineſt. Homini tantùm in partem ſiniſtram potiùs vergit, paulo à mammarum diſtinctione ad læuam inclinans papillam pectoris parte ſuperiore: nec magnum eſt, & ſpecie tota non oblongum, ſed rotundius. Parte tamen extrema in acutum ſe colligit, exitque pene in mucronem. Habet, vt modò expoſui, ſinum triplicem: maximum dextro in latere, minimum in ſiniſtro, medium magnitudine inter ſiniſtrum & dextrum. Omnes ad pulmonem foraminibus peruij redduntur. quæ res in vno tantum perſpicua eſt. Inferius verò à nexu ſuo, maximo ſinu venæ coniungitur maiori, ad quam lactes etiam ſunt. Sinu autem medio aortæ annexum eſt. Quinetiam ad pulmonem meatus à corde ducuntur perpetui, finduntúrque eodem, quo arteria, modo, in omnes pulmonis partes: & meatus, qui eōdem ab arteria tendunt, ſequuntur. Verùm hi ſuperiorem obtinent ſitum,

A ᾗ δὲ συνήρτηται, κοίλη ἐστί. φυσωμένης δὲ τῆς ἀρτηρίας, ἐν ἐνίοις μὲν οὐ καταδήλως ποιεῖ, ἐν δὲ τοῖς μείζοσι τῶν ζῴων, δῆλον ὅτι εἰσέρχεται τὸ πνεῦμα εἰς αὐτήν. ἡ μὲν οὖν ἀρτηρία τοῦτον ἔχει τὸν τρόπον, καὶ δέχεται μόνον τὸ πνεῦμα καὶ ἀφίησιν, ἄλλο δ' οὐδέν, οὔτε ξηρὸν οὔθ' ὑγρόν, ἢ πόνον παρέχει, ἕως ἂν ἐκβήξῃ τὸ κατελθόν. ὁ δὲ στόμαχος ἤρτηται μὲν ἄνωθεν ἀπὸ τοῦ στόματος, ἐχόμενος τῆς ἀρτηρίας, συνεχὴς ὢν πρὸς τῇ ῥάχει καὶ τῇ ἀρτηρίᾳ, ὑμενώδεσι δεσμοῖς, τελευτᾷ δὲ διὰ τοῦ διαζώματος εἰς τὴν κοιλίαν, σαρκώδης ὢν τὴν φύσιν, καὶ τάσιν ἔχει καὶ ἐπὶ μῆκος καὶ ἐπὶ πλάτος. ἡ δὲ κοιλία ἡ τοῦ ἀνθρώπου, B ὁμοία τῇ κυνείᾳ ἐστίν· οὐ πολλῷ γὰρ τοῦ ἐντέρου μείζων, ἀλλ' ἐοικυῖα οἱονεὶ ἐντέρῳ πλάτος ἔχοντι· εἶτα ἔντερον ἁπλοῦν εἱλιγμένον, εἶτα ἔντερον εὐρὺ ἔχει. ἡ δὲ κάτω κοιλία, ὁμοία τῇ ὑείᾳ· πλατεῖά τε γάρ ἐστι, καὶ τὸ ἀπὸ ταύτης πρὸς τὴν ἕδραν, παχὺ καὶ βραχύ. τὸ δ' ἐπίπλοον, ἀπὸ μέσης τῆς κοιλίας ἤρτηται. ἔστι δὲ τὴν φύσιν ὑμὴν πιμελώδης, ὥσπερ καὶ τοῖς ἄλλοις τοῖς μονοκοιλίοις καὶ ἀμφώδουσιν. ὑπὲρ δὲ τῶν ἐντέρων, τὸ μεσεντέριόν ἐστιν· ὑμενῶδες δ' ἐστὶ καὶ πλατύ, καὶ πιαίνεται. ἐξήρτηται δ' ἐκ τῆς μεγάλης φλεβὸς καὶ τῆς ἀορτῆς, καὶ C δι' αὐτοῦ φλέβες πολλαὶ καὶ πυκναί, κατατείνουσαι πρὸς τὴν τῶν ἐντέρων θέσιν, ἀρξάμεναι ἄνωθεν μέχρι κάτω. τὰ μὲν οὖν περὶ τὸν στόμαχον καὶ τὴν ἀρτηρίαν, οὕτως ἔχει, καὶ τὰ περὶ τὴν κοιλίαν.

ΚΕΦΑΛ. ιζ.

Περὶ καρδίας.

Η Δὲ καρδία, ἔχει μὲν τρεῖς κοιλίας· κεῖται δ' ἀνωτέρω τοῦ πνεύμονος κατὰ τὴν σχίσιν τῆς ἀρτηρίας, ἔχει δ' ὑμένα πιμελώδη καὶ παχύν, ᾗ προσπέφυκε τῇ φλεβὶ τῇ μεγάλῃ καὶ τῇ ἀορτῇ. κεῖται δ' ἐπὶ τῇ ἀορτῇ κατὰ τὰ ὀξέα. D κεῖται δὲ τὰ ὀξέα κατὰ τὸ στῆθος ὁμοίως ἁπάντων τῶν ζῴων, ὅσα ἔχει στῆθος. πᾶσι δ' ὁμοίως καὶ τοῖς ἔχουσι καὶ τοῖς μὴ ἔχουσι τοῦτο τὸ μόριον, εἰς τὸ πρόσθεν ἔχει ἡ καρδία τὸ ὀξύ· λάθοι δ' ἂν πολλάκις, διὰ τὸ μεταπίπτειν διαιρουμένων. τὸ δὲ κυρτὸν αὐτῆς, ἐστὶν ἄνω. ἔχει δὲ τὸ ὀξὺ σαρκῶδες ἐπὶ πολύ, καὶ πυκνόν, καὶ ἐν τοῖς κοίλοις αὐτῆς νεῦρα ἔνεισι. κεῖται δὲ τὴν θέσιν ἐν μὲν τοῖς ἄλλοις κατὰ μέσον τὸ στῆθος, ὅσα ἔχει στῆθος· τοῖς δ' ἀνθρώποις, ἐν τοῖς ἀριστεροῖς μᾶλλον, μικρὸν τῆς διαιρέσεως τῶν μαστῶν ἐγκλίνουσα εἰς τὸν ἀριστερὸν μαστόν, ἐν τῷ ἄνω μέρει τοῦ στήθους. καὶ οὔτε μεγάλη, οὔτε ὅλον αὐτῆς εἶδος οὐ προμήκης ἐστίν, ἀλλὰ στρογγυλώτερον· πλὴν τὸ ἄκρον εἰς E ὀξὺ συνῆκται. ἔχει δὲ κοιλίας τρεῖς, ὥσπερ εἴρηται· μεγίστην μὲν ἐν τοῖς δεξιοῖς ὑπάρχουσαν, τὴν ἐν τοῖς ἀριστεροῖς ἐλαχίστην, μέσην δὲ μεγέθει, τὴν ἐν τοῖς ἄνω μέσον· καὶ εἰσὶν εἰς τὸν πνεύμονα τετρημένας πάσας. ἀμφοτέρας δ' ἔχει τὰς δύο μικράς, καὶ εἰς τὸν πνεύμονα τετρημένας ἁπάσας. κατάδηλον δὲ κατὰ μίαν τῶν * κοιλιῶν κάτωθεν ἐκ τῆς προσφύσεως. κατὰ μὲν τὴν μεγίστην κοιλίαν, ἐξήρτηται τῇ μεγίστῃ φλεβί, πρὸς ἣν καὶ τὸ μεσεντέριόν ἐστι· κατὰ δὲ τὴν μέσην, τῇ ἀορτῇ. φέρουσι δὲ καὶ εἰς τὸν πνεύμονα πόροι ἀπὸ τῆς καρδίας, καὶ σχίζονται τὸν αὐτὸν τρόπον ὅνπερ ἡ ἀρτηρία, κατὰ πάντα τὸν πνεύμονα παρακολουθοῦντες τοῖς ἀπὸ τῆς ἀρτηρίας. ἐπάνω δ' εἰσὶν οἱ ἀπὸ τῆς καρδίας πό-

* Gaz. κοιλιῶν κάτωθεν ἡ ἐκ τῆς προσφύσεως καί, melius.

ἐστι. κοινὸς δ' οὐδεὶς ἐστι πόρος, ἀλλὰ διὰ τὴν σύναψιν δέχονται τὸ πνεῦμα, καὶ τῇ καρδίᾳ διαπέμπουσι. φέρει γὰρ ὁ μὲν ἐπὶ τὸ δεξιὸν κοῖλον τῶν πόρων ὁ δ', εἰς τὸ ἀριστερόν. περὶ δὲ τῆς φλεβὸς τῆς μεγάλης καὶ τῆς ἀορτῆς καθ' αὑτὰς κοινῇ περὶ ἀμφοτέρων ἐροῦμεν* ὕστερον. αἷμα δὲ πλεῖστον μὲν ὁ πλεύμων ἔχει τῶν ἐν τοῖς ζῴοις μορίων, τοῖς ἔχουσι τε πλεύμονα, καὶ ζῳοτοκοῦσιν ἐν αὑτοῖς τε καὶ ἔξω. ἅπας μὲν γάρ ἐστι σομφὸς, παρὰ δ' ἑκάστην τὴν σύριγγα, πόροι φέρουσι τῆς μεγάλης φλεβός. ἀλλ' οἱ νομίζοντες εἶναι κενὸν, διηπάτηνται, θεωροῦντες τοὺς ἐξαιρουμένους ἐκ τῶν διαιρουμένων ζῴων, ὧν εὐθέως ἐξελήλυθε τὸ αἷμα ἀθρόον. τῶν δ' ἄλλων σπλάγχνων, ἡ καρδία μόνον ἔχει αἷμα. καὶ ὁ μὲν πλεύμων, οὐκ ἐν αὑτῷ, ἀλλ' ἐν ταῖς φλεψίν· ἡ δὲ καρδία, ἐν αὑτῇ. ἐν ἑκάστῃ γὰρ ἔχει αἷμα τῶν κοιλιῶν. λεπτότατον δ' ἐστὶ τὸ ἐν τῇ μέσῃ. ὑπὸ δὲ τὸν πλεύμονά ἐστι τὸ διάζωμα τὸ τοῦ θώρακος, αἱ καλούμεναι φρένες, πρὸς μὲν τὰς πλευρὰς καὶ τὰ ὑποχόνδρια καὶ τὴν ῥάχιν συμπεφυκός· ἐν μέσῳ δ' ἔχει τὰ λεπτὰ καὶ ὑμενώδη. ἔχει δὲ καὶ δι' αὐτοῦ φλέβας τεταμένας. εἰσὶ δὲ καὶ αἱ τοῦ ἀνθρώπου φλέβες παχεῖαι, ὡς κατὰ τὸ ἀνάλογον τοῦ ἀνθρωπίνου σώματος. ὑπὸ δὲ τὸ διάζωμα, ἐν μὲν τοῖς δεξιοῖς κεῖται τὸ ἧπαρ, ἐν δὲ τοῖς ἀριστεροῖς ὁ σπλήν, ὁμοίως ἐν ἅπασι τοῖς ἔχουσι ταῦτα τὰ μόρια κατὰ φύσιν, καὶ μὴ τερατωδῶς. ἤδη γὰρ ὦπται μετηλλαχότα τὴν τάξιν ἔν τισι τῶν τετραπόδων. συνήρτηται δὲ τῇ κάτω κοιλίᾳ κατὰ τὸ ἐπίπλοον. ἔστι δ' ὁ τοῦ ἀνθρώπου σπλὴν στενὸς καὶ μακρὸς, ὅμοιος τῷ ὑείῳ. τὸ δ' ἧπαρ, ὡς μὲν ἐπὶ τὸ πολὺ, καὶ ἐν τοῖς πλείστοις, οὐκ ἔχει χολήν· ἐπ' ἐνίοις δ' ἔπεστι. στρογγύλον δ' ἐστὶ τὸ τοῦ ἀνθρώπου ἧπαρ, καὶ ὅμοιον τῷ βοείῳ. συμβαίνει δὲ τοῦτο καὶ ἐν τοῖς ἱερείοις. ἐν μὲν γὰρ τόπῳ τινὶ τῆς ἐν Εὐβοίᾳ Χαλκιδικῆς, οὐκ ἔχει τὰ πρόβατα χολήν· ἐν δὲ Νάξῳ, πάντα σχεδὸν τὰ τετράποδα τοσαύτην, ὥστε ἐκπλήττεσθαι τοὺς θύοντας τῶν ξένων, οἰομένους αὐτῶν ἴδιον εἶναι τὸ σημεῖον, ἀλλ' οὐ φύσιν αὐτῶν εἶναι τοιαύτην. προσπέφυκε δὲ τῇ μεγάλῃ φλεβὶ τὸ ἧπαρ, τῇ δ' ἀορτῇ οὐ κοινωνεῖ. διὰ γὰρ τοῦ ἥπατος διέχει ἡ ἀπὸ τῆς μεγάλης φλεβὸς φλέψ, ᾗ αἱ καλούμεναι πύλαι εἰσὶ τοῦ ἥπατος. συνήρτηται δὲ καὶ ὁ σπλὴν τῇ μεγάλῃ φλεβὶ μόνον. τείνει γὰρ ἀπ' αὐτῆς φλὲψ εἰς τὸν σπλῆνα. μετὰ δὲ ταῦτα οἱ νεφροὶ πρὸς αὐτῇ τῇ ῥάχει κεῖνται, τὴν φύσιν ὄντες τοῖς βοείοις ὅμοιοι. ἀνώτερος δὲ ὁ δεξιός ἐστιν ἐν πᾶσι τοῖς ζῴοις τοῖς ἔχουσι νεφρούς, καὶ ἐλάττω τε πιμελὴν ἔχει τοῦ ἀριστεροῦ, καὶ αὐχμηρότερος ὁ δεξιός. ἐν πᾶσι δ' ἔχει ὁμοίως τοῖς ἄλλοις καὶ τοῦτο. φέρουσι δ' εἰς αὐτοὺς πόροι ἔκ τε τῆς μεγάλης φλεβὸς, καὶ τῆς ἀορτῆς, πλὴν οὐκ εἰς τὸ κοῖλον. ἔχουσι γὰρ οἱ νεφροὶ ἐν μέσῳ κοῖλον, οἱ μὲν μεῖζον, οἱ δὲ ἔλαττον, πλὴν οἱ τῆς φώκης. οὗτοι δ' ὅμοιοι τοῖς βοείοις ὄντες, στερεώτατοι πάντων εἰσίν. οἱ δὲ πόροι οἱ τείνοντες εἰς αὐτοὺς, εἰς τὸ σῶμα καταναλίσκονται τῶν νεφρῶν. σημεῖον δ' ὅτι οὐ διαφέρουσι, τὸ μὴ ἔχειν αἷμα, μηδὲ πήγνυσθαι ἐν αὐτοῖς. ἔχουσι δὲ κοιλίαν, ὥσπερ εἴρηται, μικράν. ἐκ δὲ τοῦ κοίλου τῶν νεφρῶν, φέρουσιν εἰς τὴν κύστιν πόροι δύο νεανικοὶ, καὶ ἄλλοι ἐκ τῆς ἀορτῆς ἰσχυροὶ καὶ συνεχεῖς. ἐκ μέσου δὲ τῶν νεφρῶν ἑκατέρου, φλὲψ κοίλη καὶ νευρώδης ἐξήρτηται, τείνουσα παρ' αὐτὴν τὴν ῥάχιν διὰ τῶν στενῶν

* Lib.3.ca.3.

* Lib.3.c.19.

A neque vllo communi foramine commeant, ſed ſui ipſi copulatione ſpiritum, quem cordi tranſmittant, recipiunt. pertinet enim alter ad cauum dextrum, alter ad ſiniſtrũ. De vena maiore, ac de aorta ſeparatim ratione communi pòſt diſſeremus. Sanguinis autem plurimum pulmo ex cæteris continet membris, quæ animal pulmonis compos, idemque viuiparum intus foriſve conſtituunt: quippe qui totus inanis ſit, & fungoſus, ac riuulos venæ maioris ſingulis ſuis fiſtulis excipiat. Errant enim, qui ſanguinis vacuum pulmonem eſſe arbitrantur, decepti ſcilicet conſpectu eorum pulmonum, quos diſſectis detraxerint animalibus, quorum ſanguis illico effluit vniuerſus. Cor vnum B ex reliquis viſceribus ſanguinem habet. Et cùm pulmo non intra ſe, ſed in venis contineat ſanguinem, cor eundem intra ſe continere apertum eſt: ſingulis enim ſuis ſinibus ſanguinem tenet, verùm tenuiſſimum medio. Sub pulmone ſeptum tranſuerſum pectoris eſt, quæ præcordia & cinctum appellant, coſtis, & ſubcartilagineis, & ſpinæ annexum, parte media tenue, membraneaque exilitate contextum. Venis etiam per ſe continet porrectas. Sunt porrò hominis venæ craſſæ proportione humani corporis. Iecur ſupra ſeptum poſitum a dextro latere eſt. Lien à læuo æque in omnibus quæ membra iſta diſpoſita habent per naturam, non prodigioſe. Iam enim C legitimum illum locum in nonnullis quadrupedum lienem cum iecinore permutaſſe viſum eſt. Ventri lien annectitur, quà omentum obducit. Eſt hominis lien ſuillo ſimilis, ſed ſpecie anguſta, & longa. Iecur magna ex parte, maximoque animalium numero felle caret. Verùm in nonnullis id habere fibra adnexum videtur. Rotundum iecur hominis eſt, ac ſimile bubulo. Fellis priuationem vel in victimis non nunquam percipi certum eſt: quippe cùm parte quadã agri Chalcidici Eubœæ fel nunquam pecori ſit: aut in Naxo omnibus ferme quadrupedibus adeo grandè, vt D qui ſacra fecerint aduenæ ſtupeſcant, rem ſcilicet prodigij loco ſibi arbitrantes, non talem eſſe naturam terræ illius quadrupedum. Iecur venæ maiori adnexum eſt, nulla ex parte aortam attingens. Vena enim, quæ a maiore proficiſcitur, iecur trãſigit, quà portæ appellatæ iecoris habentur. Lien quoque venæ vni maiori adnexus eſt: vena enim inde ad lienem pertendit. Renes poſt hæc iuxta ſpinam ipſam adhærent, bubulis ſimiles. Dexter in omnibus quibus ſunt renes animalibus, ſuperiorem obtinet locum, minuſque pingui obducitur, & ſiccior eſt: quod vel in omnibus æquè liquidò manifeſtatur. Pertinent ad renes meatus tam E ex vena maiore, quàm ex aorta, ſed non ad cauum: quod alij amplius, alij arctius ſua media parte continent, præterquam in vitulo marino, cuius ſanè renes, quanuis bubulis ſimiles ſint, tamen omnium ſolidiſſimi viſuntur. Meatus verò, qui eò pertinent, omnes in renum corpus abſumuntur: cuius rei argumentum eſt, quòd ſanguine carent, nec intra ſe quicquam concreſcere oſtendunt. Habent igitur, vt modò dixi, ſinum exiguum, à quo meatus duo inſignes ad veſicam deueniunt. alij etiam ex aorta frequentes ac validi eòdem pertendunt. Ex medio autem renum ſingulorũ venæ ſingulæ, cauæ, neruoſæ depẽdent, ſpinam prætereuntes ipſam anguſto itinere;

tum in vtramque abolentur coxam, ac denuo ibi porrectæ apparent, demúmque in veſicam deſcendunt: hæc enim loco vltimo poſita eſt, meatibus annexa illis porrectis à renibus ad ceruicem, vrinarium producentem meatum, & fere circum vndique extenuatis in fibras membranulis proximis, quodammodo ſepto illi tranſuerſo pectoris deligata. Eſt profectò veſica hominis pro portione, quam cæterorum, amplior. Genitale ceruici veſicæ adhæcitur, foramine foras directo penitum: ſed paulo inferius altero intra eandem ſemitam commo deductum. Quorum foraminum alterum ad teſtes, alterum ad veſicam, neruoſum cartilaginoſumque tendit. Teſtes ex eo meatibus pendent: de quibus poſtea partium communi examine, quemadmodum ſe habeant, diſſeremus. Hæc eodem modo vel in ſexu fœminino omnia natura conformauit, atque diſpoſuit. Nulla enim parte interiore ſexus inter ſe differunt, niſi vtero: cuius forma qualiſnam ſit, ex confectionum deſcriptione petendum expectandumque eſt. Situs eius ad inteſtina infra aluum à parte priore: tum veſica iuncta ſupra vterum eſt. Sed de vteris quoque pariter omnibus diſſerẽdum poſtea eſt. Neque enim ſimiles dati omnibus ſunt, nec forma ſimili conſtituti, ſi vteris cæterorũ quoque animalium vulua dicenda eſt. Partes hominis tum interiores tum exteriores, has taleſque, & ad hunc modum haberi perſpectum eſt.

τείνουσι δ' εἰς ἑκάτερον τὸ ἰσχίον ἀπ' αὐτῆς, καὶ πάλιν ἄδηλοι γίγνονται, τεταμέναι εἰς τὸ ἰσχίον. αὗται δ' αἱ ἀπὸ τῶν φλεβῶν εἰς τὴν κύστιν καθήκουσι. τελευταία γὰρ ἡ κύστις κεῖται, τὴν μὲν ἀρτηρίαν ἔχουσα ἀπὸ τῶν νεφρῶν τεταγμένοις πόροις πρὸς αὐτὴν κατὰ τὸν καυλόν, περὶ τὴν ... καὶ σχεδὸν πάντη κύκλῳ λεπτοῖς καὶ ἰνώδεσι φλεβίοις ἐστὶ συνηρτημένη, παραπλησίως ἔστιν τρόπον τινὰ τῷ διαφράγματι τοῦ θώρακος. ἔστι δ' ἡ τοῦ ἀνθρώπου κύστις ἐπιεικῶς ἔχουσα * μέγεθος. πρὸς δὲ τὸν καυλὸν τὸν τῆς κύστεως, συνήρτηται τὸ αἰδοῖον, τὸ μὲν ἐξώτατον τρῆμα συνερρυηκὸς εἰς ταὐτό, μικρὸν δ' ὑποκάτω τὸ μὲν ἕτερον εἰς τοὺς ὄρχεις φέρει τῶν σπερμάτων, τὸ δ' εἰς τὴν κύστιν, νευρῶδες καὶ χονδρῶδες ὄν. τούτου δ' ἐξήρτηνται οἱ ὄρχεις τοῖς ἄρρεσι, περὶ ὧν ἐν τοῖς κοινῇ λεγομένοις ἅμα καὶ περὶ τούτων * ὕστερον διορισθήσεται, πῶς ἔχουσι. τὸν αὐτὸν δὲ τρόπον καὶ ἐν τῷ θήλει πάντα πέφυκε. διαφέρει γὰρ οὐθενὶ τῶν ἔσω, πλὴν τῆς ὑστέρας· ἧς ἡ μὲν ὄψις θεωρείσθω ἐκ τῆς διαγραφῆς τῆς ἐν ταῖς ἀνατομαῖς, ἡ δὲ θέσις ἐστὶν ἐπὶ τοῖς ἐντέροις· ἐπάνω δὲ τῆς ὑστέρας ἡ κύστις. λεκτέον δὲ καὶ περὶ ὑστέρας καθόλου πάσης ἐν τοῖς ἑπομένοις· οὔτε γὰρ ὁμοίας πάντα, οὔθ' ὁμοίως ἔχουσι. τὰ μὲν οὖν μόρια, καὶ τὰ ἐντὸς καὶ τὰ ἐκτὸς τοῦ ἀνθρώπου, ταῦτα καὶ τοιαῦτ' ἐστί, καὶ τοῦτον ἔχει τὸν τρόπον.

* Quid [illegible]

* Infrà lib. 3.

ARISTOTELIS STAGIRITÆ, de Hiſtoria animalium, LIBER II.

CAPVT I.

Quæ animalia in quibuſdam conueniant, in quibuſdam autem differant.

Cæterorum animalium partes, aut communes omnium ſunt, vt ſuperiore volumine explicatum eſt, aut aliquorum generum propriæ. Eædem autem, diuerſæve inter ſe ſunt, eo modo quo ſuperiùs dictum eſt: quippe cum omnia fere animalia genere diuerſa, partium quoque ſuarum plurimas ſpecie habeant diuerſas: & aut proportione tantùm eaſdem, genere autem diuerſas: aut genere tantùm eaſdem, ſpecie autem diuerſas. Sunt etiam complures, quæ aliis datæ, aliis denegatæ ſunt. Ergo quadrupedes, quæ animal generant, caput, collum, & omnes capitis partes ſortiuntur: verùm ipſæ ſingulæ partes forma inter ſe differunt. Iam leoni ceruix oſſe vno rigida conſtat, nec vertebris vllis iungitur: interiora autem omnia canibus ſimilia continentur. Habent quadrupedes, quæ animal generant, omnes vice brachiorum crura priora: ſed præcipue, quæ multifidæ ſunt, hæ manibus ſuo digitato pede reſpondent: hoc enim ad plura, quaſi manu, vtuntur. Partem etiam læuam minùs, quàm homo, abſolutam habent, & agilem: excepto elephãto, qui digitos numero quinque indiuiſos, leuiterque diſcretos, crura priora multo poſterioribus longiora, & malleolos poſterioribus imis cruribus, poſſidet.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζῴων ἱστορίας τὸ Β.

ΚΕΦΑΛ. α.

Τίνα τῶν μορίων κοινὰ πάντων, τίνα δὲ γενῶν τινῶν, καὶ τίνα ταὐτὰ καὶ τίνα ἕτερα ἐστὶν ἀλλήλων.

ΤΩΝ δ' ἄλλων ζῴων τὰ μόρια τὰ μὲν, κοινὰ πάντων ἐστὶν, ὥσπερ εἴρηται πρότερον, τὰ δὲ, γενῶν τινῶν. ταὐτὰ δὲ καὶ ἕτερα ἐστὶν ἀλλήλων, τὸν ἤδη πολλάκις εἰρημένον τρόπον. σχεδὸν γὰρ ὅσα γε ἐστὶ γένει ἕτερα τῶν ζῴων, καὶ τὰ πλεῖστα τῶν μορίων ἔχει ἕτερα τῷ εἴδει· καὶ τὰ μὲν, κατ' ἀναλογίαν ἀδιάφορα μόνον τῷ γένει δ' ἕτερα· τὰ δὲ, τῷ γένει μὲν ταὐτά, τῷ εἴδει δ' ἕτερα· πολλὰ δὲ τοῖς μὲν ὑπάρχει, τοῖς δ' οὐχ ὑπάρχει. τὰ μὲν οὖν τετράποδα καὶ ζῳοτόκα, κεφαλὴν μὲν ἔχει, καὶ αὐχένα, καὶ τὰ ἐν τῇ κεφαλῇ μόρια ἅπαντα. διαφέρει δὲ ταῖς μορφαῖς τῶν μορίων ἕκαστον. καὶ ὁ μὲν λέων τὸν τοῦ αὐχένος ἔχει ἓν ὀστοῦν, * σφονδύλους δ' οὐκ ἔχει. τὰ δ' ἐντὸς αἰσθητικὰ, ὅμοια ἔχει ἅπαντα κυνί. ἔχει δὲ τὰ τετράποδα ζῷα καὶ ζῳοτόκα ἀντὶ τῶν βραχιόνων, σκέλη πρόσθια· πάντα μὲν τὰ τετράποδα, μάλιστα δὲ ἀνάλογον ταῖς χερσὶ τὰ πολυσχιδῆ αὐτῶν. χρῆται γὰρ πρὸς πολλὰ ὡς χερσί. καὶ τὰ ἀριστερὰ δ' ἧττον ἔχει ἀπολελυμένα τῶν ἀνθρώπων, πλὴν τοῦ ἐλέφαντος. οὗτος δὲ τά τε περὶ τοὺς δακτύλους ἀδιαρθρότερα ἔχει τῶν ποδῶν, καὶ τὰ πρόσθια σκέλη πολλῷ μείζω, ἔστι δὲ πενταδάκτυλος, καὶ πρὸς τοῖς ὀπισθίοις σκέλεσι, σφυρὰ ἔχει βραχέα.

* γρ. [illegible]

ἔχει δὲ μυκτῆρα τοιοῦτον καὶ τηλικοῦτον, ὥστε ἀντὶ χειρῶν ἔχειν αὐτόν. πίνει γὰρ καὶ ἐσθίει, ὀρέγων τούτῳ εἰς τὸ στόμα, καὶ τῷ ἐλέφαντι τῷ ἄνω ὀρέγει τούτῳ, καὶ δένδρα ἀποσπᾷ, καὶ διὰ τοῦ ὕδατος βαδίζων, τούτῳ ἀναφυσᾷ. τοῦ δὲ μυκτῆρος τὸ ἄκρον κάμπτει μὲν, οὐ κάμπτεται δὲ, χονδρῶδες γάρ ἐστι. μόνον δὲ καὶ ἀμφιδέξιον γίνεται τῶν ἄλλων ζῴων ἄνθρωπος. τὸ δὲ στῆθος τὸ ἀνάλογον τῷ τοῦ ἀνθρώπου, πάντα τὰ ζῷα ἀνάλογον ἔχει τοῦτο τὸ μέρος, οὐχ ὅμοιον δέ· τὸ μὲν γὰρ πλατύ ἐστι, τὰ δ' ἄλλων στενά. μαστοὺς δ' οὐδὲν ἔχει ἐν τοῖς προσθίοις, ἀλλ' ἢ ἄνθρωπος. ὁ δ' ἐλέφας ἔχει μὲν μαστοὺς δύο, ἀλλ' οὐκ ἐν τῷ στήθει, ἀλλὰ πρὸς τῷ στήθει. *Τὰς δὲ καμπὰς τῶν κώλων καὶ τῶν ἐμπροσθίων καὶ τῶν ὀπισθίων ἐναντίας ἔχει καὶ αὐτὰ αὑτοῖς, καὶ πρὸς τὰς τοῦ ἀνθρώπου καμπάς, πλὴν ἐλέφαντος. τὰ μὲν γὰρ ζῳοτοκοῦντα τῶν τετραπόδων, [πλὴν ἐλέφαντος,] κάμπτει τὰ μὲν πρόσθια εἰς τὸ πρόσθεν, τὰ δὲ ὀπίσθια εἰς τὸ ὄπισθεν, καὶ ἔχουσι τὰ κοῖλα τῆς περιφερείας ἀντίστροφα πρὸς ἄλληλα. *ὁ δ' ἐλέφας, οὐχ ὥσπερ λέγουσί τινες, ἀλλὰ συγκαθίζει καὶ κάμπτει τὰ σκέλη, πλὴν οὐ δύναται διὰ τὸ βάρος ἐπ' ἀμφότερα ἅμα, ἀλλ' ἀνακλίνεται ἢ ἐπὶ τὰ εὐώνυμα ἢ ἐπὶ τὰ δεξιά, καὶ καθεύδει ἐν τούτῳ τῷ σχήματι. κάμπτει δὲ τὰ ὀπίσθια σκέλη ὥσπερ ἄνθρωπος. τὰ δ' ᾠοτοκοῦντα, οἷον κροκόδειλος καὶ σαῦρα, καὶ τὰ ἄλλα τοιαῦτα πάντα, ἀμφότερα τὰ σκέλη, καὶ τὰ πρόσθια καὶ τὰ ὀπίσθια εἰς τὸ πρόσθεν κάμπτεται, μικρὸν εἰς τὸ πλάγιον παρεγκλίνοντα. ὁμοίως δὲ καὶ τοῖς ἄλλοις τοῖς πολύποσι, πλὴν τὰ μεταξὺ τῶν ἐσχάτων ἀεὶ ἐπ' ἀμφότερα, ἔτι κατὰ κάμψιν ἔχει εἰς τὸ πλάγιον μᾶλλον. ὁ δ' ἄνθρωπος ἀμφοτέρας τὰς καμπὰς τῶν κώλων ἐπὶ τὸ αὐτὸ ἔχει, [καὶ] ἐναντίας· τοὺς μὲν βραχίονας εἰς τοὔπισθεν κάμπτει, πλὴν μικρὸν ἐγκλίνων ἐπὶ τὰ πλάγια τὰ ἐκτός, τὰ δὲ σκέλη εἰς τοὔμπροσθεν. εἰς δὲ τοὔπισθεν, ὥστε τὰ πρόσθια καὶ τὰ ὀπίσθια, οὐδὲν κάμπτει τῶν ζῴων. ἐναντίως δὲ τοῖς ἀγκῶσιν ἐν τοῖς προσθίοις σκέλεσιν ἡ τῶν ὤμων ἔχει κάμψις, καὶ τῶν ὀπισθίων γονάτων ἡ τῶν ἰσχίων· ὥστ' ἐπεὶ ὁ ἄνθρωπος τοῖς πολλοῖς ἐναντίως κάμπτει, καὶ οἱ τὰ τοιαῦτα ἔχοντες ἐναντίως. παραπλησίως δὲ τὰς καμπὰς ἔχει καὶ ὁ ὄρνις τοῖς τετράποσι ζῴοις. δίπους μὲν γὰρ ὢν, τὰ μὲν σκέλη εἰς τοὔπισθεν κάμπτει, ἀντὶ δὲ τῶν βραχιόνων καὶ σκελῶν τῶν προσθίων, πτέρυγας ἔχει, ὧν ἡ κάμψις ἐστὶν εἰς τὸ πρόσθεν. ἡ δὲ φώκη, ὥσπερ πεπηρωμένον τετράπουν ἐστίν. εὐθὺς γὰρ ἔχει μετὰ τὴν ὠμοπλάτην τοὺς πόδας ὁμοίους χερσίν, ὥσπερ καὶ οἱ τῆς ἄρκτου· πενταδάκτυλοι γάρ εἰσι, καὶ ἕκαστος τῶν δακτύλων καμπὰς ἔχει τρεῖς, καὶ ὄνυχα [οὐ μέγαν]. οἱ δ' ὀπίσθιοι πόδες πενταδάκτυλοι μέν εἰσι, καὶ τὰς καμπὰς καὶ τοὺς ὄνυχας ὁμοίως ἔχουσι τοῖς προσθίοις, τῷ δὲ σχήματι παραπλήσιοι ταῖς τῶν ἰχθύων οὐραῖς εἰσιν. αἱ δὲ κινήσεις τῶν ζῴων, τῶν μὲν τετραπόδων καὶ πολυπόδων, κατὰ διάμετρόν εἰσι, καὶ ἑστᾶσιν οὕτως. ἡ δ' ἀρχὴ ἀπὸ τῶν δεξιῶν πᾶσι. κατὰ σκέλος δὲ βαδίζουσιν ὅ τε λέων, καὶ αἱ κάμηλοι ἀμφότεραι, αἵ τε Βακτριαναὶ καὶ αἱ Ἀράβιαι. τὸ δὲ κατὰ σκέλος ἐστίν, ὅταν μὴ προβαίνῃ τὸν ἀριστερὸν τὸν δεξιόν, ἀλλ' ἐπακολουθῇ. ἔχουσι δὲ τὰ τετράποδα ζῷα, ὅσα μὲν ὁ ἄνθρωπος μόρια ἔχει ἐν τῷ ἔμπροσθεν, κάτω ἐν τοῖς ὑπτίοις, τὰ δὲ ὄπισθεν ἐν τοῖς πρανέσιν. ἔτι δὲ τὰ πλεῖστα κέρκον ἔχει· καὶ γὰρ καὶ ἡ φώκη μικρὰν ἔχει, ὁμοίαν τῇ τῆς ἐλάφου. περὶ δὲ τῶν πιθηκοειδῶν ζῴων, *ὕστερον διορισθήσεται.

* De inceſſu animal. cap. 13.

* [illegible]

* Infr. c. 8.

A Habet præterea talem tantámque narem, vt ea manus vice vtatur: quippe qui non niſi ad os illam admouens, & bibat, & edat: ſuo etiam rectori eam erigit, atque offert: & arbores quoque eadem proſternit, & quoties immerſus per aquam ingreditur, ea ipſa edita in ſublime, teſſat, atque reſpirat. Aduncitcula parte ſui poſtrema, naris hæc eſt, ſed flecti non poteſt: cartilaginea enim, & proinde rigidiuſcula eſt. Solus etiam animalium homo ambidexter, hoc eſt, dexter manu vtraque naſcitur. Pectus animalia omnia humano proportionatum pectori habere videntur, verùm non ſimile: latum enim pectus humanum eſt, cætera B anguſta. Nullum eſt enim, quod, præter hominem, mammas parte gerat priore. Elephantus mammas duas quidem, ſed non in pectore habet, ſed paulò citra. Flectunt autem crura priora contra, atque poſteriora: & è contrario, quàm homo, membra inflectunt, excepto elephanto. Quadrupedes enim, quæ animal generant, genua ante ſe flectunt, ſuffragines in auerſum: aduerſaque inter ſe habent conuexa curuaturæ crurum ſuorum. Elephas non, vt aliqui retulerunt, agit: ſed conſidendo crura inflectit, nequit tamen præ nimio pondere vtrumque in latus æquilibrio quodam vergere: ſed aut læuo incubat, aut dextro, atque eo ipſo habitu requieſcit. Flectit hic certè ſuos poſterio- C res poplites modo hominis. At ouiparis quadrupedibus, vt crocodilo, lacertæ, & reliquis generis eiuſdem, crura tum priora, tum etiam poſteriora retroflectuntur, paulùm in latus vergentia. Nec ſecus in cæteris multipedibus agitur, niſi quòd medij pedes ſubinde ambigui ampliùs in latus flectuntur. Homo inflexum membrorum ſuorum eodem è contrario agit: quippe qui brachia retrorſum flectat, quanquam ita, vt paulùm vergant in latera exteriora, crura antè contrahat rectè. Sed quod antè tam priora quàm poſteriora inflectat, nullum eſt. Omnibus verò humeri, armive contra quàm cubiti, aut crura priora flectun- D tur. Coxæ etiam contra, quàm ſuffragines. Cùm itaque homo contra, quàm magna pars cæterorum animalium, flectat, fit, vt ſi qua alia membris huiuſcemodi conſtant, ea quoque è contrario flectant. Aues etiam ſuos inflexus ſimiles quadrupedibus agunt: crura enim quæ bina habent, in poſteriora curuant; alas, quas vice brachiorum, aut crurum priorum obtinent, in priora. Vitulus marinus tanquam læſa imperfectaque quadrupes eſt: quippe qui continuò à ſcapulis pedes habeat manibus ſimiles, modo vrſæ: in quinos enim ſinduntur digitos, qui ſinguli ternis articulis flectantur, & vnguibus muniantur non magnis. Pedes quoque poſteriores quinis diſcretos digitis E habet, & curuatura, & vnguibus cum primis conuenientes, verùm forma proximos piſcium caudis. Motus animalium quadrupedum, ac multipedum, per diametrum agitur: quomodo ſubſiſtere etiam ſolent. Initium autem incedendi omnibus à dextris partibus. Gradiuntur pedatim leones: & genus camelorum vtrumque, Bactrianum dico, atque Arabium, pedatim incedit, cùm pes ſiniſter nō tranſit dextrum, ſed ſubſequitur. Partes, quas homo habet priores, quadrupedes infrà habent ſupinas: quas autem ille poſteriores, hæ pronas. Magna item quadrupedum pars caudam habet: nam vitulo quoque marino cauda ineſt, quãuis exigua, cerui modo. De genere ſimiarum poſtea dicemus.

Omnia ferè quadrupeda, eadémque viuipara, ſunt A piloſa: nec hominis modo læuia eſſe nouimus. Homo certè pauciſſimis exiguíſque integitur pilis, niſi in capite, qua quidẽ parte hirtiſſimus omnium ipſe eſt. Cæteris, quæ pilis veſtiuntur, partes pronæ piloſiores ſunt: ſupinæ aut glabræ omnino, aut minùs piloſæ habentur. at homo contra. Cilium etiam homini vtraque in palpebra, & alæ oppletæ pilis, & pubes: quod cæteris abeſt: carent enim cilio palpebræ inferioris, ſed paulò inferiùs pili rari nonnullis exeunt. Ipſorum autem quadrupedum pilis intectorum, alijs corpus totum eſt hirtum, vt ſui, vrſæ, cani. Alijs collum hirtius pari vndique modo, vt leoni, & reliquis iubatis. Alijs B prona tantùm ceruicis, à capite ad ſummos armos villi geruntur, vt equo vt mulo, & reliquis capronatis: quo in genere bonaſus quoque è ſyluestribus cornigeris numerandus eſt. Quinetiam hippelaphus ſatis iubæ ſummis continet armis, qui à forma equi, & cerui, quam habet compoſitam, nomen accepit: quaſi equiceruus dici meruiſſet. Necnon fera, quæ & ipſa ab equo Hippardium nominata eſt, capronas parte gerit eadem. Sed vtrumque id genus tenuiſſimo iubæ ordine à capite ad ſummos armos crineſcit. Proprium equiceruo villus, qui eius gutturi, modo barbæ dependet. Gerit cornua vtrumque, excepta fœmina equiceruini generis: & pedes habet biſulcos. Magnitudo C equiceruí non diſſidet à ceruo. Gignitur apud Arachotas: vbi etiam boues ſylueſtres ſunt, qui differunt ab vrbanis, quantum inter ſues vrbanos & ſylueſtres intereſt. Sunt colore atro, corpore robuſto, rictu leniter adunco, cornua gerunt reſupinatiora. Equiceruo cornua ſunt capreæ proxima. Elephantus in quadrupedum genere hirtus minimè eſt. Caudæ etiam animalium pili corporis modum imitantur, dummodo cauda nota aliqua auctiore dependeat: eſt enim nonnullis tam exigua, vt vix dignoſci à ſenſu poſſit. Camelus proprium inter cæteras quadrupedes habet in dorſo, quod tuber appellant: ſed ita vt Bactrianæ ab A- D rabiis differant: alteris enim bina, alteris ſingula tubera habentur. Sunt etiam omnibus ſingula parte ima, quale in dorſo, tubera, quibus incumbat reliquum corpus & firmetur, quoties in genua inclinantur. Papillas quatuor modo vaccæ habet camelus, caudam aſino ſimilem, genitale retrò. Genua ſingula in ſingulis cruribus ſunt, & flexus artuum, non vt quidam perhibent, plures, ſed propter alui interuallum plures eſſe videntur. Habet etiam talum ſimilem bubulo: clunes proportione magnitudinis paruos. Biſulcum id animal eſt, nec vtrinque dentatum. ſed biſulcum ſic eſt, vt pes parte ſuperiore ſciſſus paululum ſit ad flexum digiti ſecundum: parte autem priore ſumma, quadri- E partitò ſindatur diſcrimine paruo, quantum primo tenus digiti inflexu; & quiddam inter fiſſuras, perinde vt in anſerum pedibus adiectum cõtexat. Pes veſtigio eſt carnoſus, vt vrſæ: qua de cauſa eas, quæ per exercitum longiore itinere fatiſcunt, calceant carbatinis. Omnium quadrupedum crura, oſſe neruóque abundant, carne deficiunt. Quinetiam nullũ, quod pedibus conſtet, excepto homine, pedes habere carnoſos perſpectum eſt. Coxarũ etiam carne exuperante, in clunes vacant: quod in genere auium conſpici apertiùs poteſt. at homo contrà: quippe qui nullam ferè ſui corporis partem tam carnoſam habeat, quàm nates, femora, tibias.

A πάντα δ᾽ ὅσα τετράποδα καὶ ζωοτόκα, δασέα (ὡς εἰπεῖν) ἐστὶ, καὶ οὐχ ὥσπερ ὁ ἄνθρωπος, ὀλιγότριχα καὶ μικρότριχα, πλὴν τῆς κεφαλῆς· τὴν δὲ κεφαλὴν δασύτατος τῶν ζώων. ἔτι δὲ τῶν μὲν ἄλλων ζώων τῶν ἐχόντων τρίχας, τὰ πρανῆ δασύτερα· τὰ δ᾽ ὕπτια, ἢ λεῖα πάμπαν, ἢ δασέα ἧττον. ὁ δ᾽ ἄνθρωπος τοὐναντίον. καὶ βλεφαρίδας ὁ μὲν ἄνθρωπος ἐπ᾽ ἀμφότερα ἔχει, καὶ ἐν ταῖς μασχάλαις ἔχει τρίχας, καὶ ἐπὶ τῆς ἥβης· τῶν δ᾽ ἄλλων, οὐδὲν, οὔτε τούτων οὐδέτερον, οὔτε τὴν κάτωθεν βλεφαρίδα, ἀλλὰ κάτωθεν τῆς βλεφάρου ἐνίοις μανοὶ τρίχες πεφύκασιν. αὐτῶν δὲ τῶν τετραπόδων καὶ τρίχας ἐχόντων, τῶν B μὲν ἅπαν τὸ σῶμα δασὺ, καθάπερ ὑὸς, καὶ ἄρκτου, καὶ κυνός· τὰ δὲ δασύτερα τὸν αὐχένα ὁμοίως πάντη, ὅσα χαίτην ἔχει, ὥσπερ λέων· τὰ δ᾽, ἐπὶ τὸ πρανὲς τοῦ αὐχένος, ἀπὸ τῆς κεφαλῆς μέχρι τῆς ἀκρωμίας, ὅσα λοφιὰς ἔχει, ὥσπερ ἵππος καὶ ὀρεὺς, καὶ τῶν ἀγρίων καὶ κερατοφόρων βόνασος. ἔχει δὲ καὶ ὁ ἱππέλαφος ἐπὶ τῇ ἀκρωμίᾳ χαίτην, καὶ τὸ θηρίον τὸ ἱππάρδιον ὀνομαζόμενον· ἀπὸ δὲ τῆς κεφαλῆς ἐπὶ τὴν ἀκρωμίδα, λεπτὴν ἑκάτερον. ἴδια δὲ ὁ ἱππέλαφος πώγωνα ἔχει κατὰ τὸν λάρυγγα. ἔστι δ᾽ ἀμφότερα κερατοφόρα καὶ * διχηλά· ἡ δὲ θήλεια ἱππέλαφος οὐκ ἔχει κέρατα. τὸ δὲ μέγεθός ἐστι C τούτου τοῦ ζώου, ἐλάφῳ παρεμφερές. γίνονται δ᾽ οἱ ἱππέλαφοι ἐν Ἀραχώταις, οὗπερ καὶ οἱ βόες οἱ ἄγριοι. διαφέρουσι δ᾽ οἱ ἄγριοι τῶν ἡμέρων, ὅσονπερ οἱ ὕες οἱ ἄγριοι πρὸς τοὺς ἡμέρους. μέλανές τε γάρ εἰσι, καὶ ἰσχυροὶ τὸ εἶδος, καὶ ἐπίγρυποι· τὰ δὲ κέρατα ἐξυπτιάζοντα ἔχουσι μᾶλλον. δὲ τὰ τῶν ἱππελάφων κέρατα, παραπλήσια τοῖς τῆς δορκάδος ἐστίν. ὁ δὲ ἐλέφας, ἥκιστα δασὺς ἐστὶ τῶν τετραπόδων. ἀκολουθοῦσι δὲ κατὰ τὸ σῶμα καὶ αἱ κέρκοι δασύτητι καὶ ψιλότητι, ὅσων αἱ κέρκοι μέγεθος ἔχουσιν. ἔνια γὰρ μικρὰν ἔχει πάμπαν. αἱ δὲ κάμηλοι, ἴδιον ἔχουσι παρὰ τὰ ἄλλα τετράποδα, τὸν καλούμενον ὕβον ἐπὶ τῷ νώτῳ. D διαφέρουσι δ᾽ αἱ Βάκτριαι τῶν Ἀραβίων. αἱ μὲν γὰρ, δύο ἔχουσιν ὕβους· αἱ δ᾽ ἕνα μόνον, ἄλλον δ᾽ ἔχουσιν ὕβον τοιοῦτον, οἷον ἄνω, ἐν τοῖς κάτω· ἐφ᾽ οὗ, ὅταν καθῶσιν εἰς γόνατα, ἐρείδεται τὸ ἄλλο σῶμα. θηλὰς δ᾽ ἔχει τέτταρας ἡ κάμηλος, ὥσπερ βοῦς, καὶ κέρκον ὁμοίαν ὄνῳ, καὶ τὸ αἰδοῖον ὄπισθεν. καὶ γόνυ δ᾽ ἔχει ἐν ἑκάστῳ σκέλει ἓν, καὶ καμπὰς οὐ πλείους, ὥσπερ λέγουσί τινες, ἀλλὰ φαίνεται διὰ τὴν ὑπόστασιν τῆς κοιλίας. καὶ ἀστράγαλον δὲ ὅμοιον μὲν βοΐ, ἰσχνὸν δὲ μικρὸν ὡς κατὰ τὸ μέγεθος. ἔστι δὲ διχηλὸν καὶ οὐκ ἀμφόδουν· διχηλὸν δὲ ὧδε. ἐκ μὲν γὰρ τοῦ ὄπισθεν μικρὸν ἔσχισται, μέχρι τῆς δευτέρας καμπῆς τῶν δα- E κτύλων· τὸ δ᾽ ἔμπροσθεν, ἔσχισται μικρὸν, ὅσον ἄχρι τῆς πρώτης καμπῆς τῶν δακτύλων ἐπ᾽ ἄκρον τέτταρα· καὶ ἔστι τι διὰ μέσου τῶν σχισμάτων, ὥσπερ τοῖς χησίν. ὁ δὲ πούς ἐστι κάτωθεν σαρκώδης, ὥσπερ καὶ οἱ τῶν ἄρκτων. διὸ καὶ τὰς εἰς πόλεμον ἰούσας * ἀποδύουσι καρβατίναις, ὅταν ἀλγήσωσιν. ἅπαντα δὲ τὰ τετράποδα, ὀστώδη τὰ σκέλη ἔχει, καὶ νευρώδη, καὶ ἄσαρκα· ὅλως δὲ καὶ τὰ ἄλλα ζῷα ἅπαντα, ὅσα ἔχει πόδας, * ἐκτὸς ἀνθρώπου. ἔστι δὲ καὶ ἄνισχα. καὶ γὰρ οἱ ὄρνιθες ἔτι μᾶλλον τοῦτο πεπόνθασιν. ὁ δ᾽ ἄνθρωπος τοὐναντίον. σαρκώδη γὰρ ἔχει σχεδὸν μάλιστα τοῦ σώματος τὰ ἰσχία, καὶ τοὺς μηροὺς, καὶ τὰς κνήμας.

* κεραοφόρα

* Scrib. ὑποδοῦσι

* χ. ἐκτὸς ἀνθρώπου, ἐν ᾧ ἀνίσχια sic quidam interpr. Gaza aliã lectionem aut ſecutus eſt, aut ipſe cõmentus.

A αἱ γὰρ καλούμεναι γαστροκνημίαι ἐν ταῖς κνήμαις εἰσὶ σαρκώδεις. τῶν δὲ τετραπόδων καὶ ἐναίμων καὶ ζῳοτόκων, τὰ μέν ἐστι πολυσχιδῆ, ὥσπερ αἱ τοῦ ἀνθρώπου χεῖρες καὶ οἱ πόδες· πολυδάκτυλα γὰρ ἔνιά ἐστιν, οἷον λέων, κύων, πάρδαλις· τὰ δὲ διχηλά, καὶ ἀντὶ τῶν ὀνύχων χηλὰς ἔχει, οἷον πρόβατον καὶ αἲξ καὶ ἔλαφος, καὶ ὁ ποτάμιος ἵππος· τὰ δὲ ἀσχιδῆ, οἷον τὰ μώνυχα, οἷον ἵππος, καὶ ὀρεύς. τὸ δὲ τῶν ὑῶν γένος ἐπαμφοτερίζει· εἰσὶ γὰρ καὶ ἐν Ἰλλυριοῖς καὶ ἐν Παιονίᾳ, καὶ ἄλλοθι, μώνυχες ὕες. τὰ μὲν οὖν διχηλὰ, δύο ἔχει σχίσεις [ἔμπροσθεν καὶ] ὄπισθεν· τοῖς δὲ μώνυξι, τοῦτ᾽ ἐστὶ συνεχές. ἔτι δὲ καὶ τὰ μὲν, κερατοφόρα, B τὰ δὲ, ἀκέρατα τῶν ζῴων ἐστί. τὰ μὲν πλεῖστά γε τῶν ἐχόντων κέρατα, διχηλὰ τῇ φύσει ἐστίν, οἷον βοῦς καὶ ἔλαφος, καὶ αἴξ. μώνυχον δὲ καὶ δίκερων, οὐδὲν ἑωράκαμεν. μονόκερατα δὲ καὶ μώνυχα, ὀλίγα, οἷον ὁ Ἰνδικὸς ὄνος· μονόκερων δὲ καὶ διχηλόν, ὄρυξ. καὶ ἀστράγαλον δὲ ὁ Ἰνδικὸς ὄνος ἔχει τῶν μωνύχων μόνον· ἡ γὰρ ὗς, ὥσπερ ἐλέχθη πρότερον, ἐπαμφοτερίζει· διὸ καὶ* οὐκ ἀστράγαλον ἐστί. τῶν δὲ διχηλῶν πολλὰ ἔχει ἀστράγαλον. πολυσχιδὲς δὲ οὐδὲν ἔοικεν ἔχειν ἀστράγαλον, ὥσπερ οὐδ᾽ ἄνθρωπος· ἀλλ᾽ ἡ μὲν λύγξ, οἷον ἡμιαστραγάλιον· ὁ δὲ λέων, οἷόνπερ πλάττουσι, λαβυρινθώδη. πάντα C δὲ τὰ ἔχοντα ἀστράγαλον, ἐν τοῖς ὄπισθεν ἔχει σκέλεσιν. ἔχει δὲ ὀρθὸν τὸν ἀστράγαλον ἐν τῇ καμπῇ, τὸ μὲν πρανὲς ἔξω, τὸ δ᾽ ὕπτιον εἴσω· καὶ τὰ μὲν κῷα ἐντός, ἐστραμμένα πρὸς ἄλληλα, τὰ δὲ χῖα καλούμενα, ἔξω, καὶ τὰς κεραίας ἄνω. ἡ μὲν οὖν θέσις τῶν ἀστραγάλων τοῖς ἔχουσι πᾶσι, τοῦτον ἔχει τὸν τρόπον. διχηλὰ δ᾽ ἅμα καὶ χαίτην ἔχοντα, καὶ κέρατα δύο κεκαμμένα εἰς αὑτά, ἐστὶν ἔνια τῶν ζῴων, οἷον ὁ βόνασος, ὃς γίνεται περὶ τὴν Παιονίαν καὶ τὴν Μαιδικήν. πάντα δὲ ὅσα κερατοφόρα, τετράποδά ἐστιν, εἰ μή τι κατὰ μεταφορὰν λέγεται ἔχειν κέρας, καὶ λόγου χάριν, ὥσπερ τοὺς περὶ Θήβας ὄφεις οἱ Αἰγύπτιοι φασὶν, ἔχοντας ἐπανάστασιν, ὅσον περ προφάσεως χάριν. D τῶν δ᾽ ἐχόντων κέρατα, δι᾽ ὅλου μὲν ἔχει στερεὸν μόνον ἔλαφος, τὰ δ᾽ ἄλλα κοῖλα μέχρι τινὸς μᾶλλον, τὸ δ᾽ ἔσχατον στερεόν. τὸ μὲν οὖν κοῖλον ἐκ τοῦ δέρματος πέφυκε μᾶλλον· περὶ δὲ τοῦτο περιήρμοσται τὸ στερεὸν ἐκ* τῶν ὀστῶν, οἷον τὰ κέρατα τῶν βοῶν. ἀποβάλλει δὲ τὰ κέρατα μόνον ἔλαφος κατ᾽ ἔτος, ἀρξάμενος ἀπὸ διετοῦς, καὶ πάλιν φύει· τὰ δ᾽ ἄλλα, συνεχῶς ἔχει, ἐὰν μή τι βίᾳ πηρωθῇ. ἔτι δὲ περί τε τοὺς μαστοὺς ὑπεναντίως ἐν τοῖς ἄλλοις ζῴοις ὑπάρχει, πρὸς αὑτά τε καὶ πρὸς τὸν ἄνθρωπον, καὶ περὶ τὰ ὄργανα τὰ χρήσιμα πρὸς τὴν ὀχείαν. τὰ μὲν γὰρ, ἔμπροσθεν ἔχει E τοὺς μαστοὺς ἐν τῷ στήθει ἢ πρὸς τῷ στήθει, καὶ δύο μαστοὺς, καὶ δύο θηλάς, ὥσπερ ἄνθρωπος καὶ ὁ ἐλέφας, καθάπερ ἔμπροσθεν εἴρηται· καὶ γὰρ ὁ ἐλέφας ἔχει τοὺς μαστοὺς δύο περὶ τὰς μασχάλας· ἔχει δὲ καὶ ἡ θήλεια τοὺς μαστοὺς μικροὺς παντελῶς, καὶ οὐ κατὰ λόγον τοῦ σώματος, ὥστ᾽ ἐκ τοῦ πλαγίου μὴ πάνυ ὁρᾶν. ἔχουσι δὲ καὶ οἱ ἄρρενες μαστοὺς, ὥσπερ αἱ θήλειαι, μικροὺς παντελῶς. ἡ δ᾽ ἄρκτος, τέτταρας. τὰ δὲ, δύο μὲν μαστοὺς ἔχει ἐν τοῖς μηροῖς, καὶ θηλὰς δύο, ὥσπερ πρόβατον· τὰ δὲ, τέτταρας θηλάς, ὥσπερ βοῦς. τὰ δ᾽, οὔτ᾽ ἐν τῷ στήθει ἔχει τοὺς μαστοὺς, οὔτ᾽ ἐν τοῖς μηροῖς, ἀλλ᾽ ἐν τῇ γαστρί, οἷον κύων καὶ ὗς· καὶ πολλούς, οὐ πάντας δ᾽ ἴσους.

* Gaza in ne-gat. Sylb.

* χ. τῶν ὤτων.

A Quas enim ſuras vocamus, non niſi carnis copia, parte tibiæ poſteriore complentur. Quadrupedum autem, quæ ſanguine conſtant, eædemque animal generant, aliæ multifidæ ſunt, quales hominis manus, pedéſque habentur. Sunt enim quæ multiplici pedum fiſſura digitentur, vt canis, leo, panthera. aliæ biſulcæ ſunt, quæ forcipem pro vngula habeant, vt oues, capræ, cerui, equi fluuiatiles. aliæ inſiſſo ſunt pede, vt quæ ſolipedes nominantur, vt equus, mulus. Genus ſanè ſuillum ambiguum eſt. Nam & in terra Illyriorum, & in Pæonia, & nonnullis aliis locis ſues ſolipedes gignuntur. Biſulca igitur binis fiſſuris vtrinque, id eſt, à parte priore B poſterioreque diducuntur. Solipeda eam partem continentem ex toto habent. Sunt item animantium alia cornigera, alia mutila. Quæ cornua gerunt, biſulca magna ex parte per naturam ſunt, vt bos, ceruus, capra. Quod autem idem & ſolipes, & bicorne ſit, nullum eſt, quod nos adhuc norimus. at ſolipes, idemque vnicorne eſt, quanquam rarum: vt aſinus Indicus: ille enim & vnicornis, & ſolipes eſt. Vnicornis verò, idémque biſulcus, oryx eſt. Talum etiam aſinus ille Indicus ſolus in ſolipedum genere poſſidet. Sus enim, vt modò dixi, ambiguus eſt: quo fit etiam vt talo careat probiore. Permulta ex biſulcorum numero talum habent. at verò multifidum nullum adhuc talum eiuſmodi habe- C re cognitum eſt, vt ne hominem quidem habere certum eſt. Sed lynci ſemitalo ſimile quiddam: leoni autem tortuoſum in anfractum eſt, quale effingunt. Omnia verò, quibus datus eſt talus, cruribus eum poſterioribus continent, ita vt erectus in ſuffragine parte ſui prona foras, ſupina introrſum ſpectet, & quæ veneres vocantur, intus aduerſæ ſibi poſitæ ſint: quæ canes, foris: quæ antennæ, ſupra habeantur. Situs talorum omnium talis eſt. Sunt nonnulla, quæ ſimul biſulca ſint, & iubam habeant, & cornua bina, orbem inflexu mutuo colligentia gerant, vt bonaſus, qui in Pæonia terra, & Medica gignitur. Quæ autem cornuta D ſunt, eadem omnino quadrupeda eſſe certum eſt, niſi quid per tranſlationem cornu habere dicatur: quemadmodum Ægyptij de colubris Thebanis perhibent, quaſi aliquod illis veluti veſtigium cornus extuberet. Ceruo ex cornigeris vni cornua tota ſolida, cæteris caua quodam tenus, & mucrone demum concreta ſunt. Pars caua ex cute potius oritur, quam ſolidum quiddam oſſe enaſcens ſubit, impletque totam: quomodo cornua boum conſtare videmus. Soli etiam ceruo cornua omnibus annis decidua, initio à bimatu: cæteris perpetua, niſi per vim aliquam amittant. Mammas item haberi variè certum eſt. Nam & inter ſe ipſæ quadrupedes, & ab homine mamma- E rum differunt ratione. Membrorum etiam, quæ ad venereum coitum accommodata habentur, diſcrimen planè eſt. Patet ratio varia mammarum, cùm aliis mammæ parte priore, hoc eſt, in pectore, aut iuxta pectus ſint binæ, biniſque papillis, vt homini, vt elephanto ſub armis duæ, tam mari quam fœminæ, perquam exiguæ, nec pro corporis vaſtitate, ita vt eas a latere conſpicere propemodum nequeas. Vrſæ mammas habent quaternas. Aliis mammæ inter femina binæ, papillæque binæ, vt ouibus: aliis papillæ quaternæ, vt vaccis. Quibuſdam nec in pectore, nec in feminibus mammæ, ſed in ventre habentur, & quidē plures, verùm non omnes pares: vt canibus, vrſuibus.

Cùm

Cùm itaque cætera id genus habeant plures, pantheræ quaternas ventre medio gerunt. Camelus quoque in ventre mãmas duas cũ papillis quatuor habet, vt bos. Leæna etiam duas in vẽtre. Maribus ſolipedis generis, nullæ ſunt mãmæ, niſi iis qui matri ſimiles prodierunt: quod in equorũ genere euenit. Genitale marium aliis foris eſt, vt homini, equo & aliis multis: aliis intus, vt delphino. Quibus foris eſt, iis aut antè habetur, vt homini, & reliquis, quæ modò dixi: aut retro. Quinetiam iis quæ antè gerunt, aut & penis, & teſtes abſoluti pendent, vt homini: aut aluo adhærent, & aut plus aut minus abſoluuntur. Non enim pariter apro & equo membrum hoc abſolutum eſt. Elephantus etiam genitale equo ſimile habet, ſed paruum, nec pro corporis magnitudine. Teſtes idem non foris conſpicuos, ſed intus circa renes conditos habet: quocirca initum celerius agit. aliis itaque teſtes abſoluti, vt equo: aliis non abſoluti, vt apro. Sus fœmina, genitale ea continet parte, qua pecoris vbera habentur: & cùm per libidinem turget, ac prurit ad coitũ, ſurſum tantiſper hoc retrahit, vertitque foras, vt inde mari coitus fit facilior: reſciſſum id longè productius, & deluſcens amplius eſt. Genitale maxima animalium parte ita ſe habet. Nonnulla ex auerſo mingunt, vt lynx, leo, camelus, lepus. Mares igitur ita inter ſe diſcrepãt, vt expoſitum eſt. Fœminæ omnes ex auerſo mingunt: quippe cùm etiã fœmina elephantorum genitale, vt cæteræ, inter femora habeat. Genitalis vero ipſius differentia numeroſa eſt. aliis enim cartilaginoſum, carnoſumque eſt, vt homini: quod vt parte carnoſa inflari nequit, ſic cartilaginoſa intumeſcit, excreſcitque. aliis neruoſum, vt camelo, vt ceruo. aliis oſſeum, vt lupo, vulpi, muſtelæ, ictidi, id eſt, muſtelæ ruſticæ, quam viuerram interpretor: nam is quoque oſſeum gerit. ad hæc, homo, cùm ad iuſta incrementa peruenit, partem ſuperiorem habet minorem, quàm inferiorem, contra atque cætera animalia, quæ ſanguine conſtant. Partem ſuperiorem intelligi volo, quantum de capite ad eam pertendit partem, qua exitus patet excrementis. Inferiorem autem, quantum ab ea ipſa ſubſequitur reliquum corporis: animalibus ergo, quæ pedibus inniti natura voluit, crura poſteriora partem complent inferiorem. Quæ autem pedibus carent, iis cauda, & quicquid vice caudæ, ſimileue habetur, pro parte inferiore eſt. Tales perfectis iam incrementis animantes euadunt. Diſcrimen autem in creſcendo eſt. Homo enim prius quàm adultior ſit, partem ſuperiorem corporis habet maiorem, quàm inferiorem: & quo per ætatem ampliùs augetur, eo contra euenit, vt inferiora ſint ſuperioribus longiora. Quamobrem vnus ipſe nõ modo eodem ingredi ſolet infirma adhuc ætate, quo iam firma ingreditur: ſed primùm cùm infans eſt, quadrupes reptat, dein de ſe erigit, bipeſque incedit. Sunt quæ ex proportione incrementa partis vtriuſque capere ſoleant, vt canis. Nonnulla primùm parte ſuperiore minora ſunt, poſt maiora cùm creuerint, eadem parte euadunt, vt iumenta: nullum enim ex iis addita ætate auctius redditur ea parte quæ ab vngula ad clunẽ porrecta eſt. Dentes etiam cæterorũ animalium multiplici differentia, tum inter ſe tum hominis ratione euariant. Habent enim dentes omnia, quæ quadrupeda, ſanguinea, viuipara ſunt, ſed variè. Sunt enim alia vtrinque dentata, altera altero dentium ordine carent. Quæ enim cornua gerunt,

A τὰ μὲν οὖν ἄλλα, πλείους ἔχει· ἡ δὲ πάρδαλις, τέτταρας ἐν τῇ γαστρί. [ἡ δὲ λέαινα, δύο ἐν τῇ γαστρί.] ἔχει δὲ καὶ ἡ κάμηλος μαστοὺς δύο καὶ θηλὰς τέτταρας, ὥσπερ ὁ βοῦς. τῶν δὲ μωνύχων τὰ ἄρρενα οὐκ ἔχουσι μαστούς, πλὴν ὅσα ἐοίκασι τῇ μητρί· ὅπερ συμβαίνει ἐπὶ τῶν ἵππων. Τὰ δ' αἰδοῖα, τῶν μὲν ἀρρένων τὰ μὲν ἔξω ἔχει, οἷον ἄνθρωπος καὶ ἵππος καὶ ἄλλα πολλά· τὰ δ' ἐντός, ὥσπερ δελφίς. τῶν δ' ἔξω ἐχόντων τὰ μὲν, εἰς τὸ πρόσθεν, ὥσπερ καὶ τὰ εἰρημένα· καὶ τούτων τὰ μὲν, ἀπολελυμένα καὶ τὸ αἰδοῖον καὶ τοὺς ὄρχεις, ὥσπερ ἄνθρωπος· τὰ δὲ, πρὸς τῇ γαστρὶ καὶ τοὺς ὄρχεις καὶ τὸ αἰδοῖον· καὶ τὰ μὲν, B μᾶλλον, τὰ δ', ἧττον ἀπολελυμένα. οὐ γὰρ ὡσαύτως ἀπολέλυται κάπρῳ καὶ ἵππῳ τοῦτο τὸ μόριον. ἔχει δὲ καὶ ὁ ἐλέφας τὸ αἰδοῖον ὅμοιον μὲν ἵππῳ, μικρὸν δὲ, καὶ οὐ κατὰ λόγον τοῦ σώματος· τοὺς δ' ὄρχεις, οὐκ ἔξω φανερούς, ἀλλ' ἐντὸς περὶ τοὺς νεφρούς. διὸ καὶ ἐν τῇ ὀχείᾳ ἀπαλλάττεται ταχέως. [καὶ τὰ μὲν, ἀπολελυμένους ἔχει τοὺς ὄρχεις, ὥσπερ ἵππος· τὰ δ', οὐκ ἀπολελυμένους, ὥσπερ κάπρος.] ἡ δὲ θήλεια, τὰ αἰδοῖα ἔχει ἐν ᾧπερ τόπῳ τὰ οὔθατα τῶν προβάτων ἐστίν. ὅταν δὲ ὀργᾷ εἰς τὸ ὀχεύεσθαι, ἀνασπᾷ ἄνω, καὶ ἐκτρέπει πρὸς τὸν ἔξω τόπον, ὥστε ῥᾳδίαν εἶναι τῷ ἄρρενι τὴν ὀχείαν. ἀναπτύσσεται δὲ ἐπὶ πο- C λὺ τὸ αἰδοῖον. Τῶν μὲν οὖν πλείστων αὐτῶν, τὰ αἰδοῖα τοῦτον ἔχει τὸν τρόπον. ἔνια δὲ ὀπισθουρητικά ἐστιν, οἷον λύγξ, καὶ λέων, καὶ κάμηλος, καὶ δασύπους. τὰ μὲν οὖν ἄρρενα, διαφέρει ἀλλήλοις, καθάπερ εἴρηται. τὰ δὲ θήλεα, πάντα ὀπισθουρητικά ἐστι. καὶ γὰρ ὁ θῆλυς ἐλέφας ἔχει τὰ αἰδοῖα ὑπὸ τοῖς μηροῖς, καθάπερ καὶ τὰ ἄλλα. τῶν δ' αἰδοίων διαφορὰ, πολλή ἐστι. τὰ μὲν γὰρ, ἔχει τὸ αἰδοῖον χονδρῶδες καὶ σαρκῶδες, ὥσπερ ἄνθρωπος. τὸ μὲν οὖν σαρκῶδες, οὐκ ἐμφυσᾶται· τὸ δὲ χονδρῶδες, ἔχει αὔξησιν. τὰ δὲ, νευρῶδες, οἷον κάμηλος καὶ ἔλαφος· τὰ δ', ὀστῶδες, ὥσπερ ἀλώπηξ καὶ λύκος, καὶ ἴκτις, καὶ γα- D λῆ· καὶ γὰρ ἡ γαλῆ ὀστοῦν ἔχει τὸ αἰδοῖον. *Πρὸς δὲ τούτοις ὁ μὲν ἄνθρωπος τελειωθεὶς, τὰ ἄνω ἔχει ἐλάττω τῶν κάτωθεν· τὰ δ' ἄλλα ζῷα, ὅσα ἔναιμα, τοὐναντίον. λέγομεν δ' ἄνω, τὸ ἀπὸ κεφαλῆς μέχρι τῶν μορίων, ᾗ ἡ τοῦ περιττώματός ἐστιν ἔξοδος· κάτω δὲ, τὸ ἀπὸ τούτου λοιπόν. τοῖς μὲν οὖν ἔχουσι πόδας, τὸ ὀπίσθιόν ἐστι σκέλος, ὃ κάτω τοῦτο μέρος πρὸς τὸ μέγεθος· τοῖς δὲ μὴ ἔχουσιν, οὐρὰ καὶ κέρκος, καὶ τὰ τοιαῦτα. τελειούμενα μὲν οὖν, τοιαῦτά ἐστιν· ἐν δὲ τῇ αὐξήσει διαφέρει. ὁ μὲν γὰρ ἄνθρωπος, μείζω τὰ ἄνω ἔχει νέος ὢν, ἢ τὰ κάτω· αὐξανόμενος δὲ, μεταβάλλει τοὐναντίον. διὸ καὶ μόνος οὐ τὴν αὐ- E τὴν κίνησιν ποιεῖται τῆς πορείας, νέος ὢν καὶ τελειωθείς· ἀλλὰ τὸ πρῶτον, παιδίον ὄν, ἕρπει τετραποδίζον. τὰ δ' ἀνάλογον ἀποδίδωσι τὴν αὔξησιν, οἷον κύων. ἔνια δὲ, τὸ πρῶτον ἐλάττω τὰ ἄνω, τὰ δὲ κάτω μείζω ἔχει· αὐξανόμενα δὲ τὰ ἄνω γίνεται μείζω, ὥσπερ τὰ λοφουρά. τούτων γὰρ οὐδὲν μεῖζον γίνεται ὕστερον [δὲ] τὸ ἀπὸ τῆς ὁπλῆς μέχρι τῆς ἰσχύος. *Ἔτι δὲ καὶ περὶ τοὺς ὀδόντας, πολλὴ διαφορὰ τοῖς ἄλλοις ζῴοις, καὶ πρὸς αὑτὰ, καὶ πρὸς τὸν ἄνθρωπον. ἔχει μὲν γὰρ πάντα ὀδόντας, ὅσα τετράποδα, καὶ ἔναιμα, καὶ ζῳοτόκα· ἀλλὰ πρῶτον τὰ μέν ἐστιν ἀμφώδοντα, τὰ δ' οὔ. ὅσα μὲν γὰρ ἐστι κερατοφόρα,

* De partibus lib. 4. cap. 10. De inceſſu c. 11.

* De partibus lib. 3. cap. 1.

A οὐκ ἀμφόδοντά ἐστιν. οὐ γὰρ ἔχει τοὺς προσθίους ὀδόντας ἐπὶ τῆς ἄνω σιαγόνος. ἔστι δ' ἔνια οὐκ ἀμφόδοντα καὶ ἀκέρατα, οἷον κάμηλος. καὶ τὰ μὲν χαυλιόδοντας ἔχει, ὥσπερ οἱ ἄρρενες ὕες, τὰ δ' οὐκ ἔχει. ἔτι δὲ τὰ μέν ἐστι καρχαρόδοντα αὐτῶν, οἷον λέων, καὶ πάρδαλις, καὶ κύων· τὰ δὲ, ἀνεπάλλακτα, οἷον ἵππος, καὶ βοῦς. καρχαρόδοντα γάρ ἐστιν, ὅσα ἐπαλλάττει [τοὺς ὀδόντας] τοὺς ὀξεῖς ὁμοῦ. ἅμα δὲ χαυλιόδοντα καὶ κέρας οὐδὲν ἔχει ζῷον· οὐδὲ καρχαρόδουν, καὶ τούτων θάτερον. τὰ δὲ πλεῖστα τοὺς προσθίους ἔχει ὀξεῖς, τοὺς δ' ἐντὸς πλατεῖς. ἡ δὲ φώκη καρχαρόδους ἐστὶ πᾶσι τοῖς ὀδοῦσιν, ὡς ἐπαλλάττουσα τῷ γένει τῶν ἰχθύων. B οἱ γὰρ ἰχθύες πάντες σχεδὸν καρχαρόδοντές εἰσι. διστοίχους δ' ὀδόντας οὐδὲν ἔχει τούτων τῶν ζῴων. ἔστι δὲ, εἰ δεῖ πιστεῦσαι Κτησίᾳ. ὁ γάρ φησιν ἐν Ἰνδοῖς τὸ θηρίον, ᾧ ὄνομα εἶναι μαρτιχόραν, τοῦτ' ἔχειν ἐπ' ἀμφότερα φησὶ τριστοίχους τοὺς ὀδόντας. εἶναι δὲ μέγεθος μὲν ἡλίκον λέοντα, καὶ δασὺ ὁμοίως, καὶ πόδας ἔχειν ὁμοίους. πρόσωπον δὲ καὶ ὦτα ἀνθρωποειδὲς, τὸ δ' ὄμμα γλαυκὸν, τὸ δὲ χρῶμα κινναβάρινον. τὴν δὲ κέρκον, ὁμοίαν τῇ τοῦ σκορπίου τοῦ χερσαίου, ἐν ᾗ κέντρον ἔχει, καὶ τὰς ἀποφυάδας ἀποκοντίζειν. φθέγγεσθαι δ' ὅμοιον φωνῇ σύριγγος καὶ σάλπιγγος. ταχὺ δὲ θεῖν οὐχ ἧττον τῶν ἐλάφων, καὶ εἶναι ἄγριον καὶ ἀνθρωποφάγον. C ἄνθρωπος μὲν οὖν βάλλει τοὺς ὀδόντας. βάλλει δὲ καὶ ἄλλα τῶν ζῴων, οἷον ἵππος, καὶ ὀρεὺς, καὶ ὄνος. βάλλει δ' ἄνθρωπος τοὺς προσθίους, τοὺς δὲ γομφίους οὐδὲν βάλλει τῶν ζῴων. ὗς δ' ὅλως οὐθένα βάλλει τῶν ὀδόντων.

ΚΕΦΑΛ. β'.

Περὶ τῶν κυνῶν.

ΠΕρὶ δὲ τῶν κυνῶν ἀμφισβητεῖται, καὶ οἱ μὲν ὅλως οὐκ οἴονται βάλλειν οὐθένα αὐτούς· οἱ δὲ, τοὺς κυνόδοντας μόνον. οὐκ ὄντως δ' ἐστὶ βάλλει καθάπερ καὶ ἄνθρωπος, D ἀλλὰ λανθάνει, διὰ τὸ μὴ βάλλειν πρότερον, πρὶν ἀναφυῶσιν ἐντὸς ἴσοι. ὁμοίως δὲ εὔλογον καὶ ἐπὶ τῶν ἄλλων τῶν ἀγρίων εἰκὸς συμβαίνειν, ἐπεὶ λέγουσί γε τοὺς κυνόδοντας μόνον βάλλειν. τοὺς δὲ κύνας διαγινώσκουσι τοὺς νεωτέρους καὶ πρεσβυτέρους ἐκ τῶν ὀδόντων. οἱ μὲν γὰρ νέοι, λευκοὺς ἔχουσι καὶ ὀξεῖς τοὺς ὀδόντας· οἱ πρεσβύτεροι δὲ μέλανας καὶ ἀμβλεῖς.

Ἴσ. ὁμοίως δὲ τὸ ἐπὶ τ.

ΚΕΦΑΛ. γ'.

Περὶ τῶν ὀδόντων τῶν ἵππων.*

ΕΝαντίως δὲ παρὰ τἆλλα ζῷα, καὶ ἐπὶ τῶν ἵππων E συμβαίνει. τὰ μὲν γὰρ ἄλλα ζῷα, πρεσβύτερα γινόμενα, μελαντέρους ἔχει τοὺς ὀδόντας· ὁ δὲ ἵππος, λευκοτέρους. διορίζουσι δὲ τούς τε ὀξεῖς καὶ τοὺς πλατεῖς οἱ καλούμενοι κυνόδοντες ἀμφοτέρων μετέχοντες τῆς μορφῆς. ἄνωθεν μὲν γάρ εἰσι πλατεῖς, κάτωθεν δὲ εἰσιν ὀξεῖς. ἔχουσι δὲ πλείους οἱ ἄρρενες τῶν θηλειῶν ὀδόντας καὶ ἐν ἀνθρώποις, καὶ ἐπὶ προβάτων καὶ αἰγῶν καὶ ὑῶν· ἐπὶ δὲ τῶν ἄλλων, οὐ τεθεώρηταί πω ταῦτα. ὅσοι δὲ πλείους ἔχουσι, μακροβιώτεροι, ὡς ἐπὶ τὸ πολύ εἰσιν· οἱ δ' ἐλάττους καὶ ἀραιόδοντες, ὡς ἐπὶ τὸ πολὺ βραχυβιώτεροι.

* Proble. ſect. 10.41. & ſect. 34.1.

hæc non dentata vtrinque ſunt, quippe quæ primoribus maxillæ ſuperioris careant dentibus. Quanquam ſunt nonnulla, quæ & cornibus vacẽt, & vtrinque dentata non ſint, vt cameli. Item alia dentes habent exertos, velut aper: alia ſine iis ſunt. Et aliis dentes ſerrati, vt leoni, pantheræ, cani: aliis continui, vt equo & boui. Sunt enim dentibus ſerratis, quorum ſeries acutorum dentium mutua inſertione pectinatim ſe conſtipat. Quod autem ſimul & dentem exertum, & cornu habeat, nullum eſt: nec vero quod ſimul & ſerratis dentibus ſit, & alterutrum habeat illorum, hoc eſt, vel cornu, vel dentem exertum. Primores maxima ex parte habent acutos, interiores planos. Vitulus marinus ſerratis omnibus eſt, vt generi piſcium affinis: piſcibus enim ferè omnibus ſerrati ſunt dentes. Genus autem, quod duplicem dentium ordinem habeat, nullum noſtro in orbe eſt: verum apud Indos (ſi Cteſiæ credendum eſt) bellua gignitur (vt ille ſcribit) cui nomen mantichora, dentes triplici vtrinque ordine, magnitudo, hirtitudo, & pedes leonis, facies & aures hominis, oculi cæſij, color rubricæ, cauda ſcorpionis modo terreſtris, aculeo armata, ſpiculaque agnata iaculans, vox fiſtulæ, tubæve nõ abſimilis, curſus non minoris pernicitatis, quàm ceruis, feritas tanta, vt nunquam poſſit inficere appetitus: præcipuè carnis humanæ. Mutantur dentes, tum homini, tum etiam quibuſdam aliis animalibus, vt equo, mulo, aſino. Homini primores mutantur. Maxillares autem nullum animal mutat. Sus nullum omnino dentem amittit.

CAPVT II.

An canes mutent dentes, quóve modo vetuſtiores à recentioribus dignoſcantur.

DE canibus diuerſa ſententia eſt: quippe cùm alij nullum iis decidere dentem opinentur, alij caninos tantùm appellatos mutare velint, quos etiam homo amittit: verùm hoc latére, propterea quia non ante mutant, quàm pares intus enaſcantur. Quod idem vel in cæteris ſcilicet feris euenire veriſimile eſt. Et quidem caninos tantùm mutare perhibentur. Ætas vetuſtiorum recentiorumque canum, dentibus iudicatur. Iuuenibus enim dentes candidi, & acuti: ætate prouectis, nigri obtuſique.

CAPVT III.

Dentes equorum in ſenectute candidiores fieri, pluréſque mares quàm fœminas habere dentes.

AGitur certè in equis contrà, atque in cæteris animalibus. Cùm enim cæteris ſenectute dentes nigreſcant, equo candidiores redduntur. Planos ab acutis diſterminant, qui canini appellantur, formæ vtrorumque participes: quippe qui infrà latiuſculi, ſuprà acutiuſculi ſint. Maribus dentes plures, quàm fœminis, vt in genere hominum, ouium, ſuum, caprarum, patet. In cæteris nondum exploratum eſt. Quibus plures, hæc viuaciora magna ex parte ſunt. Quibus pauciores, & rariores, hæc magna ex parte vitæ ſunt breuioris.

CAPVT IV.

Hominibus circiter viceſimum annum genuinos dentes gigni.

HOmini nouiſſimi maxillares, quos genuinos vocamus, circiter viceſimum annum gignuntur, & viris, & mulieribus. Iam verò quibuſdã mulieribus anno etiam octogeſimo maxillares illi nouiſſimi non ſine dolore exierunt. Viris quoque idẽ eueniſſe accepimus: quod certè iis accidit, quibus in iuuentute ipſi genuini nati non fuerint.

CAPVT V.

Elephantes mares à fœminis diſtare in ordine dentium.

ELephanto dẽtes vtrinque quatuor, quibus cõficit cibum, atque in farinæ ſpeciẽ molit. Duo præterea prominent grandes, quos mares grandiores, reſimatóſque habent: fœminæ minores, & contra quàm mares: vergunt enim deorſum, pronique deuiant. Statim cùm natus eſt elephantus, dẽtes habet, quanquam grandes illos, non illico perſpicuos obtinet.

CAPVT VI.

Exiguam eſſe elephantis linguam.

LInguam perquam exiguam habet, atque interiùs poſitam, quàm in cæteris ſit, ita vt vix eam videre poſſis.

CAPVT VII.

Quæ animalia in oris magnitudine diſcrepent, ibíque de equo fluuiatili Aegyptio.

ORis etiam magnitudine diſcrimen exiſtere animalibus planum eſt. Aliis enim os reſciſſũ, vt cani, leoni, denique omnibus, quibus dentes ſerrati. aliis paruum, vt homini. aliis mediocre, vt generi ſuum. Equo fluuiatili, quem gignit Ægyptus, iuba equi, vngula qualis bubus, roſtrum reſimum. Talus etiam ineſt biſulcorum modo: dentes exerti, ſed leuiter: cauda apri, vox equi, magnitudo aſini, tergoris craſſitudo tanta, vt ex eo venabula faciant: interiora omnia, equi & aſini ſimilia.

CAPVT VIII.

De genere ſimiarum, quod partim hominem, partim quadrupedes imitatur.

SVnt quæ natura ancipite, partim hominem, partim quadrupedem imitentur: velut ſimiæ, cebi, canicipites. Sic enim cynocephalos appello. Cebus, ſimia gerens caudã eſt. Caniceps etiã eadẽ forma qua ſimia eſt, ſed maior, validiórque, & facie caninæ ſimilior, vnde & nomen accepit: ad hæc moribus ferocioribus eſt, & dente robuſtiore, caninóque propiore. Simia tam parte ſui corporis prona piloſa eſt, vtpote quadrupes, quàm ſupina, vt ſpeciem gerens hominis, qui contra atque quadrupedes, obtinet pilum, vt dictum iam eſt. Sed craſſiore pilo ſimiæ veſtiuntur, longéque hirtiores parte vtraque ſunt. Conueniunt cum homine plurimùm ſua facie, quippe quæ nares, aures, dentes, tã primores quàm maxillares hominis more habeãt. Cilium etiã cùm cæteræ quadrupedes nõ in vtraque palpebra habeãt, ſimiæ habent, quanquã pręte-

A

ΚΕΦΑΛ. δ'.

Περὶ τῶν γομφίων, τῶν κραντήρων καλουμένων.

ΦΥονται δ' οἱ τελευταῖοι τοῖς ἀνθρώποις γόμφιοι, οὓς καλοῦσι κραντῆρας, περὶ τὰ εἴκοσιν ἔτη καὶ ἀνδράσι καὶ γυναιξίν. ἤδη δέ τισι γυναιξὶ καὶ ὀγδοήκοντα ἐτῶν οὔσαις ἔφυσαν γόμφιοι ἐν τοῖς ἐσχάτοις, πόνον παρέχοντες ἐν τῇ ἀνατολῇ, καὶ ἀνδράσιν ὡσαύτως. τοῦτο δὲ συμβαίνει, ὅσοις ἂν μὴ ἐν τῇ ἡλικίᾳ ἀνατείλωσιν οἱ κραντῆρες.

ΚΕΦΑΛ. ε'.

Περὶ τῶν ὀδόντων τοῦ ἐλέφαντος.

B ΟΔ' ἐλέφας, ὀδόντας μὲν ἔχει τέτταρας ἐφ' ἑκάτερα, οἷς κατεργάζεται τὴν τροφήν· λεαίνει δ' ὥσπερ κρίμνα· χωρὶς δὲ τούτων ἄλλους δύο τοὺς μεγάλους. ὁ μὲν οὖν ἄρρην τούτους ἔχει μεγάλους τε καὶ * ἀνωσίμους· ἡ δὲ θήλεια, μικροὺς καὶ ἐξ ἐναντίας τοῖς ἄρρεσι. κάτω γὰρ οἱ ὀδόντες βλέπουσιν. ἔχει δ' ὁ ἐλέφας εὐθὺς γινόμενος ὀδόντας· τοὺς μέντοι μεγάλους, ἀδήλους τὸ πρῶτον.

* Meliùs ἀνασίμους, vt alibi apud Ariſtot.

ΚΕΦΑΛ. ϛ'.

Περὶ τῆς γλώττης τοῦ ἐλέφαντος.

ΓΛῶτταν δὲ ἔχει μικράν τε σφόδρα, καὶ ἐντός· ὥστε ἔργον εἶναι ἰδεῖν.

C

ΚΕΦΑΛ. ζ'.

Περὶ τῶν στομάτων τῶν ζώων καὶ περὶ ἱπποποτάμου.

ΕΧουσι δὲ [τὰ ζῷα καὶ] τὰ μεγέθη διαφέροντα τοῦ στόματος. τὰ μὲν γάρ ἐστι τὰ στόματα ἀνερρωγότα, ὥσπερ κυνὸς καὶ λέοντος, καὶ πάντων τῶν καρχαροδόντων. τὰ δὲ, μικρόστομα, ὥσπερ ἄνθρωπος· τὰ δὲ, μεταξύ, ὥσπερ τὰ τῶν ὑῶν γένος. ὁ δ' ἵππος ὁ ποτάμιος ὁ ἐν Αἰγύπτῳ, χαίτην μὲν ἔχει, ὥσπερ ἵππος· δίχηλος δ' ἐστιν, ὥσπερ βοῦς· τὴν δ' ὄψιν, σιμός. ἔχει δὲ καὶ ἀστράγαλον, ὥσπερ τὰ δίχηλα, καὶ χαυλιόδοντας
D ὑποφαινομένους, κέρκον δ' ὑός, φωνὴν δ' ἵππου· μέγεθος δ' ἐστὶν ἡλίκον ὄνος. τοῦ δὲ δέρματος τὸ πάχος, ὥστε * δόρατα ποιεῖσθαι ἐξ αὐτοῦ. τὰ δ' ἐντὸς ἔχει ὅμοια ἵππῳ καὶ ὄνῳ.

* Docti quidam θώρακας ex Plinio 8. 25. vbi ait hippopotamũ eſſe *tergoris ad ſcuta galeaſque impenetrabilis.* verius eſt nihil eſſe mutãdum. Plinius idem l. 11. c. 39. *hippopotamo*, ait, *corij craſſitudo talis, vt inde tornentur haſtæ.* Ipſiſſima ſunt verba Ariſtotelis.

ΚΕΦΑΛ. η'.

Περὶ τῶν ἐπαμφοτεριζόντων ζώων τὴν φύσιν, τῷ τε ἀνθρώπῳ καὶ τοῖς τετράποσι, πιθήκων, κήβων, κυνοκεφάλων.

ΕΝια δὲ τῶν ζώων ἐπαμφοτερίζει τὴν φύσιν, τῷ τε ἀνθρώπῳ καὶ τοῖς τετράποσιν, οἷον πίθηκοι καὶ κῆβοι, καὶ κυνοκέφαλοι. ἔστι δ' ὁ μὲν κῆβος, πίθηκος ἔχων οὐράν. καὶ οἱ κυνοκέφαλοι δὲ τὴν αὐτὴν ἔχουσι μορφὴν τοῖς πιθήκοις, πλὴν μείζονές τε εἰσὶ, καὶ ἰσχυρότεροι, καὶ τὰ πρόσωπα
E ἔχοντες κυνοειδέστερα. ἔτι δὲ ἀγριώτερά τε τὰ ἤθη, καὶ τοὺς ὀδόντας ἔχουσι κυνοειδεστέρους καὶ ἰσχυροτέρους. οἱ δὲ πίθηκοι, δασεῖς μέν εἰσι τὰ πρανῆ, ὡς ὄντες τετράποδες· καὶ τὰ ὕπτια δὲ ὡσαύτως, ὡς ὄντες ἀνθρωποειδεῖς. τοῦτο γὰρ ἐπὶ τῶν ἀνθρώπων ἐναντίως ἔχει καὶ ἐπὶ τῶν τετραπόδων, καθάπερ ἐλέχθη πρότερον. πλὴν ἥ τε θρὶξ παχεῖα, καὶ δασεῖς ἐπ' ἀμφότερα σφόδρα εἰσὶν οἱ πίθηκοι. τὸ δὲ πρόσωπον, ἔχει πολλὰς ὁμοιότητας τῷ τοῦ ἀνθρώπου. καὶ γὰρ μυκτῆρας, καὶ ὦτα παραπλήσια ἔχει· καὶ ὀδόντας, ὥσπερ ὁ ἄνθρωπος, καὶ τοὺς προσθίους καὶ τοὺς γομφίους. ἔτι δὲ βλεφαρίδας, τῶν ἄλλων τετραπόδων οὐκ ἐπ' ἀμφότερα ἐχόντων, οὗτος ἔχει μὲν, λεπτὰς

δασέα σφόδρα, καὶ μᾶλλον τὰ κάτω, καὶ μικρὰς πάμπαν. τὰ γὰρ ἄλλα τετράποδα ταύτας οὐκ ἔχει. ἔχει δὲ ἐν τῷ στήθει δύο θηλὰς μαστῶν μικρῶν. ἔχει δὲ καὶ βραχίονας, ὥσπερ ἄνθρωπος, πλὴν δασεῖς· καὶ κάμπτει καὶ τούτους καὶ τὰ σκέλη, ὥσπερ ἄνθρωπος, τὰς περιφερείας πρὸς ἀλλήλας ἀμφοτέρων τῶν κώλων. πρὸς δὲ τούτοις, χεῖρας καὶ δακτύλους καὶ ὄνυχας ὁμοίους τῷ ἀνθρώπῳ· πλὴν πάντα ταῦτα ἐπὶ τὸ θηριωδέστερον. ἰδίους δὲ τοὺς πόδας. εἰσὶ γὰρ οἷον χεῖρες μεγάλαι· καὶ οἱ δάκτυλοι, ὥσπερ οἱ τῶν χειρῶν, ὁ μέσος, μακρότατος· καὶ τὸ κάτω τοῦ ποδός, χειρὶ ὅμοιον· πλὴν ὅτι τὸ μῆκος τῆς χειρὸς ἐπὶ τὰ ἔσχατα τεῖνον, καθάπερ θέναρ. τοῦτο δὲ ἐστὶν ἄκρου σκληρότερον, κακῶς καὶ ἀμυδρῶς μιμούμενον πτέρναν. χρῆται δὲ τοῖς ποσὶν ἐπ' ἄμφω, καὶ ὡς χερσί, καὶ ὡς ποσί, καὶ συγκάμπτει ὥσπερ χεῖρας. ἔχει δὲ τὸν βραχίονα καὶ τὸν μηρὸν βραχεῖς, ὥσπερ πρὸς τὸν βραχίονα καὶ τὴν κνήμην. ὀμφαλὸν δ' ἐξέχοντα μὲν οὐκ ἔχει, σκληρὸν δέ τι κατὰ τὸν τόπον τοῦτον τοῦ ὀμφαλοῦ. τὰ δ' ἄνω τῶν κάτω πολὺ μείζονα ἔχει, ὥσπερ τὰ τετράποδα· σχεδὸν γάρ, ὥσπερ πέντε πρὸς τρία ἐστί, καὶ διά τε ταῦτα, καὶ διὰ τὸ τοὺς πόδας ἔχειν ὁμοίους χερσί, καὶ ὥσπερ συγκειμένους ἐκ χειρὸς καὶ ποδός· ἐκ μὲν ποδός, κατὰ τὸ τῆς πτέρνης ἔσχατον· ἐκ δὲ χειρός, τἆλλα μέρη. καὶ γὰρ οἱ δάκτυλοι ἔχουσι τὸ καλούμενον θέναρ· διατελεῖ δὲ τὸν πλείω χρόνον τετράπουν ὂν μᾶλλον ἢ ὀρθόν· καὶ οὔτε ἰσχία ἔχει ὡς τετράπουν ὄν, οὔτε κέρκον ὡς δίπουν, πλὴν μικρὰν τὸ ὅλον, ὅσον σημείου χάριν. ἔχει δὲ καὶ τὸ αἰδοῖον ἡ θήλεια ὅμοιον γυναικός· ὁ δ' ἄρρην, κυνωδέστερον ἢ ἀνθρώπου.

ΚΕΦΑΛ. θʹ.

Ἔτι περὶ κήβων.

ΟΙ δὲ κῆβοι, καθάπερ εἴρηται πρότερον, ἔχουσι κέρκον. τὰ δ' ἐντὸς διαιρεθέντα, ὅμοια ἔχουσιν ἀνθρώπῳ πάντα τὰ τοιαῦτα. τὰ μὲν οὖν εἰς τὸ ἐκτὸς τῶν ζῳοτοκούντων μόρια, τοῦτον ἔχει τὸν τρόπον.

ΚΕΦΑΛ. ιʹ.

Περὶ τῶν ἐκτὸς μορίων τῶν τετραπόδων μέν, ᾠοτόκων δὲ καὶ ἐναίμων.

ΤΑ δὲ τετράποδα μέν, ᾠοτόκα δὲ καὶ ἔναιμα, (οὐδὲν δὲ ᾠοτοκεῖ χερσαῖον καὶ ἔναιμον, μὴ τετράπουν ὄν, ἢ ἄπουν) κεφαλὴν μὲν ἔχει καὶ αὐχένα καὶ νῶτον, καὶ τὰ πρανῆ, καὶ τὰ ὕπτια τοῦ σώματος. ἔτι δὲ σκέλη πρόσθια καὶ ὀπίσθια, καὶ τὸ ἀνάλογον τῷ στήθει, ὥσπερ τὰ ζῳοτόκα τῶν τετραπόδων· καὶ κέρκον τὰ μὲν πλεῖστα, μείζω· ὀλίγα δέ, ἐλάττω. πάντα δὲ πολυδάκτυλα καὶ πολυσχιδῆ ἐστι τὰ τοιαῦτα. πρὸς δὲ τούτοις, καὶ τὰ αἰσθητήρια καὶ γλῶτταν πάντα, πλὴν ὁ Αἰγύπτιος κροκόδειλος. οὗτος δὲ παραπλήσιος τῶν ἰχθύων τισίν. ὅλως μὲν γὰρ οἱ ἰχθύες ἀκανθώδη, καὶ οὐκ ἀπολελυμένην ἔχουσι τὴν γλῶτταν· ἔνιοι δὲ πάμπαν λείαν καὶ ἀδιάρθρωτον τὸν τόπον, μὴ ἐγκλίνοντι σφόδρα τὸ χεῖλος. ὦτα δ' οὐκ ἔχουσιν,

A nuc, ac prolixius, potiſſimùm in inferiore. Cæteræ enim quadrupedes inferioribus carent ciliis. Habent ſimiæ in pectore binas mammarum papillas, & brachia hominis modo, ſed hirtiuſcula, quæ & ipſa, & pedes, vt homo, inflectunt, hoc eſt, ita vt circumferentiæ membrorum vtrorumque obuerſæ inter ſe adducantur. Ad hæc, manus, digitos, vngues homini ſimiles, verùm omnia fœdiora efferatioráque. Pedes ſui generis habent: ſunt enim velvt manus maiuſculæ, & digitis vt manus conſtant, medio longiore. Veſtigium etiam manui ſimile eſt, niſi quòd in longum ſe porrigat, & volam referens tendat ad poſtrema.
B Calloſius hoc altera ſui parte èxtrema eſt, & calcē ineptè atque exiliter imitatur. Pedum officium duplex eſt: iis enim & vt pedibus, & vt manibus vtuntur, inflectúntque eoſdem perinde ac manus. Lacertos & femora habent breuia proportione cubitorum, & tibiarum. Vmbilicum, qui emineat, nullum habent: ſed durum quiddam continetur loco vmbilici. Partem corporis ſuperiorem multo maiorem habent, quàm inferiorem, videlicet more quadrupedum: quinarij enim fere ad ternarium ratione conſtant. Degenerant ergo, tum ea de cauſa tum etiam quod pedes manibus habeant ſimiles, & quaſi ex manu pedéque conſtitutos. Calcis enim poſtremum ad pedem, re-
C liquæ autem particulæ ad manum facile referuntur: digiti namque volæ ſpeciem gerunt. Degunt plus temporis pronæ, quadrupedum more, quàm erectæ. Carent natibus, vtpote quadrupedes. Priuatæ cauda ſunt, vtpote bipedes. Exigua enim omnino cauda ineſt, quatenus nota ſolùm habeatur. Genitale etiam fœminæ, mulieris eſt: mari potiùs canis, quàm hominis.

CAPVT IX.

De cebis.

D CEbi (vt ſuperiùs dixi) omnes caudam habent. Partes verò interiores humanis ſimiles, genera hæc omnia continent. Partes animalium viuiparorum exteriores ita ſe habent.

CAPVT X.

Ouipara quadrupeda, quibuscum cæteris quadrupedibus conueniant, & diſſentiant.

QVadrupedes, quæ oua pariunt, eædémque ſanguinem habent (Terreſtre autem, ac ſanguinis particeps nullum oua edit, quin idem aut quadrupes ſit, aut pedibus careat omnino) omnes
E caput, collum, dorſum, prona, atque ſupina corporis poſſident: pedes etiā priores, poſterioréſque, & quod pectori proportionetur, modo viuipari quadrupedū generis. Caudā quoque habent longiorē, exceptis paucis. Sed hæc omnia pedes in plures digitos habent diſcretos. ad hæc, omnibus his ſenſus totidē quot cæteris quadrupedibus ſunt: & lingua omnibus data eſt, excepto, quē Ægyptus fert, crocodilo: nam ille ſimilis quibuſdā piſcibus eſt. Cùm enim piſces omnino ſpineam, nec abſolutam continent linguam, tum vel maximè nonnulli adeo læuem indiſcretúmque eum ipſum linguæ tributū locum ſortiuntur, vt niſi admodum labrum diduxeris, ne veſtigium quidem linguæ inſpicere queas.

Auriculis tamen hæc omnia carent, meatúſque tantùm habent audiendi. Carent etiam mammis. Nec genitale, aut teſtes foris obtinent manifeſtos, ſed intus conditos. Nec pilo, ſed cortice omnia tecta ſunt. Dentibus etiam ſerratis ſunt omnia. Crocodilo fluuiatili oculi ſunt ſuis, dentes magni, exertique, vngues robuſti, cutis corticoſa, contra omnem ictum inuicta, viſus in aqua hebes, extrà acerrimus. Dies itaque in terra parte maxima agit, noctes in aqua, teporis ratione: tepidiorem enim aquam experitur quàm aërem.

CAPVT XI.

De chamæleone, & eius cum cæteris ſimilitudine.

CHamæleo figura totius corporis lacertam planè repræſentat. Latera deorſum ducta, ventri iunguntur, vt piſcibus: & ſpina modo piſcium eminet: roſtrum ſimiæ porcariæ ſimillimũ, cauda prælonga, in tenue deſinens, & longis implicata in ſe orbibus lori modo permultis. Elatior à terra eſt, quàm lacerta: inflexus crurum perinde vt lacertæ. Pedes ſinguli bipartitò ſecantur, partéſque talem inter ſe habent ſitum, qualem pollex ad manus reliquam partem obiectam. Sed ipſæ etiam reliquæ partes paulòtenus in digitos quoſdam ſinduntur: videlicet priores, triplici fiſſura interiùs, duplici exteriùs: poſteriores interiùs duplici, exteriùs triplici. Vnguiculi adunci. Corpus aſperum totum, vt crocodilo. Oculi in receſſu cauo intus recepti, prægrandes, rotundi, cute ſimili, atque reliquum corpus, obducti, media ſui parte perquam exigua detecti, qua videant. Quæ quidem videndi ſedes nunquam cute operitur, nec pupillæ motu, ſed totius oculi verſatione in orbem, mutationéque quoquouerſus aſpicit, quæ velit. Mutat ſuum colorem inflatus. Verùm & niger non longè diſſimilis crocodilo eſt: & pallidus, vt lacertę: maculis diſtinctus, vt pardus, nigris. Mutatur color toto in corpore: nam & oculi concolores reliquo corpori redduntur, & cauda eundem colorem accipit. Motus ei piger admodum, vt teſtudinis eſt: palleſcit cùm moritur, defunctúſque colorem eundem ſeruat. Gulam, atque arteriam ſitu eodem continet, quo lacerta. Carnem nuſquam, niſi in capite, & maxillis, & poſtremo caudæ admodum exiguam poſſidet: nec alibi ſanguinem, quàm in corde, & oculis, & loco à corde ſuperiore, & venulis hinc tendentibus. Verùm nec in iis quidem vlla copia, ſed pauxillum habetur ſanguinis. Cerebrum paulò ſuperius oculis poſitum eſt, & propè iis contiguum. Cute autem exteriore detracta oculis, quiddam luceſ velut anulus æneus tenuis, nulla pelle interceptus cingit. Membranæ in omnes ferè corporis partes multæ, ac validæ, longéque firmiores quàm in cæteris, tendunt. Diſſectus hic totus, ſpirare præterea diu poteſt, motu admodum exiguo adhuc circa cordis ſedem extante. Et cùm omnes corporis partes contrahit, tum vel maximè coſtas cogere atque adducere poteſt. Lienem conſpicuum nuſquam continet. Subit cauernas, & latitat more lacertarum.

A ἀλλὰ τὸν πόρον τῆς ἀκοῆς μόνον πάντα τὰ τοιαῦτα. οὐδὲ μαστοὺς, οὐδ' αἰδοῖον, οὐδ' ὄρχεις ἔξω φανερούς, ἀλλ' ἐντός· οὐδὲ τρίχας, ἀλλὰ πάντ' ἐστὶ φολιδωτά. ἔστι δὲ καρχαρόδοντα πάντα. οἱ δὲ κροκόδειλοι οἱ ποτάμιοι, ἔχουσιν ὀφθαλμοὺς μὲν ὑός, ὀδόντας δὲ μεγάλους καὶ χαυλιόδοντας, καὶ ὄνυχας ἰσχυρούς, καὶ δέρμα ἄρρηκτον φολιδωτόν. βλέπουσι δ' ἐν μὲν τῷ ὕδατι φαύλως, ἔξω δ' ὀξύτατον. τὴν μὲν οὖν ἡμέραν ἐν τῇ γῇ τὸ πλεῖστον διατρίβουσι, τὴν δὲ νύκτα, ἐν τῷ ὕδατι. ἀλεεινότερον γάρ ἐστι τῆς αἰθρίας.

ΚΕΦΑΛ. ια'.

B Περὶ τοῦ χαμαιλέοντος.

Ὁ δὲ χαμαιλέων, ὅλον μὲν τοῦ σώματος ἔχει τὸ σχῆμα σαυροειδὲς, τὰς δὲ πλευρὰς, κάτω καθηκούσας, συνάπτοντας πρὸς τὸ ὑπογάστριον, καθάπερ τοῖς ἰχθύσι. καὶ ἡ ῥάχις ἐπανέστηκεν ὁμοίως τῇ τῶν ἰχθύων. τὸ δὲ πρόσωπον ὁμοιότατον τῷ τοῦ χοιροπιθήκου. κέρκον δ' ἔχει μακρὰν σφόδρα, εἰς λεπτὸν καθήκουσαν, καὶ συνελιττομένην ἐπὶ πολὺ, καθάπερ ἱμάντα. μετεωρότερος δ' ἐστὶ τὸ ἀπὸ τῆς γῆς ἀποστάσει τῶν σαυρῶν. τὰς δὲ καμπὰς τῶν σκελῶν καθάπερ οἱ σαῦροι ἔχει. τῶν δὲ ποδῶν ἕκαστος αὐτοῦ, * διῄρηται εἰς μέρη, θέσιν ὁμοίαν πρὸς αὐτὰ ἔχοντα, οἵανπερ ὁ μέγας ἡμῶν δάκτυλος πρὸς C τὸ λοιπὸν τῆς χειρὸς ἀντίθεσιν ἔχει. ἐπὶ βραχὺ δὲ καὶ τούτων τῶν μερῶν ἕκαστον διῄρηται εἰς τινὰς δακτύλους. τῶν μὲν ἔμπροσθεν ποδῶν, τὰ μὲν πρὸς αὐτοῦ, τρίχα, τὰ δ' ἐκτὸς, δίχα. τῶν δὲ ὀπισθίων, τὰ μὲν πρὸς αὐτοῦ, δίχα, τὰ δ' ἐκτὸς, τρίχα. ἔχει δὲ καὶ ὄνυχα ἐπὶ τούτων ὅμοια τοῖς τῶν γαμψωνύχων. τραχὺ δ' ἔχει ὅλον τὸ σῶμα, καθάπερ ὁ κροκόδειλος. ὀφθαλμοὺς δ' ἔχει ἐν κοίλῳ τε κειμένους καὶ μεγάλους σφόδρα, καὶ στρογγύλους, καὶ δέρματι ὁμοίῳ τῷ λοιπῷ σώματος περιεχομένους. κατὰ μέσους δ' αὐτοὺς διαλέλειπται μικρά τι ἡ χώρα, δι' ἧς ὁρᾷ. οὐδέποτε δὲ τῷ δέρματι ἐπικαλύπτεται τοῦτο. στρέφει δὲ τὸν ὀφθαλμὸν κύκλῳ, καὶ τὴν ὄψιν ἐπὶ πάντας D τοὺς τόπους μεταβάλλει, καὶ οὕτως ὁρᾷ ὃ βούλεται. τοῦ δὲ χροιᾶς ἡ μεταβολὴ ἐμφυσωμένῳ αὐτῷ γίνεται. ἔχει δὲ καὶ μέλαιναν ταύτην, οὐ πόρρω τῆς τῶν κροκοδείλων, καὶ ὠχρὰν καθάπερ οἱ σαῦροι, μέλανι, ὥσπερ τὰ παρδάλια, διαπεποικιλμένην. γίνεται δὲ καθ' ἅπαν τὸ σῶμα αὐτοῦ ἡ τοιαύτη μεταβολή. καὶ γὰρ οἱ ὀφθαλμοὶ συμμεταβάλλουσιν ὁμοίως τῷ λοιπῷ σώματι, καὶ ἡ κέρκος. ἡ δὲ κίνησις αὐτοῦ νωθὴς ἰσχυρῶς ἐστι, καθάπερ ἡ τῶν χελωνῶν. ἀποθνήσκων τε ὠχρὸς γίνεται, καὶ τελευτήσαντος αὐτοῦ, ἡ χροιὰ τοιαύτη ἐστί. τὰ δὲ περὶ τὸν στόμαχον καὶ τὴν ἀρτηρίαν ὁμοίως ἔχει τοῖς σαύροις κείμενα. σάρκα δ' οὐδαμοῦ ἔχει, πλὴν πρὸς τῇ κεφαλῇ καὶ ταῖς σια-E γόσιν. ἃ σαρκία δὲ παντελῶς ἐστι, καὶ ταῖς σιαγόσιν ὀλίγα σαρκία, καὶ περὶ ἄκραν τὴν τῆς κέρκου προσπέφυκεν. καὶ αἷμα δ' ἔχει περί τε τὴν καρδίαν μόνον, καὶ τὰ ὄμματα, καὶ τὸν ἄνω τῆς καρδίας τόπον, καὶ ὅσα ἀπὸ τούτων φλέβια ἀποτείνει. ἔστι δὲ καὶ ἐν τούτοις βραχὺ παντελῶς. κεῖται δὲ καὶ ὁ ἐγκέφαλος ἀνώτερον μὲν ὀλίγον τῶν ὀφθαλμῶν, συνεχὴς δὲ τούτοις. περιαιρεθέντος δὲ τοῦ ἔξωθεν δέρματος τὸν ὀφθαλμὸν, περιέχει τι διαλάμπον διὰ τούτων, οἷον κρίκος χαλκοῦς λεπτός. κατ' ἅπαν δὲ αὐτοῦ τὸ σῶμα σχεδὸν διατείνουσιν ὑμένες πολλοὶ [καὶ ἰσχυροί,] καὶ πολὺ ὑπερβάλλοντες τοὺς περὶ τὰ λοιπὰ ὑπάρχοντας. ἀναπνεῖ δὲ καὶ τῷ πνεύματι, ἀνατετμημένος ὅλος ἐπὶ πολὺν χρόνον, βραχείας ἰσχυρῶς ἔτι κινήσεως ἐν αὐτῷ περὶ τὴν καρδίαν οὔσης, καὶ συνάγει διαφερόντως μὲν τὰ περὶ τὰ πλευρὰ, οὐ μὴν ἀλλὰ καὶ τὰ λοιπὰ μέρη τοῦ σώματος. σπλῆνα δ' οὐδαμοῦ ἔχει φανερόν. φωλεύει δὲ καθάπερ οἱ σαῦροι.

* γρ. διχῇ διῄ.

ΚΕΦΑΛ. ιβ'.

Περὶ τῶν ἐκτὸς μερῶν τῶν ὀρνίθων.

Ὁμοίως δ' ἔνια μόρια καὶ οἱ ὄρνιθες τοῖς εἰρημένοις ἔχουσι ζῴοις. καὶ γὰρ κεφαλὴν καὶ αὐχένα πάντ' ἔχει, καὶ νῶτον, καὶ τὰ ὕπτια τοῦ σώματος, καὶ τὸ ἀνάλογον τῷ στήθει· σκέλη δὲ δύο, καθάπερ ἄνθρωπος, μάλιστα τῶν ζῴων πλὴν κάμπτει εἰς τοὔπισθεν ὁμοίως τοῖς τετράποσιν, ὥσπερ εἴρηται πρότερον. χεῖρας δὲ οὐδὲ πόδας προσθίους ἔχει, ἀλλὰ πτέρυγας ἴδιον πρὸς τὰ ἄλλα ζῷα. ἔτι δὲ τὸ ἰσχίον ὅμοιον μηρῷ, μακρὸν καὶ προσπεφυκὸς μέχρις ὑπὸ μέσην τὴν γαστέρα, ὥστε δοκεῖν διαιρούμενον μηρὸν εἶναι· τὸν δὲ μηρὸν μεταξὺ τῆς κνήμης, ἕτερόν τι μέρος. μεγίστους δὲ τοὺς μηροὺς ἔχει τὰ γαμψώνυχα τῶν ὀρνίθων, καὶ τὸ στῆθος ἰσχυρότερον τῶν ἄλλων. πολυώνυχοι δέ εἰσι πάντες οἱ ὄρνιθες· ἔτι δὲ πολυσχιδεῖς τρόπον τινὰ πάντες. τῶν μὲν γὰρ πλείστων διήρηνται οἱ δάκτυλοι· τὰ δὲ πλωτά, στεγανόποδά ἐστι· διηρθρωμένους δ' ἔχει καὶ χωριστοὺς δακτύλους. εἰσὶ δέ, ὅσοι αὐτῶν μετεωρίζονται, πάντες τετραδάκτυλοι. τρεῖς μὲν γὰρ εἰς τὸ ἔμπροσθεν, ἕνα δὲ εἰς τὸ ὄπισθεν κείμενον οἱ πλεῖστοι ἀντὶ πτέρνης. ὀλίγοι δέ τινες, δύο μὲν ἔμπροσθεν, δύο δὲ ὄπισθεν, οἷον ἡ καλουμένη ἴυγξ. αὕτη δ' ἐστὶ μικρὰ μέν, μείζων σπίζης· τὸ δὲ εἶδος ποικίλον. ἴδια δ' ἔχει τά τε περὶ τοὺς δακτύλους, καὶ τὴν γλῶτταν, ὁμοίως τοῖς ὄφεσιν. ἔχει γὰρ ἐπὶ μῆκος ἔκτασιν, καὶ ἐπὶ τέτταρας δακτύλους, καὶ πάλιν συστέλλεται εἰς ἑαυτήν. ἔτι δὲ περιστρέφει τὸν τράχηλον εἰς τοὔπισω, τοῦ λοιποῦ σώματος ἠρεμοῦντος, καθάπερ οἱ ὄφεις. ὄνυχας δ' ἔχει μεγάλους μέν, ὁμοίους μέντοι πεφυκότας τοῖς τῶν κολοιῶν. τῇ δὲ φωνῇ τρίζει. στόμα δ' οἱ ὄρνιθες ἔχουσι μέν, ἴδιον δέ. οὔτε γὰρ χείλη οὔτ' ὀδόντας ἔχουσιν, ἀλλὰ ῥύγχος· οὔτε ὦτα οὔτε μυκτῆρας, ἀλλὰ τοὺς πόρους τούτων τῶν αἰσθήσεων· τῶν μὲν μυκτήρων, ἐν τῷ ῥύγχει, τῆς δ' ἀκοῆς ἐν τῇ κεφαλῇ. ὀφθαλμοὺς δὲ πάντες, καθάπερ καὶ τἄλλα ζῷα, δύο, ἄνευ βλεφαρίδων. μύουσι δ' οἱ βαρεῖς τῷ κάτω βλεφάρῳ· σκαρδαμύττουσι δὲ ἐκ τοῦ κανθοῦ δέρματι ἐπιόντι πάντες· οἱ δὲ γλαυκώδεις τῶν ὀρνίθων, καὶ τῷ ἄνω βλεφάρῳ. τὸ δ' αὐτὸ τοῦτο ποιοῦσι καὶ τὰ φολιδωτά, οἷον οἱ σαῦροι, καὶ τἄλλα τὰ ὁμογενῆ τούτοις τῶν ζῴων. μύουσι γὰρ τῷ κάτω βλεφάρῳ πάντες. οὐ μέντοι σκαρδαμύττουσί γε πάντες, ὥσπερ οἱ ὄρνιθες. ἔτι δ' οὔτε φολίδας οὔτε τρίχας ἔχουσιν, ἀλλὰ πτερά. τὰ δὲ πτερὰ ἔχει καυλὸν ἅπαντα. καὶ οὐρὰν μὲν οὐκ ἔχουσιν, ὀρροπύγιον δέ. οἱ μὲν μακροσκελεῖς καὶ στεγανόποδες, βραχύ· οἱ δ' ἐναντίοι, μέγα. καὶ οὗτοι μὲν πρὸς τῇ γαστρὶ τοὺς πόδας ἔχουσιν, ὅταν πέτωνται· οἱ δὲ* μικρορροπύγιοι, ἐκτεταμένους. καὶ γὰρ γλῶτταν ἅπαντες, ταύτην δ' ἀνομοίαν. οἱ μὲν γὰρ μακράν, οἱ δὲ πλατεῖαν. μάλιστα δὲ τῶν ζῴων, μετὰ τὸν ἄνθρωπον, γράμματα φθέγγεται ἔνια τῶν ὀρνίθων γένη. τοιαῦτα δ' ἐστὶ τὰ πλατύγλωττα αὐτῶν μάλιστα. τὴν δὲ ἐπιγλωττίδα ἐπὶ τῆς ἀρτηρίας, οὐδὲν τῶν ᾠοτοκούντων ἔχει, ἀλλὰ συνάγει καὶ* διοίγει τὸν πόρον, ὥστε μηθὲν κατιέναι τῶν ἐχόντων βάρος ἐπὶ τὸν πνεύμονα.

* [illegible]ρροπύγιοι.

* [illegible] sic alibi.

A

CAPVT XII.

De auium natura, & quibuscum cæteris terrꝭ animantibus conueniant.

IN auibus etiam partes nonnullæ ſimiliter atque in iis quæ expoſui, animalibus habentur. Omnibus enim caput ineſt, & collum, & dorſum, & ſupina pars corporis, & quod pectori proportionetur. Crura etiam bina, hominis modo, ſed quæ in auerſum flectantur eodem ritu, quo quadrupedes faciunt, vt dictum iam eſt. Carent manibus, pedibuſque prioribus. Peculiare inter cætera animalia, alas poſſident, & clunem femori ſimilem, longiorem, ventrémque medio tenus porrectum, co-
B hæſione perpetua, ita vt ipſum diuulſum femur eſſe videatur. ſed enim femur parte alia iunctum tibiæ eſt. Sunt femora ſanè maxima iis auibus quæ vngues habent aduncos, & pectus, quàm cæteris, robuſtius. Copia omnibus auibus vnguium eſt. Multifidæ etiam omnes quodammodo ſunt, quippe cùm pars maxima digitata ſit, & nantes, quamuis plampedes, tamen & ipſæ digitos perfectos diſtinctóſque habeant. Omnibus, quæ ſe efferunt, quaterni digiti dati ſunt, terni in priore parte, ſinguli in poſteriore maxima ex parte pro calce. Paucis quibuſdam vtrinque bini, vt auiculæ, quam Iyngem vocant. Hæc paulò maior quàm fringilla eſt, colore vario. Habet ſibi
C propriam digitorum quam modò dixi, diſpoſitionem, & linguam ſerpentibus ſimilem: quippe quam in longitudinem menſura quatuor digitorum porrigat, rurſúmque contrahat intra roſtrum. Collum etiam circumagit in auerſum, reliquo quieſcente corpore, modo ſerpentum, vnde torquilla vulgò appellata eſt, quanquam turbo ab antiquis. Vngues ei grandes, & ſimiles vt monedulis exeunt: voce autem ſtridet. Os ſibi proprium volucres poſſident: non enim labra, non dentes, ſed roſtrum habent. auriculis etiam carent, & naribus, meatúſque odorandi in roſtro continent, audiendi in capite. Oculi omnibus, ſicvt cæteris animalibus, bini, ſine ciliis. Grauiores
D palpebra inferiore conniuent. Nictantur omnes, ab angulo obeunte membrana. at verò quæ ſpeciem noctuæ gerunt, ſuperiore etiam palpebra conniuent. Hoc idem cortice intecta animalia quoque faciunt, vt lacertæ, & reliqua generis eiuſdem. Conniuent enim palpebra inferiore omnia: quanquam non more auium nictantur. Volucres item non pilis, non ſquama, non cortice, ſed pennis teguntur. Pennæ omnes caule conſtant. Cauda etiam tali, qualis data quadrupedibus eſt, volucres carent: ſed pennis conditam gerunt: breuem, quæ longipedes ac plampedes ſunt: maiorem autem, quæ è contrario conſtant, quæ vel contractis ad ventrem pedibus volant, cùm illæ caudæ
E puſillæ gerulæ, porrectis in caudam cruribus feruntur. Lingua omnibus eſt, ſed variè: aliis enim longa, aliis breuis, aliis lata, aliis anguſta. Omnium maximè animalium poſt hominem literas proferre nonnulla auium genera queunt, videlicet ea præcipuè, quibus lingua latior eſt. Linguam autem illam minorem operiendi miniſtram, nullum ex iis quæ oua pariunt, ſuperimpoſitam ſuæ arteriæ continet: ſed meatum ipſum modò trahunt, modò laxant, pro ſui commodi deſiderio: atque ita efficitur ne quid pōderis in pulmonem delabatur.

Sunt nonnulla ex auibus genera, quibus natura calcar etiam dederit: ſed nulli datum hoc eſt, cui vngues adunci ſint. Volaces porrò notantur, quæ vngues habent aduncos: calcarigeræ, quæ præ ſua grauitate ſint ad volandum ineptiores. ad hæc, auium nonnullis criſta addita eſt: quam cùm ceteræ pennarum eminentia quadam extructam gerant, gallinaceus vnus peculiarem ſibi ſortitus eſt: ſic enim inſtitutam, vt nec caro ſit, nec à natura carnis omnino aliena.

CAPVT XIII.

De genere piſcium, eiuſque differentiis.

PIſcium genus inter ea quæ aquas incolunt, vnum diſtingui à cæteris iure poteſt, cùm forma euariet numeroſiore. Habet id caput, & prona, & ſupina. Parte, qua venter, & viſcera continentur, ſupina habet. Caudam continuam indiuiſamque parte gerit poſteriore variè. Piſcium nulli ceruix, nulli manus, aut pedes, nulli teſtes, nulli mammæ. Sed mamma cæteris quoque negata eſt omnibus quæ animal nequeant generare. Nec verò viuiparis omnino data eſt, ſed iis tantùm quæ protinus intra ſe animal formant, nec primùm ouum, deinde animal. Vnde fit vt delphinus etiam mammas habeat: animal enim concipit illico, & creat. Continet hic ſuas mammas non parte ſuperiore, ſed prope genitale. Nec modo quadrupedum papillas conſpicuas habet, ſed velut alueolos quoſdam humoris duos, vtroque de latere ſingularem, è quibus lac fluit, quod ore catulorum ſectantium parentem excipiatur: idque iam à nõnullis perſpectum eſt. Piſces igitur (vt modò dixi) nec mammas habent, neque meatum genitalium vllum intus conſpicuum: branchias autem rem habent peculiarem, quibus humorem, quem ore acceperint, reddunt: atque etiam pinnas, quas magna ex parte quaternas gerunt. attamen longis, vt anguillæ, binæ iuxta branchias hærent. Mugilibus etiam, quos lacus Sipharum gignit, binæ, atque etiam ei quam vittam appellant. Nõnullis è longis nullæ omnino ſunt pinnæ, vt murænæ: nec brãchiæ integræ, vt cæteris piſcibus habentur. Qui autem branchias habent, aut intectas continent eas, aut detectas, vt cartilaginea genera omnia. Qui intectas habent, iis in obliquum vtroque latere tenentur. Quæ tegumento carent, cartilaginea dico, iis, ſi plana ſunt, parte inferiore ſupinàque habentur: vt torpedini, vt raiæ. Sed ſi oblonga ſunt, eorum lateribus adhærent, vt in quouis muſtelino genere cernitur. Rana tametſi deductas in latera habet branchias, tamen non ſpineo intectas operimento, vt quæ non cartilaginea ſunt, ſed cutilari. Item branchiatorum ipſorum aliis ſimplices branchiæ ſunt, aliis duplices: omnibus tamen ſimplex, quæ nouiſſima corpori admota eſt: & aliis paucæ, aliis multæ; verùm in vtrumque latus æquè partitæ omnibus ſunt. Habent, quibus pauciſſimæ ſunt, ſingulas branchias vtrinque, eaſque duplices, vt aper. aliis binæ, vtrinque, alteræ ſimplices, alteræ duplices, vt congro, vt ſcaro. aliis quaternæ vtrinque ſimplices, vt acipenſeri, dentici, murænæ, anguillæ. aliis quaternæ duplici ordine, nouiſſima excepta, vt turdo, percæ, ſiluro, cyprino. Muſteligenis etiã duplices, & quinæ, vtraque ex parte ſunt. Gladio, à roſtri mucrone ita appellato, octonæ duplices. Ita branchiarum colligitur numerus.

A ἤδη δ' ἔνια τῶν ὀρνίθων ἔχει καὶ πλῆκτρον. γαμψώνυχα δ' ἅμα καὶ πλῆκτρον ἔχον, οὐδέν. ἔστι δὲ τὰ μὲν γαμψώνυχα, τῶν πτητικῶν· τὰ δὲ πληκτροφόρα, τῶν βαρέων. ἔτι δ' ἔνια τῶν ὀρνέων λόφον ἔχουσι, τὰ μὲν, αὐτῶν τῶν πτερῶν ἐπανεστηκότα· ὁ δ' ἀλεκτρυὼν μόνος ἴδιον, ὃ οὔτε σάρξ ἐστιν, οὔτε πόῤῥω σαρκὸς τὴν φύσιν.

ΚΕΦΑΛ. ιγ'.

Περὶ τῶν ἔξω μορίων τῶν ἰχθύων.

B Τῶν δ' ἐνύδρων ζώων τὸ τῶν ἰχθύων γένος, ἓν ἀπὸ τῶν ἄλλων ἀφώρισται, πολλὰς περιέχον ἰδέας. κεφαλὴν μὲν γὰρ ἔχει, καὶ τὰ πρανῆ, καὶ τὰ ὕπτια, ἐν ᾧ τόπῳ ἡ γαστὴρ καὶ τὰ σπλάγχνα· καὶ ὄπισθεν οὐραῖον συνεχὲς ἔχει, καὶ ἄσχιστον. τοῦτο δ' οὐ πᾶσιν ὅμοιον. αὐχένα δὲ οὐδεὶς ἔχει ἰχθὺς, οὐδὲ κῶλον οὐδὲν, οὐδ' ὄρχεις ὅλως, οὔτ' ἐντὸς, οὔτ' ἐκτὸς· οὐδὲ μαστούς. τοῦτο μὲν οὖν ὅλως, οὐδ' ἄλλο οὐδὲν τῶν μὴ ζωοτοκούντων, οὐδὲ τὰ ζωοτοκοῦντα πάντα, ἀλλ' ὅσα εὐθὺς ἐν αὑτοῖς ζωοτοκεῖ, καὶ μὴ ᾠοτοκεῖ πρῶτον. καὶ γὰρ ὁ δελφὶς ζωοτοκεῖ· διὸ ἔχει μαστοὺς δύο, οὐκ ἄνω δὲ, ἀλλὰ πλησίον τῶν ἄρθρων. ἔχει δ' C οὐχ ὥσπερ τὰ τετράποδα, ἐπιφανεῖς θηλάς, ἀλλ' οἷον ῥύακας δύο ἑκατέρωθεν ἐκ τῶν πλαγίων ἕνα, ἐξ ὧν τὸ γάλα ῥεῖ· καὶ θηλάζεται ὑπὸ τῶν τέκνων παρακολουθούντων· καὶ τοῦτο ὦπται ἤδη ὑπό τινων φανερῶς. οἱ δ' ἰχθύες, ὥσπερ εἴρηται, οὔτε μαστοὺς ἔχουσιν, οὔτε αἰδοίων πόρον ἐκτὸς οὐδένα φανερόν. ἴδιον δ' ἔχουσι τό, τε τῶν βραγχίων, ᾗ τὸ ὕδωρ ἀφιᾶσι, δεξάμενοι κατὰ τὸ στόμα· καὶ τὰ πτερύγια, οἱ μὲν πλεῖστοι, τέτταρα· οἱ δὲ προμήκεις, οἷον ἐγχέλεις, δύο, ὄντα πρὸς τὰ βραγχία. ὁμοίως δὲ καὶ κεστρεῖς, οἷον ἐν Σιφαῖς οἱ ἐν τῇ λίμνῃ, δύο· καὶ ἡ καλουμένη ταινία ὡσαύτως. ἔνια δὲ τῶν προμήκων, οὐδὲ πτερύγια ἔχει, οἷον D σμύραινα· οὐδὲ τὰ βραγχία διηρθρωμένα ὁμοίως τοῖς ἄλλοις ἰχθύσιν. αὐτῶν δὲ τῶν ἐχόντων τὰ βραγχία, τὰ μὲν ἔχει ἐπικαλύμματα τοῖς βραγχίοις· τὰ δὲ σελάχη πάντα, ἀκάλυπτα. καὶ τὰ μὲν ἔχοντα καλύμματα, πάντα ἐκ πλαγίου ἔχει τὰ βραγχία· τῶν δὲ σελαχῶν, τὰ μὲν πλατέα, κάτω ἐν τοῖς ὑπτίοις, οἷον νάρκη καὶ βάτος· τὰ δὲ προμήκη, διαφόρως ἔχει ἐν τοῖς πλαγίοις, οἷον πάντα τὰ γαλεώδη. ὁ δὲ βάτραχος, ἐκ πλαγίου μὲν ἔχει, καλυπτόμενα δ' οὐκ ἀκανθώδει καλύμματι, ὥσπερ οἱ μὴ σελαχώδεις, ἀλλὰ δερματώδει. ἔτι δὲ τῶν ἐχόντων βραγχία, τῶν μὲν ἁπλᾶ ἐστὶ τὰ βραγχία, τῶν δὲ δι- E πλᾶ· τὸ δ' ἔσχατον, πρὸς τὸ σῶμα πάντων ἁπλοῦν. καὶ πάλιν, τὰ μὲν, ὀλίγα βραγχία ἔχει· τὰ δὲ, πλῆθος βραγχίων· ἴσα δ' ἐφ' ἑκάτερα πάντες. ἔχει δ' ὁ ἐλάχιστα ἔχων, ἓν ἐφ' ἑκάτερα βραγχίον διπλοῦν δὲ τοῦτο, οἷον ὁ κάπρος. οἱ δὲ, δύο ἐφ' ἑκάτερα, τὸ μὲν ἁπλοῦν, τὸ δὲ, διπλοῦν· οἷον γόγγρος καὶ σκάρος. οἱ δὲ, τέτταρα ἐφ' ἑκάτερα ἁπλᾶ· οἷον ἔλλοψ, συναγρίς, σμύραινα, ἔγχελυς. οἱ δὲ, τέτταρα μὲν, δίστιχα δὲ, πλὴν τοῦ ἐσχάτου, οἷον κίχλη, καὶ πέρκη, καὶ γλάνις, καὶ κυπρῖνος. ἔχουσι δὲ καὶ οἱ γαλεώδεις διπλᾶ πάντες, καὶ πέντε ἐφ' ἑκάτερα· ὁ δὲ ξιφίας, ὀκτὼ διπλᾶ. περὶ μὲν οὖν πλήθους βραγχίων ἐν τοῖς ἰχθύσι, τοῦτον ἔχει τὸν τρόπον.

* De partib. lib. 4. c. 13. & De inceſſu anim. c. 7.

ἔτι δὲ πρὸς τἆλλα ζῷα, οἱ ἰχθύες διαφέρουσι πρὸς τῇ διαφορᾷ τῇ περὶ τὰ βράγχια. οὔτε γὰρ, ὥσπερ τῶν πεζῶν ὅσα ζῳοτόκα, ἔχει τρίχας οὔτ', ὥσπερ ἔνια τῶν ᾠοτοκούντων τετραπόδων, φολίδας οὔτε, ὡς τὸ τῶν ὀρνίθων γένος πτερωτά· ἀλλ' οἱ μὲν πλεῖστοι αὐτῶν, λεπιδωτοί εἰσιν· ὀλίγοι δέ τινες, τραχεῖς. ἐλάχιστον δ' ἐστὶ πλῆθος αὐτῶν τὸ λεῖον. τῶν μὲν οὖν σελαχῶν τὰ μὲν τραχέα ἐστὶ, τὰ δὲ λεῖα. γόγγροι δὲ, καὶ ἐγχέλυες, καὶ θύννοι, τῶν λείων. καρχαρόδοντες δὲ πάντες οἱ ἰχθύες, ἔξω τοῦ σκάρου· καὶ πάντες ἔχουσιν ὀξεῖς τοὺς ὀδόντας, καὶ πολυστοίχους, καὶ ἔνιοι ἐν τῇ γλώττῃ. καὶ γλῶτταν σκληρὰν καὶ ἀκανθώδη ἔχουσι, καὶ προσπεφυκυῖαν οὕτως, ὥστ' ἐνίοτε μὴ δοκεῖν ἔχειν. τὸ δὲ στόμα, οἱ μὲν ἀνερρωγός, ὥσπερ [ἔνια] τῶν ᾠοτόκων καὶ τετραπόδων. τῶν δ' αἰσθητηρίων, τῶν μὲν ἄλλων οὐθὲν ἔχουσι φανερὸν, οὔτ' αὐτὸ, οὔτε τοὺς πόρους, οὔτ' ἀκοῆς οὔτ' ὀσφρήσεως. ὀφθαλμοὺς δὲ πάντες ἔχουσιν ἄνευ βλεφάρων, οὐ σκληροφθάλμους ὄντας. [βλέφαρα δὲ οὐκ ἔχουσιν.] ἔναιμον μὲν οὖν ἐστιν ἅπαν τὸ τῶν ἰχθύων γένος. εἰσὶ δ' αὐτῶν, οἱ μὲν, ᾠοτόκοι· οἱ δὲ, ζῳοτόκοι. οἱ μὲν λεπιδωτοὶ, εἰσὶ πάντες ᾠοτόκοι· τὰ δὲ σελάχη, πάντα ζῳοτόκα, πλὴν * βατράχου.

* Quid. excepta rana πλὴν βάτου.

ΚΕΦΑΛ. ιδ.

Περὶ τῶν ἔξω μορίων τῶν ὄφεων.

ΛΟιπὸν δὲ τῶν ἐναίμων ζῴων τὸ τῶν ὄφεων γένος. ἔστι δὲ κοινὸν ἀμφοῖν. τὸ μὲν γὰρ πλεῖστον αὐτῶν, χερσαῖόν ἐστιν. ὀλίγον δὲ τὸ τῶν ἐνύδρων, ὃ ἐν τοῖς ποταμίοις ὕδασι διατελεῖ. εἰσὶ δὲ καὶ θαλάττιοι ὄφεις, παραπλήσιοι τὴν μορφὴν τοῖς χερσαίοις τἆλλα· πλὴν τὴν κεφαλὴν ἔχουσι γογγροειδεστέραν. γένη δὲ πολλὰ τῶν θαλαττίων ὄφεων ἐστὶ, καὶ χρόαν ἔχουσι παντοδαπήν. οὐ γίνονται δ' οὗτοι ἐν τοῖς σφόδρα βαθέσιν. * ἄποδες δ' εἰσὶν, οἱ ὄφεις, ὥσπερ τὸ τῶν ἰχθύων γένος. εἰσὶ δὲ σκολόπενδραι θαλάτται παραπλήσιαι τὸ εἶδος ταῖς χερσαίαις· τὸ δὲ μέγεθος, μικρῷ ἐλάττους. γίνονται δὲ περὶ τοὺς πετρώδεις τόπους. τὴν δὲ χρόαν εἰσὶν ἐρυθρότεραι, καὶ πολύποδες μᾶλλον, καὶ λεπτοσκελέστεραι τῶν χερσαίων. οὐ γίνονται δ' αὗται, ὥσπερ οὐδ' οἱ ὄφεις, ἐν τοῖς βαθέσι σφόδρα. ἔστι δ' ἰχθύδιόν τι τῶν πετραίων, ὃ καλοῦσί τινες ἐχενηίδα· καὶ χρῶνταί τινες αὐτῷ πρὸς δίκας καὶ φίλτρα. ἔστι δ' ἄβρωτον. τοῦτο δ' ἔνιοι φασὶν ἔχειν πόδας, οὐκ ἔχον· ἀλλὰ φαίνεται, διὰ τὸ τὰς πτέρυγας ὁμοίας ἔχειν ποσί. τὰ μὲν οὖν ἔξω μόρια, καὶ πόσα καὶ ποῖα τῶν ἐναίμων ζῴων, καὶ τίνας ἔχει πρὸς ἄλληλα διαφορὰς, εἴρηται.

* In ſequentib. ad finem cap. multa alio ordine legit Gaza, quam in Græcis codd.

ΚΕΦΑΛ. ιε.

Περὶ τῶν ἐντὸς μορίων τῶν ἐναίμων ζῴων.

ΤΑ δ' ἐντὸς πῶς ἔχει, λεκτέον ἐν τοῖς ἐναίμοις ζῴοις πρῶτον. τοῦτο γὰρ διαφέρει τὰ μέγιστα γένη πρὸς τὰ λοιπὰ τῶν ἄλλων ζῴων, τῷ τὰ μὲν, ἔναιμα, τὰ δ', ἄναιμα εἶναι. ἔστι δὲ ταῦτα, ἄνθρωπός τε καὶ τὰ ζῳοτόκα τῶν τετραπόδων, καὶ ὄρνις, καὶ ἰχθὺς, καὶ κῆτος, καὶ εἴ τι ἄλλο ἀνώνυμόν ἐστι, διὰ τὸ μὴ εἶναι γένος,

A Sed præter brãchiarum diſcrimen, piſces à cæteris animalibus differunt, eo quòd non pilis, vt terreſtria, quæ animal generant: non cortice, vt nonnullæ oua parientes quadrupedes: non penna, vt genus auium, integuntur: ſed plurimi ſquamoſi ſunt, pauci quidam ſcabri, pauciſſimi leues. Ergo cartilagineorum alia aſpera, alia læuia ſunt. Congri etiam, & anguillæ, & thunni læues ſunt. Dentes omnia piſcium genera habent ſerratos, pectinatimque coeuntes, excepto ſcaro, ac omnia ſerie dentium acuta atque multiplici fulciuntur. In lingua etiam dentes nonnullis. Linguam autem ipſam duram, & penè ſpineam habent, & ita adhærentem, vt interdum carere lingua videantur. Os reſciſſum, vt nonnullis ouiparis quadrupedibus eſt. B Partes audiendi, odorandi, denique ſentiendi nullæ conſpicuæ, præterquam oculi habentur. Latent etiam meatus, quibus ſentire neceſſe ſit. Oculi omnibus ſine palpebris, ſed non duri. Eſt omne ſanè piſcium genus ſanguinis particeps. Diſcrimine autem partus ſic diſcrepant, vt alij oua pariant, alij animal. Pariunt oua omnes, qui ſquama conteguntur: animal omnes qui genere cartilagineo continentur, excepta rana.

CAPVT XIV.

C *De genere ſerpentum.*

REliquum ex iis quæ ſanguinem habent, animalibus, genus ſerpentum eſt, quod commune ambobus ſuperioribus eſſe poteſt. Sunt enim alij terreſtres, alij aquatiles: quanquam maxima pars ſit terreſtris, exigua verò aquatilis, ſcilicet fluminũ incola. Sunt etiam maris indigenæ ſerpentes, terreſtribus ſimiles, niſi quòd caput habeant congri. Et quidem genera eorum complura ſunt, colore numeroſæ varietatis. Naſci eos non in altiſſimis gurgitibus certum eſt. Scolopendras etiam, quas centipedes voco, maris incolas eſſe nouimus, ſpecie D terreſtribus ſimiles, magnitudine paulò minores, colore rubentiores, numero pedum copioſiores, & crurum tenuitate graciliores. Naſci locis ſaxoſis ſolent, & modo ſerpentum, non magna altitudine gurgitum. Caret pedibus genus omne ſerpentum, vt piſces. Nam remoram errore nonnulli pedes habere prodiderunt, expes enim omnino eſt. Sed quoniam pinnas habeat pedibus ſimiles, hinc fit vt pedibus inſtare videatur. Piſciculus quidam hæc eſt, ſaxis aſſuetus, in cibos non admittendus, nomẽ à remorandis nauibus adeptus, vtilis ad iudiciorum cauſas, & amatoria veneficia, vt aliqui volunt. Partes exteriores ſanguineorum animalium quænam ſint, & quot numero & quibus inter ſe differentiis E diſſonent, explicatum iam eſt.

CAPVT XV.

Quæ membra quodque animalium genus interiora ſortiatur.

NVnc interiorum ordinem perſequemur, & primùm in eo genere quod ſanguine conſtat: hac enim ratione ſumma genera à cæteris differũt, quòd hæc ſanguinea ſunt, illa exanguia. Sanguine prædita ſunt, homo, & quadrupedes, quæ animal ouúmve pariunt: atque etiam aues, piſces, cete: & ſi quid aliud vacans nomine, quoniam genus non ſit,

ſed ſpecies ſimplex in ſingulis intelligatur, vt ſerpens, vt crocodilus. Igitur quæ quadrupedes viuiparæ ſunt, iis gula atque arteria omnibus eſt, & eodem ſitu, quo homini. Ouiparis etiam quadrupedibus, atque auibus eadem illa adiuncta videmus, ſed diſcrimen ſpecies affert earum partium. Denique omnia, quæ aërem accipiunt, & reddunt, habent pulmonem, arteriam, gulam, & ſitum gulæ, atque arteriæ ſimilem, quanquam eas partes diſſimiles: pulmonem autem ne ſitu quidem ſimilem continent. Cor item omnibus eſt, quibus ſanguis, & ſeptum tranſuerſum, quod præcordia, & cinctus, appellatur: verùm hoc in minutis præ ſua tenuitate, exiguitatéque, non æquè ſpectari poteſt, niſi in corde. Peculiare eſt, quod de nonnullis bubus proditum eſt: genus enim quoddam boum ſuo in corde oſſiculum continere aiunt. at verò pulmo non omnibus datus eſt: piſces enim, & omnino quæ branchias habent, carent pulmone. Iecur in omnibus eſt, in quibus ſanguis. Lien magna ex parte omnibus, quibus ſanguis: ſed magnæ parti eorum, quæ non animal, ſed oua pariunt, lien vſq; adeo exiguus eſt vt propemodum ſenſum effugiat: quod magna in parte auium experimur: verbi cauſa, in columbis, miluis, accipitribus, noctuis.* Capriceps auis liene omnino caret. In quadrupedibus etiam ouiparis ſimilis ratio eſt: nam ea quoque admodum exiguum habent lienem: vt teſtudo, mus aquatilis, rubeta, lacerta, crocodilus, rana. Fel aliis adnectitur iecori, aliis minimè. Ex genere enim quadrupedum, quæ animal generant, ceruo, & damæ deeſſe notatum eſt: atque etiam equo, mulo, aſino, vitulo marino, & murium nonnullis. Ceruis Achainis cognomine, fel contineri in cauda creditur. Eſt, quod ibi contineri aiunt, colore quidem ſimile felli, ſed non ita vt fel humidum, ſed lieni ſimile parte interiore. Vermes tamen cerui continent omnes ſuo in capite viuos, qui naſci ſolent ſub lingua in concauo circiter vertebram, quà ceruici innectitur caput, magnitudine haud minores iis vermibus, quos maximos carnes putres ediderint. Gigni vniuerſi atque contigui ſolent numero adeo circiter viginti. Sed ceruus felle (vt dictum eſt) vacat: quanquam eius inteſtinum amarum adeò eſt, vt ne à canibus quidem attingatur, niſi ceruus præpinguis ſit. Elephanto etiam iecur ſine felle: inciſo tamen parte qua fel adhærere ſolet, humor felleus effluit plùs minùs. Delphinus, inter ea quæ mare excipiunt, pulmonémque habent, vnus felle priuatus eſt. Aues piſceéſque omnes fel habent: & quadrupedes, quæ oua pariunt, dixerim in vniuerſum, omnes aut plus aut minus fellis ſortiuntur. Sed piſciū aliis in iecore poſitum eſt, vt muſteligenis, & ſiluro, & ſquatinæ, leuitaiæ, torpedini: atque ex longis anguillæ, acui, libellæ. Pulchro etiam in iecore ineſt proportione corporis maximè omnium copioſum. aliis inteſtino annexum eſt, dependens à iecore, meatibus quibuſdam perpetuis ſummæ tenuitatis. Ergo hamiæ ſuo inteſtino pari proceſſu obductum habet, ſæpe etiam replicatum, reduxque aliquatenus. reliquis collectum inteſtinis commiſſum eſt, aut remotius à iecore, aut propius: vt ranæ, accipenſeri, dentici, murænæ, gladio.

A ἀλλ' ἁπλοῦν τὸ εἶδος ἐπὶ τῶν καθ' ἕκαστα, οἷον ὄφις καὶ κροκόδειλος. ὅσα μὲν οὖν ἐστι τετράποδα καὶ ζωοτόκα, στόμαχον μὲν ἔχουσι, καὶ ἀρτηρίαν πάντ' ἔχει, καὶ κείμενα τὸν αὐτὸν τρόπον ὥσπερ ἐν τοῖς ἀνθρώποις· ὁμοίως δὲ καὶ ὅσα ᾠοτοκεῖ τῶν τετραπόδων, καὶ ἐν τοῖς ὄρνισιν· ἀλλὰ τοῖς εἴδεσι τῶν μορίων τούτων διαφέρουσιν. ὅλως δὲ πάντα ὅσα τὸν ἀέρα δεχόμενα, ἀναπνεῖ καὶ ἐκπνεῖ, πάντ' ἔχει πνεύμονα καὶ ἀρτηρίαν, καὶ στόμαχον, καὶ τὴν θέσιν τοῦ στομάχου καὶ τῆς ἀρτηρίας ὁμοίως, ἀλλ' οὐχ ὅμοια. τὸν δὲ πνεύμονα, οὐθ' ὅμοιον, οὔτε δὲ τῇ θέσει ὁμοίως ἔχοντα. ἔτι δὲ καρδίαν ἅπαντ' ἔχει, ὅσα αἷμα ἔχει καὶ τὸ B διάζωμα, ὃ καλοῦνται φρένες· ἀλλ' ἐν τοῖς μικροῖς διὰ λεπτότητα καὶ σμικρότητα, οὐ φαίνεται ὁμοίως, πλὴν ἐν τῇ καρδίᾳ. ἴδιον δ' ἐστὶν ἐπὶ τῶν βοῶν. ἔστι γάρ τι γένος βοῶν, ἀλλ' οὐ πάντες, ὃ ἔχει ἐν τῇ καρδίᾳ ὀστοῦν. [ἔχει δὲ* καὶ ἡ τῶν ἵππων καρδία ὀστοῦν.] πνεύμονα δ' οὐ πάντα ἔχει· οἷον ἰχθὺς οὐκ ἔχει, οὐδ' ὅ τι ἄλλο τῶν ζῴων ὃ ἔχει βράγχια. καὶ ἧπαρ ἅπαντ' ἔχει, ὅσαπερ αἷμα. σπλῆνα δὲ τὰ πλεῖστα ἔχει, ὅσαπερ καὶ αἷμα. τὰ δὲ πολλὰ τῶν μὴ ζωοτοκούντων, ἀλλ' ᾠοτοκούντων, μικρὸν ἔχει τὸν σπλῆνα οὕτως, ὥστε λανθάνειν ὀλίγου τὴν αἴσθησιν, ἔν τε τοῖς ὄρνισι τοῖς πλείστοις, οἷον ἐν περιστερᾷ, καὶ ἰκτίνῳ, καὶ ἱέρα-C κι, καὶ γλαυκί· ὁ δ' αἰγοκέφαλος ὅλως οὐκ ἔχει. ἐπὶ τῶν ᾠοτόκων δὲ καὶ τετραπόδων, τὸν αὐτὸν τρόπον ἔχει. μικρὸν γὰρ πάμπαν ἔχουσι καὶ ταῦτα, οἷον χελώνη, μῦς, φρύνη, σαῦρος καὶ κροκόδειλος, καὶ βάτραχος. χολὴν δὲ τῶν ζῴων τὰ μὲν ἔχει, τὰ δ' οὐκ ἔχει, ἐπὶ τῷ ἥπατι. τῶν μὲν ζωοτόκων καὶ τετραπόδων, ἔλαφος οὐκ ἔχει, οὐδὲ πρόξ· ἔτι δὲ ἵππος, ὀρεύς, ὄνος, φώκη, καὶ τῶν μυῶν ἔνιοι. τῶν δ' ἐλάφων αἱ Ἀχαΐναι καλούμεναι, δοκοῦσιν ἔχειν ἐν τῇ κέρκῳ χολήν. ἔστι δ' ὃ λέγουσι, τὸ μὲν χρῶμα, ὅμοιον χολῇ, οὐ μέντοι ὅλον ὑγρὸν οὕτως, ἀλλ' ὅμοιον τῷ τοῦ σπληνὸς τὰ ἐντός. σκώληκας μέντοι πάντες ἔχουσιν ἐν τῇ κε-D φαλῇ ζῶντας· ἐγγίνονται δὲ ὑποκάτω τοῦ ὑπογλωττίου ἐν τῷ κοίλῳ, καὶ περὶ τὸν σφόνδυλον, ᾗ ἡ κεφαλὴ προσπέφυκε· τὸ μέγεθος οὐκ ἐλάττους ὄντες τῶν μεγίστων εὐλῶν. ἐγγίνονται δ' ἀθρόοι καὶ συνεχεῖς· τὸν ἀριθμὸν δ' εἰσὶ μάλιστα περὶ εἴκοσι. χολὴν μὲν οὖν οὐκ ἔχουσιν αἱ ἔλαφοι, ὥσπερ εἴρηται. τὸ δ' ἔντερον αὐτῶν ἐστι πικρὸν οὕτως, ὥστε μηδὲ τοὺς κύνας ἐθέλειν ἐσθίειν, ἂν μὴ σφόδρα πίων ᾖ ὁ ἔλαφος. ἔχει δὲ καὶ ὁ ἐλέφας τὸ ἧπαρ ἄχολον μέν· τεμνομένου μέντοι περὶ τὸν τόπον οὗ τοῖς ἔχουσιν ἐπιφύεται ἡ χολή, ῥεῖ ὑγρότης χολώδης, ἢ πλείων, ἢ ἐλάττων. τῶν δὲ δεχομένων τὴν θάλατταν, καὶ ἐχόντων πνεύμονα, δελ-E φὶς οὐκ ἔχει χολήν. οἱ δ' ὄρνιθες καὶ ἰχθύες, πάντες ἔχουσι, καὶ τὰ ᾠοτόκα καὶ τετράποδα, καὶ ὡς ἐπίπαν εἰπεῖν, ἢ πλείω, ἢ ἐλάττω· ἀλλ' οἱ μὲν πρὸς τῷ ἥπατι τῶν ἰχθύων, οἷον οἵ τε γαλεώδεις, καὶ γλάνις, καὶ ῥίνη, καὶ λειόβατος, καὶ νάρκη καὶ τῶν μακρῶν, ἔγχελυς, καὶ βελόνη, καὶ ζύγαινα. ἔχει δὲ καὶ ὁ καλλιώνυμος ἐπὶ τῷ ἥπατι, ὅσπερ ἔχει μεγίστην τῶν ἰχθύων, ὡς κατὰ μέγεθος. οἱ δὲ ἄλλοι πρὸς τοῖς ἐντέροις ἔχουσιν, ἀποτεταμένην ἀπὸ τοῦ ἥπατος, πόροις ἐνίοις πάνυ λεπτοῖς. ἡ μὲν οὖν ἀμία παρὰ τὸ ἔντερον, παρατεταμένην ἰσομήκη ἔχει. πολλάκις δὲ καὶ ἐπαναδίπλωμα. οἱ δ' ἄλλοι πρὸς τοῖς ἐντέροις, οἱ μὲν πορρώτερον, οἱ δ' ἐγγύτερον, οἷον βάτραχος, ἔλλοψ, συναγρίς, σμύραινα, *ξιφίας,

* Incluſa non habet Gaza.

* Poſt vocem ξιφίας additur in pleriſque codd. χελιδὼν, quod eſt ineptè, vt obſeruauit Geſnerus.

πολλάκις δὲ καὶ τὸ αὐτὸ γένος ἐπ' ἀμφότερα φαίνεται ἔχον, οἷον γόγγροι· οἱ μὲν, πρὸς τῷ ἥπατι· οἱ δὲ, κάτω ἀπηρτημένην. ὁμοίως δ' ἔχει τοῦτο καὶ ἐπὶ τῶν ὀρνίθων. ἔνιοι γὰρ πρὸς τῇ κοιλίᾳ ἔχουσιν, οἱ δὲ πρὸς τοῖς ἐντέροις τὴν χολὴν, οἷον περιστερὰ, κόραξ, ὄρτυξ, χελιδὼν, στρουθός. ἔνιοι δ', ἅμα πρὸς τῷ ἥπατι ἔχουσι καὶ πρὸς τῇ κοιλίᾳ, οἷον αἰγοκέφαλος· οἱ δ', ἅμα πρὸς τῷ ἥπατι καὶ τοῖς ἐντέροις, οἷον ἱέραξ καὶ ἰκτῖνος.

ΚΕΦΑΛ. ιϛ'.

Τίνα τῶν ζώων νεφροὺς καὶ κύστιν ἔχει.

Νεφροὺς δὲ καὶ κύστιν, τὰ μὲν ζῳοτόκα τῶν τετραπόδων πάντ' ἔχει· ὅσα δὲ ᾠοτοκεῖ, τῶν μὲν ἄλλων οὐδὲν ἔχει, οἷον οὔτ' ὄρνις οὔτ' ἰχθύς· τῶν δὲ τετραπόδων, μόνη χελώνη ἡ θαλαττία μέγεθος κατὰ λόγον τῶν ἄλλων μορίων. ὁμοίους δ' ἔχει τοὺς νεφροὺς ἡ θαλαττία χελώνη τοῖς βοείοις. ἔστι δὲ ὁ τοῦ βοὸς, οἷον ἐκ πολλῶν μικρῶν εἷς συγκείμενος. ἔχει δὲ καὶ ὁ βόνασος τὰ ἐντὸς ἅπαντα ὅμοια βοΐ. τῇ δὲ θέσει, ὅσα ἔχει, πάντα τὰ μόρια ταῦτα ὁμοίως κείμενα ἔχει.

ΚΕΦΑΛ. ιζ'.

Περὶ τῆς καρδίας καὶ στομάχου, καὶ ἥπατος, καὶ σπληνὸς, καὶ κοιλίας.

Τήν τε καρδίαν περὶ τὸ μέσον, πλὴν ἐν ἀνθρώπῳ. οὗτος δ' ἐν τῷ ἀριστερῷ μᾶλλον μέρει, καθάπερ ἐλέχθη πρότερον. ἔχει δὲ καὶ τὸ ὀξὺ ἡ καρδία πάντων εἰς τὸ πρόσθεν· πλὴν ἐπὶ τῶν ἰχθύων οὐκ ἂν δόξειεν. οὐ γὰρ πρὸς τὸ στῆθος ἔχει τὸ ὀξὺ, ἀλλὰ πρὸς τὴν κεφαλὴν, καὶ πρὸς τὸ στόμα. ἀπήρτηται δ' αὐτῶν τὸ ἄκρον εἰς ὃ συνάπτει τὰ βράγχια ἀλλήλοις, τὰ δεξιὰ καὶ τὰ ἀριστερά. εἰσὶ δὲ καὶ ἄλλοι πόροι τεταμένοι ἐξ αὐτῆς εἰς ἕκαστον τῶν βραγχίων, μείζους μὲν τοῖς μείζοσιν, ἐλάττους δὲ τοῖς ἐλάττοσιν. ὁ δ' ἐπ' ἄκρας τῆς καρδίας τοῖς μεγάλοις αὐτῶν, σφόδρα παχὺς αὐλός ἐστι καὶ λευκός. στόμαχον δ' ὀλίγοι ἔχουσι τῶν ἰχθύων, οἷον γόγγρος καὶ ἔγχελυς, καὶ οὗτοι μικρόν. καὶ τὸ ἧπαρ τοῖς ἔχουσι, τοῖς μὲν ἀσχιδὲς ἔχουσιν, [ἐστὶν] ἐν τοῖς δεξιοῖς ὅλον· τοῖς δὲ ἐσχισμένον ἀπ' ἀρχῆς, τὸ μεῖζον ἐν τοῖς δεξιοῖς. ἐνίοις γὰρ ἑκάτερον τὸ μόριον ἀπήρτηται, καὶ οὐ συμπέφυκεν ἡ ἀρχή· οἷον τῶν τε ἰχθύων τοῖς γαλεώδεσι, καὶ δασυπόδων τι γένος, ὅ ἐστι καὶ ἄλλοθι, καὶ περὶ τὴν λίμνην τὴν Βόλβην, ἐν τῇ καλουμένῃ Συκίνῃ, οὓς ἄν τις δόξειε δύο ἥπατα ἔχειν, διὰ τὸ πόρρω τοὺς πόρους συνάπτειν, ὥσπερ καὶ ἐπὶ τοῦ τῶν ὀρνίθων πνεύμονος. καὶ ὁ σπλὴν δ' ἐστὶ πᾶσιν ἐν τοῖς ἀριστεροῖς κατὰ φύσιν·* καὶ οἱ νεφροὶ, τοῖς ἔχουσι, κείμενοι τὸν αὐτὸν ἔχουσι τρόπον. ἤδη δὲ διαιρεθέν τι τῶν τετραπόδων ὤφθη ἔχον τὸν σπλῆνα μὲν ἐν τοῖς δεξιοῖς, τὸ δ' ἧπαρ ἐν τοῖς ἀριστεροῖς· ἀλλὰ τὰ τοιαῦτα, ὡς τέρατα κρίνεται. τείνει δ' ἡ μὲν ἀρτηρία πᾶσιν εἰς τὸν πνεύμονα· ὃν δὲ τρόπον, ὕστερον ἐροῦμεν. ὁ δὲ στόμαχος, εἰς τὴν κοιλίαν διὰ τοῦ διαζώματος, ὅσα ἔχει στόμαχον. οἱ γὰρ ἰχθύες, ὥσπερ εἴρηται, οἱ πλεῖστοι οὐκ ἔχουσιν, ἀλλ' εὐθὺς πρὸς τὸ στόμα συνάπτει ἡ κοιλία. διὸ πολλάκις ἐνίοις τῶν μεγάλων διώκουσι τοὺς ἐλάττους, προπίπτει ἡ κοιλία εἰς τὸ στόμα. ἔχει δὲ κοιλίαν πάντα τὰ εἰρημένα, καὶ κειμένην ὁμοίως· κεῖται γὰρ ὑπὸ τὸ διάζωμα εὐθύς· καὶ τὸ ἔντερον ἐχόμενον, καὶ τελευτῶν πρὸς τὴν ἔξοδον τῆς τροφῆς, καὶ τὸν καλούμενον ἀρχόν.

* Gaza periodi huius non meminit.

A Sæpe etiam genus idem vtrumque pariter ſitum, vt conger: aliis enim ad iecur, aliis infra ſepoſitum adhęret, quod etiam in auibus pari modo perſpectum eſt: aliis enim ventri, aliis inteſtino iungitur, vt columbæ, coruo, coturnici, hirundini, paſſeri: aliis iecori ſimul, & ventri, vt capricipiti: aliis iecori ſimul & inteſtino, vt accipitri, miluo.

CAPVT XVI.

Quæ animalia renibus & veſica carent.

Renes, atque veſicam omnes, quæ animal generant, quadrupedes poſſident. at verò ex iis quæ oua pariunt, aues piſcéſque, non habent. Qua-
B drupedum vna teſtudo marina habet magnitudine ad cæterarum partium rationem. Similes bubulis renes ei omnino adhærent, quaſi ex multis exiguis conſtituti. Bonaſus etiam interiora omnia bubus ſimilia continet. Situs idem earum partium eſt omnibus, quæ ex iis conſtant.

CAPVT XVII.

Quam corporis partem in quibuſque animantibus cor, iecur, pulmo, lien, fel & venter obtineant.

Cor prorſus in medio pectore omnibus, præterquam in homine, eſt: huic enim parti po-
C tius læuæ commiſſum eſt, vt antè expoſui. Tendit omnibus priorem in partem, ſuo turbinato mucrone, præterquam piſcibus: iis enim non ita eſſe videri poteſt, cùm eorum cor ſuum mucronem non ad pectus ſpectantem, ſed ad os habeat, extremúmque inde pendens, quà branchiæ dextræ atque ſiniſtræ inter ſe coeunt copulantúrque. Sunt etiam meatus alij de corde ad branchias tendentes ſingulas, pro deſiderio magnitudinis: hoc eſt, maioribus laxiores, minoribus arctiores: inter quos craſſa admodum & candida fiſtula eſt, quæ de cordis extremo oritur. Gula paucis in piſcibus ineſt, vt congro, anguillæ, iiſque exigua. Et iecur qui habent, ſi non fiſſum eſt, dextro latere to-
D tum continetur: ſin fiſſum à principio vſque, dextro maior pars applicata eſt. Quibuſdam enim partes ſepoſitæ ſunt, nec eadem certa origine continentur, vt inter piſces muſtelino generi, & inter quadrupedes leporum generi cuidam, quod tum alibi, tum etiam in Sycino agro circiter Bolbam lacum gignitur: quippe quos bina habere iecinora credideris, quoniam meatus procul admodum coeant: quod idem vel in pulmone ſpectare auium licet. Lien etiam parti ſiniſtræ adnectitur iecori aduerſus, ſitúque valet iuſto naturæ. Quòd ſi qua diſſecta quadrupede, lienem latere contineri dextro, iecur ſiniſtro, viſum eſt, prodigiosè id eueniſſe putandum. Tendit arteria omnibus ad pul-
E monem, quemadmodum pòſt explicabimus. Gula ad ventrem perfertur, tranſiens ſeptum tranſuerſum, ſcilicet in iis quæ habeant gulam: piſces enim magna ex parte gula carent, vt dictum eſt, vt qui annexum ſtatim ori ventrem habeant. Quocirca ſæpius euenit grandibus nonnullis, vt dum per impetum inſectantur minores, ventriculus in os procidat. Habēt omnia, quæ adhuc enumeraui, vētrem ſitu conſimili: ſepto enim tranſuerſo continuò ſubeſt, inteſtinúmque de eo porrectū finit ad exitum cibi, & eam partem, quæ podex dicitur.

Sed ventris diſſimilitudo primùm, quòd quadrupedes viuiparæ, cornigeræ, altera maxilla dentatæ, quaternos eiuſmodi habent ſinus: quæ eadem & ruminare dicuntur. Gula enim incipiens ab ore deorſum tendit ad pulmonem, ſeptúmque tranſuerſum: hinc ſe ad ventrem applicat maiorem, qui parte interiore aſper, intercæptúſque eſt, ac prope gulæ commiſſuram ſinum ſibi adnexum habet, quem ex argumento reticulum vocant: eſt enim ventri extrinſecus ſimilis, intus reticulis mulierum implexis, magnitudine multò quàm venter, minor. Hunc excipit omaſum parte interiore aſperum, cancellatum, cruſtatum, magnitudine reticuli: abomaſum venter ab eo alius iungitur, magnitudine amplior omaſo, forma oblongior, cancellis intus, & cruſtis multis magnis, & leuibus innormatus, mox inteſtinum iam ſequitur. Cornigera altera maxilla dentata, omnia ad hunc modum ſuum habere ventrem certum eſt. Sed differunt inter ſe magnitudine, aut figura, atque etiam quod gula, vel in medium ventris tendat, vel in latus vergat. at vero omnia dentata maxilla vtraque ventres ſingulos habent, vt homo, canis, ſus, vrſus, leo, lupus. Quinetiam thos, quem lupum ceruarium appellem, interna omnia lupi ſimilia habet. Is igitur omnibus ſimplex ventriculus eſt, quem excipit inteſtinum: verùm aliis amplior, vt ſui, vt vrſo: & ſuillo quidem cruſtæ læues pauciores ſunt. aliis arctior, nec multo amplior inteſtino, vt cani, leoni, homini. Cæterorum etiam ſpecies omnium reſpectu eorum quos modo enumeraui diſtinguuntur. aliis enim venter ſuillo ſimilis, aliis canino, tam in maiore quam in minore animalium genere. Sed diſcrimen in iis quoque magnitudine, figura, corpulentia exilitateve oritur: atque etiam ſitu gulæ, quo meatum ad ventrem ducat, & cœnuio iungitur foramini. Inteſtinorum etiam natura vtrique illi animalium generi, hoc eſt, vtraque dentato, & altera maxilla dentato, ibi differt magnitudine, craſſitudine, replicamentis. Sunt certe maiora omnia inteſtina non vtrinque dentatis: nec immerito, nam ipſa ita dentata omnia ſunt auctiora: pauca enim parua eo in genere habentur. Admodum paruum inter cornigera nullum eſt. Quibuſdam etiam appendices ſunt inteſtinorum. Rectum autem inteſtinum nulli eſt cui non parte vtraque dentes. Elephanto inteſtinum ita eſt ſinuoſum, vt alios habere quatuor videatur. In hoc etiam cibus recipitur: nullum enim conceptaculum cibi aliud ſeparatum adeſt. Exta quoque eidem ſuillis proxima, ſed maiora: iecur enim quadruplo maius bubulo eſt, & reliqua pari ratione, excepto liene; hic enim minor ex proportione eſt. Hæc eadem ratio ventris, inteſtinorumque vel in ouiparis quadrupedibus eſt, vt in teſtudine, tum terreſtri tum etiam marina, in lacerto, crocodilo vtroque: omnibus denique generis eiuſdem. Simplicem enim vnumque habent ventrem, aut canino aut ſuillo ſimilem. Genus ſerpentum nulla euariat ratione: & omnia fere proxima lacertis ex terreſtri ouiparo genere habere ſpectes, ſi pedes iis demas, longitudinem addas: quippe quod inteſtum cortice ſit, & prona ſupinaque perinde atque lacerti habeat, ſed teſtibus caret. Nec alio modo quàm piſces meatus duo coeuntes in idem, & vuluam longam ac bifidam habet. Cętera interna eadē ſerpentibus ſunt, quę lacertis.

A ἀνομοίας δ' ἔχουσι τὰς κοιλίας. τούτων μὲν γὰρ τῶν τετραπόδων καὶ ζῳοτόκων ὅσα μή ἐστιν ἀμφώδοντα τῶν κερατοφόρων, τέτταρας ἔχει τοὺς τοιούτους πόρους· ἃ δὴ καὶ λέγεται μηρυκάζειν. διήκει γὰρ ὁ μὲν στόμαχος, ἀπὸ τοῦ στόματος ἀρξάμενος, ἐπὶ τὰ κάτω παρὰ τὸν πλεύμονα, ἀπὸ τοῦ διαζώματος ἐπὶ τὴν κοιλίαν τὴν μεγάλην. αὕτη δ' ἐστὶ τὰ ἔσω τραχεῖα, καὶ διειλημμένη. συνήρτηται δ' αὐτῇ πλησίον τῆς τοῦ στομάχου προσβολῆς, ὁ καλούμενος κεκρύφαλος, ἀπὸ τῆς ὄψεως. ἔστι γὰρ τὰ μὲν ἔξωθεν, ὅμοιος τῇ κοιλίᾳ· τὰ δ' ἐντὸς, ὅμοιος τοῖς πλεκτοῖς κεκρυφάλοις. μεγέθει δὲ πολὺ ἐλάττων ἐστὶν ὁ κεκρύφα-
B λος τῆς κοιλίας. τούτου δ' ἔχεται ὁ ἐχῖνος, τὰ ἐντὸς ὢν τραχὺς καὶ πλακώδης· τὸ δὲ μέγεθος παραπλήσιος τῷ κεκρυφάλῳ. μετὰ δὲ τοῦτον, τὸ καλούμενον ἤνυστρόν ἐστι, τῷ μὲν μεγέθει τοῦ ἐχίνου μεῖζον, τὸ δὲ σχῆμα, προμηκέστερον. ἔχει δ' ἐντὸς πλάκας πολλὰς καὶ μεγάλας καὶ λείας. ἀπὸ δὲ τούτου τὸ ἔντερον ἤδη. τὰ μὲν οὖν κερατοφόρα καὶ μὴ ἀμφώδοντα, τοιαύτην ἔχει τὴν κοιλίαν. διαφέρει δὲ πρὸς ἄλληλα τοῖς σχήμασι καὶ τοῖς μεγέθεσι τούτων, καὶ τῷ τὸν στόμαχον εἰς μέσην ἢ πλαγίαν τείνειν τὴν κοιλίαν. τὰ δ' ἀμφώδοντα, μίαν ἔχει τὴν κοιλίαν, οἷον ἄνθρωπος, ὗς, κύων, ἄρκτος, λέων, λύκος. ἔχει δὲ καὶ ὁ θὼς πάντα τὰ
C ἐντὸς, ὅμοια λύκῳ. πάντα μὲν οὖν ἔχει μίαν κοιλίαν, καὶ μετὰ ταῦτα τὸ ἔντερον· ἀλλὰ τὰ μὲν, ἔχει μείζω τὴν κοιλίαν, ὥσπερ ὗς καὶ ἄρκτος, καὶ ἡ μὲν τῆς ὑὸς, ὀλίγας ἔχει λείας πλάκας· τὰ δὲ, πολὺ ἐλάττω, καὶ οὐ πολὺ μείζω τοῦ ἐντέρου, καθάπερ ὁ κύων, καὶ λέων, καὶ ἄνθρωπος. καὶ τῶν ἄλλων δὲ τὰ εἴδη διέστηκε πρὸς τὰς τούτων κοιλίας. τὰ μὲν γὰρ, ὑείαν ἔχει· τὰ δὲ, κυνείαν· καὶ τὰ μείζω καὶ τὰ ἐλάττω τῶν ζῴων ὡσαύτως. διαφορὰ δὲ καὶ ἐν τούτοις κατὰ τὰ μεγέθη καὶ τὰ σχήματα, καὶ πάχη καὶ λεπτότητας ὑπάρχει τῆς κοιλίας, καὶ κατὰ τοῦ στομάχου τὴν θέσιν τὴν συντρήσεως. διαφέρει δὲ καὶ ἡ τῶν ἐντέρων φύσις ἑκατέροις τῶν
D εἰρημένων ζῴων, τοῖς τε μὴ ἀμφώδουσι, καὶ τοῖς ἀμφώδουσι, τῷ τε μεγέθει καὶ πάχει, καὶ ταῖς ἐπαναδιπλώσεσι. πάντα δὲ μείζω τὰ τῶν μὴ ἀμφωδόντων ἐστί· καὶ γὰρ αὐτὰ πάντα μείζω. μικρὰ μὲν γὰρ ὀλίγα. παμμικρὸν δὲ οὐδέν ἐστι κερατοφόρον. ἔχουσι δ' ἔνια καὶ ἀποφυάδας τῶν ἐντέρων. εὐθυέντερον δὲ οὐδέν ἐστι, μὴ ἀμφῶδουν. ὁ δ' ἐλέφας ἔντερον ἔχει συμφύσεις ἔχον, ὥστε φαίνεσθαι τέτταρας κοιλίας ἔχειν· ἐν τούτῳ καὶ ἡ τροφὴ ἐγγίνεται, χωρὶς δ' οὐκ ἔχει ἀγγεῖον. καὶ τὰ σπλάγχνα δ' ἔχει παραπλήσια τοῖς ὑείοις, πλὴν τὸ μὲν ἧπαρ, τετραπλάσιον τοῦ βοείου, καὶ τἆλλα· τὸν δὲ σπλῆνα, ἐλάττω κατὰ λόγον. τὸν αὐτὸν δὲ τρόπον ἔχει καὶ
E τὰ περὶ τὴν κοιλίαν, καὶ τὴν τῶν ἐντέρων φύσιν, καὶ τοῖς τετράποσι μὲν [ἢ ζῳοτόκοις,] ᾠοτόκοις δὲ, οἷον χελώνῃ χερσαίᾳ, καὶ χελώνῃ θαλαττίᾳ, καὶ σαύρᾳ, καὶ τοῖς κροκοδείλοις ἀμφοῖν, καὶ πᾶσιν ὁμοίως τοῖς τοιούτοις. ἁπλῆν τε γὰρ ἔχουσι καὶ μίαν τὴν κοιλίαν, καὶ τὰ μὲν ὁμοίαν τῇ ὑείᾳ, τὰ δὲ τῇ τοῦ κυνός. τὸ δὲ τῶν ὄφεων γένος ὅμοιόν ἐστι, καὶ ἔχει παραπλήσια σχεδὸν πάντα τῶν πεζῶν καὶ ᾠοτόκων τοῖς σαύροις, εἴ τις μῆκος ἀποδοὺς αὐτοῖς ἀφέλοι τοὺς πόδας. φολιδωτόν τε γάρ ἐστι, καὶ τὰ πρανῆ καὶ τὰ ὕπτια παραπλήσια τούτοις ἔχει· πλὴν ὄρχεις οὐκ ἔχει, ἀλλ' ὥσπερ ἰχθῦς δύο πόρους εἰς ἓν συνάπτοντας, καὶ τὴν ὑστέραν [μακρὰν] καὶ δικρόαν.

A τὰ δ' ἄλλα τὰ ἐντὸς, τὰ αὐτὰ τοῖς σαύροις, πλὴν ἅπαντα διὰ τὴν στενότητα καὶ τὸ μῆκος, στενὰ καὶ μακρὰ τὰ σπλάγχνα ἔχει, ὥστε καὶ λανθάνειν διὰ τὴν ὁμοιότητα τῶν σχημάτων. τήν τε γὰρ ἀρτηρίαν ἔχει σφόδρα μακράν, ἔτι δὲ μακρότερον τὸν στόμαχον. ἀρχὴ δὲ τῆς ἀρτηρίας πρὸς αὐτῷ ἐστὶ τῷ στόματι, ὥστε δοκεῖν ὑπὸ ταύτην εἶναι τὴν γλῶτταν. προέχειν δὲ δοκεῖ τῆς γλώττης ἡ ἀρτηρία, διὰ τὸ συσπᾶσθαι τὴν γλῶτταν, καὶ μὴ μένειν ὥσπερ τοῖς ἄλλοις. ἔστι δ' ἡ γλῶττα λεπτὴ, καὶ μακρὰ, καὶ μέλαινα, καὶ ἐξέρχεται μέχρι πόρρω. ἰδίᾳ δὲ παρὰ τὰς τῶν ἄλλων γλώττας ἔχουσι καὶ οἱ ὄφεις καὶ οἱ σαῦροι, τὸ δικρόαν αὐτῶν εἶναι τῆς γλώττας ἄκρας, B πολὺ δὲ μάλιστα οἱ ὄφεις· τὰ γὰρ ἄκρα αὐτῶν ἐστι λεπτὰ ὥσπερ τρίχες. ἔχει δὲ καὶ ἡ φώκη ἐσχισμένην τὴν γλῶτταν. τὴν δὲ κοιλίαν ὁ ὄφις ἔχει οἷον ἔντερον εὐρυχωρέστερον, ὁμοίαν τῇ τοῦ κυνός· εἶτα τὸ ἔντερον μακρὸν καὶ λεπτὸν, καὶ μέχρι τῆς τελευτῆς ἕν. ἐπὶ δὲ τοῦ φάρυγγος ἡ καρδία μικρὰ καὶ μακρὰ, καὶ νεφροειδής· διὸ δόξειεν ἂν ἐνίοτε οὐ πρὸς τὸ στῆθος ἔχειν τὸ ὀξύ. εἶθ' ὁ πνεύμων ἁπλοῦς, ἰνώδει πόρῳ διηρθρωμένος, καὶ μακρὸς σφόδρα, καὶ πολὺ ἀπηρτημένος τῆς καρδίας. καὶ τὸ ἧπαρ μακρὸν καὶ ἁπλοῦν, σπλῆνα δὲ μικρὸν καὶ στρογγύλον, ὥσπερ καὶ οἱ σαῦροι. χολὴν δ' ἔχει ὁμοίως τοῖς ἰχθύσιν· οἱ μὲν γὰρ ὕδροι, ἐπὶ τῷ ἥπατι ἔχουσιν, οἱ δ' ἄλλοι πρὸς τοῖς ἐν- C τέροις, ὡς ἐπὶ τὸ πολύ. * καρχαρόδοντες δὲ πάντες εἰσί. πλευρὰς δ' ἔχουσιν ἴσας ταῖς ἐν τῷ μηνὶ ἡμέραις· τριάκοντα γὰρ ἔχουσι. λέγουσι δέ τινες συμβαίνειν περὶ τοὺς ὄφεις τὸ αὐτὸ, ὅπερ καὶ περὶ τοὺς νεοττοὺς τῶν χελιδόνων· ἐάν γάρ τις ἐκκεντήσῃ τὰ ὄμματα τῶν ὄφεων, φασὶ φύεσθαι πάλιν. καὶ κέρκοι δὲ ἀποτμηθεῖσαι τῶν τε σαύρων καὶ τῶν ὄφεων φύονται. ὁμοίως δὲ καὶ τοῖς ἰχθύσιν ἔχει τὰ περὶ τὰ ἔντερα καὶ τὴν κοιλίαν· μίαν γὰρ καὶ ἁπλῆν ἔχουσι, διαφέρουσαν τοῖς σχήμασιν. ἔνιοι γὰρ πάμπαν ἐντεροειδῆ ἔχουσιν, οἷον ὁ καλούμενος σκάρος, ὃς δὴ καὶ μόνος ἰχθὺς δοκεῖ μηρυκάζειν. καὶ τὸ τοῦ ἐντέρου δὲ μέγεθος ἁπλοῦν, καὶ ἀναδίπλωσιν ἔχει, ὃ ἀναλύεται εἰς ἕν. D ἴδιον δὲ τῶν ἰχθύων ἐστὶ καὶ τῶν ὀρνίθων τῶν πλείστων, τὸ ἔχειν ἀποφυάδας· ἀλλ' οἱ μὲν ὄρνιθες κάτωθεν καὶ ὀλίγας, οἱ δ' ἰχθύες ἄνωθεν περὶ τὴν κοιλίαν, καὶ ἔνιοι πολλὰς, οἷον κωβιός, γαλεός, πέρκη, σκορπίος, κίθαρος, τρίγλη, σπάρος· ὁ δὲ κεστρεὺς ἐπὶ μὲν θάτερα τῆς κοιλίας, πολλὰς, ἐπὶ θάτερα δὲ μίαν. ἔνιοι δ' ἔχουσι μὲν, ὀλίγας δὲ, οἷον ἥπατος καὶ γλαῦκος. ἔχει δὲ καὶ ὁ χρύσοφρυς ὀλίγας. διαφέρουσι δὲ καὶ αὐτοὶ αὑτῶν οἱ χρύσοφρυες· ὁ μὲν γὰρ πλείους ἔχει, ὁ δὲ ἐλάττους. εἰσὶ δὲ καὶ οἱ ὅλως οὐκ ἔχουσιν, οἷον οἱ πλεῖστοι τῶν σελαχωδῶν. τῶν δ' ἄλλων οἱ μὲν, ὀλίγας, οἱ δὲ, πάνυ πολλάς. πάντες δὲ πρὸς αὐτὴν ἔχουσι τὴν κοιλίαν τὰς ἀποφυάδας οἱ ἰχθύες. οἱ δ' E ὄρνιθες ἔχουσι [καὶ πρὸς ἀλλήλους,] [καὶ πρὸς τὰ ἄλλα ζῷα,] περὶ τὰ ἐντὸς μόρια διαφοράς. οἱ μὲν γὰρ, ἔχουσι πρὸ τῆς κοιλίας πρόλοβον, οἷον ἀλεκτρυὼν, φάσσα, περιστερὰ, πέρδιξ. ἔστι δ' ὁ πρόλοβος, δέρμα κοῖλον καὶ μέγα, ἐν ᾧ ἡ τροφὴ πρῶτον εἰσιοῦσα ἄπεπτός ἐστιν. ἔστι δ' ᾗ μὲν ἀπήρτηται ἀπὸ τοῦ στόματος, στενότερος, ἔπειτα εὐρύτερος. ᾗ δὲ καθήκει πάλιν πρὸς τὴν κοιλίαν, λεπτότερος. τὴν δὲ κοιλίαν, σαρκώδη καὶ *στιφρὰν οἱ πλεῖστοι ἔχουσι, καὶ ἐντὸς δέρμα ἰσχυρὸν καὶ ἀφαιρούμενον ἀπὸ τοῦ σαρκώδους. οἱ δὲ, πρόλοβον μὲν οὐκ ἔχουσιν, ἀλλ' ἀντὶ τούτου τὸν στόμαχον εὐρὺν καὶ πλατὺν, ἢ δι' ὅλου, ἢ πρὸς τὴν κοιλίαν τείνοντα, οἷον κολοιὸς, καὶ κόραξ, καὶ κορώνη.

* Gaz. dentes exerti omnibus ſunt, legit χαυλιόδοντες falſo. nam lib. 2. c. 1. οἱ ἰχθύες πάντες εἰσὶ καρχαρόδοντες, ait.

* [illegible]

A Verùm omnia earum viſcera propter longitudinem, & anguſtiam corporis, longa arctaque habentur, ita vt dignoſci præ ſuæ figuræ diſſimilitudine non queant. arteria namque longa admodum eſt, atque etiam gula longior. arteriæ origo ita iuxta os ipſum poſita eſt, vt etiam ſub lingua videatur: & quidem videtur linguæ præeminere, quoniam longa contrahitur, nec ceteris manet. Lingua autem ipſa tenuis, longa, & atri coloris eſt, atque ſi extrahas, porrigi longiùs poteſt. Peculiare, præter cæterorum linguas, ſerpentibus, & lacertis eſt, vt ſumma eorum lingua bifida ſit: ſed præcipuè ſerpentium, B quippe quæ tenuiſſimis quibuſdam quaſi capillamentis diſcreta vibretur. Vitulo etiam marino lingua ſciſſa eſt. Ventriculum ſerpentes, velut inteſtinum laxius habent, canino ſimilem: tum inteſtinum longum, tenue, & ad exitum vſque vniforme. Cor arteriæ poſtremæ adhæret exiguum, ſed longum, & renum ſpeciem referens: quamobrem videri interdum poteſt minùs mucronem ſuum dirigere ad pectus. Pulmo deinde adnectitur ſimplex, fibroſus, fiſtuloſus, prolongus, longéque à corde ſepoſitus. Iecur item longum & ſimplex. Sed lien exiguus, rotundúſque, vt lacertis. Fel ſimiliter atque in piſcibus habetur: natricibus enim adnexum iecori eſt, cæteris inteſtino magna ex parte adhæ- C rent. Dentes exerti omnibus ſunt. Coſtæ totidem quot dies menſem integrum complent: ſingulis enim triceenæ. Euenire ſerpentibus idem quod pullis hirundinum nonnulli aiunt: oculis enim ſerpentum laceratis, ſubnaſci alios referunt. Caudæ etiam lacertis, atque ſerpentibus amputatæ renaſcuntur. Hæc eadem ratio inteſtinorum, & ventris piſcium quoque eſt. Venter enim iis vnus, & ſimplex, ſed figura varia eſt: nonnullis enim diuerſa omnino ſpecies ventris eſt, vt ei, quem ſcarum vocant, qui & ruminare ſolus piſcium creditur. Inteſtinum etiam ſimplex replicans ſe, quod in vnum continuum- D que reſoluatur. Peculiare piſcibus, & magna ex parte auibus, appendicum agnatio eſt: ſed auibus ſubter, & paucæ, piſcibus ſupernè circa ventriculum exeunt: & nonnullis complures vt gobioni, muſtelo, percæ, ſcorpioni, fidiculæ, mullo, ſcaro, mugili: cui parte altera plures exeunt, altera vna tantùm: aliis paucæ, vt iecorino, glauco. auratæ etiam paucæ. Tum autem ipſi eiuſdem ſpeciei conſortes inter ſe differunt. auratarum enim aliis plures, aliis pauciores. Sunt etiam quibus nullæ omnino ſint, vt magnæ cartilagineorum parti: cæteris ita, vt aliis paucæ, aliis vel plurimæ habeantur. Omnes tamen piſces ad E ipſum ventrem eas appendices continent. aues & inter ſeipſas differre, & à cæteris diſcrepare animalibus, interiorum partium ratione, apertum eſt. aliis enim ingluuies præpoſita ventriculo eſt, vt gallinacco, palumbo, columbo, perdici. Ingluuies, cutis in amplum ſinuata eſt, qua primùm cibus ingeſtus continetur incoctus. Hac parte, qua iungitur gulæ, anguſtior eſt, mox amplior, tum quà deſinit in ventriculum, arctior. Ventriculus parti plurimæ carnoſus, carnoſúſque eſt, cutis intus robuſta, cruſtaciſque facilè detrahi integra poteſt. aliis ingluuies deeſt, ſed eius vice gula pertinet latior, & patentior, vel tota, vel quà propiùs ventriculum adit, vt monedulæ, coruo, cornici.

Quinetiam coturnici gula amplior infra, & capriA cipiti pars inferior paulo latior eſt, atque etiam noctuæ. Aranati, anſeri, gauiæ, cataractæ, tardæ, gula tota ampla, & lata eſt. Multis etiam aliis auibus gulam huiuſmodi eſſe perſpectum eſt. Nec deſunt quibus ventriculus ipſe ſimilis ſit ingluuiei, vt tinnunculo. Sunt item quibus neque gula, neque ingluuies amplior ſit, ſed ventriculus longior, ſcilicet auiculis omnibus, qualis paſſer, aut hirundo eſt. Sunt etiam, quamuis paucæ, quæ ingluuiei gulæque amplitudine careant, longitudine autem admodum prolixa vtantur, videlicet quæ longa anguſtaque colla habent, vt porphyrio: quæ fere omnes alui excrementum humidius, quam cæteræ ſolent, reiiciunt. Coturnici præ cæteris hæc propria ha-B bentur, vt & ingluuiem, & gulam prope ventriculum amplam & latam habeat. Diſtat ingluuies à parte gulæ propinqua ventriculo multum, pro magnitudinis proportione. Tenue quoque inteſtinum parti plurimæ auium eſt, & ſimplex reſolui poteſt. Appendices autem illæ paucæ in auibus ſunt, vt dictum eſt: nec ſuprà vt in piſcibus, ſed infrà, qua deſinit inteſtinum. Habent eas non omnes, ſed plurimæ, vt gallinaceus, perdix, anas, ciconia, aſcalaphus, anſer, olor, tarda, noctua. Minoris etiam generis nonnullæ habent, ſed perexiguè, vt paſſer.

A ἔχει δὲ καὶ ὁ ὄρτυξ τοῦ στομάχου τὸ πλατὺ κάτω, καὶ ὁ αἰγοκέφαλος μικρὸν εὐρύτερον τὸ κάτω, καὶ ἡ γλαῦξ. νῆττα δὲ καὶ χὴν, καὶ λάρος, [καὶ] καταῤῥάκτης, καὶ ὠτὶς, τὸν στόμαχον εὐρὺν καὶ πλατὺν ὅλον. καὶ ἄλλοι δὲ πολλοὶ τῶν ὀρνίθων ὁμοίως. ἔνιοι δὲ τὴν κοιλίαν αὐτὴν ἔχουσιν ὁμοίαν προλόβῳ, οἷον ἡ κεγχρηΐς. ἔστι δὲ ἃ οὐκ ἔχει οὔτε τὸν στόμαχον, οὔτε τὸν πρόλοβον εὐρὺν, ἀλλὰ τὴν κοιλίαν μακρὰν, ὅσα μικρὰ τῶν ὀρνίθων, οἷον χελιδὼν καὶ στρουθός. ὀλίγοι δ' οὔτε τὸν πρόλοβον ἔχουσιν, οὔτε τὸν στόμαχον εὐρὺν, ἀλλὰ σφόδρα μακρὸν, ὅσοι τὸν αὐχένα μακρὸν ἔχουσιν, οἷον πορφυρίων. σχεδὸν δ' οὗτοι καὶ τὸ περίττωμα ὑγρότερον τῶν ἄλλων προΐενται B πάντες. ὁ δ' ὄρτυξ ἰδίως ταῦτα ἔχει πρὸς τοὺς ἄλλους. ἔχει γὰρ καὶ πρόλοβον, καὶ πρὸ τῆς γαστρὸς τὸν στόμαχον εὐρὺν καὶ πλάτος ἔχοντα. διέχει δὲ ὁ πρόλοβος τοῦ πρὸ τῆς γαστρὸς στομάχου, συχνὸν, ὡς κατὰ μέγεθος. ἔχουσι δὲ καὶ λεπτὸν τὸ ἔντερον οἱ πλεῖστοι, καὶ ἁπλοῦν ἀναλυόμενον. τὰς δ' ἀποφυάδας ἀπολελυμένας ἔχουσιν οἱ ὄρνιθες, καθάπερ εἴρηται, ὀλίγας, καὶ οὐκ ἄνωθεν, ὥσπερ οἱ ἰχθύες, ἀλλὰ κάτωθεν κατὰ τὴν τοῦ ἐντέρου τελευτήν. ἔχουσι δ' οὐ πάντες, ἀλλ' οἱ πλεῖστοι, οἷον ἀλεκτρυὼν, πέρδιξ, νῆττα, νυκτικόραξ, *λόκαλος, [ἀσκάλαφος,] χὴν, κύκνος, ὠτὶς, γλαῦξ. ἔχουσι δὲ καὶ τῶν μικρῶν τινὲς, ἀλλὰ μικρὰ πάμπαν, οἷον στρουθός.

Suſpecta vox viris doctis. vide Geſnerū in Alcyone. Fortaſſe huc pertinet vox κόκαλος quæ eſt ſpecies quædam ἀλκυόνων. Sylburg.

C

ARISTOTELIS STAGIRITÆ, de hiſtoria animalium,

LIBER III.

CAPVT I.

De ſitu & forma genitalium membrorum omnium animantium, eorúmque differentiis.

De cæteris interioribus partibus, quótnam, aut quales ſint, & quas inter ſe habeant differentias, diD ctum iam eſt. Reſtat vt de iis quæ ad generationem miniſtrant, diſſeramus. Ergo & fœminis omnibus intus conditæ habentur: maribus autem multiplici differentia euariant. Nam inter animalia ſanguinei generis, aliis teſtes nulli omnino ſunt: aliis ſunt quidem ſed intus. Et iis quæ intus continent, aut lumbis adhærent circiter ſedem renum, aut aluo crediti ſunt. Aliis foris dependent, quibus genitale aut aluo annexum ſuſtinetur, aut demiſſum pendet cum teſtibus. Nec verò modo eodem ad aluum omnibus continetur, ſed aliter iis qui ex aduerſo mingunt, aliter iis qui ex auerſo. PiE ſcium igitur nulli ſunt teſtes, nec cæteris, quibus branchiæ, neque vlli ſerpentum, nulli denique, quod pedibus careat, niſi intra ſe formare animal poſſit. Auibus teſtes dati omnibus ſunt, non tamen qui foris pendeant, ſed qui intus adhæreant lumbis, quomodo quadrupedibus quoque ouiparis habentur, vt lacerto, teſtudini, crocodilo, & inter ea quæ animal generant, herinaceo. Quæ autẽ intus continent, iis ad aluum nectũtur, vt delphino ex iis quæ pedibus vacant: vt elephanto, ex iis quæ quadrupedes viuiparæ ſunt. Cæteris conſpicuos eſſe teſtes natura voluit. Diſcrimen autem eorum

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ ζῴων ἱστορίας τὸ γ.

ΚΕΦΑΛ. α'.

Περὶ τῶν εἰς τὴν γένεσιν συντελούντων μορίων.

ΠΕΡΙ μὲν οὖν τῶν ἄλλων μορίων τῶν ἐντὸς εἴρηται, καὶ πόσα καὶ ποῖα ἄττα, καὶ τίνας ἔχει πρὸς ἄλληλα διαφοράς. λοιπὸν δὲ περὶ τῶν εἰς τὴν γένεσιν συντελούντων μορίων εἰπεῖν. ταῦτα γὰρ τοῖς μὲν θήλεσι πᾶσιν ἐντός ἐστι· τὰ δὲ τῶν ἀρρένων, διαφορὰς ἔχει πλείους. τὰ μὲν γὰρ ὅλως τῶν ἐναίμων ζῴων, οὐκ ἔχει ὄρχεις· τὰ δὲ, ἔχει μὲν, ἐντὸς δὲ ἔχει. καὶ τῶν ἐντὸς ἐχόντων τὰ μὲν, πρὸς τῇ ὀσφύϊ ἔχει, περὶ τὸν τῶν νεφρῶν τόπον· τὰ δὲ, πρὸς τῇ γαστρί· τὰ δ', ἐκτός. καὶ τὸ αἰδοῖον τούτων τοῖς μὲν συνήρτηται πρὸς τὴν γαστέρα, τοῖς δὲ ἀπήρτηται, καθάπερ καὶ οἱ ὄρχεις· πρὸς [δὲ] τὴν γαστέρα συνήρτηται ἄλλως τοῖς τ' ἐμπροσθουρητικοῖς καὶ τοῖς ὀπισθουE ρητικοῖς. τῶν μὲν οὖν ἰχθύων οὐδεὶς ὄρχεις ἔχει, οὐδ' εἴ τι ἄλλο ἔχει βράγχια, οὐδὲ τὸ τῶν ὄφεων γένος ἅπαν, οὐδ' ὅλως ἄπουν οὐδὲν, ὅσα μὴ ζῳοτοκεῖ ἐν αὑτοῖς. οἱ δ' ὄρνιθες, ἔχουσι μὲν ὄρχεις, ἔχουσι δ' ἐντὸς πρὸς τῇ ὀσφύϊ. καὶ τῶν τετραπόδων ὅσα ᾠοτοκεῖ, τὸν αὐτὸν ἔχει τρόπον, οἷον σαύρα, καὶ χελώνη, καὶ κροκόδειλος· καὶ τῶν ζῳοτόκων, ἐχῖνος. τὰ δὲ τῶν ἐντὸς ἐχόντων, πρὸς τῇ γαστρὶ ἔχει, οἷον τῶν ἀπόδων μὲν, δελφίς· τῶν δὲ τετραπόδων καὶ ζῳοτόκων, ἐλέφας. τὰ δ' ἄλλα, φανερὰς ἔχει. ἡ δ' ἐξάρτησις ἡ πρὸς

τὴν χελιδόνα καὶ περὶ τὸν τόπον τὸν συνεχῆ, τίνα διαφορὰν ἔχει, A πρότερον εἴρηται. τοῖς μὲν γὰρ ἐκ τοῦ ὄπισθεν συνεχεῖς, καὶ οὐκ ἀπηρτημένοι εἰσίν, οἷον τῷ γένει τῷ τῶν ὑῶν· τοῖς δὲ ἀπηρτημένοι, καθάπερ τοῖς ἀνθρώποις. οἱ μὲν οὖν ἰχθύες ὄρχεις μὲν οὐκ ἔχουσιν, ὥσπερ εἴρηται πρότερον, οὐδ' οἱ ὄφεις· πόρους δὲ δύο ἔχουσιν, ἀπὸ τοῦ ὑποζώματος ἠρτημένους ἐφ' ἑκάτερα τῆς ῥάχεως, συναπτομένους εἰς ἕνα ἄνω τὸν πόρον, ἄχρι τῆς τοῦ περιττώματος ἐξόδου. τὸ δὲ ἄνωθεν λέγομεν, ὃ πρὸς τὴν ἄκανθαν. οὗτοι δὲ γίνονται περὶ τὴν ὥραν τῆς ὀχείας θοροῦ πλήρεις, καὶ θλιβομένων ἐξέρχεται τὸ σπέρμα λευκόν. αὐτοὶ δὲ πρὸς αὑτοὺς ἣν ἔχουσι διαφοράν, ἔκ τε τῶν ἀνατομῶν θεωρεῖν δεῖ, B καὶ ὕστερον λεχθήσεται ἐν τοῖς * περὶ ἕκαστον αὐτῶν ἰδίοις ἀκριβέστερον. ὅσα δ' ᾠοτοκεῖ, ἢ δίποδα ὄντα, ἢ τετράποδα, πάντ' ἔχει ὄρχεις πρὸς τῇ ὀσφύι, κάτωθεν τοῦ διαζώματος, τὰ μὲν λευκοτέρους, τὰ δ' ὠχροτέρους, λεπτοῖς πάμπαν φλεβίοις περιεχομένους. καὶ ἀφ' ἑκατέρου τείνει πόρος συνάπτων εἰς ἕνα, καθάπερ καὶ τοῖς ἰχθύσιν, ὑπὲρ τῆς τοῦ περιττώματος ἐξόδου. τοῦτο δ' ἐστὶν αἰδοῖον, ὃ τοῖς μὲν μικροῖς ἄδηλον, ἐν δὲ τοῖς μείζοσιν, οἷον ἐν χηνὶ καὶ τοῖς τηλικούτοις, φανερώτερον γίνεται, ὅταν ἡ ὀχεία πρόσφατος ᾖ. οἱ δὲ πόροι, καὶ τοῖς ἰχθύσι καὶ τούτοις προσπεφύκασι C πρὸς τῇ ὀσφύι ὑποκάτω τῆς κοιλίας καὶ τῶν ἐντέρων, μεταξὺ τῆς μεγάλης φλεβός, ἀφ' ἧς τείνουσι πόροι εἰς ἑκάτερον τῶν ὄρχεων. ὥσπερ δὲ τοῖς ἰχθύσι, περὶ μὲν τὴν ὥραν τῆς ὀχείας θορός τε φαίνεται ἐνών, καὶ οἱ πόροι σφόδρα δῆλοι· ὅταν δὲ παρέλθῃ ἡ ὥρα, ἄδηλοι καὶ οἱ πόροι ἐνίοτε· οὕτω καὶ τῶν ὀρνίθων οἱ ὄρχεις, πρὶν μὲν ὀχεύειν, οἱ μὲν μικρούς, οἱ δὲ πάμπαν ἀδήλους ἔχουσιν· ὅταν δ' ὀχεύωσι, σφόδρα μεγάλους ἔχουσιν. ἐπιδηλότατα δὲ τοῦτο συμβαίνει ταῖς φάτταις καὶ τοῖς πέρδιξιν, ὥστε οἴονται * ἐνίοτε οὐδ' ἔχειν τοῦ χειμῶνος ὄρχεις αὐτούς. τῶν δ' ἐν τῷ πρόσθεν ἐχόντων τοὺς ὄρχεις, οἱ μὲν ἐντὸς ἔχουσι πρὸς τῇ γαστρί, καθάπερ δελφίς· οἱ δέ, ἐκτὸς ἐν τῷ φανερῷ, πρὸς τῷ D τέλει τῆς γαστρός. τούτοις δὲ τὰ μὲν ἄλλα τὸν αὐτὸν ἔχει τρόπον· διαφέρουσι δέ, ὅτι οἱ μὲν αὐτῶν ἔχουσι καθ' αὑτοὺς τοὺς ὄρχεις, οἱ δ' ἐν τῇ καλουμένῃ ὀσχέᾳ, ὅσοι ἔξωθεν. αὐτοὶ δ' οἱ ὄρχεις ἐν πᾶσι τοῖς πεζοῖς καὶ ζῳοτόκοις, τόνδ' ἔχουσι τὸν τρόπον. τείνουσιν ἐκ τῆς ἀορτῆς πόροι φλεβικοί, μέχρι τῆς κεφαλῆς ἑκατέρου τοῦ ὄρχεως· καὶ ἄλλοι [δὲ] ἀπὸ τῶν νεφρῶν δύο. εἰσὶ δ' οὗτοι μέν, αἱματώδεις· οἱ δ' ἐκ τῆς ἀορτῆς, ἄναιμοι. ἀπὸ δὲ τῆς κεφαλῆς πρὸς αὐτῷ τῷ ὄρχει, πόρος ἐστὶ πυκνότερος ἐκείνου καὶ νευρωδέστερος, ὃς ἀνακάμπτει πάλιν ἐν ἑκατέρῳ τῷ ὄρχει πρὸς τὴν E κεφαλὴν τοῦ ὄρχεως. ἀπὸ δὲ τῆς κεφαλῆς, ἑκάτεροι πάλιν εἰς ταὐτὸ συνάπτουσιν, εἰς τὸ πρόσθεν ἐπὶ τὸ αἰδοῖον. οἱ δ' ἐπανακάμπτοντες πόροι, καὶ προσκαθήμενοι τοῖς ὄρχεσιν, ὑμένι περιειλημμένοι εἰσὶ τῷ αὐτῷ· ὥστε δοκεῖν ἕνα εἶναι πόρον, ἐὰν μὴ διέλῃ τὸν ὑμένα τις. ὁ μὲν οὖν προσκαθήμενος πόρος, ἔτι αἱματώδη ἔχει τὸν ὑγρόν, ἧττον μέντοι τῶν ἄνω τῶν ἐκ τῆς ἀορτῆς. ἐν δὲ τοῖς ἐπανακάμπτουσιν εἰς τὸν καυλὸν τὸν ἐν τῷ αἰδοίῳ, λευκή ἐστιν ἡ ὑγρότης. φέρει δὲ καὶ ἀπὸ τῆς κύστεως πόρος, καὶ συνάπτει ἄνωθεν πρὸς τὸν καυλόν. περὶ τοῦτον δὲ οἷον κέλυφός ἐστι τὸ καλούμενον, αἰδοῖον. θεωρείσθω δὲ τὰ εἰρημένα ταῦτα καὶ ἐκ τῆς ὑπογραφῆς τῆσδε· * * τῶν πόρων ἡ ἀρχὴ ἀπὸ τῆς ἀορτείας, ἐφ' ἧς α·

* γ. περὶ ἑκάστου

* Gaz. ἐνίοι, vel ἐνίοτε

A qui ad aluum aut locum proximum poſiti in propatulo ſunt, diximus. Aut enim hærent annexi retrò nec tremuli pendent, vt ſuibus: aut propenſi dimiſsique geruntur, vt homini. Piſces, vt modò dixi, & ſerpentes, teſtibus carent: ſed meatus continent binos, qui de ſepto exorti, latus ſpinæ vtrumque perreptent, coeantque ſupernè in vnum, atque ita ad oſtium excrementi finiant: quod enim ad ſpinam eſt, id ſuperius nomino. Pleni hi meatus humoris fœtifici redduntur tempore coitus, attritúque mutuo ſemen effluit genitale candidum. Sed quibuſnam ipſi inter ſe diſcrepent, in diſſectionibus ſpeculari oportet. Nos etiam diligentiùs pòſt exponemus, B cùm ſua ſingulis reddiderimus. Omnibus autem, quæ oua edunt, ſiue bipeda, ſiue quadrupeda ſunt, teſtes lumbis innexi infra ſeptum continentur, vel candidiores, vel pallidiores, venulis admodum tenuibus circundati. Meatus de ſingulis ſinguli pertinent, eodémque coeunt ſupra oſtium excrementi, ſicut agi in piſcibus dictum eſt: iſque meatus, qui ex coitu amborum conſiſtit, genitale eſt, quod in minoribus latet: in maioribus vero, anſerem dico, & reliqua huiuſcemodi, euidentius eſt, cùm recens inierint. Meatus autem tam iis quàm piſcibus, lumbis adhærent, ſubter aluum, ventrem, & inteſtina, inter venam C maiorem, de qua meatus ad teſtem pertinent vtrumque. Sed vt piſcibus, lentor ille prolificus tempore initus haberi ſentitur, meatúſque latiſſimè patent: vbi vero id tempus præterit, incerti vel meatus ipſi interdum redduntur: ſic auium teſtes priùs quàm coire incipiant, aliis exigui, aliis omnino obſcuri ſunt: at vero cùm Venerem exercent, inſigni tantiſper magnitudine augentur. Quod apertiſſimè palumbis & perdicibus euenit, atque ita, vt hybernis menſibus ne vllos quidem teſtes in iis haberi nonnulli arbitrentur. Quibus autem parti priori teſtes commiſſi ſunt, iis aut intus iuxta aluum conduntur, vt delphino: aut foris in aperto vltima aluo poſiti ſunt. Qui- D bus vtriſque cùm cætera ſint eadem, vnum illud diſcrimen exiſtit, quòd quæ intus continent ſuos teſtes, nulla cute habent obductos: quæ autem foris, hæc coniectos in conceptaculum, quod ſcrotum vocamus, gerunt. Teſtes verò ipſi omnibus greſſilibus viuiparis ſunt ad hunc modum. Meatus duo venales ad capita teſtium de vena aorta pertendunt, & alij totidem à renibus eôdem deueniunt: ſed hi ſanguinolenti, illi, quos mittit aorta, exangues ſunt. A capite autem ipſorum teſtium meatus excipit ſpiſſior illo ſuperiore, atque neruoſior: qui progreſſus per teſtem flectit ſeſe inde, & caput eiuſdem repetit: vnde rur- E ſus in idem coeunt, & in parte priore ſubeunt genitale. Qui caput repetunt, ipſi tam continua membrana obuelantur cum iis qui reſident, teſtibus, vt vnus eſſe meatus videantur, niſi membranæ diuortium feceris. Humorem adhuc ſanguineũ continet is qui reſidet, ſed minùs quàm illi ſuperiores. at verò qui reuerſi ceruicem ſubeũt genitalis, humorem iam habent candicantem. Quinetiã de veſica meatus perfertur, & ſe ad ceruicem applicat, quem velut puramen canaliculatum ambit id quod penem vocamus. Specta ea, quæ dixi, deſcriptione hac: Sit α initium meatuum, qui de aorta proficiſcuntur:

κκ meatus deſcendentes ad capita teſtiū: ωω qui ab iis aſſident teſtibus: ββ qui repetunt, ſcilicet quibus humor candicans continetur: Δ genitale: Ε veſica: ΨΨ teſtes. Exciſis detractiſve teſtibus meatus ſurſum ſe retrahunt. Caſtrare ſolent duobus modis: aut enim teſtes nouellos adhuc frangunt, aut adultos iam firmóſque, excîdunt. Taurum aliquando exciſum initu protinus acto, progenerasse traditum eſt. Teſtes animalium ita ſe habere cognitum eſt. Vuluæ, ſiue vteri, nec eodem ſitu habentur, nec ſimiles omnium ſunt: ſed differunt inter ſe, tum eorum quæ animal generant, tum illorum quæ oua pariunt. Habent omnes, qui iuxta genitale continentur, ſinus geminos, alterum in latere dextro, alterum in ſiniſtro. B Initium verò vnum eſt, & commune oſtium, quaſi ceruix carnoſa admodum cartilagineáque, parti plurimæ auctiſſimæque animantium tributum eſt. Pars vuluæ interior, loci, & vterus appellatur: vnde fratres vterinos cognominamus. Oſtium autem, & ceruix, matrix dicitur. Sed bipedes, atque etiam quadrupedes, quæ animal procreant, omnes vuluam, aut vterum intra ſeptum tranſuerſum continent, vt homo, canis, ſus, equus, bos. Cornigera quoque omnia ſitum habent eundem. Extrema plurimarum vuluarum, quæ cornua vocant, inuolui perſpectum eſt. At eorum, quæ oua edunt, ſitus non ſimilis omnium eſt. Sed auium vuluæ iuxta ſeptum annexæ C ſunt: piſcium infra, ſicut bipedum, aut quadrupedum, quæ animal pariunt: ſed tenues & membrana conſtantes, & longæ, ita vt in minutiſſimis piſciculis ſinum vuluæ vtrumque iungi in faciem oui vnius videatur, tanquam bina habeant oua hi piſces, quorum ouum arenidum eſt: non enim continuum, ſed quoddam arenulentum eſt: ita diffundi in multa poteſt. Vulua auium ceruicem habet carnoſam, calloſámque parte inferiore: at ſuperne, quà ſepto iungitur, membrana conſtat, & prætenuis adeo eſt, vt oua extra vuluam eſſe exiſtimes. Auibus ergo auctioribus membrana conſpectior eſt, & per ceruicem inflata extollitur, atque ſinuatur. At in minoribus D obſcuriora hæc omnia habentur. Quadrupedum quoque ouiparàrum hæc eadem ratio vuluæ eſt, vt teſtudinis, lacertæ, ranæ, & reliquorum generis eiuſdem. Enimvero ceruix vna in vno, & carnulentior eſt: fiſſura autem, & oua proxima ſepto ſuſtinentur. Necnon ea quæ in genere pedibus priuato animal edunt in lucem, poſteaquam oua inter ſe pepererunt, vt muſteli, & reliqua cartilaginea dicta, (quicquid enim inter marina pedibus orbatum, & branchias habens animal generat, ſub eo nomine intelligitur) iis vulua partita, pertinénſque ad ſeptum, quo modo auibus, eſt. Atque etiam de medio ſui bipartiti ſinus, arctior ad ſeptum vſque per- E tendit: ac oua tam hic quàm ſuprà ad ſepti originem conſiſtunt: mox prolapſa in ſpatium latius fœtus animales excludunt. Sed eorum ipſorum differentia vuluæ, qua tum inter ſe tum verò à cæteris piſcibus diſcrepent, accuratiùs per diſſectiones ſpectari figuris ſingulis poteſt. Serpentes etiam tam ab iis ſuprà dictis, quàm inter ſe differre apertum eſt. Vipera enim animal edit, poſtquam intra ſe oua peperit, cùm cætera ſerpentum omnia genera oua edant in lucem.

A κεφαλὰς τῶν ὀρχέων, ΓΓ οἱ καθήκοντες πόροι, ἐφ' οἷς κκ· οἱ ἀπὸ τούτων πρὸς τοῖς ὄρχεσι * καθήμενοι, ἐφ' οἷς τὰ ωω· οἱ δ' ἀνακάμπτοντες ἐφ' οἷς ἡ ὑγρότης ἡ λευκή, ἐφ' οἷς τὰ ββ· αἰδοῖον, Δ· κύστις, Ε· ὄρχεις δ', ἐν οἷς τὰ ΨΨ. ἀποτεμνομένων δὲ ἢ ἀφαιρουμένων τῶν ὄρχεων αὐτῶν, ἀνασπῶνται οἱ πόροι ἄνω. διαφθείρουσι δ' οἱ μὲν, ἔτι νέων ὄντων, τρίβοντες· οἱ δὲ, καὶ ὕστερον ἐκτέμνοντες. συνέβη δ' ἤδη ταῦρον ἐκτμηθέντα, καὶ εὐθὺς ἐπιβάντα, ὀχεῦσαι, καὶ γεννῆσαι. τὰ μὲν οὖν περὶ τοὺς ὄρχεις τῶν ζῴων, τοῦτον ἔχει τὸν τρόπον. αἱ δ' ὑστέραι τῶν ἐχόντων ὑστέρας ζῴων, οὔτε τὸν αὐτὸν τρόπον ἔχουσιν, οὔθ' ὅμοιαι πάντων εἰσὶν, ἀλλὰ διαφέ- B ρουσι καὶ τῶν ζῳοτοκούντων πρὸς ἄλληλα, καὶ τῶν ᾠοτοκούντων. δίκροαι μὲν οὖν εἰσιν ἁπάντων τῶν πρὸς τοῖς ἄρθροις ἐχόντων τὰς ὑστέρας· καὶ τὸ μὲν αὐτῶν, ἐν τοῖς δεξιοῖς μέρεσι, τὸ δ' ἕτερον, ἐν τοῖς ἀριστεροῖς ἐστιν. ἡ δ' ἀρχὴ μία, καὶ τὸ στόμα ἕν, οἷον καυλὸς σαρκώδης σφόδρα καὶ χονδρώδης τοῖς πλείστοις καὶ μεγίστοις. καλεῖται δὲ τούτων τὰ μὲν, ὑστέρα καὶ δελφύς, ὅθεν καὶ ἀδελφοὺς προσαγορεύουσι· μήτρα δ', ὁ καυλὸς καὶ τὸ στόμα τῆς ὑστέρας. ὅσα μὲν οὖν ἐστὶ ζῳοτόκα καὶ δίποδα καὶ τετράποδα, τούτων μὲν ἡ ὑστέρα πάντων ἐστὶ κάτω τοῦ ὑποζώματος, οἷον ἀνθρώπῳ, καὶ κυνὶ, καὶ ὑῒ, καὶ ἵππῳ, καὶ βοΐ· καὶ τοῖς κερατοφόροις ὁμοίως ταῦτ' ἔχει πᾶσιν. ἐπ' ἄκρων δὲ αἱ ὑστέραι τῶν κα- C λουμένων * κεράτων εἴλιγμα δ' ἔχουσιν αἱ τῶν πλείστων. τῶν δ' ᾠοτοκούντων εἰς τοὐμφανὲς, οὐχ ὁμοίως αἱ πάντων ἔχουσιν, ἀλλ' αἱ μὲν τῶν ὀρνίθων πρὸς τῷ ὑποζώματι, αἱ δὲ τῶν ἰχθύων, κάτω, καθάπερ αἱ τῶν ζῳοτοκούντων διπόδων καὶ τετραπόδων· πλὴν λεπταὶ καὶ ὑμενώδεις καὶ μακραί· ὥστ' ἐν τοῖς σφόδρα μικροῖς τῶν ἰχθύων δοκεῖν ἑκατέραν ᾠὸν εἶναι ἕν, ὡς δύο ἐχόντων ᾠὰ τῶν ἰχθύων τούτων, ὅσων λέγεται τὸ ᾠὸν εἶναι ψαθυρόν. ἔστι γὰρ οὐχ ἕν, ἀλλὰ πολλά· διόπερ διαχεῖται εἰς πολλά. ἡ δὲ τῶν ὀρνίθων ὑστέρα, κάτωθεν μὲν ἔχει τὸν καυλὸν σαρκώδη * καὶ στιφρόν· τὸ δὲ πρὸς τῷ ὑποζώματι, ὑμενῶδες καὶ λεπτὸν πάμ- D παν· ὥστε δόξαι ἂν ἔξω τῆς ὑστέρας εἶναι τὰ ᾠά. ἐν μὲν οὖν τοῖς μείζοσι τῶν ὀρνίθων, δῆλός ἐστιν ὁ ὑμὴν μᾶλλον, καὶ φυσώμενος διὰ τοῦ καυλοῦ, αἴρεται καὶ κολποῦται ὁ ὑμήν· ἐν δὲ τοῖς μικροῖς ἀδηλότερα ταῦτα πάντα. τὸν αὐτὸν δὲ τρόπον ἔχει ἡ ὑστέρα καὶ ἐν τοῖς τετράποσι μὲν τῶν ζῴων, ᾠοτόκοις δὲ, οἷον χελώνῃ, καὶ σαύρᾳ, καὶ βατράχοις, καὶ τοῖς ἄλλοις τοῖς τοιούτοις. ὁ μὲν γὰρ καυλὸς κάτωθεν εἷς καὶ σαρκωδέστερος· ἡ δὲ σχίσις καὶ τὰ ᾠὰ, ἄνω πρὸς τῷ ὑποζώματι. ὅσα δὲ τῶν ἀπόδων εἰς τὸ φανερὸν μὲν ζῳοτοκεῖ, ἐν αὑτοῖς δ' ᾠοτοκεῖ, οἷον οἵ τε γαλεοὶ, καὶ τἆλλα τὰ καλούμενα σελάχη (καλεῖται δὲ σέλαχος, ὃ ἂν ἄπουν ὂν, καὶ βράγχια ἔχον, ζῳοτόκον ᾖ) τούτων E δὴ, δίκροα μὲν ἡ ὑστέρα· ὁμοίως δὲ καὶ πρὸς τὸ ὑπόζωμα τείνει, καθάπερ καὶ τῶν ὀρνίθων. ἔτι δὲ διὰ μέσου τῶν δικρόων κάτωθεν ἀρξαμένη, μέχρι πρὸς τὸ ὑπόζωμα τείνει· καὶ τὰ ᾠὰ ἐνταῦθα γίγνεται, καὶ ἄνω ἐπ' ἀρχῇ τοῦ ὑποζώματος· εἶτα προελθόντα εἰς τὴν εὐρυχωρίαν, ζῷα γίγνεται ἐκ τῶν ᾠῶν. αὐτῶν δὲ τούτων πρὸς ἄλληλά τε καὶ πρὸς τοὺς ἄλλους ἰχθῦς ἡ διαφορὰ τῶν ὑστερῶν, ἀκριβέστερον ἂν θεωρηθείη τοῖς σχήμασιν ἐκ τῶν ἀνατομῶν. ἔχει καὶ τὸ τῶν ὄφεων γένος πρός τε ταῦτα καὶ πρὸς ἄλληλα διαφοράν. τὰ μὲν γὰρ ἄλλα γένη τῶν ὄφεων, ᾠοτοκεῖ· ἔχις δὲ, ζῳοτοκεῖ μόνον, ᾠοτοκήσασα ἐν αὑτῇ πρότερον·

* κ. προσκαθήμενοι.

* κ. κεράτων. Gaz. ſublata diſtinctione poſt κεράτων, εἴλιγμα ἔχ. vel εἰλίγματα legiſſe videtur.

* κ. στερεόν.

διὸ παραπλησίως ἔχει τὰ περὶ τὴν ὑστέραν τοῖς σελάχεσιν. ἡ δὲ τῶν ὄφεων ὑστέρα μακρά, καθάπερ τὸ σῶμα, τείνει, κάτωθεν ἀρξαμένη ἀφ' ἑνὸς πόρου συνεχής, ἔνθεν καὶ ἔνθεν τῆς ἀκάνθης, οἷον πόροι ἑκάτεροι ὤν, μέχρι πρὸς τὸ ὑπόζωμα, ἐν ᾗ τὰ ᾠὰ κατὰ στοῖχον ἐγγίνεται, καὶ ἐκτίκτει οὐ καθ' ἕν, ἀλλὰ συνεχές. ἔχει δὲ τὴν ὑστέραν, ὅσα μὲν ζωοτοκεῖ, καὶ ἐν αὑτοῖς, καὶ εἰς τοὐμφανές, ἄνωθεν τῆς κοιλίας· ὅσα δὲ ᾠοτοκεῖ, πάντα κάτωθεν πρὸς τῇ ὀσφύϊ. ὅσα δὲ εἰς τὸ φανερὸν μὲν ζωοτοκεῖ, ἐν αὑτοῖς δ' ᾠοτοκεῖ, ἐπαμφοτερίζει. τὸ μὲν γὰρ κάτωθεν [καὶ] πρὸς τὴν ὀσφὺν αὐτῆς μέρος ἐστίν, ἐν ᾧ τὰ περὶ τὰ ᾠά· τὸ δέ, περὶ τὴν ἔξοδον ἐπάνω τῶν ἐντέρων. ἔτι δὲ διαφορὰ καὶ ἥδε πρὸς ἀλλήλας ἐστὶ τῶν ὑστερῶν. τὰ μὲν γὰρ κερατοφόρα καὶ μὴ ἀμφόδοντα, ἔχει κοτυληδόνας ἐν τῇ ὑστέρᾳ, ὅταν ἔχῃ τὸ ἔμβρυον· καὶ τῶν ἀμφοδόντων, οἷον δασύπους, καὶ μῦς, καὶ νυκτερίς· τὰ δ' ἄλλα τὰ ἀμφόδοντα καὶ ζωοτόκα, καὶ ὑπόποδα, πάντα λείαν ἔχει τὴν ὑστέραν· καὶ ἡ τῶν ἐμβρύων ἐξάρτησις, ἐξ αὐτῆς ἐστὶ τῆς ὑστέρας, ἀλλ' οὐκ ἐκ κοτυληδόνος. τὰ μὲν οὖν ἀνομοιομερῆ ἐν τοῖς ζῴοις μέρη, τοῦτον ἔχει τὸν τρόπον, καὶ τὰ ἐκτὸς καὶ τὰ ἐντός.

ΚΕΦΑΛ. ϐ.

Ἀρχὴ τοῦ περὶ τῶν ὁμοιομερῶν. καὶ πρῶτον περὶ αἵματος καὶ φλεβῶν τὰ ὑπὸ Συεννέσιος καὶ Διογένους εἰρημένα.

ΤΩν δ' ὁμοιομερῶν, κοινότατον μέν ἐστι τὸ αἷμα πᾶσι τοῖς ἐναίμοις ζῴοις, καὶ τὸ μόριον ἐν ᾧ πέφυκεν ἐγγίνεσθαι· τοῦτο δὲ καλεῖται φλέψ. ἔπειτα δέ, τὸ ἀνάλογον τούτοις, ἰχὼρ καὶ ἶνες· καὶ ὃ μάλιστά ἐστι τὸ σῶμα τῶν ζῴων, ἡ σάρξ, καὶ τὸ τούτῳ ἀνάλογον ἐν ἑκάστῳ μόριον· ἔτι ὀστοῦν, καὶ τὸ ἀνάλογον τούτῳ, οἷον ἄκανθα, καὶ χόνδρος. ἔτι δέρμα, ὑμήν, νεῦρα, τρίχες, ὄνυχες, καὶ τὰ ὁμολογούμενα τούτοις. πρὸς δὲ τούτοις, πιμελή, στέαρ, καὶ τὰ περιττώματα· ταῦτα δ' ἐστὶ κόπρος, φλέγμα, καὶ χολὴ ξανθὴ καὶ μέλαινα. ἐπεὶ δ' ἀρχῇ ἔοικεν ἡ τοῦ αἵματος φύσις καὶ ἡ τῶν φλεβῶν, πρῶτον περὶ τούτων λεκτέον, ἄλλως τε καὶ ἐπεὶ τῶν πρότερον εἰρηκότων τινὲς οὐκ ἀληθῶς λέγουσιν. αἴτιον δὲ τῆς ἀγνοίας, τὸ δυσθεώρητον αὐτῶν. ἐν μὲν γὰρ τοῖς τεθνεῶσι τῶν ζῴων, ἄδηλος ἡ φύσις τῶν κυριωτάτων φλεβῶν, διὰ τὸ συμπίπτειν εὐθὺς ἐξιόντος τοῦ αἵματος, μάλιστα ταύτας· (ἐκ τούτων γὰρ ἐκχεῖται ἀθρόον, ὥσπερ ἐξ ἀγγείου. καθ' αὑτὸ γὰρ οὐδὲν ἔχει αἷμα, πλὴν ὀλίγον ἐν τῇ καρδίᾳ· ἀλλὰ τὸ πᾶν ἐστιν ἐν ταῖς φλεψίν.) ἐν δὲ τοῖς ζῶσιν, ἀδύνατόν ἐστι θεάσασθαι πῶς ἔχουσιν. ἐντὸς γὰρ ἡ φύσις αὐτῶν· ὥσθ' οἱ μὲν ἐν τεθνεῶσι καὶ διῃρημένοις τοῖς ζῴοις θεωροῦντες, τὰς μεγίστας ἀρχὰς οὐκ ἐθεώρουν· οἱ δ' ἐν τοῖς λελεπτυσμένοις σφόδρα ἀνθρώποις, ἐκ τῶν τότε ἔξωθεν φαινομένων, τὰς ἀρχὰς τῶν φλεβῶν διώρισαν. Συέννεσις μὲν ὁ Κύπριος ἰατρὸς τόνδε τὸν τρόπον· Αἱ φλέβες αἱ παχεῖαι ὧδε πεφύκασιν· ἐκ τοῦ ὀφθαλμοῦ παρὰ τὴν ὀφρὺν διὰ τοῦ νώτου, παρὰ τὸν πλεύμονα ὑπὸ τοὺς μαστούς· ἡ μέν, ἐκ τοῦ δεξιοῦ εἰς τὰ ἀριστερά· ἡ δ', ἐκ τοῦ ἀριστεροῦ, εἰς τὰ δεξιά. ἡ μὲν ἐκ τοῦ ἀριστεροῦ, διὰ τοῦ ἥπατος εἰς τὸν νεφρὸν καὶ εἰς τὸν ὄρχιν· ἡ δ' ἐκ τοῦ δεξιοῦ, εἰς τὸν σπλῆνα, καὶ νεφρόν, καὶ ὄρχιν· ἐντεῦθεν δὲ εἰς τὸ αἰδοῖον. Διογένης δὲ ὁ Ἀπολλωνιάτης, τάδε λέγει·

A Quo fit vt viperæ vni vulua ſimilis vt cartilagineis ſit. Tendit porrò ſerpentibus vulua prolixior, modo corporis exorſa inferiùs, vno continua meatu, diductáque in latus ſpinæ vtrumque, quaſi duplex meatus vſque ad ſeptum: in qua oua ordinatim gignuntur, & edi inde non ſingulatim, ſed iunctim continente ſolent. Vulua omnibus, quæ & intra ſe, & foras animal generant, ſupra aluum poſita eſt: quæ oua pariunt, iis infrà, lumbis adhærens. Quæ animal edunt in lucem, cùm intra ſe oua generarunt, iis anceps ratio eſt: nam & infrà lumbis adiungitur ea pars vuluæ, qua oua continentur, & ſupra inteſtina oſtium eius ſuſtinetur. Ad hæc diſcrimen vuluarum eſt, quòd cornigera, &
B vna parte dentata, acetabula habent vuluæ, dum partum gerunt: atque etiam parte vtraque dentatorum, lepus, mus, veſpertilio, eadem illa acetabula ſuis continent locis. At cætera vtrinque dentata animalia, fœcunda, pedibus prædita, vuluam læuem omnia habent, & partus ipſi vuluæ, non acetabulis adhæret. Partes diſſimilares animalium interiores exterioreſque, hunc in modum haberi cognitum eſt.

CAPVT II.

De partibus animalium ſimilaribus, ibique Syenneſis Cyprij Diogeniſque Apolloniatæ opiniones de ſanguine, & venis.

C SImilarium ſanguis potiſſimùm communis animalibus ſanguineis omnibus eſt, nec minus communis ea pars eſt, qua ſanguis continetur, quæ vena dicitur. Locum autem communitatis ſecundum obtinent ea quæ iis proportionentur, hoc eſt, ſanies, & fibra, atque etiam caro, quod præcipuè corpus animalium ineſt. Os item, & quod vice fungitur oſſis, vt ſpina, & cartilago. Adde communitati eiuſmodi, cutem, membranam, neruos, vngues, pilos, & quæ iis ex proportione reſpondeant. Ad hæc, adipem, ſebum, atque excrementa, ſtercus dico, pituitam, bilem
D tum flauam, tum etiam atram. Sed cùm natura ſanguinis, venarúmque, principium eſſe videatur, primùm de iis differendum eſt: præſertim cùm autores nonnullos ex iis qui res eas tractarunt, minùs rectè dixiſſe intelligam. Cauſa verò ignorationis, occultationi earum partium, ac perdifficili contuitui tribuenda eſt: nam in animalibus mortuis natura venarum principaliorum abolетur, propterea quòd ipſæ in primis effluente ſanguine langueſcant, & collabantur. Ex iis enim quaſi vaſe, vniuerſus ſanguis effunditur: quippe qui omnis in venis contineatur, præter exiguum qui in corde eſt. In viuis autem fieri non poteſt, vt quemadmodum habeant, cernantur: intus enim
E natura earum occultatur. Itaque alij cùm in cadaueribus diſſectis inſpicerent, ſumma principia cernere nequiuerunt. Alij in hominibus admodum extenuatis, per ea, quæ extrinſecus viderentur, interna venarum principia definiere. Syenneſis medicus Cyprius ita ſcribit: *Venæ corporis craſſiores oriuntur ad hunc modum, & tendunt de oculo propter ſupercilium, per dorſum ad pulmonem ſub mammis. altera de latere dextro ad ſiniſtrum, altera de ſiniſtro in dextrum: & altera per iecur in renem ac teſtem: altera ad lienem, & renem, & teſtem: poſtremò ad genitale perfertur.* Diogenes Apolloniata hæc

Venas hominis conſtare ad hunc modum novimus: duæ maximæ habentur, quæ per ventriculum propter dorſi ſpinam protendunt, altera dextrorſum, altera ſiniſtrorſum, utraque ad pedem ſibi ſubiectum: & in caput eædem per iugulum propter humeros efferuntur, hinc ſparſa ramorum ſerie, aliæ minores membris omnibus ſanguinem riuant, de dextra dextrorſum, de ſiniſtra ſiniſtrorſum. Maxime autem illæ duæ cor adeant, circa ipſam ſpinam dorſi: alteræ item duæ paulo ſuperius per pectus ſub ala utramque in manum diſpeſſatæ pertendunt, quarum altera lienaria, altera iecoraria vocatur. Harum poſtrema ita ſcinduntur, ut parte pollicem adeant, parte volam: tamen ex iis ramorum tenuiorum frequentia in digitos manumque ſpargitur totam. Propagines tenuiores à primis venis mittuntur, à dextra ad iecur, à ſiniſtra ad lienem, & renes. Quæ autem pertinent ad pedes, ſcinduntur qua femur iungitur, tenduntque per totum femur: quarum maxima femur ex averſo perrepiat, craſſaque apparet: altera paulo interius, minus craſſa procedit per femur: tum propter genu tendunt ad crus, pedemque imum, quo modo ad manus: hinc ſubeunt plantam, & ſe ſpargunt in digitos. Complures etiam tenues de eiſdem illis ad ventrem & coſtas ſparſæ obrepunt. quæ porrectæ per iugulum petunt caput, apparentque craſſiuſculæ in cervice: quarum extrema, ſiſſura multiplici permeant per caput, dextra dextrorſum, ſiniſtra ſiniſtrorſum, atque utraque ad aurem deſinunt. Sunt præterea venæ collo commiſſæ iuxta maiorem, paulo minores, utraque ex latere tranſeuntes, ad quas plurima illarum capitis pars contendit: quæ immerſæ per iugulum mittunt alias ad ſcapulas, & manus. Apud lienariam etiam, & iecorariam aliæ paulo minores apparent, quibus adigere cultellum ſolemus, quoties aliquid ſub cute affligit. At ſi quid circa ventrem infeſtat, ſanguinem ex iecoraria & lienaria mittimus. Quinetiam ad mammas hinc aliæ pertinent. Sunt item quæ de utraque perferantur ad teſtes, per dorſi medullam, tenues: atque etiam aliæ, quæ ſubdita cuti tendant per carnem ad renes, ceſſentque ad teſtes, viris, ad uterum, mulieribus. Prodeunt primo à ventriculo ampliores: tum attenuantur, dum de parte dextra in lævam, indeque tranſeant ad dextram, quæ ſeminariæ nominantur. Sanguis craſſior à carne ebibitur: ſed cum ad loca devenerit, tenuis redditur, & calidus, & ſpumoſus. Syenneſis ac Diogenes ita.

A αἱ δὲ φλέβες ἐν τῷ ἀνθρώπῳ ὧδ' ἔχουσιν· εἰσὶν αἱ δύο μέγισται. αὗται τείνουσι διὰ τῆς κοιλίας ἐπὶ τὴν νωτιαίαν ἄκανθαν· ἡ μὲν, ἐπὶ δεξιά· ἡ δ', ἐπ' ἀριστερά. εἰς τὰ σκέλη ἑκατέρα τὰ παρ' ἑαυτῇ, καὶ ἄνω εἰς τὴν κεφαλὴν παρὰ τὰς κλειδας διὰ τῶν σφαγῶν. ἀπὸ δὲ τούτων καθ' ἅπαν τὸ σῶμα αἱ φλέβες διατείνουσιν· ἀπὸ μὲν τῆς δεξιᾶς, ἐπὶ τὰ δεξιά· ἀπὸ δὲ τῆς ἀριστερᾶς, ἐπὶ τὰ ἀριστερά. μέγισται μὲν δύο εἰς τὴν καρδίαν, περὶ αὐτὴν τὴν νωτιαίαν ἄκανθαν· ἕτεραι δ' ὀλίγον ἀνωτέρω, διὰ τῶν στηθῶν ὑπὸ τὴν μασχάλην, εἰς ἑκατέραν [τὴν χεῖρα] τὴν παρ' ἑαυτῇ· καὶ καλεῖται ἡ μὲν, σπληνῖτις, ἡ
B δὲ, ἡπατῖτις. σχίζεται δ' αὐτῶν ἄκρα ἑκατέρα, ἡ μὲν, ἐπὶ τὸν μέγαν δάκτυλον, ἡ δὲ, ἐπὶ τὸν ταρσόν. ἀπὸ δὲ τούτων, λεπταὶ καὶ πολύοζοι ἐπὶ τὴν ἄλλην χεῖρα καὶ δακτύλους. ἕτεραι δὲ λεπτότεραι ἀπὸ τῶν πρώτων φλεβῶν τείνουσιν, ἀπὸ μὲν τῆς δεξιᾶς εἰς τὸ ἧπαρ, ἀπὸ δὲ τῆς ἀριστερᾶς εἰς τὸν σπλῆνα, καὶ εἰς τοὺς νεφρούς. αἱ δὲ εἰς τὰ σκέλη τείνουσαι, σχίζονται κατὰ τὴν πρόσφυσιν, καὶ διὰ παντὸς τοῦ μηροῦ τείνουσιν. ἡ δὲ μεγίστη αὐτῶν, ὄπισθεν τείνει τοῦ μηροῦ, καὶ ἐκφαίνεται παχεῖα· ἑτέρα δὲ, εἴσω τοῦ μηροῦ,* παχεῖα, μικρὸν ἧττον ἐκείνης. ἔπειτα παρὰ τὸ γόνυ τείνουσιν εἰς τὴν κνήμην τε καὶ τὸν πόδα, καθάπερ καὶ εἰς τὰς χεῖρας· καὶ ἐπὶ τὸν ταρσὸν τοῦ
C ποδὸς καθήκουσι, καὶ ἐντεῦθεν ἐπὶ τοὺς δακτύλους διατείνουσι. σχίζονται δὲ ἐπὶ τὴν κοιλίαν καὶ ἐπὶ τὸ πλευρὸν, πολλαὶ ἀπ' αὐτῶν καὶ λεπταὶ φλέβες. αἱ δὲ εἰς τὴν κεφαλὴν τείνουσαι διὰ τῶν σφαγῶν, φαίνονται ἐν τῷ αὐχένι μεγάλαι. ἀφ' ἑκατέρας δ' αὐτῶν, ᾗ τελευτᾷ, σχίζονται εἰς τὴν κεφαλὴν πολλαί· αἱ μὲν, ἐκ τῶν δεξιῶν εἰς τὰ ἀριστερά· αἱ δ', ἐκ τῶν ἀριστερῶν εἰς τὰ δεξιά. τελευτῶσι δὲ παρὰ τὸ οὖς ἑκάτεραι. ἔστι δ' ἑτέρα φλὲψ ἐν τῷ τραχήλῳ παρὰ τὴν μεγάλην ἑκατέρω-
D θεν, ἐλάττων ἐκείνης ὀλίγον, εἰς ἣν αἱ πλεῖσται ἐκ τῆς κεφαλῆς* συνέχουσιν αὐτῆς· καὶ αὗται τείνουσι διὰ τῶν σφαγῶν εἴσω· καὶ ἀπ' αὐτῶν ἑκατέρας* ἐπὶ τὴν ὠμοπλάτην τείνουσι, καὶ εἰς τὰς χεῖρας. καὶ φαίνονται παρά τε τὴν σπληνῖτιν καὶ τὴν ἡπατῖτιν ἕτεραι ὀλίγον ἐλάττους,* ἃς ἀποσχῶσιν, ὅταν τι ὑπὸ τὸ δέρμα λυπῇ· ἂν δέ τι περὶ τὴν κοιλίαν, τὴν ἡπατῖτιν καὶ σπληνῖτιν. τείνουσι δὲ καὶ εἰς τοὺς μαστοὺς ἀπὸ τούτων ἕτεραι. ἕτεραι δ' εἰσὶν αἱ ἀπὸ ἑκατέρας τείνουσαι διὰ τοῦ νωτιαίου μυελοῦ εἰς τοὺς ὄρχεις, λεπταί. ἕτεραι δ' ὑπὸ τὸ δέρμα, καὶ διὰ τῆς σαρκὸς, τείνουσιν εἰς τοὺς νεφρούς, καὶ τελευτῶσιν εἰς τοὺς ὄρχεις τοῖς ἀνδράσι, ταῖς δὲ γυναιξὶν εἰς τὰς ὑστέρας. αἱ δὲ φλέβες, αἱ μὲν πρῶται, ἐκ τῆς κοιλίας, εὐρύτεραι εἰσίν· ἔπειτα δὲ λεπτότεραι γίνονται, ἕως ἂν μεταβάλλωσιν ἐκ τῶν δεξιῶν εἰς τὰ ἀριστερά, καὶ ἐκ τούτων εἰς τὰ δεξιά. αὗται δὲ σπερματίτιδες καλοῦνται. τὸ δ' αἷμα, τὸ μὲν παχύτατον ὑπὸ τῶν σαρκωδῶν ἐκπίνεται· ὑπερβάλλον δὲ εἰς τοὺς τόπους τούτους, λεπτὸν καὶ θερμὸν καὶ ἀφρῶδες γίνεται. Συέννεσις μὲν οὖν καὶ Διογένης οὕτως εἰρήκασι.

* Gaza, τι μικρὸν ἧττον ὤν.

* γρ. συνέχουσιν αὐτῆς.

* γρ. ὑπὸ τὴν.

* γρ. αἱ ἀποσχάζουσιν, ὅταν τι ὑπόδερμα λυπῇ. ex gloſſa & mendo conflata lectione.

E

CAPVT III.

Polybi ſententia de venarum ordine: ibique falſarum opinionum refutatio.

POlybius hæc. *Venarum paria quatuor habentur: primum quod à ſincipite ortum tendit per cervicem, ſumma perreptans latera ſpinæ, ad clunes, & crura: deinde per tibias ad malleolos exteriores, & pedes.*

ΚΕΦΑΛ. γ΄.

Πολύβου δόξα περὶ φλεβῶν· εἶτα τίνα τρόπον τὰ ἄνωθεν τῆς καρδίας ἔχουσιν αἱ φλέβες.

ΠΟλυβος δ' ὧδε. Τὰ τῶν φλεβῶν τέτταρα ζεύγη ἐστίν. ἓν μὲν, ἀπὸ τοῦ ὄπισθεν τῆς κεφαλῆς, διὰ τοῦ αὐχένος, ἔξωθεν παρὰ τὴν ῥάχιν ἔνθεν καὶ ἔνθεν, μέχρι τῶν ἰσχίων εἰς τὰ σκέλη. ἔπειτα διὰ τῶν κνημῶν ἐκ τῶν σφυρῶν εἰς τὸ ἔξω, καὶ εἰς τοὺς πόδας.

διὸ καὶ τὰς φλεβοτομίας ποιοῦνται τῶν περὶ τὸν νῶτον ἀλγημάτων καὶ * ἰσχίου, ἀπὸ τῶν ἰγνύων καὶ σφυρῶν τῶν ἔξωθεν. ἕτεραι δὲ φλέβες, ἐκ τῆς κεφαλῆς παρὰ τὰ ὦτα διὰ τοῦ αὐχένος· αἳ καλοῦνται σφαγίτιδες, ἔσωθεν παρὰ τὴν ῥάχιν ἑκάτεραι φέρονται παρὰ τὰς ψόας εἰς τοὺς ὄρχεις καὶ εἰς τοὺς μηρούς, καὶ διὰ τῆς ἰγνύος τῆς ἐντὸς μερίδος, καὶ διὰ τῶν κνημῶν ἐπὶ τὰ σφυρὰ τὰ εἴσω καὶ τοὺς πόδας. διὸ καὶ τὰς φλεβοτομίας ποιοῦνται, τῶν περὶ τὰς ψόας καὶ τοὺς ὄρχεις ἀλγημάτων, ἀπὸ τῶν ἰγνύων καὶ τῶν σφυρῶν. ἡ δὲ τρίτη συζυγία, ἐκ τῶν κροτάφων διὰ τοῦ αὐχένος, ὑπὸ τὰς ὠμοπλάτας, εἰς τὸν πλεύμονα ἀφικνοῦνται· αἱ μὲν, ἐκ τῶν δεξιῶν εἰς τὰ ἀριστερὰ ὑπὸ τὸν μαστὸν, καὶ εἰς τὸν σπλῆνά τε, καὶ εἰς τὸν νεφρόν· αἱ δ', ἀπὸ τῶν ἀριστερῶν εἰς τὰ δεξιὰ ἐκ τοῦ πλεύμονος ὑπὸ τὸν μαστὸν καὶ ἧπαρ, καὶ εἰς τὸν νεφρόν· ἀμφότεραι δὲ τελευτῶσιν εἰς τὸν ὄρχιν. αἱ δὲ τέταρται, ἀπὸ τοῦ ἔμπροσθεν τῆς κεφαλῆς, καὶ τῶν ὀφθαλμῶν, ὑπὸ τὸν αὐχένα καὶ τὰς κλεῖδας· ἐντεῦθεν δὲ τείνουσι διὰ τῶν βραχιόνων ἄνωθεν εἰς τὰς καμπάς, εἶτα διὰ τῶν πηχέων ἐπὶ τοὺς καρποὺς καὶ τὰς συγκαμπάς, καὶ διὰ τῶν βραχιόνων τῆς κάτω μερίδος, ὑπὸ τὰς μασχάλας ἐπὶ τὰς πλευρὰς ἄνωθεν, ἕως ἡ μὲν ἐπὶ τὸν σπλῆνα, ἡ δ' ἐπὶ τὸ ἧπαρ ἀφίκηται· εἶθ' ὑπὲρ τῆς γαστρὸς, εἰς τὸ αἰδοῖον ἀμφότεραι τελευτῶσι. τὰ μὲν οὖν ὑπὸ τῶν ἄλλων εἰρημένα, σχεδὸν ταῦτ' ἐστίν. εἰσὶ δὲ καὶ τῶν περὶ φύσιν, οἳ τοιαύτην μὲν οὐκ ἐπραγματεύθησαν ἀκριβολογίαν περὶ τὰς φλέβας, πάντες δ' ὁμοίως τὴν ἀρχὴν αὐτῶν ἐκ τῆς κεφαλῆς καὶ τοῦ ἐγκεφάλου ποιοῦσι, λέγοντες οὐ καλῶς. χαλεπῆς δ' οὔσης, ὥσπερ εἴρηται, τῆς θεωρίας, ἐν μόνοις τοῖς ἀποπεπνιγμένοις τῶν ζῴων προλεπτυνθεῖσιν ἔστιν ἱκανῶς καταμαθεῖν, εἴ τινι περὶ τῶν τοιούτων ἐπιμελές. ἔχει δὲ τόνδε τὸν τρόπον ἡ τῶν φλεβῶν φύσις. δύο φλέβες εἰσὶν ἐν τῷ θώρακι κατὰ τὴν ῥάχιν ἐντός· κεῖνται δ' αὐτῆς ἡ μὲν μείζων ἐν τοῖς ἔμπροσθεν, ἡ δ' ἐλάττων ὄπισθεν ταύτης· καὶ ἡ μὲν μείζων ἐν τοῖς δεξιοῖς μᾶλλον, ἡ δ' ἐλάττων ἐν τοῖς ἀριστεροῖς, ἣν καλοῦσί τινες ἀορτὴν ἐκ τοῦ τεθεᾶσθαι καὶ ἐν τοῖς τεθνεῶσι τὸ νευρῶδες αὐτῆς μέρος. αὗται δ' ἔχουσι τὰς ἀρχὰς ἀπὸ τῆς καρδίας· διὰ μὲν γὰρ τῶν ἄλλων σπλάγχνων, ᾗ τυγχάνουσι τείνουσαι, ὅλαι δι' αὐτῶν διέρχονται σῳζόμεναι, καὶ οὖσαι φλέβες. ἡ δὲ καρδία, ὥσπερ μόριον αὐτῶν ἐστι, καὶ μᾶλλον τῆς ἐμπροσθίας καὶ μείζονος· ὥστε ἄνω μὲν καὶ κάτω τὰς φλέβας εἶναι ταύτας, ἐν μέσῳ δ' αὐτῶν τὴν καρδίαν. ἔχουσι δ' αἱ πᾶσαι μὲν καρδίαι κοιλίας ἐν αὑταῖς· ἀλλ' αἱ μὲν τῶν σφόδρα μικρῶν ζῴων, μόλις φανερὰν τὴν μεγίστην ἔχουσι· τὰ δὲ μέσα τῷ μεγέθει τῶν ζῴων καὶ τὴν ἑτέραν· τὰ δὲ μέγιστα, τὰς τρεῖς. ἔτι δὲ τῆς καρδίας τὸ ὀξὺ ἔχούσης εἰς τὸ ἔμπροσθεν, καθάπερ εἴρηται πρότερον, ἡ μεγίστη μὲν κοιλία ἐν τοῖς δεξιοῖς, καὶ ἀνωτάτω ταύτης· ἡ δ' ἐλαχίστη, ἐν τοῖς ἀριστεροῖς· ἡ δὲ μέση μεγέθει τούτων ἐν τῷ μέσῳ ἀμφοῖν. ἀμφότεραι δ' αἱ δύο, πολλῷ ἐλάττους εἰσὶ τῆς μεγίστης. συντέτρηνται μέντοι πᾶσαι αὗται πρὸς τὸν πλεύμονα· ἀλλ' ἄδηλοι διὰ σμικρότητα τῶν πόρων, πλὴν μιᾶς. ἡ μὲν οὖν μεγάλη φλὲψ ἐκ τῆς μεγίστης ἤρτηται κοιλίας τῆς ἄνω, καὶ ἐν τοῖς δεξιοῖς· εἶτα διὰ τοῦ κοίλου τοῦ μέσου γίνεται πάλιν φλέψ, ὡς οὔσης τῆς κοιλίας μορίου τῆς φλεβὸς ἐν ᾧ λιμνάζει τὸ αἷμα. ἡ δὲ ἀορτὴ, ἀπὸ τῆς μέσης· πλὴν οὐχ οὕτως,

A *quam ob rem doloribus dorſi, & coxarum, de poplitibus malleoliſve exteris ſanguinem mitti ſolitum eſt. Secundum venarum par de capite circum aures per ceruicem, quæ iugulariæ dictæ ſunt, intus propter ſpinam & lumbos ad teſtes & femora perfertur: atque per poplites, & tibias, redit ad interiores malleolos & plantas: quapropter doloribus lumborum & teſtium ſanguinem ex poplitibus aut malleolis mittimus. Tertium par venarum à temporibus per ceruicem, ſub ſcapulis porrigitur ad pulmones: & altera de parte dextra in ſiniſtram pergens, mammam ſubit, & ad lienem renemque deſcendit: altera de ſiniſtra in dextram procedens, à pulmonibus mammam ſubit, iecur petit & renem, vtraque poſtremò ad teſtes deſinit.*
B *Quartum par ortum parte priore capitis, & ſede oculorum per ceruices ad humerorum ſcapulas deuenit: vnde per lacertos ad flexum, mox per cubitum ad volam & digitos, ſed malis etiam de humero propaginem mittit, quæ coſtas percipiat, dum altera ad lienem, altera ad iecur perueniat, deinde vtraque currens per ventrem ad genitale deſinit.* Hæc fere ſunt quæ à cæteris medicinæ authoribus dicta accepimus. Nec deſunt naturæ interpretes, qui tametſi accuratius, perinde vt medici, non quæſiuerint de venis, tamen omnes earum ortum à capite atque cerebro deducunt: quod error eſt. Cum itaque perdifficile ſit venarum examen, ſolis in ſtrangulatis animalibus iam antè extenuatis effi-
C ci poteſt, vt ſatis percipiat, cui hæc res curæ ſit. Sed enim natura venarum ita ſe habet: Duæ intra pectus venæ continentur ſpinæ appoſitæ, altera maior, altera minor: maior partem priorem adit, minor poſteriorem: & maior dextram potius ſedem obtinet, minor ſiniſtram, quam aortam nonnulli vocant, eò quod neruoſa eius pars conſpici vel in mortuis potuit. Ambæ ex corde originem ducunt: transfigunt enim totæ cætera viſcera, per quæ tendunt, ſuam ſeruantes naturam, vt nihil contrahant detrimenti, quominus & ſint venæ, & appellentur. Sed cor non eodem permeant modo, verùm ei, tanquam ſuæ parti, continuantur, magiſque ea, quæ prior, & maior eſt. Situ autem ta-
D li oriuntur, vt altera ſupra, altera infrà ſit, & cor inter ſe poſitum amplectantur. Habent intra ſe corda omnia ſinum triplicem, ſed magnitudine varia. Minutiſſimorum enim animalium ſinus arctiores ſunt, ita vt vnus qui amplior eſt, vix conſpici poſſit, reliqui ſenſum effugiant. Mediocrium animalium ſecundus etiam conſpicuus eſt: maximorum perſpici omnes poſſunt. Et cùm priorem in partem cor ſuo mucrone ſpectet, vt dictum eſt, ſinus, qui ampliſſimus eſt, dextrum ſupremumque recipit ſitum, minimus ſiniſtrum, mediocris medium. Qui autem maximus inter eos eſt, hic longè reliquis ambobus amplior eſt: omnes tamen ad pulmonem foramine ſpectãt perpetuo, ſed pro-
E pter exiguitatem meatuum latent, præterquam in vno. Oritur ex eo ampliſſimo ſupremoq; ſinu vena maior, ſedemque dextram tenet, mox per medium ſinum formam recipit venæ, vtpote cùm ipſe ventriculus cordis venæ particula ſit, in qua ſanguis reſtagnet. Aorta de ſinu medio exit: non codẽ modo,

ſed per fiſtulam multo arctiorem init ſocietatem, & tendit à latere cordis, cùm vena maior ſua radice cor tranſfigat, cùm ſe promit. Vena item ipſa maior, membrana & cute conſtat. Aorta arctior eſt, & vehementer neruoſa, deductáque longius, hoc eſt, ad caput, aut imas partes, in anguſtum admodum coarctatur, ac nerui naturam ex toto accipit. Pars prima venæ maioris ſurſum à corde prouenient, ſcinditur bipartitò. Adit alterum membrum pulmones, alterum ſpinam, & vertebram colli nouiſſimam. Rurſus membrorum, quod pulmonem adierit, bipartitò ſe findit, quia pulmo in duas partes diſcretus ſit: deinde ſingulas fiſtulas, ſingulaque foramina ſubit, amplius ampliora, arctius arctiora, ita vt pars nulla ſit ſine foramento, & venula: quanquam poſtrema diminutionum præ ſui exiguitate viſum effugiunt: quo fit vt pulmo omni ex parte refertus ſanguine videatur. Hos autem venæ meatus induci ſupra fiſtulas, ex arteria pertinentes, certum eſt. Membrum alterum, quod ad ſpinam, & colli vertebram diximus tendere, per ſpinam ipſam porrigitur. Quam venam Homerus notat, cùm ait:

——venamque inciſit & omnem,
Quæ per dorſum eius ceruices fertur ad imas.

Hinc venulæ ſingulæ ad ſingulas coſtas, & vertebras, feruntur. Finditur etiam bipartitò hæc eadem vena iuxta vertebram, quæ ſupra renes poſita eſt. Ita hæc membra venæ maioris, in ramos ſparguntur: ſed rurſus parte ſuperiore, qua ex corde tendit, ſciſſa numeroſiore venarum propagine, duo petit loca, quippe quæ alias in latera & humeros mittat, quæ mox per alas homini ad manus feruntur, quadrupedi ad pedes priores, auibus ad alas, piſcibus ad pinnas, quæ parte prona continentur. Quarum venarum capita iugulares, qua primum ſcinduntur, appellamus: ſed qua ſciſſæ ceruicem ſubeunt, iuxta pulmonum arteriam tendunt. Quibus interdum foris apprehenſis corruunt homines ſenſibus ereptis, & palpebris compreſſis: ita porrectæ amplexæque arteriam, ad interuallum aurium feruntur, qua maxillæ faucibus coeunt. Denuo inde ſcinduntur in venas quatuor, quarum vna remeans per collum & humerum deſcendit, & cum priore propagine ad flexum brachij copulatur. Secunda ad palmam, & digitos ceſſat. Tertia de vtraque ſede aurium ad cerebrum pertinet, atque in multos prætenues ramulos ſpargitur, itaque membranam cuſtodem cerebri ſubit. Cerebrum autem ipſum omnium expers ſanguinis eſt, nec aliquid venæ, vel auctæ vel minutionis in id ceſſat. Reliqui rami, qui ab eadem vena mittuntur, partim ambiunt caput, partim ad ſedes ſenſuum, dentéſque, gracili venularum ſerie terminantur.

ἀλλὰ κατὰ στενοτέραν σύριγγα πολλῷ κοινωνεῖ· καὶ ἡ μὲν φλὲψ, διὰ τῆς καρδίας· * ἡ δὲ ἀορτὴ, ἀπὸ τῆς καρδίας τείνει· καὶ ἔστι μὲν ἡ μεγάλη φλέψ, ὑμενώδης καὶ δερματώδης· ἡ δ' ἀορτὴ, στενοτέρα μὲν ταύτης, σφόδρα δὲ νευρώδης· καὶ ἀποτεινομένη πόρρω πρός τε τὴν κεφαλὴν, καὶ πρὸς τὰ κάτω μόρια, στενή τε γίνεται καὶ νευρώδης πάμπαν. τείνει δὲ πρῶτον μὲν ἄνω ἀπὸ τῆς καρδίας τῆς μεγάλης φλεβὸς μόριον πρὸς τὸν πνεύμονα καὶ τὴν σύναψιν τῆς ἀορτῆς, ἄσχιστος καὶ μεγάλη οὖσα φλέψ. σχίζεται δ' * ἀπ' αὐτῆς μόρια δύο· τὸ μὲν ἐπὶ τὸν πνεύμονα, τὸ δὲ ἐπὶ τὴν ῥάχιν, καὶ τὸν ὕστατον τοῦ τραχήλου σπόνδυλον. ἡ μὲν οὖν ἐπὶ τὸν πνεύμονα τείνουσα φλὲψ, εἰς διμερῆ ὄντα αὐτὸν διχῆ σχίζεται πρῶτον· ἔπειτα παρ' ἑκάστην σύριγγα, καὶ ἕκαστον τρῆμα τείνει, μείζων μὲν, παρὰ τὰ μείζω· ἐλάττων δὲ, παρὰ τὰ ἐλάττω, οὕτως, ὥστε μηδὲν εἶναι μόριον λαβεῖν, ἐν ᾧ οὐ * τρῆμά τ' ἔνεστι καὶ φλέβιον· τὰ γὰρ τελευταῖα τὸ μέγεθος ἄδηλα διὰ τὴν σμικρότητά ἐστιν· ἀλλὰ πᾶς ὁ πνεύμων φαίνεται μεστὸς αἵματος ὤν. ἐπάνω δ' εἰσὶν ἀπὸ τῆς φλεβὸς οἱ πόροι, τῶν ἀπὸ τῆς ἀρτηρίας συριγγίων. ἡ δ' ἐπὶ τὸν σπόνδυλον τοῦ τραχήλου τείνουσα φλὲψ, καὶ τὴν ῥάχιν, πάλιν παρὰ τὴν ῥάχιν τείνει· ἣν καὶ Ὅμηρος ἐν τοῖς ἔπεσιν εἴρηκε ποιήσας·

* ἀπὸ δὲ φλέβα πᾶσαν ἔκερσεν,
Ἥ τ' ἀνὰ νῶτα θέουσα διαμπερὲς αὐχέν' ἱκάνει.

ἀπὸ δὲ ταύτης τείνει, παρά τε τὴν πλευρὰν ἑκάστην φλέβια, καὶ πρὸς ἕκαστον τὸν σπόνδυλον· κατὰ δὲ τὸν ὑπὲρ τῶν νεφρῶν σπόνδυλον σχίζεται διχῇ. ταῦτα μὲν οὖν τὰ μόρια ἀπὸ τῆς μεγάλης φλεβὸς, τοῦτον ἔσχισται τὸν τρόπον. ἐπάνω δὲ τούτων, ἀπὸ τῆς ἐκ τῆς καρδίας τεταμένης, πάλιν ἡ ὅλη σχίζεται εἰς δύο τόπους. αἱ μὲν γὰρ φέρονται εἰς τὰ πλάγια, καὶ τὰς κλεῖδας· κἄπειτα διὰ τῶν μασχαλῶν, τοῖς μὲν ἀνθρώποις εἰς τοὺς βραχίονας, τοῖς δὲ τετράποσιν, εἰς τὰ πρόσθια σκέλη τείνουσι· τοῖς δὲ ὄρνισιν, εἰς τὰς πτέρυγας· τοῖς δὲ ἰχθύσιν, εἰς τὰ πτερύγια τὰ πρανῆ. αἱ δὲ ἀρχαὶ τούτων τῶν φλεβῶν, ᾗ σχίζονται τὸ πρῶτον, καλοῦνται σφαγίτιδες· ᾗ δὲ σχίζονται εἰς τὸν αὐχένα ἀπὸ τῆς μεγάλης φλεβὸς, παρὰ τὴν ἀρτηρίαν τείνουσι τὴν τοῦ πνεύμονος· ὧν ἐπιλαμβανομένων ἐνίοτε ἔξωθεν, ἄνευ πνιγμοῦ καταπίπτουσιν οἱ ἄνθρωποι μετ' ἀναισθησίας τὰ βλέφαρα * συμβεβληκότες. οὕτω δὲ τείνουσαι, καὶ μεταξὺ λαμβάνουσαι τὴν ἀρτηρίαν, φέρονται μεταξὺ τῶν ὤτων, ᾗ συμβάλλουσιν αἱ γένυες τῆς κεφαλῆς. πάλιν δ' ἐντεῦθεν, εἰς τέτταρας σχίζονται φλέβας, ὧν μία μὲν, ἐπανακάμψασα, καταβαίνει διὰ τοῦ τραχήλου καὶ τοῦ ὤμου, καὶ συμβάλλει τῇ προτέρᾳ ἀποσχίσει τῆς φλεβὸς κατὰ τὴν τοῦ βραχίονος καμπήν· τὸ δ' ἕτερον μόριον, εἰς τὴν χεῖρα τελευτᾷ, καὶ τοὺς δακτύλους· μία δ' ἑτέρα, ἀφ' ἑκατέρου τοῦ τόπου * τοῦ περὶ τὰ ὦτα, ἐπὶ τὸν ἐγκέφαλον τείνει, καὶ σχίζεται εἰς πολλὰ καὶ λεπτὰ φλέβια, εἰς τὴν καλουμένην μήνιγγα, τὴν περὶ τὸν ἐγκέφαλον. αὐτὸς δὲ ὁ ἐγκέφαλος ἄναιμος πάντων ἐστὶ, καὶ οὔτε μικρὸν οὔτε μέγα φλέβιον ἀποτελευτᾷ εἰς αὐτόν. τῶν δὲ λοιπῶν ἀπὸ τῆς φλεβὸς ταύτης σχισθεισῶν φλεβῶν, αἱ μὲν, τὴν κεφαλὴν κύκλῳ περιλαμβάνουσιν· αἱ δὲ, εἰς τὰ αἰσθητήρια ἀποτελευτῶσι, καὶ τοὺς ὀδόντας, λεπτοῖς πάμπαν φλεβίοις.

ΚΕΦΑΛ. Δ.

Τίνα τρόπον ἔχουσιν αἱ φλέβες τὰ κάτω τῆς καρδίας.

Τὸν αὐτὸν δὲ τρόπον καὶ τὰ τῆς ἐλάττονος φλεβός, καλουμένης δ' ἀορτῆς, ἔσχισται μέρη, συμπαρηκολουθηκότα τοῖς τῆς μεγάλης· πλὴν ἐλάττους οἱ πόροι καὶ τὰ φλέβια πολὺ ἐλάττω ταῦτ' ἐστὶ τῶν τῆς μεγάλης φλεβός. Τὰ μὲν οὖν ἄνω τῆς καρδίας, τοῦτον ἔχουσι τὸν τρόπον αἱ φλέβες. Τὸ δ' εἰς τὸ κάτω τῆς καρδίας μέρος τῆς μεγάλης φλεβός, τείνει μετέωρον διὰ τοῦ ὑποζώματος. συνέχεται δὲ καὶ πρὸς τὴν ἀορτήν, καὶ πρὸς τὴν ῥάχιν, πόροις ὑμενώδεσι καὶ χαλαροῖς. τείνει δ' ἀπ' αὐτῆς μία μὲν διὰ τοῦ ἥπατος φλέψ, βραχεῖα μὲν πλατεῖα δέ, ἀφ' ἧς πολλαὶ καὶ λεπταί, εἰς τὸ ἧπαρ ἀποτείνουσαι, ἀφανίζονται. δύο δ' ἀπὸ τῆς διὰ τοῦ ἥπατος φλεβὸς ἀποσχίσεις εἰσίν· ὧν ἡ μὲν εἰς τὸ ὑπόζωμα τελευτᾷ, καὶ τὰς καλουμένας φρένας· ἡ δέ, πάλιν ἐπανελθοῦσα διὰ τῆς μασχάλης, εἰς τὸν βραχίονα τὸν δεξιόν, συμβάλλει ταῖς ἑτέραις φλεψὶ κατὰ τὴν ἐντὸς καμπήν. διὸ ἀποσχαζόντων τῶν ἰατρῶν ταύτην, ἀπολύονται πόνων τινῶν περὶ τὸ ἧπαρ. ἐκ δὲ τῶν ἀριστερῶν αὐτῆς, μικρὰ μέν, παχεῖα δὲ φλέψ, τείνει εἰς τὸν σπλῆνα, καὶ ἀφανίζεται τὰ ἀπ' αὐτῆς φλέβια εἰς τοῦτον. ἕτερον δὲ μέρος ἀπὸ τῶν ἀριστερῶν τῆς μεγάλης φλεβὸς ἀποσχισθὲν τὸν αὐτὸν τρόπον ἀναβαίνει εἰς τὸν ἀριστερὸν βραχίονα· πλὴν ἐκείνη μέν, ἡ διὰ τοῦ ἥπατός ἐστιν, αὕτη δ', ἑτέρα τῆς εἰς τὸν σπλῆνα τεινούσης. ἔτι δ' ἄλλαι ἀπὸ τῆς μεγάλης φλεβὸς ἀποσχίζονται· ἡ μέν, ἐπὶ τὸ ἐπίπλοον· ἡ δέ, ἐπὶ τὸ καλούμενον πάγκρεας. ἀπὸ δὲ ταύτης πολλαὶ φλέβες διὰ τοῦ μεσεντερίου τείνουσι. πᾶσαι δ' αὗται εἰς μίαν φλέβα μεγάλην τελευτῶσι, παρὰ πᾶν τὸ ἔντερον, καὶ τὴν κοιλίαν μέχρι τοῦ στομάχου τεταμένην. καὶ περὶ ταῦτα τὰ μόρια, πολλαὶ ἀπ' αὐτῶν σχίζονται φλέβες. μέχρι μὲν οὖν τῶν νεφρῶν μία οὖσα, ἑκατέρα τείνει καὶ ἡ ἀορτή, καὶ ἡ μεγάλη φλέψ. ἐνταῦθα δὲ πρός τε τὴν ῥάχιν μᾶλλον προσπεφύκασι, καὶ σχίζονται εἰς δύο, ὥσπερ εἰς λάμβδα ἑκατέρα, καὶ γίνεται εἰς τοὔπισθεν μᾶλλον ἡ μεγάλη φλὲψ τῆς ἀορτῆς. προσπέφυκε δ' ἡ ἀορτὴ μάλιστα τῇ ῥάχει περὶ τὴν καρδίαν· ἡ δὲ πρόσφυσις, ἐστὶ φλεβίοις νευρώδεσι μικροῖς. ἔστι δ' ἡ ἀορτὴ ἀπὸ μὲν τῆς καρδίας ἀγομένη εὖ μάλα κοίλη· προϊοῦσα δ' ἐστὶ στενοτέρα καὶ νευρωδεστέρα. τείνουσι δ' ἀπὸ τῆς ἀορτῆς εἰς τὸ μεσεντέριον φλέβες, ὥσπερ αἱ ἀπὸ τῆς μεγάλης φλεβός, πλὴν πολλῷ λειπόμεναι τῷ μεγέθει. στεναὶ γάρ εἰσι καὶ ἰνώδεις. λεπταῖς γὰρ καὶ κοίλαις καὶ ἰνώδεσι τελευτῶσι φλεβίοις. εἰς δὲ τὸ ἧπαρ καὶ τὸν σπλῆνα, οὐδεμία τείνει ἀπὸ τῆς ἀορτῆς φλέψ. αἱ δὲ σχίσεις ἑκατέρας τῆς φλεβός, τείνουσιν εἰς τὸ ἰσχίον ἑκάτερον, καὶ καθάπτουσιν εἰς τὸ ὀστοῦν ἀμφότεραι. φέρουσι δὲ καὶ εἰς τοὺς νεφρούς, ἀπό τε τῆς μεγάλης φλεβός, καὶ τῆς ἀορτῆς, φλέβες· πλὴν οὐκ εἰς τὸ κοῖλον, ἀλλ' εἰς τὸ σῶμα καταναλίσκονται τῶν νεφρῶν. ἀπὸ μὲν οὖν τῆς ἀορτῆς ἄλλοι δύο πόροι φέρουσιν εἰς τὴν κύστιν, ἰσχυροὶ καὶ συνεχεῖς, καὶ ἄλλοι ἐκ τοῦ κοίλου τῶν νεφρῶν, οὐδὲν κοινωνοῦντες τῇ μεγάλῃ φλεβί. ἐκ μέσου δὲ τῶν νεφρῶν ἑκατέρου, φλὲψ κοίλη καὶ νευρώδης ἐξήρτηται, τείνουσα παρ' αὐτὴν τὴν ῥάχιν διὰ τῶν φλεβῶν· εἶτα εἰς ἑκάτερον τὸ ἰσχίον ἀφανίζεται ἑκατέρα [illegible].

CAPVT IV.

De aorta vena minore, eiuſque ſede.

Vena etiam minor, quam aortam [dixi] nominari, eodem ſpargitur modo in ram[os], qui partes venæ maioris conſequantur: [verum] meatus eius, & venulæ multo minores [ſunt], quam venæ maioris. Locis à corde ſuperioribus venas hunc in modum haberi nouimus. Pars autem maioris venæ cordi ſubiecta, fertur elatior, per ſeptúmque applicata, tum ad aortam, tum etiam ad ſpinam membranei flaccidiſque meatibus continetur: mox vena ad iecur ab ea mittitur breuis, ſed lata: de qua multæ ac tenues ſparſæ in iecur obliterantur. Rami inde ab ipſa iecur tranſigente duo procurrunt, quorum alter ad ſeptum & præcordia dicta ceſſat: alter ſupera repetit, ductúſque per alam ad lacertum brachij dextri ſe porrigit, qua cæteris venis ſe applicat iuxta flexum interiorem. Quamobrem ſanguine hinc miſſo dolores iecoris quidam leuari poſſunt. Pars altera venæ eiuſdem breuis quidem, ſed craſſa, latus petit ſiniſtrum, pergitque ad lienem, quæ ſparſa in ramulos ſubit, itaque aboletur. Quinetiam ab eadem maiore propago, pari modo ad lacertum ſiniſtri brachij mittitur: ſed quæ ad brachium dextrum procedit, eadem quæ pertingit ad iecur, eſt. Hæc vero diuerſa ab ea quæ ad lienem pertinet, eſt. Aliæ item à vena maiore duæ propagantur, quarum altera ad omentum, altera ad id quod à carne pancreum appellatum eſt, de qua, venarum frequentia per lactes tendunt, quæ omnes in vnam deſinunt venam grandem per totum inteſtinum, & ventriculum, ad gulam vſque porrectam, quæ & ipſa ramos de iis quas [p]erreptat, partibus ſpargit complures. Vtraque igitur tam maior quam aorta, renum tenus vna atque perpetua tendit. Hic capitibus renum potius adhæreſcunt, finduntúrque bipartito, vel vt in literam lambda, aut v literam inuerſam: vergitque magis in partem poſteriorem corporis vena maior, quam aorta. Spinæ annecti aortam, potiſſimum circa cor, venulis prætenuibus, & neruoſis, notum eſt. Ducitur eadem de corde nimirum amplitudine inſigni, ſed procedens arctior atque neruoſior euadit. Mittit ea quoque ad lactes ramos, quemadmodum maior: verum longè minores: perangustos enim, & fibris proximos, quippe quos extenuatos in fibras, cauas tamen, ceſſare aduertimus. Ad iecur aut lienem nulla ab aorta pertinet vena. Rami autem illi, in quos venam ſcindi vtramque dixi, ad coxam vtramque proficiſcuntur, atque os ipſum attingunt. Ad renes etiam à maiore aortaque venæ deueniunt: ſed cauum non ſubeunt renum: verum in corpus eorum abſumuntur. Nec non alij duo meatus ab aorta validi & perpetui ad veſicam procedunt, [at]que etiam alij de cauo renum eodem veniunt, qui nihil commune cum vena maiore [ſortiuntur]. Singulis item renibus de medio [vena] exorta, caua neruoſæque iuxta ſpinam ipſam per venas ſe porrigunt: mox in coxam vtramque conduntur, ac deliteſcunt:

deinde denuò porrectæ in clunes apparent: quarum & ipſarum poſtrema, vt in ſexu virili ad veſicam genitaléque coniiciuntur, ſic in fœmineo ad vuluam aut vterum pertinent. Nonnullam ſanè venam de maiore vuluam adire videmus, cùm de aorta multæ frequentéſque veniant. Ramis etiam tum aortæ, tum etiam maioris, aliæ mittuntur propagines: quæ primùm ad inguina amplíuſculæ cauæque accedunt, deinde per femora cruráque, in plantas & digitos finiunt. Atque etiam duæ aliæ per inguina & femora commutatis vicibus perferuntur: altera de parte dextra in ſiniſtram, altera de ſiniſtra in dextram, ac cæteris venis circa poplites ſe coniungunt. Quemadmodum venæ ſe habeant, & vndénam ſuam originem ducant, apertum iam eſt. Continet autem genus animantium omne ſanguinis compos, venarum initia, & genera ſumma, eo, quo expoſuimus, modo: nam reliqua copia venarum non ſimili ratione in omnibus eſt. Neque enim partes eodem modo, aut eædem in omnibus habentur: nec verò æquè in omnibus patet venarum ſeries, ſed potiſſimùm in iis conſtat, quibus ſanguinis copia, & præcipua magnitudo eſt. Nam in minutis, ſanguiniſve inopibus, vel per naturam, vel per immodicam corporis obeſitatem, haud æquè inſpici poſſunt. Alteris enim meatus quaſi alucoli quidam multo interſepti limo permiſcentur: alteris paucæ, eædémque fibræ potiùs quàm venæ, continentur. Vna tamen, quam maiorem ex præcipua magnitudine cognominamus, potiſſimùm euidens in omnibus etiam minutis animalibus eſt.

CAPVT V.

De neruis eorúmque origine.

NEruórum mox ordinem perſequemur. Origo eorum quoque in corde eſt: id enim neruulos ſuo ampliore ventriculo continet. Et vena aorta appellata, neruoſa eſt, & quidem poſtrema eius neruo omnino conſtant: quippe quæ nullo intus cauo diſtinguantur, tendantúrque modò neruorum, quà deſinunt, applicata ad nodos oſſium lubricos. Cæterùm natura neruorum non more venarum continua de eodem initio procedit. Venæ enim, vt in depictis canalibus, hoc eſt, fontibus riuo multiplici ſparſis, patet, figuram totius corporis diſtribuunt, ita, vt corporibus admodum extenuatis, partes omnes venulis refertæ conſpiciantur. Locus enim idem venulis in macilentis, carne in corpulentis redundat. Sed nerui diducti diſtractique paſſim ad artus & flexus oſſium applicantur. Quod inde etiam percipi poteſt; nam ſi eorum natura eſſet continuata, latè iam in extenuatis corporibus continentia omniũ pateret. Summæ neruorum partes; quæ membrum ad ſaliendum accommodatum continet, poples dicta; & quę ſe geminam porrigit, tendo nomine; & quæ ad vires corporis iuuant, attendo, & humerarius; reliquæ, quibus oſſium nodi deligantur, nomine vacant. Nam oſſa omnia ſiue foris viciſſim tanguntur, ſiue alterum inſeritur alteri, neruis ligantur: & circiter oſſa quæuis neruorum copia ducitur, capite excepto: id enim non neruis, ſed ſuturis ipſorum oſſium continetur. Nerui natura fiſſilis in longitudinem tendit: ſcindi per latitudinẽ non poteſt: intendique vehementer idonea eſt.

ἔπειτα διαλαμβάνονται πάλιν, διατεταμέναι πρὸς τὸ ἰσχίον. καθήκουσι δὲ πάλιν πρὸς τὴν κύστιν καὶ τὸ αἰδοῖον τὰ πέρατα αὐτῶν [ἐν] τοῖς ἄρρεσιν, ἐν δὲ ταῖς θηλείαις πρὸς τὰς ὑστέρας. τείνει δ᾽ ἀπὸ μὲν τῆς μεγάλης φλεβὸς, οὐδεμία εἰς τὰς ὑστέρας· ἀπὸ δὲ τῆς ἀορτῆς, πολλαὶ καὶ πυκναί. τείνουσι δὲ ἀπὸ τῆς ἀορτῆς καὶ τῆς μεγάλης φλεβὸς ἀπὸ τῶν σχιζομένων, καὶ ἄλλαι αἱ μὲν ἐπὶ τοὺς βουβῶνας πρῶτον, μεγάλαι καὶ κοῖλαι· ἔπειτα διὰ τῶν σκελῶν τελευτῶσαι εἰς τοὺς πόδας καὶ τοὺς δακτύλους· καὶ πάλιν ἕτεραι διὰ τῶν βουβώνων καὶ τῶν μηρῶν φέρονται ἐναλλάξ· ἡ μὲν, ἐκ τῶν ἀριστερῶν, εἰς τὰ δεξιά· ἡ δὲ, εἰς τὰ ἀριστερὰ, ἐκ τῶν δεξιῶν· καὶ συνάπτουσι περὶ τὰς ἰγνύας ταῖς ἑτέραις φλεψίν. ὃν μὲν οὖν τρόπον ἔχουσιν αἱ φλέβες, καὶ πόθεν ἤρτηνται τὰς ἀρχὰς, φανερὸν ἐκ τούτων. ἔχει δ᾽ ἐν ἅπασι μὲν οὕτω τοῖς ἐναίμοις ζώοις τὰ περὶ τὰς ἀρχὰς καὶ τὰς μεγίστας φλέβας. τὸ μὲν γὰρ ἄλλο πλῆθος τῶν φλεβῶν, οὐχ ὡσαύτως ἔχει πᾶσιν. οὐδὲ γὰρ τὰ μέρη τὸν αὐτὸν τρόπον ἔχουσιν, οὐδὲ ταῦτα πάντα ἔχουσιν. οὐδὲ ταῦτα μὴν οὐδ᾽ ὁμοίως ἐν ἅπασίν ἐστι φανερὸν, ἀλλὰ μάλιστα ἐν τοῖς πολυαίμοις καὶ μεγίστοις. ἐν γὰρ τοῖς μικροῖς καὶ μὴ πολυαίμοις ἢ διὰ φύσιν, ἢ διὰ πιότητα τοῦ σώματος, οὐχ ὁμοίως ἐστὶ καταμαθεῖν. τῶν μὲν γὰρ οἱ πόροι συγκεχυμένοι, καθάπερ ὀχετοί τινες ὑπὸ πολλῆς * ἰλύος, εἰσίν· οἱ δ᾽ ὀλίγας, καὶ ταύτας ἶνας ἀντὶ φλεβῶν ἔχουσιν. ἡ δὲ μεγάλη φλὲψ, ἐν πᾶσι μάλιστα διάδηλος, καὶ τοῖς μικροῖς.

* χ. ἰλύος, ὑπὸ δὲ ἰλύι.

ΚΕΦΑΛ. ε᾽.

Περὶ νεύρων.

ΤΑ δὲ νεῦρα τοῖς ζώοις ἔχει τοῦτον τὸν τρόπον. ἡ μὲν ἀρχὴ καὶ τούτων ἐστὶν ἐκ τῆς καρδίας. καὶ γὰρ ἐν αὐτῇ ἡ καρδία νεῦρα ἔχει ἐν τῇ μεγίστῃ κοιλίᾳ· καὶ ἡ καλουμένη ἀορτὴ, νευρώδης ἐστὶ φλὲψ, τὰ μὲν τελευταῖα, καὶ παντελῶς αὐτῆς. ἄκοιλα γάρ ἐστι, καὶ τάσιν ἔχει τοιαύτην, οἵαν περ τὰ νεῦρα, ᾗ τελευτᾷ πρὸς τὰς καμπὰς τῶν ὀστῶν. οὐ μὴν ἀλλ᾽ οὐκ ἔστι συνεχὴς ἡ τῶν νεύρων φύσις ἀπὸ μιᾶς ἀρχῆς, ὥσπερ αἱ φλέβες. αἱ μὲν γὰρ φλέβες, ὥσπερ ἐν τοῖς γραφομένοις κανάβοις, τὸ τοῦ σώματος ἔχουσι σχῆμα παντὸς οὕτως, ὥστ᾽ ἐν τοῖς σφόδρα λελεπτυσμένοις, πάντα τὸν ὄγκον φαίνεσθαι πλήρη φλεβίων. ὁ γὰρ αὐτὸς τόπος λεπτῶν μὲν ὄντων, φλέβια. παχυνθέντων δὲ, σάρκες. τὰ δὲ νεῦρα διεσπασμένα περὶ τὰ ἄρθρα καὶ τὰς τῶν ὀστῶν ἐστὶ καμπάς. εἰ δ᾽ ἦν συνεχὴς ἡ φύσις αὐτῶν, ἐν τοῖς λελεπτυσμένοις ἂν καταφανὴς ἐγένετο ἡ συνέχεια πάντων. μέγιστα δὲ μέρη τῶν νεύρων, τό, τε περὶ τὸ μόριον τὸ τῆς ἅλσεως κύριον· (καλεῖται δὲ τοῦτο ἰγνύα) καὶ ἕτερον νεῦρον διπτυχὲς, ὁ τένων· καὶ τὰ πρὸς τὴν ἰσχὺν βοηθητικὰ, ἐπίτονός τε, καὶ ὠμιαῖα· τὰ δ᾽ ἀνώνυμα περὶ τὴν τῶν ὀστῶν ἐστι κάμψιν. πάντα γὰρ τὰ ὀστᾶ, ὅσα ἅπτονται, ἢ πρὸς ἄλληλα σύγκεινται, συνδέδενται νεύροις· καὶ περὶ πάντα ἐστὶ τὰ ὀστᾶ πλῆθος νεύρων. ἐν δὲ τῇ κεφαλῇ οὐκ ἔστιν οὐδὲν, ἀλλ᾽ αἱ ῥαφαὶ αὐτῶν τῶν ὀστῶν συνέχουσιν αὐτήν. ἔστι δ᾽ ἡ τοῦ νεύρου φύσις σχιστὴ κατὰ τὸ μῆκος· κατὰ δὲ τὸ πλάτος, ἄσχιστος, καὶ τάσιν ἔχουσα πολλήν.

A ὑγρότης δὲ περὶ ταῦτα μυξώδης ἐστί, καὶ λευκὴ, καὶ κολλώδης, ᾗ τρέφεται καὶ ἐξ ἧς γεννώμενα φαίνεται. ἡ μὲν οὖν φλὲψ δύναται πυροῦσθαι· νεῦρον δὲ πᾶν, φθείρεται πυρωθέν· κἂν διακοπῇ, οὐ συμφύεται πάλιν. οὐ λαμβάνει δὲ οὐδὲ νάρκη, ὅπου μὴ νεῦρόν ἐστι τοῦ σώματος. πλεῖστα δέ ἐστι νεῦρα περὶ τοὺς πόδας, καὶ τὰς χεῖρας καὶ ὠμοπλάτας, καὶ περὶ τὸν αὐχένα καὶ τοὺς βραχίονας. ἔχει δὲ νεῦρα, πάντα ὅσα ἔχει αἷμα. ἀλλ' ἐν οἷς μή εἰσι καμπαὶ, ἀλλ' ἄποδα καὶ ἄχειρά ἐστι, καὶ λεπτὰ καὶ ἄδηλα· διὸ τῶν ἰχθύων μάλιστά ἐστι δῆλα πρὸς τοῖς πτερυγίοις.

Humor circa neruos mucroni ſimilis, albidus, glutinoſúſque conſiſtit, quo ipſos neruos & naſci & ali certum eſt. Neruus ignem non patitur, cùm vena patiatur: & inciſus ſolidari non poteſt. Pars corporis nulla ſtupore tentatur, quæ neruo caret. Neruis plurimis pedes, manus, & ſcapulæ continentur: atque etiam ceruices, & lacerti. Quibus datus eſt ſanguis, iiſdem omnibus nerui adiuncti ſunt. Sed quæ nullos habent articulos, priuatáque pedibus, & manibus ſunt, iis prætenues incertique habentur. Quapropter in piſcibus, qui iuxta pinnas poſiti ſunt, ij præcipuè veniunt in conſpectum.

ΚΕΦΑΛ. ϛ'.

Περὶ ἰνῶν.

B Αἱ δὲ ἶνές εἰσι μεταξὺ νεύρου καὶ φλεβός. ἔνιαι δ' αὐτῶν ἔχουσιν ὑγρότητα, τὴν τοῦ ἰχῶρος, καὶ διέχουσιν ἀπό τε τῶν νεύρων πρὸς τὰς φλέβας, καὶ ἀπ' ἐκείνων πρὸς τὰ νεῦρα. ἔστι δὲ καὶ ἄλλο γένος ἰνῶν, ὃ γίνεται μὲν ἐν αἵματι, οὐκ ἐν ἁπάντων δὲ ζῴων αἵματι· ὧν ἐξαιρουμένων ἐκ τοῦ αἵματος, οὐ πήγνυται τὸ αἷμα· ἐὰν δὲ μὴ ἐξαιρεθῶσι, πήγνυται. ἐν μὲν οὖν τῷ τῶν πλείστων ζῴων αἵματι ἔνεισιν· ἐν δὲ τῷ τῆς ἐλάφου καὶ προκὸς, καὶ βουβαλίδος, καὶ ἄλλων τινῶν, οὐκ εἰσὶν ἶνες· διὸ καὶ οὐ πήγνυται αὐτῶν τὸ C αἷμα ὁμοίως τοῖς ἄλλοις. ἀλλὰ τὸ μὲν τῶν ἐλάφων παραπλησίως τῷ τῶν δασυπόδων· ἔστι δ' ἀμφοτέρων αὐτῶν ἡ πῆξις οὐ στιφρά, καθάπερ ἡ τῶν ἄλλων, ἀλλὰ πλαδῶσα, καθάπερ ἡ τοῦ γάλακτος, ἄν τις εἰς αὐτὸ τὸ πῆγμα ἐμβάλῃ. τὸ δὲ τῆς βουβαλίδος πήγνυται μᾶλλον. παραπλησίως γὰρ συνίσταται, ἢ μικρῷ ἧττον τοῦ τῶν προβάτων. περὶ μὲν οὖν φλεβὸς, καὶ νεύρου, καὶ ἰνὸς, τοῦτον ἔχει τὸν τρόπον.

De part. anim. l. 1. c. 4. & alibi.

CAPVT VI.

De fibris.

Fibræ inter neruum & venam, ſuam habent naturam: & nonnullæ humorem, ſaniem appellatum, continent: tendunt à neruis ad venas, ac inde ad neruos. Secundum etiam genus fibrarum eſt, quod conſiſtere in ſanguine ſolet: quanquam non cuiuſque animalis. Spiſſari autem ſanguis non poteſt, ſi id genus fibrarum detrahatur: ſpiſſatur verò, ſi non detrahatur. Genus id ergo fibrarum tametſi maiore ex parte in ſanguine animalium ineſt, tamen cerui, damæ, bubali, & aliorum quorumdam ſanguini deeſt: quocirca eorum ſanguis non ſimiliter, atque cæterorum, concreſcit. Sed ceruorum perinde, vt leporum, ſolet ſpiſſari, videlicet non coitu firmiore, vt cæterorum, ſed fluido, quale lac eſt, quod ſine coagulo ſponte coiuerit. Bubali ſanguis aliquantulò ampliùs ſpiſſatur: quippe qui proximè ouillo aut paulò minùs conſiſtat. Vena, neruus, & fibra ita ſe habent.

ΚΕΦΑΛ. ζ.

Περὶ ὀστῶν.

D Τὰ δ' ὀστᾶ τοῖς ζῴοις, ἀφ' ἑνὸς πάντα συνήρτηται, καὶ συνεχῆ ἐστιν ἀλλήλοις, ὥσπερ φλέβες· αὐτὸ δὲ καθ' αὑτὸ, οὐδέν ἐστιν ὀστοῦν. ἀρχὴ δὲ ἡ ῥάχις ἐστὶν ἐν πᾶσι τοῖς ἔχουσιν ὀστᾶ. σύγκειται δ' ἡ ῥάχις ἐκ σφονδύλων, τείνει δ' ἀπὸ τῆς κεφαλῆς μέχρι πρὸς τὰ ἰσχία. οἱ μὲν οὖν σφόνδυλοι πάντες τετρημένοι εἰσίν. ἄνω δὲ, τὸ τῆς κεφαλῆς ὀστοῦν συνεχές ἐστι τοῖς ἐσχάτοις σφονδύλοις, ὃ καλεῖται κρανίον. τούτου δὲ τὸ πριονωτὸν μέρος, * ῥαφίς. ἔστι δὲ οὐ πᾶσιν ὁμοίως ἔχον τοῦτο τοῖς ζῴοις. τὰ μὲν γὰρ, ἔχει μονόστεον τὸ κρανίον, ὥσπερ ὁ κύων· τὰ δὲ, συγκείμενον, ὥσπερ ἄνθρωπος. καὶ τούτου τὸ μὲν θῆλυ, κύκλῳ ἔχει τὴν ῥαφήν· τὸ δ' ἄρρεν, τρεῖς ῥαφὰς, ἄνωθεν συνα- E πτούσας, τριγωνοειδεῖς. ἤδη δὲ ὤφθη καὶ ἀνδρὸς κεφαλὴ οὐκ ἔχουσα ῥαφάς. σύγκειται δὲ ἡ κεφαλὴ οὐκ ἐκ τεσσάρων ὀστῶν, ἀλλ' ἐξ ἕξ. ἔστι γὰρ δύο τούτων περὶ τὰ ὦτα, μικρὰ πρὸς τὰ λοιπά. ἀπὸ δὲ τῆς κεφαλῆς αἱ σιαγόνες τείνουσιν ὀστᾶ. κινεῖται δὲ τοῖς μὲν ἄλλοις ζῴοις ἅπασιν, ἡ κάτωθεν σιαγών. ὁ δὲ κροκόδειλος ὁ ποτάμιος, μόνος τῶν ζῴων κινεῖ τὴν σιαγόνα τὴν ἄνωθεν. ἐν δὲ ταῖς σιαγόσιν ἐστὶ τὸ τῶν ὀδόντων γένος ὀστοῦν, τῇ μὲν ἄτρητον, τῇ δὲ τρητὸν, καὶ ἀδύνατον γλύφεσθαι τῶν ὀστῶν μόνον. ἀπὸ δὲ τῆς ῥάχεως, ἥ τε περόνη ἐστὶ, καὶ αἱ κλεῖδες, καὶ αἱ πλευραί.

Scrib. ῥαφή, vt ſemper alibi.

CAPVT VII.

De oſſibus, eorúmque differentiis.

Oſſa alia ab aliis nexa, & omnia inter ſe apta, vnam continuant ſeriem modo venarum, nec eſt vllum os, quod ſeorſum ipſum per ſe maneat. Initium verò in omnibus, quæ oſſibus conſtant, ſpina eſt: quæ compacta ex vertebris à capite ad coxas porrigitur. Vertebræ omnes foramine medio peruiæ ſibi iunguntur. Extat os capitis continuum, nouiſſimis ſuperimpoſitum vertebris, quod calua dicitur. Eius pars ſerrata, ſuturæ nomine ſignificatur. Pars hæc non ſimili modo in quoque genere animalium habetur. Aliis enim oſſe continuo calua perficitur, vt cani: aliis compacto, vt homini. eiúſque fœminæ ſutura circulariter eſt. Mari tres in ſummum verticem aſcendunt ſuturæ, coeúntque in figuræ triangulæ ſpeciem. Sed iam & viri caput viſum ſine vlla ſutura eſt. Conſtat ſanè caput non quatuor oſſibus ſed ſex, quorum duo exigua, ſcilicet reliquorum comparatione, circa aures poſita ſunt. Maxillæ à capite protenduntur oſſa duo: quarum inferiorem animalia omnia mouent, excepto fluuiatili crocodilo: hic enim vnus non inferiorem ſed ſuperiorem mouet. Maxillis dentium genus inhæret, os partim cauum, partim ſolidum, & adeo firmum, vt ſolum inter oſſa ferri aciem reſpuat. Oritur à ſpina, fibula, iugale, & ordo coſtarum.

Pectus etiam coſtis impoſitum eſt: quæ quidem aduerſæ inter ſe coeunt, cùm reliquæ breuiores ſint, quàm vt facere idem queant. Nullum enim animal eſt quod circa ventrem os habeat. Sunt item oſſa humerorum, & quæ ſcapulæ appellantur, & quæ iis annexa dependent, brachia, & manus. Modus idem compaginum vel in iis eſt quæ crura habent priora. Acetabulum infra, quà ſpina deſinit, à coxa eſt: & oſſa iam crurum oriuntur, quibus femora & tibiæ conſtant, pernæ aut culinæ nomine: quorum pars malleolus eſt, & malleoli calcar: videlicet in iis quæ habent malleolos, ab iis oſſa pedis minuta & plura ſubiacent. Quæ igitur ex ſanguineis pedeſtribus animal generant, hæc oſſa non multo diuerſa habent, ſed ad proportionem tantummodo duritia, mollitie, magnitudine diſcrepant. Oſſium item animalis eiuſdem, alia medullam intra ſe continent, alia minimè. Sunt nonnulla, quæ ſuis in oſſibus nullam omnino habere medullam videantur, vt leo: quòd admodum exiguam ac tenuem habeat, eámque in paucis oſſibus: ſolis enim inferioribus, atque brachiis. Conſtat profectò leo præcipuè omnium animalium oſſibus ſolidis: ſunt enim adeò dura, vt ex eis concuſſis, ignis velut à ſilice elidatur. Delphinus etiam oſſa habet, non ſpinas. Cæterorum animalium ſanguineorum oſſa, aut paulò inter ſe differunt, vt auium: aut proportione eadem ſunt, vt piſcium. Qui enim inter eos animal generant, cartilaginem pro ſpina habent: vt ea quæ cartilaginea appellauimus. Qui autem oua pariunt, ſpinam continent: quæ perinde vt dorſum in quadrupedum ordine habetur. Sed proprium in piſcibus eſt, quòd nonnullis ſpinulæ quædam prætenues ſeparatim per carnem inhærent. Serpentibus etiam dorſum piſcium more compleri apertum eſt. At verò ea quæ inter quadrupedes oua pariunt, os aut ſpinam pro ſuæ magnitudinis modo meruerunt: maiora enim oſſis naturam potiùs obtinent, minora, ſpina potiùs in oſſis vicem fulciuntur. Omnia prorſus animalia, quæ ſanguinem habent, dorſo conſtant, aut oſſeo, aut ſpineo: cætera oſſa aliis inſunt, aliis deſunt. Vt enim partes corporis quæque habentur, ita oſſa quoque ad partes accommodata habentur. Quibus enim crura & brachia deſunt, iis pernæ aut culinæ prædictæ etiam deſunt. Nec verò iis quibus partes, eædem quidem, ſed diſſimiles ſunt, eadem oſſium ratio ſeruatur, ſed aut pluris minoriſve modo differunt, aut proportione. Oſſa igitur ita ſe habent.

CAPVT VIII.

De cartilagine, eiúſque cum oſſe differentia.

CArtilago differt ab oſſe pluris minoriſve ratione, cùm aliàs natura eadem qua oſſa, conſtet. Et quemadmodum os præciſum nunquam recreſcit, ita & cartilago rupta nunquam reparatur. Terreſtrium quæ & animal gignunt, & ſanguinem habent, cartilago nullo foramine hiſcit, nec oſſium more medullam continet. At verò aquatilium cartilagineis quod per dorſum proportionatum oſſibus tendit, cartilago eſt, humorem in medullæ ſpeciem continens. Grandilium, quæ animal gignunt, auriculæ, nares, extremáque oſſium nonnulla, cartilagine conſtant.

A. ἔστι δὲ καὶ τὸ στῆθος ἐπὶ πλευραῖς κείμενον· ἀλλ' αὗται μὲν συνάπτουσιν, αἱ δ' ἄλλαι, ἀσυνάπτοι. οὐδὲν γὰρ ἔχει ζῷον ὀστοῦν περὶ τὴν κοιλίαν. ἔπειτα τά τε ἐν τοῖς ὤμοις ὀστᾶ, καὶ αἱ καλούμεναι ὠμοπλάται, καὶ τὰ τῶν βραχιόνων ἐχόμενα, καὶ τούτων τὰ ἐν ταῖς χερσίν. ὅσα δ' ἔχει σκέλη πρόσθια, καὶ ἐν τούτοις τὸν αὐτὸν ἔχει τρόπον. κάτω δ' ἢ τελευτᾷ μετὰ τὸ ἰσχίον, ἡ κοτυληδών ἐστι, καὶ τὰ τῶν σκελῶν ἤδη ὀστᾶ, τά τε ἐν τοῖς μηροῖς καὶ κνήμαις, οἱ καλούμενοι κωλῆνες, ὧν τὸ σφυρὸν μέρος· καὶ τούτων τὰ καλούμενα πλῆκτρα ἐν τοῖς ἔχουσι σφυρὸν· καὶ τούτοις συνεχῆ τὰ ἐν τοῖς ποσίν. ὅσα μὲν οὖν τῶν ἐναίμων καὶ πεζῶν ζῳοτόκα ἐστίν, οὐ πολὺ διαφέρει τὰ ὀστᾶ, ἀλλὰ κατ' ἀναλογίαν μόνον σκληρότητι, καὶ μαλακότητι, καὶ μεγέθει. ἔτι δὲ τὰ μὲν, ἔχει μυελόν, τὰ δ', οὐκ ἔχει τῶν ἐν τῷ αὐτῷ ζῴῳ ὀστῶν. ἔνια δὲ ζῷα, οὐδ' ἔχειν ἂν δόξειεν ὅλως μυελὸν ἐν τοῖς ὀστοῖς, οἷον λέων, διὰ τὸ πάμπαν ἔχειν μικρὸν καὶ λεπτόν, καὶ ἐν ὀλίγοις· ἔχει γὰρ ἐν τοῖς μηροῖς καὶ βραχίοσι. στερεὰ δὲ μάλιστα ὁ λέων πάντων ἔχει τὰ ὀστᾶ. οὕτω γάρ ἐστι σκληρά, ὥστε συντριβομένων ὥσπερ ἐκ λίθων ἐκλάμπειν πῦρ. ἔχει καὶ ὁ δελφὶς ὀστᾶ, ἀλλ' οὐκ ἀκάνθας. τὰ δὲ τῶν ἄλλων ζῴων τῶν ἐναίμων, τὰ μὲν, μικρὸν παραλλάττει, οἷον τὰ τῶν ὀρνίθων· τὰ δέ, τῷ ἀνάλογόν ἐστι ταὐτά, οἷον ἐν τοῖς ἰχθύσι. τούτων γὰρ τὰ μὲν ζῳοτοκοῦντα, χονδράκανθά ἐστιν, οἷον τὰ καλούμενα σελάχη·
C τὰ δ' ᾠοτοκοῦντα ἄκανθαν ἔχει, ἥ ἐστιν ὥσπερ τοῖς τετράποσιν ἡ ῥάχις. ἴδιον δὲ ἐν τοῖς ἰχθύσιν, ὅτι ἐν ἐνίοις εἰσὶ κατὰ τὴν σάρκα κεχωρισμένα ἀκάνθια λεπτά. ὁμοίως δὲ καὶ ὄφις ἔχει τοῖς ἰχθύσιν. ἀκανθώδης γὰρ ἡ ῥάχις αὐτοῦ ἐστι. τὰ δὲ τῶν τετραπόδων μέν, ᾠοτοκούντων δέ, τῶν μὲν μειζόνων, ὀστωδέστερά ἐστι, τῶν δὲ ἐλαττόνων, ἀκανθωδέστερά ἐστι. πάντα δὲ τὰ ζῷα ὅσα ἔναιμά ἐστιν, ἔχει ῥάχιν ἢ ὀστώδη, ἢ ἀκανθώδη. τὰ δ' ἄλλα μόρια τῶν ὀστῶν, ἐνίοις μὲν ἔστιν, ἐνίοις δ' οὐκ ἔστιν· ἀλλ' ὡς ὑπάρχει τοῦ ἔχειν τὰ μόρια, οὕτω καὶ τοῦ ἔχειν τὰ ἐν τούτοις ὀστᾶ. ὅσα γὰρ μὴ ἔχει σκέλη καὶ βραχίονας, οὐδὲ κωλῆνας ἔχει,
D οὐδ' ὅσα τὰ αὐτὰ μὲν ἔχει μόρια, μὴ ὅμοια δέ. καὶ γὰρ ἐν τούτοις, ἢ τῷ μᾶλλον καὶ ἧττον διαφέρει, ἢ τῷ ἀνάλογον. τὰ μὲν οὖν περὶ τῶν ὀστῶν, τοῦτον ἔχει τὸν τρόπον τοῖς ζῴοις.

ΚΕΦΑΛ. η'.

Περὶ χόνδρου.

ΕΣτι δὲ καὶ ὁ χόνδρος τῆς αὐτῆς φύσεως τοῖς ὀστοῖς, ἀλλὰ τῷ μᾶλλον διαφέρει καὶ ἧττον. καὶ ὥσπερ οὐδ'
E ὀστοῦν, οὐδ' ὁ χόνδρος αὐξάνεται, ἂν ἀποκοπῇ. εἰσὶ δὲ ἐν μὲν τοῖς χερσαίοις καὶ ζῳοτόκοις τῶν ἐναίμων ἄτρητοι καὶ οἱ χόνδροι, καὶ οὐ γίνεται ἐν αὐτοῖς, ὥσπερ ἐν τοῖς ὀστοῖς, μυελός. ἐν δὲ τοῖς σελάχεσιν (ταῦτα γάρ ἐστι χονδράκανθα) ἔνεστιν αὐτῶν ἐν τοῖς πλατέσι, τὸ κατὰ τὴν ῥάχιν ἀνάλογον τοῖς ὀστοῖς χονδρῶδες, ἐν οἷς ὑπάρχει ὑγρότης μυελώδης. τῶν ζῳοτοκούντων δὲ πεζῶν, περί τε τὰ ὦτα χόνδροι εἰσὶ καὶ τοὺς μυκτῆρας, καὶ περὶ ἔνια ἀκρωτήρια τῶν ὀστῶν.

ΚΕΦΑΛ. θ'.

Περὶ ὀνύχων καὶ ὁπλῶν, καὶ χηλῶν, καὶ κεράτων καὶ ῥύγχους.

Ἔτι δ' ἐστὶν ἄλλα γένη μορίων, οὔτε τὴν αὐτὴν ἔχοντα φύσιν τούτοις, οὔτε πόῤῥω τούτων· οἷον ὄνυχές τε καὶ ὁπλαὶ, καὶ χηλαὶ, καὶ κέρατα, καὶ παρὰ ταῦτα ἔτι ῥύγχος, οἷον ἔχουσιν οἱ ὄρνιθες, [ἐν οἷς ὑπάρχει ταῦτα τὰ μόρια τῶν ζώων] ταῦτα μὲν γὰρ, καὶ καμπτὰ καὶ σχιστά· ὀστοῦν δ' οὐδὲν καμπτὸν, οὐδὲ σχιστὸν, ἀλλὰ θραυστόν. καὶ τὰ χρώματα, καὶ τῶν κεράτων καὶ τῶν ὀνύχων καὶ χηλῆς, καὶ ὁπλῆς, κατὰ τὴν τοῦ δέρματος καὶ τῶν τριχῶν ἀκολουθεῖ χρόαν. τῶν μὲν γὰρ μελάνων δερμάτων, μέλανα τὰ κέρατα· καὶ αἱ χηλαὶ καὶ αἱ ὁπλαὶ, ὅσα χηλὰς ἔχει· καὶ τῶν λευκῶν, λευκά· μεταξὺ δὲ, τὰ τῶν ἀνὰ μέσον. ἔχει δὲ καὶ περὶ τοὺς ὄνυχας τὸν αὐτὸν τρόπον. οἱ δ' ὀδόντες, κατὰ τὴν τῶν ὀστῶν εἰσι φύσιν. διόπερ τῶν μελάνων ἀνθρώπων, ὥσπερ Αἰθιόπων καὶ τῶν τοιούτων, οἱ μὲν ὀδόντες, λευκοὶ, καὶ τὰ ὀστᾶ· οἱ δὲ ὄνυχες, μέλανες, ὥσπερ καὶ τὸ πᾶν δέρμα. τῶν δὲ κεράτων τὰ μὲν πλεῖστα κοῖλά ἐστι, τὸ ἀπὸ τῆς προσφύσεως περὶ τὸ ἐντὸς ἐκπεφυκὸς ὀστοῦν τῆς κεφαλῆς· ἐπ' ἄκρου δ' ἔχει τὸ στερεὰ, καὶ ἔστιν ἁπλᾶ. τὰ δὲ τῶν ἐλάφων, μόνα διόλου στερεὰ, καὶ πολυσχιδῆ. καὶ τῶν μὲν ἄλλων τῶν ἐχόντων κέρας, οὐδὲν ἀποβάλλει τὰ κέρατα· ἔλαφος δὲ μόνον καθ' ἕκαστον ἔτος, ἐὰν μὴ ἐκτμηθῇ. περὶ δὲ τῶν ἐκτετμημένων ἐν τοῖς ὕστερον λεχθήσεται. τὰ δὲ κέρατα προσπέφυκε μᾶλλον τῷ δέρματι, ἢ τῷ ὀστῷ. διὸ καὶ ἐν Φρυγίᾳ εἰσὶ βόες, καὶ ἄλλοθι, κινοῦσι τὰ κέρατα ὥσπερ τὰ ὦτα. τῶν δ' ἐχόντων ὄνυχας, (ἔχει δ' ὄνυχας ἅπαντα, ὅσαπερ δακτύλους· δακτύλους δὲ, ὅσα πόδας, πλὴν ἐλέφας· οὗτος δὲ καὶ δακτύλους ἀσχίστους, καὶ ἠρέμα διηρθρωμένους, καὶ ὄνυχας ὅλως οὐκ ἔχει) τῶν δ' ἐχόντων, τὰ μὲν εἰσὶν εὐθυώνυχα, ὥσπερ οἱ ἄνθρωποι· τὰ δὲ, γαμψώνυχα, ὥσπερ καὶ τῶν πεζῶν λέων, καὶ τῶν πτηνῶν αἰετός.

ΚΕΦΑΛ. ι'.

Περὶ τριχῶν καὶ τῶν ἀνάλογον.

Περὶ δὲ τριχῶν καὶ τῶν ἀνάλογον, καὶ δέρματος, ἔχει τόνδε τὸν τρόπον. τρίχας μὲν ἔχει τῶν ζώων, ὅσα πεζὰ καὶ ζωοτόκα· φολίδας δ', ὅσα πεζὰ, καὶ ᾠοτόκα· λεπίδας δ', ἰχθύες μόνοι, ὅσοι ᾠοτοκοῦσι τὸ ψαφυρὸν ᾠόν· τῶν γὰρ μακρῶν, γόγγρος μὲν οὐ τοιοῦτον ἔχει ᾠὸν, οὐδ' ἡ μύραινα, ἔγχελυς δὲ ὅλως οὐκ ἔχει. τὰ δὲ πάχη τῶν τριχῶν, καὶ αἱ λεπτότητες, καὶ τὰ μεγέθη, διαφέρουσι κατὰ τοὺς τόπους, ἐν οἷς ἂν ὦσι τῶν μερῶν, καὶ ὁποῖον ἂν ᾖ τὸ δέρμα. ὡς γὰρ ἐπὶ τὸ πολὺ ἐν τοῖς παχυτέροις δέρμασι, σκληρότεραι αἱ τρίχες, καὶ παχύτεραι· καὶ πλείους δὲ καὶ μακρότεραι ἐν τοῖς κοιλοτέροις καὶ ὑγροτέροις, ἄν περ ὁ τόπος ᾖ τοιοῦτος οἷος ἔχειν τρίχας. ὁμοίως δὲ καὶ περὶ τῶν λεπιδωτῶν ἔχει, καὶ τῶν φολιδωτῶν. ὅσα μὲν οὖν μαλακὰς ἔχει τὰς τρίχας, εὐβοσίᾳ χρώμενα, σκληροτέρας ἴσχει· ὅσα δὲ σκληράς, μαλακωτέρας καὶ ἐλάττους. διαφέρουσι δὲ καὶ κατὰ τοὺς τόπους τοὺς θερμοτέρους καὶ ψυχροτέρους· οἷον, αἱ τῶν ἀνθρώπων τρίχες, ἐν μὲν τοῖς θερμοῖς, σκληραί· ἐν δὲ τοῖς ψυχροῖς, μαλακαί. εἰσὶ δ' αὖ αἱ μὲν εὐθεῖαι, μαλακαί· αἱ δὲ κεκαμμέναι, σκληραί.

CAPVT IX.

De vngue, vngula, cornu, & dentibus, eorúmque cum oſſe conuenientia.

SVnt item alia partium genera, quæ naturam nec eandem habent, quam ea quæ expoſita ſunt, nec longè ab iis remotam, vt vngues, vngulæ, cornua: præterea roſtrum, quale datum auibus eſt. Hæc enim & flexilia, & fiſſilia ſunt, cùm nullum os vel flecti, vel findi poſſit, ſed fragile quodque habeatur. Colores cornuum, vnguium, vngularum, pro cutis pilorúmque colore ſequuntur. Etenim cutis nigræ, cornua nigra, & vngulæ nigræ oriuntur, & candidæ pari modo in colore reſpondent & cornua, & vngues, & vngulæ: mediis etiam medium eadem colorem præferunt. At dentes naturam oſſium æmulantur: quam ob rem hominum nigrorum, vt Æthiopum atque ſimilium, dentes & oſſa candent: vngues nigri modo ſuæ cutis apparent. Cornua parte plurima caua ſunt ab radice, quatenus ambiunt os, quod ortum à capite cauo cornu inſeritur, totúmque implet: in mucronem tamen ſolidum exeunt, & ſimplici parte extrema conſtant. Ceruis tantummodo tota ſolida, & ſparſa in ramos, & omnibus annis decidua, niſi caſtrentur: cùm ex cæteris cornigeris nullum cornua amittat. De caſtratis autem poſtea diſſeremus. Adhærent cornua cuti potiùs quàm oſſi. Vnde fit vt in Phrygia, & alibi, boues ſint, qui cornua perinde vt auriculas, moueant. Quæ habent vngues, (habent autem, quibus digiti, digiti verò iis ſunt, quibus pedes, excepto elephanto: huic enim digiti indiuiſi, ac leuiter formati, nec vngues omnino ſunt) hæc ergo, aut rectis vnguibus ſunt, vt homo: aut aduncis, vt inter pedeſtria leo, inter volatilia, aquila.

CAPVT X.

De pilis, & iis quæ pilorum vice funguntur.

DE pilis, atque de iis quæ vicem pilorum ſuppetunt, & ob eam rem pili proportionalia dicuntur, atque etiam de cute, res ita ſe habet. Pilos habent quæ pedeſtria, eademque viuipara ſunt. Cortice autem integuntur, quæ ouipara ſunt pedeſtria. Squama verò piſces tantùm, qui ouum arenidum illud pariunt. Nam ex longis conger, tale ouum non edit, nec muræna: anguilla verò nullum omnino ouum generat. Craſſitudinis, tenuitatis, copiæ, & magnitudinis pilorum diſcrimina, pro partium, quibus adhærent, conditione, atque pro cutis qualitate proueniunt. Fit enim magna ex parte, vt pili & duriores & craſſiores cuti craſſiori enaſcantur: plures autem & longiores humidioribus locis, atque cauatioribus (dummodo ſint ad gignendum pilum idonei) prodeunt. Hoc idem de genere quoque tam ſquama munito quàm cortice, intelligere licet. Quæ igitur molles ſuapte natura pilos habere ſolent, hæc per vſum pabuli melioris, duriores incipiunt gerere, contra autem molliores, pauciorésque, ea quæ duros copioſóſque habuerint, eadem illa ſcilicet ratione. Regionum etiam tepore, aut frigore differentia eſt: vt pili hominum locis calidis duri, frigidis molles oriuntur. Sunt molles, qui promiſſi, & ſimplices: duri qui criſpi.

A

CAPVT XI.

De pilis, & cute, & iis, quibus pili & cutis.

NAtura omnium pilorum fiſſilis eſt: ſed pluris minorisve ratione inter ſe differunt. Nonnulli paulatim adeò duritate degenerant, vt non pilis prætcrea, ſed ſpinis ſimiles eſſe videantur, vt pili herinaceorum. Quod idem vnguibus etiam euenit: quippe cùm in nonnullis animalium, genus vnguium præ nimia duritudine, nihilo ab oſſibus differat. Cutis homini proportione magnitudinis tenuiſſima eſt. Ineſt in cute omnium lentor quidam mucoſus, verùm aliis minùs, aliis magis: vt in tergore bubulo, ex quo glutinum facere ſolent. Quinetiam è piſcibus glutinum à nonnullis excoquitur. Senſu cutem ipſam carere conſtat, maximéque in capite, quoniam ibi nulla interpoſita carne oſſi adhæreat. Vbicumque cutis per ſe, ac ſine carne eſt, vulnerata non coit: vt in gena, bucca, præputio, palpebra. Contextu perpetuo cutis in omnibus animalibus continuatur: nec alibi interpellatur, quàm vbi naturales meatus ſolent euaporare, atque etiam in ore, & vnguibus. Cutem omnia habet quibus eſt ſanguis, pilos non omnia, ſed ſicvt diſtinctum iam eſt. Mutatur color pilorum in ſenectute, candidique pili efficiuntur in hominibus. quod vel cæteris animalibus accidit, ſed non ſatis aperto, præterquam in equo. Candeſcunt pili à parte ſui poſtrema. Plurimis tamen canorum numerus candicans illico exiſtit: qua ex re patet, canitiem nō ariditate committi, vt quidam volunt: nihil enim illico aridum gigni ſolet. Cutis autem vitio, quod vitiliginem appellamus, pilos omnes produci canos apertum eſt. Iam nonnullis pili dum ægrotarent, incanuerunt: quibus in bonam valetudinem reſtitutis, nigri enati ſunt, canis defluxis. Caneſcere pilos ocyus opertos, quàm detectos difflatóſque, aduertimus. Tempora hominum, & partes primores, quàm poſteriores, celeriùs canitiem ſentiunt. Pubes noviſſimè caneſcit. Pili in homine animalium omnium vno partim ſimul partim poſtea per ætates gignuntur. Congeniti ſunt pili capitis & ſuperciliorum, & palpebrarum: pòſt geniti, pubis primùm, mox alarum, poſtremò menti. Loca enim, quibus pili proueniant totidem ſunt congenitis deputata, quot pòſt genitis. Deficiunt, ac defluunt, maximè primique per ætatem pili capitis, non tamen omnes, ſed tantùm priores: parte namque poſteriore caluus nemo efficitur. Ergo capitis læuitatem, caluitium nuncupamus: quam rem in ſuperciliis ſalitium appellemus, quoad melius vocabulum inuenerimus. Neutrum eorum priùs quàm cœptus coitus Venereus ſit, accidere nouimus. Caluitij mulieres eſſe immunes, & pueros, & ſpadones, apertū eſt. Pili pòſt geniti, iis qui ante pubertatem caſtrati ſunt, non exeunt: & poſt pubertatem exciſis, ſoli decidunt, præterquam pubis. Pili in mento mulieris non prodeunt: niſi interdū pauci, cùm menſtrui curſus ſubſliterunt: & vt in terra Caria mulieribus ſacerdotibus euenire aiunt, quod diuinationis indicium interpretantur. Reliqui pili, qui poſtea gigni ſolent, mulieribus quoque proueniunt, ſed parciùs. Fieri poteſt vt homo, tum mas tum etiam fœmina, pilis pòſt genitis careat, iam inde ab ortu, naturæ vitio contracto: & niſi vt pubeſcant, contingat, ſteriles in gignendo ſunt.

ΚΕΦΑΛ. ια΄.

Περὶ τριχῶν καὶ δέρματος.

Ἡ Δὲ φύσις τῆς τριχός ἐστι σχιστή. τῷ μᾶλλον δὲ καὶ ἧττον διαφέρουσι πρὸς ἀλλήλας. ἔνιαι δὲ τῇ σκληρότητι μεταβαίνουσι κατὰ μικρόν, οὐκ ἔτι θριξὶν ἐοίκασιν, ἀλλ' ἀκάνθαις εἰσὶν, αἱ τῶν ἐχίνων τῶν χερσαίων, παραπλησίως τοῖς ὄνυξι. καὶ γὰρ τὸ τῶν ὀνύχων γένος ἐνίοις τῶν ζῴων οὐθὲν διαφέρει, διὰ τὴν σκληρότητα τῶν ὀστῶν. δέρμα δὲ πάντων λεπτότατον ἄνθρωπος ἔχει κατὰ λόγον τοῦ μεγέ- B θους. ἔνεστι δ' ἐν τοῖς δέρμασι πᾶσι γλισχρότης μυξώδης· ἐν μὲν τοῖς, ἐλάττων· ἐν δὲ τοῖς, πλείων, οἷον ἐν τοῖς τῶν βοῶν, ἐξ ἧς ποιοῦσι τὴν κόλλαν· ἐνιαχοῦ δὲ καὶ ἐξ ἰχθύων ποιοῦσι κόλλαν. ἀναίσθητον δὲ τὸ δέρμα τεμνόμενόν ἐστι καθ' αὑτό· μάλιστα δὲ τοιοῦτον, τὸ ἐν τῇ κεφαλῇ, διὰ τὸ μεταξὺ ἀσαρκότατον εἶναι πρὸς τὸ ὀστοῦν. ὅπου δ' ἂν ᾖ καθ' αὑτὸ δέρμα, ἂν διακοπῇ, οὐ συμφύεται· οἷον, γνάθου τὸ λεπτόν, καὶ ἀκροποσθία, καὶ βλεφαρίς. τῶν συνεχῶν δ' ἐστὶ τὸ δέρμα ἐν ἅπασι τοῖς ζῴοις καὶ ταύτῃ διαλείπει, ᾗ τε οἱ κατὰ φύσιν πόροι ἐξικμάζονται, καὶ κατὰ τὸ στόμα καὶ ὄνυχας. δέρμα μὲν οὖν ἔχει ἅπαντα τὰ ἔναιμα ζῷα· τρίχας δ' οὐ πάντα, ἀλλ' C ὥσπερ εἴρηται πρότερον. μεταβάλλουσι δὲ τὰς χροιὰς γηρασκόντων, καὶ λευκότεραι γίνονται ἐν ἀνθρώποις· τοῖς δ' ἄλλοις, γίνεται μὲν, οὐκ ἐπιδήλως δὲ σφόδρα, πλὴν ἐν ἵππῳ. λευκαίνεται δὲ καὶ ἀπ' ἄκρας ἡ θρίξ· αἱ δὲ πλεῖσται εὐθὺς φύονται λευκαὶ τῶν πολιῶν.* ᾗ καὶ δῆλον ὅτι οὐ ξηρότης ἐστὶν ἡ πολιότης, ὥσπερ τινές φασιν. οὐθὲν γὰρ φύεται εὐθὺς αὖον. ἐν δὲ τῷ ἐξανθήματι, ὃ καλεῖται λεύκη, πᾶσαι πολιαὶ γίνονται. ἤδη δέ τισι κάμνουσι μὲν πολιαὶ* γίνονται· ὑγιασθεῖσι δὲ, ἀπορρυεισῶν, μέλαιναι* ἀνέφυσαν. γίνονται τε μᾶλλον πολιαὶ, σκεπαζομένων τῶν τριχῶν, ἢ διαπνεο- D μένων. πρῶτοι δὲ πολιοῦνται οἱ κρόταφοι τῶν ἀνθρώπων, καὶ τὰ πρόσθια πρότερον τῶν ὀπισθίων· τελευταῖον δὲ ἡ ἥβη. εἰσὶ δὲ τῶν τριχῶν αἱ μὲν συγγενεῖς· αἱ δ', ὕστερον κατὰ τὰς ἡλικίας γινόμεναι ἐν ἀνθρώπῳ μόνῳ τῶν ζῴων, συγγενεῖς μὲν αἱ ἐν τῇ κεφαλῇ, καὶ ἐν τοῖς βλεφάροις καὶ [ταῖς] ὀφρύσιν· ὑστερογενεῖς δὲ, αἱ ἐπὶ τῆς ἥβης πρῶτον, ἔπειτα αἱ ἐπὶ τῆς μασχάλης, τρίται δὲ αἱ ἐπὶ τοῦ γενείου. ἴσοι γὰρ τόποι εἰσίν, ἐν οἷς αἱ τρίχες ἐγγίνονται, αἵ τε συγγενεῖς καὶ αἱ ὑστερογενεῖς. λείπουσι δὲ καὶ ῥέουσι κατὰ τὴν ἡλικίαν, αἱ ἐκ τῆς κεφαλῆς, καὶ μάλιστα, καὶ πρῶται. τούτων δὲ αἱ ἔμπροσθεν μόναι· τὰ γὰρ ὄπισθεν, οὐδεὶς γί- E νεται φαλακρός. ἡ μὲν οὖν κατὰ κορυφὴν λειότης, φαλακρότης καλεῖται· ἡ δὲ κατὰ τὰς ὀφρύας, ἀναφαλαντίασις. οὐδέτερον δὲ τούτων συμβαίνει οὐθενί, πρὶν ἢ ἀφροδισιάζειν ἄρξηται. οὐ γὰρ δὲ οὔτε παῖς φαλακρός, οὔτε γυνὴ οὐδὲ οἱ ἐκτετμημένοι· ἀλλ' ἐὰν μὲν ἐκτμηθῇ πρὸ ἥβης, οὐ φύονται αἱ ὑστερογενεῖς· ἐὰν δὲ ὕστερον, αὗται μόναι ἐκρέουσι, πλὴν τῆς ἥβης. γυνὴ δὲ τὰς ἐπὶ τοῦ γενείου οὐ φύει τρίχας, πλὴν ὀλίγαις ἐνίαις γίνονται, ὅταν τὰ καταμήνια στῇ, καὶ οἷον ἐν Καρίᾳ ταῖς ἱερείαις· ὃ δοκεῖ συμβαίνειν σημεῖον τῶν μελλόντων. αἱ δ' ἄλλαι, γίνονται μὲν, ἐλάττους δέ. γίνονται δὲ καὶ ἄνδρες καὶ γυναῖκες, ἐκ γενετῆς ἐνδεεῖς τῶν ὑστερογενῶν τριχῶν ἅμα καὶ ἄγονοι, ὅσοιπερ ἂν καὶ ἥβης στερηθῶσιν.

* De generat. lib. 5. cap. 5.

* Scrib. γίνονται.

* γρ. ἀνέφυσαν.

αἱ μὲν οὖν ἄλλαι τρίχες αὐξάνονται κατὰ λόγον, ἢ πλεῖον, ἢ ἔλαττον, μάλιστα μὲν αἱ ἐν τῇ κεφαλῇ, εἶτα [ἐν] πώγωνι, καὶ αἱ λεπτότεραι μάλιστα. δασύνονται δὲ τισὶ καὶ αἱ ὀφρύες, γηράσκουσι πρεσβυτέροις, οὕτως, ὥστ' ἀποκείρεσθαι, διὰ τὸ ἐπὶ συμφύσει ὀστῶν κεῖσθαι, ἃ γηράσκοντα διίσταται, διίησι πλείω ὑγρότητα. αἱ δ' ἐν τοῖς βλεφαρίσιν, οὐκ αὐξάνονται· ῥέουσι δέ, ὅταν ἀφροδισιάζειν ἄρξωνται, καὶ μᾶλλον, τοῖς μᾶλλον ἀφροδισιαστικοῖς. πολιοῦνται δὲ βραδύτατα αὗται. ἐκτιλλόμεναι δ' αἱ τρίχες, μέχρι τῆς ἀκμῆς ἀναφύονται, εἶτα οὐκέτι. ἔχει δὲ πᾶσα θρὶξ ὑγρότητα πρὸς τῇ ῥίζῃ γλίσχραν, καὶ ἕλκει εὐθὺς ἐκτιλθεῖσα, τὰ κοῦφα θιγγάνουσα. ὅσα δὲ ποικίλα τῶν ζῴων κατὰ τὰς τρίχας, ἐν τούτοις καὶ ἐν τῷ δέρματι προϋπάρχει ἡ ποικιλία, καὶ ἐν τῷ τῆς γλώττης δέρματι. περὶ δὲ τὸν πώγωνα, τοῖς μὲν, συμβαίνει καὶ τὴν ὑπήνην καὶ τὸ γένειον δασὺ ἔχειν· τοῖς δὲ, ταῦτα μὲν λεῖα, τὰς σιαγόνας δὲ δασείας· ἧττον δὲ γίγνονται φαλακροί, * οἱ μὴ δίπωγοι. αὐξάνονται δ' αἱ τρίχες, ἔν τε νόσοις τισί, οἷον [τε] ταῖς φθισικαῖς μᾶλλον, καὶ ἐν γήρᾳ, καὶ τεθνεώτων, καὶ σκληρότεραι γίνονται ἀντὶ μαλακῶν. τὰ δ' αὐτὰ ταῦτα συμβαίνει καὶ περὶ τοὺς ὄνυχας. ῥέουσι δὲ μᾶλλον αἱ τρίχες τοῖς ἀφροδισιαστικοῖς, αἱ μὲν σύμφυες· αἱ δὲ ὑστερόφυες, γίνονται θᾶττον. οἱ δὲ κιρσοὺς ἔχοντες, ἧττον φαλακροῦνται. κἂν ὄντες φαλακροὶ λάβωσιν, ἔνιοι δασύνονται. οὐκ αὐξάνεται δὲ θρὶξ ἀποτμηθεῖσα, ἀλλὰ κάτωθεν ἀναφυομένη, γίνεται μείζων. καὶ αἱ λεπίδες δὲ τοῖς ἰχθύσι, σκληρότεραι γίνονται καὶ παχύτεραι· τοῖς δὲ λεπτυνομένοις, καὶ τοῖς γηράσκουσι, σκληρότεραι. καὶ τῶν τετραπόδων δὲ γινομένων πρεσβυτέρων, τῶν μὲν, αἱ τρίχες, τῶν δὲ, τὰ ἔρια βαθύτερα μὲν γίνεται, ἐλάττω δὲ τῷ πλήθει. καὶ τῶν μὲν, αἱ ὁπλαί, τῶν δὲ, αἱ χηλαί, γίνονται γηρασκόντων μείζους, καὶ τὰ ῥύγχη τῶν ὀρνίθων. αὐξάνονται δὲ καὶ αἱ χηλαί, ὥσπερ καὶ οἱ ὄνυχες.

ΚΕΦΑΛ. ιβ'.

Περὶ πτερῶν καὶ τριχῶν μεταβολῆς.

Περὶ δὲ τὰ πτερωτὰ τῶν ζῴων, οἷον τοὺς ὄρνιθας, κατὰ μὲν τὰς ἡλικίας οὐθὲν μεταβάλλει, πλὴν γέρανος· αὕτη δ', ὡς εἴρηται, γηράσκουσα μελάντερα τὰ πτερὰ ἴσχει. διὰ δὲ τὰ πάθη τὰ γινόμενα κατὰ τὰς ὥρας, οἷον ὅταν ψῦχος γένηται μᾶλλον, ἐνίοτε γίνεται τῶν μονοχρόων, ἐκ μελάνων τε καὶ μελαντέρων ἢ λευκοτέρων, λευκά, οἷον κόραξ τε καὶ στρουθὸς, καὶ χελιδόνες· ἐκ δὲ τῶν λευκῶν γενῶν, οὐκ ὦπται εἰς μέλαν μεταβάλλον. καὶ κατὰ τὰς ὥρας δὲ οἱ πολλοὶ τῶν ὀρνίθων μεταβάλλουσι τὰς χρόας· ὥστε λαθεῖν ἂν τὸν μὴ συνήθη. μεταβάλλουσι δ' ἔνια τῶν ζῴων τὰς χρόας τῶν τριχῶν κατὰ τὰς τῶν ὑδάτων μεταβολάς. ἔνθα μὲν γάρ, λευκὰ γίνεται· ἔνθα δέ, μέλανα. ταῦτα δὲ καὶ περὶ τὰς ὀχείας· ἔστιν ὕδατα πολλαχοῦ τοιαῦτα, ἃ πιόντα καὶ ὀχεύσαντα μετὰ τὴν πόσιν, τὰ πρόβατα μέλανας γεννῶσι τοὺς ἄρνας, οἷον ἐν τῇ Χαλκιδικῇ τῇ ἐπὶ τῆς Θρᾴκης, ἐν τῇ Ἀσσυρίτιδι, ἐποίει ὁ καλούμενος Ψυχρὸς ποταμός. καὶ ἐν τῇ Ἀντανδρίᾳ δὲ δύο ποταμοί εἰσιν, ὧν ὁ μὲν λευκά, ὁ δὲ μέλανα ποιεῖ τὰ πρόβατα. δοκεῖ δὲ καὶ ὁ Σκάμανδρος ποταμὸς ξανθὰ τὰ πρόβατα ποιεῖν·

Mercurialis Var. lib. 5. c. 9.

* Gaza οἱ ἐρῆμ.

A Creſcunt cæteri pili plus minúſve, prout ſingulorum ratio poſtulat, maximè in capite, mox in barba, & præcipuè quibus pili tenuiores. Nonnullis etiam ſupercilia per ſenectutem adeò hirſuta redduntur, vt tondendum ſit: quod propterea euenit, quia cohæſioni appoſita ſint oſſium, quæ ſeneſcente ætate laxantur, & inde plus humoris tranſmitti patiuntur. at verò pili palpebrarum nunquam plus iuſto excreſcunt: defluunt rebus Venereis inceptis, eòque magis, quo vſus Veneris fuerit amplior: eoſdem etiam lentiſſimè omnium caneſcere clarum eſt. Pili euulſi ſubnaſci denuò poſſunt, dum citra ætatis florem degitur, nec vlteriùs. Habet autem genus quodque pilorum ad ſuam radicem lentum quendam humorem, quo protinus, vbi euul- B ſum eſt, ſi qua leuiuſcula tangat, adhæret, vt ea trahere poſſit tenaciùs. Quibus verò animalibus verſicolores ſunt pili, eiſdem etiam in cute varius ille color habetur, atque etiam in lingua. Barba non pari modo effunditur omnibus, ſed aliis tam maxillæ, quàm muſtax, & mentum pilorum frequentia integuntur: aliis mentum læue, & muſtax, maxillæ piloſæ cernuntur. Calueſcere minùs ſolent, qui mento ſunt bipartito. Creſcunt etiam pili quibuſdam in morbis, vt præcipuè in tabificis. Quinetiam in ſenectute & defuncto augeſcunt, durioréſque redduntur: quod idem vnguibus quoque euenit. Libidinoſis pili congeniti maturiùs defluunt: poſtgeniti, celeriùs ſeſe promunt. Minùs, qui varices C habent, calueſcunt. Et ſi calui habere inceperint, pilos nonnulli producunt. Pili præciſi non ab inciſura augentur, ſed inferiùs ab radice exeunt: atque ita euadunt longiores. Piſcibus quoque extenuatis ac ſeneſcentibus, ſquamæ duriores craſſioréſque efficiuntur. Quadrupedum etiam villi, lanæve, ſenectute prolixiùs augentur, quanquam rareſcant fiantque pauciores. Et vngulæ quoque maiores in ſenecta redduntur: quod idem roſtris etiam auium euenit. Incrementum vngularum idem, quod vnguium eſt.

CAPVT XII.

D *De pennis auium, & earum mutatione, aliorúmque animalium, e potu quorundam fluminum.*

PEnnæ auium nullæ per ætates mutantur, præterquam gruum, quas nigreſcere in ſenecta perſpectum eſt. at verò per affectus temporarios, quoties frigora vrgent acriora, pennæ volucrum vnicolores interdum è nigris, aut nigriuſculis, albidiſve in albas tranſeunt: vt corui, paſſeris, hirundinis. Cuius rei contrarium, vt quicquam ex genere albo veniret in nigrum, nunquam viſum eſt. Temporum quoque viciſſitudine bona pars auium ita colore immutatur, vt quænam ſint, latère poſſint, niſi rem peritiùs noueris. Aquarum item diuerſa- E rum vſu, nonnulla ſuos immutant colores: alibi enim candida, alibi nigra redduntur. Sunt etiam aquæ multis in locis, quas cùm oues biberint, móxque inierint, nigros generent agnos: vt in terra Aſſyritide agri Chalcidici Thraciæ facit amnis, quem præ nimia frigiditate Pſychrum vocant. Et in Antandria quoque duo ſunt fluuij, quorũ alter candorem, alter nigritiam pecoribus facit. Scamander etiam amnis flauas reddere oues creditur:

quamobrem Xanthum pro Scamandro nuncupatum ab Homero autumant. Lepori vni pili & in bucca intus, & ſub pedibus ſunt: cùm cætera animalia nec intra os habeant pilos, nec parte pedum reſupina, ſed prona. Muſculus etiam piſcis pilos in ore intus habet vice dentium, quibus omnino caret, ſuillis ſimiles. Sed pili, vt dictum eſt, præſecti augeri ab radice poſſunt, ſupernè non poſſunt: pennæ autem nec ab radice, neque ſupernè ab inciſura poſſunt reparari, ſed cadant neceſſe eſt. Nec penna apum, aut quæuis inſiſſa renaſci poteſt, cùm euulſa eſt. aculeo etiam apibus detracto, nullus ſubnaſcitur alius; imò breui moriantur, neceſſe eſt.

CAPVT XIII.

De membranis in ſanguineis animalibus.

SVnt & membranæ in ſanguineis animalibus, quæ quidem pars ſimilis cuti prætenui ſpiſſæque eſt. Sed diuerſum ſane genus id eſt, quippe quod nec ſiſſile nec euulſile ſit. ambit ſingula, cum oſſa tum etiam viſcera membrana, tam in maiore quàm in minore animalium genere: verùm in minore ſenſum effugit, quoniam admodum tenuis atque exigua ſit. Maximæ inter membranas duæ ſunt illæ, quibus cerebrum opertum munitur: altera ſupra adhæret oſſi, quæ firmior, & craſſior eſt: altera infra contigua cerebro: mox quæ operit cor, magna habetur. Præciſa membrana ipſa ſyncera non coit: & oſſa ſuis diſpoliata membranis ſyderantur.

CAPVT XIV.

De omento.

OMentum quoque non niſi membrana eſt: quod omnia habent quæ ſanguine non carent, ſed alia pingue, alia macilentum. Oritur id, & dependet in iis quæ animal generant, eademque dentata parte vtraque ſunt, à medio ventre qua velut quædam ſutura ducitur. Nec ſecus in iis quæ altero dentium ordine carent, à maiore ventre dependet.

CAPVT XV.

De veſica, & quomodo generentur calculi.

VEſica etiam membrana eſt: ſed genus id aliud membranæ eſt, quippe quod tendi ingenuè poſſit. Non omnibus data veſica eſt, ſed iis tantùm quæ animal gignunt. Ouipari autem generis nulli, præter teſtudinem, data eſt. Nec veſica præciſa coire poteſt, niſi ad ipſum exordium ſuæ ceruicis. Quanquam non ignoro ita aliquando contigiſſe, vt vulnerata veſica ſolideſceret. Sed quod admodum raro contingit, parum id obſeruandum cenſeo. Defunctis nihil humoris in veſicam tranſmittitur. at viuis non ſolùm humor, ſed etiam ſicca quædam, & concrementa deſcendunt, ex quibus calculi conficiantur. Iam nonnullis talia in veſica conſtiterunt, quæ nihilo differre à conchylijs viderentur. Ergo de venis, neruis, fibris, cute, membranis, atque etiam de pilis, vnguibus, vngulis, cornibus, dentibus, roſtro, cartilagine, oſſibus, eorúmque proportionalibus, ſtatuendum ad hunc modum eſt.

A διὸ καὶ τὸν Ὅμηρόν φασιν ἀντὶ Σκαμάνδρου, Ξάνθον προσαγορεύειν αὐτόν. τὰ μὲν οὖν ἄλλα ζῷα, οὔτ' ἐντὸς ἔχει τρίχας, τῶν τε ἀκρωτηρίων ἐν τοῖς πρανέσιν, ἀλλ' οὐκ ἐν τοῖς ὑπτίοις· ὁ δὲ δασύπους μόνος, καὶ ἐντὸς ἔχει τῶν γνάθων τρίχας [καὶ ὑπὸ τοῖς ποσίν.] ἔτι δὲ καὶ ὁ μυστικῆτος ὀδόντας μὲν ἐν τῷ στόματι οὐκ ἔχει, τρίχας δὲ ὁμοίας ὑείαις. αἱ μὲν οὖν τρίχες αὐξάνονται ἀποτμηθεῖσαι κάτωθεν, ἄνωθεν δ' οὔ. τὰ δὲ πτερά, οὔτε ἄνωθεν, οὔτε κάτωθεν, ἀλλ' ἐκπίπτει. οὐκ ἀναφύεται δὲ ἐκτιλθὲν, οὔτε τῶν μελιττῶν τὸ πτερόν, οὐδ' ὅσα ἄλλα ἄσχιστα ἔχει τὸ πτερόν· οὐδὲ τὸ κέντρον, ὅταν ἀποβάλλῃ ἡ μέ-
B λιττα, ἀλλ' ἐκ τούτε ἀποθνήσκει.

ΚΕΦΑΛ. ιγ.

Περὶ ὑμένων.

ΕΙσὶ δὲ καὶ ὑμένες ἐν τοῖς ζῴοις ἅπασι τοῖς ἐναίμοις· ὅμοιος δὲ ἐστὶν ὁ ὑμὴν δέρματι πυκνῷ καὶ λεπτῷ. ἔστι δὲ τὸ γένος ἕτερον. οὔτε γὰρ ἐστι σχιστόν, οὔτε τατόν. περὶ ἕκαστον δὲ τῶν ὀστῶν, καὶ περὶ ἕκαστον τῶν σπλάγχνων, ὁ ὑμήν ἐστι, καὶ ἐν τοῖς μείζοσι καὶ ἐν τοῖς ἐλάττοσι ζῴοις· ἀλλ' ἄδηλοι ἐν τοῖς ἐλάττοσι, διὰ τὸ πάμπαν εἶναι λεπτοὶ καὶ μικροί. μέγιστοι δὲ τῶν ὑμένων εἰσίν, οἵ τε περὶ τὸν ἐγκέφαλον δύο,
C ὧν ὁ περὶ τὸ ὀστοῦν, ἰσχυρότερος καὶ παχύτερος τοῦ περὶ τὸν ἐγκέφαλον· ἔπειθ' ὁ περὶ τὴν καρδίαν ὑμήν. διακοπεὶς δὲ οὐ συμφύεται ψιλὸς ὑμήν· [καὶ] ψιλούμενα τὰ ὀστᾶ τῶν ὑμένων, σφακελίζει.

ΚΕΦΑΛ. ιδ.

Περὶ ἐπιπλόου.

ΕΣτι δὲ καὶ τὸ ἐπίπλοον ὑμήν. ἔχει δ' ἐπίπλοον ἅπαντα τὰ ἔναιμα· ἀλλὰ τοῖς μὲν πῖον, τοῖς δὲ, ἀπίμελον ἐστι. ἔχει δὲ καὶ τὴν ἀρχὴν καὶ τὴν ἐξάρτησιν, ἐν τοῖς ζῳοτόκοις καὶ ἀμφώδουσιν, ἐκ μέσης τῆς κοιλίας, ᾗ
D ἐστιν οἷον ῥαφή τις αὐτῆς· καὶ τοῖς μὴ ἀμφώδουσι δὲ, ἐκ τῆς μεγάλης κοιλίας ὡσαύτως.

ΚΕΦΑΛ. ιε.

Περὶ κύστεως.

ΕΣτι δὲ καὶ ἡ κύστις ὑμενώδης μὲν, ἄλλο δὲ γένος ὑμένος· ἔχει γὰρ τάσιν. ἔχει δὲ κύστιν οὐ πάντα, ἀλλὰ τὰ μὲν ζῳοτόκα πάντα, τῶν δ' ᾠοτόκων, ἡ χελώνη μόνον. διακοπεῖσα δὲ οὐδ' ἡ κύστις συμφύεται, ἀλλ' ἢ παρ' αὐ-
E τὴν τὴν ἀρχὴν τοῦ οὐρητῆρος, εἰ μή τι πάμπαν σπάνιον· γέγονε γάρ τι ἤδη τοιοῦτον. τεθνεώτων μὲν οὖν οὐδὲν διίησιν ὑγρόν· ἐν δὲ τοῖς ζῶσι, καὶ ξηρὰς συστάσεις, ἐξ ὧν οἱ λίθοι γίγνονται τοῖς κάμνουσιν. ἐνίοις δ' ἤδη καὶ τοιαῦτα συνέστη ἐν τῇ κύστει, ὥστε μηδὲν δοκεῖν διαφέρειν κογχυλίων. περὶ μὲν οὖν φλεβὸς, καὶ νεύρου, καὶ δέρματος, καὶ περὶ ἰνῶν καὶ ὑμένων, ἔτι δὲ καὶ περὶ τριχῶν καὶ ὀνύχων, καὶ χηλῆς, καὶ ὁπλῆς, καὶ κεράτων, καὶ ὀδόντων, καὶ ῥύγχους, καὶ χόνδρου, καὶ ὀστῶν, καὶ τῶν ἀνάλογον τούτοις, ἔχει τόνδε τὸν τρόπον.

A

ΚΕΦΑΛ. ις.

Περὶ σαρκός.

Σὰρξ δὲ, καὶ τὸ παρὰ ταύτην ἔχον τὴν φύσιν τῆς σαρκὸς, ἐν τοῖς ἐναίμοις πᾶσίν ἐστι μεταξὺ τοῦ δέρματος καὶ τοῦ ὀστοῦ, καὶ τῶν ἀνάλογον τοῖς ὀστοῖς. ὡς γὰρ ἡ ἄκανθα ἔχει πρὸς τὸ ὀστοῦν, οὕτω καὶ τὸ σαρκῶδες πρὸς τὰς σάρκας ἔχει τῶν ἐχόντων ὀστᾶ καὶ ἀκάνθας. ἔστι δὲ διαιρετὴ ἡ σὰρξ πάντῃ, καὶ οὐχ ὥσπερ τὰ νεῦρα καὶ αἱ φλέβες, ἐπὶ μῆκος μόνον. λεπτυνομένων δὲ τῶν ζῴων, ἀφανίζονται, καὶ γίνονται φλέβια καὶ ἶνες. εὐβοσίᾳ δὲ πλείονι χρωμένων, πιμελὴ ἀντὶ σαρκῶν. εἰσὶ δὲ τοῖς μὲν ἔχουσι τὰς σάρκας πολλὰς, αἱ φλέβες ἐλάττους καὶ τὸ αἷμα ἐρυθρότερον, καὶ τὰ σπλάγχνα καὶ κοιλία μικρά. τοῖς δὲ τὰς φλέβας ἔχουσι μεγάλας, καὶ τὸ αἷμα μελάντερον, καὶ σπλάγχνα μεγάλα, καὶ κοιλία μεγάλη, αἱ δὲ σάρκες ἐλάττους. γίνονται δὲ κατὰ σάρκα πίονα τὰ τὰς κοιλίας ἔχοντα μικράς.

ΚΕΦΑΛ. ιζ.

Περὶ πιμελῆς καὶ στέατος.

Πιμελὴ δὲ καὶ στέαρ διαφέρουσιν ἀλλήλων. τὸ μὲν γὰρ στέαρ, ἐστὶ θραυστὸν πάντῃ, καὶ πήγνυται ψυχόμενον· ἡ δὲ πιμελὴ, χυτὸν καὶ ἄπηκτον. καὶ οἱ μὲν ζωμοὶ τῶν πιόνων, οὐ πήγνυνται, οἷον ἵππου καὶ ὑός· οἱ δὲ τῶν στέαρ ἐχόντων, πήγνυνται, οἷον προβάτου καὶ αἰγός. διαφέρουσι δὲ καὶ τοῖς τόποις. ἡ μὲν γὰρ πιμελὴ γίνεται μεταξὺ δέρματος καὶ σαρκός. στέαρ δ᾽ οὐ γίνεται, ἀλλ᾽ ἢ ἐπὶ τέλει τῶν σαρκῶν. γίνεται δὲ καὶ τὸ ἐπίπλοον, τοῖς μὲν πιμελώδεσι, πιμελῶδες· τοῖς δὲ στεατώδεσι, στεατῶδες. ἔχει δὲ τὰ μὲν ἀμφώδοντα, πιμελήν· τὰ δὲ μὴ ἀμφώδοντα, στέαρ. τῶν δὲ σπλάγχνων τὸ ἧπαρ ἐν ἐνίοις τῶν ζῴων γίνεται πιμελῶδες, οἷον τῶν ἰχθύων ἐν τοῖς σελάχεσι· ποιοῦσι γὰρ ἔλαιον ἀπ᾽ αὐτῶν ὀπτώμενον. αὐτὰ δὲ τὰ σελάχη ἐστὶν ἀπιμελώτατα καὶ κατὰ σάρκα καὶ κατὰ κοιλίαν, κεχωρισμένην πιμελήν. ἔστι δὲ καὶ τὸ τῶν ἰχθύων στέαρ πιμελῶδες, καὶ οὐ πήγνυται. καὶ πάντα δὲ τὰ ζῷα, τὰ μὲν κατὰ σάρκα ἐστὶ πίονα, τὰ δὲ ἀφωρισμένως. ὅσα δὲ μὴ ἔχει κεχωρισμένην τὴν πιότητα, ἧττον ἐστὶ πίονα κατὰ κοιλίαν καὶ ἐπίπλοον, οἷον ἔγχελυς· ὀλίγον γὰρ στέαρ ἔχουσι περὶ τὸ ἐπίπλοον. τὰ δὲ πλεῖστα γίνεται πίονα κατὰ τὴν γαστέρα, καὶ μάλιστα τὰ μὴ ἐν κινήσει ὄντα τῶν ζῴων. οἱ δ᾽ ἐγκέφαλοι, τῶν μὲν πιμελωδῶν, λιπαροί, οἷον ὑός· τῶν δὲ στεατωδῶν, αὐχμηροί. τῶν δὲ σπλάγχνων περὶ τοὺς νεφροὺς μάλιστα πίονα γίνεται τὰ ζῷα. ἔστι δ᾽ ἀεὶ ὁ δεξιὸς ἀπιμελώτερος· κἂν σφόδρα πίονες ὦσιν, ἐλλείπεταί τι ἀεὶ κατὰ τὸ μέσον. περίεφρα δὲ γίνεται τὰ στεατώδη μᾶλλον, καὶ μάλιστα τῶν ζῴων πρόβατα. τοῦτο γὰρ ἀποθνήσκει, τῶν νεφρῶν πάντῃ αὐτοῦ καλυφθέντων. γίνεται δὲ περίεφρα δι᾽ εὐβοσίαν, οἷον τῆς Σικελίας περὶ Λεοντίνους. διὸ ἐξελαύνουσιν ὀψὲ τὰ πρόβατα τῆς ἡμέρας, ὅπως ἔλαττον λάβωσι τὴν τροφήν.

CAPVT XVI.

De carne.

CAro autem hæc,& quod carni ſimile, in genere ſanguineo, eſt omnibus inter cutem & oſſa, aut quæ oſſium proportione continentur. Vt enim ſe habet ſpina ad os, ita carnis æmulum illud ad carnem. Diuiſibilis vndiquę caro eſt, nec venarum, aut neruorum more in longum ſecari tantùm idonea. aboletur & in venas fibraſque tranſit, quoties animal extenuatur & graciléſcit. Vertitur item
B in pingue, quoties pabuli copia ſuppetit. Quibus multum eſt carnis, iis venæ arctiores, & ſanguis rubentior,& venter ac viſcera parua. Quibus parum, iis venæ ampliores, ſanguis atrior, viſcera maiora, & venter auctior. Pingueſcunt intra carnem, quibus paruus eſt venter.

CAPVT XVII.

De adipe,& ſebo:& quæ animalia adipe, quæ ſebo pingueſcant.

ADeps autem & ſebum differunt inter ſe, cùm ſebum fragile vſquequaque ſit, & cùm refri-
C xit, concreſcat: adeps liquidus ſit, miniméque aptus durari. Iura enim ſebo opimorum concreſcunt, vt ouis, vt capræ. Adipe pinguium liquida reſiſtunt frigori vt equi, vt ſuis: locis etiam diſcrepant. adeps enim inter carnem cutemque ſolet conſiſtere: ſebum in fine carnis ſemper eſt. Omentum quoque adipe pingueſcentibus adipeum eſt, ſebo obeſis ſebale. Quæ parte vtraque dentata ſunt, adipe pingueſcunt: quæ vna, ſebo. Iecur è viſceribus adipeum nonnullis conſiſtit, vt inter aquatilia cartilagineis: quorum iecinoribus colliquatis oleum facimus. Ipſa tamen cartilaginea nullo diſcreto adipe carni ventrive adhærente pingueſcunt. Piſcium ſebum adipem præ ſe fert, nec concreſcere ſolet.
D animalia quæuis aut intra carnē, aut ſeorſum pingueſcunt. E quibus autem pingue ſeparatum non eſt, ea minus per ventrem omentumque pingueſcunt: vt anguillæ. paucum enim eſt eis ſebum in omento. Plurima tamen pars animalium ventre pingueſcit, & præcipuè quæ parum ſe moueant. Cerebrum, vt adipe pingueſcentium, pinguiuſculū eſt, velvt ſuis: ſic ſebo obeſorum, ſqualliduſculum ſentitur, vt ouis. Renes ex viſceribus maximè pingueſcunt: verùm dexter minus ſemper, quàm ſiniſter: & quamuis vehementer fuerint pingues, tamen aliquid ſemper mediis deeſt. Quæ ſebo pingueſcunt, magis quàm quæ adipe, in renibus opi-
E mandis luxuriant, ac omnium præcipuè oues, quippe quæ renibus pingui vndique obductis intereãt. quod vbertate pabuli fit, vt in Sicilia agro Leontino fieri conſtat. Quocirca ſero diei agere oues ad paſcua paſtores loci illius ſolent, quo minùs capiant pabuli.

CAPVT XVIII.

Pupillas omnibus animantibus eaſdem eſſe.

OMnium verò animalium commune pupillæ inſtitutio eſt. Omnibus enim quæ partem hāc poſſident, nec duris oculis ſunt, ſebo conſtat. Minùs eſſe fœcunda, quæ adipe pingueſcunt, ſiue mares, ſiue fœminæ, notum eſt. Omnia ætate prouecta potiùs quàm nouella pingueſcunt: ſed præcipuè, cùm iam ſuæ longitudinis ac latitudinis modum adepta, augeri in profundum incipiunt.

CAPVT XIX.

Sanguinem omnibus & communem, & neceſſarium eſſe animantibus ſanguineis deque ſanguinum varietate.

SAnguis in primis neceſſarius communiſque ſanguineis omnibus animalibus eſt, nec aduentitius ſuppetit, ſed vernaculus, atque intimus in omnibus integris atque imputidis habetur. Venas hic vaſa ſibi & conceptacula habet: nec in vllo alio niſi in corde, præter venas, continetur. Tactum nullo in genere ſentit: ſicvt excrementa quoque in aluo contenta, ſenſu carere certum eſt. Quinetiam cerebrum, & medulla tactum non ſentiunt. Effluit ſanguis quamcumque partem incideris carnis viuæ, ac incorruptæ. Si ſanguis integer eſt, ruber, & dulcis ſaporis eſt: ſed ſi vel natura, vel morbo ſit vitiatus, atrior cernitur. Nec vero admodum craſſus, aut admodum tenuis eſt, qui optimo habitu conſtet: humidus & calidus ſemper eſt, quamdiu in corpore animalis continetur. at vbi effluxerit, concreſcit omnium præterquam ceruorum, & damarum, & ſi quid aliud natura eiuſmodi ſit. Itaque cæterorum omnium ſanguis ſpiſſari ſolet, niſi fibræ, quibus refertus eſt, eximantur: ſed celerrimè omnium ſanguis taurorum coit dureſcitque. Copia ſanguinis in primis, animalibus iis quæ animal & intra ſe formāt, & in lucem edunt: mox iis ſanguineis, quæ pariunt oua. Quæ autem vel natura, vel arte, bono habitu ſunt, iis nec multum admodum ſanguinis eſt, velvt iis quæ per aliquam potionem recentem ſanguine exundant: nec parum, velvt iis quæ nimium ſunt obeſa: quippe cùm præpinguia omnia ſanguinem, quamuis purum, tamen paucum habeant: & quo plus pinguedinis, eo minus poſſideāt ſanguinis: pingue enim omne exangue eſt. Obeſa item ſanguinem habent imputidum, quanquam ſanguis, & quæ ſanguinea ſunt, facilè putrent: ac præcipuè quæ ad oſſa propius applicantur. Homini ſanguis tenuiſſimus, ac mundiſſimus: tauro, & aſino inter ea quæ animal generant, craſſiſſimus & nigerrimus: parte etiam inferiore craſſior, & atrior eſt, quàm ſuperiore. Palpitat intra venas ſanguis omnium animalium, pulſuque ſimul vndique mouetur, ſolúſque omnium humorum ſparſus per totum corpus animalium eſt. Et ſemper quādiu vita ſeruatur, ſāguis vnus animatur, & feruet. Oritur primùm in corde, antè quàm totū corpus formetur. Si multum ſanguinis effluat, anima deficit: ſi nimiùm, vita interit. Si ſanguis immodicè humeſcit, morbus infeſtat: ſic enim in ſpeciem ſaniei diluitur, & adeò ſereſcit, vt iā nonnulli ſudore cruento exundarint.

ΚΕΦΑΛ. ιη'.

Περὶ κόρης.

ΠΑντων δὲ τῶν ζώων κοινόν ἐστι, τὸ περὶ τὴν κόρην ἐν τοῖς ὀφθαλμοῖς. ἔχουσι γὰρ τοῦτο τὸ μόριον στεατῶδες πάντα ὅσα ἔχουσι τοῦτο τὸ μόριον ἐν τοῖς ὀφθαλμοῖς, καὶ μὴ εἰσὶ σκληρόφθαλμα. ἔστι δ' ἀγονώτερα τὰ πιμελώδη καὶ ἄρρενα καὶ θήλεα. πιαίνεται δὲ πάντα πρεσβύτερα μᾶλλον, ἢ νεώτερα ὄντα· μάλιστα δ', ὅταν καὶ τὸ πλάτος καὶ τὸ μῆκος ἔχῃ τοῦ μεγέθους, καὶ εἰς βάθος αὐξάνηται.

ΚΕΦΑΛ. ιθ'.

Περὶ αἵματος.

ΠΕρὶ δὲ τοῦ αἵματος ὧδε ἔχει. τοῦτο γὰρ πᾶσιν ἀναγκαιότατον καὶ κοινότατον τοῖς ἐναίμοις, καὶ οὐκ ἐπίκτητον, ἀλλ' ὑπάρχει πᾶσι τοῖς μὴ φθειρομένοις. πᾶν δ' αἷμά ἐστιν ἐν ἀγγείῳ, ἐν ταῖς καλουμέναις φλεψίν, ἐν ἄλλῳ δ' οὐδενί, πλὴν ἐν τῇ καρδίᾳ μόνον. οὐκ ἔχει δ' αἴσθησιν τὸ αἷμα ἁπτομένων ἐν οὐδενὶ τῶν ζώων, ὥσπερ οὐδ' ἡ περίττωσις ἡ ἐν τῇ κοιλίᾳ. οὐδὲ δὴ ὁ ἐγκέφαλος, οὐδ' ὁ μυελός. οὐκ ἔχει αἴσθησιν ἁπτομένων. ὅπου δ' ἂν τις διέλῃ τὴν σάρκα, γίνεται αἷμα ἐν ζῶντι, ἐὰν μὴ ᾖ διεφθαρμένη ἡ σάρξ. ἔστι δὲ τὴν φύσιν τὸ αἷμα, τόν τε χυμὸν ἔχον γλυκύν, ἐάνπερ ὑγιὲς ᾖ, καὶ τὸ χρῶμα ἐρυθρόν· τὸ δὲ χεῖρον, ἢ φύσει, ἢ νόσῳ, μελάντερον. καὶ οὔτε λίαν παχύ, οὔτε λίαν λεπτὸν τὸ βέλτιστον, ἐὰν μὴ χεῖρον, ἢ διὰ φύσιν, ἢ διὰ νόσον ᾖ. καὶ ἐν μὲν τῷ ζώῳ, θερμὸν καὶ ὑγρὸν ἀεί· ἐξιὸν δὲ ἔξω, πήγνυται πάντων, πλὴν ἐλάφου καὶ προκός, καὶ εἴ τι ἄλλο τοιαύτην ἔχει τὴν φύσιν. τὸ δ' ἄλλο αἷμα πήγνυται, ἐὰν μὴ ἐξαιρεθῶσιν αἱ ἶνες. τάχιστα δὲ πήγνυται τὸ τοῦ ταύρου αἷμα * πάντων. ἔστι δὲ τῶν μὲν ἐναίμων τὰ ζωοτοκοῦντα πολυαιμότερα, τὰ καὶ ἐν αὑτοῖς καὶ ἔξω ζωοτοκοῦντα τῶν ἐναίμων μὲν ᾠοτοκούντων. τὰ δ' εὖ ἔχοντα, ἢ φύσει, * ἢ παρ' ὑγιείας, οὔτε πολὺ λίαν ἔχει, ὥσπερ τὰ πεπωκότα πόμα προσφάτως, οὔτ' ὀλίγον, ὥσπερ τὰ πίονα λίαν. τὰ γὰρ πίονα καθαρὸν μὲν ἔχει, ὀλίγον δὲ τὸ αἷμα, καὶ [γίνεται] πιότερα γινόμενα, ἀναιμότερα. ἄναιμον γὰρ τὸ πῖον, καὶ τὸ μὲν πῖον, ἄσηπτον· τὸ δ' αἷμα, καὶ τὰ ἔναιμα, τάχιστα σήπεται, καὶ τούτων τὰ περὶ τὰ ὀστᾶ. ἔχει δὲ λεπτότατον μὲν αἷμα καὶ καθαρώτατον ἄνθρωπος. παχύτατον δὲ καὶ μελάντατον τῶν ζωοτοκούντων, ταῦρος καὶ ὄνος. καὶ ἐν τοῖς κάτω δὲ μορίοις, ἢ ἐν τοῖς ἄνω, παχύτερον τὸ αἷμα γίνεται καὶ μελάντερον. σφύζει δὲ τὸ αἷμα ἐν ταῖς φλεψίν, ἐν ἅπασι πάντη ἅμα τοῖς ζώοις. καὶ ἔστι τῶν ὑγρῶν μόνον καθ' ἅπαν τὸ σῶμα τοῖς ζώοις, καὶ ἀεί, ἕως ἂν ζῇ, τὸ αἷμα μόνον. πρῶτον δὲ γίνεται τὸ αἷμα ἐν τοῖς ζώοις τῇ καρδίᾳ, καὶ πρὶν ὅλον διηρθρῶσθαι τὸ σῶμα. προϊεμένου δ' αὐτοῦ καὶ ἀφαιρουμένου ἔξω, πλείονος μὲν, * οὐ θνήσκουσι· πολλοῦ δ' ἄγαν, ἀποθνήσκουσιν. ἐξυγραινομένου δὲ λίαν, νοσοῦσι. γίνεται γὰρ ἰχωροειδές, καὶ διορροῦται οὕτως, ὥστε ἤδη τινὲς ἴδισαν αἱματώδη ἱδρῶτα.

* κ. τῶν [illegible]

* Gaza, vel arte nempe, medendi, niſi aliter legit.

* Gaza vertit quaſi legiſſet λιποψυχοῦσι.

καὶ ἐξιὸν ἐνίοις, οὐ πήγνυται παντελῶς, ἢ διῃρημένως καὶ χωρίς. τοῖς δὲ καθεύδουσιν, ἐν τοῖς ἐκτὸς μέρεσιν ἔλαττον γίνεται τὸ αἷμα· ὥστε καὶ κεντουμένων μὴ ῥεῖν ὁμοίως. γίνεται δὲ πεττομένων, ἐξ ἰχῶρος μὲν, αἷμα· ἐξ αἵματος δὲ, πιμελή. νενοσηκότος δὲ τοῦ αἵματος, αἱμοῤῥοῒς, ἥ τε ἐν ταῖς ῥισὶ, καὶ ἡ περὶ τὴν ἕδραν, καὶ ἰξία. σηπόμενον δὲ γίνεται τὸ αἷμα ἐν τῷ σώματι πύον, ἐκ δὲ τοῦ πύου πῶρος. τὸ δὲ τῶν θηλειῶν αἷμα, πρὸς τὸ τῶν ἀῤῥένων διαφέρει· παχύτερόν τε γὰρ καὶ μελάντερόν ἐστιν, ὁμοίως ἐχόντων πρὸς ὑγίειαν καὶ ἡλικίαν ἐν τοῖς θήλεσιν· καὶ ἐπιπολῆς μὲν, ἔλαττον [μὲν] ἐν τοῖς θήλεσιν, ἐντὸς δὲ πολυαιμότερα. μάλιστα δὲ καὶ τῶν θηλέων ζῴων, ἡ γυνὴ πολύαιμον, καὶ τὰ καλούμενα καταμήνια γίνεται πλεῖστα τῶν ζῴων ἐν ταῖς γυναιξί. νοσηματικὸς δὲ τοῦτο τὸ αἷμα καλεῖται ῥοῦς. τῶν δὲ ἄλλων τῶν νοσηματικῶν, ἧττον μετέχουσιν αἱ γυναῖκες. ὀλιγάκις δὲ γίνεται ἰξία καὶ αἱμοῤῥοῒς, καὶ ἐκ ῥινῶν ῥύσις· ἐὰν δέ τι συμβαίνῃ τούτων, τὰ καταμήνια χείρω γίνεται. διαφέρει δὲ καὶ κατὰ τὰς ἡλικίας, πλήθει καὶ εἴδει τὸ αἷμα. ἐν μὲν γὰρ τοῖς πάμπαν νέοις, ἰχωροειδές ἐστι καὶ πλεῖον· ἐν δὲ τοῖς γέρουσι, παχὺ καὶ μέλαν, καὶ ὀλίγον· ἐν ἀκμάζουσι δὲ, μέσως. καὶ πήγνυται ταχὺ τὸ τῶν γερόντων, καὶ ἐν τῷ σώματι, ἢ ἐπιπολῆς· τοῖς δὲ νέοις οὐ γίνεται τοῦτο. ἰχὼρ δέ ἐστιν ἄπεπτον αἷμα, ἢ τῷ μήπω πεπέφθαι, ἢ τῷ διωῤῥῶσθαι.

A Idem etiam interdum cauſæ eſt, vt qui effluxerit, aut omnino concreſcere nequeat, aut incomposite particulatimque ſpiſſetur. Dormientibus porro ſanguinis copia partes exteriores deſerit, ſubitque interiores, ita vt adacto cultello non æquè effluere poſſit. Fit per concoctionem ex ſanie ſanguis, ex ſanguine adeps. Vitiato excreſcenteque ſanguine, profluuium vel è naribus, vel per infera mariſcis mouetur, aut varices fiunt. Idē putreſcens pus redditur, quo demum concalleſcente porus, id eſt, tofus lapis conſiſtit. Fœminis ſanguis nigrior & craſſior quàm maribus eſt, dummodo cætera adſint pariter, quæ vel ab ætate vel à ſanitate proficiſcantur. B Et minus ſanguinis per ſumma corporis fœminarum eſt: plus enim parte interiore continetur. Sed omnium fœminarum maximè mulier ſanguine abundat, & quæ menſtrua appellamus, plurima fieri in mulieribus ſolent: quod genus ſanguinis vitiatum ægrotanſque, fluit immodicè, atque profluuiū ob eam rem dictum eſt. Cæteris morbis ſanguinis minùs mulieres infeſtantur, quàm viri. Paucis item mulieribus fiunt mariſcæ, aut varices, aut è naribus profuſio ſanguinis. Et ſi quid eorum acciderit, detrimentum in menſtrua deſumbit. Ætatum etiam ratione ſanguis diſcrimen, tum in modo, tum in genere recipit. Etenim in ætate admodum iuuenili ſaniem trahit, & largior eſt: in ſenectute autem C craſſus, niger, & paucus. Medium tenet in media firmáque ætate. Concreſcit etiam facilè ſenum vel in corpore ſanguis, qui per ſumma eſt: quod idem nunquam iuuenibus euenit. Sanies, ſanguis incoctus eſt: aut quia concoctus nondum eſt, aut quia in ſerum degenerauerit.

ΚΕΦΑΛ. κ΄.

Περὶ μυελοῦ καὶ γονῆς, καὶ γάλακτος.

Περὶ δὲ μυελοῦ· καὶ γὰρ τοῦτο ἓν τῶν ὑγρῶν ἐνίοις τῶν ἐναίμων ἐστὶ ζῴων. πάντα δὲ ὅσα φύσει ἐστὶν ὑγρὰ ἐν τῷ σώματι, ἐν ἀγγείοις ὑπάρχει, ὥσπερ καὶ αἷμα ἐν φλεψὶ καὶ μυελὸς ἐν ὀστοῖς· τὰ δ' ἐν ὑμενώδεσι, καὶ δέρμασι, καὶ κοιλίαις. γίνεται δὲ ἐν μὲν τοῖς νέοις αἱματώδης πάμπαν ὁ μυελός· πρεσβυτέρων δὲ γινομένων, ἐν μὲν τοῖς πιμελώδεσι, πιμελώδης· ἐν δὲ τοῖς στεατώδεσι, στεατώδης. οὐ πάντα δ' ἔχει τὰ ὀστᾶ μυελὸν, ἀλλὰ τὰ κοῖλα, καὶ τούτων ἐνίοις οὐκ ἔνεστι. τὰ γὰρ τοῦ λέοντος ὀστᾶ, τὰ μὲν, οὐκ ἔχει πάμπαν, τὰ δ', ἔχει πάμπαν μικρόν. διόπερ ἔνιοι οὔ φασιν ὅλως ἔχειν μυελὸν τοὺς λέοντας, ὥσπερ εἴρηται

Cap. 7. πρότερον. καὶ ἐν τοῖς ὑείοις δ' ὀστοῖς, ἐλάττων ἐστὶν, ἐνίοις δ' αὐτῶν πάμπαν οὐκ ἔνεστι. ταῦτα μὲν οὖν τὰ ὑγρὰ, σχεδὸν ἀεὶ σύμφυτά ἐστι τοῖς ζῴοις. ὑστερογενῆ δὲ γάλα τε καὶ γονή. τούτων δὲ τὸ μὲν ἀποκεκριμένον ἅπασιν, ὅταν ἐνῇ, ἐστὶ τὸ γάλα· ἡ δὲ γονὴ, οὐ πᾶσιν, ἀλλ' ἐνίοις, οἷον οἱ καλούμενοι θοροὶ ἐν ἰχθύσιν. ἔχει δὲ, ὅσα ἔχει τὸ γάλα, ἐν τοῖς μαστοῖς. μαστοὺς δ' ἔχει ὅσα ζῳοτοκεῖ καὶ ἐν αὑτοῖς, καὶ θύραζε· ὅσα τε τρίχας ἔχει, ὥσπερ ἄνθρωπος, καὶ ἵππος· καὶ τὰ κήτη, οἷον δελφὶς καὶ φώκη, καὶ φάλαινα. καὶ γὰρ ταῦτα μαστοὺς ἔχει καὶ γάλα. ὅσα δ' ἔξω ζῳοτοκεῖ μόνον, ἢ ᾠοτοκεῖ, οὐκ ἔχει οὔτε μαστοὺς.

CAPVT XX.

De medullis, lacte, ſero, & caſeo.

Medullæ rationem iis addere debemus: nā ea quoque humidis annumeranda generibus in nōnullis ſanguineis animalibus eſt. D Omnia verò quæ ſuapte natura humida in corpore ſunt, conceptaculis quibuſdam, tanquam vaſculis, continentur: vt ſanguis in venis, medulla in oſſibus: alia in membranis, aut cutibus, aut ventribus. Nouellis adhuc animalibus medulla cruenta admodum eſt: ætate prouectis, vt adipe pingueſcentibus, adipem trahit: ſic ſebo deputatis generibus, ſebum præ ſe fert. Sed quanquam medulla non niſi incluſa oſſibus eſt, tamen non oſſa omnia medullam intra ſe continent, ſed ea tantùm quæ caua habentur, tametſi ne ipſa quidē omnia cōtinēt. Oſſa enim leonis partim nullam partim admodū exiguam habent: quamobrem nullam omnino medullam leones habere nonnulli putarūt, vt dictum eſt. E In ſuillis etiam oſſibus minus medullæ eſt, & nonnullis omnino deeſt. Hæc ferè ſemper in animalibus natiua & congenita humidi genera habentur: adnata autem poſterioraque ſunt, lac & genitura: quorum alterum non eodem modo in omnibus eſt, ſed quibuſdam pro genitura thorus genitale virus ſui generis habetur, vt piſcibus. Quæ verò lac habent omnia, mammis id continent. Mammæ autem iis datæ ſunt, quæ animal & intra ſe concipiunt, & foras edunt: vt omnia quæ pilis integuntur, velut homo & equis. Cete etiam in aquatili genere: vt delphinus, vitulus marinus, balæna. hæc enim mammas habent, & lac. At ea quæ oua pariunt, aut ouo intus concepto, animal post in lucem excludunt, hæc & mammis carent,

A & lacte: vt piſces, vt aues. Genus autem vnũquodque lactis habet tum ſaniem dilutam, quod ſerum vocamus: tum corpulentum quiddam, qui caſeus dicitur. Plus caſei lac illud habere videmus, quod craſſius eſt. Coit lac eorum quæ non vtrinque dentata ſunt. Quapropter caſeus ex iis fit quæ inter vrbana dentium ordine carent ſuperiore. Eorum autem quæ vtrinque dentata ſunt, lac coire non poteſt, ſicvt nec pingue: & tenue dulcéq; eſt. Tenuiſſimum cameli eſt, mox equæ, tum aſinæ: craſſiſſimũ bubulum eſt. Nullum lac coit frigore, ſed ſerũ potiùs trahit. Igne nimirum omne ſpiſſatur, & craſſeſcit. Nulli ferè animalium lac fieri ſolet antè quàm vterum ferat: nec dum ferunt, vtile omne eſt, ſed B primum nouiſſimumque inutile. Non prægnantibus aliquando, ſed raro, eduliis quibuſdam efficitur vt lacteſcant. Etiam quibuſdam mulieribus natu maioribus, ſuctu frequentiore lac prodiit, & copia tanta, vt infantẽ enutrire potuerint. Vbera etiã caprarum quæ coitum non patiuntur, paſtores mõtis Oetæ vrtica perfricant vehementer, vt dolorem infligant. Itaque primùm cruentum humorem eliciunt, mox purulentum, poſtremò lac non minùs quàm ex iis quæ Venerem patiantur. Maribus, magna ex parte, nec beſtiis, nec hominibus gignitur lac. Fieri tamen poteſt vt ex aliquibus interdum gignatur. Nam & in Lemno inſula capro ex mã- C mis, quas geminas iuxtà genitale gerit, tantum lactis emulgebatur, vt coloſtra inde conficerent. Quod idem etiam proli maſculæ capri illius eueniſſe accepimus. Sed hæc oſtentis annumerãda potiùs ducunt. Nam & Lemnio illi pecoris domino conſulenti, Deus amplius incrementum peculij futurum reſpondit. Viris poſt pubem exiguum nõnullis exprimitur: veruntamen per ſuctum frequẽtiorem, vel multum prodiiſſe aliquibus, traditũ eſt. Lacti ineſt pinguedo, quæ etiam concreto oleum propè trahit. Caprinum lac miſcere cum ouillo Siculi, & quibuſcumque ſit copia caprini, conſueuerunt. Coit ſpiſſatúrque potiſſimùm, non modò quod plurimum habet caſeum, verumetiam quod D ſquallidiorem. Lactis copia quibuſdã maior quàm ad fœtus alendos ſatis ſit. Commodum ad conficiendum reponendumque caſeum præcipuè ouillum caprinumque eſt: mox bubulum. Equinum ac aſininum miſcent ad Phrygium caſeum conficiendum. Bubulum fertilius caſeo eſt, quàm caprinum. Cùm enim ex amphora lactis caprini formagines obolæ vndeuiginti conficiantur, bubulum eadem menſura triginta facit, vt paſtores confirmãt. Quibuſdam quantum ſatis ad fœtum ſit, tantum gignitur: nec vlla copia, aut ad reponendum commoditas ſuppetit: vt quibus mammæ plures quàm binæ. Nulli enim in eo genere lac, vel copioſum, vel caſeo vtile. Cogitur lac ſucco ficulno, & coagulo. E Succus lana excepto pauxillo lacte abluitur, quod iniectum lactis copiam denſat, atque coloſtrat.

CAPVT XXI.

De coagulo, & pabuli genere, quod lactis copiam extinguat, quódque idem augeat.

COagulum, lactis ſubſtantia eſt: quippe quod in eorum ventriculo, quæ adhuc lactent, contineatur. Eſt ergo coagulum lac ignem habens intra ſeſe, quod cùm animalis tepore concoqueretur,

A οὔτε γάλα, ὥσπερ ἰχθὺς καὶ ὄρνις. πᾶν δὲ γάλα ἔχει ἰχῶρα ὑδατώδη, ὃ καλεῖται ὀρρὸς, καὶ σωματῶδες, ὃ καλεῖται τυρός. ἔχει δὲ πλείω τυρὸν τὸ παχύτερον τῶν γαλάκτων. τὸ μὲν οὖν τῶν μὴ ἀμφωδόντων γάλα πήγνυται· διὸ καὶ τυρεύεται τῶν* ἡμέρων. τῶν δὲ ἀμφωδόντων οὐ πήγνυται, ὥσπερ οὐδὲ ἡ πιμελή. καὶ ἔστι λεπτὸν καὶ γλυκύ. ἔστι δὲ λεπτότατον μὲν γάλα καμήλου, δεύτερον δὲ ἵππου, τρίτον δὲ ὄνου, παχύτατον δὲ τὸ βόειον. ὑπὸ μὲν οὖν τοῦ ψύχους οὐ πήγνυται τὸ γάλα, ἀλλὰ ὀρροῦται μᾶλλον· ὑπὸ δὲ τοῦ πυρὸς πήγνυται καὶ παχύνεται. οὐ γίνεται δὲ γάλα, πρὶν μὲν ἐκύουν γένηται, οὐδενὶ τῶν ζώων, ὡς B ἐπὶ τὸ πολύ. ὅταν δὲ ἐκύουσι, γίνεται μὲν, ἄχρηστον δὲ τὸ πρῶτον καὶ ὕστερον. μὴ ἐκυούσαις δὲ οὔσαις, ὀλίγα μὲν ἀπὸ ἐδεσμάτων τινῶν· οὐ μὴν ἀλλὰ καὶ βδαλλομέναις ἤδη πρεσβυτέραις προῆλθε, καὶ τοσοῦτον ἤδη ποτὲ ὥστ' ἐκθηλάσαι τὸ παιδίον. καὶ οἱ περὶ τὴν Οἴτην δὲ ὅσαι ἂν μὴ ὑπομένωσι τὴν ὀχείαν τῶν αἰγῶν, λαμβάνοντες κνίδην, τρίβουσι τὰ οὔθατα βίᾳ, διὰ τὸ ἀλγεῖν. τὸ μὲν οὖν πρῶτον, αἱματῶδες ἀμέλγονται, εἶθ' ὑπόπυον, τὸ δὲ τελευταῖον γάλα ἤδη οὐδὲν ἔλαττον τῶν ὀχευομένων. τῶν δὲ ἀρρένων, ἔν τε τοῖς ἄλλοις ζώοις καὶ ἐν ἀνθρώποις οὐδενὶ μὲν ὡς ἐπὶ τὸ πολὺ γίνεται γάλα, ὅμως C δὲ γίνεται ἐν ἐνίοις· ἐπεὶ καὶ ἐν Λήμνῳ αἲξ ἐκ τῶν μαστῶν, οὓς ἔχει δύο ἄρρην παρὰ τὸ αἰδοῖον, γάλα ἠμέλγετο τοσοῦτον, ὥστε γίνεσθαι τροφαλίδας, καὶ πάλιν ἐκ τούτου γενομένῳ συνέβαινε ταὐτόν. ἀλλὰ τὰ μὲν τοιαῦτα, ὡς σημεῖα ὑπολαμβάνουσιν· ἐπεὶ καὶ* ἐν Λήμνῳ ἀνεῖλεν ὁ θεὸς* μαντευσαμένῳ, ἐπίκτησιν ἔσεσθαι* κτημάτων. ἐν δὲ τοῖς ἀνδράσι μετὰ τὴν ἥβην ἐνίοις ἐκθλίβεται ὀλίγον· βδαλλομένοις δὲ, καὶ πολὺ ἤδη ποτὲ προῆλθεν. ὑπάρχει δὲ ἐν τῷ γάλακτι λιπαρότης, ἣ καὶ ἐν τῷ πεπηγότι γίνεται ἐλαιώδης. εἰς δὲ τὸ προβάτειον ἐν Σικελίᾳ, καὶ ὅπου πλέον, αἴγειον μιγνύουσι. πήγνυται δὲ μάD λιστα, οὐ μόνον τὸ τυρὸν ἔχον πλεῖστον, ἀλλὰ καὶ τὸ αὐχμηρότατον πλεῖστον ἔχει. τὰ μὲν οὖν πλέον ἔχει γάλα, ἢ ὅσον εἰς τὴν ἐκτροφὴν τῶν τέκνων, καὶ εἰς τύρευσιν χρήσιμα καὶ ἀπόθεσιν. (μάλιστα μὲν τὸ προβάτειον καὶ τὸ αἴγειον, ἔπειτα τὸ βόειον· τὸ δὲ ἱππεῖον καὶ τὸ ὄνειον, μιγνύουσιν εἰς τὸν Φρύγιον τυρόν. ἔστι δὲ τυρὸς πλείων ἐν τῷ βοείῳ, ἢ ἐν τῷ αἰγείῳ. γίνεσθαι γάρ φασιν οἱ νομεῖς, ἐκ μὲν ἀμφορέως αἰγείου γάλακτος, τροφαλίδας ὀβολιαίας, μιᾶς δεούσας εἴκοσιν· ἐκ δὲ βοείου, τριάκοντα) τὰ δ', ὅσον τοῖς τέκνοις ἱκανόν. πλῆθος δὲ οὐδὲν οὐδὲ χρήσιμον εἰς τύρευσιν, ὥσπερ πάντα τὰ πλείους ἔχοντα μαστοὺς δυοῖν. οὐδενὸς γὰρ τούE των, οὔτε πλῆθός ἐστι γάλακτος, οὔτε τυρεύεται τὸ γάλα. πηγνύουσι δὲ τὸ γάλα, ὀπός τε συκῆς, καὶ πυετία. ὁ μὲν οὖν ὀπὸς, εἰς ἔριον ἐξοπισθεὶς, ὅταν ἐκπλυθῇ πάλιν τὸ ἔριον εἰς γάλα ὀλίγον. τοῦτο γὰρ κεραννύμενον, ἐκπηγνύει.

ΚΕΦΑΛ. ια'.

Περὶ πυετίας, καὶ τῶν τὸ γάλα σβεννύντων, ἢ πολὺ ποιούντων.

Ἡ δὲ πυετία, γάλα ἐστί· γίνεται γὰρ ἐν τῇ κοιλίᾳ τῶν ἔτι θηλαζόντων. ἔστιν οὖν ἡ πυετία, γάλα ἔχον ἐν ἑαυτῷ πῦρ, ὃ ἐκ τῆς τοῦ ζώου θερμότητος, πεττομένου τοῦ γάλα-

* Deeſt aliquid poſt hanc vocem: puta τὰ μὴ ἀμφόδοντα. Gaza vertit quaſi legiſſet, ἐκ τῶν ἄνω ὀδόντων ἐστερημένων.

* Scrib. τῷ Λ.

* γ. μαντευσαμένῳ.

* γ. χρημάτων.

κτος γίνεται. ἔχει δὲ πυετίαν τὰ μὲν μηρυκάζοντα πάντα, τῶν δ' ἀμφωδόντων δασύπους. βελτίων δ' ἐστὶν ἡ πυετία, ὅσῳ ἂν ᾖ παλαιοτέρα. συμφέρει γὰρ πρὸς τὰς διαῤῥοίας ἡ τοιαύτη μάλιστα, καὶ ἡ τοῦ δασύποδος. ἀρίστη δὲ πυετία ἡ τῆς νεβροῦ. διαφέρει δὲ τὸ πλέον ἢ ἔλαττον βδάλλεσθαι γάλα τῶν ἐχόντων γάλα ζώων, κατά τε τὰ μεγέθη τῶν σωμάτων, καὶ τὰς τῶν ἐδεσμάτων διαφοράς. οἷον ἐν Φάσει μέν ἐστι βοΐδια μικρά, ὧν ἕκαστον βδάλλεται γάλα πολύ. αἱ δὲ Ἠπειρωτικαὶ βόες αἱ μεγάλαι, βδάλλεται ἑκάστη ἀμφορέα, καὶ τούτου τὸ ἥμισυ κατὰ τοὺς δύο μαστούς. ὁ δὲ βδάλλων, ὀρθὸς ἕστηκεν, ἢ μικρὸν ἐπικύπτων, διὰ τὸ μὴ δύνασθαι ἂν ἐφικνεῖσθαι καθήμενος. γίνεται δὲ ζῷα [τὰ] καὶ τἆλλα μεγάλα τετράποδα ἐν τῇ Ἠπείρῳ. μέγιστοι δὲ οἱ βόες καὶ οἱ κύνες. νομῆς δὲ δέονται τὰ μεγάλα πλείονος. ἀλλ' ἔχει πολλὴν ἡ χώρα τοιαύτην εὐβοσίαν, καὶ καθ' ἑκάστην ὥραν ἐπιτηδείους τόπους. μέγιστοι δὲ οἵ τε βόες εἰσί, καὶ τὰ πρόβατα τὰ καλούμενα * Πυρρικά, τὴν ἐπωνυμίαν ἔχοντα ταύτην ἀπὸ Πύρρου τοῦ βασιλέως. τῆς δὲ τροφῆς ἡ μὲν σβέννυσι τὸ γάλα, οἷον ἡ Μηδικὴ πόα, καὶ μάλιστα τοῖς μηρυκάζουσι· ποιεῖ δὲ πολὺ ἑτέρα, οἷον κύτισος καὶ ὄροβοι· πλὴν κύτισος μὲν ὁ ἀνθῶν οὐ συμφέρει, ἐπικαίει γάρ· οἱ δ' ὄροβοι, καὶ ταῖς κυούσαις οὐ συμφέρουσι· τίκτουσι γὰρ χαλεπώτερον. ὅλως δὲ τὰ φαγεῖν δυνάμενα τῶν τετραπόδων, ὥσπερ καὶ πρὸς τὴν κύησιν, συμφέρει καὶ βδάλλεσθαι πολλὴν τροφὴν ἔχοντα. πολὺ δὲ γάλα ποιεῖ καὶ τῶν φυσωδῶν ἔνια προσφερόμενα, οἷον καὶ κυάμων πλῆθος ὀλίγον καὶ αἰγὶ, καὶ βοΐ, καὶ χιμαίρᾳ. ποιεῖ γὰρ καθιέναι τὸ οὖθαρ. σημεῖον δὲ τοῦ γάλα πλεῖστον γενέσθαι, ὅταν πρὸ τοῦ τόκου τὸ οὖθαρ βλέπῃ κάτω. γίνεται δὲ πολὺν χρόνον γάλα πᾶσι τοῖς ἔχουσιν, ἂν ἀνόχευτα διατελῇ, καὶ τὰ ἐπιτήδεια ἔχωσι. μάλιστα δὲ τῶν τετραπόδων προβάτοις. ἀμέλγεται γὰρ μῆνας ὀκτώ. ὅλως δὲ τὰ μηρυκάζοντα, γάλα πολύ, καὶ χρήσιμον εἰς τυρείαν ἀμέλγεται. περὶ δὲ Τορώνην αἱ βόες ὀλίγας ἡμέρας πρὸ τοῦ τόκου διαλείπουσι, τὸν δ' ἄλλον χρόνον πάντα ἔχουσι τὸ γάλα. τῶν δὲ γυναικῶν τὸ πελιδνότερον γάλα, βέλτιον τοῦ λευκοῦ τοῖς τιθηνουμένοις· καὶ αἱ μέλαιναι τῶν λευκῶν ὑγιεινότερον ἔχουσι. τροφιμώτατον μὲν οὖν, τὸ πλεῖστον ἔχον τυρόν. ὑγιεινότερον δὲ τοῖς παιδίοις, τὸ ἔλαττον.

* κ. πυῤῥικαὶ

ΚΕΦΑΛ. κβ'.

Περὶ σπέρματος.

Σπέρμα δὲ προΐενται τὰ ἔχοντα αἷμα ἅπαντα. τί δὲ συμβάλλεται εἰς τὴν γένεσιν, καὶ ὅπως, ἐν ἄλλοις λεχθήσεται. πλεῖστον δὲ κατὰ τὸ σῶμα ἄνθρωπος προΐεται. ἔστι δὲ τῶν μὲν ἐχόντων τρίχας, γλίσχρον· τῶν δ' ἄλλων ζῴων, οὐκ ἔχει γλισχρότητα. λευκὸν δὲ πάντων. * ἀλλ' Ἡρόδοτος διέψευσται, γράψας τοὺς Αἰθίοπας προΐεσθαι μέλαιναν γονήν. τὸ δὲ σπέρμα ἐξέρχεται μὲν λευκὸν καὶ παχύ, ἂν ᾖ ὑγιεινόν· θύραζε δ' ἐλθόν, λεπτὸν γίνεται καὶ μέλαν. ἐν δὲ τοῖς πάγοις οὐ πήγνυται, ἀλλὰ γίνεται πάμπαν λεπτὸν καὶ ὑδατῶδες, καὶ τὸ χρῶμα καὶ τὸ πάχος· ὑπὸ δὲ τοῦ θερμοῦ πήγνυται καὶ παχύνεται. καὶ ὅταν ἐξίῃ χρονίσαν ἐν τῇ ὑστέρᾳ, παχύτερον ἐξέρχεται· ἐνίοτε δὲ ξηρὸν καὶ συνεστραμμένον. καὶ τὸ μὲν γόνιμον, ἐν τῷ ὕδατι χωρεῖ κάτω·

* De generat. animal. li. 2. c. 2.

A caſeum traxerit. Habent coagulum omnia ruminantia: & inter dentata vtrinque lepus. Quo vetuſtius coagulum eſt, eo præſtantius. Tale profluuio alui mederi præcipuè poteſt: atque etiam quod leporis eſt: ſed laudatiſſimum hinnuli. Plus minúſve emulgeri, diſcrimen aut pabuli, aut magnitudinis animalium efficit. Nam puſillæ buculæ, quas Phaſiana regio fert, ſingulæ abunde beneficio pabuli mulgentur. Et Epiroticæ vaccæ præ ſua præcipua magnitudine, amphoras ſingulas ſingulæ implent lactis, menſuræque eius dimidium mammis duabus præſtant. Erectus qui mulget, aut paululum ſe inclinat: quoniam ſedendo vbera contingere nequeat. Cæteras etiam quadrupedes magnas terra eadem Epirus gignit, excepto aſino: ſed præcipuè B boues, & canes. Paſtu opus eſt grandibus largiore: quem terram illam abundè præbere, & loca ſingulis anni temporibus accommodata habere certum eſt. Boues igitur egregia magnitudine ibi ſunt: atque etiam oues Pyrrhicæ, à Pyrrho rege ita cognominatæ. Pabuli genus aliud, copiam lactis extinguit: vt medica herba, & præcipuè ruminantibus, aliud auget: vt cytiſus, vt eruum. Sed cytiſus dum floret, incommodus eſt: vrit enim tantiſper, atque extinguit. Eruum prægnantibus non prodeſt: facit enim partum difficiliorem omnino. Quæ in quadrupedum genere ſunt edaciora, eadem vt ad poſſidendum meliora, ita ad lactis etiam copiam eſſe fœcundiora, videlicet dum alimenti copiam ha- C beant, planum eſt. Nonnulla etiam flatuoſa, paſtu exhibita, copiam efficiunt lactis: vt fabæ largius datæ ouibus, capris, bubus, capellis: faciunt enim vt vbera demittantur. Indicium autem futuræ copiæ lactis, cùm ante partum vbera ſpectant deorſum. Edurat diu lac omnibus, ſi non coeant, nec paſtu careant copioſo. Sed omnium maximè quadrupedum, ouibus: quippe quibus mulctra menſium octo ſpatio continuetur. Denique ruminantibus lac & copioſius & caſeo vtilius emulgetur. Boues circa Toronam, paucis ante partum diebus lacte carent, reliquo tempore habent perpetuò. Mulierum lac commodius lactentibus eſt, quod liuorem trahit, quàm quod candidum eſt: & fuſcæ ſalubrius ha- D bent quàm candidæ. Est porro ad alendum validius, in quo plus caſei eſt: ſed infantibus ſalubrius, quod minus caſei contrahat.

CAPVT XXII.

De ſemine genitali, & eius natura.

SEmen genitale omnia emittũt, quæ habẽt ſanguinem. Quid & quemadmodũ conferat hoc ad generationem, ſuo loco dicetur. Plurimum verò proportione corporis homo emittit. Pilos habentiũ ſemen lentum eſt, cæterorum nullam habet lenti- E tiam. Album omnium eſt. Nec audiendus Herodotus, qui Æthiopes genituram colore nigro promere ſcripſerat. Exit profectò ſemen hoc genitale, album, & craſſum ſi integrum eſt: ſed foris tenue totum redditur, & nigrum. Nunquam id gelu concreſcit: imò admodum extenuatur, & aquæ tum colorem tum etiam ſubſtantiam habet: calore autem coit, & craſſeſcit. Et quod de vulua eſt exceptum, aliquamdiu in ea iam immoratum craſſius prodit. Nonnunquã etiam ſiccum contortumque. Delabitur in aqua quod fœcundũ eſt, aqua ſubſidit:

quod autem infœcundum eſt, diffunditur, atque exoleſcit. Falſum etiam eſt quod Cteſias de genitura elephantorum ſcriptum reliquit.

A τὸ δ' ἄγονον διαχεῖται. * Ψευδὲς δ' ἐστὶ καὶ ὅπερ Κτησίας γέγραφε περὶ τῆς γονῆς τῶν ἐλεφάντων. * Ibidem.

ARISTOTELIS STAGIRITÆ, de Hiſtoria Animalium,

Liber IV.

Caput I.

De animalibus quæ ſanguine careant, quatuorque eorum generibus.

B

De partibus animalium habentium ſanguinem, quas cõmunes, quaſve proprias ſingula habent genera; atque etiam de iis quas ſimilares diſſimilareſque appellauimus: denique de omnibus, tã interiorib. quã exterioribus partibus, dictũ iã eſt. Nunc ordinem animaliũ, quæ ſanguine carent, perſequemur. Genera in hoc ordine plura ſunt. Primũ, quæ mollia appellamus, hoc eſt, quæ ſanguine carent, & foris carne molli obducta, ſolidũ intus, modo ſanguinei generis continẽt: quale ſepia eſt. Secũdũ, quæ cruſtis tenuibus operiũtur, hoc eſt, quæ partẽ ſolidã foris, C mollẽ carnoſamque intus cõtinent. Durũ illud eorum tegmen, nõ fragile, ſed colliſile eſt: quale cancrorũ genus & locuſtarum. Tertiũ, quæ ſilicea teſta coclulis muniuntur, hoc eſt, quibus pars carnea intus, ſolida foris, fragilis atque ruptilis, nõ colliſilis: quale genus concharũ & oſtrearũ eſt. Quartũ, inſecta omnia. Quod quidẽ genus multas & varias cõplectitur ſpecies animaliũ. Sunt porrò inſecta, quæ, vt nomen ipſũ declarat, inciſuras parte ſui vel ſupina, vel prona, vel etiã vtraq; habẽt: nec oſſeũ quicquam diſcretũ, aut carneũ, ſed quiddam inter hæc ipſa medium continent: quippe quæ corpore pariter intus foriſque duro conſtent. Sunt alia impen- D nata, vt iuli, vt centipedæ: alia pennata, vt apes, veſpæ, ſcarabei: alia vtroque modo, vt formicæ. Eſt enim pars formicarũ pennata; pars impennis. Quod idem vel in iis quas cicindelas vocant, licet contẽplari. Partes eorum, quæ mollia nominauimus, exteriores, pedes vulgari nomine, ſiue brachia: & iis continuum caput: tum alueus, ſiue, ſinus continens interiora, quẽ pinnulæ ambiunt in orbẽ: caput eum nõnulli minus rectè appellarũt. Euenit in mollibus ſanè omnibus, vt caput inter pedes & vẽtrẽ habeatur. Brachia tergo octona omnibus, binis acetabulorũ ordinibus, ductu perpetuo omnib. excepto genere vno polyporũ. Sepiæ, lolligines, & lollij peculiares binas ſortiũtur promuſcides lõgas, acetabulo E parte extima bino aſperiuſculas, quibus capiunt, & ad ora admouẽt cibos. Iis etiã quoties tẽpeſtates vrgẽt, ad ſaxa aliqua adhærẽtes ſe veluti anchoris iactis ſtabiliũt: pinnulis autẽ, quibus alueũ circũdari diximus, natãt. Polypus ergo ſuis brachiis, vt pedib. ac manibus vtitur: quippe qui duobus ſupra os poſitis cibũ admoueat. Vltimo verò, quod & acutius, & ſolùm albicãs eſt, & parte ſui extrema bifurcatũ, dorſóque adnexum, (dorſum autem partẽ læuẽ appellant, à qua acetabulorum ordo inchoatur)

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζῴων ἱστορίας τὸ Δ.

ΚΕΦΑΛ. α.

Περὶ τῶν ἀναίμων, καὶ πρῶτον περὶ τῶν μαλακίων, καὶ μάλιστα περὶ πολυπόδων.

Περὶ μὲν οὖν τῶν ἐναίμων ζῴων, ὅσα τε κοινὰ ἔχουσι μέρη, καὶ ὅσα ἴδια ἑκάστου γένους, καὶ τῶν ἀνομοιομερῶν καὶ τῶν ὁμοιομερῶν, καὶ ὅσα ἐντὸς, καὶ ὅσα ἐκτὸς, εἴρηται πρότερον· περὶ δὲ τῶν ἀναίμων ζῴων νῦν λεκτέον. ἔστι δὲ γένη πλείω. ἓν μὲν, τὸ τῶν καλουμένων μαλακίων· ταῦτα δ' ἐστὶν, ὅσα ἄναιμα ὄντα, ἐκτὸς ἔχει τὸ σαρκῶδες, ἐντὸς δὲ τὸ στερεὸν, καθάπερ καὶ τὰ ἔναιμα [τῶν ζῴων,] οἷον τὸ τῶν σηπιῶν γένος. ἓν δὲ, τὸ τῶν μαλακοστράκων· ταῦτα δ' ἐστὶν, ὅσα τὸ μὲν στερεὸν ἐκτὸς ἔχουσιν, ἐντὸς δὲ τὸ μαλακὸν καὶ σαρκῶδες· τὸ δὲ σκληρὸν αὐτῶν ἐστὶν οὐ θραυστὸν, ἀλλὰ φλαστόν· οἷόν ἐστι τὸ τῶν καράβων γένος, καὶ τὸ τῶν καρκίνων. ἔτι δὲ, τὰ ὀστρακόδερμα· ταῦτα δ' ἐστὶν, ὧν ἐντὸς μὲν τὸ σαρκῶδές ἐστιν, ἐκτὸς δὲ τὸ στερεὸν, θραυστὸν ὂν καὶ κατακτὸν, ἀλλ' οὐ φλαστόν. τοιοῦτο δὲ τὸ τῶν * κογχῶν, καὶ τὸ τῶν ὀστρέων γένος ἐστί. τέταρτον δὲ, τὸ τῶν * ἢ κοχλιῶν
ἐντόμων, ὃ πολλὰ καὶ ἀνόμοια εἴδη περιείληφε ζῴων. ἔστι δ' ἔντομα, ὅσα κατὰ τοὔνομά ἐστιν ἐντομὰς ἔχοντα ἢ ἐν τοῖς ὑπτίοις, ἢ ἐν τοῖς πρανέσιν, ἢ ἐν ἀμφοῖν, καὶ οὔτε ὀστῶδες ἔχει κεχωρισμένον, οὔτε σαρκῶδες, ἀλλὰ μεταξὺ ἀμφοῖν. τὸ σῶμα γὰρ ὁμοίως καὶ ἔσω καὶ ἔξω σκληρόν ἐστιν αὐτῶν. ἔστι δ' ἔντομα καὶ ἄπτερα, οἷον ἴουλος καὶ σκολόπενδρα· καὶ πτερωτὰ, οἷον μέλιττα, καὶ μηλολόνθη, καὶ σφήξ· καὶ ταὐτὸ δὲ γένος αὐτῶν ἐστὶ καὶ πτερωτὸν καὶ ἄπτερον· οἷον, μύρμηκές εἰσι καὶ πτερωτοὶ καὶ ἄπτεροι, καὶ αἱ καλούμεναι πυγολαμπίδες. τῶν μὲν οὖν μαλακίων καλουμένων, τὰ μὲν ἔξω μόριά ἐστι ταῦτα· ἓν μὲν, οἱ καλούμενοι πόδες· δεύτερον δὲ τούτων ἐχομένη ἡ κεφαλή· τρίτον, τὸ κύτος, ὃ περιέχει * τὸ σῶμα, ὃ καλοῦσι μὲν κεφαλήν τινες, οὐκ * ἢ τὰ ἐντός
ὀρθῶς καλοῦντες· * ἔτι δὲ πτερύγια κύκλῳ περὶ τὸ κύτος. * ἢ ἐπὶ δὲ τὸ
συμβαίνει δ' ἐν πᾶσι τοῖς μαλακίοις, μεταξὺ τῶν ποδῶν καὶ τῆς γαστρὸς εἶναι τὴν κεφαλήν. πόδας μὲν οὖν ὀκτὼ πάντ' ἔχει, καὶ τούτους δικοτύλους πάντα, πλὴν ἑνός τινος γένους πολυπόδων. ἴδια δ' ἔχουσιν αἵ τε σηπίαι, καὶ αἱ τευθίδες, καὶ οἱ τεῦθοι, δύο προβοσκίδας μακρὰς ἐπ' ἄκρων τραχύτητα ἐχούσας δικότυλον, αἷς προσάγονταί τε καὶ λαμβάνουσιν εἰς τὸ στόμα τὴν τροφὴν, καὶ ὅταν χειμὼν ᾖ, βαλλόμεναι πρός τινα πέτραν, ὥσπερ ἀγκύρας, ἀποσαλεύουσι. τοῖς δὲ πτερυγίοις, οἷς ἔχουσι περὶ τὸ κύτος, νέουσιν. ἐπὶ δὲ τῶν ποδῶν αἱ κοτυληδόνες ἅπασιν εἰσίν. ὁ μὲν οὖν πολύπους καὶ ὡς ποσὶ καὶ ὡς χερσὶ χρῆται ταῖς πλεκτάναις· προσάγεται μὲν γὰρ ταῖς δυσὶ, ταῖς ὑπὲρ τοῦ στόματος· τῇ δ' ἐσχάτῃ τῶν πλεκτανῶν, ἥ ἐστιν ὀξυτάτη τε καὶ μόνη παράλευκος αὐτῶν, καὶ ἐξ ἄκρου δίκροα, (ἔστι δ' αὕτη ἐπὶ τῇ ῥάχει· καλεῖται δὲ ῥάχις τὸ λεῖον, οὗ πρόσεισιν αἱ κοτυληδόνες)

ταύτῃ δὲ τῇ πλεκτάνῃ χρῆται ἐν ταῖς ὀχείαις. πρὸ δὲ τοῦ κύτους ὑπὲρ τῶν πλεκτανῶν, ἔχουσι κοῖλον αὐλόν, ᾧ τὴν θάλατταν ἀφιᾶσι δεξάμενοι τῷ κύτει, ὅταν τι τῷ στόματι λαμβάνωσι. μεταβάλλει δὲ τοῦτο, ὁτὲ μὲν εἰς τὰ δεξιά, ὁτὲ δὲ εἰς τὰ ἀριστερά. ἀφιᾶσι δὲ καὶ τὸν θολὸν ταύτῃ. νεῖ δὲ πλάγιος, ἐπὶ τὴν καλουμένην κεφαλὴν ἐκτείνων τοὺς πόδας. οὕτω δὲ νέοντι συμβαίνει προορᾶν μὲν εἰς τὸ πρόσθεν (ἐπάνω γάρ εἰσιν οἱ ὀφθαλμοί) τὸ δὲ στόμα ἔχειν ὄπισθεν. τὴν δὲ κεφαλήν, ἕως ἂν ζῇ, σκληρὰν ἔχει, καθάπερ ἐμπεφυσημένην. ἅπτεται δὲ καὶ κατέχει ταῖς πλεκτάναις ὑπτίαις· καὶ ὁ μεταξὺ τῶν ποδῶν ὑμὴν διαπέπταται πᾶς. ἐὰν δὲ εἰς τὴν ἄμμον ἐμπέσῃ, οὐκέτι δύναται κατέχειν. ἔχουσι δὲ διαφορὰν, οἵ τε πολύποδες, καὶ τὰ εἰρημένα τῶν μαλακίων. τῶν μὲν γὰρ πολυπόδων, τὸ μὲν κύτος μικρόν, οἱ δὲ πόδες μακροί εἰσι· τῶν δὲ, τὸ μὲν κύτος μέγα, οἱ δὲ πόδες βραχεῖς, ὥστε μὴ πορεύεσθαι ἐπ᾽ αὐτῶν. αὐτῶν δὲ πρὸς αὑτά, τὸ μὲν μακρότερόν ἐστιν ἡ τευθίς, ἡ δὲ σηπία πλατύτερον. τῶν δὲ τευθίδων, οἱ τεῦθοι καλούμενοι, πολὺ μείζους. γίνονται γὰρ καὶ πέντε πηχῶν τὸ μέγεθος. γίνονται δὲ καὶ σηπίαι ἔνιαι διπήχεις, καὶ πολυπόδων πλεκτάναι τηλικαῦται, καὶ μείζους ἔτι τὸ μέγεθος. ἔστι δὲ τὸ γένος ὀλίγον τῶν τευθῶν. διαφέρουσι δὲ τῷ σχήματι τῶν τευθίδων οἱ τεῦθοι· πλατύτερον γάρ ἐστι τὸ ὀξὺ τῶν τευθῶν. ἔτι δὲ τὸ κύκλῳ πτερύγιον περὶ ἅπαν ἐστὶ τὸ κύτος, τῇ δὲ τευθίδι ἐλλείπει. ἔστι δὲ πελάγιος, ὥσπερ καὶ ἡ τευθίς. μετὰ δὲ τοὺς πόδας ἡ κεφαλή ἐστιν ἁπάντων ἐν μέσῳ τῶν ποδῶν, τῶν καλουμένων πλεκτανῶν. ταύτης δὲ τὸ μέν ἐστι στόμα, ἐν ᾧ εἰσὶ δύο ὀδόντες. ὑπὲρ δὲ τούτων, ὀφθαλμοὶ μεγάλοι δύο, ὧν τὸ μεταξὺ μικρὸς χόνδρος ἔχων ἐγκέφαλον μικρόν. ἐν δὲ τῷ στόματι ἔστι μικρὸν σαρκῶδες. γλῶτταν δ᾽ οὐκ ἔχει αὐτῶν οὐδὲ ἕν, ἀλλὰ τούτῳ χρῆται ἀντὶ γλώττης. μετὰ δὲ τοῦτο ἔξωθεν μέν ἐστιν ἰδεῖν προφαινόμενον κύτος. ἔστι δ᾽ αὐτοῦ ἡ σὰρξ σχιστή, οὐκ ἐπ᾽ εὐθὺ, ἀλλὰ κύκλῳ. δέρμα δ᾽ ἔχουσι πάντα τὰ μαλάκια περὶ ταύτην. μετὰ δὲ τὸ στόμα ἔχουσιν οἰσοφάγον μακρὸν καὶ στενόν, ἐχόμενον δὲ τούτου πρόλοβον μέγαν καὶ περιφερῆ ὀρνιθώδη. τούτου δ᾽ ἔχεται ἡ κοιλία, οἷον ἤνυστρον, τὸ δὲ σχῆμα, ὁμοία τῇ τῶν κηρύκων ἕλικι. ἀπὸ δὲ ταύτης ἀνάπαλιν φέρεται πρὸς τὸ στόμα ἔντερον λεπτόν, παχύτερον δ᾽ ἐστὶ τοῦ στομάχου τὸ ἔντερον. σπλάγχνον δ᾽ οὐδὲν ἔχει τῶν μαλακίων, ἀλλ᾽ ἣν καλοῦσι μύτιν, καὶ ἐπὶ ταύτῃ θολόν. πλεῖστον δὲ ἐστὶ τῆς θολοῦ αὐτὴ καὶ μέγιστον ἡ σηπία ἔχει. ἀφιᾶσι μὲν οὖν ἅπαντα, ὅταν φοβηθῇ, μάλιστα δὲ ἡ σηπία. ἡ μὲν οὖν μύτις κεῖται ὑπὸ τὸ στόμα, καὶ δι᾽ αὐτῆς τεταμένος ὁ στόμαχος. ᾗ δὲ εἰς τὸ ἔντερον ἀνατείνει κάτωθεν ὁ θολός, καὶ τῷ αὐτῷ ὑμένι ἔχει περιειλημμένον τόν τε πόρον τοῦ ἐντέρου, καὶ ἀφίησι κατὰ ταὐτὸν τόν τε θολὸν καὶ τὸ περίττωμα. ἔχουσι δὲ καὶ τριχώδη ἄττα ἐν τῷ σώματι. ἡ μὲν οὖν σηπία καὶ ἡ τευθὶς καὶ ὁ τεῦθος, ἔχουσι τὰ στερεὰ ἐν τῷ πρανεῖ τοῦ σώματος, ἃ καλοῦσι, τὸ μὲν, σήπιον, τὸ δὲ ξίφος. διαφέρει δέ. τὸ μὲν γὰρ σήπιον, ἰσχυρὸν καὶ πλατύ ἐστι, μεταξὺ ἀκάνθης καὶ ὀστοῦ, ἔχον ἐν αὑτῷ ψαθυρὸν σομφόν· τὸ δὲ τῶν τευθίδων, λεπτὸν καὶ χονδρωδέστερον. τῷ δὲ σχήματι διαφέρουσιν ἀλλήλων, ὥσπερ καὶ τὰ κύτη.

Qu. ἴσαι

Qu. αὐτῇ

ἢ χονδρώδη.

A Hoc vltimo, inquam, brachio in coitu vtitur. Fiſtulam idem ante aluum poſitum ſupra brachia gerit cauam, qua mare tranſmittit: quantum admiſerit aluo, quoties aliquid ore capit: eam modo in dexteram partem transfert, modò in ſiniſtram. Hac eadem fiſtula ſuum quoque atramentum fundere aſſolet. Natat obliquus, pedes in eam porrigens partem, quod capitis nomine appellatum eſt: atque ita efficitur, vt cum natat, proſpiciat in aduerſum (nam oculi ſupra ſunt conſtituti) & os habeat ex aduerſo. Caput illud polypis, quamdiu viuunt, prædurum, & quaſi inflatum eſt. Tangunt, ac tenent brachiis ſupinis, membranamque interiectam totam extendunt: in arenam B tamen elapſis facultas apprehendēdi retinēdique nulla eſt. Differunt polypi a cæteris quæ mollia enumeraui, mollibus, eo quod aluus polyporum paruus, & crura prælonga: cæteris e diuerſo, aluus amplus, crura breuia, ita vt poteſtas nulla ſit ingrediendi. Ipſa autem inter ſe diſcrepant, quatenus lolligo longior, ſepia latior eſt. Lolligine vero longe grandior, qui lollius nominatur: quippe qui vel in cubita quinque excreſcat. Sepias quoque aliquas in bina augeri cubita proditum eſt. Brachia etiam polyporum tantumdem, atque etiam plus magnitudinis capiunt. Sed lolliorum genus puſillum admodum eſt, & facie quoque C a lolligine diſſidens. Pars enim lollii, quæ exit in acutum, latior eſt. Pinnulæ etiam circundantes illæ totum in lollio aluum ambiunt, cùm in lolligine partem aliquam relinquant. Pelagius tamen lollius non alio modo, quam lolligo conſiſtit. Caput omnibus inter crura, quæ & brachia, & barbæ, & cirri appellantur. Eius pars oris habitus eſt in quo dentes duo, ſupra quos oculi totidem grandiuſculi, quibus diſcrimen exigua quædam præſtat cartilago continens cerebellum. Ineſt etiam in ore caro quædam exigua, qua vice linguæ vtuntur. Lingua enim nullis hoc in genere data eſt. Aluus à capite amplioris capaci- D tatis propenſus, cuius caro fiſſilis eſt: verum non per directum, ſed in orbem, cuteque omnibus intecta eſt. Os gula excipit anguſta, & longa: quam guttur ſequitur ampliuſculum, neque abſimile auibus: cui iungitur venter, tanquam omaſum, ſpecie clauiculæ buccinorum. Inteſtinum ab eo tenue, partem repetēs ſuperiorem ad os fertur, quod laxius quàm gula, eſt. Viſcera mollium nullis: ſed habent, quam mutem appellant, atrúmque illum humorem, cui nomen atramentum, quod plurimum in ſepia eſt. Effundunt enim id atramentum omnia metu perculſa, ſed præcipue ſepia. Mutis ergo ſub ore eſt, & gula per eam tendit: at verò atramentum infra continetur, qua inteſtinum parte E incipit ſuperiora: foramenque ſuum eadem obuolutum habet membrana qua inteſtinum: atque idē meatus emittendi atramenti excrementique eſt. Capillamenta etiam quędam in corpore omnia habentur. Sepiæ, lolligini, & lollio, partes duræ, ac ſolidæ intus per dorſum & corporis prona continentur, quas non eodem appellant nomine: ſed quod inſertum ſepiis eſt, ſepium vocant: quod lolliginibus id gladiolum. Differunt. n. quòd ſepium robuſtum latumque eſt, inter ſpinam & os medium præ ſe ferens naturam, fungoſam intra ſe complectēs, & friabilē corpulentiam. Gladiolus arctior, & cartilaginoſior eſt. Forma etiā diſcrepat, videlicet pro aluorū modo, quibus ipſe inſertus cōtinetur.

Polypis nihil ſolidum intus, ſed caput cartilagine penè conſtat, quæ ſeneſcentibus maiorem in modum indureſcit. Differunt fœminæ à maribus, quia in mare meatus ille ſubditus gulæ à cerebello in ima aluei pertendit: idque ipſum ad quod fertur, ſpeciem mammę imitatur. In fœmina duplex idem illud, ſupráque habetur. Vtroque tamen in ſexu corpuſcula quædam rubentia parti eiuſmodi ſubiuncta ſpectantur. Ouum polypi vnum incomptum foris, & grande intus humorem candicantem concolorem totum atque æquabilem continens. Tanta eſt eius oui vbertas, vt vas impleat amplius capite polypi ipſius. Sepiæ alueus bipartitus eſt, oua cãdicantia grandini ſimilia complectens permulta. Sed quiſnam ſitus ſingularũ, quas enumerauimus, partium ſit, ex deſcriptione diſſectionum contemplare. Cùm verò mares in hoc genere à fœminis differunt, tum vel maximè ſepiæ id probant. Mas enim prona ſui corporis nigriora ſupinis potiùs, partéſque omnes aſperiores habet, quàm fœmina, & lineis interuenientibus varias: caudam etiam acutiorem. Sed polyporum genera plura ſunt: eſt enim quod & conſpectius, & maximum eſt, cuius terreni maiores quàm pelagij ſunt: & quod corpore exiguo, varióque eſt, cibo ineptum: & quod eledonam vocat, crurum prolixitate diuerſum: & quod vnum ex mollium numero ſimplicem acetabulorum ordinem agat: cætera namque omnia duplici caliculantur. ad hæc, quod alij bolitænam, alij oſſolem appellat. Duo item viſuntur genera conchis indita, quorum alterum nautam aliqui vocant, alterum pompilum, ſiue ouum polypi. Teſta iis vt pectunculis concaua, ſimplex tamen, nec ita deſtinata, vt ei inhæreant. Sæpius ij iuxta terram paſcuntur, vnde euenit vt fluctibus iactati in aridam elidantur, & teſta dilapſa nudi capiantur, aut in terra anima extinguantur. Conſtant exiguo corpore, facie ſimiles bolitænis. Eſt etiam qui cochlearum more ſiliceo tegmine ita muniatur, vt nunquam egredi ſoleat, ſuáque interdum brachia exerat. Sed de generibus mollium ſatis dictum iam eſt.

CAPVT II.

De animalibus, quæ cruſta integuntur.

CRuſta autem intectorum genus primum locuſta: cui proximum genus alterum eſt, quem gammarum vocant. Differt is à locuſta brachiis, quæ denticularis forcipibus protendit: atque etiam quibuſdam aliis diſcriminibus, quanquam nõ multis. Tertium genus ſquilla eſt. Quartum, cancer: quorum ſanè plura habentur genera. Squillarum enim genere continentur gibbæ, crangines, & paruæ, quæ maiores nunquam effici poſſunt. Cancrorum enim genus multiplex eſt, nec facile enumerandum. Maximum, quas maias appellant. Secundum, paguri, & quos heracleoticos vocant. Tertiũ, fluuiales. Cæteri minutiores, & nullis penè nominibus annotari. Genus cancrorum litorale Phœnice fert, tantæ velocitatis, vt vix conſequi ſit: vnde hippeas, hoc eſt, equites illos appellarunt. Iis nihil ferè intus propter inopiã pabuli. Genus item aliud eſt, quod magnitudine cancrum non excedat, facie gammaris ſimile: ſed iis omnibus (vt antè dixi) pars dura, & teſtacea foris pro cute eſt, mollis & carnea intus: ſupina corporis planiora, & tabellatiora ſunt, quibus & oua deponunt cùm

οἱ δὲ πολύποδες οὐκ ἔχουσιν ἔσω στερεὸν τοιοῦτον οὐδέν, ἀλλὰ περὶ τὴν κεφαλὴν χονδρῶδες, ὃ γίνεται, ἐάν τις αὐτῶν παλαιωθῇ, σκληρόν. τὰ δὲ θήλεα τῶν ἀρρένων διαφέρουσι. οἱ μὲν γὰρ ἄρρενες, ἔχουσι πόρον ὑπὸ τὸν στόμαχον, ἀπὸ τοῦ ἐγκεφάλου τείνοντα πρὸς τὰ κάτω τοῦ κύτους. ἔστι δὲ πρὸς ὃ τείνει, ὅμοιον μαστῷ. ἐν δὲ ταῖς θηλείαις δύο τε τοῦτ᾽ ἐστὶ, καὶ ἄνω. ἀμφοτέροις δὲ ὑπὸ τοῦτο ἐρυθρὰ ἄττα σωμάτια πρόσεστι. τὸ δ᾽ ᾠὸν ὁ μὲν πολύπους ἓν καὶ ἀνώμαλον, ἔξω δὲ καὶ μέγα ἔχει. ἔσω δὲ τὸ ὑγρὸν, ὁμόχρουν ἅπαν καὶ λεῖον, χρῶμα δὲ λευκόν. τὸ δὲ πλῆθος τοῦ ᾠοῦ τοσοῦτον, ὥστε πληροῦν ἀγγεῖον μεῖζον τῆς τοῦ πολύποδος κεφαλῆς. ἡ δὲ σηπία, δύο τε τὰ κύτη, καὶ πολλὰ ᾠὰ ἐν τούτοις, χαλάζαις ὅμοια λευκαῖς. ἕκαστα δὲ τούτων ὡς κεῖται τῶν μορίων, θεωρείσθω ἐκ τῆς ἐν ταῖς ἀνατομαῖς διαγραφῆς. πάντα δὲ τὰ ἄρρενα * τούτων τῶν θηλειῶν διαφέρει, καὶ μάλιστα ἡ σηπία. τά τε γὰρ πρανῆ τοῦ κύτους, πάντα μελάντερα τῶν ὑπτίων, τραχύτερα τε πάντα ἔχει ὁ ἄρρην τῆς θηλείας, καὶ διαποικίλα ῥαβδοῖς, καὶ τὸ ὀρροπύγιον ὀξύτερον. ἔστι δὲ γένη πλείω πολυπόδων, ἓν μὲν, ὃ μάλιστ᾽ ἐπιπολάζει, καὶ μέγιστον αὐτῶν. εἰσὶ δὲ πολὺ μείζους οἱ πρόσγειοι τῶν πελαγίων. ἔτι δὲ ἄλλοι μικροὶ, ποικίλοι, οἳ οὐκ ἐσθίονται. ἄλλαι τε δύο, ἥ τε καλουμένη ἐλεδώνη, μήκει τε διαφέρουσα τῶν ποδῶν, καὶ τῷ μονοκότυλον εἶναι μόνον τῶν μαλακίων. τὰ γὰρ ἄλλα πάντα δικότυλά ἐστι. καὶ ἣν καλοῦσιν οἱ μὲν * βολιταίναν, οἱ δὲ ὀζόλιν. ἔτι δ᾽ ἄλλοι δύο ἐν ὀστρείοις, ὅ τε καλούμενος ὑπό τινων ναυτίλος, καὶ ὁ * ναυτικὸς, ὑπ᾽ ἐνίων δὲ ᾠὸν πολύποδος. τὸ δὲ ὄστρακον αὐτοῦ ἐστιν, οἷον κτεὶς κοῖλος, καὶ οὐ συμφυής. οὗτος νέμεται πολλάκις παρὰ τὴν γῆν, εἶθ᾽ ὑπὸ τῶν κυμάτων ἐκκλύζεται εἰς τὸ ξηρὸν, καὶ περιπεσόντος τοῦ ὀστράκου ἁλίσκεται, καὶ ἐν τῇ γῇ ἀποθνήσκει. εἰσὶ δ᾽ οὗτοι μικροὶ, τὸ εἶδος δὲ ὅμοιοι ταῖς βολιταίναις. καὶ ἄλλος ἐν ὀστράκῳ, οἷον κοχλίας, ὃς οὐκ ἐξέρχεται ἐκ τοῦ ὀστράκου, ἀλλ᾽ ἔστιν ὥσπερ ὁ κοχλίας, καὶ ἔξω ἐνίοτε προτείνει τὰς πλεκτάνας. περὶ μὲν οὖν τῶν μαλακίων εἴρηται.

* Qui mares

* γ. βολιταίνας,

* Gaz. ναυτίλος, vt ſint diuerſi piſces nautilus & pompilus: contrà Plinius lib. 9. c. 19. ſed conſule quæ de his ſcripta ſunt à doctiſſimis viris.

ΚΕΦΑΛ. β.

Περὶ τῶν μαλακοστράκων.

ΤΩν δὲ μαλακοστράκων ἓν μέν ἐστι τὸ γένος τὸ τῶν καράβων, καὶ τούτῳ παραπλήσιον ἕτερον, τὸ τῶν καλουμένων ἀστακῶν. οὗτοι δὲ διαφέρουσι τῶν καράβων, τῷ ἔχειν χηλὰς, καὶ ἄλλας τινὰς διαφορὰς οὐ πολλάς. ἓν δὲ, τὸ τῶν καρίδων, καὶ ἄλλο τὸ τῶν καρκίνων. γένη δὲ πλείω τῶν καρίδων ἐστὶ, καὶ τῶν καρκίνων. τῶν μὲν γὰρ καρίδων, αἵ τε κυφαὶ, καὶ αἱ * κράγγονες, καὶ τὸ μικρὸν γένος (αὗται γὰρ οὐ γίνονται μείζους). τὸ δὲ τῶν καρκίνων παμποδαπώτερον τὸ γένος, καὶ οὐκ εὐαρίθμητον. μέγιστον μὲν οὖν ἐστιν, ἃς καλοῦσι μαίας. δεύτεροι δὲ, οἵ τε πάγουροι, καὶ οἱ Ἡρακλεωτικοὶ καρκίνοι. ἔτι δ᾽, οἱ ποτάμιοι. οἱ δ᾽ ἄλλοι, ἐλάττους, καὶ ἀνωνυμώτεροι. περὶ δὲ τὴν Φοινίκην γίνονται ἐν τῷ αἰγιαλῷ, οὓς καλοῦσιν ἱππεῖς, διὰ τὸ οὕτως ταχέως θεῖν, ὥστε μὴ ῥᾴδιον εἶναι ταχέως καταλαβεῖν. ἀνοιχθέντες δὲ, κενοὶ, διὰ τὸ μὴ ἔχειν νομήν. ἔστι δὲ καὶ ἕτερον γένος μικρὸν μὲν, ὥσπερ οἱ καρκίνοι, τὸ δὲ εἶδος ὅμοιον τοῖς ἀστακοῖς. πάντα μὲν οὖν ταῦτα (καθάπερ εἴρηται πρότερον) τὸ μὲν στερεὸν καὶ ὀστρακῶδες, ἐκτὸς ἔχει ἐν τῇ χώρᾳ τῇ τοῦ δέρματος, τὸ δὲ σαρκῶδες, ἐντός. τὰ δ᾽ ἐν τοῖς ὑπτίοις πλακωδέστερα, εἰς ἃ καὶ ἐκτί-

* [illegible]

κτουσιν αἱ θήλειαι. πόδας δ' οἱ μὲν κάραβοι, ἐφ' ἑκάτερα ἔχουσιν, ἐφ' ἑκάτερα πέντε σὺν ταῖς ἐσχάταις χηλαῖς. ὁμοίως δὲ καὶ οἱ καρκίνοι δέκα τοὺς πάντας σὺν ταῖς χηλαῖς. τῶν δὲ καρίδων αἱ μὲν κυφαὶ, πέντε μὲν ἐφ' ἑκάτερα ἔχουσιν, ὀξεῖς τοὺς πρὸς τῇ κεφαλῇ. ἄλλους δὲ πέντε ἐφ' ἑκάτερα κατὰ τὴν γαστέρα, τὰ ἄκρα ἔχοντας πλατέα· πλάκας δὲ ἐν τοῖς ὑπτίοις οὐκ ἔχουσι· τὰ δ' ἐν τοῖς πρανέσιν, ὅμοια τοῖς καράβοις. ἡ δὲ κράγγη, τὸ ἀνάπαλιν. τοὺς πρώτους γὰρ ἔχει τέτταρας ἐφ' ἑκάτερα, εἶτ' ἄλλους ἐχομένους λεπτοὺς τρεῖς ἐφ' ἑκάτερα. τὸ δὲ λοιπὸν πλεῖον μόριον τοῦ σώματος ἄπουν ἐστί. κάμπτονται δ' οἱ μὲν πόδες πάντων εἰς τὸ πλάγιον, ὥσπερ καὶ τῶν ἐντόμων· αἱ δὲ χηλαὶ, ὅσα ἔχει χηλὰς, εἰς τὸ ἐντός. ἔχει δ' ὁ κάραβος καὶ κέρκον, πτερύγια δὲ πέντε· καὶ ἡ καρὶς ἡ κυφὴ τὴν οὐράν, καὶ πτερύγια τέτταρα. ἔχει δὲ καὶ ἡ κράγγη πτερύγια ἐφ' ἑκάτερα ἐν τῇ οὐρᾷ· τὸ δὲ μέσον αὐτῶν, ἀκανθῶδες ἀμφοτέραις· πλὴν αὕτη μὲν πλατύ, ἡ δὲ κυφὴ ὀξύ. ὁ δὲ καρκίνος, μόνος τῶν τοιούτων ἀορροπύγιον· καὶ τὸ σῶμα, τὸ μὲν τῶν καράβων καὶ καρίδων προμηκές· τὸ δὲ τῶν καρκίνων, στρογγύλον. διαφέρει δ' ὁ κάραβος ὁ ἄρρην τῆς θηλείας. τῆς μὲν γὰρ θηλείας ὁ πρῶτος ποὺς δίκρους ἐστί, τοῦ δ' ἄρρενος * μώνυξ. καὶ τὰ πτερύγια τὰ ἐν τῷ ὑπτίῳ. ἡ μὲν γὰρ θήλεια, μεγάλα ἔχει, καὶ ἐπαλλαττόμενα πρὸς τῷ τραχήλῳ· ὁ δ' ἄρρην, ἐλάττω, καὶ οὐκ ἐπαλλαττόμενα. ἔτι τοῦ μὲν ἄρρενος ἐν τοῖς τελευταίοις ποσὶ μεγάλα καὶ ὀξέα ἐστὶν, ὥσπερ πλῆκτρα· τῆς δὲ θηλείας ταῦτα μικρὰ καὶ λεῖα. * ὅμως δ' ἔχουσιν ἀμφότεροι κεραίας δύο πρὸ τῶν ὀφθαλμῶν μεγάλας καὶ τραχείας, καὶ ἄλλα κεράτια μικρὰ ὑποκάτω λεῖα. τὰ δ' ὄμματα πάντων τούτων ἐστὶ σκληρόφθαλμα, καὶ κινεῖται καὶ ἐντὸς καὶ ἐκτὸς, καὶ εἰς τὸ πλάγιον. ὁμοίως δὲ καὶ τοῖς καρκίνοις τοῖς πλείστοις, καὶ ἔτι μᾶλλον. ὁ δ' ἀστακὸς, τὸ μὲν ὅλον λαμπρὸς ἔχει τὸ χρῶμα, μέλανι δὲ, * διαπεπασμένον. ἔχει δὲ τοὺς μὲν ὑποκάτω πόδας, τοὺς ἄχρι τῶν μεγάλων, ὀκτώ· μετὰ δὲ ταῦτα, τοὺς μεγάλους πολλῷ μείζους, καὶ ἐξ ἄκρου πλατυτέρους ἢ ὁ κάραβος. ἀνωμάλους δὲ αὐτούς. ὁ μὲν γὰρ δεξιὸς, τὸ πλατὺ τὸ ἔσχατον προμῆκες ἔχει καὶ λεπτόν· ὁ δὲ ἀριστερὸς, παχὺ καὶ στρογγύλον. ἐξ ἄκρου δ' ἑκάτερος ἐσχισμένος ὥσπερ σιαγὼν, ὀδόντας ἔχων καὶ κάτωθεν καὶ ἄνωθεν. πλὴν ὁ μὲν δεξιὸς, μικροὺς ἅπαντας, καρχαρόδοντας· ὁ δ' ἀριστερὸς, ἐξ ἄκρου μὲν καρχαρόδοντας, τοὺς δὲ ἐντὸς ὥσπερ γομφίους, ἐκ μὲν τοῦ κάτωθεν μέρους τέτταρας καὶ συνεχεῖς, ἄνωθεν δὲ τρεῖς, καὶ οὐ συνεχεῖς. κινοῦσι δὲ τὸ ἄνω μέρος ἀμφότεροι, καὶ προσπιέζουσι πρὸς τὸ κάτω. βλαισοὶ δ' ἀμφότεροι τῇ κάτω θέσει, καθάπερ προτείνειν καὶ πιέσαι πεφυκότες. ἐπάνω δὲ τῶν μεγάλων ἄλλοι δύο δασεῖς, μικρὸν ὑποκάτω τοῦ στόματος, καὶ μικρὸν ὑποκάτω τούτων τὰ βραγχιοειδῆ τὰ περὶ τὸ στόμα, δασέα καὶ πολλά. ταῦτα δ' ἀεὶ διατελεῖ κινῶν. κάμπτει δὲ καὶ προσάγεται τὼ λοιπὼ τοὺς δύο πόδας πρὸς τὸ στόμα τοὺς δασεῖς. ἔχουσι δὲ καὶ παραφυάδας λεπτὰς οἱ πρὸς τῷ στόματι πόδες. ὀδόντας δ' ἔχει δύο καθάπερ ὁ κάραβος. ἐπάνω δὲ τούτων, τὰ κέρατα * μικρά, βραχύτερα δὲ καὶ λεπτότερα πολὺ ἢ ὁ κάραβος· καὶ ἄλλα τέτταρα, τὴν μὲν μορφὴν ὅμοια τούτοις, βραχύτερα δὲ καὶ λεπτότερα. τούτων δὲ ἐπάνω τοὺς ὀφθαλμοὺς μικροὺς καὶ βραχεῖς, οὐχ ὥσπερ ὁ κάραβος, μεγάλους. τὸ δ' ἐπάνω τῶν ὀφθαλμῶν, ὀξὺ καὶ τραχὺ, καθάπερ ἀεὶ μέτωπον, μεῖζον ἢ ὁ καράβου.

* γρ. μονώνυξ.
* γρ. ὁμοίως
* γρ. διαπεπασμέναι.
* γρ. μακρά,

A pariunt. Pedes locuſtis vtroque ex latere quini, vltimis annumeratis, qui in forcipem exeunt denticulatum. Cancris etiam omnes deni cum forcipibus ſunt. Squillarum generi, quas gibbas vocamus, quini vtrinque, ſitu, quo cæteris: quorum proximi capiti acutiores, & quini vtrinque alij vētri ſubiuncti, quorum extrema latiuſcula ſunt. Tabellæ iis nullæ parte ſupina: prona ſimilis locuſtarum eſt. Cancris è diuerſo: quippe quibus primi vtrinque quaterni, tum terni alij, ordinem eodem modo explentes. Reliqua bona pars corporis pedibus caret. Flectuntur omnium crura in obliquum, ſicvt & inſectorum. Brachia forcipata quibus ſunt, introrſum ſe flectunt. Locuſtis & cauda eſt, & pin-
B næ quinæ adſunt. Squillis etiam gibbis cauda, & pinnæ quaternæ. Cranginis quoque lateri caudæ vtrinque pinnæ adnexæ ſunt: quarum pinnarum media vtroque in genere ſpinulis horrent. Verùm in crangine latiora, in gibbis acutiora ſunt. Cancris ex cruſtaceis ſolis cauda deeſt, & corpus rotundum eſt, cùm locuſtis ſquillisque lōgum ſit. Differt mas locuſta à fœmina, quòd fœminæ primus pes duplex, mari ſimplex. Pinnæ etiam parti ſupinæ adnexæ, fœminæ maiores, & quæ collo proximæ ſunt, minores habentur. Mari omnes æquè minores, nec vſquam per diminutionem diſſimiles. ad hæc, mari in nouiſſimis cruribus, velvt calcaria mauſcula
C prominent acuta, quæ fœmina parua habet, & læuiora. Vtrique tamen cornua ante oculos bina, longa, & aſpera, quibus alia minuta & læuiora cornicula ſubiacent. Oculi iis omnibus duri, & apti, tum intrò, tum foras, tum etiam in obliquum moueri: quales etiam ſunt parti plurimæ cancrorum, imo verò mobiliores. Gammaro color, quod ex toto dixerim, nitet, nigriſque maculis diſperſis euariat: pedes inferiores ad grandes vſque diſpoſiti octo: tum grandes ipſi longè maiores, extremaque parte latiores, quàm locuſtæ habentur: ſed non ſpecie eadem. Dexter enim ſuum extremum, latum, & oblongum, & tenue ha-
D bet: ſiniſter craſſum & rotundum: vterque tamen ſciſſus in extremo, perinde vt maxilla tam infrà quàm ſuprà dentatus eſt. Verùm dexter puſillos ſerratóſque dentes continet omnes: læuus primos ſerratos, intimos velvt maxillares, ſcilicet parte inferiore quatuor, & continuos: ſuperiore tres non continuos. Vterque tamen partem mouet ſuperiorem, ad inferioremque adſtringit. Blæſus item vterque ſitu inferiore tanquam nati ad capiendum premendúmque. Duo ſuprà eos grandes habentur alij hirtiuſculi, paulò ab ore inferiores. Mox branchiæ os circundant, non ſine hirſutia frequētes, quas aſſiduè mouet. Flectit, atque in os adducit duos illos hirtiuſculos pedes. Surculi etiam graci-
E les geruntur à pedibus, qui ori proximi habentur. Dentes huic quoque duo, vt locuſtæ: ſuprà quos cornua breuiora, tenuioráque quàm locuſtæ. Quatuor item alia adſunt cornua, ſpecie quidem duobus illis ſimilia: ſed tenuiora, & breuiora. Super hæc oculi conſtituti ſunt parui, craſſiuſculi, non vt locuſtæ, maiuſculi: frons quaſi quædam acuta, & aſpera ſuprà oculos extat latior, quàm locuſtæ.

Denique

Denique faciés acutior, & pectus latius quàm locuſtæ, totúmque corpus mollius & carnoſius. Pedum autem octo numero, pars ſciſſa in extremo bifurcatur, pars deſinit indiuiſa: quatuor enim bifurces ſunt, reliqui quatuor ſimplices ex toto pertendunt. Quod autem collum appellant, quinque partium foris eſt: & ſextum latius illud ſitum loco nouiſſimo habetur, tabellis continuatum quinque. Interiora verò, in quibus fœminæ priùs pariunt quàm fœtum edant, hirtiuſcula quædam quatuor continentur, quibus ſingulis ſpinæ ſingulæ breues, arrectæque eminent ad exteriora. Pectus, corpuſque totum læue eſt, non more locuſtarum aculeatum, & aſperum. Verùm in pedibus magnis aculeos partis exterioris maiores eſſe, manifeſtum eſt. Fœminam hoc in genere nullum diſcrimen à mari diſtinguit. Nam & mari & fœminæ forceps alterutrer grandior more incerto eſt, parem verò vtrumque neuter vnquam habere viſus eſt: mares omnia eius generis ore excipiunt. Sed cancri parte oris exigua adducta reſpuunt; locuſtæ ſuas ad branchias tranſmittunt, quas ipſæ plures, quàm cætera, habent: communis enim omnibus branchiarum adnexus eſt. Dentes omnibus bini. Locuſtis enim duo primores, & in ore caruncula quædam conſtituta pro lingua eſt. Tum venter os protinus excipit, præterquam locuſtis. iis enim gula ante ventrem exigua. Mox à ventre inteſtinum, quod locuſtis, & ſquillis, & gammaris rectà in caudam finit, qua excrementa emittunt, & oua pariunt. Cancris autem, qua applicatum illud operculum geritur medio applicaminis ipſius: verùm iis quoque parte exteriore, qua oua pariunt, deſinit. Fœminis item huius generis locus ouis deputatus iuxta inteſtinum omnibus eſt. Et quam mutem, ſiue papauer appellarunt, amplius parciúſve habent hæc omnia genera. Diſcrimina propria contemplari in ſingulis congruum eſt. Locuſtis igitur, vt modo dixi, dentes bini maiuſculi, & venter, quo humor ſimilis muti continetur. Caruncula etiam inter dentes linguæ repræſentans effigiem: & gula ab ore breuis, quam venter membraneus excipit; cuius oſtio tres denticuli inhærent: duo aduerſi, reliquus infra. Inteſtinum verò à ventris latere ſimplex pari craſſamento ad excrementi vſque oſtium fertur. Hæc locuſtæ, & gammari, & cancri ſortiuntur: ſed locuſtis meatus quoque à pectore pendens, ad excrementi exitum pertinet: qui fœminis pro vulua eſt, maribus genitalis ſeminis receptaculum ſufficit. Meatus hic iuxta cauum carnis continetur, ita vt media caro interiaceat: inteſtinum enim deuexum pertingit: meatus verò cauo applicatur. Nec ſecus quàm in quadrupedum genere hæc habentur. Nulla maris meatũ ac fœminæ differentia diſtinguit; quippe cùm vterque tenuis ſit, & albidus, & humorem intra ſe continens, pallentem: vterque etiam ex pectore pendet. Squillas etiam ouum clauiculáſque, ſimilem in modum habere certum eſt. Maribus ſanè præ fœminis propria in pectoris carne bina quædam candicantia conſtant, diſtera à cæteris partibus colore, formaque promuſcidi ſepiarum proxima: verùm hæc torta in vertiginem more buccinorum papaueris, quorum origo ab acetabulis, quæ ſubdita pedibus nouiſſimis ordinantur.

A ὅλως δὲ τὸ μὲν πρόσωπον, ὀξύτερον, τὸν δὲ θώρακα, εὐρύτερον ἔχει τοῦ καράβου, καὶ τὸ ὅλον σῶμα σαρκωδέστερον καὶ μαλακώτερον. τῶν δ' ὀκτὼ ποδῶν οἱ μὲν τέτταρες ἐπ' ἄκρου δίκροοι εἰσίν· οἱ δὲ τέτταρες, οὔ. τὸ δὲ περὶ τὸν τράχηλον καλούμενον, διῄρηται μὲν ἔξωθεν πενταχῇ, καὶ ἕκτον ἐστὶ τὸ πλατὺ καὶ ἔσχατον, πέντε πλάκας ἔχον. τὰ δ' ἐντός, εἰς ἃ προσεκτίκτουσιν αἱ θήλειαι, δασέα τέτταρα· καθ' ἕκαστον δ' ἐστὶ τῶν εἰρημένων πρὸς τὰ ἔξω, ἄκανθαν ἔχει βραχεῖαν καὶ ὀρθήν. τὸ δ' ὅλον σῶμα, καὶ τὰ περὶ τὸν θώρακα, λεῖον ἔχει, οὐχ ὥσπερ ὁ κάραβος τραχύ· ἀλλ' ἐν τοῖς μεγάλοις ποσὶ τὰ ἔξωθεν, ἀκάνθας

B ἔχει μείζους. τῆς δὲ θηλείας πρὸς τὸν ἄρρενα οὐδεμία διαφορὰ φαίνεται. καὶ γὰρ ὁ ἄρρην καὶ ἡ θήλεια, ὁποτέραν ἂν τύχῃ τῶν χηλῶν ἔχουσι μείζω, ἴσας μέντοι ἀμφοτέρας οὐδέποτε οὐδέτερον. τὴν δὲ θάλατταν δέχονται μὲν παρὰ τὸ στόμα πάντα τὰ τοιαῦτα· * ἀφιᾶσι δ' ἀποκαλύψαντα μικρὸν πάντα μὲν οἱ καρκίνοι· οἱ δὲ κάραβοι, παρὰ τὰ βραγχιοειδῆ. ἔχουσι δὲ τὰ βραγχιοειδῆ πολλὰ οἱ κάραβοι. κοινὸν δὲ πάντων τούτων ἐστὶν ὀδόντας * τε πάντ' ἔχει δύο· καὶ γὰρ οἱ κάραβοι τοὺς πρώτους δύο ἔχουσι. καὶ ἐν τῷ στόματι σαρκῶδες ἀντὶ γλώττης, εἶτα κοιλίαν τῷ στόματι ἐχομένην εὐθύς. πλὴν οἱ κάραβοι μικρὸν στόμαχον πρὸ τῆς κοιλίας, εἶτ' ἐκ ταύτης

C ἔντερον εὐθύ. τελευτᾷ δὲ τοῦτο, τοῖς μὲν καραβοειδέσι καὶ ταῖς καρίσι, κατ' εὐθυωρίαν πρὸς τὴν οὐράν, ᾗ τὸ περίττωμα ἀφιᾶσι, καὶ τὰ ᾠὰ ἐκτίκτουσι· τοῖς δὲ καρκίνοις, [ᾗ] τὸ ἐπίπτυγμα ἔχουσι, κατὰ μέσον τὸ ἐπίπτυγμα. ἐντὸς δ' ἐστὶν, ᾗ τὰ ᾠὰ ἐκτίκτουσιν. ἔτι ταῖς θηλείαις, παρὰ τὸ ἔντερον τὴν τῶν ᾠῶν χώραν ἔχουσι. καὶ τὴν καλουμένην δὲ μύτιν ἢ μήκωνα, πλείω ἢ ἐλάττω πάντ' ἔχει ταῦτα. τὰς δ' ἰδίας διαφορὰς, ἤδη καθ' ἕκαστον δεῖ θεωρεῖν. οἱ μὲν οὖν κάραβοι, ὥσπερ εἴρηται, δύο ἔχουσιν ὀδόντας μεγάλους καὶ κοίλους· ἐν οἷς ἔνεστι χυμὸς ὅμοιος τῇ μύτιδι. μεταξὺ δὲ τῶν ὀδόντων, σαρκίον γλωττοειδές. ἀπὸ δὲ τοῦ στόματος, ἔ-

D χει στόμαχον βραχὺν, καὶ κοιλίαν ταύτῃ ἐχομένην ὑμενώδη· ἧς πρὸς τῷ στόματι, ὀδόντες εἰσὶ τρεῖς· οἱ μὲν δύο, κατ' ἀλλήλους· ὁ δὲ εἷς, ὑποκάτω. τῆς δὲ κοιλίας ἐκ τοῦ πλαγίου ἔντερον ἐστὶν ἁπλοῦν καὶ ἰσοπαχὲς δι' ὅλου, μέχρι πρὸς τὴν ἔξοδον τοῦ περιττώματος. ταῦτα μὲν οὖν [πάντα] ἔχουσι καὶ οἱ κάραβοι καὶ αἱ καρίδες, καὶ οἱ καρκίνοι. [καὶ οἱ καρκίνοι γὰρ ὀδόντας δύο ἔχουσι] ἔτι δ' οἵ γε κάραβοι πόρον ἔχουσιν ἀπὸ τοῦ στήθους ἠρτημένον, μέχρι πρὸς τὴν ἔξοδον τοῦ περιττώματος. οὗτος δ' ἐστὶ τῆς μὲν θηλείας ὑστερικός, τοῦ δ' ἄρρενος θορικός. ἔστι δ' ὁ πόρος οὗτος, παρὰ τὸ κοῖλον τῆς σαρκός, ὥστε μεταξὺ εἶναι τὴν

E σάρκα. τὸ μὲν γὰρ ἔντερον πρὸς τὸ κυρτὸν ἐστίν, ὁ δὲ πόρος πρὸς τὸ κοῖλον, ὁμοίως ἔχοντα ταῦτα, ὥσπερ τοῖς τετράποσι. διαφέρει δ' οὐθὲν ὁ τοῦ ἄρρενος, ἢ ὁ τῆς θηλείας· ἀμφότεροι γὰρ εἰσὶ λεπτοὶ καὶ λευκοί, καὶ ὑγρότητα ἔχοντες ἐν αὐτοῖς ὠχράν· ἐπὶ δ' ἠρτημένοι ἀμφότεροι ἐκ τοῦ στήθους. ἔχουσι δ' οὕτω τὸ ᾠὸν καὶ αἱ καρίδες καὶ τὰς ἕλικας. ἴδια δ' ἔχει ὁ ἄρρην πρὸς τὴν θήλειαν ἐν τῇ σαρκὶ κατὰ τὸ στῆθος δύο λευκὰ ἄττα καθ' αὐτά, ὅμοια τὸ χρῶμα καὶ τὴν σύστασιν ταῖς τῆς σηπίας προβοσκίσιν. εἰλιγμένα δ' ἐστὶ ταῦτα ὥσπερ ἡ τοῦ κήρυκος μήκων. ἡ δ' ἀρχὴ τούτων ἐστὶν ἀπὸ τῶν κοτυληδόνων, αἵ εἰσιν ὑποκάτω τῶν ἐσχάτων ποδῶν.

* χ. ἀφιᾶσι

* Quidam πάντ

ἔχει δὲ καὶ ἐν τούτῳ σάρκα ἐρυθρὰν, καὶ αἱματώδη τὴν χρόαν· τὴν δ' ἁφὴν γλίσχραν, καὶ οὐχ ὁμοίαν τῇ σαρκί. * ἀπὸ δὲ τοῦ περὶ τὰ στήθη κηρυκώδους, ἄλλος ἐστὶν ἑλιγμὸς, ὥσπερ ἁρπεδόνη τὸ πάχος· ὧν ὑποκάτω δύο ἄττα * ψαθυρά ἐστι προσηρτημένα τῷ ἐντέρῳ θορικά. ταῦτα μὲν οὖν ὁ ἄρρην ἔχει. ἡ δὲ θήλεια, ᾠὰ ἴσχει τὸ χρῶμα ἐρυθρά· ὧν ἡ πρόσφυσίς ἐστι πρὸς τῇ κοιλίᾳ, καὶ τοῦ ἐντέρου ἑκατέρωθι μέχρι εἰς τὰ σαρκώδη, ὑμένι λεπτῷ περιεχόμενα. τὰ μὲν οὖν μόρια ὅσα ἐντὸς καὶ ἐκτὸς ἔχουσι, ταῦτά ἐστι.

* γρ. ψαφαρά, malè. quidam, ψαθυρὰ ex Suida.

ΚΕΦΑΛ. γ'.

Ἔτι περὶ τῶν μαλακοστράκων.

Συμβέβηκε δὲ τῶν μὲν ἐναίμων τὰ ἐντὸς μόρια, ὀνόματα ἔχειν· πάντα γὰρ σπλάγχνα ἔχει τὰ ἔσωθεν· τῶν δ' ἀναίμων οὐδὲν, ἀλλὰ κοινὸν τούτοις καὶ ἐκείνοις πᾶσι, κοιλία * καὶ στόμαχος, καὶ ἔντερον. οἱ δὲ καρκίνοι, περὶ μὲν τῶν χηλῶν καὶ τῶν ποδῶν, ὅτι ἔχουσι καὶ πῶς ἔχουσιν, εἴρηται πρότερον. ὡς δ' ἐπὶ τὸ πολὺ, πάντες τὴν δεξιὰν ἔχουσι μείζω χηλὴν, καὶ ἰσχυροτέραν. εἴρηται δὲ πρότερον καὶ περὶ ὀφθαλμῶν, ὅτι εἰς τὸ πλάγιον βλέπουσιν οἱ πλεῖστοι. τὸ δὲ κύτος τοῦ σώματος, ἐστιν ἀδιαίρετον. ἔτι δὲ κεφαλὴ, καὶ εἴ τι ἄλλο μόριον. ἔχουσι δ' ὀφθαλμοὺς, οἱ μὲν, ἐκ τοῦ πλαγίου ἄνω ὑπὸ τὸ πρανὲς εὐθὺς πολὺ διεστῶτας πως· ἔνιοι δὲ, ἐν μέσῳ, καὶ ἐγγὺς ἀλλήλων, οἷον οἱ Ἡρακλεωτικοὶ, καὶ αἱ μαῖαι. ὑποκάτω δὲ τὸ στόμα τῶν ὀφθαλμῶν, καὶ ἐν αὐτῷ ὀδόντας δύο, ὥσπερ ὁ κάραβος· πλὴν οὐ στρογγύλοι οὗτοι, ἀλλὰ μακροί. καὶ ἐπὶ τούτων ἐπικαλύμματά ἐστι δύο· ὧν μεταξύ ἐστιν οἷάπερ ὁ κάραβος ἔχει πρὸς τοῖς ὀδοῦσι. δέχεται μὲν οὖν τὸ ὕδωρ περὶ τὸ στόμα, ἀπωθῶν τοῖς ἐπικαλύμμασιν· ἀφίησι δὲ κατὰ τοὺς ἄνω πόρους * τοῦ σώματος, ἐπιλαμβάνων τοῖς ἐπικαλύμμασιν, ᾗ εἰσῆλθεν. οὗτοι δ' εἰσὶν εὐθὺς ὑπὸ τοὺς ὀφθαλμούς· καὶ ὅταν δέξηται τὸ ὕδωρ, ἐπιλαμβάνει τὸ στόμα τοῖς ἐπικαλύμμασιν ἀμφοτέροις, ἔπειθ' οὕτως ἀποπτύει τὴν θάλατταν. ἐχόμενος δὲ τῶν ὀδόντων ὁ στόμαχος, βραχὺς πάμπαν, ὥστε δοκεῖν εὐθὺς εἶναι μετὰ τὸ στόμα τὴν κοιλίαν. καὶ κοιλία τούτου ἐχομένη δικρόα· ἧς ἐκ μέσης μὲν τὸ ἔντερόν ἐστιν ἁπλοῦν καὶ λεπτόν· τελευτᾷ δὲ τὸ ἔντερον ὑπὸ τὸ ἐπικάλυμμα τὸ ἔξω, ὥσπερ εἴρηται καὶ πρότερον. ἔχει δὲ τὸ μεταξὺ τῶν ἐπικαλυμμάτων, οἷάπερ ὁ κάραβος, πρὸς τοῖς ὀδοῦσιν. ἐν δὲ τῷ κύτει ἔσω χυμός ἐστιν ὠχρὸς, καὶ μικρὰ ἄττα προμήκη λευκὰ, καὶ ἄλλα πυρρὰ διεσπασμένα. διαφέρει δ' ὁ ἄρρην τῆς θηλείας τῷ μεγέθει, καὶ τῷ πάχει, καὶ τῷ ἐπικαλύμματι. μεῖζον γὰρ τοῦτο ἔχει ἡ θήλεια, καὶ πλέον ἀφεστηκὸς καὶ συνηρεφές, καθάπερ * ἐπὶ τῶν θηλειῶν καράβων. τὰ μὲν οὖν τῶν μαλακοστράκων μόρια, τοῦτον ἔχει τὸν τρόπον.

* Emendatior codex habet & στόμα, ait Niphus.

* Gaza, τὸ στόματος. ſed σώματος etiam veteres tranſlationes agnoſcunt.

* κ. θηλειῶν

A Caro in iis quoque eſt colore ſanguinis rubra, & tactu lento, nec ſimilis carni. Ab hoc, pectori infractus alter ſtrue buccinea, craſſitudine lineæ ſeſe porrigit: ſub quo duo quædam arenæ conditioni ſimilia, ſemini genitali accommodata, inteſtino adnectuntur. Hæc in mare. Fœmina autem ouum rubidum parit, membranáque obuolutum prætenui, ventri, laterique vtrique inteſtini annexum, atque ad carnem vſque adhærens. Partes has habent interiores, atque exteriores.

CAPVT III.

B *De partibus animantium cruſta intectorum, quibúſve cum iis quæ ſanguinem habent, conueniant.*

SEd cùm animalia quæque ſanguinea, partes tum interiores tum etiam exteriores, ſuis quaſque appellatas nominibus habeant, genus, quod ſanguine caret, pluribus vacat. Iam enim viſcera, quæ cuique ſanguineo inſunt omnia, nullum exangue quod habeat, nouimus: ſed communes generi vtrique partes, gula, venter, inteſtinum. Cancris autem forcipes, pedéſque haberi, & ij quales eſſent, dictum iam eſt. Omni- C bus verò magna ex parte grandior ac validior forceps dexter, quàm læuus eſt. Quinetiam de oculis diximus, viſum parti plurimæ eſſe in obliquum. Alueus verò totius corporis indiſcretus eſt: nec enim caput diſtinctum, nec aliud quicquam. Oculi non eodem ſitu omnibus poſiti, ſed aliis è latere ſuprà, continuo ſub prono, amplo diſtantes diſcrimine: aliis in medio breui diſcrimine, vt Heracleoticis, aut maiis. Os oculis ſubditum, in quo dentes duo, vt locuſtis: verùm non rotundi, ſed longi. Tegmina dentes operiunt duo, inter quæ talia interiacent quædam, qualia locuſtarum dentibus adnecti expoſui. Humorem igitur ore accipit, tegminibus illis D depellendo: emittitque meatu oris ſuperiore, obductis meatibus quà interfluxit. Duplex ille meatus ſub oculis eſt. Quoties ergo aquam acceperit, vtroque tegumento os obturat, atque ita reſpuit humorem. Gula poſt dentes breuis admodum eſt, ita vt protinus venter os excipere videatur. Venter biſulcus gulæ ſubiungitur, cuius ex medio inteſtinum ſimplex, & tenue procedit, quod ſub applicato exteriore operculo deſinit, vt dictum eſt. Quod autem inter tegumenta interiacet, huius, ſicvti locuſtarum, dentibus adnectitur. Humor intus in alueo pallidus, & minuta quædam oblonga, albida continentur. E Rufa etiam alia, maculis diſperſis. Differt à fœmina mas, magnitudine, craſſitudine, & operculo: id enim amplius in fœmina eſt, & diſtantius, & hirſutius, & ſpacius, quale etiam fœminæ locuſtarum ſortiuntur. Partes cruſta intecti generis ita ſe habent.

A

CAPVT IV.

De animalibus, quæ teſta integuntur, eorúmque inter ſe differentiis.

QVæ verò teſta operiuntur animalia, vt vmbilici, cochleæ, purpuræ, & omnia, quæ oſtrei, aut conchæ nomine appellamus, atque etiam echinorum genus, carnem quæcunque habent, ſimiliter atque cruſtata habent: quippe quæ intus eam contineant, teſtáque foris claudantur, nec intra ſe durum habeant quicquam. Sed ipſa inter ſeſe numeroſa diſcrepant differentia, tum teſtæ, tum carnis interioris ratione. Aliis enim in eo genere nulla eſt caro, vt echinis: aliis eſt, ſed penitus incluſa, nec vlla ex parte conſpecta, excepto capite, vt terreſtrium limacibus, & iis quæ cocalia quidam appellarunt, & aquatilium purpuris, buccinis, cochleis, & reliquis omnibus turbinatis. Cætera aut duplici conſtant valuula, aut ſimplici, vt genus alterum biualue, alterum vniualue poſſit nuncupari. Biualue appello, quod gemina teſta continetur: vniualue, quod teſta ſingulari clauditur. Sunt item quibus altera pars ſuperficiei detecta, carnem oſtendat, vt patellæ. Biualuis generis pars cluſilis eſt, vt pectunculi & mitili. Eiuſmodi namque omnia parte altera ligata, altera ſoluta conſtant, vt & concludi poſſint, & aperiri. Alia binis quidem concluſa valuulis ſunt, verùm vtroque latere conuexa: vt vngues, ſiue digiti. Non deſunt quæ teſta tota occultentur, vt nulla ex parte carnem detectam habeant: vt quæ vertibula, ſiue tubera, & callos appellamus. Ipſarum etiam teſtarum magna varietas: nam aliæ læues, vt vngues, mitili, & concharum quædam, vt quas aliqui galadas appellant. Aliæ ſcabræ, vt oſtreæ, pinnæ, & conchæ nonnullæ, & buccina. Quædam etiam pectinatim diuiſæ, vt pectunculi, & concharum nonnullæ. Craſſitudine quoque differunt, & tenuitate: tum totius, tum partis: velut labrorum. Aliis enim labra tenuia, vt mitilis: aliis craſſa, vt oſtreis. Item alii ſe mouent, vt pectines, quos etiam volare nonnulli aiunt: nam & de ferramento, quo capiuntur, ſæpe exiliunt. Alia item natura immobili ſunt, vt nunquam ſedem, in qua hærent, ſponte ipſa mutare valeant: vt pinna. Omne ſane turbinatorum genus mouetur, & ſerpit. Patella etiam ſaxis abſolui, in paſtúmque ferri ſolita eſt. Commune autem & iis quæ adhuc enumeraui, & cæteris teſtacei generis, vt teſta intus æqualis læuiſque habeatur. Caro biualuis & vniualuis generis ita teſtæ adhæret, vt niſi per vim nequeat detrahi. At turbinatis laxior continetur & abſolutior: cui generi peculiare eſt, vt teſtæ poſtrema à capite intorqueantur. Operculum etiam eadem iam inde ab ortu naturæ omnia gerunt. Mouentur item eadem omnia parte dextra, non ad vertiginem, ſiue clauiculam, ſed in aduerſum. Partes exteriores eius generis differentiis iis variantur. Interiorum natura ſimilis quodam modo in omnibus eſt: maximéque in turbinatis. Differunt enim inter ſe magnitudinis exceſſúſque affectu. Nec verò multùm vniualue ac biualue genus concluſile ſibi diſſident, quippe quæ parum differentiæ inter ſe afferant: quanquam longè ab immobilibus diſcrepét: quod latiùs poſtea patebit. Natura ergo turbinatorum ſimilis conſtat, nec niſi magnitudine variat,

ΚΕΦΑΛ. δ'.

Περὶ τῶν ὀστρακοδέρμων.

Τὰ δὲ ὀστρακόδερμα τῶν ζώων, οἷον οἵ τε κοχλίαι, καὶ οἱ κόχλοι, καὶ πάντα τὰ καλούμενα ὄστρεα· ἔτι δὲ τὸ τῶν ἐχίνων γένος, τὸ μὲν σαρκῶδες, ὅσα σάρκας ἔχει, ὁμοίως ἔχει τοῖς μαλακοστράκοις· ἐντὸς γὰρ ἔχει· τὸ δὴ ὄστρακον, ἐκτός· ἐντὸς δ' οὐθὲν σκληρόν. αὐτὰ δὲ πρὸς ἑαυτὰ διαφορὰς ἔχει πολλὰς, καὶ κατὰ τὰ ὄστρακα, καὶ κατὰ τὴν σάρκα τὴν ἐντός. τὰ μὲν γὰρ αὐτῶν, οὐκ ἔχει σάρκα οὐδεμίαν, οἷον
B ἐχῖνος. τὰ δ' ἔχει μὲν, ἐντὸς δ' ἔχει τὴν σάρκα ἀφανῆ πᾶσαν, πλὴν τῆς κεφαλῆς, οἷον οἵ τε χερσαῖοι κοχλίαι, καὶ τὰ καλούμενα ὑπό τινων κωκάλια, καὶ τῶν ἐν τῇ θαλάττῃ, αἵ τε πορφύραι, καὶ οἱ κήρυκες, καὶ ὁ κόχλος, καὶ τἄλλα τὰ στρομβώδη. τῶν δ' ἄλλων, τὰ μέν ἐστι δίθυρα, τὰ δὲ, μονόθυρα· λέγω δὲ δίθυρα τὰ δυσὶν ὀστράκοις περιεχόμενα· μονόθυρα δὲ, τὰ ἑνί· τὰ δὲ, σαρκώδη ἐπιπολῆς, οἷον ἡ λεπάς. τῶν δὲ διθύρων, τὰ μέν ἐστιν ἀνάπτυχα, οἷον οἱ κτένες, καὶ οἱ μύες· ἅπαντα γὰρ τὰ τοιαῦτα, τῇ μὲν, συμπέφυκε, τῇ δὲ, διαλέλυται, ὥστε συγκλείεσθαι καὶ ἀνοίγε-
C σθαι. τὰ δὲ δίθυρα μέν ἐστιν, ὁμοίως δὲ συμπέφυκεν ἐπ' ἀμφότερα, οἷον οἱ σωλῆνες. ἔστι δὴ ἃ ὅλα περιείχεται τῷ ὀστράκῳ, καὶ οὐθὲν τῆς σαρκὸς ἔχει εἰς τὸ ἔξω γυμνὸν, οἷον τὰ καλούμενα τήθυα. ἔτι δ' αὐτῶν τῶν ὀστράκων διαφοραὶ πρὸς ἄλληλά εἰσι. τὰ μὲν γὰρ λειόστρακά ἐστιν, ὥσπερ σωλὴν καὶ μύες, καὶ κόγχαι ἔνιαι, αἱ καλούμεναι ὑπό τινων γαλάδες· τὰ δὲ, * τραχέα, οἷον τὰ λιμνόστρεα καὶ πίνναι, καὶ γένη κόγχων ἔνια, καὶ κήρυκες. καὶ τούτων τὰ μὲν, ῥαβδωτά ἐστιν, οἷον κτεὶς, καὶ κόγχων τι γένος· τὰ δὲ ἀρράβδωτα, οἷον αἵ τε πίνναι, καὶ κόγχων τι γένος. καὶ πάχει δὲ καὶ λεπτότητι τῶν ὀστράκων διαφέρουσιν, ὅλων τε τῶν ὀστράκων, καὶ κατὰ μέρος, οἷον περὶ τὰ χείλη. τὰ μὲν γὰρ,
D λεπτόχειλά ἐστιν, οἷον οἱ μύες· τὰ δὲ, παχύχειλα, οἷον τὰ λιμνόστρεα. ἔτι, τὰ μὲν, κινητικὰ αὐτῶν ἐστιν, οἷον ὁ κτείς· ἔνιοι γὰρ καὶ πέτεσθαι λέγουσι τοὺς κτένας. ἐπεὶ καὶ ἐκ τοῦ ὀργάνου ᾧ θηρεύονται, ἐξάλλονται πολλάκις· τὰ δ', ἀκίνητα καὶ προσφυῆ, οἷον ἡ πίννα. τὰ δὲ στρομβώδη, πάντα κινεῖται καὶ ἕρπει. νέμεται δὲ ἀπολυομένη καὶ ἡ λεπάς. κοινὸν δὲ τούτων καὶ τῶν ἄλλων τῶν σκληροστράκων, τὸ λεῖον εἶναι ἐντὸς τὸ ὄστρακον· τὸ δὲ σαρκῶδες, τοῖς μὲν μονοθύροις καὶ διθύροις, προσπέφυκε τοῖς ὀστράκοις, ὥστε βίᾳ ἀποσπᾶσθαι, τοῖς δὲ στρομβώδεσιν, ἀπολέλυται μᾶλλον. ἴ-
E διον δὲ τούτοις κατὰ τὸ ὄστρακον ὑπάρχει πᾶσι, τὸ ἑλίκην ἔχειν τὸ ὄστρακον τὸ ἔσχατον ἀπὸ τῆς κεφαλῆς. ἔτι δὴ ἐπίπτυγμα πάντ' ἔχει ἐκ γενετῆς. ἔτι δὲ πάντα τὰ στρομβώδη τῶν ὀστρακοδέρμων, δεξιὰ κινεῖται, οὐκ ἐπὶ τὴν ἑλίκην, ἀλλ' ἐπὶ τὴν ἀντικρύ. τὰ μὲν οὖν ἔξωθεν μόρια τούτων τῶν ζώων, τοιαύτας ἔχει τὰς διαφοράς· τῶν δ' ἐντὸς, τρόπον μέν τινα παραπλησία ἡ φύσις ἐστὶ πάντων, καὶ μάλιστα τῶν * στρομβωδῶν. μεγέθει γὰρ ἀλλήλων διαφέρει, καὶ τοῖς καθ' ὑπεροχὴν πάθεσιν. οὐ πολὺ δὲ διαφέρει οὐδὲ τὰ μονόθυρα καὶ δίθυρα. τὰ συγκλειστὰ δὲ, διαφορὰν ἔχει πρὸς ἄλληλα μὲν μικρὰν, πρὸς δὲ τὰ ἀκίνητα πλείω. τοῦτο δ' ἴσως φανερὸν ἐκ τῶν ὕστερον μᾶλλον. ἡ δὲ φύσις τῶν στρομβωδῶν ἁπάντων, ὁμοίως ἔχει· διαφέρει δ',

* γρ. τραχυόστρακα

* γρ. στρομβωδῶν

ὥσπερ εἴρηται καθ' ὑπεροχήν. τὰ μὲν γὰρ μείζω μέρη, καὶ ἐνδηλότερα ἔχει αὐτῶν· τὰ δ' ἐλάττω, τοὐναντίον. ἔτι δὲ σκληρότητι, καὶ μαλακότητι. καὶ τοῖς ἄλλοις τοῖς τοιούτοις πάθεσιν. ἔχει γὰρ πάντα, τὴν μὲν ἐξωτάτω τοῦ ὀστράκου ἐν τῷ στόματι σάρκα στιφράν, τὰ μὲν μᾶλλον, τὰ δὲ ἧττον. ἐκ μέσου δὲ τούτου ἡ κεφαλή, καὶ κεράτια δύο. ταῦτα δ', ἐν μὲν τοῖς μείζοσι, μεγάλα· ἐν δὲ τοῖς ἐλάττοσι, πάμπαν μικρά ἐστιν. ἡ δὲ κεφαλὴ ἐξέρχεται πᾶσι τὸν αὐτὸν τρόπον· καὶ ὅταν φοβηθῇ, συσπᾶται πάλιν εἰς τὸ ἐντός. ἔχει δὲ στόμα καὶ ὀδόντας ἔνια, οἷον ὁ κοχλίας, ὀξεῖς, καὶ μικρούς, καὶ λεπτούς. ἔχουσι δὲ καὶ προβοσκίδας, ὥσπερ καὶ αἱ μυῖαι. τοῦτο δ' ἐστὶ γλωττοειδές. ἔχουσι δὲ καὶ οἱ κήρυκες τοῦτο καὶ αἱ πορφύραι στιφρόν, καὶ ὥσπερ οἱ μύωπες καὶ οἱ οἶστροι, τὰ δέρματα διατρυπῶσι τῶν τετραπόδων, ἔτι τὴν ἰσχὺν τοῦτ' ἐστὶ σφοδρότατον· τῶν γὰρ δελεάτων τὰ ὄστρακα διατρυπῶσι. τοῦ δὲ στόματος ἔχεται εὐθὺς καὶ ἡ κοιλία. ὁμοία δ' ἐστὶν ἡ κοιλία προλόβῳ ὄρνιθος, ὁμοία οὖσα τῶν κόχλων. κάτω δ' ἔχει δύο λευκὰ στιφρά, ὅμοια μαστοῖς, οἷα ἐγγίνεται καὶ ἐν ταῖς σηπίαις· πλὴν στιφρὰ ταῦτα μᾶλλον. ἀπὸ δὲ τῆς κοιλίας, στόμαχος ἁπλοῦς μακρὸς μέχρι τῆς μήκωνος, ἥ ἐστιν ἐν τῷ πυθμένι. ταῦτα μὲν οὖν ἐστι δῆλα καὶ ἐπὶ τῶν πορφυρῶν, καὶ τῶν κηρύκων ἐστὶν ἐν τῇ ἕλικι τοῦ ὀστράκου. τοῦ δὲ στομάχου τὸ ἐχόμενόν ἐστιν ἔντερον· συνεχὲς δ' ἐστὶ στόμαχος καὶ τὸ ἔντερον, καὶ ἁπλοῦν μέχρι τῆς ἐξόδου. ἡ δ' ἀρχὴ τοῦ ἐντέρου περὶ τὴν ἕλικα τῆς μήκωνος, καὶ ταύτῃ ἐστὶν εὐρύτερον· ἔστι γὰρ ἡ μήκων οἱονεὶ [κοιλίας] περίττωμα πᾶσι τοῖς ὀστρακηροῖς τὸ πολὺ αὐτῆς· εἶτα ἐπικαμφθὲν ἄνω φέρεται πάλιν πρὸς τὸ σαρκῶδες, καὶ ἡ τελευτὴ τοῦ ἐντέρου, περὶ τὴν κεφαλήν ἐστιν, ᾗ ἀφίησι τὸ περίττωμα πᾶσιν ὁμοίως καὶ τοῖς στρομβώδεσι καὶ τοῖς χερσαίοις καὶ τοῖς θαλαττίοις. παρύφανται δ' ἀπὸ τῆς κοιλίας τῷ στομάχῳ ἐν τοῖς μεγάλοις κόχλοις συνεχόμενος ὑμήν, ὁ μακρὸς πόρος καὶ λευκός, ὅμοιος τὴν χρόαν τοῖς ἄνω μαστοειδέσιν. ἔχει δ' ἐντομάς, ὥσπερ τὸ ἐν τῷ καράβῳ ᾠόν· πλὴν τὴν χρόαν τὸ μέν, λευκόν, ἐκεῖνο δέ, ἐρυθρόν. ἔχει δ' οὐδεμίαν ἔξοδον τοῦτο, οὐδὲ πόρον, ἀλλ' ἐν ὑμένι ἐστὶ λεπτῷ, κοιλότητα ἔχον ἐν αὐτῷ στενήν. ἀπὸ δὲ τοῦ ἐντέρου κάτω παρατείνει μέλανα καὶ τραχέα συνεχῆ, οἷα καὶ ἐν ταῖς χελώναις, πλὴν ἧττον μέλανα. ἔχουσι δὲ καὶ οἱ ἄλλοι κόχλοι ταῦτα τὰ λευκά, πλὴν ἐλάττω οἱ ἐλάττους. τὰ δὲ μονόθυρα καὶ δίθυρα, τῇ μέν, ὁμοίως ἔχει τούτοις· τῇ δ', ἑτέρως. κεφαλὴν μὲν γὰρ καὶ κεράτια, καὶ στόμα ἔχουσι, καὶ τὸ γλωττοειδές· ἀλλ' ἐν μὲν τοῖς ἐλάττοσιν, διὰ μικρότητα αὐτῶν, ἄδηλα· ταῦτα δέ, καὶ ἐν τεθνεῶσιν, ἢ μὴ κινουμένοις, ἄδηλα. τὴν δὲ μήκωνα, πάντα ἔχει· ἀλλ' οὐκ ἐν τῷ αὐτῷ τόπῳ ἴσην, οὐδ' ὁμοίως φανεράν· ἀλλ' αἱ μὲν λεπάδες, κάτω ἐν τῷ βάθει· τὰ δὲ δίθυρα, ἐν τῷ γιγγλυμώδει. καὶ τὰ τριχώδη πᾶσιν ὑπάρχει κύκλῳ τούτοις, οἷον καὶ τοῖς κτεσί. καὶ τὸ λεγόμενον ᾠόν, τοῖς ἔχουσιν, ὅταν ἔχωσιν, ἐν τῷ κύκλῳ τῆς περιφερείας τῷ ἐπὶ θάτερά ἐστιν, ὥσπερ καὶ τὸ λευκὸν τοῖς κόχλοις. καὶ γὰρ ἐκείνοις τοῦτο ὅμοιον ὑπάρχει. ἀλλὰ πάντα τὰ τοιαῦτα μόρια, ὥσπερ εἴρηται, ἐν μὲν τοῖς μεγάλοις δῆλά ἐστιν· ἐν δὲ τοῖς μικροῖς, ἢ οὐθέν, ἢ μόλις. διὸ μάλιστα ἐν τοῖς μεγάλοις κτεσὶ φανερά ἐστιν. οὗτοι δ' εἰσὶν οἱ τὴν ἑτέραν θυρίδα πλατεῖαν ἔχοντες, οἷον ἐπίθημα.

A vt modò dixi. Aliis enim partes maiores atque euidentiores: aliis minores obſcurioréſque ſunt. Ad hæc diſcrimen illud duritiæ, mollitiæ, cæterarúmque generis eiuſdem affectionum. Caro enim prima in ore teſtæ, quam omnia toroſiuſculam habent, aliis magis talis, aliis minùs. Caput eius medio partis prominulum iungitur: & cornicula duo, quæ pro magnitudine animantis plus minus capiunt incrementi. Exerunt caput more omnia eodem, idémque per motum retrahunt intro. Nonnullis etiam os, & dentes acuti, breues, & tenues, vt cochleis. Promuſcidas item gerunt modo muſcarum: quod quidem membrum linguæ effigiem præ ſe fert. Habent hoc idem & purpuræ, B & buccina firmum & toroſum, quo ſimiliter vt aſili atque tabani, quadrupedum tergora penetrant: imò longè validiùs: teſtas enim eſcarum poſſunt perforare. Venter os protinus excipit, ſimilis in vmbilicis gutturi auium: habéntque parte inferiore duo quædam albida, toroſa, mammis ſimilia, cuiuſmodi carunculas vel in ſepiis eſſe aduertimus: ſed hæc toroſiora. Gula à ventre duplex longa porrigit ſe vſque ad papauer, quod poſtremum, fundo commiſſum eſt. Hæc ergo, vt in purpuris & buccinis conſpicua, in clauicula teſtæ continentur. Quod autem gulæ ſubiungitur, inteſtinum eſt, gulæ ipſi continuum, ſimplexque ex toto, vſque ad exitum: cuius initium circa anfractum papaueris C eſt, quà & laxiùs hæret. Quod enim papauer appellamus, quaſi materia vacans, atque excrementitia, magna ſui parte in omnibus teſtaceis generibus ineſt. Hinc ſurſum verſus replicans, carnis repetit ſedem, finitque ad caput: vnde eiicitur excrementum, pariter in omnibus turbinatis generibus, tam aquaticis quàm terreſtribus. Membrana in grandiuſculis vmbilicis à ventre gulæ attexitur continua, per quam meatus prolixior albicans colore, ſimilis ſuperioribus illis mammillantibus carniculis tendit. Habet etiam inciſuras, quales in ouo locuſtarum habentur: verùm hoc albidum, illud rubidum eſt. Nullus exitus huic, nullum foramen poſtremum patet, ſed prætenui membrana cauo D perductus anguſto continetur. Tendunt ab inteſtino ad imum nigrantia quædam aſpera, atque continua, qualia vel in teſtudine viſuntur, ſed minùs nigra. Cæteri quoque vmbilici hæc habent eadem: ſed quo minores, eo minutiora. Vniualue autem & biualue genus partim iis ſimile eſt, partim diuerſum. Caput enim, & cornicula, & os obtinent, atque etiam quod linguæ ſpeciem gerat: verùm hæc in minutioribus ſenſum præ ſua exiguitate effugiunt. Nonnulla etiam in exanimatis, aut non mouentibus percipi nequeunt. Papauer illud, quod etiam mutem appellamus, omnia habent, ſed non loco eodem, nec par, nec ex æquo manifeſtum, ſed patellæ in imo, biualuia verò ad E partem, qua mutuo teſtarum complexu continentur. Capillamentis etiam illis hæc omnia circundantur: & quod ouum appellant, tempore, quo gigni ſolet, ambitu alterius lateris oræ continetur, videlicet iis quibus datum id à natura eſt, ſicut etiam albugo vmbilicis: id enim illis iunctum ſimile intelligimus. Sed eiuſmodi partes, vt dixi, cùm conſpicuæ in magnis habeantur, in paruis tamen aut nullo pacto aut vix ſentiuntur: quamobrem in magnis pectunculis præcipuè patent. quod genus id eſt, cui altera valuularum latior, velut tegmen ſuperpoſita eſt.

A Oſtium excrementi cæteris à latere eſt. Foramen enim, quo egerant, omnia habent: quippe cùm papauer illud, vt dictum iam eſt, excrementitium quiddam omnia membrana contentum ſortiantur. At illi, quod ouum appellant, foramen, nullo in genere tributum videmus, ſed carni ipſi intumeſcit: nec eadem, qua inteſtinum, parte continetur, ſed dextera, cùm inteſtinum habeat ſiniſtra. Cæteris ergo talis excrementi exitus eſt. At verò patellæ feræ, quam marinam aurem quidam appellarunt, parte ima teſtæ excernitur, qua foramen habetur. Ventrem etiam poſt os eſſe, in hoc eodem patellæ genere conſtat, atque etiam ouis illa ſimilia. Sed quis eorum cuique ſitus ſit, diligentiùs ex diſſectionibus petendum eſt. B Quem autem cancellum appellant, communis ferè ſocius cruſtatorum & teſtatorum generum eſt: quippe qui ſpecie locuſtis ſimilis ſpectetur, naſcíque ſeorſum per ſe ſolitus ſit. Verùm quòd teſtam deinde petit, quam ingreſſus vitam traducat, hinc ſimilis teſta contectis animantibus eſt: quapropter is in ancipiti eſſe, genúſque ſibi vendicare vtrumque videtur. Forma tamen (quod ſimpliciùs dixerim) ſimilis araneis eſt, niſi quòd partem capiti & pectori ſubditam ampliorem quàm aranei habeat. Cornicula duo rufa tenuia gerit, quibus oculi totidem ſubiacent, qui nunquam intrò recedant, vt cancrorum, ſed ſemper eminentes appareant. C Os ſub iis eſt, quod velut capillamentis quibuſdam pluribus circundatur. Iis pedes ſubiuncti duo bifurces, quibus cibum ori admoueat. Bini item vtrique adhærent lateri, & tertius paruus. Thoracis pars inferior mollis tota eſt, diſſectóque ſinu pallidum intus cernitur. Meatus ab ore ad ventrem pergit. Foramen excrementi perſpici nullum poteſt. Pedes ac thorax duritiem præ ſe ferunt, ſed minùs quàm cancri. Nexu nullo teſtis adhæret, purpurarum modo, & buccinarum, ſed abſolutus liberque vagatur. Oblongior eſt, qui turbinem ſubit, quàm qui neritem, quem naticem interpretamur. Genus enim diuerſum eſt, quod in natice degit, cætera quidem non abſimile: ſed dextrum D biſurculatum pedem paruum habens, cùm læuum grandiuſculum habeat, & ingredi eodem ipſo grandiore potiſſimùm ſolet. Tale profectò genus, vel intra conchas, quarum adhæſio ſimilis cæteris eſt, reperitur: quod & ſquillam paruam appellat. Natex teſta læui, ampla, & rotunda, forma buccinis proxima eſt: papauere tamen non nigro, vt illa, ſed rubro: teſtæ adnexum corpus medium eius firmiter eſt. Paſcuntur hæc mari tranquillo, abſoluta ſaxis. At quoties flatus vrgent, cancelli hoſpites illi ſeſe in ſaxa recipiunt, atque latibulis tutantur. Natices ſaxis adhæreſcunt more patellarum, & muricum, ac cæterorum generis eiuſdem, nec niſi tegmine dimoto adhærent, quod velut operculum E ſibi poſſident. Vſum enim, quem biualuibus pars vtraque adminiſtrat, eundem altera exhibet turbinatis. Caro intus, quà oris habitus. Modus hic idem muricibus, purpuris, atque omnibus generis eiuſdem. Quibus verò ſiniſter pes grandior eſt, ij nunquam cum turbinatis hoſpitantur, ſed cum naticibus tantùm ineunt ſocietatem, vt dictum eſt. Sunt inter cochleas, quæ intra ſe beſtiolas habeant ſimiles gammaris puſillis, qui vel in flumine giguntur: ſed ea differentia, vt præmollem intra ſuam teſtam carunculam habeant. Forma qualeſnam ſint, ex diſſectionibus contemplare.

A ἡ δὲ τοῦ περιττώματος ἔξοδος, τοῖς μὲν ἄλλοις, ἐκ πλαγίου ἐστίν. ἔστι γὰρ πόρος ᾗ προΐεται ἔξω· ἡ γὰρ μήκων, ὥσπερ εἴρηται, περίττωμά ἐστιν ἅπασιν ἐν ὑμένι. ὃ δὲ καλούμενον ᾠὸν, οὐκ ἔχει πόρον ἐν οὐδενὶ, ἀλλ' αὐτῆς τῆς σαρκὸς ἐπανοιδεῖ. ἔστι δ' οὐκ ἐπὶ ταὐτὸν τῷ ἐντέρῳ, ἀλλὰ τὸ μὲν ᾠὸν, ἐν τοῖς δεξιοῖς, τὸ δ', ἐν τοῖς ἀριστεροῖς. τοῖς μὲν οὖν ἄλλοις τοιαύτη ἔξοδος τῆς περιττώσεως· τῇ δ' ἀγρίᾳ λεπάδι, ἣν τινες καλοῦσι θαλάττιον οὖς, ὑποκάτω τοῦ ὀστράκου ἡ περίττωσις ἐξέρχεται· τέτρηται γὰρ τὸ ὄστρακον. φανερὰ δὲ καὶ ἡ κοιλία μετὰ τὸ στόμα οὖσα ἐν ταύτῃ, καὶ τὰ ᾠοειδῆ. πάντα δὲ ταῦτα τίνα τρόπον τῇ θέσει ἔχει, ἐκ τῶν ἀνατομῶν θεωρείσθω. B ὁ δὲ καλούμενος καρκίνιον, τρόπον τινὰ κοινόν ἐστι τῶν τε μαλακοστράκων, καὶ τῶν ὀστρακοδέρμων. αὐτὸ μὲν γὰρ, τὴν φύσιν ὅμοιον τοῖς καραβοειδέσι, καὶ γίνεται αὐτὸ καθ' ἑαυτό· τῷ δ' εἰσδύεσθαι καὶ ζῆν ἐν ὀστράκῳ, ὅμοιον τοῖς ὀστρακοδέρμοις· ὥστε διὰ ταῦτα ἔοικεν ἐπαμφοτερίζειν. τὴν δὲ μορφὴν, ὡς μὲν ἁπλῶς εἰπεῖν, ὅμοιόν ἐστι * τοῖς ἀράχναις· πλὴν τὸ κάτω τῆς κεφαλῆς καὶ τοῦ θώρακος, μεῖζον ἔχει ἐκείνου. ἔχει δὲ κεράτια δύο λεπτὰ πυῤῥὰ, καὶ ὀφθαλμοὺς ὑποκάτω τούτων δύο μακροὺς, οὐκ εἰσδυομένους, οὐδὲ * κατακλιδομένους, ὥσπερ οἱ τῶν καρκίνων, ἀλλ' ὀρθούς. ὑποκάτω δὲ τούτων τὸ στόμα, καὶ περὶ αὐτὸ καθαπερεὶ τριχώδη, ἄττα πλείω. τούτων δ' ἐχομένους δύο πόδας δικρόους, οἷς προσάγεται, C καὶ ἄλλους ἐφ' ἑκάτερα, δύο, καὶ τρίτην μικρόν. τὸ δὲ κάτω τοῦ θώρακος, μαλακὸν ἅπαν ἐστὶ, καὶ διοιγόμενον, ὠχρὸν ἔνδοθεν. ἀπὸ δὲ τοῦ στόματος πόρος εἷς ἄχρι τῆς κοιλίας. τῆς δὲ περιττώσεως, οὐ δῆλος ὁ πόρος, οἱ δὲ πόδες καὶ ὁ θώραξ, σκληροὶ μὲν, ἧττον δὲ ἢ τῶν καρκίνων. πρόσφυσιν δ' οὐκ ἔχει πρὸς τὰ ὄστρακα, ὥσπερ αἱ πορφύραι καὶ οἱ κήρυκες, ἀλλ' εὐαπόλυτόν ἐστι. προμηκέστερα δέ ἐστι τὰ ἐν τοῖς στρόμβοις τῶν ἐν τοῖς νηρείταις. ἕτερον δὲ γένος ἐστὶ τὸ τῶν νηρειτῶν, τὰ μὲν ἄλλα, παραπλήσιον· τῶν δὲ δικρόων ποδῶν, τὸν μὲν δεξιὸν, ἔχει μικρὸν, τὸν δ' ἀριστερὸν μέγαν, καὶ ποιεῖται τὴν βάδισιν μᾶλλον ἐπὶ τούτῳ. λαμβάνεται δὲ καὶ ἐν D ταῖς κόγχαις τοιοῦτον· ὧν ἐστὶν ἡ πρόσφυσις παραπλησία καὶ ἐν τοῖς ἄλλοις. τοῦτον δὲ καλοῦσι σκύλλαρον. ὁ δὲ νηρείτης, τὸ μὲν ὄστρακον ἔχει λεῖον καὶ μέγα, καὶ στρογγύλον, τὴν δὲ μορφὴν παραπλησίαν τοῖς κήρυξι· πλὴν οὐχ ὥσπερ ἐκεῖνοι τὴν μήκωνα μέλαιναν, ἀλλ' ἐρυθράν. προσπέφυκε δὲ νεανικῶς κατὰ τὸ μέσον. ἐν μὲν οὖν ταῖς εὐδίαις, ἀπολυόμενα νέμεται ταῦτα· πνευμάτων δὲ ὄντων, τὰ μὲν καρκίνια, ἡσυχάζει πρὸς τοῖς λίθοις· οἱ δὲ νηρεῖται, προσέχονται μὲν, καθάπερ αἱ λεπάδες, καὶ αἱ ἀποῤῥαΐδες, καὶ πᾶν τὸ τοιοῦτο γένος· προσφύονται δὲ ταῖς πέτραις, ὅταν ἀποκλίνωσι τὸ ἐπικάλυμμα. τοῦτο γὰρ ἔοικεν εἶναι ὥσ- E περ πῶμα. ὃ γὰρ τοῖς διθύροις ἄμφω, τοῦτο τοῖς στρομβώδεσι τὸ ἕτερον μέρος. τὸ δ' ἐντὸς, σαρκῶδές ἐστι, καὶ ἐν τούτῳ τὸ στόμα. τὸν αὐτὸν δὲ τρόπον ἔχει ταῖς ἀποῤῥαΐσι καὶ ταῖς πορφύραις, καὶ πᾶσι τοῖς τοιούτοις. ὅσα δ' ἔχει μείζω τὸν ἀριστερὸν πόδα, ταῦτα ἐν μὲν τοῖς στρόμβοις οὐκ ἐγγίνεται, ἐν δὲ τοῖς νηρείταις ἐγγίνεται. * εἰσὶ δέ τινες κόχλοι, οἳ ἔχουσιν ἐν αὑτοῖς ὅμοια ζῷα τοῖς ἀστακοῖς τοῖς μικροῖς, οἳ γίνονται καὶ ἐν τοῖς ποταμοῖς. διαφέρουσι δ' αὐτῶν τῷ μαλακὸν ἔχειν τὸ ἔσω τοῦ ὀστράκου. τὴν δὲ ἰδέαν οἷοί εἰσιν, ἐκ τῶν ἀνατομῶν θεωρείσθωσαν.

* γρ. ταῖς ἀρ.

* Fortè κατακλινομένους, Sylb.

* γρ. γίνεται

A

ΚΕΦΑΛ. έ.

Περὶ τῶν ἐχίνων.

Οἱ δ' ἐχῖνοι τὸ μὲν σαρκῶδες οὐκ ἔχουσιν, ἀλλ' ἴδιον αὐτῶν τοῦτό ἐστιν. ἐστέρηνται γὰρ πάντες, καὶ οὐκ ἔχουσι σάρκα ἐντὸς οὐθεμίαν· τὰ δὲ μέλανα, πάντες. ἔστι δὲ πλείω ἐχίνων γένη. ἓν μὲν, τὸ ἐσθιόμενον. τοῦτο δ' ἐστὶν ἐν ᾧ τὰ καλούμενα ᾠὰ μεγάλα γίνεται, καὶ ἐδώδιμα, ὁμοίως ἐν μείζοσι καὶ ἐλάττοσι. καὶ γὰρ εὐθὺς, καὶ μικροὶ ὄντες, ἔχουσι ταῦτα. ἄλλα δὲ δύο γένη, τό τε τῶν σπατάγγων, καὶ τὸ B τῶν καλουμένων βρύσσων. γίνονται δὲ οὗτοι πελάγιοι, καὶ σπάνιοι. ἔτι αἱ ἐχινομῆτραι καλούμεναι, μεγέθει πάντων μέγισται. πρὸς δὲ τούτοις ἄλλο γένος μικρὸν ἀκάνθας ἔχον μεγάλας καὶ σκληράς· γίνεται δὲ ἐκ τῆς θαλάττης ἐν πολλαῖς ὀργυιαῖς· ᾧ χρῶνταί πρὸς τὰς στραγγουρίας τινές. περὶ δὲ Τορώνην εἰσὶν ἐχῖνοι λευκοὶ θαλάττιοι καὶ τὰ ὄστρακα καὶ τὰς ἀκάνθας καὶ τὰ ᾠὰ, μείζους δὲ τῶν ἄλλων εἰς μῆκος· ἡ δὲ ἄκανθα οὐ μεγάλη, οὐδὲ ἰσχυρὰ, ἀλλὰ μαλακωτέρα· τὰ δὲ μέλανα τὰ ἀπὸ τοῦ στόματος, πλείω, καὶ πρὸς C μὲν τὸν ἔξω πόρον, συνάπτοντα, πρὸς ἑαυτὰ δὲ, ἀσύναπτα· τούτοις δὲ ὥσπερ διειλημμένος ἐστί. κινοῦνται δὲ μάλιστα καὶ πλειστάκις οἱ ἐδώδιμοι αὐτῶν. καὶ σημεῖον δὲ τι ἀεὶ ἔχουσιν ἐπὶ ταῖς ἀκάνθαις. ἔχουσι μὲν οὖν ἅπαντες ᾠὰ, ἀλλ' ἔνιοι πάμπαν μικρὰ, καὶ οὐκ ἐδώδιμα. συμβαίνει δὲ τὴν μὲν λεγομένην κεφαλὴν καὶ τὸ στόμα τὸν ἐχῖνον κάτω ἔχειν· ᾗ δ' ἀφίησι τὸ περίττωμα, ἄνω. ταὐτὸν δὲ τοῦτο συμβέβηκε τοῖς τε στρομβώδεσι πᾶσι, καὶ ταῖς λεπάσιν. ἡ γὰρ νομὴ, ἐκ τῶν κάτωθεν· ὥστε τὸ μὲν στόμα, πρὸς τὴν νομήν. τὸ δὲ περίττωμα, ἄνω πρὸς τοῖς πρανέσι τοῦ ὀστράκου. ἔχει δὲ ὁ ἐχῖνος ὀδόντας πέντε κοίλους D ἔνδοθεν· ἐν μέσῳ δὲ τούτων, σῶμα σαρκοειδὲς, ἀντὶ γλώττης. τούτου δ' ἔχεται ὁ στόμαχος· εἶτα ἡ κοιλία, εἰς πέντε μέρη διῃρημένη, πλήρης περιττώματος. συνέχουσι δὲ πάντες οἱ κόλποι αὐτῆς εἰς ἓν πρὸς τὴν ἔξοδον τῆς περιττώσεως, ᾗ τετρύπηται τὸ ὄστρακον. ὑπὸ δὲ τὴν κοιλίαν ἐν ἄλλῳ ὑμένι τὰ καλούμενα ᾠά ἐστιν, ἴσα τὸν ἀριθμὸν ὄντα ἐν πᾶσι. πέντε γάρ ἐστι καὶ περιττά. ἄνω δὲ τὰ μέλανα. ἀπὸ δὲ τῆς ἀρχῆς τῶν ὀδόντων ἤρτηται ἅ ἐστι πικρὰ, καὶ οὐκ ἐδώδιμα. ἐν πολλοῖς δὲ τῶν ζῴων τὸ τοιοῦτόν E ἐστιν, ἢ τὸ ἀνάλογον· καὶ γὰρ ἐν ταῖς χελώναις, καὶ ἐν φρύναις, καὶ ἐν βατράχοις, καὶ ἐν τοῖς στρομβώδεσι, καὶ τοῖς μαλακίοις· ἀλλὰ τῷ χρώματι διαφέρει, καὶ ἄβρωτά ἐστι τὰ τοιαῦτα, ἢ πάμπαν, ἢ μᾶλλον. κατὰ μὲν οὖν τὴν ἀρχὴν καὶ τελευτὴν συνεχὲς τὸ σῶμα τοῦ ἐχίνου ἐστί. κατὰ δὲ τὴν ἐπιφάνειαν, οὐ συνεχὲς, ἀλλ' ὅμοιον λαμπτῆρι μὴ ἔχοντι τὸ κύκλῳ δέρμα. ταῖς δ' ἀκάνθαις ὁ ἐχῖνος χρῆται ὡς ποσί. ταύταις γὰρ ἀπερειδόμενος καὶ κινούμενος, μεταβάλλει τὸν τόπον.

CAPVT V.

De Echinorum genere.

Echinis caro negata eſt, idque ipſum habent peculiare, vt nullam intus carnem contineant. Nigra quædam in omnibus vice carnis ſpectamus. Genera echinorum plurima. Primum, quod cibo idoneum eſt, in quo quæ oua appellant, magna eſculentáque conſiſtunt, pariter in maiore corpore & minore: nam nouelli adhuc paruique pleniuſculi illis conſtant. Secundum, ac tertium, ſpatagi, & briſſi, quæ genera pelagia ſunt,raráque B inuentu. Ad hæc, quæ echinometra appellatur, quaſi matrem aut matricem dixeris echinorum: quæ quidem omnes magnitudine excedit. Genus item aliud eſt minutum, ſpinis longis prædurífque, gigni in alto gurgite ſolitum, quo nonnulli ad deſtillationes vrinæ medicamento vtuntur. Circa Toronem echini naſcuntur candidi & teſta, & ſpina, & ouo: augeri forma productiore quam cæteri ſoliti. Spina iis parua, nec rigida, ſed mollior. Nigra autem illa ori applicata, plura, & ad foramen exterius coeuntia habentur, ſed disiuncta inter ſeſe, quibus quaſi interuentu liminum diſcriminantur. Mouentur C agiliùs & frequentiùs, qui ſunt cibo idonei: cuius rei argumentum, quòd ſemper aliquid algæ ſuis ſpinis implexum gerunt. Sunt ergo omnibus oua, ſed nonnullis exigua, nec cibo apta. Euenit autem, vt quod caput appellant, & os verſum in terram ſit. Quod verò ad excrementi exitum deputatum eſt, id ſuprà habeatur. Quod idem omnibus turbinatis patelliſque euenit: paſtus enim de imis petatur neceſſe eſt. Vnde fit vt os inuerſum ad paſtum ſit, excementum verò ſuperiùs parte prona teſtæ contineatur. Dentes quini echinis omnibus ſunt, caui intrinſecus: inter quos caruncula quædam interiacens linguæ officio fungitur, mox iungitur gula, deinde venter in partes D quinque diſtinctus, plenus excrementi: cuius meatus omnes in exitu excrementi coeunt, qua teſta forata eſt. Ventri autem ſubdita ſunt, quæ oua appellant, membrana obducta diuerſa, eodem in omnibus impari quinario numero: quorum quod nigricat, parti creditum eſt ſuperiori, ex dentium origine pendens, amarum, nec eſculentum, quale in multis ineſſe animaduertimus, aut certè eius proportionale. Nam & in teſtudine, & in rubeta, & in rana, atque etiam in turbinato genere, & in molli: ſed colore diuerſo, & aut omnino inguſtabili, aut magis ab vſu cibario alieno. Corpus echinis priore atque nouiſſima parte ſpiſſum, & E continens: cætera verò non continuum, ſed ſimile laternæ, cui non obducta membrana eſt. Spinis ſuis echini vtuntur perinde ac pedibus: iis enim nitibundi mouentur, ſedémque permutant.

A

CAPVT VI.

De vertibulis, & vrticis, déque eorum animantium natura.

QVæ autem vertibula, ſiue callos ſpeciali nomine à tegminis qualitate appellamus, naturam inter hæc genera peculiarem ſortiri notum eſt: iis enim ſolis corpus totum tegumento includitur, cuius durities inter teſtam & corium eſt: quamobrem modo præduri bubuli tergoris ſecatur. Adhæret ergo id genus ſaxis ſua teſta, duóque ſepoſita inter ſe foramina exigua admodum habet, & viſum vix patientia, quibus humorem accipit, & reddit. Excrementum enim nullum in B eo ſpectatur, quale in cæteris oſtreis, vel echinæum, vel quod appellant papauer, continetur. Diſſectis, primùm membrana neruoſa, cruſta ambiente obtenta oſtenditur, qua vertibuli caro ipſa continetur, nulli è cæteris ſimilis, in omnibus tamen ſui generis eadem. Adhæret hæc vtroque ex latere membranæ circumdanti, & corio: & quà adhæret, arctius in partem vtramque eſt, videlicet quà tendit ad meatus ductos foras per cruſtam, quibus redditur, & accipitur cibus, & humor; quaſi alterum ſit os, alterum oſſium excrementis delegatum. Nec modus idem: ſed alterum craſſius, alterum tenuius eſt, cauúmque intus vtrinque, exiguo quodam interueniente continuo, humórque in altero cauo conſiſtere ſolitus eſt. C Pars verò alia, quæ vel inſtrumentalis, vel ſenſualis ſit, nulla omnino percipitur: neque excrementitium quicquam (vt dictum iam eſt) quo in cæteris more continetur. Color vertibulis, aut pallidus aut rubidus eſt. Vrtica etiam ſui generis cernitur: quippe quæ & adhæreat ſaxis, more nonnullorum intectorum teſta, & interdum ſaxis abiuncta vagetur. Nulla huic teſta, ſed corpus omni ex parte carnem præ ſe fert. Sentit & manum admotam corripit, adhæreſcitque perinde ac polypus, ſuis brachiis, ita vt caro intumeſcat. Os medio in corpore continet, & de ſaxo quaſi de teſta viuit, & prænatantes piſciculos excipit, retinétque, ſicut manu admota hominis agi dictum eſt, deuorát- D que in hunc modum quæcunque nacta eſt eſculenta. Abſolui etiam ſaxis genus quoddam vrticæ (vt modò dixi) notatum eſt, quod & echinos, & pectunculos, in quos offenderit, corrodit. Excrementum nulla in vrtica eſſe videtur, ſed hac re ſimilis ſtirpibus eſt. Duplex genus percipitur vrticarum: alterum corpore paruo, quod cibo aptius eſt: alterum maiuſculo, duróque, quale circa Euboiæ Chalcidem gigni ſcimus. Sunt omnes hybernis menſibus carne conſtante, atque rigidiuſcula: quamobrem per id tempus capiuntur, cibóque idoneæ ſunt. At æſtate rareſcunt, & reſoluuntur: præmadent enim, & marcent, vt, E ſi tetigeris, facilè diſcerpantur, atque diſpereant. Denique nulla tantiſper euelli integra poteſt, ac æſtus impatientia ſaxa ſubire interiùs ſolent. Partes iam expoſui mollium, & vel cruſta, vel teſta intectorum, tam exteriores, quàm interiores.

ΚΕΦΑΛ. ϛʹ.

Περὶ τῶν τηθύων καὶ ἀκαλήφων.

Τὰ δὲ καλούμενα τήθυα, τούτων πάντων ἔχει τὴν φύσιν περιττοτάτην. κέκρυπται γὰρ αὐτῶν μόνον τὸ σῶμα ἐν τῷ ὀστράκῳ πᾶν· τὸ δὲ ὄστρακόν ἐστι μεταξὺ δέρματος καὶ ὀστράκου· διὸ καὶ τέμνεται ὥσπερ βύρσα σκληρά. προσπέφυκε μὲν οὖν ταῖς πέτραις τῷ ὀστράκῳ. δύο δ᾽ ἔχει πόρους ἀπέχοντας ἀπ᾽ ἀλλήλων, πάμπαν μικρούς, καὶ οὐ ῥᾳδίους ἰδεῖν· ᾗ ἀφίησι τὸ ὑ- B γρὸν, καὶ δέχεται· περίττωμα γὰρ οὐδὲν ἔχει φανερὸν, ὥσπερ τῶν ἄλλων ὀστρέων, τὰ μὲν, ὥσπερ ἐχῖνος, τὰ δὲ, τὴν καλουμένην μήκωνα. διοιχθέντα δ᾽ ἔσωθεν, πρῶτον μὲν ὑμένα ἔχει νευρώδη περὶ τὸ σαρκῶδες· ἐν δὲ τούτῳ ἐστὶν αὐτὸ τὸ σαρκῶδες τοῦ τηθύου. οὐδενὶ δ᾽ ἐστὶν ὅμοιον τῶν ἄλλων· αὕτη μέντοι ἡ σὰρξ πᾶσιν ὁμοία. προσπέφυκε δὲ τοῦτο κατὰ δύο τόπους, τῷ ὑμένι, καὶ τῷ δέρματι ἐκ πλαγίου· καὶ ᾗ προσπέφυκε, ταύτῃ ἐστὶ στενώτερον ἐφ᾽ ἑκάτερα, εἰς τείνει πρὸς τοὺς πόρους, τοὺς ἔξω διὰ τοῦ ὀστράκου φέροντας, ᾗ ἀφίησι καὶ δέχεται τὴν τροφὴν καὶ τὸ ὑγρόν· ὡς ἂν εἰ τὸ μὲν, στόμα εἴη, τὸ δὲ, τῇ περιττώσει ἔξοδος. καὶ ἔστιν αὐτῶν τὸ μὲν, παχύτερον, τὸ δὲ, λε- C πτότερον. ἔσω δὲ κοῖλον ἐφ᾽ ἑκάτερα, καὶ διείργει μικρόν τι συνεχές. ἐν θατέρῳ δὲ τῶν κοίλων ἡ ὑγρότης ἐγγίνεται. ἄλλο δὲ οὐδὲν ἔχει μόριον, οὔτε ὀργανικὸν, οὔτε αἰσθητήριον, οὔτε, ὥσπερ ἐλέχθη πρότερον ἐν τοῖς ἄλλοις, τὸ περιττωματικόν. χρῶμα δὲ τοῦ τηθύου ἐστὶ τὸ μὲν, ὠχρόν· τὸ δ᾽, ἐρυθρόν. ἔστι δὲ καὶ τὸ τῶν * ἀκαλήφων γένος ἴδιον. προσπέφυκε μὲν γὰρ ταῖς πέτραις, ὥσπερ ἔνια τῶν ὀστρακοδέρμων· ἀπολύεται δ᾽ ἐνίοτε. οὐκ ἔχει δὲ ὄστρακον, ἀλλὰ σαρκῶδες τὸ σῶμα πᾶν ἐστιν αὐτῆς. αἰσθάνεται δὲ καὶ συναρπάζει προσφερομένης τῆς χειρὸς· καὶ προσέχεται, καθάπερ ὁ πολύπους ταῖς πλεκτάναις, οὕτως, ὥστε τὴν σάρκα ἐποιδεῖν. D ἔχει δὲ τὸ στόμα ἐν μέσῳ, καὶ ζῇ ἀπὸ τῆς πέτρας, ὥσπερ ἀπ᾽ ὀστρέου. καὶ ἄν τι προσπέσῃ τῶν μικρῶν ἰχθυδίων, ἀντέχεται ὥσπερ τῆς χειρὸς· οὕτω κἂν προσπέσῃ αὐτῇ ἐδώδιμον, κατεσθίει. καὶ ἀπολύεται δὲ γένος τι αὐτῶν· ὃ, ἄν τι προσπέσῃ, κατεσθίει καὶ ἐχίνους καὶ κτένας. περίττωμα δὲ οὐδὲν παντελῶς φαίνεται ἔχουσα, ἀλλ᾽ ὁμοία κατὰ τοῦτο τοῖς φυτοῖς. ἔστι δὲ γένη τῶν ἀκαλήφων δύο· αἱ μὲν, ἐλάττους, καὶ ἐδώδιμοι μᾶλλον· αἱ δὲ, μεγάλαι καὶ σκληραὶ, οἷαι γίνονται καὶ περὶ Χαλκίδα. τοῦ μὲν οὖν χειμῶνος τὴν σάρκα στιφρὰν E ἔχουσι· (διὸ καὶ θηρεύονται, καὶ ἐδώδιμοί εἰσι) τοῦ δὲ θέρους, ἀπόλλυνται. γίνονται γὰρ μαδαραί· καὶ ἄν τις θίγῃ, διασπῶνται ταχέως, καὶ ὅλως οὐ δύνανται ἀφαιρεῖσθαι· πονοῦσαί τε ταῖς ἀλέαις, εἰς τὰς πέτρας ἐνδύονται μᾶλλον. περὶ μὲν οὖν τῶν μαλακίων καὶ μαλακοστράκων καὶ ὀστρακοδέρμων, ὅσα ἔχουσιν ἐκτὸς μέρη, καὶ ὅσα ἐντὸς, εἴρηται.

* γρ. ἀκαλύφαι

A

ΚΕΦΑΛ. ζʹ.

Περὶ τῶν ἐντόμων.

ΠΕρὶ δὲ τῶν ἐντόμων λεκτέον τὸν αὐτὸν τρόπον. ἔστι γὰρ τὸ γένος τοῦτο πολλὰ ἔχον εἴδη ἐν αὐτῷ. καὶ ἐνίοις πρὸς ἄλληλα συγγενικοῖς οὖσιν, οὐκ ἐπέζευκται κοινὸν ὄνομα οὐδέν, οἷον ἐπὶ μελίττῃ καὶ ἀνθρήνῃ καὶ σφηκί, καὶ τοῖς τοιούτοις· καὶ πάλιν ὅσα τὸ πτερὸν ἔχει ἐν κολεῷ. οἷον μηλολόνθη καὶ κάνθαρος, καὶ κανθαρὶς, καὶ ὅσα τοιαῦτα. πάντων μὲν οὖν κοινὰ μέρη ἐστὶ τρία, κεφαλή τε, καὶ τὸ περὶ τὴν κοιλίαν κύτος· καὶ τρίτον, τὸ μεταξὺ τούτων· οἷον τοῖς B ἄλλοις τὸ στῆθος καὶ τὸ νῶτόν ἐστι. τοῦτο δὲ τοῖς μὲν πολλοῖς ἕν ἐστιν· ὅσα δὲ μακρὰ καὶ πολύποδα, σχεδὸν, ἴσα ταῖς ἐντομαῖς ἔχει τὰ μεταξύ. πάντα δ' ἔχει διαιρούμενα ζωὴν τὰ ἔντομα· πλὴν ἃ ἢ λίαν κατέψυκται, ἢ διὰ μικρότητα ταχὺ καταψύχεται· ἐπεὶ καὶ οἱ σφῆκες διαιρεθέντες ζῶσι. μετὰ μὲν οὖν τοῦ μέσου, καὶ ἡ κεφαλὴ καὶ ἡ κοιλία ζῇ. ἄνευ δὲ τούτου ἡ κεφαλὴ οὐ ζῇ. ὅσα δὲ μακρὰ καὶ πολύποδά ἐστι, πολὺν χρόνον ζῇ διαιρούμενα, καὶ κινεῖται τὸ ἀποτμηθὲν ἐπ' ἀμφότερα τὰ ἔσχατα. καὶ γὰρ ἐπὶ τὴν τομὴν πορεύεται καὶ ἐπὶ τὴν οὐράν, οἷον ἡ καλουμένη σκολόπενδρα. ἔχει δὲ ὀφθαλμοὺς μὲν ἅπαντα, ἄλλο C δὲ αἰσθητήριον οὐδὲν φανερόν· πλὴν ἔνια γλῶτταν ἣν καὶ τὰ ὀστρακόδερμα ἔχει πάντα ᾗ καὶ γεύεται, καὶ εἰς αὑτὰ τὴν τροφὴν ἀνασπᾷ. τοῦτο δὲ, τοῖς μὲν μαλακόν· τοῖς δ', ἔχει ἰσχὺν πολλήν, ὥσπερ ταῖς πορφύραις. καὶ οἱ μύωπες, καὶ οἱ οἶστροι ἰσχυρὸν τοῦτο ἔχουσι, καὶ τἄλλα σχεδὸν τὰ πλεῖστα. ἐν ἅπασι γὰρ τοῖς μὴ ὀπισθοκέντροις τοῦτο ὥσπερ ὅπλον ἔχει ἕκαστον. ὅσα δ' ἔχει τοῦτο, ὀδόντας οὐκ ἔχει, ἔξω ὀλίγων τινῶν. ἐπεὶ καὶ αἱ μυῖαι τούτῳ θιγγάνουσαι αἱματίζουσι, καὶ οἱ κώνωπες τούτῳ κεντοῦσιν. ἔχουσι δ' ἔνια τῶν ἐντόμων καὶ κέντρα. τὸ δὲ κέντρον τὰ μὲν ἔχει ἐν αὑτοῖς, οἷον αἱ μέλιτται καὶ οἱ σφῆκες· τὰ δ', ἐκτός, οἷον σκορπίος· καὶ D μόνον δὴ τῶν ἐντόμων τοῦτο μακρόκεντρόν ἐστιν. ἔτι δὲ χηλὰς ἔχει τοῦτό τε, καὶ τὸ ἐν τοῖς βιβλίοις γινόμενον σκορπιῶδες. τὰ δὲ πτηνὰ αὐτῶν πρὸς τοῖς ἄλλοις μορίοις, καὶ πτερὰ ἔχει. ἔστι δὲ τὰ μὲν δίπτερα αὐτῶν, ὥσπερ αἱ μυῖαι· τὰ δέ, τετράπτερα, ὥσπερ αἱ μέλιτται. οὐδὲν δ' ἐστὶ δίπτερον ὀπισθόκεντρον. ἔτι δὲ τὰ μὲν ἔχει τῶν πτηνῶν ἔλυτρον τοῖς πτεροῖς, ὥσπερ ἡ μηλολόνθη· τὰ δέ, ἀνέλυτρά ἐστιν, ὥσπερ ἡ μέλιττα. ἀνορροπύγιος δὲ πάντων αὐτῶν ἡ πτῆσίς ἐστι, καὶ τὸ πτερὸν, οὐκ ἔχει καυλὸν οὐδὲ σχίσιν. ἔτι κεραίας πρὸ τῶν ὀμμάτων ἔνια, οἷον αἵ τε * ψυχαὶ, καὶ οἱ κάραβοι. ὅσα δὲ πηδητικὰ αὐτῶν ἐστι, τού- E των τὰ μέν, ἔχει τὰ ὄπισθεν σκέλη μείζω· τὰ δέ, πηδάλια καμπτόμενα εἰς τοὔπισθεν, ὥσπερ τὰ τῶν τετραπόδων σκέλη. πάντα δ' ἔχει τὰ πρανῆ, πρὸς τὰ ὕπτια, διαφορὰς, ὥσπερ καὶ τἄλλα ζῷα. ἡ δὲ τοῦ σώματος σάρξ, οὔτε ὀστρακώδης ἐστίν, οὔτε οἷον τὸ ἐντὸς τῶν ὀστρακοδέρμων, οὔτε σαρκώδης, ἀλλὰ μεταξύ. διὸ καὶ οὔτε ἄκανθαν ἔχουσιν, οὔτε ὀστοῦν, οὔτε οἷον σηπίον, οὔτε κύκλῳ ὄστρακον. αὐτὸ γὰρ αὑτὸ τὸ σῶμα διὰ τὴν σκληρότητα σώζει, καὶ οὐ προσδεῖται ἑτέρου ἐρείσματος. δέρμα δ' ἔχουσι μέν, πάμπαν δὲ τοῦτο λεπτόν.

* Malim ψυχαί.

CAPVT VII.

De inſectis, eorúmque varietatibus, & natura.

NVnc de inſectis pari ratione tractandum eſt. Continet genus vel ſpecies plures: quarum nonnullis, quamuis cognatis, nomen nullum commune eſt inditum, vt api, crabroni, veſpæ, cæteriſque generis eiuſdem. Item quibus pennæ vagina incluſæ, continentur, vt gallerucæ, fulloni, pilulario, & reliquis generis eiuſdem. Omnium ergo partes communes tres illas haberi conſtat, caput, aluum, & quod inter hæc ſitum eſt: quale in cæteris pectus dorſúmque habetur: vnum, id quod interiacet, magna ex parte eſt. Quæ tamen ſunt longa, & multipeda, iis ferè totidem ſunt, quæ interiacent, quot inciſuræ. Inſecta diuulſa etiam viuere poſſunt omnia, exceptis iis quæ vel admodum frigeant, vel præ ſua exiguitate quàm primùm refrigerentur. Nam veſpis quoque diuulſis, non deeſt viuacitas. Viuit ergo cum pectore, tum caput, tum etiam aluus: at ſine eo caput auulſum viuere non poteſt. Diutiùs ea viuunt diuulſa, quibus corpus longum pedéſque multi: & pars, quæ abſciſſa eſt, in vtrumque ſe mouet extremum: nam & caput verſus ingreditur, & in caudam: vt in iis quas vocant centipedas, moueri videmus. Oculi in omnibus patent: ſed nulla ex cæteris partibus ſenſoriis manifeſta eſt, præterquam lingua in nonnullis, quæ vel teſta intectis omnibus data eſt, qua & guſtant, & cibum attrahunt. Hæc aliis mollis infirmáque eſt: aliis dura, & valida, vt purpuris, tabanis, aſilis, atque aliis plurimis. Omnia enim, quibus non in aluo aculeus eſt, linguam eiuſmodi velvti arma gerunt: nec dentes habent, quibus iunctum id eſt, exceptis quibuſdam paucis. Nam & muſcæ eo ipſo pertingentes, cruorem mouent: & culices eodem acriùs pungunt. Habent aculeos item pleráque inſectorum, vel intus conditos, vt apes, & veſpæ: vel extrà prominentes, vt ſcorpio: qui etiam vnus inter inſecta longo ſpiculo armatur. Is brachia quinque biſulcis dentata forcipibus habet. Atque etiam beſtiola, quæ in libris ſimilis ſcorpioni creatur. Quæ autem in eo genere volucrum ſortiuntur naturam, iis præter cætera membra pennæ adnexæ, aliis binæ, vt muſcis, aliis quaternæ, vt apibus. Nullis binæ, quibus in aluo aculeus. Item ex volucribus ipſis, alia pennas cruſta ſuperueniente, quaſi vagina incluſas gerunt, vt ſcarabei: alia detectas habent, vt apes. Nullis volatus regitur gubernaculo caudæ: & penna ipſa nullo caule conſtat, nulla ſciſſura diſcernitur. Ad hæc, antennæ nonnullis ante oculos prætenduntur, vt papilioni, & fulloni. Quæ verò ex iis ſaliunt, hæc vel crura poſteriora habent longiora, vel gubernaculis quibuſdam ſaltui accommodatis fulciuntur retrò curuatis, vt crura quadrupedum. Omnibus partes corporis pronæ differunt à ſupinis, ſicut vel in cæteris animantibus eſt. Quod autem pro carne in iis habetur, id nec teſtam imitatur, neque quod in teſtaceis genus carnis continetur: ſed mediam quandam inter hæc refert naturam: quamobrem his non ſpinam, non os, non aliquid ſepio ſimile, non teſtam ambientem natura dedit: ipſum enim corpus ſe ſua duritia tueri poteſt, & ſeruare: nec eſt quod aliunde muniri deſideret. Cute omnia circundantur, ſed admodum tenui.

Partes inſectorum exteriores has eſſe, atque in hunc modum ſe habere conſtat. Intra ſinum ab ore, inteſtinum pluribus directum, ac ſimplex vſque ad exitum fertur. paucis id eſt replicatum. Viſcus nullum in iis, nullum pingue, ſicut neque in cæteris quæ ſanguine carent. Ventrem etiam nonnulla habere aduertimus, à quo reliquum inteſtinum vel ſimplex vel replicatum proficiſcitur: vt locuſtas. Cicada inter hæc, & omnino in animalium genere vna ore caret: prolixum quiddam compactum indiuiſumque gerit, ſimile ei quod linguæ ſpeciem refert, in iis quibus aculeus in ore, eóque ipſo rorem haurit, alimentum vnum, & peculiare. Excrementum cicadis nullum in aluo reperitur. Plura earum ſunt genera, quæ magnitudinis modo differunt: atque etiam quod aliis corpus ſub tranſuerſo ſepto præcinctum diſtinguitur, membranámque liquidò refert: vt iis quas ab argutioſo ſono, achetas appellarunt: aliis non ita eſt, vt cicadaſtris. Sunt vel in mari nonnulla animalia effigie inſolenti, & ſui generis: quæ quoniam rara inuentu ſint, conſtitui in genus non decet. Iam enim piſcatores vidiſſe ſe retulerunt quædam trabunculis proxima, pullo colore, tereti figura, pari ex toto craſſamento. Item alia ſcutorum effigie, colore rubro, pinnulis crebris. Ad hæc alia, quæ genitale viri imitarentur, tum ſpecie, tum magnitudine, ſed pennis ſubnexis binis loco teſtium, eiſque veretile nomen inditum eſt: exceptúmque eſt aliquando genus tale hamorum frequentia vſitata. Partes animalium omnium interiores exterioréſque generatim, tum propriæ, tum communes, ita ſe habent.

A τὰ μὲν οὖν ἔξωθεν αὐτῶν μόρια, τοιαῦτα, καὶ τοῦτον ἔχει τὸν τρόπον. ἐντὸς δὲ τοῦ κύτους, μετὰ τὸ στόμα ἔντερόν ἐστι, τοῖς μὲν πλείστοις εὐθὺ, καὶ ἁπλοῦν μέχρι τῆς ἐξόδου ἐστὶν, ὀλίγοις δὲ ἑλιγμὸν ἔχει. σπλάγχνον δὲ οὐδὲν ἔχει τῶν τοιούτων, οὐδὲ πιμελὴν, ὥσπερ οὐδὲ ἄλλο τῶν ἀναίμων οὐδέν. ἔνια δὲ ἔχει καὶ κοιλίαν, καὶ ἀπὸ ταύτης τὸ λοιπὸν ἔντερον ἢ ἁπλοῦν, ἢ εἰλιγμένον, ὥσπερ αἱ ἀκρίδες. ὁ δὲ τέττιξ, μόνον τῶν τοιούτων, καὶ τῶν ἄλλων δὲ ζώων, στόμα οὐκ ἔχει, ἀλλ' ὥσπερ τοῖς ἐμπροσθοκέντροις τὸ γλωττοειδὲς, τοῦτο μακρὸν καὶ συμφυὲς, καὶ ἀδιάσχιστον, δι' οὗ τῇ δρόσῳ τρέφεται μόνον· ἐν δὲ τῇ κοιλίᾳ οὐκ ἴσχει περίττωμα. ἔστι B δὲ αὐτῶν πλείω εἴδη, καὶ διαφέρουσι μεγέθει καὶ μικρότητι, καὶ τῷ τοὺς μὲν καλουμένους ἀχέτας ὑπὸ τὸ ὑπόζωμα διῃρῆσθαι, καὶ ἔχειν ὑμένα φανερόν· τὰ δὲ τεττιγόνια, μὴ ἔχειν. ἔστι δὲ ἔνια ζῷα περιττὰ καὶ ἐν τῇ θαλάττῃ· ἃ διὰ τὸ σπάνια εἶναι, οὐκ ἔστι θεῖναι εἰς γένος. ἤδη γάρ τινες φασὶ τῶν ἐμπειρικῶν ἁλιέων,* οἱ μὲν, ἑωρακέναι ἐν τῇ θαλάττῃ ὅμοια δοκοῖς, μέλανα, στρογγύλα τε καὶ ἰσοπαχῆ· ἕτερα δὲ, ἀσπίσιν ὅμοια, τὸ μὲν χρῶμα ἐρυθρὰ, πτερύγια δὲ ἔχοντα πυκνά· ἄλλα δὲ, ὅμοια αἰδοίῳ ἀνδρὸς, τό, τε εἶδος καὶ τὸ μέγεθος· πλὴν ἀντὶ τῶν ὄρχεων πτέρυγας ἔχειν δύο· καὶ λα- C βέσθαι ποτὲ τοιοῦτον τοῦ πολυαγκίστρου τῷ ἄκρῳ.

τὰ μὲν οὖν μέρη τῶν ζώων πάντων τά τ' ἐντὸς καὶ τὰ ἐκτὸς περὶ ἕκαστον γένος καὶ ἴδια καὶ κοινὰ τοῦτον ἔχει τὸν τρόπον.

* Gaza, τινὲς μὲν, ſicut ſequitur ἕτερα δὲ, & ἄλλα. malim tamen legi οἱ μὲν & ἕτερα δὲ, & ἄλλα δὲ. ſanè ita melius.

CAPVT VIII.

Quibus animalibus inſit ſentiendi vis.

NVnc de ſenſibus diſſerendum eſt. Non enim pariter in omnibus vis ineſt ſentiendi: ſed aliis ſenſus omnes, aliis pauciores dedit natura. Sunt ſanè ſenſus, qui plurimi habeantur, & ſupra quos nullum adeſſe alium generis ſui nouerimus, numero quinque, viſus, auditus, olfactus, guſtus, tactus. Homo igitur, & quæcunque terreſtrium animal generant, atque etiam quæ & ſanguinem habent, & animal pariunt, omnia hos omnes habere ſenſus videmus, niſi quid læſum laceſſitúmque ſit: quale genus talparum, cui viſus deeſt: non enim oculos in aperto id habet, cute tamen detracta, quæ craſſiuſcula obtenta ſedem luminum opacat, oculi intus laceſſiti imperfectique viſuntur: ſed ità, vt partes eaſdem habeant omnes, quibus oculi integri conſtant. Habent enim nigricantem illum orbiculum, & quod intra eum continetur, quam vocant pupillam, atque etiam portionis albidæ ambitionem: ſed non tam liquidò quàm oculi, conſpecti & eminentes. Nec in partem exteriorem apparere hæc poſſunt, propter cutis obductæ corpulentiam, vtpote cùm natura inter generandum lædatur, atque ita opus inchoatum relinquatur. Pertinent enim à cerebro, quà cum neruo coniungitur, meatus duo neruoſi validi ad ipſas oculorum ſedes, qui in dentes ſuperiores finiunt. Cætera igitur & colores, & ſonos ſentiunt, atque etiam odores ſaporéſque. Quintum autem ſenſuum, quem tactum appellamus, omnia habent animalium genera. Ergo in nonnullis vel ipſæ ſenſoriæ partes latiſſimè patet, ac præcipuè videndi.

ΚΕΦΑΛ. η'.

Τίνας τῶν αἰσθήσεων ἔχει ἕκαστον τῶν ζώων.

ΠΕρὶ δὲ τῶν αἰσθήσεων νῦν λεκτέον. οὐ γὰρ ὁμοίως πᾶσιν ὑπάρχουσιν, ἀλλὰ τοῖς μὲν πᾶσαι, τοῖς δὲ ἐλάττους. εἰσὶ δὲ πλεῖσται καὶ παρ' ἃς οὐδεμία φαίνεται ἴδιος ἑτέρα, πέντε τὸν ἀριθμὸν, ὄψις, ἀκοὴ, ὄσφρησις, D γεῦσις, ἁφή. ἄνθρωπος μὲν οὖν, καὶ τὰ ζῳοτόκα καὶ πεζὰ, καὶ ἔτι πρὸς τούτοις καὶ ὅσα ἔναιμα καὶ ζῳοτόκα, πάντα φαίνονται ἔχοντα ταύτας πάσας, πλὴν εἴ τι πεπήρωται γένος, οἷον τὸ τῶν ἀσπαλάκων. τοῦτο μὲν γὰρ ὄψιν οὐκ ἔχει· ὀφθαλμοὺς μὲν γὰρ ἐν τῷ φανερῷ οὐκ ἔχει. ἀφαιρεθέντος δὲ τοῦ δέρματος ὄντος παχέος ἀπὸ τῆς κεφαλῆς κατὰ τὴν χώραν τὴν ἔξωθεν τῶν ὀμμάτων, ἔσωθεν εἰσὶν οἱ ὀφθαλμοὶ διεφθαρμένοι, πάντα ἔχοντες ταὐτὰ τὰ μέρη τοῖς ἀληθινοῖς. ἔχουσι γὰρ τό, τε μέλαν, καὶ τὸ ἐντὸς τοῦ μέλανος τὴν καλουμένην κόρην, καὶ τὸ κυκλώπιον· ἐλάττω μέν τοι ταῦτα τῶν φανερῶν ὀφθαλμῶν· εἰς δὲ τὸ ἔξω τούτων οὐδὲν σημαίνει, διὰ E τὸ τοῦ δέρματος πάχος, ὡς ἐν τῇ γενέσει πηρουμένης τῆς φύσεως. εἰσὶ γὰρ ἀπὸ τοῦ ἐγκεφάλου, ᾗ συνάπτει τὸ νεῦρον, δύο πόροι νευρώδεις καὶ ἰσχυροὶ, παρ' αὐτὰς τείνοντες τὰς ἕδρας τῶν ὀφθαλμῶν, τελευτῶντες δὲ εἰς τοὺς ἄνω χαυλιόδοντας. τὰ δὲ ἄλλα καὶ τῶν χρωμάτων αἴσθησιν ἔχει, καὶ τῶν ψόφων· ἔτι δὲ, καὶ ὀσμῆς, καὶ χυμῶν· τὴν δὲ πέμπτην αἴσθησιν, τὴν ἁφὴν καλουμένην, καὶ τὰ ἄλλα πάντα ἔχει ζῷα. ἐν μὲν οὖν ἐνίοις καὶ τὰ αἰσθητήρια φανερώτατά εἰσι, τὰ μὲν τῶν ὀμμάτων, καὶ μᾶλλον.

διωρισμένον γὰρ ἔχει τὸν τόπον τῶν ὀφθαλμῶν, καὶ τῆς ἀκοῆς. ἔνια μὲν γὰρ, ὦτα ἔχει· ἔνια δὲ, τοὺς πόρους φανερούς. ὁμοίως δὲ καὶ περὶ ὀσφρήσεως. τὰ μὲν γὰρ, ἔχει μυκτῆρας· τὰ δὲ, τοὺς πόρους τοὺς τῆς ὀσφρήσεως, οἷον τὸ τῶν ὀρνίθων γένος. ὁμοίως δὲ καὶ τὸ τῶν χυμῶν αἰσθητήριον τὴν γλῶτταν ἔχουσιν. ἐν δὲ τοῖς ἐνύδροις, καλουμένοις δὲ ἰχθύσι, τὸ μὲν τῶν χυμῶν αἰσθητήριον, τὴν γλῶτταν, ἔχουσι μὲν, ἔχουσι δ' ἀμυδρῶς. ὀστώδη τε γὰρ, καὶ οὐκ ἀπολελυμένην· ἀλλ' ἐνίοις τῶν ἰχθύων ὁ οὐρανὸς ἐστὶ σαρκώδης, οἷον τῶν ποταμίων ἐν τοῖς κυπρίνοις· ὥστε τοῖς μὴ σκοπουμένοις ἀκριβῶς, δοκεῖν ταύτην εἶναι γλῶτταν. ὅτι δὲ αἰσθάνονται γευόμενα, φανερόν· ἰδίοις τε γὰρ πολλὰ χαίρει χυμοῖς, καὶ τὸ τῆς ἀμίας λαμβάνουσι μάλιστα δέλεαρ, καὶ τὸ πῖον τῶν ἰχθύων ὡς χαίροντες τῇ γεύσει, καὶ ἐν τῇ ἐδωδῇ τοῖς τοιούτοις δελέασι. τῆς δ' ἀκοῆς καὶ τῆς ὀσφρήσεως, οὐδὲν ἔχουσι φανερὸν αἰσθητήριον. ὃ γὰρ ἄν τισιν εἶναι δόξειε κατὰ τοὺς τόπους τῶν μυκτήρων, οὐδὲν περαίνει πρὸς τὸν ἐγκέφαλον. ἀλλὰ τὰ μὲν, τυφλά· τὰ δὲ, φέρει μέχρι τῶν βραγχίων. ὅτι δὲ καὶ ἀκούουσι καὶ ὀσφραίνονται, φανερόν. τούς τε γὰρ ψόφους φεύγοντα φαίνεται τοὺς μεγάλους, οἷον τὰς εἰρεσίας τῶν τριήρων ὥστε λαμβάνεσθαι ῥᾳδίως ἐν ταῖς θαλάμαις. καὶ γὰρ ἂν μικρὸς ᾖ ὁ ἔξω ψόφος, ὅμως τοῖς ἐν τῷ ὑγρῷ τὴν ἀκοὴν ἔχουσι, χαλεπὸς καὶ μέγας καὶ βαρὺς φαίνεται πᾶσιν· ὃ συμβαίνει καὶ ἐπὶ τῆς τῶν δελφίνων θήρας. ὅταν γὰρ ἀθρόον περικυκλώσωσι τοῖς μονοξύλοις, ψοφοῦντες ἐξ αὐτῶν ἐν τῇ θαλάττῃ, ἀθρόους ποιοῦσιν ἐξοκέλλειν φεύγοντας εἰς τὴν γῆν, καὶ λαμβάνουσιν ὑπὸ τοῦ ψόφου καρηβαροῦντας. καίτοι οὐδ' οἱ δελφῖνες τῆς ἀκοῆς οὐδὲν φανερὸν ἔχουσιν αἰσθητήριον. ἔτι δ' ἐν ταῖς θήραις τῶν ἰχθύων, ὅτι μάλιστα εὐλαβοῦνται ψόφον ποιεῖν ἢ κώπης ἢ δικτύων, οἱ περὶ τὴν θήραν ταύτην ὄντες· ἀλλ' ὅταν κατανοήσωσιν ἔν τινι τόπῳ πολλοὺς ἀθρόους ὄντας, ἐκ τοσούτου τόπου τεκμαιρόμενοι καθιᾶσι τὰ δίκτυα, ὅπως μήτε κώπης, μήτε ῥύμης τῆς ἁλιάδος ἀφίκηται πρὸς τὸν τόπον ἐκεῖνον ὁ ψόφος· παραγγέλλουσί τε πᾶσι τοῖς ναύταις, ὅτι μάλιστα σιγῇ πλεῖν, μέχρι περ ἂν συγκυκλώσωνται. ἐνίοτε δ', ὅταν βούλωνται συνδραμεῖν, ταὐτὸν ποιοῦσιν ὅπερ ἐπὶ τῆς τῶν δελφίνων θήρας. ψοφοῦσι γὰρ λίθοις, ἵνα φοβηθέντες συνθέωσιν εἰς ταὐτὸ, καὶ τοῖς δικτύοις οὕτω περιβάλλονται. καὶ πρὶν μὲν συγκλεῖσαι, καθάπερ εἴρηται, κωλύουσι ψοφεῖν· ἐπὰν δὲ κυκλώσωσι, κελεύουσιν ἤδη βοᾶν καὶ ψοφεῖν. τὸν γὰρ ψόφον καὶ τὸν θόρυβον ἀκούοντες, ἐμπίπτουσι διὰ τὸν φόβον. ἔτι δ', ὅταν ἴδωσιν οἱ ἁλιεῖς ἐκ πάνυ πολλοῦ νεμομένους ἀθρόους πολλοὺς, ἐν ταῖς γαλήναις καὶ εὐδίαις ἐπιπολάζοντας, καὶ βουληθῶσιν ἰδεῖν τὰ μεγέθη, καὶ τί τὸ γένος αὐτῶν, ἂν μὲν ἀψοφητὶ προσπλεύσωσι, λανθάνουσι, καὶ καταλαμβάνουσιν ἐπιπολάζοντας ἔτι· ἐὰν δέ τις ψοφήσας τύχῃ πρότερον, φανεροὶ φεύγοντές εἰσιν. ἔτι δ' ἐν τοῖς ποταμοῖς εἰσιν ἰχθύδια ὑπὸ ταῖς πέτραις, ἃ καλοῦσί τινες * βοῖττας· καὶ ταῦτα θηρεύουσί τινες, διὰ τὸ ὑπὸ ταῖς πέτραις ὑποδεδυκέναι, κόπτοντες τὰς πέτρας λίθοις· τὰ δ', * ἐμπίπτουσι παραφερόμενα, ὡς ἀκούοντα καὶ καρηβαροῦντα ὑπὸ τοῦ ψόφου. ὅτι μὲν οὖν ἀκούουσιν, ἐκ τῶν τοιούτων ἐστὶ φανερόν.

* Gaza & veteres interpretes κωίτας.
* κ. ἐκπίπτουσι

A Nam viſui ſedes certa deſcriptáque eſt, atque etiam auditui: cùm aliis auriculæ promineant, aliis foramina pateant meatus audiendi. Olfactus item pari modo conſtitutum eſt diuerſorum. Nam auium generi foramina tantùm ſunt odorandi, cùm aliis permultis nares etiam habeantur. Similis & linguæ, partis ſaporum percipiendorum miniſtræ ratio eſt. Aquatilium tamen generi, quos piſces vocamus, data quidem eſt lingua, ſed imperfecta incertáque: oſſea enim, nec abſoluta. Sed palatum nonnullis carnoſum pro lingua eſt, velut inter fluuiales cyprino, ita vt niſi diligenter inſpexeris, lingua id eſſe videatur. Piſces autem ſenſum guſtus habere conſtat, eo quod multi ſuis quibuſdam ſaporibus gaudent, & eſcam in primis B ex piſce amia expetunt, & piſcium pingue, vt qui guſtatu eiuſmodi delectentur, voluptatémque ex eo genere eſculenti capiant. Auditus verò olfactúſve nullum continent membrum manifeſtum. Quod enim tale videri poteſt per loca narium, id non ad cerebrum vſque tranſmeat, ſed partim obſeptum & cæcum mox deſinit, partim ad branchias fertur. Audire tamen, atque olfacere piſces palam eſt: ſonos enim immodicos, vt triremium remigia, fugere viſuntur. Itaque fit vt facilè intra ſua ſtabula capiantur. Nam etſi externus ſtrepitus paruus eſt, iis tamen qui demerſum in humore ſuum auditum habent, æquè omnibus ingens, moleſtus, grauiſque occurrit: quod certè vel in delphinorum captura euenit. C Cùm enim piſcatores repentè alueis vniuerſum circundederint gregem delphinorum, inde obſtrepentes in mare, efficiunt vt territi erumpant vniuerſi in litora, capiantúrque, tentato grauatóque capite, præ ſtrepitus inflicti nimietate: quanquam ne in delphinis quidem pars vlla eſt manifeſta, quæ ſenſum miniſtret audiendi. Ad hæc, inter piſcandum quàm maximè cauent, ne vel remo vel retibus moueant ſtrepitum: ſed cùm aliquo in loco gregatim piſces ſtabulari intellexerint, certo interuallo conjectantes r.tia demittunt, vt neque remo, neque impetu cymbæ ſtrepitus ad locum deueniat piſcium: & omnibus præcipitur nautis ſilentio quàm maximo nauigent, dum gregem circundant. D Nonnunquam vbi aggregare piſces placuerit, idem faciunt quod in delphinorum captura: obſtrepunt enim iactis lapidibus, vt deterriti in arctius coeant, atque ita vniuerſi irretiantur: & antequam circunueniant, omnem, vt modò dixi ſtrepitum vetant: at cùm circundatum iam eſt, clamandum obſtrependúmque iubent: ſtrepitum enim tumultúmque ſentientes perterriti compelluntur, interrumpúntque incauti. Item vbi piſcatores è longinquo piſces agminatim paſcentes, ac per tranquilli ſerenique maris ſumma oberrantes aſpexere, libuítque magnitudinem genúſque cognoſcere, ſi ſilentio ſenſimque E acceſſerint, latent, ſupernatantéſque adhuc comperiunt. At ſi quem priùs, quàm occuparint, ſtrepitum citarint, fugam inde planè arripere videntur. Addo etiam piſciculos fluuiatiles cottos nomine, qui ſub ſaxis ſtabulantur. Capiuntur enim à nonnullis ſaxo percuſſo, ſub quo latent: protinus enim inde exturbantur, vt qui audiant, & caput per ſtrepitũ tententur. Piſces igitur audire, iis ac aliis eiuſmodi documentis conſtat.

Sunt autem qui vel maximè animalium piſces auditu valere arbitrentur, videlicet hominum experimento, qui aſſiduè in mari verſantur, remque piſcatoriam percallent. Sunt verò qui liquidiùs inter piſces audiant, mugilis, chromis, lupus, ſalpa, & reliqui id genus. Cætera piſcium genera minùs audiunt: quam ob rem imis gurgitibus verſari potiùs ſolent. Olfactus quoque ſimilis intelligitur ratio: eſcam enim non recentem attingere pars plurima piſcium recuſat: nec eiſdem eſcarum generibus omnes capiuntur, ſed varijs, ſcilicet ſui agnitione odoris: quippe cùm vel fœtida nonnullis accommodentur, vt ſalpæ ſtercus. Complures item piſcium in ſpeluncis latentes, quoties euocare captum piſcator voluit, fauces ſpecus odoribus illinunt cetariis, itàque protinus excitant. Anguillam item hoc eodem capi modo palàm eſt. Vas enim ſalſamentarium ponunt, obſtaculo in eius os indito, quod colum vocant. Nidores denique potiùs genera quæque piſcium appetunt: vnde etiam carunculas ſepiarum deuſtas, odoris gratia eſcam hamis affigunt: ita enim fit vt piſces auidiùs accedant. Polypos etiam aſſatos, non niſi nidoris cauſa naſſis inditos dimitti aſſeuerant. Quinetiam flutæ quoties vel piſcium lotura, vel nauis ſentina eiecta eſt, fugiunt, vt odorem ſentientes. Sanguinem quoque ſuum ſagaciter piſces odorari dicuntur. Quæ res eo patet argumento, quòd quoties ſanguis effuſus piſcium eſt, fugiunt, & loca petunt longinqua. Omnino vt eſca putrida naſſis iniecta, nunquam ſubire, aut appropinquare patiuntur: ſic recente nidorulentáque, protinus vel è longinquo feſtinantes irrumpunt. Conſtant hæc eadem in delphinorum genere latiùs: cùm enim nullam partem auditui deputatam apertè delphini habent, tamen capiuntur per ſtrepitum capite aggrauato, vt dictum iam eſt. Et cùm olfactus quoque partem nullam ſenſoriam habeant manifeſtam, tamen ſagaciter odorantur. His igitur in animalibus ſenſus ineſſe omnes, apertum iam eſt. Reliquus animantium ordo, qui quadripartitò diuiditur, hoc eſt, molli, cruſtato, teſtato, inſecto, quemadmodum ſe habeat, videamus. Ergo, mollia, & quæ vel cruſta vel teſta operiuntur, atque etiam inſecta, ſenſibus prædita eſſe omnibus conſtat: nam & viſu, & olfactu, & guſtu. Inſecta enim tam pennata quàm non pennata, procul ſentiunt, vt mel apes, & culices dicti muliones. Quod niſi odore agnoſcerent, nunquam è longinquo ſentirent. Sulphuris item odore genera inſectorum multa intereunt. Ad hæc formicæ, origani ſulphuriſque puluiſculo inſperſo, ſuas relinquunt cauernas, alióque migrant. Cornus præterea ceruini facto incenſu, plurima inſectorum pars fugiunt: ſed præcipuè ſtyracis ſuffitu. Iam ſepiæ, polypi, gammari, odore eſcarum allectati capiuntur: & polypi quidem ita adhæreſcunt, vt auelli inde non poſſint, ſed truncari potiùs patiantur. At verò pulicaria herba admota, protinus ab odore eius reſilire dicuntur. Guſtus etiam ſimilis ratio: interdum enim cibum perſequuntur diuerſum, nec eiſdem ſaporibus omnia delectantur. Nam apes nullam ad rem putidam ſolent aduolare,

A εἰσὶ δέ τινες οἵ φασι καὶ μάλιστα ὀξυηκόους εἶναι τῶν ζῴων τοὺς ἰχθῦς· λέγειν δὲ τούτους τοὺς διατρίβοντας περὶ τὴν θάλατταν, διὰ τὸ συντυγχάνειν τοιούτοις πολλοῖς. μάλιστα δ' εἰσὶ τῶν ἰχθύων ὀξυήκοοι, κεστρεύς, χρέμψ, λάβραξ, σάλπη, χρομὶς καὶ ὅσοι ἄλλοι τοιοῦτοι τῶν ἰχθύων· οἱ δὲ ἄλλοι τούτων ἧττον. διὸ μᾶλλον περὶ τὰ ἐδάφη τῆς θαλάττης ποιοῦνται τὰς διατριβάς. ὁμοίως δὲ καὶ περὶ ὀσφρήσεως ἔχει. τῶν τε γὰρ μὴ προσφάτων δελεάτων οὐκ ἐθέλουσιν ἅπτεσθαι τῶν ἰχθύων οἱ πλεῖστοι· τοῖς δελέασί τε οὐ τοῖς αὐτοῖς ἁλίσκονται πάντες, ἀλλὰ ἰδίοις, διαγινώσκοντες τῷ ὀσφραίνεσθαι. ἔνια γὰρ δελεάζεται
B τοῖς δυσώδεσιν, ὥσπερ ἡ σάλπη τῇ κόπρῳ. ἔτι δὲ πολλοὶ τῶν ἰχθύων διατελοῦσιν ἐν σπηλαίοις· οὓς ἐπειδὰν βούλωνται προσκαλέσασθαι εἰς ἄγραν οἱ ἁλιεῖς, τὸ στόμα τοῦ σπηλαίου περιαλείφουσι ταριχηραῖς ὀσμαῖς· πρὸς ἃς ἐξέρχονται ταχέως. ἁλίσκεται δὲ καὶ ἡ ἔγχελυς τοῦτον τὸν τρόπον. τιθέασι γὰρ τῶν ταριχηρῶν τι κεραμίων, ἐνθέντες εἰς τὸ στόμα τοῦ κεραμίου τὸν καλούμενον ἰθμόν. καὶ ὅλως δὲ πρὸς τὰ κνισώδη πάντες φέρονται μᾶλλον. καὶ τῶν σηπιῶν δὲ τὰ σαρκία πυρώσαντες ἕνεκα τῆς ὀσμῆς, δελεάζουσι τούτοις· προσέρχονται γὰρ μᾶλλον. τοὺς δὲ πολύποδας φασὶν ὀπτήσαντες, εἰς τοὺς κύρτους ἐντιθέναι οὐδενὸς ἄλλου χάριν, ἢ τῆς κνίσης. ἔτι δὲ οἱ ῥυάδες ἰχθύες,
C ὅταν ἐκχυθῇ τὸ* πλύσμα τῶν ἰχθύων, ἢ τῆς ἀντλίας *ἐκχυθείσης, φεύγουσιν, ὡς ὀσφραινόμενοι τῆς ὀσμῆς αὐτῶν. καὶ τοῦ αὐτῶν δὲ αἵματος ταχὺ ὀσφραίνεσθαί φασιν αὐτούς. δῆλον δὲ ποιοῦσι, φεύγοντες καὶ ἐκτοπίζοντες μακράν, ὅταν* γένηται αἷμα ἰχθύων. καὶ ὅλως μὲν ἐὰν σαπρῷ τις δελέατι δελεάσῃ εἰς τὸν κύρτον, οὐκ ἐθέλουσιν εἰσδύειν, οὐδὲ πλησιάζειν· ἐὰν δὲ νεαρῷ δελέατι καὶ κεκνισωμένῳ, εὐθὺς φερόμενοι πόρρωθεν εἰσδύουσι. μάλιστα δὲ φανερόν ἐστι περὶ τῶν εἰρημένων ἐπὶ τῶν δελφίνων. οὗτοι γὰρ τῆς ἀκοῆς αἰσθητήριον μὲν οὐδὲν ἔχουσι φανερόν, ἁλίσκονται δὲ διὰ τὸ καρηβαρεῖν ὑπὸ τοῦ ψόφου, καθά-
D περ εἴρηται πρότερον. οὐδὲ δὴ τῆς ὀσφρήσεως αἰσθητήριον οὐδὲν ἔχει φανερόν· ὀσφραίνεται δ' ὀξέως. ὅτι μὲν οὖν πάσας τὰς αἰσθήσεις ταῦτα ἔχει τὰ ζῷα, φανερόν. τὰ δὲ λοιπὰ γένη τῶν ζῴων, ἐστὶν εἰς τέτταρα διῃρημένα εἴδη, ἃ περιέχει τὸ πλῆθος τῶν λοιπῶν ζῴων, τά τε μαλάκια, καὶ τὰ μαλακόστρακα, καὶ τὰ ὀστρακόδερμα, καὶ ἔτι τὰ ἔντομα. τούτων δὲ τὰ μὲν μαλάκια, καὶ τὰ μαλακόστρακα, καὶ τὰ ἔντομα, ἔχει πάσας τὰς αἰσθήσεις. καὶ γὰρ ὄψιν ἔχει, καὶ ὄσφρησιν, καὶ γεῦσιν. τά τε γὰρ ἔντομα ὄντα πόρρω, συναισθάνεται, καὶ τὰ πτερωτὰ καὶ ἄπτερα, οἷον αἵ τε μέλιτται καὶ οἱ κνῖπες, τοῦ μέλιτος. ἐκ πολλοῦ γὰρ
E αἰσθάνονται, ὡς τῇ ὀσμῇ γινώσκοντα. καὶ ὑπὸ τῆς τοῦ θείου ὀσμῆς πολλὰ ἀπόλλυται. ἔτι δὲ οἱ μύρμηκες ὑπὸ τῆς ὀριγάνου καὶ θείου περιπαττομένων λείπουσι τὰς μυρμηκίας· καὶ ἐλαφείου κέρατος θυμιωμένου, τὰ πλεῖστα φεύγει τῶν τοιούτων. μάλιστα δὲ φεύγουσι θυμιωμένου τοῦ στύρακος. αἵ τε σηπίαι, καὶ οἱ πολύποδες, καὶ οἱ κάραβοι, τοῖς δελέασιν ἁλίσκονται. καὶ οἵ γε πολύποδες οὕτω μὲν προσέχονται, ὥστε μὴ ἀποσπᾶσθαι, ἀλλ' ὑπομένειν ἀποτεμνόμενοι· ἐὰν δέ τις κόνυζαν προσενέγκῃ, ὥς φασιν, εὐθὺς ὀσφραινόμενοι ἀφιᾶσιν. ὁμοίως δὲ καὶ περὶ γεύσεως, διότι γὰρ τήν τε τροφὴν ἑτέραν διώκουσι, καὶ οὐ τοῖς αὐτοῖς πάντα χαίρει χυμοῖς· οἷον ἡ μέλιττα πρὸς οὐδὲν προσιζάνει σαπρόν,

γρ. πλύσμα
γρ. ἐγχυθείσης
* Fort. γίνηται

ἀλλὰ πρὸς γλυκέα· ὁ δὲ κώνωψ, πρὸς οὐδὲν γλυκύ, ἀλλὰ πρὸς τὰ ὀξέα. τὸ δὲ τῇ ἁφῇ αἰσθάνεσθαι, ὥσπερ καὶ πρότερον εἴρηται, πᾶσιν ὑπάρχει τοῖς ζῴοις. τὰ δὲ ὀστρακόδερμα ὄσφρησιν μὲν καὶ γεῦσιν ἔχει· φανερὸν δ' ἐκ τῶν δελεασμάτων, οἷον ἐπὶ τῆς πορφύρας. αὕτη γὰρ δελεάζεται τοῖς σαπροῖς, καὶ προσέρχεται πρὸς τὸ τοιοῦτο δέλεαρ, ὡς αἴσθησιν ἔχουσα πόρρωθεν. καὶ τῶν χυμῶν δ' ὅτι αἴσθησιν ἔχει, φανερὸν διὰ τῶν αὐτῶν. πρὸς ἃ γὰρ διὰ τὰς ὀσμὰς προσέρχεται κρίνοντα, τούτοις χαίρει καὶ τοῖς χυμοῖς ἕκαστα. ἔτι δὲ ὅσα ἔχει στόμα, χαίρει καὶ λυπεῖται τῇ τῶν χυμῶν ἁφῇ. περὶ δὲ ὄψεως καὶ ἀκοῆς, βέβαιον μὲν οὐδέν ἐστιν, οὐδὲ λίαν φανερόν. δοκοῦσι δὲ οἵ τε σωλῆνες, ἄν τις ψοφήσῃ, καταδύεσθαι καὶ φεύγειν κατωτέρω, ὅταν αἴσθωνται τὸ σιδήριον προσφερόμενον· ὑπερέχει γὰρ αὐτῶν μικρόν· τὸ δὲ ἄλλο, ὥσπερ ἐν θαλάμῃ ἐστί. καὶ οἱ κτένες, ἐάν τις προσφέρῃ τὸν δάκτυλον, χάσκουσι καὶ συμμύουσιν ὡς ὁρῶντες. καὶ τοὺς νηρείτας δὲ οἱ θηρεύοντες, οὐ κατὰ πνεῦμα προσιόντες θηρεύουσιν, ὅταν θηρεύωσιν αὐτοὺς εἰς τὸ δέλεαρ· οὐδὲ φθεγγόμενοι, ἀλλὰ σιωπῶντες· ὡς ὀσφραινομένων καὶ ἀκουόντων· ἐὰν δὲ φθέγγωνται, φασὶν ὑποφεύγειν αὐτούς. ἥκιστα δὲ τὴν ὄσφρησιν τῶν ὀστρακοδέρμων φαίνεται ἔχειν, τῶν μὲν πορευτικῶν, ὁ ἐχῖνος· τῶν δὲ ἀκινήτων, οἷον τὰ τήθυα, καὶ αἱ βάλανοι. περὶ μὲν οὖν τῶν αἰσθητηρίων τοῦτον ἔχει τὸν τρόπον τοῖς ζῴοις πᾶσι.

ΚΕΦΑΛ. θ'.

Περὶ φωνῆς τῶν ζῴων.

Περὶ δὲ φωνῆς τῶν ζῴων ὧδε ἔχει. φωνὴ δὲ, καὶ ψόφος, ἕτερόν ἐστι· καὶ τρίτον τούτων, διάλεκτος. φωνεῖ μὲν οὖν οὐδενὶ τῶν ἄλλων μορίων οὐδὲν, πλὴν τῷ φάρυγγι. διὸ ὅσα μὴ ἔχει πνεύμονα, οὐδὲ φθέγγεται. διάλεκτος δὲ, ἡ τῆς φωνῆς ἐστι τῇ γλώττῃ διάρθρωσις. τὰ μὲν οὖν φωνήεντα, ἡ φωνὴ καὶ ὁ λάρυγξ ἀφίησιν· τὰ δ' ἄφωνα, ἡ γλῶττα καὶ τὰ χείλη· ἐξ ὧν ἡ διάλεκτός ἐστι. διὸ ὅσα γλῶτταν μὴ ἔχει, ἢ μὴ ἀπολελυμένην, οὔτε φωνεῖ οὔτε διαλέγεται· ψοφεῖν δ' ἐστὶ καὶ ἄλλοις μορίοις. τὰ μὲν οὖν ἔντομα, οὔτε φωνεῖ, οὔτε διαλέγεται· ψοφεῖ δὲ τῷ ἔσω πνεύματι, οὐ τῷ θύραζε· οὐδὲν γὰρ ἀναπνεῖ αὐτῶν· ἀλλὰ τὰ μὲν, βομβεῖ, οἷον μέλιττα, καὶ τὰ πτηνὰ αὐτῶν· τὰ δ', ᾄδειν λέγεται, οἷον οἱ τέττιγες. πάντα γὰρ ταῦτα ψοφεῖ τῷ ὑμένι τῷ ὑπὸ τὸ * ζῶμα. * ὅσων διῄρηται, οἷον τὸ τῶν τεττίγων γένος τῇ τρίψει τῇ τοῦ πνεύματος. καὶ αἱ μυῖαι δὲ καὶ μέλιτται, καὶ τἆλλα πάντα, τῇ πτήσει αἴρονται καὶ συστέλλονται. ὁ γὰρ ψόφος, τρῖψις τοῦ ἔσω πνεύματός ἐστιν. αἱ δ' ἀκρίδες, τοῖς πηδαλίοις τρίβουσαι, [ποιοῦσι] τὸν ψόφον. οὔτε δὲ τῶν μαλακίων οὐδὲν οὔτε φθέγγεται, οὔτε ψοφεῖ οὐδένα φυσικὸν ψόφον· οὐδὲ τῶν μαλακοστράκων. οἱ δὲ ἰχθύες, ἄφωνοι μέν εἰσιν· οὔτε γὰρ πνεύμονα, οὔτε ἀρτηρίαν καὶ φάρυγγα ἔχουσι· ψόφους δέ τινας ἀφιᾶσι καὶ τριγμούς, οὓς λέγουσι φωνεῖν, οἷον λύρα καὶ χρομίς. οὗτοι γὰρ ἀφιᾶσιν ὥσπερ γρυλλισμὸν· καὶ ὁ κάπρος ὁ ἐν τῷ Ἀχελῴῳ· ἔτι δὲ χαλκὶς, καὶ ὁ κόκκυξ. ὁ μὲν γὰρ, ψοφεῖ οἷον τριγμόν· ὁ δὲ παραπλήσιον τῷ κόκκυγι ψόφον, ὅθεν καὶ τοὔνομα ἔχει. πάντα δὲ ταῦτα τὴν δοκοῦσαν φωνὴν ἀφιᾶσι, τὰ μὲν, τῇ τρίψει τῶν βραγχίων·

ὑποζώματι. vide De respir. cap. 4.

* Quid. ἔσω δὲ. Gaza ita vertit quasi legisset, ὑπὸ τὸ ὑπόζωμα, ὃ τὸ σῶμα διεῖ.

sed dulcia petunt: culices nulla dulcia gestiunt sed acida. Tactu verò sentire (quod etiam antè dixi) omnibus datum animantibus est. Quæ autem ſiliceo tegmine operiuntur, olfactum gustúmque habere constat, argumento escarum. Purpuris enim escas putidas purpurarij emoliuntur, & accedunt ipſæ ad eiusmodi escam à longe, vtpote odorantes. Sensus item saporum iis inesse, eisdem illis rationibus patet: sapore enim rerum earundem quæque delectantur, ad quas veniunt odoribus inuitatæ, quos gratos senserunt, & discreuerunt. Adde quod quæcunque os obtinent, iis & voluptas per saporum attrectationem euenit, & dolor. De visu & auditu quanquam nihil certi manifestique habemus, vngues tamen ad strepitum se subtrahere, inferiúsque subsidere cernuntur, quoties ferramentum sentiunt admoueri. Exiguo namque extant, reliquo autem toto corpore perinde ac in cubili, occuluntur. Pectines quoque admoto digito dehiscunt, mox comprimunt se vt cernentes. Narices item qui capiunt, non aduerso flatu, sed secundo adeunt, quoties escam persequuntur: nec voce vlla, sed silentio agunt, vtpote cùm & olfaciant, & audiant. Nec fieri posse aiunt, quin subterfugiant, si vox proferatur. Echinus, inter testacea genera quibus facultas ingrediendi est vertibula: glandésque, inter immobilia eiusdem generis, olfactum minimè habere videntur. Sensus ad hunc modum animalium generi natura dispensauit & tribuit.

CAPVT IX.

Quæ animalia vocem, quæ sonum, quæ murmur edant, quæ item loquantur.

MOx quemadmodum vox se habeat, disseremus. Differt proculdubio vox à sono, & tertia his adnumeranda res est, locutio. Gutture parte vna vox agitur: quocirca quibus pulmo deest, iis nulla vocis emittendæ facultas est. Locutio non nisi vocis per linguam explanatio est. Vocales igitur literæ, à voce, & gutture, consonantes lingua & labris proferuntur: quibus literis omnem locutionē confici nulli dubium est. Quamobrem quibus animantium lingua libera, absolutáque nō est, ea neq; vocem emittunt, neque sermocinātur: at sonus edi vel aliis partibus potest. Ergo insectis animalibus, neque vocis neque locutionis vlla facultas: sonúsque iis spiritu interiore mouetur, non exteriore. Nullum enim ex iis spirat, sed alia murmur edunt, vt apes: alia canere dicuntur, vt cicadæ. Omnia verò in eo genere membrana, septo transuerso subdita, qua præcinctū corpus distinguitur, sonant: vt genus cicadarum attritu spiritus. Muscæ etiam, apes, & reliqua iis similia, cùm volant, sese attollunt, & contrahunt. Sonus enim attritus interioris spiritus est. Locustæ suis gubernaculis atterentes sonant: nullum molle, nullum crustatum, vel vocem vel sonum aliquem mittit naturalem. Pisces vocis quidem expertes sunt: quippe qui neque pulmonem, neque arteriam, aut guttur obtineant: sed sonos quosdam stridorésque mouent, qui vocales esse existimantur, vt lyra, vt chromis: his enim quasi grunnitus quidam emittitur. Aper etiam piscis, quem amnis Achelous gignit, vocalis habitus est, & erica, & cuculus. Alter enim quodam modo strides, alter perinde vt cuculus auis obstrepit, vnde nomen accepit. Quæ omnia creditam illam vocem emittunt, aut attritu branchiarū,

quas

quas horridiuſculas continent, aut ſuis interioribus, quæ circa ventrem habentur: ſpiritus enim incluſus in his eſt, quem dum atterunt atque agitãt, ſonos illos elidunt. Necnon cartilaginei generis nonnulla ſtridere videntur: verùm ab his vocem emitti vllam, rectè dici non poteſt: at ſonum, ſiue ſtrepitũ reddi, veriùs dixeris. Nam & pectines quoties per ſumma humoris nitibundi feruntur, quod volitare dicunt, ſtridere ſentiuntur: atque etiã marinæ hirundines, quæ ſublimes volitant, haudquaquam mare attingentes: ſunt enim iis pennæ latæ, & longæ. Vt igitur per volatum auium ſtrepitus, quem alæ excutiunt, nulla vox eſt: ita nec eiuſmodi ſonorum aliquis vox iure appelletur. Delphinus item ſtridet, ac mutit, efferens ſe in aërem: ſed non quemadmodum ea quæ ſuperiùs enumeraui. Hic enim & pulmonem, & arteriam habet, proindeque nonnihil vocis poteſt promouere: lingua tamen libera abſolutaque caret, & labris, quibus vocis aliquem poſſit articulum efformare. At verò quæ & linguam habent, & pulmonem, ſi quadrupedes, aut omnino pedeſtres ouiparæ ſunt, vocem quidem emittunt, ſed exilem. Et alia longum ſibilum edunt, vt ſerpentes: alia abruptum, & perexiguum, vt teſtudines: alia vocem exilem atque imbecillem. Ranis lingua ſui generis eſt. Pars enim prima, quæ cæteris abſoluta eſt, iis cohæret, modo quo tota ferè piſcium: intima verò abſoluta ad guttur applicatur, qua ſuam vocem ſolent emittere. Et quidem genus illud vlulatus, quam ololyginem nominant, mares intra aquam reddunt, vt cieant ad coitum fœminas. Sunt enim ſingulis animalium voces propriæ ad initum, & venereum coitum: vt & ſuibus, & capris, & ouibus. Reddunt ranæ ſuam ololyginem illam, maxillæ inferioris labro demiſſo pari libra, cum aqua modicè recepta in fauces, ſuperioréque intenta. Flagrant tantiſper oculi modo lucernæ, cùm ſinus buccarum maxillis diſtentis interlucear. Coitum enim noctu magna ex parte agere viſuntur. Genus auium vocem mittere poteſt: iiſque præcipuè facultas conficiendæ locutionis, quibus lingua mediocriter lata, vel tenuis. Mares ac fœminæ partim vocem reddũt eandẽ, partim diuerſam. Garrulæ linguacioreſque ſunt auiũ minores: & circa coitum maximè talem effici vnamquãque auem moris eſt. aliis in pugna vox, vt coturnicibus: aliis ante pugnam, vt perdicibus, dum ſuos aduerſarios prouocant: aliis cùm vicere, vt gallinaceis. Canunt item nonnulli mares perinde vt ſuæ fœminæ: ſicvt in luſciniarum genere patet. Fœmina tamen ceſſat cantu, cùm incubat, pullóſque educat. Sed in nonnullis generibus cantus maribus tantùm datus eſt, vt gallinaceis, vt coturnicibus. Quadrupedum autem genus, quod animal procreat, vocem variè mittit: neque eſt quod loqui poſſit, ſed propriũ id hominis eſt. Quibus enim locutio, iis etiam vox: at quibus vox, non iis omnibus & locutio eſt. Qui ſurdi iam inde ab ortu naturæ ſunt, iidem etiam muti: vocem ergo emittere poſſunt, locutionem autem nullam. Pueri vt cætera ſua membra continere, ac regere nequeunt, ſic etiam linguæ ſunt impotentes, & quidem imperfecti, & ſeriùs lingua abſoluuntur: itaque magna ex parte balbutiunt, torti que lingua ſunt. Differunt tum voces, tum etiam locutiones, tractus ratione, & regionis. Vox igitur acumine grauitatéque maximè noteſcit: nec ſpecies diſcrepant generis eiuſdem. at vox explanata, quam eſſe quaſi locutionem vel brutorum dixeris,

A (ἀκανθώδεις γὰρ οἱ τόποι) τὰ δὲ, τοῖς ἐντὸς τοῖς περὶ τὴν κοιλίαν. πνεῦμα γὰρ ἔχει τούτων ἕκαστον ὃ προστρίβοντα καὶ κινοῦντα, ποιεῖ τοὺς ψόφους. καὶ τῶν σελαχῶν δ' ἔνια τρίζειν δοκεῖ. ἀλλὰ ταῦτα φωνεῖν μὲν οὐκ ὀρθῶς ἔχει φάναι, ψοφεῖν δέ. καὶ γὰρ οἱ κτένες, ὅταν φέρωνται ἀπερειδόμενοι τῷ ὑγρῷ, ὃ καλοῦσι πέτεσθαι, ῥοιζοῦσι· καὶ αἱ χελιδόνες αἱ θαλάττιαι· καὶ γὰρ αὗται πέτονται μετέωροι, οὐχ ἁπτόμεναι τῆς θαλάττης· τὰ γὰρ πτερύγια ἔχουσι πλατέα καὶ μακρά. ὥσπερ οὖν τῶν ὀρνίθων πετομένων ὁ γινόμενος ταῖς πτέρυξι ψόφος οὐ φωνή ἐστιν, οὕτως οὐδὲ τῶν τοιούτων οὐδέν. ἀφίησι δὲ καὶ ὁ δελφὶς τριγμὸν, καὶ μύζει, ὅταν ἐξέλθῃ ἐν

B τῷ ἀέρι, οὐχ ὁμοίως δὲ τοῖς εἰρημένοις. ἔστι γὰρ τούτῳ φωνή· ἔχει γὰρ καὶ πνεύμονα καὶ ἀρτηρίαν· ἀλλὰ τὴν γλῶτταν οὐκ ἀπολελυμένην, οὐδὲ χείλη, ὥστε ἄρθρον τι τῆς φωνῆς ποιεῖν. τῶν δὲ ἐχόντων γλῶτταν, καὶ πνεύμονα, ὅσα μὲν ᾠοτόκα ἐστὶ καὶ τετράποδα, ἀφίησι φωνήν, ἀσθενῆ μέντοι, καὶ τὰ μὲν, συριγμὸν, ὥσπερ οἱ ὄφεις· τὰ δὲ, λεπτὴν καὶ ἀσθενῆ φωνήν· τὰ δὲ, σιγμὸν μικρὸν, ὥσπερ αἱ χελῶναι. ὁ δὲ βάτραχος, ἰδίαν ἔχει τὴν γλῶτταν. τὸ μὲν γὰρ ἔμπροσθεν, προσπέφυκεν ἰχθυωδῶς, ὃ τοῖς ἄλλοις ἀπολέλυται· τὸ δὲ πρὸς τὸν φάρυγγα, ἀπολέλυται, καὶ ἐπέπτυκται, ᾧ τὴν ἰδίαν ἀφίησι φωνὴν ἀεί. καὶ τὴν ὀλολυγόνα δὲ, τὴν

C γινομένην ἐν τῷ ὕδατι, οἱ βάτραχοι οἱ ἄρρενες ποιοῦσιν, ὅταν ἀνακαλῶνται τὰς θηλείας πρὸς τὴν ὀχείαν. εἰσὶ γὰρ ἑκάστοις τῶν ζῴων ἴδιαι φωναὶ πρὸς τὴν ὁμιλίαν καὶ τὸν πλησιασμὸν, οἷον καὶ ὑσὶ, καὶ τράγοις, καὶ προβάτοις. ποιεῖ δὲ τὴν ὀλολυγόνα, ὅταν ἰσοχειλῆ τὴν κάτω σιαγόνα ποιήσας ἐπὶ τῷ ὕδατι* περιτείνῃ τὴν ἄνω.* δοκεῖ δὲ διαλαμπουσῶν τῶν σιαγόνων ἐκ τῆς ἐπιτάσεως, ὥσπερ οἱ λύχνοι φαίνεσθαι, οἱ ὀφθαλμοί. ἡ γὰρ ὀχεία τὰ πολλὰ φαίνεται νύκτωρ οὖσα. τὸ δὲ τῶν ὀρνίθων γένος, ἀφίησι φωνὴν καὶ μάλιστα ἔχει διάλεκτον, ὅσοις ὑπάρχει μετρίως ἡ γλῶττα πλατεῖα, καὶ ὅσοι ἔχουσι λεπτὴν τὴν γλῶτταν αὐτῶν.

* κ. [illegible]
* Scrib. [illegible]

D ἔνια μὲν οὖν ἀφίησι τὴν αὐτὴν φωνὴν, τά τε θήλεα καὶ τὰ ἄρρενα. ἔνια δ', ἑτέραν. πολύφωνα δ' ἐστὶ, καὶ λαλίστερα, τὰ ἐλάττω τῶν μεγάλων· καὶ μάλιστα περὶ τὴν ὀχείαν ἕκαστον γίνεται τῶν ὀρνίθων τοιοῦτον· καὶ τὰ μὲν, μαχόμενα φθέγγεται, οἷον ὄρτυξ· τὰ δὲ, πρὸ τοῦ μάχεσθαι προκαλούμενα, ἢ νικῶντα, οἷον ἀλεκτρυόνες. ᾄδουσι δ' ἔνια μὲν ὁμοίως τὰ ἄρρενα τοῖς θήλεσιν, οἷον καὶ ἡ ἀηδὼν ᾄδει, καὶ ὁ ἄρρην καὶ ἡ θήλεια. πλὴν ἡ θήλεια παύεται, ὅταν ἐπῳάζῃ καὶ τὰ νεόττια ἔχῃ. ἐνίων δὲ καὶ τὰ ἄρρενα μᾶλλον, οἷον ἀλεκτρυόνες τε καὶ ὄρτυγες· αἱ δὲ θήλειαι οὐκ ᾄδουσι. τὰ δὲ ζῳοτόκα, καὶ τὰ τετράποδα ζῷα, ἄλλο ἄλλην ἀφίησι φωνήν.

E διάλεκτον δὲ οὐδὲν ἔχει, ἀλλ' ἴδιον τοῦτο τοῦ ἀνθρώπου ἐστίν. ὅσα μὲν γὰρ διάλεκτον ἔχει, καὶ φωνὴν ἔχει· ὅσα δὲ φωνήν, οὐ πάντα διάλεκτον. ὅσοι δὲ κωφοὶ γίνονται ἐκ γενετῆς, πάντες καὶ ἐνεοὶ γίνονται. φωνὴν μὲν οὖν ἀφιᾶσι, διάλεκτον δὲ οὐδεμίαν. τὰ δὲ παιδία, ὥσπερ καὶ τῶν ἄλλων μορίων οὐκ ἐγκρατῆ ἐστιν, οὕτως οὐδὲ τῆς γλώττης τὸ πρῶτον· καὶ ἔστιν ἀτελὴς, καὶ ἀπολύεται ὀψιαίτερον· ὥστε ψελλίζουσι καὶ τραυλίζονται τὰ πολλά. διαφέρουσι δὲ καὶ αἱ φωναὶ κατὰ τόπους, καὶ αἱ διάλεκτοι. ἡ μὲν οὖν φωνὴ, ὀξύτητι καὶ βαρύτητι μάλιστα ἐπίδηλος· τὸ δὲ εἶδος, οὐθὲν διαφέρει τῶν αὐτῶν γενῶν. ἡ δ' ἐν τοῖς ἄρθροις, ἣν ἄν τις ὥσπερ διάλεκτον εἴπειεν,

καὶ τῶν ἄλλων ζῴων διαφέρει, καὶ τῶν ἐν ταὐτῷ γένει ζῴων κατὰ τόπους· οἷον τῶν περδίκων, οἱ μὲν κακκαβίζουσιν, οἱ δὲ τρίζουσι. καὶ τῶν μικρῶν ὀρνίθων ἔνια οὐ τὴν αὐτὴν ἀφίησι φωνὴν ἐν τῷ ᾄδειν τοῖς γεννήσασιν, ἂν ἀποτρέφωνται, καὶ τῶν ἄλλων ἀκούωσιν ὀρνίθων ᾀδόντων. ἤδη δὲ ὦπται καὶ ἀηδὼν νεοττὸν προδιδάσκουσα· ὡς οὐχ ὁμοίως φύσει τῆς διαλέκτου οὔσης καὶ τῆς φωνῆς, ἀλλ' ἐνδεχόμενον πλάττεσθαι. καὶ οἱ ἄνθρωποι φωνὴν μὲν τὴν αὐτὴν ἀφιᾶσι, διάλεκτον δὲ οὐ τὴν αὐτήν. ὁ δὲ ἐλέφας φωνεῖ, ἄνευ μὲν τῶν μυκτήρων, αὐτῷ τῷ στόματι πνευματῶδες, ὥσπερ ὅτ' ἄνθρωπος ἐκπνέῃ καὶ λαλῇ· μετὰ δὲ τῶν μυκτήρων, ὅμοιον σάλπιγγι τετραχυσμένῃ.

ΚΕΦΑΛ. ί.

Περὶ ὕπνου καὶ ἐγρηγόρσεως τῶν ζῴων.

Περὶ δὲ ὕπνου καὶ ἐγρηγόρσεως τῶν ζῴων, ὅτι ὅσα πεζὰ καὶ ἔναιμα, πάντα καθεύδει καὶ ἐγρηγορεῖ, φανερὸν ποιοῦσι κατὰ τὴν αἴσθησιν. πάντα γὰρ ὅσα ἔχει βλεφαρίδας, μύοντα ποιεῖται τὸν ὕπνον. ἔτι δ' ἐνυπνιάζειν φαίνονται οὐ μόνον ἄνθρωποι, ἀλλὰ καὶ ἵπποι, καὶ κύνες, καὶ βόες· ἔτι δὲ πρόβατα καὶ αἶγες, καὶ πᾶν τὸ τῶν ζῳοτόκων καὶ τετραπόδων γένος. δηλοῦσι δὲ οἱ κύνες τῷ ὑλαγμῷ. περὶ δὲ τῶν ᾠοτοκούντων τοῦτο μὲν ἄδηλον· ὅτι δὲ καθεύδουσι, φανερόν. ὁμοίως δὲ καὶ τὰ ἔνυδρα, οἷον οἵ τε ἰχθύες, καὶ τὰ μαλάκια καὶ τὰ μαλακόστρακα, κάραβοί τε, καὶ τὰ τοιαῦτα. βραχύυπνα μὲν οὖν ἐστιν ἅπαντα τὰ τοιαῦτα, φαίνεται δὲ καθεύδοντα. σημεῖον δὲ κατὰ μὲν τὰ ὄμματα λαβεῖν οὐκ ἔστιν, (οὐδὲν γὰρ ἔχει βλέφαρα) ἀλλὰ ταῖς ἀτρεμίαις. ἁλίσκονται γὰρ οἱ ἰχθύες, εἰ μὴ διὰ τοὺς φθεῖρας καὶ τοὺς λεγομένους ψύλλους, κἂν ὥστε τῇ χειρὶ λαμβάνειν ῥᾳδίως· νῦν δ', ἂν χρονίσωσιν, οὗτοι τῆς νυκτὸς κατεσθίουσι περιεστῶτες, πολλοὶ τὸ πλῆθος ὄντες. γίνονται δὲ ἐν τῷ βυθῷ τῆς θαλάσσης, καὶ τοσοῦτοι τὸ πλῆθος, ὥστε καὶ τὸ δέλεαρ, ὅταν ἰχθύος ᾖ, ἂν χρονίσῃ ἐπὶ τῆς γῆς, κατεσθίουσι· καὶ ἀνέλκουσι πολλάκις οἱ ἁλιεῖς περὶ τὸ δέλεαρ, ὥσπερ σφαῖραν συνεχομένων αὐτῶν. ἀλλ' ἐκ τῶν τοιούτων μᾶλλόν ἐστι τεκμαίρεσθαι ὅτι καθεύδουσι. πολλάκις γάρ ἐστιν ἐπιπεσόντα τοὺς ἰχθῦς λαθεῖν οὕτως, ὥστε καὶ τῇ χειρὶ λαβεῖν, ἢ πατάξαντα λαθεῖν. ὑπὸ δὲ τὸν καιρὸν τοῦτον ἠρεμοῦσι σφόδρα, καὶ κινοῦσιν οὐθέν, πλὴν ἠρέμα τὸ οὐραῖον. δῆλον δὲ γίνεται ὅτι καθεύδει, καὶ ταῖς φοραῖς, ἄν τι κινηθῇ ἡσυχαζόντων. φέρεται γὰρ ὡς ἐξ ὕπνου ὄντα. ἔτι δ' ἐν ταῖς πέτραις ἁλίσκεται, διὰ τὸ καθεύδειν. πολλάκις δὲ καὶ οἱ θυννοσκόποι περιβάλλονται καθεύδοντας. δῆλον δ' ἐκ τοῦ ἡσυχάζοντας, καὶ τὰ λευκὰ ὑποφαίνοντας, ἁλίσκεσθαι. καθεύδουσι δὲ τῆς νυκτὸς μᾶλλον ἢ τῆς ἡμέρας οὕτως, ὥστε βαλλόντων μὴ κινεῖσθαι. τὰ δὲ πλεῖστα καθεύδουσιν, ἢ τῆς ἄμμου, ἢ τῆς γῆς, ἢ λίθου τινὸς ἐχόμενοι ἐν τῷ βυθῷ, ἢ ἀποκρύψαντες ὑπὸ πέτραν ἢ θῖνα ἑαυτούς.

A differt & cæterorum animalium,& eorum quę genere eodem continentur loci ratione. Verbi gratia: perdicum alij caccabant, alij ſtrident. Et auicularum nonnullæ haud vocem eandem mittunt, quam ſui parentes, ſi præreptæ paterna caruerint educatione, moribúſque, & cantibus cæterarum auium inſueuerint. Iam verò luſciniam modulos ſuos pullos docere, verſúſque quos imitarentur, tradere viſa eſt: vtpote cùm non perinde locutio vt vox per naturam proueniret, ſed acquiri poſſet per diſciplinam, & ſtudium. Vnde homines quoque locutione vtuntur varia, cùm vocem omnes reddant eandem. Elephantus citra nares ore ipſo vocem elidit ſpirabundam, quemadmodum cùm homo ſimul & ſpiritum reddit, & loquitur: at per nares ſi-
B mile tubarum raucitati ſonat.

CAPVT X.

De ſomno, & vigilia animalium, multáque præter hominem animalia ſomniare.

De ſomno & vigilia animantium, nulla quæſtionis obſcuritas eſt. Nam omnia pedeſtria & prædita ſanguine, dormire ac vigilare, ſenſu ipſo percipimus. Quibus enim palpebræ adiunctæ ſunt, conniuendo obdormiſcunt. Item ſomniare non ſolùm homines, ſed etiam equos, & canes, & boues palàm eſt: atque etiam oues &
C capras: denique genus omne quadrupedum, idemque animalis fœcundum. Declarant id canes ſub latratu, quem per quietem agunt. Quanquam de iis quæ oua pariunt, incertum hoc eſt: ſed dormire ea item certum. Aquatilium quoque ſomnus apparet, vt piſcium mollium, & cruſtâ opertorum, locuſtarum, inquam, & cæterorum generis eiuſdem. Sunt autem iſthæc omnia ſomno exiguo contenta: dormire tamen videntur. Argumentum verò quamuis nullum deduci ab oculis poteſt, quia palpebris carent: ipſa tamen quiete cernuntur placida, ſeu ſoporata. Piſces enim vel manu facilè caperentur, dum dormiunt, niſi pediculis, & pulicibus appellatis ſolicitarentur:
D nunc verò ſi ſomno dati immorentur, noctu abinnumera multitudine illarum beſtiolarum occupati abſumuntur. Gignuntur hæc in profundo maris tanta fœcunditate, vt etiam eſcam de piſce emolitam, ſi diu in imo manſerint, totam corrodant, atque abſumant. Et quidem ſæpenumero piſcator eſcam demiſſam glomeratis vndique his beſtiolis, perinde vt pilam recipit. Sed enim piſces dormire argumentis potiùs huiuſcemodi arbitrari licet. Sæpius enim piſcator adortus piſces vſque adeo latet, vt poſſit etiam manu tollere, aut certè fuſcina pulſo indice ſenſu ferire. Quieſcunt tantiſper ex toto: neque parte alia quàm cauda leuiter mouentur. Conſtat hoc idem vel ipſo impetu, quem faciunt, ſi
E dum quieſcunt, motum aliquid fuerit: expauentes enim velut ſomno excuſſi auferuntur. Quinetiam in petris ſtabulantes capiuntur, videlicet propter ſomnum. Et ſępe thunnarij circunretiunt thunnos dormientes: quod argumento conſtat, quia admodum quieſcentes, leuitérque pandentes albida oculorum capiuntur. Noctu potiùs quàm interdiu dormiunt, ita ſopiti, vt ne iacta quidem fuſcina moueantur. Et magna ex parte vel ad arenam, vel ad terram, vel ad lapidem aliquem procùbentes quieſcũt imis gurgitibus, vel ſub ſaxo, aut litore abditi.

Plani autem piſcium arena ſeſe occultant. Deprehenduntur ſitu ipſius arenæ, tolluntúrque fuſcina percuſſi. Lupi quoque & auratæ, & mugiles, & id genus alij, fuſcina interdiu ſæpenumero dormientes capiuntur: alioqui ex iis nullus fuſcina poſſe capi exiſtimatur. Cartilaginea vero ita interdum dormiunt, vt vel manu tollantur. nam delphini, balænæ, & quæcunque fiſtulam gerunt, edita per ſumma æquoris fiſtula dormiunt: qua etiam ſpirant, pinnas ſuas mouendo leuiter. Iam delphinum ſtertentem etiam nonnulli audiere. Mollia quoque ad morem ſimilem dormiunt, vt piſces, nec ſecus quæ cruſta operiuntur. Inſecta etiam animalium dormire argumentum, quod requiem capiunt, motúque omni proculdubio ceſſant. Quod præcipuè patet in apibus: quieſcunt enim noctu, & conticeſcunt, vt nullus omnino bombus ſentiatur. Conſtat hoc idem vel argumento eorum quæ maximè in conſpectu noſtro, & intra noſtros parietes verſantur. Non enim modo quia clare non videant, idcirco noctu quieſcunt (nam omnia, quibus oculi duri, exiliter vident) ſed etiam ad lucernarum lucem nihilo minus quieſcere videntur. Homo maximè animalium ſomniat. Editis nuper in lucem, & infantibus adhuc, nullum penitus contrahitur ſomnium: ſed plurimis anno circiter quarto, aut quinto ætatis, viſa incipiunt. Produntur tamen & viri, & mulieres, qui nunquam quicquam ſomniarint. Quorum nonnullis in proceſſu ætatis accidit, vt viſo ſomnio mutarentur habitu ſui corporis, vel in mortem, vel in morbum. De ſenſu, de vigilia, de ſomno res ita ſe habet.

CAPVT XI.

De ſexu maſculino, fœmineóque, eorumque in animantibus differentiis.

SExus autem maſculinus, fœmininuſque, non in omnibus animantibus eſt. Sunt enim quibus id deeſt, ut ſimilitudine quadam & parere dicantur, & ferre vterum. Sexus ergo diſcrimen in animalibus, quæ vitam ſtabilem viuunt, aut omnino in iis quæ teſta integuntur, nullum omnino eſt. at in mollibus & cruſta opertis, mas habetur, & fœmina. In pedeſtribus quoque tum bipedibus, tum quadrupedibus, ſexus vterque eſt: atque etiam in iis quæ animal per coitum generant, aut ouum aut vermem. Cæteris igitur in generibus ſimplici rationis modo, aut eſt, aut deeſt: verbi cauſa, vt in quadrupedibus omnibus, alterum mas, alterum fœmina eſt: ſic in teſta opertis ſexus deeſt diſcrimen. ſed quemadmodum in genere ſtirpium, aliæ fructum ferunt, aliæ ſterilem ſortiuntur naturam, ita etiam in iis eſt. at vero in genere inſectorum, & piſcium, ſunt quæ omnino ſexus hoc diſcrimen alterutram in partem non habeant. Nam anguilla neque mas neque fœmina eſt, neque prolem ex ſe aliquam poteſt procreare: ſed qui eam capillamentis, & lubricis quædam ſimilia interdum adnexa ſibi gerentem vidiſſe aiunt, inconſiderate id afferunt, antè quam aduertant qua parte illa gerantur. Neque enim aliquid eiuſmodi eſt, quod animal creet, niſi prius generarit ouum: quod in nulla anguilla viſum eſt. Et quæ animal gignunt, ſuo in vtero fœtum continent non in ventriculo. Ita enim non ſecus quam cibus, concoquerentur primordia genituræ. Quam autē differentiam maris & fœminæ anguillæ notarunt,

A [illegible]

B [illegible]

De inſomniis, capi.

C [illegible]

ΚΕΦΑΛ. ια.

Περὶ ἄρρενος καὶ θήλεος.

D [illegible]

E [illegible]

τὴν μὲν γὰρ μείζω κεφαλὴν καὶ μακροτέραν ἔχειν, τὴν δὲ θήλειαν, [μικρὰν καὶ] * σιμοτέραν, οὐ τῷ θήλεος καὶ ἄρρενος λέγεται, ἀλλὰ τῷ γένει. εἰσὶ δέ τινες ἰχθύες οἳ καλοῦνται ἐπιτράγαι. γίνονται δὲ τοιοῦτοι τῶν ποταμίων κυπρῖνος καὶ βαλερός. οὐκ ἔχουσι δὲ οἱ τοιοῦτοι οὔτε ᾠὸν, οὔτε θορὸν οὐδέποτε· ἀλλ᾽ ὅσοι στερεοί εἰσι καὶ πίονες, ἔντερον μικρὸν ἔχουσι, καὶ εἶναι ἄριστοι οὗτοι. ἔτι δ᾽ ἔνια, καθάπερ ἐν τοῖς ὀστρακοδέρμοις καὶ φυτοῖς, τὸ μὲν τίκτειν ἐστὶ καὶ γεννᾶν, τὸ δ᾽ ὀχεύειν οὐκ ἔστιν, οὕτω καὶ ἐν τοῖς ἰχθύσι τὸ τῶν ψηττῶν γένος, καὶ τὸ τῶν * ἐρυθρίνων, καὶ αἱ χάνναι, καὶ πάντα τὰ τοιαῦτα, ὠὰ φαίνεται ἔχοντα. Ἐν μὲν οὖν τοῖς πεζοῖς καὶ ἐναίμοις τῶν ζῴων, * ὅσα μὴ ᾠοτοκεῖ, τὰ πλεῖστα, καὶ μείζω καὶ μακροβιώτερα τὰ ἄρρενα τῶν θηλειῶν, πλὴν ἡμιόνου· τούτων δὲ αἱ θήλειαι μακροβιώτεραι καὶ μείζους. ἐν δὲ τοῖς ᾠοτόκοις καὶ σκωληκοτόκοις, οἷον ἐν * ἰχθύσι καὶ ἐν τοῖς ἐντόμοις, μείζω τὰ θήλεα τῶν ἀρρένων ἐστίν, οἷον ὄφεις, καὶ φαλάγγια, καὶ ἀσκαλαβῶται, καὶ βάτραχοι, καὶ ἐπὶ τῶν ἰχθύων δ᾽ ὡσαύτως, οἷον τῶν σελαχῶν τῶν μικρῶν, καὶ τῶν ἀγελαίων τὰ πλεῖστα, καὶ τὰ πετραῖα πάντα. ὅτι δὲ μακροβιώτεροί εἰσι τῶν ἰχθύων αἱ θήλειαι τῶν ἀρρένων, δῆλον ἐκ τοῦ παλαιότερα ἁλίσκεσθαι τὰ θήλεα τῶν ἀρρένων. ἔτι δὲ τὰ μὲν ἄνω καὶ τὰ ἔμπροσθεν πάντων τῶν ἀρρένων, κρείττω καὶ ἰσχυρότερα, καὶ εὐοπλότερα· τὰ δ᾽ ὄπισθεν καὶ τὰ κάτω, τῶν θηλειῶν. τοῦτο δὲ καὶ ἐπ᾽ ἀνθρώπου, καὶ ἐπὶ τῶν ἄλλων ζῴων τῶν πεζῶν καὶ ζῳοτόκων πάντων τοῦτον ἔχει τὸν τρόπον. καὶ ἀνευρότερον τὸ * καὶ ἀναρθρότερον τὸ θῆλυ μᾶλλον, καὶ λεπτοτριχότερον, ὅσα ἔχει τρίχας· τὰ δὲ μὴ τρίχας ἔχοντα, [κατὰ] δ᾽ αἱ ἀνάλογον. καὶ ὑγροσαρκότερα τὰ θήλεα τῶν ἀρρένων, καὶ γονυκροτώτερα, καὶ αἱ κνῆμαι λεπτότεραι· τοὺς δὲ πόδας γλαφυρωτέρους, ὅσα ἔχει ταῦτα μόρια, [ἔχει] τῶν ζῴων. καὶ περὶ φωνῆς δὲ, πάντα τὰ θήλεα λεπτοφωνότερα καὶ ὀξυφωνότερα, πλὴν βοὸς, ὅσα ἔχει φωνήν. οἱ δὲ βόες, βαρύτερον φθέγγονται αἱ θήλειαι τῶν ἀρρένων. τὰ δ᾽ εἰς ἀλκὴν ἐν τῇ φύσει ὑπάρχοντα μόρια, οἷον ὀδόντες καὶ χαυλιόδοντες, καὶ κέρατα καὶ πλῆκτρα, καὶ ὅσα ἄλλα τοιαῦτα μόρια, ἐνίοις μὲν γένεσιν ὅλως τὰ μὲν ἄρρενα ἔχει, τὰ δὲ θήλεα οὐκ ἔχει, οἷον κέρατα ἔλαφος θήλεια οὐκ ἔχει, καὶ τῶν ὀρνίθων ἐνίων τὰ πλῆκτρα ἐχόντων, αἱ θήλειαι ὅλως τὰ πλῆκτρα οὐκ ἔχουσιν· ὁμοίως δὲ καὶ χαυλιόδοντας αἱ θήλειαι οὐκ ἔχουσι τῶν ὑῶν. ἐνίοις δ᾽ ὑπάρχει μὲν ἀμφοῖν, ἀλλὰ κρείττω τοῖς ἄρρεσι μᾶλλον, οἷον τὰ κέρατα τῶν ταύρων ἰσχυρότερα, ἢ τὰ τῶν θηλειῶν βοῶν.

* κινοσπίεω. [illegible]

* Sylburg. ἰχθύσιν, vt alibi.

* Gaza. ἀναιμο[illegible] vel ἀνα[illegible]

* Lib. 5. c. 5.

* γε. ἀναρθρ. alij ἐναρθρότερα. Physiognom. cap. 5.

A scilicet alteram caput habere amplius, atque oblongius: alteram, hoc eſt, fœminam, repandius: hæc non maris ac fœminæ differẽtia eſt, ſed generis. Sunt enim piſcium nonnulli epitragæ ab hirci ſterilitate appellati: quo in genere cyprini, & balagri ex amnicis annotantur, [illegible] ouum, nec ſemen vllum profluentium habeant, ſed qui ſolidiores pinguioreſque in eo genere ſunt, iis inteſtinum paruum eſt, & hi ſunt præcipua in paſtu. Ad hæc, in teſtaceis, atque in ſtirpibus quod pariat, & generet, eſt: quod autem maris fungatur officio, deeſt. Sic etiam inter piſces genus paſſerum eſt, & rubelliorum, & hiatularum: oua enim in iis omnibus reperiun-
B tur. Sed in pedeſtribus ſanguineis non ouiparis, maxima ex parte maiores, longioriſque vitæ ſunt mares quam fœminæ: præter quam in genere mulorum: eius enim fœminæ & maiores ſunt & viuaciores, quam mares. at in iis quæ aut ouum pariunt, aut vermem, vt piſcibus atque inſectis, fœminæ maiores ſuis maribus euadunt, vt ſerpentes, phalangia, ſtelliones, ranæ, & inter piſces puſilli cartilaginei generis, & pari plurima gregalium, & genus omne ſaxatile. Fœminas autem piſcium maribus eſſe viuaciores conſtat, eo quod fœminæ vetuſtiores quam mares capiuntur. Partes ſuperiores prioreſque in quo-
C cunque animalium genere, maribus ſunt potiores, validiores, & aptiores. Quæ autem dici poſſunt inferiores, poſterioreſque, eas fœminæ habent robuſtiores, tum in hominibus, tum in cæteris animalibus omnibus, quæ pedeſtria ſunt, atque animal generant. Quod tamen omnino dixerim, fœmina inneruior, atque infirmior eſt: pilum etiam habet tenuiorem quam mas: aut quod vice pili ad proportionem haberi natura ſtatuerat. Caro quoque humidior eſt fœminæ, quam maris, & genua pleniora, & crura tenuiora: ſed pedes elegantiores, videlicet quocunque in genere hæ partes habentur. Vox item fœminis o-
D mnibus tenuior, & acutior, boue excepto: bubus etenim fœminis vox grauior, quam maribus eſt. Partes autem, quas velut arma natura animalibus dedit, vt dentes, cornua, calcaria, & cætera generis eiuſdem, ea certe in nonnullis generibus omnino vt mares habent, ſic fœminæ non habent: vel in genere ceruini, fœmina cornuum inops, mutilaque eſt: & auium nonnullarum quibus data calcaria ſunt, fœmina omnino iis caret: pari modo, ſues fœminæ dentibus vacant exertis: at in nonnullis generibus ſunt quidem hæc ſexui vtrique, ſed maribus potiora: vt cornua tauri robuſtiora, quam vaccæ.

E

A

ARISTOTELIS STAGIRITÆ, de Hiſtoria Animalium,

LIBER V.

CAPVT I.

Omnium animantium generis partitio.

EXpoſui partes animalium omniũ, tum interiores, tum exteriores: atque etiam de ſenſibus, de voce, de ſomno, & quæ fœminæ mareſve B ſint, ſatis iam explicaſſe exiſtimo. Reſtat, vt eorumdem generationes perſequamur: exorſique item à primis, ordine apto & commodo diſſeramus. Sunt porrò generationes animalium multæ, ac variæ: partim diſſimiles, partim quodammodo ſimiles. Sed cùm genera antè, vt res exigit, digeſſerimus, nunc quoque eodem modo tractare tentemus, præterquam quod initium tunc ab homine, cùm de partibus ageremus, ſumendum cenſuimus: nunc de eo nouiſſimè diſſerere placet, quoniam plurima ipſe de ſe afferat explicanda. Ergo ordiendum ab iis eſt quę teſta integuntur: mox de iis quæ cruſta ambit, agendum. Et reliqua deinceps ad hunc modum C exponenda ſunt, hoc eſt, mollia, & inſecta. Deinde piſcium genus duplex, ouiparum dico, atque viuiparum. Tum auium genus. Ad poſtremum de pedeſtri dicendum eſt: quo in genere quæ animal generent, quæ oua pariant, prætermittenda non ſunt. Euenit vt commune animalia cum ſtirpibus habeant, quòd alia ſemine, alia ſponte naturæ oriantur. Vt enim ſtirpes aut ſemine ſtirpium aliarum proueniunt, aut ſponte erumpunt, primordio quodam contracto ad ortum idoneo, quarum aliæ ex terra alimentum ſibi hauriunt, aliæ in ſtirpibus aliis & naſci & augeri ſolent, vt in libris de ſtirpibus ſiue plantis expoſuimus: ſic animalia naſci alia ex animalibus ſolent per formę co- D gnationem, alia ſponte, nullo cognationis ſemine antecedente, creantur. quorum alia humo, aut ſtirpe putreſcente conſiſtunt, vt complura inſecta generantur: alia in animalibus ipſis excrementiſque partium gignuntur. Quæ igitur niſi ſui cognati ſemine nunquam procreentur, iis omnibus ortus per coitum eſt, dummodo ſexus diſcrimen id habeant, quod marem ac fœminam deſcribere poteſt. Nam in piſcium genere, nonnulla nec mares nec fœminæ gignuntur: quæ licèt genus idem cum aliis ſortiantur, tamen ſpecie differunt. Quædam etiam ſui generis omnino conſiſtunt. Nec deſunt quæ mare vidua, ſexu vno fœmineo formētur: quæ perinde, vt aues, pariunt, quæ vento oua concipiũt: E quibus ab argumento conceptus, nomen hypenemia, quaſi ſubuentanea, inditum eſt. Verùm ea quæ aues concipiunt, omnia ſunt infœcunda. Ita enim eorum natura nihil vltra ouum creare poteſt, niſi quo alio modo maris opera contingat. Sed de his diligentiùs pòſt diſſeremus. Piſcium verò nonnullis cùm ſpontina ediderint oua, euenit vt ex iis animal progeneretur. Sed alia ex ſe ipſa id faciunt, alia non ſine opera maris: vt de his quoque ſequenti diſputatione cōmentabimur planiùs.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζῴων ἱστορίας τὸ Ε.

ΚΕΦΑΛ. α΄.

Ὅτι περὶ γενέσεως ζῴων λοιπὸν διελθεῖν· εἶτα τί διαφέρει τὰ ζῷα περὶ τὰς γενέσεις.

ΟΣΑ μὲν οὖν ἔχουσι μόρια τὰ ζῷα πάντα καὶ τῶν ἐντὸς καὶ τῶν ἐκτὸς· ἔτι B δὲ περί τε τῶν αἰσθήσεων, καὶ φωνῆς, καὶ ὕπνου καὶ ποῖα θήλεα, καὶ ποῖα ἄρρενα, πρότερον εἴρηται περὶ ἁπάντων. περὶ δὲ * τὰς γενέσεις αὐτῶν λοιπὸν διελθεῖν, καὶ πρῶτον περὶ τῶν πρώτων. εἰσὶ δὲ πολλαὶ καὶ πολλὴν ἔχουσαι ποικιλίαν τῇ μὲν, ἀνόμοιοι τῇ δὲ, τρόπον τινὰ παρεοίκασιν ἀλλήλαις. ἐπεὶ δὲ διῄρηται τὰ γένη πρότερον, τὸν αὐτὸν τρόπον καὶ νῦν πειρατέον ποιεῖσθαι τὴν θεωρίαν. πλὴν τότε μὲν τὴν ἀρχὴν ἐποιούμεθα, σκοποῦντες περὶ τῶν μερῶν ἀπὸ ἀνθρώπου· νῦν δὲ περὶ τούτου τελευταῖον λεκτέον, διὰ τὸ πλείστην ἔχειν πραγματείαν. πρῶτον δὲ ἀρκτέον ἀπὸ τῶν ὀστρακοδέρμων· μετὰ C δὲ ταῦτα, περὶ τῶν μαλακοστράκων· καὶ τὰ ἄλλα δὲ τοῦτον τὸν τρόπον ἐφεξῆς· ἔστι δὲ τά τε μαλάκια καὶ τὰ ἔντομα· καὶ μετὰ ταῦτα τὸ τῶν ἰχθύων γένος, τό τε ζῳοτόκον καὶ τὸ ᾠοτόκον αὐτῶν· εἶτα τὸ τῶν ὀρνίθων· μετὰ δὲ ταῦτα, περὶ τῶν πεζῶν καὶ λεκτέον ὅσα τε ζῳοτόκα καὶ ᾠοτόκα. ζῳοτόκα δέ ἐστι, τῶν τετραπόδων ἔνια, καὶ ἄνθρωπος τῶν διπόδων μόνον. κοινὸν μὲν οὖν συμβέβηκε καὶ ἐπὶ τῶν ζῴων, ὥσπερ καὶ ἐπὶ τῶν φυτῶν. τὰ μὲν γὰρ, ἀπὸ σπέρματος ἑτέρων φυτῶν· τὰ δὲ, αὐτόματα γίνεται, συστάσης τινὸς τοιαύτης ἀρχῆς. καὶ τούτων τὰ μὲν, ἐκ τῆς γῆς λαμβάνει τὴν τροφήν· τὰ δ᾽, ἐν ἑτέροις ἐγγίνεται φυ- D τοῖς, ὥσπερ εἴρηται ἐν τῇ θεωρίᾳ τῇ περὶ τῶν φυτῶν. οὕτω καὶ τῶν ζῴων τὰ μὲν, ἀπὸ ζῴων γίνεται κατὰ συγγένειαν τῆς μορφῆς· τὰ δ᾽, αὐτόματα καὶ οὐκ ἀπὸ συγγενῶν. καὶ τούτων τὰ μὲν, ἐκ γῆς σηπομένης καὶ φυτῶν, ὥσπερ πολλὰ συμβαίνει τῶν ἐντόμων· τὰ δ᾽, ἐν τοῖς ζῴοις αὐτοῖς, καὶ ἐκ τῶν ἐν τοῖς μορίοις περιττωμάτων. τῶν δὲ τὴν γένεσιν ἐχόντων ἀπὸ συγγενῶν ζῴων, ὅσοις μὲν αὐτῶν ἐστι τὸ θῆλυ καὶ τὸ ἄρρεν, ἐκ συνδυασμοῦ γίνεται. ἐν δὲ τῷ τῶν ἰχθύων γένει, ἔνια γίνεται οὔτε θήλεα, οὔτε ἄρρενα· τῷ γένει μὲν, ὄντα τῶν ἰχθύων ἑτέροις τὰ αὐτά, τῷ δὲ εἴδει, ἕτερα· ἔνια δὲ, καὶ παντελῶς ἴδια. τὰ δὲ, θήλεα E μὲν ἐστὶν, ἄρρενα δὲ, οὐκέτι· ἐξ ὧν γίνεται ὥσπερ ἐν τοῖς ὄρνισι τὰ ὑπηνέμια. τὰ μὲν οὖν τῶν ὀρνίθων ἄγονα πάντα εἰσὶ ταῦτα· ἀλλὰ μέχρι τοῦ ᾠοῦ γεννᾶν δύναται ἡ φύσις αὐτῶν ἐπιτελεῖν, ἐὰν μή τις αὐτοῖς συμβῇ τρόπος ἄλλος τῆς κοινωνίας πρὸς τοὺς ἄρρενας· περὶ ὧν ἀκριβέστερον ἔσται δῆλον ἐν τοῖς ὕστερον. τῶν δὲ ἰχθύων ἐνίοις, ὅταν αὐτόματα γεννήσωσιν ᾠά, συμβαίνει ἐκ τούτων καὶ ζῷα γίνεσθαι, τελέως τῶν μὲν, καθ᾽ αὑτά, τῶν δὲ, οὐκ ἄνευ ἄρρενος· ὃν δὲ τρόπον, καὶ περὶ τούτων ἐν τοῖς ἐχομένοις ἔσται φανερόν.

* γρ. τὰς φύσεις

σχεδὸν γὰρ παραπλήσια συμβαίνει καὶ ἐπὶ τῶν ὀρνίθων. ὅσα δὲ ἀπὸ τοῦ αὐτομάτου γίνεται ἐν τοῖς ζῴοις, ἢ ἐν γῇ, [ἢ ἐν φυτοῖς,] ἢ ἐν τοῖς τούτων μορίοις, ἔχουσι δὲ τὸ ἄρρεν καὶ θῆλυ, ἐκ τούτων συνδυαζομένων * γίνεται μέν τι τοῦτο, αὐτὸ δ' οὐδὲν οὐθενὸς, ἀλλ' ἀτελές· οἷον ἔκ τε τῶν φθειρῶν ὀχευομένων, αἱ καλούμεναι * κονίδες, καὶ ἐκ τῶν μυιῶν σκώληκες, καὶ ἐκ τῶν * ψυλλῶν σκώληκες ᾠοειδεῖς· ἐξ ὧν οὔτε τὰ γεννήσαντα γίνεται, οὔτε ἄλλο οὐθὲν ζῷον, ἀλλὰ τοιαῦτα μόνον. πρῶτον μὲν οὖν περὶ τῆς ὀχείας λεκτέον, πόσα ὀχεύεται· εἶτα μετὰ ταῦτα περὶ τῶν ἄλλων ἐφεξῆς, τά τε καθ' ἕκαστα καὶ κοινῇ συμβαίνοντα περὶ αὐτῶν.

* Gaza legit, γίνεται μέν τι, ἐκ τούτου δὲ οὐκέτι οὐθέν. Sylb.
* Sic ſcribendum, non κνίδες, vt notat Ammonius.
* Sylburg. ψυχῶν h. e. *papilionum*. & ita legitur De gener. animalium lib. 1. c. 18.

Simile enim ferè & in genere auium exiſtit. Quæ autem per ſe, vel in animali, vel in terra, vel in ſtirpe, vel etiam in eorum ipſorum partibus creantur, eademque maris ac fœminæ ſexu diſtincta ſunt, iis coeuntibus gignitur quidem aliquid, ſed ex quo nihil amplius gigni poſſit: verbi gratia, coitu pediculorum, lendes dictæ procreãtur: muſcarum, vermiculi: pulicum, genus vermiculorum oui ſpeciem referens, ex quibus nec ea quæ generarint, proueniunt, nec aliud vllum animal, ſed id quod ſunt, ſordes tantùm perſiſtunt. Primùm igitur de iis quæ ſolent coire, dicendum eſt: mox de cæteris ex ordine, quæ vel ſingulatim vel ex communi accidunt ratione, exponemus.

ΚΕΦΑΛ. β'.

Πῶς ὀχεύεται τῶν ζῴων ἕκαστον.

Ὀχεύεται μὲν οὖν ταῦτα τῶν ζῴων, ἐν οἷς ὑπάρχει τὸ θῆλυ καὶ τὸ ἄρρεν. εἰσὶ δὲ αἱ ὀχεῖαι, οὐθὲν ὅμοιαι πᾶσιν, οὐδ' ὁμοίως ἔχουσαι. τὰ μὲν γὰρ ζῳοτόκα καὶ πεζὰ τῶν ἐναίμων, ἔχει μὲν ὄργανα πρὸς τὴν τοιαύτην πρᾶξιν ἅπαντα τὰ ἄρρενα τὴν γεννητικήν· οὐ μὴν ὁμοίως γε πάντα πλησιάζουσιν· ἀλλὰ τὰ μὲν ὀπισθουρητικὰ, συνιόντα πυγηδὸν, οἷον λέοντες, καὶ δασύποδες, καὶ λύγκες. τῶν δασυπόδων δὲ πολλάκις ἡ θήλεια προτέρα ἀναβαίνει ἐπὶ τὸν ἄρρενα. τῶν δ' ἄλλων, τῶν μὲν πλείστων, ὁ αὐτὸς τρόπος. τὸν ἐνδεχόμενον γὰρ ποιοῦνται συνδυασμὸν τὰ πλεῖστα τῶν τετραπόδων, ἐπιβαίνοντος ἐπὶ τὸ θῆλυ τοῦ ἄρρενος· καὶ τὸ τῶν ὀρνίθων ἅπαν γένος, οὕτω τε καὶ μοναχῶς. εἰσὶ δὲ διαφοραί τινες καὶ περὶ τοὺς ὄρνιθας. τὰ μὲν γὰρ * συγκαθείσης τῆς θηλείας ἐπὶ τὴν γῆν, ἐπιβαίνει τὸ ἄρρεν, ὥσπερ αἱ νεοττίδες καὶ οἱ ἀλεκτρυόνες· τὰ δὲ, οὐ συγκαθείσης τῆς θηλείας, οἷον καὶ οἱ γέρανοι. ἐν τούτοις γὰρ ὁ ἄρρην * ἐπιπηδῶν ὀχεύει τὴν θήλειαν, καὶ συγγίνεται ὥσπερ τὰ στρουθία ὀξέως. τῶν δὲ τετραπόδων, αἱ ἄρκτοι, παρακεκλιμέναι τὸν αὐτὸν τρόπον, ὅνπερ καὶ τὰ ἄλλα ἐπὶ τῶν ποδῶν ποιούμενα τὴν ὀχείαν, πρὸς τὰ πρανῆ τῶν θηλειῶν τὰ ὕπτια τῶν ἀρρένων. οἱ δὲ χερσαῖοι ἐχῖνοι, ὀρθοὶ τὰ ὕπτια πρὸς ἄλληλα ἔχοντες. τῶν δὲ ζῳοτόκων καὶ μεγέθη ἐχόντων, οὔτε τοὺς ἄρρενας ἐλάφους αἱ θήλειαι ὑπομένουσιν, εἰ μὴ ὀλιγάκις. οὔτε τοὺς ταύρους αἱ βόες, διὰ τὴν τοῦ αἰδοίου συντονίαν, ἀλλ' ὑπάγοντα τὰ θήλεα δέχονται τὴν γονήν. καὶ γὰρ ἐπὶ τῶν ἐλάφων ὦπται τοῦτο συμβαῖνον, τῶν γε τιθασῶν. λύκος δὲ ὀχεύει τὸν αὐτὸν τρόπον ὥσπερ κύων. αἱ δ' αἴλουροι, οὐκ ὄπισθεν συνιόντες, ἀλλ' ὁ μὲν, ὀρθὸς, ἡ δὲ θήλεια, ὑποτιθεῖσα ἑαυτήν. εἰσὶ δὲ τῇ φύσει αἱ θήλειαι ἀφροδισιαστικαὶ, καὶ προσάγονται τοὺς ἄρρενας εἰς τὰς ὀχείας, καὶ συνοῦσαι * κράζουσιν. αἱ δὲ κάμηλοι ὀχεύονται, τῆς θηλείας καθημένης· περιβεβηκὼς δὲ ὁ ἄρρην ὀχεύει οὐκ ἀντίπυγος, ἀλλὰ καθάπερ καὶ τὰ ἄλλα τετράποδα· καὶ διημερεύει τὸ μὲν, ὀχεῦον, τὸ δ' ὀχευόμενον. ἀποχωροῦσι δὲ εἰς ἐρημίαν, ὅταν ποιῶνται τὴν ὀχείαν, καὶ οὐκ ἔστι πλησιάσαι, ἀλλ' ἢ τῷ βοσκοῦντι. τὸ δὲ αἰδοῖον ἔχει ὁ κάμηλος νευρῶδες οὕτως, ὥστε καὶ νευρὰν ἐκ τούτου ποιεῖσθαι τοῖς τόξοις. οἱ δὲ ἐλέφαντες, ὀχεύονται μὲν ἐν ταῖς ἐρημίαις, μάλιστα δὲ περὶ τοὺς ποταμοὺς, καὶ οὗ διατρίβειν εἰώθασιν. ὀχεύεται μὲν ἡ θήλεια, συγκαθίσασα καὶ διαβαίνουσα· ὁ δὲ ἄρρην, ἐπαναβαίνων ὀχεύει.

* γρ. συγκαθιείσης
* γρ. ἐπὶ ποδῶν
* γρ. καλάζουσι. & id ſecutus Gaza.

CAPVT II.

Quomodo quæque animalia generatim coeant.

Coitus nec ſimiles omnium ſunt, nec ſimilem in modum aguntur. Quæ enim ex ſanguineis pedeſtria viuipara ſunt, eorum omnibus maſculis datum quidem eſt membrum ad officium generationis aptum. Verùm non omnia ſimili modo coniunguntur: ſed quæ retro vrinam mittunt, auerſa coeunt, vt leones, lepores, lynces: leporum etiam fœmina * ſæpenumero marem prior ſuperuenit. Cæterorum magna ex parte modus coeundi idem eſt. Plurimæ enim quadrupedes more coeunt iuſto, fœminam ſcilicet mare ſupergrediente. Genus quoque auium omne eodem illo ac ſimplici more coniungitur. Differentias autem vel in auibus has annotamus, vt aliæ fœmina conſidente humi, mare ſuperueniente coeant, vt gallinæ: aliæ non conſidente fœmina, ſed ſtante, vt grues. Et quæ ita coeunt, rem quàm celerrimè peragunt: mas enim ſuperſiliens citò, vt paſſeres, perficit. Quadrupedum vrſæ demiſſis cruribus, quemadmodum cætera, quæ pedibus innitendo exercent Venerem, admota parte maris ſupina, ad dorſum fœminę coeũt. Hermaceis coitus erectis partibus, ſupinis hærentibus ſibi aduerſis. Inter ea quæ animal generant, augentúrque magnitudine inſigni, nec ceruæ mares ſuos patiuntur niſi raro: nec vaccæ tauros, propter rigorem genitalis nimiámque tentiginem, ſed clunibus ſubſidentibus ſemen recipiunt genitale. Sic in ceruis manſuetis fieri viſum eſt. Lupi eodem coeunt modo, quo canes. Pedes non parte poſteriore ſe iungunt, ſed mas ſtat, fœmina ſubiacet. Sunt porro in eo genere fœminæ ipſæ natura libidinoſæ, & ſalaces: itaque mares ad coitum ipſæ frequentes alliciunt, inuitant, cogunt: puniunt etiam, niſi pareant. Cameli ſedente fœmina coeunt, nec auerſi, ſed complectente mare, vt cæteræ quadrupedes agunt, & coitum toto die exercent. Petunt receſſuum ſolitudines, cùm libet coire, nec aliquis eò poteſt tutò accedere, præterquam paſtor armenti. Genitale camelis neruo ita conſtat, vt vel ex eo confici poſſit quo arcus fidiſſimè intendatur. Elephanti etiam ſolitudines petunt coituri: ſed præcipuè ſecus flumina, & qua paſci cõſueuerũt. Subſidit fœmina, clunibúſq; ſubmiſſis inſiſtit pedibus, ac innititur. Mas ſuperueniẽs comprimit, atque ita munere Venereo fungitur.

Vituli marini modo animalium retro mingentium coeunt, & diu ligati in coitu cohærent, vt canes. Genitale iis maribus grande eſt.

CAPVT III.

Quomodo quadrupeda ouipara coeant.

QVin etiam pedeſtrium quadrupedes, quæ oua pariunt, eodem coeunt modo, quo ea quæ animal generant, mare ſuperueniente: vt teſtudo tã aquatilis quàm terreſtris. Habent verò in quod meatus contingant, & quo per coitum adhæreant, vt rana, & paſtinaca, & reliqua generis eiuſdem.

CAPVT IV.

De coitu eorum quæ pedibus carent, longóque ſunt corpore, id eſt, ſerpentum.

QVæ autem pedibus carent, & longo ſunt corpore, vt ſerpentes, vt murænæ, iis coitus circumplexu mutuo ſupinarum partium agitur. Et quidem ſerpentes ita circumvolutæ ſibi ipſæ cohærent, vt vnius ſerpentis bicipitis corpus, totum eſſe videatur. Hoc eodem modo lacertarum etiam genus complexu coit.

CAPVT V.

De coitu piſcium.

PIſces omnes, exceptis planis cartilaginei generis, admotis inuicem partibus ſupinis copulantur. Plani autem eius generis iidémque habentes caudam, vt raia, paſtinaca, & reliqua huiuſcemodi, non ſolùm admotis ſupinis, ſed etiam tergo fœminarum ſupinis marium ſuperpoſitis, modò cauda impedimento nullo ob craſſitudinem ſit, coeunt. at ſquatinæ, & quibuſcũque plenior cauda eſt, his attritu mutuo tantùm partium ſupinarum coitus agitur. Sunt qui ſe vidiſſe confirment nonnulla ex cartilagineis auerſa modo canum terreſtrium cohærere. Fœmina in omni cartilagineo genere maior, quàm mas eſt: quod idem ferè vel in cæteris generibus piſcium eſſe conſtat. Cartilaginea verò, præter ea quæ enumerauimus, ſunt, bos, lamia, aquila, torpedo, rana, omnéque genus muſtelorũ. Sed omnia cartilaginea hunc in modum coire apertiùs notatum à pluribus eſt: morantur enim in coeundo diutiùs omnia, quæ animal generãt, quàm quæ oua. Delphinis quoque, omnique cetario generi hic idem modus eſt coeũdi: planis idem admotis partibus agunt: nec parum multúmve tẽporis, ſed mediocre in coitu ipſo conſumunt. Differunt nonnulli mares cartilaginei generis à ſuis fœminis, eo quod maribus bina quædam circa excrementi oſtium pendent, quibus fœminæ careant, vt perſpici in genere muſtelorum poteſt: in his enim, quod dixi, omnibus eſt. Teſtes igitur nec piſces habent, nec vllum aliud genus, quod careat pedibus: ſed binos meatus, tum ſerpentes tum etiam piſces maſculi continent, qui fœtifico ſemine, cùm coeũdi eſt tempus, implentur, & lacteum omnes emittunt humorem. Colligunt hi ſeſe in vnum caput, quemadmodum in auium genere vnitur quod ſubeat. Cõtinent enim aues intus ſuos teſtes, ac cętera animalia, quæ & pedes habent, & oua pariunt.

A ὀχεύεται δὲ καὶ ἡ φώκη, καθάπερ καὶ τὰ ὀπισθουρητικὰ τῶν ζῴων, καὶ συνέχονται ἐν τῇ ὀχείᾳ πολὺν χρόνον, ὥσπερ καὶ αἱ κύνες. ἔχουσι δὲ τὸ αἰδοῖον μέγα οἱ ἄρρενες.

ΚΕΦΑΛ. γ'.

Περὶ τῆς τῶν τετραπόδων καὶ ᾠοτόκων ὀχείας.

ΤΟν αὐτὸν δὲ τρόπον, καὶ τῶν πεζῶν τὰ τετράποδα καὶ ᾠοτόκα ποιεῖται τὴν ὀχείαν. τὰ μὲν γὰρ, ἐπιβαίνοντα, καθάπερ τὰ ζῳοτόκα, οἷον χελώνη καὶ ἡ θαλαττία, καὶ ἡ χερσαία. ἔχουσι δὲ τι εἰς ὃ οἱ πόροι συνάπτουσιν,
B καὶ ᾧ ἐν τῇ ὀχείᾳ πλησιάζουσιν, οἷον τρυγόνες καὶ βάτραχοι, καὶ πᾶν τὸ τοιοῦτον γένος.

ΚΕΦΑΛ. δ'.

Περὶ τῆς τῶν ἀπόδων καὶ μακρῶν ζῴων ὀχείας.

ΤΑ δὲ ἄποδα καὶ μακρὰ τῶν ζῴων, οἷον ὄφεις τε καὶ μύραινα, * περιπλεκόμενοι τοῖς ὑπτίοις πρὸς τὰ ὕπτια. οὕτω δὲ σφόδρα οἱ ὄφεις περιελίττονται ἀλλήλοις, ὥστε δοκεῖν ἑνὸς ὄφεως δικεφάλου εἶναι τὸ σῶμα ἅπαν. τὸν αὐτὸν δὲ τρόπον καὶ τὸ τῶν σαυρῶν γένος. ὁμοίως γὰρ τῇ περιπλοκῇ ποιοῦνται τὴν ὀχείαν. * ἢ συμπλεκόμενοι

G

ΚΕΦΑΛ. ε'.

Περὶ τῆς ὀχείας τῶν ἰχθύων.

ΟΙ δὲ ἰχθύες πάντες, ἔξω τῶν πλατέων σελαχῶν, * παραπίπτοντες τὰ ὕπτια πρὸς τὰ ὕπτια, ποιοῦνται τὸν συνδυασμόν. τὰ δὲ πλατέα καὶ κερκοφόρα, οἷον βάτος καὶ τρυγὼν, καὶ τὰ τοιαῦτα, οὐ μόνον παραπίπτοντα, ἀλλὰ καὶ ἐπιπίπτοντα τοῖς ὑπτίοις ἐπὶ τὰ πρανῆ τῶν θηλειῶν, ὅσοις ἂν μὴ ἐμποδίζῃ τὸ οὐραῖον, οὐδὲν ἔχον πάχος. αἱ δὲ ῥῖναι, καὶ ὅσοις τῶν τοιούτων πολὺ τὸ οὐραῖον, παρατριβό-
D μενα μόνον ὀχεύεται τὰ ὕπτια πρὸς τὰ ὕπτια. εἰσὶ δέ τινες οἱ ἑωρακέναι φασὶ καὶ ὄπισθεν συνεχόμενα τῶν σελαχῶν ἔνια, ὥσπερ τοὺς κύνας φασίν. ἔστι δ' ἐν πᾶσι τοῖς σελαχώδεσι μείζων ὁ θῆλυς τοῦ ἄρρενος. σχεδὸν δὲ καὶ ἐν τοῖς ἄλλοις ἰχθύσι τὰ θήλεα μείζω τῶν ἀρρένων. σελάχη δέ ἐστι τά τε εἰρημένα, καὶ βοῦς, καὶ λάμια, καὶ ἀετὸς, καὶ νάρκη, καὶ βάτραχος, καὶ πάντα τὰ γαλεώδη. τὰ μὲν οὖν σελάχη πάντα τεθεώρηται μᾶλλον ὑπὸ πολλῶν τοῦτον ποιούμενα τὸν τρόπον τὴν ὀχείαν. χρονιωτέρα γὰρ ἡ συμπλοκὴ πάντων τῶν ζῳοτόκων, ἢ τῶν ᾠοτόκων. καὶ δελφῖνες δὲ, καὶ πάντα τὰ κητώδη, τὸν αὐτὸν τρόπον. παραπίπτοντα γὰρ ὀχεύει παρὰ τὴν
E θήλειαν τὸ ἄρρεν, καὶ χρόνον οὔτε ὀλίγον, οὔτε λίαν πολύν. διαφέρουσι δ' ἔνιοι τῶν σελαχωδῶν ἰχθύων οἱ ἄρρενες τῶν θηλειῶν, τῷ τοὺς μὲν ἔχειν ἀποκρεμάμενα ἄττα δύο περὶ τὴν ἔξοδον τῆς περιττώσεως, τὰς δὲ θηλείας ταῦτα μὴ ἔχειν, οἷον ἐν τοῖς γαλεώδεσιν. ἐπὶ γὰρ τούτων ὑπάρχει πάντων τὸ εἰρημένον. ὄρχεις μὲν οὖν οὔτε ἰχθὺς, οὔτε ἄλλο τῶν ἀπόδων ἔχει οὐθέν. πόρους δὲ δύο οἱ ὄφεις καὶ οἱ ἰχθύες οἱ ἄρρενες ἔχουσιν, οἳ γίνονται καὶ * θοροῦ πλήρεις περὶ τὴν τῆς ὀχείας ὥραν, καὶ προΐενται ὑγρότητα γαλακτώδη πάντες. ἔτι δ' οἱ πόροι εἰς ἓν συνάπτουσιν, ὥσπερ καὶ τοῖς ὄρνισιν. οἱ γὰρ ὄρνιθες ἐντὸς ἔχουσι τοὺς ὄρχεις, καὶ τὰ ἄλλα πάντα, ὅσα ᾠοτοκεῖ πόδας ἔχοντα.

* Quid. παραπίπτοντες. al. ἐπιπίπτοντες.

Lib. 4 c. vlt.

* γρ. θόρου

τοῦτο δὴ συμπεραίνει καὶ ἐπεκτείνεται εἰς τὴν τοῦ θήλεος χώραν καὶ ὑποδοχήν. ἔστι δὲ τοῖς μὲν ζῳοτόκοις καὶ πεζοῖς ὁ αὐτὸς πόρος τοῦ σπέρματος, καὶ τοῦ τοῦ ὑγροῦ περιττώματος ἔξωθεν· ἔσωθεν δὲ, ἕτερος πόρος, ὥσπερ ἐλέχθη * πρότερον ἐν τῇ διαφορᾷ τῇ τῶν μορίων. τοῖς δὲ μὴ ἔχουσι κύστιν, ὁ αὐτὸς καὶ τοῦ ξηροῦ περιττώσεως πόρος, ἔξωθεν· ἔσωθεν δὲ, σύνεγγυς ἀλλήλων. ὁμοίως δὲ ταῦτα ἔχει τοῖς θήλεσιν αὐτῶν καὶ τοῖς ἄρρεσιν. οὐ γὰρ ἔχουσι κύστιν, πλὴν χελώνης. αὕτη δὲ ἡ θήλεια ἕνα πόρον ἔχει, καίτοι κύστιν * ἔχουσα· αἱ χελῶναι δὲ, τῶν ᾠοτοκούντων εἰσίν. ἡ δὲ τῶν ᾠοτοκούντων ἰχθύων ὀχεία, ἧττον γίνεται κατάδηλος. διόπερ οἱ πλεῖστοι νομίζουσι πληροῦσθαι τὰ θήλεα * τῶν ἀρρένων * ἀνακάπτοντα τὸν θορόν. τοῦτο γὰρ πολλάκις ὁρᾶται γινόμενον. περὶ γὰρ τὴν τῆς ὀχείας ὥραν, αἱ θήλειαι τοῖς ἄρρεσιν ἑπόμεναι, τοῦτο δρῶσι, καὶ κόπτουσιν ὑπὸ τὴν γαστέρα τοῖς στόμασιν· οἱ δὲ θᾶττον προΐενται, καὶ μᾶλλον. κατὰ δὲ τὸν τόκον, οἱ ἄρρενες τοῖς θήλεσιν, ἀποτικτουσῶν ἀνακάπτουσι τὰ ᾠά· ἐκ δὲ τῶν περιλειπομένων, γίνονται οἱ ἰχθύες. περὶ δὲ τὴν Φοινίκην, καὶ θήραν ποιοῦνται δι' ἀλλήλων. ἄρρενας μὲν γὰρ ὑπάγοντες κεστρέας, τὰς θηλείας περιβάλλονται συνάγοντες· θηλείας δὲ, τοὺς ἄρρενας. τοῦτο μὲν οὖν, διὰ τὸ πολλάκις ὁρᾶσθαι, τὴν δόξαν ἐποίησε τῆς ὀχείας ταύτης. ποιεῖ δὲ τοῦτο καὶ τὰ τετράποδα τῶν ζῴων. περὶ γὰρ τὴν ὥραν τῆς ὀχείας, ἀπορραίνουσι καὶ τὰ ἄρρενα καὶ τὰ θήλεα, καὶ τῶν αἰδοίων ὀσφραίνονται ἀλλήλων. οἱ γὰρ πέρδικες, ἂν κατ' ἄνεμον στῶσιν αἱ θήλειαι τῶν ἀρρένων, ἔγκυοι γίνονται. πολλάκις δὲ καὶ τῆς φωνῆς, ἐὰν ὀργῶσαι τύχωσι· καὶ ὑπερπετομένων, ἐκ τοῦ καταπνεῦσαι τὸν ἀέρα. χάσκει δὲ καὶ ἡ θήλεια καὶ ὁ ἄρρην, καὶ τὴν γλῶτταν ἔξω ἔχουσι περὶ τὴν τῆς ὀχείας ποίησιν. ἡ δ' ἀληθινὴ σύνοδος τῶν ᾠοτόκων ἰχθύων, ὀλιγάκις ὁρᾶται, διὰ τὸ ταχέως ἀπολύεσθαι παραπεσόντας· ἐπεὶ ὦπται καὶ ἡ ἐπὶ τούτων ὀχεία γινομένη τοῦτον τὸν τρόπον.

Lib. 3 cap. 1.

* γ. ἔχοντα.

Herodotus libro 2.

ΚΕΦΑΛ. ϛʹ.

Περὶ τῆς ὀχείας τῶν μαλακίων.

Τὰ δὲ μαλάκια, οἷον οἱ πολύποδες, καὶ σηπίαι καὶ τευθίδες, τὸν αὐτὸν τρόπον πάντα πλησιάζουσιν ἀλλήλοις. κατὰ στόμα γὰρ συμπλέκονται, τὰς πλεκτάνας πρὸς τὰς πλεκτάνας συναρμόττοντες. ὁ μὲν οὖν πολύπους, ὅταν τὴν λεγομένην κεφαλὴν ἐρείσῃ πρὸς τὴν γῆν, καὶ διαπετάσῃ τὰς πλεκτάνας, ἅτερος ἐφαρμόττει ἐπὶ τὸ πέτασμα τῶν * πλεκτανῶν, καὶ συνεχεῖς ποιοῦνται τὰς κοτυληδόνας πρὸς ἀλλήλας. φασὶ δέ τινες καὶ τὸν ἄρρενα ἔχειν αἰδοιῶδές τι ἐν μιᾷ τῶν πλεκτανῶν, ἐν ᾗ δύο αἱ μέγισται κοτυληδόνες εἰσίν. εἶναι δὲ τὸ τοιοῦτον, ὥσπερ νευρῶδες, μέχρι εἰς μέσην τὴν πλεκτάνην, προσπεφυκὸς ἅπαν εἰς τὸν μυκτῆρα τῆς θηλείας. αἱ δὲ σηπίαι καὶ αἱ τευθίδες νέουσιν ἅμα συμπεπλεγμέναι, τὰ στόματα καὶ τὰς πλεκτάνας ἐφαρμόττουσαι καταντικρὺ ἀλλήλαις, νέουσαι ἐναντίως. ἐναρμόττουσι δὲ καὶ τὸν καλούμενον μυκτῆρα εἰς τὸν μυκτῆρα. τὴν δὲ νεῦσιν, ἡ μὲν, ἐπὶ τὸ ὄπισθεν, ἡ δὲ, ἐπὶ τὸ στόμα ποιεῖται. ἐκτίκτει δὲ κατὰ τὸν φυσητῆρα καλούμενον, καθ' ὃν ἔνιοι καὶ ὀχεύεσθαί φασιν αὐτάς.

* γρ. πλεκτανῶν.

A Hoc ergo inſeritur, atque in locos & receptaculum tenditur fœminarum. Pedeſtribus viuiparis idem meatus foris extat, & ſeminis, & excrementitij humoris. alter intus meatus ducitur, vt dixi, cùm partium differentias explicarem. Sed quibus veſica deeſt, iis idem meatus ſicco etiam excremento pertinet foris: intúſque alter iuxtà habetur. quæ quidem ſimiliter tam in fœminis eorum, quàm in maribus ſunt. Carent enim veſica, præter teſtudines, quarum fœminæ ſingularem habent meatum, quanquam veſicam obtineant. Sed teſtudo in eorum quæ oua pariunt genere eſt. Piſcium oua parientium coitus minùs patet, quamobrem complu-B res, fœminas prolificum maris vorando impleri crediderunt. Id enim fieri ſæpius cernitur: nam tempore coitus, fœminæ, mares ſequentes, id faciunt, ventrémque eorum ſuis percutiunt roſtris. Quo etiam fit vt mares ſemen & celeriùs fundant, & largiùs. Tempore autem partus mares fœminas ſequentes, quæ illa oua ediderint, ipſi mordicus vorant: piſces verò ex iis quæ * remanſerint, oriuntur. Circa Phœnicem piſces vel mutuo ſexuum aſpectu capi accepimus: mugiles enim mares à piſcatore ſubducuntur, quorum aſpectu fœminæ congregantur, atque ita obtrtiuntur: verſáque vice mares capiuntur ſubductis fœminis. Sed deuoratio illa ſeminis genitalis, quia ſæpiùs cernitur, argumen-C tum coitus talis ementitur. Faciunt hoc idem quadrupedes quoque. Tempore enim coitus nonnihil humoris ſuo genitali, tum mares, tum etiam fœminæ emittunt, atque admotis ad genitalia naribus odorantur. Perdices, ſi aduerſæ maribus ſteterint, ventúſque inde afflet vbi mares ſtant, concipiunt, & maritantur. * Plerúmque etiam voce marium vtero ingraueſcunt, ſi geſtiunt, ac libidine turgent. Volatu quoque ſuperne marium effici idem poteſt, videlicet dum mas ipſe in fœminam fœtificum ſpiritum demittit. Ore hiante, exertaque lingua, & mares & fœminę coeunt. At verò piſcium oui parorum coitus rarò cernitur, quoniam D congreſſionem quàm primùm digreſſio ſequatur: fieri tamen ita eorum coitum, viſum eſt.

CAPVT VI.

De coitu mollis generis piſcium.

Mollia, vt polypi, ſepiæ, lolligines, modo eodem omnia coeunt: oribus enim inuicem admotis, complexúque mutuo brachiorum libidinem explent. Ergo polypis coitus, cùm alter capite vulgò appellato in terram verſo, nitibũdóque, explicat porrigitque ſua brachia, alter ſuperuenit, paſſiſque brachiis ſingulis ad ſingula ſubiacentis, acetabulorum conceptu mutuo adhæreſcit. Ma-E rem etiam nonnulli aiunt gerere, quod genitalis ſpeciem referat, ſuo brachio, in quo duo ampliſſima acetabula habentur. Neruo id quaſi conſtare porrectum ad medium vſque brachium confirmãt, totumque nari fœminæ annecti. Sepiæ ac lolligines ora applicantes, & brachia inter ſe componentes, natantéſque, in aduerſum coeũt. Narem etiam dictam in narem inſerunt. Natatus alteri retrorſum, alteri anteuerſus in os agitur. Pariunt ea ſui corporis parte, quæ fiſtula dicitur, qua & coire eas nonnulli arbitrantur.

CAPVT VII.

De coitu piſcium cruſta opertorum.

GEnera cruſta operta, vt locuſtæ, gamari, ſquillæ, & huiuſmodi reliqua, more quadrupedum retro mingentium coeunt, ſcilicet vt fœmina caudam ſupinam exponat, mas ſuam ſuperponat, & applicet. Coire ſolent ineunte Vere iuxta terram. Iam enim coitus omnium id genus exploratus eſt. Interdum etiam cum ficus maturescunt, coire incipiunt. Hoc eodem modo gamari quoque & ſquillæ coeunt. Cancri parte priore copulantur, ſua opercula loculoſa illa rugoſaque mutua conſertione componentes. Primum cancer minor ab auerſo ſuperuenire ſolet, tum maior, vbi ille ſuperuenerit, vertit ſe in latus. Nulla re differt fœmina a mare, niſi quod operculum applicatile illud amplius, & diſtantius, & hirſutius fœmina gerant, in quo oua pariunt, & qua egerunt excrementum. Membrum autem, quod mas in fœminam inferat, nullum omnino habetur.

CAPVT VIII.

De coitu inſectorum, quoue tempore Venereis ſtimulis magis animalia quæque excitet.

INſecta auerſa coeunt: deinde quod minus eſt, ſuperuenit maius; hoc eſt, mas fœminam. Nec mas in fœminam genitale vllum inſerit membrum more animalium cæterorum: ſed fœmina ſurſum in marem receptum, caudæ vltimum ſuæ meatum quendam producens reflectit: qui in nonnullis maior, quam proportione totius corporis eſſe videtur, cum ipſa parua admodum ſint. Sed ſunt etiam, in quibus minus inconueniens æſtimetur. Planum hoc fuerit, ſi muſcas coitu Venereo copulatas diuiſeris. Tarde etiam, cum coierint, ſeiunguntur digreſſu: diu namque eorum copulatio durat: quod in iis quæ in noſtro conſpectu verſantur, facile patet: verbi cauſa, in muſcis, in ſcarabeis. Omnia enim ad hunc modum coeunt, videlicet muſcæ, ſcarabei, vermicula, phalangia, & ſi quid aliud generis eiuſdem coire ſolet. Phalangiis, quæ texunt, coitus agitur hoc modo: Cum fœmina deductam araneam traxerit, mas eandem mutuo trahit: quod vbi ſæpius fecerint, coeunt, & auerſis clunibus copulantur: nam propter aluum orbicularem modus hic coniungendi iis congruit. Coitum omnium animalium fieri ad hunc modum apertum eſt. Tempora autem coitus deſcripta, & ætates certas ad Venerem ſingulis animalium natura fixit, & ſtatuit. Ergo plurimorum animantium natura vult quidem tum Veneream per id tempus, cum hyemis ceſſante ſæuitia, æſtatis clementia oritur: quod ſane tempus veris eſt, quo plurima & volatilia, & pedeſtria, & natantia ad coitum excitantur. Sed ſunt quæ per autumnum etiam, & hyemem coeant, atque pariant, vt nonnulla cum aquatilium tum volucrum genera. Homini maximè temporibus omnibus opportunus coitus eſt; atque etiam alia plura pedeſtris generis, quæ cum homine viuunt, coitum nullo tempore aſpernantur, videlicet propter teporem, & pabuli vbertatem. Quorum tempus etiam gerendi vteri breue eſt, vt ſuis, vt canis, & volucrum, quæ ſæpius pariunt.

A

ΚΕΦΑΛ. ζ.

Περὶ ὀχείας τῶν μαλακοστράκων.

ΤΑ δὲ μαλακόστρακα ὀχεύεται, οἷον κάραβοι, καὶ ἀστακοὶ, καὶ καρίδες, καὶ τὰ τοιαῦτα, ὥσπερ καὶ τὰ ὀπισθουρητικὰ τῶν τετραπόδων, ὅταν τὸ μὲν ὕπτιον, τὸ δὲ ἐπὶ τούτου τὴν κέρκον ἐπαλλάξῃ. ὀχεύονται δὲ τοῦ ἔαρος ἀρχομένου πρὸς τῇ γῇ. ἤδη γὰρ ὦπται ἡ ὀχεία πάντων τῶν τοιούτων. ἐνίοτε δὲ καὶ ὅταν τὰ σῦκα ἄρχηται πεπαίνεσθαι. τὸν αὐτὸν δὲ τρόπον καὶ οἱ ἀστακοὶ καὶ αἱ καρίδες ὀχεύονται. B οἱ δὲ καρκίνοι, κατὰ τὰ πρόσθια ἀλλήλων συνδυάζονται, τὰ ἐπικαλύμματα τὰ ἐπιπτυσσόμενα πρὸς ἄλληλα συμβάλλοντες. πρῶτον δὲ ὁ καρκίνος ἀναβαίνει ὁ ἐλάττων, ὄπισθεν. ὅταν δὲ ἀναβῇ, ὁ μείζων ἐπὶ πλάγιον ἐπιστρέφει. ἄλλῳ μὲν οὖν οὐθενὶ τὸ θῆλυ τοῦ ἄρρενος διαφέρει, ἀλλ' ἢ ὅτι τὸ ἐπικάλυμμα, μεῖζον καὶ μᾶλλον ἀφεστηκὸς ἔχει τὸ θῆλυ καὶ δασύτερον, εἰς ὃ ἐκτίκτει, καὶ ᾗ τὸ περίττωμα ἐξέρχεται. μόριον δὲ οὐδὲν προΐεται θάτερον εἰς θάτερον.

ΚΕΦΑΛ. η.

C Περὶ ὀχείας τῶν ἐντόμων, καὶ πότε τὰ ζῷα ὁρμᾷ πρὸς τὴν ὀχείαν.

ΤΑ δ' ἔντομα συνδυάζεται μὲν ὄπισθεν, εἶτ' ἐπιβαίνει τὸ ἔλαττον ἐπὶ τὸ μεῖζον· τοῦτο δ' ἐστὶ τὸ ἄρρεν. ἀφίησι δὲ τὸ ὑποκάτωθεν τὸ θῆλυ εἰς τὸ ἄρρεν μόριον, ἀλλ' οὐ τὸ ἄρρεν εἰς τὸ θῆλυ, ὥσπερ ἐπὶ τῶν ἄλλων. φαίνεται δὲ τοῦτο τὸ μόριον ἐν ἐνίοις μεῖζον ἢ κατὰ λόγον τοῦ ὅλου σώματος, καὶ ταῦτα πάνυ μικρῶν ὄντων, ἐν ἐνίοις δ' ἧττον. φανερὸν δ' ἐάν τις διαιρῇ τὰς ὀχευομένας μυίας. ἀπολύονται δ' ἀπ' ἀλλήλων μόλις· πολὺν γὰρ χρόνον ὁ συνδυασμὸς ἐπὶ D τῶν τοιούτων. δῆλον δ' ἐπὶ τῶν ἐν ποσίν, οἷον μυιῶν τε καὶ κανθαρίδων. πάντα δὲ τὸν τρόπον τοῦτον ὀχεύεται, αἵ τε μυῖαι, καὶ αἱ κανθαρίδες, καὶ αἱ σφονδύλαι, καὶ τὰ φαλάγγια, καὶ εἴ τι ἄλλο τοιοῦτόν ἐστι τῶν ὀχευομένων. ὀχεύεται δὲ τὰ φαλάγγια, τῶν γε τὰ ἀράχνια ὑφαινόντων, τοῦτον τὸν τρόπον· ἡ θήλεια ἐπισπᾶται τῶν ἀπὸ τοῦ μέσου ἀραχνίου, πάλιν δ' ὁ ἄρρην ἀντισπᾷ. τοῦτο δὲ ποιήσαντα πολλάκις, οὕτω συνέρχεται καὶ συμπλέκεται ἀνάπαλιν. διὰ γὰρ τὴν περιφέρειαν τῆς κοιλίας, ἁρμόττει ὁ συνδυασμὸς οὗτος. Ἡ μὲν οὖν ὀχεία τῶν ζῴων ἁπάντων τοῦτον γίνεται τὸν τρόπον. E ὧραι δὲ καὶ ἡλικίαι εἰσὶ τῆς ὀχείας ἑκάστοις ὡρισμέναι τῶν ζῴων. βούλεται μὲν οὖν ἡ φύσις τῶν πλείστων, περὶ τὸν αὐτὸν χρόνον ποιεῖσθαι τὴν ὁμιλίαν ταύτην, ὅταν ἐκ τοῦ χειμῶνος μεταβάλλῃ πρὸς τὸ θέρος. αὕτη δ' ἐστὶν ἡ τοῦ ἔαρος ὥρα, ἐν ᾗ τὰ πλεῖστα, καὶ πτηνὰ, καὶ πεζὰ, καὶ πλωτὰ, ὁρμᾷ πρὸς τὸν συνδυασμόν. ποιεῖται δ' ἔνια καὶ μετοπώρου τὴν ὀχείαν καὶ τοῦ χειμῶνος, οἷον τῶν τ' ἐνύδρων ἔνια καὶ τῶν πτηνῶν. ἄνθρωπος δὲ μάλιστα πᾶσαν ὥραν, καὶ τῶν συνοικούντων ζῴων πολλὰ, διὰ τὴν ἀλέαν καὶ εὐτροφίαν, ὅσων καὶ αἱ κυήσεις ὀλιγοχρόνιαι εἰσίν, οἷον ὗς καὶ κύων, Probl. ſect. 4. 29
καὶ τῶν πτηνῶν ὅσα πολλάκις ποιοῦνται τοὺς τόκους.

[illegible]

ΚΕΦΑΛ.

[illegible]

[illegible]

* Fort. [illegible] apud Heſychium. [illegible] vide Athenæum ſub finem ſeptimi.

A Complita etiam educationi ſuorum partuum conſulendo, non niſi commodo tempore coeunt. Stimulatur ad Venerem mas hominum magis tempore hyberno, fœmina æſtiuo. Genus autem auium (vt dictum eſt) parte plurima vêre, ac ineunte æſtate coit, & parit, excepta alcyone, quæ circa brumam parere ſolita eſt. Quamobrem quoties bruma ſerena exiſtit, dies alcyonei appellantur, ſeptem ante brumam, & ſeptem a bruma, vt Simonides quoque ſuo carmine tradidit, vt: *Cum per menſem hybernum Iupiter bis ſeptem moliuit dies tepores, Clementiam hanc temporis nutricem ſacram variæ & pictæ alcyonis mortales dixere.* Tranquillum verò tantiſper

B tempus efficitur, ſi ita euenerit, vt bruma auſtrina Vergiliis Aquilonis fiat. Septem primis diebus nidum conficere auem hanc fertur, reliquis ſeptem parere educareque. Dies alcyoneos fieri circa brumam, non ſemper noſtris locis contingit: at in Siculo mari penè ſemper id euenit. Parit alcyon circiter quinque oua.

CAPVT IX.

Quæ animalia ſemel, quæve pluries, in anno pariant.

C Mergi & gauiæ ſaxis maritimis oua bina ternave pariunt: ſed gauiæ æſtate, mergi a bruma ineunte vêre, & incubant cæterarum auium more, ſed neutra earum auium conditur. Omnium rariſſimum vidiſſe alcyonem eſt: ferè enim circa Vergiliarum occaſum, brumamque ipſam apparet: & vbi primum per portum non pluſ quàm nauem circumvolarit, ſtatim abit, vt nuſquam præterea videatur: quo modo *Steſichorum* quoque eius meminiſſe, notum eſt. *Luſcinia etiam parit* æſtate quinque aut ſex oua. Conditur ab autumno vſque ad vernos dies. Inſecta hyberno quoque tempore gignunt, & ſerenis auſtrinique diebus naſ-

D cuntur ea quæ ſe abdere non ſolẽt, vt muſcæ, formicæ. Semel anno magna pars ſyluestriũ animaliũ parit, quæ ſcilicet non, vt lepores, ſuperfœtãt. Piſces plurimi etiã ſemel pariunt: vt ij quos fuſaneos, ex argumento cognominant, quia fuſim retibus capiantur, vt thunni, ſmariæ, mugiles, ſpuriæ, monedulæ, chromes, paſſeres, & reliqua generis eiuſdẽ, excepto lupo: hunc enim ſoli ex eo genere partus bis anno exercetur, ſed poſterior infirmior eſt. Sarda quoque, & ſaxatiles bis, excepto mullo: hic enim ſolus ter parit, quod ex fœtu ipſo ſtaturáque intelligitur. Ter enim aliquibus in locis partus apparet. Scorpio bis: & Sargus vêre, ac autumno. Salpa ſemel autumno. Thunna etiam ſemel: ſed quo-

E niam partem præmature, partem ſero producat, ſic bis ſœtificare bis creditur. Edit primam partem circa medium Decembrem, a bruma, alteram vêre. Differt mas thunnus à fœmina, eo quòd fœminæ pinnula iuncta ſub ventre eſt, aphareus nuncupata, quæ mari deeſt.

* [illegible]

[illegible], ἐχ. ὁ δ', ἐκ ἔχει ὑπὸ τῇ γαστρὶ πτερύγιον, ὃ καλοῦσιν [illegible]

A

CAPVT X.

Quoties, quibuſve anni temporibus cartilaginea pariant.

CArtilagineorum ſquatina vna bis parit nam & incipiente autumno, & circa Vergiliarum occaſum: ſed per autumnum felicius. Singulis verò fœturis partus ſepteni aut octoni proueniunt. Nonnulli ex muſtelorum genere bis menſe putantur parere, videlicèt qui ſtellari appellantur: quod ideo videtur, quià oua eorum non ſimul perficiuntur. Non deſunt quæ omnibus anni temporibus pariant, vt muræna, cuius partus & numeroſior eſt. Et quæ prodierint ex partu, celeri incremento adoleſcunt, vt & equiſelis: nam eius etiam partus de minimo in maximum celerrimè augetur. Sed muræna omnibus anni temporibus parit, equiſelis vère tantùm. Murus non idem quod muræna eſt: quippe cùm muræna ſit varia, atque infirmior: murus vnicolor, & robuſtus, colore larici arbori ſimilis. Dentes etiam tam intus quàm foris, poſſidet. Sexus diſcrimine perinde ac in cæteris, volunt vt alterum mas ſit, alterum fœmina. Exeunt hæc in terram, & ſæpe ibi ea capiuntur. Fit vt piſces omnes celeri incremento perficiantur: ſed præcipuè graculus inter minora. Solet hic parere iuxta litora, algoſis denſiſque locis. Cernua etiā breui ex paruo inſignem magnitudinem accipit. Limariæ ac thunni in ponto pariunt: nec vſpiam alibi. Mugiles, auratæ, lupi, locis iis maximè edunt, quà flumina exeunt. Orcinæ, ſcorpiones, & multa alia genera in alto fœtificant.

B

C

CAPVT XI.

Quibus menſibus piſces pariant, maiori ex parte.

PAriunt piſces plurima ſui parte menſibus his tribus, Martio, Aprili, Maio: autumno pauci, vt ſalpa, ſargus, & nonnulla alia generis eiuſdem, paulo ante æquinoctium. adde iis torpedinem & ſquatinam. Sunt certè quæ vel per hyemem æſtatémve ſuos edāt partus, vt dictum eſt. Per hyemem lupus, mugilis, acus, per æſtatem menſe Iunio thunna circa ſolſtitium parit. Hæc folliculo quiddam ſimile, in quo oua exigua multaque conſiſtunt. Spargi etiam per æſtatem pariunt, mugilum labeones, ſargones, mucones, capitones. grauéſcere verò menſe Decembri incipiunt, gerúntque diebus tricenis. Mugiles aliquos non coitu ſed limo arenave naſci conſtat. Conceptus igitur piſcium magna ex parte verno agitur tempore: ſed tamen, quod dictum eſt, & æſtate, & autumno, & hyeme, nonnulla coitu implentur. Verùm nec pariter omnibus, aut ſimpliciter, aut generatim id euenit: nec plurimæ parti, vt verno tempore. Nec verò cæteris illis temporibus tam numeroſo partu fœtificatur, quàm vère. Denique latere non decet, vt ſtirpium & quadrupedum animantium generi plurimùm intereſſe ex regione, non ſolùm ad cæteram corporis fœlicitatem, ſed etiam ad coitum partúmque ampliorem: ſic in piſcium quoque ratione locis ipſis diſcrimen plurimum oritur, non ad magnitudinem tantùm, habitúmque vegetiorem, verùm ad coitum etiam & partum, vt eadem alibi pluries generent, alibi minùs.

D

E

ΚΕΦΑΛ. ι.

Ποσάκις καὶ πότε τίκτει τὰ σελάχη.

ΤΩν δὲ σελαχῶν, ἡ μὲν ῥίνη τίκτει δίς. τίκτει γὰρ καὶ ἀρχομένου τοῦ φθινοπώρου, καὶ περὶ τὴν πλειάδος δύσιν. εὐημερεῖ δὲ ἐν τῷ φθινοπώρῳ μᾶλλον. ἔστι δὲ ὁ τόκος γίνεται περὶ ἑπτὰ ἢ ὀκτώ. δοκοῦσι δ' ἔνιοι τῶν γαλεῶν, οἷον αἱ ἀστερίαι, δὶς τοῦ μηνὸς τίκτειν. τοῦτο δὲ συμβαίνει ὅτι οὐχ ἅπαντα λαμβάνει τελείωσιν τὰ ᾠά. ἔνια δὲ τίκτει πᾶσαν ὥραν, οἷον ἡ μύραινα. τίκτει δ' αὕτη πολλὰ ᾠά, καὶ ἐκ μικροῦ ταχεῖαν τὴν αὔξησιν λαμβάνουσι τὰ γινόμενα, ὥσπερ καὶ τὰ τοῦ ἱππούρου. καὶ γὰρ ταῦτα ἐξ ἐλαχίστου μέγιστα γίνεται τάχιστα. ἡ μὲν οὖν σμύραινα, πᾶσαν ὥραν τίκτει. ὁ ἵππουρος δὲ, ἔαρος. διαφέρει δὲ ὁ σμύρος καὶ ἡ σμύραινα. ἡ μὲν γὰρ σμύραινα, διαφόρως ποικίλον καὶ ἀσθενέστερον. ὁ δὲ σμύρος, ὁμόχρους καὶ ἰσχυρός, καὶ τὸ χρῶμα ὅμοιον ἔχει τῇ πίτυϊ, καὶ ὀδόντας ἔχει καὶ ἔσωθεν καὶ ἔξωθεν. φασὶ δ' ὥσπερ καὶ τἆλλα, τὸν μὲν ἄρρενα, τὴν δὲ θήλειαν εἶναι. ἐξέρχονται δὲ ταῦτα εἰς τὴν ξηράν, καὶ λαμβάνονται πολλάκις. συμβαίνει μὲν οὖν πᾶσι ταχεῖαν γίνεσθαι τὴν αὔξησιν τοῖς ἰχθύσιν, οὐχ ἥκιστα δ' ὁ κορακῖνος τῶν μικρῶν. τίκτει δὲ πρὸς τῇ γῇ, καὶ πρὸς τοῖς βρυώδεσι καὶ δασέσι. ταχὺ δὲ καὶ ὁ ὀρφὼς ἐκ μικροῦ γίνεται μέγας. αἱ δὲ πηλαμύδες καὶ οἱ θύννοι τίκτουσιν ἐν τῷ Πόντῳ, ἄλλοθι δ' οὔ. οἱ δὲ κεστρεῖς, καὶ οἱ χρυσόφρυες, καὶ οἱ λάβρακες, μάλιστα οὗ ἂν ποταμοὶ ῥέωσιν. οἱ δὲ ὀρκύνες καὶ * σκορπίδες, καὶ ἄλλα πολλὰ γένη, ἐν τῷ πελάγει.

* κ. σκομβρίδες. minus recte, vt etiam ex Athenæo patet.

ΚΕΦΑΛ. ια.

Πότε τίκτουσιν οἱ ἰχθύες.

ΤΙκτουσι δ' οἱ πλεῖστοι τῶν ἰχθύων ἐν τρισὶ μησί, Μουνυχιῶνι, Θαργηλιῶνι, Σκιρροφοριῶνι. μετοπώρου δ' ὀλίγοι, οἷον σάλπη, καὶ σαργὸς, καὶ ἄλλα τοιαῦτα, μικρὸν πρὸ ἰσημερίας τῆς φθινοπωρινῆς, καὶ νάρκη καὶ ῥίνη. τίκτει δ' ἔνια χειμῶνος καὶ θέρους, ὥσπερ ἐλέχθη πρότερον. χειμῶνος μὲν, λάβραξ, κεστρεὺς, βελόνη. θέρους δὲ, περὶ τὸν * Ἑκατομβαιῶνα, θυννὶς, περὶ τροπάς. τίκτει δὲ θυννὶς ὥσπερ θυλακώδες, ἐν ᾧ μικρὰ πολλὰ καὶ πολλὰ ᾠά. καὶ οἱ ῥυάδες τοῦ θέρους τίκτουσιν. ἄρχονται δὲ κύειν τῶν κεστρέων, οἱ μὲν * χελλῶνες τοῦ Ποσειδεῶνος, καὶ ὁ σαργὸς, καὶ ὁ * μύξων καλούμενος, καὶ ὁ κέφαλος. κύουσι δὲ τριάκοντα ἡμέρας. ἔνιοι δὲ τῶν κεστρέων οὐ γίνονται ἐκ συνδυασμοῦ, ἀλλὰ φύονται ἐκ τῆς ἰλύος καὶ τῆς ἄμμου. ὡς μὲν οὖν ἐπὶ τὸ πολὺ τοῦ ἔαρος τὰ πλεῖστα κυΐσκεται. οὐ μὴν ἀλλὰ καθάπερ εἴρηται, καὶ θέρους ἔνια, καὶ φθινοπώρου, καὶ χειμῶνος. ἀλλ' οὔτε ἅπασιν ὁμοίως τοῦτο συμβαίνει, οὔτε ἁπλῶς, οὔτε καθ' ἕκαστον γένος, ὥσπερ τοῖς πλείστοις τοῦ ἔαρος. οὐδὲ δὴ κύουσι πολλὰ κυήματα ὁμοίως ἐν ταῖς ἄλλαις ὥραις. ὅλως δὲ δεῖ μὴ λεληθέναι, ὅτι ὥσπερ τῶν φυτῶν καὶ τῶν ζῴων τῶν τετραπόδων, πολλὴν αἱ χῶραι ποιοῦσι διαφορὰν, οὐ μόνον πρὸς τὴν ἄλλην τοῦ σώματος εὐημερίαν, ἀλλὰ καὶ πρὸς [τὸ] πλεονάκις ὀχεύεσθαι καὶ γεννᾶν, οὕτω καὶ περὶ τοὺς ἰχθύας πολλὴν ποιοῦσι τὴν διαφορὰν αὐτοὶ οἱ τόποι, οὐ μόνον κατὰ μέγεθος καὶ εὐτροφίαν, ἀλλὰ καὶ κατὰ τοὺς τόκους καὶ τὰς ὀχείας, τῷ ἐνταῦθα μὲν πλεονάκις, ἐνταῦθα δὲ ἐλαττονάκις γίνεσθαι τὰ αὐτά.

* κ. Βοηδρομιῶνος. [illegible]

* Geſnerus χελῶνες vt infr. li. 7. c. 17. & apud Athen.

* κ. μύξος. apud Athen. ὁ μύξος.

A

ΚΕΦΑΛ. ιβʹ.

Πότε τίκτει τὰ μαλάκια, καὶ τὰ ὀστρακόδερμα.

Τίκτει δὲ καὶ τὰ μαλάκια τοῦ ἔαρος,* καὶ ἐν τοῖς πρώτοις τίκτει δὲ τῶν θαλαττίων ἡ σηπία. τίκτει δὲ πᾶσαν ὥραν. ἀποτίκτει δὲ ἐν ἡμέραις δεκαπέντε. ὅταν δὲ* ἀποτίκῃ τὰ ᾠά, ὁ ἄρρην παρακολουθῶν, καταφυσᾷ* τὸν θολόν, καὶ γίνεται στιφρά. βαδίζουσι δὲ κατὰ ζεύγη. ἔστι δὲ ὁ ἄρρην τῆς θηλείας ποικιλώτερος καὶ μελάντερος τὰ νῶτα. ὁ δὲ πολύπους, ὀχεύεται τοῦ χειμῶνος, B τίκτ[illegible] τοῦ ἔαρος, καὶ φωλεύει περὶ δύο μῆνας. τίκτει δὲ [illegible] καθάπερ βόστρυχον, ὅμοιον τῷ τῆς λεύκης καρπῷ. ἔστι δὲ πολύγονον τὸ ζῷον. ἐκ γὰρ τοῦ ἀποτικτομένου, ἄπειρον γίνεται τὸ πλῆθος. διαφέρει δὲ ὁ ἄρρην τῆς θηλείας, τῷ τε τὴν κεφαλὴν ἔχειν προμηκεστέραν, καὶ τὸ καλούμενον ὑπὸ τῶν ἁλιέων αἰδοῖον, ἐν τῇ πλεκτάνῃ λευκόν. ἐπῳάζει δὲ ὅταν τέκῃ· διὸ καὶ χείριστοι γίνονται. οὐ γὰρ νέμονται κατὰ τοῦτον τὸν χρόνον. γίνονται δὲ καὶ αἱ πορφύραι τοῦ ἔαρος, καὶ οἱ κήρυκες λήγοντος τοῦ χειμῶνος. καὶ ὅλως τὰ ὀστρακόδερμα ἔν τε τῷ ἔαρι φαίνεται τὰ καλούμενα ᾠὰ ἔχοντα, καὶ ἐν [illegible] μετοπώρῳ, C πλὴν τῶν ἐχίνων [τῶν] ἐδωδίμων. οὗτοι δὲ μάλιστα μὲν ταύταις ταῖς ὥραις, οὐ μὴν ἀλλὰ καὶ ἀεὶ ἔχουσι, καὶ μάλιστα ταῖς πανσελήνοις, καὶ ταῖς ἀλεειναῖς ἡμέραις, πλὴν τῶν ἐν τῷ εὐρίπῳ τῶν Πυρραίων. ἐκεῖνοι δὲ ἀμείνους τοῦ χειμῶνος. εἰσὶ δὲ μικροὶ μέν, πλήρεις δὲ τῶν ᾠῶν. κύοντες δὲ φαίνονται καὶ οἱ* κοχλίαι πάντες ὁμοίως τὴν αὐτὴν ὥραν.

* Gaza ἢ ἐν τοῖς πρώτοις σηπία. ſublatis reliquis vocibus.

* γ. ἀποτέκῃ

* Voces τὸν θολὸν eſſe inducẽdas docti viri cenſent.

* Sic omnes codices. Gazæ ſunt vmbilici. veteri interpreti *limaca*, vel *limaces*, vt ipſi Gazæ alibi, vt De generatione lib. 3. cap. 11.

ΚΕΦΑΛ. ιγʹ.

D

Περὶ τόκου τῶν ὀρνίθων.

Τῶν δὲ ὀρνίθων τὰ μὲν ἄγρια, ὥσπερ εἴρηται, ἅπαξ ὀχεύεται καὶ τίκτει τὰ πλεῖστα. χελιδὼν δὲ δὶς τίκτει, καὶ ὁ κόττυφος. τὰ μὲν οὖν πρῶτα τοῦ κοττύφου, ὑπὸ χειμῶνος ἀπόλλυται. πρώτιστα γὰρ τίκτει τῶν ὀρνίθων πάντων· τὸν δὲ ὕστερον τόκον, εἰς τέλος ἐκτρέφει. ὅσα δὲ ἥμερα, ἢ ἡμεροῦσθαι δύναται, ταῦτα δὲ πλεονάκις, οἷον αἱ περιστεραὶ κατὰ πᾶν τὸ θέρος, καὶ τὸ τῶν ἀλεκτορίδων γένος. ὀχεύουσι γὰρ καὶ οἱ ἄρρενες καὶ αἱ θήλειαι τῶν ἀλεκτορίδων, καὶ τίκτουσιν αἰεί, πλὴν [τῶν] ἐν τῷ χειμῶνι τροπικῶν ἡμερῶν. τῶν δὲ περιστεροειδῶν τυγχάνει πλείω E ὄντα τὰ γένη. ἔστι γὰρ ἕτερον πελειὰς καὶ περιστερά. ἐλάττων μὲν οὖν ἡ πελειάς· τιθασὸν δὲ γίνεται μᾶλλον ἡ περιστερά. ἡ δὲ πελειάς, καὶ μέλαν, καὶ μικρόν, καὶ ἐρυθρόπουν, καὶ τραχύπουν· διὸ καὶ οὐδεὶς τρέφει. μέγιστον μὲν οὖν τῶν τοιούτων, ἡ φάττα ἐστί. δεύτερον δέ, ἡ οἰνάς· αὕτη δέ, μικρῷ μείζων ἐστὶ τῆς περιστερᾶς. ἐλάχιστον δὲ τῶν τοιούτων, ἡ τρυγών. τίκτουσι δὲ αἱ περιστεραὶ πᾶσαν ὥραν καὶ ἐκτρέφουσιν, ἐὰν τόπον ἔχωσιν ἀλεεινόν, καὶ τὰ ἐπιτήδεια· εἰ δὲ μή, τοῦ θέρους μόνον. τὰ δὲ ἔκγονα, βέλτιστα τοῦ ἔαρος, ἢ τοῦ φθινοπώρου· τὰ δὲ τοῦ θέρους, καὶ ἐν ταῖς θερμημερίαις, χείριστα.

CAPVT XII.

Molle genus piſcium verno tempore parere, ſepiam vero omnibus anni temporibus.

Mollia quoque verno tempore pariunt, & ſepia in primis. Parit hæc omnibus anni temporibus, perſeuerátque in edendo ouorum numero dies quindecim. Quoties autem ediderit, mas è veſtigio ſequens, atramentum ouis ſuperinfundit, atque ita efficitur vt ſolideſcant. Incedere coniugatim ſolent. Mas varius magis quam fœmina, dorſoque atriore eſt. Polypus hyberno tempore coit, B verno parit: latet circiter mẽſes duos. Ouum velut cirrum edit, fructui populi albæ ſimile. Perquam fœcundum hoc animal eſt: nam de eo quod ediderit, copia innumera prouenit. Diſcrepat mas à fœmina, eo quòd capite eſt productiore, &, quod genitale piſcatores appellant, albidum ſuo in brachio continet. Fouet polypus oua, quæ ediderit: quamobrem deterrimi tantiſper efficiuntur. haud enim in paſtum prodire patiuntur. Quinetiam purpuræ vére generantur, & buccina hyeme abeunte. Genus denique omne, quod teſta operitur, verno autumnalíque tempore habere cernuntur ea quæ oua appellant, exceptis echinis cibo idoneis: quippe C quibus etſi per ea tempora præcipuè vbertas ouorum eſt, tamen nullo tempore committitur, vt ouis omnino careant: ſed maximè pleniluniis, diebúſque tepidis reſtituuntur, reddúntque pleniores, præterquam ij quos Pyrræus fert Euripus: nam illi hybernis mẽſibus meliores ſunt, parui quidem, ſed pleni ouorum. Ad hæc vmbilici pariter omnes, hoc eodem tempore ſua oua habere viſuntur.

CAPVT XIII.

De auium fœtura, & quoties, quibúſve anni temporibus hirundo, merula, columba & gallina pariant.

Auium ſylueſtres, vt dixi, ſemel magna ex parte coeunt, atque pariunt. Verùm hirundo bis parit, & merula: ſed eius primi partus intereunt frigore hyberno: omnium namque auium prima hæc parit: poſteriorem autem partum educat, & feliciter ducit ad finem. at vero quæ aut vrbana ſunt, aut traduci poſſunt ad mores mitiores, hæc ſæpius generant, vt columbæ, quæ tota æſtate fœtãt. Gallinæ etiam ineunt, & pariunt omnibus anni temporibus, exceptis brumalibus diebus. Columbacei verò generis plures ſpecies ſunt: eſt enim liuia dicta à liuore, diuerſum certè à columba genus: quippe E quæ minor, quàm columba ſit, & minùs patiens manſueſcere. Liuet etiam plumis, & penè nigricat, & pedibus rubidis, ſcabroſiſque eſt: quas ob res nullus id genus cellare alit. Maximo inter hæc genera corpore ſunt palumbes. Secundum magnitudinis locum vinago obtinet: paulo maior quàm columbus eſt. Minimum ex iis turtur eſt. Pariunt columbæ omnibus anni temporibus, pullóſque educant, ſi locum apricum habeãt, & cibum: ſin minùs, æſtate tantummodo fœtant. Sed proles præſtãtior vére quàm autumno eſt: deterrima æſtate, & omnino tempore calidiore.

CAPVT

CAPVT XIV.

De fœtura viuiparorum animantium: & quo ætatis tempore incipiat, quoue deſinat.

Ætate etiam differunt ad coitum animalia: primùm enim magnæ eorum parti ſemen non ſimul incipit & excerni, & poſſe generare: ſed vis illa prolifica poſtea accedit. Nouellorum enim in omnibus animalium generibus, prima emiſſio ſeminis, aut infœcunda eſt, aut, ſi fœcunda ſit, imbecilliora tamen generat, & pauciora. Quod potiſſimùm in hominum & quadrupedum animal gignentium genere, atque etiam auium, patet: alterum enim prolem pauciorem procreat, alterum oua edit pauciora. Ætas vero accommodata ad coitum quæque ſuo in genere plurima ex parte ferè tempus idem ſortitur: niſi qui præmaturet, & aut aliquam ob rem monſtroſam, aut ex detrimento naturæ, & vitio anticipet. Res igitur homini innoteſcit, tum vocis mutatione, tum etiam teſtium, non magnitudine tantùm, verùm etiam ſpecie, quemadmodum mammis etiam declaratur: ſed præcipuè ortu pilorum pubis. Semen autem ferre incipit circiter annos bis ſeptem: ſed vim genitalem recipit circa annos ter ſeptem. Cæteris animalibus denegata pubertas eſt. Aliis enim nulli omnino dati ſunt pili, aliis ſupina in parte nulli, aut pauciores quàm in prona. At vocem immutari nonnullis apertum eſt. Aliis partes corporis aliæ quædam ſignificant ſemen iam initium vireſque prolificas ſibi trahere. Vox fœminæ magna ex parte acutior, & iunioribus, quàm vetuſtioribus, acutior eſt. Nam ceruini etiam generis mares vocem grauiorem quàm fœminæ mittunt. Vox autem maribus in hoc genere cùm tempus coeundi eſt; fœminis autem cùm metuerint. Breuis vox fœminæ eſt, maris productior, canibus item ſeneſcentibus vox grauior redditur. Equorum etiam voces differe palam eſt. Fœminæ enim ſimul ac natæ ſunt, vocem exiguam mittunt, ac tenuem: mares exiguam quidem & ipſi, ſed pleniorem tamen, & grauiorem, quàm fœminæ, & in dies maiorem reddunt. Bimus cùm eſt, atque inire incipit, vocem magnam grauemque mas mittit: fœmina maiorem, quàm antè, & clariorem vſque ad vigeſimum ætatis annum magna ex parte: ſed ab hoc tempore imbecilliorem tum mares quàm fœminæ reddunt. magna igitur ex parte, vt dixi, vox marium fœminarumque differt, eò quòd mares grauiùs ſonant quàm fœminæ, quorum ſcilicet vox aliqua cum productione emittitur. Verùm non in omnium animalium genere ita agitur. Sunt enim in quibus è contrario fit, vt in bubus. Nam boum fœmina grauiorem quàm mas, agit vocem: & vitulis grauior quàm adultis perfectiſque: quamobrem his caſtratis vox è contrario mutatur: tranſeunt enim quæ caſtrantur, in fœminam. Tempora autem coitus ad hunc modum per ætates natura ſuis animalibus ſtatuit. Oues & capræ anniculæ coeunt, atque vterum ferunt: ſed capræ potius. Mares quoque in iis ipſis generibus eodem illo tempore ineunt: ſed proles differt, quatenus præſtantior ea eſt quam ſeneſcentes mares & fœminæ procrearint. Sues tum mares tum fœminæ coire incipiunt menſe ſuæ ætatis octauo

A

ΚΕΦΑΛ. ιδʹ.

Περὶ ἀρχῆς καὶ τέλους τῆς τῶν ζῳοτόκων ὀχείας τε καὶ ἐγκυήσεως καὶ περὶ τῆς τῶν φωνῶν μεταβολῆς.

Διαφέρουσι δὲ καὶ κατὰ τὴν ἡλικίαν τὰ ζῷα πρὸς τὴν ὀχείαν. πρῶτον μὲν οὖν οὐχ ἅμα τοῖς πολλοῖς ἄρχεται, τό, τε σπέρμα ἐκκρίνεσθαι, καὶ γεννᾶν δύνασθαι, ἀλλ' ὕστερον. τὸ γὰρ τῶν νέων, ἐν πᾶσι τοῖς ζῴοις, τὸ μὲν πρῶτον, ἄγονον· γονίμων δὲ ὄντων, ἀσθενέστερα καὶ ἐλάττω τὰ ἔκγονα. τοῦτο δὲ μάλιστα δῆλον ἐπί τε τῶν ἀνθρώπων καὶ τῶν ζῳοτόκων τετραπόδων, καὶ ἐπὶ τῶν ὀρνίθων. τῶν μὲν
B
γὰρ τὰ ἔκγονα ἐλάττω, τῶν δὲ, τὰ ᾠά. αἱ δὲ ἡλικίαι τοῖς ὀχεύουσιν, αὐτοῖς μὲν πρὸς αὑτοὺς τοῖς γένεσι τοῖς πλείστοις σχεδὸν κατὰ τὸν αὐτὸν γίνονται χρόνον, ἐὰν μή τι προτερῇ, ἢ διά τι τερατῶδες πρᾶγμα, ἢ διὰ βλάβην τῆς φύσεως. τοῖς μὲν οὖν ἀνθρώποις ἐπισημαίνει κατά τε τὴν τῆς φωνῆς μεταβολὴν, καὶ τῶν αἰδοίων, οὐ μόνον μεγέθει, ἀλλὰ καὶ εἴδει· καὶ ἐπὶ τῶν μαστῶν ὡσαύτως· μάλιστα δὲ τῇ τριχώσει τῆς ἥβης. ἄρχεται δὲ φέρειν τὸ σπέρμα περὶ τὰ δὶς ἑπτὰ ἔτη· * γεννητικοὶ δὲ περὶ τὰ τρὶς ἑπτά. τοῖς δὲ * γ. γόνιμοι
ἄλλοις ζῴοις ἥβη μὲν οὐ γίνεται, τὰ μὲν γὰρ, ὅλως οὐκ ἔχει
C
τρίχας, τὰ δ' οὐκ ἔχει ἐν τοῖς ὑπτίοις, ἢ ἐλάττους τῶν ἐν τοῖς πρανέσιν. ἡ δὲ φωνὴ, μεταβάλλουσα ἐνίοις ἔνδηλός ἐστι· τοῖς δὲ, ἕτερα τοῦ σώματος μόρια ἐπισημαίνει τήν τε ἀρχὴν τοῦ σπέρμα ἔχειν, καὶ τὸ γόνιμον. τὴν δὲ φωνὴν ἔχει τὸ θῆλυ ἐν τοῖς πλείστοις ὀξυτέραν, καὶ τὰ νεώτερα τῶν πρεσβυτέρων· ἐπεὶ καὶ οἱ ἔλαφοι οἱ ἄρρενες τῶν θηλειῶν φθέγγονται βαρύτερον. φθέγγονται δὲ οἱ μὲν ἄρρενες, ὅταν ἡ ὥρα τῆς ὀχείας ᾖ· αἱ δὲ θήλειαι, ὅταν φοβηθῶσιν. ἔστι δὲ ἡ μὲν τῆς θηλείας φωνὴ, βραχεῖα· ἡ δὲ τοῦ ἄρρενος, ἔχει μῆκος. καὶ ἡ τῶν κυνῶν γηρασκόντων γὰρ βαρυτέρα φωνή. καὶ τῶν ἵππων δὲ διαφέρουσιν αἱ φωναί. εὐθὺς γὰρ γενόμεναι, ἀφιᾶσι φωνὴν
D
λεπτὴν καὶ μικρὰν αἱ θήλειαι· οἱ δὲ ἄρρενες, μικρὰν μὲν, μείζω μέντοι γε καὶ βαρυτέραν τῆς θηλείας· τῷ δὲ χρόνῳ προϊόντι, μείζονα. διετὴς δὲ ἐπειδὰν γένηται καὶ τῆς ὀχείας ἄρξηται, φωνὴν ἀφίησι μὲν ὁ ἄρρην, μεγάλην καὶ βαρεῖαν· ἡ δὲ θήλεια, μείζω καὶ λαμπροτέραν ἢ πρότερον, ἄχρι ἐτῶν εἴκοσιν ὡς ἐπὶ τὸ πολύ. μετὰ μέντοι τοῦτον χρόνον τοῦτον ἀσθενεστέραν ἀφιᾶσι καὶ οἱ ἄρρενες καὶ αἱ θήλειαι. ὡς μὲν οὖν ἐπὶ τὸ πολὺ, καθάπερ εἴρηται, διαφέρει ἡ φωνὴ τῶν ἀρρένων καὶ τῶν θηλειῶν, ἐν τῷ βαρύτερον φθέγγεσθαι τὰ ἄρρενα τῶν θηλειῶν, ὅσων ἐστὶν * ἀπότασις τῆς φω- * γ. ἀπόστασις
E
νῆς. οὐ μὴν ἐν πᾶσί γε τοῖς ζῴοις, ἀλλ' ἐνίοις τοὐναντίον, οἷον ἐπὶ τῶν βοῶν. ἐπὶ γὰρ τούτων τὸ θῆλυ τοῦ ἄρρενος βαρύτερον φθέγγεται, καὶ οἱ μόσχοι, τῶν τελείων. διὸ καὶ τὰς φωνὰς τὰ ἐκτεμνόμενα μεταβάλλουσιν ἐναντίως. εἰς τὸ θῆλυ γὰρ μεταβάλλουσι τὰ ἐκτεμνόμενα. οἱ δὲ χρόνοι τῆς ὀχείας κατὰ τὴν ἡλικίαν ἔχουσιν ὧδε τοῖς ζῴοις. πρόβατον μὲν καὶ αἲξ, ἀδιετὲς ὀχεύεται καὶ κύει· μᾶλλον δὲ ἡ αἴξ. καὶ οἱ ἄρρενες δὲ ὀχεύουσιν ὡσαύτως. τὰ δὲ ἔκγονα τῶν ἀρρένων, διαφέρει ἐπὶ τούτων καὶ τῶν ἄλλων. οἱ γὰρ ἄρρενες, βελτίους γίνονται ἢ τῷ ὑστέρῳ ἔτει, ὅταν γηράσκωσιν. ὗς δὲ ὀχεύει μὲν καὶ ὀχεύεται πρῶτον ὀκτάμηνος.

τίκτει δ' ἡ θήλεια μὲν, ἐνιαυσία· οὕτω γὰρ συμβαίνει ὁ χρόνος τῆς κυήσεως. ὁ δ' ἄρρην, γονᾷ μὲν ὀκτάμηνος, φαῦλα μέντοι, πρὶν γενέσθαι ἐνιαύσιος. οὐ πανταχοῦ δὲ, ὥσπερ εἴρηται, ὁμοίως συμβαίνουσιν αἱ ἡλικίαι. ἐνιαχοῦ γὰρ ὕες ὀχεύονται μὲν καὶ ὀχεύουσι τετράμηνοι· ὥστε δὲ γεννᾶν καὶ ἐκτρέφειν, ἑξάμηνοι. ἐνιαχοῦ δὲ οἱ κάπροι δεκάμηνοι ἄρχονται ὀχεύειν, ἀγαθοὶ δὲ μέχρι τριετίας. κύων δὲ, ὡς ἐπὶ τὸ πολὺ μὲν, ὀχεύεται ἐνιαυσιαία, καὶ ὀχεύει ἐνιαύσιος· ἐνίοτε δὲ συμβαίνει τοῦτο καὶ ὀκταμήνοις. μᾶλλον δὲ τοῦτο γίνεται ἐπὶ τῶν θηλειῶν ἢ τῶν ἀρρένων. κύει δὲ ἑξήκοντα καὶ μίαν, ἢ δύο ἢ τρεῖς ἡμέρας τὸ μακρότατον· ἔλαττον δ' οὐ φέρει τῶν ἑξήκοντα ἡμερῶν· ἀλλ' ἐάν τι γένηται, οὐκ ἐκτρέφεται εἰς τέλος. τεκοῦσα δὲ, πάλιν ὀχεύεται ἕκτῳ μηνὶ, καὶ οὐ πρότερον. ἵππος δ' ὀχεύειν ἄρχεται διετὴς, καὶ ὀχεύεται, ὥστε καὶ γεννᾶν· τὰ μέντοι ἔκγονα, κατὰ τούτους τοὺς χρόνους ἐλάττω καὶ ἀσθενικώτερα. ὡς δ' ἐπὶ τὸ πλεῖστον, τριετὴς ὀχεύει καὶ ὀχεύεται. καὶ ἐπιδίδωσι δ' ἀεὶ ἐπὶ τὸ βελτίω τὰ ἔκγονα γεννᾶν μέχρις ἐτῶν εἴκοσιν. ὀχεύει δ' ὁ ἵππος ὁ ἄρρην μέχρις ἐτῶν τριάκοντα καὶ τριῶν· ἡ δὲ θήλεια, ὀχεύεται ἄχρις ἐτῶν τετταράκοντα· ὥστε συμβαίνει σχεδὸν διὰ βίου γίνεσθαι τὴν ὀχείαν. ζῇ γὰρ ὡς ἐπὶ τὸ πολὺ ὁ μὲν ἄρρην, περὶ τριάκοντα πέντε ἔτη· ἡ δὲ θήλεια, πλείω τῶν τετταράκοντα. ἤδη δέ τις ἐβίωσεν ἵππος καὶ ἑβδομήκοντα πέντε ἔτη. ὄνος δὲ, τριακοντάμηνος ὀχεύει καὶ ὀχεύεται· οὐ μέντοι γεννᾷ γε, ὡς ἐπὶ τὸ πολύ· ἀλλὰ διετὴς, ἢ καὶ * τριετὴς, ἢ καὶ ἑξάμηνος. ἤδη δὲ καὶ ἐνιαυσία ἐκύησεν, ὥστε καὶ ἐκτραφῆναι· καὶ βοῦς ἐνιαυσία ἔτεκεν, ὥστε καὶ ἐκτραφῆναι· καὶ τοσοῦτον μέγεθος ηὐξήθη ὅσον ἔμελλε, καὶ οὐκέτι. αἱ μὲν οὖν ἀρχαὶ τοῖς ζώοις τούτοις τῆς γεννήσεως τοῦτον ἔχουσι τὸν τρόπον. γεννᾷ δὲ ἄνθρωπος τὸ ἔσχατον μέχρις * ἑβδομήκοντα ἐτῶν ὁ ἄρρην· γυνὴ δὲ μέχρι πεντήκοντα. ἀλλὰ τοῦτο μὲν, σπάνιον γάρ· ὀλίγοις γὰρ * γεγένηται ἐν ταύταις ταῖς ἡλικίαις τέκνα. ὡς δ' ἐπὶ τὸ πολὺ, τοῖς μὲν, πέντε καὶ ἑξήκοντα ὅρος· τοῖς δὲ, πέντε καὶ τετταράκοντα. πρόβατα δὲ, τίκτει μέχρι ἐτῶν ὀκτώ· ἐὰν δὲ θεραπεύηται καλῶς, καὶ μέχρις ἕνδεκα. σχεδὸν δὲ διὰ βίου συμβαίνει ὀχεύειν καὶ ὀχεύεσθαι ἀμφοτέροις. οἱ δὲ τράγοι, πίονες ὄντες, ἧττόν εἰσι γόνιμοι· ἀφ' οὗ καὶ τὰς ἀμπέλους, ὅταν μὴ φέρωσι, τραγᾶν καλοῦσιν· ἀλλὰ προϊσχναινόμενοι, δύνανται ὀχεύοντες γεννᾶν. ὀχεύουσι δὲ οἱ κριοὶ τὰς πρεσβυτάτας πρῶτον· τὰς δὲ νέας, διώκουσι. τίκτουσι δὲ, ὥσπερ εἴρηται ἐν τοῖς πρότερον, αἱ νέαι, ἐλάττω τὰ ἔκγονα τῶν πρεσβυτέρων. κάπρος δὲ, ἀγαθὸς μὲν ὀχεύειν μέχρι ἐπὶ τριετίας. τῶν δὲ πρεσβυτέρων, χείρω τὰ ἔκγονα. οὐ γὰρ ἔτι γίνεται * αὐτῶν ἐπίδοσις, οὐδὲ ῥώμη. ὀχεύει δὲ εἰωθὼς χορτασθεὶς καὶ μὴ προσβιβάσας ἄλλην· εἰ δὲ μὴ, ὀλιγοχρονιωτέρα ἡ ὀχεία γίνεται, καὶ μικρότερα τὰ ἔκγονα. τίκτει δὲ ἐλάχιστα μὲν ὗς, ὅταν * πρωτοτόκος ᾖ· δευτεροτόκος δὲ οὖσα, ἀκμάζει· γηράσκουσα δὲ, τίκτει μὲν ὁμοίως, ὀχεύεται δὲ βραδύτερον. ὅταν δὲ πεντεκαιδεκαέτεις ὦσιν, οὐκέτι γεννῶσιν, ἀλλὰ ἀγριαίνονται. ἐὰν δὲ εὐτραφὴς ᾖ, θᾶττον ὁρμᾷ πρὸς τὰς ὀχείας, καὶ νέα καὶ γηράσκουσα· ἔγκυος δὲ οὖσα, ἐὰν πιαίνηται σφόδρα, ἔλαττον ἔχει τὸ γάλα μετὰ τὸν τόκον.

* Gaza, τριετὴς ἢ ἑξ.

* Gaza, & veteres quidã interpretes, ἑξήκοντα.

* γεγέννηται

De generatione anim. l. 1. c. 18

* γ. αὐτῷ

* Vulgò πρωτόγονος, & δευτερόγονος. mendosè.

A quanquam mas antè quàm ſit anniculus, prolem generat vitioſam: foemina annicula parit: ſic enim tempus gerendi vteri exigit. Sed non omnibus locis eadem ætatis ratio eſt, vt dixi: iam enim ſues nonnuſquam tam mares quàm foeminæ quarto coeunt menſe: ſexto tamen ita, vt vel progenerare & educare poſſint. Nonnuſquam apri menſe decimo inire incipiunt. Valent ij coitu ad triennium. Canes tam mares quàm foeminæ annicul[i] magna quidem ex parte coeunt: ſed nonnunquam vel menſe octauo: quod magis foeminæ euenit quàm mari. Gerit vterum diebus ſexaginta & vno, aut duobus, & ad ſummum tribus: nec minùs quàm ſexaginta diebus. Quòd ſi quid celeriùs B prodierit, educari ac perfici nequit. Cùm peperit, rurſum ſexto pòſt menſe, nec prius coitu impletur. Equus inire tam mas quam foemina incipit biennis, ita vt valeat procreare. Proles tamen per id tempus minor & imbecillior eſt. At verò (quod ex more plurimo agitur) in trimatu coeunt, & proficiunt ſubinde in generando, vt proles præſtantior advſque annos viginti procreetur. Coeunt mares ad annos tricenos ternos, foeminæ ad quadragenos: ita vt per totam ferè vitam coitum equis ſeruari eueniat. Viuit enim magna ex parte mas annos circiter quinque & triginta, foemina plus quàm quadraginta. Iam & quinque & ſexaginta annos vixiſſe equum proditum eſt. Aſinus tam C mas quàm foemina menſe triceſimo coit: ſed magna ex parte nequeunt generare: verùm in bimatu, aut trimatu, & ſemiſſe. Sed iam vel anniculam, ventrem geſſiſſe aſellam aiunt, ita vt quod pepererat, educari ac perfici potuerit. Bos etiam annicula peperit, vt educari augerique quantum genus exigeret, licuerit. Primordia generationis horum animalium ita ſe habere perpenſum eſt. Homo mas, ad annum vſque ſeptuageſimum, videlicet termino vltimo poteſt generare, foemina vſque ad quinquageſimum, verùm id raro. Paucis enim proles in eo ætatis tempore procreata eſt. Sed magna ex parte maribus quintus & ſexageſimus annus finis progenerandi eſt: foeminis, quintus & D quadrageſimus. Oues parere vſque ad annum octauum poſſunt: &, ſi bene curentur, vel in vndecimum facultas pariendi protrahitur. Et quidem fieri poteſt vt etiam per totam ferè vitam coeant tam mares quàm foeminæ. Hirci pingues minùs foecundi ſunt: quorum argumento vites, quoties per nimiam alimenti copiam luxuriantes fructum non ferunt, hirceſcere ruſtici dicunt. Verùm cura extenuandi adhibita, efficitur vt coeant atque procreent. Arietes primùm vetuſtiores foeminas ineunt: nouellas enim minùs perſequuntur. Pariunt, vt dixi, iuniores pauciora quàm vetuſtiores. Apro ad triennium probitas coeundi edurat. vetuſtioribus proles deterior gignitur. E Nullus enim præterea profectus ei accedit, nulla viriũ recreatio. Solet inire pabulo ſatiatus, & cùm alteram non ſubegerit, vel initus breuior agitur, & foetus corpore minore creatur. Pauciſſima ſus edit prima partione, viget ſecunda, nec ſeneſcens copia foetus deficitur, quanquam lentiùs coit. Vbi verò quintumdecimum annũ nacta eſt, non præterea generat, ſed efferatur. Si pinguet, ocyùs & iuuenis & ſeneſcens mouentur ad coitũ. Si grauida admodũ pingueſcat, efficitur vt foeta minus habeat lactis.

ies, quod ad ætatem attinet, optima eſt, cùm ent parentes. Quod ad tempora, præſtantior hyemis initio gignitur: deterrima, quæ æſtate: pe quæ parua, exilis, & perhumida fit. Mas pinguet, inire omnibus anni temporibus poteſt, ſolum interdiu, ſed etiam noctu, aut certè mapotiſſimum tempore. Seneſcens autem miſubinde agit, vt dictum eſt. Sæpe qui vel per tatem, vel per infirmitatem ſuæ naturæ nequeant edite coire, quum fœmina impotens ſuſtinenmans feſſa clunes demittat, cubantes vnà cum mina coeunt. Concipit præcipue ſus, cum libidine geſtiente pruriens auriculas flaccidas mittit: aliter ſemen à vulua reſpuitur, relapſumque euaneſcit. Canes non per totam coeunt vitam, ſed vſque ad quendam ætatis vigorem: ad annos enim duodecim magna ex parte & coeunt, & implentur. Verùm iam aliquibus, tum fœminis tum maribus, vel annum octauum & decimum, atque etiam vigeſimum natis, facultas non defuit prolifici coitus. Nam iis quoque ſenectus vim generandi, pariendique, vt & cæteris, tollit. Camelus ab auerſo vrinam reddit, ſed coit quemadmodum dictum iam eſt. Tempus coeundi in terra Arabia, menſe Septembri: fert ventrem menſes duodecim: parit ſingulos: viuiparum namque eſt. Incipit & mas & fœmina coire in trimatu. Fœmina poſt partum vno interpoſito anno coit. Elephantus fœmina incipit coire anno aut duodecimo, cùm celerrimè: aut quintodecimo, cùm lentiſſimè. Mas quinque, aut ſex annos natus, ſuperuenit ineunte vere: coitum triennio interpoſito repetit. Quam grauidam reddidit, eandem prætereà tangere nunquam patitur. Vterum biennio gerit: parit ſingulos: viuiparum namque eſt. Fœtum magnitudine bimeſtris aut trimeſtris vituli edit. Coitum animalium, quæ non niſi coeundo progenerent, ad hunc modum habere ſe, intelligimus.

τὰ δ' ἔκγονα, κατὰ μὲν τὴν ἡλικίαν, βέλτιστα ἐν ἀκμῇ· κατὰ δὲ τὰς ὥρας, ὅσα τοῦ χειμῶνος ἀρχομένου γίνεται· χείριστα δέ, τὰ θερινά· καὶ γὰρ μικρά, καὶ λεπτά, καὶ ὑγρά. ὁ δὲ ἄρρην, ἐὰν μὲν εὐτραφὴς ᾖ, πᾶσαν ὥραν ὀχεύειν δύναται, καὶ μεθ' ἡμέραν καὶ νύκτωρ· εἰ δὲ μή, μάλιστα τὸ ἕωθεν· καὶ γηράσκων, ἧττον αἰεί, ὥσπερ εἴρηται καὶ πρότερον. πολλάκις δ' οἱ ἀδυνατοῦντες διὰ τὴν ἡλικίαν ἢ ἀσθένειαν, οὐ δυνάμενοι ταχέως ὀχεύειν, κατακλινομένης τῆς θηλείας, διὰ τὸ κάμνειν τῇ στάσει, συγκατακλιθέντες πλησιάζουσι· κυίσκεται δὲ μάλιστα ἡ ὗς, ἐπειδὰν θυῶσα καταβάλλῃ τὰ ὦτα· εἰ δὲ μή, οὐ, ἀλλ'* ἀναθυᾷ πάλιν. αἱ δὲ κύνες, ὀχεύονται οὐ διὰ βίου, ἀλλὰ μέχρι ἀκμῆς τινος. ὡς μὲν ἐπὶ τὸ πολύ, μέχρι ἐτῶν δώδεκα αἵ τ' ὀχεῖαι συμβαίνουσι καὶ αἱ κυήσεις αὐτῶν. οὐ μὴν ἀλλ' ἤδη τισὶ καὶ ὀκτωκαίδεκα ἔτη γεγονόσι καὶ εἴκοσι, συνέβη καὶ θηλείαις ὀχευθῆναι, καὶ ἄρρεσι γεννῆσαι. ἀφαιρεῖται δὲ καὶ τὸ γῆρας, ὥστε μὴ γεννᾶν, μηδὲ τίκτειν, καθάπερ καὶ ἐπὶ τῶν ἄλλων. ἡ δὲ κάμηλος, ἐστὶ μὲν ὀπισθουρητικόν, καὶ ὀχεύεται, ὥσπερ εἴρηται πρότερον· τῆς δ' ὀχείας ὁ χρόνος, ἐν τῇ Ἀραβίᾳ περὶ τὸν μαιμακτηριῶνα μῆνα. κύει δὲ δώδεκα μῆνας, τίκτει δὲ ἕν. ἔστι γὰρ μονοτόκον. ἄρχεται δὲ τῆς ὀχείας ἡ θήλεια, τριέτης οὖσα· καὶ ὁ ἄρρην, τριετὴς ὤν, μετὰ δὲ τὸν τόκον, ἓν ἔτος διαλιποῦσα, ὀχεύεται ἡ θήλεια. ὁ δὲ ἐλέφας, ἄρχεται μὲν βαίνεσθαι, ὁ μὲν νεώτατος, δέκα ἐτῶν· ὁ δὲ πρεσβύτατος, πεντεκαίδεκα· ὁ δ' ἄρρην, βαίνει πέντε ἐτῶν ἢ ἓξ ὤν. χρόνος δὲ τῆς ὀχείας τὸ ἔαρ. πάλιν δὲ βαίνει μετὰ τὴν ὀχείαν διὰ τρίτου ἔτους· ἣν δ' ἂν ἐγκύμονα ποιήσῃ, ταύτης πάλιν οὐχ ἅπτεται. κύει δὲ ἔτη δύο, τίκτει δὲ ἕν· ἔστι γὰρ μονοτόκον· τὸ δ' ἔμβρυον, γίνεται ὅσον μόσχος δίμηνος ἢ τρίμηνος. περὶ μὲν οὖν τῆς ὀχείας τῶν ζῴων τῶν ὀχευομένων, τοῦτον ἔχει τὸν τρόπον.

* Vulgo ἀναθυμιᾷ, quod Gaza ſecutus eſt mendosè vt annotauit Sylburg. ex cap.18.l.6.

CAPVT XV.

De iis, quæ ſilicea integuntur teſta, quæ coitus omnino expertes ſunt.

MOx de generatione eorum quæ vel coeant vel non coeant, commẽtabimur: & primùm de iis quæ ſiliceo tegmine operiũtur: hoc enim vnũ ferè genus totum expers coitus eſt. Purpuræ verno tempore eundẽ in locum ſeſe colligentes condũt quam fauaginẽ nominant, quæ velut fauus eſt apũ: verùm non ita elegans: ſed quaſi è putaminibus cicerum alborum, multa inter ſe compoſita, ſtruem vnam ſua cohæſione coagmẽtarint. Nullum iis patet foramen: neque ex iis purpuræ enaſcuntur, ſed cùm purpuræ, tum etiam reliqua teſtis incluſa, è limo ferè & materia putreſcente oriuntur. Illa verò coagmentatio fauo ſimilis, tanquam purgamentũ, tam iis quàm buccinis euenit: nam buccinis quoq; fauificare in more eſt. Itaque ne ea quidem, quæ ex teſtaceis fauos ſaliuant, alio modo quàm cætera teſtis incluſa generãtur. Verùm melius atque vberius quoties præſunt, quæ eiuſdẽ ſunt generis. Emittũt enim, cum ſuos ordiũtur fauos, mucorẽ quendam, ex quo putamineæ cellulæ illæ conſiſtũt. Hæc ergo rupta diffusáq; omnis humorẽ, quem continebant, in terrã dimittunt: mox eo, quo effuderint loco, gignũtur purpurulæ, exordio admodũ exiguo cõſiſtẽtes, quas ſibi annexas gerũt, quæ grandes capiũtur.

ΚΕΦΑΛ. ιε'.

Πῶς καὶ πόθεν φύονται τὰ ὀστρακόδερμα.

ΠΕρὶ δὲ τῆς γενέσεως τῶν ὀχευομένων καὶ τῶν ἀνοχεύτων λεκτέον, καὶ πρῶτον περὶ τῶν ὀστρακοδέρμων. τοῦτο γὰρ ἐστὶν ἀνόχευτον μόνον, ὡς εἰπεῖν, ὅλον τὸ γένος. αἱ μὲν οὖν πορφύραι, τοῦ ἔαρος συναθροιζόμεναι εἰς ταὐτό, ποιοῦσι τὴν καλουμένην μελίκηραν. τοῦτο δ' ἐστὶν οἷον κηρίον, πλὴν οὐχ οὕτω γλαφυρόν, ἀλλ' ὥσπερ ἂν εἰ ἐκ λεπυρίων* ἢ ἐρεβίνθων λευκῶν πολλὰ συμπλακείη. οὐκ ἔχει δ' ἀνεῳγμένον πόρον οὐδὲν τούτων· οὐδὲ γίνονται ἐκ τούτων αἱ πορφύραι, ἀλλὰ φύονται* καὶ αὗται καὶ τὰ ἄλλα ἐκ τῆς σήψεως καὶ ἰλύος, ὀστρακόδερμα. τοῦτο δὲ συμβαίνει ὥσπερ ἀποκάθαρμα, καὶ ταύταις καὶ τοῖς κήρυξι. κηριάζουσι γὰρ καὶ οἱ κήρυκες. γίνονται μὲν οὖν καὶ τὰ κηριάζοντα τῶν ὀστρακοδέρμων, τὸν αὐτὸν τρόπον τοῖς ἄλλοις ὀστρακοδέρμοις· οὐ μὴν ἀλλὰ μᾶλλον, ὅταν προϋπάρχῃ τὰ ὁμογενῆ. ἀφιᾶσι γάρ, ἀρχόμενα κηριάζειν, γλισχρότητα μυξώδη.* ἐξ ὧν τὰ λεπυριώδη συνίσταται. ταῦτα μὲν οὖν ἅπαντα διαχεῖται. ἀφίησι δ' ὃ εἶχεν, εἰς τὴν γῆν· καὶ ἐν τούτῳ τῷ τόπῳ γὰρ ἐν τῇ γῇ συνίσταται πορφύρεια μικρά, ἃ ἔχουσαι ἁλίσκονται αἱ πορφύραι ἀπ' αὐτῶν.

Dele ἢ cum Gaza

Malim δ' αὐταὶ

Gaza ἀφ' ἧς.

* Gaza mutata distinctione legit, πορφυρῶν· ... & ... ante ... habet ... de pro ... legit ...

ἔνια δ' ἤδη διακεκριμένα τὴν* μορφήν. ἐὰν δὲ πρὶν ἐκτεκεῖν ἁλῶσιν, ἐνίοτε ἐν ταῖς φορμίσιν ὅπου ἔτυχεν ἐκτίκτουσιν, ἀλλ' εἰς τὸν αὐτὸν τόπον, ὥσπερ ἐν τῇ θαλάττῃ· καὶ διὰ τὴν στενοχωρίαν γίνονται οἱονεὶ βότρυς. εἰσὶ δὲ τῶν πορφυρῶν γένη πολλά· καὶ ἔνιαι μὲν, μεγάλαι, οἷον αἱ περὶ τὸ Σίγειον καὶ Λεκτόν· αἱ δὲ, μικραί, οἷον ἐν τῷ Εὐρίπῳ καὶ περὶ τὴν Καρίαν. καὶ αἱ μὲν ἐν τοῖς κόλποις, μεγάλαι καὶ τραχεῖαι, καὶ τὸ ἄνθος αὐτῶν, αἱ μὲν πλεῖσται μέλαν ἔχουσιν, ἔνιαι δ' ἐρυθρὸν μικρόν· γίνονται δ' ἔνιαι τῶν μεγάλων καὶ μναῖαι. αἱ δ' ἐν τοῖς αἰγιαλοῖς καὶ περὶ τὰς ἀκτάς, τὸ μὲν μέγεθος γίνονται μικραί, τὸ δὲ ἄνθος ἐρυθρὸν ἔχουσιν. ἔτι δὲ ἐν μὲν τοῖς βορείοις μέλαιναι, ἐν δὲ τοῖς νοτίοις ἐρυθραί, ὡς ἐπὶ τὸ πλεῖστον εἰπεῖν. ἁλίσκονται δὲ τοῦ ἔαρος, ὅταν κηριάζωσιν· ὑπὸ κύνα δὲ, οὐχ ἁλίσκονται· [οὐ γὰρ νέμονται] ἀλλὰ κρύπτουσιν ἑαυτὰς, καὶ φωλεύουσι. τὸ δὲ ἄνθος ἔχουσιν ἀνὰ μέσον τῆς μήκωνος καὶ τοῦ τραχήλου. τούτων δὲ ἐστὶν ἡ σύμφυσις πυκνή· τὸ χρῶμα δὲ ἰδεῖν ὥσπερ ὑμὴν λευκὸς, ὃν ἀφαιροῦσι. θλιβόμενος δὲ, βάπτει καὶ ἀνθίζει τὴν χεῖρα· διατείνει δ' αὐτὸν, ὥσπερ φλέβα. τοῦτο δὲ δοκεῖ εἶναι τὸ ἄνθος. ἡ δὲ ἄλλη σύμφυσις οἷον στυπτηρίας. ὅταν δὲ κηριάζωσιν αἱ πορφύραι, τότε χείριστον ἔχουσι τὸ ἄνθος. τὰς μὲν οὖν μικρὰς μετὰ τῶν ὀστράκων κόπτουσιν· οὐ γὰρ ῥᾴδιον ἀφελεῖν· τῶν δὲ μειζόνων περιελόντες τὸ ὄστρακον, ἀφαιροῦσι τὸ ἄνθος. διὸ καὶ χωρίζεται ὁ τράχηλος καὶ ἡ μήκων. μεταξὺ γὰρ τούτων τὸ ἄνθος, ἐπάνω τῆς καλουμένης κοιλίας. ἀφαιρεθέντος οὖν, ἀνάγκη διῃρῆσθαι. σπουδάζουσι δὲ ζώσας κόπτειν. ἐὰν γὰρ πρὶν κόπτειν προτέρα ἀποθάνῃ, συνεξεμεῖ τὸ ἄνθος. διὸ καὶ φυλάττουσιν ἐν τοῖς κύρτοις, ἕως ἂν ἀθροίσωσι καὶ σχολάσωσιν. οἱ μὲν οὖν ἀρχαῖοι πρὸς τοῖς δελέασιν οὐ καθίεσαν, οὐδὲ προσῆπτον τοὺς κύρτους· ὥστε συνέβαινεν ἀνασπωμένην, ἤδη πολλάκις ἀποπίπτειν· οἱ δὲ νῦν, προσάπτουσιν, ὅπως ἐὰν ἀποπέσῃ, μὴ ἀπόληται). μάλιστα δὲ ἀποπίπτει, ἐὰν πλήρης ᾖ· κενῆς δὲ οὔσης, ἀποσπασθῆναι χαλεπόν. ταῦτα μὲν οὖν τὰ συμβαίνοντα ἴδια περὶ τὰς πορφύρας ἐστί. τὸν αὐτὸν δὲ (τρόπον ἐκείνοις) ταῖς πορφύραις καὶ οἱ κήρυκες, καὶ τὴν αὐτὴν ὥραν. ἔχουσι δὲ καὶ τὰ ἐπικαλύμματα κατὰ ταὐτὰ ἀμφότερα, καὶ τὰ ἄλλα τὰ στρομβώδη, ἐκ γενετῆς πάντα· νέμονται δὲ ἐξείροντα τὴν καλουμένην γλῶτταν ὑπὸ τὸ κάλυμμα. τὸ δὲ μέγεθος τῆς γλώττης ἔχει ἡ πορφύρα μεῖζον δακτύλου, ᾧ νέμεται καὶ διατρυπᾷ τὰ κογχύλια καὶ τὸ αὑτῆς ὄστρακον. ἔστι δὲ καὶ ἡ πορφύρα καὶ ὁ κῆρυξ ἀμφότερα μακρόβια. ζῇ γὰρ ἡ πορφύρα, περὶ ἔτη ἕξ, καὶ καθ' ἕκαστον ἐνιαυτὸν φανερά ἐστιν ἡ αὔξησις τοῖς διαστήμασι, τοῖς ἐν τῷ ὀστράκῳ τῆς ἕλικος. κηριάζουσι δὲ καὶ οἱ μύες. τὰ δὲ λιμνόστρεα καλούμενα, ὅπου αἱ βόρβοροί εἰσιν, ἐνταῦθα συνίσταται πρῶτον αὐτῶν ἡ ἀρχή. αἱ δὲ κόγχαι, καὶ χῆμαι, καὶ σωλῆνες, καὶ κτένες, ἐν τοῖς ἀμμώδεσι λαμβάνουσι τὴν σύστασιν. αἱ δὲ πῖνναι ὀρθαὶ φύονται* ἐκ τοῦ βύσσου ἐν τοῖς ἀμμώδεσι καὶ βορβορώδεσιν. ἔχουσι δὲ ἐν αὑταῖς πιννοφύλακα, αἱ μὲν καρίδιον, αἱ δὲ καρκίνιον· οὗ στερισκόμεναι, διαφθείρονται θᾶττον. ὅλως δὲ πάντα τὰ ὀστρακώδη γίνεται αὐτόματα ἐν τῇ ἰλύϊ, κατὰ τὴν διαφορὰν τῆς ἰλύος ἕτερα· ἐν μὲν τῇ βορβορώδει, τὰ ὄστρεα· ἐν δὲ τῇ ἀμμώδει, κόγχαι καὶ τὰ εἰρημένα.

* Apud Athen. ἐν τῷ γ'. lib. 3.

A Nonnullæ etiam forma nondum diſtincta cernuntur, ſi forte prius quàm pepererint, capiantur. Foetus interdum per crates & tegetes non qualibet elidunt, ſed congregatæ eôdem, vt facere in mari ſolent. Itaque per anguſtiam, velvti vuæ ſpecie foetus conformatur. Genera purpurarum plura: nonnullę magnitudine augentur inſigni, vt quæ Sigeum, & Lectum, Idæ promontoria, gignuntur. Aliæ paruæ, vt quas Euripus fert, & Caria. Pelagiæ magnæ, ſcabræque ſunt, quarum flos magna ex parte niger: ſed nonnullis rubidus puſillum. Nonnullas ex magnis, vel ad pretium minæ euadere nouimus. Paruæ ad litora & oras repeçiuntur flore rubro. Partes item Aquiloniæ nigras, Auſtrinæ
B rubras magna ex parte ferunt. Capiuntur tempore verno, cùm fauos extruunt. Caniculæ tempore nullæ ferè capiuntur: non enim tantiſper paſcuntur, ſed ſe abſcondunt, & latent. Florem ſuũ inter papauer dictum, & collum, continent, textu ſpiſſiore, aſpectu velvti membranæ candicantis, quam detrahunt. Tingit hæc preſſa, & inficit manum. Pertinet eadem ſuo ſitu, perinde vt vena: idque flos ille celeber putatur: reliquum contextus quaſi alumen eſt. Cùm fauificant purpuræ, tunc deterrimum habent florem. Paruas tundunt cum teſtis: non enim detrahere facile eſt. Maiorum florem teſta ablata detrahunt: quamobrem euenit vt collum à papauere ſeparetur. Flos enim
C poſitus inter hæc eſt, ſupra eam partem quam ventrem appellant. Itaque detracto flore diuidantur partes illæ, neceſſe eſt. Dant operam vt viuæ frangantur: nam ſi priùs quàm fregeris, expirarint, florem omnem cum vita euomunt. Quapropter ſolent eas aſſeruare in naſſis, dum ipſæ ſe colligant, atque requieſcant. Veteres naſſam eſcæ adiunctam demittere non ſolebant: itaque ſæpe accidebat vt purpura iam extracta decideret. at homines noſtræ ætatis adiungunt naſſas, ne ſi decidat, abſoluatur. Quod tunc potiſſimùm euenit, cùm plena eſt. Nam ſi inanis ſit, difficile ſe euellere poteſt. hæc propria eueniunt purpuris. Buccinis etiam modus idem gignendi, qui purpuris, tempúſque
D idem eſt: operculum item oris idem tam huic vtrique generi adhæret natiuum, quàm cæteris turbinatis omnibus. Paſci quoque exerta lingua appellata ſub illo operculo ſolent. Longior digito lingua hæc purpuris eſt, qua paſcitur: & tum conchulas, tum etiam ſui generis teſtam perforare poteſt. Tempus viuendi & purpuris & buccinis longum: annos enim circiter ſex purpuræ viuunt, & ſingulis annis incrementum earum patet per orbes, quibus totidem quot annos habent, teſta intorta cuniculatim in crepidinem deſinit. Mituli enim fauificare ſoliti ſunt. Oſtreis quà coenum, ibi origo conſiſtit. Conchæ, chamæ, vngues, pectines, locis arenoſis ſui ortus initia capiunt. Pin-
E næ erectæ locis arenoſis, coenoſiſque, ex byſſo, id eſt, villo ſiue lana illa pinnali, proueniunt: quæ cuſtodem intra ſe continent, aut ſquillam paruam, aut cancellum: quo quidem cuſtode priuatæ pereunt breui tempore. Teſtacea denique omnia ſponte naturæ in limo diuerſa, pro differentia limi oriuntur: nam in coenoſo oſtreæ, in arenoſo conchæ, & reliqua, quæ modò enumeraui.

A Rimis cauernisque ſaxorum vertibula generantur, & glandes, & quæ per ſumma adhærent, vt patellæ, vt natices. Omnia id genus, celeri incremento augentur: ſed præcipuè purpuræ, atque pectines, quippe quæ anno perfici poſſint. Cancri colore albido, corpore admodum paruo, in nonnullis teſta operti generis naſcuntur, & plurimi quidem in mitulis foliatis: mox in pinnis, quos pinnotheras vocant. Quinetiam in pectunculis, atque oſtreis. Verùm ij nullum conſpicuum capiunt incrementum. Piſcatores cancros eiuſmodi naſci confirmant, vna cum illis, quorum teſtam inhabitant. Latent aliquandiu in arena pectines, ſicut etiam purpuræ. Naſcitur ergo concharum genus quemadmodum expoſitum eſt, ſed locis B variis: nam alia vadis, alia gurgite, alia duris locis, atque aſperis, alia arenoſis: & alia ſedem mutant, alia ſtabiliter degunt. Pinnæ, ex iis quæ ſedem nunquam mutare ſolent, radice innituntur. Vngues & conchæ nulla innitentes radice permanent: euulſæ viuere prætereà nequeunt pinnæ. * Quæ ſtella vocatur, adeo natura calida eſt, vt omnia contacta protinus decoquat. Detrimento etiam ſummo echinis Euripi Pyrrhæi eandem eſſe confirmant. Forma eius ſtellis, quæ pinguntur, ſimilis eſt. Quinetiam qui pulmones appellantur, ſponte proueniunt. Concha, quæ pictoribus vſui eſt, craſſitudine plurimum excedit, & florem illum non intra teſtam, ſed foris habet. Comperiri id genus locis Cariæ potiſſimum nouimus. Cancellus C ille concharum hoſpes, principio ex terra limóque conſiſtit, mox conchulas ingreditur vacuas: vbi cùm excreuerit, tranſit in concham ampliorem, videlicet aut naticis, aut turbinis, aut alicuius ſimilis. Sæpe etiam parua buccina ſubit, ingreſsúſque ampliorem illam gerit pari modo, & viuit in domicilio capaciore, rurſúſque excreſcens aliam petit ampliorem.

CAPVT XVI.

De vrticis, & ſpongiarum genere, quóue modo gignuntur.

D MOdus enim gignendi iis etiam eſt quæ nulla teſta integuntur, vt vrticis & ſpongiis, qui teſta incluſis: per rimas enim, & cauernas, & fauces ſaxorum oriuntur. Genus duplex vrticæ eſt: aliæ enim ſinuoſis adhærent, quæ nunquam à ſaxis abſoluuntur: aliæ plana, & litora amant, quæ ſuis abiunctæ ſedibus vagantur. Patellæ quoque abſolui ſolent, alióque tranſire. Naſci etiam in cubilibus ſpongiarum nouimus beſtiolam aranei ſimilem, nomen pinnothera mutuantem. Degit hæc intra ſpongiarum cubile, & aperiendo claudendóque piſciculos capit. Aperit antequam ingrediantur: clau- E dit, & contrahit, cùm ingreſſi ſunt. Genus ſpongiarum triplex ſtatuitur: nam aliæ raræ, aliæ ſpiſſæ, aliæ quas nominant Achilleas. Tenuiſſimum genus id tertium, & ſpiſſiſſimum, & validiſſimum eſt, quod galeis ocreiſque inſeritur: eóque minus edere ſtrepitum poſſe notatum eſt. Genus hoc inuentu perquam rarum eſt. Quæ autem in genere illo ſpiſſo prædurae ſunt, atque aſperæ, nomine hirci nuncupantur: quæ quidem omnes aut ad ſaxa naſcuntur, aut iuxta litus, lutóque aluntur. Cuius rei argumentum eſt, quòd captæ, limo refertæ omnes cernûtur.

A περὶ τὰς σηραγγώδεις τῶν πετρῶν, * τήθυα, καὶ βάλανοι, καὶ ὅσα ἐπιπολῆς προσπέφυκεν, οἷον αἱ λεπάδες καὶ οἱ νηρεῖται. ἅπαντα μὲν οὖν τὰ τοιαῦτα τὴν αὔξησιν ἐν τάχει λαμβάνει, μάλιστα δ' αἵ τε πορφύραι, καὶ οἱ κτένες· ἐν ἐνιαυτῷ γὰρ πλέα γίνονται. γίνονται δ' ἐν ἐνίοις τῶν ὀστρακοδέρμων καρκίνοι λευκοί, τὸ δὲ μέγεθος πάμπαν μικροί· πλεῖστοι μὲν ἐν τοῖς μυσὶ τοῖς πυελώδεσιν· ἔπειτα ἐν ταῖς πίνναις οἱ καλούμενοι * πιννοθῆραι. γίνονται δὲ καὶ ἐν τοῖς κτενσὶ καὶ ἐν τοῖς λιμνοστρέοις. αὔξησιν δὲ οὐδεμίαν οὗτοι ἐπίδηλον λαμβάνουσι. φασὶ δ' αὐτοὺς οἱ ἁλιεῖς ἅμα συγγίνεσθαι γινομένοις. ἀφανίζονται δέ τινα χρόνον ἐν τῇ ἄμμῳ οἱ κτένες, ὥσπερ καὶ αἱ πορφύραι. φύονται μὲν οὖν τὰ B ὄστρεα, καθάπερ εἴρηται. φύονται δ' αὐτῶν τὰ μὲν ἐν τοῖς τενάγεσι, τὰ δ' ἐν τοῖς * πηλώδεσι τόποις· ἔνια δ' ἐν τοῖς σκληροῖς καὶ τραχέσι· τὰ δ', ἐν τοῖς ἀμμώδεσι. ἔστι τὰ μὲν, μεταβάλλει τοὺς τόπους, τὰ δ' οὔ. τῶν δ' οὖν μὴ μεταβαλλόντων, αἱ μὲν πίνναι, ἐρρίζωνται· οἱ δὲ σωλῆνες καὶ αἱ κόγχαι, ἀρρίζωτοι διαμένουσιν. ὅταν δὲ ἀνασπασθῶσιν, οὐκέτι δύνανται ζῆν. ὁ δὲ καλούμενος ἀστὴρ, οὕτω θερμός ἐστι τὴν φύσιν, ὥσθ' ὅτι ἂν λάβῃ, παραχρῆμα ἐξαιρούμενον * διέφθαρται. φασὶ δ' * καὶ οὗτος τὸ θηρίον [ἐν] τῷ Εὐρίπῳ τῷ Πυρραίων μέγιστον εἶναι. τὴν δὲ μορφὴν ὅμοιον ἐστι τοῖς γραφομένοις. γίνονται δὲ καὶ οἱ καλούμενοι πλεύμονες αὐτόματοι. ὧν δ' οἱ γραφεῖς ὀστρέων χρῶνται, C πάχει τε πολὺ ὑπερβάλλει, καὶ ἔξωθεν τοῦ ὀστράκου τὸ ἄνθος ἐπιγίνεται. εἰσὶ δὲ τὰ τοιαῦτα μάλιστα περὶ τοὺς τόπους τοὺς περὶ Καρίαν. τὸ δὲ καρκίνιον γίνεται μὲν τὴν ἀρχὴν ἐκ τῆς γῆς καὶ ἰλύος· εἶτα εἰς τὰ κενὰ τῶν ὀστράκων εἰσδύεται. καὶ αὐξανόμενον, μετεισδύεται πάλιν εἰς ἄλλο μεῖζον ὄστρακον, οἷον εἴς τε τὸ τοῦ νηρείτου, καὶ τὸ τοῦ στρόμβου, καὶ τῶν ἄλλων τῶν τοιούτων. πολλάκις δὲ καὶ εἰς τοὺς κήρυκας τοὺς μικρούς. ὅταν δὲ εἰσδύῃ, συμπεριφέρει τοῦτο, καὶ ἐν τούτῳ τρέφεται πάλιν· καὶ αὐξανόμενον πάλιν, εἰς ἄλλο μετεισδύεται μεῖζον.

ΚΕΦΑΛ. ιϛ'.

Περὶ κνιδῶν καὶ σπόγγων.

D TOν αὐτὸν δὲ τρόπον γίνονται τοῖς ὀστρακοδέρμοις καὶ τὰ μὴ ἔχοντα ὄστρακα· οἷον αἵ τε κνίδαι καὶ οἱ σπόγγοι, ἐν ταῖς σήραγξι τῶν πετρῶν. τῶν δὲ κνιδῶν δύο γένη. αἱ μὲν γὰρ ἐν τοῖς κοίλοις, οὐκ ἀπολύονται τῶν πετρῶν· * αἱ δ' ἐπὶ τοῖς μείζοσι καὶ ἐπὶ τοῖς πλαταμώδεσιν, ἀπολυόμεναι μεταχωροῦσι. καὶ αἱ λεπάδες δὲ ἀπολύονται καὶ μεταχωροῦσι. τῶν δὲ σπόγγων ἐν ταῖς θαλάμαις γίνονται πιννοφύλακες. ἔστι δὲ ὥσπερ ἀράχνιον ἐπὶ τὴν θαλάμην. καὶ διοίγοντες καὶ συνάγοντες, θηρεύουσι τὰ ἰχθύδια τὰ μικρά· πρὶν μὲν εἰσελ- E θεῖν, διοίγοντες αὐτά· ὅταν δ' εἰσέλθῃ, συνάγοντες. ἔστι δὲ τῶν σπόγγων τρία γένη· ὁ μὲν, μανός· ὁ δὲ, πυκνός· τρίτος δ', ὃν καλοῦσιν Ἀχίλλειον, λεπτότατος καὶ πυκνότατος καὶ ἰσχυρότατος· ὃν ὑπὸ τὰ κράνη καὶ τὰς κνημῖδας ὑποτιθέασι, καὶ ἧττον ἡ πληγὴ ποιεῖ ψόφον· σπανιώτατος δὲ γένος ἐστί. τῶν δὲ πυκνῶν, οἱ σκληροὶ σφόδρα καὶ τραχεῖς τράγοι καλοῦνται. φύονται δ' ἢ πρὸς πέτραις πάντες, ἢ πρὸς ταῖς θισί. τρέφονται δὲ ἐν τῇ ἰλύϊ. σημεῖον δέ· ὅταν γὰρ ληφθῶσι, φαίνονται μεστοὶ ἰλύος·

* γρ. τήθυα,
* γ. πιννοτῆραι.
* Fort. [illegible] vel [illegible], vt notat Sylb.
* γρ. [illegible]
* Geſnerus ita legit, [illegible]
* Scribe, αἱ δ' ἐν τοῖς λείοις [illegible] ſic apud Athen. l. 3

* Gaza, τοῖς προσφυομένοις.
* χ. [illegible]

ὅπερ σημεῖον καὶ τοῖς ἄλλοις * τοῖς φυομένοις ἀπὸ τῆς προσφύσεως ὥσπερ ἡ τροφή. ἀσθενέστεροι δέ εἰσιν οἱ πυκνοὶ τῶν μανῶν, διὰ τὸ τὴν * πρόσφυσιν εἶναι μὴ κατελθοῦσαν. ἔχει δὲ καὶ αἴσθησιν ὥς φασι. σημεῖον δέ· ἐὰν γὰρ μέλλοντος ἀποσπᾶν αἴσθηται, συνάγεται, καὶ χαλεπὸν ἀφελεῖν ἐστι. ταὐτὸ δὲ τοῦτο ποιεῖ καὶ ὅταν ἡ πνεῦμα πολὺ καὶ κλυδών, πρὸς τὸ μὴ ἀποπίπτειν. εἰσὶ δέ τινες οἳ περὶ τούτου ἀμφισβητοῦσιν, ὥσπερ οἱ ἐν Τορώνῃ. φασὶ γὰρ τρέφειν ἐν ἑαυτῷ ζῷα, ἑλμινθάς τε καὶ ἕτερα τοιαῦτα· ἃ ὅταν ἀποσπασθῇ, τὰ ἰχθύδια τὰ πετραῖα κατεσθίει, καὶ τὰς ῥίζας τὰς ὑπολοίπους· ἐὰν δὲ ἀπορραγῇ, φύεται πάλιν ἐκ τοῦ καταλοίπου, καὶ ἀναπληροῦται. μέγιστοι μὲν οὖν οἱ μανοί, καὶ πλεῖστοι περὶ τὴν Λυκίαν. μαλακώτατοι δὲ, οἱ πυκνοί. οἱ γὰρ Ἀχίλλειοι, στιφρότεροι τούτων εἰσίν. ὅλως δὲ οἱ ἐν τοῖς βαθέσι καὶ εὐδιεινοῖς, μαλακώτατοί εἰσι. τὸ γὰρ πνεῦμα καὶ ὁ χειμὼν σκληρύνει, καθάπερ καὶ τὰ ἄλλα τὰ φυόμενα καὶ ἀφαιρεῖται τὴν αὔξησιν. διὸ καὶ οἱ ἐν Ἑλλησπόντῳ τραχεῖς εἰσι καὶ πυκνοί· καὶ ὅλως οἵ τε ἐπέκεινα Μαλέας, καὶ οἱ ἐντὸς, διαφέρουσι μαλακότητι καὶ σκληρότητι. δεῖ δὲ μηδ' ἀλέαν εἶναι σφόδρα. σήπεται γὰρ, ὥσπερ καὶ τὰ φυόμενα. διὸ οἱ πρὸς ταῖς ἀκταῖς εἰσι κάλλιστοι, ἂν ὦσιν ἀγχιβαθεῖς. εὖ γὰρ κέκρανται πρὸς [illegible], διὰ τὸ βάθος. ἄπλυτοι δὲ ὄντες, καὶ ζῶντες, [ἰδεῖν μὲν] εἰσὶ μέλανες. ἡ δὲ πρόσφυσίς ἐστιν οὔτε καθ' ἕν, οὔτε κατὰ πᾶν. μεταξὺ γάρ εἰσι πόροι κενοί. περιτέταται δὲ ὥσπερ ὑμὴν περὶ τὰ κάτω· κατὰ πλείω δέ ἐστιν ἡ πρόσφυσις. ἄνωθεν δὲ οἱ μὲν ἄλλοι πόροι συγκεκλεισμένοι· φανεροὶ δέ εἰσι τέτταρες, ἢ πέντε. διὸ φασίν ἔνιοι τούτους εἶναι καθ' οὓς δέχεται τὴν τροφήν. ἔστι δὲ ἄλλο γένος ὃ καλοῦσιν ἀπλυσίας, διὰ τὸ μὴ δύνασθαι πλύνεσθαι. τοῦτο δὲ τοὺς μὲν μεγάλους πόρους ἔχει, τὸ δὲ ἄλλο, πυκνόν ἐστι πᾶν· ὅλον δὲ πυκνότερον καὶ γλισχρότερόν ἐστι τοῦ σπόγγου, καὶ τὸ σύνολον πλευμονῶδες. ὁμολογεῖται δὲ μάλιστα περὶ πάντων τοῦτο τὸ γένος αἴσθησιν ἔχειν καὶ πολυχρόνιον εἶναι. διάδηλοι δέ εἰσιν ἐν τῇ θαλάττῃ πρὸς τοὺς σπόγγους, τῷ τοὺς μὲν σπόγγους εἶναι λευκούς, ὑφιζούσης τῆς ἰλύος· τούτους δὲ, ἀεὶ μέλανας. τὰ μὲν οὖν περὶ τοὺς σπόγγους καὶ τὴν τῶν ὀστρακοδέρμων γένεσιν, τοῦτον ἔχει τὸν τρόπον.

ΚΕΦΑΛ. ιζ'.

Περὶ καράβων καὶ καρκίνων.

Τῶν δὲ μαλακοστράκων οἱ κάραβοι μετὰ τὴν ὀχείαν κύουσι καὶ ἴσχουσι τὰ ᾠὰ περὶ τοὺς μῆνας, Σκιρροφοριῶνα, καὶ Ἑκατομβαιῶνα, καὶ Μεταγειτνιῶνα· καὶ μετὰ ταῦτα προσαφιᾶσιν ὑπὸ τὴν κοιλίαν εἰς τὰς πτύχας, καὶ αὐξάνεται αὐτῶν τὰ ᾠά, ὥσπερ οἱ σκώληκες. τὸ δ' αὐτὸ τοῦτο καὶ ἐπὶ τῶν μαλακίων ἐστὶ καὶ τῶν ἰχθύων, ὅσα ᾠοτοκεῖ. αὐξάνεται γὰρ πάντων τὸ ᾠόν. τὸ μὲν οὖν ᾠὸν τῶν καράβων ψαθυρόν, διῃρημένον εἰς ὀκτὼ μοίρας. καθ' ἕκαστον γὰρ τῶν ἐπικαλυμμάτων τῶν ἐκ τοῦ πλαγίου πεφυκότων, ἐστὶ χονδρῶδές τι πρὸς ὃ προσπέφυκε, καὶ τὸ ὅλον γίνεται ὥσπερ βότρυς. σχίζεται γὰρ ἕκαστον εἰς πλείω τῶν χονδρωδῶν. ταῦτα δὲ διαστέλλοντι μὲν γίνεται φανερά· προσβλέποντι δὲ συνεστηκός τι φαίνεται.

Quod certè indicat, cæteris quoque adhærentibus, cibum per ipſum annexum hauriri. Imbecilliores propterea ſunt ſpiſſæ, quàm raræ, quia minus alto radicis hæſu innituntur. Senſum etiam ſpongiis eſſe aiunt, argumento, quòd ad euulſoris acceſſum contrahuntur, ita vt euelli difficile ſit. Quod idem etiam faciunt, quoties flatus tempeſtaſque vrget, ne ſua de ſede pellantur. Sed ſunt qui de hoc dubitent, vt qui Toronam incolunt. Narrant tamen procul dubio beſtiolas quaſdam velut tineas, lumbricóſve, & eiuſmodi alias conſiſtere intra ſpongias atque aliquas, & euulſis ſpongiis piſciculi ſaxatiles deuorent, qui vel radices abſumunt totas, quæ inhærentes ſaxis remanſerint. Si euenerit fortè vt ſpongia abrumpatur, reſidua item renaſcitur, & completur. Magnitudine ampliſſima ſolutæ illæ, & raræ ſpongiæ augentur plurimæ, quæ circa Lyciam ſunt. Sed molliſſimæ, quæ ſpiſſæ: nam Achilleæ toroſiores iis conſtant. Omnino quæ altis tranquilliſque inſunt gurgitibus, molliſſimæ ſunt: flatus enim, ac tempeſtates, ſpongias quoque, vt cætera alitilia, reddunt duriores, & incrementum impediunt. Quamobrem ſpongiæ Helleſponti ſpiſſæ, ac duræ ſunt, & omnino, quas mare vltra Maleam promontorium, citràque fert, differunt inter ſe mollitie, duritatéque. Nec calorem immodicum ſpongiæ patiuntur: fit enim eo, more pullulantium putreſcant. Quocirca optimæ iuxta oras comperiuntur ſpongiæ, ſi gurgite alto demerſæ ſunt: commodè enim temperantur propter altitudinem gurgitis. Color illotis viuiſque nigricans eſt. Adhærent nec parte, nec toto: interſunt enim fiſtulæ quædam inanes: ſed pluribus paſſim particulis hæſitant, & quaſi membrana extenta ſubeſſe radicibus earum videtur: supernè autem cæteri meatus concreti propemodum latent. At verò quaterni, aut quini patent, per quos paſci exiſtimantur. Genus item aliud eſt, quod nomen aplyſias inde accepit, quia nunquam lauetur, quaſi illotarium voces. Habet hoc ampliores illos meatus, ſed reliquo toto corpore denſum eſt: nihilo tamen denſius, quàm quæ antè enumerauimus genera, quanquam lentius & ex toto pulmoni ſimilius cernitur. Senſum id genus habere, diúque viuere inter omnes præcipuè conuenit. Cognoſci præ cæteris ſpongiis eo facilè poteſt documento, quòd cùm illæ albicent limo ſubſidente, id ſemper nigrorem oſtendit. Quod ad ſpongias, & teſtatorum generationem pertinet, res ita ſe habet.

CAPVT XVII.

De locuſtis, & earum partus tempore, déque cæteris cruſta opertis.

Locuſtæ inter cruſtata quæ per coitum conceperunt, oua gerunt ytero tribus menſibus his, Maio, Iunio, Iulio: tum deinde ſub aluo in rugas deponunt, qua oua more vermium augentur. Quod idem de mollibus etiam, ac de piſcibus ouiparis intelligitur: ouum enim omnium ita accreſcit. Fit igitur locuſtarum ouum arenidum in partes octo diductum: ſingulis enim operimentis, quæ de latere extant, ſingula quædam cartilaginea iunguntur, quibus oua adhærent: totúmque quaſi ſpecies vuæ conſiſtit: vnumquodque enim illorum cartilagineorum in plura ſcinditur: quæ ſi diſcreueris, patet, ſin aſpicis, tantùm compoſitum quiddam apparet.

Fiunt maxima, non quæ iuxta meatum, ſed quæ media ſita ſint: minimáque nouiſſima continentur. Magnitudo minimis, quanta granis ficuum eſt. Nec meatum ipſum vlla contingunt, ſed per medium hærent: vtraque enim ex parte, caudam dico, & aluum, bino maximè diſtinguitur interuallo: ſic enim operimenta quoque diſpoſita ſunt. Sed quoniam latera ipſa complecti ſatis non poſſunt, addito extremo cuncta teguntur, idque velut operculum obturat. Videtur prorſus locuſta cartilaginoſis illis particulis mandare oua, cùm enititur, caudam adducens, & protinus comprimens, inflectenſque ſeſe, parere. Cartilagineæ vero illæ appendices per id tempus augentur, atque ouorum capaces redduntur. Partus enim in iis recipitur, vt ſepiarum in ſarmentis, & qualibet colluuione collocatus. Locuſtæ ad hunc pariunt modum: mox vbi ea ſui corporis parte intra diem maximè vigeſimum oua concoxerint, abigunt vniuerſa, conglomerataque ita in idem, vt & foris congeſta appareant. Tum ex eo locuſtæ proueniunt intra diem maximè decimumquintum: & ſæpe minores, quàm vt digiti magnitudinem expleant, capiuntur. Excludunt igitur oua ante arcturum: abigunt iam concocta, atque abſoluunt ab arcturo. Squillæ gibbæ vterum menſes circiter quatuor ferunt. Locuſtæ aſperis ſaxoſiſque locis proueniunt: gammari leuioribus, ac terrenis. Neutrum genus limoſa amat: vnde fit vt gammari apud Helleſpontum, & circa Thaſum gignantur: locuſtæ circa Sigeum, & Athon. Coniectantur loca aſpera limoſave piſcatores oris litoralibus, atque aliis id genus indiciis, quoties capturam in alto libet exercere. Litora potiùs vernis hyberniſque temporibus expetunt. Conferunt ſe in altum, æſtate videlicet, cùm aliàs calorem, aliàs frigus perſequuntur. Iis etiam, quas nomine vrſæ arctos appellant, idem pariendi tempus Natura ſtatuit, quod locuſtis: quocirca per hyemem & vere priusquàm oua excludant, cibo laudantur: cùm excluſerint, deterrimæ ſiunt. Cruſta ſua & locuſtæ, & cancri, tam nuper nati, quàm poſt, exuuntur per ver, quemadmodum angues membrana vernationis, quam ſenectutem appellant. Locuſtis omnibus vita diuturnior data eſt.

CAPVT XVIII.

De polypo, ſepia, lolligine, cæteriſque mollibus oui paris, déque eorum fœtura, & partu.

Mollia, copulatione ac venereo coitu, ouum concipiunt candidum, quod in dies arenidum, quale illud cruſtati generis, euadit. Edit polypus ſuum ouum, vel in cubilibus, vel in ſigulino, vel in quo alio cauo, ſimile labruſcæ florentis racemulis, aut fructui arboris populi albæ, vt iam dictum eſt. Pendent vtique per cubile oua tanta fœcunditate, vt collectis vas impleatur longè amplius quàm caput ſit, quo continebantur. Polyporum itaque ouis diebus poſt quinquaginta maximè ruptis, polypuli modo araneorum perquàm multi exſerpunt, quorum natura ſigillatim nondum conſpicua eſt, quanquam forma ſatis tota apparet: ſed ob exiguitatem imbecillitatémque copia interit. Iam nonnulli adeo ſpectantur exigui, vt nulla partium conſtent diſtinctione, quamuis ad tactum moueantur. Oua, quæ ſepiæ edunt, magnitudinem myrtorum capiunt, & nigreſcunt.

A καὶ γὰρ μέγιστα, οὐ τὰ πρὸς τῷ πόρῳ, ἀλλὰ τὰ μέσα· ἐλάχιστα δὲ τὰ ἔσχατα. τὸ δὲ μέγεθος τῶν μικρῶν ᾠῶν, ἐστὶν ἡλίκα κεγχραμίς. οὐκ ἐφεξῆς δ' ἐστὶν ἐχόμενα τοῦ πόρου, ἀλλὰ κατὰ μέσον ἐπαμφοτερίζει γάρ. ἀπὸ τῆς κέρκου καὶ ἀπὸ τοῦ θώρακος, δύο διαφράγματα μάλιστα ἀπέχει· οὕτω γὰρ καὶ τὰ ἐπικαλύμματα πέφυκεν. αὐτὰ μὲν οὖν τὰ ἐκ τοῦ πλαγίου οὐ δύναται συμπεριλαμβάνειν· τὰ δ' ἄκρα προσεπιτεθέντα καλύπτει πάντα, καὶ γὰρ αὐτοῖς ἐστι πῶμα. ἔοικε δὲ τὰ ᾠὰ τίκτουσα προσάγειν πρὸς τὰ χονδρώδη τὸ τῆς κέρκου προσκάμψασα πλάτος αὐτῆς, καὶ συμπιέσασα δὲ εὐθὺς καὶ κάμψασα, ἀποτίκτει. τὰ δὲ χονδρώδη, κατὰ τοὺς καιροὺς τούτους αὔξεται, καὶ δεκτικὰ γίνεται τῶν ᾠῶν. B πρὸς γὰρ τὰ χονδρώδη ἀποτίκτει, καθάπερ αἱ σηπίαι πρὸς τὰ κληματίδια καὶ τὰ φορυτά. ἀποτίκτει μὲν οὖν τοῦτον τὸν τρόπον. συμπέψασα δ' ἐν τούτῳ μάλιστα ἐν εἴκοσιν ἡμέραις, ἀποβάλλει συνεχῆ καὶ ἀθρόα, ὥσπερ φαίνεται καὶ ἐκτός. εἶτ' ἐκ τούτων γίνονται οἱ κάραβοι ἐν ἡμέραις μάλιστα πεντεκαίδεκα, καὶ λαμβάνονται πολλάκις ἐλάττους ἢ δακτυλιαῖοι. τίκτει μὲν οὖν πρὸ ἀρκτούρου, μετὰ δὲ ἀρκτοῦρον ἀποβάλλει τὰ ᾠά. τῶν δὲ κυφῶν καρίδων, ἡ κύησίς ἐστι περὶ τέτταρας μῆνας. γίνονται δ' οἱ μὲν κάραβοι ἐν τοῖς τραχέσι καὶ πετρώδεσιν, οἱ δὲ ἀστακοὶ ἐν τοῖς C λείοις, ἐν δὲ τοῖς πηλώδεσιν οὐδέτεροι. διὸ καὶ ἐν Ἑλλησπόντῳ μὲν καὶ περὶ Θάσον, ἀστακοὶ γίνονται· περὶ δὲ τὸ Σίγειον καὶ τὸν Ἄθω, κάραβοι. διασημαίνονται δὲ τοὺς τόπους οἱ ἁλιεῖς, τούς τε τραχεῖς καὶ τοὺς πηλώδεις, τοῖς τε αἰγιαλοῖς, καὶ ἄλλοις τοιούτοις σημείοις, ὅταν βούλωνται ἐν τῷ πελάγει ποιεῖσθαι τὴν θήραν. γίνονται δ' ἐν μὲν τῷ ἔαρι καὶ τῷ χειμῶνι, πρὸς τῇ γῇ μᾶλλον· τοῦ δὲ θέρους, ἐν τῷ πελάγει διώκοντες, ὁτὲ μὲν τὴν ἀλέαν, ὁτὲ δὲ τὸ ψῦχος. τοῖς δὲ χρόνοις παραπλησίως καὶ αἱ καλούμεναι ἄρκτοι τίκτουσι τοῖς καράβοις. διὸ καὶ τοῦ χειμῶνος, καὶ πρὶν ἐκτεκεῖν, τοῦ ἔαρος, ἄρισταί εἰσιν· ὅταν δ' ἐκτέκωσι, χείρισται. D ἐκδύνουσι δὲ τὸ κέλυφος τοῦ ἔαρος, ὥσπερ οἱ ὄφεις τὸ καλούμενον γῆρας, καὶ εὐθὺς γινόμενοι, καὶ ὕστερον, καὶ οἱ κάραβοι καὶ οἱ καρκίνοι. εἰσὶ δὲ οἱ κάραβοι μακρόβιοι πάντες.

ΚΕΦΑΛ. ιη'.

Περὶ πολυπόδων, καὶ σηπιῶν, καὶ τευθίδων.

Τὰ δὲ μαλάκια, ἐκ τοῦ συνδυασμοῦ καὶ τῆς ὀχείας ᾠὸν ἴσχει λευκόν. τοῦτο δὲ γίνεται τῷ χρόνῳ, ὥσπερ τὰ τῶν σκληροδέρμων, χαλαζῶδες. καὶ ἀποτίκτει ὁ μὲν πολύπους, ἢ εἰς τὰς θαλάμας, ἢ εἰς κεράμιον, ἢ ἄλλο κοῖλον, ὅμοιον βοστρυχίοις οἰνάνθης, καὶ λεύκης καρπῷ, καθάπερ εἴρηται πρότερον. E ἐκκρεμάννυται μὲν περὶ τὴν θαλάμην τὰ ᾠά, ὅταν ἐκτέκῃ· τὸ δὲ πλῆθος ἔχει τοσοῦτον ᾠά, ὥστε ἐξαιρεθέντων ἐμπίπλασθαι ἀγγεῖον πολλῷ μεῖζον τῆς κεφαλῆς, ἐν ᾗ εἶχε τὰ ᾠά. τὰ μὲν οὖν τῶν πολυπόδων, μεθ' ἡμέρας μάλιστα πεντήκοντα γίνεται ἀπὸ τῶν ἀπορραγέντων πολύπια, καὶ ἐξέρπει, ὥσπερ τὰ φαλάγγια πολλά. τὸ πλῆθος ὧν ἡ μὲν καθ' ἕκαστα φύσις τῶν μελῶν, οὔπω διάδηλος· ἡ δὲ ὅλη μορφή, φανερά. διὰ δὲ τὴν σμικρότητα καὶ τὴν ἀσθένειαν, φθείρεται τὸ πλῆθος αὐτῶν. ἤδη δὲ ὦπται καὶ οὕτω πάμπαν μικρά, ὥστε ἀδιάρθρωτα μὲν εἶναι, ἁπτομένων δὲ κινεῖσθαι. αἱ δὲ σηπίαι ἀποτίκτουσι, καὶ γίνεται ὅμοια μύρτοις μεγάλοις καὶ μέλασιν.

[illegible]

Quidam Latini interpretes veteres hæc non agnoſcunt.

Sic legendum, vulgò πλαγίᾳ, mendosè.

ΚΕΦΑΛ. ιθ'.

[illegible]

A Emiſſo enim atramento parentis infunduntur, atque ita inficiuntur. Cohærent inter ſe ad ſpeciem racemi cuncta vinculo abducta cuidam nexui: nec facile detrahi alterum ab altero poteſt. Mas enim humorem quendam mucoris mittit, quo lentore tenaciter oua ſibi cohæreſcunt, ac creſcunt. Et hæc & cum primum edita candida ſint, [illegible] gua, mox atramento perfuſa, nigra [illegible] duntur. Cumque ſepiola iam intus coſtiterit, videlicet tota ex candido oui interno concreſcens, tunc rupta cuti membranula proles exit: primum pars illa interior candida, velut grando conſiſtit, cum fœmina ſuum atramentum aſperſerit. Naſcuntur enim ſepiolæ ex eo ipſo candicante corpuſculo verſa in B caput, modo auium ventre annexo. Sed qualis nam ſit in his annexus vmbilici, nondum exploratum habemus. Conſtat tamen candidum illud ſubinde diminui, dum ſepiola augetur: & ad poſtremum, vt luteum auibus, ſic candidum his aboleri. Primum oculi grandes in his quoque, perinde vt in cæteris apparent. Sit a ouum, b c oculi, d ſepiola ipſa, e hoc ipſum. Feruntur vterum ſepiæ verno tempore. Pariunt intra diem decimumquintum. Mox oua edita craſſitudinem acinorum vuæ minorum, intra diem item decimumquintum capiunt, quibus obruptis ſepiolæ excluduntur. Quæ, ſi quis prius, prole iam perfecta obſciderit oui membranam, C ſtercuſculum mittunt, ſuumque præ metu colorem immutant ex candicante in rubriuſculum. Sed cùm genus omne cruſtatum ſibi iuncta contineat oua, itaque foueat, polypus & ſepia, & reliqua generis eiuſdem, oua, quæ pepererint, abſoluta fouent, & præcipuè ſepia: quippe cuius ſæpenumero alueus iuxta terram, dum hoc facit, appareat. Polypus fœmina modò incubat ouis, modò in ore ſui cubilis aſſidens, brachium ſuper ouis exporrectum tenet. Sepia parit iuxta terram inter algas & arundines, & ſi quod aggeſtum tale iniectum ſit, vt ſarmenta, aut lapides, aut quælibet alia materiei congeries. Et quidem piſcatores de induſtria faſces ſarmentorum diſponunt. Hæc perlibenter in eis loculamentis parit prolixam, illam continentémque ſeD riem ouorum, qualis cirri muliebris ſpecies eſt. Enititur, alium per interualla reprimens, inſpergitque atramentum, interpoſita quiete: vtpote cùm non niſi cum labore enitatur. Lolligines in alto pariunt: conſertum iis quoque ouum, quale ſepiis eſt. Viuendi ſpatium tam ſepiæ quàm lolligini breue: nam exceptis paucis bimatum non complent. Polypis etiam tantundem temporis ad viuendum datum eſt. Prodeunt è ſingulis ſepiarum ouis ſepiolæ ſingulæ: quod idem in genere etiam lolliginum fit. Inter lolliginem marem & fœminam hoc intereſt, quòd fœmina inteſtina conE tinet duo, velut mammas: quæ ſi aluo diſſecta inſpectes, facilè videris. Mas omnino iis caret. Sepia tum hoc idem diſcrimen habet, tum verò quòd mas varius plus quàm fœmina eſt, vt expoſui.

CAPVT XIX.

De iis inſectorum generibus, quæ aut ex eruca, aut ex vermibus, aut ex fimo gignuntur.

INſecti generis mares fœminis eſſe minores, ac ſuperuentu coire, vixque abſolui, dictum

iam eſt. Breui à coitu pariunt maxima ſui parte, quæ ſolent coire. Vermem autem omnia faciunt, excepto genere quodam papilionum, quod durum quiddam ſimile cartamo, id eſt, cnici ſemini producit, ſed intus fluidum. Vermibus verò ipſis non parte aliqua, ſicut in ouis, animal creatur, ſed totus vermis accreſcit, & particulatim diſcretus formatur in ſpeciem deſtinati animalis. Procreantur porrò inſecta aut ex animalibus generis eiuſdem, vt phalangia, & aranea. Ex phalangiis, & araneis, vt bruci, locuſtæ, cicadæ. Aut non ex animalibus, ſed ſponte: alia ex rore, qui frondibus inſidat, videlicet verno tempore, vt natura fert. Sæpe tamen & hyberno, quoties tranquillum auſtraléque tempus diutius conſiſtit. Item alia ex cœno aut fimo putreſcente oriuntur: alia in lignis aut ſtirpium, aut cæſis: alia in animalium pilis: alia in excrementis, aut iam excretis, aut adhuc intra animantem contentis, vt quæ tineæ, ſiue lumbrici appellantur, quorum genera tria ſunt, latum, teres, & quod aſcarida appellatum eſt, ex quo nihil procreari aliud poteſt. Latum autem illud ſolum inteſtino adhærens, parit ſimile cucumeris ſemini, quo indicio medici genus id lumbrici ineſſe intelligunt. Naſcuntur papiliones ex erucis: erucæ ex virentibus foliis, maximéque ex braſſica. Primùm minus quid milio conſiſtit in folio, mox vermiculi inde contrahuntur, & accreſcunt, tum intra triduum eruculæ afformantur: quæ auctæ motu ceſſant, ſuáque forma immutantur, appellantúrque tantiſper chryſalides: quaſi aurelias dixeris. Duro intectæ putamine ſunt, ad tactum mobiles, meatibus araneoſis obductæ. Non os, non aliud ex membris, quod conſpicuum ſit, poſſident. Longo pòſt tempore putamine obrupto euolant inde animalia pennigera, quos papiliones vocamus. Itaque primùm, dum erucæ ſunt, cibo aluntur, atque excrementum emittunt. at verò cùm in aurelias dictas tranſierint, nihil vel guſtant, vel excernunt. Hæc eadem generandi ratio cæterorum etiam eſt, quæ ex vermibus conſiſtant, ſiue ex coitu animalium vermes, ſeu ſine coitu prodiere. Nam & apum, & crabronum, & veſparum vermes, quandiu recentes ſunt, & aluntur, tantiſper & ſtercus emittere videntur: at cùm formæ lineamenta receperint, ſub qua facie nymphæ appellantur, iam neque cibum præterea capiunt, neque vllum reddunt alui excrementum, ſed coerciti, & contracti quieſcunt, nec vllo pacto mouere ſe patiuntur, vſque dum ſpecies deſtinata perficiatur: quo facto euolat proles, rupto, quo continebatur, folliculo. Quinetiam ſuperæ, & aciæ dictæ è quibuſdam eiuſmodi aliis generantur erucis, quæ vndent ingreſſu: parte enim innitentes priore contrahunt ſeſe, adducentes poſteriorem, arcuatímque incedunt. Verùm quæque orta, ſibi colorem à ſua eruca trahunt. Fit ex quodam verme grandiore, qui veluti cornua gemina protendit, ſuique generis eſt, primùm toto immutato, eruca: deinde quæ bombyx appellatur: ex quo necydalus, inualidam dixerim. quæ varia formarum ſucceſſio, in ſemeſtri temporis ſpatio completur. Ex hoc animalis genere bombycia illa mulieres nonnullæ retorquendo in filum deducunt, deinde texunt. Prima texiſſe in Co inſula, Pamphila Platis filia dicitur. Eodem modo ſcarabei tauri gignuntur ex vermibus, qui in lignis aridis naſcũtur.

A εἴργεται πρότερον· ὅταν δὲ ὀχευθῇ, ταχέως προσίεται πλεῖστα τῶν τικόντων ὅσα ὀχεύεται. τίκτει δὲ πάντα σκώληκα, πλὴν γένος τι ψυχῶν. αὗται δὲ σκληρὸν, ὅμοιον κνήκου σπέρματι, ἔσω δ' ἔγχυμα. ἐκ δὲ τῶν σκωλήκων οὐκ ἐκ μέρους τινὸς γίνεται ζῷον, ὥσπερ ἐκ τῶν ᾠῶν, ἀλλ' ὅλον αὐξάνεται καὶ διαρθρούμενον, γίνεται ζῷον. γίνεται δὲ αὐτῶν τὰ μὲν, ἐκ ζῴων τῶν συγγενῶν, οἷον, φαλάγγια καὶ ἀράχνια, ἐκ φαλαγγίων καὶ ἀραχνίων, καὶ ἀττέλαβοι, καὶ ἀκρίδες, καὶ τέττιγες. τὰ δὲ, οὐκ ἐκ ζῴων, ἀλλ' αὐτόματα· τὰ μὲν, ἐκ τῆς δρόσου τῆς ἐπὶ τοῖς φύλλοις ἐπιπιπτούσης, κατὰ φύσιν μὲν τοῦ ἔαρος, πολλάκις δὲ καὶ τοῦ χειμῶνος, ὅταν εὐδία καὶ νότια γένηται πλείω χρόνον· τὰ δ', B ἐν βορβόρῳ καὶ κόπρῳ σηπομένῃ γίνεται· τὰ δ', ἐν ξύλοις, τὰ μὲν, φυτῶν, τὰ δ' ἐν αὔοις ἤδη· τὰ δ', ἐν θριξὶ ζῴων γίνεται· τὰ δ', ἐν τοῖς περιττώμασι· καὶ τούτων τὰ μὲν, ἐκ κεχωρισμένων, τὰ δ', ἐκ τῶν ἐν τοῖς ζῴοις, οἷον αἱ καλούμεναι ἕλμινθες. εἰσὶ δὲ αὐτῶν γένη τρία, αἵ τε ὀνομαζόμεναι πλατεῖαι, καὶ στρογγύλαι, καὶ αἱ τρίται καλοῦνται ἀσκαρίδες. ἐκ μὲν οὖν τούτων, ἕτερον οὐ γίνεται· ἡ δὲ πλατεῖα, προσπέφυκε μόνη τῷ ἐντέρῳ, καὶ ἀποτίκτει τι, οἷον σικύου σπέρμα· ᾧ γινώσκουσι σημείῳ οἱ ἰατροὶ τοὺς ἔχοντας αὐτήν. γίνονται δὲ αἱ μὲν καλούμεναι ψυχαὶ ἐκ τῶν καμπῶν· αἱ δὲ, [illegible]ται ἐκ τῶν φύλλων τῶν χλωρῶν, καὶ C μάλιστα ἐπὶ τῆς ῥαφάνου, ἣν καλοῦσί τινες κράμβην· πρῶτον μὲν, ἔλαττον κέγχρου· εἶτα μικροὶ σκώληκες, καὶ αὐξανόμενοι. ἔπειτα, ἐν τρισὶν ἡμέραις κάμπαι μικραί· μετὰ δὲ ταῦτα, αὐξηθεῖσαι ἀκινητίζουσι, καὶ μεταβάλλουσι τὴν μορφὴν, καὶ καλοῦνται χρυσαλλίδες, καὶ σκληρὸν ἔχουσι τὸ κέλυφος· ἁπτομένου δὲ κινοῦνται. περιέχονται δὲ πόροις ἀραχνιώδεσιν, οὔτε στόμα ἔχουσαι, οὔτε ἄλλο τῶν μορίων διάδηλον οὐθέν. χρόνου δὲ πολλοῦ διελθόντος, περιρρήγνυται τὸ κέλυφος, καὶ ἐκπέτονται ἐξ αὐτῶν πτερωτὰ ζῷα, ἃς καλοῦμεν ψυχάς. τὸ μὲν οὖν πρῶτον, ὅταν ὦσι κάμπαι, τρέφονται καὶ περίττωμα ἀφιᾶσιν. ὅταν δὲ γένωνται χρυσαλλίδες, οὐδενὸς οὔτε γεύονται, οὔτε D προΐενται περίττωμα. τὸν αὐτὸν δὲ τρόπον, καὶ τἆλλα ὅσα γίνεται ἐκ σκωλήκων, καὶ ὅσοι ἐκ συνδυασμοῦ γίνονται ζῴων σκώληκες, καὶ ὅσοι ἄνευ ὀχείας. καὶ γὰρ οἱ τῶν μελιττῶν καὶ ἀνθρηνῶν καὶ σφηκῶν, ὅταν μὲν νέοι σκώληκες ὦσι, τρέφονταί τε, καὶ κόπρον ἔχοντες φαίνονται· ὅταν δ' ἐκ τῶν σκωλήκων εἰς τὴν διατύπωσιν ἔλθωσι, καλοῦνται μὲν οὖν νύμφαι· τότε οὐ λαμβάνουσι τροφὴν, οὐδὲ κόπρον ἔχουσιν, ἀλλὰ περιειργμέναι, ἀκινητίζουσι μέχρις ἂν αὐξηθῶσι· τότε δὲ ἐξέρχονται διακόψασαι,* ᾧ καταλέλειπται ὁ κύτταρος. γίνονται δὲ καὶ τὰ πηνία καὶ τὰ ὑπέρα E ἔκ τινων καμπῶν τοιούτων, αἳ κυματίζουσι τῇ πορείᾳ, καὶ προβᾶσαι τῷ ἑτέρῳ κάμψασαι ἐπιβαίνουσιν. ἕκαστον δὲ τῶν γινομένων τὸ οἰκεῖον χρῶμα λαμβάνει ἀπὸ τῆς κάμπης. ἐκ δέ τινος σκώληκος μεγάλου, ὃς ἔχει οἷον κέρατα, καὶ διαφέρει τῶν ἄλλων, γίνεται δὲ πρῶτον μὲν, μεταβαλόντος τοῦ σκώληκος, κάμπη.* ἔπειτα, βομβύλιος· ἐκ δὲ τούτου, νεκύδαλος· ἐν ἓξ δὲ μησὶ μεταβάλλει ταύτας τὰς μορφὰς πάσας. ἐκ δὲ τούτου τοῦ ζῴου καὶ τὰ βομβύκια ἀναλύουσι τῶν γυναικῶν τινες ἀναπηνιζόμεναι, κἄπειτα ὑφαίνουσι. πρώτη δὲ λέγεται ὑφῆναι ἐν Κῷ Παμφίλη Λατῴου θυγάτηρ. ἐκ δὲ τῶν σκωλήκων τῶν ἐν τοῖς ξύλοις τοῖς αὔοις, οἱ κάραβοι γίνονται.

* Gazæ verſio hanc lectionem præ ſe fert, ᾧ καταλειπόμενος (vel καταλιμπάνεται) ὁ κύτταρος.

* Quid legendū cenſent, ἔπειτα νεκύδαλος· ἐκ δὲ τούτου βομβύλιος. ita tamē & Plinius habet l. 11. c.22. & Athen. lib. 8.

* Gaza, γίνεται ἐν αὐτῷ ἔτει ἀρ. mutata diſtinct. ſed & ſequētem periodum idē aliter legiſſe videtur.

τὸν αὐτὸν δὲ τρόπον, πρῶτον μὲν ὑμὴν τις ἀκινητούντων τῶν σκωλήκων γίνεται· περιρραγέντος δὲ τοῦ κελύφους, ἐξέρχονται οἱ κάραβοι. * ἐκ δὲ τῶν καράβων γίνονται αἱ [illegible]ειδεῖς· ἔχουσι δὲ πτερὰ καὶ αὗται. ἐκ δὲ τῶν ἐν τοῖς ποταμοῖς πλατέων ζῳδαρίων τῶν ἐπιπετόντων γίν. διὸ καὶ οἱ πλεῖστοι περὶ τὰ ὕδατα γίνονται· καὶ τὰ τοιαῦτα ἐπὶ ζῷα. ἐκ δὲ μελάνων τινῶν καὶ δασέων οὐ μεγάλων καμπῶν, πρῶτον γίνονται * πυγολαμπάδες, οὐκ αἱ πτερωμέναι. αὗται δὲ πάλιν μεταβάλλουσι, καὶ γίνονται * πτερωτὰ ζῷα * καὶ ἐξ αὐτῶν οἱ καλούμενοι βόστρυχοι. αἱ δ' ἐμπίδες, γίνονται ἐκ τῶν ἀσκαρίδων. αἱ δὲ ἀσκαρίδες, γίνονται ἔν τε τῇ ἰλύϊ τῶν φρεάτων, καὶ ὅπου ἂν σύρρευσις γένηται ὕδατος, γεώδη ἔχουσα ὑπόστασιν. τὸ μὲν οὖν πρῶτον αὐτὴ ἡ ἰλὺς σηπομένη, χρῶμα λαμβάνει λευκὸν, εἶτα μέλαν, τελευτῶσα δὲ αἱματῶδες. ὅταν δὲ τοιαύτη γένηται, φύεται ἐξ αὐτῆς ὥσπερ τὰ φυκία μικρὰ σφόδρα καὶ ἐρυθρά. ταῦτα δὲ, χρόνον τινὰ κινεῖται πεφυκότα. ἔπειτα ἀπορραγέντα, φέρεται κατὰ τὸ ὕδωρ αἱ καλούμεναι ἀσκαρίδες. μετὰ ἡμέρας δὲ ὀλίγας ἵστανται ὀρθαὶ ἐπὶ τοῦ ὕδατος ἀκινητίζουσαι καὶ σκληραί. ἔπειτα περιρραγέντος τοῦ κελύφους, ἡ ἐμπὶς ἄνω ἐπικάθηται, ἕως ἂν ἥλιος ἢ πνεῦμα κινήσῃ· τότε δὲ πέτεται. πᾶσι δὲ καὶ τοῖς ἄλλοις σκώληξι, καὶ τοῖς ζῴοις τοῖς ἐκ τῶν σκωλήκων περιρρηγνυμένοις, ἡ ἀρχὴ φαίνεται γίνεσθαι τῆς γενέσεως, ἢ ὑφ' ἡλίου, ἢ ὑπὸ πνεύματος. μᾶλλον δὲ καὶ θᾶττον γίνονται αἱ ἀσκαρίδες ἐν τοῖς ἔχουσι παντοδαπὴν ὑπόστασιν, οἷον * Μεγαροῖ τε γὰρ καὶ ἐν τοῖς ἔργοις· σήπεται γὰρ τὰ τοιαῦτα θᾶττον. τοῦ μετοπώρου δὲ γίνονται μᾶλλον, τότε γὰρ ὑγρὸν συμβαίνει εἶναι ἔλαττον. αἱ δὲ κρότωνες γίνονται ἐκ τῆς ἀγρώστεως· αἱ δὲ μηλολόνθαι, ἐκ τῶν σκωλήκων τῶν ἐν τοῖς βολίτοις, καὶ τῶν ὀνίδων. * αἱ δὲ κάνθαροι, οὓς κυλίουσι κόπρου, ἐν ταύτῃ φωλεύουσί τε τὸν χειμῶνα, καὶ ἐντίκτουσι σκώληκας, ἐξ ὧν γίνονται κάνθαροι. γίνονται δὲ καὶ ἐκ τῶν σκωλήκων τῶν ἐν τοῖς ὀσπρίοις πτερωτὰ ζῷα ὁμοίως τοῖς εἰρημένοις. αἱ δὲ μυῖαι, ἐκ τῶν σκωλήκων τῶν * ἐν τῇ χωριζομένῃ κατὰ μέρος· διὸ καὶ οἱ περὶ ταύτην τὴν ἐργασίαν ὄντες, μάχονται χωρίζειν τὴν ἄλλην τὴν μεμιγμένην· καὶ λέγουσι κατεργάσασθαι τότε τὴν κόπρον. ἡ δὲ ἀρχὴ τῶν σκωληκίων μικρά. πρῶτον μὲν γὰρ καὶ ἐνταῦθα ἐρυθραίνεται, καὶ ἐξ ἀκινησίας λαμβάνει κίνησιν οἷον πεφυκότα· εἶτα σκωλήκιον ἀποβαίνει ἀκίνητον. εἶτα κινηθὲν, ὕστερον γίνεται ἀκίνητον πάλιν. ἐκ δὲ τούτου μυῖα ἀποτελεῖται, καὶ κινεῖται πνεύματος ἢ ἡλίου γενομένου. οἱ δὲ μύωπες, γίνονται ἐκ τῶν ξύλων· καὶ αἱ ὀρσοδάκναι, ἐκ τῶν σκωλήκων μεταβαλλόντων. τὰ δὲ σκωλήκια ταῦτα, γίνεται ἐν τοῖς καυλοῖς τῆς κράμβης. αἱ δὲ κανθαρίδες, ἐκ τῶν πρὸς ταῖς συκαῖς καμπῶν, καὶ ταῖς ἀπίοις, καὶ ταῖς πεύκαις· πρὸς ἅπασι γὰρ τούτοις γίνονται σκώληκες· καὶ ἐκ τῶν ἐν τῇ κυνακάνθῃ. ὁρμῶσι δὲ καὶ πρὸς τὰ δυσώδη, διὰ τὸ ἐκ τοιούτων γεγενῆσθαι ὕλης. οἱ δὲ κώνωπες, ἐκ σκωλήκων, οἳ γίνονται ἐκ τῆς περὶ τὸ ὄξος ἰλύος· καὶ γὰρ ἐν τοῖς δοκοῦσιν ἀσηπτοτάτοις, ἐγγίνεται ζῷα, οἷον ἐν χιόνι τῇ παλαιᾷ σκώληκες· γίνεται δὲ ἡ παλαιὰ ἐρυθροτέρα· διὸ καὶ οἱ σκώληκες τοιοῦτοι, καὶ δασεῖς. * οἱ δὲ ἐκ τῆς ἐν Μηδίᾳ χιόνος, μεγάλοι καὶ λευκοί. δυσκίνητοι δὲ πάντες. ἐν δὲ Κύπρῳ, οὗ ἡ χαλκῖτις λίθος καίεται, ἐπὶ πολλὰς ἡμέρας ἐμβαλλόντων, ἐνταῦθα γίνεται θηρία ἐν τῷ πυρί,

* Gaza aliter legit, fortasse ἐκ τῶν [illegible] γ. vel ἐκ τῶν [illegible] γ.

* γρ. πυγολαμπίδες.

* Gaza legit. πτερωτὰ ζῷα, οἱ καλ. βόστρυχοι, reliquis omissis.

* Gaza, Μεγαροῖ γίνεται ἐν τοῖς ἔργοις. alij codd. Μεγαροῖ τε ἐν. ſunt autem ἔργα, arua, ſiue, arui agri, qui arari ſolet. ſic apud Homerũ, Xenoph. & alios.

* Quidã putant legiſſe Gazam, αἱ δὲ κανθαρίδες. ſed de cantharidib. mox Ariſt. alij, οἱ δὲ κάνθ.

* Gaza, ἐν τῇ χωριζομένῃ κ. μ.

* Gaza legit, οἱ δ' ἐν τῇ ἐν Μηδίᾳ χιόνι [illegible] quam eſſe veterũ codicum lectionẽ cõfirmat Mercurialis Variarum lib. 3. c. 14.

A Primùm enim vermes ipſi immobiles fiũt, mox diſrupto putamine in ſcarabei genus exit. Blattas in alucariis gigni apertum eſt, quæ & ipſæ pennatæ ſunt. Aſilus latiuſculis quibuſdam beſtiolis, quæ in fluuiis ſupernatant, enaſcitur: quamobrem magna aſilorum copia circa aquas, vbi id genus beſtiolarum eſt. Erucis quibuſdam corpore piloſo, non magno primum, cicindelæ à clunũ fulgore nomine dicto, fiunt, nõ volucres, quibus deinde mutatis, pennigera animalia gignũtur, quos cirros vocãt. Culices muliones ex aſcaridis, hoc eſt, tipulis, generantur. Tipulæ ferè in puteis, & vbicũque aqua ſe colligit, terrena ſubſidente concretione, oriuntur. Et in principio fæx ipſa putreſcens colorẽ candicantem trahat, mox nigricantem, poſtremò cruentũ. Talis B cum fuerit, minutiſſima quædam, & rubra ſpecie algulæ prodeunt: quæ ad tempus hærentia ſuæ originis mouentur, deinde abſoluuntur; itaque feruntur per aquam, tipulæ nuncupatæ: tum paucis poſt diebus erigũt ſe ſuper aqua duræ, atq; immobiles mox diſrupto putamine, culex emergit, ac inſidet donec vel ſole vel flatu moueatur, & volet. Commune omnium vermium eſt, & eorum, quæ ex vermibus proueniunt, animalium, vt primordium generationis, aut à ſole aut à ſpiritu præſtetur. Sed copioſius ac celerius fiunt tipulæ in aquis, quarum ſedimentum varium ac promiſcuum ſit, quale in agro Megarico in operis ſolet miſceri: putreſcit enim hoc facilius: & autumno quoque vberius ge- C neratur: minus enim humoris eſſe tunc accidit. Rediuij gramine oriuntur. Scarabei virides, gallerucæ iam vocari incipientes, vermibus fimo bouis aut iumenti creatis gignuntur. Scarabei pilularij in fimo quem voluunt, conduntur per hyemem, paruóſque vermiculos pariunt, ex quibus ipſi procreãtur. Quin etiam leguminum vermiculis pennata animalia ratione ſimili prodeunt. Muſcæ ex vermiculis fimi digeſti in partes gignuntur. quamobrem qui eo funguntur munere contendunt reliquum fimi promiſcui diſcernere: etiam confectum concoctúmque eſſe fimum confirmant. Principium autem vermiculorum ipſorum exiguum eſt, quod primum rubeſcit, atque ex immobili quaſi hærens adhuc fibris moueri incipit: mox vermiculus im- D mobilis redditur: qui cum poſtea motus eſt, rurſus immobilis fit: demũmq; generat muſcam, quæ flatus aut Solis beneficio moueatur. Tabani ex ligno naſcuntur. Orſodagnæ, quas mordellas appellem, ex vermiculis immutatis, qui in braſſicæ caule creantur. Cantharidæ ex erucis fici, piri, pini, atque etiam ſentis caninæ oriuntur: fiunt enim in his omnibus vermes. Petit genus id animalis foetida, quoniam ex tali materia conſtitutum eſt. Vinarij culices ex vermiculis, qui fæce vini aceſcente gignuntur, originem trahunt. Quinetiam in iis, quæ putredinem nullam poſſe recipere exiſtimantur, naſci animalia nouimus, E vt vermes in niue vetuſtiore, qui hirti ſunt pilis & rubidi, quoniam & ipſa nix vetuſtate rubeſcit. Sed in niue Mediæ terræ candidi & grandiores inueniuntur. Torpent omnes, ac difficulter mouentur. In Cypro inſula, ærariis fornacibus, vbi chalcites lapis ingeſtus compluribus diebus crematur, beſtiolæ in medio igne naſcuntur pennatæ,

paulo muſcis grandibus maiores, quæ per ignem ſaliant, atque ambulent. Emoritur & hoc genus, & illud niuis alumnum, cùm alterum ab igne, alterum à niue dimotum eſt. Nonnulla corpora eſſe animalium, quæ igne non abſumantur, ſalamandra claro documento eſt: quæ, vt aiunt, ignem, inambulans per eum, extinguit. Hypanis fluuius apud Cimmerium Boſphorum ſub ſolſtitio defert velvti folliculos acinis maiores, quibus quadrupedes volucres erumpunt: quod genus animalis in poſtmeridianum vſque diei tempus viuit, & volat: mox deſcendente Sole macreſcit, & languet: deinde occidente emoritur, vita non vltra vnum diem peracta: vnde ephemerum, id eſt, diarium, appellatum eſt. Quæ ex erucis, aut vermibus gignuntur aranea inuoluta, magna ex parte principio exeunt. Hæc ita.

CAPVT XX.

De Veſparum generatione, & eius tempore: quando etiam inſectorum genera quam plurima pereant.

VEſpæ autem ichneumones nuncupatæ, quæ minores quàm cæteræ ſunt, phalangia perimunt, occiſaque ferunt in parietinas, aut aliquid tale foramine peruium: deinde illinunt luto, atque ex iis incubando ſuum procreant genus. Nonnulla ex iis quorum pennis cruſta ſuperuenit, & ex minutis, quæ nomine carent, nidos ſibi è luto parnos, aut ad ſepulcra, aut ad parietinas confingunt, & in iis vermiculos pariunt. Tempus generationis à principio ad finem, maximæ ferè parti ſeptenariis ternis deſcribitur, aut quaternis. Culicum & vermiformis generis parti plurimæ ter ſepteni attributi ſunt. Ouiparis quater ſepteni magna ex parte: ſeptem ex iis ab initu, concretio & conſummatio oui vendicat ſibi: reliquis tribus ſeptenis incubant: & excludunt, ea ſcilicet quæ ſuo procreant fœtu: vt araneus, aut aliquid generis eiuſdem. Mutationes verò, & tranſitus in figuras alias, trinis aut quadrinis diebus parti maximæ peraguntur: ſicut in morbis quoque dies decretorius euenit. Talis inſectorum generatio eſt. Pereunt ſtriatis contortiſque membris, vt ſenectute genus maiorum animalium moritur. Quæ pennata ex iis ſunt, pennis etiam conuulſis autumno ferè moriuntur. Tabani quidem vel aqua intercute oculorum cæci intereunt.

CAPVT XXI.

De coitu, & generatione apum, variæ opiniones.

DE generatione apum varia ſententia eſt. Alij enim eas parere, & coire negant, ſed deportare fœturam exiſtimant. Nec vnde portent, conſtat inter omnes: ſed alij ex flore cerinthi, alij ex flore arundinis, alij ex flore oleæ aiunt: argumentúmque afferunt, quòd cùm oliuarum prouentus ſit largior, tunc plura examina prodeant. Sunt qui fucorum quidem fœturam comportari ab aliquo ex iis quæ modò dixi, arbitrentur: ſed apum generi ortum præſtari à ducibus. Quorum duo ſunt genera, alterum fuluum, quod præſtantius eſt: alterum nigrum, magíſque varium.

A τῶν μεγάλων μυιῶν μικρῷ τι μείζονα, ὑπόπτερα, ἃ διὰ τοῦ πυρὸς βαδίζει καὶ πηδᾷ. ἀποθνήσκουσι δὲ καὶ σκώληκες καὶ ταῦτα χωριζόμενα, τὰ μὲν, τοῦ πυρὸς οἱ δὲ, τῆς χιόνος. ὅτι δ' ἐνδέχεται μὴ κάεσθαι συστάσεις τινὰς ζῴων, ἡ σαλαμάνδρα ποιεῖ φανερόν. αὕτη γάρ, ὥς φασι, διὰ τοῦ πυρὸς βαδίζουσα, κατασβέννυσι τὸ πῦρ. περὶ δὲ τὸν * Ὕπανιν ποταμὸν τὸν περὶ Βόσπορον τὸν Κιμμέριον, ὑπὸ τροπὰς θερινὰς, καταφέρονται ὑπὸ τοῦ ποταμοῦ οἷον θύλακοι μείζους * ῥωγῶν ἐξ ὧν ῥηγνυμένων, ἐξέρχεται ζῷον πτερωτὸν, τετράπουν· ζῇ δὲ καὶ πέτεται μέχρι δείλης· καταφερομένου δὲ τοῦ ἡλίου, ἀπομαραίνεται, καὶ ἅμα δυομένου ἀποθνήσκει, βιοῦν ἡμέραν μίαν· B διὸ καὶ καλεῖται ἐφήμερον. τὰ πλεῖστα δὲ τῶν γινομένων καμπῶν ἐκ τῶν σκωλήκων, ὑπὸ ἀραχνίων περιέχεται τὸ πρῶτον. Ταῦτα μὲν οὖν γίνεται τοῦτον τὸν τρόπον.

* γρ. Ὕπαν

* Scrib. ῥαγῶν. nam ῥῶγας pro acinis vix eſt vt vſurparit Ariſtoteles, damnatã Græcis Gramm. vocem hac notiorem.

ΚΕΦΑΛ. κ'.

Περὶ σφηκῶν τῶν ἰχνευμόνων. καὶ περὶ χρόνου τῆς γενέσεως τῶν ἐντόμων.

ΟΙ δὲ σφῆκες οἱ ἰχνεύμονες καλούμενοι, εἰσὶ δὲ ἐλάττους τῶν ἑτέρων, τὰ φαλάγγια ἀποκτείνοντες, φέρουσι * πρὸς τὸ κεῖον, ἤ τι τοιοῦτον τρώγλην ἔχον· καὶ πηλῷ καταχρίσαντες, ἐντίκτουσιν ἐνταῦθα, καὶ γίνονται C ἐξ αὐτῶν οἱ σφῆκες οἱ ἰχνεύμονες. ἔνια δὲ τῶν κολεοπτέρων, καὶ μικρῶν, καὶ ἀνωνύμων ζῴων, τοῦ πηλοῦ τρώγλας ποιοῦνται μικρὰς, ἢ πρὸς τάφοις, ἢ τειχίοις· καὶ ἐνταῦθα τὰ σκωλήκια ἐκτίκτουσιν. ὁ δὲ χρόνος τῆς γενέσεως, ἀπὸ μὲν τῆς ἀρχῆς μέχρι τέλους, σχεδὸν τοῖς πλείστοις ἑπτάσι μετρεῖται τρισὶν ἢ τέτταρσι. τοῖς μὲν οὖν κώνωψι, καὶ τοῖς σκωληκοειδέσι τοῖς πλείστοις, τρεῖς γίνονται ἑπτάδες. τοῖς δὲ ᾠοτοκοῦσι, τέτταρες, ὡς ἐπὶ τὸ πολύ. τούτων δὲ ἀπὸ μὲν τῆς ὀχείας ἐν ταῖς ἑπτὰ, ἡ σύστασις γίνεται. ἐν δὲ ταῖς λοιπαῖς τρισὶν ἐπῳάζουσι, καὶ ἐκλέπουσιν ὅσα γόνῳ τίκτεται, οἷον ὑπὸ ἀράχνης, ἢ ἄλλου τοιούτου τινός. αἱ δὲ με- D ταβολαὶ γίνονται τοῖς πλείστοις κατὰ τριήμερον ἢ τετραήμερον, ὥσπερ καὶ αἱ τῶν νόσων συμβαίνουσι κρίσεις. τῶν μὲν οὖν ἐντόμων ἐστὶ ὁ τρόπος ἐπὶ τῆς γενέσεως· φθείρονται δὴ, ἐρρικνωμένων τῶν μορίων, ὥσπερ γήρᾳ τὰ μείζω τῶν ζῴων· ὅσα δὲ πτερωτὰ, καὶ τῶν πτερῶν συσπωμένων περὶ τὸ μετόπωρον· αἱ δὲ μύωπες, καὶ τῶν ὀμμάτων ἐξυδρωπιώντων.

* Gaza legiſſe videtur, περὶ τειχίον.

ΚΕΦΑΛ. κα'.

Αἱ τῶν ἄλλων δόξαι περὶ τῆς γενέσεως τῶν μελιττῶν.

ΠΕρὶ δὲ τὴν γένεσιν τῶν μελιττῶν οὐ τὸν αὐτὸν τρόπον πάντες ὑπολαμβάνουσιν. οἱ μὲν γάρ E φασιν οὐ τίκτειν οὐδὲ ὀχεύεσθαι τὰς μελίττας, ἀλλὰ φέρειν τὸν γόνον· καὶ φέρειν, οἱ μὲν, ἀπὸ τοῦ ἄνθους τοῦ καλλύντρου· οἱ δὲ, ἀπὸ τοῦ ἄνθους τοῦ καλάμου· ἄλλοι δὲ, ἀπὸ τοῦ ἄνθους τῆς ἐλαίας· καὶ σημεῖον λέγουσιν, ὅτι ἂν ἐλαιῶν φορὰ γένηται, τότε καὶ ἑσμοὶ ἀφίενται πλεῖστοι. οἱ δὲ φασὶ, τὸν μὲν τῶν κηφήνων φέρειν αὐτὰς γόνον, ἀπό τινος ὕλης τῶν εἰρημένων· τὸν δὲ τῶν μελιττῶν, τίκτειν τοὺς ἡγεμόνας. τῶν δὲ ἡγεμόνων ἐστὶ γένη δύο· ὁ μὲν βελτίων, πυρρός· ὁ δ' ἕτερος, μέλας καὶ ποικιλώτερος.

τὸ δὲ μέγεθος, διπλάσιος τῆς χρηστῆς μελίττης· καὶ τὸ κάτω τοῦ διαζώματος ἔχουσιν ἡμιόλιον μάλιστα τῷ μήκει, καὶ καλοῦνται ὑπό τινων μητέρες, ὡς γεννῶντες. σημεῖον δὲ λέγουσιν, ὅτι ὁ μὲν τῶν κηφήνων ἐγγίνεται γόνος, κἂν μὴ ἐνῇ ἡγεμών· ὁ δὲ τῶν μελιττῶν, οὐκ ἐγγίνεται. οἱ δὲ φασιν ὀχεύεσθαι, καὶ εἶναι ἄρρενας μὲν τοὺς κηφῆνας, θηλείας δὲ τὰς μελίττας. ἔστι δὲ τῶν μὲν ἄλλων ἡ γένεσις ἐν τοῖς κοίλοις τοῦ κηρίου. οἱ δὲ ἡγεμόνες, γίνονται κάτω πρὸς τοῦ κηρίου, ἀποκρεμάμενοι χωρίς,* καὶ ἐξ ἢ ἑπτὰ, ἐναντίως τῷ γόνῳ πεφυκότες. κέντρον δ' αἱ μὲν μέλιτται ἔχουσιν, οἱ δὲ κηφῆνες οὐκ ἔχουσιν· οἱ δὲ βασιλεῖς καὶ ἡγεμόνες, ἔχουσι μὲν, ἀλλ' οὐ τύπτουσι. διὸ ἔνιοι μὲν οὐκ οἴονται ἔχειν αὐτούς.

* Gaza, ἓξ ἢ ἑπτὰ, ἐναντ.

A Magnitudo iis duplo quàm cæteris frugi apibus, auctior eſt. Pars à præcinctu inferior proportione ſeſquialtera adeò longitudinis habetur. Vocantur à nonnullis matres, vtpote originis authores. Argumento referunt, quòd fucorum fœtus editur etiam ſine duce, apum nunquam. Aliqui per coitum agi opinantur, mareſque eſſe fucos, fœminas verò apes eſſe contendunt. Cæteræ in concauis iniuſque fauorum proueniunt. Duces ſubter ad fauum pendentes oriuntur ſeparatim ſex, aut ſeptem, contrà quàm cæteræ turmæ fœturæ, adhærentes. Aculeum apes poſſident, fuci eo carent. Reges, ducéſque habent, ſed non vtuntur: quocirca eos carere aculeo nonnulli exiſtimant.

B

ΚΕΦΑΛ. κβ'.

Τὰ τῶν μελιττῶν καὶ τῶν ἡγεμόνων γένη· καὶ περὶ γενέσεως αὐτῶν, καὶ ἐργασίας βίου, σχαδόνων καὶ μέλιτος.

Εἰσὶ δὲ γένη τῶν μελιττῶν, ἡ μὲν ἀρίστη, μικρὰ καὶ στρογγύλη καὶ ποικίλη· ἄλλη δὲ μακρὰ, ὁμοία τῇ* ἀνθρήνῃ· τρίτος δὲ, ὁ φὼρ καλούμενος· οὗτος δὲ ἐστὶ μέλας, καὶ πλατυγάστωρ. τέταρτος δὲ, ὁ κηφὴν, μεγέθει μὲν μέγιστος πάντων, ἄκεντρος δὲ καὶ νωθρός. διὸ περιπλέκουσί τινες περὶ τὰ σμήνη, ὥστε τὰς μὲν μελίττας εἰσδύεσθαι, τοὺς δὲ κηφῆνας μὴ, διὰ τὸ εἶναι αὐτοὺς μείζους. ἡγεμόνων δὲ δύο γένη εἰσὶν, ὥσπερ εἴρηται καὶ πρότερον. εἰσὶ δ' ἐν ἑκάστῳ σμήνει πλείους ἡγεμόνες, καὶ οὐχ εἷς μόνος. ἀπόλλυται δὲ τὸ σμῆνος, ἐάν τε ἡγεμόνες ἱκανοὶ μὴ ἐνῶσιν (οὐχ οὕτω δὲ διὰ τὸ ἄναρχα εἶναι, ἀλλ' ὥς φασιν, ὅτι συμβάλλονται εἰς τὴν γένεσιν τὴν τῶν μελιττῶν) ἐάν τε πολλοὶ ἡγεμόνες ὦσι, διασπῶσιν. ὅταν μὲν οὖν ἔαρ ὄψιμον γένηται, καὶ ὅταν αὐχμοὶ καὶ ἐρυσίβη, ἐλάττων γίνεται ὁ γόνος· ἀλλ' αὐχμοῦ μὲν ὄντος, μέλι ἐργάζονται μᾶλλον· ἐπομβρίας δὲ, γόνον. διὸ καὶ ἅμα συμβαίνει ἐλαιῶν φορὰ καὶ ἑσμῶν. ἐργάζονται δὲ πρῶτον μὲν, τὸ κηρίον· εἶτα τὸν γόνον ἐναφιᾶσιν, ὡς μὲν ἔνιοι λέγουσιν, ἐκ τοῦ στόματος· οἱ δὲ φέρειν φασὶν ἄλλοθεν εἰς τοῦτο. τὸ δὲ μέλι* τρέφει τὴν μὲν τοῦ θέρους, τὴν δὲ τοῦ μετοπώρου. ἄμεινον δ' ἐστὶ τὸ μετοπωρινὸν μέλι. γίνεται δὲ τὸ κηρίον μὲν ἐξ ἀνθῶν· κήρωσιν δὲ φέρουσιν ἀπὸ τοῦ δακρύου τῶν δένδρων. μέλι δὲ τὸ πῖπτον ἐκ τοῦ ἀέρος, καὶ μάλιστα τῶν ἄστρων ἐπιτολαῖς, καὶ ὅταν κατασκήψῃ ἡ ἶρις. ὅλως δ' οὐ γίνεται μέλι πρὸ πλειάδος ἐπιτολῆς. τὸ μὲν οὖν κηρίον ποιεῖ, ὥσπερ εἴρηται, ἐκ τῶν ἀνθέων· τὸ μέλι ὅτι οὐ ποιεῖ, ἀλλὰ φέρει τὸ πῖπτον μόνον, σημεῖον. ἐν μιᾷ γὰρ, ἢ ἐν δυσὶν ἡμέραις, πλήρη εὑρίσκουσι τὰ σμήνη οἱ μελιττουργοὶ μέλιτος. ἔτι δὲ, τοῦ μετοπώρου ἄνθη γίνεται μὲν, μέλι δ' οὔ, ὅταν ἀφαιρεθῇ. ἀφαιρεθέντος μὲν οὖν ἤδη τοῦ γινομένου μέλιτος, τῆς τροφῆς οὐκ ἐνούσης ἔτι, ἢ σπανίας, ἐγίνετο ἄν, εἴπερ ἐποίουν ἐκ τῶν ἀνθέων. συνίσταται δὲ τὸ μέλι, πεττόμενον. ἐξ ἀρχῆς γὰρ οἷον ὕδωρ γίνεται, καὶ ἐφ' ἡμέρας μέν τινας ὑγρόν ἐστι· διὸ κἂν ὑφαιρεθῇ ἐν* ταύταις ταῖς ἡμέραις, οὐκ ἔχει πάχος· ἐν εἴκοσι δὲ μάλιστα συνίσταται. δῆλον δ' ἐστὶν εὐθέως τὸ ἀπὸ τοῦ θύμου μάλιστα. διαφέρει γὰρ τῇ γλυκύτητι καὶ τῷ πάχει. φέρει δὲ ἀπὸ πάντων ἡ μέλιττα ὅσα ἀνθεῖ ἐν κάλυκι, καὶ ἀπὸ τῶν ἄλλων δ', ὅσα ἂν γλυκύτητα ἔχῃ, οὐθὲν βλάπτουσα καρπόν, τοὺς δὲ χυμοὺς τούτων τῷ ὁμοίῳ τῇ γλώττῃ ἀναλαμβάνουσα, κομίζει.

* κ. ἀνθρήν.

* Lego φέρειν. nam quid eſt τὸ μέλι τρέφειν? certè ita Gaza legit. at mox iterum τὸ μέλι φέρειν dicit Ariſt. & alibi ſæpe. Virgil. *mella ſtipare.* Varro, *Fauos melle farcire.* Deinde legiſſe Gaza videtur τὸ μὲν τοῦ θ. τὸ δὲ τοῦ μ.

Gaza aliter.

* κ. αὐταῖς

* Gaza rectè βλίττεται. vt notat & Sylb.

CAPVT XXII.

De apum generibus, & earum ducibus, & ætate, deque fauorum confectione, & Schadonibus, id eſt, apum ſobole.

Genera apum plura: optimum, quæ breues, variæ, & in rotunditatem compactiles ſunt. Secundum, quæ longæ, & veſpis ſimiles. Tertium, qui fur nuncupatur: grandis hic & aluo eſt ampliore. Quartum, fucus præcipua magnitudine, ſed nullo armatus aculeo, & ignauus: quamobrem alueis aliquid intexunt, quo apes ſubire poſſint: fuci autem vt grandiores nequeant. C Ducum duo ſunt genera, vt dictum iam eſt. Nec vnus in quoque examine dux tantummodo eſt, ſed plures: peritque ipſum examen, ſi duces vel non ſatis habeantur (quod non tam principis deſiderio, quàm ortus, vt aiunt, ad quem illi neceſſarij ſunt, incidit) vel plures quàm ſatis: diſtrahunt enim examen. Prouenit fœtus apum parciùs vere ſerotino, ſqualore, rubigine. Augent porrò mella ſiccitates, ſobolem imbres. Vnde fit vt ſimul oliuæ & examinum copia ſit. Fauos primùm conficiunt, mox collocant fœtum ore emittentes ſuo, vt iis placet qui cenſent aliunde prolis primordia conuehi. Deinde cibi cauſa mellificant, tam æſtate quàm autumno, ſed melius mel autumnale eſt. D Conſtruunt fauos è floribus, ceram ex lacryma arborum fingunt, mella ex rore aëris, ſyderum exortu potiſſimùm, & arcus cæleſtis incubitu contrahunt. Omnino ante Vergiliarum exortum mel non fit. Fauos itaque, vt dictum eſt, floribus faciunt: mel autem non ipſas facere apes, ſed rorem cadentem deferre, argumento eſt, quòd vno aut altero die cellas melle repletas inueniunt apiarij. Item autumno mel, poſteaquam detractum eſt, non reparatur, cum tamen illo etiam tempore flores proueniant. Sublato itaque melle, & cibo aut nullo extante, aut exiguo, repeterent certè apes munus mellis conficiendi, ſi ex floribus poſſent accipere. Craſſeſcit autem mel con- E coctum iam tempore: initio enim vt aqua dilutum eſt, & primis diebus ſine craſſitudine cernitur. Quod ſi exemptum eo tempore ſit, craſſitudine caret: tum viceſimo maximè die ſpiſſatur. Indicium perfectionis in ſapore potiſſimùm eſt: dulcius enim, quod craſſius. Colligunt apes ex omnibus, quæ florem caliculatum ferunt, atque etiam ex cæteris in quibus dulcedo eſt: & lingua ſuſceptum genus id ſaporis deportant, ſine vllo fructuum detrimento. Vindemiantur initio caprifici aluei: tunc enim mellationis terminus eſt.

* εἰλίττεται δὲ τὰ σμήνη, ὅταν ἐρινεὸν ἄρχηται φαγ.

Schadones

Schadones autem (ſobolem dico) optimæ fiunt,
cùm mellificatur aggerunt ſuis cruribus ceram, at-
que erithacam. Mel ore euomunt in cellas. Fœtu
poſito incubant auium more. Excluſus inde vermi-
culus, dum paruus eſt, iacet in fauo obliquus: poſt
deinde ſua ipſe facultate ſe erigit, cibúmque capit:
& fauo ita adhæret, vt retineri videatur. Fœtus a-
pum & fucorum candidus eſt: ex quo vermiculi
fiunt, qui in apes fucóſque tranſeant. Primordium
regum colore cernitur fuluo, corpulentia mellis
craſſioris, magnitudine illico proxima ſuæ futuræ
ſoboli. Nec primùm ex eo vermiculus gignitur, ſed
ſtatim apis, vt aiunt. Qua autem parte fœtus con-
ſtiturus ſit, mel ibi è regione conficitur. Schado-
nes, ſi fœtus oppreſſus intercipiatur, truncatæ ſine
pennis & cruribus prodeunt. Sed ſi liberè ad finem
generationis venerunt, rupta, qua cingitur, mem-
brana euolant. Stercus quamdiu ſit vermis, emit-
tit, poſtmodum non, niſi perfectæ (vt modò dixi)
prodierint. Si quis capita iis demat priuſquam pen-
nas habeant, pro pabulo nimirum apibus ſunt. Et
ſi fucum ademptis pennis in alueum reijcias, ipſæ
reliquorum pennas erodunt. Vita apum anni ſex.
Nonnullæ etiam ſeptem poſſunt complere. Quòd
ſi examen nouem aut decem annos durauerit, pro-
ſperè actum eſſe exiſtimatur. Genus quoddam a-
pum in Ponto eſt candidum valde, quod bis men-
ſe mellificet. Apud Themiſcyram circa Thermo-
dontem amnem, apes tam in terra quàm in alueis
faciunt fauos, qui parum admodum ceræ conti-
neant, & mel craſſius reddant. Fauus ipſe læuis at-
que æquabilis eſt, quem non ſemper, ſed hybernis
temporibus tantùm conſtruunt. Copia enim in eo
tractu eſt hederæ, quæ hyeme floreat, vnde apes
mel capiant. Ad Amiſum vrbem conuehitur à lo-
cis ſuperioribus mel candidum, craſſúmque maio-
rem in modum, quod apes faciunt arboribus ſine
fauo, quale etiam fieri in Ponto cognitum eſt. Sunt
etiam apes, quæ fauos ſub terra triplici ordine fa-
ciant: in quibus mel eſt, vermis nullus. Sed nec fa-
ui omnes eiuſmodi ſunt, nec apes ita omnes con-
fingunt.

CAPVT XXIII.

De ſatura Crabronum, & Veſparum.

CRabrones, & veſpæ, ſi duce amiſſo aberraue-
rint, fauos ſuæ proli conſtituunt, in ſubli-
mi & foraminibus. Crabrones in ſublimi, veſpæ in
foraminibus. Sed ſi habeant ducem, ſub terra nidi-
ficant. Cellis ſexangulis fauos extruunt omnes, vt
apes, ſed ex materia corticea quadam, & araneoſa.
Longè tamen lautior fauus crabronū quàm veſpa-
rum eſt. Fœturam modo apum inſtillant ad latus
cellarum faui, & parietibus admouent. Verùm non
in omnibus cellis ineſt æqualis fœtus, ſed aliis iam
grandiuſculus, vt vel queat volare: aliis in nym-
pha eſt, aliis adhuc in vermiculo. Excrementum
vermiculis tantùm, vt & in apum genere eſt. Ma-
net fœtus immobilis, cùm in nympha eſt, & mem-
brana velatur. Paululum mellis quantum gut-
ta, in cellis crabronum è regione proli paratur.

A σχάδονας δὲ ἀρίστας ποιοῦσιν, ὅταν μέλι ἐργάζωνται. φέ-
ρει δὲ κηρὸν μὲν καὶ ἐριθάκην, περὶ τοῖς σκέλεσι· τὸ μέλι δὲ
ἐμεῖ εἰς τὸν κύτταρον. τὸν δὲ γόνον ὅταν ἀφῇ, ἐπωάζει, ὥσπερ
ὄρνις. ἐν δὲ τῷ κηρίῳ τὸ σκωλήκιον, μικρὸν μὲν ὄν, κεῖται
πλάγιον· ὕστερον δὲ, ἀνίσταται αὐτὸ ὑφ' ἑαυτοῦ, καὶ τρέφεται,
καὶ πρὸς τῷ κηρίῳ ἔχεται, ὥστε καὶ ἀντειλῆφθαι. ὁ δὲ γόνος
ἐστὶ τῶν μελιττῶν καὶ τῶν κηφήνων λευκὸς, ἐξ οὗ τὰ σκω-
λήκια γίνεται· αὐξανομένων δὲ, γίνονται μέλιτται καὶ κη-
φῆνες. ὁ δὲ τῶν βασιλέων γόνος, τὴν χρόαν γὰρ ὑπό-
πυρρος· τὴν δὲ λεπτότητα ἐστὶν οἷον μέλι παχύ· τὸν ὄγκον
δὲ εὐθέως ἔχει παραπλήσιον τῷ γινομένῳ ἐξ αὐτοῦ. σκώ-
B ληξ δὲ οὐ γίνεται πρότερον ἐκ τούτου, ἀλλ' εὐθέως ἡ μέ-
λιττα φαίνεται. ὅταν δὲ τέκῃ ἐν τῷ κηρίῳ μέλι, ἐκ τοῦ
ἀντιμήκρου γίνεται.* φύει δὲ σχάδων πόδας καὶ πτερὰ,
ὅταν καταληφθῇ· ὅταν δὲ λάβῃ πέρας, τὸν μὲν ὑμένα
περιρρήξας ἐκπέτεται· κόπρον δὲ προΐεται ὡσανεὶ
σκωλήκιον, ὕστερον δὲ οὐκέτι, πλὴν ἐὰν μὴ ἐξέλθῃ, ὥσπερ
ἐλέχθη πρότερον. ἐὰν δέ τις ἀφέληται τὰς κεφαλὰς τῆς
σχάδονος πρὶν πτερὰ ἔχειν, ἐξεσθίουσιν αὐτὰ αἱ μέλιτ-
ται. κἂν κηφῆνος τὸ πτερὸν ἀποκνίσας ἀφῇ τις, τῶν λοι-
πῶν αὗται τὰ πτερὰ ἀπεσθίουσι. βίος δὲ τῶν μελιττῶν ἔτη
ἕξ. ἔνιαι δὲ τῶν μελιττῶν καὶ ἑπτὰ ἔτη ζῶσιν. ἐπὰν δὲ
C σμῆνος διαμείνῃ ἔτη ἐννέα ἢ δέκα, εὖ δοκεῖ διαγεγενῆ-
σθαι. ἐν δὲ τῷ Πόντῳ εἰσὶ μέλιτται τινὲς λευκαὶ σφό-
δρα, αἳ μέλι ποιοῦσι δὶς τοῦ μηνός. αἱ δ' ἐν Θεμισκύρᾳ
περὶ τὸν Θερμώδοντα ποταμὸν, ἐν τῇ γῇ, καὶ ἐν τοῖς σμή-
νεσι ποιοῦνται κηρία, οὐκ ἔχοντα κηρὸν πολὺν, ἀλλὰ πά-
νυ μικρὸν, μέλι δὲ παχύ. τὸ δὲ κηρίον λεῖον καὶ ὁμαλόν ἐστιν.
οὐκ ἀεὶ δὲ τοῦτο ποιοῦσιν, ἀλλὰ τοῦ χειμῶνος. ὁ γὰρ κιττὸς πο-
λὺς ἐν τῷ τόπῳ ἐστὶν, ἀνθεῖ δὲ ταύτην τὴν ὥραν· ἀφ' οὗ
φέρουσι τὸ μέλι. καταγεται δὲ καὶ εἰς Ἀμισὸν ἄνωθεν μέ-
λι λευκὸν καὶ παχὺ σφόδρα, ὃ ποιοῦσιν αἱ μέλιτται ἄνευ
D κηρίων πρὸς τοῖς δένδρεσι. γίνεται δὲ τοιοῦτον καὶ ἄλλοθι
ἐν τῷ Πόντῳ. εἰσὶ δὲ καὶ μέλιτται, αἳ ποιοῦσι τριπλᾶ
κηρία ἐν τῇ γῇ. ταῦτα δὲ μέλι μὲν ἴσχει, σκώληκα δὲ οὐκ
ἴσχει. ἔστι δὲ οὔτε τὰ κηρία πάντα τοιαῦτα, οὔτε πᾶσαι αἱ
μέλιτται τοιαῦτα ποιοῦσιν.

* Gaza aliter hanc periodum legiſſe videtur.

ΚΕΦΑΛ. κγ΄.

Περὶ ἀνθρηνῶν καὶ σφηκῶν.

Αἱ δὲ ἀνθρῆναι καὶ σφῆκες ποιοῦσι κηρία τῷ γό-
νῳ, ὅταν μὴ ἔχωσιν ἡγεμόνα, ἀλλὰ ἀποπλανη-
θῶσι καὶ μὴ εὑρίσκωσιν· αἱ μὲν ἀνθρῆναι, ἐπὶ μετεώ-
ρου τινός· οἱ δὲ σφῆκες, ἐν τρώγλῃ· ὅταν δ' ἔχωσιν
ἡγεμόνας, ὑπὸ γῆν. ἑξάγωνα μὲν οὖν πάντα ἐστὶ τὰ
E κηρία καὶ τὰ τούτων, ὥσπερ καὶ τὰ τῶν μελιττῶν. σύγ-
κειται δὲ οὐκ ἐκ κηροῦ, ἀλλ' ἐκ φλοιώδους καὶ ἀρα-
χνώδους ὕλης τὸ κηρίον. γλαφυρώτερον δὲ πολλῷ τὸ
τῶν ἀνθρηνῶν ἐστιν, ἢ τὸ τῶν σφηκῶν κηρίον. ἐνα-
φιᾶσι δὲ γόνον, ὥσπερ αἱ μέλιτται, ὅσον σταλαγμὸν, εἰς
τὸ πλάγιον τοῦ κυττάρου, καὶ προσέχεται τῷ τοίχῳ.
οὐχ ἅμα δὲ ἐν πᾶσι τοῖς κυττάροις ἔνεστιν ὁ γόνος,
ἀλλ' ἐνίοις μὲν ἤδη μεγάλα ἔνεστιν, ὥστε καὶ πέτεσθαι·
ἐνίοις δὲ, * νύμφαι· ἐν τοῖς δὲ, σκώληκες ἔτι. κόπρος
δὲ μόνον ἔπεστι τοῖς σκώληξιν, ὥσπερ ταῖς μελίτταις, καὶ * ἔστ' ἂν νύμφαι ὦσι καὶ ἀκινητίζωσι, καὶ ἀπαληλιπται
ἐκ κυττάρου. κατ' ἀντικρὺ δὲ ἐν τῷ κυττάρῳ τοῦ γόνου, ὅσον σταλαγμὸς μέλιτος ἐγγίνεται ἐν τοῖς τῆς ἀνθρήνης κηρίοις.

* Suprà, c.19.
* κ. ὅτ' ἄν. mendosè.

γίνονται δὲ σχαδόνες οὐκ ἐν τῷ ἔαρι τούτων, ἀλλ' ἐν τῷ μετοπώρῳ· τὴν δ' αὔξησιν ἐπίδηλον λαμβάνουσι μάλιστα ἐν ταῖς πανσελήνοις. ἔχεται δὲ καὶ ὁ γόνος καὶ οἱ *σκώληκες, οὐ κάτωθεν τοῦ κυττάρου, ἀλλ' ἐκ τῶν πλαγίων. A

ΚΕΦΑΛ. κδ'.

Περὶ βομβυκίων.

* γ. ὥσπερ ἑαλι. quod ſecutus eſt Gaza. Plin. 11.22.
* γ. ἐκτίκτ.

Ἔνια δὲ τῶν βομβυκίων πρὸς λίθῳ, ἢ τοιούτῳ τινὶ ποιοῦσι πήλινον ὀξύ, καὶ * ὥσπερ οἱ ἅλες καταλείφονται· τοῦτο δὲ σφόδρα παχὺ καὶ σκληρόν· λόγχῃ γὰρ μόλις διαιροῦσιν. ἐνταῦθα * ἐντίκτουσι, καὶ γίνεται σκωλήκια λευκὰ ἐν ὑμένι μέλανι. B χωρὶς δὲ τοῦ ὑμένος ἐν τῷ πηλῷ γίνεται κηρός. οὗτος δ' ὁ κηρὸς πολύ τι ὠχρότερος γίνεται τοῦ τῶν μελιττῶν.

ΚΕΦΑΛ. κε'.

Περὶ μυρμήκων.

Ὀχεύονται δὲ καὶ οἱ μύρμηκες καὶ τίκτουσι σκωλήκια, ἃ οὐ προσπέφυκε πρὸς οὐδέν. αὐξανόμενα δὲ ταῦτα ἐκ μικρῶν καὶ στρογγύλων, τὸ πρῶτον μακρὰ γίνονται, καὶ διαρθροῦνται· ἡ δὲ γένεσίς ἐστι τούτοις τοῦ ἔαρος.

ΚΕΦΑΛ. κϛ'. C

Περὶ σκορπίων.

Τίκτουσι δὲ καὶ οἱ σκορπίοι οἱ χερσαῖοι σκωληκώδη πολλά, καὶ ἐπῳάζουσιν. ὅταν δὲ τελειωθῇ, ἐκβάλλονται ὥσπερ οἱ ἀράχναι, καὶ ἀπόλλυνται ὑπὸ τῶν τέκνων. πολλάκις δὲ γίνονται περὶ ἕνδεκα τὸν ἀριθμόν.

ΚΕΦΑΛ. κζ'.

Περὶ ἀραχνίων.

D

* γ. ἐπιστρογγύλα γίνεται. & ita etiam Gaza.
* Melius, γλαφυραί,

Τὰ δ' ἀράχνια ὀχεύεται πάντα τὸν εἰρημένον τρόπον. γεννᾷ δὲ σκωλήκια μικρὰ πρῶτον. ὅλα γὰρ μεταβάλλοντα γίνεται ἀράχνια, καὶ οὐκ ἐκ μέρους. * ἐπιστρόγγυλα δέ ἐστι κατ' ἀρχάς· ὅταν δὲ τέκῃ, ἐπῳάζει, καὶ ἐν τρισὶν ἡμέραις διαρθροῦται. τίκτει δὲ πάντα μὲν εἰς ἀράχνιον· ἀλλὰ τὰ μὲν, εἰς λεπτὸν καὶ μικρόν, τὰ δέ, εἰς παχύ. καὶ τὰ μὲν, ὅλως ἐν κύτει στρογγύλῳ, τὰ δέ, μέχρι τινὸς περιέχεται ὑπὸ τοῦ ἀραχνίου. οὐχ ἅμα δὲ πάντα ἀράχνια γίνεται· πηδᾷ δὲ εὐθύς, καὶ ἀφίησιν ἀράχνιον. ὁ δὲ χυμός, ὅμοιος ἐν τοῖς σκώληξι θλιβομένοις, καὶ ἐν αὐτοῖς νέοις οὖσι, παχὺς καὶ λευκός. αἱ δὲ λειμώνιαι ἀράχναι, E παραποτίκτουσιν εἰς ἀράχνιον, οὗ τὸ μὲν ἥμισυ, πρὸς αὐταῖς ἐστι, τὸ δὲ ἥμισυ, ἔξω· καὶ ἐν τούτῳ ἐπῳάζουσαι, ζῷα ποιοῦσι. τὰ δὲ φαλάγγια τίκτει εἰς γύργαθον πλεξάμενα παχύν, ἐν ᾧ ἐπῳάζουσι. τίκτουσι δέ, αἱ μὲν * γλαφυραί, ἐλάττω τὸ πλῆθος· τὰ δὲ φαλάγγια, πολὺ πλῆθος· καὶ αὐξηθέντα περιέχει τὸ φαλάγγιον, καὶ ἀποκτείνει δὲ τὴν τεκοῦσαν ἐκβάλλοντα· πολλάκις δὲ καὶ τὸν ἄρρενα, ἐὰν λαμβάνωσι. συνεπῳάζει γὰρ τῇ θηλείᾳ ἐνίοτε. τὸ δὲ πλῆθος γίνεται καὶ τριακόσια περὶ ἓν φαλάγγιον. ἐκ δὲ μικρῶν, τέλειοι ἀράχναι γίνονται, περὶ τὰς ἑβδομάδας τὰς τέτταρας.

A Scadones huius generis non vere ſed autumno fiunt, & creſcunt maximè plenilunio. Hæret & fœtus, & vermiculus non in imo cellæ, ſed lateri.

CAPVT XXIV.

De parte nonnullorum ex genere Bombycum.

Nonnulla ex bombycum genere, nidos in acutum exeuntes è luto quaſi illitos, vitri ſpecie affigũt lapidi, aut alicui tali, tam craſſos duróſque, vt ſpiculo perforari vix poſſint. Pariunt in iis, & vermiculos producunt candidos, membrana B obuolutos nigra: ſeorſúmque à membrana ceram in luto faciunt, quæ multo pallidior ſit, quàm cera apum.

CAPVT XXV.

De coitu, & partu Formicarum.

Coeunt & formicæ, & vermiculũ pariunt nulli annexum: qui accreſcens, ex minutulo & rotundo longiuſculus fit, formámque accipit debitam. Ortus eorum verno tempore agitur.

CAPVT XXVI.

De partu terreſtrium Scorpionum.

Qvin & ſcorpiones terreſtres vermiculos ouorum ſpecie pariunt complures, & incubant. Mox vt prolem perfecerunt, pelluntur ab ea ipſa, ſicut & araneis accidit, & interimuntur à ſuis liberis magno numero: ſæpius enim vndenos pariunt.

CAPVT XXVII.

De generibus Araneorum, & eorum partu.

D Aranei verò coeunt modo quo dictum eſt. Pariunt vermiculos, qui non ex parte, ſed toti in aranei formam immutantur: nam & rotundi iam inde à primo ortu proueniunt. Cùm pepererint, incubant & triduo peragunt. Pariunt omnes in tela, ſed alij in ſubtili & breui, alij in craſſiore, & alij omnino in ſitu orbiculato: alij ita, vt aliquatenus tela obducta proles muniatur. Proles autem ipſa non vniuerſa producitur: vt tamen quiſque exiuit, protinus ſalit, filúmque mittit. Humor ſimilis in vermiculis infrictu percipitur, atque in araneis ipſis recèns natis, hic eſt craſſus, & candidus. Pratenſes aranei in tela pariùnt. cuius dimidium applicatum E ipſis matribus eſt, reliquum foris recipit partum, & incubant eadem in tela, atque viuificant. Phalangij in rete, quod craſſum confecerint, pariunt, atque incubant. Cæterùm lautioribus illis partus minoris numeri eſt: at verò phalangiis admodum numeroſus. Cúmque ipſa proles increuerit, matrem amplexa conſumit, & eijcit. Sæpe etiam patrem, ſi ceperint: adiuuat enim fœminam incubitu. Pariuntur interdum & trecenti eodem vtero. Conſummantur aranei, & iuſta ſibi recipiunt incrementa diebus quater ſeptenis, à paruo ſui ortus initio ad finem.

CAPVT XXVIII.

De coitu, & partu Locuſtarum, earumque ætate.

Locuſtæ eodem coeunt modo, quo cætera inſecta, ſcilicet minore ſuperueniente maius. Sunt enim in eo genere mares minores quàm fœminæ. Pariūt in terra fixo cauliculo, quo mares vacant: ac vniuerſæ, & loco eodem fœtum deponūt, ita vt quaſi fauus eſſe videatur. Hinc vermiculi ſpeciem oui gerentes oriuntur, qui terra quadam prætenui, tanquam membranula ambiuntur, qua diſrupta emergunt locuſtæ, ac euolant. Tam mollis fœtura hæc eſt, vt ad tactum leuiſſimum dilabatur, & pereat. Non ſummæ telluri partus committitur, ſed paulo altius. His concoctione peracta, exeunt ex illo terreno amiculo paruæ locuſtæ, & nigrantes: deinde cute obrupta, maiores ſtatim efficiuntur. Pariunt exitu veris, & ſtatim à partu moriuntur, vermiculis circa collum innaſcentibus tempore partus, qui eas ſtrangulent. Mares quoque eodem tempore obeunt. Vere e terra emergunt. Locis mõtanis, aut tenuibus locuſtæ non fiunt, ſed planis, rimoſiſque. Pariunt enim in rimis ſua oua, quæ durant hyeme in terra: ineunte æſtate prouenunt ex fœtu anni ſuperioris locuſtæ.

CAPVT XXIX.

De Brucis, & eorum fœtura.

Pari modo, & quos brucos appellant, pariunt: & cum pepererint, moriuntur. Intereunt oua eorum aquis autumnalibus, cùm nimiæ inceſſerint. At ſicco autumno largior prouentus brucorum eſt, quoniam minus oua intereant. Innormis enim eſſe videtur eorum quidem interitus: quinetiam ortus nulla certa agitur ratione.

CAPVT XXX.

De generibus Cicadarum, & earum coitu.

Cicadarum duo ſunt genera: aliæ enim minores, quæ primæ prodeunt, & nouiſſimè pereunt: aliæ maiores quæ canunt, eædemque nouiſſimæ prodeunt, & primæ intereunt. Sunt quæ canunt præcinctu diuiduo, ſiue minores, ſiue maiores ſint. Quæ autem non canunt, indiuiduæ conſtant. Vocant nonnulli grandiores illas & canentes, argutas: minores, mutas. Sed canere vel in ſecundo hoc genere poſſunt paululum, quæ præcinctæ prodeunt. Naſci non poſſunt cicadæ, vbi arbores deſunt: quocirca apud Cyrenam nullæ in campo ſunt, cum circa oppidum ipſum multæ prouenīat. Oleas maximè amant, vt minus vmbroſas. Loca enim frigidiora aſpernantur: quamobrem in opacis nemoribus eſſe nequeunt. Coeunt tam maiores quàm minores, ſupinæ complexu mutuo: maſque inſerit in fœminam, ſicut & cætera inſecta agunt. Genitale fœmina habet reſciſſum, quo recipit id quod à mare inijcitur. Pariunt in aruis ceſſantibus, excauantes aſperitate præacuta, quam parte habēt poſteriore: quomodo bruci etiam ſolo eiuſmodi pariunt: quapropter in Cyrenenſi agro copia eſt.

ΚΕΦΑΛ. κη΄.

Περὶ ἀκρίδων.

Αἱ δ' ἀκρίδες ὀχεύονται τὸν αὐτὸν τρόπον τοῖς ἄλλοις ἐντόμοις, ἐπιβαινόντος τοῦ ἐλάττονος ἐπὶ τὸ μεῖζον· τὸ γὰρ ἄρρεν ἔλαττόν ἐστι. τίκτουσι δὲ εἰς τὴν γῆν, καταπήξασαι τὸν ὄπισθεν καυλὸν, ὃν οἱ ἄρρενες οὐκ ἔχουσιν. ἀθρόα δὲ τίκτουσι, καὶ κατὰ τὸν αὐτὸν * τόπον, ὥστε εἶναι οἷον κηρίον. ὅταν δὲ τέκωσιν, ἐνταῦθα γίνονται σκώληκες ᾠοειδεῖς, οἳ περιλαμβάνονται ὑπὸ γῆς τινος λεπτῆς, ὥσπερ ὑμένος· ἐν τούτῳ ἐκπέττονται. οὕτω δ' ἐστὶ μαλακὸν τὸ κύημα, ὥστε ἄν τις ἅψηται, συνθλίβεσθαι. ταῦτα δ' οὐκ ἐπιπολῆς, ἀλλὰ μικρὸν ἐντὸς γῆς ἐστιν. ὅταν δ' ἐκπεφθῇ, ἐκδύονται ἐκ τοῦ γεώδους τοῦ περιέχοντος ἀκρίδες μικραὶ καὶ μέλαιναι· εἶτα περιρρήγνυται αὐταῖς τὸ δέρμα, καὶ γίνονται εὐθὺς μείζους. τίκτουσι δὲ λήγοντος * τοῦ θέρους, καὶ τεκοῦσαι ἀποθνήσκουσιν ἅμα. ἅμα γὰρ * τικτούσαις σκώληκες ἐγγίνονται περὶ τὸν τράχηλον· καὶ οἱ ἄρρενες δὲ ἀποθνήσκουσι περὶ τὸν αὐτὸν χρόνον. ἐκδύονται δ' ἐκ τῆς γῆς τοῦ ἔαρος. οὐ γίνονται δ' αἱ ἀκρίδες ἐν τῇ ὀρεινῇ, οὐδ' ἐν τῇ * λεπτῇ, ἀλλ' ἐν τῇ πεδινῇ καὶ κατερρωγυίᾳ· ἐν ταῖς ῥωγμαῖς γὰρ ἐντίκτουσι. διαμένει δὲ τὰ ᾠὰ τὸν χειμῶνα ἐν τῇ γῇ· * ἅμα δ' ἐν τῷ θέρει γίνονται ἐκ τῶν περυσινῶν κυημάτων ἀκρίδες.

* [illegible]
* Gaza [illegible]
* [illegible]
* Scrib. [illegible], cum Sylb.
* G. [illegible]

ΚΕΦΑΛ. κθ΄.

Περὶ ἀττελάβων.

Ὁμοίως δὲ τίκτουσι καὶ οἱ ἀττέλαβοι, καὶ τεκόντες ἀποθνήσκουσι. φθείρεται δ' αὐτῶν τὰ ᾠὰ ὑπὸ τῶν μετοπωρινῶν ὑδάτων, ὅταν πολλὰ γένηται· ἂν δὲ αὐχμὸς τύχῃ ὤν, τότε γίνονται μᾶλλον ἀττέλαβοι πολλοὶ, διὰ τὸ μὴ φθείρεσθαι ὁμοίως· ἐπεὶ ἄτακτός γε δοκεῖ εἶναι ἡ φθορὰ αὐτῶν, καὶ γίνεσθαι ὅπως ἂν τύχῃ.

ΚΕΦΑΛ. λ΄.

Περὶ τεττίγων.

Τῶν δὲ τεττίγων γένη μέν ἐστι δύο· οἱ μὲν μικροὶ, οἳ πρῶτοι φαίνονται, καὶ τελευταῖοι ἀπόλλυνται· οἱ δὲ μεγάλοι, οἱ ᾄδοντες, οἳ ὕστερόν τε γίνονται, καὶ πρότεροι ἀπόλλυνται. ὁμοίως δὲ ἔν τε τοῖς μικροῖς καὶ ἐν τοῖς μεγάλοις, οἱ μὲν διῃρημένοι εἰσὶ τὸ ὑπόζωμα, οἱ ᾄδοντες· οἱ δὲ ἀδιαίρετον ἔχοντες, οὐκ ᾄδουσι. καλοῦσι δέ τινες τοὺς μὲν μεγάλους καὶ ᾄδοντας, ἀχέτας· τοὺς δὲ μικροὺς, τεττιγόνια. ᾄδουσι δὲ μικρὰ καὶ τούτων [οἱ] διῃρημένοι. Sup. li. 4. c. 7. οὐ γίνονται δὲ τέττιγες ὅπου δένδρα μή ἐστι· διὸ καὶ ἐν Κυρήνῃ οὐ γίνονται ἐν τῷ πεδίῳ, περὶ δὲ τὴν πόλιν πολλοὶ, μάλιστα δὲ οὗ ἐλᾶαι· οὐ γίνονται παλίσκιοι. ἐν γὰρ τοῖς ψυχροῖς οὐ γίνονται τέττιγες· διὸ οὐδὲ ἐν τοῖς συσκίοις ἄλσεσιν. ὀχεύονται δ' οἱ μεγάλοι ὁμοίως ἀλλήλοις καὶ οἱ μικροὶ, ὕπτιοι συνδυαζόμενοι πρὸς ἀλλήλους. ἐναφίησι δὲ ὁ ἄρρην εἰς τὴν θήλειαν, ὥσπερ καὶ τἆλλα ἔντομα. ἔχει δὲ ἡ θήλεια αἰδοῖον ἐσχισμένον· τὸ δὲ θῆλύ ἐστιν, εἰς ὃ ἐναφίησιν ὁ ἄρρην. τίκτουσι δ' ἐν τοῖς ἀργοῖς, τρυπῶντες ᾧ ἔχουσιν ὄπισθεν ὀξεῖ, καθάπερ καὶ οἱ ἀττέλαβοι· καὶ γὰρ οἱ ἀττέλαβοι τίκτουσιν ἐν τοῖς ἀργοῖς· διὸ πολλοὶ ἐν τῇ Κυρηναίᾳ γίνονται.

ἐντίκτουσι δὲ καὶ ἐν τοῖς καλάμοις, ἐν οἷς ἱστᾶσι τὰς ἀμπέλους, διατρυπῶντες τοὺς καλάμους· καὶ ἐν τοῖς τῆς σκίλλης καυλοῖς. ταῦτα δὲ τὰ κυήματα καταρρεῖ εἰς τὴν γῆν. γίνονται δὲ πολλοί, ὅταν ἐπομβρία γένηται. ὅταν δὲ ὁ σκώληξ αὐξηθῇ ἐν τῇ γῇ, τότε γίνεται τεττιγομήτρα, καὶ εἰσὶ τότε ἥδισται, πρὶν περιρραγῆναι τὸ κέλυφος. ὅταν δὲ ἡ ὥρα ἔλθῃ περὶ τροπάς, ἐξέρχονται νύκτωρ, καὶ εὐθὺς ῥήγνυται τὸ κέλυφος, καὶ γίνονται τέττιγες ἐκ τῆς τεττιγομήτρας. γίνονται δὲ μέλανες καὶ σκληρότεροι εὐθύς, καὶ μείζους, καὶ ᾄδουσιν. εἰσὶ δὲ ἄρρενες μὲν, οἱ ᾄδοντες, ἐν ἀμφοτέροις τοῖς γένεσι· θήλεις δέ, οἱ ἕτεροι. καὶ τὸ μὲν πρῶτον ἡδίους οἱ ἄρρενες, μετὰ δὲ τὴν ὀχείαν αἱ θήλειαι· ἔχουσι γὰρ ᾠὰ λευκά. ἀναπετόμενοι δὲ ὅταν σοβήσῃ τις, ἀφιᾶσιν ὑγρόν, οἷον ὕδωρ, ὃ λέγουσιν οἱ γεωργοί, ὡς κατουρούντων καὶ ἐχόντων περίττωμα, καὶ τρεφομένων τῇ δρόσῳ. ἐὰν δέ τις κινῶν τὸν δάκτυλον προσίῃ ἀπ' ἄκρου, ἢ συγκάμπτων καὶ ἐκτείνων πάλιν, μᾶλλον ὑπομένουσιν, ἢ ἐὰν εὐθὺς ἐκτείνῃ· ἀναβαίνουσι δ' ἐπὶ τὸν δάκτυλον, διὰ τὸ ἀμυδρῶς ὁρᾶν, ὡς ἐπὶ τὸ φύλλον ἀναβαίνοντες κινούμενον.

ΚΕΦΑΛ. λα΄.

Περὶ φθειρῶν καὶ ψυλλῶν, καὶ κορῶν.

Τῶν δ' ἐντόμων ὅσα σαρκοφάγα μὲν μή ἐστι, ζῇ δὲ χυμοῖς σαρκὸς ζώσης, οἷον οἵ τε φθεῖρες καὶ ψύλλαι, καὶ κόρεις, ἐκ μὲν τῆς ὀχείας πάντα γεννᾷ τὰς καλουμένας κόνιδας· ἐκ δὲ τούτων ἕτερον οὐδὲν γίνεται πάλιν. αὐτῶν δὲ τούτων γίνονται αἱ μὲν ψύλλαι, ἐξ ἐλαχίστης σηπεδόνος· ὅπου γὰρ κόπρος ξηρὰ γίνεται, ἐν ταύτῃ συνίστανται· αἱ δὲ κόρεις, ἐκ τῆς ἰκμάδος τῆς ἀπὸ τῶν ζῴων συνισταμένης ἐκτός. οἱ δὲ φθεῖρες, ἐκ τῶν σαρκῶν. γίνονται δέ, ὅταν μέλλωσιν, οἷον ἴονθοι μικροί, οὐκ ἔχοντες πύον. τούτους ἄν τις κεντήσῃ, ἐξέρχονται φθεῖρες. ἐνίοις δὲ συμβαίνει τῶν ἀνθρώπων νόσημα, ὅταν ὑγρασία πολλὴ ἐν τῷ σώματι ᾖ· καὶ διεφθάρησαν ἤδη τινὲς τοῦτον τὸν τρόπον, ὥσπερ Ἀλκμᾶνά τέ φασι τὸν ποιητὴν, καὶ Φερεκύδην τὸν Σύριον. καὶ ἐν νόσοις δέ τισι γίνεται πλῆθος φθειρῶν. ἔστι δὲ γένος φθειρῶν οἳ καλοῦνται ἄγριοι, καὶ σκληρότεροι τῶν ἐν τοῖς πολλοῖς γινομένων· εἰσὶ δὲ ἔτι καὶ δυσαφαίρετοι ἀπὸ τοῦ σώματος. παισὶ μὲν οὖν, αἱ κεφαλαὶ φθειρώδεις γίνονται· τοῖς δ' ἀνδράσιν, ἧττον. γίνονται δὲ καὶ αἱ γυναῖκες τῶν ἀνδρῶν μᾶλλον φθειρώδεις. ὅσοις δ' ἂν φθειριᾶν συμβῇ τῇ κεφαλῇ, ἧττον πονοῦσι τὰς κεφαλάς. ἐγγίνονται δὲ καὶ τῶν ἄλλων ζῴων ἐν πολλοῖς φθεῖρες. καὶ γὰρ οἱ ὄρνιθες ἔχουσι· καὶ οἵ γε καλούμενοι φασιανοὶ ἐὰν μὴ κονίωνται, διαφθείρονται ὑπὸ τῶν φθειρῶν· καὶ τῶν ἄλλων δὲ ὅσα πτερὸν ἔχει, τῶν ἐχόντων καυλόν, καὶ τῶν ἐχόντων τρίχας. πλὴν ὄνος οὐκ ἔχει οὔτε φθεῖρας, οὔτε κρότωνας· οἱ δὲ βόες, ἔχουσιν ἀμφότερα. τὰ δὲ πρόβατα καὶ αἶγες, κρότωνας, φθεῖρας δὲ οὐκ ἔχουσι· καὶ ὕες, φθεῖρας μεγάλους καὶ σκληρούς. ἐν δὲ τοῖς κυσίν, οἱ καλούμενοι γίνονται κυνοραισταί. πάντες δὲ οἱ φθεῖρες, ἐν τοῖς ἔχουσιν, ἐξ αὐτῶν γίνονται τῶν ζῴων. γίνονται δὲ οἱ φθεῖρες μάλιστα, ὅταν μεταβάλλωσι τὰ ὕδατα οἷς λούονται, ὅσα ἔχει τῶν λουομένων φθεῖρας. ἐν δὲ τῇ θαλάττῃ γίνονται μὲν ἐν τοῖς ἰχθύσι φθεῖρες· οὗτοι δὲ οὐκ ἐξ αὐτῶν τῶν ἰχθύων,

A Quinetiam in arundinibus, quo adminiculo vites eriguntur, nidum fœturæ excauant. Et in caulibus ſquillæ herbæ interdum pariunt: ſed hic fœtus facilè in terram dilabitur. Proueniunt largè copia imbrium. Creſcit primò in terra vermiculus: deinde fit ex eo quæ tettigometra vocatur, parentis nomine: quo tempore guſtu ſuauiſſimæ ſunt, antequā cortex rumpatur. Poſtmodum citra ſolſtitia noctu exeunt, ſtatimque rupto cortice, prodeunt cicadæ ex matrice illa cicada, quam modo tettigometram dixi, nigræ protinus & duriuſculæ, & maiuſculæ atque incipiunt canere. Mares vtroque in genere canunt: fœminæ ſilent. Et ante coitum mares ſuauiores ſunt: à coitu, fœminæ, quippe quæ oua can- B dida, guſtu habeant grata. Excitatæ cùm ſubuolāt, quendam reddunt humorem modo aquæ, quo ruſtici eas mingere, & excremento non carere, roreque ali aſſeuerant. Si quis digitum contrahens, ac remittens, ſubinde appropinquet, magis expectant, quàm ſi illico extendat: & quidem tranſire in digitum alliciuntur: quòd enim oculis hebetes ſunt, quaſi frons aliqua moueatur, digitum ita admotum conſcendunt.

CAPVT XXXI.

De coitu, & generibus Pediculorum, Pulicum, Cimicum, quæve animantium genera hi infeſtent.

C QVæ ex numero inſectorum non carne viuūt, ſed carnis viuæ humore aluntur, vt pediculi, pulices, cimices, hæc per coitum generant ea quæ lendes vocātur: ex quibus nihil præterea naſci poteſt. Illorum autem generatio talis eſt. Pulices minima quadam putredine gignuntur, ſedemque ſui ortu ſordes obtinēt aridas. Cimices, ex humore, qui per ſumma corporis animalium conſiſtit. Pediculi, ex carne: quibus futuris, emergūt ceu puſtulę quædam ſine pure exiguæ: quas ſi pungas, pediculi exeunt. Accidit morbus hic nonnullis hominibus D præ nimio corporis humore. Et quidem aliquos ea fœditate obiiſſe proditum eſt, vt Alcmanem Poetam, & Pherecydem Syrium. Quibuſdam itē morborum generibus copia naſcitur pediculorum. Genus pediculi ferum vocatū, eſt durius eo quòd magna ex parte prouenit, & corpori detrahitur difficiliùs. Pueris pediculi in capillo magis, viris minùs. Omnino fœminæ magis quam mares pediculum ſentiunt. Minùs laborant eorum capita, quibus pediculus in capillo eſt. Quin & ex cæteris animalibus complura pediculo infeſtātur: vt aues. Et phaſianæ quidem intereunt, niſi ſe puluerēt. Omnino quibus penna caule conſtat, iis pediculus gignitur. Nec ea quibus pilus eſt, carent eodem, excepto a- E ſino, qui non pediculo tantùm, verùm etiam rediuo immunis eſt. Boues vtrumque id habent. Oues & capræ rediuos habent, pediculis vacant. Suibus quoddam pediculi genus, grande ac durum, familiare eſt. Canibus proprium ricinus, qui ab eodem animali nomen cynoraiſtæ accepit. Genus autem vnumquodque pediculi ex corpore ipſo ſui animalis enaſcitur. Proueniunt largiùs pediculi mutatione aquarum, quibus lauare ſe ſolent ea quorum natura pediculum patitur. In mari etiam piſces hoc malum infeſtat: verùm non in piſcibus ipſis,

ſed limo gignitur, ſimile multipedibus aſellis, niſi quod caudam hoc ampliuſculam habeat. Genus pediculi marinum ſimplex, vnúmque eſt, vbique prouenienſ: ſed maximè in foraminibus, & cauernis. Inſecta hæc omnia ſunt, & multipeda, & exanguia. aſilus thunnorum ſub pinna oritur, ſpecie ſcorpionis, aranei magnitudine. Maris, quod à Cyrena in Ægyptum panditur, piſcis, pediculus nomine circa delphinum eſt, qui omnium pinguiſſimus fit pabuli copia, quæ delphini opera ſuppeditatur.

CAPVT XXXII.

De genere tinearum, quod in lanis procreatur: déque xylophthoro, quod in lignis: necnon de ficariis culicibus, quos caprificus generat.

QVin etiam aliæ generantur beſtiolæ, vt dictũ eſt, tum in lanis, & quibuſuis lanificio confectis: vt tineæ, quæ lanis puluerulentis præcipuè oriuntur: atque etiam magis ſi araneus vna includatur. Si quid enim humoris ineſt, hic abſorbens amplius ſiccitatem. Naſcitur & in tunicis hoc idem vermiculi genus. Tum verò in cera vetuſta, vt in ligno, animal gignitur candidum, quod omnium animalium eſſe minimum exiſtimatur, nomine acari. Necnon alia in chartis, aut iis proxima, quæ in veſte, aut ſcorpioni, ſed ſine cauda generantur perquam exigua. Omnibus propè dixerim, vel ſiccis humeſcentibus, vel humidis ſiccescentibus, creari animal poteſt. Naſcitur & vermiculus quidam, cui nomen à corrumpendis lignis, xylophthoro, ac ſi ligniperdi appelles, nullo minùs abſurdum: caput enim ſuo putamine exerit varium, pedes in poſtremo habet, vt alij vermes: reliquum corpus tunica araneoſa integitur, ſuóque tegumento hærentes feſtucas gerit, ita vt fortè eas, caſúque ſibi contraxiſſe, dum ambularet, videretur: verùm ipſæ natiuæ inhærent tunicæ: & vt limacibus teſta, ſic totum id vermiculo huic adhæret: nec decidit vnquam, ſed euellitur, vt natiuum. Quòd ſi hanc eius tunicam detrahas, expirat, parique modo, atque limax, teſta detracta hebeteſcit. Proceſſu vtique temporis id quoque in aureliam tranſit, vt eruca, atque immobile viuit. Sed quidnam ex eo animalis pennati oriatur, compertum non adhuc eſt. Ficarios culices caprificus generat ſuis pomis: fit primùm vermiculus, mox rupta cute euolat culex, mutatáque ſede, petit ficus immaturas: quibus ſe inſinuãs, facit ne decidant. Quamobrem agricolæ appendere ficis caprificos, & iuxta eaſdem caprificos ſerere aſſolent.

CAPVT XXXIII.

De ſœtura quadrupedum Ouiparorum.

QVadrupedũ autem ſanguinei & ouipari generis coitus verno tempore quidem agitur, ſed coitus non tempore eodem. alia enim vére, alia æſtate, alia circa autumnum coeunt, vtcumque ſingulis tempus ſequens ad prolem commodius eſt. Teſtudo oua durioris teſtæ, & bicolora edit, quale ouum auium eſt: eáque defoſſa, & cooperta terra, ac pauita, & complanata incubat, crebriùs repetens: fœtúmque ſequente anno excludit.

A ἀλλ' ἐκ τῆς ἰλύος· εἰσὶ δὲ τὰς μορφὰς ὅμοιοι τοῖς ὄνοις τοῖς πολύποσι, πλὴν τὴν οὐρὰν ἔχουσι πλατεῖαν. ἓν δὲ εἶδός ἐστι τῶν φθειρῶν τῶν θαλαττίων, καὶ γίνονται πανταχοῦ, μάλιστα δὲ περὶ τὰς τρώγλας. πάντα δὲ πολύποδά ἐστι ταῦτα καὶ ἄναιμα τὰ ἔντομα. ὁ δὲ τῶν θύννων οἶστρος γίνεται μὲν περὶ τὰ πτερύγια, ἔστι δὲ ὅμοιος τοῖς σκορπίοις, καὶ τὸ μέγεθος ἡλίκον ἀράχνης. ἐν δὲ τῇ θαλάττῃ τῇ ἀπὸ Κυρήνης πρὸς Αἴγυπτον, ἔστι περὶ τὸν δελφῖνα ἰχθύς, ὃν καλοῦσι φθεῖρα· ὃς γίνεται πάντων πιότατος, διὰ τὸ ἀπολαύειν τροφῆς ἀφθόνου, θηρεύοντος τοῦ δελφῖνος.

B ΚΕΦΑΛ. λβ'.

Περὶ σητῶν καὶ ἀκάρεως, καὶ ξυλοφθόρου καὶ ψηνῶν.

ΓΙνεται δὲ καὶ ἄλλα ζωδάρια, ὥσπερ ἐλέχθη, τὰ μὲν ἐν ἐρίοις, καὶ ὅσα ἐξ ἐρίων ἐστίν, οἷον οἱ σῆτες, οἳ ἐμφύονται μᾶλλον, ὅταν κονιορτώδη ᾖ τὰ ἔρια· μάλιστα δὲ γίνονται, ἂν ἀράχνης συγκατακλεισθῇ· ἐκπίνων γὰρ, ἐάν τι ἐνῇ ὑγρὸν, ξηραίνει. γίνεται δὲ ἐν χιτῶνι ὁ σκώληξ οὗτος. Καὶ* ἐν κηρῷ δὲ γίνεται παλαιουμένῳ, ὥσπερ ἐν ξύλῳ ζῷον, ὃ δὴ δοκεῖ ἐλάχιστον εἶναι τῶν ζῴων πάντων, καὶ καλεῖται ἀκαρί, λευκὸν καὶ μικρόν. καὶ ἐν τοῖς βιβλίοις ἄλλα γίνεται, τὰ μὲν ὅμοια τοῖς C ἐν τοῖς ἱματίοις· τὰ δὲ, σκορπίοις, ἄνευ τῆς οὐρᾶς, μικρὰ παμπάν· καὶ ὅλως ἐν πᾶσιν, ὡς εἰπεῖν, ἔν τε τοῖς ξηροῖς ὑγραινομένοις, καὶ ἐν τοῖς ὑγροῖς ξηραινομένοις, ὅσα ἔχει αὐτῶν ζωήν. ἔστι δέ τι σκωλήκιον ὃ καλεῖται ξυλοφθόρον, οὗ οὐθὲν ἧττον ἄτοπον τοῦτο τῶν ζῴων. ἡ μὲν γὰρ κεφαλὴ ἔξω τοῦ κελύφους* προέχεται ποικίλη, καὶ οἱ πόδες ἐπ' ἄκρου, ὥσπερ τοῖς ἄλλοις σκώληξιν. ἐν χιτῶνι δὲ τὸ ἄλλο σῶμα ἀραχνιώδει, καὶ περὶ αὐτὸ κάρφη, ὥστε δοκεῖν προσέχεσθαι βαδίζοντι. ταῦτα δὲ σύμφυτα τῷ χιτῶνί ἐστιν, ὥσπερ κοχλίαις τὸ ὄστρακον, οὕτω τὸ ἅπαν τῷ σκώληκι, καὶ οὐκ ἀποπίπτει, ἀλλ' ἀποσπᾶται, ὥσπερ προσπεφυκότα· καὶ ἐάν D τις τὸν χιτῶνα περιέλῃ, ἀποθνήσκει, καὶ γίνεται ὁμοίως* ἄχρηστος, ὥσπερ ὁ κοχλίας περιαιρεθέντος τοῦ ὀστράκου. χρόνου δὲ προϊόντος, γίνεται καὶ οὗτος ὁ σκώληξ χρυσαλλίς, ὥσπερ καὶ αἱ κάμπαι, καὶ ζῇ ἀκινητίζων. ὅ τι δ' ἐξ αὐτοῦ γίνεται τῶν πτερωτῶν ζῴων, οὔπω συνῶπται.* οἱ δὲ ῥῶπες οἱ ἐν τοῖς ἐρινοῖς, ἔχουσι τοὺς καλουμένους ψῆνας. γίνεται δὲ τοῦτο πρῶτον σκωλήκιον· εἶτα ἐμπεριρραγέντος τοῦ δέρματος, ἐκπέτεται,* τοῦτο ἐγκαταλιπὸν ὁ ψὴν, καὶ εἰσδύεται εἰς τὰ τῶν συκῶν ἐρινά, καὶ διὰ στομάτων ποιεῖ μὴ ἀποπίπτειν τὰ ἐρινά· διὸ περιάπτουσί τε τὰ ἐρινὰ πρὸς τὰς συκᾶς οἱ γεωργοὶ, καὶ φυτεύουσι πλησίον ταῖς συκαῖς ἐρινεούς.

ΚΕΦΑΛ. λγ'.

E Περὶ γενέσεως τετραπόδων καὶ ἐναίμων καὶ ᾠοτόκων.

ΤΩν δὲ τετραπόδων καὶ ἐναίμων καὶ ᾠοτόκων, αἱ μὲν γενέσεις εἰσὶ τοῦ ἔαρος· ὀχεύεται δὲ οὐ πάντα τὴν αὐτὴν ὥραν, ἀλλὰ τὰ μὲν ἔαρος, τὰ δὲ, θέρους, τὰ δὲ, περὶ τὸ μετόπωρον, ὡς ἑκάστοις πρὸς τὴν γένεσιν τῶν ἐκγόνων ἡ ἐπιοῦσα ὥρα συμφέρει. ἡ μὲν οὖν χελώνη, τίκτει ᾠὰ σκληρόδερμα καὶ δίχροα, ὥσπερ τὰ τῶν ὀρνίθων· τεκοῦσα δὲ, κατορύττει, καὶ τὸ ἄνω ποιεῖ ἐπίκροτον· ὅταν δὲ τοῦτο ποιήσῃ, φοιτῶσα ἐπωάζει ἄνωθεν, ἐκλέπεται δὲ τὰ ᾠὰ τῷ ὑστέρῳ ἔτει.

* Sylburg. ἐν κηρῷ.
* Gaza περιέχει.
* κ. ἄχρηστος.
* Lego, οἱ δὲ ἐρινεοὶ οἱ ἐν τοῖς ἐρινεοῖς ἔχουσι τοὺς κ. ψῆνας.
* Locum hunc corruptum ita legiſſe Gaza videtur, vt & Sylburgius notat, τοῦτο ἐγκαταλιπὸν ὁ ψὴν, εἰσδύεται εἰς τὰ τῶν συκῶν ἐρινά, & διατετραίνων, ποιεῖ. vide Plin. lib.15.c.19.

* Sylburgius, ἡ ἐμύς. ex Plinio.

A * ἡ δὲ μῦς, ἐξιοῦσα ἐκ τοῦ ὕδατος, τίκτει, ὀρύξασα βόθυνον πιθώδη· καὶ ἐκτεκοῦσα καταλείπει. ἐάσασα δὲ ἡμέρας [ἐλάττους ἢ] τριάκοντα, ἀνορύττει καὶ ἐκλέπει ταχύ, καὶ ἀπάγει εὐθὺς τοὺς νεοττοὺς εἰς τὸ ὕδωρ. τίκτουσι δὲ καὶ αἱ θαλάττιαι χελῶναι ἐν τῇ γῇ ὅμοια τοῖς ὄρνισι τοῖς ἡμέροις· καὶ κατορύξασαι, ἐπῳάζουσι τὰς νύκτας. τίκτουσι δὲ πλῆθος πολὺ ᾠῶν. καὶ γὰρ ἑκατὸν τίκτουσιν ᾠά. τίκτουσι δὲ καὶ σαῦροι, καὶ κροκόδειλοι οἱ χερσαῖοι καὶ οἱ ποτάμιοι, εἰς τὴν γῆν. ἐκλέπεται δὲ τὰ τῶν σαύρων αὐτόματα ἐν τῇ γῇ. οὐ γὰρ διετίζει ὁ σαῦρος. λέγεται γὰρ ἑξαμηνόβιος εἶναι ὁ σαῦρος. ὁ δὲ ποτάμιος κροκόδειλος, τίκτει μὲν ᾠὰ περὶ ἑξήκοντα, λευκὰ τὴν χρόαν· καὶ ἐπικάθηται ἡμέρας ἑξήκοντα. καὶ γὰρ βιοῖ χρόνον πολύν. ἐξ ἐλαχίστων δὲ ᾠῶν, μέγιστον ζῷον γίνεται ἐκ τούτων. τὸ μὲν γὰρ ᾠόν, οὐκ ἔστι μεῖζον χηνείου, καὶ ὁ νεοττὸς κατὰ λόγον· αὐξανόμενος δὲ γίνεται καὶ ἑπτακαίδεκα πηχῶν. λέγουσι δέ τινες ὡς καὶ αὐξάνεται ἕως ἂν ζῇ.

ΚΕΦΑΛ. λδ'.

Περὶ ἔχεων γενέσεως.

Τῶν δὲ ὄφεων ὁ μὲν ἔχις, ἔξω ζωοτοκεῖ ἐν αὑτῷ, πρότερον ᾠοτοκήσας. τὸ δὲ ᾠόν, ὥσπερ τῶν ἰχθύων, μονόχρουν ἐστί, καὶ μαλακόδερμον. ὁ δὲ νεοττός, ἄνω περιγίνεται, καὶ οὐ περιέχει φλοιὸς ὀστρακώδης, ὥσπερ οὐδὲ τὰ τῶν ἰχθύων. τίκτει δὲ μικρὰ ἐχίδια ἐν ὑμέσιν, οἳ περιρρήγνυνται τριταῖοι· ἐνίοτε δὲ καὶ ἔσωθεν διαφαγόντα, αὐτὰ ἐξέρχεται. τίκτει δ' ἐν μιᾷ ἡμέρᾳ καθ' ἕν. τίκτει δὲ πλείω ἢ εἴκοσιν. οἱ δ' ἄλλοι ὄφεις, ᾠοτοκοῦσιν ἔξω· τὰ δ' ᾠά, ἀλλήλοις συνεχῆ ἐστιν, ὥσπερ αἱ τῶν γυναικῶν ὑποδειρίδες· ὅταν δὲ τέκῃ εἰς τὴν γῆν, ἐπῳάζει. ἐκλέπεται δὲ καὶ ταῦτα τῷ ὑστέρῳ ἔτει. [αἱ μὲν οὖν τῶν ὄφεων καὶ τῶν ἐντόμων γενέσεις, ἔτι δὲ καὶ ζῴων τῶν τετραπόδων καὶ ᾠοτοκούντων, τοῦτον ἔχουσι τὸν τρόπον.]

A Mus aquatilis, ſiue teſtudo lutaria, in terra ſcrobe effoſſa dolij amplitudine parit oua, quæ deſerit terra obruta, diéque triceſimo repetit, refoſſáque aperit, fœtúmque continuò ducit in aquam. Teſtudines etiam marinæ egreſſæ in terram, pariunt oua auium cortalium ouis ſimilia: & defoſſa coopertáque incubant noctibus. Ouorum numerus maximus eſt, nam ad centena pariunt oua. Quin & lacertæ, & crocodili tam terreſtres quàm fluuiales, ſua oua terræ gremio committunt. Lacertarum oua ſponte in terra aperiuntur: vitam enim earum annum non complere, ſed ſemeſtrem finire aiunt. Crocodilus fluuiatilis oua ſexaginta cumplurimũ B parit, viuitque diu, maximúmque animal minimo hac origine euadit. Ouum enim non maius quàm anſeris, & fœtus inde excluſus proportione eſt: attamen creſcit ad quindecim cubita. Sunt qui eum tamdiu augeri, quamdiu viuat, confirment.

CAPVT XXXIV.

De Viperæ, cæterarúmque ſerpentium fœtura.

Vipera è ſerpentibus vna animal edit, cùm intra ſe oua primùm pepererit. Ouum hoc vnius coloris, & molle, vt piſcium eſt. Fœtus ſupernè conſiſtit: nec cortice continetur, ſicut nec C piſcium quidem. Parit catulos obuolutos membranis, quæ tertia die rumpantur. Euenit interdum vt qui in vtero adhuc ſunt, abroſis membranis prorumpãt: ſingulos, diebus ſingulis parit, plures quàm viginti. Cæteræ ſerpentes oua pariunt foris contexta ad monilis, hoc eſt, ornamenti mulierum, quod ambit collum, ſimilitudinem. Incubant quæ pepererint in terra, & fœtum ſequente excludunt anno.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζῳοϊστορίας τὸ Ζ.

ΚΕΦΑΛ. α'.

Περὶ ὀρνίθων γενέσεως.

Αἱ μὲν οὖν τῶν ὄφεων καὶ τῶν ἐντόμων γενέσεις, ἔτι δὲ τῶν τετραπόδων καὶ ᾠοτοκούντων, τοῦτον ἔχουσι τὸν τρόπον. οἱ δὲ ὄρνιθες, ᾠοτοκοῦσι μὲν ἅπαντες· ἡ δὲ ὥρα τῆς ὀχείας, καὶ οἱ τόκοι, οὐ πᾶσιν ὁμοίως ἔχουσι. τὰ μὲν γὰρ ὀχεύεται καὶ τίκτει κατὰ πάντα τὸν χρόνον, ὡς εἰπεῖν, οἷον ἀλεκτορίδες καὶ περιστεραί. αἱ μὲν ἀλεκτορίδες, ὅλον τὸν ἐνιαυτόν, ἔξω δύο μηνῶν τῶν ἐν τῷ χειμῶνι τροπικῶν. πλῆθος δὲ τίκτουσιν ἔνιαι τῶν γενναίων, πρὸ ἐπῳασμοῦ, καὶ ἑξήκοντα· καίτοι ἧττον πολυτοκοῦσιν αἱ γενναῖαι τῶν ἀγεννῶν εἰσίν. αἱ δὲ Ἀδριατικαὶ ἀλεκτορίδες, εἰσὶ μὲν μικραὶ τὸ μέγεθος, τίκτουσι δὲ ἀν' ἑκάστην ἡμέραν. εἰσὶ δὲ χαλεπαί, καὶ κτείνουσι τοὺς νεοττοὺς πολλάκις. χρώματα δὲ παντοδαπὰ ἔχουσι. τίκτουσι δὲ καὶ οἰκογενεῖς ἔνιαι δὶς τῆς ἡμέρας. ἤδη δέ τινες λίαν πολυτοκήσασαι, ἀπέθανον διὰ ταχέων. αἱ μὲν οὖν ἀλεκτορίδες, τίκτουσιν, ὥσπερ εἴρηται, συνεχῶς· περιστερὰ δὲ καὶ φάττα, καὶ τρυγών, καὶ οἰνάς, διτοκοῦσι μέν, ἀλλ' οὐχ ὡς περιστεραὶ δεκάκις τοῦ ἐνιαυτοῦ τίκτουσιν.

D ARISTOTELIS STAGIRITÆ, de Hiſtoria Animalium,

LIBER VI.

CAPVT I.

Aues omnes oua parere, diuerſis tamen anni temporibus, nec in ouorum numero omnes conuenire.

Serpentium, & inſectorum, atque etiam quadrupedum oua parientium generationes fieri ad hunc modum animaduertimus. Aues autem oua pariunt omnes: ſed tempus coeundi pariendíve, non idem omnibus eſt: quippe cùm aliæ E coeant & pariant omni ferè tempore, vt gallinæ, vt columbæ. Gallina enim toto anno, præterquam duobus menſibus brumalibus, parit. Magna etiam generoſarum nonnullis fœcunditas, quando vel ſexaginta edunt ante incubitum: quanquam ipſæ minùs fœcundæ, quàm ignobiles ſunt. Item Hadrianę paruo quidẽ ſunt corpore, ſed quotidie pariunt: ferociunt tamẽ, & pullos ſæpè interimũt. Color his varius. Nõnullæ etiam è cortalibus bis die pariũt. Iam aliquæ in tãtum copiæ prouenerunt, vt effœtæ breui morerẽtur. Sed gallinæ, vt dictum eſt, perpetuò pariunt. Columbæ autẽ, palumbes, turtur, vinago, bina pariunt. Sed columba vel decies anno: aliæ ſemel anno, & parciùs generant.

Agitur maximo auium numero partus verno tempore. Sed aliis aliæ ſœcundiùs pariunt. Quod bifariam fit: aut enim quia crebriùs, vt columbæ: aut quia numeroſiùs, vt gallinę. Omnes quibus vngues adunci, parciùs generant, excepto tinunculo, qui plurima in adunco genere parit: iam enim quatuor eius reperti ſunt pulli. Sed plures etiam poſſe procreari apertum eſt. Pariunt cæteræ in nidis: quę autem minùs volant, vt perdices, vt coturnices, non nidis, ſed condenſo frutice prolem muniunt. Sic & alauda, & tetrix. Sed hæ ſuum nidum patêre auræ cupiunt. Quem vero Bœoti meropen vocant, hic vnus ſubiens terræ cauernas, facit cunabula. Turdi nidos ex luto, vt hirundines, faciunt in excelſis arboribus, ita deinceps continuato opere, vt quaſi catena quædam nidorum contexta videatur. Vpupa vna ſuo in genere non nidificat, ſed ſtipites arborum ſubiens, parit ſine vllo ſtramento in cauis. Cuculus ſaxa & domicilia petit, in quibus nidificet. Tetrix, quam Athenienſes vragem vocant, nec terræ, nec arbori ſuum nidum committit, ſed frutici.

CAPVT II.

De natura, & diuerſitate ouorum omnium auium, ſeminéque genitali, & incubandi officio.

OVum æquè omnium volucrum duro putamine conſtat, ſi modò non deprauetur, ſed lege conſummetur naturæ (Gallinæ enim nonnullæ pariunt mollia vitio.) Et bicolor quoque ouum auium intus eſt, luteum interius, album exterius. Sed differunt oua aquaticarũ à terreſtribus, quòd multò plus lutei, quàm albi, ex proportione contineant. Differunt & colore inter ſe oua auium. Sũt enim alia candida, vt columbarum, & perdicum: alia pallida, vt paluſtrium: alia punctis diſtincta, vt meleagridum, & phaſianarum. Rubrum tinunculi eſt modo minij. Quin & ipſum ouum in ſe ſuum habet diſcrimen, quippe quod parte ſui acutum, parte latius ſit: qua quidem parte latiore exit, cùm gignitur. Quæ oblonga ſunt oua, & faſtigio cacuminata, fœminam ædunt: quæ autem rotundiora, & parte ſui acutiore obtuſa, orbiculum habẽt, marem gignunt. Incubitu auium, fœtum excludi, naturæ ratio eſt, non tamen ita ſolùm oua aperiuntur, ſed etiam ſponte in terra, vt in Ægypto obruta fimo pullitiem procreant. Et Syracuſis potator quidam, ouis ſub ſtorea in terra poſitis, tamdiu potabat, donec oua æderent fœtum. Iam verò, & cùm in vaſis quibuſdam tepidis eſſent coniecta, ſponte oua pullos prompſere. Semen genitale volucrum omnium album, vt cæterorum animalium eſt. Concipit fœmina quæ coierit, ouum ſuperius ad ſeptum tranſuerſum: quod ouum primò minutum, & candidum cernitur: mox rubrum, cruentùmque: deinde increſcens, luteum & flauum efficitur totum. Iam ampliùs auctum diſcernitur, ita vt intus pars lutea ſit, foris cãdida ambiat. Vbi perfectum eſt, abſoluitur, atque exit putamine, dum paritur, molli, ſed protinus dureſcente, quibuſcũque emergit portionibus, niſi vitio vuluæ defecerit. Iam quale certo tempore eſt, tale aliquando prodiit luteum totum, qualis poſtea pullus eſt.

A οἱ δὲ πλεῖστοι τῶν ὀρνίθων, τίκτουσι τὴν ἐαρινὴν ὥραν· καὶ εἰσὶν οἱ μὲν πολύγονοι αὐτῶν· πολύγονοι δὲ διχῶς· αἱ μὲν, τῷ πολλάκις, ὥσπερ αἱ περιστεραί· αἱ δὲ, τῷ πολλὰ, ὥσπερ αἱ ἀλεκτορίδες. τὰ δὲ γαμψώνυχα, πάντα ὀλιγόγονά ἐστιν, ἔξω κεγχρίδος· αὕτη δὲ πλεῖστα τίκτει τῶν γαμψωνύχων. ὦπται μὲν οὖν καὶ τέτταρα ἤδη. τίκτει δὲ καὶ πλείω. τίκτουσι δὲ τὰ μὲν ἄλλα, ἐν νεοττείαις· τὰ δὲ μὴ πτητικὰ, οὐκ ἐν νεοττείαις, οἷον αἵ τε πέρδικες καὶ οἱ ὄρτυγες, ἀλλ' ἐν τῇ γῇ, ἐπηλυγαζόμενα ὕλην. ὡσαύτως δὲ καὶ * κόρυδος καὶ τέτριξ. ταῦτα μὲν οὖν ὑπηνέμους ποιεῖται τὰς νεοττεύσεις. ὃν δ' οἱ Βοιωτοὶ καλοῦσι μέροπα, εἰς τὰς ὀπὰς ἐν τῇ γῇ κα-
B ταδυόμενος, νεοττεύει μόνος. αἱ δὲ κίχλαι, νεοττείαν μὲν ποιοῦνται, ὥσπερ αἱ χελιδόνες, ἐκ πηλοῦ, ἐπὶ τοῖς ὑψηλοῖς τῶν δένδρων· ἐφεξῆς δὲ ποιοῦσιν ἀλλήλαις καὶ ἐχομένας, ὥστε εἶναι διὰ τὸ συνέχειαν, * ὥσπερ ὁρμαθὸν νεοττιῶν. ὁ δ' ἔποψ, μόνος οὐ ποιεῖται νεοττείαν τῶν * καθ' ἑαυτὸν νεοττευόντων· ἀλλ' εἰσδυόμενος εἰς τὰ στελέχη, ἐν τοῖς κοίλοις αὐτῶν τίκτει, οὐδὲν συμφορούμενος. ὁ δὲ κόκκυξ, καὶ ἐν οἰκίᾳ νεοττεύει, καὶ ἐν πέτραις. ἡ δὲ τέτριξ, ἣν καλοῦσιν οἱ Ἀθηναῖοι οὔραγα, οὔτε ἐπὶ τῆς γῆς νεοττεύει, οὔτε ἐν τοῖς δένδρεσιν, ἀλλ' ἐν τοῖς χαμαιζήλοις φυτοῖς.

* κ. κόρυδος

* Vulgò, ὥσπερ ὁρμαθὸν. νεοττείαν. mendoſiſſimè.

* κ. καθ' ἑαυτὸν, melius, καθ' ἑαυτούς.

ΚΕΦΑΛ. β.

C Περὶ ᾠῶν καὶ ἐπῳασμοῦ ὀρνίθων.

ΤΟ δὲ ᾠὸν ἁπάντων ὁμοίως τῶν ὀρνίθων, σκληρόδερμόν τε ἐστὶν, ἐὰν γόνιμον γένηται, καὶ μὴ διαφθαρῇ (ἔνια γὰρ μαλακὰ τίκτουσιν αἱ ἀλεκτορίδες) καὶ δίχροα τὰ ᾠὰ τὰ τῶν ὀρνίθων, ἐκτὸς μὲν τὸ λευκὸν, ἐντὸς δὲ τὸ ὠχρόν. διαφέρουσι δὲ καὶ τὰ τῶν περὶ ποταμοὺς καὶ λίμνας γινομένων ὀρνίθων, πρὸς * τὰ τῶν ξηροβιωτικῶν. πολλῷ πλεῖον γὰρ ἔχει τὰ τῶν ἐνύδρων κατὰ λόγον τὸ ὠχρὸν, πρὸς τὸ λευκόν. καὶ τὰ χρώματα δὲ τῶν ᾠῶν διαφέρει κατὰ γένη τῶν ὀρνίθων. τῶν μὲν γὰρ, λευκά ἐστι τὰ ᾠὰ, οἷον περιστερᾶς καὶ περδικος· τῶν δὲ ὠχρὰ, οἷον τῶν περὶ τὰς λίμνας· τῶν δὲ κατε-
D στιγμένα, οἷον τὰ τῶν μελεαγρίδων καὶ φασιανῶν. τὰ δὲ τῆς κεγχρίδος, ἐρυθρά ἐστιν, ὥσπερ μίλτος. ἔχει δὲ τὸ ᾠὸν διαφορὰν· τῇ μὲν γὰρ, ὀξύ, τῇ δὲ, πλατύτερον ἐστιν. ἐξιόντος δὲ ἡγεῖται τὸ πλατύ. ἔστι δὲ τὰ μὲν μακρὰ καὶ ὀξέα τῶν ᾠῶν, θήλεα· τὰ δὲ στρογγύλα καὶ περιφερῆ ἔχοντα κατὰ τὸ ὀξὺ, ἄρρενα. ἐκπέττεται μὲν οὖν ἐπῳαζόντων τῶν ὀρνίθων· οὐ μὴν ἀλλὰ καὶ αὐτόματα ἐν τῇ γῇ, ὥσπερ ἐν Αἰγύπτῳ, κατορυττόντων εἰς τὴν γῆν ἐν τῇ κόπρῳ. καὶ ἐν Συρακούσαις δὲ φιλοπότης τις, ὑποτιθέμενος ὑπὸ τὴν ψίαθον εἰς τὴν γῆν, τοσοῦτον ἔπινεν, ὥς φασι, χρόνον συνεχῶς, ἕως ἐκλέπειν τὰ ᾠὰ. ἤδη δὲ καὶ κείμενα ἐν ἀγγείοις ἀλεεινοῖς,
E * ἐξεπέμφθη καὶ ἐξῆλθεν αὐτομάτως. ἡ μὲν οὖν γονὴ πάντων τῶν ὀρνίθων λευκὴ, ὥσπερ καὶ τῶν ἄλλων ζῴων. ὅταν δὲ ὀχευθῇ, ἄνω πρὸς τὸ ὑπόζωμα λαμβάνει ἡ θήλεια. καὶ τὸ μὲν πρῶτον μικρὸν καὶ λευκὸν φαίνεται τὸ ᾠὸν, ἔπειτα ἐρυθρὸν καὶ αἱματῶδες· αὐξανόμενον δὲ, ὠχρὸν καὶ ξανθὸν ἅπαν. ὅταν δ' ἤδη μεῖζον ᾖ, ἁδρότερον, διακρίνεται καὶ ἔσω μὲν, τὸ ὠχρὸν, ἔξω δὲ, τὸ λευκὸν περιίσταται. ὅταν δὲ τελειωθῇ, ἀπολύεται καὶ ἐξέρχεται οὔπω τῷ καιρῷ ἐκ τοῦ μαλακὸν εἶναι μεταβάλλοντος εἰς τὸ σκληρὸν, ὥστε ἐξέρχεται μὲν οὔπω πεπηγὸς, ἐξερχόμενον δ', εὐθέως πήγνυται καὶ γίνεται σκληρὸν, ἐὰν μὴ ᾖ νοσηματικός. ἐφάνη δὲ ἤδη, οἷον ἐν τινι καιρῷ γίνεται, τὸ ᾠὸν ἅπαντα γὰρ ὠχρὰ ὁμοίως ἐστὶν, ὥσπερ ὕστερον ὁ νεοττός.

* κ. πρὸς τ. ξ. ποιά. τῶ.

* Sylburg. ἐξεπέφθη

* C. διαιρουμένῃ

τοιαῦτα καὶ ἐν ἀλεκτορίδι* διαιρουμένῃ ὑπὸ τὸ ὑπόζωμα, οὗ περ αἱ θήλειαι ἔχουσι τὰ ᾠά, τὸ μὲν εἶδος ὠχρὰ ὅλα, τὸ δὲ μέγεθος ἡλίκα ᾠά. ὃ ἐν τέρατος λόγῳ τιθέασιν. οἱ δὲ λέγοντες, ὅτι ὑπολείμματά ἐστι τὰ ὑπηνέμια τῶν ἔμπροσθεν ἐξ ὀχείας γινομένων, οὐκ ἀληθῆ λέγουσιν. ὦπται γὰρ ἱκανῶς ἤδη ἀνόχευτοι νεοττίδες ἀλεκτορίδων καὶ χηνῶν, τεκοῦσαι ὑπηνέμια. τὰ δ᾽ ᾠὰ τὰ ὑπηνέμια, ἐλάττω μὲν τῷ μεγέθει γίνεται, καὶ ἧττον ἡδέα, καὶ ὑγρότερα τῶν γονίμων, πλήθει δὲ πλείω. ὑποτιθεμένων δὲ τῇ ὄρνιθι, οὐθὲν παχύνεται τὸ ὑγρόν, ἀλλὰ καὶ τὸ ὠχρὸν διαμένει καὶ τὸ λευκόν, ὅμοια ὄντα. γίνεται δὲ ὑπηνέμια πολλῶν, οἷον ἀλεκτορίδος, πέρδικος, περιστερᾶς, ταῶνος, χηνός, χηναλώπεκος. ἐκλέπεται δ᾽ ἐπῳαζουσῶν, ἐν τῷ θέρει θᾶττον, ἢ ἐν τῷ χειμῶνι. ἐν ὀκτωκαίδεκα γὰρ ἡμέραις αἱ ἀλεκτορίδες ἐν τῷ θέρει ἐκλέπουσιν· ἐν δὲ τῷ χειμῶνι, ἐνίοτε πέντε καὶ εἴκοσι. διαφέρουσι μέντοι καὶ αἱ ὄρνιθες ὀρνίθων, τῷ ἐπῳαστικώτεραι εἶναι ἕτεραι ἑτέρων. ἐὰν δὲ βροντήσῃ ἐπῳαζούσης, διαφθείρεται τὰ ᾠά. τὰ δὲ καλούμενα ὑπό τινων κυνόσουρα καὶ οὔρια, γίνεται τοῦ θέρους μᾶλλον. ζεφύρια δὲ καλεῖται τὰ ὑπηνέμια ὑπό τινων, ὅτι ὑπὸ τὴν ἐαρινὴν ὥραν φαίνονται δεχόμεναι τὰ πνεύματα αἱ ὄρνιθες. τοιοῦτον δὲ ποιοῦσι καὶ τῇ χειρί πως ψηλαφώμεναι. γίνεται δὲ τὰ ὑπηνέμια γόνιμα, καὶ τὰ ἐξ ὀχείας ἤδη συνειληφότα, μεταβάλλει τὸ γένος εἰς ἄλλο γένος, ἐάν, πρὶν μεταβάλλειν ἐκ τοῦ ὠχροῦ εἰς τὸ λευκόν, ὀχεύηται ἢ τὰ ὑπηνέμια ἔχουσα ἢ τὰ γόνιμα εἰλημμένα ἐξ ἑτέρου ὄρνιθος. καὶ γίνεται τὰ μὲν ὑπηνέμια, γόνιμα· τὰ δὲ προϋπάρχοντα, κατὰ τὸν ὕστερον ὀχεύοντα ὄρνιθα. ἂν δ᾽ ἤδη μεταβάλλῃ εἰς τὸ λευκόν, οὐθὲν μεταβάλλονται, οὔτε τὰ ὑπηνέμια, ὥστε γίνεσθαι γόνιμα, οὔτε τὰ γόνιμα κυούμενα, ὥστε μεταβάλλειν εἰς τὸ τοῦ ὀχεύοντος γένος. καὶ ἐὰν ὑπαρχόντων δὲ μικρῶν, διαλείπῃ ἡ ὀχεία, οὐθὲν ἐπαυξάνεται τὰ προϋπάρχοντα· ἐὰν δὲ πάλιν ὀχεύηται, ταχεῖα γίνεται ἡ ἐπίδοσις εἰς τὸ μέγεθος. ἔχει δὲ φύσιν τοῦ ᾠοῦ τό, τε ὠχρὸν καὶ τὸ λευκὸν ἐναντίας, οὐ μόνον τῷ χρώματι, ἀλλὰ καὶ τῇ δυνάμει. τὸ μὲν γὰρ ὠχρόν, ὑπὸ τοῦ ψύχους πήγνυται, τὸ λευκὸν δέ, οὐ πήγνυται, ἀλλ᾽ ὑγραίνεται μᾶλλον. ὑπὸ δὲ τοῦ πυρός, τὸ μὲν λευκὸν πήγνυται, τὸ δὲ ὠχρόν, οὐ πήγνυται, ἀλλὰ μαλακὸν διαμένει, ἂν μὴ κατακαυθῇ· καὶ μᾶλλον ἑψόμενον ἢ πυρούμενον συνίσταται καὶ ξηραίνεται. ἑκάτερον δὲ χωρὶς ἐν ὑμένι διείληπται* ὑπ᾽ ἀλλήλων. αἱ δὲ πρὸς τῇ ἀρχῇ τοῦ ὠχροῦ χάλαζαι, οὐθὲν συμβάλλονται πρὸς τὴν γένεσιν, ὥσπερ τινὲς ὑπολαμβάνουσιν. εἰσὶ δὲ δύο, ἡ μὲν κάτωθεν, ἡ δὲ ἄνωθεν. συμβαίνει δὲ περὶ τὸ ὠχρὸν καὶ τὸ λευκόν, καὶ ἐὰν ὁμοῦ ἐξαιρεθέντα* συγκεράσῃ τις πλείω τοιαῦτα εἰς κύστιν, καὶ ἕψῃ μαλακῷ* καὶ μὴ ταχεῖ πυρὶ τὸ ὠχρόν, εἰς τὸ μέσον συνίσταται πᾶν, τὸ δὲ λευκόν, κύκλῳ περιίσταται. τῶν δὲ ἀλεκτορίδων αἱ νεοττίδες, τίκτουσι πρῶται εὐθὺς ἀρχομένου τοῦ ἔαρος, καὶ πλείω δὲ τίκτουσιν ἢ αἱ πρεσβύτεραι, ἐλάττω δὲ τῷ μεγέθει τὰ ἐκ τῶν νεωτέρων. ὅλως δὲ ἐὰν μὴ ἐπῳάζωσιν αἱ ὄρνιθες, διαφθείρονται καὶ κάμνουσιν. ὀχευθεῖσαι δέ, αἱ μὲν ὄρνιθες, φρίττουσί τε καὶ ἀποτινάσσονται, καὶ πολλάκις κάρφος περιβάλλονται· ποιοῦσι δὲ τὸ αὐτὸ τοῦτο καὶ τεκοῦσαι ἐνίοτε. αἱ δὲ περιστεραί, ἕλκουσι τὸ ὀρροπύγιον· οἱ δὲ χῆνες, καταχολυμβῶσιν. αἱ δὲ κυήσεις, καὶ αἱ τῶν ὑπηνεμίων ταχὺ συλλήψεις

* Malim ἐν ὑμένων,

* Libro 3. De generat. anim. c. 1. in eadem re συγχεῖν legitur, quod aptius eſt.

* Gaza legit, ἐν συνεχεῖ, quod vertit, *& continente*, minùs rectè.

A Gallina etiam diſciſſa, talia ſub ſepto, quo loco fœminis oua adhærent, reperta ſunt, colore luteo tota magnitudine oui perfecti: quod pro oſtento augures capiunt. Nec audiendi ſunt, qui oua hypenemia dicta à vento, quaſi ſubuentanea dixeris, reliquias eſſe partus, quem coitus fecerit, arbitrantur. Iam enim aliquas gallinarum & anſerum iuuencas expertes adhuc coitus parere hypenemia viſum ſæpius eſt. Sunt hæc ſterilia, & minora, ac minùs iucundi saporis, & magis humida, quàm ea quæ fœcunda gignuntur, ſed plura numero. Humor eorum craſſeſcere incubatione auis non poteſt, ſed tam candida quàm lutea pars ſimilis ſibi perſeue-
B rat. Pariunt genus id oui plures aues, vt gallinæ, perdices, columbæ, pauones, anſeres, & quæ ab anſere & vulpe compoſito nomine chenalopeces, id eſt, vulpanſeres dictæ ſunt. Excludunt celeriùs incubantes æſtate, quàm hyeme. Ideo æſtate gallinæ duodevigeſimo die fœtum excludunt, hyeme aliquando vigeſimoquinto. Diſcrimen tamen & auiū eſt, quòd aliæ magis aliis fungi officio incubandi poſſunt. Si incubante gallina, tonuit, oua pereunt. Quæ autem canicularia & vrina à nonnullis vocantur, æſtate magis conſiſtunt. Sunt qui hypenemia, hoc eſt, ſubuentaneos illos partus, zephyria nominent, eo quòd verno tempore aues flatus illos fœcundos ex Fauonio recipere videantur. Sed idē
C faciunt, etiam ſi digito in genitale palpetur. Redditur certè ouum ſubuentaneum illud fœcundum, & quod iam conceptum per coitum eſt, tranſit in genus diuerſum, ſi priùs coeat, quæ vel ſubuentaneum, vel ſemine maris diuerſi conceptum fert, quàm ouum ipſum à lutea in candidam ambientē partem mutetur. Ita enim fit, vt ſubuentanea oua fœcunda reddantur: & quæ inchoata à mare priora ſunt, ſpecie poſterioris prouenient. at ſi iam candidum acceperunt humorē, fieri non poteſt vt vel ſubuentanea in fœcunda mutentur, vel quæ per coitum concepta geſtantur, tranſeant in genus maris, qui ſecundus coierit. Incœpta quoque, ſi adhuc
D paruis deſierit coitus, non accreſcunt: ſed ſi continuetur, celeri incremēto augentur, iuſtámque magnitudinem implent. Naturam vitellus oui, & albumen habent contrariam, non tantùm colore, verùm etiam virtute. Vitellus enim ſpiſſatur frigore, albumen non, ſed ampliùs humet. Contrà, albumē ſpiſſatur igne, vitellus non, ſed mollis perſiſtit, niſi peruratur: magiſque in aqua feruēte, quàm ad ignē cogitur, atque induratur. Membrana hæc inter ſe diſcernuntur. Grandines autem dictæ, quæ initio vitelli adhærent, nihil ad generationē conferunt: quanquam aliqui ita non exiſtimant. Has duas eſſe certū eſt, alteram parti ſuperiori iunctā, alteram inferiori. Euenit etiam vt ſi quis rupto putamine oua
E plura in patinā coiecit excreta, & coquit igne molli, & continente, vitelli omnes in medium coeant, albumina autem circundent, & ſe in oras conſtituant. Gallinarum iuuencæ pariunt primæ ſtatim vere ineunte: & plura quàm veteres, ſed minora. Denique aues, niſi pariant, laborant morbo: atque intereūt. Inhorreſcūt à coitu, ac ſe excutiunt. Sæpe etiā feſtuca aliqua ſeſe luſtrant: quod idem & edito ouo interdum faciunt. Columbæ caudam diſtendunt, anſeres ſeſe aquis ingurgitāt. Celeriter magna pars auium & impletur, & oua ſubuētanea

[..]e cōcipit. Quod vel in perdice percipi poteſt, eo, quo libidine incitatur, tēpore. Nā ſi cōtra marē ſteterit fœmina, aura ab eo flante, fit prægnās, atque extemplo inutilis aucupiis. Olfactum n. eſſe exquiſitum perdicibus creditur. Oui generatio ab initu, & pulli rurſus ouo concocto prouentus, non pari temporis ſpatio euenit omnibus: ſed pro magnitudine generantis intereſt. Ouum gallinæ conſiſtit à coitu, & perficitur decem diebus magna ex parte: columbæ paucioribus. Facultas columbis retinendi oui, etiam tempore parturiendi eſt. Nam ſi ab aliquo vexetur, aut penna in nido euulſa, vel quauis alia ſimili re infeſtetur, aut etiam ſponte moroſius habeat, ouum per triſtitiam retinet, partúmque differt. Peculiare columbis illud etiam eſt, vt in coitu, niſi antè mutuò oſculentur, mas non aſcendat. Sed iunior ſit, an ſenior, intereſt: ſenior enim primum coitum oſculo exorditur: ſequentem & ſine oſculo agit. at iunior quoties libet coire, toties oſculatur. Igitur hic ritus columbarum proprius eſt, atque etiam ille, vt fœminæ ſaliant, ac ſupergreſſu mutuo agant, ſi mas non ſit, & cum oſculo vt mares: & quamuis nihil altera emittat in alterā, tamen plura ſic oua, quam ex maris coitu, pariunt. Verùm nullus hic enaſcitur pullus, ſed ſunt omnia irrita.

CAPVT III.

Quot dierum ſpatio pullus in ouo generetur, deque eius creationis ordine.

GEneratio vero ex ouo omnibus volucribus euenit, modo quidem eodem: ſed tempora differunt, vt dictum iam eſt. Gallinis porrò tertia die ac nocte poſtquam cœpêre incubare, indicium præſtare incipiunt. at maiorum auium generi plus prætereat temporis, neceſſe eſt. minori autem minus ſufficit. Effertur per id tempus luteus humor ad cacumen, qua principium oui eſt: atque ouum detegitur ea parte, & cor quaſi pūctum ſanguineum in candido liquore conſiſtit: quod punctum ſalit iam, & mouetur, vt animal. Tendunt ex eo meatus venales ſanguiferi duo tortuoſi ad tunicam, ambientem vtramque, dum augetur. Membrana etiam fibris diſtincta ſanguineis, iam album liquorem per id tempus circumdat, à meatibus illis venarum oriens. Paulò autem poſt, & corpus iam pulli diſcernitur, exiguum admodum primum & candidum, conſpicuum capite, & maximè oculis inflatis, quibus ita permanet diu: ſero enim decreſcunt oculi, & ſe ad ratam contrahunt proportionem. Pars autem inferior corporis, nullo membro à ſuperiore diſtingui inter initia cernitur. Meatuum, quos ex corde tendere diximus, alter ad ambiēdum album liquorem fertur, alter ad luteum, velut vmbilicus. Origo itaque pulli in albumine eſt, cibus per vmbilicum ex luteo petitur. Die iam decimo pullus totus perſpicuus eſt, & membra omnia patent. Caput grandius toto corpore eſt. Oculi capite grandiores hærent: quippe qui fabis maiores per id tempus emineant nigri, nondum cum pupilla. Quibus ſi cutem detrahas, nihil ſolidi videris, ſed humorem candidum, rigidúmque admodum refulgentē ad lucem, nec quicquam aliud. Ita oculi, & caput.

A ταχεῖαι γίνονται ταῖς πλείσταις τῶν ὀρνίθων, οἷον καὶ τῇ περδίκι, ὅταν ὀργᾷ πρὸς τὴν ὀχείαν. ἐὰν γὰρ κατ᾽ ἀντίον στῇ τοῦ ἄρρενος, κυίσκεται, καὶ εὐθὺς ἄχρηστος γίνεται πρὸς τὰς θήρας. ὀσφρητικὸν γὰρ δοκεῖ ἔχειν ἱκανῶς ὁ πέρδιξ. Ἡ δὲ τοῦ ᾠοῦ γένεσις, μετὰ τὴν ὀχείαν καὶ ἐκ τοῦ ᾠοῦ πάλιν συμπεττομένου ἡ τοῦ νεοττοῦ γένεσις οὐκ ἐν ἴσοις χρόνοις συμβαίνει πᾶσιν, ἀλλὰ διαφέρει κατὰ μεγέθη τῶν γεννώντων. συνίσταται δὲ τὸ τῆς ἀλεκτορίδος ᾠὸν κατὰ τὴν ὀχείαν καὶ τελειοῦται τὸ ᾠὸν ἐν δέχ᾽ ἡμέραις ὡς ἐπὶ τὸ πολύ, τὸ τῆς περιστερᾶς ἐν μικρῷ ἐλάττοσι. δύνανται δ᾽ αἱ περιστεραὶ, ἤδη τὸ ᾠὸν ὠδίνουσαι, κατέχειν. ἐὰν γάρ τι ἐνοχληθῇ ὑπό τινος, ἢ περὶ τὴν νεοττείαν, ἢ πτερὸν ἐκτιλθῇ, ἢ ἄλλο τι πονέσῃ, ἢ καὶ δυσαρεστήσῃ, κατέχει καὶ οὐ τίκτει, μέλλουσα. ἴδιον δὲ περὶ τὰς περιστερὰς συμβαίνει καὶ τόδε περὶ τὴν ὀχείαν. κυνοῦσί τε γὰρ ἀλλήλας, ὅταν μέλλῃ ἀναβαίνειν ὁ ἄρρην, ἢ οὐκ ἂν ὀχεύσειεν ὁ μὲν πρεσβύτερος, τὸ πρῶτον ὑπερεκλιθεὶς ἀναβαίνει καὶ μὴ κύσας. οἱ δὲ νεώτεροι, ἀεὶ τοῦτο ποιήσαντες, ὀχεύουσι. τοῦτο τὸ ἴδιον ποιοῦσι· καὶ ἔτι αἱ θήλειαι ἀλλήλαις ἀναβαίνουσιν, ὅταν ὁ ἄρρην μὴ παρῇ, κύσασαι, ὥσπερ οἱ ἄρρενες· καὶ οὐθὲν προϊέμεναι εἰς ἀλλήλας, τίκτουσιν ᾠὰ πλείω ἢ τὰ γόνιμα. γίνεται δ᾽ ἐξ αὐτῶν οὐδεὶς νεοττὸς οὐδὲ εἷς, ἀλλ᾽ ὑπηνέμια πάντα τὰ τοιαῦτά ἐστιν.

ΚΕΦΑΛ. γ´.

Τίνα τρόπον ἔχει ἡ γένεσις ἐκ τοῦ ᾠοῦ τοῖς ὄρνισι.

ΗΔὲ γένεσις ἐκ τοῦ ᾠοῦ συμβαίνει τοῖς ὄρνισι· συμβαίνει μὲν τὸν αὐτὸν τρόπον πᾶσιν, οἱ δὲ χρόνοι διαφέρουσι τῆς τελειώσεως, καθάπερ εἴρηται. Ταῖς μὲν οὖν ἀλεκτορίσι, τριῶν ἡμερῶν καὶ νυκτῶν παρελθουσῶν, ὑποσημαίνει τὸ πρῶτον· ταῖς δὲ μείζοσιν αὐτῶν ὀρνίσιν, ἐν πλείοσι· ταῖς δ᾽ ἐλάττοσιν, * ἐλάττονα. ἐν δὲ τούτῳ τῷ χρόνῳ ἤδη ἀνελήλυθεν ἡ ὠχρὰ πρὸς τὸ ὀξύ, ᾗπερ ἡ ἀρχὴ τοῦ ᾠοῦ καὶ ἐκλέπεται τὸ ᾠόν, καὶ ὅσον στιγμὴ αἱματίνη ἐν τῷ λευκῷ ἡ καρδία. τοῦτο δὲ τὸ σημεῖον πηδᾷ καὶ κινεῖται, ὥσπερ ἔμψυχον· καὶ ἀπ᾽ αὐτοῦ δύο πόροι φλεβικοὶ ἔναιμοι ἑλισσόμενοι φέρουσιν αὐξανομένου εἰς ἑκάτερον τῶν χιτώνων τῶν περιεχόντων· καὶ ὑμὴν δὲ αἱματικὰς ἶνας ἔχων, ἤδη περιέχει τὸ λευκὸν κατὰ τὸν χρόνον τοῦτον, ἀπὸ τῶν πόρων τῶν φλεβικῶν ἐκείνων. μικρὸν δ᾽ ὕστερον, καὶ τὸ σῶμα ἤδη ἀποκρίνεται, μικρὸν τὸ πρῶτον πάμπαν, καὶ τὸ λευκόν. δῆλον δὲ ἡ κεφαλή, καὶ ταύτης οἱ ὀφθαλμοὶ μάλιστα ἐμπεφυσημένοι· καὶ τοῦτο μέχρι πόρρω διατελεῖ· ὀψὲ γάρ ποτε μικροὶ γίνονται καὶ συμπίπτουσι. τοῦ δὲ σώματος τὸ κάτω μόριον οὐθὲν φαίνεται μόριον πρὸς τὸ ἄνω τὸ πρῶτον. τῶν δὲ πόρων τῶν ἐκ τῆς καρδίας τεινόντων, ὁ μὲν φέρει εἰς τὸ κύκλῳ περιέχον, ὁ δὲ εἰς τὸ ὠχρόν, ὥσπερ ὀμφαλὸς ὤν. ἡ μὲν οὖν ἀρχὴ τοῦ νεοττοῦ ἐστὶν ἐν τῷ λευκῷ, ἡ δὲ τροφὴ διὰ τοῦ ὀμφαλοῦ ἐκ τοῦ ὠχροῦ. δεχαταίου δὲ ἤδη ὄντος, ὁ νεοττὸς ἐπίδηλος ὅλος, καὶ τὰ μέρη πάντα. ἔχει δὲ τὴν κεφαλὴν μείζω τοῦ ἄλλου σώματος, καὶ τοὺς ὀφθαλμοὺς τῆς κεφαλῆς, οὐκ ἔχοντας πω ὄψιν. οἱ δὲ ὀφθαλμοὶ περὶ τὸν χρόνον τοῦτον * ἐξαιρούμενοι μείζους κυάμων, καὶ μέλανες· ἀφαιρουμένου δὲ τοῦ δέρματος, ὑγρὸν ἔνεστι λευκὸν καὶ ψυχρόν, σφόδρα στίλβον πρὸς τὴν αὐγήν, ἕτερον δ᾽ οὐθέν. τὰ μὲν οὖν περὶ τὰ ὄμματα καὶ τὴν κεφαλὴν, τοῦτον διάκειται τὸν τρόπον.

* Fort. ἐν ἐλάττονι.
* κ. ἐξαιρούμενοι.

ἔχει δ' ἐν τῷ χρόνῳ τούτῳ καὶ τὰ σπλάγχνα ἤδη φανερά, καὶ τὰ περὶ τὴν κοιλίαν, καὶ τὴν τῶν ἐντέρων φύσιν· καὶ αἱ φλέβες, αἱ ἀπὸ τῆς καρδίας φαινόμεναι τείνειν, πρὸς τῷ ὀμφαλῷ ἤδη γίγνονται. ἀπὸ δὲ τοῦ ὀμφαλοῦ τέταται φλέψ, ἡ μὲν, πρὸς τὸν ὑμένα τὸν περιέχοντα τὸ ὠχρόν· τὸ δ' ὠχρὸν ἐν τούτῳ τῷ χρόνῳ ὑγρὸν ἤδη ἐστὶ, καὶ πλέον ἢ κατὰ φύσιν· ἡ δὲ ἑτέρα, εἰς τὸν ὑμένα τὸν περιέχοντα ὅλον τὸν ὑμένα ἐν ᾧ ὁ νεοττός, καὶ τὸν τοῦ ὠχροῦ ὑμένα, καὶ τὸ μεταξὺ τούτων ὑγρόν. αὐξανομένου γὰρ τοῦ νεοττοῦ κατὰ μικρὸν, τοῦ ὠχροῦ τὸ μὲν, ἄνω γίνεται, τὸ δὲ, κάτω· ἐν μέσῳ δὲ τὸ λευκὸν ὑγρόν· τοῦ δὲ κάτω ὠχροῦ, τὸ λευκὸν ὑποκάτω, ὥσπερ τὸ πρότερον ὑπῆρχε. δεκάτῃ δὲ ἡμέρᾳ, τὸ λευκὸν ἔσχατον γίνεται, ὀλίγον ἤδη ὂν καὶ γλίσχρον, καὶ παχὺ καὶ ὑπόχλωρον. τέτακται γὰρ τῇ θέσει ἕκαστα τόνδε τὸν τρόπον. πρῶτος μὲν καὶ ἔσχατος, πρὸς τὸ ὄστρακον ὁ τοῦ ᾠοῦ ὑμήν, οὐχ ὁ τοῦ ὀστράκου, ἀλλ' ὑπ' ἐκεῖνον. ἐν δὲ τούτῳ λευκόν ἐστιν ὑγρόν· εἶτα ὁ νεοττός, καὶ περὶ αὐτὸν ὑμὴν χωρίζων, ὅπως μὴ ᾖ ἐν ὑγρῷ ὁ νεοττός. ὑπὸ δὲ τὸν νεοττὸν τὸ ὠχρόν, εἰς ὃ τῶν φλεβῶν ἔφερεν ἡ ἑτέρα· ἡ δ' ἑτέρα εἰς τὸ περιέχον λευκόν. τὸ δὲ πᾶν περιέχει ὑμὴν μεθ' ὑγρότητος ἰχωροειδοῦς. εἶτα ἄλλος ὑμὴν περὶ αὐτὸ ἤδη τὸ ἔμβρυον, ὥσπερ εἴρηται, χωρίζων πρὸς τὸ ὑγρόν. ὑποκάτω δὲ τούτου, τὸ ὠχρὸν ἐν ἑτέρῳ ὑμένι περιειλημμένον, ἐν ᾧ ὁ ἕτερος ὀμφαλὸς ὁ ἀπὸ τῆς καρδίας καὶ τῆς μεγάλης φλεβὸς φέρων, ὥστε μὴ εἶναι τὸ ἔμβρυον ἐν ὁποτέρῳ τῶν ὑγρῶν. περὶ δὲ τὴν εἰκοστὴν ἤδη φθέγγεταί τε κινούμενος ἔσωθεν, ἄν τις κινῇ διελών, καὶ ἤδη δασὺς γίνεται, ὅταν ὑπὲρ τὰς εἴκοσι γένηται ἡ ἐκκόλαψις τῶν ᾠῶν. ἔχει δὲ τὴν κεφαλὴν ὑπὲρ τοῦ δεξιοῦ σκέλους ἐπὶ τῇ λαγόνι, τὴν δὲ πτέρυγα ὑπὲρ τῆς κεφαλῆς· καὶ φανερὸς κατὰ τοῦτον τὸν χρόνον, * ὅ τε χωριώδης ὑμήν, ὁ μετὰ τὸν τοῦ ὀστράκου ὑμένα τὸν ἔσχατον, εἰς ὃν ἔτεινεν ὁ ἕτερος τῶν ὀμφαλῶν· καὶ ὁ νεοττὸς ἐν τούτῳ ἤδη γίνεται τὸ τέλος· καὶ ὁ ἕτερος ὑμήν, * χωριώδης ὤν, ὁ περὶ τὸ ὠχρόν, εἰς ὃν ἔτεινεν ὁ ἕτερος ὀμφαλός. ἀμφότεροι δ' ἦσαν ἀπό τε τῆς καρδίας καὶ τῆς φλεβὸς τῆς μεγάλης. ἐν δὲ τούτῳ τῷ χρόνῳ ὁ μὲν πρὸς τὸ ἔξω * χωρίον ὀμφαλὸς τείνων, ἀπολύεται τοῦ ζῴου συμπεπτωκώς· ὁ δὲ εἰς τὸ ὠχρὸν φέρων, * συναρτᾶται τοῦ νεοττοῦ πρὸς τὸ ἔντερον τὸ λεπτόν. καὶ ἔσω τοῦ ὠχροῦ πολὺ ἤδη γίνεται ἐν τῷ νεοττῷ, καὶ ὑπόστημα ἐν τῇ κοιλίᾳ ὠχρόν. καὶ περίττωμα δὲ ἀφίησι περὶ τὸν χρόνον τοῦτον πρὸς τὸ ἔξω χωρίον· καὶ ἐν τῇ κοιλίᾳ δ' ἔχει λευκόν, καὶ τὸ ἔξω περίττωμα λευκόν ἐστι. τέλος δὲ τὸ ὠχρὸν ἀεὶ ἐλαττούμενον κατὰ μικρὸν ἀναλίσκεται τελέως, καὶ ἐμπεριλαμβάνεται ἐν τῷ νεοττῷ, ὥστε δεκάτῃ ἡμέρᾳ * ἐκκεκολαμμένου ἀνατεμόντι, ἔτι μικρόν τι λείπεται τοῦ ὠχροῦ πρὸς τῷ ἐντέρῳ· τοῦ δὲ ὀμφαλοῦ ἀπολέλυται. ἐν δὲ τῷ μεταξὺ οὐδέν, ἀλλ' ἀνήλωται πᾶν. περὶ δὲ τὸν χρόνον τὸν προειρημένον, καθεύδει μὲν ὁ νεοττός, ἐγείρεται δὲ καὶ ἀναβλέπει κινούμενος, καὶ φθέγγεται· καὶ ἡ καρδία ἅμα τῷ ὀμφαλῷ ἀναφυσᾷ, ὡς ἀναπνέοντος. ἡ μὲν οὖν γένεσις ἐκ τοῦ ᾠοῦ τοῖς ὄρνισι τοῦτον ἔχει τὸν τρόπον. τίκτουσι δὲ καὶ ὑπηνέμια ἔνια τῶν ᾠῶν, καὶ τὰ ἐξ ὀχείας γινόμενα, καὶ ἐπῳαζόντων οὐδὲν γίνεται ἔκγονον. τεθεώρηται δὲ τοῦτο μάλιστα ἐπὶ τῶν περιστερῶν.

* Scrib. ἤ τε χοριοειδὴς ὑμήν, vt De gen. anim. lib. 3. c. 2. & iterum mox ita scrib. ac quoties hic χωρίον legitur, scribo χορίον ex eodem loco. Gaza legisse videtur, χοριοειδὴς δ' αὐτὸς ὤν.

* Melius συνήρτηται, vel συναρτᾶται.

* Scrib. vel ἐκκεκολαμμένου, vel ἐκκεκολαμμένῳ ἀνατμηθέντι.

A Iam verò & viſcera eo tempore patent, & alui inteſtinorúmque natura perſpicua eſt. Venæ etiam illæ à corde proficiſcentes, iam ſeſe iuxta vmbilicum conſtituunt. ab ipſo autem vmbilico vena oritur duplex: altera tendens ad membranã ambientem vitellum, qui eo tempore humet, & largior, quàm ſecundùm naturam, eſt: altera permeans ad membranam, ambientem eam, qua pullus operitur, & eam quæ vitellum humorémque interiectũ continet. Dum enim pullus paulatim increſcit, vitellus ſeorſum in duas partes ſecatur: quarum altera locum tenet ſuperiorem, altera inferiorem: & medius humor candidus continetur. Nec partem B inferiorem à vitello liquor deſerit albus, qualis antè habebatur. Decimo die albumen exiguum iam, & lentum, craſſum, pallidulum nouiſſimè ineſt. Sunt enim quæque locata hoc ordine. Prima poſtremáque ad teſtam oui membrana poſita eſt, non teſtæ ipſius natiua, ſed altera illi ſubiecta. Liquor in ea candidus eſt. Deinde pullus continetur obuolutus membrana, ne in humore maneat. Mox pullo vitellus ſubiacet, in quem alterã ex venis prorepere dictum eſt, cùm altera albumen ambiens petat. Cuncta autem ambit membrana cum humore, ſpecie ſaniei. Tum verò membrana alia circa ipſum fœtum, vt dictum eſt, ducitur, arcens humorem: ſub qua vitellus, alia obuolutus mem- C brana: in quem vmbilicus à corde ac vena maiore oriens pertinet: atque ita efficitur ne fœtus alterutro humore attingatur. Viceſimo die iam pullus, ſi quis putamine ſecto ſolicitet, mouet intus ſeſe, pipitque aliquantulum: & iam ab eodẽ die plumeſcit, quoties vltra viceſimum excluſio protelatur. Ita poſitus eſt, vt caput ſuper crus dextrum admotum ilibus, alam ſuper caput poſitam habeat. Quinetiam membrana, quæ pro ſecundis habetur, poſt vltimam teſtæ membranam, ad quã alter vmbilicus pertendit, euidens per id tempus eſt, pulluſque in eadem iam totus locatur. Et altera quoque membrana, quæ & ipſa vicem ſecundarum D præſtat, vitellumque ambit, ad quem alter vmbilicus procedit, latiùs patet. Oritur vmbilicus vterque à corde, & vena maiore, vt dictum eſt. Fit autem per id tempus, vt vmbilicus alter, qui in ſecundas exteriores fertur, compreſſo iam animante abſoluatur: alter, qui adit vitellum, ad pulli tenue inteſtinum annectatur. Iam & pullum ipſum multum humoris lutei ſubit: atque in eius aluo fæcis aliquid ſubſidit luteum. Excremẽtum etiam album eodem tempore pullus emittit, & in aluo quiddam album conſiſtit. Demum vitellus paulatim abſumitur totus membrorum hauſtu, ita vt ſi pullo decimo die poſt excluſo reſcindas aluum nonnihil adhuc vitelli comperias. Vmbilico verò abſoluitur E pullus: nec quicquam præterea haurit. totus enim humor, qui in medio continebatur, abſumptus iam eſt. Tempore autem ſupra dicto pullus dormit quidem, ſed non perpetuò, quippe qui excitetur interdum, & mouens ſeſe reſpiciat, atque pipiat. Cor etiam eius cum vmbilico, vt ſpirantis reſflat, & palpitat. Sed auium ortus ad hunc modum ex ouo agitur. Pariunt autem oua nonnulla infœcunda, vel ex iis ipſis quæ conceperint coitu. Nullus enim prouenit fœtus, quamuis incubitu foueatur. quod maximè in columbis notatum eſt.

Oua gemina binis conſtant vitellis: qui ne inuicem confundantur, facit in nonnullis prætenue quoddam ſeptum albuminis medium: aliis vitelli contactu mutuo ſine vllo diſcrimine iunguntur. Sunt in genere gallinarum, quæ pariant gemina omnia, in quibus animaduerſum eſt quod de vitello expoſui. Quædam enim duodeuiginti peperit gemina, excluſitque præterquam ſi qua eſſent (vt fit) irrita. Cæteris itaque fœtus prodiit: ſed ita gemini excluduntur, vt alter ſit maior, alter minor: & tandem in monſtrum degeneret, qui minor nouiſſimè prouenit.

A τὰ δὲ δίδυμα τῶν ᾠῶν, δύο ἔχει λεκίθους· ὧν τὰ μὲν διείργει τοῦ μὴ εἰς ἄλληλα συγκεχύσθαι τὰ ὠχρὰ, τοῦ λευκοῦ λεπτὴ διάφυσις· τὰ δὲ, οὐκ ἔχει ταύτην τὴν διάφυσιν, ἀλλὰ συμψαύουσιν. εἰσὶ δ' ἔνιαι ἀλεκτορίδες, αἳ πάντα δίδυμα τίκτουσιν, ἐφ' ὧν ὤφθη τὸ περὶ τὴν λέκιθον συμβαῖνον. ὀκτωκαίδεκα γάρ τις τεκοῦσα, ἐξέλεψε δίδυμα πλὴν ὅσα οὔρια ἐγένετο. τὰ μὲν οὖν ἄλλα, γόνιμα* πλὴν ὅσα τὸ μὲν, μεῖζον, τὸ δ', ἔλαττον γίνεται τῶν διδύμων· τὸ δὲ τελευταῖον, τερατῶδες. * γ. πολλῶν

CAPVT IV.

Genus columbaceum bina oua, vel terrena ad ſummum parere, déque eius fœtificationis ordine. B

PAriunt magna ex parte bina oua, quæ ſpecie columbacea continentur omnia, vt palumbes, vt turtur: ſed cùm plurimùm, terna palumbes, & turtur. Columbæ omni tempore, vt dictum eſt, pariunt. Turtur, & palumbes vêre, nec plus quàm bis: atque ita, ſi prior fœtus corruptus eſt. Frangunt enim oua mares auium complures. Sed quamuis tria interdum pepererint oua, nunquam plus duobus pullis educunt: nonnunquam etiam vnum tãtùm: reliquum ouum ſemper irritum eſt, quod vrinum vocant. Aues magna ex parte anniculæ nequeunt generare. Omnes verò cum parere incœpere, ſemper ferè oua continent: quanquam in nonnullis facilè ob exilitatem videri non poſſunt. Columbæ magna ex parte marem & fœminam generãt: priorem marem, poſteriorem fœminam: & cùm pepererint primum ouum, vno interpoſito die ſecundum pariunt. Incubant ambo viciſſim, interdiu mas, noctu fœmina. Concoquunt, atque aperiũt citra diẽ viceſimum, ouum, quod priùs ediderint. Perforant ouum pridie eius diei, quo pullum excludunt: & fouent prolem ambo ad certum tempus eodem modo quo oua. Fœmina in opere ſobolis acerbior mare eſt, vt cæteris quoque à partu euenit animalibus. pariunt decies anno: nonnullæ etiam vndecies: Ægyptiæ verò & duodecies. Coeunt intra annum columbæ, quippe quæ ſemeſtres noſſe incipiant venerem. Palumbes & turtures etiam trimeſtres coire fœtificaréque aliqui referunt, argumento quòd larga eorum copia eſt. Gerũt vterum decem & quatuor diebus, ac totidem aliis incubãt, & totidem aliis foetus ita volucer fit, atque perficitur, vt vix poſſit apprehendi. Vita palumbium vel ad quadraginta annos durare exiſtimatur: perdicum ampliùs, quàm ad ſexdecim. Columba citra dies triginta prole expedita ſuperiore, parit.

ΚΕΦΑΛ. δ'.

Περὶ τόκου τῶν περιστεροειδῶν.

ΤΙκτουσι δὲ πάντα μὲν τὰ περιστεροειδῆ δύο, οἷον φάτται καὶ τρυγόνες ὡς ἐπὶ τὸ πολύ. τὰ δὲ πλεῖστα, τρία, τρυγὼν καὶ φάττα. τίκτει δὲ ἡ μὲν περιστερὰ, ὥσπερ εἴρηται, πᾶσαν ὥραν· τρυγὼν δὲ καὶ φάττα, ἐν τῷ ἔαρι, οὐ πλεονάκις ἢ δίς· τίκτει δὲ τὰ δεύτερα, ὅταν τὰ πρότερα γεννηθέντα διαφθαρῇ. πολλαὶ γὰρ διαφθείρουσιν αὐτὰ τῶν ὀρνίθων. τίκτει μὲν οὖν οὕτως, ὥσπερ εἴρηται· καὶ τρία ποτέ· ἀλλ' ἐξάγει γε καὶ οὐδέποτε δυοῖν πλείονα νεοττία· ἐνίοτε δὲ καὶ ἓν μόνον. τὸ δ' ὑπολειπόμενον τῶν ᾠῶν, ἀεὶ οὔριόν ἐστι. τῶν C δὲ πλείστων ὀρνέων οὐδὲν ἀδύνατες γίνεται. ἅπαντες δὲ οἱ ὄρνιθες, ἐπειδὰν ἅπαξ ἄρξωνται τίκτειν, διὰ τέλους, ὡς εἰπεῖν, ἔχουσιν ᾠά· ἀλλ' ἐνίοις, διὰ μικρότητα, οὐ ῥάδιον ἰδεῖν. ἡ δὲ περιστερὰ, ὡς ἐπὶ τὸ πολὺ ἄρρεν καὶ θῆλυ· καὶ τούτων, ὡς ἐπὶ τὸ πολὺ, πρότερον τὸ ἄρρεν τίκτει καὶ τεκοῦσα, μίαν ἡμέραν διαλείπει τὰ πολλά· εἶτα πάλιν τίκτει θάτερον. ἐπῳάζει δὲ καὶ ὁ ἄρρην ἐν τῷ μέρει, τὰς ἡμέρας· τὰς δὲ νύκτας, ἡ θήλεια· ἐκπέττεταί τε καὶ ἐκλέπεται ἐντὸς εἴκοσιν ἡμερῶν τὸ γεννώμενον πρότερον τῶν ᾠῶν. τιτρώσκει δὲ τὸ ᾠὸν τῇ προτέρᾳ ἢ ἐκλέπει. καὶ συνθερμαίνουσι τοὺς νεοττοὺς ἀμφότεροι ἐπὶ χρόνον τινὰ, ὥσπερ καὶ τὰ ᾠά. χαλεπωτέρα δὲ ἡ θήλεια D ἐστὶ περὶ τὴν τεκνοτροφίαν τοῦ ἄρρενος, ὥσπερ καὶ τὰ ἄλλα ζῷα μετὰ τὸν τόκον. τίκτουσι δὲ τοῦ ἐνιαυτοῦ καὶ δεκάκις καὶ ἑνδεκάκις· αἱ δ' ἐν Αἰγύπτῳ, καὶ δωδεκάκις. ὀχεύει δὲ καὶ ὀχεύεται ἡ περιστερὰ, ἐντὸς τοῦ ἐνιαυτοῦ· καὶ γὰρ ἑξαμηνιαῖον, ὀχεύει καὶ ὀχεύεται. τὰς δὲ φάττας καὶ τὰς τρυγόνας ἔνιοί φασιν ὀχεύεσθαι καὶ γεννᾶν καὶ τρίμηνα ὄντα· σημεῖον ποιούμενοι τὴν πολυπλήθειαν αὐτῶν. κύει δὲ τὰς δέκα καὶ τέτταρας ἡμέρας, καὶ ἐπῳάζει ἄλλας τοσαύτας. ἐν ἑτέραις δὲ δέκα καὶ τέτταρσι, πτεροῦνται οὕτως, ὥστε μὴ ῥᾳδίως καταλαμβάνεσθαι. βιοῖ δὲ φάττα, ὥς φασι, καὶ* τετταράκοντα ἔτη· καὶ αἱ πέρδικες δὲ πλείω ἔτη ἢ ἑκκαίδεκα. τίκτει δὲ καὶ ἡ περιστερὰ ἀπονεοττεύσασα πάλιν ἐν τριάκοντα ἡμέραις. * Libro 9 c. 7.

CAPVT V.

De nidificatione, & fœtura vulturis & hirundinis. E

VVltur nidificat in excelſiſſimis rupibus: vnde fit, vt rarò nidus, & pulli vulturis cernãtur. Quocirca Herodotus Bryſonis rhetoris pater, vultures ex diuerſo orbe nobis incognito aduolare putauit, argumẽto, quòd nemo nidũ vidiſſet vulturis, & quòd multi exercitũ ſequẽtes repentè appareãt. Sed quanquam difficilè nidum eius alitis videris, tamen viſus aliquãdo eſt. Pariũt vultures oua bina.

ΚΕΦΑΛ. ε'.

Περὶ νεοττείας γυπὸς καὶ χελιδόνος.

ΟΔὲ γὺψ, νεοττεύει μὲν ἐπὶ πέτραις ἀπροσβάτοις. διὸ σπάνιον ἰδεῖν νεοττείαν γυπὸς, καὶ νεοττούς. καὶ διὰ τοῦτο Ἡρόδωρος ὁ Βρύσωνος τοῦ σοφιστοῦ πατὴρ, φησὶν εἶναι τοὺς γῦπας* ἐφ' ἑτέρας γῆς, ἀδήλους ἡμῖν· τοῦτό γε λέγων σημεῖον, ὅτι οὐδεὶς ἑώρακε γυπὸς νεοττείαν, καὶ ὅτι πολλοὶ ἐξαίφνης φαίνονται ἀκολουθοῦντες τοῖς στρατεύμασι.* τὸ δὲ ἐστι χαλεπὸν ἰδεῖν, ὦπται δ' ὅμως. τίκτουσι δὲ δύο ᾠὰ οἱ γῦπες.

* Scrib. ἀπ' ἐπέκ. γῆς ἀδήλου ἡμῖν.
* Fortaſſe τὸ δὲ, vel στρατεύμασι· ἔστι δ.

A ἔχει δὴ ἐν τῷ χρόνῳ τούτῳ καὶ τὰ σπλάγχνα ἤδη φανερά, καὶ τὰ περὶ τὴν κοιλίαν, καὶ τὴν τῶν ἐντέρων φύσιν· καὶ αἱ φλέβες, αἱ ἀπὸ τῆς καρδίας φαινόμεναι τείνειν, πρὸς τῷ ὀμφαλῷ ἤδη γίνονται. ἀπὸ δὲ τοῦ ὀμφαλοῦ τείνει φλέψ, ἡ μὲν, πρὸς τὸν ὑμένα τὸν περιέχοντα τὸ ὠχρόν· τὸ δὴ ὠχρὸν ἐν τούτῳ τῷ χρόνῳ ὑγρόν ἤδη ἐστί, καὶ πλεῖον ἢ κατὰ φύσιν· ἡ δὲ ἑτέρα, εἰς τὸν ὑμένα τὸν περιέχοντα ὅλον τὸν ὑμένα ἐν ᾧ ὁ νεοττός, καὶ τὸν τοῦ ὠχροῦ ὑμένα, καὶ τὸ μεταξὺ τούτων ὑγρόν. αὐξανομένου γὰρ τοῦ νεοττοῦ κατὰ μικρόν, τοῦ ὠχροῦ τὸ μὲν ἄνω γίνεται, τὸ δὲ κάτω, ἐν μέσῳ δὲ τὸ λευκὸν ὑγρόν· τοῦ δὲ κάτω B ὠχροῦ τὸ λευκὸν ὑποκάτω, ὥσπερ τὸ πρῶτον ὑπῆρχε. δεκαταίου δ' ὄντος, τὸ λευκὸν ἔσχατον γίνεται, ὀλίγον ἤδη ὂν καὶ γλίσχρον, καὶ παχὺ καὶ ὑπόχλωρον. τέτακται γὰρ τῇ θέσει ἕκαστα τόνδε τὸν τρόπον. πρῶτος μὲν καὶ ἔσχατος, πρὸς τὸ ὄστρακον ὁ τοῦ ᾠοῦ ὑμήν, οὐχ ὁ τοῦ ὀστράκου, ἀλλ' ὁ ὑπ' ἐκεῖνον. ἐν δὲ τούτῳ λευκόν ἐστιν ὑγρόν· εἶτα ὁ νεοττός, καὶ ὁ περὶ αὐτὸν ὑμὴν χωρίζων, ὅπως μὴ ᾖ ἐν ὑγρῷ ὁ νεοττός· ὑπὸ δὲ τὸν νεοττὸν τὸ ὠχρόν, εἰς ὃ τῶν φλεβῶν ἔφερεν ἡ ἑτέρα· ἡ δ' ἑτέρα εἰς τὸ περιέχον λευκόν. τὸ δὲ πᾶν περιέχει ὑμὴν μεθ' ὑγρότητος ἰχωροειδοῦς· εἶτα ἄλλος ὑμὴν περὶ αὐτὸ ἤδη τὸ ἔμβρυον, ὥσπερ εἴρηται, χωρίζων πρὸς τὸ ὑγρόν. ὑποκάτω δὲ τούτου, τὸ ὠχρὸν C ἐν ἑτέρῳ ὑμένι περιειλημμένον· ἐν ᾧ εἰς ὁ ὀμφαλὸς ὁ ἀπὸ τῆς καρδίας καὶ τῆς μεγάλης φλεβὸς φέρων, ὥστε μὴ εἶναι τὸ ἔμβρυον ἐν ὁποτέρῳ τῶν ὑγρῶν. περὶ δὲ τὴν εἰκοστὴν ἤδη φθέγγεταί τε κινούμενος ἔσωθεν, ἄν τις κινῇ διελών, καὶ ἤδη δασύνεται, ὅταν ὑπὲρ τὰς εἴκοσι γίγνηται ἡ ἐκκόλαψις τῶν ᾠῶν. ἔχει δὲ τὴν κεφαλὴν ὑπὲρ τοῦ δεξιοῦ σκέλους ἐπὶ τῇ λαγόνι, τὴν δὲ πτέρυγα ὑπὲρ τῆς κεφαλῆς. καὶ φανερὸς κατὰ τοῦτον τὸν χρόνον, * ὅτε χωριώδης ὑμήν, ὁ μετὰ τὸν τοῦ ὀστράκου ὑμένα τὸν ἔσχατον, εἰς ὃν ἔτεινεν ὁ ἕτερος τῶν ὀμφαλῶν· καὶ ὁ D νεοττὸς ἐν τούτῳ δὴ γίνεται τότε ὅλος· καὶ ὁ ἕτερος ὑμήν, * χωριώδης ὤν, ὁ περὶ τὸ ὠχρόν, εἰς ὃν ἔτεινεν ὁ ἕτερος ὀμφαλός. ἀμφότεροι δ' ἦσαν ἀπό τε τῆς καρδίας καὶ τῆς φλεβὸς τῆς μεγάλης. ἐν δὲ τούτῳ τῷ χρόνῳ ὁ μὲν πρὸς τὸ ἔξω * χωρίον ὀμφαλὸς τείνων, ἀπολύεται τοῦ ζῴου συμπεπτωκώς· ὁ δ' εἰς τὸ ὠχρὸν φέρων, * συναρτίζεται τοῦ νεοττοῦ πρὸς τὸ ἔντερον τὸ λεπτόν, καὶ ἔσω τοῦ ὠχροῦ πολὺ ἤδη γίνεται ἐν τῷ νεοττῷ, καὶ ὑπόστημα ἐν τῇ κοιλίᾳ ὠχρόν. καὶ περίττωμα δ' ἀφίησι περὶ τὸν χρόνον τοῦτον πρὸς τὸ ἔξω χωρίον· καὶ ἐν τῇ κοιλίᾳ δ' ἔχει λευκόν, ἐκ τοῦ ἔξω περίττωμα, καὶ ἔσω τὸ ἐγγίνεται λευκόν. τέλος E δὲ τὸ ὠχρόν, ἔλαττον ἀεὶ γιγνόμενον κατὰ μικρόν, ἀναλίσκεται ὅλως καὶ ἐναπολαμβάνεται τῷ νεοττῷ, ὥστε * ἐκκεκαλυμμένου δεκαταίου, ἐὰν ἀνασχίσῃς, ἔτι ἐνίοτε μικρὸν ἐπιλείπεσθαι τοῦ ὠχροῦ πρὸς τῷ ἐντέρῳ. τοῦ δ' ὀμφαλοῦ ἀπολέλυται, καὶ οὐ λαμβάνει οὐδέν, ἀλλ' ἀνήλωται πᾶν. περὶ δὲ τὸν χρόνον τὸν προειρημένον καθεύδει μὲν ὁ νεοττός, οὐ μέντοι διὰ τέλους, ἀλλ' ἐνίοτε ἐγειρόμενος καὶ κινούμενος ἀναβλέπει, καὶ φθέγγεται· καὶ ἡ καρδία ἅμα τῷ ὀμφαλῷ ἀναφυσᾷ, ὡς ἀναπνέοντος. ἡ μὲν οὖν γένεσις ἐκ τοῦ ᾠοῦ τοῖς ὄρνισι τοῦτον ἔχει τὸν τρόπον. τίκτουσι δὲ αἱ ὄρνιθες ἔνια ἄγονα τῶν ᾠῶν, καὶ τὰ ἐξ ὀχείας γενόμενα, καὶ οὐδὲν ἐπωαζόντων γίνεται ἔμβρυον. τεθεώρηται δὲ τοῦτο μάλιστα ἐπὶ τῶν περιστερῶν.

* Scrib. ὅ,τε χοριώδης ὑμὴν, vt De gen. anim. lib.3.c.2. & iterum mox ita scrib. ac quoties hic χωρίον legitur, scribo χορίον ex eodem loco. Gaza legisse videtur, χοριώδης δὲ αὐτῆς ὤν.

* Melius συναρτᾶται, vel συνήρτηται.

* Scrib. vel ἐκκεκολαμμένου δεκαταίου. Vel, ἐκκεκολαμμένου δεκαταίου.

A Iam verò & viſcera eo tempore patent, & alui inteſtinorúmque natura perſpicua eſt. Venæ etiam illæ à corde proficiſcentes, iam ſeſe iuxta vmbilicum conſtituunt. ab ipſo autem vmbilico vena oritur duplex: altera tendens ad membranã ambientem vitellum, qui eo tempore humet, & largior, quàm ſecundùm naturam, eſt: altera permeans ad membranam, ambientem eam, qua pullus operitur, & eam quæ vitellum humorémque interiectũ continet. Dum enim pullus paulatim increſcit, vitellus ſeorſum in duas partes ſecatur: quarum altera locum tenet ſuperiorem, altera inferiorem: & medius humor candidus continetur. Nec partem B inferiorem a vitello liquor deſerit albus, qualis antè habebatur. Decimo die albumen exiguum iam, & lentum, craſſum, pallidulum nouiſſimè ineſt. Sunt enim quæque locata hoc ordine. Prima poſtremáque ad teſtam oui membrana poſita eſt, non teſtæ ipſius natiua, ſed altera illi ſubiecta. Liquor in ea candidus eſt. Deinde pullus continetur obuolutus membrana, ne in humore maneat. Mox pullo vitellus ſubiacet, in quem alterã ex venis protepere dictum eſt, cùm altera albumen ambiens petat. Cuncta autem ambit membrana cum humore, ſpecie ſaniei. Tum verò membrana alia circa ipſum fœtum, vt dictum eſt, ducitur, arcens humorem: ſub qua vitellus, alia obuolutus mem- C brana: in quem vmbilicus à corde ac vena maiore oriens pertinet: atque ita efficitur ne fœtus alterutro humore attingatur. Vigeſimo die iam pullus, ſi quis putamine ſecto ſolicitet, mouet intus ſeſe, pipitque aliquantulum: & iam ab eodẽ die plumeſcit, quoties vltra vigeſimum excluſio procelatur. Ita poſitus eſt, vt caput ſuper crus dextrum admotum ilibus, alam ſuper caput poſitam habeat. Quinetiam membrana, quæ pro ſecundis habetur, poſt vltimam teſtæ membranam, ad quã alter vmbilicus pertendit, euidens per id tempus eſt, pulluſque in eadem iam totus locatur. Et altera quoque membrana, quæ & ipſa vicem ſecundarum D præſtat, vitellumque ambit, ad quem alter vmbilicus procedit, latiùs patet. Oritur vmbilicus vterque à corde, & vena maiore, vt dictum eſt. Fit autem per id tempus, vt vmbilicus alter, qui in ſecundás exteriores fertur, compreſſo iam animante abſoluatur: alter, qui adit vitellum, ad pulli tenue inteſtinum annectatur. Iam & pullum ipſum multum humoris lutei ſubit, atque in eius aluo fæcis aliquid ſubſidit luteum. Excremẽtum etiam album eodem tempore pullus emittit, & in aluo quiddam album conſiſtit. Demum vitellus paulatim abſumitur totus membrorum hauſtu, ita vt ſi pullo decimo die poſt excluſo reſcindas aluum nonnihil adhuc vitelli comperias. Vmbilico verò abſoluitur E pullus: nec quicquam præterea haurit. totus enim humor, qui in medio continebatur, abſumptus iam eſt. Tempore autem ſuprà dicto pullus dormit quidem, ſed non perpetuò, quippe qui excitetur interdum, & mouens ſeſe reſpiciat, atque pipiat. Cor etiam eius cum vmbilico, vt ſpirantis reſſat, & palpitat. Sed auium ortus ad hunc modum ex ouo agitur. Pariunt autem oua nonnulla infœcunda, vel ex iis ipſis quæ conceperint coitu. Nullus enim prouenit fœtus, quamuis incubitu foueatur. quod maximè in columbis notatum eſt.

Oua gemina binis conſtant vitellis: qui ne inuicem confundantur, facit in nonnullis prætenue quoddam ſeptum albuminis medium: aliis vitelli contactu mutuo ſine vllo diſcrimine iunguntur. Sunt in genere gallinarum, quæ pariant gemina omnia, in quibus animaduerſum eſt quod de vitello expoſui. Quædam enim duodeuiginti peperit gemina, excluſitque præterquam ſi qua eſſent (vt fit) irrita. Cæteris itaque fœtus prodiit: ſed ita gemini excluduntur, vt alter ſit maior, alter minor: & tandem in monſtrum degeneret, qui minor nouiſſimè prouenit.

CAPVT IV.

Genus columbaceum bina oua, vel terrena ad ſummum parere, déque eius fœtificationis ordine. B

PAriunt magna ex parte bina oua, quæ ſpecie columbacea continentur omnia, vt palumbes, vt turtur: ſed cùm plurimùm, terna palumbes, & turtur. Columbæ omni tempore, vt dictum eſt, pariunt. Turtur, & palumbes vere, nec plus quàm bis: atque ita, ſi prior fœtus corruptus eſt. Frangunt enim oua mares auium complures. Sed quamuis tria interdum pepererint oua, nunquam plus duobus pullis educunt: nonnunquam etiam vnum tātùm: reliquum ouum ſemper irritum eſt, quod vrinum vocant. Aues magna ex parte anniculæ nequeunt generare. Omnes verò cùm parere incœpere, ſemper ferè oua continent: quanquam in nonnullis facilè ob exilitatem videri non poſſunt. Columbæ magna ex parte marem & fœminam generāt: priorem marem, poſteriorem fœminam: & cùm pepererint primum ouum, vno interpoſito die ſecundum pariunt. Incubant ambo viciſſim, interdiu mas, noctu fœmina. Concoquunt, atque aperiunt citra diē viceſimum, ouum, quod priùs ediderint. Perforant ouum pridie eius diei, quo pullum excludunt: & fouent prolem ambo ad certum tempus eodem modo quo oua. Fœmina in opere ſobolis acerbior mare eſt, vt cæteris quoque à partu euenit animalibus. pariunt decies anno: nonnullæ etiam vndecies: Ægyptiæ verò & duodecies. Coeunt intra annum columbæ, quippe quæ ſemeſtres noſſe incipiant venerem. Palumbes & turtures etiam trimeſtres coire fœtificaréque aliqui referunt, argumento quòd larga eorum copia eſt. Gerūt vterum decem & quatuor diebus, ac totidem aliis incubāt, & totidem aliis foetus ita volucer fit, atque perficitur, vt vix poſſit apprehendi. Vita palumbium vel ad quadraginta annos durare exiſtimatur: perdicum ampliùs, quàm ad ſexdecim. Columba citra dies triginta prole expedita ſuperiore, parit.

CAPVT V.

De nidificatione, & fœtura vulturis & hirundinis. E

VVltur nidificat in excelſiſſimis rupibus: vnde fit, vt rarò nidus, & pulli vulturis cernantur. Quocirca Herodotus Bryſonis rhetoris pater, vultures ex diuerſo orbe nobis incognito aduolare putauit, argumēto, quòd nemo nidū vidiſſet vulturis, & quòd multi exercitū ſequētes repentè appareāt. Sed quanquam difficilè nidum eius alitis videris, tamen viſus aliquādo eſt. Pariūt vultures oua bina.

A τὰ δὲ δίδυμα τῶν ὠῶν, δύο ἔχει λεκίθους· ὧν τὰ μὲν διείργει τοῦ μὴ εἰς ἄλληλα συγκεχύσθαι τὰ ὠχρά, τοῦ λευκοῦ λεπτὴ διάφυσις· τὰ δὲ, οὐκ ἔχει ταύτην τὴν διάφυσιν, ἀλλὰ συμψαύουσιν. εἰσὶ δ' ἔνιαι ἀλεκτορίδες, αἳ πάντα δίδυμα τίκτουσιν, ὡς ἐπὶ τούτων ὤφθη ὃ περὶ τὴν λέκιθον συμβαῖνον. ὀκτωκαίδεκα γάρ τις τεκοῦσα, ἐξέλεψε δίδυμα πλὴν ὅσα οὔρια ἐγένετο. τὰ μὲν οὖν ἄλλα, γόνιμα* πλὴν ὅσα τὸ μὲν, μεῖζον, τὸ δ', ἔλαττον γίνεται τῶν διδύμων· τὸ δὲ τελευταῖον, τερατῶδες. * [illegible]

ΚΕΦΑΛ. δ'.

B

Περὶ τόκου τῶν περιστεροειδῶν.

ΤΙκτουσι δὲ πάντα μὲν τὰ περιστεροειδῆ δύο, οἷον φάτται καὶ τρυγόνες ὡς ἐπὶ τὸ πολύ. τὰ δὲ πλεῖστα, τρία, τρυγὼν καὶ φάττα. τίκτει δὲ ἡ μὲν περιστερά, ὥσπερ εἴρηται, πᾶσαν ὥραν· τρυγὼν δὲ καὶ φάττα, ἐν τῷ ἔαρι, οὐ πλεονάκις ἢ δίς· τίκτει δὲ τὰ δεύτερα, ὅταν τὰ πρότερα γενόμενα διαφθαρῇ. πολλαὶ γὰρ διαφθείρουσιν αὐτὰ τῶν ὀρνίθων. τίκτει μὲν οὖν οὕτως, ὥσπερ εἴρηται· καὶ τρία ποτέ· ἀλλ' ἐξάγει τε καὶ οὐδέποτε δυοῖν πλέον νεοττοῖν· ἐνίοτε δὲ καὶ ἕνα μόνον· τὸ δ' ὑπολειπόμενον τῶν ὠῶν, ἀεὶ οὔριόν ἐστι. τῶν C δὲ πλείστων ὀρνέων οὐδὲν αὐτοετὲς γεννᾷ. ἅπαντες δὲ οἱ ὄρνιθες, ἐπειδὰν ἅπαξ ἄρξωνται τίκτειν, διὰ τέλους, ὡς εἰπεῖν, ἔχουσιν ᾠά· ἀλλ' ἐνίοις, διὰ μικρότητα, οὐ ῥᾴδιον ἰδεῖν. ἡ δὲ περιστερά, ὡς ἐπὶ τὸ πολὺ ἄρρεν καὶ θῆλυ· καὶ τούτων, ὡς ἐπὶ τὸ πολύ, πρότερον τὸ ἄρρεν τίκτει καὶ τεκοῦσα, μίαν ἡμέραν διαλείπει τὰ πολλά· εἶτα πάλιν τίκτει θάτερον. ἐπωάζει δὲ καὶ ὁ ἄρρην ἐν τῷ μέρει. τῆς ἡμέρας· τῆς δὲ νύκτα, ἡ θήλεια· ἐκπέττεταί τε καὶ ἐκλέπεται ἐντὸς εἴκοσιν ἡμερῶν τὸ γενόμενον πρότερον τῶν ὠῶν. τιτρώσκει δὲ τὸ ᾠὸν τῇ προτέρᾳ ἢ ἐκλέπει. ἐπιθερμαίνουσι τοὺς νεοττοὺς ἀμφότεροι ἐπὶ χρόνον τὸν αὐτόν, ὅνπερ καὶ τὰ ᾠά. χαλεπωτέρα δὲ ἡ θήλεια ἐστὶ περὶ τὴν τεκνοτροφίαν τοῦ ἄρρενος, ὥσπερ καὶ τὰ ἄλλα D ζῷα μετὰ τὸν τόκον. τίκτουσι δὲ τοῦ ἐνιαυτοῦ καὶ δεκάκις καὶ ἑνδεκάκις· αἱ δ' ἐν Αἰγύπτῳ, καὶ δωδεκάκις. ὀχεύει δὲ καὶ ὀχεύεται ἡ περιστερά, ἐντὸς τοῦ ἐνιαυτοῦ· καὶ γὰρ ἐξ μηνῶν, ὀχεύει καὶ ὀχεύεται. τὰς δὲ φάττας καὶ τὰς τρυγόνας ἔνιοί φασιν ὀχεύεσθαι καὶ γεννᾶν καὶ τρίμηνα ὄντα· σημεῖον ποιούμενοι τὴν πολυπληθίαν αὐτῶν. κύει δὲ ταῦτα δέκα καὶ τέτταρας ἡμέρας, καὶ ἐπωάζει ἄλλας τοσαύτας. ἐν ἑτέραις δὲ δέκα καὶ τέτταρσι, πτεροῦνται οὕτως, ὥστε μὴ ῥᾳδίως καταλαμβάνεσθαι. βιοῖ δὲ φάττα, ὥς φασι, καὶ* τετταράκοντα ἔτη· καὶ αἱ πέρδικες δὲ πλείω ἔτη ἢ ἑκκαίδεκα. τίκτει δὲ καὶ ἡ περιστερὰ ἀπονεοττεύουσα πάλιν ἐν τριάκοντα ἡμέραις. * Libro 9. c. 7.

ΚΕΦΑΛ. ε'.

E

Περὶ νεοττείας γυπὸς καὶ χελιδόνος.

ΟΔὲ γύψ, νεοττεύει μὲν ἐπὶ πέτραις ἀπροσβάτοις. διὸ σπάνιον ἰδεῖν νεοττείαν γυπός, καὶ νεοττούς. καὶ διὰ τοῦτο Ἡρόδοτος ὁ Βρύσωνος τοῦ σοφιστοῦ πατήρ, φησὶν εἶναι τοὺς γύπας* ἐφ' ἑτέρας γῆς, ἀδήλους ἡμῖν. τοῦτό γε λέγων τὸ σημεῖον, ὅτι οὐδεὶς ἑώρακε γυπὸς νεοττείαν, καὶ ὅτι πολλοὶ ἐξαίφνης φαίνονται ἀκολουθοῦντες τοῖς στρατεύμασι.* τὸ δὲ ἐστι χαλεπὸν ἰδεῖν, ὦπται δ' ὅμως. τίκτουσι δὲ δύο ᾠὰ οἱ γῦπες.

* Scrib. ἀφ' ἑτέρας γῆς ἀδήλου ἡμῖν.
* Fortaſſe τὸ δέ, vel στρατεύμασιν· ὤπτ' ἔ.

τὰ μὲν οὖν ἄλλα ὅσα σαρκοφάγα, οὐχ ὦπται πλεονάκις ἢ ἅπαξ τίκτοντα· ἡ δὲ χελιδὼν, δὶς νεοττεύει, μόνον τῶν σαρκοφάγων. τῶν δὲ νεοττῶν ἄν τις, ἔτι νέων ὄντων, τῆς χελιδόνος τὰ ὄμματα ἐκκεντήσῃ, γίνονται ὑγιεῖς, καὶ βλέπουσιν ὕστερον.

ΚΕΦΑΛ. ϛ'.

Περὶ τόκου ἀετῶν, καὶ χηνὸς, καὶ ὠτίδος, καὶ ἰκτῖνος, καὶ ἱέρακος καὶ κόρακος.

Ὁ Δὲ ἀετὸς, ᾠὰ μὲν τίκτει τρία, ἐκλέπει δὲ τούτων τὰ δύο· ὥσπερ ἐστὶ καὶ ἐπὶ τοῖς λεγομένοις Μουσαίου ἔπεσιν·

Ὃς τρία μὲν τίκτει, δύο δ' ἐκλέπει, ἓν δ' ἀλεγίζει.

ὡς μὲν οὖν τὰ πολλὰ οὕτω συμβαίνει. ἤδη δὲ καὶ τρεῖς νεοττοὶ ὠμμένοι εἰσίν. ἐκβάλλει δ' αὐξανομένων τὸν ἕτερον τῶν νεοττῶν, ἀχθόμενος τῇ ἐδωδῇ. ἅμα δὲ λέγεται ἐν τῷ χρόνῳ τούτῳ * ἀπαιτὴς γίνεσθαι, ὅπως μὴ ἁρπάζῃ τοὺς τῶν θηρίων σκύμνους. οἵ τε οὖν ὄνυχες αὐτοῦ διαστρέφονται ὀλίγας ἡμέρας, καὶ τὰ πτερὰ λευκαίνεται· ὥστε καὶ τοῖς τέκνοις τότε γίνονται χαλεποί. τὸν δ' ἐκβληθέντα δέχεται καὶ τρέφει ἡ φήνη. ἐπῳάζει περὶ τριάκοντα ἡμέρας. καὶ τῶν ἄλλων δὲ τοῖς μεγάλοις ὁ χρόνος τοσοῦτός ἐστι τῆς ἐπῳάσεως, οἷον χηνὶ καὶ ὠτίδι· τοῖς δὲ μέσοις, περὶ εἴκοσιν, οἷον ἰκτίνῳ καὶ ἱέρακι. τίκτει δὲ ὁ ἰκτῖνος, τὰ μὲν πλεῖστα, δύο· ἐνίοτε δὲ καὶ τρεῖς ἐξάγει νεοττούς. ὁ δ' αἰτώλιος καλούμενος, ἔστιν ὅτε καὶ τέτταρας. τίκτει δὲ καὶ ὁ κόραξ οὐ μόνον δύο, ὥσπερ φασί τινες, ἀλλὰ καὶ πλείω, καὶ ἐπῳάζει περὶ εἴκοσιν ἡμέρας, καὶ ἐκβάλλει τοὺς νεοττοὺς ὁ κόραξ. ποιεῖ δὲ καὶ ἄλλα τῶν ὀρνέων τὸ αὐτὸ τοῦτο. πολλάκις γὰρ, ὅσα πλείω τίκτει, ἓν ἐκβάλλουσιν. οὐ πάντα δὲ τὰ τῶν ἀετῶν γένη ὅμοια περὶ τὰ τέκνα· ἀλλ' ὁ πύγαργος, χαλεπός· οἱ δὲ μέλανες, εὔτεκνοι περὶ τὴν τροφήν εἰσιν. ἐπεὶ πάντες, ὡς εἰπεῖν, οἱ γαμψώνυχες, ὅταν θᾶττον οἱ νεοττοὶ δύνωνται πέτεσθαι, ἐκβάλλουσι τύπτοντες ἐκ τῆς νεοττιᾶς. καὶ τῶν ἄλλων δὲ, ὥσπερ εἴρηται, σχεδὸν οἱ πλεῖστοι τοῦτο δρῶσι· καὶ ἐκθρέψαντες, οὐδεμίαν ἐπιμέλειαν ποιοῦνται τὸ λοιπὸν, πλὴν κορώνης. αὕτη γὰρ ἐπί τινα χρόνον ἐπιμελεῖται· καὶ γὰρ ἤδη πετομένη σιτίζει παραπετομένους.

* γ. ἀπαίτης. al. ἀπαιτεῖ. Gaz. legit ἀπαίνης, quod liberè more ſuo eſt interpretatus. Plinius tamen 10. 3. ἀπαίνεις. & mox idē ἔσι. μὴ δοκ.

ΚΕΦΑΛ. ζ'.

Περὶ τόκου κόκκυγος.

Ὁ Δὲ κόκκυξ, λέγεται μὲν ὑπό τινων, ὡς μεταβάλλει ἐξ ἱέρακος, διὰ τὸ ἀφανίζεσθαι τὸν ἱέρακα ὃν περὶ τοῦτον τὸν χρόνον, ᾧ ὅμοιός ἐστι. σχεδὸν δὲ καὶ τοὺς ἄλλους ἱέρακας οὐκ ἔστιν ἰδεῖν, ὅταν θᾶττον φθέγγηται ὁ κόκκυξ, πλὴν ὀλίγας ἡμέρας. ὁ δὲ κόκκυξ, φαίνεται μὲν ἐπ' ὀλίγον χρόνον τοῦ θέρους, τὸν δὲ χειμῶνα, ἀφανίζεται. ἔστι δὲ ὁ μὲν ἱέραξ, γαμψώνυχος· ὁ δὲ κόκκυξ, οὐ γαμψώνυχος. ἔτι δὲ οὔτε τὰ περὶ τὴν κεφαλὴν ἔοικεν ἱέρακι, ἀλλ' ἀμφότερα ταῦτα περιστερᾷ μᾶλλον· ἀλλ' ἢ κατὰ τὸ χρῶμα μόνον προσέοικεν ἱέρακι· πλὴν τοῦ μὲν ἱέρακος τὰ ποικίλα, οἷον γραμμαί εἰσι, τοῦ δὲ κόκκυγος, οἷον στιγμαί. τὸ μέντοι μέγεθος καὶ ἡ πτῆσις, παραπλησία τῷ ἐλαχίστῳ τῶν ἱεράκων, ὃς κατὰ τὸν χρόνον τοῦτον ἀφανής ἐστιν ἐπὶ τὸ πολὺ ἐν ᾧ φαίνεται ὁ κόκκυξ· ἐπεὶ ἤδη τι ὠμμένοι εἰσὶν ἄμφω. καὶ κατεσθιόμενος δὲ ὦπται κόκκυξ ὑπὸ ἱέρακος.

Cætera, quæ carne veſcuntur, non plus quàm ſemel anno parere exploratum eſt. Hirundo vna bis anno nidificat. Pullorum hirundinis adhuc recentium oculi, ſi quis ſtimulo eos vexarit, reſaneſcunt, & cernendi vim poſtea planè recipiunt.

CAPVT VI.

De Aquilarum genere, & fœtu: déque Anſeris, Accipitris, Milui, & Corui partu.

AQuilæ oua pariunt terna: ſed pullos binos excludunt, vt ex verſu, quem ad Muſæum referunt authorem, conſtat:

Excludit binos, edit terna, educat vnum.

Sed quamuis magna ex parte ſic fiat, tamen & tres viſi aliquando ſunt pulli. alterum in educando expellunt tædio nutriendi: nam & degenerare, ac hebeſcere aquila dicitur eo tempore, vt fœtus ferarum rapere non queat: noménque hinc exacti, hoc eſt, degenerantis aquilæ, accipit. Vngues etiã eius inuertuntur diebus paucis, & pennæ albeſcunt, vt meritò ſuos oderit partus. Sed pullum eiectum oſſifraga excipit, atque educat. Incubat aquila tricenis diebus. Et cęteris quoque magnis alitibus tempus incubandi tantumdem à natura ſtatutum eſt, vt anſeri, vt tardæ. Mediocribus viceni perficiunt incubationem, vt accipitri, vt miluo. Pariunt milui bina magna ex parte: interdum tamen & terna, totidémque excludunt pullos: ſed qui ætolius nuncupatur, vel quaternos aliquando excludit. Coruus quoque non modò bina, vt aliqui volunt, parit, verùm etiam plura. Incubat autem viginti diebus, & pullos nido expellit. Quod idem & alię complures volucres faciunt. Quibus enim partus numeroſior eſt, vnum ſæpe eijciunt. Genera aquilarum non æquè omnia prolem faſtidiunt: ſed difficilior in alendo vna, cui nomen pygargo cauda albicans dederat: benignior, quæ tota nigricat colore. Nam omnes ferè alites, quibus vngues adunci, pullos cùm primùm prouolandi facultas fuerit, nido expellũt, percutientéſque cogunt diſcedere. Et cæteræ quoque aues maxima ferè ſui parte, vt dictum eſt, idem hoc faciunt. Cúmque enutrierint, nihil præterea adhibent curæ, excepta cornice, quæ aliquamdiu prouidet: quippe quæ volantes iam ſuos pullos paſcens ipſa comitetur.

CAPVT VII.

De Cuculi natura, & eius partu.

CVculus ex accipitre fieri, immutata figura, à nonnullis putatur: quoniam quo tempore is apparet, accipiter ille, cui ſimilis eſt, non aſpicitur. Sed ita ferè euenit vt ne cæteri quidem accipitres item cernantur, cùm primùm vocem emiſit cuculus, niſi perquam paucis diebus. Ipſe autem breui tempore æſtatis viſus, hyeme non cernitur. Eſt hic neque aduncis vnguibus, vt accipiter, neque capite accipitri ſimilis: ſed ea vtraque parte columbum potiùs quàm accipitrem repræſentat: nec alio, quàm colore imitatur accipitrem, niſi quòd accipiter maculis diſtinguitur, ceu lineis: cuculus velvt punctis. Magnitudo, atque volatus ſimilis accipitrũ minimo, qui magna ex parte per id tempus non cernitur, quo cuculus apparet: nam vel ambo vnà viſi aliquando ſunt. Quinetiam ab accipitre interimi cuculus viſus eſt: quod

quod nulla auis ſuo in genere ſolet facere. Pullos A cuculi nemo ſe ait vidiſſe. Parit tamen, verùm non in nido, quem ipſe fecerit, ſed interdum in nidis minorum auium: & oua, quæ aliena repererit, edit. Maximè verò nidos palumbium petit, quorum & ipſorum oua eſu abſumens, ſua relinquit. Parit maiore ex parte ſingula oua, rarò bina. Curucæ quoque in nido parit. Fouet illa, excludit, & educat. Quo quidem præcipuè tempore & pinguis, & grati ſaporis pullus cuculi eſt. Pulli etiam accipitrum ſuaues valde, pinguéſque efficiuntur. Genus eorum quoddam nidos facere procul in petris excelſis præruptiſque aſſolet.

CAPVT VIII.

De auium incubitu, quóve tempore mas, quo item fœmina incubet.

INcubat magna auium pars (vt de columbis retuli) fœminæ mare ſuccedente. aliqui mares incubandi munus tantiſper ſubeunt, dum fœminæ intermiſſo incubitu cibum quærunt. Anſerum fœminæ tantùm incubant: quæ vt cœperunt, nunquam intermittunt, ſed perpetuo fouent incubitu. Aquaticæ omnes iuxta paludes, & locis herbã habentibus, nidos faciunt: quo fit vt vel occupatę negotio incubandi, poſſint ſumere cibum, nec omnino inedia laborẽt. Cornicum etiam fœminæ tantùm incubant, aſſiduéque in opere perſeuerant. Mares his cibum ſuggerunt, paſcúntque incubantes. Palumbium fœmina incubat à pomeridiano incipiens, totáque nocte, & vſque ad tempus ientaculi perſeuerans: reliquo tempore munus idem mas ſubit. Perdices bina ouorum receptacula faciunt: in altero fœmina incubat, in altero mas: excluditque ſua vterque, & educat. Pulli etiam ipſi ſubiguntur à mare ſtatim cùm procedunt.

CAPVT IX.

De pauone, & eius fœtu, quotiéſque in anno pariat: deque auium teſtibus, qui coitus tempore grandiores efficiantur.

PAuo viuit annos vigintiquinque. Parit maximè à trimatu, & colores pennarum varios recipit. Excludit diebus tricenis, aut paulò tardiùs. Semel tantummodo anno parit oua duodecim, aut paulò pauciora: nec continuatis diebus, ſed binis terniſve interpoſitis. Primiparæ octona maximè edunt. Irrita, & ſubuentanea illa pauones etiam pariunt. Coeunt vere: & partus breui à coitu agitur. amittit pennas cum primis arborum frondibus: recipit cum germine earumdem. Gallinis ſubijciunt incubanda oua pauonia, quoniam mas, dum fœmina incubat, aduolans ea frangat. Quam ob cauſam & ſylueſtres nonnullæ aues pariunt fugientes marem, & incubant. Subijciuntur maximè bina, cùm plura ſuo incubitu nequeant aperire. Curáque adhibetur vt cibus aſſit, ne deſiderio eius diſcedens gallina intermittat fouẽdi operam. Teſtes auium grandiores effici tempore coitus certum eſt: ſed ſalaciorum conſpectiores ſunt, vt gallinaceorũ, & perdicũ: temperantiorũ minùs.

A κείτει οὐδὲν ποιεῖ τῶν ὁμοιογενῶν ὀρνίθων. νεοττοὺς δὲ κόκκυγος λέγουσιν ὡς οὐδεὶς ἑώρακεν. ὁ δὲ, τίκτει μὲν, ἀλλ' οὐ ποιησάμενος νεοττείαν, ἀλλ' ἐνίοτε μὲν, ἐν τῇ τῶν ἐλαττόνων ὀρνίθων ἐντίκτει, καὶ καταφαγὼν τὰ ᾠὰ τὰ ἐκείνων· μάλιστα δὲ ἐν ταῖς τῶν φαττῶν νεοττείαις, καὶ καταφαγὼν καὶ τὰ τούτων ᾠά. τίκτει δὲ ὀλιγάκις μὲν δύο, τὰ δὲ πλεῖστα, ἕν. τίκτει δὲ καὶ * ὑπὸ τῇ τῆς ὑπολαΐδος νεοττείᾳ· ἡ δὲ, ἐκλέπει καὶ ἐκτρέφει. γίνεται δὲ πίων καὶ ἡδύκρεως κατὰ τοῦτον τὸν καιρὸν μάλιστα. γίνονται δὲ καὶ τῶν ἱεράκων οἱ νεοττοὶ ἡδύκρεῳ σφόδρα καὶ πίονες. νεοττεύει δὲ γένος τι αὐτῶν πόῤῥω, καὶ ἐν ἀποτόμοις πέτραις. * καὶ ἐπὶ τῇ

B

ΚΕΦΑΛ. η'.

Περὶ ἐπῳάσεως τῶν ὀρνίθων.

ΕΠῳάζει δὲ τὰ πολλὰ τῶν ὀρνίθων (ὥσπερ εἴρηται περὶ τῶν περιστερῶν) διαδεχόμενα * τὰ ἄῤῥενα ταῖς θηλείαις τὸν τοσοῦτον χρόνον, ὅσον ἀπολείπει τὸ θῆλυ τὴν τροφὴν αὑτῷ πορίζόμενον. τῶν δὲ χηνῶν αἱ θήλειαί τε ἐπῳάζουσι μόναι, καὶ διὰ παντὸς ἐφεδρεύουσιν, ὅταν περ ἄρξωνται τοῦτο ποιεῖν. πρὸς δὲ τόποις ἑλώδεσί τε, καὶ πόας C ἔχουσι, πάντων τῶν λιμναίων ὀρνίθων αἱ νεοττεῖαι γίνονται· διόπερ καὶ ἡσυχίαν ἔχοντες ἐπὶ τῶν ᾠῶν, δύνανται τὴν τροφὴν τινὰ αὑτοῖς πορίζεσθαι, καὶ μὴ παντάπασιν ἄσιτοι εἶναι. ἐπῳάζουσι δὲ καὶ τῶν κορωνῶν αἱ θήλειαι μόναι, καὶ διαμένουσιν ἐπ' αὐτῶν οὖσαι διὰ παντός. τρέφουσι δ' αὐτὰς οἱ ἄῤῥενες, κομίζοντες τὴν τροφὴν αὐταῖς καὶ σιτίζοντες. τῶν δὲ φαττῶν ἡ μὲν θήλεια, ἀπὸ δείλης ἀρξαμένη, τήν τε νύκτα ὅλην ἐπῳάζει, καὶ ἕως ἀκρατίσματος ὥρας· ὁ δὲ ἄῤῥην, τὸ λοιπὸν τοῦ χρόνου. οἱ δὲ πέρδικες, δύο ποιοῦνται τῶν ᾠῶν σηκούς· καὶ ἐφ' ᾧ μὲν, ἡ θήλεια, ἐπὶ θατέρῳ δὲ, ὁ ἄῤῥην ἐπῳάζει· καὶ ἐκλέψας, ἐκτρέφει ἑκάτερος ἑκάτερα· καὶ τοὺς νεοττοὺς, ὅταν πρῶτον ἐξάγῃ, ὀχεύει * αὐτοὺς ὁ ἄῤῥην. D

* κ. πιάῤῥενα, mendosè.

* Qu. αὐτὰς

ΚΕΦΑΛ. θ'.

Περὶ ταὼν κυήσεως καὶ γενέσεως.

ΟΔὲ ταὼς, ζῇ μὲν περὶ εἴκοσι καὶ πέντε ἔτη, γεννᾷ δὲ τριετὴς μάλιστα· ἐν οἷς καὶ τὴν ποικιλίαν τῶν πτερῶν ἀπολαμβάνει· καὶ ἐκλέπει ἐν τριάκοντα ἡμέραις, ἢ μικρῷ πλείοσιν. ἅπαξ δὲ τοῦ ἔτους τίκτει μόνον. τίκτει δὲ ᾠὰ δώδεκα, ἢ μικρῷ ἐλάττω. τίκτει δὲ διαλιπὼν δύο ἢ τρεῖς ἡμέρας, καὶ οὐκ ἐφεξῆς· αἱ δὲ πρωτοτόκοι, μάλιστα περὶ ὀκτὼ ᾠά. τίκτουσι δὲ οἱ ταῲ τὰ ᾠὰ καὶ τὰ ὑπηνέμια. ὀχεύονται δὲ περὶ τὸ ἔαρ. γίνεται δὲ καὶ ὁ τόκος εὐθέως E μετὰ τὴν ὀχείαν. πτεροῤῥυεῖ δὲ ἅμα τοῖς πρώτοις τῶν δένδρων, καὶ ἄρχεται αὖθις ἀπολαμβάνειν τὴν πτέρωσιν ἅμα τῇ τούτων βλαστήσει. ταῖς δὲ ἀλεκτορίσιν ὑποτιθέασιν αὐτῶν τὰ ᾠὰ ἐπῳάζειν οἱ τρέφοντες, διὰ τὸ τὸν ἄῤῥενα, τῆς θηλείας τοῦτο δρώσης, ἐπιπετόμενον συντρίβειν. διὰ ταύτην δὲ τὴν αἰτίαν καὶ τῶν ἀγρίων ἔνιοι ὀρνίθων ἀποδιδράσκοντες τοὺς ἄῤῥενας, τίκτουσι καὶ ἐπῳάζουσιν. ὑποτίθενται δὲ ταῖς ὄρνισι μάλιστα δύο ᾠά. πλείω γὰρ οὐ δύνανται μόνα ἐπῳάζουσαι ἐξάγειν. ἐπιμελοῦνται δὲ ὅπως μὴ καταβαίνουσα διαλείπῃ τὸν ἐπῳασμὸν, παρατιθέντες τροφήν. οἱ δὲ ὄρνιθες, περὶ τὴν ὀχείαν τοὺς ὄρχεις μείζους ἔχουσιν ἐπιδήλως· οἱ μὲν μᾶλλον ὀχευτικοὶ, καὶ μᾶλλον ἐπιδήλως, οἷον ἀλεκτρυόνες καὶ πέρδικες· οἱ δὲ μὴ συνεχῶς, ἧττον.

περὶ μὲν οὖν τῆς τῶν ὀρνίθων κυήσεως καὶ γενέσεως, τοῦτον ἔχει τὸν τρόπον.

ΚΕΦΑΛ. ι'.

Περὶ τόκου καὶ ὠῶν καὶ ὑστέρας τῶν ἰχθύων.

ΟΙ δὲ ἰχθύες ὅτι μὲν οὐ πάντες ᾠοτοκοῦσιν, εἴρηται πρότερον. τὰ μὲν γὰρ σελάχη, ζῳοτοκεῖ· τὸ δὲ τῶν ἄλλων ἰχθύων γένος, ᾠοτοκεῖ. ζῳοτοκεῖ δὲ τὰ σελάχη, πρότερον ᾠοτοκήσαντα ἐν αὑτοῖς, καὶ ἐκτρέφουσιν ἐν αὑτοῖς, * πλὴν βατράχου. ἔχουσι δὲ καὶ τὰς ὑστέρας, ὥσπερ καὶ ἐν τοῖς πρότερον ἐλέχθη, διαφόρους οἱ ἰχθύες. τὰ μὲν γὰρ ᾠοτοκοῦντα, δικρόας ἔχει, καὶ κάτω· τὰ δὲ σελάχη, ὀρνιθωδεστέρας. διαφέρει δὲ τῆς τῶν ὀρνίθων ὑστέρας, ὅτι οὐ πρὸς τῷ ὑποζώματι ἐνίοις συνίσταται τὰ ᾠά, ἀλλὰ μεταξὺ κατὰ τὴν ῥάχιν· ἐκεῖθεν δ' αὐξανόμενα μεταβαίνει. τὸ δὲ ᾠὸν γίνεται πάντων τῶν ἰχθύων οὐ δίχροον, ἀλλ' ὁμόχροον. λευκότερον δέ, ἢ ὠχρότερον, καὶ πρότερον, καὶ ὅταν ἦ ὁ νεοττός. διαφέρει δὲ ἡ γένεσις ἡ ἐκ τοῦ ᾠοῦ, τῆς τῶν ἰχθύων καὶ τῶν ὀρνίθων, ἢ οὐκ ἔχει τὸν ἕτερον ὀμφαλόν, τείνοντα πρὸς τὸν ὑμένα τὸν ὑπὸ τὸ ὄστρακον· τὸν δὲ εἰς τὸ ὠχρὸν τοῖς ὄρνισι τείνοντα πόρον, τοῦτον ἔχει τὸν τρόπον. ἡ δὲ ἄλλη γένεσις, ἤδη πᾶσα ἡ αὐτὴ ἐκ τοῦ ᾠοῦ, τῶν τε ὀρνίθων καὶ τῶν ἰχθύων. ἐπ' ἄκρου τε γὰρ τούτου γίνεται, καὶ αἱ φλέβες ὁμοίως τείνουσιν ἐκ τῆς καρδίας πρῶτον, καὶ ἡ κεφαλή, καὶ τὰ ὄμματα, καὶ τὰ ἄνω, μέγιστα ὁμοίως πρῶτον· αὐξανομένου δέ, ἀεὶ ἔλαττον γίνεται τὸ ᾠόν, καὶ τέλος ἀφανίζεται καὶ εἰσδύεται ἔσω, καθάπερ ἐν τοῖς ὄρνισιν ὁ νεοττὸς καλούμενος. προσπέφυκε δὲ καὶ ὁ ὀμφαλὸς μικρὸν κατώτερον τοῦ στόματος τῆς γαστρός. ἔστι γὰρ νέοις μὲν οὖσιν ὁ ὀμφαλὸς μακρός, αὐξανομένοις δ' ἐλάττων, καὶ τέλος μικρός, ἕως ἂν εἰσέλθῃ, καθάπερ ἐλέχθη ἐπὶ τῶν ὀρνίθων. περιέχεται δὲ τὸ ἔμβρυον καὶ τὸ ᾠὸν ὑμένι κοινῷ. ὑπὸ δὲ τοῦτον ἄλλος ἐστὶν ὑμήν, ὃς περιέχει ἰδίᾳ τὸ ἔμβρυον. μεταξὺ δὲ τῶν ὑμένων ἔνεστιν ὑγρότης. καὶ ἡ τροφὴ δὲ ὁμοία γίνεται τοῖς ἰχθυδίοις ἐν τῇ κοιλίᾳ, ὥσπερ τοῖς τῶν ὀρνίθων νεοττοῖς· ἡ μέν, λευκή, ἡ δέ, ὠχρά. τὸ μὲν οὖν σχῆμα τῆς ὑστέρας ὡς ἔχει, ἐκ τῶν ἀνατομῶν θεωρείσθω. διαφορὰ δ' ἐστὶν ἐν αὐτοῖς πρὸς αὑτούς, οἷον τοῖς γαλεώδεσι, καὶ πρὸς αὑτούς, καὶ πρὸς τὰ πλατέα. ἐνίοις μὲν γάρ, ἐν τῷ μέσῳ τῆς ὑστέρας περὶ τὴν ῥάχιν προσπέφυκε τὰ ᾠά, ὥσπερ εἴρηται, οἷον τοῖς σκυλίοις· αὐξανόμενα δέ, περιέρχεται. οὔσης δὲ δικρόας τῆς ὑστέρας, καὶ προσπεφυκυίας πρὸς τῷ ὑποζώματι, ὥσπερ καὶ τῶν ἄλλων τῶν τοιούτων, περιέρχεται εἰς ἑκάτερον τὸ μέρος. ἔχει δὲ ἡ ὑστέρα καὶ αὕτη, καὶ ἡ τῶν ἄλλων τῶν γαλεωδῶν, μικρὸν προελθόντι ἀπὸ τοῦ ὑποζώματος, οἷον μαστοὺς λευκούς, οἳ κατὰ μὴ ἐνόντων, οὐκ ἐγγίνον) τὰ μὲν οὖν σκύλια καὶ αἱ βατίδες, ἴσχουσι τὰ ὀστρακώδη, ἐν οἷς ἐγγίνεται ᾠοειδὴς ὑγρότης· τὸ δὲ σχῆμα τοῦ ὀστράκου, ὅμοιον ταῖς τῶν αὐλῶν γλώτταις· καὶ πόροι τριχώδεις ἐγγίνονται τοῖς ὀστράκοις. τοῖς μὲν οὖν σκυλίοις, οὓς καλοῦσί τινες νεβρίας γαλεούς, ὅταν περιρραγῇ καὶ ἐκπέσῃ τὸ ὄστρακον, γίνονται οἱ νεοττοί· ταῖς δὲ βατίσιν, ὅταν ἐκτέκωσι, τοῦ ὀστράκου περιρραγέντος, ἐξέρχεται ὁ νεοττός. ὁ δὲ ἀκανθίας γαλεός, ἐν τῷ ὑποζώματι ἴσχει τὰ ᾠὰ ἄνωθεν τῶν μαστῶν· ὅταν δὲ καταβῇ τὸ ᾠόν, ἐπὶ τούτων ἀπολυομένων, γίνεται ὁ νεοττός.

* Gaza, πλὴν βάτου. quam lectionem quidam magis probant. etſi Græcus ſcholiaſtes βατράχου agnoſcit.

A Aues ad hunc modum coeunt, geſtant, & pariunt.

CAPVT X.

De piſcium fœtu, eiuſdémque inter eos diuerſitate, & vuluæ forma.

PIſces haud omnes parere oua dictum iam eſt. Genus enim cartilagineum animal generat. reliqua oua pariunt. Sed nec cartilagineis quidem fœtus ſine ouo: pariunt enim intra ſe oua, & augent, atque excludunt præterquam raia. Vuluas etiam piſces habent diuerſas, vt dictum eſt. Nã qui pariunt oua, bifurcatas habent, atque inferiùs B poſitas. Cartilaginea verò ea ſpecie potiùs habent, qua aues: ſed intereſt, quòd oua non iuxta præcordia omnibus, ſed infra nonnullis per ſpinam conſiſtunt: vnde aucta in alium transferuntur locum. Ouum piſcium non bicolor, vt auium, ſed vnicolor omnium eſt, & plus albi trahens, quàm lutei, tam antè quàm poſtea, cùm fœtus inſidet. Differt piſcium generatio ex ouo, ab auium generatione, eo quòd altero caret vmbilico, qui ad membranam teſtæ ſubditam tendat: alterum enim tantùm, qui auibus ad vitellum fertur, habet meatum. Cætera idem ortus ex ouo auium, & piſcium eſt, quippe cùm & fœtus in extremo ouo naſcantur, & venæ ſimiles* ex corde inter initia proficiſcantur: C & caput, oculi, denique partes ſuperiores principio fiant prægrandes: increſcente etiam fœtu, humor pari modo ſubinde abſumitur: demúmque nihil ſupereſt, quod non fœtum ſubierit, ſicvt de vitello auium expoſitum eſt. Quinetiam vmbilicus paulò à ventre inferiùs hæret, qui recens natis longior ſit, creſcentibus paulatim breuior reddatur, demúmque ſe totum intra fœtum recondat, vt dictum de auibus eſt. Membrana quoque eadem ouum & fœtum continet: cui membrana altera fœtum per ſe continens ſubiacet, humor autem inter membranas poſitus eſt. adhæc, cibus in aluo ſuggeritur, eodem modo piſciculis albus, quo auium pullis luteus. Figura vuluæ ex diſſectione D petenda eſt. Diſcrimen autem inter ſe ipſi piſces oſtendunt, vt muſtelini, qui tum inter ſe tum etiam à planis ratione vteri differunt. Nonnullis enim medio vuluæ circa ſpinam oua adhærent, quemadmodum dictum eſt, vt caniculis: quæ cùm accreuerint, abſoluta feruntur per vuluam bifurcem, annexámque ad præcordia, quomodo & cæteris generis eiuſdem in vtramque partem transferuntur. Habet tam eorum quàm cæterorum muſtelini generis vulua paulò à præcordiis inferiùs, velvti mammas albidas, quæ non niſi grauidis habeantur. Caniculæ & raiæ teſtacea quædam gerunt, in quibus humor ad oui ſimilitudinẽ conſiſtit. Figura eius teſtæ ſimilis tibiarũ ligulis eſt: meatúſque fiunt capil- E lamentorum ſpecie in teſtis. Sed caniculis, quas aliqui ab hinnulo, nebrios muſtelos appellant, fœtus rupta dilapſaque illa teſta proueniunt. Raijs, cùm pepererint, rupta teſta excluditur fœtus: ſpinaces verò muſteli, ſic à ſpina, quã habent, nuncupati, oua ad præcordia cõtinent ſuper mammas: quibus vt deſcenderint, iam abſolutis, fœtus innaſcitur.

Idem hic generandi modus & vulpeculis eſt. Muſteli autem læues vocati, oua per vuluam mediam, vt caniculæ geſtant, quæ poſtea in vtrumque vteri ſinum deſcendant. Mox animal gignitur vmbilico hærente ad vuluam, ita vt ouo abſumpto, partus nõ aliter quàm in quadrupede contineri videatur. adhæret vmbilicus ille prolixus capite altero ad partem vuluæ inferiorem, velvti acetabulo annexus: altero ad medium fœtum, qua in parte iecur eſt. Cibum ſi reſeces, fœtum ad oui ſimilitudinẽ videris, etiam ſi non præterea ouum habeat. Secundæ, membranæque ſingulæ fœtus ſingulos modo quadrupedum continent. Caput prolis in vtero nouæ adhuc partem ſpectat ſuperiorem: auctioris iam, & perfectioris, inferiorem verſus transfertur. Mares in læua fœminæ in dextra ingenerantur: atque etiã parte eadem vna, fœminæ & mares. Viſcera etiam fœtus habet, vt iecur: perinde atque in quadrupede magna cruentáque reſecto cernuntur. Omnia cartilaginea ſimul & oua parte ſuperiore circa pręcordia continent complura: alia maiora, alia minora, & inferiore animalia iam excluſa. Vnde fit vt genus id piſcium ſæpius menſe & pariat, & coeat: quippe quod non vniuerſa edere ſoleat quæ conceperit, ſed particulatim repetẽs ſæpe, & diu peragens, vt dum ſuperiùs oua contrahit, inferiùs coquat, atque perficiat. Cæteri muſteli fœtus ſuos & emittunt, & recipiunt intra ſe ipſos. Quod idem & ſquatinæ & torpedines faciunt. Et quidem iam viſa torpedo eſt grandis, quæ fœtus intra ſe circiter octoginta haberet. Sed ſpinax vnus ex muſtelis recipere prolem ſpinæ impedimento non poteſt. Neque verò paſtinaca, & raia ex planis recipiunt propter caudæ aſperitatem. Raia etiam ſuam non recipit ſobolem, tum capitis magnitudine, tum aculeorum impedimento. Nam ne animal quidem vna hæc parit, vt dictum eſt. Diſcrimen, quo hęc inter ſe ipſa diſcrepent, & generatio ex ouo ad hunc modum eſt.

CAPVT XI.

De affluentia genitalis ſeminis in piſcibus maribus fœtus tempore, quomodóque differant genitales meatus maris & fœminæ: déque cartilagineorum partu.

MAres autẽ piſciũ, tẽpore coitus, meatus plenos ſeminis genitalis ita habẽt, vt attritu facilè ſemẽ ipſũ effluat candidũ. Meatus hi à præcordiis venáq; maiore oriuntur bifurces, patẽntque eo tẽpore etiã imperitis; ſcilicet incremẽto ſeminis, & turgẽtis fartu libidinis. Interdũ enim, ac nonnullis admodum incerti redduntur, vt de teſtibus in auiũ genere expoſitũ eſt. Differunt inter ſe meatus genitales maris & fœminæ, tum aliis rebus, tum etiam quòd maris lũbis inhærẽt firmiùs: fœminæ mobiles ſunt, & mẽbrana tenui continẽtur. Sed hæc quẽadmodum ſe habeant, ex deſcriptione diſſectionum conſiderãda ſunt. Superfœtãt cartilaginea genera, & ferunt vterũ menſibus cumplurimum ſenis: ſed ſępiſſimè qui ex muſtelis ſtellares vocantur, quippe qui mẽſe bis pariant. Initium autem coitus menſe Septẽbri eſt. Cæteri muſteli bis anno pariunt, excepta canicula, quæ ſemel. Omnia in vẽre hęc pariũt.

A τὸν αὐτὸν δὲ τρόπον συμβαίνει ἡ γένεσις καὶ ἐπὶ τῶν ἀλωπέκων. οἱ δὲ καλούμενοι λεῖοι τῶν γαλεῶν, τὰ μὲν ᾠὰ ἴσχουσι μεταξὺ τῶν ὑστερῶν ὁμοίως τοῖς σκυλίοις· περιίσταται δὲ ταῦτα, εἰς ἑκατέραν τὴν δικρόαν τῆς ὑστέρας καταβαίνει, καὶ τὰ ζῷα γίνεται, τὸν ὀμφαλὸν ἔχοντα πρὸς τῇ ὑστέρᾳ· ὥστε ἀναλισκομένων τῶν ᾠῶν, ὁμοίως δοκεῖν ἔχειν τὸ ἔμβρυον τοῖς τετράποσι. προσπέφυκε δὲ μακρὸς ὢν ὁ ὀμφαλὸς, τῆς μὲν ὑστέρας πρὸς τοῖς κάτω μέρεσιν, ὥσπερ ἐκ κοτυληδόνος ἕκαστος ἠρτημένος· τοῦ δὲ ἐμβρύου, κατὰ τὸ μέσον, ᾗ τὸ ἧπαρ. ἡ δὲ τροφὴ ἀνατεμνομένου, κἂν μὴ ἔχῃ τὸ ᾠὸν, ᾠοειδής. χορίον δὲ καὶ ὑμένες, ἴδιοι, περὶ B ἕκαστον γίνονται τῶν ἐμβρύων, καθάπερ ἐπὶ τῶν τετραπόδων. ἔχει δὲ τὰ ἔμβρυα τὴν κεφαλὴν, νέα μὲν ὄντα, ἄνω· *ἁδρυνόμενα δὲ καὶ τέλεα ὄντα, κάτω. γίνεται δὲ καὶ ἐν τῷ ἀριστερῷ ἄρρενα, καὶ ἐν τῷ δεξιῷ θήλεα, καὶ ἐν τῷ αὐτῷ ἅμα καὶ θήλεα καὶ ἄρρενα. καὶ τὰ ἔμβρυα διαιρούμενα, ὁμοίως ὥσπερ ἐπὶ τῶν τετραπόδων, ἔχει τῶν σπλάγχνων ὅσα ἔχει μεγάλα, οἷον τὸ ἧπαρ, καὶ αἱματώδη. πάντα δὲ τὰ σελάχη, ἅμα ἔχουσιν, ἄνω μὲν πρὸς τῷ ὑποζώματι ᾠὰ, τὰ μὲν μείζω, τὰ δὲ ἐλάττω, πολλά. κάτω δὲ ἔμβρυα ἤδη· διὸ πολλὰ κατὰ μῆνα τίκτει καὶ ὀχεύεσθαι ἔνια τῶν τοιούτων ἰχθύων, ὅτι οὐχ ἅμα πάντα προΐενται, ἀλλὰ πολλάκις καὶ πολὺν χρόνον. C τὰ δὲ κάτωθεν ἐν τῇ ὑστέρᾳ ἀναπέττεται καὶ τελειοῦται. οἱ μὲν οὖν ἄλλοι γαλεοὶ, καὶ ἐξαφιᾶσι καὶ δέχονται εἰς ἑαυτοὺς τοὺς νεοττοὺς, καὶ αἱ ῥῖναι, καὶ αἱ νάρκαι. ἤδη δὲ ὤφθη νάρκη μεγάλη, περὶ ὀγδοήκοντα ἔχουσα ἐν ἑαυτῇ ἔμβρυα. ὁ δὲ ἀκανθίας, μόνος οὐκ εἰσδέχεται τῶν γαλεῶν, διὰ τὴν ἄκανθαν. τῶν δὲ πλατέων, τρυγὼν καὶ βάτος οὐ δέχονται, διὰ τὴν τραχύτητα τῆς κέρκου. οὐκ εἰσδέχεται δὲ οὐδὲ βάτραχος τοὺς νεοττοὺς, διὰ τὸ μέγεθος τῆς κεφαλῆς, καὶ τὰς ἀκάνθας. οὐδὲ γὰρ ζῳοτοκεῖ μόνος τούτων, ὥσπερ εἴρηται πρότερον. αἱ μὲν οὖν πρὸς ἄλληλα D διαφοραὶ, τοῦτον ἔχουσι τὸν τρόπον αὐτῶν, καὶ ἡ γένεσις ἡ ἐκ τῶν ᾠῶν.

* γρ. ἁδρυνόμενα

ΚΕΦΑΛ. ια'.

Περὶ θοροῦ τῶν ἰχθύων καὶ περὶ κυήσεως τῶν σελαχῶν.

ΟΙ δὲ ἄρρενες, περὶ τὸν χρόνον τοῦτον τῆς ὀχείας, τοὺς πόρους ἔχουσι πλήρεις θοροῦ οὕτως, ὥστε θλιβομένων, ῥεῖν ἔξω τὸ σπέρμα λευκόν. εἰσὶ δὲ οἱ πόροι δίκροοι, ἀπὸ τοῦ ὑποζώματος τῆς μεγάλης φλεβὸς ἔχοντες τὴν ἀρχήν. περὶ μὲν οὖν τὸν χρόνον τοῦτον ἤδη διάδηλοι πρὸς τὴν τῶν θηλειῶν ὑστέραν εἰσὶν οἱ πόροι τῶν ἀρρένων· ὅταν E δὲ μὴ *αὐτὴ ἡ ὥρα, ἧττον διάδηλοι τοῖς μὴ συνήθεσι γίνονται. παντάπασι γὰρ ἐνίοις καὶ ἐνίοτε ἄδηλοι γίνονται, ὥσπερ ἐλέχθη περὶ τῶν ὄρχεων ἐν τοῖς ὄρνισιν. ἔχουσι δὲ διαφορὰς καὶ ἄλλας πρὸς ἀλλήλους, οἵ τε θορικοὶ πόροι καὶ οἱ ὑστερικοί· καὶ ὅτι οἱ μὲν, προσπεφύκασι τῇ ὀσφύϊ, οἱ δὲ τῶν θηλειῶν πόροι, εὐκίνητοί εἰσι, καὶ λεπτῷ ὑμένι προσειλημμένοι. θεωρείσθωσαν δὲ καὶ οἱ τῶν ἀρρένων πόροι, ὡς ἔχουσιν, ἐκ τῶν ἀνατομῶν διαγεγραμμένων. ἐπικυΐσκεται δὲ τὰ σελάχη, καὶ κύει τοὺς πλείστους μῆνας ἕξ. πλειστάκις δὲ ἀποτίκτει ὁ καλούμενος τῶν γαλεῶν ἀστερίας· ἀποτίκτει γὰρ δὶς τοῦ μηνός. ἄρχονται δὲ ὀχεύεσθαι μηνὸς Μαιμακτηριῶνος. οἱ δὲ ἄλλοι γαλεοὶ, δὶς τίκτουσι, πλὴν τοῦ σκυλίου· οὗτος δὲ ἅπαξ τοῦ ἐνιαυτοῦ. τίκτουσι δὲ πάντα τοῦ ἔαρος αὐτῶν.

* Scrib. αὕτη ἡ ὥρα.

ῥίνη δὲ καὶ τοῦ μετοπώρου περὶ δύσιν πλειάδος· ἀμείνω, ὁ ὕστερος ὁ δὲ πρότερον, τοῦ ἔαρος. εὐθηνεῖ δ' αὐτοῖς μάλιστα μὲν ὁ γόνος ὁ ὕστερος· αἱ δὲ νάρκαι, περὶ τὸ φθινόπωρον. ἐκτίκτει δὲ τὰ σελάχη πρὸς τὴν γῆν, * ἐκ δὲ τῶν πελαγίων καὶ τῶν βαθέων ἐπανιόντα, διά τε τὴν ἀλέαν, καὶ διὰ τὸ φοβεῖσθαι περὶ τῶν τέκνων. τῶν μὲν οὖν ἄλλων ἰχθύων, παρὰ τὰς συζυγείας οὐδὲν ὦπται συνδυαζόμενον· ῥίνη δὲ μόνη δοκεῖ τοῦτο ποιεῖν, καὶ βάτος· ἔστι γάρ τις ἰχθὺς ὃς καλεῖται ῥινοβάτης. ἔχει γὰρ τὴν μὲν κεφαλὴν καὶ τὰ ἔμπροσθεν, βάτου, τὰ δ' ὄπισθεν, ῥίνης, ὡς γινόμενος ἐξ ἀμφοτέρων τῶν ἰχθύων. οἱ μὲν οὖν γαλεοὶ καὶ οἱ γαλεοειδεῖς, οἷον ἀλώπηξ, καὶ κύων, καὶ οἱ πλατεῖς ἰχθύες, νάρκη, καὶ βάτος, καὶ ῥινοβάτος, καὶ τρυγὼν, τὸν εἰρημένον τρόπον ζωοτοκοῦσιν ᾠοτοκήσαντες.

* Melius ἐκ τ.

ΚΕΦΑΛ. ιβ.

Περὶ τόκου τοῦ δελφῖνος καὶ τῆς φαλαίνης, καὶ τῶν ἄλλων κητῶν ὅσα μὴ ἔχει βράγχια.

Δελφὶς δὲ καὶ φάλαινα, καὶ τὰ ἄλλα κήτη ὅσα μὴ ἔχει βράγχια, ἀλλὰ φυσητῆρα, ζωοτοκοῦσιν· ἔτι δὲ πρίστις καὶ βοῦς. οὐδὲν γὰρ τούτων φαίνεται ἔχον ᾠά, ἀλλ' εὐθέως κύημα, ἐξ οὗ διαρθρουμένου γίνεται τὸ ζῷον, καθάπερ ἄνθρωπος, καὶ τῶν τετραπόδων τὰ ζωοτόκα. τίκτει δὲ ὁ μὲν δελφὶς, τὰ μὲν πολλὰ, ἕν, ἐνίοτε δὲ καὶ δύο· ἡ δὲ φάλαινα, ἢ δύο τὰ πλεῖστα καὶ πλεονάκις, ἢ ἕν. ὁμοίως δὲ τῷ δελφῖνι καὶ ἡ φώκαινα. καὶ γάρ ἐστιν ὅμοιον δελφῖνι μικρῷ. γίνεται δὲ ἐν τῷ Πόντῳ. διαφέρει δὲ φώκαινα δελφῖνος. ἔστι γὰρ τὸ μέγεθος ἔλαττον, εὐρύτερον δὲ ἐκ τοῦ νώτου· τὸ χρῶμα κυάνεον. πολλοὶ δὲ δελφίνων τι γένος εἶναί φασι τὴν φώκαιναν. ἀναπνεῖ δὲ πάντα ὅσα ἔχει φυσητῆρα, καὶ δέχεται τὸν ἀέρα. πνεύμονα γὰρ ἔχουσι. καὶ ὅ γε δελφὶς ὦπται, ὅταν καθεύδῃ, ὑπερέχων τὸ ῥύγχος, καὶ ῥέγχει καθεύδων. ἔχει δὲ ὁ δελφὶς καὶ ἡ φώκαινα γάλα, καὶ θηλάζονται· καὶ εἰσδέχονται δὲ μικρὰ ὄντα. τὴν δὲ αὔξησιν τὰ τέκνα τῶν δελφίνων ποιοῦνται ταχεῖαν. ἐν ἔτεσι γὰρ δέκα, μέγεθος λαμβάνουσι τέλειον. κύει δὲ δέκα μῆνας. τίκτει δὲ ὁ δελφὶς ἐν τῷ θέρει, ἐν ἄλλῃ δὲ ὥρᾳ οὐδεμιᾷ. συμβαίνει δὲ καὶ ἀφανίζεσθαι αὐτοὺς ὑπὸ κύνα περὶ τριάκοντα ἡμέρας. παρακολουθεῖ δὲ τὰ τέκνα πολὺν χρόνον, καὶ ἔστι τὸ ζῷον φιλότεκνον. ζῇ [γὰρ] ἔτη πολλά. δῆλοι γὰρ ἔνιοι γεγόνασι βιοῦντες, οἱ μὲν, πέντε καὶ εἴκοσιν ἔτη, οἱ δὲ, τριάκοντα. ἀποκόψαντες γὰρ ἐνίων τὸ οὐραῖον οἱ ἁλιεῖς ἀφιᾶσιν, ὥστε τούτῳ γνωρίζεσθαι τοὺς χρόνους αὐτῶν. ἡ δὲ φώκη, ἐστὶ μὲν τῶν ἐπαμφοτεριζόντων ζῴων· οὐ δέχεται μὲν γὰρ τὸ ὕδωρ, ἀλλ' ἀναπνεῖ καὶ καθεύδει· καὶ τίκτει ἐν τῇ γῇ μὲν, πρὸς τοῖς αἰγιαλοῖς δὲ, ὡς οὖσα τῶν πεζῶν. διατρίβει δὲ τὸν χρόνον τὸ πολὺ, καὶ τρέφεται ἐκ τῆς θαλάττης· διὸ μετὰ τῶν ἐνύδρων περὶ αὐτῆς λεκτέον. ζωοτοκεῖ μὲν οὖν εὐθὺς ἐν αὑτῇ, καὶ τίκτει ζῷα καὶ * χόειον, καὶ τὸ γάλα προΐεται, ὥσπερ πρόβατα. τίκτει δ' ἓν ἢ δύο, τὰ δὲ πλεῖστα τρία. καὶ μαστοὺς δ' ἔχει δύο, καὶ θηλάζε(ι) ὑπὸ τῶν τέκνων, καθάπερ τὰ τετράποδα. τίκτει δ' ὥσπερ ἄνθρωπος πᾶσαν ὥραν τοῦ ἔτους, μάλιστα δ' ἅμα ταῖς πρώταις αἰξίν.

* Scrib. χόριον, & diſtingue cum Gaza.

A Squatina etiam autumno, occaſu Vergiliarum, qui partus ſecundus eſt. Primus enim verno fit tempore: ſed ſecundus felicior eſt. Torpedo circa autumnũ. Repetunt cartilaginea littus & vada, pelago, & alto relicto gurgite, cùm tempus pariendi inſtat, vt neque tepore careant, & progeniem tutiùs collocent. Piſcium cæterorum diuerſa genera coire viſum à nemine eſt. Squatinam ſolam, & raiam hoc facere creditur, argumẽto piſcis cuiuſdam, qui nomen ex vtroque cõpoſitum trahit rhinobati, quaſi ſquatinoraiam appelles. Eſt enim parte priore raiæ ſimilis, poſteriore ſquatinæ, tanquam ex eo vtroque proueniens genere. Muſteli igitur, genuſque omne muſtelinum, vt vulpecula, vt canis: & plani,
B vt torpedo, raia, leuiraia, paſtinaca, modo, quo diximus, gignunt animal, cùm intra ſe oua pepererint.

CAPVT XII.

De partu, & pullorum numero piſcium viuiparorum, delphino, balena, vitulo marino, & reliquis, quæ cete appellantur.

Delphini, balænæ, & reliqua cete, quæ non branchias ſed fiſtulam habent, animal generant. additur iis priſtes, & bos. Nullum ex iis e-
C nim oua habere cernitur: ſed ſtatim fœtum, ex quo redacto in formam animal conſtat: quemadmodum homo, & quadrupedes, quæ animal pariunt. Delphini ſingulos magna ex parte edunt: interdum tamen & binos. Balænæ vel binos cumplurimùm magnaque ex parte vel ſingulos procreant. Idem & phocænæ, id eſt, turſioni, partus, qui delphino ſimilis eſt, naſcens in Ponto. Sed intereſt, quòd minor turſio eſt, dorſo ampliore, colore cæruleo. Complures cum genus eſſe delphini opinantur. Spirant, quæ fiſtulam habent, omnia, & recipiunt aërem: haud enim carent pulmone. Et quidem viſus delphinus eſt dormire, ro-
D ſtro emerſo, ac ſtertere. Lac & delphinus habet, & turſio, quo ſuos nutriunt fœtus: geſtantque eoſdem infirmos infantia. adoleſcit celeriùs proles delphini, quippe quæ annis decem ad ſummam perueniat magnitudinem. Geſtatur vtero decem menſibus. Partus delphinis æſtate, nec vllo tempore alio. Fit etiam vt delphini tricenis diebus occultentur, & lateãt circa ortum canis ſyderis. adultos etiam fœtus diu comitantur. Magna erga gnatos charitas in hoc animali eſt: viuit annis compluribus. Conſtitit enim nonnullos vixiſſe annis viginti quinque, alios etiam triginta. Quod cognitum eſt, præciſa à piſcatoribus cauda, vt quos ita reddidiſſent mari, captos item agnoſcerent, & temporis
E ſpatium ſcirent. Vitulus marinus generis ambigui eſt: nam & mari degit: quanquam humorem non recipit, ſed ſpirat, ac dormit, & egreſſus in terram parit in littore, vt terreſtre. Sed quoniam plus temporis mari quàm terræ immoretur, cibumque ex humore petat, ideo in aquaticis de eo narrandum eſt. Ergo hoc animal & concipit ſtatim intra ſe, & parit: ſecundas quoque emittit, & lac reddit modo pecudum. Parit ſingulos, aut geminos & cumplurimùm tres. Mammis, quas geminas habet, educat fœtum ritu quadrupedum. Parit vt homo omni tempore, ſed maximè cum primis capris.

Prolem circa duodecimum diem à partu deducit in mare, ſubinde aſſuefaciens. Illa decliuis fertur, nec ambulat, cùm nondum inniti ſuis pedibus valeat. Colligere ſe ipſe vitulus, & contrahere poteſt: carne enim abundat, molliſque eſt, atque oſſibus cartilaginoſis conſtat. Interficitur difficulter, niſi eliſis temporibus capitis: corpus enim totum carnoſum eſt. Mugitus ei in ſomno. Genitale fœminæ ſimile raiæ eſt. Omnia verò id genus muliebris ſexus ſimilitudinem referunt. Generatio partúſque aquaticorum, quæ animal vel intra ſe, vel foris pariant, ita agitur.

CAPVT XIII.

De partu piſcium ouiparorum, deque ſexus, fœminæ & maris, diſcrimine.

PIſces autem, qui oua pariunt, vuluam biſurcem, ac inferiùs poſitam habent, vt dictum eſt. Pariunt oua omnes, qui ſquamis teguntur, vt lupus, mugilis, etelis, & qui candidi appellantur, & qui læues, præterquam anguilla. Ouum ipſum arenidum eſt. Quod etſi vtero continetur, tamen detectum, & per ſeipſum conſtare videtur, quia tota vulua ouis referta eſt. Itaque fit, vt in paruis quidem piſciculis oua tantummodo gemina eſſe videantur: nam ob tenuitatem exiguitatemque vulua incerta in iis eſt. De coitu piſcium ſatis dictum iam eſt. Sexu autem eos quoque diſtingui apertum eſt. Pars enim piſcium maxima, conſummatur mare & fœmina. De rubelione & hiatula ambigitur: omnes enim grauidæ capiuntur. Conſiſtunt itaque oua per coitum, in iis qui Venerem norunt: ſed non coitu tantùm, verumetiam ſine coitu. Quod argumento conſtat nonnullorum fluuiatilium: nam phoxini ſtatim, propè dixerim, cùm nati ſunt, & admodum parui adhuc, oua habent. Spargunt ſua oues omnes, & magnam ouorum partem (vt narratur) mares deuorant: alia pereunt in humore. Quæ autem in locis opportunis edita ſunt, hæc ſeruantur. Nam ſi omnia ſeruarentur, nimia cuiuſque generis eſſet copia. Nec verò hæc omnia fœcunda locantur, ſed ea certè, quibus editis mas ſemen aſperſerit genitale. Sub partu enim mas ſequens, ſemen ouis aſpergit: & quæ vitaleid virus contigerit, iis piſciculi enaſcuntur: cæteris prout fors tulit, euenit. Hoc idem & in mollium genere fit. Mas enim ſepia, oua, quæ fœmina ediderit, perſequitur, ſuum ſemen aſpergens. Quod vel in reliquis eiuſdem generis fieri, ratio eſt. Verùm non niſi in ſepiis hoc viſum adhuc eſt. Pariunt iuxta litora gobiones, ſuáque oua lapidum amplexibus mandant, latiuſcula, & arenida. Idem & cæteri faciunt, quoniam litora & tepidiora ſunt, & tutiora, ne fœtus à maioribus abſumantur. Cibum etiam præbent vberiùs: vnde fit, vt in Ponto circa Thermodontem amnem plurimi pariant: eſt enim is locus tranquillus, tepidus, & aquarum dulcium copioſus. Piſces, qui oua edunt, ſemel pariunt anno: præter phucas puſillas, quæ bis pariunt anno. Differt hoc in genere mas à fœmina, quòd nigrior, & ſquamis amplioribus eſt. Cæteri piſces oua eodem foramine vuluæ edunt. Quæ autem acus vocatur, vnus tempore pariendi vtero dehiſcente oua emittit.

ἄγει δὲ περὶ δωδεκαταῖα ὄντα τὰ τέκνα, εἰς τὴν θάλατταν πολλάκις τῆς ἡμέρας, συνεθίζουσα κατὰ μικρόν· τὰ δὲ, καταντικρὺ φέρεται, ἀλλ' οὐ βαδίζει, διὰ τὸ μὴ δύνασθαι ἀπερείδεσθαι τοῖς ποσί. συνάγει δὲ καὶ συστέλλει ἑαυτήν. σαρκώδης γάρ ἐστι καὶ μαλακὴ, καὶ ὀστᾶ χονδρώδη ἔχει. ἀποκτεῖναι δὲ φώκην χαλεπὸν βιαίως, ἂν μή τις πατάξῃ περὶ τὸν κρόταφον· τὸ γὰρ σῶμα σαρκῶδες αὐτῆς. * ἀφίησι δὲ ὁμοίαν φωνὴν βοΐ. ἔχει δὲ καὶ τὸ αἰδοῖον ἡ θήλεια ὅμοιον βατίδι. τὰ δ' ἄλλα πάντα ὅμοια γυναικί. περὶ μὲν οὖν τῶν ἐνύδρων, καὶ ζῳοτοκούντων, ἢ ἐν αὑτοῖς, ἢ ἔξω, ἡ γένεσις καὶ τὰ περὶ τὸν τόκον, τοῦτον ἔχει τὸν τρόπον.

ΚΕΦΑΛ. ιγ'.

Περὶ τόκου τῶν ᾠοτοκούντων ἰχθύων.

ΟΙ δὲ ᾠοτοκοῦντες τῶν ἰχθύων, τὴν μὲν ὑστέραν δικρόαν ἔχουσι, καὶ κάτω, καθάπερ ἐλέχθη πρότερον. ᾠοτοκοῦσι δὲ πάντες οἱ λεπιδωτοὶ, οἷον λάβραξ, κεστρεὺς, κέφαλος, ἐτελὶς καὶ οἱ λευκοὶ καλούμενοι πάντες καὶ οἱ λεῖοι, πλὴν ἐγχέλυος. ᾠὸν δὲ ἴσχουσι τὸ ψαθυρόν. τοῦτο δὲ φαίνεται διὰ τὸ τὴν ὑστέραν εἶναι πλήρη πᾶσαν ᾠῶν, ὥστ' ἔν γε τοῖς μικροῖς τῶν ἰχθύων δοκεῖν ᾠὰ μόνον εἶναι δύο. διὰ τὴν σμικρότητα γὰρ καὶ τὴν λεπτότητα, ἄδηλος ἐν αὐτοῖς ἡ ὑστέρα. περὶ μὲν οὖν τῆς ὀχείας πάντων τῶν ἰχθύων εἴρηται πρότερον. εἰσὶ δὲ τῶν ἰχθύων οἱ μὲν πλεῖστοι, ἄρρενες καὶ θήλεις. περὶ δὲ ἐρυθρίνου καὶ χάννης ἀπορεῖται. πάντες γὰρ ἁλίσκονται κυήματα ἔχοντες. συνίσταται μὲν οὖν καὶ ὀχευομένων ᾠὰ τοῖς συνδυαζομένοις τῶν ἰχθύων. ἴσχουσι δὲ καὶ ἄνευ ὀχείας· δηλοῦσι δ' ἔνιοι τῶν ποταμίων. εὐθὺς γὰρ γενόμενοι, ὡς εἰπεῖν, καὶ μικροὶ ὄντες οἱ φοξῖνοι, κυήματα ἔχουσιν. ἀπορραίνουσι δὲ τὰ ᾠὰ, καὶ καθάπερ λέγεται, τὰ μὲν πολλὰ ᾠὰ, οἱ ἄρρενες ἀναχάπτουσι, τὰ δ', ἀπόλλυται ἐν τῷ ὑγρῷ. * ὅσα δ' ἂν ἐκτέκωσιν εἰς τοὺς τόπους οὗ ἐκτίκτουσι, ταῦτα σώζεται. εἰ γὰρ πάντα ἐσώζετο, παμπληθὲς ἂν τὸ γένος ἦν ἑκάστων. καὶ τούτων δὲ οὐ γίνεται τὰ πολλὰ γόνιμα, ἀλλ' ὅσα ἂν περιρράνῃ ὁ ἄρρην τῷ θορῷ. ὅταν γὰρ ἐκτίκτῃ, παρεπόμενος ὁ ἄρρην ἐπιρραίνει ἐπὶ τὰ ᾠὰ τὸν θορόν· καὶ ὅσα μὲν ἂν ἐπιρρανθῇ, ἐκ πάντων γίνεται ἰχθύδια· ἐκ δὲ τῶν ἄλλων, ὅπως ἂν τύχῃ. ταὐτὸ δὲ συμβαίνει τοῦτο καὶ ἐπὶ τῶν μαλακίων. ὁ γὰρ ἄρρην τῶν σηπιῶν, ὅταν ἐκτέκῃ ἡ θήλεια, ἐπιρραίνει τὰ ᾠά. ὥσπερ εὔλογον συμβαίνειν καὶ ἐπὶ τῶν ἄλλων μαλακίων· ἀλλ' ἐπὶ τῶν σηπιῶν ὦπται ἐν τῷ παρόντι μόνον. ἐκτίκτουσι δὲ * πρὸς τῇ γῇ οἱ μὲν κωβιοὶ, πρὸς τοῖς λίθοις, πλατὺ καὶ ψαθυρὸν τὸ ἀποτικτόμενόν ἐστιν. ὁμοίως δὲ καὶ οἱ ἄλλοι. ἀλεεινά τε γάρ ἐστι τὰ περὶ τὴν γῆν, καὶ τροφὴν ἔχει μᾶλλον, καὶ πρὸς τὸ μὴ κατεσθίεσθαι ὑπὸ τῶν μειζόνων τὰ κυήματα. διὸ καὶ ἐν τῷ Πόντῳ περὶ τὸν Θερμώδοντα ποταμὸν οἱ πλεῖστοι τίκτουσι, νήνεμος γὰρ ὁ τόπος καὶ ἀλεεινὸς, ὁ ἔχων ὕδατα γλυκέα. τίκτουσι δὲ οἱ μὲν ἄλλοι τῶν ᾠοτόκων ἰχθύων ἅπαξ τοῦ ἐνιαυτοῦ, πλὴν τῶν μικρῶν * φυκίδων· αὗται δὲ, δίς. διαφέρει δὲ ὁ ἄρρην φυκὶς τῆς θηλείας τῷ μελάντερος εἶναι, καὶ μείζους ἔχειν τὰς λεπίδας. οἱ μὲν οὖν ἄλλοι ἰχθύες, ἐν γένει τίκτουσι, καὶ τὰ ᾠὰ ἀφιᾶσιν· ἣν δὲ καλοῦσί τινες βελόνην, ὅταν ἤδη ὥρα ᾖ τοῦ τίκτειν, διαρρήγνυται, καὶ οὕτω τὰ ᾠὰ ἐξέρχεται.

* Gaza addidit *in ſomno*, ἐν ὕπνῳ, quæ verba in Græcis codd. non extant. vt videatur Plin. codd. ſecutus qui habent lib. 9. c. 13. *Ipſi in ſomno mugiunt.* etſi pleriſque vet. codd. habēt *ſomo.* quam lectionem quidam defendūt. Verùm illas voces ἐν ὕπνῳ, & Græci quidam interpretes agnoſcunt.

* Gaza aliam lectionem ſequitur, eámque planiorem & meliorem.

* Gaza πρ. τῇ γῇ οἱ κωβιοί,

* καὶ φυκίδων

ἔχει γάρ τινα ἐν ὑποχονδρίῳ διάφυσιν ὑπὸ τὴν γαστέρα καὶ τὸ ἦτρον, ὥσπερ οἱ τυφλῖναι· ἐφ᾽ ἧς ὅταν τέκῃ, ζῇ, καὶ συμφύεται πάλιν ταῦτα. ἡ δὲ γένεσις ἐκ τοῦ ᾠοῦ συμβαίνει ὁμοίως ἐπί τε τῶν ἔσω ᾠοτοκούντων, καὶ ἐπὶ τῶν ἔξω* ζῳοτοκούντων. ἐπ᾽ ἄκρου τε γὰρ γίνεται, καὶ ὑμὴν περιέχεται· καὶ πρῶτον διάδηλοι οἱ ὀφθαλμοί, μεγάλοι καὶ σφαιροειδεῖς ὄντες· ᾗ καὶ δῆλον ὅτι οὐχ, ὥσπερ τινές φασιν, ὁμοίως γίνονται τοῖς ἐκ τῶν σκωλήκων γινομένοις. τοὐναντίον γὰρ συμβαίνει ἐπ᾽ ἐκείνων, τὰ κάτω μείζω πρῶτον, ὕστερον δ᾽ ἡ κεφαλὴ καὶ οἱ ὀφθαλμοί. ὅταν δ᾽ ἀναλωθῇ τὸ ᾠόν, γίνονται* πυρηνώδεις· καὶ τὸ μὲν πρῶτον οὐδεμίαν τροφὴν λαμβάνοντα, αὐξάνονται ὑπὸ τῆς τοῦ ᾠοῦ εἰλημμένης ὑγρότητος· ὕστερον δὲ τρέφονται ἕως ἂν αὐξηθῶσι τοῖς ποταμίοις ὕδασι. τῷ δὲ Πόντῳ καθαιρομένῳ, ἐπιφέρεται κατὰ τὸν Ἑλλήσποντον, ὃ καλοῦσι φῦκος· ἔστι δ᾽ ὠχρὸν τοῦτο. οἱ δὲ φασὶ τοῦτο ἄνθος εἶναι τοῦ φύκους, ἀφ᾽ οὗ τὸ φυκίον ἐστίν. ἀρχομένου δὲ γίνεται τοῦ θέρους. τούτῳ τρέφεται καὶ τὰ ὄστρεα, καὶ τὰ ἰχθύδια τὰ ἐν τοῖς τόποις τούτοις. φασὶ δέ τινες τῶν θαλαττίων καὶ τὴν πορφύραν ἴσχειν ἀπὸ τούτου τὸ ἄνθος.

* Gazæ verſio diſſentit ab hac lectione:& pro ζῳοτοκ. legiſſe videtur τὸ ᾠὸν ξύσι.

* Melius, πυρηνώδεις.

ΚΕΦΑΛ. ιδ΄.

Περὶ γενέσεως τῶν λιμναίων καὶ ποταμίων ἰχθύων.

Οἱ δὲ λιμναῖοι καὶ ποτάμιοι τῶν ἰχθύων, κυήματα μὲν ἴσχουσι, πέντε μηνῶν τὴν ἡλικίαν ἔχοντες, ὡς ἐπὶ τὸ πολὺ εἰπεῖν· τίκτουσι δὲ τοῦ ἐνιαυτοῦ περὶ τοὺς ἅπαντες. ὥσπερ δὲ καὶ οἱ θαλάττιοι, καὶ οὗτοι οὐκ ἐξαφιᾶσιν οὐδέποτε ἅμα πᾶν, οὔτε αἱ θήλειαι τὸ ᾠόν, οὔτε οἱ ἄρρενες τὸν θορόν, ἀλλ᾽ ἔχουσιν ἀεὶ πλείω ἢ ἐλάττονα, αἱ μὲν ᾠά, οἱ δὲ θορόν. τίκτουσι δ᾽ ἐν τῇ καθηκούσῃ ὥρᾳ· κυπρῖνος μέν, πεντάκις, ἢ ἑξάκις· ποιεῖται δὲ τὸν τόκον μάλιστα ἐπὶ τοῖς ἄστροις. χαλκὶς δὲ τίκτει τρίς, οἱ δ᾽ ἄλλοι ἅπαξ τοῦ ἐνιαυτοῦ. τίκτουσι δὲ πάντες ἐν ταῖς περιλιμνάσι τῶν ποταμῶν καὶ τῶν λιμνῶν, πρὸς τὰ καλαμώδη, οἷον οἵ τε φοξῖνοι καὶ αἱ πέρκαι. οἱ δὲ γλάνεις καὶ αἱ πέρκαι συνεχὲς ἀφιᾶσι τὸ κύημα, ὥσπερ οἱ βάτραχοι. οὕτω δὲ συνεχές ἐστι τὸ κύημα περιειλιγμένον, ὥστε* τό γε τῆς πέρκης, διὰ πλατύτητα ἀναπηνίζονται ἐν ταῖς λίμναις οἱ ἁλιεῖς ἐκ τῶν καλάμων. οἱ μὲν οὖν μείζους τῶν γλανέων ἐν τοῖς βάθεσιν ἐκτίκτουσιν, ἔνιοι καὶ κατ᾽ ὀργυιὰν τὸ βάθος· οἱ δ᾽ ἐλάττους αὐτῶν, ἐν τοῖς βραχυτέροις, μάλιστα πρὸς ῥίζαις ἰτέας, ἢ ἄλλου τινὸς δένδρου, καὶ πρὸς τῷ καλάμῳ δέ,* καὶ πρὸς τῷ βρύῳ. συμπλέκονται δὲ πρὸς ἀλλήλους ἐνίοτε καὶ μέγας πρὸς μικρόν, καὶ προσάγοντες τοὺς πόρους πρὸς ἀλλήλους, οὓς καλοῦσί τινες ὀμφαλούς, ᾗ ἐκτίκτουσιν ἀφιᾶσιν, αἱ μὲν τὰ ᾠά, οἱ δὲ τὸν θορόν. ὅσα δ᾽ ἂν τῷ θορῷ μιχθῇ τῶν ᾠῶν, εὐθύς τε λευκότερα φαίνεται, καὶ μείζω ἐν ἡμέρᾳ, ὡς εἰπεῖν. ὕστερον δ᾽ ὀλίγον χρόνον διάδηλα ἐστὶ τὰ ὄμματα τῶν ἰχθύων. τοῦτο γὰρ ἐν πᾶσι τοῖς ἰχθύσιν, ὥσπερ καὶ ἐν τοῖς ἄλλοις ζῴοις, ἐπιδηλότατον ἐστὶν εὐθύς, καὶ φαίνεται μέγιστον. ὅσων δ᾽ ἂν ᾠῶν ὁ θορὸς μὴ θίγῃ, καθάπερ καὶ ἐπὶ τῶν θαλαττίων, ἄχρειον τὸ ᾠὸν τοῦτο, καὶ ἄγονον ἐστι. ἀπὸ δὲ τῶν γονίμων ᾠῶν αὐξανομένων τῶν ἰχθυδίων, ἀποκαθαίρεται οἷον κέλυφος. τοῦτο δ᾽ ἐστὶν ὑμὴν ὁ περιέχων τὸ ᾠὸν καὶ τὸ ἰχθύδιον. ὅταν δὲ μιγῇ τῷ ᾠῷ ὁ θορός, σφόδρα γὰρ κολλῶδες τὸ συστρεπτικὸν δὲ αὐτῶν πρὸς ταῖς ῥίζαις, ἢ ὅπου ἂν ἐκτίκωσιν. οὗ δ᾽ ἂν πλεῖστον ἐκτέκωσιν, ὁ φυλάττει ὁ ἄρρην· ἡ δὲ θήλεια ἀπο-

* Melius, πηνι.

* Gaza, & οὐκῶ, & βρύω, ſicut alibi, φύκος & βρύον iungit Ariſtot.

A Habet enim hic rimam quandam ſub ventre imo, vt cæciliæ ſerpentes. A partu autem viuit, & vulnus calleſcit. Generatio ex ouo ſimili agitur modo, ſiue intus, ſiue foris eſt ouum. Summo namque ouo innaſcitur fœtus mẽbrana obducta. Oculi primum patent grãdes, & in globi ſpeciem afformati. Quare conſtat, non ſimiliter gigni, atque ex vermibus, vt quidam putarunt. Contrà enim in illis euenit, vt pars inferior maior inter initia ſit, oculi & caput poſtea augeantur. Ouo autem rupto, fœtus velut nucleus conſtat, qui primùm nullum accipit cibũ, ſed oui humore iam hauſto increſcunt, pòſt nutriuntur aquis dulcibus fluuiorum, vſque dum ſatis augeantur. B Defertur ex Ponto in Helleſpõtum purgamentum quoddam illius maris, quod algæ nomine phycos appellant, colore pallidum. Florem algæ id eſſe alij volũt, atque ex eo fucariam algam prouenire. Fit hoc æſtatis initio, eóque tum oſtreæ tum etiam piſciculi eius loci aluntur. Purpuram quoque ſuum florem hinc trahere nonnulli exiſtimant.

CAPVT XIV.

De partu, & generatione piſcium lacuſtrium fluuiatiliumque.

C Lacuſtres & fluuiatiles piſces quinto ſuæ ætatis menſe vterum geſtare magna ex parte incipiunt. Pariunt omnes intra annum, nec ſemen generationis ſimul omne emittunt, ſed modo marinorum. Hic quoque ſemper intra ſe aliquid plus minus fœminæ ouorum, mares liquoris prolifici retinent. Pariunt temporibus ſtatis. Cyprini quinquies, aut ſexies anno, partúmque ſyderum ratione potiſſimùm faciunt. Erica ter, reliqui ſemel edunt oua, in ſtagnis fluuiorum, & arundinetis lacuum, vt phoxini, & percæ. Siluri & percæ continentem emittunt ſuum fœtum, vt ranæ. adeo enim fœtus ipſe continuo filo ſibi cohæret, vt percæ quidem, quoniam latior eſt, D piſcatores in lacu arundine glomerent. Pariunt ſiluri grandiores ſtagno altiore, quippe cùm nonnulli vel trium paſſuum altitudine pariant. Minores breuiore contenti ſunt gurgite, præcipuè ad radices ſalicis, aut cuiuſuis arboris. atque etiam inter arundines & algas, & muſcoſam congeriem, non ſolùm pares cum paribus, ſed etiam admodum grandes cum paruis veniunt: admotiſque meatibus, quos aliqui vmbilicos vocant, fœmina ouum, mas liquorem venereum depromit: & oua, quæ liquor ille vitalis contigerit, candidiora extemplo cernuntur, maioráque reddi eodem die propemodum dixerim. Paulò autem pòſt oculi E fœtus exiſtunt conſpicui, qui in quouis piſcium genere perinde, vt in cæteris animalibus, ſtatim pateſcunt, prægrandéſque apparent. Quæ ex ouis non attigerit liquor maſculi ille vitalis, hæc ſterileſcunt, & ſuperuacua ſunt, vt in marino etiam genere incidit. Fœcundis iam ouis, piſciculo increſcente, detrahitur velut putamen, quod membrana eſt ouum ambiens, & piſciculum. Oua tacta à fœtifico maris ſemine, admodum glutinoſa redduntur, ad ceſpites coeuntia, aut vbi pepererint. Mas oua, quæ edita ſunt, cuſtodit: fœmina abit,

cùm pepererit. Tardiſſimum ſiluri incrementum ex ouo eſt: quamobrem mas ſæpe vel quadraginta & quinquaginta diebus aſſidet cuſtodiens oua, ne à piſcibus occurrentibus abſumantur. Secundæ eſt tarditatis generatio cyprinorum: parique modo oua edita à mare ſeruantur. at minorum nonnulla vel tertio die ſpeciem piſciculi capiunt. Augentur oua, quæ ſemen maris attigerint, vt dictum eſt, & eodem die, & poſt. Fit ouum ſiluri, quantum eruum, cyprini & reliquorum generis eiuſdem, magnitudine milij. Hæc ad hunc modum pariunt, atque generant. Erica gregatim ſua oua gurgiti altiori mandat congeſta. Contrà, quem fullonem appellant, is litora petit tranquilliora: ſed is quoque gregalis eſt. Cyprinus, balerus, & cæteri ferè omnes vadis intrudunt ſeſe, cùm parturiunt: ac ſæpenumero ſingulas fœminas mares tredecim, & quatuordecim perſequuntur. Mox fœmina oua procedendo emittit. mares ſectantes, ſemen ſuum ouis reſpergunt: verùm plurima pereunt: quòd enim fœmina non ſtabilis, ſed mutans continuè parit, diſſipari oua neceſſe eſt, videlicet ea quæ non in materiem inciderint aliquam, ſed excepta a[illegible]nda ferantur. Neque eſt enim qui ſua oua cuſtodiat excepto ſiluro, & cyprino: ſed cyprinus tunc ea cuſtodit, cùm congeſta repererit. Habent mares omnes ſemen genitale, præter anguillam, quæ neutrum, neque ouum, neque ſemen ſortita eſt. aſcendunt de mari in lacus & fluuios mugiles. Contrà, anguillæ inde in mare veniunt. Piſces maxima quidem ex parte ouo gignuntur, vt dictum iam eſt.

CAPVT XV.

De generibus piſcium, quæ vel limo, vel arena, vel ſpuma maris ex imbre excitata procreantur.

SEd ſunt qui & limo & arena proueniant, etiam ex iis generibus quæ per coitum, & oui primordio generentur. Quod tum aliis locis paluſtribus, tum verò apud Gnidum factum olim memoratur. Stagnis enim ſub canis ortu reſiccatis, & limo iam arido, vbi primùm imbribus reſtagnare loca inciperent, piſciculi naſcebantur generis mugilum, quod per coitum procreatur, magnitudine halecula paruæ: nec in his aliquid vel oui vel ſeminis continebatur. Quinetiam in nonnullis Aſiæ amnibus, quà effluunt in mare piſciculi quidam magnitudine naricarum, modo eodem proueniũt. Sunt qui omne mugilum genus ſponte oriri opinentur, ſed non rectè: nam & oua, eorum fœminæ, & ſemen genitale mares habere cernuntur. Verùm genus quoddam eorum eſt, quod non coitu, ſed ex limo arenáve enaſcatur. Sed nonnulla vel ſponte generare, ex iis quæ per coitum prodeant, ſatis ex iis conſtat. Quæ autem nec ouum nec animal pariant, iis ortus vel ex limo, vel ex arena, & per ſumma facta putredine agitur: qualis etiam apuæ origo, ſpuma nuncupata, ex terra arenoſa conſiſtit. Quod quidem apuæ genus nec incrementum capit, nec prolem affert, & temporis longioris ſpatio perit, ſed denuò naſcitur. Vndeſit vt breui quodam tempore excepto, omnibus ferè anni temporibus generetur: quippe cùm ſpuma illa ab arcturo autumnali ad ver vſque eduret.

A γεννᾷ τεκοῦσα. ἔστι δὲ βραδυτάτη μὲν ἐκ τῶν ᾠῶν ἡ τῶν γλανίων αὔξησις· διὸ προσεδρεύει ὁ ἄρρην καὶ τετταράκοντα καὶ πεντήκοντα ἡμέρας, ὅπως μὴ καταφαγῶνται ὁ γόνος ὑπὸ τῶν παρατυχόντων ἰχθύων. δευτέρα δὲ βραδυτῆτι ἡ τῶν κυπρίνων γένεσις. ὅμως δὲ ταχέως καὶ τούτων ὁ σωζόμενος διαφεύγει γόνος. τῶν δ' ἐλαττόνων ἐνίων, καὶ τριταίων ὄντων, ἤδη ἰχθύδια ἐστί. λαμβάνει δὲ αὔξησιν τὰ ᾠά, ὧν ἂν ἐπιψαύσῃ ὁ θορός, καὶ αὐθημερόν, καὶ ἔτι ὕστερον. τὰ μὲν οὖν τοῦ γλάνιος, γίνεται ὅσον ὄροβος· τὰ δὲ τῶν κυπρίνων καὶ τῶν τοιούτων, ὅσον κέγχρος. ταῦτα μὲν οὖν τοῦτον τὸν τρόπον τίκτει καὶ γεννᾷ. χαλκὶς δὲ, τίκτει B ἐν τοῖς βαθέσιν ἀθρόα καὶ ἀγελαῖα. ὃν δὲ καλοῦσι τυλῶνα, πρὸς τοὺς αἰγιαλοὺς, ἐν τοῖς ὑπηνέμοις· ἀγελαῖος δὲ καὶ οὗτος. κυπρῖνος δὲ, καὶ οἱ ἄλλοι πάντες, ὡς εἰπεῖν, ὠθοῦνται μὲν πρὸς τὰ βραχέα πρὸς τὸν τόκον, μιᾷ δὲ θηλείᾳ πολλάκις ἀκολουθοῦσιν ἄρρενες καὶ τρεισκαίδεκα, καὶ τεσσαρεσκαίδεκα. τῆς δὲ θηλείας ἀφιείσης τὸ ᾠὸν καὶ ὑποχωρούσης ἐπακολουθοῦντες ἐπιρραίνουσι τὸν θορόν. ἀπόλλυται δὲ τὰ πλεῖστα αὐτῶν. διὰ γὰρ τὸ ὑποχωροῦσαν τίκτειν τὴν θήλειαν, σκεδάννυται τὸ ᾠὸν, ὅταν ὑπὸ ῥεύματος ληφθῇ, καὶ μὴ προσπέσῃ πρὸς ὕλην. καὶ γὰρ οὐδὲν ᾠοφυλακεῖ τῶν ἄλλων ἔξω γλάνιος, πλὴν ἐὰν ἀθρόα γένηται C ἑαυτῷ περιτύχῃ ὁ κυπρῖνος. τοῦτον δέ φασιν ᾠοφυλακεῖν. θορὸν δὲ πάντες ἔχουσιν οἱ ἄρρενες, πλὴν ἔγχελυς· αὕτη δὲ οὔτε θορὸν, οὔτε ᾠόν. οἱ μὲν οὖν κεστρεῖς, ἐκ τῆς θαλάττης ἀναβαίνουσιν εἴς τε τὰς λίμνας καὶ τοὺς ποταμούς· αἱ δ' ἐγχέλεις, τοὐναντίον ἐκ τούτων εἰς τὴν θάλασσαν. οἱ μὲν οὖν πλεῖστοι, ὥσπερ εἴρηται, τῶν ἰχθύων, γίνονται ἐξ ᾠῶν.

ΚΕΦΑΛ. ιε'.

Περὶ τῶν αὐτομάτως ἐκ τῆς ἰλύος, καὶ ἐκ τῆς ἄμμου γενομένων ἰχθύων.

ΟΥ μὴν ἀλλ' ἔνιοι καὶ ἐκ τῆς ἰλύος, καὶ ἐκ τῆς ἄμμου γίνονται, καὶ τῶν τοιούτων γενῶν, ἃ γίνε- D ται ἐκ συνδυασμοῦ καὶ ᾠῶν, ἐν τέλμασιν ἄλλοις τε, καὶ οἷόν περὶ Κνίδον φασὶν εἶναί ποτε. ὃ ἐξηραίνετο μὲν ὑπὸ κύνα, καὶ ἡ ἰλὺς ἅπασα ἐξηράνθη· ὕδωρ δὲ ἤρχετο ἐγγίνεσθαι ἅμα τοῖς πρώτοις γενομένοις [ὑετοῖς.] ἐν τούτῳ δὲ ἰχθύδια ἐνεγίνετο, ἀρχομένου τοῦ ὕδατος. ἦν δὲ κεστρέων τι γένος τοῦτο ὃ γίνεται μὲν ἐξ ὀχείας, μέγεθος ἡλίκα μαινίδια μικρά· ᾠὸν δὲ τούτων εἶχεν οὐδὲν, οὐδὲ θορόν. γίνεται δὲ καὶ ἐν* ποταμοῖς ἐν τῇ Ἀσίᾳ, ὅπου διαρρέουσιν εἰς θάλασσαν, ἰχθύδια μικρὰ ἡλίκα ἑψητοῦ ἕτερα, τὸν αὐτὸν τρόπον τούτοις. ἔνιοι δὲ καὶ οὕτως φασὶ τοὺς κεστρεῖς φύεσθαι πάντας οὐκ ὀρθῶς λέγοντες. ἔχου- E σαι γὰρ φαίνονται καὶ ᾠὰ αἱ θήλειαι αὐτῶν, καὶ θορὸν οἱ ἄρρενες. ἀλλὰ γένος τι ἐστὶν αὐτῶν τοιοῦτον, ὃ φύεται ἐκ τῆς ἰλύος καὶ τῆς ἄμμου. * ὅτι μὲν οὖν γίνεται αὐτόματα ἔνια, οὔτε ἐκ ζῴων, οὔτε ἐξ ὀχείας, φανερὸν ἐκ τούτων. ὅσα δὲ μήτε ᾠοτοκεῖ, μήτε ζῳοτοκεῖ, ἅπαντα γίνεται, τὰ μὲν ἐκ τῆς ἰλύος, τὰ δ', ἐκ τῆς ἄμμου, καὶ τῆς ἐπιπολαζούσης σήψεως. ἐπεὶ καὶ τῆς ἀφύης ὁ καλούμενος ἀφρὸς, γίνεται ἐκ τῆς ἀμμώδους γῆς· καὶ ἔστιν αὕτη ἡ ἀφύη, ἀναυξὴς καὶ ἄγονος· καὶ ὅταν πλείων διέλθῃ χρόνος, ἀπόλλυται, ἄλλη δὲ πάλιν ἐπιγίνεται· διὸ ἔξω χρόνου τινὸς ὀλίγου, πάντα, ὡς εἰπεῖν, τὸν ἄλλον γίνεται ὥραν· διαμένει γὰρ ἀρξαμένη ἀπὸ ἀρκτούρου μετοπωρινοῦ μέχρι τοῦ ἔαρος.

* ἐν ποταμοῖς, ἐν τῇ Α.

* Gaza aliter.

A σημεῖον δ' ὅτι ἐνίοτ' ἔξω τῆς γῆς ἀναφέρεται ἀλιευομένων· ψύχους μὲν, οὐχ ἁλίσκεται, ἐὰν δ' εὐδία, ἁλίσκεται, ὡς ἐκ τῆς γῆς ἀνιέντα πρὸς τὴν ἀλέαν. καὶ ἑλκόντων καὶ ἀναξυομένης τῆς γῆς πλεονάκις, πλείων γίνεται καὶ βελτίων. αἱ δ' ἄλλαι ἀφύαι χείρους, διὰ τὸ ταχέως λαμβάνειν αὔξησιν. γίνονται δ' ἐν τοῖς ἐπισκίοις καὶ ἑλώδεσι τόποις, ὅταν εὐημερίας γινομένης ἀναθερμαίνηται ἡ γῆ, οἷον περὶ Ἀθήνας ἐν Σαλαμῖνι, καὶ πρὸς τῷ Θεμιστοκλείῳ, καὶ ἐν Μαραθῶνι. ἐν γὰρ τούτοις τοῖς τόποις γίνεται ὁ ἀφρός. φαίνεται δ' ἐν τοῖς τοιούτοις τόποις καὶ ὥραις τοιαύταις· γίνεται δ' ἐνιαχοῦ, ὅταν ὕδωρ πολὺ ἐκ τοῦ οὐρανοῦ γένηται, ἐν τῷ ἀφρῷ τῷ γινομένῳ ὑπὸ τοῦ ὀμβρίου ὕδατος· διὸ καὶ καλεῖται ἀφρός· B καὶ ἐπιφέρεται ἐνίοτε ἐπιπολῆς τῆς θαλάττης, ὅταν εὐημερία ᾖ· ἐν ᾧ συστρέφεται ὥσπερ ἐν τῇ κόπρῳ τὰ σκωλήκια μικρά, οὕτως ἐν τούτῳ ὁ ἀφρός, ὅπου ἂν συστῇ ἐπιπολῆς. διὸ πολλαχοῦ προσφέρεται ἐκ τοῦ πελάγους ἀφύη αὕτη. καὶ εὐθηνεῖ δὲ καὶ ἁλίσκεται πλείστη, ὅταν ἔνικμον καὶ εὔδιον γένηται τὸ ἔτος. ἡ δ' ἄλλη ἀφύη, γόνος ἰχθύων ἐστίν, ἡ* μὲν καλουμένη κωβῖτις, κωβιῶν τῶν μικρῶν καὶ φαύλων, οἳ καταδύνουσιν εἰς τὴν γῆν. ἐκ δὲ τῆς φαληρικῆς, γίνονται μεμβράδες· ἐκ δὲ τούτων, τριχίδες· ἐκ δὲ τῶν τριχίδων, τριχίαι· ἐκ δὲ μιᾶς ἀφύης, οἷον τῆς ἐν τῷ Ἀθηναίων λιμένι, οἱ ἐγκρασίχολοι καλούμενοι. ἔστι δὲ καὶ ἄλλη ἀφύη, ἣ γόνος ἐστὶ μαινίδων καὶ κεστρέων. ὁ δὲ ἀφρὸς ὁ ἄγονος, ὑγρός C ἐστι, καὶ διαμένει ὀλίγον χρόνον, καθάπερ εἴρηται πρότερον. τέλος γὰρ λείπεται κεφαλὴ καὶ ὀφθαλμοί. πλὴν εὕρηται τοῖς ἁλιεῦσι πρὸς τὸ διακομίζειν. ἁλιζομένη γὰρ, πλείω μένει χρόνον.

* γρ. ἡ καλουμένη κωβῖτις.

ΚΕΦΑΛ. ιϛ'.

Περὶ γενέσεως τῶν ἐγχελύων.

Αἱ δ' ἐγχέλυες, οὔτ' ἐξ ὀχείας γίνονται, οὔτ' ᾠοτοκοῦσιν, οὐδ' ἐλήφθη ποτὲ οὔτε θορὸν ἔχουσα οὐδεμία, οὔτ' ᾠὸν, οὔτ' ἀνασχισθεῖσαι φαίνονται θορικοὺς πόρους, οὔτε ὑστερικοὺς ἔχουσαι. ἀλλὰ τοῦτο ὅλον τὸ γένος τῶν ἐναίμων, οὐ γίνεται οὔτε ἐξ ὀχείας, οὔτε ἐξ ᾠῶν. φανερὸν δέ ἐστιν D ὅτι οὕτως ἔχει. ἐνίαις γὰρ τελματώδεσι λίμναις, τοῦ τε ὕδατος παντὸς ἐξαντληθέντος, καὶ τοῦ πηλοῦ ἐξυασθέντος, γίνονται πάλιν, ὅταν ὕδωρ γένηται ὄμβριον. ἐν δὲ τοῖς αὐχμοῖς οὐ γίνονται, οὐδ' ἐν ταῖς διαμενούσαις λίμναις. καὶ γὰρ ζῶσι καὶ τρέφονται ὀμβρίῳ ὕδατι. ὅτι μὲν οὖν οὔτε ἐξ ὀχείας, οὔτε ἐξ ᾠῶν γίνονται, φανερόν ἐστι. δοκοῦσι δέ τισι γεννᾶν, ὅτι ἐνίαις τῶν ἐγχελύων ἑλμίνθια ἐγγίνονται. ἐκ τούτων οἴονται γίνεσθαι ἐγχέλεις. τοῦτο δ' ἐστὶν οὐκ ἀληθές· ἀλλὰ γίνονται ἐκ τῶν καλουμένων γῆς ἐντέρων, ἃ αὐτόματα συνίσταται ἐν τῷ πηλῷ, καὶ ἐν τῇ γῇ τῇ ἐνίκμῳ. καὶ ἤδη εἰσὶν ὠμμέναι αἱ μὲν, ἐκδυόμεναι ἐκ τούτων· αἱ δὲ, ἐν διακνιζομένοις καὶ διαιρουμένοις, γίνονται E φανεραί. καὶ ἐν τῇ θαλάττῃ δὲ, καὶ ἐν τοῖς ποταμοῖς γίνονται τὰ τοιαῦτα, ὅταν ᾖ μάλιστα σηπεδών· τῆς μὲν θαλάσσης, πρὸς τοῖς τοιούτοις τόποις, οὗ ἂν ᾖ φῦκος· τῶν δὲ ποταμῶν καὶ λιμνῶν, περὶ τὰ χείλη. ἐνταῦθα γὰρ ἡ ἀλέα ἰσχύουσα, σήπει. περὶ μὲν οὖν τῆς τῶν ἐγχελύων γενέσεως, τοῦτον ἔχει τὸν τρόπον.

A Efferri id piſciculi genus funditus de terra, argumentum eſt, quòd niſi tempore tepido non capiatur, vtpote quod de humo ad ſumma, tepore [illegible] veniat. Quin & ſolo agitato, detractaque eius colluuione, copioſior & melior exit. Cætera apuæ genera deteriora propterea ſunt, quia citò augentur. Fiunt locis vmbroſis apricíſve, quoties tẽporis beneficio ſolum tepeſcit: vt in Attica terra apud Salaminem, & iuxta Themiſtocleum, & in Marathone. Locis enim huiuſcemodi ſpuma illa conſiſtit, & tempore tali apparet: ſed nonnuſquam vel cùm aqua de cælo inceſſit. Oritur piſciculus hic in ſpuma, quæ imbre admiſſo caluerit, vnde nomen ſpumæ accepit. Fertúrque interdum per ſumma maris, cùm cælum tepidum eſt, & in ſpuma fluitante, B perindeac in fimo, vermiculus voluitur. Quamobrem in loca complura genus id apuæ adfertur ex alto, & copioſè quoque generatur, & capitur anno quieto, & humido. Reliqua apua fœtura piſcium eſt. Quæ enim gobionaria dicitur, gobiones paruos ignobiles, qui terram ſubeunt, creat. Quam verò phalericam vocant, membradas gignit: ex quibus ſardinæ, ex ſardinis ſardæ oriuntur. Genus apuæ, quod in portu Athenienſium naſcitur, encraulos dictos progenerat. Quinetiam genus aliud apuæ eſt, quod alecum, & mugilum ſit fœtura. Spuma autem altera illa ſterilis humida eſt, breuéque (vt dictum eſt) tempus edurat: mox capita, & oculi reſtant. Sed iam piſcatores quemadmodum de- C portare poſſent, inuenerunt. Sale enim aſperſa, plus temporis aſſeruari poteſt.

CAPVT XVI.

De procreatione anguillarum.

Anguillæ nec per coitum procreantur, nec pariunt oua: nec verò capta vnquam aliqua eſt, quæ aut ſemen genitale, aut oua haberet. Meatus quoque vel ſeminis, vel vuluæ accommodatos nulla reſciſſa oſtendit. Sed hoc vnum inter ſanguinea genus totum ſine coitu, ſine ouo pro- D creatur. Quod ita eſſe argumento conſtat, quòd in nonnullis fæculentis ſtagnis aqua omni exhauſta, & limo detracto, anguillæ denuò generantur, vbi aqua acceſſerit pluuia: nam ſiccis temporibus gigni nequeunt, etiam in lacu perenni, quippe quæ imbre & viuant, & alantur. Sed hoc genus non coitu, non ouo creari, apertum eſt. Videntur tamen nonnullæ habere facultatem gignendi, quòd in aliquibus lumbriculi fiant: his enim generari anguillas creditur, quod error eſt. Sed certè ex his prodeunt, quæ terræ inteſtina vocantur, quæ ſponte in luto, humeſcentéque humo, prouenium. Iam aliæ abſolui ex his viſæ ſunt, aliæ ſcalptis diſcerptiſque intus apparuerunt. Oriun- E tur hæc inteſtina dicta, tum in mari tum etiam in fluuiis ſtagniſque, putredinis maximè ratione: ſed in mari, qua algæ ſunt: in ſtagnis autem & fluuiis, iuxta ripas. Calor enim ampliùs eas ſubiens partes, facit vt putreant. Talis generatio anguillarum eſt.

CAPVT XVII.

De vtero & tempore partus aquatilium, quomodóque alterum ab altero in fœtibus emittendis differat.

PArtus autem piſcium neque eodem tempore, nec ſimili modo omnium fit: nec pari temporis ſpatio geritur vterus. Greges ante coitum marium & fœminarum conſiſtunt: ſed ſub coitu & partu coniugia aguntur. Vterum vero alij diebus ampliùs tricenis ferunt, alij minùs. Omnes, tamen ſpatium numeris diſtinguendum ſeptenariis ſortiuntur. Plurimum temporis datur iis quos nonnulli appellant marinos. Sargus coit menſe Decembri, fert vterum dies triginta. Quinetiam in mugilum genere, qui labeo à nonnullis vocatur, & muco, eodem, quo ſargus, tempore coeunt, & tantumdem temporis ferunt. Laborant omnes per id tempus, quo gerunt vterum: vnde fit vt tunc potiſſimùm ruant in terram, atque excidant. Feruntur porro graui ſtimulo agitati in terram, atque omnino id temporis motu perpetuo incitantur, donec pariant. Sed omnium maximè mugilem ita ſolicitari certum eſt. Requieſcunt à partu continuo. Exitus pariendi piſcium compluribus eſt, vbi vermiculi nati in ventre fuerint. Innaſcuntur enim minuta quædam animalia vermiculi ſpecie, quæ partum expellunt. Parit ſolitariorum genus in vêre. Plurimis denique partus circa æquinoctium vernum agitur. Cæteris non eadem anni tempeſtas accommodata eſt: ſed aliis æſtas, aliis autumnale æquinoctium attribuitur. Parit prima hoc in genere antherina, quam ariſtam appello, & iuxta terram. Capito autem vltimus eſt. Conſtat id, cùm fœtus ariſtæ primùm, capitonis nouiſſimè appareat. Mugilis etiam inter primos partum accelerat, & ſalpa æſtatis initio locis plurimis, non nuſquam etiam autumno. *Quinetiam ſacer æſtate parit, mox aurata, lupus, mormur, molaris: denique omnes, qui curſiones vocantur. Vltimi gregalium, mullus & graculus pariunt autumno. Mullus ſua oua limo committit, vnde fit vt ſerò pariat: diutius enim frigus continetur in limo. Graculus poſt mullum fœtificat inter algas, vtpote qui locis ſaxoſis degat. Fert vterum longo temporis ſpatio. Alec̨es bruma pariunt: cæteri, qui pelagici ſunt, æſtate magna ex parte. Cuius rei argumētum eſt, quòd minimè per id tempus capiantur. Fœcundiſſima omnium piſcium alec eſſe videtur. Rana inter cartilaginea fœtificat numeroſiùs. Verùm quòd de facili pereunt, hinc efficitur vt appareant paucæ. Edit hæc oua diuerſa, & iuxta terrā. Omnino genus cartilagineum minùs fœtificat, quia animal gignit: ſeruari tamen ſua potiſſimùm magnitudine poteſt. Acus etiam appellata, ſerò fœtificat. Compluréſque eius generis diſrupto ac dehiſcente vtero pariunt, non tam multitudine ouorum, quàm magnitudine. Et modo phalangiorum, proles parentem offuſa circundat: quippe quam diſcedere ſtatim prolis amor non ſinat: & ſi tetigeris, fugiunt. Ariſta atterens aluum arenæ, parit. Thunni etiam præ nimia pinguedine dehiſcunt, nec plus, quàm biennio, poſſunt viuere. Cuius rei argumentum piſcatores inde deducunt, quòd cùm aliquando limariæ anno ſuperiore defeciſſent, thunni ſequenti anno defecerint. Limarius enim thunni prouectiores ætate anno eſſe putantur vno.

A

ΚΕΦΑΛ. ιζ΄.

Περὶ χρόνου καὶ τόπου τῆς τῶν ἰχθύων ἀφρίσεως.

ΤΟὺς δὲ τόκους οὔτε πάντες οἱ ἰχθύες ποιοῦνται τὴν αὐτὴν ὥραν, οὔθ' ὁμοίως, οὔτε κύουσι τὸν ἴσον χρόνον. πρὸ μὲν οὖν τῆς ὀχείας, ἀγέλαι γίνονται ἀρρένων καὶ θηλειῶν. ὅταν δὲ περὶ τὴν ὀχείαν καὶ τοὺς τόκους ὦσι, συνδυάζονται. κύουσι δὲ τούτων ἔνιοι, οὐ πλείους τριάκονθ' ἡμερῶν· οἱ δὲ, ἐλάττω χρόνον· πάντες δὲ ἐν χρόνοις διαιρουμένοις εἰς τὸν τῶν ἑβδομάδων ἀριθμόν. B κύουσι δὲ πλεῖστον χρόνον οὓς καλοῦσί τινες μαρίνους. *Σαργὸς κυΐσκεται μὲν περὶ τὸν Ποσειδεῶνα μῆνα· κύει δὲ ἡμέρας τριάκοντα· καὶ ὃν καλοῦσι δέ τινες *χελῶνα, τῶν κεστρέων, καὶ μύξωνα, τὸν αὐτὸν καὶ ἴσον χρόνον κύουσι τῷ σαργῷ. πονοῦσι δὲ τῇ κυήσει πάντες· διὸ μάλιστα τὴν ὥραν ταύτην ἐκπίπτουσι. φέρονται γὰρ οἰστρῶντες πρὸς τὴν γῆν, καὶ ὅλως ἐν κινήσει περὶ τὸν χρόνον τοῦτον διατελοῦσιν ὄντες, ἕως ἂν ἐκτέκωσι· καὶ μάλιστα ὁ κεστρεὺς τοῦτο ποιεῖ τῶν ἰχθύων· ὅταν δ' ἐκτέκωσιν, ἡσυχάζουσι. πολλοῖς δὲ τῶν ἰχθύων πέρας ἐστὶ τοῦ τίκτειν, ὅταν ἐγγένηται σκωλήκια ἐν τῇ γαστρί. ἐγγίνεται C γὰρ μικρὰ καὶ ἔμψυχα, ἃ ἐξελαύνει τὰ κυήματα. οἱ δὲ τόκοι, γίνονται τοῖς μὲν ῥυάσι, τοῦ ἔαρος· καὶ τοῖς πλείστοις δὲ περὶ τὴν ἐαρινὴν ἰσημερίαν· τοῖς δ' ἄλλοις οὐχ ἡ αὐτὴ ὥρα τοῦ ἔτους, ἀλλὰ τοῖς μὲν, τοῦ θέρους, τοῖς δὲ, περὶ τὴν μετοπωρινὴν ἰσημερίαν. τίκτει δὲ πρῶτον τῶν τοιούτων, ἀθερίνη· τίκτει δὲ πρὸς τῇ γῇ· κέφαλος δὲ, ὕστατος. δῆλον δὲ, ἐκ τοῦ πρῶτον ταύτης φαίνεσθαι τὸν γόνον, τοῦ δὲ, ὕστατον. τίκτει δὲ καὶ κεστρεὺς ἐν τοῖς πρώτοις· καὶ σάλπη τοῦ θέρους ἀρχομένου ἐν τοῖς πλείστοις, ἐνιαχοῦ δὲ καὶ μετοπώρου. τίκτει δὲ καὶ ὁ αὐλωπίας, ὃν καλοῦσιν ἀνθίαν, τοῦ θέρους. μετὰ δὲ ταῦτα, ὁ χρύσοφρυς, καὶ λάβραξ, καὶ μόρμυρος, καὶ ὅλως οἱ D καλούμενοι δρομάδες. ὕστατοι δὲ τῶν ἀγελαίων, τρίγλη, καὶ κορακῖνος· τίκτουσι δὲ οὗτοι περὶ τὸ μετόπωρον. τίκτει δὲ ἡ τρίγλη, ἐπὶ τῷ πηλῷ· διὸ ὀψὲ τίκτει· πολὺν γὰρ χρόνον ὁ πηλὸς ψυχρός ἐστιν. ὁ δὲ κορακῖνος, ὕστερον τῆς τρίγλης, ἐπὶ τὸ φυκίον ἐκπορευόμενος, διὰ τὸ βιοτεύειν ἐν τοῖς πετραίοις χωρίοις· καὶ κύει δὲ πολὺν χρόνον. αἱ δὲ μαινίδες, τίκτουσι μετὰ τὰς τροπὰς χειμερινάς. τῶν δὲ ἄλλων ὅσοι πελάγιοι, οἱ πολλοὶ θέρους τίκτουσι. σημεῖον δὲ, ὅτι οὐχ ἁλίσκονται τὸν χρόνον τοῦτον. πολυγονώτατον δὲ ἐστὶ τῶν ἰχθύων ἡ μαινίς· τῶν δὲ σελαχῶν, βάτραχος· ἀλλὰ σπάνιοί εἰσι, διὰ τὸ ἀπόλλυσθαι ῥᾳδίως. τίκτει γὰρ ἀθρόα ἅμα πρὸς τῇ γῇ. ὅλως E δὲ ὀλιγοτόκα μέν ἐστι τὰ σελάχη, διὰ τὸ ζῳοτοκεῖν. σώζεται δὲ μάλιστα ταῦτα, διὰ τὸ μέγεθος. ὀψίγονον δέ ἐστι καὶ ἡ καλουμένη βελόνη· καὶ αἱ πολλαὶ αὐτῶν πρὸ τοῦ τίκτειν διαρρήγνυνται ὑπὸ τῶν ᾠῶν. ἴσχει δὲ οὐχ οὕτω πολλὰ ὡς μεγάλα· καὶ ὥσπερ τὰ φαλάγγια δὲ, περικέχυνται καὶ περὶ τὴν βελόνην. ἐκτίκτει γὰρ πρὸς αὐτήν· κἂν τις θίγῃ, φεύγουσιν. ἡ δὲ ἀθερίνη, τίκτει τρίβουσα τὴν κοιλίαν πρὸς τὴν ἄμμον. διαρρήγνυνται δὲ καὶ οἱ θύννοι ὑπὸ τῆς πιμελῆς. ζῶσι δὲ ἔτη δύο. σημεῖον δὲ τούτου ποιοῦνται οἱ ἁλιεῖς. ἐκλιπουσῶν γάρ ποτε τῶν *θυννίδων ἐνιαυτὸν, τῷ ἐχομένῳ ἔτει καὶ οἱ θύννοι ἐξέλιπον. δοκοῦσι δ' ἐνιαυτῷ εἶναι πρεσβύτεροι τῶν πηλαμίδων.

* Gesnerus, σαργῖνος

* Gaza legit, χειλῶνα.

* Gaza, πηλαμίδων

ὀχεύονται δὲ οἱ θύννοι καὶ οἱ σκόμβροι, περὶ τὸν ἐλαφηβολιῶνα φθίνοντα· τίκτουσι δὲ, περὶ τὸν ἑκατομβαιῶνα ἀρχόμενοι. τίκτουσι δὲ οἷον ἐν θυλάκῳ τὰ ᾠά. ἡ δὲ αὔξησις ἐστὶ τῶν θυννίδων ταχεῖα. ὅταν γὰρ τέκωσιν οἱ ἰχθύες ἐν τῷ Πόντῳ, γίγνονται ἐκ τοῦ ᾠοῦ, ἃς καλοῦσιν οἱ μὲν,* σκορδύλας, Βυζάντιοι δὲ αὐξίδας, διὰ τὸ ἐν ὀλίγαις ἡμέραις αὐξάνεσθαι. καὶ ἐξέρχονται μὲν τοῦ φθινοπώρου ἅμα ταῖς θύννοις, εἰσπλέουσι δὲ τοῦ ἔαρος, ἤδη οὖσαι πηλαμύδες. σχεδὸν δὲ καὶ οἱ ἄλλοι πάντες ἰχθύες ταχεῖαν λαμβάνουσι τὴν αὔξησιν· πάντες δ' ἐν τῷ Πόντῳ θᾶττον. παρ' ἡμέραν γὰρ καὶ ἀμίαι πολλαὶ ἐπιδήλως αὔξονται. ὅλως δὲ δεῖ νομίζειν τοῖς αὐτοῖς ἰχθύσι μὴ ἐν τοῖς αὐτοῖς τόποις, μήτε τῆς ὀχείας καὶ κυήσεως εἶναι τὴν αὐτὴν ὥραν, μήτε τοῦ τόκου καὶ τῆς εὐημερίας (ἐπεὶ καὶ οἱ καλούμενοι κορακῖνοι ἐνιαχοῦ τίκτουσι περὶ τὸν πυραμητόν) ἀλλὰ τοῦ ὡς ἐπὶ τὸ πολὺ γιγνομένου ἐστόχασται τὰ εἰρημένα. ἴσχουσι δὲ καὶ οἱ γόγγροι κυήματα, ἀλλ' οὐκ ἐν πᾶσι τοῖς τόποις ὁμοίως τοῦτ' ἐπίδηλον. οὐδὲ τὸ κύημα σφόδρα φανερόν, διὰ τὴν πιμελήν· ἴσχει γὰρ μακρόν, ὥσπερ καὶ οἱ ὄφεις. ἀλλ' ἐπὶ τὸ πῦρ τιθέμενον, διάδηλον ποιεῖ. ἡ μὲν γὰρ πιμελή, θυμιᾶται καὶ τήκεται· τὰ δὲ, πηδᾷ καὶ ψοφεῖ ἐκθλιβόμενα. ἔτι δ' ἄν τις ψηλαφᾷ καὶ τρίβῃ τοῖς δακτύλοις, τὸ μὲν στέαρ, λεῖον φαίνεται, τὸ δὲ ᾠόν,* παχύ. ἔνιοι μὲν οὖν γόγγροι στέαρ μόνον ἔχουσιν, ᾠὸν δ' οὐδέν· οἱ δὲ, τοὐναντίον, στέαρ μὲν οὐδέν, ᾠὸν δὲ τοιοῦτον οἷον εἴρηται νῦν. περὶ μὲν οὖν τῶν ἄλλων ζῴων καὶ πλωτῶν, καὶ πτηνῶν, καὶ περὶ τῶν πεζῶν ὅσα ᾠοτοκεῖ, σχεδὸν εἴρηται περὶ πάντων, περί τε ὀχείας καὶ κυήσεως, καὶ γενέσεως, καὶ τῶν ἄλλων τῶν ὁμοιοτρόπων τούτοις.

* γ. σκερδύλας. apud Plinium & alios cordyla.

* Gaza τραχὺ, vt videtur, legit. hæ voces ſæpe inuicem confunduntur.

ΚΕΦΑΛ. ιη'.

Τὰ περὶ τὴν ὀχείαν συμβαίνοντα τῶν πεζῶν ὅσα ζῳοτοκεῖ.

ΠΕρὶ δὲ τῶν πεζῶν ὅσα ζῳοτοκεῖ, καὶ περὶ ἀνθρώπων, λεκτέον τὰ συμβαίνοντα τὸν αὐτὸν τρόπον. περὶ μὲν οὖν ὀχείας εἴρηται καὶ ἰδίᾳ, καὶ κοινῇ. κατὰ πάντων δὲ τῶν ζῴων, κοινὸν τὸ περὶ τὴν ἐπιθυμίαν καὶ τὴν ἡδονὴν ἐπτοῆσθαι τὴν ἀπὸ τῆς ὀχείας μάλιστα. τὰ μὲν οὖν θήλεα, χαλεπώτατα, ὅταν ἐκτέκωσι πρῶτον· οἱ δὲ ἄρρενες, περὶ τὴν ὀχείαν. οἵ τε γὰρ ἵπποι, δάκνουσι τοὺς ἵππους, καὶ καταβάλλουσι καὶ διώκουσι τοὺς ἱππέας· καὶ οἱ ὕες οἱ ἄγριοι, χαλεπώτατοι, καίπερ ἀσθενέστατοι περὶ τὸν καιρὸν τοῦτον ὄντες, διὰ τὴν ὀχείαν· καὶ πρὸς ἀλλήλους μὲν ποιοῦνται μάχας θαυμαστάς, θωρακίζοντες ἑαυτούς, καὶ ποιοῦντες τὸ δέρμα ὡς παχύτατον ἐκ παρασκευῆς, πρὸς τὰ δένδρα διατρίβοντες, καὶ τῷ πηλῷ μολύνοντες πολλάκις, καὶ ξηραίνοντες ἑαυτούς. μάχονται δὲ πρὸς ἀλλήλους, ἐξελαύνοντες ἐκ τῶν συοφορβείων οὕτω σφοδρῶς, ὥστε πολλάκις ἀμφότεροι ἀποθνήσκουσιν. ὡσαύτως δὲ καὶ οἱ ταῦροι καὶ οἱ κριοί, καὶ οἱ τράγοι. πρότερον γὰρ ὄντες σύννομοι ἕκαστοι, περὶ τοὺς καιροὺς τῆς ὀχείας μάχονται, διιστάμενοι πρὸς ἀλλήλους. χαλεπὸς δὲ καὶ ὁ κάμηλος περὶ τὴν ὀχείαν ὁ ἄρρην, ἐάν τε ἄνθρωπος, ἐάν τε κάμηλος πλησιάζῃ. ἵππῳ μὲν γὰρ ὅλως ἀεὶ πολεμεῖ. τὸν αὐτὸν δὲ τρόπον [καὶ] ἐπὶ τῶν ἀγρίων. καὶ γὰρ ἄρκτοι, καὶ λύκοι, καὶ λέοντες, χαλεποὶ τοῖς πλησιάζουσι γίνονται περὶ τὸν καιρὸν τοῦτον· πρὸς ἀλλήλους δ' ἧττον μάχονται, διὰ τὸ μὴ ἀγελαῖον εἶναι μηδὲν τῶν τοιούτων ζῴων. χαλεπαὶ δὲ καὶ αἱ θήλειαι ἄρκτοι ἀπὸ τῶν σκύμνων,

A Coeunt thunni & ſcombri menſe Februario poſt Idus: pariunt Iunio ante Nonas: edunt ſua oua recondita quaſi vtriculo: incrementum autem pelamides præcipua ſumit celeritate. Cùm enim thunni in Ponto pepererint, prodeunt ex ouo, quas alij ſcordulas vocant, Byzantij auxumas nominant, quia diebus paucis adoleſcunt: quæ exeunt Ponto autumno fœtas comitantes, eôdem autem redeunt verno tempore, iam adeptæ eam magnitudinem, qua limariæ nomen accipiant. Profectò omne piſcium genus celeriter adoleſcit, & præcipuè in Ponto: quippe cùm ibi incrementum ſingulis diebus planè intelligatur: ſed amiæ longè conſpectiùs. B Omnino ita exiſtimandum, vt eiſdem piſcibus, nõ eiſdem locis degentibus, nec coeundi, ferendive tempus eſſe idem, nec fœtificandi, aut proficiendi: nam & qui graculi appellantur, nonnuſquam meſſe tritici pariunt. Verùm ita hæc nos exponimus, vt magna ex parte res euenit. Congri etiam fœturam intra ſe continent: ſed non omnibus locis æquè id conſtat. Nec ipſa fœtura ſatis patet in vtero pingui obeſo: ineſt tamen ſerie quadam prolixiuſcula, vt in ſerpentibus: quod certè ignis periculo innoteſcit. Pingue enim abſumitur, atque euaporatur: oua autem crepant, & extruſa diſſiliunt. adhæc ſi palpites, & atteras digitis pingue, læue vtique ſenſeris, ouũm autem duriuſculum. Congri itaque alij C pingue habent, ouum nullum: alij contrà, pingue nullum, ouum autem quale modò expoſui, poſſident. Sed de coitu, vtero, & eiuſmodi reliquis, cæterorum animantium omnium, tum aquatilium, tum volucrum, atque etiam terreſtrium, quæ oua pariunt, dictum iam eſt.

CAPVT XVIII.

De coitu, eiuſque tempore, & libidine quadrupedum, quæ animal pariunt.

SEquitur vt pari modo de iis quæ in terreſtrium genere animal pariunt, atque etiam D de homine diſſeramus. Coitum & priuatim & publicè omnium diximus. Commune autem omnium animalium eſt, vt cupidine voluptatéque rei Venereæ maximè geſtiant, atque incitentur. Ferociunt fœminæ à partu, mares tempore coitus. Iam equi equos mordent, ſternunt equitem, atque inſequuntur. Sues quoque feri acerrimè ſæuiunt, quanquam per id tempus imbecilles ex coitu reddantur. Dimicant inter ſe mirum in modum armantes ſeſe, & cutem quàm craſſiſſimam præparantes, indurantéſque attritu arborum. Sæpe etiam luto obducto, ac reſiccato, tergus inuictum contra ictus efficiunt. Pugnant adeo acri certamine, E grege relicto, vt ſæpenumero mortem vterque aduerſarius obeat. Simili modo & tauri efferantur, & arietes, & hirci. Qui enim ſuperiore tempore ſocij, iugi concordia paſcerentur, coitus tempore diſſident, & alter alterum libidinis rabie inuadit. Camelus etiam mas ſæuit tempore coitus, ſiue homo, ſiue camelus accedat: nam equis quidem odio naturali aduerſantur. Idem feris quoque euenire apertum eſt. Nam vrſi, lupi, leones, acriùs per id tempus in eos qui acceſſerint, ſæuiunt: inter ſe tamen minùs hæc dimicant, videlicet ob eam rem, quia nullũ ex iis gregale eſt. Quinetiam vrſæ à ſuis catulis vehementer ferociunt,

vt canes à catellis. Et elephanti quoque ad coitum efferari ſolent: quamobrem apud Indos iis haudquaquam permitti initum aiunt. Libidinis enim rabie agitati caſas proſternunt malè conditas, pluráque alia incommoda faciunt. Mitigari pabuli copia narrantur. Plagis etiam temperant, adductis aliis, quibus ferire præcipiant. Quæ autem non vno tempore, ſed ſæpius anno coeunt, vt ea quæ cum homine degunt, verbi gratia, canes, ſues, vt minùs efferentur, facit coitus copia. Incenduntur libidine ex fœminis equæ potiſſimùm, mox vaccæ. Equę itaque equiunt: vnde vocabulum id ab hoc vno animali trahitur, maledicto in mulieres libidinoſas. Necnon euentari per id tempus equæ dicuntur. quapropter in Creta inſula equos admiſſarios minimè à fœminis ſemouendos cenſent. Cùm verò ita affectæ fuerint, currunt relicta ſocietate. Simile hoc vitium eſt, vt quod ſubare in ſuibus dicitur. Currunt non Orientem aut Occidentem verſus, ſed ex aduerſo Aquilonis, aut Auſtri: nec appropinquare quenquam patiuntur, donec vel defatigatæ deſiſtant, vel ad marem deueniant. Tum aliquid emittunt, quod hippomanes appellatur, eodē, quo illud, quod naſcitur, nomine. Tale hoc ſanè eſt, quale ſuis illud, quod apriam vocant: ſed hoc præcipuè ad amoris veneficia petitur. Equæ tempore coitus colligūt ſeſe, & ſocietate magis quàm antea, gaudent. Iactant caudam crebriùs, vocē immutant, humorem emittunt ſuis genitalibus, ſimilem geniture, ſed multo tenuiorem, quàm mares, quem hippomanes nonnulli appellant, non quod pullis naſcentibus adhæret. accipi eum humorem difficile eſſe aiunt, quod paulatim admodum labitur. Mingunt etiam plures, atque inter ſe ludunt, cùm equiunt. hæc de equis. Vaccæ tauriunt, & libidine adeò incenduntur, vt bubulci eas tenere aut capere nequeant. Indicium tum equæ, tum vaccæ ſuæ libidinis præſtant, genitalis ſpecie prominentiore. Vaccæ etiam mingunt crebriùs more equarum. adhæc, vaccæ tauros ſuperueniunt, & ſequuntur ſedulò, & aſſiſtunt. Turgent ad coitum priùs minores natu, quàm maiores, tum in equorum genere, tum in boum. Temporis etiam beneficio, & corporis valetudine propenſiora redduntur ad Venerem animalia. Equarum libido extinguitur magis iuba tonſa, & frons triſtior redditur. Mares in hoc genere fœminas ſibi ſocietate coniunctas dignoſcunt olfactu, etſi paucis antè diebus vnà fuerint. Quòd ſi fœminæ diuerſæ permiſceantur, mares alienas mordendo expellunt, ſuáſque ſinguli ſeorſum habentes paſcuntur. Tricenæ, aut paulò plures ſingulis dantur: Quoties mas acceſſerit aliquis, confeſtim in eum maritus conuertitur, & currens gyro aggreditur pugna: & fœminam, ſi qua ſe mouerit, morſu reuocat. Taurus tempore coitus tantùm cum fœminis paſcitur, cæteróſque oppugnat mares. Temporibus cæteris mares inter ſe conuerſantur: quod coarmentari dicitur. Iam Epiri prouinciæ tauri ſæpius trimeſtris temporis ſpatio nō apparent. Omnino fera omnia, aut certè plurima, non antè cum fœminis ad commune paſcuum veniunt, quàm tempus ſit coeundi.

A ὥσπερ καὶ αἱ κύνες ἀπὸ τῶν σκυλακίων. ἐξαγριαίνονται δὲ καὶ οἱ ἐλέφαντες περὶ τὴν ὀχείαν. διόπερ φασὶν οὐκ ἐᾶν αὐτοὺς ὀχεύειν τὰς θηλείας τοὺς θρέψαντας ἐν τοῖς Ἰνδοῖς. ἐμμανεῖς γὰρ γινομένους ἐν τοῖς χρόνοις τούτοις, ἀνατρέπειν τὰς οἰκήσεις αὐτῶν, ἅτε φαύλως ᾠκοδομημένας, καὶ ἄλλα πολλὰ ἐργάζεσθαι. φασὶ δὲ καὶ τὴν τῆς τροφῆς δαψίλειαν πρᾳοτέρους αὐτοὺς ποιεῖν. καὶ προσάγοντες δ' αὐτοῖς ἑτέρους, κολάζονται καὶ δουλοῦνται, προστάττοντες τύπτειν *τοὺς προσταττομένους. τὰ δὲ πολλάκις ποιούμενα τὰς ὀχείας, καὶ μὴ κατὰ μίαν ὥραν, οἷον τὰ συνανθρωπευόμενα, οἷον ὕες τε καὶ κύνες, ἧττον τὰ τοιαῦτα φαί- B νεται ποιοῦντα, διὰ τὴν ἀφθονίαν τῆς ὁμιλίας. τῶν δὲ θηλειῶν ὁρμητικῶς ἔχουσι πρὸς τὸν συνδυασμόν, μάλιστα μὲν ἵππος, ἔπειτα βοῦς. αἱ μὲν οὖν ἵπποι αἱ θήλειαι, ἱππομανοῦσιν· ὅθεν καὶ ἐπὶ τὴν βλασφημίαν τὸ ὄνομα αὐτῶν ἐπιφέρουσιν ἀπὸ μόνου τῶν ζώων, ἐπὶ τῶν ἀκολάστων περὶ τὸ ἀφροδισιάζεσθαι. λέγονται δὲ καὶ ἐξανεμοῦσθαι περὶ τὸν καιρὸν τοῦτον· διὸ ἐν Κρήτῃ οὐκ *ἐξαιροῦσι τὰ ὀχεῖα ἐκ τῶν θηλειῶν. ὅταν δὲ τοῦτο πάθωσι, θέουσιν ἐκ τῶν ἄλλων ἵππων. ἔστι δὲ τὸ πάθος, ὥσπερ ἐπὶ ὑῶν λέγεται τὸ καπρίζειν. θέουσι δ' οὔτε πρὸς ἕω, οὔτε πρὸς δυσμάς, ἀλλὰ πρὸς ἄρκτον, ἢ νότον. ὅταν δ' ἐμπέσῃ τὸ πάθος, οὐδένα C ἐῶσι πλησιάζειν, ἕως ἂν ἢ ἀπείπωσι διὰ τὸν πόνον, ἢ πρὸς θάλατταν ἔλθωσι· τότε δ' ἐκβάλλουσί τι. καλοῦσι δὲ καὶ τοῦτο, *ὥσπερ ἐπὶ τοῦ τικτομένου, ἱππομανές. ἔστι δ' οἷον ἡ καπρία· καὶ ζητοῦσι τοῦτο μάλιστα πάντων οἱ περὶ τὰς φαρμακείας. περὶ δὲ τὴν ὥραν τῆς ὀχείας, συγκύπτουσί τε πρὸς ἀλλήλας μᾶλλον ἢ πρότερον, καὶ τὴν κέρκον κινοῦσι πυκνά, καὶ τὴν φωνὴν ἀφιᾶσιν ἀνομοιοτέραν, ἢ κατὰ τὸν ἄλλον χρόνον. ῥεῖ δὲ αὐταῖς ἐκ τοῦ αἰδοίου ὅμοιον γονῇ, λεπτότερον δὲ πολὺ ἢ τὸ τοῦ ἄρρενος· καὶ καλοῦσι τοῦτο τινὲς ἱππομανές, ἀλλ' οὐ τὸ ἐπὶ τοῖς πώλοις ἐπιφυόμενον· ἐργῶδες δὲ εἶναί φασι λαβεῖν· κατὰ μικρὸν γὰρ D ῥεῖ. καὶ οὐροῦσι δὲ πολλάκις, ὅταν σκυζῶσι, καὶ πρὸς αὑτὰς παίζουσι. τὰ μὲν οὖν περὶ *τὰς ἵππους, τοῦτον ἔχει τὸν τρόπον. αἱ δὲ βόες, ταυρῶσιν. οὕτω δὲ σφόδρα καταχάγιμοι γίνονται τῷ πάθει, ὥστε μὴ δύνασθαι αὐτῶν κρατεῖν μηδὲ λαμβάνεσθαι τοὺς βουκόλους. δῆλαι δὲ εἰσὶ καὶ αἱ ἵπποι καὶ αἱ βόες, ὅταν ὀργῶσι πρὸς τὴν ὀχείαν, καὶ τῇ ἐπάρσει τῶν αἰδοίων, καὶ τῷ πυκνὰ οὐρεῖν αἱ βόες, ὥσπερ αἱ ἵπποι. ἔτι δὲ αἵ γε βόες, ἐπὶ τοὺς ταύρους ἀναβαίνουσι, καὶ παρακολουθοῦσιν ἀεί, καὶ παρεστᾶσι. πρότερα δὲ τὰ νεώτερα ὀργᾷ πρὸς τὴν ὀχείαν, καὶ ἐν τοῖς ἵπποις καὶ ἐν τοῖς βουσί. καὶ ὅταν εὐημερίαι γίνωνται, καὶ τὰ σώματα εὖ ἔχωσι, μᾶλλον E ὀργῶσιν. αἱ μὲν οὖν ἵπποι, ὅταν ἀποκείρωνται, ἀποπαύονται τῆς ὁρμῆς μᾶλλον, καὶ γίνονται κατηφέστεραι. οἱ δὲ ἄρρενες ἵπποι, διαγινώσκουσι τὰς θηλείας τὰς συννόμους τῇ ὀσμῇ, κἂν ὀλίγας ἡμέρας ἀλλαχῇ ἅμα γίνωνται πρὸ τῆς ὀχείας, καὶ ἀναμιχθῶσιν ἀλλήλαις, ἐξελαύνουσι δάκνοντες, καὶ νέμονται χωρὶς ἕκαστοι τὰς ἑαυτῶν ἔχοντες. δίδοασι δ' ἑκάστῳ περὶ τριάκοντα, ἢ μικρῷ πλείους. ὅταν δὲ προσίῃ τις ἄρρην, συστρέψας εἰς ταὐτό, καὶ περιδραμὼν κύκλῳ, προσελθὼν μάχεται· κἄν τις κινῆται, δάκνει καὶ κωλύει. ὁ δὲ ταῦρος, ὅταν ὥρα τῆς ὀχείας ᾖ, τότε γίνεται σύννομος, καὶ μάχεται τοῖς ἄλλοις· τὸν δὲ πρότερον χρόνον μετ' ἀλλήλων εἰσίν· ὃ καλεῖται ἀτιμαγελεῖν. πολλάκις γὰρ οἵ γε ἐν τῇ Ἠπείρῳ, οὐ φαίνονται τριῶν μηνῶν. ὅλως δὲ τὰ ἄγρια πάντα, ἢ τὰ πλεῖστα, οὐ συννέμονται ταῖς θηλείαις πρὸ τῆς ὥρας τοῦ ὀχεύειν,

* Fortaſſe, τοὺς προσταγμένους, ait Sylburg.

* γ. ἐξαίρουσι

* Fort. ὥσπερ τὸ ἐπὶ τῷ τικτ. ſicut alibi legitur. Inf. c. 22.

* γ. τὰς ἵππ.

ἀλλ' ἐκκρίνονται, ὅταν εἰς ἡλικίαν ἔλθωσι, καὶ χωρὶς βόσκονται τὰ ἄρρενα τῶν θηλειῶν. καὶ αἱ ὕες, ὅταν ἔχωσι πρὸς τὴν ὀχείαν ὁρμητικῶς, ὃ καλεῖται * καπρᾷν, ἐπιτίθενται καὶ πρὸς τοὺς ἀνθρώπους. περὶ δὲ τὰς κύνας, τὸ τοιοῦτο πάθος καλεῖται σκυζᾶν. ἔπαρσις μὲν οὖν τοῖς θήλεσιν ἐγγίνεται τῶν αἰδοίων, ὅταν πρὸς τὴν ὀχείαν ὁρμῶσι, καὶ ὑγρασία περὶ τὸν τόπον. αἱ δὲ ἵπποι, καὶ ἀπορραίνουσι λευκὴν ὑγρότητα περὶ τὸν καιρὸν τοῦτον. καθάρσεις δὲ γίνονται μὲν καταμηνίων, οὐ μὴν ὅσαι γε ταῖς γυναιξὶν, οὐδενὶ τῶν ἄλλων ζώων. τοῖς μὲν οὖν προβάτοις καὶ αἰξὶν, ἐπειδὰν ἡ ὥρα ὀχεύεσθαι, ἐπισημαίνει πρὸ τοῦ ὀχεύεσθαι· καὶ ἐπειδὰν ὀχευθῶσι, γίνονται σημεῖα, εἶτα διαλείπει, μέχρις οὗ ἂν μέλλωσι τίκτειν. τότε δ' ἐπισημαίνει, καὶ οὕτω γινώσκουσιν ὅτι ἐπίτοκά εἰσιν, οἱ ποιμένες. ἐπειδὰν δὲ τέκῃ, κάθαρσις γίνεται πολλὴ, οὐ μὴν πρῶτον οὐ σφόδρα αἱματώδης, ὕστερον μέντοι σφόδρα. βοῒ δὲ καὶ ὄνῳ καὶ ἵππῳ, πλείω μὲν τούτων, διὰ τὸ μέγεθος γίνεται, ἐλάττω δὲ κατὰ λόγον πολλῷ. ἡ μὲν οὖν βοῦς ὅταν ὀργᾷ πρὸς τὴν ὀχείαν ἡ θήλεια, καθαίρεται κάθαρσιν βραχεῖαν ὅσον ἡμικοτύλιον, ἢ μικρῷ πλεῖον· καιρὸς δὲ γίνεται τῆς ὀχείας μάλιστα περὶ τὴν κάθαρσιν. ἵππος δὲ, τῶν τετραπόδων ἁπάντων εὐτοκώτατον, καὶ λοχείων καθαρώτατον, καὶ ἐλαχίστην προΐεται αἵματος ῥύσιν, ὡς κατὰ τὸ τοῦ σώματος μέγεθος. μάλιστα δὲ καὶ ταῖς βουσὶ καὶ ταῖς ἵπποις τὰ καταμήνια σημεῖον διαλιπόντα, δίμηνον, καὶ τετράμηνον, καὶ ἑξάμηνον. ἀλλ' οὐ δυνατὸν γνῶναι μὴ παρεπομένῳ, μηδὲ συνήθει σφόδρα· διὸ ἔνιοι οὐκ οἴονται γίνεσθαι αὐτοῖς. τοῖς δ' ὀρεῦσι τοῖς θήλεσιν, οὐδὲν γίνεται καταμήνιον, ἀλλὰ τὸ οὖρον παχύτερον τὸ τῆς θηλείας. ὅλως μὲν οὖν τὸ τῆς κύστεως περίττωμα τοῖς τετράποσι παχύτερον, ἢ τὸ τῶν ἀνθρώπων· τὸ δὲ τῶν προβάτων καὶ τῶν αἰγῶν τῶν θηλειῶν, παχύτερον ἔτι ἢ τὸ τῶν ἀρρένων· ὄνου δὲ λεπτότερον τὸ τῶν θηλειῶν· βοὸς δὲ καὶ δριμύτερον τὸ τῆς θηλείας. μετὰ δὲ τοὺς τόκους, ἁπάντων τῶν τετραπόδων παχύτερον τὸ οὖρον γίνεται, καὶ μᾶλλον τῶν ἐλάττω προϊεμένων κάθαρσιν. τὸ δὲ γάλα, γίνεται ὅταν ὀχεύεσθαι ἄρχωνται, πυῶδες· χρήσιμον δὲ γίνεται, ἐπειδὰν τέκωσιν ὕστερον. κύοντα δὲ τὰ πρόβατα καὶ αἶγες, πιότερα γίνονται, καὶ ἐσθίουσι μᾶλλον. καὶ βόες δὲ ὡσαύτως, καὶ τὰ ἄλλα τὰ τετράποδα πάντα. ὁρμητικώτατα μὲν οὖν, ὡς ἐπὶ τὸ πολὺ εἰπεῖν, πρὸς τὴν ὀχείαν, τὴν ἐαρινὴν ὥραν ἐστίν. οὐ μὴν τά γε πάντα ποιεῖται τὸν αὐτὸν καιρὸν τῆς ὀχείας, ἀλλὰ πρὸς τὴν ἐκτροφὴν τῶν τέκνων ἐν τοῖς καθήκουσι καιροῖς. αἱ μὲν οὖν ἥμεροι ὕες, κύουσι τέτταρας μῆνας, τίκτουσι δὲ τὰ πλεῖστα εἴκοσι· πλὴν ἂν πολλὰ τέκωσιν, οὐ δύνανται ἐκτρέφειν πάντα. γηράσκουσαι δὲ, τίκτουσι μὲν ὁμοίως, ὀχεύονται δὲ [βραδύτερον· κυΐσκονται δὲ] * οὐκ ἐκ μιᾶς ὀχείας, ἀλλὰ πολλάκις ἐπιβάλλουσι, διὰ τὸ ἐκβάλλειν μετὰ τὴν ὀχείαν, τὴν καλουμένην ὑπό τινων καπρίαν· ἥτις μὲν οὖν καὶ συμβαίνει πάσαις· ἔνιαι δὲ ἅμα ταύτῃ καὶ τὸ σπέρμα προΐενται. ἐν δὲ τῷ κυήσει ὃ ἂν βλαφθῇ τῶν τέκνων, καὶ τῷ μεγέθει πηρωθῇ, καλεῖται * μετάχοιρον. τοῦτο δὲ γίνεται ὅπου ἂν τύχῃ τῆς ὑστέρας. ὅταν δὲ γεννήσῃ, τῷ πρώτῳ τὸν πρῶτον παρέχει μαστόν. θυῶσαν δὲ οὐ δεῖ εὐθὺς βιβάζειν, πρὶν ἂν μὴ τὰ ὦτα καταβάλλῃ· εἰ δὲ μὴ, αἰαθυᾷ πάλιν. ἂν δὲ ὀργῶσαν βιβάσῃ, μία ὀχεία, ὥσπερ εἴρηται, ἀρκεῖ.

* κ. καπρᾶν.

* Gaza negationem non agnoſcit.

* Infrà, cap. 24.

A Sed cùm iam per ætatem licuerit, ſegregantur mares à fœminis, ſeorſùmque paſcũtur. Sues fœminæ, cùm libidine excitantur, quod ſubare dicuntur, vel homines aggrediũtur. Canes eodem illo modo affectæ, canire dicuntur. Prominet genitale in fœminis, cùm ad coitum ſtimulantur, & locus humeſcit. Equabus humoris aliquid ibi defluit per id tẽpus. Purgatio menſtruorum fit quidem & cæteris, ſed nulli æquè ac mulieri. Oui & capræ tẽpora coeundi indicantur. quod idem poſt coitum etiam fit ad tempus, mox deſiſtit, donec parturiant: tum denuò indicatur: quare paſtores proximum eſſe partũ intelligunt. A partu autem purgatio ſequitur abundè: primùm leuiter cruenta, poſtmodũ valde. B Vaccæ, aſinæ, equæ, modo quidem ampliore quàm ſuprà dictis emittitur, vtpote magnitudine excedentibus, ſed multo ex proportione minùs. Bos itaque fœmina, cùm coitum affectat, leuiter purgatur, quantum heminæ dimidium, aut paulo plùs. Tempus autem coeundi tunc potiſſimùm eſt, cùm purgatur. Equa facillimè omnium quadrupedum parit. Vacat admodum purgamentis, minimúmque emittit profluuium ſanguinis, videlicet pro corporis magnitudine. Conceptus indicium maximè in vaccis equabúſque, cùm menſes ceſſarunt, ſpatio temporis bimeſtri, trimeſtri, quadrimeſtri, ſemeſtri. Sed id percipere difficile eſt, niſi quis iã du- C dum ſecutus aſſuetúſque admodũ ſit. Quamobrẽ non deſunt, qui menſes in his animalibus negent. Mulabus menſes nulli mouentur, ſed earum vrina craſſior quàm marium eſt. Omnino excrementum veſicæ quadrupedum craſſius quàm hominum eſt. Inter eas tamen quadrupedes, oues fœminæ, & capræ, craſſiorem reddunt vrinam quàm mares. Aſinæ contrà, tenuiorẽ quàm mares, & vaccæ acriorem. A partu vrina quadrupedum omnium craſſior redditur, & magis eorum quæ minùs purgantur. Lac fieri incipit ad ſpeciem puris initio coitus, ſed vtile poſtea eſt, cùm pepererint. Pinguescunt tam oues quàm capræ, cùm gerunt D partum, edúntque ampliùs. Quod idem de bubus etiam ac cæteris quadrupedibus affirmandũ. Sunt porrò animalia propenſiora ad coitum, propè dixerim, omnia verno tempore. Sed ſunt tamen quæ non eo tempore coeant, verùm prout quæque alere ſuos fœtus commodiùs poſſunt, ita tempus ſibi conueniens habeant. Sues cicures vterum ferunt menſes quatuor. Numerus partus plurimum ad vicenos. Si tamen multos pepererint, educare omnes non queunt. Seneſcentes etiam pariunt quidem ſimili modo, ſed tardiùs coeunt. Implentur vno coitu: ſæpius tamen ſuperuentum patiuntur, ea de cauſa, quòd poſt coitum, humorem, quem a- E priam nonnulli appellant, emittunt. quod quidem commune omnibus incidit: ſed aliquæ vnà cũ hoc, ſemen etiam admiſſum eijciunt. Fœtus, qui in vtero læſus, minutúſque fuerit, metachœrum dicitur, quaſi poſthumum voces, quod in parte qualibet vuluę accidere poteſt. Cùm ſcrofa peperit, primam mammam porco, qui primus in lucem prodiit, prębet. Cauendum ne prima ſubatione ante aures flaccidas coitus fiat, fruſtra etenim fuerit. at ſi plena iam auiditate, ac deſiderio libidinis turgido admiſſura fiat, vnus (vt modò dixi) initus ſatis ſit.

Prodeſt apro coeunti hordeum apponere pabulo: quod idem & ſcrofæ fœtæ commodum eſt, ſed elixum. Sunt è ſcrofis aliæ ſtatim prolis fœcundæ laudabiles, aliæ increſcentes melius generant. Suem altero oculo amiſſo breui extingui magna ex parte nonnulli exiſtimant. Plurimis vita ad annos xv. aliquibus etiam propè ad vicenos.

συμφέρει δὲ ὀχεύοντι μὲν τῷ κάπρῳ παρέχειν κριθάς, τετοκυίᾳ δὲ τῇ ὑΐ, κριθὰς ἑφθάς. εἰσὶ δὲ τῶν ὑῶν αἱ μὲν, εὐθὺς καλλίχοιροι * μόνον· αἱ δ', ἐπαυξανόμεναι, τὰ τέκνα καὶ τὰς δέλφακας χρηστὰς γεννῶσι. φασὶ δέ τινες, ἐὰν τὸν ἕτερον ὀφθαλμὸν ἐκκοπῇ ἡ ὗς, ἀποθνήσκειν διὰ ταχέων ὡς ἐπὶ τὸ πολύ. ζῶσι δὲ αἱ πλεῖσται μὲν περὶ ἔτη πεντεκαίδεκα, ἔνιαι δὲ καὶ τῶν εἴκοσιν ὀλίγον ἀπολείπουσι.

* Vocem μόνον Gaza nõ agnoſcit, & vel tollenda, vel poſt ἐπαυξ. collocanda.

CAPVT XIX.

De coitu fœtúque ouium, & caprarum.

OVes & capræ terno aut quaterno coitu implentur: & ſi à coitu imber acceſſit, abortum infert. Pariunt maxima ex parte ſingulos, ſed aliquando & binos, & ternos & quaternos. Ferunt quinque menſibus, tum oues tum capræ. Vnde fit vt locis nonnullis, quibus cæli clementia, & pabuli copia eſt, bis pariant. Vita capris ad octonos cumplurimum annos, ouibus ad denos: ſed magna ex parte ad pauciores. Duces pecoris tamen vel ad quindenos protrahunt vitam. Singulis ouilibus ſinguli duces conſtituuntur, qui quoties ſuo nomine à paſtore vocantur, antecedunt: quod ab ineũte ætate facere aſſueſcunt. Oues Æthiopicæ vel ad duodecim & tredecim annos vitam agunt: capræ etiam ad decem, & vndecim. Coeunt tam oues quàm capræ, quamdiu viuunt. Pariunt geminos, tum pabuli beneficio, tum ſi pater, aut mater, vim eam geminandi per naturam obtineat. Mares autẽ aut fœminæ generantur vi tum aquarum, tum admiſſariorum. Nam & aquæ faciũt, vt fœminæ mareſve concipiantur. adhæc, Aquilonis flatu mares potiùs concipiuntur, Auſtri fœminæ. Vis tanta eſt Aquilonis, vt vel ea quæ non niſi fœminas pariant, immutet ad prolis maſculæ procreationẽ. Spectare ad Aquilonem oportet cùm coeunt fœminę. Quæ manè iniri ſolent, marem, ſi ſerò diei admiſeris, nõ patiuntur. Candidi nigriue efficiuntur fœtus, ſi ſub lingua arietis venæ nigræ aut candidæ habentur. Cuius enim coloris ſunt venæ, eiuſdem & vellus eſt. Varium etiam, ſi plures venarum colores ſunt. Quæ aquam ſalſiuſculam bibunt, maturiùs coeũt: nec ſolum antę coitum, ſed etiam à coitu ſaliẽdum eſt: atque etiam verno tempore. Capris nullum ducem paſtores conſtituunt, quia earum natura non ſtabilis, ſed lubrica, atque mobilis eſt. In grege ouium, ſi maiores natu tempeſtiuè libidine incitantur, annum eſſe felicem gregi paſtores confirmãt: ſed ſi minores, infelicem.

ΚΕΦΑΛ. ιθʹ.

Περὶ προβάτων καὶ αἰγῶν ὀχείας καὶ τόκου.

ΤΑ δὲ πρόβατα κυΐσκεται μὲν ἐν τρισὶν ἢ τέτταρσιν ὀχείαις· ἂν δὲ ὕδωρ γένηται μετὰ τὴν ὀχείαν, ἀποκυΐσκει. ὁμοίως δὲ καὶ αἱ αἶγες. τίκτουσι δὲ τὰ μὲν πλεῖστα, δύο, ἐνίοτε δὲ καὶ τρία, ἤδη δὲ καὶ τέτταρα. κύει δὲ πέντε μῆνας πρόβατον καὶ αἴξ. διὸ ἐν ἐνίοις τόποις, ὅσοι ἀλεεινοί εἰσι, καὶ ἐν οἷς εὐημεροῦσι καὶ τροφὴν ἄφθονον ἔχουσι, δὶς τίκτουσι. ζῇ δὲ αἴξ μὲν, περὶ ἔτη ὀκτώ· πρόβατον δὲ, δέκα· τὰ δὲ πλεῖστα, ἐλάττω, πλὴν οἱ ἡγεμόνες τῶν προβάτων· οὗτοι δὲ καὶ πεντεκαίδεκα. ἐν ἑκάστῃ γὰρ ποίμνῃ κατασκευάζουσιν ἡγεμόνα τῶν ἀρρένων· ὃς ὅταν ὀνόματι κληθῇ ὑπὸ τοῦ ποιμένος, προηγεῖται. συνεθίζουσι δὲ τοῦτο δρᾶν ἐκ νέων. τὰ δὲ περὶ τὴν Αἰθιοπίαν πρόβατα, ζῇ καὶ δώδεκα καὶ τρεισκαίδεκα ἔτη· καὶ αἶγες δὲ καὶ δέκα καὶ ἕνδεκα. ὀχεύει δὲ καὶ ὀχεύεται, ἕως ἂν ζῇ, καὶ πρόβατον καὶ αἴξ. διδυμοτοκοῦσι δὲ καὶ πρόβατα καὶ αἶγες, διά τε εὐβοσίαν, καὶ ἐὰν ὁ κριὸς ἢ ὁ τράγος ᾖ διδυμοτόκος, ἢ ἡ μήτηρ. θηλυγόνα δὲ καὶ ἀρρενογόνα γίνεται, διά τε τὰ ὕδατα (ἔστι γὰρ τὰ μὲν, θηλυγόνα· τὰ δὲ, ἀρρενογόνα) καὶ * διὰ τὰς ὀχείας. ὡσαύτως καὶ βορείοις μὲν ὀχευόμενα, ἀρρενοτοκεῖ μᾶλλον· νοτίοις δὲ, θηλυτοκεῖ. μεταβάλλει δὲ καὶ τὰ θηλυτοκοῦντα, καὶ ἀρρενοτοκεῖ. δεῖ δὲ ὁρᾶν ὀχευόμενα πρὸς βορέαν. τὰ δὲ εἰωθότα πρωῒ ὀχεύεσθαι, ἐὰν ὀψὲ ὀχευθῇ τις, οὐχ ὑπομένουσι τοὺς κριούς. λευκὰ δὲ τὰ ἔκγονα γίνεται καὶ μέλανα, ἐὰν ὑπὸ τῇ τοῦ κριοῦ γλώττῃ λευκαὶ φλέβες ὦσιν, ἢ μέλαιναι· λευκὰ μὲν, ἐὰν λευκαί· μέλανα δὲ, ἐὰν μέλαιναι· ἐὰν δὲ ἀμφότεραι, ἀμφότερα· πυρρὰ δὲ, ἐὰν πυρραί. τὰ δὲ τὸ ἁλυκὸν ὕδωρ πίνοντα, πρότερον ὀχεύεται. δεῖ δὲ ἁλίζειν πρὶν τεκεῖν, καὶ ἐπειδὰν τίκῃ, καὶ ἔαρος αὖθις. αἰγῶν δὲ ἡγεμόνα οὐ καθιστᾶσιν οἱ νομεῖς, διὰ τὸ μὴ μόνιμον εἶναι τὴν φύσιν αὐτῶν, ἀλλ' ὀξεῖαν καὶ εὐκίνητον. τῶν δὲ προβάτων ἐὰν μὲν τὰ πρεσβύτερα ὁρμᾷ πρὸς τὴν ὀχείαν κατὰ τὴν τεταγμένην ὥραν, φασὶν οἱ ποιμένες σημεῖον εὐετηρίας εἶναι τοῖς προβάτοις· ἐὰν δὲ τὰ νεώτερα, κακοθηνεῖν τὰ πρόβατα.

* Scrib. δ. τ. ὀχείας ὡσαύτως & βορ.

CAPVT XX.

De coitu, & fœtura canum, eorúmque vitæ longitudine.

CAnum genera plura ſunt. Coit Laconicũ mẽſe ſuæ ętatis octauo. Et crus iam circa id tẽpus attollentes nõnulli vrinam reddũt. Impletur canis vno initu, quod in furtiuis maximè cõſtat initibus: implent enim qui ſemel inierint. Gerũt Laconicæ vterũ parte ſexta anni, hoc eſt, ſexagenis diebus, aut vno vel altero, plus minúſve. Catelli cęci gignũtur, nec ante duodecimũ diem viſum accipiũt. Coeunt canes poſteaquam pepererunt, ſexto menſe, nec citiùs. Sunt quæ parte quinta anni vterum ferant,

ΚΕΦΑΛ. κʹ.

Περὶ κυνῶν ὀχείας, καὶ τόκου, καὶ ἡλικίας.

ΤΩν δὲ κυνῶν ἐστι μὲν γένη πλείω· ὀχεύει δὲ κύων ἡ Λακωνικὴ μὲν, ὀκτάμηνος, καὶ ὀχεύεται· καὶ τὸ σκέλος δὲ αἴροντες, οὐροῦσιν ἤδη ἔνιοι περὶ τὸν χρόνον τοῦτον. κυΐσκεται δὲ κύων ἐκ μιᾶς ὀχείας. δῆλον δὲ τοῦτο γίνεται μάλιστα ἐν τοῖς κλέπτουσι τὰς ὀχείας· ἅπαξ γὰρ ἐπιβάντες πληροῦσι. κύει δὲ ἡ μὲν Λακωνικὴ, ἕκτον μέρος τοῦ ἐνιαυτοῦ. τοῦτο δέ ἐστιν ἡμέραι ἑξήκοντα κἂν ἄρα μιᾷ ἢ δυσὶν, ἢ τρισὶ πλείονας ἡμέρας, καὶ ἐλάττους μιᾷ. τυφλὰ δὲ γίνεται αὐτῇ τὰ σκυλάκια, ὅταν τίκῃ δώδεκα ἡμέρας. τεκοῦσα δὲ, πάλιν ὀχεύεται ἕκτῳ μηνὶ, καὶ οὐ πρότερον. ἔνιαι δὲ κύουσι τῶν κυνῶν τὸ πέμπτον μέρος τοῦ ἐνιαυτοῦ.

τοῦτο δ' ἐστὶν ἡμέραι ἑβδομήκοντα καὶ δύο. τυφλὰ δὲ γίνεται τὰ σκυλάκια τούτων τῶν κυνῶν ἡμέρας δεκατέσσαρας. ἔνιαι δὲ κύνες κύουσι μὲν τέταρτον μέρος τοῦ ἐνιαυτοῦ· τοῦτο δ' ἐστὶ τρεῖς μῆνες ὅλοι· τυφλὰ δὲ γίνεται τούτων τὰ σκυλάκια ἑπτακαίδεκα ἡμέρας. δοκεῖ δὲ σκυζᾶν τὸν ἴσον χρόνον κύων ὅσον κύει. τὰ δὲ καταμήνια ταῖς κυσὶν ἑπτὰ ἡμέραις γίνεται. συμβαίνει δὲ ἅμα καὶ ἔπαρσις αἰδοίου. ἐν δὲ τῷ χρόνῳ τούτῳ οὐ προσίενται ὀχείαν, ἀλλ' ἐν ταῖς μετὰ ταύτας ἑπτὰ ἡμέραις. τὰς γὰρ πάσας δοκεῖ σκυζᾶν ἡμέρας τέτταρας καὶ δέκα ὡς ἐπὶ τὸ πολύ. οὐ μὴν ἀλλὰ καί τισι καὶ περὶ ἑκκαίδεκα ἡμέρας γεγένηται τοῦτο τὸ πάθος. ἡ δ' ἐν τοῖς τόκοις κάθαρσις, γίνεται ἅμα τοῖς σκυλακίοις τικτομένοις. ἔστι δ' αὕτη παχεῖα καὶ φλεγματώδης· καὶ τὸ πλῆθος, ὅταν τέκωσιν, ἀπισχναίνεται ἔλαττον ἢ κατὰ τὸ σῶμα. τὸ δὲ γάλα αἱ κύνες ἴσχουσι πρὸ τοῦ τεκεῖν, ὡς ἐπὶ τὸ πολύ, ἡμέρας πέντε. οὐ μὴν ἀλλ' ἐνίαις καὶ ἑπτὰ γίνεται πρότερον, καὶ τέτταρσι. χρήσιμον δ' εὐθύς ἐστι τὸ γάλα, ὅταν τέκωσιν. ἡ δὲ Λακωνικὴ, μετὰ τὴν ὀχείαν τριάκοντα ἡμέραις ὕστερον. τὸ μὲν οὖν πρῶτον, παχύ ἐστι· χρονιζόμενον δὲ, γίνεται λεπτότερον. διαφέρει δὲ παχύτητι τὸ κύνειον παρὰ τὸ τῶν ἄλλων ζῴων, μετὰ τὸ ὕειον καὶ δασυπόδειον. γίνεται δὲ σημεῖον καὶ ὅταν ἡλικίαν ἔχωσι τοῦ ὀχεύεσθαι· ὥσπερ γὰρ τοῖς ἀνθρώποις, ἐπὶ ταῖς θηλαῖς τῶν μαστῶν ἐπιγίνεται ἀνοίδησίς τις, καὶ χόνδρον ἴσχουσιν. οὐ μὴν ἀλλ' ἔργον, μὴ συνήθει ὄντι, καταμαθεῖν ταῦτα. οὐ γὰρ ἔχει μέγεθος οὐδὲν τὸ σημεῖον. τῇ μὲν οὖν θηλείᾳ τοῦτο συμβαίνει· τῷ δ' ἄρρενι, οὐδὲν τούτων. τὸ δὲ σκέλος αἴροντες, οὐροῦσιν οἱ ἄρρενες, ὡς μὲν ἐπὶ τὸ πολὺ, ὅταν ἑξάμηνοι ὦσι. ποιοῦσι δέ τινες καὶ ὕστερον τοῦτο, ἤδη ὀκτάμηνοι ὄντες, καὶ πρότερον ἢ ἑξάμηνοι. ὡς δ' ἁπλῶς εἰπεῖν, ὅταν ὀχεύειν ἄρξωνται, αὐτὸ ποιοῦσιν. αἱ δὲ θήλειαι, πᾶσαι καθεζόμεναι οὐροῦσιν· ἤδη δέ τινες καὶ τούτων, ἄρασαι τὸ σκέλος, οὔρησαν. τίκτει δὲ καὶ κύων σκυλάκια δώδεκα, τὰ πλεῖστα· ὡς δ' ἐπὶ τὸ πολὺ πέντε, ἢ ἕξ· ἤδη δὲ καὶ ἓν ἔτεκέ τις. αἱ δὲ Λακωνικαὶ, ὡς ἐπὶ τὸ πολὺ καὶ ὀκτώ. ὀχεύονται δὲ αἱ θήλειαι, καὶ ὀχεύουσιν οἱ ἄρρενες, ἕως ἂν ζῶσιν. ἴδιον δὲ ἐπὶ τῶν Λακωνικῶν συμβαίνει πάθος. πονήσαντες γὰρ, μᾶλλον δύνανται ὀχεύειν, ἢ ἀργοῦντες. ζῇ δὲ τῶν Λακωνικῶν κυνῶν ὁ μὲν ἄρρην, ἔτη δέκα· ἡ δὲ θήλεια, περὶ ἔτη δώδεκα· τῶν δὲ ἄλλων κυνῶν αἱ πλεῖσται, περὶ ἔτη τετταρεσκαίδεκα, ἢ πεντεκαίδεκα· ἔνιαι δὲ καὶ εἴκοσι. διὸ καὶ Ὁμηρόν τινες οἴονται ὀρθῶς ποιῆσαι, τῷ εἰκοστῷ ἔτει ἀποθανόντα τὸν κύνα τοῦ Ὀδυσσέως. ἐπὶ μὲν οὖν τῶν Λακωνικῶν, διὰ τὸ πονεῖν τοὺς ἄρρενας μᾶλλον, μακροβιώτεραι αἱ θήλειαι τῶν ἀρρένων· ἐπὶ δὲ τῶν ἄλλων, λίαν μὲν οὐκ ἐπίδηλον· μακροβιώτεροι δὲ ὅμως οἱ ἄρρενες τῶν θηλειῶν εἰσιν. ὀδόντας δὲ κύων οὐ βάλλει πλὴν τοὺς καλουμένους κυνόδοντας· τούτους δ', ὅταν ὦσι τετράμηνοι, ὁμοίως αἵ τε θήλειαι καὶ οἱ ἄρρενες. διὰ δὲ τὸ τούτους μόνους βάλλειν, ἀμφισβητοῦσί τινες. οἱ μὲν γὰρ, διὰ τὸ δύο μόνους βάλλειν, ὅλως οὔ φασι· χαλεπὸν γὰρ ἐπιτυχεῖν τούτοις· οἱ δὲ, ὅταν ἴδωσι τούτους, ὅλως οἴονται βάλλειν καὶ τοὺς ἄλλους. τὰς δὲ ἡλικίας ἐκ τῶν ὀδόντων σκοποῦσιν. οἱ μὲν γὰρ νέοι, λευκοὺς καὶ ὀξεῖς ἔχουσιν· οἱ δὲ πρεσβύτεροι, μέλανας καὶ ἀμβλεῖς.

A hoc eſt, duobus & ſexaginta diebus : quarum catelli duodecim diebus luce carent. Nonnullæ quarta parte anni, hoc eſt, tribus menſibus, ferunt: quarum catelli diebus decem & ſeptem luce carent. Tantumdem temporis canire etiam fœminæ putantur. Menſtrua huius animalis diebus ſeptem mouentur: ſimúlque euenit vt genitale promineat. Verùm nondum per id temporis coitum patiuntur, ſed ſequentibus ſeptem diebus. Tempus enim, quo toto canis libidine tenetur, diebus quatuordecim magna ex parte deſcribitur. Verùm nonnullæ etiam ad ſextumdecimum pruriunt. Purgatio autem, quæ coniuncta partui eſt,
B vnà cum catellis naſcentibus prouenit, craſſo pituitoſóque humore. Redduntur etiam tenuiores à partu: & lac antè diebus quinque, quàm pariant, habent magna ex parte. Verùm nonnullis etiam ſeptem aut quatuor diebus anticipat. Vtile ſtatim, vt pepererint, eſt. Genus Laconicum, poſt coitum diebus triginta, habere lac incipit. Craſſum inter initia omnium eſt: deinde proceſſu temporis tenuius redditur. Craſſius canum, quàm cæterorum animalium, lac eſt, excepto ſcrofæ, ac leporis. Indicium in mammis etiam apparet, cùm ætatem coeundi iam habent. Fit enim perinde ac in hominibus, tumor, in papillis mammarum, & cartilago quædam conſiſtit. Sed
C difficilè id perceperis, niſi habeas vſum rei: carent enim hæc indicia magnitudine. Hoc igitur fœminæ euenire certum eſt: mari nihil eiuſmodi accidit. Crus mares tollentes mingunt, magna ex parte quidem ſexto menſe ætatis, ſed nonnulli vel ſeriùs, octauo ſcilicet menſe id faciunt: atque etiam maturiùs quàm ſexto. Quod autem ſimpliciter dixerim, cùm coire incipiunt, tollunt. Fœminæ omnes conſidentes mingunt. Verùm in hoc etiam ſexu nonnullæ crure elato minxerunt. Parit canis duodecim cumplurimum, ſed magna ex parte quinque aut ſex. Vnum etiam aliquam peperiſſe certum eſt. Laconicæ magna ex parte
D octo pariunt. Coeunt quamdiu viuunt, & mares, & fœminæ. Peculiare generis Laconici eſt, vt cùm laborarint, coire meliùs quàm per otium, poſſint. Viuit in hoc eodem genere mas ad annos decem, fœmina ad duodecim. Cæteri canes maxima quidem ex parte ad annos quatuordecim, ſed nonnulli vel ad viginti protrahunt vitam. Quamobrem rectè apud Homerum, canem Vlyſſis viceſimo anno mori aliqui iudicant. Laconici ſanè generis fœminæ, quia minùs laborant, quàm mares, viuaciores maribus ſunt. At verò in cæteris, etſi non latè admodum conſtat, tamen mares viuaciores ſunt. Dentes canes non
E mutant, præterquam eos quos vocant caninos, eóſque quarto ætatis menſe tam fœminæ quàm mares. Vnde fit vt diuerſa ſit authorum ſententia. alij enim quòd duos tantummodo mutant, negant omnino vllos mutari, cùm eos paucos reperire difficile ſit: alij cùm hos viderint, cæteros quoque pari ratione mutari exiſtimant. Ætatis iudicium ex dentibus ſumitur: quippe cùm iuniores candidos habeant, & acutos: ſeniores, nigros, & hebetes.

CAPVT XXI.

De coitu, & partu boum, déque maris & fœminæ ætate.

BOs vno initu implet, agitque vehementer, ita, vt fœmina vix tolerans ſuccumbat. ſi fortè cõceptio pererrauerit, viceſimo poſt die marem fœmina recipit. Seniores tauri nec ſæpius quidem fœminam eandem, eodem ſuperueniũt die, niſi ex interuallo. at iuniores & eandem ſæpius cogunt, & pluries petunt, ac ſuperueniunt vigore ſuæ ætatis. Salax minimè inter mares bos eſt. Coit qui vicerit. Cúmque is Venere iam debilitatus languerit, aggreditur victus ille languentem, & plerumque ſuperat. Coire tum mares tum fœminæ anno ætatis primo peracto incipiũt, quoad facultas ſit procreãdi: verùm, quod magna ex parte fit, vel anniculi, vel nacti octauum mẽſem Venerem adeunt. Sed enim quod maximè confeſſum habemus, bimatu generant. Ferunt vterum menſes nouẽ, decimo pariũt. Sunt qui decem totos menſes, exceptis paucis diebus, affirment. Quod autem in lucem præcurrerit hæc tempora, id abortiuum eſt, vitaléque minimè, etiam ſi paulo maturauerit partum: prẹmolli namque imperfectáque vngula prodit. Pariũt ſingulos, geminos raro. Quamdiu viuunt, & coire ſolent, & parere. Viuunt magna ex parte fœminæ annos quindecim, atque etiam mares exciſi. Nonnullis ætas vel ad viginti annos, atque etiam plures, ſi corpore bene habito ſint. Nam exciſos aſſuefaciunt, & duces conſtituunt boum, vt ouium, qui plus tẽporis quàm cæteri, viuunt vſu exercitij, & copia pabuli. Vigent quinquennes maximè. Quocirca Homerum quidam rectè dixiſſe aiunt, Quinquennem taurum, &, Bouis luſtro florentis. Idem namque ſignificari arbitrantur. Dentes bimus emittit bos, nec vniuerſos, vt equus. Vngulas, cùm dolore articulorum laborat, non amittit: ſed pedes tantummodo intumeſcunt vehemẽter. Lac à partu vtile eſt: antè quàm peperit, caret lacte. Quantum lactis prouenerit primum, concreſcens perinde vt lapis dureſcit. Quod ita accidit, niſi aqua admiſceatur. Iuuenca recentior, quàm annicula, non patitur Venerem, niſi oſtento. Iam enim vel quarto ætatis menſe coiſſe perſpectum eſt. Initium coitus plurimis quidem menſe Aprili, & Maio: ſed nonnullæ etiam ad autumnum vſque tempus coeundi deducunt. Cùm plures grauidæ ſunt, & facilè initum patiuntur, nimirum pro ſigno hyemis, & imbrium id accipitur. Menſes & vaccis fiunt, vt equabus, ſed minùs.

CAPVT XXII.

De coitu, & partu equorum, de amiſſione dentium, déque maris, & fœminæ ætate.

EQuus coire incipit bimus, tam mas quàm fœmina: ſed hoc in paucis fit, pullíque eorum ipſorum minores imbecillioréſque ſunt. Quod autem plurimùm, trimatu tam mares quàm fœminæ incipiunt, & proficiunt ſubinde ad prolis præſtantiam, in viceſimum vſque annum. Fert vterum equa menſes vndecim: parit duodecimo mẽſe. Equus non certo dierum numerum implet,

A

ΚΕΦΑΛ. κα'.

Περὶ βοῶν ὀχείας, καὶ τόκου, καὶ ἡλικίας.

ΒΟῦς δὲ πληροῖ μὲν ὁ ἄρρην ἐκ μιᾶς ὀχείας· βαίνει δὲ σφοδρῶς, ὥστε συγκάμπτεσθαι τὴν βοῦν. ἐὰν δ' ἁμάρτῃ τῆς ὁρμῆς, εἴκοσιν ἡμέρας διαλείπουσα, προσίεται πάλιν ἡ θήλεια τὴν ὀχείαν. οἱ μὲν οὖν πρεσβύτεροι τῶν ταύρων, οὐκ ἀναβαίνουσι πλεονάκις ἐπὶ τὴν αὐτὴν τῆς αὐτῆς ἡμέρας, ἐὰν μὴ ἀνὰ διαλιπόντες. οἱ δὲ νεώτεροι, καὶ τὴν αὐτὴν [βιάζονται] πλεονάκις, καὶ ἐπὶ πολλὰς ἀνα-
B βαίνουσι, διὰ τὴν ἀκμήν. ἥκιστα δὲ λάγνον τῶν ἀρρένων ἐστὶ βοῦς. ὀχεύει δὲ ὁ νικῶν τῶν ταύρων· ὅταν δ' ἐξαδυνατήσῃ διὰ τὴν λαγνείαν, ἐπιτίθεται ὁ ἡττώμενος, καὶ κρατεῖ πολλάκις. ὀχεύει δὲ τὰ ἄρρενα, καὶ ὀχεύεται τὰ θήλεα, ἐνιαύσια ὄντα πρῶτον, ὥστε καὶ γεννᾶν· οὐ μὴν ἀλλά, τό γε ὡς ἐπὶ τὸ πολὺ * ἐνιαύσιοι καὶ ὀκτάμηνοι. τὸ δ' ὁμολογούμενον μάλιστα, διετεῖς. κύει δὲ, ἐννέα μῆνας, δεκάτῳ δὲ τίκτει. ἔνιοι δὲ διισχυρίζονται δέκα μῆνας κύειν, ἡμερῶν ὀλίγων ἐκτός. τὸ δὲ ἂν πρότερον ἐξενεχθῇ τοῦ εἰρημένου χρόνου, ἐκβόλιμόν ἐστι, * καὶ οὐ ζῇ ἔτι, κἂν μικρὸν προτερήσῃ ὁ τόκος ὅτε θήλ. ζῆν. μαλακαὶ γὰρ καὶ ἀτελεῖς γίνονται αἱ ὁπλαί. τίκτει δὲ ἓν τὰ
C πλεῖστα, ὀλιγάκις δὲ δύο, καὶ τίκτει καὶ ὀχεύει ἕως ἂν ζῇ. ζῇ δ' ὡς ἐπὶ τὸ πολὺ περὶ πεντεκαίδεκα ἔτη ἡ θήλεια, καὶ ἄρρενες δὲ, ἐὰν ἐκτμηθῶσιν. ἔνιαι δὲ ζῶσι καὶ εἴκοσιν ἔτη, καὶ ἔτι πλείω, ἐὰν εὐφορῶσι τὸ σῶμα. καὶ γὰρ τῶν βοῶν τινες τομίας ἐπάγουσι, καὶ καθηγεῖσθαι τῶν βοῶν νεμομένας, ὥσπερ τῶν προβάτων, καὶ ζῶσι πλείω χρόνον τῶν ἄλλων, διά τε τὸ πονεῖν, καὶ διὰ τὸ νέμεσθαι ἀκέραιον νομήν. ἀκμάζει δὲ μάλιστα πενταετής. ὧν διὸ καὶ Ὅμηρον φασὶ πεποιηκέναι τινὲς ὀρθῶς, ποιήσαντα, ἄρσενα πενταέτηρον. καὶ τὸ, βοὸς ἐννεώροιο. δύναται γὰρ ταὐτό. τοὺς δ' ὀδόντας βάλλει ὁ βοῦς διετής, καὶ οὐκ ἀθρόους, ὥσπερ ὁ ἵππος. τὰς δὲ ὁπλάς, ὅταν πο-
D δαγρᾷ, οὐκ ἀποβάλλει, ἀλλ' οἰδεῖ μόνον σφόδρα τοὺς πόδας. τὸ δὲ γάλα, ὅταν τέκῃ, χρήσιμον· πρὸ δ' ἔμπροσθεν δ' οὐκ ἔχει γάλα. τὸ δὲ πρῶτον γινόμενον γάλα ὅταν παγῇ, οὕτω γίνεται σκληρόν, ὥσπερ λίθος. τοῦτο δὲ συμβαίνει, ἐὰν μή τις μίξῃ ὕδατι. νεώτεραι δ' ἐνιαυσιαίων οὐκ ὀχεύονται, πλὴν ἐάν τι τερατῶδες. ἤδη δέ τινες τετραμήνων ὠχεύθησαν. ἄρχονται δὲ τῆς ὀχείας περὶ τὸν θαργηλιῶνα μῆνα καὶ τὸν σκιρροφοριῶνα αἱ πλεῖσται. οὐ μὴν ἀλλ' ἔνιαι καὶ μέχρι τοῦ μετοπώρου κυΐσκονται. ὅταν δὲ πολλαὶ κύωσι, καὶ προσδέχωνται τὴν ὀχείαν, σφόδρα δοκεῖ σημεῖον εἶναι καὶ χειμῶνος καὶ ἐπομβρίας. αἱ δὲ καθάρσεις γίνονται μὲν ταῖς βου-
E σίν, ὥσπερ ταῖς ἵπποις, ἧττον δέ.

ΚΕΦΑΛ. κβ'.

Περὶ ἵππων ὀχείας, καὶ τόκου, καὶ ὀδόντων ἀποβολῆς, καὶ μακροβιότητος.

ΙΠπος δ' ἄρχεται ὀχεύειν, ὁ μὲν ἄρρην, διετής· ἡ δὲ θήλεια, διετὴς ὀχεύεσθαι. ταῦτα μέντοι ὀλίγα ἐστί, καὶ τὰ ἔκγονα τούτων ἐλάττω καὶ ἀσθενικώτερα. ὡς δ' ἐπὶ τὸ πολὺ ἄρχονται ὀχεύειν, τριετεῖς ὄντες, καὶ αἱ ἵπποι ὀχεύονται. καὶ ἐπιδιδόασι δ' ἀεὶ πρὸς τὸ βέλτιον τὰ ἔκγονα γίνεσθαι, μέχρι ἐτῶν εἴκοσι. κύει δ' ἕνδεκα μῆνας, δωδεκάτῳ δὲ τίκτει. πληροῖ δ' ὁ ἵππος οὐκ ἐν τεταγμέναις ἡμέραις,

* Gaza legit, ἢ ἑκτάμ. minùs rectè.

* Scrib. καὶ οὐ ζῇ ἐὰν καὶ μικρὸν προτερήσῃ τῷ τόκῳ, οὐ δύναται ζ. vulgata lectio ſubinepta eſt.

A ἀλλ' ἐνίοτε μὲν ἐν μιᾷ, ἢ δυοῖν, ἢ τρισίν· ἐνίοτε δὲ, πλείοσι. θᾶττον δ' ἐπιβαίνων πληροῖ ὄνος, ἢ ἵππος. ἡ δὲ ὀχεία οὐκ ἐπίπονος τῶν ἵππων, ὥσπερ ἡ τῶν βοῶν. λαγνίστατον δὲ καὶ τῶν θηλειῶν καὶ τῶν ἀρρένων ἵππος μετ' ἄνθρωπόν ἐστιν. ἡ δὲ τῶν νεωτέρων ὀχεία, γίνεται παρὰ τὴν ἡλικίαν, ὅταν εὐβοσία καὶ ἀφθονία γίνηται τροφῆς. ἔστι μὲν οὖν ὡς ἐπὶ τὸ πολὺ μονοτόκος· τίκτει μέντοι ποτὲ καὶ δύο τὰ πλεῖστα. καὶ ἡμίονος δὲ ἤδη ἔτεκε τις δύο· ἃ νομίζουσιν ἐν τέρασιν. ὀχεύει μὲν οὖν ἵππος καὶ τριακοντάμηνος· ὥστε δὲ καὶ γεννᾶν ἀξίως, ὅταν παύσηται* βάλλων. ἤδη δὲ τινες καὶ βάλλοντες ἐπλήρωσαν, ὥς φασιν, ἂν μὴ φύσει ἄγονοι τυγχάνωσιν ὄντες. ἔχει μὲν οὖν ὀδόντας τετταράκοντα. βάλλει δὲ τοὺς μὲν πρώτους τέτταρας, τριακοντάμηνος, τοὺς μὲν δύο ἄνωθεν, τοὺς δὲ δύο κάτωθεν. ἐπειδὰν δὲ γένηται ἐνιαυτὸς, βάλλει τὸν αὐτὸν τρόπον τέτταρας, δύο μὲν ἄνωθεν, δύο δὲ κάτωθεν· καὶ πάλιν, ὅταν ἄλλος ἐνιαυτὸς γένηται, ἑτέρους τέτταρας τὸν αὐτὸν τρόπον. τεττάρων δὲ ἐτῶν γενόμενος καὶ ἓξ μηνῶν, οὐκέτι βάλλει οὐδένα. ἤδη δέ τις ἤδη, ὁ πρότερον ἅμα πάντας ἐξέβαλε, καὶ ἄλλος ἅμα τοῖς τελευταίοις ἅπαντας· ἀλλὰ τὰ τοιαῦτα γίνεται ὀλιγάκις. ὥστε συμβαίνει, ὅταν τεττάρων ἐτῶν ᾖ καὶ ἓξ μηνῶν, γεννητικώτατον εἶναι πρὸς τὴν γένεσιν μάλιστα. εἰσὶ δὲ οἱ πρεσβύτεροι τῶν ἵππων, γονιμώτεροι· καὶ οἱ ἄρρενες τῶν ἀρρένων, καὶ αἱ θήλειαι τῶν θηλειῶν. ἀναβαίνουσι δὲ καὶ ἐπὶ τὰς μητέρας οἱ ἵπποι, καὶ ἐπὶ τὰς θυγατέρας· καὶ τότε δοκεῖ τέλειον εἶναι τὸ ἱπποφόρβιον, ὅταν ὀχεύωσιν ἑαυτῶν τὰ ἔκγονα. οἱ δὲ Σκύθαι ἱππεύουσι ταῖς κυούσαις ἵπποις, ὅταν θᾶττον στραφῇ τὸ ἔμβρυον· καί φασι γίνεσθαι αὐτὰς εὐτοκωτέρας. τὰ μὲν οὖν ἄλλα τετράποδα, τίκτει κατακείμενα· διὸ καὶ πλάγια προέρχεται τὰ ἔμβρυα πάντων. ἡ δὲ ἵππος ἡ θήλεια, ὅταν ἤδη πλησίον ᾖ τῆς ἀποτέξεως, ὀρθὴ στᾶσα, προΐεται τὸ ἔκγονον. ζῶσι δὲ τῶν ἵππων οἱ πλεῖστοι, περὶ ὀκτωκαίδεκα ἔτη, καὶ εἴκοσι· [ἔνιοι δὲ πέντε καὶ εἴκοσι,] καὶ τριάκοντα· ἐὰν δέ τις θεραπεύῃ, ἐκτείνει καὶ περὶ τὰ πεντήκοντα. ὁ δὲ μακρότατος βίος τῶν ἵππων ἐστὶν ὡς ἐπὶ τὸ πολὺ τριάκοντα ἐννέα ἔτη. ἡ δὲ θήλεια, ὡς ἐπὶ τὸ πολὺ, πέντε καὶ εἴκοσιν ἔτη· ἤδη δέ τινες καὶ τετταράκοντα ἔτη βεβιώκασιν. ἐλάττω δὲ χρόνον βιοῦσιν οἱ ἄρρενες τῶν θηλειῶν, διὰ τὰς ὀχείας, καὶ ἰδίᾳ τρεφόμενοι τῶν ἐν τοῖς ἱπποφορβίοις. ἡ μὲν οὖν θήλεια, πέντε ἐτῶν, τέλος λαμβάνει μήκους καὶ ὕψους· ὁ δὲ ἄρρην, ἓξ ἐτῶν. μετὰ δὲ ταῦτα, ἐν ἄλλοις ἓξ ἔτεσι, τὸ πλῆθος λαμβάνει τοῦ σώματος, καὶ ἐπιδίδωσι μέχρις ἐτῶν εἴκοσι, καὶ ἀποτελειοῦνται. τελειοῦνται δὲ τὰ θήλεα τῶν ἀρρένων ἔμπροσθεν· ἐν δὲ τῇ γαστρὶ, τὰ ἄρρενα τῶν θηλειῶν, καθάπερ καὶ ἐπὶ τῶν ἀνθρώπων. τὸ αὐτὸ δὲ τοῦτο συμβαίνει καὶ ἐπὶ τῶν ἄλλων ζῴων, ὅσα πλείω τίκτει. θηλάζειν δέ φασι τὸν μὲν ἡμίονον, ἑξάμηνον· εἶτα οὐκέτι προσίεσθαι, διὰ τὸ ἀνιᾶσθαι καὶ πιέζεσθαι· τὸν δὲ ἵππον, πλείω χρόνον. ἀκμάζει δὲ καὶ ἵππος καὶ ἡμίονος μετὰ τοὺς βόλους· ὅταν δὲ πάντας ὦσι βεβληκότες, οὐ ῥᾴδιον γνῶναι τὴν ἡλικίαν· διὸ καὶ λέγουσι * γνώμην ἔχειν, ὅταν ἄβολος ᾖ· ὅταν δὲ βεβληκὼς, οὐκ ἔχειν. ὅμως δὲ μάλιστα γνωρίζεται ἡ ἡλικία μετὰ τοὺς βόλους τῷ κυνόδοντι. τῶν μὲν γὰρ ἱππαστῶν, γίνεται μικρὸς, διὰ τὴν τρῖψιν· κατὰ τοῦτον γὰρ ἐμβάλλεται ὁ χαλινός· τῶν δὲ μὴ ἱππαστῶν, μέγας μὲν,

* Malim, βάλλων. (ἤδη δέ τινες καὶ βάλ. ἐπλ. ὥς φασιν) ἂμ planiore ſenſu quàm quem expreſſit Gaza.

* Suprà, li. 5. c. 14.

* Fortaſſe, γνῶμα, vel γνώμων. quas voces hac notiores accipi teſtantur veteres Grammatici.

A ſed aliquando vno, aut duobus, tribúſve, aliquando pluribus. Seriùs certè quàm aſinus equam ſuperueniens implet. Coitus non tam laborioſus equis, quàm bubus eſt. Salaciſſimum omnium, tum fœminarum, tum marium, equus eſt, homine excepto. Iuniorum coitus præter ætatem contingit pabuli bonitate, & copia. Pariunt magna ex parte equæ ſingulos, ſed gemellos quoque aliquando cumplurimum procreant. Mula etiam gemellos peperit, quæ quidem pro oſtento accipiuntur. Coire itaque incipit equus vel triceſimo menſe, ſed quoad dignè procreare poſſit, tunc tempus eſt, cùm dentibus mittendis ceſſauit. Verùm iam nonnullos etiam cùm mutant, implere potuiſ- B ſe aiunt: idque fieri ita confirmant, niſi natura ſteriles ſint. Equo dentes quadraginta numero ſunt, quorum primi quatuor menſe triceſimo mutantur, bini vtrimque, ſuprà dico, & ſubter: tum vbi præterea annum compleuerit, quatuor item, modo eodem mittuntur, duo ſuperiùs, totidémque inferiùs: rurſúſque anno altero peracto, ſimili modo quatuor alij mutantur. Quibus iam præteritis annis quatuor, & menſibus ſex, nullus præterea mittitur: quanquam eueniſſe in aliquo certum eſt, vt cùm primis omnes amitterentur: atque etiam in alio, vt cum vltimis omnes, ſed hæc raró. Fit itaque vt equo ferè tempus idoneum maximè ſit ad C procreandum, cùm annum quartum & ſex menſes cõplerit. Seniores equi profectò fœcundiores ſunt, tam fœminæ quàm mares. Equi vel ſuas matres & filias ſuperueniunt, atque tunc perfectum eſſe armentum videtur, cùm parentes ſuam ineunt prolem. Scythæ equabus grauibus equitant, cùm primùm ſe mouerit fœtus: & nimirum eas proficere ad partus facilitatem arbitrantur. Cæteræ quadrupedes iacentes parere ſolent: quo fit vt fœtus obliqui omnium exeant. At verò equa cùm tempus iam edendi appropinquarit, erigit ſe, ſtánſque emittit partum. Vita equorum plurimis ad decimum octauum, atque etiam viceſimum annum: D ſed nonnulli etiam quinque & viginti, atque triginta egerunt. Et, ſi cura diligenter adhibeatur, vel ad quinquaginta protrahitur ætas. Longiſſima tamen vita in pluribus ad triceſimum nonum annum, quod magna ex parte fieri nouimus. Fœmina magna quidem parte quinque & viginti annos viuere poteſt: ſed iam nonnullæ etiam quadraginta vixere. Minus temporis mares viuunt, quàm fœminæ, propter coitum: & qui domi aluntur, minùs quàm gregarij. Fœmina quinquennio finem, tum longitudinis, tum etiam proceritatis ſui corporis recipit: ſed mas ſexennio: poſt, annis ſequentibus totidem creſcit in corpulentiam, & ad viginti vſque E annos pergit proficiens. Verùm celeriùs fœminæ quàm mares, perficiuntur: quanquam in vtero mares quàm fœminæ, citiùs: quemadmodum etiam homines. Quod idem vel in cæteris animalibus, quæ pariant plura, fieri ſolet. Lactare mulum ſemeſtre temporis ſpatium referunt, mox ſugi non pati: vi namque humorem trahi, & cum dolore. Equo autem plus temporis tribuunt. Viget & equus, & mulus à dentium ortu: cúmque prodierint omnes, non facilè ætatem dignoueris. Quamobrem dici ſolet certa ſub ortu, incerta ab ortu. Denique poſt dentium ortum, eo maximè declaratur ætas, quem caninum vocamus: breuior enim hic ſeptennibus eſt, propter fræni attritum, quod ad eum inijcitur: non ſeptennibus maior quidem,

ſed non vertice extans adactiore. Iunioribus acutior & procerior eſt. Mas omnibus temporibus init, nec ceſſat, quamdiu viuit. Fœmina etiam quâdiu viuit, initur, nec tempus vllum certum libidinem aufert: ſed ingenium hominis arcet, aut vinculo, aut aliquo huiuſcemodi impedimento: non tamen quouis tempore facto initu, facultas enutriendi quod pepererit, datur. Equum apud Opûta gregarium fuiſſe accepimus, qui annos quadragenta natus poſſet coire: ſed adiumētum quoad ſui pedes priores attollerentur, deſiderabat. Coeundi initium equis in vêre. Non ſtatim à partu equa impletur, ſed intermiſſo tẽpore & meliùs quarto aut quinto anno interpoſito procreat. Omnino, ſi nihil plus detur, vnum tamen interponere annũ, & quaſi nouale facere neceſſe eſt. Equa igitur interpoſito tempore, vt dictum eſt, parit: at aſina continuè parere poteſt. Fit etiam in equorum genere, vt aliæ omnino ſteriles ſint, aliæ concipiant quidem, ſed edere nequeant. Cuius rei indicium aiunt, quòd fœtus circum renes alia quędam ſpecie propemodum renum, ita continet, vt reſciſſis quatuor renes habere videatur. Cùm equa peperit, ſtatim ſecundas deuorat, atque etiam quod pulli naſcentis fronti adhæret, hippomanes dictum, magnitudine minus carica parua, ſpecie latiuſculum, orbiculatum, nigrum: hoc ſi quis prærepto odorem moueat, equa excitatur, furitque agnito eo odore. Quapropter id à veneficis petitur & percipitur mulierculis. Si cũ equa ex equo prægnante coierit aſinus, fœtus iam conceptus corrumpitur. Equorum ducem, vt boũ, nullum cõſtituunt: quoniam equorum natura non ſtabilis, ſed mobilis, procaxque eſt.

CAPVT XXIII.

De coitu aſini, & aſinæ partu, mariſque & fœminæ ætate.

ASinus, tum mas tum fœmina, triceſimo menſe coire incipit, eodémque tempore dentes mittit priores: ſecundos autem ſexto menſe, atque etiam tertios quartóſque eodem. Gnomonas hos quartos à diiudicanda ætate nuncupant. Sed iam vel annicula aſina concepit, vt perfici proles ac adoleſcere poſſet. Reijcit ſemen à coitu, niſi interpelletur. Quamobrem ſtatim poſt coitum verberant inſectantúrque. Parit duodecimo menſe. Singulatim magna ex parte procreat prolem. Ea namque natura eſt, vt vnum pariat: ſed nonnunquam gemellos etiam edit. Aſinus quidem equi genituram corrumpit, vt dictum eſt: ſed equus aſini minimè, cùm equa iam aſini initu conceperit. Lac grauida habet menſe decimo. A partu die ſeptimo mari iungitur, eóque die iuncta maximè recipit initum, ſed poſtmodum etiam patitur. Solet hæc, niſi priùs quàm gnomonem amittat, pepererit, nunquam poſtea initum recipere. Parere vel in conſpectu hominis, vel in luce nolit, ſed in tenebras ducitur cùm parturit. Si priùs, quàm gnomonem dimiſiſſet, pepererit, parere tota ſua ætate poteſt. Vita aſinis amplior annis triginta, & fœmina viuacior mare eſt. Cùm vel equus cum aſina, vel aſinus cum equa inierit, multò magis abortus conſequitur, quàm cùm vnigenæ inter ſe iungantur: verbi gratia, equa cum equo, aut aſina cum aſino.

A ἀλλ' ἀπηρτημένος· τῶν δὲ νέων, ὀξεῖς καὶ μικρός. ὀχεύει δὲ ὁ μὲν ἄρρην, πᾶσαν τὴν ὥραν, καὶ ἕως ἂν ζῇ· καὶ ἡ θήλεια δ', ὀχεύεται ἕως ἂν ζῇ. * οὕτω δὲ πᾶσαν ὥραν, ἐὰν μή τις δεσμεύῃ ἢ ἄλλην τινὰ προσάγῃ ἀνάγκην· ὥρα δὲ οὐκ ἀφαιρεῖται οὐδεμία τεταγμένη τοῦ ὀχεύεσθαι καὶ ὀχεύειν. οὐ μέντοι γε ὅτ' ἔτυχε ἡμαρτημένης τῆς ὀχείας, δύνανται ἃ ἂν γεννήσωσιν, ἐκτρέφειν. Ὀπουντίῳ δὲ ὁ * φορβειῷ ἵππος ὤχευεν ἐτῶν ὢν τετταράκοντα· ἔδει δὲ τὰ πρόσθια σκέλη συνεπαίρειν. ἄρχονται δ' ὀχεύεσθαι αἱ ἵπποι τοῦ ἔαρος. ὅταν δὲ τέκῃ ἡ ἵππος, οὐκ εὐθὺς πίμπλαται, ἀλλὰ διαλείπει χρόνον, καὶ τίκτει B ἄμεινον τετάρτῳ ἢ πέμπτῳ ἔτει μετὰ τὸν τόκον. ἕνα δ' ἐνιαυτὸν καὶ παντελῶς ἀνάγκη διαλείπειν, καὶ ποιεῖ, ὥσπερ νέον. ἵππος μὲν οὖν, διαλείπουσα τίκτει, ὥσπερ εἴρηται· * ἡμίονος δὲ συνεχῶς. γίνονται δὲ τῶν ἵππων αἱ μὲν [καὶ] ἄτεκνοι ὅλως· αἱ δὲ συλλαμβάνουσι μὲν, οὐ δύνανται δ' ἐκφέρειν· σημεῖον δὲ τῶν τοιούτων λέγουσιν εἶναι, τὸ ἔμβρυον ἀνασχιζόμενον ἔχειν ἄλλα νεφροειδῆ περὶ τοὺς νεφροὺς, ὥστε δοκεῖν τέτταρας εἶναι νεφρούς. ὅταν δὲ τέκῃ ἡ ἵππος, τότε χόριον εὐθὺς κατεσθίει, καὶ ἀπεσθίει τοῦ πώλου ὃ ἐπιφύεται ἐπὶ τοῦ μετώπου τούτων τῶν πώλων, ὃ καλεῖται ἱππομανές. ἔστι δὲ τὸ μέγεθος, ἔλαττον μικρῷ C ἰσχάδος· τὴν δὲ ἰδέαν, πλατὺ, περιφερὲς, μέλαν. τοῦτο ἐάν τις φθῇ λαβὼν, καὶ ὀσφραίνηται ἡ ἵππος, ἐξίσταται καὶ μαίνεται πρὸς τὴν ὀσμήν. διὸ καὶ αἱ φαρμακίδες ζητοῦσι καὶ συλλέγουσιν. ἐπὰν δὲ ὀχευομένην ἵππον ὑπὸ ἵππου ὄνος ὀχεύσῃ, διαφθείρει τὸ ἔμβρυον τὸ ἐνυπάρχον. ἵππων δὲ ἡγεμόνα οὐ καθιστᾶσιν οἱ ἱπποφορβοὶ, ὥσπερ βοῶν, διὰ τὸ μὴ μόνιμον εἶναι τὴν φύσιν αὐτῶν, ἀλλ' ὀξεῖαν καὶ εὐκίνητον.

ΚΕΦΑΛ. κγ'.

Περὶ ὄνων ὀχείας, καὶ τόκου, καὶ ἡλικίας.

D ΟΝος δὲ ὀχεύει μὲν καὶ ὀχεύεται τριακοντάμηνος, καὶ βάλλει τοὺς πρώτους ὀδόντας· τοὺς δὲ δευτέρους ἑκταμήνῳ, καὶ τοὺς τρίτους καὶ τοὺς τετάρτους ὡσαύτως· τούτους δὲ γνώμονας καλοῦσι, τοὺς τετάρτους. ἤδη δὲ καὶ ἐνιαυσία ὄνος ἐκύησεν, ὥστε καὶ ἐκτραφῆναι. ἐξουρεῖ δὲ, ὅταν ὀχευθῇ, τὴν γονὴν, ἐὰν μὴ κωλύηται· διὸ τύπτουσι μετὰ τὴν ὀχείαν εὐθὺς, καὶ διώκουσι. τίκτει δὲ δωδεκάτῳ μηνί. τίκτει δὲ τὰ μὲν πολλὰ, ἕν· μονοτόκον γὰρ ἐστὶ φύσει· τίκτει δ' ἐνίοτε καὶ δύο. ὁ μὲν οὖν ὄνος ἐπαναβὰς, διαφθείρει τὸ τοῦ ἵππου ὄχευμα, ὥσπερ εἴρηται· ὁ δὲ ἵππος, τὸ τοῦ ὄνου οὐ διαφθείρει, ὅταν ᾖ ὀχευομένη ἡ ἵππος ὑπὸ τοῦ ὄνου. ἴσχει δὲ γάλα κύουσα, δεκάμηνος E οὖσα. τεκοῦσα δὲ, βιβάζεται ἑβδόμῃ ἡμέρᾳ, καὶ μάλιστα δέχεται τὸ πλήρωμα ταύτῃ τῇ ἡμέρᾳ. βιβασθεῖσα λαμβάνει δὲ καὶ ὕστερον· ἐὰν δὲ μὴ τέκῃ πρὶν * τὸ γνῶμα λείπειν, οὐκέτι λαμβάνει πλήρωμα, οὐδὲ κυΐσκεται τοῦ λοιποῦ βίου πάμπαν. τίκτειν δὲ οὐ θέλει οὔτε ὁρωμένη ὑπὸ ἀνθρώπου, οὔτε ἐν τῷ φωτὶ, ἀλλ' εἰς τὸ σκότος ἀπάγουσιν, ὅταν μέλλῃ τίκτειν. τίκτει δὲ διὰ βίου, ἐὰν τέκῃ πρὶν τὸ γνῶμα λείπειν. βιοῖ δὲ ὄνος πλείω τριάκοντα ἐτῶν, καὶ ἡ θήλεια τοῦ ἄρρενος πλείω ἔτη. ὅταν δὲ ἵππος ὀχεύσῃ ὄνον, ἢ ὄνος ἵππον, πολὺ μᾶλλον ἐξαμβλοῖ, ἢ ὅταν ὁμογενῆ ἀλλήλοις μιχθῇ, οἷον ἵππος ἵππῳ, καὶ ὄνος ὄνῳ.

* Mendoſus eſt hic locus. Itaque Gaza quædam omiſit, quædam tranſpoſuit. planus erit locus ſi ita legas, οὕτως δὲ καὶ πᾶσαν ὥρ. &c. & mox. ὥρα δὲ οὐκ ἀφαιρεῖται οὐδ. τ. ὀ.

* Gaza φορβίῳ.

* Scrib. cum Gaza, ἡ ἵππος δὲ. vel ἐνίοτε.

* Sic legendum cum veteribus codd. non τὸ γνώμονα, vt quidam emendant hîc & mox. fruſtra.

A ἀποβαίνει δὲ καὶ ὁ τῆς κυήσεως χρόνος, ὅταν μιχθῇ ἵππος καὶ ὄνος, κατὰ τὸ ἄρρεν. λέγω δὲ, ἐφ᾿ ὅσον χρόνον τὸ ἄρρεν γίνεται, ἐξ ὁμογενῶν γινόμενον. τὸ δὲ μέγεθος τοῦ σώματος, καὶ τὸ εἶδος, καὶ ἡ ἰσχὺς, μᾶλλον τῇ θηλείᾳ ἀφομοιοῦται τὸ γεννώμενον. ἂν δὲ συνεχῶς μίσγηται, καὶ μὴ διαλείπῃ χρόνον τινὰ οὕτως ὀχευόμενα, ταχέως ἡ θήλεια ἄγονος γίνεται· διὸ συνεχῶς οὐ μισγέουσιν οἵ γε περὶ τὰ τοιαῦτα πραγματευόμενοι, ἀλλὰ διαλείπουσί τινα χρόνον. οὐ προσδέχεται δὲ οὔτε ἡ ἵππος τὸν ὄνον, οὔτε ἡ ὄνος τὸν ἵππον, ἐὰν μὴ τύχῃ τεθηλακὼς ὁ ὄνος ἵππον. ἐπιβάλλουσι γὰρ ἐπιτηδὲς οὓς καλοῦσιν ἱπποθήλας. οὗτοι δ᾿ ὀχεύουσιν ἐν τῇ νομῇ B βίᾳ κρατοῦντες, ὥσπερ οἱ ἵπποι.

ΚΕΦΑΛ. κδ'.

Περὶ ὀρέων ὀχείας καὶ τόκου καὶ ἡλικίας.

Ὁ δὲ ὀρεὺς, ἀναβαίνει μὲν καὶ ὀχεύει μετὰ* τὴν πρώτην βόλον ἑπταέτης δ᾿ ὢν, καὶ πληροῖ.* καὶ ἤδη γέγονε γίνος ὅταν ἀναβῇ ἐφ᾿ ἵππον θήλειαν· ὕστερον δ᾿ οὐκέτι ἀναβαίνει. καὶ ὁ θῆλυς δὲ ὀρεὺς ἤδη ἐπληρώθη, οὐ μέντοι γε ὥστ᾿ ἐξενεγκεῖν διὰ τέλους. αἱ δὲ ἐν τῇ Συρίᾳ τῇ ὑπὲρ Φοινίκης ἡμίονοι, καὶ ὀχεύονται καὶ τίκτουσιν· ἀλλ᾿ C ἔστι τὸ γένος ὅμοιον μὲν, ἕτερον δέ. οἱ δὲ καλούμενοι γίννοι, γίνονται ἐξ ἵππου, ὅταν νοσήσῃ ἐν τῇ κυήσει, ὥσπερ [οἱ] μὲν τοῖς ἀνθρώποις, οἱ νάνοι· ἐν δὲ τοῖς ὑσὶ, τὰ μετάχοιρα. καὶ ἴσα δὲ, ὥσπερ οἱ νάνοι, ὁ γίννος τὸ αἰδοῖον μέγα. ζῇ δὲ ἡμίονος ἔτη πολλά. ἤδη γάρ τις βεβίωκε καὶ ὀγδοήκοντα ἔτη· οἷον Ἀθήνησιν ὅτε τὸν νεὼν ᾠκοδόμουν· ὃς* καὶ ἀφειμένος ἤδη διὰ γῆρας, συναμπρεύων* παραπροβαινόμενος, παρώξυνε τὰ ζεύγη πρὸς τὸ ἔργον· ὥστ᾿ ἐψηφίσαντο μὴ ἀπελαύνειν αὐτὸν τοὺς σιτοπώλας ἀπὸ τῶν τηλιῶν. γηράσκει δὲ βραδύτερον ὁ θῆλυς ὀρεὺς τοῦ ἄρρενος. λέγουσι δ᾿ ἔνιοι, ὅτι ἡ μὲν, καθαίρεται οὐροῦσα· ὁ δ᾿ ἄρρην, διὰ τὸ ὀσφραίνεσθαι τοῦ οὔρου, γηράσκει μᾶλλον θᾶττον. D τούτων μὲν οὖν τῶν ζῴων αἱ γενέσεις, τοῦτον ἔχουσι τὸν τρόπον.

* Scrib. ὁ δὲ ἐνεῶν γ᾿ ἔτει, vt alibi docemus. & Gaza quoque scripserat *hinnum*. De generat. anim. lib. 2. c. vlt.

* κ. καὶ τὸ ἀφ. melius.

* Fort. παραπροβαίνων τε. vt Plinius vertit 8.44. *continendo comitandóque.*

ΚΕΦΑΛ. κε'.

Σημεῖον ἡλικίας τῶν τετραπόδων.

Τὰ δὲ νέα καὶ τὰ παλαιὰ τετράποδα διαγινώσκουσιν οἱ περὶ τὰς θεραπείας ὄντες αὐτῶν. ἐὰν μὲν ἀπὸ τοῦ γνάθου τὸ δέρμα ἑφελκόμενον ταχὺ ἐπίῃ, νέον τὸ τετράποδον· ἐὰν δὲ πολὺν χρόνον ἐρρυτιδωμένον μένῃ, παλαιόν.

E

ΚΕΦΑΛ. κς'.

Περὶ κυήσεως καὶ ἡλικίας τῆς καμήλου.

Ἡ δὲ κάμηλος, κύει μὲν δέκα μῆνας, τίκτει δ᾿ ἀεὶ ἓν μόνον· μονοτόκον γάρ ἐστιν. ἐκκρίνουσι δὲ ἐκ τῶν καμήλων ἐνιαύσιον τὸ ἔκγονον. ζῇ δὲ χρόνον πολὺ πλείω ἢ πεντήκοντα ἔτη. τίκτει δὲ τοῦ ἔαρος, καὶ γάλα ἔχει μέχρις οὗ ἂν ἐν γαστρὶ λάβῃ. ἔχει δὲ καὶ* τὰ κρέα καὶ τὸ γάλα, μέχρις οὗ ἂν ἐν γαστρὶ λάβῃ, ἥδιστα πάντων. πίνουσι δὲ τὸ γάλα, δύο καὶ ἓν, ἢ τρία καὶ ἓν, πρὸς ὕδωρ κεράσαντες.

* Mercurialis Variar. li. 2. c. 5.

A Euenit etiam tempus gerendi vteri, cùm equus cum aſino coierit, maris norma: id eſt, vt quo ſuo ſpatio temporis mas perficitur ſuo in genere, eo etiam fœtus, quem ipſe procreat, abſoluatur: at magnitudine corporis, ſpecie, & viribus, magis fœminæ quàm mari ſimile euadit quod naſcitur. Si frequenter coeant, neque vllo interpoſito tempore ceſſent, quæ ita iunguntur, breui fœmina ſterileſcit. Qua de cauſa non frequenter ita coniungunt, qui curam huic adhibent rei, ſed tempus aliquod interponunt. Non aſinum equa, vt aſina equum, recipit, niſi aſinus ſit, qui equam ſuxerit. Admittunt de induſtria quos hippothelas vocant, ac ſi equimulgos cognomines, qui in paſcuis modo e- B quorum viribus bonis ſuperantes coeant.

CAPVT XXIV.

De mulo, & eius coitu, & ætate.

MVlus ſuperuenire coitéque incipit miſſis dentibus primis: ſed ſeptennis implere poteſt, & iam cum equa coniunctus ginnum procreauit: pòſt deinde ſuperuenire non ſolet. Mula quoque iam facta grauida eſt, ſed non quoad perficeret, atque ederet prolem. In terra Syria ſuper Phœnicem mulæ & coeunt, & pariunt omnes: ſed id ge- C nus diuerſum eſt, quanquam ſimile. Prodeũt, quos ginnos vocant, ex equa, cum in gerendo vtero ægrotauit, more pumilionum in ordine hominum, aut porcorum deprauatorum in genere ſuum, quos poſthumos nuncupaui. & quidem vt pumilio, ſic ginnus modum ſuo genitali excedit. Vita mulis ad annos multos: iam quidam vel octogeſimum annum potuit agere, vt Athenis cùm templum ædificaretur, qui quamuis dimiſſus iam munere per ſenectam, commeans tamen ac obiens iumenta, exhortabatur ad opus: quamobrem decreto à nemine eum arceri à frumentorum aceruis ſancitũ eſt. Seriùs fœmina ſeneſcit, quàm mas. Nonnulli fœminam profluuio vrinæ purgari aiunt: marem, olfa- D ctu vrinæ priùs ſeneſcere. Ortus eorum animalium talis eſt.

CAPVT XXV.

Indicium ætatis quadrupedum.

ÆTatem dignoſci quadrupedum confirmant, qui in earum cura ſunt conſtituti, ſi cutis prætenta maxillis, detracta, mox relaxata, illico in ſuum redeat locum. Hoc enim indicium recentioris quadrupedis eſt: veteris contrà, ſi diutiùs rugata maneat cutis.

E

CAPVT XXVI.

De vtero, & ætate Cameli.

CAmelus fert vterum mẽſes decem: parit ſemper vnum tantummodo: vnipara namque eſt. Separant prolem à parente anniculam. Viuit diu: plus enim quàm quinquaginta annos. Parit in vêre, & lac ſuum vſque eò ſeruat, quò iam conceperit. Tum lac, tum caro cameli ſuauiſſima omnium eſt. Bibitur eius lac ad vnam, menſuram, duabus aut tribus aquæ admiſtis.

A

CAPVT XXVII.

De elephantorum coitu: déque tempore, quo vterus fertur, & eorum pullis.

ELephantus, tam mas quàm fœmina, incipit coire anno ætatis vigeſimo. Ferendi vteri tempus alij annum & ſex menſes, alij trienniū ſtatuunt. Cauſa quamobrem incertum hoc ſit, quòd non pateat coitus. Parit enitens poſterioribus cruribus, & ſubſidens cum dolore. Pullus editus ore ſugit, non promuſcide: & ſtatim, cùm natus eſt, cernit, & ambulat.

CAPVT XXVIII.

De coitu ſuum, & eius tempore.

SVes feræ principio hyemis coeunt, vêre pariūt, petentes maximè inuia, prærupta, anguſta, & opaca. Mas cum fœminis cōuerſari dies triginta magna ex parte ſolet. Numerus partus, & tempus ferendi idem atque in vrbanis ſuibus eſt. Vox etiam ſimilis: ſed fœmina vocalior eſt, mas rarò vocem emittit. Mares caſtrati maiores ferocioréſque euadunt: vt ſcitè Homerus fingit, cùm dicat:

Nutriit excelſum ſyluis horrentibus aprum,
Inſtar non bruti ſed dorſi montis opaci.

Caſtrantur, quod recentibus adhuc morbus pruriens incumbit in teſtes, quo atterentes eam partem ad arbores, teſtes extinguunt.

CAPVT XXIX.

De ceruorum coitu, partu, & natura.

CErua plurimùm ſubſidens coit, vt dictum iam eſt: marem enim ſuſtinere non poteſt, ob eius contentiſſimum impetum. Veruntamen aliquando etiam ſuſtinent modo ouium, & ſocias declinant, cùm turgente iam Venere coitum appetunt. Mas non in eadem immoratur, ſed mutat: breuíque interpoſito tempore, aliam atque aliam ſupergreditur. Coitus ab arcturo menſe Auguſto & Septembri. Implentur paucis diebus, & ab eodem multæ. Vterum ferunt octo menſes. Pariunt magna ex parte vnum, ſed nonnullas etiam geminos pepeiſſe perſpectum eſt. Parere iuxta vias maximè ſolent, metu belluarum. Incrementum hinnuli celere. Purgatio cæteris temporibus nulla euenit ceruæ: cùm autem parit, pituitoſo quodam humore purgatur. Ducere ſuum hinnulum ad ſtabula conſueuit. Quem locum ſibi habet refugium, petra diſrupta eſt, vno aditu, vnde defendere ſe, repugnaréque ſolet iis qui inuadunt. Vita eſſe perquàm longa hoc animal fertur, ſed nihil certi ex iis quæ narrantur, videmus: nec geſtatio, aut incrementum hinnuli ita euenit, quaſi vita eſſet prælonga. Monte Aſiæ Elapho nomine apud Arginuſſam, quo loco Alcibiades mortem obiit, ceruæ omnes ſciſſa aure ſunt, qua nota vel alibi, ſi loca mutarint, dignoſcuntur. Et quidem fœtus iam inde à primo ortu in vtero idem contrahit ſignum. Quaterna vbera fœminis, vt vaccis.

ΚΕΦΑΛ. κζ'.

Περὶ ἐλεφάντων ὀχείας καὶ τόκου.

Ὁ δὲ ἐλέφας, ὀχεύει καὶ ὀχεύεται περὶ τὰ εἴκοσιν ἔτη. ὅταν δ' ὀχευθῇ ἡ θήλεια, φέρει ἐν γαστρὶ, ὡς μέν τινές φασιν, ἐνιαυτὸν καὶ ἓξ μῆνας· ὡς δ' ἕτεροι, τρία ἔτη. τοῦ δὲ μὴ ὁμολογεῖσθαι τὸν χρόνον, αἴτιον τὸ μὴ θεωρεῖσθαι τὴν ὀχείαν. τίκτει δὲ ἡ θήλεια, συγκαθίσασα ἐπὶ τὸ ὄπισθεν, καὶ ἀλγοῦσα δήλη ἐστί. ὁ δὲ σκύμνος, ὅταν γένηται,
B θηλάζει τῷ στόματι, οὐ τῷ μυκτῆρι· καὶ βαδίζει καὶ βλέπει εὐθὺς * γενόμενος. * [illegible]

ΚΕΦΑΛ. κη'.

Περὶ τόκου τῶν ἀγρίων ὑῶν.

Αἱ δ' ὕες αἱ ἄγριαι, τοῦ χειμῶνος ἀρχομένου ὀχεύονται. τίκτουσι δὲ τοῦ ἔαρος, ἀποχωροῦσαι εἰς τοὺς δυσβατωτάτους τόπους, καὶ ἀποκρήμνους μάλιστα, καὶ φαραγγώδεις, καὶ συσκίους. διατρίβει δὲ ὁ ἄρρην ἐν ταῖς ὑσὶν ὡς ἐπιτοπολὺ ἡμέρας τριάκοντα. τὸ δὲ πλῆθος τῶν τικτομένων, καὶ ὁ χρόνος τῆς κυήσεως, ὁ αὐτός τε, ὡς καὶ ἐπὶ τῶν ἡμέρων ὑῶν ἐστί. τὰς δὲ φωνὰς παραπλησίως
C ἔχουσι ταῖς ἡμέροις· πλὴν μᾶλλον ἡ θήλεια φωνεῖ, ὁ δ' ἄρρην, σπανίως. τῶν δ' ἀρρένων καὶ ἀγρίων οἱ τομίαι μείζους γίνονται καὶ χαλεπώτεροι· ὥσπερ καὶ Ὅμηρος ἐποίησε·

Θρέψεν ἐπὶ χλούνην σῦν ἄγριον· οὐδὲ ἐῴκει,
Θηρί γε σιτοφάγῳ, ἀλλὰ ῥίῳ ὑλήεντι.

γίνονται δὲ τομίαι, διὰ τὸ νέοις οὖσιν ἐμπίπτειν νόσημα κνησμὸν εἰς τοὺς ὄρχεις. εἶτα ξυόμενοι πρὸς τὰ δένδρα, ἐκθλίβουσι τοὺς ὄρχεις.

ΚΕΦΑΛ. κθ'.

Περὶ ἐλάφων ὀχείας, καὶ τόκου καὶ φύσεως.

Ἡ δ' ἔλαφος τὴν μὲν ὀχείαν ποιεῖται, καθάπερ ἐλέχθη πρότερον, τὰ πλεῖστα μὲν * ἐξ ἐπαγωγῆς· οὐ γὰρ ὑπομένει ἡ θήλεια τὸν ἄρρενα πολλάκις, διὰ τὴν συντονίαν· οὐ μὴν ἀλλὰ καὶ ὑπομένουσιν ἐνίοτε ὀχεύειν, καθάπερ τὰ πρόβατα· καὶ ὅταν ὀργῶσι, παρεκκλίνουσιν ἀλλήλας. μεταλλάττει δὲ ὁ ἄρρην, καὶ οὐ πρὸς μιᾷ διατρίβει· ἀλλὰ διαλείπων βραχὺν χρόνον, πλησιάζει ἄλλαις. ἡ δ' ὀχεία γίνεται μετ' ἀρκτοῦρον, περὶ τὸν βοηδρομιῶνα καὶ μαιμακτηριῶνα. κύει δ' ὀκτὼ μῆνας. κυίσκεται δ' ἐν ὀλίγαις ἡμέραις, καὶ ὑφ' ἑνὸς πολλαί. τίκτει δὲ, ὡς μὲν ἐπιτοπολὺ ἕν· ἤδη δέ τινες ὠμμέναι εἰσὶν ὀλίγαι, καὶ δύο. καὶ ποιεῖται τοὺς τόκους παρὰ τὰς ὁδούς, διὰ τὸν πρὸς τὰ θηρία φόβον. ἡ δὲ αὔξησις ταχεῖα τῶν νεβρῶν. κάθαρσις δὲ κατ' ἄλλους μὲν χρόνους οὐ συμβαίνει ταῖς ἐλάφοις· ὅταν δὲ τέκωσι, γίνεται φλεγματώδης αὐταῖς κάθαρσις. εἴθισται δὲ ἄγειν τοὺς νεβροὺς ἐπὶ τοὺς σταθμούς. ἔστι δὲ τοῦτο τὸ χωρίον αὐταῖς καταφυγή, πέτρα περιρραγεῖσα μίαν ἔχουσα εἴσοδον· οὗ καὶ ἀμύνεσθαι εἴωθεν ἤδη τοὺς ἐπιτιθεμένους. περὶ δὲ τῆς ζωῆς μυθολογεῖται μὲν ὡς ὂν μακρόβιον, οὐ φαίνεται δ' οὔτε τῶν μυθολογουμένων οὐθὲν σαφές· ἥ τε κύησις καὶ αὔξησις τῶν νεβρῶν συμβαίνει, οὐχ ὡς μακροβίου τοῦ ζῴου ὄντος. ἐν δὲ τῷ ὄρει τῷ Ἐλαφόεντι καλουμένῳ, ὅ ἐστι τῆς Ἀσίας ἐν τῇ Ἀργινούσῃ, οὗ τετελεύτηκεν Ἀλκιβιάδης, αἱ ἔλαφοι πᾶσαι τὸ οὖς ἐσχισμέναι εἰσίν· ὥστε, κἂν ἐκτοπίσωσι, γινώσκεσθαι. καὶ τὰ ἔμβρυα δὲ ἐν τῇ γαστρὶ ὄντα, εὐθὺς ἔχει τοῦτο τὸ σημεῖον. θηλὰς δ' ἔχουσιν αἱ θήλειαι τέτταρας, ὥσπερ αἱ βοῦς.

* Malim ἐξ ὑπαγωγῆς. vide lib. 5. c. 2.

D

E

ἐπειδὰν δ' ἐμπλησθῶσιν αἱ θήλειαι, ἐκκρίνονται οἱ ἄρρενες καθ' ἑαυτούς, καὶ διὰ τὴν * ὁρμὴν τὴν τῶν ἀφροδισίων, ἕκαστος μονούμενος, βόθρους ὀρύττει, καὶ βρωμῶνται ὥσπερ οἱ τράγοι· καὶ τὰ πρόσωπα, διὰ τὸ ῥαίνεσθαι, μέλανα γίνεται αὐτοῖς, ὥσπερ τὰ τῶν τράγων. οὕτω δὲ διάγουσιν, ἕως ἂν ὕδωρ γένηται· μετὰ δὲ ταῦτα τρέπονται πρὸς τὴν νομήν. ταῦτα δὲ ποιεῖ τὸ ζῷον, διὰ τὸ φύσει λάγνον εἶναι καὶ διὰ τὴν παχύτητα. ὑπερβάλλουσα γὰρ γίνεται τοῦ θέρους αὐτῶν· διὸ καὶ οὐ δύνανται θεῖν, ἀλλ' ἁλίσκονται ὑπὸ τῶν πεζῇ διωκόντων ἐν τῷ δευτέρῳ δρόμῳ καὶ τρίτῳ· καὶ φεύγουσι διὰ τὸ καῦμα καὶ τὸ ἄσθμα εἰς τὸ ὕδωρ. καθ' ὃν δὲ χρόνον ὀχεύουσι, τὰ κρέα γίνεται φαῦλα καὶ δυσώδη, καθάπερ καὶ τῶν τράγων. ἐν μὲν οὖν τῷ χειμῶνι γίνονται λεπτοὶ καὶ ἀσθενεῖς· πρὸς δὲ τὸ ἔαρ, μάλιστα ἀκμάζουσι πρὸς τὸ δραμεῖν. ἐν δὲ τῷ φεύγειν ἀνάπαυσιν ποιοῦνται τοῦ δρόμου, καὶ ὑφιστάμενοι μένουσιν, ἕως ἂν πλησίον ἔλθῃ ὁ διώκων· τότε δὲ πάλιν φεύγουσι. τοῦτο δὲ δοκοῦσι ποιεῖν, διὰ τὸ πονεῖν τὰ ἐντός. τὸ γὰρ ἔντερον ἔχει λεπτὸν καὶ ἀσθενὲς οὕτως, ὥστε ἂν ἠρέμα τις πατάξῃ, ἐκκόπτεται, τοῦ δέρματος ὑγιοῦς ὄντος.

* Gaza, τὴν ὀσμήν

ΚΕΦΑΛ. λ΄.

Περὶ ἄρκτων καὶ ὑστρίχων ὀχείας καὶ τόκου.

ΑΙ δ' ἄρκτοι τὴν ὀχείαν ποιοῦνται, ὥσπερ εἴρηται πρότερον, οὐκ ἀναβάδην, ἀλλὰ καταχεκλιμέναι ἐπὶ τῆς γῆς. κύει δ' ἡ ἄρκτος τριάκοντα ἡμέρας. τίκτει δὲ καὶ ἓν καὶ δύο· τὰ δὲ πλεῖστα, πέντε. ἐλάχιστον δὲ τίκτει τὸ ἔμβρυον τῷ μεγέθει, ὡς κατὰ τὸ σῶμα τὸ αὐτῆς. ἔλαττον μὲν γὰρ γαλῆς τίκτει, μεῖζον δὲ μυός, καὶ ψιλόν, καὶ τυφλόν, καὶ σχεδὸν ἀδιάρθρωτα τὰ σκέλη καὶ τὰ πλεῖστα τῶν μορίων. τὴν δ' ὀχείαν ποιεῖται τοῦ μηνὸς τοῦ Ἐλαφηβολιῶνος. τίκτει δὲ περὶ τὴν ὥραν τὴν τοῦ φωλεύειν. γίνονται μὲν οὖν περὶ τὸν χρόνον τοῦτον καὶ ἡ θήλεια καὶ ὁ ἄρρην πιόταται· ὅταν δ' ἐκθρέψῃ τρίτῳ μηνί, ἐκφαίνονται ἤδη τοῦ ἔαρος. καὶ ἡ ὕστριξ δὲ φωλεύει καὶ κύει ἴσας ἡμέρας, καὶ τὰ ἄλλα ὡσαύτως τῇ ἄρκτῳ. κυοῦσαν δὲ ἄρκτον ἔργον ἐστὶ λαβεῖν.

ΚΕΦΑΛ. λα΄.

Περὶ λέοντος ὀχείας, καὶ τόκου, καὶ ἀποβολῆς ὀδόντων.

ΛΕων δὲ ὅτι μὲν ὀχεύει ὄπισθεν, καὶ ἔστιν ὀπισθουρητικόν, εἴρηται πρότερον. ὀχεύει δὲ καὶ τίκτει οὐ πᾶσαν ὥραν, καθ' ἕκαστον μέντοι τὸν ἐνιαυτόν. τίκτει μὲν οὖν τοῦ ἔαρος. τίκτει δ' ὡς ἐπιτοπολὺ δύο, τὰ μέντοι πλεῖστα ἕξ. τίκτει δ' ἐνίοτε καὶ ἕν. ὁ δὲ λεχθεὶς μῦθος περὶ τοῦ ἐκβάλλειν τὰς ὑστέρας τίκτοντα, ληρώδης ἐστί, συνετέθη δέ, ἐκ τοῦ σπανίους εἶναι τοὺς λέοντας, ἀποροῦντος τὴν αἰτίαν τοῦ τὸν μῦθον συνθέντος. σπάνιον γὰρ τὸ γένος τὸ τῶν λεόντων ἐστί, καὶ οὐκ ἐν πολλῷ γίνεται τόπῳ, ἀλλὰ τῆς Εὐρώπης ἁπάσης ἐν τῷ μεταξὺ τοῦ Ἀχελώου καὶ τοῦ Νέσσου ποταμοῦ. τίκτει δὲ καὶ ὁ λέων πάμπαν μικρὰ οὕτως, ὥστε δίμηνα ὄντα μόλις βαδίζειν. οἱ δ' ἐν Συρίᾳ λέοντες, τίκτουσι πεντάκις· τὸ πρῶτον, πέντε, εἶτα ἀεὶ ἑνὶ ἐλάττονα· μετὰ δὲ ταῦτα οὐκέτι οὐδὲν τίκτουσιν, ἀλλ' ἄγονοι διατελοῦσιν. οὐκ ἔχει δὲ ἡ λέαινα χαίτην, ἀλλ' ὁ ἄρρην λέων. βάλλει δὲ ὁ λέων τοὺς κυνόδοντας καλουμένους τέτταρας μόνους, δύο μὲν ἄνωθεν, δύο δὲ κάτωθεν· βάλλει δὲ ἑξάμηνος ὢν τὴν ἡλικίαν.

A Cùm mares impleuerint fœminas, ſeparantur per ſeipſi, & propter libidinis graueolentiam quiſque ſolitarius ſcrobes fodit. Fœtet vt hirci. Facieſque eorum nigreſcit aſpergine, vt hircorum. Degunt ita quouſque imber accedat, tum paſcua repetunt. Hæc ideo ceruo accidũt, quia ſalax animal ſuapte natura eſt, atque etiam quia pingui abũdat. Pingueſcunt enim æſtate ſupra modum: quamobrẽ nec currere quidem poſſunt: ſed ſecundo aut tertio curſu capiuntur ab iis qui pedibus inſectantur. Fugiunt etiam in aquas propter æſtum atque anhelitum. Caro eorum libidinis tempore vitiatur, & fœtet perinde quaſi hircorum. Hyeme itaque extenuantur debilitantúrque: vère autem viget, maximè ad curſum. Cùm fugiunt, requiem inter currendum aliquam faciunt, conſiſtentéſque manent, B dum qui inſequitur, appropinquet, tum fugã item arripiunt. Quod ideo facere videntur, quia interiora laborant. Inteſtinum enim tam tenue imbecilléque habent, vt etiam ſi leniter percuſſeris, poſſit rumpi, cute adhuc integra.

CAPVT XXX.

De vrſi coitu, partu, & pullis, déque hyſtricis natura.

VRſi coeunt, vt dictum eſt, non ſuperuenientes, ſed humi ſtrati. Fert vterum vrſa dies triginta. Parit tum vnum tum etiam duos: ſed cùm pluri- C mùm quinque. Fœtum minimum pro ſui corporis magnitudine edit: quippe quæ minorẽ catto, maiorem mure parere ſoleat. Nudum item, & cæcum: & cruribus propemodum, membriſque aliis plurimis indiſcretum, & rudem. Coit menſe Februario, parit eo tempore, quo latet. Pingueſcit per id tempus tam mas quàm fœmina vehementer. Cùm prolem enutrierit, exit à menſe iam vèris tertio. Hyſtrix etiam latet, totidemque diebus fert vterum, & reliqua facit perinde vt vrſa. Grauidam capi vrſam difficile eſt.

CAPVT XXXI.

D *De partu leonum, & pullorum numero, déque dentium mutatione.*

LEonem auerſum coire, vrinámque retrò reddere dictum iam eſt. Coit, & parit, non omni tempore: ſingulis tamen annis, vère parit, & magna ex parte geminos, ſed cùm plurimos, ſex catulos: nonnunquam etiam vnum. Quod de leæna fertur, vuluam cum partu emittere, delira fabula eſt, facta ex ea cauſa, quòd rarum genus hoc animalis eſt, nec rationem cur ita eſſet, comperire author illius fabulæ poterat. Rarum hoc enim eſt, nec multis naſcitur locis: ſed Europæ totius ea parte ſolùm quæ inter Acheloum amnem & Neſſum eſt. Parit leæna quoque adeò paruos, vt vix poſt ſecundum E menſem incipiãt ingredi. Leones certè Syriæ quinquies vita pariũt: primùm quinque, poſt vno ſubinde pauciores, deinde ſteriles degunt. Caret leæna iuba: maris hæc propria eſt. Dentes eos tantummodo mutat leo, qui canini vocantur, quatuor, duos ſuperiùs, totidémque inferiùs, idque ſexto menſe ætatis fit.

CAPVT XXXII.

De hyænæ natura, meatibúſque genitalibus maris, & fœminæ.

HYæna colore lupi propè eſt, ſed hirſutior, & iuba per totum dorſum prædita eſt. Quod autem de ea fertur, genitale ſimul & maris & fœminæ eandem habere, commentitium eſt: ſed virile ſimiliter atque in lupis & canibus habetur. Quod verò fœmineum eſſe videtur, ſub cauda poſitum eſt, figura ſimile genitali fœminę, ſed ſine vllo meatu. Sub hoc meatus excrementorum eſt. Quinetiam fœmina hyæna, præter ſuum illud, etiam ſimile vt mas habet ſub cauda ſine vllo meatu: à quo excrementorum meatus eſt, atque ſub eo genitale verum continetur. Vuluam etiam hyæna fœmina, vt cæteræ huiuſcemodi fœminæ animantes, habet. Sed rarò hyæna fœmina capitur. Iam inter vndecim numero, viſam tantùm cepiſſe venator retulit quidam.

CAPVT XXXIII.

De coitu, & fœtura leporum.

LEpores auerſi coeunt, vt expoſitum eſt. retrò enim vrinam reddunt. Coeunt, & pariũt quoquo tempore, dúmque vtero ferũt, ſuperfœtant, & ſingulis menſibus generant: ſed fœtus edunt non vniuerſos. Interpoſitis enim diebus quot res tulerit, peragunt partionem. Habet fœmina lac priuſquam pariat, & à partu continuo repetit coitum, & lactans adhuc concipit fœtum. Lac ſuillo ſimile ſua craſſitudine eſt. Partum non, vt maior ſidipedum pars, cæcum edit.

CAPVT XXXIV.

De coitu, & partu vulpis.

VVlpes ſuperueniens coit. Parit cæcos, vt vrſa, atque etiam infirmiores. Parturiens ita ſecedit, vt rarò grauida capiatur. Cùm partum ediderit, lingua lambendo refouet, & concoquit. Parit, cùm plurimos, quatuor.

CAPVT XXXV.

De partu luporum, felis, ichneumonis, lupi canarij, & lupi ceruarij.

LVpus fert & parit vt canis, tũ tẽpore, tũ etiam fœtus numero. Cæcos etiã generat canis modo. Coit vno tẽpore tãtùm: parit ineũte æſtate. Fertur de eius partu ad fabulam proximè, lupos omnes intra duodecim dies parere. Cuius rei cauſam proferunt fabuloſè, quòd Latonam oberrantem totidem diebus ex Hyperboreis Delum deduxerint ſub ſpecie lupæ, propter metum Iunonis. Sed an tempus hoc pariendi ſit, nondum exploratum habemus. Fertur quidem ſic vulgò, ſed verum minimè eſſe videtur, quale vel illud ferunt, lupos ſemel in vita parere. Feles & ichneumones tot numero pariunt, quot canes, veſcuntúrque eiſdem. Viuunt circiter annos ſex. Lupus item canarius cæcos parit luporum ritu, numero cumplurimum quatuor.

A

ΚΕΦΑΛ. λβ'.

Περὶ ὑαίνης.

Ἡ Δὲ ὕαινα, τῷ μὲν χρώματι λυκώδης ἐστί, δασυτέρα δέ, καὶ λοφιὰν ἔχει δι' ὅλης τῆς ῥάχεως. περὶ δὲ τῶν αἰδοίων ὃ λέγεται, ὡς ἔχει ἄρρενος καὶ θηλείας, ψεῦδός ἐστιν. ἀλλ' ἔχει τὸ μὲν τοῦ ἄρρενος, ὅμοιον τῷ τῶν λύκων καὶ τῶν κυνῶν· τὸ δὲ δοκοῦν θηλείας εἶναι, ὑποκάτω μὲν ἐστι τῆς κέρκου, παραπλήσιον δ' ἐστὶ τῷ σχήματι τῷ θήλεος· οὐκ ἔχει μέντοι οὐδένα πόρον. ὑποκάτω δ' ἐστὶν αὐτοῦ ὁ τοῦ περιττώματος πόρος. B ἡ δὲ θήλεια ὕαινα ἔχει μὲν τὶ ὅμοιον τῷ τῆς θηλείας λεγομένῳ αἰδοίῳ· ἔχει δ' ὥσπερ ὁ ἄρρην αὐτὸ ὑποκάτω τῆς κέρκου, πόρον δὲ οὐδένα ἔχει. μετὰ δὲ τοῦτο ὁ τοῦ περιττώματός ἐστι πόρος· ὑποκάτω δὲ τούτου, τὸ ἀληθινὸν αἰδοῖον. ἔχει δὲ ἡ ὕαινα ἡ θήλεια καὶ ὑστέραν ὥσπερ καὶ τὰ ἄλλα ζῷα τὰ θήλεα, ὅσα ἐστὶ τοιαῦτα. σπάνιον δέ ἐστι λαβεῖν ὕαιναν θήλειαν. ἐν ἕνδεκα γοῦν κυνηγός τις μίαν ἔφη λαβεῖν.

ΚΕΦΑΛ. λγ'.

Περὶ δασυπόδων ὀχείας καὶ τόκου.

ΟΙ δὲ δασύποδες, ὀχεύονται μὲν συνιόντες ὄπισθεν, ὥσπερ εἴρηται πρότερον. ἔστι γὰρ ὀπισθουρητικόν. C ὀχεύονται δὲ καὶ τίκτουσι πᾶσαν ὥραν, καὶ ἐπικυΐσκονται ὅταν τέκωσι, καὶ τίκτουσι κατὰ μῆνα. τίκτουσι δὲ οὐκ ἀθρόα, ἀλλὰ διαλείπουσιν ἡμέρας ὁπόσας ἂν τύχωσιν. ἴσχει δὲ ἡ θήλεια γάλα πρότερον ἢ τεκεῖν· καὶ τεκοῦσα εὐθὺς ὀχεύεται, καὶ συλλαμβάνει ἔτι θηλαζομένη. τὸ δὲ γάλα, παχύτητι ὅμοιόν ἐστι τῷ ὑείῳ. * τίκτει δὲ τυφλά, ὥσπερ τὰ πολλὰ τῶν πολυσχιδῶν.

* Gaza, τίκτει δ' οὐ τ.

ΚΕΦΑΛ. λδ'.

Περὶ ἀλώπεκος ὀχείας καὶ τόκου.

D Ἡ Δὲ ἀλώπηξ, * ὀχεύεται μὲν ἀναβαίνουσα, τίκτει [τυφλὰ] ὥσπερ ἡ ἄρκτος, καὶ ἔτι μᾶλλον ἀδιάρθρωτα. ὅταν δὲ μέλλῃ τίκτειν, ἐκτοπίζει οὕτως, ὥστε σπάνιον εἶναι τὸ ληφθῆναι κύουσαν. ὅταν δὲ ἐκτέκῃ, τῇ γλώττῃ ἐκλείχουσα, ἐκθερμαίνει καὶ συμπέττει. τίκτει δὲ τέτταρα τὰ πλεῖστα.

* Gaza, ὀχεύει μέν. alij ὀχεύεται ἀναβαινομένη.

ΚΕΦΑΛ. λε'.

Περὶ τόκου λύκων, αἰλούρων, ἰχνευμόνων, πανθήρων, καὶ θωῶν.

ΛΥκος δὲ, ὀχεύει μὲν, καὶ τίκτει, καθάπερ κύων, τῷ χρόνῳ καὶ πλήθει τῶν γεννωμένων, καὶ τυφλὰ τίκτει ὥσπερ κύων. ὀχεύει δὲ καὶ ὀχεύεται κατὰ μίαν ὥραν, καὶ τίκτει E ἀρχομένου τοῦ θέρους. λέγεται δέ τις περὶ τοῦ τόκου λόγος πρὸς μῦθον συνάπτων. φασὶ γὰρ ἅπαντας τοὺς λύκους ἐν δώδεκα ἡμέραις ἐνιαυτοῦ τίκτειν. τούτου δὲ τὴν αἰτίαν ἐν μύθῳ λέγουσιν, ὅτι ἐν τοσαύταις ἡμέραις τὴν Λητὼ παρεκόμισαν ἐξ Ὑπερβορέων εἰς Δῆλον, λύκαιναν φαινομένην, διὰ τὸν τῆς Ἥρας φόβον. εἰ δ' ἐστὶν ὁ χρόνος οὗτος τῆς κυήσεως, ἢ μὴ ἐστιν, οὐδέν πω συνῶπται μέχρι γε τοῦ νῦν, ἀλλ' ἢ ὅτι λέγεται μόνον, οὐκ ἀληθὲς δὲ φαίνεται, οὐδὲ τὸ λεγόμενον δή, ὅτι ἅπαξ [ἐν τῷ βίῳ] τίκτουσιν οἱ λύκοι. οἱ δὲ αἴλουροι, καὶ ἰχνεύμονες, τίκτουσιν ὅσαπερ καὶ οἱ κύνες, καὶ τρέφονται τοῖς αὐτοῖς. ζῶσι δὲ περὶ ἔτη ἕξ. καὶ ὁ πάνθηρ δὲ τίκτει τυφλά, ὥσπερ λύκος. τίκτει δὲ τὰ πλεῖστα, τέτταρα τὸν ἀριθμόν.

[library stamp]

καὶ οἱ θῶες δὲ ὁμοίως κυΐσκονται τοῖς κυσί, καὶ τίκτουσι τυφλά· τίκτουσι δὲ καὶ δύο καὶ τρία καὶ τέτταρα τὸν ἀριθμόν. * ἔστι δὲ τὴν ἰδέαν ἐπὶ κέρκῳ μὲν μακρός, τὸ δ' ὕψος βραχύτερος· ὁμοίως δὲ ταχυτῆτι διαφέρει, καίπερ τῶν σκελῶν ὄντων βραχέων· ἀλλὰ διὰ τὸ ὑγρὸς εἶ], καὶ πηδᾷ πόρρω.

* Incluſa vidẽtur delenda, vel excuſari fortaſſe aliqua ratione poſſunt.

ΚΕΦΑΛ. λϛʹ.

Περὶ τῶν ἐν Συρίᾳ ἡμιόνων.

Εἰσὶ δ' ἐν Συρίᾳ οἱ καλούμενοι ἡμίονοι, ἕτερον γένος τῶν ἐκ συνδυασμοῦ γινομένων ἵππου καὶ ὄνου. ὅμοιοι δὲ τὴν ὄψιν, ὥσπερ καὶ οἱ ἄγριοι ὄνοι πρὸς τοὺς ἡμέρους, ἀπό τινος ὁμοιότητος λεχθέντες εἰσίν. [ὥσπερ οἱ ὄνοι ἄγριοι, καὶ] ἡμίονοι, τὴν ταχυτῆτα διαφέροντες. αὗται αἱ ἡμίονοι γεννῶσιν ἐξ ἀλλήλων. σημεῖον δέ· ἦλθον γάρ τινες εἰς Φρυγίαν ἐπὶ Φαρνάκου τοῦ Φαρναβάζου πατρός, καὶ διαμένουσιν ἔτι. εἰσὶ δὲ νῦν μὲν τρεῖς, τὸ παλαιὸν δ' ἐννέα ἦσαν, ὥς φασι.

ΚΕΦΑΛ. λζʹ.

Περὶ μυῶν πολυγονίας καὶ φύσεως.

Ἡ δὲ τῶν μυῶν γένεσις, θαυμασιωτάτη παρὰ τὰ ἄλλα ζῷά ἐστι, τῷ πλήθει καὶ τῷ τάχει. ἤδη γάρ ποτε * ἐναπολειφθείσης τῆς θηλείας κυούσης ἐν ἀγγείῳ κέγχρου, μετ' ὀλίγον χρόνον ἀνοιχθέντος τοῦ ἀγγείου, ἐφάνησαν ἑκατὸν καὶ εἴκοσι μύες τὸν ἀριθμόν. ἀπορεῖται δὲ καὶ ἡ τῶν ἐπιπολαζόντων μυῶν γένεσις ἐν ταῖς χώραις καὶ ἡ φθορά. πολλαχοῦ γὰρ εἴωθε γίνεσθαι πλῆθος ἀμύθητον τῶν ἀρουραίων, ὥστε ὀλίγον λείπεσθαι τοῦ σίτου παντός. γίνεται δὲ οὕτω ταχεῖα ἡ φθορά, ὥστ' ἐνίοι τῶν μὴ μεγάλας γεωργίας ἐργαζομένων, τῇ προτεραίᾳ ἰδόντες ὅτι θερίζειν ὥρα, τῇ ὑστεραίᾳ ἕωθεν ἄγοντες τοὺς θεριστάς, * καταβεβρωμένα ἅπαντα καταλαμβάνουσιν. ὁ δὲ ἀφανισμὸς οὐ κατὰ λόγον ἀποβαίνει. ἐν ὀλίγαις γὰρ ἡμέραις ἀφανεῖς παντελῶς γίγνονται· καίτοι ἐν τοῖς ἔμπροσθεν χρόνοις οὐ κρατοῦσιν οἱ ἄνθρωποι, ἀποθυμιῶντες καὶ ἀνορύττοντες, ἔτι δὲ θηρεύοντες, καὶ τὰς ὗς ἐμβάλλοντες. αὗται γὰρ ἀνορύττουσι τὰς μυωπίας. θηρεύουσι δὲ καὶ αἱ ἀλώπεκες αὐτούς, καὶ αἱ γαλαῖ αἱ ἄγριαι μάλιστα ἀναιροῦσιν, [ὅταν ἐπιγίνωνται] ἀλλ' οὐ κρατοῦσι τῆς πολυγονίας καὶ * τῆς ταχυτῆτος· οὐδ' ἄλλο οὐδέν, πλὴν οἱ ὄμβροι, ὅταν ἐπιγένωνται· τότε δὲ ἀφανίζονται ταχέως. τῆς δὲ Περσικῆς ἔν τινι τόπῳ ἀνασχιζομένων τῶν ἐμβρύων, τὰ θήλεα δὴ κυοῦντα φαίνεται. φασὶ δέ τινες καὶ διισχυρίζονται, ὅτι ἂν ἅλα λείχωσιν, ἄνευ ὀχείας γίνεσθαι ἐγκύους. οἱ δ' ἐν Αἰγύπτῳ μύες, σκληρὰν ἔχουσι τὴν τρίχα, σχεδὸν ὥσπερ οἱ χερσαῖοι ἐχῖνοι. εἰσὶ δὲ καὶ ἕτεροι οἳ βαδίζουσιν ἐπὶ τοῖς δυσὶ ποσί. τὰ γὰρ πρόσθια, μικρὰ ἔχουσι· τὰ δ' ὀπίσθια, μεγάλα. γίνονται δὲ πλήθει πολλοί. ἔστι δὲ καὶ ἄλλα γένη μυῶν πολλά.

* Gaza, ἐναπολειφθείσης

* γρ. καταβεβρωμένα, nempe τὰ σῖτα.

* κ. τῆς ταχυγονίας

Quinetiam lupus ceruarius coitu vt canes impletur, & cæcos generat, numero duos, aut tres, aut quatuor. Corpore longior, & cauda porrectior: ſed proceritate breuior. Celeritate æque præſtat, quamuis crura habeat breuiora. mollis enim & agilis eſt, proſilireque longius ob eam rem poteſt.

CAPVT XXXVI.

De mulis quos terra Syria fert.

SVnt in Syria, quos mulos appellant, genus diuerſum ab eo quod coitu equæ & aſini procreatur: ſed ſimili facie, quomodo aſini ſyluestres, ſimilitudine quadam nomen vrbanorum accepere. Et quidem, vt aſini illi feri, ſic muli præſtant celeritate. Procreant eiuſmodi mulæ ſuo in genere. Cuius rei argumento illæ ſunt, quæ tempore Pharnacæ patris Pharnabazi in terram Phrygiam venerunt, quæ adhuc extant. Tres tamen ex nouem, quot numero olim fuiſſe aiunt, ſeruantur hoc tempore.

CAPVT XXXVII.

De natura & variis generibus murium, déque pullorum numeroſitate.

MVrium generatio mirabilis præter cætera animalia maiorem in modum eſt, tum numero tum celeritate. Iam enim fœmina prægnante in vaſe miliario aliquando occupata, paulo pòſt reſerato vaſe, muſculi numero viginti & centum reperti ſunt. Mirum etiam percipimus ortum redũdantis agreſtis murium generis. Locis enim compluribus agri, tam inaudito modo oriri ſolent, vt parum ex vniuerſo frumento relinquatur. Tam citò abſumitur, vt nonnulli mediocres agricolæ, cùm pridie metendum ſtatuerint, poſtridie mane cum meſſoribus accedentes ad ſegetem, abſumptam inueniant totam. Interitus autem minimè euenit ratione. Paucis enim diebus omnino abolentur, quanquam ſuperiore tempore homines vincere vel ſuffiendo, vel ſues, vt latibula effoderent, admittendo, non poſſent. Quinetiam vulpes eos venantur, & catti ſyluestres in primis: ſed tamen ſuperare copiam, & celeritatem prouentus nequeunt: nec aliud quicquam omnium vincit, niſi imbres: iis enim quàm primùm intereunt. Terræ Perſicæ parte quadam, mure fœmina reſciſſa, fœtus fœminini prægnantes comperiuntur. Sunt qui vehementer confirment, mures, ſi ſalem lambant, impleri ſine coitu. Ægyptiis muribus prædurus, ferè vt herinaceis pilus eſt. Sunt etiam alij qui erecti bipedes ambulent: habent enim crura poſteriora longa priora breuia. Ortus eorum quoque numeroſus eſt. Sunt vel alia genera murium plura. Sed de iis hactenus.

A

ARISTOTELIS STAGIRITÆ, de Hiſtoria Animalium,

LIBER VII.

CAPVT I.

De ſignis quæ puerorum ſeminis emiſſionem, puellarúmque viripotentiam præueniunt.

DE hominis generatione, tum prima in vtero, tum poſteriore in luce, & vſque in ſenectutem, quemadmodum ſe habeant, quæ ſuæ naturæ ratione eueniant, loco hoc dicimus. Quæ inter marem & fœminam differentia ſit, & quibúſnam partibus conſtet, antè expoſitum eſt. Mas autem primum ſemen genitale magna ex parte incipit ferre anno peracto bis ſeptimo: ſimul etiam pubeſcere incipit eo tempore, vt ſtirpes ſemen laturas primùm florere Alcmæon Crotoniata ait. Vox item per id tempus mutari in ſonum aſperiorem inæquabiliorémque incipit, quanquam nondum grauem. Neque enim acuta præterea eſt, neque tota æquabilis: ſed ſimilis fidibus incontentis & aſperis, quod caprire denominant. Idque potiſſimùm incidit iis qui rem Veneream incipiunt agere. Iis enim vox tranſit in ſonum virilem. abſtinentibus verò econtrario fit: &, ſi curam adhibeant (quod aliqui faciunt ex iis qui choreis indulgent) vel longo ſeruari tempore ſine magna mutatione poteſt. Mammæ etiam extuberant: & genitale non ſolùm magnitudine, ſed etiam ſpecie proficit. Euenit porrò id temporis, qui iam fricari cõtrectaríque per libidinem cœperint, vt cùm ſemen emittunt, non modò voluptate, verùm dolore quoque afficiantur. Fœminis etiam per id tempus exurgunt vbera, quod frattare dicitur: & quæ menſtrua vocantur, erumpunt: quod ſanguis quaſi occiſi animalis eſt. Quæ autem alba dicuntur, admodum etiam puellis eueniunt, & magis ſi cibo vtuntur humidiori. Hæc incrementum impediunt corporis, & puellam extenuant. Sed menſes tunc plurimis fiunt, cùm iam vbera ad duos digitos prominent: & vox eodem tempore puellarum mutatur in grauiorem. Denique cùm mulier vocis acutioris quàm vir, ſit, tum natu minores acutiùs quàm maiores, ſonant: vt & pueri, quàm viri, acutiùs. Sed vox fœminæ acutior eſt, quàm maris, & fiſtula puellarum acutior quàm puerorum eſt. Fit etiam vt per id tempus cuſtodiri præcipuè debeant: maximè enim ad vſum rei Venereæ incitantur, cùm hæc incipiunt. Quòd ſi iam inde nihil plus commoueri, temperent, quàm corpora ipſa nullo adhuc vſu Venereo, ſed ſponte mutentur, ſequi ſeruaríque temperantia ſolet per ætates ſuperiores. Nam & quæ admodum puellæ concumbunt, libidinoſiores euadunt: & mares ſiue altera parte, ſiue vtraque minùs cauerint, propenſiores eódem efficiuntur. Meatus enim laxantur, reddúntque eo corpus lubricum,

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζώων ἱστορίας τὸ Η.

ΚΕΦΑΛ. α'.

Τὰ περὶ τὴν τῶν ἀφροδισίων ἀρχὴν τοῖς ἀνθρώποις συμβαίνοντα.

B ΠΕΡΙ δὲ ἀνθρώπου γενέσεως, τῆς τε πρώτης ἐν τῷ θήλει, καὶ τῆς ὕστερον μέχρι γήρως, ὅσα συμβαίνει διὰ [τὴν φύσιν] τὴν οἰκείαν, τόνδ᾿ ἔχει τὸν τρόπον. ἡ μὲν διαφορὰ τοῦ ἄρρενος πρὸς τὸ θῆλυ καὶ τὰ μόρια, πρότερον εἴρηται. φέρειν δὲ σπέρμα πρότερον ἄρχεται τὸ ἄρρεν ὡς ἐπιτοπολύ, ἐν τοῖς ἔτεσι τοῖς δὶς ἑπτὰ τετελεσμένοις. ἅμα δὲ καὶ τρίχωσις τῆς ἥβης ἄρχεται, καθάπερ καὶ τὰ φυτὰ τὰ μέλλοντα φέρειν τὸ σπέρμα, ἀνθεῖν φησι πρῶτον Ἀλκμαίων ὁ Κροτωνιάτης. περὶ δὲ τὸν αὐτὸν χρόνον τοῦτον, ἥ τε φωνὴ μεταβάλλειν ἄρχεται ἐπὶ τὸ τραχύτερον καὶ ἀνωμαλέστερον, C * οὔτε τι ὀξεῖα οὖσα, οὔτε πω βαρεῖα, οὔτε πᾶσα ὁμαλή, ἀλλ᾿ ὁμοία φαινομένη ταῖς παρανενευρισμέναις καὶ * τραχίαις χορδαῖς· ὃ καλοῦσι τραγίζειν. γίνεται δὲ τοῦτο μᾶλλον τοῖς πειρωμένοις ἀφροδισιάζειν. τοῖς γὰρ περὶ ταῦτα προθυμουμένοις, καὶ μεταβάλλουσιν αἱ φωναὶ εἰς τὴν τῶν ἀνδρῶν φωνήν. τοῖς δ᾿ ἀπεχομένοις, τοὐναντίον. ἐὰν δὲ καὶ συναποβιάζωνται ταῖς ἐπιμελείαις, (ὅπερ ποιοῦσιν ἔνιοι τῶν περὶ τὰς χορείας σπουδαζόντων) καὶ μέχρι πόρρω διαμένει, καὶ τὸ πάμπαν μικρὰν λαμβάνει μεταβολήν. καὶ μαστῶν ἔπαρσις γίνεται καὶ αἰδοίων, οὐ μεγέθει μόνον, ἀλλὰ καὶ εἴδει. συμβαίνει δὲ περὶ τοῦτον τὸν χρόνον D τοῖς τε πειρωμένοις τρίβεσθαι περὶ τὴν τοῦ σπέρματος πρόεσιν, οὐ μόνον ἡδονὴν γίνεσθαι τοῦ σπέρματος ἐξιόντος, ἀλλὰ καὶ λύπην. περὶ δὲ τὸν αὐτὸν χρόνον καὶ τοῖς θήλεσιν ἥ τε ἔπαρσις γίνεται τῶν μαστῶν, καὶ τὰ καταμήνια καλούμενα καταρρήγνυται. τοῦτο δέ ἐστιν αἷμα οἷον νεόσφακτον. τὰ δὲ λευκά, καὶ παιδίοις οὖσι γίνεται πάμπαν νέοις, μᾶλλον δ᾿, ἂν ὑγρᾷ χρῶνται τροφῇ· καὶ κωλύει τὴν αὔξησιν, καὶ τὰ σώματα ἰσχναίνει τῶν παιδίων. τὰ δὲ καταμήνια γίνεται ταῖς πλείσταις, ἤδη τῶν μαστῶν ἐπὶ δύο δακτύλους ἠρμένων. καὶ ἡ φωνὴ δὲ καὶ ταῖς παισὶ μεταβάλλει περὶ τὸν χρόνον τοῦτον ἐπὶ τὸ βαρύτερον. E ὅλως μὲν γὰρ γυνή, ἀνδρὸς ὀξυφωνότερον· αἱ δὲ νέαι, τῶν πρεσβυτέρων, ὥσπερ καὶ οἱ παῖδες τῶν ἀνδρῶν. ἀλλ᾿ ἐστὶν ἡ φωνὴ ὀξυτέρα τῶν θηλειῶν παίδων, ἢ τῶν ἀρρένων· καὶ ὁ παρθένιος αὐλὸς τοῦ παιδικοῦ, ὀξύτερος. μάλιστα δὲ καὶ φυλακῆς δέονται περὶ τὸν χρόνον τοῦτον. μάλιστα γὰρ ὁρμῶσι πρὸς τὴν τῶν ἀφροδισίων χρῆσιν, ἀρχομένων αὐτῶν. ὥστε ἂν μὴ [ἤδη] διευλαβηθῶσι, μηθὲν ἐπιπλέον * κινεῖν, ἢ ὅσον αὐτὰ τὰ σώματα μεταβάλλει, μηθὲν χρωμένων ἀφροδισίοις, ἀκολουθεῖν εἴωθεν εἰς τὰς ὕστερον ἡλικίας. αἵ τε γὰρ νέαι πάμπαν ἀφροδισιαζόμεναι, ἀκολαστότεραι γίνονται· καὶ οἱ ἄρρενες, ἐάν τ᾿ ἐπὶ θάτερα, ἐάν τ᾿ ἐπ᾿ ἀμφότερα ἀφυλακτήσωσιν. οἵ τε γὰρ πόροι διαστομοῦνται, καὶ ποιοῦσιν εὔρουν τὸ σῶμα ταύτῃ·

* G. οὔτ᾿ ἔτι

* κ. τραχείαις

* κ. κιν. ἴσως ἔν.

Politic. lib. 7. c. 16.

καὶ ἅμα ἡ τότε μνήμη τῆς συμβαινούσης ἡδονῆς, ἐπιθυμίαν ποιεῖ τῆς τότε γενομένης ὁμιλίας. γίνονται δέ τινες ἄνηβοι ἐκ γενετῆς καὶ ἄγονοι, διὰ τὸ πεπηρῶσθαι τὸν τόπον τὸν γόνιμον. ὁμοίως δὲ καὶ γυναῖκες γίνονται ἄνηβοι ἐκ γενετῆς. μεταβάλλουσι δὲ καὶ αἱ ἕξεις τὰ ἄῤῥενα καὶ τὰ θήλεα, περί τε τὸ ὑγιεινότερα εἶναι καὶ νοσηρότερα, καὶ περὶ τὴν τοῦ σώματος ἰσχνότητα καὶ παχύτητα, καὶ εὐτροφίαν· μετὰ γὰρ τὴν ἥβην, οἱ μὲν, ἐξ ἰσχνῶν παχύνονται, καὶ ὑγιεινότεροι γίνονται· οἱ δὲ, τοὐναντίον. ὁμοίως δὲ τοῦτο συμβαίνει καὶ ἐπὶ τῶν παρθένων. ὅσοι μὲν γὰρ παῖδες, ἢ ὅσαι παρθένοι περιττώματα κατὰ τὰ σώματα εἶχον, συναποκρινομένων τῶν τοιούτων, τοῖς μὲν, ἐν τῷ σπέρματι. ταῖς δὲ, ἐν τοῖς καταμηνίοις, ὑγιεινότερα τὰ σώματα γίνεται καὶ εὐτραφέστερα, ἐξιόντων τῶν ἐμποδιζόντων τὴν ὑγείαν καὶ τὴν τροφήν· ὅσοι δὲ τοὐναντίον, ἰσχνότερα καὶ νοσηρότερα τὰ σώματα γίνεται· ἀπὸ γὰρ τῆς φύσεως καὶ τῶν καλῶς ἐχόντων, ἡ ἀπόκρισις γίνεται, τοῖς μὲν, ἐν τῷ σπέρματι, ταῖς δὲ, ἐν τοῖς καταμηνίοις. ἔτι δὲ ταῖς γε παρθένοις καὶ τὰ περὶ τοὺς μαστοὺς γίνονται διαφερόντως ἑτέραις πρὸς ἑτέρας. αἱ μὲν γὰρ, πάμπαν μεγάλους ἴσχουσιν· αἱ δὲ, μικρούς. ὡς ἐπιτοπολὺ δὲ συμβαίνει τοῦτο, ὅσαι ἂν παῖδες οὖσαι, περιττωματικαὶ ὦσι. μελλόντων γὰρ, καὶ οὔπω γινομένων τῶν γυναικείων, ὅσῳ ἂν πλείων ἡ ὑγρότης ᾖ, τοσούτῳ μᾶλλον ἀναγκάζει αἴρεσθαι ἄνω, ἕως ἂν καταῤῥαγῇ. ὥστε τότε λαβόντες ὄγκον οἱ μαστοὶ, διαμένουσι καὶ εἰς τὸ ὕστερον. καὶ τῶν ἀῤῥένων δὲ ἐπιδηλότεροι γίνονται, καὶ γυναικικώτεροι οἱ μαστοὶ, καὶ νεωτέροις καὶ πρεσβυτέροις οὖσι, τοῖς ὑγροῖς καὶ λείοις, καὶ μὴ φλεβώδεσι· καὶ τούτων μᾶλλον τοῖς μέλασιν ἢ λευκοῖς. μέχρι μὲν οὖν τῶν δὶς ἑπτὰ ἐτῶν, τὸ μὲν πρῶτον, ἄγονα τὰ σπέρματά ἐστιν. ἔπειτα γόνιμα μὲν, μικρὰ δὲ καὶ ἀτελῆ γεννῶσι καὶ οἱ νέοι καὶ αἱ νέαι, ὥσπερ καὶ ἐπὶ τῶν ἄλλων ζώων τῶν πλείστων. συλλαμβάνουσι μὲν οὖν αἱ νέαι θᾶττον· ἐὰν δὲ συλλάβωσιν, ἐν τοῖς τόκοις πονοῦσι μᾶλλον. καὶ τὰ σώματα δὲ αὐτῶν ἀτελέστερα γίνεται, ὡς ἐπιτοπολὺ καὶ γηράσκει θᾶττον, τῶν τ' ἀφροδισιαστικῶν ἀῤῥένων, καὶ τῶν γυναικῶν τῶν τοῖς τόκοις χρωμένων πλείοσι. δοκεῖ γὰρ οὐδ' ἡ αὔξησις ἔτι γίνεσθαι μετὰ τοὺς τρεῖς τόκους. καθίστανται δὲ καὶ σωφρονίζονται μᾶλλον, ὅσαι τῶν γυναικῶν ἀκόλαστοι πρὸς τὴν ὁμιλίαν τὴν τῶν ἀφροδισίων εἰσὶν, ὅταν τοῖς τόκοις χρήσωνται πολλοῖς. μετὰ δὲ τὰ τρὶς ἑπτὰ ἔτη, αἱ μὲν γυναῖκες, πρὸς τὰς τεκνογονίας ἤδη εὐκαίρως ἔχουσιν· οἱ δ' ἄνδρες, ἔτι ἔχουσιν ἐπίδοσιν. ἔστι δὲ τὰ μὲν λεπτὰ τῶν σπερμάτων, ἄγονα· τὰ δὲ χαλαζώδη, γόνιμα, καὶ ἀῤῥενογόνα μᾶλλον· τὰ δὲ λεπτὰ, καὶ μὴ θρομβώδη, θηλυγόνα. καὶ τοῦ γενείου δὲ τρίχωσις συμβαίνει τοῖς ἄῤῥεσι περὶ τὴν ἡλικίαν ταύτην.

ΚΕΦΑΛ. β΄.

Περὶ καταμηνίων τῶν γυναικῶν.

Ἡ δὲ τῶν γυναικείων ὁρμὴ γίνεται περὶ φθίνοντας τοὺς μῆνας· διὸ φασί τινες τῶν σοφιζομένων καὶ τὴν σελήνην εἶναι θῆλυ, ὅτι ἅμα συμβαίνει ταῖς μὲν, ἡ κάθαρσις, τῇ δὲ, ἡ φθίσις· καὶ μετὰ τὴν κάθαρσιν καὶ τὴν φθίσιν, ἡ πλήρωσις ἀμφοῖν. καὶ ταῖς μὲν, συνεχῶς καθ' ἕκαστον * ὀλιγάκις τὰ καταμήνια φοιτᾷ, παρὰ μῆνα δὲ τρίτον ταῖς πλείσταις. ὅσαις μὲν οὖν ὀλίγον χρόνον γίνεται, δύο ἢ τρεῖς ἡμέρας, ἀπαλλάττουσι ῥᾷον· ὅσαις δὲ πολλὰς,

* Gaza ὀλίγαις Mercur. Var. li. 5. c. 4.

A & ſimul voluptatis, qua olim geſtirent, memoria, deſiderio mouentur præteritæ contrectationis. Prodeunt nonnulli iam inde à primo ortu Natura impubes, infœcundique, propterea quòd partes genitalis fuerint deprauati. Mulieres etiam similiter modo impubes à natiuitate poſſunt creari. Habitus quoque tum marium tum fœminarum mutantur, vt ſint vel ſanitati, vel morbo habiliores: & vel graciles vel pleni, benéque vegeti. Nam à pube ex macilentis craſſeſcunt, euadúntque ſaniores: alij contrà. quod pari modo puellis etiam euenit. Qui enim pueri, aut quæ puellæ excrementis antea corporis redundabant, cùm ea ipſa excre- B menta vnà cum ſemine, aut menſibus ſecernantur, ſaniore ob eam rem corpore efficiuntur, atque vegetiore. Iam enim ea quæ ſanitati alimentóque obſtent, exeunt. at verò quibus contrà anteceſſerit, iis corpora graciliora, & morbis opportuniora redduntur. Excernitur enim de ipſa natura & bene habitis, cùm aut ſemen, aut menſes prodeunt. In puellis item diuerſitas vberum eſt: aliis enim admodum magna, aliis exigua ſunt. Euenit ſanè vt corpora immodicè creſcant, cùm puellæ excrementis redundant. Futuris enim adhuc, & nondum profluentibus menſtruis, quo plus continetur humoris, eo magis efferri, ſurſúmque impelli neceſſe eſt, donec infrà erumpat. Ita- C que quod interim incrementum mammæ acceperint, ſeruant poſtea. Maribus etiam mammæ conſpectiores, & fœminatiores, tum iunioribus tum ſenioribus efficiuntur, qui humidiores, læuiores, nec venulenti ſunt: eorúmque ipſorum iis magis, qui fuſci, quàm qui candidi ſunt. Semen profectò infœcundum vſque ad ter ſeptimum annum eſt, mox prolificum quidem eſt, ſed exigua imperfectáque generant iuniores, & mares, & fœminæ, vt in cæterorum quoque animalium genere plurimis euenit. Concipiunt quidem faciliùs natu minores, ſed laborant in puerperio vehementiùs. Corpore etiam minùs magna ex par- D te perficiuntur: & ſeneſcunt celeriùs mares ſalaces, & mulieres, quæ frequentiùs pariant: nam ne incrementum quidem poſt tertium partum effici poſſe videtur. Sedantur autem, temperantúrque melius, quæ in rei venereæ vſum luxuriant, cum partum multoties exercuerint. Sed poſt annum ter ſeptimum mulieribus quidem opportunè iam procreatio eſt. Sed viris item accedere aliquid poteſt ad prolem perfectiorem. Semina infœcunda ſunt, quæ tenuia: fœcunda, quæ grandinis ſpeciem referunt: eadémque potius marem fœtificant: contrà tenuia, nec globulenta, fœminam gignunt. Mentum etiam maris ea ætate pilis integitur.

E

CAPVT II.

De menſtruis mulieris.

PRofluuium autem menſium decreſcēte Luna cōtingit: quamobrem nonnulli cauillo ſexum fœmineum Lunæ tribuunt, quoniam ſimul vt illa decreſcat, & mulier purgetur, móxque repleantur ambæ, eueniat. Paucis menſtrua ſingulis menſibus mouētur: ſed vno intermiſſo plurimis. Faciliùs agitur cum iis quibus breui tēpore, hoc eſt, biduo, aut triduo profluunt, ſed quibus longum protrahitur, diffici-

difficilius: laborant enim id temporis. Aliis namque vniuerſim hæc purgatio fit, aliis paulatim. attamen omnibus corpus grauatur, quamdiu effluat humor. Multis etiam cum menſtrua citantur, & eruptioni propinqua ſunt, ſtrangulationes vuluarum ſequuntur, & crepitus, donec erumpãt. Conceptus mulieribus à profluuio menſtruorum ſua natura contingit: & quæ iis careant, ſteriles magna ex parte exiſtunt. Verùm fieri poteſt vt aliquæ etiam ſine eorum profluuio concipiant, videlicet quibus tantum humoris colligitur, quantum iis quæ purgantur, reſtare ſolet: quanquam non tanta copia, vt & foras poſſint profluere. Nonnullæ etiam dum profluunt menſes, concipiunt, poſtea concipere nequeunt: quibus vulua ſtatim à purgatione comprimitur. Sunt quibus prægnantibus etiam menſtrua vſque in poſtremum gerendi tempus eueniant: quibus accidit vt parua pariant, & proles aut minùs vitalis, aut infirma procreetur. Multis etiam deſiderio coitus (quo vel iuuenilis ætatis ratione, vel quia longo tempore abſtinuerint, tenentur) deſcendunt vteri: & menſtrua ſæpe ter in menſe citantur, donec concipiant: quo facto aſcendunt, & ſuo ſitu conſtituuntur. Nonnunquam etſi cætera bene ſe habet vterus, humidus tamen eſt. Reſpuit ſemen genitale, ſi humidus ſit. Omnium autem animalium (vt antè dixi) mulieribus inter fœminas plurima hæc purgatio euenit. Nam iis quæ non pariunt animal, nihil tale mouetur, propterea quòd hoc materiæ ſuperuacuum vertitur in corporis alimentum. Sunt enim nonnulla maribus ſuis maiora: atque etiam aliis in corticem, aliis in ſquamam, aliis in frequentiam pennarum abſumitur. Terreſtribus quoque animal parientibus, in pilos & corpulentiã tranſit: homo enim læuior cæteris eſt: atque etiam in vrinam diuertitur. plurima enim ex cæteris largiùs mingunt, & craſſius. at mulieribus vice eorum quæ dixi, omnium quantum ſuperuacuum ſit, in purgationem menſium vertitur. Quod in maribus quoque ſimili fieri modo percipimus, ſeminis genitalis ratione. Plurimum .n. omnium animalium emittit, comparatione dico magnitudinis ſuæ. Et verò inter ipſos mares, qui humidiores natura ſunt, nec valde carnoſi, plus reddunt: atque etiam plus candidiores, quàm fuſci. Nec ſecus in mulieribus fit: corpulentis enim multum menſtrui excrementi in corporis alimentum tranſit. Et in vſu quoque rei venereæ candidiores ſua natura plus quàm fuſcæ, euaporant. Præparatur hoc amplius vſu ciborum humidorum & acrium.

CAPVT III.

De indiciis conceptionis, & quot dierum ſpatio mas, quot item fœmina in vtero moueatur: déque abortionibus.

INdicium mulierem iam concepiſſe, cùm ſtatim à coitu locus ſiccescit. Fit certè, vt ſi oris, quo concipitur, labra ſunt læuia, inepta ſint ad conceptum: labitur enim, & effluit ſemen. Nec verò ſi craſſa ſunt, commodè vſum præſtant. Sed ſi ad digiti tactum aſperiuſcula, & hærentia ſint, atque etiamſi tenuiora, ita commodè ad conceptionem habent. Talis igitur præparandus eſt vterus, qui concipiat. Quòd ſi facere ne cõcipiat, placet, contrà agendum eſt: nam ſi labra ſint læuiora,

χαλεπώτερον. πονοῦσι γὰρ ταῖς ἡμέραις ταύταις. ταῖς μὲν γὰρ κατ' ὀλίγον, ταῖς δὲ, ἀθρόα ἡ κάθαρσις γίνεται. καὶ τὸ σῶμα βαρύνεται πάσαις, ἕως ἂν ἐξέλθῃ. πολλαῖς δὲ καὶ ἐπὶ ὁρμῇ τὰ καταμήνια, καὶ μελλόντων ῥήγνυσθαι, πνιγμοὶ γίνονται καὶ ψόφοι ἐν ταῖς ὑστέραις, ἕως ἂν ῥαγῇ. φύσει μὲν οὖν ἡ σύλληψις γίνεται μετὰ τὴν τούτων ἀπαλλαγὴν ταῖς γυναιξί. καὶ ὅσαις μὴ γίνεται ταῦτα, ὡς ἐπὶ τὸ πολὺ ἄτεκνοι διατελοῦσιν. οὐ μὴν ἀλλὰ καὶ μὴ γινομένων τούτων, ἔνιαι συλλαμβάνουσιν, ὅσαις συναθροίζεται ἐκ μιᾶς τοσαῦτα, ὅσα ταῖς γινομέναις ὑπολείπεται μετὰ τὴν κάθαρσιν, ἀλλὰ μὴ ὥστε καὶ θύραζε ἐξιέναι. ἐπιγινομένων ἔτι ἔνιαι συλλαμβάνουσιν, ὕστερον δ' οὐ συλλαμβάνουσιν, ὅσαις εὐθὺς μετὰ τὴν κάθαρσιν αἱ ὑστέραι συμμύουσιν. γίνεται δ' ἐνίαις καὶ κυούσαις διὰ τέλους τὰ γυναικεῖα· συμβαίνει μέντοι αὐταῖς φαῦλα τίκτειν, καὶ ἢ μὴ σώζεσθαι εἰς αὔξησιν, ἢ ἀσθενῆ τὰ ἔκγονα γίγνεσθαι. πολλαῖς δὲ καὶ διὰ τὸ ἐνδεεῖς εἶναι τῆς συνουσίας, ἢ διὰ τὴν νεότητα, καὶ τὴν ἡλικίαν, ἢ διὰ τὸ χρόνιον ἀπέχεσθαι πολύν, καταβαίνουσιν αἱ ὑστέραι κάτω, καὶ τὰ γυναικεῖα γίνεται πολλάκις τρὶς τοῦ μηνός, ἕως ἂν συλλάβωσι. τότε δὲ ἀναχωροῦσι πάλιν εἰς τὸν αὑτῶν τόπον τὸν οἰκεῖον. ἐνίοτε δὲ, * καὶ εὖ συμβῇ ἔχουσα, τύχῃ δ' ὑγρὰ οὖσα, ἀποφυσᾷ τὸ σπέρμα πρὸς τὸ ὑγρότερον. πάντων δὲ τῶν ζῴων (ὥσπερ εἴρηται καὶ πρότερον) ταῖς γυναιξὶ μάλιστα τῶν ἄλλων θηλέων ἡ κάθαρσις γὰρ πλείστη. τοῖς μὲν γὰρ μὴ ζωοτοκοῦσιν, οὐδὲν τοιοῦτον ἐπισημαίνει, διὰ τὸ τὴν περίττωσιν ταύτην τρέπεσθαι εἰς τὸ σῶμα. μείζω τε γὰρ ἔνια τῶν ἀρρένων εἰσί. καὶ ἔτι τοῖς μὲν εἰς φολίδας, τοῖς δὲ εἰς λεπίδας, τοῖς δὲ εἰς τὸ τῶν πτερῶν ἀναλίσκεται πλῆθος· τοῖς δὲ πεζοῖς καὶ ζωοτόκοις, εἴς τε τὰς τρίχας καὶ τὸ σῶμα, (λεῖον γὰρ ἄνθρωπος ἐστὶ μόνον) καὶ εἰς τὰ οὖρα. παχεῖαν γὰρ τὰ πλεῖστα καὶ πολλὴν τὰ τοιαῦτα προΐεται τὴν * ἔκκρισιν. ταῖς δὲ γυναιξὶν, ἀντὶ τούτων τρέπεται τὸ περίττωμα εἰς τὴν κάθαρσιν. ὁμοίως δ' ἔχει τοῦτο καὶ ἐπὶ τῶν ἀρρένων. πλεῖστον γὰρ, ὡς κατὰ τὸ μέγεθος, ἀφίησι σπέρμα τῶν ἄλλων ζῴων ἄνθρωπος· διὸ καὶ λειότατον τῶν ζῴων ἐστὶν ἄνθρωπος. καὶ αὐτῶν δὲ οἱ ὑγρότεροι τὰς φύσεις, καὶ μὴ πολύσαρκοι λίαν, καὶ οἱ λευκότεροι, τῶν μελάνων. καὶ ἐπὶ γυναικῶν δὲ τὸν αὐτὸν τρόπον. ταῖς γὰρ εὐσάρκοις παραλύεται εἰς τὴν τροφὴν τοῦ σώματος πολὺ τῆς * ἐκκρίσεως· καὶ ἐν ταῖς ὁμιλίαις δὲ τῶν ἀφροδισίων, αἱ λευκότεραι τὴν φύσιν ἐξικμάζουσι μᾶλλον τῶν μελαινῶν. ποιεῖ δὲ τῆς τροφῆς τὰ ὑγρὰ καὶ δριμέα τοιαύτην τὴν ὁμιλίαν μᾶλλον.

* Vulgò, κἂν μὲ perperam.

* κ. ἔκρυσιν.

* Gaza ἐκκρίσεως. meliùs. nã ἐκκρίσεις mulierum aliud ſunt. de quib. c. ſeq.

ΚΕΦΑΛ. γʹ.

Τίνα σημεῖα τοῦ συνειληφέναι τὰς γυναῖκας, καὶ τὰ αὐταῖς μετὰ τὴν σύλληψιν συμβαίνοντα· καὶ περὶ ἐκτρωσμοῦ.

ΓΙνεται δὲ σημεῖον τοῦ συνειληφέναι ταῖς γυναιξὶν, ὅταν εὐθὺς ξηρὸς ᾖ μετὰ τὴν ὁμιλίαν ὁ τόπος. ἐὰν μὲν οὖν λεῖα τὰ χείλη ᾖ τοῦ στόματος, οὐ δύναται συλλαμβάνειν· ἀπολισθαίνει γάρ· οὐδ' ἂν παχέα. ἐὰν δ' ἁπτομένῳ τῷ δακτύλῳ τραχύτερα ᾖ, καὶ ἀντέχῃ, καὶ ἂν λεπτὰ τὰ χείλη, τότε εὐφυῶς ἔχει πρὸς τὴν σύλληψιν. πρὸς μὲν οὖν τὸ συλλαμβάνειν, τοιαύτας δεῖ κατασκευάζειν τὰς ὑστέρας· πρὸς δὲ τὸ μὴ συλλαμβάνειν, τοὐναντίον. ἂν γὰρ ᾖ λεῖα τὰ χείλη,

A οὐ συλλαμβάνει. δεῖ δ' ἐπὰν, ἵνα τῆς μήτρας πρὸ τοῦ πίπτῃ τὸ σπέρμα, ἀλείφουσιν ἐλαίῳ κεδρίνῳ, ἢ ψιμυθίῳ, ἢ λιβανωτῷ, διέντες ἐλαίῳ. ἐὰν δὲ ἑπτὰ ἐμμείνῃ ἡμέρας, φανερὸν ὅτι εἴληπται· αἱ γὰρ καλούμεναι ἐκρύσεις, ἐν ταύταις γίνονται ταῖς ἡμέραις. αἱ δὲ καθάρσεις, φοιτῶσι ταῖς πλείσταις ἐπί τινα χρόνον συνειληφυίαις, ἐπὶ μὲν τῶν θηλειῶν, τριάκοντα ἡμέρας μάλιστα· περὶ τετταράκοντα δὲ, ἐπὶ τῶν ἀρρένων. καὶ μετὰ τοὺς τόκους δ' αἱ καθάρσεις βούλονται τὸν αὐτὸν ἀριθμὸν ἀποδιδόναι τούτων· οὐ μὴν ἐξακριβοῦσί γε πάσαις ὁμοίως. μετὰ δὲ τὴν σύλληψιν καὶ τὰς ἡμέρας τὰς εἰρημένας, οὐκέτι κατὰ φύσιν, ἀλλ' εἰς τοὺς μαστοὺς τρέπεται, καὶ γίνεται γάλα. B ἐπισημαίνει δὲ τὸ πρῶτον μικρόν τε καὶ ἀραχνιῶδες τὸ γάλα ἐν τοῖς μαστοῖς. ὅταν δὲ συλλάβωσιν, αἴσθησις μάλιστα γίνεται ταῖς λαγόσιν· ἐνίαις γὰρ γίνονται πληρέστεραι εὐθύς· μᾶλλον δ' ἐπίδηλος τοῦτο συμβαίνει ταῖς ἰσχναῖς· καὶ ἐπὶ τοῖς βουβῶσιν. ἐπὶ μὲν τῶν ἀρρένων, ὡς ἐπὶ τὸ πολὺ ἐν τῷ δεξιῷ μᾶλλον περὶ τὰς τετταράκοντα γίνεται ἡ κίνησις· τῶν δὲ θηλειῶν, ἐν τῷ ἀριστερῷ, περὶ ἐνενήκοντα ἡμέρας. οὐ μὴν ἀλλ' ἀκριβοῦν γε τούτων οὐδὲν μᾶλλον ὑποληπτέον· πολλαῖς γὰρ θηλυτοκούσαις, ἡ κίνησις ἐν δεξιῷ γίνεται, καὶ ταῖς ἐν τῷ ἀριστερῷ ἀρρενοτοκούσαις. ἀλλὰ ταῦτα καὶ τὰ τοιαῦτα πάντα, διαφέρει ὡς ἐπὶ τὸ πολὺ κατὰ τὸ μᾶλλον καὶ τὸ ἧττον. C περὶ δὲ τὸν χρόνον τοῦτον καὶ σχίζεται τὸ κύημα· τὸν δὲ ἔμπροσθεν, ἀδιάρθρωτον συνέστηκε κρεῶδες. * καλοῦνται δὲ ἐκρύσεις μὲν αἱ μέχρι τῶν ἑπτὰ ἡμερῶν διαφθοραί· ἐκτρωσμοὶ δὲ, αἱ μέχρι τῶν τετταράκοντα· καὶ πλεῖστα διαφθείρεται τῶν κυημάτων ἐν ταύταις ταῖς ἡμέραις. τὸ μὲν οὖν ἄρρεν, ὅταν ἐξέλθῃ τετταρακοσταῖον, ἐὰν μὲν εἰς ἄλλο τι ἀφῇ τις, διαχεῖταί τε καὶ ἀφανίζεται· ἐὰν δ' εἰς ψυχρὸν ὕδωρ, συνίσταται ὥσπερ ἐν ὑμενίῳ. τούτου δὲ διακνισθέντος, φαίνεται τὸ ἔμβρυον τὸ μέγεθος ἡλίκον μύρμηξ τῶν μεγάλων· τά τε μέρη δῆλα, τά τε ἄλλα πάντα, καὶ τὸ αἰδοῖον, καὶ οἱ ὀφθαλμοί, καθάπερ ἐπὶ τῶν ἄλλων ζῴων, μέγιστοι. D τὸ δὲ θῆλυ, ὅτι μὲν ἂν διαφθαρῇ ἐντὸς τῶν τριῶν μηνῶν, ἀδιάρθρωτον ὡς ἐπὶ τὸ πολὺ φαίνεται· ὅτι δ' ἂν ἐπιλάβῃ τοῦ τετάρτου μηνὸς, γίνεται ἐσχισμένον, καὶ διαταχέων λαμβάνει τὴν ἄλλην διάρθρωσιν. τέως μὲν οὖν πᾶσαν τὴν τελείωσιν τῶν μορίων βραδύτερον ἀπολαμβάνει τὸ θῆλυ τοῦ ἄρρενος, καὶ δεκάμηνα γίνεται μᾶλλον τῶν ἀρρένων· ὅταν δὲ γένηται, θᾶττον τὰ θήλεα τῶν ἀρρένων, καὶ νεότητα καὶ ἀκμὴν λαμβάνει, καὶ γῆρας· καὶ μᾶλλον αἱ τετοκυῖαι πλείους τόκους, ὥσπερ εἴρηται πρότερον.

* De generat. animalium. lib. 3. cap. 9.

A concipere nequit. Quamobrem nonnullæ, vt ſemen incidat, antè vuluam ex oleo iuniperino, aut ex ceruſa, thureve, excipientes, oleo illinunt. Sed ſi in ſeptimum diem intus permanſerit, conceptum iam eſſe certum eſt: nam quæ effluxiones vocantur, intra tot numero dies fieri ſolent. Purgationes autem accedunt plurimis, cùm conceperint, ad tempus quoddam, ſcilicet triginta dierũ, maximè ſi concepta fœmina eſt: quadraginta, ſi mas. A partu etiam purgationes eodem dierum numero conſequi volunt, quanquam non æquè ita diligenter eueniunt. at verò poſt conceptum, & dies, quos modò dixi, non item ſecundùm na- B turam inferiùs agitur, ſed in vbera tranſitur, & lac efficitur. Cuius nota inter initia exiguo quodam & araneæ propemodum ſpecie apparet in mammis. Cum iam conceperint, ſentiũt præcipuè ſuis ilibus: hæc enim nonnullis ſtatim pleniora efficiuntur. quod iis quæ graciliores ſunt, euidentiùs accidit. Inguina etiam ſentiunt, & conceptui argumento eſſe poſſunt. Mares fœtus magna ex parte circa quadrageſimum diem dextro potius latere mouentur, fœminæ ſiniſtro, circiter nonageſimum. Nihil tamen certi in his affirmari licet: multis enim ferentibus fœminam, motus agitur in dextro, & contrà in ſiniſtro, gerentibus marem. Sed enim hæc & reliqua huiuſcemodi, vt diffe- C runt, eo quo magna ex parte, & magis minúſve accidit, ſic accepimus. Finditur etiam fœtus hoc eodem tempore, cùm antè caruncula informis conſtaret. Effluxiones vocantur, quæ intra ſeptimum diem corruptiones incidunt. Abortiones autem, quæ intra quadrageſimum. Et quidẽ plurimi fœtus intra tot numero dies deprauantur. Mas, qui quadrageſimo die exierit, ſi in quoduis aliud mittatur, diffunditur atque abolctur: ſed ſi in aquam frigidam, cogitur, conſiſtitque, velvti in mẽbranula, qua rupta, fœtus ipſe apparet magnitudine formicæ maiuſculæ, & membra iam inde diſcreta, tum cętera omnià, tum genitalia conſtãt: D & oculi, quemadmodum in cæteris animantibus, prægrandes. Sed fœmina, quæ intra tertium menſem eruperit, indiſtincta eſt: quæ autem quartũm adepta eſt menſem, finditur, & réliquam diſtinctionis effigiem breui tempore accipit. Cum itaque fœtus in vtero formatur, fœmina tardius quàm mas, perfectionem quarumque partium recipit, & ſæpius in decimum menſem, quàm mas, protrahitur. Sed cum in lucem prodierit, fœmina ocyus quàm mas, & accreſcit, & ætate floret, & ſenectute maceratur, & magis quæ pluries pariunt, vt dictum iam eſt.

ΚΕΦΑΛ. δ. E

Τὰ περὶ κυούσας συμβαίνοντα τὰς γυναῖκας· καὶ πότε καὶ πόσα τίκτουσι.

Ὅταν δὲ συλλάβῃ ἡ ὑστέρα τὸ σπέρμα, εὐθὺς συμμύει ταῖς πολλαῖς, μέχρι τῶν ἑπτὰ μηνῶν· τῷ δ' ὀγδόῳ χάσκει, καὶ τὸ ἔμβρυον, ἐὰν ᾖ γόνιμον, προσκαταβαίνει τῷ ὀγδόῳ μηνί· τὰ δὲ μὴ γόνιμα, ἀλλ' ἀπεπνιγμένα ἑπτάμηνα ἐν τοῖς τόκοις, οὐκ ἐκφέρουσιν ὀκτάμηνα αἱ γυναῖκες, οὔτε προσκαταβαίνει κάτω τὰ ἔμβρυα τῷ ὀγδόῳ μηνί, οὔτε αἱ ὑστέραι ἐν τῷ χρόνῳ τούτῳ χάσκουσιν· ἀλλὰ σημεῖον ὅτι οὐ γόνιμον, ἐὰν γένηται μὴ συμπεσόντων τῶν εἰρημένων.

CAPVT IV.

De iis, quæ à conceptione ad partum vſque mulieribus eueniunt, quóve tempore pariant, quótque vno partu parere poſſint.

CVm ſemen conceperit vterus, ſtatim ſe cõtrahit, donec ad ſeptimum menſem ventum ſit. Octauo iã adaperitur, atque dehiſcit. Et partus, ſi viuit, deſcendit menſe eodem. Sed ſi mortuus eſt, neque ipſe deſcẽdit, nec vterus per id tẽpus dehiſcit. idque indiciũ facit haudquaquã eſſe vitalem.

Euenit profectò vt mulieres à conceptu corpus totum grauentur, & oculorum caligines, & dolores capitis moueantur. quæ aliis maturiùs, & ferè die decimo accidunt, aliis ſeriùs, prout magis minuſve ex materia ſuperuacua tentantur. Nauſeæ item & vomitus plurimas capiunt, & præcipuè quibus purgationes conſtiterint, necdum ad vbera tranſeant. Aliquæ igitur principio magis laborant, aliæ poſt, cùm iam fœtus pleniùs creuerit. Sæpe etiam multas deſtillatio vrinæ ad poſtremum infeſtat: ſed magna ex parte, quæ marem ferunt, faciliùs exigunt, minuſque pallent: contra quæ fœminam: ſunt enim pallidiores, & grauiùs degunt. Multis etiam tumores exuberationeſque carnis in cruribus incidunt: ſed tamen contra etiam nonnullis contingit. Solent appetitus varij grauidis euenire, citóque commutari: quod picare quidam à pica aue denominant: & ſummum, cùm fœtum ſexus fœminei ferunt, auidiùs appetunt, minuſque re frui iam præſente, quam cupierint, poſſunt: faſtidiunt enim ſtatim, quod modo vehementer appetierant. Paucis contingit vt meliùs habeant, cùm vterum gerunt, ſed præcipuè tunc faſtidiunt, tædióque fatiſcunt, cùm fœtui capillus oriri incipit. Pili congeniti grauidis defluunt, paucioréſque redduntur. Contra, qua parte pilos minimè habere ſolebant, ea magis accipiunt. Plus etiam motus magna ex parte mas in vtero infert, quàm fœmina, & celeriùs prodit. fœminæ enim partus tardior eſt. Dolor etiam ex fœmina continuus, ſed obtuſior: ex mare acer, & longè moleſtior. Quæ paulò ante partum concumbunt, faciliùs pariunt. Parturire interdùm mulieres videntur, cùm tamen tempus non ſit, ſed quoniam fœtus inuertit ſuum caput, ideo initium hoc eſſe parturiendi videtur. Sed cùm cætera animalia omnia ſingulari ac ſimplici modo partum ſuum perficiant (vnum enim pariendi tempus ſtatutum omnibus eſt) homini vni multiplex datum eſt: nam & ſeptimo menſe, & octauo, & nono parere poteſt, & quod plurimum decimo, nonnullæ etiam vndecimum tangunt. Fœtus, qui maturiùs, quàm ſeptimo menſe prodeat, nullo pacto vitalis eſt. Qui ſeptimo, vitalis quidem hic primus exit, ſed magna ex parte infirmior: quamobrem cunabulis ex lana eum obuoluunt, & faſciis alligant. Meatus etiam nonnulli inſiſſi, vt aurium, aut narium, ſæpenumero generantur: ſed accreſcenti articulantur infanti, & demum ſuam formam recipiunt: & pleríque de his quoque ſeptimo natis viuere atque adoleſcere poſſunt. Qui autem menſe octauo naſcuntur, viuere, ac adoleſcere in terra Ægypto poſſunt, & quibuſdam aliis in locis, vbi mulieres fertiliores ſunt, multóſque ſimul facilè & ferunt, & pariunt, etiam ſi monſtroſi ſint. Sed locis Græciæ multi intereunt, nec niſi perpauci ſeruantur. Vnde fit, vt ſi quis ſeruetur, non octauo menſe natus exiſtimetur, ſed mulierem ſui conceptus initium latuiſſe. Infeſtantur maximè mulieres menſe quarto, octauoque. Et ſi vel quarto, vel octauo fœtus perierit, ipſæ quoque magna ex parte intereunt. Itaque fit, ne ſolùm menſe octauo nati non viuant, ſed etiam ipſis emortuis, periculum, quæ pariunt, ſubeant. Simili modo, & qui diuturniores, quàm vndecimo menſe naſci videntur, latere putantur.

A μετὰ δὲ τὰς συλλήψεις, αἱ γυναῖκες βαρύνονται τὸ σῶμα πᾶν, καὶ σκοτοδινιῶσι περὶ τῶν ὀμμάτων, καὶ ἐν τῇ κεφαλῇ γίνονται πόνοι. ταῦτα δὲ ταῖς μὲν θᾶττον καὶ σχεδὸν δεκαταίαις γίνονται, ταῖς δὲ βραδύτερον, ὅπως ἂν τύχωσιν ἔχουσαι τοῦ περιττώματος εἶναι μᾶλλον καὶ ἧττον. ἔτι δὲ ναυτίαι καὶ ἔμετοι λαμβάνουσι τὰς πλείστας, καὶ μάλιστα τὰς τοιαύτας, ὅταν αἵ τε καθάρσεις στῶσι, καὶ μήπω εἰς τοὺς μαστοὺς τετραμμέναι ὦσιν. ἐνίαις μὲν οὖν ἀρχομέναις μᾶλλον πονεῖ τὸ σῶμα, ἐνίαις δὲ ὕστερον, ἤδη τοῦ κυήματος ἔχοντος αὔξησιν μᾶλλον. πολλαῖς δὲ καὶ πολλάκις καὶ στραγγουρίαι γίνονται τὸ τελευταῖον. αἱ μὲν οὖν ἐπὶ τὸ πολὺ ῥᾷον ἀπαλλάττουσιν αἱ τὰ ἄρρενα κύου- B σαι, καὶ μᾶλλον μετ' εὐχροίας διατελοῦσιν· ἐπὶ δὲ τῶν θηλέων τοὐναντίον. ἀχρούστεραι γὰρ ὡς ἐπὶ τὸ πολύ, καὶ βαρύτεραι διάγουσι, καὶ πολλαῖς ἴσχει τὰ σκέλη οἰδήματα καὶ ἐπάρσεις γίνονται τῆς σαρκός. οὐ μὴν ἀλλ' ἐνίαις γίνεται καὶ τἀναντία τούτων. εἰώθασι δὲ ταῖς κυούσαις αἱ ἐπιθυμίαι γίνεσθαι παντοδαπαί, καὶ μεταβάλλειν ὀξέως· ὃ καλοῦσί τινες κιττᾶν· καὶ ἐπὶ τῶν θηλέων ὀξύτεραι μὲν αἱ ἐπιθυμίαι, τυγχάνουσαι δὲ ἧττον δύνανται ἀπολαύειν. ὀλίγαις δέ ποτε συμβαίνει βέλτιον ἔχειν τὸ σῶμα κυούσαις. μάλιστα δὲ πονοῦσιν, ὅταν ἄρχωνται τὰ παιδία τρίχας* ποιεῖν. αἱ δὲ τρίχες, ταῖς μὲν κυούσαις αἱ μὲν σύμφυτοι γίνονται ἐλάττους, C καὶ ἐκρέουσιν· ἐν οἷς δὲ μὴ εἰώθασιν ἔχειν τρίχας, ταῦτα δασύνεσθαι μᾶλλον. καὶ κινήσεις δὲ παρέχεται ἐν τῷ σώματι μᾶλλον ὡς ἐπὶ τὸ πολὺ τὸ ἄρρεν τοῦ θήλεος, καὶ τίκτεται θᾶττον, τὰ δὲ θήλεα βραδύτερον. καὶ ὁ πόνος ἐπὶ μὲν τοῖς θήλεσι, συνεχὴς καὶ νωθρότερος· ἐπὶ δὲ τοῖς ἄρρεσιν, ὀξὺς μὲν, πολλῷ δὲ χαλεπώτερος. αἱ δὲ πλησιάζουσαι πρὸ τῶν τόκων τοῖς ἀνδράσι, θᾶττον τίκτουσι. δοκοῦσι δ' ὠδίνειν αἱ γυναῖκες ἐνίοτε καὶ μὴ γινομένης ὠδῖνος· ἀλλὰ διὰ τὸ τὴν κεφαλὴν στρέφειν τὸ ἔμβρυον, φαίνεται ὠδῖνος ἀρχὴ τοῦτο γίνεσθαι. τὰ μὲν οὖν ἄλλα ζῷα, μοναχῶς ποιεῖται τὴν τοῦ τόκου τελείωσιν (εἷς γὰρ ὥρισται τοῦ τόκου χρόνος πᾶσιν) ἀνθρώπῳ D δὲ πολλοὶ μόνῳ τῶν ζῴων. καὶ γὰρ ἑπτάμηνα, καὶ ὀκτάμηνα καὶ ἐννεάμηνα γίνονται, καὶ δεκάμηνα τὸ πλεῖστον εἶναι· αἱ δὲ ἐπιλαμβάνουσι καὶ τοῦ ἑνδεκάτου μηνός. ὅσα μὲν οὖν γίνεται πρότερον τῶν ἑπτὰ μηνῶν, οὐδὲν οὐδαμῆ δύναται ζῆν. τὰ δ' ἑπτάμηνα γόνιμα γίνεται πρῶτον, ἀσθενῆ δὲ τὰ πολλά· διὸ καὶ σπαργανοῦσιν ἐρίοις αὐτά. πολλὰ δὲ καὶ τῶν πόρων ἐνίοις ἔχοντα ἄτρητα, οἷον ὤτων καὶ μυκτήρων· ἀλλ' ἐπαυξανομένοις διαρθροῦται, καὶ βιοῦσι πολλὰ καὶ τῶν τοιούτων. τὰ δ' ὀκτάμηνα, περὶ μὲν Αἴγυπτον, καὶ ἐν ἐνίοις τόποις, ὅπου εὔφοροι αἱ γυναῖκες καὶ φέρουσί τε πολλὰ ῥᾳδίως, καὶ τίκτουσι, καὶ γενόμενα δύναται ζῆν, κἂν τερατώδη γένη- E ται. ἐν τούτοις μὲν οὖν ζῇ τὰ ὀκτάμηνα καὶ ἐκτρέφεται· ἐν δὲ τοῖς περὶ τὴν Ἑλλάδα τόποις, ὀλίγα παμπὰν σῴζεται, τὰ δὲ πολλὰ ἀπόλλυται. καὶ διὰ τὴν ὑπόληψιν, κἂν σωθῇ τι, νομίζουσιν οὐκ ὀκτάμηνον εἶναι τὸ * γεγενημένον, ἀλλὰ λαθεῖν αὐτὰς αἱ γυναῖκες συλλαβούσας πρότερον. πονοῦσι δ' αἱ γυναῖκες μάλιστα τὸν μῆνα τὸν τέταρτον, καὶ τὸν ὄγδοον, καὶ ἐὰν διαφθείρωσι τετάρτῳ ἢ ὀγδόῳ μηνί, διαφθείρονται καὶ αὐταὶ ὡς ἐπὶ τὸ πολύ· ὥστ' οὐ μόνον τὰ ὀκτάμηνα οὐ ζῇ, ἀλλὰ καὶ διαφθειρομένων αἱ τεκοῦσαι κινδυνεύουσι. τὸν αὐτὸν δὲ τρόπον δοκεῖ λανθάνειν καὶ ὅσα φαίνεται τίκτεσθαι πολυχρονιώτερα τῶν ἕνδεκα μηνῶν.

* Malim φύειν, ſed & ποιεῖν legi poteſt.

* [illegible]

καὶ γὰρ τούτοις ἡ τῆς συλλήψεως ἀρχὴ λανθάνει τὰς γυναῖκας. πολλάκις γὰρ πνευματικῶν γινομένων ἐμπροσθεν τῶν ὑστερῶν, μετὰ ταῦτα πλησιάσασαι καὶ συλλαβοῦσαι, ἐκείνην οἴονται τὴν ἀρχὴν εἶναι τῆς συλλήψεως, δι' ἣν ἐχρήσαντο τοῖς σημείοις. Τὸ δὲ δὴ πλῆθος τῶν τόκων τῆς τελειώσεως, παρὰ τἆλλα ζῷα τοῖς ἀνθρώποις ταύτην ἔχει τὴν διαφοράν· καὶ τῶν μὲν, μονοτόκων ὄντων, τῶν δὲ, πολυτόκων, ἐπαμφοτερίζει τὸ γένος τὸ τῶν ἀνθρώπων. τὸ μὲν γὰρ πλεῖστον, καὶ παρὰ τοῖς πλείστοις, ἓν τίκτουσιν αἱ γυναῖκες· πολλάκις δὲ καὶ πολλαχοῦ δίδυμα, οἷον περὶ Αἴγυπτον. τίκτουσι δὲ καὶ τρία καὶ τέτταρα, περὶ ἐνίους μὲν καὶ σφόδρα τόπους, ὥσπερ εἴρηται πρότερον· πλεῖστα δὲ τίκτεται πέντε τὸν ἀριθμόν. ἤδη γὰρ ὦπται τοῦτο καὶ ἐπὶ πλειόνων συμβεβηκός. μία δέ τις ἐν τέτταρσι τόκοις ἔτεκεν εἴκοσιν· ἀνὰ πέντε γὰρ ἔτεκε, καὶ τὰ πολλὰ αὐτῶν ἐξετράφη. ἐν μὲν οὖν τοῖς ἄλλοις ζῴοις, κἂν ᾖ τὰ δίδυμα ἄρρεν καὶ θῆλυ, οὐδὲν ἧττον ἐκτρέφεται γινόμενα καὶ σῴζεται τῶν ἀρρένων ἢ θηλειῶν· ἐν δὲ τοῖς ἀνθρώποις, ὀλίγα σῴζεται τῶν διδύμων, ἐὰν ᾖ τὸ μὲν ἄρρεν, τὸ δὲ θῆλυ. δέχεται δ' ὀχείας κύοντα μάλιστα τῶν ζῴων γυνὴ καὶ ἵππος· τὰ δ' ἄλλα, ὅταν πληρωθῇ, φεύγει τοὺς ἄρρενας, ὅσα μὴ πέφυκεν ἐπικυΐσκεσθαι, καθάπερ δασύποδες. ἀλλ' ἵππος μὲν, ἂν συλλάβῃ τὸ πρῶτον, οὐκ ἐπικυΐσκεται πάλιν, ἀλλ'* ἓν τίκτει μόνον ὡς ἐπὶ τὸ πολύ. ἐν ἀνθρώπῳ δὲ ὀλίγα μὲν, γέγονε δέ ποτε. τὰ μὲν οὖν ὕστερον πολλῷ χρόνῳ συλληφθέντα, οὐδὲν λαμβάνει τέλος, ἀλλὰ πόνον παρέχοντα, συνδιαφθείρει τὸ προϋπάρχον. ἤδη γὰρ γινομένης διαφθορᾶς, καὶ δέκα συνέβη καὶ δώδεκα ἐκπεσεῖν τὰ ἐπικυηθέντα. ἐὰν δὲ ἐγγὺς ἡ σύλληψις ἐγένετο, τὸ ἐπικυηθὲν ἐξενήνοχε, καὶ τίκτουσιν ὥσπερ δίδυμα γόνιμα, καθάπερ καὶ τὸν Ἰφικλέα καὶ τὸν Ἡρακλέα μυθολογοῦσι. γέγονε γὰρ καὶ τοῦτο φανερόν. μοιχευομένη γάρ τις, τὸ μὲν ἐκ τῶν τέκνων, ἐοικὸς τῷ ἀνδρὶ ἔτεκε, τὸ δὲ, τῷ μοιχῷ. ἤδη δὲ καὶ δίδυμα κύουσά τις, ἐπεκύησε τρίτον. γινομένου δὲ τοῦ χρόνου τοῦ καθήκοντος, τὰ μὲν, τελειόγονα τῷ χρόνῳ ἔτεκε· τὸ δὲ, πεντάμηνον· καὶ τοῦτ' ἀπέθανεν εὐθύς. καὶ ἑτέρᾳ δέ τινι συνέβη τεκούσῃ, πρότερον μὲν ἑπτάμηνον, ὕστερον δὲ δύο τελεόμηνα τεκεῖν· καὶ τούτων τὸ μὲν, ἐτελεύτησε, τὰ δὲ ἐβίωσε. καὶ ἐκτιτρώσκουσαι δέ τινες, συνέλαβον ἅμα· καὶ τὸ μὲν, ἐξέβαλον, τὸ δὲ, ἔτεκον. ταῖς δὲ πλείσταις, ἐὰν συγγίνωνται κυούσαις μετὰ τὸν ὄγδοον μῆνα, ὡς ἐπὶ πλέον μυξῶδες τὸ παιδίον ἐξέρχεται γλίσχρῳ τινί. καὶ τῶν ἐδεσμάτων δὲ τῶν προσφερομένων, περὶ πλέον φαίνεται πολλάκις· τῷ ἁλὶ δὲ δαψιλεστέρῳ χρησαμένων, οὐκ ἔχοντα γίνεται τὰ παιδία ὄνυχας.

* ἢ· οὐτ.

ΚΕΦΑΛ. έ.

Περὶ γυναικείου γάλακτος, καὶ περὶ ἀρχῆς καὶ παύλης τοῦ τίκτειν καὶ τεκνοῦσθαι.

ΤΟ δ' γάλα τὸ γινόμενον πρότερον τῶν ἑπτὰ μηνῶν, ἄχρηστόν ἐστιν· ἀλλ' ἅμα τά τε παιδία γόνιμα, καὶ τὸ γάλα χρήσιμον. τὸ δὲ πρῶτον, καὶ ἁλμυρὸν, ὥσπερ τοῖς προβάτοις. μάλιστα δ' ἐν ταῖς κυήσεσι τῷ οἴνῳ αἰσθάνονται αἱ πλεῖσται. διαλύονταί τε γὰρ, ἐὰν πίωσι, καὶ ἀδυνατοῦσιν. ἀρχὴ δὲ ταῖς γυναιξὶ τοῦ τεκνοῦσθαι, καὶ τοῖς ἄρρεσι τοῦ τεκνοῦν, καὶ παῦλα ἀμφοτέροις, τοῖς μὲν, ἡ τοῦ σπέρματος πρόεσις, ταῖς δὲ, ἡ τῶν καταμηνίων.

Latet enim mulieres conceptus initium, ſi cùm antè inflatus fuerit vterus, vt ſæpe accidit, poſt coierint, atque conceperint. Hoc enim principium eſſe ſui conceptus exiſtimant, quod ſimile indicium attulit. Ita multiplex perficiendi tempus pariendique diuerſum homini datum eſt. Et cùm alia ſingulos pariant, alia plures, genus humanũ in ancipiti eſt. Nam quod plurimum, & locis plurimis agitur, mulieres ſingulos ſingulæ pariunt. Sed ſæpe & locis pleriſque geminos etiam, vt in terra quoque Ægypto fieri certum eſt. Pariunt etiam tres, & quatuor. Et quidem locis nonnullis valde ita fit, quod dictum iam eſt, ſed quinque cumplurimum naſcuntur. Iam enim hoc pluribus eueniſſe conſpectum eſt. Et quædam viginti, partubus quatuor edidit: quinos enim ſingulis partubus enixa eſt, maiórque eorum pars enutriri, & adoleſcere potuit. Et cùm in cæteris animalibus gemini nati, etiamſi mas & fœmina ſint, nihilo minus enutriantur, ſeruenturque, quàm ſi mares ambo, aut fœminæ ſint: in genere certè humano pauci gemini ſeruantur, ſi alter mas ſit, alter fœmina. Mulier & equa omnium maximè animalium grauidæ coitum patiuntur: cætera vbi grauida fuerint, fugiunt mares, ea ſcilicet quorum natura ſuperfœtare more leporis recuſat: verùm equa nunquam ſuperfœtat, ſed magna ex parte vnum tantummodo generat. at verò in muliere raro quidem euenit vt ſuperfœtet, ſed factum tamen aliquando eſt. Qui itaque longo poſt tempore ſint concepti, nihil perfici poſſunt: ſed præmaturiùs dolorem, quo ipſi & primus fœtus intereat, mouent. Iam incidit vt facta corruptione duodecim ſuperfœtã puerperia egererentur. at verò ſi proximè à primo conceptu ſecundus ſit factus, abſolui edique poteſt, quod ſuperfœtatũ, vt quaſi gemini naſci videantur: quomodo Herculem & Iphiclem procreatos eſſe fabulantur. Nam id etiã conſtitit adulterâ quadam, quæ alterum ſuo marito, alterum adultero ſimilem peperit. Iam & cùm geminos quædam ferret, tertium ſuperfœtauit: & cùm tempus pariendi iuſtum iam eſſet, primos vitales peperit, tertium quinto menſe eliſit, qui ſtatim mortuus eſt. altera cùm primùm ſeptimo peperiſſet, qui mortuus eſt, mox duos iuſto menſium numero edidit, qui vixerunt. Quædam etiam ſub abortu conceperant, atque alterum abegerunt, alterum continuerunt, pertulerúntque ad partum. Plurimis ſi concubuerint menſe octauo, infans mucore oppletus exit. Eſculentorum etiam, quæ mater comederit, ſæpe gerulus venit in lucem: & ſi ſale immodicè vſa eſt, ipſe ſine vnguibus naſcitur.

CAPVT V.

De lactis bonitate, & malignitate, déque menſtruorum muliebrium fine.

LAc, quod ante ſeptimum menſem contractum eſt, inutile eſt: ſed ſimul infans natalis eſt, & lac eſſe vtile incipit: prius autem ſalſum etiam eſt, vt pecoris. Vino præcipuè cùm vterum ferunt, plurimæ infeſtantur: diſſoluuntur enim, ſi biberint, atque debilitantur. Principium, & finis mulieribus prolis recipiendæ, maribus præbendæ, ſeminis, & menſtruorum emiſſio eſt.

Sed neque cùm incipiunt, ſtatim prolifica ſunt, neque cùm deſinunt, & iam pauciora ſunt, & infirmiora. Quànam ætate incipiant menſtrua, & ſemen, dictum iam eſt. Sed deſinunt plurimis menſtrua circa quadrageſimum annum: quod tempus quæ exceſſerint, iis ad quinquageſimum ſeruantur. Et iam nonnullæ eo tempore pepererunt: ſed vltra hoc tempus nulla poteſt protrahere.

CAPVT VI.

Vſquequo maribus ſit generandi facultas, & de prolis ſimilitudine cum parentibus, vel cum aliis.

MAres plurimi ad ſexageſimum generant: quem ſi exceſſerint, ad ſeptuageſimum vſque procedunt. Et iam quidam annos ſeptuaginta nati genuerunt. Euenit ſanè multis & mulieribus, & viris, vt qui coniuncti inter ſe nequeāt procreare, vbi diſſociati ſe iunxere cum aliis, queant. Quod idē in maris quoque aut fœminæ procreatione nimirum euenire certum eſt. Plerumque enim tum mulieres, tum viri, quamdiu cum eiſdem iunguntur, fœminam tantùm marémve procreāt, ſeiuncti autem contrà. Ætatis etiam ratione immutantur, vt iuuenes inter ſe fœminas generent, ſeniores facti mares, aut contrà. Ratio quoque generandi omnino diſcrimen hoc idem recipit, vt iuuenes nihil procreent, ſeniores iam incipiāt generare. aut contrà, vt qui antè poſſent, pòſt nihil poſſint fœtificare. Sunt etiam aliquæ mulieres, quæ vix concipiant: ſed ſi conceperint, perficiant, atque edant. aliæ contrà, facilè quidem concipiūt, ſed ſeruare non poſſunt. Sunt & viri, qui non niſi fœminam procreent: & mulieres, quæ non niſi marem, & contrà: vt de Hercule fabulantur, qui inter duos & ſeptuaginta liberos, fœminam vnam tantummodo genuit. Quæ concipere nequeāt, ſi vel cura adhibita, aut aliquo caſu conceperint, fœminam magna ex parte pariunt potiùs quàm marem. Multis etiam viris euenit, vt cùm antea poſſent generare, pòſt nequeant, deinde rurſus facultatem recipiant generandi. Gignuntur læſi quoque ex læſis, verbi cauſa, claudi ex claudis, & cæci ex cæcis. Denique ſimiles ſæpenumero in re, quæ præter naturam comitetur, & ſigna habentes ſibi cognata hæreditaria, vt verrucas, vt næuos, aut cicatrices, aut quid aliud generis eiuſdem. Iam tale quid vel tertia prole pòſt regeneratum eſt, vt cùm quidam ſuo in brachio puncti notam haberet, filius non id retulit, ſed nepos, ea corporis parte nigritiem quandam habens confuſam, prodiit. Sed raro hæc eueniunt. Integri autem ex mancis ne gignantur, nulla res obſtat, & ſæpiſſimè ita agitur. Similes etiam aliqui parentibus, aut auis, ſuiſque maioribus generantur: aliqui ſimilitudinis nihil referunt. Redditur etiam vel poſt plures eiuſdem proſapiæ: vt in Sicilia, eius quæ adulterium cum Æthiope commiſerat, filia non colorem patris Æthiopis retulit, ſed qui natus ex hac eſt, is auum Æthiopem regenerauit. Fœminæ magna ex parte matri, mares patri proueniūt ſimiles: ſed fit etiam è diuerſo, vt fœminæ patri, mares matri ſimiles procreentur. Particulatim etiam ſimiles fiunt, vt alia corporis parte ſimiles ſint patri, alia matri. Gemini vel diſſimiles inter ſe nati iam ſunt, ſed plurimi magna ex parte ſimiles prodeunt.

A πλείω οὔτ' ἀρχομένων γόνιμα εὐθὺς, οὔτ' ἔτι ὀλίγων γινομένων καὶ ἀσθενῶν. ἡλικία δὲ τῆς μὲν ἀρχῆς, εἴρηται· παύεται δὲ ταῖς γυναιξὶ ταῖς μὲν πλείσταις τὰ καταμήνια περὶ τετταράκοντα ἔτη· αἷς δ' ἂν ὑπερβάλλῃ τὸν χρόνον τοῦτον, διαμένει μέχρι τῶν πεντήκοντα ἐτῶν· καὶ ἤδη δὲ τινες ἔτεκον. πλείω δὲ χρόνον οὐδεμία.

ΚΕΦΑΛ. ϛ'.

Τῆς τεκνογονίας διαφοραὶ, καὶ τῶν γεννωμένων ὁμοιότητος καὶ ἀνομοιότητος.

B ΟΙ δ' ἄνδρες, οἱ μὲν πλεῖστοι, γεννῶσι μέχρις ἑξήκοντα ἐτῶν. ὅταν δὲ ὑπερβάλλῃ τοῦτο, μέχρις ἑβδομήκοντα· καὶ ἤδη τινὲς γεγεννήκασιν ἑβδομήκοντα ἐτῶν ὄντες. συμβαίνει δὲ πολλοῖς καὶ πολλαῖς γυναιξὶ καὶ ἀνδράσι μετ' ἀλλήλων μὲν συνεζευγμένοις, μὴ δύνασθαι τεκνοποιεῖσθαι, διαζευχθεῖσι δέ. τὸ δὲ αὐτὸ συμβαίνει καὶ περὶ ἀρρενογονίας καὶ θηλυγονίας. ἐνίοτε γὰρ καὶ γυναῖκές εἰσι καὶ ἄνδρες, οἱ μετ' ἀλλήλων μὲν ὄντες, θηλυγόνοι εἰσὶν, ἢ ἀρρενογόνοι· διεζευγμένοι δὲ, γίνονται τοὐναντίον. καὶ κατὰ τὴν ἡλικίαν δὲ μεταβάλλου-
C σι. νέοι μὲν γὰρ ὄντες μετ' ἀλλήλων, θήλεα γεννῶσι· πρεσβύτεροι δὲ, ἄρρενα. τοῖς δὲ καὶ ἐπὶ τούτων συμβαίνει τοὐναντίον. καὶ ἐπὶ τοῦ γεννᾶν δὲ ὅλως τὸ αὐτό· νέοις μὲν οὖσιν, οὐδὲν γίνεται, πρεσβυτέροις δέ. οἱ δὲ, τὸ πρότερον, ὕστερον δὲ γεννῶσιν οὐδέν. εἰσὶ δὲ καὶ τῶν γυναικῶν τινες, αἳ μόλις μὲν συλλαμβάνουσιν, ἐὰν δὲ συλλάβωσιν, ἐκφέρουσιν· αἱ δὲ, τοὐναντίον, συλλαμβάνουσι μὲν ῥᾳδίως, οὐ δύνανται δ' ἐκφέρειν. εἰσὶ δὲ καὶ ἄνδρες θηλυγόνοι, καὶ γυναῖκες ἀρρενογόνοι· οἷον καὶ κατὰ τὸν Ἡρακλέους μυθολογεῖται, ὃς ἐν δύο καὶ ἑβδομήκοντα τέκνοις
D θυγατέρα μίαν ἐγέννησεν. αἱ δὲ μὴ δυνάμεναι συλλαμβάνειν, ἐὰν ἢ διὰ θεραπείαν συλλάβωσιν, ἢ δι' ἄλλην τινὰ σύμπτωσιν, ὡς ἐπιτοπολὺ θηλυτοκοῦσι μᾶλλον, ἢ ἀρρενοτοκοῦσι. πολλοῖς δὲ συμβαίνει καὶ τῶν ἀνδρῶν, δυναμένοις γεννᾶν, ὕστερον μὴ δύνασθαι, καὶ πάλιν καθίστασθαι εἰς τὸ αὐτό. γίνονται δὲ καὶ ἐξ ἀναπήρων ἀνάπηροι· οἷον ἐκ χωλῶν χωλοὶ, καὶ τυφλῶν τυφλοὶ, καὶ ὅλως τὰ παρὰ φύσιν ἐοικότες πολλάκις, καὶ σημεῖα ἔχοντες συγγενῆ, οἷον φύματα καὶ οὐλάς. ἤδη δὲ ἀπέδωκε τῶν τοιούτων τι καὶ διὰ τριῶν· οἷον, ἔχοντός τινος στίγμα ἐν τῷ βραχίονι, ὁ μὲν υἱὸς οὐκ ἐγένετο, ὁ δὲ υἱδοῦς,
E ἔχων ἐν τῷ αὐτῷ τόπῳ συγκεχυμένον μέλαν. ὀλίγα μὲν οὖν γίνεται τὰ τοιαῦτα· τὰ δὲ πλεῖστα οὐ γίνεται, ἀλλ' ὁλόκληρα ἐκ κολοβῶν, καὶ οὐδὲν ἀποτέτακται τούτων. καὶ ἐοικότες δὲ τοῖς γεννήσασιν, ἢ τοῖς ἄνωθεν γονεῦσιν, ὁτὲ δὲ οὐδὲν οὐδενί. ἀποδίδωσι δὲ καὶ διὰ πλειόνων γενῶν, οἷον ἐν Σικελίᾳ ἡ τῷ Αἰθίοπι μιγεῖσα. ἡ μὲν γὰρ θυγάτηρ, ἐγένετο οὐκ Αἰθίοψ, ὁ δὲ ἐκ ταύτης. καὶ ὡς μὲν ἐπιτοπολὺ τὰ θήλεα ἔοικε τῇ μητρὶ μᾶλλον, τὰ δ' ἄρρενα τῷ πατρί· γίνεται δὲ καὶ τοὐναντίον, τὰ μὲν θήλεα τῷ πατρὶ, τὰ δ' ἄρρενα τῇ μητρί. καὶ κατὰ μέρη δὲ γίνονται ἐοικότα ἄλλα μέρη ἑκατέρων. τὰ δὲ δίδυμα ἤδη μὲν ἐγένετο καὶ οὐκ ἐοικότα ἀλλήλοις, τὰ δὲ πλεῖστα καὶ ὡς ἐπιτοπολὺ ἐοικότα.

ἐπεὶ μετὰ τὸν τόκον τῆς ἑβδομαίας συγγενομένη καὶ συλλαβοῦσα, ἔτεκε τὸ ὕστερον τῷ προτέρῳ ἐοικὸς, ὥσπερ δίδυμον. εἰσὶ δὲ καὶ γυναῖκες ἐοικότα αὑταῖς γεννῶσαι· αἱ δὲ, τῷ ἀνδρὶ, ὥσπερ ἡ ἐν Φαρσάλῳ ἵππος ἡ Δικαία καλουμένη.

Politicor. lib. 1. cap. 3.

A Nam & quædam cùm ſeptimo die à partu concubuiſſet, concepiſſétque, peperit ſimilem ſuperiori quaſi geminum. Naturæ etiam ratione aliæ ſibi, aliæ ſuo marito ſimiles generant, vt equa Pharſalia cognomine Iuſta.

ΚΕΦΑΛ. ζ.

Πῶς ἐν τῇ ὑστέρᾳ μορφοῦται τὸ σπέρμα.

Ἐν δὲ τῇ τοῦ σπέρματος ἐξόδῳ πρῶτον μὲν ἡγεῖται πνεῦμα· δηλοῖ δὲ ἡ ἔξοδος, ὅτι γίνεται ὑπὸ πνεύματος· οὐθὲν γὰρ ῥιπτεῖται πόρρω ἄνευ βίας πνευματικῆς. ὅταν δὲ λάβηται τὸ πνεῦμα τῆς ὑστέρας καὶ ἐγχρονισθῇ, ὑμὴν περιίσταται. φαίνεται γὰρ, ὅταν πρὶν διαρθρωθῆναι ἐξέλθῃ, οἷον ᾠὸν ἐν ὑμένι περιεχόμενον, ἀφαιρεθέντος τοῦ ὀστράκου· ὁ δὲ, ὑμὴν, φλεβῶν μεστός. πάντα δὲ καὶ πλωτὰ, καὶ πεζὰ, καὶ πτηνὰ, εἴτε ζωοτοκεῖται ἢ ᾠοτοκεῖται, ὁμοίως γίνεται· πλὴν τὸν ὀμφαλὸν τὰ μὲν πρὸς τὴν ὑστέραν ἔχει τὰ ζωοτοκούμενα, τὰ δὲ, πρὸς τῷ ᾠῷ, τὰ δὲ ἀμφοτέρως, οἷον ἐπὶ γένους τινὸς ἰχθύων. καὶ τὰ μὲν περιέχουσιν οἱ ὑμένες, τὰ δὲ, χορίῳ περιέχονται· καὶ πρῶτον μὲν τῷ ἐσχάτῳ χορίῳ ἐντὸς γίνεται τὸ ζῷον· εἶθ' ὑμὴν * περὶ τοῦτον ἄλλος, ὁ μὲν πλεῖστον προσπεφυκὼς τῇ μήτρᾳ, τῇ δὲ ἀφεστὼς καὶ ὕδωρ ἔχων. μεταξὺ δὲ ἡ ὑγρότης ὑδατώδης, καὶ ἰχωρώδης ἢ αἱματώδης, ὁ καλούμενος ὑπὸ τῶν γυναικῶν πρόφορος.

* Scrib. περὶ τοῦτον, ſicut Gaza: vel, ἢ περὶ τοῦτον. vt ſint plures ὑμένες, atque hæc verior lectio.

CAPVT VII.

Quomodo ſemen genitale informetur.

CVm ſemen genitale exit, ſpiritus antecedit, & quidem ipſo exitu conſtat agi cum ſpiritu: nihil enim procul ſine violentia ſpiritali proijci
B poteſt. Tum inſinuatum in vtero, diúque contentum membrana obducitur: quippe quod antè, quàm diſcernatur, exeat velvt ouum in ſua membranula contectum, detracto putamine: membrana autem ipſa venis referta eſt. Omnia verò natatilia, tum pedeſtria, tum etiā volatilia, ſiue animalis ſiue oui forma proueniunt, ſimili modo gignūtur, niſi quòd alia vmbilicum habeant vuluæ adhærentem, videlicet quæ animalis forma enaſcūtur, alia ouo, alia vtroque modo, vt in quodam piſcium genere: & alia quaſi membranis continentur, alia ſecundis. Primum intra vltimum inuolucrum animal gignitur, mox altera membrana obuelat, plurima quidem ſui parte vuluæ adhærens,
C ſed parte etiam ſeiuncta, & aquam continens. Humor autem inter has cruentus aquoſúſque eſt, quem mulieres proliferum vocant.

ΚΕΦΑΛ. η.

Πῶς αὐξάνεται καὶ ἔχει τὰ ἔμβρυα.

Αὐξάνεται τὰ ζῷα πάντα, ὅσα ἔχει ὀμφαλὸν, διὰ τοῦ ὀμφαλοῦ. ὁ δὲ ὀμφαλὸς, ὅσα μὲν κοτυληδόνας ἔχει, πρὸς τῇ κοτυληδόνι προσπέφυκεν· ὅσα δὲ λείαν ἔχει τὴν ὑστέραν, πρὸς τῇ ὑστέρᾳ ἐπὶ φλεβός. σχῆμα δὲ ἔχει ἐν τῇ ὑστέρᾳ, τὰ μὲν τετράποδα, πάντα ἐκτεταμένα· καὶ τὰ ἄποδα, πλάγια, οἷον ἰχθύς· τὰ δὲ δίποδα, συγκεκαμμένα, οἷον ὄρνις· καὶ ἄνθρωπος, συγκεκαμμένος· καὶ ῥῖνα μὲν μεταξὺ τῶν γονάτων ἔχουσι, ὀφθαλμοὺς δὲ ἐπὶ τοῖς γόνασιν, ὦτα δὲ ἐκτός. ἔχει δὲ ὁμοίως πάντα τὰ ζῷα τὴν κεφαλὴν ἄνω τὸ πρῶτον· αὐξανόμενα δὲ, καὶ πρὸς τὴν ἔξοδον ὁρμῶντα, κάτω περιάγεται. καὶ ἡ γένεσις ἐστὶν ἡ κατὰ φύσιν, πᾶσιν ἐπὶ κεφαλήν· συγκεκαμμένα δὲ καὶ ἐπὶ πόδας γίνεται παρὰ φύσιν. τὰ δὲ τῶν τετραπόδων, ἔχει καὶ περιττώματα, ὅταν ἤδη τέλεια ᾖ, καὶ ὑγρὸν, καὶ σφυράδας· τὰς μὲν, ἐν τῷ ἐσχάτῳ τοῦ ἐντέρου· ἐν δὲ τῇ κύστει, οὖρον. τοῖς δὲ ἔχουσι κοτυληδόνας ἐν τῇ μήτρᾳ τῶν ζῴων, ἀεὶ ἐλάττους γίνονται αἱ κοτυληδόνες, αὐξανομένου τοῦ ἐμβρύου, καὶ τέλος ἀφανίζονται. ὁ δὲ ὀμφαλὸς, ἐστὶ κέλυφος περὶ φλέβας, ὧν ἡ ἀρχὴ ἐκ τῆς ὑστέρας ἐστί· τοῖς μὲν οὖν ἔχουσι τὰς κοτυληδόνας, ἐκ τῶν κοτυληδόνων· τοῖς δὲ μὴ ἔχουσιν, ἀπὸ φλεβός. εἰσὶ δὲ τοῖς μὲν μείζοσιν, οἷον τοῖς τῶν βοῶν ἐμβρύοις, τέτταρες αἱ φλέβες· τοῖς δὲ ἐλάττοσι, δύο· τοῖς δὲ πάμπαν μικροῖς, οἷον ὄρνισι, μία φλέψ. τείνουσι δὲ εἰς τὰ ἔμβρυα, αἱ μὲν δύο, διὰ τοῦ ἥπατος, ᾗ αἱ καλούμεναι πύλαι εἰσί, πρὸς τὴν φλέβα τὴν μεγάλην· αἱ δὲ δύο, πρὸς τὴν ἀορτὴν, ᾗ σχίζεται καὶ γίνεται ἡ ἀορτὴ δύο ἐκ μιᾶς. εἰσὶ δὲ περὶ τὴν συζυγίαν ἑκατέραν τῶν φλεβῶν ὑμένες· περὶ δὲ τοὺς ὑμένας ὀμφαλὸς, οἷον ἔλυτρον.

CAPVT VIII.

De alimento animalis in vtero exiſtentis, déque hominis ſtatu in eodem.

AVgentur animalia omnia, quibus eſt vmbilicus, per ipſum vmbilicum. Hic acetabulis vuluæ adhæret, ſi ſunt: ſed ſi læuis ſit vulua, ipſi vuluæ adhæret vena ſubiecta. Situs in vtero
D quadrupedum omnium extenſus eſt: expedum autem obliquus: vt piſcium: bipedum verò inflexus contractúſque: vt auium. Homo etiam in ſemet conglobatus ſic geſtatur, vt naſum inter genua, oculos ſuper genua, aures extra genua habeat. Omnibus æquè animalibus caput primum ſuperius eſt: ſed cùm creuerint, & iam exitum appetāt, deorſum deducitur. Ita fit vt omnibus partus ſecundùm Naturam in caput, contra Naturam in pedes aut inflexo circumactóque corpore agatur. Quadrupedes vel excrementum iam inde habēt & alui, & veſicæ, alterum in poſtremo inteſtini, alterum in ipſa veſica. Quibus in vulua acetabula ſunt, fœtu accreſcente, acetabula ipſa ſubinde
E minuuntur, poſtremò abolentur omnia. Vmbilicus autem velvt putamen eſt circa venas, quarum origo ab vtero eſt. aut acetabulis, ſi habentur, aut venæ commiſſa eſt. Sunt fœtui maiori, vt boui, quatuor venæ, minori duæ, minimo vna, vt auibus. Pertinent duæ ad fœtum per iecur, quà, portas appellant, ortæ à vena maiori: reliquæ duæ, aorta quà finditur, & duæ de vna efficiuntur. Vtrumque venarum par membranulæ ambiunt, & mēbranulas ipſas ambit velvt putamē vmbilicus.

Collabuntur ſubinde venæ, & quo fœtus ampliùs creuerit, eo adductiùs ipſæ contrahuntur. Fœtus autem grandeſcens caua vteri ſubit, vbi palpitans iam ſentitur, & circa genitale parentis interdum voluitur.

A αὐξανομένων δ', ἀεὶ μᾶλλον συμπιέζουσιν αὐτὸ αἱ φλέβες. τὸ δ' ἔμβρυον ἁδρυνόμενον, εἴς τε τὰ κοῖλα ἔρχεται, καὶ ἐνταῦθα δῆλόν ἐστι κινούμενον, καὶ ἐνίοτε κυλινδεῖται περὶ τὸ αἰδοῖον.

CAPVT IX.

De doloribus mulierum in partu, & quæ facilè quæve difficulter pariant.

CVm mulieres parturiũt, dolores multas quidem in partes incumbunt, ſed plurimis ad alterutrum femur. Cæterùm quibus aluum tormina vehementer exercent, ocyſſimè pariunt. Quæ lumbos dolent, vix pariunt: quæ imum ventrem, expeditiùs. Si mas naſcitur, profluit ſanies diluta pallidiuſcula: ſed ſi fœmina, cruenta: verùm ea quoque præhumida eſt. Sed fieri quoque poteſt nonnullis, vt eorum neutrum accidat. Cæteris animalibus partus non laborioſi eueniunt: minùs enim cùm parturiunt, infeſtari videntur. at mulieribus dolores vehementiſſimi incidunt, & præcipuè ſtabilibus, & ſellulariis, & quibus non bona latera ſunt, neque facultas retinendi ſpiritus ſuppetit. Difficiliùs etiam edunt, ſi interea dum per vim retinent, coactæ eruperint reſpirationem. Primùm aqua illa ſubter cutem fuſa, per fœtus motionem, ruptis membranis effluit: deinde fœtus inuerſo vtero, & ſecundis interna euoluentibus, foras venit in lucem.

ΚΕΦΑΛ. θ'.

Περὶ τῶν ὠδίνων, καὶ περὶ τοῦ εὐτοκεῖν ἢ δυστοκεῖν.

Ὅταν δὲ ὠδίνωσιν αἱ γυναῖκες, εἰς πολλὰ μὲν καὶ ἄλλα ἀποσκηρίζονται αὐταῖς οἱ πόνοι· ταῖς δὲ πλείσταις, B εἰς ὁπότερον ἂν τύχῃ τῶν μηρῶν. ὅσαις δ' ἂν περὶ τὴν κοιλίαν σφοδρότατοι γίνωνται πόνοι, αὗται τάχιστα τίκτουσιν· καὶ ὅσαι μὲν τὴν ὀσφὺν προαλγοῦσι, μόλις τίκτουσιν. ὅσαι δὲ τὸ ἦτρον, ταχύ. ἂν μὲν οὖν ἀρρενοτοκῇ, προέρχονται οἱ ἰχῶρες ὑδαρεῖς ὑπόχλωροι· ἐὰν δὲ θηλυτοκῇ, αἱματώδεις· ὑγροὶ δὲ καὶ οὗτοι. ἐνίαις μέντοι συμβαίνει περὶ τὰς ὠδῖνας καὶ οὐδέτερα τούτων. τοῖς μὲν οὖν ἄλλοις ζῴοις οὐκ ἐπίπονοι γίνονται οἱ τόκοι, ἀλλὰ μετρίως ἐπίδηλά ἐστιν ἐνοχλούμενα ὑπὸ τῆς ὠδῖνος· ταῖς δὲ γυναιξὶ συμβαίνουσιν οἱ πόνοι ἰσχυρότεροι, καὶ μάλιστα ταῖς ἑδραίαις, καὶ ὅσαι μὴ εὔπλευροι, μηδὲ δύνανται τὸ πνεῦμα κατέχειν. C δυστοκοῦσι δὲ μᾶλλον, κἂν μεταξὺ ἀποπνεύσωσιν ἀποβιαζόμεναι τῷ πνεύματι. πρῶτον μὲν οὖν ὕδρωψ ἐξέρχεται* γενομένου τοῦ ἐμβρύου, καὶ ῥηγνυμένων τῶν ὑμένων· ἔπειτα τὸ ἔμβρυον, στρεφομένων μὲν τῶν ὑστερῶν, καὶ τοῦ ὑστέρου τὰ ἔσω ἐκτὸς ἰσχόντος.

* κινουμένου

CAPVT X.

De obſtetricis curâ, & de infantis exitu, de tarditate durationis oſſium, & dentium amiſſione.

IAm verò & obſtetricis officium, pars ingenij perſpicaciſque intelligentiæ eſt. Non ſolùm enim difficultati partus opportunè expeditéque ſuccurrendum eſt, ſed etiam contra ea quæ accidant, protinus agendum ingenioſè: & in ſecando deligandóque vmbilico infantis, prudentia requiritur, & peritia. Nam ſi ſimul ſecundæ quoque exciderint, vellere vmbilicus cum ſecundis alligatur, ſuperiùſque præciditur. Quà autem delegatum eſt, cohæreſcit, & pars continua decidit. Si copula amentúmque diſſoluatur, fœtus ſanguine effuſo emoritur. Sed ſi ſecundæ non ſtatim cum fœtu exierint, dum intus ipſe, foris autem infans eſt, deligato vmbilico ſecantur. Sæpe viſus eſt puer emortuus naſci, cum ei infirmo priùs quàm deligaretur vmbilicus, ſanguis in vmbilicum, & circa efflueret. Sed iam aliquæ obſtetrices factæ peritiores, reprimunt intro de vmbilico ſanguinem, quo facto ſtatim infans, qui modò exanguis deficiebat, recreatur vitæque reſtituitur. Naſcuntur, vt dictum eſt, ſecundùm naturam cætera etiã animalia verſa in caput: ſed pueri manus quoque ad coſtas, porrectas extenſáſque habent. Qui cùm exierint, vocem ſtatim emittũt, & manus in os admouent. Excrementum etiam reddunt, alij ſtatim, alij breui, ſed omnes intra diem: quod excremẽtum pluris, quàm pro infantis magnitudine eſt. Papauerculum hoc mulieres vocant, colore cruentum, atque admodum nigrũ, & piceum eſt, mox lacteum: iam & albidum redditur. Sugit enim confeſtim vbera infans.

ΚΕΦΑΛ. ι'.

Ἡ τῆς μαίας ὀμφαλοτομία, καὶ τὰ τοῖς παισὶ τεχθεῖσι συμβαίνοντα.

Καὶ τῆς μαίας ἡ ὀμφαλοτομία, μέρος ἐστὶν οὐκ ἀσύνου διανοίας. οὐ γὰρ μόνον περὶ τὰς δυστοκίας τῶν γυναικῶν τῇ εὐχερείᾳ δύνασθαι δεῖ βοηθεῖν, ἀλλὰ καὶ πρὸς D τὰ συμβαίνοντα ἀγχίνουν εἶναι, καὶ περὶ τὴν τοῦ ὀμφαλοῦ ἀπόδεσιν τοῖς παιδίοις. ἵνα γὰρ μὴ καὶ τὸ ὕστερον συνεκπέσῃ, ἐρίῳ ἀποδεῖται ἀπὸ τοῦ ὑστέρου ὁ ὀμφαλὸς, καὶ ἀποτέμνεται ἄνωθεν ᾗ ἀποδεθῇ, συμφύεται δὲ τὸ συνεχὲς, ἀποπίπτει. ἐὰν δὲ λυθῇ τὸ ἅμμα, ἀποθνήσκει, τοῦ αἵματος ἐκρυέντος, τὸ ἔμβρυον. ἐὰν δὲ μὴ συνεξέλθῃ εὐθὺς τὸ ὕστερον, ἔσω ὄντος αὐτοῦ, τοῦ παιδίου δὲ ἔξω, ἀποτέμνεται ἀποδεθέντος τοῦ ὀμφαλοῦ. πολλάκις δὲ ἔδοξε τεθνεὼς τίκτεσθαι τὸ παιδίον, ὅταν ᾖ ἀσθενικοῦ ὄντος, πρὶν ἀποδεθῆναι τὸν ὀμφαλὸν, τὸ αἷμα ἔξω εἰς τὸν ὀμφαλὸν καὶ τὸ πέριξ τύχῃ ἐξερρυηκός. ἀλλὰ τεχνικαί τινες ἤδη τῶν μαιῶν γινόμεναι, E ἀπέθλιψαν εἴσω ἐκ τοῦ ὀμφαλοῦ, καὶ εὐθὺς τὸ παιδίον, ὥσπερ ἔξαιμον γινόμενον πρότερον, πάλιν ἀνεβίωσε. γίνεται δὲ, καθάπερ ἐλέχθη πρότερον, κατὰ φύσιν ἐπὶ κεφαλὴν καὶ τἆλλα ζῷα· τὰ δὲ παιδία, καὶ τὰς χεῖρας* παρατεταμένας παρὰ τὰς πλευράς. ἐξελθόντα δ' εὐθὺς φθέγγεται, καὶ προσάγει πρὸς τὸ στόμα τὰς χεῖρας. ἀφίησι δὲ περιττώματα τὰ μὲν εὐθὺς, τὰ δὲ διαταχέων. πάντα δ' ἐν ἡμέρᾳ. καὶ τοῦτο τὸ περίττωμα πλέον ἢ τοῦ παιδὸς κατὰ μέγεθος· ὃ καλοῦσιν αἱ γυναῖκες μηκώνιον. χρῶμα δὲ τούτου αἱματῶδες, καὶ σφόδρα μέλαν, καὶ πιττῶδες· μετὰ δὲ τοῦτο, ἤδη γαλακτῶδες. ἅπτεται γὰρ εὐθὺς καὶ τὸν μαστόν.

* Sylb. παρατεταμένα

πρὶν δ' ἐξελθεῖν, οὐ φθέγγεται τὸ παιδίον, κἂν δυστοκούσης, τὴν κεφαλὴν μὲν ὑπερέχῃ, τὸ δ' ὅλον σῶμα ἔχῃ ἐντός. ὅσαις δ' ἂν ἐν ταῖς ἀποκαθάρσεσι προεξορμήσωσιν αἱ καθαρμοί, δυστοκώτεραι γίνονται τῶν ἐμβρύων. ἐὰν δὲ [αἱ] καθάρσεις μετὰ τὸν τόκον ἐλάττους γένωνται, καὶ ὅσαι μόνον αἱ πρῶται, καὶ μὴ διατελέσωσιν εἰς τὰς τεσσαράκοντα, ἰσχύουσί τε μᾶλλον αἱ γυναῖκες, καὶ συλλαμβάνουσι θᾶττον. τὰ δὲ παιδία ὅταν γένωνται, περὶ τετταράκοντα ἡμερῶν, ἐγρηγορότα μὲν, οὔτε γελᾷ, οὔτε δακρύει, νύκτωρ δ' ἐνίοτε ἄμφω· οὐδὲ κνιζόμενα τὰ πολλὰ αἰσθάνεται. τὸ δὲ πλεῖστον καθεύδει τοῦ χρόνου. αὐξανόμενον δ' αἰεὶ εἰς τὸ ἐγρηγορέναι μεταβάλλει μᾶλλον· καὶ ἐνυπνιαζόμενον δῆλον μὲν γίνεται, μνημονεύει δ' ὀψὲ τὰς φαντασίας. τοῖς μὲν οὖν ἄλλοις ζῴοις οὐδεμία* διαφορὰ τῶν ὀστῶν, ἀλλὰ πάντα τετελεσμένα γίνεται· τοῖς δὲ παιδίοις τὸ βρέγμα* λευκὸν, καὶ ὀψὲ πήγνυται, καὶ τὰ μὲν, ἔχοντα γίνεται ὀδόντας· τὰ δὲ παιδία, ἑβδόμῳ μηνὶ ἄρχονται ὀδοντοφυεῖν. φύει δὲ πρώτους τοὺς ἐμπροσθίους καὶ τὰ μὲν, τοὺς ἄνωθεν πρότερον, τὰ δὲ, τοὺς κάτωθεν· πάντα δὲ θᾶττον φύουσιν, ὅσων αἱ τίτθαι θερμότερον ἔχουσι τὸ γάλα.

* γρ. διαφορὰ mendosè.

* Gaza μαλακὸν,

ΚΕΦΑΛ. ια΄.

Τὰ μετὰ τοὺς τόκους συμβαίνοντα ταῖς γυναιξί.

ΜΕτὰ δὲ τοὺς τόκους καὶ τὰς καθάρσεις, ταῖς γυναιξὶ τὸ γάλα πληθύνεται· καὶ ἐνίαις ῥεῖ οὐ μόνον κατὰ τὰς θηλάς, ἀλλὰ πολλαχῇ τοῦ μαστοῦ· ἐνίαις δὲ καὶ κατὰ τὰς μασχάλας· καὶ διαμένουσιν εἰς τὸν ὕστερον χρόνον στραγγαλίδες, ὅταν μὴ ἐκπεφθῇ, μηδὲ ἐξέλθῃ ὑγρότης, ἀλλὰ πληρωθῇ. ἅπας γὰρ ὁ μαστὸς σομφὸς ἐστὶν οὕτως, ὥστε κἂν ἐν τῷ πόματι λάβωσι τρίχα, πόνος ἐγγίνεται ἐν τοῖς μαστοῖς· ὃ καλοῦσι* τριχίαν· ἕως ἂν ἢ αὐτομάτη ἐξέλθῃ θλιβομένη, ἢ μετὰ τοῦ γάλακτος ἐκθηλασθῇ. τὸ δὲ γάλα ἔχουσιν, ἕως ἂν πάλιν συλλάβωσι· τότε δὲ παύεται καὶ σβέννυται, ὁμοίως ἐπ' ἀνθρώπων καὶ τῶν ἄλλων ζῳοτόκων καὶ τετραπόδων. τοῦ γάλακτος δ' ἐξιόντος, οὐ γίνονται αἱ καθάρσεις ὡς ἐπὶ τὸ πολύ. ἐπεὶ ἤδη τισὶ θηλαζομέναις ἐγένετο κάθαρσις· ὅμως δ' ἅμα πολλαχῇ οὐ συμβαίνει ἡ ὁρμὴ τῆς ὑγρότητος· οἷον ταῖς ἐχούσαις αἱμορροΐδας, χείρους αἱ καθάρσεις ἐπιγίνονται. ἐνίαις δὲ καὶ διὰ τῶν ἰσχίων, ὅταν ἀπὸ τῆς ὀσφύος ἐκκριθῇ, πρὶν ἐλθεῖν εἰς τὰς ὑστέρας. καὶ ὅσαις δ' ἂν μὴ γινομέναις τῶν καθαρσίων ἅμα συμπίπτῃ ἐμέσαι, οὐδὲν βλάπτονται.

* Qui malint, τριχιᾶν.

ΚΕΦΑΛ. ιβ΄.

Περὶ σπασμοῦ τῶν παιδίων.

ΕΙωθε δὲ τὰ παιδία τὰ πλεῖστα σπασμὸς ἐπιλαμβάνειν, καὶ μᾶλλον τὰ εὐτραφέστερα, καὶ γάλακτι χρώμενα πλείονι, ἢ παχυτέρῳ, καὶ τίτθαις εὐσάρκοις. βλαβερὸς δὲ πρὸς τὸ πάθος, καὶ ὁ οἶνος ὁ μέλας μᾶλλον τοῦ λευκοῦ, καὶ ὁ μὴ ὑδαρής, καὶ τὰ πλεῖστα τῶν φυσωδῶν, καὶ ἐὰν ἡ κοιλία στῇ. τὰ πλεῖστα δὲ ἀναιροῦνται πρὸ τῆς ἑβδόμης· διὸ καὶ τὰ ὀνόματα τότε τίθενται, ὡς πιστεύοντες ἤδη μᾶλλον τῇ σωτηρίᾳ. καὶ ἐν ταῖς πανσελήνοις δὲ μᾶλλον πονοῦσιν. ἐπικίνδυνον δὲ καὶ ὅσοις τῶν παιδίων οἱ σπασμοὶ ἐκ τοῦ νώτου ἄρχονται,* προϊούσης δὲ τῆς ἡλικίας.

* Verba hæc pertinere ad initium libri vltimi notat Scaliger, in Commentariis illius libri: vide infrà.

A Vocem antequam egrediatur, nunquam emittit, etiamſi cùm difficulter egreditur, caput extet, corpus intus ſit totum. Quibus purgationes partum anticiparint, difficiliùs liberantur: ſed ſi à partu purgationes parciùs ſequantur, nec largiùs quam primæ, neque ad quadrageſimum diem perſeuerauerint, efficitur vt mulier validior ſit, & celeriùs poſſit concipere. Infantes autem primis quadraginta diebus neque rident cùm vigilant, neque lacrymantur: ſed noctu, & per quietem vtrumque interdum faciunt. Nec verò ſentiunt magna ex parte, cùm ſcalpuntur. Plurimam huius temporis partem dormiunt. Cæterùm in dies quo ſubinde B auctiores fuerint, eo magis ad vigilandum immutantur. Somniare etiam eos conſtat, ſed ſerò meminiſſe poſſunt imaginum. Cæteris quidem animalibus diſcrimen oſſium nullum eſt, ſed omnia perfecta iam inde à natiuitate proueniunt. at pueris ſinciput molle eſt, ſeróque duratur: & cùm cætera animalia naſcantur cum dentibus, pueri ſeptimo menſe dentire incipiunt. Primùm edunt primores, alij ſuperiores prius, alij inferiores. Denique omnes maturius dentiunt, quorum nutrices lac habent calidius.

CAPVT XI.

C *De aduentu lactis in muliere, & malo pilari, deque lactis duratione.*

POſt partum, purgationéſque, lactis copia excitatur, & nonnullis effluit non ſolum de papillis, ſed etiam paſſim per vbera, aliquibus etiam per alas, edurántque in poſterum globuli, quoties humor non coquatur, nec exeat, ſed redundet. Vbera enim, tota fungoſa ita ſunt, vt ſi in poculo pilū fortè hauſerit mulier, dolor moueatur in mămis, quod malum pilare appellant, nec ſedatur, donec pilus vel preſſus exeat ſponte, vel cum lacte exugatur. Seruatur lac donec mulier concipiat, tum deſinit, atque extinguitur, tam in homine quàm D in quadrupedum viuiparo genere. Quamdiu lac emanat, purgationes magna ex parte non fiunt: magna, inquam, ex parte, quoniam iam quibuſdā lactantibus facta purgatio eſt. Sed enim natura ita fert, ne humor locis pluribus ſimul erumpere ſoleat. Nam & mariſcas habenti, deteriores accedūt purgationes: &, quod in nonnullis accidit, cùm delapſus humor à lumbis per anum excernitur, antequam vterum ſubeat, idem euenit. Quibuſdam etiam purgationes non fiunt, inciderit vomitus, ſecurius exigunt.

CAPVT XII.

E *Pueros vt plurimum ante ſeptimum diem conuulſione interire.*

SOlent pueri plurimi conuulſione excipi, & præcipuè corpulētiores, & lacte veſcentes copioſiore, craſſioréque, & nutricem lactentes ſucci plenam, & corpulētam. Nocet etiam ad hoc morbi genus vinum, magiſque nigrum, quàm album, & quòd minus dilutum eſt. atque etiam ex cibis, qui inflent, plurimi obſunt: & ſi aluus ſubſtiterit, nocuum eſt. Plurimi ante ſeptimum diem intereunt. Vnde fit vt nomina ſeptimo die imponantur, tanquam ſaluti iam pueri magis credamus. Plenilunio etiam infeſtantur hoc malo periculoſius. Et ſi à ſcapulis conuulſio oriatur, in anguſto ſpes eſt.

A

ARISTOTELIS STAGIRITÆ, de Hiſtoria Animalium,

LIBER VIII.

CAPVT I.

De varietate actionum, & victus omnium animantium.

Generatio, & reliqua animalium natura ita ſe habet. Actiones autem, & vitæ, pro moribus victuque differunt. Sunt B enim vel in plurimis cæterorum animalium, veſtigia morum animi humani: quanquam hæc apertiùs in homine diſcernantur. Ineſt vrbanitas, feritas, clementia, acerbitas, fortitudo, ignauia, metus, fidentia, ira, malitia. atque etiam prudentiæ imago ineſt in multis, quemadmodum, cùm de partibus docerem, expoſui. Alia enim eo quod magis minúſve habeant, comparatione hominis differunt: homóque ipſe cum multis aliis animalibus ita diſſidet: quippe cùm aliqua ex his magis in homine habeantur, aliqua in cæteris animalibus latiùs: alia verò differant proportione. Vt enim in homine C ars, ſapientia, prudentia: ſic in nonnullis brutis ineſt vis quædam eiuſmodi altera naturalis. Conſtat hoc ita eſſe plane argumento pueriliſ ætatis, in qua futurorum habituum quaſi veſtigia & ſemina videris: & tamen nihil per id tempus animam hominis differre à beſluarum anima propè dixerim. Itaque nihil remotum à ratione eſt, ſi partim eadem, partim ſimilia, partim ex proportione in cæteris animalibus habentur. Sed adeò de inanimatis paulatim ſenſimque ad animata natura tranſit, vt continuatione ipſa lateat eorum confinium & medium vtriuſnam ſit extremi. Iam ab animantium genere primum genus plantarum eſt, earúmque alia D ab alia differt, eo quod magis vitæ particeps eſſe videtur. Vniuerſum autem genus reſpectu corporum cæterorum, quæ anima vacant, ipſum quaſi animal eſt: at reſpectu animalis, inanime eſſe videtur. Sed enim digreſſus hinc ad animalia continuus (vt modò dixi) procedit. Sunt enim maris nonnulla, quæ ambiges animalne ſint, an planta: hærent enim, & detracta compluta id genus intereunt. Verbi gratia, pinnæ adhærent, vngues euulſi viuere nequeunt: denique genus vniuerſum eorum quæ teſta integuntur, plantæ ſimile reſpectu gradientium animalium eſt. Quin & vis ſentiendi ita habetur, vt aliqua nullum eius indicium præbeant, alia le- E uiter, & perobſcurè ſentire videantur. Nonnullorum natura corporis carnoſa eſt, vt eorum, quæ tubera appellantur, aut vrticæ. at verò ſpongia omnino ſimilis plantis eſt. Cæterùm paruo quodam diſcrimine ſubinde alia præ aliis iam adipiſci vitam motúmque videntur. Quod idem in muneribus etiam vitæ percipere licet. Plantarum enim nullum aliud munus eſſe videtur, niſi quoad ſimilem quæque ſibi faciant alteram, videlicet quæ ſemine oriantur.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζώων ἱστορίας τὸ Θ.

ΚΕΦΑΛ. α'.

Περὶ διαφορῶν τῶν ἔργων καὶ βίου τῶν ζώων.

Τὰ μὲν οὖν περὶ τὴν [ἄλλην] φύσιν τῶν ζώων καὶ τὴν γένεσιν, τοῦτον ἔχει τὸν τρόπον· αἱ δὲ πράξεις καὶ οἱ βίοι κατὰ τὰ ἤθη καὶ τὰς τροφὰς διαφέρουσιν. ἔνεστι γὰρ ἐν τοῖς πλείστοις καὶ τῶν ἄλλων ζώων ἴχνη τῶν περὶ τὴν ψυχὴν τρόπων, ἅπερ ἐπὶ τῶν ἀνθρώπων ἔχει φανερωτέρας τὰς διαφοράς. καὶ γὰρ ἡμερότης [καὶ ἀγριότης,] πραότης καὶ χαλεπότης, καὶ ἀνδρία, καὶ δειλία, καὶ φόβοι καὶ θάρρη, καὶ θυμοὶ, καὶ πανουργίαι, καὶ τῆς περὶ τὴν διάνοιαν συνέσεως ἔνεισιν ἐν πολλοῖς αὐτῶν ὁμοιότητες, καθάπερ ἐπὶ τῶν μερῶν ἐλέγομεν. τὰ μὲν γὰρ, τῷ μᾶλλον καὶ ἧττον διαφέρει πρὸς τὸν ἄνθρωπον, καὶ ὁ ἄνθρωπος πρὸς πολλὰ τῶν ζώων. ἔνια γὰρ τῶν τοιούτων, ὑπάρχει μᾶλλον ἐν ἀνθρώπῳ· ἔνια δὲ, ἐν τοῖς ἄλλοις ζώοις μᾶλλον. τὰ δὲ, τῷ ἀνάλογον διαφέρει. ὡς γὰρ ἐν ἀνθρώπῳ τέχνη καὶ σοφία καὶ σύνεσις, οὕτως ἐν ἐνίοις τῶν ζώων ἐστί τις ἑτέρα τοιαύτη φυσικὴ δύναμις. φανερώτατον δ' ἐστὶ τὸ τοιοῦτον ἐπὶ τὴν τῶν παίδων ἡλικίαν βλέψασιν. ἐν τούτοις γὰρ, τῶν μὲν ὕστερον ἕξεων ἐσομένων ἔστιν ἰδεῖν οἷον ἴχνη καὶ σπέρματα. διαφέρει δὲ οὐδὲν, ὡς εἰπεῖν, ἡ ψυχὴ τῆς τῶν θηρίων ψυχῆς κατὰ τὸν χρόνον τοῦτον. ὥστε οὐδὲν ἄλογον, εἰ τὰ μὲν, ταὐτὰ, τὰ δὲ, παραπλήσια, τὰ δ', ἀνάλογον ὑπάρχει τοῖς ἄλλοις ζώοις. οὕτω δ' ἐκ τῶν ἀψύχων εἰς τὰ ζῷα μεταβαίνει κατὰ μικρὸν ἡ φύσις, ὥστε τῇ συνεχείᾳ λανθάνει τὸ μεθόριον αὐτῶν καὶ τὸ μέσον ποτέρων ἐστί. μετὰ [γὰρ] τὸ τῶν ἀψύχων γένος, τὸ τῶν φυτῶν πρῶτόν ἐστι· καὶ τούτων ἕτερον πρὸς ἕτερον διαφέρει, τῷ μᾶλλον δοκεῖν μετέχειν ζωῆς. ὅλον δὲ τὸ γένος πρὸς μὲν τἄλλα σώματα, φαίνεται σχεδὸν ὥσπερ ἔμψυχον· πρὸς δὲ τὸ ζῷον, ἄψυχον. ἡ δὲ μετάβασις ἐξ αὐτῶν εἰς τὰ ζῷα, συνεχής ἐστιν, ὥσπερ ἐλέχθη πρότερον. ἔνια γὰρ τῶν ἐν τῇ θαλάττῃ, διαπορήσειεν ἄν τις πότερον ζῷον ἢ φυτόν ἐστι. προσπέφυκε γὰρ, καὶ χωριζόμενα, πολλὰ διαφθείρεται τῶν τοιούτων. αἱ μὲν γὰρ πίνναι, προσπεφύκασιν· οἱ δὲ σωλῆνες, ἀνασπασθέντες, οὐ δύνανται ζῆν. ὅλως δὲ πᾶν τὸ γένος τῶν ὀστρακοδέρμων, φυτοῖς ἔοικε πρὸς τὰ πορευτικὰ τῶν ζώων. καὶ περὶ αἰσθήσεως, τὰ μὲν αὐτῶν, οὐδὲν σημαίνεται· τὰ δ', ἀμυδρῶς. ἡ δὲ τοῦ σώματος ἐνίων σαρκώδης ἐστὶ φύσις, οἷον τά τε καλούμενα τήθυα, καὶ τὸ τῶν ἀκαληφῶν γένος· ὁ δὲ σπόγγος, παντελῶς ἔοικε τοῖς φυτοῖς. ἀεὶ δὲ κατὰ μικρὰν διαφορὰν, ἕτερα πρὸ ἑτέρων ἤδη φαίνεται μᾶλλον ζωὴν ἔχοντα καὶ κίνησιν. καὶ κατὰ τὰς τοῦ βίου δὲ πράξεις, τὸν αὐτὸν ἔχει τρόπον. τῶν γε γὰρ φυτῶν ἔργον οὐδὲν ἄλλο φαίνεται, πλὴν, οἷον αὐτὸ, ποιῆσαι πάλιν ἕτερον, ὅσα γίνεται διὰ σπέρματος.

ὁμοίως δὲ καὶ τῶν ζώων ἐνίοις γὰρ, παρὰ τὴν γένεσιν, οὐδὲν ἔστι λαβεῖν ἔργον ἕτερον· διόπερ αἱ μὲν τοιαῦται πράξεις, κοιναὶ πάντων εἰσί. προσούσης δὲ αἰσθήσεως ἤδη, περί τε τὴν ὀχείαν, διὰ τὴν ἡδονὴν, διαφέρουσιν αὐτῶν οἱ βίοι, καὶ περὶ τοὺς τόκους καὶ τὰς ἐκτροφὰς τῶν τέκνων. τὰ μὲν οὖν ἁπλῶς, ὥσπερ φυτὰ, κατὰ τὰς ὥρας ἀποτελεῖ τὴν οἰκείαν γένεσιν· τὰ δὲ, καὶ περὶ τὰς τροφὰς ἐκπονεῖται τῶν τέκνων· ὅταν δ' ἀποτελέσῃ, χωρίζονται, καὶ κοινωνίαν οὐδεμίαν ἔτι ποιοῦνται. τὰ δὲ συνετώτερα καὶ κοινωνοῦντα μνήμης ἐπὶ πλέον, καὶ * πολιτικωτέρως χρῶνται τοῖς ἀπογόνοις. ἓν μὲν οὖν μέρος τοῖς ζώοις αἱ περὶ τὴν τεκνοποιίαν εἰσὶ πράξεις· αἱ δ' εἰσὶν δ' ἕτεραι, αἱ περὶ τὴν τροφήν. περὶ γὰρ δύο ταῦτα, αἵ τε σπουδαὶ τυγχάνουσιν οὖσαι πᾶσαι, καὶ ὁ βίος. πᾶσαι δὲ τροφαὶ διαφέρουσι μάλιστα κατὰ τὴν ὕλην ἐξ οἵας συνεστήκασιν. ἡ γὰρ αὔξησις, ἑκάστοις γίνεται κατὰ φύσιν ἐκ ταύτης. τὸ δὲ κατὰ φύσιν, ἡδύ. διώκει δὲ πάντα τὴν κατὰ φύσιν ἡδονήν. διῄρηνται δὲ κατὰ τοὺς τόπους. τὰ μὲν γὰρ, πεζὰ, τὰ δὲ, ἔνυδρα τῶν ζώων ἐστί. * διχῶς δὲ λεγομένης ταύτης τῆς διαφορᾶς, τὰ μὲν, τῷ δέχεσθαι τὸν ἀέρα, τὰ δὲ, τῷ τὸ ὕδωρ, λέγεται τὰ μὲν, πεζὰ, τὰ δὲ, ἔνυδρα. τὰ δὲ οὐ δεχόμενα μὲν, πεφυκότα δέ τοι πρὸς τὴν κρᾶσιν τῆς ψύξεως τὴν ἐφ' ἑκατέρου τούτων ἱκανῶς, τὰ μὲν, πεζὰ, τὰ δὲ, ἔνυδρα καλεῖται, οὔτ' ἀναπνέοντα, οὔτε δεχόμενα τὸ ὕδωρ· * τὰ δὲ τὴν τροφὴν ποιεῖσθαι καὶ διαγωγὴν ἐν ἑκατέρῳ τούτων. Πολλὰ γὰρ δεχόμενα τὸν ἀέρα, καὶ τοὺς τόκους ἐν τῇ γῇ ποιούμενα, τὴν τροφὴν ἐκ τῶν ἐνύδρων ποιεῖται τόπων, καὶ διατρίβει τὸν πλείω χρόνον ἐν ὕδατι. σχεδὸν ἅπερ, ὡς ἔοικεν, ἐπαμφοτερίζει μόνα τῶν ζώων. καὶ γὰρ ὡς πεζὰ, καὶ ὡς ἔνυδρα τις ἂν θείη.

* Quidam κοινωνικωτέρως

* Gaza legit τριχῶς. recte: vide c. seq.

* Scrib. cũ Gaza, τὰ δὲ τῷ τὴν τρ. vt hoc ſit membrum tertium, & ita leg. Prima differentia poſita eſt ἐν τῷ δέχεσθαι τὸν ἀέρα ἢ ὕδωρ: altera, ἐν τῇ κράσει: tertia ἐν ταῖς τροφαῖς.

ΚΕΦΑΛ. β'.

Περὶ τῶν ἐνύδρων λεγομένων ζώων, καὶ ποσαχῶς λέγεται.

Τῶν δὲ δεχομένων τὸ ὑγρὸν, οὐδὲν οὔτε πεζὸν, οὔτε πτηνὸν, οὔτε ἐκ τῆς γῆς τὴν τροφὴν ποιεῖται· τῶν δὲ πεζῶν καὶ δεχομένων τὸν ἀέρα, πολλὰ καὶ τὰ μὲν οὕτως ὥστε μηδὲ ζῆν δύνασθαι χωριζόμενα τῆς τοῦ ὕδατος φύσεως· οἷον αἵ τε καλούμεναι θαλάττιαι χελῶναι, καὶ κροκόδειλοι, καὶ ἵπποι ποτάμιοι, καὶ φῶκαι, καὶ τῶν ἐλαττόνων ζώων, οἷον * αἵ τ' ἐμύδες, καὶ τὸ τῶν βατράχων γένος. ταῦτα γὰρ ἅπαντα, μὴ διὰ χρόνου ἀναπνεύσαντα χρόνου, ἀποπνίγεται· καὶ τίκτει δὲ καὶ ἐκτρέφει ἐν τῷ ξηρῷ· τὰ δὲ πρὸς τῷ ξηρῷ· διάγει δ' ἐν τῷ ὑγρῷ. περιττότατα δὲ πάντων ὁ δελφὶς ἔχει τῶν ζώων, καὶ εἴ τι ἄλλο τῶν τοιούτων ἐστὶ, καὶ τῶν ἐνύδρων, καὶ τῶν ἄλλων κητωδῶν ὅσα τοῦτον ἔχει τὸν τρόπον, οἷον φάλαινα, καὶ ὅσα ἄλλα τοιαῦτα ἔχει αὐλόν. * οὐ μὲν ῥᾴδιον, οὔτε ἔνυδρον μόνον θεῖναι τούτων ἕκαστον, οὔτε πεζὸν, εἰ πεζὰ μὲν τὰ δεχόμενα τὸν ἀέρα θετέον, τὰ δὲ τὸ ὕδωρ, ἔνυδρα τὴν φύσιν. ἀμφοτέρων γὰρ μετείληφε· καὶ γὰρ τὴν θάλατταν δέχεται καὶ ἀφίησι κατὰ τὸν αὐλὸν, καὶ τὸν ἀέρα τῷ πνεύμονι. τοῦτο γὰρ ἔχουσι τὸ μόριον, καὶ ἀναπνέουσι. διὸ καὶ λαμβανόμενος ὁ δελφὶς ἐν τοῖς δικτύοις, ἀποπνίγεται ταχέως, διὰ τὸ μὴ ἀναπνεῖν· καὶ ἔξω δὲ ζῇ πολὺν χρόνον μύζων καὶ τρίζων, ὥσπερ καὶ τὰ ἄλλα τῶν ἀναπνεόντων ζώων. ἔτι δὲ καθεύδων ὑπερέχει τὸ ῥύγχος, ὅπως ἀναπνέῃ. τὰ δ' αὐτὰ ταῦτα εἰς ἀμφοτέρας τὰς διαιρέσεις, ἄτοπον, τὰς ἐναντίας

* καὶ αἱ ἐμύδ. vide De reſpir. anim. c. 1.

* Gaza aliam lectionem indicat. Fortaſſe leg. οὐ μόνον δέχεται, οὔτ.

A Sic animalium etiam quorumdam nihil muneris præter generationem acceperis. Vnde fit, vt eiuſmodi actiones ſint omnium communes, ſed procedente ſenſu, iam Venerei coitus voluptate vita eorum diſcrepat, atque etiam partus, enutriendæque prolis ratione. Itaque alia ſimpliciter, perinde vt plantæ, officio procreandi funguntur ſuis temporibus: alia in enutrienda etiam prole laborant, ſed cum perfecerint, deſiſtunt, nec vllam inſuper ſeruant ſocietatem. alia, quæ prudentiora ſunt, & plus memoriæ ſortiuntur, ciuilius agunt cum prole. Prima igitur pars vitæ animalium in officio procreandi conſiſtit, altera in alendo. In his enim B duobus ſtudium omnium vitaque verſatur. Cibi autem differunt, potiſſimum ratione materiæ, ex qua ipſa, quæ aluntur, conſiſtunt. Incrementum enim quibuſque ſecundum naturam ex eadem, qua conſtiterint, materia fit. Quod autem ſecundum naturam eſt, id ſuaue contingit: ſequunturque omnia eam voluptatem, quæ ſecundum naturam eſt. Degunt igitur animalia locis diſiuncta: alia namque terreſtria, alia aquatilia ſunt. Quam differentiam trifariàm intelligimus. Aut enim recipiendi aëris, aut aquæ ratione, altera terreſtria, altera aquatilia dicimus: aut quòd apta natura ſunt, ſeruari temperamento alterutro, quanquam aërem aquámve non recipiant: aut etiam quòd ci- C bum petant, verſentúrque vtrobique diutius. Cõplura enim cum recipiant aërem, partúſque faciãt in terra, cibum tamen à locis madidis petunt, verſantúrque in humore partem maximam temporis: quæ ſola vitam ambiguam agere videntur, quippe quæ eadem & velut pedeſtria, & velut aquatica ſtatui poſſint.

CAPVT II.

De victu aquatilium animantium.

D AT eorum, quæ humorem recipiunt, nullum vel pedeſtre, vel volatile eſt, nec cibum ſibi ex terra petit: quanquam multa ſpirabilis pedeſtriſque generis humore gaudent, & ita nonnulla, vt ne viuere quidem diſcluſa ab aquæ natura valeant: vt quæ marinæ teſtudines appellantur, & crocodili, & fluuiatiles equi, & vituli marini, atque etiam ex minori genere teſtudines lutariæ, ſiue mures aquatiles dicti, & ranæ: hæc enim omnia, niſi aliquamdiu ſpirent, intereunt: & parere educaréque ſolent in ſicco. Natura omnium maximè animalium ſuperflua, peculiariſque delphino, & ſi quid aliud tale, vel in cetaceo genere, vel in reliquo aquatili ſit, vt balæna, & E quæcumque fiſtulam gerunt: hoc enim genus nec terreſtre tantùm, neque aquaticum facilè dixerim. Siquidem terreſtre, quod aërem recipit: aquatile, quod aquam, ſecundum naturam eſt: particeps namque eſt vtriuſque, cum & mare accipiat, reddátque per fiſtulam, & aërem per pulmonem: habent enim hoc membrum, & ſpirant. Quamobrem delphinus retibus apprehenſus, breui tempore ſtrangulatur, vt qui ſpirandi facultatem amiſerit: foris verò diutius viuere poteſt mutiens, & anhelans modo cæterorum ſpirantium: quinetiam dormiens roſtrum exerit ſupra mare, vt ſpiret. Sed in vtraque diuiſionis tam contrariorum parte collocari hoc genus abſurdũ eſt.

Quamobrem aquatile genus amplius diſtinguendum videtur, vt alia accipiant, reddántque aquam, ea cauſa, qua ſpirantia aërem, quo refrigerentur: alia, propter cibum. Cùm enim in humore cibum accipiunt, fieri non poteſt, quin ſimul aliquid humoris admittatur: quod admiſſum, quo emittant, inſtrumentum habeant neceſſe eſt. Quæ igitur proportione ſpirationis humore vtuntur, branchias habent: quibus autem per cibum humor illabitur, iis fiſtula in ſanguineo genere data eſt. Mollibus etiam, & cruſtaceis hoc idem adhibitum eſt: nam ea quoque humorem propter cibum accipere coguntur. Sed altero illo modo aquatilia ſunt, temperationem corporis dico, & victum, vt quæ accipiant quidem aërem, ſed in humore ætatem degant: aut quæ accipiant quidem humorem, & branchias habeãt, ſed terram petant, vnde cibum accipiant: quale vnum adhuc tantummodo nouimus, cordulum nomine: hic enim non pulmonem, ſed branchias habet, egreſſúſque cibum petit in terra: & quadrupes idem eſt vt ad ambulandum idoneus. Horum autem omnium natura quaſi peruerſa videtur, ſicvt marium nonnullorum natura fœminam refert, fœminarum marem. Exiguis enim quibuſdam partibus ſuis natura animalium immutata, plurimùm toto in corpore differre videtur: quod latiſſimè in exciſis patet. Particula enim quadam oblæſa, totum animal in fœminam vertitur. Quapropter in prima etiam ortus conſtitutione minimæ magnitudinis quoquam immutato, dummodo ſit principale, efficitur vt alterum mas, alterum fœmina reddatur: atque ſi omnino tollatur, neutrum prodeat. Itaque terreſtre etiam & aquatile eſſe modo vtroque prædicto, parte animalis exigua immutata, poteſt, vt alia terreſtria, alia aquatilia procreentur: & alia vitam ſimplicem agant, alia ambiguam, propterea quòd generatione ſuæ conſtitutionis materia tali participarint, qualem ſibi in cibo aſſumunt. Charum enim cuique, ſuauéque eſt, quod per naturam habetur, vt ſuperius diximus. Sed cùm animalia trifariàm in aquatile & terreſtre diuidantur: aut enim recipiendi aëris, aquæve neceſſitudine, aut corporis temperatione, aut tertio victus ratione: vitæ prorſus diſcrimen pro his diuiſionum membris conſequetur. alia enim temperandi corporis gratia, & victus ratione, atque etiam recipiendi aëris, aut aquæ neceſſitate ita degent: alia temperamenti victúſque cauſa tantùm. Igitur eorum, quæ teſta operiuntur, nonnulla immota alũtur humore dulci, & potulento, qui per ſpiſſa trãſmittitur, cùm tenuior ipſe mari concocto eliciatur, quemadmodum & primo naturæ ortu inſtituuntur. Dulcem autem contineri humorem in mari, atque ita tranſmitti, & percolari conſtat eo experimento, quo ſi ex cerá vas tenui latere finxeris, idque annexa linea in mare demittas inane die ac nocte vna, humoris copiam dulcis intra ſe colliget. Vrticæ piſciculis fortè incidentibus veſcuntur. Os in medio habent, quod in maioribus euidentius eſt. Meatum etiam vt oſtreæ, quo excrementum ſecedat, habent parte ſuperiore. Vrtica enim ipſa quaſi oſtreorum caro eſſe videtur incluſa ſaxo, perinde vt teſta. Patellæ etiam ſecedunt abſoluentes ſeſé, vt veſcãtur. Quæ autẽ mobilia, eadémque carne veſcentia ſunt, iis victus ex piſciculis eſt, vt purpuris: ſunt enim carniuoræ,

A ὕτως· ἀλλ' ἔοικεν εἶναι τὸ ἔνυδρον ἐπὶ πλεῖον διαιρετέον. τὰ μὲν γὰρ, δέχεται τὸ ὕδωρ καὶ ἀφίησι, διὰ τὴν αὐτὴν αἰτίαν, δι' ἣν καὶ τὰ ἀναπνέοντα τὸν ἀέρα, καταψύξεως χάριν· τὰ δὲ, διὰ τὴν τροφήν. ἀνάγκη γὰρ ἐν ὑγρῷ λαμβάνοντα ταύτην, καὶ τὸ ὑγρὸν ἅμα δέχεσθαι, καὶ δεξάμενον ὄργανον ἔχειν ᾧ ἐκπέμψει. τὰ μὲν οὖν ἀνάλογον τῇ ἀναπνοῇ χρώμενα τῷ ὑγρῷ, βράγχια ἔχει· ταῦτα δὲ διὰ τὴν τροφὴν, αὐλὸν τῶν ἐναίμων ζώων. ὁμοίως δὲ τά τε μαλάκια καὶ μαλακόστρακα· καὶ γὰρ ταῦτα δέχεται τὸ ὑγρὸν διὰ τὴν τροφήν. ἔνυδρα δέ ἐστι τὸν ἕτερον τρόπον, διὰ τὴν τοῦ σώματος κρᾶσιν καὶ τὸν βίον, ὅσα δέχεται μὲν τὸν ἀέρα, ζῇ δὲ B ἐν τῷ ὑγρῷ· ἢ ὅσα δέχεται μὲν τὸ ὑγρὸν, καὶ ἔχει βράγχια, πορεύεται δὲ εἰς τὸ ξηρὸν καὶ λαμβάνει τροφήν. ἓν δὲ μόνον νῦν ὦπται τοιοῦτον, ὁ καλούμενος κορδύλος· οὗτος γὰρ, πνεύμονα μὲν οὐκ ἔχει, ἀλλὰ βράγχια, τετράπουν δ' ἐστὶν, ὡς καὶ πεζεύειν πεφυκός. τούτων δὲ πάντων πέφυκεν ἡ φύσις ὥσπερ ἀνεστράφθαι, καθάπερ τῶν τε ἀρρένων ἔνια γίνεται θηλυκὰ, καὶ τῶν θηλέων ἀρρενωπά. ἐν μικροῖς γὰρ μορίοις λαμβάνοντα τὰ ζῷα διαφορὰν, μεγάλα διαφέρειν φαίνεται κατὰ τὴν τοῦ ὅλου σώματος φύσιν. * δηλοῖ δὲ ἐπὶ τῶν ἐκτεμνομένων. μικροῦ γὰρ μορίου πηρωθέντος, εἰς τὸ θῆλυ μεταβάλλει τὸ ζῷον. ὥστε δῆλον ὅτι καὶ C ἐν τῇ ἐξ ἀρχῆς συστάσει, ἀκαριαίου τινὸς μεταβάλλοντος τῷ μεγέθει, ἐὰν ᾖ ἀρχοειδὲς, γίνεται τὸ μὲν θῆλυ, τὸ δ' ἄρρεν· ὅλως δὲ ἀναιρεθέντος, οὐδέτερον· ὥστε καὶ τὸ πεζὸν καὶ [τὸ] ἔνυδρον εἶναι κατ' ἀμφοτέρους τοὺς τρόπους, ἐν μικροῖς μορίοις γινομένης τῆς μεταβολῆς, συμβαίνει γίνεσθαι τὰ μὲν πεζὰ, τὰ δ' ἔνυδρα τῶν ζῴων. καὶ τὰ μὲν οὐκ ἐπαμφοτερίζει, τὰ δὲ ἐπαμφοτερίζει, διὰ τὸ μετέχειν τι τῆς ὕλης ἐν τῇ συστάσει τῆς γενέσεως, ἐξ οἵας ποιεῖται τὴν τροφήν. περὶ φιλὲς γὰρ ἕκαστον τῶν ζῴων τὸ κατὰ φύσιν, ὥσπερ εἴρηται καὶ πρότερον. διῃρημένων δὲ τῶν ζῴων εἰς D τὸ ἔνυδρον καὶ πεζὸν τριχῶς, τῷ δέχεσθαι τὸν ἀέρα ἢ τὸ ὕδωρ, καὶ τῇ κράσει τῶν σωμάτων, τὸ δὲ τρίτον ταῖς τροφαῖς, ἀκολουθοῦσιν οἱ βίοι κατὰ ταύτας τὰς διαιρέσεις. τὰ μὲν γὰρ, κατὰ τὴν κρᾶσιν καὶ τὴν τροφὴν ἀκολουθοῦσι, καὶ κατὰ τὸ δέχεσθαι τὸ ὕδωρ ἢ τὸν ἀέρα· τὰ δὲ τῇ κράσει, καὶ τοῖς βίοις μόνον. τῶν μὲν οὖν ὀστρακοδέρμων ζῴων, τὰ μὲν ἀκινητίζοντα, τρέφεται τῷ ποτίμῳ. διηθεῖται γὰρ διὰ τῶν πυκνῶν, διὰ τὸ λεπτότερον εἶναι τῆς θαλάττης συμπεττόμενον, ὥσπερ καὶ τὴν ἐξ ὑπαρχῆς λαμβάνει * κίνησιν. ὅτι δ' ἐν τῇ θαλάττῃ πότιμόν ἐστι, καὶ ταύτῃ διηθεῖσθαι δύναται, φανερόν ἐστιν. ἤδη γὰρ εἰλη-E φέναι τούτου συμβέβηκε τὴν πεῖραν. ἐὰν γάρ τις κήρινον πλάσας λεπτὸν ἀγγεῖον, καὶ περιδήσας, καθῇ εἰς τὴν θάλασσαν κενὸν, ἐν νυκτὶ καὶ ἡμέρᾳ λαμβάνει ὕδατος πλῆθος· καὶ τοῦτο φαίνεται πότιμον. αἱ δὲ ἀκαλῆφαι τρέφονται ὅ,τι ἂν προσπέσῃ ἰχθύδιον. ἔχει δὲ τὸ στόμα ἐν μέσῳ. δῆλον δὲ τοῦτο μάλιστά ἐστιν ἐπὶ τῶν μεγάλων. ἔχει δὲ ὥσπερ τὰ ὄστρεα, ᾗ ὑποχωρεῖ ἔξω ἡ τροφὴ, πόρον. ἔστι δ' αὐτῆς ἄνω. ἔοικε γὰρ ἡ ἀκαλήφη ὥσπερ τὸ ἔσω εἶναι τῶν ὀστρέων τὸ σαρκῶδες· τῇ δὲ πέτρᾳ χρῆται ὡς ὀστρέῳ. καὶ αἱ λεπάδες δὲ, ἀπολυόμεναι, μεταχωροῦσι καὶ τρέφονται. ὅσα δὲ κινητικὰ, τὰ μὲν ζωοφαγοῦντα, τρέφεται τοῖς μικροῖς ἰχθυδίοις, οἷον ἡ πορφύρα· σαρκοφάγον γάρ ἐστι·

* Malim, δῆ ει δὲ

* κ. φύσιν.

Meteorologicorum. li. 2. c. 3.

διὸ καὶ δελεάζονται τοῖς τοιούτοις τὰ δὲ, καὶ τοῖς ἐν τῇ θαλάττῃ φυομένοις. αἱ δὲ χελῶναι αἱ θαλάττιαι, τὰ [τε] κογχύλια νέμονται. ἔχουσι γὰρ τὸ στόμα ἰσχυρότατον πάντων. ὅτου γὰρ ἂν ἐπιλάβωνται, ἢ λίθου, ἢ ἄλλου ὁτουοῦν, ἀποθραύει καὶ κατεσθίει. ἐξιοῦσα, τὴν πόαν νέμεται. πονοῦσι δὲ καὶ ἀπόλλυνται πολλάκις, ὅταν ἐπιπολάζουσαι ξηρανθῶσιν ὑπὸ τοῦ ἡλίου. καταφέρεσθαι γὰρ οὐ δύνανται πάλιν ῥᾳδίως. τὸν αὐτὸν δὲ τρόπον καὶ τὰ μαλακόστρακα. καὶ γὰρ ταῦτα παμφάγα. καὶ γὰρ λίθους καὶ ἰλὺν, καὶ φυκία νέμονται, καὶ κόπρον, οἷον οἱ πετραῖοι τῶν καρκίνων, καὶ σαρκοφαγοῦσιν. οἱ δὲ κάραβοι, κρατοῦσι μὲν καὶ τῶν μεγάλων ἰχθύων, καί τις συμβαίνει περιπέτεια τούτων ἐνίοις. τοὺς μὲν γὰρ καράβους οἱ πολύποδες κρατοῦσιν, ὥστε κἂν ὦσι πλησίον ἐν ταὐτῷ δικτύῳ αἰσθόμενοι, ἀποθνήσκουσιν οἱ κάραβοι διὰ τὸν φόβον. οἱ δὲ κάραβοι, τοὺς γόγγρους. διὰ γὰρ τὴν τραχύτητα οὐκ ἐξολισθαίνουσιν αὐτῶν. οἱ δὲ γόγγροι, τοὺς πολύποδας κατεσθίουσιν. οὐδὲν γὰρ αὐτοῖς διὰ τὴν λειότητα * δύνανται χρῆσθαι. τὰ δὲ μαλάκια, πάντα σαρκοφάγα ἐστί. νέμονται δὲ οἱ κάραβοι, τὰ ἰχθύδια θηρεύοντες περὶ τὰς θαλάμας. καὶ γὰρ ἐν τοῖς πελάγεσιν [καὶ] ἐν τοῖς τοιούτοις γίνονται τόποις, οἷοι ἂν ὦσι τραχεῖς καὶ λιθώδεις. ἐν τοιούτοις γὰρ ποιοῦνται τὰς θαλάμας. καὶ ὅ,τι ἂν λάβωσι, προσάγεται πρὸς τὸ στόμα τῇ δικρόᾳ χηλῇ, καθάπερ οἱ καρκίνοι. βαδίζει δὲ κατὰ φύσιν μὲν εἰς τὸ πρόσθεν, ὅταν ἄφοβος ᾖ, καταβάλλων τὰ κέρατα πλάγια. ὅταν δὲ φοβηθῇ, φεύγει ἀνάπαλιν, καὶ μακρὰν ἐξακοντίζει. μάχονται δὲ πρὸς ἀλλήλους, ὥσπερ οἱ κριοὶ, τοῖς κέρασιν, ἐξαίροντες καὶ τύπτοντες. ὁρῶνται δὲ μετ' ἀλλήλων πολλάκις καὶ ἀθρόοι, ὥσπερ ἀγέλη. τὰ μὲν οὖν μαλακόστρακα, τοῦτον ζῇ τὸν τρόπον. τῶν δὲ μαλακίων αἱ τευθίδες καὶ αἱ σηπίαι, κρατοῦσι καὶ τῶν μεγάλων ἰχθύων. οἱ δὲ πολύποδες, μάλιστα κογχύλια συλλέγοντες καὶ ἐξαιροῦντες τὰ σαρκία, τρέφονται τούτοις. διὸ καὶ τοῖς ὀστράκοις οἱ θηρεύοντες γνωρίζουσι τὰς θαλάμας αὐτῶν. ὃ δὲ λέγουσί τινες, ὡς αὐτὸς αὑτὸν ἐσθίει, ψεῦδός ἐστιν. ἀλλὰ περιεδηδεσμένας ἔχουσιν ἔνιοι τὰς πλεκτάνας ὑπὸ τῶν γόγγρων. οἱ δὲ ἰχθύες, τοῖς μὲν κυήμασι τρέφονται πάντες, ὅταν οἱ χρόνοι καθήκωσιν. οὔτι τὴν δ' ἄλλην τροφὴν οὐ τὴν αὐτὴν ποιοῦνται πάντες. οἱ μὲν γὰρ αὐτῶν, εἰσὶ σαρκοφάγοι μόνον, οἷον τά τε σελάχη, καὶ οἱ γόγγροι, καὶ αἱ * χαννῶαι, καὶ οἱ θύννοι, καὶ λάβρακες, καὶ συνόδοντες, καὶ ἀμίαι, καὶ ὀρφοὶ, καὶ μύραιναι. αἱ δὲ τρίγλαι, φυκίοις τρέφονται καὶ ὀστρέοις, καὶ βορβόρῳ καὶ σαρκοφαγοῦσιν. [οἱ δὲ κέφαλοι, τῷ βορβόρῳ.] ὁ δὲ δασκίλλος τῷ βορβόρῳ καὶ κόπρῳ. σκάρος δὲ καὶ μελάνουρος, φυκίοις. ἡ δὲ σάλπη τῇ κόπρῳ καὶ φυκίοις. βόσκεται δὲ καὶ τὸ πράσον. ἁλίσκεται δὲ καὶ * κολοκύνθῃ μόνη τῶν ἰχθύων. ἀλληλοφαγοῦσι δὲ πάντες μὲν, πλὴν κεστρέως, μάλιστα δὲ οἱ γόγγροι. ὁ δὲ κέφαλος καὶ ὁ κεστρεὺς, ὅλως μόνοι οὐ σαρκοφαγοῦσι. σημεῖον δέ, οὔτε γὰρ ἐν τῇ κοιλίᾳ πώποτ' ἔχοντες εἰλημμένοι εἰσὶ τοιοῦτον οὐδὲν, οὔτε δελέατι χρῶνται ζῴων σαρξὶ πρὸς αὐτούς, ἀλλὰ μάζῃ. τρέφεται δὲ πᾶς κεστρεὺς φυκίοις καὶ ἄμμῳ. ἔστι δὲ ὁ μὲν κέφαλος ὃν καλοῦσί τινες χελῶνα, πρόσγειος * ὁ δὲ περαίας, οὐ βόσκεται δὲ ὁ περαίας μύξαν τὴν ἀφ' αὑτοῦ· διὸ καὶ νῆστίς ἐστιν ἀεί. οἱ δὲ κέφαλοι, νέμονται τὴν ἰλύν· διὸ καὶ βαρεῖς καὶ βλεννώδεις εἰσίν. ἰχθὺν δ' ὅλως οὐκ ἐσθίουσι διὰ τὸ ἐν τῇ ἰλύϊ διατρίβειν, ἐξανακυλινδοῦσι πολλάκις, ἵνα * περιπλύνωνται τὸ βλένος.

* χ. δύνανται

* χ. χάνναι,

* χ. κολοκύντῃ

* Gaza, ὁ δὲ περαίος. οὐ βόσκεται δὲ ὁ π. τὴν ἀφ' ἑαυτοῦ μύξαν, vt & Geſnerus annotat in mugilibus.

* Gaza, περιπλύνωνται

A & quidem eſca huiuſmodi capiuntur, quanquam iis etiam, quæ mari pullulant, alliciuntur. Teſtudines marinæ conchulas petunt, habent enim os omnium robuſtiſſimum: quicquid namque in os ceperint, ſiue lapidem, ſiue quoduis aliud, perfringunt, ac deuorant. Exeunt etiam in terram, & paſcunt herbam. Laborant plerumque, & intereunt, quoties innatantes ſiccantur Sole: deferri in gurgitem facilè nequeunt. Hic idem veſcendi modus cruſtaceis eſt: nam ea quoque omniuora ſunt, quippe quæ & lapillos, & limum & algam deuorent, atque etiam ſtercus: vt cancri ſaxatiles. Carnes etiam nimirum appetunt. Locuſtæ vel piſces maiores conuincere poſſunt.

B Euenit vſu, vt locuſtis polypi ſuperiores ſint, & adeò, vt ſi eiſdem in retibus ſenſerit locuſta polypum, præ metu emoriatur. Congros locuſtæ conuincunt: nam elabi non queunt propter cruſtæ aſperitatem. Congri polypos ſuperant, ſed edere non poſſunt: læue enim & lapſum polypi corpus vſum hoſtis effugit. Mollia vero carniuora omnia ſunt. Paſcuntur locuſtæ venatu piſciculorum circa ſua cubilia, quæ in alto locis aſperis, ſaxoſis, cauernoſiſque faciunt. Quicquid ceperint, ori admouent ſuo forcipe, vt cancri. Incedit locuſta ſua natura antè, cùm nihil metuit, demiſſis in latera cornibus: at vbi metuit, fugit retro, longeque ſua cornua porrigit. Dimicant

C inter ſe more arietum cornibus, quæ extollentes, vibrantéſque, feriunt aduerſarium: ſed vniuerſæ etiam plerumque tanquam gregis collegium viſuntur. Talis viuendi modus eorum eſt, quæ cruſta operiuntur. In mollium genere lolligines, atque ſepiæ, piſces vel maiores euincunt. Polypi conchulis maximè extringentes carunculas veſcuntur. Vnde fit vt eorum cubilia cognoſcant qui venantur, congerie teſtarum. Quod autem nonnulli aiunt, polypum ſeipſum eſſe, falſum eſt, ſed aliqui ſua brachia corroſa habent à congris. Piſces omnes fœturam ſuo tempore deuorãt. Reliqua victus ratio non eadem omnibus eſt. alij enim carniuori tantùm ſunt, vt cartilaginei, vt congri, hiatulæ, thunni, murænæ, lupi, dentices, amiæ,

D cernuæ. Mulli vero & carne veſcuntur, & alga, & concha, & cœno: capitones, cœno: daſquilli, cœno, & ſtercore: ſcarus, & oculata, alga: ſalpa, ſtercore & alga: porrum etiam petit, & cucurbita capitur, quod ei ex omnibus vni euenit. Alter etiam alterum ſui generis edit, excepto mugile, ſed maximè congri. Capito & mugilis ſoli carne omnino abſtinent. Cuius rei argumentum eſt, quod neque in ventre tale quid vnquam habentes capiuntur, neque eſca in eos ex carne vtimur, ſed offa panis. Veſcitur mugilis vnuſquiſque alga, atque arena. Capito, quem aliqui labeonem vocant, litoribus gaudet. alter generis eiuſdem trãs-

E litoranus eſt, qui non niſi mucore veſcitur ſuo: quamobrem ſemper ipſe ieiunus eſt. Paſcuntur limo omnes capitones; quo fit, vt graues & ſordidi ſint. Piſcem ipſi nullum omnino edunt: & quoniam verſari in limo ſolent, efferunt ſe, vrinantúrque ſæpe, vt corporis ſordes abluant.

Oua, fœtúſque eorum à nulla bellua violantur, quapropter copioſè exiſtunt: ſed cùm adoleuerint, tunc à cæteris piſcibus corripiuntur, maximeque ab archano. Guloſus omniũ maximè mugilis eſt atque inſatiabilis, quocirca ventre diſtento graueſcit, & niſi ieiunus ſit, hæret iners. Cùm hic metuerit, caput abſcondit, quaſi corpus totum occultet. Dentex etiam (vt dictum eſt) carne veſcitur, & mollia appetit. Euenit plerumque & huic & hiatulæ, vt cùm piſces minores inſequantur, venter procidat, propterea quod piſcium venter iuxta os poſitus, eſt nec gula ſubeſt. alia igitur (vt dixi) carniuora tantùm ſunt, vt delphinus, dentex, aurata, vt cartilaginea, vt mollia: alia magna ex parte luto viuunt, & alga, & muſco, & eo, quod cauliculum vocant, & enaſcente materie: vt phuca, gobio, omnes ſaxatiles. Phucæ quanquam cætera abſtinent carne, tamen ſquillas ſæpenumero appetunt. Sed alter etiam inuadit (vt dictum eſt) alterum, maiorúmque minores ſunt præda. Argumentum, vt carne veſcantur, eſt, quòd eſca huiuſmodi capiantur. Amia, thunnus, & lupus magna ex parte carne aluntur, ſed algam etiã tangunt. Sargus mulli reliquias ſequitur: nam vbi ille luto excitato abiit, (fodere enim poteſt) hic deſcendit, & paſcitur, imbecillioreſque ne eodem adnatent, arcet. Scarus viſus inter piſces ruminare quadrupedum ritu videtur. Cæteris piſcibus captura minorum à fronte agitur ore, vt ſolent meare: at cartilaginei, & delphini, & omnes cetacei generis reſupinati corripiunt: habent enim os ſubter: vnde fit vt periculum minores faciliùs poſſint euadere, alioqui pauci admodum ſeruarentur: quippe cùm delphini celeritas, atque edendi facultas, mira eſſe videantur. Anguillæ paucæ quædam, certiſque locis veſcuntur limo, atque edulijs, ſi quis apponat: ſed plurimæ dulci humore viuunt. Idque qui viuarijs anguillarijs dant operam, ſeruant, vt quàm maximè pura ſyncerâque ſit aqua: affluens ſemper, & effluens per ripas, vbi viuaria extruunt. Nam niſi aqua ſit clara, breui ſtrangulatæ intereunt: branchias enim habent exiguas. Hinc turbare aquam ſoliti ſunt, qui eas piſcantur. Et quidem in Strymone amne circa Vergilias capiuntur: tunc enim aqua, & lutum aduerſis flatibus inturbatur: alioqui ſatius eſt quieſcere. anguillæ non ſuperfluitant mortuæ, nec ſurſum, vt cæteri piſces, maxima parte efferuntur: ſunt enim ventre exiguo. Pingue in paucis ineſt: plurimæ eo carent. Viuere exemptæ aquis, vel ad diem quintum ſextúmque poſſunt: & Aquilone plures diutiùs durant, Auſtro minùs. Et ſi æſtate de lacu in piſcinam transferuntur, viuere nequeunt: ſed ſi hyeme, facilè ſedis mutationem patiuntur. Nullam denique vehementem mutationem tolerant: & quidem æſtate, etiamſi in frigidam aquam transfers, omnes plerumque intereunt. Quin & ſi exigua in aqua ſtabulentur, pereunt. Quod idẽ & cæteris piſcibus euenit; ſtrãgulantur enim, ſi ſemper eadem in aqua exigua verſantur: quomodo ſpirantia animalia intereunt ſi in aëre exiguo claudantur. Vita anguillis nonnullis vel ad ſeptem octoque annos protrahitur.

A τὸν δὲ γόνον αὐτῶν, οὐδὲν ἐσθίει τῶν θηρίων· διὸ γίνονται πολλοί· ἀλλ᾽ ὅταν αὐξηθῶσι, τότε κατεσθίονται ὑπὸ τῶν ἄλλων ἰχθύων, καὶ μάλιστα ὑπὸ τοῦ * ἀχάρνου. λαίμαργος δὲ μάλιστα τῶν ἰχθύων ἐστὶν ὁ κεστρεὺς καὶ ἄπληστος· διὸ ἡ κοιλία περιτείνεται· καὶ ὅταν ἢ μὴ νῆστις, φαῦλος [κεῖται;] ὅταν δὲ φοβηθῇ, κρύπτει τὴν κεφαλήν, ὡς ὅλον τὸ σῶμα κρύπτων. σαρκοφαγεῖ δὲ καὶ * ὁ συνόδων, καὶ τὰ μαλάκια κατεσθίει. πολλάκις δὲ καὶ οὗτος καὶ ἡ χάννη ἐκβάλλουσι τὰς κοιλίας, διώκοντες τοὺς ἐλάττους ἰχθύας, διὰ τὸ πρὸς τῷ στόματι τὰς κοιλίας τῶν ἰχθύων εἶναι, καὶ στόμαχον μὴ ἔχειν. τὰ μὲν οὖν, ὥσπερ εἴ- B ρηται, σαρκοφάγα μόνον ἐστίν, οἷον δελφὶς καὶ συνόδων, καὶ χρύσοφρυς, καὶ οἱ σελαχώδεις τῶν ἰχθύων, καὶ τὰ μαλάκια. τὰ δὲ, ὡς ἐπὶ τὸ πολὺ νέμεται μὲν τὸν πηλὸν, καὶ φῦκος, καὶ τὸ βρύον, καὶ τὸ καλούμενον καυλίον, καὶ τὴν φυομένην ὕλην· οἷον φυκὶς καὶ κωβιός, καὶ οἱ πετραῖοι· ἡ δὲ φυκὶς ἄλλης μὲν σαρκὸς οὐχ ἅπτεται, τῶν δὲ καρίδων. πολλάκις δὲ καὶ ἀλλήλων ἅπτονται, καθάπερ εἴρηται, καὶ τῶν ἐλαττόνων οἱ μείζους. σημεῖον δ᾽ ὅτι σαρκοφαγοῦσιν· ἁλίσκονται γὰρ τοιούτοις δελέασι. καὶ ἀμία δὲ καὶ θύννις καὶ λάβραξ, τὰ μὲν πολλὰ, σαρκοφαγοῦσιν, ἅπτονται δὲ καὶ φυκίου. ὁ δὲ σαργὸς, ἐπινέμεται τὴν τρίγλαν· καὶ ὅταν ἡ τρίγλη * κινήσασα τὸν πηλὸν ἀ- C πέλθῃ, (δύναται γὰρ ὀρύττειν) ἐπικαταβὰς νέμεται, καὶ τοὺς ἀσθενεστέρους ἑαυτοῦ κωλύει συνεπιβαίνειν. δοκεῖ δὲ τῶν ἰχθύων καὶ ὁ καλούμενος σκάρος μηρυκάζειν, ὥσπερ τὰ τετράποδα, μόνος. τοῖς μὲν οὖν ἄλλοις ἰχθύσιν ἡ θήρα τῶν ἐλαττόνων κατὰ μικρὸν γίνεται τοῖς στόμασιν, ὥσπερ πεφύκασι νεῖν· οἱ δὲ σελαχώδεις, καὶ δελφῖνες, καὶ πάντες οἱ κητώδεις, ὕπτιοι ἀναπίπτοντες λαμβάνουσι· κάτω γὰρ τὸ στόμα ἔχουσι· διὸ σώζονται * μᾶλλον οἱ ἐλάττους. εἰ δὲ μὴ, πάμπαν ἂν * δοκοῦσιν ὀλίγοι εἶναι. καὶ γὰρ ἡ τοῦ δελφῖνος ὀξύτης καὶ δύναμις τοῦ φαγεῖν, δοκεῖ εἶναι θαυμαστή. τῶν δ᾽ ἐγχέλεων τρέφονται μὲν ὀλίγαι τινὲς καὶ ἐν πηλῷ, καὶ ἰλύϊ, καὶ σιτίοις, ἄν τις παραβάλλῃ· D αἱ μέντοι πλεῖσται, τῷ ποτίμῳ ὕδατι· καὶ τοῦτο τηροῦσιν οἱ ἐγχελυοτρόφοι, ὅπως ὅτι μάλιστα καθαρὸν ᾖ, ἀπορρέον [ἀεὶ καὶ ἐπιρρέον] ἐπὶ πλατάμωνος ἢ κονιῶνται τοὺς ἐγχελεῶνας. ἀποπνίγονται γὰρ ταχὺ, ἐὰν μὴ καθαρὸν ᾖ τὸ ὕδωρ· ἔχουσι γὰρ τὰ βράγχια μικρά. διὸ καὶ ὅταν θηρεύωσι, ταράττουσι τὸ ὕδωρ. καὶ ἐν τῷ Στρυμόνι δὲ περὶ Πλειάδα ἁλίσκονται· τότε γὰρ ἀναθολοῦται τὸ ὕδωρ καὶ ὁ πηλὸς ὑπὸ πνευμάτων γινομένων ἐναντίων. εἰ δὲ μὴ, συμφέρει ἡσυχίαν ἔχειν. ἀποθανοῦσαι δὲ αἱ ἐγχέλυες, οὐκ ἐπιπολάζουσιν, οὐδὲ φέρονται ἄνω, E ὥσπερ οἱ πλεῖστοι τῶν ἰχθύων· ἔχουσι γὰρ τὴν κοιλίαν μικράν. δημὸν δὲ ὀλίγαι μὲν ἔχουσιν, αἱ δὲ πλεῖσται οὐκ * ἔχουσιν. ἐκ δὲ τοῦ ὑγροῦ ἀφαιρούμεναι, ἡμέρας καὶ πέντε καὶ ἓξ ζῶσι· καὶ βορείων μὲν ὄντων, πλείους· νοτίων δὲ, ἐλάττους. καὶ μεταβαλλόμεναι τοῦ θέρους εἰς τοὺς ἐγχελεῶνας ἐκ τῶν λιμνῶν, ἀποθνήσκουσι· χειμῶνος δ᾽ οὔ. καὶ τὰς μεταβολὰς δ᾽ οὐχ ὑπομένουσι τὰς ἰσχυράς, οἷον καὶ τοῖς φέρουσιν, ἐὰν βάπτωσιν εἰς ψυχρόν. ἀπόλλυνται γὰρ ἀθρόαι πολλάκις. ἀποπνίγονται δὲ, ἐὰν καὶ ὀλίγῳ ὕδατι τρέφωνται. τὸ δ᾽ αὐτὸ τοῦτο καὶ ἐπὶ τῶν ἄλλων συμβαίνει ἰχθύων. ἀποπνίγονται γὰρ ἐν τῷ αὐτῷ ὕδατι καὶ ὀλίγῳ ἀεὶ ὄντες, ὥσπερ καὶ τὰ ἀναπνέοντα, * ἐὰν περιπωμασθῇ ὀλίγος ἀήρ. ζῶσι δ᾽ ἔνιαι ἐγχέλυες καὶ ἑπτὰ καὶ ὀκτὼ ἔτη.

* γρ. ἀχάρν.

* γρ. ὁ σινόδων. vide Athenæũ.

* Sylburg. κινήσασα

* γρ. δοκοῦσιν

* γρ. ἔχουσι [illegible].

* Sylburg. ἐὰν περιπωμασθῇ

τροφῇ δὲ οἱ ποτάμιοι χρῶνται, ἀλλήλους τε ἐσθίοντες, καὶ βοτάνας, καὶ ῥίζας, κἄν τι ἐν τῷ βορβόρῳ λάβωσι. νέμονται δὲ μᾶλλον τῆς νυκτός, τὴν δ' ἡμέραν εἰς τὰ βαθέα ὑποχωροῦσι. τὰ μὲν οὖν περὶ τὴν ἰχθύων τροφὴν τοῦτον ἔχει τὸν τρόπον.

ΚΕΦΑΛ. γ'.

Περὶ ὀρνίθων τροφῆς.

Τῶν δ' ὀρνίθων ὅσοι μὲν γαμψώνυχοι, σαρκοφάγοι πάντες εἰσί· σῖτον δέ, οὐδ' ἐάν τις ψωμίζῃ, δύνανται καταπίνειν· οἷον τά τε τῶν ἀετῶν γένη πάντα, καὶ ἰκτῖνοι, καὶ ἱέρακες ἀμφω, ὅ τε φαβοτύπος, καὶ ὁ σπιζίας. διαφέρουσι δὲ τὸ μέγεθος οὗτοι πολὺ ἀλλήλων, καὶ ὁ τριόρχης. ἔστι δ' ὁ τριόρχης τὸ μέγεθος ὅσον ἰκτῖνος, καὶ φαίνεται διὰ παντός. ἔτι δὲ φήνη, καὶ γύψ. ἔστι δ' ἡ μὲν φήνη τὸ μέγεθος ἀετοῦ μείζων, ὁ δὲ χρῶμα *σποδοειδής. τῶν δὲ γυπῶν δύο ἐστὶν εἴδη· ὁ μὲν, μικρὸς καὶ ἐκλευκότερος, ὁ δὲ, μείζων καὶ σποδοειδέστερος. ἔτι τῶν νυκτερινῶν ἔνιοι γαμψώνυχές εἰσιν, οἷον νυκτικόραξ, γλαύξ, βύας. ἔστι δ' ὁ βύας, τὴν μὲν ἰδέαν ὅμοιος γλαυκί, τὸ δὲ μέγεθος οὐκ ἔλαττον ἀετοῦ. ἔτι δ' ἐλεὸς, καὶ αἰγωλιός, σκώψ. ἔστι δ' ὁ μὲν ἐλεὸς, μείζων ἀλεκτρυόνος· ὁ δ' αἰγωλιὸς, παραπλήσιος· ἀμφότεροι δὲ θηρεύουσι τὰς κίττας· ὁ δὲ σκώψ, ἐλάττων γλαυκός. πάντα δὲ ταῦτα, τρία ὄντα, ὅμοια τὰς ὄψεις, καὶ σαρκοφάγα πάντα ἐστίν. εἰσὶ δὲ καὶ τῶν μὴ γαμψωνύχων ἔνιοι σαρκοφάγοι, οἷον ἡ χελιδών. τὰ δὲ, σκωληκοφάγα, οἷον σπίζα, στρουθὸς, βάτις, χλωρίς, αἰγίθαλος. ἔστι δὲ τῶν αἰγιθάλων εἴδη τρία. ὁ μὲν σπιζίτης, μέγιστος· ἔστι γὰρ ὅσον σπίζα. ἕτερος, ὀρεινός, διὰ τὸ διατρίβειν ἐν τοῖς ὄρεσιν, οὐραῖον μακρὸν ἔχων. ὁ δὲ τρίτος, ὅμοιος μὲν τούτοις, διαφέρει δὲ κατὰ τὸ μέγεθος· ἔστι γὰρ ἐλάχιστος. ἔτι δὲ συκαλίς, μελαγκόρυφος, πυρρούλας, ἐριθακός, *ὑπολαΐς, οἶστρος, τύραννος. οὗτος τὸ μέγεθος μικρῷ μείζων ἀκρίδος· ἔστι δὲ φοινικοῦν λόφον *ἔχων, καὶ ἄλλως εὔχαρι τὸ ὄρνεον, καὶ εὔρυθμον. ὁ δὲ λεγόμενος ἄνθος, οὗτος τὸ μέγεθος ὅσον σπίζα. ὀρεσπίζος, οὗτος σπίζῃ ὅμοιος, καὶ τὸ μέγεθος παραπλήσιος· πλὴν ἔχει τὸν αὐχένα κυανοῦν, καὶ διατρίβει ἐν τοῖς ὄρεσιν. ἔτι βασιλεύς, *σπερμολόγος. ταῦτα μὲν οὖν καὶ τὰ τοιαῦτα, τὰ μὲν ὅλως, τὰ δὲ, ὡς ἐπὶ τὸ πολὺ σκωληκοφάγα. τὰ δὲ τοιάδε, ἀκανθοφάγα, ἀκανθίς, θραυπίς· ἔτι ἡ καλουμένη *χρυσομήτρις. ταῦτα γὰρ πάντα ἐπὶ τῶν ἀκανθῶν νέμεται, σκώληκα δὲ οὐδέν, οὐδ' ἔμψυχον οὐδέν. ἐν ταὐτῷ δὲ ταῦτα καὶ καθεύδει καὶ νέμεται. ταῦτα ἄλλα δ' ἐστὶ σκνιποφάγα, ἃ τοὺς σκνῖπας θηρεύοντα ζῇ. ἄλλα δὲ δύο πίπραι, αἳ ξυλοκόπται*, ἥ τε μείζων καὶ ἡ ἐλάττων. καλοῦσι δέ τινες ἀμφότερα ταῦτα δρυοκολάπτας, ὅμοια δ' ἀλλήλοις, καὶ φωνὴν ἔχουσιν ὁμοίαν, πλὴν μείζω τὸ μεῖζον. νέμονται δ' ἀμφότερα ταῦτα πρὸς τὰ ξύλα προσπετόμενα. ἔτι δ' ὁ κελεός· τὸ μέγεθος ὅσον τρυγών· τὸ δὲ χρῶμα, χλωρὸς ὅλος. ἔστι δὲ ξυλοκόπος σφόδρα, καὶ νέμεται ἐπὶ τῶν ξύλων τὰ πολλά, φωνήν τε μεγάλην ἔχει. γίνεται δὲ μάλιστα τὸ ὄρνεον τοῦτο περὶ Πελοπόννησον. ἄλλος, ὃ καλεῖται *κνιπολόγος, τὸ μέγεθος μικρὸς ὅσον ἀκανθυλλίς, τὴν δὲ χρόαν σποδοειδὴς καὶ κατάστικτος· φωνὴν δὲ μικρὰν. ἔστι δὲ καὶ τοῦτο ξυλοκόπον. ἄλλα δέ τινα ζῇ καρποφαγοῦντα [καὶ ποηφαγοῦντα] οἷον φάψ, φάττα, περιστερά, οἰνάς, τρυγών.

* Fort. σποδοειδής.
* γρ. ὑπολαΐς.
* γρ. ἔχει.
* γρ. τὸ σπέρμα.
* Gaza, χρυσομήτρεις.
* Gaza legit, οἷον πίπρα.
* γρ. κνιπολόγος.

Victus fluuialibus etiam tum ex mutua ſui generis præda, tum ex herba, radice, & ſi quid in cœno comperiant. Nocte potiùs paſcere, interdiu ſeccedere in altum ſoliti ſunt. Talis piſcium victus eſt.

CAPVT III.

De victu auium, & quæ carniuoræ, quæ frugiuoræ, quæue omniuoræ ſint: quæ item cibum è terra, quæ ex aquis petant.

IN auium genere, quibus vngues adunci, omnes carniuoræ ſunt. Fruges autē ipſæ, etiam ſi in os indideris, nequeunt deuorare: vt genera aquilarum omnia, milui, accipitres ambo, id eſt, palumbarius, & fringillarius, qui multùm inter ſe magnitudine differunt: atque etiam buteo, qui miluo æquiparatur magnitudine, ſemperque ipſe cernitur: adhæc oſſifraga, & vultur. Eſt oſſifragæ magnitudo maior, quàm aquilæ, color ex cinere albicans. Vulturum duo genera ſunt, alterum paruum, & albicantius: alterum maius, ac multiformius. Nocturnarum etiam nonnullæ aduncis vnguibus ſunt, vt cicuma, noctua, bubo. Specie ſimilis noctuæ bubo eſt, ſed magnitudine non minor quàm aquila. Item aluco, vlula, aſio. aluco maior gallinaceo eſt, vlula compar. Picas vtrique venantur. Aſio minor quàm noctua eſt. Hæc tria ſimili ſpecie conſtant, & carne viuunt. Sunt etiam in genere non adunco, quæ carne veſcantur: vt hirundo. aliqua vermiculos petunt, vt fringilla, paſſer, rubetra, luteola, paris, cuius genera tria ſunt: fringillago, quæ maior eſt, quippe quæ fringillam æquet. alter monticola cognomine eſt, quoniam in montibus degat, cui cauda longior. tertius magnitudine ſui exigui corporis diſcrepat, quanquam cætera ſimilis eſt. Item ficedula, atricapilla, rubicilla, rubecula, ſilua, curuca, aſilus, tyrannus, cui corpus non multò amplius, quàm locuſtæ, criſta rutila ex pluma elatiuſcula, & cætera elegans, cantúque ſuauis hæc auicula eſt. adhæc florus, cui magnitudo quanta fringillæ: & montifringilla, quæ fringillæ ſimilis, & magnitudine proxima eſt, ſed collo cæruleo, & in montibus degit, vnde nomen accepit: tum etiam regulus, & frugilega. Hæc, & reliqua id genus, vermiculis partim ex toto partim magna ex parte aluntur. Spinam appetunt illa, ſpinus, ſiue ligurinus, carduelis, item quæ auriuittis appellatur: hæc enim omnia victitant in ſpinis. Vermem autem, & quoduis aliud animal aſpernatur. Dormiunt hæc, & paſcuntur eodem in loco. alia culicibus gaudent, nec alio magis quàm venatu culicum viuunt, vt pipo, tum maior, tum minor. Vtrumque picum martium vocant. Similes inter ſe ſunt, vocemque ſimilem emittunt: ſed maiorem, qui maior eſt. Paſcuntur ad maceriem aduolantes. Item galgulus, cui magnitudo quanta turturi ferè eſt, color luteus. Lignipeta hic admodum eſt, magnáque ex parte macerie paſcitur, vocem emittit magnam. Incola maximè Peloponneſi auis hæc eſt. Tum verò enumerandus inter hæc eſt culicilega dictus, magnitudine parua quanta ſpinus, colore cinereus, diſtinctus maculis, voce parua, qui & ipſe lignipeta eſt. alia frugibus viuunt, vt palumbes, columbus, vinago, turtur.

Viſuntur ſemper columbi, atque palumbes, ſed turtur æſtate tantùm: hyeme ſe condit: latitat enim ſuo tempore. Viſago autumno potiſſimùm & conſpicitur, & capitur, cui magnitudo maior columbo, minor quam palumbi, eſt. Modus maximè capiendi eam, dum ſe in aquam bibendo propendit. Veniunt ad noſtra loca, cùm iam fecerint prolem. Cætera verò omnia, quæ æſtate accedũt, nidulãtur apud nos, & carne magna ex parte ſuos enutriunt pullos, excepto columbaceo genere. Omnium ferè auium aliæ victum à terra petunt, aliæ à fluuio, aliæ à lacu, aliæ à mari: ſed palmipedes in ipſa aqua partem maximam temporis verſantur, & aliquæ ingurgitantes ſe, quærunt quod comedant. Fidipedes circa aquam: earúmque nõnulliæ terra contentis altilibus veſcuntur, quæ ſcilicet carnem non tangunt. Petit lacus, & fluuios ardeola, & albardeola, quæ magnitudine minor eſt, roſtro lato, porrectóque. Item ciconia, & gauia, cui color cinereus. adhæc, iunco, cinchlus, albicula, tringa, quæ inter minora hæc mauiſcula eſt: turdo enim æquiparatur. Omnibus his cauda motitat: quinetiam calidris, cui cinereus color diſtinctus variè. Præterea genus alcedonum aquas adamat, quod duplex eſt: alterum vocale, arundinibus inſidens: alterum mutum, quod ampliore corpore eſt: vtrique dorſum cæruleum. Trochilus etiam hoc loco ponendus eſt. *Sed apud mare alcedo quoque verſatur, & carulus: necnon cornices litora petunt, & quæ vnda eiecerit animalia, tangunt: nam & his natura omniuora eſt. Tum etiam gauia alba, & fulica, mergus, & rupex, victitant apud mare. Palmipedum grauiores circa lacus & amnes verſantur: vt anas, olor, phalaris, vrinatrix. Adhæc boſca ſimilis anati, ſed minor: & qui coruus appellatus eſt, cui magnitudo, quanta ciconiæ, ſed crura breuiora: palmipes, natánſque eſt, colore niger: inſidet arboribus, & nidulatur in iis, hic vnus ex hoc genere. Item anſer maior, anſer minor, qui gregatilis eſt, & vulpanſer, capella, penelops. Aquila dicta marina, & mare adit, & lacum. Multæ etiam herbis veſcuntur. alites vncæ tum cætera, quæ ſuperare poſſunt, animalia, tum aues aggrediuntur, ſed non ſui generis: carniuoræ ſunt, modo piſcium, qui plerumque ſibi cognatos rapiunt. Genus auium cùm omne potu exiguo cõtentum ſit, tum aduncis nullus omnino vſus bibendi eſt, præterquam pauciſſimis quibuſdam, quæ & ipſæ rarò vtuntur: qualis potiſſimùm tinnunculus eſt. Miluus etiam viſus eſt bibere, quanquam rarò.

CAPVT IV.

De victu ſerpentum, cæterorúmque animalium cortice intectorum.

GEnus animalium cortice intectum, vt lacerti, & reliquæ huiuſcemodi quadrupedes, atque etiam ſerpentes, omniuorum eſt: nam & carnem edunt, & herbam. Serpentes omnium maximè animalium vel cupediæ deditiſunt: ſed deſiderium iis quoque bibendi exiguum, & reliquis, quibus pulmo fungoſus eſt, qualem omnia habent, quæ oua pariunt, & quibus parum ſanguinis eſt. Serpentes vini incontinentes etiam ſunt: proinde viperas aliqui vino cum fictilibus ad ſepes diſpoſito venantur: ebriæ enim capiuntur.

φάτλα μὲν οὖν καὶ περιστερὰ, ἀεὶ φαίνονται· τρυγὼν δὲ, τοῦ θέρους· τοῦ γὰρ χειμῶνος ἀφανίζεται· φωλεῖ γάρ. οἰνὰς δὲ, τοῦ φθινοπώρου καὶ φαίνεται μάλιστα, καὶ ἁλίσκεται· ἔστι δὲ τὸ μέγεθος ἡ οἰνὰς, μείζων μὲν περιστερᾶς, ἐλάττων δὲ φαβός. ἡ δὲ ἅλωσις αὐτῆς, γίνεται μάλιστα *καμπτούσης τὸ ὕδωρ. ἀφικνοῦνται δ' εἰς τοὺς τόπους τούτους ἔχοντες νεοττούς. τὰ δ' ἄλλα πάντα τοῦ θέρους ἀφικνούμενα, νεοττεύει ἐνταῦθα, καὶ ἐκτρέφει τὰ πλεῖστα ζώοις, πλὴν τῶν περιστεροειδῶν. πάντων δὲ, ὡς εἰπεῖν, τῶν ὀρνίθων οἱ μὲν, πεζεύουσι περὶ τὴν τροφήν. οἱ δὲ περὶ ποταμοὺς καὶ λίμνας βιοτεύουσιν· οἱ δὲ, περὶ τὴν θάλατταν. καὶ ὅσοι μὲν στεγανόποδες, ἐν αὐτῷ τῷ ὕδατι ποιούμενοι τὴν πλείστην διατριβήν· ὅσοι δὲ σχιζόποδες, περὶ αὐτὸ τὸ ὕδωρ· καὶ τούτων ἔνιοι διὰ τῶν φαινομένων τρεφόμενοι, ὅσοι μὴ σαρκοφάγοι, οἷον περί τε τὰς λίμνας, καὶ τοὺς ποταμοὺς ἐρωδιὸς, καὶ ὁ λευκερωδιός. ἔστι δὲ τὸ μέγεθος τοῦτ' ἐκείνου ἐλάττων, καὶ ἔχει τὸ ῥύγχος πλατὺ καὶ μακρόν. ἔτι δὲ πελαργὸς, καὶ λάρος. ὁ δὲ λάρος, τὸ χρῶμα σποδοειδής καὶ σχοινίκλος, καὶ κίγκλος, *καὶ ὁ πύγαργος. ἔστι δὲ μέγιστος τῶν ἐλαττόνων τούτων· ἔστι γὰρ οἷον κίχλη. πάντες δ' οὗτοι τὸ οὐραῖον κινοῦσιν. ἔτι ὁ καλίδρις· ἔστι δὲ τοῦτο τὸ ὀρνέον ποικιλίαν ἔχον, τὸ δ' ὅλον σποδοειδές. καὶ τὸ τῶν ἀλκυόνων δὲ γένος πάρυδρόν ἐστι. τυγχάνει δ' αὐτῶν ὄντα δύο εἴδη· καὶ ἡ μὲν, φθέγγεται, καθιζάνουσα ἐπὶ τῶν δονάκων· ἡ δ' ἄφωνος. ἔστι δ' αὕτη μείζων· τὸ δὲ νῶτον ἀμφότεραι κυανοῦν ἔχουσι. καὶ τροχίλος. περὶ δὲ τὴν θάλατταν, καὶ ἀλκυὼν, καὶ κηρύλος· καὶ αἱ κορῶναι δὲ νέμονται ἁπτόμεναι τῶν ἐκπιπτόντων ζώων· παμφάγον γάρ ἐστιν. ἔτι δὲ λάρος ὁ λευκὸς, καὶ κέπφος, αἴθυια, χαραδριός. τῶν δὲ στεγανοπόδων, τὰ μὲν βαρύτερα, περὶ τοὺς ποταμοὺς καὶ λίμνας ἐστὶν, οἷον κύκνος, νῆττα, φαλαρίς, *κολυμβεὶς. ἔτι δὲ *βόσκας, ὅμοιος μὲν νήττῃ, τὸ δὲ μέγεθος ἐλάττων. καὶ ὁ καλούμενος κόραξ· ἔστι δ' ἐστὶ τὸ μέγεθος οἷον πελαργὸς, πλὴν τὰ σκέλη ἔχει ἐλάττω· στεγανόπους δὲ καὶ νευστικός· τὸ δὲ χρῶμα, μέλας. καθίζει δὲ οὗτος ἐπὶ τῶν δένδρων, καὶ νεοττεύει ἐνταῦθα μόνος τῶν τοιούτων. ἔτι χὴν, καὶ ὁ μικρὸς χὴν ὁ ἀγελαῖος, καὶ χηναλώπηξ καὶ αἲξ, καὶ πηνέλοψ. ὁ δὲ ἁλιαίετος, καὶ περὶ τὴν θάλατταν διατρίβει, καὶ τὰ λιμναῖα κόπτει. πολλοὶ δὲ καὶ παμφάγοι τῶν ὀρνίθων εἰσίν. οἱ δὲ γαμψώνυχοι καὶ τῶν ἄλλων ἅπτονται ζώων ὅσων ἂν κρατῶσι, καὶ τῶν ὀρνέων. πλὴν οὐκ ἀλληλοφάγοι τοῦ γένους τοῦ οἰκείου, ὥσπερ οἱ ἰχθύες ἅπτονται πολλάκις καὶ ἑαυτῶν. ἔστι δὲ τὸ τῶν ὀρνίθων γένος πᾶν μὲν, ὀλιγόποτον· οἱ δὲ γαμψώνυχες, καὶ ἄποτοι πάμπαν, εἰ μή τι ὀλίγον γένος, καὶ ὀλιγάκις. μάλιστα δὲ τοιοῦτον ἡ κεγχρὶς· καὶ ἰκτῖνος ὀλιγάκις μὲν, ὦπται δὲ πίνων.

ΚΕΦΑΛ. δ'.

Περὶ τῆς τῶν φολιδωτῶν καὶ ὄφεων τροφῆς.

Τὰ δὲ φολιδωτὰ τῶν ζώων, οἷον σαῦρός τε καὶ τὰ τετράποδα τὰ ἄλλα, καὶ οἱ ὄφεις, παμφάγα ἐστί. καὶ γὰρ σαρκοφάγα καὶ πόας ἐσθίουσιν. οἱ δὲ ὄφεις καὶ λιχνότατοι τῶν ζώων εἰσίν. ἔστι μὲν οὖν ὀλιγόποτα καὶ ταῦτα, καὶ τἆλλα ὅσα ἔχει τὸν πνεύμονα σομφόν. ἔχουσι δὲ σομφὸν, τὰ ὀλίγαιμα πάντα, καὶ τὰ ᾠοτόκα. οἱ δὲ ὄφεις καὶ περὶ τὸν οἶνόν εἰσιν ἀκρατεῖς· διὸ θηρεύουσί τινες καὶ τοὺς ἔχεις εἰς ὀστράκια διὰ τὸ τιθέναι οἶνον εἰς τὰς αἱμασιάς. λαμβάνονται γὰρ μεθύοντες.

* Meliùs καπτούσης

* χ. [illegible] sic & Gaza.

* χ. κολυμβίς.
* γρ. βοσκάς,

σαρκοφάγοι δὲ ὄντες οἱ ὄφεις, ὅ,τι ἂν λαμβάνωσι, ζῷον, ἐξικμάζοντες, ὅλα κατὰ τὴν ὑποχώρησιν προΐενται. σχεδὸν δὲ καὶ τὰ ἄλλα τὰ τοιαῦτα, οἷον οἱ ἀράχναι· ἀλλ' ἔξω οἱ ἀράχναι ἐκχυμίζουσιν. οἱ δὲ ὄφεις, ἐν τῇ κοιλίᾳ. λαμβάνει μὲν οὖν ὁ ὄφις ὅθεν ἂν τύχῃ τὸ διδόμενον. ἐσθίει ὀρνίθια καὶ θηρία, καὶ καταπίνει ᾠά. λαβὼν δὲ ἐπανάγει, ἕως ἂν ἐπὶ τὸ ἄκρον ἔλθῃ, εἰς εὐθὺ καταστήσῃ· κἄπειθ' οὕτω συνάγει ἑαυτὸν καὶ συστέλλει μικρὸν, ὥστ' ἐκταθέντος κάτω γίνεσθαι τὸ καταποθέν. τοῦτο δὲ ποιεῖ, διὰ τὸ τὸν στόμαχον εἶναι μακρὸν καὶ λεπτόν. δύνανται δ' ἄσιτα καὶ τὰ φαλάγγια καὶ οἱ ὄφεις πολὺν χρόνον ζῆν. ἔστι δὲ τοῦτο θεωρῆσαι ἐκ τῶν παρὰ τοῖς φαρμακοπώλαις τρεφομένων.

A Sed cùm ſerpentes carniuoræ ſint, quicquid ceperint, ſucco exucto, reliquum totum per meatum ſui ſeceſſus emittunt. Quod idem omnia ferè id genus animalia faciunt: vt araneæ, ſed his foris ſugendo euaporare mos eſt, ſerpētibus intus in ventre. accipit ſerpens vndelibet quod datur, ſiue auis, ſiue bellua eſt. Oua etiam deuorat, ſed cùm acceperit, reducit, & vſque eò retractat, quoad partem nactus poſtremam è directo cōſtituat, tum colligit ſe, in breuéque cōtrahit, vt quod indicum ſuprà tenetur, in imum extento corpore deducatur. Quod propterea ita facit, quia gulam tenuem habet, & longam. Diu & ſerpentes & phalangia viuere poſſunt ſine cibo: quod ex iis quæ pharma- B copolæ, id eſt, pigmentarij, alunt, perpendi poteſt.

ΚΕΦΑΛ. ε'.

Περὶ ἀγρίων καὶ καρχαροδόντων τετραπόδων τροφῆς.

Τῶν δὲ τετραπόδων καὶ ζῳοτοκούντων, τὰ μὲν ἄγρια καὶ καρχαρόδοντα, πάντα σαρκοφάγα· πλὴν τοὺς λύκους φασὶν, ὅταν πεινῶσιν, ἐσθίειν τινὰ γῆν, μόνον δὴ τοῦτο τῶν ζῴων. πόας δὲ ἄλλοτε μὲν οὐχ ἅπτονται, ὅταν δὲ κάμνωσι, καθάπερ καὶ αἱ κύνες ὅταν κάμνωσιν, ἐσθίουσαι ἀνεμοῦσι, καὶ καθαίρονται. ἀνθρωποφαγοῦσι δὲ οἱ μονοπεῖραι τῶν λύκων μᾶλλον [αὐτῶν,] ἢ τὰ κυνηγέσια. ὃν δὲ καλοῦσιν οἱ μὲν γλάνον, οἱ δὲ ὕαιναν, ἔστι τὸ μέγεθος οὐκ ἔλαττον λύκου, χαίτην δ' ἔχει ὥσπερ ἵππος, καὶ ἔτι σκληροτέρας καὶ βαθυτέρας τὰς τρίχας, καὶ δι' ὅλης τῆς ῥάχεως· καὶ ἐπιβουλεύει δὲ καὶ θηρεύει τοὺς ἀνθρώπους· τοὺς δὲ κύνας καὶ ἐμοῦσα, θηρεύει, ὥσπερ οἱ ἄνθρωποι. καὶ τυμβωρυχεῖ δὲ, ἐφιεμένη τῆς σαρκοφαγίας τῶν ἀνθρώπων. ἡ δὲ ἄρκτος, παμφάγον ἐστί. καὶ γὰρ καρπὸν ἐσθίει, καὶ ἀναβαίνει ἐπὶ τὰ δένδρα, διὰ τὴν ὑγρότητα τοῦ σώματος· καὶ τοὺς καρποὺς τοὺς χεδροπάς. ἐσθίει δὲ καὶ μέλι, τὰ σμήνη καταγνύουσα· καὶ καρκίνους, καὶ μύρμηκας· καὶ σαρκοφαγεῖ. διὰ γὰρ τὴν ἰσχὺν, ἐπιτίθεται οὐ μόνον τοῖς ἐλάφοις, ἀλλὰ καὶ τοῖς ἀγρίοις ὑσὶν, ἐὰν δύνηται λαθεῖν ἐπιπεσοῦσα, καὶ τοῖς ταύροις. ὁμόσε γὰρ χωρήσασα τῷ ταύρῳ κατὰ πρόσωπον, ὑπτία καταπίπτει· καὶ τοῦ ταύρου τύπτειν ἐπιχειροῦντος, τοῖς μὲν βραχίοσι τοῦ ταύρου τὰ κέρατα περιλαμβάνει, τῷ δὲ στόματι τὴν ἀκρωμίαν δάκνουσα, καταβάλλει τὸν ταῦρον. βαδίζει δ' ἐπί τινα χρόνον ὀλίγον καὶ τοῖν δυοῖν ποδοῖν ὀρθή. τὰ δὲ κρέα πάντα κατεσθίει, προσηπῆσασα πρότερον. ὁ δὲ λέων σαρκοφάγον μέν ἐστιν, ὥσπερ καὶ τὰ ἄλλα ὅσα ἄγρια καὶ καρχαρόδοντα· τῇ δὲ βρώσει χρῆται λάβρως, καὶ καταπίνει πολλὰ οὐ διαιρῶν· εἶθ' ἡμέρας δύο ἢ τρεῖς ἀσιτεῖ. δύναται γὰρ, διὰ τὸ ὑπερπληροῦσθαι· ὀλιγόποτον δὲ ἐστί. τὸ δὲ περίττωμα προΐεται σπανίως. διὰ τρίτης γὰρ, ἢ ὅπως ἂν τύχῃ, προχωρεῖ· καὶ τοῦτο ξηρὸν καὶ ἐξικμασμένον, ὅμοιον κυνί. προΐεται δὲ καὶ τὴν φῦσαν σφόδρα δριμεῖαν, καὶ τὸ οὖρον ἔχον ὀσμήν· διόπερ οἱ κύνες ὀσφραίνονται τῶν δένδρων. οὐρεῖ γὰρ αἴρων τὸ σκέλος, ὥσπερ οἱ κύνες. ἐμποιεῖ δὲ καὶ ὀσμὴν βαρεῖαν ἐν τοῖς ἐσθιομένοις καταπνέων. καὶ γὰρ διαιρεθέντος αὐτοῦ, τὰ ἔσω ἀτμίδα ἀφίησι βαρεῖαν. ἔνια δὲ τῶν τετραπόδων καὶ ἀγρίων ζῴων, ποιεῖται τὴν τροφὴν περὶ λίμνας καὶ ποταμούς. περὶ δὲ τὴν θάλατταν οὐδὲν, ἔξω φώκης.

CAPVT V.

De victu lupi, vrſi, leonis, eorúmque quadrupedum, quæ ex lacubus fluuiiſque victum petunt.

QVadrupedum, quæ animal generant, ſylueſtres eædémque ſerratæ dentibus, carne omnes veſcuntur: niſi quod lupos aiunt terram quandam, cùm eſuriunt, edere. Hoc igitur peculiare luporum ſit. Herbas autem non alio tempore tangunt, niſi cùm morbo laborant: C quomodo & canes herba ingeſta, euomunt, atque ita purgantur. Lupi hominem illi potiùs petunt, qui inertes, & vnipetæ quidem ſunt, quàm qui venatores. Quam autem alij glanum, alij hyænam appellant, corpore non minore quàm lupus, eſt: iuba qua equus, ſed ſeta duriore, longioréque, & per totum dorſum porrecta. Molitur hæc inſidias homini. Canes etiam (vomitionem hominis imitando) capit, & ſepulchra effodit, humanæ auida carnis, ac eruit. Vrſus animal omniuorum eſt, quippe qui & fructus arborum, quas conſcendit corpore lubrico, edat, & legumina, & apes, perfringens alueos, & cancros, & formicas. Carne etiam veſcitur: viribus enim ſuis confidens, inuadit non ſolùm ceruos, ſed etiam ſues feros, ſi clàm D repentéque potuerit agere. Taurum aperto Marte aggreditur: conſerta iam pugna ſternit ſe reſupinum, dúmque taurus ferire conatur, ipſe ſuis brachiis amplectitur cornua, ore morſum armis defigit, proſternitque aduerſarium. Ingredi vel duobus innitens pedibus erectus aliquamdiu poteſt. Carnes omnes præmaceratas, & propemodum putres, comedit. Leo veſcitur quidem carne, ritu cæterorum ſylueſtrium ſerratorum, ſed cibo incontinenter admodum vtitur, multáque deuorat ſolida, ſine vllo diſſectu. Mox nihil triduo aut certè biduo edit: ferre enim inediam poteſt, vt qui iam ad multam ſatietatem repletus eſt. Parum bi- E bit, excrementum rarò emittit, tertio die, vel vtcumque accidit egerit, idque durum, aridum, & ſimile vt canis. Flatum etiam alui acerrimum emittit, & vrinam grauiter olentem, vnde fit, vt canes arbores odorentur. Mingit enim crure elato, vt canes, ad ſtipites. Fœdum quoque odorem in cibo relinquit ex ſuo halitu: proſciſſo nāque leone, interiora grauiter olent. Sunt inter quadrupedes, feráſque, quæ victum ex lacu & fluuiis petant. at verò à mari nullum, præterquā vitulus marinus.

Sunt etiam in hoc genere fiber, ſatherium, ſatyrium, lutris, latax, quæ latior lutre eſt, dentéſque habet robuſtos, quippe quæ noctu plerumque egrediens, virgulta proxima ſuis dentibus, vt ferro, præcidat. Lutris etiam hominem mordet, nec deſiſtit (vt ferunt) niſi fracti oſſis crepitum ſenſerit. Lataci pilus durus, ſpecie inter pilum vituli marini, & cerui.

CAPVT VI.

Quæ animalia lambendo, quæ ſorbendo, quæve mordendo bibant: quibuſque rebus cornigera omnia paſcantur, necnon de victu ſuis.

B Ibunt, quibus dentes ſerrati, animalia lambẽdo: atque etiam nonnulla ex non ſerratis, vt mures. Quibus autem continui, ſorbẽdo: vt equi, & boues: vrſus neque ſorbendo, neque lambẽdo, ſed morſu: auium cæteræ, ſorptu. Sed quibus collum eſt longum, intermittunt, capútque reſupinant. Porphyrio vnus, morſu. Cornigera animalia, tam fera quàm vrbana, & quibus dentes ſerrati non ſunt, omnia fruge herbáque veſcuntur, niſi vehementer eſuriant, ſue excepto, qui minimè herbæ frugúmve appetens eſt, ſed radicum maximè ex omnibus animalibus, quoniam rictu aptiſſimo ad id negotij eſt. *Faciliimè etiam omnium idem hoc animal ad quoduis pabulum aſſueſcit, & celerrimè quoque in pinguedinem proficit pro ſui corporis magnitudine. Sexaginta enim diebus pingueſcit. Quantum autem profecerit, ij cognoſcunt, quibus ea res curæ eſt, vbi ieiunum ad ſaginam conſtituerint. Pingueſcit fame præfatigatus triduò. Et cætera quoque omnia ferè meliùs præfatigata fame pingueſcunt. Saginant à triduo iam qui ſues obeſant. Thraces per ſaginam cùm primo die potum præbuerint, poſt interpoſito vno die præbent, tum duobus, deinde triduo, atque ita ſubinde augendo numerum vſque in ſeptimum, curant. Pingueſcit hoc animal ordeo, milio, ficu, glande, pyro, cucumere. Sed maximè tum hoc tũ cætera, quibus venter calidus eſt, quiete, immotióne que pingueſcũt. Cæterum ſues pinguiores redduntur etiam cùm in luto ſe volutant. Paſcere gregatim pro ætate velle videtur. Lupo etiam ſus obſiſtere repugnaréque poteſt. Sexta pars ponderis quantum ponderarit viuus, abſumitur occiſo, in pilos, ſanguinem, & reliqua id genus. Tam ſues quàm cætera animalia omnia ſolent, cùm lactantur, extenuari.* Hæc ita ſe habent.

CAPVT VII.

Quibus rebus paſcantur boues, & de eorum incremento.

BOues & fruge & herba veſcuntur. Pingueſcunt iis quæ flatum cient, vt eruo, & faba freſa, atque etiam ipſa fabarum herba. Et ſeniores, ſi cute inciſa ſpiritum adigas, deinde præbeas pabulum, pingues facies. adhæc ordeo vel integro, vel pinſito, & à gluma ſeparato pingueſcunt, & dulcibus vt ficu, & paſſa: vino etiam, & frondibus vlmi: ſed præcipuè Sole, & lotione calidæ aquæ. Cornua iuniorum tepefacta in cera flectuntur, ducuntúrque facilè quò volueris. Nec pedum dolores ſentiunt, ſi eorum cornua illinantur cera, aut oleo, aut pice.

A Τοιαῦτα δέ ἐστιν ὅ,τε καλούμενος κάστωρ, καὶ τὸ σαθέριον, καὶ [τὸ] σατύριον, καὶ ἐνυδρίς, καὶ ἡ καλουμένη λάταξ. ἔστι δὲ τ[illegible] πλατύτερον ἐνύδριδος, καὶ ὀδόντας ἔχει ἰσχυρούς. ἐξιοῦσα γὰρ νύκτωρ πολλάκις, τὰς περὶ τὸν ποταμὸν κερκίδας ἐκτέμνει τοῖς ὀδοῦσι. δάκνει δὲ τοὺς ἀνθρώπους καὶ ἡ ἐνυδρίς, καὶ οὐκ ἀφίησιν, ὡς λέγουσι, μέχρις ἂν ὀστοῦ ψόφον ἀκούσῃ. τὸ δὲ τρίχωμα ἔχει ἡ λάταξ σκληρόν, καὶ τὸ εἶδος μεταξὺ τοῦ τῆς φώκης τριχώματος, καὶ τοῦ τῆς ἐλάφου.

ΚΕΦΑΛ. ϛ.

Πῶς πίνει τὰ ζῷα· καὶ περὶ τροφῆς τῆς ὑός.

B ΠΙνει δὲ τῶν ζῴων τὰ μὲν καρχαρόδοντα, λάπτοντα· ἔνια δὲ καὶ τῶν μὴ καρχαροδόντων, οἷον οἱ μύες. τὰ δὲ συνόδοντα, σπῶντα, οἷον ἵπποι καὶ βόες. ἡ δὲ ἄρκτος, οὔτε σπᾷ, οὔτε λάπτει, ἀλλὰ κάπτει. καὶ τῶν ὀρνέων δὲ τὰ μὲν ἄλλα, σπᾷ· πλὴν τὰ μὲν μακραύχενα, διαλείποντα καὶ αἴροντα τὴν κεφαλήν· ὁ δὲ πορφυρίων, μόνος κάπτει. τὰ δὲ κερατώδη τῶν ζῴων, καὶ ἥμερα καὶ ἄγρια, [καὶ] ὅσα μὴ καρχαρόδοντα, πάντα καρποφάγα καὶ ποηφάγα ἐστί, μὴ λίαν κατεχόμενα ὑπὸ πείνης, ἔξω τῆς ὑός. αὕτη δὲ ἥκιστα ποηφάγον καὶ καρποφάγον ἐστί· ῥιζοφάγον δὲ μάλιστα ἡ ὗς ἐστὶ τῶν ζῴων, διὰ τὸ εὖ πεφυκέναι τὸ ῥύγχος πρὸς τὴν C ἐργασίαν ταύτην· καὶ εὐχερέστατον πρὸς πᾶσαν τροφὴν τῶν ζῴων ἐστί. τάχιστα δὲ καὶ ἐπιδίδωσιν εἰς πιότητα, ὡς κατὰ μέγεθος. πιαίνεται γὰρ ἐν ἑξήκοντα ἡμέραις. ὅσον δὲ ἐπιδίδωσι, ἐπιγινώσκουσιν οἱ περὶ ταῦτα πραγματευόμενοι, νῆστιν ἱστάντες. πιαίνεται δὲ προλιμοκτονηθεῖσα ἡμέρας τρεῖς. σχεδὸν καὶ τὰ ἄλλα πάντα προλιμοκτονούμενα πιαίνεται. μετὰ δὲ τὰς τρεῖς ἡμέρας εὐωχοῦσιν ἤδη οἱ πιαίνοντες τὰς ὗς. οἱ δὲ Θρᾷκες πιαίνουσι, τῇ μὲν πρώτῃ πιεῖν διδόντες· εἶτα διαλείπουσιν ἡμέραν μίαν τὸ πρῶτον, μετὰ δὲ ταῦτα δύο, εἶτα καὶ τρεῖς καὶ τέτταρας μέχρι τῶν ἑπτά. D πιαίνεται δὲ τὸ ζῷον τοῦτο, κριθαῖς, κέγχροις, σύκοις, ἀκύλοις, ἀχράσι, σικύοις. μάλιστα δὲ καὶ ταῦτα καὶ τὰ ἄλλα τὰ ἔχοντα κοιλίαν ἀγαθὴν, ἡ ἠρεμία πιαίνει· τὰς δὲ ὗς καὶ τὸ λούεσθαι ἐν πηλῷ. νέμεσθαι δὲ βούλονται κατὰ τὰς ἡλικίας. μάχεται δὲ ὗς καὶ λύκῳ. ἀπογίνεται δὲ ἀπὸ τῶν σταθμῶν, ἐὰν ἕλκει ζῶσα, τὸ ἕκτον μέρος εἰς τρίχας καὶ αἷμα, καὶ τὰ τοιαῦτα. θηλαζόμεναι δὲ καὶ αἱ ὕες καὶ τὰ ἄλλα πάντα, λεπτότερα γίνεται. ταῦτα μὲν οὖν τοῦτον ἔχει τὸν τρόπον.

ΚΕΦΑΛ. ζ.

E Περὶ βοῶν τροφῆς καὶ αὐξήσεως.

ΟΙ δὲ βόες, εἰσὶ μὲν καὶ καρποφάγοι καὶ ποηφάγοι. πιαίνονται δὲ τοῖς φυσητικοῖς, οἷον ὀρόβοις, καὶ κυάμοις *ἐρηρειγμένοις, καὶ χλόῃ κυάμων· καὶ ἐάν τις τὸ δέρμα ἐντεμὼν φυσήσῃ, καὶ μετὰ ταῦτα παρέχῃ τὴν τροφὴν τοῖς πρεσβυτέροις. ἔτι δὲ κριθαῖς, καὶ ἁπλαῖς καὶ ἐπτισμέναις· καὶ τοῖς γλυκέσιν, οἷον σύκοις καὶ σταφίσι, καὶ οἴνῳ, καὶ τοῖς φύλλοις τῆς πτελέας. μάλιστα δὲ οἱ ἥλιοι, καὶ τὰ λουτρὰ τὰ θερμά. τὰ δὲ κεράτια τῶν νέων, χλιαινόμενα τῷ κηρῷ, ἄγεται ῥαδίως ὅπῃ ἄν τις ἐθέλῃ. καὶ τοὺς πόδας δὲ ἧττον ἀλγοῦσιν, ἐάν τις τὰ κεράτια ἀλείφῃ κηρῷ, ἢ πίττῃ, ἢ ἐλαίῳ.

* κ. ἐρηριγμένοις

πονοῦσι δὲ αἱ ἀγέλαι μᾶλλον ὑπὸ τῆς πάχνης μεταμοισά-μεναι, ἢ ὑπὸ χιόνος. αὐξάνον(ται) δὲ, ὅταν πλείω ἔτη ἀνόχευτοι ὦσι. διὸ οἱ ἐν τῇ Ηπείρῳ τὰς καλουμένας * Πυῤῥίκας βοῦς, ἐννέα ἔτη διατηροῦσιν ἀνοχεύτους καὶ καλοῦσιν ἀτοταύρους, ὅπως αὐξάνωνται. τούτων δὲ τὸ μὲν πλῆθος εἶναί φασι περὶ τετρακοσίους, ἰδίους τῶν βασιλέων. ἐν ἄλλῃ δὲ ζῆν χώρᾳ οὐ δύνασθαι· καίτοι πεπειρᾶσθαι τινάς.

* γ. Πυῤῥίχας, per χ, ſicut πυῤῥίχα, lib. 3. c. 21. ſed πυῤῥίχας boues iſtas vocant veteres. vide ſcholiaſtē Theocriti.

A Laborant armenta vehementiùs pruina ſollicitata, quàm niue. augentur iuuencæ ampliùs cùm plus temporis expertes Veneris degunt. Quamobrem terræ Epiri incolæ, quas pyrrhicas vocant, annis nouem intactas Venere ſeruant, vt incrementum ampliter capiant, & ſetauras nuncupant. Has numero quadringentas eſſe, & proprias regis accipimus, nec poſſe viuere locis alijs: quanquam tentatum ab aliquibus eſt.

ΚΕΦΑΛ. η΄.

Περὶ ἵππων καὶ ὀρέων καὶ ὄνων καὶ καμήλων τροφῆς καὶ ποτοῦ.

Ἵπποι δὲ καὶ ὀρεῖς, καὶ ὄνοι, καρποφάγα μέν ἐστι καὶ ποηφάγα· μάλιστα δὲ πιαίνεται τῷ ποτῷ. ὡς γὰρ ἂν πίνῃ τὰ ὑποζύγια τὸ ὕδωρ, οὕτω καὶ πρὸς τὴν ἀπόλαυσιν ἔχει τῆς τροφῆς. καὶ ὁποῖον ἂν ἧττον δυσχεραίνῃ τὸ ποτόν, τοῦτο μᾶλλον εὐχορτεῖ. ἡ δὲ * κρᾶσις λεπτοτριχεῖν ποιεῖ, ὅταν ἔγκυος ᾖ. ὅταν δ' ἀθέρας ἔχῃ σκληρούς, οὐκ ἀγαθή. τῆς δὲ πόας τῆς Μηδικῆς ἥ τε πρωτόκουρος φαύλη, καὶ ὅπου ἂν ὕδωρ δυσῶδες ἐπαγγέλλεται τῇ πόᾳ· ὄζει γάρ. πίνειν δὲ οἱ μὲν βόες ζητοῦσι καθαρόν· οἱ δ' ἵπποι, ὥσπερ καὶ αἱ κάμηλοι. ἡ δὲ κάμηλος, πίνει ἥδιον θολερὸν καὶ παχύ. οὐδ' ἀπὸ τῶν ποταμῶν πρότερον πίνει, ἢ συνταράξῃ. δύνανται δ' ἄποτος ἀνέχεσθαι καὶ τέτταρας ἡμέρας· εἶτα μετὰ ταῦτα πίνει πολὺ πλῆθος.

* Sylburg. κράστις, ex Heſychio.

CAPVT VIII.

De paſtu, & potu equi, muli, & aſini.

B Equi, muli, & aſini, fruge herbàque veſcuntur, ſed maximè potu pingueſcunt. Iumenta enim pro aquæ, quam bibant, vſu, ſuo fruuntur pabulo: & quod minus potum aſpernatur, id appetentius pabuli eſt, & pleniùs obeſatur. Farrago pilum expolit, cùm frugibus grauida eſt: ſed duriſsiam horrens ariſtis inutilis eſt. Herbæ medicæ prima falx vitio datur, & cùm fœtida aqua rigatur, incommoda eſt. Boues claram bibere geſtiunt. at equi, vt cameli, turbulentam, & craſſam ſuauiùs bibūt: quippe quæ ne ex fluuio quidem priùs hauriant, quàm pede inturbent. Poſſunt vel ad quatuor C dies tolerare ſine potu, mox bibunt quam multum.

ΚΕΦΑΛ. θ΄.

Περὶ ἐλεφάντων τροφῆς καὶ ποτοῦ καὶ περὶ ἡλικίας αὐτῶν τε καὶ τῶν καμήλων.

Ὁ δ' ἐλέφας, ἐσθίει πλεῖστον μὲν, μεδίμνους Μακεδονικοὺς ἐννέα ἐπὶ μιᾶς ἐδωδῆς· ἐπικίνδυνον δὲ τὸ τοσοῦτον πλῆθος· τὸ δ' ἐπίπαν, ἓξ μεδίμνους ἢ ἑπτὰ ἀλφίτων δὲ πέντε [μεδίμνους] καὶ οἴνου πέντε μάρεις· ἔστι δ' ὁ μάρις, ἓξ κοτύλαι. ἤδη δέ τις ἔπιεν ἐλέφας μετρητὰς ὕδατος Μακεδονικοὺς εἰσάπαξ δέκα καὶ τέσσαρας, καὶ πάλιν τῆς δείλης ἄλλους ὀκτώ. ζῶσι δ' αἱ μὲν πολλαὶ τῶν καμήλων, περὶ ἔτη τριάκοντα, ἔνιαι δὲ πολλῷ πλείω. καὶ γὰρ εἰς ἔτη ἑκατὸν ζῶσι. τὸν δ' ἐλέφαντα ζῆν φασὶν οἱ μὲν περὶ ἔτη τριακόσια, οἱ δὲ, διακόσια.

CAPVT IX.

De paſtu, & potione elephanti, deíque ætate eiuſdem & cameli.

Elephantus eodem paſtu modios Macedonios nouem, quod plurimùm, edere poteſt. Sed tantùm dare periculoſum eſt. Sex aut ſeptem dediſſe modios, in vſu frequenti ſatis eſt. Sed farinæ non plus quàm quinque, vini etiam quinque mares, quæ menſura heminas continet ſex. Iam qui-D dam amphoras aquæ menſuræ Macedonicæ quatuordecim eodem hauſit potu, & rurſus à meridie eiuſdem diei octo. Viuit magna pars camelorum annos triginta, ſed multo plures nonnullæ: nam vel ad centeſimum annum facultatem viuendi protrahunt. Elephantem alij annos ducentos viuere aiunt, alij trecentos.

ΚΕΦΑΛ. ι΄.

Περὶ προβάτων καὶ αἰγῶν τροφῆς καὶ πῶς πιαίνονται.

Πρόβατα δὲ καὶ αἶγες, εἰσὶ μὲν ποηφάγα· τὴν δὲ νομὴν ποιοῦνται τὰ μὲν πρόβατα, προσεδρεύοντα, καὶ μόνιμα· αἱ δ' αἶγες, ταχὺ μεταβάλλουσαι, καὶ τῶν ἄκρων ἀπτόμεναι μόνον. πιαίνει δὲ μάλιστα τὸ πρόβατον τὸ ποτόν· διὸ καὶ τοῦ θέρους διδόασιν ἅλας διὰ πέντε ἡμερῶν, μέδιμνον τοῖς ἑκατόν. γίνεται γὰρ ὑγιεινότερον οὕτω καὶ πιότερον τὸ ποίμνιον. καὶ τὰ πολλὰ δ' ἁλίζοντες, διὰ τοῦτο προσφέρουσιν, ἔν τε τοῖς ἀχύροις ἅλας πολλούς, (διψῶντα γὰρ πίνει μᾶλλον) καὶ τοῦ μετοπώρου τὴν κολοκυντίαν, ἅλας πάττοντες. τοῦτο γὰρ καὶ γάλα ποιεῖ πλεῖον. καὶ κινούμεναι δὲ μεσημβρίας, πίνουσι μᾶλλον πρὸς τὴν δείλην. πρὸς δὲ τοὺς τόκους ἁλιζόμεναι, μείζω τὰ οὔθατα καθιᾶσι.

CAPVT X.

Quibus herbis oues & capræ veſcantur, & de cauſa impinguationis earundem.

E Oues & capræ herba veſcuntur. Paſcere oues ſedulæ, atque ſtabiles ſolent. Capræ loca crebrò permutant, ſummáque tantùm contingunt. Pingueſcit potiſſimùm ouis ex potu: quamobrem æſtate ſalem dare, die quinto ſoliti ſunt, ſingulis centenis ſingulos modios. Sic enim pecus incolume atque pinguius redditur. Frequens igitur ſalis vſus eò pertinet, quando & paleis copiam ſalis admiſcent, vt ſitibundæ plus aquæ hauriant. & autumno cucurbitam ſale contactam afferunt: quod lac etiam auget. Et agitatæ quoque meridie, plus poſtmeridianis bibunt. Fœtis diſtenta vbera pendent, quibus ſalis abundè eſt.

Opimat pecus olea, oleaſter, aphaca, palea, herba, quæ omnia efficaciora ſunt ex ſalſugine reſperſa. Pingueſcunt & hæc pleniùs præfatigata inedia triduò. Aqua ouibus autumno commodior Aquilonia quàm auſtrina eſt: & paſcua ad Solis occaſum ſpectantia proſunt. Itinera, & labores extenuant. Iudicant paſtores ouem validiorem, cùm hybernis temporibus pruinam, quam ſuſceperit, ſeruat. Nam quibus virium minus, parum præ ſua imbecillitate conſtantes, diſcutiunt ſuo motu quantum ſuſceperint. Caro cuiuſque quadrupedis deterior eſt, cùm locis paluſtribus, quàm editioribus paſcit. Sunt porrò frigoris patientiores, quibus cauda amplior quàm quibus porrectior, & glabræ exutiores quàm veſtitiores. Criſpæ etiam algoris impatientes ſunt. Valēt meliùs oues, quàm capræ: ſed robuſtiores capræ quàm oues, ſunt. Ouium, quas lupus occiderit, pelles, ac vellera, & facta ex his veſtis, longè, quàm cætera, aptiora ſunt ad pediculos procreandos.

A πιαίνει δὲ τὰ πρόβατα θαλλὸς, κότινος, ἀφάκη, ἄχυρα, καὶ πόα· πάντα δὲ μᾶλλον πιαίνει ἅλμῃ προσερραμμένα. παχύνεται δὲ καὶ ταῦτα μᾶλλον προλιμοκτονηθέντα τρεῖς ἡμέρας. ὕδωρ δὲ προβάτοις τοῦ μετοπώρου τὸ βόρειον τοῦ νοτίου ἄμεινον, καὶ αἱ νομαὶ αἱ πρὸς ἑσπέραν συμφέρουσι. λεπτύνουσι δ' αἱ ὁδοὶ καὶ αἱ ταλαιπωρίαι. οἱ δὲ ποιμένες γινώσκουσι τὰς ἰσχυρὰς τῶν οἰῶν, ὅταν χειμὼν ᾖ, τῷ τὰς μὲν πάχνην ἔχειν, τὰς δὲ, τῷ μὴ ἔχειν. διὰ γὰρ τὴν ἀσθένειαν κινούμεναι, ἀποβάλλουσιν αἱ μὴ ἰσχύουσαι. πάντων δὲ τετραπόδων τὰ κρέα χείρω, ὅπου [εἰς] ἑλώδη χωρία νέμονται, ἢ ὅπου μετεωρότερα.* εἰσὶ δ' εὐχειμερώτεραι αἱ πλατύκερκοι οἶες
B τῶν μακροκέρκων, καὶ αἱ κολοβαὶ τῶν λασίων· δυσχείμεροι δὲ καὶ * αἱ αἶγες. ὑγιεινότεραι μὲν οὖν οἶες τῶν αἰγῶν· ἰσχύουσι δὲ μᾶλλον αἱ αἶγες τῶν οἰῶν. τῶν δὲ λυκοβρώτων προβάτων, τὰ κῴδια καὶ τὰ ἔρια, καὶ τὰ ἐξ αὐτῶν ἱμάτια, φθειρωδέστερα γίνεται πολὺ μᾶλλον τῶν ἄλλων.

* Scrib. καὶ αἱ δυσχειμερώτεραι, ita poſtulante ratione, & ita ſcriptum inuenimus. At Gaza aliter. non rectè.
* Gaza legit aliter.

CAPVT XI.

De paſtione, & potu inſectorum.

INſecta animalia, quibus dentes, omniuora ſunt: quibus autem lingua, tantùm humore vndique eliquando ſua lingua veſcuntur: quorum alia omniuora ſunt, quibus guſtus omnium ſaporũ eſt, vt muſcæ: alia ſanguiuora, vt tabani, & aſili: alia ſuccis plantarum, & fructuum viuunt. apis vna nullis putidis aſſidet, nec vtitur alio cibo, quàm dulci. aquam etiam libentiſſimè inde hauriunt, quam ſynceri clariſſimique fontes ſcaturiunt. Talis animalium victus eſt.

ΚΕΦΑΛ. ια'.

Περὶ ἐντόμων τροφῆς.

Τῶν δ' ἐντόμων τὰ μὲν ἔχοντα ὀδόντας, παμφάγα ἐστί· τὰ δὲ γλῶτταν, μόνον τοῖς ὑγροῖς τρέφεται, πάντοθεν
C ἐκχυλίζοντα ταύτῃ. καὶ τούτων τὰ μὲν, παμφάγα (πάντων γὰρ γεύεται τῶν χυμῶν, οἷον αἱ μυῖαι) τὰ δ', αἱμοβόρα, καθάπερ μύωψ, καὶ οἶστρος· τὰ δὲ, φυτῶν καὶ καρπῶν ζῇ χυλοῖς. ἡ δὲ μέλιττα, μόνον πρὸς οὐδὲν προσιζάνει σαπρόν. χρῆται δ' ἐν τροφῇ οὐδεμιᾷ, ἀλλ' ἢ τῇ γλυκὺν ἐχούσῃ χυμόν. καὶ ὕδωρ δ' ἥδιστον εἰς ἑαυτὰς λαμβάνουσιν, ὅπου ἂν ἀναπηδᾷ. τροφαῖς μὲν οὖν χρῶνται τὰ γένη τῶν ζώων ταῖς εἰρημέναις.

CAPVT XII.

De actionibus animalium, & rebus, in quibus eadem verſantur.

ACtio autem, & omne eorum negotium in coitu, procreatione, atque victus ſolertia verſatur: necnon ad frigora, æſtus, mutationes denique temporum pertinet. Ineſt enim omnibus ſenſus natiuus mutationis factæ, frigore, aut calore. Itaque vt homines alij domicilia hyeme repetunt, alij qui amplioris prouinciæ principes ſunt, ſedem pro tempore mutant, vt moram æſtate locis frigidis, hyeme tepidis trahant: ſic bruta, quæ loca poſſunt permutare, faciunt. atque alia ſubſidium in ipſis conſuetis ſibi locis comperiunt, alia peregrè proficiſcuntur. Iam ab autumnali æquinoctio ex Ponto locíſque frigidis fugiunt hyemem futuram. A verno autem ex tepida regione, ad frigidam ſeſe conferunt, æſtus metu futuri: & alia de locis vicinis diſcedunt, alia de vltimis, propè dixerim, vt grues faciunt, quæ ex Scythicis campis ad paludes Ægypto ſuperiores, vnde Nilus profluit, veniunt: quo in loco pugnare cum Pygmæis dicuntur. Non enim id fabula eſt: ſed certè, genus tum hominum, tum etiam equorum puſillum (vt dicitur) eſt, degúntque in cauernis, vnde nomen Troglodytæ à ſubeundis cauernis accepere. Plateæ etiam migrant, & de Strymone amne ad Iſtrum aduolant, prolémque ibi faciunt.

ΚΕΦΑΛ. ιβ'.

Περὶ πράξεων καὶ ἐκτοπισμοῦ τῶν ζώων.

D Αἱ δὲ πράξεις αὐτῶν ἅπασαι, περί τε τὰς ὀχείας καὶ τεκνώσεις εἰσί, καὶ περὶ τὰς εὐπορίας τῆς τροφῆς, καὶ πρὸς τὰ ψύχη καὶ τὰς ἀλέας πεπορισμέναι, καὶ πρὸς τὰς μεταβολὰς τὰς τῶν ὡρῶν. πάντα γὰρ τῆς κατὰ τὸ θερμὸν καὶ ψυχρὸν μεταβολῆς αἴσθησιν ἔχει σύμφυτον. καὶ καθάπερ τῶν ἀνθρώπων οἱ μὲν, τὰς οἰκίας τοῦ χειμῶνος μεταβάλλουσιν, οἱ δὲ, πολλῆς χώρας κρατοῦντες, θερίζουσι μὲν ἐν τοῖς ψυχροῖς, χειμάζουσι δ' ἐν τοῖς ἀλεεινοῖς· οὕτω καὶ τῶν ζώων τὰ δυνάμενα μεταβάλλει τοὺς τόπους. καὶ τὰ μὲν, ἐν αὐτοῖς τοῖς συνήθεσι τόποις εὑρίσκεται τὰς βοηθείας· τὰ δ', ἐκτοπίζει μετὰ μὲν τὴν φθινοπωρινὴν ἰσημερίαν, ἐκ
E τοῦ Πόντου καὶ τῶν ψυχρῶν φεύγοντα τὸν ἐπιόντα χειμῶνα· μετὰ δὲ τὴν ἐαρινὴν, ἐκ τῶν θερμῶν, εἰς τοὺς τόπους τοὺς ψυχροὺς, φοβούμενα τὰ καύματα. τὰ μὲν, καὶ ἐκ τῶν ἐγγὺς τόπων ποιούμενα τὰς μεταβολάς, τὰ δὲ, καὶ ἐκ τῶν ἐσχάτων, ὡς εἰπεῖν, οἷον αἱ γέρανοι ποιοῦσι· μεταβάλλουσι γὰρ ἐκ τῶν Σκυθικῶν εἰς τὰ ἕλη τὰ ἄνω τῆς Αἰγύπτου, ὅθεν ὁ Νεῖλος ῥεῖ. ἔστι δὲ ὁ τόπος οὗτος, περὶ ὃν οἱ Πυγμαῖοι κατοικοῦσιν. οὐ γάρ ἐστι τοῦτο μῦθος, ἀλλ' ἔστι κατὰ τὴν ἀλήθειαν, γένος μικρὸν μὲν, ὥσπερ λέγεται, καὶ αὐτοὶ καὶ οἱ ἵπποι, τρωγλοδύται δ' εἰσὶ τὸν βίον. καὶ οἱ πελεκᾶνες δ' ἐκτοπίζουσι, καὶ πέτονται ἀπὸ τοῦ Στρυμόνος ποταμοῦ ἐπὶ τὸν Ἴστρον, κἀκεῖ τεκνοποιοῦνται·

ἀθρόοι δ' ἀπέρχονται, ἀναμένοντες οἱ πρότεροι τοὺς ὑστέρους, διὰ τὸ, ὅταν ὑπερβάλλωνται τὸ ὄρος, ἀδήλους γίνεσθαι τοὺς ὑστέρους τοῖς προτέροις. καὶ οἱ ἰχθύες δὲ τὸν αὐτὸν τρόπον, οἱ μὲν, ἐκ τοῦ Πόντου, ἢ εἰς τὸν Πόντον μεταβάλλουσιν· οἱ δ', ἐν μὲν τῷ χειμῶνι, ἐκ τοῦ πελάγους πρὸς τὴν γῆν, τὴν ἀλέαν διώκοντες· ἐν δὲ τῷ θέρει, ἐκ τῶν προσγείων εἰς τὸ πέλαγος, φεύγοντες τὴν ἀλέαν. καὶ τὰ ἀσθενῆ δὲ τῶν ὀρνέων, ἐν μὲν τῷ χειμῶνι καὶ τοῖς πάγοις, εἰς τὰ πεδία καταβαίνουσι, διὰ τὴν ἀλέαν· ἐν δὲ τῷ θέρει, ἀποχωροῦσιν εἰς τὰ ὄρη ἄνω, διὰ τὰ καύματα. ποιεῖται δὲ ἀεὶ τὰ πρῶτα τὴν μετάβασιν τὰ ἀσθενέστερα καθ' ἑκατέραν τὴν ὑπερβολήν· οἷον οἱ μὲν σκόμβροι, τῶν θύννων· οἱ δὲ ὄρτυγες, τῶν γεράνων. τὰ μὲν γὰρ, μεταβάλλει τοῦ Βοηδρομιῶνος· τὰ δὲ, τοῦ Μαιμακτηριῶνος. ἔστι δὲ πιότερα πάντα, ὅταν ἐκ τῶν ψυχρῶν τόπων μεταβάλλῃ, ἢ ὅταν ἐκ τῶν θερμῶν· οἷον καὶ οἱ ὄρτυγες τοῦ φθινοπώρου μᾶλλον, ἢ τοῦ ἔαρος. συμβαίνει δ' ἐκ τῶν ψυχρῶν τόπων ἅμα μεταβάλλειν, καὶ ἐκ τῆς ὥρας τῆς θερμῆς. ἔχουσι δὲ καὶ πρὸς τὰς ὀχείας ὁρμητικώτερον κατὰ τὴν ἐαρινὴν ὥραν, καὶ ὅταν μεταβάλλωσιν ἐκ τῶν θερμῶν. τῶν μὲν οὖν ὀρνέων αἱ γέρανοι, καθάπερ εἴρηται πρότερον, ἐκτοπίζουσιν εἰς τὰ ἔσχατα ἐκ τῶν ἐσχάτων. πέτονται δὲ πρὸς τὸ πνεῦμα. τὸ δὲ περὶ τοῦ λίθου, ψεῦδός ἐστι. λέγεται γὰρ ὡς ἔχουσιν ἕρμα λίθον, ὃς γίνεται χρήσιμος πρὸς τὰς τοῦ χρυσοῦ βασάνους, ὅταν ἐκπέσῃ. ἀπαίρουσι δὲ καὶ αἱ φάτται, καὶ αἱ πελειάδες, καὶ οὐ χειμάζουσι, καὶ αἱ χελιδόνες καὶ αἱ τρυγόνες· αἱ δὲ περιστεραὶ καταμένουσιν. ὁμοίως δὲ καὶ οἱ ὄρτυγες, ἐὰν μή τινες ὑπολειφθῶσι καὶ τῶν τρυγόνων καὶ τῶν ὀρτύγων, ἐν εὐηλίοις χωρίοις. ἀγελάζονται δὲ αἵ τε φάτται καὶ αἱ τρυγόνες, ὅταν τε παραγίνωνται, καὶ ὅταν πάλιν ὥρα ᾖ πρὸς τὴν ἀνακομιδήν. οἱ δὲ ὄρτυγες, ὅταν * πέσωσιν, ἐὰν μὲν εὐδία ἢ βόρειον ᾖ, συνδυάζονταί τε καὶ * ἠρεμοῦσιν· ἐὰν δὲ νότος, χαλεπῶς ἔχουσι, διὰ τὸ μὴ εἶναι πτητικοί· ὑγρὸς γὰρ καὶ βαρὺς ὁ ἄνεμος· διὸ καὶ οἱ θηρεύοντες, ἐπιχειροῦσι τοῖς νοτίοις. εὐδίας δὲ, οὐ πέτονται, διὰ τὸ βάρος. πολὺ γὰρ τὸ σῶμα· διὸ καὶ βοῶντες πέτονται. πονοῦσι γάρ. ὅταν μὲν οὖν ἐκεῖθεν παραβάλλωσιν, οὐκ ἔχουσιν ἡγεμόνας· ὅταν δ' ἐντεῦθεν ἀπαίρωσιν, ἥ τε γλωττὶς συναπαίρει, καὶ ἡ ὀρτυγομήτρα, καὶ ὁ ὦτος καὶ ὁ κόγχραμος, ὅσπερ αὐτοὺς καὶ ἀνακαλεῖται νύκτωρ. καὶ ὅταν τούτου τὴν φωνὴν ἀκούσωσιν οἱ θηρεύοντες, ἴσασιν ὅτι οὐ καταμένουσιν. ἡ δὲ ὀρτυγομήτρα, παραπλήσιος τὴν μορφὴν τοῖς λιμναίοις ἐστί· καὶ ἡ γλωττὶς, γλῶτταν ἐξαγομένην ἔχουσα μέχρι πόρρω. ὁ δὲ ὦτος, ὅμοιος ταῖς γλαυξὶ, καὶ περὶ τὰ ὦτα πτερύγια ἔχων. ἔνιοι δὲ αὐτὸν νυκτικόρακα καλοῦσιν. ἔστι δὲ κόβαλος καὶ μιμητής, καὶ ἀντορχούμενος ἁλίσκεται, περιελθόντος θατέρου τῶν θηρευτῶν, καθάπερ γλαῦξ. ὅλως δὲ τὰ γαμψώνυχα πάντα βραχυτράχηλα καὶ πλατύγλωττα καὶ μιμητικά. καὶ γὰρ τὸ Ἰνδικὸν ὄρνεον ἡ ψιττάκη, τὸ λεγόμενον ἀνθρωπόγλωττον, τοιοῦτόν ἐστι· καὶ ἀκολαστότερον δὲ γίνεται, ὅταν πίῃ οἶνον. ἀγελαῖοι δὲ τῶν ὀρνίθων εἰσί, γέρανοι, κύκνος, πελεκᾶν, χὴν ὁ μικρός.

* Geſnerus, πέτωνται,
* Gaza, εὐημερεῖν

A Abeunt vniuerſæ, ac priores expectant poſteriores, propterea quòd vbi montem ſuperarint, videri priores à poſterioribus nequeant. Quinetiam piſces modo eodem, alij ex Ponto, aut in Pontum tranant, alij per hyemem ex alto in litora teporis gratia veniunt: contrà æſtate ex litore in altum vitantes æſtum diſcedunt. Aues quoque imbecilliores, hyberno & gelido tempore diſcedunt in campos, vt tepore potiantur: æſtiuò autem repetunt montes, vt æſtu careant. Semper quæ imbecilliora ſunt, priùs vtrauis ratione diſcedunt. Iam ſcombri antè, quàm thunni, coturnices antè, quàm grues: altera enim B Auguſto, altera Septembri menſe incipiunt. Sunt profectò omnia pinguiora, quæ de locis diſcedunt frigidis, quàm quæ de calidis: vt coturnices autumno quàm vêre ſunt pinguiores. Fit enim vt ſimul de locis frigidis, & tempore calido diſcedatur. Sunt etiam Veneris appetentiora verno tempore, cúmque ex tepido diſceſſerunt. Sed auium, grues, vt dictum eſt, ex vltimis in vltima abeunt. Volant flatu ſecundo. Quod de lapide narrant, falſum eſt. Lapidem enim eas tenere fulcimento, quem, vbi deciderit, accipi vtilem ad auri probationem aiunt. Palumbes etiam diſcedunt, & liuiæ, nec hybernare apud nos patiuntur: atque etiam turtures, & hirundines: ſed columbæ C manent. Coturnices quoque diſcedunt, niſi paucæ locis apricis remanſerint: quod & turtures faciunt. Volant gregatim tum palumbes, tum turtures, cùm accedunt, & cùm ſuo tempore abeunt. Coturnices cùm ceciderint, ſi ſerenum ſit, aut aquilonium tempus, ſociantur, & proſperè degunt: ſed ſi auſtrinum, moleſtè, propterea quòd parum volant: humidus enim grauiſque auſter eſt. Quamobrem qui aucupantur, auſtrum, non aquilonem obſeruant. Omnino ægrè propter ſui corporis pondus volant. Sunt enim corpore grandiore, quàm ſuis pennis deferri poſſint, vociferantéſque ob eam rem volant: laborant enim quaſi oppreſſæ onere. Cùm hæc adeunt loca, ſi D ne ducibus pergunt: at cùm hinc abeunt, ducibus lingulaca, oto, & matrice proficiſcuntur, atque etiam cynchramo, à quo etiam reuocantur noctu: cuius vocem cùm ſenſerint aucupes, intelligunt parari diſceſſum. Matrix forma perinde ac aues lacuſtres eſt: atque etiam lingulaca, quæ linguam exerit prælongam, vnde ei nomen. Ortus noctuæ ſimilis eſt, pinnulis circiter aures eminentibus præditus, vnde nomen accepit quaſi auritum dicas. Nonnulli vlulam eum appellant, alij aſionem. Blatero hic eſt, & hallucinator, & planipes: ſaltantes enim imitatur. Capitur intentus in altero aucupe, altero circumeunte, vt noctua. E Omnes denique aues vncæ, breui ſunt collo, & lingua lata, aptæque ad imitandum. Nam & Indica auis, cui nomen pſittacæ, quam loqui aiunt, talis eſt, & loquacior cùm biberit vinum, redditur. Gregales ex auibus ſunt, grus, olor, platea, anſer minor.

A

CAPVT XIII.

De actionibus piſcium, quorumdámque terreſtrium, in fugiendis aduerſis.

PIſcium alij, vt dictum eſt, diſcedunt ab alto ad litus, & contrà de litore in altum, fugientes exuperantias caloris, & frigoris. Sed præſtant pelagicis litorales: quippe qui cibo copioſiore melioréque potiantur. Quà enim Sol ingruit, plura exeunt, vt fit in hortis: nam & lituus niger propius terram oritur, alter ſimilis erraticis eſt. Tum etiam bene ex calido frigidóque temperata ſunt loca maris terrena. Quo fit, vt & caro B eorum piſcium magis conſtet, cùm pelagiorum humida, mollis, ſolutáque ſit. Litorales ſunt dentex, ſcarabeus, cernua, aurata, mugilis, mullus, turdus, draco, pulcher, gobio, atque omne ſaxatile genus. Pelagij ſunt paſtinaca, genúſque omne cartilagineum & congrorum albicantium genus, & hiatula, rubelio, glaucus. Pagri autem, ſcorpiones, congri nigrantes, murænæ, cuculi, ambigunt. Sed diſcrimen horum, diuerſitate etiam locorum ac temporum exiſtere poteſt: vt apud Cretam inſulam gobiones, omnéque ſaxatile genus ſatis pingueſcit. Thunnus etiam poſt Arcturum melior eſt: iam enim eo tempore ab infeſtantis aſili agitatione requieſcit, quæ facit vt ſit in æſtate deterior. Quinetiam maritimis C lacubus genera plura piſcium marinorum gigni apertum eſt, vt ſalpam, auratam, mullum, alios ferè plurimos. Amias etiam in Alopeconneſo reperies: & in Biſtonide lacu plurima genera habentur. Monedulæ, magna ex parte non ſubeunt Pontum, ſed in Propontide tranant æſtatem, & pariunt: hyemem in Ægeo. Sed thunni, limariæ, amiæ, ſubeunt Pontum vere, æſtatémque ibi traducunt: & reliqui ferè plurimi fuſanei & gregatilis generis eôdem tranſeunt. Eſt ſanè plurima piſciũ pars gregatilis, nec vllus grex caret duce. Petunt autem Pontum paſtus gratia, qui vberior & commodior ibi, propter aquarum dulcium admiſtionem, ſuppeditatur. Bel- D luæ quoque magnæ pauciores ibidem ſunt: nam excepto delphino, & phocæna, quam tirſionem interpretor, nihil in Ponto maleficum eſt. Nec delphinus hic magnus eſt, quanquam extrà vbi aliquantum proceſſeris, magni habeantur. Tum itaque victus tum etiam partus gratia Pontum ſubeunt. Sunt enim ibi loca ad partionem aptiora, & humor dulcior ac potulentior fœtum meliùs educat. Sed cùm pepererint, & proles iam adoleuerit, exeunt poſt Vergilias ſtatim: & ſi hyems Auſtrina ſit, tardiùs: ſi Aquilonia, citiùs, propter ſecundi flatus commoditatem: proléſque adhuc parua apud Byzantium capitur, vtpote cùm E longior mora in Ponto non fuerit. Sed de cæteris & cùm adeunt, & cùm exeunt, conſtat. Sarda autem vna cùm adit, videtur, & capitur: ſed exiens nuſquam viſa adhuc eſt. Quòd ſi qua apud Byzantium aliquando capiatur, piſcatores ſua retia luſtrant, propter exitus inſolentiam: cuius rei cauſa eſt, quòd ſolæ ipſæ ſubeunt Iſtrũ amnem: vnde ſiſſo flumine per abditũ terræ meatum defluunt in Adriam ſinum. argumento eſt, quòd ibi contrà euenit quàm in Ponto: exeũtes enim ſemper capiuntur, ſubeuntes nunquam.

ΚΕΦΑΛ. ιγ΄.

Τίνες τῶν ἰχθύων ἀμείνους, καὶ περὶ τοῦ αὐτῶν ἐκτοπισμοῦ.

ΤΩν δὲ ἰχθύων οἱ μὲν, ὥσπερ εἴρηται, μεταβάλλουσιν εἰς τὴν γῆν ἐκ τοῦ πελάγους, καὶ εἰς τὸ πέλαγος ἀπὸ τῆς γῆς, φεύγοντες τὰς ὑπερβολὰς τοῦ ψύχους καὶ τῆς ἀλέας. ἀμείνους δ' εἰσὶν οἱ πρόσγειοι τῶν πελαγίων. πλείω γὰρ καὶ βελτίω νομὴν ἔχουσι. ὅπου γὰρ ἂν ὁ ἥλιος ἐπιβάλλῃ, φύεται πλείω καὶ βελτίω, καὶ ἁπαλώτερα, οἷον ἐν κήποις. καὶ ὁ θὶς ὁ μέλας, φύεται πρὸς τῇ γῇ· ὁ δ' ἄλλος, ὅμοιός ἐστι τοῖς ἀγρίοις. ἔτι δὲ καὶ * κεκρασμένοι τυγχάνουσι καλῶς τῷ θερμῷ καὶ τῷ ψυχρῷ οἱ τόποι οἱ πρόσγειοι τῆς θαλάττης· διὸ καὶ αἱ σάρκες συνεστήκασι μᾶλλον τῶν τοιούτων ἰχθύων· τῶν δὲ πελαγίων ὑγραί εἰσι καὶ κεχυμέναι. εἰσὶ δὲ πρόσγειοι,* σινώδων, κάνθαρος, ὀρφὸς, χρύσοφρυς, κεστρεὺς, τρίγλη, κίχλη, δράκων, καλλιώνυμος, κωβιὸς, καὶ τὰ πετραῖα πάντα. πελάγιοι δὲ, τρυγὼν, καὶ τὰ σελάχη, καὶ γόγγροι οἱ λευκοὶ, χάννη, ἐρυθρῖνος, γλαῦκος. φάγροι δὲ καὶ σκορπίοι, καὶ γόγγροι οἱ μέλανες, καὶ μύραιναι, καὶ κόκκυγες, ἐπαμφοτερίζουσιν. εἰσὶ δὲ διαφοραὶ τούτων καὶ κατὰ τοὺς τόπους· οἷον περὶ Κρήτην οἱ κωβιοὶ, καὶ τὰ πετραῖα πάντα, πίονα γίνεται. γίνεται δὲ καὶ ὁ θύννος ἀγαθὸς πάλιν μετ' ἀρκτοῦρον. ἤδη γὰρ οἰστρῶν παύεται ταύτην τὴν ὥραν. διὰ γὰρ τοῦτο ἐν τῷ θέρει χείρων ἐστί. γίνονται δὲ καὶ ἐν ταῖς λιμνοθαλάτταις πολλοὶ τῶν ἰχθύων, οἷον σάλπαι, χρύσοφρυς, τρίγλη, καὶ τῶν ἄλλων σχεδὸν οἱ πλεῖστοι. γίνονται δὲ καὶ αἱ ἀμίαι, οἷον περὶ Ἀλωπεκόννησον· καὶ ἐν τῇ * Βιστωνίδι λίμνῃ ἔνεστι * τὰ γένη τῶν ἰχθύων. τῶν δὲ κολιῶν οἱ πολλοὶ, εἰς μὲν τὸν Πόντον οὐκ ἐμβάλλουσιν, ἐν δὲ τῇ Προποντίδι θερίζουσι καὶ ἐκτίκτουσι, χειμάζουσι δ' ἐν τῷ Αἰγαίῳ. * θύννες δὲ καὶ * πηλαμίδες, καὶ ἀμίαι, εἰς τὸν Πόντον ἐμβάλλουσι τοῦ ἔαρος, καὶ θερίζουσι. σχεδὸν δὲ καὶ οἱ πλεῖστοι τῶν ῥυάδων [τε] καὶ ἀγελαίων ἰχθύων. εἰσὶ δὲ οἱ πλεῖστοι ἀγελαῖοι. ἔχουσι δὲ οἱ ἀγελαῖοι ἡγεμόνα. πάντες δὲ εἰσπλέουσιν εἰς τὸν Πόντον, διά τε τὴν τροφὴν, (ἡ γὰρ νομὴ καὶ πλείων καὶ βελτίων, διὰ τὸ πότιμον) καὶ διὰ τὰ θηρία τὰ μεγάλα, ὅτι ἐλάττω εἰσὶν ἐκεῖ. ἔξω γὰρ * φαλαίνης καὶ δελφῖνος, οὐδέν ἐστιν ἐν τῷ Πόντῳ· καὶ ὁ δελφὶς μικρός. ἔξω δὲ εὐθὺς προελθόντι μεγάλοι. διά τε δὴ τὴν τροφὴν εἰσπλέουσι, καὶ διὰ τὸν τόκον. τόποι γάρ εἰσιν ἐπιτήδειοι εἰς τὸ τίκτειν· καὶ τὸ πότιμον, καὶ τὸ γλυκύτερον ὕδωρ ἐκτρέφει τὰ κυήματα. ὅταν δὲ τέκωσι, καὶ τὰ γεννώμενα αὐξηθῇ, ἐκπλέουσιν εὐθὺς μετὰ πλειάδα. ἂν μὲν οὖν νότιος ὁ χειμὼν ᾖ, βραδύτερον ἐκπλέουσιν· ἂν δὲ βόρειος, θᾶττον, διὰ τὸ τὸ πνεῦμα συμπροάγειν· καὶ ὁ γόνος δὲ τότε μικρὸς ἁλίσκεται περὶ Βυζάντιον,* ἅτ' οὐ χρονιώδης ἐν τῷ Πόντῳ πολλῆς διατελέσας. οἱ μὲν οὖν ἄλλοι καὶ ἐκπλέοντες καὶ εἰσπλέοντες δῆλοί εἰσιν· * οἱ δὲ τριχαῖοι, μόνοι τῶν ἰχθύων εἰσπλέοντες μὲν ἁλίσκονται, ἐκπλέοντες δὲ οὐχ ὁρῶνται· ἀλλ' ὅταν μὴ καὶ ληφθῇ τις περὶ Βυζάντιον, οἱ ἁλιεῖς τὰ δίκτυα περικαθαίρουσι, διὰ τὸ μὴ εἰωθέναι ἐκπλεῖν. αἴτιον δὲ, ὅτι οὗτοι μόνοι ἀναπλέουσιν εἰς τὸν Ἴστρον, εἶθ' ᾗ σχίζεται, καταπλέουσιν εἰς τὸν Ἀδρίαν. σημεῖον δὲ καὶ γὰρ συμβαίνει τοὐναντίον. ἐκπλέοντες μὲν γὰρ, οὐχ ἁλίσκονται εἰς τὸν Ἀδρίαν· εἰσπλέοντες δὲ, ἁλίσκονται.

* Sylb. κεκραμένοι. vel κεκερασμένοι

* Scrib. σινόδων vel certè συνόδων, nam ω in medio locum habere nequit, vt ex Oppiano liquet.

* κ. Βιστώνι

* Gaza πλεῖστα γένη

* G. θύννοι. Forſaſſe θυννίδες, vt alibi vide lib. 9. c. 2.

* κ. πηλαμύδες,

* G. φωκαίνης. Plinius φωκῆς. lib. 9. c. 15.

* Sic legendum vulgò αὐτὸ γ. malè.

* Geſnerus, τριχίαι, vel θρίσσαι.

εἰσπλέουσι δὲ οἱ θύννοι ἐπὶ δεξιὰ, ἐχόμενοι τῆς γῆς· ἐκπλέουσι δ' ἐπ' ἀριστερά. τοῦτο δέ φασί τινες ποιεῖν, ὅτι τῷ δεξιῷ ὀξύτερον ὁρῶσι φύσει, τῷ δ' ἀριστερῷ οὐκ ὀξὺ βλέπουσι. τὴν μὲν οὖν ἡμέραν οἱ ῥυάδες κομίζονται, τὴν δὲ νύκτα ἡσυχάζουσι καὶ νέμονται, ἐὰν μὴ σελήνη ᾖ. τότε δὲ κομίζονται καὶ οὐχ ἡσυχάζουσι. λέγουσι δέ τινες τῶν περὶ τὴν θάλατταν, ὡς ὅταν τροπαὶ χειμεριναὶ γίνωνται, οὐκέτι κινοῦνται, ἀλλ' ἡσυχάζουσιν, ὅπου ἂν τύχωσι καταληφθέντες, μέχρι ἰσημερίας. οἱ μὲν οὖν κολίαι, εἰσιόντες ἁλίσκονται· ἐξιόντες δὲ, ἧττον. ἄριστοι δέ εἰσιν ἐν τῇ Προποντίδι πρὸ τοῦ τίκτειν. οἱ δ' ἄλλοι ῥυάδες, ἐξιόντες ἐκ τοῦ Πόντου, ἁλίσκονταί τε, καὶ μᾶλλον ἄριστοι τότε εἰσίν. ὅταν δὲ εἰσπλέωσιν ἐγγύτατα τοῦ αἰγιαλοῦ, πιότατοι ἁλίσκονται· ὅσῳ δ' ἀνωτέρω, ἀεὶ λεπτότεροι. πολλάκις δὲ καὶ ὅταν πνεῦμα ἀντικόψῃ νότιον, συνεκπλέουσι* ταῖς κολίαις καὶ τοῖς σκόμβροις, καὶ κάτω ἁλίσκονται μᾶλλον ἢ περὶ Βυζάντιον. τοὺς μὲν οὖν ἐκτοπισμοὺς τοῦτον ποιοῦνται τὸν τρόπον. ὁ δ' αὐτὸ τοῦτο συμβαίνει πάθος καὶ ἐπὶ τῶν χερσαίων κατὰ τὴν φωλείαν. τοῦ μὲν γὰρ χειμῶνος ὁρμῶσι πρὸς τὴν φωλείαν· ἀπαλλάττονται δὲ, κατὰ τὴν θερμοτέραν ὥραν. ποιοῦνται δὲ τὰ ζῷα καὶ τὰς φωλείας, πρὸς τὴν βοήθειαν καὶ τὰς ὑπερβολὰς τῆς ὥρας ἑκατέρας*. φολιδωτῶν μὲν ὅλον τὸ γένος· ἐνίων δὲ, τὰ μὲν, τὰ δ', οὔ. τὰ μὲν γὰρ ὀστρακόδερμα, πάντα φωλεῖ· οἷον τά τε ἐν τῇ θαλάττῃ, πορφύραι, καὶ κήρυκες, καὶ πᾶν τὸ τοιοῦτο γένος. ἀλλὰ τῶν μὲν ἀπολελυμένων, ἐπιδηλοτέρα ἐστὶν ἡ φωλεία· κρύπτουσι γὰρ αὑτά, οἷον οἱ κτένες· τὰ δὲ, ἔχει ἐπιπολῆς ἐπικάλυμμα, οἷον οἱ χερσαῖοι κοχλίαι· τῶν δ' ἀπολύτων, ἄδηλος ἡ μεταβολή. φωλοῦσι δ' οὐ τὴν αὐτὴν ὥραν· ἀλλ' οἱ μὲν κοχλίαι, τοῦ χειμῶνος· αἱ δὲ πορφύραι, καὶ οἱ κήρυκες, ὑπὸ κύνα περὶ ἡμέρας τριάκοντα· καὶ οἱ κτένες περὶ τὸν αὐτὸν χρόνον. τὰ δὲ πλεῖστα αὐτῶν, φωλεῖ καὶ ἐν τοῖς σφόδρα ψύχεσι, καὶ ἐν ταῖς σφόδρα ἀλέαις.

* κ. ταῖς κολίαις

* Scrib. φωλεῖ δὲ τῶν μὲν ὅ. τ. γ.

ΚΕΦΑΛ. ιδ'.

Περὶ ἐντόμων φωλείας.

Τὰ δ' ἔντομα σχεδὸν ἅπαντα φωλεῖ, πλὴν εἴ τι ἐν ταῖς οἰκήσεσι συνανθρωπεύεται αὐτῶν, καὶ ὅσα φθείρεται καὶ μὴ διετίζει. ταῦτα δὲ φωλεῖ τοῦ χειμῶνος. φωλεῖ δὲ τὰ μὲν, πλείους ἡμέρας· τὰ δὲ, τὰς χειμεριωτέρας, οἷον αἱ μέλιτται. καὶ γὰρ [καὶ] αὗται φωλοῦσι. σημεῖον δ', ὅτι οὐδὲν φαίνονται γευόμεναι τῆς παρακειμένης τροφῆς· καὶ ἐάν τις αὐτῶν ἐξερπύσῃ, φαίνεται διαφανής, καὶ οὐδὲν ἐν τῇ κοιλίᾳ ἐνὸν δῆλον. ἡσυχάζει δ' ἀπὸ πλειάδος δύσεως μέχρι τοῦ ἔαρος. ποιεῖται δὲ τὰ ζῷα τὰς φωλείας, ἀποκρυπτόμενα ἐν ἀλεεινοῖς, καὶ ἐν οἷς εἰώθει τόποις ἐπικοιτάζεσθαι.

ΚΕΦΑΛ. ιε'.

Περὶ φολιδωτῶν καὶ ἰχθύων φωλείας.

Φωλεῖ δὲ καὶ τὰ πολλὰ τῶν ἐναίμων· οἷον τά τε φολιδωτά, ὄφεις τε καὶ σαῦροι, καὶ ἀσκαλαβῶται, καὶ κροκόδειλοι οἱ ποτάμιοι, τέτταρας μῆνας

A Thunni dextrorſum terrã contingentes ſubeunt, ſed remeant contrà: læuum enim in latus ſe admouent. Quod propterea facere dicuntur, quia dextro oculo clariùs vident ſua natura, læuo hebetiùs. Fuſaneis, de quibus loquor, interdiu meare, noctu quieſcere in more eſt. Paſcuntur etiam nocte, niſi luceat luna. Ita enim faciunt iter, nec volunt quieſcere. Quidam vſu periti rei marinæ nihilo eos moueri, ſed quieſcere à bruma ad æquinoctium vernum, vbicumque id temporis ſint, aſſeuerant. Monedulæ ſubeuntes Pontum capiuntur, exeuntes autem minùs. Optimæ in Propontide ſunt, antequam pariant. at cæteri fuſanei exeuntes potiùs capiuntur, & optimi per id temporis B ſunt. Cùm verò adeũt Pontum, proximè Ægeum pinguiſſimi capiuntur. Quò ſubinde aſcenderint magis, eò macilentiores fiunt. Sæpe etiam flatu Auſtrino vehementiùs occurſante fit, vt cum monedulis & ſcombris exeant, ac mari inferiore magis quàm circa Byzantium capiantur. Diſceſſum ſediſque mutationem hoc modo faciunt. Hic idẽ affectus terreſtribus etiam euenit, cùm ſe abdunt, & latent: hyeme enim latebras ſubeunt, tempore iam tepidiore exeunt. Ratio verò & latendi & patendi communis animalium ea eſt, vt ſibi contra vtriuſque exuperantiam temporis opitulentur. Latet aliquorum genus totum, aliquorum partim C latet, partim non latet. Teſta enim intecta omnia latent, vt in mari purpura, buccinum, omnéque id genus. Sed abſolutorum latibulum euidẽtius eſt: conduntur enim receſſu, vt pectines facere viſuntur. aliqua leuiore quodam tegmine ſuperimpoſito deliteſcunt, vt cochleæ terreſtres, id eſt limaces: & adhærentium mutatio incerta eſt. Non tamen eodem tempore omnia latent, ſed limaces hyeme. Purpuræ, & buccina canis exortu dies circiter tricenos conduntur: pectines etiam tempore eodem. Sed eorum plurima ſanè latent, & algore vrgente, & æſtu.

CAPVT XIV.

D

Quo tempore inſectorum genera ſeſe abſcondant, aut æſtus, aut hyemis impetu.

INſecta penè omnia conduntur, præter ea quæ vitam in domiciliis cum hominibus agant, quęque priùs intereant, quàm annuum tempus excedant. Latent hæc hyeme, alia diutiùs, alia quamdiu algor vehemens eſt, vt apes: nam ipſæ etiam ceſſant, & latent. Cuius rei argumentum, quòd minimè cibum ſibi appoſitum guſtare videntur, & ſi qua erepſerit, ieiuna ſpectatur, ventre tranſlu- E cente, nullóque penitus contento, quod manifeſtum ſit. Quieſcunt ab occaſu Vergiliarum vſque ad ver. Conduntur autem quæque locis apricis abdita, & vbi ſibi cubile conſtituere tutius ſolent.

CAPVT XV.

De genere ſerpentum, quod hyeme abditur: déque nonnullis piſcibus, qui hyeme frigoris cauſa conduntur, quique æſtate propter calorem.

SAnguinei quoq; generis multa ſe cõdũt, vt ea quę intecta cortice ſũt, ſerpẽtes dico, lacertos, ſtelliones, crocodilos fluuiatiles. Mẽſibus quatuor

frigidiſſimis hæc latent, nec per id tempus quicquam comedunt. Cæteræ quidem ſerpentes cauernas ſubeunt terræ, ſed viperæ ſub ſaxis conduntur. Piſcium etiam complures latêre nouimus, ſed apertiſſimè hippurum, quem equiſelem nominaui: & coruulum, ſiue graculum, per hyemem. Nam hi ſoli nunquam capiuntur, niſi certis quibuſdam temporibus, eiſdemque ſemper, cùm cæteri omnes ferè ſemper capiantur. Muræna etiam latet, & cernua, & conger. Saxatiles verò coniugatim mares cum fœminis conduntur, quomodo & fœtificare ſolent: vt turdi, merulæ, percæ. Thunni etiam latent præaltis gurgitibus hyeme, pingueſcuntque à latibulo maiorem in modum. Capi incipiunt Vergiliarum ab ortu ad Arcturi occaſum vltimum, reliquo tempore quieſcunt latentes. Capiuntur nonnulli ex his, cæterisque latentibus, tempore ſui receſſus, cùm ſe moueant locis tepidis, aut ſi temporis inſolitæ quietes contingant. Prodeunt enim aliquantulo de ſuo cubili paſtum & præcipuè plenilunio. Sunt magna ex parte ſuauiſſimi cùm latent. Primadæ in cœno ſe abdunt: cuius rei argumentum eſt, quòd neque eo tempore capiuntur, & dorſo fæculento, pinniſque adductis oppreſſiſque ſpectantur. Verno autem tempore prodeunt, & appropinquant ad terram coeuntes, parienteſque: quo tempore fœtu grauidæ capiuntur, tempeſtiuæque tantiſper eſſe putantur. autumno verò & hyeme deteriores ſunt. Simul etiam mares pleni ſemine genitali, lacte appellato, per id tempus cernuntur: itaque præſtant ad vſum. Prole adhuc parua difficilè capiuntur: adultiore, iam larga captura propter infeſti aſili ſtimulum eſt. Latent alia in arena, alia in luto, ore tantùm detecto. Plurima tempore conduntur ſolùm hyberno, vt cruſtata, & piſces ſaxatiles, & raiæ, omneque cartilagineum genus, diebus ſcilicet frigidiſſimis. quod ita eſſe eo argumento conſtat, quòd minimè, cùm algor eſt, capiuntur. ſed piſcium nonnulli æſtate etiam latent, vt glaucus: hic enim per id tempus ſe abdit circiter dies ſexaginta. Aſellus etiam latet, & aurata plurimum temporis. Aſellum latêre indicio eſſe videtur, quòd longo interpoſito tempore capiatur. Piſces vel æſtate latêre documento illo probatur, quòd temporibus ſyderum fiant capturæ, & præcipuè Caniculæ. mare enim per id tempus euertitur: quod latiſſimè apud Boſphorū patet. Limus enim in ſumma effertur, piſceſque innatant. aiunt etiam, ſi gurgitum ima ſæpius tentantur, plures eadem ſagena capi ſecundo iactu, quàm primo. Tum etiam magnis imbribus multa apparent animalium genera, quæ antè vel nunquam vel rarò viſa fuerint.

CAPVT XVI.

De auibus, quæ hyeme occultantur.

AVium etiã complures condũtur, nõ, vt aliqui putant, paucæ: nec omnes ad loca tepidiora abeũt, ſed quibus loca eiuſmodi ſunt vicina ſolitæ ſedi, iis eò ſecedere libet: vt & miluos & hirũdines agere animaduerſum eſt. Quæ autem procul locis eiuſmodi morantur, non mutant ſedem, ſed ſe ibidem condunt. Iam enim viſæ ſunt multæ hirundines in anguſtiis conuallium nudæ, atque omnino deplumes. Milui etiam de huiuſmodi locis euolaſſe, cùm primùm apparerent, viſi ſunt.

A ταῖς χειμεριωτάταις, καὶ οὐκ ἐσθίουσιν οὐθέν. οἱ μὲν οὖν ἄλλοι ὄφεις, ἐν τῇ γῇ φωλοῦσιν· αἱ δ' ἔχιδναι, ὑπὸ τὰς πέτρας κρύπτουσιν ἑαυτάς. φωλοῦσι δὲ πολλοὶ καὶ τῶν ἰχθύων, ἐμφανέστατα δ' ἵππουρος καὶ κορακῖνος τοῦ χειμῶνος. οὗτοι γὰρ μόνοι οὐχ ἁλίσκονται οὐδαμοῦ, πλὴν κατά τινας χρόνους τακτοὺς ἀεί. τὰ δὲ λοιπά, πάντα φωλεῖ* σχεδόν. φωλεῖ δὲ καὶ σμύραινα, καὶ ὀρφὸς, καὶ γόγγρος. κατὰ συζυγίας δὲ οἱ πετραῖοι φωλοῦσιν, οἱ ἄρρενες τοῖς θήλεσιν, ὥσπερ καὶ νεοττεύουσιν· οἷον κίχλαι, κόττυφοι, πέρκαι. φωλοῦσι δὲ καὶ οἱ θύννοι τοῦ χειμῶνος ἐν τοῖς βάθεσι, καὶ γίνονται πιότατοι μετὰ τὴν φωλείαν. καὶ ἄρχονται θηρεύεσθαι ἀπὸ πλειάδος ἀνα- B τολῆς, μέχρι ἀρκτούρου δύσεως τῆς ἐσχάτης. τὸν δ' ἄλλον χρόνον ἡσυχίαν ἔχουσι φωλεύοντες. ἁλίσκονται δ' ἔνιοι περὶ τὸν χρόνον τῆς φωλείας, καὶ τούτων, καὶ τῶν ἄλλων τινὲς τῶν φωλευόντων, κινούμενοι ἐν ἀλεεινοῖς τόποις, καὶ εἰ ἐπιγίνονται αἱ εὐδίαι παράλογοι. ἀπὸ γὰρ τῆς θαλάμης προέρχονται μικρὸν ἐπὶ νομὴν, καὶ ταῖς πανσελήνοις. εἰσὶ δὲ οἱ πολλοὶ φωλοῦντες ἥδιστοι. αἱ δὲ πριμάδες κρύπτουσιν ἑαυτὰς ἐν τῷ βορβόρῳ. σημεῖον δὲ, τό τε μὴ ἁλίσκεσθαι, ἰλὺν δ' ἔχουσαι ἐν τῷ νώτῳ φαίνονται πολλὴν, καὶ τὰ πτερύγια συντεθλιμμένα. κατὰ δὲ τὴν ἐαρινὴν ὥραν κινοῦνται, καὶ προέρχονται πρὸς τὴν γῆν ὀχευόμεναι καὶ τίκτου- C σαι, καὶ ἁλίσκονται κύουσαι. καὶ τότε ὡραῖαι δοκοῦσιν εἶναι· οἱ δὲ μετοπωρινοὶ καὶ χειμερινοὶ, χείρους. ἅμα δὲ καὶ οἱ ἄρρενες φαίνονται πλήρεις ὄντες θοροῦ. ὅταν μὲν οὖν μικρὰ τὰ κυήματα ἔχωσι, δυσάλωτοί εἰσιν· ὅταν δὲ μείζω, πολλοὶ ἁλίσκονται, διὰ τὸ οἰστρᾶν. φωλεῖ δὲ τὰ μὲν, ἐν τῇ ἄμμῳ· τὰ δὲ, ἐν τῷ πηλῷ, ὑπερέχοντα τὸ στόμα μόνον. τὰ μὲν οὖν πλεῖστα, φωλεῖ τοῦ χειμῶνος· τὰ δὲ μαλακόστρακα, καὶ τῶν ἰχθύων οἱ πετραῖοι, καὶ τὰ σελάχη, τὰς χειμεριωτάτας ἡμέρας. δῆλον δὲ τὸ μὴ ἁλίσκεσθαι, ὅταν ᾖ ψῦχος. ἔνιοι δὲ τῶν ἰχθύων φωλεύουσι καὶ τοῦ θέρους, οἷον γλαῦκος. οὗτος γὰρ τοῦ D θέρους φωλεῖ περὶ ἑξήκοντα ἡμέρας. φωλεῖ δὲ καὶ ὄνος, καὶ ὁ χρύσοφρυς. σημεῖον δὲ δοκεῖ εἶναι τοῦ τὸν ὄνον φωλεῖν πλεῖστον χρόνον, τὸ διὰ πλείστου ἁλίσκεσθαι χρόνου. τοῦ δὲ θέρους τοὺς ἰχθύας φωλεῖν, δοκεῖ σημεῖον εἶναι τὸ ἐπὶ τοῖς ἄστροις γίνεσθαι τὰς ἁλώσεις, καὶ μάλιστα ἐπὶ κυνί. περὶ γὰρ τοῦτον ἀνατρέπεσθαι τὴν θάλατταν. ὃ ἐν τῷ Βοσπόρῳ γίνεται μάλιστα φανερόν· ὅ τε γὰρ βόρβορος ἐπιπολάζει, καὶ ἐπιφέρονται οἱ ἰχθύες. φασὶ δὲ καὶ πολλάκις περιβαλλομένου τοῦ βυθοῦ, ἁλίσκεσθαι πλείους ἐν τῷ αὐτῷ βόλῳ τὸ δεύτερον ἢ τὸ πρῶτον. ἐπειδὰν δ' ὄμβροι μεγάλοι γίγνωνται, πολλὰ φαίνονται ζῷα, ἃ πρότερον ἢ ὅλως οὐχ ἑωρᾶτο, ἢ οὐ πολλάκις.

E

ΚΕΦΑΛ. ιϛ'.

Περὶ ὀρνίθων φωλείας.

ΦΩλοῦσι δὲ πολλοὶ καὶ τῶν ὀρνίθων, καὶ οὐχ (ὥσπερ τινὲς οἴονται) ὀλίγοι, ἢ εἰς ἀλεεινοὺς τόπους ἀπέρχονται πάντες· ἀλλ' οἱ μὲν πλησίον ὄντες τοιούτων τόπων, ἐν οἷς ἀεὶ διαμένουσι, * καὶ ἰκτῖνοι καὶ χελιδόνες, ἀποχωροῦσιν ἐνταῦθα· οἱ δὲ πορρωτέρω ὄντες τῶν τοιούτων, οὐκ ἐκτοπίζουσιν, ἀλλὰ κρύπτουσιν ἑαυτούς. ἤδη γὰρ ὠμμέναι εἰσὶ πολλαὶ χελιδόνες ἐν * ἄγγεσιν ἐψιλωμέναι παντελῶς, καὶ ἰκτῖνοι ἐκ τοιούτων ἐκπετόμενοι χωρίων, ὅταν φαίνωνται τὸ πρῶτον.

* Gaza ἀεὶ; vel πάντα ἀεί.

* G. ὡς α.

* Malim ἄγκεσιν. eſt enim ἄγκος, ea quidem notione qua accepit G.

φωλοῦσι δὲ οὐδὲν διακεκριμένως, καὶ τῶν γαμψωνύχων καὶ τῶν εὐθυωνύχων. φωλεῖ γὰρ καὶ πελαργὸς, καὶ κόττυφος, καὶ τρυγὼν, καὶ κόρυδος. καὶ ἥ γε τρυγὼν, ὁμολογουμένως μάλιστα πάντων. οὐδεὶς γὰρ, ὡς εἰπεῖν, λέγεται τρυγόνα ἰδεῖν οὐδαμοῦ χειμῶνος. ἄρχεται δὲ τῆς φωλείας σφόδρα πίειρα οὖσα, καὶ πτερορρυεῖ μὲν ἐν τῇ φωλείᾳ, παχεῖα μέντοι διατελεῖ οὖσα. τῶν δὲ φαττῶν ἔνιαι μὲν φωλοῦσιν, ἔνιαι δὲ οὐ φωλοῦσιν, ἀπέρχονται δὲ ἅμα ταῖς χελιδόσι. φωλεῖ δὲ καὶ ἡ κίχλη, καὶ ὁ ψάρος· καὶ τῶν γαμψωνύχων ὀλίγας ἡμέρας ἰκτῖνος, καὶ ἡ γλαῦξ.

A Latibulo genera diſtingui vel aduncâ vel rectunguia non poſſunt. Nam & ciconia latet, & merula, & turtur, & alauda. De turture quidem maximè omnium conſtat: nemo enim, propè dixerim, vidiſſe per hyemem vſpiam turturem dicitur. Latere autem incipit præpinguis, & quanquam pennas in latebra dimittit, tamē pinguedinem ſeruat. Palumborum aliqui latent, aliqui nō latent, ſed cum hirundinibus abeunt. Turdus etiam latet, & ſturnus, & ex genere vnico miluus, paucis quibuſdam diebus, & noctua.

ΚΕΦΑΛ. ιζ.

Ποῖα καὶ πότε τῶν ζωοτόκων καὶ τετραπόδων φωλεῖ, καὶ ἐκδύει τὸ γῆρας.

B

Τῶν δὲ ζωοτόκων καὶ τετραπόδων φωλοῦσιν αἵ τε ὕστριχες καὶ αἱ ἄρκτοι. ὅτι μὲν οὖν φωλοῦσιν αἱ ἄγριαι ἄρκτοι, φανερόν ἐστι· πότερον δὲ διὰ ψῦχος, ἢ δι᾿ ἄλλην αἰτίαν, ἀμφισβητεῖται. γίνονται γὰρ περὶ τὸν χρόνον τοῦτον οἵ τ᾿ ἄρρενες καὶ αἱ θήλειαι πιότατοι, ὥστε μὴ εὐκίνητοι εἶναι. ἡ δὲ θήλεια, καὶ τίκτει περὶ τοῦτον τὸν καιρὸν καὶ φωλεῖ, ἕως ἂν ἐξαγαγεῖν ὥρα ᾖ τοὺς σκύμνους. τοῦτο δὲ ποιεῖ τοῦ ἔαρος περὶ τρίτον μῆνα ἀπὸ τροπῶν. ὃ δ᾿ ἐλάχιστον, φωλεῖ περὶ τετταράκοντα ἡμέρας· τούτων δὲ δὶς ἑπτὰ λέγουσιν, ἐν αἷς οὐδὲν κινεῖται· ἐν δὲ ταῖς πλείοσι ταῖς μετὰ ταῦτα, φωλεῖ μὲν, κινεῖται δὲ καὶ ἐγείρεται. κύουσα δ᾿ ἄρκτος, ἢ ὑπ᾿ οὐδενὸς, ἢ πάνυ ὑπ᾿ ὀλίγων εἴληπται. C ἐν δὲ τῷ χρόνῳ τούτῳ φανερόν ἐστιν ὅτι οὐδὲν ἐσθίουσιν· οὔτε γὰρ ἐξέρχονται. ὅταν δὲ ληφθῶσι, κενὰ φαίνονται ἥ τε κοιλία καὶ τὰ ἔντερα. λέγεται δὲ, διὰ τὸ μηδὲν προσφέρεσθαι, τὸ ἔντερον ὀλίγου συμφύεσθαι αὐτῇ· καὶ διὰ τοῦτο πρῶτον ἐξιοῦσαν γεύεσθαι τοῦ ἄρου, πρὸς τὸ ἀφεστάναι τὸ ἔντερον καὶ διευρύνειν. φωλεῖ δὲ καὶ ὁ ἐλειὸς ἐν αὐτοῖς τοῖς δένδρεσι, καὶ γίνεται τότε παχύτατος· καὶ ὁ μῦς ὁ πόντιος ὁ λευκός. τῶν δὲ φωλούντων ἔνιοι τὸ καλούμενον γῆρας ἐκδύουσιν. ἔστι δὲ τοῦτο ἔσχατον δέρμα, καὶ τὸ περὶ τὰς γενέσεις κέλυφος. τῶν μὲν οὖν πεζῶν καὶ ζωοτόκων περὶ τῆς ἄρκτου ἀμφισβητεῖται ἡ αἰτία τῆς φωλείας, καθάπερ ἐλέχθη πρότερον. D τὰ δὲ φολιδωτὰ, φωλεῖ μὲν σχεδὸν τὰ πλεῖστα· ἐκδύει δὲ τὸ γῆρας, ὅσων τὸ δέρμα μαλακὸν καὶ μὴ ὀστρακῶδες, ὥσπερ τῆς χελώνης (καὶ γὰρ ἡ χελώνη, τῶν φολιδωτῶν ἐστι, καὶ * ἡ ἐμύς) ἀλλ᾿ οἷον ἀσκαλαβώτης τε καὶ σαῦρος· καὶ μάλιστα πάντων οἱ ὄφεις. ἐκδύουσι γὰρ καὶ τοῦ ἔαρος ὅταν ἐξίωσι, καὶ τοῦ μετοπώρου πάλιν. ἐκδύουσι δὲ καὶ οἱ ἔχεις τὸ γῆρας καὶ τοῦ ἔαρος καὶ τοῦ μετοπώρου, καὶ οὐχ ὥσπερ τινές φασι τοῦτο τὸ γένος τῶν ὄφεων μὴ ἐκδύεσθαι μόνον. ὅταν δὲ ἄρχωνται ἐκδύεσθαι οἱ ὄφεις, ἀπὸ τῶν ὀφθαλμῶν ἀφίστασθαι πρῶτόν φασιν, ὥστε δοκεῖν γίνεσθαι τυφλοὺς τοῖς μὴ συνιεῖσι τὸ πάθος· μετὰ δὲ τοῦτο, ἀπὸ τῆς κεφαλῆς, καὶ λευκὴ φαίνεται πάντων. ἐν νυκτὶ δὲ καὶ E ἡμέρᾳ πᾶν ἀποδύεται σχεδὸν τὸ γῆρας, ἀπὸ τῆς κεφαλῆς ἀρξάμενον μέχρι τῆς κέρκου. γίνεται δὲ ἐκδυομένου τὸ ἐντὸς ἐκτός. ἐκδύεται γὰρ ὥσπερ τὰ ἔμβρυα ἐκ τῶν χορίων. τὸν αὐτὸν δὲ τρόπον καὶ τῶν ἐντόμων ἐκδύει τὸ γῆρας, ὅσα ἐκδύει· οἷον σίλφη, καὶ ἐμπὶς, καὶ τὰ κολεόπτερα, οἷον κάνθαρος. πάντα δὲ μετὰ τὴν γένεσιν ἐκδύεται. ὥσπερ γὰρ τοῖς ζωοτοκουμένοις καὶ τοῖς σκωληκοτοκουμένοις περιρρήγνυται τὸ κέλυφος, ὁμοίως καὶ μελίτταις καὶ ἀκρίσιν.

* ἐμύς. vide De reſpiratione cap. 1.

CAPVT XVII.

De quadrupedibus, quæ hyeme lateant, déque iis quæ ſenectutem exuant.

QVadrupedum, quæ animal generant, hyſtrices conduntur, & vrſi: ſed verùm propter frigus, an alia de cauſa, ambigitur. Pinguesſcunt vrſi per id tempus, tum mares tum fœminæ vehementer, vt mouere ſeſe facilè nequeant. Parit etiam fœmina eo tempore, & tamdiu latet, quoad tempus ſit, vt ſuos catulos in apertum producat: quod verno tempore menſe a bruma tertio facit. Sed quod minimum, dies circiter quadraginta latet: ex quibus bis ſeptem ita ſopitur, vt ſe nihilo moueat. Reliquis poſtea pluribus latet quidem, ſed mouetur, & ſurgit. Fœtu grauida vrſa, vel à nemine, vel à pauciſſimis capta eſt. C Tempore ſui latibuli hoc animal nihil edere certum eſt: quippe quod neque exeat, & captum ventre inteſtinóque inani videatur. Narrant eius inteſtinum per inediam ita conniuere, vt adductum propè cohæreat. Itaque vrſum latebram egreſſum, primùm herbam arum dictam deguſtare, vt inteſtinū laxetur & hiet. Glires etiam latent in ipſis arboribus, pingueſcuntque per id tempus vehemēter. Itidem mures Pontici generis. Nonnulla ex iis quæ conduntur, exuunt id quod ſenectus vocatur: quod cutis vltima eſt, & primi ortus operculum. Sed in pedeſtri viuiparo genere de vrſo, qua de cauſa lateat, ambigitur, vt di- D ctum iam eſt. Cortice intecta, maxima ferè ſui parte ſeceſſus ſuo tempore latent: & exuunt ſenectutem ea quibus cutis mollis, nec prædura, & teſtacea quidem eſt, qualis teſtudini (nam & teſtudo inter cortice intecta enumeranda eſt, & mus aquatilis) ſed qualis ſtellioni, lacerto, & præcipuè ſerpentibus eſt. Exuunt enim hæc omnia, tum vere cùm egrediuntur, tum etiam autumno. Vipera etiam exuit tam vère quàm autumno. Cùm ſerpens exuere incipit, ab oculis primùm detrahi aiunt, ita vt obcæcati videantur iis qui rem non intelligunt: tum caput exuitur: glabrum enim hoc omnium antè quàm reliquum corpus apparet: atque vna ferè nocte E & die ſenectus tota exuitur, à capite orſa ad caudam, & cute altera intus ſubnaſcente ipſa remouetur. Vt enim fœtus inuolucro ſecundarum, quo contentus prodierit, exuitur: ſic iſta ſenectute detracta renouantur. Inſecta enim eodem modo exuunt ſenectutem, quibus hoc ſolitum eſt: vt ſilpha, & culex, & ea quorum pennæ vagina continentur, vt ſcarabei: ſed omnia facto iam quod gigni debuerit, exeunt: nam vt partui viuiparo ſecundæ, ſic vermiculariæ proli operculum circumrumpitur. Æquè & apibus, & locuſtis.

Cicadæ

Cicadæ vbi eruperunt, oleis aut arundinibus inſidunt:& cùm rupto operculo exeunt, paruũ quiddam in eo relinquunt humoris, nec multò pòſt volant,& incipiunt canere. Locuſtæ inter marina & gammari exeunt, aut vère, aut autumno poſt partum. Iam captæ aliquæ ſunt locuſtæ, mollem habentes partem ſuperiorem, quòd cruſta iam circumrupta detractáque eſſet: inferiorem autem duram, quia nondum eſſet diſrupta. Non enim ſimilis in his atque in anguibus, exutio fit. Latent locuſtæ menſes circiter quinque. Cancri etiam exuunt ſenectutem, molliores quidem perſpicuè: ſed etiam duriores exuere aiunt, vt maias. Cùm verò exuunt, mollis admodum cruſta ſubnaſcitur: & quidem cancri præ teneritate non ſatis ambulare poſſunt. Exuunt hæc ſæpius anno. Sed quænam lateant, & quo modo, & tempore, atque etiam quæ, & quo tempore exuant ſenectutem, iam dictum eſt.

CAPVT XVIII.

Non omnia animalia omni tempore proſperè valere: quódve tempus auibus conducat.

Viuunt autem animalia proſperè non eiſdem temporibus, nec omnibus æquè exuperantiis. Valetudines etiam, & morbi per tempora pro generum diuerſitate variè accidunt, & in totum non eadem omnibus valetudo exiſtit. Iam auibus proſunt ſqualores, tum ad cæteram ſanitatem, tum etiam ad partum, & præcipuè palumbis. at verò piſcibus, exceptis quibuſdam paucis, imbres conducunt. Incommodi contrà auibus anni pluuij ſunt, piſcibus ſicci: quippe cum auium talis natura ſit, vt ne bibere quidem largiùs poſſint ſine detrimento. Aduncæ igitur aues, vt dictum eſt, viuunt, propè dixerim, ſine vllo potu: quod Heſiodus neſciuit: facit enim in narratione obſeſſionis Nini, aquilam augurij præſidem bibentem. Cæteræ aues bibunt quidem, ſed parum. Nec aliud vllum potioni indulget, quod pulmonẽ fungoſum habeat, aut pariat ouum. Cum aues ægrotant, plumæ indicium proferunt: turbantur enim, nec poſituram eandem ſeruant, quam habent, cùm rectè valent.

CAPVT XIX.

Quæ animantia pluuia gaudeant, quibúſque noceat.

Piſcium genus maxima ex parte annis pluuiis bene (vt dictum eſt) viuit: ita enim non modò plus cibi nanciſcitur, verùm etiam omnino pluuio humore iuuatur, vt ea quæ terra gignuntur. Olera enim quamuis rigentur, tamen non tantùm proficiunt, quantum imbre. Quod inde arundinibus etiam lacu prognatis euenit: nihil enim ferè accreſcunt, niſi aquæ pluuiæ incidant. Indicium vel inde accipi poteſt, quòd piſces plurimi petant Pontum, vt in eo traducant æſtatem: facit enim copia amnium loci illius, vt mare ſit dulcius, & cibus largior habeatur, quem iidem fluuij deferant. Subeũt etiam fluuios genera piſcium complura, & præſtant in fluentis & lacubus, vt amia, mugilis. Gobiones etiam pingueſcunt in fluuiis. Denique loca prædita lacus commoditate, piſces poſſident optimos.

A οἱ δὲ τέττιγες, ὅταν ἐξέλθωσι, καθίζουσιν ἐπί τε τὰς ἐλαίας καὶ καλάμους· περιρραγέντος δὲ τοῦ κελύφους, ἐξέρχονται, ἐγκαταλιπόντες ὑγρότητα μικράν· καὶ μετ' οὐ πολὺν χρόνον ἀναπέτονται καὶ ᾄδουσι. τῶν δὲ θαλαττίων, οἱ κάραβοι καὶ ἀστακοὶ ἐκδύουσιν· ὁτὲ μὲν, τοῦ ἔαρος· ὁτὲ δὲ, τοῦ μετοπώρου μετὰ τοὺς τόκους. ἤδη δὲ εἰλημμένοι ἔνιοί εἰσι τῶν καράβων, τὰ μὲν περὶ τὸν θώρακα, μαλακὰ ἔχοντες, διὰ τὸ περιερρῶγέναι τὸ ὄστρακον· τὰ δὲ κάτω, σκληρὰ, διὰ τὸ μήπω περιερρῶγέναι. τὴν γὰρ ἔκδυσιν ποιοῦνται οὐχ ὁμοίαν τοῖς ὄφεσι. φωλοῦσι δὲ οἱ κάραβοι περὶ πέντε μῆνας· ἐκδύουσι δὲ καὶ οἱ καρκίνοι τὸ γῆρας· οἱ μὲν μαλακόστρακοι, B ὁμολογουμένως· φασὶ δὲ καὶ τοὺς ὀστρακοδέρμους, οἷον τὰς μαίας. ὅταν δὲ ἐκδύωσι, γίνονται μαλακὰ πάμπαν τὰ ὄστρακα· καὶ οἵ γε καρκίνοι βαδίζειν οὐ σφόδρα δύνανται. ἐκδύουσι δὲ τὰ τοιαῦτα οὐχ ἅπαξ, ἀλλὰ πολλάκις. ὅσα μὲν οὖν φωλεῖ, καὶ πότε, καὶ πῶς, ἔτι δὲ ποῖα καὶ πότε ἐκδύει τὸ γῆρας, εἴρηται.

ΚΕΦΑΛ. ιη'.

Περὶ εὐημερίας ζῴων.

Εὐημεροῦσι δὲ τὰ ζῷα κατὰ τὰς ὥρας οὐ τὰς αὐτὰς, οὐδ' ἐν ταῖς ὑπερβολαῖς ὁμοίως ἁπάσαις. ἔτι δὲ ὑγίειαι καὶ C νόσοι κατὰ τὰς ὥρας τοῖς ἑτερογενέσιν ἕτεραι, καὶ τὸ σύνολον οὐχ αἱ αὐταὶ πᾶσι. τοῖς μὲν οὖν ὄρνισιν οἱ αὐχμοὶ συμφέρουσι καὶ πρὸς τοὺς τόκους, καὶ οὐχ ἥκιστα ταῖς φάτταις· τοῖς δὲ ἰχθύσιν, ἔξω τινῶν ὀλίγων, αἱ ἐπομβρίαι. ἀσύμφορα δὲ τοὐναντίον ἑκατέροις, τοῖς μὲν ὄρνισι, τὰ ἐπόμβρια ἔτη. οὐδὲ γὰρ ὅλως συμφέρει τὸ πολὺ πίνειν. τὰ μὲν οὖν γαμψώνυχα, καθάπερ εἴρηται πρότερον, ὡς ἁπλῶς εἰπεῖν, ἄποτα πάμπαν ἐστίν· ἀλλὰ * Ἡρόδοτος ἠγνόει τοῦτο. πεποίηκε γὰρ τὸν τῆς μαντείας πρόεδρον ἀετὸν ἐν τῇ διηγήσει τῇ περὶ τὴν πολιορκίαν τῆς Νίνου, πίνοντα. D τὰ δ' ἄλλα, πίνει μὲν, οὐ πολύποτα δέ ἐστιν, ὁμοίως δ' οὐδ' ἄλλο οὐδὲν τῶν πνεύμονα ἐχόντων σομφὸν καὶ ᾠοτόκων. τῶν δ' ὀρνίθων ἐν ταῖς ἀρρωστίαις ἐπίδηλος ἡ πτέρωσις γίνεται. ταράττεται γὰρ, καὶ οὐ τὴν αὐτὴν ἔχει κατάστασιν, ἥνπερ ὑγιαινόντων.

* κ. Ἡσίοδος. quod ſecutus Gaza.

ΚΕΦΑΛ. ιθ'.

Περὶ ἰχθύων εὐθηνίας.

Τῶν δ' ἰχθύων τὸ πλεῖστον γένος εὐθηνεῖ μᾶλλον, ὥσπερ εἴρηται πρότερον, ἐν τοῖς ἐπομβρίοις ἔτεσιν. οὐ γὰρ μόνον τότε τροφὴν ἔχουσιν, ἀλλὰ καὶ ὅλως τὸ ἔμβριον E συμφέρει, καθάπερ καὶ τοῖς ἐκ τῆς γῆς φυομένοις. καὶ γὰρ τὰ λάχανα, καίπερ ἀρδευόμενα, ὅμως ἐπιδίδωσιν ὑόμενα πλέον. τὸ δ' αὐτὸ καὶ οἱ κάλαμοι πάσχουσιν οἱ πεφυκότες ἐν ταῖς λίμναις. οὐδὲν γὰρ, ὡς εἰπεῖν, αὐξάνονται, μὴ γινομένων ὑδάτων. σημεῖον δὲ καὶ τὸ τοὺς πλείστους τῶν ἰχθύων εἰς τὸν Πόντον ἐκτοπίζειν θερειοῦντας· διὰ γὰρ τὸ πλῆθος τῶν ποταμῶν, γλυκύτερον τὸ ὕδωρ, καὶ τροφὴν οἱ ποταμοὶ καταφέρουσι πολλήν. ἔτι δὲ καὶ εἰς τοὺς ποταμοὺς ἀναπλέουσι πολλοὶ τῶν ἰχθύων, καὶ εὐθηνοῦσιν ἐν τοῖς ποταμοῖς καὶ ἐν ταῖς λίμναις, οἷον ἀμία καὶ κεστρεύς. γίνονται δὲ οἱ κωβιοὶ πίονες ἐν τοῖς ποταμοῖς. καὶ ὅλως * τὰ εὐλίμενα τῶν χωρίων ἀρίστους ἔχει ἰχθῦς.

*Gaza, vt puto, legit, τὰ εὐλίμνα.

αὐτῶν δὲ τῶν ὑδάτων οἱ θερινοὶ ὄμβροι συμφέρουσι μᾶλλον τοῖς πλείστοις ἰχθύσι, καὶ ὅταν τὸ ἔαρ, καὶ τὸ θέρος, καὶ τὸ φθινόπωρον γένηται ἔπομβρον, ὁ δὲ χειμὼν εὐδιεινός. ὡς δ' εἰπεῖν τὸ σύνολον, καὶ ὅταν κατὰ τοὺς ἀνθρώπους εὐετηρία ᾖ, καὶ τοῖς πλείστοις ἰχθύσι συμβαίνει εὐημερεῖν. ἐν δὲ τοῖς ψυχροῖς τόποις, οὐκ εὐθενοῦσι. μάλιστα δὲ πονοῦσιν ἐν τῷ χειμῶνι οἱ ἔχοντες λίθον ἐν τῇ κεφαλῇ, οἷον χρομὶς, λάβραξ, σκίαινα, φάγρος. διὰ γὰρ τὸν λίθον ὑπὸ τοῦ ψύχους καταπήγνυνται καὶ ἐκπίπτουσι. τοῖς μὲν οὖν πλείστοις ἰχθύσι συμφέρει μᾶλλον· κεστρεῖ δὲ καὶ κεφάλῳ, καὶ ὃν καλοῦσί τινες * μύξωνον, τοὐναντίον. ὑπὸ γὰρ τῶν ὀμβρίων ὑδάτων, οἱ πολλοὶ αὐτῶν ἀποτυφλοῦνται θᾶττον, ἂν ὑπερβάλλωσιν. εἰώθασι γὰρ αὐτὸ πάσχειν οἱ κέφαλοι ἐν τοῖς χειμῶσι μᾶλλον. γίνονται γὰρ αὐτῶν τὰ ὄμματα λευκὰ, καὶ ἁλίσκονται τότε λευκοὶ, καὶ τέλος ἀπόλλυνται πάμπαν. ἔοικε δ' οὐ διὰ τὴν ὑπερομβρίαν τοῦτο πάσχειν μᾶλλον, ἀλλὰ καὶ διὰ τὸ ψῦχος μᾶλλον. ἤδη γοῦν καὶ ἄλλοθι καὶ περὶ Ναυπλίαν τῆς Ἀργείας περὶ τὸ τέναγος τυφλοὶ πολλοὶ ἐλήφθησαν, ἰσχυροῦ γενομένου ψύχους. ἐλήφθησαν δὲ πολλοὶ καὶ λευκὴν ἔχοντες τὴν ὄψιν. πονεῖ δὲ τοῦ χειμῶνος καὶ ὁ χρύσοφρυς· τοῦ δὲ θέρους, [ὁ] * ἀρχάνας, καὶ γίνεται λεπτός. συμφέρει δὲ τοῖς κορακίνοις, ὡς εἰπεῖν, παρὰ τοὺς ἄλλους ἰχθῦς τὰ αὐχμώδη μᾶλλον τῶν ἐτῶν· καὶ τούτοις δὲ, διὰ τὸ συμβαίνειν μᾶλλον ἀλέαν ἐν τοῖς αὐχμοῖς. τόποι δὲ ἑκάστοις συμφέρουσι πρὸς εὐθενίαν, ὅσα μὲν εἰσὶ φύσει * πελάγια ἢ αἰγιαλώδη, ἐν ἑκατέρῳ τούτων· ὅσα δ' ἐπαμφοτερίζει, ἐν ἀμφοτέροις. εἰσὶ δέ τινες καὶ ἴδιοι τόποι ἑκάστοις ἐν οἷς εὐθενοῦσιν· ὡς δ' ἁπλῶς εἰπεῖν, οἱ φυκώδεις συμφέρουσι. πιότεροι γοῦν ἐν τοῖς τοιούτοις ἁλίσκονται, ὅσοι παντοδαποὺς νέμονται τόπους. οἱ μὲν γὰρ φυκιοφάγοι, τροφῆς εὐποροῦσιν· οἱ δὲ σαρκοφάγοι, πλείοσιν ἐντυγχάνουσιν ἰχθύσι. διαφέρουσι δὲ καὶ τὰ βόρεια καὶ τὰ νότια. τὰ γὰρ μακρὰ μᾶλλον εὐθενεῖ ἐν τοῖς βορείοις, καὶ τοῦ θέρους ἁλίσκονται ἐπὶ τοῦ αὐτοῦ χωρίου πλείους ἐν τοῖς βορείοις τῶν μακρῶν, ἢ τῶν πλατέων. οἱ δὲ θύννοι καὶ ξιφίαι, οἰστρῶσι περὶ κυνὸς ἐπιτολήν. ἔχουσι γὰρ ἀμφότεροι τηνικαῦτα παρὰ τὰ πτερύγια οἷον σκωλήκιον, τὸ καλούμενον οἶστρον, ὅμοιον μὲν σκορπίῳ, μέγεθος δὲ ἴσον ἀράχνῃ. ποιοῦσι δὲ ταῦτα πόνον τοιοῦτον, ὥστ' ἐξάλλεσθαι ἐνίοτε οὐκ ἔλαττον τὸν ξιφίαν τοῦ δελφῖνος· διὸ καὶ τοῖς πλοίοις πολλάκις ἐμπίπτουσι. χαίρουσι δ' οἱ θύννοι μάλιστα τῶν ἰχθύων τῇ ἀλέᾳ, καὶ πρὸς τὴν ἄμμον τὴν πρὸς τῇ γῇ προσχωροῦσι, τῆς ἀλέας ἕνεκεν, ὅτι θερμαίνονται, καὶ τὸ ἄνω ἐπιπολάζουσι. τὰ δὲ μικρὰ τῶν ἰχθυδίων σώζεται, διὰ τὸ παρορᾶσθαι· διώκουσι γὰρ τὰ μείζω οἱ μεγάλοι. τῶν δὲ ᾠῶν καὶ τοῦ γόνου διαφθείρεται τὸ πολὺ διὰ τὰς ἀλέας. οὗ γὰρ ἂν ἐφάψωνται, τοῦτο πᾶν λυμαίνονται. ἁλίσκονται δὲ μάλιστα οἱ ἰχθύες πρὸ ἡλίου ἀνατολῆς, καὶ μετὰ τὴν δύσιν· ὅλως δὲ περὶ δυσμὰς ἡλίου καὶ ἀνατολάς. οὗτοι γὰρ λέγονται εἶναι ὡραῖοι βόλοι· διὸ καὶ τὰ δίκτυα ταύτην τὴν ὥραν ἀναιροῦνται οἱ ἁλιεῖς. μάλιστα γὰρ ἀπατῶνται οἱ ἰχθύες τῇ ὄψει κατὰ τούτους τοὺς καιρούς. τῆς μὲν γὰρ νυκτὸς, ἡσυχάζουσι· πλείονος δὲ γινομένου τοῦ φωτὸς, μᾶλλον ὁρῶσι. νόσημα δὲ λοιμῶδες μὲν ἐν οὐδενὶ τοῖς ἰχθύσι φαίνεται ἐμπῖπτον, οἷον ἐπὶ τῶν ἀνθρώπων συμβαίνει πολλάκις, καὶ τῶν ζῳοτόκων καὶ τετραπόδων εἰς ἵππους καὶ βοῦς, καὶ τῶν ἄλλων εἰς ἔνια καὶ ἥμερα καὶ ἄγρια· νοσεῖν μέντοι δοκοῦσι·

* Geſnerus, μύξινον,

* χ. ἀχαίας. ſed ἀχάρνας etiam 8. c. 2.

* χ. πελάγια

A Ex pluuiis autem ipſis æſtiui imbres commodiores ſunt parti maximæ piſcium, & præcipuè cùm ver, æſtas, & autumnus imbribus abundarint, hyems contrà ſerenior fuerit. ad ſummam propè dixerim, cùm bene hominibus annus cedit, tunc & piſcibus feliciter degere contingit. Locis autem frigidis parum vigent. Maximè infeſtantur algore, qui lapidem in capite habent, vt chromis, lupus, phager, vmbra: facit enim lapidis rigor, vt per algorem gelentur, & excidant. Sed cùm plurimis piſcium generibus imbres conducant, mugili tamen, & capitoni, & ei, qui à nonnullis murinus vocatur, nocent. Fit enim vt pluuiis multi ex his de facili excæcentur, ſi modum aqua exceſſerit. B Solet enim per hyemem potiùs capito ita affici: nam oculi eius albeſcunt, & macilentus per id temporis capitur, atque ad poſtremum malo eodem interit: quod nō magis imbrium copia, quàm algore accidere videtur. Iam enim cùm alibi, tum in Nauplio agro terræ Argiuæ, in vadis multis capti ſunt cæci, cùm hyems fuiſſet aſperrima: multi etiam albos habentes oculos capti ſunt. Aurata quoque hyeme laborat: ſed archanas æſtate, cōque tempore extenuatur. Prodeſt coruulis fermè, præter cæteros piſces, annus ſquallens, quòd his quoque ob eam rem commodior eſt, quia per ſiccitatem potius tepor accidit. Loca pro ſua natura genera quæque ſibi habent ad incolumitatem commodiora. C Quod enim natura litorale, aut pelagium eſt, huic ſuo loco pro naturæ deſiderio verſari commodius eſt: quod autem ambigit, id commodè vtroque degere poteſt. Sed ſunt etiam loca quædam ſingulis propria: in quibus rectiùs valeant. Commodiora (quod ſimpliciter dixerim) loca ſunt ea quæ algarum copia ſcatent: pinguiores enim locis his capiuntur, qui multis & variis locis ſolent pabulari. Nam & quibus alga in cibo eſt, abundè paſcuntur: & quibus caro appetitur, plures piſces ſibi reperiunt. Intereſt etiam, Aquilonia ſint, an Auſtrina. Genus enim longum Aquiloniis meliùs viget: D & quidem æſtate loco eodem in Aquiloniis plures longi quàm lati, capiuntur. Thunni & gladij agitantur aſilo, canis exortu: habent enim vtrique per id tempus ſub pinna ceu vermiculum, quem aſilum vocant, effigie ſcorpionis, magnitudine aranei. Infeſtat hoc tanto dolore, vt non minùs interdum gladius quàm delphinus exiliat: vnde fit, vt vel in nauigia ſæpenumero incidat. Thunni omnium maximè piſcium gaudent tepore, & ob eam rem arenam & litora adeunt: per ſumma etiam maris innatant, quo teporis potiantur. Piſciculi autem ſeruari propterea poſſunt, quia ſpernuntur: maiora enim magni ſequuntur. E Sed ouorum & prolis pars magna proinde abſumitur. cùm enim piſces deſiderio teporis loca fœturæ adeant, liguriunt quicquid attigerint. Capiuntur maximè piſces non multo antè quàm Sol oriatur, aut poſtquam occidit, denique circa Solis ortum, aut occaſum. Tempeſtiuè enim iaci tantiſper putatur: quamobrem eo tempore piſcatores ſolent retia tollere: tunc enim maximè viſus piſcium fallitur: quippe cum noctu quieſcant, luce autem iam clariore melius videant. Morbus peſtilēs nullus incidere piſcibus vniuerſis videtur, qualis plerumque hominibus, & quadrupedū, equis, & bubus, & reliqui generis nonnullis accidit, tum feris, tum vrbanis. Ægrotare tamen & ipſi putātur.

Et quidam piſcatores pro morbi indicio capiunt, cùm aliquot extenuatos languentibus ſimiles, & colore immutatos, inter multos pingues ac validos eiuſdem generis ceperit. Marinum genus ita ſe habet.

CAPVT XX.

Quæ fluuialibus & lacuſtribus piſcibus noceant, quóve ingenio iidem capiantur.

FLuuiatile, & lacuſtre, à peſte quidem & ipſum immune eſt, ſed nonnullis morbi incidũnt proprij. Silurus enim canis exortu potiſſimùm (quòd ſublimis innatet) ſideratur, & tonitruo ſopitur magno. Quod & cyprino accidit, ſed leuiùs. Silurus vel à dracone angue, gurgite parum alto ictus interit. Ballero, & tilloni lumbricus canis exortu innaſcitur, qui debilitat, cogitque ad ſumma ſtagni efferri, quà æſtu intereunt. Chalcis, quam æricam appello, vitio infeſtatur diro, vt pediculi ſub branchiis innati quàm multi interimant: quod nulli ex cæteris accidit. Moriuntur piſces verbaſco herba, quamobrem cæteri, fluuiatiles & lacuſtres ea inficientes capiunt: ſed Phœnices marinos etiam ita piſcantur. Sunt qui duobus quoque aliis capiendi generibus vtantur. Quòd enim altos gurgites amnium piſces per hyemem vitare ſolent, (cùm enim aliàs dulcis aqua frigidior ſit, tum vel maximè eius ima algent) idcirco foſſam in fluuium ducunt, quam maceriæ iungentes operiunt, & fœno, atque lapidibus ſtipant, vt quaſi cuniculum faciant, aditu patente ad fluuium, vnde impleatur: tum facto gelu naſſa inde piſcantur. Alterum genus capturæ tale eſt, cuius vſus & hyeme eſt, & æſtate. Medio amne fruticibus, & lapidibus circunſepiunt, vno aditu dato modo oris: tum in eo ore poſita naſſa piſcantur, motis lapidibus. Teſtaceo generi anni pluuij proſunt, præterquam purpuris: cuius rei indicium eſt, quòd ſi amnis in mare fluentis aquam guſtarint, moriuntur eodem die. Viuit purpura extra mare, quæ capta eſt, dies circiter quinquaginta. alit altera alteram, eo quòd ſua teſta gnatum, velvti algam, muſcúmve gerit. Quæ autem pro cibo iis afferunt, ponderis cauſa adhiberi aiunt, vt in libra ſint grauiores. Cæteris ſqualor incõmmodus eſt: nam & pauciora reddũtur, & deteriora. Et quidem pectines tunc magis trahunt rufum colorem. Iam in Pyrrhæo Euripo pectines aliquando defuerunt, non modò propter ferramentum, quo piſcatores abradendo vbertim caperent, verumetiam propter ſiccitates. Cæteris etiam teſtatis imbres conducunt, propterea quòd mare dulcius redditur: ſed frigus facit profectò, ne vel in Ponto, vel in fluuiis gigni poſſint, exceptis biforibus paucis. Genus namque vnifore potiſſimùm rigore induratur, & interit. Aquatile animalium genus ita ſe habet.

CAPVT XXI.

De morbis ſuum, eorúmque remediis.

QVadrupedum, ſues tribus morbi generibus laborant, quorum vnum raucedo vocatur, quo maximè fauces maxillæque inflãmantur. Sed idem malum vel qualibet alia corporis parte contrahi poteſt. Iam enim plerumque in pedem,

A τεκμαίρονται δ' οἱ ἁλιεῖς, τῷ ἐνίοτε ἁλίσκεσθαι λεπτοὺς καὶ ἠσθενηκόσιν ὁμοίους, καὶ τὸ χρῶμα μεταβεβληκότας, ἐν πολλοῖς καὶ πίοσιν ἑαλωκότας, καὶ τοῦ γένους τοῦ αὐτοῦ. περὶ μὲν οὖν τῶν θαλαττίων τοῦτον ἔχει τὸν τρόπον.

ΚΕΦΑΛ. κ'.

Περὶ ποταμίων καὶ λιμναίων ἰχθύων.

ΤΟῖς δὲ ποταμίοις καὶ λιμναίοις, λοιμῶδες μὲν οὐδὲ *τούτοις οὐδενὶ γίνεται· ἐνίοις δ' αὐτῶν ἴδια νοσήματα ἐμπίπτει, οἷον γλάνις ὑπὸ κύνα μάλιστα (διὰ τὸ μετέωρος νεῖν) *ἀστροβλὴς τε γίνεται, καὶ ὑπὸ βροντῆς νεανικῆς καροῦται. B πάσχει δέ ποτε τοῦτο καὶ κυπρῖνος, ἧττον δέ. οἱ δὲ γλάνεις ἐν τοῖς βραχέσι καὶ ὑπὸ δράκοντος τοῦ ὄφεως τυπτόμενοι, ἀπόλλυνται. ἐν δὲ τῷ βαλλέρῳ καὶ τίλλωνι ἕλμις ἐγγινομένη ὑπὸ κύνα, μετεωρίζει τε καὶ ἀσθενῆ ποιεῖ· μετέωρος δὲ γινόμενος, ὑπὸ τοῦ καύματος ἀπόλλυται. τῇ δὲ χαλκίδι νόσημα ἐμπίπτει νεανικόν· φθεῖρες ὑπὸ τὰ βράγχια γινόμενοι πολλοί, ἀναιροῦσι. τῶν δ' ἄλλων ἰχθύων οὐδενὶ οὐδὲν τοιοῦτόν ἐστι νόσημα. ἀποθνήσκουσι δ' οἱ ἰχθύες τῷ πλόμῳ· διὸ καὶ θηρεύουσιν, οἱ μὲν ἄλλοι, τοὺς ἐν τοῖς ποταμοῖς καὶ λίμναις πλομίζοντες· οἱ δὲ Φοίνικες, καὶ τοὺς ἐν τῇ θαλάττῃ. C ποιοῦνται δέ τινες καὶ δύο ἄλλας θήρας τῶν ἰχθύων. διὰ γὰρ τὸ φεύγειν ἐν τῷ χειμῶνι τὰ βαθέα ἐν τοῖς ποταμοῖς, (καὶ γὰρ ἄλλως τὸ ποτάμιον ὕδωρ *ψυχρόν) ὀρύττουσι τάφρον εἰς τὸν ποταμὸν διὰ ξηροῦ· εἶτα ταύτην καταστεγάσαντες χόρτῳ καὶ λίθοις, οἷον φωλεὸν ποιοῦσιν, ἔκδυσιν ἔχοντα ἐκ τοῦ ποταμοῦ· καὶ ὅταν πάγος ᾖ, ἐκ ταύτης κύρτῳ θηρεύουσι τοὺς ἰχθῦς. καὶ ἄλλην δὲ θήραν ποιοῦνται ὁμοίως θέρους καὶ χειμῶνος· ἐν μέσῳ τῷ ποταμῷ φρυγάνοις καὶ λίθοις περιφράξαντες, ὅσον στόμα καταλείπουσιν· ἐν τούτῳ κύρτον ἐνθέντες, θηρεύουσι περιελόντες τοὺς λίθους. τῶν δ' ὀστρακοδέρμων καὶ τοῖς ἄλλοις συμφέρει τὰ ἐπομβρία ἔτη, D πλὴν ταῖς πορφύραις. σημεῖον δέ· ὅταν γὰρ τεθῇ οὗ ποταμὸς ἐξερεύγεται, καὶ γεύσωνται τοῦ ὕδατος, ἀποθνήσκουσιν αὐθημερόν. καὶ ζῇ δ' ἡ πορφύρα, ὅταν θηρευθῇ, περὶ ἡμέρας πεντήκοντα. τρέφονται δ' ὑπ' ἀλλήλων. ἐπιγίνεται γὰρ ἐπὶ τοῖς ὀστράκοις ὥσπερ φῦκός τι καὶ βρύον. ἃ δ' ἐμβάλλουσιν εἰς τροφὴν αὐταῖς, τοῦ σταθμοῦ χάριν εἶναί φασι, πρὸς τὸ πλεῖον ἕλκειν. τοῖς δ' ἄλλοις οἱ αὐχμοὶ ἀσύμφοροι· ἐλάττω γὰρ καὶ χείρω γίνεται· καὶ οἱ πυρροὶ τότε μᾶλλον γίνονται κτένες. ἐν δὲ τῷ Πυρραίων ποτὲ εὐρίπῳ ἐξέλιπον οἱ κτένες, οὐ μόνον διὰ τὸ ὄργανον, ὃ οἱ θηρεύοντες ἀνέξυον, ἀλλὰ καὶ διὰ τοὺς αὐχμούς. τοῖς δ' ἄλλοις ὀστρακοδέρμοις τὰ ἔπομ- E βρα ἔτη συμφέρει, διὰ τὸ γλυκυτέραν γίνεσθαι τὴν θάλατταν. ἐν δὲ τῷ Πόντῳ διὰ τὸ ψῦχος οὐ γίνονται, οὐδ' ἐν τοῖς ποταμοῖς, ἀλλ' ἢ ὀλίγα τῶν διθύρων· τὰ δὲ μονόθυρα, μάλιστα ἐν τοῖς πάγοις ἐμπήγνυται. περὶ μὲν οὖν τὰ ἔνυδρα τῶν ζώων, τοῦτον ἔχει τὸν τρόπον.

ΚΕΦΑΛ. κα'.

Περὶ νοσημάτων τῶν ὑῶν.

ΤΩν δὲ τετραπόδων αἱ μὲν ὕες, νοσήμασι μὲν κάμνουσι τρισίν· ὧν ἓν μὲν καλεῖται βράγχος, ἐν ᾧ μάλιστα τὰ περὶ τὰς σιαγόνας καὶ τὰ *βράγχια φλεγμαίνει. (γίνεται δὲ καὶ ὅπου ἂν τύχῃ τοῦ σώματος. πολλάκις γὰρ τοῦ ποδὸς λαμβάνει),

* Scrib. τούτοις οὐδέν. vel πάντων οὐδέν.

* κ. ἀστροπληξ, minùs rectè.

* Poſt vocem ψ. aliquot voces ampliùs legit G. aut ille de ſuo adiecit.

* Quid. βρόγχια

ὅτε δὲ ἐν τῷ ὠτί. γίνεται δ' εὐθὺς περὶ ἓν καὶ τὸ ἐχόμενον, ἕως ἂν ἔλθῃ πρὸς τὸν πνεύμονα· τότε δὲ ἀποθνήσκει. ταχὺ δὲ αὐξάνεται καὶ οὐδὲν ἐσθίει, ὅταν ἄρξηται τὸ πάθος κἂν ὁποσονοῦν. ἰῶνται δὲ οἱ * ὑοβόσκοι, ὅταν αἴσθωνται μικρὸν ὄν, ἄλλον μὲν οὐδένα τρόπον· ἀποτέμνουσι δ' ὅλον. δύο δ' ἄλλα ἐστί· λέγεται δὲ κραυρᾶν ἄμφω· ὧν τὸ μὲν ἕτερον, ἐστὶ κεφαλῆς πόνος καὶ βάρος, ᾧ αἱ πλεῖσται ἁλίσκονται· τὸ δ' ἕτερον, ἡ κοιλία ῥεῖ. καὶ τοῦτο μὲν, δοκεῖ εἶναι ἀνίατον· θατέρῳ δὲ βοηθοῦσιν, οἶνον προσφέροντες πρὸς τοὺς μυκτῆρας, καὶ κλύζοντες τοὺς μυκτῆρας οἴνῳ. διαφυγεῖν δὲ καὶ τοῦτο χαλεπόν. ἀναιρεῖται γὰρ ἐν ἡμέραις τρισὶν ἢ τέτταρσι. βραγχῶσι δὲ μάλιστα, ὅταν τὸ θέρος ἐνέγκῃ εὖ, καὶ πίονες ὦσι. βοηθεῖ δὲ τά τε συκάμινα διδόμενα, καὶ τὸ λουτρὸν ἐὰν ᾖ πολὺ καὶ θερμόν, καὶ ἐάν τις σχάσῃ ὑπὸ τὴν γλῶτταν. χαλαζώδεις δὲ εἰσὶ τῶν ὑῶν αἱ ὑγρόσαρκοι, τά τε περὶ τὰ σκέλη, καὶ τὰ περὶ τὸν τράχηλον, καὶ τοὺς ὤμους· ἐν οἷς μέρεσι καὶ πλεῖσται γίνονται χάλαζαι. κἂν μὲν ὀλίγας ἔχῃ, γλυκυτέρα ἡ σάρξ· ἂν δὲ πολλάς, ὑγρὰ λίαν καὶ ἄχυλος γίνεται. δῆλαι δὲ εἰσὶν αἱ χαλαζῶσαι· ἔν τε γὰρ τῆς γλώττης τῷ κάτω ἔχουσι τὰς χαλάζας· καὶ ἐάν τις τρίχας ἐκτίλλῃ ἐκ τῆς λοφιᾶς, ὕφαιμοι φαίνονται. ἔτι δὲ τὰ χαλαζῶντα, τοὺς ὀπισθίους πόδας οὐ δύνανται ἡσυχάζειν· οὐκ ἔχουσι δὲ χαλάζας, ἕως ἂν ὦσι γαλαθηνοὶ μόνον. ἐκβάλλουσι δὲ τὰς χαλάζας ταῖς τίφαις· ὃ καὶ πρὸς τὴν τροφὴν ἐστὶ χρήσιμον. ἄριστοι δὲ πρὸς τὸ πιαίνειν καὶ τρέφειν, οἱ ἐρέβινθοι καὶ τὰ σῦκα. τὸ δὲ ὅλον, μὴ ποιεῖν ἁπλῆν τὴν τροφήν, ἀλλὰ ποικίλην. χαίρει γὰρ μεταβάλλουσα, καθάπερ καὶ τὰ ἄλλα ζῷα· καὶ ἅμα φασὶ τὸ μὲν, ἐμφυσᾶν, τὸ δέ, πιαίνειν τῶν προσφερομένων. τὰς δὲ βαλάνους μόνον ἡδέως μὲν ἐσθίει, ποιεῖ δ' ὑγρὰν τὴν σάρκα· καὶ ἐὰν ἐγκύουσαι πλείους ἐσθίωσιν, ἐκβάλλουσιν, ὥσπερ καὶ τὰ πρόβατα. ταῦτα γὰρ ἐπιδηλοτέρως τοῦτο πάσχει, διὰ τὰς βαλάνους. χαλαζῶνται δὲ μόνον τῶν ζῴων ὧν ἴσμεν ὗς.

* χοιροβόσκοι.

ΚΕΦΑΛ. κβ'.

Περὶ νοσημάτων τῶν κυνῶν.

Οἱ δὲ κύνες, κάμνουσι νοσήμασι τρισίν. ὀνομάζεται δὲ ταῦτα, λύττα, κυνάγχη, ποδάγρα. τούτων ἡ λύττα, ἐμποιεῖ μανίαν· καὶ ὅταν δάκῃ, λυττῶσιν ἅπαντα τὰ δηχθέντα, πλὴν ἀνθρώπου. ἀναιρεῖ δὲ τὸ νόσημα τοῦτο τάς τε κύνας, καὶ ὅ,τι ἂν δηχθῇ ὑπὸ λυττώσης, * πλὴν ἀνθρώπου. ἀναιρεῖ δὲ καὶ ἡ κυνάγχη τὰς κύνας. ὀλίγαι δὲ καὶ ἐκ τῆς ποδάγρας περισώζονται. λαμβάνει ταῦτα καὶ τὰς καμήλους. τοὺς δὲ ἐλέφαντας πρὸς μὲν τὰ ἄλλα ἀρρωστήματα ἀνόσους εἶναι φασιν, ἐνοχλεῖσθαι δ' ὑπὸ φυσῶν.

* Mercur. Variar. lib. 1. c. 2.

ΚΕΦΑΛ. κγ'.

Βοῶν νοσήματα.

Οἱ δὲ βόες οἱ ἀγελαῖοι, νοσοῦσι δύο νόσους· ὧν τὸ μὲν, ποδάγρα· τὸ δέ, κραυρος καλεῖται. ἐν μὲν οὖν τῇ ποδάγρᾳ, τοὺς πόδας οἰδοῦσιν, οὐκ ἀποθνήσκουσι δέ, τὰς δ' ὁπλὰς ἀποβάλλουσι· * βέλτιω δὲ ἴσχουσι τῶν κεράτων ἀλειφομένων πίττῃ θερμῇ. ὅταν δὲ κραυρῶσι, τὸ πνεῦμα γίνεται θερμὸν καὶ πυκνόν, καὶ ὅ ἐστιν ἐν τοῖς ἀνθρώποις πυρετός,

* G. βέλτιω

aliàs in aurem decumbit. Putreſcit protinus membrum, & vlcus ſerpit, donec ad pulmonem deueniat, quo tacto, mors ſequitur. Creſcit hoc vitium celeriter, nec poteſt ſus quicquam edere, cùm ita ægrotat, etiamſi quantumlibet ſit morbi incrementum. Curatur à porcariis, cùm malum incipere ſenſerint, haud alio modo, quàm tota parte abſciſſa, qua cœperit. Reliqua duo genera eodem vocabulo nominantur ſtruma, quorum alterum dolor capitis, & grauitas eſt, quo plurimi laborare ſolent: alterum alui profluuium eſt, quod irremediabile incidit. alteri ſuccurritur ex vino adhibito naribus, eóque ipſo dilutis, ſed difficulter eo quoque periculo ſubtrahitur: biduo enim aut quatriduo interitus obuenit. Rauceſcunt potiſſimùm eo anno, quo mõtes abundè tulerint, & pinguiſſimi ſint. Iuuat mora celſi dediſſe in cibatu, & balneum multum & calidum, & venæ ſub lingua ſitæ cultello adacto ſanguinem detraxiſſe. Grandinoſi autem fiunt ſues, quorum crura, & collum, & armi carne conſtant humidiore, quibus partibus vel grandines plurimæ innaſcuntur. Caro dulcior eſt, ſi grandines habet paucas: ſed ſi multas, humida valde, & inſipida eſt. Facilè qui grandent, cognoſcuntur: parte enim linguæ inferiore grandines habentur, & ſi ſetam dorſo euellas, cruorem in radice pili euulſi videris. Pedibus etiam poſterioribus conſtare non poſſunt, qui grãdent. Carent grandine, cùm adhuc lactent. Tolluntur grandines tipha, quæ vel in cibatu vtilis eſt. Sed præcipuè alunt, & opimant ficus, & cicer. Cibus denique non ſimplex, ſed varius, ſagina optima eſt. Gaudent enim ſues pabuli mutatione, quemadmodum & cætera animalia. Tum etiam fieri aiunt cibi varietate, vt partim infletur partim impleatur carne, partim opimetur. Glandes ſuauiter quidem à ſuibus comeduntur, ſed carnem humidam faciunt ſi ſolæ dantur. Et ſi grauidæ glandem copioſiùs ederint, abortum faciunt, vt oues: quibus conſtantiùs hoc glandibus eſitatis accidit. Vnum ex omnibus quæ nouimus animalibus, ſus grandinem concipit.

CAPVT XXII.

Quibus morbis infeſtentur canes.

Canes tribus laborant vitiis, rabie, angina, podagra. Facit rabies furorem, & quæ momorderint, omnia rabiunt, excepto homine. Intereũt canes hoc morbo, & quæ morſa ſunt, excepto homine. angina etiam interimit. Et podagra tentati pauci euadere poſſunt. Rabies camelum etiam prehendit. Elephantos cæteris malis immunes aiunt, inflatione autem alui acriùs infeſtari.

CAPVT XXIII.

Morbi boum gregalium.

Boues gregales morbis duobus tentantur, podagra & ſtruma. Facit podagra vt pedibus intumeſcant: & quamuis non intereant, tamẽ vngulas amittant. Valent meliùs cornibus pice illitis calida. Euenit ſtruma, vt calidiùs frequentiúſque ſpiretur. Quod denique in homine febris,

idem in boue ſtruma eſt. indicium morbi, vt demiſſæ aures flacceant, & vt comedere nequeant. breui moriuntur, adapertiſque pulmo inſpicitur putris.

CAPVT XXIV.

Quibus morbis laborent equi gregales, domeſticique: & de morborum indiciis, & remediis, necnon de hippomane, & potu equorum, & boum.

EQuorum gregales morbo immunes ſunt, excepta podagra: hoc enim vno laborant, & plerumque ob id vngues amittunt. Sed amiſſis alij ſtatim enaſcuntur: fit enim vt altero ſubnaſcente vngue, alter amittatur. Indicium morbi, vt alter teſtium dexter palpitet, vel vt paulò citra nares cauum quiddam rugoſumque gignatur. at verò equi domeſtici morbis pluribus obnoxij ſunt. Laborant ileo dicto, id eſt, tenuioris inteſtini morbo: cuius mali indicium, vt crura poſteriora attrahant ad priora, & ita ſummoueant, vt propemodum collidant. Si, vbi antea diebus aliquot ſponte ieiunarint, mox in furorem vertantur, ſanguine detracto iuuantur. Capiuntur etiam rigore neruorum: cuius indicium, venæ vt omnes neruique intendantur, & caput ceruicéſque immobiliter rigeant, rectiſque cruribus gradiantur. Suppuratione etiam equi infeſtantur. Vitium quoque eorum eſt, quod hordeatio dicitur. Cuius indicium, vt palatum moleſtet, & feruentiùs ſpiret equus quàm ex conſueto. Nullum huius mali remedium eſt, niſi ſponte naturæ emendetur. Quod autem lymphati dicitur, tale eſt, vt equus ad tibiæ ſonum quieſcat, & demittat frontem: cùm verò conſcenderis, citetur contentiùs donec retineas. Demiſſus etiam ſemper triſtiſque eſt, ſi rabie tenetur: cuius indicium, vt auriculas demittat ad iubam, ruſſuſque protendat, idque viciſſim factitet. Irremediabile etiam malum, ſi cordis dolore vexatur: cuius indicium, vt latera ſubſidant, & alia præſtringantur. Et, ſi veſica dimoueatur de ſuo ſitu: cuius indicium, ne vrinam reddere poſſit, & vt vngulas cluneſque trahat. Et, ſi paſtinacam deuorarint, cuius magnitudo, quæ verticilli beſtiolæ eſt. (nam morſus muris aranei, vel cæteris iumentis moleſtiſſimus eſt) puſtulæ hoc excitantur, & periculoſior, quem defixerit grauida. puſtulæ enim rumpuntur, ex quo interitus ſequitur. Sed ſi non grauida eſt, non interimit. Quinetiam ea quam alij chalcidam, alij dygnidam vocant, ſuo morſu aut interimit, aut vehementem dolorem mouet. Similis hæc paruis lacertis eſt: ſed colore ſerpentis, quam cæciliam nominant. Denique homines vſu periti totidem ferè morbis equum atque etiam ouem infeſtari, quot hominem, referunt. Interit veneno ſandaracæ & equus, & quoduis iumentum, ſiue veterinum. datur in aqua percolatum. abortum etiam facit equa, odorem ſentiens fungi fumigantis lucernæ extinctæ: quod & mulierum nonnullis accidit. Hactenus de equorum morbis. Quod hippomanes vocant, hæret quidem fronti naſcentis pulli, vt narratur: ſed equæ perlibentes abſtergentéſque, id abrodunt. Quæ autẽ de hoc fabulantur, figmenta muliercularũ, & profeſſorum carminis incantamentorum eſſe, credẽdum potiùs eſt. Emitti etiam ab aqua priùs, quàm pullum, quod pulium dicitur, certum eſt.

τοῦτ' ἔστιν ἐν τοῖς βουσὶ τὸ κραυρᾶν. σημεῖον δὲ τῆς ἀρρωστίας τὰ ὦτα καταβάλλουσι, καὶ οὐ δύνανται ἐσθίειν. ἀποθνήσκουσι δὲ ταχέως, καὶ ἀνοιχθεῖσι τῶν ὁ πνεύμων φαίνεται σαπρός.

ΚΕΦΑΛ. κδ'.

Περὶ νόσων τῶν ἵππων, καὶ περὶ ἱππομανοῦς.

ΤΩν δ' ἵππων αἱ μὲν φορβάδες, ἄνοσοι τῶν ἄλλων ἀρρωστημάτων εἰσὶ, πλὴν ποδάγρας· ταύτην δὲ κάμνουσι, καὶ ἐνίοτε ἀποβάλλουσι τὰς ὁπλάς· ὅταν δὲ ἀποβάλλωσι, πάλιν φύουσιν εὐθύς. γίνεται γὰρ ἅμα τῆς ἑτέρας ὑποφυομένης, ἡ τῆς ἑτέρας ὁπλῆς ἀποβολή. σημεῖον δὲ τῆς ἀρρωστίας· ὁ γὰρ ὄρχις ἅλλεται ὁ δεξιὸς, ἢ κατὰ μέσον ὀλίγον κατωτέρω τῶν μυκτήρων, * ἐν κοῖλον γίνεται καὶ ῥυτιδῶδες. οἱ δὲ τροφίαι ἵπποι, πλείστοις ἀρρωστήμασι κάμνουσι. λαμβάνει γὰρ καὶ εἰλεός. σημεῖον δὲ τῆς ἀρρωστίας· τὰ ὀπίσθια σκέλη ἐφέλκουσιν ἐπὶ τὰ ἔμπροσθεν, καὶ ὑποφέρουσιν, ὥστε ἀλλήλοις συγκρούειν. ἐὰν δὲ ἀσιτήσαντες τὰς ἔμπροσθεν ἡμέρας, εἶτα μανῶσιν, αἷμα ἀφαιροῦντες καὶ ἐκτέμνοντες, βοηθοῦσι. λαμβάνει δὲ καὶ τέτανος. σημεῖον δὲ αἱ φλέβες τέτανται πᾶσαι, καὶ ἡ κεφαλὴ καὶ ὁ αὐχήν· καὶ * προβαίνει ἐκτεταμένοις τοῖς σκέλεσι. γίνονται δὲ καὶ ἔμπυοι οἱ ἵπποι. λαμβάνει δὲ καὶ ἄλλος αὐτοὺς πόνος. καλεῖται δὲ τοῦτο * κριθιᾶν. σημεῖον δὲ τοῦ ἀρρωστήματος· μαλακὸς γίνεται ὁ οὐρανὸς, καὶ θερμὸν πνεῖ. ἀνίατα δὲ, ἐὰν μὴ αὐτόματα καταστῇ. τότε νυμφιᾶν καλούμενον, ἐν ᾧ συμβαίνει κατέχεσθαι ὅταν αὐλῇ τις, καὶ κατωπιᾶν· καὶ ὅταν ἀναβῇ τις, ἐπιτρέχει, ἕως ἂν κατάσχῃ τις. κατηφεῖ δὲ ἀεὶ, κἂν λυττήσῃ. σημεῖον δὲ καὶ τούτου τὰ ὦτα καταβάλλει πρὸς τὴν χαίτην, καὶ πάλιν προτείνει, καὶ ἐκλείπει, καὶ πνεῖ. ἀνίατα δὲ καὶ τάδε, ἐὰν καρδίαν ἀλγήσῃ (σημεῖον δ' λαπαρὸς ὢν ἀλγεῖ·) καὶ ἐὰν ἡ κύστις, [παραχωρῇ.] σημεῖον δὲ καὶ τούτου, τὸ μὴ δύνασθαι οὐρεῖν, καὶ τὰς ὁπλὰς καὶ τὰ ἰσχία ἐφέλκει, καὶ ἐὰν σταφυλῖνον καταπίῃ. τοῦτο δ' ἐστὶν ἡλίκον ἡ σφονδύλη. τὰ δὲ δήγματα τῆς μυγαλῆς καὶ τοῖς ἄλλοις ὑποζυγίοις χαλεπά. γίνονται δὲ φλύκταιναι. χαλεπώτερον δὲ τὸ δῆγμα, ἐὰν κύουσα δάκῃ. ἐκρήγνυνται γὰρ αἱ φλύκταιναι· εἰ δὲ μὴ, οὐκ ἀποκτείνει. δὲ δάκνουσα ἢ σφόδρα ἀλγεῖν ποιεῖ καὶ ἡ καλουμένη χαλκὶς ὑπό τινων, ὑπὸ δέ τινων ζιγνίς. ἔστι δ' ὅμοιον ταῖς μικραῖς σαύραις, τὸ δὲ χρῶμα τοῖς τυφλίνοις ὄφεσιν. ὅλως δὲ φασὶν οἱ ἔμπειροι, σχεδὸν ὅσαπερ ἀρρωστεῖ ἄνθρωπος ἀρρωστήματα, τὸ ἵππον ἀρρωστεῖν καὶ πρόβατον. ὑπὸ φαρμάκου δὲ διαφθείρεται καὶ ἵππος καὶ πᾶν ὑποζύγιον, σανδαράκης. δίδοται δὲ ἐν ὕδατι, καὶ διηθεῖται. ἐκβάλλει δ' ἵππος κύουσα * ὀσμῆς λύχνου ἀποσβεσθέντος. συμβαίνει δὲ τοῦτο καὶ γυναιξὶν ἐνίαις κυούσαις. περὶ μὲν οὖν τὰς νόσους τῶν ἵππων, τοῦτον ἔχει τὸν τρόπον. τὸ δ' ἱππομανὲς καλούμενον ἐπιφύεται μὲν τοῖς πώλοις, ὥσπερ λέγεται, τὰς δ' ἵππους περιλειχούσας καὶ καθαιρούσας, περιτρώγειν αὐτό. τὰ δ' ἐπιμυθευόμενα πέπλασται μᾶλλον ὑπὸ τῶν γυναικῶν καὶ τῶν περὶ τὰς ἐπῳδάς. ὁμολογουμένως δὲ καὶ τὸ καλούμενον πώλιον αἱ ἵπποι προεκβάλλουσι πρὸ τοῦ πώλου.

* Melius ἔγκοιλον γίνεται & ῥυτιδῶδες, vt notat & Sylb.

* κ. προβαίνει

* Sylb. κριθιᾶν.

* Quid. ὀσμῇ

γινώσκουσι δ' οἱ ἵπποι καὶ τὴν φωνὴν ἀκούοντες τῶν ἵππων, οἷς ἂν μαχεσάμενοι τύχωσι. χαίρουσι δ' οἱ ἵπποι τοῖς λειμῶσι καὶ τοῖς ἕλεσι. καὶ γὰρ τῶν ὑδάτων τὰ θολερὰ πίνουσι· κἂν ᾖ καθαρά, ἀνατρέπουσιν αὐτὰ οἱ ἵπποι ταῖς ὁπλαῖς· εἶτα πιοῦσαι, λούονται. καὶ γὰρ ὅλως ἐστὶ φιλόλουτρον τὸ ζῷον, καὶ ἔτι φίλυδρον. διὸ καὶ ἡ τοῦ ποταμίου ἵππου φύσις οὕτω συνέστηκεν. ὁ δὲ βοῦς, τοὐναντίον τῷ ἵππῳ· ἂν γὰρ μὴ καθαρὸν ᾖ τὸ ὕδωρ καὶ ψυχρὸν καὶ ἀκέραιον, οὐκ ἐθέλει πιεῖν.

ΚΕΦΑΛ. κε'.

Ὄνων νόσος μία.

Οἱ δὲ ὄνοι, νοσοῦσι μάλιστα νόσον μίαν, ἣν καλοῦσι μυλίδα. γίνεται δὲ περὶ τὴν κεφαλὴν πρῶτον, καὶ ῥεῖ φλέγμα κατὰ τοὺς μυκτῆρας παχὺ καὶ πυρρόν· ἐὰν δὲ πρὸς τὸν πνεύμονα καταβῇ, ἀποκτείνει· τὸ δὲ περὶ τὴν κεφαλὴν πρῶτον οὐ θανάσιμον. δυσριγότατον δὲ ἐστὶ τοῦτο τὸ ζῷον· διὸ περὶ τὸν Πόντον καὶ τὴν Σκυθίαν οὐ γίνονται οἱ ὄνοι.

ΚΕΦΑΛ. κϛ'.

Ελεφάντων νόσοι.

Οἱ δ' ἐλέφαντες, κάμνουσι τοῖς φυσώδεσι νοσήμασι· διὸ οὔτε τὸ ὑγρὸν περίττωμα προΐεσθαι δύνανται, οὔτε τὸ τῆς κοιλίας. καὶ ἐὰν γῆν ἐσθίῃ, μαλακίζεται, ἐὰν μὴ συνεχῶς· εἰ δὲ συνεχῶς, οὐδὲν βλάπτεται. καταπίνει δὲ καὶ λίθους ἐνίοτε. ἁλίσκεται δὲ καὶ διαρροίᾳ. ὅταν δ' ἁλῶσιν, ἰατρεύουσιν ὕδωρ θερμὸν διδόντες πίνειν, καὶ τὸν χόρτον εἰς μέλι βάπτοντες, διδόασιν ἐσθίειν, καὶ ἵστησιν ἑκάτερον τούτων. ὅταν δὲ κοπιάσωσι, διὰ τὸ μὴ κοιμηθῆναι, ἁλὶ τριβόμενοι καὶ ἐλαίῳ καὶ ὕδατι θερμῷ τοὺς ὤμους, ὑγιάζονται. καὶ ὅταν τοὺς ὤμους ἀλγῶσιν, ὕεια κρέα ὀπτήσαντες προστιθέασι, καὶ βοηθεῖ αὐτοῖς. ἔλαιον δ' οἱ μὲν πίνουσι, οἱ δ' οὔ, τῶν ἐλεφάντων. κἂν τύχῃ σιδήριόν τι ἐν τῷ σώματι ἐνόν, τὸ ἔλαιον ἐκβάλλει, ὅταν πίωσιν, ὥς φασι· τοῖς δ' οὔ, ῥίζαν ἑψήσαντες ἐλαίῳ διδόασι. περὶ μὲν οὖν τῶν τετραπόδων ζῴων, τοῦτον ἔχει τὸν τρόπον.

ΚΕΦΑΛ. κζ'.

Εντόμων διάθεσις· καὶ μελιττῶν νόσοι.

Τῶν δ' ἐντόμων τὰ πλεῖστα εὐθηνεῖ ἐν ᾗπερ ὥρᾳ καὶ γίνεται, ὅταν τοιοῦτον ᾖ τὸ ἔτος, οἷον τὸ ἔαρ, ὑγρὸν καὶ ἀλεεινόν. ταῖς δὲ μελίτταις ἐγγίνεται ἐν τοῖς σμήνεσι θηρία, ἃ λυμαίνεται τὰ κηρία· τό τε σκωλήκιον τὸ *ἀραχνιοῦν, καὶ λυμαινόμενον τὰ κηρία· καλεῖται δὲ κλῆρος· οἱ δὲ πυραύστην καλοῦσιν· ὃς ἐντίκτει ἐν τῷ κηρίῳ ὅμοιον ἑαυτῷ οἷον ἀράχνιον, καὶ νοσεῖν ποιεῖ τὸ σμῆνος. καὶ ἄλλο θηρίον, οἷον ἠπίολος ὁ περὶ τὸν λύχνον πετόμενος. οὗτος ἐντίκτει τι χνοῦ ἀνάπλεων· καὶ οὐ κεντεῖται ὑπὸ τῶν μελιττῶν, ἀλλὰ μόνον φεύγει καπνιζόμενος. ἐγγίνονται δὲ καὶ κάμπαι ἐν τοῖς σμήνεσιν, ἃς καλοῦσι τερηδόνας· ἃς οὐκ ἀμύνονται αἱ μέλιτται. [νοσοῦσι δὲ μάλιστα ἠλυόμενα,] ὅταν ἐρυσιβώδη τὰ ἄνθη ἡ ὕλη ἐνέγκῃ· καὶ ἐν τοῖς αὐχμηροῖς ἔτεσι. πάντα δὲ τὰ ἔντομα ἀποθνήσκει ἐλαιούμενα· τάχιστα δ', ἄν τις τὴν κεφαλὴν ἀλείψας, ἐν τῷ ἡλίῳ θῇ.

*Qu. ἀραχνιῶδες.

A Equi vocem quoque agnoſcũt equorum, quibuſcum pugnarint. Gaudent pratis riguis, & paludibus: bibunt enim aquas libentiùs turbidas. Quòd ſi clara eſt, inturbant eam vngulis ſuis, & cùm biberint, lauant ſe totos, lymphiſque potiuntur. Balneum enim omnino hoc animal adamat, & aquæ deditum eſt: quamobrem natura etiam equi fluuiatilis ita conſtat, vt viuere niſi in humore non poſſit. Bos contrà, quàm equus, niſi aqua ſit clara, frigida, atque lympida, bibere nolit.

CAPVT XXV.

B *Aſinos vno morbo laborare, frigoriſque impatientes eſſe.*

Aſini vno maximè morbo laborant, quem malidam vocant. Quod vitium in capite oritur, facitque vt per nares pituita multa rufaque effluat. Quæ ſi ad pulmonem deſcenderit, moriuntur: ſed ſi in capite eſt, non infert interitum. Impatiens frigoris maximè hoc animal eſt. quapropter Pontica & Scythica terra aſinis caret.

CAPVT XXVI.

De elephantorum morbis, & eorum curatione.

C Elephanti morbis inflatione contractis laborant: quo fit ne poſſint excrementum vel veſicæ vel alui reddere. Ægrotant etiam, ſi comedant terram, niſi ea frequenter vtantur: nam ſi frequenter, nihil ſentiunt mali. Lapides etiam interdum deuorant. Necnon fluore tentantur, quo, cùm vires languerint, curantur potione aquæ calidæ, & cibo fœni melle imbuti: vtrumque enim id ſiſtit profluuium alui. Si per inſomnium feſſi ſunt, armis perfricatis ex ſale, oleo, & aqua, curantur. Cùm humeri dolent, carnibus ſuillis aſſis appoſitis iuuantur. Oleum alij bibunt, alij non. Et ſi ſpiculum in corpore ineſt, eijcitur eo quod biberit, oleo, vt aiunt. Qui autem oleum non bibunt, D iis radix tyrtami decocta in vino datur. Quadrupedum res ita ſe habet.

CAPVT XXVII.

De morbis inſectorum, & præcipuè apum.

Inſectorum maxima pars eo tempore valet, quo gignitur: videlicet cùm annus talis, quale ver, humidus, & tepidus eſt. Apibus beſtiolæ quædam in alueis innaſcuntur, quæ fauis officiant. Vermiculus item ſpecie aranei, nocet fauis, quem alij clerum, alij pyrauſtam vocant. Hic ſibi ſimilem forma aranei parit in fauo, & facit vt examen æ-E grotet. Obeſt etiam alia quædam beſtiola ſimilis hepiolo papilioni, qui lucernarum luminibus aduolat. Hæc puluerem ſpirando in alueo parit, nec aculeo ab apibus ſtimulatur, ſed tãtùm fumo abigitur. Erucæ quoque naſcuntur in alueis teredines dictæ, quas apes non inſectantur. Ægrotant potiſſimùm, cùm ſylua flores æruginoſos tulerit, atque etiam temporibus ſiccis. Intereunt inſecta omnia tacta ex oleo: ſed celerrimè, ſi capite illito exponantur Soli.

CAPVT XXVIII.

Animalium differentia pro locorum varietate.

DIuerſitate etiam locorum differentia oritur. Vt enim locis nõnullis gigni omnino aliqua nequeunt, ſic aliis generantur quidem ſed pauciora, & vita breuiore, nec proſpera. Locis etiam vicinis diſcrimen huiuſmodi exiſtit: vt agri Mileſij locis ſibi propinquis cicadæ alteris gignuntur, alteris non. Amnis in Cephallenia inſula dirimit, cuius citra alterum latus cicadarum copia eſt, vltra alterum nullæ. In Pordoſelena, via interiacet, cuius vltra alterum latus gignitur cattus, citra alterum gigni non poteſt. Terræ Bœotiæ in Orchomenio agro talpæ habentur multæ: at in Lebadico vicino nullæ ſunt, neque ſi aliunde portatæ eò fuerint, volunt infodere. In Ithaca inſula lepores ſi aliunde illati dimittantur, viuere nequeunt: ſed eodem reuerſi, vnde maris introierint inſulam, moriuntur. In Sicilia formicæ, quæ equites appellantur, non ſunt. In Cyrenenſi agro ranæ vocales præterito tempore deerant. In Africa non aper, non ceruus, non capra ſylueſtris eſt. India, teſte Cteſia, quanquam non fide digno, ſuem nec ferum, nec manſuetum habet. Quæ autem ſanguine carent, & quæ ſeceſſus tempore conduntur, grandiora nimirum illa poſſidet. In Ponto neque mollia ſunt, neque teſtata, niſi locis quibuſdam pauca. In mari rubro teſtata omnia mira quadam magnitudine augẽtur. In Syria oues ſunt caudi lata ad cubiti mẽſuram. Capræ auriculis menſura palmari, & dodrantali, ac nonnullæ demiſſis, ita vt ſpectent ad terram. Boues nodos ſcapularum ſectunt, vt cameli. In Cilicia capræ tondentur, vt alibi oues. In Africa arietes ſtatim cornigeri generantur, nec ſolùm mares, vt Homerus ſcribit, ſed etiam fœminæ. Contrà, in Ponto per prouinciam Scythicam nullis cornua enaſcuntur. In Ægypto aliqua maiora quàm in Græcia, fiunt, vt boues, & oues: aliqua minora, vt canes, lupi, lepores, vulpes, corui, accipitres: aliqua magnitudine pari, vt cornices, & capræ. Cuius rei cauſam attribuunt cibo, qui aliis largè, aliis parcè ſit, vt lupis & accipitribus. Carniuoris enim parum cibi ſuppeditatur, propter raptus quo viuunt, penuriam: aues enim minores paucæ ibi habentur. Lepori verò, omníque non carniuoro generi, victus ieiunior ob eam rem eſt, quòd neque nuces nec poma ſunt diuturniora. Tum etiam multis locis, cæli, & ſitus conditio cauſæ eſt: vt in terra Illyrica, & Thracia, & in Epiro, aſini parui habentur: in Scythica, & Gallica nulli, propter immodicum frigus. In Arabia lacerti magnitudine cubitum excedunt. Mures etiam multo ſoricibus ardiores, quibus crura priora vel palmi menſura, poſteriora ad primum digiti nodum habentur. In Africa magnitudo anguium mira, ſicut & fertur. Iam enim nõnulli vbi triremi applicuiſſent, oſſa boum multorum vidiſſe narrant, quos abſumptos eſſe ab anguibus non dubitarent, cùm triremes productas in altum, quàm primùm angues inſectarentur, & nonnulli aggreſſi triremem euerterent. Item leones in Europa potiùs ſunt, & ea Europæ parte, quæ inter Acheloum amnem & Neſſum eſt. Pantheræ in Aſia, in Europa autem nullæ.

ΚΕΦΑΛ. κη'.

Ζώων διαφοραὶ κατὰ τοὺς τόπους.

ΟΛως δὲ τὰ ζῷα διαφέρει κατὰ τοὺς τόπους. ὥσπερ γὰρ ἐν τισὶ τόποις οὐ γίνονται πάμπαν, οὕτως ἐν ἐνίοις τόποις γίνονται μὲν, ἐλάττω δὲ καὶ ὀλιγοχρονιώτερα, καὶ οὐκ εὐημερεῖ. καὶ ἐνίοτε ἐν τοῖς σύνεγγυς τόποις ἡ διαφορὰ γίνεται· τῶν οἷον τῆς Μιλησίας ἐν τόποις γειτνιῶσιν ἀλλήλοις, ἔνθα μὲν γίνονται τέττιγες, ἔνθα δὲ οὐ γίνονται. καὶ ἐν Κεφαλληνίᾳ ποταμὸς διείργει, οὗ ἐπὶ τάδε μὲν γίνονται τέττιγες, ἐπ' ἐκεῖνα δὲ οὐ γίνονται. ἐν δὲ *Πορδοσελήνῃ ὁδὸς διείργει, ἧς ἐπέκεινα μὲν γαλῆ γίνεται, ἐπὶ θάτερα δὲ οὐ γίνεται. καὶ ἐν τῇ Βοιωτίᾳ ἀσπάλακες μὲν περὶ τὸν Ὀρχομενὸν πολλοὶ γίνονται· ἐν δὲ τῇ Λεβαδικῇ γειτνιώσῃ οὐκ εἰσὶν, οὐδ' ἄν τις κομίσῃ, ἐθέλουσιν ὀρύττειν. ἐν Ἰθάκῃ δὲ οἱ δασύποδες, ἐάν τις ἀφῇ κομίσας, οὐ δύνανται ζῆν, ἀλλὰ φαίνονται τεθνεῶτες πρὸς τῇ θαλάττῃ ἐστραμμένοι, ὅθεν ἂν εἰσαχθῶσι. καὶ ἐν μὲν Σικελίᾳ ἱππομύρμηκες οὐκ εἰσίν· ἐν δὲ Κυρήνῃ οἱ φωνοῦντες βάτραχοι οὐκ ἦσαν πρότερον. ἐν δὲ Λιβύῃ πάσῃ οὔτε σῦς ἄγριός ἐστιν, οὔτ' ἔλαφος, οὔτε αἲξ ἄγριος. ἐν δὲ τῇ Ἰνδικῇ, ὥς φησι Κτησίας, οὐκ ὢν ἀξιόπιστος, οὔτε ἥμερος οὔτ' ἄγριος σῦς· τὰ δ' ἄναιμα καὶ τὰ φωλοῦντα, πάντα μεγάλα. καὶ ἐν μὲν τῷ Πόντῳ οὔτε τὰ μαλάκια γίνεται, οὔτε τὰ ὀστρακόδερμα πάντα, εἰ μὴ ἔν τισι τόποις ὀλίγοις· ἐν δὲ τῇ Ἐρυθρᾷ θαλάττῃ ὑπερμεγέθη τὰ ὀστρακόδερμα πάντα. ἐν δὲ τῇ Συρίᾳ τὰ πρόβατα τὰς οὐρὰς ἔχει τὸ πλάτος πήχεως· τὰ δὲ ὦτα αἱ αἶγες σπιθαμῆς καὶ παλαιστῆς, καὶ ἔνιαι συμβάλλουσι τὰ ὦτα κάτω *διηλοις· καὶ οἱ βόες, ὥσπερ αἱ κάμηλοι, ἔχουσι τὰ λοφία ἐπὶ τὴν ἀκρωμίαν. καὶ ἐν Κιλικίᾳ αἱ αἶγες κείρονται, ὥσπερ τὰ πρόβατα παρὰ τοῖς ἄλλοις. καὶ ἐν μὲν Λιβύῃ εὐθὺς γίνεται κέρατα ἔχοντα τὰ κερατώδη τῶν κριῶν, οὐ μόνον οἱ ἄρρενες, ὥσπερ Ὅμηρός φησιν, ἀλλὰ καὶ τὰ θήλεα· ἐν δὲ τῷ Πόντῳ περὶ τὴν Σκυθικὴν, τοὐναντίον. ἀκέρατα γὰρ γίνονται. καὶ ἐν τῇ Αἰγύπτῳ, τὰ μὲν ἔνια, μείζω ἢ ἐν τῇ Ἑλλάδι, καθάπερ οἱ βόες καὶ τὰ πρόβατα· τὰ δὲ, ἐλάττω, οἷον οἱ ὄνοι, καὶ λύκοι, καὶ λαγωοὶ, καὶ ἀλώπεκες, καὶ κόρακες, καὶ ἱέρακες· τὰ δὲ, παραπλήσια, οἷον κορῶναι, καὶ αἶγες. αἰτιῶνται δὲ τὰς τροφὰς, ὅτι τοῖς μὲν, ἀφθόνως, τοῖς δὲ, σπανίως· οἷον τοῖς λύκοις καὶ τοῖς ἱέραξι, τοῖς δὲ σαρκοφάγοις, ἡ ὕλη σπανία· γὰρ τὰ μικρὰ ὄρνεα. τοῖς δὲ δασύποσι, καὶ ὅσα οὐ σαρκοφάγα, ὅτι οὔτ' ἀκρόδρυα, οὔτ' ὀπώρα χρόνιος. πολλαχοῦ δὲ καὶ ἡ κρᾶσις αἰτία· οἷον ἐν τῇ Ἰλλυρίδι καὶ τῇ Θρᾴκῃ καὶ τῇ Ἠπείρῳ, οἱ ὄνοι μικροί· ἐν δὲ τῇ Σκυθικῇ καὶ Κελτικῇ ὅλως οὐ γίνονται· δυσχείμερα γὰρ ταῦτα. ἐν δὲ τῇ Ἀραβίᾳ, σαῦραι μείζους πηχυαίων γίνονται. δὲ καὶ μύες πολὺ μείζους τῶν ἀρουραίων, τὰ μὲν ἔμπροσθεν σκέλη ἔχοντες σπιθαμῆς, τὰ δὲ ὀπίσθια, ὅσον ἄχρι τοῦ πρώτου καμπτῆρος τῶν δακτύλων. ἐν δὲ τῇ Λιβύῃ τὸ τῶν ὄφεων μέγεθος γὰρ *ἄπλατον, ὥσπερ καὶ λέγεται. ἤδη γάρ τινές φασι, προσπλεύσαντες, ἰδεῖν ὀστᾶ βοῶν πολλῶν, καὶ δῆλον ἦν αὐτοῖς ὅτι ὑπὸ τῶν ὄφεων ἦν κατεδηδεσμένα. ἀναχθέντων γὰρ, ταχὺ διώκειν τὰς τριήρεις αὐτοὺς, *καὶ ἐνίων αὐτῶν ἐκβαλλεῖν ἀναστρέψαντας τὴν τριήρη. ἔτι δὲ λέοντες μὲν ἐν τῇ Εὐρώπῃ μᾶλλον, καὶ τῆς Εὐρώπης ἐν τῷ μεταξὺ τόπῳ τοῦ Ἀχελῴου καὶ τοῦ Νέσσου· πάρδαλις δ' ἐν τῇ Ἀσίᾳ, ἐν δὲ τῇ Εὐρώπῃ οὐ γίνονται.

* χ. Πορποσελήνῃ

* χ. ἀλλήλαις

* χ. ἄπλατον

* Gaza leg. & ἐνίους αὐτῶν ἐμβαλόντας ἀναστρέψαι τὴν τρ. ait Sylb.

ὅλως δὲ, τὰ μὲν ἄγρια, ἀγριώτερα ἐν τῇ Ἀσίᾳ, ἀνδρειότερα δὲ πάντα τὰ ἐν τῇ Εὐρώπῃ, πολυμορφότατα δὲ τὰ ἐν τῇ Λιβύῃ· καὶ λέγεταί τις παροιμία, ὅτι ἀεὶ φέρει τι Λιβύη καινόν. διὰ γὰρ τὴν ἀνομβρίαν, μίσγεσθαι δοκεῖ ἀπαντῶντα πρὸς τὰ ὑδάτια, καὶ τὰ μὴ ὁμόφυλα, καὶ ἐκφέρειν ὧν οἱ χρόνοι τῆς κυήσεως οἱ αὐτοί, καὶ τὰ μεγέθη μὴ πολὺ ἀπ' ἀλλήλων. πρὸς ἄλληλα δὲ πραΰνεται, διὰ τὴν τοῦ ποτοῦ χρείαν. καὶ γὰρ καὶ δέονται τοῦ πίνειν τοὐναντίον τῶν ἄλλων, τοῦ χειμῶνος μᾶλλον ἢ τοῦ θέρους. διὰ γὰρ τὸ μὴ εἰωθέναι ὕδατι χρῆσθαι τοῦ θέρους, ἀσυνήθες αὐτοῖς τὸ πίνειν ἐστί. καὶ οἵ γε μύες, ὅταν πίωσιν, ἀποθνήσκουσι. γίνεται δ' ἄλλα ἐκ μίξεως μὴ ὁμοφύλων. ὥσπερ καὶ ἐν Κυρήνῃ μίσγονται οἱ λύκοι ταῖς κυσί, καὶ γεννῶσι· καὶ ἐξ ἀλώπεκος καὶ κυνὸς οἱ Λακωνικοί. φασὶ δὲ καὶ ἐκ τοῦ τίγρεος καὶ κυνὸς γίνεσθαι τοὺς Ἰνδικούς, οὐκ εὐθὺς δέ, ἀλλ' ἐπὶ [τῆς] τρίτης μίξεως. τὸ γὰρ πρῶτον γεννηθέν, θηριώδες γενέσθαι φασίν. ἄγοντες δέ, δεσμεύουσιν εἰς τὰς ἐρημίας τὰς κύνας· καὶ πολλαὶ κατεσθίονται, ἐὰν μὴ τύχῃ ὀργῶν πρὸς τὴν ὀχείαν τὸ θηρίον.

ΚΕΦΑΛ. κθ'.

Ὅτι οἱ τόποι διαφέροντα ποιοῦσι τὰ ζῶα ἤθη.

Ποιοῦσι δὲ καὶ οἱ τόποι διαφέροντα τὰ ἤθη· οἷον οἱ ὀρεινοὶ καὶ τραχεῖς, τῶν ἐν τοῖς πεδίοις καὶ τοῖς μαλακοῖς. καὶ γὰρ τὰς ὄψεις ἀγριώτερα, καὶ ἀλκιμώτερα· καθάπερ καὶ οἱ ἐν τῷ Ἄθῳ ὕες. τούτων γὰρ οὐδὲ τὰς θηλείας ὑπομένουσι τῶν κάτω οἱ ἄρρενες. καὶ πρὸς τὰ δήγματα δὲ τῶν θηρίων, μεγάλην ἔχουσιν αἱ χῶραι διαφοράν· οἷον περὶ μὲν Φάρον καὶ ἄλλους τόπους οἱ σκορπίοι οὐ χαλεποί· ἐν ἄλλοις δὲ τόποις καὶ ἐν τῇ Καρίᾳ, πολλοὶ καὶ μεγάλοι, [καὶ χαλεποὶ] γίνονται· καὶ ἐὰν τινα πατάξωσιν ἄνθρωπον ἢ θηρίον, ἀποκτείνουσι· καὶ τὰς ὗς, αἳ ἥκιστα αἰσθάνονται τῶν ἄλλων δηγμάτων, καὶ τούτων τὰς μελαίνας μᾶλλον ἀποκτείνουσι. μάλιστα δ' ἀπόλλυνται αἱ ὕες πληγεῖσαι, ἐὰν εἰς ὕδωρ ἔλθωσι. τά τε τῶν ὄφεων δήγματα, πολὺ διαφέρουσιν. ἥ τε γὰρ ἀσπὶς ἐν Λιβύῃ γίνεται, ἐξ οὗ ὄφεως ποιοῦσι τὸ σηπτικόν, καὶ ἄλλως* ἀνίατος. γίνεται δὲ καὶ ἐν τῷ σιλφίῳ τι ὀφίδιον, οὗ καὶ λέγεται ἄκος εἶναι λίθος τις, ὃν λαμβάνουσιν ἀπὸ τάφου βασιλέως τῶν ἀρχαίων, καὶ ἐν οἴνῳ ἀποβάψαντες, πίνουσι. τῆς δ' Ἰταλίας ἔν τισι τόποις, καὶ τὰ τῶν ἀσκαλαβωτῶν δήγματα θανάσιμά ἐστι. πάντων δὲ χαλεπώτερα ἐστὶ τὰ δήγματα τῶν ἰοβόλων, ἐὰν τύχῃ ἄλληλα ἐδηδοκότα, οἷον* σκορπίον ἔχις. ἔστι δὲ τοῖς πλείστοις αὐτῶν πολέμιον τὸ τοῦ ἀνθρώπου πτύελον. ἔστι δέ τι ὀφίδιον μικρόν, ὃ καλοῦσί τινες ἱερόν, ὃ οἱ πάνυ μεγάλοι ὄφεις φεύγουσι. γίνεται δὲ τὸ μέγιστον πηχυαῖον, καὶ δασὺ* ἰδεῖν. ὅ,τι δ' ἂν δάκῃ, εὐθὺς σήπεται τὸ κύκλῳ. ἔστι δὲ καὶ ἐν τῇ Ἰνδικῇ ὀφίδιόν τι, ὃ μόνον φάρμακον οὐκ ἔχουσι.

* Quid. ἀνίατοι.
* Melius σκορπίον vel σκορπίου.
* χνοώδη.

Beſtiæ denique omnes ferè efferatiores in Aſia ſunt, fortiores in Europa, multiformiores in Africa. Vnde prouerbio quodam dicitur: Semper aliquid noui Africam afferre. Facit enim illius ſiti aquarum penuria, vt feræ eodem concurrant bibendi cauſa: quo quidem loco etiam quæ alienigenæ ſunt, coeunt, & generant. quorum tempora eadem ferendi vteri ſint, & magnitudines non multo inter ſe diſcrepent. Redduntur mitiores inter ſe deſiderio fluuij: nam & contrà, quam cætera, potum quærunt: tempore enim hyberno magis quam æſtiuo. Inſuetum namque his eſt bibere æſtate, propterea quod imbres fieri per id tempus non ſoleant: & mures quidem, cùm biberint, moriuntur. Sed vel alibi coitu alienigenarum procreari apertum eſt: vt in Cyrenenſi agro, lupi cum canibus coeunt, & Laconici canes ex vulpe & cane generantur. Indicos etiam canes ex tigride & cane gigni confirmant: verùm non ſtatim, ſed tertio coitu: primo enim belluinos adhuc catulos procreari aiunt. alligantur canes locis deſertis, & niſi bellua incenſa libidine ſit, ſæpe lacerantur.

CAPVT XXIX.

Mores etiam animalium pro locorum qualitate differre, venenaque ſerpentum, vel mitiora vel aſperiora effici.

MOrum etiam diuerſitatem loca efficiunt: vt montana & aſpera ſuas beſtias reddunt & aſpectu efferatiores, & viribus robuſtiores, quam plana & molliora. argumento vel ſues Athimontis acceperim, quorum ne fœminas quidem ſpectare mares ſitus inferioris audent. Morſus etiam belluarum ex locorum diuerſitate plurimùm differunt: vt in Pharo, locíſque aliis, ſcorpiones non lædunt: at aliis, & præcipue in Scythia, multi, & magni, & nocui ſunt. Et, ſi vel hominem, vel quãuis beſtiam percuſſerint, interimunt. Nec ſues euadere poſſunt, quanquam cæteros virulentos ictus minimè ſentiunt: & nigri eorum potiſſimùm interimuntur. Quiſque tamen celerrimè interit, ſi ictus adierit aquam. Anguium quoque ictus per loca plurimùm differunt. aſpis enim anguis, ex quo medicamentum putrificum illud componunt, in Africa gignitur, cuius ictui nullum remedium eſt. Naſcitur eodem in agro, in quo laſer, ſerpens quidam puſillus, cuius remedium lapis eſt, quem ex ſepulchro cuiuſdam regis antiqui accipiunt, eóque perfuſo ex vino bibunt. Italiæ locis quibuſdam morſus etiam ſtellionum exitiales ſunt. Sed omnium venenatorum morſus grauiores ſunt, ſi alterum ederit alterum, vt ſcorpium deuorari à vipera certum eſt. Plurimis verò eorum aduerſatur ſaliua hominis. Serpens quidam minutus eſt, quem aliqui ſacrum appellant, quem angues prægmagni fugiunt. magnitudo huic ad cubitum, ſpecies hirſuta. quicquid momorderit, continuò circiter putreſcit. Eſt præterea in Indica regione ſerpens paruus, cuius vnius remedio carent incolæ.

A

CAPVT XXX.

Quo tempore piſcium genera præſtantiora in cibum reddantur.

DIſcrimen animalium vt proſperè contráve exigant, vel vtero pleno, exiſtere nouimus. Teſta enim intecta, vt pectines, omnéque oſtrearium ſiue concharium genus, atque etiam cruſta intecta, tunc optima ſunt, cùm grauida, vt latè in locuſtis & reliquis huiuſmodi patet. Sed quanquam teſta intecta grauida dicimus, tamen nullum eorum vel coitum vel partum videmus. Cruſta intecta nimirum & coire & parere percipiuntur. Mollia etiam præſtant, cùm grauida ſunt, vt lolligines, ſepiæ, polypi. Piſces, cùm impleri incipiunt coitu, boni omnes ferè ſunt; ſed procedente vteri tempore, alij præſtant, alij non. Alec, ſiue mæna, vtero grauis melior eſt: forma rotundior fœminæ, porrectior mari, & latior. Euenit vt cùm fœtu impleri fœmina incipit, maris color in nigriòrem, pluréſque varietates, mutetur, & caro deterrima cibo efficiatur. Vocantur à nonnullis per id tempus hirci. Mutantur piſces, qui merulæ, & qui turdi appellantur, atque etiam ſquillæ: vêre enim nigreſcunt, poſt ver albedinem ſuam recipiunt. Phuca etiam mutat colorem: cùm enim cæteris temporibus candida ſit, verno varia redditur. Solam hanc ex marinis piſcibus nidum ſibi conſternere, atque in ſtragula parere aiunt. alec etiã mutatur, vt dixi, & cerrus, vt ex albedine rurſus æſtate ad nigredinem redeant: quod maximè ſuis pinnis & branchiis declarant. Coruulus etiam cùm vtero fert, optimus eſt, perinde vt alec: mugilis verò, & lupus, & reliqui ferè omnes ſquama intecti deteriores ſunt, cùm ferunt. Similes ſibi, ferentes & non ferentes pauci ſunt, vt glaucus. Vitiantur etiam ſenectute piſces, & quidem thũni, vel ad rem ſalſamentariam ſenes improbi ſunt: multum enim carnis abſumitur: quod idem vel in cæteris piſcibus euenit. Declaratur eorum ſenectus duritie, magnitudinéque ſquamarum. Iam captus eſt thunnus ſenex, cuius pondus erat ad talenta quindecim, & caudæ interuallum ad cubita quinque, & palmum. Flũuiatiles, & lacuſtres piſces optimi ſunt poſt partum, & ſeminis genitalis emiſſionem. Sed nonnulli etiam, cùm ferunt, commendantur, vt ſaperdis: alij damnantur, vt ſilurus: cùm cæteri omnes mares ſuis fœminis ſint præſtantiores. Silurus fœmina præſtat ſuo mari: & in genere anguillarum quoque meliores ſunt, quas fœminas nominant: quæ nomen fœminæ temerè acceperunt: non ſunt enim fœminæ: ſed quia aſpectu à cæteris diſcrepant, fœminæ appellantur.

ΚΕΦΑΛ. λ'.

Πῶς διαφέρει τὰ ζῷα τῷ εὐημερεῖν ἢ τοὐναντίον.

Διαφέρει δὲ τὰ ζῷα καὶ τῷ εὐημερεῖν, ἢ τοὐναντίον, καὶ περὶ τὰς κυήσεις. τὰ μὲν γὰρ ὀστρακόδερμα, οἷον κτένες, καὶ ἅπαντα τὰ ὀστρεώδη, καὶ μαλακόστρακα, ἄριστά ἐστιν ὅταν κύῃ, οἷον τὰ καραβώδη. βλέπεται δὲ ἡ κύησις καὶ τῶν ὀστρακοδέρμων· τὰ μὲν γὰρ μαλακόστρακα, καὶ ὀχευόμενα ὁρᾶται καὶ ἀποτίκτοντα· ἐκεῖνα δὲ οὐδέν. καὶ τὰ
B μαλάκια δὲ κύοντα, ἄριστα. οἷον τευθίδες τε καὶ σηπίαι, καὶ πολύποδες. οἱ δὲ ἰχθῦς, ἀρχόμενοι μὲν κυΐσκεσθαι, σχεδὸν ἀγαθοὶ πάντες. προϊούσης δὲ τῆς κυήσεως, οἱ μὲν, οἱ δ' οὔ. κύουσα μὲν οὖν ἀγαθὴ μαινίς. μορφὴ δὲ τῆς θηλείας στρογγυλωτέρα· ὁ δ' ἄρσην, μακρότερος καὶ πλατύτερος. συμβαίνει δὲ ἀρχομένης κυΐσκεσθαι τῆς θηλείας, τοὺς ἄρρενας μέλαν τὸ χρῶμα ἴσχειν καὶ ποικιλώτερον, καὶ φαγεῖν χείριστους εἶναι. καλοῦνται δὲ ὑπ' ἐνίων τράγοι κατὰ τοῦτον τὸν χρόνον. μεταβάλλουσι δὲ καὶ οὓς καλοῦσι κοττύφους, καὶ κίχλας· καὶ ἡ καρὶς τὸ χρῶμα κατὰ τὰς ὥρας, ὥσπερ ἔνια τῶν ὀρνέων. τοῦ μὲν γὰρ ἔαρος, μέλανες γίνονται· εἶτα ἐκ τοῦ ἔαρος λευκοὶ πάλιν. μεταβάλλει δὲ καὶ ἡ φυκὶς τὴν
C χροιάν· τὸν μὲν γὰρ ἄλλον χρόνον λευκή ἐστι· τοῦ δὲ ἔαρος ποικίλη. μόνη δὲ αὕτη τῶν θαλαττίων ἰχθύων στιβάδας ποιεῖται, ὥς φασι, καὶ τίκτει ἐν ταῖς στιβάσι. μεταβάλλει δὲ καὶ ἡ μαινὶς, ὥσπερ εἴρηται, καὶ ἡ σμαρίς· καὶ ἐκ λευκοτέρων, πάλιν ἐν τῷ θέρει καθίστανται, καὶ γίνονται μέλανες. μάλιστα δ' ἐπίδηλός ἐστι περὶ τὰ πτερύγια καὶ τὰ βράγχια. καὶ κορακῖνος δὲ ἄριστός ἐστι κύων, ὥσπερ καὶ ἡ μαινίς. κεστρεὺς δὲ καὶ λάβραξ καὶ οἱ λεπιδωτοὶ, φαῦλοι κύοντες σχεδὸν πάντες. ὅμοιοι δὲ κύοντες καὶ μὴ ὀλίγοι, οἷον γλαῦκος. φαῦλοι δὲ καὶ οἱ γέροντες τῶν ἰχθύων· καὶ οἵ γε θύννοι, καὶ εἰς ταριχείας φαῦλοι οἱ γέροντες. πολὺ γὰρ συντήκεται τῆς σαρκός· τὸ δ' αὐτὸ καὶ ἐπὶ τῶν ἄλλων συμβαί-
D νει ἰχθύων. δῆλοι δὲ οἱ γέροντες αὐτῶν τῷ μεγέθει τῶν λεπίδων καὶ τῇ σκληρότητι. ἤδη δὲ εἰλήφθη γέρων θύννος, οὗ σταθμὸς μὲν ἦν τάλαντα πεντεκαίδεκα, τοῦ δ' οὐραίου τὸ διάστημα πέντε πήχεων ἦν καὶ σπιθαμῆς. οἱ δὲ ποτάμιοι καὶ οἱ λιμναῖοι, ἄριστοι γίνονται μετὰ τὴν ἄφεσιν τοῦ κυήματος καὶ τοῦ θοροῦ, ὅταν ἀναστραφῶσιν. κύοντες δ', ἔνιοι μὲν, ἀγαθοὶ, οἷον * σαπέρδις· ἔνιοι δὲ, φαῦλοι, οἷον γλάνις. οἱ μὲν οὖν ἄλλοι πάντες, ἀμείνους οἱ ἄρρενες τῶν θηλειῶν· γλάνις δὲ ὁ θῆλυς, τοῦ ἄρρενος ἀμείνων. καὶ ἐν ταῖς ἐγχέλεσι δὲ, ἃς καλοῦσι θηλείας, ἀμείνους εἰσίν· οὐκ οὔσας δὲ θηλείας * κα-
E λοῦσιν, ἀλλὰ τῇ * ὄψει διαφερούσας.

* γρ. σαπέρδης.

* γρ. ὄψει διαφερούσας. & ita Gaza.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζώων ἱστορίας τὸ Ι.

ΚΕΦΑΛ. α'.

Τῶν ζώων ἔχθραι καὶ φιλίαι· καὶ τίνες αἱ τούτων αἰτίαι.

Τὰ δ' ἤθη τῶν ζώων ἐστί, τῶν μὲν ἀμαυροτέρων καὶ βραχυβιωτέρων, ἧττον ἡμῖν ἔνδηλα κατὰ τὴν αἴσθησιν· τῶν δὲ μακροβιωτέρων, ἐνδηλότερα. φαίνεται γὰρ ἔχοντά τινα δύναμιν περὶ ἕκαστον τῶν τῆς ψυχῆς παθημάτων φυσικήν, περί τε φρόνησιν καὶ εὐήθειαν, καὶ ἀνδρίαν καὶ δειλίαν, περί τε πρᾳότητα καὶ χαλεπότητα, καὶ τὰς ἄλλας τὰς τοιαύτας ἕξεις. ἔνια δὲ κοινωνεῖ τινος ἅμα καὶ μαθήσεως καὶ διδασκαλίας. τὰ μὲν γὰρ, [παρ'] ἀλλήλων· τὰ δὲ, παρὰ τῶν ἀνθρώπων, ὅσαπερ ἀκοῆς μετέχει, μὴ μόνον ὅσα τῶν ψόφων, ἀλλ' ὅσα καὶ τῶν σημείων αἰσθάνεται τὰς διαφοράς. ἐν πᾶσι δὲ ὅσοις ἐστὶ γένεσι τὸ θῆλυ καὶ τὸ ἄρρεν, σχεδὸν ἡ φύσις ὁμοίως διέστησε τὸ ἦθος τῶν θηλειῶν πρὸς τὸ τῶν ἀρρένων. μάλιστα δὲ φανερὸν ἐπί τε τῶν ἀνθρώπων καὶ τῶν μέγεθος ἐχόντων, καὶ τῶν ζωοτόκων τετραπόδων. μαλακώτερον τε γὰρ τὸ ἦθός ἐστι τὸ τῶν θηλειῶν, καὶ τιθασεύεται θᾶττον, καὶ προσίεται τὰς χεῖρας μᾶλλον, καὶ μαθηματικώτερον· οἷον καὶ αἱ Λάκαιναι κύνες αἱ θήλειαι, εὐφυέστεραι τῶν ἀρρένων [εἰσί.] τὸ δ' ἐν τῇ Μολοττίᾳ γένος τῶν κυνῶν, τὸ μὲν θηρευτικόν, οὐδὲν διαφέρει πρὸς τὸ παρὰ τοῖς ἄλλοις· τὸ δ' ἀκόλουθον τοῖς προβάτοις, τῷ μεγέθει, καὶ τῇ ἀνδρίᾳ τῇ πρὸς τὰ θηρία. διαφέρουσι δὲ οἱ ἐξ ἀμφοῖν ἀνδρίᾳ καὶ φιλοπονίᾳ, οἵ τε ἐκ τῶν ἐν τῇ Μολοττίᾳ γινομένων κυνῶν, καὶ ἐκ τῶν Λακωνικῶν. ἀθυμότερα δὲ τὰ θήλεα πάντα τῶν ἀρρένων, πλὴν ἄρκτου καὶ παρδάλεως· τούτων δ' ἡ θήλεια δοκεῖ εἶναι ἀνδρειοτέρα. ἐν δὲ τοῖς ἄλλοις γένεσι τὰ θήλεα μαλακώτερα καὶ κακουργότερα, καὶ ἧττον ἁπλᾶ, καὶ προπετέστερα, καὶ περὶ τὴν τῶν τέκνων τροφὴν φροντιστικώτερα. τὰ δ' ἄρρενα, ἐναντίως, θυμωδέστερά τε καὶ ἀγριώτερα, καὶ ἁπλούστερα, καὶ ἧττον ἐπίβουλα. τούτων δ' ἴχνη μὲν τῶν ἠθῶν ἐστὶν ἐν πᾶσιν, ὡς εἰπεῖν. μᾶλλον δὲ φανερώτερα ἐν τοῖς ἔχουσι μᾶλλον ἦθος καὶ μάλιστα ἐν ἀνθρώπῳ. τοῦτο γὰρ ἔχει τὴν φύσιν ἀποτετελεσμένην, ὥστε καὶ ταύτας τὰς ἕξεις εἶναι φανερωτέρας ἐν αὐτοῖς. διόπερ γυνὴ ἀνδρὸς ἐλεημονέστερον, καὶ ἀρίδακρυ μᾶλλον· ἔτι δὲ φθονερώτερόν τε καὶ μεμψιμοιρότερον, καὶ φιλολοίδορον μᾶλλον, καὶ πληκτικώτερον. ἔστι δὲ καὶ δύσθυμον μᾶλλον τὸ θῆλυ τοῦ ἄρρενος, καὶ δύσελπι, καὶ ἀναιδέστερον, καὶ ψευδέστερον, εὐαπατητότερον καὶ μνημονικώτερον· ἔτι δὲ ἀγρυπνότερον, [καὶ ὀκνηρότερον,] καὶ ὅλως ἀκινητότερον τὸ θῆλυ τοῦ ἄρρενος, καὶ τροφῆς ἐλάττονός ἐστι. βοηθητικώτερον δὲ, ὥσπερ ἐλέχθη, καὶ ἀνδρειότερον τὸ ἄρρεν τοῦ θήλεός ἐστιν· ἐπεὶ καὶ ἐν τοῖς μαλακίοις, ὅταν τῷ τριόδοντι πληγῇ ἡ σηπία, ὁ μὲν ἄρρην βοηθεῖ τῇ θηλείᾳ· ἡ δὲ θήλεια, φεύγει τοῦ ἄρρενος πληγέντος. πόλεμος μὲν οὖν πρὸς ἄλληλα τοῖς ζώοις ἐστὶν, ὅσα τούς αὐτούς τε κατέχει τόπους, καὶ ἀπὸ τῶν αὐτῶν ποιεῖται τὴν ζωήν.

Metaphyſic. lib. 1. cap. 1.

ARISTOTELIS STAGIRITÆ, de Hiſtoria Animalium,

LIBER IX.

CAPVT I.

De affectibus animorum omnium animalium, [illegible] quæ perpetuas inter ſe inimicitias gerunt, & earum cauſis.

B Mores animalium obſcuriorum, parúmque viuentium temporis, minùs ſenſu percipiuntur: viuaciorum euidentiores ſunt. Habere enim vim quandam naturalem animantes in quauis animi affectione videntur, hoc eſt, prudentia, ſtultitia, fortitudine, ignauia, clementia, acerbitate, & reliquis habitibus generis eiuſdem. In nonnullis etiam commune aliquid diſciplinæ eruditioniſque habetur. alia enim viciſſim inter ſe; alia ab homine (quæ ſcilicet auditu non carent) non modò ſtrependi, verùm etiam ſignificandi differentias poſſunt dignoſcere. In omnibus verò, quorum procreatio eſt, fœminam & marem ſimili ferè modo C natura diſtinxit moribus, quibus mas differt à fœmina: quod præcipuè tum in homine tum etiam in iis quæ magnitudine præſtent, & quadrupedes viuiparæ ſint, percipitur. Sunt enim fœminæ moribus mollioribus, miteſcunt celeriùs, & malum faciliùs patiuntur. Diſcunt etiam, imitantúrque ingenioſiùs: vt in genere canum Laconico, fœminas eſſe ſagaciores, quàm mares, apertum eſt. Molotticum etiam genus venaticum, nihilo à cæteris diſcrepat. at pecuarium longè & magnitudine, & fortitudine contra belluas præſtat. Inſignes verò animo & induſtria, qui ex vtroque, Molotticum dico, & Laconicum, prodierint. Sed fœminæ omnes minùs quàm mares, ſunt ani- D moſæ, excepta panthera & vrſa: fœminæ enim in his generibus eſſe videntur animoſiores, cùm in cæteris ſint proculdubio molliores: verùm malitioſiores, aſtutiores, inſidioſiores fœminæ ſunt, atque in enutrienda prole ſolicitiores. Mares contrà animoſiores, ferociores, ſimpliciores, minúſque inſidioſi. Quorum veſtigia morum cùm in omnibus ferè inſunt, tum vel maximè in perfectioribus, & præcipuè in homine: hic enim natura perfectiſſima eſt, & ob eam rem habitus iſti conſpectiores in eo ipſo continentur: ita quòd mulier miſericors magis, & ad lacrymas propenſior, quàm vir, eſt, inuida item magis, & querula, & ma- E ledicentior, & mordacior: præterea anxia, & deſperans magis quàm mas, atque impudentior & mendacior: quinetiam facilior decipi, meminiſſéque aptior: adhæc vigilantior, ſegnior, immobilior denique eſt, & minùs cibi deſiderans: mas verò iuuantior, vt modò dixi, & fortior eſt. Nam & in mollium genere, cùm ſepia icta eſt tridente, mas fœminam adiuuat, fœmina mare percuſſo fugam arripit. Pugnant inter ſe ipſa animalia, quæ loca eadem incolunt, atque eiſdem veſcuntur cibis.

Nam ſi victus penuria ſit, fit certè ob eam rem, vt vel eiuſdem generis animantes pugnam inter ſe conſerant. Et quidem marinos vitulos ſitus eiuſdem pugnare inuicem aiunt & marem cum mare, & fœminam cum fœmina, donec alter ab altero vel occidatur, vel eijciatur. Idémque eorum catulos facere. Carniuora etiam & oppugnantur à cæteris omnibus, & ipſa cum cæteris pugnant: quoniam victus his ab animalibus eſt. Vnde augures ſua diſſidia & conſidia colligunt. Diſſidio bella, omnémque diſcordiam ſtatuunt, conſidio pacem omnémque concordiam. Quòd ſi cibi copia ſuppetat, haud ſcio an ea quæ nunc metuunt, & ferociunt, inter ſe eant, manſuetéque cùm inter ſe eunt, cum homine etiam agant. Cuius rei indicium facit cura quam Ægyptij animantibus impendunt. Quòd enim apud illos cibo non carent, ſed copioſè aluntur, ideo collegio vel ipſa efferatiſſima degunt: manſueſcunt enim ſui commodi ratione. Quale ſe genus crocodili exhibet ſacerdoti locis quibuſdam, propter cibi curam, quæ ibi inſumitur. Quod idem fieri cæteris etiam locis intelligi licet. Diſſidet aquila cum dracone: veſcitur enim aquila anguibus. Ichneumo cum phalange: venatur enim phalanges ichneumo. Auium variæ dictæ, cum alaudis. Pipo cum lutea: oua enim inuicem exedunt. Cornix cum noctua: cornix enim meridie oua ſurripiens noctuæ, abſumit, cùm non clarè interdiu noctua videat. Noctua contrà, oua cornicis noctu exedit: éſtque altera interdiu, altera noctu potentior. Item noctua cum orchilo: nam is quoque oua exedit noctuæ. Sed die vel cæteræ auiculæ omnes noctuam nimirum circumuolant: quod mirari vocatur: aduolantéſque percutiunt. Quapropter aucupes ea conſtituta, auicularum genera multa & varia capiunt. Quinetiam qui rex auium appellatur, priuatas contra eandem inimicitias gerit. Muſtela inimicus cornicis eſt, quippe qui eius oua & pullos violet. Turtur cum ignaria pugnat: locus enim paſcendi victúſque idem eorum eſt. Galgulus cum lybio, miluus cum coruo: eripit enim miluus à coruo quicquid tenet, vt qui & vnguibus ſit præſtantior, & volatu. Ita fit, vt eos quoque victus ratio faciat inimicos. Adhæc interea, quæ cibum ſibi à mari petunt, anàs, gauia, & harpa, inuicem diſſident. Buteo in alio genere hoſtis ranæ & rubetæ, & anguis eſt: rapit enim eos atque exedit. Turtur & luteus pugnant. Occiditur à luteo turtur, & à cornice tympanus nomine. Colarem vlula, cæterique adunci rapiunt, vnde his oritur bellum. Inter ſtellionem etiam, & araneum, bellũ eſt: deuorátur enim aranei à ſtellione. Pipo inimica ardeolæ eſt: oua enim & pulli ardeolæ violantur à pipone. Salo prælium cum aſino eſt, propterea quòd aſinus ſpinetis ſua vlcera ſcabendi cauſa atterat: tum igitur ob eam rem, tum etiam quòd ſi vocem rudentis audierit, oua abigat per abortum, pulli etiam metu labantur in terram. Itaque ob eam iniuriam aduolans, vlcera eius roſtro excauat. Lupus aſino, tauro, & vulpi eſt hoſtis. Cùm enim carne ipſa alatur, boues inuadit, & aſinos, & vulpes. Hac eadem de cauſa, & cum circo accipitre vulpi inimicitiæ ſunt: circus enim, quia vnguibus eſt aduncis, & carne viuit, vulpem inuadit, ac vulnerat. Coruus tauro, & aſino aduerſarius eſt, quippe qui aduolans feriat, & eorum oculos laceret.

A ἐὰν γὰρ ᾖ ἀσθμίος ἡ τροφὴ, καὶ πρὸς ἄλληλα τὰ ὁμόφυλα μάχεται· ἐπεὶ καὶ τὰς φώκας φασὶ πολεμεῖν περὶ τὸν αὐτὸν τόπον καὶ ἄρρενι ἄρρενα, καὶ θηλεία θηλείαις, ἕως ἂν ἀποκτείνῃ, ἢ ἐκβληθῇ θάτερον ὑπὸ θατέρου. καὶ τὰ σκυμνία ὡσαύτως πάντα. ἔτι δὲ τοῖς ὠμοφάγοις ἅπαντα πολεμεῖ, καὶ ταῦτα τοῖς ἄλλοις· ἀπὸ γὰρ τῶν ζώων ἡ τροφὴ αὐτοῖς· ὅθεν καὶ τὰς διεδρίας καὶ τὰς συνεδρίας οἱ μάντεις λαμβάνουσι· διεδρα μὲν, τὰ πολέμια τιθέντες· σύνεδρα δὲ, τὰ εἰρηνεύοντα πρὸς ἄλληλα. κινδυνεύει δὲ, εἰ ἀφθονία τροφῆς εἴη, πρός τε τοὺς ἀνθρώπους * ἀμέχειν τιθασσῶς, τὰ νῦν φοβούμενα αὐτῶν καὶ ἀγριαίνοντα, καὶ πρὸς * Malim ἂν ἔχειν
B ἄλληλα τὸν αὐτὸν τρόπον. δῆλον δὲ ποιεῖ τοῦτο ἡ περὶ Αἴγυπτον ἐπιμέλεια τῶν ζώων. διὰ γὰρ τὸ τροφὴν ὑπάρχειν, καὶ μὴ ἀπορεῖν, μετ' ἀλλήλων ζῶσι καὶ αὐτὰ τὰ ἀγριώτατα. διὰ τὰς ὠφελείας γὰρ ἡμεροῦνται, οἷον ἐνιαχοῦ τὸ τῶν κροκοδείλων γένος πρὸς τὸν ἱερέα, διὰ τὴν ἐπιμέλειαν τῆς τροφῆς. τὸ δ' αὐτὸ τοῦτ' ἔστιν ἰδεῖν καὶ περὶ τὰς ἄλλας χώρας γινόμενον, καὶ κατὰ μόρια αὐτῶν. ἔστι δ' ἀετὸς καὶ δράκων, πολέμια· τροφὴν γὰρ ποιεῖται τοὺς ὄφεις ὁ ἀετός. καὶ ἰχνεύμων καὶ φάλαγξ· θηρεύει γὰρ τοὺς φάλαγγας ὁ ἰχνεύμων. τῶν δ' ὀρνίθων, ποικιλίδες καὶ * κορυδῶνες, καὶ πίπρα * κ. κορύδωνες,
καὶ χλωρεύς· τὰ γὰρ ᾠὰ κατεσθίουσιν ἀλλήλων. καὶ κορώνη
C καὶ γλαῦξ· ἡ μὲν γὰρ τῆς μεσημβρίας, διὰ τὸ μὴ ὀξὺ βλέπειν τὴν γλαῦκα τῆς ἡμέρας, κατεσθίει ὑφαρπάζουσα αὐτῆς τὰ ᾠά· ἡ δὲ γλαῦξ, τῆς νυκτὸς τὰ τῆς κορώνης· καὶ κρείττων ἡ μὲν, τῆς ἡμέρας, ἡ δὲ, τῆς νυκτός ἐστι. καὶ γλαῦξ δὲ καὶ ὄρχιλος πολέμια· τὰ γὰρ ᾠὰ κατεσθίει καὶ οὗτος τῆς γλαυκός· τῆς δ' ἡμέρας καὶ τὰ ἄλλα ὀρνίθια τὴν γλαῦκα * περιπέτεται ὃ καλεῖται θαυμάζειν· καὶ προσ- * κ. περιπέτανται
πετόμενα τίλλουσι· διὸ οἱ ὀρνιθοθῆραι θηρεύουσιν αὐτῇ παντοδαπὰ ὀρνίθια. πολέμιος δὲ καὶ ὁ πρέσβυς καλούμενος, καὶ γαλῆ καὶ κορώνη. τὰ γὰρ ᾠὰ καὶ τοὺς νεοττοὺς κατεσθίουσιν αὐτῆς. καὶ τρυγὼν καὶ πυραλίς. τόπος γὰρ τῆς νομῆς καὶ βίος
D ὁ αὐτός. καὶ κελεὸς καὶ λιβυός· * ἰκτῖνός τε καὶ κόραξ. ὑφαι- * κ. ἰκτῖνος δὲ καὶ
ρεῖται γὰρ τοῦ κόρακος ὁ ἰκτῖνος ὅ,τι ἂν ἔχῃ, διὰ τὸ κρείττων εἶναι τοῖς ὄνυξι, καὶ τῇ πτήσει· ὥστε ἡ τροφὴ ποιεῖ πολεμίους καὶ τούτους. ἔτι οἱ ἀπὸ τῆς θαλάττης ζῶντες, ἀλλήλοις· οἷον βρένθος, καὶ λάρος, καὶ ἅρπη. τριόρχης δὲ καὶ φρύνος, καὶ ὄφις· κατεσθίει γὰρ ὁ τριόρχης αὐτούς. τρυγὼν δὲ καὶ χλωρεύς· ἀποκτείνει γὰρ τὴν τρυγόνα ὁ χλωρεύς, καὶ ἡ κορώνη τὸν καλούμενον * τύπανον. τὸν δὲ κολιὸν ὁ αἰγωλιὸς, καὶ * Gaza, τύμπανον.
οἱ ἄλλοι γαμψώνυχες κατεσθίουσιν· ὅθεν ὁ πόλεμος αὐτοῖς. πόλεμος δὲ καὶ ἀσκαλαβώτῃ καὶ ἀράχνῃ· κατεσθίει γὰρ τοὺς ἀράχνας ὁ ἀσκαλαβώτης. πίπῳ δὲ καὶ ἐρωδιῷ· τὰ γὰρ ᾠὰ
E κατεσθίει καὶ τοὺς νεοττοὺς τοῦ ἐρωδιοῦ. αἰγίθῳ δὲ καὶ ὄνῳ πόλεμος διὰ τὸ παριόντα τὸν ὄνον, ξύεσθαι εἰς τὰς ἀκάνθας τὰ ἕλκη. διά τε οὖν τοῦτο, κἂν ὀγκήσηται, ἐκβάλλει τὰ ᾠὰ καὶ τοὺς νεοττούς· φοβούμενοι γὰρ ἐκπίπτουσιν· ὁ δὲ, διὰ τὴν βλάβην ταύτην κολάπτει ἐπιπετόμενος τὰ ἕλκη αὐτοῦ. λύκος δ' ὄνῳ, καὶ ταύρῳ, καὶ ἀλώπεκι πολέμιος. ὠμοφάγος γὰρ ὢν, ἐπιτίθεται τοῖς βουσὶ καὶ τοῖς ὄνοις, καὶ τῇ ἀλώπεκι. καὶ ἀλώπηξ δὲ καὶ κίρκος, διὰ τὴν αὐτὴν αἰτίαν. γαμψώνυχος γὰρ ὢν καὶ ὠμοφάγος, ἐπιτίθεται, καὶ λυπεῖ κόπτων. καὶ κόραξ ταύρῳ καὶ ὄνῳ πολέμιος, διὰ τὸ τύπτειν ἐπιπετόμενος αὐτοὺς, καὶ τὰ ὄμματα κολάπτειν αὐτῶν.

A πολεμεῖ δὲ καὶ ἀετὸς καὶ ἐρωδιός· γαμψώνυχος γὰρ ὢν ὁ ἀετὸς, ἐπιτίθεται· ὁ δὲ, * ἀποθνήσκει ἀμυνόμενος. καὶ αἰσάλων δὲ αἰγυπιῷ πολέμιος. καὶ κρὲξ * κολεῷ, καὶ κοττύφῳ, καὶ χλωρίωνι, ὃν ἔνιοι μυθολογοῦσι γίνεσθαι ἐκ πυρκαϊᾶς· καὶ γὰρ αὐτοὺς βλάπτει καὶ τὰ τέκνα αὐτῶν. καὶ σίττη καὶ τροχίλος ἀετῷ πολέμια ἐστιν· ἡ γὰρ σίττη, καταγνύει τὰ ᾠὰ τοῦ ἀετοῦ· ὁ δὲ ἀετὸς, καὶ διὰ τοῦτο, καὶ διὰ τὸ ὠμοφάγος εἶναι, πολέμιός ἐστι πᾶσιν. ἄνθος δὲ ἵππῳ πολέμιος· ἐξελαύνει γὰρ τὸν ἵππον ἐκ τῆς νομῆς. πόας γὰρ ἐπινέμεται ὁ ἄνθος. ἐπάργεμος δέ ἐστι καὶ οὐκ * ὀξυωπός. μιμεῖται δὲ τοῦ ἵππου τὴν φωνὴν, καὶ φοβεῖ ἐπιπετόμενος, καὶ ἐξελαύνει, * ὅταν δὲ λάβῃ, κτείνει αὐτόν. οἰκεῖ δ' ὁ ἄνθος παρὰ ποταμὸν καὶ ἕλη· χροίαν δ' ἔχει καλὴν καὶ εὔβιοτος. B * κωλώτῃ δ' ὄνος πολέμιος. κοιμᾶται γὰρ ἐν τῇ φάτνῃ αὐτοῦ, καὶ κωλύει ἐσθίειν, εἰς τοὺς μυκτῆρας ἐνδυόμενος. τῶν δ' ἐρωδιῶν ἐστι τρία γένη· ὅ,τε πέλλος, καὶ ὁ λευκὸς, καὶ ὁ ἀστερίας καλούμενος. τούτων ὁ πέλλος χαλεπῶς ὀχεύει τε καὶ ὀχεύεται. κράζει τε γὰρ, καὶ αἷμα, ὥς φασιν, ἀφίησιν ἐκ τῶν ὀφθαλμῶν ὀχεύων, καὶ τίκτει φαύλως καὶ ὀδυνηρῶς. πολεμεῖ δὲ τοῖς βλάπτουσιν, ἀετῷ· ἁρπάζει γὰρ αὐτόν· καὶ ἀλώπεκι· φθείρει γὰρ αὐτὸν τῆς νυκτός· καὶ κορύδῳ· τὰ γὰρ ᾠὰ αὐτοῦ * κλέπτει. ὄφις δὲ γαλῇ καὶ ὑὶ πολέμιον. τῇ μὲν γαλῇ, κατ' οἰκίαν ὅταν ὦσιν ἀμφότερα· ἀπὸ γὰρ τῶν αὐτῶν ζῶσιν· ἡ δὲ ὗς, ἐσθίει τοὺς ὄφεις. καὶ αἰσάλων ἀλώπεκι πολέμιος· C τύπτει γὰρ καὶ τίλλει αὐτὴν, καὶ τὰ τέκνα ἀποκτείνει· γαμψώνυχος γάρ ἐστι. κόραξ δὲ καὶ ἀλώπηξ ἀλλήλοις φίλοι. πολεμεῖ γὰρ τῷ αἰσάλωνι ὁ κόραξ· διὸ βοηθεῖ τυπτομένῃ αὐτῇ. καὶ αἰγυπιὸς δὲ καὶ αἰσάλων, πολέμιοι σφίσιν αὐτοῖς. ἀμφότεροι γὰρ γαμψώνυχοι. μάχεται δὲ καὶ ἀετῷ αἰγυπιὸς καὶ κύκνος· κρατεῖ δ' ὁ κύκνος πολλάκις. εἰσὶ δ' οἱ κύκνοι ἀλληλοφάγοι μάλιστα τῶν ὀρνέων. ἔστι δὲ τῶν θηρίων τὰ μὲν, ἀεὶ πολέμια ἀλλήλοις· τὰ δ', ὥσπερ ἄνθρωποι, ὅταν τύχωσιν. ὄνος δὲ καὶ ἀκανθίδες, πολέμιοι. αἱ μὲν γὰρ, * ἀπὸ τῶν ἀκανθῶν βιοτεύουσιν· ὁ δὲ, ἁπαλὰς οὔσας ἐσθίει τὰς ἀκάνθας. καὶ ἄνθος, καὶ ἀκανθὶς, καὶ αἴγιθος. λέγεται δ' ὅτι αἰγίθου καὶ ἄνθου αἷμα οὐ συμμίσγεται ἀλλήλοις. D κορώνη δὲ καὶ ἐρωδιὸς φίλοι, καὶ σχοινίων καὶ κόρυδος, καὶ λιβυὸς, καὶ κελεός· ὁ μὲν γὰρ κελεὸς, παρὰ ποταμὸν οἰκεῖ καὶ λόχμας· ὁ δὲ λιβυὸς, πέτρας καὶ ὄρη, καὶ φιλοχωρεῖ οὗ ἂν οἰκῇ. καὶ πίφηξ, καὶ ἅρπη, καὶ ἰκτῖνος, φίλοι· καὶ ἀλώπηξ, καὶ ὄφις. ἄμφω γὰρ τρωγλοδυτεῖ, καὶ κόττυφος, καὶ τρυγών. πολέμιοι δὲ καὶ ὁ λέων καὶ ὁ θὼς ἀλλήλοις. ὠμοφάγοι γὰρ ὄντες, ἀπὸ τῶν αὐτῶν ζῶσι. μάχονται δὲ καὶ ἐλέφαντες σφοδρῶς πρὸς ἀλλήλους, καὶ τύπτουσι τοῖς ὀδοῦσι σφᾶς αὐτούς· ὁ δὲ ἡττηθεὶς, δουλοῦται ἰσχυρῶς, καὶ οὐχ ὑπομένει τὴν τοῦ νικήσαντος φωνήν. διαφέρουσι δὲ καὶ τῇ ἀνδρίᾳ ἀλλήλων E οἱ ἐλέφαντες, θαυμαστὸν ὅσον. χρῶνται δὲ οἱ Ἰνδοὶ πολεμιστηρίοις, καθάπερ τοῖς ἄρρεσι, καὶ ταῖς θηλείαις. εἰσὶ μέντοι καὶ ἐλάττονες αἱ θήλειαι, καὶ ἀψυχότεραι πολύ. τοὺς δὲ τοίχους καταβάλλει ὁ ἐλέφας, τοὺς ὀδόντας τοὺς μεγάλους προσβάλλων. τοὺς δὲ φοίνικας τῷ μετώπῳ, ἕως ἂν κατακλίνῃ, ἔπειτα τοῖς ποσὶν ἐπιβαίνων, κατατείνει ἐπὶ τῆς γῆς. ἔστι δὲ καὶ ἡ θήρα τῶν ἐλεφάντων τοιάδε· ἀναβάντες ἐπί τινας τῶν τιθασῶν καὶ ἀνδρείων, διώκουσι καὶ ὅταν καταλάβωσι, τύπτειν προστάττουσι τούτοις, ἕως ἂν ἐκλύσωσι.

* γρ. ἐπιθέμενος. * γρ. κολιῷ. Vide Geſnerum.
* γρ. ὀξύωπος.
* Gaza legiſſe videtur. ἐὰν δὲ ὁ ἵππος λάβῃ, κτείνει αὐτόν. vel ὅταν δὲ ὁ ἵππος λά.
* γρ. κωλώτῃ
* Sylb. κωλάπτει.
* γρ. ἐπὶ τῶν ἀ.

A Aquila etiam cum ardeola pugnat, vnguibus etenim valens aggreditur: hæc autem repugnando emoritur. Æſalo cum vulture: crex cum galgulo, & merula, & vireone, quem ex flagratione procreatum quidam fabulantur: nocet enim his, & eorum pullis. Sitta & trochilus aquila: ſitta enim oua aquilæ frangit: aquila tum ob eam rem, tum etiam quòd carniuora eſt, aduerſatur. Florus odio equum habet, pellitur enim ab equo pabulo herbæ qua veſcitur. Nubeculans hic, nec valens acie oculorum eſt, quippe qui vocem quidem equi imitetur, atque aduolans equum fuget: ſed interdum excipiatur occidatúrque ab equo. Colit hic paludes, & ripas. Coloris eſt pulchri & B victu facilis. Colotæ hoſtis aſinus eſt: dormit enim colota in præſepibus, & narem ſubiens aſini, ne comedat, impedit. Ardeolarum tria ſunt genera, pella, alba, ſtellaris, piger cognomine. Pellæ coitus difficilis eſt: vociferatur enim, & ſanguinem ex oculis, vt aiunt, emittit, cùm coit. Parit etiam ægrè, ſummóque cum dolore. Prælium cum iis init, à quibus læditur, hoc eſt, cum aquila, à qua rapitur: cum vulpe, à qua noctu capitur: cum alauda, à qua oua eius diripiuntur. Serpens muſtelæ ſuíſque aduerſarius eſt, muſtelæ, quòd eadem in domo verſantur: victus enim ex eiſdem appetatur, neceſſe eſt: ſuis verò, quia ab ea deuoratur. Æſalo vulpi eſt inimicus: ferit enim, pi- C lóſque eius euellit, occiditque catulos, vncis namque vnguibus eſt. Coruus vulpi amicus eſt, pugnat enim cum æſalone: vnde fit vt huic, cùm ab illo percutitur, auxilietur. Vultur etiam & æſalo inuicem inimici ſunt: vngues enim vtrique vnci habentur. aquilæ etiam pugnat vultur & olor, nutritque eam ſæpius olor. Oloribus verò vt alter alterum deuoret, in more eſt, maximè in volucrum genere. Sunt porrò alia ſemper inter ſe infeſta, alia hominum ritu, cùm res ita tulerit. Aſinus item & ſpinus inimici inter ſe ſunt: victus enim ſpino à vepribus, quas aſinus tenellas adhuc paſcit. Florus, ſpinus, ægithus, quem ſalum voco, odium inter ſe exer- D cent: & nimirum ſanguinem ægithi & flori miſceri non poſſe dicitur. amici cornix, & ardeola, iunco & alauda, galgulus & lædus. Colit enim galgulus fruteta, & nemora, lædus ſaxa, & montes: ſuíſque locis vterque contentus degit pacificè. amici etiam pifex, herpa, miluus. Vulpes etiam, cum ſerpente amicè viuit: ambo enim cauernis gaudent: & merula quoque turturem amat. Leo & lupus ceruarius inimici ſunt: cùm enim carne alantur, victum ex eiſdem petant neceſſe eſt. Elephanti etiam pugnant inter ſe vehementer, & dentibus alter alterum ferit. Qui autem victus fuerit, adeò animum amittit, vt ne vocem quidem victoris toleret. Differunt inter ſe e- E lephantes mirum in modũ robore, atque animo. Sunt apud Indos in vſu rei bellicæ non ſolùm mares, ſed etiam fœminæ: veruntamen fœminæ pauciores ſunt, & longè timidiores. Euertit ædificia elephantus, dentes admouens magnos. Palmas verò ſua fronte impellit, donec declinet, tum pedibus inculcans proſternit in terram. Venatio talis elephantorum eſt: Conſcendunt mites aliquos animoſóſque elephantos, qui venantur curſúque inſequuntur feros: quos cùm occuparint, ferire præcipiunt ſuis, dum fatigent, viréſque diſſoluãt.

Tum

Tum rector in defatigatum illum inſilit, regitque falce, poſt breui tempore fera miteſcit, atque obtemperat. Quandiu inſidat rector, mitem ſe quiſque exhibet: cùm deſcenderit, alij manſuetudinem ſeruant, alij ſuam repetunt feritatem. Itaque immiteſcentium crura priora præpediunt vinculis, vt quieſcant. Capiuntur & natu iam grandes, & pulli. Sed amicitiæ atque inimicitiæ in his belluis, victus vitæque ratione, ita exiſtunt.

CAPVT II.

De iis piſcibus, qui gregatim amicéque viuunt, quíve non gregatim inimicíve ſunt.

PIſcium autem alij gregatim degũt, amicique ſunt: alij non gregatim, inimicique viuũt. Qui amici ſunt, congregantur, partim cùm vtero ferunt, partim cùm fœtum ædiderint. Gregales denique ſunt thunni, aleces, gobiones, vocæ, lacerti, coruuli, ſiue graculi, dentices, mulli, malleoli, elegini, ſacri, ariſtulæ, ſargiaci, lollij, papaueres, iuliæ, limariæ, ſcombri, monedulæ: horum nonnulli non modò gregales ſunt, verùm etiam coniugales. Reliqui omnes coniugia agunt quidem, ſed greges ſtatis temporibus, vt modò dixi, conſtituunt, ſcilicet aut cùm vterum gerunt, aut poſt partum. Lupus, & mugilis, quanquam inimici ſunt capitales, tamen ſtato tempore congregantur: coeunt enim in gregem ſæpius, non ſolum quæ eiuſdem generis ſunt, ſed etiam quibus idem aut ſimilis paſtus appetitur, dummodo ſit abundè cibarij. Sæpe mugiles cauda abſciſſa viuunt, atque etiam congri, meatu tenus excrementario. Abſcinditur mugilis cauda à lupo, congri à muræna. Ineunt prælium maiores contra minores: maior enim quiſque atque robuſtior minorem inferioremque deuorat. Sed de marinis generibus ſatis.

CAPVT III.

De genere ouili amente, & ſtulto.

MOres autem animalium, vt dictum iam eſt, differunt inter ſe fortitudine, ignauia, manſuetudine, ferocitate, mente, dementia. Iam enim genus ouile amens, & moribus, vt dici ſolet, ſtultiſſimis eſt, quippe quod omnium quadrupedum ineptiſſimum ſit. Repit in deſerta ſine cauſa. Hyeme obſtante ipſum ſæpe egreditur ſtabulo: occupatum à niue, niſi paſtor compulerit, abire non vult, ſed perit deſiſtens, niſi mares à paſtore ducantur: ita enim reliquus grex conſequitur. Caprarum ex grege ſi quis vnam villo mento dependente, quem aruncum vocant, apprehenderit, cæteræ ſtant velut ſtupidæ ſuos in vnam illam oculos conijcientes. Cubant difficiliùs oues quàm capræ: magis enim capræ quieſcunt, accedúntque ad hominem familiariùs: ſed ſunt frigoris impatientiores quàm oues. Docent paſtores ſuas oues gregari, facto ſtrepitu. Nam ſi cùm tonuerit, aliqua relinquatur, quæ non concurrerit, abortum, ſi eſt grauida, facit. Vnde fit vt ſi quem domi ſtrepitum moueris, omnes concurrant, propter conſuetudinem. Cubant oues capræque vniuerſæ per cognationem.

ὅτε δὲ ὁ ἐλεφαντιστὴς ἐπιπηδήσας, κατατείνει τῷ δρεπάνῳ. τιθασεύει δὲ μετὰ ταῦτα πείθονται καὶ πειθαρχεῖ. ἐπιβεβηκότος μὲν οὖν τοῦ ἐλεφαντιστοῦ, ἅπαντες πρᾶοί εἰσιν· ὅταν δ' ἀποβῇ, οἱ μὲν, οἱ δ' οὔ· ἀλλὰ τῶν ἐξαγριουμένων τὰ πρόσθια σκέλη δεσμεύουσι σχοινίοις, ἵν' ἡσυχάζωσιν. θηρεύεται δὲ καὶ μεγάλων ἤδη ὄντων, καὶ πώλων. αἱ μὲν οὖν φιλίαι καὶ οἱ πόλεμοι τοῖς θηρίοις τούτοις, διὰ τὰς τροφὰς καὶ τὸν βίον συμβαίνουσι.

ΚΕΦΑΛ. β'.

Τίνες τῶν ἰχθύων συναγελάζονται.

ΤΩν δ' ἰχθύων οἱ μὲν, συναγελάζονται μετ' ἀλλήλων, καὶ φίλοι εἰσίν· οἱ δὲ μὴ συναγελαζόμενοι, πολέμιοι. ἔνιοι μὲν οὖν, ἀγελάζονται κύοντες· ἔνιοι δὲ, ὅταν ἐκτέκωσιν. ὅλως δ' ἀγελαῖα ἐστὶ τάδε· θυννίδες, μαινίδες, κωβιοί, βῶκες, σαῦροι, κορακῖνοι, * συνόδοντες, τρίγλαι, σφύραιναι, ἀνθίαι, ἐλεγῖνοι, ἀθερῖνοι, σαργῖνοι, βελόναι, * μύξωνες, τευθοί, ἰουλίδες, πηλαμύδες, σκόμβροι, κολίαι. τούτων δ' ἔνια οὐ μόνον ἀγελαῖα, ἀλλὰ καὶ σύνδυα. τὰ γὰρ λοιπὰ συνδυάζεται μὲν ἅπαντα· τὰς δ' ἀγέλας ποιοῦνται κατὰ καιρούς, ὥσπερ εἴρηται, ὅταν κύωσιν, ἔνια δὲ, καὶ ὅταν τέκωσι. λάβραξ δὲ καὶ κεστρεὺς, πολεμιώτατοι ὄντες, κατὰ τοὺς καιροὺς συναγελάζονται ἀλλήλοις. συναγελάζονται γὰρ πολλάκις οὐ μόνον τὰ ὁμογενῆ, ἀλλὰ καὶ οἷς ἡ αὐτὴ καὶ ἡ παραπλήσιός ἐστι νομὴ, ἂν ἡ ἄφθονος. ζῶσι δὲ πολλάκις ἀφῃρημένοι οἱ κεστρεῖς τὴν κέρκον, καὶ οἱ γόγγροι, μέχρι τῆς ἐξόδου τοῦ περιττώματος. ἀπεσθίεται δὲ ὁ μὲν κεστρεὺς, ὑπὸ λάβρακος· ὁ δὲ γόγγρος, ὑπὸ μυραίνης. ὁ δὲ πόλεμός ἐστι τοῖς κρείττοσι πρὸς τοὺς ἥττους· κατεσθίει γὰρ ὁ κρείττων. καὶ περὶ μὲν τῶν θαλαττίων ταῦτα.

ΚΕΦΑΛ. γ'.

Προβάτων καὶ αἰγῶν ἤθη.

ΤΑ δ' ἤθη τῶν ζώων, ὥσπερ εἴρηται πρότερον, διαφέρει κατά τε δειλίαν καὶ πρᾳότητα, καὶ ἀνδρίαν καὶ ἡμερότητα, καὶ νοῦν τε καὶ ἄνοιαν. τό, τε γὰρ τῶν προβάτων ἦθος, ὥσπερ λέγεται, εὔηθες, καὶ ἀνόητον. πάντων γὰρ τῶν τετραπόδων κάκιστον ἐστι, καὶ ἕρπει εἰς τὰς ἐρημίας πρὸς οὐδὲν, καὶ πολλάκις χειμῶνος ὄντος, ἐξέρχεται ἔνδοθεν. καὶ ὅταν ὑπὸ τοῦ νιφετοῦ ληφθῶσιν, ἂν μὴ κινήσῃ ὁ ποιμὴν, οὐκ ἐθέλουσιν ἀπιέναι, ἀλλ' ἀπόλλυνται καταλειπόμενα, ἐὰν μὴ ἄρρενας κομίσωσιν οἱ ποιμένες· τότε δ' ἀκολουθοῦσι. τῶν δ' αἰγῶν ὅταν τις μιᾶς λάβηται τὸ ἄκρον τοῦ ἠρύγγου, (ἔστι δὲ οἷον θρίξ) αἱ ἄλλαι ἑστᾶσιν ὥσπερ * μεμωρανθεῖσαι, καὶ βλέπουσιν εἰς ἐκείνην. ἐγκαθεύδει δὲ ψυχρότεραι αἱ οἶες αἰγῶν· αἱ γὰρ αἶγες, * μᾶλλον μηρυκάζουσι, καὶ προσοικειοῦνται πρὸς τοὺς ἀνθρώπους. εἰσὶ δὲ αἶγες δυσριγότεραι τῶν οἰῶν. διδάσκουσι δ' οἱ ποιμένες τὰ πρόβατα συνθεῖν, ὅταν ψοφήσῃ. ἐὰν γὰρ βροντήσαντος, ὑπολειφθῇ τις, καὶ μὴ συνδράμῃ, ἐκτιτρώσκει, ἐὰν τύχῃ κύουσα. διὸ ἐὰν ψοφήσῃ, ἐν τῇ οἰκίᾳ συνθέουσι, διὰ τὸ ἔθος. ἀπόλλυνται δὲ καὶ οἱ ταῦροι, ὅταν ἀπαγελήσαντες ἀποπλανηθῶσιν, ὑπὸ θηρίων. κατακεῖνται δὲ αἱ οἶες καὶ αἶγες ἀθρόαι κατὰ συγγένειαν.

* Scrib. συνόδοντες, vel συνόδοντες.

* Gesnerus legit μύξωνες.

* Sylb. μεμωραμέναι vel μεμωρωμέναι.

* G. μᾶλλον ἡσυχάζουσι.

ὅταν δ' ὁ ἥλιος * τραπῇ θᾶττον, φασὶν οἱ ποιμένες οὐκέτι ἀντιβλεπούσας κατακεῖσθαι τὰς αἶγας, ἀλλ' ἀπεστραμμένας ἀπ' ἀλλήλων.

* γρ. τραπῇ, ... cominus fe- cet.

ΚΕΦΑΛ. δʹ.

Βοῶν καὶ ἵππων ἤθη.

ΑΙ δὲ βόες, καὶ νέμονται καθ' ἑταιρείας καὶ συνηθείας· καὶ μία ἀποπλανηθῇ, ἀκολουθοῦσιν αἱ ἄλλαι· διὸ καὶ οἱ βουκόλοι, ἐὰν μίαν μὴ εὕρωσιν, εὐθὺς πάσας ἐπιζητοῦσι. τῶν δ' ἵππων αἱ συννόμοι ὅταν ἡ ἑτέρα ἀπόληται, ἐκτρέφουσι τὰ πῶλα ἀλλήλων. καὶ ὅλως γε δοκεῖ τὸ τῶν ἵππων γένος εἶναι φύσει φιλόστοργον. σημεῖον δέ· πολλάκις γὰρ αἱ στεῖραι ἀφαιρούμεναι τὰς μητέρας, τὰ πῶλα αὐταὶ στέργουσι· διὰ δὲ τὸ μὴ ἔχειν γάλα, διαφθείρουσι.

ΚΕΦΑΛ. εʹ.

Ἐλάφων ἤθη.

ΤΩν δ' ἀγρίων καὶ τετραπόδων, ἡ ἔλαφος οὐχ ἥκιστα δοκεῖ εἶναι φρόνιμον, τῷ τε τίκτειν παρὰ τὰς ὁδούς (τὰ γὰρ θηρία διὰ τοὺς ἀνθρώπους οὐ προσέρχεται) καὶ ὅταν τέκῃ, ἐσθίει τὸ χορίον πρῶτον. καὶ ἐπὶ τὴν σέσελιν δὲ τρέχουσι, καὶ φαγοῦσαι, οὕτως ἔρχονται πρὸς τὰ τέκνα πάλιν. ἔτι δὲ τὰ τέκνα ἄγει ἐπὶ τοὺς σταθμούς, ἐθίζουσα οὗ δεῖ ποιεῖσθαι τὰς ἀποφυγάς· ἔστι δὲ τοῦτο πέτρα ἀπορρώξ, μίαν ἔχουσα εἴσοδον· οὗ δὴ καὶ ἀμύνεσθαί φασιν ὑπομένουσαν. ἔτι δ' ὁ ἄῤῥην, ὅταν γένηται παχύς, (γίνεται δὲ σφόδρα πίων ὀπώρας οὔσης) οὐδαμοῦ ποιεῖ ἑαυτὸν φανερόν, ἀλλ' ἐκτοπίζει, ὡς διὰ τὴν παχύτητα εὐάλωτος ὤν. ἀποβάλλουσι δὲ καὶ τὰ κέρατα ἐν τόποις χαλεποῖς καὶ δυσεξευρέτοις· ὅθεν [καὶ] ἡ παροιμία γέγονεν, Οὗ αἱ ἔλαφοι τὰ κέρατα ἀποβάλλουσιν. ὥσπερ γὰρ ὅπλα ἀποβεβληκυῖαι, φυλάττονται ὁρᾶσθαι. λέγεται δ' ὡς τὸ ἀριστερὸν κέρας οὐδείς πω ἑώρακεν. ἀποκρύπτει γὰρ * αὐτό, ὡς ἔχον τινὰ φαρμακείαν. οἱ μὲν οὖν ἐνιαύσιοι, οὐ φύουσι κέρατα, πλὴν ὥσπερ σημείου χάριν, ἀρχήν τινα. τοῦτο δ' ἐστὶ βραχὺ καὶ δασύ. φύουσι δὲ διετεῖς πρῶτον τὰ κέρατα εὐθέα, καθάπερ παττάλους· διὸ καὶ καλοῦσι τότε παττάλας αὐτούς. τῷ δὲ τρίτῳ ἔτει δίκερων φύουσι, τῷ δὲ τετάρτῳ τραχύτερον. καὶ τοῦτον τὸν τρόπον αἰεὶ ἐπιδιδόασι μέχρι ἓξ ἐτῶν. ἀπὸ τούτου δὲ ὅμοια ἀεὶ ἀναφύουσιν, ὥστε μηκέτι ἂν γνῶναι τὴν ἡλικίαν τοῖς κέρασιν. ἀλλὰ τοὺς γέροντας γνωρίζουσι μάλιστα δυοῖν σημείοιν. ὀδόντας τε γὰρ οἱ μὲν ὅλως οὐκ ἔχουσιν, οἱ δ', ὀλίγους· καὶ τοὺς ἀμυντῆρας οὐκέτι φύουσι. καλοῦνται δ' ἀμυντῆρες, τὰ προνενευκότα τῶν φυομένων κεράτων εἰς τὸ πρόσθεν, οἷς ἀμύνονται. ταῦτα δ' οἱ γέροντες οὐκ ἔχουσιν, ἀλλ' εἰς τὸ ὀρθὸν γίνεται ἡ αὔξησις αὐτοῖς τῶν κεράτων. ἀποβάλλουσι δ' ἀνὰ ἕκαστον ἐνιαυτὸν τὰ κέρατα· ἀποβάλλουσι δὲ περὶ τὸν θαργηλιῶνα μῆνα. ὅταν δ' ἀποβάλλωσι, κρύπτουσιν ἑαυτοὺς τὴν ἡμέραν, ὥσπερ εἴρηται. κρύπτονται δ' ἐν τοῖς δασέσιν, εὐλαβούμενοι τὰς μυίας. νέμονται δὲ τὸν χρόνον τοῦτον ἐν τοῖς δασέσι νύκτωρ, μέχριπερ ἂν ἐκφύσωσι τὰ κέρατα. φύεται δ' ὥσπερ ἐν δέρματι τὸ πρῶτον, καὶ γίνονται δασέα·

* γρ. αὐτὰς. Fort. αὐταί.

A Cùm primùm Sol conuerſus deſtiterit, capras nõ aduerſis præterea inter ſe oculis, ſed auerſis, cubare accepimus.

CAPVT IV.

De ſocietate boum, equarumque mutuo inter ſe amore.

BOues & paſcunt per ſocietates, atque cõſuetudines, &, ſi vnus aberrarit, reliqui ſequuntur. Quapropter boarij niſi præuenerint, totum armentum requirant, neceſſe eſt. Equæ ſocietate B coniunctæ: ſi altera fortè perierit, altera pullum parente orbatum enutrit. Equarum denique genus miro quodam amore prolis teneri putatur: cuius rei indicium eſt, quòd ſæpius ſteriles, auferunt pullos à matribus, quos ipſæ amore proſequentes tueantur: ſed quoniam lacte careant, deprauant eos quos diligunt.

CAPVT V.

De ceruæ prudentia in pullis edendis, déque maris ceruinum amiſſione & reparatione.

C FErarum quadrupedum cerua maximè prudẽtia præſtare videtur, tùm quia circa ſemitas pariat, quò ſcilicet belluæ propter homines minùs accedunt: tum etiam, quia cùm peperit, inuolucrum primum exedit, mox ſeſelim herbam petit, quam cùm ederit, redit ad prolem. Præterea hinnulum ducens in ſtabula, aſſuefacit, quo refugere debeat. Saxum hoc eſt abruptum, vno aditu, quo loco eam ſi quis inuadit, expectare repugnaréque affirmant. Mas itèm cum pinguerit, quod valde tempore fructuum fit, nuſquam apparet, ſed longè ſecedit, vt qui pondere ſuæ corpulentiæ capi ſe poſſe faciliùs ſentiat. Cornua etiam locis difficilibus amittit, & quà inueniri nequeant: vnde illud prouerbium ortum: Quà cerui amittũt cor- D nua. Quaſi enim ſua amiſerit arma, cauet ne inermis reperiatur. Cornu ſiniſtrum compertum eſſe à nemine adhuc fertur: occulit enim id, tanquam quodam medicamento præditum. Anniculis nondum cornua naſcuntur, niſi quoad indicij gratia ſit initium quoddam prætuberans, quod breue hirtúmque eſt. Bimis cornua primùm oriũtur ſimplicia, & recta, ad ſubularum ſimilitudinem: quamobrem ſubulones per id temporis eos vocant. Trimis bifida exeunt, quadrimis trifida, atque deinceps ad hunc modum procedit numerus vſque ad annum ſextum. ab hoc ſimilia ſemper prodeunt, ita ne ſit dignoſcere ætatem ramorum E numero. Sed ſenes cognoſcimus maximè indicio duplici illo: dentes enim aut nullos, aut paucos habent, atque adminiculis carent. Vocantur adminicula, rami qui imis cornibus prominent ante frontem, quibus in pugna vtuntur iuniores: ſenes autem carent. amittunt ſingulis annis cornua menſe Aprili, quæ cum amiſerint, occultant ſeſe interdiu, vt ſuperius dixi, idque opacis faciunt locis, vt muſcarum tædio vacent. Paſcuntur per id tempus noctu, donec recipiant cornua, quæ primùm quaſi cute veſtita & hirtiuſcula emittunt:

ſed cùm creuerint, ſoli exponũt, vt excoquantur, A & ſiccent. Vbi iam nihil attritu arborum, cùm eã ſcalpant, indolent, tunc ea relinquunt loca, confiſi habere iam quo repugnare poſſint, cùm res exigit. Captus iam ceruus eſt, hederam ſuis enatam cornibus gerens viridem, quæ cornu adhuc tenello fortè inſerta, quaſi ligno viridi coaluerit. Cerui morſi vel à phalangio, vel à quouis generis eiuſdẽ, cancros edunt: quod idem homini etiam prodeſſe putatur, ſed non caret faſtidio. Ceruæ ſtatim à partu exedunt inuolucrum, vt dictum eſt: nec fieri poteſt, vt id accipias. Priùs enim quàm in terram demittant, ipſæ arripiunt. Vis in eo medica eſſe creditur. Cerui ſibilo & cantu venantium capiuntur: mulcentur enim alliciuntúrque ea voluptate. B Itaque alter venantium cantat palam, aut ſibilat, alter clàm ferit à tergo, vbi ſocius tempus iam eſſe ſignificarit. Sed ſi ceruus erectas auriculas teneat, acerrimè ſentit, nec latere inſidiæ poſſunt: ſin demiſſas, facilè interimitur.

CAPVT VI.

De quibuſdam animalibus, quæ prudentia quadam natura inſtituit.

VRſæ cùm fugiunt, ſuos catulos propellunt, ſuſceptóſque portant: cùm ab inſectante iam occupantur, arbores ſcandunt. Solent vrſi arum C herbam comedere cùm è latibulo egrediuntur, vt dictum eſt. Ligna etiam manducant, quaſi dentiant. Sed ex cæteris quoque quadrupedibus multæ prudenter ſibi opitulari videntur. Nam & in Creta inſula capras ſylueſtres ſagitta transfixas dictamnum herbam quærere aiunt: hoc enim ſpicula ex corpore eijci. Canes etiam ægreſcentes herba quadam comeſa vomitant. Panthera cùm venenum, pardalianches dictum ab angore, ederit, quo leones etiam intereunt, ſtercus hominis quærit: eo enim ipſo iuuatur. Quocirca venatores ſtercus ibi propinquum ſuſpendunt ex arbore aliqua, ne procul bellua abeat, petẽs ſuum medicamentum. Itaque inſiliens ibidem, & ſpe capiendi perſeuerans, in ſe efferenda emoritur. D Eandem ſeſe abſcondentem venari ferunt, propterea quòd ſuo odore belluas delectari intelligat. Propius enim ita accedunt, quas corripiat. Ichneumo Ægypti, vbi aſpidem anguem ſuum hoſtem aſpexerit, non prius aggreditur, quàm ſocios vocet, & limo obducto, contra ictus morſúſque ſeſe loricet. Modus armandi, vt primùm madefaciat corpus, & in terra ſe volutet. Crocodilis hiantibus trochili aues inuolantes depurgant dentes, quo munere & ipſi aluntur: & crocodilus ſentiens ſecum commodè agi, nihil nocet, ſed cùm egredi auem vult, ceruices mouet, ne comprimat. Teſtudo cum viperam ederit, mox cu- E nilam edit. Quod cum ita ſæpius factum animaduertiſſet quidã, vt guſtata cunila viperam teſtudo repeteret, herbam euulſit, quo facto teſtudo interiit. Muſtela quoties dimicatura cum ſerpente eſt, rutam comedit. odor etenim eius herbæ infeſtus ſerpentibus eſt. Draco cum per vſum pomorum nauſea infeſtatur, ſuccum ſylueſtris lactucæ exorbet: quod ita facere viſus ſæpius eſt.

A ὅταν δ' αὐξηθῶσιν, ἡλιάζονται, ἵν' ἐκπέψωσι καὶ ξηράνωσι τὰ κέρας. ὅταν δὲ μηκέτι πονῶσι, πρὸς τὰ δένδρα κνώμενοι αὐτὰ, τότε ἐκλείπουσι τοὺς τόπους τούτους, διὰ τὸ θαρρεῖν, ὡς ἔχοντες ᾧ ἀμυνοῦνται. ἤδη δὲ εἴληπται ἀγραία ἔλαφος, ἐπὶ τῶν κεράτων ἔχων κιττὸν πολὺν πεφυκότα χλωρὸν, ὡς ἁπαλῶν ὄντων τῶν κεράτων ἐμφυέντα, ὥσπερ ἐν ξύλῳ χλωρῷ. ὅταν δὲ δηχθῶσιν αἱ ἔλαφοι ὑπὸ φαλαγγίου, ἤ τινος τοιούτου, τοὺς καρκίνους συλλέγουσαι ἐσθίουσι. δοκεῖ δὲ καὶ ἀνθρώπῳ ἀγαθὸν εἶναι τοῦτο πίνειν, ἀλλ' ἐστὶν ἀηδές. αἱ δὲ θήλειαι τῶν ἐλάφων, ὅταν τέκωσι, εὐθὺς κατεσθίουσι τὸ χορίον, καὶ οὐκ ἔστι λαβεῖν. πρὶν γὰρ τὸ χαμαὶ B βαλεῖν, αὐταὶ ἅπτονται. δοκεῖ δὲ τοῦτ' εἶναι φάρμακον. ἁλίσκονται δὲ θηρευόμεναι αἱ ἔλαφοι συριττόντων καὶ ᾀδόντων, ὥστε καὶ * κατακηλοῦνται ὑπὸ τῆς ἡδονῆς. δυοῖν δ' ὄντων, ὁ μὲν, φανερῶς ᾄδει, ἢ συρίττει· ὁ δὲ, ἐκ τοῦ ὄπισθεν βάλλει, ὅταν ἐκεῖνος σημήνῃ τὸν καιρόν. ἐὰν μὲν οὖν τύχῃ ὀρθὰ τὰ ὦτα ἔχουσα, ὀξὺ ἀκούει, καὶ οὐκ ἔστι λαθεῖν· ἐὰν δὲ καταβεβληκυῖα τύχῃ, λανθάνει.

* γρ. καταπαύονται

ΚΕΦΑΛ. ϛʹ.

Ζώων τινῶν φρόνησις περί τε τἄλλα, καὶ περὶ τὰ φάρμακα.

AΙ δ' ἄρκτοι, ὅταν φεύγωσι, τὰ σκυμνία προωθοῦσι, καὶ ἀναλαβοῦσαι φέρουσιν· ὅταν δὲ ἐπικαταλαμβάνωνται, C ἐπὶ τὰ δένδρα ἀναπηδῶσι. καὶ ὅταν ἐκ τοῦ φωλεοῦ ἐξέλθωσι, πρῶτον τὸ ἄρον ἐσθίουσιν, ὥσπερ εἴρηται * πρότερον· καὶ τὰ ξύλα διαμασῶνται, ὥσπερ ὀδοντοφυοῦσαι. πολλὰ δὲ καὶ τῶν ἄλλων ζώων τῶν τετραπόδων ποιεῖ πρὸς βοήθειαν ἑαυτοῖς φρονίμως· ἐπεὶ καὶ ἐν Κρήτῃ φασὶ τὰς αἶγας τὰς ἀγρίας, ὅταν τοξευθῶσι, ζητεῖν τὸ δίκταμνον. δοκεῖ γὰρ τοῦτο ἐκβλητικὸν εἶναι τῶν τοξευμάτων ἐν τῷ σώματι. καὶ αἱ κύνες δὲ, ὅταν τι πονῶσιν, ἔμετον ποιοῦσι, φαγοῦσαι τινὰ πόαν. ἡ δὲ πάρδαλις, ὅταν φάγῃ τὸ φάρμακον τὸ παρδαλιαγχὲς, ζητεῖ τὴν τοῦ ἀνθρώπου κόπρον. βοηθεῖ γὰρ αὐτῇ. διαφθείρει δὲ τοῦτο τὸ φάρμακον καὶ λέοντας. διὸ καὶ οἱ κυνηγοὶ κρεμαννύουσιν ἐν ἀγγείῳ ἔκ τινος D δένδρου τὴν κόπρον, ὅπως μὴ ἀποχωρῇ μακρὰν τὸ θηρίον. αὐτοῦ γὰρ προσαλλομένη ἡ πάρδαλις, καὶ ἐλπίζουσα λήψεσθαι, τελευτᾷ. λέγουσι δὲ καὶ καταμεμαθηκυῖαν τὴν πάρδαλιν ὅτι τῇ ὀσμῇ αὐτῆς χαίρουσι τὰ θηρία, ἀποκρύπτουσαν ἑαυτὴν, θηρεύειν. προσιέναι γὰρ ἐγγὺς, καὶ λαμβάνειν οὕτω καὶ τὰς ἐλάφους. ὁ δὲ ἰχνεύμων ὁ ἐν Αἰγύπτῳ, ὅταν ἴδῃ τὸν ὄφιν τὴν ἀσπίδα καλουμένην, οὐ πρότερον ἐπιτίθεται, πρὶν συγκαλέσῃ βοηθοὺς ἄλλους· πρὸς δὲ τὰς πληγὰς καὶ τὰ δήγματα πηλῷ καταπλάττουσιν ἑαυτούς. βρέξαντες γὰρ ἐν τῷ ὕδατι πρῶτον, οὕτω καλινδοῦνται E ἐν τῇ γῇ. τῶν δὲ κροκοδείλων χασκόντων, οἱ τροχίλοι καθαίρουσιν εἰσπετόμενοι τοὺς ὀδόντας· καὶ αὐτοὶ μὲν, τροφὴν λαμβάνουσιν· ὁ δ', ὠφελούμενος αἰσθάνεται, καὶ οὐ βλάπτει· ἀλλ' ὅταν ἐξελθεῖν βούληται, κινεῖ τὸν αὐχένα, ἵνα μὴ συνδάκῃ. ἡ δὲ χελώνη, ὅταν ἔχεως φάγῃ, ἐπεσθίει τὴν ὀρίγανον· καὶ τοῦτο ὦπται· καὶ ἤδη κατιδών τις τοῦτο πολλάκις ποιοῦσαν αὐτὴν, καὶ ἐπειδὴ * γευσαμένη τῆς ὀριγάνου, πάλιν ἐπὶ τὸν ἔχιν προσβαδιζομένην, ἐξέτιλε τὸ ὀρίγανον· τούτου δὲ συμβάντος, ἀπέθανεν ἡ χελώνη. ἡ δὲ γαλῆ, ὅταν ὄφει μάχηται, ἐπεσθίει τὸ πήγανον. πολεμία γὰρ ἡ ὀσμὴ τοῖς ὄφεσιν. ὁ δὲ δράκων, ὅταν ὀπωρίζῃ, τὸν ὀπὸν τῆς πικρίδος ἐκροφεῖ. καὶ τοῦτ' ἑώραται ποιῶν.

* Lib. 8. c. 17.

* Scrib. γευσαμένην, vel ἐμφαγοῦσαν

αἱ δὲ κύνες, ὅταν ἑλμινθιῶσιν, ἐσθίουσι τοῦ σίτου τὸ λήϊον. οἱ δὲ πελαργοὶ, καὶ οἱ ἄλλοι τῶν ὀρνίθων, ὅταν ἑλκωθῶσί τι μαχόμενοι, ἐπιτιθέασι τὴν ὀρίγανον. πολλοὶ δὲ καὶ τὴν ἀκρίδα ἑωράκασιν, ὅτι, ὅταν μάχηται τοῖς ὄφεσι, λαμβάνεται τοῦ τραχήλου τῶν ὄφεων. φρονίμως δὲ δοκεῖ καὶ ἡ γαλῆ χειροῦσθαι τοὺς ὄρνιθας. σφάζει γὰρ ὥσπερ οἱ λύκοι τὰ πρόβατα. μάχεται δὲ καὶ τοῖς ὄφεσι μάλιστα τοῖς μυοθήραις, διὰ τὸ καὶ αὐτὴν τοῦτο τὸ ζῷον θηρεύειν. περὶ δὲ τῆς τῶν ἐχίνων αἰσθήσεως συμβέβηκε πολλαχοῦ τεθεωρῆσθαι, ὅτι μεταβαλλόντων βορέων καὶ νότων, οἱ μὲν ἐν τῇ γῇ, τὰς ὀπὰς αὐτῶν μετακινοῦσιν· οἱ δ' ἐν ταῖς οἰκίαις τρεφόμενοι, μεταβάλλουσι πρὸς τοὺς τοίχους. ὥστ' ἐν Βυζαντίῳ γέ τινά φασι προλέγοντα λαβεῖν δόξαν ἐκ τοῦ κατανενοηκέναι ταῦτα ποιοῦντα τὸν ἐχῖνον. ἡ δ' ἴκτις, ἔστι μὲν τὸ μέγεθος ἡλίκον Μελιταῖον κυνίδιον τῶν μικρῶν· τὴν δὲ δασύτητα καὶ τὴν ὄψιν, καὶ τὸ λευκὸν τὸ ὑποκάτω, καὶ τοῦ ἤθους τὴν κακουργίαν, ὅμοιον γαλῇ· καὶ τιθασὸν γίνεται σφόδρα, τὰ δὲ σμήνη κακουργεῖ· τῷ γὰρ μέλιτι χαίρει. ἔστι δὲ καὶ ὀρνιθοφάγον, ὥσπερ αἱ αἴλουροι. τὸ δ' αἰδοῖον αὐτῆς ἐστι μὲν, ὥσπερ εἴρηται, ὀστοῦν· δοκεῖ δ' εἶναι φάρμακον στραγγουρίας τὸ τοῦ ἄρρενος· διδόασι δ' ἐπιξύοντες.

ΚΕΦΑΛ. ζ.

Χελιδόνων καὶ περιστερῶν καὶ τρυγόνων καὶ φαττῶν μιμήματα τῆς ἀνθρωπίνης ζωῆς· αὐτῶν τε καὶ περδίκων καὶ στρουθίων ἡλικίαι.

Ὅλως δὲ περὶ τοὺς βίους πολλὰ ἂν θεωρηθείη μιμήματα τῶν ἄλλων ζῴων τῆς ἀνθρωπίνης ζωῆς· καὶ μᾶλλον ἐπὶ τῶν ἐλαττόνων ἢ μειζόνων ἴδοι τις ἂν τὴν τῆς διανοίας ἀκρίβειαν· οἷον πρῶτον ἐπὶ τῶν ὀρνίθων ἡ τῆς χελιδόνος σκηνοπηγία. τῇ γὰρ περὶ τὸν πηλὸν ἀχυρώσει τὴν αὐτὴν ἔχει τάξιν. συγκαταπλέκει γὰρ τοῖς κάρφεσι πηλόν· κἂν ἀπορῇ πηλοῦ, βρέχουσα αὑτὴν, καλινδεῖται τοῖς πτεροῖς πρὸς τὴν κόνιν. ἔτι δὲ στιβάδα ποιεῖται, καθάπερ οἱ ἄνθρωποι τὰ σκληρὰ πρῶτα ὑποτιθεῖσα, καὶ τῷ μεγέθει σύμμετρον ποιοῦσα πρὸς αὑτήν. περί τε τὴν τροφὴν τῶν τέκνων ἐκπονεῖται ἀμφότερα. δίδωσι δὲ ἑκατέρῳ διατηροῦσα τινὶ συνηθείᾳ τὸ προειληφὸς, ὅπως μὴ δὶς λάβῃ. καὶ τὴν κόπρον τὸ πρῶτον αὐταὶ ἐκβάλλουσιν· ὅταν δὲ αὐξηθῶσι, μεταστρέφοντας ἔξω, διδάσκουσι τοὺς νεοττοὺς προΐεσθαι. περί τε τὰς περιστερὰς ἐστιν ἕτερα τοιαύτην ἔχοντα τὴν θεωρίαν. οὔτε γὰρ * συνδυάζεσθαι θέλουσι πλείοσιν, οὔτε προαπολείπουσι τὴν κοινωνίαν, πλὴν ἐὰν χῆρος ἢ χήρα γένηται. ἔστι δὲ περὶ τὴν ὠδῖνα δεινὴ ἡ τοῦ ἄρρενος θεραπεία καὶ συναγανάκτησις· ἐάν τε ἀπομαλακίζηται πρὸς τὴν εἴσοδον τῆς νεοττιᾶς, διά τε τὴν λοχείαν, τύπτει καὶ ἀναγκάζει εἰσιέναι· γενομένων δὲ τῶν νεοττῶν, φροντίζει τῆς * ἀρμυριζούσης γῆς· ἧς διαμασησάμενος, εἰσπτύει τοῖς νεοττοῖς διοιγνὺς τὸ στόμα· προπαρασκευάζων πρὸς τὴν τροφήν. ὅταν δ' ἐκ τῆς νεοττιᾶς ἐξάγειν μέλλῃ, πάντας ὁ ἄρρην ὀχεύει. ὡς μὲν οὖν ἐπὶ τὸ πολὺ, τοῦτον τὸν τρόπον στέργουσιν ἀλλήλας. παροχεύονται δέ ποτε καὶ τῶν τοὺς ἄρρενας ἐχουσῶν τινες. ἔστι δὲ μάχιμον τὸ ζῷον, καὶ ἐνοχλοῦσιν ἀλλήλας, καὶ εἰς τὰς νεοττιὰς παραδύονται τὰς ἀλλήλων ὀλιγάκις μέντοι· καὶ γὰρ ἂν ἄποθεν ἧττον ἢ,

* γ. συνωτάζεσθαι, vtramque lectionem expreſſit Gaza.

* Gaza, ἁλμυριζούσης. ſic & Plinius.

A Canes cùm lumbricis infeſtantur, herbam tritici comedunt. Ciconiæ cæteræque aues cùm vulnus per pugnam acceperint, cunilam plagæ apponũt. Locuſtam etiam complures viderunt, quoties cũ ſerpente pugnat, collum eius prehendere. Quin & muſtela prudenter capere aues videtur: iugulat enim quas ceperit, vt lupus ouem. Serpentẽ quoque impugnat, cum præcipuè qui mures venantur, videlicet ea cauſa, quia ipſa etiam mures perſequitur. De herinaceorum ſenſu locis multis perpenſum eſt, vt qui in cauernis ſunt, commutent ſua cubilia, Aquilonum & Auſtrorum mutatione: qui autem intra tecta aluntur, ad parietes diſcedunt:
B Quod ita fieri cùm Byzantij quidam animaduertiſſet, conſecutus exiſtimationem eſt, vt tempus futurum poſſet præſagire. Ictis genus muſtolæ ruſticæ, quod viuerram interpretor, magnitudine eſt, quàm melitenſis catellus minor: ſed pilo, forma, albedine partis inferioris, & morum aſtutia, muſtelæ ſimilis. Manſueſcit maiorem in modum. Officit aluearibus: mellis enim auida eſt. aues etiam petit, vt felis. Genitale eius oſſeum eſt, vt antè dixi, & medicamento vrinæ ſtillationibus eſſe putatur. Datur per ramenta ex vino.

CAPVT VII.

C *De ea intelligentiæ parte, qua animalia quædam hominum rationem repræſentant, vt hirundines, & omne columbaceum genus: déque ætate columbarum, perdicum, & paſſerum.*

Omnino ratio brutorum magnam refert vitæ humanæ ſimilitudinem, magiſque in minore genere quàm in maiore videris intelligentiæ rationem. Quod primùm in auium genere hirundo in effingendo conſtituendóque nido oſtendit. Confingit implicito luto feſtucis, ad normam lutariæ paleationis: & ſi quando luti inopia eſt, ſe ipſa madefaciens volutat
D in puluere omnibus pennis. Stragulum ſibi etiam more hominum facit, duriora primùm ſubijciens, & modicè totum conſternens pro ſui corporis magnitudine: atque in enutrienda prole mira tam mas quàm fœmina æquitate laborat. Impartit pullis ſingulis cibum, obſeruans conſuetudine quadam, ne qui acceperit, bis accipiat. Excrementa etiam pullorum parentes eijciunt: poſt adultiores iam natos circu nagi, foráſque ipſos egerere edocent. Adhæc, columbi pleráque contemplationis huiuſmodi afferunt: neque enim cum pluribus adoleſcere, aut coire patiuntur, neque coniugium iam inde à primo ortu initum deſerunt, niſi cælebs aut vidua. Quin-
E etiam fœminæ parturienti mas adeſt, & cultu omnique officio fungitur. Sæpe etiam fœminam pigriùs euntem ad nidum propter partus laborem mas percutit, cogitque intrare. Excluſis iam pullis terram ſalſuginoſam potiſſimùm præmanducatam in eorum os, inferens ſuum, ingerit, atque ita præparat ad cibum recipiendum. adultos iam, cùm tempus prodeundi ex nido eſt, mas ſubigit. Ita magna ex parte columbæ mutuo degunt amore. Sed interdum nonnullæ etiam ex maritatis cum alijs coeunt. Pugnax hoc animal eſt: alter alterum infeſtat, nidúmque alter alterius ſubit, ſed rarò. Nam etſi ex longinquo minùs,

tamen apud ipſum nidum ſummo certamine dimicatur. Proprium columbarum, & palumbium, & turturum eſſe videtur, ne collum, cùm bibunt, reſupinent, niſi ſatis hauſerint. Mare vno contenta, & turtur, & palumbes viuit, nec alterum recipit. Incubant ambo, & mas & fœmina. Dignoſci máſne an fœmina ſit, haud facile eſt, niſi interiorum aſpectu. Vita palumbibus longa: nam ad vigeſimumquintum & ad trigeſimum annum protrahitur. Nonnullas quadraginta etiam annos compleuiſſe exploratũ habetur. Ætate autem prouectis vngues accreſcunt, quos recidere ſolent, qui alunt. Nihil, quo lædantur apertè, aliud his ſeneſcentibus accidit. Turtures, & columbæ vel ad annum octauum viuunt, ſcilicet quæ excæcatæ allectatrices aluntur. Perdicibus vita ad quinque & viginti annos. Nidulantur & palumbes & turtures ſemper locis eiſdem. Et cùm mares in totum diuturniores quàm fœminæ ſint, in his marem priùs quàm fœminam, mori nonnulli aiunt, videlicet documento earum quæ domi allectatrices aluntur. Sunt qui paſſerum etiam mares anno diutius durare non poſſe arbitrentur, argumento quòd vèris initio nulli mentum habere nigrũ ſpectentur, ſed poſtea, tanquam nullus anni ſuperioris ſeruetur. Fœminas verò hoc in genere eſſe viuaciores volunt: capi enim has cum nouellis, cognoſcique labrorum callo aſſeuerant. Degunt æſtate turtures locis frigidis, hyeme tepidis: fringillæ contrà, æſtate tepidis, hyeme frigidis.

CAPVT VIII.

De iis auibus quæ nidum non ædificant, déque Perdicis aſtutia.

AVes grauiores nidos ſibi non faciunt, vt coturnices, vt perdices, & reliquæ generis eiuſdem. Quibus enim volandi facultas deeſt, iis nidus non prodeſt, ſed facta in aprico area, (alibi enim nuſquam pariunt) atque materia, vt vepribus quibuſdam congeſtis, quoad accipitrum & aquilarum iniuriam deuitare poſſint, oua edunt, & incubant. Mox cùm excluſerint, protinus pullos educunt, proptereà quòd nequeunt ſuo volatu iis cibum adminiſtrare. Refouent ſuos pullos ſub ſe ipſæ ducendo, more gallinarum, & coturnices, & perdices: nec in eodem loco & pariũt, & incubãt, ne quis locum percipiat longioris temporis mora. Cùm ad nidum quis venãdo acceſſerit, prouoluit ſeſe perdix ante pedes venantis, quaſi iam poſſit capi, atque ita allicit ad ſe capiendam, hominem, eouſque dum pulli effugiant: tum ipſa auolat, & reuocat prolem. Parit oua non pauciora quàm decẽ, ſed ſæpius ſedecim. Malitioſa aſtutáque auis hæc eſt, vt dixi. Secernuntur verno tẽpore de grege per cantũ & pugnam, cõiugatim mares cũ fœminis, quãcunque ſibi quiſque fortè acceperit. Oua mares quæ cõpererint, peruoluunt, & frangunt præ ſua ſalacitate, ne fœmina incubet. Quod ne accidat fœmina emoliens, clanculum diffugiens parit. Sed fit ſæpius, vt præ turgore parturiendi quolibet loco edat, & mare præsẽti: verùm vt oua ſeruentur, nũquã ex eo, quo peperit, loco diſcedit.

ἀλλὰ περί γε τὴν νεοττιὰν διαμάχονται ἐσχάτως. ἴδιον δὲ ταῖς περιστεραῖς δοκεῖ συμβεβηκέναι, καὶ ταῖς φάτταις καὶ τρυγόσι, τὸ μὴ ἀνακύπτειν πινούσας, ἐὰν μὴ ἱκανὸν πίωσιν. ἔχει δὲ τὸν ἄρρενα ἡ τρυγὼν τὸν αὐτὸν καὶ φάττα, καὶ ἄλλον οὐ * προσίενται, καὶ ἐπῳάζουσιν ἀμφότεροι καὶ ὁ ἄρρην καὶ ἡ θήλεια. διαγνῶναι δ' οὐ ῥᾴδιον τὴν θήλειαν καὶ τὸν ἄρρενα, ἀλλ' ἢ τοῖς ἐντός. ζῶσι δ' αἱ φάτται πολὺν χρόνον. καὶ γὰρ εἴκοσιν ἔτη καὶ πέντε καὶ τριάκοντα ὠμμέναι εἰσίν· ἔνιαι δὲ καὶ τετταράκοντα ἔτη. πρεσβυτέρων δὲ γινομένων αὐτῶν, οἱ ὄνυχες αὐξάνονται· ἀλλ' ἀποτέμνουσιν οἱ τρέφοντες. ἄλλο δ' οὐδὲν βλάπτονται ἐπιδήλως γηράσκουσαι. καὶ αἱ τρυγόνες δὲ καὶ αἱ περιστεραὶ ζῶσι καὶ ὀκτὼ ἔτη, αἱ τετυφλωμέναι ὑπὸ τῶν παλευτείας τρεφόντων αὐτάς. ζῶσι δὲ καὶ οἱ πέρδικες περὶ πεντεκαίδεκα ἔτη. νεοττεύουσι δὲ καὶ αἱ φάβες καὶ αἱ τρυγόνες ἐν τοῖς αὐτοῖς τόποις ἀεί. πολυχρονιώτερα δ' ὅλως μέν ἐστι τὰ ἄρρενα τῶν θηλέων· ἐπὶ δὲ τούτων τελευτᾶν φασί τινες πρότερον τὰ ἄρρενα τῶν θηλειῶν, τεκμαιρόμενοι ἐκ τῶν κατ' οἰκίαν τρεφομένων παλευτριῶν. λέγουσι δέ τινες καὶ τῶν στρουθίων ἐνιαυτὸν μόνον ζῆν τοὺς ἄρρενας· ποιούμενοι σημεῖον, ὅτι τοῦ ἔαρος οὐ φαίνονται ἔχοντες εὐθὺς τὰ περὶ τὸν πώγωνα μέλανα, ὕστερον δ' ἴσχουσιν· ὡς οὐδενὸς σωζομένου τῶν προτέρων. τὰς δὲ θηλείας μακροβιωτέρας εἶναι τῶν στρουθίων. ταύτας γὰρ ἁλίσκεσθαι ἐν τοῖς νέοις, καὶ διαδήλας εἶναι τῷ ἔχειν τὰ * περὶ τὰ χείλη σκληρά. διάγουσι δ' αἱ μὲν τρυγόνες τοῦ θέρους ἐν τοῖς χειμερίοις, τοῦ δὲ χειμῶνος ἐν τοῖς ἀλεεινοῖς· αἱ δὲ σπίζαι τοῦ μὲν θέρους ἐν τοῖς ἀλεεινοῖς, τοῦ δὲ χειμῶνος ἐν τοῖς ψυχροῖς.

* Qu. προσίενται.

* χ. περὶ τὰ χ.

ΚΕΦΑΛ. η'.

Περὶ περδίκων πανουργίας καὶ ὀχείας καὶ θήρας.

ΟΙ δὲ βαρεῖς τῶν ὀρνίθων, οὐ ποιοῦνται νεοττιάς (οὐ συμφέρει γάρ, μὴ πτητικοῖς οὖσιν) οἷον ὄρτυγες καὶ πέρδικες, καὶ τἆλλα τὰ τοιαῦτα τῶν ὀρνέων· ἀλλ' ἐπειδὰν ποιήσωνται ἐν τῷ λείῳ κονίστραν, (ἐν ἄλλῳ γὰρ τόπῳ οὐθενὶ τίκτει) ἐπηλυγασάμενοι ἄκανθάν τινα καὶ ὕλην, τῆς * περὶ τοὺς ἱέρακας ἕνεκα καὶ τοὺς ἀετοὺς ἀλεωρᾶς, ἐνταῦθα τίκτουσι, καὶ ἐπῳάζουσιν. ἔπειτα ἐκλέψαντες εὐθὺς, ἐξάγουσι τοὺς νεοττούς, διὰ τὸ μὴ δύνασθαι τῇ πτήσει πορίζειν αὐτοῖς τὴν τροφήν. ἀναπαύονται δ', ὑφ' ἑαυτοὺς ἀγόμενοι τοὺς νεοττούς, καὶ οἱ ὄρτυγες καὶ οἱ πέρδικες, ὥσπερ αἱ ἀλεκτορίδες, καὶ οὐκ ἐν τῷ αὐτῷ τίκτουσι καὶ ἐπῳάζουσιν, ἵνα μή τις καταμονήσῃ τὸν τόπον, πλείω χρόνον προσεδρευόντων. ὅταν δέ τις θηρεύῃ περιπεσὼν τῇ νεοττιᾷ, προκυλινδεῖται ἡ πέρδιξ τοῦ θηρεύοντος, ὡς ἐπίληπτος οὖσα, καὶ ἐπισπᾶται, ὡς ληψόμενον, ἐφ' ἑαυτήν, ἕως ἂν διαδράσῃ τῶν νεοττῶν ἕκαστος. μετὰ δὲ ταῦτα ἀναπτᾶσα αὐτή, ἀνακαλεῖται πάλιν. τίκτει μὲν οὖν ᾠὰ ἡ πέρδιξ οὐκ ἐλάττω ἢ δέκα, πολλάκις δ' ἑκκαίδεκα. ὥσπερ δ' εἴρηται, κακόηθες τὸ ὄρνεόν ἐστι καὶ πανοῦργον. τοῦ δ' ἔαρος ἐκ τῆς ἀγέλης ἐκκρίνονται δι' ᾠδῆς καὶ μάχης κατὰ ζυγὴ μετὰ θηλείας, ἣν ἂν λάβῃ ἕκαστος. διὰ δὲ τὸ εἶναι ἀφροδισιαστικοὶ οἱ πέρδικες, ὅπως μὴ ἐπῳάζῃ ἡ θήλεια, οἱ ἄρρενες τὰ ᾠὰ διακυλινδοῦσι καὶ συντρίβουσιν, ἐὰν εὕρωσιν. ἡ δὲ θήλεια, ἀντιμηχανωμένη, ἀποδιδράσκουσα τίκτει· καὶ πολλάκις, διὰ τὸ ὀργᾶν τεκεῖν, ὅπου ἂν τύχῃ, ἐκβάλλει, ἂν παρῇ ὁ ἄρρην· καὶ ὅπως * σώζηται ἀθρόα, οὐκ ἔρχεται πρὸς αὐτά.

* Fort. περὶ τὰ

* Gaza, ε. τὰ ᾠά, ἃ ἀφορᾶται ἀπ' αὐτῶν.

καὶ ἐὰν ὑπ' ἀνθρώπου ὀφθῇ, ὥσπερ περὶ τοὺς νεοττοὺς, οὕτω καὶ ἀπὸ τῶν ᾠῶν ἀπάγει, πρὸ ποδῶν φαινομένη τοῦ ἀνθρώπου, ἕως ἂν ἀπαγάγῃ. ὅταν δ' ἀποδρᾶσα ἐπῳάζῃ, οἱ ἄρρενες κεκράγασι, καὶ μάχονται συνιόντες· καλοῦσι δὲ τούτους χήρους. ὁ δ' ἡττηθεὶς μαχόμενος, ἀκολουθεῖ τῷ νικήσαντι, ὑπὸ τούτου ὀχευόμενος μόνου· ἐὰν δὲ κρατηθῇ τις ὑπὸ τοῦ δευτέρου ἢ ὁποιουοῦν, οὗτος λάθρα ὀχεύεται ὑπὸ τοῦ κρατιστεύοντος. γίνεται δὲ τοῦτο οὐκ ἀεὶ, ἀλλὰ καθ' ὥραν τινὰ τοῦ ἔτους· καὶ ἐπὶ τῶν ὀρτύγων ὡσαύτως. ἐνίοτε δὲ συμβαίνει τοῦτο καὶ ἐπὶ τῶν ἀλεκτρυόνων. ἐν μὲν γὰρ τοῖς ἱεροῖς, ὅπου ἄνευ θηλειῶν ἀνάκεινται, τὸν ἀνατιθέμενον πάντες εὐλόγως ὀχεύουσι. καὶ τῶν περδίκων δ' οἱ τιθασοὶ τοὺς ἀγρίους πέρδικας ὀχεύουσι, καὶ ἐπικορίζουσι καὶ ὑβρίζουσιν. ἐπὶ δὲ τὸν θηρευτὴν πέρδικα ὠθεῖται τῶν ἀγρίων ὁ ἡγεμὼν, ἀντιάσας ὡς μαχούμενος. τούτου δ' ἁλόντος ἐν ταῖς πηκταῖς, πάλιν προσέρχεται ἄλλος, ἀντιάσας τὸν αὐτὸν τρόπον. ἐὰν μὲν οὖν ἄρρην ᾖ ὁ θηρεύων, τοῦτο ποιοῦσιν· ἐὰν δὲ θήλεια ἡ θηρεύουσα ᾖ, καὶ ᾄδουσα, ἀντιάσῃ δ' ὁ ἡγεμὼν αὐτῇ, οἱ ἄλλοι ἀθροισθέντες τύπτουσι τοῦτον, καὶ ἀποδιώκουσιν ἀπὸ τῆς θηλείας, ὅτι ἐκείνῃ ἀλλ' οὐκ αὐτοῖς προσέρχεται. ὁ δὲ, πολλάκις διὰ ταῦτα σιωπῇ προσέρχεται, ὅπως μὴ ἄλλος τῆς φωνῆς ἀκούσας, ἔλθῃ* μαχούμενος αὐτῷ. ἐνίοτε δέ φασιν οἱ ἔμπειροι τὸν ἄρρενα προσιόντα, τὴν θήλειαν καταστιγάζειν, ὅπως μὴ ἀκουσάντων τῶν ἀρρένων, ἀναγκασθῇ διαμάχεσθαι πρὸς αὐτούς. οὐ μόνον δὲ ὁ πέρδιξ ᾄδει, ἀλλὰ καὶ τετρυμὸν ἀφίησι, καὶ ἄλλας φωνάς. πολλάκις δὲ καὶ ἡ θήλεια ἐπῳάζουσα ἀνίσταται, ὅταν τῇ θηρευούσῃ θηλείᾳ αἴσθηται προσέχοντα τὸν ἄρρενα, καὶ ἀντιάσασα ὑπομένει, ἵνα ὀχευθῇ, καὶ ἀποσπάσῃ ἀπὸ τῆς θηρευούσης. οὕτω δὲ σφόδρα καὶ οἱ πέρδικες καὶ οἱ ὄρτυγες ἐπτόηνται περὶ τὴν ὀχείαν, ὥστ' εἰς τοὺς θηρεύοντας ἐμπίπτουσι, καὶ πολλάκις καθίζουσιν ἐπὶ τὰς κεφαλάς. περὶ μὲν οὖν τὴν ὀχείαν καὶ θήραν τῶν περδίκων, τοιαῦτα συμβαίνει, καὶ περὶ τὴν ἄλλην τοῦ ἤθους πανουργίαν. νεοττεύουσι δ' ἐπὶ τῆς γῆς, ὥσπερ εἴρηται, οἵ τε ὄρτυγες καὶ οἱ πέρδικες, καὶ τῶν ἄλλων ἔνιοι τῶν πτητικῶν. ἔτι δὲ τῶν τοιούτων, ὁ μὲν κόρυδος, καὶ ὁ σκολόπαξ καὶ ὄρτυξ, ἐπὶ δένδρου οὐ καθίζουσιν, ἀλλ' ἐπὶ τῆς γῆς.

* μαχούμενος

A Et ſi ab homine viſa eſt, ita ſe ab ouis aſtutè quemadmodum à pullis, ſubtrahit, labans ante hominis pedes, dum dimoueat. Sed cùm diffugerit fœmina vt incubet, mares tumultuant, clamitant, pugnámque inter ſe conferunt, quos cęlibes vocant. Qui autem victus in pugna fuerit, ſequitur, victoris Venerem patiens, nec ab alio, niſi à ſuo victore ſubigitur. Sed ſi à comite principis, aut quouis vulgari vincatur, clam à principe, ac furto ſubigitur. Verùm hoc non ita fit ſemper, ſed certo tẽpore anni planum eſt. Hoc idem à coturnicibus quoque agi animaduertimus. Gallinacei etiam idem interdum faciunt. In templis enim, vbi ſine fœminis munerarij dicatique verſantur, non te- B merè eum qui nuper dicatus acceſſerit, omnes ſubigunt. Necnon perdices manſueti iam & domeſtici ſubigunt feros, & ſpernunt, contumelioſeque tractant. Perdicem venatorem dux ſylueſtrium primus inuadit, pugnámque obuiam conferit, quo capto cõpage, alter occurrit, tum alius, atque ita ſingulis dimicatur, ſi mas ſit, qui venatur: ſed ſi fœmina eſt, vbi dux ad eius vocem occurrerit, cæteræ vniuerſæ eum inuadunt, feriunt, fugant ab ea fœmina, inuidentes quòd non ſibi, ſed illi acceſſerit. Hic tacitus ob eam rem ſæpe accedit, ne voce percepta oppugnetur. Nonnunquam marem adeuntem efficere, vt fœmina ob- C muteſcat, ne re cognita pugnare cum cæteris maribus cogatur, periti referunt. Perdices non modò canunt, verùm etiam ſtrident, & voces alias quaſdam emittunt. Sæpe & fœmina incubans exurgit, cùm marem fœminæ venatrici attendere ſenſerit, occurrénſque ſe ipſa præbet libidini maris, vt ſatiatus negligat venatricem. Vſque adeò tum perdices tum etiam coturnices copia libidinis gaudent, vt in aucupantes corruant, & ſæpenumero capitibus eorum reſidant. Talis perdicum coitus, & morum aſtutia eſt. Nidulantur humi, vt dixi, tum coturnices, tum perdices, atque etiam aliæ quædam eiuſdem parum volantis ge- D neris. Ex his item alauda, & gallinago, & coturnix nunquam in arbore conſiſtunt, ſed humi.

ΚΕΦΑΛ. θ'.

Δρυοκολάπτου ἤθη.

Ὁ Δὲ δρυοκολάπτης οὐ καθίζει ἐπὶ τῆς γῆς· κόπτει δὲ τὰς δρῦς, τῶν σκωλήκων καὶ σκνιπῶν ἕνεκεν, ἵν' ἐξίωσιν. ἀναλέγεται γὰρ ἐξελθόντας αὐτοὺς τῇ γλώττῃ· πλατεῖαν δ' ἔχει καὶ μεγάλην. καὶ πορεύεται ἐπὶ τοῖς δένδρεσι ταχέως πάντα τρόπον, καὶ ὕπτιος, καθάπερ οἱ ἀσκαλαβῶται. ἔχει δὲ καὶ τοὺς ὄνυχας βελτίους τῶν κολοιῶν πεφυκότας, πρὸς τὴν ἀσφάλειαν τῆς ἐπὶ τοῖς δένδρεσιν ἐφεδρείας. τούτους γὰρ ἐμπηγνὺς πορεύεται. ἔστι δὲ τῶν δρυοκολαπτῶν ἓν μὲν γένος ἔλαττον τοῦ κοττύφου. ἔχει δ' ὑπέρυθρα μικρά. ἕτερον δὲ γένος, μεῖζον ἢ κόττυφος. τὸ δὲ τρίτον γένος αὐτῶν, οὐ πολλῷ ἔλαττόν ἐστιν ἀλεκτορίδος θηλείας. νεοττεύει δὲ ἐπὶ τῶν δένδρων, ὥσπερ εἴρηται, ἔν ἄλλοις τε τῶν δένδρων, καὶ ἐν ἐλαίαις. βόσκεται δὲ τούς τε μύρμηκας καὶ τοὺς σκώληκας τοὺς ἐκ τῶν δένδρων. θηρεύοντα δὲ τοὺς σκώληκας, οὕτω σφόδρα φασὶ κοιλαίνειν, ὥστε καταβάλλειν τὰ δένδρα. καὶ τιθασευόμενος δέ τις ἤδη ἀμύγδαλον εἰς ῥωγμὴν ξύλου ἐνθεὶς,

CAPVT IX.

De pico Martio, & tribus generibus eiuſdem.

CОntrà atque Martius picus, qui humi nunquam conſiſtere patitur: tundit hic quercus, vermium & culicum cauſa, quò exeant. Recipit enim egreſſos lingua ſua, quam maiuſculam & latiuſculam habet. Scandit per E arborem omnibus modis: nam vel reſupinus more ſtellionum ingreditur. Vngues etiam habet commodiores, quàm monedula, ad tutiorem arborum reptationem: his enim affixis aſcendit. Sunt pici, Martij cognomine, tria genera, vnum minus quàm merula: cui rubidæ aliquid plumæ ineſt: alterum maius quàm merula: tertium, non multò minus quàm gallina. Nidulatur (vt dictum eſt) in arboribus, cùm aliis tum oleis. Paſcitur formicis, & coſſis. Cùm coſſos venatur, tam vehementer excauare, vt ſternat arbores, dicitur. Iam verò miteſcens quidam amygdalum,

quod rimæ inſeruiſſet ligni, vt fixum conſtanter ictum reciperet, tertio ictu pertudit, & nucleum edit.

CAPVT X.

De prudentia Gruum.

GRues etiam multa prudenter faciunt: loca enim longinqua petunt, ſui commodi gratia, & volant altè, vt procul proſpicere poſſint. Et, ſi nubes tempeſtatemque viderint, conferunt ſe in terram, & humi quieſcunt. Ducem etiam habent, & eos qui clament, diſpoſiti in extremo agmine, vt vox percipi poſſit. Cùm conſiſtunt, cæteræ dormiunt, capite ſubter alam condito, alternis pedibus inſiſtentes. Dux detecto capite proſpicit, & quod ſenſerit, voce ſignificat. Platea fluuiatilis conchas maiuſculas læuéſque deuorat: quas vbi ſua ingluuie coxerit, euomit, vt hiantibus iam, legat, teſtis exuens, atque edat.

CAPVT XI.

De domicilijs agreſtium volucrum.

DOmicilia verò agreſtes volucres aptiſſimè ad victum & prolis ſalutem moliuntur. Sunt aliæ parentes feliciores, & ſuorum gnatorum diligentiores, aliæ minùs: & aliis ingenium ad victum acutius, aliis obtuſius eſt. Colunt aliæ loca fragoſa, & ſaxa, & cauernas: vt quem à prætruptis torrentium alueis charadrium appellamus, quaſi hiaticulam dixeris. Praua hæc auis, & colore, & voce: & noctu apparet, die aufugit. accipiter etiam locis ſaxoſis & arduis nidulatur. auium quas ceperit, cor nunquam edit. Idque nonnulli in coturnice, & turdo, alij in aliis obſeruarunt. Quinetiam venandi differentia adnotatur, ne ſimili modo æſtate, vt hyeme rapiat. Vulturis vel pullum, vel nidum à nemine viſum adhuc, nonnulli aiunt. Et nimirum ob eam rem Herodotus Bryſonis rhetoris pater, aliunde ſitu eminentiore quodam venire dixit: argumentúmque afferebat, quòd breui tempore multi apparerent, & tamen vnde, conſtaret nemini. Sed cauſa huius rei eſt, quòd rupibus inacceſſis pariat: neque locorũ plurium incola auis hæc eſt. Edit non plus quàm vnum ouum, aut duo cumplurimum. Sunt quæ montes colant, & ſyluas, vt vpupa, & brenthus: cui & victus probus, & vox ſonora eſt. Trochilus & frutet incolit, & foramina: capi difficilè poteſt. Fugax, atque infirmis moribus eſt, ſed victus probitate, & ingenij ſolertia præditus. Vocatur idem & ſenator, & rex: quamobrem aquilam pugnare cum eo referunt.

CAPVT XII.

De generibus auium quæ apud aquas degunt, déque chalcide aue, & eius natura, necnon de concertatione eiuſdem cum aquila: & gruum pugna.

SVnt aliæ, quæ vitã apud mare traducũt, vt cinclus, qui aſtutus & capi difficilis eſt, ſed captus omniũ maximè miteſcit. Læſus hic eſt: incontinés enim parte ſui poſteriore. Viuunt apud mare,

A ὅπως ἐναρμοσθὲν ὑπομείνειεν αὐτοῦ τὴν πληγὴν, ἐν τρίτῃ πληγῇ διέκοψε, καὶ * κατήσθιεν αὐτοῦ τὸ ἁπαλόν. * γρ. κατήσθιε τὸ μαλακόν.

ΚΕΦΑΛ. ι.

Γεράνων καὶ πελεκάνων ἤθη.

ΦΡόνιμα δὲ πολλὰ καὶ περὶ τὰς γεράνους δοκεῖ συμβαίνειν. ἐκτοπίζουσί τε γὰρ μακρὰν, καὶ εἰς ὕψος πέτονται, πρὸς τὸ καθορᾶν τὰ πόρρω. καὶ ἐὰν ἴδωσι * γέφη καὶ χειμέρια, καταπτᾶσαι ἡσυχάζουσιν. ἔτι δὲ τὸ ἔχειν ἡγεμόνα τε, καὶ τοὺς ἐπισυρίττοντας ἐν τοῖς ἐσχάτοις, ὥστε ἀκούεσθαι τὴν φωνήν. ὅταν δὲ καθίζωνται, αἱ μὲν ἄλλαι ὑπὸ B τῇ πτέρυγι τὴν κεφαλὴν ἔχουσαι, καθεύδουσιν ἐπὶ ἑνὸς ποδὸς ἐναλλάξ. ὁ δ' ἡγεμὼν, γυμνὴν ἔχων τὴν κεφαλὴν, προορᾷ· καὶ ὅταν αἴσθηταί τι, σημαίνει βοῶν. οἱ δὲ πελεκᾶνες, οἱ ἐν τοῖς ποταμοῖς γινόμενοι, καταπίνουσι τὰς μεγάλας κόγχας καὶ λείας· ὅταν δ' ἐν τῷ πρὸ τῆς κοιλίας τόπῳ πέψωσιν, ἐξεμοῦσιν, ἵνα χασκουσῶν, τὰ κρέα ἐξαιροῦντες ἐσθίωσι. * Fort. νέφη κ.

ΚΕΦΑΛ. ια.

Ἀγρίων ὀρνέων οἰκήσεις.

ΤΩν δ' ἀγρίων ὀρνέων, αἵ τ' οἰκήσεις μεμηχανημέναι πρὸς τοὺς βίους καὶ τὰς σωτηρίας τῶν τέκνων. εἰσὶ C δ' οἱ μὲν εὔτεκνοι αὐτῶν, καὶ ἐπιμελεῖς τῶν τέκνων· οἱ δὲ, τοὐναντίον. καὶ οἱ μὲν, εὐμήχανοι πρὸς τὸν βίον· οἱ δ', ἀμηχανώτεροι. τὰς δ' οἰκήσεις οἱ μὲν, περὶ τὰς χαράδρας, οἱ δὲ, χηραμοὺς ποιοῦνται καὶ πέτρας, οἷον ὁ καλούμενος χαραδριός. ἔστι δ' ὁ χαραδριὸς καὶ τὴν χρόαν καὶ τὴν φωνὴν φαῦλος. φαίνεται δὲ νύκτωρ, ἡμέρας δὲ ἀποδιδράσκει. ἐν ἀποτόμοις δὲ καὶ ὁ ἱέραξ νεοττεύει. ὠμοφάγος δ' ὢν, ὧν ἂν κρατήσῃ ὀρνέων, τὴν καρδίαν οὐ κατεσθίει· καὶ τοῦτο τινὲς ἑωράκασι καὶ ἐπ' ὄρτυγος, καὶ ἐπὶ κίχλης, καὶ ἕτεροι ἐφ' ἑτέρων. ἔτι δὲ καὶ περὶ τὸ θηρεύειν μεταβάλλουσιν. οὐ γὰρ ἁρπάζουσιν ὁμοίως τοῦ θέρους καὶ τοῦ χειμῶνος. γυπὸς δὲ λέγεται ὑπό τινων, ὡς οὐδεὶς ἑώ-D ρακεν οὔτε νεοττὸν οὔτε νεοττιάν· ἀλλὰ διὰ τοῦτο * Ἡρόδωρος ὁ τοῦ Βρύσωνος τοῦ σοφιστοῦ πατὴρ, ἀπό τινος αὐτὸν ἑτέρας εἶναι μετεώρου γῆς ἔλεγε, τεκμήριον τοῦτο λέγων, καὶ τὸ φαίνεσθαι ταχὺ πολλούς· ὅθεν δὲ, μηδενὶ εἶναι δῆλον. τούτου δ' αἴτιον, ὅτι τίκτει ἐν πέτραις ἀπροσβάτοις. ἔτι δ' οὐδὲ πολλαχοῦ ἐπιχώριος ὁ ὄρνις. τίκτει δ' ἓν ᾠὸν, ἢ δύο τὰ πλεῖστα. ἔνιοι δὲ τῶν ὀρνίθων ἐν τοῖς ὄρεσι καὶ τῇ ὕλῃ κατοικοῦσιν, οἷον ἔποψ, * καὶ βεύθος. ἔστι δὲ ὁ ὄρνις, εὐβίοτος καὶ ᾠδικός. ὁ δὲ τροχίλος, καὶ λόχμας καὶ τρώγλας οἰκεῖ· δυσάλωτος δὲ καὶ δραπέτης, καὶ τὸ ἦθος ἀσθενής· εὐβίοτος δὲ καὶ τεχνικός. καλεῖται δὲ πρέσβυς καὶ βα-E σιλεύς· διὸ καὶ τὸν ἀετὸν αὐτῷ φασι πολεμεῖν.

* Gaza, Herodotum, vt ſuprà l.6.c.5.

* γρ. βρένθος, vt ſuprà c.1.

ΚΕΦΑΛ. ιβ.

Περὶ τῶν περὶ τὴν θάλατταν βιούντων, καὶ περὶ χαλκίδος καὶ ὕβριδος, καὶ γεράνων μάχης.

ΕΙσὶ δέ τινες οἱ περὶ τὴν θάλατταν βιοῦσι, οἷον κίγκλος. ἔστι δὲ τὸ ἦθος ὁ κίγκλος πανοῦργος καὶ δυσθήρατος· ὅταν δὲ ληφθῇ, τιθασσώτατος. τυγχάνει δ' ὢν καὶ ἀνάπηρος· ἀκρατὴς γὰρ τῶν ὄπισθέν ἐστι. ζῶσι δὲ περὶ θάλατταν

καὶ ποταμοὺς καὶ λίμνας, οἱ μὲν στεγανόποδες ἅπαντες· ἡ γὰρ φύσις αὐτὴ ζητεῖ τὸ συμφέρον. πολλοὶ δὲ καὶ τῶν σχιζοπόδων περὶ τὰ ὕδατα καὶ τὰ ἕλη βιοτεύουσιν· οἷον ἄνθος περὶ τοὺς ποταμούς. ἔχει δὲ τὴν χροιὰν καλὴν, καὶ ἔστιν εὔβιοτον. ὁ δὲ καταῤῥάκτης, ζῇ μὲν περὶ θάλατταν. ὅταν καθῇ ἑαυτὸν εἰς τὸ βαθὺ, μένει χρόνον οὐκ ἐλάττονα, ἢ ὅσον πλέθρον διέλθοι τις. ἔστι δ' ἔλαττον ἱέρακος τὸ ὄρνεον. καὶ οἱ κύκνοι δὲ, εἰσὶ μὲν τῶν στεγανοπόδων, καὶ βιοτεύουσι δὲ περὶ λίμνας καὶ ἕλη· εὐβίοτοι δὲ καὶ εὐήθεις, καὶ εὔτεκνοι, καὶ εὔγηροι, καὶ τὸν ἀετὸν, ἐὰν ἄρξηται, ἀμυνόμενοι νικῶσιν· αὐτοὶ δὲ οὐκ ἄρχουσι μάχης. ᾠδικοὶ δὲ, καὶ περὶ τὰς τελευτὰς μάλιστα ᾄδουσιν. ἀναπέτονται γὰρ καὶ εἰς τὸ πέλαγος· καί τινες ἤδη πλέοντες παρὰ τὴν Λιβύην, περιέτυχον ἐν τῇ θαλάττῃ πολλοῖς ᾄδουσι φωνῇ γοώδει, καὶ τούτων ἑώρων ἀποθνήσκοντας ἐνίους. ἡ δὲ χαλκὶς, ὀλιγάκις μὲν φαίνεται· οἰκεῖ γὰρ ὄρη· ἔστι δὲ μέλας· καὶ μέγεθος ὅσον ἱέραξ ὁ φασσοφόνος καλούμενος, καὶ τὴν ἰδέαν μακρὸς καὶ λεπτός. κύμινδιν δὲ καλοῦσιν Ἴωνες αὐτήν· ἧς καὶ Ὅμηρος μέμνηται ἐν τῇ Ἰλιάδι εἰπών·

Iliad. ξ. Χαλκίδα κικλήσκουσι θεοὶ, ἄνδρες δὲ κύμινδιν.

* Verba hæc, ἡ δὲ ὕβρις, Gaza & codd. quidam non agnoſcunt.

* ἡ δὲ ὕβρις, φασὶ δέ τινες εἶναι τὸν αὐτὸν τοῦτον ὄρνιθα τῷ πτυγγὶ, αὕτη ἡμέρας μὲν οὐ φαίνεται, διὰ τὸ μὴ βλέπειν ὀξύ· τὰς δὲ νύκτας θηρεύει, ὥσπερ οἱ ἀετοί· καὶ μάχονται δὲ πρὸς τὸν ἀετὸν οὕτω σφόδρα, ὥστ' ἄμφω πολλάκις λαμβάνεσθαι ζῶντας ὑπὸ τῶν νομέων. τίκτει μὲν οὖν δύο ᾠά· νεοττεύει δὲ καὶ αὕτη ἐν πέτραις καὶ σπηλαίοις. μάχιμοι δὲ καὶ αἱ γέρανοι εἰσὶ πρὸς ἀλλήλας οὕτω σφόδρα, ὥστε καὶ λαμβάνεσθαι μαχομένας· ὑπομένουσι γάρ. τίκτει δὲ καὶ γέρανος δύο ᾠά.

ΚΕΦΑΛ. ιγ'.

Περὶ κίττης καὶ πελαργοῦ, καὶ μέροπος, καὶ χλωρίδος, καὶ ἀκανθυλλίδος καὶ κινναμώμου.

Ἡ Δὲ κίττα, φωνὰς μὲν μεταβάλλει πλείστας· καθ' ἑκάστην γὰρ, ὡς εἰπεῖν, ἡμέραν ἄλλην ἀφίησι. τίκτει δὲ περὶ ἐννέα ᾠά. ποιεῖται δὲ τὴν νεοττιὰν ἐπὶ τῶν δένδρων ἐκ τριχῶν καὶ ἐρίων. ὅταν δ' ὑπολείπωσιν αἱ βάλανοι, ἀποκρύπτουσα ταμιεύεται. περὶ μὲν οὖν τῶν πελαργῶν, ὅτι ἀντεκτρέφονται, θρυλεῖται παρὰ πολλοῖς. φασὶ δέ τινες καὶ τοὺς μέροπας ταὐτὸ τοῦτο ποιεῖν, καὶ ἀντεκτρέφεσθαι ὑπὸ τῶν ἐκγόνων, οὐ μόνον γηράσκοντας, ἀλλὰ καὶ εὐθὺς, ὅταν οἷοί τ' ὦσι· τὸν δὲ πατέρα καὶ τὴν μητέρα μένειν ἔνδον. ἡ δὲ ἰδέα τοῦ ὄρνιθος τῶν πτερῶν ἐστι, τὰ μὲν ὑποκάτω, * ὠχρόν· τὰ δ' ἐπάνω, ὥσπερ τῆς ἀλκυόνος, κυανοῦν· τὰ δ' ἐπ' ἄκρων τῶν πτερύγων, ἐρυθρά. τίκτει δὲ περὶ ἓξ ἢ ἑπτὰ ὑπὸ τὴν ὀπώραν, ἐν τοῖς κρημνοῖς τοῖς μαλακοῖς· εἰσδύεται δ' εἴσω καὶ τέτταρας πήχεις. ἡ δὲ καλουμένη χλωρὶς, διὰ τὸ τὰ κάτω ἔχειν ὠχρά, ἔστι μὲν ἡλίκον κόρυδος. τίκτει δὲ ᾠὰ τέτταρα ἢ πέντε. τὴν δὲ νεοττιὰν ποιεῖται μὲν ἐκ τοῦ συμφύτου ἑλοῦσα περιειλεῖν, στρώματα δ' ὑποβάλλει τρίχας καὶ ἔρια. ταὐτὸ δὲ τοῦτο ποιεῖ καὶ ὁ κόττυφος καὶ ἡ κίττα, καὶ τὰ ἐντὸς τῆς νεοττιᾶς ἐκ τούτων ποιοῦνται. τεχνικῶς δὲ καὶ ἡ τῆς * ἀκανθυλλίδος ἔχει νεοττιά. πέπλεκται γὰρ, ὥσπερ σφαῖρα λινῆ, ἔχουσα τὴν εἴσδυσιν μικράν. φασὶ δὲ καὶ τὸ κινναμώμον ὄρνεον εἶναι οἱ ἐκ τῶν τόπων ἐκείνων, καὶ τὸ καλούμενον κιννάμωμον φέρειν ποθὲν τοῦτο τὸ ὄρνεον,

* Quid. ὠχρὰ, & mox κυανεα.

* Gaza & Plin. ἀργαθυλλίδος

A & fluuios, & lacus palmipedes omnes. Natura e-nim ipſa quærit, quod ſibi cōmodius ſit. Sed mul-tæ etiam fiſſipedes circa aquas paludéſque degunt, vt florus apud amnes: cui color pulcher, & vita commoda. Cataracta mari victitat, & cùm ſe alto ingurgitarit, manet nō minus temporis, quàm quo ſpatium tranſieris iugeri. Minor quàm accipiter auis hæc eſt. Olores etiam palmipedes ſunt, & a-pud lacus paludéſque viuunt: nec probitate victûs, morum, prolis, ſenectutis carent. aquilam, ſi pugnam cœperit, repugnantes vincunt: ipſi autem nunquam, niſi prouocati, inferunt pugnam. Canere ſoliti ſunt, & præcipuè iamiam morituri. Volát B etiam in pelagus longiùs. Et iam quidam cùm in mari Africo nauigarent, multos canentes voce flebili, & mori nonnullos conſpexere. Chalcis rarò apparet: montes etenim incolit. Nigro colore eſt, magnitudine accipitris, quem palumbarium nominãt, forma longa, ac tenui. Iones cymindem eam appellant. Cuius Homerus etiam meminit in Iliade, cùm dicit:

Chalcida dij perhibent, homines dixere cymindem.

Sunt qui eandem hanc auem non aliam eſſe ac ptyngem, velint. Interdiu minùs apparet, quia non clarè videt, ſed noctu venatur more aquilæ: & pugnat verò cum aquila adeò acriter, vt ſæpius ambæ implexæ deferantur in terram, & viuæ à paſto-C ribus capiantur. Parit hæc oua duo, & ſaxis ſpelūciſque nidulatur. Grues etiam pugnant inter ſe tam vehementer, vt dimicantes capiantur: hominem enim expectare potiùs, quàm pugna deſiſtere, patiuntur. Pariunt oua non ampliùs quàm bina.

CAPVT XIII.

De partu & nidificatione Picarum, Meropis, Luteæ, Argathylis, & Cinnamomi Arabici, déque Ciconiarum & Meropum prudentia in alendis parentibus.

D Pica voces plurimas commutat: ſingulis enim ferè diebus diuerſam emittit vocem. Parit oua circiter nouem numero. Nidum in arboribus facit ex pilis & lana. Glandes, cùm deficiunt, colligit, & in repoſitorio abditas reſeruat. Ciconias genitorum ſenectutem inuicem educare inuulgatum eſt. Sed ſunt qui merops quoque idem facere confirment, vicémque reddi: vt parentes non modò ſeneſcentes, verùm etiam ſtatim, cùm iam datur facultas, alantur opera liberorum: nec matrem, aut patrem exire, ſed in cubili manentes paſci labore eorum quos ipſi genuerunt, enutrierunt, e-E ducarũt. Pennæ huius auis inferiores pallidæ ſunt, ſuperiores cæruleæ, vt halcyonis: poſtremæ pinnulæ rubræ habentur. Parit ſex aut ſeptem æſtate in præcipitiis mollioribus, intrò vel ad quatuor cubita ſubiens. Lutea dicta à colore partis ſuæ inferioris pallido, magnitudine alaudæ eſt. Parit quatuor, aut quinque. Nidum ſibi ex alo herba euulſa ſtirpitus facit: ſed ſtragulum ſubijcit ex villo & lana. Hoc idem & merula facit, & pica, interioráque nidis ex eiſdem conſternunt. Solerti porrò ingenio argathylis in ripariarum genere ſuum inſtruit nidū: filis enim intexit lineis ſpecie pilæ, aditu arcto. In Arabia cinnamomus auis appellatur, quam ſurculos cinnamomi portare,

ac nidum ex his conficere aiunt. Nidificat excelſis arboribus, & ramis: ſed incolæ ſagittis plumbatis nidum petunt, atque ita diſcuſſo in terram, cinnamomum legunt.

CAPVT XIV.

De ſpecie, nidulatione, & partu Alcedonum.

Alcedo non multo amplior paſſere eſt, colore tum cæruleo, tum viridi, tum etiam leuiter purpureo inſignis. videlicet non particulatim colore ita diſtincta, ſed ex indiſcreto variè refulgens corpore toto, & alis, & collo: roſtrum ſubviride, longum & tenue: talis ſpecies eius eſt. Nidus marinæ ſimilis pilæ, & iis, quæ à flore maris haloſachnæ dicantur, ſed colore leuiter rufo: figura proxima cucurbitis medicinalibus, iis quibus collum porrectius eſt: magnitudo maximis amplior quàm ſpongiæ: ſunt enim alij maiores, alij minores. conſeptus ſtipatúſque vndique eſt. & cerebro tū inani tum ſolido conſtat. renititur ferramento acuto, vt vix poſſit diſcindi: ſed ſi vnà & ferro tundis, & manu collidis, facilè perinde vt flos aridus maris (haloſachnam dico) confringitur. Os eius anguſtum, quoad ſit exiguus aditus, vt etiamſi vertatur mare, influere nequeat. Habet ſua inania proxima cauis ſpongiarum. ambigitur ex quanam materia componatur: videtur tamen è ſpinis potiùs acus piſcis conſtitui: piſcibus enim alcedo viuit. Sed amnes etiam ſubit, aſcendens longiùs. Partus huic ouis maximè quinque conſumitur. Fœtificat toto ſuæ ætatis tempore. Parere nata menſes quatuor incipit.

CAPVT XV.

De partu, & nidificatione Vpupæ, Pari, Atricapillæ, Sali, & Vireonis.

Vpupa nidum potiſſimè è ſtercore hominis facit. Mutat faciem tempore æſtatis & hyemis, ſicvt cæterarum quoque agreſtium plurimæ. Parus oua plurima edit, vt aiunt. Atracapillam etiam plurima edere aliqui referunt, ſed poſt Africam ſtruthionem. Iam vel decem & ſeptem oua atricapillæ reperta ſunt: ſed plura etiam quàm viginti parit, & numero impari ſemper, vt narrant. Nidificat ea quoque in arboribus, & vermiculis alitur. Proprium huius, & luſciniæ, præter cæteras aues, vt linguæ ſummæ acumine careant. Salus vitæ commoditate & partus numero commendatur: ſed alterius pedis claudítate cedit. Vireo docilis, & ad vitæ munera ingenioſus notatur, ſed malè volat, nec grati coloris eſt.

CAPVT XVI.

De Velia aue, & eius colore, & ſtatura.

Velia cùm primis vitæ commoditate nota eſt. Conſiſtit æſtate in vmbra, & aura: hyeme in Sole, & apricis. Inſpectat paludes ab arundinibus ſummis. Paruo corpore eſt, ſed voce proba, colore etiam pulchro, necnon ingenio valet in vitæ officiis, & ſpeciem præ ſe fert decoram. Peregrina hæc auis eſſe videtur, quippe quæ rarò noſtris locis appareat.

A καὶ τὴν νεοττίαν ἐξ αὐτῶν ποιεῖσθαι. νεοττεύει δ' ἐφ' ὑψηλοῦ δένδρου, καὶ ἐν τοῖς θαλλοῖς τῶν δένδρων· ἀλλὰ τοὺς ἐγχωρίους μολυβδίδας πρὸς τοῖς οἰστοῖς προσαρτῶντας, τοξεύοντας καταβάλλειν, καὶ οὕτω συνάγειν ἐκ τοῦ φορυτοῦ τὸ κιννάμωμον.

ΚΕΦΑΛ. ιδ'.

Περὶ ἀλκυόνος.

Ἡ Δ' ἀλκυὼν, ἔστι μὲν οὐ πολλῷ μείζων στρουθοῦ· τὸ δὲ χρῶμα, καὶ κυανοῦν ἔχει καὶ χλωρὸν, καὶ ὑποπόρφυρον· μεμιγμένον δὲ τοιοῦτο τὸ σῶμα πᾶν, καὶ αἱ πτέρυγες καὶ τὰ περὶ τὸν τράχηλον, οὐ χωρὶς ἕκαστον τῶν χρωμάτων. τὸ δὲ ῥύγχος, ὑπόχλωρον μὲν, μακρὸν δὲ καὶ λεπτόν. B τὸ μὲν οὖν εἶδος ἔχει τοιοῦτον· ἡ δὲ νεοττιὰ παρομοία ταῖς σφαίραις ταῖς θαλαττίαις ἐστὶ, καὶ ταῖς καλουμέναις ἁλοσάχναις, πλὴν τοῦ χρώματος. τὴν δὲ χρόαν ὑπόπυρρον ἔχουσι. τὸ δὲ σχῆμα παραπλήσιον ταῖς σικύαις, ταῖς ἐχούσαις τοὺς τραχήλους μακρούς. τὸ δὲ μέγεθος αὐτῶν ἐστὶ τῆς μεγίστης, σπογγιᾶς μεῖζον· εἰσὶ γὰρ μείζους καὶ ἐλάττους· κατάστεγοι δὲ, καὶ τὸ στερεὸν ἔχουσι συχνὸν καὶ τὸ κοῖλον· καὶ κόπτοντι μὲν σιδηρίῳ ὀξεῖ, οὐ ταχὺ διακόπτεται· ἅμα δὲ κόπτοντι, καὶ ταῖς χερσὶ θραύοντι, ταχὺ διαθραύεται, ὥσπερ ἡ ἁλοσάχνη. τὸ δὲ στόμα στενὸν ὅσον* εἴσδυσιν μικρὰν ὥστ' οὐδ', ἂν ἀνατραπῇ ἡ θάλαττα, οὐκ εἰσέρχεται. C τὰ δὲ κοῖλα παραπλήσια ἔχει τοῖς τῶν σπόγγων. ἀπορεῖται δ' ἐκ τίνος συντίθησι τὴν νεοττιάν. δοκεῖ δὲ μάλιστα ἐκ τῶν ἀκανθῶν τῆς βελόνης. ζῇ γὰρ ἰχθυοφαγοῦσα. ἀναβαίνει δὲ καὶ ἐπὶ τοὺς ποταμούς. τίκτει δὲ περὶ πέντε μάλιστα ᾠά. λοχεύεται δὲ διὰ βίου· ἄρχεται δὲ τετράμηνος.

* Scrib. εἰς εἴσδυσιν. vel, ὅσον εἴσδυσιν μικρὰν ἔχειν, vt alibi.

ΚΕΦΑΛ. ιε'.

Περὶ ἔποπος, καὶ αἰγιθάλου, καὶ μελαγκορύφου, καὶ ἀηδόνος, καὶ αἰγιόθου, καὶ χλωρίωνος.

Ὁ Δὲ ἔποψ τὴν νεοττίαν μάλιστα ποιεῖται ἐκ τῆς ἀνθρωπίνης κόπρου· τὴν δ' ἰδέαν μεταβάλλει τοῦ D θέρους καὶ τοῦ χειμῶνος, ὥσπερ καὶ τῶν ἄλλων ἀγρίων τὰ πλεῖστα. ὁ δ' αἰγίθαλος τίκτει μὲν ᾠὰ πλεῖστα, ὡς φασιν. ἔνιοι δὲ καὶ τὸν μελαγκόρυφον καλούμενον, φασὶ πλεῖστα τίκτειν, μετά γε τὸν ἐν Λιβύῃ στρουθόν. ἑώραται μὲν γὰρ καὶ ἑπτακαίδεκα. τίκτει μέντοι καὶ πλείω ἢ εἴκοσι. τίκτει δ' ἀεὶ περιττὰ, ὡς φασιν. νεοττεύει δὲ καὶ οὗτος ἐν τοῖς δένδρεσι, καὶ βόσκεται τοὺς σκώληκας. ἴδιον δὲ* τούτου καὶ ἀηδόνι παρὰ τοὺς ἄλλους ὄρνιθας, τὸ μὴ ἔχειν τῆς γλώττης τὸ ὀξύ. ὁ δ'* αἰγίοθος, εὐβίοτος καὶ πολύτεκνος. τὸν δὲ πόδα χωλός ἐστι. χλωρίων δὲ μαθεῖν μὲν ἀγαθὸς καὶ βιομήχανος, κακόπτερος δὲ καὶ χρόαν ἔχει μοχθηράν.

* Gaza τούτῳ καὶ ἀ.

* Geſnerus αἴγιθος, vt apud Oppianum.

E

ΚΕΦΑΛ. ιϛ'.

Περὶ ἐλέας καὶ γναφάλου.

Ἡ Δ' ἐλέα, ὥσπερ ἄλλη τις τῶν ὀρνίθων, εὐβίοτος, καὶ καθίζει θέρους μὲν ἐν προσηνέμῳ καὶ σκιᾷ· χειμῶνος δ' ἐν εὐηλίῳ. καὶ ἐπισκοπεῖ ἐπὶ τῶν δονάκων περὶ τὰ ἕλη. ἔστι δὲ τὸ μὲν μέγεθος βραχὺς, φωνὴν δ' ἔχει ἀγαθήν. [καὶ ὁ γνάφαλος καλούμενος, τήν τε φωνὴν ἔχει ἀγαθὴν] καὶ τὸ χρῶμα καλὸς, καὶ βιομήχανος, καὶ τὸ εἶδος εὐπρεπής· δοκεῖ δ' εἶναι ξενικὸς ὄρνις. ὀλιγάκις γὰρ φαίνεται ἐν τοῖς μὴ οἰκείοις τόποις.

* Incluſa non agnoſcit Gaza, vitio codd. quibus eſt vſus, vt videtur.

A

ΚΕΦΑΛ. ιζ'.

Περὶ κρεκὸς καὶ σίττης, καὶ αἰγωλιὸς, καὶ κερθίου καὶ ἀκανθίδος.

Η Δὲ κρὲξ, τὸ μὲν ἦθος μάχιμος, τὴν δὲ διάνοιαν εὐμήχανος πρὸς τὸν βίον. ἄλλως δὲ κακόποτμος ὄρνις. ἡ δὲ καλουμένη * σίττη, τὸ μὲν ἦθος μάχιμος, τὴν δὲ διάνοιαν εὔθικτος, καὶ εὐθήμων, καὶ εὔβιοτος· καὶ λέγεται φαρμακεία εἶναι, διὰ τὸ πολυΐδρις εἶναι. πολύγονος δὲ καὶ εὔτεκνος, καὶ ζῇ ὑλοτομοῦσα. αἰγωλιὸς δ' ἐστὶ νυκτινόμος, καὶ ἡμέρας ὀλιγάκις φαίνεται. καὶ οἰκεῖ [καὶ] ἐπὶ πέτρας καὶ σπήλυγγας. ἔστι γὰρ δίτταλος· τὴν δὲ διάνοιαν βιωτικὸς καὶ εὐμήχανος. ἔστι δέ τι ὀρνίθιον μικρὸν, ὃ καλεῖται κέρθιος· τοῦτο τὸ μὲν ἦθος θρασὺς, καὶ οἰκεῖ περὶ δένδρα, καὶ ἔστι θριποφάγος· τὴν δὲ διάνοιαν εὔβιοτος, καὶ τὴν φωνὴν ἔχει λαμπράν· αἱ δ' ἀκανθίδες, κακόβιοι, καὶ κακόχροοι, φωνὴν μέντοι λιγυρὰν ἔχουσι.

* γρ. σίπτη.

CAPVT XVII.

De moribus & natura Cregis, Sittæ, Vlulæ, Certhiæ & Ligurini.

CRex moribus pugnacibus eſt, ingenio valens ad victum, ſed cætera infelix. Sunt & ei, quæ ſitta dicitur, mores pugnaces, ſed animus hilaris, concinnus, compos vitæ facilioris. Rem maleficam ei tribuunt, quia rerum callet cognitione. Prolem hæc numeroſam felicemque progignit. Viuit maceriem contundens. Vlula nocte vagatur, ac paſcitur: die rarò apparet. Colit hæc etiam ſaxa, & ſpeluncas: victus enim gemini eſt. Pollet ingenio ac induſtria in vitæ muneribus. Nouimus auiculam quandam exiguam nomine certhiam, cui mores audaces, domicilium apud arbores, victus ex coſſis, ingenium ſagax in vitæ officiis, vox clara. Ligurini, & vita, & colore ignobiles ſunt, ſed valent vocis amœnitate.

B

ΚΕΦΑΛ. ιη'.

Περὶ ἐρωδιῶν καὶ φοίνικος.

Τ Ων δ' ἐρωδιῶν ὁ μὲν πέλλος, ὥσπερ εἴρηται, ὀχεύει μὲν χαλεπῶς, εὐμήχανος δὲ καὶ δειπνοφόρος, * καὶ ἐπάγης. ἐργάζεται δὲ τὴν ἡμέραν· τὴν μέντοι χρόαν ἔχει φαύλην, καὶ τὴν κοιλίαν ἀεὶ ὑγράν. τῶν δὲ λοιπῶν δύο, (τρία γὰρ γένη ἐστὶν αὐτῶν) ὁ μὲν λευκὸς, τήν τε χρόαν ἔχει καλὴν, καὶ ὀχεύει ἀσινῶς, καὶ νεοττεύει καὶ τίκτει καλῶς ἐπὶ τῶν δένδρων. νέμεται δὲ ἕλη καὶ λίμνας, καὶ πεδία καὶ λειμῶνας. ὁ δ' ἀστερίας, ὁ ἐπικαλούμενος ὀκνὸς, μυθολογεῖται μὲν γενέσθαι ἐκ δούλων τὸ ἀρχαῖον, ἔστι δὲ κατὰ τὴν ἐπωνυμίαν τούτων ἀεργότατος. οἱ μὲν οὖν ἐρωδιοὶ, τοῦτον τὸν τρόπον βιοῦσιν· ἡ δὲ καλουμένη φοῖνιξ, ἴδιον ἔχει πρὸς τὰ ἄλλα. μάλιστα γάρ ἐστιν ὀφθαλμοβόρος τῶν ὀρνίθων. πολέμιος δὲ τῇ ἅρπῃ· καὶ γὰρ ἐκείνη ὁμοιόβιοτος.

* G. ὁ ἐπάγης.

C

CAPVT XVIII.

De tribus Ardeolarum generibus, & earum vita, déque Phoicis natura.

ARdeolarum pella difficulter coit, vt dictum eſt, ſed ſagax, & cœnæ gerula eſt, & operoſa. agere interdiu ſolet. Colore tamen eſt prauo, & aluo humida. Reliquarum duarum (tria enim ſunt genera) candida, colore eſt pulchro, & coit, & nidulatur, & parit probè. Paſcitur paludibus, lacu, campis, & pratis. Sed ſtellaris piger cognominata, (in fabula eſt vt olim è ſeruo in auem tranſierit) atque vt cognomen ſonat, iners, otioſaque eſt. Talis ardeolarum vita eſt. Phoici appellatæ peculiare præ cæteris eſt, vt oculos potiſſimùm appetat. Inimica eſt harpæ: victus enim earum ſimilis eſt.

D

ΚΕΦΑΛ. ιθ'.

Περὶ κοττύφων.

Τ Ων δὲ κοττύφων δύο γένη ἐστίν· ὁ μὲν ἕτερος, μέλας τε καὶ πανταχοῦ ὤν· ὁ δ' ἕτερος, ἔκλευκος, τὸ δὲ μέγεθος ἴσος ἐκείνῳ, καὶ ἡ φωνὴ παραπλησία ἐκείνῳ· ἔστι δ' οὗτος ἐν Κυλλήνῃ τῆς Ἀρκαδίας, ἄλλοθι δ' οὐδαμοῦ. τούτων ὅμοιος τῷ μέλανι κοττύφῳ. ἔστι δὲ, * βαιὸς, τὸ δὲ μέγεθος μικρῷ ἐλάττων. οὗτος ἐπὶ τῶν πετρῶν καὶ ἐπὶ τῶν κεράμων τὰς διατριβὰς ποιεῖται· τὸ δὲ ῥύγχος οὐ φοινικοῦν ἔχει καθάπερ ὁ κόττυφος.

* Gaza, ῥαιός.

CAPVT XIX.

De duobus Merularum generibus.

MErularum duo ſunt genera, alterum nigrũ, & vulgare, alterum candidum: magnitudine quidem compari, & voce ſimili: ſed circa Cyllenam Arcadiæ familiare, nec vſquam alibi naſcens. Eſt enim ex hoc genere, quæ ſimilis nigræ ſit, ſed fuſca colore, & magnitudine paulò minor. Verſari hæc in ſaxis & tectis ſolita eſt: nec roſtrum rutilum, vt merula habet.

E

ΚΕΦΑΛ. κ'.

Περὶ κιχλῶν.

Κ Ιχλῶν δ' εἴδη τρία· ἡ μὲν, ἰξοβόρος· αὕτη δ' οὐκ ἐσθίει ἀλλ' ἢ ἰξὸν καὶ ῥητίνην· τὸ δὲ μέγεθος ὅσον κίττα ἐστὶν· ἑτέρα, τριχάς· αὕτη δὲ ὀξὺ φθέγγεται, τὸ δὲ μέγεθος ὅσον κόττυφος. ἄλλη δ' ἣν καλοῦσί τινες * ἰλιάδα. ἐλαχίστη δὲ τούτων, καὶ ἧττον ποικίλη.

* γρ. ἰλιάδα.

CAPVT XX.

De tribus Turdorum generibus.

TVrdorum tria ſunt genera, vnum viſciuorũ, quod niſi viſco atque reſina non veſcitur, & magnitudine picæ eſt. alterum pilare, quod ſonat acutè, & magnitudine merulæ eſt. Tertium, quod iliacum quidam vocant, minimum inter eos, minúſque maculis diſtinctum.

CAPVT XXI.

De aue Cæruleo nomine, & eius forma.

NOuimus & ſaxatilem auiculam quãdam, cui nomen cæruleo, quæ maximè in Scyro colit, ſaxa amans, magnitudinè minor, quàm merula, maior paulò quàm fringilla. Pede magno eſt, ſcãditque ſaxa: colore cæruleo, roſtro tenui & longo: crure breui ſimiliter vt pipo eſt.

CAPVT XXII.

De Vireone, & Molliciptte auibus.

VIreo totus viridans ex obſcuro eſt. Hyeme hic non videtur, ſed æſtiuo ſolſtitio potiſſimùm venit in conſpectum. Diſcedit ex ortu Arcturi ſyderis. Magnitudine turturis eſt. Molliceps eodem in loco ſemper ſibi ſtatuit ſedem, atque ibidem capitur. Grandi & cartilagineo capite eſt, magnitudine paulò minor quàm turdus, ore firmo, paruo, rotundo: colore totus cinereo. Depes, & pennis infalens eſt. Capitur maximè noctu.

CAPVT XXIII.

De Pardalo, & Collurione, déque auibus cæteris, quæ ſemper conſpicuæ ſunt.

PArdalus etiam auicula quædam perhibetur, quæ magna ex parte gregatim volat, nec ſingularem hanc videris. Colore tota cinereo eſt, magnitudine proxima ſuperiori: ſed pennis, ac pedibus bonis. Vocem frequentem nec grauem emittit. Collurio eiſdem, quibus merula, veſcitur. Magnitudo eius quoque eadem quæ ſuperioribus eſt. Capitur hyberno potiùs tempore. Hæc omnia ſemper apparent, atque etiam ea quæ in vrbibus ſolent præcipuè viuere: vt coruus, vt cornix: nam ea quoque ſemper conſpicua ſunt, nec loca mutant, aut latent.

CAPVT XXIV.

De tribus generibus Monedularum.

MOnedularum tria ſunt genera: vnum, quod graculus vocatur, magnitudine quãta cornix, roſtro rotundo, rutilo. alterum, lupus cognominatum, paruum, & ſcurra. tertium, quod familiare Lydiæ ac Phrygiæ terræ, idemque palmipes eſt.

CAPVT XXV.

De duobus Alaudarum generibus.

ALaudarum duo ſunt genera: alterum terrenum, criſtatum, galerita à criſta appellatum: alterum gregale, nec ſingulare, more alterius, verùm colore ſimile, quanquam magnitudine minus, & galero carens: cibo verò idoneum.

ΚΕΦΑΛ. κα'.

Περὶ κυανοῦ.

ΕΣτι δέ τις πετραῖος ᾧ ὄνομα κύανος· οὗτος ὁ ὄρνις ἐν Σκύρῳ μάλιστα ἐστί· ποιεῖται δ' ἐπὶ τῶν πετρῶν τὰς διατριβάς. τὸ δὲ μέγεθος, κοττύφου μὲν ἐλάττων, σπίζης δὲ μείζων μικρῷ. μεγαλόπους δέ, καὶ πρὸς τὰς πέτρας προσαναβατικός, κυανοῦς ὅλως. τὸ δὲ ῥύγχος ἔχει * χαλεπὸν καὶ μακρόν· σκέλη δὲ βραχέα τῷ πίπῳ παρόμοια.

* Gaza, ἢ λεπτόν.

ΚΕΦΑΛ. κβ'.

Περὶ χλωρίωνος καὶ μαλακοκρανέως.

ΟΔὲ χλωρίων, χλωρὸς ὅλος ἐστί· τὸν χειμῶνα οὐχ ὁρᾶται· περὶ δὲ τὰς τροπὰς τὰς θερινὰς φανερὸς μάλιστα γίνεται· ἀπαλλάττεται δ' ὅταν ἀρκτοῦρος ἐπιτέλλῃ. τὸ δὲ μέγεθος ἐστὶν ὅσον τρυγών. ὁ δὲ μαλακοκρανεὺς ἀεὶ ἐπὶ ταὐτοῦ καθίζει, καὶ ἁλίσκεται ἐνταῦθα. τὸ δ' εἶδος, κεφαλὴ μὲν μεγάλη χονδρώδης· τὸ δὲ μέγεθος, ἐλάττων κίχλης μικρῷ· στόμα δ' εὔρωστον, μικρόν, στρογγύλον· τὸ δὲ χρῶμα σποδοειδὴς ὅλως· εὔπους δὲ καὶ κακόπτερος· ἁλίσκεται δὲ μάλιστα γλαυκί.

ΚΕΦΑΛ. κγ'.

Περὶ παρδάλου καὶ κολλυρίωνος, καὶ κόρακος καὶ κορώνης.

ΕΤι δὲ καὶ ὁ πάρδαλος. τοῦτο δὲ τὸ ὀρνέον ἐστὶν ἀγελαῖον, ὡς ἐπὶ τὸ πολύ, καὶ οὐκ ἔστι καθ' ἕνα ἰδεῖν. τὸ δὲ χρῶμα σποδοειδὴς ὅλος· μέγεθος δὲ παραπλήσιος ἐκείνοις. εὔπους δέ, καὶ οὐ κακόπτερος. φωνὴ δὲ πολλή, καὶ οὐ βαρεῖα. ὁ δὲ κολλυρίων τὰ αὐτὰ ἐσθίει τῷ κοττύφῳ· τὸ δὲ μέγεθος καὶ τοῦτο ταὐτὸ τοῖς προειρημένοις. ἁλίσκεται δὲ κατὰ χειμῶνα μάλιστα. ταῦτα δὲ πάντα καὶ διὰ παντὸς φανερά ἐστιν. ἔτι δὲ τὰ κατὰ πόλεις εἰωθότα μάλιστα ζῆν, κόραξ καὶ κορώνη. καὶ γὰρ ταῦτ' ἀεὶ φανερά, καὶ οὐ μεταβάλλει τοὺς τόπους, οὐδὲ φωλεύει.

ΚΕΦΑΛ. κδ'.

Περὶ κολοιῶν.

ΚΟλοιῶν δ' ἐστὶν εἴδη τρία· ἓν μέν, ὁ κορακίας· οὗτος ὅσον κορώνη, * φοινικόρυγχος. ἄλλος, ὁ λύκος καλούμενος. ἔτι δὲ ὁ μικρός, ὁ βωμολόχος. ἔστι δὲ καὶ ἄλλο γένος κολοιῶν περὶ τὴν Λυδίαν καὶ Φρυγίαν, ὃ στεγανόπουν ἐστί.

* Gaza φοινικόρυγχος, ait Sylb.

ΚΕΦΑΛ. κε'.

Περὶ κορυδαλῶν.

ΚΟρυδαλῶν δ' ἐστὶ δύο γένη· ἡ μὲν ἑτέρα ἐπίγειος καὶ λόφον ἔχουσα· ἡ δ' ἑτέρα, ἀγελαία καὶ οὐ σποράς, ὥσπερ ἐκείνη· τὸ μέντοι χρῶμα ὅμοιον τῇ ἑτέρᾳ ἔχουσα, τὸ δὲ μέγεθος ἐλάττων· καὶ λόφον οὐκ ἔχει· ἐσθίεται δέ.

A

ΚΕΦΑΛ. κϛʹ.

Περὶ σκαλώπου, καὶ ψάρου.

* Ἀσκαλώπας δ' ἐν τοῖς κήποις ἁλίσκεται * ἕρκεσι· τὸ δὲ μέγεθος ὅσον ἀλεκτορίς, τὸ ῥύγχος μακρόν, τὸ δὲ χρῶμα ὅμοιον ἀτταγῆνι· τρέχει δὲ ταχὺ, καὶ φιλάνθρωπόν ἐστιν ἐπιεικῶς. ὁ δὲ ψάρος, ἐστὶ ποικίλος· μέγεθος δ' ἐστὶν ἡλίκον κόττυφος.

* Scribe, ὁ σκαλώπας. vel ὁ σκαλώπαξ, vt c. 8. & apud Heſych.
* Fortaſſe ἕρκεσι, ait Sylb.

ΚΕΦΑΛ. κζʹ.

Περὶ ἴβεων.

B Αἱ δ' ἴβεις αἱ ἐν Αἰγύπτῳ, εἰσὶ μὲν διτταί· αἱ μὲν λευκαὶ αὐτῶν, αἱ δὲ, μέλαιναι. ἐν μὲν οὖν τῇ ἄλλῃ Αἰγύπτῳ αἱ λευκαί εἰσι, πλὴν ἐν Πηλουσίῳ οὐ γίνονται· αἱ δὲ μέλαιναι, ἐν τῇ ἄλλῃ Αἰγύπτῳ οὐκ εἰσίν, ἐν Πηλουσίῳ δ' εἰσί.

ΚΕΦΑΛ. κηʹ.

Περὶ σκωπῶν.

Σκῶπες δὲ, οἱ μὲν, ἀεὶ πᾶσαν ὥραν εἰσὶ, καὶ καλοῦνται ἀεισκῶπες, καὶ οὐκ ἐσθίονται, διὰ τὸ ἄβρωτοι εἶναι. ἕτεροι δὲ, γίνονται ἐνίοτε τοῦ φθινοπώρου. φαίνονται δὲ ἐφ' ἡμέραν μίαν, ἢ δύο τὸ πλεῖστον, καὶ εἰσὶν ἐδώδιμοι, καὶ σφόδρα εὐδοκιμοῦσι· καὶ διαφέρουσι τῶν ἀεισκώπων καλουμένων οὗτοι, ἄλλῳ μὲν, ὡς εἰπεῖν, οὐδενὶ, τῷ δὲ πάχει· καὶ οὗτοι μὲν εἰσὶν ἄφωνοι, ἐκεῖνοι δὲ φθέγγονται. περὶ δὲ γενέσεως αὐτῶν ἥτις ἐστὶν, οὐθὲν ὦπται, πλὴν ὅτι τοῖς ζεφυρίοις φαίνονται. τοῦτο δὲ φανερόν. C

ΚΕΦΑΛ. κθʹ.

Περὶ κόκκυγος.

Ὁ δὲ κόκκυξ, ὥσπερ εἴρηται ἐν ἑτέροις, οὐ ποιεῖ νεοττιάν, ἀλλ' ἐν ἀλλοτρίαις τίκτει νεοττιαῖς, μάλιστα μὲν ἐν ταῖς τῶν φαβῶν, καὶ ἐν ὑπολαΐδος, καὶ κορύδου, χαμαὶ· ἐπὶ δένδρου δὲ, ἐν τῇ τῆς χλωρίδος καλουμένης D νεοττιᾷ. τίκτει μὲν οὖν [ἓν ᾠόν,] ἐπῳάζει δ' οὐκ αὐτός, ἀλλ' ἐν ᾗ ἂν τέκῃ νεοττιᾷ, ἐκεῖνος ὁ ὄρνις ἐκκολάπτει καὶ ἐκτρέφει· καὶ ὥς φασιν, ὅταν αὐξάνηται ὁ τοῦ κόκκυγος νεοττός, ἐκβάλλει τὰ αὐτῆς, καὶ ἀπόλλυνται οὕτως. οἱ δὲ λέγουσιν ὡς καὶ ἀποκτείνασα ἡ τρέφουσα δίδωσι καταφαγεῖν. διὰ γὰρ τὸ καλὸν εἶναι τὸν τοῦ κόκκυγος νεοττὸν, ἀποδοκιμάζει τὰ αὑτῆς. τὰ μὲν οὖν πλεῖστα τούτων ὁμολογοῦσιν αὐτόπται γεγενημένοι τινές. περὶ δὲ τῆς φθορᾶς τῆς τῶν νεοττῶν τῆς ὄρνιθος, οὐχ ὡσαύτως πάντες λέγουσιν· ἀλλ' οἱ μὲν, φασὶν αὐτὸν ἐπιφοιτῶντα τὸν κόκκυγα, κατεσθίειν τὰ τῆς ὑποδεξαμένης ὄρνιθος νεόττια· οἱ δὲ, διὰ τὸ τῷ μεγέθει ὑπερέχειν τὸν νεοττὸν τοῦ κόκκυγος, ὑποκάπτοντα τὰ προσφερόμενα φθάνειν, ὥστε λιμῷ τοὺς ἑτέρους ἀπόλλυσθαι νεοττούς. οἱ δὲ, κρείττω ὄντα, ἀποκτιννύναι συντρεφομένους αὐτούς. δοκεῖ δὲ ὁ κόκκυξ φρόνιμος ποιεῖσθαι τὴν τέκνωσιν. διὰ γὰρ τὸ συνειδέναι αὑτῷ τὴν δειλίαν, καὶ ὅτι οὐκ ἂν δύναιτο βοηθῆσαι, διὰ τοῦτο ὥσπερ ὑποβολιμαίους ποιεῖ τοὺς ἑαυτοῦ νεοττοὺς, ἵνα σωθῶσι. τὴν γὰρ δειλίαν ὑπερβάλλει τοῦτο τὸ ὄρνεον. τίλλεται γὰρ ὑπὸ τῶν μικρῶν ὀρνέων, καὶ φεύγει αὐτά. E

CAPVT XXVI.

De Gallinagine, & Sturno, earúmque forma.

Gallinago dicta, per ſepes hortorum capitur, magnitudine quanta gallina eſt, roſtro longo, colore attagenæ. Currit celeriter, & hominem mirè diligit. Sturnus niger, albis diſtinctus maculis eſt, magnitudine merulæ.

CAPVT XXVII.

De Ibe, & duobus earum generibus.

Ibes Ægypti duplici genere diſtinguuntur: ſunt enim aliæ candidæ, aliæ nigræ. Candidæ apud Peluſium tantùm non ſunt, cùm in reliqua tota Ægypto habeantur. Nigræ contrà, apud Peluſium tantùm, in cætera Ægypto nullæ.

CAPVT XXVIII.

De duobus Aſionum generibus.

Aſiones aliqui omnibus anni temporibus patent, & ob eam rem perennes & ſemperaſiones vocabulo compoſito appellantur, qui eſui non ſunt, propter vitium carnis. Aliqui autumno interdum apparent, nec plus vno, aut altero die immorantur: qui & eſui ſunt, & valde probantur. Differunt hi nullo ferè alio à perennibus illis, niſi corpulentia pingui, & quòd vox his deeſt, illis non deeſt. De generatione eorum, quænam ſit, nihil adhuc exploratum habemus, niſi quòd Fauoniis flantibus apparent. Certum enim hoc eſt.

CAPVT XXIX.

De Cuculi fatu, & eius prudentia.

Cvculus, vt antea dictum eſt, non nidificat, ſed in nidis parit alienis, & præcipuè in palumbium, & curucæ, & alaudæ, humi, atque etiam in nido luteolæ appellatæ, ſuper arborem. Parit hic vnum ouum, nec ipſe incubat, ſed auis, in cuius nido pepererit, ea incubat, excludit, atque enutrit: quæ, cùm ipſe alienigena pullus accreuerit, ſuos eijcere dicitur, ita vt pereant. alij eos à genitrice occidi, & dari in cibo cuculi pullo aiunt, videlicet improbatos propter ſpeciem cuculi elegãtiorem. Sed quanquam plurima ex iis vidiſſe nonnulli cõfirmant, tamen de pullorum interitu non conuenit inter omnes. alij enim cuculum ipſum repetere nidum, cui ſuum ouum mandarit, pulloſque deuorare nutricis volunt; alij pullum cuculi, quòd magnitudine præſtet, poſſe percipere cibum omnem oblatum, atque ita cæteros fame perire autumant: alij ipſum vt fortiorem, cæteros paſtus conſortes occidere authores ſunt. Sed prudenter ſanè prolis ſuæ procreationem moliri videtur cuculus. Cùm enim ſe ignauum, minimeque opitulandi potentem nouerit, facit quaſi ſuppoſititios ſuos pullos, quò ſeruari poſſint. Timiditate enim hæc auis excedit, quippe quæ ab auiculis vellatur, & præ metu earum fugiat.

A

CAPVT XXX.

De Apodum nidulatione, & Caprimulgi forma.

APodes, quos aliqui cypſellos appellant, ſimiles eſſe hirundinum, dictum iam eſt. Haud enim diſcerni ab hirundine poſſunt, niſi quòd tibiis ſunt hirſutis. Nidum ſpecie ciſtellæ productæ longiùs, fictæ ex luto, vno aditu dato arctiſſimo, faciunt: idque locis anguſtis intra ſaxa & ſpecus, vt & belluas deuitare poſſint, & homines. Quem caprimulgum appellant, auis montana eſt, magnitudine paulo maior quàm merula, minor quàm B cuculus, moribus mollior parit oua duo aut tria cùm plurima. Sugit caprarum vbera aduolans, vnde nomen accepit. Cùm ſuxerit, vber extingui, caprámque excæcari aiunt. Parum clarè interdiu videt, ſed noctu perſpicax eſt.

CAPVT XXXI.

De coruorum nidificatione & fœtu.

COrui locis arctioribus, & vbi non ſatis cibi pluribus ſit, duo tãtùm incolunt: & ſuos pullos, cùm iam poteſtas volandi eſt, primùm nido C eijciunt, deinde regione tota expellũt. Parit coruus quatuor & quinque. Tempore, quo apud Pharſala hoſpites Mediæ periere, corui locis Athenarum Peloponneſique defuerunt, quaſi ſenſum haberent aliquem, quo inter ſe rerum euenta ſignificarent, & mouerentur.

CAPVT XXXII.

De ſex Aquilarum generibus, earúmque nidulatione, & venatione.

AQuilarum plura ſunt genera: vnũ, quod Pygargus ab albicante cauda dicitur, ac ſi albi- D cillam nomines. Gaudet hæc planis, & lucis, & oppidis. Hinnularia à nõnullis vocata cognomine eſt. Montes etiam ſyluáſque ſuis freta viribus petit. Reliqua genera, rarò plana & lucos adeunt. alterum genus magnitudine ſecundũ, & viribus, planga, aut clanga nomine, ſaltus, & conualles, & lacus incolere ſolitũ, cognomine anataria, & morphna à macula pennæ, quaſi næuiam dixeris: cuius Homerus etiam meminerat in exitu Priami. Tertium genus colore nigricãs, vnde nomẽ accepit, vt pulla & fuluia vocetur. Magnitudine minima, ſed viribus omniũ præſtantiſſima hæc eſt. Colit mõtes ac ſyluas, & leporaria cognominatur. Vna hæc fœtus E ſuos alit, atq; educit: pernix, cõcinna, polita, apta, intrepida, ſtrenua, liberalis, non inuida eſt: modeſta etiam, nec petulans, quippe quæ non clangat neque lippiat, aut murmuret. Quartum genus percnopterus ab alarum notis appellatum: capite albicãte, corpore maiore, quàm cæteræ adhuc dictæ, hæc eſt: ſed breuioribus alis, cauda longiore. Vulturis ſpeciem hæc refert: ſubaquila, & montana ciconia cognominatur. Incolit lucos, degener, nec vitiis cæterarũ caret, & bonorũ, quæ illæ obtinẽt, expers eſt: quippe quæ à coruo cæteriſq; id genus alitibus verberetur, fugetur, capiatur. Grauis eſt enim, victu iners, exanimata fert corpora. Famelica ſemper eſt, & querula, clamitat, & clangit.

ΚΕΦΑΛ. λ'.

Περὶ ἀπόδων καὶ αἰγοθήλου.

ΟΙ δ' ἄποδες, οὓς καλοῦσί τινες κυψέλλους, ὅτι μὲν ὅμοιοι ταῖς χελιδόσιν εἰσίν, εἴρηται πρότερον· οὐ γὰρ ῥᾴδιον γνῶναι πρὸς τὴν χελιδόνα, πλὴν τῷ τὴν κνήμην ἔχειν δασεῖαν. οὗτοι νεοττεύουσιν ἐν κυψέλαις ἐκ πηλοῦ πεπλασμέναις μακραῖς, ὅσον εἴσδυσιν ἐχούσαις. ἐν στενῷ δὲ ποιοῦνται τὰς νεοττίας ὑπὸ πέτραις καὶ σπηλαίοις, ὥστε καὶ τὰ θηρία καὶ τοὺς ἀνθρώπους διαφεύγειν. ὁ δὲ καλούμενος αἰγοθήλας, ἐστὶ μὲν ὄρειος, τὸ δὲ μέγεθος κοττύφου μὲν μικρῷ μείζων, κόκκυγος δ' ἐλάττων. τίκτει μὲν ᾠὰ δύο ἢ τρία τὸ πλεῖστον, τὸ δ' ἦθος ἐστὶ βλακικός. θηλάζει δὲ τὰς αἶγας προσπετόμενος· ὅθεν καὶ τοὔνομ' εἴληφε. φασὶ δ', ὅταν θηλάσῃ τὸν μαστόν, ἀποσβέννυσθαί τε, καὶ τὴν αἶγα ἀποτυφλοῦσθαι. ἔστι δ' οὐκ ὀξυωπὸς τῆς ἡμέρας, ἀλλὰ τῆς νυκτὸς βλέπει.

ΚΕΦΑΛ. λα'.

Περὶ κοράκων.

ΟΙ δὲ κόρακες, ἐν τοῖς μικροῖς χωρίοις, καὶ ὅπου μὴ ἱκανὴ τροφὴ πλείοσι, δύο μόνοι γίνονται· καὶ τοὺς ἑαυτῶν νεοττούς, ὅταν οἷοί τ' ὦσιν ἤδη πέτεσθαι, τὸ μὲν πρῶτον ἐκβάλλουσιν, ὕστερον δὲ καὶ ἐκ τοῦ τόπου ἐκδιώκουσι. τίκτει δ' ὁ κόραξ καὶ τέτταρα καὶ πέντε. περὶ δὲ τὸν χρόνον ἐν ᾧ ἀπώλοντο οἱ Μηδίου ξένοι ἐν Φαρσάλῳ, ἐρημία ἐν [τοῖς τόποις] τοῖς περὶ Ἀθήνας καὶ Πελοπόννησον ἐγένετο κοράκων, ὡς ἐχόντων αἴσθησίν τινα τῆς παρ' ἀλλήλων* δηλώσεως. * γρ. ἐνδηλώσεως. Plinius δηλώσεως, lib. 10. 11. vide de hoc loco Victorium Var. 37. 2.

ΚΕΦΑΛ. λβ'.

Περὶ ἀετῶν.

ΤΩν δ' ἀετῶν ἐστὶ πλείονα γένη· ἓν μέν, ὁ καλούμενος πύγαργος· οὗτος κατὰ τὰ πεδία καὶ τὰ ἄλση, καὶ περὶ τὰς πόλεις γίνεται. ἔνιοι δὲ καλοῦσι νεβροφόνον αὐτόν. πέτεται δὲ καὶ εἰς τὰ ὄρη καὶ εἰς τὴν ὕλην, διὰ τὸ θάρσος. τὰ δὲ λοιπὰ γένη, ὀλιγάκις εἰς πεδία καὶ εἰς ἄλση φοιτᾷ. ἕτερον δὲ γένος ἀετοῦ ἐστιν, ὃ* πλάγγος καλεῖται, δεύτερος μεγέθει καὶ ῥώμῃ. οἰκεῖ δὲ βήσσας, καὶ ἄγκη καὶ λίμνας· ἐπικαλεῖται δὲ νηττοφόνος καὶ μορφνός· οὗ καὶ Ὅμηρος μέμνηται ἐν τῇ Πριάμου ἐξόδῳ. ἕτερος δέ, μέλας τὴν χρόαν, καὶ μέγεθος ἐλάχιστος καὶ κράτιστος τούτων. οὗτος οἰκεῖ ὄρη καὶ ὕλας· καλεῖται δὲ μελανάετος καὶ λαγωφόνος. ἐκτρέφει δὲ μόνος οὗτος τὰ τέκνα καὶ ἐξάγει. ἔστι δὲ ὠκυβόλος, καὶ εὐθήμων καὶ ἄφθονος, καὶ ἄφοβος, καὶ μάχιμος, καὶ εὔφημος· οὐ γὰρ μινυρίζει, οὐδὲ λέληκεν. ἔστι δ' ἕτερον γένος, περκνόπτερος, λευκὴ κεφαλή, μεγέθει δὲ μέγιστος· πτερὰ δὲ βραχύτατα, καὶ ὀρροπύγιον προμῆκες, γυπὶ ὅμοιος· ὀρειπέλαργος καλεῖται, καὶ* ὑπαετός. οἰκεῖ δ' ἄλση· τὰ μὲν κακὰ ταὐτὰ ἔχων τοῖς ἄλλοις, τῶν δ' ἀγαθῶν οὐδέν· ἁλίσκεται γὰρ καὶ διώκεται ὑπὸ κοράκων καὶ τῶν ἄλλων. βαρὺς γὰρ καὶ κακόβιος, καὶ τὰ τεθνεῶτα φέρων. πεινῇ δὲ ἀεὶ καὶ βοᾷ, καὶ μινυρίζει.

* γρ. πλάγγος

Ιλιάδ. ω.

* Gaza, ὑπαετός.

ἕτερον δ' ἐστὶ γένος ἀετῶν, οἱ καλούμενοι ἁλιάετοι. οὗτοι δ' ἔχουσιν αὐχένα τε μέγαν καὶ παχύν, καὶ πτερὰ καμπύλα, οὐροπύγιον δὲ πλατύ· οἰκοῦσι δὲ περὶ θάλατταν καὶ ἀκτάς. ἁρπάζοντες δὲ, καὶ οὐ δυνάμενοι φέρειν, πολλάκις καταφέρονται εἰς βυθόν. ἔτι δ' ἄλλο γένος ἐστὶν ἀετῶν, οἱ καλούμενοι γνήσιοι. φασὶ δὲ τούτους μόνους καὶ τῶν ἄλλων ὀρνίθων γνησίους εἶναι. τὰ γὰρ ἄλλα γένη μέμικται καὶ μεμοίχευται ὑπ' ἀλλήλων, καὶ τῶν ἀετῶν καὶ τῶν ἱεράκων, καὶ τῶν ἐλαχίστων. ἔστι δ' οὗτος μέγιστος τῶν ἀετῶν ἁπάντων, μείζων τε τῆς φήνης· τῶν δ' ἀετῶν καὶ ἡμιόλιος, χρῶμα ξανθός. φαίνεται δ' ὀλιγάκις, ὥσπερ ἡ καλουμένη κύμινδις. ὥρα δὲ τοῦ ἐργάζεσθαι ἀετοῦ καὶ πέτεσθαι ἀπ' ἀρίστου μέχρι δείλης. τὸ γὰρ ἕωθεν κάθηνται μέχρι ἀγορᾶς πληθούσης. γηράσκουσι δὲ τοῖς ἀετοῖς τὸ ῥύγχος αὐξάνεται τὸ ἄνω, γαμψούμενον ἀεὶ μᾶλλον, καὶ τέλος λιμῷ ἀποθνήσκουσιν. ἐπιλέγεται δέ τις καὶ μῦθος, ὡς τοῦτο πάσχει, διότι ἄνθρωπός ποτ' ὢν, ἠδίκησε ξένον. ἀποτίθεται δὲ τὴν περιττεύουσαν τροφὴν τοῖς νεοττοῖς, διὰ τὸ μὴ εὔπορον εἶναι καθ' ἑκάστην ἡμέραν αὐτὴν πορίζεσθαι, ἐνίοτε οὐκ ἔχουσιν ἔξωθεν κομίζειν. τύπτουσι δὲ ταῖς πτέρυξι, καὶ τοῖς ὄνυξιν ἀμύττουσιν, ἄν τινα λάβωσι σκευωρούμενον περὶ τὰς νεοττιάς. ποιοῦνται δ' αὐτὰς οὐκ ἐν πεδινοῖς τόποις, ἀλλ' ἐν ὑψηλοῖς, μάλιστα μὲν ἐν πέτραις ἀποκρήμνοις, οὐ μὴν ἀλλὰ καὶ ἐπὶ δένδρων. τρέφουσι δὲ τοὺς νεοττοὺς, ἕως ἂν δυνατοὶ γένωνται πέτεσθαι. τότε δ' ἐκ τῆς νεοττιᾶς αὐτοὺς ἐκβάλλουσι, καὶ ἐκ τοῦ τόπου τοῦ* περὶ αὐτὴν πάμπαν ἀπελαύνουσιν. ἐπέχει γὰρ ἓν ζεῦγος ἀετῶν πολὺν τόπον. διόπερ οὐκ ἐᾷ πλησίον αὐτῶν ἄλλους αὐλισθῆναι. τὴν θήραν δὲ ποιεῖται, οὐκ ἐκ τῶν σύνεγγυς τόπων τῆς νεοττιᾶς, ἀλλὰ συχνὸν ἀποπτάς. ὅταν δὲ κυνηγήσῃ καὶ ἄρῃ, τίθησι, καὶ οὐκ εὐθὺς φέρει, ἀλλὰ ἀποπειραθεὶς τοῦ βάρους, ἀφίησι. [καὶ] τοὺς δασύποδας δ' οὐκ εὐθὺς λαμβάνει, ἀλλ' εἰς τὸ πεδίον ἐάσας προελθεῖν· καὶ καταβαίνει οὐκ εὐθὺς εἰς τὸ ἔδαφος, ἀλλ' ἀεὶ ἀπὸ τοῦ μείζονος ἐπὶ τὸ ἔλαττον κατὰ μικρόν. ἄμφω δὲ ταῦτα ποιεῖ πρὸς ἀσφάλειαν τοῦ μὴ ἐνεδρεύεσθαι. καὶ ἐφ' ὑψηλοῦ καθίζει, διὰ τὸ βραδέως αἴρεσθαι ἀπὸ τῆς γῆς. ὑψοῦ δὲ πέτεται, [ὅπως] ἐπὶ πλεῖστον τόπον καθορᾷ· διόπερ θεῖον οἱ ἄνθρωποί φασιν εἶναι μόνον τῶν ὀρνέων. πάντες δ' οἱ γαμψώνυχες [οὐχ] ἥκιστα καθίζουσιν ἐπὶ πέτρα, διὰ τὸ τῇ γαμψότητι ἐμπόδιον εἶναι τὴν σκληρότητα. θηρεύει δὲ νεβροὺς, καὶ λαγὼς, καὶ ἀλώπεκας, καὶ τὰ λοιπά, ὅσων κρατεῖν οἷός τ' ἐστί. μακρόβιος δ' ἐστί. δῆλον δὲ τοῦτο ἐκ τοῦ τὴν νεοττιὰν τὴν αὐτὴν ἀεὶ διαμένειν.

* Gaza, περὶ αὐτήν.

ΚΕΦΑΛ. λγ'.

Περὶ ὠτίδων.

Ἐν δὲ Σκυθίᾳ ὀρνίθων γένος ἐστὶν αἱ ὠτίδες. τοῦτο τίκτει δύο νεοττούς· οὐκ ἐπῳάζει δὲ, ἀλλ' ἐν δέρματι λαγωοῦ ἢ ἀλώπεκος ἐγκρύψασα, ἐᾷ· ἐπ' ἄκρῳ δὲ τῷ δένδρῳ φυλάττει, ὅταν μὴ τύχῃ θηρεῦον· κἄν τις ἀναβαίνῃ, μάχεται καὶ τύπτει ταῖς πτέρυξιν, ὥσπερ οἱ ἀετοί.

A Quintum genus eſt, quod haliæetus, hoc eſt, marina, vocatur, ceruice magna, & craſſa, alis curuantibus, cauda lata. Moratur hæc in litoribus, & oris: accidit huic ſæpius, vt cùm ferre quod ceperit nequeat, in gurgitem demergatur. Sextum genus gneſium, id eſt, verum germanúmque, appellant. Vnum hoc ex omni auium genere eſſe veri incorruptique ortus creditur. Cætera enim genera, & aquilarum, & accipitrum, & minutarum etiam auium, promiſcua adulterináque inuicē procreant. Maxima aquilarum omnium hæc eſt, maior etiā quàm oſſifraga: ſed cæteras aquilas vel ſeſquialtera portione excedit. Colore eſt rufa, conſpectu rara, more eius quam cymindem vocari diximus.
B Tempus aquilæ operandi volandique à prandio ad meridianum. Mane enim quieſcit vſquedum forum frequens, & prandendum iam ſit. Seneſcētibus aquilis roſtrum ſuperiùs accreſcit, incuruatúrque ſubinde magis magíſque, vt demum fame intereant. Cui rei data eſt fabula, vt hoc ita accidat aquilæ, quoniam cùm olim homo eſſet, hoſpiti iniuriam intulerit. Condunt reſeruántque ſuo in nido quantum cibi pullis ſuperſit. Quòd enim die quaque facultas venandi non datur, fit interdum ne, quod portent, extrinſecus habeant: ſi quē deprehenderint violantem nidum, verberant ſuis alis, & vnguibus lacerant. Nidulantur locis non
C planis, ſed celſis, præcipuè quidem arduis ſaxis, & præcipitibus, ſed arboribus etiam. Alunt ſuos pullos, donec poteſtas volandi fiat: tum nido eos expellunt: pòſt regione, quam ipſi genitores incolūt, tota exterminant. Tenēt enim ſingula aquilarum paria longum tractum: vnde fit ne vllo pacto vicinos habere patiantur. Venantur locis nōn ſuo nido propinquis, ſed longè diſtantibus. Rapta non protinus ferunt, ſed cùm corripuerint, & ſuſtulerint, deponunt, expertæque iam pondus requieſcunt. Leporem etiam non ſtatim rapiunt, ſed expectant dum prodeat in plana. Nec protinus de alto in terram ruunt, ſed paulatim deſcendunt. Quæ ideo faciunt, vt tutiores ab inſidiis ſint. Con-
D fidunt etiam locis editioribus, quia difficulter à terra tolluntur. Volant ſublimes, vt per quàm maximè procul aſpiciant: quapropter homines ſolam auium omnium aquilam eſſe diuinam perhibent. Omnes profectò, quibus vngues adunci, minimè in ſaxis conſiſtunt, quoniam ſaxi durities impedimento curuaturæ vnguium eſt. Venatur aquila lepores, hinnulos, vulpes, & reliqua quæ vincere valeat. Viuit tempore longo, quod diuturnitate nidi eiuſdem declaratur.

CAPVT XXXIII.

E *De aue quadam Scythica, & eius nidificatione.*

SCythiæ terræ incola auis eſt, magnitudine otidis, hoc eſt, auis tardæ, quæ duos procreat pullos: & quæ peperit oua non incubitu fouet, ſed condita in leporina aut vulpina pelle relinquit, atque ita obuoluta in ſumma arbore collocat. Cúmque à venatione vacat, cuſtodit. Et ſi quis ſcandit, impugnat, & verberat alis, perinde vt aquilæ faciunt.

CAPVT XXXIV.

De Noctua, Cicunia, & Oſſifraga.

NOctuæ, cicuniæ, & reliqua quæ interdiu nequeunt cernere, noctu venando cibum ſibi acquirunt. Verùm non tota nocte id faciunt, ſed veſpertino & matutino. Venantur autem mures, lacertas, verticillos, & eiuſmodi alias quaſdam beſtiolas. Quæ oſſifraga appellatur, probè & fœtificat, & viuit. Cœnæ gerula, & benigna eſt. Nutricat bene & ſuos pullos, & aquilæ: cùm enim illa ſuos nido eiecerit, hæc recipit eos, ac educat. Mittit namque ſuos aquila ante quàm tempus ſit, adhuc parentis operam deſiderantes, nec volandi adeptos facultatem: quod per inuidiam ita facere creditur. Natura enim inuida, & famelica eſt, nec copioſæ venationis. Magnum tamen quid nanciſcitur cùm venatur. Inuidet igitur ſuis liberis iam maiuſculis, atque edaciuſculis, & ob eam rem vnguibus ſecat. Pulli etiam ipſi inter ſe pugnare incipiunt de ſede, ac paſtu: itaque à parente eijciútur, & pulſantur: deiecti vociferantur, periclitantúrque: ſed oſſifraga recipit eos benignè, & tuetur, & alit, dum quantum ſatis ſit, adoleſcant. Parum hęc oculis valet: nubecula enim oculos habet læſos. at verò marina illa clariſſima oculorum acie eſt, ac pullos adhuc implumes cogit aduerſos intueri Solem. Percutit, qui recuſet, & vertit ad Solem: tum cuius oculi priùs lacrymarint, hunc occidit, reliquum educat. Vagatur hæc per mare, & litora, vnde nomen accepit: viuítque auium marinarum venatu, vt dictũ eſt. aggreditur ſingulas: cùm emergentem obſeruarit, refugit: auis, vt euolans vidit aquilam, metu percuſſa ſe rurſus ingurgitat, vt in diuerſa prolapſa emergat: ſed hæc acie oculorum valens, ſedulò aduolat, donec vel ſtrangulet in humore, vel per ſumma corripiat. Vniuerſas nunquã inuadit: arcent enim frequentes, reſpergentéſque ſuis alis repellunt.

CAPVT XXXV.

Fulicarum aucupatio.

FVlicæ ſpuma capiuntur, appetunt enim eam auidiùs. Quocirca ſpuma inſperſa eas venari in vſu eſt. Caro earum probi odoris eſt, excepta parte poſteriore vltima, quæ ſola limum olet. Pingueſcunt ſatis, & eſui ſunt.

CAPVT XXXVI.

De accipitrum generibus numero decem.

ACcipitrum genus præcipuum buteo eſt, triorcha à numero teſtium nuncupatus. ſecundum, æſalo. tertium, circus. Stellaris autem, palumbarius, & pernix differunt. appellantur ſubbuteones, qui latiores ſunt: alij percæ, & fringillarij vocantur: alij leues, & rubetarij, qui abundè viuunt, atque humiuolæ ſunt. Genera non pauciora quàm decem, eſſe accipitrum, aliqui prodiderunt: quæ modo quoque venandi inter ſe diſſident. alij enim columbam humi conſidentẽ rapiunt, volantem non appetunt. alij ſuper arborem, aut tale quid conſidentem venãtur: ſin humi

ΚΕΦΑΛ. λδ'.

Περὶ νυκτερινῶν ὀρνίθων, καὶ φήνης, καὶ ἁλιαιέτου.

ΓΛαῦκες δὲ καὶ νυκτικόρακες, καὶ τὰ λοιπὰ ὅσα τῆς ἡμέρας ἀδυνατεῖ βλέπειν, τῆς νυκτὸς μὲν θηρεύοντα τὴν τροφὴν αὑτοῖς πορίζεται· οὐ κατὰ πᾶσαν δὲ τὴν νύκτα τοῦτο ποιεῖ, ἀλλ' * ἄγρεις ἑσπέρου, καὶ περὶ ὄρθρον. θηρεύει δὲ μῦς καὶ σαύρας καὶ * σφονδύλας, καὶ τοιαῦτα ἄλλα ζωδάρια. ἡ δὲ καλουμένη φήνη, ἐστὶν εὔτεκνος, καὶ εὐβίοτος, καὶ δειπνοφόρος, καὶ ἤπιος, καὶ τὰ τέκνα ἐκτρέφει καὶ τὰ αὑτῆς, καὶ τὰ τοῦ αἰετοῦ. καὶ γὰρ ταῦθ' ὅταν ἐκβάλλῃ ἐκεῖνος, ἀναλαβοῦσα τρέφει. ἐκβάλλει γὰρ ὁ αἰετὸς πρὸ ὥρας, ἔτι βίου δεόμενα, καὶ οὔπω δυνάμενα πέτεσθαι. ἐκβάλλειν δὲ δοκεῖ τοὺς νεοττοὺς ὁ αἰετὸς διὰ φθόνον. φύσει γάρ ἐστι φθονερὸς καὶ ὀξύπεινος, * ἔτι δ' ὀξυλαβής. λαμβάνει δὲ μέγα, ὅταν λάβῃ. φθονεῖ οὖν τοῖς νεοττοῖς ἁδρυνομένοις, ὅτι φαγεῖν ἀγαθοὶ γίνονται καὶ σπᾷ τοῖς ὄνυξι. μάχονται δὲ καὶ οἱ νεοττοὶ ἑαυτοῖς περὶ τῆς ἕδρας καὶ τῆς τροφῆς. ὁ δ', ἐκβάλλει καὶ κόπτει αὐτούς· οἱ δ' ἐκβαλλόμενοι βοῶσι, καὶ οὕτως ὑπολαμβάνει αὐτοὺς ἡ φήνη. ἡ δὲ φήνη ἐπάργεμός τ' ἐστὶ, καὶ πεπήρωται τοὺς ὀφθαλμούς· * ὁ δ' αἰετὸς, ὀξυωπέστατος μέν ἐστι, καὶ τὰ τέκνα ἀναγκάζει ἔτι ψιλὰ ὄντα πρὸς τὸν ἥλιον βλέπειν, καὶ τὸν μὴ βουλόμενον, κόπτει καὶ στρέφει· καὶ ὁποτέρου ἂν ἔμπροσθεν οἱ ὀφθαλμοὶ δακρύσωσιν, τοῦτον ἀποκτείνει, τὸν δ' ἕτερον ἐκτρέφει. διατρίβει δὲ περὶ τὴν θάλασσαν, καὶ ζῇ θηρεύων τοὺς περὶ τὴν θάλατταν ὄρνιθας, ὥσπερ εἴρηται. θηρεύει δ' ἀπολαμβάνων καθ' ἕνα, παρατηρῶν ἀναδυόμενον ἐκ τῆς θαλάττης. ὅταν δ' ἴδῃ ὁ ὄρνις ἀνακύπτων τὸν ἁλιαιετὸν, πάλιν φοβηθεὶς καταδύεται, ὡς αὖθις ἀνακύψων. ὁ δὲ, διὰ τὸ ὀξὺ ὁρᾶν, ἀεὶ πέτεται, ἕως ἂν ἀποπνίξῃ, ἢ λάβῃ μετέωρον. ἀθρόαις γὰρ οὐκ ἐπιχειρεῖ. ῥαίνουσαι γὰρ ἀποψύχουσι ταῖς πτέρυξιν.

* Sylb. περὶ ἑσπέραν,
* κ. σφονδύλας,
* Gaza, ἔτι δὲ οὐκ ὀξυλαβὴς, vel ὀπιλαβής.
* Scrib. ὁ δ' ἁλιαιετὸς,

ΚΕΦΑΛ. λε'.

Περὶ κέπφων.

ΟΙ δὲ κέπφοι, ἁλίσκονται τῷ ἀφρῷ. κάπτουσι γὰρ αὐτόν. διὸ προσραίνοντες θηρεύουσι. ἔχει δὲ τὴν μὲν ἄλλην σάρκα εὐώδη· τὸ δὲ πυγαῖον μόνον * θῖνος ὄζει. γίνονται δὲ πίονες.

* Gaza θινὸς

ΚΕΦΑΛ. λϛ'.

Περὶ ἱεράκων.

ΤΩν δ' ἱεράκων κράτιστος μὲν, ὁ τριόρχης· δεύτερος δ', ὁ αἰσάλων· τρίτος, ὁ κίρκος. ὁ δ' ἀστερίας, καὶ ὁ φασσοφόνος, καὶ ὁ * πτέρνης, ἀλλοῖοι. οἱ δὲ πλατύτεροι ἱέρακες, ὑποτριόρχαι καλοῦνται. ἄλλοι δὲ, πέρκοι καὶ σπιζίαι. οἱ δὲ λεῖοι καὶ οἱ φρυνολόγοι, οὗτοι εὐβιώτατοι καὶ χθαμαλοπέτηται. γένη δὲ τῶν ἱεράκων φασί τινες εἶναι οὐκ ἐλάττω τῶν δέκα. διαφέρουσι δὲ ἀλλήλων. οἱ μὲν γὰρ αὐτῶν, ἐπὶ τῆς γῆς καθημένην τύπτουσι τὴν περιστερὰν, καὶ συναρπάζουσι· πετομένης δ' οὐ θιγγάνουσιν. οἱ δ', ἐπὶ δένδρου μὲν ἢ τινος ἄλλου καθημένην θηρεύουσιν· ἐπὶ τ

* Geſnerus, πτέρνις, & mox σπιζίαι.

γῆς δ' οὔσης, ἢ μετεώρου, οὐχ ἅπτονται. οἱ δ', οὔτ' ἐπὶ τῆς γῆς, οὔτ' ἐπ' ἄλλου καθημένης θηρεύουσιν, ἀλλὰ πετομένην πειρῶνται λαμβάνειν. φασὶ δὲ καὶ τὰς περιστερὰς γινώσκειν ἕκαστον τούτων τῶν γενῶν· ὥστε προσπετομένων, ἐὰν μὲν ᾖ τῶν μετεωροθήρων, μένειν ὅπου ἂν καθήμεναι τύχωσιν· ἐὰν δὲ ᾖ τῶν χαμαιτύπων ὁ προσπετόμενος, οὐχ ὑπομένειν, ἀλλ' ἀναπέτεσθαι. ἐν δὲ *Θρᾴκης τῇ καλουμένῃ ποτὲ *Κεδροπόλει, ἐν τῷ ἕλει θηρεύουσιν οἱ ἄνθρωποι τὰ ὀρνίθια κοινῇ μετὰ τῶν ἱεράκων. οἱ μὲν γὰρ, ἔχοντες ξύλα, σοβοῦσι τὸν κάλαμον καὶ τὴν ὕλην, ἵνα πέτωνται τὰ ὀρνίθια· οἱ δὲ ἱέρακες, ἄνωθεν ὑπερφαινόμενοι, καταδιώκουσι· ταῦτα δὲ, φοβούμενα, κάτω πέτεται πάλιν πρὸς τὴν γῆν· οἱ δ' ἄνθρωποι, τύπτοντες τοῖς ξύλοις, λαμβάνουσι, καὶ τῆς θήρας μεταδιδόασιν αὐτοῖς. ῥίπτουσι γὰρ τῶν ὀρνίθων· οἱ δὲ, ὑπολαμβάνουσι. περὶ τὴν Μαιώτιν δὲ λίμνην τοὺς λύκους φασὶ συνήθεις εἶναι τοῖς ποιουμένοις τὴν θήραν τῶν ἰχθύων· ὅταν δὲ μὴ μεταδιδῶσι, διαφθείρειν αὐτῶν τὰ δίκτυα ξηραινόμενα [ἐν] τῇ γῇ. τὰ μὲν οὖν περὶ τοὺς ὄρνιθας τοῦτον ἔχει τὸν τρόπον.

* χ. Θρᾴκη
* Quid. Ἀμφιπόλει, vt apud Plinium lib.10. cap.8.

ΚΕΦΑΛ. λζ.

Τινὰ τῶν ἰχθύων ἤθη.

Ἔστι δὲ καὶ ἐν τοῖς θαλαττίοις ζῴοις πολλὰ τεχνικὰ θεωρῆσαι πρὸς τοὺς ἑκάστων βίους. τά τε γὰρ θρυλλούμενα περὶ τὸν βάτραχον τὸν ἁλιέα καλούμενον, ἐστὶν ἀληθῆ, καὶ τὰ περὶ τὴν νάρκην. ὁ μὲν γὰρ βάτραχος, τοῖς πρὸ τῶν ὀφθαλμῶν ἀποκρεμαμένοις, ὧν τὸ μὲν μῆκός ἐστι τριχῶδες, ἐπ' ἄκρου δὲ στρογγύλον, ὥσπερ προσκείμενον ἑκατέρῳ δέλεατος χάριν, ὅταν ἐν τοῖς ἀμμώδεσιν ἢ θολώδεσιν ἀναταράξας κρύψῃ ἑαυτὸν, ἐπαίρει τὰ τριχώδη. κοπτόντων δὲ τῶν ἰχθυδίων, συγκατάγει μέχριπερ ἂν πρὸς τὸ στόμα προσαγάγῃ. ἥ τε νάρκη, ναρκᾶν ποιοῦσα ὧν ἂν κρατήσειν μέλλῃ ἰχθύων, τῷ τρόπῳ ὃν ἔχει ἐν τῷ σώματι λαμβάνουσα, τρέφεται τούτοις. κατακρύπτεται δὲ εἰς τὴν ἄμμον καὶ πηλὸν· λαμβάνει δὲ τὰ ἐπινέοντα, ὅσα ἂν ναρκήσῃ ἐπιφερόμενα τῶν ἰχθύων· καὶ τούτου αὐτόπται γεγένηνταί τινες. κατακρύπτει δὲ καὶ ἡ τρυγὼν αὑτὴν· πλὴν οὐχ ὁμοίως. σημεῖον δὲ ὅτι τοῦτον τὸν τρόπον ζῶσιν· ἁλίσκονται γὰρ ἔχοντες κεστρέας πολλάκις, ὄντες αὐτοὶ βραδύτατοι, τὸν τάχιστον τῶν ἰχθύων. ἔπειτα ὁ μὲν βάτραχος, ὅταν μηκέτ' ἔχῃ τὰ ἐπὶ ταῖς θριξὶν, ἁλίσκεται λεπτότερος· ἡ δὲ νάρκη, φανερά ἐστι καὶ τοὺς ἀνθρώπους ποιοῦσα ναρκᾶν. *καταμμίζουσι δ' ἑαυτοὺς καὶ ὄνος, καὶ βάτραχος, καὶ ψῆττα, καὶ ῥίνη· καὶ ὅταν ποιήσωσιν ἀφανεῖς αὑτοὺς, εἶτα ῥαβδεύονται τοῖς ἐν τῷ στόματι, ἃ καλοῦσιν οἱ ἁλιεῖς ῥαβδία· τὰ δὲ μικρὰ ἰχθύδια προσέρχονται, ὡς πρὸς φυκία, ἀφ' ὧν τρέφονται. ὅπου δ' ἂν ἀνθίας ὀφθῇ, οὐκ ἔστι θηρίον· ᾧ καὶ σημείῳ χρώμενοι, κατακολυμβῶσιν οἱ σπογγεῖς, καὶ καλοῦσιν ἱεροὺς ἰχθῦς τούτους. ἔοικε δὲ συμπτώματι, καθάπερ ὅπου ἂν ᾖ κοχλίας, οὔθ' ὗς ἐστιν, οὔτε πέρδιξ· κατεσθίουσι γὰρ πάντες τοὺς κοχλίας. ὁ δ' ὄφις ὁ θαλάττιος, τὸ μὲν χρῶμα παραπλήσιον ἔχει τῷ γόγγρῳ, καὶ τὸ σῶμα· πλὴν ἐστὶν ἀμαυρότερος καὶ σφοδρότερος. *ἐὰν δὲ ληφθῇ καὶ ἀφεθῇ, εἰς τὴν ἄμμον καταδύεται ταχὺ, τῷ ῥύγχει διατρυπήσας. ἔχει δ' ὀξύτερον στόμα τῶν ὄφεων. ἣν δὲ καλοῦσι σκολόπενδραν,

* γρ. καταμμίζ.
* χ. ἐὰν δὲ φοβηθῇ ἢ ληφθῇ,

A eſt, aut volat, non inuadunt. alij neque humi, neque in ſublimi manentem aggrediuntur, ſed volantem capere conantur. Fertur etiam à columbis quodque accipitrum genus cognoſci. Itaque cùm accipiter prouolat, ſi ſublimipeta eſt, manent eo conſtiterint loco: ſed ſi humipeta, qui prouolat, eſt, non manent, ſed continuò auolant. Thraciæ parte, quæ olim Cedropolis vocabatur, homines ſocietate accipitrum per paludes aucupantur. Cùm enim ipſi lignis quæ tenent, arũdines & fruteta mouerunt, quò aues euolent, accipitres deſuper inſectantur: quorum metu aues perculſæ terram repetunt: mox homines percutiunt baculis, itáque capiunt, tum partem earum quas ceperint, auium, accipitribus impartiuntur. Quinetiam a-
B pud Mæotidem paludem lupos eſſe piſcatorum familiares, aiunt: & niſi partem ſuam à piſcatoribus acceperint, retia cùm in terra expanſa reſiccantur, lacerare. Ratio auium talis eſt.

CAPVT XXXVII.

De ingenio marinorum, & fluuiatilium piſcium pro ratione commodioris vitæ.

SEd in marinis quoque animantibus permulta intelligi poſſunt, non ſine ſolerti ingenio effici ratione vitæ commodioris. Nam & inuulgata illa de rana, quæ piſcatrix cognominata eſt,
C & quæ de torpedine, vera omnino certáque ſunt. Rana enim his, quæ gemina ante oculos ſuos dependent, quorum fila capilli ſpeciem referunt, ſed poſtrema rotundis quibuſdam præpilantur, quaſi eſcæ cauſa additis: his, inquam, vbi locis arenoſis aut fæculentis obturbato ſolo ſe abſconderit, piſcatur, attollens illa ſibi pendentia fila. Dum enim piſciculi occurrunt, & capita machinamenti penſilis pulſant, ipſa ſubtrahens fila allicit, donec eos ſuum in os adducat. Torpedo piſces, quos appetit, afficit ea ipſa, quam ſuo in corpore continet, facultate torpendi: atque ita retardos præ ſtupore capit, & veſcitur. abdit ſe in arena, & limo, tum piſces, qui adnatantes obtorpuerint,
D corripit: quam rem plerique conſpectam à ſe retulerunt. Paſtinaca etiam ſe ipſam occultat, ſed non ſimili modo. argumentum ſic viuere hos piſces adduci poteſt, quod ſæpius habentes in ventre mugilem capiũtur, velociſſimum piſcem, cùm tardiſſimi ipſi ſint. Tum etiam rana, quæ caruerit præpilatis villorum illis capitibus, macilentior capitur. Torpedinem autem vel hominibus inſpirare torporem certum eſt. Obruunt arena ſeſe & aſelli, & raiæ, & paſſeres, & ſquatinæ: cùmque nullam ſui corporis partem intectam reliquerint, verberant radiolis ſui oris, quos piſcatores virgulas vocant, quas piſciculi cùm aſpexerint, adnatant quaſi ad algas, quibus veſci ſoliti ſunt. Quo in
E loco Anthias ſit, nullam ibi belluam eſſe, confeſſum eſt. Quo etiam indicio ſecurè ſpongiatores vrinantur, & ſacrum hunc piſcem ob eam rem nominant. Sed id caſu ſic euenire dixerim, quo modo & vbi ſit limax, neque ſus eſt, neque perdix: omnes enim limaces ab his eduntur. Serpens marina colore, & corpore congro proxima eſt, ſed obſcurior, atque acrior. Hęc ſi capta dimittatur foris, in arenam roſtro quàm primum adacto terebrat, ſubitque tota. Eſt ore acutiore hæc quàm terreſtres. Qui autem centipeda appellatur,

vbi hamum deuorarit, euomit foras ſua interiora, donec hamum eijciat: tum recipit intrò, ac valet eadem qua antè ſalubritate. appetitus his quoque nidorulentorum, vt terreſtribus, eſt. Mordent non ore ſed tactu totius corporis ſimiliter, vt quæ vrticæ vocantur. Piſces, qui vulpes nuncupantur, cum ſe deglutiſſe hamum ſenſerint, ſibi opitulantur, vt centipedæ. Longius namque ſeſe efferentes hami lineam abrodunt. Capiuntur enim locis nonnullis hamo multiplici, gurgite præalto, & fluctuoſo. Quinetiam amiæ, cum belluam viderint aliquam, colligunt ſeſe: & quæ magnitudine præſtant, luſtrantes gregem circumuallant: & ſi qua violatur, defendunt. Dentes his validi: & iam cùm aliæ belluæ, tum amia aggreſſa, vulnera accepiſſe acriùs viſa eſt. Fluuiatilium ſilurus mas plurimum curæ proli impendit: fœmina, vt peperit, abit. Sed mas quo in loco plurimus fœtus conſtiterit, perſeuerans oua cuſtodit: nec alium præbet vſum, niſi vt piſciculos ne deripiant fœtum, arceat: idque vel ad quadrageſimum & quinquageſimum diem facit, donec ſatis iam aucta ſoboles, ſe tueri à cæteris piſcibus valeat. Prehenditur ſæpe à piſcatoribus, vbi oua cuſtodit. Dum enim arcet piſciculos, quatit, proſilit, & ictum ſonúmque mouet. Manet apud oua tam ardente animo, vt cùm ſæpe à piſcatoribus oua, ſi præaltis gurgitibus ſubſidũt, educantur, quoad magis fieri poteſt, in vadum, ipſe tamen eodem ſtudio fœtum ſequatũr, neque deſerere vnquam patiatur: tunc ſi minor ſit natu, minúſque vſu exercitatus, facilè hamo capitur: ſed ſi peritus, & hamifraga eſt, morſu dentis ſui duriſſimi rumpit hamum, & fœtum aſſiduè cuſtodit. Omnia verò tum nantia, tum ſtabilia, locis eiſdem, quibus orta ſint, aut ſimilibus, degunt: ſuus enim quibuſque cibus in iis eſt. Vagantur maximè, & oberrant, quæ carne aluntur, præter pauca, vt mugilem, ſalpam, mullum, æricam. Quæ autem pholis appellatur, mucorem, quem ipſa emittit, ſibi obducit, ita vt in eo quaſi cubili quieſcat. Generis teſtati & expedis pecten potiſſimum, plurimúmque ſe mouet volatu. Nam purpura & eius ſimilia, parum admodum progrediuntur. De Euripo Pyrrhæo piſces per hyemem omnes, excepto gobione, foras enatant propter frigus: locus hic enim frigidior eſt: ſed ineunte vêre eôdem redeunt. Vacat Euripus ſcaro, & aloſa, & reliquis ſpinoſioris generis omnibus. Muſteli etiam & ſpinaces in eo mari nequaquam gignuntur, necnon locuſtæ, polypi, bolitænæ, atque alia quædam genera. Gobionem album Euripi non eſſe pelagium certum eſt. Vigent piſces ouipari vêris tempore, donec pariant: viuipari autumno, atque etiam mugiles, mulli, & reliqui generis eiuſdem. Apud Leſbum inſulam omnia tã pelagia quàm Euripica parere ſolent in Euripo. Coeunt autumno, pariũt vêre: cartilaginea etiam autumno. Mares cum fœminis circa coitum congregantur: ſed vêre ſubeunt Euripum diſiuncta: neque coniugium reperitur vllum, donec pariant, cùm coitus tempore complura ex his ſibi adhærentia capiantur. Mollium aſtutiſſima ſepia eſt: ſola hæc ſuo vtitur atramento, non modò cùm metuit, verùm etiam abſcondendi cauſa.

A ὅταν καταπίῃ τὸ ἄγκιστρον, ἐκτρέπεται τὰ ἐντὸς ἐκτός, ἕως ἂν ἐκβάλλῃ τὸ ἄγκιστρον· εἶθ' οὕτως εἰστρέπεται πάλιν ἐντός. βαδίζουσι δ' αἱ σκολόπενδραι πρὸς τὰ κνισώδη, ὥσπερ καὶ χερσαῖαι. τῷ μὲν οὖν στόματι οὐ δάκνουσι, τῇ δὲ ἅψει καθ' ὅλον τὸ σῶμα, ὥσπερ αἱ καλούμεναι κνίδαι. τῶν δ' ἰχθύων αἱ ὀνομαζόμεναι ἀλώπεκες, ὅταν αἴσθωνται ὅτι τὸ ἄγκιστρον καταπεπώκασι, βοηθοῦσι πρὸς τοῦτο, ὥσπερ καὶ ἡ σκολόπενδρα. ἀναδραμοῦσαι γὰρ ἐπὶ πολὺ πρὸς τὴν ὁρμιάν, ἀποτρώγουσιν αὐτῆς· ἁλίσκονται δὲ περὶ ἐνίους τόπους πολυαγκίστροις, ἐν * ῥωδέσι καὶ βαθέσι τόποις. συστρέφονται δὲ καὶ αἱ ἀμίαι, ὅταν τι θηρίον ἴδωσι, καὶ κύκλῳ B αὐτῶν περινέουσιν αἱ μέγισται· κἂν ἅπτηται τινος, ἀμύνουσιν. ἔχουσι δ' ὀδόντας ἰσχυρούς. καὶ ἤδη ὦπται καὶ ἄλλα καὶ ἄμια ἐμπεσοῦσα καὶ καθελκυσθεῖσα. τῶν δὲ ποταμίων ὁ γλάνις ὁ ἄρρην, περὶ τὰ τέκνα ποιεῖται ἐπιμέλειαν πολλήν. ἡ μὲν γὰρ θήλεια, τεκοῦσα, ἀπαλλάττεται· ὁ δὲ ἄρρην, οὗ ἂν πλεῖστον συστῇ τοῦ κυήματος, ᾠοφυλακεῖ παραμένων, οὐδεμίαν ὠφέλειαν ἄλλην παρεχόμενος, πλὴν ἐρύκων τἆλλα ἰχθύδια, μὴ διαρπάσωσι τὸν γόνον· καὶ τοῦτο ποιεῖ ἡμέρας τετταράκοντα καὶ πεντήκοντα, ἕως ἂν αὐξηθεὶς ὁ γόνος, δύνηται διαφεύγειν ἀπὸ τῶν ἄλλων ἰχθύων. γινώσκεται δ' ὑπὸ τῶν ἁλιέων οὗ ἂν τύχῃ ᾠοφυλακῶν. ἐρύκων γὰρ τὰ C ἰχθύδια ἅλλεται, καὶ ἦχον ποιεῖ καὶ μυγμόν. οὕτω δὲ φιλοστόργως μένει πρὸς τοῖς ᾠοῖς, ὥστε οἱ ἁλιεῖς ἑκάστοτε, ἐὰν ἐν βαθείαις ῥίζαις τὰ ᾠὰ προσῇ, ἀνάγουσιν ὡς ἂν δύνωνται εἰς βραχύτατον· ὁ δέ, * ὁμοίως οὐκ ἀπολείπει τὸν γόνον· ἀλλ' ἐὰν μὲν νέος τύχῃ, ταχέως ὑπὸ τοῦ ἀγκίστρου ἑάλω, διὰ τὸ ἁρπάζειν τὰ προσιόντα τῶν ἰχθυδίων· ἐὰν δ' ᾖ συνήθης καὶ ἀγκιστροφάγος, λείπει μὲν οὐδ' ὡς τὸν γόνον, τῷ δὲ ὀδόντι τῷ σκληροτάτῳ συνδάκνων, διαφθείρει τὰ ἄγκιστρα. ἅπαντα δὲ, καὶ τὰ πλωτά, καὶ τὰ μόνιμα, τοὺς νέμεται περὶ τόπους ἐν οἷς ἂν φύωσι, καὶ τοὺς ὁμοίους τούτοις. ἡ γὰρ οἰκεία τροφὴ ἑκάστων, ἐν τούτοις ἐστί. πλανᾶται δὲ μάλιστα D τὰ σαρκοφάγα, πάντα δὲ σχεδόν ἐστι σαρκοφάγα, πλὴν ὀλίγων, οἷον κεστρέως, καὶ σάλπης, καὶ τρίγλης, καὶ χαλκίδος. τὴν δὲ καλουμένην φωλίδα, ἡ μύξα ἣν ἀφίησι, περιπλάττεται περὶ αὐτήν, καὶ γίνεται καθάπερ θαλάμη. τῶν δ' ὀστρακοδέρμων καὶ ἀπόδων ὁ κτεὶς μάλιστα καὶ πλεῖστον κινεῖται δι' αὑτοῦ πετόμενος. ἡ γὰρ πορφύρα ἐπὶ μικρότατον προέρχεται, καὶ τὰ ὅμοια ταύτῃ. ἐκ δὲ τοῦ Εὐρίπου * τοῦ ἐκ Πυῤῥου οἱ ἰχθύες χειμῶνος μὲν ἐκπλέουσιν ἔξω, πλὴν κωβιοῦ, διὰ τὸ ψῦχος. ψυχρότερος γάρ ἐστιν ὁ Εὔριπος· ἅμα δὲ τῷ ἔαρι πάλιν εἰσπλέουσιν. οὐ γίνεται δ' ἐν τῷ Εὐρίπῳ οὔτε σκάρος, οὔτε θρίσσα, οὔτε ἄλλο τῶν ἀκανθηρῶν οὐ- E δέν, οὐδὲ γαλεοί, οὐδὲ ἀκανθίαι, οὐδὲ κάραβοι, οὐδὲ πολύποδες, οὐδὲ βολιταῖναι, οὐδ' ἄλλ' ἄττα. τῶν δ' ἐν τῷ Εὐρίπῳ φυομένων, οὐκ ἔστι πελάγιος ὁ λευκὸς κωβιός. ἀκμάζουσι δὲ τῶν ἰχθύων οἱ μὲν ᾠοφόροι, τοῦ ἔαρος, ἄχρις οὗ ἂν ἐκτέκωσιν· οἱ δὲ ζῳοτόκοι, τοῦ μετοπώρου, καὶ πρὸς τούτοις κεστρεῖς καὶ τρίγλαι, καὶ τἆλλα τὰ τοιαῦτα πάντα. περὶ δὲ τὴν Λέσβον, καὶ τὰ πελάγια πάντα καὶ τὰ εὐριπώδη, τίκτει ἐν τῷ Εὐρίπῳ. ὀχεύονται μὲν οὖν τοῦ μετοπώρου, τίκτουσι δὲ τοῦ ἔαρος. ἔστι δὲ καὶ τὰ σελάχη κατὰ μὲν τὸ μετόπωρον, ἀναμὶξ τὰ ἄρρενα τοῖς θήλεσι κατὰ τὴν ὀχείαν· τοῦ δὲ ἔαρος εἰσπλέουσι διακεκριμένα, μέχρις οὗ ἂν ἐκτέκωσι. κατὰ δὲ τὴν ὀχείαν ἁλίσκεται πολλὰ συνεζευγμένα. τῶν δὲ μαλακίων πανουργότατον μὲν ἡ σηπία, καὶ μόνον χρῆται τῷ * θόλῳ κρύψεως χάριν, καὶ οὐ μόνον φοβουμένη.

* Scrib. ῥοώδεσι

* γρ. ὅμως Gaza vtrumque agnoſcit.

* G. τοῦ Πυῤῥαίου. alibi τῶν Πυῤῥαίων. alterutro modo legendum.

* γρ. θολῷ

ὁ δὲ πολύπους καὶ ἡ τευθὶς, διὰ φόβον ἀφίησι τὸν θολόν. ἀφίησι δὲ ταῦτα πάντα οὐδέποτε ἀθρόον τὸν θολόν· καὶ ὅταν ἀφῇ, αὐξάνεται πάλιν. ἡ δὲ σηπία, ὥσπερ εἴρηται, τῷ τε θολῷ πολλάκις χρῆται κρύψεως χάριν· καὶ προδείξασα εἰς τὸ πρόσθεν, ἀναστρέφεται εἰς τὸν θολόν. ἔτι δὲ θηρεύει τοῖς μακροῖς τοῖς ἀποτείνουσιν, οὐ μόνον τὰ μικρὰ τῶν ἰχθυδίων, ἀλλὰ καὶ κεστρέας πολλάκις. ὁ δὲ πολύπους, ἀνόητον μέν ἐστι, (καὶ γὰρ πρὸς τὴν χεῖρα βαδίζει τοῦ ἀνθρώπου καθιεμένην) οἰκονομικὸν δ' ἐστί. πάντα γὰρ συλλέγει μὲν εἰς τὴν θαλάμην, οὗ τυγχάνει κατοικῶν. ὅταν δὲ καταναλώσῃ τὰ χρησιμώτατα, ἐκβάλλει τὰ ὄστρακα, καὶ τὰ κελύφια τῶν καρκίνων καὶ κογχυλίων, καὶ τὰς ἀκάνθας τῶν ἰχθυδίων. καὶ θηρεύει τοὺς ἰχθῦς, τὸ χρῶμα μεταβάλλων, καὶ ποιῶν ὅμοιον οἷς ἂν πλησιάζῃ λίθοις. τὸ δ' αὐτὸ τοῦτο ποιεῖ καὶ φοβηθείς. λέγεται δ' ὑπό τινων, ὡς καὶ ἡ σηπία τοῦτο ποιεῖ. παρόμοιον γάρ φασι τὸ χρῶμα τὸ αὑτῆς ποιεῖν τῷ τόπῳ περὶ ὃν διατρίβει. τῶν δ' ἰχθύων τοῦτο ποιεῖ μόνον ἡ ῥίνη. μεταβάλλει γὰρ τὴν χρόαν, ὥσπερ ὁ πολύπους. τὸ μὲν οὖν πλεῖστον γένος τῶν πολυπόδων, οὐ διετίζει· καὶ γὰρ φύσει συντηκτικόν ἐστιν. σημεῖον δ' ἐστί· πιεζόμενος γὰρ ἀφίησιν ἀεί τι, καὶ τέλος, ἀφανίζεται. αἱ δὲ θήλειαι, μετὰ τὸν τόκον τοῦτο πάσχουσι μᾶλλον, καὶ γίνονται μωραὶ, καὶ οὔτε κυματιζόμεναι αἰσθάνονται· λαβεῖν τε τῇ χειρὶ κατακολυμβῶντα, ῥᾴδιον· βλεννώδεις τε γίνονται, καὶ οὐδὲ θηρεύουσιν ἔτι προσκαθήμεναι. οἱ δ' ἄρρενες, σκυτώδεις τε γίνονται καὶ γλίσχροι. σημεῖον δὲ δοκεῖ εἶναι τοῦ μὴ διετίζειν, ὅτι μετὰ τὴν γένεσιν τῶν πολυποδίων, ἔν τε τῷ θέρει καὶ πρὸς τὸ φθινόπωρον, μέγαν πολύπουν οὐκέτι ῥᾴδιόν ἐστιν ἰδεῖν· μικρὸν δὲ πρὸ τούτου τοῦ καιροῦ, μέγιστοί εἰσιν οἱ πολύποδες. ὅταν δὲ τὰ ᾠὰ ἐκτέκωσιν, οὕτω καταγηράσκειν καὶ ἀσθενεῖς γίνεσθαι ἀμφοτέρους φασὶν, ὥστε ὑπὸ τῶν ἰχθυδίων κατεσθίεσθαι, καὶ ῥᾳδίως ἀποσπᾶσθαι ἀπὸ τῶν φωλεῶν· πρότερον δὲ τοιοῦτον οὐδὲν πάσχειν. ἔτι δὲ τοὺς μικροὺς καὶ νέους τῶν πολυπόδων μετὰ τὴν γένεσιν οὐδέν φασι τοιοῦτον πάσχειν, ἀλλ' ἰσχυροτέρους εἶναι τῶν μειζόνων. οὐ διετίζουσι δ' οὐδὲ αἱ σηπίαι. εἰς δὲ τὸ ξηρὸν ἐξέρχεται μόνον τῶν μαλακίων ὁ πολύπους. πορεύεται δ' ἐπὶ τοῦ τραχέος, τὸ δὲ λεῖον φεύγει. ἔστι δὲ τὰ μὲν ἄλλα ἰσχυρὸν τὸ ζῷον, τὸν δὲ τράχηλον ἀσθενὲς, ὅταν πιεσθῇ. περὶ μὲν οὖν τῶν μαλακίων τοῦτον ἔχει τὸν τρόπον. τὰς δὲ κόγχας φασὶ τὰς λεπτὰς καὶ τραχείας ποιεῖσθαι περὶ αὑτὰς οἷον θώρακα σκληρὸν, καὶ τοῦτον μείζονα, ὅταν γίνωνται μείζους, καὶ ἐκ τούτου ἐξιέναι, ὥσπερ ἐκ φωλεοῦ τινος ἢ οἰκίας. ἔστι δὲ καὶ ὁ ναυτίλος πολύπους τῇ τε φύσει, καὶ οἷς ποιεῖ, περιττός. ἐπιπλεῖ γὰρ ἐπὶ τῆς θαλάττης, τὴν ἀναφορὰν ποιησάμενος κάτωθεν ἐκ τοῦ βυθοῦ· καὶ ἀναφέρεται μὲν κατεστραμμένῳ τῷ ὀστράκῳ, ἵνα ῥᾷόν τε ἀνέλθῃ, καὶ κενῷ ναυτίλληται· ἐπιπολάσας δὲ, μεταστρέφει. ἔχει δὲ μεταξὺ τῶν πλεκτανῶν * ἐπί τι συνυφὲς, ὅμοιον τοῖς στεγανόποσι τὸ μεταξὺ τῶν δακτύλων· πλὴν ἐκείνοις μὲν παχὺ, τούτοις δὲ λεπτὸν τοῦτο καὶ ἀραχνῶδές ἐστι. χρῆται δ' αὐτῷ, ὅταν πνεῦμα τι ᾖ, ἱστίῳ· ἀντὶ πηδαλίου δὲ, * τῶν πλεκτανῶν παρακαθίησιν. ἂν δὲ φοβηθῇ, καταδύνει τῆς θαλάσσης μεστώσας τὸ ὄστρακον. περὶ δὲ γενέσεως καὶ συναυξήσεως τοῦ ὀστράκου, ἀκριβῶς μὲν οὔπω ὦπται· δοκεῖ δ' οὐκ ἐξ ὀχείας γίνεσθαι, ἀλλὰ φύεσθαι, ὥσπερ τἆλλα κογχύλια. οὐ δῆλον δέ πω, οὐδ' εἰ ἀποδυόμενος δύναται ζῆν.

* Gaza, *membranam*, h.c. ὑμένα. Oppianus, μέσσης δὲ διαφρίνει ἅτε λαῖφος λεπτὸς ὑμήν.

* Athenæus li. 7. ἄνας δύο πλεκτάνας καθίησι.

A Polypus atque lolligo atramentum pro metu mittunt, ſed accreſcit denuo poſtquam miſerunt, vt nunquam copia deſit atramenti. Cæterum ſepia, vt dixi, ſæpe vel ſine pauore, ſuo vtitur atramento ad ſe occultandam: & cùm progreſſa paululum ſe oſtenderit, redit in atramentum. Venatur etiam ſuis illis prælongis prætenturis non ſolùm pisciculos, ſed mugiles etiam ſæpius. Polypus fatuus quidem eſt, cùm ad manum demiſſam hominis accedit: ſed prudens rei familiaris, cùm omnia colligat, & ſuo in domicilio recondat: cúmque conſumpſerit quantum vtile ſit, abigit teſtas, & cancrorum cruſtas, & putamina conchularum, & ſpinas piſciculorum. B Sui etiam mutatione coloris venatur piſces: trahit enim ſibi colorem ſimilem iis quibus appropinquarit, ſaxis: quod idem etiam, cùm metuerit, facit. Sunt qui ſepiam quoque facere hoc idem autument: colorem namque eam ſibi contrahere ſimilem loco, in quo verſatur, confirmant. Sed piſcium ſola ſquatina ita affici ſolet: mutat enim hæc more polypi, ſuum colorem. Genus polyporum magna ex parte biennio viuere non poteſt: ſua enim natura tabi obnoxium eſt. Cuius rei indicium, cùm preſſus polypus aliquid ſubinde humoris emittat, demúmque abſumatur totus: quod fœminis à partu potiſſimum incidit. Stupent etiam fœminæ, vt neque vndis iactatæ C ſentiant, & manu vrinantis de facili capiantur. Sordeſcunt etiam, nec præterea aſſidendo venari poſſunt. Mares verò alueo tument, & in mucorem lenteſcunt. Indicium, ne bimatum compleát, eſſe videtur, quòd ab ortu eorum, qui æſtate fit, ad autumnum non facilè grandem polypum videris, cùm paulò ante id tempus pergrandes ſpectentur. A partu ita ſeneſcere debilitarique tam marem quàm fœminam, ferunt, vt vel à piſciculis deuorentur, & facilè à ſuis detrahantur cubilibus, cùm antea nihil tale iis vſu eueniat: tum verò paruos nouellóſque, quamuis recèns natos, tamen nullo eiuſmodi malo affici narrant: quinimo validiores D eſſe, quàm grandes, confirmant. Sepias etiam bimatu non viuere, apertum eſt. Mollium vnus polypus exit in ſiccum, graditur per aſperiora, vitat læuia. Validum cùm cæteris ſuis partibus hoc animal ſit, collo tamen imbecille, cùm premitur, eſt. Mollia ita ſe habent. Conchas tenuiores ſcabráſque efficere circum ſe velut loricam duram, eámque eo ampliorem, quo ipſæ ſunt ampliores, atque de ea quaſi latibulo aut caſula quadam prodire, aiunt. Nauta quoque polypus natura, & vitæ muneribus ſingularis eſt: nauigat enim per maris ſumma elatus. De imo gurgite effert ſe concha inuerſa, vt aſcendere poſſit facilius, & inani ſcapha enauiget: vbi verò emerſit, concham reuertit. E Habet inter ſua brachia membranulam quandam annexam ſimilem iis quæ digitis inſertæ palmipedum auium continentur: verum illæ craſſiuſculæ ſunt, hæc prætenuis eſt, & araneæ ſpeciem imitatur. Hac velificat, cum aura inſpirat, cirros pro gubernaculis vtroque demittit latere. Si quid metuerit, concham protinus mari replet, atque ita demergit. De generatione incrementóque eius conchæ, nihil adhuc exploratum habeo. Videtur tamen non ex coitu gigni, ſed ſponte, vt cæteræ conchæ, prouenire. Nec verò an concha ſolutus viuere poſſit, certum adhuc eſt.

A

CAPVT XXXVIII.

De ingenio inſectorum, & formicæ ſtudio.

INſectorum officioſiſſimum, & præ cæteris ferè omnibus animalibus genus formicarum & apum eſt: crabrones item ac veſpæ, &, propè dixerim, omnia huius cognata generis. Aranei etiam lautiores, & ſtrigoſiores, ingenioſiores in vitæ muneribus ſunt. Iam formicarum negotia omnibus in promptu habentur: vtque eadem ſemita ſemper ambulant, & cibaria recondunt, & cellas promptuarias faciunt, nec interdiu ſolùm, ſed etiam noctibus plena luna laborem exercent, nemo eſt, qui non videat.

CAPVT XXXIX.

De generibus Araneorum, eorúmque induſtria in venatione, & tela conficienda.

ARaneorum autem & phalangiorũ plura ſunt genera. Mordax, quod in duo diſtinguitur. alterum ſimile iis quæ lupos appellant, eſt, paruũ, varium, procax, ſalax, pulex nuncupatum: alterum maius, coloris nigri, cruribus prioribus nigris, tardum, & lentè ambulans, nec viribus valens, neque ſaliens. Cætera, quæ medicamentarij proponunt, aut nullum, aut certè exilem inferunt morſum. Genus ſecundum, quod lupi nomen accepit, partim exiguum eſt, quod non texit: partim maius, quod aſperam prauámque telam apud terram, aut ſepes, orditur. Bucculis intexere ſolitum primordiis intus poſitis obſeruatur. Dum aliquid in tela offendens commouerit, mox accurrit, vt capiat. Partim varium eſt, quod paucam vilémque telam ſub arboribus facit. Tertium genus, quod ſapientiſſimum lautiſſimúmque omnium eſt. texit enim, primùm filis quoquo verſus diſtendens in orbem, tum ſtamina ducens, initio à medio accepto, nec inſcitè medium ipſum accipit: deinde ſubtegmina inferens, atque ſtipans, cubile & repoſitorium alibi ſibi conſtituit: ſed venationem in medio ſui operis obſeruando exercet. Cùm enim beſtiola eò inciderit, motu medij excitus occurrit, deuincítque primùm obuoluens araneis: dum defatiget, infirmámque faciat: tum tollit, ac defert: & ſi fortè fame tenetur, exugit: hæc enim fruitio eius eſt. Sin minùs, recondito, quod ceperit, in repoſitorio, repetit venandi negotium, ſed priùs conſarcinato, quod per venatum laceſſitum eſt. Si quid inter medium & extrema inciderit, primùm ipſe in medium currit, inde ad id quod inciderit, velvt à ſtrato initio properat. Si quis telam lacerarit, texere iterum incipit. Venatur oriente Sole, aut occidente: quoniam beſtiolæ temporibus his potiſſimùm offendant. Fœmina & texit, & venatur, mas comes fruendi, non laborandi eſt. araneorum lautiorum, & telam ſpiſſiorem texentium, duo ſunt genera, alterum minus, alterum maius. Quod igitur longioribus eſt cruribus, pendens ſubtus obſeruat, ne beſtiolæ præ formidine ſibi caueant, ſed incautæ incidant in partem ſuperiorem: ineptius enim propter ſui corporis magnitudinem eſt. at alterum, quod moderatius eſt, ſupernè obſeruat, latens in quodam exiguo ſuæ telæ foramine.

ΚΕΦΑΛ. λη'.

Μυρμήκων καὶ μελιττῶν καὶ τῶν τούτων συγγενῶν ἤθη.

ΤΩν δ' ἐντόμων ζώων ἐργατικώτατα σχεδὸν* ἐστὶ, καὶ πρὸς τἄλλα συγκρίνεσθαι πάντα, τό, τε τῶν μυρμήκων γένος, καὶ τὸ τῶν μελιττῶν. ἔτι δ' ἀνθρῆναι καὶ σφῆκες, καὶ πάντα, ὡς εἰπεῖν, τὰ συγγενῆ τούτοις. εἰσὶ δὲ καὶ τῶν ἀραχνίων οἱ γλαφυρώτατοι καὶ λαγαρώτατοι, καὶ τεχνικώτεροι περὶ τὸν βίον. ἡ μὲν οὖν τῶν μυρμήκων ἐργασία, πᾶσιν ἐστὶν ἐπιπολῆς ἰδεῖν [* ἀνατρέποντες] ἀεὶ B μίαν ἀτραπὸν πάντες βαδίζουσι· καὶ τὴν ἀπόθεσιν τῆς τροφῆς καὶ ταμιείαν. ἐργάζονται γὰρ καὶ* ταῖς νύκταις ταῖς πανσελήνοις.

* Sylb. πεῖν, ὡς πρὸς.
* Quidam ἀναστρέφοντες
* Sylb. ταῖς νυξὶ vel τῆς νυκτὸς,

ΚΕΦΑΛ. λθ'.

Περὶ ἀραχνίων.

ΤΩν δ' ἀραχνίων καὶ τῶν φαλαγγίων ἐστὶ μὲν πολλὰ γένη· τῶν μὲν δηκτικῶν φαλαγγίων, δύο· τὸ μὲν ἕτερον, ὅμοιον τοῖς καλουμένοις λύκοις, μικρὸν καὶ ποικίλον, καὶ ὀξὺ καὶ πηδητικόν· καλεῖται δὲ ψύλλα· τὸ δ' ἕτερον, μεῖζον, τὸ μὲν χρῶμα μέλαν, τὰ δὲ σκέλη τὰ πρόσθια μα- C κρὰ ἔχον, καὶ τῇ κινήσει νωθρὸν, καὶ βαδίζον ἠρέμα, καὶ οὐ κρατερὸν, οὐδὲ πηδῶν. τὰ δ' ἄλλα πάντα, ὅσα παρατίθενται οἱ φαρμακοπῶλαι, τὰ μὲν, οὐδεμίαν, τὰ δ', ἀσθενῆ ποιεῖ τὴν δῆξιν. ἄλλο δ' ἐστὶ τῶν καλουμένων λύκων γένος. τοῦτο μὲν οὖν τὸ μικρὸν, οὐχ ὑφαίνει ἀράχνιον· τὸ δὲ μεῖζον, παχὺ καὶ φαῦλον, πρὸς τῇ γῇ, καὶ ταῖς αἱμασιαῖς. ἐπὶ τοῖς στομίοις δ' ἀεὶ ποιεῖ τὸ ἀράχνιον, καὶ ἔνδον ἔχον τὰς ἀρχὰς τηρεῖ, ἕως ἂν ἐμπεσόντος τινὸς κινηθῇ· ἔπειτα προσέρχεται. τὸ δὲ ποικίλον, ὑπὸ τοῖς δένδρεσι ποιεῖται μικρὸν καὶ φαῦλον ἀράχνιον. ἄλλο δ' ἐστὶ τρίτον σοφώτατον καὶ γλαφυρώτατον. ὑφαίνει γὰρ, πρῶτον μὲν διατεῖναν πρὸς τὰ πέρατα πανταχόθεν· εἶτα στημονίζεται ἀπὸ τοῦ μέσου. λαμβάνει δὲ D τὸ μέσον ἱκανῶς· ἐπὶ δὲ τούτοις, ὥσπερ κρόκας ἐμβάλλει· εἶτα συνυφαίνει. τὴν μὲν οὖν κοίτην καὶ τὴν ἀπόθεσιν τῆς θήρας ἄλλοθι ποιεῖται· τὴν δὲ θήραν, ἐπὶ τοῦ μέσου τηροῦσα· ἔπειθ' ὅταν ἐμπέσῃ [τι,] κινηθέντος τοῦ μέσου, πρῶτον μὲν περιδεῖ καὶ περιειλεῖ τοῖς ἀραχνίοις, ἕως ἂν ἀχρεῖον ποιήσῃ. μετὰ δὲ ταῦτα ἐξάγει ἀραμένη· καὶ ἂν μὲν τύχῃ πεινῶσα, ἐξεχύλισεν· αὕτη γὰρ ἡ ἀπόλαυσις· εἰ δὲ μὴ, πάλιν ὁρμᾷ πρὸς τὴν θήραν, ἀκεσαμένη πρῶτον τὸ διερρωγός. ἐὰν δὲ μεταξὺ ἐμπέσῃ, πρῶτον ἐπὶ τὸ μέσον βαδίζει, κἀκεῖθεν ἐπανέρχεται πρὸς τὸ ἐμπεσὸν, ὥσπερ ἀπ' ἀρ- E χῆς. ἐὰν δέ τις λυμήνηται τοῦ ἀραχνίου, πάλιν ἄρχεται τῆς ὑφῆς καταφερομένου τοῦ ἡλίου, ἢ ἀνατέλλοντος, διὰ τὸ μάλιστα ἐν ταύταις ταῖς ὥραις ἐμπίπτειν τὰ θηρία. ἐργάζεται δὲ καὶ θηρεύει ἡ θήλεια· ὁ δ' ἄρρην, συναπολαύει. τῶν δ' ἀραχνίων τῶν γλαφυρῶν, καὶ ὑφαινόντων ἀράχνιον πυκνὸν, δύο ἐστὶ γένη· τὸ μὲν μεῖζον, τὸ δ', ἔλαττον. τὸ μὲν οὖν μακροσκελέστερον, κάτωθεν κρεμάμενον τηρεῖ, ὅπως ἂν μὴ φοβούμενα τὰ θηρία εὐλαβῆται, ἀλλ' ἐμπίπτῃ ἄνω, (διὰ γὰρ τὸ μέγεθος, οὐκ εὔκρυφές ἐστι) τὸ δὲ συμμετρότερον ἄνωθεν ἐπικαλυπτόμενον τοῦ ἀραχνίου ὀπῇ μικρᾷ,

* οὐ δύνανται δ' ἀφιέναι οἱ ἀράχναι τὸ ἀράχνιον, εὐθὺς γινόμενοι, οὐδ' ἔσωθεν, ὡς ὂν περίττωμα, καθάπερ φησὶ Δημόκριτος· ἀλλ' ἀπὸ τοῦ σώματος οἷον φλοιόν, ἢ τὰ βάλλοντα ταῖς θριξίν, οἷον αἱ ὕστριχες. * περιτίθεται δὲ καὶ περιελίττεται καὶ τοῖς μείζοσι ζῴοις· ἐπεὶ καὶ ταῖς σαύραις ταῖς μικραῖς ἐπιβάλλον περὶ τὸ στόμα, περιθέον ἀφίησιν, ἕως ἂν συλλάβῃ τὸ στόμα· τότε δ' ἤδη δάκνει προσελθόν. καὶ περὶ μὲν οὖν τούτων τῶν ζῴων, τοῦτον ἔχει τὸν τρόπον.

* Gaza, [illegible]

A Aranei ſtatim, cùm editi ſunt, fila mittunt, non intrinſecus, tanquam excrementum, vt Democritus ait, ſed extrinſecus de ſuo corpore, velut corticem, aut more eorum quæ ſuos villos iaculantur, vt hyſtricis. Maiora etiam animalia inuadit, illaqueat ſuis filis: nam & lacertos paruos aggreſſus circundatos, & filis obducit, donec cohibeat, mox ſubiens, morſum defigit. Hæc ita ſe habent.

ΚΕΦΑΛ. μ΄.

Τῶν κηροποιῶν διαιρεσμὸς καὶ περὶ μελιττῶν ἤθους.

* G. ἀνώνυμον

ΕΣτι δέ τι γένος τῶν ἐντόμων, ὃ ἑνὶ μὲν ὀνόματι* ὁμώνυμόν ἐστιν, ἔχει δὲ πάντα τὴν μορφὴν συγγενικήν. ἔστι δὲ ταῦτα ὅσα κηροποιά ἐστι, μέλιτται, καὶ τὰ παραπλήσια τὴν μορφήν. τούτων δ' ἐστὶ γένη ἐννέα· ὧν τὰ μὲν ἓξ ἀγελαῖα, μέλιττα, βασιλεῖς τῶν μελιττῶν, κηφὴν ὁ ἐν ταῖς μελίτταις, σφὴξ ὁ ἐπέτειος, ἔτι δὲ ἀνθρήνη καὶ τενθρηδών· μοναδικὰ δὲ τρία, σειρὴν ὁ μικρός, φαιός· ἄλλος σειρὴν μείζων, ὁ μέλας καὶ ποικίλος· τρίτος δ', ὁ καλούμενος βομβύλιος, μέγιστος τούτων. οἱ μὲν οὖν μύρμηκες, θηρεύουσι μὲν οὐδέν, τὰ δὲ πεποιημένα συλλέγουσιν· οἱ δ' ἀράχναι, ποιοῦσι μὲν οὐδέν, οὐδ' ἀποτίθενται, θηρεύουσι δὲ μόνον τὴν τροφήν. τῶν δ' ἐννέα γενῶν τῶν εἰρημένων, περὶ μὲν τῶν λοιπῶν ὕστερον λεχθήσεται· αἱ δὲ μέλισσαι, θηρεύουσι μὲν οὐδέν, αὐταὶ δὲ ποιοῦνται καὶ ἀποτίθενται· ἔστι γὰρ αὐταῖς τὸ μέλι τροφή. δῆλον δὲ ποιοῦσιν, ὅταν τὰ κηρία ἐπιχειρῶσιν οἱ μελιττουργοὶ ἐξαιρεῖν· θυμιώμεναι γάρ, καὶ σφόδρα πονοῦσαι ὑπὸ τοῦ καπνοῦ, τότε μάλιστα τὸ μέλι ἐσθίουσιν· ἐν δὲ τῷ ἄλλῳ χρόνῳ οὐ σφόδρα ὁρῶνται, ὡς φειδόμεναι καὶ ἀποτιθέμεναι τροφῆς χάριν. ἔστι δ' αὐταῖς καὶ ἄλλη τροφή, ἣν καλοῦσί τινες κήρινθον. ἔστι δὲ τοῦτο ὑποδεέστερον, καὶ γλυκύτητα συκώδη ἔχον. κομίζουσι δὲ τοῦτο τοῖς σκέλεσι, καθάπερ καὶ τὸν κηρόν. ἔστι δὲ περὶ τὴν ἐργασίαν αὐτῶν καὶ τὸν βίον πολλὴ ποικιλία. ἐπειδὰν γὰρ παραδοθῇ αὐταῖς καθαρὸν τὸ σμῆνος, οἰκοδομοῦσι τὰ κηρία, φέρουσαι τῶν τ' ἄλλων ἀνθέων, καὶ ἀπὸ τῶν δένδρων τὰ δάκρυα, ἰτέας καὶ πτελέας, καὶ ἄλλων τῶν κολλωδεστάτων. τούτῳ δὲ καὶ τὸ ἔδαφος διαχρίουσι, τῶν ἄλλων θηρίων ἕνεκεν. καλοῦσι δ' οἱ μελιττουργοὶ τοῦτο* κώνησιν. καὶ τὰς εἰσόδους δὲ περιοικοδομοῦσιν, ἐὰν εὐρεῖαι ὦσι. πλάττουσι δὲ κηρία πρῶτον ἐν οἷς αὐταὶ γίνονται· εἶτ' ἐν οἷς οἱ καλούμενοι βασιλεῖς, καὶ τὰ κηφήνια. τὰ μὲν οὖν αὑτῶν, ἀεὶ πλάττουσι· τὰ δὲ τῶν βασιλέων, ὅταν ᾖ πολυγονία· τὰ δὲ κηφήνια, ἐὰν μέλιτος* ἀφθονίαν ἐπισημαίνῃ. πλάττουσι δὲ τὰ μὲν τῶν βασιλέων, πρὸς τοῖς αὑτῶν (μικρὰ δ' ἐστὶ ταῦτα) τὰ δὲ κηφήνια, πρὸς αὐτά. ἐλάττω δ' ἐστὶ ταῦτα [τῷ μεγέθει] τῶν μελιττίων. ἄρχονται δὲ τῶν ἱστῶν ἄνωθεν ἀπὸ τῆς ὀροφῆς τοῦ σμήνους, καὶ κάτω* συνυφεῖς ποιοῦσιν ἕως τοῦ ἐδάφους ἱστοὺς πολλούς. αἱ δὲ θυρίδες καὶ αἱ τοῦ μέλιτος καὶ [αἱ] τῶν σχαδόνων, ἀμφίστομοι (περὶ μίαν γὰρ βάσιν δύο θυρίδες εἰσίν, ὥσπερ ἡ τῶν ἀμφικυπέλλων) ἡ μὲν, ἐντός, ἡ δέ, ἐκτός. αἱ δὲ περὶ τὰς ἀρχὰς τῶν κηρίων πρὸς τὰ σμήνη συνυφαί, ὅσον ἐπὶ δύο ἢ τρεῖς στίχους κύκλῳ, βραχεῖαι καὶ κεναὶ μέλιτος· πληρέστερα δὲ τῶν κηρίων, τὰ μάλιστα τῷ κηρῷ καταπεπλασμένα. περὶ δὲ τὸ στόμα τοῦ σμήνους, τὸ μὲν πρῶτον τῆς εἰσδύσεως, περιαλη-

* γρ. κόνισιν. qu. κόμμωσιν. vide Turneb. Aduerſar. lib. 13. c. 13.

* Sylb. ἀφθονία

* κ. συνυφεῖς. ποιοῦσι δὲ

CAPVT XL.

De generibus Apum, earúmque ſtudio in ædificandis fauis, déque his herbis, quibus apes aluntur.

B GEnus eſt inſectorum quoddam nomine adhuc vacans, quo vno comprehendatur: ſed formam ſuarum partium cognatam omnium referens, videlicet ea quæ fauos faciunt, vt apes, & reliqua ſimilis formæ inſecta: quorum genera nouem numero ſunt. Sex illa ex his gregalia, apes, reges apum, fuci, qui inter apes degunt, veſpæ annuæ, item crabrones, & teredines. Solitaria verò reliqua tria: ſirenis minor, qui fuſcus totus eſt: ſirenis maior, niger, varius: tertium, quem bombycem vocant, qui maximus inter hæc eſt. Formicæ nihil venantur, ſed facta ab aliis colli-

C gunt. Aranei nihil conficiunt, neque recondunt, ſed cibum ſolum venatu ſibi acquirunt. Ex nouem iis quæ modò enumeraui, generibus, apes (nã de cæteris pòſt) nihil venantur, ſed ipſæ ſibi cibaria faciunt, atque recondunt: mel enim cibus earum eſt. Cuius rei indicium faciunt, cùm apiarij eximere incipiunt fauos: quamuis enim ſuffiantur, vehementérque ex fumo laborẽt, tamen plus mellis tunc edunt, quàm prius. Quod enim cibi cauſa recondiderint, parciùs eo temporibus cæteris vtuntur. ſed habent etiam quo altero cibo alantur, quod quidam ceraginem, alij cereum vocant: verùm hoc deterius eſt, & dulcedine propè ficus. Congerunt id quoque, vt ceram, ſuis cruri-

D bus. Perquam varia in earum operatione, & vitæ ratio eſt. Cùm enim alueum receperint mundum, conſtruere incipiunt fauos, deferentes ex floribus, atque etiam arborum lacrymis, ſalicis, & vlmi, & reliquarum, quæ glutinum pariunt. His pauimentum quoque illinunt, ne beſtiolæ nocuæ ſubeant. Vocant hoc opus apiarij tectorium imum. aditus, etiamſi ampliores ſunt, fabrica obſtruentes coarctant. Effingunt fauos primùm in quibus ipſæ gignuntur: deinde in quibus reges dicti & fuci. Suos certè ſemper componunt, ſed regum, cùm fœtus largior eſt: fucorum autem cum copia mellis ſperatur. Fauos regum minores fa-

E ciunt iuxta ſuos; fucorum iuxta regum, minores quàm ſuos. Exordium operis à tecto, aluei, textúſque ad pauimentum perpetuo ſtabilimento agitur, pluréſque ad pauimentum telæ deducuntur. Cellæ autem & mellariæ & ſobolariæ geminæ omnes ſunt: vno enim eodémque interſepto, duæ ſibi iunguntur cellæ, modo poculi gemini: altera intus, altera foris. Compages, quæ parietibus faui adhærent, arctiores, & melle vacuæ relinquuntur, gemino aut triplici verſu: pleniores enim ſunt faui, quibus plus ceræ obducitur. Pars aditus aluei prior illita eſt ex com-

A moſce: ſic enim vocant, quod velut excrementum purgamentúmque ceræ eſt, bene nigrum acriſque odoris. Medentur hoc plagis, & huiuſcemodi ſuppurationibus. Proximum ab eo tectorium piſſatus cereus præbet: leuius id quàm commoſis, medicamentum eſt. Sunt qui fucos & per ſe fingere fauos eodem in alueo, & cum apibus negotium conficiendi faui partiri dicant: verùm mellificandi nullam habere facultatem, ſed veſci tum eos, tum eorum pullos melle, quod apes fecerint. Manent fuci magna temporis parte intus, cúmque exeunt, efferunt ſeſe fuſim in ſublime: gyróque volitant, & quaſi exercitium faciũt: quod vbi ſatis iam fecerint, redeunt domum, & epulis B perfruuntur. Reges nunquam prodeunt foras, vel vt paſcantur, vel alia cauſa, niſi vniuerſa cum plebe. Et ſi, cùm pergunt, rex ipſe fortè aberrarit, omnes inquirere odoratúque ſagaci perſequi donec inueniant, accepimus. Geſtari etiam eum à plebe, cùm volare non poteſt. Et ſi perierit, omnes diſcedere: vel ſi aliquamdiu manſerint, fauos quidem conficere, ſed mel nullum: nec fieri poſſe quin breui omnes diſcedant.* Ceram apes pertreptando flores, capiunt, priorum acumine pedum: mox priores in medios abſtergunt, & medios in blæſa poſteriorum, atque ita onuſtæ diſcedunt: & quidem grauari premique onere cernuntur, quoties redeunt. C Mos apibus, ne florum plura genera petant vno eodémque profectu, ſed ſingulis ſingula. Verbi gratia, à viola ad violam aduolant, nec aliud attingunt, quouſque ſuum in alueũ redeant. Hîc ſe quatiunt, & ſingulas, tres, aut quatuor ſequuntur: ſed quid accipiant, haud facilè videris, nec verò quemadmodum operantur, viſum adhuc eſt. Ceræ congeſtio notari potuit in oleis, cùm diutius in eadem morentur, propter frondem eius arboris ſpiſſiorem. Poſt hæc fœtificare incipiunt: nec prohibet quicquam quominus eadem in cella ſint, & pulli, & mel, & fuci. Gigni fucos ſeorſum dicitur, ſi dux viuit: ſed ſi obiit, D in apum loculamentis oriri ex ipſis apibus, atque hos fieri animoſiores, quocirca aculeatos vocari, quamuis aculeo careant: animo namque feriendi, non poteſtate, nomen hoc meruerunt. Sunt loculi ipſi fucorum ampliores, & finguntur ſeorſum quoque per ſe faui fucorum, ſed magna ex parte fauis apum inſeruntur, quapropter ſecandum eſt. Genera apum plura, vt dixi. Duo principum: alterum rufum, quod præſtantius eſt: alterum nigrum, magíſque varium, duplo amplius ape vtili. Tertium genus, quod optimum, breue hoc, in rotunditatem compactile, & varium eſt. Quartum longum, crabronibus ſimile. Præterea, quod fur appellatur, nigrum hoc, aluóque am-* E pliore eſt: quinetiam fucus, qui omnium maximus eſt, ſed ſine aculeo, & ignauus. Differunt inter ſe apes parentibus natæ vrbanis, & quæ ruſtico montanóque victu educatis prodierint: ſunt enim hæ ſylueſtres horridiores aſpectu, & iracundiores, & minores, ſed opere ac labore præſtantiores. Genus frugi fauos ſuos æquabiles conſtruit, ſupernúmque totum operimentum politum apponit, & ad ſingulos vſus fauum ſingulatim effingit, videlicet partem aliam ad mella, aliam ad prolem, aliam ad fucos accommodatam. Quòd ſi acciderit, vt eodẽ in fauo omnia hæc recipiantur, loculus alter deinceps diſpoſitus habetur inanis. at verò illæ porrectiores, fauos inæquales conficiunt,

λίπαι μίτυν· ἔστι δ' ἐστὶ μέλαν ἱκανῶς, ὥσπερ ἀποκάθαρμα αὐταῖς τοῦ κηροῦ, καὶ τὴν ὀσμὴν δριμύ. φάρμακον δ' ἐστὶ τυμμάτων καὶ τῶν τοιούτων ἐμπυημάτων. ἡ δὲ συνεχὴς ἀλοιφὴ τούτῳ, πισσόκηρος, ἀμβλύτερον καὶ ἧττον φαρμακῶδες τῆς μίτυος. λέγουσι δέ τινες, τοὺς κηφῆνας κηρία μὲν πλάττειν καθ' αὑτοὺς, καὶ ἐν τῷ αὐτῷ σμήνει, καὶ ἐν τῷ αὐτῷ κηρίῳ μεριζομένους πρὸς τὰς μελίττας· μελιτουργεῖν μέντοι οὐδὲν, ἀλλὰ τρέφεσθαι ἐκ τῶν μελιττῶν, καὶ αὐτοὺς καὶ τοὺς νεοττούς. διατελοῦσι δ' οἱ κηφῆνες τὰ μὲν πολλὰ, ἔνδον· ἐὰν δ' ἐκπετασθῶσιν, ἀναφέρονται ῥοιζηδὸν ἄνω πρὸς τὸν οὐρανὸν, ἐπιδινοῦντες αὑτοὺς, καὶ ὥσπερ ἀπογυμνάζοντες· ὅταν δὲ τοῦτο δράσωσι, πάλιν εἰσελθόντες εὐωχοῦνται. οἱ δὲ βασιλεῖς οὐ πέτονται ἔξω, ἐὰν μὴ μετ' ὅλου τοῦ ἑσμοῦ, οὔτ' ἐπὶ βοσκὴν οὔτ' ἄλλως. φασὶ δὲ καὶ ἐὰν ἀποπλανηθῇ ὁ ἀφεσμὸς, ἀνιχνευούσας μεταθεῖν, ἕως ἂν εὕρωσι τὸν ἡγεμόνα τῇ ὀσμῇ. λέγεται δὲ καὶ φέρεσθαι αὐτὸν ὑπὸ τοῦ ἑσμοῦ, ὅταν πέτεσθαι μὴ δύνηται· καὶ ἐὰν* ἀπόληται, ἀπόλλυσθαι τὸν ἀφεσμόν. ἐὰν δ' ἄρα χρόνον τινὰ διαμείνωσι, καὶ κηρία οὐ ποιήσωσι, μέλι οὐκ ἐγγίνεσθαι, καὶ αὐτὰς ταχὺ ἀπόλλυσθαι. τὸν δὲ κηρὸν ἀναλαμβάνουσιν αἱ μέλιτται, ἀναρριχώμεναι πρὸς τὰ βρύα ὀξέως, τοῖς ἔμπροσθεν ποσί. τούτους δ' ἐκματτοῦσιν εἰς τοὺς μέσους, τοὺς δὲ μέσους εἰς* τὰ βλαισὰ τῶν ὀπισθίων· καὶ οὕτω* γεμισθεῖσαι ἀποπέτονται· καὶ δῆλαι δ' εἰσὶ βαρυνόμεναι. καθ' ἑκάστην δὲ πτῆσιν, οὐ βαδίζει ἡ μέλιττα ἐφ' ἕτερα τῷ εἴδει ἄνθη, ἀλλ' ἀπὸ ἴου ἐπὶ ἴον, καὶ οὐ θιγγάνει ἄλλου γε, ἕως ἂν εἰς τὸ σμῆνος εἰσπετασθῇ. ὅταν δὲ εἰς τὸ σμῆνος ἀφίκωνται, ἀποσείονται, καὶ ἀκολουθοῦσιν ἑκάστῃ τρεῖς ἢ τέτταρες. ὃ δὲ λαμβανόμενον οὐ ῥᾴδιόν ἐστιν ἰδεῖν· οὐδὲ τὴν ἐργασίαν ὅντινα τρόπον ποιοῦνται, οὐκ ὦπται. τοῦ δὲ κηροῦ ἡ ἀνάληψις, τεθεώρηται ἐπὶ τῶν ἐλαιῶν, διὰ πυκνότητα τῶν φύλλων, ἐν ταὐτῷ διαμενουσῶν πλείω χρόνον. μετὰ δὲ τοῦτο νεοττεύουσιν. οὐδὲν δὲ κωλύει* ἐν τῷ κηρίῳ εἶναι νεοττοὺς, καὶ μέλι, καὶ κηφῆνας. ἐὰν μὲν οὖν ὁ ἡγεμὼν ζῇ, χωρὶς φασὶ τοὺς κηφῆνας γίνεσθαι· εἰ δὲ μὴ, ἐν τοῖς τῶν μελιττῶν κυττάροις γεννᾶσθαι ὑπὸ τῶν μελιττῶν, καὶ γίνεσθαι τούτους θυμικωτέρους· διὸ καὶ καλεῖσθαι κεντρωτοὺς, οὐκ ἔχοντας κέντρον, ἀλλ' ὅτι βούλονται μὲν, οὐ δύνανται δὲ βάλλειν. εἰσὶ δὲ μείζους οἱ τῶν κηφήνων κύτταροι. ἀναπλάττουσι δὲ ὁτὲ μὲν καὶ αὐτὰ καθ' αὑτὰ τὰ κηρία τὰ τῶν κηφήνων· ὡς ἐπὶ τὸ πολὺ δ' ἐν τοῖς τῶν μελιττῶν· διὸ καὶ ἀποτέμνουσιν. εἰσὶ δὲ γένη τῶν μελιττῶν πλείω, καθάπερ εἴρηται πρότερον· δύο μὲν, ἡγεμόνων· ὁ μὲν βελτίων, πυῤῥὸς· ὁ δ' ἕτερος, μέλας καὶ ποικιλώτερος, τὸ δὲ μέγεθος διπλάσιος τῆς χρηστῆς μελίττης. ἡ δ' ἀρίστη, μικρὰ, στρογγύλη, καὶ ποικίλη. ἄλλη, μακρὰ, ὁμοία τῇ ἀνθρήνῃ. ἕτερος, ὁ φὼρ καλούμενος, μέλας καὶ πλατυγάστωρ· ἔστι δὲ ὁ κηφὴν τούτων μέγιστος πάντων, ἄκεντρος δὲ καὶ νωθρός. διαφέρουσι δ' αἱ γινόμεναι τῶν μελιττῶν, αἵ τ' ἀπὸ τῶν τὰ ἥμερα νεμομένων, καὶ ἀπὸ τῶν τὰ ὄρεια. εἰσὶ γὰρ αἱ ἀπὸ τῶν ὑλονόμων, δασύτεραι καὶ ἐλάττους, καὶ ἐργατικώτεραι καὶ χαλεπώτεραι. αἱ μὲν οὖν χρησταὶ μέλιτται, ἐργάζονται τά τε κηρία ὁμαλὰ, καὶ τὸ ἐπιπολῆς κάλυμμα πᾶν λεῖον*· ἔτι δὲ ἓν εἶδος τοῦ κηρίου, οἷον ἅπαν μέλι, ἢ νεοττοὺς, ἢ κηφῆνας. ἂν δὲ συμβαίνῃ ὥστε ἐν τῷ αὐτῷ κηρίῳ ἅπαντα γίνεσθαι αὐτὰ, ἔσται ἐφεξῆς ἓν εἶδος εἰργασμένον διὰ τέλους. αἱ δὲ* μακραὶ, τά τε κηρία ποιοῦσιν ἀνώμαλα,

* κ. ἀπόλλυται.
* Sylb. τὰ βλαισά.
* κ. βιασθεῖσαι.
* Scrib. ἐν τῷ αὐτῷ κηρίῳ.
* κ. ἴσον δ. Locus est deprauatus.
* Vulgò, μικραὶ, falsò.

A καὶ τὸ κάλυμμα ἀνῳδηκὸς, ὅμοιον τῷ τῆς ἀνθρήνης. ἔτι δὲ τὸν γόνον καὶ τἆλλα οὐ τεταγμένα, ἀλλ' ὡς ἂν τύχῃ. γίνονται δὲ ἐξ αὐτῶν οἵ τε πονηροὶ ἡγεμόνες, καὶ πολλοὶ κηφῆνες, καὶ οἱ φῶρες καλούμενοι, μέλι δὲ πάνυ βραχὺ, ἢ οὐδέν. ἐπικαθεύδουσι δ' ἐπὶ τοῖς κηρίοις αἱ μέλιτται καὶ * συμπλήθουσιν. ἐὰν δὲ τοῦτο μὴ ποιῶσι, φθείρεσθαί φασι τὰ κηρία, καὶ ἀραχνιοῦσθαι. καὶ ἐὰν μὲν τὸ λοιπὸν δύνωνται κατέχειν ἐπικαθήμεναι, τοῦθ' ὥσπερ * ἔκβρωμα γίνεται· εἰ δὲ μή, ἀπόλλυνται ὅλα. γίνεται δὲ σκωλήκια ἐν τοῖς φθειρομένοις, ἃ πτερούμενα ἐκπέτεται. καὶ τὰ πίπτοντα δὲ τῶν κηρίων ὀρθοῦσιν αἱ μέλιτται, καὶ ὑφιστᾶσιν ἐρείσματα, ὅπως δύνωνται ὑπιέναι. ὅταν γὰρ μὴ ἔχωσιν ὁδὸν ᾗ * προσδύωνται, οὐ προσκαθίζουσιν· εἶτ' ἀραχνιοῦνται. τοῦ δὲ φωρὸς καὶ τοῦ κηφῆνος γινομένων, οὐδέν ἐστιν ἔργον. τὰ δὲ τῶν ἄλλων βλάπτουσιν. ἁλισκόμενοι δὲ, ἀποθνήσκουσιν ὑπὸ τῶν χρηστῶν μελιττῶν. κτείνουσι δ' αὗται σφόδρα καὶ τῶν ἡγεμόνων τοὺς πολλοὺς, καὶ μᾶλλον τοὺς πονηροὺς, ἵνα μὴ πολλοὶ ὄντες, διασπῶσι τὸν ἑσμόν. κτείνουσι δὲ μάλιστα, ὅταν μὴ πολύγονον ᾖ τὸ σμῆνος, μηδὲ ἀφέσεις μέλλωσι γίνεσθαι· ἐν γὰρ τούτοις τοῖς καιροῖς, καὶ τὰ κηρία διαφθείρουσι τὰ τῶν βασιλέων, ἐὰν ᾖ παρεσκευασμένα, ὡς ἐξαγωγέων ὄντων. διαφθείρουσι δὲ καὶ τὰ τῶν κηφήνων, ἐὰν ὑποφαίνηται ἀπορία μέλιτος, καὶ μὴ εὐμελιτῇ τὰ C σμήνη· καὶ τοῖς * ἐξαιροῦσι περὶ τοῦ μέλιτος τότε μάχονται μάλιστα, καὶ τοὺς ἐνυπάρχοντας τῶν κηφήνων ἐκβάλλουσι, καὶ πολλάκις ὁρῶνται ἐν τῷ τεύχει ἀποκαθήμεναι. πολεμοῦσι δὲ σφόδρα αἱ μικραὶ τῷ γένει τῷ μακρῷ, καὶ πειρῶνται ἐκβάλλειν ἐκ τῶν σμηνῶν· κἂν ἐπικρατήσωσι, τοῦτο δοκεῖ ὑπερβολῇ γίνεσθαι ἀγαθὸν σμῆνος. αἱ δ' ἕτεραι, ἂν γένωνται αὗται ἐφ' ἑαυτῶν, ἀργοῦσί τε, καὶ τελέως οὐδὲν ποιοῦσιν ἀγαθόν. ἀπόλλυνται δὲ καὶ αὗται περὶ τὸ φθινόπωρον. ὅσας δὲ κτείνουσιν αἱ χρησταὶ μέλιτται, πειρῶνται μὲν ἔξω τοῦ σμήνους τοῦτο πράττειν· ἐὰν δ' ἔσω τις ἀποθάνῃ, ἐξάγουσιν ὁμοίως. οἱ δὲ φῶρες καλούμενοι, κακουργοῦσι μὲν καὶ τὰ παρ' αὑτοῖς κηρία· εἰσέρχονται δὲ, D ἐὰν λάθωσι, καὶ εἰς τὰ ἀλλότρια· ἐὰν δὲ ληφθῶσιν εἰς τὰ ἀλλότρια, ἀποθνήσκουσιν. οὐκ ἔργον δ' ἐστὶ λαθεῖν· ἐπί τε γὰρ εἰσόδῳ ἑκάστῃ φύλακές εἰσι. αὐτός τε ἐὰν εἰσελθὼν λάθῃ, διὰ τὸ ὑπερπεπλῆσθαι, οὐ δύναται πέτεσθαι, ἀλλὰ πρὸ τοῦ σμήνους κυλίεται· ὥστ' ἔργον ἐστὶν αὐτῷ ἐκφυγεῖν. οἱ δὲ βασιλεῖς, αὐτοὶ μὲν οὐχ ὁρῶνται ἔξω ἄλλως, ἢ μετ' ἀφέσεως· ἐν δὲ ταῖς ἀφέσεσιν, αἱ λοιπαὶ περὶ τοῦτον συνεσπειραμέναι φαίνονται. ὅταν δ' ἄφεσις μέλλῃ γίνεσθαι, φωνὴ μονῶτις καὶ ἰδία γίνεται ἐπὶ τινὰς ἡμέρας, καὶ πρὸ δύο ἢ τριῶν ἡμερῶν ὀλίγαι πέτονται περὶ τὸ σμῆνος. εἰ δὲ γίνεται καὶ βασιλεὺς ἐν ταύταις, οὐκ ὦπταί πω, διὰ τὸ μὴ E ῥᾴδιον εἶναι. ὅταν δ' ἀθροισθῶσιν, ἀποπέτονται καὶ χωρίζονται καθ' ἕκαστον τῶν βασιλέων αἱ ἄλλαι. ἐὰν δὲ τύχωσιν ὀλίγαι πολλαῖς ἐγγὺς καθεζόμεναι, μετανίστανται αἱ ὀλίγαι πρὸς τὰς πολλὰς, καὶ τὸν βασιλέα ὃν ἀπέλιπον, ἐὰν συνακολουθήσῃ, διαφθείρουσι. τὰ μὲν οὖν περὶ τὴν ἀπόλειψιν καὶ ἄφεσιν, τοῦτον συμβαίνει γίνεσθαι τὸν τρόπον. εἰσὶ δ' αὐταῖς τεταγμέναι ἐφ' ἕκαστον τῶν ἔργων ἐπί, αἱ μὲν, ἀνθοφοροῦσιν· [αἱ δὲ, ὑδροφοροῦσιν·] αἱ δὲ, λεαίνουσι καὶ κατορθοῦσι τὰ κηρία. φέρει δ' ὕδωρ, ὅταν τεκνοτροφῇ. πρὸς σάρκα δὲ οὐδενὸς καθίζει, οὐδ' ὀψοφαγεῖ. χρόνος δ' αὐταῖς οὐκ ἔστιν εἰθισμένος, ἀφ' ὅτου ἄρχεται ἐργάζεσθαι·

* γρ. συμπέττουσι.

* Scrib. ἔκπωμα

* γρ. προσπορεύονται.

* γρ. ἐξαίρουσι

A & operimentum retumidum perinde, vt crabrones, imponunt: fœtum etiam, & reliqua ſine ordine ſtatuunt. Duces improbi ex his oriuntur, & copia tum fucorum, tum etiam earum quos fures vocant: ſed mellis aut nihil, aut admodum parum opera earum conficitur. Incubant apes ſuis fauis, & concoquunt. Quod niſi fecerint, vitiari ex aranea fauos aiunt. Quod ſi de cætero ſe continere potuerint, vt incubitu perſeuerent, partus quaſi abortus fit. ſin minùs, toti pereunt faui. Gignuntur in iis quæ vitiãtur, vermiculi, qui mox pennis ſubnatis euolant. Curant etiam apes vt faui erecti ſtent. Quòd ſi qui corruerint, erigunt, & pilis fulciunt fornicatis, vt ſubire poſſint. Cùm e- B nim via, qua accedant, non datur, ceſſant incubitu (vnde fit vt faui araneentur.) Furis & fuci nullum eſt munus, ſed cæteris, quibuſcum viuũt, iniuriam faciunt, non tamen impunè ſemper: nam deprehenſi interdum à bonis apibus occiduntur. Enecant nimirum ipſæ etiam duces, qui plures quàm ſatis ſit, habeantur: & potiſſimùm improbos, ne principum multitudo ſeditiones in examine faciat. Necant præcipuè, cùm non ampla ſobolis copia exiſtit, nec habent tanquam coloniam mittant. Fauos etiam regum, eo tempore, ſi parati ſunt, diruunt: vtpote cùm deſint, quibus mittendis duces ipſi præficiantur. Necnon fauos tollunt fucorum, ſi mellis penuriam coniectantur, nec al- C uei annona ſuperioris anni abundant. Et apiarium eximentem de melle tunc præcipuè impugnãt, ac præſentes fucos expellunt, & quidem ſæpe viſuntur foris in alueo reſidentes exules. Flagrant odio breues contra longas, eáſque alueis pellere conãtur: qua in pugna ſi illæ vicerint, optimum ita fore examen putatur: ſed ſi hæ ſolæ remanſerint, otioſæ viuunt, & nihil boni integrè faciunt. Pereunt etiam ipſæ antè quàm autumnus ſit. Student bonæ apes, quoad fieri poteſt, ne quam intra alueum interimant: ſi quæ interierit intus, ſtatim foras cadauer educunt. Qui autem fures vocantur, & ſuos inuicem fauos offendunt, & alienos ſi latuerint, ſubeunt: ſed ſi capiantur, capite puniuntur, nec facilè aut latêre, aut aufugere poſ- D ſunt. Sunt enim in quoque aditu cuſtodes: & fur ipſe, ſi quando ſurripere ingreſſum potuerit, adeo in ſatietatem repletur, vt nequeat euolare, ſed ante alueum volutetur: itaque fuga perquam difficilis eſt. Reges nunquam foris viſuntur, niſi cùm migratur: & tunc ita, vt reliquæ omnes circa ipſum principem ſuum glomerentur. Cùm verò migrandum eſt, vox ſolitaria, & peculiaris quędam aliquot antè diebus intus mittitur: & biduo aut triduo paucæ circum alueum volant. an rex etiam inter eas ſit, nondum exploratum habemus, quoniam difficile cognitu eſt. Collectæ iam auolant, & per ſingulos reges diuiduntur. Et E ſi fortè paucæ prope multas conſiſtunt, concedũt paucæ ipſæ ad plures, ac regem, quem reliquerint, ſi ſequatur, interimunt. Diſceſſus & migratio ita agitur. Singulis autem muneribus ſe diſtribuunt, vt aliæ flores conuehant, aliæ extruant, aliæ poliãt fauos, & dirigant. aquam tunc portant, cùm prolem nutriunt. Carnem nullius animalis tangunt, nec obſonium appetunt. Nullum his tempus certum conſuetúmque eſt, quo operari incipiant:

A ſed ſi cibariis non carent, benéque degunt, æſtiuo potiſſimùm tempore opus aggrediuntur, & quamdiu ſerenum ſit, aſſiduè operantur. Nouellæ etiam tertio quam prodierint, die, ſtatim negotium ineunt, ſi cibus ſuppetit. Cùmque incubant, digrediuntur nonnullæ ad paſtum, ſed breui redeunt. Proles felicis examinis quadraginta diebus intermittitur, tantummodo à bruma. Cùm ſatis iam concreuiſſe pullitiem ſenſerint, cibo appoſito derelinquunt: ipſa verò, cùm datur facultas, rupto operculo exit. Beſtiolas quæ in alueis naſcuntur, & fauis officiunt, apes notæ melioris tollunt, & rem familiarem tuentur: ſed alteræ pro ſuo vitio negligunt, & perire patiuntur.

B Cùm autem fauos apiarij eximunt, cibi tantum relinquunt, quãtum per hyemem ſufficiat. Quod ſi ſatis ſit, ſeruatur examen: ſin minùs, vel moritur ibidem, ſi ne diſcedat, hyems obſtat: vel deſerit ſedem, ſi ſerenum nanciſcitur. Mel apibus tum æſtate tum hyeme in cibo eſt, ſed recondunt alterum quoque cibarij genus, cui durities ceræ proxima, quod ſandaracam nonnulli appellant. Inferunt iniuriam apibus maximè veſpæ, & auiculæ, quas paros vocant, atque etiam hirundo & merops: qui apiaſter eſt, tùm verò ranæ lutariæ, eas vbi ad aquam acceſſerint, rapiunt. Quamobrem eas apiarij per paludes & ſtagna, vnde apes aquantur, venari ſolent, & veſparum latibula, &

C hirundinum, ac meropum nidos propinquos alueis, tollunt. Nullum animal, niſi ſui generis, apes fugiunt. præliantur enim inter ſe, & cum veſpis. Sed cùm ruri ſunt, nec ſibi inuicem, neque vllis aliis iniuriantur: at verò apud ſuos alueos pugnant acerrimè, & hoſtes, quos vicerint, enecant. Intereunt quæ percuſſerint: quoniam ſine inteſtini eruptione, aculeus eximi non poteſt. Sæpius enim euadunt, ſi, qui ictus eſt, curam adhibet, vt aculeus infixus iunctus cum aluo extringatur, alioqui apis interit. Necant vel maxima animalia ictu ſui aculei. Iam equus occiſus ab apibus eſt. Sed principes minimè irritantur, & feriunt.

D Efferunt foras apes vita in alueo defunctas, & cætera. Mundiſſimum omnium hoc animal eſt. quamobrem ſæpenumero cùm alui neceſſitas eſt, euolant, & in receſſu reddunt excrementum, quoniam malè oleat. Oderunt non ſolum fœdos odores, ſed etiam vnguentorum delitias. Ex quo fit vt homines his delibutos percutiant. Pereunt apes tum aliis caſibus, tum verò cùm multi principes orti, partem quiſque ſecum, quò libuit, abducat. Rubeta etiam apes interimit: ſubiens enim aditus aluei, afflat, & obſeruans rapit euolantes. Nullo hæc affici malo ab apibus poteſt, ſed ab apiario facilè interimitur. Genus autem apum, quod improbum eſſe, ac fauos fingere aſperos diximus, no-

E uellis maximè tribuunt apiarij nonnulli: peccaréque ita per imperitiam eas arbitrantur: nouellæ autem ſunt anniculæ omnes, quarum examen quotannis auolare ſolitum eſt. Nec verò nouellæ ipſæ perinde ac veteranæ, pungunt. Cùm copia mellis non ſuppetit, apiarij fucos depellunt: & ficus, ac reliqua id genus dulcia in cibo apponunt.

A ἀλλ' ἐὰν τὰ ἐπιτήδεια * ἔχῃ, καὶ εὖ διάγωσι, μάλλον ἐν ὥρᾳ τοῦ ἔτους ἐγχειροῦσι τῇ ἐργασίᾳ· καὶ ὅταν εὐδία ᾖ, συνεχῶς ἐργάζονται. καὶ εὐθὺς δὲ νέα οὖσα, ὅταν ἐκδύῃ, ἐργάζεται τριταία, ἐὰν ἔχῃ τροφήν. καὶ ὅταν ἑσμὸς προσκαθίζηται, ἀποτρέπονται ἔνιαι πρὸς τροφήν, εἶτ' ἐπανέρχονται πάλιν. ἐν δὲ τοῖς εὐθενοῦσι τῶν σμηνῶν, ἐκλείπει ὁ γόνος τῶν μελιττῶν περὶ τετταράκοντα ἡμέρας μόνον τὰς μετὰ χειμερινὰς τροπάς. ἐπειδὰν δ' ηὐξημένοι ὦσιν οἱ νεοττοί, τροφὴν αὐτοῖς παραθεῖσαι καταχρίουσιν· ὅταν δ' ᾖ δυνατός, αὐτὸς διελὼν τὸ κάλυμμα ἐξέρχεται. τὰ δὲ γινόμενα θηρία ἐν τοῖς σμήνεσι,

B καὶ λυμαινόμενα τὰ κηρία, αἱ μὲν χρησταὶ μέλιτται ἐκκαθαίρουσιν· αἱ δ' ἕτεραι, διὰ κακίαν, περιορῶσιν ἀπολλύμενα τὰ ἔργα. ὅταν δὲ τὰ κηρία * ἐξαιρῶσιν οἱ μελιττουργοί, ἀπολείπουσιν αὐταῖς τροφὴν διὰ χειμῶνα· ἣ ἐὰν διαρκὴς ᾖ, σώζεται τὸ σμῆνος· εἰ δὲ μή, ἐὰν μὲν χειμὼν ᾖ, αὐτοῦ ἀποθνήσκουσιν· εὐδίας δ' οὔσης, ἐκλείπουσι τὸ σμῆνος. τροφῇ δὲ χρῶνται μέλιτι καὶ θέρους καὶ χειμῶνος. τίθενται δὲ καὶ ἄλλην τροφὴν ἐμφερῆ τῷ κηρῷ τὴν σκληρότητα, ἣν ὀνομάζουσί τινες σανδαράκην. ἀδικοῦσι δ' αὐτὰς μάλιστα οἵ τε σφῆκες, καὶ οἱ αἰγίθαλοι καλούμενοι τὰ ὄρνεα· ἔτι δὲ χελι-

C δὼν καὶ μέροψ. θηρεύουσι δὲ καὶ οἱ τελματιαῖοι βάτραχοι πρὸς τὸ ὕδωρ αὐτὰς ἀπαντώσας· διόπερ καὶ τούτους οἱ μελιττουργοὶ ἐκ τῶν τελμάτων, ἀφ' ὧν ὑδρεύονται αἱ μέλιτται, θηρεύουσι, καὶ τὰς σφηκίας καὶ τὰς χελιδόνας τὰς πλησίον τῶν σμηνῶν * ἐξαιροῦσι, καὶ τὰς τῶν μερόπων νεοττιάς. οὐδὲν δὲ φεύγουσι τῶν ζῴων, ἀλλ' ἢ ἑαυτάς. ἡ δὲ μάχη αὐτῶν ἐστί, καὶ πρὸς αὑτάς, καὶ πρὸς τοὺς σφῆκας· καὶ ἔξω μέν, οὔτε ἀλλήλας ἀδικοῦσιν, οὔτε τῶν ἄλλων οὐθέν· τὰ δὲ πρὸς τῷ σμήνει ἀποκτείνουσιν, ὧν ἂν κρατήσωσιν. αἱ δὲ τύπτουσαι, ἀπόλλυνται, διὰ τὸ μὴ δύνασθαι τὸ κέντρον ἄνευ τοῦ

D ἐντέρου ἐξαιρεῖσθαι· πολλάκις γὰρ σώζεται, ἐὰν ὁ πληγεὶς ἐπιμελῆται, καὶ τὸ κέντρον ἐκθλίψῃ. τὸ δὲ κέντρον ἀποβάλλουσα ἡ μέλιττα, ἀποθνήσκει. κτείνουσι δὲ βάλλουσαι καὶ τὰ μεγάλα τῶν ζῴων· καὶ ἵππος ἤδη ἀπέθανεν ὑπὸ μελιττῶν. ἥκιστα δὲ χαλεπαίνουσιν οἱ ἡγεμόνες καὶ τύπτουσι. τὰς δ' ἀποθνησκούσας τῶν μελιττῶν, ἐκκομίζουσιν ἔξω· καὶ τἆλλα δὲ καθαριώτατόν ἐστι τὸ ζῷον. διὸ καὶ τὸ περίττωμα πολλάκις ἀφιᾶσιν ἀποπετόμεναι, διὰ τὸ δυσῶδες εἶναι. δυσχεραίνουσι δ', ὥσπερ εἴρηται, ταῖς δυσώδεσιν ὀσμαῖς, καὶ ταῖς τῶν μύρων· διὸ καὶ τοὺς χρωμένους αὐτοῖς τύπτουσιν. ἀπόλλυνται

E δὲ διά τε ἄλλα συμπτώματα, καὶ ὅταν οἱ ἡγεμόνες πολλοὶ γινόμενοι, ἕκαστος αὐτῶν μέρος ἀπαγάγῃ. ἀπολλύει δὲ καὶ ὁ φρύνος τὰς μελίττας· ἐπὶ τὰς εἰσόδους γὰρ ἐλθὼν φυσᾷ τε, καὶ ἐπιτηρῶν ἐκπετομένας, κατεσθίει. ὑπὸ μὲν οὖν τῶν μελιττῶν οὐδὲν δύναται πάσχειν· ὁ δ' ἐπιμελούμενος τῶν σμηνῶν, κτείνει αὐτόν. τὸ δὲ γένος τὸ τῶν μελιττῶν, ὃ εἴρηται ὅτι πονηρόν τε, καὶ τραχέα τὰ κηρία ἐργάζεται, εἰσί τινες τῶν μελιττουργῶν, οἵ φασι μάλιστα τὰς νέας τοῦτο ποιεῖν δι' ἀνεπιστημοσύνην * νέαι δ' εἰσὶν αἱ ἐπέτειοι. οὐχ ὁμοίως δὲ κεντοῦσιν αἱ νέαι· διὸ οἱ ἑσμοὶ φέρονται. ἐξ ὧν δ' ἐστὶ νέων μελιττῶν. ὅταν δ' ὑπολίπῃ τὸ μέλι, τοὺς κηφῆνας ἐκβάλλουσι, καὶ προσβάλλουσι σῦκα καὶ τὰ γλυκέα αὐταῖς.

* Scrib. ἔχωσι.

* ἢ ἐξαίρωσι

* ἢ ἐξαίρουσι.

* Gaza mutato verborum ordine ita legit, ... αἱ ἐπέτειοι ... μελιττῶν.

A τῶν δὲ μελιττῶν, αἱ μὲν πρεσβύτεραι, τὰ εἴσω ἐργάζονται, καὶ δασεῖαί εἰσι, διὰ τὸ εἴσω μένειν· αἱ δὲ νέαι, ἔξωθεν φέρουσι, καὶ εἰσὶ λειότεραι, καὶ τοὺς κηφῆνας ἀποκτείνουσιν, ὅταν μηκέτι χώρα ᾖ αὐταῖς ἐργαζομέναις. εἰσὶ γὰρ ἐν μυχῷ τοῦ σμήνους. ἤδη δέ, νοσήσαντός τινος σμήνους, ἦλθόν τινες ἐπ' ἀλλότριον, καὶ μαχόμεναι, ἐνίκων, ἐξέφερον τὸ μέλι. ἐπεὶ δ' ἀπέκτεινεν ὁ μελιττουργός, οὕτως ἐπεξῄεσαν αἱ ἕτεραι, καὶ ἠμύνοντο, καὶ τὸν ἄνθρωπον οὐκ ἔτυπτον. τὰ δὲ νοσήματα ἐμπίπτει μάλιστα εἰς τὰ εὐθενοῦντα τῶν σμηνῶν, ὅ,τε καλούμενος κλῆρος. τοῦτο γίνεται ἐν τῷ ἐδάφει σκωλήκια μικρά· ἀφ' ὧν αὐξανομένων, ὥσπερ ἀράχνια κατίσχει ὅλον τὸ σμῆνος, καὶ σήπεται τὰ κηρία. B ἄλλο δὲ νόσημα, οἷον ἀργία τις γίνεται τῶν μελιττῶν, καὶ δυσωδία τῶν σμηνῶν. νομὴ δὲ τῶν μελιττῶν τὸ θύμον. ἄμεινον δὲ τὸ λευκὸν τοῦ ἐρυθροῦ. τόπος δ', ἐν τῷ πνίγει, μὴ ἀλεεινός· ἐν δὲ τῷ χειμῶνι, ἀλεεινός. νοσοῦσι δὲ μάλιστα, ὅταν ἐρυσιβώδη ἐργάζωνται ὕλην. ὅταν δ' ἄνεμος ᾖ μέγας, φέρουσι λίθον ἐφ' ἑαυταῖς, ἕρμα πρὸς τὸ πνεῦμα. πίνουσι δ', ἂν μὲν ᾖ ποταμὸς πλησίον, οὐδαμόθεν ἄλλοθεν πίνουσιν, ἢ ἐντεῦθεν, θέμεναι τὸ ἄχθος πρῶτον· ἐὰν δὲ μὴ ᾖ, ἑτέρωθεν πίνουσαι, ἀνεμοῦσι τὸ μέλι, καὶ εὐθὺς ἐπ' ἔργον πορεύονται. τῇ δὲ τοῦ μέλιτος ἐργασίᾳ δύο καιροί εἰσιν, ἔαρ καὶ μετόπωρον. ἥδιον δὲ καὶ λευκότερον, καὶ τὸ ὅλως κάλλιον ἐστὶ τὸ ἐαρινὸν τοῦ μετοπωρινοῦ. μέλι δὲ κάλλιον C γίνεται ἐκ νέου κηροῦ καὶ ἐκ μόσχου. τὸ δὲ πυρρόν, χεῖρον, διὰ τὸ κηρίον. διαφθείρεται γὰρ ὥσπερ οἶνος, ὑπ' ἀγγείου· διὸ δεῖ ξηραίνειν αὐτό. ὅταν δὲ τὸ θύμον ἀνθῇ, καὶ πλῆρες γίνηται τὸ κηρίον, οὐ πήγνυται τοῦτο. ἔστι δὲ καλὸν τὸ χρυσοειδές· τὸ δὲ λευκόν, οὐκ ἐκ θύμου εἰλικρινοῦς, ἀγαθὸν δὲ πρὸς ὀφθαλμοὺς καὶ ἕλκη. τοῦ δὲ μέλιτος τὸ μὲν ἀσθενές, ἀεὶ ἐπιπολάζει· ὃ δεῖ ἀφαιρεῖν· τὸ δὲ καθαρόν, κάτω. ὅταν δὲ ἡ ὕλη ἀνθῇ, κηρὸν ἐργάζονται. διὸ ἐκ τοῦ σμήνους τότε ἐξαιρετέον τὸν κηρόν· ἐργάζονται γὰρ εὐθύς. ἀφ' ὧν δὲ φέρουσιν, ἔστι τάδε· ἀτρακτυλλίς, μελίλωτον, ἀσφόδελος, μυρρίνη, φλεώς, ἄγνος, σπάρτον. ὅταν δὲ D τὸ θύμον ἐργάζωνται, ὕδωρ μιγνύουσι, πρὶν τὸ κηρίον* καταλείφειν. ἀφοδεύουσι δὲ αἱ μέλιτται πᾶσαι, ἢ ἀποπετόμεναι, ὥσπερ εἴρηται, ἢ εἰς ἓν κηρίον. εἰσὶ δ' αἱ μικραὶ ἐργάτιδες μᾶλλον τῶν μεγάλων, ὥσπερ εἴρηται. ἔχουσι δὲ τὰ πτερὰ περιτετριμμένα, καὶ χροιὰν μέλαιναν, καὶ ἐπικεκαυμέναι. αἱ δὲ φαναὶ καὶ λαμπραί, ὥσπερ γυναῖκες, ἀργαί. δοκοῦσι δὲ χαίρειν αἱ μέλιτται καὶ τῷ κρότῳ· διὸ καὶ κροτοῦντές φασιν ἀθροίζειν αὐτὰς εἰς τὸ σμῆνος, ὀστράκοις τε καὶ ψήφοις. ἔστι μέντοι ἄδηλον ὅλως, εἴτε ἀκούουσιν, εἴτε μή, καὶ πότερον δι' ἡδονὴν τοῦτο ποιοῦσιν, ἢ διὰ φόβον. ἐξελαύνουσι δὲ καὶ τὰς ἀργὰς αἱ μέλιτ- E ται, καὶ τὰς μὴ φειδομένας. διῄρηνται δὲ τὰ ἔργα, ὥσπερ εἴρηται πρότερον· καὶ αἱ μέν, κηρία ἐργάζονται· αἱ δέ, τὸ μέλι· αἱ δ', ἐριθάκην. καὶ αἱ μέν, πλάττουσι κηρία· αἱ δὲ ὕδωρ φέρουσιν εἰς τοὺς κυττάρους, καὶ μιγνύουσι τῷ μέλιτι· αἱ δ', ἐπ' ἔργον ἔρχονται. ὄρθριαι δὲ σιωπῶσιν, ἕως ἂν μία ἐγείρῃ βομβήσασα δὶς ἢ τρίς. τότε δ' ἐπ' ἔργον ἀθρόαι πέτονται, καὶ ἐλθοῦσαι πάλιν, θορυβοῦσι τὸ πρῶτον, κατὰ μικρὸν δ' ἧττον, ἕως ἂν μία περιπετομένη βομβήσῃ, ὥσπερ σημαίνουσα καθεύδειν· εἶτ' ἐξαπίνης σιωπῶσι.

* Gaza, καταλιφεῖν.

A *Apum ſeniores intus operantur, hirtioréſque mo- ræ domeſticæ ratione ſunt. adoleſcentes foris negotium exercent, & ea quæ res exigit [illegible] læuioréſque ſunt, labore hirſutie detri[illegible] cos etiam ipſæ interimunt, quoties [illegible] operibus eſt: tenent enim aluei [illegible] rem. Cùm morbo examen quoddam [illegible] agmen peregrinum inuaſit, & pugna [illegible] adeptáque victoria, mella diripiebat. Quod cum apiarius proſterneret, victum examen ſtatim egreſſum vlciſcebatur, nec hominem ipſum vllo pacto impetebat. Morbo examina valentiora potiſſimùm infeſtantur clero (ſic enim vocant vermiculos, qui in pauimento naſcuntur) è quibus creſcentibus velvt aranea alueo toti obduci- B tur, & faui carie pereunt. alterum morbi genus quaſi otium quoddam, & veternitas apum, incidit cum fœdo aluei odore. Paſtus gratiſſimus apibus thymum eſt: ſed rubido albidum præfertur: locus æſtate non feruidus, hyeme tepidus. Ægrotant eo potiſſimùm tempore, cùm per æruginoſam materiem operantur. Quoties verò flatu vehementi iactantur, lapillum geſtant, quo ſe quaſi fulcro & fundamine quodam ſtabiliant contra flatum. Bibunt, ſi fluuius ſit propinquus, non aliunde quàm ex eo, poſito onere: ſin minùs, aliunde humore hauſto pergunt ire ad mel euomendum, confeſtimque negotium repetunt. Mellis conficiendi tempora duo ſunt, ver, atque au- C tumnus, ſed vernum ſuauius, candidius, omnino præſtantius autumnali eſt. Conficitur profectò melius ex noua cera, nouelliſque ſtirpibus. Rufum verò, atque deformius faui vitio redditur, quippe quod perinde, vt vinum à vaſe, vitietur: quapropter coquendum id reſiccandúmque eſt. Cum autem ex thymo florente faui replentur, ſit ita, vt minùs vel coeat, & duretur. Probatur cui ex aureolo color: quod autem albicat, non è ſincero thymo confectum eſt: ſed id oculis & vlceribus commodiùs applicatur. Mellis exilior pars fluitat, quæ eximenda eſt: pura verò & valida ſubſidit. Conficiunt ceram, cùm ſtirpes florent: quamobrem eximenda per id tempus cera de alueo eſt: D continuò enim reparatur. Hæc ſunt vnde accipiunt, thymus, fuſus agreſtis, ſertula campana, albucum, myrtus, phleus, vitex, geniſta. Cùm ex thymo conficiũt, aquam admiſcent ante quàm fauus occupetur. Egerunt alui excrementa omnes, aut volantes, vt dictum eſt, aut cera in parte faui. Minores officioſiores maioribus ſunt, vt dixi. Pennæ his detritæ, color niger, dorſum repandum: illæ nitidæ venuſtæque ſunt, more otioſarum mulierum. Gaudere etiam plauſu atque ſonitu apes videntur: quapropter tinnitu æris aut fictilis conuocari eas in alueum aiunt. Quanquam incertum eſt, an audiant, & voluptaténe an formidine, ita faciant. Quin & ſocias otioſas ac deſides, aut minùs par- E cas pellere in more apibus eſt. Partiuntur inter ſe opera vt antè dixi, & aliæ fauos conficiunt, aliæ mella, aliæ erithacam: & aliæ fauos expoliunt, aliæ aquam important ad cellas, & mella temperant, aliæ munus extrarium ſubeunt. Tempore matutino omnes ſilent, donec vna gemino aut triplici bombo excitet omnes: tum vniuerſæ ad opus prouolant. Cúmque redierint, primùm item tumultuant: paulatimque minùs ſubinde ſtrepunt, dum vna circumuolitando ſuſurret, quaſi dormiendum præcipiat: tum repentè omnes conticeſcunt.

Dignoſcitur

Dignoſcitur examen valere, ſuſurri frequentia, & exeundi ingrediendique vertiginoſa agitatione: tunc enim nouellæ operantur. Eſuriunt ab hyeme potiſſimùm cùm opus incipiunt. Redduntur otioſiores, ſi in eximendis fauis plus mellis relinquatur: itaque pro examinis numero relinquendum eſt. agunt etiam anxiùs, ſi plus demeratur quàm vt reſiduum ſufficiat. atque etiamſi alueus iuſto amplior ſit, deſidioſiores redduntur: ægriùs enim, quaſi deſperent, operi incumbunt. Caſtrantur faui ſinguli ſextariis, aut ternis ſemiſextariis: ſed ſi exuberant, binis ſextariis caſtrari, aut quinis ſemiſextariis poſſunt, pauci ternis ſextariis. Impugnantur apes à veſpis, vt antè dixi: quamobrem apiarij eas venantur, conſtituta olla, & carne in ea poſita: vbi enim multæ iam ad carnem acceſſerint, appoſito operculo ſuper ignem ollam ponunt. Fuci autem, ſi pauci adſunt, iuuant. reddunt, n. apes in opere ſolicitiores. Præſagiunt apes & hyemem, & imbres. Cuius rei indiciũ eſt, quòd non auolant, ſed ſereno adhuc in alueo volitantur, quo apiarij hyemem expectant. Cùm verò mutuo inter ſe annexi alia ex alia dependet in alueo, indicium deſerendi cubilis eſt. Quod ne eueniat, apiarij alueis afflant ex vino dulci. Expedit conſeuiſſe apud aluearia pyros, fabas, medicam herbam, ſuriam, eruiliam, myrtum, papauer, ſerpyllum, amygdalam. Cognoſcunt ſuas apiarij nonnulli farina in prato reſperſa. Minùs apes fœtificant, ſi ver ſerotinum ſit, aut ſquallor, aut rubigo inciderit. Ratio apum ad hunc modum eſt.

CAPVT XLI.

De duobus veſparum generibus, & earum ſtudio in fauis conſtruendis.

VEſparum duo ſunt genera: alterum ferum, quod rarum eſt, naſcens in montibus, & pariens non ſub terra, ſed in quercu, ſpecie grandius, porrectius, nigrius: varium etiam aculeatúmque eſt, & robuſtius, ictuque acerbius, quàm alterum, eſt: aculeo enim maiori, quàm ex proportione ſui corporis, ſpiculatur. Viuit hoc toto anno: & quidem tempore hyberno, quercu cæſa euolare ſpectatur. Exigit hyemem in latebra, & ſemper in macerie diuerſatur. Sunt eius aliæ matrices, aliæ operariæ, vt & in altero genere, quod placidius eſt. Quæ autem ſit natura operariæ ac matricis, in eo ipſo placidiore genere percipi faciliùs poteſt. Sunt enim huius quoque duo genera: alterum duces, quas matrices appellant, alterum operariæ: maiores mitioreſque duces ſunt. Ætas operariarum annum non complet, ſed omnes hyeme inualeſcente moriuntur. Quod ea re conſtat, quia hyeme incipiẽte ſtupeſcãt: bruma autem nullæ omnino appareant: duces verò, qui matrices vocantur, tota hyeme viſuntur, atque ſub terra latent. Plerique enim, cùm per hyemem ararent, aut foderent, matrices viderunt, operarias nemo. Ortus talis veſparum eſt. Duces vbi iam locum ſibi opportunum delegerunt, fauos opere æſtiuo confingunt, & veſpeta (cellulas dico) conſtituunt quaternis foriculis, aut propè, in quibus veſpæ, non matrices naſcuntur. Quæ cùm increuerint,

διαγινώσκεται δὲ ἰσχύων ὁ σμῆνος, τῷ ψόφῳ τε πολὺν, καὶ κινεῖσθαι ἐξιούσας καὶ εἰσιούσας· τότε γὰρ * σμηκίδας ἐργάζονται. * πεινῶσι μάλιστα δὲ, ὅταν ἄρχωνται ἐκ τοῦ χειμῶνος. ἀργότεραι δὲ γίνονται, ἐὰν πλεῖόν τις καταλείπῃ μέλι * βλίττων· ἀλλὰ δεῖ πρὸς τὸ πλῆθος καταλείπειν τὰ κηρία. ἀθυμότερον δὴ ἐργάζονται, καὶ ἐὰν ἔλαττον καταλειφθῇ. ἀργότεραι δὲ γίνονται, καὶ ἂν μέγα τὸ κύτος ᾖ· ἀθυμότερον γὰρ πονοῦσι. βλίττεται δὲ σμῆνος χοᾶ, ἢ τρία ἡμίχοα· τὰ δὲ εὐθενοῦντα, δύο χοᾶς, ἢ πέντε ἡμίχοα. τρεῖς δὲ χοᾶς, ὀλίγα. πολέμιοι δὲ τυγχάνουσι ταῖς μελίτταις, καὶ οἱ σφῆκες, ὥσπερ εἴρηται καὶ πρότερον. θηρεύουσι δὲ τούτους καὶ οἱ μελιττουργοί, λοπάδα τιθέντες, καὶ κρέας εἰς αὐτὴν ἐμβάλλοντες· ὅταν δὲ πολλοὶ ἐμπέσωσιν, εἰς τὸ πῦρ πωμάσαντες ἐπιτιθέασι. κηφῆνες δὲ, ὀλίγοι ἐνόντες, ὠφελοῦσι τὸ σμῆνος· ἐργατικωτέρας γὰρ ποιοῦσι τὰς μελίττας. προγινώσκουσι δὲ καὶ χειμῶνα καὶ ὕδωρ αἱ μέλιτται. σημεῖον δέ· οὐκ ἀποπέτονται γὰρ, ἀλλ' ἐν τῇ εὐδίᾳ αὐτοῦ ἀνειλοῦνται· ᾧ γινώσκουσιν οἱ μελιττουργοί, ὅτι χειμῶνα προσδέχονται. ὅταν δὲ κρέμωνται ἐξ ἀλλήλων ἐν τῷ σμήνει, σημεῖον γίνεται τοῦτο ὅτι ἀπολείψει τὸ σμῆνος· ἀλλὰ καταρραίνουσι τὸ σμῆνος οἴνῳ γλυκεῖ οἱ μελιττουργοί, ὅταν τοῦτ' αἰσθάνωνται. φυτεύειν δὲ συμφέρει περὶ τὰ σμήνη, ἀχράδας, κυάμους, πόαν μηδικὴν, * συρίαν, ὤχρους, μυρρίνην, μήκωνα, ἕρπυλλον, ἀμυγδαλῆν. γινώσκουσι δέ τινες τῶν μελιττουργῶν τὰς ἑαυτῶν ἐν τῇ νομῇ ἀλεύρῳ καταπάττοντες. ἐὰν δὲ τὸ ἔαρ ὄψιον γένηται, ἢ αὐχμὸς, καὶ ὅταν ἐρυσίβη, * ἔλαττον ἐργάζονται αἱ μέλιτται τὸν γόνον. τὰ μὲν οὖν περὶ τὰς μελίττας, τοῦτον ἔχει τὸν τρόπον.

* κ. χοᾶς, idque ſecutus G. Gaza nouam

* κ. [illegible]

* Fort. [illegible], ut Sylb.

* Fort. [illegible]

ΚΕΦΑΛ. μα'.

Περὶ σφηκῶν.

ΤΩν δὲ σφηκῶν ἐστὶ δύο γένη. τούτων δ' οἱ μὲν ἄγριοι, σπάνιοι· γίνονται δ' ἐν τοῖς ὄρεσι, καὶ τίκτουσιν οὐ κατὰ γῆς, ἀλλ' ἐν ταῖς δρυσί· τὴν μὲν μορφὴν μείζους, καὶ προμηκέστεροι, καὶ μελαγχρώτεροι τῶν ἑτέρων μᾶλλον, ποικίλοι δὲ, καὶ ἐγκεντρίδας ἔχοντες, καὶ ἀλκιμώτεροι, καὶ τὸ πλῆγμα ἀλγεινότερον αὐτῶν ἢ ἐκείνων. καὶ γὰρ τὸ κέντρον ἀνάλογον μεῖζον τὸ τούτων. οὗτοι μὲν οὖν διετίζουσι, καὶ ὁρῶνται τοῦ χειμῶνος ἐκ δρυῶν κοπτομένων ἐκπετόμενοι. ζῶσι δὲ φωλοῦντες τὸν χειμῶνα. ἡ δὲ διατριβὴ ἐν τοῖς ξύλοις. εἰσὶ δ' αὐτῶν οἱ μὲν, μῆτραι, οἱ δ', ἐργάται, ὥσπερ καὶ τῶν ἡμερωτέρων. τίς δ' ἡ φύσις τοῦ ἐργάτου καὶ τῆς μήτρας, ἐπὶ τῶν ἡμερωτέρων ἔσται δῆλον. ἔστι γὰρ καὶ τῶν ἡμέρων σφηκῶν δύο γένη· οἱ μὲν, ἡγεμόνες, οὓς καλοῦσι μήτρας· οἱ δ', ἐργάται. εἰσὶ δὲ μείζους οἱ ἡγεμόνες πολὺ, καὶ πρᾳότεροι. καὶ οἱ μὲν ἐργάται, οὐ διετίζουσιν, ἀλλὰ πάντες ἀποθνήσκουσιν, ὅταν χειμὼν ἐπιγένηται. φανερὸν δ' ἐστὶ τοῦτο, τοῦ γὰρ χειμῶνος ἀρχομένου μὲν, μωροὶ γίνονται οἱ ἐργάται, περὶ τροπὰς δ' οὐ φαίνονται ὅλως. οἱ δ' ἡγεμόνες, οἱ καλούμενοι μῆτραι, ὁρῶνται δι' ὅλου τοῦ χειμῶνος, καὶ κατὰ γῆς φωλοῦσιν. ἀροῦντες γὰρ καὶ σκάπτοντες ἐν τῷ χειμῶνι, μήτρας μὲν πολλοὶ ἑωράκασιν, ἐργάτας δ' οὐδείς. ἡ δὲ γένεσις τῶν σφηκῶν ἐστὶ τοιάδε. οἱ ἡγεμόνες, ὅταν λάβωσι τόπον εὔσκοπον, ἐπιπλάττουσι τὰ κηρία, καὶ συνιστᾶσι τὰ καλούμενα * σφηκία, τὰ μικρὰ, ὡς τετραθύρια, ἢ ἐγγὺς τούτων· ἐν οἷς σφῆκες γίνονται, καὶ οὐ μῆτραι. τούτων δὲ αὐξηθέντων,

* κ. σφηκ[illegible] melias.

πάλιν μετὰ τούτους ἄλλους μείζους ἴσους συνιστᾶσι· καὶ πάλιν, τούτων αὐξηθέντων, ἑτέρους· ὥστε τοῦ μετοπώρου τελευτῶντος, πλεῖστα καὶ μέγιστα γίνεσθαι σφηκία· ἐν οἷς ὁ ἡγεμών, ἡ καλουμένη μήτρα, οὐκέτι σφῆκας γεννᾷ, ἀλλὰ μήτρας. γίνονται δ' οὗτοι ἄνω ἐπὶ τοῦ σφηκίου ἐπιπολῆς μείζους σκώληκες ἐν θυρίσι συνεχέσι τέτταρσιν, ἢ μικρῷ πλείοσιν· παραπλησίως δ' ὥσπερ ἐν τοῖς κηρίοις τὰ τῶν σφηκῶν. ἐπειδὰν δὲ γένωνται οἱ ἐργάται σφῆκες ἐν τοῖς κηρίοις, οὐκέτι οἱ ἡγεμόνες ἐργάζονται, ἀλλ' οἱ ἐργάται αὐτοῖς τὴν τροφὴν εἰσφέρουσι. φανερὸν δ' ἐστὶ τοῦτο, τῷ μηκέτι τοὺς ἡγεμόνας ἐκπέτεσθαι τῶν ἐργατῶν, ἀλλ' εἴσω μένοντας ἡσυχάζειν. πότερον δὲ οἱ πέρυσινοι ἡγεμόνες, ὅταν νέους ποιήσωσιν ἡγεμόνας, ἀποθνήσκουσι μετὰ τῶν νέων σφηκῶν, καὶ τοῦτ' ὁμοίως συμβαίνει, ἢ καὶ πλείω χρόνον δύνανται ζῆν, οὐδὲν ὦπταί πω· οὔτε γῆρας, οὔτε μήτρας, οὔτε τῶν ἀγρίων σφηκῶν, οὐδείς πω ὦπται ἑωρακώς, οὐδ' ἄλλο τοιοῦτο πάθος οὐδέν. ἔστι δ' ἡ μήτρα πλατὺ καὶ βαρύ, καὶ παχύτερον καὶ μεῖζον τοῦ σφηκός· καὶ πρὸς τὴν πτῆσιν, διὰ τὸ βάρος, οὐκ ἄγαν ἰσχυρόν· οὐδὲ δύναται ἐπὶ πολὺ πέτεσθαι. διὸ καὶ κάθηνται ἐν τοῖς σφηκίοις ἀεί, συμπλάττουσαι καὶ διοικοῦσαι τὰ εἴσω. ἐν δὲ τοῖς πλείστοις σφηκίοις ἔνεισιν αἱ μῆτραι καλούμεναι. ἀμφισβητεῖται δέ, πότερον ἔγκεντροί εἰσιν, ἢ ἄκεντροι. ἐοίκασι δ', ὥσπερ οἱ τῶν μελιττῶν ἡγεμόνες, ἔχειν μέν, οὐκ ἐξιέναι δέ, οὐδὲ βάλλειν. τῶν δὲ σφηκῶν οἱ μέν, ἄκεντροί εἰσιν, ὥσπερ κηφῆνες· οἱ δ', ἔχουσι κέντρον. εἰσὶ δ' οἱ ἄκεντροι, ἐλάττους καὶ ἀσθενέστεροι, καὶ οὐκ ἀμύνονται· οἱ δ' ἔχοντες τὰ κέντρα, μείζους καὶ ἄλκιμοι· καὶ καλοῦσι τούτους ἔνιοι μὲν ἄρρενας, τοὺς δ' ἀκέντρους, θηλείας. πρὸς δὲ τὸν χειμῶνα ἀποβάλλειν δοκοῦσι πολλοὶ τῶν ἐχόντων, τὰ κέντρα. αὐτόπταις δ' οὔπω ἐντετυχήκαμεν. γίνονται δ' οἱ σφῆκες μᾶλλον ἐν τοῖς αὐχμοῖς, καὶ ἐν ταῖς χώραις ταῖς τραχείαις. γίνονται δ' ὑπὸ γῆν, καὶ τὰ κηρία πλάττουσιν ἐκ φορυτοῦ καὶ γῆς, ἀπὸ μιᾶς ἀρχῆς ἕκαστον, ὥσπερ ἀπὸ ῥίζης. τροφῇ δὲ χρῶνται μὲν καὶ ἀπ' ἀνθῶν τινῶν καὶ καρπῶν· τῇ δὲ πλείστῃ, ἀπὸ ζωοφαγίας. ὠμμένοι δ' εἰσὶν ὀχευόμενοι ἤδη καὶ τῶν ἄλλων τινές. εἰ δ' ἄκεντροι ἄμφω, ἢ κέντρα ἔχοντες, ἢ ὁ μέν, ὁ δ' οὔ, οὐκ ὦπται. καὶ τῶν ἀγρίων ὀχευόμενοι ὠμμένοι, καὶ ὁ ἕτερος ἔχων κέντρον· περὶ θατέρου δὲ οὐκ ὤφθη. ὁ δὲ γόνος, οὐ δοκεῖ ἐκ τοῦ τόκου γίνεσθαι, ἀλλ' εὐθὺς μείζων ἐστίν, ἢ ὡς σφηκὸς τόκος. ἐὰν δὲ λαβών τις τῶν ποδῶν σφῆκα, καὶ τοῖς πτεροῖς ἐᾷ βομβεῖν, προσπέτονται οἱ ἄκεντροι· οἱ δὲ τὰ κέντρα ἔχοντες, οὐ προσπέτονται· ᾧ τινὲς τεκμηρίῳ χρῶνται, ὡς τῶν μέν, ἀρρένων ὄντων, τῶν δέ, θηλειῶν. ἁλίσκονται δ' ἐν τοῖς σπηλαίοις τοῦ χειμῶνος, καὶ ἔχοντες ἔνιοι κέντρα, καὶ οὐκ ἔχοντες. ἐργάζονται δ', οἱ μὲν μικρὰ καὶ ὀλίγα σφηκία, οἱ δέ, πολλὰ καὶ μεγάλα. αἱ δὲ μῆτραι καλούμεναι, ἁλίσκονται περιιούσης τῆς ὥρας, αἱ πολλαὶ περὶ τὰς πτελέας. συλλέγουσι γὰρ τὰ γλίσχρα καὶ τὰ κομμιώδη. γεγένηται δέ που μητρῶν πλῆθος, γενομένων τῷ ἔμπροσθεν ἔτει πολλῶν σφηκῶν, καὶ ἐπομβρίας. θηρεύονται δὲ περὶ τοὺς κρημνούς, καὶ τὰ ῥήγματα τῆς γῆς τὰ εἰς ὀρθόν· καὶ πάντες φαίνονται ἔχοντες κέντρα. τὰ μὲν οὖν περὶ τοὺς σφῆκας τοῦτον ἔχει τὸν τρόπον.

A rurſus altera ampliora effingunt. Quorum item proles, cùm creuerit, alia faciunt, ita, vt poſtremo autumno plurima ampliſſimáque veſparum condita habeantur: in quibus dux, quæ matrix vocata eſt, non inſuper veſpas, ſed matrices generat: quæ quidem ſupernè per ſummum veſparium vermium ſpecie multo grandiorum gignuntur cellulis continuatis quatuor numero, aut paulo pluribus. alioqui increſcendi ratio ducibus eadem quæ veſpis eſt. Sed cùm veſpæ operariæ ſiluis affuerint, non præterea duces operantur, ſed operariæ ipſæ cibum ſuis ducibus ſubminiſtrant. Quod ea re conſtat, quia duces non item euo-
B lant, ſed intra tecta quieſcunt. Cæterùm vtrùm duces anni ſuperioris, nouellis iam procreatis ducibus, interimantur à veſpis nouellis, idque ſimili modo eueniat, an plus etiam temporis poſſint viuere, nondum exploratum eſt. Nec verò ſenectutem matricis, & veſparum generis feri, aut aliquem huiuſmodi affectum annotare adhuc quiſquam potuit. Eſt autem matrix latior, ponderoſior, craſſior, & maior, quàm veſpa, volatúque haud plurimum valet. Præ pondere enim ſui corporis volare longiùs nequit. Quo fit vt ſemper in veſpariis ſedeant effingentes fauos, & munere fungentes cellario. Inſunt porrò matrices nuncupatæ in veſpariis plurimis: ſed aculeatæ ſint nécne, am-
C bigitur. Videntur tamen & ipſæ, vt apum duces, gerere quidem aculeum, ſed non extringere, aut ferire. Veſparum autem aliæ carent aculeo, vt fuci: aliæ habent. Minores imbecilliorέſque ſunt quæ carent, neque repugnant. contrà, quæ habẽt, maiores, robuſtæ, atque pugnaces, quas nonnulli mares appellant: fœminas verò, eas quæ carent. Pleræque ex iis quæ aculeum gerunt, amittere eum putantur hyeme inſtante: ſed hoc ex nemine, qui vidiſſet, accepimus. *Veſpæ temporibus* ſiccis, locíſque aſperis *potiùs* oriuntur. Ortus ſub terra agitur. *Fingunt ſuos* fauos ex congerie ac terra, & ab *eodem* primordio quaſi ſtirpe vnumquemque ædificant. Cibum vel ex floribus qui-
D buſdam & fructibus petunt: ſed quàm plurimùm ex carne. Coire nonnullæ etiam ex cæteris viſæ ſunt: ſed an ambæ aculeo careant, aut habeant, vel altera habeat, altera careat, nondum exploratum eſt. Ferarum etiam nonnullæ coire viſæ ſunt, & alteram gerere aculeum conſtitit, ſed de altera incertum eſt. Fœtus non partu prouenire videtur: ſtatim enim auctior, quàm partus veſpæ patiatur, exiſtit. Si veſpam ex pedibus ceperis, bombilaréque ſiueris, aduolant quæ aculeo carent: quod nõ faciunt, quæ aculeatæ ſunt. Itaque argumento quidam hoc vtuntur, vt alteræ mares ſint, alteræ fœminæ. Capiuntur hyberno tempore, in ſpelun-
E cis, & quæ aculeum habent, & quæ carent. Condunt aliæ ſua veſparia pauca, & exigua: aliæ plura, & ampliora. Capitur magna matricum pars à ſolſtitio apud vlmos: colligunt enim hinc lentam & gummoſam materiam. Prodiere locis quibuſdam matrices ortu admodum numeroſo, cùm ſuperiori anno veſparum atque imbrium copia præceſſiſſet. Capiuntur per præcipitia, & terræ rimas, præruptáque directiora: omnéſque viſuntur aculeum gerere. Talis veſparum ratio eſt.

A

CAPVT XLII.

De crabronibus, victúque eorum, & alueis.

CRabrones, non floribus, vt apes, ſed carne magna ex parte viuunt. Vnde fit vt verſari vel in ſtercore ſæpe ſoleant. Venantur etiam muſcas maiuſculas, quas vbi ceperint, abſciſſo capite, reliquum corpus geſtantes auolant. Sed pomum etiam dulce appetunt. Cibus his talis eſt. Duces more apum veſparúmque habent, qui proportione ad crabrones maiores quàm veſparum ad veſpas, & apum ad apes ſunt. Degunt hi quoque intus, vt veſparum duces. Faciunt ſibi alueum ſub terra crabrones, terra egeſta: & vt formicæ excauant. Miſſio enim vt apum, nulla vel eorum vel veſparum fieri ſolet. Sed qui ſubinde oriantur nouelli, ibidem manent, & alueum terra egeſta faciunt ampliorem: amplificant maiorem in modū, & iam ex valentiore quodam examine qualli tres, & quatuor fauorum pleni excepti ſunt. Nec verò cibum ritu apum ſibi recondunt, ſed ieiuni latent per hyemem, quo tempore plurimi moriuntur: an etiam omnes, nondum certum eſt. Duces nō plures vno, ſingulis eorum examinibus oriuntur, vt inter apes gignuntur plures, qui examina diſtrahunt. Sed ſi qui crabrones ſuo alueo aberrarint, colligunt ſe ad aliquam arborem, fauóſque ibi cōficiunt, qui vel ſæpe conſpicui apparent: in quibus vnum procreant ducē, qui cùm adoleuerit, agmen adducit, & ſecum in alueo collocat. De coitu crabronum nihil adhuc exploratum habeo, nec vnde fœtificent. Sed cùm in genere apum careant aculeo, & fuci, & reges, atque etiam veſparum nonnullæ inaculeatæ ſint, vt antè dixi, crabrones omnes armari aculeo videntur. Sed de eorum duce conſiderandum accuratiùs eſt, an aculeum habeat.

ΚΕΦΑΛ. μβʹ.

Περὶ ἀνθρηνῶν.

Αἱ δ' ἀνθρῆναι, ζῶσι μὲν, οὐκ ἀπανθολογούμεναι δὲ ὥσπερ αἱ μέλιτται, ἀλλὰ τὰ πολλὰ σαρκοφαγοῦσαι· διὸ καὶ περὶ τὴν κόπρον διατρίβουσι. θηρεύουσι γὰρ τὰς μεγάλας μυίας, καὶ ὅταν καταλάβωσιν, ἀφελοῦσαι τὴν κεφαλὴν, ἀποπέτονται φέρουσαι τὸ σῶμα τὸ λοιπόν. ἅπτονται δὲ καὶ τῆς γλυκείας ὀπώρας. τροφῇ μὲν οὖν χρῶνται τῇ εἰρημένῃ· ἔχουσι δ' ἡγεμόνας, ὥσπερ αἱ μέλιτται καὶ οἱ σφῆκες·

B καὶ οἱ ἡγεμόνες οὗτοι μείζους εἰσὶ τῷ μεγέθει κατὰ λόγον πρὸς τὰς ἀνθρήνας, ἢ ὁ τῶν σφηκῶν πρὸς τοὺς σφῆκας, καὶ ὁ τῶν μελιττῶν πρὸς τὰς μελίττας. διατρίβει δὲ εἴσω καὶ οὗτος, ὥσπερ ὁ τῶν σφηκῶν ἡγεμών. ποιοῦσι δὲ τὸ σμῆνος ὑπὸ γῆν αἱ ἀνθρῆναι, ἐκφέρουσαι τὴν γῆν, ὥσπερ οἱ μύρμηκες. ἀφεσμὸς γὰρ, ὥσπερ τῶν μελιττῶν, οὐ γίνεται οὔτε τούτων, οὔτε τῶν σφηκῶν, ἀλλ' ἀεὶ ἐπιγινόμεναι νεώτεραι αὐτοῦ μένουσι, καὶ τὸ σμῆνος μεῖζον ποιοῦσιν, ἐκφέρουσαι τὸν χοῦν. γίνεται δὲ μεγάλα τὰ σμήνη. ἤδη γὰρ εὐθενοῦντος σμήνους, κόφινοι τρεῖς καὶ τέτταρες ἐξῃρέθησαν κηρίων. οὐδ' ἐναποτίθενται τροφὴν, ὥσπερ αἱ μέλιτται, ἀλλὰ φωλοῦσι τὸν

C χειμῶνα· αἱ δὲ πλεῖσται ἀποθνήσκουσιν· εἰ δὲ καὶ πᾶσαι, οὔπω δῆλον. οἱ δὲ ἡγεμόνες πλείους ἑνὸς οὐ γίνονται ἐν τοῖς σμήνεσιν, ὥσπερ ἐν τοῖς τῶν μελιττῶν, οἳ διασπῶσι τὰ σμήνη τῶν μελιττῶν. ὅταν δὲ πλανηθῶσί τινες τῶν ἀνθρηνῶν ἀπὸ τοῦ σμήνους, συστραφεῖσαι πρός τινα ὕλην, ποιοῦσι κηρία, οἷάπερ καὶ ὁρᾶται ἐπιπολῆς ὄντα πολλάκις· καὶ ἐν τούτῳ ἐργάζονται ἡγεμόνα. οὗτος δὲ ἐπειδὰν ἐξέλθῃ καὶ αὐξηθῇ, ἀπαγαγὼν, καὶ κατοικίζει μεθ' αὐτοῦ εἰς σμῆνος. περὶ δὲ ὀχείας τῶν ἀνθρηνῶν, οὐδὲν ὦπταί πω, οὐδ' ὅθεν γίνεται ὁ γόνος. ἐν μὲν οὖν ταῖς μελίτταις, ἄκεντροί εἰσι καὶ οἱ κη-

D φῆνες καὶ οἱ βασιλεῖς, καὶ τῶν σφηκῶν ἔνιοι ἄκεντροί εἰσι, καθάπερ εἴρηται πρότερον· αἱ δ' ἀνθρῆναι, πᾶσαι φαίνονται κέντρον ἔχουσαι. ἐπισκεπτέον δὲ μᾶλλον καὶ περὶ τοῦ ἡγεμόνος, εἰ κέντρον ἔχει, ἢ μή.

CAPVT XLIII.

De genere bombycum, & teredinum, earúmque fœtibus.

BOmbyces ſub ſaxis apud ipſam terram fœtificant, binis aut paulò pluribus cellulis. Mellis etiam praui cuiuſdam inchoatio in his reperitur. Teredo non abſimilis crabronibus eſt, ſed varia, & latitudine proxima apibus. Cupedioſa hæc eſt, & ad culinam, & piſces, & huiuſcemodi delicias ſingularis aduolat. Fœtum ſub terra edit, vt veſpæ. Multiplex huius quoque teredinarium eſt, & longè amplius quàm veſpæ, atque porrectius. Muneris vitæque ratio apum, veſparum, & reliquorum generis eiuſdem, ad hunc modum eſt.

ΚΕΦΑΛ. μγʹ.

Περὶ βομβυλίων καὶ τενθρηδόνων.

Οἱ δὲ βομβύλιοι, τίκτουσιν ὑπὸ πέτρας ἐπ' αὐτῆς τῆς γῆς, θυρίσι δυσὶν, ἢ μικρῷ πλείοσιν. εὑρίσκεται δὲ καὶ μέλιτος ἀρχὴ φαύλου τινὸς ἐν τούτοις. ἡ δὲ τενθρηδὼν, προσεμφερὴς μέν ἐστι τῇ ἀνθρήνῃ, ποικίλον δὲ, καὶ τὸ πλάτος ὅμοιον τῇ μελίττῃ. λίχνον δ' ὂν, καὶ πρὸς τὰ μαγειρεῖα,

E καὶ τοὺς ἰχθῦς, καὶ περὶ τὰ τοιαῦτα ἀπολαύειν καταμόνας προσπέταται. ἐκτίκτει δὲ κατὰ γῆς, ὥσπερ καὶ οἱ σφῆκες. πολύγονον δ' ἐστὶ, καὶ τὸ τενθρήνιον αὐτῶν πολὺ μεῖζον ἢ τῶν σφηκῶν, καὶ προμηκέστερον. τὰ μὲν οὖν περὶ τὴν τῶν μελιττῶν, καὶ τῶν σφηκῶν, καὶ τῶν ἄλλων τῶν τοιούτων ἐργασίαν καὶ τὸν βίον, τοῦτον ἔχει τὸν τρόπον.

CAPVT XLIV.

Mores animantium differre & manſuetudine & feritate: déque leonum generibus, & natura: & lupiceruarij.

CÆterùm in moribus animantium (vt dictum iam eſt) percipi differentias licet, præcipuè

ΚΕΦΑΛ. μδʹ.

Περὶ λέοντος καὶ θωός.

Περὶ δὲ τὰ ἤθη τῶν ζῴων, (ὥσπερ εἴρηται καὶ πρότερον) ἔστι θεωρῆσαι διαφορὰς, πρὸς

ἀνδρείαν μὲν μάλιστα καὶ δειλίαν, ἔπειτα καὶ πρὸς πρᾳότητα καὶ ἀγριότητα, καὶ αὐτῶν τῶν ἀγρίων. καὶ γὰρ ὁ λέων ἐν τῇ βρώσει μὲν χαλεπώτατός ἐστι, μὴ πεινῶν δὲ καὶ βεβρωκὼς, πρᾳότατος. ἔστι δὲ τὸ ἦθος οὐχ ὑπόπτης οὐδενός, οὐδ' ὑφορώμενος οὐδέν· πρός τε τὰ σύντροφα καὶ συνήθη, σφόδρα φιλοπαίγμων, καὶ στερκτικός. ἐν δὲ ταῖς θήραις ὁρώμενος μὲν, οὐδέποτε φεύγει, οὐδὲ πτήσσει· ἀλλ' ἐὰν καὶ διὰ πλῆθος ἀναγκασθῇ τῶν θηρευόντων ὑπαγαγεῖν, βάδην ὑποχωρεῖ, καὶ κατὰ σκέλος, καὶ κατὰ βραχὺ ἐπιστρεφόμενος. ἐὰν μέντοι ἐπιλάβηται δασέος, φεύγει ταχέως, ἕως ἂν καταστῇ εἰς φανερόν· τότε δὲ πάλιν ὑπάγει βάδην. ἐν δὲ τοῖς ψιλοῖς ἐάν ποτ' ἀναγκασθῇ εἰς φανερὸν διὰ [τὸ] πλῆθος φεύγειν, τρέχει κατατείνας, καὶ οὐ πηδᾷ. τὸ δὲ δρόμημα συνεχῶς, ὥσπερ κυνός, ἐστὶ κατατεταμένον. διώκων μέντοι ἐπιρρίπτει ἑαυτὸν, ὅταν ᾖ πλησίον. ἀληθῆ δὲ καὶ τὰ λεγόμενα· τό τε φοβεῖσθαι μάλιστα τὸ πῦρ, ὥσπερ καὶ Ὅμηρος ἐποίησε·

Ιλιάδ. λ. Καιόμεναί τε δεταί, τάς [τε] τρεῖ ἐσσύμενός περ·

καὶ τὸ, τὸν βάλλοντα, τηρήσαντα, ἵεσθαι ἐπὶ τοῦτον. ἐὰν δέ τις βάλλῃ μὲν μή, ἐνοχλῇ δὲ αὐτὸν, ἐὰν ἐπᾴξας συλλάβῃ, ἀδικεῖ μὲν οὐδὲν, οὐδὲ βλάπτει τοῖς ὄνυξι· σείσας δὲ καὶ φοβήσας, ἀφίησι πάλιν. πρὸς δὲ τὰς πόλεις ἔρχονται μάλιστα, καὶ τοὺς ἀνθρώπους ἀδικοῦσιν, ὅταν γηράσωσι, διά τε τὸ γῆρας ἀδυνατοῦντες θηρεύειν ὄντες, καὶ διὰ τὸ πεπονηκέναι τοὺς ὀδόντας. ἔτη δὲ ζῶσι πολλά· καὶ ὁ ληφθεὶς λέων χωλὸς πολλοὺς τῶν ὀδόντων εἶχε κατεαγότας· ᾧ τεκμηρίῳ ἐχρῶντό τινες, ὅτι πολλὰ ἔτη ζῶσι. τοῦτο γὰρ οὐκ ἂν συμπεσεῖν, μὴ οὐ πολυχρονίῳ ὄντι. γένη δ' ἐστὶ λεόντων δύο· τούτων δ' ἐστὶ τὸ μὲν, στρογγυλώτερον, καὶ οὐλοτριχώτερον, καὶ δειλότερον· τὸ δὲ μακρότερον, καὶ εὐθύτριχον, ἀνδρειότερον. καὶ φεύγουσι δ' ἐνίοτε κατατείναντες τὴν κέρκον, ὥσπερ κύνες. ἤδη δ' ὤφθη λέων καὶ ὑὶ ἐπιτίθεσθαι μέλλων, καὶ ὡς εἶδεν ἀντιφρίξαντα, φεύγων. ἔστι δὲ πρὸς τὰς πληγὰς, εἰς μὲν τὰ κοῖλα, ἀσθενής· κατὰ δὲ τὸ ἄλλο σῶμα, δέχεται πολλὰς, καὶ κεφαλὴν ἔχει ἰσχυράν. ὅσα δ' ἂν δάκῃ, ἢ τοῖς ὄνυξιν ἑλκώσῃ, ἐκ τῶν ἑλκῶν ἰχῶρες ῥέουσιν ὠχροὶ σφόδρα, καὶ ἐκ τῶν ἐπιδέσμων καὶ σπόγγων ὑπ' οὐδενὸς δυνάμενοι ἐκκλύζεσθαι. ἡ δὲ θεραπεία ἡ αὐτὴ καὶ τῶν κυνοδήκτων ἑλκῶν. φιλάνθρωποι δ' εἰσὶ καὶ οἱ θῶες, καὶ οὔτ' ἀδικοῦσι τοὺς ἀνθρώπους, οὔτε φοβοῦνται σφόδρα· πολεμοῦσι δὲ τοῖς κυσὶ καὶ τοῖς λέουσι. διὸ ἐν τῷ αὐτῷ τόπῳ οὐ γίνονται. ἄριστοι δ' οἱ μικροὶ τῶν θώων. γένη δ' αὐτῶν οἱ μέν φασιν εἶναι δύο, οἱ δὲ τρία· οὐ δοκεῖ δὲ πλείω εἶναι, ἀλλ' ὥσπερ τῶν ἰχθύων καὶ τῶν ὀρνέων καὶ τῶν τετραπόδων ἔνια, καὶ οἱ θῶες μεταβάλλουσι κατὰ τὰς ὥρας, καὶ τὸ, τε χρῶμα ἕτερον τοῦ χειμῶνος καὶ τοῦ θέρους ἴσχουσι. καὶ τοῦ μὲν θέρους λεῖοι γίνονται, τοῦ δὲ χειμῶνος δασεῖς.

A quidem ad fortitudinem, & timiditatem: ſed ad manſuetudinem quoque & feritatem etiã in ipſo ſylueſtrium genere. Leo enim quamuis in edendo ferociſſimus ſit, tamen paſtus, & fame iam vacans, facilis mitiſque maiorem in modum eſt. Nihil ſuſpicatur, nullius ſuſpicioſus eſt, feſtiuus, ludibundus, beneuolus admodum ſuis cum ſociis & familiaribus eſt. In venatu, dum cernitur, nunquam fugit, aut metuit, ſed etiam ſi venantium multitudine cedere cogitur, ſenſim pedatimque diſcedit, crebrò ſubſiſtens, atque reſpectans. Nactus verò opaca, fuga, qua maximè poteſt, veloci ſe ſubtrahit, donec in aperta deueniat, tum rurſus, B lentè incedit. Sed ſi quando locis nudis atque patentibus cogitur fugam apertè arripere, currit cõtentus, nec ſalit, curſuſque eius continens, vt canum, intenditur: cùm tamen ipſe inſectatur, vbi iam propinquarit, inſilit. Vera etiam illa de eo narrantur, ignem præcipuè formidare, vt Homerus quoque teſtatur, cùm dicat:

Ardentéſque faces, quas, quamuis ſæuiat, horret:

& percuſſorem agnoſcere, atque ex obſeruato inuadere. Si quis etiam non percuſſerit, ſed infeſter, hunc ſi ceperit, non vnguibus lacerat, nec vlla iniuria afficit, ſed quatit ſolùm: atque vbi ita perterruit, dimittit. adeunt vrbes, & iniuriam hominibus inferunt, potiſſimùm tempore ſuæ ſenectu- C tis: tunc enim per corporis imbecillitatem, & dẽtium defectionem, venari nequeunt. Viuere annos multos putantur. Et quidem qui captus eſt claudus, dentes complures fractos habebat. Quo argumento quidam longam eſſe leonum ætatem exiſtimarunt: haud enim hoc accidere niſi longo tempore potuiſſe. Leonum ſunt duo genera, quorum alterũ breuius, criſpioréque pilo, quod ignauius eſt: alterum longius, pilóque probiore, quod generoſius eſt. Fugiunt interdum leones demiſſa inter crura cauda, vt canes. Iam viſus eſt leo, qui, cùm ſuem aggrederetur, vt ſetis horrentem aſpexit, fugeret. Infirmus parte ilium eſt contra ictus, D ſed reliquo corpore multas patitur plagas, & capite validiſſimo eſt. Quæcumque vel momorderit, vel vnguibus lacerarit, ſanies pallẽs admodum de his vlceribus effluit, etiã per faſcias, atque ſpõgias, nec reprimi vllo pacto poteſt. Curantur eodem modo, quo morſus canini, vlcera. Thoes etiam quos lupos ceruarios diximus, hominem diligunt, & neque offendunt, neque metuunt valde. Pugnant cum canibus, & leonibus: quo fit ne eodem in loco ſint ceruarij, & leones. Optimi ceruarij, qui minores ſunt. Genera huius alij duo, alij tria ſtatuunt. Plura iis eſſe non videntur. Sed vt piſcium, auium, quadrupedum genera aliqua, ita ceruarij quoque per tempora immutantur: & co- E lorem diuerſum hyeme æſtatéve trahunt: atque æſtate nudi, hyeme hirti redduntur.

ΚΕΦΑΛ. με'.

Περὶ βονάσου.

Ὁ δὲ βόνασος, γίνεται μὲν ἐν τῇ Παιονίᾳ ἐν τῷ ὄρει τῷ Μεσσαπίῳ, ὃ ὁρίζει τὴν Παιονικὴν καὶ τὴν * Μαιδικὴν χώραν. καλοῦσι δὲ αὐτὸν οἱ Παίονες μόναπον. τὸ δὲ μέγεθός ἐστιν ἡλίκον ταῦρος, καὶ ἔστιν εὐσωματώτερος ἢ βοῦς. οὐ γὰρ προμήκης ἐστί. τὸ δὲ δέρμα αὐτοῦ κατέχει εἰς * ἑπτάκλινον

* χ. Μαιδικὴν

* Alibi ἑπτακλι- νον. Mirabilium narrat. initio.

CAPVT XLV.

De natura, ſpecie, & partu Bonaſi.

BOnaſus gignitur in terra Pæonia, monte Meſſapo, qui Pæoniæ & Mediæ terræ collimitium eſt, & monapios à Pæonibus appellatur, magnitudine tauri, ſed corpore, quàm bos, latiore: breuior enim, & in latera auctior eſt. Tergus diſtentum eius locum ſeptem accubantium

occupat. Cætera, forma bouis ſimilis eſt, niſi quod ceruix iubata armorum tenus, vt equi, eſt, ſed villo molliore quàm iuba equina, & compoſitiore. Color pili totius corporis flauus, iuba prolixa, & ad oculos vſque demiſſa, & frequens colore inter cinereum & rufum, non qualis equorum, quos paroos vocant, eſt, ſed villo ſupra ſquallidiore, ſubter lanario. Nigri, aut admodum rufi, nulli ſunt. Vocem ſimilem boui emittunt. Cornua adunca in ſe flexa, & pugnæ inutilia gerunt, magnitudine palmari, aut paulò maiora, amplitudine non multò arctiore, quàm vt ſingula ſemiſextarium capiant, nigritie proba. Antiæ ad oculos vſque demiſſæ, ita vt in latus potiùs quàm antè pendeant. Caret ſuperiore dentium ordine, vt bos, & reliqua cornigera omnia. Crura hirſuta atque biſulca habet, caudam minorem quàm pro ſui corporis magnitudine, ſimilem bubulæ. Excitat puluerem, & fodit vt taurus. Tergore contra ictus prævalido eſt. Carnem habet guſtu ſuauem: quamobrem in vſu venandi eſt. Cùm percuſſus eſt, fugit: niſi defatigatus, nuſquam conſiſtit. Repugnat calcitrans, & proluuiem alui vel ad quatuor paſſus projiciens: quo præſidio facilè vtitur, & plerumque ita adurit, vt pili inſectantium canum abſumantur. Sed tunc ea vis eſt in fimo, cùm bellua excitatur, & metuit: nam ſi quieſcit, nihil vrere poteſt. Talis natura, & ſpecies huius animalis eſt. Tempore pariendi, vniuerſi in mõtibus enituntur. Sed priùs quàm fœtum edant, excremento alui circiter eum locũ in quo pariunt, ſe, quaſi vallo, circundant, & muniunt. Largam enim quandam eius excrementi copiam hæc bellua egerit.

CAPVT XLVI.

De ingenio & ſagacitate elephanti.

ELephantus, omnium ferarum mitiſſimus & placidiſſimus eſt: quippe qui permulta officia & erudiatur, & intelligat: quando etiam regem adorare condiſcit. Valet ſenſu, & reliqua ſagacitate ingenij excellit. Quam impleuerit coitu, eam rurſus non tangit. Viuere elephantos mares alij annos ducentos, alij centum & viginti aiunt: fœminas etiam ferè totidem: ſed florere ætate circa ſexageſimum narrant. Hyemis ac frigoris impatiẽs hoc animal eſſe dicitur. amat amnes, & quanquam non fluuiatile ſit, tamen riparium dici poteſt. Incedit etiam per aquam: & eatenus mergitur, quatenus eius promuſcis ſuperat. Reflat enim per eam & ſpiritum accipit, & reddit: ſed natare ſatis pondere ſui corporis non poteſt.

CAPVT XLVII.

Camelum, matrem nunquam ſuperuenire, déque prudentia equi regis Scytharum.

CAmeli, matres nunquam ſuperueniunt ſuas: ſed etiamſi quis cogat, ipſi non patiuntur. Iam cùm aliquando admiſſarius non haberetur, curator pullum matri opertæ admiſit. Qui dũ coiret, delapſo operimento agnouit matrem, & quãuis coitum abſoluerit, memor tamen commiſſi ſceleris, paulò poſt camelarium illum morſu defixo interemit. Ferunt etiam, regi Scytharum

ἀποπατεῖ. τὸ δὲ ἄλλο εἶδος ὅμοιον βοΐ· πλὴν χαίτην ἔχει μέχρι τῆς ἀκρωμίας, ὥσπερ ἵππος. μαλακωτέρα δ' ἡ θρὶξ ἢ τῆς ἱππείας, καὶ προσεσταλμένη μᾶλλον. χρῶμα δ' ἔχει τοῦ τριχώματος ξανθόν· βαθεῖα δὲ καὶ μέχρι τῶν ὀφθαλμῶν καθήκουσα ἡ χαίτη ἐστὶ καὶ πυκνή. τὸ δὲ χρῶμα ἔχει μέσον τοῦ τεφροῦ καὶ πυρροῦ, οὐχ οἷον αἱ πάρωαι ἵπποι καλούμεναι, ἀλλ' αὐχμηροτέραν τὴν τρίχα, κάτωθεν ἐριώδη. μέλανες δ' ἢ πυρροὶ σφόδρα οὐ γίνονται. φωνὴν δ' ὁμοίαν ἔχουσι βοΐ. κέρατα δὲ γαμψά, κεκαμμένα πρὸς ἄλληλα, καὶ ἄχρηστα πρὸς τὸ* ἀμύνεσθαι, τὸ μέγεθος σπιθαμιαῖα, ἢ μικρῷ μείζω· πάχος δ' ὥστε χωρεῖν μὴ πολλῷ ἔλαττον *ἡμίχουν ἑκάτερον. ἡ δὲ μελανία καλὴ καὶ λιπαρὰ τοῦ κέρατος. τὸ δὲ προκόμιον καθήκει ἐπὶ τοὺς ὀφθαλμούς, ὥστ' εἰς τὸ πλάγιον παρορᾶν μᾶλλον, ἢ εἰς τὸ πρόσθεν. ὀδόντας δὲ τοὺς ἄνωθεν οὐκ ἔχει, ὥσπερ οὐδὲ βοῦς, οὐδ' ἄλλο τῶν κερατοφόρων οὐδέν. σκέλη δὲ δασέα· καὶ ἐστὶ διχηλόν. κέρκον δ' ἐλάττω ἢ κατὰ τὸ μέγεθος, ὁμοίαν τῇ τοῦ βοός. καὶ ἀναρριπτεῖ τὴν κόνιν καὶ ὀρύττει ὥσπερ ταῦρος. δέρμα δ' ἔχει πρὸς τὰς πληγὰς ἰσχυρόν. ἐστι δὲ ἡδύκρεων· διὸ καὶ θηρεύουσιν αὐτό. ὅταν δὲ πληγῇ, φεύγει, καὶ ὑφίσταται ὅταν ἐξαδυνατῇ. ἀμύνεται δὲ λακτίζον, καὶ προσαφοδεῦον, καὶ εἰς τέτταρας ὀργυιὰς ἀφ' ἑαυτοῦ ῥίπτον· ῥᾳδίως δὲ χρῆται τούτῳ, καὶ πολλάκις, καὶ ἐπικάει, ὥστ' ἀποψήχεσθαι τὰς τρίχας τῶν κυνῶν. ταραττομένου μὲν οὖν καὶ φοβουμένου, τοῦτο ποιεῖ ἡ κόπρος· ἀταράκτου δ' ὄντος, οὐκ ἐπικάει. ἡ μὲν οὖν ἰδέα τοῦ θηρίου καὶ ἡ φύσις, τοιαύτη τίς ἐστιν. ὅταν δ' ὥρα ᾖ τοῦ τίκτειν, ἀθρόοι τίκτουσιν ἐν τοῖς ὄρεσι. περὶ δὲ τὸν τόπον ἀφοδεύουσι πρότερον πρὶν τίκτειν, καὶ ποιοῦσιν οἷον περίβολον· προΐεται γὰρ τὸ θηρίον πολύ τι πλῆθος τούτου τοῦ περιττώματος.

* κ. [illegible]

* χ. [illegible]

ΚΕΦΑΛ. μϛ'.

Περὶ ἐλέφαντος.

ΠΑντων δὲ τιθασσότατον καὶ ἡμερώτατον τῶν ἀγρίων ἐστὶν ὁ ἐλέφας. πολλὰ γὰρ καὶ παιδεύεται καὶ ξυνίησιν· ἐπεὶ καὶ προσκυνεῖν διδάσκονται τὸν βασιλέα. ἐστι δὲ καὶ εὐαίσθητον, καὶ συνέσει τῇ ἄλλῃ ὑπερβάλλον. ὃ δ' ἂν ὀχεύσῃ καὶ ἔγκυον ποιήσῃ, τούτου πάλιν οὐχ ἅπτεται. ζῆν δέ φασι τὸν ἐλέφαντα, οἱ μὲν, ἔτη διακόσια, οἱ δὲ, ἑκατὸν εἴκοσι· καὶ τὴν θήλειαν ἴσα σχεδὸν τῷ ἄρρενι· ἀκμάζειν δὲ περὶ ἔτη ἑξήκοντα. πρὸς δὲ τοὺς χειμῶνας καὶ τὰ ψύχη δυσχερῶς ἔχει. ἐστι δὲ τὸ ζῷον παραποτάμιον, οὐ ποτάμιον. ποιεῖται δὲ καὶ διὰ τοῦ ὕδατος τὴν πορείαν· ἕως τούτου δὲ προέρχεται, ἕως ἂν ὁ μυκτὴρ ὑπερέχῃ αὐτοῦ. ἀναφυσᾷ γὰρ διὰ τούτου, καὶ τὴν ἀναπνοὴν ποιεῖται. νεῖν δὲ οὐ πάνυ δύναται, διὰ τὸ τοῦ σώματος βάρος.

ΚΕΦΑΛ. μζ'.

Περὶ καμήλων ἀγνοίας, καὶ περὶ ἵππου τοῦ τῶν Σκυθῶν βασιλέως.

ΟΙ δὲ κάμηλοι οὐκ ἀναβαίνουσιν ἐπὶ τὰς μητέρας, ἀλλὰ κἂν βιάζηταί τις, οὐ θέλουσιν. ἤδη γάρ ποτε, ἐπεὶ οὐκ ἦν ὀχεῖον, ὁ ἐπιμελητὴς περικαλύψας τὴν μητέρα, ἐφῆκε τὸν πῶλον. ὡς δ' ἐν τῇ ὀχείᾳ περιέπεσε, τότε μὲν ἀπετέλεσε τὴν συνουσίαν, μικρὸν δ' ὕστερον δακὼν τὸν καμηλίτην ἀπέκτεινε. λέγεται δὲ καὶ τοῦ Σκυθῶν βασιλέως

γενέσθαι ἵππον γενναίαν, ἐξ ἧς ἀπέβαινον ἀγαθοὺς γίνεσθαι τοὺς ἵππους. * τούτων ἐκ τοῦ ἀρίστου βουλόμενοι γεννῆσαι ἐκ τῆς μητρὸς, προσαγαγεῖν ἐγκαλύψαντες· τὸν δὲ οὐκ ἐθέλειν. περικαλυφθείσης δὲ, λαθόντα ἀναβῆναι· ὡς δ᾽ ὀχεύσαντος, ἀπεκαλύφθη τὸ πρόσωπον τῆς ἵππου, ἰδόντα τὸν ἵππον φυγεῖν, καὶ ῥῖψαι ἑαυτὸν κατὰ τῶν κρημνῶν.

* Fort. τ. ἑαυτῆς ἄριστον

ΚΕΦΑΛ. μη'.

Περὶ δελφίνων.

ΤΩν δὲ θαλαττίων πλεῖστα λέγεται σημεῖα περὶ τοὺς δελφῖνας πραότητος καὶ ἡμερότητος, καὶ δὴ καὶ πρὸς παῖδας ἔρωτες καὶ ἐπιθυμίαι, καὶ περὶ Τάραντα καὶ Καρίαν, καὶ ἄλλους τόπους. περὶ Καρίαν γὰρ ληφθέντος δελφῖνος, καὶ τραύματα λαβόντος, ἀθρόον ἐλθεῖν λέγεται πλῆθος δελφίνων εἰς τὸν λιμένα, μέχρις οὗ ὁ ἁλιεὺς ἀφῆκε· τότε δὲ πάλιν ἅμα πάντες ἀπῆλθον. καὶ τοῖς μικροῖς δελφῖσιν ἀκολουθεῖ τις ἀεὶ τῶν μεγάλων, φυλακῆς χάριν. ἤδη δ᾽ ὤφθη δελφίνων μεγάλων ἀγέλη ἅμα καὶ μικρῶν. τούτων δ᾽ ἀπολειπόμενοί τινες δύο, μετ᾽ οὐ πολὺ ἐφαίνοντο, δελφινίσκον μικρὸν τεθνηκότα, ὅτ᾽ εἰς βυθὸν φέροιτο, ὑπονέοντες καὶ μετεωρίζοντες τῷ νώτῳ, οἷον κατελεοῦντες, ὥστε μὴ καταβρωθῆναι ὑπό τινος τῶν ἄλλων θηρίων. λέγεται δὲ καὶ περὶ ταχυτῆτος ἄπιστα τοῦ ζῴου. ἁπάντων γὰρ δοκεῖ εἶναι ζῴων τάχιστον, καὶ τῶν ἐνύδρων καὶ τῶν χερσαίων· καὶ ὑπεράλλονται δὲ πλοίων μεγάλων ἱστούς. μάλιστα δὲ τοῦτ᾽ αὐτοῖς συμβαίνει, ὅταν διώκωσί τινα ἰχθὺν τροφῆς χάριν. τότε γὰρ, ἐὰν ἀποφεύγῃ, συνακολουθοῦσιν εἰς βυθὸν, διὰ τὸ πεινῆν. ὅταν δ᾽ αὐτοῖς μακρὰ γίνηται ἡ ἀναστροφὴ, κατέχουσι τὸ πνεῦμα, ὥσπερ ἀναλογισάμενοι· καὶ συστρέψαντες ἑαυτοὺς, φέρονται ὥσπερ τόξευμα, τῇ ταχυτῆτι τὸ μῆκος διελθεῖν βουλόμενοι πρὸς τὴν ἀναπνοήν· καὶ * ὑπεράλλονται τοὺς ἱστοὺς, ἐὰν παρατύχωσι τῶν πλοίων. ταὐτὸ δὲ ποιοῦσι καὶ οἱ κατακολυμβηταὶ, ὅταν εἰς βυθὸν ἑαυτοὺς ἀφῶσι. κατὰ γὰρ τὴν ἑαυτῶν δύναμιν καὶ οὗτοι ἀναφέρονται συστρέψαντες. διατελοῦσι δὲ μετ᾽ ἀλλήλων κατὰ συζυγίας οἱ ἄῤῥενες ταῖς θηλείαις. διαπορεῖται δὲ περὶ αὐτῶν, διὰ τί ἐξοκέλλουσιν εἰς τὴν γῆν. ποιεῖν γάρ φασι τοῦτ᾽ αὐτοὺς ἐνίοτε, ὅταν τύχωσι, δι᾽ οὐδεμίαν αἰτίαν.

* γρ. ὑπερβάλλονται

ΚΕΦΑΛ. μθ'.

Περὶ τῶν ὀρνίθων τῶν τὰ ἤθη μεταβαλλόντων κατὰ τὰς πράξεις.

ΩΣπερ * γὰρ καὶ [τὰ] πάθη κατὰ τὰς πράξεις συμβαίνει ποιεῖσθαι πᾶσι τοῖς ζῴοις, οὕτω πάλιν καὶ τὰ ἤθη μεταβάλλουσι κατὰ τὰς πράξεις. πολλάκις δὲ καὶ τῶν μορίων ἔνια· οἷον ἐπὶ ὀρνίθων συμβαίνει. αἵ τε γὰρ ἀλεκτορίδες, ὅταν νικήσωσι τοὺς ἄρρενας, κοκκύζουσί τε, καὶ μιμοῦνται τοὺς ἄρρενας, ὀχεύειν ἐπιχειροῦσι· καὶ τό τε κάλλαιον ἐξαίρεται αὐταῖς καὶ τὸ ὀρροπύγιον, ὥστε μὴ ῥᾳδίως ἂν ἐπιγνῶναι ὅτι θήλειαί εἰσιν· ἐνίαις δὲ καὶ πλῆκτρα μικρά τινα ἐπιφύεται. ἤδη (δὲ) καὶ τῶν ἀρρένων τινὲς ὤφθησαν, ἀπολομένης τῆς θηλείας,

* Scribe, ὥσπερ δὲ κατὰ τὰ πάθη καὶ τὰς πράξ. ita poſtulante ratione omnino.

A fuiſſe equam egregiam, ex qua mares generoſi omnes gignerentur, quorum vnum, qui præſtantiſſimus haberetur, cùm, vt ex matre procrearet, placeret, admiſſum omnino recuſaſſe. Opertam deinde tuiſſe matrem, vt imprudens ſuperueniret. Verùm vbi à concubitu faciem matris detectam agnouerat, fugam properaſſe, atque ſeipſum actum præcipitem interemiſſe.

CAPVT XLVIII.

De manſuetudine, amore, & celeritate delphinorum.

IN marino etiam genere plurima de delphinis narrantur indicia morum placidorum, ac mi- B tium: amores quoque in pueros, & affectus libidinis, cùm circa Tarentum & Cariam, tum etiam locis aliis referunt. Fertur etiam delphino apud Cariam capto, atque ſaucio, ingẽtem reliquorum multitudinem cõueniſſe ad portum, immoratámque donec piſcator dimiſerit eum, quem ceperat, tum omnes ſimul recepto captiuo rediiſſe. Paruos item delphinos magnus aliquis ſemper comitatur cuſtodiæ cauſa. Iam conſpectus eſt delphinorum grex, maiorum & minorũ promiſcuus, poſt quem duo quidam paulò pòſt viderentur delphinulum defunctum labentem in imum, ſubire, & in ſumma pelagi dorſo euehere, quaſi miſeran- C tes, ne ab aliqua bellua deuoraretur. Quinetiam de velocitate huius animalis mira & incredibilia quædam accepimus. Omniũ enim velociſſimum eſſe creditur animalium tum aquatilium, tum terreſtrium. Superſiliunt etiam malos nauigiorũ maiorum: quod tunc potiſſimùm euenit, cùm aliquẽ inſectantur piſcem, quem deuorent: tunc enim, ſi, quem impetunt, longiùs fugit, ad ima gurgitum perſequuntur, propter famis neceſſitatem. Quòd reditus longior ſit, retinent ſeſe, quaſi ſpatium cogitantes, conuerſique feruntur perinde, ac ſagitta, pernices, vt celeritate opportuna longo tranſmiſſo itinere ad locum ſpirandi deueniant. Quo impetu fit vt ſe eiaculentur in aërem, & ſuperſiliant malos nauigiorum, quæ fortè affuerint. Hoc idem D vrinatores faciunt, cùm ſe in profundum dimiſerunt: pro viribus enim conuerſi enixiùs efferũtur, vt ſpirent. Degunt coniugatim mares cum fœminis. Quæritur quamobrem in terram erumpant, hoc enim interdum eos facere incerta de cauſa dicitur.

CAPVT XLIX.

De his animalibus, quæ pro actionibus aſſiciuntur, moribúſque immutantur.

E SEd vt quæque animalia pro ſuis affectibus agere, ſic pro ſuis quoque actionibus affici, immutarique moribus ſolent. Partes etiam corporis nonnullæ ſæpenumero ratione agendi immutantur, vt in auium genere euenit. Gallinæ enim, cùm mares vicerint, cucuriunt, & exemplo marium, tentant ſuperuentu coire. Criſta etiam caudáque erigitur, ita, ne facile prætereà ſit, an fœminæ ſint, cognoſcere. Nonnunquam etiã calcaria parua iis enaſcuntur. Iam verò & mares viſi nonnulli ſunt, qui, cùm fortè fœmina interiiſſet,

ipſi officio matris fungerentur in pullos, ductando, fouendo, educando, ita nè de cætero vel cucurire vel coire appeterent. Quinetiam inde à primo ortu Naturæ, ita nonnulli mares effœminati proueniunt, vt neque cucuriant neque per coitum agere velint, & Venerem eorum qui tentent ſuperuenire, patiantur. Cuculus etiam immutatur colore, & vocem minùs explanat, cùm ſe abditurus eſt, quod facere exortu caniculæ ſolet: apparere autem incipit ab ineunte vêre ad eius ſyderis ortum. Abditur & ea, quam œnanthem quidam appellant, ac ſi vitiſſoram dixeris, exortu eiuſdem ſyderis, occaſu verò apparet: vitat enim interdum frigora, aliâs æſtum. Necnon vpupa cùm colore tum verò ſpecie immutatur, vt Æſchylus poeta ſatis carmine ſuo expoſuit:

Quin fert ſui ſpectantem & epopem mali,
Colore ſpeciem multimodo pingens ſuam,
Saxicolam & improbum arma geſtantem alitem.
Adulti infantis forma hic ſeſe refert.
Nam vêre candicans vbi extitit nouo,
Aeſtate tum deinde, vt recanduit ſeges,
Alas repentè varius maculatas quatit.
Vagatur hic ſemper faſtidiens locos,
Deſerta quærit nemorum, & inuias plagas.

Complures etiam aliæ aues immutantur per tempora, & colore, & voce: vt merula, quæ ex nigra redditur rufa, & vocem mittit diuerſam. Strepitat enim per hyemem, cùm per æſtatem tumultuans cantet. Mutat & turdus colorem, quippe qui collo æſtate varius, hyeme murino diſtinctus ſpectetur: voce tamen eadem eſt. Luſcinia canere ſolet aſſiduè diebus ac noctibus quindecim, cùm ſylua fronde incipit opacare: dein canit quidem, ſed non aſſiduò: mox adulta æſtate, vocem mittit diuerſam, non inſuper variam, aut celerem, modulatámque, ſed ſimplicem: colore etiam immutatur. Et quidem in terra Itala per id tempus alio nomine appellatur. Apparet non diu: abdit enim ſeſe, & latet. Rubeculæ, & quæ ruticillæ appellantur, inuicem tranſeunt. Eſtque rubecula hyberni temporis, ruticilla æſtiui. Nec alio ferè inter ſe differunt, niſi pectoris colore, & caudæ. Sic & ficedulæ & atricapillæ vicibus commutantur: fit enim ineunte autumno ficedula, ab autumno protinus atricapilla: nec inter eas diſcrimen aliquod, niſi coloris, & vocis eſt. Auem autem eſſe eandem conſtat: quia dum immutaretur, hoc genus vtrumque conſpectum eſt, nondum abſolutè mutatum: nec alterutrum adhuc proprium vllum habens appellationis. Nec mirum, ſi hæc ita voce, aut colore mutantur, quando & palumbes hyeme non gemit, niſi quòd aliquando ex aſperrima hyeme placidum tempus ſucceſſiſſet, gemuerit: quod apud peritos in admiratione habitum eſt: cæterùm ineunte vêre gemere incipit. Denique aues tunc maximè, plurimáſque emittunt voces, cùm coeunt. Mos auium eſt vt aliæ ſeſe in puluere volutent: aliæ ſeſe lauent, aliæ nec puluere neque balneo vtantur. Sunt puluerantrices, quæ non altiuolæ, ſed terræ propinquæ: vt gallina, perdix, attagena, alauda, faſiana:

A αὐτοὶ περὶ τοὺς νεοττοὺς (τὴν τῆς θηλείας) ποιούμενοι ἐπιμέλειαν, περιάγοντές τε καὶ ἐκτρέφοντες οὕτως, ὥστε μήτε κοκκύζειν ἔτι, μήτ᾽ ὀχεύειν ἐπιχειρεῖν. γίνονται δὲ καὶ θηλυδρίαι ἐκ γενετῆς τῶν ὀρνίθων τινὲς οὕτως, ὥστε μήτε κοκκύζειν ἔτι, μήτ᾽ ὀχεύειν ἐπιχειρεῖν· καὶ ὑπομένειν τοὺς ἐπιχειροῦντας ὀχεύειν. μεταβάλλει δὲ καὶ ὁ κόκκυξ τὸ χρῶμα, καὶ τὴν φωνὴν οὐ σαφηνίζει, ὅταν μέλλῃ ἀφανίζεσθαι. ἀφανίζεται δὲ ὑπὸ κύνα. φανερὸς δὲ γίνεται ἀπὸ τοῦ ἔαρος ἀρξάμενος, μέχρι κυνὸς ἐπιτολῆς. ἀφανίζεται δὲ καὶ ἣν καλοῦσί τινες οἰνάνθην, ἀνίσχοντος τοῦ σειρίου· δυομένου δὲ φαίνεται. φεύγει δὲ ὁτὲ μὲν τὰ ψύχη, ὁτὲ δὲ τὴν
B ἀλέαν. μεταβάλλει δὲ καὶ ὁ ἔποψ τὸ χρῶμα καὶ τὴν ἰδέαν ὥσπερ πεποίηκεν Αἰσχύλος ἐν τοῖσδε·

Τοῦτον δ᾽ ἐπόπτην ἔποπα τῶν αὐτοῦ κακῶν
Πεποίκιλωκε, κἀποδηλώσας ἔχει
Θρασὺν πετραῖον ὄρνιν ἐν παντευχίᾳ.
Ὃς ἦρι μὲν* φαίνοντι διαπάλλει πτερὸν
Κίρκου λευκοπτέρου. δύο γὰρ οὖν μορφὰς* φανεῖ
Παιδός τε χ᾽ αὑτοῦ νηδύος μιᾶς ἄπο.
Νέας δ᾽ ὀπώρας* ἡνίκ᾽ ἂν ξανθῇ στάχυς,
Τίκτει νιν αὖθις* χερεφινομένη πτέρυξ.
Ἀεὶ δὲ μισεῖ* τῶνδ᾽ ἐπ᾽ ἄλλον εἰς τόπον
C Δρυμοὺς ἐρήμους ὑπάγουσ᾽ ἀποικιεῖ.

καὶ ἄλλα δὲ πολλὰ τῶν ὀρνίθων μεταβάλλουσι κατὰ τὰς ὥρας, καὶ τὸ χρῶμα καὶ τὴν φωνήν· οἷον ὁ κόσσυφος ἀντὶ μέλανος ξανθὸς, καὶ τὴν φωνὴν ἴσχει. ἐν μὲν γὰρ τῷ θέρει ᾄδει, τοῦ δὲ χειμῶνος παταγεῖ, καὶ φθέγγεται θορυβῶδες. μεταβάλλει δὲ καὶ ἡ κίχλη τὸ χρῶμα. τοῦ μὲν γὰρ χειμῶνος ψαρά, τοῦ δὲ θέρους ποικίλα τὰ περὶ τὸν αὐχένα ἴσχει· τὴν μέντοι φωνὴν οὐδὲν μεταβάλλει. ἡ δ᾽ ἀηδὼν ᾄδει μὲν συνεχῶς ἡμέρας καὶ νύκτας δεκαπέντε, ὅταν τὸ ὄρος ἤδη δασύνηται. μετὰ δὲ ταῦτα, ᾄδει
D μὲν, συνεχῶς δ᾽ οὐκέτι. τοῦ δὲ θέρους προϊόντος, ἄλλην ἀφίησι φωνὴν, καὶ οὐκέτι παμποίκιλον, οὐδὲ ταχεῖαν καὶ ἐπιστρεφῆ, ἀλλ᾽ ἁπλῆν· καὶ τὸ χρῶμα μεταβάλλει· καὶ ἔν γε Ἰταλίᾳ τὸ ὄνομα ἕτερον καλεῖται περὶ τὴν ὥραν ταύτην. φαίνεται δ᾽ οὐ πολὺν χρόνον· φωλεῖ γάρ. μεταβάλλουσι δὲ οἱ ἐρίθακοι καὶ οἱ καλούμενοι* φοινίκουροι ἐξ ἀλλήλων. ἔστι δ᾽ ὁ μὲν ἐρίθακος, χειμερινός· οἱ δὲ φοινίκουροι, θερινοί. διαφέρουσι δ᾽ ἀλλήλων οὐθὲν, ὡς εἰπεῖν, ἀλλ᾽ ἢ τῇ χρόᾳ μόνον. ὡσαύτως δὲ καὶ αἱ συκαλίδες καὶ οἱ μελαγκόρυφοι. καὶ γὰρ οὗτοι μεταβάλλουσιν εἰς ἀλλήλους. γίνεται δ᾽ ἡ συ-
E καλὶς περὶ τὴν ὀπώραν· ὁ δὲ μελαγκόρυφος, εὐθέως μετὰ τὸ φθινόπωρον. διαφέρουσι δὲ καὶ οὗτοι ἀλλήλων οὐδὲν, πλὴν τῇ χρόᾳ καὶ τῇ φωνῇ. ὅτι δ᾽ ὁ αὐτός ἐστιν ὄρνις, ἤδη ὦπται περὶ τὴν μεταβολὴν ἑκάτερος τὸ γένος τοῦτο οὔπω δὲ τελέως* μεταβεβληκότος οὐδὲν, ἑκατέρου ἴδιόν τι ὑπῆρχεν. οὐδὲν δ᾽ ἄτοπον, εἰ ἐπὶ τούτων αἱ φωναὶ μεταβάλλουσιν, ἢ τὰ χρώματα· ἐπεὶ καὶ ἡ φάττα τοῦ μὲν χειμῶνος οὐ φθέγγεται. πλὴν ἤδη ποτὲ εὐδίας ἐκ χειμῶνος σφοδροῦ γενομένης, ἐφθέγξατο, καὶ ἐθαυμάσθη ὑπὸ τῶν ἐμπείρων· ἀλλ᾽ ὅταν ἔαρ γένηται, τότε ἄρχεται φωνεῖν. τὸ δ᾽ ὅλον, τὰ ὄρνεα καὶ μάλιστα καὶ πλείστας ἀφίησι φωνάς, ὅταν ὦσι περὶ τὴν ὀχείαν. εἰσὶ δὲ τῶν ὀρνίθων οἱ μὲν, κονιστικοί· οἱ δὲ, λουστικοί· οἱ δὲ, οὔτε κονιστικοὶ, οὔτε λουστικοί. ὅσοι μὲν μὴ πτητικοὶ, ἀλλ᾽ ἐπίγειοι, κονιστικοί· οἷον ἀλεκτρυὼν, πέρδιξ, ἀτταγὴν, κορυδαλὸς, φασιανός·

*Iosephus Scaliger emendat φαίνει.
* Scal. [illegible] qui φαίνει vel φαν.
* Scal. ἡνίκ᾽ αὐξανθῇ [illegible].
* Scal. [illegible] Geſnerus, [illegible].
* Scal. [illegible] Παιδὸς [illegible].

* Melius [illegible], vt apud alios ſcriptores: ſic & mox ſcribendum.

* γρ. μεταβεβλ[illegible] quæ corrupta lectio, fallor, aut veræ veſtigia retinet.

τῶν δ' εὐθυωνύχων ἔνιοι, καὶ ὅσοι περὶ ποταμοὺς ἢ ἕλη ἢ θάλατταν διατρίβουσι, λούονται. οἱ δὲ, ἀμφω, καὶ κονίονται καὶ λούονται, οἷον περιστερὰ καὶ στρουθός. τῶν δὲ γαμψωνύχων οἱ πολλοί, οὐδέτερον. ταῦτα μὲν οὖν τοῦτον ἔχει τὸν τρόπον. ἴδιον δ' ἐνίοις συμβαίνει τῶν ὀρνίθων τὸ ἀποψοφεῖν, οἷον καὶ ταῖς τρυγόσι· ποιοῦνται δὲ καὶ περὶ τὴν ἕδραν κίνησιν οἱ σείουσι ἰσχυρὰν ἅμα τῇ φωνῇ.

ΚΕΦΑΛ. ν.

Περὶ τῶν ἐκτεμνομένων ζῴων, καὶ τῶν μηρυκαζόντων.

Μεταβάλλει δὲ τὰ ζῷα οὐ μόνον τὰς μορφὰς ἔνια καὶ τὸ ἦθος κατὰ τὰς ἡλικίας καὶ τὰς ὥρας, ἀλλὰ καὶ ἐκτεμνόμενα. ἐκτέμνεται δὲ τῶν ζῴων ὅσα ἔχει ὄρχεις. ἔχουσι δ' οἱ μὲν ὄρνιθες ἐντὸς ὄρχεις, καὶ τὰ ᾠοτόκα τῶν τετραπόδων, πρὸς τῇ ὀσφύϊ· τὰ δὲ ζῳοτόκα, καὶ πεζά, τὰ μὲν πλεῖστα, ἐκτός, τὰ δ', ἐντός· πάντα δὲ πρὸς τῷ τέλει τῆς γαστρός. ἐκτέμνονται δ' οἱ μὲν ὄρνιθες, κατὰ τὸ ὀρροπύγιον, καθ' ὃ συμπίπτουσιν ὀχεύοντες. ἐν τούτῳ γὰρ, ἐὰν ἐπικαύσῃ τις δυσὶν ἢ τρισὶ σιδηρίοις, ἐὰν μὲν ἤδη τελειοῦντα, τότε καλλαιόν τε ἔξωχρον γίνεται, καὶ οὐκέτι κοκκύζει, οὐδ' ἐπιχειρεῖ ὀχεύειν· ἐὰν δ' ἔτι νεοττὸς ὤν, οὐδὲ γίνεται τούτων οὐδὲν αὐξανομένου. τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἀνθρώπων. ἐὰν μὲν γὰρ παῖδας ὄντας πηρώσῃ τις, οὔτε αἱ ὑστερογενεῖς ἐπιγίνονται τρίχες, οὔτε ἡ φωνὴ μεταβάλλει, ἀλλ' ὀξεῖα διατελεῖ· ἂν δ' ἤδη ἡβῶντας, αἱ μὲν ὑστερογενεῖς τρίχες ἀπολείπουσι, πλὴν τῶν ἐπὶ τῆς ἥβης· αὗται δ' ἐλάττους μὲν, μένουσι δέ· αἱ δ' ἐκ γενετῆς τρίχες, οὐκ ἀπολείπουσιν. οὐδεὶς γὰρ γίνεται εὐνοῦχος φαλακρός. μεταβάλλει δὲ καὶ ἡ φωνὴ ἐπὶ τῶν τετραπόδων τῶν ἐκτεμνομένων ἁπάντων ἐπὶ τὸ θῆλυ. τὰ μὲν οὖν ἄλλα τετράποδα, ἐὰν μὴ νέα ἐκτέμνηται, διαφθείρεται· ἐπὶ δὲ τῶν κάπρων οὐδὲν * διαφέρει. πάντα δ', ἐὰν μὲν νέα ἐκτέμνηται, μείζω γίνεται τῶν ἀτμήτων καὶ γλαφυρώτερα· ἐὰν δὲ καθεστηκότα ἤδη, οὐκέτι αὐξάνεται ἐπὶ πλέον. οἱ δ' ἔλαφοι, ἐὰν μὲν μήπω τὰ κέρατα ἔχοντες διὰ τὴν ἡλικίαν ἐκτμηθῶσιν, οὐκέτι φύουσι κέρατα· ἐὰν δ' ἔχοντας ἐκτέμῃ τις, τό τε μέγεθος ταὐτὸν μένει τῶν κεράτων, καὶ οὐκ ἀποβάλλουσιν. οἱ μὲν οὖν μόσχοι ἐκτέμνονται ἐνιαύσιοι· εἰ δὲ μὴ, αἰσχίους καὶ ἐλάττους * γίνονται. αἱ δὲ δαμάλεις, ἐκτέμνονται τρόπον τοῦτον· κατακλίνοντες καὶ ἀποτέμνοντες τῆς ὀσχέας, κάτωθεν τοὺς ὄρχεις ἀποθλίβουσιν· εἶτα ἀναστέλλουσι τὰς ῥίζας ἄνω, ὡς μάλιστα, καὶ τὴν τομὴν θριξὶ βύουσιν, ὅπως ὁ ἰχὼρ ῥέῃ ἔξω· καὶ ἐὰν φλεγμαίνῃ, κατακαύσαντες τὴν ὀσχέαν, ἐπιπάττουσιν. οἱ δ' ὀργῶσαι τῶν βοῶν, * ἐὰν ἐκτμηθῶσι, τὸ φανερὸν συγγεννῶσι. ἐκτέμνεται δὲ καὶ ἡ κάπρια τῶν θηλειῶν ὑῶν, ὥστε μηκέτι δεῖσθαι ὀχείας, ἀλλὰ πιαίνεσθαι ταχέως. ἐκτέμνεται δὲ νηστεύσασα δύο ἡμέρας· εἶτα κρεμάσαντες * τῶν ὀπισθίων σκελῶν, τέμνουσι τὸ ἦτρον, ᾗ τοῖς ἄρρεσιν οἱ ὄρχεις μάλιστα φύονται. ἐνταῦθα γὰρ ἐπὶ τῇ μήτρᾳ προσπέφυκεν ἡ κάπρια, ἧς σμικρὸν ἀποτέμνοντες, συρράπτουσιν. ἐκτέμνονται δὲ καὶ αἱ κάμηλοι αἱ θήλειαι, ὅταν εἰς πόλεμον χρῆσθαι αὐταῖς βούλωνται, ἵνα μὴ ἐν γαστρὶ λαμβάνωσι. κέκτηνται δ' ἔνιοι * τῶν ἀνθρώπων καμήλους καὶ τρισχιλίας. θέουσι δὲ θᾶττον τῶν Νισαίων ἵππων πολὺ, ἐὰν θέωσι, διὰ τὸ μέγεθος τοῦ ὀρέγματος. καὶ ὅλως δὲ μακρότερα γίνεται τὰ ἐκτεμνόμενα ζῷα τῶν ἀτμήτων.

* Vulgò, διαφθείρει, ineptè.

* Gesnerus, γίνονται αἱ δὲ δαμάλεις, ἐκτέμνονται δὲ τ.

* Fortaſſe, ἐὰν [illegible], ἐκβάλλουσιν, ἢ φθείρουσι. ex ca. 1. lib. 3. ſic ferè Gaza: ſed vocē ὀργῶσαι ille non agnoſcit.

* Gaza legit aut legi voluit, ἐκ [illegible], ſecutus Plinij codices lib. 8. cap. 51.

* Gaza, τῶν ἀνωτέρων, vel τῶν ἀσιανῶν.

Lotrices, nonnullæ rectungues, quæ circa fluuios, aut paludes, aut mare verſantur. Aliæ vtramque, tum lauare, tum puluerare ſolent: vt columbus, vt paſſer. Aduncarum pars maior neutrum facit. Hæc ita ſe habent. Proprium nonnullis auibus euenit crepitus alui, vt turturi. Pars etiam nouiſſima alui earundem vehementer citatur, eiuſque vocem reddunt.

CAPVT L.

De iis animalibus quæ caſtratione immutantur, quæve ruminent.

Mvtantur verò animantium aliqua, forma, & moribus, non modò per ætates, & tempora, verùm etiam caſtratione. Caſtrantur autem ea quibus ſunt teſtes. Sunt auibus teſtes intus lumbis hærentes, & quadrupedum iis quæ oua pariunt. at verò iis quæ animal generant, eademque terreſtria ſunt, plurima quidem parte foris, ſed nonnullis etiam intus continentur: omnibus verò poſtrema aluo habentur. Caſtrantur gallinacei parte nouiſſima ſuæ alui, quæ cùm coeūt, concidit. Hanc enim ſi duobus aut tribus ferramentis aduſſeris, capos facies. Quòd ſi perfectus eſt qui caſtratur, criſta palleſcit, & cucurire deſinit, neque coitum Venereum repetit. Sed ſi adhuc pullus eſt, ne inchoari quidem ex iis quicquam poteſt, cùm accreſcit. Quod idem in homine quoque accidere certum eſt. Nam ſi puer adhuc excidatur, neque poſtgeniti pili innaſcuntur, neque vox immutatur, ſed ſuum ſeruat acumen. at ſi iam puber, poſtgeniti defluunt pili, præterquam pubis. Hæc enim quamuis minuatur, tamē manet: ſed congeniti non defluunt: nemo enim ſpado caluescit. Quadrupedum etiam exectorum vox omnium in fœmininam immutatur. Sed cùm cætera niſi nouella caſtrentur, intereant, aper vnus qua ætate caſtretur, non refert. Omnia denique, ſi dum creſcunt, caſtrantur, maiora & elegantiora quàm incaſtrata euadunt. Sed ſi poſtea quàm adoleuerunt, & iam incremento conſtiterunt, caſtres, nihil præterea accedere ad magnitudinem poteſt. Cerui, ſi cùm per ætatem nondum cornua gerunt, caſtrentur, non edunt cornua: ſed ſi corrnigeri exciduntur, non decidunt cornua, & magnitudine eadem ſeruantur. Vitulis tempus caſtrandi anniculis eſt, alioqui minores deformioréſque euadunt. Modus caſtrandi hic eſt; Tractos deorſum teſtes, atque obtentos, preſſóſque in imum ſcroti, cultello adacto, extrudunt: mox fibras ſurſum, quoad maximè fieri poteſt, reprimunt, & plagam infarciunt capillamētis, vt ſanies effluere poſſit: & ſi inflammatur, ignem adhibent ſcroto, & reſpergūt. Si bos à recenti caſtratu ineat, procreare poteſt. Apria etiam ſcropharum caſtratur, ne præterea coitum appetat, ſed breui tempore obeſetur. Caſtratur autem cùm biduo ieiunarit, ſuſpenſa pernis prioribus, reciſa cute inter femina, quà maribus teſtes maximè continentur: hac enim parte adhæret vuluis apria dicta, cuius exigua parte abſciſſa, conſarcinant. Cameli etiam fœminæ caſtrantur, cùm eis vti in prælio libet, ne concipiant vtero. Nonnulli ſuperioris Aſiæ incolæ, camelos vel ad tria millia poſſident. Currunt cameli celeriùs quàm equi Niſſani, propter laxiorem ſui gradus glomerationem. Et caſtrata denique auctiora, quàm incaſtrata, euadunt.

Animalia, quibus ruminare in more eſt, proficiũt, delectantúrque non minus in ruminando, quàm edendo. Ruminant quæ ſuperiore dentium ordine carent, vt boues, oues, capræ. Ex feris nullum adhuc ruminare conſtat, prætérquam ea quæ aliquando cum hominibus exigunt, vt ceruus: hunc etenim ruminare planum eſt. Iacent potiſſimùm, cùm ruminant, omnia, & hybernis præcipuè menſibus ſolent ruminare. Septem ferè menſibus hoc faciunt quæ intra tecta aluntur. Gregales leuiùs, minúſque temporis ruminant, quoniam foris paſcantur. Sunt etiam ex dentatis vtrimque nonnulla, quæ ruminent, vt mures Põtici, & piſcis, quem ab ea re ruminalem quidam appellarunt. Sũt item alui fluentioris ea quibus longiora ſunt crura: ſed propenſiora ad vomitum, quibus latius pectus eſt. Idque tum in quadrupedum genere, tum in auiũ, tum etiam in hominum, ita eſſe magna ex parte propenſum eſt.

A τὰ δὲ μηρυκάζοντα τῶν ζώων, χαίρει μηρυκάζοντα καὶ μηρυκάζουσιν, ὥσπερ ἐσθίοντα. μηρυκάζει δὲ τὰ μὴ* ἀμφώδοντα· οἷον βόες, καὶ πρόβατα, καὶ αἶγες. τῶν δὲ ἀγρίων οὐδὲν πω συνῶπται, ὅσα μὴ συντρέφεται ἐνίοτε, οἷον ἔλαφος· αὕτη δὲ μηρυκάζει. πάντα δὲ κατακείμενα μηρυκάζουσι μᾶλλον. μάλιστα δὲ τοῦ χειμῶνος μηρυκάζουσι· τά τε κατ' οἰκίαν τρεφόμενα, σχεδὸν ἑπτὰ μῆνας τοῦτο ποιεῖ. τὰ δ' ἀγελαῖα, καὶ ἧττον καὶ ἐλάττονα χρόνον μηρυκάζει, διὰ τὸ νέμεσθαι ἔξω. μηρυκάζουσι δὲ καὶ τῶν ἀμφωδόντων ἔνια. οἷον οἵ τε μῦες οἱ Ποντικοί, καὶ οἱ ἰχθύες, καὶ ὃν καλοῦσιν ἔνιοι ἀπὸ τοῦ ἔργου μήρυκα. ἔστι δὲ τὰ μὲν μακροσκελῆ τῶν ζώων, ὑγροκοίλια· τὰ δ' εὐρυστήθη, ἐμετικὰ μᾶλλον, B καὶ ἐπὶ τῶν τετραπόδων, καὶ ἐπὶ τῶν ὀρνίθων, καὶ ἐπ' ἀνθρώπων ὡς ἐπιτοπολύ.

* χ' ἀμφώδοντα.

ARISTOTELIS STAGIRITÆ, de Hiſtoria Animalium, LIBER X.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζώων ἱστορίας τὸ Κ.

Iulio Cæſare Scaligero interprete.

Librum hunc poſt ſeptimum illico eſſe ſtatuendum cenſet maximus interpres: In eo namque, *inquit*, de hominis generatione per cõpendia diſputauit, certóſque affectus aſcripſit, tum parentum coniugationi, tum puerperæ, tum infanti ipſi. In hoc itaque quod erat reliquum, quemadmodum ea res conficeretur, ſubtiliùs contemplatus eſt. Quamobrem quæ verba in fine ſeptimi ſunt, προϊούσης δὲ τῆς ἡλικίας, vereor admodum ne fuerit tanquam teſſera ſequentis libri: iiſdem enim vocibus is qui hîc decimus inſcribitur, incipit. *Hæc ille, vt quidem opinio mea eſt, veriſſimè. niſi quòd videtur hic qui decimus vocatur liber, non ſolum poſt ſeptimum ſtatuendus: ſed etiam pars eſſe ſeptimi cenſendus. Idque tum auctoritate veteris Latini interpretis poteſt confirmari: tum eo etiam, quòd hac parte ſublata, liber ſeptimus breuior eſt multo quàm cæteri: vt non temerè dici queat deſiderari de eo aliquid. Porro capita, quæ hoc libello tractantur, ſunt hæc: De indiciis matricis bene ſe habentis, à qualitate eius & ſitu: déque eius affectionibus. De irrito conceptu, ſiue ſubuentaneo. De mola quæ in vtero mulierum generatur interdum.*

C

CAPVT I.

De matricibus, & qualitate ſitúque earum, quando bene valent.

APpetente hominis ętate, qua mutuo congreſſu tum vir tum fœmina deberent generare, nonnunquam in vtroque, aliquando in altero tantùm exiſtit impedimentũ. Principio quemadmodũ ſeſe habeat fœminarum vterus, contemplandum eſt, qui ſi impedimento quopiam afficiatur, manus ei medicæ adhibeatur. Si bene habeat: ad alia membra, quæ in cauſa ſint, curæ tempus tranſmittamus. Conſtare autem poterit matricis valetudo ex ipſis functionibus: ſicvt & alterius membri, cùm officium ſuum quantum ſatis eſt, facit: ac poſt- D quam peregit, & labore & dolore caret. Id quod cùm ex aliis membris, tum oculi exemplo perſpici ſanè poteſt. Quemadmodum enim oculus cùm neque gramioſus eſt, & primo videt, mox ab eo viſu nihil conturbatur, poſtremò retinet adhuc priſtinam videndi facultatem, ſanus eſt: ita matrix quoque: ſi neque dolet, & officio ſuo quantum ſatis eſt, fungitur, cum abſoluto opere ſuo nullum capiat dolorem, neque fatiſcat. II. Quanquam autem matrix ipſa non bene ſe habeat: dicitur aliquando tamen, ad officium ſuum perficiendum & bene & proſperè valere, ſi opus ipſum nihilo deteriùs efficiatur. III. Quemadmodum ſiue oculi partes non omnes rectè valent, ſiue aliqua inſit puſtula: nihil horum impedimento erit, quominus oculus exactè videat: ſic & ipſa matrix,

ΚΕΦΑΛ. α'.

Περὶ σημείων τῶν ὑστερῶν, εἰ ἔχει ὡς δεῖ πρὸς τὴν τέκνωσιν.

ΠΡοϊούσης δὲ τῆς ἡλικίας ἀνδρὶ [καὶ γυναικί, τοῦ] μὴ γεννᾶν ἀλλήλοις συνόντας, τὸ αἴτιον ὁτὲ μὲν ἐν ἀμφοῖν ἐστιν, ὁτὲ δ' ἐν θατέρῳ μόνον. πρῶτον μὲν οὖν ἐπὶ τοῦ θήλεος δεῖ θεωρεῖν τὰ περὶ τὰς ὑστέρας ὅπως ἔχει, ἵν' εἰ μὲν ἐν ταύταις τὸ αἴτιον, αὗται τυγχάνωσι θεραπείας· εἰ δὲ μὴ ἐν ταύταις, περὶ ἕτερόν τι τῶν αἰτίων ποιῶνται τὴν ἐπιμέλειαν. ἔστι δή, ὥσπερ καὶ περὶ ἄλλο μέρος, φανερὸν εἰ ὑγιαίνει, ὅταν τὸ ἔργον τὸ αὐτοῦ ἱκανῶς ἀποτελῇ, καὶ ἄλυπόν τε ᾖ, καὶ μετὰ τὴν ἐργασίαν ἄκοπον. οἷον ὀφθαλμός, ὅταν λήμην τε μηδεμίαν ποιῇ, καὶ ὁρᾷ, καὶ μετὰ τὴν ὅρασιν μὴ ταράττηται, μηδ' * ἀδυνατῇ ὁρᾶν πάλιν. οὕτω καὶ ὑστέρα, ἢ πόνον τε μὴ παρέχουσα, καὶ ὃ ἐκείνης ἐστί, τοῦτο ἱκανῶς ἀπεργαζομένη καὶ μετὰ τὰ ἔργα μὴ ἀδυνατοῦσα, ἀλλ' ἄκοπος. 2 * λέγεται δὲ καὶ μὴ καλῶς ἔχουσαν τὴν ὑστέραν, ὅμως πρὸς τὸ ἔργον τὸ ἑαυτῆς ἔχειν καλῶς καὶ ἀλύπως, ἂν μὴ ταύτης χεῖρον τὸ ἔργον ἐστὶν αὐτῆς ἔχειν. 3 * ὥσπερ ὄμμα οὐδὲν κωλύει αὐτὸ ὁρᾶν ἀκριβῶς, μὴ ἔχοντας τοῦ ὀφθαλμοῦ καλῶς πάντα τὰ μόρια, ἢ εἰ φῦμά τι ὄν. ὁμοίως δὲ καὶ ὑστέρα,

* χ' ἀδυνατεῖ

* Scaliger, λέγεται δὲ καλῶς ἡ μὴ καλ.

* Scal. ... vide Comm.

εἰ δ' ἔχῃ ἐπὶ τοῦ τόπου, οὐδὲν αὖ παρὰ τοῦτο βλάπτεσθαι. 4 δεῖ δὴ τὴν ἔχουσαν καλῶς ὑστέραν, πρῶτον μὲν τὸν τόπον μὴ ἐν ἄλλῳ καὶ ἄλλῳ εἶναι, ἀλλ' ὁμοίως τε διὰ τέλους τὸν γίγνεσθαι δὲ πορρώτερον ἀναισθήτως καὶ ἀλύπως, καὶ μηδὲν ἀναισθητοτέρας εἶναι ἐπιψαυομένας. τοῦτο δὲ κρίνειν οὐ χαλεπόν. 5 Ὅτι δὲ δεῖ τοιαύτας εἶναι, ἐκ τῶνδε φανερόν. εἴτε γὰρ μὴ πλησίον προσίασιν, οὐκ ἔσονται ἀναρπαστικαί. πόρρω γὰρ αὐταῖς ἔσται ὁ τόπος, ὅθεν δεῖ ἀναλαβεῖν. εἰ δὲ μὴ πλησίον μένουσι, καὶ μὴ ἀναπεπτάμεναι πορρωτέρω, κωφότεραι ἔσονται. δεῖ δ' ἐπιγίνεσθαι δι' ἀεί, ὥστε μὴ πεγὰρ αἰσθάνεσθαι, δεῖ τοῦτο σφόδρα ποιεῖν καὶ εὐηκόους εἶναι. ταῦτα τε οὖν χρὴ ὑπάρχειν· ὅσαις τε μὴ ὑπάρχει, αὐται θεραπείας δέονται τινός. 6 καὶ τὰ καταμήνια γίνεσθαι καλῶς. τοῦτο δ' ἐστὶ δι' ἴσων χρόνων, καὶ μὴ πεπλανημένως, ὑγιαίνοντος τοῦ σώματος. σημαίνει γὰρ οὕτω γινόμενα, καλῶς ἔχειν ἀνοίγεσθαι, καὶ δέχεσθαι τὴν ἐκ τοῦ σώματος ὑγρότητα, ὅταν τὸ σῶμα διδῷ. 7 ὅταν δὲ ἢ πλεονάκις, ἢ ἐλαττονάκις, ἢ πεπλανημένως * ἀφίωσι, τοῦ ἄλλου σώματος μὴ αἰτίου ὄντος, ἀλλ' ὑγιαίνοντος, ἀνάγκη τοῦτο συμβαίνειν * δι' αὐτάς. 8 καὶ διὰ κωφότητα οὐκ ἀνοίγονται δ' ἐν τοῖς καιροῖς, ὥστ' ὀλίγα δέχονται, ἢ μᾶλλον ἐπισπῶνται τὸ ὑγρὸν, διά τινα φλεγμασίαν αὐτῶν. ὥστε θεραπείας * σημαίνουσι δεόμεναι, ὥσπερ καὶ ὀφθαλμοὶ καὶ κύστις, καὶ κοιλία, καὶ τἆλλα. πάντες γὰρ οἱ τόποι φλεγμαίνοντες, ἕλκουσιν ὑγρότητα τοιαύτην, ἣν πέφυκεν ἐκκρίνεσθαι εἰς ἕκαστον τόπον, ἀλλ' οὐ τοιαύτη, ἢ τοσαύτη. 9 ὁμοίως δὲ καὶ ἡ ὑστέρα πλείω ἀποδιδοῦσα σημαίνει φλεγματικόν τι πάθος, ἐὰν ὅμοια μὲν, πλείω δ' ἀποδιδῷ. ἐὰν δὲ * ἀνόμοια καὶ σεσηπότα μᾶλλον, οἷα ταῖς ὑγιαινούσαις προσέρχεται, τοῦτο μὲν ἤδη πάθος ἐπίδηλον γίνεται. ἀνάγκη γὰρ καὶ πόνους τινὰς ἐπισημαίνειν, ἐχούσης ὡς οὐ δεῖ. 10 ταῖς δ' ὑγιαινούσαις, τὰ λευκὰ καὶ σεσηπότα προσέρχεται, ταῖς μὲν καὶ ἀρχομένων, ταῖς δὲ πλείσταις ληγόντων τῶν καταμηνίων. ὅσαις μὲν οὖν σεσηπότα μᾶλλον γίνεται ἢ ταῖς ὑγιαινούσαις, ἢ ἄτακτα, πλείω ἢ ἐλάττω, μᾶλλον δέονται θεραπείας, ὡς ἐμποδιζόντων πρὸς * τὴν τέκνωσιν. ὅσαις δὲ τοῖς χρόνοις μόνον * ἀνωμάλως καὶ μὴ δι' ἴσου, ἧττον μὲν διακωλυτικὸν τὸ πάθος, διασημαίνει μέντοι τῆς ὑστέρας τὴν ἕξιν κινουμένην, καὶ οὐκ ἀεὶ ὁμοίως μένουσαν. ἔστι δὲ τοῦτο τὸ πάθος, ἐπὶ μὲν βλάψαι τὰς εὐφυεῖς πρὸς τὴν σύλληψιν· οὐ μέντοι νόσος, ἀλλὰ τοιοῦτόν τι πάθος, ἐπὶ καθίστασθαι καὶ ἄνευ θεραπείας, ἂν μή τι προσεξαμαρτάνῃ αὐτή. 11 ἐὰν δὲ μεταβάλλωσι τῇ τάξει, ἢ τῷ πλήθει, τοῦ ἄλλου σώματος μὴ ὁμοίως ἔχοντος, ἀλλ' ὁτὲ μὲν ὑγροτέρου, ὁτὲ δὲ ξηροτέρου, οὐδὲν αἴτιαι αἱ ὑστέραι· ἀλλὰ δεῖ καὶ ἀκολουθεῖν αὐτὰς τῇ τοῦ σώματος ἕξει, δεχομένας καὶ ἀφιείσας κατὰ λόγον. ἐὰν μὲν οὖν ὑγιαίνοντος τοῦ σώματος, μεταβαλλόντος δὲ, τοῦτο ποιῶσιν, οὐδὲν αὐταὶ δέονται θεραπείας.

* Melius, [illegible] ἀφίωσι.

* Scal. δι' αὐτάς. & διὰ κωφ. δὲ οὐκ ἀνοίγ.

* Fortasse, συμβαίνουσι. etsi σημαίνουσι excusari potest: sic etiã alibi. vide Scal. 531

* γρ. ἀνόμοια δὲ σεσηπ. vide Scal.

* γρ. τεκνοποιΐαν. vide Scalig.

* γρ. ἀνωμάλως

A ſi bene ſuo in loco ſibi à natura attributo exiſtat, nihil inde capiat detrimenti, aut damni det[illegible]. Primùm igitur oportet ſuo certóque loco p[illegible]re matricem: neque aliam atque aliam [illegible] ſedem, vt bene valere exiſtimetur. Deinde [illegible]dem conſtantem ſitum obtinere, niſi [illegible] quatenus promouere poſſit: idque ſine [illegible]modo atque difficultate. Neque ſi acceder[illegible] eam obtorpeſcere, quaſi nihil ſentiat [illegible]. Id quod facilè percipi poteſt. v. Matricem autem talem eſſe oportere, ex hiſce rationibus ſatis conſtat. Nam ſi non prodeat, nihil quicquam ad ſeſe attrahere valebit. Etenim longinquior erit, receſſus ille, quàm vt inde quippiam poſſit com-
B prehendere. Quòd ſi neque prope manere, neque prorſum adire valent, contumaces ſunt. at ſi ad tactum minimè moueantur, id verò vehementer curandum eſt, obedientiores vti ſint. Cùm his igitur præditas eſſe matrices neceſſe eſt, tum ſi non ſunt, certis remediis curandum eſt vt ſint ita. vi. Oportet præterea ritè ſolui menſtrua: ritè autem ſoluentur, ſi æqualibus ſtatiſque interuallis ſano in corpore emittantur. Ita enim fiet vt intelligamus, & commodè aperiri, & quo tempore corpus humorem illum tranſmittat, eum excipere poſſe. vii. Quòd ſi aut ſæpius, aut ſpiſſiùs, aut incertis ſpatiis temporis ſoluantur, ac reliquum corpus bene habeat,
C neque eiuſmodi erroris communis cauſſa ſit: neceſſe eſt ab ipſis matricibus nocumentum proficiſci. viii. Euenit ſanè propter contumaciam vti debito tempore ne aperiantur. Quare aut parum accipiunt humoris, aut plus attrahunt quàm par ſit: idque propter inflammationem quãdam. Quamobrem quemadmodum de oculo diximus, déque veſica, & aluo, atque aliis corporis partibus: ita matrices quoque medici curam videntur poſtulare. Quæcumque enim loca inflammata ſunt, eum trahunt ad ſeſe humorem, qui ipſa in loca excerni conſueuit: verùm neque quantitas, neque qualitas illa reſpondet, quibus humor ille præditus antea fluere ſolitus erat. ix. Ea ratione muliebris quoque vterus de
D ſeſe iudicium faciet, cùm morbo quopiam erit inflammatus: ſi plus humoris reddat, qui tamen ſimilitudine non differat à priore. Quod ſi humor ille, licèt ſimilis fuerit, putridus tamen ſit (qualem egerere conſueuère fœminæ valentiores) manifeſtò iam hæc apparebit ægritudo. Et matrices ipſas morbo laborare, neque prout decet, bene affectas eſſe, ea ſunt indicia. x. Alba autem menſtrua & putrida bene valentibus mulieribus non vno modo prodire ſolent. ſed aliis mẽſium initio, aliis cùm ceſſant. Quibuſcumque igitur mulieribus aut putridiora, aut ſine ordine vberiora, aut parciora menſtrua quàm ſanis fluũt: eæ multo ac-
E curatioris egent medicinæ ad exigenda hæc impedimenta, quæ prohibẽt generationem. Quibus verò temporum tantùm interualla incerta atque inæqualia ſunt, minùs hæc incõmodat ægritudo. nihilominus tamen matricis indicat habitudinem immutatam, neque conſtanti ſtatu conſtitutam eſſe. atque hoc affectio quædam potiùs, qua conceptiones prohibentur, quàm ægritudo, appellari meretur: propterea quòd etiam nullis adhibitis medicamentis redire ad priſtinam ſanitatem poſſunt, niſi alterius cuiuſpiam peccati fiat acceſſio. xi. Quod ſi aut ordinis, aut quantitatis ratio immutetur, ipſúmque corpus non eodem habitu conſtet ſibi, ſed aliquando humidius, aliquando ſiccius exiſtat: nequaquam vteri in cauſſa ſunt, propterea quòd oportet, eos tum in excipiendo, tũ in emittendo, rationẽ ſequi habitudinis quæ in corpore eſt. Igitur ſi corporis ſanitate variata hoc eis euenerit, nulla ipſi indigẽt medicatione.

Sin corrupta valetudine minus ſoluerint, quoniã A eiuſmodi excremẽtum alias in corporis partes deriuatum abſumatur, laborat ſanè corpus ipſum. Quod ſi abundantiùs emiſerint, iccirco quia eum in locũ à cætero corpore largiùs redundet, ne hoc quidem indicio eſt, vteros egere medicamẽtis: ſed curandum eſſe corpus ipſum. Denique menſtruorum immutatio hæc, quæ corporis conſequitur immutationem, nullam oſtẽdit in matricibus noxam, ſed eas bene valere. XII. Ipſæ autem matrices ſeipſis interdum deteriùs interdum meliùs habent. Siquidem humidiores aliquãdo, aliàs ſicciores ſunt. Et frequentat ipſas corpus plus, cùm plenius eſt. Cum autem minùs eſt plenum, minùs implet. Ita ab ſicciore corpore plus ſanguinis adipiſcuntur; ab humidiore, plus aquæ. Atque ea quidem quæ alba effluunt per initia menſium, ſpeciẽ lactis præ ſe ferunt: ſed odore carent. Quæ autem initio rubra ſunt, & cùm ceſſare incipiunt, extrema miſtione exeunt albidiora. Quæ vt nullam olent putredinem, ita ſpirant graue quid, & acre: neque tamen pus cõcretum, ſed liquidum repræſentant. Quanquam non ſine calore is menſium modus euenire ſolitus eſt. Quare eæ mulieres, quę talibus menſtruis exoluuntur, habent ad generationem liberorum matrices accommodatas.

CAPVT II.

Sect. XIII.

PRimum igitur contemplandum, an bene habeant matrices. Deinde, quonam ſitu earum corpus conſtitutum ſit. Oportet enim rectas eſſe: alioqui ſemen non attrahent. Si quidem ipſa quoque mulier prorſum ſemen ſuum proijcit. Idque ex earum venereis inſomniis perfectè manifeſtum eſt. Eo namque tempore vteri locus anterior humefactus nihilo minùs eget abſterſione, quàm ſi cum viro tum coiiſſent. ſine cuius viri coitione in eundem locum item proijciunt: nõn autem ad interiorem vteri receſſum. Cæterùm eam in partem matricis anteriorem cùm proiecerint ſemen, inde ſpiritus vi trahunt illud intro, quemadmodum naribus quoque fieri ſolet. Quo fit vt non vno coeũdi modo concipere poſſint: propterea quod in anteriorem matricis partem tam mulier quàm vir emittit ſemen. Si enim in ipſam matricem eijcerẽt, nequaquã fieret vt quouis concubitus modo concipere poſſent. XIV. Quod ſi fit, vt in rectum nõ ſpectent matrices, ſed aut ad femina, aut ad lumbos, aut ad pectinem: nequaquam poterunt concipere, propter eam, quam diximus, rationẽ. Nimirum ſemen ipſum quando nequeũt attrahere: atque hæc affectio ſi aut natura conſtituta extiterit, aut validioris morbi euenerit vi, nulla cura poterit emendari: Si verò aut à natura rupta fuerit, aut propter morboſam inflammationem contingat vt conuellatur, pro alterutrius ratione affectio hæc animaduertenda eſt. XV. Quæ igitur hoc agunt, vt prægnantes fiant, iis matricis os non ſolùm, vt diximus, rectum eſſe neceſſe eſt, ſed etiam bene affectum ad aperiendum. Erit autem bene affectum, ſi, quo tempore effluere incipiunt menſes, attrectatum inueniatur mollius quàm eſſet antea: neque penitus clauſum, niſi ſi menſium initia alba frequentiáque ſint. Nam ſi extiterint coloratiora, quaſi rubore ſpectatur caro: ſi tangatur, apertum manifeſtò occurret os, & neque contumax, neque cui tactus afferat dolorem, neque alia diuerſum affectione, quàm eſſe debuit. XVI. Cùm autem ceſſarunt menſtrua: occluſum vehementer ſiccúmque os eſſe debet, diem integrum & ſemiſſem, aut etiam alterum diem: neque durum tamen.

A ἐὰν δὲ* νοσωδῶς, ἢ ἐλάττω ἀποδιδῶσι, διὰ τὸ ἄλλοθί που ἀναλίσκεσθαι τὸ περίττωμα, ἢ κάμνει τὸ σῶμα. ἐὰν δὲ πλείω ἀφίωσι, διὰ τὸ ἐνδεὲς ἐξερεύγεσθαι τὸ σῶμα, οὐδὲ τοῦτο σημεῖον αὐτάς γε τὰς ὑστέρας δεῖσθαι θεραπείας, ἀλλὰ τὸ σῶμα. ὡς ὅταν συμμεταβάλλῃ ταῖς ἕξεσι τοῦ σώματος τὰ γυναικεῖα, δηλοῖ ὅτι οὐδὲν αἴτιον ἐν ταῖς ὑστέραις ἐστίν, ὅτι ὑγιαίνουσαι διατελοῦσι. 12 αὗται δ' αὐτῶν ὁτὲ μὲν ἀρρωστότεραι, ὁτὲ δὲ ἰσχύουσι μᾶλλον· καὶ ὁτὲ μὲν ὑγρότεραι, ὁτὲ δὲ ξηρότεραι. καὶ φοιτᾷ αὐταῖς, ὅταν μὲν πλέον τὸ σῶμα * αὐτοῦ, πλείω· ὅταν δ' ἔλαττον, ἐλάττω· καὶ ἐὰν μὲν ὑγρόν, ὑδαρέστερα· ἐὰν δὲ ξηρόν, αἱματωδέστερα. B καὶ ἄρχονται μὲν ἐκ λευκῶν γαλακτωδῶν, * ἀνόσμων μενουσῶν· τὰ δὲ φοινικᾶ μέν, ἀπολήγοντα δέ, λευκότερα, ἐσχάτης καταμίξεως. ὀσμὴν δ' ἔχει τὰ λευκὰ ταῦτα οὐ σηπεδόνος, ἀλλὰ δριμυτέραν καὶ βαρυτέραν, οὔτε πύου· καὶ ἀεὶ μὲν τήξεως, μετὰ μέντοι θερμασίας, ὅταν ἐστὶν ὁ τρόπος τῶν σημείων. ὅσαις μὲν οὖν οὕτω συμβαίνει, ταύτας ἔχουσιν ὡς δεῖ τὰ περὶ τὰς ὑστέρας πρὸς τὴν τέκνωσιν. 13 Καὶ πρῶτον σκεπτέον, εἰ καλῶς ἔχει· μετὰ δὲ ταῦτα, πῶς ἔχει τὸ σῶμα τῶν ὑστερῶν. δεῖ γὰρ εἰς ὀρθὸν ἔχειν. εἰ δὲ μή, οὐχ ἕλξουσιν εἰς αὐτὰς τὸ σπέρμα. εἰς τὸ πρόσθεν γὰρ αὐτῶν, καὶ ἡ γυνὴ προΐεται, ὡς δῆ-C λον, ὅταν ἐξονειρώττωσιν αὗται τελέως. τότε γὰρ ἐστὶν ὁ τόπος θεραπείας δεῖται αὐταῖς ὑγρασθείς, ὥσπερ εἰ ἀνδρὶ * συνεγένετο· ὡς προϊεμέναις ἐνταῦθα καὶ τὸ παρὰ τοῦ ἀνδρός, εἰς τὸν αὐτὸν τόπον, καὶ οὐχὶ * τὰς ὑστέρας εἴσω. ἀλλὰ ὅταν ἐνταῦθα προῶνται, ἐντεῦθεν σπῶσι τῷ πνεύματι, ὥσπερ αἱ ῥῖνες, καὶ αἱ ὑστέραι τὸ σπέρμα. διὸ καὶ παντὶ σχήματι συνιοῦσαι κυΐσκονται, ὅτι εἰς τὸ πρόσθεν παντελῶς ἐχούσης, γίνεται καὶ αὐταῖς καὶ τοῖς ἀνδράσιν ἡ πρόεσις τοῦ σπέρματος. εἰ δ' εἰς αὐτήν, οὐκ ἂν πάντως συγγινόμεναι συνελάμβανον. 14 ἐὰν δὲ μὴ εἰς ὀρθὸν βλέπωσιν αἱ ὑστέραι, ἀλλ' ἢ πρὸς τὰ ἰσχία, ἢ πρὸς τὴν ὀσφύν, ἢ D πρὸς τὸ ὑπογάστριον, ἀδύνατον συλλαβεῖν, διὰ τὴν προειρημένην αἰτίαν, ὅτι ἀνελέσθαι οὐκ ἂν δύναιτο τὸ σπέρμα. ἐὰν μὲν οὖν ἰσχυρῶς τῇ φύσει οὕτως ἔχωσιν, ἢ ὑπὸ νόσου, ἀνίατον τὸ πάθος. ἐὰν δὲ ἢ ῥῆγμα, ἢ φύσει ἢ ὑπὸ τῆς νόσου, διὰ φλεγμασίαν συσπάσασης, * ἐπὶ θάτερα αὐτῆς τὸ πάθος. 15 Ταῖς δὲ μελλούσαις εὐκύοις ἔσεσθαι, δεῖ (καθάπερ εἴρηται) τὸ στόμα εἰς ὀρθὸν εἶναι, καὶ πρὸς τούτοις διοίγεσθαι καλῶς. λέγω δὲ τὸ καλῶς τοιοῦτον, ὅπως ὅταν ἄρχηται τὰ γυναικεῖα, θιγγανόμενον, ἔστω τὸ στόμα μαλακώτερον ἢ πρότερον, καὶ μὴ διεστομωμένον φανερῶς. ἀλλ' εἰ οὕτως ἔχοντες, τὰ πρῶτα ση-E μεῖα, τὰ λευκὰ φοιτάτω. ὅταν δὲ σαρκικώτερα ἢ τὴν χρόαν τὰ σημεῖα, φανερῶς ἔσται ἀνεστομωμένον ἄνευ ἀλγήματος * ἐὰν θιγγάνῃ, καὶ μήτε κωφότητα, μήτε σχῆμα ἀλλοιότερον ἄνευ αὐτοῦ. 16 Λήξαντων δὲ τῶν γυναικείων, διεστομωμένον ἔστω σφόδρα καὶ ξηρόν, ἀλλὰ μὴ σκληρὸν ἡμέραν ὅλην καὶ ἡμίσειαν, ἢ καὶ δύο ἡμέρας.

* Scal. νοσοῦσι, ἔλαττον ἀποδιδῶσι,
* Meliùs αὐτῆς vel αὐτῶν.
* Scal. legiſſe videtur ἀνόσμων.
* Scal. συνεγίνετο.
* Scal. τῆς ὑσ.
* Vide Scalig. Comm.
* χ. καὶ θιγγανόμενον, καὶ μὴ ἀλγῆσαι, μ.

ταῦτα γὰρ σημεῖα οὕτω γιγνόμενα, ὅτι καλῶς ἔχουσιν αἱ ὑστέραι, καὶ ποιοῦσι τὸ αὑτῶν ἔργον· τὸ μὲν μὴ θᾶττον ἀνεστομῶσθαι, ἀλλὰ μαλακὸν τὸ στόμα γίνεσθαι, ὅτι ἅμα τῷ ἄλλῳ σώματι λυομένῳ, λύονται, καὶ οὐκ ἐμποδίζουσι, καὶ ἀφιᾶσι πρῶτον τὰ ἀπ' αὐτοῦ τοῦ στόματος. ὅταν δὲ πλείω τὸ σῶμα προΐεται, ἀναστομοῦνται ὥσπερ τοῦ σώματος ὑγιεινῶς ἔχοντος. 17 Παυσαμένων δὲ τῶν σημείων, τὸ μὴ εὐθὺς συμπεπτωκέναι, σημαίνουσιν ὅτι, ὅταν ἀπορρυῇ, κεναὶ καὶ ξηραὶ γίνονται, καὶ διψηραί, καὶ οὐκ ἔχουσι λείψανα περὶ τὴν δίοδον. 18 Περισπαστικαὶ δ' οὖσαι, σημαίνουσι καλῶς ἔχειν πρὸς τὸ συλλαβεῖν πλησιαζόμενος, ὅταν οὕτως ἔχωσιν αὐταὶ ἀλγεῖς, καὶ μετ' αἰσθήσεως· τό,τε μὴ ἀλλοιότερον ἔχειν τὸ σῶμα, ἀγαθόν. καὶ γὰρ τοῦτο σημεῖον ὅτι οὐδέν ἐστιν ὃ κωλύει μὴ συμμύειν αὐτὰς ὅταν δέῃ.

ΚΕΦΑΛ. γ'.

III. 19 Περὶ δὲ τὰ σώματα τῶν ὑστερῶν, ἐν τούτοις σκεπτέον ἐστίν, εἰ ἔχει ὡς δεῖ, ἢ μή. Περὶ αὐτὴν δὲ τὴν ὑστέραν δεῖ συμβαίνειν τοιαῦτα μετὰ τὴν κάθαρσιν. πρῶτον μέν, ἐν τοῖς ὕπνοις ὡς συγγινομένην τῷ ἀνδρί, καὶ προϊεμένην, ὡς ἂν εἰ προσεπλησίαζε, ῥᾳδίως· ἂν τοῦτο φαίνηται πλεονάκις πάσχουσα, ἄμεινον. καὶ ἀνισταμένην, ὁτὲ μὲν δεῖσθαι θεραπείας, οἵας ὅταν πλησιάσῃ ἀνδρί· ὁτὲ δὲ, ξηρασίας. τὴν δὲ ξηρότητα ταύτην μὴ συνεχῆ, ἀλλ' ὕστερον μετὰ τὴν ἔξοδον ἐξυγραίνεσθαι· ὁτὲ μὲν θᾶττον, ὁτὲ δὲ ὀψιαίτερον, καὶ ὅσον εἰς ἥμισυ τῆς ἡμέρας βραχείας προσελθούσης. ἡ δὲ ὑγρότης ἔστω τοιαύτη, οἵα ὅταν πλησιάσῃ τῷ ἀνδρί. πάντα γὰρ ταῦτα σημεῖα δεκτικὴν τὴν ὑστέραν εἶναι τοῦ διδομένου, καὶ περισπαστικὰς τὰς κοτυληδόνας, καὶ καθεκτικὰς ὧν λαμβάνουσι, καὶ ἀκουσίας ἀφιείσας. 20 Ἔτι φύσας ἐξεγείρεσθαι ἄνευ πάθους, ὥσπερ ἡ κοιλία· καὶ ἀφιέναι, καὶ μεγάλας γινομένας καὶ ἐλάττους αὐτάς, ἄνευ νόσου. καὶ γὰρ ταῦτα δηλοῖ αὐτάς, ὅτι οὐδὲν στερεώτεραι τοῦ δέοντός εἰσιν, οὔτε κοῦφαι, οὔτε φύσει, οὔτε νόσῳ, ἀλλὰ δύνανται, ὡς ἂν δέξωνται, αὐξανομένῳ παρέχειν χώραν. ἔχουσι δὲ καὶ διαίσθησιν. ὅταν δὲ τοῦτο μὴ γένηται, ἢ πυκνότεραί εἰσιν, ἢ ἀναισθητότεραι, ἢ φύσει, ἢ νόσῳ. διὸ καὶ οὐ δύνανται τρέφειν, ἀλλὰ καὶ διαφθείρουσι τὰ ἔμβρυα, ἐὰν μὲν σφόδρα τοιαῦται ὦσιν, ἔτι μικρὰ ὄντα· ἐὰν δ' ἧττον, μείζω· ἐὰν δὲ ὅταν ἠρέμα, * φαυλότερα. 21 Ἔτι δὲ ἐγγαλουμένης, * τὰ ἐπὶ δεξιὰ καὶ τὰ ἐπ' ἀριστερά, ὁμαλὰ αὐτὰ εἶναι, καὶ τἆλλα τούτοις ὁμοίως. 22 Καὶ ἐν τῇ πρὸς τὸν ἄνδρα συνουσίᾳ, μεταξὺ ὑγραίνεσθαι, μὴ πολλάκις δέ, μηδὲ σφόδρα. ἔστι δὲ τοῦτο τὸ πάθος, οἷον ἵδρωμα τοῦ τόπου, ὥσπερ καὶ τῷ στόματι * σίαλον πολλάκις μὲν καὶ πρὸς τὴν φορὰν τῶν σιτίων, καὶ ὅταν λαλῶμεν, καὶ * ἐργαζώμεθα αὐτοὶ πλέον· καὶ τοῖς ὄμμασι δάκρυον πρὸς τὰ λαμπρότερα ὁρῶντες· καὶ ὑπὸ ψύχους καὶ θερμότητος ἰσχυροτέρας ἧς κρατεῖ τὰ μόρια ταῦτα, ὅταν τύχῃ ὑγρότερα ὄντα. οὕτω καὶ αἱ ὕστεραι ὑγραίνονται

* Vide Scal.

* κ. φαυλότερα. [illegible]

* κ. τὰ [illegible]

* Fort. κατὰ τὴν [illegible]

* κ. [illegible] de hoc loco adi Comment. Scal.

A His enim indiciis dignoſcētur, & bene valere matrices, & officio ſuo fungi, propterea quod [illegible] citò aperiuntur: & ore tamen molli [illegible]. Itaque fit, vt, cùm ſoluitur corpus, [illegible] quoque, neque vlli ſint impedimēto, [illegible] expellunt ea quæ in ipſius oris veſtibulo [illegible] autem largiore copia perfluxerit corpus, [illegible]tur. Quo indicio deprehenditur oris [illegible]tudo. Vbi autem defecerint indicia, ſi non ſtatim contrahatur, humoris inopia ſignificatur. atque ipſæ euadunt inanes, aridæ, ſiticuloſæ: neque partem vllam obtinent reliquiarum circum eum locum quà tranſmitti conſueuēre. XVIII. Igitur ſi vim habeant attrahendi, idque ſine moleſtia, & B cum ſenſu tamen fiat: argumentum eſt bene eſſe comparatas, nō ſolùm ad coitum, verumetiam ad concipiendum. Quanquam illud quoque inter bona indicia obſeruandum eſt: ne corpus à natura ſua delapſum ſit. Hoc enim pacto intelligemus, nullum eſſe impedimentum: quominus matrices, cùm opus ſit, occludi poſſint.

CAPVT III.

Declarat affectiones ab officiis matricis.

QVemadmodum vteri os bene maléve affici conſueuerit, his rationibus perſpici debet. Nunc ipſi matrici poſt purgationem quidnam ſoleat euenire dicendum eſt. Principio ſi C in ſomnis perinde afficietur, quaſi cum viro vbi coit: atque ita ſemen emittat facilè: bene eſt. tantóque melius ſi ei frequenter id contingat. tum vbi ſurrexerit, opus habeat aut abſterſione, aut alia curatura: qua vti ſolent à coitu mulieres. Oportet autem, ſi nihil exierit, nequaquam continenter retineri: ſed poſtquam expertecta mulier ſit, humeſcere matricem. idque non ſtatim ſemper: ſed interdum ſeriùs, atque adeo ad dimidium puſillæ diei. Humor autem ille talis eſto qualis in coitu emitti conſueuit. Hæc namque omnia argumenta ſunt: & matricem ſuſcipere id quod datur: & acceptabula tum attrahere tum continere poſſe, quod acceperint: poD ſtremo quoque eam inuitam emittere. XX. Præterea ſi intus & creentur flatus ſine vexatione: & emittantur, ſicvt & ab aluo. tum autem ipſæ ſi minores interdum, interdum ampliores ſponte ſua, non morbo vllo fiant. Hoc enim intelligemus, eas neque duriores vel natura, vel morbo, neque contumaces eſſe. ſed extendendo ſeſe dare locum poſſe ei quod receperint: cùm id capiet incrementum. Quòd ſi hoc ita non ſit, propter aut denſitatem, aut quia minùs ſentiant: ſiue id natura fiat, ſiue morbo contingat: eæ fœtus alere nec poterunt: & adhuc puſillos ſua vehementia corrumpent. De ea verò vehementia ſi quid deſit: etiam maiores fœtus interficiunt: ſin paulatim adE modum cedunt: eos interimunt fœtus, qui minùs ſunt valentiores. XXI. Oportet autem tum dextras tum ſiniſtras partes cùm attrectaris, eas inter ſe æquales inuenire: atque alia ad eundem modum. XXII. Inter coeundum quoque humeſcere neque ſæpe neque vehementer. Eſt autem humor hic, exudatio quaſi quædam loci illius: quemadmodum & oris ſaliua. quæ tum acceptis cibis, tum inter loquēdum ſolet euenire: itémque cùm multum laboramus: prætereà ſicut fit, vbi ciemus ex oculis lacrymas illuſtriorum aſpectu rerum atque etiā præ frigore, atque calore validiore quem ea obtinent membra, ſimul cum humiditate: quo tempore frigus viget. Sic & matrices humeſcunt, cùm

cùm id quod ad ſe pertinet, opus peragunt: ſi humidiore habitu affectæ ſint. Contingere autem ſolet id iis quæ bona ſunt habitudine. Quamobrem ſicut os ſpuitione, ita matrices nunc maiore nunc minore indigent curatura. Quædam enim tanta afficiuntur humectatione, vt virile ſemen nequaquam poſſint purius attrahere, propterea quod & hoc & illud quod à muliere deciditur, miſceatur. XXIII. Præter has affectiones autem illud quoque animaduertendum eſt: ſi id vſuueniat, vt per ſomnum cum viro coire videantur, imbecilliorésne à cubitu exurgant, an valentiores. Atque horum vtrumlibet ſempérne ita fiat, an interdum tantùm. Item an ſicciore primùm, deinde humeſcente vulua. Oportet enim hanc habitudinē conſequi eas mulieres quæ aptæ natæ ſunt ad generandum. Nam quòd exoluūtur, id argumentum eſt, earum corpus habere ſemper aliquid ſeminis ad emittendum, efficique vt mulier efficax ſit. Imbecillitas autem illa ex eo oritur, quoniam ſemen ipſum corpulentum eſt. Ab iis autem quæ ſine moleſtia emiſere, intelligamus nihil exiſſe præter modū, prætérque naturam, alioqui morboſa quæpiā ſecuta eſſet laſſitudo. Quòd autē valentiores exurgunt, atque ipſa matrix tunc ſiccior eſt, poſtea verò humeſcit, id indicat vniuerſi corporis vim ad ſemen & excipiendum & ſubtrahendum: corpúſque ipſum non deteriùs valere, quàm matricem. Spiritus enim vi attrahit introrſum matrix id quod extrinſecus appellitur, quemadmodum ſupradictum eſt: neque enim intro in ipſam proiicitur. XXIV. Cæterùm ſi quis & bona valetudine ſit & ætate integra, etiam iuuatur ad celeritatem ſeminis emittendi. Semen ex iis reb. eſt, quæ celeriter & augeſcere poſſunt, & augentur ſanè. Itaque tunc mulieres latet conceptio, quæ fit: neque enim ſeſe concepiſſe arbitrantur quoniam non ſenſere. Id autem iccirco fit: quia putant in proiectione ipſa vtriuſque tum viri tū mulieris ſemen iaci eodem momento temporis debere. XXV. Maximè verò illas latet conceptio: quæ negant fieri poſſe vt concipiant, niſi ſicca matrice ſint à coitu: propterea quòd oblatum ſemen manifeſtò nō retineatur. At verò tum à muliere tū à viro emitti plus poſſe ſeminis, quàm quantum aut retrahi valeat, aut requiratur ad cōceptionem, obſeruatum eſt. Quare cùm quantum ſatis ſit, attraxerit, multúmque reliquum factum ſit, tum verò neſciunt ſe concepiſſe. XXVI. Quod autem ita ſit, neque vniuerſo è ſemine conſletur fœtus, ex eo liquet, quòd animalia aliquot vnico initu multa concipiunt, tum autem ex gemellorum generatione, quæ coitu vnico fit, palam quoque eſt. Manifeſtò enim intelligimus non cuncto è ſemine conſtitui: ſed eius portione tantùm retenta in locis, maiorem partem abiectam eſſe ab ſuperfluo. XXVII. Igitur ſi multiplex fœtus vnico tantùm cōcipitur initu (id quod tum ſuillo in genere, tum in iis quæ gemellos aliquando pariunt, ſatis patet) ſanè ſemen ipſum toto à corpore nequaquam proficiſcitur: ſed ita à toto decidi conuenit, ſi in ſingulis formis diſtribuatur: atque inde totum illud in multa partiatur. Neque enim & ſimul, & particulatim poteſt. XXVIII. Præterea fœmina prorſum in matricis os ſemen proiicit: quem in locum etiam vir ipſe, quo coit tempore. Inde nanque trahit ſpiritu, quaſi bucca, aut narib. Quæcunque enim nullo admouentur inſtrumento, aut natura trahuntur ſurſum in caua loca, aut ſpiritus vi, ſicut ex hoc loco. Quo fit vt obſeruent mulieres, is ne locus ſiccus ſit, quemadmodum antea, quàm coïrent.

ἐργαζόμεναι, ὅταν τύχωσιν ὑγροτέρως διατεθεῖσαι. πάσχουσι δὲ τοῦτο τὸ πάθος, καὶ αἱ μάλιστα καλῶς πεφυκυῖαι. διὸ θεραπείας ἀεὶ δέονται αἱ γυναῖκες, ἢ πλείονος ἢ ἐλάττονος, ὥσπερ καὶ τὸ στόμα σιελώσεως. ἀλλὰ ἐνίαις τοσαύτη ὑγρασία γίνεται, ὥστε μὴ δύνασθαι καθαρὸν τὸ τοῦ ἀνδρὸς ἀνασπάσαι, διὰ τὴν σύμμιξιν τῆς γιγνομένης ἀπὸ τῆς γυναικὸς ὑγρότητος. 23 πρὸς δὲ τούτοις τοῖς πάθεσι καὶ τοῖσδε δεῖ κατανοεῖν, εἰ συμβαίνει, ὅταν δόξῃ ἐν τῷ ὕπνῳ πλησιάσαι τῷ ἀνδρί, πῶς ἔχουσα ἐξανίσταται, οἷον εἰ ἀσθενεστέρα, καὶ εἰ ἀεί, μὴ ὁτὲ μὲν, ὁτὲ δὲ οὔ, ἢ ἐνίοτε, καὶ ἰσχυροτέρα· εἰ δὲ μὴ ξηροτέρα τὸ πρῶτον, εἶτα ἐφυγραίνεται. δεῖ γὰρ ταῦτα συμβαίνειν τῇ γονίμῳ γυναικί. τὸ μὲν γὰρ ἐκλύεσθαι, σημεῖον προετικὸν εἶναι τὸ σῶμα σπέρματος ἀεί, τήν τε πρόοδον ποιεῖ· καὶ σωματώδους δ' οὔσης, ἀσθενεστέρα. τὸ δ' αἰτίως τοῦτο πάσχειν, σημεῖον ὅτι κατὰ φύσιν, καὶ ὃν δεῖ τρόπον, ἡ ἄφοδος τούτου γίνεται. εἰ γὰρ μή, νοσώδης ἂν ἡ ἀρρωστία. τὸ δὲ ποτὲ καὶ ἰσχύειν μᾶλλον, καὶ ξηρὰν εἶναι τὴν ὑστέραν, εἶτα ἐφυγραίνεσθαι, σημεῖον ὅτι πᾶν τὸ σῶμα λαμβάνει, καὶ ἀφανίζει, καὶ οὐ μόνον ἡ ὑστέρα καὶ τὸ σῶμα ἰσχύει. πνεύματί τε γὰρ ἕλκει ἡ ὑστέρα τὸ προσελθὸν ἔξωθεν αὐτῇ, ὥσπερ πρότερον εἴρηται. οὐ γὰρ * εἰς αὐτὴν προσίεται. 24 * ἀλλ' οὐ καὶ ἂν ἄλλως τις ὑγιαίνῃ τὸ σῶμα, καὶ ἐν ἡλικίᾳ ᾖ, ταχύσπερμον ποιεῖ. τῶν γὰρ αὐξανομένων τοῦτ' ἐστὶ ταχύ, καὶ τῶν αὐξητῶν· καὶ λανθάνουσι τότε μάλιστα κυισκόμεναι. οὐ γὰρ οἷόν τε συνειλῆφθαι, ἐὰν μὴ αἴσθωνται. προϊέμεναι δέ, τυγχάνουσιν ὑπολαμβάνουσαι ὡς δεῖ ἀπ' ἀμφοῖν συμπεσεῖν ἅμα, καὶ ἀπὸ τῆς γυναικὸς καὶ ἀπὸ τοῦ ἀνδρός. 25 μάλιστα δὲ λανθάνει, ὅσαι οἴονται ἀδύνατον εἶναι συλλαβεῖν, ἐὰν μὴ ξηρανθῶσι, καὶ ἐπιδήλως ἀφανισθῇ τὸ ἐλθόν. συμβαίνει δ' ἐνίοτε πλέον προΐεσθαι καὶ αὐτὴν καὶ τὸν ἄνδρα, οὗ ἂν * δύναιτο ἀφανίσαι, καὶ τοῦ ἱκανοῦ. ὅταν οὖν ἀνασπάσῃ μὲν ἱκανόν, λειφθῇ δὲ πολύ, τότε λανθάνουσι κυισκόμεναι. 26 Ὅτι δὲ τοιοῦτον ἐνδέχεται γίνεσθαι, καὶ οὐκ ἐξ ἅπαντος γίνεται τὸ πάθος, δηλοῖ ὅσα τῶν ζῴων ἀπὸ μιᾶς ὀχείας πολλὰ τίκτει, καὶ ἡ τῶν διδύμων γένεσις, ὅταν ἀπὸ μιᾶς γένηται. δηλοῖ γὰρ ὅτι * οὐκ ἐξ ἅπαντος ἐγένετο, ἀλλὰ μέρος τι αὐτοῦ ἔλαβε τόπος, τὸ δὲ * περιελείπετο πολλαπλάσιον. 27 Ἔτι εἰ πολλὰ ἀπὸ μιᾶς ὀχείας γίνεται, ὥσπερ φαίνεται ἐπὶ τῶν ὑῶν καὶ τῶν διδύμων ἐνίοτε γιγνόμενα· * δῆλον ὅτι οὐκ ἀπὸ παντὸς ἔρχεται τὸ σπέρμα τοῦ σώματος, ἀλλ' ἐφ' ἑκάστου εἴδους ἐμερίζετο. ἀπὸ παντὸς μὲν γὰρ ἐνδέχεται ἀποχωρισθῆναι, καὶ τὸ πᾶν εἰς πολλά. ὥστε ἅμα καὶ κατὰ μέρος ἀδύνατον. 28 ἔτι ἡ γυνὴ προΐεται εἰς τὸ πρόσθεν τοῦ στόματος τῶν ὑστερῶν, οὗ καὶ ὁ ἀνήρ, ὅταν πλησιάσῃ. ἐντεῦθεν γὰρ αὐτὰ τῷ πνεύματι, ὥσπερ τοῖς στόμασιν ἢ τοῖς μυκτῆρσιν. πάντα γὰρ ὅσα μὴ ὀργάνοις προσάγεται, ἢ * συμφύσει ἐγγὺς ἄνωθεν κοῖλα ὄντα, ἢ πνεύματι ἕλκονται ἐκ τούτου τοῦ τόπου. διὸ ἐπιμελοῦνται * ὅπως γένηται ξηρός, ὥσπερ πρὶν τοῦτο συμβαίνειν.

* Sylb. εἰς αὐτὴν non malè.
* Scal. ἀλλ' ἐὰν ᾖ ... ἄν.
* χ. δύναιτο
* χ. ἐξ ἴσου.
* γρ. περιελείπετο
* γρ. δυνατόν
* γρ. εἰς ξηρόν
* Scal. verſio hanc lectionē præſe fert, ἢ φύσει ... ἄνωθεν κοῖλα ὄντα, ἢ πνεύματι ἕλκονται, ...
* Scal. [illegible]

29 πέφυκε δὲ οὕτως ἡ ὁδὸς, δι' ἧς ἔρχεται, ταῖς γυναιξὶν· ἔχουσι καυλὸν, ὥσπερ καὶ οἱ ἄνδρες τὸ αἰδοῖον· ἀλλ' ἐν τῷ σώματι· ἀποπνέουσι διὰ τούτου μικροῦ τε πόρου ἀνωτέρω, ἢ οὐροῦσιν αἱ γυναῖκες. διὸ καὶ ὅταν ὀργῶσιν ἀφροδισιάζειν, ἔστι ὁ τόπος οὐκ ἔχει ὁμοίως καὶ πρὶν ὀργᾶν. ἀπὸ δὲ τούτου τοῦ καυλοῦ γίνεται ἡ ἐκπτωσις, καὶ τὸ ἔμπροσθεν τῆς ὑστέρας πολλῷ μεῖζον, ἢ καθ' ὃ εἰς ἐκεῖνον τὸν τόπον ἐκπίπτει. ὅμοιον δ' ἐστὶ τοῦτο κατὰ τοῦτο τὸ μόριον. καὶ γὰρ αἱ ῥῖνες ἔχουσιν εἴσω εἰς τὸν φάρυγγα πόρον τινὰ, καὶ εἰς τὸν ἔξω ἀέρα· οὕτω καὶ ἐκεῖ, καὶ ἔξω ἔχει πόρον μικρόν τε πάνυ καὶ στενὸν, ὅσον * πνεύματι ἐξόδου· τὸν δὲ εἰς τὸ ἔμπροσθεν τῆς ὑστέρας, εὐρύχωρον, ὥσπερ αἱ ῥῖνες τὸν εἰς τὸν ἀέρα μείζω τοῦ εἰς τὸ στόμα καὶ φάρυγγα. ὁμοίως δὲ καὶ αἱ γυναῖκες μείζω τὸν εἰς τὸ ἔμπροσθεν τῶν ὑστερῶν πόρον ἔχουσι, * καὶ εὐρυχωρότερον τὸ ἔξω. * ὅτι συμβάλλεται, εἰς τοῦτο ποιεῖ τὴν αὐτὴν παθημάτων, ὅτι καὶ ἡ γυνὴ γόνιμον προΐεται. 30 τὰ δ' αὐτὰ αἴτια ταῦτα συμβαίνει. καὶ γὰρ οἷς νόσου ἢ θανάτου δοκεῖ ἐστερῆσθαι τὸ αἴτιον, θεωρεῖν τὸ τελευταῖον ἐπὶ τὰς ἀρχὰς ὃ δεῖ ὁρᾶν. ταῖς μὲν γὰρ ταῦτα αἴτια τὰ πρῶτα, ταῖς δὲ, οὐδὲν· τῶν δὲ, τὰ μὲν, τὰ δὲ, οὔ. ἀποδιδόναι οὖν κατὰ λόγον καὶ τὰ ἀποβαίνοντα· καὶ ταῖς μὲν, διὰ πάντων συμβαίνει διελθεῖν τῶν αὐτῶν παθημάτων· ταῖς δὲ, διὰ πολλῶν, οἷς πολλά· ταῖς δὲ, δι' ὀλίγων· ταῖς δὲ, δι' οὐδενὸς, ὅσοις μηδέν. 38 * Φανερὸν δὲ τὰ ζῷα ὅτι, ὅταν συνδυάζειν δέηται, διώκει γὰρ τὰ ἄρρενα· οἷ αἱ ἀλεκτορίδες διώκουσι καὶ ὀφιζάνουσιν αὐταὶ, ἐὰν μὴ ὀργᾷ ὁ ἄρρην. τοῦτο δὲ ποιεῖ καὶ ἄλλα ζῷα. εἰ δὴ ταῦτα πάθη πᾶσι τοῖς ζῴοις φαίνεται ὄντα περὶ τὴν συνουσίαν, δηλονότι καὶ τὰ αἴτια συμβαίνοντα· ἀλλὰ μὴν ἥ γε ὄρεξις οὐ μόνον τοῦ λαβεῖν ἐπιθυμίαν, ἀλλὰ καὶ τοῦ προέσθαι· σημεῖον δὲ τούτου. ἐὰν γὰρ μὴ προῆ ὁ ἄρρην, πίπτει ὑπ' αὐτὴν, καὶ ἕλκος γίνεται, καὶ τίκτει ὑπηνέμια, ὡς ἐπιθυμοῦσα καὶ τοῦ ἀφεῖναι τότε, καὶ ἀφεῖσα, ὅταν καὶ τῷ ἄρρενι ἅμα. ὅσα δὲ πνεύματι, πάντα ἰσχύϊ ἐργάζεται. ὥστε * δῆλον ὅτι καὶ τὸ σῶμα προεματικὸν τὸ τῆς τοιαύτης. 32 Εἰσὶ δέ τινες αἱ πάσχουσί τι τοιοῦτον, ὃ καλοῦσιν ἐξανεμοῦσθαι. δεῖ δὲ καὶ τοῦτο μὴ πάσχειν. ἔστι δὲ τὸ τοιοῦτον πάθος, ὅταν συγγένωνται τῷ ἀνδρὶ, * οὔτε προΐεσθαι δοκεῖ τὸ σπέρμα, οὔτε κυΐσκονται· διὸ καὶ καλεῖται ἐξανεμοῦσθαι. αἴτιον δὲ τοῦ πάθους ἡ ὑστέρα, ὅταν ᾖ λίαν ξηρά. ἑλκύσασα γὰρ πρὸς αὐτὴν τὸ ὑγρὸν, ἀφίησιν ἔξω. τὸ δὲ, κατασκελετεύεται, καὶ μικρόν τι γινόμενον ἐξ αὐτοῦ ἀπέπεσέ τε, καὶ ἔλαθε διὰ μικρότητα ἐξιόν. καὶ ὅταν μὲν τοῦτο σφόδρα πάθη ἡ ὑστέρα, καὶ ἤρξηται ὑπερξηρὸς, ταχύ τε ἀπέβαλε, καὶ ταχὺ δῆλον γίνεται ὅτι οὐ κύει. ἐὰν δὲ μὴ σφόδρα ταχέως ταῦτα ποιῇ, ἐν τῷ μεταξὺ χρόνῳ δοκεῖ κύειν, ὃ ἂν ἔχῃ αὐτὴ πρὸς αὐτὴν, ἕως ἂν ἀποβάλῃ· καὶ ὅμοια συμβαίνει ταχὺ ταύτης παθήματα ταῖς ὀρθῶς κυούσαις· καὶ ἐὰν γίγνηται πολὺς χρόνος, αἴρεται ἡ ὑστέρα ὥστε φανερῶς δοκεῖν κύειν, ἕως ἂν ἀποπέσῃ. τότε δ' ὅμοια ἐγένετο, οἷα πρότερον ἦν.

* Fortaſſe πνεύματι, ait Scal.

* Scal. καὶ εὐρ. τὸ ἔξω.

* Scal. vertit quaſi legeret, ... αἱ συμβαίνουσιν εἰς τὰ αὐτὰ παθήματα. vel ... τῶν αὐτῶν παθημάτων.

VI.

* Interpres tmematum 31. & 38. permutauit: vide eius Comm.

* γρ. δῆλον ὅτι

* Fort ἔτι πρ. δή- ... κυΐσκονται.

A xxix. Comparauit autem natura viam in mulieribus, qua ſemen egrediatur, ad hunc modum. Colem .n. habent, quemadmodum viri penem, ſed in ore ipſo per illum reflant puſillo meatu: ſitus paulo altior eſt quàm is quo vrinam reddunt. Quo fit vt ea pars aliter ſeſe habeat, quum ſibi in Venerem incitâtur, quàm cùm non appetunt. Ab hoc igitur cole fit ſeminis caſus. Anteriorem autem matricis regionem natura multò conſtituit maiorem, quàm is ſit meatus, per quem illum in locum excidit. Eſt autem id ſimile naribus hâc in parte. Nares enim meatum quendam habent peruium, tum in guttur, tum in aërem extrorſum. Eodem modo & in matrice meatus eſt
B paruus admodum & perangustus: quippe quantum ſatis ſit ad ſpiritus exitum. anteriorem autem matricis locum latum ac ſpacioſum: quem admodum nares quoque latiores ſunt, qua parte ad aërem flant, quàm qua reflant ad os & guttur. Ad eum modum mulieres quoque eam viam, quæ ad matricis anteriorem locum pertinet, habent maiorem & ampliorem, quàm eam quæ foras tendit. Quodcunque autem hunc in locum conficietur, ſimiles efficiet effectiones, propterea quòd mulier ipſa quoque prolificum iacit ſemen. xxx. Hæc autem eaſdem conſequantur cauſſas. Quas cauſſas qui aut ad morbum aut ad mortem referunt in alterutro: id,
C quod poſtremum eſt, loco principij contemplantur. Hoc autem animaduertere operæ pretium eſt. Etenim in quibuſdam, principia ipſa in cauſſa ſunt: in aliis autem, nulla. In aliquibus autem partim inſunt ſic, partim non ita. Quare contingit, eas affici ſecundùm proportionem: ſi quidem nonnullæ patiuntur omnes affectiones, quædam magnam partem, quibus magna cauſſa eſt: aliæ paucas: aliæ autem nihil penitus, quibus nulla eſt cauſſa. *Spiritu autem quæ agunt, vi id efficiunt.* Quare matricis eiuſmodi corpus facultatem obtinet attrahendi. xxxi. Euenit autem interdum tum mulieribus nocturna venere, tum viris, ſi coitu exonerati ſint, melius ha-
D beant, non robore, ſed valetudine. Id quòd fit propter ſeminis coagmentati copiam eo in loco, vnde emitti conſueuit. Quippe inde ſemine exeunte, nihilo fiunt imbecilliores. Neque enim tunc exoluuntur, cùm adhuc relinquitur, quod ſit & ſatis, & vtile & facile ad habendum: quippe perfluis partibus exoneratum. Itaque non robore, ſed leuitate fiunt habiliores. Verùm ſi ex iis quorum corpus indiget, quicquam ademptum ſit, imbecilliores fiunt. * quanquam affectus ille citò tollitur: vbi tantundem repoſitum ſit. xxxii. Cauendum eſt, mulieres ne patiantur id quod quibuſdam euenire ſolet. Hoc appellant Græci, ἐξανεμοῦσθαι: Latini, fruſtrari.
E Fit autem, vbi in coitu neque proiiciunt quicquam neque concipiunt. Vnde & nomen fruſtrationis comparatum eſt. In cauſſa eſt matrix quæ admodum arida ſit. Ea enim ita affecta attractum ad ſeſe humorem emittit foras. Is tum humor attenuatur præter modum, atque puſillum fit: Tum dilabitur, neque ſentitur, propter exiguitatē. Igitur matrix ſi vehementer ac ſupra modum ſicca ſit, celeriter ſemen abigit: citòque palam fit, fœminā non concepiſſe. Quòd ſi nō valde feſtinat ad eiiciendū, tantiſper videtur vterū gerere, ſi eius tumor cū priore ſtatu comparetur, donec abiiciat. at interea ſanè iiſdē affectionib. affliĉtantur, quibus eæ quæ verè vterum gerunt. Tum autē ſi plus tēporis adiiciatur, intumeſcit vterus adeò, vt apertè cōcepiſſe quoad excidat, videâtur. Ibi verò redit ad priſtinū ſtatū ſuum.

In ea igitur ſententia ſunt mulieres, hoc numinis cuiuſpiam euenire poteſtate. At id eſt aliquando medicabile: quippe eo morbo ſuapte natura mulier ſi non afficiatur. Animaduertimus autem carere hoc morbo eas quæ iaciente ſemen viro, ipſæ nullum iaciunt: quo fit vt ne cõcipiant quidem.

CAPVT IV.

XXXIII.

ALia quoque matricis impedimenta ſunt. Inter quæ conuulſio magnopere lædit. Item ignei calores, quos Græci φλεγμασίας vocant. Quoties diſtenditur matrix: aut quoties in locum confluxerit derepente magna humoris copia: neque aperitur os: tunc enim ex diſtentione conuellitur matrix. Poſſumus autem cognoſcere non conuelli matricem, cùm illam obſeruamus nullo igneo calore incendi. Id quod ex vſitatis eius functionibus patebit. Etenim ex conuulſione aliquando incenſio illa ſequi poteſt. XXXIIII. Item tubera matricis ſi occupauerint, atque ipſum vlcerum frequẽtia vitioſum ſit, impedimento erit ad concipiendum. Intelligimus autem vacuam eſſe ab his impedimentis matricem, ſi probè aperta ſit, ſi conniuet, poſtquam menſtrua ſunt ſoluta, ſiue cùm copiam ſui fecit viro. XXXV. Sunt autem nonnullæ fœminæ, quibus à principio ſui ortus matricis ora modo quodam coaluere. Aliàs propter cuiuſpiam morbi vim ita euenit. Qui morbus in nonnullis ſanè medicabilis eſt, in aliis non item. Deprehendes autem hoc incommodum ex his notis facilè. Neque enim aut recipere matrix, aut proiicere eorum poteſt quicquam, quæ opus habet. Quod ſi & recipit, & emittit, argumento erit, ipſam eo vitio carere. XXXVI. Quæ autem liberæ ab his impedimentis, atque eo, quem diximus, modo affectæ erunt, quanquam vterque aptus ſit ad generandum, neque vir ſterilis ſit, tamen niſi inter eos conueniat ad ſeminis emiſſionem, vt eodem fiat tempore, ſed valde diſcordes ſint: ij nunquam parentes fient.

CAPVT V.

XXXVII.

QVod autem ad viri pertinet generandi facultatem, inter alia argumenta quibus hoc deprehendimus, illud facile erit; ſi cum aliis coëat, neque concurrit ad ſeminis proiectionem, modò cætera omnia, quæ diximus, conueniant. Sic enim agnoſcemus, hanc vnam cauſam eſſe. Quippe ſi mulier quoque ſemen proiicit ad generandum, æqualem eſſe oportet curſum ab vtroque. Nam ſi ille citò peragat, illa autem nondum, (magna enim ex parte mulieres tardiores ſunt:) hoc erit impedimento. Ea enim cauſa eſt, propter quam coniuges inter ſe non generant. Nam ij generant, quorum proiectiones hinc atque hinc æqualiter concurrent. Ergo mulier ſi Veneris impetu agitata præſto ſit, & alacri & attento animo, vir autem triſtior, & frigidior: tunc neceſſariò ſemina inter ſe concurrent.

ἀναφέρουσι δὲ τοῦτο τὸ πάθος εἰς τὸ δαιμόνιον. ὃ ἐστι θεραπευτόν, ἐὰν μὴ φύσει τοιαύτη ἡ σφόδρα πάσχουσα * τὸ πάθει. σημεῖον δὲ τοῦ μὴ τοιαύτας εἶναι, ἐὰν φαίνωνται μὴ προϊέμεναι, ὅταν λάβωσι παρὰ τοῦ ἀνδρός, καὶ μὴ συλλάβωσι. 33 Κωλύονται δὲ, καὶ ἐὰν ἀπόσπασμα ἔχωσιν αἱ ὑστέραι. γίνονται δὲ ἀποσπάσματα ἐν ταῖς ὑστέραις ἢ φλεγμασίᾳ, διατεινομένης τῆς ὑστέρας· ἢ ἐν τῷ τόκῳ, πληρώματος πολλοῦ ἐξαπίνης ἐπιπεσόντος καὶ μὴ ἀνοιγομένου τοῦ στόματος· τότε ὑπὸ τῆς διατάσεως γίνεται ἀπόσπασμα. σημεῖον δὲ τοῦ μὴ ἔχειν ἀπόσπασμα, ἐὰν μὴ φαίνηται εἰς φλεγμασίαν ἀφικνουμένη ἐν τοῖς αὐτῆς ἔργοις ἡ ὑστέρα. ἔχουσα γὰρ ἀπόσπασμα, φλεγμαίνοι ἄν ποτε. 34 ἔτι δὲ ἐὰν φῦμα ἐπὶ τοῦ στόματος ᾖ, πολλὰ ἑλκωθέντος, ἐμποδίζει πρὸς τὰς συλλήψεις. σημεῖον δὲ τοῦ ταῦτα μὴ ἔχειν, ἐὰν φαίνηται ἀνοιγομένη καλῶς ἡ ὑστέρα, καὶ συμμύουσα, ὅταν γίνηται αὐταῖς τὰ γυναικεῖα, καὶ αἱ πρὸς τὸν ἄνδρα χρήσεις. 35 ἔτι ἔστιν αἷς πως τὸ στόμα συμφύεται, ταῖς μὲν ἐκ γενετῆς, ταῖς δὲ διὰ νόσον. γίνεται δὲ τοῦτο καὶ ἰατόν, καὶ ἀνίατον. οὐ χαλεπὸν δὲ τοῦτο γνῶναι, ἐὰν ᾖ. οὔτε γὰρ εἴσεισί τι οὔτε λαμβάνει οὐθὲν ὧν δεῖ, οὔτε προΐεται. ἐὰν οὖν φαίνηται καὶ δεχομένη παρὰ τοῦ ἀνδρὸς, καὶ ἀφιεῖσα, δῆλον * ὅτι κἂν ἔλεγχος εἴη τοῦ πάθους. 36 ὅσαις δὲ τούτων μηδὲν ἐμποδίζον ᾖ, ἀλλ' ἔχουσιν ὃν τρόπον δὲ εἴρηται ἔχειν, ἂν μὴ ὁ ἀνὴρ αἴτιος ᾖ τῆς ἀτεκνίας, * ἢ ἀμφότεροι δύνωνται τεκνοῦσθαι, πρὸς ἀλλήλους δὲ μὴ ὦσι σύμμετροι [τῷ] ἅμα προΐεσθαι, ἀλλὰ πολὺ διαφωνῶσιν, οὐκ ἔσονται τέκνα τούτοις. 37 Τοῦ μὲν οὖν εἰδέναι τὰ τοῦ ἀνδρὸς αἴτια, ἔστι μὲν καὶ ἄλλα σημεῖα λαβεῖν· ἃ δὲ * ῥᾷον μάλιστα φαίνοιτο, πρὸς ἄλλας πλησιάζων καὶ γεννῶν. τὸ γὰρ πρὸς ἄλλας μὴ συνδρόμους ἔχειν, πάντων τῶν εἰρημένων ὑπαρξάντων, οὐ γεννῶσιν. * δηλοῖ γὰρ ὅτι τοῦτο αἴτιον μόνον. εἰ γὰρ καὶ ἡ γυνὴ συμβάλλεται εἰς τὸ σπέρμα καὶ τὴν γένεσιν, * δῆλον ὅτι δεῖ ἰσοδρομῆσαι παρ' ἀμφοῖν. ἐὰν [γὰρ] ὁ μὲν ταχὺ ἐκποιήσῃ, ἡ δὲ μόλις (τὰ γὰρ πολλὰ αἱ γυναῖκες βραδύτεραι) τοῦτο κωλύει. * διὸ καὶ συζυγούμενοι, γεννῶσι μετ' ἀλλήλων οὐ γεννῶντες δὲ, ὅταν ἐντύχωσιν ἰσοδρομοῦσι πρὸς τὴν συνουσίαν. εἰ γὰρ ἡ μὲν, ὀργῶσα καὶ προεσκευασμένη εἴη, καὶ ἐννοίας ἔχουσα ἐπιτηδείας, ὁ δὲ, προλελυπημένος καὶ κατεψυγμένος, ἀνάγκη τότε ἰσοδρομῆσαι αὐτοὺς ἀλλήλοις. * 38 Ἔτι δὲ ἐνίοτε γυναιξὶ καὶ ὀξοκρωξάσαις, καὶ ἀνδράσιν ἀφροδισιάσασι, συμβαίνει εὐρώστοις εἶναι, μὴ ἰσχύειν, ἀλλ' ὑγιείᾳ. γίνεται δὲ τοῦτο, ὅταν πολὺ τὸ σπέρμα ᾖ καὶ ἠθροισμένον ἐπὶ τὸν τόπον, ὅθεν προΐενται. ἐὰν οὖν τότε ἀπέλθῃ, οὐδὲν ἀσθενέστεροι γίνονται. οὐ γὰρ ἀεὶ ἐκλύονται ἀπελθόντων, ὅταν ἱκανὰ ᾖ τὰ λείμματα· οὐδ' ἂν εἰ ἐκφλεγμάτωσιν(?) ἢ αἷμα καὶ ῥᾷον, εἶτα πλησιάσας ἀπαλλάττωνται· διὸ οὐκ ἰσχυρότεραι, ἀλλὰ κουφότεραι γίνονται. ἀλλ' ὅταν * ἀπὸ τοσούτων ἀπῇ, ὧν τὸ σῶμα δεῖται, τότε ἀσθενεστέρας ποιεῖ· παύεται δὲ ταχύ, * ὅταν σειῶσι(?).

* Scribe τὸ πάθος cum Scal. 533.

IIII.

* Emendat Scaliger ἐν ἐλέγχει(?). Fortaſſe nihil mutandum, & locus ita accipiendus. Si perſpicuum eſt quando matrix officio ſuo rectè fungitur (patet enim facilè cùm recipit illa à viro, & emittit) ergo etiam dignoſci facilè poterit, ſi hoc vitio laboret.

* Fort. εἰ καὶ ἀμφ.

V.

* Malim τὸ μάλιστα, ἢ φαίνοιτο πρὸς ἄλλας πλ. καὶ γεννῶν. τὸ δὴ πρὸς ἄλλ. Scal. paulò aliter, maiore mutatione.

* Malim ὅπερ δῆλον.

* γρ. ἀνάγκη(?)

* Lego minima mutatione: διὸ καὶ ἄλλοις συζυγούμενοι (vel, διὸ καὶ διαζευγνύμενοι) γεννῶσι, μετ' ἀλλήλων οὐ γεννῶντες, ὅταν ἐντυχ. h. e. *Quam etiam ob cauſam copulati aliis (vel facto diuortio) generant,* tam vir quàm mulier: *qui tamen inter ſe generare non poterant: ſi nacti ſint mutuum coniugem qui pari curſu in generando ſemen proiiciat.*

CAPVT VI.

XXXVIII.

ADueniente autem coitus tempore, animantes ipſæ libidinis indicium mares inſectando manifeſtum oſtendunt. Etenim gallinæ, ſi gallus Venerem ſegniùs appetat, ſequuntur eum: atque ipſæ ſeſe ſubiiciunt illi: quemadmodum cætera quoque animalia. Quod ſi omnibus ita euenit, omnibus item erunt cauſſæ eædem communes. Quanquam genus auium non ſolùm recipiendi ſemen, ſed etiam proiiciendi libidine incendi argumento eſt id: quippe ſi mas nullus adſit, proiiciunt intra ſeſe, atque ita prægnantes fiunt. Quo conceptu eduntur oua, quæ Græci vocant ὑπηνέμια. Hoc autem ſatis indicat deſiderio maris proieciſſe tunc, tanquã ſi maris initum paſſa eſſet. Nã ſedatur ea affectio, ſi ineatur.

* Vide Scalig.

* Scal. ἀπαλλάττωνται(?)

* Vide Scal.

39 Ποιεῖ δὲ τοῦτο καὶ τἆλλα· ἐπεὶ καὶ τῶν ἀδουσῶν ἀκρίδων ἤδη τις ἐπιμεληθη τρέφουσα, ἐπὶ ἁπαλὰς λαβοῦσα· καὶ ἐγένοντο αὐτόματοι ἔγκυοι. 40 Ἐκ δὴ τούτων δῆλον ὅτι συμβάλλεται εἰς τὸ σπέρμα πάντῃ τὸ θῆλυ, εἴ γε καὶ ἐφ' ἑνὸς γένους φαίνεται τοῦτο γινόμενον. οὐδὲν γὰρ διαφέρει τὸ ζῷον τὸ ὑπηνέμιον τούτου, ἀλλὰ τῷ μὴ γίνεσθαι ζῷον. τοῦτο δ', ὅτι καὶ παρ' ἀμφοῖν ἦλθε. διὸ οὐδὲ τὰ ἀπὸ τοῦ ἄρρενος ἅπαντα γόνιμα φαίνεται, ἀλλ' ἔνια ἄγονα, ὅταν μὴ ἐξ ἀμφοῖν ὡς δεῖ συναρμοσθῇ. *ἔτι γυναῖκες ἐξονειρώττουσι, καὶ ταύταις γίνεται, ὡς ὅταν συγγένωνται ἀνδρί, ταὐτὰ παθήματα μετὰ τὸν ὀνειρωγμόν, διάλυσις καὶ ἀδυναμία. δῆλον τοίνυν, εἰ ἐν τῷ ἐξονειρωγμῷ φαίνονται προϊέμεναι, * καὶ τότε συμβάλλονται· ὅτι μετὰ τοὺς ἐξονειρωγμοὺς ὁ αὐτὸς τόπος ἀφυγραίνεται. καὶ θεραπείας δέονται τῆς αὐτῆς αὐταὶ ὑφ' αὑτῶν, ὥσπερ ὅταν συγγένωνται ἀνδρί. ὥστε φανερὸν ὅτι παρ' ἀμφοῖν γίνεται πρόεσις τοῦ σπέρματος, εἰ μέλλει γόνιμον ἔσεσθαι. 41 Προΐεται δ' οὐκ εἰς αὐτὰς αἱ ὑστέραι, ἀλλ' ἔξω, οὗ καὶ ὁ ἀνὴρ εἶτ' ἐκεῖθεν ἕλκει εἰς αὑτάς· * ὧν τὰ μὲν γόνιμα ἀφ' αὑτῶν τὰ θήλεα, οἷον ὄρνις τὰ ὑπηνέμια· τὰ δ', οὐδέν, οἷον ἵπποι καὶ πρόβατα. ἢ ὅτι ἡ μὲν ὄρνις εἰς τὴν ὑστέραν προΐεται, καὶ οὐκ ἔστιν ἔξω τόπος εἰς ὃν ἀφίησιν, * οὐδὲ ὁ ἄρρην· διὸ ἐὰν μὴ τύχῃ ὀχεύων, εἰς τὴν γῆν ἐκχεῖ. τοῖς δὲ τετράποσιν ἐστὶν ἔξω τόπος ἄλλος, εἰς ὃν καὶ τὸ θῆλυ προΐεται καὶ τὸ ἄρρεν ὥσπερ τῆς μὲν ἄλλοις μετὰ τῶν ἄλλων ὑγρῶν συγχεῖται, καὶ οὐ συνίσταται ἐν τῇ ὑστέρᾳ διὰ τὸ μὴ εἰσιέναι· ταῖς δ' ὄρνισι λαβοῦσα ἡ ὑστέρα συμπέττει, καὶ σῶμά τι ὅμοιον τἆλλα, πλὴν οὐ ζῷον· διὸ δεῖ ἐξ ἀμφοῖν τὸ ζῷον εἶναι. 42 Ἔστι δ' ἐνστῆναι, εἰ ἀληθῆ λέγουσι φάσκουσαι, ὅτι ἂν ἐξονειρώττωσι, ξηραὶ * ἀνίστασθαι. δῆλον γὰρ ὅτι ἕλκει ἡ ὑστέρα ἄνωθεν. ὥστε διὰ τί οὐ γεννᾷ αὐτὰ καθ' αὑτὰ τὰ θήλεα, ἐπείπερ καὶ μιχθὲν ἕλκει τὸ τοῦ ἄρρενος; διὰ τί * οὐχὶ καὶ αἱ αἶγες τὸ αὐτῆς ἕλκει, ὅταν εἰς τὸ ἔξω διατείνῃ· ὡς γίνεται τοῦτο τὸ πάθος κυούσαις ἔτη πολλά. 43 Τίκτουσι γὰρ ὃ καλοῦσι μύλην· ὃ συνέβη τινὶ γυναικί· συγγενομένης τῷ ἀνδρί, καὶ δοξάσης συλλαβεῖν, ὅτι ὄγκος ηὐξάνετο τῆς ὑστέρας, καὶ τἆλλα ἐγίγνετο τὸ πρῶτον κατὰ λόγον. ἐπεὶ δ' ὁ χρόνος ἦν τοῦ τόκου, οὔτε ἔτικτεν, οὔτε ὁ ὄγκος ἐλάττων ἐγίγνετο· ἀλλ' ἔτη τρία ἢ τέτταρα οὕτω διετέλεσεν, ἕως δυσεντερίας γενομένης, καὶ κινδυνευσάσης αὐτῆς, ἔτεκε σάρκα τὸ μέγεθος ἣν καλοῦσι μύλην. ἐνίαις δὲ καὶ συγκαταγηράσκει τὸ πάθος, καὶ συναποθνήσκει. 44 Πότερον δὲ διὰ θερμότητα γίνεται τὸ πάθος τοῦτο, ὅταν τύχῃ ἡ ὑστέρα θερμὴ καὶ ξηρὰ οὖσα, καὶ διὰ ταῦτα σπαστικὴ πρὸς αὑτήν, καὶ οὕτως ὥστ' ἐστὶν αἰρέσθαι καὶ φυλάξαι πρὸς αὐτήν· οὕτω γὰρ ἐγγίνεται, ἐὰν μὴ μεμιγμένον ᾖ τὸ ἀπ' ἀμφοῖν, ἀλλ' ὥσπερ τὸ ὑπηνέμιον ἐνδέξηται ἀπὸ θατέρου, τότε γίνεται ἡ καλουμένη μύλη· οὔτε ζῷον, διὰ τὸ μὴ παρ' ἀμφοῖν· * οὔτε ἄψυχον, διὰ τὸ ἔμψυχον ληφθὲν εἶναι, ὥσπερ τὰ ὑπηνέμια.

* γρ. ἐπὶ γ.

* Scal. ἐπεὶ οὐ συμβ. ἐπιμ.

* Scal. ἅσπερ τ.

* Scal. ὡς οὐδὲ ἐν ἄν.

VII.

* Melius ἀνίστασθαι. ita tamen ſæpe.

* Vide Scalig. Comm.

* Vide Comm. Scalig.

A XXXIX. Hoc idem alia quoque faciunt animalia. ſiquidem muliercula olim, ex earum cicadarum genere quæ canoræ ſunt, aliquas inuen[illegible] alendas curauit. Atque illæ ſponte ſua prægnantes inuentæ ſunt. XL. Ex his igitur liquet, vniuerſum fœmineum ſexum conferre ad ſemen: ſiquidem etiam vno in genere hoc fieri videmus. Neque enim differt illud animal quod hypenemium dicimus, ab hoc: niſi quòd ex illo animal non generatur. Hoc autem ab vtroque proceſſit. Quare ne ea quidem quæ ab ſolo maſculo proficiſcuntur, prolifica ſunt omnia, ſed è quibuſdam nihil oritur, niſi ex vtriſque, ſicut res exigit, componantur. Præterea mulieres per ſomnium afficiuntur, quaſi cum viris vbi concumbunt, atque B eas ijdem affectus conſequuntur, exolutio ſcilicet ac languor. Ergo in ſomnijs ſemen ſi videntur iacere, etiam tunc conijcient. Siquidem poſt ea inſomnia idem locus humectatur: indigéntque abſterſionis: quemadmodum cum viris ſi coeant. Palam igitur eſt, ab vtroque ſemen emitti: ſi ex eo proles generanda eſt. XLI. Locus autem in quem ſemen ſuum iacit matrix, quanquam in matrice ipſa eſt, nõn eſt alius tamen, quàm is, in quem iacit vir: tum inde trahit in ſe. Quare aliquæ fœminæ per ſeipſas generant, vt aues oua caſſa: aliquæ autem nihil gignunt, vt equæ & oues. An verò fit hoc propterea, quòd aues in matricem ia- C ciunt, propter quam nullum habent locum foris, in quem iaciant: ſicuti neque mas: quippe, ſi non init, in terram effundit ſemen. At genus quadrupedum habet extra matricem locum alium, in quem tam mas quàm fœmina conijciunt. Quod cum alijs humoribus confunditur, neque conſtituitur in matrice, idcirco quia in eam non eſt ingreſſum. At in auibus matrix ſemen arripit, atque concoquit, corpúſque efficit, animali quidem ſimile, ſed vita caſſum. Quare oportet animal ex vtriſque fieri.

XLII. CAPVT VII.

D INſtare autem licet. Nam ſi verum eſt quod aiunt, à nocturna Venere, qua inſomnia ſoluuntur, ſicca nihilominus vulua exurgere: ſatis patet matricem ad ſeſe ſurſum attrahere. Igitur quam ob cauſam eæ fœminæ ſine viris non gignunt? Quippe maris trahunt ſemen: vbi id cum ſuo cõmiſtum fuerit. Ergo capræ quoque cur non attrahent id quod foras permeat, ſicut iis euenit, quæ gerunt vterum annos multos? XLIII. Pariũt enim id quod molam vocant. Olim hoc euenit mulieri cuidam: quæ in concubitu cùm viſa eſſet facta grauida, propterea quòd tunc vterus intumuerat: tum cætera ſigna ſunt conſecuta. Elapſo E autẽ iuſto tempore pariundi, neque ipſa peperit, neque venter detumuit: ſed tertium quartumve ſuperauit annũ, donec non ſine periculo correpta eſt cruento alui profluuio, quam Græci δυσεντερίαν vocant. Atque ita grandem carnis molem peperit quam molam appellãt. Nonnullæ namque exoneratæ ſunt: ſed exacta ætate illius morbi atque earum vitæ idem finis fuit. XLIV. Eſtne igitur in cauſſa eiuſmodi affectionis, calor? propter quem matrix habeat ad ſeſe attrahendi facultatem? Quippe quæ etiam ſicca ſit. Quibus de cauſſis & tollere & ſeruare vellet. Quæ enim eiuſmodi ſunt: niſi ſemen ab vtroque miſtum ſit, ſed ab alterutro tantummodo, in ijs euenit, vt quaſi id, quod hypenemium vocabamus, fiat hoc quod molam nominant. Id autem neque animal eſt: propterea quòd ex ambobus ſeminibus non eſt confectum: neque inanimum, quia quod receptum eſt, habuit animantis principia, ſicut & hypenemia.

XLV. Diuturnæ autem geſtationis non vna cauſſa eſt. Nam & matricis natura ad id eſt comparata. Et auium genus quoddam, quoniam intra ſe numeroſa parit oua, ab iis commota matrix iccirco propellit, & parit. Quæ ſemel aperta vbi fuerit, ad vnum omnia exeunt. Neque enim quicquam eſt, quod arceat. Verùm quia ſemel repletum matricis corpus fuit, poſtquam eò redactum eſt vt eijciat, nullam obtinet amplius facultatem contra attrahendi. at verò quæ animalia viuum gerunt in vtero animal, eorum matrix ad expulſionem nō ſolicitatur: niſi ipſa igneos calores, quos vocant phlegmonas, patiatur. Id quod fieri conſueuit incrementum capiente fœtu, mutatóque in validiorem habitudinem: quo tempore excitatur etiam ad vberiores cibos capiendos. at caro iſta molæ, cùm animal non ſit, æquali ſuperficie contenta fuit. Itaque non niſi propter pondus ſuum in cauſſa eſſe poteſt tandem, vti matrix incendatur. Id quod nonnullis euenit aliquando. Quare quo ad viuunt, interdum gerunt: niſi fortè quæpiam ęgrotent, velvti illa quæ cruento alui profluuio capta fuit. XLVI. Vtrùm igitur propter calorem fit hoc, quemadmodum diximus: an potiùs propter humorem? Eſt enim quaſi plena, ſicvt & cùm clauſa eſt. An tum fit, cùm matrix, neque tam frigida eſt, vt amittere poſſit: neque tam calida, vt concoquere valeat? Quare neceſſe eſt, longinquam fieri ægritudinem. Videmus enim quædam, quæ ad coquendum multi egent temporis. Quæ autem percocta, ſunt adepta finem ſuum, celeritatem quoque nanciſcuntur. Huiuſmodi verò matrices peſſimè temperatæ cùm ſint, multum ponunt temporis. XLVII. Præterea mola, cùm animal non ſit, ac propterea nullum cieat motum, dolorem nullum facit: eſt enim parturiendi dolor ex motu ligamentorum, quem facit fœtus vitæ appetens. XLVIII. Tum autem duritia eiuſmodi corporis prohibet efficaciam concoctionis: adeo enim durum fit, vt etiam ſecuris aciem reſpuat. Quæ enim aut percocta, aut matura ſunt, omnia teneſcunt. Quæ autem prædecerpta, ea & immatura, & dura. XLIX. Non defuerunt autem medici, quibus ignota eſſet molæ res, quo pacto ſe haberet. Qui viderent ventris tumorem: cùm neque aqua intercus eſſet, neque menſtrua ſoluerentur, neque ceſſaret tumor. Nempe ergo falſi ſunt. at enimvero perrarò vſu venit, vti molæ generentur. Sed interdum confluunt in ventrem humores ſuperflui, iique frigidi ac liquidi: interdum ſecundùm naturam & habitum craſſiores: atque ij neque dolorem creant, neque calore afficiunt: quoniam ſunt frigidi ipſi. neque aliud afferunt nocumenti quicquam, cùm capiant incrementum, ſiue minus ſiue maius; ſed quaſi res imperfecta otiū agitat. L. Siſtuntur autem menſtrua iccirco, quia cum in focum ſuperflua inſumuntur: quemadmodum & nutricibus: quibus, præter puſillum admodum raro quicquam ſoluitur menſtruorum. LI. Fit autem vt tumor ex humoribus de carne confluentibus in locum, qui inter matricem atque aluum interiacet, molæ ſpecimen falſò præbeat. Dignoſcetur autem matrix tali carere morbo: ſi ipſa attrectando compoſita, neque tumida inueniatur. Quæ ſi ſit eiuſmodi, quaſi cùm aut fœtum aut molam gerunt, erit calida & frigida & ſicca: propterea quòd humor introrſum conuerſus ſit. Os quoque tale erit, quale cùm grauidæ ſunt. Quòd ſi alterius generis tumor ſit, erit ad tactum frigida, ſed non ſicca: os autem ſemper ſimile.

45 Πολὺν δὲ χρόνον ἐμμένει, διά τε τὴν τῆς ὑστέρας διάθεσιν, καὶ διότι ἡ μὲν ὄρνις πολλὰ εἰς αὑτὴν τίκτουσα, ὑπὸ τούτων* γινομένης τῆς ὑστέρας, προεξάγει καὶ τίκτει· καὶ ὅταν ἅπαξ οἰχθῇ, καὶ τὸ τελευταῖον ἐξέρχεται. οὐ γάρ ἐστι τὸ εἶργον, ἀλλὰ κατὰ σῶμα προεξετικὸν γινόμενον, ὅτε ἐπληρώθη τότε οὐκ ἔτι τὴν ὑστέραν ποιεῖ ἀντισπαστικήν.* ὅσα δὲ ζωοφορεῖ, διὰ τὸ μεταβάλλειν τὴν δύναμιν αὐξανομένου, καὶ ἄλλοτε ἀλλοίας δεῖσθαι τροφῆς, ἐπιφλεγμαίνουσά τι ἡ ὑστέρα ποιεῖ τοῦτον τίκτειν. ἡ δὲ σὰρξ, διὰ τὸ μὴ ζῷον εἶναι, ἀεὶ τὴν ὁμαλῶν. δεῖ γὰρ ὁ βαρύνει τὴν ὑστέραν* οὐδὲν οἷόν φλεγμαίνειν. ὡς ἐνίαις γε καὶ συναποθνήσκει τὸ πάθος, *ἐὰν μὴ δι' *ἐντύχημα ἀτυχήματος συμβῇ, οἷον τῇ ληφθείσῃ ὑπὸ τῆς δυσεντερίας. 46 Πότερον δή, ὥσπερ εἴρηται, διὰ θερμότητα γίνεται τὸ πάθος, ἢ μᾶλλον δι' ὑγρότητα, ὅτι καὶ ἔστι τὸ πλήρωμα *οἷον μύλη, ἢ ὅταν μὴ οὕτως ᾖ ψυχρὰ ἡ ὑστέρα, ὥστε ἀφεῖναι· μηδ' οὕτω θερμή, ὥστε πέψαι; διὸ καὶ χρόνιον τὸ πάθος, ὥσπερ καὶ τὰ ἐν ἑψήσει πολὺν χρόνον διαμένει. τὰ δ' ἑψόμενα, τέλος ἔχει καὶ ταχυτῆτα. αἱ δὲ τοιαῦται ὑστέραι *ἀκρότατοι οὖσαι, τὸν χρόνον ποιοῦσι πολύν. 47 Ἔτι δὲ τὸ μὴ ζῷον εἶναι μὴ κινούμενον, οὐ ποιεῖ τὴν ὠδῖνα. ἡ γὰρ κίνησις τῶν συνδέσμων, ὠδίς ἐστιν *ἣν διὰ τὸ ζῆν προσγίνεσθαι τὸ κυόμενον. 48 Καὶ ἡ σκληρότης δὲ ἡ γιγνομένη τοῦ πράγματος, κωλύσεως ἔργον ἐστίν. οὕτω γὰρ γίνεται σκληρόν, ὥστε πελέκει οὐ δύνανται διακόπτειν. τὰ μὲν [γὰρ] ἑφθά, καὶ πάντα τὰ πεπεμμένα, μαλακὰ γίγνεται* τὰ δὲ ἀπολελυμένα, ἄπεπτα καὶ σκληρά. 49 *Ὅ,τι πολλοὶ ἰατροὶ ἀγνοοῦντες δι' ὁμοιότητα, μύλας εἶναι τὸ πάθος λέγουσιν, ἂν μόνον ἴδωσι τάς τε κοιλίας ἐπαιρομένας ἄνευ ὕδρωπος, καὶ τῶν ἐπιμηνίων ἄφεσιν, ὅταν χρονίζῃ τοῦτο τὸ πάθος. τὸ δ' οὐκ ἔστιν, ἀλλ' ὀλιγάκις γίνονται αἱ λεγόμεναι μύλαι. ἄλλοτε μὲν σύρροιες γίνεται ψυχρῶν καὶ ὑγρῶν περιττωμάτων, καὶ ὑδαρῶν· ἄλλοτε δὲ παχυτέρων, εἰς τὸν περὶ τὴν κοιλίαν τόπον, ἐὰν τὴν φύσιν τοιαύτη ᾖ, ἢ τὴν ἕξιν. ταῦτα γὰρ οὔτε *ὀδυνηρὰν παρέχει, οὔτε θερμότητα, διὰ ψυχρότητα. αὔξησιν δὲ λαβόντα, τὰ μέν, μείζω, τὰ δέ, ἐλάττω, οὐδεμίαν ἄλλην ἐπισπῶνται νόσον περὶ ἑαυτά, ἀλλ' ὥσπερ πήρωμα ἡσυχάζει. 50 Ἡ δ' ἀπόληψις τῶν καταμηνίων γίνεται, διὰ τὸ δεῦρο καταναλίσκεσθαι τὰ περιττώματα, ὥσπερ καὶ ὅταν θηλάζωνται. καὶ γὰρ ταύταις ἢ οὐ γίνεται, ἢ ὀλίγα. 51 Ἔστι δ' ὅτε καὶ εἰς τὸν μεταξὺ τόπον τῆς ὑστέρας καὶ τῆς κοιλίας συρρέον, ἐκ τῆς σαρκός, δοκεῖ μύλη εἶναι, οὐκ οὖσα. ἔστι δ' οὐ χαλεπὸν γνῶναι,* αἱ μύλαι* θιγγάνουσα ἡ τῆς ὑστέρας. ἐὰν γὰρ ᾖ εὐσταλής, καὶ μὴ ἔχουσα αὔξησιν, δῆλον ὅτι οὐκ ἐν ἐκείνῃ τὸ πάθος. ἐὰν δὲ τοιαύτη ᾖ, οἷον ὅτε παιδίον ἔχει μύλην, θερμή τε καὶ ψυχρὰ καὶ ξηρὰ ἔσται, διὰ τὸ εἴσω τετράφθαι τὰ ὑγρά· καὶ τὸ στόμα τοιαύτη, οἷον ὅταν κύωσιν. ἐὰν δέ τι ἄλλο ᾖ ὁ ὄγκος, ἔσται ψυχρὰ θιγγανομένη, καὶ οὐ ξηρά, καὶ ἀεὶ τὸ στόμα ὅμοιον.

* Scal. κινουμένης τῆς ὑστέρας προεξάγει
* Scal. ὅσα δ' ζῳοτοκεῖ, οὐ ... ἀλλ' ...
* Scal. οὐδὲν οἷόν τε φλεγ.
* Fort. ἐὰν μὴ τι
* Fort. ἀτύχημα Sylburg.
* Scal. οἷον ἢ ἐν μύλῃ,
* Scal. ἀκρατέσταται
* Sylb. ἣν, διὰ τὸ ζῆν προσγίνεσθαι ...
* Fort. πεπεμμένα. quia πέπανσις eſt τῇ ἑψήσει contraria. Meteorol. lib. 4 c. 1. & alibi. Sylb.
* Scal. legit ὃ
* Scal. ὀδύνην. vel ſcri. edum, ὅτι ὀδυνηρὰ οὐ παρέχει ...
* Scal. αἱ μύλαι θιγγανόμεναι τῆς ὑστέρας.

LII. Quæ autem arbitrantur, fieri non poſſe vt concipiant, niſi ſicca vulua exurgant à coitu, nihilque compareat ſeminis immiſſi, eæ tunc falluntur: cùm plus emittitur ſeminis, & ab ipſis, & à viris, quàm quantum ſatis ſit: quaſi totum contineri ita oporteat, vt non compareat. vbi igitur quantum ſatis habet, attraxerit, ac reliqui multum factum ſit: tum verò ignaræ ſunt quemadmodum grauidæ euaſerint. at hoc verum eſſe, neque totum requiri [illegible] men ad conceptionem, palam eſt in iis [illegible] bus quæ vnico initu multa pariunt. Si[illegible] mellorum generatio, quæ vno coitu [illegible] paret enim non ex toto ſemine, ſed [illegible] tionibus generatis: quas portiones [illegible] receperint. Reliquum autem mul[illegible] quanquam remiſſum eſt.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΖΩΩΝ ΜΟΡΙΩΝ ΤΟ Α.

ARISTOTELIS STAGIRITÆ DE PARTIBVS ANIMAlium & earum cauſis,

LIBER I.

Theodoro Gaza Interprete.

ΚΕΦΑΛ. α'.

Ὅτι περὶ πᾶσαν θεωρίαν καὶ μέθοδον δύο εἰσὶ τρόποι τῆς ἕξεως.

ΠΕΡΙ πᾶσαν θεωρίαν καὶ μέθοδον, ὁμοίως ταπεινοτέραν τε καὶ τιμιωτέραν, δύο φαίνονται τρόποι τῆς ἕξεως εἶναι· ὧν τὴν μὲν ἐπιστήμην τοῦ πράγματος, καλῶς ἔχει προσαγορεύειν, τὴν δ' οἷον παιδείαν τινά. πεπαιδευμένου γάρ ἐστι κατὰ τρόπον, τὸ δύνασθαι κρῖναι εὐστόχως, τί καλῶς ἢ μὴ καλῶς ἀποδίδωσιν ὁ λέγων. τοιοῦτον γὰρ δή τινα καὶ τὸν ὅλως πεπαιδευμένον οἰόμεθ' εἶναι, καὶ τὸ πεπαιδεῦσθαι, τὸ δύνασθαι ποιεῖν τὸ εἰρημένον. πλὴν τοῦτον μὲν περὶ πάντων, ὡς εἰπεῖν, τινὰ κριτικὸν νομίζομεν ἕνα τὸν ἀριθμὸν ὄντα, τὸν δὲ περί τινος φύσεως ἀφωρισμένης. εἴη γὰρ ἄν τις ἕτερος τὸν αὐτὸν τρόπον διακείμενος τῷ εἰρημένῳ, περὶ ἓν μόριον. ὥστε δῆλον ὅτι καὶ τῆς περὶ φύσεως ἱστορίας δεῖ τινας ὑπάρχειν ὅρους τοιούτους πρὸς οὓς ἀναφέρων, ἀποδέξεται τὸν τρόπον τῶν δεικνυμένων, χωρὶς τοῦ πῶς ἔχει τἀληθές, εἴτε οὕτως, εἴτε ἄλλως. λέγω δ' οἷον πότερον δεῖ λαμβάνοντας μίαν ἑκάστην οὐσίαν, περὶ ταύτης διορίζειν καθ' αὑτήν, οἷον περὶ ἀνθρώπου φύσεως, ἢ λέοντος, ἢ βοός, ἢ καί τινος ἄλλου τοιούτου καθ' ἕκαστον προχειριζομένους, ἢ τὰ κοινῇ συμβεβηκότα πᾶσι κατά τι κοινὸν ὑποθεμένους. πολλὰ γὰρ ὑπάρχει ταὐτὰ γένεσι [πολλοῖς] ἑτέροις οὖσιν ἀλλήλων, οἷον ὕπνος, ἀναπνοή, αὔξησις, φθίσις, θάνατος· καὶ πρὸς τούτοις, ὅσα τοιαῦτα τῶν λειπομένων παθῶν τε καὶ διαθέσεων. ἄδηλον γὰρ καὶ ἀδιόριστόν ἐστι λέγειν νῦν περὶ τούτων. φανερὸν δὲ ὅτι καὶ κατὰ μέρος μὲν λέγοντες, περὶ πολλῶν ἐροῦμεν πολλάκις ταὐτά. καὶ γὰρ ἵπποις καὶ κυσὶ καὶ ἀνθρώποις ὑπάρχει τῶν εἰρημένων ἕκαστον. ὥστε ἐὰν καθ' ἕκαστον τῶν συμβεβηκότων λέγῃ τις, πολλάκις ἀναγκασθήσεται περὶ τῶν αὐτῶν λέγειν, ὅσα ταὐτὰ μὲν ὑπάρχει τοῖς εἴδει διαφέρουσι τῶν ζῴων,

Nicomach. lib. 1. c. 1.

CAPVT I.

Duos eſſe & contemplandi & docendi præcipuè habitus.

IN omni contemplandi genere, omnique tum nobiliori tum ignobiliori docēdi via, & ratione, duos eſſe habitus conſtat, quorũ alterũ ſcientiam rei appellaſſe, alterum quaſi peritiam quandam, bene eſt. Hominis enim probè periti officium eſt, iudicare perſpicienter poſſe, quidnam rectè, aut non rectè, ab eo qui docet, exponitur: quippe cùm & hominem omnino peritum talem eſſe exiſtimemus, & peritiam ipſam non niſi facultatem huius officij eſſe ſtatuamus. Sed hunc omnibus ferè in rebus valere iudicio arbitramur numero vnum: illum verò cæteræ naturæ alicui delegamus. Fieri enim poteſt vt rem vnam quiſpiam ita vt alias omnes poſſit iudicare. Quamobrem naturalis quoque hiſtoriæ, ſiue contemplationis limites huiuſmodi aliqui poni debent, ad quos iudex modum explicandi referre poſſit, & approbare, ſemoto illo veritatis examine, quonam modo res, itáne an aliter ſe habeat. Verbi gratia, vtrùm ſubſtantias ſingulatim diſcutiendas cepiſſe præſtet, hoc eſt, naturam hominis, aut leonis, aut bouis, aut alius cuiuſquam generatim exponere aptius ſit: an rebus ſubiectis, quæ communiter omnibus accidunt, communi vſu quodam potiùs agendum. Sunt enim complura, quæ eadem in multis generibus diuerſis inter ſe ſint, vt ſomnus, ſpiratio, auctio, diminutio, mors: adhæc & reliqui id genus affectus, & diſpoſitiones. Nihil enim adhuc certi explanatíque habetur, quod de his dicere poſſimus: ſed cùm ſingulatim agimus, eadem ſæpe de multis referre neceſſe eſt. Nam & in equis, & in canibus, & in hominibus, ea, quæ modò dixi, omnia inſũt. Quapropter qui ſingulatim agere per accidētia velit, ſæpenumero verba eiſdē de rebus facere cogetur, quæ ſcilicet eædem animantibus

adiunctæ ſunt ſpecie diuerſis. Sunt etiam fortaſſe quæ cùm eandem ſortiantur appellationem, diſcrimine diſtent ſpeciei, vt animalium inceſſus: quippe qui ſpecie vnus eſſe minùs videatur: diſcrepant enim inter ſe volatio, natatio, ingreſſio, reptio. Quamobrem quonam modo tractandum ſit, latêre non conuenit, vtrum, inquam, communiter primum per generis complexionem, pòſt verò res proprias conſiderare oporteat: an protinus quæque perſequi ſingulatim, rectius eſt: non enim de hac re adhuc præfinitum eſt. Nec illud confeſſum eſt, vtrùm, vt mathematici rem ſuam cæleſtem demonſtrare conſueuerunt, ſic homo rerum naturalium ſtudioſus, primùm quæ patent in animantium genere, partéſque ſingulas explorare: deinde cauſam, quamobrem ita ſint, reddere debeat: an ſecus agendum ſit. adhæc, cùm plures cauſas generationis naturalis eſſe videamus, ſcilicet eam, cuius gratia res gignantur, atque eam, vnde mouendi principium ſit: definiendum de iis etiam eſt, quænam prima, quæ ſecunda haberi debeat. Principatum ſanè illa obtinere videtur, quam ſub hoc verbo, cuius gratia, ſignificamus: hæc enim ratio eſt. Ratio autem, principium eſt pariter in rebus tam arte quam natura conſtituendis. Vbi enim vel per intellectum vel per ſenſum medicus ſanitatem, opifex ædes definierit, rationes & cauſas rei, quam facit, reddere ſolet: & cur ita faciat, ſubiungit: quanquam illa, cuius gratia, cauſa, & ratio boni, & pulchri, naturæ operibus potiùs quàm artis, coniuncta eſt. Neceſſitas verò non æquè in rebus naturæ omnibus ineſt, ea videlicet ad quam omnes ferè authores rationes referre tentant priùs quàm doceant, quot modis accipi neceſſarium debeat. Ineſt idipſum rebus quidem æternis, ſimplici abſolutáque ratione, ſed caducis etiam, gignendiſque omnibus ex *ſuppoſitione* tribuitur: quomodo in artificioſis, vt ædibus, & quibuſuis aliis generis eiuſdem. Materiam enim talem adeſſe neceſſe eſt, ſi domus, aut quiuis alius finis futurus ſit: atque etiam fieri moue rique illud primum oportet, deinde hoc, ac deinceps ad hunc modum itur ad finem, cuius gratia res quæque & efficitur, & eſt. Eodémque modo in rebus quoque natura gignẽdis agitur: quanquam demonſtrandi modus, neceſſitatiſque ratio, in naturali doctrina diuerſa, atque ſcientiis ſpeculatiuis eſt. Dixi de his alio loco: principium enim alteris quod eſt, alteris quod erit, accommodatur. Quòd enim talis ſanitas, aut homo, vel hoc eſſe vel factum iri neceſſe eſt: non quia hoc vel eſt, vel fuit illud, neceſſariò vel eſt, vel erit: neque huiuſmodi demonſtrationis neceſſitatem ita perpetuitati annectere poſſumus, vt dicere liceat, hoc eſſe, quoniam illud eſt. Sed de his etiam alio loco diſputatum à nobis eſt, & quibus in rebus id liceat, & quæ poſſint reciprocari, & quam ob cauſam. Latêre autem ne illud quidem oportet, an ita agendum, quẽadmodum priores authores, qui quomodo res quæque fieret, quàm quomodo eſſet, tractare maluerunt: nõ enim inter hæc paruum intereſt. Sed enim exordiendum quod dictum iam eſt, vt primùm res perſequamur, quæ quoque in genere conſpectiores promptioréſque habentur: deinde cauſas reddamus, & generationẽ. Hoc enim in ædificiis etiam potiùs euenit. Quòd enim forma ædium talis eſt, aut quòd tales ſunt ædes, idcirco fieri ædes hunc potiùs in modum cenſemus: generatio enim, ſubſtantiæ gratia eſt, non ſubſtantia, generationis gratia.

A αὐτὰ δὲ μηδεμίαν ἔχει διαφοράν. ἕτερα δὲ ἴσως ἐστὶν, οἷς συμβαίνει τὴν μὲν κατηγορίαν ἔχειν τὴν αὐτὴν, διαφέρειν δὲ τῇ κατ' εἶδος διαφορᾷ, οἷον ἡ τῶν ζῴων πορεία. οὐ γὰρ φαίνεται μία τῷ εἴδει· διαφέρει γὰρ πτῆσις, καὶ νεῦσις, καὶ βάδισις, καὶ ἕρψις. διὸ δεῖ μὴ λεληθέναι πῶς ἐπισκεπτέον. λέγω δὲ πότερον κοινῇ κατὰ γένος πρῶτον, εἶτα ὕστερον περὶ τῶν ἰδίων θεωρητέον, ἢ καθ' ἕκαστον εὐθύς. νῦν γὰρ οὐ διώρισται περὶ αὐτοῦ, οὐδέ γε τὸ νῦν ῥηθησόμενον. οἷον πότερον, καθάπερ οἱ μαθηματικοὶ τὰ περὶ τὴν ἀστρολογίαν δεικνύουσιν, οὕτω δεῖ καὶ τὸν φυσικὸν, τὰ φαινόμενα πρῶτον περὶ τὰ ζῷα θεωρήσαντα, καὶ τὰ μέρη τὰ περὶ ἕκαστον, B ἔπειθ' οὕτω λέγειν τὸ διὰ τί, καὶ τὰς αἰτίας, ἢ ἄλλως πως. πρὸς δὲ τούτοις, ἐπεὶ πλείους ὁρῶμεν αἰτίας περὶ τὴν γένεσιν τὴν φυσικὴν, οἷον τήν τε οὗ ἕνεκα, καὶ τὴν ὅθεν ἡ ἀρχὴ τῆς κινήσεως, διοριστέον καὶ περὶ τούτων, ποία πρώτη καὶ δευτέρα πέφυκε. φαίνεται δὲ πρώτη, ἣν λέγομεν ἕνεκά τινος. λόγος γὰρ οὗτος· ἀρχὴ δὲ ὁ λόγος ὁμοίως ἔν τε τοῖς κατὰ τέχνην καὶ τοῖς φύσει συνεστηκόσιν. ἢ γὰρ τῇ διανοίᾳ, ἢ τῇ αἰσθήσει ὁρισάμενος, ὁ μὲν ἰατρὸς τὴν ὑγίειαν, ὁ δὲ οἰκοδόμος τὴν οἰκίαν, ἀποδιδόασι τοὺς λόγους καὶ τὰς αἰτίας οὗ ποιοῦσιν ἑκάστου, καὶ διότι ποιητέον οὕτως. μᾶλλον δ' ἐστὶ τὸ οὗ ἕνεκα, καὶ τὸ καλὸν, ἐν τοῖς φύσεως ἔργοις, ἢ ἐν τοῖς τῆς τέχνης. C τὸ δ' ἐξ ἀνάγκης, οὐ πᾶσιν ὑπάρχει τοῖς κατὰ φύσιν ὁμοίως, εἰς ὃ πειρῶνται πάντες σχεδὸν τοὺς λόγους ἀνάγειν, οὐ διελόμενοι ποσαχῶς λέγεται τὸ ἀναγκαῖον. ὑπάρχει δὲ τὸ μὲν ἁπλῶς τοῖς ἀιδίοις· τὸ δ' ἐξ ὑποθέσεως καὶ τοῖς ἐν γενέσει πᾶσιν, ὥσπερ ἐν τοῖς τεχναστοῖς, οἷον οἰκίᾳ, καὶ τῶν ἄλλων ὁτῳοῦν τῶν τοιούτων. ἀνάγκη δὲ τοιάνδε τὴν ὕλην ὑπάρξαι εἰ ἔσται οἰκία, ἢ ἄλλο τι τέλος· καὶ γενέσθαι τε καὶ κινηθῆναι δεῖ τόδε πρῶτον, εἶτα τόδε· καὶ τοῦτον δὴ τὸν τρόπον ἐφεξῆς μέχρι τοῦ τέλους, καὶ οὗ ἕνεκα γίνεται ἕκαστον καὶ ἔστιν. ὡσαύτως δὲ καὶ ἐν τοῖς φύσει γινομένοις. ἀλλ' ὁ τρόπος τῆς ἀποδείξεως καὶ τῆς ἀνάγκης ἕτερος, ἐπί τε τῆς φυσικῆς καὶ τῶν θεωρητικῶν ἐπιστημῶν. εἴρηται δ' ἐν ἑτέροις D περὶ τούτων. ἡ γὰρ ἀρχὴ, τοῖς μὲν τὸ ὄν, τοῖς δὲ τὸ ἐσόμενον. ἐπεὶ γὰρ τοιάδε ἐστὶν ἡ ὑγίεια, ἢ ὁ ἄνθρωπος, ἀνάγκη τόδε εἶναι, ἢ γενέσθαι· ἀλλ' οὐκ ἐπεὶ τόδε ἐστὶν ἢ γέγονεν, ἐκεῖνο ἐξ ἀνάγκης ἐστὶν, ἢ ἔσται. οὐδ' ἔστιν εἰς ἀΐδιον συναρτῆσαι τῆς τοιαύτης ἀποδείξεως τὴν ἀνάγκην, ὥστε εἰπεῖν, ἐπεὶ τόδε ἐστὶν, ὅτι τόδε ἐστί. διώρισται δὲ καὶ περὶ τούτων ἐν ἑτέροις, καὶ ποίοις ὑπάρχει, καὶ ποῖα ἀντιστρέφει, καὶ διὰ τίν' αἰτίαν. δεῖ δὲ μὴ λεληθέναι καὶ πότερον προσήκει λέγειν, ὥσπερ οἱ πρότερον ἐποιοῦντο τὴν θεωρίαν, πῶς ἕκαστον πέφυκε γίνεσθαι μᾶλλον, E ἢ πῶς ἐστί. τοῦτο γὰρ οὐ μικρόν τι διαφέρει ἐκείνου. ἔοικε δ' ἐντεῦθεν ἀρκτέον εἶναι, καθάπερ καὶ πρότερον εἴπομεν, ὅτι πρῶτον τὰ φαινόμενα ληπτέον περὶ ἕκαστον γένος, εἶτα τὰς αἰτίας τούτων λεκτέον, καὶ περὶ γενέσεως· μᾶλλον γὰρ καὶ τόδε συμβαίνει καὶ περὶ τὴν οἰκοδόμησιν, ἐπεὶ τοιόνδε ἐστὶ τὸ εἶδος τῆς οἰκίας, ἢ τοιόνδε ἐστὶν ἡ οἰκία, ὅτι γίνεται οὕτως. ἡ γὰρ γένεσις ἕνεκα τῆς οὐσίας ἐστὶν, ἀλλ' οὐχ ἡ οὐσία ἕνεκα τῆς γενέσεως.

διόπερ Ἐμπεδοκλῆς οὐκ ὀρθῶς εἴρηκε λέγων, ὑπάρχειν διὰ τὸ συμβῆναι οὕτως ἐν τῇ γενέσει πολλὰ τοῖς ζῴοις, διὰ τὸ συμβῆναι οὕτως ἐν τῇ γενέσει· οἷον καὶ ῥάχιν τοιαύτην ἔχειν, ὅτι στραφέντος κατεαγῆναι συνέβη· ἀγνοῶν πρῶτον μὲν, ὅτι δεῖ τὸ σπέρμα τὸ συστὰν, ἔχον δύναμιν τοιαύτην ὑπάρχειν· εἶτα ὅτι τὸ ποιῆσαν προϋπῆρχεν οὐ μόνον τῷ λόγῳ, ἀλλὰ καὶ τῷ χρόνῳ· γεννᾷ γὰρ ὁ ἄνθρωπος ἄνθρωπον· ὥστε διὰ τὸ *ἐκεῖνον τοιόνδ' εἶναι, ἡ γένεσις συμβαίνει τοιάδε τῷδε. ὁμοίως δὲ καὶ ἐπὶ τῶν αὐτομάτως δοκούντων γίνεσθαι, καθάπερ καὶ ἐπὶ τῶν τεχναστῶν. ἔνια γὰρ καὶ ἀπὸ ταὐτομάτου γίνεται ταὐτὰ τοῖς ἀπὸ τέχνης, οἷον ὑγίεια. τῶν μὲν οὖν προϋπάρχει τὸ ποιητικὸν ὅμοιον, οἷον ἀνδριαντοποιητική. οὐ γὰρ γίνεται αὐτομάτως. ἡ δὲ τέχνη, λόγος τοῦ ἔργου ἄνευ τῆς ὕλης ἐστί. καὶ τοῖς ἀπὸ τύχης ὁμοίως. ὡς γὰρ ἡ τέχνη ἔχει, οὕτω γίνεται. διὸ μάλιστα μὲν λεκτέον, ὡς ἐπειδὴ τοῦτο ἦν τὸ ἀνθρώπῳ εἶναι, διὰ τοῦτο ταῦτα ἔχει. οὐ γὰρ ἐνδέχεται εἶναι ἄνευ τῶν μορίων τούτων. εἰ δὲ μὴ, ὅτι ἐγγύτατα τούτοις, καὶ ἢ ὅλως ὅτι ἀδύνατον ἄλλως, ἢ καλῶς γε οὕτω. ταῦτα δὲ ἕπεται. ἐπεὶ δ' ἐστὶ τοιοῦτον, τὴν γένεσιν ὡδὶ, καὶ τοιαύτην συμβαίνειν ἀναγκαῖον. διὸ γίνεται πρῶτον τῶν μορίων τόδε, εἶτα τόδε, καὶ τοῦτον δὴ τὸν τρόπον ἐπὶ πάντων τῶν φύσει συνισταμένων. οἱ μὲν οὖν ἀρχαῖοι καὶ πρῶτοι φιλοσοφήσαντες περὶ φύσεως, περὶ τῆς ὑλικῆς ἀρχῆς καὶ τῆς τοιαύτης αἰτίας ἐσκόπουν, τίς καὶ ποία τις, καὶ πῶς ἐκ ταύτης γίνεται τὸ ὅλον, καὶ τίνος κινοῦντος, οἷον νείκους, ἢ φιλίας, ἢ νοῦ, ἢ τοῦ αὐτομάτου. τῆς δὲ ὑποκειμένης ὕλης, τοιάνδε τινὰ φύσιν ἐχούσης ἐξ ἀνάγκης· οἷον τοῦ μὲν πυρὸς θερμὴν, τῆς δὲ γῆς ψυχρὰν, τοῦ μὲν κούφην, τῆς δὲ βαρεῖαν. οὕτως γὰρ καὶ τὸν κόσμον γεννῶσιν. ὁμοίως δὲ καὶ περὶ τὴν τῶν ζῴων καὶ τῶν φυτῶν γένεσιν λέγουσιν· οἷον ἐν τῷ σώματι ῥέοντος μὲν τοῦ ὕδατος, κοιλίαν γίνεσθαι, καὶ πᾶσαν ὑποδοχὴν τῆς τε τροφῆς καὶ τοῦ περιττώματος· τοῦ δὲ πνεύματος διαπορευομένου, τοὺς μυκτῆρας ἀναρραγῆναι. ὁ δὲ ἀὴρ καὶ τὸ ὕδωρ ὕλη τῶν σωμάτων ἐστίν. ἐκ τῶν τοιούτων γὰρ σωμάτων συνιστᾶσι τὴν φύσιν πάντες. εἰ δ' ἐστὶν ὁ ἄνθρωπος καὶ τὰ ζῷα φύσει, καὶ τὰ μόρια αὐτῶν, λεκτέον ἂν περὶ σαρκὸς εἴη καὶ ὀστοῦ καὶ αἵματος, καὶ τῶν ὁμοιομερῶν ἁπάντων. ὁμοίως δὲ καὶ ἐπὶ τῶν ἀνομοιομερῶν, οἷον προσώπου, χειρὸς, ποδὸς, ἢ τοιοῦτον ἕκαστόν ἐστιν αὐτῶν, καὶ κατὰ ποίαν δύναμιν. οὐ γὰρ ἱκανὸν τὸ ἐκ τίνων ἐστὶν, οἷον πυρὸς ἢ γῆς. ὥσπερ κἂν εἰ περὶ κλίνης ἐλέγομεν, ἢ τινος ἄλλου τῶν τοιούτων, ἐπειρώμεθα μᾶλλον ἂν διορίζειν τὸ εἶδος αὐτῆς, ἢ τὴν ὕλην, οἷον τὸν χαλκὸν, ἢ τὸ ξύλον. εἰ δὲ μὴ, τήν γε τοῦ συνόλου. κλίνη γὰρ, τόδε ἐν τῷδε, ἢ τόδε τοιόνδε. ὥστε κἂν περὶ τοῦ σχήματος εἴη λεκτέον, καὶ ποῖον τὴν ἰδέαν. ἡ γὰρ κατὰ τὴν μορφὴν φύσις, κυριωτέρα τῆς ὑλικῆς φύσεως. εἰ μὲν οὖν τῷ σχήματι καὶ τῷ χρώματι ἕκαστόν ἐστι τῶν τε ζῴων καὶ τῶν μορίων, ὀρθῶς ἂν Δημόκριτος λέγοι. φαίνεται γὰρ οὕτως ὑπολαβεῖν. φησὶ γὰρ παντὶ δῆλον εἶναι, οἷόν τι τὴν μορφήν ἐστιν ὁ ἄνθρωπος, ὡς ὄντος αὐτοῦ τῷ τε σχήματι καὶ τῷ χρώματι. καίτοι καὶ ὁ τεθνεὼς ἔχει τὴν αὐτὴν τοῦ σχήματος μορ-

* γρ. ἐκείνου. al. ἐκεῖνο

A Quam ob rem Empedocles pleraque in animalibus propterea ita contineri, quia ita, cùm orirentur, acciderit, malè ait: vt & ſpinam haberi talem, quòd per contortionem diſiungi frangique accidit: neſcius & quàm ſemen genitale, quod conſtiterat, vim talem habere oportet, & quàm res, quæ effecerat, prior eſſet non modò ratione, verùm etiam tempore. Gignit etenim homo hominem. Itaque ortus talis euenit ſpeciei, quoniam talis, qui gignit, eſt. * Quinetiam de iis quæ ſponte fieri videntur, pariter atque de artificioſis animaduertere licet. Nonnulla enim vel ſponte, eadem, quæ arte, fieri poſſunt, vt ſanitas. His igitur B cauſa efficiens ſimilis antecedat neceſſe eſt: vt ars condendarum ſtatuarum prior ſtatuis eſt, quando ſponte fieri nequeunt. Artem autem, operis rationem eſſe omni abiunctam materia, certum eſt. Fortuitis quoque ratio ſimilis eſt: vt enim ars ſe habet, ita exiſtunt. Quam ob rem cenſendum ita potiſſimum, vt ob eam rem membris his homo conſtet, quia hoc homini eſſe eſt. Non enim fieri poteſt, vt ſine his membris homo ſit: ſin minus, proximum tamen aliud quicquam opinandum, & vel omnino fieri aliter non poſſe, vel bene ita fieri tantum poſſe ſtatuendum. Cùm itaque talis res ſit, generationem in hunc modum, talémque euenire neceſſe eſt. Quapropter membra non ſi- C ne ordine oriuntur: ſed primum hoc, deinde illud, atque in hunc modum omnia, quæ natura conſiſtunt, diſponuntur. Veteres igitur illi, & primi naturæ interpretes, materiale principium, atque eiuſmodi cauſam, quænam qualiſque eſſet, indagarunt: & quonam pacto hinc tota orirentur, & quo mouente, vt diſcordia, & concordia, aut mente, aut caſu, temeritatéque ſpontina, docuerunt: cùm ſubiecta materia talem quandam præ ſe ferre naturam videretur, vt feruidam ignis, gelidam terra, & alter leuem, altera grauem: ſic enim Mundum etiam generant. Hæc eadem de ortu plantarum & animalium quoque referunt. Ventrem enim, aluum, omnéque cibi & D excrementi conceptaculum, ita conſtitiſſe, cum in corpore humor laberetur, & rueret, nares ex rupto patuiſſe, cùm ſpiritus, ſiue flatus tranſmearet, atque diſpelleret. At verò aër, & aqua non niſi corporum materia eſt. Naturam enim omnes ex iis corporibus componunt, atque conſtituunt. Quòd ſi homo, cæteráque animalia, membráque eorum Natura conſtent, dicendum profectò de carne, de oſſe, de ſanguine, denique de omnibus tam ſimili quàm diſſimili ſtrue compactis: vt de facie, de manu, de pede, qua quodque eorum tale ſit, & qua ita conſtent facultate, ſiue virtute: non enim ſatis eſt, eatenus tantùm noſſe, quibus ex re- E bus compoſitum ſit, vt igne, terráve: ſed perinde agendum, vt ſi de lecto, aut de quolibet alio generis eiuſdem ageretur: formam enim potius quàm materiam eius declarare tentaremus, vt æs, aut lignum: vel ſi id minus, totius quidẽ ipſius ſpeciem non omitteremus: lectus enim hoc in hoc eſt, aut hoc tale eſt. Quocirca vel ipſam figuram explanari, qualiſque forma ſit, indicari congruit: quippe cùm formæ natura potior ſit, quàm materiæ. Igitur ſi animalium membrorúmque vnumquodque figura coloréq; eſt, rectè Democritus diſſerit, qui ex iis ipſis putaſſe animalia conſtare videtur: quippe qui perſpicuum eſſe dicat, qualis forma ſit homo, quaſi ſua ipſe homo figura coloréque pateat. Atqui mortuus homo quanquam figuræ formam

habet eandem, tamen homo non eſt. Adhæc, fieri non poteſt vt manus ſit quocunque modo conſtans, vt ænea, aut lignea, niſi æquiuoca nominis communione: ſicut quæ picta eſt: vtpote quæ ſuo fungi officio nequeat. quomodo nec lapideæ tibiæ ſuum aſſequi munus poſſunt: neque medicus pictus artem medicinalem exercere poteſt. pari ratione membrorum quoque hominis vita functi, nullum id eſſe inſuper poteſt, quod erat, cùm viueret: vt oculus, manus, pes, reliqua. Ergo ſimplici admodum & pingui Minerua dictum hoc eſt, ac perinde quaſi faber de lignea manu loqueretur. Sic enim Naturæ illi exploratores ortus & cauſas referunt figurarum: à quibus enim facultatibus condita fuerint, exponunt. Itaque faber ſecurim fortaſſe, aut terebrum dicet, illi terram, & aërem: ſed meliùs faber, vt qui parum ſufficere arbitretur, ſi vſque eò dicat, quòd inſtrumento incidente, partim caua partim plana extiterunt: ſed adijciat, quoniam talem adegerit ictum: & cauſam, cur ita exponat, videlicet, vt talem aut talem formam opus acciperet. Conſtat igitur non rectè illos diſſeruiſſe, atque animal tale eſſe dicere oportere, & quid qualéque tum id ipſum, tum etiam membrum vnumquodque explicari oportere, quomodo de forma lecti docendum eſt. Ergo ſi animal, vel anima, vel pars animæ, vel non ſine anima eſt, (quàm primùm enim à corpore anima diſceſſit, animal eſſe deſinit, neque membrum vllum niſi figuræ ſuæ ratione idem relinquitur: modo eorum quę fabulæ tranſiſſe in lapidem narrant.) Si hæc, inquam, ita ſtatui debent, hominis Naturæ ſtudioſi ſanè intereſt de anima & diſſerere & ſcire: & ſi non de omni anima, tamen de ea ipſa quæ tale animal eſt: & quidnam anima aut certè pars iſta animæ ſit, aut quæ etiam de iis quæ tali eius ſubſtantiæ accidant, præſertim cùm bifariam naturam *intelligamus*, vt altera *pro* materia ſit, altera pro ſubſtantia: quæ quidem & vt mouens, & vt finis eſt: taliſque animalium anima, vel omnis, vel pars aliqua eius ſit. Nam ob eam etiam rem, qui de natura agit, eò amplius docere de anima quàm de materia, debet, quo materia, natura potiùs per animam, quàm è contrario eſt. Lignum enim & lectus, & tripes, propterea eſt, quia idem potentia illa eſt. Sed quæret quiſpiam animaduertens ad id quod modò dixi: Vtrùm de anima omni docere naturalis ſcientiæ interſit, an de aliqua vna. At ſi de omni, nulla certè præter naturalem philoſophiam relinquetur ſcientia. Intellectus enim ſiue mens, rerum intelligibilium eſt: itaque rerum omnium notiones naturalis vna tenebit. Eſt enim eiuſdem ſcientiæ, vt tam de intellectu quàm de re intelligibili doceat: ſiquidem eadem contemplatio omnium eſt inter ſe coniunctorum, ſicut ſenſus etiam, & rei ſenſibilis. An non omnis anima principium motus eſt? neque partibus animæ omnibus id tribui debet, ſed augendi principium idem putandum, quod & in plantis eſt, alterandi vim eandem, quam ſentiendi, deferendi autem aliud quiddam, non vim intelligendi? delationem enim vel in cæteris eſſe animalibus nouimus, intellectum ſiue mentem in nullis. Conſtat igitur non de anima diſſerere omni oportere: quandoquidem non anima omnis natura eſt, ſed aliqua eius pars vna, aut etiam plures. Ad hæc rem à materia abſtractam nullam poteſt ſcientia naturalis contemplari, cùm natura rei alicuius gratia faciat omnia: rebus autem abſtractis abiunctum id eſt, quod ſub hoc, cuius gratia, verbo intelligimus. Vt enim ars in artificioſis, ita in rebus ipſis aliquod eſſe principium aliud, & talis cauſa videtur,

A φὴν, ἀλλ᾽ ὅμως οὐκ ἔστιν ἄνθρωπος. ἔτι δὲ ἀδύνατον εἶναι χεῖρα ὁπωσοῦν διακειμένην, οἷον χαλκῆν, ἢ ξυλίνην, πλὴν ὁμωνύμως, ὥσπερ τὸν γεγραμμένον ἰατρόν. οὐ γὰρ δυνήσεται ποιεῖν τὸ ἑαυτῆς ἔργον, ὥσπερ οὐδ᾽ αὐλοὶ λίθινοι τὸ ἑαυτῶν ἔργον, οὐδ᾽ ὁ γεγραμμένος ἰατρός. ὁμοίως δὲ τούτοις, οὐδὲ τῶν τοῦ τεθνεῶτος μορίων οὐδὲν ἐπὶ τῶν τοιούτων ἐστί. λέγω δ᾽ οἷον ὀφθαλμός, χείρ. λίαν οὖν ἁπλῶς εἴρηται, καὶ τὸν αὐτὸν τρόπον, ὥσπερ ἂν εἰ τέκτων λέγοι περὶ χειρὸς ξυλίνης. οὕτως γὰρ καὶ οἱ φυσιολόγοι τὰς γενέσεις καὶ τὰς αἰτίας τοῦ σχήματος λέγουσιν· ὑπὸ τίνων γὰρ ἐδημιουργήθησαν δυνάμεων. ἀλλ᾽ ἴσως ὁ μὲν τέκτων ἐρεῖ πέλεκυν, ἢ τρύπανον· ὁ B δὲ, ἀέρα καὶ γῆν. πλὴν βέλτιον ὁ τέκτων. οὐ γὰρ ἱκανὸν ἔσται αὐτῷ τὸ τοσοῦτον εἰπεῖν, ὅτι ἐμπεσόντος τοῦ ὀργάνου, τὸ μὲν κοῖλον ἐγένετο, τὸ δὲ ἐπίπεδον. ἀλλὰ διότι τὴν πληγὴν ἐποιήσατο τοιαύτην, καὶ τίνος ἕνεκα, ἐρεῖ τὴν αἰτίαν, ὅπως τοιόνδε ἢ τοιόνδε ποτὲ τὴν μορφὴν γένηται. δῆλον τοίνυν ὅτι οὐκ ὀρθῶς λέγουσι, καὶ ὅτι λεκτέον ὡς τοιοῦτον τὸ ζῷον, καὶ περὶ ἐκείνου, καὶ τί, καὶ ποῖόν τι, καὶ τῶν μορίων ἕκαστον, ὥσπερ καὶ περὶ τοῦ εἴδους τῆς κλίνης. εἰ δὴ τοῦτό ἐστι ψυχή, ἢ ψυχῆς μέρος, ἢ μὴ ἄνευ ψυχῆς (ἀπελθούσης γοῦν, οὐκέτι ζῷόν ἐστι. οὐδὲ τῶν μορίων οὐδὲν τὸ αὐτὸ λείπεται, πλὴν τῷ σχήματι μόνον, καθάπερ τὰ μυθευόμενα C λιθοῦσθαι.) εἰ δὴ ταῦτα οὕτως, τοῦ φυσικοῦ περὶ ψυχῆς ἂν εἴη λέγειν καὶ εἰδέναι, καὶ εἰ μὴ πάσης, καθ᾽ αὐτὸ τοῦτο, καθ᾽ ὃ τοιοῦτον τὸ ζῷον, καὶ τί ἐστιν ἡ ψυχή, ἢ αὐτὸ τοῦτο τὸ μόριον, καὶ περὶ τῶν συμβεβηκότων κατὰ τὴν τοιαύτην αὐτῆς οὐσίαν· ἄλλως τε καὶ τῆς φύσεως διχῶς λεγομένης καὶ οὔσης, τῆς μὲν ὡς ὕλης, τῆς δὲ ὡς οὐσίας. καὶ ἔστιν αὕτη καὶ ὡς ἡ κινοῦσα, καὶ ὡς τὸ τέλος. τοιοῦτον δὲ τοῦ ζῴου, ἤτοι πᾶσα ἡ ψυχή, ἢ μέρος τι αὐτῆς. ὥστε καὶ οὕτως λεκτέον ἂν εἴη τῷ περὶ φύσεως θεωρητικῷ περὶ ψυχῆς μᾶλλον, ἢ τῆς ὕλης, ὅσῳ μᾶλλον ἡ ὕλη δι᾽ ἐκείνην φύσις ἐστίν, * ἢ ἀνάπαλιν. καὶ γὰρ κλίνη καὶ τρίπους τὸ ξύλον ἐστίν, ὅτι δυνάμει ταῦτά ἐστιν. ἀπορήσειε δ᾽ ἄν τις, εἰς τὸ νῦν λεχθὲν ἐπιβλέ- D ψας, πότερον περὶ πάσης ψυχῆς, τῆς φυσικῆς ἐστι τὸ εἰπεῖν, ἢ περί τινος. εἰ γὰρ περὶ πάσης, οὐδεμία λείπεται παρὰ τὴν φυσικὴν ἐπιστήμην φιλοσοφία. ὁ γὰρ νοῦς, τῶν νοητῶν. ὥστε περὶ πάντων ἡ φυσικὴ γνῶσις ἂν εἴη. τῆς γὰρ αὐτῆς περὶ νοῦ καὶ τῶν νοητῶν θεωρῆσαι, εἴπερ πρὸς ἄλληλα· καὶ ἡ αὐτὴ θεωρία τῶν πρὸς ἄλληλα πάντων, καθάπερ καὶ περὶ αἰσθήσεως καὶ τῶν αἰσθητῶν. ἢ οὐκ ἔστι πᾶσα ἡ ψυχὴ κινήσεως ἀρχή, οὐδὲ τὰ μόρια ἅπαντα, ἀλλὰ αὐξήσεως μὲν, ὅπερ καὶ ἐν τοῖς φυτοῖς, ἀλλοιώσεως δὲ τὸ αἰσθητικόν, φορᾶς δὲ ἕτερόν τι, καὶ οὐ τὸ νοητικόν· ὑπάρχει γὰρ ἡ φορὰ καὶ ἐν ἑτέροις τῶν ζῴων, διάνοια δὲ ἐν οὐδενί. δῆλον οὖν ὡς οὐ περὶ πά- E σης ψυχῆς λεκτέον. οὐδὲ γὰρ πᾶσα ψυχὴ φύσις, ἀλλά τι μόριον αὐτῆς ἕν, ἢ καὶ πλείω. ἔτι δὲ τῶν ἐξ ἀφαιρέσεως οὐδενὸς οἷόν τ᾽ εἶναι τὴν φυσικὴν θεωρητικήν, ὅτι ἡ φύσις ἕνεκά του ποιεῖ πάντα. φαίνεται γάρ, ὥσπερ ἐν τοῖς τεχναστοῖς ἐστιν ἡ τέχνη, οὕτως ἐν αὐτοῖς τοῖς πράγμασιν ἄλλη τις ἀρχὴ καὶ αἰτία τοιαύτη

* κ. ὥσπερ ἡ ἀνάπαλιν Fort. ὑφ᾽ ἧς

τὸς ἔχομεν, καθάπερ τὸ θερμὸν καὶ τὸ ψυχρὸν ἐκ τοῦ παντός· διὸ μᾶλλον εἰκὸς τὸν οὐρανὸν γεγενῆσθαι ὑπὸ τοιαύτης αἰτίας, εἰ γέγονε, καὶ εἶναι διὰ τοιαύτην αἰτίαν μᾶλλον, ἢ τὰ ζῷα τὰ θνητά. τὸ γοῦν τεταγμένον καὶ ὡρισμένον πολὺ μᾶλλον φαίνεται ἐν τοῖς οὐρανίοις, ἢ περὶ ἡμᾶς. τὸ δὲ ἄλλοτε ἄλλως, καὶ ὡς ἔτυχε, περὶ τὰ θνητὰ μᾶλλον. οἱ δὲ τῶν μὲν ζώων ἕκαστον φύσει φασὶν εἶναι καὶ γενέσθαι· τὸν δ' οὐρανὸν ἀπὸ τύχης καὶ τοῦ αὐτομάτου τοιοῦτον συστῆναι, ἐν ᾧ ἀπὸ τύχης καὶ ἀταξίας οὐδ' ὁτιοῦν φαίνεται. πανταχοῦ δὲ λέγομεν τόδε τοῦδε ἕνεκα, ὅπου ἂν φαίνηται τέλος τι, πρὸς ὃ ἡ κίνησις περαίνει, μηδενὸς ἐμποδίζοντος. ὥστε εἶναι φανερὸν ὅτι ἔστι τι τοιοῦτον, ὃ δὴ καὶ καλοῦμεν φύσιν. οὐ γὰρ δὴ ὅ, τι ἔτυχεν, ἐξ ἑκάστου γίνεται σπέρματος, ἀλλὰ τόδε ἐκ τοῦδε. οὐδὲ σπέρμα τὸ τυχὸν, ἐκ τοῦ τοιούτου σώματος· ἀρχὴ ἄρα, καὶ ποιητικὸν τοῦ ἐξ αὐτοῦ, τὸ σπέρμα. φύσει γὰρ ταῦτα. φύεται γοῦν ἐκ τούτου. ἀλλὰ μὴν τούτου πρότερον τὸ οὗ τὸ σπέρμα. γένεσις μὲν γὰρ τὸ σπέρμα, οὐσία δὲ τὸ τέλος. ἀμφοῖν δὲ ἔτι πρότερον, ἀφ' οὗ ἐστι τὸ σπέρμα. ἔστι γὰρ τὸ σπέρμα διχῶς, ἐξ οὗ τε, καὶ οὗ. καὶ γὰρ ἀφ' οὗ ἀπῆλθε, τούτου σπέρμα, οἷον ἵππου· καὶ τούτου ὃ ἔστιν ἐξ αὐτοῦ, οἷον ὀρέως. τρόπον δὲ οὐ τὸν αὐτὸν, ἀλλ' ἑκατέρου τὸν εἰρημένον. ἔτι δὲ δυνάμει τὸ σπέρμα. δύναμις δὲ ὡς ἔχει πρὸς ἐντελέχειαν, ἴσμεν. εἰσὶν ἄρα δύο αἰτίαι αὗται, τό, τε οὗ ἕνεκα, καὶ τὸ ἐξ ἀνάγκης. πολλὰ γὰρ γίνεται, ὅτι ἀνάγκη. ἴσως δ' ἄν τις ἀπορήσειε, ποίαν λέγουσιν ἀνάγκην, οἱ λέγοντες ἐξ ἀνάγκης. τῶν μὲν γὰρ δύο τρόπων, οὐδέτερον οἷόν τε ὑπάρχειν, τῶν διωρισμένων ἐν τοῖς κατὰ φιλοσοφίαν. ἔστι δὲ ἔν γε τοῖς ἔχουσι γένεσιν ὁ τρίτος. λέγομεν γὰρ τὴν τροφὴν ἀναγκαῖόν τι, κατ' οὐδέτερον τούτων τῶν τρόπων, ἀλλ' ὅτι οὐχ οἷόν τε ἄνευ ταύτης εἶναι. τοῦτο δ' ἐστὶν ὥσπερ ἐξ ὑποθέσεως. ὥσπερ γὰρ ἐπεὶ δεῖ σχίζειν τῷ πελέκει, ἀνάγκη σκληρὸν εἶναι· εἰ δὲ σκληρὸν, χαλκοῦν, ἢ σιδηροῦν· οὕτως καὶ ἐπεὶ τὸ σῶμα ὄργανον (ἕνεκά τινος γὰρ ἕκαστον τῶν μορίων, ὁμοίως δὲ καὶ τὸ ὅλον) ἀνάγκη ἄρα τοιονδὶ εἶναι, καὶ ἐκ τοιωνδὶ, εἰ ἐκεῖνο ἔσται. ὅτι μὲν οὖν δύο τρόποι τῆς αἰτίας, καὶ δεῖ λέγοντας τυγχάνειν μάλιστα μὲν ἀμφοῖν· εἰ δὲ μὴ, δῆλον γε πειρᾶσθαι ποιεῖν· καὶ ὅτι πάντες οἱ τοῦτο μὴ λέγοντες, οὐδὲν, ὡς εἰπεῖν, περὶ φύσεως λέγουσιν. ἀρχὴ γὰρ ἡ φύσις μᾶλλον τῆς ὕλης. ἐνιαχοῦ δέ που αὐτῇ καὶ Ἐμπεδοκλῆς περιπίπτει, ἀγόμενος ὑπ' αὐτῆς τῆς ἀληθείας, καὶ τὴν οὐσίαν καὶ τὴν φύσιν ἀναγκάζεται φάναι τὸν λόγον εἶναι, * οἷον ὀστοῦν ἀποδιδοὺς τί ἐστιν. οὔτε γὰρ ἕν τι τῶν στοιχείων λέγει αὐτὸ, οὔτε δύο, ἢ τρία, οὔτε πάντα, ἀλλὰ λόγον τῆς μίξεως αὐτῶν. δῆλον τοίνυν ὅτι καὶ ἡ σὰρξ τὸν αὐτὸν τρόπον ἐστὶ, καὶ τῶν ἄλλων τῶν τοιούτων μορίων ἕκαστον. αἴτιον δὲ τοῦ μὴ ἐλθεῖν τοὺς προγενεστέρους ἐπὶ τὸν τρόπον τοῦτον, ὅτι τὸ τί ἦν εἶναι, καὶ τὸ ὁρίσασθαι τὴν οὐσίαν, οὐκ ἦν. ἀλλ' ἥψατο μὲν Δημόκριτος πρῶτος, ὡς οὐκ ἀναγκαίου δὲ τῇ φυσικῇ θεωρίᾳ, ἀλλ' ἐκφερόμενος ὑπ' αὐτοῦ τοῦ πράγματος.

* Metaphyſ. li. 1. in fine.

* Metaphyſ. li. 1. cap. 4.

A quam ex vniuerſo perinde vt caloris frigoriſque primordia habemus. Quamobrem veriſimilius dixerim, cœlum & factum eſſe ab eiuſmodi cauſa, ſi factum eſt, & magis eſſe ob eam cauſam, quàm animalia caduca atque mortalia. Ordo enim, & ratus certúſque ſtatus, longè magis in rebus patet cœleſtibus, quàm in nobis: incerta autem, inconſtans & fortuita conditio in genere mortali potiùs eſt. At illi genus animalium quodque natura conſtare, extitiſſeque cenſent. Cælum autem fortè, ſpontéque tale conſtitiſſe volunt, in quo nihil fortunæ, nihil temeritatis deprehendi poteſt. Rem autem hanc eſſe illius gratia aſſerere vbique ſolemus, quo-

B ties finem intelligimus aliquem, in quem motus (ſi nulla res prohibet) terminetur. Quocirca eiuſmodi aliquid eſſe conſtat, quod Naturam vocamus. Non enim quodlibet, & vtcunque fors tulit, ex quouis ſemine oritur, ſed hoc ex hoc. Neque ex corpore quolibet ſemen quodlibet prodit: principium nanque, & efficiens rei, quæ gignitur, ſemen eſt: ſunt hæc enim natura, & proinde ex hoc enaſcuntur. Atque etiam priùs, quàm hoc, illud eſt, vnde ſemen expromitur. Semen enim ipſum generatio eſt, finis verò ſubſtantia: vtriſque autem his prius illud eſt, à quo proficiſcitur. Semen enim bifariàm accipitur, videlicet ex quo, & cuius. Nam & à quo

C deceſſit, eius ſemen eſt, vt equi: & eius, quod ex illo futurum eſt, vt muli: verùm non eodem modo, ſed vt dictum iam eſt. Adhæc, ſemen non niſi potentia eſt. Potentia autem quemadmodum ad actum ſe habeat, nouimus. Cauſæ igitur hæ ſunt duæ numero, altera, cuius gratia, altera ex neceſſitate: multa enim gignuntur, quia neceſſe eſt. Sed quæret fortaſſe quiſpiam, quam neceſſitatem intelligi velint, qui res fieri neceſſario aiunt: neuter enim accipi poteſt eorum modorum qui præfiniuntur, in iis quæ per philoſophiam tractata ſunt. Tertius autem iis quæ habent generationem, rebus eſt. Alimentum enim neutro illorum modorum eſſe

D dicimus neceſſarium: ſed quia fieri non poteſt vt res ſine eo ſit, ideo neceſſitatem ei adſcribimus, quod quaſi ex ſuppoſitione eſt: vt enim quia ſecuri ſcindendum ſit, durum aliquid eſſe neceſſe eſt, &, ſi durum, vel æneum, vel ferreum: ita cùm inſtrumentum ſit corpus (eſt enim tum membrum vnumquodque rei alicuius gratia, tum verò totum ipſum) efficitur profectò vt eſſe tale, atque ex talibus conſtare neceſſe ſit, ſi illud, cuius gratia ipſum eſt, futurum ſit. Conſtat igitur duos eſſe cauſæ modos, ac potiſſimùm vtrunque aſſequi verbis oportere: ſed ſi minùs id fieri poteſt, tamen pro viribus eniti ad eius ſignificationem: omnéſque nihil ferè de

E Natura docere, qui hoc non dicunt exiſtimare. Principium enim rerum Natura potiùs quàm materia eſt. Empedocles etiam in eam interdum incidit, ductus ab ipſa veritate: & ſubſtantiam, atque naturam eſſe rationem fateri compellitur: velvti cùm os quid ſit, reddit: quippe qui non aliquod elementum vnum eſſe id velit, non duo, aut tria: non omnia, ſed miſtionis elementorum rationem. Igitur & carnem, & cæteras eiuſmodi partes hunc eundem in modum eſſe, apertum eſt. Cauſa verò quam ob rem antiquiores illi authores non ad hunc venerint modum, quòd quid res eſſet, atque ſubſtantiæ definitionem ipſam explicare haudquaquam ſolebant. Sed Democritus hæc tetigit primus, non tamẽ quòd ad rerum naturalium ſtudium putauerit neceſſariam, ſed quòd ab ipſa re alliceretur.

Socratis verò temporibus vſus quidem definiendi increuit, ſed indagatio rerum naturalium deſiit: nam omne philoſophandi ſtudium ad vtilem virtutem ciuilémque vſum translatum eſt. Licet quodammodò dixi, ita demonſtrare. Data animalibus ſpiratio eſt huius gratia rei: ſed eam propter has effici res neceſſe eſt. Neceſſitas vero aliâs ita ſignificat, vt ſi res cuius gratia futura ſit, hæc haberi neceſſe ſit, aliâs ita, vt ſic ſe habeant, aptáque ſua natura ita ſint. Egredi enim calorem, rurſúſque ingredi, cùm in re obuia offendatur, aëremque interlabi, neceſſarium eſt. Sed cùm aer exterior refrigerando retorquet, ingreſſus atq; egreſſus caloris interioris rei alicuius gratia agitur. Hic modus tractandi eſt: hæc ad id genus doctrinæ via & ratio attinet. Hæc, & eiuſmodi, ſunt ea quorum cauſas accepiſſe operæpretium eſſe ducimus.

A ἐπὶ Σωκράτους δὲ τοῦτο μὲν ηὐξήθη, τὸ δὲ ζητεῖν τὰ περὶ φύσεως, ἔληξε· πρὸς δὲ τὴν χρήσιμον ἀρετὴν καὶ τὴν πολιτικὴν ἀπέκλιναν οἱ φιλοσοφοῦντες. δεικτέον δ' οὕτως· οἷον ὅτι ἔστι μὲν ἡ ἀναπνοὴ τουδὶ χάριν, τοῦτο δὲ γίγνεται διὰ τάδε ἐξ ἀνάγκης. ἡ δ' ἀνάγκη, ὁτὲ μὲν σημαίνει ὅτι εἰ ἐκεῖνο ἔσται τὸ οὗ ἕνεκα, ταῦτα ἀνάγκη ἐστὶν ἔχειν· ὁτὲ δὲ, ὅτι ἔστιν οὕτως ἔχοντα καὶ πεφυκότα. τὸ θερμὸν γὰρ ἀναγκαῖον ἐξιέναι, καὶ πάλιν εἰσιέναι, ἀντικροῦον, τὸν δ' ἀέρα εἰσρεῖν. τοῦτο δὲ ἤδη ἀναγκαῖόν ἐστι. τοῦ ἐντὸς δὲ θερμοῦ ἀντικόπτοντος ἐν τῇ ψύξει τοῦ θύραθεν B ἀέρος ἡ εἴσοδος καὶ ἡ ἔξοδος. ὁ μὲν οὖν τρόπος οὗτος τῆς μεθόδου, καὶ περὶ ὧν δεῖ λαβεῖν τὰς αἰτίας, ταῦτα καὶ τοιαῦτά εἰσι.

CAPVT II.

Contra dichotomiam Platonis, & eos qui genus ſingulare in duas diuidunt differentias.

SVnt verò, qui genus in duas ſecando differentias accipiant ſingulare: quod quidem partim non facile, partim nullo pacto fieri poteſt. Non enim deſunt, quorum vna tantùm ſit differentia, cætera autem ſuperuacua ſint. Verbi gratia, pedatum, bipes, fiſſipes, multifidum: hæc enim vna potiſſima eſt: ſin minùs ſæpius idem dici neceſſe erit. Adhæc, genus quoduis diſtrahi non debet, vt exempli gratia, aues aliæ in hoc, aliæ in illo diuiſionis membro collocentur, quod æditæ illæ diuiſiones faciunt: quippe cùm ita fiat, vt auium, aliæ cum aquatilibus conſtituantur, aliæ in alio ponantur genere. Sed vt nomen huic ſimilitudini, auis, illi, piſcis inditum eſt: ſic aliæ ſunt, quæ nomine vacent, vt illa compos ſanguinis, aut expers, vtraque enim nomine vno carent. Quòd ſi nihil ex iis quæ generis ſocietate iunguntur, diſtrahi debet, fruſtra illa ſeorſum in duas partes diſtinctio agitur, cùm ſeiungi ac diſtrahi ſit neceſſe, ſi ita diuidatur. Sunt enim ex multipedibus alia in terreſtri, alia in aquatili genere.

ΚΕΦΑΛ. β'.

Κατὰ τῶν διαιρουμένων τὸ γένος εἰς δύο διαφοράς.

ΛΑμβάνουσι δ' ἔνιοι τὸ καθ' ἕκαστον, διαιρούμενοι τὸ γένος εἰς δύο διαφοράς. τοῦτο δ' ἐστὶ τῇ μὲν οὐ ῥᾴδιον, τῇ δ' ἀδύνατον. ἐνίων γὰρ ἔσται διαφορὰ μόνη μία, C τὰ δ' ἄλλα περίεργα, οἷον ὑπόπουν, δίπουν, * σχιζόπουν. αὕτη γὰρ μόνη κυρία. εἰ δὲ μή, ταὐτὸν πολλάκις ἀναγκαῖον λέγειν. ἔτι δὲ προσήκει μὴ διασπᾶν ἕκαστον γένος, οἷον τοὺς ὄρνιθας, τοὺς μὲν ἐν τῇδε, τοὺς δὲ ἐν ἄλλῃ διαιρέσει, καθάπερ ἔχουσιν αἱ γεγραμμέναι διαιρέσεις. ἐκεῖ γὰρ συμβαίνει τοὺς μὲν μετὰ τῶν ἐνύδρων διῃρῆσθαι, τοὺς δὲ ἐν ἄλλῳ γένει. ταύτῃ μὲν οὖν τῇ ὁμοιότητι, ὄρνις ὄνομα κεῖται, ἑτέρᾳ δὲ ἰχθύς. ἄλλαι δ' εἰσὶν ἀνώνυμοι, οἷον τὸ ἔναιμον καὶ τὸ ἄναιμον. ἐφ' ἑκατέρῳ γὰρ τούτων οὐ κεῖται ἓν ὄνομα. εἴπερ οὖν μηθὲν τῶν ὁμογενῶν διασπαστέον, ἡ εἰς δύο διαίρεσις * μάταιος ἂν εἴη. οὕτως γὰρ διαιρουμένους ἀναγκαῖον χωρίζειν καὶ διασπᾶν. D τῶν πολυπόδων γάρ ἐστι τὰ μὲν ἐν τοῖς πεζοῖς, τὰ δ' ἐν τοῖς ἐνύδροις.

* Gaza alijque interpret. poſt vocem σχ. addunt πολυσχιδές. quam vocem Michaël Eph. non videtur agnoſcere.

* γρ. ματαία

CAPVT III.

Contra eos qui differentias per priuationes diuidunt, & de recta ratione diuidendi.

PRiuatione item diuidere ita neceſſe eſt. Et quidem id faciunt, qui ſeorſum in duo ſecant. At priuationis, qua priuatio eſt, nulla eſt differentia: non. n. fieri poteſt vt ſpecies eius ſit, quod non eſt, vel vt impedati, aut impennati, ſicut pennati, & pedati. Differentiæ autem vniuerſalis, ſpecies habeat neceſſe eſt: nam niſi habeat, cur vniuerſalibus potiùs adnumerari quàm ſingularibus debeat? Sed quanquam ſunt differentiæ, quæ vniuerſales ſint & ſpecies habeant, vt pennatus, cùm pennarum alia fiſſa, alia continua ſit: pedatus etiam partim multifidus eſt, partim bifidus, quod in biſulcis animalibus patet: partim continuus, nulla fiſſura diductus, qualis eorum eſt quæ ſolidam habent vngulam: tamen difficile eſt, vel in eiuſmodi differentias, quarum ſpecies ſunt, diſpartire, vt quoduis animal contineatur in iis ipſis, nec idem in plures veniat, vt pennatum & impennatum. ambo. n. hæc in eadem ſpecie poſſunt contineri, vt formica, vt nitedula, ſiue cicindela, & alia quædam vtrunque recipiunt: omnium verò difficillimum, imò impoſſibile eſt, vt in ea quæ ſanguine carent, ita diuidamus.

ΚΕΦΑΛ. γ'.

Ὅτι οὐκ ἔστι διαφορὰ στερήσεως ᾗ στέρησις.

ΕΤι στερήσει μὲν ἀνάγκη διαιρεῖν, καὶ διαιροῦσιν οἱ διχοτομοῦντες. οὐκ ἔστι δὲ διαφορὰ στερήσεως ᾗ στέρησις. ἀδύνατον γὰρ εἴδη εἶναι τοῦ μὴ ὄντος, οἷον τῆς ἀποδίας, ἢ τοῦ ἀπτέρου, ὥσπερ πτερώσεως καὶ ποδῶν. δεῖ E δὲ τῆς καθόλου διαφορᾶς εἴδη εἶναι. εἰ γὰρ μὴ ἔσται, διὰ τί ἂν εἴη τῶν καθόλου, καὶ οὐ τῶν καθ' ἕκαστον; τῶν δὲ διαφορῶν, αἱ μὲν καθόλου εἰσὶ, καὶ ἔχουσιν εἴδη, οἷον πτερότης. τὸ μὲν γὰρ, ἄσχιστον· τὸ δὲ, ἐσχισμένον ἐστὶ πτερόν. καὶ ποδότης ὡσαύτως, ἡ μὲν πολυσχιδής, ἡ δὲ διχαλής, οἷον τὰ διχηλά· ἡ δὲ, ἀσχιδὴς καὶ ἀδιαίρετος, οἷον τὰ μώνυχα. χαλεπὸν μὲν οὖν διαλαβεῖν καὶ εἰς τοιαύτας διαφοράς, ὧν ἐστιν εἴδη, ὥσθ' ὁτιοῦν ζῷον ἐν ταύταις ὑπάρχειν, καὶ μὴ ἐν πλείοσι ταὐτόν, οἷον πτερωτὸν καὶ ἄπτερον. ἔστι γὰρ ἄμφω ταὐτόν, οἷον μύρμηξ καὶ λαμπυρὶς καὶ ἕτερά τινα. πάντων δὲ * χαλεπώτατον εἰς τὰ ἄναιμα.

* γρ. χαλ. ἢ [illegible] ἀδύνατον [illegible]. vide Epheſ.

ἀναγκαῖον γὰρ τῶν καθέκαστον ὑπάρχειν τινί, τῶν διαφορῶν ἑκάστην· ὥστε καὶ τὴν ἀντικειμένην. εἶδος δὲ μὴ ἐνδέχεται τοῖς εἴδει διαφέρουσιν ὑπάρχειν εἶδός τι τῆς οὐσίας ἄτομον καὶ ἕν, ἀλλὰ διαφορὰν ἕξει, οἷον ὄρνις ἀνθρώπου. ἡ διποδία γὰρ ἄλλη καὶ διάφορος. κἂν εἰ ἔναιμα, τὸ αἷμα διάφορον ἢ οὐδὲν τῆς οὐσίας τὸ αἷμα θετέον. εἰ δὲ οὕτως ἐστίν, ἡ μία διαφορὰ δυσὶν ὑπάρξει. εἰ δὲ τοῦτο, δῆλον ὅτι ἀδύνατον στέρησιν εἶναι διαφοράν. ἔσονται δὲ διαφοραὶ ἴσαι τοῖς ἀτόμοις ζῴοις, εἴπερ ἄτομά τε ταῦτα καὶ αἱ διαφοραὶ ἄτομοι. κοινὴ δὲ μὴ ἐστι. εἰ δ' ἐνδέχεται μὴ ὑπάρχειν κοινήν, ἄτομοι δέ, δῆλον ὅτι κατά γε τὴν κοινὴν, ἐν τῷ αὐτῷ ἐστιν, ἕτερα ὄντα τῷ εἴδει ζῷα. ὥστ' ἀναγκαῖον, εἰ ἴδιαι αἱ διαφοραί, εἰς ἃς ἅπαντα ἐμπίπτει τὰ ἄτομα, μηδεμίαν αὐτῶν εἶναι κοινήν. εἰ δὲ μὴ ἕτερα ὄντα, εἰς τὴν αὐτὴν βαδιεῖται. δεῖ δὲ οὔτε τὸ αὐτὸ καὶ ἄτομον εἰς ἑτέραν καὶ ἑτέραν ἰέναι διαφορὰν τῶν διῃρημένων, οὔτ' εἰς τὴν αὐτὴν ἕτερον, καὶ ἅπαντα εἰς ταύτας. φανερὸν τοίνυν, ὅτι οὐκ ἔστι λαβεῖν τὰ ἄτομα εἴδη, ὡς διαιροῦνται οἱ εἰς δύο διαιροῦντες τὰ ζῷα, ἢ καὶ ἄλλο ὁτιοῦν γένος. καὶ γὰρ κατ' ἐκείνους, ἀναγκαῖον ἴσας τὰς ἐσχάτας εἶναι διαφορὰς πᾶσι τοῖς ζῴοις τοῖς ἀτόμοις τῷ εἴδει. ὄντος γὰρ τοῦδέ τινος γένους, οὗ διαφοραὶ πρῶται τὸ λευκόν, καὶ τὸ μέλαν, τούτων δὲ ἑκατέρου ἄλλαι, καὶ οὕτως εἰς τὸ πρόσω ἕως τῶν ἀτόμων, αἱ τελευταῖαι τέτταρες ἔσονται, ἢ ἄλλο τι πλῆθος τῶν ἀφ' ἑνὸς διπλασιαζομένων. τοσαῦτα δὲ καὶ τὰ εἴδη. ἔστι δὲ ἡ διαφορά, τὸ εἶδος ἐν τῇ ὕλῃ. οὔτε γὰρ ἄνευ ὕλης οὐδὲν ζῴου μόριον, οὔτε μόνη ἡ ὕλη. οὐ γὰρ πάντως ἔχον σῶμα ἔσται ζῷον, οὐδὲ τῶν μορίων οὐδέν, ὥσπερ πολλάκις εἴρηται. ἔτι διαιρεῖν χρὴ τοῖς ἐν τῇ οὐσίᾳ, καὶ μὴ τοῖς συμβεβηκόσι * καθ' αὑτό, οἷον εἴ τις τὰ σχήματα διαιροίη, ὅτι τὰ μὲν δυσὶν ὀρθαῖς ἴσας ἔχει τὰς γωνίας, τὰ δὲ πλείοσι. συμβεβηκὸς γάρ τι τῷ τριγώνῳ, τὸ δυσὶν ὀρθαῖς ἴσας ἔχειν τὰς γωνίας. ἔτι τοῖς ἀντικειμένοις χρὴ διαιρεῖν. διάφορα γὰρ ἀλλήλοις τὰ ἀντικείμενα, οἷον λευκότης καὶ μελανία, καὶ εὐθύτης καὶ καμπυλότης. ἐὰν οὖν θάτερα διάφορα ᾖ, τῷ ἀντικειμένῳ διαιρετέον, καὶ μὴ τὸ μὲν νεύσει, τὸ δὲ χρώματι. πρὸς δὲ τούτοις τά γ' ἔμψυχα τοῖς κοινοῖς ἔργοις τοῦ σώματος καὶ τῆς ψυχῆς· οἷον καὶ ἐν ταῖς ῥηθείσαις νῦν, πορευτικὰ καὶ πτηνά. ἔστι γάρ τινα γένη, οἷς ἄμφω ὑπάρχει, καὶ ἔστι πτηνὰ καὶ ἄπτερα, καθάπερ καὶ τὸ τῶν μυρμήκων γένος. καὶ τῷ ἀγρίῳ καὶ τῷ ἡμέρῳ * διαιρεῖσθαι. ὡσαύτως γὰρ ἂν δόξειε τὰ αὐτὰ εἴδη διαιρεῖν. πάντα γάρ, ὡς εἰπεῖν, ὅσα ἥμερα, καὶ ἄγρια τυγχάνει ὄντα, οἷον ἄνθρωποι, ἵπποι, βόες, κύνες ἐν τῇ Ἰνδικῇ, ὕες, αἶγες, πρόβατα· ὧν ἕκαστον, εἰ μὲν ὁμώνυμον, οὐ διῄρηται χωρίς· εἰ δὲ ταῦτα ἓν εἴδει, οὐχ οἷόν τε εἶναι διαφοράν, τὸ ἄγριον καὶ τὸ ἥμερον. ὅλως δὲ ὁποιανοῦν διαφορᾷ μιᾷ διαιροῦντι, τοῦτο συμβαίνειν ἀναγκαῖον. ἀλλὰ δεῖ πειρᾶσθαι λαμβάνειν κατὰ γένη τὰ ζῷα, ὡς ὑφήγηνται οἱ πολλοί, διορίζοντες ὄρνιθος γένος καὶ ἰχθύος. τούτων δὲ ἕκαστον πολλαῖς ὥρισται διαφοραῖς.

* Verba καθ' αὑτό. Gaza & Niphus non habent: leguntur tamen in ſcholiis Gr. & iterum inf. c. 5.

*Interpre. Lat. legunt. δι. ἔχει κ καλῶς.

A Differentiam vnamquanque in aliquo ſingulari ineſſe, & proinde oppoſitam neceſſe eſt. Quòd ſi fieri non poteſt, vt iis quæ ſpecie inter ſe differũt, ſpecies aliqua ſubſtantiæ indiuidua, vnáque [illegible] ſed differentiam intercedere neceſſe eſt, [illegible] homine differt. Bipedis enim ratio ali[illegible] que eſt. Vel ſi ſanguine conſtant, ſa[illegible] pat ipſe, niſi pro nulla eſſentiæ parte d[illegible] ri. Sed ſi hoc ita eſt, differentia vna d[illegible]bus inerit. Quòd ſi ita ſequetur, apertum iam [illegible], impoſſibile eſſe, vt priuatio ſit differentia. Quinetiam totidem differentiæ erũt, quot animalia indiuidua: ſiquidem & ea ipſa indiuidua ſunt, & differentiæ indiuiduæ: neque vlla differentia communis eſt. B Quod ſi ita fieri poteſt, vt non communis, ſed indiuidua ſit, conſtat, quæ diuerſa ſunt ſpecie animalia, in eodem, per illam quidem communẽ contineri. Itaque neceſſe eſt, vt ſi propriæ ſint differentiæ, in quas omnia indiuidua cadant, nulla cõmunis ſit. Sin minùs, quæ diuerſa ſunt, venient in eandem: cùm neque indiuiduum idem, diuerſas per diſtinctionem adire debeat differentias, neque diuerſa eandem, atque omnia in iis ipſis oporteat contineri. Species igitur indiuiduas colligi ita nõ poſſe, vt diuidunt, qui animalia, aut quoduis aliud genus ſeorſum in duo ſecant, apertum iam eſt: fit enim authoribus illis, vt vltimas differentias totidem eſſe, quot animalia omnia indiuidua ſpecie C neceſſe ſit. Cùm enim genus aliquod ſit, cuius differentiæ primæ album & nigrum habeantur, atque eorum vtrorumque aliæ ſint, itidémque vlterius vſque ad indiuidua, efficitur profectò, vt vltimæ, aut quatuor, aut aliquo numero eliciantur, videlicet qui ab vno multiplicari poſſit. Totidem autem ſpecies quoque erunt, cùm differentia ſpecies ſit in materia. Neque enim ſine materia pars vlla eſſe poteſt animalis, neque ſola materia: non enim quoquo modo habens quid corpus, animal eſt, nec partium vlla, vt ſæpius dictum eſt. Adhęc, diuidendum iis rebus eſt, quæ ſitæ in ſubſtantia ſunt, non iis, quæ accidunt: vt ſi quis ita figuras diuidat, vt aliæ angulos pares duobus rectis, aliæ pares pluribus habeant: accidit enim triangulæ D figuræ, vt pares duob. rectis angulos habeat. Oppoſitis item diuidendum eſt: diſtant enim inter ſe oppoſita omnia, vt albedo & nigredo: vt rectitudo & curuitas. Quòd ſi altera diuerſa ſunt, diuidendum per oppoſita eſt, & non ita, vt alterum natatione, alterum colore diſtinguatur. Animata etiam communibus corporis & animæ muneribus diuidenda ſunt: quod in iis etiam quæ modò diximus, patet: alia enim greſſilia ſunt, alia volatilia. Sunt enim nonnulla genera, quibus datum vtrunque eſt, vt partim volucres partim inuolucres ſint, velut formicarum genus: atque etiam ſyluestris vrbanique ratione ita diuiE detur: quod error eſt. Fit enim vt quæ ſpecie ſunt eadem, hæc diſtinguere videamur: cùm omnia quæ vrbana ſunt, eadem ſylueſtria quoque reperiantur, vt homines, equi, boues, canes in terra Indica, ſues, capræ, oues: quæ ſi æquiuoca ſunt, non ſeorſum diſtincta ſunt: ſed ſi eadem ſpecie, vnúmque ſunt, iam fieri non poteſt vt ſylueſtre atque vrbanum pro differentiis rectè capiantur. Omnino quancunque differentiam diuidis vna tantùm diuiſione, id accidere neceſſe eſt. Quapropter generatim ſumere animalia tentandum eſt, vt à vulgo iam authore diſtinctum eſt genus auis, piſcis, cæterorum, quæ ſingula multis differentiis deſcribuntur: nec bipartita illa ſectione agendum eſt.

Sic enim

A Sic enim aut omnino fieri nō poteſt vt inſtitutum aſſequamur, cùm idem in plures cadat diuiſiones, & contraria veniant in eandem: aut vna tantùm prouenìet differentia, quæ vel ſimplex, vel per cōplexionem, ſpeciem vltimam referat. Sed ſi nō differentiæ differentiam accipis, diuiſioné effici continuam perinde, vt orationem coniūctione vnam, neceſſe eſt: verbi cauſa, occurrit iis qui ita diuidere conſueuerunt, aliud pennatum aliud impennatum: pennati aliud vrbanum, aliud ſylueſtre: aut aliud album, aliud nigrum: non enim differentia pennati vrbanum, albúmve eſt, ſed hoc principiū eſt alterius differentiæ, impennato autem per accidens eſt. Quamobrem pluribus diuidēdum pro-
B tinus differentiis eſt quod vnum eſt, vt nos cenſemus: ſic enim priuationes differentiam facient, quam in bipartita ſectione facere nequeant. Apertum vel inde eſt, fieri non poſſe vt ex ſingularibus ſpeciebus quicquam accipiamus, bipartita generis ſectione, vt quidam fieri poſſe putarunt. Impoſſibile eſt enim vnam differentiam eſſe eorum, quæ vt ſingula diuiſionem recipiūt, ſiue ſimplicia, ſiue complexa accipiantur. Simplicia dico, ſi non habeant differentiam, qualis fiſſipedatio eſt: complexa autem, ſi habeant, vt multifidum ad fiſſipes eſt: id enim illa ſibi vult continuatio differentiarū, quæ de genere per diuiſionem deducuntur, perinde quaſi quid vnum omnis hæc ſeries referat: quā-
C quam vocabulo euenit, vt vltima tantùm differētia eſſe videatur, velut multifidum, aut bipes: pedatum autem & multipes ſuperuacua ſint. at verò plures huiuſcemodi differentias haberi nō poſſe conſtat eo argumento, quòd cùm pergis ſubinde, deuenies quidem ad vltimam differētiam, ſed non ad ſummam, & ſpeciem: quæ quidem differentia, vel fiſſipes tātùm eſt, vel omnis complexio, verbi gratia, ſi hominem diuidēs, pedatum, bipes, fiſſipes componis. at ſi *homo bipes tantummodo* eſſet, hæc differentia vna ſufficeret. *Sed quoniam* hæc vna non eſt, multas eſſe non ſub vna diuiſione neceſſe eſt. atqui fieri non poteſt vt plures e-
D iuſdem ſub bipartita vna ſint ſectione, ſed ſingulæ ſingulis finiant, neceſſe eſt. itaque fieri quoque nō poteſt vt per bipartitam illam diuiſionem, aliquod ſingulare animal accipiamus.

CAPVT IV.

De genere, & ſpecie.

SEd quæret quiſpiam, cur principio homines non complectendo appellarint nomine vno generis, quod beſtias tum aquatiles, tum volucres contineret: ſunt enim nonnulli affectus, tum his tum cæteris animalibus omnibus communes.
E Veruntamen rectè ad hunc modum definitum diſtinctúmque eſt: genera. n. quæcumque exceſſu inter ſe differant, & plus minúſve recipiant, hæc vni ſubiecta ſunt generi: quæ autem proportionem recipiunt, hæc ſeorſum poſita ſunt. Verbi gratia: Auis differt ab aue, aut eo quòd magis habeat quicquam, aut ſuperantiæ ratione: aliæ enim aliæ penna ſunt longiore, aliæ breuiore. Piſces verò proportione ab auibus differunt: quod .n. penna in auibus eſt, hoc idem ſquama in piſcibus habetur. Verùm id facere in omnibus nō facile eſt: magna .n. pars animaliū eadem affecta eſt proportione. Sed cùm vltimæ ſpecies ſubſtantiæ ſint, quæ quidem ſpecies nullo ſpeciei diſcrimine differant,

A οὕτω μὲν γὰρ ἤτοι τὸ προθέμενον οὐκ ἔστι λαβεῖν (τὸ αὐτὸ γὰρ εἰς πλείους ἐμπεσεῖται διαιρέσεις, καὶ τὰ ἐναντία εἰς τὴν αὐτήν) ἢ μία μόνον διαφορὰ ἔσται· καὶ αὕτη, ἤτοι ἁπλῆ, ἢ ἐκ συμπλοκῆς τὸ τελευταῖον ἔσται εἶδος. ἐὰν δὲ μὴ διαφορᾶς λαμβάνῃ τὴν διαφοράν, ἀναγκαῖον ὥσπερ συνδέσμῳ τὸν λόγον ἕνα ποιοῦντας, οὕτω καὶ τὴν διαίρεσιν συνεχῆ ποιεῖν. λέγω δὲ οἷον συμβαίνει τοῖς διῃρημένοις, τὸ μὲν ἄπτερον, τὸ δὲ πτερωτόν. τοῦ πτερωτοῦ δὲ, τὸ μὲν ἥμερον, τὸ δὲ ἄγριον· ἢ τὸ μὲν λευκόν, τὸ δὲ μέλαν. οὐ γὰρ διαφορὰ τοῦ πτερωτοῦ τὸ ἥμερον, οὐδὲ τὸ λευκόν· ἀλλ' ἑτέρας ἀρχὴ διαφορᾶς, ἐκεῖ δὲ κατὰ συμβεβη-
B κός. διὸ πολλαῖς τὸ ἓν εὐθέως διαιρετέον, ὥσπερ λέγομεν. καὶ γὰρ οὕτως μὲν αἱ στερήσεις ποιήσουσι διαφοράν, ἐν δὲ τῇ διχοτομίᾳ οὐ ποιήσουσιν. ὅτι δ' οὐκ ἐνδέχεται τῶν καθ' ἕκαστον εἰδῶν λαμβάνειν οὐδέν, διαιροῦσι δίχα τὸ γένος, ὥσπερ τινὲς ᾠήθησαν, καὶ ἐκ τῶνδε φανερόν. ἀδύνατον γὰρ μίαν ὑπάρχειν διαφορὰν τῶν καθ' ἕκαστον διαιρετῶν, ἐάν τε ἁπλᾶ λαμβάνῃ, ἐάν τε συμπεπλεγμένα. λέγω δὲ ἁπλᾶ μὲν, ἐὰν μὴ ἔχῃ διαφοράν, οἷον τὴν σχιζοποδίαν· συμπεπλεγμένα δὲ, ἐὰν ἔχῃ, οἷον τὸ πολυσχιδὲς, πρὸς τὸ σχιζόπουν. τοῦτο γὰρ ἡ συνέχεια βούλεται τῶν ἀπὸ τοῦ γένους κατὰ τὴν διαίρεσιν διαφορῶν, ὡς ἕν τι τὸ
C πᾶν ὄν. ἀλλὰ παρὰ τὴν λέξιν συμβαίνει δοκεῖν τὴν τελευταίαν μόνον εἶναι διαφοράν, οἷον τὸ πολυσχιδὲς, ἢ τὸ δίπουν· τὸ δὲ ὑπόπουν καὶ πολύπουν περίεργον. ὅτι δ' ἀδύνατον πλείους εἶναι τοιαύτας, δῆλον. αἰεὶ γὰρ βαδίζων, ἐπὶ τὴν ἐσχάτην διαφορὰν ἀφικνεῖται, ἀλλ' οὐκ ἐπὶ τὴν τελευταίαν καὶ τὸ εἶδος. αὕτη δ' ἐστὶν, ἢ τὸ σχιζόπουν μόνον, ἢ πᾶσα ἡ συμπλέξις, ἐὰν διαιρῆται ἄνθρωπον, οἷον εἴ τις συνθείη ὑπόπουν, δίπουν, σχιζόπουν. εἰ δ' ἦν ὁ ἄνθρωπος σχιζόπουν μόνον, οὕτως ἐγίνετ' ἂν αὕτη μία διαφορά. νῦν δ' ἐπειδὴ οὐκ ἔστιν, ἀνάγκη πολλὰς εἶναι μὴ ὑπὸ μίαν διαίρεσιν. ἀλλὰ μὴν πλείους γε τοῦ αὐτοῦ οὐκ
D ἔστιν ὑπὸ μίαν διχοτομίαν εἶναι, ἀλλὰ μίαν κατὰ μίαν τελευτᾶν. ὥστε ἀδύνατον ὁτιοῦν λαβεῖν τῶν καθ' ἕκαστον ζώων, δίχα διαιρουμένοις.

ΚΕΦΑΛ. δ'.

Περὶ γένους καὶ εἴδους.

Ἀπορήσειε δ' ἄν τις, διὰ τί οὐκ ἄνωθεν ἑνὶ ὀνόματι ἐμπεριλαβόντες ἅμα ἓν γένος, ἄμφω προσηγόρευσαν οἱ ἄνθρωποι, ὃ περιέχει τά τε ἔνυδρα καὶ τὰ πτηνὰ τῶν ζώων.
E ἔστι γὰρ ἔνια πάθη κοινὰ καὶ τούτοις, καὶ τοῖς ἄλλοις ἅπασι ζώοις. ἀλλ' ὅμως ὀρθῶς διώρισται τοῦτον τὸν τρόπον. ὅσα μὲν γὰρ διαφέρει τῶν γενῶν καθ' ὑπεροχὴν, καὶ τὸ μᾶλλον καὶ τὸ ἧττον, ταῦτα ὑπέζευκται ἑνὶ γένει· ὅσα δ' ἔχει τὸ ἀνάλογον, χωρίς. λέγω δ' οἷον ὄρνις ὄρνιθος διαφέρει τῷ μᾶλλον, ἢ καθ' ὑπεροχὴν· τὸ μὲν γὰρ μακρόπτερον, τὸ δὲ βραχύπτερον. ἰχθύες δὲ ὄρνιθος τῷ ἀνάλογον· ὃ γὰρ ἐκείνῳ πτερόν, θατέρῳ λεπίς. τοῦτο δὲ ποιεῖν [ἐν] πᾶσιν οὐ ῥᾴδιον. τὰ γὰρ πολλὰ ζῷα ἀνάλογον ταὐτὸν πεπόνθασιν. * ἐπεὶ δὲ οὐσίαι μέν εἰσι τὰ ἔσχατα εἴδη, ταῦτα δὲ κατὰ τὸ εἶδος ἀδιάφορα,

* Vide ſcholia Epheſij. Gaza aliam lectionē excogitaſſe videtur.

A ἢ Σωκράτης, Κορίσκος, ἀναγκαῖον ἢ τὰ καθόλου ὑπάρχοντα πρότερον εἰπεῖν, ἢ πολλάκις ταὐτὸν λέγειν, καθάπερ εἴρηται. τὰ δὲ καθόλου, κοινά· τὰ γὰρ πλείοσιν ὑπάρχοντα, καθόλου λέγομεν. ἀπορίαν δ' ἔχει περὶ τοῦ, ποτέρων δεῖ πραγματεύεσθαι. τῇ μὲν γὰρ ἕνα τὸ τῷ εἴδει ἄτομα, κράτιστόν ἐστιν, εἴ τις δύναιτο περὶ τῶν καθ' ἕκαστον καὶ ἀτόμων τῷ εἴδει, θεωρεῖν χωρίς, ὥσπερ ἀνθρώπου, οὕτω καὶ περὶ ὀρνίθων· ἔχει γὰρ εἴδη τὸ γένος τοῦτο· ἀλλὰ περὶ ὁτουοῦν ὄρνιθος τῶν ἀτόμων, οἷον ἢ στρουθὸς, ἢ γέρανος, ἢ τι τοιοῦτον. ᾗ δὲ συμβήσεται λέγειν πολλάκις περὶ τοῦ αὐτοῦ πάθους, διὰ τὸ κοινῇ πλείοσιν ὑπάρχειν. ταύτῃ δ' ἐστὶν ὑπάτοπον, καὶ μακρὸν τὸ περὶ ἑκάστου λέγειν χωρίς. ἴσως μὲν οὖν ὀρθῶς ἔχει, τὰ μὲν κατὰ γένος κοινῇ λέγειν, ὅσα λέγεται καλῶς ὡρισμένα τῶν ἀνθρώπων, καὶ ἔχει τε μίαν φύσιν κοινὴν καὶ εἴδη ἐν αὐτοῖς μὴ πολὺ διεστῶτα, * ὄρνις καὶ ἰχθύς, καὶ εἴ τι ἄλλο ἐστὶν ἀνώνυμον μὲν, περιέχει δὲ ὁμοίως τὰ ἐν αὐτῷ εἴδη. ὅσα δὲ μὴ τοιαῦτα, καθ' ἕκαστον, οἷον περὶ ἀνθρώπου, κἂν εἴ τι τοιοῦτον ἕτερόν ἐστι. σχεδὸν δὲ τοῖς σχήμασι τῶν μορίων καὶ τοῦ σώματος ὅλου, ἐὰν ὁμοιότητα ἔχῃ, ἀφώρισται τὰ γένη, οἷον τὸ τῶν ὀρνίθων γένος πρὸς αὑτὰ πέπονθε, καὶ τὸ τῶν ἰχθύων, καὶ τὰ μαλάκιά τε καὶ τὰ † ὄστρεα. τὰ γὰρ μόρια διαφέρει τούτων, οὐ τῇ ἀνάλογον ὁμοιότητι, οἷον ἐν ἀνθρώπῳ καὶ ἰχθύι πέπονθεν ὀστοῦν πρὸς ἄκανθαν, ἀλλὰ μᾶλλον τοῖς σωματικοῖς πάθεσιν, οἷον μεγέθει, μικρότητι· μαλακότητι, σκληρότητι· λειότητι, τραχύτητι, καὶ τοῖς συστοίχοις· ὅλως δὲ τῷ μᾶλλον καὶ ἧττον. πῶς μὲν οὖν ἀποδέχεσθαι δεῖ τὴν περὶ φύσιν μέθοδον, καὶ τίνα τρόπον γίνοιτ' ἂν ἡ θεωρία περὶ αὐτῶν ὁδῷ, καὶ ῥᾷστα· ἔτι δὲ περὶ διαιρέσεως, τίνα τρόπον ἐνδέχεται μετιοῦσι λαμβάνειν χρησίμως, καὶ διότι τῇ μὲν ἡ διχοτομία ἀδύνατον, τῇ δὲ κενή, εἴρηται. διωρισμένων δὲ τούτων, περὶ τῶν ἐφεξῆς λέγωμεν, ἀρχὴν τήνδε ποιησάμενοι.

* C. ἢ ὡς.

† χηλαί.

ΚΕΦΑΛ. ε.

Τῶν οὐσιῶν τὰς μὲν ἀγενήτους εἶναι, τὰς δὲ φθειρομένας.

Τῶν οὐσιῶν ὅσαι φύσει συνεστᾶσι, τὰς μὲν ἀγενήτους καὶ ἀφθάρτους εἶναι τὸν ἅπαντα αἰῶνα, τὰς δὲ μετέχειν γενέσεως καὶ φθορᾶς. συμβέβηκε δὲ περὶ μὲν ἐκείνας τιμίας οὔσας καὶ θείας, ἐλάττους ἡμῖν ὑπάρχειν θεωρίας. καὶ γὰρ ἐξ ὧν ἄν τις περὶ αὐτῶν, καὶ περὶ ὧν εἰδέναι ποθοῦμεν, παντελῶς ἐστιν ὀλίγα τὰ φανερὰ κατὰ τὴν αἴσθησιν. περὶ δὲ τῶν φυτῶν τε καὶ ζῴων εὐποροῦμεν μᾶλλον πρὸς τὴν γνῶσιν, διὰ τὸ σύντροφον. πολλὰ γὰρ περὶ ἕκαστον γένος λάβοι τις ἂν τῶν ὑπαρχόντων, βουλόμενος διαπονεῖν ἱκανῶς. ἔχει δ' ἑκάτερα χάριν. τῶν μὲν γὰρ εἰ καὶ κατὰ μικρὸν ἐφαπτόμεθα, ὅμως διὰ τὴν τιμιότητα τοῦ γνωρίζειν ἥδιον, ἢ τὰ παρ' ἡμῖν ἅπαντα, ὥσπερ καὶ τῶν ἐρωμένων τὸ τυχὸν καὶ μικρὸν μόριον κατιδεῖν ἥδιόν ἐστιν, ἢ πολλὰ ἕτερα καὶ μεγάλα δι' ἀκριβείας ἰδεῖν. τὰ δὲ διὰ τὸ μᾶλλον καὶ πλείω γνωρίζειν αὐτῶν,

vt Socrates, Coriſcus: efficitur profectò vt vel vniuerſalia explicari priùs, vel idem ſæpius dicere neceſſe ſit, vt dictum iam eſt. Vniuerſalia verò communia ſunt: quæ enim in pluribus inſunt, h[illegible] niuerſalia appellamus. Sed quæſtio exiſti[illegible] dem tractari debeant: quia enim ſubſtan[illegible] quod ſpecie indiuiduum eſt, potiſſim[illegible] fore, ſi quis de ſingulis indiuiduis ſpecie [illegible] conſiderare potuerit: atque vt de homine, ita de auibus eſſe agendum: habet enim hoc genus ſpecies: ſed non de iis verùm de ſingulis indiuiduis auibus, vt de paſſere, de grue, de reliquis huiuſcemodi. Sed ſi ita eueniet, vt ſæpe de eodem dicatur

B affectu (quoniam communis pluribus ſit) efficietur ſane vt ſeorſum referre de ſingulis, & ſubabſurdũ ſit, & prolixum. Cæterum recte fortaſſe agetur, ſi quæ ad genera attinent, ea communi negotio explicemus: videlicet quæ rectè ab hominibus deſinita dicuntur, quæque naturam ſortiuntur communem, & ſpecies non longè inter ſe differentes complectuntur, vt auis, vt piſcis. & ſi quid aliud ſit, nomine quidem vacans, ſed genere pari modo ſpecies continens. Quæ autem nõ eiuſmodi ſunt, hęc ſingillatim doceamus: vt de homine, & ſi quid aliud tale habeatur. Genera autem ſi quam ſimilitudinem præ ſe ferant, figuris ferè partium, totiúſque corporis deſcribuntur: quale genus auium aut

C piſcium eſt. Mollia etiam, atque oſtrea, figurarum affinitate ſua genera deſcribunt: partes enim eorum non proportionis ſimilitudine diſcrepãt, quomodo os hominis, & ſpina piſcis, ſed potiùs affectionibus corporis, id eſt, magnitudine, paruitate, mollitie, duritate, lenitate, aſperitate, & reliquis generis eiuſdem: atque omnino eo quòd magis minúſve quicquam habeát. Sed quemadmodum ratio tractandæ Naturæ probari debeat, vtque de iis rebus via apta, faciliméque contemplari docereque poſſimus, atque etiam de diuiſione, quem in modum fieri poſſit, vt commodè ſpecies ſumatur, & quare bipartita ſectio partim fieri nequeat, partim fruſtra fiat, dictum iam eſt. Quæ cùm iam

D præfinita explicatáque ſint, de iis quæ deinceps ſequantur, agamus, indéque ordiamur.

CAPVT V.

De ſubſtantiis naturalibus, partim mortalibus, partim immortalibus.

SVbſtantiæ, quæ Natura conſtant, partim ingenitæ immortaléſque ſeculis omnibus ſũt: partim ortus participes, atque interitus intelliguntur. ſed partem illam æternam, & proinde nobilem ac diuinam, minùs contemplari propterea poſſumus, quòd admodum pauca illius noſtro ſenſui patent, quorum beneficio tum de ea ipſa parte diuina,

E tum de iis quæ noſſe cupimus, facultas nobis cogitandi indagandíque ſuppeditetur. Res mortales atque caducas, vt ſtirpes, vt animantes, quod eas ſocias familiaréſque habemus, noſſe vberiùs poſſumus: quippe cùm multa ineſſe quoque in genere percipere poſſit, quicumque nõ laborem recuſat [illegible] maiorem: vtrumque tamẽ ſtudium nos delectat. Res namque illas ſuperiores, tametſi leuiter attingere poſſumus, tamen ob eius cognoſcendi generis excellẽtiam amplius oblectamur, quàm cùm hæc nobis iuncta omnia tenemus, quemadmodum quamlibet partem minimam(?) corporis noſtrarum puellæ deliciarum vidiſſe gratum ac iucundius eſt, quàm cæterorum hominum membra tota perſpexiſſe, & contrectaſſe. at hæc inferiora, quia & plura ſunt, & cognoſci plenius poſſunt:

idcirco præſtãtiam ſibi ſcientiæ vendicant. Quinetiã quòd & nobis propiora & Naturæ familiariora ſunt, hinc aliquid cum rerũ diuinarum ſtudio rependunt, atque cõpenſant. Sed cùm iam ſatis de iis egerimus, noſtrámque explicuerimus ſententiã, reſtat vt de animante Natura diſſeramus, nihil pro viribus omittentes, vel vilius vel nobilius. Nam & in iis quæ hoc in genere minus grata noſtro occurrunt ſenſui, Natura parens & author omnium, miras excitat voluptates hominibus qui intelligunt cauſas, atque ingenuè philoſophantur. Abſurdum enim, nullâque ratione probãdum eſt, ſi imagines quidem rerum naturalium, non ſine delectatione propterea inſpectamus, quod ingenium vnà contemplamur, quod illas cõdiderit, id eſt, artem pingendi, aut fingendi: rerum autem ipſarum Naturæ ingenio miráque ſolertia conſtitutarum contemplationem, non magis perſequamur, atque exoſculemur, modò cauſas perſpicere valeamus. Quamobrem viliorum animalium diſputationem perpenſionémque faſtidio puerili quodam ſpreuiſſe, moleſtéque tuliſſe, dignum nequaquam eſt, cùm nulla res ſit Naturæ, in qua non mirãdum aliquid inditum habeatur. Et quod Heraclitum dixiſſe ferunt ad eos qui cùm alloqui eum vellent, quòd fortè in caſa furnaria quadam caloris gratia ſedentem vidiſſent, accedere temperarunt: ingredi enim eos fidenter iuſſit, Quoniam, inquit, ne huic quidem loco dij deſunt immortales. Hoc idem in indaganda quoque natura animantium faciendum eſt. Aggredi enim quæque ſine vllo pudore debemus, cùm in omnibus Naturæ numen & honeſtum pulchrúmque inſit ingenium. Quippe cùm naturæ operibus iunctum illud præcipuè ſit, vbi nihil temerè, vicéque fortuita committatur, ſed alicuius gratia omnia agantur. Finis autem, cuius gratia quicquam vel conſtat, vel conditum eſt, boni honeſtique obtinet rationem. at verò ſi quis cæterorum animalium cõtemplationem ignobilem abiectámque putat, iam hic de ſe quoque idem arbitrari debet. Non enim fieri poteſt vt ea ſine magna abominatione inſpiciamus, ex quibus corpus conſtat humanum, vt ſanguinem, carnem, oſſa, venas, reliqua generis eiuſdem. Omnino ita cenſendum, vt qui de quauis corporis parte, aut de vaſe aliquo diſputat, non de materia, aut eius materiæ gratia doceat, ſed formæ totius ratione: ſicvt & cùm de ædibus agitur, non de lateribus, non de luto, non de lignis, ſed de forma ipſarum ædium docemus. Pari ratione qui de Natura agit, de compoſitione, totáque ſubſtantia tractet, non de iis quæ nunquã euenit vt à ſubſtantia ſeparentur. Sed primùm ea diſtingui ſingulis in generibus neceſſe eſt, quæ per ſe animalibus accidunt omnibus: pòſt verò cauſas perſequi eorum conandum eſt. Quod igitur antè diximus, multa in multis animalibus inſunt communia, partim ſimplici ratione, vt pedes, pennæ, ſquamæ, atque etiã affectus ſimiliter: partim proportione. Proportione, inquam, quòd aliis pulmo datus eſt, aliis pulmo quidem negatus, ſed vice pulmonis iunctum aliquid eſt, quod pulmoni reſpondeat. aliis item ſanguis ineſt, aliis ſanguinis proportionale, quod eandem in genere exangui obtinet vim, quam ſanguis in compote illo ſanguinis habet. Verùm ſi ſeorſum de ſingulis diſputetur, eueniet quod dictum iam eſt, vt ſæpe eadem iterentur, dum de omnibus, quæ adiuncta ſunt, agitur: quippe cùm eadem compluribus iuncta habeantur. Hæc ita placeat præfiniri, & ſtatui.

A λαμβάνει τὴν τῆς ἐπιστήμης ὑπεροχήν. ἔτι δὲ διὰ τὸ πλησιαίτερα ἡμῶν εἶναι, καὶ τῆς φύσεως οἰκειότερα, ἀντικαταλλάττεταί τι πρὸς τὴν περὶ τὰ θεῖα φιλοσοφίαν. ἐπεὶ δὲ περὶ ἐκείνων διήλθομεν, λέγοντες τὸ φαινόμενον ἡμῖν, λοιπὸν περὶ τῆς ζωϊκῆς φύσεως εἰπεῖν, μηδὲν παραλιπόντας εἰς δύναμιν, μήτε ἀτιμότερον, μήτε τιμιώτερον. καὶ γὰρ ἐν τοῖς μὴ κεχαρισμένοις αὐτῶν πρὸς τὴν αἴσθησιν, κατὰ τὴν θεωρίαν ὅμως ἡ δημιουργήσασα φύσις ἀμηχάνους ἡδονὰς παρέχει τοῖς δυναμένοις τὰς αἰτίας γνωρίζειν, καὶ φύσει φιλοσόφοις. καὶ γὰρ ἂν εἴη παράλογον καὶ ἄτοπον, εἰ τὰς μὲν εἰκόνας αὐτῶν θεωροῦν- B τες χαίρομεν, ὅτι τὴν δημιουργήσασαν συνθεωροῦμεν, οἷον τὴν γραφικὴν, ἢ τὴν πλαστικήν· αὐτῶν δὲ τῶν φύσει συνεστώτων μὴ μᾶλλον ἀγαπῷμεν τὴν θεωρίαν, δυνάμενοί γε τὰς αἰτίας καθορᾶν. διὸ δεῖ μὴ δυσχεραίνειν παιδικῶς τὴν περὶ τῶν ἀτιμοτέρων ζώων ἐπίσκεψιν. ἐν πᾶσι γὰρ τοῖς φυσικοῖς ἔνεστί τι θαυμαστόν· καὶ καθάπερ Ἡράκλειτος λέγεται πρὸς τοὺς ξένους εἰπεῖν τοὺς βουλομένους αὐτῷ ἐντυχεῖν, οἳ ἐπειδὴ προσιόντες εἶδον αὐτὸν θερόμενον πρὸς τῷ ἴπνῳ, ἔστησαν· ἐκέλευσε γὰρ αὐτοὺς εἰσιέναι θαρροῦντας· εἶναι γὰρ καὶ ἐνταῦθα θεούς· οὕτω καὶ πρὸς τὴν ζήτησιν περὶ ἑκάστου τῶν ζώων προσιέ- C ναι δεῖ μὴ δυσωπούμενον, ὡς ἐν ἅπασιν ὄντος φυσικοῦ καὶ καλοῦ. τὸ γὰρ μὴ τυχόντως, ἀλλ' ἕνεκά τινος ἐν τοῖς τῆς φύσεως ἔργοις ἐστὶ, καὶ μάλιστα· οὗ δ' ἕνεκα συνέστηκεν ἢ γέγονε τέλους, τὴν τοῦ καλοῦ χώραν εἴληφεν. εἰ δέ τις τὴν περὶ τῶν ἄλλων ζώων θεωρίαν ἄτιμον εἶναι νενόμικε, τὸν αὐτὸν τρόπον οἴεσθαι χρὴ καὶ περὶ αὑτοῦ. οὐκ ἔστι γὰρ ἄνευ πολλῆς δυσχερείας ἰδεῖν ἐξ ὧν συνέστηκε τὸ τῶν ἀνθρώπων γένος, οἷον αἷμα, σάρκες, ὀστᾶ, φλέβες, καὶ τὰ τοιαῦτα μόρια. ὁμοίως τε δεῖ νομίζειν τὸν περὶ οὑτινοσοῦν τῶν μορίων ἢ τῶν σκευῶν διαλεγόμενον, μὴ περὶ τῆς ὕλης ποιεῖσθαι τὴν μνήμην, μηδὲ ταύτης χάριν, ἀλλὰ τῆς ὅλης μορφῆς· οἷον καὶ περὶ οἰ- D κίας, ἀλλὰ μὴ πλίνθων καὶ πηλοῦ, καὶ ξύλων· καὶ τὸν περὶ φύσεως, περὶ τῆς συνθέσεως, καὶ τῆς ὅλης οὐσίας, ἀλλὰ μὴ περὶ τούτων, ἃ μὴ συμβαίνει χωριζόμενά ποτε τῆς οὐσίας αὐτῆς. ἀναγκαῖον δὲ πρῶτον τὰ συμβεβηκότα διελεῖν περὶ ἕκαστον γένος, ὅσα καθ' αὑτὰ πᾶσιν ὑπάρχει τοῖς ζώοις. μετὰ δὲ ταῦτα, τὰς αἰτίας αὐτῶν πειρᾶσθαι διελεῖν. εἴρηται μὲν οὖν καὶ πρότερον, ὅτι πολλὰ κοινὰ πολλοῖς ὑπάρχει τῶν ζώων· τὰ μὲν ἁπλῶς, οἷον πόδες, πτερά, λεπίδες· καὶ πάθη δὲ τὸν αὐτὸν τρόπον τούτοις· τὰ δ' ἀνάλογον. λέγω δὲ ἀνάλογον, ὅτι τοῖς μὲν ὑπάρχει πνεύμων, τοῖς δὲ πνεύμων μὲν οὔ, ὃ δὲ τοῖς ἔχουσι πνεύμο- E να, ἐκείνοις ἕτερον ἀντὶ τούτου. καὶ τοῖς μὲν αἷμα, τοῖς δὲ τὸ ἀνάλογον, τὴν αὐτὴν ἔχον δύναμιν, ἥνπερ τοῖς ἐναίμοις τὸ αἷμα. τὸ δὲ λέγειν χωρὶς περὶ ἑκάστου τῶν καθ' ἕκαστον, καὶ πρότερον εἴπομεν ὅτι πολλάκις ταὐτὰ λέγειν συμβήσεται, ἐπειδὴ λέγομεν περὶ πάντων τῶν ὑπαρχόντων. ὑπάρχει δὲ πολλοῖς * ταὐτά. ταῦτα μὲν οὖν ταύτῃ διωρίσθω.

* γρ. Ἡράκλειτον

* γρ. ταῦτα.

A ἐπεὶ δὲ τὸ μὲν ὄργανον πᾶν ἕνεκά του, τῶν δὲ τοῦ σώματος μορίων ἕκαστον ἕνεκά του, τὸ δ' οὗ ἕνεκα, πρᾶξίς τις, φανερὸν ὅτι καὶ τὸ σύνολον σῶμα συνέστηκε πράξεώς τινος ἕνεκα πλήρους. οὐ γὰρ ἡ πρίσις τοῦ πρίονος χάριν γέγονεν, ἀλλὰ ὁ πρίων τῆς πρίσεως. χρῆσις γάρ τις ἡ πρίσις. ὥστε καὶ τὸ σῶμά πως τῆς ψυχῆς ἕνεκεν, καὶ τὰ μόρια * τῶν ἔργων ἕνεκα, πρὸς ἃ πέφυκεν ἕκαστον. λεκτέον ἄρα τὰς πράξεις πρῶτον τάς τε κοινὰς πάντων, καὶ τὰς κατὰ γένος, καὶ τὰς κατ' εἶδος. λέγω δὲ κοινὰς μὲν, αἳ πᾶσιν ὑπάρχουσι τοῖς ζώοις· κατὰ γένος δὲ, ὅσων παρ' ἄλληλα τὰς διαφορὰς ὁρῶμεν καθ' ὑπεροχὴν οὔσας· οἷον ὄρνιθα λέγω κατὰ γένος, ἄνθρωπον B δὲ κατ' εἶδος, καὶ πᾶν ὃ κατὰ τὸν καθόλου λόγον οὐδεμίαν ἔχει διαφοράν. τὰ μὲν γὰρ ἔχουσι τὸ κοινὸν κατ' ἀναλογίαν, τὰ δὲ κατὰ γένος, τὰ δὲ κατ' εἶδος. ὅσαι μὲν οὖν πράξεις ἄλλων ἕνεκα, * δῆλον ὅτι καὶ ὧν αἱ πράξεις τὸν αὐτὸν τρόπον διεστᾶσιν, ὅνπερ αἱ πράξεις. ὁμοίως δὲ κἂν εἴ τινες πρότεραι καὶ τέλος ἑτέρων πράξεων τυγχάνωσιν οὖσαι, τὸν αὐτὸν ἕξει τρόπον καὶ τῶν μορίων ἕκαστον, ὧν αἱ πράξεις αἱ τοιαῦται· καὶ τρίτον, ὧν ὄντων, ἀναγκαῖον ὑπάρχειν. λέγω δὲ πάθη καὶ πράξεις, γένεσιν, αὔξησιν, ὀχείαν, ἐγρήγορσιν, ὕπνον, πορείαν, καὶ ὁπόσ' ἄλλα τοιαῦτα τοῖς ζώοις ὑπάρχει. μόρια δὲ C λέγω, ῥῖνα, ὀφθαλμὸν, καὶ τὸ σύνολον πρόσωπον· ὧν ἕκαστον καλεῖται μέλος. ὁμοίως δὲ καὶ περὶ τῶν ἄλλων. καὶ περὶ μὲν τοῦ τρόπου τῆς μεθόδου, τοσαῦθ' ἡμῖν εἰρήσθω. τὰς δ' αἰτίας πειραθῶμεν εἰπεῖν περί τε τῶν κοινῶν, καὶ τῶν ἰδίων, ἀρξάμενοι καθάπερ διωρίσαμεν, πρῶτον ἀπὸ τῶν πρώτων.

* κ. τ. ἑ. ἕνεκα ὃ πέφυκεν ἕκαστον.

* κ. δῆλον

A Cùm autem inſtrumentum omne rei alicuius gratia ſit, & partes corporis quaſque gratia eſſe alicuius videamus: id autem ipſum eſſe alicuius gratia non niſi pro aliqua actione ſit: patet iam totum etiam corpus conſtare alicuius gratia actionis plenioris. Non enim ſectio, ſerræ gratia facta eſt, ſed ſerra ſectionis gratia, cùm ſectio quidem vſus ſit. Quapropter corpus etiam totum animæ gratia conditum eſt, & membra officiorum gratia conſtant, & munerum, ad quæ ſingula accommodantur. Primùm igitur actiones, tum omnium communes, tum eas quæ ſuæ ſingulis generibus ſpeciebúſque habeantur, exponi oportebit. Communes dico, quæ adiunctæ omnibus ſunt animalibus: ſuas autem, propriáſque appello, quarum differen- B tias per exceſſum ſiue ſuperantiam comparando accipimus. Verbi gratia: Auem pro genere pono, hominem pro ſpecie, & quodcumque ratione illa vniuerſali, nullam differentiam recipit. Nam alia proportione, alia genere, alia ſpecie rationem cõplent communitatis. Quorum itaque actiones rerum aliarum gratia diſpenſatæ ſunt, hæc etiam, quorum ſunt actiones, modo eodem inter ſe differunt, quo actiones. Item ſi quæ priores ſint actiones & pro fine aliarum capiantur, quomodo ipſæ ſe habent, eodem membra etiam habent, quorum illæ ſunt actiones. Addo tertium: quæ cùm ſint, C aliquid ineſſe neceſſe eſt. affectus, & actiones intelligi volo, ortum, incrementum, coitum venereum, vigiliam, ſomnum, inceſſum, & quęcumque huiuſmodi alia poſſunt generi animalium tribui: membra appello, naſum, oculum, atque etiam totam faciem, quę partes quoque vocamus. Pari modo de cæteris item intelligendum eſt, ſed de modo viáque tractandi hactenus: cauſas nunc explicare, tum communium, tum propriorum conemur, exorſi à primis, ſicvt ſtatuimus.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζώων μορίων τὸ Β.

D

ΚΕΦΑΛ. α'.

Περὶ τριῶν συνθέσεων τῶν ὄντων.

ΕΚ τίνων μὲν οὖν μορίων καὶ πόσων συνέστηκεν ἕκαστον τῶν ζώων, ἐν ταῖς ἱστορίαις ταῖς περὶ αὐτῶν δεδήλωται σαφέστερον. δι' ἃς δ' αἰτίας ἕκαστον τοῦτον ἔχει τὸν τρόπον, ἐπισκεπτέον νῦν, χωρίσαντες καθ' αὑτὰ τῶν E ἐν ταῖς ἱστορίαις εἰρημένων. τριῶν δ' οὐσῶν τῶν συνθέσεων, πρώτην μὲν ἄν τις θείη τὴν ἐκ τῶν καλουμένων ὑπό τινων στοιχείων, οἷον γῆς, ἀέρος, ὕδατος, πυρός. ἔτι δὲ βέλτιον ἴσως ἐκ τῶν δυνάμεων λέγειν, καὶ τούτων οὐκ ἐξ ἁπασῶν, ἀλλ' ὥσπερ ἐν ἑτέροις εἴρηται καὶ πρότερον. ὑγρὸν γὰρ καὶ ξηρὸν, καὶ θερμὸν καὶ ψυχρὸν, ὕλη τῶν συνθέτων σωμάτων ἐστίν. αἱ δ' ἄλλαι διαφοραὶ ταύταις ἀκολουθοῦσιν, οἷον βάρος καὶ κουφότης, καὶ πυκνότης καὶ μανότης, καὶ τραχύτης καὶ λειότης, καὶ τἆλλα τὰ τοιαῦτα πάθη τῶν σωμάτων. δευτέρα δὲ σύστασις ἐκ τῶν πρώτων, ἡ τῶν ὁμοιομερῶν φύσις

Qα. χωρίσαντες

ARISTOTELIS STAGIRITÆ, de partibus Animalium & earum cauſis,

Liber II.

Capvt I.

Triplicem eſſe rerum omnium compoſitionem.

EX quibuſnam & quot numero mẽbris ſingula animalia conſtarẽt, libris hiſtoriarũ, qui de his ſcripti à nobis ſunt, planiùs explicauimus: nũc quas ob cauſas, quæq; ad hũc modũ ita ſe habẽt, conſideremus: E videlicet ita vt omnis ratio ſeiuncta ab iis quæ per hiſtorias expoſuimus, tractetur. Cùm itaq; triplex ſit cõpoſitio, prima ſtatui poteſt ea quæ ex primordiis conficitur, iis quæ nonnulli elementa appellant, terram dico, aquam, aërem, ignem: ſed melius fortaſſe dici poteſt, ex virtutibus confici elementorum, iiſque non omnibus, ſed vt antè expoſitum eſt: humiditas enim & ſiccitas, & caliditas & frigiditas, materia corporum ſunt compoſitorum. Cæteræ autem differentiæ eas ſequuntur, vt grauitas, leuitas: denſitas, raritas: aſperitas, lenitas, & reliquæ id genus affectiones. Secunda conſtitutio ex primis illis natura ſimilarium partium

inanimalibus eſt, vt oſſis, vt carnis, & reliquorum generis eiuſdem. Tertia, & vltima numero, partium diſſimilarium eſt, vt faciei, manus, & reliquorum eiuſmodi membrorum. Sed cùm contra in generatione, atque in eſſentia agatur: quæ enim poſteriora ſunt generatione, hæc natura priora ſunt: & quod primum natura eſt, id vltimum eſt generatione. non enim ædes, laterum aut lapidum gratia ſunt, ſed hæc ædium gratia petuntur: quod idem de quauis alia materia intelligimus. Nec inductione tantùm id patet, verùm etiam ratione: Omne enim quod gignitur, ex aliquo, & ad aliquid ſuam generationem deducit, & à principio ad principium pergit, hoc eſt, ab eo quod primum mouet, & naturam iam aliquam obtinet, ad formam aliquam, aut talem quempiam finem: homo enim hominem gignit, & ſtirps ſtirpem ex materia, quæ ſubiecta ſingulis eſt. Cùm igitur generatio, & eſſentia ita ſe habeant, tempore materiam generationémque eſſe priorem neceſſe eſt: ratione verò eſſentiam rei cuiuſque, & formam. Patet hoc definitione generationis: quippe cùm ædificationis definitio contineat ædium definitionem, ædium definitio non contineat ædificationis definitionem: idémque in cæteris euenit. Quamobrem elementorum materiam eſſe ſimilarium partium gratia neceſſe eſt. Sunt enim hæ poſteriores illis generatione: iis autem ipſis diſſimilares ſunt poſteriores. Iam enim finem hæ tenent, ac terminum, ternatio conſtitutionem adeptæ numero, ſcilicet vt perfici generationem in multis naturæ fert. Conſtant igitur animalia ex vtroque membrorum hoc genere. Verùm ſimilaria diſſimilarium gratia habentur: illorum enim officia ſunt, & actiones, vt oculi, vt narium, & faciei totius: item digiti, manus, & brachij totius. Sed cùm actiones motionéſque multiformes, tum animalibus totis, tum etiam membris eiuſmodi tribuantur: diuerſa virtutibus eſſe ea, ex quibus conſtant, neceſſe eſt: ad alia enim mollities, ad alia durities commodior eſt: & alia intendi alia flecti debent. Itaque partes ſimilares obtinent ſibi vires eiuſmodi ſingillatim accommodatas: alia enim mollis, alia dura, & alia humida, alia ſicca, & alia lenta, alia rigida. At verò diſſimilares, plures, & compoſitas vires continent: vis enim alia ad premendum, alia ad mittendum commoda manui eſt. Quamobrem partes organicæ, quas officiales & inſtrumentarias licet appellare, ex oſſibus, neruis, carne, cæteriſque eiuſmodi conſtant, non illa ex iis. Cauſa, cuius gratia, cur hæc ita ſe habent, hæc eſt. Sed cùm præterea quæratur, quam ob cauſam hæc ita ſe habere neceſſe ſit, ratio manifeſta eſt, quòd iam præfuit, vt ita ſe inuicem ex neceſſitate haberent: diſſimilares enim conſtare ex ſimilaribus poſſunt: tum pluribus, tum etiam ſingulis, vt viſcera nonnulla. Conſtant enim ferè omnia multiformi figura, quæ ex corpore ſimilari condita habentur. at fieri non poteſt vt ſimilares ex diſſimilaribus conficiantur: ſic enim pars ſimilaris multæ eſſet diſſimilares. His de cauſis membra animaliũ, alia ſtrue ſimplici ſimilariq; cõſtãt: alia cõpoſita, & diſſimilaria ſunt. Cùm autẽ partes aliæ inſtrumẽtariæ, aliæ ſenſoriæ ſint, inſtrumentariæ omnes, vt dictum iam eſt, diſſimilares ſunt: ſenſus autem omnibus cõtingit per ſimilares,

ἐν τοῖς ζῴοις ἐστὶν, οἷον ὀστοῦ καὶ σαρκὸς, καὶ τῶν ἄλλων τῶν τοιούτων. τρίτη δὲ καὶ τελευταία κατ' ἀριθμὸν, ἡ τῶν ἀνομοιομερῶν οἷον προσώπου καὶ χειρὸς, καὶ τῶν τοιούτων μορίων. ἐπεὶ δ' ἐναντίως ἐπὶ τῆς γενέσεως ἔχει καὶ τῆς οὐσίας· τὰ γὰρ ὕστερα τῇ γενέσει, πρότερα τὴν φύσιν ἐστὶ καὶ πρῶτον, τὸ τῇ γενέσει τελευταῖον· οὐ γὰρ οἰκία πλίνθων ἕνεκεν ἐστὶ καὶ λίθων, ἀλλὰ ταῦτα τῆς οἰκίας· ὁμοίως δ' ἔχει τοῦτο καὶ περὶ τὴν ἄλλην ὕλην. οὐ μόνον δὲ φανερὸν ὅτι τοῦτον ἔχει τὸν τρόπον ἐκ τῆς ἐπαγωγῆς, ἀλλὰ καὶ κατὰ τὸν λόγον. πᾶν γὰρ τὸ γινόμενον, ἔκ τινος καὶ εἴς τι ποιεῖται τὴν γένεσιν, καὶ ἀπ' ἀρχῆς ἐπ' ἀρχὴν, ἀπὸ τῆς πρώτης κινούσης καὶ ἐχούσης ἤδη τινὰ φύσιν, ἐπί τινα μορφὴν, ἢ τοιοῦτον ἄλλο τέλος· ἄνθρωπος γὰρ ἄνθρωπον, καὶ φυτὸν γεννᾷ φυτὸν, ἐκ τῆς περὶ ἕκαστον ὑποκειμένης ὕλης. τῷ μὲν οὖν χρόνῳ προτέραν ἀναγκαῖον τὴν ὕλην εἶναι, καὶ τὴν γένεσιν, τῷ λόγῳ δὲ τὴν οὐσίαν καὶ τὴν ἑκάστου μορφήν. δῆλον δ' ἂν λέγῃ τις τὸν λόγον τῆς γενέσεως. ὁ μὲν γὰρ τῆς οἰκοδομήσεως λόγος ἔχει τὸν τῆς οἰκίας. ὁ δὲ τῆς οἰκίας οὐκ ἔχει τὸν τῆς οἰκοδομήσεως. ὁμοίως δὲ τοῦτο συμβέβηκε καὶ ἐπὶ τῶν ἄλλων. ὥστε τὴν μὲν τῶν στοιχείων ὕλην ἀναγκαῖον εἶναι τῶν ὁμοιομερῶν ἕνεκεν. ὕστερα γὰρ ἐκείνων ταῦτα τῇ γενέσει, τούτων δὲ τὰ ἀνομοιομερῆ. ταῦτα γὰρ ἤδη τὸ τέλος ἔχει καὶ τὸ πέρας, ἐπὶ τρίτου λαβόντα τὴν σύστασιν ἀριθμοῦ, καθάπερ ἐπὶ πολλῶν συμβαίνει τελειοῦσθαι τὰς γενέσεις. ἐξ ἀμφοτέρων μὲν οὖν τὰ ζῷα συνέστηκε τῶν μορίων· ἀλλὰ τὰ ὁμοιομερῆ τῶν ἀνομοιομερῶν ἕνεκέν ἐστιν. ἐκείνων γὰρ ἔργα καὶ πράξεις εἰσὶν, οἷον ὀφθαλμοῦ καὶ μυκτῆρος, καὶ τοῦ προσώπου παντὸς, καὶ δακτύλου, καὶ χειρὸς, καὶ παντὸς τοῦ βραχίονος. πολυμόρφων δὲ τῶν πράξεων καὶ τῶν κινήσεων ὑπαρχουσῶν τοῖς ζῴοις, ὅλοις τε καὶ τοῖς μορίοις τοῖς τοιούτοις, ἀναγκαῖον ἐξ ὧν σύγκειται, τὰς δυνάμεις ἀνομοίας ἔχειν. πρὸς μὲν γὰρ τινα μαλακότης χρήσιμος, πρὸς δέ τινα σκληρότης· καὶ τὰ μὲν τάσιν ἔχει, τὰ δὲ κάμψιν. τὰ μὲν οὖν ὁμοιομερῆ κατὰ μέρος διείληφε τὰς δυνάμεις τὰς τοιαύτας. τὸ μὲν γὰρ ἐστι μαλακὸν, τὸ δὲ ξηρὸν καὶ τὸ μὲν γλίσχρον, τὸ δὲ κραῦρον· τὰ δ' ἀνομοιομερῆ, κατὰ πολλὰς καὶ συγκειμένας ἀλλήλαις. ἑτέρα γὰρ πρὸς τὸ πιέσαι τῇ χειρὶ χρήσιμος, καὶ πρὸς τὸ λαβεῖν. διόπερ ἐξ ὀστῶν καὶ νεύρων καὶ σαρκὸς, καὶ τῶν ἄλλων τῶν τοιούτων συνεστήκασι τὰ ὀργανικὰ τῶν μορίων, ἀλλ' οὐκ ἐκεῖνα ἐκ τούτων. ὡς μὲν οὖν ἕνεκά τινος, διὰ ταύτην τὴν αἰτίαν ἔχει περὶ τούτων τὸν εἰρημένον τρόπον. ἐπεὶ δὲ ζητεῖται καὶ πῶς ἀναγκαῖον ἔχειν οὕτως, φανερὸν ὅτι προϋπῆρχεν οὕτω πρὸς ἄλληλα ἔχοντα ἐξ ἀνάγκης. τὰ μὲν γὰρ ἀνομοιομερῆ, ἐκ τῶν ὁμοιομερῶν ἐνδέχεται συνεστάναι, καὶ ἐκ πλειόνων καὶ ἐξ ἑνὸς, οἷον ἔνια τῶν σπλάγχνων. πολύμορφα γὰρ τοῖς σχήμασιν, ἐξ ὁμοιομεροῦς ὄντα σώματος, ὡς εἰπεῖν ἁπλῶς. τὰ δ' ὁμοιομερῆ, ἐκ τούτων ἀδύνατον. τὸ γὰρ ὁμοιομερὲς, πολλὰ ἂν εἴη ἀνομοιομερῆ. διὰ μὲν οὖν ταύτας τὰς αἰτίας, τὰ μὲν ἁπλᾶ καὶ ὁμοιομερῆ, τὰ δὲ, σύνθετα καὶ ἀνομοιομερῆ τῶν μορίων ἐν τοῖς ζῴοις ἐστίν. ὄντων δὲ τῶν μὲν ὀργανικῶν μορίων, τῶν δ' αἰσθητηρίων ἐν τοῖς ζῴοις, τῶν μὲν ὀργανικῶν ἕκαστον ἀνομοιομερές ἐστιν, ὥσπερ εἶπον πρότερον. ἡ δ' αἴσθησις συμβαίνει πᾶσιν ἐν τοῖς ὁμοιομερέσι,

διὰ τὸ τῶν αἰσθήσεων ὁποιασοῦν ἑνός τινος εἶναι γένους, καὶ τὸ αἰσθητήριον ἑκάστου δεκτικὸν εἶναι τῶν αἰσθητῶν. πάσχει δὲ τὸ δυνάμει ὂν ὑπὸ τοῦ ἐνεργείᾳ ὄντος, ὥστε ἐστὶ τὸ αὐτὸ τῷ γένει, καὶ ἐκεῖνο ἕν, καὶ τοῦτο ἕν. καὶ διὰ τοῦτο χεῖρα μὲν, ἢ πρόσωπον, ἢ τῶν τοιούτων τι μορίων, οὐδεὶς ἐπιχειρεῖ λέγειν τῶν φυσιολόγων, τὸ μὲν εἶναι γῆν, τὸ δ' ὕδωρ, τὸ δὲ πῦρ. τῶν δ' αἰσθητηρίων ἕκαστον πρὸς ἕκαστον ἐπιζευγνύουσι τῶν στοιχείων, τὸ μὲν ἀέρα φάσκοντες εἶναι, τὸ δὲ πῦρ. οὔσης δὲ τῆς αἰσθήσεως ἐν τοῖς ἁπλοῖς μέρεσιν εὐλόγως μάλιστα συμβαίνει τὴν ἁφὴν ἐν ὁμοιομερεῖ μὲν, ἥκιστα δ' ἁπλῷ τῶν αἰσθητηρίων γίνεσθαι. μάλιστα γὰρ αὕτη δοκεῖ πλειόνων εἶναι γενῶν, καὶ πολλὰς ἔχειν ἐναντιώσεις τὸ ὑπὸ ταύτην αἰσθητὸν, θερμὸν, ψυχρὸν, ξηρὸν, ὑγρὸν καὶ εἴ τι ἄλλα τοιαῦτα. καὶ τὸ τούτων αἰσθητήριον ἡ σὰρξ, καὶ τὸ ταύτῃ ἀνάλογον, σωματωδέστατόν ἐστι τῶν αἰσθητηρίων. ἐπεὶ δ' ἀδύνατον εἶναι ζῷον ἄνευ αἰσθήσεως, καὶ διὰ τοῦτ' ἂν εἴη ἀναγκαῖον ἔχειν τοῖς ζῴοις ἔνια μόρια ὁμοιομερῆ. ἡ μὲν γὰρ αἴσθησις ἐν τούτοις, αἱ δὲ πράξεις διὰ τῶν ἀνομοιομερῶν ὑπάρχουσιν αὐτοῖς. τῆς δ' αἰσθητικῆς δυνάμεως καὶ τῆς κινούσης τὸ ζῷον, καὶ τῆς θρεπτικῆς ἐν ταὐτῷ μορίῳ τοῦ σώματος οὔσης, καθάπερ ἐν ἑτέροις εἴρηται πρότερον, ἀναγκαῖον τὸ ἔχον πρῶτον μόριον τὰς τοιαύτας ἀρχὰς, ᾗ μὲν ἐστι δεκτικὸν πάντων τῶν αἰσθητῶν, τῶν ἁπλῶν εἶναι μορίων· ᾗ δὲ κινητικὸν, [καὶ πρακτικὸν] τῶν ἀνομοιομερῶν. διόπερ ἐν μὲν τοῖς ἀναίμοις ζῴοις τὸ ἀνάλογον, ἐν δὲ τοῖς ἐναίμοις ἡ καρδία τοιοῦτόν ἐστι. διαιρεῖται μὲν γὰρ εἰς ὁμοιομερῆ, καθάπερ τῶν ἄλλων σπλάγχνων ἕκαστον. διὰ δὲ τὴν τοῦ σχήματος μορφὴν, ἀνομοιομερές ἐστι. ταύτῃ δ' ἠκολούθηκε καὶ τῶν ἄλλων τῶν καλουμένων σπλάγχνων ἕκαστον. ἐκ τῆς αὐτῆς γὰρ ὕλης συνεστᾶσιν. αἱματικὴ γὰρ ἡ φύσις πάντων αὐτῶν, διὰ τὸ τὴν θέσιν ἔχειν ἐπὶ πόροις φλεβικοῖς καὶ διαλήψεσι. καθάπερ οὖν ῥέοντος ὕδατος ἰλὺς, τἆλλα σπλάγχνα τῆς διὰ τῶν φλεβῶν ῥύσεως τοῦ αἵματος οἷον προχεύματά ἐστιν· ἡ δὲ καρδία, διὰ τὸ τῶν φλεβῶν ἀρχὴ εἶναι, καὶ ἔχειν ἐν ἑαυτῇ τὴν δύναμιν τὴν δημιουργοῦσαν τὸ αἷμα πρώτην, εὔλογον, ἐξ οἵας δέχεται τροφῆς, ἐκ τοιαύτης συνεστάναι καὶ αὐτήν. διότι οὖν αἱματικὰ τὴν μορφὴν τὰ σπλάγχνα ἐστὶν, εἴρηται, καὶ διότι τῇ μὲν ὁμοιομερῆ, τῇ δὲ ἀνομοιομερῆ.

ΚΕΦΑΛ. β'.

Ἀρχὴ τῆς περὶ τῶν ὁμοιομερῶν μορίων θεωρίας. πρῶτον δὲ περὶ θερμοῦ καὶ ψυχροῦ.

Τῶν δ' ὁμοιομερῶν μορίων ἐν τοῖς ζῴοις, ἐστὶ τὰ μὲν μαλακὰ καὶ ὑγρὰ, τὰ δὲ σκληρὰ καὶ στερεά. ὑγρὰ μὲν, ἢ ὅλως, ἢ ἕως ἂν ᾖ ἐν τῇ φύσει· οἷον αἷμα, ἰχὼρ, πιμελὴ, στέαρ, μυελὸς, γονὴ, χολὴ, γάλα ἐν τοῖς ἔχουσι, σὰρξ, καὶ τὰ τούτοις ἀνάλογα. οὐ γὰρ πάντα τὰ ζῷα τούτων τῶν μορίων τέτευχεν, ἀλλ' ἔνια τῶν ἀνάλογον τούτων τισί. τὰ δὲ ξηρὰ καὶ στερεὰ τῶν ὁμοιομερῶν ἐστὶν οἷον ὀστοῦν, ἄκανθα, νεῦρον, φλέψ. καὶ γὰρ τῶν ὁμοιομερῶν ἡ διαίρεσις ἔχει διαφοράν. ἔστι γὰρ ὡς ἐνίων τὸ μέρος ὁμώνυμον τῷ ὅλῳ· οἷον φλεβὸς φλέψ. *ἔστι δ' οὐχ ὡς ὁμώνυμον, ἀλλὰ προσώπου πρόσωπον οὐδαμῶς. πρῶτον μὲν οὖν

*Gaza hîc alios codices eſt ſecutus.

A ſcilicet propterea quòd quiuis ſenſus vnius generis certi eſt, ſingulæque ſenſoriæ partes ſingulorum ſenſibilium generum capaces habentur. Afficitur etiam, quod potentia eſt, ab eo quod actu eſt, quòd idem ſunt genere, vnúmque illud & hoc ſunt. Quamobrem manum, aut faciem, aut aliam quamuis eiuſmodi partem, nullus naturæ interpres terram, aut aquam, aut ignem eſſe conatur exponere: partes verò ſenſorias ſingulas elementis ſingulis tribuunt, vt aliam aërem, aliam ignem eſſe confirment. Sed cùm ſenſus in partibus ſimplicibus poſitus ſit, euenit ratione optima, vt tactus ſedem ſimilarem quidem, ſed minimè ſimplicem ſortiatur: quippe qui maximè vim recipiendi plura B genera videatur habere, multáſque præ ſe ferre contrarietates ſui obiecti: verbi gratia, caliditatẽ, rigiditatem, ſiccitatem, humiditatem, alias etiam generis eiuſdem: & quidem caro in quauis earum qualitatum ſentiendarum poſita eſt, aut quod carni proportione reſpondet, corpulentiſſimum omnium partium ſenſibus accommodatarum eſt. Quinetiam cùm fieri non poſſit vt animal ſit carens ſenſu: eo quoque efficitur neceſſariò, vt mẽbra nonnulla ſimilaria in animalibus habeãtur: vis enim ſentiendi ſita in his eſt, actiones autem per diſſimilaria adminiſtrantur. Sed cùm vis ſentiẽdi, vis mouendi, vis nutriendi, eodem in membro cõtineantur, quod alio loco explicatum à nobis eſt, C fit neceſſariò vt membrum, quod primum principia eiuſmodi teneat, id & ſimplex eo debeat eſſe, quà omnium capax ſenſibilium eſt: & diſſimilare eo, quà mouens, & agens eſt. Quamobrem in genere exangui, hoc eſt, experte ſanguinis, animaliũ proportionale eſt: in ſanguineo autem, id eſt, cõpote ſanguinis, cor tale habetur membrum: quippe cùm cor & in partes ſimilares ſecetur, quemadmodum quoduis ex aliis viſceribus: & diſſimilare ſit, propter ſuæ figuræ formam. Cætera etiam omnia viſcera appellata, ſecuta hoc ſunt: quippe quæ ex eadem materia conſtent. Natura enim eorum omnium ſanguinea eſt, quoniam poſita ſunt ad meatus venarum, atque intercapedines. Igitur perinde quaſi fæx aquæ profluentis, cætera viſce-D ra, velvti profuſiones ſanguinis per venas fluentis, conſiſtunt. At verò, cor, quia venarum initium eſt, & vim creandi ſanguinis primam obtinet, idcirco ex tali materia conſtare, quale recipit alimentum, ratio eſt. Sed quam ob cauſam viſcera forma ſanguinea ſint, & partim *ſimilaria, partim diſſimilaria, dictum iam eſt.

CAPVT II.

Partium ſimilarium alias molles & humidas, alias ſiccas & ſolidas eſſe: déque ordinis ſimilarium diſcrepantia. Item de calidi & frigidi acceptationibus, eorúmque exceſſu.

E PArtium autem ſimilarium aliæ molles & humidæ ſunt, aliæ duræ & ſolidæ. Humidæ vel omnino, vel quamdiu in conſtitutione naturę manẽt ſanguis, ſanies, adeps, ſeuum, medulla, genitura, lac, vbi haberi ſolet, caro, & quę iis proportione reſpondẽt: non enim omnia animalia partes has obtinent, ſed ſunt quæ ad proportionem nonnullarum ex iis conſtent. Siccæ ac ſolidæ inter ſimilares ſunt, os, ſpina, neruus, vena. Ordo enim ſimilarium diſcrepat: quippe qui nomen partim commune toti cum parte ſeruet, vt venæ pars, vena rectè appellatur: partim non ſeruet, vt in viſceribus patet: figura enim diuerſa eſt. Primùm igitur

partibus his, tum humidis tum ſiccis, multi cauſæ modi tribuuntur, cùm aliæ tanquam materia membrorum diſſimilarium ſint: ex iis enim mēbra quæque officialia, ſiue inſtrumentaria conſtant, oſſibus, neruis, carnibus, aliiſque generis eiuſdem, quæ partim ad eſſentiam, partim ad actionem conducunt: aliæ nutrimento ſint, vt humidæ ſiccis. (etenim omnia ex humore ſua capiunt alimenta:) aliæ vt excrementa earum ſint, accidit: vt ſedimentum ſicci alimenti, atque etiam humidi in iis quibus veſica data eſt. Earum autem ipſarum partium diſcrimina, quibus inter ſe diſcrepēt, notæ melioris gratia habētur, vt tum aliarum tum ſanguinis ad ſanguinē: alius.n. tenuior, alius craſſior eſt: & alius ſyncerior, alius turbulentior: item alius frigidior, alius calidior, tam in eodem animali quàm in diuerſis. Quantum enim ſanguinis parte corporis continetur ſuperiori, his differentiis diſcrepat cum inferiori. Omnino animalibus aliis ſanguinem dedit natura, aliis vice ſanguinis partem eiuſmodi aliam. Eſt certè roboris efficacior ſanguis, qui craſſior & calidior eſt: vim autem ſentiendi intelligendique obtinet pleniorem, qui tenuior atque frigidior eſt. Hoc idem diſcrimen in iis quoque habetur, quæ ſanguini proportione reſpondent. Quamobrem apes, atque eiuſmodi alia animalia ingenioſiora multis carentibus ſanguine ſunt: nec non inter ea quæ ſanguinem habent, ingenioſiora ſuis contrariis ſunt, quæ ſanguinem habent frigidiorem, & tenuiorem. Sed optimè conſtant quæ calidum, tenuem, & ſyncerum habent: quippe quæ vnà & viribus corporis, & animę ingenio plurimùm valeant. Quapropter pars etiam ſuperior corporis ea ipſa differentia diſſidet cum inferiori, & fœmina cum mare, & dextra pars cum ſiniſtra eiuſdem corporis. Pari modo cæteris quoque tam eiuſmodi partibus, quàm diſſimilaribus, ſtatuere differentiam debemus, partim ad officia & eſſentiam cuiuſuis animalis, partim ad melius deteriúſve. Exempli gratia, inter ea quæ oculos habent, alia duris oculis ſunt, alia humidis: & alia carent palpebris, alia habent, vt viſus ſit exquiſitior. Sanguinem verò haberi, aut quod eandem quam ſanguis, naturam obtineat, quàm neceſſe ſit, atque etiam quænam ſanguinis ſit natura, explicandum ſuis iam cauſis eſt, ſi priùs calidi frigidique rationem diſtinxerimus. natura enim rerum multarum ad ea ipſa principia refertur. Compluréſque ambigunt, quænam animalia, membráve, calida aut frigida ſint. Etenim nonnullis aquatilia terreſtribus eſſe calidiora placet, argumento, quòd naturæ frigiditas calore naturæ eorum compenſetur. Sanguine etiam deſtituta, iis quæ ſanguinem obtinent, eſſe calidiora: & fœminas ampliùs quàm mares calere arbitrantur. Parmenides enim, mulieres eſſe viris calidiores, author eſt: quod idem quibuſdam etiam aliis placuit, argumento copiæ ſanguinis, qua menſtrua fiant. Empedocles contrà opinatur. Sanguinem etiam, & bilem alij inter calida enumerant, alij inter frigida. Quòd ſi calidum atque frigidum tātam recipiunt ambiguitatem, & controuerſiam, quid de cæteris arbitrari debeamus? Hæc enim omnium, quæ ſenſum patiuntur, apertiſſima ſunt. Sed quæſtio hæc orta inde videtur, quòd calidum multifariàm dicitur: quiſque enim, quamuis contraria dicat, tamen aliquid dicere videtur.

A καὶ τοῖς ὑγροῖς μορίοις καὶ τοῖς ξηροῖς, πολλοὶ τρόποι τῆς αἰτίας εἰσί. τὰ μὲν γὰρ ὡς ὕλη τῶν μερῶν ἐστιν. ἐκ τούτων γὰρ συνέστηκεν ἕκαστον τῶν ὀργανικῶν, ἐξ ὀστῶν καὶ νεύρων καὶ σαρκῶν, καὶ ἄλλων τοιούτων συμβαλλομένων, τὰ μὲν εἰς τὴν οὐσίαν, τὰ δ' εἰς τὴν ἐργασίαν· τὰ δέ, τροφὴ τούτοις τῶν ὑγρῶν ἐστι. πάντα γὰρ ἐξ ὑγροῦ λαμβάνει τὴν αὔξησιν. τὰ δὲ περιττώματα συμβέβηκεν εἶναι τούτων· οἷον τήν τε τῆς ξηρᾶς τροφῆς ὑπόστασιν, καὶ τὴν τῆς ὑγρᾶς, τοῖς ἔχουσι κύστιν αὐτῶν. τούτων δὲ αἱ διαφοραὶ πρὸς ἄλληλα τοῦ βελτίονος ἕνεκέν εἰσιν· οἷον τῶν τε ἄλλων, καὶ αἵματος πρὸς αἷμα. τὸ μὲν γὰρ λεπτό-B τερον, τὸ δὲ παχύτερον· καὶ τὸ μέν, καθαρώτερόν ἐστι· τὸ δέ, θολερώτερον. ἔτι δέ, τὸ μέν, ψυχρότερον· τὸ δέ, θερμότερον. ἔν τε τοῖς μορίοις τοῦ ἑνὸς ζῴου· τὸ γὰρ ἐν τοῖς ἄνω μέρεσι πρὸς τὰ κάτω μόρια, διαφέρει ταύταις ταῖς διαφοραῖς, καὶ ἑτέρῳ πρὸς ἕτερον. καὶ ὅλως τὰ μὲν ἔναιμα τῶν ζῴων ἐστί, τὰ δὲ ἀντὶ τοῦ αἵματος ἔχει ἕτερον μόριον τοιοῦτον. ἔστι δ' ἰσχύος μὲν ποιητικώτερον, τὸ παχύτερον αἷμα καὶ θερμότερον· αἰσθητικώτερον δὲ καὶ νοερώτερον, τὸ λεπτότερον καὶ ψυχρότερον. τὴν αὐτὴν δ' ἔχει διαφορὰν καὶ τῶν ἀνάλογον ὑπαρχόντων πρὸς τὸ αἷμα. διὸ καὶ μέλιτται, καὶ ἄλλα τοιαῦτα ζῷα, φρο-C νιμώτερα τὴν φύσιν ἐστὶν * ἐναίμων πολλῶν. καὶ τῶν ἐναίμων τὰ ψυχρὸν ἔχοντα καὶ λεπτὸν αἷμα, φρονιμώτερα τῶν ἐναντίων ἐστίν. ἄριστα δέ, τὰ λεπτὸν ἔχοντα, καὶ θερμόν, καὶ καθαρόν. ἅμα γὰρ πρός τε ἀνδρείαν καὶ φρόνησιν τὰ τοιαῦτα ἔχει καλῶς. διὸ καὶ τὰ ἄνω μόρια πρὸς τὰ κάτω ταύτην ἔχει τὴν διαφοράν, καὶ πρὸς τὸ θῆλυ τὸ ἄρρεν, καὶ τὰ δεξιὰ πρὸς τὰ ἀριστερὰ τοῦ σώματος. ὁμοίως δὲ καὶ περὶ τῶν ἄλλων τῶν τοιούτων μορίων καὶ τῶν ἀνομοιομερῶν ὑποληπτέον ἔχειν τὴν διαφοράν· τὰ μέν, πρὸς τὸ βέλτιον ἢ χεῖρον· τὰ δέ, πρὸς D τὴν ἐργασίαν καὶ τὴν οὐσίαν τῶν ζῴων· οἷον, τῶν ἐχόντων ὀφθαλμούς, τὰ μὲν ἐστι σκληρόφθαλμα, τὰ δ' ὑγρόφθαλμα· καὶ τὰ μὲν οὐκ ἔχει βλέφαρα, τὰ δ' ἔχει πρὸς τὸ τὴν ὄψιν ἀκριβεστέραν εἶναι. ὅτι δ' ἀναγκαῖον ἔχειν ἢ αἷμα, ἢ τὸ ταύτῃ τὴν αὐτὴν ἔχον φύσιν, καὶ τίς ἐστιν ἡ τοῦ αἵματος φύσις, πρῶτον διελομένοις περὶ θερμοῦ καὶ ψυχροῦ, οὕτω καὶ περὶ τούτου θεωρητέον τὰς αἰτίας. πολλῶν γὰρ ἡ φύσις ἀνάγεται πρὸς ταύτας τὰς ἀρχάς, καὶ πολλοὶ διαμφισβητοῦσι ποῖα θερμὰ καὶ ποῖα ψυχρὰ τῶν ζῴων ἢ τῶν μορίων. ἔνιοι γὰρ τὰ ἔνυδρα τῶν πεζῶν φασιν εἶναι θερμότερα, λέγοντες ὡς E ἐπανισοῖ τὴν ψυχρότητα τοῦ τόπου, ἡ τῆς φύσεως αὐτῶν θερμότης· καὶ τὰ ἄναιμα τῶν ἐναίμων, καὶ τὰ θήλεα τῶν ἀρρένων· οἷον Παρμενίδης τὰς γυναῖκας τῶν ἀνδρῶν θερμοτέρας εἶναί φησι, καὶ ἕτεροί τινες, ὡς διὰ τὴν θερμότητα * καὶ πολυαιμοσύνης γινομένων τῶν γυναικείων. Ἐμπεδοκλῆς δὲ τοὐναντίον. ἔτι δ' αἷμα καὶ χολήν, οἱ μὲν θερμότερον ὁποτεροῦν εἶναί φασιν αὐτῶν, οἱ δὲ ψυχρόν. εἰ δ' ἔχει τοσαύτην τὸ θερμὸν καὶ τὸ ψυχρὸν ἀμφισβήτησιν, τί χρὴ περὶ τῶν ἄλλων ὑπολαβεῖν; ταῦτα γὰρ ἡμῖν ἐναργέστατα τῶν περὶ τὴν αἴσθησιν. ἔοικε δὲ διὰ τὸ πολλαχῶς λέγεσθαι τὸ θερμότερον, ταῦτα συμβαίνειν. ἕκαστος γὰρ δοκεῖ τι λέγειν, τἀναντία λέγων.

* γρ. ἀναίμων π. ſic legit Gaza.

* γρ. ἢ πολυαιμίαν

δῆλον δὴ μὴ λανθάνειν πῶς δεῖ τῶν φύσει συνεστώτων, τὰ μὲν θερμὰ λέγειν, τὰ δὲ ψυχρά· καὶ τὰ μὲν ξηρά, τὰ δ' ὑγρά· ἐπεί, ὅτι γ' αἴτια ταῦτα σχεδὸν καὶ θανάτου καὶ ζωῆς ἔοικεν εἶναι, φανερόν. ἔτι δ' ὕπνου καὶ ἐγρηγόρσεως, καὶ ἀκμῆς καὶ γήρως, καὶ νόσου καὶ ὑγιείας· ἀλλ' οὐ τραχύτητες καὶ λειότητες, οὐδὲ βαρύτητες καὶ κουφότητες, οὐδ' ἄλλο τῶν τοιούτων οὐδὲν, ὡς εἰπεῖν. καὶ τοῦτ' εὐλόγως συμβέβηκε. καθάπερ γὰρ ἐν ἑτέροις εἴρηται πρότερον, ἀρχαὶ τῶν φυσικῶν στοιχείων αὗταί εἰσι, θερμὸν καὶ ψυχρόν, καὶ ξηρόν, καὶ ὑγρόν. πότερον οὖν ἁπλῶς λέγεται τὸ θερμόν, ἢ πλεοναχῶς, δεῖ δὴ λαβεῖν τί ἔργον τοῦ θερμοτέρου, ἢ πόσα, εἰ πλείω. ἕνα μὲν δὴ τρόπον λέγεται μᾶλλον θερμόν, ὑφ' οὗ μᾶλλον θερμαίνεται τὸ ἁπτόμενον· ἄλλον δέ, τὸ μᾶλλον αἴσθησιν ἐμποιοῦν ἐν τῷ θιγγάνειν, καὶ τοῦτ', ἐὰν μετὰ λύπης. ἔστι δ' ὅτε δοκεῖ τοῦτ' εἶναι ψεῦδος. ἐνίοτε γὰρ ἡ ἕξις αἰτία τοῦ ἀλγεῖν αἰσθανομένοις· ἔτι τὸ τηκτικώτερον τοῦ τηκτοῦ, καὶ τοῦ καυστοῦ καυστικώτερον. ἔτι δέ, ἐὰν ᾖ τὸ μὲν πλέον, τὸ δ' ἔλαττον τὸ αὐτό, τὸ πλέον τοῦ ἐλάττονος θερμότερον. πρὸς δὲ τούτοις, δυοῖν τὸ μὴ ταχέως ψυχόμενον, ἀλλὰ βραδέως θερμότερον· καὶ τὸ θᾶττον θερμαινόμενον τοῦ θερμαινομένου βραδέως θερμότερον τὴν φύσιν εἶναι φαμέν· ὡς τὸ μὲν ἐναντίον, ὅτι πόρρω· τὸ δ' ὅμοιον, ὅτι ἐγγύς. λέγεται μὲν οὖν εἰ μὴ πλεοναχῶς, ἀλλὰ τοσαυταχῶς ἕτερον ἑτέρου θερμότερον. τούτους δὲ τοὺς τρόπους ἀδύνατον ὑπάρχειν τῷ αὐτῷ πάντας. θερμαίνει μὲν γὰρ μᾶλλον τὸ ζέον ὕδωρ τῆς φλογός· καίει δὲ καὶ τήκει τὸ καυστὸν καὶ τηκτὸν ἡ φλόξ. τὸ δ' ὕδωρ, οὐδέν. ἔτι θερμότερον μὲν τὸ ζέον ὕδωρ, ἢ πῦρ ὀλίγον. ψύχεται δὲ καὶ θᾶττον καὶ μᾶλλον τὸ θερμὸν ὕδωρ, μικροῦ πυρός. οὐ γὰρ γίνεται ψυχρὸν πῦρ, ὕδωρ δὲ γίνεται πᾶν. ἔτι θερμότερον μὲν κατὰ τὴν ἁφὴν τὸ ζέον ὕδωρ, ψύχεται δὲ θᾶττον καὶ πήγνυται τοῦ ἐλαίου. ἔτι τὸ αἷμα κατὰ μὲν τὴν ἁφὴν, θερμότερον ὕδατος καὶ ἐλαίου, πήγνυται δὲ θᾶττον. ἔτι λίθος καὶ σίδηρος καὶ τὰ τοιαῦτα, θερμαίνεται μὲν βραδύτερον ὕδατος, καίει δὲ θερμανθέντα μᾶλλον. πρὸς δὲ τούτοις τῶν λεγομένων θερμῶν, τὰ μὲν ἀλλοτρίαν ἔχει τὴν θερμότητα, τὰ δ' οἰκείαν. διαφέρει δὲ τὸ θερμὸν εἶναι οὕτως ἢ ἐκείνως, πλεῖστον. ἐγγὺς γὰρ τοῦ κατὰ συμβεβηκὸς εἶναι θερμόν, ἀλλὰ μὴ καθ' αὑτὸ θάτερον αὐτῶν· ὥσπερ ἂν εἴ τις λέγοι, εἰ συμβεβηκὸς εἴη τῷ πυρέττοντι εἶναι μουσικῷ, τὸν μουσικὸν εἶναι θερμότερον, ἢ τὸν μεθ' ὑγιείας θερμόν. ἐπεὶ δ' ἐστὶ τὸ μὲν καθ' αὑτὸ θερμόν, τὸ δὲ κατὰ συμβεβηκός, ψύχεται μὲν βραδύτερον τὸ καθ' αὑτό· θερμαίνει δὲ πολλάκις τὴν αἴσθησιν μᾶλλον τὸ κατὰ συμβεβηκός. καὶ πάλιν καίει μὲν μᾶλλον τὸ καθ' αὑτὸ θερμόν, οἷον ἡ φλόξ, τοῦ ὕδατος τοῦ ζέοντος· θερμαίνει δὲ κατὰ τὴν ἁφὴν τὸ ζέον μᾶλλον, τὸ κατὰ συμβεβηκὸς θερμόν. ὥστε φανερὸν ὅτι τὸ κρῖναι δυοῖν πότερον θερμότερον, οὐχ ἁπλοῦν· ὡδὶ μὲν γὰρ τόδε ἔσται θερμότερον, ὡδὶ δὲ θάτερον. ἔνια δὲ τῶν τοιούτων οὐδ' ἔστιν ἁπλῶς εἰπεῖν ὅτι θερμόν, ἢ μὴ θερμόν. ὃ μὲν γάρ ποτε τυγχάνει ὂν τὸ ὑποκείμενον, οὐ θερμόν· συνδυαζόμενον δέ, θερμὸν ἐστὶν, εἴ τις θεῖτο ὄνομα ὕδατι ἢ σιδήρῳ. τοῦτον γὰρ τὸν τρόπον τὸ αἷμα θερμόν ἐστι. καὶ ποιεῖ δὲ φανερὸν ἐν τούτοις, ὅτι τὸ ψυχρὸν φύσις τις, ἀλλ' οὐ στέρησίς ἐστιν, ἐν ὅσοις τὸ ὑποκείμενον κατὰ πάθος θερμόν ἐστι.

A Quamobrem noſſe oportet, quem ad[illegible] rerum naturalium conſtitutarum pa[illegible] dæ, partim frigidæ, & aliæ ſiccæ, [illegible] dæ dici debeant. Nam vitæ quoque [illegible] cauſas hæc habere, atque etiam ſom[illegible] liæ, iuuentutis & ſenectutis, & m[illegible] nitatis: non aſperitatem, aut leni[illegible] grauitatem, aut leuitatem, nihil fe[illegible] pertum eſſe videtur. & recte quidem. Sunt enim hæc, vt alio loco expoſuimus, initia elementorum naturalium: calidum dico, frigidum, ſiccum, humidum. Vtrùm igitur ſimplici ratione, an multiplici calidum dicatur? Sed quodnam B officium rei calidioris ſit, aut ſi plura ſint, quot numero ſint, declarandum eſt. Primo igitur modo calidius dicitur id quod ampliorem inuehit ſenſum, cùm tangitur, nec ſine dolore: quod quidem fallere interdum videtur. Nam fieri poteſt vt corporis habitus cauſam dolendi afferat, cùm ſentitur. adhæc, calidius, quod rei liquabilis liquantius, & rei cremabilis cremantius eſt. Item ſi alterum plus, alterum minus ſit, idem, quod plus eſt, hoc altero, quod minus, calidius eſt. Præterea, quod de duobus non citò, ſed lentè frigeſit, id calidius eſt: & quod citiùs caleſit, eo, quod lentiùs, natura eſſe calidiori cenſemus: perinde quaſi alterum ſit aduerſum, vt C remotius: alterum ſimile, vt propinquius. alterum igitur altero calidius eſſe, etſi non pluribus, tamen tot modis dicitur: qui modi omnes eidem ineſſe non poſſunt. aqua enim feruens pleniùs calefacit, quàm flamma: ſed flamma vrit, & liquat rem, vri aut liquari idoneam: quod aqua efficere non poteſt. Item aqua feruens calidior eſt, quàm ignis exiguus: attamen citiùs magíſque refrigeſcit, quàm ignis, quamuis exiguus: quippe qui frigidus nunquam fiat, cùm aqua omnis refrigerari poſſit. *Ad hæc, aqua feruens calidior ſentitur,* ſed celeriùs refrigeſcit & congelaſcit, quàm oleũ. Sanguis præterea tactu calidior quàm aqua, aut oleum eſt, ſed celeriùs gelaſcit. Lapis etiam, ferrum, D & reliqua generis eiuſdem, lentiùs quidem caleſiunt, quàm aqua, ſed vbi calefacta fuerint, vrere vehementiùs poſſunt. Poſtremò ea quæ calida eſſe diximus, calorem aut externũ continent, aut ſuum. Plurimũ autem refert, hoc an illo modo calidum quicquam ſit: alterum enim eorum propè eſt, vt calidum per accidens ſit, non per ſe: perinde quaſi, ſi febrienti muſicum eſſe accidit, dixeris muſicum eſſe calidiorem, quàm eum qui calidus ſanus eſt. Sed cùm aliud per ſe calidum, aliud per accidens ſit, refrigeſcit quidem lentiùs, quod per ſe calidum eſt. Sed ſæpe fit, vt ſenſu vehementiùs calefaciat id quod per accidens calidum eſt. E Item amplius vrit, quod per ſe calidum eſt, vt flamma, quàm aqua feruens: ſed tactu ampliùs calefacit aqua feruens, quæ per accidens calida eſt. Itaque iudicium vtrúmnã ex duobus calidius ſit, non eſſe ſimplex, apertũ eſt: quãdo fieri poteſt, vt hac alterũ, illa alterũ ratione calidius ſit: nonnulla verò ex iis ne dici quidem ſimpliciter calida aut non calida poſſunt. Subiecto enim quod tandem ſint, non calida ſunt: ſed per aſſociationem calida ſunt: velut ſi ferro calido, aut aquæ nomen impones: hoc enim modo ſanguis calidus eſt. Et quidem patet, frigiditatem aliquã [illegible] tura, non priuationem in iis quorum [illegible] calidum per affectionem, ſiue paſſio[illegible] eſt.

Natura etiam ignis tale quid fortaſſe eſt. ſubiectum enim forſitan eſt, vel fumus, vel carbo: quorum alterum ſemper calidum eſt, quippe cùm fumus non niſi exhalatio ſit: carbo autem extinctus frigidum eſt. Oleum, & teda effici frigida poſſunt. Aduſta etiam ferè omnia aliquid habent caliditatis, vt calx, cinis, ſedimenta animalium, & inter excrementa fel, eo quod feruore nimio exaruerint, relictúmque ſibi contineant aliquid caliditatis. Teda, & quoduis pingue alio modo calidum eſt, videlicet quod celeriter in actum ignis mutari poteſt. Calor autem vim tum cogendi, tum liquãdi habere videtur. Quæ igitur aquæ vnius ſunt, ea frigore coguntur: quæ terræ, igne calida etiam indurantur: frigore celeri, atque irreſolubili concreta, quæ terram potiùs præ ſe ferunt: leuiùs autem, quæ aquam. Sed de his planiùs alio loco definitũ à nobis eſt, ſcilicet quænam concreſcere apta ſint, & quibus cauſis ſtringantur. Calidum verò, & calidius, cùm multifariàm dicitur, non eodem modo rebus iungetur omnibus: ſed addere debebis, aliud per ſe eſſe calidum, aliud plerumque per accidẽs. Item aliud potentia, aliud actu: & aliud hoc modo, quod tactum ampliùs calefaciat: aliud, quod flammam excitet, atque igniat. Quòd ſi calidum multiplici ratione dicatur, frigidum quoque pari ratione ſequatur, neceſſe eſt. atque de calido, frigido, exceſſúque eorum, ad hunc modum definiſſe ſatis ſit.

A τάχα δὲ καὶ ἡ τοῦ πυρὸς φύσις, εἰ ἔτυχε, τοιαύτη τίς ἐστ. ἴσως γὰρ τὸ ὑποκείμενον ἐστὶν ἢ καπνός, ἢ ἄνθραξ· ὧν τὸ μὲν ἀεὶ θερμόν· ἀναθυμίασις γὰρ ὁ καπνός· ὁ δ' ἄνθραξ ἀποσβεσθείς, ψυχρός. ἔλαιον δὲ καὶ πεύκη, γένοιτ' ἂν ψυχρά. ἔχει δὲ θερμότητος καὶ τὰ πυρωθέντα πάντα σχεδόν, οἷον κονία, καὶ τέφρα, καὶ τὰ ὑποστήματα τῶν ζῴων, καὶ τῶν περιττωμάτων ἡ χολή, τῷ ἐμπεπυρῶσθαι καὶ ἐγκαταλελεῖφθαί τι ἐν αὐτοῖς θερμόν. ἄλλον δὲ τρόπον θερμὸν πεύκη καὶ τὰ πίονα, τῷ ταχὺ μεταβάλλειν εἰς ἐνέργειαν πυρός. δοκεῖ δὲ τὸ θερμὸν καὶ πηγνύναι καὶ τήκειν. ὅσα μὲν οὖν ὕδατος μόνον, ταῦτα πήγνυσι τὸ ψυχρόν· ὅσα δὲ γῆς, τὸ πῦρ. καὶ τῶν B θερμῶν πήγνυται ὑπὸ ψυχροῦ, ταχὺ μέν, ὅσα γῆς μᾶλλον, καὶ ἀλύτως· λυτῶς δέ, ὅσα ὕδατος. ἀλλὰ περὶ μὲν τούτων ἐν ἑτέροις διώρισται σαφέστερον, ποῖα τὰ πηκτά, καὶ πήγνυται διὰ τίνας αἰτίας. τὸ δὲ τί θερμόν, καὶ ποῖον θερμότερον, ἐπεὶ λέγεται πλεοναχῶς, οὐ τὸν αὐτὸν τρόπον ὑπάρξει πᾶσιν, ἀλλὰ προσδιοριστέον ὅτι καθ' αὑτὸ μὲν τόδε, κατὰ συμβεβηκὸς δὲ πολλάκις θάτερον. ἔτι δὲ δυνάμει μὲν τοδί, τοδὶ δὲ κατ' ἐνέργειαν· καὶ τόνδε μὲν τὸν τρόπον τοδί, τῷ μᾶλλον τὴν ἁφὴν θερμαίνειν, τοδὶ δὲ τῷ φλόγα ποιεῖν καὶ πυροῦν. λεγομένου δὲ τοῦ θερμοῦ πολλαχῶς, ἀκολουθήσει δῆλον ὅτι καὶ τὸ ψυχρὸν κατὰ τὸν αὐτὸν λόγον. καὶ περὶ μὲν C θερμοῦ καὶ ψυχροῦ, καὶ τῆς ὑπεροχῆς αὐτῶν, διωρίσθω τὸν τρόπον τοῦτον.

CAPVT III.

De ſicco & humido diſputatio.

SEquitur vt de ſicco & humido, modò ſuperiorum diſſeramus. Nam ea quoque multifariàm dici ſolent, vt alia ſicca, aut humida potentia ſint, alia actu. Gelu enim, omnémque humorem concretum ſiccum dicimus actu, & per accidens, cùm tamen potentia, & per ſe humidus ſit: contrà terra, cinis, & reliqua generis eiuſdem miſta humori, humida actu, & per accidens redduntur, quanquam per ſe, atque potentia ſicca ſunt. at vbi hæc ſeparata fuerint, quod aqua refertum eſt, id & actu & potentia humidum eſt. Quæ autem terræ propria ſunt, hæc omnia ſicca ſunt. Et quidem quod propriè ac ſimpliciter ſiccum eſt, hoc modo maximè intelligitur: altera etiam, humida dico, hac eadem ratione, qua calida, & frigida, proprij abſolutique nomen recipiant. His ita præfinitis, apertum iam eſt, ſanguinem quodammodo calidum eſſe, videlicet eo, quale eſt ei ſanguini eſſe, perinde quaſi aquam feruentem nomine vno ſignificemus. at verò ſubiecto, & quoũ eandem cùm ſit, ſanguis eſt, non calidus eſt: & quodammodo per ſe calidus, quodammodo nõ per ſe calidus eſt. Caliditas enim in eius ratione ineſt: quemadmodum albedo in albi hominis ratione. at eo, qua ſanguis per affectionem ſiue paſſionem eſt, non per ſe calidus eſt. pari modo de ſicco & humido ſtatuẽdum eſt: quapropter in eiuſmodi rerum natura, partim calida, & humida ſunt: ſed ſeparata congelaſcunt, & frigida eſſe videntur, qualis eſt ſanguis: partim calida craſſioráque ſunt, vt bilis: ſed ſeparata ab eorum, in quibus habentur, natura, contrà afficiũtur: quippe quæ refrigeſcentur, atque humeſcant: ſanguis enim ſiccior redditur, bilis flaua humidior. Magis autem minúſve participari oppoſita,

ΚΕΦΑΛ. γ'.

Περὶ ξηροῦ καὶ ὑγροῦ, καὶ περὶ αἵματος.

ΕΧόμενον δὲ καὶ περὶ ξηροῦ καὶ ὑγροῦ διελθεῖν ἀκολούθως τοῖς εἰρημένοις. λέγεται δὲ ταῦτα πλεοναχῶς, ἢ τὰ μὲν δυνάμει, τὰ δ' ἐνεργείᾳ. κρύσταλλος γὰρ καὶ πᾶν τὸ πεπηγὸς ὑγρόν, λέγεται ξηρὸν μὲν ἐνεργείᾳ καὶ κατὰ συμβεβηκός, ὄντα δυνάμει καὶ καθ' αὑτὰ ὑγρά· γῆ δὲ D καὶ τέφρα καὶ τὰ τοιαῦτα μιχθέντα ὑγρῷ, ἐνεργείᾳ μὲν ὑγρά, καὶ κατὰ συμβεβηκός, καθ' αὑτὰ δὲ καὶ δυνάμει ξηρά. διακριθέντα δέ, τὰ μὲν ὕδατος ἀναπληστικά, καὶ ἐνεργείᾳ καὶ δυνάμει ὑγρά· τὰ δὲ γῆς, ἅπαντα ξηρά. καὶ τὸ κυρίως καὶ ἁπλῶς ξηρόν, τοῦτον μάλιστα λέγεται τὸν τρόπον. ὁμοίως δὲ καὶ θάτερα τὰ ὑγρά, κατὰ τὸν αὐτὸν λόγον ἔχει τὸ κυρίως καὶ ἁπλῶς, καὶ ἐπὶ θερμῶν καὶ ψυχρῶν. τού- Hiſtoriæ animal. lib. 3. c. 2. των δὲ διωρισμένων, φανερὸν ὅτι τὸ αἷμα, ὡδὶ μὲν ἐστὶ θερμόν, οἷον τί ἦν αὐτῷ τὸ αἵματι εἶναι. καθάπερ γὰρ εἰ ὀνόματι σημαίνοιμεν, καὶ ζέον ὕδωρ οὕτω λέγεται, τὸ δ' ὑποκείμενον καὶ ὅ ποτε ὂν αἷμά ἐστιν, οὐ θερμόν· καὶ καθ' αὑτὸ ἔστι E μὲν ὡς θερμόν, ἔστι δ' ὡς οὔ. ἐν μὲν γὰρ τῷ λόγῳ ὑπάρξει αὐτοῦ ἡ θερμότης, ὥσπερ ἐν τῷ τοῦ λευκοῦ ἀνθρώπου, τὸ λευκόν. ᾗ δὲ κατὰ πάθος [τὸ] αἷμα, οὐ καθ' αὑτὸ θερμόν. ὁμοίως δὲ καὶ περὶ ξηροῦ καὶ ὑγροῦ. διὸ καὶ ἐν τῇ φύσει τῶν τοιούτων, τὰ μὲν θερμὰ καὶ ὑγρά· χωριζόμενα δέ, πήγνυται καὶ ψυχρὰ φαίνεται, οἷον τὸ αἷμα· τὰ δὲ θερμὰ καὶ πάχος ἔχοντα, καθάπερ ἡ χολή· χωριζόμενα δ' ἐκ τῆς φύσεως τῶν ἐχόντων, τοὐναντίον πάσχει· ψύχεται γὰρ καὶ ὑγραίνεται. τὸ μὲν γὰρ αἷμα ξηραίνεται μᾶλλον, ὑγραίνεται δ' ἡ ξανθὴ χολή. τὸ δὲ μᾶλλον καὶ τὸ ἧττον μετέχειν τῶν ἀντικειμένων,

ὡς ὑπάρχοντα δεῖ τεθεῖναι τούτοις. πῶς μὲν οὖν θερμὸν, καὶ πῶς ὑγρὸν, καὶ πῶς τῶν ἐναντίων ἡ φύσις τοῦ αἵματος κεκοινώνηκεν, εἴρηται σχεδόν. ἐπεὶ δ' ἀνάγκη πᾶν τὸ αὐξανόμενον λαμβάνειν τροφήν· ἡ δὲ τροφὴ πᾶσιν ἐξ ὑγροῦ καὶ ξηροῦ, καὶ τούτων ἡ πέψις γίνεται καὶ ἡ μεταβολὴ, διὰ τῆς τοῦ θερμοῦ δυνάμεως· καὶ τὰ ζῶα πάντα καὶ τὰ φυτὰ, κἂν εἰ μὴ δι' ἄλλην αἰτίαν, ἀλλὰ διὰ ταύτην, ἀναγκαῖον ἔχειν ἀρχὴν θερμοῦ φυσικὴν, καὶ ταύτην [πλείοσι μορίοις ἐνυπάρχουσαν,] ὥσπερ αἱ ἐργασίαι τῆς τροφῆς πλειόνων εἰσὶ μορίων. ἡ μὲν γὰρ πρώτη φανερὰ τοῖς ζώοις λειτουργία, διὰ τοῦ στόματος οὖσα, καὶ τῶν ἐν τούτῳ μορίων, ὅσων ἡ τροφὴ δεῖται διαιρέσεως. ἀλλ' αὕτη μὲν οὐδεμιᾶς αἰτία πέψεως, ἀλλ' εὐπεψίας μᾶλλον. ἡ γὰρ εἰς μικρὰ διαίρεσις τῆς τροφῆς, ῥᾴω ποιεῖ τῷ θερμῷ τὴν ἐργασίαν. ἡ δὲ τῆς ἄνω καὶ τῆς κάτω κοιλίας, ἤδη μετὰ θερμότητος φυσικῆς ποιεῖται τὴν πέψιν. ὥσπερ δὲ καὶ τὸ στόμα τῆς ἀκατεργάστου τροφῆς πόρος ἐστὶ, καὶ τὸ συνεχὲς αὐτῷ μόριον, ὃ καλοῦσιν οἰσοφάγον, ὅσα τῶν ζώων ἔχει τοῦτο τὸ μόριον, ἕως αὐτῆς εἰς τὴν κοιλίαν, οὕτως καὶ ἄλλας ἀρχὰς δεῖ πλείους εἶναι, δι' ὧν ἅπαν λήψεται τὸ σῶμα τὴν τροφὴν, ὥσπερ ἐκ φάτνης, ἐκ κοιλίας, καὶ τῆς τῶν ἐντέρων φύσεως. τὰ μὲν γὰρ φυτὰ λαμβάνει τὴν τροφὴν κατειργασμένην ἐκ τῆς γῆς ταῖς ῥίζαις· διὸ καὶ περίττωμα οὐ γίνεται τοῖς φυτοῖς. τῇ γὰρ γῇ, καὶ τῇ ἐν αὐτῇ θερμότητι χρῆται ὥσπερ κοιλίᾳ. τὰ δὲ ζῶα πάντα μὲν σχεδὸν, τὰ δὲ πορευτικὰ φανερῶς, οἷον γῆν ἐν αὐτοῖς ἔχει τὸ τῆς κοιλίας κύτος, ἐξ ἧς, ὥσπερ ἐκεῖνα ταῖς ῥίζαις, ταῦτα δεῖ τινι τὴν τροφὴν λαμβάνειν, ἕως ὃ τῆς ἐχομένης πέψεως λάβῃ τέλος. ἡ μὲν γὰρ τοῦ στόματος ἐργασία, παραδίδωσι τῇ κοιλίᾳ. παρὰ δὲ ταύτης ἕτερον ἀναγκαῖον λαμβάνειν, ὅπερ συμβέβηκεν. αἱ γὰρ φλέβες κατατείνονται τοῦ μεσεντερίου παρ' ὅλον, κάτωθεν ἀρξάμεναι μέχρι τῆς κοιλίας. δεῖ δὲ ταῦτα θεωρεῖν ἔκ τε τῶν ἀνατομῶν καὶ τῆς φυσικῆς ἱστορίας. ἐπεὶ δὲ πάσης τροφῆς ἐστί τι δεκτικὸν, καὶ τῶν γινομένων περιττωμάτων· αἱ δὲ φλέβες, οἷον ἀγγεῖον αἵματός εἰσι· φανερὸν ὅτι τὸ αἷμα ἡ τελευταία τροφὴ τοῖς ζώοις τοῖς ἐναίμοις ἐστὶ, τοῖς δὲ ἀναίμοις τὸ ἀνάλογον. καὶ διὰ τοῦτο μὴ λαμβανομένοις τι τροφὴν, ὑπολείπει τοῦτο καὶ λαμβανομένοις αὐξάνεται· καὶ χρηστῆς μὲν οὔσης, ὑγιεινὸν· φαύλης δὲ, φαῦλον. ὅτι μὲν οὖν τὸ αἷμα τροφῆς ἕνεκεν ὑπάρχει τοῖς ἐναίμοις, φανερὸν ἐκ τούτων καὶ τῶν τοιούτων. καὶ γὰρ διὰ τοῦτο θιγγανόμενον αἴσθησιν οὐ ποιεῖ, ὥσπερ οὐδ' ἄλλο τῶν περιττωμάτων οὐθέν· οὐδ' ἡ τροφὴ καθάπερ σάρξ. αὕτη γὰρ θιγγανομένη ποιεῖ αἴσθησιν. οὐ γὰρ συνεχές ἐστι τὸ αἷμα ταύτῃ, οὐδὲ συμπεφυκὸς, ἀλλ' οἷον ἐν ἀγγείῳ τυγχάνει κείμενον, ἔν τε τῇ καρδίᾳ καὶ ταῖς φλεψίν. ὃν δὲ τρόπον λαμβάνει ἐξ αὐτοῦ τὴν αὔξησιν τὰ μόρια, ἔτι δὲ περὶ τροφῆς ὅλως, ἐν τοῖς περὶ γενέσεως καὶ ἑτέροις οἰκειότερόν ἐστι διελθεῖν. νῦν δ' ἐπὶ τοσοῦτον εἰρήσθω. τοσοῦτον γὰρ χρήσιμον, ὅτι τὸ αἷμα τροφῆς ἕνεκα, καὶ τροφῆς τῶν μορίων ἐστί.

A velut rem inſitam his, ſtatuere debem[...] catum iam eſt, quonam modo ſang[...] particeps ſit caliditatis, humiditatis[...] tiarum qualitatum. Sed cùm omn[...] getur, capiat alimentum neceſſe ſit[...] autem omnibus ex humido & ſicco ſ[...] quorum concoctio & mutatio non [...] per caloris vim agitur, fit vt tam animalia omnia, quam ſtirpes, etſi non alia de cauſa, tamen ob eam rem principium caloris naturale habeant, neceſſe ſit: idque ipſum partibus ſit pluribus accommodatum, quemadmodum cibi conficiendi adminiſtrationes. Prima enim adminiſtratio perſpicua eſt, cùm per os partéſque ore contentas perficiatur animalibus, B quorum cibus ſectionem deſideret: ſed hæc nullius cauſa eſt concoctionis, ſed facilitatem concoquendi potiùs præſtat. Cibi enim illa minutatim diuiſio facit, vt calor faciliùs conficiendo expediat: at ſuperior, & inferior venter, iam cum calore naturali ſuo concoquendi officio funguntur. Sed vt os animalis cibi inconfecti meatus eſt, atque etiam pars ei annexa, quam gulam appellant, cibum quibus data eſt animalibus vſque ad ventriculum deducit: ſic alia quoque adeſſe principia oportet, quorum opera membra omnia corporis ex ventre, naturáque inteſtinorum, quaſi præſepi, pabulum capiant. Stirpes enim, ſiue C plantæ, ſuis radicibus alimentum iam confectum ex terra hauriunt: quocirca ne excrementum quidem contrahi in ſtirpibus ſolet: terra enim caloréque eius perinde ac ventre, vtuntur. at animalium genus omne ferè, ſed apertè quæ incedunt, quaſi terram intra ſe continent ſinum ventris, ex quo, vt illæ radicibus, ita hæc aliquo intercedente, cibum aſſumere debent, donec finem ſequentis concoctionis faciant. Cibus enim ab oris officio ventri mandatur: *hinc membrum aliud capiat, neceſſe eſt. & quidem ita natura conſtituit. Venæ enim per totas lactes ad ventrem tendunt* vſque, exorſæ inferiùs. Sed hæc ex animalium D conſectione, commentationéque naturali, petenda ſunt. Cùm autem omnis alimenti omniſque excrementi conceptaculum aliquod haberi neceſſe ſit, venæque quaſi vaſa ſint ſanguinis, patet, ſanguinem eſſe animalibus ſanguineis vltimum alimentum: exanguibus verò id eſſe, quod vice ſanguinis habeatur proportionale. Quamobrem quoties cibus non ingeritur, ſanguis deficit: quoties ingeritur, augetur. Et ſi alimenta bona aſſumuntur, ſanguis integer eſt, ſi praua, vitioſus. Igitur ſanguinem alimenti gratia datum eſſe animalibus ſanguine præditis, apertum ex iis cæteriſque eiuſmodi rationibus eſt. Nam ob eam rem ſanguis ne tactus quidem ſenſum mouere poteſt, ſic- E vt nec cætera excrementorum gen[...] Nec verò alimentum ſenſum mouet, vt caro: hæc enim ſenſum, cùm tangitur, mouet. Non enim ſanguis cõtinuus carni, neque cognatus eſt, ſed in corde, ac venis, quaſi vaſis, continetur. Sed quonam modo membra ex ſanguine ſua capiant incrementa, atque etiam de alimenti omnino ratione differere, cùm de generatione agemus, lociſque aliis, aptius eſt. Nunc hactenus dictum ſit: non enim plus hic locus deſiderat, quàm vt ſanguinem eſſe alimenti gratia, & alimenti membrorum cauſa exploratum habeatur.

A

CAPVT IV.

De fibris, & quæ animalia iis careant, deque metus cauſa, & ſaniei natura.

QVas autem fibras vocant, non omnis continet ſanguis: ſed ſunt qui non habeant, vt ceruarum ſanguis, & damarum: quamobrem id ſanguinis genus nunquam ſpiſſatur. Sanguis enim, qui dilutior eſt, frigidior eſt: itaque dureſcere non poteſt. Qui autem terrenus eſt, nimirum coit, cùm humor euaporatur. Fibræ autem illæ terræ ſunt opificium. Quoniam etiam euenit vt nõnulla ex iis animalibus, quæ talem obtinent ſanguinem, ſapientiora ſint: verùm non ſanguinis frigiditate, ſed potiùs tenuitate, atque mũditia, quorum neutrum in terreno eſt. Habent enim ſenſum mobiliorem, quorum humor tenuior & ſyncerior eſt: hinc etiam nonnulla ex iis, quæ ſanguine vacant, animalibus, prudentiora nonnullis ſanguinem habentibus ſunt, vt dictum iam eſt. Verbi gratia, apes, formicæ, & ſi quid aliud tale eſt. timidiora, quibus ſanguis dilutus nimium eſt: metus enim refrigerat. Itaque ea quibus eiuſmodi temperamentum in corde habetur, metuendi affectioni ſunt opportuniora: aqua enim frigore congelaſcit. Quamobrem cætera, quæ exanguia, timidiora ſanguineis ſunt animalibus, (quod ſimpliciter dixerim) ac mota ceſſant præ nimio metu, & excrementa emittunt: nonnulla etiam ſuos colores immutant. Quorum autem ſanguis fibris admodum multis craſſiſque refertus eſt, hæc terrena ampliùs conſtant natura, & animoſa, iracunda, proindeque furibunda ſunt: ira enim calorifica eſt. Solida autem firmioraque omnia concalefacta, vehementiùs quàm humida, calefaciunt. Fibræ verò ſolidæ, terrenæque ſunt: itaque quaſi formatæ in ſanguine efficiuntur, feruoremque per iram accendunt. Ex quo fit, vt tauri & apri animoſi, iracundi furibundique ſint: ſanguis enim eorum fibris refertior eſt. Et quidem taurorum ſanguis omnium celerrimè coit, & dureſcit. at ſi fibras detraxeris, ſanguis non cogetur. Vt enim ſi ex luto terrenam portionem remoueris, aqua non concreſcet, ita ſanguis, fibris detractis, incongelabilis manet: fibrarum enim natura terrena eſt. quòd ſi non eximantur, cogitur, vt terra humida, frigore. Cùm enim calor exprimitur, humor vna trahitur, atque euaporatur, vt dictum iam eſt: atque ita cõcreſcit, non à calore ſicceſcens, ſed à frigore. at verò quâdiu in corpore cõtinetur, humidus eſt propter calorem animalibus inditum: & profectò naturam ſanguinis cauſam eſſe, cur permulta animalibus veniant, tum per mores, tum etiam per ſenſum, ratio eſt: materia enim totius corporis eſt. quippe cùm alimentum materia ſit, ſanguis autem vltimum alimentum habeatur. Facit igitur vt plurimum differentiæ exiſtat, ſi calidus aut frigidus ſit, ſi tenuis aut craſſus, ſi turbulentus aut nitidus. Sanies, pars diluta ſiue aquoſa ſanguinis eſt, eo quòd aut nondum concocta aut corrupta eſt. Itaque id vel ſanies neceſſariò eſt, vel ſanguinis gratia eſt.

ΚΕΦΑΛ. δ.

Περὶ τῶν ἰνῶν, ὃ τοῦ φόβου αἴτιον, καὶ περὶ ἰχῶρος.

Τὰς δὲ καλουμένας ἶνας, τὸ μὲν ἔχει αἷμα, τὸ δ' οὐκ ἔχει, οἷον τὸ τῶν ἐλάφων καὶ προκῶν. διόπερ οὐ πήγνυται τὸ τοιοῦτον αἷμα. τοῦ γὰρ αἵματος τὸ μὲν ὑδατῶδες, μᾶλλον ψυχρόν ἐστι· διὸ καὶ οὐ πήγνυται· τὸ δὲ γεῶδες, πήγνυται, συνεξατμίζοντος τοῦ ὑγροῦ· αἱ δ' ἶνες, γῆς εἰσι. συμβαίνει δ' ἔνιά γε καὶ γλαφυρωτέραν ἔχειν (B) τὴν διάνοιαν τῶν τοιούτων, οὐ διὰ τὴν ψυχρότητα τοῦ αἵματος, ἀλλὰ διὰ τὴν λεπτότητα μᾶλλον, καὶ τὸ καθαρὸν εἶναι. τὸ δὲ γεῶδες, οὐδέτερον ἔχει τούτων. εὐκινητοτέραν γὰρ ἔχει τὴν αἴσθησιν τὰ λεπτοτέραν ἔχοντα τὴν ὑγρότητα καὶ καθαρωτέραν. διὰ γὰρ τοῦτο, καὶ τῶν ἀναίμων ἔνια συνετωτέραν ἔχει τὴν ψυχὴν ἐνίων ἐναίμων, καθάπερ εἴρηται πρότερον· οἷον ἡ μέλιττα, καὶ τὸ τῶν μυρμήκων γένος, καὶ εἴ τι ἕτερον τοιοῦτόν ἐστι. δειλότερα δὲ, τὰ λίαν ὑδατώδη. ὁ γὰρ φόβος καταψύχει. προωδοποίηται οὖν τῷ πάθει τὰ τοιαύτην ἔχοντα τὴν ἐν τῇ καρδίᾳ κρᾶσιν. τὸ γὰρ ὕδωρ τῷ ψυχρῷ (C) πηκτόν ἐστι. διὸ καὶ τὰ ἄλλα τὰ ἄναιμα δειλότερα τῶν ἐναίμων ἐστὶν, ὡς ἁπλῶς εἰπεῖν, καὶ ἀκινητίζει τε φοβούμενα, καὶ προΐεται περιττώματα, καὶ μεταβάλλει ἔνια τὰς χρόας αὐτῶν. τὰ δὲ πολλὰς ἔχοντα λίαν ἶνας καὶ παχείας, καὶ γεωδέστερα τὴν φύσιν ἐστὶ, καὶ θυμώδη τὸ ἦθος, καὶ ἐκστατικὰ διὰ τὸν θυμόν. θερμότητος γὰρ ποιητικὸς ὁ θυμός. τὰ δὲ στερεὰ θερμανθέντα, μᾶλλον θερμαίνει τῶν ὑγρῶν· αἱ δὲ ἶνες, στερεὸν καὶ γεῶδες. ὥστε γίνονται οἷον πυρίαι ἐν τῷ αἵματι, καὶ ζέσιν ποιοῦσιν ἐν τοῖς θυμοῖς. διὸ οἱ ταῦροι καὶ οἱ κάπροι, θυμώδεις καὶ ἐκστατικοί. τὸ γὰρ αἷμα τούτων ἰνωδέστατον, καὶ τό γε τοῦ (D) ταύρου τάχιστα * πήγνυται πάντων. ἐξαιρουμένων δὲ τούτων τῶν ἰνῶν, οὐ πήγνυται. καθάπερ γὰρ ἐκ πηλοῦ εἴ τις ἐξέλοι τὸ γεῶδες, οὐ πήγνυται τὸ ὕδωρ, οὕτω καὶ τὸ αἷμα. αἱ γὰρ ἶνες, γῆς. μὴ ἐξαιρουμένων δὲ, πήγνυται, οἷον ὑγρὰ γῆ ὑπὸ ψύχους. τοῦ γὰρ θερμοῦ ὑπὸ τοῦ ψυχροῦ ἐκθλιβομένου, συνεξατμίζεται τὸ ὑγρὸν, καθάπερ εἴρηται πρότερον, καὶ πήγνυται οὐχ ὑπὸ θερμοῦ, ἀλλ' ὑπὸ ψυχροῦ ξηραινόμενον. ἐν δὲ τοῖς σώμασιν ὑγρόν ἐστι, διὰ τὴν θερμότητα τὴν ἐν τοῖς ζῴοις. πολλῶν δ' ἐστὶν αἰτία ἡ τοῦ αἵματος φύσις, καὶ κατὰ τὸ ἦθος τοῖς ζῴοις, καὶ κατὰ τὴν αἴσθησιν εὐλόγως· ὕλη γάρ ἐστι (E) παντὸς τοῦ σώματος. ἡ γὰρ τροφὴ, ὕλη· τὸ δ' αἷμα, ἡ ἐσχάτη τροφή. πολλὴν οὖν ποιεῖ διαφορὰν, θερμὸν ὂν καὶ ψυχρὸν, καὶ λεπτὸν καὶ παχὺ, καὶ θολερὸν καὶ καθαρόν. ἰχὼρ δέ ἐστι τὸ ὑδατῶδες τοῦ αἵματος, διὰ τὸ μήπω πεπέφθαι, ἢ διεφθάρθαι. ὥστε ὁ μὲν, ἐξ ἀνάγκης ἰχὼρ, ὁ δ', αἵματος χάριν ἐστί.

Hiſtoriæ animal. lib. 3. c. 6.

* [illegible]

A

ΚΕΦΑΛ. ε΄.

Περὶ πιμελῆς καὶ στέατος.

Historiæ animal. li. 3. c. 17.

Πιμελὴ δὲ καὶ στέαρ διαφέρουσι μὲν ἀλλήλων κατὰ τὴν τοῦ αἵματος διαφοράν. ἔστι γὰρ ἑκάτερον αὐτῶν αἷμα πεπεμμένον δι' εὐτροφίαν, καὶ τὸ μὴ καταναλισκόμενον εἰς τὸ σαρκῶδες μόριον τῶν ζώων. εὔπεπτον γὰρ καὶ εὐτραφές. δηλοῖ δὲ τὸ λιπαρὸν αὐτῶν. τῶν γὰρ ὑγρῶν τὸ λιπαρὸν, κοινὸν ἀέρος καὶ πυρός ἐστι. διὰ τοῦτο οὐδὲν ἔχει τῶν ἀναίμων πιμελὴν, οὔτε στέαρ, ὅτι οὐδ' αἷμα. τῶν δ' ἐναίμων, τὰ μὲν σωματώδες ἔχοντα τὸ αἷμα, στέαρ ἔχει μᾶλλον. B τὸ γὰρ στέαρ γεῶδες, καὶ αὐτὸ, καὶ οἱ ζωμοὶ οἱ τοιοῦτοι. ὀλίγον γὰρ ἔχει ὕδατος, τὸ δὲ πολὺ γῆς. διὸ τὰ μὴ* ἀμφώδοντα, ἀλλὰ κερατώδη, στέαρ ἔχει. φανερὰ δὲ ἡ φύσις αὐτῶν, τοῦ τοιούτου στοιχείου πλήρης οὖσα, τῷ κερατώδη εἶναι, καὶ ἀστραγάλους ἔχειν. ἅπαντα γὰρ ξηρὰ καὶ γεηρὰ τὴν φύσιν ἐστί. τὰ δ' ἀμφώδοντα καὶ ἀκέρατα καὶ πολυσχιδῆ, πιμελὴν ἔχει ἀντὶ στέατος, ἣ οὐ πήγνυται, οὐδὲ θρύπτεται ξηραινομένη, διὰ τὸ μὴ εἶναι γεώδη τὴν φύσιν αὐτῆς. μέτρια μὲν οὖν ταῦτα ὄντα ἐν τοῖς μορίοις τῶν ζώων ὠφελεῖ. πρὸς μὲν γὰρ αἴσθησιν οὐκ ἐμποδίζει, πρὸς δ' ὑγίειαν καὶ δύναμιν ἔχει βοήθειαν. ὑπερβάλλοντα δὲ τῷ πλήθει, φθείρει καὶ C βλάπτει. εἰ γὰρ πᾶν γένοιτο [τὸ σῶμα] πιμελὴ καὶ στέαρ, ἀπόλοιτ' ἄν. ζῷον μὲν γάρ ἐστι κατὰ τὸ αἰσθητικὸν μόριον· ἡ δὲ σὰρξ καὶ τὸ ἀνάλογον, αἰσθητικόν· τὸ δ' αἷμα, ὥσπερ εἴρηται καὶ πρότερον, οὐκ ἔχει αἴσθησιν. διὸ οὐδὲ πιμελὴ, οὐδὲ στέαρ· αἷμα γὰρ πεπεμμένον ἐστίν. ὥστε εἰ πᾶν γένοιτο τὸ σῶμα τοιοῦτον, οὐκ ἂν ἔχοι οὐδεμίαν αἴσθησιν. διὸ καὶ γηράσκει ταχέως τὰ λίαν πίονα. ὀλίγαιμα γὰρ, ἅτε εἰς τὴν πιότητα ἀναλισκομένου τοῦ αἵματος. τὰ δ' ὀλίγαιμα ἤδη προωδοποίηται πρὸς τὴν φθοράν. ἡ γὰρ φθορὰ, ὀλιγαιμία ἐστί. καὶ τὸ ὀλίγον παθητικὸν, καὶ ὑπὸ ψυχροῦ τοῦ τυχόντος, καὶ ὑπὸ θερμοῦ. καὶ ἀγονώτερα δὴ τὰ πίονα ἐστὶ, D διὰ τὴν αὐτὴν αἰτίαν. ὃ γὰρ δεῖ ἐκ τοῦ αἵματος εἰς τὴν γονὴν ἰέναι καὶ τὸ σπέρμα, τοῦτ' εἰς τὴν πιμελὴν ἀναλίσκεται καὶ τὸ στέαρ. πεττόμενον γὰρ τὸ αἷμα, γίνεται ταῦτα. ὥστε ἢ ὅλως οὐ γίνεται αὐτοῖς περίττωμα οὐδὲν, ἢ ὀλίγον. καὶ περὶ μὲν αἵματος, καὶ ἰχῶρος, καὶ πιμελῆς, καὶ στέατος, τί τέ ἐστιν ἕκαστον αὐτῶν, καὶ διὰ τίνας αἰτίας, εἴρηται.

* χ. ἀμφώδοντα

ΚΕΦΑΛ. ϛ΄.

Περὶ μυελοῦ.

Histor. anim. lib. 3. c. 20.

Ἔστι δὲ καὶ ὁ μυελὸς αἵματος φύσις, καὶ οὐχ ὥσπερ οἴονταί τινες, τῆς γονῆς σπερματικὴ δύναμις.* E δηλοῖ δ' ἐν τοῖς νέοις πάμπαν. ἅτε γὰρ ἐξ αἵματος συνεστώτων τῶν μορίων, καὶ τῆς τροφῆς οὔσης τοῖς ἐμβρύοις, αἵματος, καὶ ἐν τοῖς ὀστοῖς ὁ μυελὸς αἱματώδης ἐστίν. αὐξανομένων δὲ καὶ πεττομένων, καθάπερ καὶ τὰ μόρια,* μεταβάλλει καὶ τὰ σπλάγχνα τὰς χρόας. ὑπερβολῇ γὰρ αἱματώδες καὶ τῶν σπλάγχνων ἕκαστόν ἐστιν, ἔτι νέων ὄντων. οὕτω δὲ καὶ ὁ μυελός· καὶ τῶν μὲν πιμελωδῶν, λιπαρὸς, καὶ πιμελῇ ὅμοιος·

* Meliùs δύναμις

* χ. [illegible]

CAPVT V.

De ſeuo & adipe eorúmque differentia, & quæ an[…] ſeuum, quæ item adipem habeant.

SEuum & adeps inter ſe differunt, ſangui[…]tione. Eſt enim eorum vtrumque ſangu[…] coctus per bonitatem enutriendi: conſiſtitque, e[…] eo quòd in pulpam quidem animalis non abſumitur, ſed concoctionis alimentique bonitate præditum eſt. Indicat id pinguedo eorum: cùm pingue inter humida, commune ignis & aëris ſit. Quamobrem nullum ex iis quæ ſanguine carent, vel adipem habet, vel ſeuum. quandoquidem ſangui[…] B deeſt. Quorum autem ſanguis corpulentior eſt, hæc ſeuum potiùs habent: ſeuum enim terrenu[…] eſt. Vnde fit, vt modo fibroſi ſanguinis cogatur tam ipſum quàm eiuſmodi ius, cùm parum aquæ, multum terræ contineat. Quamobrem quæ non vtrimque dentata, ſed cornigera ſunt, hæc ſeuum habent. Naturam eorum refertam eſſe huiuſmodi elemento patet, eò quòd cornua gerunt, talóſque obtinent: quæ quidem omnia natura ſunt arida & terrena. at verò genus vtrimque dentatum, & cornuum expers, & multifidum, vice ſeui adipem habet: quæ non cogitur, nec ſiccitate aliqua frangitur, quoniã eius natura minùs terrena eſt. Hæc ſi mediocriter in animalium membris habẽtur, pro- C ſunt: nec. n. ſenſum impediunt, & ad ſanitatem vireſque opitulantur. ſed ſi modum excedunt, nocent, atque interimunt. Nam ſi corpus totum trãſierit in adipem, aut ſeuũ, peribit: animal. n. ea parte eſt, in qua ſenſus habetur. Caro autem, & quod carni proportionetur, vim obtinet ſentiendi. Sanguis, vt dictum iam eſt, & ſenſu caret, & ob eã rẽ, nec adeps, nec ſeuũ ſentit: ſunt enim ſanguis concoctus. Quòd ſi totum corpus tale efficiatur, nullũ præterea ſenſum habere poterit. Hinc & celeriter ea ſeneſcunt, quæ valde pinguerint: quippe quæ parum ſanguinis habeãt, vtpote cùm copia ſit abſumpta ad pinguedinem. Quæ autem parum ſan- D guinis habent, hæc iam inde ad interitum ſunt opportuniora: interitus enim inopia quædã ſanguinis eſt. Quódque parũ eſt, affici tum à frigore quolibet, tum à calore facilè poteſt. Quinetiam obeſa omnia ſteriliora ea de cauſa ſunt: quantũ enim ex ſanguine proficiſci ad geniturã, & ſemen genitale debeat, hoc in adipem, aut ſeuũ ſumptitatur: ſanguis enim cùm concoquitur, ad hæc trãſit: itaque aut nullum omnino excrementum in iis ipſis cõſiſtit, aut parum. atque de ſanguine, ſanie, adipe, ſeuo, quid ſint, & ob quas cauſas habeantur, dictum iam eſt.

CAPVT VI.

Quid medulla, quibúſve animalibus data ſit.

E SEd medulla etiam natura quædam ſanguinis eſt, non, vt quidam volunt, vis genituræ ſeminalis. Patet hoc in iis quæ nuper in lucem prodierint: medulla enim in oſſibus quoque eorum ſanguinea continetur, vtpote cùm omnes corporis partes ex ſanguine conſtent, & partui alimentum præſtetur à ſanguine. Sed per incrementum concoctionémque efficitur, vt quemadmodum cætera mẽbra, ſic viſcera quoque immutentur colore: per copiam enim ſanguinis viſcera, etiam cùm recentia adhuc ſunt, colorem ſibi ſanguineũ trahunt: ſic etiam medulla afficitur, & pinguis in pinguibus animalibus eſt, atque axungiæ ſimilis.

At

A Quibus ſanguis non pinguedini, ſed ſeuo ſimilis per concoctionem euadit, iis medulla ſeuo ſimilis eſt. Quamobrem vt cornigeris animalibus nec vtrinque dentatis medulla ſpeciem gerit ſeui: ſic vtrinque dentatis atque multifidis pinguedinem refert. Verùm ſpinæ dorſi medulla minimè talis eſt, quoniam continuam hanc eſſe oportet, porrectámque per longitudinem ſpinæ totius, quæ ex multis vertebratis orbiculatim oſſibus iungitur. Nam ſi ex pinguedine aut ſeuo eſſet, non æquè perpetua eſſe poſſet, ſed vel fragilis vel humida eſſet. Sunt ex animalibus, quæ nullam commentatione dignam medullam habeant, videlicet ea quib. oſſa robuſta & ſolida ſunt, vt leoni. Eius enim oſſa, quòd exiguam admodum B & perobſcuram medullā continent, carere omnino medulla videntur. Sed cùm oſſium naturam ineſſe animalibus neceſſe ſit, aut quod oſſibus proportionetur, vt in aquatilibus ſpinam, fit neceſſariò vt nonnulla habeant etiam quod pro alimento contineatur, ex quo oſſa conſiſtant: alimentum autem omnibus eſſe ſanguinem, dictum iam eſt. Seuoſas etiam & pingues eſſe medullas, ratio eſt: tepor enim, quem oſſium complexio facit, ſanguinem concoquit. Sanguinis autem per ſe concoctio, ſeuum & adeps eſt, quoniam etiam in iis quæ oſſa ſpiſſa firmáque habent, non temerè partim nulla, partim exigua ineſt medulla: alimentum C enim in oſſa abſumitur. Quæ autem non oſſa habent, ſed ſpinam, iis dorſi tantùm medulla eſt, parum enim continent ſanguinis ſuapte natura: & dorſi ſpina tantummodo caua habetur, quam ob rem in ea medullæ aliquid creari poteſt. Vna enim ipſa capax eſt, ſoláque eget copula propter interceptiones: quam ob rem medulla etiam eius partis differt, vt dictum eſt. Quòd enim vice fibulæ fungitur, idcirco lenta neruoſáque eſt, vt intendi poſſit. Cauſa quamobrem medullam habent animalia, quibus data eſt, declarata iam eſt. Quid etiam medulla ſit, patet: ſcilicet alimenti ſanguinei, quod in oſſa ſpinámve diſtribuatur, contentúmque concoctum excrementum.

D

CAPVT VII.

De cerebro, & eius natura, déque capitis fluxionibus, & ſomni cauſa.

PRoximum ferè eſt vt de cerebro doceamus. Nam cerebrum quoque medullam eſſe atque originem medullæ, compluribus placuit authoribus, argumento, quòd dorſi medullam iunctā cum cerebro cernerent. Sed res contrà ſe habet omnino, propè dixerim. Cerebrum enim partium omnium corporis frigidiſſimum eſt, cùm medulla calida ſuapte natura ſit. Quod eius pinguedine & axungia perſpicuum eſt: idque facit, vt cerebro iungi continuarique poſſit ipſa dorſi medulla: Solet enim Natura ſemper emoliri contra E cuiuſuis exuperantiam auxilium, per coniunctionem rei aduerſæ, vt exceſſum alterius altero compenſet & moderetur. Sed enim medullam calidam eſſe pluribus ſanè rationibus conſtat: cerebri autem frigiditas & tactu percipi poteſt, & ratione intelligitur, quòd omnium maximè humorum corporis ſanguine caret: quippe quod nihil ſanguinis habeat, ſqualoréque obſitum ſit, atque horridum: nec verò excrementū eſt, nec inter partes continuas enumerandum, ſed ſui generis eſt, & quidem ratione optima naturam eiuſmodi ſortitum eſt. Nullam verò cum partib. quæ vim obtinent ſentiendi, continuitatē habere, cū intuitu pateat,

A ὅσοις δὲ * μὴ πιμελὴ ὅμοιος, ἀλλὰ στέαρ γίνεται τὸ αἷμα πεττόμενον, τούτοις στεατώδης. διὸ τοῖς μὲν κερατοφόροις, καὶ μὴ ἀμφώδουσι, στεατώδης· τοῖς δὲ ἀμφώδουσι καὶ πολυσχιδέσι, πιμελώδης. ἥκιστα δὲ ὁ ῥαχίτης τοιοῦτός ἐστι μυελὸς, διὰ τὸ δεῖν αὐτὸν εἶναι συνεχῆ, καὶ διήκειν διὰ πάσης τῆς ῥάχεως διῃρημένης κατὰ τοὺς σπονδύλους. λιπαρὸς δ' ὢν καὶ στεατώδης, οὐκ ἂν ὁμοίως συνεχὴς, ἀλλ' ἢ θραυστὸς, ἢ ὑγρός. ἔνια δὲ οὐκ ἔχει τῶν ζώων, ὡς ἄξιον εἰπεῖν, μυελὸν, ὅσων τὰ ὀστᾶ ἰσχυρὰ καὶ πυκνά, οἷον τὰ τοῦ λέοντος. τούτου γὰρ τὰ ὀστᾶ, διὰ τὸ παμπόλυ ἄσημον ἔχειν, δοκεῖ οὐκ ἔχειν ὅλως μυελόν. ἐπεὶ δὲ τὴν μὲν τῶν ὀστῶν ἀνάγκη B φύσιν ὑπάρχειν τοῖς ζώοις, ἢ τὸ ἀνάλογον τοῖς ὀστοῖς, οἷον τοῖς ἐνύδροις τὴν ἄκανθαν, ἀναγκαῖον ἐνίοις ὑπάρχειν καὶ μυελὸν, ἐμπεριλαμβανομένης τῆς τροφῆς, ἐξ ἧς γίνεται τὰ ὀστᾶ. ὅτι δ' ἡ τροφὴ πᾶσιν αἷμα, εἴρηται πρότερον. εὐλόγως δὲ καὶ στεατώδεις εἰσὶν οἱ μυελοὶ [καὶ πιμελώδεις.] διὰ γὰρ τὴν ἀλέαν τὴν γινομένην ὑπὸ τοῦ περιέχεσθαι τοῖς ὀστοῖς, πέττεται τὸ αἷμα. ἡ δὲ καθ' αὑτὸ πέψις αἵματος, στέαρ καὶ πιμελή ἐστι. καὶ ἐν τοῖς δὴ τὰ ὀστᾶ πυκνὰ ἔχουσι καὶ ἰσχυρὰ, εὐλόγως ἐν τοῖς μὲν οὐκ ἔστι, τοῖς δ' ὀλίγος ἔνεστιν. εἰς γὰρ τὰ ὀστᾶ ἀναλίσκεται ἡ τροφή. ἐν δὲ τοῖς μὴ ἔχουσιν ὀστᾶ, ἀλλὰ ἄκανθαν, ὁ ῥαχίτης μόνος ἐστὶ C μυελός. ὀλίγαιμά τε γὰρ φύσει ὑπάρχει ὄντα, καὶ κοίλη ἄκανθα μόνον ἡ τῆς ῥάχεώς ἐστι. διὸ ἐν ταύτῃ ἐγγίνεται. μόνη τε γὰρ ἔχει χώραν, καὶ μόνη δεῖται συνδέσμου, διὰ τὰς διαλήψεις. διὸ καὶ ἐνταῦθα μυελὸς, ὥσπερ εἴρηται, ἀλλοιότερός ἐστι. διὰ τὸ αὐτὶ περόνης γὰρ γίνεσθαι, γλίσχρος καὶ νευρώδης ἐστὶν, ἵν' ἔχῃ τάσιν. διότι μὲν οὖν μυελὸν ἔχει τὰ ζῷα τὰ ἔχοντα μυελὸν, εἴρηται· καὶ τί ἐστιν ὁ μυελὸς, ἐκ τούτων φανερὸν, ὅτι τῆς αἱματικῆς τροφῆς, τῆς εἰς ὀστᾶ καὶ ἀκάνθας μεριζομένης, ἐστὶ τὸ ἐμπεριλαμβανόμενον περίττωμα πεφθέν.

ΚΕΦΑΛ. ζ.

Περὶ ἐγκεφάλου.

ΠΕρὶ δὲ ἐγκεφάλου σχεδὸν ἐστὶν ἐχόμενον εἰπεῖν. πολλοῖς γὰρ ὁ ἐγκέφαλος δοκεῖ μυελὸς εἶναι, καὶ ἀρχὴ τοῦ μυελοῦ, διὰ τὸ συνεχῆ τὸν ῥαχίτην αὐτῷ ὁρᾶν μυελόν. ἔστι δὲ πᾶν τοὐναντίον αὐτῷ τὴν φύσιν, ὡς εἰπεῖν. ὁ μὲν γὰρ ἐγκέφαλος, ψυχρότατον τῶν ἐν τῷ σώματι μορίων. ὁ δὲ μυελὸς, θερμὸς τὴν φύσιν. δηλοῖ δ' ἡ λιπαρότης αὐτοῦ καὶ τὸ πῖον. διὸ καὶ συνεχὴς ὁ ῥαχίτης τῷ ἐγκεφάλῳ ἐστίν. ἀεὶ γὰρ ἡ φύσις μηχανᾶται πρὸς ἑκάστου ὑπερβολὴν, E βοήθειαν τὴν τοῦ ἐναντίου παρεδρίαν, ἵνα ἀνισάζῃ τὴν θατέρου ὑπερβολὴν θάτερον. ὅτι μὲν οὖν ὁ μυελὸς θερμὸς ἐστὶ, δῆλον ἐκ πολλῶν. ἡ δὲ τοῦ ἐγκεφάλου ψυχρότης φανερὰ μὲν καὶ κατὰ τὴν θίξιν. ἔτι δ' ἀναιμότατος τῶν ὑγρῶν τῶν ἐν τῷ σώματι πάντων (οὐδ' ὁτιοῦν γὰρ αἵματος ἔχει ἐν αὐτῷ) καὶ αὐχμηρότατος. ἔστι δὲ οὔτε περίττωμα, οὔτε τῶν συνεχῶν μορίων· ἀλλὰ ἴδιος ἡ φύσις, καὶ εὐλόγως τοιαύτη. ὅτι μὲν οὖν οὐκ ἔχει συνέχειαν οὐδεμίαν πρὸς τὰ αἰσθητικὰ μόρια, δῆλον μὲν καὶ διὰ τῆς ὄψεως·

Hiſtor. anim. lib. 3. c. 47.

A ἔτι δὲ μᾶλλον, τῷ μηδεμίαν ποιεῖν αἴσθησιν θιγγανόμενος, ὥσπερ οὐδὲ τὸ αἷμα, οὐδὲ τὸ περίττωμα τῶν ζώων. ὑπάρχει δὲ ἐν τοῖς ζώοις πρὸς τὴν τῆς φύσεως ὅλης σωτηρίαν. οἱ μὲν γὰρ τῶν ζώων τὴν ψυχὴν τιθέασι πῦρ, ἤ τοιαύτην τινὰ δύναμιν· φορτικῶς τιθέντες. βέλτιον δ' ἴσως φάναι ἐν τοιούτῳ τινὶ σώματι συνεστάναι. τούτου δ' αἴτιον, ὅτι τῆς ψυχῆς [τοῖς ἔργοις] ὑπηρετικώτατον τῶν σωμάτων τὸ θερμόν ἐστι. τὸ τρέφειν γὰρ καὶ κινεῖν ψυχῆς ἔργον ἐστί. ταῦτα δὲ διὰ ταύτης γίνεται μάλιστα τῆς δυνάμεως. ὅμοιον οὖν τὸ τὴν ψυχὴν φάναι πῦρ, καὶ τὸ πρίονα εἴτε τρύπανον τὸν τέκτονα, ἢ τὴν τεκτονικὴν, ὅτι τὸ ἔργον ἀπεργάζεται ἐγγὺς ἀλλήλων ὄντων. ὅτι μὲν οὖν θερμότητος τὰ ζῷα μετέχειν ἀναγ-B καῖον, δῆλον ἐκ τούτων. ἐπεὶ δ' ἅπαντα δεῖται τῆς ἐναντίας ῥοπῆς, ἵνα τυγχάνῃ τοῦ μετρίου καὶ μέσου (τὴν γὰρ οὐσίαν ἔχει τοῦτο καὶ τὸν λόγον· τῶν δ' ἄκρων ἑκάτερον οὐκ ἔχει χωρὶς) διὰ ταύτην τὴν αἰτίαν πρὸς τὸν τῆς καρδίας τόπον, καὶ τὴν ἐν αὐτῇ θερμότητα μεμηχάνηται τὸν ἐγκέφαλον ἡ φύσις. τούτου χάριν ὑπάρχει τὸ μόριον τοῦτο τοῖς ζώοις, τὴν φύσιν ἔχον κοινὴν ὕδατος καὶ γῆς. διὰ τοῦτο τὰ ἔναιμα ἔχει πάντα ἐγκέφαλον· τῶν δ' ἄλλων οὐδέν, ὡς εἰπεῖν, πλὴν ὅτι κατὰ τὸ ἀνάλογον, οἷον ὁ πολύπους. ὀλιγόθερμα γὰρ πάντα διὰ τὴν ἀναιμίαν. ὁ μὲν οὖν ἐγκέφαλος εὔκρατον ποιεῖ τὴν ἐν τῇ καρδίᾳ θερμότητα καὶ ζέσιν· ἵνα δὲ καὶ C τοῦτο τὸ μόριον τυγχάνῃ μετρίας θερμότητος, ἀφ' ἑκατέρας τῆς φλεβὸς, τῆς μεγάλης καὶ τῆς καλουμένης ἀορτῆς, τελευτῶσιν αἱ φλέβες εἰς τὴν μήνιγγα τὴν περὶ τὸν ἐγκέφαλον. πρὸς δὲ τὸ τὴν θερμότητα μὴ βλάπτειν, ἀντὶ μὲν μεγάλων ὀλίγων, πυκναὶ καὶ λεπταὶ φλέβες περιέχουσιν αὐτόν· ἀντὶ δὲ πολλοῦ καὶ παχέος αἵματος, λεπτὸν καὶ καθαρόν. διὸ καὶ τὰ ῥεύματα τοῖς σώμασιν, ἐκ τῆς κεφαλῆς ἐστὶ τὴν ἀρχὴν, ὅσοις ἂν ᾖ τὰ περὶ τὸν ἐγκέφαλον ψυχρότερα τῆς ἐμμέτρου κράσεως. ἀναθυμιωμένης γὰρ διὰ τῶν φλεβῶν ἄνω τῆς τροφῆς, τὸ περίττωμα ψυχόμενον διὰ τὴν τοῦ τόπου δύναμιν, ῥεύματα ποιεῖ φλέγματος καὶ ἰχῶρος. δεῖ δ' ὑπολαβεῖν, ὡς μεγάλῳ παρεικάζοντι μικρὸν, ὁμοίως συμβαί-D νειν ὥσπερ τὴν τῶν ὑετῶν γένεσιν. ἀναθυμιωμένης γὰρ ἐκ τῆς γῆς τῆς ἀτμίδος, καὶ φερομένης ὑπὸ τοῦ θερμοῦ πρὸς τὸν ἄνω τόπον, ὅταν ἐν τῷ ὑπὲρ τῆς γῆς γένηται ἀέρι ὄντι ψυχρῷ, συνίσταται πάλιν εἰς ὕδωρ, καὶ ῥεῖ κάτω διὰ τὴν ψύξιν πρὸς τὴν γῆν. ἀλλὰ περὶ μὲν τούτων, ἐν ταῖς τῶν νόσων ἀρχαῖς ἁρμόττει λέγειν, ἐφ' ὅσον τῆς φυσικῆς φιλοσοφίας ἐστὶν εἰπεῖν περὶ αὐτῶν. ποιεῖ δὲ καὶ τὸν ὕπνον τοῖς ζώοις τοῦτο τὸ μόριον τοῖς ἔχουσιν ἐγκέφαλον· τοῖς δὲ μὴ ἔχουσι, τὸ ἀνάλογον. καταψύχον γὰρ τὴν ἀπὸ τῆς τροφῆς τοῦ αἵματος ἐπιρροὴν, ἢ καὶ διὰ τινὰς ὁμοίας αἰτίας ἄλλας, βαρύνει τε τὸν τόπον (διὸ τὴν κεφαλὴν καρηβαροῦσιν οἱ ὑπνώττοντες) E καὶ κάτω ποιεῖ τὸ θερμὸν ὑποφεύγειν μετὰ τοῦ αἵματος. διὸ πλεῖον ἀθροιζόμενον ἐπὶ τὸν κάτω τόπον, ἀπεργάζεται τὸν ὕπνον, καὶ τὸ δύνασθαι ἑστάναι ὀρθὸν ἀφαιρεῖται, ὅσα τῶν ζώων ὀρθὰ τὴν φύσιν ἐστί· τῶν δ' ἄλλων, τὴν ὀρθότητα τῆς κεφαλῆς. περὶ ὧν εἴρηται καθ' αὐτὰ, ἔν τε τοῖς περὶ αἰσθήσεως καὶ περὶ ὕπνου διωρισμένοις. ὅτι δ' ἐστὶν ὁ ἐγκέφαλος κοινὸς ὕδατος καὶ γῆς, δηλοῖ τὸ συμβαῖνον περὶ αὐτόν. ἑψόμενος γὰρ γίνεται ξηρὸς καὶ σκληρὸς, καὶ λείπεται τὸ γεῶδες, ἐξατμισθέντος τοῦ ὕδατος ὑπὸ τῆς θερμότητος,

A tum vel maximè inde conſtat, quòd cùm tangitur, nullum efficit ſenſum, quemadmodum nec ſanguis, neque excrementum animalium vllum: datum autem hoc animalibus eſt ad naturæ totius ſalutem. Quod enim nonnulli ſtatuunt importunè, animam eſſe ignem, aut aliquam eiuſmodi vim, meliùs fortaſſe dixeris, animam in quodam eiuſmodi corpore conſtare. Cuius rei cauſa eſt: quòd ad exequenda animæ officia, calor omnium maximè adminiſtrandi vim obtinet. Cùm enim officium animæ ſit alere & mouere, hæc ea ipſa facultate potiſſimùm efficiuntur. Igitur animam eſſe ignem arbitrari, ſimile eſt, atque ſi ſerram, aut aſciam, fabrum aut artem B fabrilem eſſe ideo arbitreris, quia opus non, niſi iunctis his, efficiatur. Sed quàm genus omne animalium caloris particeps eſſe neceſſe ſit, apertum hinc eſt. Cùm autem omnia momentum requirant contrarium, quo mediocritatem ac medium aſſequantur (in hoc enim eſſentia ratióque conſiſtit, non in alterutro extremo ſeorſum poſito) idcirco aduerſus cordis ſedem, & calorem, cerebrum Natura molita eſt. Et ea de cauſa pars iſta animalibus iuncta eſt, naturam obtinens aquę & terræ communem: atque ob eam rem cerebrum omnia ſanguine prædita habent, ex cæteris nullum ferè, niſi per proportionem, vt polypus. Parum enim caloris obtinet omne id genus C propter ſanguinis priuationem. Cerebrum igitur calorem feruorémque cordis moderatur, & temperiem affert. Sed vt ea quoque pars modico potiatur calore, venæ ad membranam cerebri deueniunt ex vtraque vena, maiorem dico, & eam quæ aorta vocatur. Et ne calor nimius offendat, non paucæ amplæ, ſed frequentes ac tenues venæ ambiunt: nec ſanguis copioſus & craſſus, ſed tenuis ſyncerúſque ſubit eòdem. Fluxiones etiam ob eam rem ex capite oriuntur in iis corporibus, quibus cerebrum frigidius eſt, quàm temperamentum modicum poſtulet. Cùm enim alimentum per venas ſurſum reſpirat, vbi excrementum ob eius loci vim refrigeratum eſt, fluxiones pituitæ D ſanieíque mouet. Quod ſimile generationi imbrium euenire intelligendum eſt, quoad magnum conferre cum paruo licet. Cùm enim ex terra vapor exhalat, effertúrque in ſublime à calore, vbi ſupernum aërem ſubierit frigidum, conſiſtit: denuò in aquam propter refrigerationem, atque in terram defluit. Sed de his, cùm de morborũ cauſis agitur, diſſerere, congruum eſt: videlicet quoad tractare de his naturalis ſcientiæ intereſt. Somnus etiam à cerebro proficiſcitur, iis quæ eam obtinent partem, animalibus: quæ autem carent, iis proportionale ſuppetit. Cùm enim ſanguinis alentis affluentia refrigeretur à cerebro, aut etiam ob alias cauſas ſimiles, caput E aggrauatur. Et quidem ſomno ſopiti, ea corporis parte ſolent tentari: atque efficitur vt calor ad ima cum ſanguine ſubterfugiat, collectáque copia caloris in loco inferiori ſomnum facit, & facultatem erigendi corporis aufert ab iis animalibus quæ erecta incedere Natura voluit: cæteris caput erigi prohibet. Quibus de rebus ſeorſum docuimus, cùm de ſenſu & ſomno ageremus. Cerebrum autem eſſe commune aquæ & terræ conſtat, ex eo quod ei accidit: cùm enim coquitur, indureſcit, atque ſicceſcit, vt humore exacto à calore, terrena portio relinquatur,

quemadmodum in leguminum reliquorumque A fructuum decoctione: quòd enim ex terra magna ex parte conſtant, hinc exacto humore, quem exiguum ſibi admiſtum continent, dura terrenaque admodum ea quoque relinquuntur. Homo inter omnia animalia plurimum cerebri habet, ſcilicet proportione ſui corporis: & inter homines, mares plus quàm fœminæ. Cordis enim pulmoniſque locum calidiſſimum, & ſanguine refertiſſimum homo habet: vnde animalium homo vnus erectus eſt. Caloris enim natura inualeſcens, incrementum de medio agit pro ſuo impetu. Itaque contra multum caliditatis, multum humiditatis frigiditatiſque, opponitur. Qua quidem B copia fit, vt capitis os, quod caluariam nonnulli appellant, ſerò admodum induretur, cùm diu calor euaporetur, quod nulli ex cæteris animalibus ſanguine præditis euenit. Iuncturas etiam plurimas in capite homo habet, & mas plures, quàm fœmina, eadem de cauſa, vt locus ſpirantior ſit: & ampliùs, in quo plus cerebri habetur. Nam ſi cerebrum vel humet, vel ſiccet ſupra modum, ſuo fungi officio non poteſt: ſed aut non refrigerabit, aut coagulabit. Itaque morbos, deliria, mortes afferet. Calor enim cordis, atque principium conſentientiſſimum eſt, ſenſúmque celerrimè facit, cùm ſanguis cerebri, vllo pacto C mutatur, atque afficitur. Sed de cognatis animalium humoribus omnibus dictum ferè eſt. Poſtgeniti excrementa ſunt cibi, id eſt, veſicæ ſedimen, atque alui: prætereà genitura, & lac, ſcilicet in iis quorum natura hæc obtinet. Verùm cibi excrementa quibuſnam animalibus iuncta ſint, & quas ob cauſas, aptiùs in conſideranda differendáque alimẽti ratione explicetur. De ſemine autem genitali, & lacte, tractandum eſt, cùm de generatione: alterum enim eorum principium generationis eſt, alterum generationis gratia habetur.

ὥσπερ τὰ τῶν χεδρόπων ἑψήματα καὶ τῶν ἄλλων καρπῶν· διὰ τὸ γῆς εἶναι τὸ πλεῖστον μέρος, ἐξιόντος τοῦ μιχθέντος ὑγροῦ· καὶ γὰρ ταῦτα γίνεται σκληρὰ καὶ γεηρὰ παντελῶς. ἔχει δὲ τῶν ζώων ἐγκέφαλον πλεῖστον ἄνθρωπος, ὡς κατὰ μέγεθος, καὶ τῶν ἀνθρώπων οἱ ἄρρενες τῶν θηλειῶν· καὶ γὰρ περὶ τὴν καρδίαν καὶ τὸν πνεύμονα τόπος, θερμότατος καὶ ἐναιμότατος· διὸ καὶ μόνον ἐστὶ τῶν ζώων ὀρθόν· ἡ γὰρ τοῦ θερμοῦ φύσις ἐνισχύουσα, ποιεῖ τὴν αὔξησιν ἀπὸ τοῦ μέσου κατὰ τὴν αὐτῆς φοράν. πρὸς οὖν τὴν πολλὴν θερμότητα * οἷον ἀντίκειται ὑγρότης καὶ ψυχρότης, καὶ διὰ τὸ πλῆθος, ὀψιαίτατα πήγνυται τὸ περὶ τὸν ἐγκέφαλον ὀστοῦν, ὃ καλοῦσί τινες βρέγμα, διὰ τὸ πολὺν χρόνον τὸ θερμὸν ἀπατμίζειν. τῶν δ' ἄλλων οὐδενὶ τοῦτο συμβαίνει τῶν ἐναίμων ζώων. καὶ ῥαφὰς δὲ πλείστας ἔχει περὶ τὴν κεφαλήν, καὶ ὁ ἄρρην πλείους τῶν θηλειῶν, διὰ τὴν αὐτὴν αἰτίαν, ὅπως ὁ τόπος εὔπνους ᾖ, καὶ μᾶλλον ὁ πλείων ἐγκέφαλος. ὑγραινόμενος γὰρ ἢ ξηραινόμενος, οὐ ποιήσει τὸ αὐτοῦ ἔργον, ἀλλ' ἢ οὐ ψύξει, ἢ πήξει· ὥστε νόσους καὶ παρανοίας ποιεῖ καὶ θανάτους. τὸ γὰρ ἐν τῇ καρδίᾳ θερμόν, καὶ ἡ ἀρχή, συμπαθεστάτη ἐστί, καὶ ταχεῖαν ποιεῖται τὴν αἴσθησιν, μεταβάλλοντός τε καὶ πάσχοντος τοῦ περὶ τὸν ἐγκέφαλον αἵματος. περὶ μὲν οὖν τῶν συμφύτων τοῖς ζώοις ὑγρῶν, σχεδὸν εἴρηται περὶ πάντων. τῶν δ' ὑστερογενῶν, τά τε περιττώματα τῆς τροφῆς ἐστι, τό, τε τῆς κύστεως ὑπόστημα, καὶ τὸ τῆς κοιλίας· καὶ παρὰ ταῦτα γονὴ καὶ γάλα, τοῖς πεφυκόσιν ἔχειν ἕκαστα τούτων. τὰ μὲν οὖν τῆς τροφῆς περιττώματα, περὶ τὴν τῆς τροφῆς σκέψιν καὶ θεωρίαν οἰκείως ἔχει τοῖς λόγοις, τίσι τε τῶν ζώων ὑπάρχει, καὶ διὰ τίνας αἰτίας. τὰ δὲ περὶ σπέρματος καὶ γάλακτος, ἐν τοῖς περὶ γενέσεως· τὸ μὲν γάρ, ἀρχὴ γενέσεως αὐτῶν ἐστι· τὸ δέ, χάριν γενέσεως.

* Gaza, [illegible]

CAPVT VIII.

D

De carne, ſeu iis quæ vice carnis habeantur.

NVnc de cæteris ſimilaribus partibus dicendum eſt, & primùm de carne, in iis quæ obtinent carnem: in cæteris autem de eo quod vice carnis proportione reſpondeat. Hoc enim principium, & corpus per ſe animalium eſt: quod ratione etiam patet. Animal enim eo definimus, quod ſenſum obtinet, primúmque eum qui primus eſt. Tactum autem primum eſſe, certum eſt. Tactus verò ſenſorium pars eiuſmodi eſt aut prima, vt pupilla viſus: aut coniuncta, per quam agitur, perinde quaſi pupillæ omne diaphanes, hoc eſt, translucidum, coniungas. Cæteris igitur ſen- E ſibus nec tribui hoc poterat, neque operæ pretium erat effici à Natura. At verò tactui dari neceſſe fuit. Sola enim, aut maximè omnium ſenſoriorum, ſedes tangendi corpulenta eſt. Senſui autem patet, cætera omnia eius vnius gratia haberi: oſſa dico, neruos, cutem, venas, pilos etiam, & vnguium genus, & quicquid eiuſmodi iunctum eſt. Natura enim oſſium adhibita eſt, vt ſua duritie rem mollem ſeruaret in iis quæ oſſa habent. Eadémque de cauſa proportionale oſſium habetur in iis quæ oſſibus carent: vt in genere piſcium aliis ſpina, aliis cartilago iuncta eſt. Habent hoc præſidium alia intus, alia foris, vt in genere ſanguinis experte.

ΚΕΦΑΛ. η'.

Περὶ σαρκὸς, καὶ τοῦ ἀνάλογον.

ΠΕρὶ δὲ τῶν ἄλλων μορίων τῶν ὁμοιομερῶν σκεπτέον, καὶ περὶ σαρκὸς πρῶτον ἐν τοῖς ἔχουσι σάρκας· ἐν δὲ τοῖς ἄλλοις τοῦ ἀνάλογον. τοῦτο γὰρ ἀρχὴ καὶ σῶμα τῶν ζώων ἐστί. δῆλον δὲ καὶ κατὰ τὸν λόγον. τὸ γὰρ ζῶον ὁριζόμεθα τῷ ἔχειν αἴσθησιν, πρῶτον δὲ τὴν πρώτην· αὕτη δ' ἐστὶν ἁφή. ταύτης δ' ἐστὶ τὸ τοιοῦτον μόριον αἰσθητήριον, ἤτοι τὸ πρῶτον, ὥσπερ ἡ κόρη τῆς ὄψεως, ἢ τὸ δι' οὗ συνειλημμένον, ὥσπερ ἂν εἴ τις προσλάβοι τῇ κόρῃ τὸ διαφανὲς πᾶν. ἐπὶ μὲν οὖν τῶν ἄλλων αἰσθήσεων, ἀδύνατόν τε, καὶ οὐθὲν προὔργου τοῦτ' ἦν ποιῆσαι τῇ φύσει· τὸ δ' ἁπτικόν, ἐξ ἀνάγκης· μόνον γὰρ ἢ μάλιστα τοῦτ' ἐστὶ σωματῶδες τῶν αἰσθητηρίων. κατὰ δὲ τὴν αἴσθησιν τὸ φανερόν, πάντα τἆλλα τούτου χάριν ὄντα· λέγω δ' οἷον ὀστᾶ, καὶ νεῦρα, καὶ δέρμα, καὶ φλέβες, ἔτι δὲ τρίχες, καὶ τὸ τῶν ὀνύχων γένος, κἂν εἴ τι τοιοῦτον ἕτερόν ἐστιν. ἡ μὲν γὰρ τῶν ὀστῶν φύσις, σωτηρίας ἕνεκεν μεμηχάνηται μαλακῶν, σκληρὰ τὴν φύσιν οὖσα, ἐν τοῖς ἔχουσιν ὀστᾶ· ἐν δὲ τοῖς μὴ ἔχουσι, τὸ ἀνάλογον, οἷον ἐν τοῖς ἰχθύσι, τοῖς μὲν ἄκανθα, τοῖς δὲ χόνδρος. τὰ μὲν οὖν ἐντὸς ἔχει τῶν ζώων ταύτην τὴν βοήθειαν· ἔνια δὲ τῶν ἀναίμων ἐκτός,

Hiſtor. anim. lib. 3. c. 16.

ὥσπερ τῶν τε μαλακοστράκων ἕκαστον, οἷον καρκίνοι καὶ τὸ τῶν καράβων γένος· καὶ ὀστρακοδέρμων ὡσαύτως, οἷον τὰ καλούμενα ὄστρεα. πᾶσι γὰρ τούτοις τὸ μὲν σαρκῶδες ἐντός· τὸ δὲ συνέχον καὶ φυλακτικὸν ἐκτός, τὸ μὲν γεῶδές ἐστι. πρὸς γὰρ τῷ συνέχειν καὶ φυλακτικὸν τῆς συνεχείας, τῷ ἔχειν ὀλίγον αὐτῶν τὴν φύσιν θερμόν, ἀναίμων ὄντων, οἷον πνιγεύς τις περιεχόμενον τὸ ὄστρακον, φυλάττει τὸ ἐμπεπυρευμένον θερμόν. ἡ δὲ χελώνη, καὶ τὸ τῶν * ἀμυδῶν γένος, ὁμοίως ἔχειν δοκεῖ τούτοις, ἕτερον ὂν γένος αὐτῶν. τὰ δ' ἔντομα τῶν ζώων καὶ τὰ μαλάκια, τούτοις ἐναντία, καὶ αὐτοῖς ἀντικειμένως συνέστηκεν. οὐδὲν γὰρ ὀστῶδες ἔχειν ἔοικεν, οὐδὲ γεηρὸν ἀποκεκριμένον, ὅ,τι καὶ ἄξιον εἰπεῖν· ἀλλὰ τὰ μὲν μαλάκια σχεδὸν ὅλα σαρκώδη καὶ μαλακά· πρὸς δὲ τὸ μὴ εὔφθαρτον εἶναι τὸ σῶμα αὐτῶν, καθάπερ τὰ σαρκώδη, μεταξὺ σαρκὸς καὶ νεύρου τὴν φύσιν ἔχει. μαλακὸν μὲν γὰρ ὥσπερ σάρξ ἐστιν, ἔχει δὲ τάσιν, ὥσπερ νεῦρον· τὴν δὲ φύσιν ἔχει τῆς σαρκὸς οὐ κατ' εὐθυωρίαν, ἀλλὰ κατὰ κύκλους διαιρετήν. οὕτως γὰρ ἂν ἔχον, χρησιμώτατον ἂν εἴη πρὸς τὴν ἰσχύν· ὑπάρχει δὲ ἐν αὐτοῖς καὶ τὸ ἀνάλογον ταῖς τῶν ἰχθύων ἀκάνθαις· οἷον ἐν μὲν ταῖς σηπίαις τὸ καλούμενον σήπιον, ἐν δὲ ταῖς τευθίσι τὸ καλούμενον ξίφος. τὰ δὲ τῶν πολυπόδων τοιοῦτον οὐδὲν ἔχει, διὰ τὸ μικρὸν ἔχειν τὸ κύτος τὴν καλουμένην κεφαλήν, θάτερα δ' εὐμήκη. διὸ πρὸς τὴν ὀρθότητα αὐτῶν καὶ τὴν ἀκαμψίαν ἀπέγραψεν αὐτὰ φύσις, ὥσπερ * τῶν ἐναίμων τοῖς μὲν ὀστοῦν, τοῖς δὲ ἄκανθαν. τὰ δ' ἔντομα τούτοις ἐναντίως ἔχει καὶ τοῖς ἐναίμοις, καθάπερ εἴπομεν. οὐδὲ γὰρ ἀφωρισμένον ἔχει σκληρόν, ἀλλ' ὅλον σῶμα σκληρόν. σκληρότητα δὲ ταύτην, ὥστε μὲν σαρκωδεστέραν, σαρκὸς δὲ ὀστωδεστέραν καὶ γεωδεστέραν, πρὸς τὸ μὴ εὐδιαίρετον εἶναι τὸ σῶμα αὐτῶν.

* χ. ἀμύδων. al. μυδῶν. al. ἐμύδων. vide de reſpirat. c. 1.

* χ. τῶν ἀναίμων

ΚΕΦΑΛ. θ'.

Περὶ ὀστῶν καὶ φλεβῶν καὶ χόνδρου.

Hiſtor. anim. li. 3. c. 7.

Ἔχει δὲ ὁμοίως ἥ τε τῶν ὀστῶν καὶ ἡ τῶν φλεβῶν φύσις. ἑκατέρα γὰρ αὐτῶν ἀφ' ἑνὸς ἠργμένη συνεχής ἐστι, καὶ οὔτε ὀστοῦν ἐστιν αὐτὸ καθ' αὑτό, οὐδέν, ἀλλ' ἢ μέρος συνεχές, ἢ ἁπτόμενον καὶ προσδεδεμένον, ἵνα χρῆται ἡ φύσις καὶ ὡς ἑνί, καὶ ὡς συνεχεῖ, καὶ ὡς διῃρημένοις πρὸς τὴν κάμψιν. ὁμοίως δὲ καὶ φλὲψ οὐδεμία αὐτὴ καθ' αὑτήν ἐστιν, ἀλλὰ πᾶσαι μόρια μιᾶς εἰσιν. ὀστοῦν γὰρ εἴπερ ἦν κεχωρισμένον τι, τό,τ' ἔργον οὐκ ἂν ἐποίει, οὗ χάριν ἡ τῶν ὀστῶν ἐστι φύσις (οὔτε γὰρ ἂν κάμψεως ἦν αἴτιον, οὔτ' ὀρθότητος οὐδεμιᾶς, μὴ συνεχὲς ὄν, ἀλλὰ διειλημμένον) ἔτι τ' ἔβλαπτεν ἂν ὥσπερ ἄκανθά τις, ἢ βέλος ἐνὸν ταῖς σαρξίν. εἴ τε φλὲψ ἦν τις κεχωρισμένη καὶ μὴ συνεχὴς πρὸς τὴν ἀρχήν, οὐκ ἂν ἐσῴζετο ἐν αὐτῇ αἷμα. ἡ γὰρ ἀπ' ἐκείνης θερμότης κωλύει πήγνυσθαι. φαίνεται δὲ καὶ σηπόμενον τὸ χωριζόμενον. ἀρχὴ δὲ τῶν μὲν φλεβῶν ἡ καρδία· τῶν δ' ὀστῶν, ἡ καλουμένη ῥάχις, τοῖς ἔχουσιν ὀστᾶ πᾶσιν· ἀφ' ἧς συνεχὴς ἡ τῶν ἄλλων ὀστῶν ἐστι φύσις. ἡ γὰρ τὸ μῆκος καὶ τὴν ὀρθότητα συνέχουσα τῶν ζώων ἡ ῥάχις ἐστίν. ἐπεὶ δ' ἀνάγκη κινουμένου τοῦ ζώου κάμπτεσθαι τὸ σῶμα, μία μὲν διὰ τὴν συνέχειαν ἐστί, πολυμερὴς δὲ τῇ διαιρέσει τῶν σπονδύλων. ἐκ δὲ ταύτης, τοῖς ἔχουσι κῶλα συνεχῆ πρὸς αὐτήν, τὰ τούτων ὀστᾶ,

Cruſtata omnia extra ſe munita ſeruantur: velut cancri, genúſque omne locuſtarum, atque etiam teſtatorum, vt quæ oſtreæ appellantur. His enim omnibus caro intus: terrenum autem illud, quod contineat, & conſeruet, foris eſt. Nam præter ipſum continendi officium, quoniam eorum natura parum caloris obtinet, cùm ſanguine careant, idcirco teſta veluti furnulus quidam amplectens, conſeruat inteſtinum calorem, & tuetur. Quinetiam teſtudo, & lutariæ genus ſimili modo ſe habere videtur, quanquam diuerſum genus ab illis hoc eſt. At verò animalia inſecta, & mollia contrà quàm hæc, & modo inter ſe oppoſita conſtant: nihil enim oſſis, nihil terreni habere diſcretum videntur, quod dignum effatu ſit: ſed mollia ferè tota, carnoſa, & tactui cedentia ſunt. Ne tamen corpus eorum facilè pereat, modo illorum quæ carne laſciuiunt, naturam inter carnem & neruum obtinent. Mollis enim vt caro eſt, ſed intendi poteſt vt neruus. Fiſſilis autem caro eorum non in directum, ſed in anfractum: ita enim ad vires commodior eſſe poteſt. Habent etiam quod piſciū ſpinis proportionetur; vt ſepiæ quod ſepium vocant: lolligines quod gladiolum. Polypi nihil eiuſmodi habent, quòd eorum alueus, quem caput appellant, breuior eſt, illorum procerior. Ideóque vt directus inflexúſque maneret, natura his adminiculis faciendum cenſuit: quemadmodum in genere ſanguineo, aliis os dedit, aliis ſpinam. Inſecta contrà quàm hæc & ſanguine prædita conſtant, vt modo diximus, quippe quæ nihil habeant duri aut mollis diſcretum: ſed dura toto corpore ſint duritie tali, vt oſſe carnoſiora, carne oſſatiora terratioráque conſiſtent, ne facilè corpus eorum diuidi poſſit.

CAPVT IX.

De venis, oſſibus, & cartilagine.

Similis natura eſt oſſibus, & venis: vtraque enim ex vno orſa continua eſt. Et neque os vllum ſeorſum per ſe habetur, ſed aut pars continui eſt, aut tangit, atque annectitur, vt natura & tanquam vnò continuóque, & tanquam duobus diſtinctiſque ad flexum vtatur. Neque vena vlla ſeorſum per ſe eſt, ſed omnes pars ſunt vnius. Nā ſi quod os ſeparatum eſſet, accideret, vt nec officio fungi poſſet, cuius gratia natura oſſium habetur: quippe quod nec flectendi, neque dirigendi cauſam vllam præberet, cùm non continuum eſſet, ſed interceptum: & lędere proculdubio poſſet perinde quaſi vel ſpina, vel ſpiculū carni infixum. Vena etiam ſi qua ſeparata, nec ſuæ origini continua tenderet, ſuum ſanguinem ſeruare nō poſſet. Calor enim profluens ab origine facit ne ſanguis gelet. Putreſcere etiam ſanguis videtur, qui à ſuo fonte remotus eſt. Principium venarum cor eſt: oſſium, quod ſpina dorſi vocatur, videlicet in omnibus iis quæ oſſa habent. Hinc enim cætera oſſa oriuntur, & continuantur. Spina eſt enim, quod longitudinem ac rectitudinem contineat animalium. Sed cùm corpus inflecti per animalis motum neceſſe ſit, ita conſtat, vt & vna ſit propter continuitatem, & multipartita propter vertebrarum diſtinctionem. Hinc femorum brachiorúmque oſſa dependent continua,

eodémque arctiùs adnectuntur, qua flectendum eſt: neruis deligantur, extremáque ſibi cohærent. Alterum cauum, alterum rotundum, aut vtrunque cauum, medio talo quaſi clauo complexo, vt flecti extendique poſſint: aliter enim aut nullo pacto, aut non bene motus eiuſmodi agi poſſet. Nonnulla extremis ſimilibus coniunguntur, neruis deligata. Cartilaginoſæ etiam partes inſeruntur flexuris, velvti lectiſternium, ne attritu mutuo lædantur. Caro circa oſſa conſiſtit, vinculis modo fibrarum tenuibus adhærens, cuius cauſa oſſium genus habetur. Vt enim qui ex limo aut alia maſſa humida animal effingunt, firmo aliquo ſubdito corpore obducunt, atque afformant: ſic natura ex carnibus animal condidit. Cæteris igitur partibus, ſcilicet carnoſis, oſſa omnibus ſubiacent, aut flectendi gratia, ſi mouentur, aut conſeruandi cauſa, ſi immobilia ſunt: vt coſtæ, quæ pectus, ſalutis viſcerum gratia, claudunt. Venter omnium oſſibus vacat, ne tumori impedimento ſint, qui per cibum ingeſtum exurgat, neceſſe eſt, atque etiam ne in fœminis incremento partuum obſtent. Sed enim quæ animal vel intra ſe, vel foris pariunt, hæc ſimiles robuſtáſque oſſium obtinent vires. Multo enim maiora hæc ſunt iis quæ non pariunt animal: videlicet proportione ſolitæ magnitudinis. Nam nonnuſquam complura ex hoc animalium genere creſcunt mirum in modũ, vt in Africa, locíſque aliis calidis, & ſiccis: magnis autem adminiculo opus eſt maiori, validiori, & firmiori: atque inter magna iis potiſſimùm tali opus eſt adiumento, quę violentiora ſunt. Quam ob rem mares oſſibus durioribus conſtent, quàm fœminæ, & quæ carniuora ſunt, quàm quæ alio cibo veſcuntur: iis enim victus per dimicationem acquiritur: velvt leonis oſſa adeo dura ſunt, vt ex iis percuſſis, ignis quaſi ex ſilice excutiatur. Delphinus etiam non ſpinas, ſed oſſa habet: viuiparum enim eſt. Sanguineis autem non viuiparis natura aliquantum degenerat, vt volucribus: quamuis enim habeant oſſa, tamen imbecilliora. Inter piſces ſpinam, qui oua pariunt, habent. Serpentibus etiam natura oſſium ſpinacea eſt, prætérquam magnis: robur enim eorum validiora exigit firmamenta, eadem, qua & viuiparis, ratione. At cartilaginea nomine, ſpinam ex cartilagine habent. Motum enim eorum eſſe molliorem, neceſſe eſt: itaque fulcimenti genus non rigidum, ſed mollius eſſe oportuit. Adde quòd terrenam omnem materiam ad eorum cutem conficiendam Natura abſumpſerit. Pluribus autem locis ſimul tantundem exuperantiæ diſpenſare Natura non poteſt; quoniam etiam in viuiparo genere oſſa cartilaginoſa complura habentur, ſcilicet in iis quibus expedit molle mucoſúmque eſſe quod ſolidum habeatur, ratione carnis obductæ, vt auribus ac naribus eueniſſe apertum eſt: prominentiora enim, ſi rigida ſunt, frangi celeriter poſſunt. Natura vero eadem oſſis & cartilaginis eſt, quãquam pluris minoríſque ratione intereſt: quapropter neutrum præciſum recreſcere poteſt. Vacant medulla cartilagines terreſtrium animaliũ diſcreta. Quod enim in os diſcretum cõtinetur, id miſtum per totum facit, vt cartilago res mollis mucoſáque conſtituatur. At in cartilagineo genere ſpina dorſi, quamuis cartilaginoſa, medullam habet: vicem enim oſſis hæc pars tenet in eo genere.

τὴν ἁρμονίαν ἐστίν, ἢ μὲν ἔχει τὰ κῶλα κάμψιν, συνδεδεμένα νεύροις, καὶ τῶν ἐσχάτων συναρμοττόντων, τοῦ μὲν ὄντος κοίλου, τοῦ δὲ περιφεροῦς, ἢ καὶ ἀμφοτέρων κοίλων, ἐν μέσῳ δὲ περιειληφότων, οἷον γόμφον, ἀστράγαλον, ἵνα γίνηται κάμψις καὶ ἔκτασις. ἄλλως γὰρ, ἢ ὅλως ἀδύνατον, ἢ οὐ καλῶς ἂν ἐποίουν τὴν τοιαύτην κίνησιν. * ἔνια δ' αὖ τὴν ὁμοίαν ἔχοντα τὴν ἀρχὴν τὴν θατέρου, τῇ τελευτῇ θατέρου, συνδέδεται νεύροις. καὶ χονδρώδη δὲ μόρια μεταξὺ τῶν καμψεών εἰσιν, οἷον στοιβή, πρὸς τὸ ἄλληλα μὴ τρίβεσθαι. περὶ δὲ τὰ ὀστᾶ αἱ σάρκες πεφύκασι, περιειλημμέναι λεπτοῖς καὶ ἰνώδεσι δεσμοῖς, ὧν ἕνεκα τὸ τῶν ὀστῶν ἐστὶ γένος. ὥσπερ γὰρ οἱ πλάττοντες ἐκ πηλοῦ ζῷον, ἢ τινος ἄλλης ὑγρᾶς συστάσεως, ὑφιστᾶσι τῶν στερεῶν τι σωμάτων, εἶθ' οὕτως περιπλάττουσι· τὸν αὐτὸν τρόπον ἡ φύσις δεδημιούργηκεν ἐκ τῶν σαρκῶν τὸ ζῷον. τοῖς μὲν οὖν ἄλλοις ὕπεστιν ὀστᾶ σαρκώδεσι μορίοις, τοῖς μὲν κινουμένοις διὰ κάμψιν, τούτου χάριν· τοῖς δ' ἀκινήτοις, φυλακῆς ἕνεκεν· οἷον αἱ συγκλείουσαι πλευραὶ τὸ στῆθος σωτηρίας χάριν, τῶν περὶ καρδίαν σπλάγχνων. τὰ δὲ περὶ τὴν κοιλίαν ἀνόστεα πᾶσιν, ὅπως μὴ κωλύῃ τὴν ἐξοίδησιν τὴν ἀπὸ τῆς τροφῆς γινομένην τοῖς ζῴοις ἐξ ἀνάγκης, καὶ τοῖς θήλεσι τὴν ἐν αὐτοῖς τῶν ἐμβρύων αὔξησιν. τὰ μὲν οὖν ζῳοτόκα τῶν ζῴων καὶ ἐν αὐτοῖς καὶ ἐκτὸς παραπλησίαν ἔχει τὴν τῶν ὀστῶν δύναμιν, καὶ ἰσχυράν. πολὺ γὰρ μείζω πάντα τὰ τοιαῦτα τῶν μὴ ζῳοτόκων, ὡς κατὰ λόγον εἰπεῖν τῶν σωμάτων. ἐνιαχοῦ γὰρ πολλὰ γίνεται μεγάλα τῶν ζῳοτόκων, οἷον ἐν Λιβύῃ, καὶ τοῖς τόποις τοῖς ξηροῖς καὶ θερμοῖς. τοῖς δὲ μεγάλοις ἰσχυροτέρων δεῖ τῶν ὑποστημάτων, καὶ μειζόνων, καὶ σκληροτέρων, καὶ τούτων αὐτῶν τοῖς βιαστικωτέροις. διὸ τὰ τῶν ἀρρένων σκληρότερα ἢ τὰ τῶν θηλειῶν, καὶ τὰ τῶν σαρκοφάγων. ἡ τροφὴ γὰρ διὰ μάχης τούτοις, ὥσπερ τὰ τοῦ λέοντος. οὕτω γὰρ ἔχει ταῦτα σκληρὰν τὴν φύσιν, ὥστ' ἐξάπτεσθαι τυπτομένων, ὥσπερ ἐκ λίθων, πῦρ. ἔχει δὲ καὶ ὁ δελφὶς οὐκ ἀκάνθας, ἀλλ' ὀστᾶ. ζῳοτόκος γάρ ἐστι. τοῖς δ' ἐναίμοις μὲν, μὴ ζῳοτόκοις δὲ, παραλλάττει κατὰ μικρὸν ἡ φύσις· οἷον τοῖς ὄρνισιν ὀστᾶ μὲν, ἀσθενέστερα δέ. τῶν δ' ἰχθύων τοῖς μὲν ᾠοτόκοις ἄκανθα, καὶ τοῖς ὄφεσιν ἀκανθώδης ἐστὶν ἡ τούτων φύσις, πλὴν τοῖς λίαν μεγάλοις. τούτοις δὲ, δι' ἅπερ καὶ τοῖς ζῳοτόκοις, πρὸς τὴν ἰσχὺν ἰσχυροτέρων δεῖ τῶν στερεωμάτων. τὰ δὲ καλούμενα σελάχη χονδράκανθα τὴν φύσιν ἐστίν. ὑγροτέραν τε γὰρ αὐτῶν ἀναγκαῖον εἶναι τὴν κίνησιν· ὥστε δεῖ καὶ τὴν τῶν ἐρεισμάτων μὴ κραυρὰν εἶναι, ἀλλὰ μαλακωτέραν. καὶ τὸ γεῶδες εἰς τὸ δέρμα πᾶν ἀνήλωκεν ἡ φύσις. ἅμα δὲ καὶ τὴν αὐτὴν ὑπεροχὴν εἰς πολλοὺς τόπους ἀδυνατεῖ διανέμειν ἡ φύσις. ἔνεστι δὲ καὶ ἐν τοῖς ζῳοτόκοις πολλὰ τῶν ὀστῶν χονδρώδη, ἐν ὅσοις διαφέρει μαλακὸν εἶναι καὶ μυξῶδες τὸ στερεὸν, διὰ τὴν σάρκα τὴν περικειμένην, οἷον συμβέβηκε περί τε τὰ ὦτα καὶ τοὺς μυκτῆρας· θραύεται γὰρ τὰ κραῦρα ταχέως ἐν τοῖς * ἀπέχουσι. ἡ δὲ φύσις ἡ αὐτὴ χόνδρου καὶ ὀστοῦ· διαφέρει δὲ τῷ μᾶλλον καὶ ἧττον. διὸ καὶ οὐδέτερον αὐξάνεται ἀποκοπέν. οἱ μὲν οὖν ἐν τοῖς πεζοῖς ἀμύελοι χόνδροι κεχωρισμένῳ μυελῷ. τὸ γὰρ χωριζόμενον εἰς ἅπαν μεμιγμένον, μαλακὴν ποιεῖ καὶ * μυξώδη τοῦ χόνδρου τὴν σύστασιν. ἐν δὲ τοῖς σελάχεσιν, ἡ μὲν ῥάχις χονδρώδης ἐστίν, ἔχει δὲ μυελόν. ἀντ' ὀστοῦ γὰρ αὐτοῖς ὑπάρχει τοῦτο τὸ μόριον,

* Gaza aliter legiſſe hanc periodum videtur: è qua voces illæ τὴν θατέρου abeſſe poſſunt.

* Fort. [illegible] vel [illegible].

* Vulgò [illegible] inepte.

σύνεγγυς δὲ κατὰ τὴν ἁφήν ἐστι τοῖς ὀστοῖς καὶ τὰ τοιάδε τῶν μορίων, οἷον ὄνυχές τε καὶ ὁπλαί, καὶ χηλαί, καὶ κέρατα, καὶ ῥύγχη τὰ τῶν ὀρνίθων. πάντα δὲ ταῦτα βοηθείας ἔχουσι χάριν τὰ ζῷα. τὰ γὰρ ἐξ αὐτῶν συνεστηκότα, ὅλα καὶ συνώνυμα τοῖς μορίοις, οἷον ὁπλή τε ὅλη, καὶ κέρας ὅλον μεμηχάνηται πρὸς τὴν σωτηρίαν ἑκάστοις. ἐν τούτῳ δὲ τῷ γένει, καὶ ἡ τῶν ὀδόντων ἐστὶ φύσις, τοῖς μὲν ὑπάρχουσα πρὸς ἓν ἔργον τὴν τῆς τροφῆς ἐργασίαν· τοῖς δὲ πρός τε τοῦτο, καὶ πρὸς ἀλκήν, οἷον τοῖς καρχαρόδουσι καὶ χαυλιόδουσιν. ἐξ ἀνάγκης δὲ πάντα ταῦτα γεώδη τε καὶ στερεὰν ἔχει τὴν φύσιν. ὅπλου γὰρ αὕτη δύναμις. διὸ καὶ ταῦτα πάντα μᾶλλον ἐν τοῖς τετράποσιν ὑπάρχει ζῴοις τῶν ζῳοτόκων, διὰ τὸ γεωδεστέραν ἔχειν πάντα τὴν σύστασιν, ἢ τὸ τῶν ἀνθρώπων γένος. ἀλλὰ περὶ τούτων καὶ τῶν ἐχομένων, οἷον δέρματος καὶ κύστεως, καὶ ὑμένος καὶ τριχῶν, καὶ πτερῶν, καὶ τῶν ἀνάλογον τούτοις, κἂν εἴ τι τοιοῦτόν ἐστι μέρος, ὕστερον ἅμα τοῖς ἀνομοιομερέσι θεωρητέον τὴν αἰτίαν αὐτῶν, καὶ τίνος ἕνεκεν ὑπάρχει τοῖς ζῴοις ἕκαστον. ἐκ τῶν ἔργων γὰρ γνωρίζειν, ὥσπερ κἀκεῖνα, καὶ ταῦτα ἀναγκαῖον ἂν εἴη. ἀλλ' ἐπεὶ ὁμώνυμα τοῖς ὅλοις τὰ μέρη, τὴν τάξιν ἀπελάβομεν ἐν τοῖς ὁμοιομερέσι νῦν. εἰσὶ δὲ ἀρχαὶ πάντων, τό, τε ὀστοῦν καὶ ἡ σάρξ. ἔτι δὲ περὶ γονῆς καὶ γάλακτος ἀπελίπομεν ἐν τῇ περὶ τῶν ὑγρῶν καὶ ὁμοιομερῶν θεωρίᾳ. τοῖς γὰρ περὶ γενέσεως λόγοις ἁρμόττουσαν ἔχει τὴν σκέψιν. τὸ μὲν γὰρ αὐτῶν ἀρχή, τὸ δὲ τροφὴ τῶν γινομένων ἐστί.

ΚΕΦΑΛ. Ι.

Περὶ σώματος καὶ στόματος, καὶ περὶ τῆς τῶν αἰσθητικῶν δυνάμεως καὶ τόπου.

Νῦν δὲ λέγωμεν, οἷον ἀπ' ἀρχῆς πάλιν ἀρξάμενοι πρῶτον ἀπὸ τῶν πρώτων. πᾶσι γὰρ τοῖς ζῴοις καὶ τελείοις, δύο τὰ ἀναγκαιότατα μόριά ἐστιν, ᾗ τε δέχεται τὴν τροφήν, καὶ ᾗ τὸ περίττωμα ἀφίησιν. οὔτε γὰρ εἶναι, οὔτε αὐξάνεσθαι ἄνευ τροφῆς ἐνδέχεται. τὰ μὲν οὖν φυτά (καὶ γὰρ καὶ ταῦτα ζῆν φαμέν) τοῦ μὲν ἀχρήστου περιττώματος οὐκ ἔχει τόπον. ἐκ τῆς γῆς γὰρ λαμβάνει πεπεμμένην τὴν τροφήν. ἀντὶ δὲ τούτου* περιΐεται τὰ σπέρματα καὶ τοὺς καρπούς. τρίτον δὲ μέρος ἐστὶν ἐν πᾶσι τὸ τούτων μέσον, ἐν ᾧ ἡ ἀρχή ἐστιν ἡ τῆς ζωῆς. ἡ μὲν οὖν τῶν φυτῶν φύσις, οὖσα μόνιμος, οὐ πολυειδής ἐστι τῶν ἀνομοιομερῶν. πρὸς γὰρ ὀλίγας πράξεις, ὀλίγων ὀργάνων ἡ χρῆσις. διὸ θεωρητέον καθ' αὑτὰ περὶ τῆς ἰδέας αὐτῶν. τὰ δὲ πρὸς τῷ ζῆν αἴσθησιν ἔχοντα, πολυμορφοτέραν ἔχει τὴν ἰδέαν· καὶ τούτων ἕτερα πρὸ ἑτέρων μᾶλλον, καὶ πολυχουστέραν, ὅσων μὴ μόνον τοῦ ζῆν, ἀλλὰ καὶ τοῦ εὖ ζῆν ἡ φύσις μετείληφε. τοιοῦτον δ' ἐστὶ τὸ τῶν ἀνθρώπων γένος. ἢ γὰρ μόνον μετέχει τοῦ θείου τῶν ἡμῖν γνωρίμων ζῴων, ἢ μάλιστα πάντων. ὥστε διά τε τοῦτο, καὶ διὰ τὸ γνώριμον εἶναι μάλιστα αὐτοῦ τὴν τῶν ἔξωθεν μορίων, μορφήν, περὶ τούτου ἂν εἴη λεκτέον πρῶτον.

* γ. προΐεται

A Proximas oſſibus eſſe partes oſtendit tactus etiam illas, vngues, vngulas tum ſolidas, tum biſulcas, cornua, roſtra auium, quæ omnia præſidij gratia adiuncta ſunt animalibus. Quæ enim tota ex iis conſtant, nominis conſortium tantummodo habent cum ſuis partibus. Verbi gratia, vngula tota, & cornu totum, ad ſalutem animalis excogitatum eſt. Dentes etiam in hoc eodem genere collocandi ſunt, qui aliis rem vnã tantùm expediunt, id eſt, cibi confectionem: alijs non ſolùm ad hoc vſui ſunt, ſed etiam ad pugnandum, vt iis omnibus, quibus aut ſerrati aut exerti ſunt dentes. Terrenam & validam eſſe naturam eorum quæ modò enumeraui, neceſſe eſt: vis enim armorum ea eſt. B Quam ob rem omnia eiuſmodi adminicula quadrupedibus viuiparis potiùs adiuncta ſunt, quòd terratiora, quàm genus humanum, ea omnia conſtant. Sed de iis, atque ſimilibus, cutem dico, veſicam, membranam, pilos, pennas, & quæ iis proportionentur, & ſi qua huiuſcemodi alia ſunt, poſtea vnà cum diſſimilaribus partibus conſiderandum eſt, ſcilicet quænam eorum cauſa ſit, & cuius gratia data ſint animalibus. Ex officiis enim ea quoque pariter atque illa dignoſci neceſſe eſt. Sed quòd partes eorum idem cum totis nomen ſortiuntur, propterea inter ſimilares in hoc loco enumerata ſunt. Principium autem, & origo eorum omnium, os eſt & caro. Rationem etiam C geniture, & lactis, prætermiſimus, cùm de humidis ac ſimilaribus ageremus, ſunt enim hæc loco de generatione coniunctiora, cùm alterum eorum initium ſit animalium generandorum: alterum alimentum vbi in lucem prodierint.

CAPVT X.

De duabus partibus in quibuſque animantibus neceſſariis, quæ viuunt, qua cibum capiant, & qua excrementa emittant: deque ſenſuum vi, & eorum loco in corpore.

D NVnc quaſi à primis iterum orſi diſſeramus. In omnibus vita præditis, & perfectis, partes maximè neceſſariæ duæ ſunt, altera, qua cibum capiant: altera, qua excrementum emittant. Non enim fieri poteſt vt ſine cibo vel ſeruentur, vel augeantur. Stirpium itaque genus (nam id quoque viuere fatemur) locum ſuperuacui excrementi nullum habet: cibum enim concoctum ex terra haurit, ſed vice excrementi ſemina, & fructus effundit. Tertia pars in omnibus eſt media inter eas, quas modò dixi, in qua vitæ principium continetur. Sed ſtirpium natura, quoniã ſtabilis eſt, non ex multis ac variis partibus diſſimilaribus conſtat: quippe cùm ad paucas actiones paucorum inſtrumentorum vſus requiratur. Quã ob E rem de ſtirpium ſiue plantarum forma ſeorſum agendum eſt. Quæ autem vnà cũ vita ſenſu etiam prædita ſunt, hæc ſpeciem multiformiorem, numeroſioremque varietatem recipiunt: atque inter ea aliis alia magis, & eo amplius, quòd non ſolùm viuendi ſed etiam bene viuendi rationem natura eorum obtinuit: quale hominum genus eſt, quippe quod aut vnum ex omnibus animalibus nobis cognitis diuinitatis particeps ſit, aut omnium maximè. Itaque tum ob eã rem tum etiam quòd exteriorum partium eius forma notiſſima eſt, primùm de homine diſſerendum cẽſemus.

Iam enim partes etiam naturales hominis vnius ſecundùm naturam diſpoſitæ ſunt: quãdoquidem partem ſuperiorem ad vniuerſi ſupremũ erectam obtinet: ſolus enim animalium homo erectus incedit. Caput hominis macilentum, carneque prope omni exutum eſſe, neceſſariũ ex iis quæ de cerebro diximus, euenit. Nec audiendi ſunt, qui, ſi carnoſum eſſet, viuacius hominũ genus futurum cenſeant: ſed vt meliùs ſentiret, carnem ademptam exiſtiment. Vim enim ſentiendi ſitam in cerebro: ſenſum autem per partes nimiùm carnoſas nequaquam admitti poſſe arbitrantur: neutra enim eorum ratio vera eſt. Sed ſi cerebrum à carnis copia circundaretur, contrà efficeret, quàm inſtitutum exigeret, cuius gratia adiunctum eſt animalibus: non enim refrigerare poſſet, cùm valde ipſum teperet. Nec ſenſus vllius cauſam cerebrum obtinet, quod quidem expers omnino ſenſus non aliter quam quoduis excrementum eſt. Verùm cùm intelligere cauſam, quam ob rẽ ſenſus nonnulli in capite habentur, nequeant, quòd eam partem cæteris eſſe peculiatiorẽ animaduerterint, ideo ſenſum cum cerebro coniungendum ratiocinantur. Sed enim principium ſenſuum eſſe cordis locum, definitum iam eſt, cùm de ſenſu ageremus, & quam ob cauſam duo, id eſt, tangendi & guſtandi ſenſus, ex corde apertè dependent: vnus ex reliquis tribus, id eſt, olfaciendi, medium tenet: duo, id eſt, audiendi, & videndi, maximè in capite poſiti ſunt, propter ſenſoriorum naturam, viſúſque omnibus in capite eſt. Nam auditus, olfactúſque piſcium & reliquorũ generis eiuſdem, declarant quod dicimus. Audiunt enim atque olfaciunt, cùm nullum ſenſorium eorum ſenſuum in capite habeant manifeſtum. Viſum autem omnibus, quibus eſt datus, apud cerebrũ eſſe, optima ratio eſt: cerebrum enim humidũ ac frigidum eſt. Viſus aquæ naturam obtinet: hæc enim omniũ perlucidorum facillimè conſeruari poteſt. Senſus etiam exquiſitiores per partes, quæ ſanguinem habeant ſynceriorem, abſolui neceſſe eſt. Sanguinis enim calidioris agitatio officium ſentiendi intercipit, atque reſtringit. His de cauſis ſedes eorum ſenſuum mandatæ ſunt capiti. Nec verò pars prior tantùm capitis carne vacat, ſed etiam poſterior, quod omnib. capite præditis partem hanc erectam maximè conſtare oportet: nihil enim erigi poteſt preſſum onere. Id autem accideret animali, ſi caput carne obtectum haberet. Quo etiam patet, non ideo carnem deeſſe capiti, vt cerebrum ſentiat: pars enim poſterior capitis cerebro caret, & tamen carnis expers nihilo minùs eſt. Auditum etiam nonnulla animalia ſitum in capite habent debita ratione. Quod enim inane vocatur, plenum aëris eſt. Senſorium autem audiendi aëris eſſe fatemur. Vt igitur ab oculis meatus ad venas circa cerebrum ſparſas tendunt, ſic ab auribus meatus in occiput penetrat. Vis autem ſentiendi nec vlli exangui data eſt parti, neque ſanguinis propria eſt, ſed cuidam ex his quæ ſanguine proueniunt, delegata eſt. Quocirca pars nulla exanguis eorum quæ ſanguinem habent, ſentire poteſt, nec ipſe ſanguis ſenſu præditus eſt: quippe qui nulla pars ſit animalium. Cerebrum verò parte priori capitis continent omnia quibus hoc datum eſt: quoniam id quo ſentiunt, in parte priori corporis ſitum eſt: ſenſus enim prouenit à corde, quod parti priori commiſſum eſt.

A εὐθὺς γὰρ καὶ τὰ φύσει μόρια κατὰ φύσιν ἔχει τούτῳ μόνῳ, καὶ τὸ τούτου ἄνω, πρὸς τὸ τοῦ ὅλου ἔχει ἄνω. μόνον γὰρ ὀρθόν ἐστι τῶν ζῴων ὁ ἄνθρωπος. τὸ μὲν οὖν ἔχειν τὴν κεφαλὴν ἄσαρκον, ἐκ τῶν περὶ τὸν ἐγκέφαλον εἰρημένων, ἀναγκαῖον συμβέβηκεν· οὐ γὰρ, ὥσπερ τινὲς λέγουσιν, ὅτι εἰ σαρκώδης ἦν, μακροβιώτεροι ἂν ἦν τὸ γένος· ἀλλ' εὐαισθησίας ἕνεκα ἄσαρκον εἶναί φασιν. αἰσθάνεσθαι μὲν γὰρ τῷ ἐγκεφάλῳ. τὴν δ' αἴσθησιν οὐ προσίεσθαι τὰ μόρια τὰ σαρκώδη λίαν. τούτων δ' οὐδέτερον ἐστιν ἀληθές· ἀλλὰ πολύσαρκος μὲν ὁ τόπος ὢν ὁ περὶ B τὸν ἐγκέφαλον, τοὐναντίον ἂν ἀπειργάζετο, οὗ ἕνεκα ὑπάρχει τοῖς ζῴοις ὁ ἐγκέφαλος. οὐ γὰρ ἂν ἠδύνατο καταψύχειν, ἀλεαίνων αὐτὸς λίαν· τῶν τ' αἰσθήσεων οὐκ αἴτιος οὐδεμιᾶς, ὅς γε ἀναίσθητος καὶ αὐτός ἐστιν, ὥσπερ ὁποιονοῦν τῶν περιττωμάτων. ἀλλ' οὐχ εὑρίσκοντες διὰ τίνα αἰτίαν ἔνιαι τῶν αἰσθήσεων ἐν τῇ κεφαλῇ τοῖς ζῴοις εἰσί, τοῦτο δ' ὁρῶντες* ἰδιώτερον ὂν τῶν ἄλλων μορίων, ἐκ συλλογισμοῦ πρὸς ἄλληλα συνδυάζουσιν. ὅτι μὲν οὖν ἀρχὴ τῶν αἰσθήσεών ἐστιν ὁ περὶ τὴν καρδίαν τόπος, διώρισται πρότερον ἐν τοῖς περὶ αἰσθήσεως· καὶ διότι αἱ μὲν δύο φανερῶς ἠρτημέναι πρὸς τὴν καρδίαν εἰ- C σιν, ἥ τε τῶν ἁπτῶν, καὶ ἡ τῶν χυμῶν. τῶν δὲ τριῶν, ἡ μὲν τῆς ὀσφρήσεως μέση. ἀκοὴ δὲ, καὶ ὄψις, μάλιστ' ἐν τῇ κεφαλῇ, διὰ τὴν τῶν αἰσθητηρίων φύσιν εἰσὶ, καὶ τούτων ἡ ὄψις πᾶσιν. ἐπεὶ ἥ τ' ἀκοὴ καὶ ἡ ὄσφρησις ἐπὶ τῶν ἰχθύων καὶ τῶν τοιούτων ποιεῖ τὸ λεγόμενον φανερόν. ἀκούουσι μὲν γὰρ καὶ ὀσφραίνονται, αἰσθητήριον δ' οὐδὲν ἔχουσιν ἐν τῇ κεφαλῇ φανερὸν τούτων τῶν αἰσθητῶν. ἡ δ' ὄψις πᾶσι τοῖς ἔχουσιν, εὐλόγως ἐστὶ περὶ τὸν ἐγκέφαλον. ὁ μὲν γὰρ, ὑγρὸς καὶ ψυχρός· ἡ δ', ὕδωρ τὴν φύσιν ἐστί. τοῦτο γὰρ τῶν διαφανῶν εὐφυλακτότατόν ἐστιν. ἔτι δὲ τὰς ἀκριβεστέρας τῶν αἰσθήσεων, διὰ τῶν κα- D θαρώτερον ἐχόντων τὸ αἷμα μορίων ἀναγκαῖον ἀκριβεστέρας γίνεσθαι. ἐκκρούει γὰρ ἡ τῆς ἐν τῷ αἵματι θερμότητος κίνησις τὴν αἰσθητικὴν ἐνέργειαν. διὰ ταύτας τὰς αἰτίας ἐν τῇ κεφαλῇ τούτων τὰ αἰσθητήριά ἐστιν. οὐ μόνον δ' ἐστὶ τὸ ἔμπροσθεν ἄσαρκον, ἀλλὰ καὶ τὸ ὄπισθεν τῆς κεφαλῆς, διὰ τὸ πᾶσι τοῖς ἔχουσιν αὐτὴν, ὀρθότατον δεῖν εἶναι τοῦτο τὸ μόριον. οὐθὲν γὰρ ὀρθοῦσθαι δύναται φορτίον ἔχον. ἦν δ' ἂν τοιοῦτον, εἰ σαρκώδη εἶχε τὴν κεφαλήν. ᾗ καὶ δῆλον ὅτι οὐ τῆς τοῦ ἐγκεφάλου αἰσθήσεως χάριν ἄσαρκος ἡ κεφαλή ἐστι. τὸ γὰρ ὄπισθεν οὐκ ἔχει ἐγκέφαλον, ἄσαρκον δ' ὁμοίως. ἔχει δὲ E καὶ τὴν ἀκοὴν εὐλόγως ἔνια τῶν ζῴων ἐν τῷ τόπῳ τῷ περὶ τὴν κεφαλήν. τὸ γὰρ κενὸν καλούμενον, ἀέρος πλῆρές ἐστι· τὸ δὲ τῆς ἀκοῆς αἰσθητήριον ἀέρος εἶναι φαμέν. ἐκ μὲν οὖν τῶν ὀφθαλμῶν οἱ πόροι φέρουσιν εἰς τὰς περὶ τὸν ἐγκέφαλον φλέβας. πάλιν δ' ἐκ τῶν ὤτων, ὡσαύτως πόρος εἰς τοὔπισθεν συνάπτει. ἔστι δ' οὔτ' ἄναιμον οὐδὲν αἰσθητικὸν, οὔτε τὸ αἷμα, ἀλλὰ τῶν ἐκ τούτου τι. διόπερ οὐδὲν ἐν τοῖς ἐναίμοις ἄναιμον αἰσθητικὸν, οὐδ' αὐτὸ τὸ αἷμα. οὐθὲν γὰρ τῶν ζῴων μόριον. ἔχει δ' ἐν τῷ ἔμπροσθεν τὸν ἐγκέφαλον πάντα τὰ ἔχοντα τοῦτο τὸ μόριον, διὰ τὸ ἔμπροσθεν εἶναι ἐφ' ὃ αἰσθάνεται, τὴν δ' αἴσθησιν ἀπὸ τῆς καρδίας, ταύτην δ' εἶναι ἐν τοῖς ἔμπροσθεν.

* ἢ ἰδιαίτερον

καὶ τὸ αἰσθάνεσθαι, διὰ τῶν ἐναίμων γίνεσθαι χώραν, A φλεβῶν δ' εἶναι κενὸν τὸ ὄπισθεν κύτος. τέτακται δὲ τὸν τρόπον τοῦτον τὰ αἰσθητήρια τῇ φύσει καλῶς, τὰ μὲν τῆς ἀκοῆς ἐπὶ μέσον τῆς περιφερείας. ἀκούει γὰρ οὐ μόνον κατ' εὐθυωρίαν, ἀλλὰ πάντοθεν. ἡ δ' ὄψις εἰς τὸ ἔμπροσθεν. ὁρᾷ γὰρ κατ' εὐθυωρίαν. ἡ δὲ κίνησις εἰς τὸ ἔμπροσθεν. προορᾶν δὲ δεῖ ἐφ' ὃ ἡ κίνησις. ἡ δὲ τῆς ὀσφρήσεως μεταξὺ τῶν ὀμμάτων εὐλόγως. διπλοῦν μὲν γάρ ἐστιν ἕκαστον τῶν αἰσθητηρίων, διὰ τὸ διπλοῦν εἶναι τὸ σῶμα, τὸ μὲν δεξιόν, τὸ δ' ἀριστερόν. ἐπὶ μὲν οὖν τῆς ἁφῆς τοῦτ' ἄδηλον. τούτου δ' αἴτιον, ὅτι οὐκ ἔστι τὸ πρῶτον αἰσθητήριον ἡ σὰρξ, καὶ τὸ τοιοῦτον μόριον, ἀλλ' ἐντός. ἐπὶ δὲ τῆς γλώττης B ἧττον μέν, μᾶλλον δὲ ἢ ἐπὶ τῆς ἁφῆς. ἔστι γὰρ οἷον ἁφή τις καὶ αὕτη ἡ αἴσθησις. ὅμως δὲ δῆλον καὶ ἐπὶ ταύτης. φαίνεται γὰρ ἐσχισμένη. ἐπὶ δὲ τῶν ἄλλων αἰσθητηρίων, φανερώτερόν ἐστιν ἡ αἴσθησις διμερής. ὦτά τε γὰρ δύο, καὶ ὄμματα, καὶ ἡ τῶν μυκτήρων δύναμις διφυής ἐστιν. ἄλλον οὖν τρόπον κειμένη, καὶ διεσπασμένη, καθάπερ ἡ ἀκοή, οὐκ ἂν ἐποίει τὸ αὐτῆς ἔργον, οὐδὲ τὸ μόριον ἐν ᾧ ἐστι. διὰ γὰρ τῆς ἀναπνοῆς ἡ ὄσφρησις τοῖς ἔχουσι μυκτῆρας. τοῦτο δὲ τὸ μόριον κατὰ μέσον, καὶ ἐν τοῖς ἔμπροσθέν ἐστι. διόπερ ἐπὶ μέσον τῶν τριῶν αἰσθητηρίων συνήγαγεν ἡ φύσις τοὺς μυκτῆρας, οἷον ἐπὶ στάθμην θεῖσα μίαν, ἐπὶ τὴν τῆς ἀναπνοῆς C κίνησιν. καλῶς δὲ καὶ τοῖς ἄλλοις ἔχει ταῦτα τὰ αἰσθητήρια ζῴοις πρὸς τὴν ἰδίαν φύσιν ἑκάστῳ.

A Sentire etiam partes tantummodo poſſunt, quæ ſanguinem obtinent. Occiput autem venis vacuum eſt. Sedes autem ſenſoriæ probè ad hunc modum à natura diſpoſitæ ſunt. Aures orbem capitis æquis portionibus ſecant, tenéntque medium. Auditur enim non modò per directum, verùmetiam vndique. Viſus parti priori mandatus eſt: cernitur enim per directum. Motus etiam antè fit. Proſpiciendum autem eſt eòdem, quò motus agitur. Nares inter oculos ratione optima collocatæ ſunt. Gemina enim ſedes quæque ſenſoria eſt, propter duplicē corporis partem, ſcilicet dextram & ſiniſtram: ſed hoc in tactu incertũ eſt, propterea quòd primum ſenſorium non caro, non B pars eiuſmodi aliqua eſt, ſed aliquid intimũ. Lingua etſi obſcuriùs, quàm oculi, tamen certiùs, quã tactus, geminum guſtandi veſtigium oſtendit. Eſt enim hic etiam ſenſus quaſi tactus quidam: attamen res vel in eo ſatis conſtat. fiſſura enim linguam diſtingui, perſpicuum eſt. At verò in cæteris ſentiendi partibus ſenſum bipartitum eſſe latiùs patet. Aures enim geminæ, & oculi gemini ſunt. Vis etiam narium bipartita eſt, quæ ſi aliter ſita diſtractáque eſſet, vt aures, ſuo fungi officio non poſſet, nec pars, in qua poſita eſt, ex inſtituto adminiſtraret. Efficitur enim ſenſus olfaciendi per ſpirationem, in iis quæ obtinent nares: pars autem ſpirandi medium tenet, & antè poſita eſt. C Quapropter nares in medio trium ſenſuum natura conſtituit, quaſi per lineam fabrilem directas, ad reſpirationis agitationem.

ΚΕΦΑΛ. ια'.

Περὶ τῶν ὤτων ἐν τοῖς τετράποσι.

Hiſtor. lib. 1. c. 11.

Τὰ μὲν γὰρ τετράποδα ἀπηρτημένα ἔχει τὰ ὦτα, καὶ ἄνωθεν τῶν ὀμμάτων, ὡς δόξειεν ἄν. οὐκ ἔχει δέ, ἀλλὰ φαίνεται, διὰ τὸ μὴ ὀρθὰ εἶναι τὰ ζῷα, ἀλλὰ κύπτειν. οὕτω δὲ τὸ πλεῖστον κινουμένων, χρήσιμα, μετεωρότερά τε ὄντα καὶ κινούμενα. δέχεται γὰρ στρεφόμενα D πάντοθεν τοὺς ψόφους μᾶλλον.

CAPVT XI.

De ſitu auricularum in quadrupedibus.

CÆteris etiam animalibus hæc eadem ſenſuum domicilia bene pro ſua cuiuſque natura condita habentur. Quadrupedes enim auriculas habent ſuſpenſas, & ſupra oculos ſitas habere videntur: veruntamen non ita eſt, ſed conſpectum ementiuntur: quoniam beſtiæ non erecto ſed prono ſunt corpore. Cùm igitur plurimæ ita incedant, iuuat vt & ſuſpenſiores ſint auriculę, & crebrò moueantur. Sic enim meliùs vndique ſtrepitus circumactæ excipient.

ΚΕΦΑΛ. ιβ'.

Περὶ τῆς τῶν ὀρνίθων ἀκοῆς.

Οἱ δ' ὄρνιθες τοὺς πόρους μόνον ἔχουσι, διὰ τὴν τοῦ δέρματος σκληρότητα, καὶ τὸ ἔχειν μὴ τρίχας, ἀλλὰ πτερωτὰ εἶναι. οὐκ οὖν ἔχει τὴν τοιαύτην ὕλην, ἐξ ἧς ἂν ἔπλασε τὰ ὦτα. ὁμοίως δὲ καὶ τῶν τετραπόδων τὰ ᾠοτόκα καὶ φολιδωτά. ὁ γὰρ αὐτὸς ἁρμόσει καὶ ἐπ' ἐκείνων λόγος. ἔχει δὲ καὶ ἡ φώκη τῶν ζῳοτόκων οὐκ ὦτα, ἀλλὰ πόρους ἀκοῆς, διὰ τὸ πεπηρωμένον εἶ- E ναι τετράπουν.

CAPVT XII.

De meatibus auditoriis auium.

AVes meatus tantùm auditorios habẽt. Quòd enim cutis earum durior ſit, nec pilis ſed pēnis integantur, ideo materia carent ex qua auriculæ creentur. Quadrupedes etiam ouiparæ & corticatæ eodem modo ſe habent: eadem enim ratio vel illis conueniet. Quinetiam vitulus marinus inter ea quæ animal pariunt, non auriculas, ſed cauernas tantùm habet ad audiendum, vtpote qui manca & læſa ſit quadrupes.

ΚΕΦΑΛ. ιγ'.

Περὶ βλεφάρων καὶ σκαρδαμύξεως.

Hiſtor. lib. 1. c. 9. & 10.

Καὶ οἱ μὲν ἄνθρωποι καὶ οἱ ὄρνιθες, καὶ τὰ ζῳοτόκα τῶν τετραπόδων, φυλακὰς ἔχουσι τῆς ὄψεως· τὰ δὲ ζῳοτόκα, βλέφαρα δύο, οἷς καὶ σκαρδαμύττουσι. τῶν δ' ὀρνίθων ἄλλοι τε καὶ οἱ βαρεῖς,

CAPVT XIII.

Genus hominum, auium, & quadrupedum, contectos palpebra oculos habere, quóve modo ipſorum quodque conniueat.

GEnus hominum, auium, quadrupedum, tam viuiparum quàm ouiparum, oculos viſus cuſtodiendi gratia integunt, ſed variè. Quæ enim animal pariũt, geminã habent palpebrã, & cōniuere vtraq; ſolent: aues tam leuiores quã grauiores,

& quadrupedes ouiparæ palpebra inferiori conniuent. Nictantur aues ab angulis membrana obeunte. Cuius rei cauſa eſt, vt operimentum præſidio ſit oculis eorū humidis, qui ideo humidi ſunt, vt cernere acutiùs poſſint: nam ſi duri eſſent, tutiùs quidem conſtarent contra ea quæ extrinſecus occurſarent, atque inciderent, ſed cernere acutè non poſſent. Itaque eius rei cauſa, cutis prætenuis pupillæ obtenditur. At verò ſalutis gratia palpebræ operiunt, ideóque omnia conniuent, & omnium maximè homo. omnia, inquam, vt quæ incidant, prohibere palpebris poſſint, idque non conſultò, ſed naturæ inſtinctu agitur: homo verò frequentiùs, quoniam cutem tenuiſſimam habet. Palpebra autem cute conſtat, vnde fit, ne aut palpebra, aut præputium vulnere diductum coaleſcere poſſit: ſunt enim cutes ſine carne. Quæ autem inter aues palpebra inferiori conniuent, & quadrupedes ouiparæ: præ duritia cutis caput ambientis, ita conniuent. Volucribus enim grauioribus, quòd nequeant volitare, incrementum* pennarum ad cutis craſſamentum conuertitur: eadémque palpebra inferiori conniuent: columbæ autem, & ſimilia, vtrâque. Quadrupedes ouiparæ cortice integuntur, qui pilo durior eſt: itaque cutis quoque eorum cæteris cutibus durior eſt. Cutis igitur capitis eorum prædura eſt, ideóque palpebram inde habere nequeunt: inferior carnoſa eſt, vt ſatis tenuitatis tenſioniſque habeat. Nictantur volucres grauiores non palpebra, ſed membrana, quòd palpebræ motus lentior eſt, cùm celeritate ſit opus, quam membrana præſtare poteſt: nec niſi ab angulo naribus proximo nictantur, quòd eorum naturam ex vno principio prouenire melius ſit. Principium autem in iis eſt pars naribus adhærens: pars etiam prior principium potiùs quàm latus eſt. At verò quadrupedes, quæ oua pariunt, non eodem nictantur modo, quoniam non lubricum exquiſitúmque viſum eas habere neceſſe eſt, cùm terreſtres ſint. Volucribus certè neceſſarium eſt: iis enim vſus cernendi ex longinquo eſt. Vnde fit vt quæ vnguibus ſunt aduncis, clariſſimè cernant. Cibus enim de ſublimi conſpiciendus iis eſt. Et quidem volare in excelſum omnium maximè auium, genus id ob eam rem aſſolet. Terreſtres autem, parúmque volatiles aues, vt gallinacei, & ſimiles, non acie oculorum valent: nulla enim victus neceſſitate coguntur. Piſces, inſecta, & cruſtata, quanuis diuerſos habeant oculos, tamen nullum ex iis palpebram habet. Quæ enim cruſta integuntur, vſu careant palpebræ, neceſſe eſt, cùm niſi celeri cutis officio præſtari non poſſit. Sed tamen vice eius tutelæ, duritie oculorum hæc omnia muniuntur, quaſi per palpebram obductam quandam trāslucidam cernant. Sed cùm ob eam duritiam hebetiùs contueri neceſſe ſit, moueri oculos inſectorum Natura voluit, atque etiam magis cruſtatorum, vt nonnullorum quadrupedū auriculas, ſcilicet ea cauſa, vt clariùs cernerent, cū ſe ad lucem conuerterēt, atque exciperent ſplendorem. Piſcium oculi lubrici ſunt. Vſus enim cernendi ex longinquo neceſſarius iis eſt quæ longiùs moueantur. Terreſtribus itaque aër tranſpici facilè poteſt: at piſcibus, quoniam aqua vt ad cernendum acutiùs aduerſatur, ſic ad interpellandum viſum non multa offenſacula affert, modo aëris.

A καὶ τὰ ᾠοτόκα τῶν τετραπόδων, τῷ κάτω βλεφάρῳ μύουσι. σκαρδαμύττουσι δὲ οἱ ὄρνιθες ἐκ τῶν κανθῶν ὑμένι. τοῦ μὲν οὖν φυλακὴν ἔχειν αἴτιον, τὸ ὑγρὰ τὰ ὄμματα εἶναι, ἵνα ὀξὺ βλέπωσι τοῦτον τὸν τρόπον ὑπὸ τῆς φύσεως. σκληρόδερμα γὰρ ὄντα, ἀβλαβέστερα μὲν ἂν ἦν ὑπὸ τῶν ἔξωθεν προσπιπτόντων, οὐκ ὀξυωπὰ δέ. τούτου μὲν οὖν ἕνεκα λεπτὸν δέρμα τὸ περὶ τὴν κόρην ἐστί. τῆς δὲ σωτηρίας χάριν τὰ βλέφαρα· καὶ διὰ τοῦτο σκαρδαμύττει τε πάντα, καὶ μάλιστ' ἄνθρωπος. πάντα μὲν, ὅπως τὰ προσπίπτοντα τοῖς βλεφάροις κωλύωσι. καὶ τοῦτο οὐκ ἐκ προαιρέσεως, ἀλλ' ἡ φύσις ἐποίησε· πολλάκις δ' ὁ ἄνθρωπος, διὰ τὸ λεπτοδερμότατον εἶναι. ἡ δὲ βλεφαρὶς ἐστὶ δέρματι περιειλημμένη· διὸ καὶ συμφύεται οὔτε βλεφαρὶς, οὔτε ἀκροποσθία, ὅτι ἄνευ σαρκὸς δέρματά ἐστι. τῶν δ' ὀρνίθων ὅσοι τῷ κάτω βλεφάρῳ μύουσι, καὶ τὰ ᾠοτόκα τῶν τετραπόδων, διὰ τὴν σκληρότητα τοῦ δέρματος τοῦ περὶ τὴν κεφαλὴν, οὕτω μύουσιν. οἱ μὲν γὰρ βαρεῖς τῶν πτερωτῶν, διὰ τὸ μὴ πτητικοὶ εἶναι, τὴν τῶν πτερῶν αὔξησιν εἰς τὴν τοῦ δέρματος παχύτητα τετραμμένην ἔχουσι· διὸ καὶ οὗτοι μὲν τῷ κάτω βλεφάρῳ μύουσι· περιστεραὶ δὲ καὶ τὰ τοιαῦτα ἀμφοῖν. τὰ δὲ τετράποδα τῶν ᾠοτόκων, φολιδωτά ἐστι· ταῦτα δὲ σκληρότερα πάντα τριχός· ὥστε καὶ τὰ δέρματα, τοῦ δέρματος. τὸ μὲν οὖν περὶ τὴν κεφαλὴν σκληρόν ἐστιν αὐτοῖς· διόπερ οὐκ ἔχει βλέφαρον ἐκεῖθεν. τὸ δὲ κάτωθεν, σαρκῶδες ὥστ' ἔχειν τὸ βλέφαρον λεπτότητα καὶ τάσιν. σκαρδαμύττουσι δ' οἱ βαρεῖς ὄρνιθες, τούτῳ μὲν οὔ, τῷ δ' ὑμένι, διὰ τὸ βραδεῖαν μὲν εἶναι τὴν τούτου κίνησιν, δεῖν δὲ ταχεῖαν γίνεσθαι. ὁ δ' ὑμὴν τοιοῦτον. ἐκ δὲ τοῦ κανθοῦ τοῦ περὶ τοὺς μυκτῆρας, σκαρδαμύττουσιν, ὅτι βέλτιον ἀπ' ἀρχῆς μιᾶς τὴν φύσιν εἶναι αὐτῶν. οὗτοι δ' ἔχουσιν ἀρχὴν τὴν πρὸς τοῖς μυκτῆρα πρόσφυσιν· τὸ δὲ πρόσθιον ἀρχὴ τοῦ πλαγίου μᾶλλον. τὰ δὲ τετράποδα καὶ ᾠοτόκα, οὐ σκαρδαμύττουσιν ὁμοίως· ὅτι οὐδ' ὑγρὰν αὐτοῖς ἀναγκαῖον καὶ ἀκριβῆ τὴν ὄψιν, ἐπιγείοις οὖσι· τοῖς δ' ὄρνισιν ἀναγκαῖον· πόρρωθεν γὰρ ἡ χρῆσις τῆς ὄψεως· διὸ καὶ τὰ γαμψώνυχα μὲν ὀξυωπά. ἄνωθεν γὰρ αὐτοῖς ἡ θεωρία τῆς τροφῆς· διὸ καὶ ἄνω πέτονται μάλιστα τῶν ὀρνέων εἰς ὕψος. τὰ δὲ ἐπίγεια καὶ μὴ πτητικὰ, οἷον ἀλεκτρυόνες καὶ τὰ τοιαῦτα, οὐκ ὀξυωπά. οὐδὲν γὰρ αὐτὰ κατεπείγει πρὸς τὸν βίον. οἱ δ' ἰχθύες καὶ τὰ ἔντομα, καὶ τὰ σκληρόδερμα, διαφέροντα μὲν ἔχουσι τὰ ὄμματα, βλέφαρον δ' οὐδὲν αὐτῶν ἔχει. τὰ μὲν γὰρ σκληρόδερμα ὅλως οὐκ ἔχει· ἡ δὲ τοῦ βλεφάρου χρῆσις ταχεῖαν καὶ δερματικὴν ἔχει τὴν ἐργασίαν· ἀλλ' ἀντὶ ταύτης τῆς φυλακῆς, E πάντα σκληρόφθαλμά ἐστιν, οἷον βλέποντα διὰ τοῦ βλεφάρου προσπεφυκότος. ἐπεὶ δ' ἀνάγκη διὰ τὴν σκληρότητα* ἀμβλύτερον βλέπειν, κινουμένους ἐποίησεν ἡ φύσις τοὺς ὀφθαλμοὺς τοῖς ἐντόμοις, καὶ μᾶλλον ἔτι τοῖς σκληροδέρμοις, ὥσπερ ἔνια τῶν τετραπόδων τὰ ὦτα, ὅπως ὀξύτερον βλέπῃ, στρέφοντα πρὸς τὸ φῶς, καὶ δεχόμενα τὴν αὐγήν. οἱ δ' ἰχθύες ὑγρόφθαλμοι μέν εἰσιν. ἀναγκαία γὰρ τοῖς πολλὴν ποιουμένοις κίνησιν, ἡ τῆς ὄψεως ἐκ πολλοῦ χρῆσις. τοῖς μὲν οὖν πεζοῖς ὁ ἀὴρ εὐδίοπτος· ἐκείνοις δ', ἐπεὶ τὸ ὕδωρ πρὸς μὲν τὸ ὀξὺ βλέπειν ἐναντίον, οὐκ ἔχει δὲ πολλὰ τὰ προσκρούματα πρὸς τὴν ὄψιν, ὥσπερ ὁ ἀήρ,

* καὶ ἀμβλυώτερον

* Melius ἔχουσι
* Gaza τὴν τοῦ ὑδ. παχύτητα, ὑγ. Sanè vox aliqua deſideratur.

διὰ μὲν τοῦτ' οὐκ * ἔχει βλέφαρον (οὐδὲν γὰρ ἡ φύσις ποιεῖ A
μάτην) πρὸς δὲ * τὴν τοῦ ὕδατος * ὑγρόφθαλμοί εἰσι.

ΚΕΦΑΛ. ιδʹ.

Περὶ βλεφαρίδων καὶ κέρκου καὶ τριχώματος.

Βλεφαρίδας δ' ἐπὶ τῶν βλεφάρων ἔχει, ὅσα τρίχας ἔχει· ὄρνιθες δὲ καὶ τῶν φολιδωτῶν οὐδέν. οὐ γὰρ ἔχει τρίχας. περὶ γὰρ τοῦ στρουθοῦ τοῦ Λιβυκοῦ, τὴν αἰτίαν ὕστερον ἐροῦμεν. τοῦτο γὰρ ἔχει βλεφαρίδα τὸ ζῷον. καὶ τῶν ἐχόντων τρίχας, ἐπ' ἀμφότερα οἱ ἄνθρωποι μόνον ἔχουσι. τὰ γὰρ τετράποδα τῶν ζῴων ἐν τοῖς ὑπτίοις οὐκ ἔχει τρίχας, B ἀλλ' ἐν τοῖς πρανέσι μᾶλλον· οἱ δ' ἄνθρωποι τοὐναντίον, ἐν τοῖς ὑπτίοις μᾶλλον, ἢ ἐν τοῖς πρανέσι. σκέπης γὰρ χάριν αἱ τρίχες ὑπάρχουσι τοῖς ἔχουσι. τοῖς μὲν οὖν τετράποσι, τὰ πρανῆ δεῖται μᾶλλον τῆς σκέπης. τὰ δὲ πρόσθια, τιμιώτερα μέν, ἀλλ' ἀλεαίνεται διὰ τὴν κάμψιν· τοῖς δὲ ἀνθρώποις, ἐπεὶ ἐξ ἴσου διὰ τὴν ὀρθότητα, τὰ πρόσθια τοῖς ὀπισθίοις, τοῖς τιμιωτέροις ὑπέγραψεν ἡ φύσις τὴν βοήθειαν. ἀεὶ γὰρ ἐκ τῶν ἐνδεχομένων, αἰτία τοῦ βελτίονός ἐστι. καὶ διὰ τοῦτο τῶν τετραπόδων οὐδὲν οὔτε βλεφαρίδα ἔχει τὴν κάτωθεν, ἀλλ' ὑπὸ τοῦτο τὸ βλέφαρον ἐνίοις παραφύονται μικραὶ τρίχες· οὔτ' ἐν ταῖς μα- C σχάλαις, οὔτ' ἐπὶ τῆς ἥβης, ὥσπερ τοῖς ἀνθρώποις· ἀλλ' ἀντὶ τούτων, τὰ μὲν καθ' ὅλον τὸ σῶμα τὰ πρανῆς δεδάσυνται ταῖς θριξίν, οἷον τὸ τῶν κυνῶν γένος· τὰ δὲ λοφιὰν ἔχει, καθάπερ ἵπποι, καὶ τὰ τοιαῦτα τῶν ζῴων· τὰ δὲ χαίτην, ὥσπερ ὁ ἄρρην λέων. ἔτι δὲ ὅσα κέρκους ἔχει μῆκος ἐχούσας, καὶ ταύτας ἐπικεκόσμηκεν ἡ φύσις θριξί, τὰς μὲν μικρὸν ἐχούσας τὸν στόλον, μακραῖς, ὥσπερ τοῖς ἵπποις· τὰς δὲ μακρόν, βραχείαις, καὶ κατὰ τὴν τοῦ ἄλλου σώματος φύσιν. πανταχοῦ γὰρ ἀποδίδωσι λαβοῦσα ἑτέρωθεν πρὸς ἄλλο μόριον. ὅσοις δὲ τὸ σῶμα δασὺ λίαν πεποίηκε, τούτοις ἐνδεῶς ἔχει τὰ περὶ τὴν κέρκον, οἷον ἐπὶ τῶν ἄρκτων συμ- D βέβηκε. τὴν δὲ κεφαλὴν ἄνθρωπός ἐστι τῶν ζῴων δασύτατον, ἐξ ἀνάγκης μέν, διὰ τὴν ὑγρότητα τοῦ ἐγκεφάλου, καὶ διὰ τὰς ῥαφάς· ὅπου γὰρ ὑγρὸν καὶ θερμὸν πλεῖστον, ἀναγκαῖον ἐνταῦθα πλείστην εἶναι τὴν ἔκφυσιν· ἕνεκεν δὲ βοηθείας, ὅπως σκεπάζωσι φυλάττουσαι τὰς ὑπερβολὰς τοῦ τε ψύχους καὶ τῆς ἀλέας. πλεῖστος δ' ὢν καὶ ὑγρότατος ὁ τῶν ἀνθρώπων ἐγκέφαλος, καὶ πλείστης τῆς φυλακῆς δεῖται. τὸ γὰρ ὑγρότατον, καὶ ζεῖ καὶ ψύχεται μάλιστα. τὸ δ' ἐναντίως ἔχον, ἀπαθέστερόν ἐστιν. ἀλλὰ περὶ μὲν τούτων παρεκβῆναι συμβέβηκεν, ἐχομένοις τῆς περὶ τὰς βλεφαρίδας αἰτίας, διὰ τὴν συγγένειαν αὐτῶν. ὥστε περὶ τῶν λοιπῶν ἐν τοῖς ἰδίοις καιροῖς ἀποδοτέον τὴν μνείαν.

ΚΕΦΑΛ. ιεʹ.

Τῶν ὀφρύων καὶ βλεφαρίδων αἰτίαι.

* ἴσ. ἀπογείσωμα

Αἱ δ' ὀφρύες καὶ βλεφαρίδες, ἀμφότεραι βοηθείας χάριν εἰσίν· αἱ μὲν ὀφρύες, τῶν καταβαινόντων ὑγρῶν, ὅπως ἀποστεγῶσιν οἷον * γείσωμα τῶν ἀπὸ τῆς κεφαλῆς ὑγρῶν· αἱ δὲ βλεφαρίδες, τῶν πρὸς τὰ ὄμματα προσπιπτόντων ἕνεκεν, οἷον τὰ χαρακώματα ποιοῦσί τινες πρὸ τῶν

A idcirco nec palpebram habent: nihil enim fruſtra natura agit: & oculis lubricis ſunt, propter circumfuſi humoris craſſamentum.

CAPVT XIV.

Quæ animalia cilium habeant, quæve eodem careant: deque cauda, & iubis quorundam animalium, & hominis capillo.

Cilium habent palpebræ adiunctum omnia quæ obtinent pilos: aues & quæ cortice integuntur, carent, vt quæ pilos non habeant. De ſtruthione Africæ, cauſam, quamobrem cilium habeat, poſtea reddemus, & inter ea, quæ pilos habent, homo vnus cilium in vtraque palpebra obti- B net. Quadrupedum enim generi pili non parte ſupina, ſed prona potius habentur. Homo contrà, parte magis ſupina, quàm prona: pili enim operimenti gratia adiuncti ſunt animalibus. Itaque quadrupedibus prona potius egent tegumento. Priora autem, quanquam nobiliora ſunt, tamen per corporis totius flexum fouentur, ac tepent. At homini, quoniam prior pars compar poſteriori eſt, propter corporis erectionem, idcirco Natura parti nobiliori adiumentum cenſuit adhibendum: ſemper enim Natura rei melioris author eſt, quoad eius fieri poteſt. Quamobrem quadrupes nulla eſt, quæ pilos vel in palpebra inferiori habeat (quanquam nonnullæ habent pilos quoſdam ſub- C ea naſcentes) vel in alis, vel in pube, vt homo, ſed vice eorum aliis prona totius corporis hirſuta habentur, vt canibus: aliis criſta adiuncta eſt, vt equis cæteriſque generis eiuſdem: aliis iuba, vt leoni mari. Quinetiam caudas prolixiores pilis Natura ornauit: alias longis, quibus tenor breuis, vt equis: alias breuibus, quibus tenor longus, vt bubus, atque etiam pro reliqui corporis natura: vbique enim Natura quod aliunde dempſerit, reddere ad partem aliam ſolet. Iam quibus corpus admodum piloſum condiderat, caudam iis diminuit: quod in vrſis perſpicuum eſt. Homo animalium maximè omnium piloſo capite eſt, cu- D ius rei cauſa, tum ad neceſſitatem, tum ad præſidij rationem referenda eſt: neceſſarium enim propter cerebri humiditatem, & commiſſuras caluæ. Nam vbi plurimum humoris caloriſque eſt, ibidem ortum pilorum eſſe copioſum neceſſe eſt: adiumenti autem ratio, vt frequentia pili caput operiens defendat à nimio frigore, & calore. Cùm enim cerebrum hominis proportione maximum, & humidiſſimum ſit, maximam etiam tutelam deſiderat. Res nanque humidiſſima quæque, & referueſcere, & refrigeſcere maximè, idonea eſt: quæ autem contra ſe habet, hæc minùs affici poteſt. *Sed nos, vt huc digrederemur, fecit rei* cognatio, cùm rationem ciliorum redderemus: itaque de reliquis mentionem ſuo loco & tem- E pore faciemus.

CAPVT XV.

Quas ob cauſas ſupercilia & cilia in animalibus Natura conſtituit.

Supercilia verò & cilia adiumenti gratia habentur: ſupercilia enim, vt delabētes humores arceant, velut imbricamentū, ſiue grunda homoribus, qui capite emanent, paratum: cilia, vt contra incidentia in oculos, quaſi vallum quoddam

promineant. Supercilia in compage oſſium poſita ſunt: quam ob rem compluribus ſeneſcentibus adeo creſcunt, vt tondendum ſit. Cilia venularum clauſulis ſummis innituntur. Nam vbi cutis finitur, ibidem venulæ etiam deſinunt: itaque propter vaporem, qui inde craſſiuſculus prodeat, pilos iis locis enaſci neceſſe eſt, niſi quid naturalis opificij ad alium vſum impediat.

CAPVT XVI.

Quomodo in hominibus, cæteriſque animantibus nares & labra ſint collocata: déque labrorum & narium officio.

SEnſorium verò olfaciendi non longè quodam modo euariat cæteris quadrupedibus viuiparis. Quibus enim maxillæ oblongæ exeũt in acutum, iis nares in rictu appellato continentur, modo quo fieri poteſt: cæteris explanatiùs ad maxillas conſtant. At elephantus peculiarem hanc partem præ cæteris ſortitus eſt animalibus: nam & magnitudine & viribus habet peculiarem. Naris eſt enim, qua cibum tam ſiccum quàm humidum ille capiat, orique, perinde ac manu, admoueat. Arbores etiam eadem complectendo euellit: denique ea non alio vtitur modo, niſi vt manu. Eſt enim hoc animal ſua natura ſimul terreſtre, & paluſtre. Itaque cùm cibum petere ex humore deberet, & tamen ſpirare neceſſe haberet vt terreſtre, & compos ſanguinis, nec poſſet præ nimia magnitudine celeriter diſcedere ex humore ad aërem, modo nonnullorum, quæ & animal pariunt, & ſanguinem habent, & ſpirant: idcirco vt pariter humore, atque terra vti poſſet, neceſſe fuit. Quale igitur vrinatorum nonnulli inſtrumentum ſibi accipiunt, quo quandiu in profundo manent, aërem extrinſecus trahant, talem Natura elephanti dedit narem illam prælongam. Quamobrem ſi quando iter per aquam faciunt, nare emerſa reſpirant. nam vt modò dixi promuſcis pro nare elephantibus eſt. & cùm fieri non poſſit vt naris ad eiuſmodi vſum accommodetur, niſi mollis ſit aptaque ad flectendum (impedimento enim præ ſua longitudine eſſet, ad cibum capiendum: quomodo aiunt de cornibus boum illorum qui receſſu paſcere ſolent ſua natura. Nam illos quòd progredi demiſſo in terram capite nequeant, recedendo in auerſum paſci ſolitos aiunt.) Cùm itaque naris eiuſmodi adiuncta ſit, Natura, quæ membris eiſdem abuti ad plura officia ſolet, eandem in vſum trahit pedum priorum: hos enim vice manuum habet genus quadrupedum digitatum, non ſolum ponderis cauſa ſuſtinendi. Elephantes autem non biſulcos, non ſolidos pedes habent, ſed digitatos. Sed quoniam corporis magnitudo vaſta, pondúſque ingens eſt, ideo ſuſtinendi tantummodo gratia pedes habent priores: nec ad vllum alium vſum vtiles, propter tarditatem flectendi, atque ineptiam. Narem igitur elephantus habet vt ſpiret, quo modo & cætera animalia, quibus pulmo: eandémque prælongam, atque in anfractum flexibilem, propter moram in humore diuturnam, & retardum inde diſceſſum. Cúmque vſus pedum

A ἐρυμάτων· εἰσὶ δ' αἱ μὲν ὀφρύες, ἐπὶ συνθέσεως ὀστῶν. διὸ καὶ δασύνονται πολλοῖς ἀπογηράσκουσιν οὕτως, ὥστε δεῖσθαι κουρᾶς. αἱ δὲ βλεφαρίδες, ἐπὶ πέρατι φλεβίων. ᾗ γὰρ τὸ δέρμα περαίνει, καὶ τὰ φλέβια πέρας ἔχει τοῦ μήκους. ὥστ' ἀναγκαῖον διὰ τὴν ἀπόδοσιν ἰκμάδα σωματικὴν οὖσαν, ἂν μή τι τῆς φύσεως [ἔργον] ἐμποδίσῃ πρὸς ἄλλην χρῆσιν, καὶ διὰ ταύτην αἰτίαν ἐξ ἀνάγκης ἐν τοῖς τόποις τούτοις γίνεσθαι τρίχας.

ΚΕΦΑΛ. ιϛʹ.

B *Περὶ μυκτήρων καὶ χειλέων.*

ΤΟῖς μὲν οὖν ἄλλοις ζῴοις τοῖς τετράποσι καὶ ζωοτόκοις, οὐ πόῤῥω τρόπον τινὰ διέστηκεν ἀλλήλων τὸ τῆς ὀσφρήσεως αἰσθητήριον· ἀλλ' ὅσα μὲν ἔχει προμήκεις εἰς στενὸν ἀπηγμένας τὰς σιαγόνας, ἐν τῷ καλουμένῳ ῥύγχει καὶ τὸ τῶν μυκτήρων ἐνυπάρχει μόριον, κατὰ τὸν ἐνδεχόμενον τρόπον. τοῖς δ' ἄλλοις μᾶλλον διηρθρωμένον ἐστὶ πρὸς τὰς σιαγόνας. ὁ δ' ἐλέφας * ἰδιώτατον ἔχει τοῦτο τὸ μόριον τῶν ἄλλων ζῴων. τό, τε γὰρ μέγεθος καὶ τὴν δύναμιν ἔχει περιττήν. μυκτὴρ γάρ ἐστιν, ᾧ τὴν τροφὴν προσάγεται, καθάπερ χειρὶ χρώμενος πρὸς τὸ στόμα, τήν τε ξηρὰν καὶ τὴν ὑγράν, καὶ τὰ δένδρα περιελίττων ἀνασπᾷ, καὶ χρῆται καθάπερ ἂν εἰ χειρί. τὴν γὰρ φύσιν ἑλῶδες ἅμα τὸ ζῷόν ἐστι, καὶ πεζόν· ὥστ' ἐπεὶ τὴν τροφὴν ἐξ ὑγροῦ συνέβαινεν ἔχειν, ἀναπνεῖν δ' ἀναγκαῖον, πεζὸν ὂν καὶ ἔναιμον, καὶ μὴ ταχεῖαν ποιεῖσθαι τὴν μεταβολὴν ἐκ τοῦ ὑγροῦ πρὸς τὸ ξηρόν, καθάπερ ἔνια τῶν ζωοτόκων καὶ ἐναίμων καὶ ἀναπνεόντων. τὸ γὰρ μέγεθος ὂν ὑπερβάλλον, ἀναγκαῖον ὁμοίως ἦν χρῆσθαι τῷ ὑγρῷ, ὥσπερ καὶ τῇ γῇ. ὥσπερ οὖν τῶν κολυμβητῶν ἔνιοι πρὸς τὴν ἀναπνοὴν D ὄργανα πορίζονται, ἵνα πολὺν χρόνον ἐν τῇ θαλάσσῃ μένοντες ἕλκωσιν ἔξωθεν τοῦ ὑγροῦ διὰ τοῦ ὀργάνου τὸν ἀέρα, τοιοῦτον ἡ φύσις τὸ τοῦ μυκτῆρος μέγεθος ἐποίησε τοῖς ἐλέφασι. διόπερ ἀναπνέουσιν ἄραντες ἄνω διὰ τοῦ ὕδατος τὸν μυκτῆρα, ἄν ποτε ποιῶνται δι' ὑγροῦ τὴν πορείαν. καθάπερ γὰρ εἴπομεν, μυκτήρ ἐστιν ἡ προβοσκὶς τοῖς ἐλέφασιν. ἐπεὶ δ' ἀδύνατον ἦν τὸν μυκτῆρα τοιοῦτον μὴ μαλακὸν ὄντα, μηδὲ κάμπτεσθαι δυνάμενον (ἐνεπόδιζε γὰρ ἂν τῷ μήκει, πρὸς τὸ λαβεῖν τὴν θύραθεν τροφήν, καθάπερ φασὶ τὰ κέρατα τοῖς ὀπισθονόμοις E βουσί. καὶ γὰρ ἐκείνοις νέμεσθαί φασιν ἀναχωροῦντας πάλιν πυγηδόν) ὑπάρξαντος οὖν τοιούτου τοῦ μυκτῆρος, ἡ φύσις παρακαταχρῆται (καθάπερ εἴωθεν) ἐπὶ πλείονα τοῖς αὐτοῖς μορίοις, ἀντὶ τῆς τῶν προσθίων ποδῶν χρείας. τούτοις γὰρ τὰ πολυδάκτυλα τῶν τετραπόδων ἀντὶ χειρῶν ἔχουσιν· ἀλλ' οὐ μόνον ἕνεχ' ὑποστάσεως τοῦ βάρους. οἱ δ' ἐλέφαντες τῶν πολυδακτύλων εἰσί, καὶ οὔτε διχήλους ἔχουσιν, οὔτε μώνυχας τοὺς πόδας. ἐπεὶ δὲ τὸ μέγεθος πολὺ, καὶ τὸ βάρος τὸ τοῦ σώματος, διὰ τοῦτο μόνον ἐρείσματός εἰσι χάριν, καὶ διὰ τὴν βραδυτῆτα, καὶ τὴν ἀφυΐαν τῆς κάμψεως, οὐ χρήσιμοι πρὸς ἄλλο οὐδέν. διὰ μὲν οὖν τὴν ἀναπνοὴν ἔχει μυκτῆρα, καθάπερ καὶ τῶν ἄλλων ἕκαστον τῶν ἐχόντων πνεύμονα ζῴων. διὰ δὲ τὴν ἐν τῷ ὑγρῷ διατριβὴν, καὶ τὴν βραδυτῆτα τῆς ἐκεῖθεν μεταβολῆς, δυνάμενον ἑλίττεσθαι καὶ μακρόν. ἀφῃρημένης

* γ. ἰδιαίτατον

δὲ τῆς τῶν ποδῶν χρήσεως, καὶ ἡ φύσις, ὥσπερ εἴπομεν, καταχρῆται καὶ πρὸς τὴν ἀπὸ τῶν ποδῶν γινομένην ἂν βοήθειαν τούτῳ τῷ μορίῳ. οἱ δ' ὄρνιθες καὶ οἱ ὄφεις καὶ ὅσα ἄλλα ἔναιμα καὶ ᾠοτόκα τῶν τετραπόδων, τοὺς μὲν πόρους ἔχει τῶν μυκτήρων πρὸ τοῦ στόματος. ὥστε δὲ εἰπεῖν, μυκτῆρας, εἰ μὴ διὰ τὸ ἔργον, οὐκ ἔχουσι φανερῶς διηρθρωμένους· ἀλλ' ἥ γε ὄρνις, ὥστε μηδὲν ἂν εἰπεῖν ἔχειν, ῥῖνας. τοῦτο δὲ συμβέβηκεν, ὅτι ἀντὶ σιαγόνων ἔχει τὸ καλούμενον ῥύγχος. αἰτία δὲ τούτων φύσις ἡ τῶν ὀρνίθων συνεστηκυῖα τοῦτον τὸν τρόπον· δίπουν γάρ ἐστι καὶ πτερυγωτόν. ὥστ' ἀνάγκη μικρὸν τὸ βάρος ἔχειν τὸ τοῦ αὐχένος, καὶ τὸ τῆς κεφαλῆς, ὥσπερ καὶ τὸ στῆθος στενόν. ὅπως οὖν ᾖ χρήσιμον πρός τε τὴν ἀλκὴν καὶ τὴν διατροφήν, ὀστώδες ἔχουσι τὸ ῥύγχος· στενὸν δέ, διὰ τὴν μικρότητα τῆς κεφαλῆς. ἐν δὲ τῷ ῥύγχει τοὺς πόρους ἔχουσι τῆς ὀσφρήσεως· μυκτῆρας δ' ἔχειν ἀδύνατον. περὶ δὲ τῶν ἄλλων ζῴων τῶν μὴ ἀναπνεόντων, εἴρηται πρότερον, δι' ἣν αἰτίαν οὐκ ἔχουσι μυκτῆρας, ἀλλὰ τὰ μὲν διὰ τῶν βραγχίων, τὰ δὲ διὰ τοῦ αὐλοῦ, τὰ δ' ἔντομα διὰ τοῦ ὑποζώματος αἰσθάνονται τῶν ὀσμῶν, καὶ πάντα τῷ συμφύτῳ πνεύματι τοῦ σώματος * ὥσπερ κινεῖται. τοῦτο δ' ὑπάρχει φύσει πᾶσι, καὶ οὐ θύραθεν ἐπείσακτόν ἐστιν. ὑπὸ δὲ τοὺς μυκτῆρας ἡ τῶν χειλῶν ἐστὶ φύσις, τοῖς ἔχουσι τῶν ἐναίμων ὀδόντας. τοῖς γὰρ ὄρνισι, καθάπερ εἴπομεν, διὰ τὴν τροφὴν καὶ τὴν ἀλκὴν τὸ ῥύγχος ὀστῶδές ἐστι. συνῆκται γὰρ εἰς ἕν, ἀντ' ὀδόντων καὶ χειλῶν, ὥσπερ ἂν εἴ τις ἀφελὼν ἀνθρώπου τὰ χείλη, καὶ συμφύσας, τοὺς ἄνωθεν ὀδόντας χωρίς, καὶ τοὺς κάτωθεν προαγάγοι, μῆκος ποιήσας ἀμφοτέρωθεν στενόν. εἴη γὰρ ἂν τοῦτο ἤδη ῥύγχος ὀρνιθῶδες. τοῖς μὲν οὖν ἄλλοις πρὸς σωτηρίαν τῶν ὀδόντων, ἡ τῶν χειλῶν φύσις ἐστί, καὶ πρὸς φυλακήν. διόπερ ὡς ἐκείνων μετέχουσι τοῦ ἀκριβῶς καὶ καλῶς, ἢ τοὐναντίον, οὕτω καὶ τοῦ διηρθρῶσθαι τοῦτο τὸ μόριον ἔχουσιν. οἱ δ' ἄνθρωποι, μαλακὰ καὶ σαρκώδη, καὶ δυνάμενα χωρίζεσθαι, φυλακῆς τε ἕνεκα τῶν ὀδόντων, ὥσπερ καὶ τὰ ἄλλα, καὶ μᾶλλον ἔτι διὰ τὸ εὖ. πρὸς γὰρ τὸ χρῆσθαι τῷ λόγῳ καὶ ταῦτα. ὥσπερ γὰρ τὴν γλῶτταν οὐχ ὁμοίαν τοῖς ἄλλοις ἐποίησεν ἡ φύσις, πρὸς ἐργασίας δύο καταχρησαμένη, καθάπερ εἴπομεν ποιεῖν αὐτὴν ἐπὶ πολλῶν· τὴν μὲν γλῶτταν, τῶν τε χυμῶν ἕνεκεν, καὶ τοῦ λόγου· τὰ δὲ χείλη, τούτου τε ἕνεκεν, καὶ τῆς τῶν ὀδόντων φυλακῆς. ὁ μὲν γὰρ λόγος ὁ διὰ τῆς φωνῆς, ἐκ τῶν γραμμάτων σύγκειται· τῆς δὲ γλώττης μὴ τοιαύτης οὔσης, μηδὲ τῶν χειλῶν ὑγρῶν, οὐκ ἂν ἦν φθέγγεσθαι τὰ πλεῖστα τῶν γραμμάτων. τὰ μὲν γὰρ τῆς γλώττης εἰσὶ προσβολαί, τὰ δὲ συμβολαὶ τῶν χειλῶν. ποίας δὲ ταῦτα, καὶ πόσας, καὶ τίνας ἔχει διαφοράς, δεῖ πυνθάνεσθαι παρὰ τῶν μετρικῶν. ἀναγκη δ' ἦν εὐθὺς ἀκολουθῆσαι τούτων τῶν μορίων ἑκάτερον πρὸς τὴν εἰρημένην χρῆσιν, εὔεργά καὶ τοιαύτην ἔχοντα τὴν φύσιν· διὸ σάρκινα. μαλακωτάτη δ' ἡ σὰρξ ἡ τῶν ἀνθρώπων ὑπάρχει. τοῦτο δὲ διὰ τὸ αἰσθητικώτατον εἶναι τῶν ζῴων, τὴν διὰ τῆς ἁφῆς αἴσθησιν.

* κ. ὑπὲρ α.

A priorum defuerit, ea, vt dictum eſt, parte abutitur Natura ad ſupplendum miniſterium, quod pedes præſtarent. At aues, & ſerpentes, & quæcunque ex quadrupedibus ſanguinis compotes ouiparæ ſunt, foramina quidem narium ante os habent, ſed non ita explanata, vt nares appellari poſſint, niſi ſpirandi officio. Iam autem quis naſum aut nares habere dicet? Quod propterea ita accidit, quia pro maxillis habent quod roſtrum vocatur. Huius autem rei cauſa eſt natura auium, quæ ad hunc modum conſtat: & bipes enim, & volucris eſt. Itaque leue pondus tum capitis tum etiam ceruicum ſuſtinere neceſſe eſt, vt pectus B etiam arctum habere debuit. Roſtrum igitur oſſeum habent vt commodè & cibum capiant, & ad pugnam armentur. Arctum hoc eſt propter capitis exiguitatem: cúmque meatus olfaciendi ſuo roſtro contineant, nares habere non poſſunt. De cæteris animalibus quæ non ſpirant, dictum antea eſt, quam ob cauſam naribus carent: & alia branchiis, alia fiſtula, alia præcinctu, vt inſecta, odores ſentiunt, & omnia natiuo ſpiritu ſui corporis quaſi mouentur, qui ſpiritus in omnibus ex natura inſitus eſt, non aduentitius deforis accedit. Naribus labrorum natura ſubiacet, iis quæ ſimul & dentes habent, & ſanguinem. Auibus enim, vt dictum eſt, cibi armamentique gra- C tia roſtrum oſſeum habetur. Coactum enim pro dentibus, & in idem perinde quaſi detractis hominis labris, ſuperiores inferioréſque dentes ſeorſum confundens, longitudinem vtrinque anguſtam produxeris: iam enim iſtud roſtrum auium fuerit. Sed cæteris animalibus labrorum natura ad ſalutem tutelámque dentium adiuncta eſt. Quamobrem vt quæque exquiſitè beneque dentibus prædita ſunt, ſic eam quoque obtinent partem: homini autem *mollia, carnoſa*, & quæ ſeparari poſſent, *labra adiuncta ſunt*, tum dentium tuendorum gratia, vt cæteris, tum etiam potiori cauſa vt bene eſſet: nam ad vſum ſermonis ea quoque proficiunt. Etenim vt linguam non ſimilem atque aliis animalibus, Na- D tura homini dedit, ſed idoneam, qua ad duplicem actionem vteretur, (quod eam in multis facere diximus: nam & ad percipiendos ſapores, & ad formandum ſermonem) ſic labra tam ſermonis quàm tutelæ dentium gratia adhibuit. Sermo enim, qui voce promatur, ex literis conſtat. Quòd ſi lingua talis, & labra humida, atque agilia non eſſent, maxima literarum pars exprimi non poſſet: quippe cùm literæ partim lingua producantur, partim labris comprimantur. Sed quas, * & quot numero differentias hæc habeant, ex eruditis metrica ratione accipiendum eſt. Has autem partes illico neceſſe fuit acce- E dere idoneas, & natura eiuſmodi præditas ad vſum iam dictum. Itaque carne inſtitutæ ſunt, eáque molliſſima, qualis caro hominis eſt, ſcilicet quòd maximè omnium animalium valeat ſenſu tactus.

CAPVT

A

CAPVT XVII.

De lingua, eiúſque ſitu & varietate in quibuſque animalibus.

LIngua in ore palato ſubiacet: ſed terreſtribus ferè omnibus modo ſimili, cæteris diſſimili, tum eorundem ipſorum tum terreſtrium cōparatione. Homo igitur linguam abſolutam, molliſſimam, & latam præcipuè habet, vt commoda ad vtrumque officiū ſit: hoc eſt, & ad ſapores percipiendos, & ad literas exprimendas. Eſt enim homo omnium maximè animalium ſenſu facilis. Et lingua, quæ mollis eſt, vim tangendi præcipuè obtinet: guſtus autem, tactus quidam eſt. Ad literarum etiam explanationem, & ad ſermonis expreſſionem, lingua mollis, lata, & abſoluta accommodatior eſt: quippe quæ contrahere, producere, dilatare, denique variè afformare maximè poſſit. Patet hoc in iis quibus non ſatis abſoluta eſt: blæſi enim balbi, & torti ſunt: quod vitium literarum defectus eſt. Diſcrimen in latitudine & anguſtia eſt: quippe cùm ampla anguſtam contineat, anguſta amplam non capiat. Paruum enim in magno continetur, magnum in paruo haberi non poteſt. Quamobrem aues, quæ literas proferre maximè poſſunt, lingua ſunt latiore, quā cæteræ. Quadrupedes autem, quæ & ſanguinem habent, & animal pariunt, vocem parum explanare poſſunt, vt quæ linguam duram, craſſam, & minimè abſolutam habeant: at pleræque auium vocem copioſè emittunt: & quanuis latiorem habeant, quæ vnguibus ſunt aduncis, tamen minores vocaliores ſunt. Ac omnes lingua vtuntur etiā ad ſurſenſus mutuam interpretationem, ſed aliæ aliis amplius, vt in nonnullis vel vſus docendi mutuus eſſe videatur. *Sed de iis diximus ſatis*, cùm hiſtorias animalium ſcriberemus. Terreſtrium autem ouiparorum ſanguineorū pars maior linguam habet inutilem ad vocis officium, & adhærentem, & duram. Quanquam ad ſaporum guſtatum, ſerpentes, & lacerti longam habent, & bifidam: atque ita longam ſerpentes, vt ex paruo longè protrahi poſſit. Bifida, & parte extrema capillamēti tenuitate eſt, propter ſuæ naturæ cupediam: duplex enim voluptas iis capitur, quaſi duplicem ſenſum guſtandi habeant. Omnia tam ſanguinea quàm exanguia, habent eam partem, quæ ſapores ſentire poteſt. Nam & quæ multitudini videntur carere ea parte, vt piſces nonnulli, ea quoque parciori quodam obtinent modo, & ferè ſimili, vt fluuiatiles crocodili: ſed hoc latet in plurimis cauſa quadā iuſta: locus enim oris omnium id genus ſpinoſus eſt. Et quoniam aquatile genus breui tempore ſentit ſapores, hinc fit vt pro ſui vſus breuitate linguam parum diſcretam habeāt: raptim enim ſummáque celeritate cibus ad ventrem ingeritur, quòd immorari ſaporibus perfruendis nequeant, humore interlabente. Itaque niſi os inclinaueris, cerni pars hæc diſcreta non poterit. Horret hic locus ſpinis, quippe qui ex frequenti contactu conſtitutus ſit branchiarum, quarum natura ſpinoſa eſt. Crocodilis nonnihil cauſæ ad eius partis vitiationem affert etiam immobilitas maxillæ inferioris: lingua enim inferiori annectitur maxillæ, quā illi quaſi contrà habēt ſuperiorē: cæteris. n. ſuperior immobilis eſt.

ΚΕΦΑΛ. ιζ΄.

Περὶ γλώττης.

ΥΠὸ δὲ τὸν οὐρανὸν ἐν τῷ στόματι ἡ γλῶττα τοῖς ζῴοις ἐστί· τοῖς μὲν πεζοῖς σχεδὸν ὁμοίως πᾶσι, τοῖς δ' ἄλλοις ἀνομοίως, καὶ αὐτοῖς πρὸς αὑτὰ, καὶ πρὸς τὰ πεζὰ τῶν ζῴων. ὁ μὲν οὖν ἄνθρωπος ἀπολελυμένην τε καὶ μαλακωτάτην ἔχει μάλιστα τὴν γλῶτταν, καὶ πλατεῖαν, ὅπως πρὸς ἑκατέρας ᾖ τὰς ἐργασίας χρήσιμος, πρός τε τὴν τῶν χυμῶν αἴσθησιν (ὁ γὰρ ἄνθρωπος εὐαισθητότατος τῶν ἄλλων ζῴων, καὶ ἡ μαλακὴ γλῶττα ἁπτικωτάτη γάρ. ἡ δὲ γεῦσις, ἁφή τίς ἐστι) καὶ πρὸς τὴν τῶν γραμμάτων διάρθρωσιν, καὶ πρὸς τὸν λόγον ὁμαλὴ καὶ πλατεῖα χρήσιμος. συστέλλειν γὰρ καὶ προβάλλειν παντοδαπῶς, τοιαύτη οὖσα καὶ ἀπολελυμένη, μάλιστα ἂν δύναιτο. δηλοῖ δ' ὅσοις μὴ λίαν ἀπολέλυται. ψελλίζονται γὰρ καὶ τραυλίζουσι. τοῦτο δ' ἐστὶν ἔνδεια τῶν γραμμάτων. * ἔν τε τῷ πλατεῖαν εἶναι, καὶ τὸ στενὴν ἐστίν. ἐν γὰρ τῷ μεγάλῳ καὶ τὸ μικρὸν· ἐν δὲ τῷ μικρῷ τὸ μέγα οὐκ ἔστι. διὸ καὶ τῶν ὀρνίθων οἱ μάλιστα φθεγγόμενοι γράμματα, πλατυγλωττότεροι τῶν ἄλλων εἰσί. τὰ δ' ἔναιμα καὶ ζῳοτόκα τῶν τετραπόδων, βραχεῖαν τῆς φωνῆς ἔχει διάρθρωσιν. σκληράν τε γὰρ καὶ οὐκ ἀπολελυμένην ἔχουσι, καὶ παχεῖαν τὴν γλῶτταν. τῶν δ' ὀρνίθων ἔνιοι πολύφωνοι, καὶ πλατυτέραν οἱ γαμψώνυχες ἔχουσι. πολύφωνοι δ' οἱ μικρότεροι. καὶ χρῶνται τῇ γλώττῃ πρὸς ἑρμηνείαν ἀλλήλοις πάντες μὲν, ἕτεροι δὲ τῶν ἑτέρων μᾶλλον. ὥστ' ἐπ' ἐνίων, καὶ μάθησιν εἶναι δοκεῖν παρ' ἀλλήλων. εἴρηται δὲ περὶ αὐτῶν ἐν ταῖς ἱστορίαις ταῖς περὶ τῶν ζῴων. τῶν δὲ πεζῶν καὶ ᾠοτόκων καὶ ἐναίμων, πρὸς μὲν τὴν τῆς φωνῆς ἐργασίαν, ἄχρηστον τὰ πολλὰ τὴν γλῶτταν ἔχει, καὶ προσδεδεμένην καὶ σκληράν. πρὸς δὲ τὴν τῶν χυμῶν γεῦσιν, οἵ τ' ὄφεις καὶ οἱ σαῦροι μακρὰν καὶ δίκροαν ἔχουσιν· οἱ μὲν ὄφεις οὕτω μακρὰν, ὥστ' ἐκτείνεσθαι ἐκ μικροῦ ἐπὶ πολύ· δίκροαν δὲ, καὶ τὸ ἄκρον λεπτὸν καὶ τριχῶδες, διὰ * τὸ λίχνον τῆς φύσεως. διπλῆν γὰρ τὴν ἡδονὴν κτᾶται τῶν χυμῶν, ὥσπερ διπλῆν ἔχοντα τὴν τῆς γεύσεως αἴσθησιν. ἔχει δὲ τὰ μὴ ἔναιμα τῶν ζῴων τὸ αἰσθητικὸν τῶν χυμῶν μόριον, καὶ τὰ ἔναιμα πάντα. καὶ γὰρ ὅσα μὴ δοκεῖ τοῖς πολλοῖς ἔχειν, οἷον ἔνιοι τῶν ἰχθύων, καὶ οὗτοι τρόπον τινὰ γλίσχρον ἔχουσι, καὶ σχεδὸν παραπλησίως τοῖς ποταμίοις κροκοδείλοις. οὐ φαίνονται δ' οἱ πλεῖστοι αὐτῶν ἔχειν, διά τινα αἰτίαν εὔλογον. ἀκανθώδης τε γάρ ἐστιν ὁ τόπος τοῦ στόματος πᾶσι τοῖς τοιούτοις, καὶ διὰ τὸ μικρὸν χρόνον εἶναι τὴν αἴσθησιν τοῖς ἐνύδροις τῶν χυμῶν, ὥσπερ καὶ ἡ χρῆσις αὐτῆς βραχεῖα, οὕτω βραχεῖαν ἔχουσιν αὐτῆς καὶ τὴν διάρθρωσιν. ταχεῖα δὲ ἡ δίοδος εἰς τὴν κοιλίαν, διὰ τὸ μὴ ἐνδέχεσθαι διατρίβειν ἐκχυμίζοντας. παρεισπίπτοι γὰρ ἂν τὸ ὕδωρ. ὥστε ἐὰν μή τις τὸ στόμα ἐπικλίνῃ, μὴ φαίνεσθαι ἀφεστηκὸς τοῦτο τὸ μόριον. ἀκανθώδης δ' ἐστὶν οὗτος ὁ τόπος. σύγκειται γὰρ ἐκ τῆς συμψαύσεως τῶν βραγχίων, ὧν ἡ φύσις ἀκανθώδης ἐστί. τοῖς δὲ κροκοδείλοις συμβάλλεταί τι πρὸς τὴν τοῦ μορίου τούτου ἀναπηρίαν, καὶ τὸ τὴν σιαγόνα τὴν κάτω ἀκίνητον ἔχειν. ἔστι γὰρ ἡ γλῶττα τῇ κάτω συμφυής· οἱ δ' ἔχουσιν (ὥσπερ ἀνάπαλιν) τὴν ἄνω, κάτω. τοῖς γὰρ ἄλλοις ἡ ἄνω ἀκίνητος.

* Scrib. [illegible] Gaza tamen aliter.

Vide Hiſtor. li. 9. c. 31.

* κ. [illegible]

A πρὸς μὲν οὖν τὴν ἄνω οὐκ ἔχουσι τὴν γλῶτταν, ὅτι ἐναντίως ἀνέχει πρὸς τὴν τῆς τροφῆς εἴσοδον. πρὸς δὲ τὴν κάτω, ὅτι ὥσπερ μετακεκίνηται ἡ ἄνω ἐστίν. ἔτι δὲ καὶ συμβέβηκεν αὐτῷ πεζῷ ὄντι, ζῆν ἰχθύων βίον, ὥστε καὶ διὰ τοῦτ' ἀναγκαῖον ἀδιάρθρωτον αὐτὸν ἔχειν τοῦτο τὸ μόριον. τὸν δ' οὐρανὸν σαρκώδη πολλοὶ καὶ τῶν ἰχθύων ἔχουσι, καὶ τῶν ποταμίων ἔνιοι σφόδρα σαρκώδη καὶ μαλακόν, οἷον οἱ καλούμενοι κυπρῖνοι. ὥστε δοκεῖν τοῖς μὴ σκοποῦσιν ἀκριβῶς, γλῶτταν ἔχειν ταύτῃ. οἱ δ' ἰχθύες διὰ τὴν εἰρημένην αἰτίαν ἔχουσι μέν, οὐ σαφῆ δ' ἔχουσι τὴν διάρθρωσιν τῆς γλώττης. ἐπεὶ δὲ τῆς τροφῆς χάριν [τῆς] ἐν τοῖς χυμοῖς ἐστιν ἡ αἴσθησις, B τὸ μὲν γλωττοειδὲς ἔχει μόριον οὐ πάντῃ δ' ὁμοίως, ἀλλὰ τῷ ἄκρῳ μάλιστα. διὰ τοῦτο τοῖς ἰχθύσι τοῦτ' ἀφώρισται μόνον. ἐπιθυμίαν δ' ἔχει τὰ ζῷα τροφῆς πάντα, ὡς ἔχοντα αἴσθησιν τῆς ἡδονῆς τῆς γινομένης ἐκ τῆς τροφῆς· ἡ γὰρ ἐπιθυμία, τοῦ ἡδέος ἐστίν. ἀλλὰ τὸ μόριον οὐχ ὅμοιον τοῦτο πᾶσιν, ᾧ τὴν αἴσθησιν ποιοῦνται τῆς τροφῆς· ἀλλὰ τοῖς μὲν ἀπολελυμένον, τοῖς δὲ προσπεφυκός, ὅσοις μηδὲν ἔργον ὑπάρχει φωνῆς. καὶ τοῖς μὲν σκληρόν, τοῖς δὲ μαλακόν, καὶ σαρκῶδες. διὸ καὶ τοῖς μαλακοστράκοις, οἷον καράβοις καὶ τοῖς τοιούτοις, ἐντὸς ὑπάρχει τι τοῦ στόματος τοιοῦτο· καὶ τοῖς μαλακίοις, οἷον C σηπίαις καὶ πολύποσι. τῶν δ' ἐντόμων ζῴων, τὰ μὲν ἐντὸς ἔχει τὸ τοιοῦτο μόριον, οἷον τὸ τῶν μυρμήκων γένος· ὡσαύτως δὲ καὶ τῶν ὀστρακοδέρμων πολλά· τὰ δ' ἐκτός, οἷον κέντρον· σομφὸν δὲ τὴν φύσιν καὶ κοῖλον, ὥσθ' ἅμα τούτῳ καὶ γεύεσθαι, καὶ τὴν τροφὴν ἀνασπᾶν. δῆλον δὲ τοῦτ' ἐπί τε μυιῶν καὶ μελιττῶν, καὶ πάντων τούτων· ἔτι δ' ἐπ' ἐνίων τῶν ὀστρακοδέρμων. ταῖς γὰρ πορφύραις τοσαύτην ἔχει δύναμιν τοῦτο τὸ μόριον, ὥστε καὶ τῶν κογχυλίων διατρυπῶσι τὸ ὄστρακον, οἷον τῶν στρόμβων, οἷς δελεάζουσιν αὐτάς. ἔτι δὲ οἵ τε οἶστροι καὶ οἱ μύωπες, οἱ μὲν τὰ τῶν ἀνθρώπων οἱ δὲ καὶ τὰ τῶν ἄλλων ζῴων δέρματα διαιροῦσιν. ἐν μὲν οὖν τούτοις τοῖς ζῴοις ἡ γλῶττα D τοιαύτη τὴν φύσιν ἐστίν, ὥσπερ ἀντίστροφος ἔχουσα τῷ μυκτῆρι τῷ τῶν ἐλεφάντων. καὶ γὰρ ἐκείνοις πρὸς βοήθειαν ὁ μυκτήρ, καὶ τούτοις ἡ γλῶττα ἀντὶ κέντρου ἐστίν. ἐπὶ δὲ τῶν ἄλλων ζῴων ἡ γλῶττα πάντων ἐστίν, οἵαν περ εἴπομεν. ἐχόμενον δὲ τῶν εἰρημένων, ἡ τῶν ὀδόντων ἐστὶ φύσις τοῖς ζῴοις.

A Itaque vt ad ſuperiorem non habent, quòd cibi aditus tollitur: ſic ad inferiorem carent, quòd ſuperior quaſi tranſlata in locum inferioris eſt. Accedit ad hæc genus vitæ, quam more piſcium agit, cùm tamen ipſe terreſtris ſit. Itaque vel ob eam rem inexplanatam hanc partem habeat, neceſſe eſt. Palatum piſcium etiam complures carnoſum habent: & quidem inter fluuiatiles nonnulli admodum carnoſum, & molle, vt cyprini nomine, adeò vt ſi parum diligenter aduertas, lingua id eſſe videatur. Piſces igitur ob eam, quam diximus, cauſam, etſi lingua non carent, tamen explanatam non habent. Sed cùm cibi gratia ſen- B ſus ſaporis adhibitus ſit, cúmque non quauis parte ſua lingua obtineat, ſed extrema potiſſimùm, ideo piſcibus particula hæc tantummodo diſcreta habetur. Cibum autem quanquam animalia omnia cupiunt, vt quæ voluptatem ex cibo ſentiant, (cupiditas enim rei ſuauis eſt) tamen membrum, quod ad ſentiendum accommodatum eſt, non omnibus ſimile datum eſt: ſed aliis abſolutum, aliis adhærens, videlicet iis quibus vocis defuit vſus: & aliis durum, aliis molle carnoſúmque. Nam & cruſtatis, vt locuſtis marinis, & reliquis generis eiuſdem, tale quid in ore ha- C betur atque etiam mollibus, vt ſepiis, vt polypis. Inſectorum alia membrum hoc intus continent: vt formicæ: quemadmodum multa etiam ex teſtatis: alia foris gerunt, velvt aculeum fungoſum, & cauum, vt eo ſimul & guſtare & cibum trahere poſſint. Patet hoc in muſcarum genere, & apum, & omnium generis eiuſdem, atque etiam in nonnullis teſtatis. Purpuris enim tantam obtinet vim hoc membrum, vt teſtas conchyliorum tranſfigere valeat: velvt turbinum quorum eſca capiuntur. Necnon aſili, & tabani eòdem ſpectant: quorum alteri lingua admisſa cutem hominum ſecant, alteri tergora etiam beſtiarum elacerant. His igitur animalibus lin- D gua talis natura tributa eſt, quaſi reſpondens, & obverſaria nari elephantorum. Naris enim illis adiumento eſt, & lingua his pro aculeo habetur. Cæteris animalibus omnibus lingua talis, qualem iam expoſuimus, data eſt.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζῴων μορίων τὸ Γ.

ΚΕΦΑΛ. α'.

Περὶ ὀδόντων καὶ στόματος.

Hiſtor. lib. 2. c. 1.

ἘΧΟΜΕΝΟΝ δὲ τῶν εἰρημένων, ἡ τῶν ὀδόντων ἐστὶ φύσις τοῖς ζῴοις, καὶ τὸ στόμα τὸ περιεχόμενον ὑπὸ τούτων, καὶ συνεστηκὸς ἐκ τούτων. τοῖς μὲν οὖν ἄλλοις ἡ τῶν ὀδόντων φύσις κοινὴ μὲν ἐπὶ τὴν τῆς τροφῆς ἐργασίαν ὑπάρχει· χωρὶς δὲ κατὰ γένος, τοῖς μὲν ἀλκῆς χάριν, καὶ ταύτης διῃρημένης, ἐπί τε τὸ ποιεῖν, καὶ τὸ μὴ πάσχειν. τὰ μὲν γὰρ ἀμφοῖν ἕνεκεν ἔχει, καὶ τοῦ ποιεῖν, καὶ τοῦ μὴ πάσχειν, οἷον ὅσα καρχαρόδοντα τῶν ἀγρίων τὴν φύσιν ἐστί·

ARISTOTELIS STARIGITÆ DE PARTIBVS ANIMALIVM & earum cauſis

E LIB. III. CAPVT I.

De ordine, & conſtitutione dentium, oris, & faciei, eorundémque in omnibus animantibus diuerſitate.

PROXIME ab iis natura dentium eſt, & oris, quod ſerie dentium continetur, & conſtat. Sed cùm dentium natura communi quidem officio ad cibum conficiendum adiuncta ſit, tamen generatim ſeorſum aliis roboris gratia, tum ad inuadendum, tum etiam ad defendendum, aliis auxilii tantũ cauſa data eſt. Partim enim ea vtraq; cauſa dentes obtinet, vt nec ab aliis afficiãtur, & ipſa afficiant alia: vt quæ ex feris natura carniuora ſunt:

partim ea cauſa tantùm, ne male ab aliis afficiantur, vt complura tum ſylueſtris generis tum etiam vrbani. Nonnullis cibi conficiendi cauſa tantùm adhibita eſt dentium opera. Homo verò ad vſum communem probè factos obtinet dentes: videlicet primores acutos vt ſecent, maxillares latos vt molant. Diſcriminant eos vtroſque hi, qui canini appellantur, media inter eos natura conditi: nam & medium, particeps vtriuſque extremi eſt. Et canini ipſi partim acuti ſunt, partim lati. Quod idem in cæteris quoque animalibus eſt, quibus non omnes acuti habentur. Sed potiſſimùm locutionis gratia tales, tótque numero dentes homo ſortitus eſt. Ad literas enim exprimendas plurimum conferunt primi dentes. Nonnulla animalia, quod dictum iam eſt, cibi tantū conficiendi gratia dentes obtinent. Quibus autem ſimul & auxilio ſunt, & robori dentes, hæc aut exertos habent, vt ſus: aut acutos pectinatim ſeſe ſtipantes: vnde ſerratis ea dentibus eſſe diximus. Cùm enim vires eorum acumini dentium commiſſæ ſint, rectè qui vtiles ſint ad ferocitatem, pectinatim coeunt, ne occurſu contrario atterantur, & hebeteſcant. Sed nullis ſimul & ſerrati & exerti ſunt dentes: quoniam natura nihil fruſtrà, nihil ſuperuacanei facere ſolet. Auxilium aliis per ictum, aliis per morſum: nam ſues fœminæ mordent, vt quæ careant dente exerto. Cæterùm aliquid accepiſſe in vniuerſum conuenit, quod vtile ſit, tum ad hæc ipſa tum etiam ad multa, quæ poſtea dicemus. Partes enim, quæ ad inuadendum, aut ad defendendum ſpectant, quæque à natura iis tribuuntur, quæ aut ſola aut præ cæteris vti poſſint, & quibus vis vtendi præcipua, hęc præcipuè armis dotata ſunt: vt aculeo, calcari, cornu, dente, & ſi quid eiuſmodi aliud ſit. Cúmque mares robuſtiores magiſque animoſi ſint, ideo aut *ſolis iis* aut *meliùs iis* partes eiuſmodi datæ ſunt. Quas enim in fœminis quoque haberi neceſſe eſt, vt quæ cibo accommodentur, eas habent quidem & fœminæ, ſed minùs, quàm mares: quæ autem ad rem nullam neceſſariam ſpectent, iis carent. Quapropter in ceruorum genere, cùm maribus cornua ſint, fœminis deſunt. Vaccarum etiam cornua & taurorum inter ſe diſtant. Quod idem in pecore etiam cernimus. Calcar etiam cùm mares habeant, fœminæ magna ex parte non habēt. Pari modo de reliquis quoque eiuſmodi partib. intelligendum eſt. Piſces omnes ſerratis dentib. ſunt, vno excepto, qui ſcarus vocatur. Cōplures etiam dentes in lingua habent, & in palato. Cuius rei cauſa eſt, quòd cùm merſi in aqua degant, humorem cum cibo admittant, eúmque expuant quàm primùm neceſſe eſt. Non enim in molendo commorari poſſunt, quando humor in ventrem interrumpit: idcirco omnes acuti & frequentes vndique ſunt, videlicet vt præ multitudine in minuta ſecent, quæ attritu ſubigere nequeant. Adunci præterea ſunt, quoniam robur ferè totum piſcium in dentibus ſitum eſt. Natura etiam oris, tum eorum quæ modò dixi, officiorum cauſa, tum etiam ad ſpirandum adiuncta animalibus eſt, ſcilicet iis quæ ſpirant, atque extrinſecus refrigerantur. Natura enim ipſa per ſe, vt diximus, partibus omnium communibus ad pleraque officia propria abvtitur. Proinde oris quoq; officiū omnib. cōmune, cibus conficiēdus eſt: robur nōnullo rūpeculiare eſt: ſermo aliorū.

A τὰ δὲ βοηθείας χάριν, ὥσπερ πολλὰ τῶν ἀγρίων καὶ τῶν ἡμέρων. ὁ δὲ ἄνθρωπος πρός τε τὴν κοινὴν χρῆσιν καλῶς ἔχει πεφυκότας· τοὺς μὲν προσθίους, ὀξεῖς, ἵνα διαιρῶσι· τοὺς δὲ γομφίους, πλατεῖς, ἵνα λεαίνωσι. ὁρίζουσι δὲ ἑκατέρους οἱ κυνόδοντες, μέσοι τὴν φύσιν ἑκατέρων ὄντες. τό, τε γὰρ μέσον, ἀμφοτέρων μετέχει τῶν ἄκρων· οἵ τε κυνόδοντες τῇ μὲν ὀξεῖς, τῇ δὲ πλατεῖς εἰσιν. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων ζώων, ὅσα μὴ πάντας ἔχουσιν ὀξεῖς. μάλιστα δὲ καὶ τοὺς τοιούτους καὶ τοσούτους πρὸς τὴν διάλεκτον. πολλὰ γὰρ πρὸς τὴν γένεσιν τῶν γραμμάτων οἱ πρόσθιοι τῶν ὀδόντων συμβάλλονται. B ἔνια δὲ τῶν ζώων, ὥσπερ εἴπομεν, τροφῆς χάριν ἔχει μόνον. ὅσα δὲ καὶ πρὸς βοήθειαν τε καὶ ἀλκήν, τὰ μὲν χαυλιόδοντας ἔχει, καθάπερ ὗς· τὰ δ' ὀξεῖς καὶ ἐπαλλάττοντας· ὅθεν καρχαρόδοντα καλεῖται. ἐπεὶ γὰρ ἐν τοῖς ὀδοῦσιν ἡ ἰσχὺς αὐτῶν· τοῦτο δὲ γένοιτ' ἂν διὰ τὴν ὀξύτητα. οἱ χρήσιμοι δὲ πρὸς τὴν ἀλκήν, ἐναλλὰξ ἐμπίπτουσιν, ὅπως μὴ ἀμβλύνωνται τριβόμενοι πρὸς ἀλλήλους. οὐδὲν δὲ τῶν ζώων ἐστὶν ἅμα καρχαρόδουν καὶ χαυλιόδουν, διὰ τὸ μηδὲν ποιεῖν τὴν φύσιν μάτην, μηδὲ περίεργον. ἔστι δὲ τῶν μὲν διὰ πληγῆς ἡ βοήθεια, τῶν δὲ διὰ δήγματος. διόπερ αἱ θήλειαι τῶν ὑῶν C δάκνουσιν. οὐ γὰρ ἔχουσι χαυλιόδοντας. καθόλου δὲ χρεὼν τι λαβεῖν, ὃ καὶ ἐπὶ τούτων, καὶ ἐπὶ πολλῶν τῶν ὕστερον λεχθησομένων ἔσται χρήσιμον. τῶν τε γὰρ πρὸς ἀλκήν τε καὶ βοήθειαν ὀργανικῶν μορίων ἕκαστα ἀποδίδωσιν ἡ φύσις τοῖς δυναμένοις χρῆσθαι μόνοις ἢ μᾶλλον· μάλιστα δὲ τῷ μάλιστα· οἷον κέντρον, πλῆκτρον, κέρατα, χαυλιόδοντας, καὶ εἴ τι τοιοῦτον ἕτερον. ἐπεὶ δὲ τὸ ἄρρεν ἰσχυρότερον καὶ θυμικώτερον, τὰ μὲν μόνον, τὰ δὲ ἧττον ἔχει τὰ τοιαῦτα τῶν μορίων. ὅσα μὲν γὰρ ἀναγκαῖον καὶ τοῖς θήλεσιν ἔχειν, οἷον τὰ πρὸς τὴν τροφήν, ἔχουσι μέν, ἧττον δ' ἔχουσιν· ὅσα δὲ πρὸς μηδὲν τῶν ἀναγκαίων, οὐκ D ἔχουσι. καὶ διὰ τοῦτο τῶν ἐλάφων οἱ μὲν ἄρρενες ἔχουσι κέρατα, αἱ δὲ θήλειαι οὐκ ἔχουσι. διαφέρει δὲ καὶ τὰ κέρατα τῶν θηλειῶν βοῶν, καὶ τῶν ταύρων. ὁμοίως δὲ καὶ ἐν τοῖς προβάτοις. καὶ πλῆκτρα τῶν ἀρρένων ἐχόντων, αἱ πλεῖσται τῶν θηλειῶν οὐκ ἔχουσιν. ὡσαύτως δὲ τοῦτο καὶ ἐπὶ τῶν ἄλλων τῶν τοιούτων. οἱ δ' ἰχθύες πάντες εἰσὶ καρχαρόδοντες, πλὴν τοῦ ἑνὸς τοῦ καλουμένου σκάρου. πολλοὶ δ' ἔχουσι καὶ ἐν ταῖς γλώτταις ὀδόντας, καὶ ἐν τοῖς οὐρανοῖς. τούτου δ' αἴτιον, ὅτι ἀναγκαῖον ἐν ὑγροῖς οὖσι προσδέχεσθαι τὸ ὑγρὸν ἅμα τῇ τροφῇ, καὶ τοῦτο ταχέως ἐκπέμπειν. οὐ γὰρ ἐνδέχεται λεαίνοντας διατρίβειν. εἰσρέοι γὰρ ἂν τὸ ὑγρὸν ἐν τῇ κοιλίᾳ. διὰ τοῦ- E το πάντες εἰσὶν ὀξεῖς πρὸς τὴν διαίρεσιν. πάλιν δὲ πολλοὶ καὶ πολλαχῇ, ἵνα ἀντὶ τοῦ λεαίνειν εἰς πολλὰ κερματίζωσι τῷ πλήθει. γαμψοὶ δέ, διὰ τὸ τὴν ἀλκὴν σχεδὸν ἅπασαν αὐτοῖς διὰ τούτων εἶναι. ἔχει δὲ καὶ τὴν τοῦ στόματος φύσιν τὰ ζῷα, τούτων τε τῶν ἔργων ἕνεκεν, καὶ ἔτι τῆς ἀναπνοῆς, ὅσα ἀναπνεῖ τῶν ζῴων, καὶ καταψύχεται θύραθεν. ἡ γὰρ φύσις αὐτὴ καθ' αὑτήν, ὥσπερ εἴπομεν, τοῖς κοινοῖς πάντων μορίοις εἰς πολλὰ τῶν ἰδίων καταχρῆται· οἷον καὶ ἐπὶ τοῦ στόματος, ἡ μὲν τροφὴ πάντων κοινόν, ἡ δ' ἀλκή, τινῶν ἴδιον. καὶ ὁ λόγος ἑτέρων,

ἔτι δὲ τὸ ἀναπνεῖν, οὐ πάντων κοινόν. ἡ δὲ φύσις ἅπαντα συνήγαγεν εἰς ἕν, ποιοῦσα διαφορὰν αὐτοῦ τοῦ μορίου πρὸς τὰς τῆς ἐργασίας διαφοράς. διὸ τὰ μὲν ἐστὶ συστομώτερα, [τὰ δὲ μεγαλόστομα. ὅσα μὲν γὰρ τροφῆς καὶ ἀναπνοῆς, καὶ λόγου χάριν, συστομώτερα.] τῶν δὲ βοηθείας χάριν, τὰ μὲν καρχαρόδοντα, πάντα ἀνερρωγότα. οὔσης γὰρ αὐτοῖς τῆς ἀλκῆς ἐν τοῖς δήγμασι, χρήσιμον τὸ μεγάλην εἶναι τὴν ἀνάπτυξιν τοῦ στόματος. πλείοσι γὰρ καὶ κατὰ μεῖζον δήξεται, ὅσῳπερ ἂν ἐπὶ τὸ πλέον ἀνερρωγὸς ᾖ τὸ στόμα. ἔχουσι δὲ καὶ τῶν ἰχθύων οἱ δηκτικοὶ καὶ σαρκοφάγοι τοιοῦτον στόμα· οἱ δὲ μὴ σαρκοφάγοι, μύουρον. τοιοῦτον γὰρ αὐτοῖς χρήσιμον, ἐκεῖνο δὲ ἄχρηστον. τοῖς δ' ὄρνισίν ἐστι τὸ καλούμενον ῥύγχος, στόμα. τοῦτο γὰρ ἀντὶ χειλῶν καὶ ὀδόντων ἔχουσι. διαφέρει δὲ τοῦτο κατὰ τὰς χρήσεις καὶ τὰς βοηθείας. τὰ μὲν γὰρ γαμψώνυχα καλούμενα, διὰ τὸ σαρκοφαγεῖν, καὶ μηδενὶ τρέφεσθαι καρπῷ, γαμψὸν ἔχει τὸ ῥύγχος ἅπαντα. χρήσιμον γὰρ πρὸς τὸ κρατεῖν, καὶ βιαστικώτερον τι, οὕτω πεφυκός. ἡ δ' ἀλκὴ ἐν τούτῳ καὶ τοῖς ὄνυξι. διὸ καὶ τοὺς ὄνυχας γαμψοτέρους ἔχουσι· τῶν δ' ἄλλων ἑκάστῳ, πρὸς τὸν βίον χρήσιμόν ἐστι τὸ ῥύγχος· οἷον τοῖς μὲν δρυοκόποις ἰσχυρόν, * καὶ πάνυ σκληρόν, καὶ κόραξι καὶ κορακώδεσι· τοῖς δὲ μικροῖς, γλαφυρόν, πρὸς τὰς συλλογὰς τῶν καρπῶν, καὶ τὰς λήψεις τῶν ζῳδαρίων. ὅσα δὲ ποηφάγα, καὶ ὅσα πρὸ ἕλη ζῇ, καθάπερ τὰ πλωτὰ καὶ στεγανόποδα, τὰ μὲν ἄλλον τρόπον ἔχει τὸ ῥύγχος χρήσιμον, τὰ δὲ πλατύρυγχα αὐτῶν ἐστι. τοιούτῳ γὰρ ὄντι, ῥᾳδίως δύναται ὀρύττειν, ὥσπερ τῶν τετραπόδων τὸ τῆς ὑός. καὶ γὰρ αὕτη ῥιζοφάγος. ἔτι δ' ἔχουσι τά τε πλατύρυγχα καὶ τὰ ῥιζοφάγα τῶν ὀρνέων, καὶ τῶν ὁμοιοβίων ἔνια, τὰ ἄκρα τοῦ ῥύγχους κεχαραγμένα. ποηφάγοις τε γὰρ τούτοις οὖσι, ποιεῖ ῥᾳδίως. περὶ μὲν οὖν τῶν ἄλλων μορίων τῶν ἐν τῇ κεφαλῇ σχεδὸν εἴρηται. τῶν ἀνθρώπων δὲ καλεῖται τὸ μεταξὺ τῆς κεφαλῆς καὶ τοῦ αὐχένος, πρόσωπον, ἀπὸ τῆς πράξεως αὐτῆς ὀνομασθέν, ὡς ἔοικε. διὰ γὰρ τὸ μόνον ὀρθὸν εἶναι τῶν ζῴων, μόνον πρόσωθεν ὄπωπε, καὶ τὴν φωνὴν εἰς τὸ πρόσω διαπέμπει.

* Hiſtor. 9.9.

ΚΕΦΑΛ. β'.

Περὶ κεράτων.

Hiſtor. 3.9.

Περὶ δὲ κεράτων λεκτέον. καὶ γὰρ ταῦτα πέφυκε τοῖς ἔχουσιν ἐν τῇ κεφαλῇ. ἔχει δ' οὐδὲν μὴ ζῳοτόκον. καθ' ὁμοιότητα δὲ καὶ μεταφορὰν λέγεται καὶ ἑτέρων τινῶν κέρατα· ἀλλ' οὐδενὶ αὐτῶν τὰ ἔργα τοῦ κέρατος ὑπάρχει. βοηθείας γὰρ καὶ ἀλκῆς χάριν ἔχουσι τὰ ζῳοτόκα· ὃ τῶν ἄλλων τῶν λεγομένων ἔχειν κέρας, οὐδενὶ συμβέβηκεν. οὐδὲν γὰρ χρῆται τοῖς κέρασιν, οὔτ' ἀμυνόμενον, οὔτε πρὸς τὸ κρατεῖν ἅπερ ἰσχύος ἐστὶν ἔργα. ὅσα μὲν οὖν πολυσχιδῆ τῶν ζῴων, οὐδὲν ἔχει κέρας. τούτου δ' αἴτιον, ὅτι τὸ μὲν κέρας βοηθείας αἴτιόν ἐστι· τοῖς δὲ πολυσχιδέσιν ὑπάρχουσιν ἕτεραι βοήθειαι. δέδωκε γὰρ ἡ φύσις τοῖς μὲν ὄνυχας, τοῖς δὲ ὀδόντας μαχητικούς, τοῖς δ' ἄλλο τι μόριον ἱκανὸν ἀμύνασθαι. τῶν δὲ διχηλῶν τὰ μὲν πολλὰ κέρατα ἔχει πρὸς ἀλκήν, καὶ τῶν μωνύχων ἔνια· τὰ δὲ καὶ πρὸς βοήθειαν.

A Spirandi etiam vſus non communis omnibus eſt. At verò natura hæc omnia eôdem coniecit, adhibita differentia eius partis pro actionis diſcrimine. Sunt enim alia ore compreſſiori, alia ampliori. Quibus enim cibi conficiendi, & ſpirandi, & loquendi gratia os datum eſt, iis compreſſius eſt: quibus auxilij gratia, iis ſi dentibus ſunt ſerratis, reſciſſum. Cùm enim tota eorum vis in mordendo ſit, hiatum oris ampliorem eſſe neceſſe eſt. Eo nanque pluribus, & pleniùs morſum infigent, quo ampliùs reſciſſum os ſit. Piſcium etiam mordacibus, & carniuoris tale os eſt: non carniuoris in arctum ſe colligit. Tale enim os vtile iis eſt, illud inutile. Auibus os,
B quod roſtrum vocatur: hoc enim pro labris & dentibus habent, ſed variè pro vſu, & auxilio. Quæ enim aduncis vnguibus ſunt, quoniam carne viuunt, & nullo fructu veſcuntur, roſtrum omnia habent aduncum: tale enim tum ad retinendum, tum verò ad vim inferendam commodius atque aptius eſt. Vis autem in hoc, & in vnguibus ſita eſt. Vnde fit vt vngues etiam habeant aduncìores. Cæterarum auium roſtrum vtile ad victum cuiuſque eſt. Verbi gratia, roboriſeci generis, & coruini, robuſtum atque prædurũ os eſt: minuti generis lautum, ad terræ fructus colligendos, & ad beſtiolas capiendas idoneum. Quæ autem herbis viuunt, quæque apud paludes victitãt,
C vt nantes, & palmipedes, partim alio quodam modo roſtri commoditatem obtinent, partim latitudine roſtri ſibi ſufficiunt: quippe quæ roſtro eiuſmodi infodere poſſint: quale inter quadrupedes, etiam ſuis eſt: nam is quoque radicum appetens eſt. Quinetiam aues, quæ lato ſunt roſtro, radiceſque eſitant, & reliquarum victus ſimilis non nullæ, ſerratum roſtri extremum habent: ita enim herbarum carptus, quo viuunt, facilius agitur. Sed cæteras capitis partes omnes ferè expoſuimus. Proſopum autem, id eſt, facies, quod inter caput & collum hominis eſt, nomen à re ipſa accepiſſe videtur. Quòd enim vnus animalium homo erectus eſt, ſolus proſpicit anteuerſus, vocémque anteuerſus mittit.
D

CAPVT II.

De cornuum conſtitutione, & quæ animalia habeant cornua, quæ item iis careant.

De cornibus differendum eſt: hæc enim capiti innituntur, quocunque in genere eſſe poſſunt. Carent iis omnia, quæ non viuipara ſint. Cornua vel aliis quibuſdã ineſſe dicimus, ſed per ſimilitudinem, & tranſlationem, cùm nullum ex iis cornu officio fungatur. Gerunt enim, quæ animal pariunt, cornua ad vim aut inferendam, aut
E depellendam: quod nulli ex cæteris quæ cornua habere dicuntur, contingit. Nullum enim vtitur cornibus, vel ad conuincendum, vel ad defendendum: quę viriũ ſunt officia. Quæ igitur pedes multifidos habẽt, cornu omnia carent: cuius rei cauſa eſt, quòd cornu auxilij gratia habetur. Multifidis autem non deſunt alia auxilia. Dedit enim natura aliis vngues, aliis dentes pugnaces, aliis partem aliam, qua ſeſe tueri atque defendere poſſent. At verò biſulcorum pars maior cornua gerit, & ſolipedum nonnulla, ad vim inferendam: quædam etiam ad defendendum.

Quibus autem cornua natura non dedit, eorum ſaluti præſidiis conſuluit aliis: vt pernicitate cõrporis equis opitulata eſt, magnitudine camelis: magnitudinis enim exuperantia ſufficit ad necem arcendam, quod camelis contingit: atque etiam meliùs elephantis. Quædam etiam dente exerto armantur in genere biſulco, vt ſues. Quibus autem cornua præ nimio exceſſu ſuperuacua ſunt, iis alterum auxilium natura adhibuit: vt ceruis velocitatem. Grandis enim illa, & multifida cornuum magnitudo, potiùs obeſt quàm prodeſt. Bubalis etiam capreiſque interdum cornua inutilia ſunt: nam etſi contra nonnulla reſiſtunt, & cornibus ſe defendunt, tamen feroces pugnaceſque belluas fugiunt. Bonaſis (nam ijs quoque pari aduncitate cornua reflexa inter ſe orbem colligunt) excrementi profuſionem natura pro auxilio dedit: hoc enim cùm metuunt, ſe tuentur. Hac eadem profuſione alia quoque ſeruari certum eſt. Plura autem auxilia ſimul, quorum ſingula ſatis eſſent, nulli natura tribuit. Cornigerorum pars maxima biſulca eſt. Sed ſolipes etiam traditur in eo genere, quem aſinum Indicum vocant. Maxima animalium pars, vt corpus dextro ſiniſtróque, quibus ſe mouent, diſtinguitur: ſic etiam cornua bina eadem illa de cauſa gerit naturæ ingenio. Sed ſunt etiam quæ cornu ſingulari armentur, vt oryx, & quem aſinum Indicum appellari diximus. Oryx biſulcum: aſinus ille ſolipes eſt. Gerunt ſanè medio ſui capitis cornu fixum ea quæ vnum habent. Sic enim maximè pars vtraque cornu obtinebit, cùm medium commune pariter vtrique extremo ſit. Solipes potiùs quàm biſulcum eſſe vnicorne rectè videri poteſt. Vngula enim tam ſolida quàm biſulca eandem naturam habet quam cornu. Itaque eiſdem ſimul & vngulam findi, & cornu congruum eſt. Fiſſio etiam vngulæ & cornu ex defectu naturæ euenit. Itaque cùm exuperantiam vngulæ ſolipedum natura dediſſet, rectè dempſit supernè, fecitque vnicorne. Rectè etiam capiti cornua mandauit, nec, vt Æſopi Momus vitio dat, quòd taurus non in armis cornua gerat, vnde ferire vehementiùs poſſit, ſed capite, parte corporis imbecillima. Non enim ingenio perſpicaci ille Momus hæc deprehendit. Vt enim ſi in alia quauis parte cornua haberentur, fruſtra ponderi eſſent, nulla in re vtilia, multa etiam officia impedirent: ſic armis quoque infixa ſedem omnino ineptam tenerent. Non ſolùm enim vnde ictus fiant vehementiores conſiderandum eſt, ſed etiam vnde remotiores: itaque cùm careant manibus, & nec pedibus imis affixa gerere poſſint, neque genib. (flexus enim impediretur) capite gerant, neceſſe eſt, quemadmodum à natura conſtitutum eſt. Quinetiam ad cæteras corporis motiones, ita maximè geri ſine vllo impedimento poſſunt. Ceruis duntaxat cornua tota ſolida, & decidua, tum vtilitatis cauſa, vt onere leuentur, tum ex neceſſitate præ pondere. Cæteris aliquatenus caua, & mucrone demum concreta ſunt, quoniam ad ictus hoc ſit commodius: ſed ne pars caua debilis ſit, quà cuti annectitur, ſolidum quiddam oſſib. exortum ingreditur eam, impletque totam. Sic enim ſita compactáque, & ad vim inferendam commodiſſima, & ad reliquæ vitæ munera inoffenſiſſima habentur. Sed cuiuſnam gratia natura cornuum ſit, & quam ob cauſam aliis data, aliis negata ſit, expoſitum eſt.

Ὅσοις δὲ μὴ δέδωκεν ἡ φύσις ἄλλην ἀλκὴν πρὸς σωτηρίαν, οἷον ταχυτῆτα σώματος, καθάπερ τοῖς ἵπποις βεβοήθηκεν ἢ μέγεθος, ὥσπερ καὶ ταῖς καμήλοις [καὶ γὰρ μεγέθους ὑπερβολὴ τὴν ἀπὸ τῶν ἄλλων ζῴων φθορὰν ἱκανὴ κωλύειν· ὅπερ συμβέβηκε ταῖς καμήλοις] ἔτι δὲ μᾶλλον τοῖς ἐλέφασι. τὰ δὲ χαυλιόδοντα, ὥσπερ καὶ τὸ τῶν ὑῶν γένος, διχηλὸν ὄν. ὅσοις δ' ἄχρηστος πέφυκεν ἡ τῶν κεράτων ἐξοχὴ, τούτοις προσέθηκεν ἑτέραν βοήθειαν ἡ φύσις· οἷον * τοῖς μὲν ἐλάφοις τάχος. τὸ γὰρ μέγεθος αὐτῶν, καὶ τὸ πολυσχιδὲς, βλάπτει μᾶλλον ἢ ὠφελεῖ. καὶ βουβάλοις δὲ καὶ δορκάσι· πρὸς ἔνια μὲν γὰρ ἀνθίστανται τοῖς κέρασιν ἀμύνονται, τὰ δὲ θηριώδη καὶ μάχιμα ἀποφεύγουσι. τοῖς δὲ * βονάσοις (καὶ γὰρ τούτοις γαμψὰ τὰ κέρατα πέφυκε πρὸς ἄλληλα) * τὴν τοῦ περιττώματος ἄφεσιν. τούτῳ γὰρ ἀμύνεται φοβηθέντα· καὶ ταύτῃ δὲ τῇ περιττώσει σώζεταί τινα ἕτερα. ἅμα δ' ἱκανὰς καὶ πλείους βοηθείας οὐ δέδωκεν ἡ φύσις τοῖς αὐτοῖς. ἔστι δὲ τὰ πλεῖστα τῶν κερατοφόρων διχηλά. λέγεται δὲ καὶ μώνυχον, ὃν καλοῦσιν Ἰνδικὸν ὄνον. τὰ μὲν οὖν πλεῖστα, καθάπερ τὸ σῶμα διῄρηται τῶν ζῴων, οἷς ποιεῖται τὴν κίνησιν, δεξιῷ καὶ ἀριστερῷ, καὶ κέρατα δύο πέφυκεν ἔχειν, διὰ ταύτην τὴν αἰτίαν. ἔστι δὲ καὶ μονοκέρατα ἔνια, οἷον ὄρυξ καὶ ὁ Ἰνδικὸς καλούμενος ὄνος. ἔστι δ' ὁ μὲν ὄρυξ διχηλὸν, ὁ δ' ὄνος μώνυχον. ἔχει δὲ τὰ μονοκέρατα τὸ κέρας ἐν τῷ μέσῳ τῆς κεφαλῆς. οὕτω γὰρ ἑκάτερον τῶν μερῶν μάλιστ' ἂν ἔχοι κέρας ἕν. τὸ γὰρ μέσον ὁμοίως κοινὸν ἀμφοτέρων τῶν ἐσχάτων. εὐλόγως δ' ἂν δόξειεν εἶναι μονόκερων τὸ μώνυχον τοῦ διχηλοῦ μᾶλλον. ὁπλὴ γὰρ καὶ χηλὴ τὴν αὐτὴν ἔχει κέρατι φύσιν. ὥσθ' ἅμα καὶ τοῖς αὐτοῖς ἡ σχίσις γίνεται τῶν ὁπλῶν καὶ τῶν κεράτων. ἔτι δ' ἡ σχίσις καὶ τὸ διχηλὸν κατ' ἔνδειαν τῆς φύσεώς ἐστιν, ὥστ' εὐλόγως τοῖς μώνυξιν ἐν ταῖς ὁπλαῖς δοῦσα τὴν ὑπεροχὴν ἡ φύσις, ἄνωθεν ἀφεῖλε, καὶ μονόκερω ἐποίησεν. ὀρθῶς δὲ καὶ τὸ ἐπὶ τῆς κεφαλῆς ποιῆσαι τὴν τῶν κεράτων φύσιν, ἀλλὰ μὴ καθάπερ ὁ Αἰσώπου Μῶμος διαμέμφεται τὸν ταῦρον, ὅτι οὐκ ἐπὶ τοῖς ὤμοις ἔχει τὰ κέρατα, ὅθεν τὰς πληγὰς ἐποιεῖτ' ἂν ἰσχυροτάτας, ἀλλ' ἐπὶ τοῦ ἀσθενεστάτου μέρους τῆς κεφαλῆς. οὐ γὰρ ὀξὺ βλέπων ὁ Μῶμος, ταύτῃ ἐπετίμα. ὥσπερ γὰρ καὶ εἰ ἑτέρωθί που τοῦ σώματος κέρατα ἐπεφύκει, βάρος ἂν παρεῖχε, καὶ ἄλλως οὐδὲν ὄντα χρήσιμα, κἂν ἐμπόδιζε πρὸς πολλὰ τῶν ἔργων πολλοῖς ἦν, οὕτως καὶ ἐπὶ τῶν ὤμων πεφυκότα. οὐ γὰρ μόνον χρὴ σκοπεῖν πόθεν ἰσχυρότεραι αἱ πληγαὶ, ἀλλὰ καὶ πόθεν πορρώτεραι. ὥστ' ἐπεὶ καὶ χεῖρας μὲν οὐκ ἔχουσιν, ἐπὶ δὲ τῶν ποδῶν ἀδύνατον, ἐν δὲ τοῖς γόνασιν εἴπερ ἦν, τὴν κάμψιν ἐκώλυεν, ἀναγκαῖον ὥσπερ ἔχουσιν, ἐπὶ τῆς κεφαλῆς ἔχειν. ἅμα δὲ καὶ πρὸς τὰς ἄλλας κινήσεις τοῦ σώματος ἀνεμποδίστως πέφυκεν οὕτω μάλιστα. ἔστι δὲ τὰ κέρατα δι' ὅλου στερεὰ τοῖς ἐλάφοις μόνοις, καὶ ἀποβάλλει μόνον, ἕνεκεν μὲν ὠφελείας κουφιζόμενον, ἐξ ἀνάγκης δὲ διὰ τὸ βάρος. τῶν δὲ ἄλλων τὰ κέρατα μέχρι τινὸς κοῖλα, τὰ δ' ἄκρα στερεὰ, διὰ τὸ πρὸς τὰς πληγὰς τοῦτ' εἶναι χρήσιμον. ὅπως δὲ μηδὲ τὸ κοῖλον ἀσθενὲς ᾖ, ἐκ τοῦ δέρματος πέφυκεν, ἐν τούτῳ δ' ἐναρμόζεται στερεὸν ἐκ τῶν ὀστῶν. οὕτω γὰρ καὶ τὰ κέρατα ἔχοντα πρὸς ἀλκὴν χρησιμώτατα, καὶ πρὸς τὸν ἄλλον βίον ἀνοχλότατα. τίνος μὲν οὖν ἕνεκεν ἡ τῶν κεράτων φύσις, εἴρηται, καὶ διὰ τίν' αἰτίαν τὰ μὲν ἔχει ταῦτα, τὰ δ' οὐκ ἔχει.

* γρ. τοῖς μ.

* γρ. βονάσοις; in Hiſtor.

* Hiſtor. lib. 9. c. 45.

πῶς δὲ τῆς ἀναγκαίας φύσεως ἐχούσης τοῖς ὑπάρχουσιν ἐξ ἀνάγκης, ἡ κατὰ τὸν λόγον φύσις ἕνεκά του καταχρῆται, λέγωμεν. πρῶτον μὲν οὖν τὸ σωματῶδες καὶ γεῶδες πλεῖον ὑπάρχει τοῖς μείζοσι τῶν ζῴων. κερατοφόρον δὲ μικρὸν πάμπαν οὐδὲν ἴσμεν. ἐλάχιστον γάρ ἐστι τῶν γνωριζομένων δορκάς. δεῖ δὲ τὴν φύσιν θεωρεῖν εἰς τὰ πολλὰ βλέποντα. ἢ γὰρ ἐν πᾶσιν, ἢ ὡς ἐπὶ τὸ πολὺ κατὰ φύσιν. τὸ δὲ ὀστῶδες, ἐν τοῖς σώμασι τῶν ζῴων γεῶδες ὑπάρχει· διὸ καὶ πλεῖστον ἐν τοῖς μεγίστοις, ὡς ἐπὶ τὸ πολὺ βλέψαντας εἰπεῖν. τὴν γεώδη τοιούτου σώματος περιττωματικὴν ὑπερβολὴν ἐν τοῖς μείζοσι τῶν ζῴων ὑπαρχοῦσαν, ἐπὶ βοήθειαν καὶ τὸ συμφέρον καταχρῆται ἡ φύσις, καὶ τὴν ῥέουσαν ἐξ ἀνάγκης εἰς τὸν ἄνω τόπον, τοῖς μὲν εἰς ὀδόντας καὶ χαυλιόδοντας ἀπένειμε, τοῖς δ' εἰς κέρατα. διὸ τῶν κερατοφόρων οὐδέν ἐστιν ἀμφώδουν. οὐ γὰρ ἔχει τοὺς προσθίους ὀδόντας. ἀφελοῦσα γὰρ ἡ φύσις ἐντεῦθεν, τοῖς κέρασι προσέθηκε. καὶ ἡ διδομένη τροφὴ εἰς τοὺς ὀδόντας τούτοις, εἰς τὴν τῶν κεράτων αὔξησιν ἀναλίσκεται. τοῦ δὲ τὰς θηλείας ἐλάφους κέρατα μὲν μὴ ἔχειν, περὶ δὲ τοὺς ὀδόντας ὁμοίως τοῖς ἄρρεσιν, αἴτιον τὸ τὴν φύσιν εἶναι ἀμφοῖν κερατοφόρον. ἀφῄρηνται δὲ τὰ κέρατα αἱ θήλειαι, διὰ τὸ χρήσιμα μὲν μὴ εἶναι, μηδὲ τοῖς ἄρρεσιν, ἧττον δὲ βλάπτεσθαι διὰ τὴν ἰσχύν. τῶν δ' ἄλλων ζῴων ὅσοις μὴ εἰς κέρατα ἀποκρίνεται τὸ τοιοῦτον μόριον τοῦ σώματος, ἐνίοις μὲν τῶν ὀδόντων αὐτῶν ἐπηύξησε τὸ μέγεθος κοινῇ πάντων· ἐνίοις δὲ χαυλιόδοντας, ὥσπερ κέρατα, ἐκ τῶν γνάθων ἐποίησε. περὶ μὲν οὖν τῶν ἐν τῇ κεφαλῇ μορίων ταύτῃ διωρίσθω.

A Nunc quemadmodum natura ſe habente neceſſaria rebus ſubiectis, neceſſariò natura ratiocinaria alicuius gratia abutatur, differendum eſt. Primò igitur plus corpulenti terreníque in animalibus grandioribus ineſt. Cornigerum autem nullum admodum paruum eſſe nouimus: omnium enim quæ explorata habemus, minimum caprea eſt. Natura verò contemplanda reſpectu plurium eſt: aut enim omni ex parte aut magna ex parte conſtat, quod ſecundùm naturam ſit. Os autem omne, & quicquid ſpeciem gerit oſſis, terrenum eſt: quam ob rem plurimum id eſſe propè dixerim in maximis, partis maioris contemplatione. Corporis igitur eiuſmodi excrementi exuperantia B in maioribus habita animalibus natura ad auxilium & rem abvtitur commodam: itaque quantum excrementi eius ad locum ſuperiorem efferatur, aliis in dentes, vel continuos, vel exertos diſtribuit, aliis in cornua. Quamobrem cornigerorum nullum vtrinque dentatum eſt. ſupernè enim primores dentes non habent: quippe cùm natura hinc adimendo addiderit cornibus: & alimentum, quod in eos dentes digeratur, in cornuum incrementum abſumitur. Cur ceruæ cornibus careant, cùm dentes ſimiliter habeant, atque mares, cauſa eſt, quòd eadem ſexus vtriuſque natura, & cornigera eſt: ſed fœminis adempta ſunt cornua, quoniam C ne maribus quidem vtilia ſint: ſed virium meliorum beneficio, mares minùs offenduntur. Cæteris animalibus, quibus hæc materia non in cornua ſecedit, aut dentium ipſorum magnitudinem communi omnium incremento natura auxit, aut dentes exertos, velvti cornua, è maxillis produxit. Sed de partibus capitis hactenus.

ΚΕΦΑΛ. γʹ.

Περὶ αὐχένος, καὶ τοῦ φάρυγγος, καὶ τῆς ἀρτηρίας καὶ τῆς τούτων ἐν τῷ σώματι τῶν ζῴων ὑπηρεσίας.

Historiar. lib. 2. cap. 12.

Ὑπὸ δὲ τὴν κεφαλὴν ὁ αὐχὴν πέφυκεν εἶναι τοῖς ἔχουσιν αὐχένα τῶν ζῴων. οὐ γὰρ πάντα τοῦτο τὸ μόριον ἔχει, ἀλλὰ πάντα τὰ ἔχοντα ὧν χάριν ὁ αὐχὴν πέφυκε. ταῦτα δ' ἐστὶν ὅ,τε φάρυγξ, καὶ ὁ καλούμενος οἰσοφάγος. ὁ μὲν οὖν φάρυγξ τοῦ πνεύματος ἕνεκα. διὰ τούτου γὰρ εἰσάγεται τὰ ζῷα τὸ πνεῦμα, καὶ ἐκπέμπει ἀναπνέοντα. διὸ τοῦτο τὰ μὴ ἔχοντα πνεύμονα, οὐκ ἔχουσιν οὐδ' αὐχένα, οἷον τὸ τῶν ἰχθύων γένος. ὁ δὲ οἰσοφάγος, ἐστὶ δι' οὗ ἡ τροφὴ πορεύεται εἰς τὴν κοιλίαν· ὥσθ' ὅσα μὴ ἔχει αὐχένα, οὐδ' οἰσοφάγον ἔχουσιν ἐπιδήλως. οὐκ ἀναγκαῖον δ' ἔχειν τὸν οἰσοφάγον τῆς τροφῆς ἕνεκεν. οὐδὲν γὰρ παρασκευάζει πρὸς αὐτήν. ἔτι δὲ μετὰ τὴν τοῦ στόματος θέσιν, ἐνδέχεται κεῖσθαι τὴν κοιλίαν εὐθέως· τὸν δὲ πνεύμονα οὐκ ἐνδέχεται. δεῖ γὰρ εἶναι τινὰ κοινόν, οἷον αὐλόν, δι' οὗ μερίζεται τὸ πνεῦμα κατὰ τὰς ἀρτηρίας εἰς* τὰς σύριγγας, διμερὴς ὤν.* καὶ κάλλιστα ἂν οὕτως ἀποτελῇ τὴν ἀναπνοὴν καὶ ἐκπνοήν. τοῦ δὲ ὀργάνου τοῦ περὶ τὴν ἀναπνοὴν, ἐξ ἀνάγκης ἔχοντος μῆκος, ἀναγκαῖον τὸν οἰσοφάγον εἶναι μεταξὺ τοῦ στόματος καὶ τῆς κοιλίας. ἔστι δὲ ὁ μὲν οἰσοφάγος σαρκώδης, ἔχων νευρώδη τάσιν. νευρώδη μέν, ὅπως ἔχῃ διάτασιν, εἰσιούσης τῆς τροφῆς· σαρκώδη δέ, ὅπως μαλακὸς ᾖ καὶ ἐνδιδῷ, καὶ μὴ βλάπτηται τραχυνόμενος ὑπὸ τῶν καταπινομένων. ἡ δὲ καλουμένη φάρυγξ καὶ ἀρτηρία συνέστηκεν ἐν χονδρώδει σώματι. οὐ γὰρ μόνον ἀναπνοῆς ἕνεκέν ἐστιν, ἀλλὰ καὶ φωνῆς. δεῖ δὲ τὸ ψοφῆσον μέλλον, λεῖον εἶναι, καὶ στερεότητα ἔχειν.

* γρ. & μάλιστα ἂν οὕτως ἀποτελῇ τὴν πνοήν.

CAPVT III.

De collo, gula, & arteria, & earum officiis in corpore animantium.

COllum capiti ſubiacet iis quæ id habent, animalibus. Non enim omnia habent, ſed ea tantùm quibus ſunt partes illæ, quarum gratia D collum conditum eſt: hoc eſt, guttur & quæ gula vocatur. Guttur ſpiritus cauſa datum eſt: hoc enim ſpiritum animalia trahunt, & reddunt, reſpirando & expirando. Quam ob rem, quæ carent pulmone, collo etiam carent, vt genus piſcium. Gula eſt, qua cibus & potus deuoratur: itaque ea quæ carent collo, gulam hæc manifeſtam non habent, nec gulam haberi cibi cauſa neceſſe eſt: nihil enim ad cibum parat. Et quidem à ſitu oris continuò venter eſſe poteſt, pulmo non poteſt. Aliquem enim quaſi tractum conuallis adeſſe communem oportet, quo ſpiritum ad fiſtulas per arterias digerat bipartitus: atque ita efficere ſpiritus reciprocatio- E nem maximè poteſt. Cùm igitur inſtrumentum ſpirationi accommodatum, longitudinem habeat neceſſe ſit, gulam inter os & ventrem haberi neceſſe eſt. Conſtat gula ex neruo & carne. Ex neruo, vt extendi poſſit, cùm cibus ingeritur: ex carne, vt mollis ſit, & cedat, nec lædatur aſperitate cibi deſcendentis. Guttur autem, quod & arteria vocatur, corpore conſtat cartilagi-noſo: non ſolùm enim ſpirandi cauſa eſt, ſed etiam vocis: quod autẽ ſonet, leue ac ſolidũ eſſe oportet.

A Ante gulam arteria poſita eſt, quanquam impedimento ſit, cùm cibus ingeritur. Nam ſi quid vel cibi vel potus in arteriam dilabitur, ſtrangulationes, tormina, & tuſſes grauiſſimæ incitantur. Quã ob rem non audiendi ſunt qui hac potum meare dicant. Accidunt enim apertè, quæ modò dixi, omnibus, quoties aliquid cibi dilapſum eſt. Profectò opinionem eorum qui potum hac admitti exiſtimant, irridendam eſſe plura oſtendunt. Meatus enim nullus de pulmone ad ventrem pertinet, ſicut ex ore gulam tendere cernimus: quinetiam per vomitum & nauſeam, vndenã humor remeet, incertum non eſt. Adhæc humorẽ non continuò colligi in veſicam, ſed priùs in vẽtrem, certum eſt. B Excrementa enim alui tingi videntur fæce vini atri: vulnere etiam ventris ſæpe hoc idem patefactum eſt. Sed enim ſtultas opiniones admodum ſcrutari, ſtultum fortaſſe eſt. Arteria verò, quòd exterior, vt diximus, poſita eſt, à cibo infeſtatur. Attamen natura ad hoc molita eſt minorem linguam, ſiue lingulam, quæ arteriam operiret. Non omnia viuipara eam obtinent, ſed ea tantùm quibus pulmo, & cutis pilo intecta, non cortex, non penna opertimento eſt. Corticatis enim pennatíſque, guttur, vice lingulæ operientis ipſum, contrahitur, & diducitur: quemadmodum illis operitur aliunde, & aperitur: videlicet ſpiritui trahen- C do reddendóve apetitur, cibo ingerẽdo operitur, nequid illabatur. Quòd ſi quid erroris in eo motu committitur, vel deerrante cibo in alienum tramitem, vel reſpiratione præueniente, tuſſes ſtrangulationéſque excitantur, vt dictum eſt. Tam verò ſolerti ingenio motus, & lingulæ, & linguæ adhibitus à natura eſt, vt cibus neque in ore, cùm molitur, cadat ſub dentes, neque, cũ per fauces meat, in arteriam labatur. Carent animalia, quæ modò diximus, lingula, quoniam & carne ſicca, & cute conſtant prædura: non enim facilè moueri membrum id poſſet, ſi ex tali genere carnis cutíſque conſtaret, ſed extrema ipſius arteriæ citiùs com- D primerentur, quàm lingula: quam animalia pilo prædita habent ex ſua carne. Hæc dixiſſe ſatis eſt, quam ob cauſam animalium alia lingulam habeant, alia careant: & quemadmodum natura vitio ſitus arteriæ remedium lingulam emolita adhibuerit. Guttur autem ante gulam neceſſariò poſitum eſt. Cor enim in parte priori, atque in medio ſitum eſt: in quo principium vitæ, omníſque motus & ſenſus eſſe cenſemus. Etenim partem verſus, quam priorem appellamus, tum ſenſus tum etiam motus agitur. Hac enim ipſa ratione pars prior & poſterior ſtatuenda eſt. Pulmo eandem quam cor, obtinet ſedem, idque ample- E ctitur. Spiratio tum propter pulmonem tum propter originem cordi inditam agitur. Attrahitur & redditur aër per arteriam. Itaque quum in parte priori cor primùm collocari neceſſe ſit, arteriã quoque & guttur conſtitui ante gulam neceſſe eſt: hæc enim ad pulmonem & cor tendunt, gula ad ventrem. Denique quod melius & nobilius eſt, id ſemper (niſi quid maius impedit) ſuperioris inferioriſque ratione ſuperius collocatur: prioris poſterioriſque, prius: dextri ſiniſtrique, dextrum. Sed de collo, gula, & de arteria dictum iam eſt.

A κεῖται δὲ ἔμπροσθεν τοῦ οἰσοφάγου ἡ ἀρτηρία, καίπερ ἐμποδίζουσα αὐτὸν περὶ τὴν ὑποδοχὴν τῆς τροφῆς. ἐὰν γάρ τι παρεισρυῇ ξηρὸν ἢ ὑγρὸν εἰς τὴν ἀρτηρίαν, πνιγμοὺς καὶ πόνους καὶ βῆχας χαλεπὰς ἐμποιεῖ. * ὃ δὴ καὶ θαυμάσειεν ἄν τις τῶν λεγόντων, ὡς ταύτῃ τὸ ποτὸν δέχεται τὸ ζῷον. συμβαίνει γὰρ φανερῶς τὰ λεχθέντα πᾶσιν, οἷς ἂν παρεισρυῇ τι τῆς τροφῆς. * πολλαχοῦ δὲ γελοῖον φαίνεται τὸ λέγειν ὡς ταύτῃ τὸ ποτὸν εἰσδέχεται τὰ ζῷα. πόρος γὰρ οὐδείς ἐστιν εἰς τὴν κοιλίαν ἀπὸ τοῦ πνεύμονος, ὥσπερ ἐκ τοῦ στόματος ὁρῶμεν τὸν οἰσοφάγον. ἔτι δὲ ἐν τοῖς ἐμέτοις καὶ ναυτίαις, οὐκ ἄδηλον πόθεν τὸ ὑγρὸν φαίνεται πορευόμενον. B δῆλον δὲ καὶ ὅτι οὐκ εὐθέως εἰς τὴν κύστιν συνάγεται τὸ ὑγρόν, ἀλλ᾽ εἰς τὴν κοιλίαν πρότερον. τὰ γὰρ τῆς κοιλίας περιττώματα, φαίνεται χρωματίζειν ἡ ἰλὺς τοῦ μέλανος οἴνου. συμβέβηκε δὲ τοῦτο πολλάκις φανερὸν καὶ ἐπὶ τῶν εἰς τὴν κοιλίαν τραυμάτων. ἀλλὰ γὰρ εὔηθες, τὸ τοὺς εὐήθεις τῶν λόγων λίαν ἐξετάζειν. ἡ δ᾽ ἀρτηρία, διὰ τὸ κεῖσθαι (καθάπερ εἴπομεν) ἐν τῷ πρόσθεν, ὑπὸ τῆς τροφῆς ἐνοχλεῖται. ἀλλ᾽ ἡ φύσις πρὸς τοῦτο μεμηχάνηται τὴν ἐπιγλωττίδα. ταύτην δὲ οὐκ ἔχουσιν ἅπαντα τὰ ζῳοτοκοῦντα, ἀλλ᾽ ὅσα πνεύμονα ἔχει, καὶ τὸ δέρμα τριχωτόν, καὶ μὴ φολιδωτά, μηδὲ πτερωτά. πέφυ- C κε δὲ τούτοις ἀντὶ τῆς ἐπιγλωττίδος συνάγεσθαι καὶ διΐστασθαι ὁ φάρυγξ, ὥσπερ ἐπ᾽ ἐκείνοις ἐπιβάλλει τε καὶ ἀναπτύσσεται τῇ εἰσόδῳ τοῦ πνεύματος καὶ τῇ ἐξόδῳ ἀναπτυσσόμενος, τῆς δὲ τροφῆς εἰσιούσης ἐπιπτυσσόμενος, ἵνα μηδὲν παρεισρυῇ παρὰ τὴν ἀρτηρίαν. ἐὰν δέ τι πλημμεληθῇ περὶ τὴν τοιαύτην κίνησιν, καὶ προσφερομένης τῆς τροφῆς ἀναπνεύσῃ τις, βῆχας καὶ πνιγμοὺς ποιεῖ, καθάπερ εἴρηται. οὕτω δὲ καλῶς μεμηχάνηται καὶ ἡ ταύτης καὶ ἡ τῆς γλώττης κίνησις· ὥστε τῆς τροφῆς ἐν μὲν τῷ στόματι λεαινομένης, περὶ αὐτὴν δὲ διιούσης, τὴν μὲν ὀλιγάκις ὑπὸ τοὺς ὀδόντας πίπτειν, εἰς δὲ τὴν ἀρτηρίαν σπάνιόν τι παρεισρρεῖν. οὐκ ἔχει δὲ τὰ D λεχθέντα ζῷα τὴν ἐπιγλωττίδα, διὰ τὸ σκληρὰς εἶναι τὰς σάρκας αὐτῶν, καὶ τὸ δέρμα σκληρόν. ὥστε οὐκ ἂν εὐκίνητον ἦν τὸ τοιοῦτον μόριον αὐτοῖς, ἐκ τοιαύτης σαρκὸς καὶ ἐκ τοιούτου δέρματος συνεστηκός, ἀλλ᾽ αὐτῆς τῆς ἀρτηρίας τῶν ἐσχάτων, θᾶττον γίνοιτ᾽ ἂν ἡ συναγωγὴ τῆς ἐκ τῆς οἰκείας σαρκὸς ἐπιγλωττίδος, ἣν ἔχουσι τὰ τετριχωμένα. δι᾽ ἣν μὲν οὖν αἰτίαν τὰ μὲν ἔχει τῶν ζῴων, τὰ δ᾽ οὐκ ἔχει, ταῦτ᾽ εἰρήσθω, καὶ διότι τῆς ἀρτηρίας τὴν φαυλότητα ἰάτρευκεν ἡ φύσις, μηχανησαμένη τὴν καλουμένην ἐπιγλωττίδα. κεῖται δ᾽ ἔμπροσθεν ἡ φάρυγξ τοῦ οἰσοφάγου ἐξ ἀνάγκης. ἡ μὲν γὰρ καρδία ἐν τοῖς ἔμπροσθεν, καὶ ἐν μέσῳ κεῖται, ἐν ᾗ τὴν ἀρ- E χήν φαμεν τῆς ζωῆς καὶ πάσης κινήσεως καὶ αἰσθήσεως. ἐπὶ τὸ καλούμενον γὰρ ἔμπροσθεν, ἡ αἴσθησις καὶ ἡ κίνησις. αὐτὸ γὰρ διώρισται τῷ λόγῳ τούτῳ τὸ ἔμπροσθεν καὶ ὄπισθεν. ὁ δὲ πνεύμων κεῖται οὗ ἡ καρδία, καὶ περὶ ταύτην. ἡ δὲ ἀναπνοή, διά τε τοῦτο καὶ διὰ τὴν ἀρχὴν τὴν ἐν τῇ καρδίᾳ ἐνυπάρχουσαν. ἡ δὲ ἀναπνοὴ γὰρ τοῖς ζῴοις διὰ τῆς ἀρτηρίας. ὥστ᾽ ἐπεὶ τὴν καρδίαν ἐν τοῖς ἔμπροσθεν πρώτην ἀναγκαῖον κεῖσθαι, καὶ τὸν φάρυγγα καὶ τὴν ἀρτηρίαν πρότερον ἀναγκαῖον κεῖσθαι τοῦ οἰσοφάγου. τὰ μὲν γὰρ πρὸς τὸν πνεύμονα τείνει καὶ τὴν καρδίαν, ὁ δ᾽ εἰς τὴν κοιλίαν. ὅλως δ᾽ ἀεὶ τὸ βέλτιον καὶ τιμιώτερον (ὅπου μηδὲν ἕτερον ἐμποδίζει) τοῦ μὲν ἄνω καὶ κάτω, ἐν τοῖς μᾶλλον ἐστὶν ἄνω· τοῦ δ᾽ ἔμπροσθεν καὶ ὄπισθεν, ἐν τοῖς ἔμπροσθεν· τοῦ δὲ δεξιοῦ καὶ ἀριστεροῦ, ἐν τοῖς δεξιοῖς. καὶ περὶ μὲν αὐχένος καὶ οἰσοφάγου καὶ ἀρτηρίας εἴρηται.

* Quidam, ...

* Malim, ... vel ...

A

ΚΕΦΑΛ. δ'.

Περὶ σπλάγχνων, καὶ πρῶτον περὶ καρδίας, ποία τίς, καὶ διὰ τὴν αἰτίαν τοῖς ἔχουσιν ὑπάρχει.

Ἑπόμενον δ' ἐστὶ περὶ σπλάγχνων εἰπεῖν. ταῦτα δ' ἐστὶν ἴδια τῶν ἐναίμων. καὶ τοῖς μὲν ὑπάρχει, τοῖς δ' οὐχ ὑπάρχει. τῶν δ' ἐναίμων οὐδὲν ἔχει σπλάγχνον. Δημόκριτος δὲ ἔοικεν οὐ καλῶς διαλαβεῖν περὶ αὐτῶν, εἴπερ ᾠήθη διὰ μικρότητα τῶν ἀναίμων ζώων, ἄδηλα εἶναι ταῦτα. συνισταμένων γὰρ εὐθέως τῶν ἐναίμων, καὶ B πάμπαν ὄντων μικρῶν, εὔδηλα γίνεται καρδία τε καὶ ἧπαρ. φαίνεται γὰρ ἐν μὲν τοῖς ᾠοῖς ἐνίοτε τριταίοις οὖσι, στιγμῆς ἔχοντα μέγεθος· πάμμικρα δὲ καὶ ἐν τοῖς ἐκβολίμοις τῶν ἐμβρύων. ἔτι δὲ ὥσπερ τῶν ἐκτὸς μορίων οὐ πᾶσι τῶν αὐτῶν χρῆσις, ἀλλ' ἑκάστοις* ἴδια πεπόρισται πρός τε τοὺς βίους καὶ τὰς κινήσεις, οὕτω καὶ τὰ ἐντὸς ἄλλα πέφυκεν ἄλλοις. τὰ δὲ σπλάγχνα τῶν αἱματικῶν ἐστὶν ἴδια. διὸ καὶ συνέστηκεν αὐτῶν ἕκαστον ἐξ αἱματικῆς ὕλης. δῆλον δ' ἐν τοῖς νεογνοῖς τούτων. αἱματωδέστερα δὲ καὶ μέγιστα κατὰ τὸν λόγον, διὰ τὸ εἶναι τὸ εἶδος τῆς ὕλης C καὶ τὸ πλῆθος ἐμφανέστατον κατὰ τὴν πρώτην σύστασιν. καρδία μὲν οὖν ἅπασιν ὑπάρχει τοῖς ἐναίμοις· δι' ἣν δ' αἰτίαν, εἴρηται καὶ πρότερον. αἷμα γὰρ ἔχειν τοῖς ἐναίμοις δῆλον ὡς ἀναγκαῖον. ὑγροῦ δὲ ὄντος τοῦ αἵματος, ἀναγκαῖον ἀγγεῖον ὑπάρχειν· ἐφ' ὃ δὴ καὶ φαίνεται μεμηχανῆσθαι πρὸς τὰς φλέβας ἡ φύσις. ἀρχὴν δὲ τούτων ἀναγκαῖον εἶναι μίαν. ὅπου γὰρ ἐνδέχεται, μίαν βέλτιον ἢ πολλάς. ἡ δὲ καρδία τῶν φλεβῶν ἀρχή. φαίνονται γὰρ ἐκ ταύτης οὖσαι, καὶ οὐ διὰ ταύτης. καὶ ἡ φύσις αὐτῆς φλεβώδης, ὡς ὁμογενοῦς οὔσης. ἔχει δὲ καὶ ἡ θέσις αὐτῆς ἀρχικὴν χώραν. περὶ τὸ μέσον γὰρ D μᾶλλον δ' ἐν τῷ ἄνω ἢ κάτω, καὶ ἔμπροσθεν ἢ ὄπισθεν. ἐν τοῖς γὰρ τιμιωτέροις τὸ τιμιώτερον καθίδρυκεν ἡ φύσις, εἰ μή τι κωλύει μεῖζον. ἐμφανέστατον δὲ τὸ λεχθὲν ἐστὶν ἐπὶ τῶν ἀνθρώπων. βούλεται δὲ καὶ ἐν τοῖς ἄλλοις ὁμοίως ἐν μέσῳ κεῖσθαι τοῦ ἀναγκαίου σώματος. τούτου δὲ πέρας, ᾗ τὰ περιττώματα ἀποκρίνεται. τὰ δὲ κῶλα πέφυκεν ἄλλοις ἄλλως, καὶ οὐκ ἔστι τῶν πρὸς τὸ ζῆν ἀναγκαίων. διὸ καὶ ἀφαιρουμένων, ζῶσι. δῆλον δ' ὡς οὐ προστιθέμενα φθείρει. οἱ δ' ἐν τῇ κεφαλῇ λέγοντες τὴν ἀρχὴν τῶν φλεβῶν, οὐκ ὀρθῶς ὑπέλαβον. πρῶτον μὲν E γὰρ πολλὰς ἀρχὰς καὶ διεσπασμένας ποιοῦσιν· εἶτ' ἐν τόπῳ ψυχρῷ. δηλοῖ δὲ δύσριγος ὤν· ὁ δὲ περὶ τὴν καρδίαν τοὐναντίον. ὥσπερ δὲ ἐλέχθη, διὰ μὲν τῶν ἄλλων σπλάγχνων διέχουσιν αἱ φλέβες· διὰ δὲ τῆς καρδίας, οὐδεμία διατείνει φλέψ. ὅθεν καὶ δῆλον, ὅτι ἀρχὴ τῶν φλεβῶν ἐστὶ καὶ μόριον ἡ καρδία. καὶ τοῦτ' εὐλόγως. μέσον γὰρ τὸ τῆς καρδίας ἐστὶ σῶμα πυκνὸν καὶ κοῖλον πεφυκός· ἔτι δὲ πλῆρες αἵματος, ὡς τῶν φλεβῶν ἐντεῦθεν *ἠρημένων· κοῖλον μὲν πρὸς τὴν ὑποδοχὴν τοῦ αἵματος· πυκνὸν δὲ, πρὸς τὸ φυλάττειν τὴν ἀρχὴν τῆς θερμότητος. ἐν ταύτῃ γὰρ μόνῃ τῶν σπλάγχνων καὶ τοῦ σώματος, αἷμα ἄνευ φλεβῶν ἐστί. τῶν δ' ἄλλων μορίων ἕκαστον ἐν ταῖς φλεψὶν ἔχει τὸ αἷμα. καὶ τοῦτο εὐλόγως. ἐκ τῆς καρδίας γὰρ ἐποχετεύεται εἰς τὰς φλέβας·

* κ. ἰδίᾳ

Historia. lib. 1. 17. lib. 2. 17. lib. 3. c. 3. & alibi.

* Scrib. ἠργμένων

CAPVT IV.

De corde, & eius qualitate, quámque ob cauſam animalibus iniunctum ſit.

SEquitur vt de viſceribus doceamus, quæ eorum ſanè propria ſunt, quæ ſanguinem habẽt: nulli enim exanguium animali viſcus vllum eſt, cùm ſanguineis omnia ſint. Itaque Democritus rectè de his tractaſſe videtur: ſiquidem incerta hæc eſſe putauit, præ exiguitate exanguium animalium. B Statim enim cum conſiſtunt, quæ ſanguinem habent, exiguáque admodum ſunt, depræhendi cor, & iecur ſine dubio poſſunt: quippe cùm in ouis triduò cubatis, puncti iam magnitudine appareant: necnon in partibus abortitiis perquam exigua cernuntur. Adhæc, vt exteriorum partium non idem vſus omnibus eſt, ſed quæque pro vita motúque vario ſibi peculiarem receperunt: ſic interiorum aliæ aliis accommodantur. Viſcera autem eorum peculiaria ſunt, quæ ſanguinem habent: quamobrem vnumquodque eorum ex materia ſanguinea conſtat: quod in nuper editis patet: ſunt enim cruentiora maioraque C ex ratione, quoniam in prima concretione, ſpecies copiaque materiæ euidentior eſt. Cor igitur omnibus ſanguine præditis ineſt: & quam ob cauſam, dictum & antehac eſt, & nunc dicemus. Sanguis enim neceſſariò ineſt in iis quæ ſanguinea ſunt: qui, cùm humidus ſit, conceptaculum ſibi habeat, neceſſe eſt. Ideóque venas natura emolita videtur, quarum vnum eſſe principium neceſſe eſt. Vbicunque enim fieri poteſt, vnum eſſe quàm plura, melius eſt. Cor autem, [illegible] principium eſt: ex hoc enim venæ, & p[illegible] ſe videntur. Natura etiam eius venoſa [illegible] te generis ſocietate iuncti cum venis, qu[illegible] ſitus eius ſedem obtinet principalem: in medio D enim poſitum eſt, ſed magis ſuperiùs, quàm inferiùs, & parti priori ammotius quàm poſteriori. Natura enim rem nobiliorem conſtituere in locis nobilioribus ſolet, niſi quid maius impediat. Cordis hunc eſſe locum latiſſimè in homine patet, ſed in cæteris quoque animalibus pari ratione tenere ſibi vult medium corporis neceſſarij: cuius ſanè exitus eſt, quà excrementa emittuntur. Crura autem aliis aliter adiuncta ſunt, nec ad vitam neceſſaria habentur: quamobrem iis demptis vita non tollitur, additis etiam, nullum ſequi interitum, certum eſt. Qui capiti venarum E originem tribuunt, non rectè opinantur: plura enim, diſperſáque principia faciunt, idque in loco frigido. Argumentum, quòd frigus hic locus vehementiùs ſentiat: contrà cordis locus calore abundat. Cúmque per cætera viſcera venæ tranſigant, nulla per cor tendit, vt dictum eſt. Itaque partem & principium venarum cor eſſe, apertum eſt, idque optima ratione. Medium enim cordis ſpiſſum cauúmque corpus eſt. Plenum etiam ſanguinis eſt, quaſi hinc venæ oriantur. Cauum eſt, vt contineat ſanguinem: ſpiſſum, vt principium caloris ſeruare poſſit. In hoc enim viſcerum, & partium omnium corporis, ſanguis ſine venis complectitur: cæteræ partes ſanguinem venis habent contentum, idque recta ratione. Sanguis enim ex corde ad venas quoque deriuatur.

At verò ad cor non aliunde deuenit: id enim origo prima, & fons ſanguinis eſt, aut cōceptaculum primum. Hæc ex conſectione animalium perſpici poſſunt, atque etiā ex generatione. Cor enim ſtatim omnium partium primum cōſiſtens, ſanguinolentum eſt. Motus etiam lætitiæ ac triſtitiæ, denique omnium ſenſuum hinc oriri, eodémque deſinere vidētur. Ratione quoque ita eſſe probatur. Principium enim vnum eſſe oportet, vbicunque fieri poteſt. Aptiſſimus autem omnium locorum medius eſt. Medium enim vnum eſt, & tale, vt vndique attingi, vel æquè vel proximè poſſit. Adhæc, cùm nec pars alia ſanguinea vlla, neque ſanguis ipſe vim habeat ſentiendi, quod primum ſanguinem habeat, id eſſe quod ſentiat, certum eſt. Habeat autem perinde ac vas, quod principium eſt, neceſſe eſt. Nec ratione tantùm ita eſſe probatur, verùm etiam ſenſu percipitur. Nam in partuum prima generatione, ſtatim cor palpitare cernitur, quaſi animal ſit, vt quod principium ſit naturæ eorum quæ ſanguinem habent. Argumentum vel inde deduci poteſt, quòd nullum animal ſanguinis compos careat corde: principium enim ſanguinis habeat, neceſſe eſt. Iecur etiam omnibus ſanguine præditis ineſt: ſed nemo id cenſuerit eſſe principium vel corporis totius, vel ſanguinis: ſitum enim nequaquam obtinet principalem: lienem verò ſibi habet aduerſum in iis quæ exquiſitiùs conſtent: nec verò ſanguinis conceptaculum modo cordis intra ſe continet: ſed vt reliquæ partes ſanguinem venis incluſum habet. Adhæc, vena per iecur tendit, nec vlla ex eo prouenit. Venæ enim omnes ex corde ſua initia trahunt. Itaque cùm alterutrum iſtorum principium eſſe neceſſe ſit, iecur autem non ſit, cor ſanguinis quoque principium eſſe, neceſſe eſt. Animal enim ſenſu definitur. Vis autem ſentiendi *primò illi tribuitur*, quod *primum* ſanguine præditum eſt. Tale autem cor eſt, quippe quod & origo ſanguinis ſit, & primum ſanguinem habeat. Extremum eius turbinatur in muctonem firmiſſimum. Situm in pectore eſt, & omnino parti priori corporis cōmiſſum, ne refrigeretur. Omnib. enim pectus minùs carnoſum, quàm tergum, eſt: quam ob rem à tergo perquam tutè calor opertus eſt. Cor cæteris animalibus in medio pectore eſt: homini tantùm paulò vergit ad læuam, vt eius partis refrigerationem moderetur, & compenſet. Omnium enim animalium maximè homo refrigeratam habet partem ſiniſtram. In piſcibus etiam cor ſimilem ſitum tenere, & cur diſſimilis videatur, dictum iam eſt. Solis his cordis mucro ad caput ſpectat, cùm ea pars prior ſit: eôdem enim agitur motus. Copia quoque neruorum in corde eſt, idque recta ratione: hinc enim motus oriuntur, qui intendendo remittendóque efficiũtur: itaque miniſterio tali, & robore opus eſt. Cor autem, vt ſuprà diximus, veluti alterum animal ineſt iis quæ corde vitalem originem continent. Cor ſine oſſe eſt omnium quæ nos nouerimus, præterquam equi, & generis boum cuiuſdam, quibus præ magnitudine, quaſi adminiculum ſubditum eſt: quo modo totum etiam corpus oſſibus ſuſtentatur, & continetur. Ventriculum triplicem cor magnorũ animalium habet, duplicem minorum, vnum ad poſtremum: nullũq; eſt, quod ſine vllo ventriculo conſtet: & quam ob cauſam, dictum eſt. Locum enim & conceptaculum quoddam ſanguinis primi in corde haberi conuenit.

A εἰς δὲ τὴν καρδίαν οὐκ ἄλλοθεν. αὕτη γάρ ἐστιν ἀρχὴ καὶ πηγὴ τοῦ αἵματος, ἢ ὑποδοχὴ πρώτη. ἐκ τῶν ἀνατομῶν δὲ κατάδηλα ταῦτα, καὶ ἐκ τῶν γενέσεων. εὐθέως γάρ ἐστιν ἔναιμος πρώτη γινομένη τῶν μορίων ἁπάντων. ἔτι δ᾽ αἱ κινήσεις τῶν ἡδέων καὶ τῶν λυπηρῶν, καὶ ὅλως πάσης αἰσθήσεως, ἐντεῦθεν ἀρχόμεναι φαίνονται, καὶ πρὸς ταύτην περαίνουσαι. οὕτω δ᾽ ἔχει καὶ κατὰ τὸν λόγον. ἀρχὴν γὰρ εἶναι δεῖ μίαν, ὅπου ἐνδέχεται. βέλτιστον δὲ τῶν τόπων ὁ μέσος. ἓν γὰρ τὸ μέσον, καὶ ἐπὶ πᾶν ἐφικτὸν ὁμοίως, ἢ παραπλησίως. ἔτι δ᾽ ἐπεὶ οὔτε τῶν ἀναίμων οὐδὲν αἰσθητικόν, οὔτε τὸ αἷμα, δῆλον ὡς τὸ πρῶτον ἔχον ὡς ἐν ἀγγείῳ δὲ ἔχον, ἀναγκαῖον εἶναι τὴν ἀρχήν. B οὐ μόνον δὲ κατὰ τὸν λόγον οὕτως ἔχον φαίνεται, ἀλλὰ καὶ κατὰ τὴν αἴσθησιν. ἐν γὰρ τοῖς ἐμβρύοις εὐθέως ἡ καρδία φαίνεται κινουμένη τῶν μορίων, *καθάπερ εἰ ζῶον, ὡς ἀρχὴ τῆς φύσεως τοῖς ἐναίμοις οὖσα. μαρτύριον δὲ τῶν εἰρημένων, καὶ τὸ πᾶσι τοῖς ἐναίμοις ὑπάρχειν αὐτήν. ἀναγκαῖον γὰρ αὐτοῖς ἔχειν τὴν ἀρχὴν τοῦ αἵματος. ὑπάρχει δὲ καὶ τὸ ἧπαρ πᾶσι τοῖς ἐναίμοις· ἀλλ᾽ οὐθεὶς ἂν ἀξιώσειεν αὐτὸ τὴν ἀρχὴν εἶναι, οὔτε τοῦ ὅλου σώματος, οὔτε τοῦ αἵματος. κεῖται γὰρ οὐδαμῶς πρὸς ἀρχοειδῆ θέσιν. ἔχει δ᾽ ὥσπερ ἀντίζυγον ἐν τοῖς μάλιστ᾽ ἀπηκριβωμένοις τὸν σπλῆνα. ἔτι δ᾽ C ὑποδοχὴν αἵματος οὐκ ἔχει ἐν ἑαυτῷ, καθάπερ ἡ καρδία, ἀλλ᾽ ὥσπερ τὰ λοιπά, ἐν φλεβί. ἔτι δὲ τείνει δι᾽ αὐτοῦ φλέψ· ἐξ ἐκείνης δὲ οὐδεμία. πασῶν γὰρ τῶν φλεβῶν ἐκ τῆς καρδίας αἱ ἀρχαί. ἐπεὶ οὖν ἀνάγκη θάτερον μὲν τούτων ἀρχὴν εἶναι, μή ἐστι δὲ τὸ ἧπαρ, ἀνάγκη τὴν καρδίαν *εἶναι καὶ τοῦ αἵματος ἀρχήν. τὸ μὲν γὰρ ζῶον αἰσθήσει ὥρισται. αἰσθητικὸν δὲ πρῶτον, τὸ πρῶτον ἔναιμον. τοιοῦτον δὲ ἡ καρδία. καὶ γὰρ ἀρχὴ τοῦ αἵματος, καὶ ἔναιμον πρῶτον. ἔστι δὲ τὸ ἄκρον αὐτῆς ὀξὺ καὶ στερεώτερον. κεῖται δὲ πρὸς τῷ στήθει, καὶ ὅλως ἐν τοῖς ἔμπροσθεν τοῦ σώματος, πρὸς τὸ μὴ καταψύχεσθαι αὐτό. πᾶσι γὰρ ἀσαρκότερον D τὸ στῆθος· τὰ δ᾽ ὄπισθεν σαρκωδέστερα. διὸ πολλὴν ἔχει σκέπην τὸ θερμὸν κατὰ τὸν νῶτον. ἔστι δὲ ἡ καρδία τοῖς μὲν ἄλλοις ζῴοις κατὰ μέσον τοῦ στηθικοῦ τόπου· τοῖς δὲ ἀνθρώποις εἰς τὰ εὐώνυμα μικρὸν παρεγκλίνουσα, πρὸς τὸ ἀνισοῦν τὴν κατάψυξιν τῶν ἀριστερῶν. μάλιστα γὰρ τῶν ἄλλων ζῴων ὁ ἄνθρωπος ἔχει κατεψυγμένα τὰ ἀριστερά. ὅτι δὲ καὶ ἐν τοῖς ἰχθύσιν ὁμοίως ἡ καρδία κεῖται, πρότερον εἴρηται, καὶ διότι φαίνεται ἀνομοίως. ἔχει δὲ πρὸς τὴν κεφαλὴν τὸ ὀξύ. ἔστι δ᾽ αὕτη τὸ πρόσθεν· ἐπὶ ταύτην γὰρ ἡ κίνησις. ἔχει δὲ καὶ νεύρων πλῆθος ἡ καρδία· καὶ τοῦτ᾽ εὐλόγως. ἀπὸ ταύτης γὰρ αἱ κινήσεις. περαίνονται E δὲ διὰ τοῦ ἕλκειν καὶ ἀνιέναι. δεῖ οὖν τοιαύτης ὑπηρεσίας καὶ ἰσχύος. ἡ δὲ καρδία, καθάπερ εἴπομεν καὶ πρότερον, οἷον ζῶόν τι πέφυκεν ἐν τοῖς ἔχουσιν. ἔστι δὲ ἀνόστεος πάντων, *ὅσα καὶ ἡμεῖς τεθεάμεθα,* πλὴν τῶν ἵππων, καὶ γένους τινὸς βοῶν. τούτοις δὲ διὰ τὸ μέγεθος, οἷον ἐρείσματος χάριν ὀστοῦν ὑπέστη, καθάπερ καὶ τοῖς ὅλοις σώμασι. κοιλίας δ᾽ ἔχουσιν αἱ μὲν τῶν μεγάλων ζῴων, τρεῖς· αἱ δὲ τῶν ἐλαττόνων, δύο· μίαν δὲ πᾶσαι· δι᾽ ἣν δ᾽ αἰτίαν, εἴρηται. δεῖ γὰρ εἶναι τόπον τινὰ τῆς καρδίας καὶ ὑποδοχὴν τοῦ πρώτου αἵματος.

* Scrib. καθάπερ ζῶον,

* Fort. εἶναι καὶ τοῦ σώματος καὶ τοῦ αἵματος ἀρχήν. vel, τὴν τοῦ αἵ.

* Fort. ὅσα γε.

* Hiſtor. lib. 2. c.15.

A ἔτι δὲ πρῶτον ἐν τῇ καρδίᾳ γίνεται τὸ αἷμα, πολλάκις εἰρήκαμεν. διὰ δὲ τὸ τὰς ἀρχηγοὺς φλέβας δύο εἶναι, τήν τε μεγάλην καλουμένην, καὶ τὴν ἀορτήν, ἑκατέρας γὰρ οὔσης ἀρχῆς τῶν φλεβῶν, καὶ διαφορὰς ἐχουσῶν, περὶ ὧν ὕστερον ἐροῦμεν, βέλτιον καὶ τὰς ἀρχὰς αὐτῶν κεχωρίσθαι. τοῦτο δ' ἂν εἴη διαφόρου ὄντος τοῦ αἵματος, καὶ κεχωρισμένου. διὸ ἐν οἷσπερ ἐνδέχεται, δύο εἰσὶν ὑποδοχαί. ἐνδέχεται δὲ ἐν τοῖς μεγάλοις. τούτων γὰρ ἔχουσιν αἱ καρδίαι μέγεθος. ἔτι δὲ βέλτιον τρεῖς εἶναι τὰς κοιλίας, ὅπως ᾖ μία ἀρχὴ κοινή· τὸ δὲ μέσον καὶ περιττόν, ἀρχή. αὕτη τε μεγέθους δεῖ μείζονος αὐταῖς ἀεί. διόπερ αἱ μέγισται τρεῖς ἔχουσι * μόνας. B τούτων δὲ πλεῖστον μὲν αἷμα καὶ θερμότατον ἔχουσιν αἱ δεξιαί (διὸ καὶ τῶν μερῶν θερμότερα τὰ δεξιά) ἐλάχιστον δὲ καὶ ψυχρότερον αἱ ἀριστεραί· μέσον δ' αἱ μέσαι, τῷ πλήθει καὶ θερμότητι, καθαρώτερον δέ. δεῖ γὰρ τὴν ἀρχὴν ὅτι μάλιστ' ἠρεμεῖν. τοιαύτη δ' ἂν εἴη καθαροῦ τοῦ αἵματος ὄντος, τῷ πλήθει δὲ καὶ θερμότητι, μέσου. ἔχουσι δὲ καὶ διάρθρωσίν τινα αἱ καρδίαι, παραπλησίαν ταῖς ῥαφαῖς. οὐκ εἰσὶ δὲ σαφεῖς ὥς τινος ἐκ πλειόνων συνθέτου· ἀλλά, καθάπερ εἴπομεν, διαρθρώσεις μᾶλλον. εἰσὶ δὲ τῶν μὲν αἰσθητικῶν ἀρθρωδέστεραι· τῶν δὲ νωθεστέρων ἀναρθρότεραι, καθάπερ αἱ τῶν ὑῶν. αἱ δὲ διαφοραὶ τῆς καρδίας κατὰ C μέγεθός τε καὶ μικρότητα, καὶ σκληρότητα καὶ μαλακότητα, τείνουσί πῃ καὶ πρὸς τὰ ἤθη. τὰ μὲν γὰρ ἀναίσθητα, σκληρὰν ἔχει τὴν καρδίαν καὶ πυκνήν· τὰ δ' αἰσθητικά, μαλακωτέραν. καὶ τὰ μὲν μεγάλας ἔχοντα τὰς καρδίας, δειλά· τὰ δὲ ἐλάττους καὶ μέσας, θαρραλεώτερα. τὸ γὰρ συμβαῖνον πάθος ὑπὸ τοῦ φοβεῖσθαι προϋπάρχει τούτοις, διὰ τὸ μὴ ἀνάλογον εἶναι τὸ θερμὸν τῇ καρδίᾳ, μικρὸν δ' ὂν ἐν μεγάλαις ἀμαυροῦσθαι, καὶ τὸ αἷμα ψυχρότερον εἶναι. μεγάλας δὲ τὰς καρδίας ἔχουσι, λαγώς, ἔλαφος, μῦς, ὕαινα, ὄνος, πάρδαλις, γαλῆ, καὶ τὰ ἄλλα σχεδὸν πάντα ὅσα φανερῶς δειλά, ἢ διὰ φόβον κακοῦργα. παραπλησίως D δὲ καὶ ἐπὶ τῶν φλεβῶν καὶ ἐπὶ τῶν κοιλιῶν ἔχει. ψυχραὶ γὰρ αἱ μεγάλαι φλέβες καὶ κοιλίαι. ὥσπερ γὰρ ἐν μικρῷ καὶ μεγάλῳ οἰκήματι τὸ ἴσον πῦρ, ἧττον ἐν τῷ μείζονι θερμαίνει, οὕτω κἂν τούτοις τὸ θερμόν. ἀγγεῖα γὰρ καὶ ἡ φλέψ, καὶ ἡ κοιλία. ἔτι δὲ αἱ ἀλλότριαι κινήσεις, ἕκαστον τῶν θερμῶν καταψύχουσιν. ἐν δὲ ταῖς εὐρυχωροτέραις πλεῖον τὸ πνεῦμα, καὶ ἐνισχύει μᾶλλον. διὸ τῶν μεγαλοκοιλίων οὐθέν, οὐδὲ τῶν μεγαλοφλέβων, πῖον ἐστὶ κατὰ σάρκα, ἀλλὰ τὰ πάντα ἢ τὰ πλεῖστα τούτων ἀδηλόφλεβα καὶ μικρόκοιλια φαίνεται. μόνον δὲ τῶν σπλάγχνων, καὶ ὅλως τῶν ἐν σώματι E μορίων ἡ καρδία χαλεπὸν πάθος οὐθὲν ὑπομένει· καὶ τοῦτ' εὐλόγως. φθειρομένης γὰρ τῆς ἀρχῆς, οὐκ ἔστιν ὅθεν γένοιτ' ἂν βοήθεια τοῖς ἄλλοις ἐκ ταύτης ἠρτημένοις. σημεῖον δὲ τοῦ μηδὲν ὑποδέχεσθαι πάθος τὴν καρδίαν, τὸ μὴ ἐν οὐδενὶ τῶν θυομένων ἱερείων ὦφθαι τοιοῦτον πάθος περὶ αὐτήν, ὥσπερ ἐπὶ τῶν ἄλλων σπλάγχνων. οἵ τε γὰρ νεφροὶ πολλάκις φαίνονται λίθων μεστοί, καὶ φυμάτων, καὶ δοθιήνων· καὶ τὸ ἧπαρ. ὡσαύτως δὲ καὶ ὁ πνεύμων. μάλιστα δὲ ὁ σπλήν. πολλὰ δὲ καὶ ἕτερα παθήματα συμβαίνοντα περὶ αὐτὰ φαίνεται· ἥκιστα δὲ τοῦ μὲν πνεύμονος, περὶ τὴν ἀρτηρίαν· τοῦ δ' ἥπατος, περὶ τὴν σύναψιν τῇ μεγάλῃ φλεβί· καὶ * τοῦτ' εὐλόγως. ταύτῃ γὰρ κοινωνοῦσι μάλιστα τῇ καρδίᾳ.

* γινώνται, minus rectè.

* κ. τ. εὐλόγως [illegible] γὰρ μάλ.

A Sanguinem autem primò effici in corde, ſæpe iam diximus. Sed cùm duæ venæ ſint principales, altera maior, altera minor, aortáque appellata, quæ ſparſa ramorum ſerie cæteras minores venas producant, atque inter ſe differant, vt poſthac exponemus: melius ſanè eſt, initia quoque earum eſſe diſtincta. Quod fieri poteſt, ſi ſanguis diuerſus diſtinctuſque ſit: quam ob rem vbi fieri poteſt, ſanguinis conceptacula duo habentur. Fieri autem id poteſt in magnis: ſunt enim corda eorum ampliora. Sed melius tres eſſe ventriculos, vt vnum commune principium ſit: medium autem & impar principium eſt. Itaque magnitudo amplior B ſubinde deſideratur. Vnde fit vt quæ maxima ſint, triplicem ventriculum habeāt. Dexter plurimum ſanguinis, & calidiſſimum continet: quamobrem pars corporis dextra calidior: ſiniſter parum, idque frigidiſſimum: medius mediocrem, tum copia, tum calore, ſed puriorem. Principium enim quàm maximè quieſcere debet: tale autem erit, ſi ſanguis purus & mediocris, tum copia tum calore ſit. Quinetiam articulationem quandam rimis ſuturiſve capitis ſimilem habere viſuntur, quanquam non ita conſtant, vt quod ex pluribus ſit compactum, ſed (vt modò dixi) articulationem potiùs oſtendunt. Sunt articulatiora corda C eorum quæ ſenſu meliùs valent: inarticulatiora, eorum quæ ſenſu hebetiori ſunt, vt ſuum. Diſcrimina cordis, quæ amplitudine, exiguitate, duritia, mollitia exiſtant, vel ad mores pertineant aliquatenus. Quæ enim ſenſu hebeti ſunt, cor habent durum & ſpiſſum: quæ autem ſenſu valent, molliùs. Pauida etiam ſunt, quibus cor grandius: audentiora fidentioráque, quibus minus aut mediocre. Affectus enim, qui accidit ex metu, iam in iis præeſt, quoniam calorem proportione cordis non habeant, ſed *parum caloris in magno conceptaculo exoleſcat: itaque ſanguis frigidior* ſit. Cor magnum proportione, lepori, ceruo, muri, hyænæ, aſino, pantheræ, muſtelæ, & reliquis fe- D rè omnibus, quæ apertè timida ſunt, aut propter metum malefica. Simile in venis atque in ventriculis cordis euenit: ſunt enim frigidiores, & venæ ampliores, & ventriculi ampliores. Nam vt *in paruo & in magno domicilio tantundem ignis* nō æquè calefacit: ſed minùs in magno: ſic in his calor non pariter agit. Vas enim tam vena quàm vētriculus eſt. Itē motus alieni calidum quodque refrigerant. Plus autem ſpiritus in amplioribus eſt, magiſque valet: quamobrem nullum ex iis quæ venis aut ventriculis ſunt amplioribus, obeſum per carnem opimúmque eſt: ſed quæ ita pingueſcant, aut omnia, aut maxima parte venis in- E certis, paruóque ventriculo eſſe cernuntur. Cor ſolum viſcerum, atque omnino partium corporis nullum vitium patitur graue, idque rectà ratione. Cùm enim principium corrumpitur, nihil eſt quod cæteris, quæ inde pendeant, præbere auxilium poſſit. Indicium, vt nullum affectum cor patiatur, quod in nulla hoſtia cor ita affectum viſum adhuc eſt, vt in cæteris viſceribus cernitur. Renes enim ſæpenumero calculis, & pannis, & papulis referti videntur, atque etiam iecur, & pulmo, ac potiſſimùm lien. Multa etiam alia vitiorum genera euenire in iis videmus. Sed tamen circa arteriam pulmonis, & qua iecur annectitur venæ maiori, perexiguè ita accidit, idque ratione rectà: hac enim maximè cordi aſſociantur.

At verò quæ morbo vitiiſque eiuſmodi pereunt animalia, iis diſſectis, affectus morboſi in corde cõſpiciuntur. Sed de corde qualenam ſit, & cuius gratia, & quam ob cauſam innctum animalibus ſit, hæc dixiſſe ſatis eſt.

CAPVT V.

De venis, & earum loco in corporibus eorum animantium, quæ ſanguine prædita ſunt.

SEquitur, vt de venis diſſeramus, videlicet de maiori, & de aorta. Hæ nanque ex corde primæ recipiunt ſanguinem: reliquæ earum ſoboles ſunt. Igitur ſanguinis gratia eas eſſe, dictum iam eſt. Humor enim conceptaculum quiſque deſiderat: venarum autem genus, conceptaculum, & vas eſt. Itaque ſanguis in iis, quaſi in vaſe, eſt. Sed quamobrem duæ ſint, & de eadem origine in omnes corporis partes diſcurrant, explicandum nunc eſt. Cauſa, vt principium vnum, & ab vno melius ſit, quòd animam ſentiẽtem vnam actu habeant omnia. Hinc enim pars etiam quæ eam animam primò contineat, vna eſt, tum potentia: tum actu, in iis quæ ſanguinem habent. At in nonnullis eorum quæ ſanguinẽ carent, actu duntaxat: quamobrem caloris quoque originem in eodem tantiſper eſſe neceſſe eſt. Hæc eadem cauſa eſt etiam, vt ſanguis humidus ſit, & calidus. Cùm igitur vna in parte ſit principium ſenſus & caloris, ſanguis etiam ex vno ſuam originem ducit: vnitate autem ſanguinis fit, vt venarum etiam capita ex vno eodémque oriantur. Duæ autem numero ſunt, quoniam corpora animalium, quæ ſanguinem habent, & gradiuntur, bipartita ſint. Hæc enim omnia parte priori & poſteriori, dextra & ſiniſtra, ſuperiori & inferiori diſtinguuntur. Quanto autem nobilior ac principalior pars prior, quàm poſterior eſt, tanto vena maior præſtantior eſt altera, quam aortam vocari diximus. Altera enim in priora, altera in poſteriora diſcurrit: & altera in omnibus ſanguine præditis habetur apertè, altera in nonnullis aut obſcurè, aut incertè. Cauſa verò vt venæ in omnes corporis partes digerantur, quòd ſanguis, aut quod vicem ſanguinis tenet, totius corporis materia eſt, quæ in vena aut in vicario venæ continetur. Sed quonam modo & ex quo animalia nutriantur, & quomodo ex ventre capiant alimentum, cùm de generatione agitur, aptiùs & ſpectari & explicari poteſt. Cùm autem partes ex ſanguine omnes conſiſtant, vt diximus, venarum riui in omnes corporis partes ratione rectà expanduntur. Sanguinem enim fundi per omnia adeſſeque omnibus oportet: ſiquidem partes quæque ex eo conſiſtunt. Et vt in hortis rigandis de vna origine fontéque vno aqua riuis permultis diducitur, aliique ab aliis ductus ſubinde excipiunt, quovſque humor in omnes partes deueniat: atque etiam vt in fabricis per totam fundamentorum deſcriptionem lapides apponuntur: videlicet ea ratione, quòd ſata hortorum humoris beneficio naſcantur, fundamenta ex lapidibus condantur: ſic Natura ſanguinem per totum corpus cenſuit deriuandum, cùm is omnium materia ſit. Patet hoc in iis quæ maximè extenuentur: nihil enim niſi venæ apparent: vt in vitineis, & ficulnis, & reliquis generis eiuſdem frondibus:

ὅσα δὲ διὰ νόσους καὶ τοιαῦτα πάθη φαίνεται τελευτῶντα τῶν ζῴων, τούτοις ἀνατεμνομένοις φαίνεται περὶ τὴν καρδίαν νοσώδη πάθη. καὶ περὶ μὲν τῆς καρδίας ποία τις, καὶ τίνος ἕνεκεν, καὶ διὰ τὴν αἰτίαν τοῖς ἔχουσιν ὑπάρχει, τοσαῦτ' εἰρήσθω.

ΚΕΦΑΛ. ε΄.

Περὶ φλεβῶν.

ΕΠόμενον δ' ἂν εἴη καὶ περὶ φλεβῶν εἰπεῖν, περί τε τῆς μεγάλης, καὶ τῆς ἀορτῆς. αὗται γὰρ ἐκ τῆς καρδίας δέχονται τὸ αἷμα· αἱ δὲ λοιπαὶ, τούτων ἀποφυάδες εἰσίν. ὅτι μὲν οὖν τοῦ αἵματος χάριν εἰσὶ, πρότερον εἴπομεν. τό, τε γὰρ ὑγρὸν ἅπαν ἀγγείου δεῖται· καὶ τὸ φλεβῶν γένος, ἀγγεῖον· τὸ δὲ αἷμα ἐν ταύταις. διότι δὲ δύο καὶ ἐκ μιᾶς ἀρχῆς καθ' ἅπαν τὸ σῶμα διατείνουσι, λέγωμεν. τοῦ μὲν οὖν εἰς μίαν ἀρχὴν συντελεῖν καὶ ἀπὸ μιᾶς, αἴτιον τὸ μίαν ἔχειν πάντα τὴν αἰσθητικὴν ψυχὴν καὶ ἐνέργειαν, ὥστε καὶ τὸ μόριον ἓν, τὸ ταύτην ἔχον πρώτως· ἐν μὲν τοῖς ἐναίμοις, κατὰ δύναμιν καὶ κατ' ἐνέργειαν· τῶν δ' ἀναίμων ἐνίοις, κατ' ἐνέργειαν μόνον. διὸ καὶ τὴν τοῦ θερμοῦ ἀρχὴν ἀναγκαῖον * ἐν τῷ αὐτῷ τόπῳ εἶναι. αὕτη δ' ἐστὶν αἰτία καὶ τῷ αἵματι τῆς ὑγρότητος καὶ θερμότητος. διὰ μὲν οὖν τὸ ἐν ἑνὶ μορίῳ εἶναι τὴν αἰσθητικὴν ἀρχὴν, καὶ τὴν τῆς θερμότητος, καὶ ἡ τοῦ αἵματος ἐκ μιᾶς ἀρχῆς ἐστίν· διὰ δὲ τὴν τοῦ αἵματος ἑνότητα, καὶ ἡ τῶν φλεβῶν ἐκ μιᾶς. δύο δ' εἰσὶ, διὰ τὸ τὰ σώματα εἶναι διμερῆ τῶν ἐναίμων καὶ πορευτικῶν. ἐν πᾶσι γὰρ τούτοις διώρισται τὸ ἔμπροσθεν καὶ τὸ ὄπισθεν, καὶ τὸ δεξιὸν καὶ τὸ ἀριστερὸν, καὶ τὸ ἄνω καὶ τὸ κάτω. ὅσῳ δὲ τιμιώτερον καὶ ἡγεμονικώτερον τὸ ἔμπροσθεν τοῦ ὄπισθεν, τοσούτῳ καὶ ἡ μεγάλη φλὲψ τῆς ἀορτῆς. ἡ μὲν γὰρ ἐν τοῖς ἔμπροσθεν, ἡ δ' ἐν τοῖς ὄπισθεν κεῖται. καὶ τὴν μὲν ἅπαντ' ἔχει τὰ ἔναιμα φανερῶς, τὴν δ' ἔνια μὲν ἀμυδρῶς, ἔνια δὲ ἀφανῶς. τοῦ δ' εἰς τὸ πᾶν διαδίδοσθαι τὸ σῶμα τὰς φλέβας, αἴτιον τὸ πάντος εἶναι τοῦ σώματος ὕλην τὸ αἷμα, τοῖς δ' ἀναίμοις τὸ ἀνάλογον· ταῦτα δ' ἐν φλεβὶ καὶ τῷ ἀνάλογον κεῖσθαι. πῶς μὲν οὖν τρέφεται τὰ ζῷα, καὶ ἐκ τίνος καὶ τίνα τρόπον λαμβάνουσιν ἐκ τῆς κοιλίας, ἐν τοῖς περὶ γενέσεως λόγοις μᾶλλον ἁρμόττει σκοπεῖν καὶ λέγειν. συνισταμένων δὲ τῶν μορίων ἐκ τοῦ αἵματος, καθάπερ εἴπομεν, εὐλόγως ἡ τῶν φλεβῶν ῥύσις διὰ παντὸς τοῦ σώματος πέφυκε. δεῖ γὰρ καὶ τὸ αἷμα διὰ παντὸς, καὶ περὶ πᾶν εἶναι, εἴπερ τῶν μορίων ἕκαστον ἐκ τούτου συνέστηκεν. ἔοικε δ' ὥσπερ ἔν τε τοῖς κήποις αἱ ὑδραγωγίαι κατασκευάζονται ἀπὸ μιᾶς ἀρχῆς καὶ πηγῆς, εἰς πολλοὺς ὀχετοὺς καὶ ἄλλους ἀεὶ πρὸς τὸ πάντη μεταδίδοσθαι· καὶ ἐν ταῖς οἰκοδομίαις, περὶ πᾶσαν τὴν τῶν θεμελίων ὑπογραφὴν λίθοι παραβέβληνται· διὰ τὸ τὰ μὲν κηπευόμενα φύεσθαι ἐκ τοῦ ὕδατος, τοὺς δὲ θεμελίους ἐκ τῶν λίθων οἰκοδομεῖσθαι· τὸν αὐτὸν τρόπον καὶ ἡ φύσις τὸ αἷμα διὰ παντὸς ὠχέτευκε τοῦ σώματος, ἐπειδὴ παντὸς ὕλη πέφυκε τοῦτο. γίνεται δὲ κατάδηλον ἐν τοῖς μάλιστα καταλελεπτυσμένοις. οὐδὲν γὰρ ἄλλο φαίνεται παρὰ τὰς φλέβας, καθάπερ ἐπὶ τῶν ἀμπελίνων τε καὶ συκίνων φύλλων, καὶ ὅσ' ἄλλα τοιαῦτα

Hiſtor. lib. 3. c. 2. 3. 4.

* κ. ἐν τῷ α. τό. εἶ.

καὶ γὰρ τούτων ἀναπομένων, φλέβες λείπονται μόνον. τούτων δ' αἴτιον, ὅτι τὸ αἷμα καὶ τὸ ἀνάλογον τούτῳ, δυνάμει σῶμα καὶ σάρξ, ἢ τὸ ἀνάλογόν ἐστι. καθάπερ οὖν ἐν ταῖς ὀχετείαις αἱ μέγισται τῶν τάφρων διαμένουσιν, αἱ δ' ἐλάχισται πρῶται καὶ ταχέως ὑπὸ τῆς ἰλύος ἀφανίζονται, πάλιν δ' ἐκλιπούσης, φανεραὶ γίνονται· τὸν αὐτὸν τρόπον καὶ τῶν φλεβῶν αἱ μὲν μέγισται διαμένουσιν, αἱ δ' ἐλάχισται γίνονται σάρκες ἐνεργείᾳ, δυνάμει δ' εἰσὶν οὐδὲν ἧττον φλέβες. διὸ καὶ σωζομένων τῶν σαρκῶν, καθ' ὁτιοῦν αἷμα ῥεῖ διαιρουμένων· καίτοι ἄνευ μὲν φλεβὸς οὐκ ἔστιν αἷμα· φλέβιον δ' οὐδὲν δῆλον, ὥσπερ ἐν τοῖς ὀχετοῖς αἱ τάφροι, πρὶν ἢ τὴν ἰλὺν ἐξαιρεθῆναι. ἐκ μειζόνων δ' εἰς ἐλάττους αἱ φλέβες ἀεὶ προέρχονται, ἕως τοῦ γενέσθαι τοὺς πόρους ἐλάττους τῆς τοῦ αἵματος παχύτητος· δι' ὧν τῷ μὲν αἵματι δίοδος οὐκ ἔστι, τῷ δὲ περιττώματι τῆς ὑγρᾶς ἰκμάδος, ὃν καλοῦμεν ἱδρῶτα· καὶ τοῦτο διαθερμανθέντος τοῦ σώματος, καὶ τῶν φλεβίων ἀναστομωθέντων. ἤδη δέ τισιν ἱδρῶσαι συνέβη αἱματώδει περιττώματι διὰ καχεξίαν, τοῦ μὲν σώματος ῥυάδος καὶ μανοῦ γινομένου, τοῦ δ' αἵματος ἐξυγρασθέντος δι' ἀπεψίαν, ἀδυνατούσης τῆς ἐν τοῖς φλεβίοις θερμότητος πέττειν, δι' ὀλιγότητα. εἴρηται γὰρ ὅτι πᾶν τὸ κοινὸν γῆς καὶ ὕδατος παχύνεται πεττόμενον. ἡ δὲ τροφὴ καὶ τὸ αἷμα, μικτὸν ἐξ ἀμφοῖν. ἀδυνατεῖ δὲ πέττειν ἡ θερμότης, οὐ μόνον διὰ τὴν αὑτῆς ὀλιγότητα, ἀλλὰ καὶ διὰ πλῆθος καὶ ὑπερβολὴν τῆς εἰσφερομένης τροφῆς. γίνεται δὲ πρὸς ταύτην ὀλίγη. ἡ δ' ὑπερβολὴ διττή. ἢ γὰρ τῷ ποσῷ, καὶ τῷ ποιῷ. οὐ γὰρ πᾶν ὁμοίως εὔπεπτον. ῥεῖ δὲ μάλιστα τὸ αἷμα κατὰ τοὺς εὐρυχωροτάτους πόρους. διόπερ ἐκ τῶν μυκτήρων, καὶ τῶν οὔλων καὶ τῆς ἕδρας, ἐνίοτε δὲ καὶ ἐκ τοῦ στόματος αἱμορροΐδες ἄπονοι γίνονται, καὶ οὐχ ὥσπερ ἐκ τῆς ἀρτηρίας, μετὰ βίας. διεστῶσαι δ' ἄνωθεν ἥ τε μεγάλη φλὲψ, καὶ ἡ ἀορτὴ κάτω δ' ἐναλλάττουσαι, συνέχουσι τὸ σῶμα. προϊοῦσαι γὰρ σχίζονται κατὰ τὴν διφυΐαν τῶν κώλων· καὶ ἡ μὲν ἐκ τοῦ ἔμπροσθεν εἰς τοὔπισθεν προέρχεται, ἡ δ' ἐκ τοῦ ὄπισθεν εἰς τοὔμπροσθεν, καὶ συμβάλλουσιν εἰς ἕν. ὥσπερ γὰρ ἐν τοῖς πλεκομένοις ἐγγίνεται τὸ συνεχὲς μᾶλλον, οὕτω καὶ διὰ τῆς τῶν φλεβῶν ἐναλλάξεως συνδεῖται τῶν σωμάτων τὰ πρόσθια τοῖς ὄπισθεν. ὁμοίως δὲ καὶ ἀπὸ τῆς καρδίας ἐν τοῖς ἄνω τόποις συμβαίνει. τὸ δὲ μετ' ἀκριβείας ὡς ἔχουσιν αἱ φλέβες πρὸς ἀλλήλας, ἔκ τε τῶν ἀνατομῶν δεῖ θεωρεῖν, καὶ ἐκ τῆς ζωϊκῆς ἱστορίας. καὶ περὶ μὲν φλεβῶν καὶ καρδίας εἰρήσθω. περὶ δὲ τῶν ἄλλων σπλάγχνων, σκεπτέον κατὰ τὴν αὐτὴν μέθοδον.

ΚΕΦΑΛ. ϛʹ.

Περὶ πνεύμονος.

Histor. anim. li. 2. c. 16. & 17.

ΠΝεύμονα μὲν οὖν ἔχει διὰ τὸ πεζὸν εἶναί τι γένος τῶν ζῴων. ἀναγκαῖον μὲν γὰρ γίνεσθαι τῷ θερμῷ κατάψυξιν. ταύτης δὲ δεῖται θύραθεν τὰ ἔναιμα τῶν ζῴων· θερμότερα γάρ. τὰ δὲ μὴ ἔναιμα, καὶ τῷ συμφύτῳ πνεύματι δύναται καταψύχειν. ἀνάγκη δὲ καταψύχειν ἔξωθεν, ἢ ὕδατι, ἢ ἀέρι.

A iis enim areſcentibus, venæ tantummodo relinquuntur. Cuius rei cauſa eſt, quòd ſanguis, & quod ſanguini proportionetur, potentia ſit corpus, & caro, quod iis proportione reſpondeat. Igitur vt in adaquatione ſulci altiores amplioréſque durant, minimi autem primi, ac celeriter limo obducto aboleſcunt, rurſúſque deducto apparent: ſic venæ ampliſſimæ durant, minimæ autem primæ actu carnes efficiuntur, quanquam potentia nihilo minùs venæ ſint: quam ob rem etſi caro extat, ſanguis tamen inducto vulnere vndique effluit. Atqui ſine vena ſanguis eſſe non poteſt. Vena autem nulla manifeſta eſt, quo modo neque riuorum foſſeolæ patent priùs quàm limus eximatur. B Procedunt venæ in minores ſubinde ex amplioribus, quouſque arctiores reddantur, quàm vt ſanguinem tranſmittere poſſint: quamobrem exitus ſanguini nullus patet: quanquam excremento vaporis humidi, quem ſudorem vocamus, ſatis pateat: ſed ne illi quidem niſi corpore calefacto, & venularum clauſulis patefactis. Iam nonnullis accidit vt cruentum quoddam excrementum ſudarent propter vitiatum corporis habitum, ſcilicet cùm corpus laxum fluxúmque eſſet, ſanguíſque præ cruditate humeſceret imbecillitate caloris, qui exiguus venulis incluſus concoquere non poſſet. Omne enim quod aquę & terræ commune eſt, craſſeſcere, cùm concoquitur, dictum iam eſt. C Alimentum autem & ſanguis miſtum ex iis eſt: calor verò concoquere non poteſt, non modò quia exiguus eſt, verumetiam præ nimia cibi aſſumpti copia. Fit enim exiguus comparatione tanti cibarij. Duplex autem exuperantia cibi eſt: aut enim quantitate, aut qualitate, id eſt, modo, & genere: quippe cùm cibus non æquè concoctu facilis quiſque ſit. Fluit autem ſanguis potiſſimùm per ampliores venarum foramina. Quamobrem è naribus, gingiuis, & ſede, interdum etiam ex ore profluuium ſanguinis fit ſine vllo dolore: non per vim, vt ex arteria. Diſtant ſpatio inter ſe ſupernè vena maior, & aorta: infrà mutatis vicibus tendunt, atque ita continetur corpus. Progredientes enim D ſcinduntur iuxta bifidam crurum partitionem: atque altera, ex parte priori in poſteriorem ſe porrigit, altera, ex poſteriori in priorem, eodémque concurrunt. Vt enim ea quæ implexa ſunt, continentiora conſtant: ſic vicibus venarum mutatis, partes priores corporibus cum poſterioribus copulantur. Simile etiam à corde locis ſuperioribus fit. Sed qui diligentiùs noſſe velit, quemadmodum venæ inter ſe habeant, ſpectare id tum per diſſectionem tum etiam per commentationem, hoc eſt, hiſtoriam animalium, debet. Atque de venis & corde hactenus. De reliquis etiam viſceribus hac eadem via & ratione conſiderandum eſt. E

CAPVT VI.

De pulmone, & eius forma: quibus item inſeritur, quibus non.

PVlmo ideo habetur, quia genus animalium quoddam pedeſtre eſt. Calorem enim refrigerari neceſſe eſt: quem extrinſecus ea quæ habent ſanguinem, deſiderant, ſunt enim calidiora: at quæ ſanguine carent, vel ſuo natiuo ſpiritu ſatis refrigerari poſſunt. Extrinſecus autem vel aëre, vel aqua refrigerare neceſſe eſt.

Quam

Quamobrem piſcium nullus habet pulmonem, ſed pro eo branchias obtinent, vt cùm de ſpiratione ageremus, retulimus. Aqua enim refrigerantur, vt aëre, quæ ſpirant. Quamobrem omnia, quæ ſpirant, habent pulmonem. Spirant pedeſtria omnia, & aquatilium nonnulla: vt balæna, & delphinus, atque etiam cete omnia, quæ reſlant. Compluta enim natura ancipiti ſunt, tum ex terreſtrium tum ex aquatilium numero: nam & eorum quæ terra ſuſtentantur, aëremque arripiunt, quædam in humore maximam temporis partem conſumunt, propter ſui corporis temperamentum: & eorum, quæ in humore degunt, nonnulla tantum terreſtris naturæ ſibi mutuantur, vt niſi interdum ſpirent, viuere nequeant. Pulmo igitur ſpirandi officio delegatus eſt, qui originé quidem ſui motus accipit ex corde, ſed ſua tum amplitudine tum inanitate, aditum ſpiritui patefacit: cùm enim attollitur, influit ſpiritus: cùm contrahitur, effluit. Ad cordis palpitationem pulmonem ſpectare, malè opinatum eſt: cor enim homini (propè dixerim) animalium vni palpitat, quia homo ſolùm ſpe rei futuræ expectatioñeque moueatur. In pluribus etiam cor laxo interuallo diſtat à pulmone, ſitúmque ſuperiùs tenet, vt nihil ad cordis palpitationem conferat pulmo. Differentia pulmonis varia eſt. Aliis enim ſanguineus, magnúſque: aliis minor, fungoſus, exanguis. Quæ viuipara ſunt, maiorem & copia refertum ſanguinis habent, propter calorem ſuæ naturæ ampliorem. Quæ contrà ouipara ſunt, exiguum, & ſiccum, ſed aptum ampliari ac extumeſcere, cùm inflatur: qualis eorum eſt quæ ex terreſtribus quadrupedes ouiparę ſunt, vt lacertorum, & teſtudinum, & cæterorum generis eiuſdem. Volucrum etiam natura, quas aues appellamus, eòdem pertinet. Omnium enim earum pulmo fungoſus, & *ſpumæ ſimilis* eſt. *Spuma* enim facta diffuſáque, ex amplo tumore in exiguum, reſidet, & pulmo earum exiguus, membranæque ſimilis eſt: quamobrem hæc omnia parum ſitiunt, & parum bibunt: diu etiam aquam demerſa tolerant. Satis enim ab ipſo pulmonis motu ſpiritali inanique refrigerantur diutiùs, vt quæ parum caloris habeant. Accedit ad hæc, vt magnitudo corporis eorum propè omnium minor viuiparis ſit. Calor enim eſt, quod vim obtineat augendi. Sanguinis autem copia caloris indicium eſt: corpora etiam meliùs erigit. Quamobrem homo cæteris erectior omnibus eſt, & viuipara reliquis quadrupedibus erectiora incedunt. Nullum enim viuiparum vel expes, vel ambulans, æquè latibula petit. Pulmo igitur ſpirandi gratia datus omnino eſt, ſed exanguis: taliſque cuiuſdam animalium generis cauſa eſt: verùm communi eorum nomine vacat, nec, vt auium genus, nomen obtinuit. Itaque vt auem eſſe, ex aliquo eſt: ſic in eſſentia illorum ineſt vt habeant pulmonem.

A διόπερ τῶν μὲν ἰχθύων οὐδεὶς ἔχει πνεύμονα, ἀλλ' ἀντὶ τούτου βράγχια, καθάπερ εἴρηται ἐν τοῖς περὶ ἀναπνοῆς. ὕδατι γὰρ ποιεῖται τὴν κατάψυξιν· τὰ δ' ἀναπνέοντα, τῷ ἀέρι. διόπερ πάντα τὰ ἀναπνέοντα ἔχει πνεύμονα. ἀναπνεῖ δὲ τὰ μὲν πεζὰ πάντα· ἔνια δὲ καὶ τῶν ἐνύδρων, οἷον φάλαινα καὶ δελφὶς, καὶ τὰ ἀναφυσῶντα κήτη πάντα. πολλὰ γὰρ τῶν ζώων ἐπαμφοτερίζει τὴν φύσιν, καὶ τῶν τε πεζῶν καὶ τὸν ἀέρα δεχομένων, διὰ τὴν τοῦ σώματος κρᾶσιν ἐν ὑγρῷ διατελεῖ τὸν πλεῖστον χρόνον· καὶ τῶν ἐν τῷ ὑγρῷ μετέχει τοσοῦτον ἔνια τῆς πεζῆς φύσεως, ὥστ' ἐν τῷ πνεύ-
B ματι αὐτῶν εἶναι τὸ τέλος τοῦ ζῆν. τοῦ δ' ἀναπνεῖν ὁ πνεύμων ὄργανόν ἐστι, τὴν μὲν ἀρχὴν τῆς κινήσεως ἔχων ἀπὸ τῆς καρδίας, ποιῶν δ' εὐρυχωρίαν τῇ εἰσόδῳ τοῦ πνεύματος, διὰ τὴν αὐτοῦ σομφότητα καὶ τὸ μέγεθος. αἰρομένου γὰρ, εἰσρεῖ τὸ πνεῦμα· συνιόντος δ', ἐξέρχεται πάλιν. τὸ δὲ πρὸς τὴν ἄλσιν εἶναι τὸν πνεύμονα τῆς καρδίας, οὐκ εἴρηται καλῶς. ἐν ἀνθρώπῳ γὰρ συμβαίνει μόνον, ὡς εἰπεῖν, τὸ τῆς πηδήσεως, διὰ τὸ μόνον ἐν ἐλπίδι γίνεσθαι καὶ προσδοκίᾳ τοῦ μέλλοντος· ἀπέχει τ' ἐν τοῖς πολλοῖς πολὺν τόπον, καὶ κεῖται τὴν θέσιν ἀνωτέρω τοῦ πνεύμονος. ὥστε μηδὲν συμ-
C βάλλεσθαι τὸν πνεύμονα εἰς τὴν ἄλσιν τῆς καρδίας. διαφέρει δὲ ὁ πνεύμων πολὺ τοῖς ζώοις. τὰ μὲν γὰρ, ἔναιμον ἔχει καὶ μέγαν· τὰ δ', ἐλάττω καὶ σομφόν· τὰ μὲν ζωοτόκα, διὰ τὴν θερμότητα τῆς φύσεως, μείζω καὶ πολύαιμον· τὰ δ' ᾠοτόκα, μικρὸν καὶ ξηρὸν, δυνάμενον δὲ μέγαν γε διίστασθαι ἐν τῷ ἐμφυσᾶσθαι, ὥσπερ τὰ τετράποδα μὲν, ᾠοτόκα δὲ τῶν πεζῶν, οἷον οἵ τε σαῦροι καὶ αἱ χελῶναι, καὶ πᾶν τὸ τοιοῦτον γένος· ἔτι δὲ πρὸς τούτοις ἡ τῶν πτηνῶν φύσις, καὶ καλουμένων ὀρνίθων. πάντων γὰρ τούτων σομφὸς ὁ πνεύμων καὶ ὅμοιος ἀφρῷ. καὶ γὰρ ὁ ἀφρὸς ἐκ πολλοῦ μικρὸς γίνεται συγχεόμενος, καὶ ὁ τούτων πνεύμων μικρὸς
D καὶ ὑμενώδης. διὸ καὶ ἄδιψα καὶ ὀλιγόποτα ταῦτα πάντα, καὶ δύναται πολὺν ἐν τῷ ὑγρῷ ἀνέχεσθαι χρόνον. ἅτε γὰρ ὀλίγον ἔχοντα θερμὸν, ἱκανῶς ἐπὶ πολὺν χρόνον καταψύχεται ὑπ' αὐτῆς τῆς τοῦ πνεύμονος κινήσεως, οὔσης ἀερώδους καὶ κενῆς. συμβέβηκε δὲ καὶ τὰ μεγέθη τούτων ἐλάττω τῶν ζώων, ὡς ἐπίπαν εἰπεῖν. τὸ γὰρ θερμὸν, αὐξητικόν. ἡ δὲ πολυαιμία, θερμότητος σημεῖον. ἔτι δ' ὀρθοῖ τὰ σώματα μᾶλλον. διόπερ ἄνθρωπος μὲν τῶν ἄλλων ὀρθότατον· τὰ δὲ ζωοτόκα, τῶν ἄλλων τετραπόδων. οὐδὲν γὰρ ὁμοίως φωλεύει τῶν ζωοτόκων, οὔτ' ἄπουν,
E οὔτε πεζεῦον. ὅλως μὲν οὖν ὁ πνεύμων ἐστὶν ἀναπνοῆς * χάριν. ἄναιμος δὲ καὶ τοιοῦτος γένους τινὸς ζώων ἀλλ' ἀνώνυμον τὸ κοινὸν ἐπ' αὐτῶν, καὶ οὐχ ὥσπερ ὄρνις ὠνόμασται ἐπί τινος γένους. διὸ ὥσπερ τὸ ὄρνιθι εἶναι, ἔκ τινος ἐστὶ, καὶ ἐκείνων ἐν τῇ οὐσίᾳ ὑπάρχει τὸ πνεύμονα ἔχειν τοιοῦτον δηλονότι.

CAPVT VII.

De viſcerum forma, & eorum loco in corpore animantium, & officio.

Viſcerum quædam ſimplicia eſſe videntur, vt cor, vt pulmo: quædam bipartita, vt renes: quædam vtrónam modo ſe habeant, dubitatur. Iecur enim, & lienem ancipiti inter hæc eſſe ſpecie dixeris: nam & quaſi ſimplex, & tanquam

ΚΕΦΑΛ. ζ'.

Περὶ σπλάγχνων μορφῆς καὶ τόπου καὶ ἔργου.

Δοκεῖ δὲ τῶν σπλάγχνων τὰ μὲν εἶναι μονοφυῆ, καθάπερ καρδία καὶ πνεύμων· τὰ δὲ διφυῆ, καθάπερ νεφροί· τὰ δ' ἀπορεῖται ποτέρως ἔχει. φανείη γὰρ ἂν ἐπαμφοτερίζειν τούτοις τὸ ἧπαρ καὶ ὁ σπλήν. καὶ γὰρ ὡς μονοφυὲς ἑκάτερον, καὶ ὡς Hiſt. l.1.c.16.

ἀνθ' ἑνὸς δύο παραπλησίαν ἔχοντα τὴν φύσιν. ἔστι δὲ πάντα διφυᾶ. τὸ δ' αἴτιον, ἡ τοῦ σώματος διάστασις, διφυοῦς μὲν οὔσης, πρὸς μίαν δὲ συντελούσης ἀρχήν. τὸ μὲν γάρ, ἄνω καὶ κάτω· τὸ δ', ἔμπροσθεν καὶ ὄπισθεν· τὸ δέ, δεξιὸν καὶ ἀριστερόν ἐστι. διόπερ ὁ ἐγκέφαλος βούλεται διμερὴς εἶναι πᾶσι, καὶ τῶν αἰσθητηρίων ἕκαστον. κατὰ τὸν αὐτὸν δὲ λόγον ἡ καρδία ταῖς κοιλίαις· ὁ δὲ πνεύμων ἔν τε τοῖς ᾠοτόκοις τοσοῦτον διέστηκεν, ὥστε δοκεῖν δύο ἔχειν αὐτὰ πνεύμονας. οἱ δὲ νεφροὶ καὶ παντὶ δῆλοι. κατὰ δὲ τὸ ἧπαρ καὶ τὸν σπλῆνα, δικαίως ἄν τις ἀπορήσειε. τούτου δ' αἴτιον, ὅτι ἐν μὲν τοῖς ἐξ ἀνάγκης ἔχουσι σπλῆνα, δόξειεν ἂν οἷον νόθον ἧπαρ εἶναι ὁ σπλήν. τοῖς δὲ μὴ ἐξ ἀνάγκης ἔχουσιν, ἀλλὰ παμμίκρον, ὥσπερ σημείου χάριν, ἐναργῶς διμερές ἐστι τὸ ἧπαρ, καὶ τὸ μὲν εἰς τὰ δεξιά, τὸ δ' ἔλαττον εἰς τὰ ἀριστερὰ τὴν θέσιν βούλεται ἔχειν. οὐ μὴν ἀλλὰ καὶ ἐν τοῖς [ᾠοτόκοις ἧττον μὲν ἢ ἐπὶ τούτων φανερὸν ἐνίοις, κἀκεῖ ὥσπερ ἐν τισὶ] ζῳοτόκοις ἐπιδήλως διέστηκεν· οἷον κατά τινας τόπους οἱ δασύποδες, δύο δοκοῦσιν ἥπατα ἔχειν, καθάπερ τῶν ἰχθύων ἕτεροί τε τινές, καὶ οἱ σελαχώδεις. διὰ δὲ τὸ τὴν θέσιν ἔχειν τὸ ἧπαρ ἐν τοῖς δεξιοῖς μᾶλλον, ἡ τοῦ σπληνὸς γέγονε φύσις· ὡς ἀναγκαίαν μέν πως, μὴ λίαν δ' εἶναι πᾶσι τοῖς ζῴοις. τοῦ μὲν οὖν τὴν φύσιν τῶν σπλάγχνων διφυῆ εἶναι, αἴτιον, ὥσπερ εἴπομεν, τὸ δύο εἶναι, τὸ δεξιὸν καὶ τὸ ἀριστερόν. ἑκάτερον γὰρ ζητεῖ τὸ ὅμοιον, ὥσπερ καὶ αὐτὰ βούλεται παραπλησίαν καὶ διδύμην ἔχειν τὴν φύσιν, καθάπερ καὶ ἐκεῖνα, δίδυμα μέν, συνήρτηται δὲ εἰς ἕν, καὶ τῶν σπλάγχνων ὁμοίως ἕκαστον. ἔστι δὲ σπλάγχνα τὰ [μὲν ἄνω, τὰ δὲ] κάτω τοῦ ὑποζώματος, κοινῇ μὲν πάντα τῶν φλεβῶν χάριν, ὅπως αὗται μετέωροι, μένωσι τῷ τούτων συνδέσμῳ πρὸς τὸ σῶμα. καθάπερ ἄγκυραι γὰρ βέβληνται πρὸς τὸ σῶμα, διὰ τῶν ἀποτεινομένων μορίων· ἀπὸ μὲν τῆς μεγάλης φλεβός, πρὸς τὸ ἧπαρ καὶ τὸν σπλῆνα. τούτων γὰρ τῶν σπλάγχνων ἡ φύσις, οἷον ἧλοι, πρὸς τὸ σῶμα προσλαμβάνουσιν αὐτήν, εἰς μὲν τὰ πλάγια τοῦ σώματος, τὸ ἧπαρ καὶ ὁ σπλήν, τὴν φλέβα τὴν μεγάλην. ἀπὸ ταύτης γὰρ εἰς αὐτὰ μόνα διατείνουσι φλέβες· εἰς δὲ τὰ ὄπισθεν οἱ νεφροί. πρὸς δ' ἐκείνους οὐ μόνον ἀπὸ τῆς μεγάλης φλεβός, ἀλλὰ καὶ ἀπὸ τῆς ἀορτῆς τείνει φλὲψ εἰς ἑκάτερον. ταῦτα δὴ συμβαίνει διὰ τούτων τῇ συστάσει τῶν ζῴων. καὶ τὸ μὲν ἧπαρ καὶ ὁ σπλήν, βοηθεῖ πρὸς τὴν πέψιν τῆς τροφῆς. ἔναιμα γὰρ ὄντα, θερμὴν ἔχει τὴν φύσιν· οἱ δὲ νεφροί, πρὸς τὸ περίττωμα τὸ εἰς τὴν κύστιν ἀποκρινόμενον. καρδία μὲν οὖν καὶ ἧπαρ ἅπασιν ἀναγκαῖα τοῖς ζῴοις· ἡ μέν, διὰ τὴν τῆς θερμότητος ἀρχήν (δεῖ γὰρ εἶναί τινα οἷον ἑστίαν, ἐν ᾗ κείσεται τῆς φύσεως τὸ ζωπυροῦν, καὶ τοῦτο * ἀφύλακτον, ὥσπερ ἀκρόπολις οὖσα τοῦ σώματος) τὸ δ' ἧπαρ, τῆς πέψεως χάριν. τὰ δ' ἔναιμα δεῖται δυοῖν τούτοιν· διόπερ ἔχει πάντα τὰ ἔναιμα δύο σπλάγχνα ταῦτα μόνον· ὅσα δ' ἀναπνεῖ, καὶ πνεύμονα τρίτον. ὁ δὲ σπλὴν κατὰ συμβεβηκὸς ἐξ ἀνάγκης ὑπάρχει τοῖς ἔχουσιν, ὥσπερ καὶ τὰ περιττώματα, τό, τ' ἐν τῇ κοιλίᾳ, καὶ περὶ τὴν κύστιν. διόπερ ἔν τισιν ἐκλείπει κατὰ τὸ μέγεθος,

* Fort. εὐφύλακτον,) ὥσπερ ἀ. οὖσα τ. σώματος,

A pro ſimplici duo ſimili prædita natura eſſe vtrumque videtur. Sunt tamen omnia bipartita: cuius rei cauſa eſt, corporis diſpoſitio, quæ bipartita quidem ſit, ſed in vnum initium coeat, conſummetúrque. Aut enim ſuperiore & inferiore, aut priore & poſteriore, aut dextra & ſiniſtra parte diſtinguitur. Quamobrem cerebrum quoque omnium bipartitum eſſe ſibi vult, atque etiam ſenſorium vnumquodque. Eademque ratione cor ventriculis ſuis diſtinguitur. Pulmo verò in ouiparis adeò dirimitur, vt ea binos habere pulmones videantur. Renes bipartitos eſſe nulli dubium eſt. De iecore & liene iure ambiges. Cuius rei cauſa eſt, quod in iis quæ lienem B habere neceſſe eſt, lien ipſe quaſi iecur adulteratum eſſe videtur: in iis autem quæ lienem habere non neceſſe eſt, vt exiguus admodum lien, velvti notæ gratia habetur, ſic hepar bipartitum apertè eſt, & pars altera ad dextram, altera, quæ minor eſt, ad ſiniſtram ſitum tenere expetit. Quinetiam in ouiparis quamuis minùs quàm in viuiparis, apertum ſit, tamen in nonnullis æquè diuiſum patet, vt locis quibuſdam lepores bina iecinora habere videntur: quemadmodum in genere piſcium, tum alij quidam tum cartilaginei iecur duplicatum habere videntur. Sed quoniam iecur parte dextra potiùs ſitum eſt, ideo natura lienis adhibita eſt. Itaque quanquam C neceſſariò quodammodo eſt, tamen non admodum omnibus animalibus. Cauſa igitur vt viſcerum natura bipartita ſit, quemadmodum diximus, dextrum ſiniſtrúmque eſt: vtrunque enim ſibi ſimile expoſcit, quomodo ea quoque ſimilem geminámque habere naturam expetunt. Vt enim illa, quanuis gemina eôdem coeunt, ſic viſcerum ſingula, quanuis gemina, nexu eodem continentur. *Sunt viſcerum quædam ſupra ſeptum, quædam infra: ſed omnium vſus communis* venarum gratia eſt, videlicet quo venæ, vt pote penſiles, ſuſtineri, & copula viſcerum ſtabiliri ad corpus poſſint: quaſi enim anchoræ per partes deductas iaciuntur ad corpus: verbi gratia, de vena maiore ad iecur & lienem deuenitur. Et D enim viſcerum eorum natura, quaſi clauus corpori eam affigit, ſcilicet iecur, & lien, in latera corporis venam maiorem affirmant: ad hæc enim ſola rami ab illa mittuntur. Renes autem in partem poſteriorem eandem continent, quanquam ad renem vtrumque non modò de vena maiori, ſed etiam de aorta pertendit vena. Hæc viſcerum beneficio inſtitutioni animalium præſtantur. Atque etiam iecur & lien iuuant ad cibi concoctionem: quòd enim ſanguinea ſunt, calidam habent naturam. Renes ad excrementum, quod in veſicam ſecedit, opitulantur. Sed enim cor & iecur omnibus animalibus neceſſaria ſunt: E alterum propter caloris originem, (locum enim adeſſe aliquē, quaſi lares focúmque oportet, quo naturæ fomites, & primordia ignis natiui contineantur, & ſeruentur, eundémque tutum eſſe, velvti arcem corporis totius, neceſſe eſt) alterum, iecur dico, cibi concoquendi gratia adeſt. Et quidem nullum ſanguine preditum iis duobus carere poteſt: quamobrem omnia, quibus ſanguis, duo hæc viſcera habent. Quæ autem ſpirant, tertium etiam habent pulmonem. Lien per accidens neceſſarius eſt, quomodo excremēta tū alui tū veſicæ. Ex quo fit vt in nōnullis deficiat magnitudine:

vt volucrum quibuſdam, quæ ventriculum habēt A feruentiorem, velvt columbo, accipitri, miluo. Quinetiam in ouiparis quadrupedibus pari modo hoc percipi poteſt: habent enim perquam exiguum. Multis etiam ſquamatis exiguus, quæ veſica etiam carent, quoniam excrementum per carnem laxiorem in pinnas & ſquamas tranſeat. Lien enim vapores vacantes diuertit, & attrahit ex ventriculo, & concoquere eos poteſt, vt qui ſanguineus ſit. Quòd ſi plus excrementi ſit, parúmque caloris habeat lien, corpus præ alimento immodico langueſcit. Et propter confluuium huc humoris, ſæpe accidit, vt lienoſis ventres præduri efficiantur, quo modo iis qui ſupra modum min- B gunt, ex diuerticulo humoris. At quibus parum excrementi conſiſtit, vt auibus, atque piſcibus, iis aut non magnus, aut notæ gratia duntaxat habetur. Quadrupedibus etiam ouiparis lien exiguus, rigidus, & reni ſimilis eſt, ſcilicet ob eam rē, quòd pulmo eorum fungoſus eſt, parúmque potus deſiderant: & quantum excrementi conſtiterit, in corpus, & corticem vertitur, vt auibus in pennas. Sed in iis quæ veſicam habent, & pulmonem ſanguineum, humidus eſt, tum ob eam quam modò diximus, cauſam, tum quia partis ſiniſtræ natura humidior & frigidior eſt. Contrarium enim quodque ad ſibi cognatum ordinem diſpoſitum C eſt: verbi gratia, dextrum ſiniſtro contrarium eſt, & calidum contrārium frigido: itaque modo, quem diximus, ſociantur. Renes nulla neceſſitate habentur, ſed vt meliùs & locupletiùs ſit. Humoris enim excrementitij gratia, qui confluit in veſicam, adiuncti ſunt ex ſua natura: in quibus plus huiuſcemodi ſedimenti fieri ſolet, vt veſica meliùs ſuo munere fungeretur. Sed cùm vſus eiuſdem cauſa renes atque veſica habeantur, diſſerendum nunc de veſica eſt, prætermiſſa ſequente partium enumeratione. *De præcordiis enim* nondum docuimus, quæ pars viſcerum rationi coniuncta eſt.

CAPVT VIII.

Quibus animalibus data ſit veſica, déque eius officio & ſita in corpore animantium.

VEſica non omnibus animalibus data eſt, ſed iis tantùm tribuere voluiſſe Natura videtur, quæ pulmonem haberent ſanguineum: ídque recta ratione. Caloris enim exceſſu, qui in eo ipſo membro continetur, ſitibunda hæc omnium præcipuè animalium ſunt, cibique indigent, non modò ſicci, verùmetiam humidi copioſioris. Itaque excrementum etiam copioſiùs contrahi neceſſe E eſt: nec ſolùm tantum quantum à ventre concoqui excernique cum eius excremento poſſit. Ergo huius quoque excrementi conceptaculum quoddam haberi neceſſe eſt: quamobrem omnia, quæ talem habent pulmonem, veſicam obtinent: quæ autem tali carent pulmone, & vel parum bibunt, quoniam fungoſum pulmonē habeant, vel omnino potum aſſumunt, non potus, ſed cibi gratia, vt inſecta, & piſces, vel etiam quæ penna, aut ſquama, aut cortice teguntur, hæc tum propter humoris aſſumpti exiguitatem, tum quia quantum excrementi cōtrahitur, in ea ipſa abſumatur, veſica omnia carēt, excepta teſtudine inter corticata: in hac enim tantummodo natura caſtrata non eſt.

A ὥσπερ τῶν πτερωτῶν ἐνίοις, ὅσα θερμὴν ἔχει τὴν κοιλίαν, οἷον περιστερά, ἱέραξ, ἰκτῖνος. καὶ ἐπὶ τῶν ᾠοτόκων δὲ καὶ τετραπόδων ὁμοίως· μικρὸν γὰρ πάμπαν ἔχουσι. καὶ πολλοῖς τῶν λεπιδωτῶν· ἅπερ καὶ κύστιν οὐκ ἔχει, διὰ τὸ τρέπεσθαι τὸ περίττωμα διὰ μανῶν τῶν σαρκῶν εἰς πτερὰ καὶ λεπίδας. ὁ γὰρ σπλὴν ἀντισπᾷ ἐκ τῆς κοιλίας τὰς ἰκμάδας τὰς περιττάς· καὶ δύναται συμπέττειν, αἱματώδης ὤν. ἂν δὲ τὸ περίττωμα πλέον ᾖ, ἢ ὀλιγόθερμος ὁ σπλήν, νοσώδη γίνεται πλήρη τροφῆς· καὶ διὰ τὴν ἐνταῦθα παλίρροιαν τῆς ὑγρότητος, πολλοῖς αἱ κοιλίαι σκληραὶ γίνονται B σπληνιῶσιν, ὥσπερ τοῖς λίαν οὐρητικοῖς, διὰ τὸ ἀντιπερισπᾶσθαι τὰς ὑγρότητας. οἷς δὲ ὀλίγη περίττωσις γίνεται, καθάπερ τοῖς ὀρνέοις καὶ τοῖς ἰχθύσι, τὰ μὲν οὐ μέγαν ἔχει, τὰ δὲ σημείου χάριν. καὶ ἐν τοῖς τετράποσι δὲ τοῖς ᾠοτόκοις, μικρὸς καὶ στιφρὸς καὶ νεφρώδης ὁ σπλήν ἐστι, διὰ τὸ τὸν πνεύμονα σομφὸν εἶναι, καὶ ὀλιγοποτεῖν, καὶ τὸ περιγινόμενον περίττωμα τρέπεσθαι εἰς τὸ σῶμα καὶ τὰς φολίδας, ὥσπερ εἰς τὰ πτερὰ τοῖς ὄρνισιν. ἐν δὲ τοῖς κύστιν ἔχουσι καὶ τὸν πνεύμονα ἔναιμον, ὑγρός ἐστι διά τε τὴν εἰρημένην αἰτίαν, καὶ διὰ τὸ τὴν φύσιν τὴν τῶν ἀριστερῶν ὅλως ὑγροτέραν εἶναι καὶ ψυχροτέραν. διῄρηται γὰρ τῶν ἐναντίων ἕκαστον C πρὸς τὴν συγγενῆ συστοιχίαν, οἷον δεξιὸν ἐναντίον ἀριστερῷ, καὶ θερμὸν ἐναντίον ψυχρῷ. καὶ σύστοιχα γὰρ ἀλλήλοις εἰσὶ τὸν εἰρημένον τρόπον. οἱ δὲ νεφροὶ τοῖς ἔχουσιν οὐκ ἐξ ἀνάγκης, ἀλλὰ τοῦ εὖ καὶ καλῶς ἕνεκεν ὑπάρχουσι. τῆς γὰρ περιττώσεως χάριν τῆς εἰς τὴν κύστιν ἀθροιζομένης, εἰσὶ κατὰ τὴν ἰδίαν φύσιν, ἐν ὅσοις πλέον ὑπόστημα γίνεται τὸ τοιοῦτον, ὅπως βέλτιον ἀποδιδῷ ἡ φύσις τὸ αὐτῆς ἔργον. ἐπεὶ δὲ τῆς αὐτῆς ἕνεκα χρείας, τούς τε νεφροὺς συμβέβηκεν ἔχειν τὰ ζῷα, καὶ τὴν κύστιν, λεκτέον περὶ κύστεως νῦν, ὑπερβάντας τὸν ἐφεξῆς τῶν μορίων ἀριθμόν. περὶ γὰρ φρενῶν οὐδέν πω διώρισται. τοῦτο δέ τι τῶν περὶ τὰ D σπλάγχνα μορίων ἐστί.

ΚΕΦΑΛ. η'.

Περὶ κύστεως.

Κύστιν δὲ οὐ πάντ' ἔχει τὰ ζῷα, ἀλλ' ἔοικεν ἡ φύσις βουλομένη ἀποδιδόναι τοῖς ἔχουσι τὸν πνεύμονα ἔναιμον τούτοις δ' εὐλόγως. διὰ γὰρ τὴν ὑπεροχὴν τῆς φύσεως, ἣν ἔχουσιν ἐν τῷ μορίῳ τούτῳ, διψητικά τε ταῦτά ἐστι μάλιστα τῶν ζῴων, καὶ δεῖται τροφῆς οὐ μόνον ξηρᾶς, ἀλλὰ καὶ τῆς ὑγρᾶς πλέον· ὥστ' ἐξ ἀνάγκης καὶ E περίττωμα γίνεσθαι πλέον καὶ μὴ τοσοῦτον μόνον, ὅσον ὑπὸ τῆς κοιλίας πέττεσθαι καὶ ἐκκρίνεσθαι μετὰ τοῦ ταύτης περιττώματος. ἀνάγκη τοίνυν εἶναί τι δεκτικὸν καὶ τούτου τοῦ περιττώματος. διόπερ ὅσα πνεύμονα ἔχει τοιοῦτον, ἅπαντα κύστιν ἔχει· ὅσα δὲ μὴ τοιοῦτον, ἀλλ' ἢ ὀλιγοποτά ἐστι, διὰ τὸ πνεύμονα ἔχειν σομφόν, ἢ ὅλως τὸ ὑγρὸν προσφέρεται οὐ ποτοῦ χάριν, ἀλλὰ τροφῆς (οἷον τὰ ἔντομα καὶ οἱ ἰχθύες) ἔτι δὲ πτερωτά ἐστιν, ἢ λεπιδωτά, ἢ φολιδωτά, ταῦτα δι' ὀλιγότητά τε τῆς τοῦ ὑγροῦ προσφορᾶς, καὶ διὰ τὸ τρέπεσθαι εἰς ταῦτα τὸ περιγινόμενον τοῦ περιττώματος, οὐδὲν ἔχει τούτων κύστιν, πλὴν αἱ χελῶναι τῶν φολιδωτῶν. καὶ ἐν ταύταις ἡ φύσις κεκολόβωται μόνον,

Hiſtor. lib. 3. c. 15. & alibi.

A αἴτιον δ', ὅτι αἱ μὲν θαλάττιαι σαρκώδη καὶ ἔναιμον ἔχουσι τὸν πνεύμονα, καὶ ὅμοιον τῷ βοείῳ· αἱ δὲ χερσαῖαι, μείζω ἢ κατὰ λόγον. ἔτι δὲ διὰ τὸ ὀστρακῶδες εἶναι καὶ πυκνὸν τὸ περιέχον, οὐ διαπνέοντος τοῦ ὑγροῦ διὰ μανῶν τῶν σαρκῶν, οἷον τοῖς ὄρνισι καὶ τοῖς ὄφεσι, καὶ τοῖς ἄλλοις τοῖς φολιδωτοῖς, ἡ ὑπόστασις γίνεται τοσαύτη, ὥστε δεῖσθαι τὴν φύσιν αὐτῶν τι μόριον ἔχειν δεκτικόν τε καὶ ἀγγειῶδες. κύστιν μὲν οὖν ταῦτα μόνον τῶν τοιούτων ἔχει διὰ ταύτην τὴν αἰτίαν· ἡ μὲν θαλαττία, μεγάλην· αἱ δὲ χερσαῖαι, μικρὰν πάμπαν.

Cuius rei cauſa eſt, quòd marinæ teſtudines pulmonem habent carnoſum, ſanguineum & ſimilem bubulo: terreſtres autem proportione maiorem. Superficies etiam, quia obdenſa prædurâque modo ſilicis eſt, facit ne humor difflari euaporaríque poſſit per carnem laxiorem, vt auibus, ſerpentibus, cæteriſque opertis cortice euenit. Atque ita excrementi copia tanta ſubſidet, vt eorum natura conceptaculum & vas quoddam capax humoris deſideret. Veſicam igitur teſtudo ſola inter hæc habet ea de cauſa, ſcilicet marina amplam, terreſtris exiguam admodum.

ΚΕΦΑΛ. θ'.

B

Περὶ νεφρῶν.

Hiſtor. lib. 1. c. vlt. & 2. 16.

Ὁμοίως δ' ἔχει καὶ περὶ νεφρῶν. οὐδὲν γὰρ νεφροὺς οὔτε τῶν πτερωτῶν καὶ λεπιδωτῶν ἔχει, οὔτε τῶν φολιδωτῶν, πλὴν αἱ θαλάττιαι καὶ αἱ χερσαῖαι χελῶναι· ἀλλ' ὡς τῆς εἰς τοὺς νεφροὺς* τεταγμένης σαρκὸς οὐκ ἐχούσης χώραν, ἀλλὰ διεσπαρμένης εἰς πολλά, πλατέα νεφροειδῆ ἐν ἐνίοις τῶν ὀρνίθων ἐστίν. ἡ δ' ἀμμύς, οὔτε κύστιν, οὔτε νεφροὺς ἔχει. διὰ μαλακότητα γὰρ τοῦ χελωνίου, εὐδιάπνοον γίνεται τὸ ὑγρόν. ἡ μὲν οὖν ἀμμὺς διὰ ταύτην τὴν αἰτίαν οὐκ ἔχει τῶν μορίων οὐδέτερον. C τοῖς δ' ἄλλοις ζῴοις, τοῖς πνεύμονα τοῖς ἔχουσιν ἔναιμον, ὥσπερ εἴρηται, συμβέβηκε πᾶσιν ἔχειν νεφρούς. καταχρῆται γὰρ ἡ φύσις ἅμα τῶν φλεβῶν χάριν, καὶ πρὸς τὴν τοῦ ὑγροῦ περιττώματος ἔκκρισιν. φέρει γὰρ εἰς αὐτοὺς πόρος ἐκ τῆς μεγάλης φλεβός. ἔχουσι δ' οἱ νεφροὶ πάντες κοῖλον, ἢ πλέον, ἢ ἔλαττον· πλὴν οἱ τῆς φώκης. οὗτοι δ' ὅμοιοι τοῖς βοείοις ὄντες, στερεώτατοι πάντων εἰσίν. ὅμοιοι δὲ καὶ οἱ τοῦ ἀνθρώπου τοῖς βοείοις. εἰσὶ γὰρ ὥσπερ συγκείμενοι ἐκ πολλῶν νεφρῶν μικρῶν καὶ οὐχ ὁμαλεῖς, ὥσπερ οἱ τῶν προβάτων καὶ τῶν ἄλλων τῶν τετραπόδων. διὸ καὶ τὸ ἀρρώστημα τοῖς ἀνθρώποις δυσαπάλλακτον αὐτῶν ἐστιν, ἂν D ἅπαξ νοσήσωσι. συμβαίνει γὰρ ὥσπερ πολλοὺς νεφροὺς νοσούντων, χαλεπωτέραν εἶναι τὴν ἴασιν, ἢ τῶν ἕνα νοσούντων. ὁ δ' ἀπὸ τῆς φλεβὸς τείνων πόρος, οὐκ ἀποτελευτᾷ πρὸς τὸ κοῖλον τῶν νεφρῶν, ἀλλ' εἰς τὸ σῶμα τῶν νεφρῶν καταναλίσκεται. διόπερ ἐν τοῖς κοίλοις αὐτῶν οὐκ ἐγγίνεται αἷμα, οὐδὲ πήγνυται τελευτώντων. ἐκ δὲ τοῦ κοίλου τῶν νεφρῶν, φέρουσι πόροι ἄναιμοι εἰς τὴν κύστιν δύο νεανικοί, ἐξ ἑκατέρου εἷς, καὶ ἄλλοι ἐκ τῆς ἀορτῆς ἰσχυροὶ καὶ συνεχεῖς. ταῦτα δ' ἔχει τὸν τρόπον τοῦτον, ὅπως ἐκ μὲν τῆς φλεβὸς τὸ περίττωμα τῆς ὑγρότητος βαδίζῃ εἰς τοὺς νεφρούς· ἐκ δὲ τῶν νεφρῶν ἡ γινομένη ὑπόστασις, διηθου- E μένων τῶν ὑγρῶν, διὰ τοῦ σώματος τῶν νεφρῶν, εἰς τὸ μέσον συρρέῃ, οὗ τὸ κοῖλον οἱ πλεῖστοι ἔχουσιν αὐτῶν. διὸ καὶ δυσωδέστατον τοῦτο τῶν σπλάγχνων ἐστίν. ἐκ δὲ τοῦ μέσου, διὰ τούτων τῶν πόρων ἤδη μᾶλλον εἰς τὴν κύστιν ὡς περίττωμα ἀποκρίνεται. καθώρμισται δ' ἡ κύστις ἐκ τῶν νεφρῶν· τείνουσι γάρ, ὥσπερ εἴρηται, πόροι ἰσχυροὶ πρὸς αὐτήν. οἱ μὲν οὖν νεφροί, διὰ ταύτας τὰς αἰτίας εἰσί, καὶ δυνάμεις ἔχουσι τὰς εἰρημένας. ἐν πᾶσι δὲ τοῖς ἔχουσι νεφρούς, ὁ δεξιὸς ἀνώτερος τοῦ ἀριστεροῦ ἐστι. διὰ γὰρ τὸ τὴν κίνησιν εἶναι ἐκ τῶν δεξιῶν, καὶ ἰσχυροτέραν διὰ ταῦτ' εἶναι τὴν φύσιν τῶν δεξιῶν,

* γρ. πτιλωτῶν

CAPVT IX.

De renibus, & eorum officio, quibúſque animalibus dati ſint.

RENum etiam ratio ſimilis eſt. Nullum enim pennatum, nullum ſquamatum, nullum corticatum, excepta teſtudine, renes habet, quanquam in nonnullis auibus carunculæ quędam ſint latiuſculæ, ſpeciem renum oſtendentes, quaſi ea caro, quæ renibus delegata eſt, locum non habeat, ſed in plura diſperſa ſit. Genus tamen teſtudinis, quam lutariam vocant, & veſica, & renibus caret. Fit enim propter eius mollitudinem tegminis, vt humor facilè diffletur. Lutaria igitur propter eam cauſam neutram earum partium habet. Cæteris animalibus, quæ ſanguineum, vt dictum eſt, habent pulmonē, renes omnibus natura tribuerat: quippe quæ ſimul & ad venas continendas iis vteretur, & ad humorem ſuperuacuum excernendum abuteretur: meatus enim de vena maiore ad renes vſque perfertur. Cauum in omnibus ineſt renibus, aut amplius, aut arctius, præterquam in vitulo marino: eius enim renes bubulis ſimiles, omnium firmiſſimi ac ſolidiſſimi ſunt. Hominum etiam renes bubulis ſimiles ſunt, quippe qui tanquam compoſiti ex multis renibus exiguis conſtent. Neque æquabiles ſunt, quomodo renes ouium cæterarúmque quadrupedum habentur. Quo fit vt morbus eorum difficilè curari hominibus poſſit, etiam ſi nuper ægrotare incœperint. Accidit enim vt quaſi multis renibus laborent, difficiliùs remedium adhibeatur, quàm ſi vno infeſtarentur. Meatus, qui ex vena pertendit, non cauum ſubit renum, ſed in eorum corpus abſumitur: quamobrem in cauis eorum nihil ſanguinis* continetur, neque concreſcit mortuis. Meatus verò de cauis renum exangues duo inſignes ad veſicam feruntur, ſinguli ex ſingulis: atque etiam alij ex vena aorta validi frequentéſque eòdem deueniunt. Quæ ita natura inſtituit, vt ex vena humoris excrementum ad renes veniret: in renibus autem ſedimen, humoribus per corpus renum colatis, in medium conflueret, vbi plurimi cauum continent. Quo fit vt renes omnium maximè viſcerum fœdum reddant odorem. Tum deinde ex medio per eos meatus in veſicam iam magis magiſque tanquam excrementum ſecernitur atque reiicitur. Veſica ipſa ex renibus dependet: tendunt enim in eā, vt dictum eſt, validi meatus. Renes his de cauſis habentur, & virtutes, quas diximus, obtinent. Omnibus autem, quæ renes habent, dexter ſuperior ſiniſtro eſt. Quòd enim motus ex parte dextra proueniat, naturáque dextræ proinde validior ſit,

ideo partes omnes mouendi cauſa vergant ad ſitum potiùs ſuperiorem oportet. Nam & ſupercilium dextrum magis attollitur, & arcuatum magis quàm ſiniſtrum, habetur. Tangitur in omnibus à iecore dexter, quòd elatior eſt. Iecur enim parte dextra poſitum eſt. Pingue pleniùs renes ambit, quàm reliqua viſcera. Quod & neceſſariò fit, cùm excrementum per renes tranſmiſſum coletur. Quantum enim relinquitur ſanguinis puri, facilè concoqui poteſt. Finis autem probæ concoctionis ſanguineæ, adeps, & ſeuum eſt. Vt enim in combuſtis ſiccis, velut cinere, aliquid ignis relinquitur: ſic in concoctis humidis nonnihil caloris, qui effecerit, relinquitur. Quo fit vt pingue leue ſit, & humoribus reſideat, atque fluitet. Fit non intra ipſos renes, quoniam denſum hoc viſcus ſit, ſed circum renes eſt, videlicet aut adeps in iis quæ pingueſcere adipe ſolent, aut ſeuum in iis quæ ſeuo opimantur. Quorum differentia alio loco explicata eſt. Neceſſariò igitur ea de cauſa pingueſcunt, ſcilicet ex iis quæ neceſſariò eueniunt animalibus, quæ renes habere debuerunt: ſalutis autem cauſa, vt renum natura calida ſit. Cùm enim poſiti loco vltimo ſint, teporem deſiderant ampliorem. Tergum enim carnoſum eſt, vt cor, & reliqua partis ſuperioris viſcera protegat. At lumbi carne vacant, vt flecti poſſint: omnium enim flexus excarnes ſunt. Itaque vice carnis adipe renes obſepti muniuntur. Quinetiam humorem meliùs diſcernunt, & concoquunt ſua pinguedine. Pingue enim omne calidum eſt: calor autem concoquit. Renes his de cauſis pingui operiuntur. Dexter omnibus minùs pinguis. Cuius rei cauſa eſt, quòd natura dextræ partis ſiccior eſt, & mobilior. Motus autem contrarius eſt: liquat enim pinguedinem, & conſumit. Sed cùm cæteris animalibus renes habere pingues proficiat, & plerunque totos obeſos habeant, ouibus hoc lethale eſt. Quo fit vt quanquam pingues admodum ſint, tamen aliquid deſit, & ſi non vtrique, dextro quidem. Cauſa cur hoc ſolis, aut maximè ouibus accidat, quòd iis quæ adipe pingueſcere ſolent, pingue humidum eſt. Itaque nõ ęquè flatus intercluſi dolorem faciunt, quod cauſa ſyderationis eſt. Quamobrem hominibus etiam, qui vitio renum laborant, quanquam pingueſcere iuuat, tamen ſi pingues admodum efficiantur, dolores profectò accidunt lethales. Cæteris autem etſi ſeuo pingueſcunt, tamen ſeuum minùs denſum quàm ouibus, fit. Copia etiam ſeui, genus ouium longè excedit. Omnium enim animalium oues celeri renum obeſitate opplentur. Itaque humore flatúque intercluſo, celeriter præ ſyderatione intereunt. Nanque per venam aortam, & maiorem, ſtatim vitium ad cordis ſedem transvehitur. Meatus enim ex iis venis ad renes continui pertendunt. Sed de pulmone, de corde, de iecore, de liene, & de renibus, dictum iam eſt.

CAPVT X.

De ſepto tranſuerſo, ſiue præcordiis, & eius officio.

SEparantur hæc inter ſe ſepto tranſuerſo, quod nonnulli præcordia appellant. Diſterminat hoc à reliquis pulmonem, & cor. Id autem ſeptum tráſuerſum præcordia in ſanguine præditis,

A δεῖ προσδοποιεῖσθαι διὰ τὴν κίνησιν πρὸς τὸ ἄνω, πάντα τὰ μόρια μᾶλλον· ἐπεὶ καὶ τὴν ὀφρὺν τὴν δεξιὰν αἴρουσι μᾶλλον, καὶ ἐπικεκαμμένην ἔχουσι τῆς ἀριστερᾶς μᾶλλον. καὶ διὰ τὸ ἀνεσπάσθαι ἀνωτέρω τὸν δεξιὸν νεφρὸν, τὸ ἧπαρ ἅπτεται τοῦ δεξιοῦ νεφροῦ ἐν πᾶσιν. ἐν τοῖς δεξιοῖς γὰρ τὸ ἧπαρ. ἔχουσι δ' οἱ νεφροὶ μάλιστα τῶν σπλάγχνων πιμελήν· ἐξ ἀνάγκης μὲν, διὰ τὸ διηθεῖσθαι τὸ περίττωμα διὰ τῶν νεφρῶν· τὸ γὰρ λειπόμενον αἷμα, εὔπεπτον ὄν, τέλος δ' εὐπεψίας αἱματικῆς πιμελὴ καὶ στέαρ ἐστίν. ὥσπερ γὰρ ἐν τοῖς πεπυρωμένοις ξηροῖς, οἷον τέφρα, ἐγκαταλείπεταί τι πῦρ, οὕτω καὶ ἐν τοῖς πεπεμμένοις ὑγροῖς· B ἐγκαταλείπεται γάρ τι τῆς εἰργασμένης θερμότητος μόριον. διόπερ τὸ λιπαρὸν, κοῦφόν ἐστι, καὶ ἐπιπολάζει ἐν τοῖς ὑγροῖς. ἐν αὐτοῖς μὲν γὰρ οὐ γίνεται τοῖς νεφροῖς, διὰ τὸ πυκνὸν εἶναι τὸ σπλάγχνον· ἔξω δὲ περιΐσταται, πιμελὴ μὲν ἐν τοῖς πιμελώδεσι, στέαρ δὲ ἐν τοῖς στεατώδεσιν. ἡ δὲ διαφορὰ τούτων εἴρηται πρότερον ἐν ἑτέροις. ἐξ ἀνάγκης μὲν οὖν πιμελώδεις γίνονται διὰ ταύτην τὴν αἰτίαν, ἐκ τῶν συμβαινόντων ἐξ ἀνάγκης τοῖς ἔχουσι νεφρούς. ἕνεκα δὲ σωτηρίας, καὶ τοῦ θερμὴν εἶναι τὴν φύσιν τὴν τῶν νεφρῶν. ἔσχατοί τε γὰρ ὄντες, ἀλέας δέονται πλείονος. τὸ μὲν γὰρ νῶτον σαρκῶδές ἐστιν, ὅπως ᾖ προβολὴ τῶν περὶ τὴν καρδίαν σπλάγχνων. ἡ δ' ὀσφὺς ἄσαρκος· ἄσαρκοι γὰρ αἱ καμπαὶ πάντων. ἀντὶ σαρκὸς γοῦν ἡ πιμελὴ γίνεται πρόβλημα C τοῖς νεφροῖς. ἔτι δὲ διακρίνουσι καὶ πέττουσι τὴν ὑγρότητα μᾶλλον, πίονες ὄντες. τὸ γὰρ λιπαρὸν, θερμόν· πέττει δ' ἡ θερμότης. διὰ ταύτας μὲν οὖν τὰς αἰτίας οἱ νεφροὶ πιμελώδεις εἰσίν. ἐν πᾶσι δὲ τοῖς ζῴοις ὁ δεξιὸς ἀπιμελέστερός ἐστιν. αἴτιον δὲ, τὸ τὴν φύσιν ξηρὰν εἶναι τῶν δεξιῶν, καὶ κινητικωτέραν. ἡ δὲ κίνησις ἐναντίον· τήκει γὰρ τὸ πῖον μᾶλλον. τοῖς μὲν οὖν ἄλλοις ζῴοις συμφέρει τι τοὺς νεφροὺς ἔχειν πίονας, καὶ πολλάκις ἔχουσιν ὅλους περιπλέως· τὸ δὲ πρόβατον, ὅταν τοῦτο πάθῃ, ἀποθνήσκει. ἀλλὰ κἂν πάνυ πίονα ὦσιν, ἐλλείπει τι, κἂν μὴ κατ' ἀμφοτέρους, D ἀλλὰ κατὰ τὸν δεξιόν. αἴτιον δὲ τοῦ μόνον ἢ μάλιστα τοῦτο συμβαίνειν ἐπὶ τῶν προβάτων, ὅτι τοῖς μὲν πιμελώδεσιν ὑγρὸν τὸ πῖον· ὥστ' οὐχ ὁμοίως ἐγκατακλειόμενα τὰ πνεύματα ποιεῖ τὸν πόνον. τοῦ δὲ σφακελισμοῦ τοῦτ' αἴτιόν ἐστι. διὸ καὶ τῶν ἀνθρώπων τοῖς πονοῦσι τοὺς νεφρούς, καίπερ τούτοις πιαίνεσθαι συμφέρει, ὅμως ἂν λίαν γίνωνται πίονες, ὀδύναι θανατηφόροι συμβαίνουσι. τῶν δ' ἄλλων τοῖς στεατώδεσιν ἧττον πυκνὸν τὸ στέαρ, ἢ τοῖς προβάτοις, καὶ τῷ πλήθει πολὺ τὰ πρόβατα ὑπερβάλλει. τάχιστα γὰρ περίνεφρα γίνεται τῶν ζῴων τὰ πρόβατα. ἐγκατακλειομένης οὖν τῆς ὑγρότητος καὶ τῶν πνευμάτων, διὰ τὸν σφακελισμὸν, ἀναιροῦνται ταχέως. διὰ E γὰρ τῆς ἀορτῆς καὶ τῆς μεγάλης φλεβὸς εὐθὺς ἀπαντᾷ τὸ πάθος πρὸς τὴν καρδίαν· οἱ δὲ πόροι συνεχεῖς ἀπὸ τούτων τῶν φλεβῶν εἰσὶ πρὸς τοὺς νεφρούς. περὶ μὲν οὖν τῆς καρδίας καὶ πνεύμονος εἴρηται, καὶ περὶ ἥπατος, καὶ σπληνὸς, καὶ νεφρῶν.

Lib. 2. c. 5.

ΚΕΦΑΛ. ι.

Περὶ διαζώματος ἤτοι φρενῶν.

ΤΥγχάνει δὲ ταῦτα κεχωρισμένα ἀλλήλων, τῷ διαζώματι. τοῦτο δὲ τὸ διάζωμα καλοῦσί τινες φρένας· ὃ διορίζει τόν τε πνεύμονα καὶ τὴν καρδίαν. καλεῖται δὲ τοῦτο τὸ διάζωμα ἐν τοῖς ἐναίμοις,

ὥσπερ εἴρηται, φρένες. ἔχει δὲ πάντα τὰ ἔναιμα αὐτό, καθάπερ καρδίαν καὶ ἧπαρ. τούτου δ' αἴτιον, ὅτι τοῦ διορισμοῦ χάριν ἐστὶ τοῦ τε περὶ τὴν καρδίαν τόπου,* καὶ τὸν πνεύμονα, ὅπως ἡ τῆς αἰσθητικῆς ψυχῆς ἀρχὴ ἀπαθὴς ᾖ, καὶ μὴ ταχὺ καταλαμβάνηται, διὰ τὴν ἀπὸ τῆς τροφῆς γινομένην ἀναθυμίασιν, καὶ τὸ πλῆθος τῆς ἐπεισάκτου θερμότητος. ἐπὶ γὰρ τοῦτο διέλαβεν ἡ φύσις, οἷον παροικοδόμημα ποιήσασα καὶ φράγμα τὰς φρένας, καὶ διεῖλε τό γε τιμιώτερον, καὶ τὸ ἀτιμότερον, ἐν ὅσοις ἐνδέχεται διελεῖν τὸ ἄνω καὶ τὸ κάτω. τὸ μὲν γὰρ ἄνω ἐστὶν, οὗ ἕνεκεν καὶ βέλτιον· τὸ δὲ κάτω, τὸ τούτου ἕνεκεν, καὶ ἀναγκαῖον, τὸ τῆς τροφῆς δεκτικόν. ἔστι δὲ τὸ διάζωμα πρὸς μὲν ταῖς πλευραῖς, σαρκωδέστερόν τε καὶ ἰσχυρότερον· κατὰ μέσον δ', ὑμενωδέστερον. οὕτω γὰρ πρὸς τὴν ἰσχὺν καὶ τὴν τάσιν χρησιμώτερον. διότι δὲ πρὸς τὴν θερμότητα τὴν κάτω οἷον παραφυάδες εἰσί, σημεῖον ἐκ τῶν συμβαινόντων. ὅταν γὰρ διὰ τὴν γειτνίασιν ἑλκύσωσιν ὑγρότητα θερμὴν καὶ περιττωματικήν, εὐθὺς ἐπιδήλως ταράττει τὴν διάνοιαν καὶ τὴν αἴσθησιν· διὸ καὶ καλοῦνται φρένες, ὡς μετέχουσαί τι τοῦ φρονεῖν, αἱ δὲ μετέχουσι μὲν* οὔ· ἐγγὺς δ' οὖσαι τῶν μετεχόντων, ἐπίδηλον ποιοῦσι τὴν μεταβολὴν τῆς διανοίας. διὸ καὶ λεπταὶ κατὰ μέσον εἰσὶν, οὐ μόνον ἐξ ἀνάγκης, ὅτι σαρκώδεις οὔσας, κατὰ τὸ πρὸς ταῖς πλευραῖς ἀναγκαῖον εἶναι σαρκωδεστέρας, ἀλλ' ἵν' ὀλίγης μετέχωσιν ἰκμάδος. σαρκώδεις γὰρ οὖσαι, καὶ εἶχον καὶ εἷλκον ἂν ἰκμάδα πολλὴν μᾶλλον. ὅτι δὲ θερμαινόμεναι ταχέως ἐπίδηλον ποιοῦσι τὴν αἴσθησιν, σημαίνει καὶ τὸ περὶ τοὺς γέλωτας συμβαῖνον. γαργαλιζόμενοί τε γὰρ, ταχὺ γελῶσι, διὰ τὸ τὴν κίνησιν ἀφικνεῖσθαι ταχὺ πρὸς τὸν τόπον τοῦτον. θερμαίνουσα δ' ἠρέμα, ποιεῖ ὅμως ἐπίδηλον καὶ κινεῖ τὴν διάνοιαν παρὰ τὴν προαίρεσιν. τοῦ δὲ γαργαλίζεσθαι μόνον ἄνθρωπον, αἴτιον ἥ τε λεπτότης τοῦ δέρματος, καὶ τὸ μόνον γελᾶν τῶν ζῴων τὸν ἄνθρωπον. ὁ δὲ γαργαλισμὸς γέλως ἐστί, διὰ γὰρ κινήσεως τοιαύτης τοῦ μορίου τούτου περὶ τὴν μασχάλην.* συμβαίνειν δέ φασι καὶ περὶ τὰς ἐν τοῖς πολέμοις πληγὰς εἰς τὸν τόπον τὸν περὶ τὰς φρένας, γέλωτα, διὰ τὴν ἐκ τῆς πληγῆς γινομένην θερμότητα. τοῦτο γὰρ μᾶλλον ἐστὶν ἀξιόπιστον ἀκοῦσαι λεγόντων, ἢ τὸ περὶ τὴν κεφαλήν, ὡς ἀποκοπεῖσα φθέγγεται τῶν ἀνθρώπων. λέγουσι γάρ τινες, ἐπαγόμενοι καὶ τὸν Ὅμηρον,* ὡς διὰ τοῦτο ποιήσαντος,

Φθεγγομένη δ' ἄρα τοῦ γε κάρη κονίῃσιν ἐμίχθη.

ἀλλ' οὐ, φθεγγομένου. περὶ δὲ Καρίαν οὕτω τὸ τοιοῦτον διεπίστευσαν, ὥστε καὶ κρίσιν ἐποιήσαντο περί τινος τῶν ἐγχωρίων. τοῦ γὰρ ἱερέως τοῦ ὁπλοσμίου Διὸς ἀποθανόντος, ὑφ' ὅτου δὲ δὴ ἀδήλως, ἔφασάν τινες ἀκοῦσαι τῆς κεφαλῆς ἐκκεκομμένης λεγούσης πολλάκις,

Ἐπ' ἀνδρὸς ἄνδρα Κερκιδᾶς* ἀπέκτεινε.

διὸ καὶ ζητήσαντες ᾧ ὄνομα ἦν ἐν τῷ τόπῳ Κερκιδᾶς, ἔκριναν. ἀδύνατον δὲ φθέγγεσθαι κεχωρισμένης τῆς ἀρτηρίας, καὶ ἄνευ τῆς ἐκ τοῦ πνεύμονος κινήσεως. παρά τε τοῖς βαρβάροις, παρ' οἷς ἀποτέμνουσι ταχέως τὰς κεφαλάς, οὐδέν πω τοιοῦτον συμβέβηκεν. ἔτι δὲ ἐπὶ τῶν ἄλλων ζῴων διὰ τί αἴτιον οὐ γίνεται; τὸ μὲν γὰρ τοῦ γέλωτος, πληγεισῶν, εἰκότως· οὐδὲν γὰρ γελᾷ τῶν ἄλλων.

* γρ. ἐ τ. περὶ τὴν κοιλίαν ἢ τὸν πνεύμονα,

* χ. οὐδέν.

* Probl. sect. 31. 6.

* Fort. ὡς διὰ τ. Iliad. κ.

* Fort. ἐπέκτειν. vel ἀπέκτειν., vt ſit integer ſenarius.

A vt modò dixi, vocatur. Habent hoc omnia, quæ ſanguinem obtinent, æquè, vt cor & iecur: cuius rei cauſa eſt, quòd ideo habetur, vt ſedem cordis à ventre dirimat, videlicet vt animæ ſentientis origo inoffenſa ſeruetur, nec facilè occupetur exhalatione cibi, & caloris aduentitij copia. Hac enim cauſa natura intercipit præcordiorum quaſi parietis ſepiſque interuentu, diſtinxitque partem nobiliorem ab ignobiliori: in quibus ſuperioris inferioriſque ratio poſſet haberi. Superius eſt enim, cuius gratia reliqua ſint, quódque melius ſit: inferius autem, quod eius gratia ſit, & conceptaculum cibi neceſſarium. Anne- B ctitur hoc ſeptum ſiue cinctus coſtis parte ſui carnoſiore validioréque: media autem conſtat membrana exiliori. Ita enim & ad robur & ad prætentum commodius eſt. Contra calorem ſe efferentem hoc velvti ſobolem eſſe, argumentum ex iis quæ plerumque accidunt, ducitur: vbi enim propter vicinitatem attraxerint humorem calidum, atque excrementitium, continuò mentem ſenſúmque planè perturbant. Quamobrem phrenes appellantur, quaſi participes prudentiæ ſint. Atqui nullatenus participes ſunt, ſed quia propinquæ ſunt iis quæ vim obtinent illam (cordi enim prætenduntur) hinc mentis mutationem C aperiunt. Quamobrem tenues parte ſui media ſunt, non modò de neceſſitate, quòd cùm carnoſæ ſint, parte ſui coſtis admota, carnoſiores eſſe neceſſe ſit: verùm etiam vt minus vaporis excipiant. Nam ſi carne pleniore conſtarent, copiam vaporis & haberent, & traherent. Partem hanc calefactam celeriter ſenſum aperire indicat vel id quod titillatu euenit. Rident enim celeriter, qui titillantur, quia motus celeriter ad eum locum perueniat: qui quanquam leniter calefaciat, tamen aperit, & mentem mouet præter voluntatem. Cauſæ autem cur homo animalium vnus titilletur, & cutis tenuitas eſt, & quòd ſolus omnium animalium rideat. Eſt enim D titillatio riſus cauſa per eiuſmodi motum partis, quæ alam complet. Ictu etiam traiecta præcordia in prælijs riſum attuliſſe proditum eſt, ſcilicet calore, quem moueat vulnus. Hoc enim veriſimilius credi poteſt, quàm quod de capite referunt, vt abſciſſum loqui potuerit. Sunt enim qui hoc dicant, Homerúmque teſtem adhibeant, quaſi ob eam rem illud dixerit,

Ipſeque dum loquitur, miſcetur puluere vertex.

Non enim dum ipſe homo, ſed dum ipſe vertex, intelligi volunt. In terra Caria, res adeo pro vera habita eſt, vt reum quendam ex incolis egerint. Cùm enim Iouis Hoploſmij ſacer- E dos eſſet occiſus, & à quo non conſtaret, nonnulli ſeſe audiuiſſe retulerunt, capite præciſo dicente ſæpius,

Virum ſuper viro Cercidas occidit.

Itaque hominem, cui nomen Cercidas, in prouincia quæſierunt, compertúmque in iudicium duxerunt. Sed fieri non poteſt vt caput præciſa arteria, & ſine motu pulmonis loquatur. Nec apud barbaros, qui capita ſumma cum celeritate abſcindunt, tale quid vnquam eueniſſe accepimus. Adhæc, in cæteris animalibus cur id non aliquando fiat? Riſum enim iis nunquam præcordiis traiectis moueri conſentaneum eſt, cùm ridendi vi careant: at capite abſciſſo, ne ſuam vocem aliquando emittant, quidnam prohibeat?

A Corpus tamẽ detracto capite, progredi quoquam non temere credi poteſt. Nam ea quidem, quæ ſanguine carent, vel viuere diutius poſſunt truncata capite. Cuius rei cauſam alio loco docuimus. Sed cuiuſnam gratia ſingula viſcerum habeãtur, explicatum iam eſt. Extremis autem venarum interioribus hæc neceſſariò adiunguntur. Vaporem enim prodire, eúmque ſanguineum, neceſſe eſt: ex quo conſiſtente, concreſcentéque, viſcerum corpus contrahatur, & coagmentetur. Quapropter ſanguinea hæc ſunt omnia, & naturam ſibi conſimilem, cæteris diſſimilem habent.

προϊέναι δέ ποι τὸ σῶμα τῆς κεφαλῆς ἀφῃρημένης, οὐδὲν ἄλογον· ἐπεὶ τά γ' ἄναιμα, καὶ παράδοξον ζῆν πολὺν χρόνον. δεδήλωται δὲ περὶ τῆς αἰτίας ἐν ἑτέροις. τίνος μὲν οὖν ἕνεκεν ἐστιν ἕκαστον τῶν σπλάγχνων, εἴρηται. γέγονε δ' ἐξ ἀνάγκης ἐπὶ τοῖς ἐντὸς πέρασι τῶν φλεβῶν. ἐξιέναι τε γὰρ ἰκμάδα ἀναγκαῖον, καὶ ταύτην αἱματικὴν· ἐξ ἧς συνισταμένης, γίνεσθαι τὸ σῶμα τῶν σπλάγχνων. διόπερ αἱματικὰ καὶ αὐτοῖς μὲν ὁμοίαν ἔχουσι τὴν τοῦ σώματος φύσιν, τοῖς δ' ἄλλοις ἀνομοίαν.

CAPVT XI.

B *De membranis, & eorum officio.*

Membranis omnia viſcera includuntur. Pro tegmine enim opus eſt, quo illæſa ſeruentur, eóque leuiori. Membrana autem talis ſuapte natura eſt, quippe quæ & denſa ſit, vt arcere poſſit: & carne vacet, vt vaporem nec trahat, nec habeat: & tenuis prætendatur, vt leuis ſit, & nihil ponderis afferat. Maximæ inter membranas & robuſtiſſimæ ſunt, quæ cor aut cerebrum ambiunt. Idque optima ratione: hæc enim præcipuam tutelam deſiderant. Tutela enim partibus adhibenda principalibus eſt. Hæc autem principatum maximè vitæ obtinent.

ΚΕΦΑΛ. ια'.

Περὶ ὑμένων.

Πάντα δὲ τὰ σπλάγχνα ἐν ὑμένι ἐστί. περιβολῆς τε γὰρ δεῖ πρὸς τὸ ἀπαθῆ εἶναι, καὶ ταύτης ἐλαφρᾶς. ὁ δ' ὑμὴν τὴν φύσιν τοιοῦτος. πυκνὸς μὲν γάρ, ὥστε ἀποστέγειν· ἄσαρκος δέ, ὥστε μὴ ἕλκειν μηδ' ἔχειν ἰκμάδα· λεπτὸς δέ, ὥστε κοῦφος, καὶ μηδὲν ποιεῖν βάρος. μέγιστοι δὲ καὶ ἰσχυρότατοι τῶν ὑμένων εἰσίν, οἵ τε περὶ τὴν καρδίαν καὶ περὶ τὸν ἐγκέφαλον, εὐλόγως. ταῦτα γὰρ δεῖται πλείστης φυλακῆς. ἡ μὲν γὰρ φυλακὴ περὶ τὰ κύρια· ταῦτα δὲ κύρια C μάλιστα τοῖς ζῴοις. Hiſt. lib. 3. cap. 13.

CAPVT XII.

Non omnia viſcera omnibus animalibus ineſſe.

Habent animalium quædam omnem viſcerum numerum, quædam non omnem. Quæ ſint hæc, & quam ob cauſam, dictum iam eſt. Et variè verò hæc habentur: neque enim cor ſimile habent ea quæ corde prædita ſunt, neque aliud, propè dixerim, vllum. Iam enim iecur aliis multifidum eſt, aliis ſimplicius in eorum genere, quæ ſanguinem habent, & viuipara ſunt: ſed longè D magis piſcium iecinora, & quadrupedum, & ouiparorum, tum inter ſe ipſa, tum ab iis quæ modò diximus, diſſident. Auium iecur maximè ſimile eſt iecori viuiparorum: puro enim & ſanguineo colore exhilaratur, vt illud. Cuius rei cauſa eſt, quòd auium corpora difflari euaporatique optimè poſſint, nec multum habeant excrementi vitioſi. Quo etiam fit vt nonnulla ex viuiparis felle careant. Iecur enim ad temperiem ſanitatémque corporis multum confert: finis namque eorum in ſanguine potiſſimùm ſitus eſt: iecur autem omnium viſcerum excepto corde, ſanguine refertiſſimum eſt. At verò quadrupedum ouiparorum & piſcium iecinora, maxima parte pallidiuſcula ſunt, nonnullorum etiam vitiata omnino, vt corpora quoque eorundem prauum temperamentum ſortiuntur, velut rubetæ, teſtudinis, & ſimilium. Lienem biſulca inter cornigera habent rotundum, vt capra, ouis, & reliqua omnia: niſi aliqua pro ſua magnitudine auctiorem in longitudinem habeant, vt boues. At multifidis prolixus omnibus eſt, vt homini, cani: ſolipedibus autem medium tenet, & promiſcuus eſt. Partem enim alteram habet latam, alteram anguſtam, vt equo, mulo, aſino.

ΚΕΦΑΛ. ιβ'.

Ὅτι οὐ πάντα τὰ σπλάγχνα ἐν πᾶσιν ἔνεσι ζῴοις.

Ἔχουσι δ' ἔνια μὲν τῶν ζῴων πάντα τὸν ἀριθμὸν αὐτῶν, ἔνια δ' οὐ πάντα. ποῖα δὲ ταῦτα, καὶ διὰ τίνα αἰτίαν, εἴρηται πρότερον. καὶ τῶν ἐχόντων δὲ ταῦτα διαφέρουσιν. οὐ γὰρ ὁμοίας, οὔτε τὰς καρδίας ἔχουσι πάντα τὰ ἔχοντα καρδίαν, οὔτε τῶν ἄλλων (ὡς εἰπεῖν) οὐδέν. τό, τε γὰρ D ἧπαρ τῶν μὲν πολυσχιδές ἐστι, τοῖς δὲ μονοφυέστερον, πρῶτον αὐτῶν τῶν ἐναίμων καὶ ζῳοτόκων· ἔτι δὲ μᾶλλον καὶ πρὸς ταῦτα καὶ πρὸς ἄλληλα διαφέρει τά τε τῶν ἰχθύων καὶ τῶν τετραπόδων καὶ ᾠοτόκων. τὸ δὲ τῶν ὀρνίθων μάλιστα προσεμφερὲς τῷ τῶν ζῳοτόκων ἐστὶν ἥπατι. καθαρὸν γὰρ καὶ ἔναιμον τὸ χρῶμα αὐτῶν ἐστι, καθάπερ κἀκείνων. αἴτιον δέ, τὸ τὰ σώματα εὐπνευστότατα εἶναι, καὶ μὴ πολλὴν ἔχειν φαύλην περίττωσιν. διόπερ ἔνια καὶ οὐκ ἔχει χολὴν τῶν ζῳοτόκων· τὸ γὰρ ἧπαρ συμβάλλεται πολὺ [μέρος] πρὸς εὐκρασίαν τοῦ σώματος καὶ ὑγίειαν. ἐν μὲν γὰρ τῷ αἵματι μάλιστα τὸ τούτων τέλος. τὸ δ' ἧπαρ αἱματικώτατον μετὰ τὴν καρδίαν τῶν σπλάγχνων. τὰ δὲ τῶν τετραπόδων καὶ τῶν ᾠοτόκων καὶ E τῶν ἰχθύων, ἔνωχρα τὸ πλεῖστον. ἐνίων δὲ καὶ φαῦλα παντελῶς, ὥσπερ καὶ τὰ σώματα φαύλης τετύχηκε κράσεως, οἷον φρύνης καὶ χελώνης, καὶ τῶν ἄλλων τῶν τοιούτων. σπλῆνα δ' ἔχει τὰ μὲν κερατοφόρα καὶ διχηλὰ στρογγύλον, καθάπερ αἲξ καὶ πρόβατον, καὶ τῶν ἄλλων ἕκαστον· εἰ μή τι διὰ μέγεθος εὐαυξέστερον ἔχει κατὰ μῆκος, οἷον ὁ τοῦ βοὸς πέπονθε. τὰ δὲ πολυσχιδῆ πάντα μακρόν, οἷον ὗς καὶ ἄνθρωπος καὶ κύων. τὰ δὲ μώνυχα, μεταξὺ τούτων, καὶ μικτόν. πῇ μὲν γὰρ πλατὺν ἔχει, πῇ δὲ στενόν, οἷον ἵππος, καὶ ὀρεὺς καὶ ὄνος.

A

ΚΕΦΑΛ. ιγ'.

Τῶν σπλάγχνων διαφορά.

ΟΥ μόνον δὲ διαφέρει τὰ σπλάγχνα τῆς σαρκὸς τῷ ὄγκῳ τοῦ σώματος, ἀλλὰ καὶ τῷ τὰ μὲν ἔξω, τὰ δ' ἔσω τὴν θέσιν ἔχειν. αἴτιον δ', ὅτι τὴν φύσιν ἔχει κοινωνοῦσαν ταῖς φλεψί· καὶ τὰ μὲν τῶν φλεβῶν χάριν, τὰ δ' οὐκ ἄνευ φλεβῶν ἐστιν.

CAPVT XIII.

Differentia viſcerum à carne.

DIfferunt viſcera à carne non modò ſua corpulentia, verùm etiam eo quòd caro foris poſita eſt, viſcera intus continentur. Cuius rei cauſa eſt, quòd naturam communem cum venis habeant, & partim venarum gratia ſint, partim non ſine venis eſſe poſſint.

ΚΕΦΑΛ. ιδ'.

B

Περὶ κοιλίας καὶ ἐντέρου, καὶ τῶν τῆς πέψεως τόπων.

ΥΠὸ δὲ τὸ ὑπόζωμα κεῖται ἡ κοιλία τοῖς ζῴοις· τοῖς μὲν ἔχουσιν οἰσοφάγον, οὗ τελευτᾷ τοῦτο τὸ μόριον· τοῖς δὲ μὴ ἔχουσιν, εὐθὺς πρὸς τῷ στόματι. τῆς δὲ κοιλίας ἐχόμενον τὸ καλούμενον ἔντερον. δι' ἣν δ' αἰτίαν ἔχει ταῦτα τὰ μόρια τῶν ζῴων ἕκαστον, φανερὸν πᾶσι. καὶ γὰρ δέξασθαι τὴν εἰσελθοῦσαν τροφὴν καὶ τὴν ἐξικμασμένην [ἀναγκαῖον] ἐκπέμψαι, καὶ μὴ τὸν αὐτὸν τόπον εἶναι τῆς τε ἀπέπτου καὶ τοῦ περιττώματος, εἶναί τέ τινα δεῖ τόπον ἐν ᾧ μεταβάλλει. τὸ μὲν γὰρ τὴν εἰσελθοῦσαν ἔχει μόριον, τὸ δὲ τὸ περίττωμα τὸ ἄχρηστον. ὥσπερ δὲ χρόνος ἕτερος ἑκατέρου τούτων, ἀναγκαῖον διειλῆφθαι καὶ ἐν τοῖς τόποις. ἀλλὰ περὶ μὲν τούτων ἐν τοῖς περὶ γένεσιν καὶ τὴν τροφὴν, οἰκειότερός ἐστιν ὁ διορισμός· περὶ δὲ τῆς διαφορᾶς τῆς κοιλίας καὶ τῶν συμπτωμάτων μορίων, νῦν ἐπισκεπτέον. οὔτε γὰρ τοῖς μεγέθεσιν, οὔτε τοῖς εἴδεσιν ὁμοίως ἔχουσιν ἀλλήλοις τὰ ζῷα· ἀλλ' ὅσα μὲν αὐτῶν ἐστιν ἀμφώδοντα τῶν ἐναίμων καὶ τῶν ζωοτόκων, μίαν ἔχει κοιλίαν, οἷον ἄνθρωπος, καὶ κύων, καὶ λέων, καὶ τἄλλα ὅσα πολυδάκτυλα· καὶ ὅσα μώνυχα, οἷον ἵππος, ὀρεύς, ὄνος· καὶ ὅσα διχηλὰ μέν, ἀμφώδοντα δέ, οἷον ὗς· εἰ μή τι διὰ μέγεθος τοῦ σώματος καὶ τὴν τῆς τροφῆς δύναμιν, οὖσαν οὐκ εὔπεπτον, ἀλλ' ἀκανθώδη καὶ ξυλικήν, ἔχει πλείους, οἷον κάμηλος· ὥσπερ καὶ τὰ κερατοφόρα. τὰ γὰρ κερατοφόρα οὐκ ἀμφώδοντα. διὰ τοῦτο δὲ καὶ ἡ κάμηλος οὐ τῶν ἀμφωδόντων ἐστίν, ἀκέρατος οὖσα, διὰ τὸ ἀναγκαιότερον εἶναι αὐτῇ τὴν κοιλίαν ἔχειν τοιαύτην, ἢ τοὺς προσθίους ὀδόντας. ὥστ' ἐπεὶ ταύτην ὁμοίαν ἔχει τοῖς μὴ ἀμφώδουσι, καὶ τὰ περὶ τοὺς ὀδόντας ὁμοίως ἔχει αὐτοῖς,* ὡς οὐδὲν ὄντας προὔργου. ἅμα δὲ καὶ ἐπεὶ ἡ τροφὴ ἀκανθώδης, τὴν δὲ γλῶτταν ἀνάγκη σαρκώδη εἶναι, πρὸς σκληρότητα τοῦ οὐρανοῦ καταχρῆται τῷ ἐκ τῶν ὀδόντων γεώδει ἡ φύσις. καὶ μηρυκάζει δ' ἡ κάμηλος, ὥσπερ τὰ κερατοφόρα, διὰ τὸ τὴν κοιλίαν ὁμοίως ἔχειν* ἐκείνοις. τούτων δ' ἕκαστον πλείους ἔχει κοιλίας, οἷον πρόβατον, αἴξ, βοῦς, ἔλαφος, καὶ ἄλλα τὰ τοιαῦτα τῶν ζῴων· ὅπως, ἐπειδὴ τῆς ἐργασίας ἐλλείπει περὶ τὴν τροφὴν ἡ λειτουργία ἡ τοῦ στόματος, διὰ τὴν ἔνδειαν τῶν ὀδόντων, ἡ τῶν κοιλιῶν ἑτέρα πρὸς ἑτέρας δεχομένη τὴν τροφήν, ἡ μὲν ἀκατέργαστον, ἡ δὲ κατειργασμένην μᾶλλον, ἡ δὲ παντελῶς,* ἡ δὲ λείαν. διὸ τὰ τοιαῦτα τῶν ζῴων πλείους ἔχει τόπους καὶ μόρια. καλοῦνται δὲ ταῦτα, κοιλία, καὶ κεκρύφαλος, καὶ ἐχῖνος, καὶ ἤνυστρον. ὃν δ' ἔχει τρόπον ταῦτα πρὸς ἄλληλα τῇ θέσει, καὶ τοῖς εἴδεσιν, ἐκ τῆς* ἱστορίας τῆς περὶ τὰ ζῷα δεῖ θεωρεῖν, καὶ ἐκ τῶν ἀνατομῶν.

Margin notes: * Scrib. ὡς τὸ [illegible] — * [illegible] ἐκείνοις, καὶ [illegible] κερατοφόροις, ex gloſſa. — * Deeſt aliquid. [illegible] τῆς ἐργασίας [illegible] λειτουργίαν [illegible], ait [illegible]. — * [illegible] lib. 2. c. 17.

CAPVT XIV.

De inteſtino, & ventre, eorúmque officio, & locis concoctionis.

SVbeſt præcordiis venter, quà gula deſinit, ſi habetur: ſin minùs, ori adiungitur. Ventri inteſtinum annexum eſt. Sed quam ob cauſam partes has animalia habeant omnia, nulli dubium eſt. Cibum enim & ingeſtum recipere, & euaporatum eiicere, neque eundem locum eſſe ſibi concocti & excrementi, neceſſe eſt. Conceptaculum etiam adeſſe, in quo cibus mutetur, oportet. Pars enim alia cibum ingeſtum complecti, alia excrementum, materiámque ſuperuacuam capere debet: quarum actionum vt tempus diuerſum eſt,
C ſic loca etiam diuerſa haberi neceſſe eſt. Sed de iis aptiùs diſſeremus, cùm de generatione & alimento agetur. Nunc de differentia ventris, & partium eòdem pertinentium, conſiderandum eſt. Ventres enim nec magnitudine neque ſpecie ſimiles inter ſe ſunt: ſed quæ in ſanguineo genere vtrinque dentata & viuipara ſunt, hæc ſimplicem habent ventrem, vt homo, canis, leo, & reliqua, quorum pedes in plures digitos finduntur: & quæ aut ſolipeda ſunt, vt equus, mulus, aſinus: aut biſulca quidem, ſed vtraque parte dentata, vt ſus: niſi aliqua præ ſui corporis magnitudine, aut difficultate cibi non ad concoctionem idonei, ſed
D ſpinoſi, & lignei, multiplicem habeant, vt camelus: quemadmodum cornigera habent: quippe quæ non vtraque parte dentata ſint. Et camelus quidem (quanquam cornibus caret) ideo non supernè dentata eſt, quòd ei magis neceſſarium eſt, ventrem talem habere, quàm dentes priores. Cùm itaque ventrem ſimilem non vtrinque dentatis habeat, dentes etiam ſimili modo ſortitur, vtpote parum neceſſarios. Quinetiam cùm cibus durus ſpinoſúſque ſit, & tamen linguam eſſe carnoſam neceſſe ſit, natura dentium portione terrena ad palati callum atque duritiam abvſa eſt. Ruminat etiam camelus more cornigerorum, quoniam ventres ſimiles cornigeris habeat. Habent hæc ſingula plures ventres: vt ouis, capra, ceruus, & ſimilia, vt cùm officium oris non ſatis in molendo cibo adhibetur propter
E inopiam dentium, munus ventrium expleat, dum alius ab alio cibum recipit, ſcilicet primus inconfectum, ſecundus aliquantulum confectum, tertius pleniùs, quartus perquam plenè confectum. Ita fit vt genus hoc animalium receptacula cibi habeat plura, quibus nomina hæc aut indita ſunt, aut indere licet, venter, araneum, ſiue reticulum, omaſum, abomaſum. Quonam modo hæc ſe habeant, tum ſitu tum etiam ſpecie, ex hiſtoria diſſectionéque animalium petendum eſt.

Hęc eadem cauſa eſt vt auiũ quoque gęnus partẽ, qua cibum recipit, variè habeat. Cùm enim id oris officio, quod cibo conficiendo tribuitur, omnino careat, vt quod nullos habeat dentes, & neque quo dirimat, neque quo molat cibum, obtineat, idcirco aut ante ventrem ſinum habent, qui ingluuies appellatur, pro oris officio, aut gulam patentiorem, aut ante ventrem partem aliquam gulæ ipſius ſinuoſam, in qua cibum recentem & inconfectum recondant, aut ventris ipſius partem aliquam prominentem, aut etiam ventrem ipſum validum, & carnoſum, vt cibum immolitum diu continere & concoquere poſſint. Bonis enim viribus ventris & calore, Natura defectum oris rependit, & compenſat. Sunt quæ nihil ex iis habeant, ſed ingluuie prolixa vtantur, ſcilicet ea quibus crura prælonga & læuia ſunt, propter cibi humiditatem. Cauſa igitur eſt, quòd cibus iis omnibus moli & confici facilè poſſit, vt eorum ventres per facilem cibi concoctionem humeſcant. Piſcium generi dati ſunt dentes, ſed ſerrati, propè dixerim, omnes. Genus enim quoddam exiguum eſt, quod non ſerratos habeat dentes: vt qui ſcarus vocatur, qui vnus & ruminare merito ob eam rem creditur. Quæ enim non vtrinque dentata cornigera ſunt, ruminant. Habent omnes acutos, quibus etſi cibum ſecare poſſunt: tamen malè ſecant, quòd diutius immorari nequeant. Quamobrem nec planos habent dentes. Non enim fieri poteſt vt deterant cibum: itaque fruſtra haberent. Item ſtomachum alij nullum omnino habent, alij breuem. Sed enim ad concoctionem iuuandam alij modo auium ventriculos habent carnoſos, vt mugilis. Maior autem numerus appendices iuxta ventrem frequentes obtinet, vt in iis, quaſi lacunis, cibum conditum macerent, atque concoquant. *Sed piſces* contrà, quàm aues, eas appendices ſitas habent: quippe qui supernè habeant ad ventrem, cùm aues, quibus datum hoc eſt, infrà parte inteſtini extrema diſſumant. Viuiparorum etiam nonnullis appendices inteſtinales infrà eadem de cauſa habentur. Genus piſcium omne, quoniam cibum minùs conficere poſſit, crudáque egerat, & vorax, & guloſum eſt: cætera etiam omnia, quibus inteſtina ſunt recta, ciborum auida ſunt. Cùm enim cibus celeriter egeratur, proindéque breuis vſus fruendi ſit, breui repetant cibum auida, neceſſe eſt. Quæ vtrinque dentata ſunt, paruum habere ventrem, dictum iam eſt. Differentiam autem duplicem ferè omnia recipiunt. Alia enim canino ſimilem habent, alia ſuillo. Amplior venter ſuillus eſt, flexuoſúſque, vt diutiùs concoquat: caninus paruus eſt, nec multò amplior inteſtino, læuiſque intus. A ventre natura inteſtinorum poſita eſt in omnibus animalibus. Habet & ea differentiam, vt venter, numeroſiorem. Aliis enim ſimplex inteſtinum, ſibique ſimile reſoluitur, aliis diſſimile. Quibuſdam enim parte, qua ventri iungitur, laxius eſt: qua deſinit, arctius. Quamobrem canes, vehementi nixu, nec ſine cruciatu eam partem leuant excremento. Sed tamen maiori animalium numero arctius parte ſuperiori eſt, latius inferiori. Maiora multiplicabilioráque ſunt inteſtina cornigerorum. Ventris etiam ſinus eorum amplior, quòd auctiora ſint.

A διὰ τὴν αὐτὴν δ' αἰτίαν, καὶ τὸ τῶν ὀρνίθων γένος ἔχει διάφορον πρὸς τὸ τῆς τροφῆς δεκτικὸν μόριον. ἐπεὶ γὰρ οὐδὲ ταῦτα ὅλως τὴν τῆς τροφῆς ἐκδίδωσι λειτουργίαν τοῦ στόματος (ἀνόδοντα γὰρ) καὶ οὔτε ᾧ διαιρήσει, οὔτε ᾧ λεανεῖ τὴν τροφὴν ἔχουσι, διὰ τοῦτο τὰ μὲν πρὸ τῆς κοιλίας ἔχουσι τὸν καλούμενον πρόλοβον, ἀντὶ τῆς τοῦ στόματος ἐργασίας. οἱ δὲ τὸν οἰσοφάγον πλατὺν, ἢ πρὸ τῆς κοιλίας αὐτοῦ, μέρος τι ὀγκῶδες, ἐν ᾧ προθησαυρίζουσι τὴν ἀκατέργαστον τροφήν· ἢ τῆς κοιλίας αὐτῆς τι ἐπανεστηκός. οἱ δ' αὐτὴν τὴν κοιλίαν ἰσχυρὰν καὶ σαρκώδη, πρὸς τὸ δύνασθαι πολὺν χρόνον B θησαυρίζειν, καὶ πέττειν ἀλέαστον οὖσαν τὴν τροφήν. τῇ δυνάμει γὰρ καὶ τῇ θερμότητι τῆς κοιλίας, ἡ φύσις ἀναλαμβάνει τὴν τοῦ στόματος ἔνδειαν. εἰσὶ δέ τινες, οἳ τούτων οὐδὲν ἔχουσιν, ἀλλ' αὐτὸν πρόλοβον μακρὸν, ὅσα μακροσκελῆ καὶ λεῖα, διὰ τὴν τῆς τροφῆς ὑγρότητα. αἴτιον δ', ὅτι ἡ τροφὴ πᾶσι τούτοις εὐλέαστος· ὥστε συμβαίνει διὰ ταῦτα τὰς τῶν τοιούτων κοιλίας εἶναι ὑγρὰς, διὰ τὴν ἀπεψίαν καὶ τὴν τροφήν. τὸ δὲ τῶν ἰχθύων γένος ἔχει μὲν ὀδόντας· τούτους δὲ καρχαρόδοντας σχεδὸν (ὡς εἰπεῖν) πάντας. ὀλίγον γάρ τι ἐστὶ γένος τὸ μὴ τοιοῦτον, οἷον ὁ καλούμενος σκάρος· ὃς δὴ καὶ δοκεῖ μηρυ-C κάζειν διὰ ταῦτα μόνος εὐλόγως· καὶ γὰρ τὰ μὴ ἀμφώδοντα, κερατοφόρα δὲ, μηρυκάζει. ὀξεῖς δὲ πάντες ἔχουσιν· ὥστε διελεῖν μὲν δύνανται, φαύλως δὲ διελεῖν. ἐνδιατρίβειν γὰρ οὐχ οἷόν τε χρονίζοντα. διόπερ οὐδὲ πλατεῖς ἔχουσιν ὀδόντας· οὐδ' ἐνδέχεται λεαίνειν. μάτην ἂν οὖν εἶχον. ἔτι δὲ στόμαχον, οἱ μὲν ὅλως οὐκ ἔχουσιν, οἱ δὲ βραχύν. ἀλλὰ πρὸς τὴν βοήθειαν τῆς πέψεως, οἱ μὲν ἔχουσιν ὀρνιθώδεις τὰς κοιλίας καὶ σαρκώδεις, οἷον κεστρεύς· οἱ δὲ πολλοὶ παρὰ τὴν κοιλίαν ἀποφυάδας πυκνὰς, ἵν' ἐν ταύταις, ὥσπερ ἐν προλακκίοις θησαυρίζοντες, συσσήπωσι καὶ πέττωσι τὴν τροφήν. ἔχουσι δ' ἐναντίως οἱ ἰχθύες τοῖς ὄρνισι τὰς ἀποφυά-D δας. οἱ μὲν γὰρ ἰχθύες, ἄνω πρὸς τὴν κοιλίαν· τῶν δὲ ὀρνίθων οἱ ἔχοντες ἀποφυάδας, κάτω πρὸς τῷ τέλει τοῦ ἐντέρου. ἔχουσι δ' ἀποφυάδας ἔνια καὶ τῶν ζωοτόκων ἐντεροειδεῖς κάτω, διὰ τὴν αὐτὴν αἰτίαν. τὸ δὲ τῶν ἰχθύων γένος ἅπαν, διὰ τὸ ἐνδεεστέρως ἔχειν πρὸς τὴν τῆς τροφῆς ἐργασίαν, ἀλλ' ἄπεπτα διαχωρεῖν, λαίμαργον πρὸς τὴν τροφήν ἐστι· καὶ τῶν ἄλλων δὲ πάντα ὅσα εὐθυέντερα. ταχείας γὰρ γινομένης τῆς διαχωρήσεως, καὶ διὰ ταῦτα βραχείας οὔσης τῆς ἀπολαύσεως, ταχεῖαν ἀναγκαῖον γίνεσθαι καὶ τὴν ἐπιθυμίαν πάλιν. τὰ δ' ἀμφώδοντα, ὅτι μὲν μικρὰν ἔχει κοιλίαν, εἴρηται E πρότερον. εἰς διαφορὰς δὲ πίπτουσι δύο πάσας σχεδόν· τὰ μὲν γὰρ τῇ τῆς κυνὸς ἔχουσιν ὁμοίαν κοιλίαν, τὰ δὲ τῇ τῆς ὑός. ἔστι δὲ ἡ μὲν τῆς ὑὸς μείζων, καὶ πτυχὰς ἔχουσα μετρίας πλατείας, πρὸς τὸ χρονιωτέραν γίνεσθαι τὴν πέψιν· ἡ δὲ τῆς κυνὸς μικρὰ τὸ μέγεθος, καὶ οὐ πολὺ τοῦ ἐντέρου ὑπερβάλλουσα, καὶ λεία τὰ ἐντός. μετὰ γὰρ τὴν κοιλίαν, ἡ τῶν ἐντέρων ἐπίκειται φύσις πᾶσι τοῖς ζῴοις. ἔχει δὲ διαφορὰς πολλὰς, καθάπερ ἡ κοιλία, καὶ τοῦτο τὸ μόριον. τοῖς μὲν γὰρ ἁπλοῦν ἐστι καὶ ὅμοιον ἀναλυόμενον, τοῖς δ' ἀνόμοιον. ἐνίοις μὲν γὰρ εὐρύτερον πρὸς τῇ κοιλίᾳ· τὸ δὲ πρὸς τῷ τέλει, στενότερον. διόπερ αἱ κύνες μετὰ πόνου προΐενται τὴν τοιαύτην περίττωσιν. τοῖς δὲ πλείοσιν ἄνωθεν στενότερον, πρὸς τῷ τέλει δὲ εὐρύτερον. μείζω δὲ καὶ ἀναδιπλώσεις ἔχοντα πολλὰς τὰ τῶν κερατοφόρων ἐστὶ, καὶ οἱ ὄγκοι τῆς κοιλίας τούτοις μείζους, καὶ τῶν ἐντέρων, διὰ τὸ μέγεθος·

A πάντα γὰρ, ὡς εἰπεῖν, μεγάλα τὰ τῶν κερατοφόρων, διὰ τὴν κατεργασίαν τὴν τῆς τροφῆς. πᾶσι δὲ τοῖς μὴ εὐθυεντέροις προϊοῦσιν, εὐρύτερον γίνεται τοῦτο τὸ μόριον, καὶ τὸ καλούμενον κῶλον ἔχουσι, καὶ τοῦ ἐντέρου τυφλόν τι καὶ ἐξῳδηκὸς, εἶτ' ἐκ τούτου πάλιν στενότερον καὶ εἱλιγμένον. τὸ δὲ μετὰ τοῦτο, εὐθὺ πρὸς τὴν ἔξοδον διατείνει τοῦ περιττώματος, καὶ τοῖς μὲν, τοῦτο τὸ μόριον, ὁ καλούμενος πρωκτὸς, πιμελώδης ἐστὶ, τοῖς δ' ἀπίμελος. ταῦτα δὲ πάντα μεμηχάνηται τῇ φύσει πρὸς τὰς ἁρμοττούσας ἐργασίας περὶ τὴν τροφὴν καὶ τοῦ γινομένου περιττώματος. προϊόντι γὰρ καὶ καταβαίνοντι τῷ περιττώματι, εὐρυχωρία γίνεται, καὶ πρὸς τὸ μεταβάλλειν ἱσταμένῳ τοῖς εὐχιλοτέροις τῶν ζῴων, καὶ πλείονος δεομένοις τροφῆς, διὰ τὸ μέγεθος, ἢ τὴν θερμότητα τῶν τόπων. εἶτ' ἐντεῦθεν πάλιν, ὥσπερ ἀπὸ τῆς ἄνω κοιλίας ἔρχεται στενότερον ἔντερον, οὕτως ἐκ τοῦ κώλου καὶ τῆς εὐρυχωρίας, ἐν τῇ κάτω κοιλίᾳ πάλιν εἰς στενότερον ἔρχεται, καὶ εἰς τὴν ἕλικα τὸ περίττωμα ἔρχεται ἐξικμασμένον πάμπαν, ὅπως ταμιεύηται ἡ φύσις, καὶ μὴ ἀθρόως ᾖ ἡ ἔξοδος τοῦ περιττώματος. ὅσα μὲν οὖν εἶναι δεῖ τῶν ζῴων σωφρονέστερα, πρὸς τὴν τῆς τροφῆς ἐργασίαν, μᾶλλον δὲ ποίησιν, εὐρυχωρίας μὲν οὐκ ἔχει μεγάλας κατὰ τὴν κάτω κοιλίαν, ἕλικας δ' ἔχει πλείους, καὶ οὐκ εὐθυέντερά ἐστιν. ἡ μὲν γὰρ εὐρυχωρία ποιεῖ πλήθους ἐπιθυμίαν· ἡ δ' εὐθύτης, ταχυτῆτα ἐπιθυμίας· διόπερ ὅσα τῶν ζῴων ἢ ἁπλᾶς ἔχει ἢ εὐρυχώρους τὰς ὑποδοχὰς, τὰ μὲν εἰς πλῆθος γαστρίμαργα, τὰ δὲ εἰς τάχος ἐστίν. ἐπεὶ δ' ἐν τῇ ἄνω μὲν κοιλίᾳ κατὰ τὴν πρώτην εἴσοδον τῆς τροφῆς, νεαρὰν ἀναγκαῖον εἶναι τὴν τροφὴν, κάτω δὲ προϊοῦσαν, κοπρώδη καὶ ἐξικμασμένην, ἀναγκαῖον εἶναί τι καὶ τὸ μεταξὺ, ἐν ᾧ μεταβάλλει, καὶ οὔτ' ἔτι πρόσφατος, οὔτ' ἤδη κόπρος. διὸ πάντα τὰ τοιαῦτα ζῷα, τὴν καλουμένην ἔχει νῆστιν, ἐν τῷ μετὰ τὴν κοιλίαν ἐντέρῳ τῷ λεπτῷ. τοῦτο γὰρ μεταξὺ τῆς ἄνω, ἐν ᾗ τὸ ἄπεπτον, καὶ τῆς κάτω, ἐν ᾗ τὸ ἄχρηστον ἤδη περίττωμα. γίνεται δ' ἐν πᾶσι μὲν, δήλη δ' ἐν τοῖς μείζοσι καὶ νηστεύσασιν, ἀλλ' οὐκ ἐδηδοκόσι. τότε γὰρ ἤδη μεταίχμιον γίνεται τῶν τόπων ἀμφοτέρων. ἐδηδοκότων δὲ, μικρὸς ὁ καιρὸς τῆς μεταβολῆς. ταῖς μὲν οὖν θηλείαις γίνεται ὅπου ἂν τύχῃ τοῦ ἄνω ἐντέρου ἡ νῆστις· οἱ δ' ἄρρενες ἔχουσι πρὸ τοῦ τυφλοῦ καὶ τῆς κάτω κοιλίας.

Historiar. li. 3. cap. 21.

ΚΕΦΑΛ. ιε'.

Περὶ πυετίας.

Ἔχουσι δὲ τὴν καλουμένην πυετίαν, τὰ μὲν πολυκοίλια πάντα, τῶν δὲ μονοκοιλίων, δασύπους. ἔχει δὲ τὰ ἔχοντα τῶν πολυκοιλίων τὴν πυετίαν, οὔτ' ἐν τῇ μεγάλῃ κοιλίᾳ, οὔτ' ἐν τῷ κεκρυφάλῳ, οὔτ' ἐν τῷ τελευταίῳ ἐνύστρῳ, ἀλλ' ἐν τῷ μεταξὺ τοῦ τελευταίου καὶ δύο τῶν πρώτων, ἐν τῷ καλουμένῳ ἐχίνῳ. ἔχει δὲ ταῦτα πάντα πυετίαν, διὰ τὴν παχύτητα τοῦ γάλακτος· τὰ δὲ μονοκοίλια οὐκ ἔχει· λεπτὸν γὰρ τὸ γάλα τῶν μονοκοιλίων. διὸ τῶν μὲν κερατοφόρων, πήγνυται· τῶν δ' ἀκεράτων οὐ πήγνυται τὸ γάλα. * τῷ δὲ δασύποδι γίνεται πυετία, διὰ τὸ νέμεσθαι ὀπώδη πόαν. ὁ γὰρ τοιοῦτος χυμὸς, συνίστησιν ἐν τῇ κοιλίᾳ τὸ γάλα τοῖς ἐμβρύοις. διότι δὲ τοῖς πολυκοιλίοις ἐν τῷ ἐχίνῳ γίνεται ἡ πυετία, εἴρηται ἐν τοῖς προβλήμασιν.

* Vide Mercurialem Variar. 5.11.

A Cornigerorum enim, propè dixerim, omnia ampliora ſunt pabuli ratione, vt conficiant, quod cibi ingerunt, inconfectum. Quibus autem inteſtinum non directum, iis omnibus amplius tendit, quà & quod colum vocatur, habent, & cæcum ac tumidum quiddam mox arctatur, & complicatur: ab hoc rectum ad exitum vſque excrementi pertendit, quæ quidem pars, quam podicem vocant, aliis pinguis, aliis ſine pingui eſt. Quæ omnia natura ſolers molita eſt, ad congruam cibi confectionem, & excrementi vſum, & transmiſſionem. Procedenti enim deſcendentique excremento, aut ſubſiſtenti, vt immutetur in animalibus, quæ præ magnitudine, aut locoB rum calore vegetiora, cibique plenioris indigentiora ſint, via ampliatur. Tum, vt ventrem inteſtinum anguſtius excipit, ſic à colo, quod laxum inteſtinum vocatur, & alui amplitudine, rurſus ſemitam anguſtiorem, clauiculam à flexuoſis orbibus dictam, ſubit excrementum iam penitus euaporatum, vt natura ſeruetur, nec vniuerſim exitus fiat excrementi. Quæ igitur animalia continentiora eſſe ad cibi deſiderium conuenit, hæc ſua in aluo laxiores ſinus non habent, ſed anfractus orbéſque plures continent, nec recto inteſtino vtuntur. Laxitas enim inteſtini, auiditatem auget cibi: rectitudo accelerat auiditatem. Quamobrem, animalia, quæ vel ſimplex habent C inteſtinum, vel conceptacula ampla, cibum aut copioſum capiunt, aut celeriùs repetunt. Sed cùm in ventre ſuperiore cibum ingeſtum recentem eſſe neceſſe ſit: in imum autem delapſum fæculentum, euaporatúmque, locum etiam aliquem interpoſitum eſſe, in quo immutetur, & nec recens adhuc, neque iam exactus in ſtercus ſit, neceſſe eſt. Itaque genus id animalium omne habet eam partem, quæ ieiunum vocatur, poſitam in eo quod à ventre tenue tendit, inteſtino. Hoc enim medium eſt inter ventrem ſuperiorem, in quo cibus crudus adhuc ſit, & inferiorem, in quo iam ſuperuacuum excrementum continetur. Hoc cùm in omnibus ita ſit, tum in iis patet, quæ & maiora D ſint, & ieiunarint: ita enim interſtitium loci vtriuſque conſpicitur. Nam ſi ederint, mutationi parum temporis ſuppetit. Sed fœminis pars nulla certa ſuperioris inteſtini ieiuna eſt. Alia enim aliis, vt fors tulerit. Maribus autem proximè ante cæcum aluúmque omnibus eſt.

CAPVT XV.

Quæ coagulum habeant, quæ non, & de eius loco.

HAbent, quod coagulum vocatur, omnia, quæ plures continent ventres: carent, quæ vnum habent, excepto lepore. Habent, quibus hoc datum eſt, non in magno ventre, nec in reticulo, neE que in vltimo, quod abomaſum appellauimus: ſed in eo, qui inter vltimum & duos primos poſitus eſt; quod omaſum vocatur. Habent hæc omnia coagulum, propter lactis craſſamentum: carent, quibus ſinguli ventres, quòd eorum lac tenue ſit. Quamobrem cornigerorum lac ſpiſſatur, mutilorum nequaquam. Lepori coagulum fit, quoniam herbam ſucci lactei paſcatur: talis enim humor lac in ventriculo infantium ſtringit, facitque coloſtrum. Cur coagulum in omaſo multiuentrium conſiſtat, explicatum in problematibus eſt.

A

ARISTOTELIS STAGIRITÆ DE PARTIBVS ANIMALIVM & earum cauſis,

LIBER QVARTVS.

CAPVT I.

Viſcera, & ventrem, cæteráque ſuperiùs expoſita, in quadrupedibus ouiparis, & iis quæ pedibus carent, eodem modo haberi, at in nonnullis aliis differre.

B

VISCERA, venter, & reliquæ, quas expoſuimus, partes, modo eodem in quadrupedibus ouiparis, & in iis quæ pedibus carent, vt ſerpentibus, habentur. Natura enim ſerpentum cognata iis eſt: quippe quæ ſimilis ſit lacertæ prælongæ, ac expedi. His verò, & piſcibus omnia ſimilia ſunt, nisi quòd pulmo ſerpentibus datus eſt, quoniam terra vtantur: piſces eo carent, & branchias vice pulmonis ſortiuntur. Veſica nec piſcibus, neque eorum vlli, quæ modò dixi, adiuncta eſt, niſi teſtudini. Humor enim iis in corticem tegentem, vt auibus in pennas, abſumitur, cùm exiguo potu C contenta ſint, propter exanguem pulmonis naturam. Et quidem excrementum alui iis quoque omnibus albicat, quemadmodum auibus. Itaque iis quæ veſicam habent, exempta vrina, ſalſugo quædam terrena in vaſis ſubſidet. Quantum enim dulce & potulentum ſit, in carnem præ ſua leuitate abſumitur. Viperæ inter ſerpentes eadem à cæteris ſui generis differentia diſcrepant, qua inter piſces cartilaginea à cæteris ſui generis. Nam & cartilaginea, & viperæ, animal edunt in lucem, vbi primùm intra ſe oua pepererint. Ventres ſingulos hæc quoque omnia habent, vt cætera, quæ vtrinque dentata ſunt: lienem etiam admodum paruum, vt cætera quæ carent veſica. Ser- D pentes propter corporis formam, quæ longa eſt, & anguſta, ſpeciem quoque viſcerum habent prolixam, & cæteris animalibus diſſimilem, vt quam ad ſui corporis opificium, quaſi formulam effigiatam, ſortiantur. Omentum, lactes, & inteſtinorum naturam, atque etiam ſeptum, & cor, omnia animalia ſanguine prædita obtinent. Pulmonem atque arteriam omnia, præter piſces. Situm etiam arteriæ, gulæque, omnia, quibus hæc data ſunt, ſimilem tenent, propter cauſas ſuprà dictas.

CAPVT II.

Quam ob cauſam animalium alia fel habeant, alia non.

E

FEl etiam habet maior pars animalium, quibus ſanguis: idque aut in iecore aut inteſtinis ſepoſitum, vt quod ſuam naturam non minùs aluo familiarem habeat. Hoc ita eſſe maximè in piſcibus conſtat. Cùm enim piſces fel habeant omnes, tum magna ex parte ſuis inteſtinis annexum continent: nonnulli etiam toto inteſtino prætextum, vt amia. Necnon ſerpentum pars maxima eodem modo habere cernitur. Quamobrem qui fellis naturam ſenſus alicuius gratià eſſe opinâtur,

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζώων μορίων

τὸ Δ.

ΚΕΦΑΛ. α΄.

Ὅτι τὸν αὐτὸν τρόπον ἔχει τὰ περὶ σπλάγχνα καὶ τὴν κοιλίαν, καὶ τῶν εἰρημένων μορίων ἕκαστον τοῖς τετράποσι μὲν, ᾠοτόκοις δὲ, καὶ τοῖς ἄποσι.

B

ΤΟΝ αὐτὸν δὲ τρόπον ἔχει τὰ περὶ τὰ σπλάγχνα καὶ τὴν κοιλίαν, καὶ τῶν εἰρημένων μορίων ἕκαστον, τοῖς τετράποσι μὲν, ᾠοτόκοις δὲ τῶν ζῴων, καὶ τοῖς ἄποσιν, οἷον τοῖς ὄφεσι. καὶ γὰρ ἡ τῶν ὄφεων φύσις συγγενές ἐστι τούτοις. ὁμοία γάρ ἐστι σαύρᾳ μακρῷ, ἢ τε ἄποδι. τούτοις δὲ καὶ τοῖς ἰχθύσι πάντα παραπλήσια. πλὴν τὰ μὲν, ἔχει πνεύμονα, διὰ τὸ πεζεύειν· οἱ δ' οὐκ ἔχουσιν, ἀλλὰ βράγχια ἀντὶ τοῦ πνεύμονος. κύστιν δὲ οὔτε οἱ ἰχθύες ἔχουσιν, οὔτε τούτων οὐδὲν, πλὴν χελώνης. τρέπεται γὰρ C εἰς τὰς φολίδας τὸ ὑγρὸν ὀλιγοπότων ὄντων, διὰ τὴν ἀναιμότητα τοῦ πνεύμονος. *ἐπιλευκαίνεται δὲ τὸ περίττωμα πᾶσι καὶ τούτοις, καθάπερ τοῖς ὄρνισι· διὰ ταῦτα καὶ ἐν τοῖς ἔχουσι κύστιν ὑφίσταται ἡ ἁλμυρὶς, γεώδης οὖσα καὶ λευκή. ὅσον γὰρ γλυκὺ καὶ πότιμον ἐστὶ, ἀναλίσκεται διὰ κουφότητα εἰς τὰς σάρκας. τῶν δ' ὄφεων οἱ ἔχεις πρὸς τοὺς ἄλλους ἔχουσι τὴν αὐτὴν διαφορὰν, ἣν καὶ ἐν τοῖς ἰχθύσι τὰ σελάχη πρὸς τοὺς ἄλλους. ζῳοτοκοῦσι γὰρ ἔξω τε τὰ σελάχη καὶ οἱ ἔχεις, ἐν αὐτοῖς ᾠοτοκήσαντα πρότερον. μονοκοίλια δὲ πάντα τὰ τοιαῦτά ἐστι, καθάπερ τἆλλα τὰ ἀμφώδοντα· καὶ σπλῆνα δὲ πάμπαν μικρὸν ἔχει, ὥσπερ τἆλλα τὰ μὴ ἔχοντα κύστιν. οἱ δ' ὄφεις, διὰ τὴν τοῦ σώματος D μορφὴν, οὖσαν μακρὰν καὶ στενὴν, καὶ τὰ σχήματα τῶν σπλάγχνων ἔχουσι διὰ ταῦτα μακρὰ, καὶ τοῖς τῶν ἄλλων ζῴων ἀνόμοια, διὰ τὸ καθάπερ ἐν τύπῳ τὰ σχήματ' αὐτῶν πλασθῆναι διὰ τὸν τόπον. ἐπίπλοον δὲ καὶ μεσεντέριον, καὶ τὰ περὶ τὴν τῶν ἐντέρων φύσιν, ἔτι δὲ τὸ διάζωμα, καὶ τὴν καρδίαν, πάντ' ἔχει τὰ ἔναιμα τῶν ζῴων. πνεύμονα δὲ καὶ ἀρτηρίαν πάντα, πλὴν τῶν ἰχθύων. καὶ τὴν θέσιν δὲ τῆς ἀρτηρίας καὶ τοῦ οἰσοφάγου, πάντα τὰ ἔχοντα ὁμοίως ἔχει, διὰ τὰς εἰρημένας αἰτίας πρότερον.

Histor. lib. 1. c. 17.

* κ. ὑπολευκαίνεται

ΚΕΦΑΛ. β΄.

Περὶ τῆς χολῆς.

E

ΕΧει δὲ καὶ χολὴν τὰ πολλὰ τῶν ἐναίμων ζῴων, τὰ μὲν ἐπὶ τῷ ἥπατι, τὰ δ' ἀπηρτημένην ἐπὶ τοῖς ἐντέροις, ὡς οὖσαν οὐχ ἧττον ἐκ τῆς κάτω κοιλίας τὴν φύσιν αὐτῆς. δῆλον δὲ μάλιστα ἐπὶ τῶν ἰχθύων. οὗτοι γὰρ ἔχουσί τε πάντες, καὶ οἱ πολλοὶ πρὸς ἐντέροις. ἔνιοι δὲ παρ' ὅλον τὸ ἔντερον παρυφασμένην, οἷον ἡ ἀμία· καὶ τῶν ὄφεων οἱ πλεῖστοι τὸν αὐτὸν τρόπον. διόπερ οἱ λέγοντες τὴν φύσιν τῆς χολῆς αἰσθήσεώς τινος εἶναι χάριν,

οὐ καλῶς λέγουσι· φασὶ γὰρ εἶναι διὰ τοῦτο, ὅπως τῆς ψυχῆς τὸ A περὶ τὸ ἧπαρ μόριον δάκνουσα μὲν συνιστῇ, λυομένη δὲ ἵλεων ποιῇ. τὰ μὲν γὰρ ὅλως οὐκ ἔχει χολὴν, οἷον ἵππος καὶ ὀρεὺς, καὶ ὄνος, καὶ ἔλαφος, καὶ πρόξ. οὐκ ἔχει δὲ οὐδὲ ἡ κάμηλος ἀποκεκριμένην, ἀλλὰ χολώδη φλέβια μᾶλλον. οὐκ ἔχει δὲ οὐδ' ἡ φώκη χολὴν, οὐδὲ τῶν θαλαττίων δελφίς. ἐν δὲ τοῖς γένεσι τοῖς αὐτοῖς, τὰ μὲν ἔχειν φαίνεται, τὰ δ' οὐκ ἔχειν, οἷον ἐν τῷ τῶν μυῶν. τούτων δ' ἐστὶ καὶ ὁ ἄνθρωπος. ἔνιοι μὲν γὰρ φαίνονται ἔχοντες χολὴν ἐπὶ τοῦ ἥπατος, ἔνιοι δ' οὐκ ἔχοντες. διὸ καὶ γίνεται ἀμφισβήτησις περὶ ὅλου τοῦ γένους. οἱ γὰρ ἐντυχόντες ὁποτέρως οὖν ἔχουσι, περὶ πάντων ὑπολαμβάνουσιν, ὡς ἁπάντων ἐχόντων.* συμβαίνει δὲ τὸ τοιοῦτον καὶ B περὶ τὰ πρόβατα καὶ τὰς αἶγας. τὰ μὲν γὰρ πλεῖστα τούτων ἔχει χολὴν, ἀλλ' ἐνιαχοῦ μὲν τοσαύτην, ὥστε δοκεῖν τέρας εἶναι τὴν ὑπερβολὴν, οἷον ἐν Νάξῳ· ἐνιαχοῦ δὲ οὐκ ἔχουσιν, οἷον ἐν Χαλκίδι τῆς Εὐβοίας, κατά τινα τόπον τῆς χώρας αὐτῶν. ἔτι δ', ὥσπερ εἴρηται, ἡ τῶν ἰχθύων ἀπήρτηται πολὺ τοῦ ἥπατος. οὐκ ὀρθῶς δ' ἐοίκασιν οἱ περὶ Ἀναξαγόραν ὑπολαμβάνειν, ὡς αἰτίαν οὖσαν τῶν ὀξέων νοσημάτων. ὑπερβάλλουσαν γὰρ ἀπορραίνειν πρός τε τὸν πλεύμονα καὶ τὰς φλέβας, καὶ τὰς πλευράς. σχεδὸν γὰρ οἷς ταῦτα συμβαίνει τὰ πάθη τῶν νόσων, οὐκ ἔχουσι χολήν· ἔν τε ταῖς ἀνατομαῖς ἂν ἐγίνετο τοῦτο φανερόν. ἔτι δὲ τὸ πλῆθος τό, τ' ἐν τοῖς ἀρρωστήμασιν ὑπάρχον καὶ τὸ ἀπορραινόμενον, ἀσύμβλητον. ἀλλ' C ἔοικεν, ὥσπερ ἡ χολὴ καὶ ἡ κατὰ τὸ ἄλλο σῶμα γινομένη, περίττωμά τι ἐστὶν, ἢ σύντηξις, οὕτω καὶ ἡ περὶ τὸ ἧπαρ χολὴ περίττωμά ἐστι, καὶ οὐχ ἕνεκά τινος, [ὥσπερ καὶ ἡ ἐν τῇ κοιλίᾳ καὶ ἐν τοῖς ἐντέροις ὑπόστασις. καταχρῆται μὲν οὖν ἐνίοτε ἡ φύσις εἰς τὸ ὠφέλιμον καὶ τοῖς περιττώμασιν. οὐ μὴν διὰ τοῦτο ζητεῖν δεῖ πάντα ἕνεκά τινος.] ἀλλὰ τινῶν ὄντων τοιούτων, ἕτερα συμβαίνει τοιαῦτα πολλὰ ἐξ ἀνάγκης. ὅσοις μὲν οὖν ἡ τοῦ ἥπατος σύστασις ὑγιεινή ἐστι, καὶ ἡ τοῦ αἵματος φύσις γλυκεῖα ἡ εἰς τοῦτο ἀποκρινομένη, ταῦτα μὲν ἢ πάμπαν οὐκ ἔχει χολὴν ἐπὶ τοῦ ἥπατος, ἢ ἔν τισι φλεβίοις· ἢ τὰ μὲν, τὰ δ' οὔ. D διὸ καὶ τὰ ἥπατα τὰ τῶν ἀχόλων εὔχροα καὶ γλυκερά ἐστιν, ὡς ἐπίπαν εἰπεῖν. καὶ τῶν ἐχόντων χολὴν τὸ ὑπὸ τὴν χολὴν τοῦ ἥπατος, γλυκύτατόν ἐστι. τῶν δὲ συνισταμένων ἐξ ἧττον καθαροῦ αἵματος, τοῦτ' ἐστὶν ἡ χολὴ τὸ γινόμενον περίττωμα. ἐναντίον τε γὰρ τῇ τροφῇ τὸ περίττωμα βούλεται εἶναι, καὶ τῷ γλυκεῖ τὸ πικρόν· καὶ τὸ αἷμα γλυκὺ τὸ ὑγιαῖνον. φανερὸν οὖν ὅτι οὐ τινος οὖν ἕνεκα, ἀλλ' ἀποκάθαρμά ἐστιν ἡ χολή. διὸ καὶ χαριέστατα λέγουσι τῶν ἀρχαίων οἱ φάσκοντες,* αἴτιόν ἐστι τοῦ πλείω ζῆν χρόνον τὸ μὴ ἔχειν χολὴν, βλέψαντες ἐπὶ τὰ μώνυχα καὶ τὰς ἐλάφους. ταῦτα γὰρ ἄχολά τε, καὶ ζῇ πολὺν χρόνον. ἔτι δὲ καὶ τὰ μὴ ἑωραμένα ὑπ' E ἐκείνων, ὅτι οὐκ ἔχει χολὴν (οἷον δελφὶς καὶ κάμηλος) καὶ ταῦτα τυγχάνει μακρόβια ὄντα. εὔλογον γὰρ τὴν τοῦ ἥπατος φύσιν ἐπίκαιρον οὖσαν καὶ ἀναγκαίαν πᾶσι τοῖς ἐναίμοις ζῴοις αἰτίαν εἶναι, ποιάν τινα οὖσαν τοῦ ζῆν ἐλάττω ἢ πλείω χρόνον. καὶ τούτου μὲν τοῦ σπλάγχνου εἶναι περίττωμα τοιοῦτον, τῶν δ' ἄλλων μηδενὸς, κατὰ λόγον ἐστί. τῇ μὲν γὰρ καρδίᾳ τοιοῦτον οὐδένα πλησιάζειν οἷόν τε χυμόν· οὐδὲν γὰρ δέχεται βίαιον πάθος. τῶν δ' ἄλλων οὐδὲν ἐστι σπλάγχνων ἀναγκαῖον τοῖς ζῴοις, ἀλλὰ τὸ ἧπαρ μόνον. διὸ καὶ τοῦτο συμβαίνει περὶ αὐτὸ μόνον. ἄτοπόν τε τὸ μὴ πανταχοῦ νομίζειν, ὅπου ἄν τις ἴδῃ φλέγμα,

* Hiſtor. anim. lib. 1. c. 17.

* Scrib. ὅτι αἴτ. vel αἴτιον εἶναι.

A non rectè ſentiunt. Volunt enim ideo fel adeſſe, vt partem animæ ſitam in iecore mordendo excitet, laxando exhilaret. Quædam felle omnino carent, vt equus, mulus, aſinus, ceruus, dama. Camelus, non diſcretum ſed venulis quibuſdam confuſum habet.* Vitulus etiam marinus caret, & inter piſces marinos delphinus. Sunt & quæ partim habeant, partim non habeant eodem in genere, vt mures. quod idem homini etiam accidit. Aliqui enim fel in iecore habere viſuntur, aliqui carent: itaque de toto genere ambigitur. Qui enim alterutrum compererint, idem omnibus tribuunt, quaſi omnes eodem habeant modo, quo aliqui. Hoc idem ouibus etiam capriſque B euenit: pars enim earum maxima habet fel: & quidem terris quibuſdam adeò largè, vt exuperantia prodigij loco habeatur, vt in Naxo: ſed aliis quibuſdam locis omnino careat, vt apud Chalcidem Euboicam, parte quadam agri. Ad hæc, piſcium fel (vt dictum eſt) longè remotum à iecore eſt. Anaxagoras errore opinari videtur, fel eſſe morborum cauſam acutorum: cùm enim abundat, aſpergi in pulmonem, & venas, & coſtas, aſſeuerat. Iis namque ferè accidunt ea vitia animalibus, quæ felle carent; diſſectis etiam id pateret, ſi ita eſſet. Adhæc, copia humoris, quæ per abſceſſus decumbit, conferri non poteſt cum eo quod ex fellis conceptaculo aſpergatur. Sed enim C vt bilis, quę qualibet alia corporis parte gignitur, excrementum quoddam liquamentúmque eſt: ſic fel iecori adiunctum, non rei cuiquã delegatum, ſed excrementum eſſe videtur, quomodo & alui inteſtinorúmque ſedimen. Attamen natura commodè vel excrementis ſuis interdum abvtitur: ſed non propterea quærere omnia alicuius cauſa debemus. Cùm enim aliqua eiuſmodi ſint, fit vt alia complura neceſſariò cauſa eorum proueniant. Quibus igitur iecoris conſtitutio ſalubris eſt, & ſanguinis natura, quæ iecur ſubeat, dulcis accedit, hæc aut nullum fel ſuo in iecore habent, aut venulis quibuſdam incluſum continent, aut par- D tim habent, partim non habent. Quamobrem iecinora eorum, quæ felle vacant, dulcia ſunt, probéque colorata, propè dixerim, omnium. Particula etiam iecoris, quæ felli ſubdita eſt, dulciſſima eſt. At verò quæ ſanguine minus puro conſiſtunt, hæc excrementum id quod fel appellamus, ſemouent: excrementum enim contrarium alimento eſſe vult, & amarum dulci: & ſanguis integer dulcis eſt. Fel igitur non alicuius gratia, ſed purgamentum atque inutilem eſſe materiem, conſtat. Quamobrem pulchrè à veteribus dicitur illis, qui cauſam cur diutius viuatur, fellis vacuitatem eſſe aiunt, argumento ex ſolipedum ceruorúmque genere deducto: hęc enim & E felle vacant, & diu viuunt. Quinetiam ea quæ illi non viderint felle carere, (vt delphinus, vt camelus,) longæua ſunt: iecoris enim naturam, vt opportunam, ac neceſſariam omnibus ſanguineis animalibus cauſam pro ſua qualitate afferre viuendi plus minúſve temporis ratio eſt. Excrementum etiam tale huius viſceris eſſe, cæterorum autem nullum, ratio exigit. Cordi enim nullus eiuſmodi humor appropinquare poteſt: quoniam illud affectum nullum patitur violentum. Cæterorum autem viſcerum nullum neceſſarium animalibus eſt, niſi iecur. Abſurdum autem ſit, niſi vbicunque pituitam, aut alui

aut alui ſedimen videris, excrementum id eſſe putes: parique modo de bile fellève cenſeas: ſed locis diſcrimen elicere velis. At de felle quam ob cauſam alia habeant, alia non habeant, ſatis dictum eſt.

CAPVT III.

De omento, & eius ortu, & officio.

RESTAT vt de lactibus & omento diſſeramus: hæc enim hoc loco, & cum inteſtinis continentur. Omentum membrana eſt aut ſeuoſa, aut adipoſa, ſcilicet vtro modo pingueſcere animal ſolet. Quænam differentia inter hæc ſit, dictum iam eſt. Oritur id de medio ventre, tam vniventri quàm multiventri generi, qua velvti ſutura deſcribitur: ineſt enim & in ventre, vt in corde, ſuturæ veſtigium quoddam, vnde omentum exorſum reliquam ventris partem, cunctáque inteſtina complectitur in omnibus ſanguine præditis, tum terreſtribus tum aquaticis animalibus. Ortus omenti talis, neceſſariò euenit: cùm enim ſicca aut humida miſcella caleſcit, vltimum ſemper cutis membranæve ſpeciem recipit. Hic autem locus plenus alimenti eiuſmodi eſt. Item propter membranæ denſitatem, quod ſanguinei alimenti tranſmiſſum colatúmque eſt, id pingue eſſe neceſſe eſt: tenuiſſimum enim hoc eſt, & calore loci iſtius concoctum, pro carnoſa & ſanguinea coagmentatione in ſeuum aut adipem euadere neceſſe eſt. Omentum ratione hac gignitur. Sed natura eo abvtitur ad cibi meliorem concoctionem, vt faciliùs celeriúſque cibus concoquatur. Calor enim vim habet concoquendi, pingue autem calidum eſt, & omentum pingue eſt. Itaque de medio ventre oritur, quoniam reliquam ventriculi partem iecur incidens fouet. Hæc de omento.

CAPVT IV.

De lactibus, & eorum ortu, & quam ob cauſam animalibus ſanguine præditis data ſint.

QVod autem lactes vocant, membrana & ipſum eſt, pertendens continua de inteſtinorum tenore ad venam vſque maiorem, & aortam, plena venarum multarum, atque frequentium, quæ ab inteſtinis ad venam maiorem aortámque permeant. Ortum eius ſimiliter atque cæterarum partium neceſſariò eſſe comperimus. Sed quam ob cauſam data ſit animalibus ſanguine præditis, conſiderandum eſt. Cùm enim neceſſe ſit vt animalia cibum extrinſecus capiant, rurſúſque ex hoc alimentum fiat: quod in omnes corporis partes digeratur (quod in exanguibus nomine vacat, in ſanguineis ſanguis appellatur) ideo aliquid adeſſe oportet, quo, tanquam radice, cibus de ventre ad venas deferatur. Itaque vt ſtirpes radicibus terræ innixæ cibum inde hauriunt: ſic animalibus venter, & inteſtinorum vires pro terra ſint, à quibus capiant alimentum: quamobrem lactes ſunt, venas ſibi inditas habentes quaſi radices. Sed cuius rei gratia lactes habeantur, dictum iam eſt. Quemadmodum autem capiant alimentum, & quonam pacto per venas ex alimento ingeſto ſubeat eas partes, quod in venas digeritur, explicabitur, cùm de generatione

A ἢ τὸ ὑπόστημα τῆς κοιλίας, περίττωμα εἶναι· ὁμοίως δὲ δῆλον ὅτι καὶ χολήν, καὶ μὴ διαφέρεσθαι τοῖς τόποις. καὶ περὶ μὲν χολῆς διὰ τίν᾽ αἰτίαν τὰ μὲν ἔχει, τὰ δ᾽ οὐκ ἔχει τῶν ζώων, εἴρηται.

ΚΕΦΑΛ. γʹ.

Περὶ ἐπιπλόου.

ΠΕρὶ δὲ μεσεντερίου καὶ ἐπιπλόου λοιπὸν εἰπεῖν· ταῦτα γὰρ ἐν τῷ τόπῳ τούτῳ καὶ μετὰ τῶν μορίων ἐστὶ τούτων. ἔστι δὲ τὸ μὲν ἐπίπλοον ὑμὴν, τοῖς μὲν στέαρ ἔχουσι, B στεατώδης· τοῖς δὲ πιμελὴν, πιμελώδης. ποῖα δ᾽ ἐστὶν ἑκάτερα τούτων, εἴρηται πρότερον. φύεται δὲ τὸ ἐπίπλοον ὁμοίως τοῖς τε μονοκοιλίοις καὶ τοῖς πολυκοιλίοις ἐκ μέσης τῆς κοιλίας, κατὰ τὴν ὑπογεγραμμένην οἷον ῥαφήν. ἐπέχει δὲ τό τε λοιπὸν τῆς κοιλίας, καὶ τὸ τῶν ἐντέρων πλῆθος ὁμοίως τοῖς ἐναίμοις, ἔν τε τοῖς πεζοῖς καὶ τοῖς ἐνύδροις ζώοις. ἡ μὲν οὖν γένεσις ἐξ ἀνάγκης συμβαίνει τοιαύτη τοῦ μορίου τούτου. ξηροῦ γὰρ καὶ ὑγροῦ μίγματος θερμαινομένου, τὸ ἔσχατον ἀεὶ δερματῶδες γίνεται καὶ ὑμενῶδες. ὁ δὲ τόπος οὗτος τοιαύτης ἐστὶ πλήρης τροφῆς. ἔτι δὲ διὰ πυκνότητα τοῦ ὑμένος τὸ διηθούμενον τῆς αἱματώδους τροφῆς, ἀναγκαῖον C λιπαρὸν εἶναι, (τοῦτο γὰρ θερμότατον καὶ λεπτότατον) καὶ διὰ τὴν θερμότητα τὴν περὶ τὸν τόπον συμπεττόμενον, ἀντὶ σαρκώδους καὶ αἱματώδους συστάσεως, στέαρ τε γίνεσθαι καὶ πιμελήν. ἡ μὲν οὖν γένεσις τοῦ ἐπιπλόου συμβαίνει κατὰ τὸν λόγον τοῦτον. καταχρῆται δὲ ἡ φύσις αὐτῷ πρὸς τὴν εὐπεψίαν τῆς τροφῆς, ὅπως ῥᾷον πέττῃ καὶ θᾶττον τὴν τροφὴν τὰ ζῷα. τὸ μὲν γὰρ θερμὸν, πεπτικόν· τὸ δὲ πῖον, θερμόν· τὸ δ᾽ ἐπίπλοον, πῖον. καὶ διὰ τοῦτο ἀπὸ μέσης ἤρτηται τῆς κοιλίας, ὅτι τὸ ἐπέκεινα τὸ μέρος, συμπέττει τὸ παρακείμενον ἧπαρ. καὶ περὶ μὲν τοῦ ἐπιπλόου εἴρηται.

D

ΚΕΦΑΛ. δʹ.

Περὶ μεσεντερίου.

ΤΟ δὲ καλούμενον μεσέντερον, ἔστι μὲν ὑμὴν, διατείνει δὲ συνεχὲς ἀπὸ τῆς τῶν ἐντέρων παρατάσεως, εἰς τὴν φλέβα τὴν μεγάλην, καὶ τὴν ἀορτήν, πλῆρες ὂν φλεβῶν πολλῶν καὶ πυκνῶν, αἳ τείνουσιν ἀπὸ τῶν ἐντέρων εἰς τε τὴν μεγάλην φλέβα καὶ τὴν ἀορτήν. τὴν μὲν οὖν γένεσιν ἐξ ἀνάγκης οὖσαν, εὑρήσομεν ὁμοίως τοῖς ἄλλοις μορίοις. διὰ τίνα δ᾽ αἰτίαν ὑπάρχει τοῖς ἐναίμοις, φανερόν ἐστι σκοποῦσιν. ἐπεὶ γὰρ ἀναγκαῖον τὰ ζῷα τροφὴν λαμβάνειν θύραθεν, καὶ E πάλιν ἐκ ταύτης γίνεσθαι τὴν ἐσχάτην τροφὴν, ἐξ ἧς ἤδη διαδίδοται εἰς τὰ μόρια, (τοῦτο δὲ τοῖς μὲν ἀναίμοις, ἀνώνυμον· τοῖς δ᾽ ἐναίμοις, αἷμα καλεῖται) δεῖ τι εἶναι, δι᾽ οὗ εἰς τὰς φλέβας ἐκ τῆς κοιλίας, οἷον διὰ ῥιζῶν πορεύσεται ἡ τροφή. τὰ μὲν οὖν φυτὰ τὰς ῥίζας ἔχει εἰς τὴν γῆν (ἐκεῖθεν γὰρ λαμβάνει τὴν τροφήν) τοῖς δὲ ζῴοις, ἡ κοιλία καὶ ἡ τῶν ἐντέρων δύναμις, ἀντὶ γῆς ἐστὶν, ἐξ ἧς δεῖ λαμβάνειν τὴν τροφήν. διόπερ ἡ τοῦ μεσεντερίου φύσις ἐστὶν, οἷον ῥίζας ἔχουσα τὰς δι᾽ αὐτῆς φλέβας. οὗ μὲν οὖν ἕνεκα τὸ μεσέντερόν ἐστιν, εἴρηται. τίνα δὲ τρόπον λαμβάνει τὴν τροφὴν, καὶ πῶς εἰσέρχεται διὰ τῶν φλεβῶν ἐκ τῆς εἰσιούσης τροφῆς εἰς ταῦτα τὰ μόρια τὸ διαδιδόμενον εἰς τὰς φλέβας, ἐν τοῖς περὶ τὴν γένεσιν Hiſt. 3.13.

A τῶν ζώων λεχθήσεται, καὶ τὴν τροφήν. Τὰ μὲν οὖν ἔναιμα τῶν ζώων, πῶς ἔχει μέχρι τῶν διωρισμένων μορίων, καὶ διὰ τίνας αἰτίας, εἴρηται. περὶ δὲ τῶν εἰς τὴν γένεσιν συντελούντων, οἷς δοκεῖ διαφέρειν τὸ θῆλυ τοῦ ἄρρενος, ἐχόμενον μέν ἐστι καὶ λοιπὸν τῶν εἰρημένων. ἀλλ' ἐπεὶ περὶ γενέσεως λεκτέον, ἁρμόττον ἐστὶ καὶ περὶ τούτων ἐν τῇ περὶ ἐκείνων θεωρίᾳ διελθεῖν.

ΚΕΦΑΛ. ε΄.

Πῶς τὰ μαλάκια καὶ μαλακόστρακα, καὶ ὀστρακόδερμα, καὶ ἔντομα, περὶ τὰ σπλάγχνα ἔχει, καὶ περὶ τῶν εἰρημένων ἕκαστον.

B

Hiſtor. lib. 5.

Τὰ δὲ καλούμενα μαλάκια καὶ μαλακόστρακα, πολλὴν ἔχει πρὸς ταῦτα διαφοράν. εὐθὺς γὰρ τὴν τῶν σπλάγχνων ἅπασαν οὐκ ἔχει φύσιν. ὁμοίως δ' οὐδὲ τῶν ἄλλων ἀναίμων οὐδέν. ἔστι δὲ δύο γένη λοιπὰ τῶν ἀναίμων, τά τε ὀστρακόδερμα, καὶ τὸ τῶν ἐντόμων γένος. οὐδὲν δὲ τούτων ἔχει αἷμα, ἐξ οὗ συνέστηκεν ἡ τῶν σπλάγχνων φύσις, διὰ τὸ τῆς οὐσίας αὐτῶν εἶναί τι τοιοῦτον πάθος αὐτοῖς. ὅτι γὰρ ἐστὶ τὰ μὲν ἔναιμα, τὰ δ' ἄναιμα, ἐν τῷ λόγῳ ἐνυπάρχει τῷ ὁρίζοντι τὴν οὐσίαν αὐτῶν. ἔτι δ' ὧν ἕνεκεν ἔχουσι τὰ σπλάγχνα τὰ ἔναιμα τῶν ζώων, οὐδὲν ὑπάρχει τούτοις. οὔτε γὰρ φλέβας ἔχουσιν, οὔτε κύστιν, οὔτ' ἀναπνέουσιν, ἀλλὰ μόνον
C ἀναγκαῖον ἔχειν αὐτοῖς τὸ ἀνάλογον τῇ καρδίᾳ. τὸ γὰρ αἰσθητικὸν ψυχῆς, καὶ τὸ τῆς ζωῆς αἴτιον, ἀρχῇ τινι τῶν μορίων καὶ τοῦ σώματος ὑπάρχει πᾶσι τοῖς ζώοις. τὰ δὲ πρὸς τὴν τροφὴν μόρια, ἔχει καὶ ταῦτα ἐξ ἀνάγκης πάντα. οἱ δὲ τρόποι διαφέρουσι διὰ τοὺς τόπους, ἐν οἷς λαμβάνουσι τὴν τροφήν. ἔχουσι δὲ τὰ μὲν μαλάκια περὶ τὸ καλούμενον στόμα, δύο ὀδόντας, καὶ ἐν τῷ στόματι ἀντὶ γλώττης σαρκῶδές τι, ᾧ κρίνουσι τὴν ἐν τοῖς ἐδεστοῖς ἡδονήν. ὁμοίως δὲ καὶ τὰ μαλακόστρακα τούτοις τοὺς προσθίους ὀδόντας ἔχει, καὶ τὸ ἀνάλογον τῇ γλώττῃ σαρκῶδες. ἔτι δὲ καὶ τὰ ὀστρακόδερμα πάντα τὸ τοιοῦτον ἔχει μόριον, διὰ τὴν αὐτὴν αἰτίαν τοῖς ἐναίμοις, πρὸς τὴν τῆς τροφῆς αἴσθησιν. ὁμοίως δὲ καὶ τὰ ἔντομα, τὰ μὲν τὴν προβοσκίδα
D τὴν ἐξιοῦσαν τοῦ στόματος, οἷον τό, τε τῶν μελιττῶν γένος καὶ τὸ τῶν μυιῶν, ὥσπερ εἴρηται καὶ πρότερον. ὅσα δὲ μή ἐστιν ἐμπροσθόκεντρα, ἐν τῷ στόματι ἔχει τὸ τοιοῦτον μόριον, οἷον τὸ τῶν μυρμήκων γένος, καὶ εἴ τι τοιοῦτον ἕτερον. ὀδόντας δὲ, τὰ μὲν ἔχει τούτων, ἀλλοιοτέρους δὲ, καθάπερ τὸ τῶν μυιῶν, καὶ τὸ τῶν μελιττῶν γένος. τὰ δ' οὐκ ἔχει, ὅσα ὑγρᾷ χρῆται τῇ τροφῇ. πολλὰ γὰρ τῶν ἐντόμων οὐ τροφῆς χάριν ἔχει τοὺς ὀδόντας, ἀλλ' ἀλκῆς. τῶν δὲ ὀστρακοδέρμων τὰ μὲν, ὥσπερ ἐλέχθη καὶ ἐν τοῖς κατ' ἀρχὰς λόγοις, τὴν καλουμένην ἔχει γλῶτταν ἰσχυράν. οἱ δὲ κόχλοι, καὶ ὀδόντας δύο, καθάπερ τὰ μαλακόστρακα. μετὰ δὲ τὸ στόμα, τοῖς μαλακίοις ἐστὶ στόμαχος μακρός. τούτου δ' ἐχόμενος ὁ πρόλοβος, οἷός περ τοῖς ὄρνισιν· εἶτα συνεχὴς κοιλία· καὶ ταύτης ἐχόμενον ἔντερον ἁπλοῦν
E μέχρι τῆς ἐξόδου. ταῖς μὲν οὖν σηπίαις καὶ τοῖς πολύποσιν, ὅμοια καὶ τοῖς σχήμασι καὶ τῇ ἁφῇ τὰ περὶ τὴν κοιλίαν· ταῖς δὲ καλουμέναις τευθίσι, δύο μὲν ὁμοίως αἱ κοιλιώδεις εἰσὶν ὑποδοχαί· ἧττον δὲ προλοβώδης ἡ ἑτέρα, καὶ τοῖς σχήμασιν ἐκείνων διαφέρουσι, διὰ τὸ καὶ τὸ σῶμα πᾶν ἐκ μαλακωτέρας συνεστάναι σαρκός. ταῦτα δ' ἔχει τὰ μόρια τοῦτον τὸν τρόπον, διὰ τὴν αὐτὴν αἰτίαν, ὥσπερ καὶ οἱ ὄρνιθες.

A alimentóque animalium agemus. Sed enim vt animalia ſanguine prædita conſtant partibus, quæ declaratæ adhuc ſunt, & quas ob cauſas, dictum iam eſt: ſequitur, quod & reliquum eſt, vt quæ ad generationem pertinent, quibus fœmina differat à mare, exponamus. Sed quoniam de generatione tractandum eſt, de iis quoque tunc diſſerere, cùm de illis tractamus, congruum eſt.

CAPVT V.

Mollia, cruſtacea, teſtata, & inſectorum genus, omnibus ſupra dictis membris carere: déque iis quæ vice eorum fungantur.

B

QVæ autem mollia, quæque cruſtata vocantur, plurimum ab iis quæ explicauimus, differunt. Iam enim omnem viſcerum naturam ea non habent, nec vlla ex reliquis, quæ ſanguine carent. Quæ duo genera ſunt, alterum, quod teſta contegitur: alterum, quod inſectum vocatur. Sanguinem enim, ex quo viſcerum natura conſtat, nullum ex iis obtinet, quoniam affectus eiuſmodi quidam eorum eſſentiæ proprius eſt. Etenim ſanguinem alia habere, alia non habere, in ratione recipitur, quæ eſſentiam eorum definiat. Nihil etiam ex iis quorum gratia viſcera habent animalia ſan-
C guine prædita, datum eiuſmodi animalibus eſt. Non enim venas hæc habent, non veſicam, non vſum ſpirandi: ſed vnum quod cordi proportionetur, id habeant neceſſe eſt. Vis enim animæ ſentiendi, vitæque cauſa, parte aliqua corporis principium animalibus omnibus eſt. At verò partes ad victum pertinentes ea quoque omnia neceſſariò habent, quanquam variè, propter loca quibus cibum recipiant. Habet mollium genus parte quod os vocatur, binos dentes: atque in ore pro lingua carnoſum quiddam, quo voluptatem eſculentorum diſcernat. Cruſtata etiam pari modo binos dentes habent primores, & carnoſum illud, quod
D linguæ proportionetur. Necnon teſtata omnia partem eiuſmodi habent eadem cauſa, qua ſanguinea, videlicet ad cibum ſentiendum: quoniam etiam inſecta ſimili ratione aut promuſcidem habent ore prodeuntem, vt apum muſcarúmque genus, vt dictum iam eſt: aut in ore conditam partem eiuſmodi poſſident, vt formicæ, & ſi qua alia ſint generis eiuſdem. Dentes quædam ex iis habent, quanquam diuerſos, vt apum muſcarúmque genus: quædam non habent, quæ cibo vtantur humido. Inſectorum enim complura, non victus ſed armorum gratia dentes obtinent. Teſtatorum autem quædam, vt principio diximus, linguam appellatam habent robuſtam. Conchæ dentibus etiam binis fulciuntur, vt cruſtata. Stomachus, ſiue
E gula ab ore prælonga mollibus eſt, quam ingluuies excipit, quomodo auibus: tum venter coniungitur, & inteſtinum ventri annexum, ſimplex vſque ad exitum tendit. Sepiis igitur & polypis venter ſimilis tum figura tum tactu eſt. At iis quas lolligines appellamus, bina quidem conceptacula ventris ſpeciem gerunt: ſed alterum minus ingluuiē imitatur, & tactu diſcrepat: quoniam corpus etiam totum carne molliore conſtat. Habent hæc ita eas partes eadem cauſa, qua aues.

Neque enim eorum vllum poteſt commolere cibum: itaque ingluuies ventri præiacet. Habent etiam præſidij ſalutiſque gratia, quod atramentum vocatur, tunica contentum membranea, exitum finémque habens, qua alui excrementa emittunt parte, quæ fiſtula vocatur, quæ in ſupinis poſita eſt. Sed cùm atramentum hoc mollia habeant omnia, tum præcipuè plurimúmque ſepia continet. Quoties enim metu perterrentur, hoc effuſo humore aquam infuſcant, ſibique nigrorem, ſeptum proponunt, & turbulentiam, quaſi quo ſe abſcondant. Habent hoc atramentum lolligines, & polypi ſuprà apud mutim potiùs poſitum, ſepiæ infrà ad aluum: copioſius enim habent, quoniam magis vtantur. Quod his propterea euenit, quia vitam litoralem traducunt, & tamen nihil, quo ſibi auxilientur, aliud habent: quomodo polypi & brachiis ſibi ſufficiunt, & coloris mutatione, quæ & ipſa accidit eis per metum, vt effuſio atramenti. Lolligo ſola ex iis gaudet alto, vitámque pelagicam agit. Sepia igitur plus continet atramenti, & infrà, quoniam copioſiùs. Faciliùs enim & longiùs profundere maiori ex copia poterit. Fit in hoc genere atramentum vt in auibus, quod per excrementum album terrenum ſubſidat. Nam id quoque caret veſica: quantúmque terrenum maximè ſit, in atramentum ſecernitur: & plurimum ſepiæ conſiſtit, quoniam plurimum terrenæ materiæ habeat: argumento ſepium eſt, quod tale tantúmque ſit. Hoc enim polypus caret, lolligo cartilaginoſum ac tenue gerit. Quam ob cauſam hoc alia habeant, alia careant, qualéque in vtroque habeatur genere, dictum iam eſt. Sed cùm exanguia ſint, & ob eam rem refrigerata, & pauida, hinc, vt hominum nonnullis per metum funditur aluus, aut excrementum veſicæ profluit, ſic iis accidit quidem neceſſariò, vt metu perculſa effundantur: ſed natura hoc excremento ad præſidium & tutelam eorum abvtitur. Cruſtata etiam, tum locuſtacea, tum cancri, binos dentes habent primores, & inter dentes carunculam linguæ effigie illam, vt dictum iam eſt: tum ſtomachum ori continuo iunctum, exiguum, proportione ſuorum corporum magnitudinis. Hunc excipit venter, in quo locuſtæ, & cancrorum nonnulli dentes alios habent, quoniam ſuperiores illi ſecare non ſatis queant. Hinc inteſtinum ſimplex vſque ad exitum excrementi dirigitur. Quinetiam ſingula teſtatorum genera has eaſdem obtinent partes: ſed alia explanatiùs alia obſcuriùs: quanquam maiora conſpectum earum præbeant euidentiorem. Cochleæ igitur & dentes præduros acutóſque habent, vt dictum iam eſt: & quod interiacet dentibus, carnoſum ſimiliter, vt mollia, & cruſtata. Promuſcidem etiam, vt dictum eſt, inter aculeum & linguam. Ori autem iungitur, quaſi ingluuies auium, à qua ſtomachus eſt, quem excipit venter, in quo ſitum eſt, quod papauer vocatur: mox inteſtinum continuum tendit ſimplex, originem à papauere illo ducens. In omnibus enim teſtaceis ineſt hoc excrementum, quod vel eſculentum eſſe præcipuè ſentitur. Cætera etiam turbinata, vt purpuræ, buccina ſimiliter vt cochleæ conſtant. Sunt teſtatorum genera plura: alia enim turbinata ſunt, vt ea quæ modò dixi: alia biualuia, alia vniualuia.

A οὐδὲ γὰρ τούτων οὐδὲν ἐνδέχεται λεαίνειν τὴν τροφήν. διὰ τοῦτο ὁ πρόλοβός ἐστι πρὸ τῆς κοιλίας. πρὸς βοήθειαν δὲ καὶ σωτηρίαν ἔχει ταῦτα τὸν καλούμενον θολόν, ἐν χιτῶνι ὑμενώδει προσπεφυκότα, τὴν ἔξοδον ἔχοντι καὶ τὸ πέρας, ᾗ περ ἀφιᾶσι τὸ περίττωμα τῆς κοιλίας κατὰ τὸν καλούμενον αὐλόν. οὗτος δ' ἐστὶν ἐν τοῖς ὑπτίοις. ἔχει μὲν οὖν πάντα τὰ μαλάκια τοῦτο τὸ μόριον ἴδιον· μάλιστα δ' ἡ σηπία, καὶ πλεῖστον. ὅταν γὰρ φοβηθῶσι καὶ δείσωσιν, οἷον φράγμα πρὸ τοῦ σώματος ποιοῦνται τὴν τοῦ ὑγροῦ μελανίαν καὶ θόλωσιν. αἱ μὲν τευθίδες καὶ πολύποδες ἔχουσιν ἄνωθεν τὸν θολὸν ἐπὶ B τῇ μύτιδι μᾶλλον· ἡ δὲ σηπία, πρὸς τῇ κοιλίᾳ κάτω. πλείω γὰρ ἔχει, διὰ τὸ χρῆσθαι μᾶλλον. τοῦτο δ' αὐτῇ συμβαίνει, διὰ τὸ πρόσγειον μὲν εἶναι τὸν βίον αὐτῆς, μὴ ἔχειν δὲ ἄλλην βοήθειαν, ὥσπερ ὁ πολύπους ἔχει τὰς πλεκτάνας χρησίμους, καὶ τὴν τοῦ χρώματος μεταβολήν, ἣ συμβαίνει αὐτῷ, ὥσπερ καὶ ἡ τοῦ θολοῦ πρόεσις, διὰ δειλίαν. ἡ δὲ τευθὶς πελάγιον ἐστὶ μόνον τούτων. πλείω μὲν οὖν ἔχει ἡ σηπία παρὰ τοῦτο τὸν θολόν. κάτω δὲ διὰ τὸ πλείω· ῥᾴδιον γάρ ἐστι προΐεσθαι καὶ πόρρωθεν ἀπὸ τοῦ πλείονος. γίνεται δὲ ὁ θολός, καθάπερ τοῖς ὄρνισιν τὸ ὑπόστημα τὸ λευκὸν ἐπὶ τοῦ περιττώματος γεῶδες, οὕτω καὶ τούτοις ὁ θολός, διὰ τὸ μηδὲ C ταῦτα ἔχειν τὴν κύστιν. ἐκκρίνεται γὰρ τὸ γεωδέστατον εἰς αὐτόν· καὶ τῇ σηπίᾳ πλεῖστον, διὰ τὸ πλεῖστον ἔχειν γεῶδες. σημεῖον δὲ τὸ σήπιον, τοιοῦτον ὄν. τοῦτο γὰρ ὁ μὲν πολύπους οὐκ ἔχει, αἱ δὲ τευθίδες, χονδρώδες καὶ λεπτόν. δι' ἣν δ' αἰτίαν τὰ μὲν ἔχει, τὰ δ' οὐκ ἔχει, καὶ ποῖον τούτων ἑκάτερον ἔχει, εἴρηται. ἀναίμων δ' ὄντων, καὶ τούτων κατεψυγμένων, καὶ φοβητικῶν, ὥσπερ ἐνίοις ὅταν δείσωσιν, ἡ κοιλία ταράττεται· τοῖς δ' ἐκ τῆς κύστεως ῥεῖ περίττωσις. καὶ τούτοις τοῦτο συμβαίνει μὲν ἐξ ἀνάγκης ἀφίεσθαι διὰ δειλίαν, ὥσπερ ἐκ κύστεως τοῖς ἐπουροῦσιν· ἡ δὲ φύσις ἅμα τῷ τοιούτῳ περιττώματι καταχρῆται πρὸς βοήθειαν καὶ σωτηρίαν αὐτῶν. D ἔχουσι δὲ καὶ τὰ μαλακόστρακα, τά τε καραβοειδῆ καὶ οἱ καρκίνοι, δύο μὲν ὀδόντας τοὺς προσθίους, καὶ μεταξὺ τὴν σάρκα τὴν γλωττοειδῆ, ὥσπερ εἴρηται καὶ πρότερον. εὐθὺς δ' ἐχόμενον τοῦ στόματος, στόμαχον μικρὸν κατὰ μέγεθος τῶν σωμάτων, τὰ μείζω πρὸς τὰ ἐλάττω· τούτου δὲ κοιλίαν ἐχομένην, ἐφ' ἧς οἵ τε κάραβοι καὶ ἔνιοι τῶν καρκίνων, ὀδόντας ἔχουσιν ἑτέρους, διὰ τὸ τοὺς ἄνω μὴ διαιρεῖν ἱκανῶς. ἐκ δὲ τῆς κοιλίας, ἔντερον ἁπλοῦν κατ' εὐθύ, μέχρι πρὸς τὴν ἔξοδον τοῦ περιττώματος. ἔχει δὲ καὶ τῶν ὀστρακοδέρμων ἕκαστον ταῦτα τὰ μόρια, τὰ μὲν διηρθρωμένα μᾶλλον, τὰ δ' ἧττον. ἐν δὲ τοῖς μείζοσι διαδηλότερα τούτων ἐστὶν ἕκαστα. E οἱ μὲν οὖν κόχλοι καὶ ὀδόντας ἔχουσι σκληροὺς καὶ ὀξεῖς, ὥσπερ εἴρηται πρότερον, καὶ τὸ μεταξὺ σαρκῶδες, ὁμοίως τοῖς μαλακίοις καὶ μαλακοστράκοις· καὶ τὴν προβοσκίδα, καθάπερ εἴρηται, μεταξὺ κέντρου καὶ γλώττης. τοῦ δὲ στόματος ἐχόμενον ἐστὶν ὀρνιθώδη τινὰ πρόλοβον· τούτου δ' ἐχόμενον στόμαχον· τούτου δ' ἔχεται ἡ κοιλία, ἐν ᾗ ἡ καλουμένη μήκων· ἀφ' ἧς συνεχές ἐστιν ἔντερον ἁπλοῦν τὴν ἀρχὴν ἔχον ἀπὸ τῆς μήκωνος. ἔστι γὰρ ἐν πᾶσι τοῖς ὀστρακηροῖς περίττωμα τοῦτο μάλιστα δοκοῦν εἶναι ἐδώδιμον. ἔχει δὲ ὁμοίως τῷ κόχλῳ καὶ τἆλλα τὰ στρομβώδη, οἷον πορφύραι καὶ κήρυκες. ἔστι δὲ γένη καὶ εἴδη πολλὰ τῶν ὀστρακοδέρμων· τὰ μὲν γάρ, στρομβώδη ἐστίν, ὥσπερ τὰ νῦν εἰρημένα· τὰ δέ, δίθυρα· τὰ δέ, μονόθυρα.

A τρόπον δέ τινα καὶ τὰ στρομβώδη διθύροις ἔοικεν. ἔχει γὰρ ἐπίπτυγμα ἐπὶ τῷ φανερῷ τῆς σαρκὸς πάντα τὰ τοιαῦτα ἐκ γενετῆς, οἷον αἵ τε πορφύραι καὶ οἱ κήρυκες, καὶ οἱ νηρῖται, καὶ πᾶν τὸ τοιοῦτον γένος, πρὸς βοήθειαν. ᾗ γὰρ μὴ προβέβληται τὸ ὄστρακον, ῥᾴδιον τοῦτο βλάπτεσθαι ὑπὸ τῶν θύραθεν προσπιπτόντων. τὰ μὲν οὖν μονόθυρα, διὰ τὸ προσπεφυκέναι, σώζεται τῷ πρανὲς ἔχειν τὸ ὄστρακον, καὶ τῷ ἀλλοτρίῳ φράγματι τρόπον τινὰ δίθυρα, οἷον αἱ καλούμεναι λεπάδες· τὰ δὲ δίθυρα, οἷον κτένες καὶ μύες, τῷ συνάγειν· τὰ δὲ στρομβώδη, τούτῳ τῷ ἐπικαλύμματι, ὥσπερ δίθυρα γινόμενα ἐκ μονοθύρων. ὁ δ' ἐχῖνος μάλιστα πάντων ἀλεωρίαν ἔχει· κύκλῳ γὰρ τὸ ὄστρακον συνηρεφὲς καὶ κεχαρακωμένον ταῖς ἀκάνθαις. ἴδιον δ' ἔχει τῶν B ὀστρακοδέρμων τοῦτο, καθάπερ εἴρηται πρότερον. τῶν δὲ μαλακοστράκων καὶ τῶν ὀστρακοδέρμων συνέστηκεν ἡ φύσις τοῖς μαλακίοις ἀντικειμένως. τοῖς μὲν γὰρ ἔξω τὸ σαρκῶδες, τοῖς δ' ἐντός, ἐκτὸς δὲ τὸ γεῶδες. ὁ δ' ἐχῖνος οὐδὲν ἔχει σαρκῶδες. πάντα μὲν οὖν ἔχει, καθάπερ εἴρηται, καὶ τἆλλα τὰ ὀστρακόδερμα, στόμα τε καὶ τὸ γλωττοειδές, καὶ τὴν κοιλίαν, καὶ τοῦ περιττώματος τὴν ἔξοδον. διαφέρει δὲ τῇ θέσει καὶ τοῖς μεγέθεσιν. ὃν δὲ τρόπον ἔχει τούτων ἕκαστον, ἔκ τε τῶν ἱστοριῶν τῶν περὶ τὰ ζῷα θεωρείσθω, καὶ τῶν ἀνατομῶν. τὰ μὲν γὰρ τῷ λόγῳ, τὰ δὲ πρὸς τὴν ὄψιν αὐτῶν σαφηνίζειν δεῖ C μᾶλλον. ἰδίως δ' ἔχουσι τῶν ὀστρακοδέρμων οἵ τ' ἐχῖνοι, καὶ τὸ τῶν καλουμένων τηθύων γένος. ἔχουσι δ' οἱ ἐχῖνοι ὀδόντας μὲν πέντε καὶ μεταξὺ τὸ σαρκῶδες, ὥσπερ ἐπὶ πάντων ἐστὶ τῶν εἰρημένων· ἐχόμενον δὲ τούτου στόμαχον, ἀπὸ δὲ τούτου, τὴν κοιλίαν εἰς πολλὰ διῃρημένην, ὥσπερ ἂν εἰ πολλὰς τοῦ ζῴου κοιλίας ἔχοντος. κεχωρισμέναι γάρ εἰσι καὶ πλήρεις περιττώματος. ἐξ ἑνὸς δ' ἤρτηνται τοῦ στομάχου, καὶ τελευτῶσιν εἰς μίαν ἔξοδον τὴν τοῦ περιττώματος. περὶ δὲ τὴν κοιλίαν σαρκῶδες μὲν οὐδὲν ἔχουσιν, ὥσπερ εἴρηται. τὰ δὲ καλούμενα ᾠὰ πλείω τὸν ἀριθμὸν ἐν ὑμένι χωρὶς ἕκαστον, καὶ κύκλῳ ἀπὸ τοῦ στόματος, μέλαν' ἄττα διεσπαρμένα D χύδην, ἀνώνυμα. ὄντων δὲ πλειόνων γενῶν (οὐ γὰρ ἓν εἶδος πάντων τῶν ἐχίνων ἐστὶ) πάντες μὲν ἔχουσι ταῦτα τὰ μόρια, ἀλλ' οὐκ ἐδώδιμα πάντες τὰ καλούμενα ᾠά, καὶ μικρὰ πάμπαν ἔξω τῶν ἐπιπολαζόντων. ὅλως δὲ τοῦτο καὶ περὶ τἆλλα συμβέβηκε τὰ ὀστρακόδερμα. καὶ γὰρ αἱ σάρκες οὐχ ὁμοίως ἐδώδιμοι πάντων καὶ τὸ περίττωμα, ἡ καλουμένη μήκων, ἐνίων μὲν ἐδώδιμος, ἐνίων δ' οὐκ ἐδώδιμος. ἔστι δὲ τοῖς στρομβώδεσιν ἐν τῇ ἕλικι τοῦτο· τοῖς δὲ μονοθύροις, ἐν τῷ πυθμένι, οἷον ταῖς λεπάσι· τοῖς δὲ διθύροις, πρὸς τῇ συναφῇ. τὸ δ' ᾠὸν καλούμενον, ἐν τοῖς δεξιοῖς· ἐν δὲ τοῖς ἐπὶ θάτερα, ἡ ἔξοδος τοῦ περιττώματος τοῖς διθύροις. κα- E λεῖται δ' ᾠὸν οὐκ ὀρθῶς ὑπὸ τῶν καλούντων. τοῦτο γάρ ἐστιν οἷον τοῖς ἐναίμοις, ὅταν εὐθενῶσιν, ἡ πιότης. διὸ καὶ γίνεται κατὰ τούτους τοὺς καιροὺς τοῦ ἐνιαυτοῦ, ὅταν εὐθενῶσιν, ἔν τε τῷ ἔαρι καὶ τῷ μετοπώρῳ. ἐν γὰρ τῷ ψύχει καὶ ταῖς ἀλέαις πονοῦσι πάντα τὰ ὀστρακόδερμα, καὶ φέρειν οὐ δύναται τὰς ὑπερβολάς. σημεῖον δέ, τὸ συμβαῖνον ἐπὶ τῶν ἐχίνων. εὐθύς τε γὰρ γινόμενοι, ἔχουσι, καὶ ἐν ταῖς πανσελήνοις μᾶλλον, οὐ διὰ τὸ νέμεσθαι (καθάπερ τινὲς οἴονται) μᾶλλον, ἀλλὰ διὰ τὸ ἀλεεινοτέρας εἶναι τὰς νύκτας, διὰ τὸ φῶς τῆς σελήνης. δύσριγα γὰρ ὄντα διὰ τὸ ἄναιμα εἶναι, δέονται ἀλέας.

A Sed turbinata quoque biualuibus quodammodo aſſimilantur: quippe quæ omnia operculo quodam congenito, carni patulæ appoſito, clauduntur, vt purpuræ, buccina, natices, & reliqua generis eiuſdem: idque præſidij cauſa. Qua enim teſta non protegit, facilè offendi poſſet ab iis quæ extrinſecus inciderent. Cæterùm vniualue genus, quod ſaxis teſta in dorſum datâ adhæret, ſeruari poteſt: fitque alieno ſepto quodam modo biualue, vt quæ patellæ vocantur. Biualue ſe concludendo tuetur: vt pectines, vt mituli. Turbinatum cruſta illa prætenui, quæ à fronte integitur, quaſi biualue ex vniualui efficitur. Echinus omnium maximè à natura munitus eſt: quippe qui teſta vndique ſpinis frequen- B tibus circumuallata celetur. quam rem peculiarem hunc in genere teſtato ſortiri diximus. Natura autem cruſtatorum contrà quàm mollium, conſtat. Altera enim carnis mollitiam extra habent, altera intra. Hinc foris terrenam duritiam obtinent: quanquam echinus nihil habeat carnis. Igitur cætera quoque teſtata omnia, vt dictum eſt, habent & os, & linguæ effigiem, & ventrem, & oſtium excrementi: ſed intereſt ſitu & magnitudine. Quæ ſingula quemadmodum ſe habeant, ex commentatione diſſectionéque animalium petendum eſt. Quædam enim ratione, quædam conſpectu ipſorum potiùs declaranda ſunt. Echi- C ni, & eorum quæ vertibula ſiue tubera appellant, genus, peculiari modo pre cæteris conſtant teſtatis. Habent echini dentes quinos, & carunculam interpoſitam dentibus illam, quæ in omnibus ſuprà dictis eſt, cui ſtomachus iungitur. Ab hoc venter in plura diductus perinde ac ſi plures numero ventres hoc animal habeat: ſunt enim omnes diſtincti, plenique vacantis materiæ. Ex ſtomacho vno dependent, *in vnúmque* oſtium excrementi finiunt. *Caro, vt dictum eſt*, nulla eſt circa ventrem: ſed quæ oua appellantur, numeroſiora teſtæ adhærent, membranulis ſingula obuoluta, & paribus diſtincta interuallis. Ni- D gra etiam quædam circùm ab ore fuſim ſparguntur, nomine adhuc nullo appellata. Sed cùm non vnum *ſed plura genera echinorum* ſint, omnium partes *quidem* eas omnes ſortiuntur. Sed oua appellata, nec omnes *cibo* idonea, & parua admodum continent, exceptis iis qui vada incolunt. Omnino id ipſum cæteris quoque teſtatis euenit: caro enim non æquè omnium eſculenta eſt. Et excrementum, quod papauer vocatur, quibuſdam cibo idoneum, quibuſdam non idoneum eſt. Continent hoc turbinata omnia ſua claticula: vniualuia ſuo fundo, vt patellæ: biualuia, quà nodo ligantur. Quod autem ouum vocatur, latere dextro biualuia habent, altero latere oſtium E excrementi continent. Sed errore ouum id vocitatur, quippe quod tale ſit, quale eſt pingue in ſanguineo genere, cùm viget. Quamobrem fieri ſolet per id tempus anni, quo vigent, ſcilicet vere, & autumno. Laborant enim teſtata omnia per frigus, & æſtum, atque exuperantiam temporis pati nequeunt. Argumento eſt, quod echinis euenit: habent enim id iam inde ab ortu naturæ, & pleniluniis vberiùs, non quia per id tempus copioſiùs paſcuntur, vt quidam putant, ſed quòd noctes tepidiores ſint propter lucem pleniorem. Calorem enim deſiderant, quoniam frigori patent, vtpote quæ ſanguine careant.

Ex quo fit vt æſtate potiùs vbique vigeant, præterquam in Pyrenſi Euripo. nam ibi non minùs tempore hyberno probantur. cuius rei cauſa eſt, quòd tunc vberiùs pabulentur, cùm piſces per id tempus ea loca relinquant. Habent echini omnes oua eodem numero, atque impari omnes, quina enim: dentes etiam ventreſque totidem. Ratio, quòd non ouum eſt, quod ouum vocatur, vt modò dixi: ſed quod bona animalis enutritione alimoniâque proueniat. Fit oſtreis quidem in altero tantùmmodò latere, id, quod oui nomine appellatur: idemque eſt quod echinos habere dicimus. Sed cùm teſta echini non modò cæterorũ oſtreorum orbem colligat vnum, ſed in globum circumagatur, vt non partim talis partim non talis formetur, ſed vſquequaque ſimilis ſit (vndique enim in ſe nutrib. ſuis conglobatur) idcirco ouum quoque ſimili modo habeat neceſſe eſt. Non enim ambitu, vt cætera, diſſimili conſtat echinus. Nãque iis omnibus caput in medio ſitum eſt. quam quidem corporis partem ſitum tenere ſuperiorem certum eſt. Nec vero ouum habere continuum poteſt, quando neque cætera generis eiuſdem ſic habent, ſed altero latere tantùm ſui orbis. Ergo cùm id commune omnium ſit, proprium autem illius vt globi ſpeciem gerat, oua numero impari ſint neceſſe eſt: nam ſi pari eſſent, per diametrum diſpoſita haberentur, cùm ſimilem hinc atque inde ſeruari rationem interualli conueniat. Sic autem diſpoſitis vtroque latere orbis ouum haberetur, quod in cæteris oſtreis non eſt. Altero enim latere ſuæ oræ id habent, & oſtreæ, & pectines. Itaque terna, aut quina, aut quolibet alio numero impari eſſe neceſſe eſt. At ſi terna eſſent, diducta inter ſe laxo admodum interuallo haberentur: ſi plura, quàm quina, continuum propè ouum redderetur. Quorum alterum non melius eſt, alterum fieri non poteſt. Quina igitur oua echinos habere neceſſe eſt: quam ob cauſam venter quoque quinquepartitus eſt, & dentes totidem habentur. Singula enim oua, cùm quaſi corpora quædam animalis ſint, modum quoque viuendi ſimilem habeant, neceſſe eſt. Hinc enim capitur incrementum. Nam ſi venter vnus tantummodo eſſet, oua aut longè diſtarent, aut totum alueum occuparent, vt echinus & difficilè moueretur, & cibis minùs impleretur. Cùm autẽ quinque numero interualla ſint, ventrem ſingulis adiunctum quinquepartitum eſſe neceſſe eſt. Eademque de cauſa dentes etiam totidem habẽtur. Ita enim natura ſimilem rationem prędictis membris reddiderit. Sed quam ob cauſam oua numero impari, tótque numero echinus habeat, dictum eſt. Cur autem alij parua admodum, alij magna, cauſa eſt, quòd natura conſtant alij alius calidiore. Calor enim cibum concoquere plenius poteſt: quamobrem qui cibo inutiles ſunt, in iis excrementi plus eſt. Mobiliores etiam facit natura caloris, vt paſcantur, nec ſtabiles maneant. Cuius rei indicium eſt, quòd eorum ſpinis aliquid ſemper adhæreat, tanquam crebrò moueantur: ſpinis enim vt pedibus vtuntur. Vertibula autem parum ſua natura à plantis differunt: ſunt tamen ſpongiis viuaciora, quippe cùm ſpongiæ vires habeãt plantæ. Natura enim continuè ab inanimatis ad animalia tranſit per ea quæ viuant quidẽ, ſed non ſint animalia, ita vt parum admodum differre alterum ab altero videatur, propter ſuam propinquitatem.

A διὸ καὶ ἐν τῷ θέρει μᾶλλον πολλαχοῦ εὐθενοῦσιν· οἱ δ' ἐν τῷ Πυρραίων Εὐρίπῳ, οὐχ ἐκείνου ἧττον χειμῶνος. αἴτιον δὲ, τὸ νομῆς εὐπορεῖν τότε μᾶλλον, ἀπολειπόντων τῶν ἰχθύων τοὺς τόπους, κατ' ἐκείνην τὴν ὥραν. ἔχουσι δ' οἱ ἐχῖνοι πάντες ἴσα τε τὸν ἀριθμὸν τὰ ᾠὰ, καὶ περιττά. πέντε γὰρ ἔχουσι. τοσούτους δὲ καὶ τοὺς ὀδόντας καὶ τὰς κοιλίας. αἴτιον δ', ὅτι τὸ ᾠὸν ἐστι, καθάπερ εἴρηται πρότερον, οὐκ ᾠὸν, ἀλλὰ τοῦ ζῴου εὐτροφία. γίνεται δὲ τοῦτο ἐπὶ θάτερα μόνον ἐν τοῖς ὀστρέοις τὸ καλούμενον ᾠόν. ταὐτὸ δὲ τοῦτ' ἐστὶ καὶ τὸ ἐν τοῖς ἐχίνοις. ἐπεὶ τοίνυν ἐστὶ σφαιροειδὴς ὁ ἐχῖνος, καὶ οὐχ ὥσπερ ἐπὶ B τῶν ἄλλων ὀστρέων τοῦ σώματος κύκλος εἷς, ὁ δ' ἐχῖνος οὐ τῇ μὲν τοιοῦτος, τῇ δ' οὔ, ἀλλὰ πάντῃ ὅμοιος (σφαιροειδὴς γάρ) ἀνάγκη καὶ τὸ ᾠὸν ὁμοίως ἔχειν. οὐ γάρ ἐστιν, ὥσπερ τοῖς ἄλλοις, περὶ τὸ κύκλῳ ἀνόμοιον. ἐν μέσῳ γὰρ ἡ κεφαλὴ πᾶσιν αὐτοῖς. * τοῦ δ' ἐχίνου ὡς σφαιρικοῦ, ἄνω τὸ μέσον. ἀλλὰ μὴν οὐδὲ συνεχὲς οἷόν τ' εἶναι τὸ ᾠόν. οὐδὲ γὰρ τοῖς ἄλλοις, ἀλλ' ἐπὶ θάτερα τοῦ κύκλου μόριον. ἀνάγκη τοίνυν, ἐπεὶ τοῦτο μὲν ἁπάντων κοινὸν, ἴδιον δ' ἐκείνου τὸ σῶμα ἐστὶ σφαιροειδὲς, μὴ εἶναι ἄρτια τὰ ᾠά. κατὰ διάμετρον γὰρ ἂν ἦν, διὰ τὸ ὁμοίως ἔχειν τὸ ἔνθεν καὶ ἔνθεν, εἰ ἦν ἄρτια καὶ κατὰ διάμετρον. C οὕτως δ' ἐχόντων, ἐπ' ἀμφότερα ἂν τοῦ κύκλου εἶχε τὸ ᾠόν. τοῦτο δ' οὐκ ἦν οὐδ' ἐπὶ τῶν ἄλλων ὀστρέων. ἐπὶ θάτερα γὰρ τῆς περιφερείας ἔχουσι τὰ ὄστρεα καὶ οἱ κτένες τὸ τοιοῦτον μόριον. ἀνάγκη τοίνυν τρία, ἢ πέντε εἶναι, ἢ ἄλλον τιν' ἀριθμὸν περιττόν. εἰ μὲν οὖν τρία εἶχε, πόρρω λίαν ἦν· εἰ δὲ πλείω τῶν πέντε, συνεχὲς ἄν. τούτων δὲ τὸ μὲν οὐ βέλτιον, τὸ δ' οὐκ ἐνδέχεσθαι. ἀνάγκη ἄρα πέντε αὐτὸν ἔχειν τὰ ᾠά. διὰ τὴν αὐτὴν δ' αἰτίαν καὶ ἡ κοιλία * τοιαύτη ἔσχισται, καὶ τῶν ὀδόντων τοσοῦτόν ἐστι πλῆθος. ἕκαστον γὰρ τῶν ᾠῶν, οἷον σῶμά τι τοῦ ζῴου ὂν, παραπλήσιον τὸν τρόπον τὸν τῆς ζωῆς ὁμοίως ἔχειν ἀναγκαῖον. ἐντεῦθεν γὰρ ἡ αὔξησις. μιᾶς μὲν γὰρ D οὔσης, ἢ πόρρω ἂν ἦσαν, ἢ πᾶν ἂν κατεῖχε τὸ κύτος, ὥστε καὶ δυσκίνητον εἶναι τὸν ἐχῖνον, καὶ μὴ πληροῦσθαι τῆς τροφῆς. πέντε δ' ὄντων * διαφραγμάτων, ἀνάγκη πρὸς ἑκάστῳ οὖσαν πενταχῇ διῃρῆσθαι. διὰ τὴν αὐτὴν αἰτίαν, καὶ τὸ τῶν ὀδόντων ἐστὶ τοσοῦτον πλῆθος. τὸ γὰρ ὅμοιον οὕτως ἂν ἡ φύσις εἴη ἀποδεδωκυῖα τοῖς εἰρημένοις μορίοις. διότι μὲν οὖν περιττὰ καὶ τοσαῦτα τὸν ἀριθμὸν ἔχει ὁ ἐχῖνος τὰ ᾠά, εἴρηται. διότι δὲ οἱ μὲν πάμπαν μικρὰ, οἱ δὲ μεγάλα, αἴτιον τὸ θερμοτέρους εἶναι τὴν φύσιν τούτους. πέττειν γὰρ τὸ θερμὸν δύναται τὴν τροφὴν μᾶλλον. διὸ καὶ περιττώματος πλήρεις οἱ ἄβρωτοι μᾶλλον. καὶ παρασκευάζει κινητικωτέρους ἡ τῆς φύσεως θερμότης, ὥστε νέμεσθαι καὶ μὴ μένειν ἑδραίους. E σημεῖον δὲ τούτου, τὸ ἔχειν τοὺς τοιούτους ἀεί τι ἐπὶ τῶν ἀκανθῶν, ὡς κινουμένους πυκνά. χρῶνται γὰρ ὡς ποσὶ ταῖς ἀκάνθαις. τὰ δὲ τήθυα μικρὸν τῶν φυτῶν διαφέρει τὴν φύσιν. ὅμως δὲ ζωτικώτερα τῶν σπόγγων. οὗτοι γὰρ ἔχουσι πάμπαν φυτοῦ δύναμιν. ἡ γὰρ φύσις μεταβαίνει συνεχῶς ἀπὸ τῶν ἀψύχων εἰς τὰ ζῷα, διὰ τῶν ζώντων μὲν, οὐκ ὄντων δὲ ζῴων, οὕτως ὥστε δοκεῖν πάμπαν μικρὸν διαφέρειν θάτερον θατέρου τῷ σύνεγγυς ἀλλήλοις.

* Gaza aliter legit, vt & Græcus Scholiaſtes, quem vide.

* Malim, πεν-τῇ vel ταύτῃ.

* διαλειμμάτων.

ὁ μὲν οὖν σπόγγος, καθάπερ εἴρηται, καὶ τῷ ζῆν προσπεφυκὼς μόνον, ἀπολυθεὶς δὲ μὴ ζῆν, ὁμοίως ἔχει τοῖς φυτοῖς πάμπαν. αἱ δὲ καλούμεναι * ὀλοθούρια καὶ οἱ πνεύμονες, ἔτι δὲ καὶ ἕτερα τοιαῦτα ἐν τῇ θαλάττῃ, μικρὸν διαφέρει τούτων, τῷ ἀπολελύσθαι. αἴσθησιν μὲν γὰρ οὐδεμίαν ἔχει, ζῇ δ' ὥσπερ ὄντα φυτὰ ἀπολελυμένα. ἔστι δὲ καὶ ἐν τοῖς ἐπιγείοις φυτοῖς ἔνια τοιαῦτα, ἃ καὶ ζῇ καὶ γίγνεται, τὰ μὲν ἐν ἑτέροις φυτοῖς, τὰ δὲ καὶ ἀπολελυμένα, οἷον καὶ τὸ ἐκ τοῦ Παρνασοῦ καλούμενον ὑπό τινων ἐπίπετρον. τοῦτο γὰρ ζῇ πολὺν χρόνον, κρεμάμενον ἄνω ἐπὶ τῶν παττάλων. ἔστι δὴ ἔτι καὶ τὰ τήθυα, καὶ εἴ τι τοιοῦτον ἕτερον γένος, τῷ μὲν προσπεφυκὸς ζῆν μόνον φυτῷ παραπλήσιον, τῷ δ' ἔχειν τι σαρκῶδες, δόξειεν ἂν ἔχειν τιν' αἴσθησιν. ἄδηλον δὲ τοῦτο * ποτέρως θετέον. ἔχει δὲ τοῦτο τὸ ζῷον δύο πόρους, καὶ μίαν διαίρεσιν, ᾗ τε δέχεται τὴν ὑγρότητα τὴν εἰς τροφὴν, καὶ ᾗ πάλιν διαπέμπει τὴν ὑπολειπομένην ἰκμάδα. περίττωμα γὰρ οὐδέν ἐστι δῆλον ἔχον, ὥσπερ τἆλλα ὀστρακόδερμα. διὸ μάλιστα καὶ τοῦτο, κἂν εἴ τι ἄλλο τοιοῦτον τῶν ζῴων, φυτικὸν δίκαιον καλεῖν. οὐδὲ γὰρ τῶν φυτῶν οὐδὲν ἔχει περίττωμα. διὰ μέσου δὲ λεπτὸν διάζωμα, ἐν ᾧ τὸ κύριον ὑπάρχειν εὔλογον τῆς ζωῆς. ἃς δὲ καλοῦσιν οἱ μὲν κνίδας, οἱ δὲ ἀκαλήφας, ἔστι μὲν οὐκ ὀστρακόδερμα, ἀλλ' * ἔξω τῶν διῃρημένων γενῶν. ἐπαμφοτερίζει δὲ τοῦτο καὶ φυτοῦ καὶ ζῴου τὴν φύσιν. τῷ μὲν γὰρ ἀπολελύσθαι καὶ προσπίπτειν πρὸς τὴν τροφὴν ἔνια αὐτῶν, ζωϊκόν ἐστι, καὶ τῷ αἰσθάνεσθαι τῶν προσπιπτόντων. ἔτι δὲ καὶ τῇ τοῦ σώματος τραχύτητι χρῆται πρὸς σωτηρίαν. τῷ δ' * ἀτελὲς εἶναι, καὶ προσφύεσθαι ταχέως ταῖς πέτραις, τῷ γένει τῶν φυτῶν παραπλήσιον, καὶ τῷ περίττωμα μηδὲν ἔχειν φανερόν, στόμα δ' ἔχειν. ὅμοιον δὲ τούτῳ καὶ τὸ τῶν ἀστέρων ἐστὶ γένος. καὶ γὰρ τοῦτο προσπῖπτον ἐκχυμίζει πολλὰ τῶν ὀστρέων. τοῖς τ' ἀπολελυμένοις τῶν εἰρημένων ζῴων, οἷον τοῖς τε μαλακίοις καὶ τοῖς μαλακοστράκοις, ὁ δ' αὐτὸς λόγος καὶ περὶ τῶν ὀστρακοδέρμων. τὰ μὲν οὖν μόρια τὰ περὶ τὴν τροφὴν, ἅπερ ἀναγκαῖον πᾶσιν ὑπάρχειν, ἔχει τὸν εἰρημένον τρόπον. δεῖ δὲ δηλονότι καὶ τῷ τοῖς ἐναίμοις ὑπάρχοντι κατὰ τὸ κύριον τῶν αἰσθήσεων, ἔχειν ἀνάλογόν τι μόριον. τοῦτο γὰρ δεῖ πᾶσιν ὑπάρχειν τοῖς ζῴοις. ἔστι δὲ τοῦτο τοῖς μὲν μαλακίοις ἐν ὑμένι κείμενον ὑγρόν, δι' οὗπερ ὁ στόμαχος τέταται κατὰ τὴν κοιλίαν. προσπέφυκε δὲ πρὸς τὰ πρανῆ μᾶλλον, καὶ καλεῖται μύτις ὑπό τινων. τοιοῦτον δ' ἕτερον καὶ τοῖς μαλακοστράκοις ἐστί, καὶ καλεῖται καὶ τοῦτο μύτις. ἔστι δ' ὑγρὸν καὶ σωματῶδες ἅμα τοῦτο τὸ μόριον, τείνει δὲ δι' αὐτοῦ, καθάπερ εἴρηται, διὰ μέσου μὲν ὁ στόμαχος. εἰ γὰρ ἦν μεταξὺ τούτου καὶ τοῦ πρανοῦς, οὐκ ἂν ἠδύνατο λαμβάνειν ὁμοίως διάστασιν εἰσιούσης τροφῆς, διὰ τὴν τοῦ νώτου σκληρότητα. ἐκτὸς δὲ τῆς μύτιδος τὸ ἔντερον ἔξωθεν, καὶ ὁ θολὸς πρὸς τῷ ἐντέρῳ, ὅπως ὅτι πλεῖστον ἀπέχῃ τῆς εἰσόδου, καὶ τὸ δυσχερὲς ἀπόθεν ᾖ τοῦ βελτίονος καὶ τῆς ἀρχῆς. ὅτι δ' ἐστὶ τὸ ἀνάλογον τῇ καρδίᾳ τοῦτο τὸ μόριον, δηλοῖ ὁ τόπος· ἔστι γὰρ ὁ αὐτός· καὶ ἡ γλυκύτης τῆς ὑγρότητος, ὡς οὖσα πεπεμμένη καὶ αἱματώδης. ἐν δὲ τοῖς ὀστρακοδέρμοις, ἔχει μὲν τὸν αὐτὸν τρόπον τὸ κύριον τῆς αἰσθήσεως, ἧττον δ' ἐπίδηλον. πλὴν δεῖ ζητεῖν αἰεὶ περὶ μεσότητα ταύτην τὴν ἀρχήν, ὅσα μὲν μόνιμα, τοῦ δεχομένου μορίου τὴν τροφήν, καὶ δι' οὗ ποιεῖται τὴν ἀπόκρισιν, ἢ τὴν σπερματικὴν, ἢ τὴν περιττωματικήν. ὅσα δὲ καὶ πορευτικὰ τῶν ζῴων, αἰεὶ τῷ μέσῳ τῶν δεξιῶν, καὶ τῶν ἀριστερῶν.

* γρ. ὁλοθούρια, vide Hiſt. lib. 1. c. 1.

* γρ. πότερον

* γρ. ἔξω πάντων τῶν δ.

* G. ἀπλῆς

* G. ὑγρῶν. τοῖς δ' ἀπολ. τ. εἰ. ζῴοι. τ. τ. μ. κ. τ. μαλακοστράκοις ὁ αὐτὸς λ.

A Spongia igitur, vt dictum eſt, cùm adhærendo tantum viuere poſſit, abſoluta autem nequeat viuere, ſimilis plantis omnino eſt. Quæ autem tubera vocant, & pulmones, atque etiam plura eiuſmodi alia in mari, parum ab iis differunt ſua ipſa abſolutione. Viuunt enim ſine vllo ſenſu perinde ac plantæ abſolutæ. Nam & in terreſtribus plantis ſunt nonnulla eiuſmodi, quæ & viuant & gignantur, aut in aliis plantis, aut abſoluta. Quale etiam eſt, quod modò Parnaſus fert, vocatum à quibuſdam epipetrum: hoc enim diu viuere poteſt ſuſpenſum. Et vertibulum igitur, & quicquid generis eiuſdem, ſimile plantæ eſt, quia adhærendo tantummodo viuit: ſed cùm aliquid B habeat carnis, ſenſum aliquem habere videri poteſt. Itaque vtrónam modo ſtatuendum ſit, incertum eſt. Habet hoc animalis genus duo foramina, rimámque vnam, qua recipiat humorem cibo accommodatum, & qua rurſus emittat quantum humoris remaneat. Nihil enim excrementi, vt cætera cruſtata, hoc ſe habere oſtendit. Ex quo fit potiſſimùm, vt & hoc & quicquid ſimile in animalium genere eſt, planta iure appellari poſſit: nec enim planta vlla habet excrementum. Præcingi verò per medium tenui quadam membrana, in qua vitæ principatus ſit, ratio congrua eſt. Quas autem vrticas appellant, non teſta operiuntur, ſed excluſæ omnino ſunt iis quæ C in genere diuiſimus. Ancipiti natura hoc genus eſt, ambigens & plantæ & animali. Abſolui enim, & eſcam petere nonnullas, & ſentire occurrentia poſſe, atque etiam aſperitate corporis vti ad ſe tuendum, animalis eſt: at verò quod imperfectum ſit, & ſaxis celeriter adhæreat, nec aliquid excrementi emittat, manifeſtè, quanquam os habeat, plantarum generi ſimile eſt. Stellarum etiam genus ſimile eſt: quippe quod concharum complures aggrediens exugat. Ratio eorum, quę inter exanguia abſoluta viuant, vt mollium, cruſtatorúmque, eadem atque teſtatorum eſt. Partes igitur ad cibum accommodatas, quas omnibus ineſſe neceſſe eſt, eo quo explicauimus, modo ſe- D ſe habent. Sed habeant certè illud quoque oportet, quod ei parti proportionetur, cui ſentiendi principatus in ſanguineo genere mandatus eſt: hoc enim in omnibus animalibus ineſſe neceſſe eſt. Ergo mollibus id membrana continetur humidum, per quod gula in ventrem pertendit, admota potiùs tergo: mutis id à nonnullis vocatur. Cruſtatis etiam tale quid alterum adiunctum eſt, quod & ipſum mutis nomine appellatur. Humida corpulentáque ea pars eſt. Tendit per eam mediam, vt modò diximus, ſtomachus, ſiue gula. Nā ſi inter eam & tergum poſitus eſſet, diſtendi æquè non poſſet cibo ingrediente, propter dorſi duritiam. Inteſtinum à mute natura ſemouit, extrá- E que poſuit, & atramentum inteſtino annexuit, vt quamplurimum diſtaret ab aditu, & pars ſordida à nobili & principe procul haberetur. Partem hanc cordi proportionari & ſitus ipſe oſtendit, cùm idem ſit, & dulcedo humoris, tanquam concocta & ſanguinea quædam. In cruſtatis etiam eodem modo ſentiendi principatus habetur, ſed minùs patet. Attamen in medio ſemper quærendum hoc principium eſt, aut ſcilicet inter partes, quà cibum recipiunt, & quà excrementum emittunt, ſi fixa degunt: aut inter dextram partem & ſiniſtram, ſi inceſſilia ſunt.

Inſectis principij eiuſmodi pars, vt antè diximus, inter caput & alueum eſt. Quæ etſi magna ex parte ſimplex eſt, tamen nonnullis multiplex eſt: vt iulis, & ſimilibus prælongis. Quo fit vt præciſa viuere poſſint. Natura enim partem hanc ſimplicem, vnamque tantùm facere in omnibus vult. Itaque vbi poteſt, ſimplicem facit: vbi non poteſt, multiplicem: idque in aliis minùs, in aliis magis apertum eſt. Partes autem quæ cibum adminiſtrant, non pari ratione datæ omnibus ſunt, ſed plurimùm differunt. Quibuſdam enim in ore eſt, quod aculeus appellatur, quaſi compoſitum & vna linguæ ac labiorum obtinens poteſtatem. Quibus autem aculeus non parte priore habetur, iis intra dentes tale ſenſorium continetur, idque excipit inteſtinum rectum, ſimplex ad oſtium vſque excrementi porrectum: quibuſdam hoc retortum in anfractum eſt. Sunt etiam quæ ventrem ori adiunctum, inteſtinúmque à ventre reuolutum habeant, vt quæ edaciora maioráque ſunt, conceptaculum cibi obtineant copioſioris. Genus cicadarum maximè peculiarem omnium iſtorum naturam ſortitum eſt: quippe quod partem eandem in vſum tum oris tum linguæ conſtitutam aptiſſimè habeat, qua veluti radice cibum ex humoribus trahat: nempe omne inſectorum genus minimo alimento contentum eſt, & propè ſibi ipſa ſufficiunt, non tam corporis exiguitate quàm frigiditate. Quod enim calidum eſt, cibum & deſiderat, & concoquit citò: contrà, quod frigidum eſt, cibo carere facilè patitur. Sed omniũ maximè cicadarum genus ieiunum eſt: ſatis enim iis alimento eſt humor, qui in corpore remanet. Sicut animalibus Ponticis, quæ non diutiùs quàm diem vnum, viuere queunt. Quanquam illis vita die vno perquam breui temporis ſpatio deſcribitur: *his plus temporis datur*, tamen id quoque breue eſt. *Sed cùm de partibus animalium* interioribus dictum iam ſit, ad reliquas exteriores redeundum eſt, incipiendúmque non vnde digreſſi ſumus, ſed ab iis ipſis quæ modò expoſui, vt iis expeditis quæ moram exigunt breuiorem, amplius in genere animalium perfecto & ſanguine prædito immoremur.

CAPVT VI.

De partibus exterioribus generis inſecti, earúmque inter ſe diſſidentia.

ERgo inſecta animalia quanquam non partibus numeroſis conſtant, tamen ipſa inter ſe diſſident: quippe quæ, cùm omnia multos habeãt pedes, quoniam contra tarditatem frigiditatémque naturæ eorum numerus exauctus, pedum motionem efficiat faciliorem, tamen variè numerum hunc ſortiantur. Quæ enim plurimum pro ſui corporis longitudine frigent, numero præcipuè ſuperant: vt iulorum genus. Quinetiam quòd principia plura habeant, hinc & inſectiones ſunt, & numerus pedum proinde augetur. Quibus autem pedes pauciores: hæc volucres ſunt, vt pedum inopia adiumento pennarum compenſetur. Ipſarum autem volucrum, quæ paſcuis viuant, & pabuli cauſa neceſſe habeant euagari, hæ quadripennes ſunt, & corpulentiam habent leuiorem: vt apes, & reliqua generis eiuſdem. Binas vtroque ſui corporis latere pennas gerunt,

A τοῖς δ' ἐντόμοις τὸ μὲν τῆς τοιαύτης ἀρχῆς μόριον, ὥσπερ ἐν τοῖς πρότερον ἐλέχθη λόγοις, μεταξὺ κεφαλῆς καὶ τοῦ περὶ τὴν κοιλίαν ἐστὶ κύτους. τοῦτο δὲ τοῖς μὲν πολλοῖς ἐστιν ἕν, τοῖς δὲ πλείω, καθάπερ τοῖς ἰουλώδεσι καὶ μακροῖς. διόπερ διατεμνόμενα ζῇ. βούλεται γὰρ ἡ φύσις ἐν πᾶσι μόνον ἓν ποιεῖν τὸ τοιοῦτον. οὐ δυναμένη δὲ, ἐνεργείᾳ ποιεῖ μόνον ἕν, δυνάμει δὲ πλείω. δῆλον δ' ἐν ἑτέροις ἑτέρων μᾶλλον. τὰ δὲ πρὸς τὴν τροφὴν μόρια, οὐ πᾶσιν ὁμοίως, ἀλλὰ διαφορὰν ἔχει πολλήν. ἐντὸς γὰρ τοῦ στόματος ἐνίοις μὲν ἐστὶ τὸ καλούμενον κέντρον, ὥσπερανεὶ σύνθετον, καὶ ἔχον γλώττης καὶ χειλῶν
B ἅμα δύναμιν. τοῖς δὲ μὴ ἔχουσιν ἔμπροσθεν τὸ κέντρον, ἔστιν ἐντὸς τῶν ὀδόντων τοιοῦτον αἰσθητήριον. τούτου δ' ἐχόμενον ἔντερον, πᾶσιν εὐθὺ καὶ ἁπλοῦν μέχρι τῆς ἐξόδου τοῦ περιττώματος. ἐνίοις δὲ τοῦτο ἑλικὴν ἔχει. τὰ δὲ κοιλίαν μετὰ τὸ στόμα· ἀπὸ δὲ τῆς κοιλίας, τὸ ἔντερον εἱλιγμένον, ὅπως ὅσα βρωτικώτερα καὶ μείζω τὴν φύσιν, ὑποδοχὴν ἔχῃ πλείονος τροφῆς. τὸ δὲ τῶν τεττίγων γένος ἰδίαν ἔχει μάλιστα τούτων φύσιν. τὸ γὰρ αὐτὸ μόριον ἔχει στόμα καὶ γλῶτταν συμπεφυκὸς, δι' οὗ, καθαπερεὶ διὰ ῥίζης, δέχεται τὴν τροφὴν ἀπὸ τῶν ὑγρῶν.
C πάντα μὲν οὖν ἐστὶν ὀλιγότροφα τὰ ἔντομα τῶν ζώων, οὐχ οὕτω διὰ μικρότητα, ὡς διὰ ψυχρότητα. τὸ γὰρ θερμὸν καὶ δεῖται τροφῆς, καὶ πέττει τὴν τροφὴν ταχέως· τὸ δὲ ψυχρὸν, ἄτροφον. μάλιστα δὲ τὸ τῶν τεττίγων γένος. ἱκανὴ γὰρ τροφὴ τῷ σώματι ἡ ἐκ τοῦ σώματος ὑπομένουσα ὑγρότης, καθάπερ * τοῖς ἐφημέροις ζώοις (γίνεται δὲ ταῦτα περὶ τὸν Πόντον) πλὴν ἐκεῖνα μὲν ζῇ μιᾶς ἡμέρας χρόνον, ταῦτα δὲ πλειόνων μὲν ἡμερῶν, ὀλίγων δὲ τούτων. ἐπεὶ δὲ περὶ τῶν ἐντὸς ὑπαρχόντων τοῖς ζώοις μορίων εἴρηται, πάλιν περὶ τῶν λοιπῶν τῶν ἐκτὸς ἐπανιτέον. ἀρκτέον δ' ἀπὸ τῶν νῦν εἰ-
D ρημένων, ἀλλ' οὐκ ἀφ' ὧν ἀπελίπομεν, ὅπως ἀπὸ τούτων διατριβὴν ἐλάττω ἐχόντων, ἐπὶ τῶν τελείων καὶ ἐναίμων ζώων ὁ λόγος ἁρμόζῃ, σχολάζῃ δὲ μᾶλλον.

* Hiſtor. anim. lib. 5. c. 19.

ΚΕΦΑΛ. ϛʹ.

Περὶ τῶν ἐκτὸς μορίων τῶν ἐντόμων.

ΤΑ μὲν οὖν ἔντομα τῶν ζώων, οὐ πολυμερῆ μὲν τὸν ἀριθμόν ἐστιν, ὅμως δ' ἔχει καὶ πρὸς ἄλληλα διαφοράς. πολύποδα μὲν γάρ ἐστι πάντα, διὰ τὸ πρὸς τὴν βραδυτῆτα καὶ κατάψυξιν τῆς φύσεως, τὴν πολυποδίαν εὐκινητοτέραν αὐτοῖς ποιεῖν τὴν κίνησιν. καὶ μάλιστα πολύποδα, τὰ μάλιστα κατεψυγμένα διὰ τὸ μῆκος, οἷον τὸ τῶν ἰούλων γένος. ἔτι δὲ διὰ τὸ τὰς ἀρχὰς ἔχειν πλείονας, αἵ τ' ἐντομαί εἰσι, καὶ πολύποδα κατὰ ταύτας ἐστίν. ὅσα δ' ἐλάττονας ἔχει πόδας, πτηνὰ ταῦτ' ἐστὶ πρὸς τὴν ἔλλειψιν τὴν τῶν ποδῶν. αὐτῶν δὲ τῶν πτηνῶν, ὧν μὲν ἐστὶν ὁ βίος νομαδικὸς, καὶ διὰ τὴν τροφὴν ἀναγκαῖον ἐκτοπίζειν, τετράπτερά τε ἐστι, καὶ τὸν τοῦ σώματος ἔχει κοῦφον ὄγκον, οἷον αἵ τε μέλιτται καὶ τὰ σύμφυλα ζῷα ταύταις. δύο γὰρ ἐφ' ἑκάτερα πτερὰ τοῦ σώματος ἔχουσιν.

Hiſtor. 4. 7.

ὅσα δὲ μικρὰ τῶν τοιούτων, δίπτερα, καθάπερ τὸ τῶν μυιῶν γένος. ὅσα δὲ βραχέα, καὶ τοῖς βίοις ἑδραῖα, πολύπτερα μὲν ὁμοίως ταῖς μελίτταις ἐστίν, ἔχει δ' ἔλυτρα τοῖς πτεροῖς, οἷον αἵ τε μηλολόνθαι, καὶ τὰ τοιαῦτα τῶν ἐντόμων, ὅπως σώζῃ τὴν τῶν πτερῶν δύναμιν. ἑδραῖα γὰρ ὄντα, * διαφθορὰ μὲν ἐστι μᾶλλον τῶν εὐκινήτων· διόπερ ἔχει φραγμὸν πρὸ αὐτῶν. καὶ ἄσχιστον δὲ τοῦτ' ἐστὶ τὸ πτερὸν καὶ ἄκαυλον· οὐ γάρ ἐστι πτερὸν, ἀλλ' ὑμὴν δερματικὸς, ὃς διὰ ξηρότητα ἐξ ἀνάγκης ἀφίσταται τοῦ σώματος αὐτῶν, ψυχομένου τοῦ σαρκώδους. ἔντομα δ' ἐστὶ, διά τε τὰς εἰρημένας αἰτίας, καὶ ὅπως σώζηται δι' ἀπάθειαν συγκαμπτόμενα. συνελίττεται γὰρ τὰ μῆκος ἔχοντ' αὐτῶν. τοῦτο δ' οὐκ ἂν ἐγίνετ' αὐτοῖς, μὴ οὖσιν ἐντόμοις. ὅσα δὲ μὴ ἑλικτὰ αὐτῶν, σκληρύνεται μᾶλλον συνιόντα ἐς τὰς τομάς. δῆλον δὲ τοῦτο γίνεται θιγγανόντων, οἷον ἐπὶ τῶν λεγομένων κανθάρων. φοβηθέντα γὰρ ἀκινητίζει, καὶ τὸ σῶμα γίνεται σκληρὸν αὐτοῖς. ἀναγκαῖον δ' ἐντόμοις αὐτοῖς εἶναι. τοῦτο γὰρ ἐν τῇ οὐσίᾳ αὐτῶν ὑπάρχει, τὸ πολλὰς ἔχειν ἀρχάς· καὶ ταύτῃ προσέοικε τοῖς φυτοῖς. ὥσπερ γὰρ τὰ φυτὰ, καὶ ταῦτα διαιρούμενα δύναται ζῆν· πλὴν ταῦτα μὲν μέχρι τινός, ἐκεῖνα δὲ καὶ τέλεια γίνεται τὴν φύσιν, καὶ δύο ἐξ ἑνὸς καὶ πλείω τὸν ἀριθμόν. ἔχει δ' ἔνια τῶν ἐντόμων καὶ κέντρα πρὸς βοήθειαν τῶν βλαπτόντων. τὸ μὲν οὖν κέντρον, τοῖς μὲν ἐμπροσθέν ἐστι, τοῖς δ' ὄπισθεν. τοῖς μὲν ἔμπροσθεν, κατὰ τὴν γλῶτταν· τοῖς δ' ὄπισθεν, κατὰ τὸ οὐραῖον. ὥσπερ γὰρ τοῖς ἐλέφασι τὸ τῶν ὀσμῶν αἰσθητήριον γέγονε χρήσιμον πρός τε τὴν ἀλκὴν, καὶ τὴν τῆς τροφῆς χρῆσιν, οὕτως τῶν ἐντόμων ἐνίοις [τὸ κατὰ τὴν γλῶτταν τεταγμένον.] αἰσθάνονταί τε γὰρ ταύτῃ τῆς τροφῆς, καὶ ἀναλαμβάνουσι καὶ προσάγονται. ὅσα δὲ μή ἐστιν αὐτῶν ἐμπροσθόκεντρα, ὀδόντας ἔχει, τὰ μὲν, ἐδωδῆς χάριν· τὰ δὲ, τοῦ λαμβάνειν καὶ προσάγεσθαι τὴν τροφήν· οἷον οἵ τε μύρμηκες, καὶ τὸ τῶν μελιττῶν ἁπασῶν γένος. ὅσα δὲ ὀπισθόκεντρά ἐστι, διὰ τὸ θυμὸν ἔχειν, ὅπλον ἔχει τὸ κέντρον. ἔχουσι δὲ τὰ μὲν ἐν αὐτοῖς τὰ κέντρα, καθάπερ αἱ μέλιτται καὶ οἱ σφῆκες, διὰ τὸ πτηνὰ εἶναι. λεπτὰ μὲν γὰρ ὄντα καὶ ἔξω, εὔφθαρτα ἂν εἴη· εἰ δ' ἀπέχοι, ὥσπερ τοῖς σκορπίοις, βάρος ἂν παρέχοι. τοῖς δὲ σκορπίοις πεζοῖς οὖσι καὶ κέρκον ἔχουσιν, ἀναγκαῖον ἐπὶ ταύτης ἔχειν τὸ κέντρον, ἢ μηθὲν χρήσιμον εἶναι πρὸς τὴν ἀλκήν. δίπτερον δ' οὐθέν ἐστιν ὀπισθόκεντρον. διὰ τὸ ἀσθενῆ γὰρ καὶ μικρὰ εἶναι, δίπτερά ἐστιν. ἱκανὰ γὰρ τὰ μικρὰ αἴρεσθαι ὑπὸ τῶν ἐλαττόνων τὸν ἀριθμόν. διὰ ταὐτὸ δὲ τοῦτο, καὶ ἐμπροσθόκεντρα [ἔχει τὸ κέντρον· ἀσθενῆ γὰρ ὄντα, μόλις δύναται τοῖς [ἔμπροσθεν] τύπτειν]. τὰ δὲ πολύπτερα, διὰ τὸ μείζω τὴν φύσιν εἶναι, πλειόνων τετύχηκε πτερῶν, καὶ ἰσχύει τοῖς ὀπισθίοις μορίοις. βέλτιον δ', εἰ ἐνδέχεται, μὴ ταὐτὸ ὄργανον ἐπὶ ἀνομοίας ἔχειν χρήσεις, ἀλλὰ τὸ μὲν ἀμυντικὸν, ὀξύτατον, τὸ δὲ γλωττικὸν, σομφὸν καὶ σπαστικὸν τῆς τροφῆς. ὅπου γὰρ ἐνδέχεται χρῆσθαι δυσὶν ἐπὶ δύ' ἔργα, καὶ μὴ ἐμποδίζειν πρὸς ἕτερον, οὐθὲν ἡ φύσις εἴωθε ποιεῖν, ὥσπερ * ἡ χαλκευτικὴ δι' εὐτέλειαν ὀβελισκολύχνιον· ἀλλ' ὅπου μὴ ἐνδέχεται, καταχρῆται τῷ αὐτῷ ἐπὶ πλείω ἔργα. τοὺς δὲ πόδας ἔνια τοὺς προσθίους μείζους ἔχει, ὅπως διὰ τὸ σκληρόφθαλμα εἶναι, οὐκ ἀκριβῶς ὁρῶντα, τὰ ἐμπίπτοντα τοῖς προσθίοις ἀποκαθαίρωσι σκέλεσιν.

* γρ. διάφθορα

* Politic. lib. 4. cap. 15.

A At verò quæ corpore exiguo ſunt, bipennes conſtant: vt genus muſcarum. Quæ autē parua ſunt, & vitam ſtabilem agunt, multis fulciuntur pennis, vt apes: & cruſta pennas obtectas gerunt, vel vt galerucæ, & cætera id genus inſecta, ſcilicet vt pennarum vires integras tueantur. Cùm enim ſtabilia ſint, corrumpi faciliùs poſſunt, quàm quæ motu citantur agiliori. Itaque ſepto propoſito muniuntur. Quinetiam penna eorum caret, & fiſſura, & caule: non enim penna ſed membrana cutis æmula eſt, quæ pre ſiccitate neceſſario abſoluatur corpore eorum, cùm carnis portio frigeat. Inſecta autem ſunt, tum ob cauſas prædictas, tum etiam vt ſeſe tuto inflexu ſeruare poſſint. Con-
B glomerantur enim quæcunque ex iis prolixo corpore ſunt, quod effici niſi inſectis non poſſet. Quæ autem glomerari nequeant, contrahunt ſe in inciſuras. Quod patet, cùm tanguntur, velut ea, quæ canthari vocantur. Vbi enim metuerint, motu ceſſant, totoque corpore indureſcunt. Inſecta verò hæc eſſe neceſſarium propterea eſt, quòd in eorum eſſentia ineſt, vt multa principia habeant: eaque ratione ferè plantis aſſimilantur. Vt enim plantæ, ipſa quoque præciſa viuere poſſunt, ſed hæc aliquandiu, illæ vel perfici poſſunt, ac duæ ex vna, atque etiam plures numero procreantur. Aculeis etiam armantur nonnulla inſecta contra animalia noxia. Geritur aculeus aliis parte prio-
C re, aliis poſteriore: aut enim ore, aut aluo extrema. Nam vt elephantis pars delegata odoribus commoda etiam tum ad pugnandum tum ad cibi vſum habetur, ſic inſectorum quibuſdam lingua pluribus officiis fungitur: quippe quæ & cibum ſentiat, ſuſcipiat, admoueatque, & defendat contra aliorum iniurias. Quibus autem non in ore aculeus, hæc dentes habent, cibi ſcilicet aut conficiendi, aut capiendi admouendique gratia: vt formicæ, vt apes. At verò quæ aculeo in aluo armata ſunt, hæc vt animoſa aculeum pro armis obtinuêre, qui intra aluum conditus eſt: vt in apibus, & veſpis, quoniam volucres ſunt: nam ſi prætenuis fragiliſque aculeus extra pateret, facilè corrumperetur: ſed ſi, vt in ſcorpione, diſta-
D ret, onus ita afferret. *Scorpio* profectò quod non volatu ſed greſſu ſe moueat, caudámque ſortitus ſit, aculeum caudæ adiunctum gerat, vel inutilem ad pugnam habeat, neceſſe eſt. Nulli aculeus in aluo, cui pennæ binæ. Quòd enim imbecillia paruáque ſunt, ideo binas habent: quippe cùm vel à paucioribus efferri poſſint, quæ parua ſunt. Quod idem cauſæ eſt etiam cur aculeus parte priore geratur. Cùm enim imbecilla ſint, vix parte priore ferire poſſunt. At verò quæ pluribus pennis prędita ſunt, quia auctiora ſunt, meritò pennas plures obtinuêre, parteque poſteriore valent. Inſtrumentum autem
E non idem ad vſus diſſimiles haberi, ſi fieri poteſt: ſed ad defendendum acutiſſimum, ad guſtandum fungoſum, & cibi attrahens, melius eſt. Vbi enim licet duobus vti ad duo opera, nec aliud impeditur, nihil tale natura facere ſolet, quale per inopiam ars excuſoria obeliſcolychnium ex veru lucernáque componit: attamen ſi id fieri non poteſt, eodem ad plura opera abvtitur. Pedes priores nonnulla ex iis longiores ideo habent, vt quoniam propter oculorum duritiam non exquiſitè cernant, cruribus iis longiorib. abſtergant incidentem moleſtiam, atque arceant.

Quod & facere muſcas videmus, & apes, & reliqua generis eiuſdem. Semper enim prioribus cruribus vallant, & protegunt. Poſteriora mediis longiora ſunt, vt ambulent meliùs, & attollantur faciliùs de terra, cùm auolare libet. Quod planiùs ea oſtendunt, quæ ſaliunt: vt locuſtæ, vt culices. Cùm enim inflexa ruſus connixa extendunt, attolli de terra neceſſe eſt. Locuſtæ non parte priore ſed poſteriore habent crura illa ad gubernaculorum effigiem condita. Suffraginem enim intus flecti neceſſe eſt. quod nulli crurum priorum datum eſt. Omnibus his ſeni pedes, iis etiam, quorum enixu ſaliunt, connumeratis.

A ὅπερ καὶ φαίνονται ποιοῦσαι αἵ τε μυῖαι, καὶ τὰ μελιτώδη τῶν ζῴων. ἀεὶ γὰρ χαρακίζουσι τοῖς προσθίοις σκέλεσι. τὰ δ' ὀπίσθια μείζω τῶν μέσων, διά τε τὴν βάδισιν, καὶ πρὸς τὸ αἴρεσθαι ῥᾷον ἀπὸ τῆς γῆς ἀναπτόμενα. ὅσα δὲ πηδητικὰ αὐτῶν ἐστι, μᾶλλον τοῦτο φανερόν· οἷον αἵ τ' ἀκρίδες, καὶ τὸ τῶν ψυλλῶν γένος. ὅταν γὰρ κάμψαντ' ἐκτείνῃ πάλιν, ἀναγκαῖον ἀπὸ τῆς γῆς ἤρθαι. οὐκ ἔμπροσθεν δέ, ἀλλ' ὄπισθεν μόνον ἔχουσιν αἱ ἀκρίδες τὰ πηδαλιώδη. τὴν γὰρ καμπὴν ἀναγκαῖον εἴσω κεκλάσθαι. τῶν δὲ προσθίων κώλων οὐδὲν ἐστι τοιοῦτον. ἑξάποδα δ' ἐστὶ τὰ τοιαῦτα πάντα
B εἰσὶ, σὺν τοῖς ἀλτικοῖς μορίοις.

CAPVT VII.

De partibus teſtatorum exterioribus.

TEſtatorum corpus non multiplex eſt. Cuius rei cauſa eſt, quòd eorum natura ſtabilis eſt. Quæ enim mobiliora ſunt, hæc plures habeant partes neceſſe eſt: quoniam actiones eorum ſint, & officia. Plura enim deſiderant inſtrumenta ea quæ plures motiones exercent. Adhæc, aut omnino immobiliora ſunt, aut parum motus adipiſcuntur. Verùm natura conſulens eorum ſaluti, duritiam teſtæ obduxit. Sunt alia vniualuia, alia biualuia, alia turbinata, vt dictum iam eſt. Turbinati etiam generis alia in anfractum intorta ſunt, vt buccina: alia in globum tantùm circumacta, vt echinorum genus, nec non biualuium: alia reſeratilia ſunt, vt pectines, & mituli. Ab altero enim latere nodo ligantur, quædam vtroque latere connexa ſunt, vt vnguium genus. Habent omnia teſtata caput infra, plantarum modo. Cuius rei cauſa eſt, quòd cibum de imo capiant, vt plantæ radicibus ſuis hauriunt. Itaque iis vſu euenit vt inferiora habeant ſupra, ſuperiora infra. Membrana obducit, quà portio potulenta humoris tranſmiſſa liquatáque cibo aſſumitur. Nullum ex iis eſt quod capite careat. Cæteræ corporis partes nomine vacant, præter eam quæ cibum recipit.

ΚΕΦΑΛ. ζ'.

Περὶ τῶν ἐκτὸς μορίων τῶν ὀστρακοδέρμων.

Τῶν δ' ὀστρακοδέρμων, οὐκ ἔστι τὸ σῶμα πολυμερές. τούτου δ' αἴτιον, ὅ μόνιμον αὐτῶν εἶναι τὴν φύσιν. πολυμερέστερα γὰρ ἀναγκαίως εἰσὶ τῶν ζῴων τὰ κινητικά, διὰ τὸ εἶναι αὐτῶν πράξεις. ὀργάνων γὰρ δέονται πλειόνων τὰ πλειόνων μετέχοντα κινήσεων. τούτων δὲ τὰ μὲν ἀκίνητα πάμπαν εἰσί, τὰ δὲ μικρᾶς μετέχει κινήσεως. ἀλλ' ἡ φύσις
C πρὸς σωτηρίαν αὐτοῖς τὴν τῶν ὀστράκων σκληρότητα περιέθηκεν. εἰσὶ δὲ τὰ μὲν μονόθυρα αὐτῶν, τὰ δὲ δίθυρα, τὰ δὲ στρομβώδη, καθάπερ εἴρηται πρότερον. καὶ τούτων τὰ μὲν, ἑλίκην ἔχοντα, οἷον κήρυκες· τὰ δὲ, σφαιροειδῆ μόνον, καθάπερ τὸ τῶν ἐχίνων γένος. καὶ τῶν διθύρων τὰ μὲν ἐστιν ἀναπτυκτά, οἷον κτένες καὶ μύες. ἐπὶ θάτερα γὰρ συγκέκλεισται, ὥστε ἀνοίγεσθαι ἐπὶ θάτερα καὶ συγκλείεσθαι. τὰ δ' ἐπ' ἀμφότερα συμπέφυκεν, οἷον τὸ τῶν σωλήνων γένος. ἅπαντα δὲ τὰ ὀστρακόδερμα, καθάπερ τὰ φυτά, κάτω τὴν κεφαλὴν ἔχει. τούτου δ' αἴτιον, ὅτι κάτωθεν λαμβάνει τὴν τροφήν, ὥσπερ τὰ φυτὰ ταῖς ῥίζαις. συμβαίνει οὖν αὐτοῖς τὰ
D μὲν κάτω, ἔχειν ἄνω· τὰ δ' ἄνω, κάτω. ἐν ὑμένι δ' ἐστί, δι' οὗ διηθεῖ τὸ πότιμον, καὶ λαμβάνει τὴν τροφήν. ἔχει δὲ κεφαλὴν μὲν πάντα. τὰ δὲ τοῦ σώματος μόρια πλὴν τοῦ τῆς τροφῆς δεκτικοῦ, ἀνώνυμα πάντα.

CAPVT VIII.

De exterioribus partibus cruſta intectorum.

CRuſtata omnia ingredi poſſunt: itaque pedes complures obtinuerunt. Summa eorum genera quatuor numero ſunt: locuſtæ, gammari, ſquillæ, cancri. Quæ ſingula in plures ſpecies diſtinguuntur, quæ non modò forma, verùm magnitudine etiam multum interſe differant: alia enim magna, alia parua admodum ſunt. Genus igitur cancrarium & locuſtarium ſimilia interſe ſunt, eo quòd vtrunque brachia forcipibus denticulatis habeat. Sed hæc non ingrediendi cauſa habentur, ſed vt iis quaſi manibus capiant, & retineant. Quamobrem contra, quàm pedes, ea flectere ſolent: hos enim in cauum, illa in orbem flectunt, & circũagunt. Sic enim ad cibum capiendum admouendúmque commodiùs agitur. Sed intereſt, quòd locuſtæ caudam habent, cancri non habent. Locuſtis enim vt nantibus cauda vtilis eſt: natant enim cauda, quaſi remo innitendo: at cancris inutilis eſt, quoniã vitam agere terrenam, cauernáſque ſubire ſoleant. Qui tamen ex iis pelagij ſunt,

ΚΕΦΑΛ. η'.

Περὶ τῶν ἐκτὸς μορίων τῶν μαλακοστράκων.

Τὰ δὲ μαλακόστρακα, καὶ πορευτικὰ πάντα· διὸ πόδας ἔχει πλῆθος. εἰσὶ δὲ γένη μὲν τέτταρα τὰ μέγιστα αὐτῶν, οἵ τε καλούμενοι κάραβοι, καὶ ἀστακοί, καὶ καρίδες, καὶ
E καρκίνοι. τούτων δὲ ἑκάστου, πλείω εἴδη εἰσὶ διαφέροντα, οὐ μόνον κατὰ τὴν μορφήν, ἀλλὰ καὶ κατὰ τὸ μέγεθος, πολύ. τὰ μὲν γὰρ μεγάλα, τὰ δὲ μικρὰ πάμπαν αὐτῶν ἐστι. τὰ μὲν οὖν καρκινώδη καὶ καραβώδη, παρόμοιά εἰσι, τῷ χηλὰς ἔχειν ἀμφότερα. ταύτας δὲ οὐ πορείας ἔχουσι χάριν, ἀλλ' ἀντὶ χειρῶν πρὸς τὸ λαβεῖν καὶ κατασχεῖν. διὸ καὶ κάμπτουσιν ἐναντίως ταύτας τοῖς ποσί. τοὺς μὲν γὰρ ἐπὶ τὸ κοῖλον, τὰς δ' ἐπὶ τὸ περιφερές, κάμπτουσι καὶ ἑλίσσουσιν. οὕτω γὰρ χρήσιμαι πρὸς τὸ λαβοῦσαι προσφέρειν τὴν τροφήν. διαφέρουσι δ', ᾗ οἱ μὲν κάραβοι ἔχουσιν οὐράς, οἱ δὲ καρκίνοι οὐκ ἔχουσιν. τοῖς μὲν γὰρ διὰ τὸ νευστικοῖς εἶναι, χρήσιμος ἡ οὐρά. νέουσι γὰρ ἀπερειδόμενοι ὥσπερ πτερυγίοις αὐταῖς. τοῖς δὲ καρκίνοις οὐδὲν χρήσιμον, διὰ τὸ πρόσγειον εἶναι τὸν βίον αὐτῶν, καὶ εἶναι τρωγλοδυτικούς. ὅσοι δ' αὐτῶν πελάγιοί εἰσι,

διὰ τοῦτο πολὺ [καὶ] ἀργοτέρους ἔχουσι τοὺς πόδας αὐτῶν πρὸς τὴν πορείαν. διὸ αἵ τε μαῖαι, καὶ οἱ Ἡρακλεωτικοὶ καλούμενοι καρκίνοι· ὅτι ὀλίγῃ χρῶνται κινήσει, ἀλλ' ἡ σωτηρία αὐτοῖς τῷ ὀστρακώδεις εἶναι γίνεται. διὸ αἱ μὲν μαῖαι, λεπτοσκελεῖς. οἱ δὲ Ἡρακλεωτικοί, μικροσκελεῖς εἰσιν. οἱ δὲ μικροὶ καρκίνοι, οἱ ἁλισκόμενοι ἐν τοῖς μικροῖς ἰχθυδίοις, ἔχουσι τοὺς τελευταίους πλατεῖς πόδας, ἵνα πρὸς τὸ νεῖν αὐτοῖς χρήσιμοι ὦσιν, ὥσπερ πτερύγια ἢ πλάτας ἔχοντες τοὺς πόδας. αἱ δὲ καρίδες τῶν μὲν καρκινοειδῶν διαφέρουσι, τῷ ἔχειν κέρκον. τῶν δὲ καραβοειδῶν, διὰ τὸ μὴ ἔχειν χηλάς· αὗται οὐκ ἔχουσι, διὰ τὸ πλείους ἔχειν πόδας. ἐνταῦθα γὰρ ἡ ἐκεῖθεν ἀνήλωται αὔξησις. πλείους δ' ἔχουσι πόδας, ὅτι νευστικώτεραί εἰσιν, ἢ πορευτικώτεραι. τὰ δ' ἐν τοῖς ὑπτίοις μόρια καὶ περὶ τὴν κεφαλήν, τὰ μὲν εἰς τὸ δέξασθαι τὸ ὕδωρ καὶ ἀφεῖναι, ἔχουσι βραγχιοειδῆ· πλακωδέστερα δὲ τὰ κάτω αἱ θήλειαι τῶν ἀρρένων καράβων ἔχουσι. καὶ τὰ ἐν τῷ ἐπιπτύγματι δασύτερα αἱ θήλειαι καρκίνοι τῶν ἀρρένων, διὰ τὸ ἐκτείνειν τὰ ᾠὰ πρὸς αὐτά, ἀλλὰ μὴ ἀπωθεῖν, ὥσπερ οἱ ἰχθύες καὶ τἆλλα τὰ τίκτοντα. εὐρυχωρέστερα γὰρ ὄντα, καὶ μείζω χώραν ἔχει τοῖς ᾠοῖς μᾶλλον. οἱ μὲν οὖν κάραβοι καὶ οἱ καρκίνοι πάντες, τὴν δεξιὰν ἔχουσι χηλὴν μείζω καὶ ἰσχυροτέραν. τοῖς γὰρ δεξιοῖς πάντα πέφυκε τὰ ζῷα ἀδρὰ μᾶλλον. ἡ δὲ φύσις ἀποδίδωσιν ἀεὶ τοῖς χρῆσθαι δυναμένοις ἕκαστον, ἢ μᾶλλον, ἢ μόνοις, οἷον χαυλιόδοντας, καὶ κέρατα, καὶ πλῆκτρα, καὶ πάντα τὰ τοιαῦτα μόρια, ἃ εἰς βοήθειαν, καὶ ἀλκήν ἐστιν. οἱ δ' ἀστακοὶ μόνοι, ὁποτέραν ἂν τύχωσιν, ἔχουσι μείζω τῶν χηλῶν, καὶ αἱ θήλειαι καὶ οἱ ἄρρενες. αἴτιον δὲ τοῦ μὲν ἔχειν χηλάς, ὅτι ἐν τῷ γένει εἰσὶ τῷ ἔχοντι χηλάς. τοῦτο δ' ἀτάκτως ἔχουσιν, ὅτι πεπήρωνται, καὶ οὐ χρῶνται ἐφ' ἃ πεφύκασιν, ἀλλὰ πορείας χάριν. καθ' ἕκαστον δὲ τῶν μορίων τίς ἡ θέσις αὐτῶν, καὶ τίνες διαφοραὶ πρὸς ἄλληλα, τῶν τ' ἄλλων, καὶ τίνι διαφέρει τὰ ἄρρενα τῶν θηλειῶν, ἔκ τε τῶν ἀνατομῶν θεωρείσθω, καὶ ἐκ τῶν ἱστοριῶν τῶν περὶ τὰ ζῷα.

A ij pedes habent longè retardiores ad ambulandum. Sunt enim cæteris ipſi nantiores, vt maiæ, & qui heracleotici appellantur. Crura iis breuia, quia parum mouentur: ſed ſalus eorum beneficio cruſtæ firmioris contingit. Itaque magis crura tenuiora, heracleoticis breuiora. Cancelli autem, qui perquam exigui in piſciculis reperiuntur, pedes nouiſſimos latiuſculos habent, vt ad nandum vtiles ſint, quaſi pro pinnulis aut remis pedes haberentur. Squillæ à cancrario genere differunt, eo quòd caudam habeant: à cruſtario verò, quòd forcipe careant. Idque, quoniam plures habeant pedes: eo namque redundantia illa abſumitur. Pedes obtinent plures, quòd non magis ad nan-B dum quàm ad ingrediendum ſint ſuapte natura propenſiores. Partes ſupinas, & capitis ita habent, vt alteræ ad accipiendam reddendámque aquam branchiarum ſpecie conditæ ſint: alteræ planiores tabellatioréſque in fœminis cruſtati generis omnibus, quàm in maribus, conſtent: & interiora verò operculi applicati hirtiora amplioráque fœminæ cancri habent, quàm mares, quoniam oua in ea edunt non procul vt piſces, & cætera, quæ parere ſolent. Quo enim ampliora ſint, eo locum ouis præſtare poterunt capaciorem. Locuſtæ cancrique omnes forcipem dextrum grandiorem valentiorémque habent. Parte enim dextra efficaciora ſuapte natura ſunt animalia C omnia. Redditur autem ſemper à natura cuique, vel ſoli, vel præcipuè id, quo vti poteſt: vt dentes, eóſque aut exertos, aut ſerratos, aut continuos, & cornua, & calcaria, & reliquas eiuſmodi partes, quarum vſus ad defendendum, aut dimicandum. Gammari ſoli non certum, ſed alterutrum æquè, vt ſors tulerit, forcipem habent grandiorem, tam mares quàm fœminæ. Cauſa autem cur forcipem habeant, quòd ex eo genere ſint, quod forcipem habet. Cur alterum grandiorem incertè, quod non integram ſui generis naturam tenet, ſed ita degenerat, vt quod ad aliud deſtinatum eſt, eo non eodem, ſed ad greſſum vtatur. Quiſnam ſitus partium ſingula-D rum ſit, & qua differentia inter ſe diſcrepent, & quo mares cum fœminis diſſideant, ex commentatione diſſectionéque animalium petendum eſt.

ΚΕΦΑΛ. θ'.

Περὶ τῶν ἐκτὸς μορίων τῶν μαλακίων καὶ ἀναίμων.

Τῶν δὲ μαλακίων περὶ μὲν τῶν ἐντὸς, εἴρηται πρότερον, ὥσπερ καὶ περὶ τῶν ἄλλων ζῴων. ἐκτὸς δ' ἔχει τό, τε τοῦ σώματος κύτος, ἀδιόριστον ὄν, καὶ τοὺς πόδας ἔμπροσθεν περὶ τὴν κεφαλήν, ἐντὸς μὲν τῶν ὀφθαλμῶν, περὶ δὲ τὸ στόμα καὶ τοὺς ὀδόντας. τὰ μὲν οὖν ἄλλα ζῷα τὰ ἔχοντα πόδας, τὰ μὲν ἔμπροσθεν ἔχει καὶ ὄπισθεν, τὰ δ' ἐκ τοῦ πλαγίου, ὥσπερ τὰ πολύποδα καὶ ἄναιμα τῶν ζῴων. τοῦτο δὲ τὸ γένος ἰδίως τούτων. πάντας γὰρ ἔχουσι τοὺς πόδας ἐπὶ τὸ καλούμενον ἔμπροσθεν. τούτου δ' αἴτιον, ὅτι συνῆκται αὐτοῖς τὸ ὄπισθεν πρὸς τὸ ἔμπροσθεν, [καὶ τὸ ἔμπροσθεν πρὸς τὸ ὄπισθεν] ὥσπερ τῶν ὀστρακοδέρμων τοῖς στρομβώδεσιν. ὅλως γὰρ τὰ ὀστρακόδερμα ἔχει τῇ μὲν ὁμοίως τοῖς μαλακοστράκοις, τῇ δὲ τοῖς μαλακίοις. ᾗ μὲν γὰρ ἔξωθεν [ἔχουσι] τὸ γεῶδες, ἐντὸς δὲ τὸ σαρκῶδες, τοῖς μαλακοστράκοις· τὸ δὲ σχῆμα τοῦ σώματος,

CAPVT IX.

De partibus exterioribus mollium animalium, & ſanguine carentium.

Mollium partes interiores antè, cùm cæterorum, expoſui: nunc exteriorum ordinem perſequemur. Habent hæc foris alueum corporis indiſcretum, & pedes parti priori iunctos circum caput, infra oculos, circa os, & dentes. Sed cùm E cætera animalia, quibus pedes, aut parte priore poſterioréque eos habeant, aut latere, vt ea quæ multis pedibus innituntur, & ſanguine carent, hoc vnum genus pedes parte quam priorem in eo capimus, omnes continet. Cuius rei cauſa eſt, quòd pars eius poſterior ad priorem adducta eſt, extremáque coeunt, & confunduntur, quomodo turbinatis inter teſtata accidit. Genus enim teſtatum omnino partim cruſtatis partim mollibus ſimile eſt. Qua enim foris terrenam portionem, intus carneam habent, cruſtatis aſſimilantur: qua autem forma eiuſmodi corporis cõſtat,

cum mollibus conuenit omne quodam modo, ſed præcipuè quæ ex turbinatis cuniculo in anfractū contorquentur. Natura enim eorum vtrorumque perinde ſe habet, quaſi quis directa linea (vt in quadrupedum & hominum genere eſt) primùm extrema lineæ parte ſuperiore os ſitum intelligat, qua a, mox ſtomachum, qua, b, tum ventrem, qua, c: deinde inteſtinum vſque in oſtium excrementi, qua, d: hæc ita in ſanguineo genere diſpoſita ſunt: & caput pectúſque locum obtinent primum. Reliqua eorum ipſorum gratia, aut motus cauſa à natura adiecta ſunt, vt priora poſterioráque crura. In cruſtatis etiam inſectiſque ordo interiorum eodem modo conſtare vult, ſed officiis exteriorum motionum differt à ſanguineo genere. At verò mollia & turbinata inter ſe quidem proximè conſtant, ſed iis econuerſo: finis enim ad principium flectitur, quaſi quis lineam efflectendo addducat d, ad a. Cùm enim ita partes interiores iis collocentur, ambit alueus, qui in polypis tantùm caput vocatur, qualis in teſtato genere turbo eſt. Nec aliud intereſt, niſi quòd alteris molle, quod ambit, eſt: alteris duro tegmine carnem natura complexa eſt, vt ſeruentur, cùm difficulter moueantur. Hinc fit vt excrementum tam mollibus quàm turbinatis, meatu ori vicino emittatur: quanquam mollibus infrà, turbinatis à latere. Hac de cauſa pedes mollium ita poſiti ſunt, & contrà, quàm cæterorum. Sepiæ atque lolligines non ſimili vt polypi modo conſtant: quoniam vim nandi tantummodo habent, cùm polypi vel ingredi poſſint: habent enim ſepiæ & lolligines pedes ſupra dentes ſenos exiguos, eorúmque nouiſſimos duos maiores: reliquos autem octonorum duos infrà omnium maximos. Vt enim quadrupedibus crura poſteriora firmiora validioráque ſunt, ita iis quoque maximi, qui infrà habentur. *His enim onus ſuſtinetur*, motúſque potiſſimùm agitur. Duo etiam illi nouiſſimi maiores ſuis mediis ſunt, quia illis miniſtrent. Polypus medios quatuor habet maximos. Omnibus igitur his pedes octoni. Sed ſepiis & lolliginibus breues, polypis magni. Alueum enim corporis ſepiæ & lolligines habent magnum, polypi paruum. Itaque quod natura polypis ex corpore dempſerat, id in pedum longitudinem addidit: quod ſepiis & lolliginibus de pedibus abſtulerat, eo corporis magnitudinem auxit. Quamobrem polypis pedes non ſolùm ad nandum vtiles ſunt, ſed etiam ad ambulandum: ſepiis autem & lolliginibus inutiles ſunt. Parui ſunt enim, cùm alueum habeant magnum. Cùm itaque pedes habeant breues, atque inutiles, ne æſtu maris tempeſtatéque exturbentur ſaxis, vtque de longinquo admoueant, ideo promuſcides binas prælongas habent, quibus, velvti anchoris, innitantur, ſéque ſtabiliant modo nauigij, tempeſtate vrgente: venentur etiam procul, oríque è longinquo admoueant. Polypi promuſcide carent, quoniam pedes ad vſum eundem commodos habeant. Quorum autem pedibus acetabula cirramentáque adſunt, hæc vim contextúmque talem habent, qualem implicamenta illa, quibus digitos antiqui medici indere ſolebant.

A ὃν τρόπον συνέστηκε, τοῖς μαλακίοις, τρόπον μέν τινα πάντα, μάλιστα δὲ τῶν στρομβωδῶν τὰ ἔχοντα τὴν ἕλικα. ἀμφοτέρων γὰρ τοῦτον ἔχει τὸν τρόπον ἡ φύσις, ὥσπερ εἴ τις νοήσειεν ἐπ᾽ εὐθείας, καθάπερ συμβέβηκεν ἐπὶ τῶν τετραπόδων ζῴων καὶ τῶν ἀνθρώπων· πρῶτον μὲν ἐπὶ τῷ ἄκρῳ τῷ ἄνω στόματι τῆς εὐθείας κατὰ τὸ α· ἔπειτα τὸ β, τὸν στόμαχον· τὸ δὲ γ, τὴν κοιλίαν· ἀπὸ δὲ τοῦ ἐντέρου μέχρι τῆς διεξόδου τοῦ περιττώματος, ᾗ τὸ δ. τοῦτον μὲν οὖν τὸν τρόπον ἔχει τοῖς ἐναίμοις ζῴοις, καὶ περὶ τοῦτό ἐστιν ἡ κεφαλὴ, καὶ ὁ θώραξ καλούμενος. τὰ δὲ λοιπὰ μόρια τούτων χάριν, καὶ ἕνεκα τῆς κινήσεως προσέθηκεν ἡ φύσις, οἷον B τά τε πρόσθια κῶλα, καὶ τὰ ὄπισθεν. βούλεται δὲ καὶ τοῖς μαλακοστράκοις, καὶ τοῖς ἐντόμοις ἡ εὐθυωρία τῶν *ἐντοσθίων τὸν αὐτὸν ἔχειν τρόπον. κατὰ δὲ τὰς ὑπηρεσίας τὰς ἔξωθεν κινητικὰς, διαφέρει τῶν ἐναίμων. τὰ δὲ μαλάκιά τε καὶ στρομβώδη τῶν ὀστρακοδέρμων ἔχει αὐτοῖς μὲν παραπλησίως, ἐκείνοις δ᾽ ἀντεστραμμένως. κέκαμπται γὰρ ἡ τελευτὴ πρὸς τὴν ἀρχὴν, ὥσπερ ἂν εἴ τις τὴν εὐθεῖαν ἐφ᾽ ἧς τὸ ε, κάμψας, προσαγάγοι τὸ δ πρὸς τὸ α. οὕτω γὰρ κειμένων νῦν τῶν ἐντοσθίων, περίκειται τοῖς μὲν μαλακίοις ὁ κύτος, ὃ καλεῖται μόνον ἐπὶ τῶν πολυπόδων κεφαλή· τοῖς δ᾽ ὀστρακοδέρμοις τὸ τοιοῦτόν ἐστιν ὁ στρόμβος. διαφέρει δὲ οὐδὲν ἄλλο, πλὴν ὅτι τοῖς μὲν μαλακὸν C τὸ κύκλωθεν, τοῖς δὲ σκληρὸν περὶ τὸ σαρκῶδες περιέθηκεν ἡ φύσις, ὅπως σώζηται διὰ τὴν δυσκινησίαν. καὶ διὰ τοῦτο τὸ περίττωμα τοῖς τε μαλακίοις ἐξέρχεται περὶ τὸ στόμα, καὶ τοῖς στρομβώδεσι· πλὴν τοῖς μὲν μαλακίοις κάτωθεν, τοῖς δὲ στρομβώδεσιν, ἐκ τοῦ πλαγίου. διὰ ταύτην μὲν οὖν τὴν αἰτίαν, τῶν μαλακίων οἱ πόδες τοῦτον ἔχουσι τὸν τρόπον, καὶ ὑπεναντίως ἢ τοῖς ἄλλοις. ἔχουσι δ᾽ ἀνομοίως αἱ σηπίαι καὶ αἱ τευθίδες τοῖς πολύποσι, διὰ τὸ νευστικὸν καὶ μόνον εἶναι, τοὺς δὲ πορευτικούς. αἱ μὲν γὰρ τοὺς ἄνωθεν τῶν ὀδόντων ἔχουσι, καὶ τούτων τοὺς ἐσχάτους δύο μείζους, τοὺς δὲ λοιποὺς τῶν ὀκτὼ, δύο κάτωθεν μεγίστους τούτων. D ὥσπερ γὰρ τοῖς τετράποσι τὰ ὀπίσθια ἰσχυρότερα κῶλα, καὶ ταύταις μέγιστοι οἱ κάτωθεν. τὸ γὰρ φορτίον οὗτοι ἔχουσι καὶ κινοῦσι μάλιστα, καὶ οἱ ἔσχατοι δύο μείζους τῶν μέσων, ὅτι τούτοις συνυπηρετοῦσιν. ὁ δὲ πολύπους τοὺς ἐν μέσῳ τέτταρας μεγίστους. πόδας μὲν οὖν ἔχουσι ταῦτα πάντα ὀκτώ· ἀλλ᾽ αἱ μὲν σηπίαι καὶ τευθίδες, βραχεῖς· τὰ δὲ πολυποδώδη, μεγάλους. τὸ γὰρ κύτος τοῦ σώματος αἱ μὲν μέγα ἔχουσιν, οἱ δὲ μικρόν· ὥστε τοῖς μὲν ἀφεῖλεν ἀπὸ τοῦ σώματος, καὶ πρὸς τὸ μῆκος τῶν ποδῶν προσέθηκεν ἡ φύσις· ταῖς δ᾽ ἀπὸ τῶν ποδῶν λαβοῦσα, τὸ σῶμα ηὔξησε. διόπερ τοῖς μὲν οὐ μόνον εἰς τὸ νεῖν χρήσιμοι οἱ πόδες, ἀλλὰ καὶ εἰς τὸ βαδίζειν· ταῖς E δ᾽, ἄχρηστοι· μικροὶ γάρ. τὸ δὲ κύτος μέγα ἔχουσιν. ἐπεὶ δὲ βραχεῖς ἔχουσι τοὺς πόδας, καὶ ἀχρήστους εἰς τὸ ἀντιλαμβάνεσθαι, καὶ μὴ ἀποσπᾶσθαι ἀπὸ τῶν πετρῶν, ὅταν κλύδων ᾖ καὶ χειμὼν, καὶ εἰς τὸ τὰ ἄποθεν προσάγεσθαι, διὰ ταῦτα προβοσκίδας ἔχουσι δύο μακρὰς, αἷς ὁρμοῦσι καὶ ἀποσαλεύουσιν, ὡς πλοῖον ὅταν χειμὼν ᾖ, καὶ τὰ ἄποθεν θηρεύουσι, καὶ προσάγονται ταύταις αἵ τε σηπίαι καὶ τευθίδες. οἱ δὲ πολύποδες οὐκ ἔχουσι τὰς προβοσκίδας, διὰ τὸ τοὺς πόδας εἶναι αὐτοῖς εἰς ταῦτα χρησίμους. ὅσοις δὲ κοτυληδόνες ἐν τοῖς ποσὶ καὶ πλεκτάναι πρόσεισι, δύναμιν ἔχουσι καὶ σύνθεσιν τοιαύτην, οἵανπερ τὰ πλεγμάτια, οἷς οἱ ἰατροὶ οἱ ἀρχαῖοι τοὺς δακτύλους ἐνέβαλλον.

* κ. ἐντοσθίων: vnde quidam ἐντοσθίας, ſed inſectis illa vox parum connenit.

οὕτως ἐκ τῶν ἰνῶν πεπλεγμέναι εἰσὶν, αἷς ἕλκουσι τὰ σαρκία καὶ τὰ ἐνδιδόντα. περιλαμβάνει μὲν γὰρ χαλαρὰ ὄντα· ὅταν δὲ συντείνῃ, πιέζει καὶ ἔχεται τοῦ ἐντὸς θιγόντος παντός. ὥστ' ἐπεὶ ἄλλο οὐκ ἔστιν ᾧ προσάξονται, ἀλλ' ἢ τὰ μὲν τοῖς ποσὶ, τὰ δὲ ταῖς προβοσκίσι, ταύτας ἔχουσιν εἰς ἀλκὴν καὶ τὴν ἄλλην βοήθειαν ἀντὶ χειρῶν. τὰ μὲν οὖν ἄλλα, δικότυλά εἰσι· γένος δέ τι πολυπόδων μονοκότυλον. αἴτιον δὲ, τὸ μῆκος καὶ ἡ λεπτότης τῆς φύσεως αὐτῶν. μονοκότυλον γὰρ ἀναγκαῖον εἶναι τὸ στενόν. οὐκ οὖν ὡς βέλτιστον ἔχουσιν, ἀλλ' ὡς ἀναγκαῖον, διὰ τὸν ἴδιον λόγον τῆς οὐσίας. πτερύγιον δ' ἔχουσι πάντα ταῦτα κύκλῳ περὶ τὸ κύτος. τοῦτο δ' ἐπὶ μὲν τῶν ἄλλων συναπτόμενον καὶ συνεχές ἐστι, καὶ ἐπὶ τῶν μεγάλων τευθῶν· αἱ δ' ἐλάττους καὶ καλούμεναι τευθίδες, πλατύτερόν τι τοῦτο ἔχουσι καὶ οὐ στενὸν, ὥσπερ αἱ σηπίαι καὶ οἱ πολύποδες· καὶ τοῦτ' ἀπὸ μέσου ἠργμένον, καὶ οὐ κύκλῳ διὰ παντός. τοῦτο δ' ἔχουσιν ὅπως νέωσι, καὶ εἰς τὸ διορθοῦν, ὥσπερ τοῖς μὲν πτηνοῖς τὸ ὀρροπύγιον, τοῖς δ' ἰχθύσι τὸ οὐραῖον. ἐλάχιστον δὲ τοῦτο καὶ ἥκιστα ἐπίδηλον τοῖς πολύποσίν ἐστι, διὰ τὸ μικρὸν ἔχειν τὸ κύτος, καὶ διορθοῦσθαι τοῖς ποσὶν ἱκανῶς. περὶ μὲν οὖν τῶν ἐντόμων, καὶ μαλακοστράκων, καὶ ὀστρακοδέρμων, καὶ μαλακίων, εἴρηται, καὶ περὶ τῶν ἐντὸς μορίων καὶ τῶν ἐκτός.

ΚΕΦΑΛ. ι.

Περὶ τῶν ἐκτὸς μορίων τῶν ζωοτόκων καὶ ἐναίμων, καὶ τῆς τούτων πρὸς ἄνθρωπον διαφορᾶς.

Πάλιν δ' ἐξ ὑπαρχῆς περὶ τῶν ἐναίμων καὶ ζωοτόκων ἐπισκεπτέον, ἀρξαμένοις ἀπὸ τῶν ὑπολοίπων καὶ πρότερον εἰρημένων μορίων. τούτων δὲ διορισθέντων, περὶ τῶν ἐναίμων καὶ ᾠοτόκων τὸν αὐτὸν τρόπον ἐροῦμεν. τὰ μὲν οὖν μόρια τὰ περὶ τὴν κεφαλὴν τῶν ζῴων, εἴρηται πρότερον, καὶ τὰ περὶ τὸν καλούμενον αὐχένα καὶ τράχηλον. ἔχει δὲ κεφαλὴν πάντα τὰ ἔναιμα ζῷα. τῶν δ' ἀναίμων ἐνίοις ἀδιόριστον τοῦτο τὸ μόριον, οἷον τοῖς καρκίνοις. αὐχένα οὖν τὰ μὲν ζωοτόκα πάντα ἔχει· τῶν δ' ᾠοτόκων, τὰ μὲν ἔχει, τὰ δ' οὐκ ἔχει. ὅσα μὲν γὰρ πνεύμονα ἔχει, καὶ αὐχένα ἔχει. τὰ δὲ μὴ ἀναπνέοντα θύραθεν, οὐκ ἔχει τοῦτο τὸ μόριον. ἔστι δὲ ἡ μὲν κεφαλὴ, μάλιστα τοῦ ἐγκεφάλου χάριν. ἀνάγκη γὰρ τοῦτο τὸ μόριον ἔχειν, τοῖς ἐναίμοις, καὶ ἐν ἀντικειμένῳ τόπῳ τῆς καρδίας, διὰ τὰς εἰρημένας πρότερον αἰτίας. ἐξέθετο δ' ἡ φύσις ἐν αὐτῇ καὶ τῶν αἰσθήσεων ἐνίας, διὰ τὸ σύμμετρον εἶναι τὴν τοῦ αἵματος κρᾶσιν, καὶ ἐπιτηδείαν πρός τε τὴν τοῦ ἐγκεφάλου ἀλέαν, καὶ πρὸς τὴν τῶν αἰσθήσεων ἡσυχίαν καὶ ἀκρίβειαν. ἔτι δὲ τρίτον μόριον ὑπέθηκε, τὸ τὴν τῆς τροφῆς εἴσοδον δημιουργοῦν. ἐνταῦθα γὰρ ὑπέκειτο συμμέτρως μάλιστα. οὔτε γὰρ ἄνωθεν κεῖσθαι τῆς καρδίας καὶ τῆς ἀρχῆς ἐνεδέχετο τὴν κοιλίαν, οὔτε κάτω οὔσης ὃν τρόπον ἐνεδέχετο, τὴν εἴσοδον ἐπὶ κάτω εἶναι τῆς καρδίας. πολὺ γὰρ τὸ μῆκος ἦν τοῦ σώματος, καὶ πόρρω ἂν τῆς κινούσης ἀρχῆς καὶ πεττούσης. ἡ μὲν οὖν κεφαλὴ, τούτων χάριν ἐστίν· ὁ δ' αὐχὴν, τῆς ἀρτηρίας χάριν. πρόβλημα γάρ ἐστι, καὶ σώζει ταύτην καὶ τὸν οἰσοφάγον, κύκλῳ περιέχων.

A Ita enim fibris implexa ſunt, quibus caruncula ſ cæteráque cedentia trahant: quippe quæ laxa prehendant, intenta premant, & retineant, cùm pars interior tota contingat, atque amplectatur. Itaque cùm aliud non habeant, quo capere admouereque poſſint, niſi aut pedes, aut promuſcides, hæc pro manibus obtinent ad vim tum inferendam tum propulſandam, atque etiam ad cætera vitæ munera neceſſaria. Sed cùm cætera omnia geminis acetabulis ſeriem à capite in extremos vſque cirros habeant ordinatam, genus vnum polypi quoddam ſimplici inſpergitur acetabulo: cuius rei cauſa ad longitudinem tenuitatémque brachij referenda eſt. Cùm enim anguſtum ſit, B ſimplicis acetabuli ordinem tantùm capiat neceſſe eſt. Non igitur ita conſtant, quia id optimum, ſed quia neceſſe ſit propria ſubſtantiæ ratione. Pinnulam hæc omnia habent circumdantem alueum. Quæ cùm in cæteris tum in grandium lolliginum genere iuncta perpetuáque geſtatur. Minores verò, quas lolligines vocant, latiorem hanc habent, nec anguſtam, vt polypi & ſepiæ, neque circumactam per totum alueum, ſed de medio orſam. Cauſa cur eam habeant, eſt, vt natent, & ſe dirigant, vt volucres cauda pennis condita, piſces penè cartilaginata teguntur. Polypis hoc minimum eſt, miniméque conſpicuum, quoniam paruum habeant alueum, quem ſatis C ſuis pedibus dirigere poſſint. Atque de inſectis, de teſtatis, de mollibus dictum iam eſt, tam de interioribus quàm de exterioribus partibus.

CAPVT X.

De exterioribus animantium viuiparorum ſanguinéque præditorum partibus, & eorum cum homine in ijs differentia.

De genere ſanguineo viuiparo denuo diſſerendum eſt, initio repetito à reliquis partium earum quæ antè expoſitæ ſunt: quas vbi definierimus, continuò de ſanguineis ouiparis pari modo dicemus. Partes, quibus caput animalium conſtat, & ceruix, & collum, explicatæ iam ſunt. Habent autem caput animalia omnia ſanguine D prædita. Exanguium nonnullis indiſcretum hoc eſt, vt cancris. Collum omnibus viuiparis eſt: ouiparorum aliis eſt, aliis deeſt. Quæ enim pulmonem habent, collum etiam obtinent: quæ autem ſpiritum extrinſecus non accipiunt, carent hac parte. Caput cerebri gratia potiſſimùm eſt: hanc enim partem genus omne ſanguineum habeat neceſſe eſt. Et quidem loco obiecto cordi, ob eas, quas expoſuimus, cauſas. Sed natura ſenſuum etiam nonnullos in eo collocauit, quoniam ſanguis eius membri temperatus modicè ſit, & idoneus tum ad cerebrum tepefaciendum, tum ad ſenſuum tranquillitatem, atque integritatem. Tertiam item partem ſubiecit eam, quæ aditum E cibo præberet: hîc enim commodè collocaretur: quippe cùm neque ſupra cor, & vitale principium, venter conſtitui poſſet: neque ſi inferiùs, quàm nunc eſt, poneretur, fieri poſſet vt æquè aditus cibo patêret: corporis enim prolixior longitudo faceret, vt longè à principio mouendi & concoquendi diſtaret. Sed enim caput ea cauſa conditum eſt. Collum autem arteriæ gratia habetur: quippe quod eam atque etiam gulam protegat, amplexúque ſuo tueatur.

Hoc

Hoc cæteris animalibus flexibile, & vertebris compactum eſt: at lupo & leoni oſſe perpetuo riget. Commodius enim ad robur quàm ad cæteros vſus collum iis eſſe natura voluit. A collo & capite crura priora pectúſque habentur: ſed homo vice pedum priorum, brachia, & quas manus dicimus, habet. Solus enim animalium omnium erectus eſt, quoniam eius natura atque ſubſtantia diuina eſt. Officium autem diuini eſt, intelligere, atque ſapere. Quod non facile eſſet, ſi vaſta corporis moles aſſideret: pondus enim tardiorem reddit & mentem, & ſenſum communem. Quamobrem, concretione, & pondere grauiore opprimente, corpora vergere in terram neceſſe eſt. Itaque natura tute conſulens, pro brachiis & manibus crura priora quadrupedibus ſubdidit: nam poſteriora bina omnibus greſſilibus eſſe, neceſſe eſt. Quorum igitur anima pondus ſuſtinere non poſſet, hæc quadrupeda facta ſunt. Animalia namque omnia, excepto homine, formam gerunt pomilionis. Eſt enim pomilio, cuius pars ſuperior magna eſt, inferior, quæ ſuſtinet pondus, motúmque exercet, parua miniméque reſpondens ſuperiori. Superiorem intelligi eam volo, quæ à capite vſque ad excrementi oſtium pertendit, qua pectus etiam continetur. Hominibus igitur hæc pars modicè ad inferiorem condita eſt, multóque minor adultis iam perfectíſque euadit. Infantibus enim è diuerſo eſt: ſuperior magna, inferior minor eſt. Quamobrem ſerpunt infantes, nec ambulare poſſunt: iam principiò, ne ſerpere quidem poſſunt, ſed immobiles iacent. Omnes enim infantes pomiliones ſunt: tum profectu ætatis, hominibus pars inferior augetur. Quadrupedibus contrà, inferior primum maxima eſt, tum proceſſu temporis ſuperior creſcit, quæ ſcilicet ea eſt, quæ ab ano ad caput porrecta eſt. Vnde fit vt pulli equini paulò ſuis parentibus ſint ſummiſſiores, atque adulti crure poſteriore caput attingere nequeunt, quod nouelli facilè attingunt. Solipeda & biſulca ita ſe habent. Digitata autem, cornúque vacua, forma quidem & ipſa pomilionis ſunt, ſed minùs. Quamobrem pars eorum inferior ad ſuperiorem defectus ratione incrementum capeſſit. Auium etiam & piſcium genus, omnéque ſanguine præditum, forma pomilionis eſt, vt dixi. Quamobrem bruta hominibus ſunt dementiora: etenim inter homines pueri viris, & inter viros pomiliones mente deficiunt, quanquam aliis viribus fortè valeant. Cuius rei cauſa, quam diximus, eſt, quòd principium animi admodum difficile motu, corpulentúmque in iis eſt. Addo etiam, quòd cùm minus remaneat caloris, qui efferat, plus autem terrenæ portionis ſuperſit, efficitur vt corpus animalis tum minus tum etiam multipes formetur, demúmque expes proſtratúmque in terram præ inopia caloris proueniat, ſenſimque procedendo ita degeneret, vt principium vitale, capútque infrà habeat: ad poſtremum immobile fit, & ſenſu vacuum, plantáque eſt, vice mutata, vt ſuperiora infrà, inferiora ſuprà habeat. Radix enim plantarum, vim obtinet oris, & capitis: ſemen contrà, ſupra, extremíſque ramis conſiſtit. Sed quam ob cauſam animalium aliud bipes, aliud multipes, aliud omnino expes: & cur alia plantæ, alia animantes conſtiterint, explicatum iam eſt:

A τοῖς μὲν οὖν ἄλλοις ἐστὶ καμπτὸς καὶ σπονδύλους ἔχει· οἱ δὲ λύκοι καὶ λέοντες, μονόστουν τὸν αὐχένα ἔχουσιν. ἔβλεψε γὰρ ἡ φύσις, ὅπως πρὸς τὴν ἰσχὺν χρήσιμον αὐτὸν ἔχωσι μᾶλλον ἢ πρὸς τὰς ἄλλας βοηθείας. ἐχόμενα δὲ τοῦ αὐχένος καὶ τῆς κεφαλῆς τά τε πρόσθια κῶλα τοῖς ζῴοις ἐστὶ, καὶ θώραξ. ὁ μὲν οὖν ἄνθρωπος ἀντὶ ποδῶν τῶν προσθίων, βραχίονας καὶ τὰς καλουμένας ἔχει χεῖρας. ὀρθὸν μὲν γάρ ἐστι μόνον τῶν ζῴων, διὰ τὸ τὴν φύσιν αὐτοῦ καὶ τὴν οὐσίαν εἶναι θείαν. ἔργον δὲ τοῦ θειοτάτου, τὸ νοεῖν καὶ φρονεῖν. τοῦτο δ' οὐ ῥᾴδιον πολλοῦ τοῦ ἄνωθεν ἐπικειμένου σώματος. τὸ γὰρ βάρος, δυσκίνητον ποιεῖ τὴν διάνοιαν καὶ τὴν κοινὴν αἴσθη- B σιν. διὸ πλείονος γινομένου τοῦ βάρους καὶ τοῦ σωματώδους, ἀνάγκη ῥέπειν τὰ σώματα πρὸς τὴν γῆν ὥστε πρὸς τὴν ἀσφάλειαν, ἀντὶ βραχιόνων καὶ χειρῶν, τοὺς προσθίους πόδας ὑπέθηκεν ἡ φύσις τοῖς τετράποσι. τοὺς μὲν γὰρ ὀπισθίους δύο, πᾶσιν ἀναγκαῖον τοῖς πορευτικοῖς ἔχειν. τὰ δὲ τοιαῦτα τετράποδα ζῷα, διὰ τὴν αἰτίαν ἐγένετο, μὴ δυναμένης φέρειν τὸ βάρος τῆς ψυχῆς. πάντα γάρ ἐστι τὰ ζῷα νανώδη τἆλλα παρὰ τὸν ἄνθρωπον. νανῶδες γάρ ἐστιν, οὗ τὸ μὲν ἄνω μέγα, τὸ δὲ φέρον τὸ βάρος καὶ πεζεῦον, μικρόν. ἄνω δ' ἐστὶν ὁ καλούμενος θώραξ, ἀπὸ τῆς κεφαλῆς μέχρι τῆς ἐξόδου τοῦ περιττώματος. τοῖς μὲν οὖν ἀνθρώποις τοῦτο C πρὸς τὸ κάτω σύμμετρον, καὶ πολλῷ ἔλαττον ἐστὶ τελειουμένοις· νέοις δ' οὖσι, τοὐναντίον· τὰ μὲν ἄνω, μεγάλα· τὸ δὲ κάτω, μικρόν. διὸ καὶ ἕρπουσι· βαδίζειν δ' οὐ δύνανται. τὸ μὲν πρῶτον οὐδ' ἕρπουσιν, ἀλλ' ἀκινητίζουσι. νᾶνα γάρ εἰσι τὰ παιδία πάντα. προϊοῦσι δὲ, τοῖς μὲν ἀνθρώποις, αὔξεται τὰ κάτωθεν· τοῖς δὲ τετράποσι τοὐναντίον, τὰ κάτω μέγιστα τὸ πρῶτον, προϊόντα δ' αὔξεται ἐπὶ τὸ ἄνω. τοῦτο δ' ἐστὶ τὸ ἀπὸ τῆς ἕδρας ἐπὶ τὴν κεφαλὴν κύτος. διὸ καὶ ὑψηλοὶ οἱ πῶλοι τῶν ἵππων οὐδὲν, ἢ μικρὸν ἐλάττους εἰσί· καὶ νέοι μὲν ὄντες, θιγγάνουσι τῷ ὄπισθεν σκέλει τῆς κεφαλῆς, πρεσβύτεροι δ' ὄντες, οὐ δύνανται. τὰ μὲν οὖν μώνυχα καὶ δίχηλα τοῦτον ἔχει τὸν τρόπον. τὰ δὲ πολυδάκτυλα καὶ ἀκέρατα, νανώδη μέν εἰσιν, ἧττον δὲ τούτων. διὸ καὶ τὴν αὔξησιν D πρὸς τὰ ἄνω, τὰ κάτω ποιεῖται, κατὰ λόγον τῆς ἐλλείψεως. ἔστι δὲ καὶ τὸ τῶν ὀρνίθων καὶ τὸ τῶν ἰχθύων γένος, καὶ πᾶν τὸ ἔναιμον, ὥσπερ εἴρηται, νανῶδες. διὸ καὶ ἀφρονέστερα πάντα ζῷα τῶν ἀνθρώπων εἰσί. καὶ γὰρ καὶ αὐτῶν τῶν ἀνθρώπων, οἷον τὰ παιδία, πρὸς τοὺς ἄνδρας, καὶ αὐτῶν τῶν ἐν ἡλικίᾳ, οἱ νανώδεις τὴν φύσιν, ἐὰν καί τινα ἄλλην δύναμιν ἔχωσι περιττὴν, ἀλλὰ τῷ τὸν νοῦν ἔχειν ἐλλείπουσιν. αἴτιον δ', ὥσπερ εἴρηται πρότερον, ὅτι ἡ τῆς ψυχῆς ἀρχὴ, πολλοῖς δὴ δυσκίνητός ἐστι καὶ σωματώδης. ἔτι δ' ἐλάττονος γινομένης τῆς * αἰρούσης θερμότητος, καὶ τοῦ γεώδους E πλείονος, τά τε σώματα ἐλάττονα τῶν ζῴων εἰσὶ, καὶ πολύποδα· τέλος δὲ ἄποδα γίγνεται, καὶ τεταμένα πρὸς τὴν γῆν. μικρὸν δ' οὕτω προβαίνοντα, καὶ τὴν ἀρχὴν ἔχουσι κάτω, καὶ τὸ κατὰ τὴν κεφαλὴν μόριον τέλος ἀκίνητόν ἐστι, καὶ ἀναίσθητον· καὶ γίνεται φυτὸν, ἔχον τὰ μὲν ἄνω κάτω, τὰ δὲ κάτω ἄνω. αἱ γὰρ ῥίζαι τοῖς φυτοῖς στόματος καὶ κεφαλῆς ἔχουσι δύναμιν· τὸ δὲ σπέρμα, τοὐναντίον. ἄνω γὰρ καὶ ἐπ' ἄκροις γίνεται τοῖς πτόρθοις. δι' ἣν μὲν οὖν αἰτίαν, τὰ μὲν δίποδα, τὰ δὲ πολύποδα, τὰ δ' ἄποδα τῶν ζῴων εἰσί, καὶ διὰ τὴν αἰτίαν τὰ μὲν φυτὰ, τὰ δὲ ζῷα γέγονεν, εἴρηται·

* De inceſſu animalium cap. & De memoria & rem. in fine.

* γρ. ἐγειρούσης

καὶ διότι μόνον τῶν ζώων ὀρθόν ἐστιν ὁ ἄνθρωπος· ὀρθῷ δὲ ὄντι τὴν φύσιν, οὐδεμία χρεία σκελῶν τῶν προσθίων, ἀλλ' ἀντὶ τούτων βραχίονας καὶ χεῖρας ἀποδέδωκεν ἡ φύσις. Ἀναξαγόρας μὲν οὖν φησι, διὰ τὸ χεῖρας ἔχειν, φρονιμώτατον εἶναι τῶν ζώων τὸν ἄνθρωπον. εὔλογον δὲ, διὰ τὸ φρονιμώτατον εἶναι τῶν ζώων, χεῖρας ἔχειν. τοῦ λαμβάνειν γὰρ χεῖρες ὀργανόν εἰσιν. ἡ δὲ φύσις ἀεὶ διανέμει, καθάπερ ἄνθρωπος φρόνιμος, τῷ δυναμένῳ χρῆσθαι ἕκαστον. προσήκει γὰρ τῷ ὄντι αὐλητῇ δοῦναι μᾶλλον αὐλοὺς, ἢ τῷ αὐλοὺς ἔχοντι προσθεῖναι αὐλητικήν. τῷ γὰρ μείζονι καὶ κυριωτάτῳ προσέθηκε τοὔλαττον, ἀλλ' οὐ τῷ ἐλάττονι τὸ τιμιώτερον καὶ μεῖζον. εἰ οὖν οὕτως βέλτιον, ἡ δὲ φύσις ἐκ τῶν ἐνδεχομένων ποιεῖ τὸ βέλτιον, οὐ διὰ τὰς χεῖρας ἐστὶν ὁ ἄνθρωπος φρονιμώτατος, ἀλλὰ διὰ τὸ φρονιμώτατον εἶναι τῶν ζώων, ἔχει χεῖρας. ὁ γὰρ φρονιμώτατος πλείστοις ἂν ὀργάνοις ἐχρήσατο καλῶς· ἡ δὲ χεὶρ ἔοικεν εἶναι οὐχ ἓν ὄργανον, ἀλλὰ πολλά. ἔστι γὰρ ὡσπερεὶ ὄργανον πρὸ ὀργάνων. τῷ οὖν πλείστας δυναμένῳ δέξασθαι τέχνας, τὸ ἐπὶ πλεῖστα τῶν ὀργάνων χρήσιμον τὴν χεῖρα ἀποδέδωκεν ἡ φύσις. ἀλλ' οἱ λέγοντες, ὡς συνέστηκεν οὐ καλῶς ὁ ἄνθρωπος, ἀλλὰ χείριστα τῶν ζώων, (ἀνυπόδητόν τε γὰρ αὐτὸν εἶναί φασι καὶ γυμνὸν, καὶ οὐκ ἔχοντα ὅπλον πρὸς τὴν ἀλκὴν) οὐκ ὀρθῶς λέγουσι. τὰ μὲν γὰρ ἄλλα μίαν ἔχουσι βοήθειαν, καὶ μεταβάλλεσθαι ἀντὶ ταύτης ἑτέραν οὐκ ἔστιν· ἀλλ' ἀναγκαῖον ὥσπερ ὑποδεδεμένον ἀεὶ συγκαθεύδειν, καὶ πάντα πράττειν, καὶ τὴν περὶ τὸ σῶμα ἀλεώραν μηδέποτε καταθέσθαι, μηδὲ μεταβάλλεσθαι, εἰ δὴ ἐτύγχανεν ἓν ὅπλον ἔχον. τῷ δὲ ἀνθρώπῳ τάς τε βοηθείας πολλὰς ἔχειν, καὶ ταύτας ἀεὶ ἔξεστι μεταβάλλειν· ἔτι δὲ ὅπλον οἷον ἂν βούληται, καὶ ὅπου ἂν βούληται ἔχειν. ἡ γὰρ χεὶρ, καὶ ὄνυξ, καὶ χηλὴ, καὶ κέρας γίνεται, καὶ δόρυ, καὶ ξίφος, καὶ ἄλλο ὁποιονοῦν ὅπλον καὶ ὄργανον. πάντα γὰρ ἔσται ταῦτα, διὰ τὸ πάντα δύνασθαι λαμβάνειν ταύτην. ᾗ δὲ* μεμηχάνηται καὶ τὸ εἶδος, καὶ τὴν φύσιν τῆς χειρός. διαιρετὴ γὰρ καὶ πολυσχιδής. ἔνι γὰρ ἐν τῷ διαιρετὴν εἶναι, καὶ συνθετὴν εἶναι· ἐν τούτῳ δὲ ἐκεῖνο οὐκ ἔνεστι· καὶ χρῆσθαι ἑνὶ καὶ δυοῖν, καὶ πολλαχῶς ἐστι. καὶ αἱ μὲν καμπαὶ τῶν δακτύλων καλῶς ἔχουσι, πρὸς τὰς λήψεις καὶ ἐκπιέσεις· καὶ ὁ ἐκ πλαγίου εἷς, καὶ οὗτος βραχὺς καὶ παχὺς, ἀλλ' οὐ μακρός. ὥσπερ γὰρ εἰ μὴ ἦν χεὶρ, ὅλως, οὐκ ἂν ἦν λῆψις· οὕτως κἂν εἰ μὴ ἐκ πλαγίου οὗτος ἦν. οὗτος γὰρ κάτωθεν ἄνω πιέζει, ὅπερ οἱ ἕτεροι ἄνωθεν κάτω. δεῖ δὲ τοῦτο συμβαίνειν, εἰ μέλλει ἕξειν, ὥσπερ σύναμμα ἰσχυρῶς συνδεῖν, ἵνα ἰσάζῃ εἷς ὢν πολλοῖς, καὶ βραχὺς, διά τε τὴν ἰσχὺν, καὶ διότι οὐδὲν ὄφελος εἰ μακρός. καὶ ὁ ἔσχατος δὲ μικρὸς ὀρθῶς, καὶ ὁ μέσος μακρὸς, ὥσπερ κώπη μέσον νεώς. μάλιστα γὰρ τὸ λαμβανόμενον ἀνάγκη περιλαμβάνεσθαι κύκλῳ κατὰ * τὸ μέσον, πρὸς τὰς ἐργασίας. καὶ διὰ τοῦτο καλεῖται μέγας, μικρὸς ὢν, ὅτι ἄχρηστοι (ὡς εἰπεῖν) ἄνευ τούτου. εὖ δὲ καὶ τὸ τῶν ὀνύχων μεμηχάνηται. τὰ μὲν γὰρ ἄλλα ζῶα ἔχει καὶ πρὸς χρῆσιν αὐτούς· τοῖς δ' ἀνθρώποις, ἐπικαλυπτήριον. σκέπασμα γὰρ τῶν ἀκρωτηρίων εἰσίν.

* γρ. μεμηχανῆσθαι

* G. τὸ μέσον,

A atque etiam qua de cauſa homo animalium vnus erectus eſt, vtque erectus ſuapte natura, non deſiderat crura priora, ſed pro iis brachia & manus à Natura recepit. Anaxagoras igitur hominem prudentiſſimum omnium animalium eſſe ait, quoniam vnus omnium manus obtinet. Sed recta ratio exigit, vt quoniam prudentiſſimus omnium eſt, ideo manus receperit. Manus enim inſtrumentum ſunt. Natura autem, vt homo prudens, ita tribuere ſolet cuique rem qua vti poſſit. Rectius enim tibia dabitur perito tibiæ, quàm tibiam habenti peritia tibiæ addetur. rem enim minorem maiori potiorique Natura addidit, non maiorem nobiliorémque minori. Quod B ſi ita melius eſt, natura autem ex iis quæ fieri poſſunt, facere ſolet quod melius ſit, homo non propter manus prudentiſſimus eſt: ſed quia prudentiſſimus omnium animalium eſt, ideo manus obtinet. Qui enim prudentiſſimus eſt, recte plurimis vti inſtrumentis poteſt. Manus autem eſſe videtur, non vnum inſtrumentum, ſed multa. Eſt enim, vt ita loquar, inſtrumentum ante inſtrumenta. Natura igitur ei qui artes plurimas recipere poteſt, manum reddidit, quæ ad plura inſtrumenta vtilis eſt. Qui autem hominem non bene ſed deterrimè omnium animalium conſtare aiunt (nudum enim atque inermem creatum referunt) non rectè ij ſentiunt. Cæ-C tera enim animalia vnum auxilium habent, idque nullo pacto poſſunt permutare, ſed quaſi calceata ſemper dormire, ac omnia agere, nec veſtitum vnquam deponere pleniorem, neque arma mutare, quæ ſemel acceperint, neceſſe eſt: at homini multa habere auxilia licet, eáque ſubinde mutare. arma etiam quæ velit, & vbi velit, capere poteſt. Manus enim & vnguis eſt, & vngula, & cornu, & haſta, & enſis, & quoduis aliud genus armorum, aut *inſtrumentorum*: quippe quæ omnia hæc ſit, quoniam omnia & ſumere poteſt, & tenere. Cui manus, naturæ forma etiam adhibita eſt congrua: diuiſa enim, & multifida eſt. Nam in eius diuiſione, componen-D di facultas eſt: in compoſitione vis diuidendi eſſe non poſſet. Vti etiam eadem modò ſimplici, modò duplici, & omnino multifariàm licet. Quin & flexus digitorum, ad capiendum premendúmque commodiſſimè habent. Vnus à latere adiunctus eſt digitus, iſque breuis, & craſſus, ſed non longus. Vt enim ſi manus omnino deeſſet, poteſtas capiendi non fieret, ſic niſi digitus hic à latere adeſſet, non eadem illa facultas probè daretur. Hic enim à parte inferiori surſum premit, vt cæteri à ſuperiore deorſum: quod fieri ita oportet, ſi validè quaſi copula forti colligandum ſit. Pollet hic plurimùm, vt vnus multos æquiparet. Breuis etiam eſt, vt robuſtus ſit, & quo-E niam nullam præſtaret commoditatem, ſi longus eſſet. Rectè etiam nouiſſimus digitus paruus eſt, & medius longus, tanquam remus nauigij medius. Quod enim officio capitur, circum per medium digitum complecti potiſſimùm neceſſe eſt. Sed enim pollex, & magnus, qui à latere iunctus eſt, ideo appellatur, quamuis paruus ſit, quia cæteri ſine eo inutiles ferè ſunt. Vngues etiam rectè Natura molita eſt: *quippe quæ* cæteris animalibus eos vel ad vſum alium dederit, homini operimenti tantum gratia excogitarit: digitos enim extremos integunt, & tuentur.

Flexus brachiorum homini tum ad cibum admouendum, tum ad cæteros vſus, contrà quàm quadrupedum generi, aguntur: illis namque introrſus poplites flecti neceſſe eſt, vt ad greſſum vtiles ſint. Vſum enim pedum præſtant artus priores. Quanquam illius etiam generis ea quæ digitata ſunt, non modò ad greſſum vtuntur prioribus cruribus, verumetiam ad manus officia vti nituntur: quippe quæ & capiant prioribus cruribus, & repugnent: quod ſolipedes poſterioribus faciunt. Non enim crura eorum priora, cubitis manibúſque proportione reſpondent, vt nonnullorum ex iis quorum pedes in digitos finduntur. Ob id pedes priores quinis diſtinctos digitis habent, poſteriores quaternis: vt leones, & canes, atque etiam lupi, & pantheræ: quintus enim eorum quinto magnóque manus reſpondet. Sed quæ parua inter digitata ſunt, poſteriores etiam quinque digitos obtinent, quoniam ſerpere ſolent, ſcilicet vt vnguibus numeroſioribus apprehendendo faciliùs obrepãt ad ſublimiora. Pectus inter lacertos homini conſtitutum eſt, cæteris inter crura priora. Latum id eſſe in homine ratione permittitur, cùm nihil lacerti adiuncti lateribus impediant: at quadrupedibus, quòd ante ſe crura, cùm ambulant, locúmque mutant, protendunt, pars hæc coarctata eſt. Vnde fit, ne quadrupedes eo loco habeant mammas. Nam homini, quòd & ſpatij laxitas permittit, & carnoſa ea pars eſt, cùm operiri ſedem cordis conueniat, mammæ pectori aſformatæ ſunt carnulentæ: maribus quidem ob eam, quam diximus, cauſam: ſed fœminis ad alterum quoque opus natura mammis abvtitur, quod eam ſæpe facere dicimus. Cibum enim in iis recondit ſuis paruulis. Binæ homini mammæ, quoniam binæ ſunt partes, dextra & ſiniſtra, duriuſculæ, ſpatio interpoſito diſterminantur: quòd & coſtæ eodem loco ſibi coeant, ſine vlla moleſtia. Cæteris animalibus mammæ in pectore haberi inter crura non poſſunt: ita enim greſſum impedirent. Pluribus autem locis aliis habentur ſine vllo impedimento. Quibus enim ſolida vngula, aut cornua, & partus numero parciori, hæc mammas inter femora habent, eáſque binas: quæ autem numeroſo partu, & pede multifido ſunt, hæc aut plures per ventrem duplici ordine vtroque de latere gerunt, vt ſues, vt canes: aut binas tantùm medio ventre, vt leo. Cuius rei cauſa eſt, non quia parciſſimè generat, (nam plures quàm duos interdum edit) ſed quòd minùs lacte abundat. Cibum enim, quem rarò aſſumit, quoniam carniuorum eſt, in corpus abſumit. Elephas duas tantùm habet, eáſque ſub armis. Cauſa cur duas habeat, quòd vniprolis eſt. Cur non inter femora? quòd multifidum eſt. Nullum enim inter femora habet, cui pedes diſcreti in digitos ſunt. Cur ſuprà ſub armis? quòd in iis quæ plures obtinent mammas & primæ ſunt, & plurimum lactis hauriunt, quæ ea parte continentur. Argumento eſt, quod ſcrofæ facere aſſolent: porcis enim editis primis, mammas præbent primas. Ergo cui vnum eſt, quod primum in lucem prodit, id primas habeat mammas neceſſe eſt. Primæ autem, quæ ſub armis habẽtur.

A αἱ δὲ καμπαὶ τῶν βραχιόνων ἔχουσι πρός τε τὴν τῆς τροφῆς προσαγωγήν, καὶ πρὸς ἄλλας χρήσεις ἐναντίως τοῖς τετράποσιν. ἐκείνοις γὰρ ἀναγκαῖον μὲν εἴσω κάμπτειν τὰ ἐμπρόσθια κῶλα· χρῶνται γὰρ ποσίν, ἵν᾽ ᾖ χρήσιμα πρὸς τὴν πορείαν· ἐπεὶ θέλει γε κἀκείνων τοῖς πολυδακτύλοις, οὐ μόνον πρὸς τὴν πορείαν χρήσιμα εἶναι τὰ ἔμπροσθεν σκέλη, ἀλλὰ καὶ ἀντὶ χειρῶν, ὥσπερ καὶ φαίνεται χρώμενα. καὶ γὰρ λαμβάνουσι καὶ ἀμύνονται τοῖς προσθίοις· τὰ δὲ μώνυχα, τοῖς ὀπισθίοις. οὐ γὰρ αὐτοῖς τὰ πρόσθια σκέλη ἀνάλογον τοῖς ἀγκῶσι καὶ ταῖς χερσί. τῶν δὲ πολυδακτύλων ἔνια, καὶ διὰ τοῦτο καὶ πενταδακτύλους ἔχει τοὺς B προσθίους πόδας, τοὺς δὲ ὄπισθεν τετραδακτύλους, οἷον λέοντες καὶ λύκοι· ἔτι δὲ κύνες καὶ πάρδαλις. ὁ γὰρ πέμπτος, ὥσπερ ὁ τῆς χειρὸς γίνεται πέμπτος μέγας. τὰ δὲ μικρὰ τῶν πολυδακτύλων, καὶ τοὺς ὀπισθίους ἔχει πενταδακτύλους, διὰ τὸ ἑρπυστικὰ εἶναι, ὅπως τοῖς ὄνυξι πλείοσιν οὖσιν ἀντιλαμβανόμενα, ῥᾷον ἀνέρπῃ πρὸς τὸ μετεωρότερον καὶ ὑπὲρ κεφαλῆς. μεταξὺ δὲ τῶν ἀγκώνων τοῖς ἀνθρώποις, τοῖς δ᾽ ἄλλοις τῶν ἐμπροσθίων σκελῶν, τὸ καλούμενον στῆθός ἐστι· τοῖς μὲν ἀνθρώποις ἔχον πλάτος εὐλόγως· οὐ γὰρ κωλύουσιν οἱ ἀγκῶνες ἐκ πλαγίου προσκείμενοι τοῦτον εἶναι τὸν τόπον πλατύν. τοῖς δὲ τετράποσι, διὰ C τὴν ἐμπρόσθιον τῶν σκελῶν ἔκτασιν, ἐν τῷ πορεύεσθαι καὶ μεταβάλλειν τὸν τόπον, στενὸν τοῦτ᾽ ἐστὶ τὸ μόριον. καὶ διὰ τοῦτο τὰ μὲν τετράποδα τῶν ζῴων, οὐκ ἔχει μαστοὺς ἐν τῷ τόπῳ τούτῳ· τοῖς δὲ ἀνθρώποις, διὰ τὴν εὐρυχωρίαν, καὶ τὸ * σκεπάζεσθαι τὰ περὶ τὴν καρδίαν, διὰ τοῦτο ὑπάρχοντος τοῦ τόπου σαρκώδους, οἱ μαστοὶ διήρθρωνται, σαρκώδεις ὄντες τοῖς μὲν ἄρρεσι, διὰ τὴν εἰρημένην αἰτίαν· ἐπὶ δὲ τῶν θηλειῶν παρακέχρηται καὶ πρὸς ἕτερον ἔργον ἡ φύσις, ὅπερ φαμὲν αὐτὴν πολλάκις ποιεῖν. ἀποτίθεται γὰρ ἐνταῦθα τὴν τοῖς γεννωμένοις τροφήν. δύο δ᾽ εἰσὶν οἱ μαστοί, διὰ τὸ δύο τὰ μόρια εἶναι, τό τ᾽ ἀριστερὸν καὶ τὸ δεξιόν. D καὶ σκληρότεροι μέν, διωρισμένοι δέ, διὰ τὸ καὶ τὰς πλευρὰς συνάπτεσθαι μὲν ἀλλήλαις κατὰ τὸν τόπον τοῦτον, μὴ ἐπίπονον δ᾽ εἶναι τὴν φύσιν αὐτῶν. τοῖς δ᾽ ἄλλοις ζῴοις ἐν μὲν τῷ στήθει μεταξὺ τῶν σκελῶν, ἀδύνατόν ἐστι μὴ ἔχειν τι χαλεπὸν τοὺς μαστούς. ἐμποδίζοιεν μὲν γὰρ ἂν πρὸς τὴν πορείαν. ἔχουσι δ᾽ ἤδη πολλοὺς τρόπους· τὰ μὲν γὰρ ὀλιγοτόκα καὶ μώνυχα, καὶ κερατοφόρα, ἐν τοῖς μηροῖς ἔχουσι τοὺς μαστούς, καὶ τούτους δύο· τὰ δὲ πολυτόκα καὶ πολυσχιδῆ, τὰ μέν, περὶ τὴν γαστέρα πλαγίους καὶ πολλούς, οἷον ὗς καὶ κύων· τὰ δέ, δύο μόνους. περὶ μέσην μέντοι γαστέρα, οἷον λέων. τούτου δ᾽ αἴτιον, οὐχ ὅτι E ὀλιγοτόκον (ἐπεὶ τίκτει ποτὲ πλείω δυοῖν) ἀλλ᾽ ὅτι οὐ πολυγάλακτον· ἀναλίσκει γὰρ εἰς τὸ σῶμα τὴν λαμβανομένην τροφήν. λαμβάνει δὲ σπάνιον, διὰ τὸ σαρκοφάγον εἶναι. ὁ δ᾽ ἐλέφας δύο μόνον ἔχει. τούτους δὲ ὑπὸ ταῖς μασχάλαις τῶν ἐμπροσθίων σκελῶν. αἴτιον δέ, τοῦ μὲν δύο ἔχειν, ὅτι μονοτόκον ἐστί· τοῦ δὲ μὴ ἐν τοῖς μηροῖς, ὅτι πολυσχιδές. οὐδὲν γὰρ ἔχει πολυσχιδὲς ἐν τοῖς μηροῖς. ἄνω δὲ πρὸς ταῖς μασχάλαις, ὅτι πρῶτοι οὗτοι τῶν μαστῶν, τοῖς πολλοὺς ἔχουσι μαστούς, καὶ ἱμῶνται γάλα πλεῖστον. σημεῖον δέ, τὸ ἐπὶ τῶν ὑῶν συμβαῖνον. τοῖς γὰρ πρώτοις γεννωμένοις τῶν χοίρων, τοὺς πρώτους παρέχουσι μαστούς. ᾧ οὖν τὸ πρῶτον γιγνόμενον ἓν μόνον ἐστί, τούτῳ τοὺς μαστοὺς ἀναγκαῖον ἔχειν τοὺς πρώτους. πρῶτοι δ᾽ εἰσὶν οἱ ὑπὸ τὰς μασχάλας.

* γρ. σκέπεσθαι

ὁ μὲν οὖν ἐλέφας διὰ ταύτην τὴν αἰτίαν δύο ἔχει, καὶ ἐν τούτῳ τῷ τόπῳ· τὰ δὲ πολυτόκα, περὶ τὴν γαστέρα. τούτου δ' αἴτιον, ὅτι πλειόνων δεῖ μαστῶν τοῖς πλείω μέλλουσιν ἐκτρέφειν. ἐπεὶ οὖν ἐπὶ πλάτος οὐχ οἷόν τε, ἀλλ' ἢ δύο μόνους ἔχειν, διὰ τὸ δύο εἶναι, τό τ' ἀριστερὸν, καὶ τὸ δεξιὸν, ἐπὶ μῆκος ἀναγκαῖον ἔχειν. ὁ δὲ μεταξὺ τόπος τῶν ἔμπροσθεν σκελῶν καὶ τῶν ὄπισθεν, ἔχει μῆκος μόνον. τὰ δὲ μὴ πολυσχιδῆ, ἀλλ' ὀλιγοτόκα καὶ κερατοφόρα, καὶ ἐν τοῖς μηροῖς ἔχει τοὺς μαστοὺς· οἷον ἵππος, ὄνος, κάμηλος. ταῦτα γὰρ μονοτόκα· καὶ τὰ μὲν, μώνυχα· τὸ δὲ, διχηλόν. ἔτι δ' ἔλαφος καὶ βοῦς, καὶ αἴξ, καὶ τἄλλα πάντα τὰ τοιαῦτα. αἴτιον δὲ, ὅτι τούτοις ἡ αὔξησις ἐπὶ τὸ ἄνω τοῦ σώματός ἐστιν. ὥστε ὅπου συλλογὴ καὶ * περιουσία γίνεται τοῦ περιττώματος καὶ αἵματος, (οὗτος δὲ ὁ τόπος ἐστὶν ὁ κάτω καὶ περὶ τὰς ὑστέρας) ἐνταῦθα ἐποίησεν ἡ φύσις τοὺς μαστούς. ὅπου γὰρ κίνησις γίνεται τῆς τροφῆς, ἐντεῦθεν καὶ λαβεῖν ἐστιν αὐτοῖς δυνατόν. ἄνθρωπος μὲν οὖν, καὶ ὁ θῆλυς καὶ ὁ ἄρρην, ἔχει μαστούς. ἐν δὲ τοῖς ἄλλοις ἔνια τῶν ἀρρένων οὐκ ἔχει· οἷον ἵπποι, οἱ μὲν οὐκ ἔχουσιν, οἱ δ' ἔχουσιν, ὅσοι ἐοίκασι τῇ μητρί. καὶ περὶ μὲν μαστῶν εἴρηται. μετὰ δὲ τὸ στῆθος, ὁ περὶ τὴν κοιλίαν ἐστὶ τόπος, ἀσύγκλειστος ταῖς πλευραῖς, διὰ τὴν εἰρημένην ἔμπροσθεν αἰτίαν, ὅπως μὴ ἐμποδίζωσι μήτε τὴν ἀνοίδησιν τῆς τροφῆς, (καὶ γὰρ ἀναγκαῖον συμβαίνει θερμαινομένης αὐτῆς) μήτε τὰς ὑστέρας τὰς περὶ τὴν κύησιν. τέλος δὲ τοῦ καλουμένου θώρακος, ἐστὶ τὰ μόρια τὰ περὶ τὴν τῆς περιττώσεως ἔξοδον, τῆς τε ξηρᾶς καὶ τῆς ὑγρᾶς. καταχρῆται δ' ἡ φύσις τῷ αὐτῷ μορίῳ, ἐπί τε τὴν τῆς ὑγρᾶς ἔξοδον περιττώσεως, καὶ περὶ τὴν ὀχείαν, ὁμοίως ἔν τε τοῖς θήλεσι καὶ τοῖς ἄρρεσιν (ἔξω τινῶν) πᾶσι τοῖς ἐναίμοις, ἐν δὲ τοῖς ζωοτόκοις πᾶσιν. αἴτιον δ', ὅτι ἡ γονὴ ὑγρόν ἐστί τι καὶ περίττωμα. τοῦτο δὲ νῦν μὲν ὑποκείσθω, * ὕστερον δὲ δειχθήσεται περὶ αὐτῶν. τὸν αὐτὸν δὴ τρόπον καὶ ἐν τοῖς θήλεσι, τά τε καταμήνια, καὶ ᾗ προΐενται τὴν γονήν. διορισθήσεται δὲ καὶ περὶ τούτων ὕστερον. νῦν δὲ ὑποκείσθω μόνον ὅτι περίττωμα ἐστὶ τὰ καταμήνια τοῖς θήλεσιν· ὑγρὰ δὲ τὴν φύσιν τὰ καταμήνια καὶ ἡ γονή. ὥστε τῶν αὐτῶν, καὶ τῶν ὁμοίων εἰς ταῦτα τὰ μόρια τὴν * ἔκκρισιν εἶναι, κατὰ λόγον ἐστίν. ἐντὸς δὲ πῶς ἔχει, καὶ πῇ διαφέρουσι τά τε περὶ τὸ σπέρμα, καὶ τὰ περὶ τὴν κύησιν, ἔκ τε τῆς ἱστορίας τῆς περὶ τὰ ζῷα φανερὸν, καὶ τῶν ἀνατομῶν, καὶ ὕστερον λεχθήσεται ἐν τοῖς περὶ γενέσεως. ὅτι δ' ἔχει καὶ τὰ σχήματα τῶν μορίων τούτων πρὸς τὴν ἐργασίαν ἀναγκαίως, οὐκ ἄδηλον. ἔχει δὲ διαφορὰν τὸ τῶν ἀρρένων ὄργανον κατὰ τὰς τοῦ σώματος διαφοράς. οὐ γὰρ ὁμοίως ἅπαντα νευρώδη τὴν φύσιν ἐστίν. ἔτι δὲ μόνον τοῦτο τῶν μορίων, ἄνευ νοσερᾶς μεταβολῆς αὔξησιν ἔχει καὶ ταπείνωσιν. τούτων γὰρ τὸ μὲν, χρήσιμον πρὸς τὸν συνδυασμόν· τὸ δὲ, πρὸς τὴν τοῦ ἄλλου σώματος χρείαν. ἀεὶ γὰρ ὁμοίως ἔχοντα ἐμποδίζοι ἄν. συνέστηκε δὲ τὴν φύσιν ἐκ τοιούτων τὸ μόριον τοῦτο, ὥστε δύνασθαι ταῦτα ἀμφότερα συμβαίνειν. τὸ μὲν γὰρ ἔχει νευρῶδες· τὸ δὲ, χονδρῶδες. διόπερ συνιέναι τε δύναται, καὶ ἔκτασιν ἔχειν, καὶ πνεύματός ἐστι δεκτικόν. τὰ μὲν οὖν θήλεα τῶν τετραπόδων, πάντα ἐστὶν ὀπισθουρητικὰ, διὰ τὸ πρὸς τὴν ὀχείαν οὕτως εἶναι αὐτοῖς χρησίμην τὴν θέσιν.

* γ. περιουσία

* De generat. anim. lib. 1. c. 18. & 19.

* Fort. ἴσχρισιν, vide Hist. 7. 2.

A Elephas hac de cauſa duas, eóque loco, mammas habet. Quæ autem multiprola ſunt, hæc toto ventre exuberant. Cuius rei cauſa eſt, quòd ea quæ prolem numeroſiorem educatura ſint, mammas deſiderant numeroſiores: quas cùm per latitudinem non niſi duas habere poſſint, videlicet ratione bipartiti corporis, in dextrum ſiniſtrúmque per longitudinem habeant, neceſſe eſt. Locus autem vnus, qui inter priora & poſteriora crura interiacet, porrectus per longitudinem eſt. Quæ autem non multifida, ſed deprola ſunt, aut cornuta, hæc inter femora mammas habent: vt equa, aſina, camelus. Hæc enim ſingulos pariunt.
B Et pes equo, & aſino ſolidus, camelo biſulcus. Ceruа etiam, capra, vacca, & reliqua generis eiuſdem mammas parte eadem gerunt. Cuius rei cauſa eſt, quòd hæc ſurſum versùs capiant ſui corporis incrementa. Itaque vbi confluuium, & copia excrementi ſanguinis, qui locus ſanè infrà eſt, & circa effluentis materiæ oſtia, ibi mammæ à natura poſitæ ſunt. Qua enim parte motus agitur alimenti, inde etiam capi alimentum poteſt. Sed enim homo, & fœmina, & mas habet mammas. In cæteris mares nonnulli carent, vt equi. Non enim omnes, ſed tantùm qui matri ſimiles prodiere, habent. De mammis dictum
C iam eſt. A pectore venter ſubiacet coſtis non cluſilis, ob eam, quam antè reddidimus, cauſam, ſcilicet ne aut cibi tumorem qui per calorem neceſſariò euenit, aut vteros plenos impediat. Finem autem thoracis appellati faciunt partes, quæ oſtium excrementi, tum ſicci tum humidi continent. Natura verò parte eadem, tum ad humidi excrementi exitum, tum ad rem Veneream vtitur in ſexu tum fœminino, tum etiam maſculino omni ſanguineo, (exceptis paucis) in omnique viuiparo genere, nullo excepto. Cuius rei cauſa eſt, quòd genitura humor quidam excrementitius eſt. Sed hoc ita eſſe nunc ſubiiciatur,
D pòſt demonſtrabitur. Fœminæ etiam pari modo menſtrua parte eadem emittunt: ſed de iis quoque poſtea definiemus. Nunc illud ſubiacet, menſtrua etiam fœminarum excrementum eſſe, & vacantem materiam. Humida autem ſuapte natura ſunt menſtrua, & genitura: itaque eorum profuſionem ſimilibus eiſdémque tribui partibus, ratio eſt. Intus autem quemadmodum ſe habeant, & qua differant ratione, ſemen genitale, & geſtatio vteri, ex animalium hiſtoria commentationéque apertum eſt: & cùm de generatione agemus, dicetur. Formas etiam harum partium tales neceſſariò ad officium propoſitum eſſe debere, quales iam ſunt, obſcurum non eſt. Sed
E maris inſtrumentum alterum ab altero differt pro diſcrimine corporum. Non enim æquè neruoſa natura omnia conſtant. Augetur etiam & minuitur hoc vnum membrum, ſine vlla morbi mutatione. Horum enim alterum vtile ad coitum, alterum ad cæteros corporis vſus commodum eſt. Nam ſi ſemper ſimili modo ſe haberet, impedimento nimirum eſſet. conſtat hoc membrum ex eiuſmodi partibus, vt eorum, quæ modò dixi, vtrumque poſſit euenire. Partim enim neruum, partim cartilaginem habet. Itaque & contrahi poteſt & extendi: atque etiam flatus capax eſt. Sed quadrupedes fœminæ omnes in auerſum mingunt: quippe quæ genitale non alibi commodius habere poſſint ad coitum.

Mares verò perpauci in auerſum mingũt: vt lynx, leo, camelus, lepus. Solipes nullum ſic mingit. Hominis partes poſteriores, & crura, peculiari modo præ quadrupedibus habentur. Caudam omnia ferè non ſolùm viuipara, ſed etiã ouipara habent. Nam etſi pleriſque magnitudine membrum id caret, tamen aliquid prominet, quod caudam deſcribere poſſit. Homo vnus cauda vacat, nates habet: quod nulli quadrupedum datum eſt. Crura etiam homini femore ſuráque carnulenta ſunt, cùm cætera animalia omnia non modò viuipara, verumetiam quæcunque cruribus conſtant, vacua carne hæc habeant: neruoſa enim, oſſulenta, ſpinoſa, rigida. Quorum cauſa vna eſt, propè dixerim, omnium, quòd homo ſolus animalium erectus eſt. Vt igitur facilè ſuſtinere ſuperiora poſſet, Natura corpulentiam parti ſuperiori dempſit, inferiori addidit. Itaque nates carnoſas fecit, & femora, & ſuras. ſed nates vel ad corporis requiem vtiles reddidit. Quadrupedes enim ſtare diu infatigatis viribus poſſunt, vt quæ quaſi iaceant, cùm quaternis fulcris innitantur. At verò homines non facilè erecto corpore ſtando durant, ſed requiem ſediléque deſiderant. Homo igitur nates & crura carnoſa habet, ob eam, quam diximus, cauſam: & cauda ob eam rem vacat. Alimentum enim, quod caudam adit, in hæc ipſa abſumitur. Vſúſque caudæ neceſſarius defuit, quoniam nates ſua corpulentia ſatis operiũt. At quadrupedes & reliqua animalia, è contrario. Cùm enim forma pomilionis degenerent, parte ſui ſuperiore pondus omnemque corpulentiam ſuſtinent, ſcilicet demptam parti inferiori: itaque crura habent rigidiora, & natibus vacua. Sed vt pars, quæ exitum excremento miniſtrat, protegeretur, & cuſtodiretur, caudam iis natura reddidit, ſublato, quod ad crura deferretur, alimento. Simia, quòd forma ambigua ſit, vt & in neutro, & in vtroque genere ſit conſtituenda, ideo nec caudam habet, neque nates: videlicet vt bipes, cauda vacat: vt quadrupes, natibus. Caudarum autem plures differentiæ ſunt: & natura iis quoque abvtitur, cùm non modo ad integendam tuendámque ſedem vtatur, verum etiam ad reliqui corporis vſum atque vtilitatem. Pedes quadrupedum inter ſe differunt: aliis enim ſolidi, aliis bifidi, aliis multifidi. Solidi ſunt eorum quibus præ corporis magnitudine, copiáque terrenæ portionis, pro cornu, aut dente, materia ad vnguis naturam ſeceſſerit. Sed enim ex ea copia pro pluribus vnguibus vnus vnguis, ſcilicet vngula, coaleſcit. Talo etiam ob eam rem carent (quod magna ex parte dixerim) atque etiam quòd ſi talus adeſſet, crura poſteriora difficiliùs flecterentur. Celeriùs enim & aperiuntur, & clauduntur, quæ ſingulis angulis conſtant, quàm quæ pluribus. Talus autem, vt qui clauus eſt, tanquam alienus artus duobus hiſce inſeritur, pondus quidem afferens, ſed gradum efficiens tutiorem. Hinc enim & ea quæ talum habent, non in prioribus ſed poſterioribus tantùm cruribus eum continent, quoniam leuiorà flexibilioráque eſſe debent, quæ præcedant: firmiora autem contentioráque eſſe poſteriora congruit. Ad repugnandum etiam inferendúmque ictum vehementiorem, commodiùs ita conſtant. Genus autem hoc animalium cruribus ita vti poſterioribus ſolet. Biſulca talum habere certum eſt: iis enim poſteriora ſunt planiora.

A τῶν δ᾽ ἀῤῥένων, ὀλίγα ἐστὶν ὀπισθουρητικὰ οἷον λύγξ, λέων, κάμηλος, δασύπους. μώνυχον δ᾽ οὐδὲν ὀπισθουρητικόν. τὰ δ᾽ ὄπισθεν καὶ τὰ περὶ τὰ σκέλη, διαφόρως ἀνθρώποις ἰδίως ἔχει πρὸς τὰ τετράποδα. κέρκον δ᾽ ἔχει σχεδὸν, οὐ μόνον πάντα τὰ ζωοτόκα, ἀλλὰ καὶ τὰ ᾠοτόκα. καὶ γὰρ ἂν μὴ μέγεθος αὐτοῖς ἔχον τοῦτο τὸ μόριον, ἀλλὰ σμικροῦ γ᾽ ἕνεκεν, ἔχουσι τινὰ στόλον. ὁ δ᾽ ἄνθρωπος ἄκερκον μέν ἐστιν, ἰσχία δ᾽ ἔχει, τῶν δὲ τετραπόδων οὐδέν. ἔτι δὲ τὰ σκέλη ὁ μὲν ἄνθρωπος σαρκώδη, καὶ μηροὺς καὶ κνήμας· τὰ δ᾽ ἄλλα πάντα, ἄσαρκα ἔχει, οὐ μόνον τὰ ζωοτόκα, ἀλλ᾽ ὅσα σκέλη ἔχει τῶν ζώων. νευρώδη B γὰρ ἔχει καὶ ὀστώδη, καὶ ἀκανθώδη. τούτων δ᾽ αἰτία μία τίς ἐστιν (ὡς εἰπεῖν) ἁπάντων, διότι μόνον ἐστὶν ὀρθὸν τῶν ζώων ἄνθρωπος. ἵν᾽ οὖν φέρῃ ῥᾳδίως τὰ ἄνω κοῦφα ὄντα, ἀφελοῦσα τὸ σωματῶδες ἀπὸ τῶν ἄνω, πρὸς τὰ κάτω τὸ βάρος ἡ φύσις προσέθηκε· διόπερ τὰ ἰσχία σαρκώδη ἐποίησε, καὶ μηροὺς καὶ γαστροκνημίας. ἅμα δὲ τήν τε τῶν ἰσχίων φύσιν καὶ πρὸς τὰς ἀναπαύσεις ἀπέδωκε χρησίμην. τοῖς μὲν γὰρ τετράποσιν ἐφ᾽ ἕνα τόπον ἄκοποι ἑστάναι, καὶ οὐ κάμνουσι τοῦτο ποιοῦντα συνεχῶς. ὥσπερ γὰρ κατακείμενα διατελεῖ, ὑποκειμένων τεττάρων ἐρεισμάτων. τοῖς δ᾽ ἀνθρώποις οὐ ῥᾴδιον ὀρθῶς ἑστῶσι διαμένειν, ἀλλὰ δεῖται τὸ σῶμα ἀναπαύσεως καὶ C καθέδρας. ὁ μὲν οὖν ἄνθρωπος ἰσχία τ᾽ ἔχει καὶ τὰ σκέλη σαρκώδη, διὰ τὴν εἰρημένην αἰτίαν. καὶ διὰ ταῦτα ἄκερκον. ἥ τε γὰρ ἐκεῖ τροφὴ πορευομένη, εἰς ταῦτα ἀναλίσκεται· καὶ διὰ τὸ ἔχειν ἰσχία, ἀφῄρηται ἡ τῆς οὐρᾶς ἀναγκαία χρῆσις. τὰ δὲ τετράποδα καὶ τἄλλα ζῷα, ἐξ ἐναντίας. νανώδη γὰρ ὄντα, (πρὸς τὸ ἄνω τὸ βάρος καὶ τὸ σωματῶδες ἐπίκειται) ἀφῃρημένον ἀπὸ τῶν κάτωθεν· διόπερ ἀνίσχια καὶ σκληρὰ τὰ σκέλη ἔχουσιν. ὅπως δὲ ἐν φυλακῇ καὶ σκέπῃ ᾖ τὸ λειτουργοῦν μόριον τὴν ἔξοδον τοῦ περιττώματος, τὴν καλουμένην οὐρὰν καὶ κέρκον αὐτοῖς ἀπέδωκεν ἡ φύσις, ἀφελομένη τῆς εἰς τὰ σκέλη τροφῆς. ὁ δὲ πίθηκος, διὰ τὴν μορφὴν ἐπαμφο- D τερίζειν, καὶ μηδετέρων τ᾽ εἶναι καὶ ἀμφοτέρων, διὰ τοῦτο οὔτε οὐρὰν ἔχει, οὔτε ἰσχία· ὡς μὲν δίπους ὤν, οὐράν· ὡς δὲ τετράπους, ἰσχία. τῶν δὲ καλουμένων κέρκων διαφοραί τ᾽ εἰσὶ, καὶ πλείοσιν ἡ φύσις καταχρῆται καὶ ἐπὶ τούτων, οὐ μόνον πρὸς φυλακὴν καὶ σκέπην τῆς ἕδρας, ἀλλὰ καὶ πρὸς ὠφέλειαν καὶ χρῆσιν τοῖς ἔχουσιν. οἱ δὲ πόδες τοῖς τετράποσι διαφέρουσι. τὰ μὲν γὰρ μώνυχα αὐτῶν ἐστὶ, τὰ δὲ δίχηλα, τὰ δὲ πολυσχιδῆ. μώνυχα μὲν οὖν, ὅσοις διὰ τὸ μέγεθος καὶ πολὺ γεῶδες ἔχειν, ἀντὶ κεράτων καὶ ὀδόντων, εἰς τὴν τοῦ ὄνυχος φύσιν τὸ τοιοῦτον μόριον ἔλαβε τὴν ἀπόκρισιν· καὶ διὰ πλῆθος, ἀντὶ πλειόνων ὀνύχων, εἷς ὄνυξ ὁπλή ἐστιν. καὶ ἀστράγαλον δὲ διὰ τοῦτο E οὐκ ἔχουσιν, ὡς ἐπὶ τὸ πολὺ εἰπεῖν· καὶ διὰ τὸ δυσκινητότερον εἶναι τὴν κάμψιν τοῦ ὄπισθεν σκέλους, ἀστραγάλου ὄντος. θᾶττον γὰρ ἀνοίγεται καὶ κλείεται τὰ μίαν ἔχοντα γωνίαν ἢ πλείους. ὁ δ᾽ ἀστράγαλος γόμφος ὤν, ὥσπερ ἀλλότριον κῶλον ἐμβέβληται τοῖς δυσὶ, βάρος μὲν παρέχον, ποιοῦν δὲ ἀσφαλεστέραν τὴν βάσιν. διὰ γὰρ τοῦτο καὶ ἐν τοῖς ἐμπροσθίοις οὐκ ἔχουσιν ἀστράγαλον, τὰ ἔχοντα ἀστράγαλον, ἀλλ᾽ ἐν τοῖς ὄπισθεν, ὅτι δεῖ ἐλαφρὰ εἶναι τὰ ἡγούμενα εὔκαμπτα· τὸ δ᾽ ἀσφαλὲς καὶ τὴν τάσιν, ἐν τοῖς ὄπισθεν. ἔτι δὲ πρὸς τὸ ἀμύνεσθαι, ἐμβριθεστέραν ποιεῖ τὴν πληγήν. τὰ δὲ τοιαῦτα, τοῖς ὄπισθεν χρῆται κώλοις, λακτίζοντα τὸ λυποῦν. τὰ δὲ δίχηλα ἔχει ἀστραγάλους (κουφότερα γὰρ τὰ ὄπισθεν)

καὶ διὰ τὸ ἔχειν ἀστράγαλον, καὶ οὐ μώνυχά ἐστιν, ὡς τὸ ἐκλεῖπον ὀστῶδες ἐκ τοῦ ποδὸς, ἐν τῇ καμπῇ μένον. τὰ δὲ πολυδάκτυλα, οὐκ ἔχει ἀστραγάλους. οὐ γὰρ ἂν ἦν πολυδάκτυλα, ἀλλὰ τοσοῦτον ἐσχίζετο τὸ πλάτος ὅσον ἐπεῖχεν ὁ ἀστράγαλος. διὸ καὶ τῶν ἐχόντων * αὐτόν, τὰ πλεῖω διχηλά. ὁ δ' ἄνθρωπος πόδας μεγίστους ἔχει τῶν ζῴων, ὡς κατὰ μέγεθος· εὐλόγως. μόνος γὰρ ἕστηκεν ὀρθός. ὥστε τοὺς μέλλοντας, δύ' ὄντας, ἕξειν πᾶν τὸ τοῦ σώματος βάρος, δεῖ μῆκος ἔχειν καὶ πλάτος. καὶ τὸ τῶν δακτύλων δὴ μέγεθος ἐναντίως ἔχει, ἐπί τε τῶν ποδῶν καὶ τῶν χειρῶν κατὰ λόγον. τῶν μὲν γὰρ, τὸ λαμβάνειν ἔργον, καὶ πιέζειν (ὥστε δεῖ μακροὺς ἔχειν· τῷ γὰρ καμπτομένῳ μέρει περιλαμβάνει ἡ χείρ) τῶν δὲ, τὸ βεβηκέναι ἀσφαλῶς. δεῖ δὲ τοῦτο τὸ μόριον εἶναι νομίζειν τὸ ἄσχιστον τοῦ ποδὸς τῶν δακτύλων. ἐσχίσθαι δὲ βέλτιον, ἢ ἄσχιστον εἶναι τὸ ἔσχατον. ἅπαν γὰρ ἂν συμπαθοίη τοῦ ἑνὸς μορίου πονήσαντος· * ἐσχισμένου δ' εἰς δακτύλους, τοῦτ' οὐ συμβαίνει ὁμοίως. ἔτι δὲ καὶ βραχεῖς ὄντες, ἧττον συμβλάπτοιντο. διὸ πολυσχιδεῖς οἱ πόδες τῶν ἀνθρώπων, οὐ μακροδάκτυλοι δ' εἰσί. τὸ δὲ τῶν ὀνύχων γένος, διὰ τὴν αὐτὴν αἰτίαν, ἥνπερ καὶ ἐπὶ τῶν χειρῶν ἔχουσι. δεῖ γὰρ σκέπεσθαι τὰ ἀκρωτήρια μάλιστα, διὰ τὴν ἀσθένειαν. περὶ μὲν οὖν τῶν ἐναίμων ζῴων, καὶ τετραπόδων, καὶ πεζῶν, εἴρηται περὶ πάντων.

* χ. αὐτῶν
* χ. ἐσχισμένων

ΚΕΦΑΛ. ιά.

Περὶ τῶν ἐκτὸς μορίων τῶν ἐναίμων ζῴων, τῶν τε ἀπόδων καὶ τῶν τετραπόδων.

Τῶν δ' ἐναίμων ζῴων, ᾠοτόκων δὲ, τὰ μέν ἐστι τετράποδα, τὰ δὲ ἄποδα. τοιοῦτον δ' ἓν μόνον γένος ἐστὶν ἄπουν, τὸ τῶν ὄφεων. ἡ δ' αἰτία τῆς ἀποδίας αὐτῶν, εἴρηται ἐν τοῖς * περὶ τῆς πορείας τῶν ζῴων διωρισμένοις. τὰ δ' ἄλλα παραπλησίαν ἔχει τὴν μορφὴν τοῖς τετράποσι καὶ ᾠοτόκοις. ἔχει δὲ τὰ ζῷα ταῦτα κεφαλὴν μὲν, καὶ τὰ ἐν αὐτῇ μόρια, διὰ τὰς αὐτὰς αἰτίας τοῖς ἄλλοις τοῖς ἐναίμοις ζῴοις· καὶ γλῶτταν ἐν τῷ στόματι πλὴν τοῦ ποταμίου κροκοδείλου. οὗτος δ' οὐκ ἂν δόξειεν ἔχειν, ἀλλὰ τὴν χώραν μόνην. αἴτιον δ', ὅτι τρόπον μέν τινα καὶ χερσαῖος καὶ ἔνυδρός ἐστι. διὰ μὲν οὖν τὸ χερσαῖος εἶναι, ἔχει χώραν γλώττης· διὰ δὲ τὸ ἔνυδρος, ἄγλωττος. οἱ γὰρ ἰχθύες, καθάπερ εἴρηται πρότερον, οἱ μὲν οὐ δοκοῦσιν ἔχειν, ἂν μὴ σφόδρα ἀνακλίνῃ τις· οἱ δὲ, ἀδιάρθρωτον ἔχουσιν. αἴτιον δ', ὅτι ὀλίγη τούτοις χρεία τῆς γλώττης, διὰ τὸ μὴ ἐνδέχεσθαι * μασᾶσθαι, μηδὲ προγεύεσθαι, ἀλλ' ἐν τῇ καταπόσει γίνεσθαι τὴν αἴσθησιν καὶ τὴν ἡδονὴν πᾶσι τούτοις τῆς τροφῆς. ἡ μὲν γὰρ γλῶττα τῶν χυμῶν ποιεῖται τὴν αἴσθησιν· τῶν δ' ἐδεστῶν ἐν τῇ καθόδῳ ἡ ἡδονή. καταπινομένων γὰρ αἰσθάνονται τῶν λιπαρῶν καὶ θερμῶν, καὶ τῶν ἄλλων τῶν τοιούτων. ἔχει μὲν οὖν καὶ τὰ ζῳοτόκα ταύτην τὴν αἴσθησιν· καὶ σχεδὸν τῶν πλείστων ὄψων καὶ ἐδεστῶν ἐν τῇ καταπόσει, τῇ τάσει τοῦ οἰσοφάγου γίνεται ἡ χάρις. διὸ οὐχ οἱ αὐτοὶ περὶ τὰ πόματα καὶ τοὺς χυμοὺς ἀκρατεῖς τέ εἰσι, καὶ τὰ ὄψα καὶ τὴν ἡδονήν· ἀλλὰ τοῖς μὲν ἄλλοις ζῴοις, καὶ ἡ κατὰ τὴν γεῦσιν ὑπάρχει αἴσθησις, ἐκείνοις δ' ὥσπερ ἡ ἑτέρα. τῶν δὲ τετραπόδων καὶ ᾠοτόκων οἱ σαῦροι, ὥσπερ οἱ ὄφεις,

* Cap. 8.
* χ. μασᾶσθαι,

A Et quoniam talum habeant, ſolipeda eſſe non poſſunt, quaſi os, quod pedi deeſt, maneat in ſuffragine. Digitatis talus non eſt. Nam ſi eſſet, digitata non eſſent: ſed tantum latitudinis finderetur, quantum talus occuparet. Quamobrem ea quæ talum habēt, magna ex parte biſulca ſunt. Homini pedes omnium maximi proportione magnitudinis, meritò: ſolus enim erectus eſt. Itaqui duo pondus corporis totum ſuſceptur eſſent, longitudinem latitudinemque obtinere debuerunt. Digitorum etiam manus magnitudo cōtra quàm pedis eſt, ratione. Manus enim officium eſt capere, atque premere. (Itaque longos habeat digitos oportet. Manus enim parte, qua ſe flectit, comprehendit.) B Pedis autem officium eſt, tutè conſtare. Quod ea parte pedis effici putandum eſt, quæ infiſſa eſt. Extremum autem fiſſum, quàm infiſſum eſſe, meliùs eſt. Nam ſi pes totus infiſſus eſſet, totus conſentiret, parte aliqua laborantē: quod fiſſo in digitos æquè accidere non poteſt. Breues etiam minùs offendi lædique poſſunt. Quamobrem hominis pedes multifidi & breuidigiti ſunt. Vnguium genus eadem cauſa pedes, qua manus, obtinent. Extrema enim operienda muniendáque potiſſimùm ſunt, propter imbecillitatem. De animalibus ſanguineis, viuiparis, terreſtribus ferè omnibus, dictum iam C eſt.

CAPVT XI.

De partibus animalium ouiparorum: tum quadrupedum, tum expedum: & quam ob cauſam ſic à natura digeſtæ ſint.

SAnguinea verò ouipara, partim quadrupeda ſunt, partim expeda, quale vnum tantummodo genus ſerpentum eſt. Cauſam, quamobrem id pedibus vacet, reddidimus, cùm de greſſu animalium ageremus. Cætera eius forma ſimili quadrupedibus ouiparis ſunt. Habent hæc animalia D caput, partéſque capitis eiſdem de cauſis, quibus cætera ſanguinea genera. Linguam etiam in ore continent omnia, excepto vno crocodilo fluuiatili. Hunc enim non niſi locum tantummodo linguæ habere putaueris. Cuius rei cauſa eſt, quòd idem & terreſtris & aquatilis quodam modo eſt. Ergo vt terreſtris, locum obtinet linguæ, vt aquaticus, elinguis eſt. Piſces enim, vt dictum eſt, aut nullam habere linguam videntur, niſi valde reſupinentur: aut inexplanatam habent. Cauſa eſt, quòd iis linguæ vſus perquam exiguus eſt: quoniam mandere præguſtaréque non poſſint, ſed in deuorando ſenſum voluptatémque cibi capiant. E Lingua enim ſenſum mouet ſaporum. Eſculentorum autem omnium voluptas in deſcendendo contingit. Dum enim deglutimus, pinguia ſentimus, & ſalſa, & dulcia, & reliqua generis eiuſdem. Senſum igitur hunc animalia etiam ouipara habent. Et omnium ferè condimentorum eſculentorúmque, in deuorando gulæ tactione ſuauitas exiſtit, & gratia. Quamobrem, non qui potionum ſaporúmque incontinentes ſunt, iidem etiam condimentis ac cibo luxuriant: ſed cùm cæteris animalibus ſenſus quoque guſtandi adiunctus ſit, illis quidem alter quaſi vnus tributus eſt. Lacertis ex quadrupedibus ouiparis lingua bifida, vt ſerpentibus:

parteque extrema piloſa admodum, vt dictum iam eſt. Quinetiam vitulis marinis lingua biſulca eſt. Quamobrem hæc animalia omnia tenuia ſunt. Serratis etiam dentibus quadrupedes ouiparæ ſunt, modo piſcium. Senſoria autem omnia ſimili modo atque cætera animalia habent. Verbi gratia, nares, olfaciendi; oculos, videndi; aures, audiendi ſenſorium. Non tamen hæc eminent, quomodo ne auibus quidem, ſed foramina tantùm habentur. Cauſa vtriſque duritia cutis eſt. Altera enim penna, altera cortice integuntur. Cortex loco ſquamæ, & ſimile eſt, ſed ſua natura rigidior atque durior. Quod in teſtudine atque ſerpentibus magnis, & crocodilo fluuiatili, palàm fit. Firmior enim oſſe euadit, vt qui talem naturam ſortiatur. Palpebram ſuperiorem hæc animalia non mouent, vt ne aues quidem, ſed inferiore conniuent: ea de cauſa, quam, cùm de illis ageremus, reddidimus. Sed cùm auium nonnullæ ab angulis membrana obeunte nictentur, hæc non nictantur: ſunt enim oculis durioribus, quàm aues. Cauſa eſt, quòd illis, vtpote volucribus, acumen cernendi commodius ad vitæ munera ſit. Hæc autem, quoniam cauernas ſubire omnia ſolent, minùs cernendi vſum exquiſitum requirunt. Sed cùm caput in partes duas diuidatur, ſcilicet ſuperiorem & inferiorem maxillam, homo & viuiparæ quadrupedes maxillam ſurſum, deorſum, atque in latera agitant: piſces verò, & aues, & ouiparæ quadrupedes ſurſum deorſúmque tantùm mouent. Cauſa eſt, quòd eiuſmodi motus vtilis ad mordendum ſecandúmque eſt. Qui autem in latus agitur, ad cibum molendum conficiendúmque accommodatur. Quæ igitur dentes habent maxillares, iis motus commodè agitur in latus. Quæ autem maxillaribus carent, *iis nullo pacto vtilis motus hic eſt*: quamobrem ſublatus iis omnibus eſt. Nihil enim natura ſuperuacuum facit. Cætera omnia maxillam mouent inferiorem: crocodilus fluuiatilis vnus ſuperiorem. Cuius rei cauſa eſt, quod pedes ad capiendum retinendúmque inutiles habet: parui enim admodum ſunt. Itaque ad hunc vſum natura os ei pro pedibus vtile condidit: ad retinendum verò, vnde ictus inferri vehementiùs poteſt, inde motus commodiùs agitur. Infertur autem vehementius deſuper, quam de parte inferiore. Ergo cùm vtriuſque tum capiendi tum mordendi vſus ore adminiſtretur, magis autem neceſſarium retinendi officium ſit, cui nec manus ſint, neque pedes idonei, commodius huic eſt mouere ſuperiorem maxillam, quàm inferiorem. Quod idem cauſæ eſt, cur etiam cancri ſuperiorem ſui forcipis partem moueant, non inferiorem: habet enim pro manu forcipem. Illum itaque vtilem ad capiendum, non ad mordendũ, forcipem eſſe oportet. Mordendi autem ſecandique officium dentis eſt. Cancris igitur, cæteriſque, quibus licet otioſis cibum capere, quoniam in humore non ſint, oris vſus partitus eſt, vt manibus aut pedibus capiant, ore ſecent, & mordeant: at crocodilis os in vtrumque vſum vtile factum eſt à natura, cùm ita maxillæ moueantur. Collum etiam omnia huiuſcemodi animalia obtinent propter pulmonem: quippe quæ aërem per arteriæ fiſtulam productiorem & accipiant & reddant. Collum enim id appellamus, quod inter caput, & armos humeróſve, interiacet. Serpens inter hæc collum minimè,

A μικρὰν δὲ δίκροαν ἔχουσι τὴν γλῶτταν, καὶ ἐπ' ἄκρου τριχώδη παμπόλυ, καθάπερ εἴρηται πρότερον. ἔχουσι δὲ καὶ αἱ φῶκαι δίκροαν τὴν γλῶτταν. διὸ καὶ ἰσχνὰ πάντα τὰ ζῷά ἐστι ταῦτα. ἔστι δὲ καὶ καρχαρόδοντα τὰ τετράποδα τῶν ᾠοτόκων, ὥσπερ οἱ ἰχθύες. τὰ δὲ αἰσθητήρια πάντα ὁμοίως ἔχουσι τοῖς ἄλλοις ζῴοις, οἷον τῆς ὀσφρήσεως μυκτῆρας, καὶ ὄψεως ὀφθαλμούς, καὶ ἀκοῆς ὦτα· πλὴν οὐκ ἐπανεστηκότα, καθάπερ οὐδ' οἱ ὄρνιθες, ἀλλὰ τὸν πόρον μόνον. αἴτιον δ' ἀμφοτέροις ἡ τοῦ δέρματος σκληρότης. τὰ μὲν γὰρ πτερωτά αὐτῶν ἐστι. ταῦτα δὲ πάντα φολιδωτά. ἔστι δὲ ἡ φολὶς

B ὅμοιον χώρᾳ λεπίδος, φύσει δὲ σκληρότερον. δηλοῖ δ' ἐπὶ τῶν χελωνῶν τοῦτο, καὶ ἐπὶ τῶν μεγάλων ὄφεων, καὶ ἐπὶ τῶν ποταμίων κροκοδείλων. ἰσχυρότεραι γὰρ γίνονται τῶν ὀστῶν, ὡς οὔσης τοιαύτης τὴν φύσιν. οὐκ ἔχουσι δὲ τὰ ζῷα ταῦτα τὴν ἄνω βλεφαρίδα, ὥσπερ οὐδὲ οἱ ὄρνιθες, ἀλλὰ τῇ κάτω μύουσι, διὰ τὴν αἰτίαν τὴν εἰρημένην ἐπ' ἐκείνων. τῶν μὲν οὖν ὀρνίθων ἔνιοι καὶ σκαρδαμύττουσιν ὑμένι ἐκ τοῦ κανθοῦ· ταῦτα δὲ τὰ ζῷα οὐ σκαρδαμύττει· σκληροφθαλμότερα γάρ ἐστι τῶν ὀρνίθων. αἴτιον δ', ὅτι ἐκείνοις χρησιμώτερα* ἡ ὀξυωπία πλείοσιν οὖσι πρὸς τὸν βίον, τούτοις

C δ' ἧττον. τρωγλοδυτικὰ γὰρ πάντα τὰ τοιαῦτά ἐστιν. εἰς δύο δὲ διῃρημένης τῆς κεφαλῆς, τοῦ τε ἄνω μορίου καὶ τῆς σιαγόνος τῆς κάτω, ἄνθρωπος μὲν καὶ τὰ ζῳοτόκα τῶν τετραπόδων καὶ ἄνω καὶ κάτω κινοῦσι τὰς σιαγόνας, καὶ εἰς τὸ πλάγιον· οἱ δ' ἰχθύες καὶ οἱ ὄρνιθες, καὶ τὰ ᾠοτόκα τῶν τετραπόδων εἰς τὸ ἄνω καὶ κάτω μόνον. αἴτιον δ', ὅτι ἡ μὲν τοιαύτη κίνησις χρήσιμος εἰς τὸ δακεῖν καὶ διελεῖν· ἡ δ', εἰς τὸ πλάγιον, ἐπὶ τὸ λεαίνειν. τοῖς μὲν οὖν ἔχουσι γομφίους, χρήσιμος ἡ εἰς τὸ πλάγιον κίνησις· τοῖς δὲ μὴ ἔχουσιν, οὐδὲν χρήσιμος. διόπερ ἀφῄρηται πάντων τῶν τοιούτων. οὐδὲν γὰρ ποιεῖ περίεργον ἡ φύσις. τὰ μὲν οὖν ἄλλα πάντα κινεῖ

D τὴν σιαγόνα τὴν κάτω· ὁ δὲ ποτάμιος κροκόδειλος μόνος τὴν ἄνω. τούτου δ' αἴτιον, ὅτι πρὸς τὸ λαβεῖν καὶ κατασχεῖν ἀχρήστους ἔχει τοὺς πόδας. μικροὶ γάρ εἰσι παμπόλυ. πρὸς οὖν ταύτας τὰς χρείας ἀντὶ ποδῶν ἡ φύσις τὸ στόμα χρήσιμον αὐτῷ ἐποίησε· πρὸς δὲ τὸ κατασχεῖν, ὁποτέρωθεν ἂν ἡ πληγὴ ἰσχυροτέρα, ταύτῃ χρησιμωτέρα κινουμένη ἐστίν. ἡ δὲ πληγὴ ἰσχυροτέρα ἀεὶ ἄνωθεν ἢ κάτωθεν. ἐπεὶ οὖν ἀμφοτέρων μὲν διὰ τοῦ στόματος ἡ χρῆσις, καὶ τοῦ λαβεῖν καὶ δακεῖν, ἀναγκαιοτέρα δὲ ἡ τοῦ κατασχεῖν, μήτε χεῖρας ἔχοντι μήτε πόδας εὐφυεῖς, χρησιμώτερον τὴν ἄνωθεν κινεῖν σιαγόνα,

E ἢ κάτωθεν* αὐτῷ. διὰ τὸ αὐτὸ δὲ καὶ οἱ καρκίνοι τὸ ἄνωθεν τῆς χηλῆς κινοῦσι μόριον, ἀλλ' οὐ τὸ κάτωθεν. ἀντὶ χειρὸς γὰρ ἔχουσι τὰς χηλάς. ὥστε πρὸς τὸ λαβεῖν, ἀλλ' οὐ πρὸς τὸ δακεῖν, χρήσιμον δεῖ εἶναι τὴν χηλήν. τὸ δὲ διελεῖν καὶ δακεῖν, ὀδόντων ἔργον ἐστί. τοῖς μὲν οὖν καρκίνοις καὶ τοῖς ἄλλοις ὅσοις ἐνδέχεται σχολαίως ποιεῖσθαι τὴν λῆψιν, διὰ τὸ μὴ ἐν ὑγρῷ εἶναι τὴν χρῆσιν τοῦ στόματος, διῄρηται, καὶ λαμβάνουσι μὲν χερσὶν ἢ ποσί, διαιροῦσι δὲ τῷ στόματι καὶ δάκνουσι. τοῖς δὲ κροκοδείλοις ἐπ' ἀμφότερα τὸ στόμα πεποίηκεν ἡ φύσις χρήσιμον, κινουμένων οὕτω τῶν σιαγόνων. ἔχουσι δὲ καὶ αὐχένα πάντα τὰ τοιαῦτα, διὰ τὴν τοῦ πνεύμονος σχέσιν· δέχονται γὰρ τὸ πνεῦμα διὰ τὸ μῆκος τὸ τῆς ἀρτηρίας. ἐπεὶ δὲ τὸ μεταξὺ κεφαλῆς καὶ ὤμων, κέκληται αὐχήν. ἥκιστα δὲ τῶν τοιούτων ὄφις δόξειεν ἂν ἔχειν αὐχένα,

* γρ. ὁ δὲ [illegible] πόρρω [illegible]

* γρ. αὐτοῖς

ἀλλὰ τὸ ἀνάλογον αὐχένι· εἴ γε δεῖ τοῖς εἰρημένοις ἐσχάτοις ὁρίζειν τὸ μόριον τοῦτο. ἴδιον δὲ πρὸς τὰ συγγενῆ τῶν ζῴων ὑπάρχει τοῖς ὄφεσι, τὸ στρέφειν τὴν κεφαλὴν εἰς τὰ ὄπισθεν, ἠρεμοῦντος τοῦ λοιποῦ σώματος. τούτου δ' αἴτιον, ὅτι καθάπερ τὰ ἔντομα, ἑλικτόν ἐστιν· ὥστε εὐκαμπεῖς καὶ χονδρώδεις τοὺς * σφονδύλους ἔχει. ἐξ ἀνάγκης μὲν οὖν διὰ ταύτην αἰτίαν συμβέβηκε τοῦτο αὐτοῖς· πρὸς δὲ τὸ βέλτιον, φυλακῆς τε ἕνεκεν τῶν ὄπισθεν βλαπτόντων. μακρὸν γὰρ ὂν καὶ ἄπουν, ἀφυές ἐστι πρός τε τὴν στροφὴν, καὶ πρὸς τὴν τῶν ὄπισθεν τήρησιν. οὐδὲν γὰρ ὄφελος αἴρειν, στρέφειν δὲ μᾶλλον μὴ δύνασθαι τὴν κεφαλήν. ἔχουσι δὲ τὰ τοιαῦτα καὶ τῷ στήθει ἀνάλογον μόριον. μαστοὺς δὲ οὔτ' ἐνταῦθα, οὔτ' ἐν τῷ ἄλλῳ σώματι ἔχουσιν. ἔχει δὲ οὐδεὶς οὐδ' ὄρνις, οὐδ' ἰχθῦς. τούτου δ' αἴτιον, τὸ μηδὲ γάλα ἔχειν τούτων μηθέν· ὁ δὲ μαστὸς, ὑποδοχὴ καὶ οἷον ἀγγεῖόν ἐστι τοῦ γάλακτος. ἔχει δὲ οὔτε ταῦτα, οὔτ' ἄλλο τῶν μὴ ζῳοτοκούντων ἐν αὑτοῖς οὐδὲν γάλα, διότι ᾠοτοκοῦσιν. ἐν δὲ τῷ ᾠῷ ἐγγίνεται ἡ γαλακτώδης ὑπάρχουσα ἐν τοῖς ᾠοτόκοις τροφή. σαφέστερον δὲ περὶ αὐτῶν λεχθήσεται ἐν τοῖς περὶ γενέσεως. περὶ δὲ τῆς τῶν καμπύλων κάμψεως ἐπέσκεπται πρότερον ἐν τοῖς περὶ πορείας * κοινῇ πᾶσιν. ἔχουσι δὲ καὶ κέρκον τὰ τοιαῦτα, τὰ μὲν μείζω, τὰ δὲ ἐλάττω, ὑπὲρ ἧς τὴν αἰτίαν καθόλου πρότερον εἰρήκαμεν. ἰσχνότατος δὲ ὁ χαμαιλέων τῶν ᾠοτόκων καὶ πεζῶν ἐστι πάντων. * ὀλιγαιμότατον γάρ ἐστι πάντων. αἴτιον δὲ, τὸ τῆς ψυχῆς ἦθος ἐστὶν αὐτοῦ. διὰ γὰρ τὸν φόβον γίνεται πολύμορφος. κατάψυξις γὰρ ὁ φόβος διὰ * ὀλιγαιμίαν, καὶ δι' ἔνδειάν ἐστι θερμότητος. καὶ περὶ μὲν τῶν ἐναίμων ζῴων, τῶν τε ἀπόδων καὶ τῶν τετραπόδων, ὅσα τε αὐτῶν ἐστιν ἐκτὸς, καὶ διὰ τίν' αἰτίαν, εἴρηται σχεδόν.

* χ. σπονδύλους

* Sylb. κοινῆ

* χ. ὀλιγαιμότ.

* χ. ὀλιγαιμίαν,

ΚΕΦΑΛ. ιβ'.

Περὶ τῶν ἐκτὸς μορίων τῶν ὀρνίθων.

ΕΝ δὲ τοῖς ὄρνισιν ἡ πρὸς ἄλληλα διαφορὰ, ἐν τῇ τῶν μορίων ἐστὶν ὑπεροχῇ καὶ ἐλλείψει, καὶ κατὰ τὸ μᾶλλον καὶ ἧττον. εἰσὶ γὰρ αὐτῶν οἱ μὲν μακροσκελεῖς, οἱ δὲ βραχυσκελεῖς· καὶ τὴν γλῶτταν οἱ μὲν πλατεῖαν ἔχουσιν, οἱ δὲ στενήν· ὡσαύτως δὲ καὶ ἐπὶ τῶν ἄλλων μορίων. ἴδια δ' ἐπ' ὀλίγον διαφέρουσιν ἀλλήλων τοῖς μορίοις· πρὸς δὲ * τὰ ζῷα, καὶ τῇ μορφῇ τῶν μορίων διαφέρουσι. πτερωτοὶ μὲν οὖν ἅπαντές εἰσιν, ἴδιον τε τοῦτο ἔχουσι τῶν ἄλλων. τὰ γὰρ μόρια τῶν ζῴων, τὰ μὲν τριχωτά ἐστι, τὰ δὲ φολιδωτά. τὰ δὲ λεπιδωτὰ τυγχάνουσιν ὄντα, τὰ δ' ἔντομα. οἱ δ' ὄρνιθες πτερωτοὶ, τὸ πτερὸν σχιστὸν, καὶ οὐχ ὅμοιον τῷ εἴδει τοῖς ὁλοπτέροις. τῶν μὲν γὰρ ἄσχιστον, τῶν δὲ σχιστόν ἐστι· καὶ τὸ μὲν ἄκαυλον, τὸ δ' ἔχει καυλόν. ἔχουσι δὲ καὶ ἐν τῇ κεφαλῇ περιττὴν καὶ ἴδιον τὴν τοῦ ῥύγχους φύσιν πρὸς τἆλλα. τοῖς μὲν γὰρ ἐλέφασιν ὁ μυκτὴρ ἀντὶ χειρῶν· τῶν δ' ἐντόμων ἐνίοις ἀντὶ στόματος ἡ γλῶττα. τούτοις δὲ ἀντὶ ὀδόντων καὶ χειρῶν, τὸ ῥύγχος ὀστέινον. περὶ δὲ τῶν αἰσθητηρίων εἴρηται πρότερον. αὐχένα δὲ ἐκτεταμένον τε ἔχει τῇ φύσει, καὶ διὰ τὴν αὐτὴν αἰτίαν ἥνπερ καὶ τἆλλα· καὶ τοῦτον, τὰ μὲν βραχὺν, τὰ δὲ μακρὸν, καὶ σχεδὸν ἀκόλουθον τοῖς σκέλεσι τὰ πλεῖστα.

* Scrib. τινα, vel τὰ μιμά ζ.

A ſed proportionale colli habere videri poteſt. Siquidem extremis, quæ modò dixi, pars hæc deſcribenda eſt. Proprium ſerpentibus præ cæteris eiuſdem generis animalibus eſt, vt caput vertere in auerſum, reliquo quieſcente corpore, valeant. Cuius rei cauſa eſt, quòd modo inſectorum ſtructura volubili conſtant, vt vertebras cartilaginoſas & flexibiles habeant. Euenit igitur id ſerpentibus neceſſariò hac de cauſa: ad melius verò, vt ita vitare poſſint quæ ab auerſo noceant. Cùm enim prælongo ſint corpore, & pedibus careant, inepti ſunt ad ſe conuertendum, tuendúmque contra eà quæ à tergo incurrant. Nihil enim vtilitatis eſſet, ſi caput erigere quidem poſſent, ſed circumagere B nequirent. Habent hæc & eam quæ pectori proportionetur, partem: mammas nec ea parte nec vſpiam ſui corporis continent. Aues etiam mammis carent. Cuius rei cauſa eſt, quòd nullum ex iis habeat lac: mamma enim, conceptaculũ, & tanquam vas lactis eſt. Nec ſolùm hæc, ſed etiam quæcunque non viuipara inter ſe ſunt, lacte vacant, quoniam oua pariunt. In ouo autem lacteus ille cibus ingenitus ouiparis continetur. Sed de iis planiùs dicetur, cùm de generatione agemus. De inflexu curuatum partium conſideratum iam eſt, cùm de communi animalium greſſu ageremus. Caudam etiam genus id animalium habet, partim prolixiorem, partim breuiorem. Cuius rei cauſam antè in C vniuerſum reddidimus. Omnium verò ouiparorum pedeſtrium tenuiſſimus chamæleo eſt: quippe qui omnium maximè inopia ſanguinis rigeat. Cauſa ad mores animæ eius referenda eſt: præ nimio namque metu multiformis efficitur. Metus enim refrigeratio, per inopiam ſanguinis caloriſque eſt. De partibus animalium ſanguinei generis, tum expedium, tum quadrupedum, aut bipedum, quænam ſint extrà, & qua de cauſa, dictum ferè eſt.

CAPVT XII.

De partibus auium exterioribus, & earum differentiis, quáſque ob cauſas ſic à natura poſitæ ſint.

D AVes autem diſcrimine inter ſe diſcrepant eo, quod in exceſſu defectúve partium, & in pluris minoriſque ratione verſari percipimus. Sunt enim earum aliæ longo crure, aliæ breui. Linguam etiam aliæ latiuſculam habẽt, aliæ anguſtam. Eodémque modo reliquis partibus differunt. At priuatim inter ſe paulò ratione partium differunt: quanquam à cæteris forma etiam partium diſcrepent. Pennatum enim genus omnium auium eſt, idque proprium habet ad cætera animalia. Cùm enim alia pilo, aut ſquama, aut cortice tegantur, aues penna opertæ ſunt, pennámque habent E fiſſam, nec ſimili ſpecie atque ea quæ totipennia à pennæ continuitate appello: his enim fiſſa, illis infiſſa eſt penna; & altera excaulis, altera caulata eſt. Quinetiam capite roſtri naturam ſingularem ac propriam præ cæteris gerunt. Elephantis enim naris pro manibus eſt, Inſectis quibuſdam lingua oris officio fungitur: at his vice dentium manúſque, roſtrum oſſeum datum eſt. De ſenſuum locis dictum iam eſt. Collum auibus quoque porrectum, eadémque de cauſa qua cæteris eſt. Hoc aliis breue, aliis longum, & ferè pro crurum modo, magna ex parte deſcriptum eſt.

Quibus enim longa ſunt crura, iis collum lõgum: contrà, quibus breuia crura, iis collum breue, præterquam palmipedibus. Collum enim nec breue cum cruribus longis, nec longum cum breuibus, paſtum adminiſtrare ex terra poteſt. Carniuoris etiam volucribus lõgitudo colli incommoda eſt: imbecille enim quod prolixum eſt. Is autem victus beneficio virium comparatur: quamobrem nulli collum longum, cui vngues adunci. Palmipedes, & quæ diuiſis quidem ſed parum diductis digitis ſunt, vt quæ eodem genere cum palmipedibus contineantur, collum longius habent: tale enim ad cibum ex humore petẽdum commodius eſt: ſed crura iis breuia, vt meliùs natare poſſint. Roſtra etiam inter ſe differunt victus ratione: aliis enim rectum, aliis vncum roſtrum eſt. Rectum iis quæ cibi capiendi gratia tantùm id habent: vncum carniuoris. Tale enim vtile eſt ad retinendum iis quæ raptu viuant, & cibum ex animalibus petere neceſſe habeant. Quibus autem victus ratio placida, herbiſque comparanda eſt, iis roſtrum latum: hoc enim & ad effodiendum pabulum, & ad euellendum, & ad tondendum commodius eſt. Nonnullis longum, vt & collum, quoniam cibum ex alto capere ſoleant. Et quidem bona pars tum earum tum etiam palmipedum, aut ſimpliciter aut parte eadem captura beſtiolarum quarundam aquatilium viuit. Itaque fit vt collo quaſi arũdine piſcatoria, roſtro autem velvti linea & hamo vtantur. Partes verò pronæ, ſupinæque, & thorax appellatus quadrupedum, confuſiùs in genere auium habentur: alæ enim pro branchiis & prioribus pedibus dependent, membrum peculiare auium: quamobrem pro ſcapulis extrema alarum dorſo adhærent. Crura vt in homine, bina, ſed intro flectenda, vt quadrupedum ſuffragines, *non vt hominis poplites* foras. Alas autem, quas vicem crurum *priorum* complere modò diximus, in orbem agunt. Bipes neceſſariò eſt genus auium, inter ea quæ ſanguinem habent, atque etiam aligerum. Cùm enim ſanguinea quæque non pluribus quàm quaternis notis moueantur, membra pendẽtia quaterna auibus quoque ſunt, vt cæteris greſſilibus, & pedeſtribus, quanquam illis brachia, aut crura quaterna, auibus vice crurum priorum, brachiorúmve, ala commune datum eſt membrum: hac enim volatiles ſunt. Quæ quidem volandi vis in auis eſſentia continetur. Itaque neceſſariò reſtat vt bipedes ſint. Ita enim notis, ſiue ſignis quaternis, alis ſcilicet additis, moueantur. Pectus acutum carnoſumque omnibus eſt. Acutum, vt meliùs volent. Lata enim, quia multum aëris propellunt, difficiliùs mouentur. Carnoſum, quia quod acutum eſt, niſi plenè opertum ſit, imbecillum eſt. Pectori vẽter ſubiacet, ad oſtium vſque excrementi, & ſuffraginem trudens non aliter quàm in quadrupedum atque hominum genere. Igitur inter alas, & crura, partes hæ poſitæ ſunt. Vmbilicum omnia habent, quæ vel vtero viuiparis eduntur, vel ouo ouiparis excluduntur: ſed auibus iam adultis hic deliteſcit, incertúſque eſt, vt patet per generationem eorum. Inteſtini namque coalitu vmbilicus auium conſiſtit, & non venarum pars vlla eſt, vt in viuiparo genere. Item auium aliæ volaces, aliſque grandibus atque validis ſunt: vt quæ vngues habent aduncos, & carne veſcuntur. Volaces enim tota vita eſſe neceſſe eſt.

A τὰ μὲν γὰρ μακροσκελῆ, μακρὸν· τὰ δὲ βραχυσκελῆ, βραχὺν ἔχει τὸν αὐχένα, χωρὶς τῶν στεγανοπόδων. τὰ μὲν γὰρ εἰ εἶχε βραχὺν ἐπὶ σκέλεσι μακροῖς, οὐκ ἂν ὑπηρέτει αὐτοῖς ὁ αὐχὴν, πρὸς τὴν ἀπὸ τῆς γῆς νομήν· τοῖς δὲ, εἰ μακρὸν, ἐπὶ βραχέσιν. ἔτι τοῖς κρεωφάγοις αὐτῶν, ὑπεναντίον τὸ μῆκος πρὸς τὸν βίον. ὁ γὰρ μακρὸς αὐχὴν, ἀσθενής· τοῖς δ' ὁ βίος ἐκ τοῦ κρατεῖν ἐστι. διόπερ οὐδὲν τῶν γαμψωνύχων μακρὸν ἔχει τὸν αὐχένα. τὰ δὲ στεγανόποδα, καὶ διῃρημένους μὲν ἔχοντα τοὺς πόδας, σεσιμωμένους δὲ, ὡς ἐν τῷ αὐτῷ γένει ὄντα τοῖς στεγανόποσι, τὸν μὲν αὐχένα μακρὸν ἔχουσιν, (χρήσιμος γὰρ τοιοῦτος ὢν, πρὸς τὴν τροφὴν τὴν ἐκ τοῦ B ὑγροῦ) τὰ δὲ σκέλη πρὸς τὴν νεῦσιν βραχέα. διαφορὰν δ' ἔχει καὶ τὰ ῥύγχη κατὰ τοὺς βίους. τὰ μὲν γὰρ εὐθὺ ἔχει, τὰ δὲ γαμψόν· εὐθὺ μὲν, ὅσα τροφῆς ἕνεκεν· γαμψὸν δὲ, τὸ ὠμοφάγον. χρήσιμον γὰρ πρὸς τὸ κρατεῖν τὸ τοιοῦτον· τὴν δὲ τροφὴν ἀναγκαῖον ἀπὸ ζώων πορίζεσθαι. ὅσων δὲ ὁ βίος ποώδης καὶ ποοφάγος, πλατὺ τὸ ῥύγχος ἔχουσι. πρός τε γὰρ τὴν ὄρυξιν χρήσιμον τὸ τοιοῦτον, καὶ πρὸς τὴν τῆς τροφῆς σπάσιν καὶ κουράν. ἔνια δὲ μακρὸν ἔχει τὸ ῥύγχος τῶν τοιούτων, ὥσπερ καὶ τὸν αὐχένα, διὰ τὸ λαμβάνειν τὴν τροφὴν ἐκ τοῦ βάθους· καὶ τὰ πολλὰ τῶν τοιούτων καὶ τῶν στεγανοπόδων, ἢ ἁπλῶς, ἢ κατὰ τὸ μόριον ταὐτὸ θηρεύοντα ζῇ τῶν ἐν τῷ* ὑγρῷ ἔνια ζῳδαρίων. καὶ γίνεται τοῖς τοιούτοις ὁ μὲν αὐχὴν, καθάπερ ἁλιευτικὸς C κάλαμος· τὸ δὲ ῥύγχος, οἷον ὁρμιὰ καὶ τὸ ἄγκιστρον. τὰ δὲ* πρανῆ τοῦ σώματος, καὶ τὰ ὕπτια, καὶ τὰ τοῦ καλουμένου θώρακος, ἐπὶ τῶν τετραπόδων, ὀλοφυὴς ὁ τόπος ἐπὶ τῶν ὀρνίθων ἐστίν. ἀπηρτημένας γὰρ ἀπὸ τῶν βραχιόνων καὶ τῶν σκελῶν τῶν προσθίων ἔχουσι τὰς πτέρυγας, ἴδιόν τι μόριον. διόπερ ἀντὶ ὠμοπλάτης, τὰ τελευταῖα ἐπὶ τοῦ νώτου τῶν πτερύγων ἔχουσι· σκέλη δὲ, καθάπερ ὁ ἄνθρωπος, δύο, κεκαμμένα καθάπερ τὰ τετράποδα εἴσω, καὶ οὐχ ὥσπερ ὁ ἄνθρωπος ἔξω. τὰς δὲ πτέρυγας, τὰ πρόσθια σκέλη τῶν τετραπόδων, ἐπὶ τὸ περιφερές. δίπουν δ' ἐξ ἀνάγκης ἐστὶ τῶν ἐναίμων ὁ τοῦ ὄρνιθος οὐσία, ἅμα δὲ καὶ πτερυγωτόν. τὰ γὰρ ἔναιμα οὐ κινεῖται πλείοσιν ἢ τέτρασι σημείοις. τὰ μὲν οὖν ἀπηρτημένα μό-D ρια, τέτταρα, ὥσπερ τοῖς ἄλλοις τοῖς πεζοῖς καὶ τοῖς πορευτικοῖς ἐστι, καὶ τοῖς ὄρνισιν· ἀλλὰ τοῖς μὲν βραχίονες καὶ σκέλη τέτταρα ὑπάρχουσι· τοῖς δ' ὄρνισιν, ἀντὶ προσθίων σκελῶν, ἢ βραχιόνων, πτέρυγιον κοινόν ἐστι. κατὰ ταύτας γὰρ πτηνικοί εἰσι· τῷ δ' ὄρνιθι ἐν τῇ οὐσίᾳ τὸ πτητικόν ἐστιν. ὥστε λείπεται αὐτοῖς ἐξ ἀνάγκης δίποσιν εἶναι. οὕτω γὰρ τέτρασι σημείοις κινήσονται μετὰ τῶν πτερύγων. στῆθος δ' ἔχουσιν ἅπαντες ὀξὺ καὶ σαρκῶδες. ὀξὺ μὲν, πρὸς τὴν πτῆσιν (τὰ γὰρ πλατέα, πολὺν ἀέρα ὠθοῦντα, δυσκίνητά ἐστι) σαρκῶδες δὲ, διότι τὸ ὀξὺ ἀσθενές, μὴ πολλὴν ἔχον σκέπην. ὑπὸ E δὲ τὸ στῆθος, κοιλία μέχρι πρὸς τὴν ἔξοδον τοῦ περιττώματος, καὶ τὴν τῶν σκελῶν καμπὴν, καθάπερ τοῖς τετράποσι καὶ τοῖς ἀνθρώποις. μεταξὺ μὲν οὖν τῶν πτερύγων καὶ τῶν σκελῶν, ταῦτα τὰ μόριά ἐστι. ὀμφαλὸν δὲ ἐν μὲν τῇ γενέσει ἅπαντα ἔχει, ὅσαπερ ζῳοτοκεῖται, ἢ ᾠοτοκεῖται· τῶν δ' ὀρνίθων αὐξηθέντων ἄδηλος. δῆλον δ' ἐν τοῖς περὶ γενέσεως. εἰς γὰρ τὸ ἔντερον ἡ σύμφυσις γίγνεται, καὶ οὐχ ὥσπερ τοῖς ζῳοτόκοις τῶν φλεβῶν τι μόριόν ἐστιν. ἔτι τῶν ὀρνίθων, οἱ μὲν πτητικοί, καὶ τὰς πτέρυγας μεγάλας ἔχουσι καὶ ἰσχυράς· οἷον γαμψώνυχες καὶ οἱ ὠμοφάγοι. ἀνάγκη γὰρ πτητικοῖς εἶναι διὰ τὸν βίον.

* γρ. ἀγρῷ.

* ἡ. πρανῆ ſemper alibi.

ὧν δ' ἕνεκα τούτου πλῆθος ἔχουσι πτερύγων, καὶ τὰς πτέρυγας μεγάλας. ἔστι δὲ οὐ μόνον τὰ γαμψώνυχα, ἀλλὰ καὶ ἄλλα γένη ὀρνίθων πτητικά, ὅσοις ἡ σωτηρία ἐν τῇ ταχυτῆτι τῆς πτήσεως, ἢ ἐκτοπιστικὸς ὁ βίος. ἔνια δὲ οὐ πτητικά, ἀλλὰ βαρέα τῶν ὀρνίθων ἐστίν· οἷς ὁ βίος ἐπίγειος, καὶ ἔστι καρποφάγα· ἢ πλωτά, καὶ περὶ ὕδωρ βιοτεύουσιν. ἔστι δὲ τὰ μὲν τῶν γαμψωνύχων σώματα μικρὰ ἄνευ τῶν πτερύγων, διὰ τὸ εἰς ταύτας ἀναλίσκεσθαι τὴν τροφήν, εἰς τὰ ὅπλα καὶ τὴν βοήθειαν· τοῖς δὲ μὴ πτητικοῖς τοὐναντίον, τὰ σώματα ὀγκώδη· διὸ βαρέα εἰσίν. ἔχουσι δ' ἔνιοι τῶν βαρέων βοήθειαν ἀντὶ τῶν πτερύγων τὰ πλῆκτρα καλούμενα ἐπὶ τοῖς σκέλεσιν. ἅμα δὲ οἱ αὐτοὶ οὐ γίνονται πλῆκτρα ἔχοντες καὶ γαμψώνυχοι· αἴτιον δ', ὅτι οὐδὲν ἡ φύσις ποιεῖ περίεργον, οὐδὲ μάταιον. ἔστι δὲ τοῖς μὲν γαμψωνύχοις καὶ πτητικοῖς ἄχρηστα τὰ πλῆκτρα· χρήσιμα γάρ ἐστιν ἐν ταῖς πεζαῖς μάχαις. διὸ ὑπάρχει ἐν τοῖς τῶν βαρέων. τούτοις δ' οὐ μόνον ἄχρηστον, ἀλλὰ καὶ βλαβερὸν οἱ γαμψοὶ ὄνυχες, τῷ ἐμπήγνυσθαι ὑπεναντίοι πρὸς τὴν πορείαν ὄντες. διὸ καὶ γαμψώνυχα πάντα φαύλως πορεύεται, καὶ ἐπὶ πέτραις οὐ καθίζανει. ὑπεναντία γὰρ αὐτοῖς πρὸς ἀμφότερα ἡ τῶν ὀνύχων φύσις. ἐξ ἀνάγκης δὲ τοῦτο περὶ τὴν γένεσιν συμβέβηκε. τὸ γὰρ γεῶδες ἐν τῷ σώματι καὶ ἐξορμοῦν, χρήσιμα μόρια γίνεται πρὸς τὴν ἀλκήν· ἄνω μὲν ῥυὲν, ῥύγχεσιν ἐποίησε σκληρότητα, ἢ μέγεθος· ἂν δὲ κάτω ῥυῇ, πλῆκτρα ἰσχυρὰ ἐν τοῖς σκέλεσιν· ἢ ἐπὶ τῶν ποδῶν, ὀνύχων μέγεθος καὶ ἰσχύν. ἅμα δ' ἄλλό τι τούτων ἕκαστα οὐ ποιεῖ. διασπωμένη γάρ, ἀσθενὴς γίνεται ἡ φύσις τούτου τοῦ περιττώματος, τοῖς δὲ σκελῶν κατασκευάζει μῆκος. ἐνίοις δ' ἀντὶ τούτων, συμπληροῖ μεταξὺ τῶν ποδῶν. καὶ διὰ τοῦτ' ἀναγκαίως οἱ πλωτοὶ τῶν ὀρνίθων, οἱ μὲν ἁπλῶς εἰσι στεγανόποδες, οἱ δὲ διῃρημένην μὲν ἔχουσι τὴν καθέκαστα τῶν δακτύλων φύσιν. πρὸς ἑκάστῳ δ' αὐτῶν συμπέφυκεν οἷον πλάτη καθόλου συνεχής. ἐξ ἀνάγκης μὲν οὖν ταῦτα συμβαίνει διὰ ταύτας τὰς αἰτίας. ὡς δὲ διὰ τὸ βέλτιον ἔχουσι τοιούτους τοὺς πόδας, τοῦ βίου χάριν, ἵνα ζῶντες ἐν ὑγρῷ, καὶ τῶν πτερῶν ἀχρείων ὄντων, τοὺς πόδας ἔχωσι πρὸς τὴν νεῦσιν. γίνονται γὰρ ὥσπερ κωπῆρες πλέουσι, καὶ πτερύγια τοῖς ἰχθύσι. διὸ καὶ ἐὰν τῶν μὲν τὰ πτερύγια σφαλῇ, τῶν δὲ τὸ μεταξὺ τῶν ποδῶν, οὐκέτι νέουσι. ἔνιοι δὲ μακροσκελεῖς τῶν ὀρνίθων εἰσίν. αἴτιον δ', ὅτι ὁ βίος τῶν τοιούτων ἑλώδης. τὰ γὰρ ὄργανα πρὸς τὸ ἔργον ἡ φύσις ποιεῖ, ἀλλ' οὐ τὸ ἔργον πρὸς τὰ ὄργανα. διὰ μὲν οὖν τὸ μὴ πλωτὰ εἶναι, οὐ στεγανόποδά ἐστι· διὰ δὲ τὸ ἐν ὑπείκοντι εἶναι τὸν βίον, μακροσκελῆ καὶ μακροδάκτυλα. καὶ τὰς καμπὰς ἔχουσι πλείους ἐν τοῖς δακτύλοις οἱ πολλοὶ αὐτῶν. ἐπεὶ δὲ οὐ πτητικὰ μέν, ἐκ τῆς αὐτῆς δὲ ὕλης ἐστὶ πάντα, ἡ εἰς τὸ ὀρροπύγιον αὐτοῖς τροφή, εἰς τὰ σκέλη καταναλισκομένη ταῦτα ηὔξησε· διὸ καὶ ἐν τῇ πτήσει ἀντ' ὀρροπυγίου χρῶνται αὐτοῖς. πέτονται γὰρ ἀποτείνοντες εἰς τὸ ὄπισθεν. οὕτω γὰρ αὐτοῖς χρήσιμα τὰ σκέλη· ἄλλως δὲ ἐμποδίζοιεν ἄν. ἔνια δὲ βραχέα σκέλη πρὸς τῇ γαστρὶ ἔχοντα, πρὸς τὸ πέτεσθαι. τοῖς μὲν γὰρ αὐτῶν οὐκ ἐμποδίζουσιν οἱ πόδες οὕτω· τοῖς δὲ γαμψώνυξι, καὶ πρὸ ἔργου εἰσὶ πρὸς τὴν ἁρπαγήν.

A Itaque pennis abundant, & alarum magnitudine præſtant. Sed non modò quæ vncis ſunt vnguibus, verùm alia quoque genera volucrum volatu ſuperant: videlicet ea quæ vel pernicitate volandi ſeſe tueantur, vel loca mutare ſoleant. Sunt quæ non volaces ſed graues ſint, quibus vita terrena, & aut fruge viuunt, aut nant, & apud aquas immorantur. Corpora vncunguium exigua ſunt, exceptis alis, quoniam alimenti copia in alas, & arma præſidiumque abſumitur: contrà, quæ volaces non ſunt, iis corpora in molem euadunt grandiorem, atque ita efficitur vt ſint grauiores. Sed grauium nonnullis præſidio calcar eſt, quod vice alarum ſuis cruribus gerunt. Eadem B verò, & quæ calcar habeat, & vngues aduncos, nulla eſt. Cauſa eſt, quòd Natura nihil ſuperuacuum facit. Volaci autem vncungui generi calcar vſui eſſe non poteſt: vtile enim tantùm in pedeſtri certamine eſt. Quamobrem grauium nonnullis adiunctum eſt, quibus vngues adunci non ſolùm inutiles, ſed etiam nocui eſſent, cùm ad ſolum hærerent, & contra ingreſſum infixi reniterentur. Quamobrem vncungues omnes difficulter ambulant, nec in ſaxis conſiſtunt: natura enim eiuſmodi vnguium contraria in vtrumque eſt. Euenit id per generationem neceſſariò, cùm quod terrenum & procax in corpore eſt, formam partium commodarum ad pugnam recipiat. Ita- C que vbi ſurſum proruerit, roſtri duritiam aut magnitudinem facit: vbi deorſum lapſum eſt, calcaria cruribus valida effingit, aut pedibus vnguium magnitudinem, & robur. Simul autem hæc ſingula locis diuerſis efficere non poteſt: diſtracta enim excrementi eius natura inualida redditur. Item aliis crurum longitudinem condidit, aliis pedum interualla complet, digitóſque in palmæ effigiem contexit. Quo fit neceſſariò, vt aues aptæ ad nandum, aut omnino palmipedes ſint, aut diſcretos quidem habeant digitos: ſed ſingulis annexa latitudine cutis, velvti ſpadiculas ductu perpetuo gerant. Hæc neceſſariò his de cauſis eueniunt. Quod autem ad notæ melio- D ris rationem attinet, pedes huiuſmodi habent vitæ, quam degunt, gratia, vt cùm in humore viuant, nec pennis vtantur, pedes ad nandum vtiles habeant: iis enim perinde vtuntur, vt remis nautæ, & pinnulis ſuis piſces. Quamobrem ſi vel piſcium pinnula, vel auium pedibus interiecta cutis deſtruetur, nare non poterunt. Sunt in genere auium, quæ longis cruribus innitantur. Cuius rei cauſa eſt, quòd vita earum paluſtris eſt. Natura enim inſtrumenta ad officium, non officium ad inſtrumenta accommodat. Quoniam igitur nantes non ſint, ideo non palmipedes ſunt, quòd in ſolo premolli & lubrico degant: hinc longa iis crura & digiti productiores, flexus etiam E plures in digitis magna ex parte. Sed cùm volaces non ſint, & tamen ex eadem materia omnes conſtent, efficitur vt alimentum, quod cæteris ad caudam tranſmittatur, iis in crura id abſumptum reddat eam partem auctiorem: quapropter in volatu pro cauda iis vtuntur: porrectis enim cruribus in auerſum volant. Ita enim fit vt inter volandum non impediat pedum prolixitas, ſed iuuet. At quibus crura breuia ſunt, hæc ad ventrem contractis cruribus volant. Cùm enim nullis earum impedimento ſint pedes ita poſiti, vncunguibus vel ad raptum habentur expeditiores.

Quæ longo ſunt collo, ſi id craſſius habent, volant collo porrecto: ſi tenue, curuato feruntur. Cùm enim tenue præ longitudine quatitur, facilè frangi poteſt. Clunis auibus omnibus eſt: quanquam non clunem ſed femora bina habere, propter longitudinem clunis, videantur: quippe cùm ad medium vſque ventrem porrigatur. Cauſa eſt, quòd genus hoc animalium bipes eſt, non erectū. Nam ſi modo hominum, aut quadrupedum, clunem breuem à ſede, crúſque deinde directa ſtrue ſubditum haberet, omnino ſtare non poſſet. Homo enim, quia erectus eſt, ſtare poteſt. Quadrupedibus crura priora ad corporis pondus ſuſtinendum ſubdita ſunt. At aues nec erectæ ſunt, quoniam ſua natura in pomilionem degenerant: neque crura habent priora, quoniam alas vice eorum ſortiuntur. Itaque natura pro iis clunem longiorem emolita duxit ad medium, corpúſque pronum fulciuit, & crura ſubdidit ea parte qua pondere æquilibrāte, & ambulare æquilibrio poſſent, & conſtare. Sed quam ob cauſam genus auium bipes non erectum ſit, explicatum iam eſt. Cur autem crura carnoſa non habeat, eadem cauſa eſt, quam de quadrupedum cruribus reddidimus. Sūt auibus digiti quaterni æquè omnibus, tam multifido quàm palmipedi generi: nam de ſtruthione terræ Africæ incola poſtea definiemus, vt biſulcus eſt, vnà cum reliquis quæ ad auium genus habet contrariis. Sed cùm omnibus quaterni digiti ſint, tres parte priore habentur: vnus poſteriore pro calce, vt tutè ſit, qui minutus ineſt in iis quæ longa habent crura, vt in crece euenit: nec eſt quòd plures habeat digitos. Sed cùm talis digitorum poſitio in cæteris ſit, in iynge vna, quam turbinem appellatam dixi, vtrinque bini. Cauſa eſt, quòd eius corpus minùs quàm cæterarum, propenſum eſt in aduerſum. Teſtes omnibus auibus eſſe certum eſt, ſed intus lumbis adhærent. Cuius rei cauſam in generationis ratione animalium explicabimus. Partes auium ita ſe habent.

CAPVT XIII.

De partibus exterioribus piſcium, & cauſis quare ſic à natura inſtitutæ ſint.

PIſcium genus mutilatius item, ac imperfectius, quàm auium, partibus exterioribus eſt. Non enim crura, non manus, non alas hoc habet. Cur ita, cauſa iam expoſita eſt: ſed continuò ſimplici corpore à capite in caudam vſque porrigitur. Cauda verò ipſa non omnibus ſimilis eſt, ſed cùm cæteris non euariet, planorum nonnullis ſpina conſtat, & longa eſt. Incrementum enim eius partis ad piſcis latitudinem tranſit: vt in torpedine, paſtinaca, & ſi quid aliud eiuſmodi cartilagineum eſt. Horum igitur cauda ſpinoſa, & longa eſt. Quorundam carnoſa quidem, ſed breuis, eadem cauſa qua & torpedini: nihil enim refert, breuis carnoſáque ſit, an longa atque rigidior. Contrà accidit ranis: quòd enim latitudo earum parte priore minùs carnoſa eſt, ideo natura quantū corpulentiæ priori ademerat, tantū poſteriori, & caudæ addidit. Piſcibus nulla membra dependent, quoniam eorum natura natilis eſt, ratione ſuæ ſubſtantiæ. Nihil enim ſuperuacaneum, nihil fruſtra natura agit. Sed cùm ſua ſubſtātia ſanguinem habeant, & tamen natiles non greſſiles ſint,

A τῶν δ' ἐχόντων ὀρνίθων τὸν αὐχένα μακρόν, οἱ μὲν παχύτερον ἔχοντες, πέτονται καὶ ἐκτεταμένῳ τῷ αὐχένι· οἱ δὲ λεπτὸν καὶ μακρόν, συγκεκαμμένῳ. ἐπιπετομένοις γάρ, διὰ τὴν σκέπην ἧττον εὔθρυπτόν ἐστιν. ἰσχίον δ' ἔχουσι μὲν οἱ ὄρνιθες πάντες, ἢ οὐκ ἂν δόξαιεν ἔχειν· ἀλλὰ δύο μηροὺς ἐοικὸς διὰ τὸ τοῦ ἰσχίου μῆκος. ἀποτέταται γὰρ μέχρι μέσης τῆς γαστρός. αἴτιον δέ, ὅτι δίπουν ἐστὶ τοῦτο τὸ ζῷον, οὐκ ὀρθόν. ὡς εἴ γε εἶχε, καθάπερ ἐν τοῖς ἀνθρώποις, ἢ τοῖς τετράποσιν, ἀπὸ τῆς ἕδρας βραχὺ τὸ ἰσχίον, καὶ τὸ σκέλος εὐθὺς ἐχόμενον, ἠδυνάτει ἂν ἑστάναι ὀρθόν. ὁ μὲν γὰρ ἄνθρωπος
B ὀρθός· τοῖς δὲ τετράποσι πρὸς τὸ βάρος σκέλη ἔμπροσθεν ὑπερήρεισται. οἱ δ' ὄρνιθες, οὐκ ὀρθοὶ μέν, διὰ τὸ ναννώδεις εἶναι τὴν φύσιν· σκέλη δὲ ἐμπρόσθια οὐκ ἔχουσι· διὰ τοῦτο [γὰρ] πτέρυγας ἔχουσιν ἀντ' αὐτῶν. ἀντὶ δὲ τούτου, μακρὸν ἡ φύσις τὸ ἰσχίον ποιήσασα, εἰς μέσον προσήρεισεν. ἐντεῦθεν δὲ ὑπέθηκε τὰ σκέλη, ὅπως ἰσορρόπου ὄντος τοῦ βάρους ἔνθεν καὶ ἔνθεν, πορεύεσθαι δύνηται καὶ μένῃ. δι' ἣν μὲν οὖν αἰτίαν δίπουν ἐστίν, οὐκ ὀρθόν, εἴρηται. τοῦ δ' ἄσαρκα τὰ σκέλη εἶναι, ἡ αὐτὴ αἰτία καὶ ἐπὶ τῶν τετραπόδων, ὑπὲρ ἧς καὶ πρότερον εἴρηται. τετραδάκτυλος δέ ἐστι πᾶς ὄρνις, σχιζόπους ὁμοίως καὶ στεγανόπους. περὶ γὰρ τοῦ στρουθοῦ τοῦ
C Λιβυκοῦ ὕστερον διοριοῦμεν, ὅτι δίχηλος ἅμα τοῖς λοιποῖς ἐναντιώμασιν, οἷς ἔχει πρὸς τὸ τῶν ὀρνίθων γένος, δοκεῖ. τούτων δὲ οἱ μὲν τρεῖς ἔχει πρόσθεν, ὁ δὲ ἕνα πρὸς ἀσφάλειαν πτέρνης. καὶ τῶν μακροσκελῶν λείπει τοῦτο κατὰ μέγεθος, οἷον συμβέβηκεν ἐπὶ τῆς κρεκός. πλείους δ' οὐκ ἔχουσι δακτύλους. ἐπὶ μὲν οὖν τῶν ἄλλων οὕτως ἡ τῶν δακτύλων ἔχει θέσις· ἡ δ' ἴυγξ δύο μόνον ἔχει τοὺς ὄπισθεν, καὶ δύο τοὺς ἔμπροσθεν. αἴτιον δ', ὅτι ἧττόν ἐστιν αὐτῆς τὸ σῶμα προπετὲς ἐπὶ τὸ πρόσθεν, ἢ τὸ τῶν ἄλλων. ὄρχεις δ' ἔχουσι μὲν πάντες οἱ ὄρνιθες· ἐντὸς δ' ἔχουσιν. ἡ δ' αἰτία ἐν τοῖς περὶ τὰς γενέσεις ῥηθήσεται τῶν ζῴων. τὰ μὲν οὖν
D τῶν ὀρνίθων μόρια τὸν τρόπον ἔχει τοῦτον.

ΚΕΦΑΛ. ιγ'.

Περὶ τῶν ἐκτὸς μορίων τῶν ἰχθύων.

ΤΟ δὲ τῶν ἰχθύων γένος, ἔτι μᾶλλον κεκολόβωται τῶν ἐκτὸς μορίων. οὔτε γὰρ σκέλη, οὔτε χεῖρας, οὔτε πτέρυγας ἔχουσιν (εἴρηται δ' ἡ περὶ τούτων αἰτία πρότερον) ἀλλ' ὅλον περὶ τῇ κεφαλῇ τὸ κύτος συνεχές ἐστι μέχρι τῆς οὐρᾶς. ταύτην δὲ οὐχ ὁμοίαν ἔχουσι πάντες, ἀλλὰ τὰ μὲν παραπλησίαν, τῶν δὲ πλατέων ἔνια, ἀκανθώδη καὶ μακράν. ἡ ἐκεῖθεν γὰρ αὔξη-
E σις γέγονεν εἰς τὸ πλάτος, οἷόν ἐστι νάρκαις καὶ τρυγόσι, κἂν εἴ τι τοιοῦτον ἕτερον σέλαχός ἐστι. τῶν μὲν οὖν τοιούτων ἀκανθῶδες καὶ μακρὸν τὸ οὐραῖόν ἐστιν· ἐνίων δὲ σαρκῶδες μέν, βραχὺ δέ, διὰ τὴν αἰτίαν δι' ἥνπερ ταῖς νάρκαις. διαφέρει δ' οὐδέν, ἢ βραχὺ μέν, σαρκωδέστερον δὲ ἢ μακρὸν μέν, ἀσαρκότερον δ' εἶναι. ἐπὶ δὲ τῶν βατράχων τὸ ἐναντίον συμβέβηκε. διὰ γὰρ τὸ μὴ σαρκῶδες εἶναι τὸ πλάτος αὐτῶν τὸ ἐμπρόσθιον, ὅσον ἀφῄρηται σαρκῶδες, πρὸς τὸ ὄπισθεν αὐτὸ ἔθηκεν ἡ φύσις, καὶ τὴν οὐράν. οὐκ ἔχουσι δὲ ἀπηρτημένα κῶλα οἱ ἰχθύες, διὰ τὸ νευστικὴν εἶναι τὴν φύσιν αὐτῶν, κατὰ τὸν τῆς οὐσίας λόγον. ἐπεὶ οὔτε περίεργον οὐδέν, οὔτε μάτην ἡ φύσις ποιεῖ. ἐπεὶ δ' ἔναιμά ἐστι κατὰ τὸν τῆς οὐσίας λόγον, διὰ μὲν τὸ νευστικὰ εἶναι,

πτερύγια ἔχει· διὰ δὲ τὸ μὴ πεζὰ, οὐκ ἔχει πόδας. ἡ γὰρ τῶν ποδῶν πρόσθεσις, πρὸς τὴν ἐπὶ τῷ * πέδῳ κίνησιν χρήσιμός ἐστιν. ἅμα τε δὲ πτερύγια τέτταρα καὶ πόδας οὐχ οἷόν τε ἔχειν, οὐδ' ἄλλο κῶλον τοιοῦτον οὐδὲν ἔναιμα γάρ. οἱ δὲ * κορδύλοι, βράγχια ἔχοντες, πόδας ἔχουσι. πτερύγια γὰρ οὐκ ἔχουσιν, ἀλλὰ τὴν οὐρὰν μανώδη καὶ πλατεῖαν. ἔχουσι δὲ τῶν ἰχθύων ὅσοι μὴ πλατεῖς, καθάπερ βάτος καὶ τρυγὼν, τέτταρα πτερύγια· δύο μὲν, ἐν τοῖς πρανέσι· δύο δὲ, ἐν τοῖς ὑπτίοις. πλείω δὲ τούτων οὐδείς· ἄναιμοι γὰρ ἂν ἦσαν. τούτων δὲ τὰ μὲν ἐν τῷ πρανεῖ σχεδὸν πάντες ἔχουσι, τὰ δ' ἐν τοῖς ὑπτίοις ἔνιοι τῶν μακρῶν καὶ παχέων ἐχόντων οὐκ ἔχουσιν· οἷον ἔγχελυς καὶ γόγγρος, καὶ κεστρέων τι γένος, ὃ ἐν τῇ λίμνῃ τῇ ἐν * Σίφαις. ὅσα δ' ἐστὶ μακροφυέστερα, καὶ ὀφιώδη μᾶλλον, οἷον σμύραινα, οὐδὲν ἔχουσι πτερύγιον ἁπλῶς, ἀλλὰ ταῖς καμπαῖς κινοῦνται χρώμεναι τῷ ὑγρῷ, ὥσπερ οἱ ὄφεις τῇ γῇ. τοῦτον γὰρ οἱ ὄφεις τὸν τρόπον νέουσιν, ὅνπερ ἐπὶ τῆς γῆς ἕρπουσιν. αἰτία δὲ τοῦ μὴ ἔχειν τοὺς ὀφιώδεις τῶν ἰχθύων πτερύγια, ἥπερ καὶ τῶν ὄφεων τοῦ ἄποδας εἶναι. τὸ δὲ αἴτιον ἐν τοῖς περὶ πορείας καὶ κινήσεως τῶν ζώων * εἴρηται. ἢ γὰρ κακῶς, ἢ οὐδ' ἂν ἐκινοῦντο, τέτρασι σημείοις κινούμενα. εἴτε γὰρ σύνεγγυς εἶχον τὰ πτερύγια, μόλις ἂν ἐκινοῦντο· εἴτε πόρρω, διὰ τὸ πολὺ μεταξύ. εἰ δὲ πλείω τὰ κινητικὰ σημεῖα εἶχον, ἄναιμα ἦν ἄν. ἡ δ' αὐτὴ αἰτία καὶ ἐπὶ τῶν δύο μόνον ἐχόντων πτερύγια ἰχθύων. ὀφιώδη γάρ ἐστι καὶ εὐμηκέστερα, καὶ χρῆται τῇ καμπῇ ἀντὶ τῶν δύο πτερυγίων. διὸ καὶ ἐν τῷ ξηρῷ ἕρπουσι καὶ ζῶσι πολὺν χρόνον. καὶ τὰ μὲν οὐκ εὐθὺ, τὰ δ' οἰκεῖα τῆς πεζῆς ὄντα φύσεως ἧττον ἀσπαρίζει. αὐτῶν δὲ τῶν πτερυγίων ἐν τοῖς πρανέσιν ἔχει τὰ δύο πτερύγια ἔχοντα μόνον, ὅσα μὴ κωλύεται διὰ τὸ πλάτος. τὰ δ' ἔχοντα, πρὸς τῇ κεφαλῇ ἔχει, διὰ τὸ μὴ ἔχειν μῆκος ἐν τῷ τόπῳ, ᾧ ἀντὶ τούτων κινήσεται. ἐπὶ γὰρ τὴν οὐρὰν πρόμηκες τὸ τῶν τοιούτων ἐστὶν ἰχθύων σῶμα. οἱ δὲ βάτοι καὶ τὰ τοιαῦτα, ἀντὶ τῶν πτερυγίων, τῷ ἐσχάτῳ πλάτει νέουσιν. ἡ δὲ νάρκη καὶ ὁ βάτραχος, τὰ ἐν τῷ πρανεῖ κάτω, διὰ τὸ πλάτος τῶν ἄνω· τὰ δ' ἐν τοῖς ὑπτίοις, πρὸς τῇ κεφαλῇ. οὐ γὰρ κωλύει κινεῖσθαι τὸ πλάτος, ἀλλ' ἀντὶ τοῦ ἄνω, ἐλάττω ταῦτα τῶν ἐν τῷ πρανεῖ ἔχει. ἡ δὲ νάρκη πρὸς τῇ οὐρᾷ ἔχει τὰ δύο πτερύγια· ἀντὶ δὲ τῶν δύο, τῷ πλάτει χρῆται ὡς δυσὶ πτερυγίοις ἑκατέρῳ τῷ ἡμικυκλίῳ. περὶ δὲ τῶν ἐν τῇ κεφαλῇ μορίων καὶ αἰσθητηρίων, εἴρηται πρότερον. ἴδιον δ' ἔχει τὸ τῶν ἰχθύων γένος πρὸς τἆλλα τὰ ἔναιμα ζῷα, τὴν τῶν βραγχίων φύσιν. δι' ἣν δ' αἰτίαν, εἴρηται ἐν τοῖς περὶ ἀναπνοῆς. τὰ δ' ἔχοντα βράγχια, * τὰ μὲν, ἐπικαλύμματα τοῖς βραγχίοις· τὰ δὲ σελάχη πάντα (χονδράκανθα γάρ) ἀκάλυπτα. αἴτιον δ', ὅτι οἱ μὲν, ἀκανθώδεις εἰσί· τὸ δ' ἐπικάλυμμα, ἀκανθῶδες· τὰ δὲ σελάχη πάντα, χονδράκανθα. ἔτι δ' αἱ κινήσεις τῶν μὲν νωθραὶ, διὰ τὸ μὴ ἀκανθώδη εἶναι, μηδὲ νευρώδη· τῶν δὲ ἀκανθωδῶν, ταχεῖα· τοῦ δ' ἐπικαλύμματος ταχεῖαν δεῖ γίνεσθαι τὴν κίνησιν· ὥσπερ γὰρ πρὸς ἐκπνοήν ἡ τῶν βραγχίων ἐστὶ φύσις, διὸ ἐν τοῖς σελαχώδεσι καὶ αὐτῶν τῶν πόρων ἡ συναγωγὴ γίνεται τῶν βραγχίων, καὶ οὐ δεῖ ἐπικαλύμματος, ὅπως γίγνηται ταχεῖα.

* γρ. πέδῳ
* γρ. κόρδυλοι,
* Histor. 2. 13. De inceſſu anim. cap. 7.
* Libro περὶ πορ. cap. 8.
* Fort. τὰ μὲν ἔχει ἐπικαλ.

A pinnulas habent, vt nantes: pedibus carent, vt non pedeſtres, ſed aquatiles. Pedum enim additio vtilis ad motum, qui in pedo, hoc eſt, ſolo, agatur: vnde & nomen inditũ pedibus eſt. Ad hæc, fieri non poteſt vt ſimul & quaternas habeant pinnulas, & pedes, aut aliud eiuſmodi membrum, cùm ſanguinem habeant. Corduli, quamuis branchiis præditi, pedes habent, quoniam penna carent, caudam etiam habent laxam & latam. Piſces, qui non lati ſunt modo raiæ, aut paſtinacæ, quaternas pinnulas habent, binas parte prona, & binas ſupina, neque eſt qui habeat plures, ſanguine enim careret. Binas, quæ parte prona lateribus geruntur, omnes ferè habent: reliquis, quæ ſubditæ ſunt, carẽt nonB nulli ex longis & corpulentis, vt anguilla, vt conger, & mugilum genus, quod in lacu Sipharum naſcitur. Nullæ omnino pinnæ prælongis & ſerpentis ſpeciem referentibus, vt murænæ: ſed flexuoſo impulſu corporum ita humore vtuntur, vt terra ſerpẽtes: modo namque eodem ſerpentes natãt, quo in ſicco repunt. Cauſa, cur id genus piſcium pinnis careat, eadem eſt, qua ſerpentes pedibus vacent. Cuius rei cauſam explicauimus, cùm de inceſſu & motu animalium ageremus. Aut enim malè mouerentur, aut nullo pacto moueri poſſent, ſi quaternas mouendi notas haberent: vix enim mouerentur, ſiue propinquas inter ſe haberent, ſiue remotas, propter longius interuallum. C Sed ſi plures mouendi notas, ſanguinis vacua eſſent. Hæc eadem cauſa bipennibus quoque piſcibus reddenda eſt. Serpentis enim ea quoque faciem referunt, & ſui corporis flexu pro duabus pinnis vtuntur. Vndè fit vt in ſicco & repere poſſint, & diutiùs viuere. Itaque alteri non protinus, alteri cùm pedeſtris naturæ familiares ſint, minùs exanimantur. Qui autem binis tantùm modò pinnis natant, eas habent, quæ parti pronę adhærent, niſi latitudo prohibeat: eaſque iuxta caput poſitas gerunt, qui habent, quoniam eo loco longitudine careant, qua vice pennarum moueantur: corpus enim eius generis piſcium exporrectum in caudam eſt. Raia, & ſimiles, pro pinnis D extrema ſui corporis latitudine natant. Squatina & rana pinnas lateribus accommodatas infrà gerunt, propter amplitudinem partis ſuperioris: quæ autem parti ſupinæ commiſſæ ſunt, eas iuxta caput adiunctas habent: nihil enim latitudo impedit quominus moueantur, ſed pro ſuperis illis has gerunt minores iis quæ ad latera applicantur. Torpedo duas iuxta caudam pinnas habet, pro reliquis latitudine vtitur, & vtroque ſui corporis ſemicirculo, quaſi geminis pinnis natat. De partibus capitis, & ſenſoriis antea dictum eſt. Piſcium autem genus præ cæteris, quæ ſanguinem habent, animalibus, propriam ſibi branchiarum naturam ſortitum eſt. Cuius, cauſam, cùm de ſpiratione ageremus, reddidimus. Quæ autem branchias habent, aut intectas geE runt, aut detectas: vt genus omne cartilagineum. Cauſa eſt, quòd cartilagine tum branchiæ tum earum tegmenta conſtant. Genus autem hoc omne cartilagineam habet ſpinam. Motus etiam cartilaginei generis lentus pigérque eſt, quoniam non ſpina aut neruo corroboratur: contrà, genus ſpinatum celeriter fertur. Tegmentum autem, quod branchias operiat, celeriter moueri oportet, cùm branchiarum natura quaſi ad ſpirandi vſum piſcibus data ſit: quamobrem in ſpinatis non modò tegmentum, verùm etiam ipſi branchiarum meatus contrahuntur, vt celeriùs agatur.

Habent.

Habent branchias alij multas, alij paucas, & alij A duplices, alij ſimplices: ſed nouiſſimam ſimplicem magna ex parte. Verùm cognitio diligentior ex conſectionibus commentationéque animaliũ petenda eſt. Cauſa copiæ, & inopiæ branchiarum, caloris cordi inſiti copia aut inopia eſt. In quibus enim plus ineſt caloris, hæc celeriùs moueri oportet, & vehementius. Geminæ autem branchiæ, atque duplices, talem naturam potiùs quàm ſimplices, paucioréſque obtinent. Vnde fit vt nonnulli ex iis qui branchias habent pauciores, minúſque continentes, diu extra aquam viuere poſſint: vt anguilla, & quicunque ſerpentis ſpeciem referunt: non enim multum refrigerationis deſiderant. Sũt & oris diſcrimina. Aliis enim os antè, & pronum B eſt: aliis infrà parte ſupina, vt delphinis, & cartilagineo generi. Quamobrem hæc, niſi conuerſa reſupinentur, cibum corripere nequeunt: quod natura non modò ſalutis gratia cæterorum piſcium feciſſe videtur, (dum enim ſeſe iſta conuertunt, mora intercedit, qua piſcis, quem inſectantur, euadere poſſit: nã omnia id genus rapina piſcium viuunt) verumetiam ne nimis ſuam deuorandi auiditatem explerent. Cùm enim faciliùs caperent, breui per immodicam ſatietatem perirent. Quoniam etiam cùm roſtrum eorum ſtructura tereti, ac tenui ſit, facilè ſcindi in oris habitum non poteſt. At hæc differentia exiſtit, quòd aliis os reſciſſum, aliis ſubinde in acutius compreſſum. Car- C ne veſcentibus, reſciſſum, vt iis quibus ſe pectinatim ſtipat dentium ſeries: iis enim vires ore continentur. Compreſſum, &, vt modò dixi, coarctatũ iis quæ non carne veſcantur. Cutis aliis ſquamata, (etenim ſquama præ rigiditate tenuitatéque deſiſtens ſumma corporis occupat) aliis aſpera, vt ſquatinæ, raiæ, & reliquis generis eiuſdem: aliis *læuis*, ſed pauciſſimis. Cartilaginea ſquamis carent, ſed aſpera cute *muniuntur*, *quoniam* ſpina cartilaginea conſtant. Terrenam enim portionem natura inde ad cutem tranſtulit, inque eius aſperitatem abſumpſit. Teſtes piſcium nullus, nec intus nec foris habet. Nec ſerpentes, aut ex iis aliquod, quæ pedibus carẽt, partem eã habere compertum eſt: ſed eius vice meatum excremento & D generationis vſui accõmodatum habent eundem, quem cætera quoque ouipara, eadémque quadrupeda omnia continent, quoniam nec veſicam habent, neque excrementum humidum ſecernunt. Piſciũ genus his à cæteris animalibus differentiis diſcrepat. Delphini, balænæ, & reliquũ cetarium genus, branchiis carent, ſed fiſtulam ſui pulmonis cauſa continent, qua humorem, quem in ore acceperint, reſpuant: nam & humorem admitti neceſſe eſt, cũ cibum in aqua ſubmerſum capiant, & admiſſum emitti neceſſe eſt. Branchiæ igitur iis quæ ſpirant, incommodè habentur. Cauſam verò, cùm de ſpiratione ageremus, reddidimus. Haud E enim fieri poteſt, vt idem & branchias habeat, & ſpiret. Sed enim iis ad reſpuendam aquam fiſtula data eſt, quæ ante cerebrum ſita eſt, ne poſtpoſita id interciperet à ſpina. Cauſa verò, cur pulmonem hæc habeant, & ſpirent, quòd maiora animalia plus caloris ſibi requirunt, vt poſſint moueri: quapropter pulmo iis inditus eſt, plenus caloris ſanguinei. Sunt hęc quodam modo & terreſtria, & aquatilia: vt enim aërem, terreſtrium more trahunt, ſic pedibus vacant, & cibum in humore, modo aquatilium, capiunt. Vituli etiam marini, & veſpertiliones, quoniam ambigant, alteri cum aquatilibus, & terreſtribus, alteri cum volucribus, & pedeſtribus, ideo participes & vtrorumque, & neutrorum ſunt.

A οἱ μὲν οὖν αὐτῶν ἔχουσι πολλὰ βράγχια, οἱ δ' ὀλίγα· καὶ οἱ μὲν διπλᾶ, οἱ δὲ ἁπλᾶ· τὸ δ' ἔσχατον, ἁπλοῦν οἵ γε πλεῖστοι. τὴν δ' ἀκρίβειαν ἐκ τῶν ἀνατομῶν περὶ τούτων, καὶ ἐν ταῖς ἱστορίαις ταῖς περὶ τὰ ζῶα δεῖ θεωρεῖν. αἴτιον δὲ τοῦ πλήθους καὶ τῆς ὀλιγότητος, τὸ τοῦ ἐν τῇ καρδίᾳ θερμοῦ πλῆθος, καὶ ἡ ὀλιγότης. θάττω γὰρ καὶ ἰσχυροτέραν τὴν κίνησιν δεῖ εἶναι τοῖς πλείω ἔχουσι θερμότητα. τὰ δὲ πλείω καὶ διπλᾶ βράγχια, τοιαύτην ἔχει τὴν φύσιν μᾶλλον τῶν ἁπλῶν καὶ ἐλαττόνων. διὸ καὶ ἔνια αὐτῶν ἔξω ζῆν δύνανται πολὺν χρόνον, τῶν ἐχόντων ἐλάττω καὶ ἧττον ἐγκρατῆ τὰ βράγχια· οἷον ἐγχέλυες, καὶ ὅσα ὀφιώδη· οὐ γὰρ πολλῆς B δέονται καταψύξεως. ἔχει δὲ καὶ περὶ τὸ στόμα διαφοράς. τὰ μὲν γὰρ, κατ' ἀντικρὺ ἔχει τὸ στόμα, καὶ εἰς τὸ πρόσθεν· τὰ δ', ἐν τοῖς ὑπτίοις, οἷον δελφῖνες καὶ τὰ σελαχώδη· καὶ ὕπτια στρεφόμενα, λαμβάνει τὴν τροφήν. φαίνεται δὲ ἡ φύσις οὐ μόνον σωτηρίας ἕνεκεν ποιῆσαι τοῦτο τῶν ἄλλων ζώων (ἐν γὰρ τῇ στρέψει * σώζεται, τἆλλα δὴ βραδυνόντων· πάντα γὰρ τὰ τοιαῦτα, ζωοφάγα ἐστὶν) ἀλλὰ καὶ πρὸς τὸ μὴ ἀκολουθεῖν τῇ λαιμαργίᾳ τῇ περὶ τὴν τροφήν. ῥᾷον γὰρ λαμβάνοντα, διεφθείρετ' ἂν, διὰ τὴν πλήρωσιν, ταχέως. πρὸς δὲ τούτοις περιφερῆ καὶ λεπτὴν ἔχοντα τὴν τοῦ ῥύγχους φύσιν, οὐχ οἷόν τ' εὐδιαίρετον ἔχειν. ἔτι δὲ καὶ τῶν C τὰ μὲν ἀνερρωγὸς ἔχει τὸ στόμα, τὰ δὲ μύουρον· ὅσα μὲν σαρκοφάγα, ἀνερρωγὸς, ὥσπερ τὰ καρχαρόδοντα, διὰ τὸ ἐν τῷ στόματι εἶναι τοῖς τοιούτοις τὴν ἰσχύν· ὅσα δὲ μὴ σαρκοφάγα, μύουρον. τὸ δὲ δέρμα, οἱ μὲν, λεπιδωτὸν ἔχουσιν αὐτῶν (ἡ δὲ λεπὶς, διὰ λαμπρότητα καὶ λεπτότητα ἀφίσταται τοῦ σώματος) τὰ δὲ τραχέα, οἷον ῥίνη, καὶ βάτος, καὶ τὰ τοιαῦτα· ἐλάχιστα δὲ, τὰ λεῖα. τὰ δὲ σελάχη, ἀλεπίδωτα μὲν, τραχέα δ' ἐστὶ, διὰ τὸ χονδράκανθα εἶναι. τὸ γὰρ γεῶδες ἐκεῖθεν ἡ φύσις εἰς τὸ δέρμα κατανήλωκεν. ὄρχεις δ' οὐδεὶς ἔχει, οὔτε ἐντὸς οὔτε ἐκτὸς, οὐδ' ἄλλο τι τῶν ἀπόδων οὐδὲν, οὐδ' οἱ ὄφεις. πόρον δὲ τοῦ περιττώματος καὶ τὸν περὶ τὴν γένεσιν, τὸν αὐτὸν, καθάπερ καὶ τἆλλα ᾠοτόκα πάντα, καὶ τετράποδα, διὰ τὸ μὴ ἔχειν κύστιν, μηδὲ γίνε- D σθαι αὐτοῖς περίττωμα ὑγρόν. τὸ μὲν οὖν τῶν ἰχθύων γένος πρὸς τἆλλα ζῶα ταύτας ἔχουσι τὰς διαφοράς. οἱ δὲ δελφῖνες καὶ φάλαιναι, καὶ πάντα τὰ τοιαῦτα τῶν κητῶν, βράγχια μὲν οὐκ ἔχουσιν, αὐλὸν δὲ, διὰ τὸ πνεύμονα ἔχειν· δεχόμενα δὲ τῷ κατὰ στόμα, θάλατταν ἀφιᾶσι τῷ κατὰ τὸν αὐλόν. ἀνάγκη μὲν γὰρ δέξασθαι τὸ ὑγρὸν, διὰ τὸ λαμβάνειν τὴν τροφὴν ἐν τῷ ὑγρῷ· δεξάμενα δ', ἀφιέναι ἀναγκαῖον. κεῖται δ' αὐτοῖς οὗτος πρὸ τοῦ ἐγκεφάλου. διελάμβανε γὰρ ἂν ἀπὸ τῆς ῥάχεως αὐτόν. αἴτιον δὲ τοῦ πνεύμονα ἔχειν ταῦτα καὶ ἀναπνεῖν, ὅτι τὰ μεγάλα τῶν ζώων πλείονος δεῖται θερ- E μότητος, ἵνα κινῆται. διὸ ὁ πνεύμων ἔγκειται αὐτοῖς, θερμότητος ὢν πλήρης αἱματικῆς. ἔστι δὲ ταῦτα τρόπον τινὰ, πεζὰ καὶ ἔνυδρα. τὸν μὲν γὰρ ἀέρα δέχεται ὡς πεζά· ἄποδα δ' ἐστὶ, καὶ λαμβάνει ἐκ τοῦ ὑγροῦ τὴν τροφὴν, ὥσπερ τὰ ἔνυδρα. καὶ αἱ φῶκαι δὲ, καὶ αἱ νυκτερίδες, διὰ τὸ ἐπαμφοτερίζειν, αἱ μὲν τοῖς ἐνύδροις καὶ πεζοῖς, αἱ δὲ τοῖς πτηνοῖς καὶ πεζοῖς, διὰ τοῦτο ἀμφοτέρων τε μετέχουσι, καὶ οὐδετέρων.

* Fort. σώζεται τἆλλα βραδυνόντων. hoc eſt, [illegible] τῇ στρ. β.

αἵ τε γὰρ φῶκαι, ὡς μὲν ἔνυδροι, πόδας ἔχουσιν· ὡς δὲ πεζαί, πτέρυγας. τοὺς γὰρ ὄπισθεν πόδας ἰχθυώδεις ἔχουσι παμπόδην· ἔτι δὲ τοὺς ὀδόντας πάντας καρχαρόδοντας, καὶ πάντας ὀξεῖς. καὶ νυκτερίδες, ὡς μὲν πτηνά, ἔχουσι πόδας· ὡς δὲ τετράποδα, οὐκ ἔχουσι· καὶ οὔτε κέρκον ἔχουσιν, οὔτ' ὀρροπύγιον· διὰ μὲν τὸ πτηνά, κέρκον· διὰ δὲ τὸ πεζά, ὀρροπύγιον. συμβέβηκε δ' αὐταῖς τοῦτο ἐξ ἀνάγκης. εἰσὶ γὰρ δερμόπτεροι. οὐδὲν δ' ἔχει οὐροπύγιον οὐ σχιζόπτερον. ἐκ τοιούτου γὰρ πτεροῦ τὸ οὐροπύγιον γίνεται. ἡ δὲ κέρκος, καὶ ἐμπόδιος ἂν ἦν, ὑπάρχουσα ἐν τοῖς πτεροῖς.

A Vituli namque marini, ſi vt aquatiles inſpectantur, pedes habent: ſi vt pedeſtres, pinnas: quippe qui pedes poſteriores piſceos admodum habeant, atque etiam dentes omnes ſerratos, acutóſque. Veſpertiliones etiam, pedes, vt volucres, habent, ſed vt quadrupedes non habent. Cauda etiam tam quadrupedis quàm volucris carent. Nam quia volucres ſunt, cauda quadrupedis vacant: quia pedeſtres, volucris, quod iis neceſſariò accidit: habent enim cuteas pennas. Nullum autem volatile caudam habet, niſi penna ſciſſa volatile ſit. Genus enim id caudæ ex penna eiuſmodi conſtat: cauda verò B quadrupedis, generi volatili adiuncta, vel impedimento eius pennis proculdubio eſſet.

ΚΕΦΑΛ. ιδ'.

Περὶ στρουθοῦ τοῦ Λιβυκοῦ.

Τὸν αὐτὸν δὲ τρόπον καὶ ὁ στρουθὸς ὁ Λιβυκός. τὰ μὲν γὰρ, ὄρνιθος ἔχει· τὰ δὲ, ζώου τετράποδος. ὡς μὲν γὰρ οὐκ ὢν τετράπους, πτερὰ ἔχει· ὡς δ' οὐκ ὢν ὄρνις, οὔτε πέτεται μετεωριζόμενος, καὶ τὰ πτερὰ οὐ χρήσιμα πρὸς πτῆσιν, ἀλλὰ τριχώδη. ἔτι δὲ ὡς μὲν τετράπους ὤν, βλεφαρίδας ἔχει τὰς ἄνωθεν· καὶ ψιλὸς δ' ἐστὶ τὰ περὶ τὴν κεφαλὴν καὶ τὰ ἄνω τοῦ αὐχένος· ὥστε τριχωδεστέρας ἔχει τὰς βλεφαρίδας. ὡς δ' ὄρνις ὤν, τὰ κάτω μὲν ἐπτέρωται, καὶ δίπους μέν ἐστιν ὡς ὄρνις, διχηλὸς δὲ, ὡς τετράπους· οὐ γὰρ δακτύλους ἔχει, ἀλλὰ χηλάς. τούτου δ' αἴτιον, ὅτι τὸ μέγεθος οὐκ ὄρνιθος ἔχει, ἀλλὰ τετράποδος. ἐλάχιστον γὰρ ἀναγκαῖον εἶναι τὸ μέγεθος (ὡς καθόλου εἰπεῖν) τὸ τῶν ὀρνίθων. οὐ γὰρ ῥᾴδιον πολὺν ὄγκον κινεῖσθαι σώματος μετέωρον. περὶ μὲν οὖν μορίων, διὰ τίν' αἰτίαν ἕκαστόν ἐστιν ἐν τοῖς ζώοις, εἴρηται περὶ πάντων τῶν ζώων καθ' ἕκαστον. τούτων δὲ διωρισμένων, ἐφεξῆς ἐστι τὰ περὶ τὰς γενέσεις αὐτῶν διελθεῖν.

CAPVT XIV.

De Struthione Africo, & eius natura, & forma.

Struthio etiam Africus eodem modo partim auem partim quadrupedem refert, quippe qui, vt non quadrupes, pennas habeat: vt non auis, ſublimis non volet: nec pennas ad volandum commodas gerit, ſed pilis ſimiles. Item C quaſi quadrupes ſit, pilos habet palpebræ ſuperioris, & glaber capite, & parte colli ſuperiore eſt. Itaque cilia habet piloſiora: ſed quaſi auis ſit, infrà pennis integitur. Bipes etiam, tanquam auis: biſulcus, tanquam quadrupes, eſt. Non enim digitos habet, ſed vngulam bipartitam. Quarum rerum cauſa eſt, quòd magnitudine non auis, ſed quadrupedis eſt. Magnitudinem enim auium minimam eſſe, propè dixerim, neceſſe eſt: corporis enim molem ſublimem moueri nequaquam facile eſt. Sed de partibus animalium, quam ob cauſam quæque ſint, dictum iam eſt per omnia animalium genera: quæ cùm explicata ſint, ſequitur vt de generationibus animalium diſſeramus.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΖΩΩΝ ΓΕΝΕΣΕΩΣ ΤΟ Α.

ARISTOTELIS STAGIRITÆ DE GENERATIONE Animalium,

LIBER PRIMVS.

Theodoro Gaza Interprete.

CAPVT I. A

Vniuerſalis generationis partitio.

CVM de cæteris animalium partibus, tum ſummatim tum ſingulatim ſeorſum de propriis generis cuiuſque dictum iam ſit, quemadmodum, & qua de cauſa vnumquodque eſſet: (eam cauſam dico, cuius gratia quippiam ſit. Ponimus enim cauſarum genera quatuor numero. Primum, cuius gratia, vt finem. Secundum, ſubſtantiæ rationem, quæ quaſi vnum quoddam ferè exiſtimanda ſunt. B Tertium verò, quartúmque, materiam, & id vnde principium motus.) Sed cùm de cæteris dictum iam ſit, (ratio enim, & id cuius gratia, vt finis, idem eſt: materia verò animalibus partes ſunt totis diſſimilares, diſſimilaribus ſimilares, iiſque ea quæ elementa corporum appellantur) reſtat vt de partibus quæ ad generationem pertinent, diſſeramus, de quibus nihil adhuc definitum eſt: atque etiam de cauſa mouente quænam ſit. Sed de ea ipſa cauſa conſiderare idem quodam modo eſt atque de generatione cuiuſque agere. Quamobrem noſtra hęc diſputatio in idem ea coniecit, cùm & partes quæ ad generationem accommodantur, vltimas diſpoſuiſſet, & generationis principium ab iis proximum collocaſſet. C Animalium alia per coitum fœminæ & maris gignuntur, ſcilicet in quibus generibus ſexus vterque eſt. Non enim in omnibus ſed in præditis ſanguine, paucis quibuſdam exceptis, alterum mas alterum fœmina perfectum euadit. Exāguium verò quædam marem & fœminam habent, vt ſobolem eiuſdem generis procreent: alia procreant quidē, ſed non ſui generis prolem, ſcilicet quæ non ex coitu animalium prodeunt, ſed ex terra putri, aut excrementis. Quod autem in vniuerſum dixerim eorum quæ locum mutare ſolent, aut nando, aut volando, aut gradiendo, videlicet provt quodque actum ſuo corpore eſt, nonnulla toto genere ſuo, ſexum vtrumque obtinent, non modò ſanguine prædita, verùm etiam exāguia quædam.

ΚΕΦΑΛ. α΄.

Διαίρεσις καθόλου περὶ διαφορῶν κατὰ τὴν τῶν ζῴων γένεσιν.

ΕΠΕΙ δὲ περὶ τῶν ἄλλων μορίων τῶν ἐν τοῖς ζῴοις εἴρηται, καὶ κοινῇ, καὶ καθ᾽ ἕκαστον γένος περὶ τῶν ἰδίων χωρὶς, τίνα τρόπον διὰ ταύτην τὴν αἰτίαν ἕκαστον (λέγω δὲ ταύτην, ἕνεκά του· ὑπόκεινται γὰρ αἰτίαι τέτταρες, τό, τε οὗ ἕνεκα ὡς τέλος, καὶ ὁ λόγος τῆς οὐσίας· ταῦτα μὲν οὖν, ὡς ἕν τι σχεδὸν ὑπολαβεῖν δεῖ. τρίτον δὲ καὶ τέταρτον, ὅτι ὕλη, καὶ ὅθεν ἡ ἀρχὴ τῆς κινήσεως) περὶ μὲν οὖν τῶν ἄλλων εἴρηται. (ὅ, τε γὰρ λόγος, καὶ τὸ οὗ ἕνεκα, ὡς τέλος, ταὐτόν· καὶ [ἡ] ὕλη τοῖς ζῴοις τὰ μέρη· παντὶ μὲν τῷ ὅλῳ τὰ ἀνομοιομερῆ, τοῖς δὲ ἀνομοιομερέσι τὰ ὁμοιομερῆ, τούτοις δὲ τὰ καλούμενα στοιχεῖα τῶν σωμάτων) λοιπὸν δὲ τῶν μὲν μορίων τὰ πρὸς τὴν γένεσιν συντελοῦντα τοῖς ζῴοις, περὶ ὧν οὐδὲν διώρισται πρότερον, περὶ αἰτίας τε τῆς κινούσης, τίς αὕτη. τὸ δὲ περὶ ταύτης τε σκοπεῖν, καὶ τὸ περὶ τῆς γενέσεως τῆς ἑκάστου, τρόπον τινὰ ταὐτόν ἐστι. διόπερ ὁ λόγος εἰς ἓν συνήγαγε, τῶν μὲν περὶ τὰ μόρια τελευταῖα ταῦτα, τῶν δὲ περὶ γενέσεως τὴν ἀρχὴν C ἐχομένην τούτων τάξας. τῶν δὴ ζῴων, τὰ μὲν ἐκ συνδυασμοῦ γίνεται θήλεος καὶ ἄρρενος, ἐν ὅσοις γένεσι τῶν ζῴων ἐστὶ τὸ θῆλυ καὶ τὸ ἄρρεν. οὐ γὰρ ἐν πᾶσίν ἐστιν, ἀλλ᾽ ἐν μὲν τοῖς ἐναίμοις (ἔξω ὀλίγων) ἅπασι, τὸ μὲν ἄρρεν, τὸ δὲ θῆλυ τελειωθέν ἐστι. τῶν δὲ ἀναίμων, τὰ μὲν ἔχει τὸ θῆλυ καὶ τὸ ἄρρεν, ὥστε τὰ ὁμογενῆ γεννᾶν· τὰ δὲ γεννᾷ μὲν, οὐ μέντοι τὰ ὁμογενῆ. τοιαῦτα δ᾽ ἐστὶν, ὅσα γίνεται μὴ ἐκ ζῴων συνδυαζομένων, ἀλλ᾽ ἐκ γῆς σηπομένης, καὶ περιττωμάτων. ὡς δὲ κατὰ παντὸς εἰπεῖν, ὅσα μὲν κατὰ τόπον μεταβλητικὰ τῶν ζῴων ὄντα, τὰ μὲν νευστικὰ, τὰ δὲ πτηνὰ, τὰ δὲ πεζευτικὰ τοῖς σώμασιν, ἐν ἐνίοις μὲν τούτων ἅπαν τὸ γένος ἔχει τὸ θῆλυ καὶ τὸ ἄρρεν, οὐ μόνον ἐν τοῖς ἐναίμοις, ἀλλὰ καὶ τῶν ἀναίμων ἔνιοι. Histor. li. 3. 1.

καὶ τούτων γὰρ τοῖς μὲν καθόλου τὸ γένος· οἷον τοῖς μαλακίοις καὶ τοῖς μαλακοστράκοις· ἐν δὲ τῷ τῶν ἐντόμων γένει τὰ πλεῖστα. τούτων δὲ αὐτῶν ὅσα μὲν ἐκ συνδυασμοῦ γίνεται τῶν συγγενῶν ζῴων, καὶ αὐτὰ γεννᾷ κατὰ συγγένειαν· ὅσα δὲ μὴ ἐκ ζῴων, ἀλλ' ἐκ σηπομένης τῆς ὕλης, ταῦτα γεννᾷ μὲν, ἕτερον δὲ γένος· καὶ τὸ γιγνόμενον, οὔτε θῆλύ ἐστιν, οὔτε ἄρρεν. τοιαῦτα δ' ἐστὶν ἔνια τῶν ἐντόμων. καὶ τοῦτο συμβέβηκεν εὐλόγως. εἰ γὰρ ὅσα μὴ γίγνεται ἐκ ζῴων, ἐκ τούτων ἐγίνετο ζῷα συνδυαζομένων, εἰ μὲν ὁμογενῆ, καὶ τὴν ἐξ ἀρχῆς τοιαύτην ἔδει τῶν τεκνωσάντων εἶναι γένεσιν. τοῦτο δ' εὐλόγως ἀξιοῦμεν. φαίνεται γὰρ συμβαῖνον οὕτως ἐπὶ τῶν ἄλλων ζῴων. εἰ δ' ἀνόμοια μὲν, δυνάμενα δὲ συνδυάζεσθαι, πάλιν ἐκ τούτων ἑτέρα τις ἂν ἐγίνετο φύσις καὶ πάλιν ἄλλη τις ἐκ τούτων· καὶ τοῦτ' ἐπορεύετο ἂν εἰς ἄπειρον. ἡ δὲ φύσις φεύγει τὸ ἄπειρον. τὸ μὲν γὰρ ἄπειρον, ἀτελές· ἡ δὲ φύσις, ἀεὶ ζητεῖ τέλος. ὅσα δὲ μὴ πορευτικὰ, καθάπερ τὰ ὀστρακόδερμα τῶν ζῴων, καὶ τὰ ζῶντα τῷ προσπεφυκέναι, διὰ τὸ παραπλησίαν αὐτῶν εἶναι τὴν οὐσίαν τοῖς φυτοῖς, ὥσπερ οὐδ' ἐν ἐκείνοις, οὐδ' ἐν τούτοις ἐστὶ τὸ ἄρρεν καὶ τὸ θῆλυ· ἀλλ' ἤδη καθ' ὁμοιότητα καὶ κατ' ἀναλογίαν λέγεται. μικρὰν γάρ τινα τοιαύτην ἔχει διαφοράν. καὶ γὰρ ἐν τοῖς φυτοῖς ὑπάρχει τὰ μὲν, καρποφόρα δένδρα τοῦ αὐτοῦ γένους· τὰ δὲ, αὐτὰ μὲν οὐ φέρει καρπὸν, συμβάλλεται δὲ τοῖς φέρουσι πρὸς τὸ πέττειν· οἷον συμβαίνει περὶ τὴν συκῆν καὶ τὸν ἐρινεόν. ἔστι δὲ καὶ ἐπὶ τῶν φυτῶν τὸν αὐτὸν τρόπον. τὰ μὲν γὰρ, ἐκ τοῦ σπέρματος γίνεται· τὰ δ', ἐκ τοῦ * ὥσπερ σπερματίζειν τὴν φύσιν. γίνεται γὰρ ἢ τῆς φύσεως σηπομένης τῆς γῆς, ἢ μορίων τινῶν ἐν τοῖς φυτοῖς. ἔνια γὰρ, αὐτὰ μὲν οὐ συνίσταται καθ' αὑτὰ χωρὶς, ἐν ἑτέροις δὲ γίνεται δένδρεσιν, οἷον ὁ ἰξός. περὶ μὲν οὖν φυτῶν, αὐτὰ καθ' αὑτὰ χωρὶς ἐπισκεπτέον.

* κ. ὥσπερ αὐτοματιζούσης τῆς φύσεως.

ΚΕΦΑΛ. β'.

Ὅτι τῆς γενέσεως ἀρχαὶ τὸ ἄρρεν καὶ τὸ θῆλυ.

Περὶ δὲ τῶν ἄλλων ζῴων τῆς γενέσεως λεκτέον κατὰ τὸν ἐπιβάλλοντα λόγον καθ' ἕκαστον αὐτῶν, ἀπὸ τῶν εἰρημένων συνείροντας. καθάπερ γὰρ εἴπομεν, τῆς γενέσεως ἀρχὰς ἄν τις οὐχ ἥκιστα θείη τὸ ἄρρεν καὶ τὸ θῆλυ· τὸ μὲν ἄρρεν, ὡς τῆς κινήσεως καὶ τῆς γενέσεως ἔχον τὴν ἀρχήν· τὸ δὲ θῆλυ, ὡς ὕλης. τοῦτο δὲ μάλιστ' ἄν τις πιστεύσειε, θεωρῶν πῶς γίνεται τὸ σπέρμα, καὶ πόθεν. ἐκ τούτου μὲν γὰρ τὰ φύσει γινόμενα συνίσταται. τοῦτο δὲ πῶς ἀπὸ τοῦ θήλεος καὶ τοῦ ἄρρενος συμβαίνει γίνεσθαι, δεῖ μὴ λανθάνειν. τῷ γὰρ ἀποκρίνεσθαι τὸ τοιοῦτο μόριον ἀπὸ τοῦ θήλεος καὶ τοῦ ἄρρενος, καὶ ἐν τούτοις τὴν ἀπόκρισιν εἶναι καὶ ἐκ τούτων, διὰ τοῦτο τὸ θῆλυ καὶ τὸ ἄρρεν, ἀρχαὶ τῆς γενέσεώς εἰσιν. ἄρρεν μὲν γὰρ, λέγομεν τὸ εἰς ἄλλο γεννῶν ζῷον· θῆλυ δὲ, τὸ εἰς αὑτό. διὸ καὶ ἐν τῷ ὅλῳ τὴν γῆς φύσιν, ὡς θῆλυ καὶ μητέρα νομίζουσιν· οὐρανὸν δὲ καὶ ἥλιον, καὶ εἴ τι τῶν ἄλλων τῶν τοιούτων, ὡς γεννῶντας καὶ πατέρας προσαγορεύουσι. τὸ δὲ ἄρρεν καὶ τὸ θῆλυ διαφέρει, κατὰ μὲν τὸν λόγον, τῷ δύνασθαι ἕτερον ἑκάτερον· κατὰ δὲ τὴν αἴσθησιν, μορίοις τισί. κατὰ μὲν τὸν λόγον, τῷ ἄρρεν μὲν εἶναι τὸ δυνάμενον εἰς ἕτερον γεννᾶν, καθάπερ εἴρηται πρότερον· τὸ δὲ θῆλυ, τὸ εἰς αὑτό,

A Nam eorum quoque aliis toto genere ſexus vterque eſt, vt mollibus, vt cruſtatis: aliis maxima parte, vt generi inſectorum. Eorum autem ipſorum quæ ex coitu cognatorum animalium gignũtur, ipſa quoque ſibi cognata progenerant. At verò quæ non ex coitu, ſed putri materia oriuntur, ea generant quidem, ſed genus diuerſum, quódque prodiit, nec mas eſt, neque fœmina. Talia ſunt nonnulla in genere inſectorum. Quod iuſta euenit ratione: nam ſi ex coitu eorum quæ non ex animalibus orta ſunt, animalia orirentur, hæc ſi eiuſdem generis eſſent, primum quoque ortum parentum talem eſſe oporteret. Quod rectè ita cenſemus, quando ſic euenire in cæteris B animalibus patet. Sed ſi diſſimilia quidem, ſed quæ coire inter ſe poſſent, gignerentur, rurſus ex iis alia quædam natura procrearetur, & alia ex ea: idque in infinitum procederet. At natura infinitum vitare ſolet. Infinitum enim fine caret: natura autem ſemper finem quærit. Quæ autem non greſſilia ſunt, vt teſtatum animalium genus, & quæ ſaxis adhærentia viuunt, quoniam natura ſimili plantis conſtant, hinc vt in illis, ſic in iis mas deeſt & fœmina: ſed ſimilitudine proportióneque nomen ſexus accipiunt: habent enim parum eiuſmodi differentiæ. Quodam etenim in ſtirpium genere, ſunt eodem in genere arbores, quæ fructum ferant, & quæ ipſæ quidem non ferant, C ſed ferentes adiuuant illas ad maturandum: vt inter ficum & caprificum euenit. Generationis etiam ratio eadem in ſtirpib. quoque eſt, cùm aliæ ſemine prodeant, aliæ ſponte naturę. Oriuntur enim à putreſcente vel humo, vel parte aliqua plantæ. Sunt enim quæ ipſa per ſe nunquam ſeorſum conſiſtant, ſed in aliis, arboribus dico, ſoleant generari, vt viſcum. Sed de ſtirpibus, ſiue plantis ſeorſum opere per ſe ipſis dicato agendum eſt.

CAPVT II.

Principium generationis eſſe marem, & fœminam.

D Nunc de animalium generatione differendum eſt, prout cuique ratio competit, deducenda ex iis quæ dicta iam ſunt. Generationis enim principia, vt retulimus, illa potiſſimùm quis ſtatuerit, marem & fœminam. Marem, vt quod motus, & generationis originem teneat: fœminam, vt quod materiæ. Quam rem ita eſſe potiſſimùm credes, ſi quemadmodum, vndéque ſemen genitale fiat, intellexeris. Ex hoc enim, quæ natura oriuntur, conſiſtunt. Id autem quemadmodum ex mare ac fœmina prodeat, nequaquam latêre oportet. Quòd enim ea pars de fœmina maréque ſecernitur, & in iis atque ex iis hæc ſecretio fit, ideo mas & fœmina principium conferunt generationis. Marem namque id animal dicimus, quod in alio gignit: fœminam, quod E in ſe ipſo. Quamobrem in vniuerſo quoque naturam terræ, quaſi fœminam matrémque ſtatuunt: cœlum autem, & ſolem, & reliqua generis eiuſdem, nomine genitoris patriſque appellant. Mas autem & fœmina inter ſe differunt ratione, quòd facultas vtriuſque diuerſa eſt: ſenſu autem partibus quibuſdam diſcrepãt. Rationis diſcrimen ita exultat vt mas ſit, quod in altero generare poteſt, vt eſt: fœmina, quod in ſe ipſo,

& ex quo ſit, quod generatur, contentum in eo quod generat. Sed quum facultate & munere quodam hæc diſtinguantur, ad omnem autem officij functionem inſtrumento opus ſit, inſtrumentáque facultatibus partes corporis accommodentur, ad procreationem quoque & coitum partes aliquas eſſe accommodatas neceſſe eſt, eáſque inter ſe diuerſas, quibus mas à fœmina differat. Nam etſi de toto animali mas aut fœmina dicitur, tamen non quauis ſui parte potentiáque idem mas aut fœmina eſt, ſed certa quadam virtute, ſiue potentia, & parte, ſicut & vim cernendi gradiendique obtinet, vt ſenſu patet. Partes verò eiuſmodi ſunt fœminæ vteri, & vuluæ: maris, teſtes, & coles, in omnibus ſanguine præditis. Eorum enim aliis teſtes, aliis meatus eiuſmodi quidam ſunt. In genere etiam exangui diſcrimen maris & fœminæ eſt, quibus hæc ſexus contrarietas data eſt. Differunt forma inter ſe partes ad coitum delegatæ in ſanguineo genere. Sed intelligendum ſic eſt, vt principio vel exiguo immutato, multa ex iis quæ à principio ſunt, immutari ſoleāt. Patet hoc in exectis, quibus parte genitali tantùm corrupta, tota ferè forma vſque eò commutatur, vt aut fœminæ eſſe videantur, aut parum abſint, tanquam non qualibet ſui corporis parte, aut potentia, animal ſit fœmina, aut mas. Conſtat igitur, principium quoddam eſſe marem ac fœminam: itaque meritò fit vt multa commutentur, cùm animal, qua fœmina, aut mas eſt, immutatur, quaſi principium dimoueatur.

A καὶ ἐξ οὗ γίνεται ἐνυπάρχον ἐν τῷ γεννῶντι τὸ γεννώμενον. ἐπεὶ δὲ διώρισται δυνάμει καὶ ἔργῳ τινί, δεῖται δὲ πρὸς πᾶσαν ἐργασίαν ὀργάνων, ὄργανα δὲ ταῖς δυνάμεσι τὰ μέρη τοῦ σώματος, ἀναγκαῖον εἶναι καὶ πρὸς τὴν τέκνωσιν καὶ τὸν συνδυασμὸν μόρια, καὶ ταῦτα διαφέροντα ἀλλήλων, καθ' ἃ τὸ ἄρρεν διοίσει τοῦ θήλεος. εἰ γὰρ καὶ καθ' ὅλου λέγεται τοῦ ζῴου, τοῦ μὲν τὸ θῆλυ, τοῦ δὲ τὸ ἄρρεν, ἀλλ' οὐ κατὰ πᾶν γε, θῆλυ τὸ αὐτὸ καὶ ἄρρεν ἐστίν, ἀλλὰ κατά τινα δύναμιν, καὶ κατά τι μόριον, ὥσπερ καὶ τὸ ὁρατικὸν καὶ πορευτικόν, ὅπερ καὶ φαίνεται κατὰ τὴν αἴσθησιν.* ταῦτα δὲ τυγ- * γρ. [illegible]
B χάνει μόρια ὄντα τοῦ μὲν θήλεος, αἱ καλούμεναι ὑστέραι· τοῦ δὲ ἄρρενος, τὰ περὶ τοὺς ὄρχεις καὶ τοὺς περινέους, ἐν πᾶσι τοῖς ἐναίμοις. τὰ μὲν γὰρ ὄρχεις ἔχει αὐτῶν, τὰ δὲ τοὺς τοιούτους πόρους. εἰσὶ δὲ διαφοραὶ τοῦ ἄρρενος καὶ τοῦ θήλεος καὶ ἐν τοῖς ἀναίμοις, ὅσα αὐτῶν ἔχει ταύτην τὴν ἐναντίωσιν. διαφέρει δ' ἐν τοῖς ἐναίμοις τὰ μέρη τὰ πρὸς τὴν μίξιν, τοῖς σχήμασι. δεῖ δὲ νοεῖν ὅτι μικρᾶς ἀρχῆς μετακινουμένης, πολλὰ συμμεταβάλλειν εἴωθε τῶν μετὰ τὴν ἀρχήν. δῆλον δὲ τοῦτο ἐπὶ τῶν ἐκτεμνομένων. τοῦ γεννητικοῦ γὰρ μορίου διαφθειρομένου μόνον, ὅλη σχεδὸν ἡ μορφὴ συμμεταβάλλει τοσοῦτον, ὥστε ἢ θῆλυ δοκεῖν εἶναι, ἢ μικρὸν ἀπολείπειν· ὡς οὐ κατὰ τὸ
C τυχὸν μόριον, οὐδὲ κατὰ τὴν τυχοῦσαν δύναμιν, θῆλυ ὂν ἢ ἄρρεν τὸ ζῷον. φανερὸν οὖν ὅτι ἀρχή τις οὖσα φαίνεται τὸ θῆλυ καὶ τὸ ἄρρεν. πολλὰ γοῦν συμμεταβάλλει μεταβαλλόντων ᾗ θῆλυ καὶ ἄρρεν, ὡς ἀρχῆς μεταπιπτούσης.

CAPVT III.

Genitalia membra non eadem omnibus eſſe animalibus.

TEſtes, & vteri, aut vuluæ, non pari ratione in omnibus ſanguine præditis animalibus ſunt. Iam enim, vt primùm de teſtibus dicā, alia omnino teſtibus carent in eo genere, vt piſces, vt ſerpentes, meatúſque tantùm geminos ſemini genitali præſcriptos obtinent: alia habent quidem teſtes, ſed intus lumbis adhærentes, qua renes continentur, meatúſque ab eorum vtroque foras tendunt, vt in iis quæ teſtibus carent, qui in idem coniunguntur, quomodo in illis conſtitutum eſt. Ita aues omnes habent, & quadrupedes, quæ oua pariunt, inter eas quæ aërem accipiunt, pulmonémque obtinent: his enim omnibus teſtes lumbis intus adhærent, meatúſque gemini ab his ſimiliter, atque ſerpentibus, tendunt: vt lacerto, teſtudini, atque omnibus cortice intectis. Quæ autem animal gignunt, omnia teſtes in aduerſo habent, ſed nonnulla intus vltima conditos aluo, vt delphinus: nec meatus, ſed penem pertendentem habent, vt boues. Alia foris gerunt, eorum alia pendentes, vt homines: alia annexos ad ſedem ſeſſiles, vt ſues. Sed de his diligentiùs diſtinctum eſt in libris quos de hiſtoria animalium ſcripſimus. Vteri omnium bipartiti ſunt, vt teſtes gemini omnibus maribus habentur: ſed aliis iuxta genitale, vt mulieribus, & omnibus quæ animal non ſolùm foras, ſed etiam intra ſe generant, & piſcibus, qui oua edunt: aliis iuxta ſeptum tranſuerſum, ſiue cinctum, vt auibus omnibus, & piſcibus qui animal pariunt. Cruſtatis etiam vuluæ bifidæ ſunt, atque etiam mollibus. Quæ enim oua eorum vocantur,

ΚΕΦΑΛ. γ.

Τῶν περὶ τοὺς ὄρχεις καὶ τὰς ὑστέρας διαφοραί.

Ἔχει δὲ τὰ περὶ τοὺς ὄρχεις καὶ τὰς ὑστέρας, οὐχ ὁμοίως πᾶσι τοῖς ἐναίμοις ζῴοις· καὶ πρῶτόν γε τὰ περὶ τοὺς ὄρχεις τοῖς ἄρρεσι. τὰ μὲν γὰρ, ὅλως ὄρχεις οὐκ ἔχει τῶν τοιούτων
D ζῴων, (οἷον τό, τε τῶν ἰχθύων γένος, καὶ τὸ τῶν ὄφεων) ἀλλὰ πόρους δύο μόνον σπερματικούς. τὰ δ' ἔχει μὲν ὄρχεις, ἐντὸς δ' ἔχει τούτους, πρὸς τῇ ὀσφύϊ κατὰ τὴν τῶν νεφρῶν χώραν. ἀπὸ δὲ τούτων ἑκατέρου πόρον, ὥσπερ ἐν τοῖς μὴ ἔχουσιν ὄρχεις συνάπτοντας εἰς ἕν, καθάπερ καὶ ἐπ' ἐκείνων· οἷον οἵ τε ὄρνιθες πάντες, καὶ τὰ ᾠοτοκοῦντα τετράποδα τῶν ἀναπνεόντων τὸν ἀέρα, καὶ πνεύμονα ἐχόντων. καὶ γὰρ ταῦτα πάντα ἐντὸς ἔχει πρὸς τῇ ὀσφύϊ τοὺς ὄρχεις, καὶ δύο πόρους ἀπὸ τούτων ὁμοίως τοῖς ὄφεσιν· οἷον σαῦραι, καὶ χελῶναι, καὶ τὰ φολιδωτὰ πάντα. τὰ δὲ ζῳοτόκα, πάντα μὲν ἐν τοῖς ἔμπροσθεν ἔχει τοὺς ὄρχεις· ἀλλ' ἔνια αὐτῶν ἔσω πρὸς τῷ τέλει τῆς γαστρός,
E (οἷον ὁ δελφίς) καὶ οὐ πόρους, ἀλλ' αἰδοῖον ἀπὸ τούτων τεταμένον εἰς τὸ ἔξω, καθάπερ οἱ βόες. τὰ δὲ ἔξω· καὶ τούτων τὰ μὲν, ἀπηρτημένους, ὥσπερ οἱ ἄνθρωποι· τὰ δὲ, πρὸς τῇ ἕδρᾳ, καθάπερ οἱ ὕες. διώρισται δὲ περὶ αὐτῶν ἀκριβέστερον ἐν ταῖς ἱστορίαις ταῖς περὶ τῶν ζῴων. Αἱ δ' ὑστέραι πᾶσαι μὲν εἰσὶ διμερεῖς, καθάπερ καὶ οἱ ὄρχεις τοῖς ἄρρεσι δύο εἰσὶ πᾶσι. ταύτας δ' ἔχουσι τὰ μὲν πρὸς τοῖς ἄρθροις, καθάπερ αἵ τε γυναῖκες, καὶ πάντα τὰ ζῳοτοκοῦντα, μὴ μόνον θύραζε, ἀλλὰ καὶ ἐν ἑαυτοῖς, καὶ οἱ ἰχθύες ὅσοι ᾠοτοκοῦσιν εἰς τὸ ἐμφανές· τὰ δὲ, πρὸς τῷ ὑποζώματι, καθάπερ οἵ τε ὄρνιθες πάντες, καὶ τῶν ἰχθύων οἱ ζῳοτοκοῦντες. ἔχουσι δὲ δικρόας καὶ τὰ μαλακόστρακα τὰς ὑστέρας, καὶ τὰ μαλάκια. τὰ γὰρ καλούμενα τούτων ᾠὰ

τοὺς περιέχοντας ὑμένας ὑστερικοὺς ἔχει. μάλιστα δὲ ἀδιόριστον ἐπὶ τῶν πολυπόδων ἐστὶν ὥστε δοκεῖν μίαν εἶναι. τούτου δ' αἴτιον, ὅτι τοῦ σώματος ὄγκος, πάντῃ ὅμοιος ὤν. διχαλαὶ δὲ καὶ αἱ τῶν ἐντόμων εἰσὶν ἐν τοῖς μέγεθος ἔχουσιν. ἐν δὲ τοῖς ἐλάττοσιν ἄδηλον, διὰ τὴν μικρότητα τοῦ σώματος. τὰ μὲν οὖν εἰρημένα μόρια τοῖς ζῴοις τοῦτον ἔχει τὸν τρόπον.

ΚΕΦΑΛ. δ'.

Τίνος ἕνεκέν ἐστιν ἡ τῶν ὄρχεων σύστασις.

ΠΕρὶ δὲ τῆς ἐν τοῖς ἄρρεσι διαφορᾶς τῶν σπερματικῶν ὀργάνων, εἴ τις μέλλοι θεωρήσειν τὰς αἰτίας δι' ἅς εἰσιν, ἀνάγκη λαβεῖν πρῶτον, τίνος ἕνεκέν ἐστιν ἡ τῶν ὄρχεων σύστασις. εἰ δὴ πᾶν ἡ φύσις ἢ διὰ τὸ ἀναγκαῖον ποιεῖ, ἢ διὰ τὸ βέλτιον, κἂν τοῦτο τὸ μόριον εἴη διὰ τούτων θάτερον. ὅτι μὲν τοίνυν οὐκ ἀναγκαῖον πρὸς τὴν γένεσιν, φανερόν. πᾶσι γὰρ ἂν ὑπῆρχε τοῖς γεννῶσι. νῦν δὲ οὔθ' οἱ ὄφεις ἔχουσιν ὄρχεις, οὔθ' οἱ ἰχθύες. ὠμμένοι γάρ εἰσι συνδυαζόμενοι, καὶ πλήρεις ἔχοντες θοροῦ τοὺς πόρους. λείπεται τοίνυν βελτίονός τινος χάριν. ἔστι δὲ τῶν μὲν πλείστων ζῴων ἔργον σχεδὸν οὐδὲν ἄλλο, πλὴν ὥσπερ τῶν φυτῶν σπέρμα καὶ καρπός. ὥσπερ δ' ἐν τοῖς περὶ τὴν τροφὴν, τὰ εὐθυέντερα, λαβρότερα πρὸς τὴν ἐπιθυμίαν τὴν τῆς τροφῆς, οὕτω καὶ τὰ μὴ ἔχοντα ὄρχεις, πόρους δὲ μόνον, ἢ ἔχοντα μὲν, ἐντὸς δὲ ἔχοντα, πάντα ταχύτερα πρὸς τὴν ἐργασίαν τῶν συνδυασμῶν. ἃ δὲ δεῖ σωφρονέστερα εἶναι, ὥσπερ ἐκεῖ οὐκ εὐθυέντερα, καὶ ἐνταῦθα ἕλικας ἔχουσιν οἱ πόροι, πρὸς τὸ μὴ λάβρον μηδὲ ταχεῖαν εἶναι τὴν ἐπιθυμίαν. οἱ δὲ ὄρχεις εἰσὶ πρὸς τοῦτο μεμηχανημένοι. τοῦ γὰρ σπερματικοῦ περιττώματος στασιμωτέραν ποιοῦσι τὴν κίνησιν, ἐν μὲν τοῖς ζῳοτόκοις, ἵπποις τε καὶ τοῖς ἄλλοις τοῖς τοιούτοις, καὶ ἐν ἀνθρώποις σῴζοντες τὴν * ἐπαναδίπλωσιν. ὃν δὲ τρόπον ἔχει αὕτη, ἐκ τῆς ἱστορίας τῆς περὶ τὰ ζῷα δεῖ θεωρεῖν. οὐδὲν γάρ εἰσι μόριον τῶν πόρων οἱ ὄρχεις, ἀλλὰ προσκεῖνται, * καθάπερ τοὺς * λᾶας προσάπτουσιν αἱ ὑφαίνουσαι τοῖς ἱστοῖς. ἀφαιρουμένων γὰρ αὐτῶν, ἀνασπῶνται ἐντὸς οἱ πόροι. ὥστε οὐ δύναται γεννᾶν τὰ ἐκτεμνόμενα. ἐπεὶ, εἰ μὴ ἀνεσπῶντο, ἐδύνατο ἄν. * καὶ ἤδη ταῦρός τις μετὰ τὴν ἐκτομὴν εὐθέως ὀχεύσας, ἐπλήρωσε, διὰ τὸ μήπω τοὺς πόρους ἀνεσπάσθαι. τοῖς δὲ ὄρνισι καὶ τοῖς ᾠοτόκοις τῶν τετραπόδων, δέχονται τὴν σπερματικὴν περίττωσιν· ὥστε βραδυτέραν εἶναι τὴν ἔξοδον ἢ τοῖς ἰχθύσι. φανερὸν δ' ἐπὶ τῶν ὀρνίθων. περὶ γὰρ τὰς ὀχείας πολὺ μείζους ἔχουσι τοὺς ὄρχεις ὅσα τῶν ὀρνίθων καθ' ὥραν μίαν ὀχεύει. ὅταν δὲ ὁ χρόνος οὗτος παρέλθῃ, οὕτω μικροὺς ἔχουσιν, ὥστε σχεδὸν ἀδήλους εἶναι, περὶ δὲ τὴν ὀχείαν σφόδρα μεγάλους. θᾶττον μὲν οὖν ὀχεύουσι τὰ ἐντὸς ἔχοντα· καὶ γὰρ τὰ ἐκτὸς ἔχοντα, οὐ πρότερον τὸ σπέρμα ἀφίησι, πρὶν ἀνασπάσῃ τοὺς ὄρχεις.

De partib. anim. li.3.c.14.

* γρ. ὑπαναδίπλ.

* Inf.lib.5.c.7.

* Quidam λείας

* Hist.lib.3.c.1.

ΚΕΦΑΛ. ε'.

Διὰ τί ἔνια τὸ πρὸς συνουσίαν ὄργανον οὐκ ἔχει.

ΕΤι δὲ τὸ ὄργανον τὸ πρὸς τὸν συνδυασμὸν, τὰ μὲν τετράποδα ἔχει· ἐνδέχεται γὰρ αὐτοῖς ἔχειν·

A pro vulua habent membranas, quibus continentur. Sed hoc maxime indiſcretum eſt in polypis, vt ſimplex eſſe videatur. Cuius rei cauſa eſt, forma corporis, quæ ſimilis vndique eſt. Inſectis etiam, quibus aliquid magnitudinis, bifidæ ſunt: minoribus incertæ, propter corporis exiguitatem. Partes, quas explicandas propoſui, ita ſe habent.

CAPVT IV.

Quam ob cauſam natura teſticulos animalibus indidit: quæ item animalia citiùs, & quæ tardiùs coeant. & quòd taurus cùm ſtatim à caſtratione iniſſet, impleuerit.

DE differentia inſtrumentorum genitalium, quæ in maribus ſunt, qui, quas ob cauſas ſint, B conſideret, accipiat primùm neceſſe eſt, cuiuſnam rei gratia teſtium conſtitutio habeatur. Ergo ſi natura rem quamcunque facit, aut quia neceſſaria eſt, aut quia meliùs ita eſt, hoc etiam membrum ob eorum alterutrum eſſe debet. Sed non neceſſarium id eſſe ad generationem patet. Omnibus enim, quæ generant, adiunctum eſſet, ſi neceſſitatis ratio haberetur. Nunc verò nec ſerpentibus teſtes ſunt, neque piſcibus. Viſi ſunt enim coire, plenóſque ſeminis genitalis habere ſuos meatus. Reſtat igitur vt melioris cuiuſpiam notæ gratia teſtes habeantur. Sed enim maximæ animalium parti munus nullum ferè aliud eſt, niſi quod plantarum ſemen, & fructus. Vtque in ratione cibi C voraciora auidioráque ſunt, quibus inteſtinum rectum: ſic ea quæ teſtibus carent, meatúſque tantùm habent; aut non carent, ſed intus habent, omnia propenſiora celerioráque ad Venerem ſunt. At verò quæ caſtiora eſſe conuenit, iis vt in cibi vſu inteſtino opus eſt non recto, ſic meatus illi reuolutionem, infractúſque habent, ne libido vehemens crebráque citetur. Teſtes autem ad hanc rem emolita natura eſt. Motum enim excrementi genitalis ſtabiliorem faciunt in viuiparis, vt equis, cæteriſque eiuſmodi, atque etiam hominibus, cùm replicationem ſeruēt. Sed quemadmodum ſe habeant, petendum ex animalium D hiſtoriis eſt. Nullam enim partem meatuum teſtes complent, ſed adiecti pendent eo modo, quo pondera textrices telis annectunt. His enim detractis meatus intrò ſe trahunt. Quo fit, vt execta poſſint generare: nam niſi ita retraherentur, poſſent generare. Etiam taurus quidam, cùm ſtatim à caſtratione iniiſſet, impleuit, quoniam nondum retracti eſſent meatus. Auium verò & quadrupedum ouiparorum teſtes excrementum recipiunt genitale. Itaque tardiùs iis quàm piſcibus, ſemen prodit. Patet hoc in auium genere, cùm tempore coitus teſtes multo habeant grandiores, quæ certo tempore coeant. At vbi id tempus præterierit, E adeò exiguos habent, vt incertum ſore, an habeant, ſit, cùm tamen eo tempore, quo coeunt, gerant prægrandes. Celeriùs itaque ea coeunt, quæ teſtes intra ſe continent: quæ enim extra habent, non priùs ſemen emittunt, quàm retrahant teſtes.

CAPVT V.

Quæ animalia membrum ad coitum accommodatum obtineant, & quæ non.

INſtrumentum etiam accōmodatum ad coitum quadrupedes obtinent: habere enim id poſſunt.

A Aues, & quæ pedibus vacant, habere nequeunt: quoniam alteris crura ſub media aluo poſita ſunt: alteris nulla ſunt crura. Natura autem penis hinc pendet, & ſitum hunc tenet. Et quidem ob eam rem euenit vt in coeundo crura contendantur. Nam & inſtrumentum hoc neruo conſtat, & crurum natura neruoſa eſt. Itaque cùm habere id nequeant, teſtes quoque aut non habere, aut non eo loco habere, neceſſe eſt. Idem enim ſitus penis & teſtium eſt in iis quæ habent vtrumque. Quinetiam ea quorum teſtes ſunt extrà, cùm penis per motum caleſcit, ſemen genitale proinde collectum emittunt: non parato iam ſemine contre-

B ctant, vt piſces. Omnibus, quæ animal generant, teſtes antè habentur, vel intus, vel extra, præterquam herinaceo: hic enim vnus lumbis adhærentes continet, ob eandẽ, qua aues, cauſam. Coitum enim herinaceorum celeriter fieri neceſſe eſt, cùm non more quadrupedum ſuperueniant tergis, ſed erecti coniungantur propter aculeos. Cauſa, quamobrem teſtes habent, quæ membrum hoc obtinent, & cur alia intus, alia extrà, declaratum iam eſt.

CAPVT VI.

C *Quam ob cauſam nonnulla animalia membro genitali careant.*

QVæ autem carent eo membro, non quia melius ſit carere, ideo carent: ſed tantùm quia neceſſarium, vt dictum eſt, quoniam celeriter peragatur eorum coitus neceſſe eſt: qualis natura piſcium, & ſerpentum eſt. Piſces enim incurrentes attingunt, abſoluuntúrque ocyſſimè. Nam vt in hominum, & eiuſmodi omnium genere, ſemen genitale ſpiritu retento emitti neceſſe eſt: ſic in piſcibus, mari non in branchiis accepto, emittitur. Facilè autem pereunt, niſi id aſſiduè faciant.

D Itaque non iis ſemen tantiſper concoquendum eſt, cùm coeunt, vt pedeſtribus, & viuiparis: ſed tempeſtatis tempore iam concoctum continent vniuerſum, ita, vt ne dum contingunt, conficiant, ſed concoctum paratúmque emittant. Quamobrem, teſtibus carent, meatúſque ſimplices rectóſque habent: qualis particula quædam circa teſtes quadrupedum eſt. Replicationis enim meatus pars altera ſanguinea eſt, qua recipitur materia ſeminis: altera exanguis, qua factum iam ſemen tranſit. Itaque cùm genitura eò deuenit, celeriter ea quoque abſoluuntur. At piſcibus talis totus meatus eſt, qualis in homine cæ-

E teriſque eiuſmodi animalibus pars replicationis altera eſt.

CAPVT VII.

Quomodo ſerpentes coeunt.

SErpentes complexu mutuo coëunt. Carent teſtibus, & pene, vt dictum iam eſt. (Pene, quia cruribus carent: teſtibus, propter ſui corporis longitudinem.) Meatus modo piſcium habent. Quod enim eorum natura porrecta in longum eſt, ſi præterea in teſtes protraherentur, refrigeraretur genitura, propter moram longioris itineris. Quod iis quoque accidit, quib. penis immodicus eſt: ſunt. n. infœcũdiores iis quib. mediocris,

A τοῖς δ' ὄρνισι καὶ τοῖς ἄποσιν οὐκ ἐνδέχεται, διὰ τὸ τῶν μὲν τὰ σκέλη ὑπὸ μέσην εἶναι τὴν γαστέρα, τὰ δ' ὅλως ἀσκελῆ εἶναι, τὴν δὲ τοῦ αἰδοίου φύσιν ἠρτῆσθαι ἐντεῦθεν, καὶ τὴν θέσιν κεῖσθαι ἐκεῖ. διὸ καὶ ἐν τῇ ὁμιλίᾳ ἡ σύντασις γίνεται τῶν σκελῶν. τό, τε γὰρ ὄργανον νευρῶδες, καὶ ἡ φύσις τῶν σκελῶν νευρώδης. ὥστ' ἐπεὶ οὐκ ἐνδέχεται τοῦτ' ἔχειν, ἀναγκαῖον ἢ μὴ ἔχειν ὄρχεις ἢ μὴ ἐνταῦθ' ἔχειν. τοῖς μὲν γὰρ ἔχουσιν, ἡ αὐτὴ θέσις ἀμφοτέρων αὐτῶν. ἔτι δὲ τοῖς γε τοὺς ὄρχεις ἔχουσιν ἔξω, διὰ τῆς κινήσεως θερμαινομένου τοῦ αἰδοίου, συλλέγεται τὸ σπέρμα συνιόν, ἀλλ' οὐχ ὡς ἑτοί-

B μου ὄντος εὐθὺς θιγοῦσιν, ὥσπερ τοῖς ἰχθύσι. πάντα δ' ἔχει τὰ ζωοτοκοῦντα τοὺς ὄρχεις ἐν τῷ πρόσθεν, ἢ ἐντός, ἢ ἔξω, πλὴν τοῦ ἐχίνου. οὗτος δὲ πρὸς τῇ ὀσφύϊ μόνος, διὰ τὴν αὐτὴν αἰτίαν, δι' ἥνπερ καὶ οἱ ὄρνιθες. ταχὺ γὰρ ἀναγκαῖον γίνεσθαι τὸν συνδυασμὸν αὐτῶν. οὐ γὰρ ὥσπερ τὰ τετράποδα ἐπὶ τὰ νῶτα ἐπιβαίνει, ἀλλ' ὀρθοὶ μίγνυνται διὰ τὰς ἀκάνθας. δι' ἣν μὲν οὖν αἰτίαν ἔχουσι τὰ ἔχοντα ὄρχεις, εἴρηται, καὶ δι' ἣν αἰτίαν τὰ μὲν ἔξω, τὰ δ' ἐντός.

ΚΕΦΑΛ. ϛʹ.

C Περὶ τοῦ τῶν ἰχθύων συνδυασμοῦ, καὶ τῶν πρὸς αὐτὸν μορίων.

ΟΣα δὲ μὴ ἔχει, καθάπερ εἴρηται,* διά τι μὲν οὐ τὸ βέλτιον, ἀλλὰ τὸ ἀναγκαῖον μόνον οὐκ ἔχει τοῦτο τὸ μόριον, καὶ διὰ τὸ ἀναγκαῖον εἶναι ταχεῖαν γίνεσθαι τὴν ὀχείαν. τοιαύτη δ' ἐστὶν ἡ τῶν ἰχθύων φύσις, καὶ ἡ τῶν ὄφεων. οἱ μὲν γὰρ ἰχθύες, ὀχεύουσι παραπίπτοντες καὶ ἀπολύοντες ταχέως. ὥσπερ γὰρ καὶ ἐπὶ τῶν ἀνθρώπων, καὶ πάντων τῶν τοιούτων, ἀνάγκη κατασχόντας τὸ πνεῦμα προΐεσθαι τὴν γονήν. τοῦτο δ' ἐκείνοις συμβαίνει μὴ δεχομένοις τὴν θάλατταν. εἰσὶ δ' εὔφθαρτοι

D τοῦτο μὴ ποιοῦντες. οὔκουν δεῖ ἐν τῷ συνδυασμῷ πέττειν τὸ σπέρμα αὐτῶν, ὥσπερ τὰ πεζὰ καὶ ζωοτόκα. ἀλλ' ὑπὸ τῆς ὥρας τὸ σπέρμα πεπεμμένον ἀθρόον ἔχουσιν, ὥστε μὴ ἐν τῷ θιγγάνειν ἀλλήλων ποιεῖν, ἀλλὰ προΐεσθαι πεπεμμένον. διὸ ὄρχεις οὐκ ἔχει, ἀλλ' εὐθεῖς καὶ ἁπλοῦς τοὺς πόρους, οἷον μικρὸν μέρος ἔχει τοῖς τετράποσι τὸ περὶ τοὺς ὄρχεις. τῆς γὰρ ἐπαναδιπλώσεως τοῦ πόρου, τὸ μὲν ἔναιμον μέρος ἐστί, τὸ δ' ἄναιμον, ὃ δέχεται, καὶ δι' οὗ τὸ σπέρμα ἤδη ὂν πορεύεται, ὥστε ὅταν ἐνταῦθα ἔλθῃ ἡ γονή, ταχεῖα καὶ τούτοις γίνεται ἡ ἀπόλυσις. τοῖς δ' ἰχθύσι τοιοῦτος ὁ πόρος

E *πᾶς οἷόν ἐστιν, οἷον ἐπὶ τῶν ἀνθρώπων καὶ τῶν τοιούτων ζῴων κατὰ τὸ ἕτερον μέρος τῆς ἐπαναδιπλώσεως.

* Gaza, ἢ διά τι μόνον,

* γρ. πᾶς ἐστιν

ΚΕΦΑΛ. ζʹ.

Οἱ ὄφεις πῶς ὀχεύονται.

ΟΙ δ' ὄφεις ὀχεύονται περιπλεκόμενοι ἀλλήλοις. οὐκ ἔχουσι δ' ὄρχεις οὐδ' αἰδοῖον, ὥσπερ εἴρηται πρότερον (αἰδοῖον μέν, ὅτι οὐδὲ σκέλη, ὄρχεις δέ, διὰ τὸ μῆκος) ἀλλὰ πόρους, ὥσπερ οἱ ἰχθύες. διὰ γὰρ τὸ εἶναι αὐτῶν προμήκη τὴν φύσιν, εἰ ἐπὶ ἐπιστάσεις ἐγίγνετο περὶ τοὺς ὄρχεις, ἐψύχετ' ἂν ἡ γονὴ διὰ τὴν βραδυτῆτα· ὅπερ συμβαίνει καὶ ἐπὶ τῶν μέγα τὸ αἰδοῖον ἐχόντων. ἀγονώτεροι γάρ εἰσι τῶν μετριαζόντων,

διὰ τὸ μὴ γόνιμον εἶναι τὸ σπέρμα τὸ ψυχρόν, ψύχεσθαι δὲ φερόμενον λίαν μακράν. δι' ἣν μὲν οὖν αἰτίαν, τὰ μὲν ἔχει ὄρχεις, τὰ δὲ οὐκ ἔχει τῶν ζῴων, εἴρηται. περιπλέκονται δ' ἀλλήλοις οἱ ὄφεις, διὰ τὴν ἀφυΐαν τῆς παραπτώσεως. μικρῷ μὲν γὰρ προσαρμόζοντες μορίῳ λίαν μακροὶ ὄντες, οὐκ εὐσυναρμοστοί εἰσιν. ἐπεὶ οὖν οὐκ ἔχουσι μόρια οἷς περιλήψονται, ἀντὶ τούτων τῇ ὑγρότητι χρῶνται τοῦ σώματος, περιελιττόμενοι ἀλλήλοις. διὸ καὶ δοκοῦσι βραδύτεροι ἀπολύεσθαι τῶν ἰχθύων, οὐ μόνον διὰ τὸ μῆκος τῶν πόρων, ἀλλὰ καὶ διὰ τὴν περὶ ταῦτα σκευωρείαν.

ΚΕΦΑΛ. η'.

Περὶ τῆς τῶν ὑστερῶν ἐν τοῖς ζῴοις θέσεως.

Τοῖς δὲ θήλεσι τὰ περὶ τὰς ὑστέρας, ἀπορήσειεν ἄν τις ὃν τρόπον ἔχει. πολλὰς γὰρ ὑπεναντιώσεις ὑπάρχουσιν αὐταῖς. οὔτε γὰρ τὰ ζῳοτοκοῦντα ὁμοίως ἔχει πάντα, ἀλλ' ἄνθρωποι μέν, καὶ τὰ πεζὰ πάντα, κάτω πρὸς τοῖς ἄρθροις· τὰ δὲ σελάχη ζῳοτοκοῦντα, ἄνω πρὸς τῷ ὑποζώματι· οὔτε τὰ ᾠοτοκοῦντα, ἀλλ' οἱ μὲν ἰχθύες, κάτω, καθάπερ ἄνθρωπος, καὶ τὰ ζῳοτοκοῦντα τῶν τετραπόδων· οἱ δ' ὄρνιθες, ἄνω, καὶ ὅσα ᾠοτοκεῖ τῶν τετραπόδων. οὐ μὴν ἀλλ' ἔχουσι καὶ αὗται αἱ ὑπεναντιώσεις κατὰ λόγον. πρῶτον μὲν γὰρ τὰ ᾠοτοκοῦντα ᾠοτοκεῖ διαφερόντως. τὰ μὲν γὰρ, ἀτελῆ προΐεται τὰ ᾠά, οἷον ἰχθύες. ἔξω γὰρ ἐπιτελεῖται καὶ λαμβάνει αὔξησιν τὰ τῶν ἰχθύων. αἴτιον δ', ὅτι πολύγονα ταῦτα, καὶ τοῦτ' ἔργον* αὐτῶν ὥσπερ τῶν φυτῶν. εἰ οὖν ἐν αὑτοῖς ἐτελεσιούργουν, ἀναγκαῖον ὀλίγα τὸ πλῆθος εἶναι. νῦν δὲ τοσαῦτα ἴσχουσιν, ὥστε δοκεῖν ᾠὸν εἶναι τὴν ὑστέραν, ἔν γε τοῖς μικροῖς ἰχθυδίοις. ταῦτα γὰρ πολυγονώτατά ἐστιν, ὥσπερ καὶ ἐπὶ τῶν ἄλλων τῶν ἀνάλογον τούτοις κεκτημένων τὴν φύσιν, καὶ ἐν φυτοῖς καὶ ἐν ζῴοις. ἡ γὰρ τοῦ μεγέθους αὔξησις, τρέπεται ἐπὶ τὸ σπέρμα τούτοις. οἱ δὲ ὄρνιθες, καὶ τὰ τετράποδα τῶν ᾠοτόκων, τέλεια ᾠὰ τίκτουσιν· ἃ δεῖ, πρὸς τὸ σῴζεσθαι, σκληρόδερμα εἶναι. μαλακόδερμα γάρ, ἕως ἂν αὔξησιν ἔχῃ, ἐστί. τὸ δὲ ὄστρακον γίνεται ὑπὸ θερμότητος ἐξικμαζούσης τὸ ὑγρὸν ἐκ τοῦ γεώδους. ἀναγκαῖον οὖν θερμὸν εἶναι τὸν τόπον ἐν ᾧ τοῦτο συμβαίνει. τοιοῦτος δὲ ὁ περὶ τὸ ὑπόζωμα. καὶ γὰρ τὴν τροφὴν πέττει ἐκεῖ. εἰ οὖν τὰ ᾠὰ ἀνάγκη ἐν τῇ ὑστέρᾳ εἶναι, καὶ τὴν ὑστέραν ἀνάγκη πρὸς τῷ ὑποζώματι εἶναι τοῖς τέλεια τὰ ᾠὰ τίκτουσι· τοῖς δὲ ἀτελῆ, κάτω. πρὸ ἔργου γὰρ οὕτως ἔσται· καὶ πέφυκε δὲ μᾶλλον ἡ ὑστέρα κάτω εἶναι, ἢ ἄνω· ὅπου* οὐκέτι ἐμποδίζει ἕτερον ἔργον τῆς φύσεως. κάτω γὰρ αὐτῆς καὶ τὸ πέρας ἐστίν· ὅπου δὲ τὸ πέρας, τὸ ἔργον αὐτῇ δ', οὗ τὸ ἔργον.

* κ. αὐτῶν τὸ σπέρμα

* κ. μᾶλλον

ΚΕΦΑΛ. θ'.

Περὶ τῆς τῶν ζῳοτόκων γενέσεως, τῆς τε περὶ αὐτὴν διαφορᾶς.

Ἔχει δὲ καὶ τὰ ζῳοτοκοῦντα πρὸς ἄλληλα διαφοράς. τὰ μὲν γὰρ οὐ μόνον θύραζε ζῳοτοκεῖ, ἀλλὰ καὶ ἐν αὑτοῖς· οἷον ἄνθρωποί τε καὶ ἵπποι, καὶ κύνες, καὶ πάντα τὰ τρίχας ἔχοντα· καὶ τῶν ἐνύδρων, οἷον δελφῖνές τε καὶ φάλαιναι, καὶ τὰ τοιαῦτα κήτη.

A propterea quod ſemen frigidũ infœcundũ eſt. Refrigeratur autem, quod longè admodũ fertur. Sed quam ob cauſam animaliũ alia habent teſtes, alia nõ habent, declaratum iam eſt. Coëunt ſerpentes complexu mutuo, propter ineptã ſui corporis formam ad applicandum. Cùm enim exigua quadam ſui parte coniungantur, nequeunt præ nimia prolixitate adaptari. Cúmque membris, quibus amplectantur, careant, pro iis agilitate corporis vtuntur, complexúque mutuo ſeſe obuoluentes expediunt Venerem. Vnde fit vt lentiùs abſolui quàm piſces, videantur, non ſolùm meatuum prolixitate, ſed etiam ea ipſa, qua vtuntur, ſolertia.

B CAPVT VIII.

De ſitu vterorum, aut vuluarum, in quibuſque animantibus.

De vteris, aut vuluis, quemadmodum ſe habeant, ambiges: magna eſt enim eius partis diuerſitas. Nam neque viuipara omnia habent ſimili ſitu. Sed cùm homines, omnéque genus terreſtre infrà ad genitale habeant, cartilaginea ſuprà continent iuxta ſeptum. Neque ouipara ſibi conueniunt, ſed piſces infrà, vt homines, & quadrupedes viuiparæ, habent: aues & quadrupedes ouiparæ ſuprà. Attamen ipſi quoque ſitus contra- C rij non ſunt a ratione remoti. Iam enim quæ oua pariunt, diuersè pariunt. Etenim alia imperfecta emittunt oua, vt piſces: foris enim piſcium oua perficiuntur, & augentur. Cuius rei cauſa eſt, quòd magna fœcunditas eſt, idque munus eorum, vt ſtirpium eſt. Quòd ſi intra ſe fœtum perficerent, pauciora neceſſariò ederent: nunc verò & tot continent, vt vulua vnum eſſe ouum in paruis quidem piſciculis videatur: ſunt enim hi fœcundiſſimi, vt in cæteris quoque tum plantis tum animalibus euenit, quorum natura his proportionetur. In iis enim magnitudinis incrementum vertitur in ſeminis copiam. Aues, & quadrupedes ouiparæ oua edunt perfecta: quæ vt D ſeruari poſſint, duro iam conſtent putamine oportet: ſunt enim, quamdiu increſcunt, molliora. Teſta autem efficitur calore externo euaporante humorem. Itaque calidum eſſe locum, in quo id fiat, neceſſe eſt. Talis autem locus ſepti tranſuerſi eſt: quippe qui cibum concoquendo perficiat. Quòd ſi oua cõtineri in vulua neceſſe eſt, vuluam eorum, quæ oua edunt perfecta, ſitam eſſe ad ſeptum neceſſe eſt: eorum autem, quæ imperfecta, infra. ita enim in promptu erit. Et ſua verò natura vulua propenſior ad ſitum inferiorem, quàm ad ſuperiorem, eſt: niſi quid aliud opus naturæ impedit. infrà eſt enim exitus eius officium.

E CAPVT IX.

De generatione viuiparorum, & eius inter ea, differentia.

Viuipara etiam inter ſe differunt. Alia enim non modò foras, verumetiam intra ſe animal generant, vt homines, vt equi, vt canes, denique omnia, quæ pilis teguntur: & inter aquatilia delphini, balænæ, & reliqua cetarij generis.

A

CAPVT X.

De genere cartilagineorum, & viperæ.

CArtilaginea verò & viperæ, cùm intra ſe oua generent, mox animal foras pariunt, perfectum generant ouum. Ita enim ex ouo animal gignitur, ex imperfecto nullum. Non extrà hæc pariunt oua, quia natura frigida ſunt, non quia calida, vt quidam volunt.

CAPVT XI.

B

De generatione mollium animantium.

CVte molli intecta generant oua: quòd enim caloris exigui ſunt, vltimum ſiccare natura eorum non poteſt. Quia igitur frigida ſunt, molle generant: quia molle, non extrà: periret enim propter ſuam mollitiem. Cùm autem ex ouo animal gignitur, eodem, quo in auibus, modo, parte plurima generatur. Deſcendunt oua in imum, efficiunturque animalia infrà ad genitale: quomodo in iis fit quæ iam inde à primo ortu animal generant. Quamobrem vulua quoque eorum diſſimilis tum viuiparis, tum ouiparis eſt, quoniam vtriuſque conſortium generis habent.
C
Nam & ſuprà ad ſeptum, & infrà porrectum genus omne cartilagineum habet. Sed tam de ea quàm de cæteris vuluæ aut vteri generibus, quemadmodum ſe habeant, per hiſtorias diſſectionéſque animalium indagandum percipiendúmque eſt. Itaque hoc genus & ſuprà continet vuluam, quia ouiparum perfectorum ouorum eſt: & infrà, quia viuiparum eſt, atque particeps vtriuſque euadit. At verò ea quæ protinus animal generant, omnia infrà habent: nullo enim naturæ opere impediuntur, neç partum geminant. Adhæc fieri non poteſt vt animalia iuxta ſeptum gignantur: fœtum enim pondus & motum habere neceſſe eſt. Is autem locus, cùm vitalis ſit, hæc pati non poteſt. Difficultatem etiam pariendi ita accidere
D
neceſſe eſt, propter delationem longiorem: nam & nunc mulieres ſi in partu vel oſcitando, vel aliqua eiuſmodi cauſa retrahunt, difficiliùs pariunt. Inanes etiam vteri, aut vuluæ ſurſum adiunctæ ſtrangulant. Necnon validiores eſſe eas quæ animal contineant, neceſſe eſt: quamobrem omnes eæ carnoſæ ſunt. Quæ autem ad ſeptum iunguntur, membrana conſtant: tum etiam in iis ipſis animalibus, quæ geminant partum, planum hoc idem fit: oua enim ſuprà, atque ad latus continent, animalia verò parte infera vuluæ gerunt. Sed quam ob cauſam ſitu contrario vuluas nonnulla animalia habent, & omnino quamobrem
E
aliis infrà, aliis ſuprà ad ſeptum continentur, dictum iam eſt.

CAPVT XII.

Quam ob cauſam vteros intus animalia habeant, teſtes verò alia intus, alia extrà.

CVr autem vteros aut vuluas omnia intus habeant, teſtes alia extrà, alia intus, cauſa eſt, quòd cū vtero contineatur quod gignitur, idque cuſtodiā, operimentū, & concoctionem deſideret, hinc vteri, aut vuluç omnium intus ſunt. Locus.n.

ΚΕΦΑΛ. ι'.

Περὶ τῆς τῶν σελαχῶν καὶ τῶν ἔχεων γενέσεως.

ΤΑ δὲ σελάχη καὶ οἱ ἔχεις, θύραζε μὲν ζῳοτοκοῦσιν, ἐν αὑτοῖς δὲ ᾠοτοκοῦσι πρότερον· ᾠοτοκοῦσι δὲ τέλειον ᾠόν· οὕτως γὰρ γίνεται ἐκ τοῦ ᾠοῦ τὸ ζῷον· ἐξ ἀτελοῦς δὲ οὐδέν. θύραζε δὲ οὐκ ᾠοτοκοῦσι, διὰ τὸ ψυχρὰ τὴν φύσιν εἶναι, καὶ οὐχ ὥς τινές φασι θερμά.

ΚΕΦΑΛ. ια'.

Περὶ τῆς τῶν μαλακοδέρμων γενέσεως.

ΜΑλακόδερμα γοῦν γεννῶσι. διὰ γὰρ τὸ εἶναι ὀλιγόθερμα, οὐ ξηραίνει αὐτῶν ἡ φύσις τὸ ἔσχατον. διὰ μὲν οὖν τὸ ψυχρὰ εἶναι, μαλακόδερμα γεννῶσι· διὰ δὲ τὸ εἶναι μαλακόδερμα, οὐ θύραζε· διεφθείρετο γὰρ ἄν. ὅταν δὲ ζῷον ἐκ τοῦ ᾠοῦ γίγνηται, τὸν αὐτὸν τρόπον τὰ πλεῖστα γίγνεται ὅνπερ ἐν τοῖς ὄρνισι· καταβαίνει κάτω, καὶ γίγνεται ζῷα πρὸς τοῖς ἄρθροις, καθάπερ καὶ τοῖς ἐξ ἀρχῆς εὐθὺς ζῳοτοκοῦσι. διὸ καὶ τὴν ὑστέραν τὰ τοιαῦτα ζῷα ἔχει ἀνομοίαν, καὶ τοῖς ζῳοτοκοῦσι καὶ τοῖς ᾠοτοκοῦσι, διὰ τὸ ἀμφοτέρων μετέχειν τῶν εἰδῶν. καὶ γὰρ πρὸς τῷ ὑποζώματι ἔχουσι καὶ κάτω παρήκουσαν πάντα τὰ σελαχώδη. δεῖ δὲ καὶ περὶ ταύτης καὶ περὶ τῶν ἄλλων ὑστερῶν, ὃν τρόπον ἔχουσιν, ἐκ τῶν ἀνατομῶν τεθεωρηκέναι, καὶ τῶν ἱστοριῶν. ὥστε διὰ μὲν τὸ ᾠοτόκα εἶναι τελείων ᾠῶν, ἄνω ἔχει· διὰ δὲ τὸ ζῳοτοκεῖν, κάτω· καὶ ἀμφοτέρων μετειλήφασι. τὰ δ' εὐθὺς ζῳοτοκοῦντα, πάντα κάτω· οὐ γὰρ ἐμποδίζει οὐδὲν ἔργον τῆς φύσεως, οὐδὲ διτοκεῖ. πρὸς δὲ τούτοις, ἀδύνατον ζῷα γίγνεσθαι πρὸς τοῖς ὑποζώμασι. τὰ μὲν γὰρ ἔμβρυα βάρος ἔχειν ἀναγκαῖον, καὶ κίνησιν. ὁ δὲ τόπος ἐπικαίριος ὢν τοῦ ζῆν, οὐκ ἂν δύναιτο ταῦθ' ὑπενεγκεῖν. ἔτι δὲ ἀνάγκη δυστοκίαν εἶναι, διὰ τὸ μῆκος τῆς φορᾶς· ἐπεὶ καὶ νῦν ἐπὶ τῶν γυναικῶν, ἐὰν περὶ τὸν τόκον ἀνασπάσωσι χασμησάμεναι, ἤ τι τοιοῦτον ποιήσωσι, δυστοκοῦσι. καὶ κεναὶ δ' οὖσαι αἱ ὑστέραι, ἄνω προσιστάμεναι, πνίγουσι. καὶ γὰρ ἀνάγκη τὰς μελλούσας ζῷον ἕξειν, ἰσχυροτέρας εἶναι. διὸ σαρκώδεις εἰσὶν αἱ τοιαῦται πᾶσαι· αἱ δὲ πρὸς τοῖς ὑποζώμασιν, ὑμενώδεις. καὶ ἔτι ἐπ' αὐτῶν δὲ τῶν διγονίαν ποιουμένων ζῴων, * φανερὸν τοῦτο συμβαῖνον. τὰ μὲν γὰρ ᾠὰ ἄνω καὶ ἐν τῷ πλαγίῳ ἔχουσι· τὰ δὲ ζῷα, ἐν τῷ κάτω μέρει τῆς ὑστέρας. * Scrib. φανερῶς, vel πρόδηλον.
δι' ἣν μὲν οὖν αἰτίαν ὑπεναντίως ἔχουσι τὰ περὶ τὰς ὑστέρας ἔνια τῶν ζῴων· καὶ ὅλως διὰ τί τοῖς μὲν κάτω, τοῖς δὲ ἄνω πρὸς τῷ ὑποζώματί εἰσιν, εἴρηται.

ΚΕΦΑΛ. ιβ'.

Διὰ τί τὰς μὲν ὑστέρας ἔχουσι πάντα ἐντός, τοὺς δὲ ὄρχεις τὰ μὲν ἐκτός, τὰ δὲ ἐντός· καὶ πάλιν πῶς κατὰ τὴν θέσιν διαφέρουσιν αἱ ὑστέραι.

ΔΙότι δὲ τὰς μὲν ὑστέρας ἔχουσι πάντα ἐντός, τοὺς δὲ ὄρχεις τὰ μὲν ἐκτός, τὰ δὲ ἐντός, αἴτιον τοῦ μὲν τὰς ὑστέρας ἐντὸς εἶναι πάσας, ὅτι ἐν ταύταις ἐστὶ τὸ γινόμενον, ὃ δεῖται φυλακῆς καὶ σκέπης καὶ πέψεως· ὁ δ' ἐκτὸς

τοῦ σώματος τόπος, εὐπερίπτωτος καὶ ψυχρός. οἱ δ' ὄρχεις τοῖς A
μὲν ἐντός, τοῖς δὲ ἐκτός. διὰ τὸ δεῖσθαι καὶ τούτους σκέπης καὶ
καλύμματος, πρός τε σωτηρίαν καὶ πρὸς τὴν τοῦ σπέρ-
ματος πέψιν. ἀδύνατον γὰρ ἐψυγμένους καὶ πεπηγότας ἀνα-
σπᾶσθαι καὶ προΐεσθαι τὴν γονήν. διόπερ ὅσοις ἐν φανε-
ρῷ εἰσιν οἱ ὄρχεις, ἔχουσι σκέπην δερματικήν, τὴν καλου-
μένην ὄσχεαν. ὅσοις δ' ἡ τοῦ δέρματος φύσις ἐναντιοῦται
διὰ σκληρότητα, πρὸς τὸ μὴ περιληπτικὴν εἶναι, μηδὲ
μαλθακήν, μηδὲ δερματικήν· οἷον τοῖς ἰχθυῶδες ἔχουσι τὸ
δέρμα, καὶ τοῖς φολιδωτοῖς. τούτοις δ' ἀναγκαῖον ἐντὸς ἔχειν.
διόπερ οἵ τε δελφῖνες, καὶ ὅσα τῶν κητωδῶν ὄρχεις ἔχουσιν, B
ἐντὸς ἔχουσι, καὶ τὰ ᾠοτόκα καὶ τετράποδα τῶν φολιδωτῶν.
καὶ τὸ τῶν ὀρνίθων δὲ δέρμα σκληρόν· ὥστε κατὰ τὸ μέγεθος
ἀσύμμετρον εἶναι πρὸς τὸ περιλαβεῖν, καὶ αὕτη τὴν αἰτίαν εἶναι
πᾶσι τούτοις πρὸς ταῖς εἰρημέναις πρότερον ἐκ τῶν περὶ
τὰς ὀχείας συμβαινόντων ἀναγκαῖον. διὰ τὴν αὐτὴν δ'
αἰτίαν καὶ ὁ ἐλέφας καὶ ὁ ἐχῖνος ἐντὸς ἔχουσι τοὺς ὄρχεις.
οὐδὲ γὰρ τούτοις εὐφυὲς τὸ δέρμα πρὸς τὸ χωριστὸν ἔχειν τὸ
σκεπαστικὸν μόριον. κεῖνται δὲ ἐν τῇ θέσει ὑπεναντίως αἱ
ὑστέραι, τοῖς τε ζῳοτοκοῦσιν ἐν αὑτοῖς, καὶ τοῖς ᾠοτοκοῦσι θύ-
ραζε· καὶ τούτων τοῖς τε τὰς ὑστέρας ἔχουσι κάτω, καὶ τοῖς C
πρὸς τῷ ὑποζώματι· οἷον τοῖς ἰχθύσι πρός τε τοὺς ὄρνι-
θας καὶ τὰ ᾠοτόκα τῶν τετραπόδων, καὶ τοῖς κατ' ἀμφοτέ-
ρους τοὺς τρόπους γεννῶσιν, ἐν αὑτοῖς μὲν ᾠοτοκοῦσιν, εἰς δὲ
τὸ φανερὸν ζῳοτοκοῦσι. τὰ μὲν γὰρ ζῳοτοκοῦντα καὶ ἐν αὑ-
τοῖς καὶ ἐκτός, ἐπὶ τῆς γαστρὸς ἔχει τὰς ὑστέρας· οἷον ἄνθρω-
πος καὶ βοῦς καὶ κύων, καὶ τἆλλα τὰ τοιαῦτα. πρὸς γὰρ τὴν
τῶν ἐμβρύων σωτηρίαν καὶ αὔξησιν, συμφέρει μηδὲν ἐπεῖναι
βάρος ἐπὶ ταῖς ὑστέραις.

ΚΕΦΑΛ. ιγ'.

*Διατί τοῖς μὲν ἕτερος ὁ πόρος δι' οὗ ἥ τε ξηρὰ περίττωσις
ἐξέρχεται, καὶ δι' οὗ ἡ ὑγρά, τοῖς δὲ οὐχ ἕτερος;* D

Ἔστι δὲ καὶ ἕτερος ὁ πόρος, δι' οὗ ἥ τε ξηρὰ περίττωσις
ἐξέρχεται, καὶ δι' οὗ ἡ ὑγρὰ τούτοις πᾶσι. διὸ ἔχουσιν
αἰδοῖα τὰ τοιαῦτα πάντα καὶ τὰ ἄρρενα καὶ τὰ θήλεα, καθ' ἃ
ἐκκρίνεται τὸ περίττωμα τὸ ὑγρόν· καὶ τοῖς μὲν ἄρρεσι, τὸ
σπέρμα· τοῖς δὲ θήλεσι, τὸ κύημα. ἔστι δ' ἐπάνω καὶ ἐν τοῖς
προσθίοις ὑπάρχει ὁ πόρος τοῦ τῆς ξηρᾶς τροφῆς. ὅσα
δὲ ᾠοτοκεῖ μέν, ἀτελὲς δ' ᾠόν, οἷον ὅσοι τῶν ἰχθύων ᾠοτοκοῦ-
σιν, οὗτοι δ' οὐχ ὑπὸ γαστρί, ἀλλὰ πρὸς τῇ ὀσφύϊ ἔχουσι
τὰς ὑστέρας. οὔτε γὰρ ἐμποδίζει ἡ τοῦ ᾠοῦ αὔξησις, διὰ τὸ ἔξω
τελειοῦσθαι καὶ προϊέναι τὸ αὐξανόμενον· ὅ, τε πόρος ὁ αὐ-
τός ἐστι καὶ ἐν τοῖς μὴ ἔχουσι γεννητικὸν αἰδοῖον, ὁ τῆς ξη- E
ρᾶς τροφῆς πᾶσι τοῖς ᾠοτόκοις καὶ τοῖς ἔχουσιν αὐτῶν κύ-
στιν, οἷον ταῖς χελώναις. τῆς γενέσεως γὰρ ἕνεκα, οὐ τῆς τοῦ
ὑγροῦ περιττώματος ἐκκρίσεως, εἰσὶ διττοὶ οἱ πόροι. διὰ
δὲ τὸ ὑγρὸν εἶναι τὴν τοῦ σπέρματος φύσιν, καὶ ἡ τῆς ὑγρᾶς
τροφῆς περίττωσις κεκοινώνηκε τοῦ αὐτοῦ πόρου. δῆλον δὲ
τοῦτο, ἐκ τοῦ σπέρμα μὲν πάντα φέρειν τὰ ζῷα, περίτ-
τωμα δὲ μὴ πᾶσι γίνεσθαι ὑγρόν. ἐπεὶ οὖν δεῖ καὶ τοὺς τῶν
ἀρρένων πόρους τοὺς σπερματικοὺς ἠρεμεῖσθαι, καὶ μὴ πλα-
νᾶσθαι, καὶ τοῖς θήλεσι τὰς ὑστέρας· τοῦτο δ' ἀναγκαῖον ἢ πρὸς
τὰ πρόσθια τοῦ σώματος, ἢ πρὸς τὰ ὄπισθεν συμβαίνειν·
τοῖς μὲν ζῳοτόκοις, διὰ τὰ ἔμβρυα, ἐν τοῖς προσθίοις αἱ
ὑστέραι· τοῖς δὲ ᾠοτόκοις, πρὸς τῇ ὀσφύϊ, καὶ τοῖς ὀπισθίοις.

A exterior corporis & frigidus eſt, & offenſioni ex-
poſitus. Teſtes aliis intus, aliis extra : propte-
quòd iis quoque operimento & velamine op-
eſt, tum vt ſeruentur, tum vt ſemen genitale pe-
ficere poſſint. Haud enim fieri poteſt vt frigentes
& gelidi poſſint retrahi, atque emittere genitu-
ram. Quamobrem quibus teſtes in propatulo
ſunt, habent operimentum cuteum, quod ſcro-
tum vocatur. Sed quibus natura cutis præ ſua
duritia obſtat, ne mollis, cutea, & ad comple-
ctendum habilis ſit, vt iis, quæ aut piſcea cute,
aut cortice teguntur, iis intus habeantur neceſſe
B eſt. Quapropter delphini, & quæcunque ceta-
rij generis habent teſtes, intus continent : atque
etiam ouiparæ quadrupedes corticati generis.
Cutis etiam auium dura eſt, vt magnitudini debi-
tæ inhabilis ſit ad comprehendendum. Cauſam
his omnibus deſignari neceſſe eſt, vnà cum iis
quas antea diximus, ex iis quæ per initum, & tem
Veneream accidunt. Hæc eadem cauſa eſt vt &
elephantus ac herinaceus teſtes habeant intus:
cutis enim iis quoque inepta ad habendam parti-
culam, quæ operiat. Situs etiam vterorum con-
trarius in iis quæ animal intra ſe generant, ad ea
quæ oua edunt : atque etiam eius ouipari generis
C in iis quæ vterum infrà habent, ad ea quæ ſuprà
ad ſeptum: verbi gratia, piſcibus ad aues quadru-
pedeſque ouiparas, atque etiam iis quæ modo
vtroque generant, vt oua intra ſe pariant, ani-
mal edant in lucem. Quæ enim intra ſe & foris
animal generant, vterum habent in aluo : vt ho-
mo, bos, canis, & reliqua generis eiuſdem. Nam
ad fœtus tum ſalutem, tum incrementum, expe-
dit nihil ponderis inſidere vteris.

CAPVT XIII.

*Meatus excrementi ſicci, & humidi, in omnibus
animalibus eſſe diuerſos.*

D MEatus etiam diuerſus iis omnibus eſt, quo
excrementum ſiccum & quo humidum
exit. Quamobrem omnia id genus, tam fœ-
minæ quàm mares, genitale habent, quo excre-
mentum ſiccum, & quo humidum ſecernatur,
quoque maribus genitura, fœminis partus emit-
tatur. Parte priore ſuperioreque meatus is con-
tinetur. Quæ autem pariunt quidem oua, ſed
imperfecta, vt piſces ouipari, iis non ſub aluo
ſed lumbis adhęrens vulua continetur. Nec
enim incrementum oui impedimento eſt, quo-
niam inchoatum prodiens ouum foris perficitur:
E & meatus idem excrementarius alimenti ſicci,
& intus eſt omnibus, quæ genitali carent : oui-
paris etiam iis quæ habent veſicam, vt teſtu-
dinibus. Generationis enim cauſa, non excre-
menti emittendi, duplex meatus eſt : ſed quia
ſeminis natura humida eſt, ideo meatus is
communis cum excremento humidi alimen-
ti habetur. Conſtat hoc ita eſſe eo quòd cùm
genitale ſemen omnia animalia ferant, excre-
mentum tamen humidum illud non omnia red-
dunt : ſed cùm & maris ſeminales meatus,
& fœminæ vterum firmari, nec oberrare opor-
teat, idque aut in parte priore corporis, aut in
poſteriore ad prona effici neceſſe ſit : idcirco vi-
uiparis propter fœtum vterus in parte priore
poſitus eſt, ouiparis ad lumbos, & prona.

Quæ autem animal edunt in lucem, cùm intra ſe oua generarint, iis ſitus vterque, quoniam vtrunque referunt genus: & eadem tum viuipara tum ouipara ſunt. Partem enim vuluæ ſuperiorem, in qua oua gignuntur, ſub ſepto ad lumbos & prona habent, inferiorem ad aluum: hac enim iam procreant animal. Meatus idem iis quoque ſicci alimenti, & coitus eſt. Nulli enim ex iis genitale pendet, vt antea dictum eſt. Meatus etiam genitales marium, tum eorum quorum proprij ſunt, tum verò eorum qui teſtes habent, ſimili modo atque vuluæ ouiparorum, habentur. Omnibus enim ad prona & ſpinæ locum adhærent. Non enim vagari ſed ſtabiles eſſe oportet: talis autem locus poſterior eſt: is enim eſt qui continentiam præbeat, & ſtabilitatem. Quibus itaque teſtes intus continentur, iis protinus cum meatibus firmantur. Nec ſecus iis eſt, quibus extrà: tum eôdem deueniunt, ſcilicet in locum genitalis, communique excipiuntur meatu. Similis & delphino meatuum modus eſt, ſed teſtes ſub aluo occulti. Sed quemnam ſitum partes ad generationem accommodatæ, & quas ob cauſas tenuerint in his generibus, dictum iam eſt.

CAPVT XIV.

Cruſtacea, mollia, teſtacea, & inſecta animalia tum inter ſe, tum cum ſanguineis in generatione differre.

CÆteris, quæ ſanguine vacant, animalibus, non idem membrorum ad generationem pertinentium modus: ſed tum inter ipſa tū etiam cum ſanguineis diſſident. Sunt hæc reliqua genera quatuor numero: vnum cruſtatum, ſecundum molle, tertium inſectum, quartum teſtatum. An quarti generis vlla coëant, incertum eſt: plurima tamen non coire apertum eſt. Quemadmodum conſiſtant, poſtea dicemus. Cruſtata coëunt modo eorum quæ in auerſum mingunt, cùm alterum ſupinum, alterum pronum, applicauerint caudas. Etenim ne parte ſupina ſuperueniant pronam, impediunt caudæ præ ſuarum pinnarum prolixa appendice. Habent in hoc genere mares tenues genitales meatus: fœminæ vuluas membraneas ad inteſtinum fiſſas, hinc atque inde, in quibus gignitur ouum.

CAPVT XV.

De coitu & generatione mollium animalium.

MOllia ore coëunt, renixu complexúque mutuo brachiorum. Sic enim coniungi neceſſe eſt, quoniam natura exitum excrementi in os in lectendo adduxerit, vt antea dictum eſt, cùm de partibus ageremus. Habere fœminas omnes in hoc genere membrum vuluale, apertum eſt. Continent enim ouum primò indiſcretum, mox diſcretum in plura, & pariunt omnia imperfecta, modo ouiparorum piſcium. Meatus ille interior idem excrementi & vuluæ eſt, tum in iis tum etiam in cruſtatis. Eſt enim qua ſemen genitale per meatum emittant, idque parte corporis ſupina, qua putamen diſtat,

A ὅσα δ' ᾠοτοκεῖ μὲν ἐν αὑτοῖς, ζῳοτοκεῖ δ' ἐκτός, ταῦτα δ' ἀμφοτέρως ἔχει, διὰ τὸ μετειληφέναι ἀμφοτέρων, καὶ εἶναι καὶ ζῳοτόκα καὶ ᾠοτόκα. τὰ μὲν γὰρ ἄνω τῆς ὑστέρας, ἐν ᾗ γίνεται τὰ ᾠά, ὑπὸ τὸ ὑπόζωμα πρὸς τῇ ὀσφύϊ ἐστὶ, καὶ τοῖς πρανέσι. προϊοῦσα δὲ κάτω, ἐπὶ τῇ γαστρί. ταύτῃ γὰρ ζῳοτοκεῖ ἤδη. ὁ δὲ πόρος εἷς καὶ τούτοις, τῆς τε ξηρᾶς περιττώσεως καὶ τῆς ὀχείας. οὐθὲν γὰρ ἔχει τούτων αἰδοῖον καθάπερ εἴρηται [πρότερον] ἀπηρτημένον. ὁμοίως δ' ἔχουσι καὶ οἱ τῶν ἀρρένων πόροι, καὶ τῶν ἰδίων καὶ τῶν ἐχόντων ὄρχεις, [καὶ μὴ ἐχόντων ὄρχεις,] ταῖς τῶν ᾠοτοκούντων ὑστέραις. πᾶσι γὰρ πρὸς τοῖς πρανέσι πεφύκασι, καὶ κατὰ τὸν B τόπον τῆς ῥάχεως. δεῖ γὰρ μὴ πλανᾶσθαι, ἀλλ' ἑδραίους εἶναι. τοιοῦτος δ' ὁ ὄπισθεν τόπος. οὗτος γὰρ ὁ συνεχὲς παρέχει καὶ τὴν στάσιν. τοῖς μὲν οὖν ἐντὸς ἔχουσι τοὺς ὄρχεις, εὐθὺς ἐρηρεισμένοι εἰσὶν ἅμα τοῖς πόροις· καὶ τοῖς ἐκτὸς δ' ὁμοίως· εἶτ' ἀπαντῶσιν εἰς ἓν πρὸς τὸν τοῦ αἰδοίου τόπον. ὁμοίως δὲ καὶ τοῖς δελφῖσιν οἱ πόροι ἔχουσιν· ἀλλὰ τοὺς ὄρχεις ἔχουσι κεκρυμμένους ὑπὸ τὸ περὶ τὴν γαστέρα κύτος. πῶς μὲν οὖν ἔχουσι τὴν θέσιν περὶ τὰ μόρια τὰ συντελοῦντα πρὸς τὴν γένεσιν, καὶ διὰ τίνας αἰτίας, εἴρηται.

ΚΕΦΑΛ. ιδ'.

C Ὅτι τῶν ἀναίμων γένη τέτταρα· καὶ πρῶτον περὶ τῆς τῶν ἐστρακοδέρμων καὶ τῶν μαλακοστράκων γενέσεως.

ΤΩν δ' ἄλλων ζῴων τῶν ἀναίμων, οὐχ ὁ αὐτὸς τρόπος τῶν μορίων τῶν πρὸς τὴν γένεσιν συντελούντων, οὔτε τοῖς ἐναίμοις, οὔθ' ἑαυτοῖς. ἔστι δὲ γένη τέτταρα τὰ λοιπά· ἓν μὲν, τὸ τῶν μαλακοστράκων· δεύτερον δὲ, τὸ τῶν μαλακίων· τρίτον δὲ, τὸ τῶν ἐντόμων· καὶ τέταρτον, τὸ τῶν ὀστρακοδέρμων. τούτων δὲ περὶ μὲν πάντων ἄδηλον· τὰ γὰρ πλεῖστα ὅτι οὐ συνδυάζεται, φανερόν· τίνα δὲ συνίσταται τρόπον, ὕστερον λεκτέον. τὰ δὲ μαλακόστρακα συνδυάζεται μὲν, ὥσπερ τὰ ὀπισθουρητικά, ὅταν τὸ μὲν ὕπτιον, τὸ δὲ πρη- D νὲς, ἐπαλλάξῃ τὰ οὐραῖα. τοῖς γὰρ ὑπτίοις πρὸς τὰ πρανῆ ἐπιβαίνειν ἐμποδίζει τὰ οὐραῖα μακρὰν ἔχοντα τὴν ἀπάρτησιν τῶν πτερυγίων. ἔχουσι δὲ οἱ μὲν ἄρρενες λεπτοὺς πόρους θορικούς· αἱ δὲ θήλειαι, ὑστέρας ὑμενώδεις παρὰ τὸ ἔντερον, ἔνθεν καὶ ἔνθεν ἐσχισμένας· ἐν αἷς ἐγγίνεται τὸ ᾠόν.

ΚΕΦΑΛ. ιε'.

Περὶ τῶν μαλακίων συνδυασμοῦ καὶ γενέσεως.

ΤΑ δὲ μαλάκια συμπλέκεται μὲν κατὰ τὸ στόμα, ἀντερείδοντα καὶ διαπλέκοντα τὰς πλεκτάνας. συμ- E πλέκεται δὲ τὸν τρόπον τοῦτον διὰ ἀνάγκης. ἡ γὰρ φύσις περὶ τὸ στόμα τὴν τελευτὴν τοῦ περιττώματος συνήγαγε κάμψασα, καθάπερ εἴρηται πρότερον ἐν τοῖς περὶ τῶν μορίων λόγοις. ἔχει δ' ἡ θήλεια μὲν, ὑστερικὸν μόριον φανερῶς ἐν ἑκάστῳ τούτων τῶν ζῴων· ᾠὸν γὰρ ἔχει, τὸ μὲν πρῶτον, ἀδιαίρετον· ἔπειτα διακρινόμενον, γίνεται πολλά, καὶ ἀποτίκτει ἕκαστον τούτων ἀτελές, καθάπερ καὶ οἱ ᾠοτοκοῦντες τῶν ἰχθύων. ὁ δὲ πόρος ὁ αὐτὸς τοῦ περιττώματος καὶ τοῦ ὑστερικοῦ μορίου, καὶ τοῖς μαλακοστράκοις, καὶ τούτοις. ἔστι γὰρ ᾗ τὸν θορὸν ἀφιᾶσι διὰ τοῦ πόρου. ταῦτα δ' ἐστὶν ἐν τοῖς ὑπτίοις τοῦ σώματος, ᾗ τὸ κέλυφος ἀφέστηκε,

καὶ θύραζε εἰσέρχεται· διὸ ὁ συνδυασμὸς κατὰ τοῦτο γίγνεται τῷ ἄρρενι πρὸς τὴν θήλειαν. ἀναγκαῖον γὰρ ὅταν ἀφίησιν ὁ ἄρρην, εἴτε σπέρμα, εἴτε μόριον, εἴτε ἄλλην τινὰ δύναμιν, κατὰ τὸν ὑστερικὸν πόρον πλησιάζειν. ἡ δὲ τῆς πλεκτάνης τοῦ ἄρρενος, διὰ τοῦ αὐλοῦ δίεσις ἐπὶ τῶν πολυπόδων, ᾗ φασιν ὀχεύειν πλεκτάνῃ οἱ ἁλιεῖς, συμπλοκῆς χάριν ἐστὶν, ἀλλ' οὐχ ὡς ὀργάνου χρησίμου πρὸς τὴν γένεσιν· ἔξω γάρ ἐστι τοῦ πόρου καὶ τοῦ σώματος. ἐνίοτε δὲ συνδυάζονται καὶ ἐπὶ τὰ πρανῆ τὰ μαλάκια. πότερον δὲ γενέσεως χάριν, ἢ δι' ἄλλην αἰτίαν, οὐδὲν ὦπται πω.

ΚΕΦΑΛ. ιϛ'.

Περὶ τῶν ἐντόμων συνδυασμοῦ καὶ γενέσεως. Πῶς ἡ θήλεια ἄρρενος διαφέρει ἐν τῷ τῶν ἐντόμων γένει, καὶ ἰχθύων, καὶ τετραπόδων τῶν ᾠοτόκων.

Τῶν δὲ ἐντόμων τὰ μὲν, συνδυάζονται, καὶ ἡ γένεσις αὐτῶν ἐστιν ἐκ ζῴων συνωνύμων, καθάπερ ἐπὶ τῶν ἐναίμων· οἷον αἵ τε ἀκρίδες καὶ οἱ τέττιγες, καὶ τὰ φαλάγγια, καὶ οἱ σφῆκες, καὶ οἱ μύρμηκες. τὰ δὲ, συνδυάζεται μὲν καὶ γεννῶσιν, οὐχ ὁμογενῆ δ' αὐτοῖς, ἀλλὰ σκώληκας μόνον· οὐδὲ γίγνονται ἐκ ζῴων, ἀλλ' ἐκ σηπομένων ὑγρῶν τὰ δὲ, ξηρῶν, οἷον αἵ τε ψύλλαι, καὶ αἱ μυῖαι, καὶ αἱ κανθαρίδες. τὰ δὲ, οὔτ' ἐκ ζῴων γίνονται, οὔτε συνδυάζονται, καθάπερ ἐμπίδες τε καὶ σκώληκες, καὶ πολλὰ τοιαῦτα γένη. τῶν δὲ συνδυαζομένων, ἐν τοῖς πλείστοις τὰ θήλεα μείζω τῶν ἀρρένων ἐστί. πόρους δὲ τὰ ἄρρενα θορικοὺς οὐ φαίνεται ἔχοντα. ἀφίησι δὲ (ὡς ἐπὶ τὸ πλεῖστον εἰπεῖν) τὸ ἄρρεν ἐπὶ τὸ θῆλυ, οὐδὲν μόριον, ἀλλὰ τὸ θῆλυ ἐπὶ τὸ ἄρρεν κάτωθεν ἄνω. τεθεώρηται δὲ τοῦτο ἐπὶ πολλῶν, καὶ περὶ τῆς ἀναβάσεως ὡσαύτως· τοὐναντίον δ' ἐπ' ὀλίγων· ὥστε δὲ καὶ γένει διελεῖν, οὔπω συνεώραται). σχεδὸν δὲ τοῦτο καὶ ἐπὶ τῶν ᾠοτόκων ἰχθύων τῶν πλείστων ἐστὶ, καὶ ἐπὶ τῶν τετραπόδων καὶ ᾠοτόκων. τὰ γὰρ θήλεα μείζω τῶν ἀρρένων ἐστὶ, διὰ τὸ συμφέρειν πρὸς τὸν γινόμενον αὖθις ὑπὸ τῶν ᾠῶν ὄγκον ἐν τῇ κυήσει. τοῖς δὲ θήλεσιν αὐτῶν τὸ ταῖς ὑστέραις ἀνάλογον μόριον, ἐσχισμένον ἐστὶ περὶ τὸ ἔντερον, ὥσπερ καὶ τοῖς ἄλλοις· ἐν ᾧ ἐγγίγνεται τὰ κυήματα. δῆλον δὲ τοῦτο ἐπί τε τῶν ἀκρίδων, καὶ ὅσα μέγεθος αὐτῶν ἔχει, συνδυάζεσθαι πεφυκότων. τὰ γὰρ πλεῖστα μικρὰ λίαν ἐστὶ τῶν ἐντόμων. τὰ μὲν οὖν περὶ τὴν γένεσιν ὄργανα τοῖς ζῴοις, περὶ ὧν οὐκ ἐλέχθη πρότερον, τοῦτον ἔχει τὸν τρόπον. τῶν δὲ ὁμοιομερῶν ἀπελείφθη περὶ γονῆς καὶ γάλακτος. περὶ ὧν καιρός ἐστιν εἰπεῖν περὶ μὲν γονῆς ἤδη, περὶ δὲ γάλακτος ἐν τοῖς ἐχομένοις.

ΚΕΦΑΛ. ιζ'.

Τίνα τῶν ζῴων σπέρμα προΐεται, τίνα δ' οὔ. Ζητήματα διάφορα περὶ σπέρματος.

Τὰ μὲν γὰρ προΐεται φανερῶς τῶν ζῴων, οἷον ὅσα αὐτῶν ἔναιμα τὴν φύσιν ἐστί. τὰ δὲ ἔντομα καὶ μαλάκια πότερον, ἄδηλον. ὥστε τοῦτο θεωρητέον, πότερον πάντα προΐεται σπέρμα τὰ ἄρρενα, ἢ οὐ πάντα· καὶ εἰ μὴ πάντα, διὰ τίνα αἰτίαν τὰ μὲν, τὰ δ' οὔ· καὶ τὰ θήλεα δὲ πότερον συμβάλλεται σπέρμα τι, ἢ οὔ· καὶ εἰ μὴ σπέρμα, πότερον οὐδ' ἄλλο οὐθὲν, ἢ συμβάλλεται μέν τι, οὐ σπέρμα δέ. ἔτι δὲ καὶ τὰ προϊέμενα σπέρμα, τί συμβάλλεται διὰ τοῦ σπέρματος πρὸς τὴν γένεσιν,

A & mare illabitur, faciunt. Quamobrem ea parte mas cum fœmina copulatur. Nam ſi ma[illegible], ſiue ſemen, ſiue membrum, aut aliquam [illegible]tem, ſiue vim aliam mittat, admoueri ad meatum vulualem neceſſe eſt. Crinis verò inſertio maris polypi per fiſtulam, qua piſcatores crine coire polypos aiunt, complexus gratia fit, non quaſi inſtrumentum id ſit vtile ad generationem: etenim extra meatum corpúſque eſt. Interdum tergis quoque mollia copulantur: ſed generationiſne gratia, an alia cauſa, nondum exploratum habetur.

CAPVT XVI.

B *De coitu, & generatione inſectorum.*

INſectorum aliqua coeunt, atque ex animalibus eiuſdem generis oriuntur, modo eorum quibus eſt ſanguis: vt locuſtæ, cicadæ, phalangia, veſpæ, formicæ: aliqua coëunt quidem, & generant, ſed non ſui generis animal, ſed vermiculos tantùm, neque ex animalibus procreantur, ſed ex putreſcente humido aut ſicco: vt pulices, muſcæ, ſcarabei. Quædam nec ex animalibus naſcuntur, neque coeunt: vt culices, & vermiculi, & plura eiuſmodi genera. Inter ea verò quæ coëunt, fœminæ maxima ex parte maiores maribus

C ſunt: nec meatus vlli ſeminales in maribus eſſe videntur. Nullum, parte plurima dixerim, membrum fœminæ à mare inſeritur, ſed mari à fœmina ſurſum de parte inferiore: quod conſpectum in pluribus eſt. Nec de ſuperuentu ambigitur: ſed contrà, vt mas fœminæ inſerat, viſum in paucis eſt. Neque adhuc ita exploratum habetur, vt genere poſſimus diſtinguere. Hoc idem ferè in piſcibus quoque ouiparis maxima ex parte, & in quadrupedibus ouiparis eſt, vt fœminæ maiores ſint maribus: quoniam id commodum eſt ad vterum magna ouorum copia extumeſcentem. Fœminis in eo genere membrum, quod pro vulua habetur, fiſſum iuxta inteſtinum, vt cæteris, po-

D ſitum eſt, in quo fœtus generatur. Patet hoc in locuſtis, & reliquis, quorum magnitudo aliqua ſit, & natura coitum recipiat. Maxima enim pars generis inſecti perexigua eſt. Inſtrumenta generationi accommodata, de quibus non antea diſſeruimus, ita ſe habent. Similarium partium ſemen genitale, & lac reliquimus, de quibus nunc opportunè dicemus: & primùm in ſemine, pòſt in ſequentibus, de lacte.

CAPVT XVII.

Quæ animalia ſemen emittant, quæ non: & quorundam opinio, qui ſemen ex vnaquaque corporis parte prouenire affirmant.

SEmen alia apertè emittunt, vt ea quæ ſunt

E natura ſanguinea: alia, id eſt, inſecta, & mollia, emittant néćne incertum eſt. Itaque conſiderandum hoc eſt, vtrùm mares omnes ſemen emittant, an non omnes: & ſi non omnes, cur alij emittant, alij non. Tum etiam, vtrùm fœminæ ſemen aliquod conferãt ad procreationem, an non: & ſi nõ ſemen, vtrùm nec aliud quicquam adhibeant: an quamuis non ſemen, tamen aliquid conferant. Adhæc, quidnam conducant ea quæ ſemen emittunt ſuo ſemine ad generationem,

quærendum

quærendum eſt: atque omnino quæ natura ſit ſeminis, & eorum quæ menſtrua vocantur, ſcilicet in iis animalibus quæ id humoris genus emittunt. Omnia ex ſemine gigni, ſemen autem ipſum proficiſci à generantibus videtur. Quamobrem eiuſdem ſtudij eſt quæſtio, vtrùm ambo, mas & fœmina, emittant, an alter tantùm: & vtrùm ex toto corpore ſecernitur, an nō ex toto. Nā ſi non ex toto, nec ex ambobus quidē parentibus prodire probabile eſt. Quapropter primùm de hoc, quemadmodum ſe habeat, inquirendum eſt. Sunt enim qui dicant id ex toto corpore prouenire. Quibus autem argumentis probent, vt ſemen ex vnaquaque corporis parte ſecernatur, quatuor ferè numero ſunt. Primùm vehementia voluptatis. magis enim ſuaue eſt quod idē amplioris ſit affectus: amplius autem eſt, quod omnibus membris, quàm quod paucis accidat. Secundum, quòd ex mancis manca procreentur, ſemen enim ab ea, quæ deeſt, parte proficiſci negant. Vnde autem non acceſſerit, id ne procreetur, accidit. Tertium, ſimilitudo parentum: ſimiles enim gignuntur, vt toto corpore toti, ſic particulatim ſingulis partibus. Quòd ſi cauſa eſt vt totum ſimile ſit, quòd ex tali toto ſemen genitale prodierit, partibus quoque cauſa ſimilitudinis erit, quòd ex vnaquaque parte aliquid venerit. Quartum, quòd ratio eſſe videtur vt quemadmodum totius aliquid eſt, ex quo primum generetur, ſi partis quoque cuiuſque ſit ſemen aliquod proprium. Fidem etiam illa faciunt huic opinioni veriſimilem: non ſolùm enim rebus naturæ inſitis & natiuis, liberi ſimiles parentibus prodeunt: ſed etiam aduentitias atque externas præſentant. Iam enim cùm parentes cicatrices haberent, filij quidam parte eadem ſui corporis idem habuerunt. Et Chalcedone, cùm pater brachio eſſet compuncto, filius idem retulit, confuſa tamen nota, minùſque explanata. His ferè rationibus quidam potiſſimùm crediderunt, ſemen à toto corpore proficiſci.

CAPVT XVIII.

Improbatio in eos qui dicunt ſemen ex omnibus corporis partibus prouenire, ſeménque eſſe excrementum.

SEd, cùm ſcrutamur, & diligentiùs rem diſcutimus, contrà potiùs eſſe videtur. Nec ſuprà dicta quatuor illa ſoluere difficile eſt, & quædam alia ſequuntur impoſſibilia ex ea ipſa opinione. Primùm igitur ſimilitudo nullum indicium affert, vt ſemen genitale ex toto corpore ſecedat: quandoquidem & voce, & vnguibus, & pilis, & motu ſimiles procreantur, ex quibus nihil prouenit. Nonnulla etiam nondum habent cùm generant, vt canos, aut barbam. Maioribus item ſuis plerumque ſimiles ſunt, ex quibus nihil ſeceſſit. Redditur enim poſt plura genera ſimilitudo: vt in Helide, quæ cum Æthiope concubuerat, non filiam forma Æthiops peperit, ſed natus ex filia erat Æthiops. In ſtirpibus etiam eadem ratio eſt: nam ſi hoc ita eſſet, in iis quoque ab omnibus partibus ſemen proculdubio proficiſceretur. At pleraſque partes, aut illæ non habent, aut quiſque abſcindere poteſt, aut poſtgenitas habent. Quin etiam ex fructibus nihil ſecedit, & tamen ij quoque forma eadem proueniunt.

A σκεπτέον· καὶ ὅλως τίς ἐστιν ἡ τοῦ σπέρματος φύσις, καὶ ἡ τῶν καλουμένων καταμηνίων, ὅσα τοῦτον τὸν ὑγρὸν προΐεται τῶν ζῴων. δοκεῖ δὲ πάντα γίνεσθαι ἐκ σπέρματος· τὸ δὲ σπέρμα, ἐκ τῶν γεννώντων. διὸ τοῦ αὐτοῦ λόγου ἐστὶ, πότερον τὸ ἄρρεν καὶ τὸ θῆλυ προΐεται ἄμφω, ἢ θάτερον μόνον· καὶ πότερον ἀπὸ παντὸς ἀπέρχεται τοῦ σώματος, ἢ οὐκ ἀπὸ παντός. εὔλογον γὰρ, εἰ μὴ ἀπὸ παντὸς, μηδ' ἀμφοτέρων τῶν γεννώντων. Διόπερ καὶ ἐπισκεπτέον, ἐπειδή φασί τινες ἀπὸ παντὸς ἀπιέναι τοῦ σώματος, περὶ τούτου πῶς ἔχει πρῶτον. ἔστι δὲ σχεδὸν οἷς ἄν τις χρήσαιτο τεκμηρίοις, ὡς ἀφ' ἑκάστου τῶν μορίων ἀπιόντος B τοῦ σπέρματος, τέτταρα. πρῶτον μὲν, ἡ σφοδρότης τῆς ἡδονῆς. μᾶλλον γὰρ ἡδὺ ταὐτὸ πλέον γινόμενον πάθος. πλέον δὲ, τὸ πᾶσι τοῖς μορίοις, ἢ τὸ ἑνὶ, ἢ ὀλίγοις συμβαῖνον αὐτῶν. ἔτι τὸ ἐκ κολοβῶν κολοβὰ γίνεσθαι. διὰ μὲν γὰρ τὸ τοῦ μορίου ἐνδεὲς εἶναι, οὐ βαδίζειν σπέρμα ἐντεῦθέν φασιν· ὅθεν δ' ἂν μὴ ἔλθῃ τοῦτο, συμβαίνειν μὴ γίνεσθαι. πρὸς δὲ τούτοις αἱ ὁμοιότητες πρὸς τοὺς γεννήσαντας. γίνονται γὰρ ἐοικότες ὥσπερ καὶ τὸ ὅλον σῶμα, καὶ τὰ μόρια μορίοις. εἴπερ οὖν καὶ τοῦ ὅλου αἴτιον τῆς ὁμοιότητος τὸ ἀφ' οὗ ἦλθε τὸ σπέρμα, καὶ τοῖς μορίοις ἂν αἴτιον εἴη, τὸ ἀφ' ἑκάστου τι τῶν μορίων ἐλθεῖν. ἔτι δὲ καὶ * εὔλογος ἂν εἶναι δόξειεν, ὥσπερ καὶ τοῦ ὅλου ἐστί τι, ἐξ C οὗ γίνεται τὸ πρῶτον, οὕτω καὶ τῶν μορίων ἑκάστου εἶναι ἄν τι σπέρμα ἴδιον. πιθανὰ δὲ καὶ τὰ τοιαῦτα μαρτύρια ταύταις ταῖς δόξαις. οὐ γὰρ μόνον τὰ σύμφυτα προσεοικότες τοῖς γονεῦσι γίνονται οἱ παῖδες, ἀλλὰ καὶ τὰ ἐπίκτητα. οὐλάς τε γὰρ ἐχόντων τῶν γεννησάντων, ἤδη τινὲς ἔσχον ἐν τοῖς αὐτοῖς τόποις τῶν ἐκγόνων, τὸν τύπον τῆς οὐλῆς· καὶ στίγμα ἔχοντος ἐν τῷ βραχίονι τοῦ πατρὸς, ἐπεσημαίνετο ἐν Χαλκηδόνι τῷ τέκνῳ συγκεχυμένον μέντοι καὶ οὐ διηρθρωμένον τὸ γράμμα. ὅτι μὲν οὖν ἀπὸ παντὸς ἔρχεται τὸ σπέρμα, σχεδὸν ἐκ τούτων μάλιστα πιστεύουσί τινες.

* Scrib. εὔλογον ἂν δόξειεν, ἢ ὑ… ſublato ἂν poſt … vel δόξειεν, ὥσπερ γάρ.

D

ΚΕΦΑΛ. ιη'.

Τί τὸ σπέρμα, καὶ πόθεν.

ΦΑίνεται δ' ἐξετάζουσι τὸν λόγον τοὐναντίον μᾶλλον· τὰ τέτταρα δὲ τὰ εἰρημένα λύειν, οὐ χαλεπόν. καὶ πρὸς τούτοις ἄλλα συμβαίνει λέγειν ἀδύνατα. πρῶτον μὲν οὖν ὅτι οὐδὲν σημεῖον ἡ ὁμοιότης, τοῦ ἀπιέναι ἀπὸ παντὸς, ὅτι καὶ φωνὴν καὶ ὄνυχας καὶ τρίχας ὅμοιοι γίγνονται, καὶ τὴν κίνησιν, ἀφ' ὧν οὐδὲν ἀπέρχεται. ἔνια δὲ οὐκ ἔχουσί πω ὅταν γεννῶσιν, οἷον τρίχωσιν πολιῶν, E ἢ γενείου. ἔτι τοῖς ἄνωθεν γονεῦσιν, ἐοίκασιν, ἀφ' ὧν οὐδὲν ἀπῆλθεν. ἀποδιδόασι γὰρ διὰ πολλῶν γενῶν αἱ ὁμοιότητες, οἷον καὶ ἐν Ἤλιδι ἡ τῷ Αἰθίοπι συγγενομένη. οὐ γὰρ ἡ θυγάτηρ ἐγένετο, ἀλλ' ὁ ἐκ ταύτης, Αἰθίοψ. καὶ ἐπὶ τῶν φυτῶν δὲ ὁ αὐτὸς λόγος. δῆλον γὰρ ὅτι καὶ τούτοις ἀπὸ πάντων ἂν τῶν μερῶν τὸ σπέρμα γίγνοιτο. πολλὰ δὲ, τὰ μὲν, οὐκ ἔχει· τὰ δὲ, ἀφέλοι τις ἄν· τὰ δὲ προσφύεται. ἔτι οὐδ' ἀπὸ τῶν περικαρπίων ἀπέρχεται. καίτοι καὶ ταῦτα γίνεται τὴν αὐτὴν ἔχοντα μορφήν. Hiſt.li.7.c.6.

ἔτι δὲ πότερον ἀπὸ τῶν ὁμοιομερῶν μόνον ἀπέρχεται, ἀφ' ἑκάστου, οἷον ἀπὸ σαρκὸς, καὶ ὀστοῦ, καὶ νεύρου· ἢ καὶ ἀπὸ τῶν ἀνομοιομερῶν, οἷον προσώπου καὶ χειρός; εἰ μὲν γὰρ ἀπ' ἐκείνων μόνον, ἐοίκασι δὲ κατὰ ταῦτα μᾶλλον τοῖς γονεῦσι, τὰ ἀνομοιομερῆ, οἷον πρόσωπα, καὶ χεῖρας, καὶ πόδας· εἴπερ οὖν μηδὲ ταῦτα τῷ ἀπὸ παντὸς ἀπελθεῖν, τί κωλύει μηδ' ἐκεῖνα τῷ ἀπὸ παντὸς ἀπελθεῖν ὅμοια εἶναι; ἀλλὰ δι' ἄλλην αἰτίαν. εἰ δ' ἀπὸ τῶν ἀνομοιομερῶν μόνον, οὐκ ἂν ἀπὸ πάντων. προσήκει δὲ μᾶλλον ἀπ' ἐκείνων. πρότερα γὰρ ἐκεῖνα, καὶ σύγκειται τὰ ἀνομοιομερῆ ἐξ ἐκείνων. καὶ ὥσπερ πρόσωπα καὶ χεῖρας γίγνονται ἐοικότα, οὕτω καὶ σάρκας καὶ ὄνυχας. εἰ δ' ἀπ' ἀμφοτέρων, τίς ὁ τρόπος ἂν εἴη τῆς γενέσεως; σύγκειται γὰρ ἐκ τῶν ὁμοιομερῶν τὰ ἀνομοιομερῆ, ὥστε τὸ ἀπὸ τούτων ἀπιέναι, τὸ ἀπ' ἐκείνων ἂν εἴη ἀπιέναι, καὶ τῆς συνθέσεως, ὥσπερ κἂν εἰ ἀπὸ τοῦ γεγραμμένου ὀνόματος· εἰ μὲν ἀπὸ παντὸς, κἂν ἀπὸ τῶν συλλαβῶν ἑκάστης· εἰ δ' ἀπὸ τούτων, ἀπὸ τῶν στοιχείων καὶ τῆς συνθέσεως. ὥστ' εἴπερ ἐκ πυρὸς καὶ τῶν τοιούτων σάρκες καὶ ὀστᾶ συνεστᾶσιν, ἀπὸ τῶν στοιχείων ἂν εἴη μᾶλλον. ἀπὸ γὰρ τῆς συνθέσεως πῶς ἐνδέχεται; ἀλλὰ μὴν ἄνευ γε ταύτης οὐκ ἂν εἴη ὅμοια. ταύτην δ' εἴ τι δημιουργεῖ ὕστερον, τοῦτ' ἂν εἴη τῆς ὁμοιότητος αἴτιον, ἀλλ' οὐ τὸ ἀπελθεῖν ἀπὸ παντός. ἔτι εἰ μὲν διεσπασμένα τὰ μέρη ἐν τῷ σπέρματι, πῶς ζῇ; εἰ δὲ συνεχῆ, ζῷον ἂν εἴη μικρόν. καὶ τὰ τῶν αἰδοίων πῶς; οὐ γὰρ ὅμοιον τὸ ἀπιὸν ἀπὸ τοῦ ἄρρενος καὶ τοῦ θήλεος. ἔτι εἰ ἀπ' ἀμφοτέρων ὁμοίως ἀπὸ πάντων ἔρχεται, δύο γίγνεται ζῷα. * ἑκατέρων γὰρ ἅπαντα ἕξει. διὸ καὶ Ἐμπεδοκλῆς ἔοικεν, εἴπερ οὕτω λεκτέον, μάλιστα λέγειν ὁμολογουμένως τούτῳ τῷ λόγῳ, τό γε τοσοῦτον. ἀλλ' εἴπερ ἑτέρᾳ πῃ, οὐ καλῶς. φησὶ γὰρ ἐν τῷ ἄρρενι καὶ ἐν τῷ θήλει οἷον σύμβολον εἶναι, ὅλον δ' ἀπ' οὐδετέρου ἀπιέναι.

* γ. ἑκάτερον

Ἀλλὰ διέσπασται μελέων φύσις, ἡ μὲν ἐν ἀνδρός.

διὰ τί γὰρ οὐ τὰ θήλεα ἐξ αὑτῶν γεννᾷ, εἴπερ ἀπὸ παντός τε ἀπέρχεται, καὶ ἔχει ὑποδοχήν; ἀλλ' ὡς ἔοικεν ἢ οὐκ ἀπέρχεται ἀπὸ παντὸς, ἢ οὕτως ὥσπερ ἐκεῖνος λέγει, οὐ ταὐτὰ ἀφ' ἑκατέρου. διὸ καὶ δέονται τῆς ἀλλήλων συνουσίας. ἀλλὰ καὶ τοῦτ' ἀδύνατον. ὥσπερ γὰρ καὶ μεγάλα ὄντ' ἀδύνατον διεσπασμένα σῴζεσθαι, καὶ ἔμψυχα εἶναι, καθάπερ Ἐμπεδοκλῆς γεννᾷ ἐπὶ τῆς φιλότητος λέγων,

Ἡ μὲν πολλαὶ κόρσαι ἀναύχενες ἐβλάστησαν.

εἶθ' οὕτω συμφύεσθαί φησι. τοῦτο δὲ φανερὸν ὅτι ἀδύνατον. οὔτε γὰρ μὴ ψυχὴν ἔχοντα, οὔτε μὴ ζωήν τινα, δύναιτ' ἂν σῴζεσθαι, οὔτε ὥσπερ ζῷα ὄντα πλείω συμφύεσθαι, ὥστε εἶναι πάλιν ἕν. ἀλλὰ μὴν τοῦτον τὸν τρόπον συμβαίνει λέγειν τοῖς ἀπὸ παντὸς ἀπιέναι φάσκουσιν, ὥσπερ τότ' ἐν τῇ γῇ ἐπὶ τῆς φιλότητος, οὕτω τούτοις ἐν τῷ σώματι. ἀδύνατον γὰρ συνεχῆ τὰ μόρια γίγνεσθαι, καὶ ἀπιέναι εἰς ἕνα τόπον συνιόντα. εἶτα πῶς καὶ * διεσπάσθαι τὰ ἄνω καὶ κάτω, καὶ δεξιὰ καὶ ἀριστερὰ, καὶ ἔμπροσθεν καὶ ὄπισθεν; πάντα γὰρ ταῦτα ἄλογα. ἔτι δὲ τὰ μέρη, τὰ μὲν δυνάμει, τὰ δὲ πάθεσι διώρισται· τὰ μὲν ἀνομοιομερῆ, τῷ δύνασθαί τι ποιεῖν, οἷον γλῶττα καὶ χείρ· τὰ δὲ ὁμοιομερῆ, σκληρότητι καὶ μαλακότητι, καὶ τοῖς ἄλλοις τοῖς τοιούτοις πάθεσιν. οὐ πάντως οὖν ἔχον αἷμα ἐστὶ καὶ σάρξ. δῆλον τοίνυν ὅτι ἀδύνατον τὸ ἀπελθὸν εἶναι συνώνυμον τοῖς μέρεσιν,

* γ. διεσπᾶσθαι

A Ad hæc, vtrùm ex vnaquaque ſimilari parte tantùm prodit, verbi gratia, carne, oſſe, neruo: an etiam ex diſſimilaribus, vt facie, & manu? Nam ſi ex illis tantùm, ſimiles autem parentibus ſunt, partium potiùs diſſimilarium forma, vt faciei, manuum, pedum, quidnam obſtet, ne illæ quoque ſimiles ſint ſeceſſu ex toto? Sed alia cauſa, quando nec in ipſis quidem ſimilitudo propterea ſit, quia ex toto corpore ſemen genitale ſeceſſerit. Sed ſi ex diſſimilaribus tantùm, ergo non ex toto, & partibus omnibus. At ex ſimilaribus magis conueniat: ſunt enim priores, & diſſimilares ex ſimilaribus conſtant. Et vt facie ac manibus ſimiles procreantur, ſic & carne, & vnguibus. At verò ſi ex vtriſque quiſnam modus ſit generationis?
B Conſtant enim partes diſſimilares ex ſimilaribus. Itaque quod ex iis ſecedit, ex illis quoque ſeceſſerit, atque ex ipſa compoſitione perinde quaſi à nomine ſcripto, quippiam proficiſcatur, ſi à toto vel à quauis ſyllaba proficiſcitur. Quòd ſi à ſyllabis, ab elementis compoſitionéque prodierit. Itaque ſi ex igne, & reliquis eiuſmodi, carnes oſſave conſtant, ex elementis potiùs fuerint. nam ex compoſitione quonam pacto poſſint? Atqui ſine ea ſimile eſſe nihil poterit. Quòd ſi quid eam poſtea creat, id cauſa ſimilitudinis fuerit, non ſeceſſio ex toto. Item ſi partes diſtractæ in ſemine ſint, quonam pacto viuat? Sed ſi coniunctæ,
C paruum quoddam animal fuerit. Genitales etiam partes quonam pacto conſiſtant? Non enim ſimile eſt, quod à mare & fœmina ſecedit. Item ſi vtriuſque ſemen æquè ex toto venit, duo animalia generabuntur: vtrumque enim omnia habebit. *Quamobrem Empedocles maximè (ſi ita dicendum eſt) conſentanea huic rationi ſcripſiſſe videtur hoc quidem loco: nam ſi alibi diuerſa, non bene. Dicit enim, maris ac fœminæ quaſi ſymbolum eſſe, totum verò à neutro proficiſci:

Sed diſcerpta gerunt mas ipſe & fœmina membra.

Cur enim fœmina non ex ſe ipſa generet, ſi quidem ſemen ex toto ſecedit, & conceptaculum
D obtinet? Sed, vt videtur, aut non ex toto ſecedit, aut ita, vt ille ait, non ex vtroque eadem ſecedunt: quapropter alterum alterius coitum deſiderat. Sed impoſſibile illud quoque occurrit: nec enim maiora poſſunt diſtracta ſeruari, animataque eſſe: quomodo Empedocles generat amore, cùm dicit:

Multáque ponuntur capita abſque ſua ceruice.

mox enim coaleſcere coagmentarique ait. Quod fieri non poſſe, apertum eſt, quando nec anima vitaque omni vacua ſeruari poſſent, neque velvti plura animalia coaleſcere in vnum. Et iis qui ex toto ſecedere aiunt, accidit, vt eodem modo quo ille, dicant. Nam vt tum amore in
E terra, ſic iis in corpore agitur. Non enim fieri poteſt vt partes coniungantur, commeandóque eòdem deueniant. Tum etiam quonam pacto dirimantur ſuperiora, inferiora, dextra, ſiniſtra, priora, poſteriora? Hæc enim omnia carent ratione. Item cùm partium aliæ facultate, aliæ affectibus diſtinguantur, videlicet diſſimilares eo quòd efficere aliquid poſſint, vt lingua, vt manus: ſimilares, duritia, mollitia, & reliquis eiuſmodi affectionibus, (non enim vtcumque ſe habet, ſanguis eſt, aut caro) conſtat ob eam rem fieri non poſſe, vt quod ſeceſſerit, vniuocum ſit cum partibus corporis: verbi gratia,

vt ſanguis à ſanguine, caro à carne proueniat. At ſi ex diuerſo quodam ſanguis fiat, non ea cauſa ſimilitudinis fuerit, quòd ex omnibus partibus deceſſerit: vt aiunt, qui ita opinantur. Satis eſt enim ex vna tantum ſecedere, quandoquidem non ſanguis ex ſanguine gignitur. Cur enim non omnia vel ex vno gignantur? Hæc enim ſententia eadem eſſe videtur, atque illa Anaxagoræ, vt nullum ſimilare gignatur: niſi quòd ille commune id de omnibus aſſerit, hi verò generationi tantùm animalium tribuunt. Adhæc, quonam pacto iſta augeantur, cùm ex toto ſeceſſerint? Anaxagoras enim probè ait, carnes ex alimento carni accedere: ſed iis qui eadem non dicunt, & tamen ſecedere ex toto pronuntiant, quonam pacto alio accedente magis quicquam efficietur, ſi, quod acceſſerit, maneat? At ſi mutari, quod acceſſerit, poteſt, cur non iam inde ab initio ſemen ſit tale, vt gigni ex eo poſſit ſanguis & caro, non ipſum ſit ſanguis & caro? Nec verò dici poteſt, temperatione poſt augeri perinde, vt vinum aqua adiecta. Ita enim principio maximè ſyncerum meracúmque eſſet vnumquodque. Nunc verò & caro, & os, & quæuis alia pars, quod dicitur, id poſtmodum magis eſt. Seminis autem partem aliquam dici neruum eſſe, aut os, longè plus eſt quàm vt noſter ſenſus aſſequi poſſit. Ad hæc, ſi fœmina & mas differunt inter ſe vteri ratione, vt Empedocles ait:

Funditur in puris mas, fœmina frigore miſſo:

mutari videmus tam viros quã mulieres, vt quemadmodum ex infœcũdis fœcundi, ſic ex habilibus fœminæ procreãdæ, ad maris procreationem propenſi euadant, quaſi non ſit cauſa in ſecedendo ex toto, necne, ſed in moderatione immoderatione ve eius, quod ex muliere viróque ſecedat, aut ob aliquam eiuſmodi cauſam. Si hoc, inquam, ita eſſe ponamus, conſtat non propterea eſſe fœminam, quia ex quodam ſeceſſerit. Itaque nec partem quidem, quam propriam habet mas, aut fœmina, ſeceſſu conſiſtere. Siquidem ſemen idem & mas effici poteſt, & fœmina, tanquam non alterutra pars in ſemine ſit. Quid igitur referat, de hac parte ita dicatur, an de cæteris? Nam ſi ſemen ab vtero non prouenit: eadem cæteris quoque partibus ratio ſeruanda eſt. Item nonnulla animalia oriuntur ex nullis, vel eiuſdem, vel diuerſi generis animalibus: vt muſcæ, & genera papilionum, ex quibus gignuntur quidem animalia, ſed non ſimilis naturæ, ſed genus quoddam vermiculi. Patet igitur, non ſemine, quod ex cunctis partibus ſeceſſerit, generari quæcunque diuerſi generis ſunt: nam ſimilia eſſent. Siquidem ſimilitudo indicio eſſet, quòd ex cunctis ſeceſſerit. Quædam etiam animalia vno coitu plura generant: plantas verò omnino motu eodem omnem annuum fructum afferre, certum eſt. Quod fieri non poſſet, ſi ex cunctis partibus ſemen ſecerneretur. Singulas enim è ſingulis vel coitibus, vel ſeceſſibus, fieri ſecretiones neceſſe eſt: nec verò fieri poteſt vt in vtero diuidatur: iam enim tanquam à planta nouella, aut animali nuper edito, non ſemine ſepararetur. Item quæ auulſione ſeruntur, ſemen afferunt. Ergo & priùs quàm auulſa ſererentur, ex eadem ſui magnitudine fructificaſſe, non ex tota planta deſtrictum ſemen tuliſſe certum eſt. Omnium verò maximum argumentum in genere inſectorum, animaduertimus ſatis, quòd etſi non omnium,

A εἰ αἷμα ἀπὸ αἵματος, ἢ σὰρξ ἀπὸ σαρκός. ἀλλὰ μὴν εἴ γε ἐξ ἑτέρου τινὸς τοιοῦτος αἷμα γίνεται, οὐδ' ἂν τῆς ὁμοιότητος αἴτιον εἴη, ὡς λέγουσιν οἱ φάσκοντες, τὸ ἀπελθεῖν ἀπὸ πάντων τῶν μορίων. ἱκανὸν γὰρ ἀφ' ἑνὸς ἀπιέναι μόνον, εἴπερ μὴ ἐξ αἵματος αἷμα γίνεται. διὰ τί γὰρ οὐκ ἂν καὶ ἅπαντα ἐξ ἑνὸς γίνοιτο; ὁ αὐτὸς γὰρ λόγος ἔοικεν εἶναι τῷ Ἀναξαγόρου, τῷ μηθὲν γίγνεσθαι τῶν ὁμοιομερῶν. πλὴν ἐκεῖνος μὲν ἐπὶ πάντων, οὗτοι δ' ἐπὶ τῆς γενέσεως τῶν ζῴων τοῦτο ποιοῦσιν. ἔπειτα τίνα τρόπον αὐξηθήσεται ταῦτα τὰ ἀπελθόντα ἀπὸ παντός; Ἀναξαγόρας μὲν γὰρ φησιν εὐ-

B λόγως σάρκας ἐκ τῆς τροφῆς προσιέναι ταῖς σαρξί. τοῖς δὲ μὴ ταῦτα μὲν λέγουσιν, ἀπὸ παντὸς δ' ἀπιέναι φάσκουσι, πῶς ἑτέρου* προσιόντος ἔσται μεῖζον, εἰ μένει τὸ προσελθόν; ἀλλὰ μὴν εἴ τι δύναται μεταβάλλειν τὸ προσελθόν, διὰ τί οὐκ εὐθὺς ἐξ ἀρχῆς τὸ σπέρμα τοιοῦτόν ἐστιν, ὥστ' ἐξ αὐτοῦ δυνατὸν εἶναι γίνεσθαι αἷμα καὶ σάρκας, ἀλλὰ μὴ αὐτὸ εἶναι ἐκεῖνο αἷμα καὶ σάρκας; οὐ γὰρ δὴ οὐδὲ τοῦτο ἐνδέχεται λέγειν, ὡς τῇ κατὰ κρᾶσιν αὐξάνεται ὕστερον, ὥσπερ οἶνος ὕδατος προσεγχυθέντος. ἦν γὰρ ἂν αὐτὸ ἕκαστον μάλιστα μὲν ἄκρατον κατ' ἀρχάς· νῦν δὲ ὕστερον μᾶλλον καὶ σὰρξ καὶ ὀστοῦν, καὶ τῶν ἄλλων ἕκαστον ἐστὶ μορίων. τὸ δὲ τοῦ σπέρματος φάναι τι

C νεῦρον εἶναι καὶ ὀστοῦν, λίαν ἐστὶν ὑπὲρ ἡμᾶς τὸ λεγόμενον. πρὸς δὲ τούτοις, εἰ τὸ θῆλυ καὶ ἄρρεν ἐν τῇ κυήσει διαφέρει, καθάπερ Ἐμπεδοκλῆς λέγει·

Ἐν δ' ἐχύθη καθαροῖσι· τὰ μὲν τελέθουσι γυναῖκες,
Ψύχεος ἀντιάσαντα·

φαίνονται δ' οὖν μεταβάλλουσαι γυναῖκες, καὶ ἄνδρες, ὥσπερ ἐξ ἀγόνων γόνιμοι, οὕτω καὶ ἐκ θηλυτόκων ἀρρενοτόκοι, ὡς οὐκ ἐν τῷ ἀπελθεῖν ἀπὸ πάντων ἢ μὴ τῆς αἰτίας οὔσης, ἀλλ' ἐν τῷ συμμέτρως ἢ ἀσυμμέτρως ἔχειν τὸ ἀπὸ τῆς γυναικὸς καὶ τοῦ ἀνδρὸς ἀπιόν, ἢ καὶ δι' ἄλλην τινὰ τοιαύτην αἰτίαν. δῆλον τοίνυν, εἰ τοῦτο θήσομεν οὕτως, ὅτι οὐ τῷ ἀπελ-

D θεῖν ἀπό τινος τὸ θῆλυ, ὥστ' οὐδὲ τὸ μόριον ᾧ διαφέρει τὸ ἄρρεν καὶ τὸ θῆλυ, εἴπερ τὸ αὐτὸ σπέρμα καὶ θῆλυ καὶ ἄρρεν δύναται γίγνεσθαι, ὡς οὐκ ὄντος τοῦ μορίου ἐν τῷ σπέρματι. τί οὖν διαφέρει ἐπὶ τούτου λέγειν, ἢ ἐπὶ τῶν ἄλλων μορίων; εἰ γὰρ μηδ' ἀπὸ τῆς ὑστέρας σπέρμα γίνεται, ὁ αὐτὸς λόγος καὶ ἐπὶ τῶν ἄλλων ἂν μορίων. ἔτι ἔνια γίνεται τῶν ζῴων οὔτ' ἐξ ὁμογενῶν, οὔτε τῶν ἑτερογενῶν* οἷον αἱ μυῖαι, καὶ τὰ γένη τῶν καλουμένων ψυλλῶν. ἐκ δὲ τούτων γίνεται μὲν ζῷα, οὐκέτι δὲ ὅμοια τὴν φύσιν, ἀλλὰ γένος τι σκωλήκων. δῆλον οὖν ὅτι οὐκ ἀπὸ παντὸς μέρους ἀπιόντος γίγνεται τὰ ἑτερογενῆ· ὅμοια γὰρ ἂν ἦν, εἴπερ τὸ ἀπὸ παντὸς ἀπιέ-

E ναι σημεῖόν ἐστιν ἡ ὁμοιότης. ἔτι ἀπὸ μιᾶς συνουσίας, καὶ τῶν ζῴων ἔνια γεννᾷ πολλά, τὰ δὲ φυτὰ καὶ πάμπαν. δῆλον γὰρ ὅτι ἀπὸ μιᾶς* κινήσεως τὸν ἐπέτειον πάντα φέρει καρπόν. καίτοι πῶς δυνατόν, εἰ ἀπὸ παντὸς ἀπεκρίνετο τὸ σπέρμα; μίαν γὰρ ἀπόκρισιν ἀπὸ μιᾶς ἀναγκαῖον γίνεσθαι συνουσίας, καὶ μιᾶς διακρίσεως. ἐν δὲ ταῖς ὑστέραις χωρίζεσθαι ἀδύνατον· ἤδη γὰρ ὥσπερ ἀπὸ νέου φυτοῦ ἢ ζῴου, οὐ σπέρματος εἴη ἂν διαχώρισις. ἔτι δὲ τὰ ἀποφυτευόμενα, ἀπ' αὐτῶν φέρει σπέρμα. δῆλον οὖν ὅτι καὶ πρὶν ἀποφυτευθῆναι ἀπὸ τοῦ αὐτοῦ μεγέθους ἔφερε τὸν καρπόν, καὶ οὐκ ἀπὸ παντὸς τοῦ φυτοῦ ἀπῄει τὸ σπέρμα. μέγιστον δὲ τούτων τεκμήριον τεθεωρήκαμεν ἱκανῶς ἐπὶ τῶν ἐντόμων. εἰ γὰρ μὴ ἐν ἅπασιν,

* [illegible]

* Hiſt. II. 5. c. 19.

* γρ. [illegible] Fortaſſe κινήσ.

ἀλλ' ἐπὶ τὸ πλεῖστον, ἐν τῇ ὀχείᾳ τὸ θῆλυ ἐπὶ τὸ ἄρρεν μέρος τι αὐτοῦ ἀποτείνει. διὸ καὶ τὴν ὀχείαν, καθάπερ εἴπομεν πρότερον, οὕτω ποιοῦνται. τὰ γὰρ κάτωθεν ἐπὶ τὰ ἄνω φαίνεται ἀφιέντα, οὐκ ἐν πᾶσιν, ἀλλ' ἐν τοῖς πλείστοις τῶν τεθεωρημένων. ὥστε φανερὸν ἂν εἴη ὅτι δεῖ ὅσα προΐεται γονὴν τῶν ἀρρένων, οὐ τὸ ἀπὸ παντὸς ἀπιέναι τῆς γενέσεως αἴτιόν ἐστιν, ἀλλὰ ἄλλον τινὰ τρόπον, περὶ οὗ σκεπτέον ὕστερον. καὶ γὰρ, εἰ καθάπερ ἀπὸ παντὸς ἀπιέναι συμβαίνει, ὥσπερ φασίν, οὐθὲν ἔδει ἀπὸ πάντων ἀξιοῦν ἀπιέναι, ἀλλὰ μόνον ἀπὸ τοῦ δημιουργοῦντος, οἷον ἀπὸ τοῦ τέκτονος, ἀλλὰ μὴ ἀπὸ τῆς ὕλης. νῦν δ' ὅμοιον λέγουσιν, ὥσπερ κἂν εἰ ἀπὸ τῶν ὑποδημάτων. σχεδὸν γὰρ ὁ ὅμοιος παῖς τῷ πατρὶ ὅμοια φορεῖ. ὅτι δ' ἡδονὴ σφοδροτέρα γίνεται ἐν τῇ ὁμιλίᾳ τῇ τῶν ἀφροδισίων, οὐ τὸ ἀπὸ παντὸς ἀπιέναι αἴτιον, ἀλλὰ διότι κνησμὸς ἐστὶν ἰσχυρός. διὸ καὶ εἰ πολλάκις συμβαίνει ἡ ὁμιλία αὕτη, ἧττον γίνεται τὸ χαίρειν τοῖς πλησιάζουσιν. ἔτι περὶ τὸ τέλος ἡ χαρά. ἔδει δὲ ἐν ἑκάστῳ τῶν μορίων, καὶ μὴ ἅμα, ἀλλ' ἐν μὲν τοῖς πρότερον, ἐν δὲ τοῖς ὕστερον. τοῦ δὲ ἐκ κολοβῶν γίνεσθαι κολοβά, ἡ αὐτὴ αἰτία, καὶ διὰ τί ὅμοια [γίνονται] τοῖς γονεῦσι. γίνεται δὲ καὶ οὐ κολοβὰ ἐκ κολοβῶν, ὥσπερ καὶ ἀνόμοια τοῖς τεκνώσασι· περὶ ὧν ὕστερον τὴν αἰτίαν θεωρητέον. τὸ γὰρ πρόβλημα τοῦτ' ἐκείνοις ταὐτόν ἐστιν. ἔτι εἰ τὸ θῆλυ μὴ προΐεται σπέρμα, τοῦ αὐτοῦ λόγου μηδ' ἀπὸ παντὸς ἀπιέναι. κἂν εἰ μὴ ἀπὸ παντὸς ἀπέρχεται, οὐθὲν ἄλογον τὸ μηδ' ἀπὸ τοῦ θήλεος, ἀλλὰ ἄλλον τινὰ τρόπον αἴτιον εἶναι τὸ θῆλυ τῆς γενέσεως. περὶ οὗ δὴ ἐχόμενόν ἐστιν ἐπισκέψασθαι, ἐπεὶ φανερὸν ὅτι οὐκ ἀπὸ πάντων ἀποκρίνεται τὸ σπέρμα τῶν μορίων. ἀρχὴ δὲ καὶ ταύτης τῆς σκέψεως καὶ τῶν ἑπομένων, πρῶτον λαβεῖν περὶ σπέρματος τί ἐστιν. οὕτω γὰρ καὶ περὶ τῶν ἔργων αὐτοῦ, καὶ τῶν περὶ αὐτὸ συμβαινόντων ἔσται μᾶλλον εὐθεώρητον. βούλεται δὲ τοιοῦτον τὴν φύσιν εἶναι τὸ σπέρμα, ἐξ οὗ τὰ κατὰ φύσιν συνιστάμενα γίνεται πρώτου, οὐχ ὅτι ἐξ ἐκείνου τινὸς τὶ εἶναι τὸ ποιοῦν, οἷον ἐκ τοῦ ἀνθρώπου· γίνεται γὰρ ἐκ τούτου, ἀλλ' ὅτι τοῦτό ἐστι τὸ σπέρμα. ἐπεὶ δὲ πολλαχῶς γίνεται ἄλλο ἐξ ἄλλου (ἑτέρως γὰρ τρόπον ἐξ ἡμέρας φαμὲν νύκτα γίνεσθαι, καὶ ἐκ παιδὸς ἄνδρα, ὅτι τόδε μετὰ τόδε. ἄλλον δὲ τρόπον, ὡς ἐκ χαλκοῦ ἀνδριάντα, καὶ ἐκ ξύλου κλίνην, καὶ τἆλλα ὅσα ἐξ ὕλης γίνεσθαι τὰ γιγνόμενα λέγομεν, ἐκ τινὸς ἐνυπάρχοντος καὶ σχηματισθέντος, τὸ ὅλον ἐστίν. ἐπεὶ ἑτέρως, ὡς ἐκ μουσικοῦ ἄμουσος, καὶ ὡς ἐξ ὑγιαίνοντος κάμνων, καὶ ὅλως ὡς τὸ ἐναντίον ἐκ τοῦ ἐναντίου. ἔτι πρὸς τούτοις, ὡς *Ἐπίχαρμος ποιεῖ τὴν ἐποικοδόμησιν, ἐκ τῆς διαβολῆς ἡ λοιδορία, ἐκ δὲ ταύτης ἡ μάχη· ταῦτα δὲ πάντα ἔκ τινος ἡ ἀρχὴ τῆς κινήσεώς ἐστι. τῶν δὲ τοιούτων, ἐνίων μὲν ἐν αὐτοῖς ἡ ἀρχὴ τῆς κινήσεώς ἐστιν, οἷον ἐν τοῖς νῦν εἰρημένοις· μέρος γάρ τι ἡ διαβολὴ τῆς ὅλης ταραχῆς ἐστιν. ἐνίων δ' ἔξω, οἷον αἱ τέχναι τῶν δημιουργουμένων, καὶ ὁ λύχνος τῆς καιομένης οἰκίας) τὸ δὴ σπέρμα, φανερὸν ὅτι δυοῖν τούτοιν ἐν θατέρῳ ἐστίν. ἢ γὰρ ὡς ἐξ ὕλης αὐτοῦ, ἢ ὡς ἐκ πρώτου κινήσαντος τὸ γινόμενον. οὐ γὰρ δὴ ὡς τόδε μετὰ τόδε, οἷον ἐκ τῶν Παναθηναίων ὁ πλοῦς· οὐδὲ ὡς ἐξ ἐναντίου· φθειρομένου γάρ, γίνεται τὸ ἐναντίον ἐκ τοῦ ἐναντίου, καὶ ἕτερόν τι δεῖ ὑποκεῖσθαι, ἐξ οὗ ἔσται πρώτου ἐνυπάρχοντος. τοῖν δυοῖν δὴ ληπτέον ἐν ὁποτέρῳ θετέον τὸ σπέρμα,

*Rhetor. lib. 1. ca. 7. meminit eius Epicharmei dicti. Phil. variis locis, vt Metaph. lib. 5. cap. 1. & 24. & alibi.

A tamen plurimorum fœmina per coitum particulam quandam ſuam inſerit in marem. Eodem coitum ita agunt: quod antea dictum eſt. Subiecta enim in ſuperaſcendere viſuntur, quanquam non omnia, ſed plurima ex iis quæ explorata habemus. Itaque in iis etiam maribus qui ſemen emittunt, non cauſa generationis eſt, quod ex toto receſſerit, ſed alio quodam modo, de quo poſtea videbimus. Nam ſi cauſa eſſet receſſus, vt putant, non ex cunctis recedere partibus cenſendum eſſet, ſed ab agente efficriceque tantùm virtute, velvt à fabro, non à materia. Sed hi ſimile aiunt, vt ſi vel à calceis proficiſci dicant. Filius enim qui patri ſimilis eſt, ſi- B mili ferè cultu corporis vtitur. Cauſa autem vt voluptas rei Venereæ vehementior ſit, non quod ex toto receſſerit, eſt, ſed quia prurigo vehemens accidit. Quamobrem ſi quis frequenter ea re vtitur, minùs afficitur voluptate. Item voluptas Veneris in fine coitus potiſſimùm eſt. At ſi ex toto ſecerneretur, non ſimul, ſed ſingulis partibus, aliis priùs, aliis pòſt exultaret. Cauſa verò quamobrem ex mancis manca proueniunt, eadem eſt, & cur filij ſimiles parentibus prodeunt. Sed non manca etiam ex mancis gignuntur, vt & diſſimiles ſuis parentibus: quorum cauſam poſtea conſiderabimus: eadem enim quæſtio eſt. Item ſi ſemen non à fœmina emit- C titur, eadem ratione profectò, nec ex toto ſecedere probari poteſt. Et ſi non ex toto ſecedit, nihil rationi repugnat, ſi à fœmina quoque non ſecedere, ſed alio quodam modo cauſam generationis præſtari à fœmina ſtatuemus. Qua de re vt diſſeramus, proximum eſt, cùm ſemen non ex cũctis ſecerni partibus apertum iam ſit. Initium verò tum eius ipſius propoſiti tum etiam ſequentis totius diſputationis, vt primùm de ſemine quidnam ſit, accipiamus. Ita enim & officia ipſa, & quæ officiis accidunt, faciliùs conſiderare poterimus. Tale autem ſua natura ſemen eſſe requirit, vt ex eo primo oriantur ea quæ ſecundùm naturam conſtituuntur: non quòd ex illo (verbi gra- D tia) homine aliquid ſit, quod agat. Fit enim aliquid ex hoc, quia ſemen eius eſt. Sed cùm multifariam aliud ex alio fiat (alio enim modo, cùm ex die noctem fieri dicimus, aut ex puero virum, quoniam hoc poſt hoc: alio cùm ex ære ſtatuam, aut ex ligno lectum, & quæcunque ex materia fieri dicimus, vt ex aliquo, quod inſit, & formetur, totum ſit: alio, cùm ex muſico immuſicum, aut ex ſano ægrum, & omnino contrarium ex contrario. Preterea, vt Epicharmus facit ſuam exaggerationem, ex calumniis maledicta, ex maledictis pugna. Quæ omnia eò referuntur vnde principium motus. Quale id quoque, quod modò diximus, eſt. Pars enim quædam totius diſcordiæ calumnia eſt: ſed aliquorum extra, quod mouerit, eſt: vt ars extra ſuum opus eſt, & lucerna E extra domus incendium.) Cùm itaque tot modis aliud ex alio fiat, ſemen in altero de duobus his eſſe, apertum eſt. Aut enim ex eo vt materia, aut vt ex primo, quod mouerit, eſt quod gignitur. Non enim vt hoc poſt hoc, quomodo ex Panathenæis nauigatio, neque vt ex contrario cõtrarium. Gignitur enim contrarium ex contrario, quod corrumpitur: & aliud quippiam ſubiici oportet, ex quo primo in manente ſit. Igitur in vtronam de duobus illis conſtituẽdum ſit ſemen,

conſiderandum eſt: vtrùm vt materia & patiens, an vt forma & agens, an etiam vt vtrumque. Vnà enim cum iis fortaſſe declarabitur, & quonam pacto ex contrariis generatio ſit omnibus iis quæ ex ſemine oriuntur. Nam ea quoque generatio, quæ ex contrariis ſit, naturalis eſt. Alia enim ex contrariis oriuntur, mare dico & fœmina: alia ex vno tantum, vt plantæ omnes, & animalium nonnulla, in quibus non diſtinctus ſeorſúmque conſtitutus eſt ſexus maris & fœminæ. Genitura igitur id vocatur quod à generante proueniens cauſa eſt, quæ prima obtineat principium generationis: videlicet in iis quæ coire Natura voluit. Semen autem eſt, quod ex ambobus coeuntibus illis originem trahit: quale ſemen plantarum omnium eſt, & animalium nonnullorum, in quibus ſexus diſtinctus non eſt: velvt id quod ex mare ac fœmina primum miſcetur quaſi conceptus promiſcuus quidam, aut animal. Hæc enim iam habent, quod ex ambobus requiritur. Semen & fructus inter ſe differunt, prioris poſteriorìſque ratione: fructus enim, quod ex alio eſt: ſemen, ex quo aliud: nam aliàs ambo idem ſunt. Natura autem prima eius, quod ſemen vocatur, quænam ſit, exponenda latiùs eſt. Quodcumque in corpore accipimus, aut partem eſſe ſecundum naturam, vel diſſimilarem, vel ſimilarem, neceſſe eſt: aut præter naturam, vt vel papulam, vel excrementum, vel colliquamentum, vel alimentum. Excrementum appello reliquias alimenti: colliquamentum, quod ex incremento ſecernitur reſolutione præter naturam. ſed nullam id eſſe partem vel ſimilarem, vel diſſimilarem, apertum eſt. Nihil enim ex eo, quamuis ſimilari, conſtituitur, vt ex neruo, aut carne. Quoniam etiam cùm cæteræ omnes partes ſeparatæ ſint, ipſum ſeparatum non eſt. Nec verò præter naturam eſt, neque naturæ oblæſæ vitium, cùm in omnibus inſit, & natura ex eo ipſo oriatur: alimentum planè res aduentitia eſt. Itaque aut colliquamentum, aut excrementum eſſe, neceſſe eſt. Veteres quidem authores opinari videntur id eſſe colliquamentum. Quod enim ex toto ſecedere propter motus calorem dicunt, vim habet colliquamenti. Colliquamenta autem præter naturam ſunt, nec quicquam ſecundùm naturam oriri poteſt ex iis quæ præter naturam ſunt. Excrementum igitur eſſe neceſſe eſt. At omne excrementũ, aut alimenti inutilis eſt, aut vtilis. Inutile dico, à quo nihil præterea naturæ ſuppeditetur, ſed quo plus abſumitur, eo magis natura vitiatur: vtile contra. Sed enim non tale excrementum id eſſe conſtat, eo quòd iis qui vel ætate, vel morbo peſſimè ſe habent, genus hoc excrementi plurimum ineſt, ſemen minimè. Aut enim nullum omnino, aut non prolificum, propter inutilis ac morbidi excrementi permiſtionem. Ergo vtilis excrementi pars aliqua ſemen eſt. Vtiliſſimum autem, quod vltimum eſt, & ex quo iam vnumquodque gignitur membrum: eſt enim tum prius tum poſterius. Primi igitur alimenti excrementum pituita eſt, & ſi quid aliud eiuſmodi eſt. Pituita enim alimenti vtilis excrementum eſt. Cuius rei indicium, quod permiſtum cum cibo puro alere poteſt, & labore abſumitur. Vltimũ autem paruũ admodum ex plurimo relinquitur alimẽto, ſed intelligendum perexiguo augeri quotidie animalia & plantas: nam niſi ita eſſet, additione pluris eadem vel minima modũ excederent magnitudinis.

A πότερον ὡς ὕλην καὶ πάσχον, ἢ ὡς εἶδός τι καὶ ποιοῦν, ἢ καὶ ἄμφω. ἅμα γὰρ ἴσως δῆλον ἔσται, καὶ πῶς ἐξ ἐναντίων γένεσις ὑπάρχει πᾶσι τοῖς ἐκ τοῦ σπέρματος· φυσικὴ γὰρ ἡ ἐκ τῶν ἐναντίων γένεσις. τὰ μὲν γὰρ ἐξ ἐναντίων γίγνεται, ἄρρενος καὶ θήλεος· τὰ δ', ἐξ ἑνὸς μόνον, οἷον τὰ φυτὰ καὶ τῶν ζώων ἔνια, ἐν ὅσοις μὴ ἔστι διωρισμένον τὸ ἄρρεν καὶ τὸ θῆλυ χωρίς. γονὴ μὲν οὖν, τὸ ἀπὸ τοῦ γεννῶντος καλεῖται αἴτιον, ὅσα συνδυάζεσθαι πέφυκε, τὸ πρῶτον ἔχον ἀρχὴν γενέσεως· σπέρμα δέ, τὸ ἐξ ἀμφοτέρων τὰς ἀρχὰς ἔχον τῶν συνδυασθέντων οἷον τά τε τῶν φυτῶν καὶ ἐνίων ζώων, ἐν οἷς μὴ κεχώρι-B σται τὸ θῆλυ καὶ τὸ ἄρρεν, ὥσπερ τὸ γιγνόμενον ἐκ θήλεος καὶ ἄρρενος πρῶτον μίγμα, οἷον κύημά τι ὄν, ἢ ζῷον. καὶ γὰρ ταῦτα ἤδη ἔχει τὸ ἐξ ἀμφοῖν. σπέρμα δὲ καὶ καρπὸς διαφέρει, τῷ ὕστερον καὶ πρότερον. καρπὸς μὲν γάρ, * τῷ ἐξ ἄλλου εἶναι· σπέρμα δέ, * τῷ ἐκ τούτου ἄλλο· ἐπεὶ [ἄλλως] ἄμφω ταὐτόν ἐστιν. Ἡ δὲ τοῦ λεγομένου σπέρματος φύσις, ἡ πρώτη, πάλιν λεκτέα τίς ἐστιν. ἀνάγκη δὴ πᾶν, ὃ ἐὰν λαμβάνωμεν ἐν τῷ σώματι, ἢ μόριον εἶναι τῶν κατὰ φύσιν, καὶ τούτων ἢ τῶν ὁμοιομερῶν, ἢ τῶν ἀνομοιομερῶν· ἢ τῶν παρὰ φύσιν, οἷον φῦμα, ἢ περίττωμα, ἢ σύντηγμα, ἢ τροφήν. λέγω δὲ περίττωμα μέν, τὸ τῆς τροφῆς ὑπόλειμμα· σύντη-C γμα δέ, τὸ ἀποκριθὲν ἐκ τοῦ αὐξήματος, ὑπὸ τῆς παρὰ φύσιν ἀναλύσεως. ὅτι μὲν οὖν οὐκ ἂν εἴη μόριον, φανερόν. ὁμοιομερὲς γάρ ἐστιν. ἐκ δὲ τούτου οὐθὲν σύγκειται, ὥσπερ ἐκ νεύρου καὶ σαρκός. ἔτι δὲ οὐδὲ κεχωρισμένον· τὰ δ' ἄλλα πάντα μέρη κεχωρισμένα. ἀλλὰ μὴν οὐδὲ παρὰ φύσιν, οὐδὲ πήρωμα. ἐν ἅπασί τε γὰρ ὑπάρχει, καὶ ἡ φύσις ἐκ τούτου γίγνεται· ἡ δὲ τροφή, φανερῶς ἐπείσακτον. ὥστ' ἀνάγκη ἢ σύντηγμα, ἢ περίττωμα εἶναι. οἱ μὲν οὖν ἀρχαῖοι ἐοίκασιν οἰομένοις εἶναι σύντηγμα. τὸ γὰρ ἀπὸ παντὸς ἀπιέναι φάναι, διὰ τὴν θερμότητα τὴν ἀπὸ τῆς κινήσεως, συντήγματος D ἔχει δύναμιν. τὰ δὲ συντήγματα, τῶν παρὰ φύσιν. ἐκ δὲ τῶν παρὰ φύσιν, οὐθὲν γίνεται τῶν κατὰ φύσιν. ἀνάγκη ἄρα περίττωμα εἶναι. ἀλλὰ μὴν περίττωμά γε πᾶν, ἢ ἀχρήστου τροφῆς ἐστιν, ἢ χρησίμης. ἄχρηστον μὲν οὖν λέγω, ἀφ' ἧς μηθὲν ἔτι συντελεῖται ἐπὶ τὴν φύσιν, ἀλλ' ἀναλισκομένου πλείονος, μάλιστα κακοῦται. τὴν δὲ χρησίμην, τὴν ἐναντίαν. ὅτι μὲν δὴ τοιοῦτον περίττωμα οὐκ ἂν εἴη, φανερόν. τοῖς γὰρ κάκιστα διακειμένοις δι' ἡλικίαν ἢ νόσον, πλεῖστον ὑπάρχει τοιοῦτον, σπέρμα δὲ ἥκιστα. ἢ γὰρ ὅλως οὐκ ἔχουσιν, ἢ οὐ γόνιμον, διὰ τὸ μίγνυσθαι ἄχρηστον περίττωμα καὶ νοσηματικόν. χρησίμου E ἄρα περίττωμα καὶ μέρος τι ἐστὶ τὸ σπέρμα. χρησιμώτατον δὲ τὸ ἔσχατον καὶ ἐξ οὗ ἤδη γίνεται ἕκαστον τῶν μορίων. ἔστι γὰρ τὸ μέν, πρότερον· τὸ δέ, ὕστερον. τῆς μὲν οὖν πρώτης τροφῆς περίττωμα, φλέγμα, καὶ εἴ τι ἄλλο τοιοῦτον. καὶ γὰρ τὸ φλέγμα τῆς χρησίμου τροφῆς περίττωμά ἐστι. σημεῖον δέ, ὅτι μιγνύμενον τροφῇ καθαρᾷ, τρέφει, καὶ πονοῦσι καταναλίσκεται. τὸ δὲ τελευταῖον, ἐκ πλείστης τροφῆς ὀλίγιστον. ἐννοεῖν δὲ δεῖ, ὅτι μικρῷ αὐξάνεται τὰ ζῷα, καὶ τὰ φυτὰ τὸ καθ' ἡμέραν πάμπαν. μικροῦ γὰρ ἂν προστιθεμένου, τοῦ αὐτοῦ ὑπερβάλλῃ τὸ μέγεθος.

* κ. τῷ ἐξ ἄ.
* κ. τῷ ἐκ τ. ἄ.

τοὐναντίον ἄρα ἢ οἱ ἀρχαῖοι ἔλεγον, λεκτέον. οἱ μὲν γὰρ, τὸ ἀπὸ παντὸς ἀπιόν· ἡμεῖς δὲ, τὸ πρὸς ἅπαν ἰέναι πεφυκὸς, σπέρμα ἐροῦμεν. καὶ οἱ μὲν, σύντηγμα· φαίνεται δὲ περίττωμα μᾶλλον. εὐλογώτερον γὰρ ὅμοιον εἶναι τὸ προσιὸν ἔσχατον, καὶ τὸ περίττον γινόμενον τοῦ τοιούτου· οἷον τοῖς γραφεῦσι τοῦ ἀνδρεικέλου πολλάκις περιγίνεται ὅμοιον τῷ ἀναλωθέντι. συντηκόμενον δὲ φθείρεται πᾶν, καὶ ἐξίσταται τῆς φύσεως. τεκμήριον δὲ τοῦ μὴ σύντηγμα εἶναι, ἀλλὰ περίττωμα μᾶλλον, ὅτι τὰ μεγάλα τῶν ζῴων, ὀλιγοτόκα εἶναι· τὰ δὲ μικρὰ, πολύγονα. σύντηγμα μὲν γὰρ πλεῖον, ἀναγκαῖον εἶναι τοῖς μεγάλοις, περίττωμα δὲ ἔλαττον· εἰς γὰρ τὸ σῶμα μέγα ὂν, ἀναλίσκεται τὸ πλεῖον τῆς τροφῆς. ὥστε ὀλίγον γίνεται τὸ περίττωμα. ἔτι τόπος μὲν οὐδεὶς ἀποδέδοται συντήγματι κατὰ φύσιν, ἀλλὰ ῥεῖ ὅπου ἂν εὐοδήσῃ τοῦ σώματος. τοῖς δὲ κατὰ φύσιν περιττώμασι πᾶσιν, οἷον τῆς τροφῆς τῆς ξηρᾶς, ἡ κάτω κοιλία· καὶ τῆς ὑγρᾶς, ἡ κύστις· καὶ τῆς χρησίμης, ἡ ἄνω κοιλία· καὶ τῆς σπερματικῆς, ὑστέρα καὶ αἰδοῖα καὶ μαστοί· εἰς τούτους γὰρ ἀθροίζεται καὶ συρρεῖ. καὶ μαρτύρια τὰ συμβαίνοντα, ὅτι τὸ μὲν εἰρημένον σπέρμα ἐστί. ταῦτα δὲ συμβαίνει διὰ τὸ τὴν φύσιν εἶναι τοῦ περιττώματος τοιαύτην. ἥ τε γὰρ ἔκλυσις ἐλαχίστου ἀπελθόντος τούτου γίνεται ἐπίδηλος, ὡς στερισκόμενα τὰ σώματα τοῦ ἐκ τῆς τροφῆς γινομένου τέλους. ὀλίγοις δὲ τισὶν ἐν μικρῷ χρόνῳ κατὰ τὰς ἡλικίας κουφίζει τοῦτ᾽ ἀπιὸν, ὅταν πλεονάσῃ, καθάπερ ἡ πρώτη τροφὴ, ἂν * ὑπερβάλλῃ [τῷ πλήθει.] καὶ γὰρ ταύτης ἀπιούσης, τὰ σώματα εὐημερεῖ μᾶλλον· ἔτι ὅταν συναίρῃ ἄλλα περιττώματα. οὐ γὰρ μόνον σπέρμα τὸ ἀπιὸν, ἀλλὰ καὶ ἕτεραι μεμιγμέναι δυνάμεις τούτοις συνεξέρχονται αὗται δ᾽ εἰσὶ νοσώδεις. διὸ ἐνίων καὶ ἄγονόν ποτε γίνεται τὸ ἀποχωροῦν, διὰ τὸ ὀλίγον ἔχειν τὸ σπερματικόν. ἀλλὰ τοῖς πλείστοις, καὶ ὡς ἐπὶ τὸ πολὺ εἰπεῖν, συμβαίνει ἐκ τῶν ἀφροδισιασμῶν ἔκλυσις καὶ ἀδυναμία μᾶλλον διὰ τὴν εἰρημένην αἰτίαν. Ἔτι οὐκ ἐνυπάρχει σπέρμα οὔτε ἐν τῇ πρώτῃ ἡλικίᾳ, οὔτε ἐν τῷ γήρᾳ, οὐδὲ ἐν ταῖς ἀρρωστίαις. ἐν μὲν τῷ κάμνειν, διὰ τὴν ἀδυναμίαν· ἐν δὲ τῷ γήρᾳ, διὰ τὸ μὴ πέττειν τὸ ἱκανὸν τὴν φύσιν· νέοις δὲ οὖσι, διὰ τὴν αὔξησιν. φθάνει γὰρ ἀναλισκόμενον πᾶν. ἐν ἔτεσι γὰρ πέντε σχεδὸν, ἐπί γε τῶν ἀνθρώπων, ἥμισυ λαμβάνειν δοκεῖ τὸ σῶμα τοῦ μεγέθους τοῦ ἐν τῷ ἄλλῳ χρόνῳ γιγνομένου ἅπαντος. Πολλοῖς δὲ συμβαίνει καὶ ζῴοις καὶ φυτοῖς, καὶ γένει πρὸς γένη διαφορὰ περὶ ταῦτα, καὶ ἐν τῷ γένει αὐτῷ τοῖς ὁμοειδέσι πρὸς ἄλληλα, οἷον ἀνθρώπῳ πρὸς ἄνθρωπον, καὶ ἀμπέλῳ πρὸς ἄμπελον. τὰ μὲν γὰρ, πολύσπερμα· τὰ δὲ ὀλιγόσπερμά ἐστι* πάμπαν· οὐ δι᾽ ἀσθένειαν, ἀλλ᾽ ἐνίοις γε τοὐναντίον. καταναλίσκεται γὰρ ἐπὶ τὸ σῶμα· οἷον τῶν ἀνθρώπων ἐνίοις. εὐεκτικοὶ γὰρ ὄντες καὶ γινόμενοι πολύσαρκοι, ἢ πιότεροι μᾶλλον, ἧττον προΐενται σπέρμα, καὶ ἧττον ἐπιθυμοῦσι τοῦ ἀφροδισιάζειν. ὅμοιον δὲ καὶ τὸ περὶ τὰς τραγώσας ἀμπέλους πάθος, αἳ διὰ τὴν τροφὴν ἐξυβρίζουσιν· ἐπεὶ καὶ οἱ τράγοι, πίονες ὄντες, ἧττον ἔχουσιν. διὸ καὶ προλεπτύνουσιν αὐτοὺς, καὶ τὰς ἀμπέλους τραγᾶν (ἀπὸ τοῦ πάθους τῶν τράγων) καλοῦσι.

* γ. ὑπερβάλλῃ

* γ. τὰ δ᾽ ἄσπερμα π.

Hiſtor. lib. 1. cap.14,

A Igitur contra quàm veteres putarunt, dicendum eſt. Cùm enim illi quod ex toto ſecedat, ſemen eſſe fateãtur, nos quod ad totum ſuapte natura feratur, ſemen eſſe fatebimur: cumque illi colliquamentum dicant, nos excrementum potiùs eſſe ſtatuimus. Quod enim vltimum accedat, & excrementum vltimi ſit, id ſimile eſſe probabilius eſt. Perinde vt pictoribus ſæpenumero aliquid andriceli, id eſt, purpuriſſi, remanet, ſimile eius quod conſumpſerint: tabeſcens autem quodque & colliqueſcẽs corrumpitur, & degenerat. Argumentum, nõ colliquamentum, ſed excrementum potius eſſe, illud eſt, quòd animalia magni incrementi minùs fœcunda,
B parua fœcundiſſima ſunt. Plus enim colliquamenti eſſe in magnis, neceſſe eſt, ſed minus excrementi: quippe cùm in corpus magnum copia abſumitur alimenti: itaque parum fit excrementi. Item locus ſecundùm naturam nullus colliquamento datus eſt, ſed fluit quocunque faciliùs ferri poteſt: at naturalibus excrementis omnibus locus præſcriptus eſt: verbi gratia, alimenti ſicci excrementis aluus, humidi veſica, vtilis ventriculus, ſeminalis vterus, genitale, mammæ. In ea enim loca ſe colligunt, atque confluunt. Teſtimonium etiam faciunt ea quæ eueniunt, vt ſemen, quod diximus, id ſit: quæ ideo
C accidunt, quia talis excrementi natura eſt. Diſſolutio enim & imbecillitas manifeſta conſequitur, vbi vel minimum id ſeceſſerit, vt quaſi corpus eo fine priuetur, qui demum ab alimento afferatur. Pauci vero quidam, & breui tempore per ætatem leuantur, cùm id ſecedit: videlicet vbi copia ſuperarit. Quomodo alimentum primum ſi, vbi modum exceſſerit, emittitur, meliùs corpori cedit. Leuat etiam cùm ſecum alia trahit excrementa. Non enim ſolùm ſemen eſt, quod exit, ſed etiam aliæ permiſtæ facultates cum eo ſecedunt, quæ inſalubres ſunt. Quamobrem nonnullis improle aliquando eſt, quod emittitur, quia parum ſeminis habet. Sed enim
D plurimis & magna ex parte ita accidit, vt Venere exoluantur debilitentúrque, ob eam, quam diximus, cauſam. Adhæc, ſemen nec in prima ætate, neque in ſenectute, neque in morbis eſt. Caret hoc ægri propter imbecillitatem: ſenes, quia non ſatis eorum natura poteſt concoquere: pueri, propter incrementum. Abſumitur enim totum alimentum in corporis deſiderium priùs quàm aliquid excrementi remaneat. Quinquennio namque ferè corpus in homine quidem dimidium capere videtur omnis magnitudinis, quæ reliquo toto tempore comparetur. Multis autem & animalibus & plantis euenit differentia in iis
E ipſis, tum generi cum genere, tum etiam in eodem genere conſortibus ſpeciei inter ſe, vt homini cum homine, & viti cum vite. Alia enim multum ſeminis edunt, alia parum, alia nihil omnino: idque non præ imbecillitate, ſed contrà nonnullis euenit. Abſumitur enim in corpus, vt hominum nonnullis, qui vbi per habitum corporis bonum carnulenti, aut pinguiores euaſerint, minus ſemen emittunt, minúſque rem Veneream expetunt. Similis & vitibus affectio incidit, quæ nimia alimenti copia luxuriant, & hircire tantiſper dicuntur: nam & hirci pingueſcentes minus ſeminis habent. Quamobrem eos ſolent antè extenuare. Et vites hircire ab ea ipſa hircorum affectione dixerunt.

Viri etiam mulieréſque pingues minùs fœcundæ eſſe quàm non pingues videntur: quoniam in vegetioribus excrementum concoctum tranſit in pingue: nam & pinguedo excrementum eſt bonitate ſubſtantiæ ſalubre. Sunt quæ nullum afferant ſemen, vt ſalix, vt populus. Itaque aliæ quoque eius affectionis cauſæ reddi poſſunt. Nam & per imbecillitatem non concoquunt, & per virium bonitatem abſumunt, vt dictum eſt. Simili modo fœcundiſſima quoque & fertiliſſima ſunt, alia propter vires, alia propter imbecillitatem. Multum enim atque inutile excrementum permiſcetur, vt vel morbi nonnullis contrahantur, cùm non bene purgatio ceſſit, & alij euadunt, alij obeunt mortem. Tabeſcunt enim eo modo quo per vrinæ profluuium: nam id quoque vitium iam aliquibus accidiſſe certum eſt. Item meatus idem excrementi & ſeminis eſt: quibúſque excrementum amborum tam ſicci quàm humidi alimenti, iis quò humidi, eodem ſeminis quoque ſecretio agitur: humidi enim excrementum eſt. Namque omnium alimentum humidum potiùs eſt. At verò quibus hoc deeſt, iis ea parte qua cibi ſicci ſedimentum tendit, ſemen quoque ſecernitur. Addo etiam quòd colliquatio & tabes ſemper morboſa eſt: excrementi emiſſio ſemper vtilis eſt: ſeminis ſeceſſio in ancipiti verſatur, quoniam aliquid alimenti inutilis aſſumit. At ſi colliquatio eſſet, ſemper noceret: quod non facit. Semen igitur excrementum eſſe alimenti vtilis, atque vltimi, ſiue omnia ſemen emittunt, ſiue non. In iis tamen quæ emittunt, ita eſſe apertum iam eſt.

A καὶ οἱ πίονες δὲ ἀγονώτεροι φαίνονται τῶν μὴ πιόνων, καὶ γυναῖκες καὶ ἄνδρες, διὰ τὸ τοῖς εὐτραφέσι πεττόμενον τὸ περίττωμα γίνεσθαι πιμελήν. ἔστι γὰρ καὶ ἡ πιμελὴ περίττωμα, δι' εὐβοσίαν ὑγιεινόν. ἔνια δ' οὐ φέρει σπέρμα, οἷον ἰτέα καὶ αἴγειρος. εἰσὶ μὲν οὖν καὶ ἕτεραι αἰτίαι τοῦ πάθους τούτου. καὶ γὰρ δι' ἀδυναμίαν οὐ πέττουσι, καὶ διὰ δύναμιν ἀναλίσκουσιν, ὥσπερ εἴρηται. Ὁμοίως δὲ καὶ * πολύγονα ἐστὶ καὶ πολύσπερμα, τὰ μὲν, διὰ δύναμιν τὰ δὲ, δι' ἀδυναμίαν· πολὺ γὰρ καὶ ἄχρηστον περίττωμα συμμίγνυται· ὥστ' ἐνίοις γίνεσθαι καὶ ἀρρώστημα, ὅταν αὐτῶν μὴ εὐοδώσῃ ἡ B ἀποκάθαρσις. καὶ ἔνιοι μὲν ὑγιάζονται, οἱ δὲ καὶ ἀναιροῦνται. συντήκονται γὰρ αὐτῇ ὥσπερ ἐπὶ τὸ οὖρον. ἤδη γὰρ καὶ τοῦτο τὸ ἀρρώστημα συνέβη τισίν. Ἔτι ὁ πόρος ὁ αὐτὸς τῷ περιττώματι καὶ τῷ σπέρματι· καὶ ὅσοις μὲν ἀμφοῖν γίνεται περίττωμα, καὶ τῆς ὑγρᾶς καὶ τῆς ξηρᾶς τροφῆς, ᾗπερ ἡ τοῦ ὑγροῦ, ταύτῃ καὶ ἡ τῆς γονῆς γίνεται ἀπόκρισις (ὑγροῦ γὰρ περίττωμά ἐστιν· ἡ γὰρ τροφὴ πάντων, ὑγρὰ μᾶλλον) οἷς δὲ μή ἐστιν αὕτη, κατὰ τὴν τῆς ξηρᾶς ὑποστάσεως ὑποχώρησιν. ἔτι ἡ μὲν σύντηξις, ἀεὶ νοσώδης· ἡ δὲ τοῦ περιττώματος ἀφαίρεσις, ὠφέλιμος· ἡ δὲ τοῦ σπέρματος C ἀποχώρησις, ἐπαμφοτερίζει, διὰ τὸ προσλαμβάνειν τῆς μὴ χρησίμης τροφῆς. εἰ δέ γε ἦν σύντηξις, ἀεὶ ἐπέβλαπτεν ἄν· νῦν δ' οὐ ποιεῖ τοῦτο. ὅτι μὲν οὖν περίττωμά ἐστι τὸ σπέρμα χρησίμης τροφῆς καὶ τῆς ἐσχάτης, εἴτε πάντα προΐεται σπέρμα, εἴτε μὴ [πάντα,] ἐν τοῖς προειρημένοις φανερόν.

* Gaza, πολύγονα

CAPVT XIX.

Menſtrua eſſe excrementa, omniáque ſanguinea ea ipſa emittere.

POſt hæc, cuiuſnam alimenti ſit excrementum, & de menſtruis differendum eſt. Fiunt enim in nonnullis viuiparis menſtrua: nam his declaratis apertum erit, & vtrùm fœmina ſemen emittat, vt mas, fiátque vnum ex ambobus ſeminibus miſtum, an nullum ſemen à fœmina ſecernatur: & ſi nullum, vtrùm aliud quippiam non conferat fœmina ad generationem, ſed locum tantummodo præbeat: an aliquid conferat, idque quonam pacto, & quomodo. Sed enim ſanguinem eſſe vltimum alimentum in ſanguinario genere animalium, proportionale autem in exangui, dictum antea eſt. Verùm cùm ſemen quoque excrementum ſit alimenti, eiúſque vltimi, aut ſanguis, proportionaléve eſt, aut ex iis aliquid. Sed cùm ex ſanguine concocto, digeſtóque modo quodam pars quæque gignatur, ſemen autem concoctum diuerſum à ſanguine ſecernatur, (nam inconcoctum, aut per vim emiſſum, videlicet cùm vltra modum quis re Venerea vtitur, cruentum iam aliquibus prodiit) conſtat ſemen eſſe excrementum alimenti ſanguinei, quod vltimum in membra digeritur. Et quidem vim magnam ob eam rem obtinet. Sanguinis enim ſynceri ſalubriſque ſeceſſio reſoluere poteſt. vtque filij ſimiles parentibus ſint, ratio exigit. Simile eſt enim quod ad partes acceſſerit, ei quod remanet. Itaque ſemen manus aut faciei, aut totius animalis, eſt manus indefinita,

ΚΕΦΑΛ. ιθ'.

Ὅτι τὰ καταμήνια, περιττώματα· καὶ ὅτι τὸ θῆλυ οὐ σπέρμα εἰς τὴν γένεσιν, ἀλλὰ τὴν ὕλην μόνην συμβάλλεται. Περὶ τοῦ τῆς συλλήψεως τόπου καὶ χρόνου.

D ΜΕτὰ δὲ ταῦτα διοριστέον περίττωμά τε ποίας τροφῆς, καὶ περὶ καταμηνίων. γίγνεται γάρ τισι καταμήνια τῶν ζῳοτοκούντων. διὰ τούτων γὰρ φανερὸν ἔσται καὶ περὶ τοῦ θήλεος, πότερον προΐεται σπέρμα ὥσπερ τὸ ἄρρεν· καὶ ἔστιν ἓν μῖγμα τὸ γιγνόμενον ἐκ δυοῖν σπερμάτων, ἢ οὐθὲν σπέρμα ἀποκρίνεται ἀπὸ τοῦ θήλεος· καὶ εἰ μηθέν, πότερον οὐδὲ ἄλλο οὐθὲν συμβάλλεται εἰς τὴν γένεσιν, ἀλλὰ μόνον παρέχει τόπον, ἢ συμβάλλεταί τι, καὶ τοῦτο πῶς, καὶ τίνα τρόπον. ὅτι μὲν οὖν ἐσχάτη ἐστὶ τροφὴ τὸ αἷμα τοῖς ἐναίμοις, τοῖς δ' ἀναίμοις τὸ ἀνάλογον, εἴρηται πρότερον. E ἐπεὶ δὲ καὶ ἡ γονὴ περίττωμά ἐστι τροφῆς καὶ τῆς ἐσχάτης, ἤτοι αἷμα ἂν εἴη, ἢ τὸ ἀνάλογον, ἢ ἐκ τούτων τι. ἐπεὶ δ' ἐκ τοῦ αἵματος πεττομένου καὶ μεριζομένου πως, γίνεται τῶν μορίων ἕκαστον· τὸ δὲ σπέρμα, πεφθὲν μὲν, ἀλλοιότερον ἀποκρίνεται τοῦ αἵματος· ἄπεπτον δ' ὄν, καὶ ὅταν τις προσβιάζηται πλεονάκις χρώμενος τῷ ἀφροδισιάζειν, ἐνίοις αἱματῶδες ἤδη προελήλυθε· φανερὸν ὅτι τῆς αἱματικῆς ἂν εἴη περίττωμα τροφῆς τὸ σπέρμα, τῆς ἐπὶ τὰ μέρη διαδιδομένης τελευταίας. καὶ διὰ τοῦτο μεγάλην ἔχει δύναμιν. καὶ γὰρ ἡ τοῦ καθαροῦ καὶ ὑγιεινοῦ αἵματος ἀποχώρησις, λυτικόν. καὶ τὸ ὅμοια γίνεσθαι τοῖς γεννήσασι τὰ ἔκγονα, εὔλογον. ὅμοιον γὰρ τὸ προσελθὸν πρὸς τὰ μέρη, τῷ ὑπολειφθέντι. ὥστε τὸ σπέρμα ἐστὶ τὸ τῆς χειρὸς, ἢ τὸ τοῦ προσώπου, ἢ ὅλου τοῦ ζῴου, ἀδιόριστος χείρ,

ἢ πρόσωπον, ἢ ὅλον ζῷον· καὶ ὡς ἐκείνων ἕκαστον ἐνεργείᾳ, τοιοῦτον τὸ σπέρμα δυνάμει, ἢ κατὰ τὸν ὄγκον τὸν ἑαυτοῦ, ἢ ἔχει τινὰ δύναμιν ἐν ἑαυτῷ. τοῦτο γὰρ οὔπω δῆλον ἡμῖν ἐκ τῶν διωρισμένων, πότερον τὸ σῶμα τοῦ σπέρματος, ἐστὶ τὸ αἴτιον τῆς γενέσεως. ἢ ἔχει τινὰ ἕξιν καὶ ἀρχὴν κινήσεως γεννητικήν. οὐδὲ γὰρ ἡ χείρ, ἢ ἄλλο τι τῶν μορίων οὐδὲν ἄνευ ψυχῆς, ἢ ἄλλης τινὸς δυνάμεώς ἐστι χείρ, οὐδὲ μόριον οὐθέν, ἀλλὰ μόνον ὁμώνυμον. φανερὸν δὲ ὅτι καὶ ὅσοις συντῆξις γίνεται σπερματική, καὶ τοῦτο περίττωμά ἐστι. συμβαίνει δὲ τοῦτο, ὅταν ἀναλύηται εἰς τὸ προεξελθόν, ὥσπερ ὅταν ἀποπέσῃ τὸ ἀναλειφθὲν τοῦ κονιάματος εὐθύς. ταὐτὸν γάρ ἐστι τὸ τελευταῖον περίττωμα τῷ πρώτῳ περιττώματι. καὶ περὶ μὲν τούτων διωρίσθω τὸν τρόπον τοῦτον. ἐπεὶ δ' ἀναγκαῖον καὶ τῷ ἀσθενεστέρῳ γίνεσθαι περίττωμα πλεῖον καὶ ἧττον πεπεμμένον· τοιοῦτον δ' ὄν, ἀναγκαῖον εἶναι αἱματώδους ὑγρότητος πλῆθος· ἀσθενέστερον δέ, τὸ ἐλάττονος θερμότητος κεκοινωνηκὸς κατὰ φύσιν· τὸ δὲ θῆλυ ὅτι τοιοῦτον, εἴρηται πρότερον, ἀναγκαῖον καὶ τὴν ἐν τῷ θήλει γινομένην αἱματώδη ἀπόκρισιν περίττωμα εἶναι. γίνεται δὲ τοιαύτη, ἡ τῶν καλουμένων καταμηνίων ἔκκρισις. ὅτι μὲν οὖν ἐστι τὰ καταμήνια περίττωμα, καὶ ὅτι ἀνάλογον ὡς τοῖς ἄρρεσιν ἡ γονή, οὕτω τοῖς θήλεσι τὰ καταμήνια, φανερόν. ὅτι δ' ὀρθῶς εἴρηται, σημεῖα τὰ συμβαίνοντα* περὶ αὐτήν. κατὰ γὰρ τὴν αὐτὴν ἡλικίαν, τοῖς μὲν ἄρρεσιν ἄρχεταί τε ἐγγίνεσθαι γονή, καὶ ἀποκρίνεται· τοῖς δὲ θήλεσι ῥήγνυταί τε τὰ καταμήνια, καὶ φωνήν τε μεταβάλλουσι, καὶ σημαίνεται τὰ περὶ τοὺς μαστούς. καὶ παύεται τῆς ἡλικίας ληγούσης, τοῖς μὲν, ἡ δύναμις γεννᾶν· ταῖς δέ, τὰ καταμήνια. ἔτι δὲ καὶ τὰ τοιάδε σημεῖα, ὅτι περίττωμά ἐστιν αὕτη ἡ ἔκκρισις τοῖς θήλεσιν. ὡς γὰρ ἐπὶ τὸ πολὺ οὔτε αἱμορροΐδες γίνονται ταῖς γυναιξίν, οὔτε ἐκ τῶν ῥινῶν ῥύσις αἵματος, οὔτε τι ἄλλο, μὴ τῶν καταμηνίων ἱσταμένων· ἄν τε συμβῇ τι τούτων, γίνονται χείρους αἱ καθάρσεις, ὡς ἀναλισκομένης εἰς ταῦτα τῆς ἀποκρίσεως. ἔτι δὲ οὔτε φλεβώδη ὁμοίως, γλαφυρώτερά τε καὶ λειότερα τὰ θήλεα τῶν ἀρρένων ἐστί, διὰ τὸ συνεκκρίνεσθαι τὴν εἰς ταῦτα περίττωσιν ἐν τοῖς καταμηνίοις. τὴν δ' αὐτὴν ταύτην καὶ νομίζειν αἴτιον εἶναι καὶ τοῦ τοὺς ὄγκους ἐλάττους εἶναι [τῶν σωμάτων] τοῖς θήλεσιν ἢ τοῖς ἄρρεσιν, ἐν τοῖς ζῳοτοκοῦσιν. ἐν τούτοις γὰρ ἡ τῶν καταμηνίων γίνεται ῥύσις θύραζε μόνοις, καὶ τούτων ἐπιδηλότατα ἐν ταῖς γυναιξί. πλείστην γὰρ ἀπόκρισιν ἀφίησι γυνὴ τῶν ζῴων. διόπερ ἐπιδηλότατως ἀεὶ ὠχρόν τέ ἐστι καὶ ἀδηλόφλεβον, καὶ τὴν ἔλλειψιν περὶ τοὺς ἄρρενας ἔχει τοῦ σώματος φανερόν. ἐπεὶ δὲ τοῦτ' ἐστὶν ὃ γίνεται τοῖς θήλεσιν, ὡς ἡ γονὴ τοῖς ἄρρεσιν, ἅμα δὲ δύο σπερματικὰς ἀποκρίσεις οὐκ ἐνδέχεται γίνεσθαι· φανερὸν ὅτι τὸ θῆλυ οὐ συμβάλλεται σπέρμα εἰς τὴν γένεσιν. εἰ μὲν γὰρ σπέρμα ἦν, τὰ καταμήνια οὐκ ἂν ἦν. νῦν δὲ διὰ τὸ ταῦτα γίνεσθαι, ἐκεῖνο οὐκ ἔστι. διότι μὲν οὖν, ὥσπερ τὸ σπέρμα, καὶ τὰ καταμήνια περίττωμά ἐστιν, εἴρηται. λάβοι δ' ἄν τις εἰς τοῦτο μαρτύρια, ἔνια τῶν συμβαινόντων τοῖς ζῴοις. τά τε γὰρ πίονα, ἧττον ἐστι σπερματικὰ τῶν ἀπιμελῶν, ὥσπερ εἴρηται πρότερον. αἴτιον δ', ὅτι καὶ ἡ πιμελὴ περίττωμά ἐστι καθάπερ τὸ σπέρμα, καὶ πεπεμμένον αἷμα· ἀλλ' οὐ τὸν αὐτὸν τρόπον τῷ σπέρματι. ὥστ' εὐλόγως εἰς τὴν πιμελὴν ἀνηλωμένης τῆς περιττώσεως, ἐλλείπει τὰ περὶ τὴν γονήν. καὶ τῶν τε ἀναίμων τὰ μαλάκια, καὶ τὰ μαλακόστρακα, περὶ τὴν κύησιν ἐστιν ἄριστα.

* κ. περὶ αὐτά.

A aut facies, aut animal totum indefinitum: ſed quale quodcunque illorum eſt actu, tale ſemen potentia eſt, aut corpulentia ſua, aut facultate, aut virtute, quam in ſeipſo contineat. Id enim nondum ex iis quæ expoſuimus, patet, vtrum ſemen corpus cauſa ſit generationis, an habitum aliquem & principium motus genitale obtineat: neque enim manus, neque aliud quoduis membrum, ſine anima aut alia facultate eſt manus, aut quodlibet membrum, ſed æquiuocè tantùm. Conſtat etiam, colliquationem quoque ſeminariam, vbi accidit, excrementum eſſe. Quod vitium euenit, cùm reſoluitur in quod acceſſerit: quomodo cùm protinus decidit, quod tectorij operis modo illitum fuerit. Idem enim vltimum excre- B mentum cum primo excremento eſt. Atque de his ad hunc modum diſſeruiſſe ſatis ſit. Sed cùm infirmioris plus excrementi minúſque concoctum fieri, idque copiam cruenti humoris eſſe neceſſe ſit, infirmius autem ſecundùm naturam eſt, quod minus caloris adipiſcitur, taléque fœmina ſit, vt antea dictum eſt, hinc ſecretionem quoque illam ſanguineam fœminæ excrementum eſſe neceſſe eſt. Talis autem eiectio eſt eorum quæ menſtrua appellantur. Menſtrua igitur excrementum eſſe, & proportione, vt maribus genituram, ſic fœminis menſtrua prouenire, apertum C eſt. Rectè autem ita dici indicant ea quæ in iis ipſis eueniunt: eadem enim ætate maribus genitura fieri incipit, & ſecerni: fœminis autem menſtrua erumpunt: vox etiam mutatur, & mammæ intumeſcunt. Necnon deſinente ætate aboletur maribus generandi facultas: fœminis menſtruorum conſluuium. Adhæc, indicium illa faciunt: vt excrementum ſit hæc ſecretio fœminarum, quòd non mariſcæ, non profluuium è naribus ſanguinis, non varices, non tale quid mulieribus magna ex parte accidere ſolet, quandiu menſtrua profluunt: & ſi quid tale accidit, deteriores ſiunt purgationes, quaſi hæc materia menſtrua conſumpta in ea fuerit. Minus etiam D venoſæ ſunt fœminæ, quàm mares: & lautiores læuioréſque ſunt, quoniam excrementum, quod eò tendat, confluere in menſtrua ſolet. Hanc eandem cauſam eſſe putandum, & vt corpora minora ſint fœminarum, quàm marium, in viuiparo genere. In hoc enim vno menſtrua profluunt, & omnium apertiſſimè in muliere. Plurimum namque menſtrui excrementi mulier emittit: ex quo ſit vt euidentiſſimè palleat, & obſcuriores habeat venas, & corpore planè ad marem deficiat. Sed cùm menſtrua ſint quod fœminis ſiat perinde vt maribus genitura, nec fieri poſſit vt duæ ſimul ſecretiones ſeminales agantur, ideo ſemen à fœmina non conferri ad generationem E apertum eſt. Nam ſi ſemen eſſet, menſtrua non eſſent: nunc ideo illud deeſt, quia hæc ſunt. Sed menſtrua eſſe excrementum, vt ſemen, explicatum iam eſt. Teſtimonio autem eodem accipi poſſunt aliqua ex iis quæ animalibus accidunt. Pinguia enim minus ſeminis habent, quàm macilenta, vt antea dictum eſt. Cuius rei cauſa eſt, quòd & pinguedo excrementum, vt ſemen, & ſanguis concoctus eſt: quanquam non eodem modo quo ſemen. Itaque ratione optima ſit vt cùm materia ſuperuacua conſumpta in pinguedinem ſit, deficiat genitura. Generis etiam exanguis mollia & cruſtata optima ſunt, cùm vtero gerunt.

A Quòd enim ſanguine carent, nec pinguedo in iis conſiſtit, hinc proportionale pinguedinis ſecernitur in ſeminale decrementum. Indicio autem eſt non tale ſemen à fœmina emitti, quale à mare, nec amb[illegible]um miſtura generari, vt aliqui volunt, quòd ſæpenumero fœminæ concipiant ſine ea quæ per coitum fit, voluptate. Ruſſuſque cum ea ipſa voluptate, parique concurſu profuſionis vtriuſque nihilo magis concipitur, niſi menſtruorum humor ſit modicè temperatus. Quamobrem nec nullis omnino vicibus menſtruorum fœmina generat, neque cùm effluunt, magna ex parte, ſed à purgatione. Vis enim quæ in maris genitura continetur, aut caret alimento, & materia, ex qua inſtituat animal: aut nimia co- B pia ſemen cum humore eluitur, ſed vbi effluxerint ſatis, quod remanet, conſiſtit. Quæ autem nullis menſtruorum vicibus concipiunt, aut interea dum agitantur, & effluunt, non pòſt, earum alterius cauſa eſt, quòd tantum humoris continent, quantum prolificis remanet à purgatione: quamquam non ita ſuperat, vt effluere poſſit: alteris quòd à purgatione os vteri comprimatur. Cùm igitur multum quidem effluxit, ſed adhuc effluit, tamen non tantum vt ſemen elabatur, tunc concipiunt. Nec verò abſurdum quicquam, ſi à conceptu item effluunt menſtrua: nam vel pòſt aliquandiu prodeunt, quanquam parcè, nec ſemper: ſed id morbidum eſt: quam C obrem paucis & raro accidit. Quæ autem magna ex parte fiunt, ea maximè ſecundùm naturam ſunt. A fœmina igitur conferri ad generationem materiam, quæ in menſtruorum conſtitutione fit, menſtrua autem ipſa eſſe excrementum, apertum iam eſt.

CAPVT XX.

Contra eos qui credunt, fœminas, vt mares, ſemen genitale emittere, argumento quod pari ferè voluptate afficiantur.

D QVod autem ſemen conferri à fœmina per coitum nõnulli exiſtimant, propterea quòd interdum ſimili voluptate afficiatur, vt mas, ſimúlque aliquid humoris ſecernat: id non humor ſeminalis eſt, ſed loci proprius. Vteri enim excretio eſt, quæ aliis euenit, aliis non. Euenit (quod plurimum dixerim) iis quæ nitidæ fœminaléſque ſunt: non euenit iis quæ fuſcæ atque viragines. Copia verò quibus euenit, non pro ſeminis emiſſione interdum eſt, ſed multo excedit: tum etiam ciborum diuerſa ratio plurimum facit, vt plus minúſve huius humoris excernatur: vt quædam acris ſaporis augent planè excernendi modum. Voluptas autem quæ per coitum ſentitur, non ſolùm ſemine exeunte accidit, ſed E etiam ſpiritu, ex quo conſiſtente ſemen emittitur. Quod patet tum in adoleſcentulis, qui nondum emittere queunt, propéque ætate ſunt: tum in viris genituræ expertibus. Voluptas enim iis omnibus ſcalpendo excitatur, & quorum deprauata eſt generatio: aluus interdum ſoluitur, propterea quòd excrementum eò ſecedit, quòd concoqui atque effici ſemen non poſſit. Forma etiam ſimilis mulieris, & adoleſcentuli eſt, & mulier quaſi mas inſeminis eſt. Impotentia enim quadam fœmina eſt,

A διὰ τὸ ἄναιμα γὰρ εἶναι καὶ μὴ γίνεσθαι πιμελὴν ἐν αὐτοῖς, τὸ ἀνάλογον αὐτοῖς τῇ πιμελῇ, ἀποκρίνεται εἰς τὸ περίττωμα τὸ σπερματικόν. σημεῖον δὲ ὅτι οὐ τοιοῦτο σπέρμα προΐεται τὸ θῆλυ οἷον ἄρρεν, οὐδὲ μιγνυμένων ἀμφοῖν γίνεται, ὥσπερ τινές φασιν, ὅτι πολλάκις τὸ θῆλυ συλλαμβάνει οὐ γινομένης αὐτῇ τῆς ἐν τῇ ὁμιλίᾳ ἡδονῆς· καὶ γινομένης πάλιν, οὐδὲν ἧττον, καὶ ἰσοδρομησάντων τοῦ τε ἄρρενος καὶ τοῦ θήλεος, οὐ γεννᾶται, ἂν μὴ ἡ τῶν καλουμένων καταμηνίων ἰκμὰς ὑπάρχῃ σύμμετρος. διὸ οὔτε ὅλως μὴ γινομένων αὐτῶν γεννᾷ τὸ θῆλυ οὔτε γινομένων, ὅταν ἐξικμάζῃ, ὡς ἐπὶ τὸ πολύ, ἀλλὰ μετὰ τὴν ἀποκάθαρσιν. ὁτὲ μὲν γὰρ οὐκ ἔχει τροφὴν οὐδ' B ὕλην, ἐξ ἧς δυνήσεται συστῆσαι τὸ ζῷον ἡ ἀπὸ τοῦ ἄρρενος ἐνυπάρχουσα τῇ γονῇ δύναμις· ὁτὲ δὲ συνεκκλύζεται διὰ τὸ πλῆθος. ὅταν δὲ γινόμενα ἀπέλθῃ, τὸ ὑπολειφθὲν συνίσταται. ὅσαι δὲ μὴ γινομένων τῶν καταμηνίων συλλαμβάνουσιν, ἢ μεταξὺ γινομένων, ὕστερον δὲ μή, αἴτιον ὅτι ταῖς μὲν τοσαύτη γίνεται ἰκμὰς, ὅση μετὰ τὴν κάθαρσιν ὑπολείπεται ταῖς γονίμοις· πλείων δ' οὐ γίνεται περίττωσις, ὥστε καὶ θύραζε ἀπελθεῖν· ταῖς δὲ μετὰ τὴν κάθαρσιν συμμύει τὸ στόμα τῶν ὑστερῶν. ὅταν μὲν οὖν πολὺ μὲν τὸ ἀπεληλυθὸς ᾖ, ἔτι δὲ γίνηται μὲν κάθαρσις, μὴ τοσαύτη δὲ ὥστε ἐξικμάζειν τὸ σπέρμα, τότε πλησιάζουσαι συλλαμβάνουσι. C [πάλιν] οὐθὲν δὲ ἄτοπον τὸ συνειληφυίαις ἔτι γίγνεσθαι. καὶ γὰρ ὕστερον μέχρι τινὸς φοιτᾷ ταῖς τὰ καταμήνια· ὀλίγα δὲ, καὶ οὐ διὰ παντός· ἀλλὰ τοῦτο μὲν νοσηματῶδες· διόπερ [ὀλίγαις καὶ] ὀλιγάκις συμβαίνει τοῦτο· τὰ δ' ὡς ἐπὶ τὸ πολὺ γινόμενα, μάλιστα κατὰ φύσιν ἐστίν. ὅτι μὲν οὖν συμβάλλεται τὸ θῆλυ εἰς τὴν γένεσιν τὴν ὕλην, τοῦτο δ' ἐστὶν ἐν τῇ τῶν καταμηνίων συστάσει, τὰ δὲ καταμήνια περίττωμα, δῆλον.

ΚΕΦΑΛ. κ'.

Ἔτι περὶ τοῦ τὸ θῆλυ σπέρμα μὴ συμβάλλεσθαι ἐν τῇ συνουσίᾳ, περὶ καταμηνίων καὶ πάλιν ἰδίᾳ περὶ σπέρματος αἰ[illegible], καὶ πάλιν ὅτι οὐκ ἀπὸ παντὸς τοῦ σώματος ἔρχεται ἡ γονή, καὶ πῶς πλείω γίνεσθαι συμβαίνει.

D ΟΔ' οἴονται τινὲς σπέρμα συμβάλλεσθαι ἐν τῇ συνουσίᾳ τὸ θῆλυ, διὰ τὸ γίνεσθαι παραπλησίαν τε ἡδονὴν ἐνίοτε αὐταῖς τῇ τῶν ἀρρένων, καὶ ἅμα ὑγρὰν ἀπόκρισιν. οὐκ ἔστιν ἡ ὑγρασία αὕτη σπερματική, ἀλλὰ τοῦ τόπου ἰδία ἑκάσταις. ἔστι γὰρ τῶν ὑστερῶν ἔκκρισις, καὶ ταῖς μὲν γίνεται, ταῖς δ' οὐ γίνεται μέν, ταῖς λευκοχρόοις καὶ θηλυκαῖς, ὡς ἐπὶ τὸ πολὺ εἰπεῖν, οὐ γίνεται δὲ ταῖς μελαίναις καὶ ἀρρενωποῖς. τὸ δὲ πλῆθος οἷς γίνεται, ἐνίοτε οὐ κατὰ σπέρματος πρόεσίν ἐστιν, ἀλλὰ πολὺ ὑπερβάλλει. ἔτι δὲ καὶ ἐδέσματα ἕτερα ἑτέρων ποιεῖ πολλὴν διαφορὰν τοῦ γίνεσθαι τὴν ἔκκρισιν ἢ ἐλάττω, ἢ πλείω τὴν τοιαύτην· οἷον ἔνια τῶν δριμέων, ἐπίδηλον ποιεῖ E εἰς πλῆθος τὴν ἀπόκρισιν. τὸ δὲ συμβαίνειν ἡδονὴν τῇ συνουσίᾳ, οὐ μόνον τοῦ σπέρματος προϊεμένου ἐστὶν, ἀλλὰ καὶ πνεύματος, ἐξ οὗ συνισταμένου ἀποσπερματίζει. δῆλον δ' ἐπὶ τῶν παίδων τῶν μήπω δυναμένων προΐεσθαι, ἐγγὺς δὲ τῆς ἡλικίας ὄντων, καὶ τῶν ἀγόνων ἀνδρῶν· γίνεται γὰρ πᾶσι τούτοις ἡδονὴ τριβομένοις. καὶ τοῖς γε διεφθαρμένοις τὴν γένεσιν, ἐστὶν ὅτε διαλύονται αἱ κοιλίαι, διὰ τὸ ἀποχωρεῖσθαι περίττωμα εἰς τὴν κοιλίαν, οὐ δυνάμενον πεφθῆναι καὶ γενέσθαι σπέρμα. ἔοικε δὲ καὶ τὴν μορφὴν γυνὴ καὶ παῖς, καὶ ἔστιν ἡ γυνὴ ὥσπερ ἄρρεν ἄγονον. ἀδυναμίᾳ γάρ τινι τὸ θῆλυ ἐστί,

τῷ μὴ δύνασθαι πέττειν ἐκ τῆς ἐσχάτης σπέρμα τῆς τροφῆς. τοῦτο δ' ἐστὶν αἷμα, ἢ τὸ ἀνάλογον ἐν τοῖς ἀναίμοις διὰ ψυχρότητα τῆς φύσεως. ὥσπερ δὲ ἐν ταῖς κοιλίαις διὰ τὴν ἀπεψίαν γίνεται διάρροια, οὕτως ἐν ταῖς φλεψὶν αἵ τ' ἄλλαι αἱμορροΐδες, καὶ ἡ τῶν καταμηνίων [ῥύσις]· καὶ γὰρ αὕτη αἱμορροΐς ἐστιν· ἀλλ' ἐκεῖναι μὲν διὰ νόσον· αὗται δὲ, φυσικαί. ὥστε φανερὸν ὅτι εὐλόγως γίνεται ἐκ τούτου ἡ γένεσις. ἔστι γὰρ τὰ καταμήνια σπέρμα οὐ καθαρὸν, ἀλλὰ δεόμενον ἐργασίας· ὥσπερ ἐν τῇ περὶ τοὺς καρποὺς γενέσει, ὅταν ᾖ μήπω διηθημένη, ἔνεστι μὲν ἡ τροφή, δεῖται δὲ ἐργασίας πρὸς τὴν κάθαρσιν. διὸ καὶ μιγνυμένη ἐκείνη μὲν τῇ γονῇ, αὕτη δὲ καθαρᾷ τροφῇ, ἡ μὲν γεννᾷ, ἡ δὲ τρέφει. σημεῖον δὲ τοῦ τὸ θῆλυ μὴ προΐεσθαι σπέρμα, καὶ τὸ γίνεσθαι ἐν τῇ ὁμιλίᾳ τὴν ἡδονὴν τῇ ἁφῇ, κατὰ τὸν αὐτὸν τόπον τοῖς ἄρρεσι. καίτοι οὐ προΐενται τὴν ἰκμάδα ταύτην ἐντεῦθεν. ἔτι δὲ οὐ πᾶσι γίνεται τοῖς θήλεσιν αὕτη ἡ ἔκκρισις, ἀλλὰ τοῖς αἱματικοῖς, καὶ οὐδὲ τούτοις πᾶσιν, ἀλλ' ὅσων αἱ ὑστέραι μὴ πρὸς τῷ ὑποζώματί εἰσι, μηδ' ᾠοτοκοῦσιν. ἔτι δὲ οὐδὲ τοῖς αἷμα μὴ ἔχουσιν, ἀλλὰ τὸ ἀνάλογον. ὅπερ γὰρ ἐνίοις τὸ αἷμα, ἐν τούτοις ἑτέρα ἐστὶ σύγκρισις. τοῦ δὲ μήτε τούτοις [γίνεσθαι καθάρσεις] μήτε τῶν αἷμα ἐχόντων τοῖς εἰρημένοις, [αἰτία ἡ ξηρότης, τοῖς κάτω ἔχουσι, καὶ μὴ ᾠοτοκοῦσιν,] αἰτία ἡ ξηρότης τῶν σωμάτων, ὀλίγον λείπουσα τὸ περίττωμα, καὶ τοσοῦτον, ὅσον εἰς τὴν γένεσιν ἱκανὸν μόνον, ἔξω δὲ μὴ προΐεσθαι. ὅσα δὲ ζῳοτοκεῖ, ἄνευ ᾠοτοκίας (ταῦτα δ' ἐστὶν ἄνθρωπος, καὶ τῶν τετραπόδων ὅσα κάμπτει τὰ ὀπίσθια σκέλη ἐντός· ταῦτα μὲν γὰρ πάντα ζῳοτοκεῖ ἄνευ ᾠοτοκίας) τούτοις δὲ γίνεται μὲν πᾶσι, πλὴν εἴ τι πεπήρωται ἐν τῇ γενέσει, οἷον ὀρεύς· οὐ μὴν ἐπιπολάζουσί γε αἱ καθάρσεις, ὥσπερ ἀνθρώποις. δι' ἀκριβείας δὲ, πῶς συμβαίνει ταῦτα περὶ ἕκαστον τῶν ζῴων, γέγραπται ἐν ταῖς περὶ ζῴων ἱστορίαις. πλείστη δὲ κάθαρσις γίνεται τῶν ζῴων ταῖς γυναιξί, καὶ τοῖς ἄρρεσι πλείστη τοῦ σπέρματος πρόεσις κατὰ λόγον τοῦ μεγέθους. αἴτιον δ', ἡ τοῦ σώματος σύστασις, ὑγρὰ καὶ θερμὴ οὖσα. ἀναγκαῖον γὰρ ἐν τῇ τοιούτῃ γίνεσθαι πλείστην περίττωσιν. ἔτι δὲ οὐδὲ τὰ τοιαῦτα ἔχει ἐν τῷ σώματι μέρη, εἰς ἃ ἀποτρέπεται ἡ περίττωσις, ὥσπερ ἐν τοῖς ἄλλοις. οὐ γὰρ ἔχει οὔτε τριχῶν πλῆθος κατὰ τὸ σῶμα, οὔτε ὀστῶν, καὶ κεράτων καὶ ὀδόντων ἐκκρίσεις. σημεῖον δὲ, ὅτι ἐν τοῖς καταμηνίοις τὸ σπέρμα ἐστίν. ἅμα γὰρ, ὥσπερ εἴρηται πρότερον, τοῖς ἄρρεσι γίνεται τὸ περίττωμα τοῦτο, καὶ τοῖς θήλεσι τὰ καταμήνια ἐπισημαίνει ἐν τῇ αὐτῇ ἡλικίᾳ, ὡς καὶ ἅμα διισταμένων τῶν τόπων τῶν δεκτικῶν ἑκατέρου τοῦ περιττώματος· καὶ ἀραιουμένων ἑκατέρων τῶν πλησίον τόπων, ἐξανθεῖ ἡ τῆς ἥβης τρίχωσις. μελλόντων δὲ διίστασθαι, ἐμφυσῶσιν οἱ τόποι ὑπὸ τοῦ πνεύματος· τοῖς μὲν ἄρρεσιν, ἐπιδηλότερον περὶ τοὺς ὄρχεις· ἐπισημαίνει δὲ καὶ περὶ τοὺς μαστούς· τοῖς δὲ θήλεσι περὶ τοὺς μαστοὺς μᾶλλον. ὅταν γὰρ δύο δακτύλους ἄρωσι, τότε γίνεται τὰ καταμήνια ταῖς πλείσταις. ἐν ὅσοις μὲν οὖν τῶν ζῴων μὴ κεχώρισται τὸ θῆλυ καὶ τὸ ἄρρεν, τούτοις μὲν τὸ σπέρμα, οἷον κύημά ἐστι. λέγω δὲ κύημα, τὸ πρῶτον μίγμα ἐκ θήλεος καὶ ἄρρενος. διὸ καὶ ἐξ ἑνὸς σπέρματος ἓν σῶμα γίνεται, οἷον ἐξ ἑνὸς πυροῦ εἷς πυθμήν, ὥσπερ ἐξ ἑνὸς ᾠοῦ ἓν ζῷον. τὸ γὰρ δίδυμον τῶν ᾠῶν, δύο ᾠά ἐστιν. ἐν ὅσοις δὲ τῶν γενῶν διώρισται τὸ θῆλυ καὶ τὸ ἄρρεν,

A eo quòd ſemen ex vltimo alimento concoquere nequeat: quod alimentum aut ſanguis eſt, aut ſanguini proportionale in iis quæ ſanguine carent, propter naturæ frigiditatem. [illegible] in aluo profluuium accidit cruditate, [illegible] tum cætera profluuia ſanguinis, [illegible] veniunt: nam ea quoque ſanguinis [illegible] ſunt. ſed illa morbo [illegible], hoc [illegible] Sunt enim menſtrua ſemen non purum, [illegible] gens confectionis: quomodo in fructuum generatione adhuc imperfecta ineſt quidem alimentum, ſed confectionem ad puritatem deſiderat. B Quamobrem vt menſtrua genituræ admiſſa generant, ſic alimentum in fructibus gignendis mistum alimento ſyncero alit. Indicio etiam eſt ſemen non emitti à fœmina, quod cùm per coitum fœminis voluptas contrectatione loci eiuſdem atque maribus veniat, tamen humor ille non hic emittitur. Item non omnibus fœminis id excernitur, ſed ſanguineis tantùm: iiſque non omnibus, ſed quibus vterus non ad ſeptum tranſuerſum eſt, nec partus ex ouo. Adhæc, iis quæ non ſanguinem, ſed proportionale ſanguini habent, non emittitur ille humor. Vt enim in aliis ſanguis, ſic in his alia ineſt miſcella. C Cauſa autem ne aut his aut ſupra dictis ſanguineis fiat purgatio, ſiccitas corporis eſt, quæ parum excrementi relinquit, quantumque ſatis duntaxat ad generationem ſit, non vt etiam aliquid foras mittatur. At verò quæ viuipara ſunt ſine oui partione, vt homo, & quadrupedum, quæ ſuffragines intus flectunt, (hæc enim omnia animal procreant ſine ouo) iis omnibus ea purgatio fit, niſi quid læſum per generationem ſit, vt mula. Tamen nullis tam purgationes redundant, quam homini. Sed quemadmodum cuique animali hæc eueniant, in libris de hiſtoriis animalium ſcriptum eſt. *Plurima ex omnibus animalibus purgatio mulieribus fit.* D Maribus etiam plurimum emittitur ſeminis, magnitudinis ratione. Cuius rei cauſa eſt, conſtitutio corporis, quæ humida & calida eſt. Plurimum enim excrementi fieri in eiuſmodi corpore neceſſe eſt. Carent etiam partibus iis in quas vertitur excrementum in *cæteris animalibus.* Non enim pilorum copiam gerunt per corpus, non oſſium, aut cornuum, aut dentium excretiones. Indicium, ſemen eſſe in menſtruis, quòd ſimul vt antè dixi, maribus ſemen fieri incipit, & fœminis menſtrua innoteſcunt eadem ætate, tanquam ſimul ea loca diſtendantur, quæ vtrumque recipiant excrementum. E Cùmque tempus diſtendendi inſtat, loca intumeſcunt à ſpiritu. Quod marium teſtes apertius oſtendunt, quanquam & mammæ: ſed fœminarum mammæ potius indicant. Cùm enim bino digito extolluntur, tunc plurimis incipiunt menſtrua. Igitur in quibus vita præditis ſexus maris ac fœminæ diſtinctus non eſt, in iis ſemen velut conceptus iam eſt. Conceptum appello primam ex mare ac fœmina miſturam. Quamobrem ex vno ſemine vnum gignitur corpus: verbi gratia, ex vno tritici grano vnus fundus, vt ex vno ouo vnũ animal: geminum enim ouum, duo eſt oua. *At in* quibus generibus mas & fœmina diſtinguitur,

in iis plura animalia ex eodem ſemine gigni poſ-ſunt, quaſi natura differat ſemen in plantarum & animalium genere: indicium eſt, quòd vno initu plura gignuntur in iis quæ plura, quàm vnũ, poſſunt ge[illegible]re. Quo argumentó cõſtat etiam, non omni ex parte corporis geniturам prouenire. Neque enim diſtincta ſtatim inde ex eadem parte ſecernerentur, neque poſtquam ſimul ad vterum deueniſſent, ibi diſtinguerentur. Sed euenit porrò quod ex recta ratione eſt, vt cùm mas formam & principium motus præbeat, fœmina corpus atque materiam, (quemadmodum in lactis concretione corpus lac ipſum eſt, ſuccus, aut coagulum principium ſpiſſandi cogendique obtinet) ſic quod à mare in fœmina diſtinguitur, intelligi debeat. Cur in plura pauciorave partiatur, aut ſingulare inſtituat, alia ratio eſt. Sed quia non differat forma quod diuiditur, ſi modò ſe habeat modicè ad materiam, vt neque minus ſit, vt concoquere, denſaréque nequeat, neque amplius, vt exiccare poſſit, fit ob eam rem vt plura generentur. Cæterùm ex eo quod primum conſtitit, ex vno iam vnum tantùm procreatur. Sed geniturам à fœmina non conferri ad generandum, tamen aliquid conferri, idque eſſe menſtruorum conſtitutionem, aut proportionale in genere exangui, tum ex ſuprà dictis, tum etiam ratione, vniuerſalique indagatione conſtat. Eſſe enim quod generet, & ex quo generet, neceſſe eſt. Idque quamuis vnum, forma quidem differre, & rationis diuerſitate oportet. At verò in iis quæ diſtinctas eas potentias obtinent, corpus etiam, & naturam diuerſam eſſe agentis & patientis. Quòd ſi mas eſt vt mouens & agens; fœmina, quà fœmina, vt patiens, ſequitur vt ad maris geniturам fœmina non geniturам, ſed materiam conferat. Quod & fieri ita videtur: natura enim menſtruorum pro prima materia eſt.

A ἐν δὲ τούτοις ἀφ' ἑνὸς σπέρματος ἐνδέχεται πολλὰ γενέσθαι ζῶα, ὡς διαφέροντος τῇ φύσει τοῦ σπέρματος ἐν τοῖς φυτοῖς τε καὶ ζώοις. σημεῖον δέ. ἀπὸ μιᾶς γὰρ ὀχείας, πλείω * δύναται ἐν τοῖς πλείω δυναμένοις γεννᾶν ἑνός. ᾗ καὶ δῆλον ὅτι οὐκ ἀπὸ παντὸς ἔρχεται ἡ γονή. οὔτε γὰρ κεχωρισμένα ἀπὸ τοῦ αὐτοῦ μέρους εὐθὺς ἀπεκρίνετο· οὔτε ἅμα ἐλθόντος εἰς τὰς ὑστέρας, ἐκεῖ διεχωρίζετο· ἀλλὰ συμβαίνει ὥσπερ εὔλογον ἐστίν· ὃ μὲν ἄρρεν, παρέχεται τό, τε εἶδος καὶ τὴν ἀρχὴν τῆς κινήσεως· ὃ δὲ θῆλυ, ὃ σῶμα καὶ τὴν ὕλην· οἷον ἐν τῇ τοῦ γάλακτος πήξει, τὸ μὲν σῶμα, ὃ γάλα ἐστίν· ὁ δὲ ὀπός, ἢ πιτύα, ὃ τὴν ἀρχὴν ἔχον τὴν B συνιστᾶσαν· οὕτω τὸ ἀπὸ τοῦ ἄρρενος ἐν τῷ θήλει μεριζόμενον. δι' ἣν δ' αἰτίαν μερίζεται ἔνθα μὲν εἰς πλείω, ἔνθα δὲ εἰς ἐλάττω, ἔνθα δὲ μοναχῶς, ἕτερος ἔσται λόγος. ἀλλὰ διὰ τὸ μηδέν γε διαφέρειν τῷ εἴδει, ἀλλ' ἐὰν μόνον συμμέτρως ᾖ τὸ διαιρούμενον πρὸς τὴν ὕλην, καὶ μήτε ἔλαττον, ὥστε μὴ πέττειν μηδὲ συνιστάναι· μήτε πλεῖον, ὥστε ξηραίνειν, πλείω οὕτω γίνεται. ἐκ δὲ τοῦ συνιστάντος πρώτου, ἐξ ἑνὸς ἤδη ἓν γίνεται μόνον. ὅτι μὲν οὖν τὸ θῆλυ εἰς τὴν γένεσιν γονὴν μὲν οὐ συμβάλλεται, συμβάλλεται δέ τι, καὶ τοῦτ' ἐστὶν ἡ τῶν καταμηνίων σύστασις, καὶ ἡ τὸ ἀνάλογον ἐν τοῖς ἀναίμοις, ἔκ τε τῶν εἰρημένων δῆλον, καὶ κατὰ τὸν λόγον καθόλου σκοπουμένοις. ἀνάγκη γὰρ εἶναι τὸ γεν-C νῶν, καὶ ἐξ οὗ· καὶ τοῦτ', ἂν καὶ ἓν ᾖ, τῷ γ' εἴδει διαφέρειν, καὶ τῷ τὸν λόγον αὐτῶν εἶναι ἕτερον. ἐν δὲ τοῖς κεχωρισμένας ἔχουσι τὰς δυνάμεις, καὶ τὰ σώματα, καὶ τὴν φύσιν, ἑτέραν εἶναι τοῦ τε ποιοῦντος καὶ τοῦ πάσχοντος. εἰ οὖν τὸ ἄρρεν ἐστὶν ὡς κινοῦν καὶ ποιοῦν, τὸ δὲ θῆλυ, [ᾗ θῆλυ,] ὡς παθητικόν, εἰς τὴν τοῦ ἄρρενος γονὴν τὸ θῆλυ συμβάλλοιτο οὐ γονήν, ἀλλ' ὕλην· ὅπερ καὶ φαίνεται συμβαῖνον. κατὰ γὰρ τὴν πρώτην ὕλην ἐστὶν ἡ τῶν καταμηνίων φύσις.

* κ. [illegible]

CAPVT XXI.

Quonam modo maris ſemen gignendi formandique fœtus cauſa ſit.

ATque de his ita docuiſſe ſatis ſit. Apertum vnà cum iis eſt, de quo diſſerendum deinceps ſit, quemadmodum ſcilicet ad generationem mas conferat, & quonam pacto ſemen maris cauſa eius quod gignitur, ſit: vtrùm vt inſitum, & protinus inde pars corporis gignendi, miſtum cum materia fœminæ: an ſemen nihil commune cum corpore habeat, ſed motus, viſque in eo contenta ſit, quæ communicet? Hæc eſt enim quæ agat. Quod autem conſiſtat, & formam recipiat, reliquum excrementi fœminæ eſt. Atque vt ratione, ſic effectis quoque probari videtur. Nam cùm in vniuerſum animo complectimur, non ita effici vnum ex patiente agentéque videtur, vt quod agit, in eo quod efficitur, inſit: nec omnino ex eo quod mouet, & quod mouetur, quicquam conſtitui. At fœmina quidem, quà fœmina, patiens eſt: mas, quà mas, agens, & vnde mouendi principium eſt. Itaque ſi extrema vtriuſque ſumantur, quà alterum agens & mouens, alterum patiens & quod moueatur, ſit, non ex iis vnum quod gignitur, eſt, ſed ita vt ex fabro, & ligno lectus, aut ex cera & forma globus eſt. Patet igitur, nihil ſecerni à maris ſemine eſſe neceſſe: neque

ΚΕΦΑΛ. κα'.

D Πῶς αἴτιον ἐστὶ τοῦ γιγνομένου τὸ σπέρμα τὸ ἀπὸ τοῦ ἄρρενος.

ΚΑΙ περὶ μὲν τούτων διωρίσθω τὸν τρόπον τοῦτον. ἅμα δ' ἐκ τούτων φανερόν, περὶ ὧν ἐχόμενόν ἐστιν σκέψασθαι, πῶς ποτε συμβάλλεται εἰς τὴν γένεσιν τὸ ἄρρεν, καὶ πῶς αἴτιόν ἐστι τοῦ γινομένου τὸ σπέρμα τὸ ἀπὸ τοῦ ἄρρενος, πότερον ὡς ἐνυπάρχον καὶ μόριον ὂν εὐθὺς τοῦ γινομένου σώματος, μιγνύμενον τῇ ὕλῃ τῇ παρὰ τοῦ θήλεος· ἢ τὸ μὲν σῶμα οὐδὲν κοινωνεῖ τοῦ σπέρματος, ἡ δ' ἐν αὐτῷ κίνησις, καὶ δύναμις. αὕτη μὲν γάρ ἐστιν ἡ ποιοῦσα· τὸ δὲ συνιστάμενον καὶ λαμβάνον τὴν μορφήν, τὸ τοῦ ἐν τῷ θήλει περιττώματος λοιπόν. κατά γε δὴ τὸν λόγον οὕτω φαί-E νεται καὶ ἐπὶ τῶν ἔργων. καθόλου τε γὰρ ἐπισκοποῦσιν οὐ φαίνεται γιγνόμενον ἓν ἐκ τοῦ παθητικοῦ καὶ τοῦ ποιοῦντος, ὡς ἐνυπάρχοντος ἐν τῷ γινομένῳ τοῦ ποιοῦντος· οὐδ' ὅλως δὴ ἐκ τοῦ κινουμένου καὶ κινοῦντος. ἀλλὰ μὴν τό γε θῆλυ, ᾗ θῆλυ, παθητικόν· τὸ δὲ ἄρρεν, ᾗ ἄρρεν, ποιητικόν, καὶ ὅθεν ἡ ἀρχὴ τῆς κινήσεως. ὥστε ἂν ληφθῇ τὰ ἄκρα ἑκατέρων, ᾗ τὸ μὲν ποιητικὸν καὶ κινοῦν, τὸ δὲ, παθητικὸν καὶ κινούμενον, οὐκ ἔστιν ἐκ τούτων τὸ γιγνόμενον ἕν, ἀλλ' ἢ οὕτως ὡς ἐκ τοῦ τέκτονος καὶ ξύλου ἡ κλίνη, ἢ ὡς ἐκ τοῦ κηροῦ καὶ τοῦ εἴδους ἡ σφαῖρα. δῆλον ἄρα ὅτι οὐκ ἀνάγκη ἀποκρίνεσθαί τι ἀπὸ τοῦ ἄρρενος· οὔτ'

A εἰ προέρχεται, διὰ τοῦτο ἐκ τούτου, ὡς ἐνυπάρχοντος, τὸ γιγνόμενόν ἐστιν, ἀλλ' ὡς ἐκ κινήσαντος καὶ τοῦ εἴδους, ὥσπερ ἀπὸ τῆς ἰατρικῆς ὁ ὑγιασθείς. συμβαίνει δὲ ὁμολογούμενα τῷ λόγῳ καὶ ἐπὶ τῶν ἔργων. διὰ τοῦτο γὰρ ἔνια τῶν ἀρρένων καὶ συνδυαζομένων τοῖς θήλεσιν, οὐδὲ μόριον οὐδὲν φαίνεται προϊέμενα εἰς τὸ θῆλυ· ἀλλὰ τοὐναντίον τὸ θῆλυ εἰς τὸ ἄρρεν· ὃ συμβαίνει ἐνίοις τῶν ἐντόμων. ὃ γὰρ ἐν τοῖς προϊεμένοις ἀπεργάζεται τὸ σπέρμα ἐν τῷ θήλει, τοῦτ' ἐν τῷ ζῴῳ αὐτῷ ἡ θερμότης καὶ δύναμις, εἰσφέροντος τοῦ θήλεος τὸ δεκτικὸν τοῦ σπέρματος. ὅθεν καὶ διὰ τοῦτο τὰ τοιαῦτα τῶν ζῴων συμπλέκεται μὲν πολὺν χρόνον, διαλυθέντα δὲ γεννᾷ ταχέως. συνδέδεται μὲν οὖν μέχρις ἂν συστήσῃ, ὥσπερ ἡ γονή· διαλυθέντος
B δὲ, προΐεται τὸ κύημα ταχέως. γεννᾷ γὰρ ἀτελές. σκωληκοτοκεῖ γὰρ πάντα τὰ τοιαῦτα. μέγιστον δὲ σημεῖον, τὸ συμβαῖνον περὶ τοὺς ὄρνιθας, καὶ τὸ τῶν ἰχθύων γένος τῶν ᾠοτόκων, τοῦ μήτε ἀπὸ πάντων ἀπιέναι τὸ σπέρμα τῶν μορίων, μήτε προΐεσθαι τὸ ἄρρεν τι μόριον τοιοῦτον, ὃ ἔσται ἐνυπάρχον τῷ γεννηθέντι, ἀλλὰ μόνον τῇ δυνάμει τῇ ἐν τῇ γονῇ ζῳοποιεῖν, ὥσπερ εἴπομεν ἐπὶ τῶν ἐντόμων, ἐν ὅσοις τὸ θῆλυ προΐεται εἰς τὸ ἄρρεν. ἐάν τε γὰρ ὑπηνέμια τύχῃ κύουσα ἡ ὄρνις, ἐὰν μετὰ ταῦτα ὀχευθῇ, μεταβεβληκότος τοῦ ᾠοῦ ἐκ τοῦ ὠχροῦ ὅλον εἶναι, εἰς τὸ λευκανθῆναι, γόνιμα γὰρ ἀντὶ ὑπηνεμίων· ἐάν τε ὑφ' ἑτέρου ὠχευμένη, καὶ ἔτι ὠχρῶν ὄντων, κατὰ τὸν ὕστερον ὀχεύσαντα τὸ γένος ἀποβαίνει πᾶν
C τὸ τῶν νεοττῶν. διὸ ἔνιοι οὕτω τὸν τρόπον τῶν περὶ τὰς ὄρνιθας τὰς γενναίας σπουδαζόντων ποιοῦσι, μεταβάλλοντες τὰ πρῶτα ὀχεῖα καὶ τὰ ὕστερα, ὡς οὐ συμμιγνύμενον καὶ ἐνυπάρχον, οὐδ' ἀπὸ παντὸς ἐλθὸν τὸ σπέρμα. ἀπ' ἀμφοῖν γὰρ ἂν ἦλθεν, ὥστε εἶχεν ἂν δὶς ταὐτὰ μέρη. ἀλλὰ τῇ δυνάμει τὸ τοῦ ἄρρενος σπέρμα τὴν ἐν τῷ θήλει ὕλην καὶ τροφὴν ποιάν τινα κατασκευάζει. τοῦτο γὰρ ἐνδέχεται ποιῆσαι τὸ ὕστερον ἐπεισελθὸν ἐκ τοῦ θερμαίνειν καὶ πέττειν. λαμβάνει γὰρ τροφὴν τὸ ᾠὸν ἕως ἂν αὐξάνηται. τὸ δ' αὐτὸ συμβαίνει καὶ περὶ τὴν τῶν ἰχθύων γένεσιν τῶν ᾠοτοκούντων. ὅταν μὲν γὰρ ἀποτέκῃ τὰ ᾠὰ ἡ θήλεια, ὁ ἄρρην ἐπιρραίνει τὸν θορόν· καὶ ὧν μὲν ἐφάψηται, γόνιμα ταῦτα γίνεται
D τὰ ᾠά· ὧν δ' ἂν μή, ἄγονα· ὡς οὐκ εἰς τὸ ποσὸν συμβαλλόμενον τοῖς ζῴοις τοῦ ἄρρενος, ἀλλ' εἰς τὸ ποιόν. ὅτι μὲν οὖν οὔτ' ἀπὸ πάντων ἀπέρχεται τὸ σπέρμα τοῖς προϊεμένοις σπέρμα τῶν ζῴων, οὔτε τὸ θῆλυ πρὸς τὴν γένεσιν οὕτω συμβάλλεται τοῖς συνισταμένοις ὡς τὸ ἄρρεν, ἀλλὰ τὸ μὲν ἄρρεν ἀρχὴν κινήσεως, τὸ δὲ θῆλυ τὴν ὕλην, δῆλον ἐκ τῶν εἰρημένων. διὰ γὰρ τοῦτο, οὔτ' αὐτὸ καθ' αὑτὸ γεννᾷ τὸ θῆλυ. δεῖται γὰρ ἀρχῆς καὶ τοῦ κινήσοντος καὶ διοριοῦντος. ἀλλ' ἐνίοις γε τῶν ζῴων, οἷον τοῖς ὄρνισι, μέχρι τινὸς ἡ φύσις δύναται γεννᾶν. αὗται γὰρ συνιστᾶσι μέν, ἀτελῆ δὲ συνιστᾶσι τὰ καλούμενα ὑπηνέμια ᾠά.

ΚΕΦΑΛ. κβ'.

Ὅτι ἡ γένεσις ἐν τῷ θήλει συμβαίνει οὐκ ἐν τῷ ἄρρενι.

Ἔτι ἡ γένεσις ἐν τῷ θήλει συμβαίνει τῶν γινομένων, ἀλλ' οὐκ εἰς τὸ ἄρρεν οὔτε αὐτὸ τὸ ἄρρεν προΐεται τὴν γονήν, οὔτε
E τὸ θῆλυ, ἀλλ' ἄμφω εἰς τὸ θῆλυ συμβάλλονται τὸ παρ' αὐτῶν γιγνόμενον, διὰ τὸ ἐν τῷ θήλει εἶναι τὴν ὕλην, ἐξ ἧς ἐστι τὸ δημιουργούμενον. καὶ εὐθὺς τὴν μὲν ἀθρόον ὑπάρχειν ἀναγκαῖον, ἐξ ἧς συνίσταται τὸ κύημα τὸ πρῶτον, τὴν δ' ἐπιγίνεσθαι ἀεὶ τῆς ὕλης,* εἴπερ δύναται τὸ κυούμενον. ὥστε ἀνάγκη ἐν τῷ θήλει εἶναι τὸν τόκον. καὶ γὰρ πρὸς τῷ ξύλῳ ὁ τέκτων, καὶ πρὸς τῷ πηλῷ ὁ κεραμεύς, καὶ ὅλως πᾶσιν ἡ ἐργασία,

* G ἐπιγίνεσθαι ᾗ αὐξάνεται τὸ κυόμενον.

A ſi quid accedit, idcirco ex eo vt inſito eſſe quod gignitur, ſed vt ex eo quod mouerit, & forma, vtque à medicina qui ſanatus eſt. Facta etiam rationi conſentiunt: hinc enim mares nonnulli per coitum nec membrum quidem vllum in fœminam emittere viſuntur, ſed contra fœmina in marem, vt in quibuſdam inſectis fit. Quod enim in iis qui [illegible] dunt, efficitur ſemine in fœmina, idem in mare ipſo vapor virtúſque efficit, fœmina admouente ſuam particulam, quæ ſeminis capax eſt. Vnde fit, vt genus id animalium diu coeat, abſolutúmque breui generet. Coniuncta igitur manent, quouſque conſtituant perinde vt genitura conſtituit: ſed abiuncta citò edunt conceptum, quoniam &
B imperfectum, quod pariunt, eſt: quippe quę vermiculum omnia id genus progenerent. Maximo ſanè indicio eſt, quod auibus & piſcibus ouiparis euenit, ſemen nec omni ex parte corporis venire, neque tale quid emitti à mare, quod inſit in eo quod genitum eſt: ſed virtute tantùm contenta in genitura viuificari, vt modò diximus de inſectis, quorum fœmina tranſigit in marem. Nam ſiue accidit vt auis hypenemia, id eſt, ſubuentanea, oua ferat, ſi poſtea coit nondum mutato ouo ex luteo in album, fœcunda ex ſubuentitiis redduntur: ſiue concepta ex coitu, ſi adhuc luteis, cum alio mare coiuit, ſimile eius quo cum poſtea coiuit, prouenit omne genus pullorum. Quapropter nonnulli ex
C iis qui vt gallinæ generoſæ procreentur, operam dant, ita mutatis admiſſariis faciunt, tãquam non miſceatur conſtitutionemque ſubeat ſemen, neque omni ex parte venerit, ex ambobus enim veniſſet: itaque bis partes eaſdem haberet: ſed ſua facultate ſemen maris materiam contentam in fœmina, & cibum qualitate quadam afficiat. Id enim efficere poteſt, vbi ſecundum præuenerit tepefaciendo & concoquendo. Cibus enim ab ouo abſumitur, quandiu creſcit. Hoc idem in generatione quoque ouiparorum piſcium euenit. Vbi enim fœmina oua ediderit, mas ſemen aſpergit: & quæcunque attigit, fœcunda efficiuntur: quæ non attigit, remanent infœcunda, quaſi non ad quan-
D titatem mas conferat, ſed ad qualitatem. Patet igitur ex iis, nec omni ex parte ſemen ſecedere, neque fœminam ita vt marem conferre ad generationem, ſed marem, principium motus; fœminam, materiã præſtare. Hac enim cauſa, nec per ſe ipſa fœmina generat: principium enim, & id quod moueat diſcernátque, deſiderat. Sed nõnullis, vt auibus, aliquatenus natura gignere poteſt. Aues enim conſtituunt quidem oua, ſed imperfecta, quæ ſubuentanea vocantur.

CAPVT XXII.

Eius, quod generatur, ortum non in mare ſed fœmina agi.

ET ortus eius, quod generatur, in fœmina agitur. Nec in marem ſemen emittit aut mas, aut
E fœmina, ſed ambo in fœminam conferunt quod ſuum vtrique ſit: quoniam in fœmina materia eſt, ex qua conſtat quod creatur. Ac protinus partim haberi paratam materiam neceſſe eſt, ex qua primus conceptus conſiſtat: partim ſubinde accedere, qua nutriatur, & creſcat. Itaque partum in fœmina contineri neceſſe eſt. Nam & faber adeſt ligno, & figulus limo. Denique omnis actio & motio

& motio vltima iuxta materiam eſt, vt ædificatio in iis quæ ædificantur. Hinc etiam quemadmodum mas conferat ad generationem, acceperis: nec enim mas omnis ſemen emittit, & quibus emittit, marib. nulla pars fœtus hoc eſt: ſicut nec à fabro quicquam ſecedit ad lignorum materiam, neque pars vlla artis fabrilis in eo quod efficitur, eſt, ſed forma, & ſpecies ab illo per motum in materia exiſtit. Atque anima, in qua forma, & ſcientia eſt, mouet manus, aut aliud membrum, motu certæ qualitatis, vel diuerſo, à quibus efficitur diuerſum, vel eodem, à quibus idem: manus autem inſtrumentaque materiam mouent. Ita natura etiam maris ſemen emittentis vtitur eo ſemine quaſi inſtrumento & actu habente motum: vt in operibus artium inſtrumenta mouentur: in illis enim quodam modo motio artis eſt. Quæ igitur ſemen emittunt, hoc modo ad generationem conferunt: quæ autem non emittunt, ſed fœminæ particulam ſui quandam inſerit in marem, hæc ſimile facere videntur, quaſi quis materiam ad opificem afferat. Nam ob imbecillitatem eorum marium nihil per aliud natura efficere poteſt: ſed vix aſſidente ipſa motus valent, & ſimilis fingenti, non fabricanti eſt: quippe quæ non per aliud attingens, ſed ipſa ſuis membris rem condat conſtituendam.

CAPVT XXIII.

Maris & fœminæ conuenientia & differentia in plantis & animalibus.

SExus igitur maris & fœminæ diſtinctus in genere omnium animalium greſſilium eſt. Et quanquam diuerſa ſunt animalia mas & fœmina, tamen ſpecie idem ſunt: verbi gratia, homo vtrunque. At in plantis facultates iſtæ miſcentur, nec mas à fœmina ſeparatur: quamobrem ex ſe ipſæ progenerant, nec genituram emittunt, ſed conceptum, quod ſemen vocatur, afferunt. Idque Empedocles bene retulit ſuo carmine:

Deinde etiam ouiparo genus arborum tulit ortu.

Ouum enim, conceptus eſt, & animal ex parte eius creatur: reliquum alimentum eſt. Animalis ſeminis etiam aliqua ex parte conſiſtit quod oritur: reliquum alimentum germini radicique primæ eſt. Hoc idem quodam modo in iis quoque euenit animalibus quæ ſexu diſtinguuntur. Cùm enim vniuntur, & generant, inſeparata redduntur, vt plantæ: idque natura eorum nititur, vt vnum fiat; quòd cùm coeunt & coniunguntur, conſpicitur vnum effici animal ex ambobus. Atque ea quæ ſemen emittunt, diu complexa funguntur Venere, dum conceptum conſtituant: vt inſecta, quæ ſolent coire. Alia tandiu exigunt, donec partem aduentitiam quandam mittant, quæ conceptum conſtituat ſpatio temporis longiore, quàm in ſanguineo genere agatur. Hæc enim parte quadam diei cohærent: genitura intra plures dies conſtituitur: mox vbi eam emiſerunt partem, abſoluuntur. Profectò animalia tanquam plantæ diuiſæ eſſe videntur, perinde quaſi illas quoque, poſtquam ſemen attulêre, diſſoluas, & ſepares in ſexum inſitum maris ac fœminæ. Atque hæc omnia rectè ita à natura condita ſunt. Plantarum enim ſubſtantiæ non aliud munus, nulla actio,

A καὶ ἡ κίνησις ἡ ἐσχάτη, πρὸς τῇ ὕλῃ ἐστὶν ἡ οἰκοδόμησις ἐν τοῖς οἰκοδομουμένοις. λάβοι δ' ἄν τις ἐκ τούτων καὶ τὸ ἄρρεν πῶς συμβάλλεται εἰς τὴν γένεσιν· οὐδὲ γὰρ τὸ ἄρρεν ἅπαν προΐεται σπέρμα· ὅσα τε προΐεται τῶν ἀρρένων, οὐθὲν μόριον τοῦτ' ἐστὶ τοῦ γιγνομένου κυήματος· ὥσπερ οὐδ' ἀπὸ τέκτονος πρὸς τὴν τῶν ξύλων ὕλην, οὔτ' ἀπέρχεται οὐθέν, οὔτε μόριον οὐδέν ἐστιν ἐν τῷ γιγνομένῳ τῆς τεκτονικῆς, ἀλλ' ἡ μορφὴ καὶ τὸ εἶδος τὸ ἀπ' ἐκείνου ἐγγίνεται διὰ τῆς κινήσεως ἐν τῇ ὕλῃ· καὶ ἡ μὲν ψυχὴ ἐν ᾗ τὸ εἶδος, καὶ ἡ ἐπιστήμη, κινοῦσι τὰς χεῖρας, ἤ τι μόριον ἕτερον, ποιάν τινα κίνησιν, ἑτέραν μὲν, ἀφ' ὧν τὸ γιγνόμενον ἕτερον· τὴν αὐτὴν δὲ, ἀφ' ὧν τὸ αὐτό. αἱ δὲ χεῖρες καὶ B τὰ ὄργανα, τὴν ὕλην. ὁμοίως δὲ καὶ ἡ φύσις, ἡ ἐν τῷ ἄρρενι τῶν σπέρμα προϊεμένων, χρῆται τῷ σπέρματι ὡς ὀργάνῳ, καὶ ἔχοντι κίνησιν ἐνεργείᾳ, ὥσπερ ἐν τοῖς κατὰ τέχνην γινομένοις, τὰ ὄργανα κινεῖται. ἐν ἐκείνοις γάρ πως ἡ κίνησις τῆς τέχνης. ὅσα μὲν οὖν προΐεται σπέρμα, συμβάλλεται τοῦτον τὸν τρόπον εἰς τὴν γένεσιν. ὅσα δὲ μὴ προΐεται [σπέρμα,] ἀλλ' ἐναφίησι τὸ θῆλυ εἰς τὸ ἄρρεν τῶν αὑτοῦ τι μορίων, ὅμοιον ἔοικε ποιεῖν τι, ὥσπερ ἂν εἰ τὴν ὕλην κομίσειέ τις πρὸς τὸν δημιουργόν. δι' ἀσθένειαν γὰρ τῶν τοιούτων ἀρρένων, οὐθὲν δι' ἑτέρων οἷά τε ποιεῖν ἡ φύσις, ἀλλὰ μόλις αὐτῆς προσεδρευούσης, ἰσχύουσιν αἱ κινήσεις, καὶ ἔοικε τοῖς πλάττουσιν, οὐ τοῖς τε- C κταινομένοις. οὐ γὰρ δι' ἑτέρου θιγγάνουσα δημιουργεῖ τὸ συνιστάμενον, ἀλλ' αὐτὴ τοῖς αὐτῆς μορίοις.

ΚΕΦΑΛ. κγʹ.

Τὰ ζῷα καὶ τὰ φυτὰ περὶ τὴν τοῦ ἄρρενος καὶ θήλεος φύσιν καὶ γένεσιν, τί κοινὸν καὶ τί διάφορον ἔχει.

ΕΝ μὲν οὖν τοῖς ζῴοις πᾶσι τοῖς πορευτικοῖς, κεχώρισται τὸ θῆλυ τοῦ ἄρρενος, καὶ ἔστιν ἕτερον ζῷον θῆλυ, καὶ ἕτερον ἄρρεν, τῷ δὲ εἴδει ταὐτόν ἐστιν ἄνθρωπος ἀμφότερα. ἐν δὲ τοῖς φυτοῖς μεμιγμέναι αὗται αἱ δυνάμεις εἰσὶ, καὶ οὐ κεχώρισται τὸ θῆλυ τοῦ ἄρρενος. διὸ καὶ γεννᾷ αὐτὰ ἐξ αὑτῶν, καὶ οὐ προΐεται γονὴν, ἀλλὰ κύημα τὰ καλούμενα σπέρματα. καὶ τοῦτο καλῶς λέγει Ἐμπεδοκλῆς ποιήσας·

D Οὕτω δ' ᾠοτοκεῖ μακρὰ δένδρεα· πρῶτον ἐλαίας.

τό, τε γὰρ ᾠὸν, κύημά ἐστι, καὶ ἔκ τινος αὐτοῦ γίγνεται τὸ ζῷον· [τὸ δὲ λοιπὸν, τροφὴ τοῦ σπέρματος, καὶ ἐκ μέρους γίγνεται τὸ φυόμενον] τὸ δὲ λοιπὸν, τροφὴ γίγνεται τῷ βλαστῷ καὶ τῇ ῥίζῃ τῇ πρώτῃ. τρόπον δέ τινα ταὐτὰ συμβαίνει καὶ ἐν τοῖς κεχωρισμένον ἔχουσι ζῴοις τὸ θῆλυ καὶ τὸ ἄρρεν. ὅταν γὰρ δέῃ γεννῆσαι, γίνεται ἀχώριστον, ὥσπερ ἐν τοῖς φυτοῖς, καὶ βούλεται ἡ φύσις αὐτῶν ἓν γίνεσθαι· ὅπερ ἐμφαίνεται κατὰ τὴν ὄψιν μιγνυμένων καὶ συνδυαζομένων, ἕν τι ζῷον γίγνεσθαι ἐξ ἀμφοῖν. καὶ τὰ μὲν μὴ προϊέμενα σπέρμα, πολὺν χρόνον συμπεπλέχθαι πέφυκεν, ἕως ἂν συστήσῃ τὸ κύημα, οἷον τὰ συνδυαζόμενα τῶν ἐντόμων· τὰ δ', ἕως ἂν ἀποπέμψῃ τι τῶν ἐπεισάκτων αὐτοῦ E μορίων, ὃ συστήσει τὸ κύημα ἐν πλείονι χρόνῳ, τῶν ἀναίμων. ταῦτα μὲν γὰρ, ἡμέρας τι μόριον συνέχεται, ἡ δὲ γονὴ ἐν ἡμέραις συνίστησι πλείοσι· προϊέμενα δὲ τὸ τοιοῦτον ἀπολύεται. καὶ ἀτεχνῶς ἔοικε τὰ ζῷα ὥσπερ φυτὰ εἶναι διῃρημένα· οἷον εἴ τις κἀκεῖνα, ὅταν σπέρμα ἐξενέγκῃ, διαλύσειε καὶ χωρίσειεν εἰς τὸ ἐνυπάρχον θῆλυ καὶ ἄρρεν. καὶ ταῦτα πάντα ἡ φύσις εὐλόγως δημιουργεῖ. τῆς μὲν γὰρ τῶν φυτῶν οὐσίας οὐθέν ἐστιν ἄλλο ἔργον, οὐδὲ πρᾶξις οὐδεμία,

πλείω ἢ τοῦ σπέρματος γένεσις. ὥστ' ἐπεὶ τοῦτο διὰ τοῦ θήλεος γίνεται καὶ τοῦ ἄρρενος συνδεδυασμένων, μίξασα ταῦτα διέθηκε μετ' ἀλλήλων. διὸ ἐν τοῖς φυτοῖς ἀχώριστον τὸ θῆλυ καὶ τὸ ἄρρεν. ἀλλὰ περὶ μὲν τούτων ἐν ἑτέροις ἐπέσκεπται. τοῦ δὲ ζῴου, οὐ μόνον τὸ γεννῆσαι ἔργον, (τοῦτο μὲν γὰρ κοινὸν τῶν ζώντων πάντων) ἀλλὰ καὶ γνώσεώς τινος πάντα μετέχουσι· τὰ μὲν, πλείονος· τὰ δή, ἐλάττονος· τὰ δὲ, πάμπαν μικρᾶς. αἴσθησιν γὰρ ἔχουσιν. ἡ δ' αἴσθησις, γνῶσίς τις. ταύτης δὲ τὸ τίμιον καὶ ἄτιμον πολὺ διαφέρει σκοποῦσι πρὸς φρόνησιν καὶ πρὸς τὸ τῶν ἀψύχων γένος. πρὸς μὲν γὰρ φρόνησιν, ὥσπερ οὐδὲν εἶναι δοκεῖ τὸ κοινωνεῖν ἁφῆς καὶ γεύσεως μόνον· B πρὸς δὲ ἀναισθησίαν, βέλτιστον. ἀγαπητὸν γὰρ ἂν δόξῃ τὸ ταύτης τυχεῖν τῆς γνώσεως, ἀλλὰ μὴ κεῖσθαι τεθνεὼς καὶ μὴ ὄν. διαφέρει δ' αἰσθήσει τὰ ζῷα τῶν ζώντων μόνον. ἐπεὶ δ' ἀνάγκη καὶ ζῆν, ἐὰν ᾖ ζῷον, ὅταν δέῃ ἀποτελεῖν τὸ τοῦ ζῶντος ἔργον, τότε συνδυάζεται καὶ μίγνυται καὶ γίγνεται ὡσπερεὶ φυτὸν, καθάπερ εἴπομεν. τὰ δ' ὀστρακόδερμα τῶν ζῴων, μεταξὺ ὄντα τῶν ζῴων καὶ τῶν φυτῶν, ὡς ἐν ἀμφοτέροις ὄντα τοῖς γένεσιν, οὐδετέρων ποιεῖ τὸ ἔργον. ὡς μὲν γὰρ φυτὸν ὄν, οὐκ ἔχει τὸ θῆλυ καὶ τὸ ἄρρεν, καὶ οὐ γεννᾷ εἰς τὸ ἕτερον· ὡς δὲ ζῷον, οὐ φέρει ἐξ αὑτοῦ καρπὸν ὥσπερ τὰ φυτὰ, C ἀλλὰ συνίσταται καὶ γεννᾶται ἔκ τινος συστάσεως γεοειδοῦς καὶ ὑγρᾶς. ἀλλὰ περὶ μὲν τῆς τούτων γενέσεως ὕστερον λεκτέον.

A nisi generatio ſeminis eſt. Quod cùm maris ac fœminæ coitu efficiatur, miſcuit ea natura, indiſcretúmque ſexum maris & fœminæ plantarum generi tribuit. Sed de his alibi diſputandum nobis eſt. At animalis munus non ſolùm generare, quod commune omnium viuẽtium eſt, ſed etiam cognitionis alicuius particeps vnumquodque eſt, aliud maioris, aliud minoris, aliud minimæ: ſenſum etenim habent. Senſus autem cognitio quædam eſt: cuius ſiue nobilis ſiue ignobilis nota plurimum referet ad hominiſne prudentiam, an ad genus inanimum, conſideretur. Nam ad prudentiam nihil eſſe videbitur, tactum guſtúmque tantùm adipiſci: at ad ſenſus vacuitatem ſum- B mum id eſſe putabitur. Charum enim cenſueris compotem eius eſſe cognitionis, nec emortuum, expertémque eſſentiæ omnis iacere. Senſu autem animalia differunt ab iis quæ tantùm viuunt. Sed cùm viuat etiam, quod animal eſt, neceſſe ſit, cùm fungi viuentis munere opus eſt, tunc coëunt, & miſcentur, & quaſi plantæ efficiuntur, vt dictum eſt. Cæterùm genus animalium teſta intectum, quoniam inter animalia & plantas ambiguum eſt, vt in ambobus conſtitutum generibus, munere neutrius fungitur: nam vt planta, ſexu maris & fœminę caret, nec in altero generat: vt autem animal, nullum ex ſe fructum affert modo plan- C tæ, ſed conſiſtunt, & generantur ex terrena & humida quadam concretione. Sed de eorum generatione poſtea diſſeremus.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζώων γενέσεως τὸ Β.

ΚΕΦΑΛ. α'.

Διὰ τί γένεσις ζῴων ἐστίν. διὰ τί τῶν ζῴων τὸ μὲν, θῆλυ, τὸ δὲ, ἄρρεν γίνεται. Πῶς διαφέρει τὰ ζῷα κατὰ τὴν γένεσιν, καὶ διὰ τί; D

ΤΟ δὲ θῆλυ καὶ τὸ ἄρρεν, ὅτι μέν εἰσιν ἀρχαὶ γενέσεως, εἴρηται πρότερον, καὶ τίς ἡ δύναμις καὶ ὁ λόγος τῆς οὐσίας αὐτῶν. διὰ τί δὲ γίνεται καὶ ἔστι τὸ μὲν θῆλυ, τὸ δὲ ἄρρεν, ὡς μὲν ἐξ ἀνάγκης καὶ τοῦ πρώτου κινοῦντος, καὶ ὁποίας ὕλης, προϊόντα πειρᾶσθαι δεῖ φράζειν τὸν λόγον. ὡς δὲ διὰ τὸ βέλτιον καὶ τὴν αἰτίαν τὴν ἕνεκά τινος, ἄνωθεν ἀπὸ τοῦ παντὸς ἔχει τὴν ἀρχήν. ἐπεὶ γάρ ἐστι τὰ μὲν ἀΐδια, καὶ θειότατα τῶν ὄντων· τὰ δ', ἐν- E δεχόμενα καὶ εἶναι καὶ μὴ εἶναι· τὸ δὲ καλὸν καὶ τὸ θεῖον, αἴτιον ἀεὶ κατὰ τὴν αὑτοῦ φύσιν, τοῦ βελτίονος ἐν τοῖς ἐνδεχομένοις· τὸ δὲ μὴ ἀΐδιον, ἐνδεχόμενόν ἐστι, καὶ εἶναι, καὶ μεταλαμβάνειν καὶ τοῦ χείρονος καὶ τοῦ βελτίονος· βέλτιον δὲ, ψυχὴ μὲν, σώματος· τὸ δ' ἔμψυχον, τοῦ ἀψύχου, διὰ τὴν ψυχήν· καὶ τὸ εἶναι, τοῦ μὴ εἶναι· καὶ τὸ ζῆν, τοῦ μὴ ζῆν· διὰ ταύτας τὰς αἰτίας γένεσις ζῴων ἐστίν. ἐπεὶ γὰρ ἀδύνατος ἡ φύσις τοῦ τοιούτου γένους ἀΐδιος εἶναι, καθ' ὃν ἐνδέχεται τρόπον, κατὰ τοῦτόν ἐστιν ἀΐδιον τὸ γενόμενον. ἀριθμῷ μὲν οὖν ἀδύνατον· (ἡ γὰρ οὐσία τῶν ὄντων ἐν τῷ καθ' ἕκαστον·

ARISTOTELIS STAGIRITÆ DE ANIMALIVM GENERATIONE Liber ſecundus.

CAPVT I.

Quid ſit cauſa, vt principium generationis cuiuſque mouens primum, & procreans.

MAREM ac fœminam eſſe principia generationis, & quænam eorum eſſentiæ vis, atque ratio eſſet, dictum iam eſt. Sed quamobrem gignatur, & ſit, alterum mas, alterum fœmina, vt neceſſariò, & quonam primo mouente, & quali materia id efficiatur, procedendo explicare conabimur. At verò quod ad melioris rationem, & cauſam, cuius gratia, pertinet, cælitus principium ducitur. Cùm E enim rerum aliæ ſint ſempiternæ, ſumméque diuinæ, aliæ quæ poſſint & eſſe, & nõ eſſe: pulchrum autem diuinúmque illud cauſa ſemper ſua natura melioris conditionis in rebus contingentibus ſit: quod verò ſempiternum non eſt, id & eſſe, & particeps tum deterioris cõditionis, tum melioris eſſe poſſit: cúmque anima ſit corpore melior, animatúmque inanimato pręſtet propter animam: & eſſe, quàm non eſſe, & viuere, quàm non viuere, melius ſit: efficitur his de cauſis vt generatio ſit animalium. Cùm enim natura eius ſempiterna eſſe non poſſit: quo modo fieri poteſt, eo ſempiternum, quod gignitur, eſt. Numero igitur non poteſt: (ſubſtantia enim rerum in ſingularibus eſt.

quæ ſi talia eſſent, ſempiterna eſſent.) Specie verò poteſt. Itaque genus hominum ſemper & beſtiarum & plantarum eſt. Sed cùm principium ſit eorum mas, atque fœmina, fit vt generationis gratia ſit mas & fœmina in rerum natura. Cúmque ſua natura melior, magiſque diuina cauſa ſit ea quæ prima mouet, cui ratio ineſt, & forma, quàm materia: cúmque melius etiam ſit ſeparari à deteriori quod melius eſt, ideo in quibuſcunque poteſt, & quoad eius fieri poteſt, mas à fœmina ſeparatur. Melius enim magiſque diuinum eſt principium motus, quod per generationem mas obtinet; fœmina enim materia eſt: ſed coit & iungitur ad generationis officium mas cum fœmina: id enim commune ambobus eſt. Qua igitur ratione ſexu maris ac fœminæ participant, viuunt: quamobrem plantæ quoque vitæ participes ſunt. Qua autem ſenſus adeſt, genus animalium eſt. Quorum inceſſilibus ferè omnibus mas à fœmina ſeparatur, ob eas, quas modò reddidimus, cauſas: eorúmque alia, vt dictum eſt, ſemen emittunt, alia non emittunt, cùm coeunt. Cuius rei cauſa eſt, quòd quæ nobiliora ſunt, eadem ſua natura magnitudinem ſibi poſtulant. Quod non niſi calore animali fieri poteſt. Quod enim maius eſt, id à facultate ampliore moueri neceſſe eſt. Mouere autem calor poteſt. Quamobrem in vniuerſum, propè dixerim, maiora, quæ ſanguinem habent, quàm ea quæ non habent: & incidentia, quàm ſtabilia, maiora, quæ ſemen genitale propter calorem ac magnitudinem emittunt. De mare & fœmina, quam ob cauſam ſint, dictum iam eſt. Animalium verò alia perficiunt partum, foráſque mittunt ſibi ſimile: vt ea quæ animal edunt in lucem: alia nondum explanatum, ſuámque formam adeptum pariunt, quorum ſanguinea ouum pariunt, exanguia vermem. Inter ouum & vermem hoc intereſt: Ouum eſt, cuius ex parte animal gignitur, reliquum cibus ei quod gignitur, eſt: vermis, ex quo toto animal gignitur. Eorum autem, quæ perfectum ſibi ſimile edunt in lucem, atque viuipara ſunt, alia ſtatim intra ſe animal gignunt, vt homo, equus, bos, & ex marinis delphinus, & reliqua generis eiuſdem: alia vbi primum intra ſe ouum genuerint, mox animal edunt foras: vt quæ cartilaginea appellantur. Ouiparorum, alia ouum edunt perfectum, vt aues, & quæ quadrupedes ouum pariunt, vt lacertæ, & teſtudines: aut quæ pedib. carent, vt ſerpentum pars plurima. Oua enim eorum poſtquam prodierunt, nullum inſuper capiunt incrementum: alia imperfectum edunt, vt piſces, cruſtata, & mollia nomine: namque eorum oua edita augentur. Omnia, quæ aut animal pariunt, aut ouum, ſanguinem habent: & quæ ſanguinem habent, aut animal pariunt, aut ouum, niſi omnino improlia ſint. Exanguium inſecta vermiculum pariunt, quæ aut ex coitu generantur, aut ipſa coeunt. Sunt enim nonnulla inſecta, quæ ſponte naturæ gignãtur: ſed ſexum maris ac fœminæ habeant, coniunctáque procreent aliquid. Quod tamen generant, imperfectum eſt. cauſam antea reddidi. Magna permutatio generibus euenit. Nec enim bipedes omnes vel animal pariunt, vel ouum. Aues enim ouum, homo animal parit. Neque quadrupedes omnes, aut ouum pariunt, aut animal. Equus enim, & bos, & aliæ plurimæ, animal pariunt: lacertæ, crocodili, & aliæ complures ouum.

A τοιοῦτον δ' εἴπερ ἦν, ἀΐδιον ἂν ἦν) εἴδει δ' ἐνδέχεται. διὸ γένος ἀεὶ ἀνθρώπων καὶ ζῴων ἐστὶ καὶ φυτῶν. ἐπεὶ δὲ τούτων ἀρχὴ τὸ θῆλυ καὶ τὸ ἄρρεν, ἕνεκα τῆς γενέσεως ἂν εἴη τὸ θῆλυ τε καὶ ἄρρεν ἐν τοῖς οὖσι. βελτίονος δὲ καὶ θειοτέρας τὴν φύσιν οὔσης τῆς αἰτίας τῆς κινούσης πρώτης, ᾗ ὁ λόγος ὑπάρχει καὶ τὸ εἶδος τῆς ὕλης· βέλτιον δὲ καὶ τὸ κεχωρίσθαι τὸ κρεῖττον τοῦ χείρονος, διὰ τοῦτ' ἐν ὅσοις ἐνδέχεται, καὶ καθ' ὅσον ἐνδέχεται, κεχώρισται τοῦ θήλεος τὸ ἄρρεν. βέλτιον γὰρ καὶ θειότερον ἡ ἀρχὴ τῆς κινήσεως, ἣ ἄρρεν ὑπάρχει τοῖς γινομένοις· ὕλη δὲ * τὸ ἢ θῆλυ. συνέρχεται δὲ καὶ μίγνυται B πρὸς τὴν ἐργασίαν τῆς γενέσεως τῷ θήλει τὸ ἄρρεν. αὕτη γὰρ κοινὴ ἀμφοτέρων. κατὰ μὲν οὖν τὸ μετέχειν τοῦ θήλεος καὶ τοῦ ἄρρενος, ζῇ· διὸ καὶ τὰ φυτὰ μετέχει ζωῆς· κατὰ δὲ τὴν αἴσθησιν, τὸ τῶν ζῴων ἐστὶ γένος. τούτων δὲ σχεδὸν ἐν πᾶσι τοῖς πορευτικοῖς κεχώρισται τὸ θῆλυ καὶ τὸ ἄρρεν, διὰ τὰς εἰρημένας αἰτίας· καὶ τούτων τὰ μὲν, ὥσπερ ἐλέχθη, προΐεται σπέρμα· τὰ δ', οὐ προΐεται ἐν τῷ συνδυασμῷ. τούτου δ' αἴτιον, ὅτι τὰ τιμιώτερα, καὶ αὐταρκέστερα τὴν φύσιν ἐστὶν, ὥστε μεγέθους μετειλήφεναι. τοῦτο δ' οὐκ ἄνευ θερμότητος ψυχικῆς. ἀνάγκη γὰρ τὸ μεῖζον ὑπὸ πλείονος κινεῖσθαι δυνάμεως. τὸ δὲ θερμὸν, κινητικόν. διόπερ, ὡς ἐπὶ τὸ C πᾶν βλέψαντας εἰπεῖν, τὰ ἔναιμα μείζω τῶν ἀναίμων καὶ τὰ πορευτικὰ ζῷα, τῶν μονίμων ζῴων· ἅπερ προΐεται σπέρμα, διὰ τὴν θερμότητα καὶ τὸ μέγεθος. καὶ περὶ μὲν ἄρρενος καὶ θήλεος, δι' ἣν ἑκάτερον αἰτίαν, εἴρηται. τῶν δὲ ζῴων τὰ μὲν, τελεσιουργεῖ, καὶ ἐκπέμπει θύραζε ὅμοιον ἑαυτῷ, οἷον ὅσα ζῳοτοκεῖ εἰς τοὐμφανές· τὰ δὲ, ἀδιάρθρωτον ἐκτίκτει καὶ οὐκ ἀπειληφὸς τὴν αὑτοῦ μορφήν. τῶν δὲ τοιούτων, τὰ μὲν ἔναιμα, ᾠοτοκεῖ· τὰ δ' ἄναιμα, σκωληκοτοκεῖ. διαφέρει δ' ᾠὸν καὶ σκώληξ· ᾠὸν μὲν γάρ ἐστιν, ἐξ οὗ γίνεται τὸ γινόμενον ἐκ μέρους, τὸ δὲ λοιπόν ἐστι τροφὴ τῷ γινομένῳ· σκώληξ δὲ, ἐξ οὗ τὸ γινόμενον ὅλου ὅλον γίνεται. τῶν δὲ εἰς τὸ φα-D νερὸν ὅμοιον ἀποτελούντων ζῷον καὶ ζῳοτοκούντων, τὰ μὲν, εὐθὺς ἐν αὑτοῖς ζῳοτοκεῖ, οἷον ἄνθρωπος, ἵππος καὶ βοῦς, καὶ τῶν θαλαττίων δελφὶς, καὶ τἄλλα τὰ τοιαῦτα. τὰ δ', ἐν αὑτοῖς ᾠοτοκήσαντα πρότερον, οὕτω ζῳοτοκεῖ θύραζε· οἷον τὰ σελάχη καλούμενα. τῶν δ' ᾠοτοκούντων, τὰ μὲν, τέλειον προΐεται ᾠὸν, οἷον ὄρνιθες καὶ ὅσα τετράποδα ᾠοτοκεῖ· καὶ ὅσα ἄποδα, οἷον σαῦραι, καὶ χελῶναι, καὶ τῶν ὄφεων τὸ πλεῖστον γένος· τὰ γὰρ τούτων ᾠὰ, ὅταν ἐξέλθῃ, οὐκέτι λαμβάνει αὔξησιν. τὰ δ', ἀτελῆ· οἷον οἵ τε ἰχθύες, καὶ τὰ μαλακόστρακα, καὶ τὰ μαλάκια καλούμενα· τούτων γὰρ τὰ ᾠὰ αὐξάνεται ἐξελθόντα. πάντα δὲ τὰ ζῳοτοκοῦντα ἢ ᾠοτο-E κοῦντα, ἔναιμά ἐστι. καὶ τὰ ἔναιμα, ζῳοτοκεῖ, ἢ ᾠοτοκεῖ, ὅσα μὴ ὅλως ἄγονά ἐστι. τῶν δ' ἀναίμων τὰ ἔντομα σκωληκοτοκεῖ, ὅσα ἢ ἐκ συνδυασμοῦ γίνεται, ἢ αὐτὰ συνδυάζεται. ἔστι γὰρ ἔνια τοιαῦτα τῶν ἐντόμων, ἃ γίνεται μὲν αὐτόματα, ἔστι δὲ θήλεα καὶ ἄρρενα, καὶ ἐκ συνδυαζομένων γίνεταί τι αὐτῶν. ἀτελὲς μέντοι τὸ γινόμενον. ἡ δ' αἰτία εἴρηται πρότερον ἐν ἄλλοις. συμβαίνει δὲ πολλὴ ἐπάλλαξις τοῖς γένεσιν. οὔτε γὰρ τὰ δίποδα πάντα ζῳοτοκεῖ· οἱ γὰρ ὄρνιθες ᾠοτοκοῦσιν. οὔτε ᾠοτοκεῖ πάντα· ὁ γὰρ ἄνθρωπος ζῳοτοκεῖ. οὔτε τὰ τετράποδα πάντα ᾠοτοκεῖ· ἵππος γὰρ, καὶ βοῦς, καὶ ἄλλα μυρία ζῳοτοκεῖ. οὔτε ζῳοτοκεῖ πάντα· σαῦραι γὰρ, καὶ κροκόδειλοι, καὶ ἄλλα πολλὰ, ᾠοτοκοῦσιν.

* Gaza τὸ θῆλυ.

οὐδ' ἐν τῷ πόδας ἔχειν ἢ μὴ ἔχειν διαφέρει· καὶ γὰρ ἄποδα ζωοτοκεῖ, οἷον οἱ ἔχεις καὶ τὰ σελάχη. τὰ δ', ᾠοτοκεῖ, οἷον τὸ τῶν ἰχθύων γένος, καὶ τὸ τῶν ἄλλων ὄφεων. καὶ τῶν πόδας ἐχόντων καὶ ᾠοτοκεῖ πολλὰ, καὶ ζωοτοκεῖ, οἷον τὰ εἰρημένα τετράποδα. καὶ ἐν αὐτοῖς δὲ ζωοτοκεῖ καὶ πόδας ἔχοντα, οἷον ἄνθρωπος· καὶ ἄποδα, οἷον φάλαινα καὶ δελφίς. ταύτῃ μὲν οὐκ ἔστι διελεῖν· οὐδ' αἴτιον τῆς διαφορᾶς οὐδὲν τούτων τῶν πορευτικῶν ὀργάνων· ἀλλὰ ζωοτοκεῖ μὲν, τὰ τελειότερα τὴν φύσιν τῶν ζώων, καὶ μετέχοντα καθαρωτέρας ἀρχῆς· οὐδὲν γὰρ ζωοτοκεῖ ἐν αὐτῷ, μὴ δεχόμενον τὸ πνεῦμα, καὶ ἀναπνέον. τελειότερα δὲ, τὰ θερμότερα τὴν φύσιν, καὶ ὑγρότερα, καὶ μὴ γεώδη. τῆς δὲ θερμότητος τῆς φυσικῆς ὅρος ὁ πνεύμων, ὅσων ἔναιμός ἐστι. ὅλως μὲν γὰρ τὰ ἔχοντα πνεύμονα, τῶν μὴ ἐχόντων θερμότερα. τούτων δ' αὐτῶν, τὰ μὴ σομφὸν ἔχοντα, μηδὲ στιφρὸν, μηδ' ὀλίγαιμον, ἀλλ' ἔναιμον, καὶ μαλακόν. ὥσπερ δὲ τὸ μὲν ζῶον τέλειον, ὁ δὲ σκώληξ καὶ τὸ ᾠὸν, ἀτελές· οὕτως τὸ τέλειον ἐκ τοῦ τελειοτέρου γίνεσθαι πέφυκε. τὰ δὲ θερμότερα μὲν, διὰ τὸ ἔχειν τὸν πνεύμονα, ξηρότερα δὲ τὴν φύσιν· ἢ τὰ ψυχρότερα μὲν, ὑγρότερα δὲ, τὰ μὲν, ᾠοτοκεῖ τέλειον ᾠόν· τὰ δὲ, ᾠοτοκήσαντα, ζωοτοκεῖ ἐν αὐτοῖς. οἱ μὲν γὰρ ὄρνιθες καὶ τὰ φολιδωτὰ, διὰ μὲν θερμότητα τελεσιουργοῦσι, διὰ δὲ ξηρότητα ᾠοτοκοῦσι. τὰ δὲ σελάχη, θερμὰ μὲν ἧττον τούτων, ὑγρὰ δὲ μᾶλλον· ὥστε μετέχει ἀμφοτέρων. καὶ γὰρ ᾠοτοκεῖ καὶ ζωοτοκεῖ ἐν αὐτοῖς. ᾠοτοκεῖ μὲν, ὅτι ψυχρά· ζωοτοκεῖ δ', ὅτι ὑγρά. ζωτικὸν γὰρ τὸ ὑγρόν· πορρωτάτω δὲ τοῦ ἐμψύχου τό γε ξηρόν. ἐπεὶ δ' οὔτε πτερωτὰ, οὔτε φολιδωτὰ, οὔτε λεπιδωτά ἐστιν, ἃ σημεῖα ξηρᾶς καὶ γεώδους μᾶλλον φύσεως, μαλακὸν τὸ ᾠὸν γεννῶσιν. ὥσπερ γὰρ οὐδ' ἐν αὐτοῖς, οὐδ' ἐν τῷ ᾠῷ ἐπιπολάζει τό γε ξηρόν· καὶ διὰ τοῦτο εἰς αὐτὰ ᾠοτοκεῖ. θύραζε γὰρ ἂν ἰὸν, διεφθείρετο τὸ ᾠὸν, οὐκ ἔχον περιβολήν. τὰ δὲ ψυχρὰ καὶ ξηρὰ μᾶλλον, ᾠοτοκεῖ μὲν, ἀτελὲς δὲ τὸ ᾠόν. σκληρόδερμον δὲ, διὰ τὸ γεηρὸν εἶναι, καὶ ἀτελὲς προϊέναι, ἵνα σώζηται φυλακὴν ἔχον τὸ ὀστρακῶδες. οἱ μὲν οὖν ἰχθύες λεπιδωτοὶ ὄντες, καὶ τὰ μαλακόστρακα γεηρὰ ὄντα, σκληρόδερμα τὰ ᾠὰ γεννᾷ. τὰ δὲ μαλάκια, ὥσπερ αὐτὰ γλίσχρα τὴν τοῦ σώματός ἐστι φύσιν, οὕτως σώζει ἀτελῆ προϊέμενα τὰ ᾠά. προΐεται γὰρ γλισχρότητα πολλὴν περὶ τὸ κύημα. τὰ δ' ἔντομα πάντα σκωληκοτοκεῖ. ἔστι δ' ἄναιμα τὰ ἔντομα· διὸ καὶ σκωληκοτοκοῦντα θύραζε. τὰ δ' ἄναιμα, οὐ πάντα σκωληκοτοκεῖ ἁπλῶς· ἐπαλλάττουσι γὰρ ἀλλήλοις τά τ' ἔντομα, καὶ τὰ ἀτελῆ τίκτοντα τὰ ᾠά· οἷον οἵ τε ἰχθύες οἱ λεπιδωτοὶ, καὶ τὰ μαλακόστρακα, καὶ τὰ μαλάκια. τούτων γὰρ τὰ μὲν ᾠὰ σκωληκώδη ἐστίν· αὔξησιν γὰρ λαμβάνει θύραζε. ἐκείνων δ' οἱ σκώληκες γίνονται προϊόντες ᾠοειδεῖς· ὃν δὲ τρόπον, ἐν τοῖς ὕστερον διοριοῦμεν. προσέχειν δὲ δεῖ νοῆσαι, ὡς εὖ καὶ ἐφεξῆς τὴν γένεσιν ἀποδίδωσιν ἡ φύσις. τὰ μὲν γὰρ τελειότερα καὶ θερμότερα τῶν ζώων, τέλειον ἀποδίδωσι τὸ τέκνον κατὰ τὸ ποιόν· κατὰ δὲ τὸ ποσὸν, ὅλως οὐδὲν τῶν ζώων. πάντα γὰρ τὰ γενόμενα λαμβάνει αὔξησιν·

A Nec verò in habendis pedibus, nécne, ratio partus continetur. Nam expedum aliæ animal pariunt, vt viperæ, & cartilaginea: aliæ ouum, vt piſcium genus, ac cæteræ ſerpentes. Pedes habentium multa & ouum & animal pariunt: vt quadrupedes, quas modò enumerauimus. Necnon intra ſe pariunt, tum pedata, vt homo, tum expeda, vt balænæ, delphini. Sic igitur diuidi non poteſt, nec diſcriminis eius cauſam habet inſtrumentum vllum inceſſui delegatum. Sed enim ea pariunt animal, quę natura perfectiore ſunt, & principium ſyncerius obtinent. Nullum enim intra ſe gignit animal, niſi quod aërem recipit, & ſpirat. Perfectiora autem ſunt, quæ natura calidiora B & humidiora, nec terrena conſtant. Caloris verò naturalis ratio, pulmone deſcribitur ſanguinis compote. Quæ enim pulmonē habent, omnino calidiora ſunt iis quæ non habent: & inter ea ſuperant, quæ non fungoſum, aut retorridum, & parum ſanguinis continentem habent pulmonē, ſed ſanguinolentum, & mollem. Vtque animal res perfecta, vermis autem, & ouum, imperfecta eſt: ſic perfectum naſci ſolet à perfectiore. Quæ autem calidiora quidem ſunt propter pulmonem, ſed natura conſtant ſicciore: aut quæ frigidiora quidem, ſed humidiora ſunt, eorum altera ouum edunt perfectum, altera intra ſe, & ouum & animal pariũt. Nam & aues, & cortice intecta, calo- C re ſuo perficiunt, ſed præ ſiccitate ouum pariunt. Cartilaginea cùm minus iis calida, magis humida ſint, vtroque participant: quippe quæ & ouum, & animal intra ſe pariunt: ouum, quia frigida ſunt: animal, quia humida. Humor enim viuificus eſt: ſiccitas longè à vita remota eſt. Sed cùm non penna, non cortice, non ſquama tegantur, quæ indicia ſunt naturæ ſiccæ, atque terrenæ, idcirco molle generant ouum. Vt enim ipſis ſic eorum ouis *nulla ſatis inſidet ſiccitas*. Atque ob eam rem intra ſe pariunt oua. Nam ſi ouum foras prodiret, facilè periret, carens putamine quod protegat, duriore. Frigida ſiccioráque pariunt quidem ouum, ſed imperfectum, cru- D ſta etiam duriuſcula opertum, propter naturam terrenam ſui generis, vtque imperfectum exiens poſſit ſeruari tutela operimenti teſtacei. Piſces itaque cùm ſquamati ſint, & genus cruſtatum, vt terrena conſtitutum natura, oua putamine duriore generant. Sed mollium genus, vt ipſum natura corporis lenta eſt, ſic oua, quæ imperfecta edere ſolet, tuetur, & ſeruat. Plurimum enim lentoris ſua cum fœtura emittunt. Inſecta omnia vermiculum pariunt, eadémque omnia ſanguine carent. Vnde fit vt quæ extra vermiculum pariunt, ſanguine vacent: quanquam exanguia non omnia vermem pariant. Commutant enim inter ſe vices inſecta, & quæ ouum pariunt imperfectum: vt piſces ſquamati, & cruſtata, & mollia. Horum enim oua vermem imitantur: E quippe quæ foris incrementum recipiant: illorum vermiculi tempore procedente in ſpeciem oui tranſeunt. Quod quemadmodum fiat, poſtea explicabimus. Nunc priùs intelligendum quàm bene, miróque deinceps ordine natura reddit generationem. Perfectiora enim calidioráque animalia prolem reddunt perfectam qualitate: nam quantitate nullum omnino animal perfectè progenerat. Omnia enim poſtea quàm nata ſunt, incrementum recipiunt,

& generant quoque ea ipſa animalia intra ſe ſtatim. Cætera ab iis proxima loco ſecundo conſtituta,non ſtatim perfecta intra ſe generant. Cùm enim priùs intra ſe ouum pepererint, mox animal edunt in lucem. Alia non perfectum animal generant,ſed ouum, idque perfectum. Quæ autem iis frigidiora conſtant natura, generant quidem ouum, ſed non perfectum, verùm quod foris perficiatur, vt genus piſcium,ſquamata, & cruſtata, & mollia. Quintum genus, quod frigidiſſimum eſt, ne ouum quidem ex ſeſe parere poteſt, ſed hæc affectio foris euenit ei, vt dictum eſt. Inſecta enim primò vermiculum pariunt,qui addito tempore ſpeciem accipit oui. Aurelia enim appellata oui obtinet facultatem, tum ex eo animal naſcitur, tertia mutatione finem recipiens generationis. Sunt igitur quæ non ſemine genitali procreentur, vt antea dictum eſt. Sanguinea tamen omnia ſemine procreantur, videlicet ea quæ per coitum oriuntur, emiſſa à mare in fœminam genitura: qua ingeſta animalia conſtituuntur,ſuámque formam recipiunt, aut intra ipſa animalia, quæ ſolent animal generare,aut in ouo,aut in ſemine, & eiuſmodi alia ſecretione. De quibus quæſtio longè dubia oritur, quonam pacto ex ſemine generetur aut planta, aut animal. Quod enim gignitur,& ex aliquo,& ab aliquo & aliquid gigni neceſſe eſt. Ex quo gignitur, materia eſt, (quam nonnulla ſecum habent primam acceptam ex fœmina; verbi gratia, ea quæ non forma animalis naſcuntur, ſed vermiculi,aut oui,Quædam diu ex fœmina capiunt, quoniam lactent, vt ea quæ non modò foras, verùm etiam intus forma animalis gignantur.) Talis, id, ex quo oriuntur materia eſt. ſed hoc loco, non ex quo oriantur, quærimus, ſed à quo partes corporis generentur. Aut enim extrinſecus aliquid, aut in genitura, & ſemine inſitum agit: idque aut pars aliqua animæ, aut anima; aut habens animam eſt. Sed ab aliquo extrinſecus agente effici quæque,aut viſcera, aut alia membra, remotum à ratione videtur. Fieri enim non poteſt vt moueat quod non tangit, & quicquam ab eo quod non moueat, afficiatur. Igitur in ipſo conceptu aliquid iam ineſt, quod aut pars eius ſit, aut ſeorſum contineatur. Sed aliud quicquam eſſe abiunctum irrationabile eſt. Etenim generato iam animali, corrumpatúrne illud, an maneat? At nihil ineſſe videtur, quod non totius pars ſit,aut plantæ,aut animalis.Quinetiam corrumpi, poſtquam vel omnes,vel aliquot partes effecit, abſurdum eſt. Quid enim efficiat reliquas? Nam ſi illud poſtea quàm effecerat cor, interiit, cor autem ipſum partem aliam efficit, eiuſdem rationis eſt, vt vel omnia intereant, vel omnia ſeruentur, ergo ſeruari neceſſe eſt. Pars igitur eius eſt id, quod protinus in ſemine ineſt. Sed ſi nihil animæ, quod non aliqua in parte ſit corporis, vt animata quoque pars aliqua protinus ſit, conſequitur. Sed cætera quonam pacto efficiantur? Aut enim ſimul omnes partes generantur: verbi gratia, cor, pulmo, iecur,oculus, & reliqua omnia: aut ordine deinceps, vt in his carminibus,quæ ad Orpheum authorem referuntur. Similiter enim, vt retis implexum conſtitui animal ibi ſcribitur. Sedenim non ſimul omnia effici, vel ſenſu percipi poteſt, cùm partes aliæ iam ineſſe, aliæ nondum adeſſe cernantur. Nec dici poteſt, eas præ ſua exiguitate latêre.

A καὶ τέλεια ἐν τούτοις τὰ ζῷα ἐν αὑτοῖς εὐθύς. τὰ δὲ δεύτερα, ἐν αὑτοῖς μὲν οὐ τέλεια πρῶτον εὐθύς. ζῳοτοκεῖ γάρ, ᾠοτοκήσαντα πρῶτον· θύραζε δὲ ζῳοτοκεῖ. τὰ δέ, ζῷον μὲν οὐ τέλειον γεννᾷ, ᾠὸν δὲ γεννᾷ· καὶ τοῦτο τέλειον τὸ ᾠόν. τὰ δ' ἔτι τούτων ψυχρότερα ἔχοντα τὴν φύσιν, ᾠὸν γεννᾷ, οὐ τέλειον δὲ ᾠόν, ἀλλ' ἔξω τελειοῦται, καθάπερ τὸ τῶν λεπιδωτῶν ἰχθύων γένος, καὶ τὰ μαλακόστρακα καὶ τὰ μαλάκια. τὸ δὲ πέμπτον γένος καὶ ψυχρότατον, οὐκ ᾠοτοκεῖ ἐξ αὑτοῦ, ἀλλὰ καὶ τὸ τοιοῦτον ἔξω συμβαίνει πάθος αὐτοῖς, ὥσπερ εἴρηται. τὰ γὰρ ἔντομα σκωληκοτοκεῖ τὸ πρῶτον· προελθὼν δὲ ᾠοειδὴς γίνεται ὁ σκώληξ· ἡ B γὰρ χρυσαλλὶς καλουμένη, δύναμιν ᾠοῦ ἔχει. εἶτ' ἐκ τούτου γίνεται ζῷον, ἐν τῇ τρίτῃ μεταβολῇ λαβὸν τὸ τῆς γενέσεως τέλος. τὰ μὲν οὖν οὐ γίνεται τῶν ζῴων ἀπὸ σπέρματος, ὥσπερ ἐλέχθη καὶ πρότερον. τὰ δ' ἔναιμα γίνεται πάντα ἀπὸ σπέρματος, ὅσα ἐκ συνδυασμοῦ γίνεται, προϊεμένου τοῦ ἄρρενος εἰς τὸ θῆλυ γονήν· ἧς εἰσελθούσης εἰς τὰ ζῷα, συνίσταται καὶ λαμβάνει τὴν οἰκείαν μορφήν· τὰ μὲν, ἐν αὐτοῖς τοῖς ζῴοις, ὅσα ζῳοτοκεῖ· τὰ δ', ἐν ᾠοῖς καὶ σπέρμασι, καὶ τοιαύταις ἄλλαις ἀποκρίσεσι. περὶ ὧν ἐστιν ἀπορία πλείων, πῶς γίνεταί ποτε ἐκ τοῦ σπέρματος τὸ φυτόν, ἢ τῶν ζῴων ὁτιοῦν. ἀνάγκη γάρ, τὸ γιγνόμενον, καὶ ἔκ τινος γίνεσθαι καὶ C ὑπό τινος, καὶ τί. ἐξ οὗ μὲν οὖν ἐστιν, ὕλη, (ἣν ἔνια μὲν ζῷα ἔχει πρώτην ἐν αὑτοῖς, λαμβάνοντα ἐκ τοῦ θήλεος· οἷον ὅσα μὴ ζῳοτοκεῖται, ἀλλὰ σκωληκοτοκεῖται, ἢ ᾠοτοκεῖται. τὰ δὲ, μέχρι πόρρω ἐκ τοῦ θήλεος λαμβάνει, διὰ τὸ θηλάζειν, ὥσπερ ὅσα ζῳοτοκεῖται, μὴ μόνον ἐκτὸς, ἀλλὰ καὶ ἐντὸς) ἐξ οὗ μὲν οὖν γίνεται, ἡ τοιαύτη ὕλη ἐστί· ζητεῖται δὲ νῦν, οὐκ ἐξ οὗ, ἀλλ' ὑφ' οὗ γίνεται τὰ μόρια. ἤτοι γὰρ τῶν ἔξωθέν τι ποιεῖ, ἢ ἐνυπάρχει ἐν τῇ γονῇ καὶ σπέρματι· καὶ τοῦτ' ἐστιν, ἢ μέρος τι ψυχῆς, ἢ ψυχή, ἢ ἔχον ἂν εἴη ψυχήν. τὸ μὲν οὖν ἔξωθέν τι ποιεῖν ἕκαστον, ἢ τῶν σπλάγχνων, ἢ τῶν ἄλλων μο- D ρίων, ἄλογον ἂν δόξειε. κινεῖν τε γὰρ μὴ ἁπτόμενον, ἀδύνατον· καὶ μὴ κινοῦντος, πάσχειν τι ὑπὸ τούτου. * ἐν ἑαυτῷ ἄρα τῷ κυήματι ἐνυπάρχει τι, ἢ δι' αὐτοῦ μόριον, ἢ κεχωρισμένον. τὸ μὲν οὖν ἄλλο τι εἶναι κεχωρισμένον, ἄλογον. γεννηθέντος γὰρ τοῦ ζῴου, πότερον φθείρεται ἢ ἐμμένει; ἀλλ' οὐδὲν τοιοῦτον φαίνεται ἐνόν, ὃ οὐ μόριον τοῦ ὅλου, ἢ φυτοῦ, ἢ ζῴου ἐστίν. ἀλλὰ μὴν καὶ τὸ φθείρεσθαί γε ποιῆσαν, εἴτε πάντα τὰ μέρη, εἴτε τινά, ἄτοπον. τὰ λοιπὰ γὰρ τί ποιήσει; εἰ γὰρ ἐκεῖνο μὲν τὴν καρδίαν, εἶτ' ἐφθάρη, αὕτη δ' ἕτερον, τοῦ αὐτοῦ λόγου ἢ πάντα φθείρεσθαι, ἢ πάντα μένειν. σώζεται ἄρα. αὐτοῦ ἄρα E μόριόν ἐστιν, ὃ εὐθὺς ἐνυπάρχει ἐν τῷ σπέρματι. Εἰ δὲ [δὴ] μή ἐστι τῆς ψυχῆς μηδέν, ὃ μὴ τοῦ σώματός ἐστιν ἔν τινι μορίῳ, καὶ ἔμψυχον ἄν τι εἴη μόριον εὐθύς. τὰ οὖν ἄλλα, πῶς; ἢ γάρ τοι ἅμα πάντα γίγνεται τὰ μόρια, οἷον καρδία, πνεύμων, ἧπαρ, ὀφθαλμός, καὶ τῶν ἄλλων ἕκαστον, ἢ ἐφεξῆς, ὥσπερ ἐν τοῖς καλουμένοις Ὀρφέως ἔπεσιν. ἐκεῖ γὰρ ὁμοίως φησὶ γίγνεσθαι τὸ ζῷον τῇ τοῦ δικτύου πλοκῇ. ὅτι μὲν οὖν οὐχ ἅμα, καὶ τῇ αἰσθήσει ἐστὶ φανερόν. τὰ μὲν γὰρ φαίνεται ἐνόντα ἤδη τῶν μορίων, τὰ δ' οὔ. ὅτι δ' οὐ διὰ μικρότητα οὐ φαίνεται, δῆλον.

* Gaza, ἐν αὐτῷ ἄρα τῷ κυήματι ἐνυπάρχει τι ἤ, ἢ αὐτοῦ μ. ἢ.

A μείζων γὰρ τὸ μέγεθος ὢν ὁ πνεύμων τῆς καρδίας, ὕστερον φαίνεται τῆς καρδίας ἐν τῇ ἐξ ἀρχῆς γενέσει. ἐπεὶ δὲ τὸ μὲν πρότερον, τὸ δ᾽ ὕστερον, πότερον θάτερον ποιεῖ θάτερον; καὶ ἔστι διὰ τὸ ἐχόμενον, ἢ μᾶλλον μετὰ τόδε γίνεται τόδε; λέγω δὴ, οἷον οὐχ ἡ καρδία γενομένη ποιεῖ τὸ ἧπαρ, τοῦτο δ᾽ ἕτερόν τι· ἀλλὰ τόδε μετὰ τόδε, ὥσπερ μετὰ τὸ παῖς, ἀνὴρ γίνεται, ἀλλ᾽ οὐχ ὑπ᾽ ἐκείνου. λόγος δὲ τούτου, ὅτι ὑπὸ τοῦ [ἐν] ἐντελεχείᾳ ὄντος, τὸ δυνάμει ὂν γίνεται ἐν τοῖς φύσει ἢ τέχνῃ γινομένοις. ὥστε δέοι τὸ εἶδος καὶ τὴν μορφὴν ἐν ἐκείνῳ εἶναι, οἷον ἐν τῇ καρδίᾳ τὸ τοῦ ἥπατος. καὶ ἄλλως δ᾽ ἄτοπος καὶ πλασματίας ὁ λόγος. ἀλλὰ μὴν καὶ τὸ ἐν B τῷ σπέρματι εὐθὺς ἐνυπάρχει τι μόριον τοῦ ζῴου ἢ φυτοῦ γεγενημένον, εἴτε δυνάμενον ποιεῖν τἆλλα, εἴτε μή, ἀδύνατον, εἰ πᾶν ἐκ σπέρματος καὶ γονῆς γίγνεται. δῆλον γὰρ ὅτι ὑπὸ τοῦ τὸ σπέρμα ποιήσαντος ἐγίγνετο, εἴπερ εὐθὺς ἐνυπάρχει. ἀλλὰ σπέρμα δεῖ γενέσθαι πρότερον· καὶ τοῦτ᾽ ἔργον τοῦ γεννῶντος. οὐθὲν ἄρα οἷόν τε μόριον ὑπάρχειν. οὐκ ἄρα ἔχει τὸ ποιοῦν τὰ μόρια ἐν αὑτῷ. ἀλλὰ μὴν οὐδ᾽ ἔξω· ἀνάγκη δ᾽ εἶναι θάτερον τούτων. πειρατέον δὴ ταῦτα λύειν. ἴσως γάρ τι τῶν εἰρημένων ἐστὶν οὐχ ἁπλοῦν· οἷον πῶς ποτε ὑπὸ τοῦ ἔξω οὐκ ἐνδέχεται γίνεσθαι. ἔστι μὲν γὰρ ὡς ἐνδέχεται, ἔστι δ᾽ ὡς οὔ. τὸ μὲν οὖν τὸ σπέρμα λέγειν, C ἢ ἀφ᾽ οὗ τὸ σπέρμα, οὐθὲν διαφέρει ᾗ ἔχει τὴν κίνησιν ἐν ἑαυτῷ, ἣν ἐκεῖνο ἐκίνει. ἐνδέχεται δὲ τόδε κινῆσαι, τόδε δὲ τόδε, καὶ εἶναι οἷον τὰ αὐτόματα τῶν θαυμάτων. ἔχοντα γάρ πως ὑπάρχει δύναμιν τὰ μόρια ἠρεμοῦντα· ὧν τὸ πρῶτον ὅταν τι κινήσῃ τῶν ἔξωθεν, εὐθὺς τὸ ἐχόμενον γίνεται ἐνεργείᾳ. ὥσπερ οὖν ἐν τοῖς αὐτομάτοις, τρόπον μέν τινα ἐκεῖνο κινεῖ, οὐχ ἁπτόμενον νῦν οὐδενός, ἁψάμενον μέντοι· ὁμοίως δὲ καὶ ἀφ᾽ οὗ τὸ σπέρμα, ἢ τὸ ποιῆσαν τὸ σπέρμα, ἁψάμενον μέν τινος, οὐχ ἁπτόμενον δ᾽ ἔτι· τρόπον δέ τινα ἡ ἐνοῦσα κίνησις, ὥσπερ ἡ οἰκοδόμησις τὴν οἰκίαν. ὅτι μὲν οὖν ἐστί τι ὃ ποιεῖ, οὐχ οὕτως δέ, ὡς τόδε τι, οὐδ᾽ ἐνυπάρ- D χει, ὡς τετελεσμένον τὸ πρῶτον, δῆλον. πῶς δέ ποτε ἕκαστον γίνεται, ἐντεῦθεν δεῖ λαβεῖν ἀρχὴν ποιησαμένους· πρῶτον μέν, ὅτι ὅσα φύσει γίνεται ἢ τέχνῃ, ὑπὸ ἐνεργείᾳ ὄντος γίνεται ἐκ τοῦ δυνάμει τοιούτου. τὸ μὲν οὖν σπέρμα τοιοῦτον, καὶ ἔχει κίνησιν καὶ ἀρχὴν τοιαύτην, ὥστε παυομένης τῆς κινήσεως, γίνεσθαι ἕκαστον τῶν μορίων καὶ ἔμψυχον. οὐ γάρ ἐστι πρόσωπον μὴ ἔχον ψυχήν, οὐδὲ σάρξ· ἀλλὰ φθαρέντα, ὁμωνύμως λεχθήσεται τὸ μὲν εἶναι πρόσωπον, τὸ δὲ σάρξ, ὥσπερ κἂν εἰ ἐγίγνετο ξύλινα ἢ λίθινα. ἅμα δὲ τὰ ὁμοιομερῆ γίνεται καὶ τὰ ὀργανικά. καὶ ὥσπερ οὐδ᾽ ἂν πέλεκυν, οὐδ᾽ ἄλλο ὄργανον φήσαιμεν ποιῆ- E σαι τὸ πῦρ μόνον, οὕτως οὐδὲ πόδα, οὐδὲ χεῖρα· τὸν αὐτὸν δὲ τρόπον οὐδὲ σάρκα. καὶ γὰρ ταύτης ἔργον τί ἐστι. σκληρὰ μὲν οὖν καὶ μαλακά, καὶ γλίσχρα καὶ κραῦρα, καὶ ὅσα ἄλλα πάθη ὑπάρχει τοῖς ἐμψύχοις μορίοις, θερμότης καὶ ψυχρότης ποιήσειεν ἄν. τὸν δὲ λόγον ᾧ ἤδη τὸ μὲν σάρξ, τὸ δὲ ὀστοῦν, οὐκέτι· ἀλλ᾽ ἡ κίνησις ἡ ἀπὸ τοῦ γεννήσαντος τοῦ ἐντελεχείᾳ ὄντος ὅ ἐστι δυνάμει, ἐξ οὗ γίνεται, ὥσπερ καὶ ἐπὶ τῶν γινομένων κατὰ τέχνην. σκληρὸν μὲν γὰρ καὶ μαλακὸν τὸν σίδηρον ποιεῖ τὸ θερμὸν καὶ τὸ ψυχρόν, ἀλλὰ ξίφος ἡ κίνησις ἡ τῶν ὀργάνων, ἔχουσα λόγον τὸν τῆς τέχνης. ἡ γὰρ τέχνη, ἀρχὴ καὶ τὸ εἶδος τοῦ γινομένου, ἀλλ᾽ ἐν ἑτέρῳ·

A Pulmo enim, qui amplioris quàm cor magnitudinis eſt, poſterior corde in primo ortu conſpicitur. Sed cùm aliud prius, aliud poſterius fiat, vtrum alterum efficiat alterum, & ſit propter proximum, an potiùs hoc poſt hoc fiat? Verbi cauſa, non iam ortum efficit iecur, idque aliud quippiam, ſed hoc poſt hoc: vt poſtquam puer factus eſt, vir efficitur, non à puero agente vir efficitur. Cuius ratio illa eſt, quòd ab eo quod actu eſt, id quod potentia eſt, efficiatur, tum in naturæ tum in artis operibus. Itaque ſpeciem & formam eſſe in illo oportebit: verbi gratia, in corde formam iecinoris: quanquam alias quoque illa opinio abſurda & B commentitia eſt. Quin etiam vt in ſemine protinus pars aliqua animalis, aut plantæ facta contineatur, ſiue quæ cæteras efficere poſſit, ſiue quæ non poſſit, impoſſibile eſt, quando ex ſemine & genitura omnia generantur. Ab eo enim, qui ſemen fecerit, creatum id proculdubio eſt: ſiquidem protinus ineſt. At verò ſemen prius fieri oportet, idque officium generantis eſt. Nulla igitur pars condita ineſſe poteſt. Ergo quod agit, nullam habet partem, at ne extra quidem: alterutrum autem ſit, neceſſe eſt. Hæc igitur ſoluere conandum eſt: fortaſſe enim aliquid ex iis quæ diximus, non ſimplex eſt, vt ab extero nihil effici poſ- C ſe. Nam & eſt vt poſſit, & eſt vt non poſſit. Sed ſemen, an id à quo ſemen, dicamus, nihilo refert: ſcilicet qua motum, quem illud mouebat, ſemen in ſe ipſum continet. Fieri autem poteſt vt hoc ab hoc moueatur, & hoc ab hoc, ſintq́; perinde quaſi admirabilia illa ſpontina. Partes enim habēt vim modo quodam, etiam cùm quieſcunt. Quarum primam vbi extrinſecus aliquid mouerit, ſtatim proxima actu efficitur. Vt igitur in ſpontinis illis quodam modo illud mouet, quod nihil nunc tangit, ſed antè tetigit: ſic id, à quo ſemen, aut quod ſemen effecit, mouet, cùm aliquid tetigerit, quanquam non adhuc tangit. Et motus qui ineſt, quodam efficit modo, vt ædificatio ædes. Igitur ali- D quid eſſe quod efficiat, ſed non ita, vt hoc quicquã, nec perfectum ineſſe primum agens, apertum iam eſt. Quemadmodum autem vnumquodque fiat, *accipiendum hinc eſt hoc initio*. Omnia quæcunque aut natura, aut arte efficiũtur, ab eo quod actu eſt, fiunt, ex eo quod potentia tale eſt. Semen igitur tale eſt, motúmque habet, & principium tale, vt motu peracto pars exiſtat quæque, eademque ſit animata. Non eſt enim facies, niſi animam habeat, neque caro: ſed corrupta æquiuocè dicetur facies, aut caro, perinde quaſi lapidea, aut lignea facta ſit. Simul autem partes ſimilares, & inſtrumentales, ſiue officiales, efficiuntur. Et E quemadmodum non ſecurim, non aliud inſtrumentum dixerimus factum eſſe ab igne ſolo: ſic non pedem, non manum, eodémque modo ne carnem quidem. Nam eius quoque aliquod officium eſt. Dura igitur, mollia, lenta, rigida, & quæcunque alij affectus partibus inſunt animatis, à caliditate frigiditatéve effici poſſunt. At ratio, qua iam caro, aut os eſt, non poteſt: ſed à motu proficiſcente efficitur ab eo quod genuit, quódque actu eſt id quod potentia eſt id ex quo gignitur: quomodo in iis quoq; agitur, quæ arte efficiuntur. Ferrum enim durum aut molle efficitur calore vel frigore: at verò enſis à motu inſtrumentorum, qui artis obtinet rationem. Ars enim principium formáque eius, quod efficitur, eſt, ſed in alio.

Motus autem naturæ in ipſo eſt, ab altera profectus natura, quæ actu obtinet formam. Sed habetne ſemen animam, néene, ratio eadem atque de partibus reddenda eſt. Nec enim anima vlla eſſe poteſt in alio, niſi in eo cuius eſt, neque pars vlla eſſe poteſt, quod particeps animæ non eſt: niſi æquivocè, vt mortui oculus. Semen igitur & habere animam, & eſſe potentia, palàm eſt. Propius autem & remotius idem à ſe ipſo potentia eſſe poteſt: vt geometra dormiens remotiùs quàm vigilans eſt, iſque remotiùs, quàm qui iam contemplatur. Sed enim huius nulla pars cauſa eſt generationis, ſed quod primum extrinſecus mouit, id cauſa eſt. Nihil enim ſeipſum generat, ſed poſtquam generatum eſt, ſe ipſum iam auget. Quamobrem non ſimul omnes partes generantur, ſed vna primum; eámque primum oriri neceſſe eſt, quæ principium augendi contineat. Siue enim planta, ſiue animal eſt, æquè omnibus ineſt quod vim habeat vegetandi, ſiue nutriendi. Id autem eſt quod tale alterum generet, quale ipſum eſt. Hoc enim cuiuſque perfecti, tum animalis tum ſtirpis ſecundùm naturam officium eſt. Neceſſitatis autem ratio eſt, quòd cùm aliquid ortum eſt, augeri idem neceſſe eſt. Generat igitur quod eſt vniuocum, vt homo hominem, ſed per ſe ipſum augetur. Ergo ipſum, cùm aliquid ſit, auget. Quòd ſi vnum quid, ídque primum ſit, id primum generari neceſſe eſt. Itaque ſi cor primum in nonnullis oritur animalibus, aut cordis proportionale in iis quæ corde carent; ex corde principium illud eſt, in iis quæ cor habent: cæteris ex proportionali. Expoſui iam ad ea quæ antè quærebantur, quid cauſæ ſit vt principium generationis cuiuſque mouens primum, & procreans.

A ἡ δὲ τῆς φύσεως κίνησις ἐν αὐτῷ, ἀφ' ἑτέρας οὖσα φύσεως τῆς ἐχούσης τὸ εἶδος ἐνεργείᾳ. πότερον δ' ἔχει τὸ σπέρμα ψυχὴν, ἢ οὔ, ὁ αὐτὸς λόγος καὶ περὶ τῶν μορίων. οὔτε γὰρ ψυχὴ ἐν ἄλλῳ οὐδεμία, πλὴν ἐν ἐκείνῳ οὗ ἐστιν, οὔτε μόριον ἔσται μὴ μετέχον, ἀλλ' ἢ ὁμωνύμως, ὥσπερ τεθνεῶτος ὀφθαλμός. δῆλον οὖν ὅτι καὶ ἔχει, καὶ ἔστι δυνάμει. ἐγγυτέρω δὲ καὶ πορρωτέρω αὐτὸ αὑτοῦ ἐνδέχεται εἶναι [δυνάμει] ὥσπερ ὁ καθεύδων γεωμέτρης τοῦ ἐγρηγορότος πορρωτέρω, καὶ οὗτος τοῦ θεωροῦντος. ταύτης μὲν οὖν οὐθὲν μόριον αἴτιον τῆς B γενέσεως, ἀλλὰ τὸ πρῶτον κινῆσαν ἔξωθεν. οὐθὲν γὰρ αὐτὸ ἑαυτὸ γεννᾷ· ὅταν δὲ γένηται, αὔξει ἤδη αὐτὸ ἑαυτό. διόπερ πρῶτόν τι γίγνεται, καὶ οὐχ ἅμα πάντα. τοῦτο δὲ γίγνεσθαι ἀνάγκη πρῶτον, ὃ αὐξήσεως ἀρχὴν ἔχει. εἴτε γὰρ φυτὸν, εἴτε ζῷον, ὁμοίως τοῦτο πᾶσιν ὑπάρχει τὸ θρεπτικόν. τοῦτο δ' ἐστὶ τὸ γεννητικὸν ἑτέρου, οἷον αὐτό. τοῦτο γὰρ παντὸς φύσει τελείου ἔργον καὶ ζῴου καὶ φυτοῦ. ἀνάγκη δὲ διὰ τόδε, ὅτι ὅταν τι γένηται, αὐξάνεσθαι ἀνάγκη. ἐγέννησε μὲν τοίνυν τὸ συνώνυμον, οἷον ἄνθρωπος, ἄνθρωπον· αὐξάνεται δὲ C δι' αὑτοῦ. αὐτὸ ἄρα τι ὂν αὔξει. εἰ δὴ ἕν τι καὶ τοῦτο πρῶτον, τοῦτο ἀνάγκη γίγνεσθαι πρῶτον. ὥστ' εἰ ἡ καρδία πρῶτον ἔν τισι ζῴοις γίγνεται, ἐν δὲ τοῖς μὴ ἔχουσι καρδίαν, τὸ ἀνάλογον, ἐκ ταύτης ἂν εἴη ἡ ἀρχή, τοῖς ἔχουσι· τοῖς δ' ἄλλοις, ἐκ τοῦ ἀναλόγου. τί μὲν οὖν ἐστιν αἴτιον ὡς ἀρχὴ τῆς περὶ ἕκαστον γενέσεως, κινοῦν πρῶτον καὶ δημιουργοῦν, εἴρηται πρὸς τὰ διαπορηθέντα πρότερον.

CAPVT II.

De ſeminis natura, & quid ſit, & quam ob cauſam non congelaſcit.

DE ſeminis natura dubitauerit quiſpiam. Semen enim prodit de animali craſſum, & album, mox refrigeratum, humidum ad aquæ ſpeciem redditur: colorem etiam accipit aquæ. Abſurdum igitur id putaueris: aqua enim non craſſeſcit calore. Id autem intrinſecus è loco calido proficiſcitur craſſum, refrigeratúmque humeſcit. Atqui omnia aquoſa concreſcunt frigore. Semen verò poſitum in gelu ſub dio non concreſcit, ſed humeſcit, quaſi à contrario craſſum conſtiterit. Sed neque à calore craſſari, ratio probabilis eſt. Quæ enim plus terræ continent, ea conſiſtunt, craſſantúrque per coctionem, vt lac. Igitur refrigeratum ſolideſcere debuit; at nihilo ſolidius fit, ſed totum modo aquæ liqueſcit. Hoc igitur dubium eſt. Nam ſi aqua eſt, cùm aqua non videatur poſſe à calore craſſari, hoc tamen ex corpore calido craſſum & calidum exit. Sed ſi ex terra conſtat, aut ſi miſtum terræ & aquæ eſt, non totum reſolui in humorem & aquam debuit. An non omnia, quæ accidunt, diximus? Non ſolùm enim quod ex aqua & terra humidum conſtat, craſſatur, ſed etiam quod ex aqua & ſpiritu: vt ſpuma craſſior, albáque exiſtit. Et quo ampullæ pauciores, incertioréſque ſunt, eo & albior & rigidior factus conſpicitur. Quod idem in oleo quoque fit:

ΚΕΦΑΛ. β'.

D Περὶ τῆς τοῦ σπέρματος φύσεως.

ΠΕρὶ δὲ τῆς τοῦ σπέρματος φύσεως ἀπορήσειεν ἄν τις. τὸ γὰρ σπέρμα ἐξέρχεται μὲν ἐκ τοῦ ζῴου παχὺ καὶ λευκόν· ψυχόμενον δὲ, γίνεται ὑγρὸν, ὥσπερ ὕδωρ· καὶ τὸ χρῶμα ὕδατος. ἄτοπον δὴ ἂν δόξειεν. οὐ γὰρ παχύνεται ὕδωρ θερμῷ· τὸ δ', ἔσωθεν ἐκ θερμοῦ ἐξέρχεται παχύ, ψυχόμενον δὲ, γίνεται ὑγρόν. καίτοι πήγνυταί γε τὰ ὑδατώδη· τὸ δὲ σπέρμα οὐ πήγνυται τιθέμενον ἐν τοῖς πάγοις ὑπαίθριον, ἀλλ' ὑγραίνεται, ὡς ὑπὸ τοῦ ἐναντίου παχυνθέν. ἀλλὰ μὴν οὐδ' ὑπὸ θερμοῦ παχύνεσθαι εὔλο- E γον. ὅσα γὰρ γῆς πλεῖον ἔχει, ταῦτα συνίσταται καὶ παχύνεται ἑψόμενα, οἷον καὶ τὸ γάλα. ἔδει οὖν ψυχόμενον στερεοῦσθαι. νῦν δ' οὐθὲν γίνεται στερεὸν, ἀλλὰ πᾶν ὥσπερ ὕδωρ. ἡ μὲν οὖν ἀπορία, αὕτη. εἰ μὲν γὰρ ὕδωρ, τὸ ὕδωρ οὐ φαίνεται παχυνόμενον ὑπὸ τοῦ θερμοῦ· τὸ δ', ἐξέρχεται παχὺ καὶ θερμὸν, ἐκ θερμοῦ τοῦ σώματος. εἰ δ' ἐκ γῆς, ἢ μικτὸν ἐκ γῆς καὶ ὕδατος, οὐκ ἔδει ὑγρὸν πᾶν γίνεσθαι καὶ * ὕδωρ, ἢ οὐ πάντα τὰ συμβαίνοντα διῃρήκαμεν. οὐ γὰρ μόνον παχύνεται τὸ ἐξ ὕδατος καὶ γεώδους συνιστάμενον ὑγρὸν, ἀλλὰ καὶ τὸ ἐξ ὕδατος καὶ πνεύματος· οἷον καὶ ὁ ἀφρὸς γίνεται παχύτερος καὶ λευκός. καὶ ὅσῳ ἂν ἐλάττους καὶ ἀδηλότεραι αἱ πομφόλυγες ὦσι, τοσούτῳ καὶ λευκότερος καὶ στιφρότερος ὁ ὄγκος φαίνεται. τὸ δ' αὐτὸ καὶ τὸ ἔλαιον πάσχει

* G. ὕδωρ. ἢ ὅτι τ. ε. διῃρήκαμεν.

παχύνεται γὰρ τῷ πνεύματι μιγνύμενον. διὸ καὶ τὸ λευκαινόμενον παχύτερον γίνεται, τοῦ ἐνόντος ὑδατώδους ὑπὸ τοῦ θερμοῦ διακρινομένου καὶ γινομένου πνεύματος. καὶ ἡ μολύβδαινα μιγνυμένη ὕδατι ἢ ἐλαίῳ ἐξ ὀλίγου τε πολλοῦ ὄγκον ποιεῖ, καὶ ἐξ ὑγροῦ στιφρόν, καὶ ἐκ μέλανος λευκόν. αἴτιον δ᾽, ὅτι ἐγκαταμίγνυται πνεῦμα, ὃ τόν τε ὄγκον ποιεῖ, καὶ τὴν λευκότητα διαφαίνει, ὥσπερ ἐν τῷ ἀφρῷ καὶ τῇ χιόνι. καὶ γὰρ ἡ χιών ἐστιν ἀφρός. καὶ αὐτὸ τὸ ὕδωρ τῷ ἐλαίῳ μιγνύμενον γίνεται παχὺ καὶ λευκόν. ἔν τε γὰρ ὑπὸ τῆς τρίψεως ἐγκατακλείεται πνεῦμα, καὶ αὐτὸ τὸ ἔλαιον ἔχει πνεῦμα πολύ. ἔστι γὰρ οὔτε γῆς οὔτε ὕδατος, ἀλλὰ πνεύματος τὸ λιπαρόν. διὸ καὶ ἐπὶ τῷ ὕδατι ἐπιπολάζει. ὁ γὰρ ἐν αὐτῷ ὢν ἀήρ, ὥσπερ ἐν ἀγγείῳ, φέρει ἄνω καὶ ἐπιπολάζει, καὶ αἴτιος τῆς κουφότητός ἐστι. καὶ ἐν τοῖς ψύχεσι δὲ καὶ πάγοις, παχύνεται τὸ ἔλαιον, πήγνυται δ᾽ οὔ. διὰ μὲν γὰρ θερμότητα, οὐ πήγνυται (ὁ γὰρ ἀὴρ θερμὸν καὶ ἄπηκτον) διὰ δὲ τὸ συνίστασθαι αὐτόν, καὶ πυκνοῦσθαι ὥσπερ ὑπὸ τοῦ ψύχους, παχύτερον γίνεται τὸ ἔλαιον. διὰ ταύτας τὰς αἰτίας, καὶ τὸ σπέρμα ἔσωθεν μὲν ἐξέρχεται στιφρὸν καὶ λευκόν, ὑπὸ τῆς ἐντὸς θερμότητος πνεῦμα πολὺ ἔχον θερμόν. ἐξελθόντος δέ, ὅταν ἀποπνεύσῃ τὸ θερμόν, καὶ ὁ ἀὴρ ψυχθῇ, ὑγρὸν γίνεται καὶ μέλαν. λείπεται γὰρ τὸ ὕδωρ καὶ εἴ τι μικρὸν γεῶδες, ὥσπερ ἐν φλέγματι καὶ ἐν τῷ σπέρματι ξηραινομένῳ. ἔστι μὲν οὖν ἀτμὶς κοινὸν ὕδατος καὶ πνεύματος· τὸ δὲ πνεῦμα, ἐστὶ θερμὸς ἀήρ· διὸ ὑγρὸν τὴν φύσιν, ὅτι ἐξ ὕδατος. Κτησίας γὰρ ὁ Κνίδιος ἃ περὶ τοῦ σπέρματος τῶν ἐλεφάντων εἴρηκε, φανερός ἐστιν ἐψευσμένος. φησὶ γὰρ οὕτω σκληρύνεσθαι ξηραινόμενον, ὥστε γίνεσθαι ἠλέκτρῳ ὅμοιον· τοῦτο δ᾽ οὐ γίνεται. μᾶλλον γὰρ ἕτερον ἑτέρου σπέρμα γεωδέστερον ἀναγκαῖον εἶναι, καὶ μάλιστα τοιοῦτον, ὅσοις πολὺ γεῶδες ὑπάρχει κατὰ τὸν ὄγκον τὸν τοῦ σώματος. παχὺ δὲ καὶ λευκόν, διὰ τὸ μεμῖχθαι πνεῦμα. καὶ γὰρ λευκόν ἐστι τὸ σπέρμα πάντων. * Ἡρόδοτος γὰρ οὐκ ἀληθῆ λέγει, φάσκων μέλαιναν εἶναι τὴν τῶν Αἰθιόπων γονήν· * ὥσπερ ἀναγκαῖον τῶν τὴν χρόαν μελάνων, εἶναι πάντα μέλανα· καὶ ταῦθ᾽ ὁρῶν καὶ τοὺς ὀδόντας αὐτῶν ὄντας λευκούς. αἴτιον δὲ τῆς λευκότητος τοῦ σπέρματος, ὅτι ἐστὶν ἡ γονὴ ἀφρός· ὁ δ᾽ ἀφρός, λευκόν, καὶ μάλιστα τὸ ἐξ ὀλιγίστων συγκείμενον μορίων, καὶ οὕτω μικρῶν, ὥσπερ ἑκάστης ἀοράτου τῆς πομφόλυγος οὔσης, ὥσπερ συμβαίνει καὶ ἐπὶ τοῦ ὕδατος καὶ τοῦ ἐλαίου μιγνυμένων καὶ τριβομένων, καθάπερ ἐλέχθη πρότερον. ἔοικε δὲ οὐδὲ τοὺς ἀρχαίους λανθάνειν, ἀφρώδης ἡ τοῦ σπέρματος οὖσα φύσις. τὴν γοῦν κυρίαν θεὸν τῆς μίξεως, ἀπὸ τῆς δυνάμεως ταύτης προσηγόρευσαν. ἡ μὲν οὖν αἰτία τῆς λεχθείσης ἀπορίας εἴρηται. φανερὸν δὲ ὅτι διὰ τοῦτ᾽ οὐ πήγνυται. ὁ γὰρ ἀὴρ ἄπηκτος.

* Vide Hiſtor. lib. 3. in fine.

* Scrib. ὡς κἀν- [illegible]

ΚΕΦΑΛ. γʹ.

Ποῦ τρέπεται τὸ σωματῶδες τοῦ σπέρματος, εἴπερ ἐργάζεται τῇ δυνάμει τῇ ἐνούσῃ αὐτῷ· καὶ πότερον ἐνυπάρχει τῷ σπέρματι ψυχὴ καὶ τῷ κυήματι, ἢ οὔ.

Τούτων δ᾽ ἐχόμενόν ἐστι καὶ ἀπορῆσαι καὶ εἰπεῖν, εἰ τῶν προϊεμένων εἰς τὸ θῆλυ γονὴν μηδὲν μόριόν ἐστι τὸ εἰσελθὸν τοῦ γινομένου κυήματος, ποῦ τρέπεται τὸ σωματῶδες αὐτοῦ, εἴπερ ἐργάζεται τῇ δυνάμει τῇ ἐνούσῃ αὐτῷ. διοριστέον

A craſſeſcit enim miſtum cum ſpiritu. Quamobrem craſſius redditur quod albeſcit, cùm humor in eo contentus diſcernatur à calore, efficiaturque ſpiritus. Galena etiam aquæ mixta aut oleo, amplum ex paruo erigit ſtatum, & ſpiſſum ex liquido; & album ex nigro. Cauſa eſt, quòd ſpiritus intermiſcetur, qui faſtum efficit, & albedinem dilucidè aperit, vt in ſpuma, & niue: nam & nix ſpuma eſt. Aqua etiam ipſa permiſta cum oleo, craſſa albaque redditur. Per concuſſum enim attritúmque includitur ſpiritus. Et ipſum oleum quoque multum ſpiritus continet. Pingue enim nec terræ eſt, neque aquæ, ſed ſpiritus. Ex quo fit vt per ſummam aquæ fluitet: aër enim contentus in eo, B velut in vaſe, effert, per ſummáque ſuſtinet, & cauſam leuitatis præbet. Quinetiam frigore & gelu craſſeſcit oleum, non congelaſcit. Calor enim facit ne gelu cogatur. Aër nanque calidus & incongelabilis eſt. Sed quoniam à frigore is quoque conſiſtit, & denſatur, hinc oleum craſſius redditur. His de cauſis ſemen quoque exit intrinſecus ſpiſſum, & album calore interiore, multum ſpiritus calidi continens: ſed egreſſum, vbi calor euanuit, & aër refrigeratur, humidum nigrumque euadit. Remanet enim aqua, & ſi quid paruum terrenæ portionis continetur, vt in pituita, ſic in ſemine cùm ſicceſcit. C Semen igitur commune eſt ſpiritus & aquæ: ſpiritus autem aër calidus eſt. Quamobrem natura humidum eſt, quoniam ex aqua conſtat. Cteſias Cnidius planè mentitur ea quæ de ſemine elephanti ſcribit. Ait enim vſque adeo durari ſicceſcens, vt electro, id eſt ſuccino, ſimile efficiatur: quod nunquam fit. Magis enim alterum altero ſemen eſſe terrenum neceſſe eſt. Et præcipuè tale eorum eſt, quorum in corpore multum materiæ terrenæ habetur. Craſſum autem albúmque eſt, ſpiritus miſtione. Semen enim omnium album eſt. Herodotus vera non ſcribit, cùm nigram eſſe Æthiopum genituram dicat, quaſi neceſſe D ſit, omnia nigra eſſe eorum quibus nigra eſt cutis. Atqui dentes eorum albos eſſe ſecernere potuit. Cauſa vt album ſit ſemen, quòd genitura ſpuma eſt, ſpuma autem alba eſt, & maximè, quæ ex pauciſſimis partibus conſtet, & tam paruis, vt cerni ampullę nequeant. Quod in oleo quoque, & aqua euenit, cùm miſcentur, & concutiuntur, vt antè diximus. Nec verò homines antiquos latuiſſe videtur, naturam ſeminis eſſe ſpumoſam. Deam enim, quæ rei Venereæ præeſt, ab ea ipſa facultate nominarunt. Cauſa propoſitæ quæſtionis explicata iam eſt. Congelaſcere autem ſemen non poſſe ob eam rem, apertum iam eſt; aër enim incongela- E bilis eſt.

CAPVT III.

Vtrùm in his animantibus, quæ ſemen in fœminam mittunt, inſit aliqua conſtituendi conceptus pars.

SEquitur, vt & dubitemus, & dicamus, ſi in iis quæ ſemen emittunt in fœminam, nulla pars conſtituendi conceptus ſit, quod ſubierit, quonam vertatur corpulentia eius, quando ipſum facultate, quam in ſe continet, agit. Definiendum

igitur priùs eſt, vtrùm quod in fœmina conſtituitur, accipiat aliquid ab eo quod ſubierit, an nihil accipiat. Atque etiam de anima, qua animal dicitur, (eſt autem animal parte animæ ſenſuali) vtrùm in ſemine & conceptu ineſt, an non, & vnde. Conceptum enim inanimatum eſſe nemo ſtatuerit, & vita omnibus modis priuatum: quippe cùm nihilo minùs ſemina & conceptus animalium viuant, quàm ſtirpes, & aliquandiu prolifica ſunt. Ergo animam in iis habere vegetalem palàm eſt. Sed quamobrem eam primum haberi neceſſe ſit, ex iis quæ alibi de anima diſſeruimus, apertum eſt. Senſualem etiam, qua animal eſt, tempore procedente recipi, & rationalem, qua homo, certum eſt. Non enim ſimul & animal fit & homo: nec animal & equus. Eademque in cæteris animalibus ratio eſt: finis enim poſtea contingit. Proprium autem eſt, finis cuiuſque generationis. Quamobrem de mente etiam, quonam tempore, & quomodo, & vnde eam recipiant, quæ principium id participant, plurimùm dubitatur. Sed enitendum pro viribus, & quoad fieri poteſt, accepiſſe operæpretium eſt. Animam igitur vegetalem in ſeminibus, conceptibus, ſcilicet nondum ſeparatis, haberi potentia ſtatuẽdum eſt non actu, priùs, quàm eo modo, quo conceptus, qui iam ſeparatur, cibum trahant, & officio eius animæ fungantur. Principio enim hæc omnia vitam ſtirpis viuere videntur. De anima quoque ſenſuali pari modo dicendum eſt, atque etiam de intellectuali. Omnes enim potentia priùs haberi quàm actu neceſſe eſt. Sed aut omnes contingere, cùm antè non fuerint, neceſſe eſt, aut omnes, cùm antè fuerint, aut partim, cùm antè non fuerint, partim cùm antè fuerint: & contingere aut in materia non ſubeuntes ſemen maris, aut eò quidem inde venientes, ſed in mare aut omnes extrinſecus contingere, aut nullam, aut partim extrinſecus, partim non extrinſecus. Cæterùm omnes antè eſſe, impoſſibile rationibus his eſſe oſtenditur. Quorum enim principiorum actio eſt corporalis, hæc ſine corpore ineſſe non poſſe certum eſt. Verbi gratia, ambulare ſine pedibus. Itaque extrinſecus ea venire impoſſibile eſt. Nec enim ipſa per ſe accedere poſſunt, cùm inſeparabilia ſint, neque cum corpore. Semen enim excrementum alimenti mutati eſt. Reſtat igitur vt mens ſola extrinſecus accedat, eáque ſola diuina ſit. Nihil enim cum eius actione communicat actio corporalis. Sed enim omnis animæ ſiue virtus, ſiue potentia, corpus aliud, participare videtur, idque magis diuinum quàm ea quæ elementa appellantur. Verùm prout nobilitate ignobilitatevé animæ inter ſe differunt, ita & natura eius corporis differt. Ineſt enim in ſemine omnium, quod facit, vt fœcunda ſint ſemina, videlicet quod calor vocatur. Idque non ignis, non talis facultas aliqua eſt, ſed ſpiritus, qui in ſemine, ſpumoſóque corpore continetur, & natura quæ in eo ſpiritu eſt proportione reſpondens elemento ſtellarum. Quamobrem ignis nullum animal generat, neque conſtitui quicquam denſis vel humidis vel ſiccis videtur. At verò Solis calor, & animalium, non modò qui ſemine continetur, verumetiam ſi quid excrementi quanquam diuerſum à natura, tamen id quoque principium habet vitale. Cæterùm calorem in animalibus contentum,

A τε δεῖ, πότερον μεταλαμβάνει τὸ συνιστάμενον ἐν τῷ θήλει ἀπὸ τοῦ εἰσελθόντος τι, ἢ οὐθέν· καὶ περὶ ψυχῆς καθ' ἣν λέγεται ζῷον (ζῷον δ' ἐστὶ κατὰ τὸ μόριον τῆς ψυχῆς τὸ αἰσθητικόν) πότερον ἐνυπάρχει τῷ σπέρματι καὶ τῷ κυήματι, ἢ οὔ. οὔτε γὰρ ὡς ἄψυχον θείη τις τὸ κύημα καὶ κατὰ πάντα τρόπον ἐστερημένον ζωῆς. οὐδὲν γὰρ ἧττον τά τε σπέρματα καὶ τὰ κυήματα τῶν ζῴων ζῇ τῶν φυτῶν, καὶ γόνιμα μέχρι τινός ἐστιν. ὅτι μὲν οὖν τὴν θρεπτικὴν ἔχουσι ψυχὴν, φανερόν· δι' ὅ,τε πρώτην ἐστὶν ἀναγκαῖον ταύτην λαβεῖν, ἐκ τῶν περὶ ψυχῆς διωρισμένων ἐν ἄλλοις, φανερόν. προϊόντα δὲ, καὶ τὴν αἰσθητικὴν, καθ' B ἣν ζῷόν ἐστιν. οὐ γὰρ ἅμα γίνεται ζῷον καὶ ἄνθρωπος, οὐδὲ ζῷον καὶ ἵππος. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων ζῴων. ὕστερον γὰρ γίνεται τὸ τέλος. τὸ δὲ ἴδιόν ἐστι τὸ ἑκάστου τῆς γενέσεως τέλος. διὸ καὶ περὶ νοῦ, πότε, καὶ πῶς μεταλαμβάνει, καὶ πόθεν, τὰ μετέχοντα ταύτης τῆς ἀρχῆς. ἔχει δ' ἀπορίαν πλείστην, καὶ δεῖ προθυμεῖσθαι κατὰ δύναμιν λαβεῖν, καὶ καθ' ὅσον ἐνδέχεται. τὴν μὲν οὖν θρεπτικὴν ψυχὴν, τὰ σπέρματα καὶ τὰ κυήματα τὰ ἀχώριστα δηλονότι, δυνάμει μὲν ἔχοντα θετέον, ἐνεργείᾳ δὲ οὐκ ἔχοντα, πρὶν ἢ καθάπερ τὰ χωριζόμενα τῶν κυημάτων ἕλκει τὴν τροφὴν, καὶ ποιεῖ τὸ τῆς τοιαύτης ψυ- C χῆς ἔργον. πρῶτον μὲν γὰρ ἅπαντ' ἔοικε ζῆν τὰ τοιαῦτα φυτοῦ βίον. ἑπομένως δὲ δηλονότι καὶ περὶ τῆς αἰσθητικῆς λεκτέον ψυχῆς, καὶ περὶ τῆς νοητικῆς. πάσας γὰρ ἀναγκαῖον δυνάμει πρότερον ἔχειν, ἢ ἐνεργείᾳ. ἀναγκαῖον δὲ ἤτοι μὴ οὔσας πρότερον ἐγγίνεσθαι πάσας, ἢ πάσας προϋπαρχούσας, ἢ τὰς μὲν, τὰς δὲ μή· καὶ ἐγγίνεσθαι ἢ ἐν τῇ ὕλῃ μὴ εἰσελθούσας ἐν τῷ τοῦ ἄρρενος σπέρματι ἢ ἐνταῦθα μὲν, ἐκεῖθεν ἐλθούσας· ἐν δὲ τῷ ἄρρενι, καὶ θύραθεν ἐγγινομένας ἁπάσας, ἢ μηδεμίαν ἢ τὰς μὲν, τὰς δὲ μή. ὅτι μὲν τοίνυν οὐχ οἷόν τε πάσας προϋπάρχειν, φανερόν ἐστιν ἐκ τῶν τοιούτων. ὅσων γάρ ἐστιν ἀρχῶν ἡ ἐνέργεια σωματικὴ, δῆλον ὅτι ταύ- D τας ἄνευ σώματος ἀδύνατον ὑπάρχειν· οἷον βαδίζειν ἄνευ ποδῶν· ὥστε καὶ θύραθεν εἰσιέναι ἀδύνατον. οὔτε γὰρ αὐτὰς καθ' ἑαυτὰς εἰσιέναι οἷόν τε ἀχωρίστους οὔσας, οὔτ' ἐν σώματι εἰσιέναι. τὸ γὰρ σπέρμα περίττωμα μεταβαλλούσης τῆς τροφῆς [ἐστι.] λείπεται δὲ τὸν νοῦν μόνον θύραθεν ἐπεισιέναι, καὶ θεῖον εἶναι μόνον. οὐδὲ γὰρ αὐτοῦ τῇ ἐνεργείᾳ κοινωνεῖ σωματικὴ ἐνέργεια. πάσης μὲν οὖν ψυχῆς δύναμις, ἑτέρου σώματος ἔοικε κεκοινωνηκέναι, καὶ θειοτέρου τῶν καλουμένων στοιχείων. ὡς δὲ διαφέρουσι τιμιότητι αἱ ψυχαὶ καὶ ἀτιμίᾳ ἀλλήλων, οὕτω καὶ ἡ τοιαύτη διαφέρει φύσις. πάντων μὲν γὰρ ἐν τῷ σπέρ- E ματι ἐνυπάρχει, ὅπερ ποιεῖ γόνιμα εἶναι τὰ σπέρματα, τὸ καλούμενον θερμόν. τοῦτο δ' οὐ πῦρ, οὐδὲ τοιαύτη δύναμίς ἐστιν, ἀλλὰ τὸ ἐμπεριλαμβανόμενον ἐν τῷ σπέρματι, καὶ ἐν τῷ ἀφρώδει πνεῦμα, καὶ ἡ ἐν τῷ πνεύματι φύσις, ἀνάλογος οὖσα τῷ τῶν ἄστρων στοιχείῳ. διὸ πῦρ μὲν οὐδὲν γεννᾷ ζῷον, οὐδὲ φαίνεται συνιστάμενον πυρουμένοις, οὔτ' ἐν ὑγροῖς, οὔτ' ἐν ξηροῖς οὐδέν. ἡ δὲ τοῦ ἡλίου θερμότης καὶ ἡ τῶν ζῴων, οὐ μόνον ἡ διὰ τοῦ σπέρματος, ἀλλὰ κἄν τι περίττωμα τύχῃ τῆς φύσεως ὂν ἕτερον, ὅμως ἔχει καὶ τοῦτο ζωτικὴν ἀρχήν. ὅτι μὲν οὖν ἡ ἐν τοῖς ζῴοις θερμότης,

οὔτε πῦρ, οὔτε ἀπὸ πυρὸς ἔχει τὴν ἀρχήν, ἐκ τῶν τούτων ἐστὶ φανερόν. Τὸ δὲ τῆς γονῆς σῶμα, ἐν ᾧ συναπέρχεται τὸ σπέρμα τὸ τῆς ψυχικῆς ἀρχῆς, τὸ μὲν χωριστὸν ὂν σώματος, ὅσοις ἐμπεριλαμβάνεται τὸ θεῖον, τοιοῦτος δ' ἐστὶν ὁ καλούμενος νοῦς, τὸ δ' ἀχώριστον, τοῦτο σπέρμα τῆς γονῆς διαλύεται καὶ πνευματοῦται, φύσιν ἔχον ὑγρὰν καὶ ὑδατώδη. Διόπερ οὐ δεῖ ζητεῖν ἀεὶ θύραζε αὐτὸ ἐξιέναι, οὐδὲ μόριον οὐδὲν εἶναι τῆς συστάσης μορφῆς, ὥσπερ οὐδὲ τὸν ὀπὸν τὸν τὸ γάλα συνιστάντα. καὶ γὰρ οὗτος μεταβάλλει, καὶ μόριον οὐδέν ἐστι τῶν συνισταμένων ὄγκων. Περὶ μὲν οὖν ψυχῆς πῶς ἔχει τὰ κυήματα καὶ ἡ γονή, καὶ πῶς οὐκ ἔχει, διώρισται. δυνάμει μὲν γὰρ ἔχει, ἐνεργείᾳ δ' οὐκ ἔχει. Τοῦ δὲ σπέρματος ὄντος περιττώματος καὶ κινουμένου κίνησιν τὴν αὐτήν, καθ' ἥνπερ τὸ σῶμα αὐξάνεταί τε καὶ μεριζομένης τῆς ἐσχάτης τροφῆς, ὅταν ἔλθῃ εἰς τὴν ὑστέραν, συνίστησι καὶ κινεῖ τὸ περίττωμα τοῦ θήλεος τὴν αὐτὴν κίνησιν, ἥνπερ αὐτὸ τυγχάνει κινούμενον, κἀκεῖνο. καὶ γὰρ ἐκεῖνο περίττωμα, καὶ πάντα τὰ μόρια ἔχει δυνάμει, ἐνεργείᾳ δ' οὐθέν. καὶ γὰρ τὰ τοιαῦτ' ἔχει μόρια δυνάμει, ᾗ διαφέρει τὸ θῆλυ τοῦ ἄρρενος. ὥσπερ γὰρ καὶ ἐκ πεπηρωμένων, ὁτὲ μὲν γὰρ πεπηρωμένα, ὁτὲ δ' οὔ. οὕτω καὶ ἐκ θήλεος ὁτὲ μὲν θῆλυ, ὁτὲ δ' οὔ, ἀλλὰ ἄρρεν. τὸ γὰρ θῆλυ, ὥσπερ ἐστὶν ἄρρεν πεπηρωμένον· καὶ τὰ καταμήνια, σπέρμα, οὐ καθαρὸν δέ. ἓν γὰρ οὐκ ἔχει μόνον, τὴν τῆς ψυχῆς ἀρχήν. καὶ διὰ τοῦτο ὅσοις ὑπηνέμια γίνεται τῶν ζῴων, ἀμφοτέρων ἔχει τὰ μέρη τὸ συνιστάμενον ᾠόν, ἀλλὰ τὴν ἀρχὴν οὐκ ἔχει. διὸ οὐ γίνεται ἔμψυχον. ταύτην γὰρ τὸ τοῦ ἄρρενος ἐπιφέρει σπέρμα. ὅταν δὲ μετάσχῃ τοιαύτης ἀρχῆς τὸ περίττωμα τοῦ θήλεος, κύημα γίνεται. τοῖς δ' ὑγροῖς μέν, σωματώδεσι δέ, θερμαινομένοις περιίσταται, καθάπερ ἐν τοῖς ἑψήμασι ψυχομένοις τὸ περιέχον. πάντα δὲ τὰ σώματα συνέχει τὸ γλίσχρον· ὅπερ καὶ προϊοῦσι καὶ μείζοσι γιγνομένοις, ἡ τοῦ νεύρου λαμβάνει φύσις, ἥπερ συνέχει τὰ μόρια τῶν ζῴων, ἐν μὲν τοῖς, οὖσα νεῦρον· ἐν δὲ τοῖς, τὸ ἀνάλογον. τῆς δ' αὐτῆς μορφῆς ἐστὶ καὶ δέρμα, καὶ φλέψ, καὶ ὑμήν, καὶ πᾶν τὸ τοιοῦτον γένος. διαφέρει γὰρ ταῦτα τῷ μᾶλλον καὶ ἧττον, καὶ ὅλως ἐν ὑπεροχῇ καὶ ἐλλείψει.

ΚΕΦΑΛ. δ'.

Ὅτι τῶν ζῴων κατὰ τὴν γένεσιν πολλαχῶς διαφερόντων, ἄρξεται ἐντεῦθεν περὶ ἑκάστων ἴδια λέγειν, καὶ πρῶτον περὶ τῶν ζῳοτικῶν περὶ τῆς τοῦ σπέρματος φύσεώς τε καὶ κινήσεως· καὶ περὶ καταμηνίων τῶν τε κατὰ φύσιν, καὶ τῶν λοιπῶν περὶ τῶν γινομένων ἐκ ζῴων μὴ ὁμογενῶν.

Τῶν δὲ ζῴων τὰ μὲν ἀτελέστερα ἔχοντα τὴν φύσιν, ὅταν γένηται κύημα τέλειον, ζῷον δὲ μήπω τέλειον, θύραζε προΐεται. δι' ἃς δ' αἰτίας, εἴρηται πρότερον. τέλειον δὲ ἤδη τότ' ἐστίν, ὅταν τὸ μὲν, ἄρρεν ᾖ, τὸ δέ, θῆλυ τῶν κυημάτων, ἐν ὅσοις ἐστὶν αὕτη ἡ διαφορὰ τῶν γινομένων. ἔνια γὰρ οὔτε θῆλυ γεννᾷ, οὔτε ἄρρεν, ὅσα μηδ' αὐτὰ γίνεται ἐκ θήλεος καὶ ἄρρενος, μηδ' ἐκ ζῴων μιγνυμένων. καὶ περὶ μὲν τῆς τούτων γενέσεως ὕστερον ἐροῦμεν. τὰ δὲ ζῳοτοκοῦντα ἐν αὑτοῖς τὰ τέλεια τῶν ζῴων, μέχρι περ οὗ γεννήσῃ ζῷον, καὶ θύραζε ἐκπέμψῃ, ἔχει συμφυὲς αὑτῷ τὸ γιγνόμενον ζῷον. ὅσα δὲ θύραζε μὲν ζῳοτοκεῖ, ἐν αὑτοῖς δ' ᾠοτοκεῖ τὸ πρῶτον, ὅταν γεννήσῃ τὸ ᾠὸν τέλειον, τούτων ἐνίων μὲν ἀπολύεται τὸ ᾠόν,

nec ignem eſſe, neque ab igne originem ducere, apertum ex his eſt. Corpus autem genituræ, in quo ſemen animalis principij contentum vnà prouenit, partim ſeparabile à corpore, in quibus diuina pars comprehenditur, qualis eſt, quæ mens appellatur: partim inſeparabile: hoc, inquam, genituræ ſemen diſſoluitur, verſúmque in ſpiritum euaneſcit, cùm naturam humidam aquoſamque habeat. Quamobrem an ſemper id foras exeat, quærendum non eſt, neque an pars vlla ſit formæ conſtitutæ: quomodo nec de ſucco, à quo lac cogitur, quæri tale quid conuenit. Nam is quoque mutat, & nulla pars conſtitutæ magnitudinis eſt. De anima quemadmodum conceptus & genitura habent eam, & quemadmodum non habeant, definitum iam eſt: potentia enim habent, actu non habent. Semen autem, cùm excrementum ſit, eodémque moueatur motu, quo augetur corpus digeſtione vltimi alimenti, vbi vterum ſubiit, conſtituit, & mouet excrementum fœminæ eodem motu, quo ipſum mouetur. Nam illud quoque excrementum eſt, habétque omnes partes potentia, actu nullam. Habet enim eas partes potentia, quibus differt fœmina à mare. Nam vt ex læſis interdum læſa, interdum non læſa gignuntur: ſic ex fœmina partim fœmina, aliàs non fœmina, ſed mas generatur. fœmina enim quaſi mas læſus eſt. Et menſtrua ſemen ſunt, quanquam non purum. Vnum enim illud non habent, originem & principium animæ. Quamobrem quibus animalibus oua ſubuentitia gignuntur, partes quidem vtrorumque obtinet ouum inſtitutum: ſed principio caret, quapropter animatũ non eſt. Id enim à maris ſemine affertur, quod principium, vbi fœminæ excrementum receperit, conceptus fit. Humidis verò corpulentiis cùm incaleſcunt, obducitur, vt in pulte refrigerata cruſtula. Corpora autem omnia cohærent, & continentur lentore, quem in dies iamque adauctis corporibus natura accipit nerui, quæ partes animalium continet. In aliis neruo, in aliis eo quod neruo proportionetur. Cutis etiam formæ eiuſdem eſt, & vena, & membrana, & omne eiuſmodi genus. Differunt hæc enim inter ſe maioris minoriſque ratione, & omnino exceſſu defectúve.

CAPVT IV.

Quænam ſint generationis cauſæ, & quemadmodum partes quæque conſtituantur in animalibus.

Animalia verò, quorum natura imperfectior eſt, conceptum, cùm perfectus iam eſt, ſed nondum animal perfectum, foras mittunt. Quod quas ob cauſas ita fiat, antè diximus. Perfectum autem eſt animal, cùm conceptus iam aut mas, aut fœmina eſt, ſcilicet in quibus ſexus hæc differentia habetur. Sunt enim quæ nec marem neque fœminam generent, videlicet quæ & ipſa non ex fœmina maréque, & coitu animalium, procreantur. Sed de eorum generatione poſtea dicemus. Quæ autem animal intra ſe generant, ſcilicet naturę perfectæ animalia, quouſque animal pariant, foráſque emittant, gerunt intra ſe innexum, quod gignitur. At verò quæ foras animal pariunt, cùm intra ſe priùs ouum genuerint, eorum nonnullis ouum iã perfectum abſoluitur,

vteorum quæ foras pariunt, ouum. Atque ita animal ex ouo intra fœminam naſcitur. Aliis cùm alimentum in ouo contentum abſumptum iam eſt, repletur ab vtero, & perficitur: atque ob eam rem ouum vtero non abiungitur. Hæc cartilagineorum piſcium differentia eſt, de quibus pòſt ſeorſum per ſe differemus. Nunc à primis incipiendum eſt. Prima autem ſunt, quæ perfecta. Eiuſmodi autem ſunt, quæ animal generant, eorúmque primum homo eſt. Deceſſio igitur ſeminis omnium non aliter quàm cæterorum excrementorum fieri ſolet. Fertur enim vnumquodque ſuum in locum, non vim ſpiritu inferente, non alia eiuſmodi cauſa cogente, vt quidam à teſtibus trahi modo cucurbitarum medicinalium per vim ſpiritus opinantur, quaſi fieri poſſit, vt niſi vis inferatur, aliò tendat excrementum alimenti, aut humidi, aut ſicci, quoniam retento ſpiritu ita vniuerſo excernatur. At id commune omnium eſt, quæ mouere volumus: vires enim retento ſpiritu augentur. Nam & ſine ea vi excrementa per ſomnum exeunt, ſi meatus laxi pleníque excrementi ſunt. Simile ab iis ducitur, vt ſi quis plantarum ſemina dixerit quotannis à ſpiritu ſecerni eò vbi fructum afferre ſolent. Sed enim cauſa eius rei, vt diximus, eſt, quòd excrementis partes capaces deſcriptæ à natura habentur omnibus, tum inutilibus illis ſicco & humido, tum ſanguini, quæ venæ vocantur. Fœminæ itaque, venis duabus, maiore atque aorta, fiſſis ſupernè, venarum multitudo tenuium in vterum deſinit, quibus alimento expletis, naturáque pre ſua frigiditate facultatis concoquendi indiga, transfunditur in vterum, propter venarum tenuitatem, cùm præ ſua anguſtia nequeant exuperantiam continere. Itaque affectus hic velvti mariſcæ, aut alia profuſio ſanguinis euenit. Cæterùm menſtrua nullo circuitu certo deſcribuntur. Tendunt tamen moueri decreſcente menſe, idque ratione rectà. Sunt enim corpora animalium frigidiora, cùm euenit vt continens aër talis efficiatur. Menſium autem coitus frigidi ſunt propter Lunæ defectum. Itaque fit vt fines menſium, quàm media, ſint frigidiores. Igitur poſtquam excrementum mutatum in ſanguinem eſt, menſtrua moueri tendunt eo, quem modò dixi, circuitu. At ſi concoctum non eſt, paulatim aliquid ſubinde ſecernitur. Quamobrem quæ alba vocantur, paruis adhuc & puellis proueniunt. Seruat corpora integra vterque excrementorum hic ſeceſſus, cùm modicè fit, vtpote cùm ab excrementis vindicentur, quæ cauſæ corporibus ſunt vt ægrotent. Sed ſi vel non fit, vel immodicè fit, damnum euenit. Aut enim morbi oriuntur, aut corpus emarceſcit, & extenuatur. Quamobrem & ea alba, cùm frequenter mouentur, & ſuperant, incrementum auferunt puellarum. Fit igitur neceſſariò excrementum hoc ob eas, quas diximus, cauſas. Cùm enim natura concoquere nequeat, excrementum fiat neceſſe eſt, non ſolùm alimenti inutilis, ſed etiam in venis, & per tenuiſſimas venas exundando ſuperet. Sed melioris notæ finiſque gratia natura eo abvtitur in hunc locum, ſcilicet generationis cauſa, vt quale erat futurum, tale alterum oriatur.

A ὥσπερ τῶν θύραζε ᾠοτοκούντων, καὶ τὸ ζῷον ἐκ τοῦ ᾠοῦ γίνεται ἐν τῇ θηλείᾳ· ἐνίων δὲ, ὅταν καταναλωθῇ ἡ ἐν τῷ ᾠῷ τροφὴ, τελειοῦται ἀπὸ τῆς ὑστέρας. καὶ διὰ τοῦτο οὐκ ἀπολύεται τὸ ᾠὸν ἀπὸ τῆς ὑστέρας. ταύτην δὲ ἔχουσι τὴν διαφορὰν οἱ σελαχώδεις ἰχθύες, περὶ ὧν ὕστερον καθ' αὑτὰ λεκτέον. νῦν δ' ἀπὸ τῶν πρώτων ἀρκτέον πρῶτον. ἔστι δὲ τὰ τέλεια ζῷα, πρῶτα. τοιαῦτα δὲ τὰ ζῳοτοκοῦντα· καὶ τούτων ἄνθρωπος πρῶτον. ἡ μὲν οὖν ἀπόκρισις γίνεται πᾶσι τοῦ σπέρματος, ὥσπερ ἄλλου τινὸς περιττώματος. φέρεται γὰρ ἕκαστον εἰς τὸν οἰκεῖον τόπον, οὐθὲν ἀποβιαζομένου τοῦ πνεύματος, οὐδ' ἄλλης τοιαύτης αἰτίας ἀναγκαζούσης, B ὥσπερ τινές φασιν, ἕλκειν τὰ αἰδοῖα φάσκοντες, ὥσπερ τὰς σικύας, τῷ τε πνεύματι* βιαζομένων, ὥσπερ ἐνδεχόμενον ἄλλοθί που προελθεῖν, μὴ* βιαζομένων ταύτην τὴν περίττωσιν τῆς ὑγρᾶς ἢ ξηρᾶς τροφῆς, ὅτι τὰς ἐξόδους αὐτῶν ἡ θερισμένη τῷ πνεύματι συνεκκρίνουσι. τοῦτο δὲ κοινὸν κατὰ πάντων ὅσα δεῖ κινῆσαι. διὰ γὰρ τοῦ τὸ πνεῦμα κατασχεῖν, ἡ ἰσχὺς ἐγγίνεται· ἐπεὶ καὶ ἄνευ ταύτης τῆς βίας ἐκκρίνεται τὰ περιττώματα, καὶ καθεύδουσιν, ἂν ἀνειμένοι τε καὶ πλήρεις περιττώματος οἱ τόποι τύχωσιν ὄντες. ὅμοιον δὲ κἂν εἴ τις φαίη τοῖς φυτοῖς ὑπὸ τοῦ πνεύματος ἑκάστοτε τὰ σπέρματα ἀποκρίνεσθαι πρὸς τοὺς τόπους, πρὸς οὓς εἴωθε φέρειν τὸν καρπόν. ἀλλὰ τούτων μὲν αἴτιον, C ὥσπερ εἴρηται, τὸ πᾶσιν εἶναι μόρια δεκτικὰ τοῖς περιττώμασι, τοῖς τε ἀχρήστοις, οἷον τῇ τε ξηρᾷ καὶ τῇ ὑγρᾷ, καὶ τῷ αἵματι τὰς καλουμένας φλέβας. τοῖς μὲν οὖν θήλεσι περὶ τὸν τῶν ὑστερῶν τόπον, σχιζομένων ἄνωθεν τῶν δύο φλεβῶν τῆς τε μεγάλης καὶ τῆς ἀορτῆς, πολλαὶ καὶ λεπταὶ φλέβες τελευτῶσιν εἰς τὰς ὑστέρας· ὧν ὑπερπληρουμένων ἐκ τῆς τροφῆς καὶ τῆς φύσεως, διὰ ψυχρότητα πέττειν οὐ δυναμένης, ἐκκρίνεται διὰ λεπτότητα τῶν φλεβῶν εἰς τὰς ὑστέρας, οὐ δυναμένων διὰ τὴν στενοχωρίαν δέχεσθαι τὴν ὑπερβολὴν τοῦ πλήθους· καὶ γίνεται τὸ πάθος οἷον αἱμοῤῥοΐς. ἀκριβῶς μὲν οὖν ἡ περίοδος οὐ τέτακται ταῖς γυναιξί. βούλεται D δὲ φθινόντων γίνεσθαι τῶν μηνῶν εὐλόγως. ψυχρότερα γὰρ τὰ σώματα τῶν ζῴων, ὅταν τὸ περιέχον συμβαίνῃ γίνεσθαι τοιοῦτον· αἱ δὲ τῶν μηνῶν σύνοδοι ψυχραί, διὰ τὴν τῆς σελήνης ἀπόλειψιν. διόπερ καὶ χειμερίους συμβαίνει τὰς συνόδους εἶναι τῶν μηνῶν μᾶλλον, ἢ τὰς μεσότητας. μεταβεβληκότος μὲν οὖν τοῦ περιττώματος εἰς αἷμα, βούλεται γίνεσθαι τὰ καταμήνια, κατὰ τὴν εἰρημένην περίοδον. μὴ πεπεμμένου δὲ, κατὰ μικρὸν ἀεί τι ἀποκρίνεται. διὸ τὰ λευκὰ, μικροῖς ἔτι καὶ παιδίοις οὔσι γίνεται ταῖς θήλεσι. μετριαζούσαι μὲν οὖν ἀμφότεραι αὗται αἱ ἀποκρίσεις τῶν περιττωμάτων, τὰ σώματα σῴζουσιν, ἅτε γινο- E μένης καθάρσεως τῶν περιττωμάτων, ἃ τοῦ νοσεῖν αἴτια τοῖς σώμασι. μὴ γινομένων δὲ, ἢ πλειόνων γινομένων, βλάπτει. ποιεῖ γὰρ ἢ νόσους, ἢ σωμάτων καθαιρέσεις. διὸ καὶ τὰ λευκὰ συνεχῶς γινόμενα καὶ πλεονάζοντα, τὴν αὔξησιν ἀφαιρεῖται τῶν παιδῶν. ἐξ ἀνάγκης μὲν οὖν ἡ περίττωσις αὕτη γίνεται τοῖς θήλεσι, διὰ τὰς εἰρημένας αἰτίας. μὴ δυναμένης τε γὰρ πέττειν τῆς φύσεως, ἀνάγκη περίττωμα γίνεσθαι, μὴ μόνον τῆς ἀχρήστου τροφῆς, ἀλλὰ καὶ ἐν ταῖς φλεψὶν ὑπερβάλλειν τε πληθύοντα κατὰ τὰς λεπτοτάτας φλέβας. ἕνεκα δὲ τοῦ βελτίονος καὶ τοῦ τέλους ἡ φύσις καταχρῆται πρὸς τὸν τόπον τοῦτον, τῆς γενέσεως χάριν, ὅπως οἷον ἔμελλε, τοιοῦτο γένηται ἕτερον.

ἤδη γὰρ ὑπάρχει δυνάμει γε ὂν τοιοῦτον, οἷόν περ ἐστὶ σώματος ἀπόκρισις. τοῖς μὲν οὖν θήλεσιν ἅπασιν ἀναγκαῖον γίγνεσθαι περίττωμα, τοῖς μὲν αἱματικοῖς πλεῖον, καὶ τούτων τοῖς ἀνθρώποις πλεῖστον. ἀνάγκη δὲ καὶ τοῖς ἄλλοις ἀθροίζεσθαί τινα σύστασιν εἰς τὸν ὑστερικὸν τόπον. τὸ δ' αἴτιον, ὅτι τοῖς μὲν αἱματικοῖς πλεῖον, καὶ τούτων ὅτι πλεῖστον τοῖς ἀνθρώποις, πρότερον ἐξετέθημεν. ἀλλὰ διὰ τί ἐν μὲν τοῖς θήλεσι πᾶσιν ὑπάρχει περίττωμα τοιοῦτον, ἐν δὲ τοῖς ἄρρεσι μὴ πᾶσιν; ἔνια γὰρ οὐ προΐεται γονήν, ἀλλ' ὥσπερ τὰ προϊέμενα τῇ ἐν τῇ γονῇ κινήσει δημιουργεῖ τὸ συνιστάμενον ἐκ τῆς ἐν τοῖς θήλεσιν ὕλης, οὕτω τὰ τοιαῦτα ἐν τῇ ἐν αὐτοῖς κινήσει ἐν τῷ μορίῳ τούτῳ ὅθεν ἀποκρίνεται τὸ σπέρμα, ταὐτὸ ποιεῖ καὶ συνίστησι. τοῦτο δ' ἐστὶν ὁ τόπος ὁ περὶ τὸ ὑπόζωμα τοῖς ἔχουσιν. ἀρχὴ γὰρ τῆς φύσεως ἡ καρδία, καὶ τὸ ἀνάλογον· καὶ τὸ κάτω, προσθήκη καὶ τούτου χάριν. αἴτιον μὲν δὴ τοῦ τοῖς μὲν ἄρρεσι μὴ πᾶσιν εἶναι περίττωμα γεννητικόν, τοῖς δὲ θήλεσι πᾶσιν, ὅτι τὸ ζῷον σῶμα ἔμψυχόν ἐστιν. ἀεὶ δὲ παρέχει τὸ μὲν θῆλυ τὴν ὕλην· τὸ δὲ ἄρρεν, τὸ δημιουργοῦν. ταύτην γὰρ αὐτῶν φαμὲν ἔχειν τὴν δύναμιν ἑκάτερον καὶ τοῦτ' εἶναι τὸ μὲν θῆλυ, τὸ δ' ἄρρεν τοῦτο. ὥστε τὸ μὲν θῆλυ ἀναγκαῖον παρέχειν σῶμα καὶ ὄγκον, τὸ δ' ἄρρεν οὐκ ἀναγκαῖον. οὔτε γὰρ τὰ ὄργανα ἀνάγκη ἐνυπάρχειν ἐν τοῖς γιγνομένοις, οὔτε τὸ ποιοῦν. ἔστι δὲ τὸ μὲν σῶμα ἐκ τοῦ θήλεος, ἡ δὲ ψυχὴ ἐκ τοῦ ἄρρενος. ἡ γὰρ ψυχή, οὐσία σώματός τινός ἐστι· καὶ διὰ τοῦτο ὅσα τῶν μὴ ὁμογενῶν μίγνυται θῆλυ καὶ ἄρρεν, (μίγνυται δὲ ὧν ἴσοι οἱ χρόνοι καὶ ἐγγὺς αἱ κυήσεις, καὶ τὰ μεγέθη τῶν σωμάτων μὴ πολὺ διέστηκε) τὸ μὲν πρῶτον κατὰ τὴν ὁμοιότητα γίγνεται κοινὸν ἀμφοτέρων· οἷα τὰ γιγνόμενα ἐξ ἀλώπεκος καὶ κυνός, καὶ πέρδικος καὶ ἀλεκτρυόνος. προϊόντος δὲ τοῦ χρόνου, καὶ ἐξ ἑτέρων ἕτερα γιγνόμενα, τέλος ἀποβαίνει κατὰ τὸ θῆλυ τὴν μορφήν, ὥσπερ τὰ σπέρματα τὰ ξενικὰ κατὰ τὴν χώραν. αὕτη γὰρ ἡ τὴν ὕλην παρέχουσα, καὶ τῷ σπέρματι τὸ σῶμά ἐστι. καὶ διὰ τοῦτο τοῖς θήλεσι τὸ μόριον τὸ δεκτικόν, οὐ πόρος ἐστίν, ἀλλ' ἔχουσι διάστασιν αἱ ὑστέραι· τοῖς δ' ἄρρεσι πόροι, τοῖς σπέρμα προϊεμένοις. ἄναιμοι δ' οὗτοι. τῶν δὲ περιττωμάτων ἕκαστον ἅμα ἔν τε τοῖς οἰκείοις τόποις ἐστί, καὶ γίγνεται περίττωμα. πρότερον δ' οὐδὲν ἂν μή τι βία πολλή, καὶ παρὰ φύσιν. δι' ἣν μὲν οὖν αἰτίαν ἀποκρίνεται τὰ περιττώματα τὰ γεννητικὰ τοῖς ζῴοις, εἴρηται. ὅταν δ' ἔλθῃ τὸ σπέρμα ἀπὸ τοῦ ἄρρενος τῶν σπέρμα προϊεμένων, συνίστησι τὸ καθαρώτατον τοῦ περιττώματος. τὸ γὰρ πλεῖστον ἄχρηστον καὶ ἐν τοῖς καταμηνίοις ἐστὶν ὑγρὸν ὥσπερ καὶ τῆς τοῦ ἄρρενος γονῆς τὸ ὑγρότατον, καὶ τῆς εἰσάπαξ προέσεως· καὶ ἡ προτέρα τῆς ὑστέρας ἄγονος μᾶλλον τοῖς πλείστοις. ἐλάττω γὰρ ἔχει θερμότητα ψυχικήν, διὰ τὴν ἀπεψίαν. τὸ δὲ πεπεμμένον πάχος ἔχει καὶ σεσωμάτωται μᾶλλον. ὅσαις δὲ μὴ γίνεται θύραζε πρόεσίς τις, ἢ τῶν γυναικῶν, ἢ τῶν ἄλλων ζῴων, διὰ τὸ μὴ ἐνυπάρχειν ἄχρηστον πολὺ περίττωμα ἐν τῇ ἀποκρίσει τῇ τοιαύτῃ, τοσοῦτόν ἐστι τὸ ἐγκείμενον, ὅσον ὑπολειπόμενον τοῖς θύραζε προϊεμένοις ζῴοις, ὃ συνίστησιν ἡ τοῦ ἄρρενος δύναμις ἡ ἐν τῷ σπέρματι τῷ ἀποκεκριμένῳ, ἢ εἰς τὸ ἄρρεν ἐλθόντος τοῦ ἀνάλογον μορίου ταῖς ὑστέραις, ὥσπερ ἔν τισι τῶν ἐντόμων φαίνεται συμβαῖνον. ὅτι δ' ἡ γιγνομένη ὑγρότης μετὰ τῆς ἡδονῆς τοῖς θήλεσιν, οὐδὲν συμβάλλεται εἰς τὸ κύημα, εἴρηται πρότερον.

A Iam enim tale potẽtia eſt, quale eſt corpus, cuius ſecretio eſt. Fœminis igitur omnibus excrementum fiat, neceſſe eſt. Sed ſanguineis amplius, earúmque homini plurimum, verùm cæteris quoque aliquid colligi in vuluarium locum neceſſe eſt. Cauſam quamobrem ſanguineis amplius, earúmque homini plurimum, antè expoſuit. Sed cur in fœminis omnibus excrementum tale ineſt, in maribus non omnibus ineſt? Quædam enim non emittunt genituram, ſed vt quæ emittunt, motu ſuæ genituræ careant, quod inſtituitur ex materia contenta in fœmina: ſic ea motu ſuo interno in ea parte contento, vnde ſemen ſecernitur, idem faciunt, & conſtituunt. Pars ea B locus ſepti transuerſi eſt in omnibus id habentibus. Principium enim naturæ cor proportionaléve eſt. Cauſa, inquam, cur omnibus maribus non ſit excrementum genitale, cùm omnibus fœminis ſit, quòd animal corpus eſt animatũ, ad quod inſtituendum fœmina ſemper materiam præbet, mas vim creandi. Hanc eorum vtrique facultatem tribuimus: idque eſt, quo alterum mas, alterum fœmina ſit. Itaque corpus & magnitudinem præberi à fœmina neceſſe eſt: à mare nihil tale neceſſariò deſideratur. Nec enim inſtrumenta in iis quæ efficiuntur, ineſſe: neque ipſum efficiens neceſſe eſt. Corpus igitur ex fœmina eſt, anima ex mare. Subſtantia enim cor-C poris alicuius anima eſt. Et ideo quæ non vnigena coeunt, (quod ea faciunt, quorum tempus par, & vteri geſtatio proxima, & corporis magnitudo non multò diſcrepans) hæc primos partus ſimiles ſibi edunt communi generis vtriuſque ſpecie: quales ex vulpe, & cane generantur, aut ex perdice, & gallinaceo, ſed tempore procedente diuerſi ex diuerſis prouenientes, demum forma fœminæ inſtituti euadunt, quomodo ſemina peregrina ad poſtremum pro terræ natura redduntur. Hæc enim materiam corpúſque ſeminibus præſtat. Quamobrem pars fœminarum ea, quæ ſemen recipit, non meatus traiectúſque quidam eſt, ſed vterus amplior. Mares, qui ſe-D men emittunt, meatus ad id emittendum habent exangues. Excrementum autem quoduis ſimul & ſuo in loco eſt, & excrementum efficitur: nec priùs vllum, niſi vis magna cogit, & contra naturam diuertitur. Sed quam ob cauſam excrementa animalium genitalia ſecernuntur, declaratum iam eſt. Cùm autem ſemen de mare acceſſit in fœminæ vterum, partem puriſſimam excrementi conſtituit. Plurimum enim in menſtruis quoque humoris inutilis continetur, vt in maris genitura, quod humidiſſimum eſt, tum eadem emiſſione, tum in diuerſis. Prior enim emiſſio minùs fœcunda quàm poſterior, eſt: minus enim caloris animalis continet, propter cruditaE tem. At verò quod concoctum eſt, craſſum & corpulentius eſt. Quibus autem vel mulieribus vel cæterorum animalium fœminis nihil foras emittitur, quoniam non multum excrementi inutilis continetur, iis tantundem, quod colligitur, in vtero eſt, quantum iis quæ foras emittunt, remanet, quod maris facultas conſtituit, aut in ſemine decedente contenta, aut marem ſubeunte particula fœminæ, quæ proportione reſpondeat vuluis: vt in quibuſdam inſectis fieri cernitur. Humorem autẽ, qui à fœminis cum voluptate emittitur, nihil ad conceptum conferre dictum eſt antè.

Sed

Sed potiſſimùm inde videri poteſt, quòd vt maribus, ſic & fœminis accidat noctu per quietem, quod pollutionem appellant. Verùm hoc nullum indicium eſt. Nam & adoleſcentibus idem euenit, qui etſi emiſſuri aliquando ſunt, tamen nondum emittunt, & iis qui vel emittunt, vel emiſſuri ſunt, infœcundum. Res ita ſe habet, vt ſine maris emiſſione concipi impoſſibile ſit, atque etiam ſine menſtruorum excremento, quod aut redundans effluat foras, aut intus ſatis ſit. At ſine ea voluptate quæ fœminis per coitum euenire ſolet, concipitur, ſi locus turget, & vulua deſcendit propiùs. Verumtamen magna ex parte ſic accidit, vt cum profuſione fœminæ agatur, quoniam os vteri ſe comprimat, cùm profunditur. In qua quidem profuſione voluptas & mari & fœminæ contingere ſolet. Semen etiam maris meliùs ita dirigitur, & iuuatur. Profuſio autem non intus fit, vt quidam volunt. Os enim vteri anguſtum eſt: ſed antè, quò fœmina mittit vaporem illum nonnullarum recrementum: eòdem enim mas etiam mittit, quod fuderit: & aut ibidem manet ſemen emiſſum, aut intro ab vtero trahitur, ſi calidus eſt, & modicè temperatus. Cuius rei indicium quòd locus, qui modò madebat, reſiccatus mox ſentiatur. Animalibus etiam, quorum præcordiis vulua iungitur, vt auibus & piſcibus, qui animal pariunt, ſemen illuc trahatur, ſed profuſum deueniat ipſum, impoſſibile eſt. Trahit genituram hic locus ſuo calore. Menſtruorum etiam deceſſio & confluuium fomitem in ea parte caloris parat. Itaque vt vaſa non illita, calido diluta humore aquam in ſe trahunt ore inuerſo, ita attrahitur. Nec audiendi ſunt qui partibus accommodatis ad coitum officialibus id fieri opinantur: nullo enim pacto ſic fieri poteſt. Contrà etiam euenit iis qui ſemen à muliere quoque emitti aiunt. *Accidit enim vt poſtquam foras emiſerunt, retrahant intro.* Siquidem quod emiſſum eſt, miſceri debet cum maris genitura, quod ita fieri ſuperuacaneum eſt. At verò natura nullam rem ſuperuacaneam facit. Cùm autem excrementum fœminæ in vtero conſtiterit à maris genitura, quæ ſimile facit, vt lactis coagulum (coagulum enim, lac eſt continens calorem vitalem, qui partes ſimiles ducit eòdem, & vnit, atque conſtituit. Et genitura ita ſe habet ad menſtruorum naturam: eadem enim natura lactis, & menſtruorum eſt) itaque coactis iam partibus corpulentus humor excernitur, obducunturque circum parte reſicceſcente terrena membrana, tum neceſſariò tum etiam alicuius gratia. Nam & caleſcentis frigeſcentiſve rei extrema ſicceſcere neceſſe eſt, & animal nō in humido ſed ſeorſum cōtineri oportet. Vocantur ea, quibus obuolutus eſt fœtus, partim membranæ, alia ſecundæ, quæ maioris minoriſve ratione differunt. Hæc pari modo in omnibus tam ouiparis quàm viuiparis habentur. Sed enim cùm conceptus inſtitutus eſt, facit ſimile iis quæ ſeruntur. Principium enim primum ſemina quoque intra ſe continent: quod potentia primo contentum, vbi ſecretum mox eſt, germen mittit, & radicem, qua alimentum aſſumitur: incrementum enim deſideratur.

A μάλιστα δ' ἂν δόξειεν, ὅτι καθάπερ τοῖς ἄρρεσι, γίγνεται καὶ ταῖς γυναιξὶ νύκτωρ, ὃ καλοῦσιν ἐξονειρώττειν. ἀλλὰ τοῦτο σημεῖον οὐδέν· γίνεται γὰρ καὶ τοῖς νέοις τῶν ἀρρένων, τοῖς μέλλουσι μὲν, μηδὲν δὲ προϊεμένοις, ἢ * τοῖς ἐπιπροϊεμένοις ἄγονον. ἄνευ μὲν οὖν τῆς τοῦ ἄρρενος προέσεως τῇ συνουσίᾳ ἀδύνατον συλλαβεῖν, καὶ ἄνευ τῆς τῶν γυναικείων προέσεως, ἢ θύραζε προελθούσης, ἢ ἐντὸς ἱκανῆς οὔσης. οὐ συμβαινούσης μέντοι τῆς εἰωθυίας γίγνεσθαι ταῖς θήλεσιν ἡδονῆς περὶ τὴν ὁμιλίαν τὴν τοιαύτην συλλαμβάνουσιν, ἂν τύχῃ ὁ τόπος ὀργῶν, καὶ καταβεβηκυῖαι αἱ ὑστέραι ἐγγύς. ἀλλ' ὡς ἐπιτοπολὺ συμβαίνει B ἐκείνως, διὰ τὸ μὴ συμμεμυκέναι τὸ στόμα, γινομένης τῆς ἐκκρίσεως μεθ' ἧς εἴωθε γίγνεσθαι καὶ τοῖς ἄρρεσιν ἡδονὴ καὶ ταῖς γυναιξίν. οὕτω δ' ἔχοντος, εὐοδεῖται μᾶλλον καὶ τῷ τοῦ ἄρρενος σπέρματι. ἡ δ' ἄφεσις οὐκ ἐντὸς γίγνεται καθάπερ οἴονταί τινες. στενὸν γὰρ τὸ στόμα τῶν ὑστερῶν, ἀλλὰ εἰς τὸ πρόσθεν, οὗπερ τὸ θῆλυ προΐεται τὴν ἐνίαις αὐτῶν γινομένην ἰκμάδα, ἐνταῦθα καὶ τὸ ἄρρεν προΐεται, ἐάν τις ἐξικμάσῃ. ὁτὲ μὲν οὖν μένει τοῦτον ἔχοντα τὸν τρόπον· ὁτὲ δὲ, εἴσω σπᾷ, ἂν τύχῃ συμμέτρως ἔχουσα καὶ θερμὴ διὰ τὴν κάθαρσιν ἡ ὑστέρα. σημεῖον δέ· καὶ γὰρ τὰ πρόσθεν ὑγρὰ προστεθέντα, ἀφαιρεῖται ξηρά. ἔτι δὲ ὅσα C τῶν ζώων πρὸς τῷ ὑποζώματι ἔχει τὰς ὑστέρας, καθάπερ ὄρνις καὶ τῶν ἰχθύων οἱ ζωοτοκοῦντες, ἀδύνατον ἐκεῖ μὲν σπᾶσθαι τὸ σπέρμα, ἀλλ' ἀφεθὲν ἐλθεῖν. ἕλκει δὲ τὴν γονὴν ὁ τόπος, διὰ τὴν θερμότητα τὴν ὑπάρχουσαν. καὶ ἡ τῶν καταμηνίων δὲ ἔκκρισις καὶ συνάθροισις, ἐμπυρεύει θερμότητα ἐν τῷ μορίῳ τούτῳ. ὥστε καθάπερ τὰ ἄνικμα τῶν ἀγγείων, ὅταν θερμῷ διακλυσθῇ, σπᾷ τὸ ὕδωρ εἰς αὐτὰ, καταστρεφομένου τοῦ στόματος· καὶ τοῦτον μὲν τὸν τρόπον οἱ σπᾷ· ὡς δέ τινες λέγουσι, τοῖς ὀργανικοῖς πρὸς τὴν συνουσίαν μορίοις οὐ γίνεται κατ' οὐδένα τρόπον. ἀνάπαλιν δὲ οὐ συμβαίνει καὶ τοῖς λέγουσι προΐεσθαι καὶ τὴν γυναῖκα σπέρμα. [ἄτοπον γάρ D τι ἀκολουθεῖ.] προϊεμέναις γὰρ ἔξω, συμβαίνει ταῖς ὑστέραις πάλιν εἴσω σπᾶν, εἴπερ μιχθήσεται τῇ γονῇ τοῦ ἄρρενος. τὸ δ' οὕτω γίγνεσθαι, περίεργον· ἡ δὲ φύσις οὐδὲν ποιεῖ περίεργον. ὅταν δὲ συστῇ ἡ ἐν ταῖς ὑστέραις τοῦ θήλεος ἀπόκρισις ὑπὸ τῆς τοῦ ἄρρενος γονῆς, παραπλησίαν ποιούσης, ὥσπερ ἐπὶ τῆς τοῦ γάλακτος πυετίας (καὶ γὰρ ἡ πυετία γάλα ἐστὶ ζωτικὴν θερμότητα ἔχον, ἣ τὸ ὅμοιον εἰς ἓν ἄγει καὶ συνίστησι· καὶ ἡ γονὴ πρὸς τὴν τῶν καταμηνίων φύσιν ταὐτὸ πέπονθε. ἡ γὰρ αὐτὴ φύσις γάλακτός ἐστι καὶ καταμηνίων) συνιόντος δὲ τοῦ σωματώδους, ἐκκρίνεται τὸ ὑγρὸν, καὶ περιΐστανται κύκλῳ ξηραινομένων τῶν γεηρῶν οἱ ὑμένες, καὶ ἐξ ἀνάγκης καὶ ἕνεκά τινος. καὶ γὰρ θερμαινομένων, ἀναγκαῖον ξηραίνεσθαι τὰ ἔσχατα, καὶ ψυχομένων. καὶ δεῖ μὴ ἐν E ὑγρῷ τὸ ζῶον εἶναι, ἀλλὰ κεχωρισμένον. καλοῦνται δὲ τούτων τὰ μὲν, ὑμένες· τὰ δὲ, χορία, διαφέροντα τῷ μᾶλλον καὶ ἧττον· ὁμοίως δ' ἐνυπάρχουσιν ἔν τε τοῖς ᾠοτόκοις ταῦτα, καὶ τοῖς ζωοτόκοις. ὅταν δὲ συστῇ τὸ κύημα ἤδη, παραπλήσιον ποιεῖ τοῖς σπειρομένοις. ἡ μὲν γὰρ ἀρχὴ καὶ ἐν τοῖς σπέρμασιν ἐν ἑαυτοῖς ἐστιν ἡ πρώτη. ὅταν δ' αὕτη ἀποκριθῇ ἐνοῦσα δυνάμει πρότερον, ἀπὸ ταύτης ἀφίεται ὅ, τε βλαστὸς, καὶ ἡ ῥίζα. αὕτη δ' ἐστὶν, ᾗ τὴν τροφὴν λαμβάνει. δεῖται γὰρ αὐξήσεως τὸ φυτόν.

* Qu. τοῖς ἢ πρ.

οὕτω καὶ ἐν τῷ κυήματι τρόπον τινὰ πάντων ἐνόντων τῶν μορίων δυνάμει, ἡ ἀρχὴ πρὸ ὁδοῦ μάλιστα ἐνυπάρχει. διὸ ἀποκρίνεται πρῶτον ἡ καρδία ἐνεργείᾳ. καὶ τοῦτο οὐ μόνον ἐπὶ τῆς αἰσθήσεως δῆλον. (συμβαίνει γὰρ οὕτως) ἀλλὰ καὶ ἐπὶ τοῦ λόγου. ὅταν γὰρ ἀπ' ἀμφοῖν ἀποκεκριθῇ, δεῖ αὐτὸ αὑτὸ διοικεῖν τὸ γινόμενον, καθάπερ ἀπῳκισθὲν τέκνον ἀπὸ πατρός, ὥστε δεῖ ἀρχὴν ἔχειν, ἀφ' ἧς καὶ ὕστερον ἡ διακόσμησις γίνεται τοῖς ζῴοις τοῦ σώματος. εἰ γὰρ ἔξωθέν ποτ' ἔσται καὶ ὕστερον ἐνέσται, οὐ μόνον διαπορήσειεν ἄν τις τὸ πότε, ἀλλ' ὅτι ἀνάγκη, ὅταν ἕκαστον χωρίζηται τῶν μορίων ταύτην ὑπάρχειν πρῶτον, ἐξ ἧς καὶ ἡ αὔξησις ὑπάρχει, καὶ ἡ κίνησις τοῖς ἄλλοις μορίοις. διόπερ ὅσοι λέγουσιν, ὥσπερ Δημόκριτος, τὰ ἔξω πρῶτον διακρίνεσθαι τῶν ζῴων, ὕστερον δὲ τὰ ἐντός, οὐκ ὀρθῶς λέγουσιν, ὥσπερ ξυλίνων ἢ λιθίνων ζῴων. τὰ μὲν γὰρ τοιαῦτα, οὐκ ἔχει ἀρχὴν ὅλως· τὰ δὲ ζῷα, ἔχει πάντα, καὶ ἐντὸς ἔχει. διὸ πρῶτον ἡ καρδία φαίνεται διωρισμένη πᾶσι τοῖς ἐναίμοις. ἀρχὴ γὰρ αὕτη καὶ τῶν ὁμοιομερῶν καὶ τῶν ἀνομοιομερῶν. ἤδη γὰρ ἀρχὴν ταύτην ἄξιον ἀναδοῦναι τοῦ ζῴου καὶ τοῦ συστήματος, ὅταν δέηται τροφῆς. τὸ γὰρ δὴ ὄν, αὐξάνεται. τροφὴ δὲ ζῴου ἡ ἐσχάτη αἷμα, καὶ τὸ ἀνάλογον. τούτων δ' ἀγγεῖον αἱ φλέβες. διὸ ἡ καρδία καὶ τούτων ἀρχή. δῆλον δὲ τοῦτο ἐκ τῶν ἱστοριῶν καὶ τῶν ἀνατομῶν. ἐπεὶ δὲ δυνάμει μὲν ἤδη ζῷον, ἀτελὲς δ', ἄλλοθεν ἀναγκαῖον λαμβάνειν τὴν τροφήν. διὸ χρῆται τῇ ὑστέρᾳ καὶ τῇ ἐχούσῃ, ὥσπερ γῇ φυτόν, τοῦ λαμβάνειν τροφήν, ἕως ἂν τελεωθῇ πρὸς τὸ * εἶναι ἤδη ζῷον δυνάμει πορευτικόν. διὸ ἐκ τῆς καρδίας τὰς δύο φλέβας ἡ φύσις πρῶτον ὑπέγραψεν· ἀπὸ δὲ τούτων, φλέβια ἀπήρτηται πρὸς τὴν ὑστέραν * ὁ καλούμενος ὀμφαλός. ἔστι γὰρ ὁ ὀμφαλὸς φλέψ, τοῖς μὲν μία, τοῖς δὲ πλείους τῶν ζῴων. περὶ δὲ ταύτας κέλυφος δερματικὸν ὁ καλούμενος ὀμφαλός, διὰ τὸ δεῖσθαι σωτηρίας καὶ σκέπης τὴν τῶν φλεβῶν ἀσθένειαν. αἱ δὲ φλέβες, οἷον ῥίζαι πρὸς τὴν ὑστέραν συνάπτουσι, δι' ὧν λαμβάνει τὸ κύημα τροφήν. τούτου γὰρ χάριν ἐν ταῖς ὑστέραις μένει τὸ ζῷον, ἀλλ' οὐχ ὡς Δημόκριτός φησιν, ἵνα διαπλάττηται τὰ μόρια κατὰ τὰ μόρια τῆς ἐχούσης. τοῦτο γὰρ ἐπὶ τῶν ᾠοτοκούντων φανερόν. ἐκεῖνα γὰρ ἐν τοῖς ᾠοῖς λαμβάνει τὴν διάκρισιν, κεχωρισμένα τῆς μήτρας. ἀπορήσειε δ' ἄν τις, εἰ τὸ αἷμα μέν ἐστι τροφή, ἡ δὲ καρδία πρώτη γίνεται ἔναιμος οὖσα, τὸ δ' αἷμα τροφή, ἡ δὲ τροφὴ θύραθεν, πόθεν εἰσῆλθεν ἡ πρώτη τροφή; ἢ τοῦτο οὐκ ἀληθὲς ὡς πᾶσα θύραθεν, ἀλλ' εὐθὺς ὥσπερ ἐν τοῖς τῶν φυτῶν σπέρμασιν, ἔνεστί τι τοιοῦτον ὃ φαινόμενον πρῶτον γαλακτῶδες· οὕτω καὶ ἐν τῇ ὕλῃ τῶν ζῴων, τὸ περίττωμα τῆς συστάσεως τροφή ἐστιν. ἡ μὲν οὖν αὔξησις τῷ κυήματι γίνεται διὰ τοῦ ὀμφαλοῦ, τὸν αὐτὸν τρόπον ὅνπερ διὰ τῶν ῥιζῶν τοῖς φυτοῖς, καὶ τοῖς ζῴοις αὐτοῖς, ὅταν ἀπολυθῶσιν ἐκ τῆς ἐν αὑτοῖς τροφῆς· περὶ ὧν ὕστερον λεκτέον, κατὰ τοὺς οἰκείους τῶν λόγων καιρούς. ἡ δὲ διάκρισις γίνεται τῶν μορίων, οὐχ ὥς τινες ὑπολαμβάνουσι, διὰ τὸ πεφυκέναι φέρεσθαι τὸ ὅμοιον πρὸς τὸ ὅμοιον (πρὸς γὰρ πολλαῖς ἄλλαις αἷς ὁ λόγος οὗτος ἔχει δυσχερείαις, συμβαίνει χωρὶς ἕκαστον γίνεσθαι τῶν μορίων τῶν ὁμοιομερῶν·

* γρ. τῷ εἶν δυνάμει ζ. π.

* Gaza vertit, quaſi legiſſet, ἐξ ὧν ὁ καλούμενος ὀμφαλὸς συνίσταται. nihil mutandū. vide infr. c. 7.

A Sic in conceptu quodam modo cùm partes corporis omnes potentia inſint, principium primum in promptu habetur. Quamobrem cor primum actu ſecernitur, quod non modò ſenſu conſtat, verùm etiam ratione. Cùm enim quod gignitur de ambobus abiunctum iam eſt, ſe ipſum gerere, gubernare, & diſpenſare debet per ſe, quaſi filius à patre emancipatus, ſeorſumque collocatus. Itaque principium haberi oportet, à quo etiam pòſt ordo membrorum deſcribatur, & quæcunque ad abſoluendum animal pertinent, diſponantur. Nam ſi extrinſecus aliquando aderit, & poſt ineſſe incipiet, non ſolùm dubitaueris, & quonam tempore accedat, quæſieris, ſed etiam cùm pars quæuis diſtinguitur, id primum ſubſtare neceſſe eſt, ex quo & incrementum, & motus B cæteris partibus contingat. Quamobrem qui ita, vt Democritus, aiunt, exteriora primùm animalis diſcerni, tum interiora, quaſi lapideum aut ligneum animal condant, non rectè dicunt. Res enim talis nullum principium habet. At animalia omnia habent, atque intra ſe continent. Quapropter cor primum diſtinctum in omnibus inſpicitur animalibus, quæ ſanguinem habent. Id enim principium eſt & ſimilarium & diſſimilarium partium. Iam enim principium id accepiſſe animalis, conſtitutique fœtus decet, cùm alimentum deſiderat. Quod enim iam animal C eſt, augetur. Alimentum autem vltimum animalis ſanguis eſt, aut quod ſanguini proportionetur, quorum vaſa & conceptacula venæ ſunt. Quamobrem venarum quoque principium cor eſt. Patet hoc ex hiſtoriis & diſſectionib. animaliū. Sed cùm potentia quidē animal ſit, ſed imperfectum, aliunde accipiat alimentum neceſſe eſt. Quamobrem vtero, & parente, vt terrâ planta, vtitur ad cibum hauriendum, donec perficiatur, & iam ſit animal potentia greſſile. Quocirca ex corde primùm venas illas duas natura deſcripſit, de quibus venulæ dependent in vterum, ex quibus, qui vmbilicus vocatur, conſtat. Vmbilicus enim vena in aliis D ſimplex, in aliis multiplex eſt: quam venam putamen cuticulare ambit, quod vmbilicus vocatur, quoniam venarum imbecillitas tutelam operimentúmque deſideret. Venæ autem quaſi radices contingunt ad vterum, per quas alimentum haurit fœtus. Eius enim rei gratia animal in vtero manet, non, vt Democritus ait, vt membra formentur ſecundùm membra parentis. Apertum hoc in ouiparis eſt. Nam illa in ouis diſtinguuntur ſeparata à vulua parentis. Sed dubitaueris, cùm primum cor oriatur ſanguine præditum, ſanguis autem ſit alimentum quod extrinſecus venit, vndenam primum alimentum ſubierit? An id verum non dicitur, alimentum omne E eſſe extrinſecus: ſed protinus vt in plantarum ſeminibus ineſt aliquid tale primum, quod lacteum vocatur: ſic in animalium materia excrementum conſtitutionis alimentum eſt. Incrementum igitur fœtui per vmbilicum contingit eodem quo plantis modo per radices. Atque etiam animalib. ipſis, vbi abſoluta iam ſunt, ex eo quod continetur, alimento idem accedit. De quibus poſt ſuo loco dicendum eſt. Diſtinctio autem partium nō, vt quidā opinantur, propterea fit, quia ſimile ſuapte natura ad ſimile feratur. Nam præter alias multas, quas ratio iſta habet, difficultates, accidet, vt quæuis pars ſimilaris ſeorſum creetur:

verbi gratia, oſſa per ſe, & neruí, & carnes, ſi quis eam cauſam approbet. Sed quoniam excrementum fœminæ potentia tale eſt, quale natura animal eſt, partéſque potentia inſunt, actu nulla ineſt, ideo pars quæque exiſtit. Quoniam etiam agens & patiens, cùm ſe inuicem tetigerunt, quendam in modum alterum agens, alterum patiens eſt, modum hunc ita intelligi volo vt conditionibus, ſic, vbi, quando, deſcribatur. Iam enim continuò alterum agit, alterum patitur. Materiam igitur fœmina præbet, principium motionis mas. Et quemadmodum quæ ab arte efficiuntur, per inſtrumenta efficiuntur, ſed veriùs dixerim per motum eorum, qui artis operatio eſt: ars autem forma eorum quæ efficiuntur eſt in alio: ſic à facultate, ſiue virtute animæ vegetalis, agitur; vtque in animalibus ipſis, & plantis, poſtea ex alimento vis eadem efficit incrementum, vtendo caliditate, & frigiditate, quaſi inſtrumentis, (motus enim in iis conſiſtit, & ratione aliqua vnumquodque efficitur) ſic etiam principio conſtituit id quod natura efficitur. Eadem enim materia eſt, ex qua agitur, & ex qua conſtituitur primum. Itaque facultas quoque agens eadem quæ principio eſt, ſed maior. Quòd ſi hæc vegetalis anima eſt, eadem quæ generet, quoque eſt, idque natura cuiuſque eſt inſita, & in plantis, & in animalibus omnibus: cæteræ animæ partes aliis inſunt, aliis deſunt animalibus. Sed cùm in plantarum genere nullo diſcerniculo ſexus mas diſtinguatur à fœmina, in animalibus, quanquam non omnibus, diſtinguitur, & mas ob eam rem deſiderat fœminam.

A οἷον ὀστᾶ καθ' αὑτά, καὶ νεῦρα, καὶ τὰς σάρκας καθ' αὑτάς, εἴ τις ἀποδέξηται ταύτην τὴν αἰτίαν) ἀλλ' ὅτι τὸ περίττωμα τὸ τοῦ θήλεος δυνάμει τοιοῦτόν ἐστιν, οἷον φύσει τὸ ζῷον, καὶ ἔνεστι δυνάμει τὰ μόρια, ἐνεργείᾳ δ' οὐθέν, διὰ ταύτην τὴν αἰτίαν γίνεται ἕκαστον αὐτῶν. καὶ ὅτι τὸ ποιητικὸν καὶ τὸ παθητικόν, ὅταν θίγωσιν, ὃν τρόπον ἐστὶ τὸ μὲν ποιητικόν, τὸ δὲ παθητικόν (τὸν δὲ τρόπον λέγω, τὸ ὥς, *καὶ οὗ) τότε εὐθὺς τὸ μὲν ποιεῖ, τὸ δὲ πάσχει. ὕλην μὲν οὖν παρέχει τὸ θῆλυ, τὴν δ' ἀρχὴν τῆς κινήσεως τὸ ἄρρεν. ὥσπερ δὲ τὰ ὑπὸ τῆς τέχνης γινόμενα γίνεται διὰ B τῶν ὀργάνων, ἔστι δ' ἀληθέστερον εἰπεῖν, διὰ τῆς κινήσεως αὐτῶν, αὕτη δ' ἐστὶν ἡ ἐνέργεια τῆς τέχνης, ἡ δὲ τέχνη μορφὴ τῶν γινομένων ἐν ἄλλῳ· οὕτως ἡ τῆς θρεπτικῆς [ψυχῆς] δύναμις, ὥσπερ καὶ ἐν αὐτοῖς τοῖς ζῴοις καὶ τοῖς φυτοῖς, ὕστερον ἐκ τῆς τροφῆς ποιεῖ τὴν αὔξησιν, χρωμένη οἷον ὀργάνοις θερμότητι καὶ ψυχρότητι (ἐν γὰρ τούτοις ἡ κίνησις *ἐκείνης, καὶ λόγῳ τινὶ ἕκαστον γίνεται) οὕτω καὶ ἐξ ἀρχῆς συνίστησι τὸ φύσει γιγνόμενον. ἡ γὰρ αὐτή ἐστιν ὕλη ᾗ αὐξάνεται, καὶ ἐξ ἧς συνίσταται τὸ πρῶτον· ὥστε καὶ ἡ ποιοῦσα δύναμις ταὐτὸ τῇ ἐξ ἀρχῆς. μείζων δὲ [αὕτη] ἐστίν. εἰ οὖν αὕτη ἐστὶν ἡ θρεπτικὴ ψυ- C χή, αὕτη ἐστὶ καὶ ἡ γεννῶσα· καὶ τοῦτ' ἐστὶν ἡ φύσις ἑκάστου, ἐνυπάρχουσα καὶ ἐν φυτοῖς καὶ ζῴοις πᾶσι. τὰ δ' ἄλλα μόρια τῆς ψυχῆς, τοῖς μὲν ὑπάρχει, τοῖς δ' οὐχ ὑπάρχει τῶν ζῴων. ἐν μὲν τοῖς φυτοῖς οὖν οὐ κεχώρισται τὸ θῆλυ τοῦ ἄρρενος· ἐν δὲ τοῖς ζῴοις ἐν οἷς κεχώρισται, προσδεῖται τοῦ θήλεος τὸ ἄρρεν.

* Gaza, ᾗ ἐ, ᾗ ἦν

* κ. ἐκεῖναι;

CAPVT V.

Qua de cauſa fœmina deſideret marem.

ATqui quæſierit quiſpiam, qua de cauſa fœmina deſideret marem, nec ex ſe ipſa generet: quandoquidem animam habet eandem, & materia excrementum fœminæ eſt. Cauſæ illud eſt, quòd animal ſenſu differat à planta. Nec fieri poteſt vt vel facies, vel manus, vel caro, vel alia pars ſit, niſi anima ſenſualis inſit, aut actu aut potẽtia: & aut aliquatenus, aut ſimpliciter. Erit enim vt mortuus, aut pars mortui. Quòd ſi mas eſt efficiens talis animæ, impoſſibile eſt vt fœmina ex ſe ipſa animal generet, vbi mas à fœmina ſeparatur. Eo .n. quod diximus, definitur, qua mas eſt ratione. Quæſtionẽ verò propoſitam ratione non carere, patet in auibus, quæ oua ſubuentanea pariunt, cùm fœmina aliquatenus poſſit generare. quod & ipſum recepit quæſtionem. Quonam modo oua eorum dicuntur viuere? nec enim ita vt oua fœcunda poſſunt. Sic enim actu animatum ex iis efficeretur. Neque ita ſe habent iſta vt lignum, aut lapis: quippe quæ corruptione aliqua pereant, vt quæ vitam quodammodo antè participarent. Conſtat igitur, hæc aliquam habere potentia animam. ſed quam? Iſtam vltimam prorſus habeant animam neceſſe eſt, quæ vegetabilis eſt. Hæc enim æquè in omnibus tam animalibus quàm plantis ineſt. Sed cur partes, & animal non efficiant? Quia ſenſualem animam habere ea oportet? non enim animalium partes ita ſunt, vt plantarum. Quamobrem maris ſocietate opus eſt: mas enim à fœmina ſeparatus in iis eſt.

ΚΕΦΑΛ. ε.

Διὰ τί προσδεῖται τοῦ ἄρρενος τὸ θῆλυ.

D Καίτοι τις *ἀπορήσει, διὰ τίν' αἰτίαν, εἴπερ ἔχει τὸ θῆλυ τὴν αὐτὴν ψυχήν, καὶ ἡ ὕλη τὸ περίττωμα τοῦ θήλεός ἐστι, τί προσδεῖται τοῦ ἄρρενος, ἀλλ' οὐκ αὐτὸ ἐξ αὑτοῦ γεννᾷ τὸ θῆλυ. αἴτιον δέ, ὅτι διαφέρει τὸ ζῷον τοῦ φυτοῦ αἰσθήσει. ἀδύνατόν τε πρόσωπον, ἢ χεῖρα, ἢ σάρκα εἶναι, ἢ ἄλλο τι μόριον, μὴ ἐνούσης αἰσθητικῆς ψυχῆς ἢ ἐνεργείᾳ ἢ δυνάμει, καὶ ἤ πῃ, ἢ ἁπλῶς. ἔσται γὰρ οἷον νεκρὸς ἢ νεκροῦ μόριον. εἰ οὖν τὸ ἄρρεν ἐστὶ τὸ τῆς τοιαύτης ποιητικὸν ψυχῆς, ὅπου κεχώρισται τὸ θῆλυ καὶ τὸ ἄρρεν, ἀδύνατον τὸ θῆλυ ἐξ αὑτοῦ αὐτὸ γεννᾶν ζῷον. τὸ γὰρ εἰρημένον ἦν, τὸ ἄρρενι εἶναι. ἐπεὶ ὅτι γ' ἔχει λόγον ἡ λεχθεῖσα ἀπορία, φανερὸν ἐπὶ τῶν ὀρνίθων τῶν τὰ ὑπηνέμια τικτόντων, ὅτι δύναται μέχρι γέ τινος τὸ θῆλυ γεννᾶν. ἔτι δ' ἔχει καὶ τοῦτο ἀπορίαν, πῶς τις αὐτῶν τὰ ᾠὰ φήσει ζῆν· οὔτε γὰρ οὕτως ὡς τὰ γόνιμα ᾠὰ ἐνδέχεται, (ἐγίγνετο γὰρ ἐξ αὐτῶν ἐνεργείᾳ ἔμψυχον) οὔτε οὕτως ὥσπερ ξύλον, ἢ λίθον. ἔστι γὰρ καὶ τούτων τῶν ᾠῶν φθορά τις, ὡς μετεχόντων τρόπον τινὰ ζωῆς πρότερον. δῆλον οὖν ὅτι ἔχει τινὰ δυνάμει ψυχήν. ποίαν οὖν ταύτην; ἀνάγκη δὴ τὴν ἐσχάτην. αὕτη δ' ἐστὶν ἡ θρεπτική. αὕτη γὰρ ὑπάρχει πᾶσιν ὁμοίως, ζῴοις τε καὶ φυτοῖς. διὰ τί οὖν οὐκ ἀποτελεῖ τὰ μόρια καὶ τὸ ζῷον; ὅτι δεῖ αἰσθητικὴν αὐτὰ ἔχειν ψυχήν. οὐ γάρ ἐστιν ὥσπερ φυτοῦ τὰ μόρια τῶν ζῴων· διὸ δεῖται τῆς ἄρρενος κοινωνίας· κεχώρισται γὰρ ἐν τούτοις τὸ ἄρρεν.

* γρ. ἀπορήσει;

ὅταν καὶ συμβαίνῃ. τὰ γὰρ ὑπηνέμια γίνεται γόνιμα, ἐὰν ἔν τινι καιρῷ τὸ ἄρρεν ἐποχεύσῃ. ἀλλὰ περὶ μὲν τῆς τούτων αἰτίας, ὕστερον διορισθήσεται. εἰ δή ἐστί τι γένος, ὃ θῆλυ μέν ἐστιν, ἄρρεν δὲ μὴ ἔχει κεχωρισμένον, ἐνδέχεται τοῦτο τὸ ζῷον ἐξ αὑτοῦ γεννᾶν. ὅπερ ἀξιοπίστως μὲν οὐ συνῶπται μέχρι καὶ τοῦ νῦν. ποιεῖ δὲ διστάζειν ἐν τῷ γένει τῶν ἰχθύων. τῶν γὰρ καλουμένων ἐρυθρίνων, ἄρρεν μὲν οὐδεὶς ὦπται, θήλειαι δὲ καὶ κυημάτων πλήρεις. ἀλλὰ τούτων μὲν οὔπω πεῖραν ἔχομεν ἀξιόπιστον. οὔτε δὲ θήλεα, οὔτε ἄρρενα, καὶ ἐν τῷ τῶν ἰχθύων γένει ἐστίν· οἷον αἵ τε ἐγχέλεις καὶ γένος τι κεστρέων, περὶ τοὺς* τελματιαίους ποταμούς. ἐν ὅσοις δὲ κεχώρισται τὸ θῆλυ καὶ τὸ ἄρρεν, ἀδύνατον αὐτὸ καθ' αὑτὸ τὸ θῆλυ γεννᾶν εἰς τέλος· τὸ γὰρ ἄρρεν μάτην. διόπερ ἐν τοῖς τοιούτοις ἀεὶ τὸ ἄρρεν ἐπιτελεῖ τὴν γένεσιν. ἐμποιεῖ γὰρ τοῦτο τὴν αἰσθητικὴν ψυχήν, ἢ δι' αὑτοῦ, ἢ διὰ τῆς γονῆς. ἐνυπαρχόντων δ' ἐν τῇ ὕλῃ δυνάμει τῶν μορίων, ὅταν ἀρχὴ γένηται κινήσεως, ὥσπερ ἐν τοῖς αὐτομάτοις θαύμασι, συνείρεται τὸ ἐφεξῆς· καὶ ὃ βούλονται λέγειν τινὲς τῶν φυσικῶν, τὸ φέρεσθαι εἰς τὸ ὅμοιον, λεκτέον οὐχ ὡς τόπον μεταβάλλοντα τὰ μόρια κινεῖσθαι, ἀλλὰ μένοντα, καὶ ἀλλοιούμενα μαλακότητι καὶ σκληρότητι, καὶ χρώμασι καὶ ταῖς ἄλλαις ταῖς τῶν ὁμοιομερῶν διαφοραῖς γινόμενα ἐνεργείᾳ, ἃ ὑπῆρχε δυνάμει ὄντα πρότερον.

* γ. πηλματιαίοις

ΚΕΦΑΛ. ϛʹ.

Τίνα τῶν μορίων πρότερον, τίνα δὲ ὕστερον γίγνεται καὶ πῶς.

Γίγνεται δὲ πρῶτον ἡ ἀρχή· αὕτη δ' ἐστὶν ἡ καρδία τοῖς ἐναίμοις· τοῖς δ' ἄλλοις τὸ ἀνάλογον, ὥσπερ εἴρηται πολλάκις. καὶ τοῦτο φανερὸν οὐ μόνον κατὰ τὴν αἴσθησιν, ὅτι γίνεται πρῶτον, ἀλλὰ καὶ περὶ τὴν τελευτήν. ἀπολείπει γὰρ τὸ ζῆν ἐντεῦθεν τελευταῖον. συμβαίνει δ' ἐπὶ πάντων τὸ τελευταῖον γινόμενον, πρῶτον ἀπολείπειν· τὸ δὲ πρῶτον, τελευταῖον· ὥσπερ τῆς φύσεως διαυλοδρομούσης, καὶ ἀνελιττομένης ἐπὶ τὴν ἀρχὴν ὅθεν ἦλθεν. ἔστι γὰρ ἡ μὲν γένεσις, ἐκ τοῦ μὴ ὄντος εἰς τὸ ὄν· ἡ δὲ φθορά, ἐκ τοῦ ὄντος πάλιν εἰς τὸ μὴ ὄν.

* Γίγνεται δὲ μετὰ τὴν ἀρχήν, ὥσπερ ἐλέχθη, τὰ ἐντὸς πρότερα. φαίνεται δὲ πρότερα τὰ μέγεθος ἔχοντα τῶν ἐλαττόνων, οὐδ' ἔνια γιγνόμενα πρότερον. πρῶτον δὲ τὰ ἄνω διαρθροῦται τοῦ διαζώματος, καὶ διαφέρει μεγέθει· τὸ δὲ κάτω, καὶ ἔλαττον καὶ ἀδιοριστότερον. καὶ γὰρ τοῦτο γίνεται ἐν πᾶσιν, ὅσοις τὸ ἄνω καὶ τὸ κάτω διώρισται, πλὴν ἐν τοῖς ἐντόμοις. τούτων δ' ἐν τοῖς σκωληκοτοκουμένοις ἐπὶ τὸ ἄνω ἡ αὔξησις γίνεται. τὸ γὰρ ἄνω ἐξ ὑπαρχῆς ἔλαττον. ἀδιόριστον δὲ καὶ τὸ ἄνω καὶ τὸ κάτω τοῖς μαλακίοις τῶν πορευτικῶν μόνοις. τὸ δὲ λεχθὲν συμβαίνει καὶ ἐπὶ τῶν φυτῶν, τὸ προτερεῖν τῇ γενέσει τὸ ἄνω [κύτος τοῦ κάτωθεν.] τὰς γὰρ ῥίζας πρότερον ἀφιᾶσι τὰ σπέρματα τῶν ὀρόβων. Διορίζεται δὲ τὰ μέρη τῶν ζῴων πνεύματι· οὐ μέντοι οὔτε τῷ τῆς γεννώσης, οὔτε τῷ αὐτοῦ, καθάπερ τινὲς τῶν φυσικῶν φασι. φανερὸν γὰρ τοῦτο ἐπὶ τῶν ὀρνίθων καὶ τῶν ἰχθύων καὶ τῶν ἐντόμων. τὰ μὲν γὰρ χωρισθέντα τῆς γεννώσης, γίνεται ἐξ ᾠοῦ ἐν ᾧ λαμβάνει τὴν διάρθρωσιν. τὰ δ' ὅλως οὐκ ἀναπνεῖ τῶν ζῴων, σκωληκοτοκεῖται δὲ καὶ ᾠοτοκεῖται. τὰ δὲ ἀναπνέοντα καὶ ἐν τῇ μήτρᾳ λαμβάνοντα τὴν διάρθρωσιν, οὐκ ἀναπνεῖ, πρὶν ἢ ὁ πνεύμων λάβῃ τέλος. διαρθροῦται γὰρ καὶ τοῦτ'

* Hic ſectio in aliis codd.

& quidem ſic vſu euenit. Subuentanea enim illis fœcunda redduntur, ſi mas coiuit tempore quodam. Sed de eorum cauſa pòſt. Si quod autem genus eſt, quod fœmina ſit, & marem diſtinctum non habeat, id ex ſe ipſo animal generare poteſt. Quod etſi nondum fide digna exploratum habemus, tamen facit vt in genere piſcium dubitemus: eorum enim quos rubros ſiue rubelliones vocant mas nullus adhuc viſus eſt, ſed fœminæ omnes fœtu plenæ reperiuntur. Verùm de his nondum compertum habemus, quod fidem faciat ſatis. Quod autem nec mas, neque fœmina ſit, in genere quoque piſcium eſt, vt anguilla, & genus mugilum quoddam in fluuiis lutulentis. At verò in quibus ſexus maris & fœminæ diſtinctus habetur, fieri non poteſt vt fœmina ipſa per ſe generet perfectè: ita enim mas fruſtra eſſet: Quam ob rem in iis mas ſemper perficit generationem: hic enim ſenſualem dat animam, aut per ſe, aut per genituram. Sed cùm partes omnes potentia in materia inſint, cùm principium motionis affuit perinde vt in ſpontiniis illis miraculis, quod ſubinde ſequitur, excitatur, & quod nonnulli naturales authores exponere volunt, cùm dicant ſimile ferri ad ſimile: dicendum partes moueri, non mutãtes locum, ſed manentes, & alteraſcentes mollitie, duritie, colore, & reliquis partium ſimilarium differentiis factas iam actu, quæ ante erant potentia.

CAPVT VI.

Quæ animalium partes priùs, quæ poſteriùs generentur.

Fit autem primò principium, quod in ſanguineo genere cor eſt: in cæteris proportionale, vt ſæpius dictum eſt. Idque effici primùm non modò ſenſu percipitur, ſed etiam quòd per obitum vita hic vltimò deficit. Euenit namque in omnibus, vt quod vltimum fit, id primum deficiat: & quod primum, id vltimum, quaſi natura decurſionem reducem agat, & à calce ad carceres, vnde proruit, redeat. Eſt enim generatio ex non ente in ens: corruptio contrà, ex ente in non ens. Gignuntur poſt principium, vt dictum eſt, interiora priùs quam exteriora, ſed priùs maiora, quàm minora, viſuntur, quamuis nonnulla priùs non oriantur, primùm ſuperiora præcordiis formantur, eadémque magnitudine præſtant. Nam inferiora & minora ſunt, & minùs diſcreta, idque in omnibus, quæ parte ſuperiore inferioréque diſtinguuntur, exceptis inſectis. Quæ enim ex iis vermiculis naſcuntur, parte inferiore ampliùs creſcunt, ſuperiore iam inde à primo ortu minora ſunt. Greſſilium mollibus ſolis nullum diſcrimen eſt ſuperioris & inferioris. Quod autem de parte ſuperiore diximus, priùs, quàm inferiorem conſtitui, idem in plantarum etiam genere euenit: ſemina enim priùs mittunt radicem quàm ramos. Diſtinguuntur animalium partes ſpiritu, ſed non aut parentis, aut ſuo, vt quidam naturæ interpretes voluere. Hoc enim in genere auium, & piſcium, & inſectorum palàm fit, quæ partim ſeiuncta à parente naſcuntur ex ouo, in quo formantur, & explanantur: partim non ſpirant omnino, & tamen aut ouo, aut vermiculo enaſcuntur, alia quanquam ſpirant, & in vtero capiunt explanationem, tamen non priùs ſpirare incipiũt, quà pulmo perficiatur. Articulantur & hic,

& omnes priores partes antè quàm animal ſpiret. Item quadrupedum, quæ multifida ſunt, vt canis, leo, lupus, vulpes, lupus ceruarius, omnia cæcos generant: pòſt palpebræ dehiſcunt. Itaque conſtat in cæteris quoque omnibus, vt quantitatem, ſic qualitatem potentia antè ſubſtantem effici, actu poſt ab eiſdem cauſis, à quibus diſtinguitur quantitas, & duo ex vno effici: ſpiritum verò ineſſe, quoniam humidus & calidus eſt, cùm alterum agat, alterum patiatur. Iam antiquorum nonnulli naturæ interpretum, quæ poſt quam efficeretur pars, tentarunt quidem exponere, ſed parum vſu periti earum quæ accidunt, rerum: partium enim aliæ priores aliis ſunt: quod in cæteris etiam rebus. Prius autem multiplex iam eſt. Id enim, cuius cauſa, & quod cuius cauſa, differunt: & alterum generatione, alterum eſſentia prius eſt. Quin & quod eius cauſa duplicem recipit differentiam. Aut enim eſt vnde motus: aut quo vtatur id cuius cauſa. Verbi gratia, genitale, & inſtrumentale rei generatæ, horum enim alterum, id eſt, generans, & agens, præeſſe oportet, vt quod doceat prius, quàm quod diſcat. ſed tibias poſt eum qui tibiis diſcat: fruſtra enim adeſſunt tibiæ iis qui vti neſciant tibiis. Cùm itaque tria hæc ſint: Primum, finis, quem eſſe id dicimus, cuius cauſa: Secundum, quod eius cauſa, ſcilicet principium generans, & mouens. (Efficiens enim, & generans, qua talia ſunt, ad id pertinent, quod efficitur, & generatur.) Tertium, vtile, & quo finis vtatur. Primum eam partem habere neceſſe eſt, in qua principium motus continetur: hæc enim protinus pars finis prima & potiſſima eſt. tum poſt eam totum & finem. tertium verò & vltimum partes iis accommodatas inſtrumentales ad vſus nonnullos. Itaque ſi quid tale eſt, quod in animalibus ineſſe neceſſe ſit, quod totius naturæ principium & finem contineat, id effici primum neceſſe eſt. Quà enim mouens, primum oriri, quà pars finis eſt, cum toto oriri debet. Itaque inſtrumentalium partium, quæ ſua natura genitales ſunt, eas ſemper eſſe priores oportebit: alterius enim cauſa ſunt, tanquam principium. At verò quæ tales ex iis quæ alterius gratia conſtant, non ſunt, eas eſſe poſteriores congruit. Quamobrem vtrænam partes priores ſint, quæ alterius cauſa, an cuius cauſa ipſæ ſint, diſtingui non facilè poteſt. Incidit enim vt partes mouentes priores ſint generatione, quàm finis. Mouentes autem ab inſtrumentalibus diſtingui non facile eſt. Atqui ea ipſa via rationéque, quid poſt quod fiat, quærendum eſt. Finis enim quorundam poſterior eſt, quorundam prior. Quamobrem ea pars, quę principium continet, prima extitit: mox tota ſuperior moles. Quapropter caput & oculi fœtus maximi inter initia apparent; inferiora ab vmbilico, crura dico, exigua cernuntur. Partis enim ſuperioris gratia inferior eſt. Et neque pars finis, neque genitalis eſt eius. Neceſſitatem etiam cur ita ſit, non bene reddunt, qui quod ſemper ita fit, dicunt, idque principium in his exiſtimant, vt Democritus Abderitanus opinatur, quòd ſempiterni & infiniti principium nullum eſt. Cauſa autem cur ita, principium eſt, & infinitum, quod ſempiternum eſt. Itaque interrogare de eiuſmodi rebus cur ſit, eſt, quærere, inquit, principium infiniti. Atqui ea ipſa ratione, qua cenſeant non eſſe quærendum,

A καὶ τὰ ἐκ προσθεν μόρια πρὶν ἀναπνεῖν. ἔτι δὲ ὅσα πολυσχιδῆ τῶν τετραπόδων· οἷον κύων, λέων, λύκος, ἀλώπηξ, θώς, πάντα τυφλὰ γεννᾷ, καὶ διίσταται τὰ βλέφαρα γενομένων ὕστερον· ὥστε δῆλον ὅτι τὸν αὐτὸν τρόπον καὶ ἐν τοῖς ἄλλοις πᾶσι, καθάπερ καὶ τὸ ποιὸν, καὶ τὸ ποσὸν γίνεται δυνάμει προϋπάρχον, ἐνεργείᾳ δ' ὕστερον, ὑπὸ τῶν αὐτῶν αἰτίων ὑφ' ὧνπερ καὶ τὸ ποιὸν διορίζεται, καὶ γίνεται δύο ἐξ ἑνός. πνεῦμα δ' ὑπάρχειν ἀναγκαῖον ὅτι ὑγρὸν καὶ θερμὸν, τοῦ μὲν, ποιοῦντος, τοῦ δὲ, πάσχοντος. Τῶν δ' ἀρχαίων τινὲς φυσιολόγων τί μετὰ τί γίνεται τῶν μορίων, ἐπειράθησαν λέγειν, οὐ λίαν ἐμπειρικῶς ἔχοντες τῶν συμβαινόντων. τῶν γὰρ μορίων, ὥσπερ καὶ ἐπὶ τῶν ἄλλων, πέ-
B φυκεν ἕτερον ἑτέρου πρότερον. τὸ δὲ πρότερον ἤδη πολλαχῶς ἐστι. τό, τε γὰρ οὗ ἕνεκα, καὶ τὸ τούτου ἕνεκα, διαφέρει· καὶ τὸ μὲν τῇ γενέσει πρότερον αὐτῶν ἐστι· τὸ δὲ, τῇ οὐσίᾳ. δύο δὲ διαφορὰς ἔχει καὶ τὸ τούτου ἕνεκα· τὸ μὲν γάρ ἐστι, ὅθεν ἡ κίνησις· τὸ δὲ, ᾧ χρῆται τὸ οὗ ἕνεκα. λέγω δὲ οἷον τό, τε γεννητικὸν, καὶ τὸ ὀργανικὸν τῷ γεννωμένῳ. τούτων γὰρ τὸ μὲν ὑπάρχειν δεῖ πρότερον, τὸ ποιητικόν· οἷον τὸ διδάξαν τοῦ μανθάνοντος· τοὺς δ' αὐλοὺς ὕστερον τοῦ μανθάνοντος αὐλεῖν. περίεργον γὰρ μὴ ἐπισταμένοις αὐλεῖν, ὑπάρχειν αὐλούς. τριῶν δὲ ὄντων, ἑνὸς μὲν, τοῦ τέλους,
C ὃ λέγομεν εἶναι οὗ ἕνεκα, δευτέρου δὲ τοῦ τούτου ἕνεκα τῆς ἀρχῆς τῆς κινητικῆς καὶ γεννητικῆς· (τὸ γὰρ ποιητικὸν καὶ γεννητικὸν, ᾗ τοιαῦτα, πρὸς τὸ ποιούμενόν ἐστι καὶ γεννώμενον) τρίτου δὲ τοῦ χρησίμου καὶ ᾧ χρῆται τὸ τέλος· πρῶτον μὲν ὑπάρχειν ἀναγκαῖόν τι μόριον, ἐν ᾧ ἡ ἀρχὴ τῆς κινήσεως. καὶ γὰρ εὐθὺς τοῦτο μόριόν ἐστι τοῦ τέλους ἓν καὶ κυριώτατον. ἔπειτα μετὰ τοῦτο, τὸ ὅλον καὶ τὸ τέλος. τρίτον δὲ καὶ τελευταῖον, τὰ ὀργανικὰ τούτοις μέρη πρὸς ἐνίας χρήσεις: ὥστ' εἴ τι τοιοῦτόν ἐστιν ὅπερ ἀναγκαῖον ὑπάρχειν ἐν τοῖς ζῴοις, τὸ πάσης ἔχον τῆς φύσεως ἀρχὴν καὶ τέλος, τοῦτο γίνεσθαι πρῶτον ἀναγκαῖον, ᾗ μὲν κινητικὸν, πρῶτον ᾗ δὲ
D μόριον τοῦ τέλους, μετὰ τοῦ ὅλου. ὥστε τῶν μορίων τῶν ὀργανικῶν ὅσα μέν ἐστι γεννητικὰ τὴν φύσιν, ἀεὶ πρότερον δεῖ ὑπάρχειν αὐτά· (ἄλλου γὰρ ἕνεκά ἐστιν, ὡς ἡ ἀρχή) ὅσα δὲ μὴ τοιαῦτα τῶν ἄλλων ἕνεκα, ὕστερον. διὸ οὐ ῥᾴδιον διελεῖν πότερα τῶν μορίων, ὅσα ἄλλου ἕνεκα, ἢ οὗ ἕνεκα ταῦτα. παρεμπίπτει γὰρ τὰ κινητικὰ τῶν μορίων πρότερα ὄντα τῇ γενέσει τοῦ τέλους. τὰ δὲ κινητικὰ πρὸς τὰ ὀργανικὰ διελεῖν, οὐ ῥᾴδιον. καίτοι κατὰ ταύτην τὴν μέθοδον δεῖ ζητεῖν, τί γίνεται μετὰ τί. τὸ γὰρ τέλος ἐνίων ὕστερον, ἐνίων δὲ πρότερον. καὶ διὰ τοῦτο πρῶτον μὲν, τὸ ἔχον τὴν ἀρχὴν γίνεται μόριον· εἶτ' ἐχόμενον τὸ ἄνω κύτος. διὸ
E τὰ περὶ τὴν κεφαλὴν καὶ τὰ ὄμματα, μέγιστα κατ' ἀρχὰς φαίνεται τοῖς ἐμβρύοις· τὰ δὲ κάτω τοῦ ὀμφαλοῦ, οἷον τὰ κῶλα, μικρά. τοῦ γὰρ ἄνω τὰ κάτω ἕνεκα, καὶ οὔτε μόρια τοῦ τέλους, οὔτε γεννητικὰ αὐτοῦ. οὐ καλῶς δὲ λέγουσιν, οὐδὲ τοῦ διὰ τί τὴν ἀνάγκην, ὅσοι λέγουσιν, ὅτι οὕτως ἀεὶ γίνεται· καὶ ταύτην εἶναι νομίζουσιν ἀρχὴν αὐτοῖς, ὥσπερ Δημόκριτος ὁ Ἀβδηρίτης, ὅτι τοῦ μὲν ἀεὶ καὶ ἀπείρου οὐκ ἔστιν ἀρχή· τὸ δὲ διὰ τί, ἀρχή· τὸ δὲ ἀεὶ, ἄπειρον· ὥστε τὸ ἐρωτᾶν, τὸ διὰ τί, περὶ τῶν τοιούτων τινὸς, τὸ ζητεῖν εἶναί φησι τοῦ ἀπείρου ἀρχήν. καίτοι κατὰ τοῦτον τὸν λόγον, καθ' ὃν ἀξιοῦσι τὸ διὰ τί μὴ ζητεῖν,

A οὐδενὸς ἀπόδειξις ἔσται τῶν ἀϊδίων. φαίνεται δ' οὖσα πολλῶν, τῶν μὲν γινομένων ἀεὶ, τῶν δ' ὄντων· ἐπεὶ καὶ τὸ τρίγωνον ἔχειν δυσὶν ὀρθαῖς ἴσας ἀεὶ, καὶ τὸ τὴν διάμετρον ἀσύμμετρον εἶναι πρὸς τὴν πλευρὰν ἀΐδιον· ἀλλ' ὅμως ἐστὶν αὐτῶν αἴτιόν τι καὶ ἀπόδειξις. τὸ μὲν οὖν μὴ πάντων ἀξιοῦν ζητεῖν ἀρχὴν, λέγεται καλῶς· τὸ δὲ τῶν ὄντων ἀεὶ καὶ γινομένων πάντων, οὐ καλῶς, ἀλλ' ὅσαι τῶν ἀϊδίων ἀρχαὶ τυγχάνουσιν οὖσαι. τῆς γὰρ ἀρχῆς ἄλλη γνῶσις καὶ ἀπόδειξις. ἀρχὴ δ' ἐν μὲν τοῖς ἀκινήτοις, τὸ τί ἐστιν· ἐν δὲ τοῖς γινομένοις, ἤδη πλείους, τρόπον δ' ἄλλον, καὶ οὐ πᾶσαι τὸν αὐτόν· ὧν μία τὸν ἀριθμὸν, ὅθεν ἡ κίνησίς ἐστι. B διὸ πάντα τὰ ἔναιμα καρδίαν ἔχει πρῶτον, ὥσπερ ἐλέχθη κατ' ἀρχάς. ἐν δὲ τοῖς ἄλλοις τὸ ἀνάλογον γίνεται τῇ καρδίᾳ πρῶτον. ἐκ δὲ τῆς καρδίας αἱ φλέβες διατεταμέναι, καθάπερ οἱ τοὺς * κανάβους γράφοντες ἐν τοῖς τοίχοις. τὰ γὰρ μέρη περὶ ταύτας ἐστὶν, ἅτε γινόμενα ἐκ τούτων. Ἡ δὲ γένεσίς ἐστι τῶν ὁμοιομερῶν, ὑπὸ ψύξεως καὶ θερμότητος. συνίσταται γὰρ καὶ πήγνυται τὰ μὲν ψυχρῷ, τὰ δὲ θερμῷ. περὶ δὲ τῆς τούτων διαφορᾶς εἴρηται πρότερον * ἐν ἑτέροις, ποῖα λυτὰ ὑγρῷ καὶ πυρὶ, καὶ ποῖα ἄλυτα ὑγρῷ, καὶ ποῖα ἄτηκτα πυρί. C διὰ μὲν οὖν τῶν φλεβῶν, καὶ τῶν ἐν ἑκάστοις πόρων, διαπιδύουσα ἡ τροφὴ, καθάπερ ἐν τοῖς ὠμοῖς κεραμίοις τὸ ὕδωρ, * γίνεται σάρκες, ἢ τὸ ταύταις ἀνάλογον, ὑπὸ τοῦ ψυχροῦ συνισταμέναι. διὸ καὶ λύονται ὑπὸ τοῦ πυρός. ὅσα δὲ γεηρὰ λίαν τῶν ἀνατελλόντων, ὀλίγην ἔχοντα ὑγρότητα καὶ θερμότητα, ταῦτα δὲ ψυχόμενα ἐξατμίζοντος τοῦ ὑγροῦ μετὰ τοῦ θερμοῦ, γίνεται σκληρὰ καὶ γεώδη τὴν μορφήν. οἷον ὄνυχες, καὶ κέρατα, καὶ ὁπλαὶ, καὶ ῥύγχη. διὸ μαλάττεται μὲν πυρὶ, τήκεται δ' οὐδὲν, ἀλλ' ἔνια τοῖς ὑγροῖς. οἷον τὰ κελύφη τῶν ᾠῶν. ὑπὸ δὲ τῆς ἐντὸς θερμότητος τά γε νεῦρα D καὶ τὰ ὀστᾶ γίνεται, ξηραινομένης τῆς ὑγρότητος. διὸ καὶ ἄλυτά ἐστι τὰ ὀστᾶ ἐκ τοῦ πυρὸς, καθάπερ κέραμος· οἷον γὰρ ἐν καμίνῳ, ὠπτημένα ὑπὸ τῆς ἐν τῇ γενέσει θερμότητος. αὕτη δὲ οὔτε ὅ,τι ἔτυχε, ποιεῖ σάρκα, ἢ ὀστοῦν, οὐδ' ὅπῃ ἔτυχεν ἀλλὰ τὸ πεφυκὸς, καὶ ᾗ πέφυκε, καὶ ὅτε πέφυκεν. οὔτε γὰρ τὸ δυνάμενον ὑπὸ τοῦ μὴ τὴν ἐνέργειαν ἔχοντος κινητικοῦ ἔσται, οὔτε τὸ τὴν ἐνέργειαν ἔχον ποιήσει ἐκ τοῦ τυχόντος, ὥσπερ οὔτε κιβωτὸν μὴ ἐκ ξύλου ὁ τέκτων ποιήσειεν ἂν, οὔτ' ἄνευ τούτου κιβωτὸς ἔσται ἐκ τῶν ξύλων. ἡ δὲ θερμότης ἐνυπάρχει ἐν τῷ σπερματικῷ περιττώματι τοσαύτη, καὶ τοιαύτην ἔχουσα τὴν κίνησιν καὶ τὴν ἐνέργειαν, ὅση σύμμετρος εἰς ἕκαστον τῶν μορίων. καθ' ὅσον δ' ἂν ἐλλείπῃ, ἢ ὑπερβάλλῃ, ἢ * χεῖρον ποιεῖ, ἢ ἀνάπηρον τὸ γινόμενον, παραπλησίως τοῖς ἔξω συνισταμένοις, διὰ τῆς ἑψήσεως πρὸς τροφῆς ἀπόλαυσιν, ἤ τινα ἄλλην ἐργασίαν. ἀλλ' ἐνταῦθα μὲν ἡμεῖς τὴν τῆς θερμότητος συμμετρίαν εἰς τὴν κίνησιν παρασκευάζομεν. ἐκεῖ δὲ δίδωσιν ἡ φύσις ἡ τοῦ γεννῶντος. τοῖς δὲ αὐτομάτως γινομένοις, αἰτία ἡ τῆς ὥρας κίνησις καὶ θερμότης. ἡ δὲ ψύξις, στέρησις θερμότητός ἐστι. χρῆται δ' ἀμφοτέροις ἡ φύσις, ἔχουσι μὲν δύναμιν ἐξ ἀνάγκης, ὥστε τὸ μὲν τοδὶ, τὸ δὲ τοδὶ ποιεῖν. ἐν μέντοι τοῖς γινομένοις ἕνεκά τινος,

* Histor. lib. 3.

* Meteor. li. 4. c. 9.

* χ. γίνονται

* γρ. χείρονα

A nullius rei ſempiternæ demonſtratio eſſe poterit. Et tamen eſſe cumplurimum videtur, quarum aliæ ſemper fiunt, aliæ ſemper ſunt. Nam & triangula figura duobus rectis æquales ſemper habet, & diametrum incommenſurabilem eſſe cum coſta, ſempiternum eſt. Attamen cauſa eorum aliqua, & demonſtratio eſt. Igitur non omnium rerum principium quærendum eſſe recte dicitur: at rerum, quæ ſemper aut ſunt, aut fiunt, nullum principium eſſe quærendum non bene aſſeritur. Sed ea duntaxat principia non recipiunt examen eiuſmodi, quæ rerum ſempiternarum ſunt. Principiis enim alia cognitio, non B demonſtratio eſt. Principium verò in rebus immobilibus quiditas eſt. In rebus autem, quę fiunt, iam plura habentur principia, ſed modo diuerſo, nec omnia modo eodem, quorum principiorum vnum numero eſt, vnde motus. Quamobrem omnia quæ ſanguinem habent, animalia, cor primum poſſident, vt inter initia noſtræ diſputationis dictum eſt. In cæteris primum gignitur, quod proportionale ſit cordis. Venæ ex corde tendunt diductæ modo riuorum, qui in parietibus proficiſcentes ab eodem fonte pinguntur: partes enim coniunctæ iis ſunt, vtpote quæ ex iis coaugmententur, atque conſiſtant. Ortus ſimilarium C rigore caloréve agitur: conſiſtunt coquuntúrque alia frigido, alia calido. Quarum rerum differentias alibi expoſuimus, antè ſcilicet, quæ humore ignéque reſolubiles, quæ humore irreſolubiles, ignéque illiquabiles ſint. Per venas igitur, & meatulos quoſque alimentum reſudans, quemadmodum aqua per crudiuſculam cutem, in carnem, aut carnis proportionale conuertitur frigore conſiſtens. Ex quo fit vt caro ab igne reſoluatur. Sed quæ terrena admodum oriuntur, parum humoris caloriſque adepta, hæc dum refrigeſcunt, humore cum calore euaporante duram terrenámque formam capiunt, vt vngues, cornua, vngulæ, roſtra: quamobrem igne hæc D molliuntur. Sed humore nonnulla liqueſcunt, vt ouorum putamina. Nerui, & oſſa calore interiore conficiuntur ſicceſcente humore. Quamobrem oſſa reſolui ab igne non poſſunt: quomodo teſta indiſſolubilis eſt. Quaſi enim in fornace excocta à calore generationis ita conſtant. Hic autem calor nec ex quolibet carnem, aut os facit, neque quolibet modo, aut tempore, ſed ex materia apta, & vt aptè, & cùm aptè effici poteſt. Neque enim quod effici poteſt, efficietur à mouente, quod actu careat, neque quod actum obtinet, efficere ex quolibet poterit. Sicut nec faber arcam, niſi ex ligno facere poteſt, neque arca effici ex lignis poteſt ſine ſuo artifice. Ineſt hic calor in excremento ſeminali, tantam talémque habens motionem, & actionem, quanta modicè ad quamuis corporis partem accommodetur. Quod ſi vel deficit, vel excedit, rem, quæ fit, aut deteriorem efficit, aut læſam, & mancam, ſimiliter vt in iis agitur quæ foris igne coquuntur ad cibum, aut ad alium vſum. Sed in iis motum caloris nos moderamur, in illis natura gignentis accommodat. In iis autem quæ ſponte oriuntur, cauſa eſt, motus temporis, & calor. Frigus, priuatio caloris eſt. Vtitur his ambobus Natura vim habentibus neceſſariò, vt alterum hoc, alterum illud faciat. Sed in iis quæ alicuius gratia gignuntur,

accidit vt alterum frigefaciat, alterum calefaciat, atque ita pars quæque qualitate certa efficiatur, vt caro mollis partim neceſſariò talis exinde facta, partim alicuius gratia. Neruus ſiccus, & ductilis, os ſiccum & fragile cutis carne ſicceſcente efficitur: quomodo in polentis cruſtula, quam netuiam vocant. Nec ſolùm propter extremum generatio eius euenit, ſed etiam quòd lentitudo reſideat, cùm euaporari non poſſit: verùm in cæteris lentum id ſqualidum eſt. Itaque fit vt extrema exanguium animalium teſta cruſtáve conſtent. At in ſanguineo genere lentum hoc pinguius eſt, & quidẽ quæ natura non terrena admodũ ſunt, eorũ pingue ſub cutis operimento colligitur, quaſi cutis ex eiuſmodi lentitate conſiſtat. Pingue enim habet aliquid lẽtitatis. Sed hęc omnia, vt diximus, partim neceſſariò, partim nõ neceſſariò, ſed alicuius gratia effici aſſerendum eſt. Primùm igitur moles ſuperior per generationem diſtinguitur: inferior tempore procedente recipit incrementum in ſanguineo genere. Omnia verò lineamentis primùm deſcribuntur, deinde colores recipiunt, & mollitiem, & duritiem, quaſi pictoris officio fungatur natura, cùm condit, & creat. Pictor enim, vbi lineis primùm deſcripſerit animantem, mox vario illinit colore, ac perficit. Cùm itaque principium ſenſuum, totiúſque animalis, in corde contineatur, hoc ob eam rem primum gignitur, mox ob eius calorem frigiditas ſuprà, vbi deſinunt venæ, reſpondens cordis calori, conſtituit cerebrum. Itaque caput à corde continuo generatur, & magnitudine cæteris præſtat. Principio enim cerebrum multum & humidum eſt. Sed recipit dubitationem, quod oculis animalium euenit. Principio enim maximi viſuntur, & in pedeſtri, & in natatili, & in volatili genere: vltimi verò omnium partium perficiuntur. interim enim conſidunt. Cauſa autem eſt, quòd oculorum ſenſorium poſitum quidem eſt, vt cætera ſenſoria, apud meatum: ſed cùm ſenſorium tangendi guſtandique protinus ſit aut corpus, aut aliquid proprium corporis animalium, olfaciendi verò audiendique meatus contingant aërem externum, pleni ſpiritus natiui, ortique à corde tendant ac deſinant ad venulas cerebro adiunctas, oculus ſolus proprium corpus præ cæteris habet ſenſoriis, quod humidum & frigidum eſt: nec antè contentum eo in loco potentia, vt cæteræ partes, tum deinde actu exiſtens. Sed à cerebri humore ſecernitur pars puriſſima per meatus, qui ab oculis ipſis tendere ad membranam cerebri viſuntur. Cuius rei argumentum, quòd nec alia pars humida & frigida eſt in capite, præter cerebrum, & oculus frigidus atque humidus eſt. Itaque neceſſariò locus hic magnitudinem primum capit, pòſt conſidit. Nam & in cerebro eodem euenit modo, vt primum præhumidum, multúmque ſit, mox humore efflato concoctóque corporatur magis, ſubſidétque & cerebrum, & magnitudo oculorum. Principio igitur caput prægrande propter cerebrum, oculi grandes propter humorem in ipſis contentũ apparent.

A συμβαίνει τὸ μὲν ψύχειν αὐτῶν, τὸ δὲ θερμαίνειν, καὶ γίνεσθαι τῶν μορίων ἕκαστον τὴν μὲν σάρκα, μαλακήν, τῇ μὲν ἐξ ἀνάγκης ποιουμένων τοιαύτην, τῇ δ' ἕνεκά τινος· τὸ δὲ νεῦρον, ξηρὸν καὶ ἑλκτόν· τὸ δ' ὀστοῦν, ξηρὸν καὶ θραυστόν. τὸ δὲ δέρμα, ξηραινομένης τῆς σαρκὸς γίνεται, καθάπερ ἐπὶ τοῖς ἑψήμασιν ἡ καλουμένη γραῦς. οὐ μόνον δὲ διὰ τὸ ἔσχατον συμβαίνει αὐτοῦ ἡ γένεσις, ἀλλὰ καὶ διότι ἐπιπολάζει τὸ γλίσχρον, διὰ τὸ μὴ δύνασθαι ἐξατμίζειν. ἐν μὲν οὖν τοῖς ἄλλοις, αὐχμηρὸν τὸ γλίσχρον. διὸ ὀστρακόδερμα καὶ μαλακόστρακα, τὰ ἔσχατά ἐστι τῶν ἀναίμων ζώων. ἐν B δὲ τοῖς ἐναίμοις τὸ γλίσχρον λιπαρώτερόν ἐστι. καὶ τούτων ὅσα μὴ γεώδη τὴν φύσιν ἔχει λίαν, ἀθροίζεται τὸ πιμελῶδες ὑπὸ τὴν τοῦ δέρματος σκέπην, ὡς τοῦ δέρματος γινομένου ἐκ τῆς τοιαύτης γλισχρότητος. ἔχει γάρ τινα γλισχρότητα τὸ λιπαρόν. πάντα δὲ ταῦτα, καθάπερ εἴπομεν, λεκτέον γίνεσθαι τῇ μὲν ἐξ ἀνάγκης, τῇ δ' οὐκ ἐξ ἀνάγκης, ἀλλ' ἕνεκά τινος. πρῶτον μὲν οὖν τὸ ἄνω κύτος ἀφορίζεται κατὰ τὴν γένεσιν· τὸ δὲ κάτω, προϊόντος τοῦ χρόνου λαμβάνει τὴν αὔξησιν ἐν τοῖς ἐναίμοις. ἅπαντα δὲ ταῖς περιγραφαῖς διορίζεται πρότερον, ὕστερον δὲ C λαμβάνει τὰ χρώματα καὶ τὰς μαλακότητας καὶ τὰς σκληρότητας, ἀτεχνῶς, ὥσπερ ἂν ὑπὸ τοῦ ζωγράφου, τῆς φύσεως δημιουργούσης. καὶ γὰρ οἱ γραφεῖς ὑπογράψαντες ταῖς γραμμαῖς, οὕτως ἐναλείφουσι τοῖς χρώμασι τὸ ζῷον. διὰ μὲν οὖν τὸ τὴν ἀρχὴν ἐν τῇ καρδίᾳ τῶν αἰσθήσεων εἶναι καὶ τοῦ ζῴου παντός, αὕτη γίνεται πρῶτον. διὰ δὲ τὴν θερμότητα τὴν αὐτῆς, ᾗ τελευτῶσιν αἱ φλέβες ἄνω, τὸ ψυχρὸν συνίστησιν ἀντίστροφον τῇ θερμότητι τῇ περὶ τὴν καρδίαν, τὸν ἐγκέφαλον. διόπερ τὰ περὶ τὴν κεφαλὴν λαμβάνει συνεχῆ τὴν γένεσιν μετὰ τὴν καρδίαν, καὶ μεγέθει τῶν ἄλλων διαφέρει. πολὺς γὰρ καὶ ὑγρὸς ἐξ ἀρ- D χῆς ὁ ἐγκέφαλος. ἔχει δ' ἀπορίαν τὸ περὶ τοὺς ὀφθαλμοὺς συμβαῖνον τῶν ζῴων. μέγιστοι μὲν γὰρ ἐξ ἀρχῆς φαίνονται καὶ πεζοῖς, καὶ πλωτοῖς, καὶ πτηνοῖς· τελευταῖοι δὲ γίνονται τῶν μορίων. ἐν τῷ μεταξὺ γὰρ χρόνῳ συμπίπτουσιν. αἴτιον δ', ὅτι τὸ τῶν ὀφθαλμῶν αἰσθητήριον, ἔστι μὲν ὥσπερ καὶ τὰ ἄλλα αἰσθητήρια, ἐπὶ πόρων. ἀλλὰ τὸ μὲν τῆς ἁφῆς καὶ γεύσεως, εὐθύς ἐστιν ἢ σῶμα, ἢ τοῦ σώματός τι τῶν ζῴων· ἡ δ' ὄσφρησις καὶ ἡ ἀκοή, πόροι συνάπτοντες πρὸς τὸν ἀέρα τὸν θύραθεν, πλήρεις συμφύτου πνεύματος· συμπεραίνοντες δὲ περὶ τὰ φλεβία τὰ περὶ τὸν ἐγκέφαλον, γίνονται ἀπὸ τῆς καρδίας. ὁ δ' ὀφθαλμός, σῶ- E μα μόνον ἴδιον ἔχει τῶν αἰσθητηρίων. ἔστι δ' ὑγρὸν καὶ ψυχρόν, καὶ οὐ προϋπάρχει ἐν τῷ τόπῳ, καθάπερ καὶ τὰ ἄλλα μόρια δυνάμει, ἔπειτα δὲ ἐνεργείᾳ γινόμενα ὕστερον· ἀλλ' ἀπὸ τῆς περὶ τὸν ἐγκέφαλον ὑγρότητος ἀποκρίνεται τὸ καθαρώτατον διὰ τῶν πόρων, οἳ φαίνονται φέροντες ἀπ' αὐτῶν πρὸς τὴν μήνιγγα τὴν περὶ τὸν ἐγκέφαλον. τούτου δὲ τεκμήριον· οὔτε γὰρ ἄλλο μόριον ὑγρὸν καὶ ψυχρόν ἐστιν ἐν τῇ κεφαλῇ παρὰ τὸν ἐγκέφαλον, τό,τε ὄμμα ψυχρὸν καὶ ὑγρόν. ἐξ ἀνάγκης οὖν ὁ τόπος περιλαμβάνει μέγεθος τὸ πρῶτον, συμπίπτει δ' ὕστερον. καὶ γὰρ περὶ τὸν ἐγκέφαλον συμβαίνει τὸν αὐτὸν τρόπον τὸ πρῶτον, ὑγρὸς καὶ πολύς. ἀποπνέοντος δὲ καὶ πεττομένου, σωματοῦταί τε μᾶλλον καὶ συμπίπτει καὶ ὁ ἐγκέφαλος καὶ τὰ σώματα, καὶ τὸ μέγεθος τὸ τῶν ὀμμάτων. ἐξ ἀρχῆς δὲ διὰ μὲν τὸν ἐγκέφαλον ἡ κεφαλὴ μεγίστη· διὰ δὲ τὸ ὑγρὸν τὸ ἐν τοῖς ὄμμασιν, οἱ ὀφθαλμοὶ μεγάλοι φαίνονται.

τελευταῖοι δὲ λαμβάνουσι τέλος, διὰ τὸ καὶ τὸν ἐγκέφαλον συνίστασθαι μόλις. ὀψὲ γὰρ παύεται τῆς ψυχρότητος καὶ τῆς ὑγρότητος, ἐπὶ πάντων μὲν, μάλιστα δ᾽ ὡς ἐπὶ τῶν ἀνθρώπων. διὰ γὰρ τοῦτο καὶ τὸ βρέγμα τῶν ὀστῶν γίνεται τελευταῖον. ἤδη γὰρ γεγενημένων θύραζε τῶν ἐμβρύων, μαλακὸν ἐστὶ τοῦτο τὸ ὀστοῦν τῶν παιδῶν. αἰτία δὲ τοῦ μάλιστα ἐπὶ τῶν ἀνθρώπων τοῦτο συμβαίνειν, ὅτι τὸν ἐγκέφαλον ὑγρότατον ἔχουσι καὶ πλεῖστον τῶν ζώων. τούτου δ᾽ αἴτιον, ὅτι καὶ τὴν ἐν τῇ καρδίᾳ θερμότητα καθαρωτάτην. δηλοῖ δὲ τὴν εὐκρασίαν ἡ διάνοια. φρονιμώτατος γὰρ τῶν ζώων ἄνθρωπος. ἀκρατῆ δὲ καὶ τὰ παιδία μέχρι πόρρω τῆς κεφαλῆς ἐστι, διὰ τὸ βάρος τὸ περὶ τὸν ἐγκέφαλον. ὁμοίως δὲ καὶ τῶν μορίων ὅσα δεῖ κινεῖν. ἡ γὰρ ἀρχὴ τῆς κινήσεως, ὀψὲ κρατεῖ τῶν ἄνωθεν καὶ τελευταίων, ὅσων ἡ κίνησις μὴ συνήρτηται πρὸς αὐτὴν, ὥσπερ τῶν κώλων. τοιοῦτο δ᾽ ἐστὶ μόριον τὸ βλέφαρον. ἐπεὶ δ᾽ οὐθὲν ποιεῖ περίεργον οὐδὲ μάτην ἡ φύσις, δῆλον ὡς οὐδ᾽ ὕστερον οὐδὲ πρότερον. ἔσται γὰρ τὸ γενόμενον μάτην, ἢ περίεργον. ὥστ᾽ ἅμ᾽ ἀνάγκη τὰ βλέφαρα διαχωρίζεσθαι καὶ δύνασθαι κινεῖν. ὀψὲ μὲν [οὖν] διὰ τὸ πλῆθος τῆς περὶ τὸν ἐγκέφαλον πέψεως, τελειοῦται τὰ ὄμματα τοῖς ζώοις. τελευταῖα δὲ, διὰ τὸ σφόδρα κρατούσης τῆς κινήσεως εἶναι, τὸ κινεῖν καὶ τὰ οὕτως πόρρω τῆς ἀρχῆς, καὶ ἀπεψυγμένα τῶν μορίων. δηλοῖ δὲ τὰ βλέφαρα τοιαύτην ἔχοντα τὴν φύσιν. ἂν γὰρ καὶ ὁποσονοῦν βάρος γένηται περὶ τὴν κεφαλὴν, διὰ ὕπνον, ἢ μέθην, ἢ ἄλλο τι τῶν τοιούτων, οὐ δυνάμεθα τὰ βλέφαρα αἴρειν, οὕτω βάρος αὐτῶν ἐχόντων μικρόν. περὶ μὲν οὖν ὀφθαλμῶν εἴρηται πῶς γίνονται, καὶ διὰ τίν᾽ αἰτίαν τελευταίαν λαμβάνουσι τὴν διάρθρωσιν. τῶν δ᾽ ἄλλων γίνεται μορίων ἕκαστον ἐκ τῆς τροφῆς· τὰ μὲν τιμιώτατα καὶ μετειληφότα τῆς κυριωτάτης ἀρχῆς, ἐκ τῆς πεπεμμένης καὶ καθαρωτάτης καὶ πρώτης τροφῆς· τὰ δ᾽ ἀναγκαῖα μόρια καὶ τούτων ἕνεκεν, ἐκ τῆς χείρονος, καὶ τῶν ὑπολειμμάτων καὶ περιττωμάτων. ὥσπερ γὰρ οἰκονόμος ἀγαθὸς, καὶ ἡ φύσις οὐδὲν ἀποβάλλειν εἴωθεν, ἐξ ὧν ἐστι ποιῆσαί τι χρηστόν. ἐν δὲ ταῖς οἰκονομίαις τῆς γινομένης τροφῆς, ἡ μὲν βελτίστη, τέτακται τοῖς ἐλευθέροις· ἡ δὲ χείρων καὶ τὸ περίττωμα ταύτης, τοῖς οἰκέταις· τὰ δὲ χείριστα, καὶ τοῖς συντρεφομένοις δίδοασι ζώοις. καθάπερ οὖν ἐπὶ τὴν αὔξησιν ὁ θύραθεν ταῦτα ποιεῖ νοῦς, οὕτως ἐν τοῖς γινομένοις αὐτοῖς ἡ φύσις. ἐκ μὲν τῆς καθαρωτάτης ὕλης σάρκας, καὶ τῶν ἄλλων αἰσθητηρίων τὰ σώματα συνίστησιν· ἐκ δὲ τῶν περιττωμάτων, ὀστᾶ καὶ νεῦρα καὶ τρίχας· ἔτι δ᾽ ὄνυχας καὶ ὁπλὰς, καὶ πάντα τὰ τοιαῦτα. διὸ τελευταῖα ταῦτα λαμβάνει τὴν σύστασιν, ὅταν ἤδη γίνηται περίττωμα τῆς φύσεως. ἡ μὲν οὖν τῶν ὀστῶν φύσις, ἐν τῇ πρώτῃ συστάσει γίνεται τῶν μορίων, ἐκ τῆς σπερματικῆς περιττώσεως, καὶ τῶν ζώων αὐξανομένων, ἐκ τῆς φυσικῆς τροφῆς λαμβάνει τὴν αὔξησιν, ἐξ ἧσπερ τὰ μόρια τὰ κύρια. ταύτης μέντοι αὐτῆς τὰ ὑπολείμματα καὶ τὰ περιττωματικά. γίνεται γὰρ ἐν παντὶ τὸ πρῶτον καὶ τὸ δεύτερον καὶ τῆς τροφῆς τὸ μὲν, θρεπτικόν· τὸ δ᾽, αὐξητικόν. θρεπτικὸν μὲν, ὃ τὸ εἶναι παρέχεται, τῷ τε ὅλῳ καὶ τοῖς μορίοις· αὐξητικὸν δὲ, τὸ εἰς μέγεθος ποιοῦν τὴν ἐπίδοσιν· περὶ ὧν ὕστερον διοριστέον μᾶλλον. τὸν αὐτὸν δὲ τρόπον τοῖς ὀστοῖς καὶ τὰ νεῦρα συνίσταται, καὶ ἐκ τῶν αὐτῶν, ἐκ τῆς σπερματικῆς περιττώσεως, καὶ τῆς θρεπτικῆς

A Vltimi verò perficiuntur, quoniam cerebrũ quoque vix conſiſtat. Serò enim à frigiditate humiditateque vendicatur, in omnibus quidem, ſed præcipuè in homine; nam & ſinciput inter oſſa ultimum confirmatur. Iam enim cùm partus in lucem venit, molle hoc infantis os eſt. Cauſa vt hoc maximè hominibus accidat, quoniam cerebrum humidiſſimum, & maximum omnium animalium homines habeant. Cuius rei cauſa eſt, quòd calorem etiam cordis puriſſimum obtinet, quod temperamentum intellectus planè ſignificat. Homo enim omnium animalium prudentiſſimus eſt. Pueri etiam longo tempore nequeunt continere caput, præ pondere cerebri. Nec ſe-
B cus partes, quas mouere oportet. Principium enim mouendi ſerò ſuperioribus dominatur, & ad poſtremum iis quorum motus non iungitur cum principio, vt cruribus. Palpebra etiam talis pars eſt. Sed cùm natura nihil ſuperuacaneum, nihil fruſtrà facere ſoleat, conſtat, nec priùs neque poſteriùs, quàm vſus exigat, ab ea effici quicquam. Sic enim quod factum eſt, fruſtra aut ſuperuacaneum fuerit. Itaque palpebras ſimul & diſtingui & poſſe moueri neceſſe eſt. Serò igitur oculi animalium perficiuntur propter copiam humoris concoquendi in cerebro. Vltimi autem, quòd mouendi facultas, niſi increuerit, nequeat mouere eas partes, quæ tam remotæ à princi-
C pio, refrigerat æque ſunt. Declarant hoc idem palpebræ ſua natura. Cùm enim vel quantalibet grauitate caput tentatur, aut ex ſomno, aut temulentia, aut alia eiuſmodi cauſa, palpebras attollere non poſſumus, quanquam leui pondere aggrauentur. Sed de oculis iam dictum eſt, quemadmodum oriantur, & quam ob cauſam vltimi articulentur, & abſoluantur. Cęterarum partium vnaquæque ex alimento gignitur. Nobiliſſima quæque, & potiſſimi principij particeps ex concocto ſynceriſſimo, primóque alimento. Reliquæ neceſſariæ, ac illarum gratia inſtituendæ, ex deteriore, & reliquiis, excrementíſque. Perinde enim natura, atque pater-
D familias prudens, nihil amittere ſolet, ex quo facere aliquid commodi poſſit. Diſpenſatur autem in cura rei familiaris ita, vt cibus optimus detur liberis, deterior ſeruis, viliſſimus ſociis animalibus. Vt igitur incremento iam addito mens aduena facit hæc, ſic in ortu ipſa natura ex materia ſynceriſſima carnem cęterorum ſenſoriorum corpora cõficit, in excrementis oſſa, neruos, pilos, vngues, vngulas & reliqua generis eiuſdem cõſtituit. Quamobrem hæc vltima efficiuntur, cùm iam ſuppetit excrementum naturę. Oſſa igitur in prima partium conſtitutione gignuntur ex ſeminali excremento, cúmque animal augetur, hæc incrementum ex alimento capiunt naturali, quo
E partes principales augentur. Eius tamen ipſius alimenti ſunt, & reliquiæ, & excrementa. Fit enim in quouis primum & ſecundum. Alimentíque ratio duplex eſt, altera nutriendi, altera augendi. Nutriens eſt, quod eſſe præbeat & toti, & partibus. Augens, quod acceſſionem ad magnitudinem faciat. De quibus poſtea differendum latiùs eſt. Nerui etiam eo modo, quo oſſa, inſtituuntur, & ex eodem, videlicet ex ſeminali excremento, & nutritiuo.

A Sed vngues, pili, cornua, roſtra auium, & calcaria, & ſi quid eiuſmodi aliud eſt, ex cibo gignuntur aduentitio, & auctiuo, quem tum à fœmina tum de foris ſibi acquirunt. Quamobrem oſſa quadam tenus capiunt incrementum. omnibus enim animalibus exitus magnitudinis eſt. Itaque oſſa quoque certo augendi termino deſcribuntur. Nam ſi hæc ſemper augerentur, animalia quoque, in quibus os, aut oſſis proportionale eſt, augerentur quàdiu viuerent. Magnitudinis animalium meta, & terminus* his deſcribitur. Sed quam ob cauſam non ſemper capiant incrementum, poſtea declarandum eſt. Pili autem, & eorum cognata omnia, quamdiu inſunt, tandiu augentur: & magis cùm

B corpora aut ægrotant, aut ſeneſcunt, atque decreſcunt, quoniam plus excrementi tantiſper remanet, cùm minùs in partes præcipuas conſumatur propter ſenium, aut morbum. Nam vbi id quoque ob ætatem defecerit, pili quoque deficiunt. At oſſa contra: decreſcunt enim cum corpore, & membris. Defunctis etiam pili augentur, ſed naſci nequeunt. De dentibus dubitaueris: ſunt enim eiuſdem naturæ, cuius oſſa: gignunturque ex oſſibus, vt vngues, pili, cornua, & ſimilia ex cute. Quo fit vt ipſa colorem pariter cum cute immutent: alba enim, & nigra, & vario modo diuerſa pro colore cutis redduntur. At dentes nihil tale recipiunt. Oſſibus enim annu-

C merantur in iis animalibus, quæ oſſa habent, & dentes. Accreſcunt ſoli omnium oſſium tota vita. Quod patet in iis dentibus, qui mutuum tactum declinant. Cauſa incrementi eſt, quoad pertinet ad id, cuius gratia, vt fungi officio poſſint. Breui enim tempore attritu conſumerentur, niſi ſubinde repararentur, quando vel nunc ſeneſcentibus nonnullis edacibus dente non magno præditis admodum perteruntur: plus enim in dies adimitur quàm additur. Quamobrem bene id quoque ad rem, quæ accidit, emolita natura eſt: quippe quæ in ſenectutem vitæque exitum defectum dentiū proferat, & pro vitæ ſpatio præſcripſerit modum. Sed ſi decies millies, aut decies centum

D annis vita ſeruaretur, & prægrandes primos oriri oporteret, & ſæpius renaſci. Quamuis enim aſſiduè reciperent incrementum, tamen detriti plùs quàm accreſcerent, inutiles demum ad cibum conficiendum euaderent. Sed cuiuſnam gratia capiant incrementum, dictum iam eſt. Accidit autem vt neque eandem naturam, quam cætera oſſa, dentes habeant. Cætera enim in prima conſtitutione omnia gignuntur, neque eſt quod pòſt oriatur: at dentes pòſt enaſcuntur. Quamobrem cùm deciderint, denuò poſſunt oriri. Tangunt enim oſſa, *non continuantur. Ex eo tamen gignuntur alimento, quod in oſſa adminiſtratur. Quapropter eandem, quam oſſa, habent naturam, & tunc cùm illa iam ſuum numerum receperunt. Sed cùm cætera animalia

E dentibus, aut dentium proportionali prædita enaſcantur, niſi quid præter naturam accidit, (perfectiora enim quàm homo, generatione abſoluuntur) homo dentibus carens venit in lucem, niſi quid præter naturam interceſſerit. Sed quam ob cauſam dentes alij decidant, alij non, pòſt explicabimus. Quòd autem eiuſmodi partes excremento conſtituuntur, ea cauſa homo inobſcepto & nudiſſimo omnium animalium corpore eſt, & vngues minimos pro magnitudine habet:

A ὄνυχες δέ, καὶ τρίχες, καὶ ὁπλαί, καὶ κέρατα, καὶ ῥύγχη, καὶ τὰ πλῆκτρα τῶν ὀρνίθων, καὶ εἴ τι τοιοῦτόν ἐστι μόριον, τῆς ἐπικτήτου τροφῆς καὶ τῆς αὐξητικῆς, ἥν τε παρὰ τοῦ θήλεος ἐπικτᾶται, καὶ τῆς θύραθεν. διὰ τοῦτο τὰ μὲν ὀστᾶ, μέχρι τινὸς λαμβάνει τὴν αὔξησιν. ἔστι γάρ τι πᾶσι τοῖς ζῴοις πέρας τοῦ μεγέθους· διὸ καὶ τῆς τῶν ὀστῶν αὐξήσεως. εἰ γὰρ ταῦτ' εἶχεν αὔξησιν ἀεί, καὶ τῶν ζῴων ὅσα ἔχει ὀστοῦν, ἢ τὸ ἀνάλογον, ηὐξάνετ' ἂν ἕως ἔζη. τοῦ γὰρ μεγέθους ὅρος ἐστὶ ταῦτα τοῖς ζῴοις. δι' ἣν μὲν οὖν αἰτίαν οὐκ ἀεὶ λαμβάνουσιν αὔξησιν, ὕστερον λεκτέον. τρίχες δὲ καὶ τὰ συγγενῆ τούτοις, ἕως ἂν ὑπάρχωσιν, αὐξάνονται, καὶ

B μᾶλλον ἐν νόσοις, καὶ τῶν σωμάτων γηρασκόντων καὶ φθινόντων, διὰ τὸ λείπεσθαι περίττωμα πλέον, ἐλάττονος ἐπὶ τὰ κύρια δαπανωμένου διὰ τὸ γῆρας καὶ τὰς νόσους· ἐπεί γ' ὅταν ὑπολείπῃ καὶ τοῦτο διὰ τὴν ἡλικίαν, καὶ αἱ τρίχες ὑπολείπουσι. τὰ δ' ὀστᾶ τοὐναντίον. συμφθίνει γὰρ τῷ σώματι καὶ τοῖς μέρεσιν. αὐξάνονται δ' αἱ τρίχες καὶ τεθνεώτων· οὐ μέντοι γίνονταί γ' ἐξ ὑπαρχῆς. περὶ δ' ὀδόντων ἀπορήσειεν ἄν τις. εἰσὶ μὲν γὰρ τὴν φύσιν τὴν αὐτὴν ἔχοντες τοῖς ὀστοῖς, καὶ γίνονται ἐκ τῶν ὀστῶν· ὄνυχες δὲ καὶ τρίχες καὶ κέρατα, καὶ τὰ τοιαῦτα, ἐκ τοῦ δέρματος· διὸ καὶ συμμεταβάλλουσι τῷ δέρμα-

C τι τὰς χροιάς. λευκά τε γὰρ καὶ μέλανα γίνονται καὶ παντοδαπά, κατὰ τὴν τοῦ δέρματος χρόαν· οἱ δ' ὀδόντες οὐδέν. ἐκ γὰρ τῶν ὀστῶν εἰσιν, ὅσα τῶν ζῴων ἔχει ὀδόντας καὶ ὀστᾶ. αὐξάνονται δὲ διὰ βίου μᾶλλον τῶν ἄλλων ὀστῶν. τοῦτο δὲ δῆλον ἐπὶ τῶν παρεκκλινόντων ὀδόντων τὴν ἀφὴν τὴν ἀλλήλων. αἴτιον δὲ τῆς αὐξήσεως, ὡς μὲν ἕνεκά του, διὰ τὸ ἔργον. ταχὺ γὰρ ἂν κατετρίβοντο, μὴ γινομένης τινὸς ἐπιρρύσεως· ἐπεὶ καὶ νῦν ἐνίοις γηράσκουσι, τοῖς βρωτικοῖς μέν, μὴ μεγάλους δ' ἔχουσι κατατρίβονται πάμπαν· πλείονι γὰρ λόγῳ καθαιροῦνται τῆς αὐξήσεως. διὸ καὶ τοῦτο εὖ μεμηχάνηται πρὸς τὸ συμβαῖνον ἡ φύσις· συνάγει γὰρ ἐπὶ τὸ γῆρας καὶ τὴν

D τελευτὴν τὴν ὑπόλειψιν τῶν ὀδόντων. εἰ δ' ἦν μυριετὴς ὁ βίος, ἢ χιλιετής, παμμεγέθεις τ' ἂν ἔδει γίνεσθαι τοὺς ἐξ ἀρχῆς, καὶ φύεσθαι πολλάκις. καὶ γὰρ ἂν συνεχῆ τὴν αὔξησιν εἶχον, ὅμως ἂν ἄχρηστοι * λεαινόμενοι πρὸς τὴν ἐργασίαν ἦσαν. οὗ μὲν οὖν ἕνεκα λαμβάνουσι τὴν αὔξησιν, εἴρηται. συμβαίνει δὲ μὴ τὴν αὐτὴν ἔχειν φύσιν τοῖς ἄλλοις ὀστοῖς τοὺς ὀδόντας. τὰ μὲν γὰρ, ἐν τῇ πρώτῃ συστάσει γίνεται πάντα, καὶ οὐδὲν ὕστερον· οἱ δ' ὀδόντες, ὕστερον· διὸ καὶ πάλιν δύνανται φύεσθαι ἐκπεσόντες. ἅπτονται γάρ, ἀλλ' οὐ συμπεφύκασι τοῖς ὀστοῖς. ἐκ μέντοι τῆς τροφῆς τῆς ἐπὶ τὰ ὀστᾶ διαδιδομένης γίνονται· διὸ τὴν αὐτὴν ἔχουσι φύσιν καὶ τότε, ὅταν ἐκεῖνα ἔχῃ ἤδη τὸν ἀριθμὸν τὸν αὐτόν. τὰ μὲν οὖν ἄλλα ζῷα ἔχοντα γίνεται ὀδόν-

E τας, καὶ τὸ ἀνάλογον τοῖς ὀδοῦσιν, ἐὰν μή τι γίνηται παρὰ φύσιν· διὰ τὸ ἀπολύεσθαι τῆς γενέσεως τετελεσμένα μᾶλλον τοῦ ἀνθρώπου· ὁ δ' ἄνθρωπος, ἂν μή τι συμβῇ παρὰ φύσιν, οὐκ ἔχων. δι' ἣν δ' αἰτίαν οἱ μὲν γίνονται τῶν ὀδόντων καὶ ἐκπίπτουσιν, οἱ δ' οὐκ ἐκπίπτουσιν, ὕστερον λεχθήσεται. διότι δ' ἐκ περιττώματός ἐστι τὰ τοιαῦτα τῶν μορίων, διὰ τοῦτ' ἄνθρωπος ψιλότατόν τε κατὰ τὸ σῶμα τῶν ζῴων πάντων ἐστί, καὶ ὄνυχας ἐλαχίστους ἔχει ὡς κατὰ μέγεθος.

* γρ. λειαινόμενοι

ἐλάχιστον γὰρ ἔχει περίττωμα γεῶδες. ἔστι δὲ περίττωμα μὲν, τὸ ἄπεπτον· τὸ δὲ γεηρὸν, ἐν τοῖς σώμασι πάντων ἀπεπτότερον. πῶς μὲν οὖν ἕκαστον συνίσταται τῶν μορίων, εἴρηται, καὶ τί τῆς γενέσεως αἴτιον.

ΚΕΦΑΛ. ζ΄.

Πῶς τὰ ἐν τῇ γαστρὶ ἔμβρυα αὔξησιν ἔχει.

Ἔχει δὲ τὴν αὔξησιν τὰ ζωοτοκούμενα τῶν ἐμβρύων (ὥσπερ ἐλέχθη πρότερον) διὰ τῆς τοῦ ὀμφαλοῦ προσφύσεως. ἐπεὶ γὰρ ἔνεστιν ἐν τοῖς ζώοις καὶ ἡ θρεπτικὴ δύναμις τῆς ψυχῆς, ἀφίησιν εὐθὺς οἷον ῥίζαν τὸν ὀμφαλὸν ἐπὶ τὴν ὑστέραν. ἔστι δὲ ὁ ὀμφαλὸς ἐν κελύφει φλέβες· τοῖς μὲν μείζοσι, πλείους, οἷον βοῒ καὶ τοῖς τοιούτοις· τοῖς δὲ μέσοις, δύο· μία δὲ, τοῖς ἐσχάτοις. διὰ δὲ τούτου λαμβάνει τὴν τροφὴν αἱματικήν· αἱ γὰρ ὑστέραι πέρατα φλεβῶν πολλῶν εἰσι. τὰ μὲν οὖν μὴ ἀμφόδοντα πάντα, καὶ τῶν ἀμφοδόντων ὅσων ἡ ὑστέρα μὴ μίαν φλέβα μεγάλην ἔχει διατείνουσαν, ἀλλ' ἀντὶ μιᾶς, πυκνὰς πολλὰς, ταῦτα ἐν ταῖς ὑστέραις ἔχει τὰς καλουμένας κοτυληδόνας, τὸ μὲν περιφερὲς ἐχούσας πρὸς τὴν ὑστέραν, τὸ δὲ κοῖλον, πρὸς τὸ ἔμβρυον. μεταξὺ δὲ τῆς ὑστέρας καὶ τοῦ ἐμβρύου, τὸ χόριον καὶ οἱ ὑμένες εἰσίν. αἱ δὲ κοτυληδόνες, αὐξανομένου καὶ τελειουμένου τοῦ ἐμβρύου, γίνονται ἐλάττους, καὶ τέλος ἀφανίζονται τελειωθέντος· ἐπὶ τοῦτο γὰρ παρεκτίθεται τοῖς ἐμβρύοις ἡ φύσις τὴν αἱματικὴν τῆς ὑστέρας, ὥσπερ εἰς μαστούς. καὶ διὰ τὸ ἀθροίζεσθαι καὶ κατὰ μικρὸν ἐκ πολλῶν, οἷον ἐξάνθημα καὶ φλεγμασία γίνεται τὸ σῶμα τῆς κοτυληδόνος. ἕως μὲν οὖν ἔλαττον ᾖ τὸ ἔμβρυον, οὐ δυναμένου πολλὴν λαμβάνειν τροφὴν, δῆλαί εἰσι καὶ μείζονες· αὐξηθέντος δὲ, συμπίπτουσι. τὰ δὲ πολλὰ τῶν κολοβῶν ζώων καὶ ἀμφοδόντων, οὐκ ἔχει κοτυληδόνα ἐν ταῖς ὑστέραις· ἀλλ' ὁ ὀμφαλὸς εἰς φλέβα τείνει μίαν· αὕτη δὲ τέταται διὰ τῆς ὑστέρας, ἔχουσα μέγεθος. ἐπεὶ δὲ τὰ μὲν, μονοτόκα, τὰ δὲ, πολυτόκα τῶν τοιούτων ἐστὶ ζώων, καὶ τὰ πλείω τῶν ἐμβρύων, τὸν αὐτὸν ἔχει τρόπον τῷ ἑνί. δεῖ δὲ ταῦτα θεωρεῖν ἔκ τε τῶν παραδειγμάτων τῶν ἐν ταῖς ἀνατομαῖς, καὶ τῶν ἐν ταῖς ἱστορίαις γεγραμμένων. πεφύκασι γὰρ τὰ ζῶα ἐκ τοῦ ὀμφαλοῦ, ὁ δ' ὀμφαλὸς ἐκ τῆς φλεβὸς ἐφεξῆς ἀλλήλοις, ὥσπερανεὶ παρ' ὀχετὸν τὴν φλέβα ῥέουσαν. περὶ δὲ ἕκαστον τῶν ἐμβρύων οἱ ὑμένες καὶ τὸ χόριόν ἐστιν. οἱ δὲ λέγοντες τρέφεσθαι τὰ παιδία ἐν ταῖς ὑστέραις, διὰ τοῦ σαρκίδιόν τι βδάλλειν, οὐκ ὀρθῶς λέγουσιν. ἐπί τε γὰρ τῶν ἄλλων ζώων ταὐτὸ συνέβαινε· νῦν δ' οὐ φαίνεται· θεωρῆσαι γὰρ τοῦτο ῥᾴδιον διὰ τῶν ἀνατομῶν. καὶ περὶ πάντα τὰ ἔμβρυα καὶ τὰ πτηνὰ, καὶ τὰ πλωτὰ, καὶ τὰ τῶν πεζῶν, ὁμοίως λεπτοὶ περιέχουσιν ὑμένες, χωρίζοντες ἀπὸ τῆς ὑστέρας καὶ τῶν ἐγγινομένων ὑγρῶν· ἐν οἷς οὐδ' αὐτοῖς ἔνεστι τοιοῦτον οὐδὲν, οὔτε διὰ τούτων οὐθενὸς ἐνδέχεται ποιεῖσθαι τὴν ἀπόλαυσιν. τὰ δὲ ᾠοτοκούμενα πάντα, ὅτι λαμβάνει τὴν αὔξησιν χωρισθέντα τῆς μητρὸς ἔξω, φανερόν. γίνεται δὲ ὁ συνδυασμὸς τοῖς ζώοις, κατὰ φύσιν μὲν, τοῖς ὁμογενέσιν. οὐ μὴν ἀλλὰ καὶ τοῖς μὲν ἐγγὺς τὴν φύσιν ἔχουσιν, οὐκ ἀδιαφόροις δὲ τὸ εἶδος,

A minimum namque in eo eſt excrementum terrenum. Cùm enim excrementum quodquod ſit, inconcoctum remaneat, tum quod terreum in corporibus eſt, omnium maximè eſt inconcoctum. Quemadmodum partes quæque conſtituantur, & quænam cauſa generationis, declaratum iam eſt.

CAPVT VII.

Quomodo fœtus in vtero animantium augeantur.

Augentur fœtus, qui forma animalis naſcuntur, per vmbilici annexum, vt antè diximus. B Cùm enim vis quoque nutriendi in animalibus inſit, vmbilicum ſtatim quaſi radicem agunt in vterum. Vmbilicum venæ contentæ in putamine complent. Plures in maioribus animalibus, vt boue, cæteriſque generis eiuſdem: binæ in mediocribus, ſingulæ in minimis: hoc ſanguineum hauriunt alimentum. Vterus enim exitus eſt venarum multarum. Animalia igitur non vtrinque dentata omnia, & dentatorum vtrinque, quorum vterus venam non ſingularem habet pertinentem grandem, ſed pro vna plures frequentes continet, hæc in vtero habent, quæ acetabula appellantur, in quæ vmbilicus deuenit, atque adhæret. Ten- C duntur enim venæ vmbilicares vndique laterum, fiſſæque ſparguntur vſquequaque per vterum, & qua deſinunt, hac illa acetabula exiſtunt curuamine ſuo coniuncta cum vtero: cauo autem ad fœtum conuerſa. Secundæ verò & membranæ, inter fœtum & vterum poſitæ ſunt. Acetabula fœtu accreſcente proficiſcentéque ad exitum, minora ſubinde redduntur, demúmque obliterantur, cùm perfectus iam eſt. In ea enim velvti mamma reponitur à natura fœtui alimentum ſanguineum, quod dum colligitur, & paulatim ex multis conſiſtit, quaſi puſtula & inflammatio corpus acetabulorum exiſtit. Ita- D que quamdiu fœtus ſit minor, nec multum cibi aſſumere poſſit, conſpicua maioráque ſunt: ſed aucto iam fœtu conſidunt & exoleſcunt. Minuta & vtrinque dentata animalia, magna ex parte acetabulis vteri carent. Tendit vmbilicus in iis in venam ſingularem, quæ per vterum maiuſculi fertur. Cúmque eiuſmodi animalia, alia vnum, alia plura pariant, quo modo vnum, eodem plura habentur. Sed hæc diſſectionum exemplis, & hiſtoriarum commentariis, inſpicienda explorandáque ſunt. Hærent enim & continentur animalia ex vmbilico, qui ex vena dependet per æquilibrium directum ad venam quaſi aquædu- E ctum fluentem. Fœtus membranis & ſecundis obuolutus continetur. Qui infantes ali in vtero aiunt, ſugentes carunculam quandam, non rectè dicunt: idem enim & cæteris animalibus eueniret, quod tamen nuſquam videmus. Atqui facilè per diſſectiones videtur, ſi eſſet. Omnes etiam fœtus, tum volucres tum aquatiles & pedeſtres pari modo membranæ tenues ambiunt, ſeparantes ab vtero, & humoribus admiſſis. Sed nec iis ipſis tale quicquam ineſſe videmus. Neque fieri poteſt vt per eorum aliquod alimentum hauriant. Iam quæ ouo naſcuntur, omnia incrementum foris recipere abiuncta ab vtero, apertum eſt. Itaque non rectè aiunt, qui ita dicunt, vt Democritus. Coeunt animalia generis eiuſdem ſecundùm naturam, ſed ea etiam, quorum genus diuerſum quidem, ſed natura non multùm diſtat,

A ſi modò par magnitudo ſit, & tempora æquent grauiditatis. Raro id fit, ſed tamen fieri & in canibus, & in vulpibus, & in lupis certum eſt. Canes etiam Indici ex bellua quadam ſimili, & cane generantur. Necnon in auibus ſalacioribus idem fieri viſum eſt, vt perdicibus, & gallinis. Quinetiam aduncorum accipitres ſpecie diuerſi coire putantur. Idemque in nonnullis aliis auibus euenire animaduerſum eſt. In marinis nihil adhuc exploratum habemus dignum memoratu. Qui tamen rhinobati appellantur, gigni creduntur ex ſquatina & raia. Adhæc, quod de Africa in prouerbio eſt, Semper aliquid noui Africam afferre, propterea dicitur, quòd diuerſa etiam genera coeant. B Nam ob aquæ penuriam terræ illius, vel alienigena libidine copulantur, cùm in loca pauciſſima rigua congregentur. Sed cùm cætera ſic orta, rurſus ipſa inter ſe coëant, generaréque poſſint, genus vnum mulorum ſterile eſt: quippe quod neque ſecum, neque cum aliis iunctum generet. Quæſtio igitur in vniuerſum, quam ob cauſam ſterilis, aut mas, aut fœmina ſit: ſunt enim ſteriles, & mulieres, & viri. Atque etiam in cæterorum animalium genere, vt equorum, vt ouiũ, ſunt quæ nullam faciant prolem: ſed mulorum genus totum ſterile eſt. Cauſæ verò ſterilitatis in cæteris animalibus plures ſunt. Nam & à primo ortu Naturæ locis ad coitum commodis oblæſis, C ſteriles & mulieres & viri redduntur, vt alteræ non pubeſcant, alteri non barbeſcant, ſed ſpadones quidem ſint. Aliis in proceſſu ætatis idem accidit affectus; aut propter corporis nutricationem pleniorem. Mulieribus enim pinguioribus factis, viris corpore meliùs habito excrementum ſeminale in corpus abſumitur. Itaque fit vt illis menſtrua deſint, his genitura. Aut ex morbo, viris humidum frigidúmque emittitur ſemen: mulieribus purgationes vitiantur, plenæque excrementorum morbificorum redduntur. Multis etiam tum viris tum mulieribus hoc idem accidit malum, oblæſis partibus, & locis accommodatis ad Venerem. Quæ vitia partim curabilia ſunt, D partim incurabilia. Sed maximè ſteriles tunc perſeuerant, cùm primo naturæ ortu tales conſtiterunt. Gignuntur enim & mulieres viragines, & viri fœminares: alteris, menſtrua deſunt, alteris ſemen exile, frigidúmque eſt. Quamobrem ratione fecta experimento in aqua probatur fœcunditas ſeminis. Quod enim tenue ac frigidum eſt, citò diffuſum per ſumma innatat: quod fœcundum eſt, in imum deſcendit. Calidum enim, quod concoctum eſt. Concoctum autem eſt, quod ſpiſſum craſſúmque eſt. Mulierum probatio ſuffitu, vt odores ſubeuntes vterum efferantur ad locum ſpirandi, & afficiant halitum. Atque etiam illitu, vt colores oculis E impoſiti ſaliuam perficiant oris. Nam niſi hæc ita fiant, meatus corporis, per quos excrementum decedit, confuſos, obſeptos, & obcæcatos eſſe ſignificatur. Sedes enim oculorum maximè omnium locorum capitis ſeminalis eſt. Quod patet, cùm ſola ipſa per coitum Venereum manifeſtè immutetur, & vſu immodico rei Venereæ oculi apertè langueant, & ſubſideant.

A ἐὰν τά τε μεγέθη παραπλήσια ᾖ, καὶ οἱ χρόνοι ἴσοι ὦσι τῆς κυήσεως. σπάνια μὲν οὖν γίνεταί τε τὰ τοιαῦτα ἐπὶ τῶν ἄλλων. γίνεται δὲ καὶ ἐπὶ τῶν κυνῶν, καὶ ἀλωπέκων, καὶ λύκων· καὶ οἱ Ἰνδικοὶ δὲ κύνες ἐκ θηρίου τινὸς κυνώδους γίνονται καὶ κυνός. καὶ ἐπὶ τῶν ὀρνίθων ὦπται τῶν ὀχευτικῶν τοῦτο συμβαῖνον· οἷον ἐπὶ περδίκων καὶ ἀλεκτορίδων. καὶ τῶν γαμψωνύχων ἱέρακες δοκοῦσιν οἱ διαφέροντες τῷ εἴδει, μίγνυσθαι πρὸς ἀλλήλους· καὶ ἐπ' ἄλλων δέ τινων ὀρνέων ἔχει τὸν αὐτὸν τρόπον. ἐπὶ δὲ τῶν θαλαττίων οὐθὲν ἀξιόλογον ἑώραται. δοκοῦσι δὲ μάλιστα οἱ ῥινοβάται καλούμενοι γίνεσθαι ἐκ ῥίνης καὶ βάτου συνδυαζομένων. λέγεται δὲ B καὶ τὸ περὶ τῆς Λιβύης παροιμιαζόμενον, ὡς ἀεί τι τῆς Λιβύης * τρεφούσης καινόν, διὰ τὸ μίγνυσθαι καὶ τὰ μὴ ὁμόφυλα ἀλλήλοις, λεχθῆναι τοῦτο. διὰ γὰρ τὴν σπάνιν τοῦ ὕδατος ἀπαντῶντα πάντα πρὸς ὀλίγους τόπους τοὺς ἔχοντας τὰ νάματα, * μίγνυται καὶ τὰ μὴ ὁμογενῆ. τὰ μὲν οὖν ἄλλα τῶν ἐκ τοιαύτης * μίξεως γινομένων συνδυαζόμενα φαίνεται πάλιν ἀλλήλοις καὶ μιγνύμενα καὶ δυνάμενα τό, τε θῆλυ καὶ τὸ ἄρρεν γεννᾶν. οἱ δ' ὀρεῖς, ἄγονοι μόνοι τῶν τοιούτων. οὔτε γὰρ ἐξ ἀλλήλων, οὔτε ἄλλοις μιγνύμενοι γεννῶσιν. Ἔστι δὲ τὸ πρόβλημα καθόλου μέν, διὰ τίν' αἰτίαν, ἄγονον ἢ ἄρρεν, ἢ θῆλύ ἐστιν. εἰσὶ γὰρ καὶ γυναῖκες καὶ ἄνδρες ἄγονοι, καὶ τῶν ἄλλων ζῴων ἐν τοῖς γένεσιν ἑκάστοις, C οἷον ἵπποις καὶ προβάτοις. ἀλλὰ τοῦτο τὸ γένος ὅλον ἄγονόν ἐστι, τὸ τῶν ἡμιόνων. τὰ δ' αἴτια τῆς ἀγονίας, ἐπὶ μὲν τῶν ἄλλων πλείω συμβαίνει· καὶ γὰρ ἐκ γενετῆς, ὅταν πηρωθῶσι τοὺς τόπους τοὺς πρὸς τὴν μίξιν χρησίμους, ἄγονοι γίνονται καὶ γυναῖκες καὶ ἄνδρες. ὥστε τὰς μὲν μὴ ἡβᾶν, τοὺς δὲ μὴ γενειᾶν, ἀλλ' εὐνουχίας διατελεῖν οὔσας. τοῖς δὲ προϊούσης τῆς ἡλικίας, τὸ αὐτὸ συμβαίνει πάσχειν, ὁτὲ μὲν δι' εὐτροφίαν τῶν σωμάτων· ταῖς μὲν γὰρ πιοτέραις γινομέναις, τοῖς δ' εὐεκτικωτέροις τὸ σῶμα, καταναλίσκεται τὸ περίττωμα τὸ σπερματικόν· καὶ ταῖς μὲν οὐ γίνεται τὰ καταμήνια, τοῖς δὲ ἡ γονή. ὁτὲ δὲ διὰ νόσον, οἱ μὲν ὑγρὸν καὶ D ψυχρὸν προΐενται· ταῖς δὲ γυναιξὶ καθάρσεις φαῦλαι καὶ πλήρεις νοσηματικῶν περιττωμάτων. πολλοῖς δὲ καὶ πολλαῖς, καὶ διὰ πηρώματα τοῦτο συμβαίνει τὸ πάθος, περὶ τὰ μόρια καὶ τοὺς τόπους τοὺς περὶ τὴν ὁμιλίαν χρησίμους. γίνεται δὲ τὰ μέν, ἰατά, τὰ δ' ἀνίατα τῶν τοιούτων. μάλιστα δὲ διατελοῦσιν ἄγονα, κατὰ τὴν πρώτην σύστασιν τοιαῦτα γενόμενα. γίνονται γὰρ γυναῖκές τε ἀρρενωποί, καὶ ἄνδρες θηλυκοί. καὶ ταῖς μέν, οὐ γίνεται τὰ καταμήνια· τοῖς δέ, τὸ σπέρμα λεπτὸν καὶ ψυχρόν. * διὸ καὶ εὐλόγως βασανίζεται ταῖς πείραις τό γε τῶν ἀνδρῶν, εἰ ἄγονον, ἐν τῷ ὕδατι. ταχὺ γὰρ διαχεῖται τὸ λεπτὸν καὶ ψυχρὸν ἐπι- E πολῆς· τὸ δὲ γόνιμον, εἰς βυθὸν χωρεῖ. θερμὸν μὲν γὰρ τὸ πεπεμμένον ἐστί· πέπεπται δὲ τὸ συνεστηκὸς καὶ πάχος ἔχον. τὰς δὲ γυναῖκας βασανίζουσι τοῖς τε προσθέτοις, ἐὰν διικνῶνται αἱ ὀσμαὶ πρὸς τὸ πνεῦμα τὸ ἐκπνεόμενον ἄνωθεν κάτωθεν, καὶ τοῖς ἐγχρίστοις ἐπὶ τοὺς ὀφθαλμοὺς χρώμασιν, ἐὰν χρωματίζωσι τὸ ἐν τῷ στόματι πτύελον. ταῦτα γὰρ οὐ συμβαίνοντα, δηλοῖ τὸ σῶμα τοὺς πόρους, δι' ὧν ἀποκρίνεται τὸ περίττωμα, συγκεχυμένους ἔχειν καὶ συμπεφυκότας. ὅ, τε γὰρ περὶ τοὺς ὀφθαλμοὺς τόπος, σπερματικώτατος τῶν περὶ τὴν κεφαλήν ἐστι. δηλοῖ δ' ἐν μὲν ταῖς ὁμιλίαις μετασχηματιζόμενος ἐπιδήλως μόνος· καὶ τοῖς χρωμένοις πλείοσιν ἀφροδισίοις, ἐνδιδόασι τὰ ὄμματα φανερῶς.

* γρ. φερούσης: ſic Gaza.
* κ. μίγνυται
* Qu. μίξεως
* Probl. ſ. 4.

αἴτιον δ' ὅτι ἡ τῆς γονῆς φύσις ὁμοίως ἔχει τῇ τοῦ ἐγκεφάλου. ὑδατώδης γὰρ ἐστιν ἡ ὕλη αὐτῆς, ἡ δὲ θερμότης ἐπίκτητος, καὶ αἱ σπερματικαὶ ὁσίαι καὶ καθάρσεις ἀπὸ τοῦ ὑποζώματος εἰσίν. ἡ γὰρ ἀρχὴ τῆς φύσεως ἐντεῦθεν. ὥστε διικνεῖσθαι πρὸς τὸν θώρακα τὰς κινήσεις ἀπὸ τῶν αἰδοίων. αἱ δ' ἐκ τοῦ θώρακος ὀσμαὶ, ποιοῦσιν αἴσθησιν διὰ τῆς ἀναπνοῆς. ἐν μὲν οὖν τοῖς ἀνθρώποις καὶ τοῖς ἄλλοις γένεσιν, ὥσπερ εἴρηται πρότερον, κατὰ μέρος ἡ τοιαύτη συμβαίνει πήρωσις.

ΚΕΦΑΛ. η'.

Περὶ τῶν ἡμιόνων καὶ ἵππων, καὶ ὄνων.

Τὸ δὲ τῶν ἡμιόνων γένος, ὅλον ἄγονόν ἐστι. περὶ δὲ τῆς αἰτίας, ὡς μὲν λέγουσιν Ἐμπεδοκλῆς καὶ Δημόκριτος, λέγων ὁ μὲν οὐ σαφῶς, Δημόκριτος δὲ γνωρίμως μᾶλλον, οὐ καλῶς εἰρήκασι. λέγουσι γὰρ ἐπὶ πάντων ὁμοίως τὴν ἀπόδειξιν τῶν παρὰ τὴν συγγένειαν συνδυαζομένων. Δημόκριτος μὲν γάρ φησι, διεφθάρθαι τοὺς πόρους τῶν ἡμιόνων ἐν ταῖς ὑστέραις, διὰ τὸ μὴ ἐκ συγγενῶν γίνεσθαι τὴν ἀρχὴν τῶν ζώων. συμβαίνει δὲ ἐφ' ἑτέρων ζώων τοῦτο μὲν ὑπάρχειν, γεννᾶν δὲ μηδὲν ἧττον. καίτοι χρῆν, εἴπερ αἴτιον τοῦτ' ἦν τῆς ἀγονίας, ἄγονα καὶ τἆλλα εἶναι τὰ μιγνύμενα τὸν τρόπον τοῦτον. Ἐμπεδοκλῆς δ' αἰτιᾶται τὸ μίγμα τὸ τῶν σπερμάτων γίνεσθαι πυκνὸν, ἐκ μαλακῆς τῆς γονῆς οὔσης ἑκατέρας. συναρμόττειν γὰρ τὰ κοῖλα τοῖς πυκνοῖς ἀλλήλων. ἐκ δὲ τῶν τοιούτων γίνεσθαι ἐκ μαλακῶν σκληρὸν, ὥσπερ τῷ καττιτέρῳ μιχθέντα τὸν χαλκὸν λέγων οὔτ' ἐπὶ τοῦ χαλκοῦ καὶ τοῦ καττιτέρου, τὴν αἰτίαν ὀρθῶς (εἴρηται δ' ἐν τοῖς προβλήμασι περὶ αὐτῶν) οὔθ' ὅλως ἐκ γνωρίμων ποιούμενος τὰς ἀρχάς. τὰ γὰρ κοῖλα καὶ τὰ στερεὰ ἁρμόττοντα [ἀλλήλοις] πῶς ποιεῖ τὴν μίξιν, οἷον οἴνου καὶ ὕδατος. τοῦτο γὰρ ὑπὲρ ἡμᾶς ἐστι τὸ λεγόμενον. πῶς δεῖ γὰρ λαβεῖν τὰ κοῖλα τοῦ οἴνου καὶ τοῦ ὕδατος, λίαν ἐστὶ παρὰ τὴν αἴσθησιν. ἔτι δ' ἐπεὶ συμβαίνει ἐξ ἵππων γίνεσθαι ἵππους, καὶ ἐξ ὄνων, ὄνους, καὶ ἐξ ἵππου καὶ ὄνου ἡμίονον, ἀμφοτέρως ἄρρενος καὶ θήλεος ὁποτερουοῦν ὄντος, διὰ τί ἐκ μὲν τούτων γίνεται πυκνὸν οὕτως, ὥστε ἄγονον εἶναι τὸ γινόμενον. ἐκ δ' ἵππου θήλεος καὶ ἄρρενος, ἢ ὄνου θήλεος καὶ ἄρρενος, οὐ γίνεται ἄγονον; καίτοι μαλακὸν καὶ τὸ τοῦ ἄρρενος ἵππου ἐστὶ, καὶ τὸ τοῦ θήλεος. μίγνυται δὲ ὁ θῆλυς ἵππος καὶ ὁ ἄρρην τῷ ὄνῳ, καὶ τῷ ἄρρενι καὶ τῷ θήλει. καὶ διὰ τοῦτο γίνονται ἄγονα ἐξ ἀμφοτέρων, ὥς φησιν, ὅτι ἐξ ἀμφοῖν ἕν τι γίνεται, μαλακῶν ὄντων τῶν σπερμάτων. ἔδει οὖν καὶ τὸ ἐξ ἵππου ἄρρενος καὶ θήλεος γινόμενον. εἰ μὲν γὰρ θάτερον ἐμίγνυτο μόνον, ἐνῆν ἂν λέγειν, ὅτι θάτερον αἴτιον τοῦ μὴ γεννᾶν ὅμοιον τῇ τοῦ ὄνου γονῇ. νῦν δ'* οἵαπερ ἐστὶν ἐκείνη μιγνυμένη, τοιαύτη καὶ τῇ τοῦ συγγενοῦς. ἔτι δ' ἡ μὲν ἀπόδειξις κατ' ἀμφοτέρων εἴρηται, ὁμοίως καὶ τοῦ θήλεος καὶ τοῦ ἄρρενος. γεννᾷ δ' ὁ ἄρρην ἑπταετὴς ὢν μόνος, ὥς φασιν. ἀλλ' ἡ θήλεια ἄγονος ὅλως, καὶ αὕτη τῷ μὴ ἐκτρέφειν εἰς τέλος. ἐπεὶ ἤδη κύημα ἔσχεν ἡμίονος. ἴσως δὲ μᾶλλον ἂν δόξειεν ἀπόδειξις εἶναι πιθανὴ τῶν εἰρημένων λογική. λέγω δὲ λογικὴν διὰ τοῦτο, ὅτι ὅσῳ καθόλου μᾶλλον, πορρωτέρω τῶν οἰκείων ἐστὶν ἀρχῶν. ἔστι δὲ τοιαύτη τις. εἰ γὰρ ἐξ ὁμοειδῶν ἄρρενος καὶ θήλεος, ὁμοειδὲς γίνεσθαι πέφυκε τοῖς γεννήσασιν ἄρρεν ἢ θῆλυ, οἷον ἐκ κυνὸς ἄρρενος καὶ θήλεος κύων ἄρρην ἢ θήλεια·

* κ. οἱ. τῇ ἐκείνῃ γεν.

Cauſa eſt, quòd natura geniturę ſimilis cerebro eſt. Aquoſa enim materia eius eſt, calórque aduẽtitius. Purgationes autem ſeminales à ſepto veniunt: principium enim naturæ hinc eſt. Itaque fit vt motus à genitali ad pectus deueniant, hinc odores per ſpirationem ſenſum efficiunt. Hominibus igitur cæteriſque generibus, vt ante retulimus, particulatim hæc læſio obuenit.

CAPVT VIII.

Contra Empedoclis & Democriti ſententiam, qui non rectè ſenſerunt, quam ob cauſam muli ſint ſteriles.

At genus mulorum totum ſterile eſt. Cuius rei cauſa non bene ab Empedocle & Democrito redditur. Obſcurè Empedocles, planiùs Democritus ſcribit: ſed neuter benè. Afferunt enim demonſtrationem æquè de omnibus, quæ præter ſuam cognationem coeant. Democritus meatus mulorum corruptos in vteris dicit, quoniam non ex cognatis principium eorum conſiſtit. Sed id cùm aliis etiam animalibus accidat, tamen nihilo minùs poſſunt generare. Atqui ſi id cauſa eſſet ſterilitatis, cætera quoque ſterilia eſſe deberent, quæ ita coëunt. Empedocles miſturam ſeminum cauſatur, quæ denſa ex molli vtraque genitura conſiſtat. Caua enim & denſa coaptari viciſſim, fieríque ex iis durum ex mollibus, vt ſi æs ſtanno miſceatur. Sed nec in ſtanno & ære cauſam rectè aſſignat (dixi de his in problematis) neque principia ex rebus vllo modo cognitis accipit. Caua enim, & ſolida coaptata viciſſim, quonam modo faciant miſtionem, aut vini & aquæ, aut alius cuiuſpiam? hoc enim ſupra hominis captum dicitur. Nam quemadmodum caua vini & aquæ debeant accipi, præter ſenſum omnino eſt. Item cùm ita ſit, vt & equi ex equis gignantur, & aſini ex aſinis, & mulus ex equo & aſino, alterutro mare, aut fœmina, cur ex his tam denſum conſiſtat, vt ſterile ſit quod prodierit? Ex equo autem fœmina & mare, aut aſino fœmina & mare ſterile non prouenia? Atqui molle & maris equi & fœminæ ſemen eſt. Coit autem equus cum aſino, tum mare tum fœmina, pro differentia ſui ſexus. Ideóque gigni ex iis ſterile ait, quia vnum ex ambobus ſeminibus mollibus conficiatur. Ergo & quod ex equo mare ac fœmina gignitur, ſterile eſſe debebit. Nam ſi alterum miſceretur ſolùm, liceret dicere alterum cauſam eſſe ſterilitatis, vt diſſimile genituræ aſini. Nunc verò quaſi illius ſemini, tali & cognati miſcetur. adhæc demonſtratio æquè de ambobus, tam mare quàm fœmina, rectè affertur. Sed intereſt, quòd mas ſeptennis duntaxat generat, vt aiunt, fœmina improlis omnino eſt: idque propterea, quia perducere ad finem, quod conceperit, nequeat. Nam concepiſſe quidem iam mulam conſtat. Sed fortaſſe veriſimilior iis demonſtratio logica illa videbitur. Logicam appello, quia quo vniuerſalior, eo remotior à propriis principiis eſt. Si ex mare ac fœmina ſpeciei eiuſdem, proles ſpeciei eiuſdem gigni ſolet, aut mas, aut fœmina, vt ex cane mare, & fœmina, canis aut mas, aut fœmina:

ex diuerſis

ex diuerſis etiam ſpeciebus diuerſum ſpecie proueniat, neceſſe eſt. Verbi gratia, ſi canis diuerſum eſt à leone, ex cane mare, & leone fœmina, diuerſum proueniet, ex leone mare & cane fœmina diuerſum. Cùm itaque mulus mas & fœmina ſine ſpeciei differentia gignantur, ex equo & aſino, quę diuerſa ſpecie ſunt, impoſſibile eſt vt aliquid ex mulis gignatur. Nec enim diuerſum ſpecie prouenire poteſt, quando ex mare ac fœmina ſpeciei eiuſdem, idem ſpecie generatur, neque idem, hoc eſt, mulus. gignitur enim mulus ex equo & aſino, quæ diuerſa ſpecie ſunt. Ex diuerſis autem ſpecie diuerſum animal gigni poſitum eſt. Sed enim hæc ratio admodum vniuerſalis inaniſque eſt. Rationes enim, quæ non ex propriis ducuntur principiis, inanes ſunt, & rerum eſſe videntur, cùm longè aberrent. Sunt profectò geometricæ rationes, quæ ex principiis geometricis afferuntur. Idémque in cæteris eſt intelligendum. Videntur tamen eiuſmodi rationes, quamuis inanes, aliquid eſſe. Nam & inane, ſiue vacuum illud, aliquid eſſe videtur, cùm tamen nihil omnino ſit. Nec verum eſt quod concluditur. Multa enim ex iis quæ non eadem ſpecie progenerantur, fœtifera prodeunt, vt antè expoſui. Hoc igitur modo, nec de cæteris rebus neque de naturalibus indagandum eſt. Sed ex iis quæ in genere, tum equorum tum aſinorum, inſunt, conſiderando potiùs acceperis cauſam. Primum enim vtrumque eorum ſingularem parit inter cognata animalia plura numero, tum fœminæ non ſemper concipere poſſunt. Et quidem equi interpoſito tempore admittuntur, quoniam ferre continuè nequeãt. Sed equa menſtruoſa non eſt: imò minimum inter quadrupedes emittere ſolet. Aſina conceptus incontinens eſt: genituram vtique iniectam emingit. Quamobrem verberibus eam ſectantes cogunt ne id faciat. Ad hęc, frigidum animal aſinus eſt: quamobrem locis frigidis gigni non poteſt, vtpote ſua natura impatiens frigoris, velvt apud Scythas, & eorum finitimos. Nec verò apud Gallos, qui ſupra Hiſpaniam colunt, genus id animalis eſt: nam ea quoque prouincia frigida eſt. Hinc admiſſarios etiam non vt equæ, ſic aſinæ, æquinoctio admouent: ſed æſtiuo ſolſtitio, vt tempore calido pulli naſcantur: eodem enim tempore parit, quo coierit. Annum vterum fert & aſina, & equa. Cùm igitur natura ſit frigidum animal, vt dictum eſt, ſemen quoque genitale eius frigidum eſſe, neceſſe eſt. Cuius rei indicium, quòd ſi equus ſuperuenerit aſinam, quam inierit aſinus, non peruertet aſini initum: ſed ſi aſinus ſuperuenerit equam, quam equus inierit, peruertet, propter ſeminis ſui frigiditatem. Cùm igitur inter ſeipſa iunguntur, ſeruatur ſemen propter alterius calorem: calidius eſt enim, quod ab equo ſecernitur. Nam aſini & materia & genitura frigida eſt, qui calidior eſt. Cùm autem miſtum vel calidum cum frigido, vel frigidum cum calido eſt, euenit vt conceptus ex iis ſeruetur, eáque viciſſim ex ſeipſis fœcunda ſint. At verò quod ex iis prodiit, non inſuper fœcundum, ſed infœcundum ad perfectam fœtificationem eſt. Omnino cùm vtrumque aptum propenſúmque ſit ad ſterilitatem, (ſunt enim in aſino tum ea quæ diximus, tum etiam, vt niſi à prima dentium mutatione generare incipiat, nuſquam pòſt generet, ſed ſterilis omnino perduret) ita in exiguo continetur generandi vis corporis aſinini, facilliméque labitur ad ſterilitatem.

A καὶ ἐξ ἑτέρων τῷ εἴδει ἕτερον τῷ εἴδει ἐστὶν. εἰ κύων ἕτερον λέοντος, καὶ ἐκ κυνὸς ἄρρενος καὶ θηλείας λέοντος, ἕτερον, καὶ ἐκ λέοντος ἄρρενος καὶ κυνὸς θήλεος, ἕτερον· ὥστε ἐπεὶ γίνεται ἡμίονος ἄρρην καὶ θήλεια, ἀδιαφόρων ὄντων τῷ εἴδει ἀλλήλοις, γίνεται δὲ ἐξ ἵππου καὶ ὄνου ἡμίονος, ἕτερα δ' ἐστὶ τῷ εἴδει ταῦτα καὶ οἱ ἡμίονοι, ἀδύνατον γενέσθαι ἐξ ἡμιόνων τι. ἕτερον γὰρ γένος οὐχ οἷόν τε, διὰ τὸ ἐξ ἄρρενος καὶ θήλεος τῶν ὁμοειδῶν, ταὐτὸ γίνεσθαι τῷ εἴδει· ἡμίονον δὲ, ὅτι ἐξ ἵππου καὶ ὄνου γίνεται, ἑτέρων ὄντων τῷ εἴδει. ἐκ δὲ τῶν ἑτέρων τῷ εἴδει, ἕτερον ἐτέθη γίνεσθαι ζῷον. οὗτος μὲν οὖν ὁ λόγος καθόλου λίαν καὶ B κενός. οἱ γὰρ μὴ ἐκ τῶν οἰκείων ἀρχῶν λόγοι [κενοί,] ἀλλὰ δοκοῦσιν εἶναι τῶν πραγμάτων, οὐκ ὄντες. οἱ γὰρ ἐκ τῶν ἀρχῶν τῶν γεωμετρικῶν, γεωμετρικοί. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων. τὸ δὲ κενὸν, δοκεῖ μὲν εἶναί τι, ἔστι δ' οὐθέν. οὐκ ἀληθὲς δὲ, ὅτι πολλὰ τῶν μὴ ὁμοειδῶν γινομένων, γίνεται γόνιμα καθάπερ ἐλέχθη πρότερον. τοῦτον μὲν οὖν τὸν τρόπον οὔτε περὶ τῶν ἄλλων δεῖ ζητεῖν, οὔτε περὶ τῶν φυσικῶν. ἐκ δὲ τῶν ὑπαρχόντων τῷ γένει τῷ τῶν ἵππων καὶ τῷ τῶν ὄνων θεωρῶν ἄν τις, μᾶλλον λάβοι τὴν αἰτίαν, ὅτι πρῶτον μὲν ἑκάτερον αὐτῶν ἐστὶ μονοτόκον ἐκ τῶν συγγενῶν ζῴων· ἔπειτ' οὐ συλ- C λαμβάνει τὰ θήλεα ἐκ τῶν ἀρρένων ἀεί. διόπερ τοὺς ἵππους διαλείποντες ὀχεύουσι, διὰ τὸ μὴ δύνασθαι συνεχῶς φέρειν. ἀλλ' ἡ μὲν ἵππος, οὐ καταμηνιώδης, ἀλλ' ἐλάχιστον προΐεται τῶν τετραπόδων· ἡ δ' ὄνος, οὐ δέχεται τὴν ὀχείαν, ἀλλ' ἐξουρεῖ τὸν γόνον· διὸ μαστιγοῦσιν ἀκολουθοῦντες. ἔτι δὲ ψυχρὸν τὸ ζῷον ὁ ὄνος ἐστί. διόπερ ἐν τοῖς χειμερινοῖς οὐ θέλει γίνεσθαι τόποις, διὰ τὸ δύσριγον εἶναι τὴν φύσιν, οἷον περὶ Σκύθας καὶ τὴν ὅμορον χώραν. οὐδὲ περὶ Κελτοὺς τοὺς ὑπὲρ τῆς Ἰβηρίας. ψυχρὰ γὰρ καὶ αὕτη ἡ χώρα. διὰ ταύτην δὲ τὴν αἰτίαν καὶ τὰς ὀχείας ἐπιβάλλουσι τοῖς ὄνοις οὐχ ὥσπερ τοῖς ἵπποις κατ' ἰσημερίαν, ἀλλὰ περὶ τροπὰς θερινὰς, ὅπως ἐν ἀλεεινῇ γίνηται ὥρᾳ τὰ D πωλία. ἐν τῇ αὐτῇ γὰρ γίνεται ἐν ᾗ ἂν ὀχευθῇ. ἐνιαυτὸν γὰρ κύει καὶ ἵππος καὶ ὄνος. ὄντος δ' (ὥσπερ εἴρηται) ψυχροῦ τὴν φύσιν, καὶ τὴν γονὴν ἀναγκαῖον εἶναι τὴν τοιούτου ψυχράν. σημεῖον δὲ τούτου· διὰ τοῦτο, ἐὰν μὲν ἵππος ἀναβῇ ἐπὶ ὀχευμένην ὑπὸ τοῦ ὄνου, οὐ διαφθείρει τὴν τοῦ ὄνου ὀχείαν· ὁ δ' ὄνος ἐὰν ἐπαναβῇ, διαφθείρει τὴν τοῦ ἵππου, διὰ ψυχρότητα τὴν τοῦ σπέρματος. ὅταν μὲν οὖν ἀλλήλοις μιχθῶσι, σώζεται διὰ τὴν θατέρου θερμότητα. θερμότερον γὰρ τὸ ἀπὸ τοῦ ἵππου ἀποκρινόμενον. ἡ μὲν γὰρ τοῦ ὄνου ψυχρὰ καὶ ἡ ὕλη καὶ ἡ γονή· ἡ δὲ τοῦ ἵππου, θερμοτέρα. ὅταν δὲ μιχθῇ, ἢ θερμὸν ἐπὶ ψυχρὸν, ἢ ψυχρὸν ἐπὶ θερμὸν, συμβαίνει ταὐτὸν μὲν τὸ ἐκ τούτων κύημα γινόμενον σώζεσθαι, καὶ ταῦτα ἐξ ἀλλήλων εἶναι γόνιμα. τὸ δ' ἐκ τούτων κύημα E γινόμενον, μηκέτι γόνιμον, ἀλλ' ἄγονον ἐπὶ τελεογονίαν. ὅλως δ' ὑπάρχοντος ἑκατέρου εὐφυοῦς πρὸς ἀγονίαν, τῷ τε ὄνῳ ὑπάρχει τἄλλα τὰ εἰρημένα, καὶ ἂν μὴ κατὰ τὴν βόλον τὴν πρώτην ἄρξηται γεννᾶν, οὐκέτι γεννᾷ τὸ παράπαν· οὕτως ἐπὶ μικροῦ ἔχεται τὸ ἄγονον εἶναι τὸ σῶμα τῶν ὄνων.

ὁμοίως δὲ καὶ ὁ ἵππος. εὔφυὴς γὰρ πρὸς τὴν ἀγονίαν, καὶ τοσοῦτον λείπει τοῦ ἄγονος εἶναι, ὅσον τὸ γεννᾶν τὸ ἐκ τούτου ψυχρότερον. τοῦτο δὲ γίνεται, ὅταν μιχθῇ τῇ τοῦ ὄνου ἀποκρίσει. καὶ ὁ ὄνος δὲ ὡσαύτως μικρὸν δεῖν κατὰ τὸν οἰκεῖον συνδυασμόν, ἄγονον γεννᾷ. ὥστε ὅταν προσγένηται τὸ παρὰ φύσιν, εἰ τότε εἷς μόλις γεννητικὸς ἐξ ἀλλήλων ἦν, τὸ ἐκ τούτων ἔτι μᾶλλον ἄγονον καὶ παρὰ φύσιν, οὐδενὸς δεήσεται τοῦ ἄγονον εἶναι, ἀλλ' ἐξ ἀνάγκης ἔσται ἄγονον. συμβαίνει δὲ καὶ τὰ σώματα τῶν ἡμιόνων, μεγάλα γίνεσθαι, διὰ τὸ τὴν ἀπόκρισιν τὴν ἐπὶ τὰ καταμήνια, τρέπεσθαι ἐπὶ τὴν αὔξησιν. ἐπεὶ δ' ἐνιαύσιος ὁ τοκετὸς τῶν τοιούτων, οὐ μόνον συλλαβεῖν δεῖ τὴν ἡμίονον, ἀλλὰ καὶ ἐκθρέψαι. τοῦτο δὲ ἀδύνατον, μὴ γινομένων καταμηνίων. ταῖς δ' ἡμιόνοις οὐ γίνεται· ἀλλὰ τὸ μὲν ἄχρηστον, μετὰ τοῦ περιττώματος τοῦ ἐκ τῆς κύστεως ἐκκρίνεται (διόπερ οὐδὲ τῶν αἰδοίων οἱ ἡμίονοι οἱ ἄρρενες ὀσφραίνονται τῶν θηλειῶν, ὥσπερ τὰ ἄλλα τὰ μώνυχα, ἀλλ' αὐτοῦ τοῦ περιττώματος) τὰ δ' ἄλλα τρέπεται ἐπὶ τὴν αὔξησιν καὶ τὸ μέγεθος. ὥστε συλλαβεῖν μὲν ἐνδέχεταί ποτε τὴν θήλειαν· ὅπερ ἤδη φαίνεται γεγονός. ἐκθρέψαι δὲ καὶ ἐξενεγκεῖν εἰς τέλος, ἀδύνατον. ὁ δ' ἄρρην ποτὲ γεννήσειεν ἄν, διά τε τὸ θερμότερον εἶναι τοῦ θήλεος φύσει τὸ ἄρρεν, καὶ διὰ τὸ μὴ συμβάλλεσθαι πρὸς τὴν μίξιν σῶμα μηδέν, τὸ ἄρρεν. τὸ δ' ἀποτελεσθέν, γίνεται γίννος. τοῦτο δ' ἐστὶν ἡμίονος ἀνάπηρος. καὶ γὰρ ἐκ τοῦ ἵππου καὶ τοῦ ὄνου γίνονται γίννοι, ὅταν νοσήσῃ τὸ κύημα ἐν τῇ ὑστέρᾳ. ἔστι δὲ ὁ γίννος ὥσπερ τὰ μετάχοιρα ἐν τοῖς χοίροις. καὶ γὰρ ἐκεῖ τὸ πηρωθὲν ἐν τῇ ὑστέρᾳ, καλεῖται μετάχοιρον. γίνεται δὲ τοιοῦτος, ὃς ἂν τύχῃ τῶν χοίρων. ὁμοίως δὲ γίνονται καὶ οἱ πυγμαῖοι. καὶ γὰρ οὗτοι πηροῦνται τὰ μέρη καὶ τὸ μέγεθος ἐν τῇ κυήσει, καὶ εἰσὶν ὥσπερ μετάχοιρα καὶ γίννοι. περὶ μὲν οὖν τῆς τῶν ἡμιόνων ἀτεκνίας εἴρηται.

Histor. lib. 6. cap. 24.

Histor. lib. 8. cap. 21.

A Equus etiam ſimili modo idoneus eſt ad ſterilitatem, tantóque deeſt vt ſterilis ſit, quanto, vt quod ex ipſis prodierit ſemen frigidius reddatur. Quod tunc efficitur, cùm aſini excrementum inijcitur. Aſinus quoque parum deeſt quin ſui generis initu ſterile generet. Itaque cùm acceſſerit quod præter naturam eſt, ſi antè vterque ſuum partu naturæ legitimum poterat generare, iam quod peregrinum ex iis prodiit, ſterilius, nihil deerit vt ſterile ſit, ſed neceſſariò ſterile erit. Euenit etiam vt corpora mulorum magna efficiantur, quoniam menſtruorum deceſſus ad corporis incrementum vertatur. Cúmque partus eorum annuus ſit, non modò concipiat, ſed etiam B enutriat mula opus eſt: quod fieri non poteſt ſine menſtruis. Mulis autem menſtrua deſunt: ſed quantum inutile eſt, cum excremento veſicæ abigitur. Vnde fit ne muli genitale fœminarum, ſed ipſum excrementum olfaciant. Reliquum in corporis incrementum & magnitudinem vertitur. Itaque concipere quidem aliquando mula poteſt, (quod iam factum eſt) ſed enutrire, atque in finem perducere non poteſt. Mas generare interdum poteſt, quoniam & calidioris naturæ, quàm fœmina, mas eſt, & nihil corporis per coitum confert ad generationem. Quod autem facit, ginnus eſt: quod mulus oblæſus eſt. Nam ex equo & aſino, ginni proueniunt, cùm C conceptus in vtero ægrotauit. Eſt enim ginnus idem quod metachœrum in porcis; quod enim ibi læſum deprauatúmque in vtero eſt, metachœrum vocatur, quaſi aporcellum dixeris. Idque cuilibet porco accidere poteſt. Pygmæorum etiam, id eſt, nanorum, pomilionum, & puſillorum generatio ſimilis eſt: nam eorum quoque membra & magnitudines vitiantur in vtero, & ſunt velut aporcella, & ginni. Hactenus de mulorum ſterilitate.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζώων γενέσεως τὸ Γ.

ΚΕΦΑΛ. α'.

Περὶ τῆς τῶν ἐναίμων τε ἅμα καὶ ᾠοτόκων γενέσεως. καὶ περὶ ᾠῶν ὀρνίθων τε καὶ ἰχθύων.

ΠΕΡΙ μὲν οὖν τῆς τῶν ἡμιόνων ἀτεκνίας εἴρηται, καὶ περὶ τῶν ζῳοτοκούντων καὶ θύραζε καὶ ἐν ἑαυτοῖς. ἐν δὲ τοῖς ᾠοτοκοῦσι τῶν ἐναίμων, τῇ μὲν παραπλησίως ἔχει τὰ περὶ τὰς γενέσεις, αὐτοῖς τε καὶ τοῖς πεζοῖς· καὶ ταὐτόν τι λαβεῖν ἐστὶ περὶ πάντων· τῇ δέ, ἔχει διαφορὰς καὶ πρὸς ἄλληλα, καὶ πρὸς τὰ πεζὰ τῶν ζῴων. γίνεται μὲν οὖν ἀπὸ συνδυασμοῦ πάντα, καὶ προϊεμένου γονὴν ἐπὶ τὸ θῆλυ τοῦ ἄρρενος· τῶν δ' ᾠοτοκούντων, αἱ μὲν ὄρνιθες προΐενται τέλειον ᾠὸν καὶ σκληρόδερμον, ἐὰν μή τι πηρωθῇ διὰ νόσον· καὶ πάντα δίχροα τὰ τῶν ὀρνίθων ἐστί.

D ARISTOTELIS STAGIRITÆ DE ANIMALIVM GENERATIONE Liber tertius.

CAPVT I.

De generatione animantium ſanguineorum, & ouiparorum, déque ouis ſubuentaneis, & cæterorum ouorum natura: & quam ob cauſam alia vnicolora ſunt, alia bicolora.

E DE MVLORVM ſterilitate dictum iam eſt, atque etiam de iis quæ animal & foras & intra ſe pariunt. In ſanguineo autem ouiparo genere partim ſimilis generatio vt in pedeſtribus eſt, idémque de omnibus aliquid accipi poteſt: partim differentia, tum inter ipſa tum ad pedeſtria exiſtit. Oriuntur omnia coitu, mare in fœminam emittente ſemen genitale. Sed aues ouum edunt perfectum, cruſta intectum dura, niſi morbo lædatur. Atque omnia auium oua bicolora ſunt.

Piſcium cartilaginei, vt ſæpius dixi, cùm intra ſe oua pepererint, animal excludunt, ouo in alium vteri locum ex alio tranſlato. Molle hoc ouum eſt, & vnicolor. Vnus ex iis animal non parit, qui rana vocatur: cuius cauſam pòſt exponam. Cæteri piſces, qui oua pariunt, ouum vnicolor edunt, quod imperfectum eſt: quippe quod extra capiat incrementum eadem cauſa, qua & quod intus perficitur. De vteris qua inter ſe differentia diſcrepent, & quas ob cauſas ita ſit, declaratum eſt antè. Viuiparorum enim alia ſuprà, iuxta cinctum vterum continent: alia infrà iuxta genitale. Suprà cartilaginea habent: infrà, quæ animal & intra ſe, & foras generant, vt homo, equus, & reliqua generis eiuſdem. Ouiparorum etiam alia infrà, vt piſces, qui oua pariunt: alia ſuprà, vt aues. Conſiſtunt vel ſponte conceptus in auium genere, quos ſubuentaneos, & Zephyros à Fauonio quidam appellant. Qui profectò in iis fiunt auibus, quæ non volaces ſunt, aut vncæ, ſed multiparæ, quoniam excremento ipſæ abundant; vncis in alas & pennas id vertitur, corpúſque exiguum ſiccum & calidum habetur. Deceſſus autem menſtruorum, & genitura, excrementum ſunt. Cùm igitur & pennarum natura, ex ſeminis excremento gignatur, nequit Natura largè vtróque verſùs profundere. Hæc eadem cauſa eſt & vt aues vncæ, nec ſalaces ſint nec multiparæ, ſed graues volacéſque, quarum corpus grandiuſculum, vt columba & ſimiles; aut graues non volaces, quarum corpus grande, vt gallina, coitu ſuperent, & partu: grauibus enim non volacibus, vt gallinis, perdicibus, & reliquis id genus, multum eius excrementi fit: quapropter mares eorum ſalaces ſunt, & fœminæ multum materiæ ſuggerunt, & quidem pariunt ex his aliæ complura, aliæ ſæpe: complura gallina, perdix, ſtruthio *Libycus.* ſæpe autem columbarium genus, ſed non multa: quippe quod medium ſit inter aduncum genus, & graue. Volax enim, vt aduncum eſt; corpulentum, vt graue. Itaque quoniam volax eſt, excrementúmque eò tranſit, pauca parit, ſed ſæpe corporis magnitudine, & ventris calore, & facultate concoquendi maxima, atque etiam quòd cibum facilè ſibi acquirat: adunca enim difficulter id faciunt. Paruæ etiam aues ſalaces, præfœcundæque ſunt, quomodo interdum plantæ minores ſunt fertiliores. Quod enim incremento corporis deeſt, in excrementum ſeminale exundat. Quamobrem gallinæ Adrianæ multa admodum pariunt. Fit enim propter corporis exiguitatem, vt alimentum ad partionem ſumptitetur. Vulgares etiam gallinæ fœcundiores ſunt generoſis. Corpora enim alteris humidiora, alteris grandiora, & ſicciora. Animus generoſus in eiuſmodi corporibus potiùs conſiſtit. Quin & tenuitas ac imbecillitas crurium facit, vt eorum natura & ſalacior ſit, & fœcundior: quo modo & hominibus euenit. Alimentum enim quod crura ſubiret, in ſeminale excrementum transfertur. Quicquid enim inde Natura adimit, hic adiicit. Nam vncungues aues pede ſunt firmiore, & crure craſſiore, cauſa victus.

A Τῶν δ' ἰχθύων οἱ μὲν σελαχώδεις, ὥσπερ εἴρηται πολλάκις, ἐν ἑαυτοῖς ὠοτοκήσαντες ζωοτοκοῦσι, μεταστάντος τοῦ ὠοῦ ἐξ ἄλλου τόπου εἰς ἄλλον τόπον τῆς ὑστέρας. μαλακόδερμον δὲ τὸ ὠὸν καὶ ὁμόχροόν ἐστιν αὐτῶν. εἷς δὲ μόνος οὐ ζωοτοκεῖ τῶν τοιούτων ἐν αὑτοῖς, ὁ καλούμενος βάτραχος· περὶ οὗ τὴν αἰτίαν ὕστερον λεκτέον. οἱ δὲ ἄλλοι ὅσοιπερ ὠοτοκοῦσι τῶν ἰχθύων, μονόχροον μὲν προΐενται τὸ ὠόν, ἀτελὲς δὲ τοῦτο. λαμβάνει γὰρ ἔξω τὴν αὔξησιν, διὰ τὴν αὐτὴν αἰτίαν, δι' ἣν καὶ τὰ ἔσω τελειούμενα τῶν ὠῶν. περὶ μὲν οὖν τῶν ὑστερῶν, τίνας ἔχουσι διαφοράς, καὶ διὰ τίνας αἰτίας εἰσίν, εἴρηται B πρότερον. ἔστι γὰρ τῶν ζωοτοκούντων τὰ μὲν, ἄνω πρὸς τῷ ὑποζώματι ἔχει τὰς ὑστέρας· τὰ δὲ, κάτω πρὸς τοῖς ἄρθροις· ἄνω μὲν, τὰ σελαχώδη· κάτω δὲ, τὰ καὶ ἐν αὑτοῖς ζωοτοκοῦντα, καὶ θύραζε· οἷον ἄνθρωπος, καὶ ἵππος, καὶ τῶν ἄλλων τῶν τοιούτων ἕκαστον. καὶ τῶν ὠοτοκούντων τὰ μὲν, κάτω, καθάπερ τῶν ἰχθύων οἱ ὠοτοκοῦντες· τὰ δ', ἄνω, καθάπερ οἱ ὄρνιθες. συνίσταται μὲν οὖν κυήματα τοῖς ὄρνισι καὶ αὐτόματα, ἃ καλοῦσιν ὑπηνέμια καὶ ζεφύρια τινές. γίνεται δὲ ταῦτα τοῖς μὴ πτητικοῖς, μηδὲ γαμψώνυξι τῶν ὀρνίθων, ἀλλὰ τοῖς πολυγόνοις, διὰ τὸ πολὺ περίττωμα ταῦτ' ἔχειν· τοῖς δὲ γαμψώνυξιν ἐπὶ τὰς πτέρυγας καὶ τὰ C πτερὰ τρέπεσθαι τὴν τοιαύτην ἀπόκρισιν· τὸ δὲ σῶμα μικρὸν ἔχειν καὶ ξηρόν τε καὶ θερμόν· τὴν δ' ἀπόκρισιν τὴν καταμηνιώδη, καὶ τὴν γονὴν, περίττωμα εἶναι. ἐπεὶ οὖν καὶ ἡ τῶν πτερῶν φύσις, καὶ ἡ τοῦ σπέρματος γίνεται ἐκ περιττώσεως,* οὐ δύναται ἡ φύσις ἐπ' ἀμφότερα πολὺ ποιεῖν. διὰ τὴν αὐτὴν δὲ ταύτην αἰτίαν καὶ τὰ μὲν γαμψώνυχα, οὔτε ὀχευτικά ἐστιν, οὔτε πολύγονα· τὰ δὲ βαρέα καὶ τὰ πτητικά, ὅσων τὰ σώματα ὀγκώδη, καθάπερ περιστερὰ καὶ τῶν τοιούτων. τοῖς μὲν γὰρ βαρέσι καὶ μὴ πτητικοῖς, οἷον ἀλεκτορίσι καὶ πέρδιξι, καὶ τοῖς ἄλλοις τοῖς τοιούτοις, πολὺ γὰρ περίττωμα γίνεται. διὸ τὰ ἄρρενα αὐτῶν ὀχευτικά, καὶ τὰ D θήλεα προΐεται πολλὴν ὕλην, καὶ τίκτει τῶν τοιούτων τὰ μὲν, πολλά, τὰ δέ, πολλάκις. πολλὰ μὲν, οἷον ἀλεκτορίς, καὶ πέρδιξ, καὶ στρουθὸς ὁ Λιβυκός. τὰ δὲ περιστεροειδῆ, πολλὰ μὲν οὔ, πολλάκις δέ. μεταξὺ γάρ ἐστι ταῦτα τῶν γαμψωνύχων καὶ τῶν βαρέων. πτητικὰ μὲν γάρ ἐστιν, ὥσπερ τὰ γαμψώνυχα· πλῆθος δ' ἔχει τοῦ σώματος, ὥσπερ τὰ βαρέα· ὥστε διὰ μὲν τὸ πτητικὰ εἶναι καὶ ἐνταῦθα τρέπεσθαι τὸ περίττωμα, ὀλίγα τίκτουσι· διὰ δὲ τὸ πλῆθος τοῦ σώματος, καὶ διὰ τὸ θερμὴν ἔχειν τὴν κοιλίαν καὶ πεπτικωτάτην, πρὸς τούτοις καὶ διὰ τὸ ῥᾳδίως πορίζεσθαι τὴν τροφήν, πολλάκις· δὲ τὰ γαμψώνυχα χαλεπῶς. ὀχευτικὰ δὲ καὶ πολύγονα καὶ τὰ μικρὰ τῶν ὀρνέων ἐστί, καθάπερ ἐνίοτε καὶ τῶν φυτῶν. ἡ γὰρ ἐπὶ τὸ σῶμα αὔξησις, γίνεται περίττωμα σπερματικόν. διὸ καὶ τῶν ἀλεκτορίδων αἱ Ἀδριανικαὶ πολυτοκώταταί εἰσι. διὰ γὰρ μικρότητα σώματος, εἰς τὴν τέκνωσιν καταναλίσκεται ἡ τροφή· καὶ αἱ ἀγεννεῖς τῶν γενναίων πολυτοκώτεραι. ὑγρότερα γὰρ τὰ σώματα τούτων καὶ ὀγκωδέστερα, τῶν δὲ ἰσχνότερα καὶ ξηρότερα. ὁ γὰρ θυμὸς ὁ γενναῖος ἐν τοῖς τοιούτοις σώμασι γίνεται μᾶλλον.* ἔτι δὲ καὶ ἡ τῶν σκελῶν λεπτότης καὶ ἀσθένεια συμβάλλεται πρὸς τὸ τὴν φύσιν τῶν τοιούτων ὀχευτικὴν εἶναι καὶ πολύγονον, καθάπερ καὶ ἐπὶ τῶν ἀνθρώπων. ἡ γὰρ εἰς τὰ κῶλα τροφή, τρέπεται τοῖς τοιούτοις εἰς περίττωμα σπερματικόν. ὃ γὰρ ἐκεῖθεν ἀφαιρεῖ ἡ φύσις, προστίθησιν ἐνταῦθα. τὰ δὲ γαμψώνυχα τὴν βάσιν ἰσχυρὰν ἔχει, καὶ τὰ σκέλη παχέα ἔχοντα διὰ τὸν βίον·

* Inf. li 4.c.8.

* Probl. ſect.

ὥστε διὰ ταύτας πάσας τὰς αἰτίας, οὔτε ὀχευτικά ἐστιν, οὔτε πολύγονα. μάλιστα δὲ ἡ κεγχρὶς πολύγονον. μόνον γὰρ σχεδὸν τοῦτο καὶ πίνει τῶν γαμψωνύχων. ἡ δ' ὑγρότης καὶ ἡ σύμφυτος καὶ ἡ ἐπακτὸς, σπερματικὴ, μετὰ τῆς ὑπαρχούσης αὐτῇ θερμότητος. τίκτει δ' οὐδ' αὕτη πολλὰ λίαν, ἀλλὰ τέτταρα τὸ πλεῖστον. ὁ δὲ κόκκυξ ὀλιγοτόκος ἐστὶν οὐκ ὢν γαμψώνυχος, ὅτι ψυχρὸς τὴν φύσιν ἐστί. δηλοῖ δ' ἡ δειλία τοῦ ὄρνεου. τὸ δὲ σπερματικὸν ζῷον, δεῖ θερμὸν καὶ ὑγρὸν εἶναι. ὅτι δὲ δειλὸν, φανερόν. ὑπό τε γὰρ ὀρνέων διώκεται πάντων, καὶ ἐν ἀλλοτρίαις τίκτει νεοττιαῖς. τὰ δὲ περιστεροειδῆ, δύο ὡς τὰ πολλὰ τίκτειν εἴωθε. οὔτε γὰρ μονοτόκα εἰσίν (οὐδεὶς γὰρ μονοτόκος ὄρνις, πλὴν ὁ κόκκυξ· καὶ οὗτος ἐνίοτε διτοκεῖ) οὔτε πολλὰ τίκτουσιν, ἀλλὰ πολλάκις δύο, ἢ τρία τὰ πλεῖστα γεννῶσι· τὰ δὲ πολλὰ, δύο. οὗτοι γὰρ οἱ ἀριθμοὶ μεταξὺ τοῦ ἑνὸς καὶ πολλῶν. ὅτι δὲ τοῖς πολυγόνοις τρέπεται εἰς τὸ σπέρμα ἡ τροφὴ, φανερὸν ἐκ τῶν συμβαινόντων. τῶν τε γὰρ δένδρων τὰ πολλὰ πολυκαρπήσαντα λίαν, ξηραίνεται μετὰ τὴν φορὰν, ὅταν μὴ ὑπολειφθῇ τῷ σώματι τροφή. καὶ τὰ ἐπέτεια ταὐτὸ πάσχειν ἔοικεν· οἷον τά τε * γέδρωπα, καὶ ὁ σῖτος καὶ τὰ ἄλλα τὰ τοιαῦτα. τὴν γὰρ τροφὴν ἀναλίσκουσιν εἰς τὸ σπέρμα. ἔστι γὰρ πολύσπερμον τὸ γένος αὐτῶν. καὶ τῶν ἀλεκτορίδων ἔνιαι πολυτοκήσασαι οὕτως, ὥστε καὶ δύο τεκεῖν ἐν ἡμέρᾳ, μετὰ τὴν πολυτοκίαν ἀπέθανον. ὑπέρινοι γὰρ γίνονται καὶ οἱ ὄρνιθες καὶ τὰ φυτά. τοῦτο δ' ἐστὶ τὸ πάθος, ὑπερβολὴ περιττώματος ἐκκρίσεως. αἴτιον δὲ τὸ τοιοῦτο πάθος καὶ τῷ λέοντι τῆς ἀγονίας τῆς ὕστερον. τὸ μὲν γὰρ πρότερον τίκτει πέντε ἢ ἕξ· εἶτα τῷ ὑστέρῳ τέτταρα· πάλιν δὲ τρεῖς σκύμνους· εἶτα τὸν ἐχόμενον ἀριθμὸν, ἕως ἑνός· εἶτ' οὐθὲν, ὡς ἐξαναλισκομένου τοῦ περιττώματος, καὶ ἅμα τῆς ἡλικίας ληγούσης, φθίνοντος τοῦ σπέρματος. τίσι μὲν οὖν γίνεται τὰ ὑπηνέμια τῶν ὀρνίθων, ἔτι δὲ ποῖοι πολύγονοι καὶ ὀλιγόγονοι αὐτῶν, καὶ διὰ τίνας αἰτίας, εἴρηται. γίνεται δὲ τὰ ὑπηνέμια, καθάπερ εἴρηται καὶ πρότερον, διὰ τὸ ὑπάρχειν ἐν τῷ θήλει τὴν ὕλην τὴν σπερματικήν· τοῖς δ' ὄρνισι μὴ γίνεσθαι τὴν τῶν καταμηνίων ἀπόκρισιν, ὥσπερ τοῖς ζῳοτόκοις τοῖς ἐναίμοις. πᾶσι γὰρ τούτοις γίνεται, τοῖς μὲν πλείων, τοῖς δ' ἐλάττων, τοῖς δὲ τοσαύτη τὸ πλῆθος, ὥστε ὅσον γε ἐπισημαίνειν. ὁμοίως δὲ οὐδὲ τοῖς ἰχθύσι, καθάπερ τοῖς ὄρνισι. διὸ καὶ τούτοις γίνεται μὲν ἄνευ ὀχείας σύστασις κυημάτων, ὁμοίως καὶ τοῖς ὄρνισιν, ἧττον δ' ἐπιδήλως. ψυχροτέρα γὰρ ἡ φύσις αὐτῶν. ἡ δὲ γινομένη τοῖς ζῳοτόκοις ἀπόκρισις τῶν καταμηνίων, συνίσταται τοῖς ὄρνισι κατὰ τοὺς ἱκνουμένους χρόνους τοῦ περιττώματος· καὶ διὰ τὸ τὸν τόπον εἶναι θερμὸν τὸν πρὸς τῷ διαζώματι, τελειοῦται τοῖς μεγέθεσι. πρὸς δὲ τὴν γένεσιν ἀτελῆ καὶ ταῦτα καὶ τὰ τῶν ἰχθύων ὁμοίως, ἄνευ τῆς τοῦ ἄρρενος γονῆς. ἡ δ' αἰτία τούτων εἴρηται πρότερον. οὐ γίνεται δὲ τὰ ὑπηνέμια τοῖς πτητικοῖς τῶν ὀρνίθων, διὰ τὴν αὐτὴν αἰτίαν, δι' ἣν οὐδὲ πολυτοκεῖ τὰ τοιαῦτα. τοῖς γὰρ γαμψώνυξιν ὀλίγον τὸ περίττωμα, καὶ προσδέονται τοῦ ἄρρενος πρὸς τὴν ὁρμὴν τῆς τοῦ περιττώματος ἐκκρίσεως. πλείω δὲ τὰ ὑπηνέμια τῶν γονίμων γινομένων, ἐλάττω δὲ τὸ μέγεθος, διὰ μίαν αἰτίαν καὶ τὴν αὐτήν. διὰ μὲν γὰρ τὸ ἀτελῆ εἶναι, ἐλάττω τὸ μέγεθος· διὰ δὲ τὸ μέγεθος ἔλαττον, πλείω τὸν ἀριθμὸν καὶ ἧττον ἡδέα, διὰ τὸ ἀπεπτότερα εἶ-

* κ. χέδροπα

A Itaque omnibus his de cauſis, neque ſalaces ſunt, neque præfœcundæ. Tinnunculus potiſſimùm in eo genere fœcundiſſimus eſt, qui ſolus ferè aduncarum & bibit. Humor autem & natiuus & aduentitius ſeminalis cum calore indiget. Sed ne ipſe quidem multa admodum parit, verùm cùm plurimùm quatuor. Cuculus parum generat, quanquam aduncus non eſt, quia naturæ frigidæ eſt, quod ipſius pauore indicatur. Seminale autem animal calidum eſſe & humidum oportet. Pauidam eſſe hanc auem, apertum eſt, cùm ab omnibus auibus fugetur, & in alienis pariat nidis. Columbarium genus bina, magna ex parte, parere ſolet. Nec enim vniparum eſt, cùm B nulla auis pariat vnum, excepto cuculo, qui & ipſe duo interdum parit. Nec multa parit: ſed ſæpe bina aut terna cùm plurimùm, ſed bina magna ex parte. Sunt enim hi numeri inter vnum & multa. Cibum in ſemen conuerti in iis quæ abundè fœtificant, pluribus declaratur euentis. Arborum enim multæ cùm admodum copioſè tulerint, exareſcunt fructificatione, niſi corpori alimentum remanſerit. Annuis etiam idem euenit, vt leguminibus, vt frumentis, & reliquis huiuſcemodi. Cibum enim omnem in ſemen conſumunt: quippe cùm genus id fertile admodum ſit. Necnon gallinarum nonnullæ, cùm adeo valdè peperiſſent, vt etiam bis die pepere- C rint, mox à tanto partu interiêre. Hyperinæ enim, id eſt, effœtæ, & aues & plantæ fiunt. Quod vitium nimia excrementi ſeceſſio eſt, vt exhauſtæ effœtæque dicantur, quæ ita afficiuntur. Hæc eadem affectio cauſa leænæ etiam eſt, vt ſterileſcat: primùm enim quinque aut ſex parit catulos, tum anno ſecundo quatuor, mox tres. Deinde pari modo per annos ſingulos minus vno, poſtremo nullum, cùm & excrementum omne conſumptum iam ſit, & ætate deſinente, ſemen vnà defecerit. Quibuſnam auibus ſubuentanei partus conſiſtant, & quæ perfœcundæ, parúmve fœcundæ, quáſque ob cauſas, dictum iam eſt. Fiunt ſubuentanea oua, vt antè retulimus, quoniam materia ſe- D minalis in fœmina eſt, nec menſtruorum deceſſio fit auib. *vt viuiparis ſanguine præditis.* In iis enim *omnibus fit, aliis magis, aliis minùs,* aliis quantum rem indicet. Piſcibus etiam, vt auibus, menſtrua nulla prodeunt. Quamobrem iis quoque conceptus conſiſtit ſine coitu vt auibus, ſed minùs apertè. Frigidior enim natura piſcium eſt. Deceſſio igitur menſtruorum, quæ viuiparis fit, eadem conſiſtit in auibus per debita excrementi tempora. Et quia locus ſepto propinquus calidus eſt, magnitudine iuxtà perficiuntur. Sed ad generationem imperfecta, tum hæc tum illa piſcium ſunt, niſi ſemen maris accedat. Cuius rei cauſam antè expoſui. Volacibus ſubuentanea non gignuntur, E ſcilicet eadem cauſa, qua multa nec ab iis ipſis generantur: Vncunguibus enim parum excrementi ineſt, & marem deſiderant ad excrementi commotionem. Gignuntur ſubuentanea oua plura numero, quàm quæ fœcunda ſunt, ſed minora, ob vnam eandémque cauſam. Quòd enim imperfecta ſunt, minùs augentur: quòd minùs augentur, plura numero exiſtunt: minùs etiam ſuauia ſunt, quoniam minùs concocta

Concoctum enim in quouis genere dulcius eſt: ſed oua auium aut piſcium non perfici ad generationem ſine mare, ſatis exploratum habemus. An in piſcibus quoque fiat conceptus ſine mare, non æquè apertum eſt. Sed potiſſimùm in fluuiatili genere, rubellionibus id accidere viſum eſt. Etenim nonnulli ſtatim habere oua videntur; vt de his in hiſtoriis ſcripſimus. Omnino in auium genere, ne ea quidem oua, quæ per coitum oriuntur, poſſunt magna ex parte augeri, niſi coitus auis continuetur. Cuius rei cauſa eſt, quòd vt in mulieribus coitu maris detrahitur menſium excrementum, (trahit enim humorem vterus tepefactus, & meatus aperiuntur) ſic in auibus pariter euenit, dum paulatim quidem menſtruum excrementum accedit, quod foras decedere non poteſt, quoniam parum eſt, & ſupernè ad cinctum continetur, ſed in vterum ipſum collabitur. Hoc enim ouum augetur ſicvt fœtus viuiparorum, eo quod per vmbilicum affluit. Nam cùm ſemel aues coierunt, omnia ferè oua ſemper habere perſeuerant, ſed parua admodum. Quamobrem de ſubuentaneis dicere non ſolent oriri ſponte, ſed reliquias eſſe prægreſſi coitus: quod falſum eſt. Satis enim conſpectum eſt in nouella, tum gallina, tum anſere, gigni ſine coitu: tum etiam perdices fœminæ, & quæ nondum coierint, & quæ coierint, quarum vſus in aucupiis, cùm olfaciunt marem, vocémque eius audiunt, alteræ implentur: alteræ ſtatim pariunt. Cuius affectionis cauſa eſt eadem, quæ in homine & quadrupede. Nam ſi fortè eorum corpora accenſa libidine turgent ad coitum, alia cùm primùm viderunt, alia cùm leuiter tetigerunt, ſemen emittunt. Eſt hoc auium genus ſua natura libidinoſum, vt leui egeat motu, cùm turget, citóque ſecernat: vt in iis quæ non coierint, ſubuentanea conſiſtant: in iis, quæ coierint, oua breui augeantur, & perficiantur. Aues, ex iis quæ ouum pariunt foras, perfectum hoc edunt, piſces imperfectum: quod extra recipit incrementum, vt antè diximus. Cauſa eſt, quòd genus piſcium fœcundum admodum eſt. Itaque fieri non poteſt vt multa intus finem recipiant: quapropter foras deponunt. Idque agitur citò: quòd vterus eorum piſcium, qui ouum pariunt, foras iuxta genitale poſitus eſt. Sunt auium oua bicolora: piſcium vnicolora omnium. Coloris cauſam videris ex facultate partis candidæ atque luteæ. Secernitur enim à ſanguine quod eò venit: nullum enim exſangue animal ouum generat. Sanguinem autem materiam eſſe corporum dictum iam ſæpius eſt. Pars igitur eius, quæ calida eſt, propiùs ad formam in membris inſtituendis accedit: quæ autem terroſior eſt, corporis inſtitutionem præbet, & remotior eſt. Quamobrem in bicoloribus ouis animal initium ſuæ generationis à candido ſumit. Initium enim animale in candido eſt, cibum à luteo capit. Calidioribus itaque animalibus ſeorſum iſta habentur diſtincta, ex quo principium ortus, & ex quo alimentum, atque alterum candidum, alterum luteum eſt: & plus candidi ſyncerique ſemper eſt, quàm lutei & terreni: at minùs calidis & humidioribus contrà, plus lutei, idque humidius eſt: quod in paluſtribus accidit auibus.

A ἐν παντὶ γὰρ τὸ πεπεμμένον γλυκύτερον. ὅτι μὲν οὖν οὔτε τὰ τῶν ὀρνίθων, οὔτε τὰ τῶν ἰχθύων τελειοῦται πρὸς τὴν γένεσιν ἄνευ τῶν ἀρρένων, ἱκανῶς ὦπται. περὶ δὲ τοῦ γίνεσθαι καὶ ἐν τοῖς ἰχθύσι κυήματα ἄνευ τῶν ἀρρένων, οὐχ ὁμοίως· μάλιστα δὲ ἐπὶ τῶν ποταμίων ὁρᾶται συμβαῖνον περὶ τοὺς ἐρυθρίνους. ἔνιοι γὰρ εὐθὺς ἔχοντες ᾠὰ φαίνονται, καθάπερ ἐν ταῖς ἱστορίαις γέγραπται περὶ αὐτῶν. ὅλως δ' ἐν τοῖς ὄρνισιν οὐδὲ τὰ γινόμενα διὰ τῆς ὀχείας ᾠὰ, θέλει ὡς ἐπὶ τὸ πολὺ λαμβάνειν αὔξησιν, ἐὰν μὴ ὀχεύηται ἡ ὄρνις συνεχῶς. τούτου δ' αἴτιον, ὅτι καθάπερ ἐπὶ τῶν γυναικῶν, τὸ πλησιάζειν τοῖς ἄρρεσι κατασπᾷ τὴν τῶν γυναικείων ἀπόκρισιν, B (ἕλκει γὰρ τὸ ὑγρὸν ἡ ὑστέρα θερμανθεῖσα, καὶ οἱ πόροι ἀναστομοῦνται) τοῦτο συμβαίνει καὶ ἐπὶ τῶν ὀρνίθων, ἐπιόντος κατὰ μικρὸν τοῦ καταμηνιώδους περιττώματος, ὃ θύραζε μὲν οὐκ ἀποκρίνεται, διὰ τὸ ὀλίγον εἶναι, καὶ πρὸς διαζώματι ἄνω τὰς ὑστέρας συλλείβεται δ' εἰς αὐτὴν τὴν ὑστέραν. τοῦτο γὰρ αὔξει τὸ ᾠὸν, ὥσπερ τὰ ἔμβρυα τὰ τῶν ζῳοτόκων διὰ τοῦ ὀμφαλοῦ, τὸ ἐπιρρέον διὰ τῆς ὑστέρας· ἐπεὶ, ὅταν ἅπαξ ὀχευθῇ τὰ ὄρνεα, πάντα σχεδὸν ἀεὶ διατελεῖ τὰ ᾠὰ ἔχοντα, μικρὰ δὲ πάμπαν. διὸ καὶ περὶ τῶν ὑπηνεμίων τινὲς εἰώθασι λέγειν, ὡς οὐ γινομένων, ἀλλ' ὡς τῶν ὑπολειμμάτων ἐκ προτέρας ὀχείας ὄντων. τοῦτο δ' ἐστὶ ψεῦδος. ὦπται γὰρ ἱκανῶς καὶ ἐπὶ νεοττίδων ἀλε- C κτορίδος καὶ χηνὸς γινόμενα ἄνευ ὀχείας. ἔτι δὲ αἱ πέρδικες αἱ θήλειαι αἵ τ' ἀνόχευτοι καὶ ὠχευμέναι τῶν ἐπὶ τὰς θήρας ἀγομένων, ὀσφραινόμεναι τοῦ ἄρρενος, καὶ ἀκούουσαι τῆς φωνῆς, αἱ μὲν πληροῦνται, αἱ δὲ τίκτουσι παραχρῆμα. τοῦ πάθους αἴτιον τὸ αὐτὸ, ὥσπερ ἐπὶ τῶν ἀνθρώπων καὶ τῶν τετραπόδων. ἐὰν [γὰρ] ὀργῶντα τύχῃ τὰ σώματα πρὸς τὴν ὁμιλίαν, τὰ μὲν ἰδόντα, τὰ δὲ μικρᾶς γενομένης ψαύσεως, προΐεται σπέρμα. τὰ δὲ τοιαῦτα τῶν ὀρνίθων ἔχοντα τὴν φύσιν ἐστὶν ὥστε μικρᾶς δεῖσθαι τῆς κινήσεως, ὅταν ὀργῶντα τύχῃ, καὶ γίνεσθαι ταχὺ τὴν ἔκκρισιν αὐτῶν. ὥστε τοῖς μὲν ἀνοχεύτοις ὑπηνέμια συνίστασθαι, τοῖς δ' ὠχευμένοις αὐ- D ξάνεσθαι καὶ τελειοῦσθαι ταχέως. τῶν δὲ θύραζε ᾠοτοκούντων, οἱ μὲν ὄρνιθες προΐενται τὸ ᾠὸν τέλεον, οἱ δ' ἰχθύες ἀτελές· ἀλλ' ἔξω λαμβάνει τὴν αὔξησιν, καθάπερ εἴρηται καὶ πρότερον. αἴτιον δ', ὅτι πολύγονόν ἐστι τὸ τῶν ἰχθύων γένος. ἀδύνατον οὖν ἐντὸς πολλὰ λαβεῖν τέλος· διόπερ ἀποτίκτουσιν ἔξω. ταχεῖα δὲ ἡ πρόεσις· αἱ γὰρ ὑστέραι πρὸς τοῖς ἄρθροις τῶν θύραζε ᾠοτοκούντων ἰχθύων. ἔστι δὲ τὰ μὲν τῶν ὀρνίθων δίχροα· τὰ δὲ τῶν ἰχθύων, μονόχροα πάντων. τῆς δὲ διχροίας τὴν αἰτίαν ἴδοι τις ἂν ἐκ τῆς δυνάμεως ἑκατέρου τῶν μορίων, τοῦ τε λευκοῦ καὶ τοῦ ὠχροῦ. γίνεται γὰρ ἡ ἀπόκρισις ἐκ τοῦ αἵματος. οὐθὲν γὰρ ἀναίμων E ᾠοτοκεῖ ζῷον. τὸ δ' αἷμα ὅτι ἐστὶν ὕλη τοῖς σώμασιν, εἴρηται πολλάκις. τὸ μὲν οὖν ἐστιν ἐγγυτέρω αὐτοῦ τῆς μορφῆς τῶν μορίων γινομένων, τὸ θερμόν· τὸ δὲ γεωδέστερον, τὴν τοῦ σώματος περιέχεται σύστασιν, καὶ πορρώτερον. διόπερ ὅσα δίχροα ἐστὶ τῶν ᾠῶν, τὴν μὲν ἀρχὴν τὸ ζῷον λαμβάνει ἐκ τοῦ λευκοῦ τῆς γενέσεως, (ἐν δὲ τῷ θερμῷ ἡ ψυχικὴ ἀρχή) τὴν δὲ τροφὴν ἐκ τοῦ ὠχροῦ. τοῖς μὲν οὖν φύσει θερμοτέροις τῶν ζῴων, διακέκριται χωρὶς, ἐξ οὗ ἡ ἀρχὴ γίνεται, καὶ ἐξ οὗ τρέφεται. καὶ τὸ μὲν λευκόν ἐστι, τὸ δὲ ὠχρόν· καὶ πλεῖον ἀεὶ τὸ λευκὸν καὶ καθαρὸν ἢ τὸ ὠχρὸν καὶ τὸ γεῶδες. τοῖς δ' ἧττον θερμοῖς καὶ ὑγροτέροις, τὸ ὠχρὸν πλεῖον καὶ ὑγρότερον. ὅπερ συμβαίνει ἐπὶ τῶν λιμναίων ὀρνίθων.

A ὑγρότεροι γὰρ τὴν φύσιν ὄντες, καὶ ψυχρότεροι τῶν πεζευόντων ὀρνέων εἰσίν· ὥστε καὶ τὰ ᾠὰ τῶν τοιούτων πολλὴν ἔχει τὴν καλουμένην λέκιθον καὶ ἧττον ὠχράν, διὰ τὸ ἧττον ἀποκεκρίσθαι τὸ λευκόν. τὰ δ' ἤδη καὶ ψυχρὰ τὴν φύσιν τῶν ᾠοτοκούντων, καὶ ἔτι ὑγρὰ μᾶλλον, (τοιοῦτο δ' ἐστὶ τὸ τῶν ἰχθύων γένος) οὐδ' ἀποκεκριμένον ἔχει τὸ λευκόν, διά τε μικρότητα, καὶ διὰ τὸ πλῆθος τοῦ ψυχροῦ καὶ γεώδους. διόπερ γίνεται μονόχροα πάντα τὰ τῶν ἰχθύων· καὶ ὡς μὲν ὠχρά, λευκά· ὡς δὲ λευκά, ὠχρά. τὰ δὲ τῶν ὀρνέων καὶ τὰ ὑπηνέμια, ἔχει ταύτην τὴν διχροίαν· ἔχει γὰρ ἐξ οὗ ἑκάτερον ἔσται τῶν μορίων, καὶ ὅθεν ἡ ἀρχή, καὶ ὅθεν ἡ τροφή. ἀλλὰ ταῦτα ἀτελῆ, καὶ προσδεόμενα τοῦ ἄρρενος. γίνεται γὰρ τὰ ὑπηνέμια γόνιμα, ἐὰν ἔν τινι καιρῷ ὀχευθῇ ὑπὸ τοῦ ἄρρενος. οὐκ ἔστι δὲ τῆς διχροίας αἴτιον τὸ ἄρρεν καὶ τὸ θῆλυ, ὡς τοῦ λευκοῦ μὲν ὄντος ἀπὸ τοῦ ἄρρενος, τοῦ δ' ὠχροῦ ἀπὸ τοῦ θήλεος· ἀλλ' ἄμφω γίνεται ἀπὸ τοῦ θήλεος· ἀλλὰ τὸ μέν, ψυχρόν· τὸ δέ, θερμόν. ἐν ὅσοις μὲν οὖν ἐστι πολὺ τὸ θερμόν, ἀποκρίνεται· ἐν ὅσοις δὲ ὀλίγον, οὐ δύναται· καὶ διὰ τοῦτο μονόχροα τὰ κυήματα, * καθάπερ εἴρηται τῶν τοιούτων ἐστί. ἡ δὲ γονὴ * συνίστησι μόνον· καὶ διὰ τοῦτο τὸ μὲν πρῶτον φαίνεται λευκὸν καὶ μικρὸν τὸ κύημα ἐν τοῖς ὄρνισι· προϊὸν δὲ ὠχρὸν ἅπαν, συμμιγνυμένου ἀεὶ πλείονος αἱματώδους· τέλος δ' ἀποκρινομένου τοῦ θερμοῦ, κύκλῳ περιΐσταται τὸ λευκόν, ὥσπερ ὑγροῦ ζέοντος, ὁμοίως πάντῃ· τὸ λευκόν, φύσει μὲν ὑγρόν· ἔχει δ' ἐν αὑτῷ τὴν θερμότητα τὴν ψυχικήν· διὸ κύκλῳ ἀποκρίνεται· τὸ δ' ὠχρὸν καὶ γεῶδες, ἐντός. * κἂν πολλὰ συνερανίσας τις ᾠὰ εἰς κύστιν ἤ τι τοιοῦτον, ἑψῇ πυρί, μὴ θάττονα ποιοῦντι τὴν τοῦ θερμοῦ κίνησιν, ἢ τὴν ἐν τοῖς ᾠοῖς διάκρισιν, ὥσπερ ἐν ἑνὶ ᾠῷ, καὶ τῷ ἐκ πάντων τῶν ᾠῶν συστήματι, τὸ μὲν ὠχρὸν ἐν μέσῳ γίνεται, κύκλῳ δὲ τὸ λευκόν. διότι μὲν οὖν τὰ μὲν μονόχροα, τὰ δὲ δίχροα τῶν ᾠῶν, εἴρηται.

* Gaza κ. ἐστί, τ. τ. ἐστι.
* κ. συνίστησι
* Histor. lib. 6. cap. 2.

ΚΕΦΑΛ. β'.

Περὶ τῆς ᾠοτοκίας.

Ἀποκρίνεται δ' ἐν τοῖς ᾠοῖς ἡ τοῦ ἄρρενος ἀρχὴ καθ' ὃ προσπέφυκε τῇ ὑστέρᾳ τὸ ᾠόν. καὶ γίνεται ἀνόμοιον * τὸ τῶν διχρόων ᾠῶν, καὶ οὐ πάμπαν στρογγύλον, ἀλλ' ἐπὶ θάτερα ὀξύτερον, διὰ τὸ διαφέρειν δεῖν ἀεὶ τοῦ λευκοῦ, ἐν ᾧ ἔχει τὴν ἀρχήν. διόπερ σκληρότερον ταύτῃ τὸ ᾠόν, ἢ κάτωθεν. σκεπάζειν γὰρ δεῖ καὶ φυλάττειν τὴν ἀρχήν. καὶ διὰ τοῦτο ἐξέρχεται ὕστερον τοῦ ᾠοῦ τὸ ὀξύ. τὸ γὰρ προσπεφυκὸς ὕστερον ἐξέρχεται· κατὰ τὴν ἀρχὴν δὲ προσπέφυκεν· ἐν τῷ ὀξεῖ δὲ ἡ ἀρχή. τὸν αὐτὸν δ' ἔχει τρόπον καὶ ἐν τοῖς τῶν φυτῶν σπέρμασιν. προσπέφυκε γὰρ ἡ ἀρχὴ τοῦ σπέρματος, τὰ μὲν ἐν τοῖς κλάδοις, τὰ δ' ἐν τοῖς κελύφεσι, τὰ δ' ἐν τοῖς περικαρπίοις. δῆλον δ' ἐπὶ τῶν χεδρόπων. ᾗ γὰρ ἐν τῷ λεγομένῳ ὄμματι συνήρτηται τὸ δίθυρον τῶν κυάμων, καὶ τῶν τοιούτων σπερμάτων, ταύτῃ προσπέφυκεν ἡ ἀρχὴ τοῦ σπέρματος. ἀπορήσειε δ' ἄν τις περὶ τῆς αὐξήσεως τῶν ᾠῶν, τίνα τρόπον ἐκ τῆς ὑστέρας συμβαίνει. τὰ μὲν γὰρ ζῷα, διὰ τοῦ ὀμφαλοῦ λαμβάνει τὴν τροφήν· τὰ δ' ᾠά, διὰ τίνος; ἐπειδὴ περ οὐχ ὥσπερ οἱ σκώληκες, αὐτὰ δι' αὑτῶν λαμβάνει τὴν αὔξησιν.

* Gaza, τὸ δίχροον τῶν ᾠῶν,

A Cùm enim illæ ſua natura humidiores ſint, tum frigidiores terrenis auibus conſtant. Itaque oua earum multum eius, quod vitellum vocatur, habent, minúſque luteum: quoniam candidum minùs ab eo ſeparetur. Quæ iam ſua natura frigida inter ouipara ſunt, ea longè humidiora conſtant: quale genus piſcium eſt. Nec candidum habent diſtinctum, quia exiguum hoc eſt, & frigidæ terrenæque qualitatis copia impedit. Quamobrem omnia piſcium oua vnicolora ſunt, atque ad lutea candida, ad candida lutea eſſe dixeris. Auium vel ſubuentanea oua colorem tum duplicem obtinent: habent enim ex quo vtrumque fit, & vnde principium, & vnde cibus. Sed hæc imperfecta B ſunt, & maris indiga. Fiunt enim fœcunda, ſi quo tempore ineuntur à mare. Nec verò ſexus cauſa coloris duplicis eſt, vt candidum à mare, luteum à fœmina ſit, ſed ambo à fœmina proficiſcuntur: verùm alterum frigidum, alterum calidum eſt. In quibus multum caloris eſt, diſtinguuntur: in quibus parum, diſtingui non poſſunt. Et ob eam rem conceptus eorum ſunt vnicolores, vt dictum eſt: ſemen autem maris conſtituit tantùm: ideo primùm exiguus albúſque conceptus auium cernitur: mox tempore C procedente luteus totus, cùm iam plus ſanguinis admiſcetur: poſtremò ſecedente calore pars candida circum inſiſtit, quaſi humore æquè feruente quoquouerſus. Candida enim pars oui, ſua natura humida eſt, caloremque animalem intra ſe continet. Quamobrem circùm ipſa diſcernitur, lutea & terrena intus manet. Et ſi plura oua coniecta in patinam, aut tale aliquod vas, coquis igne, ita ne motus caloris citatior ſit, quàm ouorum diſtinctio, idem in vniuerſis ouis, quod in ſingulis, euenit, vt lutea cuncta in medio conſtituantur, candida circiter ambiant. Sed quam ob cauſam alia vnicolora, alia bicolora ſunt oua, D dictum iam eſt.

CAPVT II.

De ortu eorum quæ perfectis ouis foras generantur, tum auium tum quadrupedum ouum cruſta intectum parientium.

SEcernitur in ouo principium genitale maris ea parte qua ouum vtero adhæret, ſitque proinde diſſimile, quod bicolor eſt: nec planè rotundum, ſed altera parte acutius, quoniam partem eam differre oportet, in qua principium il- E lud continetur. Quamobrem durius ea ipſa parte eſt ouum, quam inferiore. Principium enim operiendum cuſtodiendúmque eſt. Exit etiam pars oui acuta pòſt. Quod enim adhæret, id exire poſtea conuenit. Adhæret autem ea parte qua principium continetur. Et principium ipſum in parte acuta eſt. Idem in plantarum etiam ſeminibus modus eſt. Principium enim ſeminis adhæret aut ramo, aut putamini, aut pulpæ: vt in legumine patet. Quà enim biualuis fabarum ſtrues, & cæterorum id genus cemungitur, hac principium ſeminis adhæret. Sed quæres de incremento ouorum, quonam modo ex vtero veniat: animalia enim per vmbilicum capiunt cibum: oua autem quo? cùm non modo vermium, ipſa per ſe recipiant incrementum.

At ſi quid eſt, quo adhærent, id quónam tranſeat perfecto iam ouo? Nihil enim tale exit cum ouo, vt vmbilicus cum animali. Quod enim circiter ambit, teſta perfecto iam ouo efficitur: rectè igitur hoc ita quæritur. Sed latet primò, membranam mollem id eſſe, quod poſtremò teſta efficitur: perfecto enim ouo, durum ac rigidum euadit ita modicè, vt exeat adhuc molle. Dolorem enim moueret, niſi ita exiret. Egreſſum ſtatim refrigeratum duratur; euaporato humore quàm primùm qui exiguus ineſt, relictáque portione terrena. Huius itaque membranæ particula quædam vmbilicaris parte acuta principio continetur, tenditque paruis adhuc velut fiſtula: quod in eiectitiis inchoatis ouis patet. Nam ſi auis madefacta, aut alia cauſa algeſcens eiecit, cruentus adhuc cernitur conceptus, habénſque ſibi annexam appendiculam vmbilicarem, quæ ouo ampliùs increſcente obtenditur latiùs, atque minuitur, perfectóque mucro exitum complet. Membrana interior ſub hoc vmbilico eſt, quæ vitellum albuménque ab eo diſterminet. Vbi iam ad conſummationem ventum eſt, ouum abſoluitur totum, & vmbilicus ratione non inſuper apparet; extremum enim vltimum eius eſt. Partus ouorum contrà atque animalium euenit. Animal enim verſum in caput, ſummúmque principium naſcitur: at ouum quaſi in pedes conuerſum exit. Cuius rei cauſa, quod diximus, eſt, quòd ouum, ea parte qua principium continetur, adhæret. Generatio auium ex ouo ita euenit, vt incubante & concoquente aue, animal ex parte oui ſecernatur: augeatur ex reliqua parte, & conficiatur: natura enim ſimul & materiam animalis in ouo reponit, & ſatis cibi ad incrementum. Cùm enim auis intra ſe perficere nequeat, cibum vnà parit in ouo. Nam iis quæ forma animalis naſcuntur, cibus in alia corporis parte paratur, quod lac vocatur, videlicet in mammis. At auibus hoc idem in ouo natura conſtituit, ſed contrà, quàm homines putant, & Alcmæon Crotoniates ait. Non enim albumen oui lac eſt, ſed vitellum. Hoc enim pullis pro cibo eſt. Illi albumen pro cibo eſſe exiſtimant, propter caloris affinitatem. Oritur pullus incubante aue, vt dictum eſt. Sed ſi aut tempus ſit bene temperatum, aut locus, in quo oua manent, tepidus, concoquuntur & auium oua, & quadrupedum ouiparorum ſine parentis incubitu. Hæc enim omnia in terrà pariunt, concoquuntúrque oua tepore terræ. Nam ſi quæ quadrupedes ouiparæ frequentantes fouent quæ ediderint oua, cuſtodiæ gratia potiùs id faciunt. Gignuntur verò eodem modo oua quadrupedum, quo auium. Cruſta enim dura intecta, & bicolora ſunt, & iuxta cinctum conſiſtunt, vt auium: & reliqua eadem tum intus tum extrà eueniunt. Itaque omnium cauſæ eadem conſideratione continentur. Sed quadrupedum oua vt validiora tempore concoquuntur, auium imbecilliora ſunt: atque ob eam rem parentem deſiderant. Tum etiam natura attendere videtur, vt ſenſum prouidum curámque diligentem erga prolem parentes habeant. Sed in genere deteriore hoc facit quouſque pariant: in aliis quibuſdam etiam donec perficiant. Prudentioribus verò plus curæ mandatur, vt etiam enutriant.

A εἰ δ' ἔστι τι ᾧ προσπέφυκε, τοῦτο ποῖ τρέπεται τελειωθέντος; οὐ γὰρ συνεξέρχεται, καθάπερ ὁ ὀμφαλὸς τοῖς ζῴοις. γίνεται γὰρ τὸ πέριξ ὄστρακον τελειωθέντος. τὸ μὲν οὖν εἰρημένον, ὀρθῶς ζητεῖται. λανθάνει δ', ὅτι τὸ γινόμενον ὄστρακον, τὸ πρότερον μαλακὸς ὑμήν ἐστι. τελειωθέντος δὲ, γίνεται σκληρὸν καὶ κραυρὸν, οὕτω συμμέτρως, ὥστε ἐξέρχεται μὲν ἔτι μαλακὸν, (πόνον γὰρ ἂν εἶχε τικτόμενον) ἐξελθὸν δὲ εὐθὺς πήγνυται ψυχθὲν, συνεξατμίζοντος τοῦ ὑγροῦ ταχὺ δι' ὀλιγότητα, λειπομένου δὲ τοῦ γεώδους. τούτου δή τι τοῦ ὑμένος κατ' ἀρχὰς ὀμφαλῶδές ἐστι πρὸς τὸ ὀξὺ, καὶ ἀπέχει ἔτι B μικρῶν ὄντων, οἷον αὐλός. δῆλος δ' ἐστὶν ἐν τοῖς ἐκβολίμοις τῶν μικρῶν ᾠῶν. ἐὰν γὰρ βρεχθῇ, ἢ ἄλλως πως ῥιγώσασα ἐκβάλῃ ἡ ὄρνις, ἔτι αἱματῶδές τε φαίνεται τὸ κύημα, καὶ ἔχον δι' αὑτοῦ στόλον μικρὸν ὀμφαλώδη. μείζονος δὲ γινομένου, περιτείνεται μᾶλλον οὗτος, καὶ ἐλάττων γίνεται. τελειωθέντος δὲ, τὸ ὀξὺ τοῦ ᾠοῦ. τοῦτο συμβαίνει τὸ πέρας. ὑπὸ δὲ τοῦτο ὁ ἐντὸς ὑμὴν, ὃς ὁρίζει τὸ λευκὸν καὶ τὸ ὠχρὸν ἀπὸ τούτου. τελειωθέντος δ' ἀπολύεται ὅλον τὸ ᾠὸν, καὶ οὐ φαίνεται εὐλόγως ὁ ὀμφαλός· αὐτοῦ γάρ ἐστι τοῦ ἐσχάτου τὸ ἄκρον. ἡ δὲ ἔξοδος τοὐναντίον γίνεται τοῖς ᾠοῖς, ἢ τοῖς ζῳοτοκουμένοις. τοῖς μὲν γὰρ ἐπὶ τὴν κεφαλήν τε καὶ τὴν C ἀρχήν· τοῦ δὲ ᾠοῦ γίνεται ἡ ἔξοδος οἷον ἐπὶ πόδας. τούτου δ' αἴτιον, τὸ εἰρημένον, ὅτι προσπέφυκε κατὰ τὴν ἀρχήν. ἡ δὲ γένεσις ἐκ τοῦ ᾠοῦ συμβαίνει τοῖς ὄρνισιν ἐπῳαζούσης καὶ συμπεττούσης τῆς ὄρνιθος, ἀποκρινομένου μὲν τοῦ ζῴου ἐκ μέρους τοῦ ᾠοῦ, λαμβάνοντος δὲ αὔξησιν, καὶ συντελουμένου ἐκ τοῦ λοιποῦ μέρους. ἡ γὰρ φύσις ἅμα τήν τε τοῦ ζῴου ὕλην ἐν τῷ ᾠῷ τίθησι, καὶ τὴν ἱκανὴν τροφὴν πρὸς τὴν αὔξησιν. ἐπεὶ γὰρ οὐ δύναται τελεοῦν ἐν αὑτῇ ἡ ὄρνις, συνεκτίκτει τὴν τροφὴν ἐν τῷ ᾠῷ. τοῖς μὲν γὰρ ζῳοτοκουμένοις, ἐν ἄλλῳ μορίῳ γίνεται ἡ τροφὴ, τὸ καλούμενον γάλα, ἐν τοῖς μαστοῖς· τοῖς δ' ὄρνισι τοῦτο ποιεῖ ἡ φύσις ἐν τοῖς D ᾠοῖς. τοὐναντίον μέντοι ἐστὶν, ἢ οἵ τε ἄνθρωποι οἴονται, καὶ Ἀλκμαίων φησὶν ὁ Κροτωνιάτης. οὐ γὰρ τὸ λευκόν ἐστι γάλα, ἀλλὰ τὸ ὠχρόν. τοῦτο γάρ ἐστιν ἡ τροφὴ τοῖς νεοττοῖς. οἱ δ' οἴονται τὸ λευκὸν, διὰ τὴν ὁμοιότητα τοῦ χρώματος. γίνεται μὲν οὖν ἐπῳαζούσης (καθάπερ εἴρηται) τῆς ὄρνιθος ὁ νεοττός. οὐ μὴν ἀλλὰ κἂν ἡ ὥρα ᾖ εὔκρατος, ἢ ὁ τόπος ἀλεεινὸς, ἐν ᾧ ἂν κείμενα τυγχάνωσιν, ἐκπέττονται καὶ τὰ τῶν ὀρνίθων, καὶ τὰ τῶν τετραπόδων καὶ ᾠοτόκων. πάντα γὰρ ἐς τὴν γῆν ἐκτίκτει, καὶ συμπέττονται ὑπὸ τῆς ἐν τῇ γῇ θερμότητος. ὅσα δ' ἐπῳάζει φοιτῶντα τῶν ᾠοτοκούντων καὶ τετραπόδων, ταῦτα ποιεῖ μᾶλλον φυλακῆς χάριν. τὸν αὐτὸν δὲ τρόπον γίνεται τά τε τῶν ὀρνίθων ᾠὰ, καὶ τὰ τῶν ζῴων τῶν τετραπόδων. καὶ γὰρ σκληρόδερμα καὶ δίχροα, καὶ πρὸς τῷ διαζώματι συνίσταται, καθάπερ καὶ τὰ τῶν ὀρνίθων· καὶ τὰ ἄλλα ταὐτὰ πάντα συμβαίνει καὶ ἐντὸς καὶ ἐκτός. ὥστε ἡ αὐτὴ θεωρία περὶ τῆς αἰτίας ἐστὶ πάντων. ἀλλὰ τὰ μὲν τῶν τετραπόδων διὰ ἰσχὺν ἐκπέττονται, καὶ ὑπὸ τῆς ὥρας· τὰ δὲ τῶν ὀρνέων ἐπικηρότερα, καὶ δεῖται τῆς τεκούσης. ἔοικε δὲ ἡ φύσις βούλεσθαι τὴν τῶν τέκνων αἴσθησιν ἐπιμελητικὴν παρασκευάζειν. ἀλλὰ τοῖς μὲν χείροσι τοῦτ' ἐμποιεῖ μέχρι τοῦ τεκεῖν, τοῖς δὲ καὶ περὶ τὴν τελείωσιν. ὅσα δὲ φρονιμώτερα, καὶ περὶ τὴν τροφήν,

τοῖς δὲ δὴ μάλιστα κοινωνοῦσι φρονήσεως, καὶ πρὸς τὰ τέλεια γίνεται συνήθη καὶ φιλία, καθάπερ τοῖς ἀνθρώποις, καὶ τῶν τετραπόδων ἐνίοις· τοῖς δὲ ὄρνισι, μέχρι τοῦ γεννῆσαι καὶ ἐκθρέψαι.* διόπερ καὶ μὴ ἐπῳάζουσαι αἱ θήλειαι, ὅταν τέκωσι, διατίθενται χεῖρον, ὥσπερ ἑνός τινος στερισκόμεναι τῶν συμφύτων. τελεοῦνται δ' ἐν τοῖς ᾠοῖς τὰ ζῷα θᾶττον ἐν ταῖς ἀλεειναῖς ἡμέραις. συνεργάζεται γὰρ ἡ ὥρα. καὶ γὰρ ἡ πέψις, θερμότης τίς ἐστιν. ἥ τε γὰρ γῆ συμπέττει τῇ θερμότητι, καὶ ἡ ἐπῳάζουσα τὸ αὐτὸ δρᾷ. προσέχει γὰρ τὸ ἐν αὐτῇ θερμόν. καὶ διαφθείρεται δὲ τὰ ᾠά, καὶ γίνεται τὰ καλούμενα οὔρια μᾶλλον κατὰ τὴν θερμὴν ὥραν εὐλόγως. ὥσπερ γὰρ οἱ οἶνοι ἐν ταῖς ἀλέαις ὀξύνονται, ἀναστρεφομένης τῆς ἰλύος (τοῦτο γὰρ αἴτιον τῆς διαφθορᾶς) καὶ ἐν τοῖς ᾠοῖς ἡ λέκιθος. τοῦτο γὰρ ἐν ἀμφοτέροις τὸ γεῶδες. διὸ καὶ ἀναθολοῦται ὁ οἶνος, μιγνυμένης τῆς ἰλύος· καὶ τὰ διαφθειρόμενα ᾠά, τῆς λεκίθου. τοῖς μὲν οὖν πολυτόκοις συμβαίνει τὸ τοιοῦτον εὐλόγως. οὐ γὰρ ῥᾴδιον τὴν ἁρμόττουσαν πᾶσιν ἀποδιδόναι θερμασίαν, ἀλλὰ τοῖς μὲν ἐλλείπειν, τοῖς δὲ πλεονάζειν, καὶ ἀναθολοῦν, οἷον σήπουσαν. τοῖς δὲ γαμψώνυξιν, ὀλιγοτόκοις οὖσιν, οὐδὲν ἧττον συμβαίνει τοῦτο. πολλάκις μὲν γὰρ καὶ τοῖν δυοῖν θάτερον, οὔριον γίνεται· τὸ δὲ τρίτον, ὡς εἰπεῖν, ἀεί. θερμὰ γὰρ ἀεὶ ὄντα τὴν φύσιν, οἷον ὑπερζεῖν ποιεῖ τὴν ὑγρότητα τὴν ἐν τοῖς ᾠοῖς. ἔχει γὰρ δὴ καὶ τὴν φύσιν ἐναντίαν, τό, τε ὠχρόν, καὶ τὸ λευκόν. τὸ μὲν γὰρ ὠχρόν, ἐν τοῖς πάγοις πήγνυται· θερμαινόμενον δέ, ὑγραίνεται· διὸ καὶ συμπεττόμενον ἐπὶ τῆς γῆς, ἢ ἐπὶ τῇ ἐπῳάζειν ὑγραίνεται, καὶ τοιοῦτον ὂν γίνεται τροφὴ τοῖς συνισταμένοις ζῴοις. πυρούμενον δὲ καὶ ὀπτώμενον οὐ γίνεται σκληρόν, διὰ τὸ εἶναι τὴν φύσιν γεῶδες οὕτως ὥσπερ κηρός· καὶ διὰ τοῦτο θερμαινόμενα μᾶλλον, ἐὰν ᾖ μὴ ἐξ ὑγροῦ περιττώματος, διουρεῖται, καὶ γίνεται οὔρια. τὸ δὲ λευκόν, ὑπὸ μὲν τῶν πάγων οὐ πήγνυται, ἀλλ' ὑγραίνεται μᾶλλον. τὸ δ' αἴτιον εἴρηται πρότερον. πυρούμενον δὲ γίνεται στερεόν· διὸ καὶ πεττόμενον περὶ τὴν γένεσιν τῶν ζῴων παχύνεται. ἐκ τούτου γὰρ συνίσταται τὸ ζῷον, τὸ δ' ὠχρὸν τροφὴ γίνεται, καὶ τοῖς ἀεὶ συνισταμένοις τῶν μορίων, ἐντεῦθεν ἡ αὔξησις. διὸ καὶ διείργεται τό, τε ὠχρὸν καὶ τὸ λευκὸν χωρὶς ὑμέσιν, ὡς ἔχοντα τὴν φύσιν ἑτέραν. δι' ἀκριβείας μὲν οὖν, ὃν τρόπον ἔχουσι ταῦτα πρὸς ἄλληλα, κατ' ἀρχάς τε τῆς γενέσεως καὶ συνισταμένων τῶν ζῴων, ἔτι δὲ περὶ τῶν ὑμένων καὶ ὀμφαλῶν, ἐκ τῶν ἐν ταῖς * ἱστορίαις γεγραμμένων δεῖ θεωρεῖν. πρὸς δὲ τὴν παροῦσαν σκέψιν, ἱκανὸν φανερὸν εἶναι τὸ τοσοῦτον, ὅτι συστάσης πρῶτον τῆς καρδίας, καὶ τῆς μεγάλης φλεβὸς ἀπὸ ταύτης διορισθείσης, δύο ὀμφαλοὶ ἀπὸ τῆς φλεβὸς τείνουσιν· ὁ μέν, ἐπὶ τὸν ὑμένα τὸν περιέχοντα τὸ ὠχρόν· ὁ δ' ἕτερος, ἐπὶ τὸν ὑμένα τὸν χοριώδη, ὃς κύκλῳ περιέχει τὸ ζῷον. ἔστι δ' οὗτος περὶ τὸν ὑμένα τὸν τοῦ ὀστράκου. διὰ μὲν οὖν θατέρου λαμβάνει τὴν ἐκ τοῦ ὠχροῦ τροφήν. τὸ δ' ὠχρὸν γίνεται πλέον· ὑγρότερον γὰρ γίνεται θερμαινόμενον. δεῖ γὰρ τὴν τροφὴν σωματώδη οὖσαν, ὑγρὰν εἶναι, καθάπερ τοῖς φυτοῖς. (ζῇ δὲ τὸ πρῶτον καὶ τὰ ἐν τοῖς ᾠοῖς, καὶ τὰ ἐν τοῖς ζῴοις, φυτοῦ βίον. τῷ προσπεφυκέναι γάρ, ἔκ τινος λαμβάνει τὴν πρώτην αὔξησιν καὶ τροφήν.) ὁ δ' ἕτερος ὀμφαλὸς τείνει εἰς τὸ περιέχον χόριον. δεῖ γὰρ ὑπολαβεῖν τὰ ᾠοτοκούμενα τῶν ζῴων, πρὸς μὲν τὸ ὠχρὸν οὕτως ἔχειν τὸν νεοττόν,

* Gaza aliam lectionem ſequitur: vetus interpres hanc. vide Niph.

* Lib. 6.c.3.

A Poſtremò iis quæ prudentia iam maximè prædita ſunt, conſuetudo, amor, & charitas in prolem etiam adultam ſeruatur, vt homini, & quadrupedum nonnullis. Auibus cura donec pariant & enutriant. Quamobrem & ab incubitu laborant in prole enutrienda: à partu verò deteriùs afficiuntur, quaſi priuatæ aliquo ſibi natiuo geſtamine. Perficitur animal in ouo celeriùs diebus tepidis; tepore enim iuuatur. Nam concoctio eſt calor quidam. Terra enim ſuo calore concoquit. Et quæ incubant, hoc idem faciunt: adhibent enim ſuum calorem. Deprauantur etiam oua, & fiunt, quæ vrina appellantur, tempore potiùs calido, idque ratione. Vt enim vina B temporibus calidis coaceſcunt fæce ſubuerſa, (hoc enim cauſæ eſt, vt deprauentur,) ſic oua pereunt vitello corrupto. Id enim in vtrique terrena portio eſt. Quamobrem & vinum obturbatur fæce permiſta, & ouum vitello diffuſo. Multiparis igitur hoc accidit meritò, cùm non facilè omnibus calor conueniens reddi poſſit, ſed aliis deficiat, aliis ſuperet, & quaſi putrefaciendo obturbet. Vncunguibus etiam, quamuis parum fœcundis, nihilo minùs tamen idem euenit: ſæpe enim vel alterum ex duobus vrinum fit, ſed tertium ſemper ferè. Cùm enim calida ſua natura ſint, faciunt vt quaſi ferueat C ſupra modum humor ouorum. Iam enim naturam quoque contrariam luteum & candidum habent. Luteum namque gelu duratur, & coit, calore contrà humeſcit: quapropter cùm vel in terra, vel per incubitum concoquitur, humeſcit. Atque ita pro cibo animalibus naſcentibus eſt. Nec verò cùm ignitur aſſatúrque, dureſcit, quoniam naturæ terrenæ eſt, vt cera. Ideóque cùm plus iuſto caleſcunt, niſi ex recremento humido ſint, ſanieſcunt, redduntúrque vrina. At candidum gelu non concreſcit, ſed magis humeſcit. Cauſam antè reddidi. Ignitum ſolideſcit. Quamobrem cùm ad generationem animalium concoquitur, craſſeſcit. Ex hoc enim conſiſtit animal. D Luteum autem pro cibo eſt, & membris ſubinde inſtituendis incrementum hinc adminiſtratur. Quocirca luteum & candidum membranis inter ſe diſtinguuntur, quaſi naturam habeant diuerſam. Sed quemadmodum hæc inter ſe habeant, tum initio generationis, tum conſiſtentibus animalibus, atque etiam de membranis & vmbilicis diligentiùs ex iis quæ per hiſtoriam ſcripſimus, conſiderandum annotandúmque eſt. Ad id autem, quod impræſentiarum tractamus, tantùm aperuiſſe ſatis eſt. Principio corde conſtituto, & vena maiore ab eo diſtincta, vmbilici duo de vena eadem pertendunt: alter ad membranam, quæ luteum continet: alter ad membra- E nam, cui ſecundarum ſpecies eſt, qua animal obuolutum continetur, quæ circa teſtæ membranam eſt. Altero igitur vmbilico cibum ex luteo aſſumit. Efficitur luteum copioſius, quippe quòd caleſcens reddatur humidius. Cibum enim, quoniam corpulentus eſt, humidum eſſe oportet, qualis plantæ ſuppeditatur. (Viuunt autem principiò, & quæ in ouis & quæ in animalibus gignuntur, vita plantæ. Adhærendo enim capiunt primum & incrementum, & alimentum.) Alter vmbilicus ad ſecundas tendit. Ita enim in iis quæ ouo naſcuntur, animalibus, pullum vti luteo exiſtimandum,

vt fœtus viuiparus ſua parente vtitur, quamdiu intra parentem continetur. Cùm enim non intra parentem nutriantur, quæ ouo proueniunt, partem eius accipiunt aliquam, habéntque ſecum in cibo. Membrana verò exteriore nouiſſima ſanguinolenta hæc perinde, vt illa vtero, vtuntur. Simul autem & luteum, & ſecundas teſta oui cōplectitur vteri proportione, perinde quaſi quid vnum obductum amplectatur fœtum, parentémque totam. Quod ita eſt, quoniam fœtum eſſe in vtero, & cum parente neceſſe eſt. Itaque in viuiparis vterus in parente eſt. In ouiparis è diuerſo fit, quaſi dixeris parentem eſſe in vtero. Luteum eſt enim cibus qui à parente præſtatur. Cauſa eſt, quòd fœtus nutricatio non intra parentem eſt. Creſcentibus vmbilicus primùm conſidet, qui ſecundis adiungitur. Hac enim pullum excludi conuenit. Reliquum lutei, & vmbilicus ad luteum pertinens pòſt collabitur. Cibum enim habeat ſtatim oportet, quod excluſum eſt. Nec enim à parēte nutritur, & per ſe ipſum ſtatim capere cibum non poteſt: quapropter luteum ſubit cum vmbilico, & caro adnaſcitur. Talis ortus eorum eſt, quæ ex ouis perfectis foris generantur, tum in auibus tum in quadrupedibus, quæ ouum cruſta intectum dura pariunt. Sed hæc euidentiora in auctioribus ſunt animalibus. Nam in minoribus obſcura præ ſua exiguitate habentur.

CAPVT III.

De ijs animantibus, quæ perfectum ouum intra ſe pariunt, foras autem animal: quámque ob cauſam piſcium oua mollia ſint contrà quàm auium.

GEnus etiam piſcium ouiparum eſt, cuius ea, quæ infra continent vterum, imperfectum pariunt ouum, cauſa, quam antè reddidimus. Quæ autem cartilaginea nuncupantur, perfectum intra ſe ouum pariunt, mox animal foras edunt, vno excepto, quam ranam vocant: hæc enim vna foras ouum perfectum parit. Cauſa, natura corporis eſt. Caput enim longè grandius reliquo corpore habet, ídque aculeatum, valdéque aſperum: quamobrem nec poſtea ſuos catulos intra ſe recipit, neque principio animal parit. Capitis enim magnitudo, & aſperitas, vt aditum, ſiç exitum impedit. Et cùm cartilagineorum ouum cute molli operiatur, quòd enim frigidiora quàm aues ſint, nequeunt partem circumdantem indurare, ideo ouum vnum ranarum ſolidum durúmque eſt, vt foris ſeruetur. Cæterorum humida ſunt natura, & molli. Operiuntur enim intus corpore ſuæ parentis. Ortus ex ouo idem ranis quæ extra perficiuntur, & iis quæ intus. Sed eorum atque auium ortus partim ſimilis, partim diuerſus eſt. Primùm enim altero carent vmbilico, qui ad ſecundas pertinet, quæ ſub teſta ambiente poſitæ ſunt. Cuius rei cauſa eſt, quòd teſtam illam circumdantem non habent, cùm nihilò his vtilis eſſe poſſit: parens enim ipſa integit, & ſeruat. Teſta in ouis edendis tutela eſt contra detrimenta, quæ deforis veniant. Tum generatio iis quoque ex oui parte extrema eſt, ſed non qua vtero adhærent. Aues enim ex acumine oriuntur, qua ouum adhæret. Cauſa eſt,

A ὥσπερ πρὸς τὴν μητέρα τὰ ζωοτοκούμενα ἔμβρυα, ἕως ἂν ἐν τῇ μητρὶ ᾖ. ἐπεὶ γὰρ οὐκ ἐκτρέφονταί γε ἐν τῇ μητρὶ τὰ ᾠοτοκούμενα, ἐκλαμβάνει τι μέρος αὐτῆς. πρὸς δὲ τὸν ἐξωτάτω ὑμένα τὸν αἱματώδη, ὡς πρὸς τὴν ὑστέραν. ἅμα δὲ περί τε τὸ ὠχρὸν καὶ τὸ χόριον τὸ ἀνάλογον τῇ ὑστέρᾳ, τὸ ὄστρακον τοῦ ᾠοῦ περιπέφυκεν· ὥσπερ ἂν εἴ τις περιθείη περί τε τὸ ἔμβρυον αὐτὸ, καὶ περὶ τὴν μητέρα ὅλην. ἔχει δὴ οὕτως, διότι δεῖ τὸ ἔμβρυον ἐν τῇ ὑστέρᾳ εἶναι, καὶ πρὸς τῇ μητρί. ἐν μὲν οὖν τοῖς ζωοτοκουμένοις ἡ ὑστέρα ἐν τῇ μητρί ἐστιν· ἐν δὲ τοῖς ᾠοτοκουμένοις, ἀνάπαλιν· ὥσπερ ἂν εἴ τις εἴπῃ τὴν μητέρα ἐν τῇ ὑστέρᾳ εἶναι.
B τὸ γὰρ ἀπὸ τῆς μητρὸς γινόμενον, ἡ τροφὴ τὸ ὠχρόν ἐστιν. αἴτιον δ', ὅτι ἡ ἐκτροφὴ οὐκ ἐν τῇ μητρί ἐστιν. αὐξανομένων δὲ, πρότερον ὁ ὀμφαλὸς συμπίπτει ὁ πρὸς τὸ χόριον, διότι ταύτῃ δεῖ τὸ ζῶον ἐξελθεῖν. τὸ δὲ λοιπὸν τοῦ ὠχροῦ, καὶ ὁ ὀμφαλὸς ὁ ἐπὶ τὸ ὠχρὸν, ὕστερον. δεῖ γὰρ ἔχειν τροφὴν εὐθὺς τὸ γινόμενον. οὔτε γὰρ ἀπὸ τῆς μητρὸς τιθηνεῖται. δι' αὑτοῦ τε οὐκ εὐθὺς πορίζεσθαι δύναται τὴν τροφήν· διόπερ ἐντὸς εἰσέρχεται τὸ ὠχρὸν μετὰ τοῦ ὀμφαλοῦ, καὶ περιφύεται ἡ σάρξ. τὰ μὲν οὖν ἐκ τῶν τελείων ᾠῶν γινόμενα θύραζε, τοῦτον ἔχει τὸν τρόπον, ἐπί τε τῶν ὀρνίθων καὶ τῶν τετραπόδων, ὅσα ᾠοτοκεῖ τὸ ᾠὸν τὸ σκληρόδερμον. διάδηλα
C δὲ ταῦτα μᾶλλον ἐπὶ τῶν μειζόνων. ἐν γὰρ τοῖς ἐλάττοσιν ἀφανῆ διὰ σμικρότητα τῶν ὄγκων ἐστίν.

ΚΕΦΑΛ. γ'.

Περὶ τῆς τῶν ἰχθύων γενέσεως ἐξ ᾠῶν. καὶ πρότερον περὶ σελαχῶν.

ΕΤι δ' ἐστὶν ᾠοτόκον τὸ τῶν ἰχθύων γένος. τούτων δὲ τὰ μὲν ἔχοντα κάτω τὴν ὑστέραν, ἀτελὲς ᾠὸν τίκτει, διὰ τὴν προειρημένην αἰτίαν. τὰ δὲ καλούμενα σελάχη τῶν ἰχθύων, ἐν αὑτοῖς μὲν ᾠοτοκεῖ τὸ τέλειον ᾠὸν, ἔξω δὲ ζωοτοκεῖ, πλὴν ἑνὸς ὃν καλοῦσι βάτραχον. οὗτος δ' ᾠοτοκεῖ θύραζε τὸ
D τέλειον ᾠὸν μόνος. αἰτία δ' ἡ τοῦ σώματος φύσις. τήν τε γὰρ κεφαλὴν πολλαπλασίαν ἔχει τοῦ λοιποῦ σώματος, καὶ ταύτην ἀκανθώδη, καὶ σφόδρα τραχεῖαν. διόπερ οὐδ' ὕστερον εἰσδέχεται τοὺς νεοττοὺς, οὐδὲ ἐξ ἀρχῆς ζωοτοκεῖ· τὸ γὰρ μέγεθος καὶ ἡ τραχύτης τῆς κεφαλῆς, ὥσπερ καὶ εἰσελθεῖν κωλύει, οὕτω καὶ ἐξελθεῖν. ἐπεὶ δὲ μαλακόδερμόν ἐστι τὸ ᾠὸν τὸ τῶν σελαχῶν, (οὐ γὰρ δύναται σκληρῦναι τὸ πέριξ· ψυχρότεροι γὰρ τῶν ὀρνίθων εἰσὶ) τὸ τῶν βατράχων ᾠὸν μόνον στερεόν ἐστι καὶ στιφρὸν πρὸς τὴν ἔξω σωτηρίαν· τὰ δὲ τῶν ἄλλων, ὑγρὰ καὶ μαλακὰ τὴν φύσιν. σκεπάζεται γὰρ ἐντὸς τῷ σώματι τῷ τῆς ἐχούσης. ἡ δὲ γένεσις ἐκ τοῦ ᾠοῦ, τοῖς τε βατράχοις ἔξω τελειουμένοις, καὶ τοῖς ἐντὸς, ἡ αὐτή. τούτοις δὲ ἐκ τοῖς τῶν ὀρνίθων, τῇ μὲν ὁμοία, τῇ δὲ διάφορός ἐστι.
E πρῶτον μὲν γὰρ οὐκ ἔχουσι τὸν ἕτερον ὀμφαλὸν τὸν ἐπὶ τὸ χόριον τείνοντα, ὅ ἐστιν ὑπὸ τὸ περιέχον ὄστρακον. τούτου δ' αἴτιον, ὅτι τὸ πέριξ ὄστρακον οὐκ ἔχουσιν. οὐδὲν γὰρ αὐτοῖς χρήσιμον. σκεπάζει γὰρ ἡ μήτηρ. τὸ δ' ὄστρακόν ἐστι τοῖς ἐκτικτομένοις ᾠοῖς ἀλεωρὰ πρὸς τὰς θύραθεν βλάβας. ἔπειθ' ἡ γένεσις ἐξ ἄκρου μέν ἐστι τοῦ ᾠοῦ καὶ τούτοις, ἀλλ' οὐχ ᾗ προσπέφυκε πρὸς τὴν ὑστέραν. οἱ γὰρ ὄρνιθες ἐκ τοῦ ὀξέος γίνονται. ταύτῃ δ' ἦν ἡ τοῦ ᾠοῦ πρόσφυσις. αἴτιον δ',

ἔτι τὸ μὲν τῶν ὀρνίθων χωρίζεται τῆς ὑστέρας, τῶν δὲ τοιούτων οὐ πάντων, ἀλλὰ τῶν πλείστων πρὸς τῇ ὑστέρᾳ προσπέφυκε τὸ ᾠὸν τέλειον. ἐπ' ἄκρον δὲ γιγνομένου τοῦ ζῴου, καταναλίσκεται τὸ ᾠόν, ὥσπερ καὶ ἐπὶ τῶν ὀρνίθων καὶ τῶν ἄλλων τῶν ἀπολελυμένων, καὶ τέλος πρὸς τῇ ὑστέρᾳ ὁ ὀμφαλὸς προσπέφυκε τῶν ἤδη τελείων. ὁμοίως δ' ἔχει καὶ ὅσων ἀπολέλυται τὰ ᾠὰ τῆς ὑστέρας. ἐνίοις γὰρ αὐτῶν, ὅταν τέλειον γένηται τὸ ᾠόν, ἀπολύεται. ἀπορήσειεν ἂν οὖν τις, τίνι διαφέρουσιν αἱ γενέσεις τοῖς ὄρνισι κατὰ τοῦτο, καὶ τοῖς ἰχθύσιν. αἴτιον δ', ὅτι τὰ μὲν τῶν ὀρνίθων κεχωρισμένον ἔχει τὸ ὠχρὸν καὶ τὸ λευκόν· τὰ δὲ τῶν ἰχθύων μονόχροα, καὶ πάντῃ μεμιγμένον τὸ τοιοῦτο. ὥστ' οὐδὲν κωλύει τὸ ἐξ ἐναντίας ἔχειν τὴν ἀρχήν. οὐ γὰρ μόνον κατὰ τὴν πρόσφυσίν ἐστι τοιοῦτον, ἀλλὰ καὶ καταντικρύ. τὴν δὲ τροφὴν ῥᾴδιον ἕλκειν ἐκ τῆς ὑστέρας, πόροις τισὶν ἀπὸ ταύτης τῆς ἀρχῆς. δῆλον δὲ ἀπὸ τῶν μὴ ἀπολυομένων ᾠῶν. ἐν ἐνίοις γὰρ τῶν σελαχῶν οὐκ ἀπολύεται τῆς ὑστέρας τὸ ᾠόν, ἀλλ' ἐχόμενον μεταχωρεῖ κάτω πρὸς τὴν ζῳοτοκίαν, ἐν οἷς τελεωθὲν τὸ ζῷον ἔχει τὸν ὀμφαλὸν ἐκ τῆς ὑστέρας, ἀνηλωμένου τοῦ ᾠοῦ. φανερὸν οὖν ὅτι καὶ πρότερον ἔτεινον οἱ πόροι τοῦ ᾠοῦ, ἔτι ὄντος περὶ ἐκεῖνο πρὸς τὴν ὑστέραν. τοῦτο δὲ συμβαίνει, καθάπερ εἴπομεν, ἐν τοῖς γαλεοῖς τοῖς λείοις. διαφέρει μὲν οὖν ἡ γένεσις κατὰ ταῦτα τῶν ἰχθύων τοῖς ὄρνισι, καὶ διὰ τὰς εἰρημένας αἰτίας· τὰ δ' ἄλλα συμβαίνει τὸν αὐτὸν τρόπον· τόν τε γὰρ ὀμφαλὸν ἔχουσι τὸν ἕτερον, ὡσαύτως ὥσπερ οἱ ὄρνιθες πρὸς τὸ ὠχρόν, οὕτως οἱ ἰχθύες πρὸς τὸ ὅλον ᾠόν. οὐ γάρ ἐστιν αὐτοῦ τὸ μὲν λευκόν, τὸ δ' ὠχρόν, ἀλλὰ μονόχροον πᾶν, καὶ τρέφονται ἐκ τούτου, καταναλισκομένου τε ἐπέρχεται καὶ περιφύεται ἡ σὰρξ ὁμοίως. περὶ μὲν οὖν τῶν ἐν αὑτοῖς ᾠοτοκούντων τέλειον ᾠόν, θύραζε δὲ ζῳοτοκούντων, τοῦτον ἔχει τὸν τρόπον ἡ γένεσις.

ΚΕΦΑΛ. δʹ.

Διατί τὰ τῶν ἄλλων ἰχθύων ᾠὰ ἐκτὸς αὐξάνεται.

Οἱ δὲ πλεῖστοι τῶν ἄλλων ἰχθύων ἐκτὸς ᾠοτοκοῦσιν, ἀτελὲς δ' ᾠὸν πάντες, πλὴν * βατράχου· περὶ δὲ τούτου τὸ αἴτιον εἴρηται πρότερον. εἴρηται δὲ καὶ περὶ τῶν ἀτελῆ τικτόντων τὸ αἴτιον. ἡ δὲ γένεσις καὶ τούτων, ἡ μὲν ἐκ τοῦ ᾠοῦ, τὸν αὐτὸν ἔχει τρόπον, ὅνπερ καὶ τῶν σελαχῶν τῶν ἐντὸς ᾠοτοκούντων· πλὴν ἥ γε αὔξησις ταχεῖα, καὶ ἐκ μικρῶν, καὶ τὸ ἔσχατον τοῦ ᾠοῦ σκληρότερον. ἡ δὲ τοῦ ᾠοῦ αὔξησις, ὁμοία τοῖς σκώληξίν ἐστι. καὶ [γὰρ] τὰ σκωληκοτοκοῦντα τῶν ζῴων, μικρὸν ἀποτίκτει τὸ πρῶτον. τοῦτο δ' αὐξάνεται δι' αὑτοῦ, καὶ οὐ διὰ πρόσφυσιν οὐδεμίαν. τὸ δ' αἴτιον παραπλησίως ὥσπερ ἐπὶ τῆς ζύμης. καὶ γὰρ ἡ ζύμη ἐκ μικρᾶς μεγάλη γίνεται, τοῦ μὲν στερεωτέρου ὑγραινομένου, τοῦ δ' ὑγροῦ πνευματουμένου. δημιουργεῖ δὲ τοῦτο ἡ τοῦ ψυχικοῦ θερμοῦ φύσις ἐν τοῖς ζῴοις· ἐν δὲ ταῖς ζύμαις ἡ τοῦ χυμοῦ τοῦ συγκραθέντος θερμότης. αὐξάνεται μὲν οὖν τὰ ᾠά, ἐξ ἀνάγκης μὲν διὰ ταύτην τὴν αἰτίαν· ἔχει γὰρ περίττωμα ζυμῶδες. χάριν δὲ τοῦ βελτίονος· ἐν ταῖς ὑστέραις γὰρ ἀδύνατον αὐτοῖς λαμβάνειν ὅλην τὴν αὔξησιν, διὰ τὴν τῶν ζῴων πολυτοκίαν τούτων. διὰ τοῦτο γὰρ καὶ μικρὰ πάμπαν ἀποκρίνεται, καὶ ταχεῖαν λαμβάνει τὴν αὔξησιν. μικρὰ μέν, διὰ τὸ στενοχωρῆ τὴν ὑστέραν εἶναι πρὸς τὸ πλῆθος τῶν ᾠῶν· ταχὺ δ', ὅπως μὴ χρονιζόντων ἐν τῇ γενέσει πρὸς τὴν αὔξησιν, φθείρηται τὸ γένος, ἐπεὶ καὶ νῦν τὰ πολλὰ φθείρεται τῶν ἐκτικτομένων κυημάτων. διόπερ πολύγονόν ἐστι τὸ γένος τὸ τῶν ἰχθύων.

* ἢ βατράχων.

quòd auium ouum ſeparatur ab vtero. At eorum, quanquam non omnium, tamen plurimorum ouum perfectum vtero adhęret. Cúmque animal extremo innaſcitur, ouum conſumitur totum, quomodo in auibus cæteríſque, quorum omnium abſoluitur, demúmque vtero vmbilicus iam perfectorum adhęret. Similis modus eorum etiam eſt, quorum oua vtero abſoluuntur. Nonnullis enim eorum ouum abſoluitur, cùm perfectum eſt. Quæres igitur cur ita differant auium & piſcium generationes. Cauſa eſt, quòd auium oua luteum à candido ſeparatum continent: piſcium vnicolora ſunt, miſcentúrque inter ſe vſquequaque, & confunduntur. Itaque nihil prohibet quo minus econtrario principium habeant genitale. Non ſolùm enim parte ſua adhærente tale eſt, ſed etiam altera obiecta. Alimentum verò ex vtero meatibus trahere quibuſdam eo ipſo principio facile eſt. Apertum hoc eſt in iis ouis quæ non abſoluuntur. Nam in nonnullis cartilagineis ouum non abſoluitur vtero, ſed inhærens deſcendit ad animalis generationem, in quibus animal perfectum habet ſuum vmbilicum ex vtero, conſumpto iam ouo. Conſtat igitur vel antè meatus oui eòdem tendere. Fit hoc in muſtelorum genere læui cognomine, vt dictum eſt. Ortus piſcium his rebus & his de cauſis differt ab auium. Cætera eodem veniunt modo. Alterum enim vmbilicum habent ſimiliter, vt aues ad luteum, ſic piſces ad totum ouum. Non eſt enim huius pars altera lutea, altera candida, ſed totum eſt vnicolor, atque ex eo aluntur, conſumptóque pari modo ſubſidet & caro circum adnaſcitur. Talis eorum generatio eſt quæ intra ſe ouum perfectum, foras animal pariunt.

CAPVT IV.

Quam ob cauſam piſcium oua foras ſuſcipiunt incrementum.

CÆteri piſces maxima ex parte foras pariunt oua, omnéſque imperfecta, prætérquam rana, cuius cauſam iam reddidimus. Eorum etiam, qui imperfectum pariunt ouum, cauſa declarata eſt. Ortus verò eorum quoque ouo proueniens, eodem agitur modo quo cartilagineorum, quæ intra ſe pariunt: ſed incrementum celere, atque ex paruis: & vltimum oui durius eſt. Incrementum oui ſimile vermibus eſt. Animalia enim, quę vermem pariunt, primò exiguum edunt, quod per ſe augetur ſine vllo annexu. Cauſa ſimilis, vt in farina ſubacta humore. Fit enim maſſa ex parua magna, parte ſolidiore humeſcente, humida ſpiraſcente, quod in animalibus natura caloris animalis facit, in maſſa calor permiſti humoris. Augentur igitur oua neceſſariò ea cauſa: habét enim excrementũ maſſale, ſed rei melioris gratia. Quoniam fieri non poteſt vt totum ſuum incremẽtum recipiant, propter ſummam eorum animalium fœcunditatem. Hinc enim & parua admodum excernuntur, & celeriter augentur: parua, quòd vterus anguſtior ſit quàm vt tantam ouorum copiam poſſit capere celeriter, ne, dum per generationem mora in augendo protrahitur, genus pereat, quando vel nunc magna pars editi partus interit. Quamobrem genus piſcium perfœcundum eſt:

rependitur enim & compenſatur à natura interitus multitudine. Sunt quorum vterus dehiſcat, & diſrumpatur, vt quæ acus vocatur, præ magnitudine ouorum: hæc enim pro multis maiuſculos habet conceptus. Quod enim natura numero ademerat, id magnitudini addidit. Oua piſcium foris augeri, & quam ob cauſam, dictum iam eſt.

A ἀναμάχεται γὰρ ἡ φύσις τῷ πλήθει τὴν φθοράν. * εἰσὶ δέ τινες οἳ διαρρήγνυνται τῶν ἰχθύων, οἷον ἡ καλουμένη βελόνη διὰ τὸ μέγεθος τῶν ᾠῶν. αὕτη γὰρ ἀντὶ τοῦ πολλὰ, μεγάλα τὰ κυήματα ἴσχει. τοῦ γὰρ πλήθους ἡ φύσις ἀφελοῦσα, προσέθηκε * τὸ μέγεθος. ὅτι μὲν ἔξω αὐξάνεταί τε καὶ δι' * ἣν αἰτίαν τὰ τοιαῦτα τῶν ᾠῶν, εἴρηται.

* Hiſtor. lib. 6. c. 13. & 7.

* κ. περὶ τὴν μ.

CAPVT V.

De ortu cartilagineorum piſcium: eóſque, qui piſces omnes eſſe fœminas putant, non rectè ſentire.

ΚΕΦΑΛ. έ.

Περὶ γενέσεως τῶν σελαχῶν, καὶ ὅτι οὐ πάντες οἱ ἰχθῦς θήλεις.

SEd ouum eos etiam piſces parere indicium eſt, quòd viuipari quoque piſces, vt cartilaginei, primùm oua inter ſe pariunt. Totum enim piſcium genus ouiparum eſſe certum eſt. Finem tamen nullum recipit ouum eorum piſcium, qui ſexu maris & fœminæ diſtinguũtur, & per coitum generant, niſi mas ſuum ſemen aſpergat. Sunt qui omnes piſces fœminas eſſe opinentur, exceptis cartilagineis, ſed non rectè. Putant enim, eos qui mares habiti ſunt, differre à ſuis fœminis, modo plantarum, in quibus altera fructificet, altera non, vt olea, & oleaſter, ficus, & caprificus. Sic piſces differre inter ſe volunt, præter cartilagineos. De iis enim non ambigunt; quanquam ſimilis ratio partium ſeminalium in maribus omnibus, tum cartilaginei tum ouipari generis, eſt, & ſemen genitale vtriuſque ſuo tempore emitti videtur. Vuluas etiam fœminæ habent. Atqui non modò ouiparos ſed etiam cæteros vuluas habere oporteret, quamuis diuerſas, vt mulæ habent in genere vterinorum, ſi genus totum ſexu fœmineo eſſet, nec niſi ſterilitate nonnullorum diffideret. Nunc verò partim conceptacula habent ſeminis genitalis, partim vuluas. Atque in omnibus, excepto rubro, & hiatula, hoc diſcrimen eſt, vt aut conceptacula ſeminis prolifici habeant, aut vuluas. Difficultas autem, qua ita opinari mouentur, ſolui facilè poteſt, cùm rem, quæ accidit, audis. Nullum enim ex iis quæ coeunt, tam multa parere poſſe aiunt: idque rectè. Quæ enim ex ſe generant perfectum, vel animal, vel ouum, hæc non ita pariunt multa, vt piſces qui oua pariunt. Nam innumera quædam eorum multitudo ouorum eſt. Sed illud non vident, quàm diuerſa piſcium oua, ab auium ſint. Aues enim, & quadrupedum ouiparæ, & ſi qua cartilaginea enumeranda ſunt in hoc genere, perfectum generant ouum, & quod editum non recipiat incrementum. At piſces imperfecta pariunt oua, quæ foris incrementum iuſtum recipiant. Eodémque modo mollia, & cruſtata, quæ quidem & coire planè cernuntur, quoniam eorum coitus diuturnior eſt. Alterum etiam eorum marem eſſe, alterum vuluam habere certum eſt. Abſurdum præterea eſt, niſi in omnibus generibus vis hæc habeatur, quomodo in viuiparis eſt, alterum mas, alterum fœmina. Cauſa verò ignorantiæ eorum, qui ita cenſent, quòd differentiæ, quæ multæ ac variæ in animalium coitu generationéque ſunt, non omnes pateant, ſed paucarum quarundam intuitu, idem in omnibus eſſe oportere arbitrentur. Quamobrem & qui conceptus fieri aiunt captu ſeminis genitalis, quod à fœminis piſcibus deuoretur, rem, de qua verba faciunt, non tenent.

B ΟΤι δ' ᾠοτοκοῦσι καὶ οὗτοι οἱ ἰχθύες, σημεῖον τὸ καὶ τοὺς ζῳοτοκοῦντας τῶν ἰχθύων, οἷον τὰ σελάχη, ᾠοτοκεῖν ἐν αὐτοῖς πρότερον. δῆλον γὰρ ὅτι τὸ γένος ὅλον ᾠοτόκον ἐστὶ τὸ τῶν ἰχθύων. τέλος μέντοι οὐδὲν λαμβάνει τῶν τοιούτων ᾠῶν, ὅσων ἐστὶ τὸ μὲν θῆλυ, τὸ δὲ ἄρρεν, καὶ γίγνονται ἐξ ὀχείας, ἐὰν μὴ ἐπιρραίνῃ ὁ ἄρρην τὸν θορόν. εἰσὶ δέ τινες οἵ φασι πάντας εἶναι τοὺς ἰχθῦς θήλεις, ἔξω τῶν σελαχῶν οὐκ ὀρθῶς λέγοντες. οἴονται γὰρ διαφέρειν τῶν νομιζομένων ἀρρένων τοὺς θήλεις αὐτῶν, ὥσπερ τῶν φυτῶν, ἐν ὅσοις τὸ μὲν καρποφορεῖ, τὸ δὲ ἄκαρπον, οἷον ἐλαία καὶ κότινος καὶ συκῆ καὶ ἐρινεός. ὁμοίως δὲ καὶ τοὺς ἰχθῦς, πλὴν C τῶν σελαχῶν. τούτοις γὰρ οὐκ ἀμφισβητοῦσι. καίτοι ὡσαύτως τε διάκεινται οἱ ἄρρενες περὶ τὰ θορικά, οἵ τε σελαχώδεις, καὶ οἱ ἐν τῷ γένει τῷ τῶν ᾠοτοκούντων. καὶ σπέρμα κατὰ τὴν ὥραν φαίνεται ἀμφοῖν ἐκθλιβόμενον. ἔχουσι δὲ καὶ ὑστέρας αἱ θήλειαι. ἔδει δὲ οὐ μόνον τοὺς ᾠοτοκοῦντας, ἀλλὰ καὶ τοὺς ἄλλους ἔχειν μέν, ἀλλὰ διαφερούσας τῶν ᾠοτοκούντων, ὥσπερ οἱ ἡμίονοι ἐν τῷ γένει τῷ τῶν λοφούρων, εἴπερ ἦν τὸ γένος θῆλυ πᾶν· ἀλλ' ἄτεκνοί τινες αὐτῶν. νῦν δ' οἱ μὲν ἔχουσι θορικά, οἱ δ' ὑστέρας. καὶ ἐν ἅπασιν, ἔξω δυοῖν, ἐρυθίνου καὶ χάννης, αὕτη ἐστὶν ἡ διαφορά. οἱ μὲν γὰρ, θορικὰ ἔχουσιν· οἱ δ', ὑστέρας. ἡ δ' ἀπο- D ρία δι' ἣν οὕτως ὑπολαμβάνουσιν, εὔλυτος τὸ συμβαῖνον ἀκούσασιν. οὐδὲν γὰρ τῶν ὀχευομένων, πολλά φασι τίκτειν λέγοντες ὀρθῶς. ὅσα γὰρ ἐξ αὐτῶν γεννᾷ τέλεια, ἢ ζῷα, ἢ ᾠά, οὐ πολυτοκεῖ οὕτως, ὥσπερ οἱ ᾠοτοκοῦντες τῶν ἰχθύων. ἄπλετον γάρ τι τούτων πλῆθος τῶν ᾠῶν ἐστιν. ἀλλὰ τοῦτ' οὐχὶ συνεωράκεσαν, ὅτι οὐχ ὁμοιοτρόπως τοῖς τῶν ὀρνίθων ἔχει τὰ περὶ τὰ ᾠὰ τῶν ἰχθύων. οἱ μὲν γὰρ ὄρνιθες καὶ τῶν τετραπόδων ὅσα ᾠοτοκεῖ, καὶ εἴ τινα τῶν σελαχωδῶν, τέλειον ᾠὸν γεννῶσι, καὶ οὐ λαμβάνει ἐξελθὸν αὔξησιν· οἱ δ' ἰχθύες, ἀτελῆ, καὶ λαμβάνει θύραθεν τὰ ᾠὰ τὴν αὔξησιν. ἔτι καὶ ἐπὶ τῶν μαλακίων E τὸν αὐτὸν ἔχει τρόπον, καὶ ἐπὶ τῶν μαλακοστράκων, ἃ καὶ συνδυαζόμενα ὁρᾶται, διὰ τὸ χρόνιον εἶναι τὸν συνδυασμὸν αὐτῶν. [καὶ τούτων φανερόν ἐστι τὸ μὲν, ἄρρεν ὄν, τὸ δέ, ἔχον ὑστέραν.] ἄτοπον δὲ καὶ τὸ μὴ ἐν παντὶ γένει εἶναι ταύτην τὴν δύναμιν, ὥσπερ ἐν τοῖς ζῳοτόκοις, τὸ μὲν ἄρρεν, τὸ δὲ θῆλυ. αἴτιον δὲ τοῖς ἐκείνως λέγουσι τῆς ἀγνοίας, τὸ τὰς διαφορὰς μὴ δήλας εἶναι, παντοδαπὰς οὔσας περί τε τὰς ὀχείας τῶν ζῴων καὶ τὰς γενέσεις· ἀλλ' ἐξ ὀλίγου θεωροῦντας οἴεσθαι δεῖν ἔχειν ὁμοίως ἐπὶ πάντων. διὸ καὶ οἱ λέγοντες τὰς κυήσεις εἶναι ἐκ τοῦ * ἀναχάπτειν τὸ σπέρμα τὰς θηλείας τὰς τῶν ἰχθύων, οὐ κατανενοηκότες λέγουσι,

* κ. ἀνακάπτειν ... τ.τ. mendoſe.

κατὰ τὸν αὐτὸν γὰρ χρόνον οἵ τε ἄρρενες τὸν θορὸν, καὶ αἱ θήλειαι τὰ ᾠὰ ἔχουσι. καὶ ὅσῳ ἂν ἡ θήλεια ἐγγυτέρω ᾖ τοῦ τίκτειν, τότε πλείων καὶ ὑγρότερος ὁ θορὸς ἐν τοῖς ἄρρεσι γίνεται· καὶ ὥσπερ ἡ αὔξησις κατὰ τὸν αὐτὸν χρόνον τοῦ θοροῦ ἐν τοῖς ἄρρεσι, καὶ τοῦ ᾠοῦ ἐν τῇ θηλείᾳ, οὕτω καὶ ἡ ἄφεσις συμβαίνει. οὔτε γὰρ αἱ θήλειαι ἀθρόα τίκτουσιν, ἀλλὰ κατὰ μικρόν· οὔθ' οἱ ἄρρενες ἀθρόον ἀφιᾶσι τὸν θορόν. καὶ ταῦτα πάντα συμβαίνει κατὰ λόγον. ὥσπερ γὰρ καὶ τὸ τῶν ὀρνέων γένος ἐνίοις ἔχει μὲν ᾠὰ ἄνευ κυήσεως, ὀλίγα δὲ καὶ ὀλιγάκις, ἀλλ' ἐξ ὀχείας τὰ πολλά, ταὐτὸ συμβαίνει καὶ ἐπὶ τῶν ἰχθύων· ἧττον δέ. ἄγονα δὲ καὶ ἀμφότερα γίνεται τὰ αὐτόματα, ἐὰν μὴ ἐπιρράνῃ ὁ ἄρρην, ἐν οἷς γένεσιν αὐτῶν καὶ τὸ ἄρρεν ἐστί. τοῖς μὲν οὖν ὄρνισι, διὰ τὸ τέλεια ἐξιέναι τὰ ᾠά, ἔτι ἐντὸς ὄντων, ἀνάγκη τοῦτο συμβαίνειν· τοῖς δ' ἰχθύσι, διὰ τὸ ἀτελῆ συμβαίνειν τὴν αὔξησιν πᾶσιν, εἰ καὶ μὴ ἐντὸς ἐξ ὀχείας γίνηται τὸ ᾠόν, ὅμως τὰ ἔξωθεν ἐπιρραινόμενα σώζεται, καὶ ἐν τούτῳ ἀναλίσκεται ὁ θορὸς τοῖς ἄρρεσι. διὸ καὶ συγκαταβαίνει ἅμα ἐλαττούμενος τοῖς ᾠοῖς τοῖς ἐν ταῖς θηλείαις. ἀεὶ γὰρ τοῖς ἐκτικτομένοις ἐπιρραίνουσι παρακολουθοῦντες· ὥστε ἄρρενες μὲν καὶ θήλεις εἰσὶ καὶ ὀχεύονται πάντες, εἰ μὴ ἔν τινι γένει ἀδιάστατόν ἐστι τὸ θῆλυ καὶ τὸ ἄρρεν. καὶ ἄνευ τῆς τοῦ ἄρρενος γονῆς, οὐ γίνεται τῶν τοιούτων οὐδέν. συμβάλλεται δὲ πρὸς τὴν ἀπάτην αὐτοῖς καὶ τὸ ταχὺ εἶναι τὸν συνδυασμὸν τῶν τοιούτων ἰχθύων, ὥστε πολλοὺς λανθάνειν καὶ τῶν ἁλιέων. οὐδεὶς γὰρ αὐτῶν οὐδὲν τηρεῖ τοιοῦτον, τοῦ γνῶναι χάριν· ἀλλ' ὅμως ὠμμένος συνδυασμός ἐστι. τὸν αὐτὸν γὰρ τρόπον οἵ τε δελφῖνες ὀχεύονται παραπίπτοντες, καὶ οἱ ἰχθύες, ὅσοις ἐμποδίζει τὸ οὐραῖον. ἀλλὰ τῶν μὲν δελφίνων χρονιωτέρα ἡ ἀπόλυσίς ἐστι· τῶν δὲ τοιούτων ἰχθύων, ταχεῖα. διόπερ τοῦτο οὐχ ὁρῶντες, τὰς δὲ ἀναλήψεις τοῦ θοροῦ καὶ τῶν ᾠῶν, καὶ οἱ ἁλιεῖς περὶ τῆς κυήσεως τῶν ἰχθύων, τὸν εὐήθη λέγουσι λόγον καὶ τεθρυλημένον, ὅνπερ καὶ * Ἡρόδοτος ὁ μυθολόγος, ὡς κυϊσκομένων τῶν ἰχθύων ἐκ τοῦ ἀναχάπτειν τὸν θορὸν· οὐ συνορῶντες ὅτι τοῦτ' ἐστὶν ἀδύνατον. ὁ γὰρ πόρος ὁ διὰ τοῦ στόματος εἰσιών, εἰς τὴν κοιλίαν φέρει, ἀλλ' οὐκ εἰς τὰς ὑστέρας· καὶ τὸ μὲν εἰς τὰς κοιλίας ἐλθὸν, ἀνάγκη τροφὴν γίνεσθαι (καταπέττεται γάρ)· αἱ δ' ὑστέραι φαίνονται πλήρεις ᾠῶν· ἃ πόθεν εἰσῆλθεν;

* Libro 2.

ΚΕΦΑΛ. ϛ'.

Ὅτι οὐκ ὀρθῶς φασί τινες τούς τε κόρακας καὶ τὴν ἶβιν κατὰ τὸ στόμα μίγνυσθαι· καὶ τῶν τετραπόδων κατὰ τὸ στόμα τίκτειν τὴν γαλῆν· καὶ τὸν τρόχον καὶ τὴν ὕαιναν δύο αἰδοῖα ἔχειν.

Ὁμοίως δὲ καὶ περὶ τὴν τῶν ὀρνίθων γένεσιν ἔχει. εἰσὶ γάρ τινες οἳ λέγουσι κατὰ τὸ στόμα μίγνυσθαι τούς τε κόρακας καὶ τὴν ἶβιν, καὶ τῶν τετραπόδων κατὰ τὸ στόμα τίκτειν τὴν γαλῆν. ταῦτα γὰρ καὶ Ἀναξαγόρας καὶ ἄλλοι τινὲς τῶν φυσικῶν λέγουσι, λίαν ἁπλῶς καὶ ἀσκέπτως λέγοντες. περὶ μὲν [οὖν] τῶν ὀρνίθων, ἐκ συλλογισμοῦ διαψευδόμενοι, τῷ τὴν μὲν ὀχείαν ὀλιγάκις ὁρᾶσθαι τῶν κοράκων, τὴν δὲ τοῖς ῥύγχεσι πρὸς ἄλληλα κοινωνίαν πολλάκις, ἣν πάντα ποιεῖται τὰ κορακώδη τῶν ὀρνέων. δῆλον δὲ τοῦτο ἐπὶ τῶν τιθασευομένων κολοιῶν. τὸ δ' αὐτὸ τοῦτο ποιεῖ καὶ τὸ τῶν περιστερῶν γένος.

A Tempore enim eodem mares ſemen genitale, fœminæ oua habent, & quo fœmina propiùs ad partum accedit, eo copioſius & humidius redditur ſemen genitale in mare: & vt incrementum ſeminis in mare, oui in fœmina eodem tempore euenit, ſic emiſſio. Nec enim fœminæ vniuerſum, ſed paulatim pariunt: neque mares ſemen ſuum vniuerſum emittunt. Atque hæc omnia ratione ita vſu eueniunt. Vt enim in auium genere ſunt, quæ ſine coitu oua concipiant, quanquam pauca, & rarò, ſed per coitum magna ex parte implentur: ſic in piſcibus euenit, ſed minùs. Æquè tamen vtroque in genere infœcunda ſunt, quæ ſponte conſtiterunt, niſi mas ſuum aſperſerit ſemen, B videlicet in quibus mas quoque eſt. Auibus igitur quoniam oua perfecta exeunt, id fiat, cùm intus adhuc ſunt, neceſſe eſt. At piſcibus quoniam imperfecta omnia oua eduntur, quanquam non intus per coitum conſtitit ouum, tamē ſi extrà aſperſum eſt, ſeruari poteſt: atque in hunc vſum conſumitur ſemen marium genitale. Quapropter vnà cum ouis fœminarum ſubſidet, atque minuitur. Aſpergunt enim mares ſequendo in iis quæ ſubinde eduntur, ouis. Ergo in piſcibus quoque ſexus diſcrimen, maris ac fœminæ, eſt, omnéſque coeunt, niſi ſexus alicui generi ſit indiſcretus. Et ſine maris genitura nihil ex iis poteſt generari: facit enim celeritas coitus piſcium, vt eius opinio- C nis authores decipiantur. Tanta enim celeritate rem Veneream peragunt, vt etiā piſcatores complures lateant: nemo enim eorum aliquid tale cognitionis gratia obſeruat. Verumtamen coitus viſus eſt. Eodem enim modo, quo delphini, piſces etiam coeunt, amouendo ſupina per lapſum, quibus impedimento cauda. Sed delphinorum abiunctio diuturnior eſt: piſcium verò huiuſcemodi celerrima eſt. Itaque cùm eam non cernant, captu, ſiue voratu ſeminis, & ouorum, quem exploratum habent, mouentur vel piſcatores vt ſtultam illam & vulgarem rationem de conceptione piſcium afferant, quā & fabulator Herodotus ſcribit, quaſi ſeminis deuoratu piſces implean- D tur. Nec vident id fieri non poſſe: meatus enim, qui per os intrò tendit, in ventriculum fertur, non in vuluam. Quódque ventriculum ſubierit, alimentum id effici neceſſe eſt: concoquitur enim. Vuluæ autem plenæ ouorum cernuntur, quæ vnde, quæſo, ſubierint?

CAPVT VI.

Contra eos, qui coruos & ibin ore coire, muſtelam autem ore parere, hyænam duplex genitale habere, trochum verò ſe ipſum inire, opinati ſunt.

E SImilis error in generatione quoque auium euenit. Sunt enim qui coruos & ibin ore coire opinentur: inter quadrupedes etiam muſtelam ore parere. Hæc enim & Anaxagoras, & alij quidam naturales authores ſcribunt, ſimpliciter valde, & inconſideratè, qui in auium genere ratiocinatione illa falluntur, quòd rarò coruorū coitus cernatur, roſtrorum coniunctio ſæpenumero, quæ omnibus id genus auibus ſolita eſt. Quod in monedulis, quas manſuetas alimus, planum eſt. Genus etiam columbinum hoc idem facit.

Verùm

A Verùm hæc, quoniam coire quoque viſuntur, ea fama caruerunt. Coruinum genus libidinoſum non eſt, quippe quod parum fœcundum ſit. Coire tamen id quoque viſum eſt. Sed enim non cogitaſſe, quemadmodum ſemen ad vuluam deueniat per ventriculum, qui ſemper, quod ingeſtum eſt, concoquat, vt patet in cibo perficiendo, abſurdum omninò eſt. Vuluas autem id quoque auium genus, & oua habere cernitur iuxta ſeptum. Muſtelam etiam, modo cæterarum quadrupedum, vuluam habere certum eſt: ex qua quónam pacto fœtus ad os deueniat? Sed quia muſtela paruos admodum parit, vt & cæteræ fidipedes, de quibus poſtea dicemus, & ſæpe catulos ſuos ore ſuſceptos transfert, fecit vt ita B opinarentur. Quinetiam de trocho & hiæna ſtultè magnóque errore narratur. Hyænam enim complures aiunt; trochum, Herodorus Heracleota ſcribit duplex genitale habere, maris, ac fœminæ, & trochum ſe ipſum inire: hyænam inire & iniri annis alternis. Sed viſa eſt hyæna mas, & altera fœmina, ſui diſcrimine genitalis. Locis enim nonnullis penuria huius conſpectus non eſt. Verùm hyænæ tam mares quàm fœminæ, habent ſub cauda lineam quandam ſimilem genitali fœminino. Quę quidem nota, quamuis communis ſit, tamen in maribus potiùs cernitur, quia mares quàm fœminæ, magis capiuntur. Itaque qui rem parum diligenter conſiderant, in hanc aberrant C opinionem. Sed de his ſatis.

ἀλλὰ καὶ διὰ τὸ ὀχευόμενα φαίνεσθαι, διὰ τοῦτο ταύτης οὐ τετυχήκασι τῆς φήμης. τὸ δὲ κορακῶδες γένος οὐκ ἔστιν ἀφροδισιαστικόν· ἔστι γὰρ τῶν ὀλιγογόνων· ἐπεὶ ὦπταί γε καὶ τοῦτο ὀχευόμενον. τὸ δὲ μὴ συλλογίζεσθαι, πῶς εἰς τὰς ὑστέρας ἀφικνεῖται τὸ σπέρμα διὰ τῆς κοιλίας πεττούσης ἀεὶ τὸ εἰσιόν, καθάπερ τὴν τροφήν, ἄτοπον. ὑστέρας δὲ ἔχουσι καὶ ταῦτα τὰ ὄρνεα, καὶ ᾠὰ φαίνεται πρὸς τοῖς ὑποζώμασιν. καὶ ἡ γαλῆ, καθάπερ καὶ τὰ ἄλλα τετράποδα, τὸν αὐτὸν τρόπον ἔχει ἐκείνοις τὰς ὑστέρας· ἐξ ὧν εἰς τὸ στόμα πῶς βαδιεῖται τὸ ἔμβρυον; ἀλλὰ διὰ τὸ τίκτειν πάμπαν μικρὰ τὴν γαλῆν, ὥσπερ καὶ τὰ ἄλλα τὰ σχιζόποδα, περὶ ὧν ὕστερον ἐροῦμεν, τῷ δὲ στόματι πολλάκις μεταφέρειν τοὺς νεοττούς, ταύτην πεποίηκε τὴν δόξαν. εὐηθικῶς δὲ καὶ λίαν διεψευσμένοι, καὶ οἱ περὶ τρόχου καὶ ὑαίνης λέγοντες. φασὶ γὰρ τὴν μὲν ὕαιναν πολλοί, τὸν δὲ τρόχον Ἡρόδωρος ὁ Ἡρακλεώτης, δύο αἰδοῖα ἔχειν, ἄρρενος καὶ θήλεος· καὶ τὸν μὲν τρόχον, αὐτὸν αὑτὸν ὀχεύειν, τὴν δ᾽ ὕαιναν ὀχεύειν καὶ ὀχεύεσθαι παρ᾽ ἔτος. ὦπται γὰρ ἡ ὕαινα ἔχουσα αἰδοῖον. ἐν ἐνίοις γὰρ τόποις οὐκ ἀπορία τῆς θεωρίας· ἀλλ᾽ ἔχουσιν αἱ ὕαιναι ὑπὸ τὴν κέρκον ὁμοίαν γραμμὴν τῷ τοῦ θήλεος αἰδοίῳ. ἔχουσι μὲν οὖν καὶ ἄρρενες καὶ αἱ θήλειαι τὸ τοιοῦτον σημεῖον· ἀλλὰ ἁλίσκονται οἱ ἄρρενες μᾶλλον· διὸ τοῖς ἐκ παρόδου θεωροῦσι, ταύτην ἐποίησε τὴν δόξαν. ἀλλὰ περὶ μὲν τούτων ἅλις τὰ εἰρημένα.

CAPVT VII.

Quare cartilaginei piſces mares ſemen ſpargere non viſuntur, nec fœmina ſuos conceptus.

DE piſcium generatione quęres, quam ob cauſam, cartilagineorum, nec fœminę ſuos conceptus, neque mares ſuum ſemen ſpargere viſuntur, cùm generis non viuipari, & fœminæ oua, & mares ſemen ſpargere ſoleant. Cauſa verò eſt, quòd genus cartilagineum ſemine minimè abundat. Vuluas etiam fœminæ ad ſeptum poſitas continent. D Æquè enim mares à maribus, & fœminæ à fœminis differunt. Sunt enim cartilaginei minùs copioſi genitura. At verò mas ouipari generis, vt fœmina oua præ multitudine reponit, ſic ipſe ſpargit. Plus enim ſeminis habet, quàm ſatis ad coitum ſit. Tendit enim natura potiùs abſumere ſemen id ad augenda oua repoſita, quàm ad primam conſtitutionem. Nam vt & antè, & modò diximus, oua auium intus perficiuntur, piſcium extrà. Similis enim quodam modo generatio atque in vermiparis eſt, quanquam imperfectiorem edunt conceptum, quæ vermem pariunt. Sed vtriſque tã auium quàm piſciũ ouis perfectionem mas adhibet: verũ auium intus, cũ intus perfi- E ciantur: piſcium extrà, cùm hæc imperfecta edantur. Nam aliàs idem vtriſque contingit. Auium igitur ſubuentanea fœcunda redduntur, & quæ concepta maris diuerſi coitu ſunt, naturam in eum, qui pòſt coierit, mutant. Propria etiam, quæ incremento carent, cùm coitus intermiſſus eſt, celeriter accreſcunt, cùm repetitur coitus:

ΚΕΦΑΛ. ζ'.

Διὰ τί τῶν σελαχωδῶν, οὔθ᾽ αἱ θήλειαι τὰ κυήματα, οὔθ᾽ οἱ ἄρρενες ἀπορραίνοντες ὁρῶνται τὸν θορόν.

Περὶ δὲ τῆς τῶν ἰχθύων γενέσεως ἀπορήσειεν ἄν τις, διὰ τίνα ποτὲ αἰτίαν τῶν μὲν σελαχωδῶν οὔθ᾽ αἱ θήλειαι τὰ κυήματα, οὔθ᾽ οἱ ἄρρενες ἀπορραίνοντες ὁρῶνται τὸν θορόν· τῶν δὲ μὴ ζῳοτόκων καὶ αἱ θήλειαι τὰ ᾠά, καὶ οἱ ἄρρενες τὸν θορόν. αἴτιον δ᾽, ὅτι τὸ γένος οὐ πολύσπερμον τὸ τῶν σελαχωδῶν. καὶ ἔτι αἱ θήλειαι πρὸς τῷ διαζώματι τὰς ὑστέρας ἔχουσι. τὰ γὰρ ἄρρενα τῶν ἀρρένων, καὶ τὰ θήλεα τῶν θηλέων ὁμοίως διαφέρουσιν. ὀλιγοσπερμότεροι γὰρ πρὸς τὴν γονὴν οἱ σελαχώδεις εἰσί. τὸ δ᾽ ἄρρεν γένος ἐν τοῖς ᾠοτόκοις, καθάπερ αἱ θήλειαι τὰ ᾠὰ διὰ πλῆθος ἀποτίκτουσιν, οὕτως ἐκεῖνοι [οἱ ἄρρενες τὸν θορὸν] ἀπορραίνουσι. πλείω γὰρ ἔχουσι θορόν, ἢ ὅσον πρὸς τὴν ὀχείαν ἱκανόν. μᾶλλον γὰρ βούλεται ἡ φύσις δαπανᾶν τὸν θορὸν πρὸς τὸ συναυξάνειν τὰ ᾠά, ὅταν ἀποτέκῃ ἡ θήλεια, ἢ πρὸς τὴν ἐξ ἀρχῆς σύστασιν. καθάπερ γὰρ ἔν τε τοῖς ἄνω καὶ τοῖς ὑπογύοις εἴρηται λόγοις, τὰ μὲν τῶν ὀρνέων ᾠὰ τελειοῦται ἐντός, τὰ δὲ τῶν ἰχθύων, ἐκτός. τρόπον γάρ τινα ἔοικε τοῖς σκωληκοτοκοῦσιν. ἔτι γὰρ ἀτελέστερον προΐεται τὸ κύημα τὰ σκωληκοτόκα τῶν ζῴων. ἀμφοτέρως δὲ τὴν τελείωσιν καὶ τοῖς τῶν ὀρνίθων ᾠοῖς καὶ τοῖς τῶν ἰχθύων ποιεῖται τὸ ἄρρεν· ἀλλὰ τοῖς μὲν τῶν ὀρνίθων, ἐντός (τελειοῦται γὰρ ἐντός) τοῖς δὲ τῶν ἰχθύων, ἐκτός, διὰ τὸ ἔξω προΐεσθαι ἀτελές· ἐπεὶ συμβαίνει γε ἐπ᾽ ἀμφοτέρων ταὐτό. τῶν μὲν οὖν ὀρνίθων τά τε ὑπηνέμια γίνεται γόνιμα, καὶ τὰ προοχευθέντα ὑφ᾽ ἑτέρου γένους τῶν ἀρρένων, μεταβάλλει τὴν φύσιν εἰς τὸν ὕστερον ὀχεύοντα. καὶ τὰ οἰκεῖα δέ, ἀναύξητα ὄντα, ἂν διαλείπῃ τὴν ὀχείαν, ὅταν ὀχευθῇ πάλιν, ποιεῖ ταχεῖαν λαμβάνειν τὴν αὔξησιν.

οὐ μέντοι κατὰ πάντα τὸν χρόνον, ἀλλ' ἐάνπερ πρότερον γένηται ἡ ὀχεία, πρὶν μεταβάλλειν εἰς τὴν τοῦ λευκοῦ ἀπόκρισιν. τοῖς δὲ τῶν ἰχθύων οὐδὲν ὥρισται τοιοῦτον· ἀλλὰ πρὸς τὸ σώζεσθαι, ταχέως ἀποῤῥαίνουσιν οἱ ἄῤῥενες. αἴτιον δ', ὅτι οὐ δίχροα ταῦτα· διόπερ οὐχ ὥρισται τοιοῦτος καιρὸς τούτοις. ἐπὶ δὲ τῶν ὀρνίθων τοῦτο συμβέβηκεν εὐλόγως. ὅταν γὰρ τὸ λευκὸν ἀφωρισμένον ᾖ καὶ τὸ ὠχρὸν ἀπ' ἀλλήλων, ἔχει ἤδη τὴν ἀπὸ τοῦ ἄῤῥενος ἀρχήν. εἰς ταύτην γὰρ συμβάλλεται τὸ ἄῤῥεν. τὰ μὲν οὖν ὑπηνέμια λαμβάνει τὴν γένεσιν μέχρι τοῦ ἐνδεχομένου αὐτοῖς. τελεωθῆναι μὲν γὰρ εἰς ζῷον ἀδύνατον· δεῖ γὰρ αἰσθήσεως. τὴν δὲ θρεπτικὴν δύναμιν τῆς ψυχῆς ἔχει τὰ θήλεα, καὶ πάντα τὰ B ζῶντα, καθάπερ εἴρηται πολλάκις. διόπερ αὐτὸ τὸ ᾠόν, ὡς μὲν φυτοῦ κύημα, τέλειόν ἐστιν· ὡς δὲ ζῷον, ἀτελές. εἰ μὲν οὖν μὴ ἐνῆν ἄῤῥεν ἐν τῷ γένει αὐτῶν, ἐγίγνετο ἄν, ὥσπερ καὶ ἐπὶ τῶν ἰχθύων εἴπερ ἐστί τι τοιοῦτον γένος, ὃ ἄνευ ἄῤῥενος γεννᾷ. εἴρηται δὲ περὶ αὐτῶν πρότερον, ὅτι οὔπω ὦπται ἱκανῶς. νῦν δ' ἐστὶν ἐν πᾶσι τοῖς ὄρνισι τὸ μὲν, θῆλυ, τὸ δ', ἄῤῥεν. ὥσθ' ᾗ μὲν φυτόν, τετελείωκε (διόπερ οὐ μεταβάλλει πάλιν μετὰ τὴν ὀχείαν) ᾗ δ' οὐ φυτόν, οὐ τετελείωκεν, οὐδ' ἀποβαίνει ἐξ αὐτοῦ ἕτερον οὐδέν. οὔτε γὰρ ὡς φυτοῦ ἁπλῶς, οὔθ' ὡς ζῴου ἐκ συνδυασμοῦ γέγονε. τὰ δ' ἐξ ὀχείας μὲν γινόμενα ᾠά, διακεκριμένα δ' εἰς τὸ C λευκόν, γίνεται κατὰ τὸ πρῶτον ὀχεῦσαν. ἔχει γὰρ ἀμφοτέρας ἤδη τὰς ἀρχάς.

ΚΕΦΑΛ. η'.

Περὶ τοῦ τῶν μαλακίων τόκου.

Τὸν αὐτὸν δὲ τρόπον καὶ τὰ μαλάκια ποιεῖται τὸν τόκον, οἷον σηπίαι καὶ τὰ τοιαῦτα· καὶ τὰ μαλακόστρακα, οἷον κάραβοι καὶ τὰ συγγενῆ τούτοις. τίκτει γὰρ ἐξ ὀχείας καὶ ταῦτα, καὶ συνδυαζόμενον τὸ ἄῤῥεν τῷ θήλει πολλάκις ὦπται. διόπερ οὐδ' ἱστορικῶς οὐδὲ ταύτῃ φαίνονται λέγοντες, οἱ φάσκοντες τοὺς ἰχθῦς θήλεις εἶναι πάντας, καὶ τί- D κτειν ἄνευ ὀχείας. τὸ γὰρ ταῦτα μὲν ἐξ ὀχείας οἴεσθαι, ἐκεῖνα δὲ μή, θαυμαστόν. εἴτε τοῦτ' ἐλελήθει, σημεῖον ἀπειρίας. γίνεται δὲ ὁ συνδυασμὸς τούτων χρονιώτερος πάντων, ὥσπερ τῶν ἐντόμων εὐλόγως. ἄναιμα γάρ ἐστι· διόπερ ψυχρὰ τὴν φύσιν ἐστί. ταῖς μὲν οὖν σηπίαις καὶ ταῖς τευθίσι δύο τὰ ᾠὰ φαίνεται, διὰ τὸ διηρθρῶσθαι τὴν ὑστέραν, καὶ φαίνεσθαι δικρόαν. τὸ δὲ τῶν πολυπόδων, ἓν ᾠόν. αἴτιον δ', ἡ μορφή, στρογγύλη τὴν ἰδέαν οὖσα καὶ σφαιροειδής. ἡ γὰρ σχίσις ἄδηλος πληρωθείσης ἐστί. δικρόα δὲ καὶ ἡ τῶν καράβων ἐστὶν ὑστέρα. ἀποτίκτουσι δὲ τὸ κύημα ἀτελὲς καὶ [ταῦτα πάντα,] διὰ τὴν αὐτὴν αἰτίαν. τὰ μὲν οὖν κα- E ραβώδη τὰ θήλεα, πρὸς αὑτὰ ποιεῖται τὸν τόκον (διόπερ μείζους ἔχει τὰς πλάκας τὰ θήλεα αὐτῶν, ἢ τὰ ἄῤῥενα, φυλακῆς χάριν τῶν ᾠῶν) τὰ δὲ μαλάκια, ἔξω. καὶ τοῖς μὲν θήλεσι τῶν μαλακίων ἐπιῤῥαίνει ὁ ἄῤῥην, καθάπερ οἱ ἄῤῥενες ἰχθύες τοῖς ᾠοῖς, καὶ γίνεται συνεχὲς καὶ κολλῶδες· τοῖς δὲ καραβώδεσιν οὔτε ὦπται τοιοῦτον, οὔτε εὔλογον. ὑπό τε γὰρ τῇ θηλείᾳ τὸ κύημα, καὶ σκληρόδερμόν ἐστι, καὶ λαμβάνει αὔξησιν καὶ ταῦτα καὶ τὰ τῶν μαλακίων ἔξω, καθάπερ καὶ τὰ τῶν ἰχθύων. προσπέφυκε δ' ἡ γινομένη σηπία τοῖς ᾠοῖς, κατὰ τὸ πρόσθιον. ταύτῃ γὰρ ἐνδέχεται μόνον.

A non tamen quouis tempore, ſed ſi priùs quàm albumen ſecerni incipiat. At piſcium ouis nihil tale præſcriptum eſt: ſed vt ſeruentur, quàm primùm mares aſpergunt. Cuius rei cauſa eſt, quòd hæc bicolora non ſunt: hinc enim tempus his tale ſtatum non eſt. At in auium genere ratione ſic euenit. Cùm enim luteum & candidum diſtincta inter ſe ſunt, principium iam habetur, quod proficiſcitur à mare. iſthuc enim mas confert. Subuentanea igitur recipiunt generationem quoad fieri poteſt. Perfici namque ad animalis vſque fœcunditatem impoſſibile eſt: ſenſibus enim opus eſt. At vegetalem animæ virtutem obtinent & fœminæ, & omnia quæ viuunt, vt ſæpius dictum eſt. Quamobrem hoc ouum, vt plantæ conce- B ptus, perfectũ eſt: vt animalis, imperfectum. Quòd ſi mas in eorum genere deeſſet, idem ſanè fieret, quod in piſcium genere, ſi tale genus in iis eſt, quod ſine mare progeneret. Dixi de his antè nondum exploratum haberi ſatis: nunc verò in omni auium genere, alterum mas, alterum fœmina eſt. Itaque fit, vt quà planta eſt, perficiat quod non mutetur à coitu: quà non planta, non perficiat, nec aliud quicquam proueniat ex eo quod genuit. Neque enim vt plantæ ſimpliciter: neque vt animalis per coitum prouentus eſt. Quæ autem oua coitu concepta, diſcreta iam ſunt in albuminis portionem, hęc pro eo qui primùm coi- C uerit, mare euadunt. Iam enim vtrumque principium obtinent.

CAPVT VIII.

De partu mollium animantium, & ortu locuſtarum.

Mollium etiam partus ſimilis eſt, vt ſepiæ cæterorúmque id genus, atque etiam cruſtatorum, vt locuſtæ & reliquorum generis eiuſdem. Pariunt enim ea quoque per coitum: & quidem ſæpe mas coniunctus cum fœmina viſus eſt. Quamobrem hinc etiam hiſtoricè nequa- D quam dicere illi videntur, qui piſces omnes fœminas eſſe autumant, nec per coitum parere. Hæc enim oriri per coitum arbitrari, illa non, mirum eſt. Aut ſi hæc ita parere illos latuit, indicium imperitiæ eſt. Diutius hæc, quàm cætera coeunt more inſectorum, ratione. Sunt enim exanguia, & ob eam rem frigida natura. Sepiis & lolliginibus oua gemina apparent: quoniam vulua earum ita articulata eſt, vt bifida cernatur. At polyporum ouum ſimplex eſt. Cauſa eſt, forma eorum vteri, quæ ſpecie rotunda conglobatáque eſt: fiſſio enim eius iam repleti incerta eſt. Locuſtarum etiam vulua bifurcis eſt. Conceptum hæc quoque omnia imperfectum eadem de cauſa edunt. E Locuſtacei generis fœminæ apud ſe partum exponunt: quamobrem ampliores ipſæ, quàm mares, habent tabellas, vt oua ſeruentur. Mollia foris reponunt. Fœminis huius generis mares aſpergunt, quomodo ouis mares in genere piſcium: redduntúrque oua eorum glutino cohærentia ad ſpeciem vuæ. At locuſtaceis tale quid fieri nec viſum eſt, neque ratione exigitur: conceptus enim eorum ſub fœmina continetur, & cruſta intectus eſt. Incrementum tam eorum quàm mollium oua foris recipiunt, ſicut piſcium. Adhæret ouo ſepia naſcens, parte ſui priore. Hac enim tantùm poteſt adhærere,

cùm hæc vna partem poſteriorem & priorem eodem habeat. Quænam ſitus diſpoſitio ſit eius, cùm oritur, petendum ex hiſtoriis eſt. De ortu cæterorum animalium, tum pedeſtrium tum volatilium, tum etiam natatilium, diximus.

CAPVT IX.

De triplici inſectorum generatione.

DE inſectis atque cruſtatis hoc loco dicendum eſt, via & ratione, qua cœpimus. At primùm de inſectis. Hæc partim coitu, partim ſponte oriri dictum iam eſt. Item vermiculum ea parere, & quam ob cauſam ita pariunt. Genus hoc enim omne ferè vermiculum quodam modo parere videtur. Conceptus enim, qui imperfectior eſt, talis eſt. In omnibus autem vel iis quæ perfectum pariunt ouum, conceptus primus indiſcretus adhuc recipit incrementum: qualis natura etiam vermis eſt. Mox alia conceptum ſuum ouo perfecto edunt, alia imperfecto, quod extra perficiatur, vt ſæpe de piſcibus dictum eſt. Quæ verò intra ſe pariunt animal, iis quodam modo poſt primum conceptum ouiforme quiddam efficitur. Humor enim in membrana tenui continetur, perinde quaſi oui teſtam detraxeris. Quamobrem deprauationes conceptuum, quæ per id temporis accidunt, fluxus vocant. Sed inſecta & vermem generant, quæ vim obtinent generandi, & quæ non per coitum, ſed ſponte naturæ oriuntur, ex tali origine conſiſtunt. Nam & erucas genus eſſe vermis cenſendum eſt, & fœtum araneorum, quanquam propter figuræ orbiculatam ſpeciem ſimilia ouo, tum eorum nonnulla, tum alia complura primordia eſſe videantur. Verùm non figura, nec mollitie, aut duritie ouum definiendum eſt. Sunt enim conceptus nonnullorum duri, quamuis ouo diuerſi: ſed quod totum mutetur, nec ex parte eius animal gignatur, id vermis eſt. Omne autem hoc vermiculi genus, vbi ſuæ magnitudinis finem receperit, quaſi ouum efficitur. Indureſcit enim putamen eorum, & tantiſper immota redduntur. Quod in vermiculis apum & veſparum, atque etiam in erucis apertum eſt. Cuius rei cauſa eſt, quòd Natura præ ſua imperfectione quaſi maturans antè quàm tempeſtiuum ſit ouum, pariat, tanquam hic vermis ad incrementum oui mollis adhuc pergat. Hoc eodem modo in cæteris quoque euenit omnibus, quæ non coitu oriuntur, vel in lanis, vel aliis huiuſcemodi, atque etiam in aquis. Omnia enim poſt vermis naturam, motu ceſſant, & putamine obareſcunt. Mox rupto putamine exit, velut ex ouo, animal, tertia perfectum generatione, idque pinnatum magna ex parte. Ratione illud etiam euenit, quod iure multi admirẽtur. Erucæ enim cùm primò capiant cibum, mox non capiunt, ſed motu ceſſant, quæ per id tempus aureliæ à nonnullis vocantur. Veſparum etiam vermiculis, & apum idem accidit. Poſt deinde quæ nymphæ appellantur, proueniunt, quæ nihil huiuſcemodi habeant. Ouorum enim natura adepta ſuum finem, non inſuper accreſcit, ſed antè augetur, & alitur, donec diſtinguatur, & fiat ouum perfectum. Vermium autem alij, hoc intra ſe habent, vnde excrementum ipſis nutriendis accedat, vt vermes apum, & veſparum:

A ἔχει γὰρ μόνον ἐπὶ τούτου τὸ ὀπίσθιον μέρος, καὶ πρόσθιον. τὸ δὲ σχῆμα τῆς θέσεως ἐν ᾗ ἔχει γιγνόμενα τρόπον, δεῖ θεωρεῖν ἐκ τῶν ἱστοριῶν. περὶ μὲν οὖν τῶν ἄλλων ζῴων τῆς γενέσεως εἴρηται, καὶ πτηνῶν καὶ πεζῶν, καὶ πλωτῶν.

ΚΕΦΑΛ. θʹ.

Περὶ τῆς τῶν ἐντόμων γενέσεως, καὶ πῶς τριγενῆ γίγνεται τὰ τοιαῦτα. καὶ διὰ τί ἐκ κινουμένων ἀκινητίζει πάλιν.

ΠΕρὶ δὲ τῶν ἐντόμων καὶ τῶν ὀστρακοδέρμων λεκτέον κατὰ τὴν ὑφηγημένην μέθοδον. εἴπωμεν δὲ πρῶτον περὶ B τῶν ἐντόμων. ὅτι μὲν οὖν τὰ μὲν ἐξ ὀχείας γίγνεται τῶν τοιούτων, τὰ δ' αὐτόματα, πρότερον ἐλέχθη· πρὸς τούτοις δὲ, ὅτι σκωληκοτοκεῖ, καὶ διὰ τίνα αἰτίαν σκωληκοτοκεῖ. σχεδὸν γὰρ ἔοικε πάντα τρόπον τινὰ σκωληκοτοκεῖν πρῶτον. τὸ γὰρ ἀτελέστατον κύημα, τοιοῦτόν ἐστιν. ἐν πᾶσι δὲ καὶ τοῖς ᾠοτοκοῦσι τέλειον ᾠὸν, τὸ κύημα τὸ πρῶτον ὂν ἀδιόριστον, λαμβάνει τὴν αὔξησιν. τοιαύτη δ' ἐστὶν ἡ τοῦ σκώληκος φύσις. μετὰ δὲ τοῦτο, τὰ μὲν ᾠοτοκεῖ τὸ κύημα τέλειον, τὰ δὲ ἀτελές. ἔξω δὲ γίγνεται τέλειον καθάπερ εἴρηται πολλάκις ἐπὶ τῶν ἰχθύων. τὰ δ' ἐν αὑτοῖς ζῳοτοκοῦντα, τρόπον τινὰ μετὰ τὸ σύστημα τὸ ἐξ ἀρχῆς, ᾠοειδὲς γίνεται. περιέχεται γὰρ τὸ ὑγρὸν ὑμένι C λεπτῷ, καθάπερ ἂν εἴ τις ἀφέλοι τὸ τῶν ᾠῶν ὄστρακον.* διὸ καὶ καλοῦσι τὰς τότε γιγνομένας τῶν κυημάτων φθορὰς, ἐκρύσεις. τὰ δ' ἔντομα γεννᾷ, τὰ γεννῶντα, σκώληκας. καὶ τὰ γιγνόμενα μὴ δι' ὀχείας, ἀλλ' αὐτόματα, ἐκ τοιαύτης γίγνεται πρῶτον συστάσεως. δεῖ γὰρ καὶ τὰς κάμπας εἶδός τι θεῖναι σκώληκος, καὶ τὰ τῶν ἀραχνίων. καίτοι δόξειεν ἂν ᾠοειδέσιν ἐοικέναι διὰ τὴν τοῦ σχήματος περιφέρειαν, καὶ τούτων ἔνια, καὶ πολλὰ τῶν ἄλλων· ἀλλ' οὐ τῷ σχήματι λεκτέον, οὐδὲ τῇ μαλακότητι [τὸ ᾠὸν] καὶ σκληρότητι. (καὶ γὰρ σκληρὰ τὰ κυήματα γίγνεται ἐνίων) ἀλλὰ τῷ ὅλον μεταβάλλειν, καὶ μὴ ἐκ μορίου τινὸς γίνεσθαι τὸ ζῷον. προελθόντα δὲ πάντα D σκωληκώδη, καὶ τοῦ μεγέθους λαβόντα τέλος, οἷον ᾠὸν γίγνεται. σκληρύνεται γὰρ περὶ αὐτὸ τὸ κέλυφος, καὶ ἀκινητίζουσι κατὰ τοῦτον τὸν καιρόν. δῆλον δὲ τοῦτ' ἐν τοῖς σκώληξι τοῖς τῶν μελιττῶν καὶ σφηκῶν, καὶ ταῖς κάμπαις. τούτου δ' αἴτιον, ὅτι ἡ φύσις ὡσπερανεὶ πρὸ ὥρας ᾠοτοκεῖ, διὰ τὴν ἀτέλειαν τὴν αὐτῆς, ὡς ὄντος τοῦ σκώληκος ἔτι ἐν αὐξήσει ᾠοῦ μαλακοῦ. τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν ἄλλων συμβαίνει πάντων τῶν [μὴ] ἐξ ὀχείας γιγνομένων ἐν ἐρίοις, ἢ τισιν ἄλλοις τοιούτοις, καὶ τῶν ἐν τοῖς ὕδασι. πάντα γὰρ μετὰ τὴν τοῦ σκώληκος φύσιν ἀκινητίσαντα, καὶ τοῦ κελύφους περιξηρανθέντος, μετὰ ταῦτα τούτου ῥαγέντος ἐξέρχεται, καθάπερ ἐξ ᾠοῦ ζῷον ἐπιτελεσθὲν ἐκ τῆς τρίτης γενέσεως, ὧν τὰ πλεῖστα πτερωτὰ τῶν πεζῶν ἐστι. κατὰ λόγον δὲ συμβαίνει καὶ τὸ θαυμαζόμενον δικαίως ὑπὸ πολλῶν. αἵ τε γὰρ κάμπαι λαμβάνουσαι τὸ πρῶτον τροφὴν, μετὰ ταῦτα οὐκέτι λαμβάνουσιν ἀλλ' ἀκινητίζουσιν αἱ καλούμεναι ὑπό τινων χρυσαλλίδες, καὶ τῶν σφηκῶν οἱ σκώληκες, καὶ τῶν μελιττῶν μετὰ ταῦτα αἱ καλούμεναι νύμφαι γίνονται, καὶ τοιοῦτον οὐδὲν ἔχουσι. καὶ γὰρ ἡ τῶν ᾠῶν φύσις, ὅταν λάβῃ τέλος, ἀναυξής ἐστι. τὸ δὲ πρῶτον αὐξάνεται καὶ λαμβάνει τροφὴν, ἕως ἂν διορισθῇ καὶ γένηται τέλειον ᾠόν. τῶν δὲ σκωλήκων οἱ μὲν, ἔχουσιν ἐν αὑτοῖς τὸ τοιοῦτον, ὅθεν τρεφομένοις ἐπιγίγνεται τοιοῦτον περίττωμα, οἷον τῶν μελιττῶν καὶ σφηκῶν.

* Hiſtor. lib. 7. c. 3.

Hiſtor. li. 5. c. 19.

οἱ δὲ, λαμβάνουσι θύραθεν, ὥσπερ αἵ τε κάμπαι καὶ τῶν ἄλλων τινὲς σκωλήκων. διότι μὲν οὖν τριχῇ γίνεται τὰ τοιαῦτα, καὶ δι᾽ ἣν αἰτίαν ἐκ κινουμένων ἀκινητίζει πάλιν, εἴρηται. γίνεται δὲ τὰ μὲν, ἐξ ὀχείας αὐτῶν, καθάπερ οἵ τε ὄρνιθες καὶ τὰ ζωοτόκα, καὶ τῶν ἰχθύων οἱ πλεῖστοι· τὰ δ᾽, αὐτόματα, καθάπερ ἔνια τῶν φυομένων.

ΚΕΦΑΛ. ί.

Περὶ τῆς τῶν μελιττῶν καὶ κηφήνων γενέσεως.

Η Δὲ τῶν μελιττῶν γένεσις ἔχει πολλὴν ἀπορίαν. ἐπεὶ γὰρ ἔστι καὶ περὶ τοὺς ἰχθῦς τοιαύτη τις γένεσις ἐνίων, ὥστ᾽ ἄνευ ὀχείας γεννᾶν, τοῦτο συμβαίνειν ἔοικε καὶ περὶ τὰς μελίττας ἐκ τῶν φαινομένων. ἀνάγκη γὰρ ἤτοι φέρειν αὐτὰς ἄλλοθεν τὸν γόνον, (ὥσπερ τινές φασι) καὶ τοῦτον ἢ φυόμενον αὐτόματον, ἢ ἄλλου τινὸς ζώου τίκτοντος· ἢ γεννᾶν αὐτάς· ἢ τὸν μὲν φέρειν, τὸν δὲ γεννᾶν· καὶ γὰρ τοῦτο λέγουσί τινες, ὡς τὸν τῶν κηφήνων φέρουσι γόνον. καὶ γεννᾶν ἢ ὀχευομένας, ἢ ἀνοχεύτους. καὶ ὀχευομένας, γεννᾶν, ἤτοι ἕκαστον γένος καθ᾽ αὑτό, ἢ ἕν τι αὐτῶν τἆλλα, ἢ συνδυαζόμενον ἄλλο γένος ἄλλῳ. λέγω δ᾽, οἷον μελίττας μὲν γίνεσθαι ἐκ μελιττῶν συνδυαζομένων, κηφῆνας δ᾽ ἐκ κηφήνων· βασιλεῖς δ᾽ ἐκ βασιλέων, ἢ πάντα τἆλλα ἐξ ἑνός· οἷον ἐκ τῶν καλουμένων βασιλέων καὶ ἡγεμόνων, ἢ ἐκ τῶν κηφήνων καὶ τῶν μελιττῶν. φασὶ γὰρ τοὺς μὲν, ἄρρενας εἶναι· * τοὺς δὲ, θήλεις· οἷον τὰς μὲν μελίττας, θηλείας· τοὺς δὲ κηφῆνας, ἄρρενας. ταῦτα δὲ ἔστι πάντα ἀδύνατα συλλογιζομένοις, τὰ μὲν, ἐκ τῶν συμβαινόντων ἰδίᾳ περὶ τὰς μελίττας· τὰ δ᾽, ἐκ τῶν κοινοτέρων τοῖς ἄλλοις ζώοις. εἴτε γὰρ μὴ τίκτουσαι φέρουσιν ἄλλοθεν, ἔδει γίνεσθαι μελίττας· καὶ μὴ φερουσῶν τῶν μελιττῶν ἐκ τοῦ τόπου, ὅθεν τὸ σπέρμα φέρουσι. διὰ τί γὰρ μετενεχθέντος μὲν ἔσται, ἐκεῖ δ᾽ οὐκ ἔσται; προσήκει γὰρ οὐδὲν ἧττον, εἴτε φυόμενον ἐν τοῖς ἄνθεσιν αὐτόματον, εἴτε ζώου τινὸς τίκτοντος. κἂν εἴτε ζώου τινὸς ἑτέρου τὸ σπέρμα ἦν, ἐκεῖνο ἔδει γίνεσθαι ἐξ αὐτοῦ, ἀλλὰ μὴ μελίττας. ἔτι δὲ καὶ τὸ μὲν μέλι κομίζειν, εὔλογον· τὸ δὲ τὸν γόνον, ἀλλότριον ὄντα, καὶ μὴ τροφήν, ἄτοπον. τίνος γὰρ χάριν; πάντα γὰρ ὅσα πραγματεύεται περὶ τὰ τέκνα, περὶ τὸν φαινόμενον οἰκεῖον διαπονεῖται γόνον. ἀλλὰ μὴν οὐδὲ τὰς μελίττας θηλείας εἶναι, τοὺς δὲ κηφῆνας ἄρρενας, εὔλογον. οὐδενὶ γὰρ τὸ πρὸς ἀλκὴν ὅπλον τῶν θηλειῶν ἀποδίδωσιν ἡ φύσις. εἰσὶ δ᾽ οἱ μὲν κηφῆνες ἄκεντροι, αἱ δὲ μέλιτται πᾶσαι κέντρον ἔχουσαι. οὐδὲ τοὐναντίον εὔλογον, τὰς μὲν μελίττας, ἄρρενας· τοὺς δὲ κηφῆνας, θηλείας. οὐδὲν γὰρ τῶν ἀρρένων εἴωθε διαπονεῖσθαι περὶ τὰ τέκνα· νῦν δ᾽ αἱ μέλιτται τοῦτο ποιοῦσιν. ὅλως δ᾽ ἐπεὶ φαίνεται ὁ μὲν τῶν κηφήνων γόνος ἐγγινόμενος, καὶ μηδενὸς ὄντος κηφῆνος, ὁ δὲ τῶν μελιττῶν οὐκ ἐγγινόμενος ἄνευ τῶν βασιλέων, διὸ καί φασί τινες τὸν τῶν κηφήνων φέρεσθαι μόνον, δῆλον ὡς οὐκ ἐξ ὀχείας γίνονται, οὔτ᾽ ἐξ ἑκατέρου τοῦ γένους, αὐτοῦ αὑτῷ συνδυαζομένου, οὔτ᾽ ἐκ μελιττῶν καὶ κηφήνων. τό, τε τοῦτον φέρειν μόνον διά τε τὰ εἰρημένα ἀδύνατον, καὶ οὐκ εὔλογον μὴ περὶ πᾶν τὸ γένος αὐτῶν ὅμοιόν τι συμβαίνειν πάθος. ἀλλὰ μὴν οὐδ᾽ αὐτὰς τὰς μελίττας ἐνδέχεται τὰς μὲν ἄρρενας εἶναι, τὰς δὲ θηλείας.

* κ. τὰς δὲ θηλείας.

A alij deforis capiunt vt erucæ, & cæterorum nonnulli vermium. Sed quamobrem triplicem generationem hæc ſortiantur, & qua de cauſa ex motis immota reddantur, explicatum iam eſt. Oriuntur eorum alia per coitum, more auium & viuiparorum, & piſcium partis plurimæ: alia ſponte, modo nonnullarum plantarum.

CAPVT X.

De generatione, & ortu apum.

APum generatio magnam recipit ambiguitatem, & quæſtionem. Cùm enim in genere B piſcium talis quædam ſit generatio nonnullorum, vt ſine coitu generent, hoc idem in apibus etiam euenire videtur, quoad ſenſus ratióque apparens admoneat. Aut enim aliunde portare fœtum eas neceſſe eſt, vt quidam volunt, cúmque vel ſponte naſcentem, vel ab aliquo animali editum: aut ipſas generare: aut partim portare, partim generare. Nam id quoque aliqui dicunt, fucorúmque fœtum tantum portari opinantur. Item generare eas aut per coitum, aut ſine coitu, & per coitum generare, aut ſingula genera per ſe, aut quodlibet vnum cætera, aut aliud cum alio iunctum. Verbi gratia, apes ex apibus coeuntibus inter ſe gigni, fucos ex fucis, reges C ex regibus, aut cætera omnia ex vno, vt ex iis qui reges ac duces vocantur: aut ex fucis & apibus. Sunt enim qui fucos mares eſſe, apes fœminas arbitrentur: alij contrà, apes mares eſſe, fucos fœminas opinantur. Quæ omnia impoſſibilia ſunt ratiocinanti, partim ex iis quæ apibus priuatim eueniant, partim ex iis quę cum cæteris ſint animalibus communiora. Nam ſi non ipſę pariunt, ſed aliunde portant fœturam, oriri apes oportet etiam ſine vlla opera apum, ſcilicet eo loco, de quo ſemen portetur. Cur enim tranſlato ſemine oriantur, à manente ſuo loco non oriantur? prorſus oriri nihilominùs conuenit, ſiue ſponte in floribus ſemen id naſcitur, ſiue ab D aliquo editur animali: quanquam non apes, ſed illud animal gigni oportebit, quod ſemen generet. Ad hæc, mel portari ab apibus, rationis eſt: cibus eſt enim. At fœtum alienigenam deferre abſurdè credideris. Nam, cuius rei gratia, quęſo? quando omnis labor, qui prolis cauſa ſuſcipitur, in ea, quæ propria eſſe videtur, prole verſatur? Nec verò apes, fœminas eſſe; fucos, mares, ratio patitur. Arma enim ad pugnam, viréſque exercendas, nulli fœminæ à natura tribuuntur. Sunt autem fuci inermes: carent enim aculeo. Apes verò omnes aculeo armantur. Nec contrà dici ratione probabili poteſt, apes eſſe mares, fucos fœminas: mas enim nullus ſolet E in prole elaborare. Quod apes faciunt omnino, cùm fœtus fucorum gigni videatur, etiam cùm nullus eſt fucus: apum autem non gigni ſine regibus: & quidem ob eam rem fœtum fucorum tantùm portari aliqui putant. Conſtat non per coitum gigni vel ex alterutro genere ſecum coëunte, vel ex apibus & fucis. Portari etiam fœtum fucorum tantum cùm impoſſibile ſit, ob ea quæ modò diximus, tum ratio aſpernatur, vt in genere toto earum talis affectio non eueniat. Quinetiam fieri non poteſt vt ipſæ apes, partim mares partim fœminæ ſint.

In omnibus enim generibus mas à fœmina differt. Generarent etiam ſeipſæ. At nullus earum cernitur fœtus, niſi duces adſint, vt aiunt. Commune autem argumentum tam ad agendam viciſſim generationem, quàm ad eam quam fuci efficiant, & ſiue ſeorſum ſiue promiſcuè agi dicitur, quòd nullum eorum coire vnquam viſum eſt. At ſæpenumero eueniret, vt coitus cerneretur, ſi alterum mas, alterum fœmina in iis eſſet. Reliquum eſt vt ſi per coitum oriantur, reges coeuntes inter ſe generent. At fuci oriri viſuntur, etiam cùm nulli ſunt duces, quorum fœtum nec portare neque parere apes ſuo coitu poſſunt. Relinquitur itaque, vt, quod in piſcibus euenire videmus, apes ſine coitu fucos generent & fœminæ ſint, qua generant ratione: ſed habeant intra ſe, vt plantæ, ſexum maris, & fœminæ. Quamobrem iis datum eſt inſtrumentum ad pugnam. Nec fœmina appellandum eſt, in quo mas diſtinctus non eſt. Quòd ſi in fucis id euenire videtur, ortúſque eorum exiſtit ſine coitu, iam & apibus & regibus eandem ſeruari rationem neceſſe eſt, vt ſine coitu procreentur. Cæterùm ſi ſine regibus gigni fœtus apum videretur, apes etiam ſine coitu ex ſeſe generari neceſſe eſſet. Sed cùm hoc negent, qui in eorum animalium cura verſantur, relinquitur, vt reges & ſe generent, & apes. Itaque cùm ſingulari quadam peculiarique natura genus ſit apum, ortus quoque earum peculiaris meritò eſſe percipitur. Nam vt apes ſine coitu generent, minùs proprium eſt, cùm idem vel in aliis eueniat animalibus, quibus ne idem procreent genus, proprium eſt. Rubri enim generant rubros, & hiatulæ hiatulas. Cauſa eſt, quòd ipſæ generantur, non vt muſcæ, & reliqua id genus animalia, ſed ex diuerſo, tamen cognato genere prodeunt: ex ducibus enim oriuntur. Quamobrem proportio quodammodo in eorum generatione ſeruatur. Duces enim magnitudine fucis, aculeo apibus ſimiles ſunt. Apes igitur aculeo regibus aſſimilantur: fuci magnitudine. Aliquid enim diſcriminis ineſſe neceſſe eſt, niſi ſemper genus ex quouis idem gigni neceſſe ſit: quod impoſſibile eſt. Ita enim genus totum duces eſſent. Apes itaque viribus & pariendi facultate ſimiles ducibus ſunt: fuci magnitudine æmulantur. Quòd ſi aculeum quoque haberent, duces vtique eſſent. Sed nunc id ipſum ex propoſita quæſtione reſtat, & ſolutum iam eſt. Quæ enim ſuperiùs dicta ſunt, totam hanc ſoluunt quæſtionem: duces enim iidem ſimiles ſunt generi vtrique. Qua enim aculeum gerunt, apibus: qua magnitudine præſtant, fucis aſſimilantur. Sed duces etiam ipſos ab aliquo gigni neceſſe eſt. Itaque cùm nec ex apibus, neque ex fucis creentur, ipſos ſe etiam generare neceſſe eſt. Cellulæ eorum nouiſſimæ conſtruuntur, nec multæ numero. Itaque euenit vt duces generent & ſe ipſos, & aliud genus, quod apum eſt: apes aliud generent, id eſt, fucos: ipſi verò fuci non inſuper generent, ſed hoc ipſi priuentur. Cùm enim ſemper quod ſecundùm naturam eſt, ordinem habeat, ideo fucos ea quoque facultate priuari vt aliud generent, neceſſe eſt. Et quidem ita hoc euenire videmus. Ipſi enim generantur, nihil verò aliud generant, ſed in ternario numero finem generatio recipit. Atque adeò bene inſtitutũ eſt à natura vt ſemper hæc genera ſeruentur,

A ἐν πᾶσι γὰρ διαφέρει τοῖς γένεσι τὸ θῆλυ καὶ τὸ ἄῤῥεν· καὶ ἐγέννων αὐταὶ αὑτάς. νῦν δὲ οὐ φαίνεται γινόμενος ὁ γόνος αὐτῶν, ἂν μὴ ἐνῶσιν οἱ ἡγεμόνες, ὥς φασι. κοινὸν δὲ καὶ πρὸς τὴν ἐξ ἀλλήλων γένεσιν καὶ πρὸς τὴν ἐκ τῶν κηφήνων, καὶ χωρὶς καὶ μετ' ἀλλήλων, τὸ μηδέποτε ὦφθαι ὀχευόμενον μηδὲν αὐτῶν. εἰ δ' αὖ ἐν αὐταῖς τὸ μὲν θῆλυ, τὸ δ' ἄῤῥεν, πολλάκις ἂν τοῦτο συνέβαινε. λείπεται δ', εἴπερ ἐξ ὀχείας γίγνεται, τοὺς βασιλεῖς γεννᾶν συνδυαζομένους. ἀλλ' οἱ κηφῆνες φαίνονται γιγνόμενοι καὶ μὴ ἐνόντων ἡγεμόνων, ὧν οὔτε φέρειν οἷόν τε τὸν γόνον τὰς μελίττας, οὔτε γεννᾶν αὐτὰς ὀχευομένας. λείπεται δέ, καθάπερ B φαίνεται συμβαῖνον ἐπὶ τῶν ἰχθύων, τὰς μελίττας ἄνευ ὀχείας γεννᾶν τοὺς κηφῆνας, τῷ μὲν γεννᾶν, οὔσας θηλείας· ἐχούσας δ' ἐν αὑταῖς, ὥσπερ τὰ φυτά, τὸ θῆλυ καὶ τὸ ἄῤῥεν· διὸ καὶ πρὸς τὴν ἀλκὴν ἔχουσιν ὄργανον· οὐ γὰρ δεῖ θῆλυ καλεῖν, ἐν ᾧ μὴ ἄῤῥεν ἐστὶ κεχωρισμένον. εἰ δ' ἐπὶ τῶν κηφήνων τοῦτο φαίνεται συμβαῖνον, καὶ γιγνόμενοι μὴ ἐξ ὀχείας, ἤδη καὶ κατὰ τῶν μελιττῶν καὶ τῶν βασιλέων, τὸν αὐτὸν ἀναγκαῖον εἶναι λόγον, καὶ μὴ γεννᾶσθαι ἐξ ὀχείας. εἰ μὲν οὖν ἄνευ τῶν βασιλέων φαίνεται ἐγγινόμενος ὁ γόνος τῶν μελιττῶν, καὶ τὰς μελίττας ἀναγκαῖον ἦν ἐξ αὑτῶν ἄνευ ὀχείας γίγνεσθαι. νῦν δ' ἐπεὶ τοῦτο οὔ φασιν οἱ περὶ τὴν θεραπείαν τούτων τῶν ζώων ὄντες, λείπεται τοὺς C βασιλεῖς καὶ αὑτοὺς γεννᾶν καὶ τὰς μελίττας. ὄντος δὲ περιττοῦ τε γένους καὶ ἰδίου τῶν μελιττῶν, καὶ ἡ γένεσις αὐτῶν ἰδία [εἶναι] φαίνεται. τὸ μὲν γὰρ γεννᾶν τὰς μελίττας ἄνευ ὀχείας, εἴη μὲν ἂν καὶ ἐπ' ἄλλων ζώων συμβαῖνον, ἀλλὰ μὴ τὸ αὐτὸ γεννᾶν ἴδιον γένος. οἱ γὰρ * ἐρυθρῖνοι γεννῶσιν ἐρυθρίνους, καὶ αἱ χάνναι χάννας. αἴτιον δ', ὅτι καὶ αὗται γεννῶνται αἱ μέλιτται, οὐχ ὥσπερ αἱ μυῖαι καὶ τὰ τοιαῦτα τῶν ζώων, ἀλλ' ἐξ ἑτέρου μέν, συγγενοῦς δὲ γένους. γίγνονται γὰρ ἐκ τῶν ἡγεμόνων. διὸ καὶ ἔχει ἀνάλογόν πως ἡ γένεσις αὐτῶν. οἱ μὲν γὰρ ἡγεμόνες, μεγέθει μὲν ὅμοιοί εἰσι τοῖς κηφῆσι· τῷ δὲ κέντρον ἔχειν, ταῖς μελίτταις. αἱ μὲν οὖν D μέλιτται κατὰ τοῦτ' ἐοίκασιν αὐτοῖς, οἱ δὲ κηφῆνες κατὰ τὸ μέγεθος. ἀνάγκη γάρ τι παραλλάττειν, εἰ μὴ δεῖ ἀεὶ τὸ αὐτὸ γένος ἐξ ἑκάστου γίνεσθαι. τοῦτο δὲ ἀδύνατον. πᾶν γὰρ ἂν τὸ γένος, ἡγεμόνες ἦσαν. αἱ μὲν οὖν μέλιτται, κατὰ τὴν δύναμιν αὐτοῖς ὡμοίωνται καὶ τὸ τίκτειν· οἱ δὲ κηφῆνες, κατὰ τὸ μέγεθος. εἰ δ' εἶχον καὶ κέντρον, ἡγεμόνες ἂν ἦσαν. νῦν δὲ τοῦτο λείπεται τῆς ἀπορίας. οἱ γὰρ ἡγεμόνες ἀμφοτέροις ἐοίκασιν ἐν τῷ αὐτῷ τοῖς γένεσι· τῷ μὲν κέντρον ἔχειν, ταῖς μελίτταις· τῷ δὲ μεγέθει, τοῖς κηφῆσιν. ἀναγκαῖον δὲ καὶ τοὺς ἡγεμόνας γίνεσθαι ἔκ τινος. ἐπεὶ οὖν οὔτ' ἐκ τῶν μελιττῶν, οὔτ' ἐκ τῶν κηφήνων, αὐτοὺς ἀναγκαῖον καὶ αὑτοὺς γεννᾶν. γίγνονται E δ' ἐπὶ τέλει οἱ κύτταροι αὐτῶν, καὶ οὐ πολλοὶ τὸν ἀριθμόν. ὥστε συμβαίνει τοὺς μὲν ἡγεμόνας γεννᾶν μὲν καὶ αὑτούς, γεννᾶν δὲ καὶ ἄλλο τι γένος (τοῦτο δ' ἐστὶ τὸ τῶν μελιττῶν) τὰς δὲ μελίττας, ἄλλο μέν τι γεννᾶν τοὺς κηφῆνας, αὑτὰς δὲ μηκέτι γεννᾶν, ἀλλὰ τοῦτ' ἀφῃρῆσθαι αὐτῶν. ἐπεὶ δ' αἰεὶ τὸ κατὰ φύσιν ἔχει τάξιν, διὰ τοῦτο τῶν κηφήνων ἀναγκαῖον καὶ τὸ ἄλλο τι γένος γεννᾶν ἀφῃρῆσθαι· ὅπερ καὶ φαίνεται συμβαῖνον. αὐτοὶ μὲν γὰρ γίγνονται, ἄλλο δ' οὐδὲν γεννῶσιν· ἀλλ' ἐν τῷ τρίτῳ ἀριθμῷ πέρας ἔσχεν ἡ γένεσις· καὶ οὕτω δὴ συνέστηκε τῇ φύσει καλῶς· ὥστε αἰεὶ διαμένειν ὄντα τὰ γένη,

* [illegible]

καὶ οὐδὲν ἐλλείπειν, μὴ πάντων γεννώντων. εὐλόγως δὲ καὶ τοῦτο συμβαίνει, ἐν ταῖς εὐετηρίαις μὲν, μέλι καὶ κηφῆνας γίνεσθαι πολλούς· ἐν δὲ ταῖς ἐπομβρίαις, ὅλως γόνον πολύν. αἱ μὲν γὰρ ὑγρότητες περίττωμα ποιοῦσι πλεῖον ἐν τοῖς σώμασι τῶν ἡγεμόνων, αἱ δὲ εὐετηρίαι ἐν τοῖς τῶν μελιττῶν· ἔλαττον γὰρ ὂν τῷ μεγέθει, δεῖται τῆς εὐετηρίας μᾶλλον. εὖ δὲ καὶ τὸ τοὺς βασιλεῖς ὥσπερ πεποιημένους ἐπὶ τέκνωσιν, ἔσω μένειν, ἀφειμένους τῶν ἀναγκαίων ἔργων· καὶ μέγεθος δὲ ἔχειν, ὥσπερ ἐπὶ τεκνοποιίαν συστάντος τοῦ σώματος αὐτῶν· τούς τε κηφῆνας ἀργούς, ἅτ' οὐδὲν ἔχοντας ὅπλον πρὸς τὸ διαμάχεσθαι περὶ τῆς τροφῆς, καὶ διὰ τὴν βραδυτῆτα τοῦ σώματος. αἱ δὲ μέλιτται μέσαι τὸ μέγεθός εἰσιν ἀμφοῖν (χρήσιμοι γὰρ οὕτω πρὸς τὴν ἐργασίαν) καὶ ἐργάτιδες, ὡς καὶ τέκνα τρέφουσαι καὶ πατέρας. ὁμολογούμενον δ' ἐστὶ καὶ τὸ ἐπακολουθεῖν τοῖς βασιλεῦσι, τῷ τὴν γένεσιν ἐκ τούτων εἶναι τὴν τῶν μελιττῶν (εἰ γὰρ μηδὲν τοιοῦτον ὑπῆρχεν, οὐκ εἶχε λόγον τὰ συμβαίνοντα περὶ τὴν ἡγεμονίαν αὐτῶν) καὶ τοὺς μὲν ἐᾶν μηδὲν ἐργαζομένους, ὡς γονεῖς· τοὺς δὲ κηφῆνας κολάζειν, ὡς τέκνα. κάλλιον γὰρ τὰ τέκνα κολάζειν καὶ ὧν μηδὲν ἐστὶν ἔργον. τὸ δὲ τὰς μελίττας γεννᾶν πολλάς, αὐτοὺς ὄντας τοὺς ἡγεμόνας ὀλίγους, παραπλήσιον ἔοικε συμβαίνειν τῇ γενέσει τῶν λεόντων, οἳ τὸ πρῶτον πέντε γεννήσαντες, ὕστερον ἐλάττω γεννῶσι· καὶ τέλος, ἕν, εἶτ' οὐδέν. οἱ δ' ἡγεμόνες τὸ μὲν πρῶτον, πλῆθος· τὸ δ' ὕστερον, ὀλίγους αὐτούς· κἀκείνων μὲν ἐλάττω τὸν γόνον· αὐτῶν δ' ἐπεὶ τοῦ πλήθους ἀφείλετο, μέγεθος αὐτοῖς ἀπέδωκεν ἡ φύσις. ἐκ μὲν οὖν τοῦ λόγου, τὰ περὶ τὴν γένεσιν τῶν μελιττῶν, τοῦτον ἔχειν φαίνεται τὸν τρόπον, καὶ ἐκ τῶν νῦν δοκούντων συμβαίνειν περὶ αὐτάς· οὐ μὴν εἴληπταί γε τὰ συμβαίνοντα ἱκανῶς, ἀλλ' ἐάν ποτε ληφθῇ, τότε τῇ αἰσθήσει μᾶλλον ἢ τοῖς λόγοις πιστευτέον· καὶ τοῖς λόγοις, ἐὰν ὁμολογούμενα δεικνύωσι τοῖς φαινομένοις. πρὸς δὲ τὸ μὴ ἐξ ὀχείας γίνεσθαι, σημεῖον καὶ τὸ τὸν γόνον φαίνεσθαι μικρὸν ἐν τοῖς τοῦ κηρίου κυτταρίοις. ὅσα δ' ἐξ ὀχείας τῶν ἐντόμων γεννᾶται, συνδυάζεται μὲν πλείω χρόνον, τίκτει δὲ ταχέως, καὶ μέγεθος ἔχον σκωληκοειδές. περὶ δὲ τὴν γένεσιν τῶν συγγενῶν ζῴων, οἷον ἀνθρηνῶν τε καὶ σφηκῶν, τρόπον τινὰ ἔχει παραπλησίως πᾶσιν· ἀφῄρηται δὲ τὸ περιττὸν εὐλόγως. οὐ γὰρ ἔχουσιν οὐδὲν θεῖον, ὥσπερ τὸ γένος τὸ τῶν μελιττῶν. γεννῶσι μὲν γὰρ αἱ μῆτραι καλούμεναι, καὶ τὰ πρῶτα συμπλάττουσι τῶν κηρίων. ὀχευόμεναι δὲ γεννῶσιν ὑπ' ἀλλήλων. ὦπται γὰρ πολλάκις ὁ συνδυασμὸς αὐτῶν. πόσας δ' ἔχουσι διαφοράς, ἢ πρὸς ἄλληλα τῶν γενῶν ἕκαστον, ἢ πρὸς τὰς μελίττας, ἐκ τῶν περὶ τὰς ἱστορίας ἀναγεγραμμένων δεῖ θεωρεῖν. καὶ περὶ μὲν τῶν ἐντόμων τῆς γενέσεως εἴρηται πάντων.

ΚΕΦΑΛ. ια'.

Περὶ τῆς τῶν ὀστρακοδέρμων καὶ ὀστρέων γενέσεως καὶ αὐξήσεως.

Περὶ δὲ τῶν ὀστρακοδέρμων λεκτέον. ἔχει γὰρ καὶ τούτων τὰ περὶ τὴν γένεσιν, τῇ μὲν ὁμοίως, τῇ δ' οὐχ ὁμοίως τοῖς ἄλλοις. καὶ τοῦτο εὐλόγως συμβαίνει. πρὸς μὲν τὰ ζῷα, φυτοῖς ἐοίκασι. πρὸς δὲ τὰ φυτά, ζῴοις· ὥστε

A & nullum deficiat, quanquam non omnia generent. Ratione illud etiam euenit, vt annis proſperis copia mellis proueniat, & fucorum; imbribus verò crebris fœtus omnino ſuperet. Humor enim facit plus excrementi in corporibus ducum. Anni verò temperies facit hoc idem in apibus. Cùm enim corpore ſint minore, temperiem magis deſiderant. Rectè etiam reges manent immunes omni negotio neceſſario, quaſi nati ad ſobolis procreationem. Magnitudine item præſtant, quaſi ad prolem generandam corpus eorum ſit inſtitutum. Conuenit & fucos otioſos inertéſque eſſe, cùm nulla habeant arma, B quibus de cibo poſſint dimicare. Cúmque pigritia tarditatéque corporis degenerent, apes medium inter reges & fucos tenent. Ita enim vtiles ad negotia, officioſæque operariæ eſſe poſſunt, vtque & filios alant, & parentes. Quin & ſequi ſuos reges, vt faciunt, conſentaneum eſt rationi, qua generationem apum à regibus proficiſci ſtatuimus. (Nam niſi tale quid eſſet, ratione carerent ea quæ aguntur in earum imperio.) Atque etiam regibus concedere nihil laboris ſuſcipere, vt parentibus: fucos verò caſtigare, vt filios. Iuſtiùs enim filij caſtigantur, & quorum negotium nullum eſt. Apes autem multas à ducibus ipſis pau- C cis generari, ſimile videtur leonum generationi: qui cùm primum quinque numero genuerint, mox pauciores generant, poſtremóque vnum, tum deinde nullum. Nam & apum duces primùm multitudinem generant, mox ſeſe paucos, atque illarum fœtum minorem, ſuum verò auctiorem. Quod enim eorum numero natura ademerat, id magnitudini addidit. Generatio apum ita ſe habere videtur, tum ratione, tum etiam iis quę in earum genere euenire viſuntur. Non tamen ſatis adhuc explorata quæ eueniant, habemus. Quòd ſi quando ſatis cognita habebuntur, tunc ſenſui magis erit quàm rationi credendum. Rationi etiam fides adhibenda eſt, ſi, quæ demonſtrantur, conue- D niunt cum iis quæ ſenſu percipiuntur, rebus. Apes ſine coitu generare argumento illud etiam eſt, quòd fœtus exiguus admodum in cellulis faui cernitur, cùm inſecta, quæ, per coitum oriuntur, coëant diu, pariant breui, magnitudine ad ſpeciem vermis. Quod ad generationem cognatorum iis animalium pertinet, vt crabronum veſparúmque, ſimilis quodam modo ratio eſt: ſed defuit his locuples naturæ dotatio meritò. Nihil enim, vt apum genus, habent diuinitatis. Generant quippe matrices vocatæ, primóſque fauos confingunt. Generatione verò coeundo inter ſe funguntur. Viſus eſt enim ſæpe eorum coitus. Sed quotnam differentiis hæc genera aut inter ſe diſſideant, aut cum apibus, petendum eſt ex iis quæ per hiſtorias explicauimus. Atque de generatione inſectorum omnium dictum iam eſt.

CAPVT XI.

De generatione, & ortu teſtatorum animantium, quomodóque nonnulla plantarum generationi contigua ſint: déque teſtatorum incremento.

SEquitur vt de teſtatis diſſeramus. Generatio eorum quoque partim ſimilis, partim diſſimilis cæteris eſt. Idque euenit ratione: quippe cùm animalium comparatione, plantis; plantarum, animalibus aſſimulentur, ita, vt

ſemine gigni quodammodo velvt animalia videãtur: vt alio modo, non ſemine, & tum ſponte, tum ex ſe: aut alia ſponte, alia ex ſe oriri. Sed quoniam naturam proportione plantis reſpondentem hoc genus habeat, hinc teſta intectum, aut nullum in terra gignitur, aut paruum: quale genus limacum eſt, & ſi quid eiuſmodi aliud ſit, ſed rarum. At in mari, ſimilique humore multa & varia gignuntur. Genus plantarum contrà mari locisque huiuſcemodi paruum, & nullum ferè: in terra autem hæc omnia oriuntur. Habent enim naturam proportionalem, atque diſiunctam. Sed quanto vitalius humidum, quàm ſiccum, & aqua quàm terra, eſt, tanto natura teſtatorum, quàm plantarum, viuacior eſt. Nam aliàs eò quidem ſpectant, vt ſicvt plantæ ad terram, ſic teſtata ad humorem ſe habeant, quaſi plantæ oſtrea terrena, oſtrea plantæ aquatiles ſint. Hinc etiam fit vt multiformiora ſint, quæ in humore gignuntur, quàm quæ in terra. Humor enim naturam habet ad effingendum afformandúmque habiliorem, quàm terra: nec multo minùs corpulentam ea quæ potiſſimùm in mari habentur. Humor enim potulentus dulcis quidem, alumnúſque eſt. Sed tum minùs corpulentus, tum frigidus eſt. Quamobrem quæ ſanguine carent, nec natura calida ſunt, ea naſci in lacu non poſſunt: minùs etiam in ſalſis aquis, quæ ſint potulentiores, gignuntur, vt teſtata, vt mollia, vt cruſtata. Hæc enim omnia ſanguine vacant, & natura frigida ſunt. Sed ſtagnis marinis, & iuxta amnium oſtia gigni ſolent. Quærunt enim vnà teporem, & alimentum. Mare autem humidum, multóque corpulentius aqua potulenta eſt, atque etiam ſua natura calidum eſt, vt particeps omnium partium ſit, videlicet humoris, aëris, terræ. Itaque omnia adipiſcuntur, quæ ſingulis his locis gignuntur. Plantas enim terræ *incolas* quiſpiam eſſe ſtatuerit: aquæ, aquatile animalium genus: aëris, pedeſtre. ſed quòd magis minúſve, & remotiùs aut propiùs res conſtet, magna miráque differentia exiſtit. Quartum genus non his locis quærendum eſt, quanquã aliquid eſſe exigit ordine ignis. Id enim quartum corpus enumeratur. Verùm ignis ſemper formam non propriam habere videtur, ſed in alio corpore. Aut enim aër, aut fumus, aut terra eſſe videtur quod ignitum eſt. Sed enim genus hoc apud Lunam quærendum eſt. hæc enim quartam illam diſtantiam adipiſci videtur. Sed de his aliàs. Natura teſtati generis conſiſtit, partim ſponte, partim aliqua ab ipſis emiſſa facultate: quanquam ſæpenumero ea quoque ſpontina oriantur conſtitutione. Sed generationes plantarum accepiſſe hóc loco congruit. Oriuntur enim earum aliæ ſemine, aliæ auulſione, nonnullæ etiam ſobole, vt cæpe. Hoc igitur tertio modo mituli gignuntur: quippe qui minores ſubinde iuxta principium adnaſcuntur. Buccina, & purpuræ, & quæ fauatæ dicuntur, quaſi à ſeminali natura humores quoſdam mucoſos emittunt. Semen verò nullum eſſe eorũ putandum eſt, ſed quo diximus modo, plantis aſſimilantur. Quãobrem larga eorum copia prouenit, cùm primùm conſtiterit aliquid. Hæc enim omnia vel ſponte vt oriantur, euenit. Itaque ratione tunc magis, cùm origo præceſſerit, conſiſtunt. Aliquid enim excrementi ſingulis proficiſci credendum meritò eſt ab eo principio, cui ſoboles quæque adnaſcitur.

A Ἔστιν μὲν τινά, ἀπὸ σπέρματος φαίνεσθαι γινόμενα, ἔστιν δὲ ἄλλον οὐκ ἀπὸ σπέρματος· καὶ τῇ μὲν, αὐτόματα· τῇ δ', ὑφ' αὐτῶν ἢ τὰ μὲν οὕτως, τὰ δ' ἐκείνως. διὰ δὲ τὸ τοῖς φυτοῖς ἀντίστροφον ἔχειν τὴν φύσιν, διὰ τοῦτο ἐν μὲν τῇ γῇ τῶν ὀστρακοδέρμων οὐδὲν, ἢ μικρὸν γένος, οἷον τὸ τῶν κοχλιῶν, κἂν ἤ τι τοιοῦτον ἕτερον μὲν, σπάνιον δέ· ἐν δὲ τῇ θαλάττῃ καὶ τοῖς ὁμοίοις ὑγροῖς, πολλὰ καὶ παντοδαπὴν ἔχοντα μορφήν. τὸ δὲ τῶν φυτῶν γένος, ἐν μὲν τῇ θαλάττῃ καὶ τοῖς τοιούτοις, μικρὸν καὶ πάμπαν (ὡς εἰπεῖν) οὐδέν· ἐν δὲ τῇ γῇ τὰ τοιαῦτα γίγνεται πάντα. τὴν γὰρ φύσιν ἀνάλογον ἔχει καὶ διέστηκεν. ὅσῳ δὲ ζω- B τικώτερον τὸ ὑγρὸν τοῦ ξηροῦ, καὶ γῆς ὕδωρ, τοσούτῳ ἡ τῶν ὀστρακοδέρμων φύσις τῆς τῶν φυτῶν· ἐπεὶ βούλεταί γε ὡς τὰ φυτὰ πρὸς τὴν γῆν, οὕτως ἔχειν τὰ ὀστρακόδερμα πρὸς τὸ ὑγρόν· ὡς ὄντα τὰ μὲν φυτά, ὡσπερανεὶ ὄστρεα χερσαῖα· τὰ δὲ ὄστρεα, ὡσπερανεὶ φυτὰ ἔνυδρα. διὰ τοιαύτην δ' αἰτίαν καὶ πολύμορφα τὰ ἐν τῷ ὑγρῷ μᾶλλόν ἐστι τῶν ἐν τῇ γῇ· τό, τε γὰρ ὑγρὸν εὐπλαστοτέραν ἔχει τὴν φύσιν τῆς γῆς καὶ σωματικήν. οὐ πολλῷ δ' ἧττον καὶ μάλιστα ἐν τῇ θαλάττῃ ταῦτα. τὸ μὲν γὰρ πότιμον, γλυκὺ μὲν καὶ τρόφιμον, ἧττον δὲ σωματῶδες, καὶ ψυχρόν ἐστι. διόπερ ὅσα ἄναιμα καὶ μὴ θερμὰ τὴν φύ- C σιν, οὐ γίνονται ἐν ταῖς λίμναις, οὐδὲ τῶν ἁλμυρῶν ἐν τοῖς ποτιμωτέροις, ἀλλ' ἧττον οἷον τὰ ὀστρακόδερμα, καὶ τὰ μαλάκια, καὶ τὰ μαλακόστρακα (πάντα γὰρ ἄναιμα καὶ ψυχρὰ ταῦτα τὴν φύσιν ἐστίν) ἐν δὲ ταῖς λιμνοθαλάτταις καὶ πρὸς ταῖς ἐκβολαῖς τῶν ποταμῶν γίνονται. ζητοῦσι γὰρ ἅμα τήν τε ἀλέαν καὶ τὴν τροφήν. ἡ δὲ θάλασσα ὑγρά τε καὶ σωματώδης πολλῷ μᾶλλον τοῦ ποτίμου, καὶ θερμὴ τὴν φύσιν ἐστί, καὶ κεκοινώνηκε πάντων τῶν μορίων, ὑγροῦ, καὶ πνεύματος, καὶ γῆς· ὥστε καὶ πάντων μετέχειν τῶν καθ' ἕκαστα γινομένων ἐν τοῖς τόποις τῶν ζώων. τὰ μὲν γὰρ φυτά, θείη τις ἂν γῆς· ὕδατος δὲ, τὰ ἔνυδρα· τὰ δὲ πεζά, ἀέρος. τὸ δὲ μᾶλλον καὶ ἧττον, καὶ ἐγ- D γύτερον καὶ πορρώτερον, πολλὴν ποιεῖ καὶ θαυμαστὴν διαφοράν. τὸ δὲ τέταρτον γένος οὐκ ἐπὶ τούτων δεῖ ζητεῖν (καίτοι βούλεταί γέ τι κατὰ τὴν τοῦ πυρὸς εἶναι τάξιν· τοῦτο γὰρ καὶ τέταρτον ἀριθμεῖται τῶν σωμάτων. ἀλλὰ τὸ μὲν πῦρ ἀεὶ φαίνεται, τὴν μορφὴν οὐκ ἰδίαν ἔχον, ἀλλ' ἐν ἑτέρῳ τῶν σωμάτων. ἢ γὰρ ἀὴρ ἢ καπνός, ἢ γῆ φαίνεται τὸ πεπυρωμένον) ἀλλὰ δεῖ τὸ τοιοῦτον γένος ζητεῖν ἐπὶ τῆς σελήνης. αὕτη γὰρ φαίνεται κοινωνοῦσα τῆς τετάρτης ἀποστάσεως. ἀλλὰ περὶ τούτων ἄλλος ἂν εἴη λόγος. ἡ δὲ τῶν ὀστρακοδέρμων συνίσταται φύσις, τῶν μὲν αὐτομάτως, ἐνίων δὲ προϊεμένων τινὰ δύναμιν ἀπ' αὐτῶν· πολλάκις δὲ γινομένων καὶ τούτων ἀπὸ συστάσεως αὐτομάτης. E δεῖ δὲ λαβεῖν τὰς γενέσεις τὰς τῶν φυτῶν. τούτων γὰρ γίνονται τὰ μὲν ἐκ σπέρματος, τὰ δ' ἀπὸ ἀποσπασμάτων ἀποφυτευομένων· ἔνια δὲ τῷ παραβλαστάνειν, οἷον τὸ τῶν κρομμύων γένος. τοῦτον μὲν οὖν οἱ μύες γίνονται τὸν τρόπον. παραφύονται γὰρ ἐλάττους ἀεὶ παρὰ τὴν ἀρχήν. κήρυκες δὲ καὶ πορφύραι καὶ τὰ λεγόμενα κηριάζειν, οἷον ἀπὸ σπερματικῆς φύσεως προΐενται μυξώδεις ὑγρότητας. σπέρμα δ' οὐδὲν τούτων δεῖ νομίζειν, ἀλλὰ κατὰ τὸν εἰρημένον τρόπον μετέχειν τῆς ὁμοιότητος τοῖς φυτοῖς. διὸ καὶ γίνεται πλῆθος τῶν τοιούτων, ὅταν ἅπαξ γένηταί τι. πάντα μὲν γὰρ καὶ αὐτόματα ταῦτα συμβαίνει γίνεσθαι, κατὰ λόγον δὲ καὶ προϋπαρξάντων συνίστασθαι μᾶλλον. παραγίγνεσθαι γάρ τι περίττωμα πρὸς ἑκάστῳ τῆς ἀρχῆς εὔλογον, ἀφ' ἧς παραβλαστάνει τῶν παραφυομένων ἕκαστον.

ἐπεὶ δὲ παραπλησίαν ἔχει τὴν δύναμιν ἡ τροφὴ καὶ τὸ ταύτης περίττωμα, τὴν κηριαζόντων ὁμοίαν εἰκὸς εἶναι τῇ ἐξ ἀρχῆς συστάσει οὐσίαν. διόπερ εὔλογον καὶ ἐκ ταύτης γίνεσθαι. ὅσα δὲ μὴ παραβλαστάνει, μηδὲ κηριάζει, τούτων ἡ γένεσις αὐτόματός ἐστι. πάντα δὲ τὰ συνιστάμενα τὸν τρόπον τοῦτον, καὶ ἐν γῇ καὶ ἐν ὑγρῷ διαφαίνεται γινόμενα μετὰ σήψεως, καὶ μιγνυμένου τοῦ ὀμβρίου ὕδατος. ἀποκρινομένου γὰρ τοῦ γλυκέος εἰς τὴν συνισταμένην ἀρχήν, τὸ περιττεῦον τοιαύτην λαμβάνει μορφήν. γίνεται δ' οὐθὲν σηπόμενον, ἀλλὰ πεττόμενον. ἡ δὲ σῆψις καὶ τὸ σαπρόν, περίττωμα τοῦ πεφθέντος ἐστίν. οὐδὲν γὰρ ἐκ παντὸς γίνεται, καθάπερ οὐδ' ἐν τοῖς ὑπὸ τῆς τέχνης δημιουργουμένοις. οὐδὲν γὰρ ἂν ἔδει ποιεῖν. νῦν δὲ τὸ μὲν ἡ τέχνη τῶν ἀχρήστων ἀφαιρεῖ· τὸ δέ, ἡ φύσις. γίνεται δ' ἐν γῇ καὶ ὑγρῷ τὰ ζῷα καὶ τὰ φυτά, διὰ τὸ ἐν γῇ μὲν ὕδωρ ὑπάρχειν, ἐν δ' ὕδατι πνεῦμα, ἐν δὲ τῷ παντὶ θερμότητα ψυχικήν· ὥστε τρόπον τινὰ πάντα ψυχῆς εἶναι πλήρη. διὸ συνίσταται ταχέως, ὁπόταν ἐμπεριληφθῇ. ἐμπεριλαμβάνεται δὲ καὶ γίνεται, θερμαινομένων τῶν σωματικῶν ὑγρῶν, οἷον ἀφρώδης πομφόλυξ.* ἡ μὲν οὖν διαφορὰ τοῦ τιμιώτερον εἶναι τὸ γένος καὶ ἀτιμότερον τὸ συνιστάμενον, ἐν τῇ περιλήψει τῆς ψυχικῆς ἀρχῆς ἐστί. τούτου δὲ καὶ οἱ τόποι αἴτιοι, καὶ τὸ σῶμα τὸ περιλαμβανόμενον. ἐν δὲ τῇ θαλάττῃ πολὺ τὸ γεῶδές ἐστι. διόπερ ἐκ τῆς τοιαύτης συστάσεως ἡ τῶν ὀστρακοδέρμων γίνεται φύσις, κύκλῳ μὲν τοῦ γεώδους σκληρυνομένου καὶ πηγνυμένου τὴν αὐτὴν πῆξιν τοῖς ὀστοῖς καὶ τοῖς κέρασι (πυρὶ γὰρ ἄτηκτα ταῦτ' ἐστίν) ἐντὸς δὲ περιλαμβανομένου τοῦ τὴν ζωὴν ἔχοντος σώματος. μόνον δὲ τῶν τοιούτων, συνδυαζόμενον ἑώραται τὸ τῶν κοχλιῶν γένος. εἰ δ' ἐκ τοῦ συνδυασμοῦ ἡ γένεσις αὐτῶν ἐστιν, ἢ μή, οὔπω ὦπται ἱκανῶς. ζητήσειε δ' ἄν τις βουλόμενος ὀρθῶς ζητεῖν, τί τὸ κατὰ τὴν ὑλικὴν ἀρχὴν συνιστάμενόν ἐστιν ἐν τοῖς τοιούτοις. ἐν μὲν γὰρ τοῖς θήλεσι, περίττωμά τι τοῦ ζῴου τοῦτ' ἐστίν, ὃ ἡ παρὰ τοῦ ἄρρενος ἀρχὴ κινοῦσα δυνάμει τοιοῦτον ὄν, οἷον ἀφ' οὗπερ * ἦλθεν, ἀποτελεῖ τὸ ζῷον. ἐνταῦθα δὲ * τί λέγειν τὸ τοιοῦτον, καὶ πόθεν, καὶ τίς ἡ κινοῦσα ἀρχὴ ἡ κατὰ τὸ ἄρρεν; δεῖ δὴ λαβεῖν ὅτι καὶ ἐν τοῖς ζῴοις τοῖς γεννῶσιν, ἐκ τῆς εἰσιούσης τροφῆς ἡ ἐν τῷ ζῴῳ θερμότης ἀποκρίνουσα καὶ συμπέττουσα ποιεῖ τὸ περίττωμα, τὴν ἀρχὴν τοῦ κυήματος. ὁμοίως δὲ καὶ ἐν φυτοῖς· πλὴν ἐν μὲν τούτοις καὶ ἔν τισι τῶν ζῴων, οὐδὲν προσδεῖται τῆς τοῦ ἄρρενος ἀρχῆς. ἔχει γὰρ ἐν αὐτοῖς μεμιγμένην. τὸ δὲ τῶν πλείστων ζῴων περίττωμα προσδεῖται. τροφὴ δ' ἐστὶ τοῖς μέν, ὕδωρ καὶ γῆ· τοῖς δέ, τὰ ἐκ τούτων. ὥσθ' ὅπερ ἡ ἐν τοῖς ζῴοις θερμότης ἐκ τῆς τροφῆς ἀπεργάζεται, τοῦθ' ἡ τῆς ὥρας ἐν τῷ περιέχοντι θερμότης, ἐκ θαλάττης καὶ γῆς συγκρίνει πέττουσα καὶ συνίστησι. τὸ δ' ἐναπολαμβανόμενον ἢ ἀποκρινόμενον ἐν τῷ πνεύματι τῆς ψυχικῆς ἀρχῆς, κύημα ποιεῖ καὶ κίνησιν ἐντίθησιν. ἡ μὲν οὖν τῶν φυτῶν τῶν ἀπὸ ταὐτομάτου γινομένων σύστασις, ὁμοειδής ἐστιν. ἔκ τινος γὰρ μορίου γίνεται· καὶ τὸ μὲν ἀρχή, τὸ δὲ τροφὴ γίνεται ἡ πρώτη τοῖς ἐκφυομένοις. τὰ δὲ τῶν ζῴων σκωληκοτοκεῖται τά τε τῶν ἀναίμων· οἷον γένος τι κεστρέων, καὶ ἄλλων ποταμίων ἰχθύων· ἔτι δὲ τὸ τῶν ἐγχέλεων γένος,

* κ. αἱ μὲν οὖν διαφοραί

* κ. περιῆλθεν,
* Scrib. τί δεῖ λέγειν.

A Sed cùm ſimilem habeant facultatem cibus excrementúmque cibi, fauantium ſubſtantiam ſimilem eſſe conſtitutioni primæ conſentaneum eſt: quapropter excremento hoc gigni probabile eſt. Quæ autem vel ſobolem nullam procreant vel non fauant, eorum omnium ortus ſpontaneus eſt. Omnia verò, quæ hoc modo conſiſtunt, aut in terra aut in aqua cum putredine gigni videntur, & imbre admiſſo. Cùm enim dulce in principium conſtituendum ſecernitur, quod ſupereſt talem accipit formam. Nihil autem gignitur putreſcens, ſed concoctum. Putredo verò, & putridum excrementum rei concoctæ eſt. Nihil enim ex toto efficitur, quomodo neque in iis quæ ab
B arte conduntur. Nam niſi ita eſſet, facere non requireretur. Sed quantum inutile eſt, id aut à natura, aut ab arte detrahitur. Generantur autem in terra humoréque animalia, & plantæ, quoniam humor in terra, ſpiritus in humore, calor animalis in vniuerſo ineſt, ita vt quodam modo plena ſint animæ omnia. Quamobrem conſiſtunt celeriter, cùm calor ille comprehenſus ſiue exceptus eſt. Comprehenditur autem, & humoribus corporeis incaleſcentibus efficitur velut bulla ſpumoſa. Sed differentia nobilioris ignobilioriſve generis conſtituendi in comprehenſione principij animalis eſt. Huius autem rei cauſam, & loca habent, &
C corpus, quod comprehenditur. In mari verò multum portionis terrenæ eſt. Quocirca ex tali concretione natura teſtati generis oritur, ita vt pars terrena circiter dureſcat, cogatúrque eodem modo, quo oſſa, & cornua, (ſunt enim hæc illiquabilia igne) corpus intus contineatur, quod vitam obtinet. Vnum ex his genus cochlearum coire perſpectum eſt. Sed an ortus earum per coitum ſit, nécne, nondum exploratum ſatis habetur. Sed enim *quæret* quiſpiam rectè, quidnam in his ſit, *quod ſecundùm materiale principium* conſiſtat: nam in fœminis excrementum quoddam animalis hoc eſt, quod principium genitale à mare profectum mouens potentia ta-
D le, quale id eſt de quo venit, animal efficit. At in his, quidnam hoc eſſe dicendum ſit, & vnde, & quod principium genitale ſecundùm marem? Ponendum igitur, in animalibus generantibus, calorem in animali contentum, ſecernendo ex cibo ingeſto, & concoquendo facere excrementum quod conceptus principium ſit. Nec ſecus in plantis, niſi quod in iis, & quibuſdam animalibus, nihilo maris principium deſideratur. Habent enim hoc intra ſe miſtum. At plurimorum animalium excrementum illo principio eget. Alimentum autem aliis aqua, aliis terra, aliis quod ex iis conſtet. Itaque quod calor in ani-
E malibus contentus ex alimento efficit, hoc temporis calor in aëre ambiente contentus, ex mari aut terra concernit concoquens, atque conſtituit. Quod autem comprehenditur exceptum in ſpiritu animali, id conceptum facit, motúmque imponit. Conſtitutio igitur plantarum, quæ ſponte oriuntur, ſimilis eſt. Quædam enim ex parte contrahitur, & alterum eius partis principium genitale, alterum alimentum fit primùm iis quæ oriuntur. At verò animalia quædam verme naſcuntur, tum exanguia, quæ non ab animalibus gignuntur, tum etiam ſanguinea, vt mugilum genus quoddam, & aliorum fluuiatilium piſcium: ad hæc, anguillarum genus.

A Hæc enim omnia, quamuis naturam parum ſanguineam habeant, tamen ſanguinea ſunt, & cor obtinent: quod principium ſanguinarium corporis eſt. Quæ autem inteſtina terræ vocantur, vermis habent naturam, in quibus corpus anguillarum conſiſtit. Quamobrem de prima hominum atque quadrupedum generatione, ſi quando primùm terrigenæ oriebantur, vt aliqui dicunt, non temere exiſtimaueris altero de duobus his modo oriri. Aut enim ex verme conſtituto primùm, aut ex ouo: quippe cùm aut intra ſe habeant cibum ad incrementum neceſſe ſit, qui quidem conceptus vermis eſt: aut aliunde accipere, idque aut ex parente, aut ex parte conceptus. Itaque ſi alterum fieri non poteſt, vt affluat ex terra, quomodo cæteris animalibus ex parente, relinquitur neceſſariò, vt ex parte conceptus recipiatur. Talem autem generationem eſſe ex ouo aut verme fatemur. Ergo ſi initium vllum generationis omnium animalium fuit, alterutrum de his fuiſſe probabile eſſe apertum eſt. Sed minus rationis eſt, vt ex ouo prodierint: nullius enim generationem animalem talem videmus, ſed alteram tum ſanguineorum, quæ diximus: tum exanguium, qualia ſunt inſectorum nonnulla, & ea quæ teſta operiuntur, de quibus agitur. Non enim ex parte aliqua oriuntur, vt ea quæ ouo naſcuntur. Incrementum etiam ſimiliter, vt vermes, capeſſunt. Vermes enim augentur in partem ſuperiorem, & qua principium continetur. Alimentum enim ſuperius ab inferioribus miniſtratur. Atque id quidem commune cum iis quæ ex ouo proueniunt, habetur: ſed illa totam materiam abſumunt. In iis verò quæ ex verme gignuntur, cùm ex conſtitutione in parte inferiore contenta pars ſuperior creuerit, mox & reliquo alimento inferiore articulatur. Cuius rei cauſa eſt, quòd cibus poſtea quoque in parte ſepto ſubiecta conficitur omnibus. Incrementum autem hoc modo fieri vermium, apertum in apibus cæteriſque ſimilibus eſt. Principio enim partem inferiorem magnam, ſuperiorem habent minorem. Idem augeſcendi modus in teſtatis etiam eſt. Quod & ipſum conſtat in genere turbinato, ſcilicet anfractibus eius, qui ſubinde accreſcentes plures efficiuntur in partem priorem quod caput vocatur. Dixi ferè quemadmodum generatio, tum eorum tum cæterorum ſponte orientium agitur. Omne autem genus teſtatum ſponte inſtitui, apertum hinc eſt, quòd nauigiis putreſcente fæce ſpumoſa adnaſcuntur, & locis multis, vbi nihil tale aderat antè, pòſt per inopiam humoris facto cœno oſtreæ prouenerunt: vt apud Rhodum inſulam, cùm claſſis applicuiſſet, & fictilia proiecta eſſent in mare, tempore pòſt cœno obducto teſtis oſtreæ in iis reperiebantur. Nihil autem partis genitalis emitti ab iis argumentum eſt, quòd cùm Chij quidam ex Pyrrha Lesbi inſulæ oſtreas viuas portaſſent, & in loca quædam maris reciproci æſtus, & luto ſimilia dimiſiſſent, plures nihilo fuere temporis ſpatio, quanquam incremento corporis plurimum profecerunt. Quæ autem oua appellantur, nihil ad generationem conferunt, ſed indicio ſunt nutricationis melioris, quale in ſanguineis pingue eſt. Quamobrem ſapore per id tempus præſtant, ciboque laudantur: argumento, quòd & pinnæ, & buccina,

A ἅπαντα γὰρ ταῦτα, καίπερ ὀλίγαιμον ἔχοντα τὴν φύσιν, ὅμως ἔναιμά ἐστι, καὶ καρδίαν ἔχουσι τὴν ἀρχὴν τῶν μορίων, αἱματικήν. τὰ δὲ καλούμενα γῆς ἔντερα, σκώληκος ἔχει φύσιν, ἐν οἷς ἐγγίνεται τὸ σῶμα τὸ τῶν ἐγχέλεων. διὸ καὶ περὶ τῆς τῶν ἀνθρώπων καὶ τετραπόδων γενέσεως ὑπολάβοι τις ἄν, εἴπερ ἐγίγνοντό ποτε γηγενεῖς, ὥσπερ φασί τινες, δύο τρόπων γίνεσθαι τὸν ἕτερον. ἢ γὰρ ὡς σκώληκος συνισταμένου τὸ πρῶτον, ἢ ἐξ ᾠῶν. ἀναγκαῖον γὰρ ἢ ἐν αὑτοῖς ἔχειν τὴν τροφὴν ἐπὶ τὴν αὔξησιν, (τὸ δὲ τοιοῦτον κύημα σκώληξ ἐστίν) ἢ λαμβάνειν ἄλλοθεν. τοῦτο δὲ, ἢ ἐκ τῆς γεννώσης, ἢ ἐκ τοῦ μορίου τοῦ κυήματος. ὥστ' B εἰ θάτερον ἀδύνατον ἐπιρρεῖν ἐκ τῆς γῆς, ὥσπερ ἐν τοῖς ἄλλοις ζῴοις ἐκ τῆς μητρός, ἀναγκαῖον ἐκ μορίου λαμβάνειν τοῦ κυήματος. τὴν δὲ τοιαύτην ἐξ ᾠοῦ λέγομεν εἶναι γένεσιν. ὅτι μὲν οὖν εἴπερ ἦν τις ἀρχὴ τῆς γενέσεως πᾶσι τοῖς ζῴοις, εὔλογον δυεῖν τούτων εἶναι τὴν ἑτέραν, φανερόν. ἧττον δ' ἔχει λόγον ἐκ τῶν ᾠῶν. οὐθενὸς γὰρ τοιαύτην ὁρῶμεν ζῴου γένεσιν, ἀλλὰ τὴν ἑτέραν, καὶ τῶν ἐναίμων τῶν ῥηθέντων, καὶ τῶν ἀναίμων. τοιαῦτα δ' ἐστὶ τῶν ἐντόμων ἔνια, καὶ τὰ ὀστρακόδερμα, περὶ ὧν ὁ λόγος. οὐδὲ γάρ ἐκ μορίου γίνονταί τινος, ὥσπερ τὰ ᾠοτοκούμενα. γίνεται δὲ καὶ τὴν αὔξησιν ὁμοίως τοῖς σκώληξιν. ἐπὶ τὰ ἄνω γὰρ καὶ τὴν C ἀρχὴν αὔξονται οἱ σκώληκες. ἐν τῷ κάτω γὰρ ἡ τροφὴ τοῖς ἄνω. καὶ τοῦτό γε ὁμοίως ἔχει τοῖς ἐκ τῶν ᾠῶν. πλὴν ἐκεῖνα μὲν, καταναλίσκει· ἐν δὲ τοῖς σκωληκοτοκουμένοις, ὅταν αὐξηθῇ ἐκ τῆς ἐν τῷ κάτω μορίῳ συστάσεως τὸ ἄνω μόριον, οὕτως ἐκ τοῦ ὑπολοίπου καταρθροῦται τὸ κάτωθεν. αἴτιον δ', ὅτι καὶ ὕστερον ἡ τροφὴ ἐν τῷ μορίῳ τῷ ὑπὸ τὸ ὑπόζωμα γίνεται πᾶσιν. ὅτι δὲ τοῦτον τὸν τρόπον ποιεῖται τὰ σκωληκώδη τὴν αὔξησιν, φανερὸν ἐκ τῶν μελιττῶν, καὶ τῶν τοιούτων. κατ' ἀρχὰς γὰρ τὸ μὲν κάτω μόριον, μέγα ἔχουσι· τὸ δὲ ἄνω, ἔλαττον. καὶ ἐπὶ τῶν ὀστρακοδέρμων δὲ τὸν αὐτὸν τρόπον ἔχει τὰ περὶ τὴν αὔξησιν. φανερὸν δ' ἐστὶ καὶ τοῦτ' ἐπὶ τῶν στρομβωδῶν, ταῖς ἕλιξιν. D ἀεὶ γὰρ αὐξανομένων, γίνονται πλείους ἐπὶ τὸ πρόσθιον καὶ τὴν καλουμένην κεφαλήν. ὃν μὲν οὖν ἔχει τρόπον ἡ γένεσις καὶ ἐπὶ τούτων καὶ τῶν ἄλλων τῶν αὐτομάτων, εἴρηται σχεδόν. ὅτι δὲ συνίσταται αὐτόματα πάντα τὰ ὀστρακόδερμα, φανερὸν ἐκ τῶν τοιούτων, ὅτι πρός τε τοῖς πλοίοις γίνεται σηπομένης τῆς ἀφρώδους ἰλύος· καὶ πολλαχοῦ, οὗ πρότερον οὐθὲν ὑπῆρχε τοιοῦτον, ὕστερον δι' ἔνδειαν ὑγροῦ τοῦ τόπου βορβορωθέντος, ἐγένετο τὰ καλούμενα λιμνόστρεα τῶν ὀστρακηρῶν, οἷον περὶ Ῥόδον παραβαλόντος ναυτικοῦ στόλου, καὶ ἐμβληθέντων κεραμίων εἰς τὴν θάλασσαν, χρόνου γιγνομένου, καὶ βορβόρου περὶ αὐτὰ συναλισθέντος, ὄστρεα εὑρίσκονται ἐν αὐτοῖς. ὅτι δ' οὐθὲν ἀφίησι τὰ τοιαῦτα ἀπ' αὐτῶν γεννητικόν, τεκμήριον. ἐπεὶ γὰρ Χῖοί τινες E ἐκ Πύρρας τῆς ἐν Λέσβῳ, τῶν ὀστρέων διεκόμισαν ζῶντα, καὶ εἰς τόπους τῆς θαλάττης τινὰς εὐριπώδεις[*] καὶ ὁμοίους ἀφίεσαν, πλείω μὲν τῷ χρόνῳ οὐθὲν ἐγένετο, τὸ δὲ μέγεθος εἰς αὔξησιν ἀπέδωκε πολύ. τὰ δὲ λεγόμενα ᾠὰ οὐθὲν συμβάλλεται πρὸς τὴν γένεσιν, ἀλλ' ἔστιν εὐτροφίας σημεῖον, οἷον ἐν τοῖς ἐναίμοις ἡ πιότης. διὸ καὶ πρὸς τὴν ἐδωδὴν γίνεται εὔχυμα κατὰ τοὺς καιροὺς τούτους. σημεῖον δ', ὅτι τὰ τοιαῦτα ἀεὶ ἔχουσιν, οἷον αἵ τε πίνναι, καὶ οἱ κήρυκες,

* Gaza, εὐριπώδεις καὶ βορβορώδεις

καὶ αἱ πορφύραι· πλεῖον ὁτὲ μὲν, μεῖζον ὁτὲ δ', ἐλάττω. ἔνια δὲ καὶ οὐκ ἀεὶ, ἀλλὰ τὸν μὲν ἔαρος ἔχουσι. προβαινούσης δὲ φθίνει τῆς ὥρας, καὶ τέλος ἀφανίζεται πάμπαν· οἷον οἵ τε κτένες, καὶ οἱ μύες, καὶ τὰ καλούμενα λιμνόστρεα· ἡ γὰρ ὥρα αὕτη συμφέρει τοῖς σώμασιν αὐτῶν. τοῖς δὲ συμβαίνει τοιοῦτον οὐδὲν ἐπίδηλον, οἷον τοῖς * τηθύοις. τὰ δὲ καθ' ἕκαστα τούτων, καὶ ἐν οἷς γίνονται τόποις, ἐκ τῆς ἱστορίας θεωρείσθω.

* γρ. τηθύαις.

A & purpuræ continent quidem ſemper ouum illud vocatum, ſed aliâs maius, aliâs minus. Sunt etiam quæ non ſemper, ſed vêre id habeant. Mox enim tempore procedente minuitur, demumque totum abolctur, vt pectines, mituli, oſtrea. Tempus hoc enim prodeſt eorum corporibus. Aliis nihil tale apertè venit, vt callis. Sed ſingula eorum, & quibuſnam oriantur locis, petere ex hiſtoria debes.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζώων γενέσεως τὸ Δ.

ΚΕΦΑΛ. α'.

Περὶ τῆς γενέσεως τῶν ἀρρένων καὶ τῶν θηλέων, καὶ διὰ τίνα αἰτίαν γίνεται τὸ μὲν ἄρρεν, τὸ δὲ θῆλυ. πρότερον δὲ ἀνασκευάσας τὰ ὑπὸ τῶν ἀρχαίων περὶ τούτου εἰρημένα, οὕτως αὐτὸς τὸ αὐτῷ δοκοῦν ἀποφαίνεται.

ΠΕΡΙ μὲν οὖν [τῆς] γενέσεως τῆς τῶν ζώων, εἴρηται καὶ κοινῇ καὶ χωρὶς περὶ πάντων. ἐπεὶ δ' ἐν τοῖς τελειοτάτοις αὐτῶν ἐστὶ τὸ θῆλυ καὶ τὸ ἄρρεν κεχωρισμένον, καὶ ταύτας τὰς δυνάμεις ἀρχὰς εἶναι φαμὲν πάντων καὶ ζώων καὶ φυτῶν· ἀλλὰ τὰ μὲν αὐτὰς ἀχωρίστους ἔχει, τὰ δὲ κεχωρισμένας· λεκτέον περὶ τῆς γενέσεως τῆς τούτων πρῶτον. ἔτι γὰρ ἀτελῶν ὄντων ἐν τῷ γένει, διακρίνεται τὸ θῆλυ καὶ τὸ ἄρρεν. πότερον δὲ καὶ πρὶν δήλην τὴν διαφορὰν εἶναι πρὸς τὴν αἴσθησιν ἡμῶν, τὸ μὲν θῆλυ, τὸ δ' ἄρρεν ἐστὶν, ἢ ἐν τῇ μητρὶ λαβόντα τὴν διαφορὰν, ἢ πρότερον, ἀμφισβητεῖται. φασὶ γὰρ οἱ μὲν, ἐν τοῖς σπέρμασιν εἶναι ταύτην τὴν ἐναντίωσιν εὐθύς· οἷον Ἀναξαγόρας καὶ ἔνιοι τῶν φυσιολόγων. γίνεσθαί τε γὰρ ἐκ τοῦ ἄρρενος τὸ σπέρμα, τὸ δὲ θῆλυ παρέχειν τὸν τόπον. καὶ εἶναι τὸ μὲν ἄρρεν, ἐκ τῶν δεξιῶν· τὸ δὲ θῆλυ, ἐκ τῶν ἀριστερῶν. καὶ τῆς ὑστέρας, τὰ μὲν ἄρρενα, ἐν τοῖς δεξιοῖς εἶναι· τὰ δὲ θήλεα, ἐν τοῖς ἀριστεροῖς. οἱ δ', ἐν τῇ μήτρᾳ, καθάπερ * Ἐμπεδοκλῆς. τὰ μὲν γὰρ εἰς θερμὴν ἐλθόντα τὴν ὑστέραν, ἄρρενα γίνεσθαί φησι· τὰ δ' εἰς ψυχρὰν, θήλεα. τῆς δὲ θερμότητος καὶ [τῆς] ψυχρότητος, τὴν τῶν καταμηνίων αἰτίαν εἶναι ῥύσιν, ἢ ψυχροτέραν [οὖσαν] ἢ θερμοτέραν, καὶ παλαιοτέραν ἢ * προσφατωτέραν. Δημόκριτος δὲ ὁ Ἀβδηρίτης, ἐν μὲν τῇ μητρὶ γίνεσθαί φησι τὴν διαφορὰν τοῦ θήλεος καὶ τοῦ ἄρρενος. οὐ μέντοι διὰ θερμότητά γε καὶ ψυχρότητα, τὸ μὲν γίνεσθαι θῆλυ, τὸ δ' ἄρρεν· ἀλλ' ὁποτέρου ἂν κρατήσῃ τὸ σπέρμα τὸ ἀπὸ τοῦ μορίου ἐλθὸν, ᾧ διαφέρουσιν ἀλλήλων τὸ θῆλυ καὶ τὸ ἄρρεν. τοῦτο γὰρ ὡς ἀληθῶς Ἐμπεδοκλῆς ῥαθυμότερον ὑπείληφεν, οἰόμενος ψυχρότητι καὶ θερμότητι διαφέρειν μόνον [ἀλλήλων,] ὁρῶν ὅλα τὰ μόρια μεγάλην ἔχοντα διαφορὰν, τά τε τῶν αἰδοίων καὶ τὰς ὑστέρας. εἰ γὰρ πεπλασμένων τῶν ζώων, τοῦ μὲν, τὰ μόρια ἔχοντος τὰ τοῦ θήλεος * πάντα, τοῦ δὲ, τὰ τοῦ ἄρρενος, καθάπερ εἰς κάμινον ἐπὶ τὴν ὑστέραν τεθείη, τὸ μὲν ἔχον ὑστέραν, εἰς θερμὴν, τὸ δὲ μὴ ἔχον, εἰς ψυχρὰν· ἔσται θῆλυ, τὸ οὐκ ἔχον ὑστέραν· καὶ ἄρρεν, τὸ ἔχον. τοῦτο δὲ ἀδύνατον. ὥστε ταύτῃ γε βέλτιον ἂν λέγοι Δημόκριτος.

* Sup. li. 1. c. 18.

* γρ. προσφάτου.

* Scrib. καθ' ὑπ-

B

ARISTOTELIS STAGIRITÆ DE ANIMALIVM GENERATIONE Liber quartus.

CAPVT I.

Democritum, Empedoclem, & nonnullos alios non rectè de maris & fœmina generatione ſenſiſſe.

C DE generatione animalium omniũ, tum vniuerſim tum ſingulatim dictum iam eſt. Sed cùm in eorum perfectiſſimis mas & fœmina diſtinctè habeantur, eáſque facultates, omnium animalium & plantarum eſſe principia fateamur, quanquam in aliis indiſcretas, in aliis diſcretas, diſſerendum hic eſt primò de eorũ ipſorum generatione. Imperfectis enim adhuc ſuo in genere diſtinguitur ſexus maris & fœminæ. Sed vtrũ priùs etiam quã hæc differentia ſenſu noſtro percipi poſſit, alterum mas, alterum fœmina ſit, diſcrimine facto in vtero, an pòſt, ambigitur. Alij enim protinus in ſe-D minibus hanc eſſe contrarietatem aiunt, vt Anaxagoras, & alij naturales authores. Etenim ſemen gigni ex mare, fœminam autem locum præbere: marem, à parte dextra; fœminam, ſiniſtra, proficiſci: & vteri latere dextro marem contineri; fœminam, ſiniſtro. Alij verò matri id adſcribunt, vt Empedocles. Quæ enim vterum ſubierint calidum, hæc effici mares arbitratur: quæ frigidum, fœminas. Caliditatis verò frigiditatiſve cauſam eſſe confluuium menſtruorum, quòd frigidius vel calidius ſit, & aut antiquius aut recentius. Democritus Abderites differentiam maris ac fœminæ fieri quidem in E matre ait, ſed non caliditate frigiditatéve, alterum effici marem, alterum fœminam: ſed vtrius tandem ſemen euicerit, quod ab ea prodiiſſet parte, qua mas & fœmina inter ſe differunt. Hoc enim Empedocles profectò negligentiùs opinatus eſt, vt caliditate frigiditatéque tantùm differre hęc inter ſe exiſtimaret, cùm partes ipſas genitaleſ & vterum magnam habere differentiam cerneret. Nam ſi poſteaquam formata ſunt animalia, alterum, partibus fœminæ omnibus; alterum, maris, conſtitutum, mox in vtero, tanquàm fornace, ponantur, quod vterum habet, in calido, quod non habet, in frigido: erit fœmina, quod vtero caret; mas, quod vterum habet. Quæ res impoſſibilis eſt. Itaque catenus quidem meliùs à Democrito dicitur.

Quærit enim ille differentiam huius generationis, & reddere conatur: ſed an bene nécne, id aliò pertinet. Tum etiam ſi caliditas & frigiditas cauſæ ſint, vt partes hæ differant, hoc explicare debuerunt, qui ita volunt. Hoc enim ferè eſt docere de generatione maris ac fœminæ. His enim partibus planè differunt. Nec parum negotij eſt, cauſam generationis earum partium ab illo principio ducere, cùm neceſſe ſit ita ſequi, vt ſi animal refrigeratur, pars efficiatur ea quam vterum appellâmus: ſi caleſcit, non hæc efficiatur. Eodémque modo de iis partibus quæ ad coitum accommodantur. Nam eæ differunt inter ſe, vt antè expoſitum eſt. Ad hæc ſæpenumero euenit vt eadem in parte vteri, gemini mas & fœmina generentur: idque ſatis inſpeximus in diſſectionibus animalium viuiparorum, tum pedeſtrium, tum etiam piſcium. Quæ ſi non ille conſpexerat, meritò errabat, cùm eam adferret cauſam. Sed ſi cùm hæc explorata habuiſſet, ita ſenſit, abſurdum ſanè eſt, quòd inſuper putarit cauſam vteri eſſe caliditatem aut frigiditatem. Ambo enim ſemper aut mares aut fœminæ efficerentur: quod non ita euenire videmus. Item cùm partes eius quod gignitur, diſcerptas eſſe fateatur, (partim enim in mare partim in fœmina eſſe putat, ideóque alterum coire cum altero concupiſcere) magnitudinem earum quoque partium eſſe diuiſam, velléque coniungi neceſſe eſt, non refrigeratione calefactionéve ita inſtitui. Sed ſeminis huiuſmodi cauſæ complura fortaſſe obiici poſſunt: modus enim hic cauſæ figmento ſimilis eſt omnino. Cæterùm ſi ratio ſeminis ita ſe habet, vt explicatum à nobis eſt, & neque ex omni corporis parte decedit, neque materiam vllam iis quæ gignuntur, præbet, quod proficiſcitur à mare, iam & ei, & Democrito, & ſi quis alius ita cenſet, occurrendum ſimili modo eſt. Nec enim diſcerptum eſſe poteſt ſeminis corpus, vt partim in fœmina ſit, partim in mare, vt Empedocles cenſet, cùm dicat,

Sed diſcerpta gerunt, mas ipſe & fœmina membra:

neque totum ipſum ex vtroque decedens, quia pars aliqua partem aliam vicerit, ideo efficitur mas, aut fœmina, quanquam omnino meliùs partis exuperantia fœminam aut marem effici dixerit, quàm per incuriam calori aut frigori tantùm cauſam tribuat. Sed cur formam etiam genitalis diuerſam eſſe vnà eueniat, cauſa reddenda eſt, vt hæc ſemper viciſſim conſequantur. Nam ſi quoniam iuxta ſunt, ita fit, reliquæ etiam quæque partes conſequi debuerunt: ſunt enim inter eas, quæ ſuperant, aliæ aliis propinquæ. Itaque ſimul & fœmina eſſet, & matri ſimile: aut mas, & ſimile patri. Abſurdum etiam tantùm eas effici partes oportere, nec totum corpus mutari exiſtimare, & præcipuè, primóque venas, quibus, velvti deſcriptione deductis, corpus adiacet carnium, quas ſuam recipere qualitatem propter vterum, nulla probabili ratione dici poteſt: ſed potiùs vterum propter eas ſuam recipere qualitatem ratio eſt. Quanquam enim vtrumque ſanguinis conceptaculum eſt, tamen venæ ſunt priùs. Principium autem mouens prius eſſe ſemper, & cauſam generationis aliqua ſui qualitate neceſſe eſt. Accidit igitur differentia earum partium inter ſe fœminæ & mari. Nec id eſſe principium, neque cauſam eſſe hanc arbitrandum,

A ζητεῖ γὰρ ταύτης τῆς γενέσεως τὴν διαφορὰν, καὶ πειρᾶται λέγειν. εἰ δὲ καλῶς ἢ μὴ καλῶς, ἕτερος λόγος. ἀλλὰ μὴν, κἂν ᾖ τῶν μορίων τῆς διαφορᾶς αἴτιον ἡ θερμότης καὶ ἡ ψυχρότης, τοῦτο λεκτέον τοῖς ἐκείνως λέγουσι. τοῦτο γάρ ἐστιν (ὡς εἰπεῖν) τὸ λέγειν περὶ γενέσεως ἄρρενος καὶ θήλεος. τούτῳ γὰρ διαφέρει φανερῶς. οὐ μικρὸν δέ τι ἔργον τὸ ἀπ' ἐκείνης τῆς ἀρχῆς περὶ τῆς γενέσεως τούτων τῶν μορίων τὴν αἰτίαν συναγαγεῖν· ὡς ἀναγκαῖον ἀκολουθεῖν ψυχομένῳ μὲν τῷ ζῴῳ τοῦτο γίνεσθαι τὸ μόριον, ἣν καλοῦσιν ὑστέραν· θερμαινομένου δὲ, μὴ γίνεσθαι. τὸν αὐτὸν δὲ τρόπον καὶ περὶ τῶν εἰς τὴν ὁμιλίαν συντελούντων μορίων. καὶ B γὰρ ταῦτα διαφέρει, καθάπερ εἴρηται πρότερον. ἔτι καὶ γίνεται δίδυμα θῆλυ καὶ ἄρρεν, ἅμα ἐν τῷ αὐτῷ μορίῳ πολλάκις τῆς ὑστέρας· καὶ τοῦθ' ἱκανῶς τεθεωρήκαμεν ἐκ τῶν ἀνατομῶν ἐν πᾶσι τοῖς ζῳοτοκουμένοις, καὶ ἐν τοῖς πεζοῖς, καὶ ἐν τοῖς ἰχθύσι· περὶ ὧν εἰ μὴ συνεωράκει, εὐλόγως ἂν ἡμάρτανε, ταύτην τὴν αἰτίαν εἰπών. εἰ δὲ ἑωρακὼς, ἄτοπόν τι, τὸ ἔτι νομίζειν αἰτίαν εἶναι τὴν τῆς ὑστέρας θερμότητα ἢ ψυχρότητα. ἄμφω γὰρ ἂν ἐγίνετο ἢ θήλεα, ἢ ἄρρενα. νῦν δὲ τοῦτο οὐχ ὁρῶμεν συμβαῖνον. λέγοντί τε τὰ μόρια διεσπάσθαι τοῦ γινομένου· (τὰ μὲν γὰρ, ἐν τῷ ἄρρενί φησιν εἶναι· τὰ δ', ἐν τῷ θήλει· διὸ καὶ τῆς ἀλλήλων ὁμιλίας ἐπιθυμεῖν) ἀναγκαῖον καὶ τῶν τοιούτων διῃρῆσθαι τὸ μέC γεθος, καὶ γίνεσθαι σύνοδον· ἀλλ' οὐ διὰ ψύξιν ἢ θερμασίαν. ἀλλὰ περὶ μὲν τῆς τοιαύτης αἰτίας τοῦ σπέρματος, τάχα ἂν εἴη πολλὰ λέγειν. ὅλως γὰρ ἔοικεν ὁ τρόπος τῆς αἰτίας πλασματώδης εἶναι. εἰ δ' ἐστὶ περὶ σπέρματος οὕτως ἔχον, ὥσπερ τυγχάνομεν εἰρηκότες, καὶ μήτε ἀπὸ παντὸς ἀπέρχεται, μήθ' ὅλως τὸ ἀπὸ τοῦ ἄρρενος παρέχει τοῖς γινομένοις ὕλην μηδεμίαν, καὶ πρὸς τοῦτον καὶ πρὸς Δημόκριτον, καὶ εἴ τις ἄλλος οὕτω τυγχάνει λέγων,* οὕτως ἀπαντητέον. οὔτε γὰρ διεσπασμένον ἐνδέχεται τὸ σῶμα τοῦ σπέρματος εἶναι, τὸ μὲν ἐν τῷ θήλει, τὸ δ' ἐν τῷ ἄρρενι, καθάπερ Ἐμπεδοκλῆς φησιν, εἰπών, * χειμῶνας αὐτῷ

D Ἀλλὰ διέσπασται μελέων φύσις· ἡ μὲν, ἐν ἀνδρὸς,
ἡ δ', ἐν γυναικός·

οὔτ' ἐξ ἑκατέρου πᾶν ἀποκρινόμενον, τῷ κρατῆσαί τι μέρος, ἄλλου μέρους γίνεσθαι τὸ μὲν θῆλυ, τὸ δὲ ἄρρεν. ὅλως δέ τό γε τὴν τοῦ μέρους ὑπεροχὴν κρατήσασαν ποιεῖν θῆλυ, βέλτιον μὲν, ἢ μηθὲν φροντίσαντα, τὸ θερμὸν αἰτιᾶσθαι μόνον. τῷ μέντοι συμβαίνειν ἅμα καὶ τὴν τοῦ αἰδοίου μορφὴν ἑτέραν, διὰ λόγου πρὸς τὸ συνακολουθεῖν ἀεὶ ταῦτα ἀλλήλοις. εἰ γὰρ ὅτι σύνεγγυς, καὶ τῶν λοιπῶν ἕκαστον ἔδει μορίων ἀκολουθεῖν. ἕτερον γὰρ ἑτέρου ἐγγὺς τῶν νικώντων. ὥστε ἅμα θῆλύ τε ἂν ἦν, καὶ τῇ μητρὶ ἐοικός· ἢ ἄρρεν, καὶ τῷ E πατρί. ἔτι ἄτοπον καὶ τὸ μόνον ταῦτ' οἴεσθαι δεῖν γίνεσθαι τὰ μόρια, καὶ μὴ τὸ σύνολον μεταβεβληκέναι σῶμα, καὶ μάλιστα καὶ πρῶτον τὰς φλέβας, περὶ ἃς ὡς περὶ ὑπογραφὴν τὸ σῶμα περίκειται τὸ τῶν σαρκῶν. ἃς οὐ διὰ τὴν ὑστέραν εὔλογον γενέσθαι ποιάς τινας, ἀλλὰ μᾶλλον δι' ἐκείνας τὴν ὑστέραν. ὑποδοχὴ γὰρ αἵματός τινος ἑκάτερον· προτέρα δ' ἡ τῶν φλεβῶν. τὴν δὲ κινοῦσαν ἀρχὴν, ἀναγκαῖον ἀεὶ προτέραν εἶναι, καὶ τῆς γενέσεως αἰτίαν, τῷ ποιὰ εἶναί τινα. συμβαίνει μὲν οὖν ἡ διαφορὰ τῶν μερῶν τούτων πρὸς ἄλληλα τοῖς θήλεσι καὶ τοῖς ἄρρεσιν· ἀλλ' οὐκ ἀρχὴν οἰητέον, οὐδ' αἰτίαν εἶναι ταύτην,

ἀλλ' ἑτέραν, κἂν εἰ μηδὲν ἀποκρίνηται σπέρμα, μήτε ἀπὸ τοῦ θήλεος, μήτε ἀπὸ τοῦ ἄρρενος, ἀλλ' ὅπως δή ποτε συνίσταται τὸ σπέρμα τὸ γιγνόμενον. ὁ δ' αὐτὸς λόγος καὶ πρὸς τοὺς λέγοντας, τὸ μὲν ἄρρεν, ἀπὸ τῶν δεξιῶν εἶναι· τὸ δὲ θῆλυ, ἀπὸ τῶν ἀριστερῶν· ὥσπερ καὶ πρὸς Ἐμπεδοκλέα καὶ πρὸς Δημόκριτον. εἴτε γὰρ μηδεμίαν ὕλην συμβάλλεται τὸ ἄρρεν, οὐθὲν ἂν λέγοιεν οἱ λέγοντες οὕτως· εἴτε καὶ συμβάλλεται, καθάπερ φασίν, ὁμοίως ἀναγκαῖον ἀπαντᾶν καὶ πρὸς τὸν Ἐμπεδοκλέους λόγον, ὃς διορίζει τὸ θῆλυ πρὸς τὸ ἄρρεν θερμότητι καὶ ψυχρότητι τῆς ὑστέρας. οἱ δὲ τὸ αὐτὸ τοῦτο ποιοῦσι, τοῖς δεξιοῖς καὶ τοῖς ἀριστεροῖς ὁρίζοντες, ὁρῶντες διαφέροντα τὸ θῆλυ καὶ τὸ ἄρρεν καὶ μορίοις ὅλοις. διὰ τίνα οὖν αἰτίαν ὑπάρξει τοῖς ἐκ τῶν ἀριστερῶν, τοῖς δ' ἐκ τῶν δεξιῶν οὐχ ὑπάρξει τὸ σῶμα τὸ τῆς ὑστέρας; ἂν γὰρ ἔλθῃ μὲν, μὴ σχῇ δὲ τοῦτο τὸ μόριον, ἔσται θῆλυ οὐκ ἔχον ὑστέραν, καὶ ἄρρεν ἔχον, ἂν τύχῃ. ἔτι δὲ, ὥσπερ εἴρηται καὶ πρότερον, ὦπται καὶ θῆλυ ἐν τῷ δεξιῷ μέρει τῆς ὑστέρας, καὶ ἄρρεν ἐν τῷ ἀριστερῷ, καὶ ἄμφω ἐν τῷ αὐτῷ μέρει· καὶ τοῦτ' οὐχ ὅτι ἅπαξ, ἀλλὰ πλεονάκις, ἢ τὸ ἄρρεν μὲν ἐν τοῖς δεξιοῖς, τὸ δὲ θῆλυ ἐν τοῖς ἀριστεροῖς. οὐχ ἧττον δὲ ἀμφότερα γίνεται ἐν τοῖς δεξιοῖς. παραπλησίως δέ τινες πεπεισμένοι τούτοις εἰσὶ καὶ λέγουσιν, ὡς τὸν δεξιὸν ὄρχιν ἀποδουμένοις ἢ τὸν ἀριστερὸν, συμβαίνει τοῖς ὀχεύουσιν ἀρρενοτοκεῖν ἢ θηλυτοκεῖν. οὕτω γὰρ καὶ Λεωφάνης ἔλεγεν. ἐπί τε τῶν ἐκτεμνομένων τὸν ἕτερον ὄρχιν, τὸ αὐτὸ τοῦτο συμβαίνειν τινές φασιν οὐκ ἀληθῆ λέγοντες, ἀλλὰ μαντευόμενοι τὸ συμβησόμενον ἐκ τῶν εἰκότων, καὶ προλαμβάνοντες, ὡς οὕτως ἔχον, πρὶν γινόμενον οὕτως ἰδεῖν. ἔτι δ' ἀγνοοῦντες, ὡς οὐδὲν συμβάλλεται πρὸς τὴν γένεσιν τῆς ἀρρενογονίας καὶ θηλυγονίας, τὰ μόρια ταῦτα τοῖς ζῴοις. τούτου δὲ σημεῖον, ὅτι πολλὰ τῶν ζῴων, ταῦτά τε καὶ θήλεα καὶ ἄρρενά ἐστι, καὶ γεννᾷ τὰ μὲν, θήλεα, τὰ δ', ἄρρενα, ὄρχεις οὐκ ἔχοντα, καθάπερ τὰ μὴ ἔχοντα πόδας· οἷον τό, τε τῶν ἰχθύων γένος, καὶ τὸ τῶν ὄφεων. τὸ μὲν οὖν θερμότητα καὶ ψυχρότητα αἴτιον οἴεσθαι τοῦ ἄρρενος καὶ τοῦ θήλεος, καὶ τὸ τὴν ἀπόκρισιν ἀπὸ τῶν δεξιῶν γίνεσθαι, ἢ τῶν ἀριστερῶν, ἔχει τινὰ λόγον. θερμότερα γὰρ τὰ δεξιὰ τοῦ σώματος, τῶν ἀριστερῶν· καὶ τὸ σπέρμα τὸ πεπεμμένον, θερμότερον. τοιοῦτον δὲ τὸ συνεστώς. γονιμώτερον δὲ τὸ συνεστὼς μᾶλλον. ἀλλὰ λίαν τὸ λέγειν οὕτω, πόρρωθέν ἐστιν ἅπτεσθαι τῆς αἰτίας. δεῖ δὲ ὅτι μάλιστα προσάγειν ἐκ τῶν ἐνδεχομένων ἐγγὺς τῶν πρώτων αἰτίων. περὶ μὲν οὖν ὅλου τε τοῦ σώματος καὶ τῶν μορίων, τί τε ἕκαστόν ἐστι, καὶ διὰ τίνα αἰτίαν, εἴρηται πρότερον ἐν ἑτέροις. ἀλλ' ἐπεὶ τὸ ἄρρεν καὶ τὸ θῆλυ διώρισται δυνάμει τινὶ καὶ ἀδυναμίᾳ, (τὸ μὲν γὰρ δυνάμενον πέττειν καὶ συνιστάναι τε καὶ ἐκκρίνειν σπέρμα ἔχον τὴν ἀρχὴν τοῦ εἴδους, ἄρρεν. λέγω δὲ ἀρχὴν, οὐ τοιαύτην, ἐξ ἧς ὥσπερ ὕλης γίνεται τοιοῦτον, οἷον τὸ γεννῶν, ἀλλὰ τὴν κινοῦσαν πρώτην, ἐάν τ' ἐν αὐτῷ, ἐάν τ' ἐν ἄλλῳ τοῦτο δύνηται ποιεῖν. τὸ δὲ δεχόμενον μὲν, ἀδυνατοῦν δὲ συνιστάναι καὶ ἐκκρίνειν, θῆλυ) ἔτι εἰ πᾶσα πέψις ἐργάζεται θερμῷ, ἀνάγκη καὶ τῶν ζῴων τὰ ἄρρενα τῶν θηλέων θερμότερα εἶναι. διὰ γὰρ ψυχρότητα καὶ ἀδυναμίαν, πολυαιμεῖ κατὰ τόπους τινὰς τὸ θῆλυ μᾶλλον· καὶ ἔστιν αὐτὸ τοὐναντίον σημεῖον, ἢ δι' ἥνπερ αἰτίαν οἴονταί τινες τὸ θῆλυ θερμότερον εἶναι τοῦ ἄρρενος, διὰ τὴν τῶν καταμηνίων πρόεσιν.

A ſed aliam, etiam ſi nullum ſemen vel à mare vel à fœmina decedit, ſed quolibet modo conſiſtit, quod gignitur. Quin etiam contra eos qui marem à dextra, fœminam à læua parte proficiſci aiũt, eadem ratio ſufficit, quæ contra Empedoclem & Democritum. Siue enim nulla materia à mare affertur, ſiue aliqua affertur, vt quidam volunt, nihil dicunt qui ita cenſent. Necnon Empedoclis ſententiæ pari ratione occurrendum eſt, qui marem à fœmina diſtinguit caliditate vteri, & frigiditate. Quod illi etiam faciunt, qui dextris ſiniſtriſque rationem deſcribunt, quanquam videant marem & fœminam inter ſe differre, & parte, & toto. Sed cur ſiniſtris corpus vteri adiungatur,
B dextris nequaquam? Nam ſi fœtus eò venerit, nec eam ipſam habuerit partem, fœmina erit ſine vtero, & mas erit cum vtero, ſi ita fors tulerit. Item, vt antè retulimus, & fœmina parte vteri dextra contineri viſa eſt, & mas læua: & ambo eadem in parte, idque non ſemel, ſed ſæpius quàm aut mas in dextra, aut fœmina in læua, nec minùs ambo in dextra gignuntur. Atque etiam cùm gemini, mas & fœmina geſtarentur, marem in læua, fœminam in dextra contineri, perſpectum eſt. Proximè quia aliqui perſuaſi dicunt, teſte præligato dextro, aut ſiniſtro, euenire per coitum, vt mas aut fœmina generetur: ſic enim & Leophanes dicebat. Tum etiam excĩſis
C alterum teſtem, hoc idem accidere quidam aiunt, non verè: ſed rem coniectantur futuram ex conſentaneis, atque anticipant, quaſi ita ſit, priùs quàm ita fieri videant. Ignorant etiam, nihil ad generationem maris aut fœminæ conferri ab iis partibus. Cuius rei indicium, quòd multa animalia & ipſa mares ac fœminæ ſunt, & generant partim fœminas, partim mares, cùm tamen teſtes non habeant: velvt ea quæ pedibus carent: *Verbi gratia, genus piſcium & ſerpentum.* Cauſam verò maris & fœminæ, caliditatem frigiditatémve arbitrari, ſecernique de dextris aut de ſiniſtris, non ſine vlla ratione dici poteſt. Sunt enim partes corporis dextræ calidiores ſiniſtris, &
D ſemen concoctum calidius eſt, quale id quod ſpiſſum eſt, fœcundius autem quod ſpiſſius eſt. Sed valde à longè tangitur cauſa, cùm ita affertur. Accedendum autem ſemper ad rei cauſas primas, quoad maximè fieri poteſt, propiùs. De corpore igitur toto, & de partibus, quid quęque ſit, & qua de cauſa, iam antè explicatum alibi eſt. Sed cùm mas & fœmina potentia quadam & impotentia definiantur (quod enim poteſt concoquere, & conſtituere, & ſecernere ſemen, atque principium obtinet formæ, id mas eſt. Principium autem non hoc dico, ex quo vt materia tale gignitur, quale, quod generat, eſt: ſed id quod primum moueat, ſiue in ſe ipſo, ſiue in altero poſſit hoc facere: quod autem recipit, nec poteſt conſtituere, & ſecernere, id fœmina eſt.) Item,
E ſi omnis concoctio calore efficitur, mares quàm fœminas, eſſe calidiores neceſſe eſt. Ob frigiditatem enim & impotentiam fœmina ſanguine abundat quibuſdam ſui corporis locis. Idque indicium facit contra quam aliqui afferunt cauſam, cùm fœminam eſſe mare calidiorem opinentur, ob menſtruorum emiſſionem.

Sanguis

Sanguis enim calidus eſt, & quod plus ſanguinis habet, hoc calidius eſt. Putant autem hunc affe-ctum moueri abundãtia ſanguinis, & caloris, quaſi æquè quoduis ſanguis eſſe poſſit, modò humidum ſit, & colore cruentum: nec ita eueniat, vt minus ſanguinis & ſyncerius fiat in corpore alimenti melioris, & habitus. Sed illi perinde ac excrementum alui, quod pluris ſit, hoc indicium eſſe naturæ calidioris magis, quàm quod minus, exiſtimant. Atqui contrà omnino eſt. Vt enim in fructibus conficiendis ex copia primi alimenti parum ſecernitur, quod vtile ſit, demúmque nulla pars remanet reſpectu copiæ primæ: ſic in corpore animalis, poſtquam partes per ſucceſſionem alimentum conficiendum receperunt: ad poſtremum parum admodum remanet ex toto alimento: quod in aliis ſanguis, in aliis proportionale ſanguinis eſt. Sed cùm alterum poteſt, alterum non poteſt ſecernere excrementum ſyncerum, omniſque facultas inſtrumentum aliquod ſibi accommodatum habet, & quæ melius & quæ deterius idem efficiat: fœmina autem, & mas, cùm multifariàm verba hæc, poſſe & non poſſe, dicantur, modo prædictoq ſibi opponuntur, inſtrumentum ob eam rem tum fœminæ tum mari tribui neceſſe eſt. Itaque alteri vterus, alteri coles datus eſt. Natura autem ſimul, & facultatem cuiuis dat, & inſtrumentum: ſic enim melius eſt. Quamobrem ſingula loca vnà cum ſingulis excrementis & facultatibus ſibi accommodatis inſtituuntur. Atque vt nec viſus ſine oculis, neque oculus ſine viſu perficitur, ſic & aluus & veſica ſimul atque excrementa fieri poſſunt, conditur. Sed cùm idem ſit, ex quo generentur, & augeantur, idque ſit alimentum, pars corporis quæque ex tali materia, talique excremento, qualis eſt capax, conſiſtet, & fiet. Gignitur item ex contrario quodam modo vnumquodque, vt nos cenſemus. Adhæc, tertium illud ſumendum eſt, vt quoniam omnis delatio in contrarium eſt, quod non ab eo ſuperatur, à quo conditur, ſiue creatur, id in contrarium mutari neceſſe ſit. His ita ſubiectis, apertius fortaſſe iam fuerit, qua de cauſa alterum mas, alterum fœmina fiat. Cùm enim principium non ſuperat, neque concoquere poteſt propter caloris inopiam, neque ducit in ſuam formam, ſed tantiſper ſuperatur, mutari in contrarium neceſſe eſt. Contrarium autem maris, fœmina eſt, videlicet, qua alterum mas, alterum fœmina eſt. Et cùm facultatis ſuæ virtutis differentiam habeat, inſtrumentum quoque habet auerſum: itaque in tale mutatur. Parte autem aliqua opportuna mutata, conſtitutio tota animalis multo diſcrepat forma. Licet hoc perſpicere in ſpadonibus, qui vna parte truncati iam à priſtina forma diſcedunt, parúmque à fœmina ſpecie diſtant. Cuius rei cauſa eſt, quòd partes nonnullæ principia ſunt. Principio autem mutato, multa ex iis quæ ſequuntur, commutari & dimoueri neceſſe eſt. Quòd ſi mas principium quoddam & cauſa eſt, máſque eſt quà aliquid poteſt, fœmina verò quà non poteſt, potentiæ autem & impotentiæ ratio ſic deſcribenda eſt, vt facultas aut adſit aut deſit concoquendi vltimi alimenti, quod in ſanguineis ſanguis appellatur, in exanguibus proportionale, eiúſque cauſa in principio, & parte, quæ originem naturalis caloris continet, ſita eſt, cor profectò in ſanguineis conſtitui,

A τὸ μὲν γὰρ αἷμα, θερμόν· τὸ δὲ πλεῖον ἔχον, μᾶλλον. ὑπολαμβάνουσι δὲ τοῦτο γίνεσθαι τὸ πάθος δι' ὑπερβολὴν αἵματος καὶ θερμότητος· ὥσπερ ἐνδεχόμενον αἷμα εἶναι πᾶν ὁμοίως, ἄνπερ μόνον ὑγρὸν ᾖ, καὶ τὴν χρόαν αἱματῶδες, καὶ οὐκ ἔλαττον γινόμενον, καὶ καθαρώτερον τοῖς εὐτροφοῦσιν. οἱ δ' ὥσπερ τὸ κατὰ τὴν κοιλίαν περίττωμα, τὸ πλεῖον τοῦ ἐλάττονος οἴονται σημεῖον εἶναι θερμῆς φύσεως μᾶλλον. καίτοι τοὐναντίον ἐστίν. ὥσπερ γὰρ καὶ ἐκ τῆς πρώτης τροφῆς, ἐκ πολλῆς ὀλίγον ἀποκρίνεται τὸ χρήσιμον ἐν ταῖς περὶ τοὺς καρποὺς ἐργασίαις, καὶ τέλος οὐθὲν μέρος τὸ ἔσχατον πρὸς τὸ πρῶτον πλῆ-
B θός ἐστιν, οὕτω πάλιν καὶ ἐν τῷ σώματι διαδεχόμενα τὰ μέρη ταῖς ἐργασίαις, τὸ τελευταῖον πάμπαν μικρὸν ἐξ ἁπάσης γίνεται τῆς τροφῆς. τοῦτο δὲ ἐν μὲν τισιν αἷμά ἐστιν, ἐν δὲ τισὶ τὸ ἀνάλογον. ἐπεὶ δὲ τὸ μὲν δύναται, τὸ δ' ἀδυνατεῖ ἐκκρίνειν τὸ περίττωμα καθαρόν· ἁπάσῃ δὲ δυνάμει ὄργανόν τί ἐστι, καὶ τῇ χεῖρον ἀποτελούσῃ τὸ αὐτὸ, καὶ τῇ βέλτιον· τὸ δὲ θῆλυ καὶ τὸ ἄρρεν, πλεοναχῶς λεγομένου τοῦ δυνατοῦ καὶ τοῦ ἀδυνάτου, τοῦτον ἀντίκειται τὸν τρόπον· ἀνάγκη οὖν καὶ τῷ θήλει καὶ τῷ ἄρρενι εἶναι ὄργανα. τῷ μὲν οὖν ἡ ὑστέρα, τῷ δ' ὁ περίνεός ἐστιν. ἅμα δ' ἡ φύσις τήν τε δύναμιν ἀποδίδωσιν ἑκάστῳ, καὶ τὸ ὄργανον. βέλτιον γὰρ οὕτως. διὸ ἕκα-
C στοι οἱ τόποι ἅμα ταῖς ἐκκρίσεσι γίνονται καὶ ταῖς δυνάμεσιν, ὥσπερ οὔθ' ἡ ὄψις ἄνευ ὀφθαλμῶν, οὔτ' ὀφθαλμὸς τελειοῦται ἄνευ ὄψεως, καὶ κοιλία καὶ κύστις ἅμα τῷ δύνασθαι τὰ περιττώματα γίνεσθαι. ὄντος δὲ τοῦ αὐτοῦ, ἐξ οὗ τε γίνεται καὶ αὔξεται, τοῦτο δ' ἐστὶν ἡ τροφή, ἕκαστον ἂν γίνοιτο τῶν μορίων ἐκ τοιαύτης ὕλης ἧς δεκτικόν ἐστι, καὶ τοιούτου περιττώματος. ἔτι δὲ γίνεται πάλιν (ὥς φαμεν) ἐκ τοῦ ἐναντίου πως. τρίτον δὲ πρὸς τούτοις ληπτέον, ὅτι εἴπερ ἡ * φθορὰ εἰς τοὐναντίον, καὶ τὸ μὴ κρατούμενον ὑπὸ τοῦ δημιουργοῦντος, ἀνάγκη μεταβάλλειν εἰς τοὐναντίον. τούτων δὲ ὑποκειμένων, ἴσως
D ἂν ἤδη μᾶλλον εἴη φανερὸν δι' ἣν αἰτίαν γίνεται τὸ μὲν, θῆλυ, τὸ δ', ἄρρεν. ὅταν γὰρ μὴ κρατῇ ἡ ἀρχὴ, μηδὲ δύνηται πέψαι δι' ἔνδειαν θερμότητος, μηδ' ἀγάγῃ εἰς τὸ ἴδιον εἶδος τὸ αὑτοῦ, ἀλλὰ ταύτῃ ἡττηθῇ, ἀνάγκη εἰς τοὐναντίον μεταβάλλειν. ἐναντίον δὲ καὶ τῷ ἄρρενι τὸ θῆλυ καὶ ταύτῃ, ᾗ τὸ μὲν, ἄρρεν, τὸ δὲ, θῆλυ. ἐπεὶ δὲ ἔχει διαφορὰν ἐν τῇ δυνάμει, ἔχει καὶ τὸ ὄργανον διαφέρον· ὥστε εἰς τοιοῦτον μεταβάλλει. * ἑνὸς δὲ μορίου ἐπικαίρου μεταβάλλοντος, ὅλη ἡ σύστασις τοῦ ζῴου πολὺ τῷ εἴδει διαφέρει. ὁρᾶν δ' ἔξεστιν ἐπὶ τῶν εὐνούχων, οἳ ἑνὸς μορίου πηρωθέντος, τοσοῦτον ἐξαλλάττουσι τῆς ἀρχαίας μορφῆς, καὶ μικρὸν
E λείπουσι τοῦ θήλεος τὴν ἰδέαν. τούτου δ' αἴτιον, ὅτι ἔνια τῶν μορίων ἀρχαί εἰσιν. ἀρχῆς δὲ κινηθείσης, ἀνάγκη μεθίστασθαι πολλὰ τῶν ἀκολουθούντων. εἰ οὖν τὸ μὲν ἄρρεν ἀρχή τις καὶ αἴτιον, ἔστι δὲ ἄρρεν ᾗ δύναταί τι, θῆλυ δὲ, ᾗ ἀδυνατεῖ· τῆς δυνάμεως δὲ ὅρος καὶ τῆς ἀδυναμίας, τό, τε πεπτικὸν εἶναι, ἢ μὴ πεπτικὸν τῆς ὑστάτης τροφῆς, ὃ ἐν μὲν τοῖς ἐναίμοις αἷμα καλεῖται, ἐν δὲ τοῖς ἄλλοις τὸ ἀνάλογον· τούτου δὲ τὸ αἴτιον ἐν τῇ ἀρχῇ καὶ τῷ μορίῳ τῷ ἔχοντι τὴν τῆς φυσικῆς θερμότητος ἀρχήν· ἀναγκαῖον ἄρα ἐν τοῖς ἐναίμοις συνίστασθαι καρδίαν,

* Gaza φθορὰ legit mendosè.

* Sup. li. I. c. 9.

A καὶ ἢ ἄρρεν ἔσεσθαι, ἢ θῆλυ τὸ γινόμενον. ἐν δὲ τοῖς ἄλλοις γένεσιν ὑπάρχει τὸ θῆλυ καὶ ἄρρεν τὸ τῇ καρδίᾳ ἀνάλογον. ἡ μὲν οὖν ἀρχὴ τοῦ θήλεος καὶ ἄρρενος, καὶ ἡ αἰτία, αὕτη, καὶ ἐν τούτῳ ἐστί. θῆλυ δ' ἤδη καὶ ἄρρεν ἐστὶν, ὅταν ἔχῃ καὶ τὰ μόρια, οἷς διαφέρει τὸ θῆλυ τοῦ ἄρρενος. οὐ γὰρ καθ' ὁποιονοῦν μέρος ἄρρεν οὐδὲ θῆλυ, ὥσπερ οὐδὲ ὁρῶν καὶ ἀκοῦον. ἀναλαβόντες δὲ πάλιν λέγομεν, ὅτι τὸ μὲν σπέρμα ὑπόκειται περίττωμα τροφῆς ὂν τὸ ἔσχατον. ἔσχατον δὲ λέγω, τὸ πρὸς ἕκαστον φερόμενον. διὸ καὶ ἔοικε τὸ γινόμενον τῷ γεννήσαντι. οὐδὲν γὰρ διαφέρει ἀφ' ἑκάστου τῶν μορίων ἀπελθεῖν, ἢ πρὸς ἕκαστον προσελθεῖν. ὀρθότερον δ' οὕτως. διαφέρει δὲ τὸ τοῦ ἄρρενος σπέρμα, ὅτι ἔχει ἀρχὴν ἐν αὐτῷ B τοιαύτην, οἵαν κινεῖν καὶ ἐν τῷ ζώῳ, καὶ διαπέττειν τὴν ἐσχάτην τροφήν. τὸ δὲ τοῦ θήλεος, ὕλην μόνον. κρατῆσαν μὲν οὖν, εἰς αὐτὸ ἄγει· κρατηθὲν δὲ, ἐπὶ τοὐναντίον μεταβάλλει, εἰς φθοράν. ἐναντίον δὲ τῷ ἄρρενι τὸ θῆλυ. θῆλυ δὲ, τῇ ἀπεψίᾳ καὶ τῇ ψυχρότητι τῆς αἱματικῆς τροφῆς. ἡ δὲ φύσις ἑκάστῳ τῶν περιττωμάτων ἀποδίδωσι τὸ δεκτικὸν μόριον. τὸ δὲ σπέρμα, περίττωμα. τοῦτο δὲ τοῖς μὲν θερμοτέροις καὶ ἄρρεσι τῶν ἐναίμων, ἐν ὄγκῳ τῷ πλήθει. διὸ τὰ δεκτικὰ μόρια πόροι ταύτης τῆς περιττώσεώς εἰσι τοῖς ἄρρεσι· ταῖς δὲ θηλείαις δι' ἀπεψίαν, C πλῆθος αἱματικόν. ἀκατέργαστον γάρ· ὥστε καὶ μόριον δεκτικὸν ἀναγκαῖον εἶναί τε τι, καὶ εἶναι τοῦτο ἀνόμοιον, καὶ μέγεθος ἔχειν. διὸ τῆς ὑστέρας τοιαύτη ἡ φύσις ἐστί. ταύτῃ τὸ θῆλυ διαφέρει τῷ μορίῳ τοῦ ἄρρενος. δι' ἣν τινα μὲν οὖν αἰτίαν γίνεται τὸ μὲν, ἄρρεν, τὸ δὲ, θῆλυ, εἴρηται.

& aut marem aut fœminam fieri, quod gignitur, neceſſe eſt. In cæteris verò generibus mas & fœmina eſt, quod proportionale cordis habeatur. Origo & cauſa fœminæ & maris hæc & in hoc eſt. Fœmina autem & mas iam eſt, cùm partes etiam habent, quibus fœmina differat à mare. Non enim quauis parte mas, aut fœmina eſt, quomodò nec videns, nec audiens. ſed repetendo dicimus. Item, ſemen excrementum eſſe vltimi alimenti, poſitum eſt. Vltimum autem id intelligo, quod in vnamquamque partem feratur. Quamobrem quod generatum eſt, ſimile ei quod generauit, eſt. Nihil enim refert ab vnaquaque parte proficiſcatur, an ad vnamquamque accedat. Sed rectiùs ita. Maris autem ſemen differt, quòd principium in ſe continet tale, quo moueat, & alimentum in animali vltimum concoquat: fœminæ ſemen materiam tantùm præbet. Quoties igitur ſemen ſuperat maris, ad ſe ducit: cùm ſuperatum eſt, in contrarium demutatur, hoc eſt, in corruptionem. Contrarium autem maris, fœmina eſt. Fœmina cruditate frigiditatéque ſanguinei alimenti deſcribitur. Natura verò excremento cuique dat conceptaculum. Semen autem excrementum eſt, quod in calidioribus atque maribus ſanguinei generis contractius eſt. Quapropter membra capientia eius excrementi meatus in maribus ſunt. At fœminis præ cruditate copia redundat ſanguinea: inconfectus enim inconcoctúſque ſanguis eſt. Itaque conceptaculum eius haberi neceſſe eſt, ídque diſſimile eſſe, & amplius. Quocirca natura vteri talis eſt, qua parte fœmina differt à mare. Expoſui cauſam, quamobrem alterum mas, alterum fœmina generetur.

ΚΕΦΑΛ. β'.

Ὅτι τεκμήρια τὰ συμβαίνοντα τοῖς εἰρημένοις· καὶ ποῖα ταῦτα.

Τεκμήρια δὲ τὰ συμβαίνοντα τοῖς εἰρημένοις. τά τε D γὰρ νέα, θηλυτόκα μᾶλλον [τῶν ἀκμαζόντων,] καὶ γηράσκοντα μᾶλλον. τοῖς μὲν γὰρ, οὔπω τέλειον τὸ θερμόν· τοῖς δὲ, ἀπολείπει. καὶ τὰ μὲν ὑγρότερα τῶν σωμάτων, καὶ γυναικικώτερα, θηλυτόκα μᾶλλον, καὶ τὰ σπέρματα [τὰ] ὑγρὰ, τῶν συνεστηκότων. πάντα γὰρ ταῦτα γίνεται δι' ἔνδειαν θερμότητος φυσικῆς. καὶ τὸ βορείοις ἀρρενοτοκεῖν μᾶλλον ἢ νοτίοις· ὥστε καὶ περιττωματικώτερα. τὸ δὲ πλέον περίττωμα, δυσπεπτότερον. διὸ τοῖς μὲν ἄρρεσιν ὑγρότερον τὸ σπέρμα, ταῖς δὲ γυναιξὶν ἡ τῶν καταμηνίων ἔκκρισις. καὶ τὸ γίνεσθαι δὲ τὰ καταμήνια τὰ κατὰ φύσιν, φθινόντων τῶν μηνῶν μᾶλλον, διὰ τὴν αὐτὴν αἰτίαν συμ- E βαίνει. ψυχρότερος γὰρ ὁ χρόνος οὗτος τοῦ μηνὸς, καὶ ὑγρότερος, διὰ τὴν φθίσιν καὶ ἀπόλειψιν τῆς σελήνης. ὁ μὲν γὰρ ἥλιος, ἐν ὅλῳ τῷ ἐνιαυτῷ ποιεῖ χειμῶνα καὶ θέρος· ἡ δὲ σελήνη, ἐν τῷ μηνί. τοῦτο δ' οὐ διὰ τὰς τροπάς. ἀλλὰ τὸ μὲν, αὐξανομένου συμβαίνει τοῦ φωτός· τὸ δὲ, φθίνοντος. φασὶ δὲ καὶ οἱ νομεῖς διαφέρειν πρὸς θηλυγονίαν καὶ ἀρρενογονίαν, οὐ μόνον ἐὰν συμβαίνῃ τὴν ὀχείαν γίνεσθαι βορείοις ἢ νοτίοις, ἀλλὰ κἂν ὀχευόμενα βλέπῃ πρὸς νότον ἢ βορέαν· οὕτω μικρὸν ἐνίοτε ῥοπὴν αἰτίαν γίνεσθαι τῆς ψυχρότητος καὶ θερμότητος·

CAPVT II.

Indicia quibus maris à fœminæ generatione generatio diſcernatur.

D INdicia verò faciunt res, quæ accidunt. Nouella enim & ſeneſcens ætas magis quàm florens, fœminas generat. In altera enim calor nondum perfectus eſt, in altera deficit. Humidiora etiam effœminatioráque corpora fœminam potiùs gignunt: & ſemina humida magis quàm ſpiſſa, hoc idem faciunt. Hæc enim omnia eueniunt caloris inopia naturalis. Flatibus item Aquiloniis magis quàm Auſtrinis, mares gignuntur. Fit etiam vt excrementis eiuſmodi corpora abundent. Plus autem excrementi concoctu difficilius eſt. Quamobrem maribus ſemen, mulieribus menſtrua decedunt humidiora. Tum etiam vt menſtrua ſecundùm naturam menſibus E decreſcentibus potiùs fiant, eadem de cauſa accidit. Tempus enim hoc menſis frigidius eſt, & humidius, propter Lunæ decrementum defectionémque. Sol enim per totum annum, hyemem atque æſtatem facit: at Luna per menſem id agit. Quod ita fit, non acceſſu diſceſſúque Lunæ, ſed alterum increſcente luce, alterum decreſcente. Necnon paſtores aiunt intereſſe ad maris ac fœminæ pecoris fœturam, non ſolùm ſi ita accidit, vt initus Aquilonijs Auſtriníſve flatibus fiat: ſed etiã ſi, cùm pecus coit, ſpectat ad Aquilonem, aut Auſtrum. Ita minimo interdum momento cauſa datur caliditatis aut frigiditatis.

Hæc verò cauſam complent generationis. Diſſident omnino inter ſe mas & fœmina, ob eas, quas diximus, cauſas, ad maris aut fœminæ generationem: ſed moderatione, quę intercedat, opus eſt. Nam omnia, quæ vel natura vel arte efficiuntur, ratione aliqua ſunt. Calor autem, ſi valde ſuperat, exiccat humorem: ſi multùm deficit, non concernit. Sed medij rationem ad rem condendam ſeruari requiritur. Alioqui, vt in iis quæ igne coquuntur, plus ignis deurit, minus non coquit, ac euenit vtrinque, ne quod agitur, perficiatur: ſic in coitu maris & fœminæ moderatione opus eſt. Hinc multis tum maribus tum fœminis euenit, vt coniuncti inter ſe nequeant generare, diſiuncti queant: & aut minoribus natu aut maioribus hæ contrarietates exiſtant, æquè in generatione ſterilitatéque, & maris fœminæque procreatione. Quin inter terras & aquas intereſt eiſdem de cauſis. Qualitatem enim quandam potiſſimùm recipit, & alimentum, & diſpoſitio corporis ex temperamento aëris continentis, & cibi ingredientis: ſed præcipuè ex alimonia aquæ. Huius enim vſus plurimus eſt, atque in omnibus aqua alimento eſt, etiam ſiccis. Quamobrem aquę crudæ, & frigidæ, aut ſterilitatem aut partum fœmineum faciunt.

CAPVT III.

Cauſæ, ob quas nati, vel parentibus, vel aliis ſint aut ſimiles aut diſſimiles.

EÆdem cauſæ ſunt, & vt alij parentibus ſimiles generentur, alij diſſimiles, & alij patri, alij matri, tum corpore toto, tum verò partibus ſingulis, & parentibus magis quàm maioribus ſuis, & iis potiùs quàm quibuslibet, ac mares potiùs patri, fœminæ matri, alij nulli conſanguineo ſimiles, ſed tamen homini ſimiles, alij ne homini quidem, ſed iam monſtro. Qui enim ſuis parentibus ſimilis non eſt, monſtrum quodammodo eſt. Diſceſſit enim in eo quodam modo natura ex proprio genere, cœpitque degenerare: ſed initium primum degenerandi eſt, fœminam generari, non marem. Verùm hoc neceſſarium eſt naturæ. Genus enim ſeruari oportet eorum quæ & fœmina & mare diſtinguuntur. Sed cùm fieri poſſit, ne aliquando ſemen ſuperet maris, aut ob ætatem iuuenilem ſenilémve, aut ob aliam eiuſmodi cauſam, fœminam ob eam rem gigni neceſſe eſt. At monſtrum gigni, non neceſſe eſt, ſcilicet ad cauſam, cuius gratia, & finem; quanquam per accidens neceſſe eſt. nam principium hinc ſumatur oportet. Quoties enim excrementum ſeminale bene concoctum in menſtruis eſt, motus maris agit pro ſua forma. Nihil enim refert genitura dicatur, an motus, id, quod partem corporis vnamquamque augeat. Nec intereſt, augentem motum an principio inſtituentem placeat appellare. Eadem namque ratio motus eſt. Itaque ſi ſuperat, faciet marem, non fœminam, & ſimilem ei qui generat, non matri: ſed ſi non ſuperat, pro ea qua non ſuperarit, facultate, defectum faciet. Facultatem autem hoc modo intelligi volo: Quod generat, non ſolùm mas eſt, ſed etiam talis mas, vt Coriſcus, aut Socrates: nec modò Coriſcus eſt, verùm etiam homo.

A Ταῦτα δὲ, τῆς γενέσεως. διέστηκε μὲν οὖν ὅλως πρὸς ἄλληλα τό, τε θῆλυ καὶ τὸ ἄῤῥεν πρὸς τὴν ἀῤῥενογονίαν καὶ θηλυγονίαν, διὰ τὰς εἰρημένας αἰτίας. οὐ μὴν ἀλλὰ καὶ δεῖ συμμετρίας πρὸς ἄλληλα. πάντα γὰρ τὰ γινόμενα κατὰ τέχνην ἢ φύσιν, λόγῳ τινί ἐστι. τὸ δὲ θερμὸν, λίαν μὲν κρατοῦν, ξηραίνει τὰ ὑγρά· πολὺ δὲ ἐλλεῖπον, οὐ συνίστησιν, ἀλλὰ δεῖ πρὸς τὸ δημιουργούμενον ἔχειν τὸν τοῦ μέσου λόγον. εἰ δὲ μὴ, καθάπερ ἐν τοῖς ἑψομένοις προσκαίει μὲν τὸ πλεῖον πῦρ, οὐχ ἕψει δὲ τὸ ἔλαττον. ἀμφοτέρως γὰρ συμβαίνει μὴ τελεοῦσθαι τὸ γινόμενον. οὕτω καὶ ἐν τῇ τοῦ ἄῤῥενος μίξει καὶ B τοῦ θήλεος, δεῖ τῆς συμμετρίας. καὶ διὰ τοῦτο πολλοῖς καὶ πολλαῖς συμβαίνει μετ' ἀλλήλων μὲν μὴ γεννᾶν, διαζευχθεῖσι δὲ γεννᾶν· καὶ ὁτὲ μὲν νέοις, ὁτὲ δὲ πρεσβυτέροις οὖσι, ταύτας γίνεσθαι τὰς ἐναντιώσεις. ὁμοίως περί τε γένεσιν καὶ ἀγονίαν καὶ ἀῤῥενογονίαν καὶ θηλυγονίαν. διαφέρει δὲ καὶ χώρα χώρας εἰς ταῦτα, καὶ ὕδωρ ὕδατος, διὰ τὰς αὐτὰς αἰτίας. ποιὰ γάρ τις ἡ τροφὴ γίνεται μάλιστα, καὶ ἡ τοῦ σώματος διάθεσις, διά τε τὴν κρᾶσιν τοῦ περιεστῶτος ἀέρος, καὶ τῶν εἰσιόντων. μάλιστα δὲ διὰ τὴν τοῦ ὕδατος τροφήν. τοῦτο γὰρ πλεῖστον εἰσφέρονται, καὶ ἐν πᾶσίν ἐστι τροφὴ C τοῦτο, καὶ ἐν τοῖς ξηροῖς. διὸ καὶ τὰ ἀτέραμνα ὕδατα καὶ ψυχρά, τὰ μὲν, ἀτεκνίαν ποιεῖ, τὰ δὲ, θηλυτοκίαν.

ΚΕΦΑΛ. γ'.

Τῆς τῶν γεννωμένων ὁμοιότητος ἢ ἀνομοιότητος αἰτία.

Αἱ δ' αὐταὶ αἰτίαι καὶ τοῦ τὰ μὲν ἐοικότα γίνεσθαι τοῖς τεκνώσασι, τὰ δὲ μὴ ἐοικότα· καὶ τὰ μὲν πατρὶ, τὰ δὲ μητρὶ, κατά τε τὸ ὅλον σῶμα, καὶ κατὰ τὸ μόριον ἕκαστον· καὶ μᾶλλον [ἐν] αὐτοῖς, ἢ τοῖς προγόνοις· καὶ τούτοις, ἢ τοῖς D τυχοῦσι. καὶ τὰ μὲν ἄῤῥενα, μᾶλλον τῷ πατρὶ, τὰ δὲ θήλεα, τῇ μητρί· τὰ δ' οὐδενὶ τῶν συγγενῶν, ὅμως δ' ἀνθρώπῳ γέ τινι· τὰ δ' οὐδ' ἀνθρώπῳ τινὶ, ἀλλ' ἤδη τέρατι. καὶ γὰρ ὁ μὴ ἐοικὼς τοῖς γονεῦσιν, ἤδη τρόπον τινὰ τέρας ἐστί. παρεκβέβηκε γὰρ ἡ φύσις ἐν τούτοις ἐκ τοῦ γένους τρόπον τινά. ἀρχὴ δὲ ἡ πρώτη τὸ θῆλυ γίνεσθαι καὶ μὴ ἄῤῥεν. ἀλλ' αὕτη μὲν ἀναγκαία τῇ φύσει· δεῖ γὰρ σώζεσθαι τὸ γένος τῶν κεχωρισμένων κατὰ τὸ θῆλυ καὶ τὸ ἄῤῥεν. ἐνδεχομένου δὲ μὴ κρατεῖν ποτὲ τοῦ ἄῤῥενος, ἢ διὰ νεότητα, ἢ διὰ γῆρας, ἢ δι' ἄλλην τινὰ αἰτίαν τοιαύτην, ἀνάγκη γίνεσθαι θηλυτοκίαν ἐν τοῖς ζῴοις. τὸ δὲ τέρας, οὐκ ἀναγκαῖον πρὸς τὴν ἕνεκά του E καὶ τὴν τοῦ τέλους αἰτίαν· ἀλλὰ κατὰ συμβεβηκὸς ἀναγκαῖον, ἐπεὶ τὴν ἀρχὴν ἐντεῦθεν δεῖ λαμβάνειν. πεπτομένης μὲν γὰρ οὔσης τῆς περιττώσεως ἐν τοῖς καταμηνίοις τῆς σπερματικῆς, καθ' αὑτὴν ποιήσει ποτὲ τὴν μορφὴν ἡ τοῦ ἄῤῥενος κίνησις. τὸ γὰρ γονὴν λέγειν ἢ κίνησιν τὴν αὔξουσαν ἕκαστον τῶν μορίων, οὐθὲν διαφέρει, οὐδὲ τὴν αὔξουσαν, ἢ τὴν συνιστᾶσαν ἐξ ἀρχῆς. ὁ γὰρ αὐτὸς λόγος τῆς κινήσεως. ὥστε κρατούσης μὲν, ἄῤῥεν τε ποιήσει καὶ οὐ θῆλυ, καὶ ἐοικὸς τῷ γεννῶντι. ἀλλ' οὐ τῇ μητρί· μὴ * κρατησάσης δὲ, καθ' ὁποίαν ἂν μὴ κρατήσῃ δύναμιν, τὴν ἔλλειψιν ποιεῖ κατ' αὐτήν. λέγω δὲ ἑκάστην δύναμιν τόνδε τὸν τρόπον. τὸ γεννῶν ἐστιν οὐ μόνον ἄῤῥεν, ἀλλὰ καὶ τοιὸν ἄῤῥεν, οἷον Κορίσκος, ἢ Σωκράτης· καὶ οὐ μόνον Σωκράτης ἐστὶν, ἀλλὰ καὶ ἄνθρωπος.

* Scrib. κρατούσης δέ.

καὶ τοῦτον δὴ τὸν τρόπον τὰ μέν, ἐγγύτερα, τὰ δέ, πορρώτερα ὑπάρχει τῷ γεννῶντι, καθὸ γεννητικόν, ἀλλ' οὐ κατὰ συμβεβηκός· οἷον εἰ γραμματικὸς ὁ γεννῶν, ἢ γείτων τινός. ἀεὶ δὲ ἰσχύει πρὸς τὴν γένεσιν μᾶλλον τὸ ἴδιον καὶ τὸ καθ' ἕκαστον. ὁ γὰρ Κορίσκος, καὶ ἄνθρωπός ἐστι καὶ ζῶον· ἀλλ' ἐγγύτερον τοῦ ἰδίου ἄνθρωπος, ἢ τὸ ζῶον. γεννᾷ δὲ καὶ τὸ καθ' ἕκαστον καὶ τὸ γένος· ἀλλὰ μᾶλλον τὸ καθ' ἕκαστον. τοῦτο γὰρ ἡ οὐσία. καὶ γὰρ τὸ γινόμενον γίνεται μὲν καὶ ποιόν τι· ἀλλὰ τόδε τι καὶ τόδε ἡ οὐσία. διόπερ ἀπὸ τῶν δυνάμεων ὑπάρχουσιν αἱ κινήσεις ἐν τοῖς σπέρμασι πάντων τῶν τοιούτων, δυνάμει δὲ καὶ τῶν προγόνων· μᾶλλον δὲ τοῦ ἐγγύτερον ἀεί, τῶν καθ' ἕκαστόν τινος. λέγω δὲ καθ' ἕκαστον, τὸν Κορίσκον καὶ τὸν Σωκράτην. ἐπεὶ δ' ἐξίσταται πᾶν οὐκ εἰς τὸ τυχόν, ἀλλ' εἰς τὸ ἀντικείμενον, καὶ τὸ ἐν τῇ γενέσει μὴ κρατούμενον, ἀναγκαῖον ἐξίστασθαι καὶ γίνεσθαι τὸ ἀντικείμενον, καθ' ἣν δύναμιν οὐκ ἐκράτησε τὸ γεννῶν καὶ κινοῦν. ἐὰν μὲν οὖν ᾗ ἄρρεν, θῆλυ γίνεται· ἐὰν δὲ ᾗ Κορίσκος ἢ Σωκράτης, οὐ τῷ πατρὶ ἐοικός, ἀλλὰ τῇ μητρὶ γίνεται. ἀντίκειται γὰρ ὥσπερ τῷ ὅλως πατρὶ μήτηρ, καὶ τῷ καθ' ἕκαστον γεννῶντι, ἡ καθ' ἕκαστον γεννῶσα. ὁμοίως δὲ καὶ κατὰ τὰς ἐχομένας δυνάμεις. ἀεὶ γὰρ εἰς τὸν ἐχόμενον μεταβαίνει μᾶλλον τῶν προγόνων, καὶ ἐπὶ πατέρων καὶ μητέρων. ἔνεισι δ' αἱ μὲν ἐνεργείᾳ τῶν κινήσεων, αἱ δέ, δυνάμει, καὶ ἐνεργείᾳ μέν, αἱ τοῦ γεννῶντος καὶ τῶν καθόλου, οἷον ἀνθρώπου, καὶ ζῴου· δυνάμει δέ, αἱ τοῦ θήλεος καὶ τῶν προγόνων, καὶ ἐπὶ πατέρων καὶ μητέρων. μεταβάλλει μὲν οὖν ἐξιστάμενον πρὸς τὰ ἀντικείμενα. λύονται δὲ αἱ κινήσεις αἱ δημιουργοῦσαι ἐπὶ τὰς ἐγγύς· οἷον ἡ τοῦ γεννῶντος ἂν λυθῇ κίνησις, ἐλαχίστῃ διαφορᾷ μεταβαίνει εἰς τὴν τοῦ πατρός. δεύτερον δὲ εἰς τὴν τοῦ πάππου· καὶ τοῦτον δὴ τὸν τρόπον ἐπὶ τῶν ἀρρένων· καὶ ἐπὶ τῶν θηλειῶν, ἡ τῆς γεννώσης, εἰς τὴν τῆς μητρός· ἐὰν δὲ μὴ εἰς ταύτην, εἰς τὴν τῆς τήθης. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄνωθεν. μάλιστα μὲν οὖν πέφυκεν ᾗ ἄρρεν καὶ ᾗ πατήρ, ἅμα καὶ κρατεῖν καὶ κρατεῖσθαι. μικρὰ γὰρ ἡ διαφορά. ὥστε οὐκ ἔργον ἅμα συμβῆναι ἀμφότερα· ὁ γὰρ Σωκράτης ἀνὴρ τοιόσδε τις. διὸ ὡς ἐπὶ τὸ πολὺ τὰ μὲν ἄρρενα, τῷ πατρὶ ἔοικε· τὰ δὲ θήλη, τῇ μητρί. ἅμα γὰρ εἰς ἄμφω ἔκστασις ἐγένετο. ἀντίκειται δὲ τῷ μὲν ἄρρενι, τὸ θῆλυ· τῷ δὲ πατρί, ἡ μήτηρ. ἡ δ' ἔκστασις εἰς τὰ ἀντικείμενα. ἐὰν δὲ ἡ μὲν ἀπὸ τοῦ ἄρρενος κρατήσῃ κίνησις, ἡ δ' ἀπὸ τοῦ Σωκράτους μὴ κρατήσῃ, ἢ αὕτη μέν, ἐκείνη δὲ μή, τότε συμβαίνει γίνεσθαι ἄρρενά τε μητρὶ ἐοικότα, καὶ θήλεα πατρί. ἐὰν δὲ λυθῶσιν αἱ κινήσεις, καὶ ἡ μὲν ἄρρεν μείνῃ, ἡ δὲ τοῦ Σωκράτους λυθῇ εἰς τὴν τοῦ πατρός, ἔσται ἄρρεν τῷ πάππῳ ἐοικός, ἢ τῶν ἄλλων τινὶ τῶν ἄνωθεν προγόνων, [κατὰ τοῦτον τὸν λόγον.] κρατηθέντος δὲ ᾗ ἄρρεν, θῆλυ ἔσται, καὶ ἐοικὸς μάλιστα μὲν τῇ μητρί· ἐὰν δὲ καὶ αὕτη λυθῇ ἡ κίνησις, μητρὶ μητρός, ἢ ἄλλῃ τινὶ τῶν ἄνωθεν ἔσται ἡ ὁμοιότης κατὰ τὸν αὐτὸν λόγον. ὁ δ' αὐτὸς τρόπος καὶ ἐπὶ τῶν μορίων. καὶ γὰρ τὰ μέν, πατρὶ ἔοικε πολλάκις· τὰ δέ, μητρί· τὰ δέ, τῶν προγόνων τισίν. ἔνεισι γὰρ καὶ τῶν μορίων, αἱ μέν, ἐνεργείᾳ κινήσεις· αἱ δέ, δυνάμει, καθάπερ εἴρηται πολλάκις. καθόλου δὲ δεῖ λαβεῖν ὑποθέσεις,

A Ad hunc modum alia propiùs alia remotiùs inſunt in eo quod generat, videlicet quà genitale eſt, non per accidens. Verbi gratia, ſi grammaticus aut vicinus cuiuſquam, qui generat, eſt. Valet autem ſemper in generando magis quod proprium & particulare eſt. Coriſcus enim, & homo & animal eſt: ſed propiùs à proprio diſtat homo, quàm animal. Generat autem & quod particulare eſt, & quod genus eſt: ſed magis quod particulare. Hoc enim ſubſtantia eſt. Quod enim gignitur, & ſi quale quid eſt, tamen hoc quicquam eſt, ídque ſubſtantia eſt. Quamobrem ex facultatibus inſunt in ſeminibus eiuſmodi omnium motus. B Maiorum etiam propria in nepotum ſemine inſunt potentia: ſed propinquius ſemper, quod particulare eſt. Particulare Coriſcum dico, & Socratem. Sed cùm omne, quod mutatur, non in quodlibet, verùm in ſibi oppoſitum tranſeat, ideo & quod in generatione non ſuperatur, tranſeat in oppoſitum, neceſſe eſt, prò ea facultate, qua non ſuperarit, quod generat, moueatq́ue. Quòd ſi quà eſt mas, non potuit, fœmina gignitur. Sed ſi quà eſt Coriſcus, aut Socrates, non patri ſed matri ſimile gignitur. Vt enim omnino patri mater opponitur, ſic ſingulis generantibus ſingulæ generantes opponuntur: ſimilique modo in ſequentibus facultatibus agitur. C Semper enim in ſequentem & proximum maiorum potiùs tranſitur, tam in patre quàm in matre. Inſunt autem motus alij actu alij potentia. Actu inſunt motus eius qui generat, & vniuerſalium, vt hominis, vt animalis. Potentia inſunt motus fœminæ, & maiorum, tam in patre quàm in matre. Mutatur igitur tranſiens in oppoſita. Motus autem qui creant, ſoluuntur in propinquos. Verbi gratia, motus eius qui generat, ſi ſoluatur, primùm *differentia minima in motum patris* tranſibit, mox in aui, atque deinceps ad hunc modum in cæteros ſimiles. In fœminis quoque tranſitus fit. Motus enim concipientis in motum ſoluitur matris: ſi non in eum, in auiæ: eo- D démque modo in ſuperiores. Sed potiſſimùm ita natura fert, vt quà mas & quà pater eſt, ſimul & ſuperet, & ſuperetur: parum enim diſcriminis eſt. Itaque vt ſimul vtrumque eueniat, nequaquam difficile eſt. Socrates enim vir talis quis eſt: quamobrem mares magna ex parte ſimiles patri exiſtunt, fœminæ matri. Simul enim in vtrumque diſceditur. Opponitur autem fœmina mari, mater patri: diſceſſúſque in oppoſita fit. Sed ſi motus, qui à mare eſt, ſuperarit, qui verò à Socrate eſt, non ſuperarit, aut hic ſuperarit, ille non: ita euenit vt mares ſimiles matri, fœminæ ſimiles patri generentur. Item, ſi motus ſoluantur, & quà mas eſt, ſeruetur, Socratis autem ſoluatur in patris, mas erit auo ſimilis, aut alicui cęterorum ſuperiorum E maiorum, provt ſolutio tetenderit. Sed ſi, quà eſt mas, ſuperetur, fœmina erit ſimilis potiſſimùm matri. Si autem & hic ſoluatur motus, matri aſſimilabitur matris, aut alicui ſuperiorum pari ratione. Idem modus partium quoque eſt. Sæpe enim aliæ patri ſimiles, aliæ matri, aliæ maiorum alicui ſimiles conſtituuntur. Inſunt enim & partium motus, alij actu, alij potentia, vt ſæpius diximus. Omnino ſubiicienda ſunt tria illa:

Vnum, quod modò dixi, motus ineſſe, alios potentia, alios actu. Alterum, degenerare in oppoſitum, quod ſuperatur. Tertium, tranſire in motum proximum id quod ſoluitur: & ſi minùs ſoluitur, in propinquum: ſi magis, in remotiorem diſcedere: demúmque ita confundi, vt nemini ſuorum ſimiles prodeant, ſed commune tantùm relinquatur, vt homo ſit. Cuius rei cauſa eſt, quòd commune particularia conſequitur omnia. Homo enim vniuerſale eſt: Socrates pater, & quæcunque eſt mater, particulare eſt. Cauſa, vt motus ſoluantur, eſt, quòd omne agens patitur etiam à patiente: vt quod ſecat, habetatur ab eo quod ſecatur: quod calefacit, refrigeratur à caleſcente. Denique quodcunque mouet, excepto primo, mutuo mouetur aliquo motu. Verbi gratia, quod pellit, pellitur quodam modo: quod premit, reprimitur. Interdum etiã ita fit vt quod agit, magis patiatur, quàm agat, & refrigeretur, quod calefacit, caleſcat, quod frigefacit, cùm aut nihil fecerit, aut minus quàm ipſum affectum eſt. Dixi de iis, cùm de ratione agendi patiendique docerem: videlicet quibus in rebus ineſſet agere & pati. Degenerat autem quod patitur, nec ſuperatur, aut defectu facultatis eius quod coquit, & mouet, aut copia frigiditatéque eius quod concoquitur, & diſtinguitur. Cùm enim partim ſuperet, partim non ſuperet, facit multiforme, quod conſtituitur: vt athletarum nonnullis per vſum cibi nimium accidit. Cùm enim per copiam paſtus natura nequeat ſuperare, vt proportione augeat, formámque ſeruet eandem, diuerſæ efficiuntur partes, & adeo interdum, vt nihilo ferè ſimiles primis euadant. Proximum huic eſt morbus, quem ſatyriam appellamus. Etenim in eo præ abundantia fluxionis, aut flatus crudi in partes faciei decumbentis, facies animalis diuerſi, & ſatyri apparet. Sed quam ob cauſam mares & fœminæ generentur, & alij parentibus ſimiles, fœminæ fœminis, mares maribus, alij è diuerſo, fœminæ patri, mares matri, denique alij maioribus ſuis ſimiles, alij ſuorum nemini ſimiles exiſtant, idque tum corpore toto tum partibus ſingulis, de iis, inquam, omnibus dictum iam eſt. Sententiæ autem aliorum etiam naturæ interpretum ſunt de iis rebus, ſcilicet quamobrem ſimiles parentibus generentur. Afferunt illi duplicem modum rationis: Nonnulli enim ita cenſent, vt ab vtrouis plus ſeminis venerit, ei ſimilis magis generetur, æquè toti totum, & parti pars, quaſi ex vnaquaque parte ſemen decedat: ſed ſi par de vtroque venerit, ſimilis neutri procreetur. Quod ſi falſum eſt, nec omni ex parte decedit, conſtat nec ſimilitudinis & diſſimilitudinis cauſam id eſſe, quod referunt. Tum etiam quemadmodum ſimul & fœmina ſit, & patri ſimilis, aut mas, & ſimilis matri, non facilè explanare poſſunt. Qui enim, vt Empedocles, aut Democritus, cauſam de mare & fœmina reddunt, impoſſibilia modo alio dicunt: ſed qui quod plus minúſve à mare, aut à fœmina receſſerit, alterum marem, alterum fœminam gigni cauſantur: ij nequeunt explicare quemadmodum fœmina patri ſimilis, mas ſimilis matri reddatur: ſimul enim plus de vtroque venire impoſſibile eſt. Ad hæc, cur ſimiles maioribus ſuis magna ex parte, remotiſq; generentur, cùm nihil ſeminis ab illis receſſerit,

A μίαν μὲν τὴν εἰρημένην, ὅτι ἔνεστι τῶν κινήσεων αἱ μὲν δυνάμει, αἱ δὲ ἐνεργείᾳ· ἄλλας δὲ δύο, ὅτι κρατούμενον μὲν ἐξίσταται εἰς τὸ ἀντικείμενον, λυόμενον δὲ, εἰς τὴν ἐχομένην κίνησιν, καὶ ἧττον μὲν λυόμενον, εἰς τὴν ἐγγύς· μᾶλλον δὲ, εἰς τὴν πορρωτέρω. τέλος δὲ οὕτως συγχέονται, ὥστε μηθενὶ ἐοικέναι τῶν οἰκείων καὶ συγγενῶν, ἀλλὰ λείπεσθαι τὸ κοινὸν μόνον, καὶ εἶναι ἄνθρωπον. τούτου δ' αἴτιον, ὅτι πᾶσιν ἀκολουθεῖ τοῦτο τοῖς καθ' ἕκαστον. καθόλου γὰρ ὁ ἄνθρωπος· ὁ δὲ Σωκράτης ὁ πατὴρ, καὶ ἡ μήτηρ ἥτις ποτ' ἦν, τῶν καθ' ἕκαστον. αἴτιον δὲ τοῦ μὲν λύεσθαι τὰς κινήσεις, ὅτι τὸ ποιοῦν καὶ πάσχει ὑπὸ τοῦ πάσχοντος· οἷον τὸ τέμνον ἀμβλύνεται ὑπὸ τοῦ τεμνομένου, καὶ τὸ θερμαῖνον ψύχεται ὑπὸ τοῦ θερμαινομένου,
B καὶ ὅλως τὸ κινοῦν ἔξω τοῦ πρώτου, ἀντικινεῖταί τινα κίνησιν· οἷον τὸ ὠθοῦν ἀντωθεῖταί πως, καὶ ἀντιθλίβεται τὸ θλῖβον. ἐνίοτε δὲ καὶ ὅλως ἔπαθε μᾶλλον ἢ ἐποίησε, καὶ ἐψύχθη μὲν τὸ θερμαῖνον, ἐθερμάνθη δὲ τὸ ψῦχον, ὁτὲ μὲν οὐθὲν ποιῆσαν, ὁτὲ δὲ ἧττον ἢ παθόν. * εἴρηται δὲ περὶ αὐτῶν ἐν τοῖς περὶ τοῦ ποιεῖν καὶ πάσχειν διωρισμένοις, ἐν ποίοις ὑπάρχει τῶν ὄντων τὸ ποιεῖν τι καὶ πάσχειν. ἐξίσταται δὲ τὸ πάσχον καὶ οὐ κρατεῖται, ἢ δι' ἔλλειψιν δυνάμεως τοῦ πέττοντος καὶ κινοῦντος, ἢ διὰ πλῆθος καὶ ψυχρότητα τοῦ πεττομένου καὶ διοριζομένου. τῇ μὲν γὰρ κρατοῦν, τῇ δὲ οὐ κρατοῦν, ποιεῖ πολύμορφον τὸ * De generatione & corrupt. lib. 1.
C συνιστάμενον, οἷον ἐπὶ τῶν ἀθλητῶν συμβαίνει διὰ τὴν πολυφαγίαν. διὰ γὰρ τὸ πλῆθος τῆς τροφῆς, οὐ δυναμένης τῆς φύσεως κρατεῖν, ὥστ' ἀνάλογον αὔξειν καὶ διαμένειν ὁμοίαν τὴν μορφὴν, ἀλλοῖα γίγνεται τὰ μέρη, καὶ σχεδὸν ἐνίοθ' οὕτως, ὥστε μηδὲν ἐοικέναι τῷ πρότερον. παραπλήσιον δὲ τούτῳ καὶ τὸ νόσημα τὸ καλούμενον σατυριᾶν. καὶ γὰρ ἐν τούτῳ, διὰ ῥεύματος ἢ πνεύματος ἀπέπτου πλῆθος, εἰς τὰ μόρια τοῦ προσώπου παρεμπεσόντος, ἄλλου ζῴου καὶ σατύρου φαίνεται τὸ πρόσωπον. διὰ τίνα μὲν οὖν αἰτίαν θήλεα καὶ ἄρρενα γίνεται, καὶ τὰ μὲν ἐοικότα τοῖς γονεῦσι, θήλεά τε θήλεσι, καὶ ἄρρενα ἄρρεσι, τὰ δ'
D ἀνάπαλιν, θήλεά τε τῷ πατρὶ, καὶ ἄρρενα τῇ μητρὶ, καὶ ὅλως τὰ μὲν τοῖς προγόνοις ἔοικε, τὰ δ' οὐδενὶ, καὶ ταῦτα καθ' ὅλον τὸ σῶμα καὶ τῶν μορίων ἕκαστον, διώρισται περὶ πάντων. εἰρήκασι δέ τινες τῶν φυσιολόγων καὶ ἕτεροι περὶ τούτων, διὰ τίν' αἰτίαν ὅμοια γίγνεται τοῖς γονεῦσι. δύο δὴ τρόπους λέγουσι τῆς αἰτίας. ἔνιοι μὲν γάρ φασιν, ἀφ' ὁποτέρου ἂν ἔλθῃ σπέρμα πλεῖον, τούτῳ γίνεσθαι μᾶλλον ἐοικὸς, ὁμοίως πᾶν τε παντὶ, καὶ μέρη μέρει, ὡς ἀπιόντος ἀφ' ἑκάστου τῶν μορίων σπέρματος. ἂν δ' ἴσον ἔλθῃ ἀφ' ἑκατέρου, ταύτῃ δ' οὐδετέρῳ γίγνεσθαι ὅμοιον. εἰ δὲ τοῦτ' ἐστὶ ψεῦδος, καὶ μὴ ἀπὸ παντὸς ἀπέρχεται, δῆλον ὡς οὐδὲ τῆς
E ὁμοιότητος καὶ ἀνομοιότητος αἴτιον ἂν εἴη τὸ λεχθέν. ἔτι δὲ πῶς ἅμα θῆλυ μὲν πατρὶ ἐοικὸς, ἄρρεν δὲ μητρὶ ἐοικὸς, οὐκ εὐπόρως δύνανται διαιρεῖν. οἱ μὲν γὰρ, ὥσπερ Ἐμπεδοκλῆς λέγοντες, ἢ Δημόκριτος περὶ τοῦ θήλεος καὶ ἄρρενος τὴν αἰτίαν, ἄλλον τρόπον ἀδύνατον λέγουσιν. οἱ δὲ τῷ πλεῖον ἢ ἔλαττον ἀπιέναι ἀπὸ τοῦ ἄρρενος ἢ θήλεος, καὶ διὰ τοῦτο γίγνεσθαι τὸ μὲν θῆλυ, τὸ δὲ ἄρρεν, οὐκ ἂν ἔχοιεν ἀποδεῖξαι, τίνα τρόπον τὸ τε θῆλυ τῷ πατρὶ ἐοικὸς ἔσται, καὶ τὸ ἄρρεν τῇ μητρί. ἅμα γὰρ ἐλθεῖν πλεῖον ἀπ' ἀμφοτέρων ἀδύνατον. ἔτι δὲ διὰ τίν' αἰτίαν ἐοικὸς γίνεται τοῖς προγόνοις ὡς ἐπιτοπολὺ καὶ τοῖς ἄποθεν; οὐ γὰρ ἀπ' ἐκείνων ἀπελήλυθε

οὐθὲν τοῦ σπέρματος. ἀλλὰ μᾶλλον οἱ τὸν λειπόμενον τρόπον λέγοντες περὶ τῆς ὁμοιότητος, καὶ τὰ ἄλλα βέλτιον καὶ ταῦτα λέγουσιν. εἰσὶ γάρ τινες οἵ φασι, τὴν γονὴν μίαν οὖσαν, οἷον πανσπερμίαν εἶναί τινα πολλῶν. ὥσπερ οὖν εἴ τις κεράσειε πολλοὺς χυμοὺς εἰς ἓν ὑγρὸν, κἄπειτ' ἐντεῦθεν λαμβάνοι, καὶ δύναιτ' ἂν λαμβάνειν μὴ ἴσον ἀεὶ ἀφ' ἑκάστου, ἀλλ' ὁτὲ μὲν τοῦ τοιουδὶ πλέον, ὁτὲ δὲ τοῦ τοιουδὶ, ὁτὲ δὲ τοῦ μὲν λαβεῖν, τοῦ δὲ μὴ λαβεῖν, τοῦτο συμβαίνειν καὶ ἐπὶ τῆς γονῆς πολυμεροῦς οὔσης. ἀφ' οὗ γὰρ ἂν τῶν γεννώντων πλεῖστον ἐγγίνηται, τούτῳ γίνεσθαι τὴν μορφὴν ἐοικός. ἔστι δὲ ὁ λόγος, οὐ σαφὴς μὲν, καὶ πλασματίας ἐστὶ πολλαχῇ. βούλεται δὲ καὶ βέλτιον λέγει, μὴ ἐνεργείᾳ ὑπάρχειν, ἀλλὰ κατὰ δύναμιν, ἣν λέγει πανσπερμίαν. ἐκείνως μὲν γὰρ ἀδύνατον. οὕτως δὲ δυνατόν. οὐ ῥᾴδιον δὲ οὐδὲ τρόπον ἕνα τῆς αἰτίας ἀποδιδόντας, τὰς αἰτίας εἰπεῖν περὶ πάντων, τοῦ τε γίνεσθαι θῆλυ καὶ ἄρρεν· καὶ διὰ τί τὸ μὲν θῆλυ τῷ πατρὶ πολλάκις ὅμοιον, τὸ δὲ ἄρρεν τῇ μητρί· καὶ πάλιν τῆς πρὸς τοὺς προγόνους ὁμοιότητος. ἔτι δὲ διὰ τίν' αἰτίαν ὁτὲ ἄνθρωπος μὲν, τούτων δὲ οὐδενὶ προσόμοιος· ὁτὲ δὲ προϊὸν οὕτως, οὐδ' ἄνθρωπος ὅλως, ἀλλὰ ζῷόν τι μόνον φαίνεται τὸ γινόμενον· ἃ δὴ καὶ λέγεται τέρατα. καὶ γὰρ ἐχόμενόν τῶν εἰρημένων ἐστὶν, εἰπεῖν περὶ τῶν τοιούτων τὰς αἰτίας. τέλος γὰρ τῶν μὲν κινήσεων λυομένων, τῆς δ' ὕλης οὐ κρατουμένης, μένει τὸ καθόλου μάλιστα. τοῦτο δ' ἐστὶ τὸ ζῷον. τὸ δὲ γινόμενον, κριοῦ κεφαλὴν φασὶν ἢ βοὸς ἔχειν· καὶ ἐν τοῖς ἄλλοις ὁμοίως ἑτέρου ζῴου, μόσχον παιδὸς κεφαλὴν, ἢ πρόβατον βοός. ταῦτα δὲ πάντα συμβαίνει διὰ τὰς προειρημένας αἰτίας. ἔστι δ' οὐθὲν ὧν λέγουσιν, ἀλλ' ἐοικότα μόνον· ὅπερ γίνεται καὶ μὴ πεπηρωμένων. διὸ πολλάκις οἱ σκώπτοντες, εἰκάζουσι τῶν μὴ καλῶν ἐνίους, τοὺς μὲν, αἰγὶ φυσῶντι πῦρ· τοὺς δὲ, * οἲ κυρίττοντι. φυσιογνώμων δέ τις ἀνῆγε πάσας εἰς δύο ζῴων ἢ τριῶν ὄψεις, καὶ συνέπειθε πολλάκις λέγων. ὅτι δ' ἐστὶν ἀδύνατον γίνεσθαι τέρας τοιοῦτον, ἕτερον ἐν ἑτέρῳ ζῴῳ, δηλοῦσιν οἱ χρόνοι τῆς κυήσεως, πολὺ διαφέροντες ἀνθρώπου, καὶ προβάτου, καὶ βοὸς, καὶ κυνός. ἀδύνατον δ' ἕκαστον γίνεσθαι μὴ κατὰ τοὺς οἰκείους χρόνους. τὰ μὲν οὖν τοῦτον τὸν τρόπον λέγουσι τῶν τεράτων· τὰ δὲ, τῷ πολυμερῆ τὴν μορφὴν ἔχειν, πολύποδα καὶ πολυκέφαλα γινόμενα. σύνεγγυς δὲ οἱ τρόποι τῆς αἰτίας καὶ παραπλήσιοι τρόπον τινά εἰσιν, οἵ τε περὶ τῶν τεράτων καὶ οἱ περὶ τῶν ἀναπήρων ζῴων. καὶ γὰρ τὸ τέρας ἀναπηρία τίς ἐστιν.

* ἢ κερύττοντι.

ΚΕΦΑΛ. δ'.

Διὰ τί γίνεται τὰ τέρατα· περὶ τῆς πολυτοκίας, καὶ τοῦ πλεονασμοῦ τοῦ τῶν μερῶν. καὶ περὶ ὀλιγοτοκίας, καὶ μονοτοκίας, καὶ τῆς ἐνδείας τῶν μερῶν.

Δημόκριτος μὲν οὖν ἔφησε γίνεσθαι τὰ τέρατα διὰ τὸ δύο γονὰς πίπτειν· τὴν μὲν, πρότερον ὁρμήσασαν· τὴν δ', ὕστερον· καὶ ταύτην ἐξελθοῦσαν, εἰς τὴν ὑστέραν ἐλθεῖν· ὥστε συμφύεσθαι καὶ ἐπαλλάττειν τὰ μόρια.

A nihil profectò iſti, quod bene tueantur, habent: ſed qui reliquum ſimilitudinis modum afferunt, ij tum cætera tum verò hoc meliùs dicunt. Sunt enim qui ſemen genitale dicant, quamuis vnum, tamen velvti omnifariam quandam eſſe multorum ſeminum miſtionem. Itaque vt ſi quis multa ſaporum genera in eodem humore miſcuerit, móxque inde ſumat, poſſitque ſumere ſemper non tantundem ex vnoquoque, ſed modò huius, modò illius plus, aliàs etiam ex hoc ſumat, ex illo nihil ſumat: ſic in ſemine genitali eſſe, cùm ex multis ac variis miſtum ſit: à quocunque enim gignente acceſſerit plurimum, ei ſimilem forma generari. B Sed hæc ratio nec plana eſt, & paſſim fictitia eſt. Vult hęc non actu ſed potentia ineſſe, quam omnifariam ſeminis commiſtionem appellat. Et quidem ita dici melius eſt: illo enim modo impoſſibile eſt: hoc poſſibile eſt. Verùm qui ita cauſam reddunt, nullo modo rationem afferre de omnibus facilè poterunt, cur fœmina cur mas gignatur: quamobrem ſæpenumero fœmina patri ſimilis, mas matri proueniat. Atque etiam de maiorum ſimilitudine. Ad hæc, qua de cauſa interdum homo quidem, ſed nulli ſuorum ſimilis generetur: aliàs, vſqueadeo procedendo degeneret, vt demum ne homo quidem, ſed animal C tantùm aliquod exiſtat: quæ monſtra dicuntur. Proximum enim ab iis quæ iam explicauimus, eſt, vt cauſas de monſtris reddamus. Ad extremum enim, cùm motus ſoluantur, & materia non ſuperetur, remanet quod maximè eſt vniuerſale, id eſt, animal. Iam puerum ortum capite arietis, aut bouis, referunt. Idémque in cæteris membrum nominant animalis diuerſi. Vitulum capito pueri, & ouem capite bouis natam aſſeuerant. Quæ omnia accidunt quidem cauſis ſuprà dictis. Sed nihil ex iis quæ nominant, eſt, quamuis ſimilitudo quædam generatur. Quod euenit etiam non in monſtrum peruerſis. Quamobrem ſæpenumero per conuicium nonnulli deformes aſſi- D milantur, aut capræ ignem efflanti, aut arieti petulco. Phyſiognomon quidam omnes ad duorum aut trium animalium formas redigebat, & dicendo plerumque perſuadebat. Sed enim impoſſibile eſſe vt tale monſtrum gignatur, id eſt, alterum in altero animal, tempora ipſa grauiditatis declarant, quæ plurimùm diſcrepant in homine & cane, & in oue & boue. Naſci autem nullum, niſi ſuo tempore, poteſt. Partim igitur hoc modo dicuntur monſtra, partim quòd forma prodeant multimembri, ſcilicet multis pedibus, aut multis capitibus. Sed profectò rationes monſtrorum, & oblæſorum animalium propinquæ, & ſimiles inter ſe quodam modo ſunt. Monſtrum enim, oblæſio quædam eſt.

CAPVT IV.

Quas ob cauſas monſtroſa animalia generentur, & quare aliis vnifer, aliis paucifer, aliis multiplex ſit partus.

Democritus verò monſtra fieri ea cauſa ſcribit, quòd duo ſubeűt ſemina, alterum antè, alterum poſtea: quæ cűm in vtero confundantur, euenit vt membra coaleſcant atque diſſideant.

Auibus verò, quoniam coitus agitur crebrò, idcirco ſemper & oua & colorem euariare autumat. Sed ſi ita ſit, vt ex vno ſemine, eodémque coitu plura generentur, quod patet, præſtat nō circumire via omiſſa breui, & facili. Iis enim tum maximè id accidere neceſſe eſt, cū ſemina non diſtinguuntur, ſed ſimul ſubeūt. Quòd ſi ſemini maris cauſa ttibuenda eſt, hoc modo dicēdum ſit. Sed enim ex toto potiùs cauſam in materia, conſtituendiſque conceptibus eſſe cēſendum eſt. Quamobrem monſtra eiuſmodi raro admodum fiunt in iis quę ſingulos pariunt: ſed crebriùs in iis quorum partus eſt numeroſus, & præcipuè in auium genere, earúmque potiſſimùm in gallinis. Iis enim partus numeroſus, non modò quòd ſæpe pariant, vt columbæ, verumetiam quòd multos ſimul conceptus intra ſe continent, & temporibus omnibus coeūt. Hinc gemina etiam pariunt plura. Cohærēt enim conceptus, quoniam in propinquo alter alteri eſt, quomodo interdum fructus arborum complures. Quòd ſi vitella diſtinguuntur membrana, gemini pulli diſcreti ſine vlla ſuperuacua parte generantur. Sed ſi vitella continuantur, nec vlla interiecta membrana diſterminantur, pulli ex iis monſtrifici prodeunt, corpore, & capite vno, cruribus quaternis, alis totidem, quoniam ſuperiora ex albumine generentur, & priùs, (vitellum enim cibo iis eſt) pars autem inferior poſtea inſtitoitur, quanquam cibus idem indiſcretúſque ſuppeditatur. Iam ſerpens etiam biceps viſus eſt, videlicet eadem de cauſa. Nam id quoque genus oua parit, & multa numero. Sed rariùs in eo monſtri inſtitutio euenit, propter vteri formam. Porrecta enim in verſum copia ouorum continetur pro vteri longitudine. Nec verò in genere apum aut veſparum, tale quid accidit. Cellulis enim diſcretis partus earum continetur. At in gallinis è contrario fit. Vnde apertum eſt, cauſam euentorum huiuſmodi in materia eſſe putare oportere. Vt enim in iis quæ plura pariunt, magis: ſic in iis quæ pauciora, minùs id accidit. Quocirca homini minùs: ſingularem enim perfectúmque parit. Nam & homini, locis quibus mulieres præfœcundæ ſunt, magis id euenit, vt in terra Ægypto. Capris verò, & ouibus magis, vt fœcundioribus, accidit. Atque etiam magis multifidis. Multipara enim id genus animalia ſunt, nec partum perficiunt, vt canis. Cæcos enim magna eorū pars ſolet parere. Quod quam ob cauſam accidit, & quamobrem pariant multos, poſtea explicabimus. Sed enim hæc propenſiora iam ſunt ſuapte natura ad monſtrificam partionem, quando non ſimiles ſibi generant, ſed imperfectos. Nam & monſtrum, quid diſſimile eſt. Quamobrem iis quorum talis natura eſt, faciliùs caſus hic obuenit. In iis enim potiſſimùm, & quæ metachœra appellantur, conſiſtunt: quæ aliquatenus labe monſtrifica ſunt affecta. Nam deeſſe aut ſupereſſe quicquam, monſtroſum eſt. Monſtroſum eſt enim, res præter naturam: ſed præter eam, quæ magna ex parte fit. Nam præter eam, quæ ſemper & neceſſariò eſt, nihil fit. Verùm in rebus iis quæ magna quidem ex parte ita fiunt, ſed aliter etiam poſſunt fieri, euenit, quod pręter naturam conſiſtat. Nam & inter eas ipſas quibus accidit quidem pręter hunc ordinem, ſed nunquam quolibet modo, minùs monſtrum eſſe videtur: quoniam quod præter naturam ſit, idem etiam ſecundùm naturam quodam modo eſt,

A ταῖς δ' ὄρνισιν ἐπεὶ συμβαίνει ταχεῖαν γίνεσθαι τὴν ὀχείαν, ἀφαιρεῖν τὰ ᾠὰ καὶ τὴν χροιὰν αὐτῶν ἐπαλλάττειν φησίν. εἰ δὲ συμβαίνει ἐξ ἑνὸς σπέρματος πλείω γίνεσθαι, καὶ μιᾶς συνουσίας, ὥσπερ φαίνεται, βέλτιον μὴ κύκλῳ περιιέναι προέντα τὴν συντομήν. τοῖς γὰρ τοιούτοις μάλιστα ἀναγκαῖον τοῦτο συμβαίνειν, ὅταν μὴ διακριθῶσιν, ἀλλ' ἅμα τὰ σπέρματα ἔλθωσιν. εἰ μὲν οὖν αἰτιᾶσθαι δεῖ τὴν ἀπὸ τοῦ ἄρρενος γονήν, τοιοῦτον ἂν τὸν τρόπον εἴη λεκτέον. ὅλως δὲ μᾶλλον τὴν αἰτίαν οἰητέον ἐν τῇ ὕλῃ καὶ τοῖς συνισταμένοις κυήμασιν εἶναι. διὸ καὶ γίνονται τὰ τοιαῦτα τῶν τεράτων, ἐν B μὲν τοῖς μονοτόκοις σπάνια πάμπαν, ἐν δὲ τοῖς πολυτόκοις μᾶλλον, καὶ μάλιστ' ἐν ὄρνισι· τῶν δὲ ὀρνίθων ἐν ταῖς ἀλεκτορίσιν. αὗται γὰρ πολυτοκοῦσιν, οὐ μόνον τῷ πολλάκις τίκτειν, ὥσπερ καὶ τὸ τῶν περιστερῶν γένος, ἀλλὰ καὶ τῷ πολλὰ ἔχειν κυήματα, ἅμα καὶ πᾶσαν ὥραν ὀχεύεσθαι. διόπερ καὶ πολλὰ δίδυμα τίκτουσι. συμφύεται γὰρ, διὰ τὸ πλησίον ἀλλήλων εἶναι τὰ κυήματα, καθάπερ ἐνίοτε πολλὰ τῶν περικαρπίων. ὅσων μὲν ἂν αἱ λέκιθοι διορίζωνται τῷ ὑμένι, δύο γίνονται νεοττοὶ κεχωρισμένοι, περιττὸν οὐδὲν ἔχοντες· ὅσων δὲ συνεχεῖς, καὶ μὴ διείργει C μηδέν, ἐκ τούτων γίνονται τερατώδεις οἱ νεοττοί, σῶμα μὲν καὶ κεφαλὴν ἔχοντες, σκέλη δὲ τέτταρα καὶ πτέρυγας, διὰ τὸ τὰ μὲν ἄνωθεν ἐκ τοῦ λευκοῦ γίνεσθαι καὶ πρότερον, διανεμομένης ἐκ τῆς λεκίθου τῆς τροφῆς αὐτοῖς· τὸ δὲ κάτω μόριον ὑστερίζειν μέν, τὴν δὲ τροφὴν εἶναι μίαν καὶ ἀδιαίρετον. ἤδη δὲ καὶ ὄφις ὤφθη δικέφαλος διὰ τὴν αὐτὴν αἰτίαν. ᾠοτοκεῖ γὰρ καὶ πολυτοκεῖ καὶ τοῦτο τὸ γένος. σπανιώτερον δὲ τὸ τερατῶδες ἐπ' αὐτῶν, διὰ τὸ σχῆμα τῆς ὑστέρας. στοιχηδὸν γὰρ κεῖται τὸ πλῆθος τῶν ᾠῶν διὰ τὸ μῆκος αὐτῆς. καὶ περὶ τὰς μελίττας καὶ τοὺς σφῆκας οὐδὲν γίνεται τοιοῦτον. ἐν κεχωρισμένοις γὰρ κυτταρίοις ὁ τόκος ἐστὶν αὐτῶν. D περὶ δὲ τὰς ἀλεκτορίδας τοὐναντίον συμβέβηκεν· ᾗ καὶ δῆλον ὡς ἐν τῇ ὕλῃ τὴν αἰτίαν δεῖ νομίζειν τῶν τοιούτων· καὶ γὰρ τῶν ἄλλων ἐν τοῖς πολυτόκοις μᾶλλον. διὸ ἐν ἀνθρώπῳ ἧττον. ὡς γὰρ ἐπὶ τὸ πολὺ μονοτόκον ἐστί, καὶ τελεοτόκον· ἐπεὶ καὶ τούτων ἐν οἷς τόποις πολύγονοι αἱ γυναῖκές εἰσι, τοῦτο συμβαίνει μᾶλλον, οἷον περὶ Αἴγυπτον. ἐν δὲ ταῖς αἰξὶ καὶ τοῖς προβάτοις γίνεται μᾶλλον. πολυτοκώτερα γάρ ἐστιν. ἔτι δὲ μᾶλλον ἐν τοῖς πολυσχιδέσιν. *ἔστι γὰρ τὰ τοιαῦτα πολυτοκώτερα τῶν ζῴων, καὶ οὐ τελεοτόκα, καθάπερ ἡ κύων. τὰ γὰρ πολλὰ τυφλὰ τίκτει τούτων. δι' ἣν δ' αἰτίαν συμβαίνει τοῦτο, καὶ δι' ἣν αἰτίαν πολυτοκοῦσιν, ὕστερον λεκτέον. ἀλλὰ προωδοποίηται τῇ φύσει πρὸς τὸ τερατοτοκεῖν, τῷ μὴ γεννᾶν ὅμοια, διὰ τὴν ἀτέλειαν. ἔστι δὲ καὶ τὸ τέρας τῶν ἀνομοίων. διόπερ ἐπαλλάττει τοῦτο τὸ σύμπτωμα τοῖς τοιούτοις τὴν φύσιν. ἐν γὰρ τούτοις μάλιστα γίνεται καὶ τὰ *μετάχοιρα καλούμενα. ταῦτα δ' ἐστὶ κατά τινα πεπονθότα τερατῶδες. τὸ γὰρ ἐκλείπειν ἢ προσεῖναί τι, τερατῶδες. ἔστι γὰρ τὸ τέρας τῶν παρὰ φύσιν τι. παρὰ φύσιν δ' οὐ πᾶσαν, ἀλλὰ τὴν ὡς ἐπὶ τὸ πολύ. περὶ γὰρ τὴν ἀεὶ καὶ τὴν ἐξ ἀνάγκης οὐδὲν γίνεται παρὰ φύσιν, ἀλλ' ἐν τοῖς ὡς ἐπὶ τὸ πολὺ μὲν οὕτω γινομένοις, ἐνδεχομένοις δὲ καὶ ἄλλως· ἐπεὶ καὶ τούτων ἐν ὅσοις συμβαίνει παρὰ τὴν τάξιν ταύτην μέν, ἀεὶ μέντοι μὴ τυχόντως, ἧττον εἶναι δοκεῖ τέρας, διὰ τὸ καὶ τὸ παρὰ φύσιν εἶναι τρόπον τινὰ κατὰ φύσιν,

* κ. πολυτόκα γάρ ἐστι τὰ τοιαῦτα τῶν ζῴων,

* Suprà, lib. 2. c. vlt.

ὅταν μὴ κρατῇ τῆς κατὰ τὴν ὕλην, ἡ κατὰ τὸ εἶδος φύσις. διόπερ οὔτε τὰ τοιαῦτα τέρατα λέγουσιν, οὔτ' ἐν τοῖς ἄλλοις ἐν ὅσοις εἴωθέ τι γίνεσθαι, καθάπερ ἐν τοῖς περικαρπίοις. ἔστι γάρ τις ἄμπελος ἣν καλοῦσι κάπνεον, ἣν, ἂν ἐνέγκῃ μέλανας βότρυς, οὐ κρίνουσι τέρας, διὰ τὸ πλειστάκις εἰωθέναι ταύτην τοῦτο ποιεῖν. αἴτιον δ', ὅτι μεταξὺ λευκῆς ἐστι τὴν φύσιν καὶ μελαίνης· ὥστ' οὐ πόρρωθεν ἡ μετάβασις, οὐδ' ὡσπερεὶ παρὰ φύσιν· οὐ γὰρ εἰς ἄλλην φύσιν. ἐν δὲ τοῖς πολυτόκοις ταὐτά τε συμβαίνει, καὶ διὰ τὴν πολυτοκίαν ἐμποδίζει τὰς τελειώσεις ἀλλήλων, καὶ τὰς κινήσεις τὰς γεννητικάς. περὶ δὲ τῆς πολυτοκίας, καὶ τοῦ πλεονασμοῦ τοῦ τῶν μερῶν, καὶ τῆς ὀλιγοτοκίας καὶ μονοτοκίας, καὶ τῆς ἐνδείας τῶν μερῶν, ἀπορήσειεν ἄν τις. γίνεται γὰρ ἐνίοτε τὰ μὲν πλείους ἔχοντα δακτύλους, τὰ δὲ ἕνα μόνον· καὶ περὶ τὰ ἄλλα μέρη τὸν αὐτὸν τρόπον· καὶ γὰρ πλεονάζει, καὶ κολοβὰ γίνεται. τὰ δὲ καὶ δύο ἔχοντα αἰδοῖα, τὸ μὲν ἄρρενος, τὸ δὲ θήλεος, καὶ ἐν ἀνθρώποις, καὶ μάλιστα περὶ τὰς αἶγας. γίνονται γὰρ ἃς καλοῦσι τραγαίνας, διὰ τὸ θήλεος καὶ ἄρρενος ἔχειν αἰδοῖον. ἤδη δὲ καὶ κέρας αἲξ ἐγένετ' ἔχουσα πρὸς τῷ σκέλει. γίνονται δὲ μεταβολαὶ καὶ πηρώσεις καὶ περὶ τὰ ἐντὸς μόρια, τῷ μὴ ἔχειν ἔνια, ἢ κεκολοβωμένα ἔχειν, καὶ πλείω, καὶ μεθεστῶτα τοῖς τόποις. καρδίαν μὲν οὖν οὐθὲν πώποτε ἐγένετο ζῷον μὴ ἔχον, σπλῆνα δ' οὐκ ἔχον, καὶ δύο ἔχον, καὶ νεφρὸν ἕνα. ἧπαρ δὲ οὐκ ἔχον μὲν οὐθέν, * οὐχ ὅλον δὲ ἔχον. ταῦτα δὲ πάντα ἐν τοῖς τελειωθεῖσι καὶ ζῶσιν. εὑρίσκεται καὶ χολὴν οὐκ ἔχοντα, πεφυκότα ἔχειν· τὰ δὲ, πλείους ἔχοντα μιᾶς. ἤδη δὲ ἐγένετο καὶ μεθεστηκότα * κατὰ τόπον· τὸ μὲν ἧπαρ, ἐν τοῖς ἀριστεροῖς· ὁ δὲ σπλὴν, ἐν τοῖς δεξιοῖς. καὶ ταῦτα μὲν ἔν γε τετελεσμένοις ὦπται τοῖς ζῴοις, ὥσπερ εἴρηται· ἐν δὲ τοῖς τικτομένοις ἔχοντα πολλὴν καὶ παντοδαπὴν ταραχήν. τὰ μὲν οὖν μικρὸν παρεκβαίνοντα τὴν φύσιν, ζῆν εἴωθε· τὰ δὲ πλεῖον, οὐ ζῇ, ὅταν ἐν τοῖς κυρίοις τοῦ ζῆν γένηται τὸ παρὰ φύσιν. ἡ δὲ σκέψις ἐστὶν ἡ περὶ τούτων, πότερον τὴν αὐτὴν αἰτίαν δεῖ νομίζειν τῆς ὀλιγοτοκίας καὶ τῆς ἐνδείας τῶν μερῶν, καὶ τοῦ πλεονασμοῦ καὶ τῆς πολυτοκίας, ἢ μὴ τὴν αὐτήν. πρῶτον μὲν οὖν διὰ τί τὰ μέν ἐστι πολυτόκα, τὰ δὲ μονοτόκα, τοῦτ' ἄν τις δόξειεν εὐλόγως θαυμάζειν. τὰ γὰρ μέγιστα, μονοτόκα τῶν ζῴων ἐστίν· οἷον, ἐλέφας, κάμηλος, ἵππος, καὶ τὰ μώνυχα. τούτων δὲ τὰ μὲν, μείζω τῶν ἄλλων· τὰ δὲ, πολὺ διαφέρει κατὰ τὸ μέγεθος. κύων δὲ καὶ λύκος, καὶ τὰ πολυσχιδῆ, πάντα πολυτόκα σχεδόν· καὶ τὰ μικρὰ τῶν τοιούτων, οἷον τὸ τῶν μυῶν γένος. τὰ δὲ διχηλὰ, ὀλιγοτόκα, πλὴν ὗς. αὕτη γὰρ τῶν πολυτόκων ἐστίν. εὔλογον γὰρ, τὰ μὲν μεγάλα, πλείω δύνασθαι γεννᾶν, καὶ σπέρμα φέρειν πλεῖον. αἴτιον δ' αὐτὸ τὸ θαυμαζόμενον, τοῦ μὴ θαυμάζειν. διὰ γὰρ τὸ μέγεθος οὐ πολυτοκοῦσιν. ἡ γὰρ τροφὴ καταναλίσκεται τοῖς τοιούτοις εἰς τὴν αὔξησιν τοῦ σώματος· τοῖς δὲ ἐλάττοσιν ἀπὸ τοῦ μεγέθους ἡ φύσις ἀφαιροῦσα, πρὸς τὸ περίττωμα προστίθησι τὸ σπερματικὸν τὴν ὑπεροχήν. * ἔτι δὲ τοῦδε γεννῆσαν σπέρμα, πλεῖον μὲν τὸ τοῦ μείζονος ἀναγκαῖον εἶναι, μικρὸν δὲ τὸ τῶν ἐλαττόνων. πολλὰ μὲν οὖν μικρὰ γένοιτ' ἂν ἐν ταὐτῷ· μεγάλα δὲ πολλὰ, χαλεπόν.

A cùm naturam materiæ, natura formæ non ſuperat: quamobrem nec ea monſtri nomine appellantur, neque vbi fieri aliquid ſolet, vt in fructibus. Vitis enim quædam eſt, quam aliqui capneum vocant, quæ cùm vuam albam ſoleat ferre, ſi nigram tulit, monſtrum id eſſe non putant, quoniam ſæpiſſimè id facere ea ſoleat. Cauſa eſt, quòd ſua natura inter albam & nigram eſt. Itaque non longè diſceditur, nec præter naturam ferè. Non enim in aliam naturam tranſitur. At in iis quæ pariunt plura, tum ea ipſa eueniunt, tum verò copia partus impedit alter alterius perfectionem, & cauſam genitalem. De partu numeroſo, paucifero, & ſingulari, atque etiam B de iis partibus, quæ aut ſuperſunt, aut deſunt, quæſtio exiſtere poteſt. Gignuntur enim interdum alia pluribus, quàm iuſtum ſit, digitis: alia vno tantùm. Eodémque modo in cæteris partibus, aut excedunt, aut deficiunt. Nonnulla etiam duplici genitali, altero maris, altero fœminæ naſcuntur. Et in genere quidem hominum, ſed maximè in caprarum. Gignuntur enim, quas vocant hircinas, propterea quòd ſimul genitale habent & maris & fœminæ. Iam & cornu gerens in crure capra conſpecta eſt. Partibus etiam internis mutationes detrimentáque accidunt: vt vel careant aliquibus, vel habeant minuta, & læſa, vel plura numero: vel non ſuis poſita locis. C Sed corde carens nullum vnquam animal ortum eſt: quanquam liene carens: & duplicem habens lienem, & altero vacans rene, viſum eſt. Iecore etiam carens toto nullum notatum eſt: quanquam quod non totum haberet, iam patuit. Hæc autem in perfectis viuiſque reperiuntur. Felle item priuata prodierunt, cùm ſua natura habere deberent. Alia contrà, plura habuerunt. Iam locis etiam permutatis iecur latere ſiniſtro, *lien dextro contineri viſus eſt*. Hæc, vt modò dixi, in animalibus iam perfectis explorata ſunt: in naſcentibus autem variè perturbatur. Quæ ſi parum de ſua natura diſcedunt, viuere ſolent: ſi plus, viuere nequeunt; videlicet D cùm quod præter naturam eſt, partibus viuendi principalibus accidit. Modus verò conſiderandi de his eſt, vtrùm eandem cauſam putare oporteat partus ſingularis, & partium defectus: itémque partus numeroſi, & partium exceſſus, an non eandem. Primùm igitur quòd alia pariunt multa, alia vnum, meritò quiſpiam miretur. Quæ enim maxima inter animalia ſunt, ea ſingulos pariunt: vt elephas, camelus, equus, & reliquæ ſolipedes: quæ partim maiora cæteris ſunt, partim longè magnitudine ſuperant. Canis verò, & lupus, & reliqua multifida omnia ferè pariunt multa: atque etiam parua eiuſdem generis, vt mures. Biſulca pauca generant, præterquam E ſues: hæc enim inter multipara eſt enumeranda. Ratio enim probabilis eſt, vt maiora animalia plura generare, plúſque afferre ſeminis poſſint. Sed certè id ipſum quod admirari facit, cauſæ eſt ne admiremur. Facit enim eorum magnitudo, ne multa pariant. Cibus enim in iis abſumitur in corporis incrementum. Minoribus verò natura demendo de magnitudine, auget in excremento ſeminali exuperantiam. Item plus ſeminis genitalis eſſe, quod maioris eſt animalis, minus autem, quod minoris, neceſſe eſt. At multa effici parua in eodem poſſunt, multa magna effici difficile eſt.

* γρ. χολὴν δὲ ἦ ἔχειν.

* γρ. κατὰ τόπους.

* Scrib. ἔτι δὲ τὸ γεννῶσιν σπ.

A Mediocribus verò magnitudinis medium à natura datum eſt. Sed quamobrem animantium alia maiora ſunt, alia minora, alia mediocria, cauſam antè reddidimus. Sunt autem alia vnipara, alia paucipara, alia multipara. Et magna ex parte vnipara ſunt, quæ ſolipeda: paucipara, quæ biſulca: multipara, quæ multifida. Cuius rei cauſa eſt, quòd magna ex parte magnitudines corporis iis differentiis diſtinguuntur. Tamen non ita in omnibus eſt. Magnitudo enim & paruitudo corporis cauſam habent partus amplioris, & parcioris, non ſolipedis, aut multifidi, aut biſulci generis ratio. Cuius rei teſtimonium eſt, quòd elephas, animalium maximum, idémque multifidum eſt. Camelus biſulcum eſt, quod maximum inter B reliqua eſt. Nec ſolùm in pedeſtrium genere, ſed etiam in volatilium & nantium magna parum fœcunda ſunt, parua verò perquam fœcunda, eadem de cauſa. Plantæ etiam, non quæ maximæ ſunt, plurimum afferunt fructus. Diximus quamobrem alia parere multa, alia pauca ſua natura aſſolent. Sed huius quæſtionis illud maximè quis miretur in iis quæ pariunt multa, quòd plerumque vno initu animalia id genus impleri cernuntur. Semen autem maris, ſiue ad materiam confert, ſe adhibens partem conceptus, & miſcens cum ſemine fœminæ, ſiue non eo modo, ſed vt nos cenſemus, cogit conditque materiam contentam in vtero, fœminaléque fœminæ ex- C crementum, vt ſuccus lactis humorem ſpiſſat, cur tandem non vnum efficit animal incrementi maioris? vt ſuccus in lacte non certa quantitate ad cogendum deſcribitur: ſed quo plus lactis, plus ſucci ſubierit, eo plus coloſtri concreſcit. Semen igitur trahi à locis vteri, atque ob eam rem multa generari pro numero locorum, & acetabulorum, quæ vnum non ſunt, opinari nihil rationis eſt. Sæpe enim eodem in loco vteri gemini conſiſtunt. In genere etiam multiparo, cùm plenus fœtuum vterus fuerit, deinceps alius ab alio iacere cernuntur. Quod ex diſſectionibus patet. Sed vt perficiendi cuiuſque animalis certa eſt magnitudo, tum ad maius, tum D verò ad minus, quem terminum non ſupergrediuntur, vt vel maiora vel minora euadant, ſed in medio magnitudinis ſpatio exceſſum defectúmve inter ſe capiunt, atque ita homo alius alio auctior eſt, & cæterorum quoduis animalium: ſic materia ſeminalis, ex qua conſiſtunt, non indefinita eſt, nec in plus nec in minus, vt ex quantalibet poſſint generari. Quæ igitur animalia ea, quam diximus, cauſa plus excrementi ſecernunt, quàm ſatis ſit ad vnius animalis originem, iis fieri non poteſt vt ex eo toto vnum gignatur animal: ſed tot numero gigni neceſſe eſt, quot magnitudinibus debitis præſcripta ſunt. Nec verò maris ſemen, aut facultas contenta in E maris ſemine, plus quicquam aut minus conſtituit, quàm à natura ſancitum eſt. Eodémque modo, ſi plus ſeminis mas emiſerit, aut facultates plures in ſemine diuidendo contentas, nihilo maius efficiet, quamuis plurimum acceſſerit: imò contrarium aget: exiccando enim corrumpet. Neque enim ignis, quo plus fuerit, eo magis calefaciet aquam: ſed certus caloris terminus eſt, vltra quem ſi ignem augeas, nihilo reddes aquam calidiorem, ſed facies vt magis euaporetur, demúmque deleatur, & exſiccetur.

A τοῖς δὲ μέσοις μεγέθεσι τὸ μέσον ἀποδέδωκεν ἡ φύσις. τοῦ μὲν οὖν τὰ μὲν εἶναι μεγάλα τῶν ζῴων, τὰ δ' ἐλάττω, τὰ δὲ μέσα, πρότερον εἰρήκαμεν τὴν αἰτίαν. μονοτόκα δέ, τὰ δὲ ὀλιγοτόκα, τὰ δὲ πολυτόκα τῶν ζῴων ἐστίν, ὡς μὲν ἐπὶ τὸ πολύ, τὰ μὲν μώνυχα, μονοτόκα· τὰ δὲ δίχηλα, ὀλιγοτόκα· τὰ δὲ πολυσχιδῆ, πολυτόκα. τούτου δ' αἴτιον, ὅτι ὡς ἐπὶ τὸ πολὺ τὰ μεγέθη διώρισται κατὰ τὰς διαφορὰς ταύτας. οὐ μὴν ἔχει γ' οὕτως ἐπὶ πάντων. αἴτιον γὰρ τὸ μέγεθος καὶ ἡ μικρότης τῶν σωμάτων, τῆς ὀλιγοτοκίας, καὶ τῆς πολυτοκίας· ἀλλ' οὐ τὸ μώνυχον, ἢ πολυσχιδές, ἢ δίχηλον εἶναι τὸ γένος. τούτου δὲ μαρτύριον· ὁ γὰρ ἐλέφας, μέγιστον τῶν B ζῴων ἐστὶ δὲ πολυσχιδές· ἡ δὲ κάμηλος, δίχηλον, τῶν λοιπῶν μέγιστον ὄν. οὐ μόνον δὲ ἐν τοῖς πεζοῖς, ἀλλὰ καὶ ἐν τοῖς πτηνοῖς, καὶ ἐν τοῖς πλωτοῖς, τὰ μὲν μεγάλα, ὀλιγοτόκα ἐστί· τὰ δὲ μικρά, πολυτόκα, διὰ τὴν αὐτὴν αἰτίαν. ὁμοίως δὲ καὶ τῶν φυτῶν οὐ τὰ μέγιστα φέρει πλεῖστον καρπόν. διὰ τί μὲν οὖν τῶν ζῴων τὰ μέν, πολυτόκα, τὰ δ', ὀλιγοτόκα ἐστὶ τὴν φύσιν, εἴρηται. τῆς δὲ νῦν ῥηθείσης ἀπορίας μᾶλλον ἄν τις θαυμάσειεν ἐπὶ τῶν πολυτοκούντων· ἐπεὶ φαίνεται πολλάκις ἀπὸ μιᾶς ὀχείας κυισκόμενα τὰ τοιαῦτα τῶν ζῴων. τὸ δὲ σπέρμα τοῦ ἄρρενος, εἴτε συμβάλλεται πρὸς τὴν ὕλην μόριον γινόμενον τοῦ κυήματος, καὶ τῷ σπέρματι συμμιγνύμενον τὸ τοῦ θήλεος, εἴτε καὶ μὴ τοιοῦτον τὸν τρόπον, C ἀλλ' ὥσπερ φαμὲν συνάγον καὶ συνδημιουργοῦν τὴν ἐν τῷ θήλει ὕλην, καὶ τὸ περίττωμα τὸ σπερματικόν, καθάπερ ὀπὸς τὴν ὑγρότητα τοῦ γάλακτος, διὰ τίνα ποτ' αἰτίαν οὐχ ἓν ἀποτελεῖ ζῷον μέγεθος ἔχον; ὥσπερ ἐνταῦθα ὀπὸς οὐ χωρίζεται τῷ συνιστάναι ποσόν τι, ἀλλ' ὅσῳ περ ἂν εἰς πλεῖον ἔλθῃ καὶ πλεῖον, τοσούτῳ τὸ πηγνύμενον ἐστὶ μεῖζον. τὸ μὲν οὖν ἕλκειν φάναι τοὺς τόπους τῆς ὑστέρας τὸ σπέρμα, καὶ διὰ τοῦτο πλείω γίνεσθαι, διὰ τὸ τῶν τόπων πλῆθος καὶ τὰς κοτυληδόνας, οὐχ ἓν οὔσας, οὐθέν ἐστιν. ἐν ταὐτῷ γὰρ γίνονται τόπῳ τῆς ὑστέρας δύο πολλάκις· ἔν τε τοῖς πολυτόκοις, ὅταν πληρωθῇ τῶν ἐμβρύων, ἐφεξῆς κείμενα φαίνεται. D τοῦτο δὲ δῆλον ἐκ τῶν ἀνατομῶν ἐστιν. ἀλλ' ὥσπερ καὶ τελειουμένων τῶν ζῴων, ἔστιν ἑκάστου τὸ μέγεθος, καὶ ἐπὶ τὸ μεῖζον, καὶ ἐπὶ τὸ ἔλαττον, ὧν οὔτ' ἂν μεῖζον γένοιτο, οὔτ' ἔλαττον· ἀλλ' ἐν τῷ μεταξὺ διαστήματι τοῦ μεγέθους λαμβάνουσι τὴν πρὸς ἄλληλα ὑπεροχὴν καὶ τὴν ἔλλειψιν, καὶ γίνεται μείζων, ὁ δ', ἐλάττων ἂν ἄνθρωπος, καὶ τῶν ἄλλων ὁτιοῦν ζῴων· οὕτω καὶ ἐξ ἧς γίνεται ὕλης σπερματικῆς, οὐκ ἔστιν ἀόριστος, οὔτ' ἐπὶ τὸ πλεῖον, οὔτ' ἐπὶ τὸ ἔλαττον ὥστ' ἐξ ὁποσουοῦν γίνεσθαι τῷ πλήθει. ὅσα οὖν τῶν ζῴων διὰ τὴν εἰρημένην αἰτίαν πλεῖστον προΐεται σπέρμα, ἢ εἰς ἑνὸς ζῴου ἀρχήν, οὐκ ἐνδέχεται ἐκ τούτου ἓν γίνεσθαι πάσης, ἀλ- E λὰ τοσαῦτα ὅσα τοῖς μεγέθεσιν ὥρισται τοῖς ἱκνουμένοις. οὐδὲ τὸ τοῦ ἄρρενος σπέρμα, ἢ ἡ δύναμις ἡ ἐν τῷ σπέρματι, οὐθὲν συστήσει πλέον ἢ ἔλαττον τοῦ πεφυκότος. ὁμοίως τ' εἰ πλέον σπέρμα ἀφίησι τὸ ἄρρεν, ἢ δυνάμεις πλείους, ἐν διαιρουμένῳ τῷ σπέρματι, οὐθὲν ποιήσει μεῖζον τὸ πλεῖστον, ἀλλὰ καὶ τοὐναντίον διαφθερεῖ καταξηραῖνον. οὐδὲ γὰρ τὸ πῦρ θερμαίνει τὸ ὕδωρ μᾶλλον, ὅσῳ περ ἂν ᾖ πλέον, ἀλλ' ἔστιν ὅρος τῆς θερμότητος ἧς ὑπαρχούσης, ἐὰν αὐξήσῃ τις τὸ πῦρ, θερμὸν μὲν οὐκέτι γίνεται μᾶλλον, ἐξατμίζει δὲ μᾶλλον, καὶ τέλος ἀφανίζεται, καὶ γίνεται ξηρόν.

ἐπεὶ δὲ φαίνεται συμμετρίας τινὸς δεῖσθαι πρὸς ἄλληλα, τό, τε περίττωμα τὸ τοῦ θήλεος, καὶ τὸ παρὰ τοῦ ἄρρενος, ὅσα προΐεται σπέρμα τῶν ἀρρένων, τὰ πολυτόκα τῶν ζώων εὐθὺς ἀφίησι· τὸ μὲν ἄρρεν, δυνάμενον πλείω συνιστάναι μεριζόμενον· τὸ δὲ θῆλυ, τοσοῦτον, ὥστε πλείους γίνεσθαι συστάσεις. τὸ δ' ἐπὶ τοῦ γάλακτος παράδειγμα λεχθὲν, οὐχ ὅμοιόν ἐστιν. ἡ μὲν γὰρ τοῦ σπέρματος θερμότης, οὐ μόνον συνίστησι ποσὸν, ἀλλὰ καὶ ποιόν τι· ἡ δὲ ἐν τῷ ὀπῷ καὶ τῇ πυετίᾳ, τὸ ποσὸν μόνον. τοῦ μὲν οὖν πολλὰ γίνεσθαι τὰ κυήματα, καὶ μὴ συνεχὲς ἓν ἐκ πάντων ἐν τοῖς πολυτόκοις, τοῦτ' αὐτὸ αἴτιον, ὅτι οὐκ * ἐξ ὁποσουοῦν γίνεται κύημα· ἀλλ' ἐάν τε ὀλίγον ᾖ, οὐκ ἔσται, ἐάν τε πολὺ λίαν. ὥρισται γὰρ δύναμις καὶ τοῦ πάσχοντος, καὶ τῆς θερμότητος τῆς ποιούσης. ὁμοίως δὲ καὶ ἐν τοῖς μονοτόκοις καὶ μεγάλοις τῶν ζώων, οὐ πολλὰ γίνεται ἐκ πολλοῦ περιττώματος. καὶ γὰρ ἐν ἐκείνοις ἐκ ποσοῦ τινος, ποσόν τι τὸ ἐργαζόμενόν ἐστιν. οὐ προΐεται μὲν οὖν πλείω τοιαύτην ὕλην, διὰ τὴν προειρημένην αἰτίαν· ἣν δὲ προΐεται, τοσαύτη κατὰ φύσιν ἐστὶν, ἐξ ἧς ἓν γίνεται κύημα μόνον. ἐὰν δέ ποτε πλεῖον ἔλθῃ, διδυμοτοκεῖ τότε. διὸ καὶ δοκεῖ τερατώδη τὰ τοιαῦτ' εἶναι μᾶλλον, ὅτι γίνεται παρὰ τὸ ὡς ἐπιτοπολὺ, καὶ τὸ εἰωθός. ὁ δὲ ἄνθρωπος ἐπαμφοτερίζει πᾶσι τοῖς γένεσι. καὶ γὰρ μονοτοκεῖ, καὶ πολυτοκεῖ, καὶ ὀλιγοτοκεῖ ποτε. μάλιστα δὲ μονοτόκον τὴν φύσιν ἐστί· διὰ μὲν τὴν ὑγρότητα τοῦ σώματος καὶ θερμότητα, πολυτόκον (τοῦ γὰρ σπέρματος ἡ φύσις ὑγρὰ καὶ θερμή) διὰ δὲ τὸ μέγεθος, ὀλιγοτόκον καὶ μονοτόκον. διὰ δὲ τοῦτο καὶ τοῖς τῆς κυήσεως χρόνοις, μόνῳ τῶν ζώων ἀνωμάλως εἶναι συμβέβηκε. τοῖς μὲν γὰρ ἄλλοις εἷς ἐστιν ὁ χρόνος, τοῖς δ' ἀνθρώποις πλείους. καὶ γὰρ ἑπτάμηνα καὶ δεκάμηνα γίνονται, καὶ κατὰ τοὺς μεταξὺ χρόνους. καὶ γὰρ τὰ ὀκτάμηνα ζῇ μὲν, ἧττον δέ. τὸ δ' αἴτιον, ἐκ τῶν νῦν λεχθέντων συνίδοι τις ἄν. εἴρηται δὲ περὶ αὐτῶν ἐν τοῖς προβλήμασι. καὶ περὶ μὲν τούτων διωρίσθω τὸν τρόπον τοῦτον. τῶν δὲ πλεοναζόντων μορίων παρὰ φύσιν, τὸ αὐτὸ αἴτιον καὶ τῆς διδυμοτοκίας. ἤδη γὰρ ἐν τοῖς κυήμασι συμβαίνει τὸ αἴτιον, ἐὰν πλείω ὕλην συστήσῃ ἢ κατὰ τὴν τοῦ μορίου φύσιν. τότε γὰρ συμβαίνει μὲν μόριον μεῖζον τῶν ἄλλων ἔχειν, οἷον δάκτυλον, ἢ χεῖρα, ἢ πόδα, ἢ τι τῶν ἄλλων ἀκρωτηρίων ἢ μελῶν· ἢ σχισθέντος τοῦ κυήματος, πλείω γίνεσθαι, καθάπερ ἐν τοῖς ποταμοῖς αἱ δῖναι. καὶ γὰρ ἐν τούτοις τὸ φερόμενον ὑγρὸν καὶ κίνησιν ἔχον, ἂν ἀντικρούσῃ, δύο ἐξ ἑνὸς γίνονται συστάσεις, ἔχουσαι τὴν αὐτὴν κίνησιν· τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῶν κυημάτων συμβαίνει. προσφύεται δὲ μάλιστα μὲν πλησίον ἀλλήλων, ἐνίοτε δὲ καὶ πόρρω, διὰ τὴν γινομένην ἐν τῷ κυήματι κίνησιν· μάλιστα δὲ, διὰ τὴν τῆς ὕλης ὑπεροχὴν, ὅθεν ἀφαιρεθῇ, ἐκεῖ ἀποδίδοται· τὸ δὲ εἶδος ἔχειν, ὅθεν ἐπλεόνασεν. ὅσα δὲ συμβαίνει τοιαῦτα, ὥστε δύο ἔχειν αἰδοῖα, τὸ μὲν ἄρρενος, τὸ δὲ θήλεος, ἀεὶ τὸ μὲν, κύριον τῶν πλεοναζόντων γίνεται, τὸ δὲ, ἄκυρον, καὶ κατὰ τὴν τροφὴν ἀεὶ ἀμαυροῦται, ἅτε παρὰ φύσιν ὄν. προσπέφυκε δὲ ὥσπερ τὰ φύματα. καὶ γὰρ ταῦτα λαμβάνει τροφὴν, καίπερ ὄντα ὑστερογενῆ, καὶ παρὰ φύσιν.

* γ. ὁποσονοῦν

A Cùm igitur hęc moderationem certam inter ſe requirant, ſcilicet excrementum fœminæ, & maris, qui ſemen emittant, multipara animalia ſtatim emittunt quod ſibi conueniat, videlicet mas quod diuiſum poſſit conſtituere plura: fœmina tantum vt plura conſtitui poſſint. Lactis autem illud exemplum ſimile non eſt. Seminis enim calor, non modò efficit quantum, ſed etiam quale quid. [illegible] ci & coaguli calor quantum duntaxat conſtituit. Cauſa igitur vt plures conceptus contrahantur, nec vnum continuum ex cunctis conſummetur in multiparis animalibus, hęc eſt, quòd non ex quantolibet conceptus inchoetur, ſed ſi aut pa- B rum aut multum admodum ſit, gigni non poterit. Præſcripta enim certáque eſt virtus & patientis & agentis. Simili modo in vniparis, magníſque animalibus, non multa ex multo excremento conſiſtunt, cùm in iis etiam ex certo quanto certum quantum, quod conficitur, ſit. Plus igitur materiæ talis non mittit, ea, quam prædiximus, cauſa. Quam autem mittit, talis per naturam eſt, ex qua vnus tantùm conceptus generetur. Quòd ſi aliquando plus acceſſerit, tum gemini naſcentur. Ex quo fit vt hæc portenta potiùs iudicentur, quoniam præter ſolitum, & quod magna ex parte agatur, proueniunt. Homo cum C omnibus generibus ambigit. Nam & vniparum, & pauciparum, & multiparum interdum eſt. Sed maximè ſua natura vniparum eſt. Humore profectò caloréque corporis multiparum eſt. Seminis enim natura humida, & calida eſt. Sed ſuæ magnitudinis ratione pauciparum atque vniparum eſt. Hinc tempus etiam vteri ferendi enorme vnum hoc animal ſortitum eſt. Cęteris enim vnum eſt tempus, homini verò plura ſunt, quippe cùm & ſeptimo menſe, & decimo naſcatur, atque etiam inter ſeptimum & decimum poſitis. Qui enim menſe octauo naſcuntur, etſi minùs, tamen viuere poſſunt. Cuius rei cauſa accipi ex iis quæ modò explicauimus, poteſt. Dixi de his D in Problematibus, atquę de his rebus ita diſſeruiſſe ſtatuiſſéque ſatis ſit. Partium autem ſuperuacuarum præter naturam eadem cauſa eſt, quæ geminorum generationis. Iam enim in conceptu cauſa accidit, videlicet ſi plus materiæ conſiſtit, quàm pro ipſius natura partis ſit. Sic enim accidit, vt vel pars maior, quàm iuſtum ſit, efficiatur. Verbi gratia, digitus, aut manus, aut pes, aut aliud ex cæteris poſtremis, aut membris: vel fiſſo conceptu plures reddantur, quomodo in fluuiis vertigines geminantur. Fit enim ibi, vt humor, qui fertur, & profluens mouetur, ſi in aliquid offenderit, ſecetur, & ex vna in duas euadat conſtitutiones, quæ eundem habeant E motum. Hoc eodem modo in conceptibus euenit. Adnaſcuntur partes illæ vacantes, maximè quidem propinquæ, ſed aliquando etiam remotæ propter conceptus motionem, quanquam præcipuè, quòd materiæ exuperantia ibi redditur, quò tandem decubuit: formam verò, vnde ſuperfuit, inde recipit. Quibus autem gemina habere genitalia accidit, alterum maris, alterum fœminæ, iis ſemper alterum ratum, alterum irritum redditur, cùm per alimentum ſubinde deliteſcat, quoniam præter naturam eſt. Agnatum eſt enim modo abſceſſus. Nam & abſceſſus aſſumunt aliquid nutrimenti, quamuis pòſt geniti ſint, & præter naturam.

Sed ſi quod creat, omnino aut ſuperat, aut ſuperatur, ſimilia oriuntur duo: ac ſi partim ſuperauit, partim ſuperatum eſt, alterum fœmina, alterum mas generatur. Nihil enim intereſt de partibus an de toto dicamus, videlicet quam ob cauſam alterum mas, alterum fœmina gignatur. Vbi autem partes eiuſmodi deſunt, vt poſtrema aliqua, aut alia quæuis membra, eandem cauſam eſſe putandum, quam, ſi omnino quod gignitur, abortum patiatur. Abortus autem conceptum euenire complures, certum eſt. Differunt agnationes à partu multiplici, quomodo expoſui. Monſtra verò cum iis diſſident, eo quòd pluribus coaleſcant. Sed nonnulla hoc etiam modo veniunt, ſi in parte maiore & præcipua quadam peruerſum eſt. Vt ſi qua gemino liene, aut pluribus renibus oriuntur, tum etiam locis partium commutatis, monſtrum dicimus. Quod diuerſione motuum, tranſlationéque materiæ accidit. Vnúmne, an plura ſit per coagmentationem, quod monſtrificum prodit animal, iudicandum eſt principij ratione. Verbi gratia, ſi cor pars eiuſmodi eſt, quod vnum cor habet, vnum animal eſt, quod duo, id duo eſt animalia, quæ ſibi coaluerunt propter conceptuum coniunctionem. Partes verò ſuperuacuas, agnationes eſſe, declaratum iam eſt. Accidit etiam ſæpe vt pluribus ex iis quæ antè oblæſa non viderentur, animalibus iam perfectis meatus aut adducti corporarentur, aut diuerterentur. Iam fœminis nonnullis os vteri compreſſum corporatúmque ab ineunte ætate ad tempus vſque menſtruorum perſeuerauit, mox vrgentibus menſtruis, doloréque infeſtante, aliis ſponte diſruptum eſt, aliis diſſectum à medicis. Nonnullæ interierunt, cùm aut per vim diſrumperetur, aut diſrumpi non poſſet. Pueris etiam quibuſdam genitalis poſtremum, & meatus, quà excrementum veſicæ tranſit, non eòdem tetenderunt, ſed infrà meatus ille tranſegit. Quamobrem demiſſis clunibus mingunt, qui teſtibus paulò in partem ſuperiorem retractis, videntur à longè ſimul, & maris habere genitale, & fœminæ. Meatus etiam alimenti ſicci coaluit aliquibus beſtiis, ſcilicet ouibus, & quibuſdam aliis. Nam & vaccam fuiſſe Pirinthi accepimus, cui cibi excrementum per veſicam tranſmittebatur, diſſectúſque anus denuò propere coaleſcebat, nec reſecando euincere vitium poterant. De partu multiplici, & paucifero, ac de agnatione partium, aut defectu, atque etiam de monſtrifico partu, dictum iam eſt.

CAPVT. V.

Quamobrem animalium alia ſuperfœtant, alia non: & quæ ſuperfœtant, interdum fœtus enutriant, interdum non: & alia libidinoſa in eo genere ſint, alia non.

Animalium verò alia nunquam ſuperfœtant, alia ſuperfœtant. Quorum quædam enutrire ſuos cõceptus ſemper poſſunt, quædam interdum poſſunt, interdum nequeunt. Cauſa, ne ſuperfœtent, eſt, quòd ſingula pariunt. Solipedes enim, & quæ iis auctiores ſunt animantes, nunquam ſuperfœtant. Facit enim earum magnitudo vt excrementum omne in conceptum abſumatur:

γίνεται δὲ κρατήσαντος μὲν τοῦ δημιουργοῦντος ὅμοια δύο, καὶ κρατηθέντος ὅλως· ἂν δὲ τῇ μὲν κρατήσῃ, τῇ δὲ κρατηθῇ, τὸ μὲν, θῆλυ, τὸ δὲ, ἄρρεν. οὐδὲν γὰρ διαφέρει* τοῦτο λέγειν ἐπὶ τῶν μορίων ἢ ἐπὶ τοῦ ὅλου, δι' ἣν αἰτίαν γίνεται, τὸ μὲν, θῆλυ, τὸ δὲ, ἄρρεν. ὅσα δ' ἐλλείποντα γίνεται τῶν τοιούτων μορίων, οἷον ἀκρωτηρίου τινὸς, ἢ τῶν ἄλλων μελῶν, ταύτην αὐτὴν δεῖ νομίζειν αἰτίαν, ἥνπερ καὶ ἂν ὅλον τὸ γινόμενον ἀμβλωθῇ. ἀμβλώσεις δὲ γίνονται πολλαὶ τῶν κυημάτων. διαφέρουσι δ' αἱ μὲν παραφύσεις τῶν κυημάτων, τῆς πολυτοκίας, τὸν εἰρημένον τρόπον· τὰ δὲ τέρατα, τούτων, τῷ πολλῶν εἶναι αὐτὰ σύμφυσιν. ἔνια δὲ καὶ τοῦτον τὸν τρόπον, ἐὰν ἐπὶ μειζόνων γίνηται καὶ κυριωτέρων μορίων· οἷον ἔνια ἔχει δύο σπλῆνας, καὶ πλείους νεφρούς. ἔτι δ' αἱ μεταστάσεις τῶν μορίων, παρατρεπομένων τῶν κινήσεών εἰσι, καὶ τῆς ὕλης μεθισταμένης. ἓν δὲ εἶναι τὸ ζῷον τὸ τερατῶδες, ἢ πλείω συμπεφυκότα, δεῖ νομίζειν κατὰ τὴν ἀρχήν. οἷον εἰ τοιοῦτόν τι ἐστὶν ἡ καρδία μόριον, τὸ μὲν μίαν ἔχον καρδίαν, ἓν ζῷον, τὰ δὲ πλεονάζοντα μόρια, παραφυάδας· τὰ δὲ πλείους ἔχοντα, δύο μὲν εἶναι, συμπεφυκέναι δὲ, διὰ τὴν τῶν κυημάτων σύναψιν. συμβαίνει δὲ πολλάκις καὶ τῶν οὐ δοκούντων ἀναπήρων εἶναι ζῴων πολλοῖς ἤδη τετελειωμένοις, τοὺς μὲν συμπεφυκέναι τῶν πόρων, τοὺς δὲ παρεκτετράφθαι. καὶ γὰρ θηλέσι τισὶν ἤδη τὸ στόμα τῶν ὑστερῶν συμπεφυκὸς διετέλεσεν, ἤδη δ' ὥρας οὔσης τῶν καταμηνίων, καὶ πόνων γινομένων, ταῖς μὲν αὐτόματον ἐρράγη, ταῖς δ' ὑπὸ ἰατρῶν διῃρέθη· τὰς δὲ διαφθαρῆναι συνέπεσεν, ἢ βίᾳ γενομένης τῆς ῥήξεως, ἢ γενέσθαι μὴ δυναμένης. καὶ τῶν παίδων ἐνίοις οὐ κατὰ τὸ αὐτὸ συνέπεσε τὸ πέρας τοῦ αἰδοίου, καὶ ὁ πόρος ᾗ διέρχεται τὸ περίττωμα τὸ ἐκ τῆς κύστεως, ἀλλ' ὑποκάτωθεν· διὸ καὶ καθήμενοι οὐροῦσι. τῶν δὲ ὄρχεων ἀνεσπασμένων ἄνω, δοκοῦσι πόρρωθεν ἅμα θήλεος ἔχειν αἰδοῖον καὶ ἄρρενος. ἤδη δὲ καὶ ὁ τῆς ξηρᾶς τροφῆς πόρος συμπεφυκὼς ἐπί τινων ζῴων γέγονε, καὶ προβάτων καὶ ἄλλων. ἐπεὶ καὶ βοῦς ἐν Περίνθῳ ἐγένετο, ᾗ διὰ τῆς κύστεως λεπτὴ διηθουμένη τροφὴ διεχωρεῖ· καὶ ἀνατμηθέντος τοῦ ἀρχοῦ, ταχὺ πάλιν συνεφύετο, καὶ οὐκ ἐπεκράτουν διαιροῦντες. περὶ μὲν οὖν ὀλιγοτοκίας καὶ πολυτοκίας, καὶ παραφύσεως τῶν πλεοναζόντων ἢ ἐλλειπόντων μορίων, ἔτι δὲ περὶ τῶν τερατωδῶν, εἴρηται.

ΚΕΦΑΛ. ε΄.

Διὰ τί τῶν ζῴων τὰ μὲν οὐκ ἐπικυΐσκεται, τὰ δ' ἐπικυΐσκεται μὲν, τὰ δὲ κυήματα ἐκτρέφει, ὁτὲ μὲν, ὁτὲ δ' οὔ· καὶ διὰ τί τὰ μὲν ἀφροδισιαστικὰ, τὰ δ' οὔ.

Τῶν δὲ ζῴων τὰ μὲν ὅλως οὐκ ἐπικυΐσκεται· καὶ τῶν ἐπικυϊσκομένων τὰ μὲν, δύναται τὰ κυήματα ἐκτρέφειν, τὰ δὲ, ποτὲ μὲν, ποτὲ δ' οὔ. τοῦ δὲ μὴ ἐπικυΐσκεσθαι αἴτιον, ὅτι μονοτόκα ἐστί. τά τε γὰρ μώνυχα οὐκ ἐπικυΐσκεται, καὶ τὰ τούτων μείζονα. διὰ γὰρ τὸ μέγεθος, τὸ περίττωμα ἀναλίσκεται εἰς τὸ κύημα.

πᾶσι γὰρ ὑπάρχει τούτοις μέγεθος σώματος. τῶν δὲ μεγάλων, καὶ τὰ ἔμβρυα μεγάλα κατὰ λόγον ἐστί· διὸ καὶ τὸ τῶν ἐλεφάντων ἔμβρυον, ἡλίκον μόσχος ἐστί. τὰ δὲ πολυτόκα ἐπικυΐσκεται, διὰ τὸ τὰ πλείονα τοῦ ἑνὸς εἶναι θάτερον θατέρου ἐπικύημα. τούτων δὲ ὅσα μὲν μέγεθος ἔχει, καθάπερ ἄνθρωπος, ἐὰν μὲν ἡ ἑτέρα ὀχεία τῆς ἑτέρας γένηται σύνεγγυς, ἐκτρέφει τὸ ἐπικυηθέν. ἤδη γὰρ ὦπται τὸ τοιοῦτον συμβεβηκός. αἴτιον δὲ τὸ εἰρημένον. καὶ γὰρ ἐν τῇ μιᾷ συνουσίᾳ πλεῖον τὸ ἀπιὸν ἐστὶ σπέρμα· ὃ μερισθὲν, ποιεῖ πολυτοκεῖν, ὧν ὑστερίζει θάτερον. ὅταν δὲ ἤδη τοῦ κυήματος ηὐξημένου συμβῇ γίνεσθαι τὴν ὀχείαν, ἐπικυΐσκεται μέν ποτε, ὀλιγάκις μέντοι, διὰ τὸ τὴν ὑστέραν συμμύειν ὡς τὰ πολλὰ, μέχρι τῶν κυουμένων, ταῖς γυναιξίν. ἂν δὲ συμβῇ ποτε, (καὶ γὰρ τοῦτ' ἤδη γέγονεν) οὐ δύναται τελεοῦν· ἀλλὰ κυήματ' ἐκπίπτει παραπλήσια τοῖς καλουμένοις ἐκτρώμασιν. ὥσπερ γὰρ ἐπὶ τῶν μονοτόκων διὰ τὸ μέγεθος, εἰς τὸ προϋπάρχον τὸ περίττωμα τρέπεται πᾶν, οὕτω καὶ τούτοις· πλὴν ἐκείνοις μὲν, εὐθύς· τούτοις δ', ὅταν αὐξηθῇ τὸ ἔμβρυον· τότε γὰρ ἔχουσι παραπλησίως τοῖς μονοτόκοις. ὁμοίως δὲ διὰ τὸ τὸν ἄνθρωπον φύσει πολυτόκον εἶναι, καὶ περιεῖναί τι τοῦ μεγέθους τῆς ὑστέρας, καὶ τοῦ περιττώματος, μὴ μέντοι τοσοῦτον ὥστε ἐκτρέφειν ἕτερον· μόνα τῶν ζῴων ὀχείας ἐπιδέχονται κυοῦντα γυνὴ καὶ ἵππος· ἡ μὲν, διὰ τὴν εἰρημένην αἰτίαν· ἡ δ' ἵππος, διά τε τὴν φύσεως στερρότητα, καὶ τὸ περιεῖναί τι μέγεθος τῆς ὑστέρας, πλέον μὲν ἢ τῷ ἑνὶ, ἔλαττον δὲ ἢ ὥστε ἄλλο ἐπικυΐσκεσθαι τέλειον. ἔστι δὲ φύσει ἀφροδισιαστικὸν, διὰ τὸ ταὐτὸ πεπονθέναι τοῖς στερροῖς. ἐνδεᾶ τε γὰρ ταῦτ' ἐστί, διὰ τὸ μὴ γίνεσθαι κάθαρσιν· τοῦτο δ' ἐστὶν, ὥσπερ τοῖς ἄρρεσι τὸ ἀφροδισιάσαι· καὶ ἵπποι αἱ θήλειαι ἥκιστα προΐενται κάθαρσιν. ἐν πᾶσι δὲ τοῖς ζῳοτοκοῦσι τὰ στερρὰ τῶν θηλειῶν ἀφροδισιαστικὰ, διὰ τὸ παραπλησίως ἔχειν τοῖς ἄρρεσιν, ὅταν συνειλεγμένον μὲν ᾖ τὸ σπέρμα, μὴ ἀποκρινόμενον δέ. ταῖς γὰρ θηλείαις ἡ τῶν καταμηνίων κάθαρσις, σπέρματος ἔξοδός ἐστιν. ἔστι γὰρ τὰ καταμήνια, σπέρμα ἄπεπτον, ὥσπερ πρότερον εἴρηται. διὸ καὶ τῶν γυναικῶν ὅσαι πρὸς τὴν ὁμιλίαν ἀκρατεῖς τὴν τοιαύτην, ὅταν πολυτεκνήσωσι, παύονται τῆς ὀργήσεως. ἐκκεκενωμένη γὰρ ἡ σπερματικὴ περίττωσις, οὐκέτι ποιεῖ τῆς ὁμιλίας ταύτης ἐπιθυμίαν. ἐν δὲ τοῖς ὄρνισιν αἱ θήλειαι τῶν ἀρρένων ἧττόν εἰσιν ἀφροδισιαστικαὶ, διὰ τὸ πρὸς τῷ ὑποζώματι τὰς ὑστέρας ἔχειν· τὰ δὲ ἄρρενα, τοὐναντίον. ἀνεσπασμένους γὰρ ἔχει τοὺς ὄρχεις ἐντός· ὥστε ἂν ᾖ τὸ γένος τῶν τοιούτων ὀρνίθων φύσει σπερματικὸν, ἀεὶ δεῖσθαι τῆς ὁμιλίας ταύτης. ταῖς μὲν οὖν θηλείαις τὸ κάτω καταβαίνειν τὰς ὑστέρας, τοῖς δὲ ἄρρεσι, τὸ ἀνασπᾶσθαι τοὺς ὄρχεις, συμβαίνει πρὸ ὁδοῦ πρὸς τὴν ὀχείαν. δι' ἣν μὲν οὖν αἰτίαν τὰ μὲν οὐκ ἐπικυΐσκεται παντελῶς, τὰ δ' ἐπικυΐσκεται μὲν, τὰ δὲ κυήματα ἐκτρέφει ὁτὲ μὲν, ὁτὲ δ' οὔ· καὶ διὰ τίν' αἰτίαν τὰ μὲν, ἀφροδισιαστικὰ, τὰ δ', οὐκ ἀφροδισιαστικὰ τῶν τοιούτων ἐστὶν, εἴρηται. ἔνια δὲ τῶν ἐπικυϊσκομένων, καὶ πολλοῦ χρόνου διαλιπούσης τῆς ὀχείας, δύναται τὰ κυήματα ἐκτρέφειν, ὅσων σπερματικόν ἐστι τὸ γένος, καὶ μὴ τὸ σῶμα μέγεθος ἔχει, καὶ τῶν πολυτόκων. διὰ μὲν γὰρ τὸ πολυτοκεῖν, εὐρυχωρίαν ἔχει τῆς ὑστέρας·

A quippe cùm in iis omnibus corporis ſit magnitudo. Quæ autem magno corpore ſunt, eorum fœtus quoque magni pro ſui generis magnitudine inſtituuntur. Ex quo fit vt elephantorum fœtus magnitudine vituli geſtetur. Multipara ideo ſuperfœtant; quoniam plures conceptus ſuperfœtatus quidam, alter alteri ſunt. Quæ autem corporis magnitudine prædita ſunt, vt homo, ſi alter coitus proximè ab altero acceſſit, enutrire, quod ſuperfœtatum eſt, poſſunt. Iam enim id eueniſſe viſum eſt. Cuius rei cauſa id, quod diximus, eſt. Eodem enim coitu plus ſeminis mittitur, quod partitum multiplicare conceptum poteſt, ſi alterum poſt alterum accedit. Sed ſi iam aucto con-B ceptu coitus adhibetur, ſuperfœtari quidem poteſt, ſed raro: quoniam vterus magna ex parte ad partum vſque ſe comprimat. Si tamen aliquando accedit vt ſuperfœtetur, (iam enim id eueniſſe conſtat) perfici non poteſt; ſed conceptus ambiguntur ſimiles iis quos abortus vocamus. Vt enim in vniparo genere omne excrementum abſumitur in id quod præceſſerit, ob corporis magnitudinem, ſic in iis fieri ſolet, ſed in illis ſtatim, in his cùm iam fœtus accreuerit. tunc enim ſimilem vniparis conditionem recipiunt. Pari ratione ſola animalium mulier, & equa grauida coitum patiuntur. Homo enim ſua natura præfœcundum animal eſt. Aliquid etiam in vtero, tum ſpa-C tij, tum excrementi ſupereſt, quanquam non tantum, vt vel alterum poſſit alere. Mulier itaque ob eam cauſam coitum recipit. Equa autem ſoliditate ſuæ naturæ, & quòd aliquid ſpatij in vtero ſuperſit, vt dictum eſt, amplius quidem, quàm vt ab vno occupetur, ſed arctius, quàm vt alterum perfectè poſſit ſuperfœtari. Libidinoſa natura eſt equa, ob eundem affectum, quo ſolida omnia Veneris ſunt appetentiora. Illa enim ita ſe habent, quia carent purgatione, quæ perinde eſt fœminis, vt coitus maribus. Equa enim menſtrua minimè emittit. Omnium autem viuiparorum fœminæ ſolidæ ſunt libidinoſiores, quoniam ſimili modo ſe habent atque mares, qui ſemen geni-D tale collectum non excernunt. Fœminis enim purgatio menſtruorum ſeminis exitus eſt, cùm menſtrua non niſi ſemen ſint inconcoctum, vt antè diximus. Quamobrem mulieres, quæ incontinentes ad rem Veneream ſunt, libidine ceſſant, cùm ſæpius generarint. Iam enim ſeminale excrementum quod libidinem accendebat, emiſſum facit ne præterea concumbendi auiditas ſtimulet. In genere auium fœminæ minùs quàm mares, Venerem appetunt, quoniam vterum continent iuxta ſeptum: mares contrà ſalaciores ſunt, quoniam teſtes intus habent retractos. Itaque fit vt quæ ex iis ſua natura abundant ſemine, coitum ſemper deſiderent. Fœminæ igitur huius generis propenſiores ad coitum ſunt vteri deſcenſu: mares teſtium retractu. Diximus quam ob cauſam alia nullo pacto ſuperfœtant, alia ſuperfœ-E tant quidem, ſed conceptus interdum enutriunt, interdum non, & quamobrem alia libidinoſa, alia non libidinoſa in eo genere ſunt. Sunt autem nonnulla ſuperfœtantia, quæ longo etiam interpoſito tempore coeundi poſſint enutrire conceptum, quæ ſuperfœtarint: videlicet ea quorum genus ſemine genitali abundat, & corporis magnitudine caret & multa generat. Cùm enim multiparum ſit, vterum habet ampliorem.

Cùm

Cùm ſemine abundet, multum purgationis excrementitiæ emittit. Cùm corporis magnitudine careat, maioréque portione purgatio ſuperet, quàm conceptus deſideret nutrimentum, poſſunt vel poſt conſtitui animalia, eadémque enutriri, ac perfici. Vteri etiam eorum non ſe comprimunt, quoniam excrementum purgationis ſupereſt. Quod mulieribus quoque euenit. Fit enim nonnullis grauidis purgatio: & interdum quæ ad finem vſque perſeueret. Sed iis præter naturam hoc euenit. Quamobrem fœtus afficitur detrimento. At eiuſmodi animalibus per naturam ſic agitur. Ita enim corpus eorum principio conſtitutum eſt, quale corpus leporum eſt. Hoc enim animal ſuperfœtat: quippe quod nec magnum ſit, & plura generet, multifidum enim eſt. Tale autem quoduis plura generat. Semine etiam abundat, quod eius hirſutie ſignificatur. copia enim pili exuperat. Nam hoc vnum pilos & ſub pedibus habet, & intra genas. Pili autem abundantia, & hirſuties, copiam indicat excrementi. Quamobrem homines piloſi libidinoſiores, & feminis copioſiores ſunt, quàm læues. Lepus igitur ſæpenumero fœtus alios imperfectos geſtat, alios perfectos iam edit.

A διὰ δὲ τὸ σπερματικὸν εἶναι, πολὺ προΐεται περίττωμα τῆς καθάρσεως. διὰ δὲ μὴ τὸ σῶμα μέγεθος ἔχειν, ἀλλὰ πλείονι λόγῳ τὴν κάθαρσιν ὑπερβάλλειν τῆς εἰς τὰ κυήματα τροφῆς, δυνατόν τε συνίστασθαι ζῷα καὶ ὕστερον, καὶ ταῦτα τ' ἐκτρέφειν. ἔτι δ' αἱ ὑστέραι τῶν τοιούτων, οὐ συμμεμύκασι, διὰ τὸ περιεῖναι περίττωμα τῆς καθάρσεως. τοῦτο δὲ καὶ ἐπὶ τῶν γυναικῶν συμβέβηκε· γίνεται γάρ τισι κυούσαις κάθαρσις καὶ διὰ τέλους· ἀλλὰ ταύταις μὲν, παρὰ φύσιν (διὸ βλάπτει τὸ κύημα) τοῖς δὲ τοιούτοις τῶν ζῴων, κατὰ φύσιν. οὕτω γὰρ τὸ σῶμα συνέστηκεν ἐξ ἀρχῆς, οἷον τὸ τῶν δασυπόδων. τοῦτο γὰρ ἐπικυΐσκεται τὸ ζῷον. οὔτε B γὰρ τῶν μεγάλων ἐστὶ, πολυτόκον τε, (πολυσχιδὲς γὰρ· τὰ δὲ πολυσχιδῆ, πολυτόκα) καὶ σπερματικόν. δηλοῖ δ' ἡ δασύτης. ὑπερβάλλει γὰρ τοῦ τριχώματος τὸ πλῆθος· καὶ γὰρ ὑπὸ τοὺς πόδας, καὶ ἐντὸς τῶν γνάθων, τοῦτ' ἔχει τρίχας μόνον [τῶν ζῴων.] ἡ δὲ δασύτης, σημεῖον πλήθους περιττώματός ἐστι. διὸ καὶ τῶν ἀνθρώπων οἱ δασεῖς ἀφροδισιαστικοὶ, καὶ πολυσπέρμοι μᾶλλον εἰσὶ τῶν λείων. ὁ μὲν οὖν δασύπους, τὰ μὲν τῶν κυημάτων ἀτελῆ πολλάκις ἔχει· τὰ δὲ, προΐεται τετελειωμένα τῶν τέκνων.

CAPVT VI.

Quare viuiparorum alia perfectum, alia imperfectum animal pariant.

VIuiparorum alia imperfectum animal pariũt, alia perfectum, ſolipedes, & biſulcæ perfectum: multifidæ complures imperfectum. Cuius rei cauſa eſt, quòd ſolipedes ſingulos pariunt: biſulcæ aut ſingulos, aut binos magna ex parte. Enutrire autem quæ pauca gignuntur, facilè poſſunt. Multifidæ, quæ pariunt imperfecta, omnes multiparæ ſunt. Quo fit vt partum adhuc recentem alere poſſint, auctum iam adeptumque magnitudinem, nequeant: ſed cùm corpus ad nutriendum non ſufficiat, partum emittunt, vt ea quæ vermem pariunt. Quædam enim ex iis catulos inarticulatos propemodum pariunt, vt vulpes, vrſa, leæna, & alia nonnulla. Sed omnia ferè cæcos, vt ea, quæ modò dixi, atque etiam canis, lupa, lupus ceruarius. Sola inter multipara ſus parit perfectos, eáque vna euariat. Generat enim multos more multifidi generis, cùm & biſulcum & ſolipes ſit. Sunt enim locis quibuſdam ſues ſolida vngula. Partu igitur numeroſa eſt, quoniam alimentum, quod in corporis magnitudinem abſumeretur, in excrementum ſeminale decedit. Id enim vt ſolipes magnitudine caret. Quin & potius quaſi ambigens cum natura ſolipedum biſulcum eſt. Hac igitur cauſa & vnum parit, & duos, & quod plurimum, multos. Enutrit verò vſque in finem, quæ peperit, propter ſui corporis alimoniam probam. Habet enim vt ſolum pingue ſuis ſtirpibus, ſic ſcrofa filiis alimentum copioſum, & commodum. Aues etiam nonnullę imperfectos & cæcos pariunt pullos, videlicet quæ cùm paruæ corpore ſint, multos progenerant, vt cornix, pica, paſſer, hirundo, & paucipari generis, quæ copiam alimenti parere vnà cum prole non ſolent, vt palumbes, turtur, columba. Quamobrem ſi quis hirundinum nouellarum adhuc oculos præpungat, rurſum incolumes reddentur.

ΚΕΦΑΛ. ς'.

C Διὰ τί τῶν ζῳοτόκων τὰ μὲν ἀτελῆ προΐεται ζῷα· τὰ δὲ, τετελειωμένα.

ΤΩν δὲ ζῳοτόκων τὰ μὲν, ἀτελῆ προΐεται ζῷα· τὰ δὲ, τετελειωμένα· τὰ μὲν μώνυχα, καὶ τὰ δίχηλα, τετελειωμένα· τῶν δὲ πολυσχιδῶν, ἀτελῆ πολλά. τούτου δ' αἴτιον, ὅτι τὰ μὲν μώνυχα, μονοτόκα ἐστί· τὰ δὲ δίχηλα, ἢ μονοτόκα, ἢ διτόκα ὡς ἐπιτοπολύ. ῥᾴδιον δὲ τὰ ὀλιγοτόκα ἐκτρέφειν. τῶν δὲ πολυσχιδῶν ὅσα ἀτελῆ τίκτει, πάντα πολυτόκα. διὸ νέα μὲν ὄντα, δύναται τὰ κυήματα ἐκτρέφειν· ὅταν δ' αὐξηθῇ καὶ λάβῃ μέγεθος, οὐ δυναμένου τοῦ σώματος ἐκτρέφειν, προΐεται D καθάπερ τὰ σκωληκοτόκα τῶν ζῴων. καὶ γὰρ τίκτουσι τὰ μὲν, ἀδιάρθρωτα [σχεδὸν] ζῷα, καθάπερ ἀλώπηξ, ἄρκτος, λέων, παραπλησίως δ' ἔνια καὶ τῶν ἄλλων· τυφλὰ δὲ πάντα σχεδὸν, οἷον ταῦτά τε, καὶ ἔτι κύων, λύκος, θώς· μόνον δὲ πολυτόκον ὂν ὁ ὗς, τελειοτοκεῖ, καὶ ἐπαλλάττει μόνον τοῦτο. πολυτοκεῖ μὲν γὰρ, ὡς τὰ πολυσχιδῆ· δίχηλον δ' ἐστὶ καὶ μώνυχον· εἰσὶ γάρ που μώνυχες ὕες. πολυτοκεῖ μὲν οὖν διὰ τὸ τὴν εἰς τὸ μέγεθος τροφὴν, εἰς τὴν σπερματικὴν ἀποκρίνεσθαι περίττωσιν. τοῦτο γὰρ ὡς μώνυχον οὐκ ἔχει μέγεθος. ἅμα δὲ καὶ μᾶλλον, ὥσπερ ἀμφισβητοῦν τῇ φύσει τῇ τῶν μωνύχων, δίχηλόν ἐστι. διὰ μὲν οὖν τοῦτο καὶ μονοτοκεῖ καὶ διτοκεῖ, καὶ πολυτοκεῖ τὰ πλεῖστα. ἐκτρέφει δ' εἰς τέλος, E διὰ τὴν τοῦ σώματος εὐβοσίαν. ἔχει γὰρ ὡς πίειρα γῆ φυτοῖς ἱκανὴν καὶ δαψιλῆ τροφήν. τίκτουσι δ' ἀτελῆ καὶ τυφλὰ καὶ τῶν ὀρνίθων τινὲς, ὅσοι πολυτοκοῦσιν αὐτῶν, μὴ σωμάτων ἔχοντες μέγεθος· οἷον κορώνη, κίττα, στρουθοὶ, χελιδόνες. καὶ τῶν ὀλιγοτοκούντων ὅσα μὴ δαψιλῆ τροφὴν συνεκτίκτει τοῖς τέκνοις· οἷον φάττα καὶ τρυγὼν, καὶ περιστερά· καὶ διὰ τοῦτο τῶν χελιδόνων, ἐάν τις, ἔτι νέων ὄντων, ἐκκεντήσῃ τὰ ὄμματα, πάλιν ὑγιάζονται.

A γινομένων γάρ, ἀλλ' οὐ γεγενημένων, φθείρεται. διόπερ φύονται καὶ βλαστάνουσιν ἐξ ἀρχῆς. ὅλως δὲ προτερεῖ μὲν τῆς τελεογονίας, διὰ τὴν ἀδυναμίαν τῆς ἐκτροφῆς· ἀτελῆ δὲ γίνεται, διὰ τὸ προτερεῖν. τοῦτο δὲ δῆλον καὶ ἐπὶ τῶν ἑπταμηνιαίων. διὰ γὰρ τὸ ἀτελῆ εἶναι, πολλάκις ἔνια αὐτῶν γίνεται οὐδὲ τοὺς πόρους ἔχοντα διηρθρωμένους, (οἷον ὤτων καὶ μυκτήρων) ἀλλ' ἐπαυξανομένοις διαρθροῦται· καὶ βιοῦσι πολλὰ τῶν τοιούτων. γίνεται δὲ ἀνάπηρα μᾶλλον ἐν τοῖς ἀνθρώποις τὰ ἄρρενα τῶν θηλέων· ἐν δὲ τοῖς ἄλλοις, οὐδὲν μᾶλλον. αἴτιον δ', ὅτι ἐν τοῖς ἀνθρώποις πολὺ διαφέρει τὸ ἄρρεν τοῦ θήλεος τῇ θερμότητι τῆς φύσεως· διὸ κινητικώτερά ἐστι κυούμενα τὰ ἄρρενα τῶν θηλέων· διὰ δὲ τὸ B κινεῖσθαι, θραύεται μᾶλλον. εὔθραυστον γὰρ τὸ νέον, διὰ τὴν ἀσθένειαν. διὰ τὴν αὐτὴν δὲ ταύτην αἰτίαν, καὶ τελεοῦται τὰ θήλεα τοῖς ἄρρεσιν οὐχ ὁμοίως ἐν ταῖς γυναιξίν. ἐν μὲν [γὰρ] τῇ μήτρᾳ, ἐν πλείονι χρόνῳ διακρίνεται τὸ θῆλυ τοῦ ἄρρενος· ἐξελθόντων δέ, πάντα πρότερον ἐπιτελεῖται (οἷον ἥβη, καὶ ἀκμή, καὶ γῆρας) τοῖς θήλεσιν ἢ τοῖς ἄρρεσιν. ἀσθενέστερα γάρ εἰσι καὶ ψυχρότερα τὰ θήλεα τὴν φύσιν· καὶ δεῖ ὑπολαμβάνειν, ὥσπερ ἀναπηρίαν εἶναι τὴν θηλύτητα, φυσικήν. ἔσω μὲν οὖν διακρίνεται, διὰ τὴν ψυχρότητα, βραδέως (ἡ γὰρ διάκρισις πέψις ἐστί· πέττει δ' ἡ θερμότης· εὐπεπτότερον δὲ τὸ θερμότερον) ἐκτὸς δέ, C διὰ τὴν ἀσθένειαν, ταχὺ συνάπτει πρὸς τὴν ἀκμὴν καὶ τὸ γῆρας. πάντα γὰρ τὰ ἐλάττω, πρὸς τὸ τέλος ἔρχεται θᾶττον, ὥσπερ καὶ ἐν τοῖς κατὰ τέχνην ἔργοις, καὶ ἐν τοῖς ὑπὸ φύσεως συνισταμένοις. διὰ τὸ εἰρημένον δὲ αἴτιον, καὶ ἐν τοῖς ἀνθρώποις τὰ διδυμοτοκούμενα θῆλυ καὶ ἄρρεν, ἧττον σώζεται· ἐν δὲ τοῖς ἄλλοις, οὐδὲν ἧττον. τοῖς μὲν γάρ, παρὰ φύσιν τὸ ἰσοδρομεῖν, οὐκ ἐν ἴσοις χρόνοις γινομένης τῆς διακρίσεως, ἀλλ' ἀνάγκη τὸ ἄρρεν ὑστερεῖν, ἢ τὸ θῆλυ προτερεῖν. ἐν δὲ τοῖς ἄλλοις, οὐ παρὰ φύσιν. συμβαίνει δὲ καὶ διαφορὰ περὶ τὰς κυήσεις, ἐπί τε τῶν ἀνθρώπων, καὶ ἐπὶ τῶν ἄλλων ζώων. τὰ μὲν γάρ, * εὐθηνεῖ μᾶλλον τοῖς σώμασιν τὸν πλεῖστον χρόνον· τῶν δὲ γυναικῶν αἱ πολλαί, δυσφο- D ροῦσι περὶ τὴν κύησιν. ἔστι μὲν αἴτιον τούτων καὶ διὰ τὸν βίον. ἑδραῖαι γὰρ οὖσαι, πλείονος γέμουσι περιττώματος· ἐπεὶ ἐν οἷς ἔθνεσι πονητικὸς ὁ τῶν γυναικῶν βίος, οὐχ ἡ κύησις ὁμοίως ἐπίδηλός ἐστι, τίκτουσί τε ῥαδίως κἀκεῖ καὶ πανταχοῦ αἱ εἰωθυῖαι πονεῖν (ἀναλίσκει γὰρ ὁ πόνος τὰ περιττώματα) ταῖς δ' ἑδραίαις ἐνυπάρχει πολλὰ τοιαῦτα διὰ τὴν ἀπονίαν, καὶ τὸ μὴ γίνεσθαι καθάρσεις κυούσαις· ἥ τε ὠδὶς ἐπίπονός ἐστιν· ὁ δὲ πόνος γυμνάζει τὸ πνεῦμα, ὥστε δύνασθαι κατέχειν, ἐν ᾧ τὸ τίκτειν ἐστὶ ῥαδίως, ἢ χαλεπῶς. ἔστι μὲν οὖν (ὥσπερ εἴρηται) καὶ ταῦτα συμβαλλόμενα πρὸς τὴν διαφορὰν τοῦ πάθους ἄλλοις ζώοις, καὶ ταῖς γυναιξί· E μάλιστα δ', ὅτι τοῖς μὲν αὐτῶν ὀλίγη γίνεται κάθαρσις, τοῖς δ' οὐκ ἐπίδηλος ὅλως· ταῖς δὲ γυναιξὶ πλείστη τῶν ζώων ὥστε μὴ γινομένης * τῆς ἐκκρίσεως διὰ τὴν κύησιν, ταῖς μὲν ταραχὴν παρέχει. (καὶ γὰρ μὴ κυούσαις, ὅταν αἱ καθάρσεις μὴ γίγνωνται, νόσοι συμβαίνουσι· καὶ τὸ πρῶτον δὲ ταράττονται συλλαμβάνουσαι μᾶλλον αἱ πλεῖσται τῶν γυναικῶν. τὸ γὰρ κύημα, κωλύειν μὲν δύναται τὰς καθάρσεις· διὰ μικρότητα δέ, οὐδὲν ἀναλίσκει πλῆθος τοῦ περιττώματος τὸ πρῶτον, ὕστερον δὲ κουφίζει μεταλαμβάνον)

* ἢ γ. εὐσωεῖ μ.

* γ. τῆς καθάρσεως

A Cùm enim fiunt, non facti iam corrumpuntur: itaque denuò oriuntur, ac pullulant. Omnino hæc præueniunt generationem perfectam ob alendi inopiam. Generant verò imperfectos, quoniam perfectionem præueniunt. Quod in pueris etiam patet, qui menſe ſeptimo naſcuntur. Sæpe enim nonnulli eorum præ ſua imperfectione ne meatus quidem integros adhuc habent, vt aurium, aut nariũm: ſed pòſt accreſcentes recipiunt: multique ex iis vitæ compotes euadunt. Mares potiùs quã fœminæ, oblæſi in genere hominum naſcuntur, cùm in cæteris animalibus nihilò potiùs mares quã fœminæ ita proueniant. Cuius rei cauſa eſt, quòd in hominibus longè mas à fœmina differt calore na- B turæ. Quo fit vt mobiliores ſint mares in vtero, quàm fœminę. Motu autem ipſo franguntur, cùm recens quoduis facilè præ ſua imbecillitate frangi poſſit. Hæc eadem cauſa eſt, ne fœminæ ſimiliter atque mares, perficiantur in genere hominum: quippe cùm & intra parentem fœmina tempore longiore conficiatur, quàm mas: & vbi in lucẽ venerint, celeriùs fœminæ quam mares, perficiantur. Nam & pubes, & vigor, & ſenectus fœminis priùs venit, quàm maribus. Sunt enim fœminæ ſua natura debiliores frigidioréſque: & ſexum fœmineum quaſi læſionem naturalem, & detrimentum eſſe, putandum eſt. Intus igitur tardè præ ſua frigiditate diſcernuntur. hæc etenim diſcretio, con- C coctio eſt. Calor autem concoquit, & quod calidius, id concoctu facilius eſt. Sed foris propter ſuã debilitatem citò ad ętatis florem, ſenectutemque, perueniunt. Etenim omnia minora, vt in artis operibus, ſic in naturæ, citiùs ad finem deueniunt. Eadem cauſa eſt, vt qui gemini mas & fœmina in genere hominum prodeunt, minùs ſeruentur, cùm in cæteris animalibus nihilo referat. Hominibus enim hic concurſus præter naturam eſt, cùm non pari tempore mas & fœmina diſcernantur: ſed aut marem contari aut fœminam præuenire, neceſſe ſit. At in cæteris id non præter naturam eſt. In ferendo etiam vtero homines cum cæteris animalibus diſſident. Cùm enim cætera plurimum tem- D poris valeant corpore, cùm vterum ferunt; mulieres magna ex parte ægræ degunt. Cuius rei cauſa aliqua vel ad vitam referri poteſt. Cùm enim mulieres vitam otioſam & ſellulariam quandam degant, plus contrahunt ſibi excrementi. Nam quib. gentibus ſolitum eſt vt mulieres labores ſuſcipiãt, iis nec vterus tam difficulter geſtatur, & partus facilis eſt. Denique quibuſuis locis mulieres, quę laborare conſueuerunt, faciliùs pariũt. Labor enim incrementa conſumit, quæ in mulieribus otioſis augentur. Cúmque parturigo laborioſa ſit, labor & exercitatio actæ vitæ facit vt ſpiritum poſſint retinere: in qua re partus facilitas conciliatur. Adferũt igitur ea quoque, vt modò dixi, aliquid cau- E ſæ ad eius affectionis* differentiam, qua mulieres cæteris animalibus in ferendo vtero diſcrepant. Sed maximè cauſa eſt, quòd cùm cæteris aut exigua purgatio, aut nulla manifeſta fiat, fieri plurima euenit. Quæ cùm per vteri geſtationem deſierit, infeſtat, atque perturbat: quippe cùm etiam non grauidis, niſi purgationes fiant, ægritudines accidant. Principio potiùs cùm concipiunt, perturbari ſolent magna ex parte. Conceptus enim purgationem impedit, & præ ſua exiguitate abſumere copiam excrementi inter initia non poteſt: quãquam pòſt, vbi iam pleniùs abſumere cœperit, leuat.

At in cæteris animalibus, quoniam parum excrementi eſt, modicè ad fœtus incrementum accommodatur. Cúmque excrementa, quæ nutricationem impediunt, abſumantur, valent feliciùs. Nec ſecus aquatile genus aut volatile afficitur. Iam verò accreſcente fœtu, quibus non æquè proba altio contingit, cauſa eſt, quòd fœtus incrementum plus excrementitij alimenti deſideret: paucis verò quibuſdam mulieribus euenit, vt prægnantes meliùs valeant corpore, videlicet iis quarum in corpore exigua continentur excrementa, quę abſumi poſſint cum alimento, quod fœtui adminiſtratur.

CAPVT VII.

Quam ob cauſam mola in vteris mulierum generetur, & quare potiùs in muliere, quàm in cæteris animalibus.

DE eo, quod mola vocatur, videndum eſt. Accidit hoc vitium mulieribus nonnullis grauidis, quanquam rarò. Pariunt enim quod molam vocant. Iam accidit enim mulieri cuidam, vt cùm concubuiſſet, & ſe concepiſſe putaſſet, primùm ventris moles augeretur, & reliqua ex ratione venirent. Sed cùm tempus pariendi iam eſſet, nec pareret, neque moles minueretur, ſed annos tres aut quatuor ita perſeueraret, quoad dyſenteriæ, id eſt, difficultati inteſtinorum implicata, eóque modo periclitata, demum pepererit carnem, quam molam vocant. Quin & tota vita edurat hoc vitium, vt & conſeneſcat & commoriatur. Quæ autem prodierit, adeo obdureſcit, vt vix ferro tranſfigi poſſit. Cauſam huius affectus dixi in Problematibus. Afficitur enim conceptus eodem modo, quo ea quæ inquinari dicimus, cùm elixantur, nec per calorem, vt quidam volunt, ſed potiùs propter caloris debilitatem. Natura enim de vita certare videtur, nec poſſe perficere, ſinémque apponere generationi. Quamobrem aut tota vita, aut longo tempore durat, quod inchoatum eſt. Nec enim vt perfectam nec vt alienam omnino habet naturam. Cauſa namque duritiæ cruditas eſt: quippe cùm inquinatio quoque cruditas quædam ſit. Sed quæritur cur cæteris animalibus idem non accidat, niſi quid admodum lateat. Cauſam verò eſſe putandum, quòd mulier vna omnium animalium affectionibus vteri obnoxia eſt, & menſtruis abundat, nec poteſt ea concoquere. Cùm igitur ex humore concoctu difficili conceptus conſiſtit, tunc gignitur quod mola vocatur, idque in mulieribus meritò, aut ſolis, aut maximè.

CAPVT VIII.

Quæ animalia lac habeant, & quam ob cauſam à natura datum ſit.

LAc autem fit iis fœminis quæ animal intra ſe generant, quod vtile partus tempore eſt. Natura enim alimenti gratia externi animalibus parauit, vt nec deeſſet tempore debito, neque vltra id tempus ſupereſſet. Quod ita planè euenire videmus, niſi quid præter naturam acciderit. Sed cæteris animalibus, quoniam tempus ſimplex ferendi vteri, partúſque datum eſt, lactis concoctio ad

A ἐν δὲ τοῖς ἄλλοις ζῴοις, διὰ τὸ ὀλίγον εἶναι, συμμετρεῖται πρὸς τὴν αὔξησιν τῶν ἐμβρύων, καὶ ἀναλισκομένων τῶν περιττωμάτων τῶν ἐμποδιζόντων τὴν τροφὴν, εὐημερεῖ τοῖς σώμασι μᾶλλον. καὶ ἐν τοῖς ἐνύδροις δὲ τὸν αὐτὸν τρόπον, καὶ ἐν τοῖς ὄρνισιν. ἤδη δὲ μεγάλων γινομένων τῶν κυημάτων, ὅσοις μὴ συμβαίνει ἡ εὐτροφία τῶν σωμάτων, αἴτιον τὸ τὴν αὔξησιν τοῦ κυήματος δεῖσθαι πλείονος τῆς περιττωματικῆς τροφῆς. ὀλίγαις δέ τισι τῶν γυναικῶν, βέλτιον ἔχειν τὰ σώματα συμβαίνει κυούσαις. αὗται δ' εἰσὶν, ὅσαις μικρὰ τὰ περιττώματα
B τὰ ἐν τῷ σώματι, ὥστε καταναλίσκεσθαι μετὰ τῆς εἰς τὸ ἔμβρυον τροφῆς.

ΚΕΦΑΛ. ζ'.

Περὶ τῆς καλουμένης μύλης.

ΠΕρὶ δὲ τῆς καλουμένης μύλης, ἣ γίνεται μὲν ὀλιγάκις ταῖς γυναιξὶ, γίνεται δέ τισι τοῦτο τὸ πάθος κυούσαις. τίκτουσι γὰρ ὃ καλοῦσι μύλην. ἤδη γὰρ συνέβη τινὶ γυναικὶ συγγενομένῃ τῷ ἀνδρὶ, καὶ δοξάσῃ συλλαβεῖν, τὸ μὲν πρῶτον, ὅ τε ὄγκος ηὐξάνετο τῆς γαστρὸς, καὶ τἄλλα ἐγίγνετο κατὰ λόγον· ἐπεὶ δὲ ὁ χρόνος ἦν τοῦ τόκου, οὔτ' ἔτικτεν, οὔτε ὁ ὄγκος ἐλάττων ἐγίνετο, ἀλλ' ἔτη τρία ἢ τέτταρα οὕτω διετέλει, ἕως δυσεντερίας γενομένης, καὶ κινδυνεύσασα ὑπ' αὐτῆς, ἔτεκε σάρκα ἣν καλοῦσι μύλην. ἔτι δὲ καὶ συγκαταγηράσκει καὶ συναποθνήσκει τοῦτο τὸ πάθος. τὰ δὲ θύραζε ἐξιόντα τῶν τοιούτων, γίνεται σκληρὰ οὕτως, ὥστε μόλις διακόπτεσθαι καὶ σιδήρῳ. περὶ μὲν οὖν τοῦ πάθους τῆς αἰτίας, εἴρηται ἐν τοῖς προβλήμασι. πάσχει γὰρ ταὐτὸν τὸ κύημα ἐν τῇ μήτρᾳ, ὅπερ ἐν τοῖς ἑψομένοις τὰ μωλυνόμενα· καὶ οὐ διὰ θερμότητα, ὥσπερ τινές φασιν, ἀλλὰ μᾶλλον δι' ἀσθένειαν θερμότητος. ἔοικε γὰρ ἡ
D φύσις ἀδυνατεῖν, καὶ οὐ δύνασθαι τελειῶσαι, οὐδ' ἐπιθεῖναι τῇ γενέσει τὸ πέρας. διὸ καὶ συγκαταγηράσκει, ἢ πολὺν ἐμμένει χρόνον. οὔτε γὰρ ὡς τετελειωμένον, οὔθ' ὡς παντελῶς ἀλλότριον ἔχει τὴν φύσιν. τῆς γὰρ σκληρότητος ἡ ἀπεψία αἰτία. ἀπεψία γάρ τις καὶ ἡ μώλυνσίς ἐστιν. ἀπορίαν δ' ἔχει, διὰ τί ποτ' ἐν τοῖς ἄλλοις οὐχὶ γίνεται ζῴοις, εἰ μή τι παντελῶς λέληθεν. αἴτιον δὲ δεῖ νομίζειν, ὅτι μόνον ὑστερικόν ἐστι γυνὴ τῶν ἄλλων ζῴων, καὶ περὶ τὰς καθάρσεις πλεονάζει, καὶ οὐ δύναται πέττειν αὐτάς. ὅταν οὖν ἐκ δυσπέπτου ἰκμάδος συστῇ τὸ κύημα, τότε γίνεται ἡ καλουμένη μύλη, ἐν ταῖς γυναιξὶν εὐλόγως,
E ἢ μάλιστα, ἢ μόναις.

* Hiſtor. lib. 10. c. vlt.

ΚΕΦΑΛ. η'.

Τίνα τῶν ζῴων γάλα ἔχει, καὶ διὰ τί.

ΤΟ δὲ γάλα γίνεται ταῖς θηλέσιν ὅσα ζῳοτοκεῖ ἐν αὐταῖς, χρήσιμον μὲν εἰς τὸν χρόνον τὸν τοῦ τόκου. τῆς γὰρ τροφῆς χάριν αὐτὸ τῆς θύραζε ἐποίησεν ἡ φύσις τοῖς ζῴοις· ὥστ' ἐλλείπειν αὐτὸ ἐν τῷ χρόνῳ τούτῳ οὐθὲν, οὔθ' ὑπερβάλλειν οὐθέν· ὅπερ καὶ φαίνεται συμπῖπτον, ἂν μή τι γίνηται παρὰ φύσιν. τοῖς μὲν οὖν ἄλλοις ζῴοις, διὰ τὸ τὸν χρόνον ἕνα τῆς κυήσεως εἶναι, πρὸς τοῦτον ἀπαντᾷ τὸν

καιρὸν ἡ πέψις αὐτοῦ· τοῖς δὲ ἀνθρώποις, ἐπεὶ πλείους οἱ χρόνοι, κατὰ τὸν πρῶτον ἀναγκαῖον ὑπάρχειν. διὸ πρὸ τῶν ἑπταμήνων, ἄχρηστον τὸ γάλα ταῖς γυναιξί· τότε δὲ δὴ γίνεται χρήσιμον. εὐλόγως δὲ συμβαίνει καὶ διὰ τὴν ἐξ ἀνάγκης αἰτίαν πεπεμμένον, εἰς τοὺς τελευταίους χρόνους. τὸ μὲν γὰρ πρῶτον ἡ τοῦ τοιούτου περιττώματος ἀπόκρισις, εἰς τὴν τῶν ἐμβρύων ἀναλίσκεται γένεσιν. πάντων δ' ἡ τροφὴ τὸ γλυκύτατον καὶ πεπεμμένον. ὥστε ἀφαιρουμένης τῆς τοιαύτης δυνάμεως, ἀνάγκη τὸ λοιπὸν ἁλμυρὸν γίνεσθαι καὶ δύσχυμον. τελειουμένων δὲ τῶν κυημάτων, πλέον τὸ περίττωμα τὸ περιγινόμενον. ἔλαττον γὰρ τὸ ἀναλισκόμενον καὶ γλυκύτερον, οὐκ ἀφαιρουμένου ὁμοίως τοῦ εὐπέπτου. οὐ γὰρ ἔτι εἰς πλάσιν τοῦ ἐμβρύου γίνεται ἡ τροφὴ, ἀλλὰ εἰς μικρὰν αὔξησιν, ὥσπερ ἑστηκὸς ἤδη διὰ τὸ τέλος ἔχειν τὸ ἔμβρυον. ἔστι γάρ τις καὶ κυήματος τελείωσις. διόπερ ἐξέρχεται καὶ μεταβάλλει τὴν γένεσιν, * ὡς ἔχον τὰ αὑτοῦ· οὐκέτι λαμβάνει τὰ μὴ ἑαυτοῦ, ἐν ᾧ καιρῷ γίνεται τὸ γάλα χρήσιμον. εἰς δὲ τὸν ἄνω τόπον καὶ τοὺς μαστοὺς συλλέγεται, διὰ τὴν ἐξ ἀρχῆς τάξιν τῆς συστάσεως. τὸ μὲν γὰρ ἄνω τοῦ ὑποζώματος, τὸ κύριον τοῦ ζῴου ἐστί· τὸ δὲ κάτω, τῆς τροφῆς καὶ τοῦ περιττώματος· ὅπως ὅσα πορευτικὰ τῶν ζῴων ἐν αὐτοῖς ἔχοντα τὴν τῆς τροφῆς αὐτάρκειαν, μεταβάλλῃ τοὺς τόπους. ἐντεῦθεν δὲ ἡ σπερματικὴ περίττωσις ἀποκρίνεται, διὰ τὴν εἰρημένην αἰτίαν ἐν τοῖς κατ' ἀρχὰς λόγοις. ἔστι δὲ τό, τε τῶν ἀρρένων περίττωμα, καὶ τὰ καταμήνια τοῖς θήλεσιν, αἱματικῆς φύσεως. τούτου δ' ἀρχὴ, καὶ τῶν φλεβῶν, ἡ καρδία· αὕτη δὲ, ἐν τοῖς μορίοις τούτοις. διὸ πρῶτον ἐνταῦθα ἀναγκαῖον γίνεσθαι τὴν μεταβολὴν ἐπίδηλον τῆς τοιαύτης περιττώσεως. διόπερ αἵ τε φωναὶ μεταβάλλουσι καὶ τῶν ἀρρένων καὶ τῶν θηλειῶν, ὅταν ἄρχωνται σπέρμα φέρειν (ἡ γὰρ ἀρχὴ τῆς φωνῆς ἐντεῦθεν· ἀλλοία δὲ γίνεται ἀλλοιουμένου τοῦ κινοῦντος) καὶ τὰ περὶ τοὺς μαστοὺς αἴρεται καὶ τοῖς ἄρρεσιν ἐπιδήλως, μᾶλλον δὲ τοῖς θήλεσι. διὰ γὰρ τὸ κάτω τὴν ἔκκρισιν γίνεσθαι πολλὴν, κενὸς ὁ τόπος γίνεται ὁ τῶν μαστῶν αὐταῖς καὶ σομφός. ὁμοίως δὲ καὶ ταῖς κάτω τοὺς μαστοὺς ἐχούσαις. γίνεται μὲν οὖν ἐπίδηλος καὶ ἡ φωνὴ, καὶ τὰ περὶ τοὺς μαστοὺς, καὶ ἐν τοῖς ἄλλοις ζῴοις τοῖς ἐμπείροις περὶ ἕκαστον γένος. ἐπὶ δὲ τῶν ἀνθρώπων διαφέρει πλεῖστον. αἴτιον δὲ, τὸ πλείστην εἶναι τὴν περίττωσιν ταῖς θήλεσι τούτοις τῶν θηλειῶν, καὶ τοῖς ἄρρεσι τῶν ἀρρένων, ὡς κατὰ μέγεθος· ταῖς μὲν, τὴν τῶν καταμηνίων, τοῖς δὲ, τὴν τοῦ σπέρματος πρόεσιν. ὅταν οὖν μὴ λαμβάνῃ μὲν τὸ ἔμβρυον τὴν τοιαύτην ἀπόκρισιν, κωλύῃ δὲ θύραζε βαδίζειν, ἀναγκαῖον εἰς τοὺς κενοὺς τόπους ἀθροίζεσθαι τὸ περίττωμα πᾶν, ὅσοιπερ ἂν ὦσιν ἐπὶ τῶν αὐτῶν πόρων. ἔστι δὲ ἑκάστοις τοιοῦτος ὁ τῶν μαστῶν τόπος δι' ἀμφοτέρας τὰς αἰτίας· ἕνεκά γε τοῦ βελτίστου γεγονὼς τοιοῦτος, καὶ ἐξ ἀνάγκης. ἐνταῦθα δὲ ἤδη συνίσταται καὶ γίνεται πεπεμμένη τροφὴ τοῖς ζῴοις. τῆς δὲ πέψεως ἔστι μὲν λαβεῖν τὴν εἰρημένην αἰτίαν, ἔστι δὲ τὴν ἐναντίαν. εὔλογον γὰρ, καὶ μεῖζον ὂν τὸ ἔμβρυον, πλείω λαμβάνειν τροφήν· ὥστε ἔλαττον περιγίνεσθαι περὶ τὸν χρόνον τοῦτον. πέττεται δὲ θᾶττον τὸ ἔλαττον. ὅτι μὲν οὖν ἐστὶ τὸ γάλα τὴν αὐτὴν ἔχον φύσιν τῇ ἀποκρίσει, ἐξ ἧς γίνεται ἕκαστον, δῆλον. εἴρηται δὲ καὶ πρότερον.

* κ. ὡς ἔχον τὰ αὑτοῦ, οὐκέτι λαμβάνει τὰ μὴ ἑαυτοῦ.

A hoc tempus ſolet accedere. Hominibus verò quoniam plura ſunt tempora, primò adeſſe neceſſe eſt. Quamobrem lac mulierum, cùm ante ſeptimum menſem inutile ſit, vtile iam ſeptimo redditur menſe. Cauſa etiam neceſſitatis propria, concoctio lactis temporibus vltimis habetur. Principio enim deceſſio huiuſcemodi excrementi abſumitur in fœtus generationem. Omnibus autem alimento eſt, quod dulciſſimum, & coctiſſimum ſit. Itaque ſublata hac facultate, reliquum ſalſum maléque ſapidum eſſe neceſſe eſt. Sed cùm fœtus magis magiſque perficiatur, plus excrementi ſupereſt. Minùs abſumitur, idque dulcius eſt, cùm non æquè detrahatur, quod bene concoctum ſit. B Non enim inſuper ad fœtus informationem conſumitur, ſed ad incrementum mediocre, quaſi iam fœtus conſtet adeptus finem ſuum. Eſt enim & conceptus perfectio. Quamobrem exit, permutatque generationem, vt qui iam ſua receperit, nec præterea accipit quod ſuum non eſt. Quo tempore lac vtile datur. Colligitur hoc parte ſuperiore corporis, & mammis propter ordinem primæ originaliſque conſtitutionis. Præcipua enim pars animalis, quæ ſupra ſeptum eſt, inferior verò ad cibum & excrementum accommodata eſt, vt greſſile animalium genus habens intra ſe alimenti ſuppetias loca permutet. Hinc ſeminale quoque excrementum ſecernitur ob C eam, quam inter initia diſputationis noſtræ reddidimus, cauſam. Eſt enim naturæ ſanguineæ, tum excrementum maris, tum menſtrua fœminæ. Sanguinis autem & venarum principium cor eſt, quod in ea ipſa parte ſuperiore poſitum eſt. Quapropter hic primum excrementi talis mutationem innoteſcere neceſſe eſt. Ex quo fit vt & voces, tum marium tum fœminarum immutentur, cùm ſemen ferre incipiunt, (hinc enim vox ſuam originem trahit: alteratur verò, cùm id quod moueat, alteretur) & mammę ſubleuentur etiam maribus planè, ſed fœminis ampliùs. Quod enim in parte inferiore multum excernitur, ideo locus mammarum inanis fungoſúſque D fœminis fit. Eodémque modo iis euenit animalibus, quibus mammæ infrà habentur. Igitur & vox & mammæ in cæteris quoque animalibus documentum euidens præbent homini vſum habenti generis cuiuſque. Sed plurimum in genere hominum intereſt. Cuius rei cauſa eſt, quòd excrementum plurimum, & mulieribus præ cæteris fœminis, & viris præ cæteris maribus, eſt pro magnitudine, alteris menſtruorum, alteris genituræ. Itaque cùm hoc fœminæ excrementum non à fœtu hauritur, & tamen ne foras profluat, prohibetur, colligi id in loca inania, quæcumque eiſdem meatibus adhærent, neceſſe eſt. Talis autem locus mammarum in omnibus eſt vtraque de cauſa, ſcilicet notę melioris gratia ita conditus, atque etiam neceſſariò hic E iam conſiſtit, & alimentum concoctum animalibus redditur. Concoctionis autem cauſam non ſolùm quam modò diximus, accipere licet, ſed contrariam etiam. Nam & vt fœtus maiuſculus iam factus plus aſſumat cibi, minúſque ob eam rem per id tempus ſuperſit, ratio probabilis eſt. Quod autem minus eſt, concoqui celeriùs poteſt. Sed lactis naturam eandem eſſe, quam excrementi, ex quo vnumquodque generetur, apertum eſt. Nam, quod antè diximus,

eadem materia eſt, quæ alit, & ex qua generationem natura conſtituit, eáque ſanguineus humor in ſanguinem habentibus eſt. Lac enim ſanguis concoctus eſt, non corruptus. Empedocles verò aut non rectè putauit, aut non bene vſus verbo tranſlatitio eſt, cùm dixerit:

Octaui decimo menſis, pus extitit album.

putredo enim concoctioni contrarium eſt. Pus autem putredo quædam eſt. Lac verò res eſt concocta prorſus, nec lactantibus fiunt purgationes ſecundùm naturam, neque lactantes concipiunt: & ſi conceperint, lac extinguitur: quoniam eadem lactis & menſtruorum natura eſt. Natura autem non tam largè profundere poteſt, vt anceps ſit. Sed ſi alterutram in partem ſecernitur, in alteram deſit, neceſſe eſt, niſi quid acciderit violentum, & præter id quod ſolitum magna ex parte eſt. Temporibus etiam bene præſcripta eſt generatio animalium. Cùm enim præ magnitudine non ſatis præterea fœtui eſt alimentum quod per vmbilicum miniſtratur, lac ad alendum vtile ſuccedit. Cùmque per vmbilicum alimentum non ſubeat, comprimunt ſeſe venæ illæ, circum quas tunica eſt, quæ vmbilicus vocatur, atque ob eam rem tunc exitus opportunè fœtus conſequitur.

CAPVT IX.

Quam ob cauſam partus nonnullis animalibus in caput verſis fiat.

PArtus autem pronis in caput conuerſis fit per naturam animalibus omnibus, propterea quòd partem ab vmbilico maiorem habeant, quàm inferiorem. Maiora autem plus ponderis continent. Itaque veluti in ſtatera dependentes eò vergunt, quò trahuntur.

CAPVT X.

De tempore ferendi vteri, & quare non omne animal poſſit eſſe diuturnius.

VTeri autem ferendi tempora certa cuique animalium ſunt magna quidem ex parte pro vitæ ſpatio. Viuaciorum enim generationes quoque diuturniores eſſe neceſſe eſt. Non tamen id cauſæ eſt, ſed magna ex parte ſic euenit. Maiora enim perfectioráque ſanguinei generis animalia plus temporis viuunt. Sed non omnia maiora ſunt viuaciora. Homo enim plus temporis quàm quoduis animal viuit, excepto elephante; quod quidem vſu adhuc fide digno nouerimus: quanquam homo minoris eſt incrementi, quàm veterina, & alia multa. Cauſa ne quoduis animal poſſit diu viuere, eſt, quòd pro aëre ambiente temperatur, atque etiam ob alios naturales caſus, de quibus mox dicam. Tempora ferendi vteri pro magnitudine animalium, quæ generantur, deſcripta ſunt. Haud enim tempore breui conſtitutiones perfici magnas, vel animalium, vel quorumuis aliorum, ferè facile eſt. Quamobrem equi, & quæ his cognata ſunt animalia, quanquam minus temporis viuunt, tamen diutius vterum ferunt: alia enim annum, alia, quod plurimum, menſes decem grauida exigunt. Hac eadem de cauſa elephantorum etiam vterus diutinus eſt.

A ἡ γὰρ αὐτὴ ὕλη ἡ τρέφουσα, καὶ ἐξ ἧς συνίστησι τὴν γένεσιν ἡ φύσις. ἔστι δὲ τοῦτο ἡ αἱματικὴ ὑγρότης τοῖς ἐναίμοις. τὸ γὰρ γάλα, πεπεμμένον αἷμά ἐστιν, ἀλλ᾽ οὐ διεφθαρμένον. Ἐμπεδοκλῆς δὲ οὐκ ὀρθῶς ὑπελάμβανεν, ἢ οὐκ εὖ μετήνεγκε ποιήσας, ὡς τὸ γάλα,

Μηνὸς ἐν ὀγδοάτου δεκάτῃ, πύον ἔπλετο λευκόν.

σαπρότης γὰρ καὶ πέψις ἐναντία. τὸ δὲ πύον, σαπρότης ἐστί· τὸ δὲ γάλα, τῶν πεπεμμένων. οὐ γίνονται δὲ οὔτε θηλαζούσαις αἱ καθάρσεις κατὰ φύσιν, οὔτε συλλαμβάνουσι θηλαζόμεναι· κἂν συλλάβωσιν, ἀποσβέννυται τὸ γάλα, διὰ τὸ τὴν αὐτὴν εἶναι φύσιν τοῦ γάλακτος καὶ τῶν καταμηνίων. B *ἡ δὲ φύσις οὐ δύναται πολυχοεῖν οὕτως, ὥστ᾽ ἐπαμφοτερίζειν· ἀλλ᾽ ἂν ἐπὶ θάτερα γίνηται ἡ ἀπόκρισις, ἀναγκαῖον ἐπὶ θάτερα ἐκλείπειν, ἐὰν μὴ γίνηται βίαιον, καὶ παρὰ τὸ ὡς ἐπὶ τὸ πολύ. τοῦτο δ᾽ ἤδη παρὰ φύσιν. ἐν γὰρ τοῖς μὴ ἀδυνάτοις ἄλλως ἔχειν, ἀλλὰ τοῖς ἐνδεχομένοις, τὸ κατὰ φύσιν ἐστὶν ὡς ἐπὶ τὸ πολύ. καλῶς δὲ διῄρηνται τοῖς χρόνοις καὶ ἡ γένεσις ἡ τῶν ζώων. ὅταν γὰρ διὰ τὸ μέγεθος μηκέτι ἱκανὴ ᾖ τῷ κυουμένῳ ἡ διὰ τοῦ ὀμφαλοῦ τροφή, ἀλλὰ τὸ γάλα γίνεται χρήσιμον πρὸς τὴν γινομένην τροφήν, καὶ οὐκ εἰσιούσης διὰ τοῦ ὀμφαλοῦ ἡ τροφή, συμπίπτουσιν αὗται αἱ φλέβες, περὶ ἃς ὁ καλούμενος ὀμφαλός ἐστι χιτών. καὶ C διὰ ταῦτα καὶ τότε συμβαίνει θύραζε ἡ ἔξοδος.

* Sup. lib. 3. c. 1

ΚΕΦΑΛ. θ΄.

Αἴτιον τοῦ ἐπὶ κεφαλὴν εἶναι τὴν γένεσιν.

ΕΠΙ κεφαλὴν δ᾽ ἐστὶν ἡ γένεσις τοῖς ζώοις πᾶσιν ἡ κατὰ φύσιν, διὰ τὸ τὰ ἄνω τοῦ ὀμφαλοῦ μείζω ἔχειν ἢ τὰ κάτω. καθάπερ οὖν ἐν ζυγοῖς ἠρτημένα ἐξ αὐτοῦ, ῥέπει ἐπὶ τὸ βάρος. ἔχει δὲ τὰ μείζω πλεῖον βάρος.

ΚΕΦΑΛ. ι΄.

Περὶ τοῦ τῆς κυήσεως χρόνου καὶ τῆς μακροβιότητος αἰτίου.

D

ΤΗΣ δὲ κυήσεως ἑκάστῳ τῶν ζώων ὡρισμένοι οἱ χρόνοι τυγχάνουσιν, ὡς μὲν ἐπὶ τὸ πολὺ κατὰ τοὺς βίους. τῶν γὰρ χρονίων, καὶ τὰς γενέσεις εὔλογον εἶναι χρονιωτέρας. οὐ μὴν τοῦτό γε ἐστὶν αἴτιον, ἀλλ᾽ ὡς ἐπὶ τὸ πολὺ συμβέβηκε τοῦτο· τὰ γὰρ μείζω καὶ τελειότερα τῶν ἐναίμων ζώων, οὐ ζῶσι πολὺν χρόνον· οὐ μέντοι τὰ μείζω πάντα μακροβιώτερα. πάντων γὰρ ὁ ἄνθρωπος πλείω ζῇ χρόνον, (πλὴν ἐλέφαντος) ὅσων ἀξιόπιστον ἔχομεν τὴν πεῖραν. ἔλαττον δ᾽ ἐστὶ τὸ γένος τὸ τῶν ἀνθρώπων, ἢ τὸ τῶν λοφούρων, καὶ πολλῶν ἄλλων. αἴτιον δὲ τοῦ μὲν εἶναι μακρόβιον ὁποιονοῦν ζῷον, E τὸ κεκρᾶσθαι παραπλησίως πρὸς τὸν περιέχοντα ἀέρα, καὶ δι᾽ ἄλλα συμπτώματα φυσικά, περὶ ὧν ὕστερον ἐροῦμεν· τῶν δὲ χρόνων τῶν περὶ τὴν κύησιν, τὸ μέγεθος τῶν γεννωμένων. οὐ γὰρ ῥᾴδιον ἐν ὀλίγῳ χρόνῳ λαμβάνειν τὴν τελείωσιν τὰς μεγάλας συστάσεις, οὔτε ζώων, οὔτε τῶν ἄλλων (ὡς εἰπεῖν) οὐδενός. διόπερ ἵπποι καὶ τὰ συγγενῆ τούτοις, ἐλάττω ζῶντα χρόνον κύει γε πλείονα χρόνον. τῶν μὲν γάρ, ἐνιαύσιος ὁ τόκος· τῶν δέ, δεκάμηνος ὁ πλεῖστος. διὰ τὴν αὐτὴν δ᾽ αἰτίαν πολυχρόνιος καὶ ὁ τῶν ἐλεφάντων ἐστὶ τόκος.

A διετὴς γάρ ἐστιν ἡ κύησις διὰ τὴν ὑπερβολὴν τοῦ μεγέθους. εὐλόγως δὲ πάντων οἱ χρόνοι καὶ τῶν γενέσεων καὶ κυήσεων καὶ τῶν βίων, μετρεῖσθαι βούλονται κατὰ φύσιν περιόδοις. λέγω δὲ περιόδους, ἡμέραν καὶ νύκτα, καὶ μῆνα, καὶ ἐνιαυτόν, καὶ τοὺς χρόνους τοὺς μετρουμένους τούτοις. ἔτι δὲ τὰς τῆς σελήνης περιόδους. εἰσὶ δὲ περίοδοι σελήνης, πανσέληνοί τε καὶ φθίσεις, καὶ τῶν μεταξὺ χρόνων αἱ διχοτομίαι· κατὰ γὰρ ταύτας συμμεταβάλλει πρὸς τὸν ἥλιον. ὁ γὰρ μεὶς, κοινὴ περίοδός ἐστιν ἀμφοτέρων. ἔστι δ' ἡ σελήνη ἀρχὴ, διὰ τὴν πρὸς τὸν ἥλιον κοινωνίαν, καὶ τὴν μετάληψιν τοῦ φωτός. γίνεται γὰρ ὥσπερ ἄλλος ἥλιος ἐλάττων· διὸ συμβάλλεται εἰς B πάσας τὰς γενέσεις καὶ τελειώσεις. καὶ γὰρ θερμότητες καὶ ψύξεις μέχρι συμμετρίας τινὸς ποιοῦσι τὰς γενέσεις· μετὰ δὲ ταῦτα, τὰς φθοράς. τούτων δ' ἔχουσι τὸ πέρας καὶ τῆς ἀρχῆς, καὶ τῆς τελευτῆς, αἱ τούτων κινήσεις τῶν ἄστρων. ὥσπερ γὰρ καὶ θάλατταν καὶ πᾶσαν ὁρῶμεν τὴν τῶν ὑγρῶν φύσιν ἱσταμένην καὶ μεταβάλλουσαν κατὰ τὴν τῶν πνευμάτων κίνησιν καὶ στάσιν· τὸν δ' ἀέρα καὶ τὰ πνεύματα, κατὰ τὴν τοῦ ἡλίου καὶ τῆς σελήνης περίοδον· οὕτω καὶ τὰ ἐκ τούτων φυόμενα, καὶ τὰ ἐν τούτοις ἀκολουθεῖν ἀναγκαῖον. κατὰ λόγον γὰρ ἀκολουθεῖν καὶ τὰς τῶν ἀκυρωτέρων περιόδους, ταῖς τῶν κυριωτέρων. βίος γάρ τις καὶ πνεύματός ἐστι, γένεσις καὶ φθίσις. τῆς δὲ τῶν C ἄστρων τούτων περιφορᾶς, τάχα αἱ ἕτεραί τινες εἶεν ἀρχαί. βούλεται μὲν οὖν ἡ φύσις, τοῖς τούτων ἀριθμοῖς ἀριθμεῖν τὰς γενέσεις, καὶ τὰς τελευτάς. οὐκ * ἀκριβοῖ δέ, διὰ τὴν τῆς ὕλης ἀοριστίαν· καὶ διὰ τὸ γίνεσθαι πολλὰς ἀρχάς, αἳ τὰς γενέσεις τὰς κατὰ φύσιν, καὶ τὰς φθορὰς ἐμποδίζουσαι, πολλάκις αἰτίαι τῶν παρὰ φύσιν συμπιπτόντων εἰσί. περὶ μὲν οὖν τῆς ἔσωθεν τροφῆς τῶν ζῴων, καὶ τῆς θύραζε γενέσεως, εἴρηται, καὶ χωρὶς περὶ ἑκάστου, καὶ κοινῇ περὶ πάντων.

* κ. [illegible]

A Biennio namque geſtatur, propter exuperantiam magnitudinis. Ratione autem optima tempora omnium, & grauiditatum & generationum, & vitarum, dimenſionem circuitibus ſibi expoſcunt recipere. Circuitum appello diem, noctem, menſem, annum, & tempora, quæ iis deſcribuntur, atque etiam Lunæ traiectiones. Sunt enim Lunæ circuitus complementa, & ſilentia, & interpoſitorum temporum ſectiones. Ita enim coit cum Sole. Menſis namque communis amborum circuitus eſt. Luna autem principium eſt, propter Solis ſocietatem, receptúmque lucis: fit enim quaſi alter Sol minor. Quamobrem conducit ad omnes B generationes perfectionéſque. Calores enim & refrigerationes cum moderatione quadam generationes, ſine moderatione corruptiones efficiunt. Terminum autem tum principij tum finis qualitatum earum motus horum ſyderum obtinet. Vt enim & mare & omnem humorum naturam ſubſiſtere, mutarive pro flatuum motu, & quieto videmus, aërem verò, & flatus pro Solis Lunæque circuitu affici: ſic ea, quæ ex iis aut in iis oriuntur, ſequi neceſſe eſt. Nam vt rerum minùs principalium circuitus ſequantur magis principalium rerum circuitum, ratio eſt. Vitam enim quandam, & ortum, & interitum, vel flatum eſſe fa- C teor. Conuerſionis verò eorum ſyderum alia fortaſſe principia ſunt. Natura igitur ita ſibi vult, vt eorum numeris generationes, & obitus numeret. Sed exquiſitè id facere nequit, propter materiæ indefinitionem, & quòd multa principia incidunt, quæ generationes deſtinatas ſecundùm naturam, & corruptiones ſæpe impediant, atque ita cauſa ſint earum quæ veniant præter naturam. Sed de alimento intrinſecus miniſtrando animalium, atque de generatione in lucem agenda, & ſeorſum de ſingulis, & ſummatim de omnibus dictum iam eſt.

D

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ζῴων γενέσεως τὸ Ε.

ΚΕΦΑΛ. α'.

Τῆς τῶν ὀμμάτων διαφορᾶς αἰτίαι.

ΠΕΡΙ δὲ τῶν παθημάτων οἷς διαφέρουσι τὰ μόρια τῶν ζῴων, θεωρητέον νῦν. λέγω δὲ τὰ τοιαῦτα παθήματα τῶν μορίων, οἷον E γλαυκότητα ὀμμάτων καὶ μελανίαν, καὶ φωνῆς ὀξύτητα καὶ βαρύτητα, καὶ χρώματος ἢ σώματος, καὶ τριχῶν ἢ καὶ πτερῶν διαφοράν. τυγχάνει δὲ τῶν τοιούτων ἔνια μὲν ὅλοις ὑπάρχοντα τοῖς γένεσιν, ἐνίοις δὲ ὅπως ἔτυχεν· ὃ δὴ μάλιστ' ἐπὶ τῶν ἀνθρώπων τοῦτο συμβέβηκεν. ἔτι δὲ καὶ κατὰ τὰς τῆς ἡλικίας μεταβολάς, τὰ μὲν ὑπάρχει ὁμοίως πᾶσι τοῖς ζῴοις, τὰ δ' ὑπεναντίως· οἷον περί τε φωνὰς, περί τε τριχῶν χρόαν. τὰ μὲν γὰρ οὐ πολιοῦνται πρὸς τὸ γῆρας ἐπιδήλως· ὁ δ' ἄνθρωπος, μάλιστα τοῦτο πάσχει τῶν ἄλλων ζῴων. καὶ τὰ μὲν, εὐθὺς ἀκολουθεῖ γιγνομένοις· τὰ δέ, προϊούσης τῆς ἡλικίας γίνεται,

ARISTOTELIS STAGIRITÆ DE ANIMALIVM GENERATIONE Liber quintus.

CAPVT I.

De diſcrimine oculorum in animantibus, & eorundem differentia, & quid ſit ſomnus, quid item vigilia.

DE affectionibus, quibus animalium partes differant inter ſe, differendum nunc eſt. Affectiones partium dico cæſietatem oculorum, aut nigredinem, vocis, acumen, aut grauitatem, & coloris, aut corporis, & pilorum, aut pennarum diſcrimen, quorum alia totis generibus inſunt, alia vtcunque ſors tulit, habentur: quod maximè in hominibus accidit. Mutationes etiam per ætatem aliæ omnibus æquè animalibus veniunt, aliæ contrà: vt in vocis coloriſque pilorum ratione videre licet. Cùm enim cætera non caneſcant, manifeſtè in ſenectute, homo maximè omnium ita afficitur. Et alia ſtatim ab ortu Naturę conſequuntur, alia progrediente ætate,

& ſeneſcentibus accidunt. De his igitur, cæteriſque huiuſmodi omnibus non eundem præterea modum cauſæ eſſe putandum. Quæ enim non ſint opera vel naturæ communia, vel generum ſingulorum propria, horum nullum alicuius gratia aut eſt, aut fit. Oculus enim alicuius gratia eſt, ſed cæſius non alicuius gratia eſt, niſi hæc affectio ſit propria generis. Nec vero ad rationem ſubſtantiæ pertinet in nonnullis, ſed vt quæ neceſſariò fiant. Ad materiam & principium, quod mouerit, cauſæ eorum referendæ ſunt. Etenim, vt initio diſputationis noſtræ dictum eſt, non quia tale quid gignitur, quódque ideo tale quid eſt, ſcilicet in iis quæ ſtatuta, definita, & certa naturæ ſunt opera: ſed potiùs quia tale eſt, idcirco tale & gignitur. Subſtantiam enim generatio ſequitur, & ſubſtantiæ gratiâ eſt, non ipſa generationem. Veteres tamen naturæ interpretes contrà eſſe putarunt. Cuius erroris cauſa fuit, quòd cauſas plures eſſe non viderent, ſed materiæ tantùm, & motus cauſam, eámque indefinitè cognoſcerent, rationis verò & finis cauſam non conſiderarent. Sed enim alicuius gratia vnumquodque eſt. Gignitur autem iam ob eam cauſam, & reliquas, quæ in ratione cuiuſque continentur, quæ vel alicuius gratia eſt, vel cuius gratia aliud eſt. Quæ verò non eiuſmodi ſunt, videlicet quorum generatio eſt, eorum iam cauſa quærenda in motu generationéque eſt: vt pote cùm diſcrimen conſtitutione recipiant. Oculum enim neceſſariò habebit. Tale enim animal ſubiectum eſt. Sed talem oculum neceſſariò quidem, ſed non tali neceſſitate. Verùm alio modo, ſcilicet quoniam talem aut talem rem ſuapte natura agere patiue poteſt. His ita definitis, de rebus quæ deinceps eueniant, diſſeramus. Principio pueri cùm nati fuerint, dormire omnium maximè imperfectorum animalium ſolent, quoniam intra parentem cùm primum ſentire cœperint, tempus dormiendo totum ferè conſumunt. Sed quæritur de prima generatione, vtrùm vigilia præcedat, an ſomnus. Quòd enim progrediente ætate magis expergiſci viſuntur, contrarium, id eſt, ſomnum, principio generationis ineſſe probabile eſt. Tum etiam tranſitio de non eſſe in eſſe per medium fieri ſolet. Somnus autem talis ſua natura eſſe videtur, vt viuendi & non viuendi interliminium ſit, & neque omnino ſit qui dormit, neque non ſit. Viuitur enim potiſſimùm vigilia propter ſenſum. ſed ſi animal habere ſenſum neceſſe eſt, & tunc primùm eſt animal, cùm primùm contingit ſenſus, primam illam diſpoſitionem non ſomnum ſed ſimilem ſomno eſſe putandum, qualis plantarum eſt. Etenim ita accidit vt per id tempus vita plantæ animalia viuant. At plantis ſomnum ineſſe impoſſibile eſt. Nullus enim ſomnus inexpergiſcibilis eſt. Affectio autem illa plantarum, quæ ſomni eſt proportionalis, inexpergiſcibilis eſt. Neceſſe etiam eſt, animalia dormire partem maximam temporis, quoniam incrementum, & pondus locis ſuperioribus impoſitum eſt. Cauſam autem dormiendi talem eſſe alibi expoſuimus. Verumtamen expergiſci in vtero etiam videntur, (quod tum in diſſectionibus tum in prole ouipari generis patet:) mox obdormiſcunt ſtatim, rurſúſque delabuntur.

A καὶ γηρασκόντων. περὶ δὲ τούτων καὶ τῶν τοιούτων πάντων, οὐκέτι τὸν αὐτὸν τρόπον εἶναι δεῖ νομίζειν τῆς αἰτίας. ὅσα γὰρ μὴ τῆς φύσεως ἔργα κοινῇ, μηδ' ἴδια τοῦ γένους ἑκάστου, τούτων οὐδὲν ἔστιν ἕνεκά του, οὔτε γίνεται. ὀφθαλμὸς μὲν γὰρ ἕνεκά του, γλαυκὸς δὲ, οὐχ ἕνεκά του, πλὴν ἂν ἴδιον ᾖ τοῦ γένους τοῦτο τὸ πάθος.* οὕτω δ' ἐπ' ἐνίων πρὸς τὸν λόγον συντείνει τῆς οὐσίας· ἀλλ' ὡς ἐξ ἀνάγκης γιγνομένων, εἰς τὴν ὕλην καὶ τὴν κινήσασαν ἀρχὴν ἀνακτέον τὰς αἰτίας. ὥσπερ γὰρ ἐλέχθη κατ' ἀρχὰς ἐν τοῖς πρώτοις λόγοις, οὐ διὰ τὸ γίγνεσθαι ἕκαστον

*Gaza, ἴσω δ'.

B ποιόν τι, διὰ τοῦτο ποιόν τί ἐστιν, ὅσα τεταγμένα καὶ ὡρισμένα ἔργα τῆς φύσεώς ἐστιν· ἀλλὰ μᾶλλον διὰ τὸ εἶναι τοιαδί, γίνεται τοιαῦτα. τῇ γὰρ οὐσίᾳ ἡ γένεσις ἀκολουθεῖ, καὶ τῆς οὐσίας ἕνεκά ἐστιν, ἀλλ' οὐχ αὕτη τῇ γενέσει. οἱ δ' ἀρχαῖοι φυσιολόγοι τοὐναντίον ᾠήθησαν. τούτου δ' αἴτιον, ὅτι οὐχ ἑώρων πλείους οὔσας τὰς αἰτίας, ἀλλὰ μόνον τὴν τῆς ὕλης καὶ τὴν τῆς κινήσεως, καὶ ταύτας ἀδιορίστως· τῆς δὲ τοῦ λόγου καὶ τῆς τοῦ τέλους ἀνεπισκέπτως εἶχον. ἔστι μὲν οὖν ἕκαστον ἕνεκά τουδε. γίνεται δὲ ἤδη διὰ ταύτην τὴν αἰτίαν καὶ διὰ τὰς λοιπὰς, ὅσαπερ

C ἐν τῷ λόγῳ ὑπάρχει τῷ ἑκάστου, ἢ ἔστιν ἕνεκά του, ἢ οὗ ἕνεκα. τῶν *δὲ μὴ τοιούτων, ὅσων ἐστὶ γένεσις ἤδη, τούτων τὸ αἴτιον ἐν τῇ κινήσει δεῖ καὶ τῇ γενέσει ζητεῖν, ὡς ἐν αὐτῇ τῇ συστάσει τὴν διαφορὰν λαμβανόντων. ὀφθαλμὸν μὲν γὰρ ἐξ ἀνάγκης ἕξει (τοιόνδε γὰρ ζῶον ὑπόκειται ὄν) τοιόνδε δὲ ὀφθαλμὸν ἐξ ἀνάγκης μὲν, οὐ τοιαύτης δ' ἀνάγκης, ἀλλὰ ἄλλον τρόπον, ὅτι τοιονδὶ πέφυκε ποιεῖν καὶ πάσχειν. διωρισμένων δὲ τούτων, λέγωμεν περὶ τῶν ἑξῆς συμβαινόντων. πρῶτον μὲν οὖν ὅταν γένωνται τὰ παιδία, πάντων, μάλιστα τῶν ἀτελῶν, καθεύδειν εἴωθε, διὰ τὸ καὶ ἐν τῇ μητρὶ, ὅταν λάβῃ

D πρῶτον αἴσθησιν, καθεύδοντα διατελεῖν. ἔχει δ' ἀπορίαν περὶ τῆς ἐξ ἀρχῆς γενέσεως, πότερον ἐγρήγορσις ὑπάρχει τοῖς ζώοις πρότερον, ἢ ὕπνος. διὰ γὰρ τὸ φαίνεσθαι προϊούσης τῆς ἡλικίας ἐγρηγορότα μᾶλλον, εὔλογον τὸ ἐναντίον ἐν τῇ ἀρχῇ τῆς γενέσεως ὑπάρχειν, τὸν ὕπνον. ἔτι δὲ διὰ [τὸ] τὴν μετάβασιν ἐκ τοῦ μὴ εἶναι, εἰς τὸ εἶναι, διὰ τοῦ μεταξὺ γίνεσθαι. ὁ δ' ὕπνος εἶναι δοκεῖ τὴν φύσιν τῶν τοιούτων, οἷον τοῦ ζῆν καὶ μὴ ζῆν μεθόριον, καὶ οὔτε μὴ εἶναι παντελῶς ὁ καθεύδων, οὔτ' εἶναι. τῷ γὰρ ἐγρηγορέναι τὸ ζῆν μάλιστ' ὑπάρχει διὰ τὴν αἴσθησιν. εἰ δ' ἐστὶν ἀναγκαῖον ἔχειν αἴσθησιν τὸ

E ζῶον, καὶ τότε πρῶτόν ἐστι ζῶον, ὅτε πρῶτον αἴσθησις γένηται, τὴν μὲν ἐξ ἀρχῆς διάθεσιν οὐχ ὕπνον, ἀλλ' ὅμοιον ὕπνῳ δεῖ νομίζειν, οἵανπερ ἔχει καὶ τὸ τῶν φυτῶν γένος. καὶ γὰρ συμβέβηκε κατὰ τοῦτον τὸν χρόνον τὰ ζῶα φυτοῦ βίον ζῆν· τοῖς δὲ φυτοῖς ὑπάρχειν ἀδύνατον. οὐδεὶς γὰρ ὕπνος ἀνέγερτος. τὸ δὲ τῶν φυτῶν πάθος τὸ ἀνάλογον τῷ ὕπνῳ, ἀνέγερτον. καθεύδειν μὲν οὖν ἀναγκαῖον τὰ ζῶα ὄντα ἐν τῇ μητρὶ τὸν πλεῖστον χρόνον, διὰ τὸ τὴν αὔξησιν καὶ τὸ βάρος ἐπικεῖσθαι τοῖς ἄνω τόποις. εἰρήκαμεν δὲ τὴν αἰτίαν τοῦ καθεύδειν τοιαύτην οὖσαν, ἐν ἑτέροις. ἀλλ' ὅμως ἐγρηγορότα φαίνεται καὶ ἐν τῇ μήτρᾳ· (δῆλον δὲ γίνεται τοῦτο ἐν ταῖς ἀνατομαῖς, καὶ ἐν τοῖς ᾠοτοκοῦσιν) εἶτ' εὐθὺς καθεύδουσι καὶ καταφέρονται πάλιν.

A διὸ καὶ ἐξελθόντα τὸν πολὺν διάγει χρόνον καθεύδοντα. καὶ ἐγρηγορότα μὲν οὐ γελᾷ τὰ παιδία· καθεύδοντα δὲ, καὶ δακρύει καὶ γελᾷ. συμβαίνει γὰρ καὶ καθεύδουσιν αἴσθησις τοῖς ζῴοις, οὐ μόνον τὰ καλούμενα ἐνύπνια, ἀλλὰ καὶ παρὰ τὸ ἐνύπνιον, καθάπερ τοῖς ἀνισταμένοις καθεύδουσι, καὶ πολλὰ πράττειν ἄνευ τοῦ ἐνυπνιάζειν. εἰσὶ γάρ τινες οἳ καθεύδοντες ἀνίστανται, καὶ πορεύονται βλέποντες ὥσπερ οἱ ἐγρηγορότες. τούτοις [γὰρ] γίνεται τῶν συμβαινόντων αἴσθησις, οὐκ ἐγρηγορόσι μὲν, οὐ μέντοι ὡς ἐνύπνιον. τὰ δὲ παιδία ἐοίκασιν, ὥσπερ ἀνεπιστήμονα τοῦ ἐγρηγορέναι, διὰ συνήθειαν ἐν τῷ καθεύδειν, αἰσθάνεσθαι καὶ ζῆν. προϊόντος δὲ τοῦ χρόνου, καὶ τῆς αὐξήσεως εἰς τὸ κάτω μεταβαινούσης, B ἐγείρονταί τε μᾶλλον ἤδη, καὶ τὸν πλείω χρόνον οὕτω διάγουσι. μᾶλλον δὲ τῶν ἄλλων ζῴων ἐν ὕπνῳ τὸ πρῶτον διατελοῦσιν. ἀτελέστατα γὰρ γίνονται τῶν τετελεσμένων, καὶ τὴν αὔξησιν ἔχοντα μάλιστα ἐπὶ τὸ ἄνω μέρος τοῦ σώματος. γλαυκότερα δὲ τὰ ὄμματα τῶν παιδίων εὐθὺς γινομένων ἐστὶ πάντων· ὕστερον δὲ μεταβάλλει πρὸς τὴν ὑπάρχειν μέλλουσαν φύσιν. ἐπὶ δὲ τῶν ἄλλων ζῴων οὐ συμβαίνει τοῦτ' ἐπιδήλως. τούτου μὲν οὖν αἴτιον, τὸ μονόχρωμα τὰ ὄμματα τῶν ἄλλων εἶναι μᾶλλον· οἷον οἱ βόες μελανόφθαλμοι· τὸ δὲ τῶν προβάτων, ὑδαρὲς πάντων. τῶν δὲ, χαροπὸν ὅλον τὸ γένος, ἢ γλαυκόν. ἔνια δ' αἰγωπά, C καθάπερ τὸ τῶν αἰγῶν αὐτὸ πλῆθος. τὰ δὲ τῶν ἀνθρώπων ὄμματα, πολύχροα συμβέβηκεν εἶναι. καὶ γὰρ γλαυκοὶ καὶ χαροποὶ, καὶ μελανόφθαλμοί τινές εἰσιν· οἱ δ', αἰγωποί· διὸ καὶ ὥσπερ οὐδ' ἀλλήλων διαφέρουσιν, οὕτως οὐδ' αὐτὰ αὐτῶν. οὐ γὰρ πέφυκε πλείω μιᾶς ἔχειν. μάλιστα δὲ τῶν ἄλλων ζῴων ἵππος πολύχροιος ἐστί. καὶ γὰρ ἑτερόγλαυκοί τινες αὐτῶν γίνονται. τοῦτο δὲ τῶν μὲν ἄλλων οὐδὲν πάσχει ζῴων ἐπιδήλως· ἄνθρωποι δὲ γίνονταί τινες ἑτερόγλαυκοι. τοῦ μὲν οὖν τὰ ἄλλα ζῷα νέα ὄντα καὶ πρεσβύτερα, μηδὲν ἐπίδηλον μεταβάλλειν, ἐπὶ δὲ τῶν παιδίων τοῦτο συμβαίνειν, ἱκανὴν αἰτίαν οἰητέον εἶναι καὶ ταύτην, ὅτι τῶν μὲν μονό- D χροα, τῶν δὲ πολύχροα τὸ μόριόν ἐστι. τοῦ δὲ γλαυκότερα καὶ μὴ χρόαν ἄλλην ἔχειν, αἴτιον ὅτι ἀσθενέστερα τὰ μόρια τῶν νέων. ἀσθένεια δ' ἐστὶν ἡ γλαυκότης. δεῖ δὲ λαβεῖν καθόλου περὶ τῆς διαφορᾶς τῶν ὀμμάτων, διὰ τίν' αἰτίαν τὰ μὲν, γλαυκά· τὰ δὲ, χαροπά· τὰ δ', αἰγωπά· τὰ δὲ, μελανόμματα εἰσί. τὸ μὲν οὖν ὑπολαμβάνειν τὰ μὲν γλαυκά, πυρώδη, καθάπερ Ἐμπεδοκλῆς φησι· τὰ δὲ μελανόμματα, πλεῖον ὕδατος ἔχειν, ἢ πυρός, καὶ διὰ τοῦτο τὰ μὲν ἡμέρας οὐκ ὀξὺ βλέπειν, τὰ γλαυκά, δι' ἔνδειαν ὕδατος· θάτερα δὲ νύκτωρ, δι' ἔνδειαν πυρός, οὐ λέγεται καλῶς· εἴπερ μὴ πυρὸς τὴν ὄψιν θετέον, ἀλλ' ὕδατος πᾶσιν. ἔτι δ' ἐνδέχεται τῶν χρωμάτων E τὴν αἰτίαν ἀποδοῦναι καὶ κατ' ἄλλον τρόπον· ἀλλ' εἴπερ ἐστὶν, ὥσπερ ἐλέχθη πρότερον ἐν τοῖς περὶ τὰς αἰσθήσεις, καὶ τούτων ἔτι πρότερον ἐν τοῖς περὶ ψυχῆς διωρισμένοις, καὶ ὅτι ὕδατος, καὶ δι' ἣν αἰτίαν ὕδατος, ἀλλ' οὐκ ἀέρος ἢ πυρὸς τὸ αἰσθητήριον τοῦτ' ἐστί, ταύτην τὴν αἰτίαν ὑποληπτέον εἶναι τῶν εἰρημένων. οἱ μὲν γὰρ ἔχουσι τῶν ὀφθαλμῶν, πλέον ὑγρὸν· οἱ δ', ἔλαττον τῆς συμμέτρου κινήσεως· οἱ δὲ, σύμμετρον. τὰ μὲν οὖν ἔχοντα τῶν ὀμμάτων πολὺ τὸ ὑγρὸν, μελανόμματά ἐστι, διὰ τὸ μὴ εὐδίοπτα εἶναι τὰ πολλά· γλαυκὰ δὲ, τὰ ὀλίγον, καθάπερ φαίνεται καὶ ἐπὶ τῆς θαλάττης.

A Quamobrem egreſſa quoque in lucem, bonam temporis partem dormiendo traducunt. Cùm pueri vigilant, non rident: cùm dormiunt, rident: interdum etiam lacrymant. Accidit enim dormientibus etiam animalibus ſenſus, non modò quæ ſomnia vocantur, ſed etiam præter ſomnia, vt iis, qui dormientes reſurgunt, & quidem pleraque agunt ſine ſomnio. Sunt enim qui dormientes reſurgant, & ambulent, videntes eo modo quo qui vigilant. Iis enim ſenſus accidentium contingit, quanquam non vigilantibus, tamen non vt ſomnium; infantes verò propter conſuetudinem quaſi neſcij vigilandi, ſentire viuereque in dormiendo videntur. Tempore autem procedente, incrementóque tranſeunte B in partem inferiorem, expergiſcuntur. Iam magis, & partem maiorem temporis ita degunt, ſed initio plus quàm cætera animalia ſomno dediti viuunt. Imperfectiſſimi enim omnium perfectorum partuum naſcuntur, & incremento partis ſuperioris exuperant. Oculi omnium puerorum ſtatim à partu cæſiuſculi ſunt: pòſt verò immutantur in eam naturam, quæ futura eſt. Quod in cæteris animalibus non euenit manifeſtè. Cuius rei cauſa eſt, quòd cæteris animalibus oculi in ſuo cuiuſque genere vnicolores potiùs ſunt, vt boum nigri, ouium omnium aquini, aliorum rufi toto genere, aut C cæſij, nonnullorum caprini, vt caprarij generis. At hominum oculos varios verſicoloreſque eſſe euenit. Nam alij cæſij, alij flauidi, alij nigri, alij caprini. Quamobrem cæterorum vt nulli ſuo in genere diſſident inter ſe, ſic nulli à ſe ipſi differunt: quippe qui non plus quàm vnum colorem habeant ſua natura. Equus maximè omnium cæterorum animalium verſicolor eſt. Aliqui enim cæſij altero oculo naſcuntur, quod nulli ex cæteris beſtiis euenit manifeſtè. *Quanquam homines nonnulli altero oculo diuerſo gignantur.* Ergo vt cætera animalia nihil mutationis, vel recens nata, vel D ætate prouectiora recipiant, pueris autem id eueniat, ſatis cauſę hoc eſſe exiſtimandum, quòd cæterorum ea pars vnicolor, hominis verſicolor eſt. Sed vt cæſium potiùs quàm alium, habeant colorem, cauſa eſt, quòd partes nuper natorum imbecilliores ſunt. Cæſietas autem, imbecillitas eſt. Sed in vniuerſum de oculorum diſcrimine quærendum, accipiendúmque eſt, quam ob cauſam alij cęſij, alij flauidi, alij caprini, alij nigri. Sed cæſios, opinari plus ignis habere, vt Empedocles ait; nigros autem plus aquæ, quàm ignis: atque ob eam rem cæſios interdiu acutè cernere non poſſe, ſcilicet ob aquæ inopiam: nigros noctu deficere, ob ignis E inopiam, non bene eſt. Siquidem viſus non igni ſed aquæ tribuendus in omnibus eſt. Cauſam etiam colorum, vel alio modo reddere poſſumus. Sed ſi ita eſt, vt antè dixi, cùm de ſenſibus agerem, atque etiam priùs cùm de anima, vt aquæ propria pars hæc ſenſoria ſit, non aëris, aut ignis, cur ita hanc eſſe cauſam eorum putandum eſt, quòd alij plus humidi habent, alij minùs quàm motus competens requirat, alij modicum? Itaque qui multum humoris continent, nigri ſunt, quoniam humoris copia tranſpici ſatis non poteſt. Cæſij, qui parum habent humoris, vt in mari etiam cernitur.

Etenim quantum eius ſatis tranſpicitur, cæſium apparet: quantum minus, aquinum: quantum præ gurgite alto non præfinitur, id opacat, & nigrum aut cæruleum ſentitur. Qui autem inter eos ſunt, eo iam differunt, quòd magis minúſve ita conſtiterint. Eandem cauſam eſſe putandum, & vt cæſij acutè interdiu cernere nequeant, nigri noctu. Cæſij enim præ ſui humoris exiguitate mouentur magis à luce, & rebus viſibilibus, ſcilicet qua humidi, quáque perlucidi ſunt, quanquam motio eius partis viſio eſt, qua perlucida, non qua humida eſt. Nigri verò ob humoris copiam minùs mouentur. Lux enim nocturna exilis eſt, & ſimul quiuis humor per noctem moueri difficiliùs poteſt. Conuenit autem, eum, quà perlucidum, nec non moueri, neque magis moueri quàm congruum ſit. Leuior enim motus expellitur à vehementiore. Quamobrem qui aut ſuum conſpectum à colore validiore tranſtulerint, aut de Sole in opacum ſe contulerint, non cernunt. Motio enim, quæ iam vehemens ineſt, impedit eam quæ extrinſecus accidit. Denique viſus ſiue validus ſiue inualidus nequit res ſplendidas cernere, quoniam eius humor vltra modum afficitur, & mouetur. Ægritudines etiam oculorum, vtrorumque indicium faciunt. Glaucoma enim cæſiis potiùs accidit, luſcioſitas nigris. Eſt autem glaucoma ſiccitas potiùs oculorum. Itaque ſeneſcentibus magis euenit. Nam oculi quoque, vt reliquum corpus, ſenectute ſicceſcunt. Luſcioſitas verò humoris copia eſt. quapropter minoribus natu potiùs accidit. Cerebrum enim eorum humidius eſt. Viſus autem optimus eſt, qui inter multum & parum humoris moderatus conſtat. Hic enim nec per exiguitatem turbatur, vt colorum motiones impediat, neque per nimietatem præbet mouendi difficultatem. Sed non modò ea quæ diximus, cauſam habent, vt obtuſè acutéve cernatur, verùm natura etiam cutis, quæ pupillæ vocatæ obtenditur. Tranſlucidam enim eſſe eam requiritur. Talem autem eſſe, quæ tenuis, alba, & læuis ſit, neceſſe eſt. Tenuis igitur eſt, vt motus, qui extraneus veniat, recto tramite feratur. Læuis, ne rugis obumbret. Senes enim ob eam rem acutè non cernunt. Nam vt cæterarum partium cutis, ſic oculorum quoque ſeneſcentibus obrugatur: & craſſior redditur. Alba autem eſſe debet, quoniam nigrum tranſlucidum eſſe non poteſt. Hoc enim ipſum eſt nigrum quod non tranſluceat. Vnde fit ne laternæ poſſint lucere, ſi ex tali cute confectæ ſunt. Per ſenectutem igitur, & morbos acutè cernere ob eas cauſas nequeunt. Pueri verò, paucitate humoris, cæſij principio ſunt: ſed altero oculo cæſij præcipuè homines atque equi gignuntur eadem de cauſa, qua & homo ſolus caneſcit, & equus inter cætera animalia vnus euidentiùs albeſcit pilo per ſenectutem. Canities enim debilitas quædam humoris ſiti in cerebro, & cruditas eſt: quod idem cæſietas quoque eſt. Vis enim eadem eſt humoris admodum tenuis, quæ pauci; & admodum craſſi, quæ multi. Cùm igitur natura æquè conficere nequit, aut vtroque concocto humore, aut non vtroque concocto, ſed altero concocto, altero non, tunc euenit vt cæſij altero oculo reddantur. Quamobrem autem alia acutè cernant, alia non, duplex ratio eſt: acumen enim cernendi bifariàm ferè dicitur.

A τὸ μὲν γὰρ εὐδιόπτον αὐτῆς, γλαυκὸν φαίνεται· τὸ δ' ἧττον, ὑδατῶδες· τὸ δὲ μὴ διωρισμένον διὰ βάθος, μέλαν καὶ κυανοειδές. τὰ δὲ μεταξὺ τῶν ὀμμάτων τούτων, τῷ μᾶλλον ἤδη διαφέρει καὶ ἧττον. τὴν αὐτὴν δὲ αἰτίαν οἰητέον καὶ τοῦ τὰ μὲν γλαυκὰ, μὴ εἶναι ὀξυωπὰ τῆς ἡμέρας· τὰ δὲ μελανόμματα, τῆς νυκτός. τὰ μὲν γὰρ γλαυκὰ, δι' ὀλιγότητα τοῦ ὑγροῦ, κινεῖται μᾶλλον ὑπὸ τοῦ φωτὸς, καὶ τῶν ὁρατῶν, ᾗ ὑγρὸν, καὶ ᾗ διαφανές. ἔστι δ' ἡ τούτου τοῦ μορίου κίνησις, ὅρασις, ᾗ διαφανές, ἀλλ' οὐχ ᾗ ὑγρόν. τὰ δὲ μελανόμματα, διὰ πλῆθος τοῦ ὑγροῦ, ἧττον κινεῖται. ἀσθενὲς γὰρ τὸ νυκτερινὸν φῶς· ἅμα γὰρ [καὶ] δυσκίνητον ἐν B τῇ ὅλως νυκτὶ γίγνεται τὸ ὑγρόν. δεῖ δὲ οὔτε μὴ κινεῖσθαι αὐτὸ, οὔτε μᾶλλον, ἢ ᾗ διαφανές. ἐκκρούει γὰρ ἡ ἰσχυροτέρα κίνησις τὴν ἀσθενεστέραν. διὸ καὶ ἀπὸ τῶν ἰσχυροτέρων χρωμάτων μεταβάλλοντες οὐχ ὁρῶσι, καὶ ἐκ τοῦ ἡλίου εἰς τὸ σκότος ἰόντες. ἰσχυρὰ γὰρ οὖσα ἡ ἐνυπάρχουσα κίνησις, κωλύει τὴν θύραθεν, καὶ ὅλως οὔτε ἀσθενοῦσα, οὔτε ἀσθενὴς ὄψις, τὰ λαμπρότερα δύναται ὁρᾶν, διὰ τὸ πάσχειν τι μᾶλλον καὶ κινεῖσθαι τὸ ὑγρόν. δηλοῖ δὲ καὶ τὰ ἀρρωστήματα τῆς ὄψεως ἑκατέρας. τὸ μὲν γὰρ γλαύκωμα, γίνεται μᾶλλον τοῖς γλαυκοῖς· οἱ δὲ νυκταλώπεκες [καλούμενοι] τοῖς μελανοφθάλμοις. ἔστι δὲ τὸ μὲν γλαύκωμα, ξηρότης μᾶλλον τῶν ὀμμάτων· διὸ καὶ συμβαίνει μᾶλ- C λον γηράσκουσι. ξηραίνεται γὰρ, ὥσπερ καὶ τὸ ἄλλο σῶμα, καὶ ταῦτα τὰ μόρια πρὸς τὸ γῆρας. ὁ δ' αὖ νυκταλώπηξ, ὑγρότητος πλεονασμός· διὸ τοῖς νεωτέροις γίνεται μᾶλλον· ὑγρότερος γὰρ ὁ ἐγκέφαλος ὁ τούτων. ἡ δὲ μέση τοῦ πολλοῦ καὶ τοῦ ὀλίγου ὑγροῦ, βελτίστη ὄψις. οὔτε γὰρ ὡς ὀλίγη οὖσα, διὰ τὸ ταράττεσθαι ἐμποδίζει τὴν τῶν χρωμάτων κίνησιν, οὔτε διὰ τὸ πλῆθος παρέχει δυσκινησίαν. οὐ μόνον δὲ τὰ εἰρημένα αἴτια τοῦ ἀμβλὺ ἢ ὀξὺ ὁρᾶν, ἀλλὰ καὶ ἡ τοῦ δέρματος φύσις τοῦ ἐπὶ τῇ κόρῃ καλουμένῃ. δεῖ γὰρ αὐτὸ διαφανὲς εἶναι. τοιοῦτον δ' ἀναγκαῖον εἶναι τὸ λευκὸν, καὶ λεπτὸν, καὶ ὁμαλόν. λεπτὸν μὲν, ὅπως ἡ θύρα- D θεν εὐθυπορῇ κίνησις· ὁμαλὸν δὲ, ὅπως μὴ ἐπισκιάζῃ ῥυτιδούμενον (καὶ γὰρ διὰ τοῦτο οἱ γέροντες οὐκ ὀξὺ ὁρῶσιν· ὥσπερ γὰρ καὶ τὸ ἄλλο δέρμα, καὶ τὸ τοῦ ὄμματος ῥυτιδοῦταί τε καὶ παχύτερον γίνεται γηράσκοντος) λευκὸν δὲ, διὰ τὸ μέλαν μὴ εἶναι διαφανές. αὐτὸ γὰρ τοῦτ' ἐστὶ μέλαν, τὸ μὴ διαφαινόμενον. διόπερ οὐδὲ οἱ λαμπτῆρες δύνανται φαίνειν, ἐὰν ὦσιν ἐκ τοιούτου δέρματος. ἐν μὲν οὖν τῷ γήρᾳ καὶ ταῖς νόσοις, διὰ ταύτας τὰς αἰτίας οὐκ ὀξὺ βλέπουσι· τὰ δὲ παιδία, δι' ὀλιγότητα τοῦ ὑγροῦ, γλαυκὰ φαίνεται τὸ πρῶτον. ἑτερόγλαυκοι δὲ μάλιστα γίνονται καὶ οἱ ἄνθρωποι καὶ οἱ ἵπποι, διὰ τὴν αὐτὴν αἰτίαν δι' ἥνπερ ὁ E μὲν ἄνθρωπος πολιοῦται μόνον· τῶν δ' ἄλλων, ἵππος μόνον ἐπιδήλως γηράσκων λευκαίνεται τὰς τρίχας. ἥ τε γὰρ πολιότης, ἀσθένειά τίς ἐστι τοῦ ὑγροῦ τοῦ ἐν τῷ ἐγκεφάλῳ, καὶ ἀπεψία· καὶ ἡ γλαυκότης. τὸ γὰρ λίαν λεπτὸν, ἢ λίαν παχὺ, τὴν αὐτὴν ἔχει δύναμιν· τὸ μὲν, τῷ ὀλίγῳ· τὸ δὲ, τῷ πολλῷ ὑγρῷ. ὅταν μὲν οὖν μὴ δύνηται ἡ φύσις ὁμοίως ἀπαρτίσαι, ἢ πέψασα τὸ ἐν ἀμφοτέροις ὑγρὸν, ἢ μὴ πέψασα, ἀλλὰ τὸ μὲν, τὸ δὲ μὴ, τότε συμβαίνει γίνεσθαι ἑτερογλαύκους. περὶ δὲ τοῦ τὰ μὲν ὀξυωπὰ εἶναι τῶν ζῴων, τὰ δὲ μὴ, δύο τρόποι τῆς αἰτίας εἰσί. διχῶς γὰρ λέγεται τὸ ὀξὺ σχεδόν·

καὶ* περὶ τῆς ἀκούειν καὶ ὀσφραίνεσθαι ὁμοίως τι τρόπον ἔχει. λέγεται γὰρ ὀξὺ ὁρᾶν, ἓν μὲν, τὸ πόρρωθεν δύνασθαι ὁρᾶν· ἓν δὲ, τὸ τὰς διαφορὰς ὅτι μάλιστα τῶν ὁρωμένων διαισθάνεσθαι. ταῦτα δ' οὐχ ἅμα συμβαίνει τοῖς αὐτοῖς. ὁ γὰρ αὐτὸς ἐπηλυγισάμενος τὴν χεῖρα, ἢ δι' αὐλοῦ βλέπων τὰς μὲν διαφορὰς οὐδὲν ἧττον οὐδὲ μᾶλλον* κρίνει τῶν χρωμάτων, ὄψεται δὲ πόρρωθεν. οἱ γοῦν ἐκ τῶν ὀρυγμάτων καὶ φρεατιῶν ἐνίοτε ἀστέρας ἐν τῇ ἡμέρᾳ δηλονότι ὁρῶσιν. ὥστ' εἴ τι τῶν ζώων ἔχει μὲν προβολὴν τοῦ ὄμματος πολλήν, τὸ δ' ἐν τῇ κόρῃ ὑγρὸν μὴ καθαρὸν, μηδὲ σύμμετρον τῇ κινήσει τῇ θύραθεν, μηδὲ τὸ ἐπιπολῆς δέρμα λεπτόν, τοῦτο περὶ μὲν τὰς διαφορὰς οὐκ ἀκριβώσει τῶν χρωμάτων, πόρρωθεν δ' ἔσται ὁρατικόν, ὥσπερ εἰ καὶ ἐγγύθεν, μᾶλλον τῶν τὸ μὲν ὑγρὸν καθαρὸν ἐχόντων, καὶ τὸ σκέπασμα αὐτοῦ, μὴ ἐχόντων δὲ ἐπισκήνιον περὶ τῶν ὀμμάτων οὐδέν. τοῦ μὲν γὰρ οὕτως ὀξὺ ὁρᾶν, ὥστε διαισθάνεσθαι τὰς διαφοράς, ἐν αὐτῷ τῷ ὄμματί ἐστιν ἡ αἰτία. ὥσπερ γὰρ ἐν ἱματίῳ καθαρῷ καὶ αἱ μικραὶ κηλῖδες ἐπίδηλοι γίνονται· οὕτως καὶ ἐν τῇ καθαρᾷ ὄψει καὶ αἱ μικραὶ κινήσεις δῆλαι, καὶ ποιοῦσιν αἴσθησιν. τοῦ δὲ πόρρωθεν ὁρᾶν, καὶ τὴν ἀπὸ τῶν πόρρωθεν ὁρατῶν ἀφικνεῖσθαι κίνησιν, ἡ θέσις αἰτία τῶν ὀφθαλμῶν. τὰ μὲν γὰρ ἐξόφθαλμα, οὐχ ὁρᾷ πόρρωθεν· τὰ δ' ἐντὸς ἔχοντα τὰ ὄμματα ἐν κοίλῳ κείμενα, ὁρατικὰ τῶν πόρρωθεν, διὰ τὸ τὴν κίνησιν μὴ σκεδάννυσθαι εἰς ἀχανές, ἀλλ' εὐθυπορεῖν. οὐδὲν γὰρ διαφέρει τὸ λέγειν ὁρᾶν, ὥσπερ τινές φασι, τῷ τὴν ὄψιν ἐξιέναι. ἂν γὰρ μὴ ᾖ τι πρὸ τῶν ὀμμάτων, διασκεδαννυμένην ἐλάττω ἀνάγκη προσπίπτειν τοῖς ὁρωμένοις, καὶ ἧττον τὰ πόρρωθεν ὁρᾶν, ἢ τὸ τῇ ἀπὸ τῶν ὁρωμένων κινήσει ὁρᾶν. ὁμοίως γὰρ ἀνάγκη καὶ τὴν ὄψιν τῇ κινήσει ὁρᾶν. μάλιστα μὲν οὖν ἑωρᾶτο ἂν τὰ πόρρωθεν, εἰ ἀπὸ τῆς ὄψεως εὐθὺς συνεχὴς ἦν πρὸς τὸ ὁρώμενον οἷον αὐλός. οὐ γὰρ ἂν διελύετο ἡ κίνησις ἡ ἀπὸ τῶν ὁρατῶν· εἰ δὲ μή, ὅσῳπερ ἂν ἐπιπλέον ἀπέχῃ, τοσούτῳ ἀνάγκη ἀκριβέστερον τὰ πόρρωθεν ὁρᾶν. καὶ τῆς μὲν τῶν ὀμμάτων διαφορᾶς ἔστωσαν αὗται αἰτίαι.

* γρ. περὶ τὰ

* γρ. κρίνει

ΚΕΦΑΛ. β'.

Περὶ τῆς ἀκοῆς καὶ ὀσφρήσεως.

Τὸν αὐτὸν δὲ τρόπον ἔχει καὶ περὶ τὴν ἀκοὴν, καὶ περὶ τὴν ὄσφρησιν. ἓν μὲν γάρ ἐστι τὸ ἀκριβῶς ἀκούειν καὶ ὀσφραίνεσθαι, τὸ τὰς διαφορὰς τῶν ὑποκειμένων αἰσθητῶν ὅτι μάλιστα αἰσθάνεσθαι πάσας· ἓν δὲ, τὸ πόρρωθεν καὶ ἀκούειν καὶ ὀσφραίνεσθαι. τοῦ μὲν οὖν τὰς διαφορὰς κρίνειν καλῶς, τὸ αἰσθητήριον αἴτιον· ὥσπερ τῆς ὄψεως, ἂν ᾖ καθαρὸν αὐτό τε καὶ ἡ περὶ αὐτὸ* μῆνιγξ. οἱ γὰρ πόροι τῶν αἰσθητηρίων ἁπάντων (ὥσπερ εἴρηται ἐν τοῖς περὶ αἰσθήσεως) τείνουσι πρὸς τὴν καρδίαν· τοῖς δὲ μὴ ἔχουσι καρδίαν, πρὸς τὸ ἀνάλογον. ὁ μὲν οὖν τῆς ἀκοῆς, ἐπεὶ ἔστι τὸ αἰσθητήριον ἀέρος, ᾗ τὸ πνεῦμα τὸ σύμφυτον ποιεῖται, ἐνίοις μὲν τὴν σφύξιν, τοῖς δὲ τὴν ἀναπνοὴν καὶ εἰσπνοήν, ταύτῃ περαίνει· διὸ καὶ μάθησις γίνεται τῶν λεγομένων· ὥστ' ἀντιφθέγγεσθαι τὸ ἀκουσθέν. οἵα γὰρ ἡ κίνησις εἰσῆλθε διὰ τοῦ αἰσθητηρίου, τοιαύτη πάλιν, οἷον ἀπὸ χαρακτῆρος τοῦ αὐτοῦ καὶ ἑνός, διὰ τῆς φωνῆς γίνεται ἡ κίνησις, ὥστε ὃ ἤκουσε, τοῦτο εἰπεῖν. καὶ χασμώμενοι καὶ ἐκπνέοντες, ἧττον ἀκούουσιν ἢ εἰσπνέοντες,

* γρ. μῆνιγξ.

A Audiendi etiam olfaciendique ratio ſimilis eſt. Dicitur enim acutè cernere, aut quod procul cernere poteſt, aut quod differentias rerum, quæ cernuntur, quam maximè ſentiat. Quæ quidem ſimul nullis eiſdem contingunt. Idem enim, manu admota, aut per fiſtulam, quamquam nihilo magis colorum differentias iudicet, tamen longiùs cernet. Et quidem ex foueis puteiſque interdum ſtellas conſpiciunt. Itaque ſi quod animal multum quidem prominentiæ adiunctum oculis habet, ſed humorem pupillæ non purum, neque modicum conuenienter extraneo motui, neque ſummam cutem prætenuem obtinet, id vt B exquiſitè colorum differentias non percipiet, ſic procul cernere poterit. Quomodo etiam cominus magis quàm quæ humorem quidem illum ſyncerum operimentúmque eius prætenue habeant, ſed ſupercilio, quod promineat oculis, careant omnino. Cauſa enim cernendi tam acutè, vt differentiæ percipiantur, in ipſo oculo eſt. Nam vt in veſte mundiſſima, vel minima macula perſpicua eſt, ſic in puro ſynceróque oculo, vel parua motio patet, ſenſúmque afficit. At vt procul cernatur, motúſque à longinquis viſibilibus deueniat, cauſæ ſitus eſt oculo- C rum. Quæ enim oculis prominentibus ſunt, procul cernere nequeunt. Quæ contrà, intus in cauo oculos habent poſitos, longè aſpicere poſſunt, quoniam motus in vaſtum non diſſipatur, ſed recto tramite meat. Nihil enim intereſt an viſus exitu cerni dicatur, vt quidam aiunt. Nam niſi ante oculos quicquam ſit, diſſipari viſum, atque ita minorem rebus occurrere, quæ cernuntur, neceſſe eſt, minúſque procul videre, quàm ſi motu à rebus, quæ videntur, proficiſcente cernatur. Similem enim motui effici viſionem neceſſe eſt. Ita igitur potiſſimùm res cernerentur longinquæ, ſi illico ab oculo velut fiſtula quædam porrecta ad rem vſque cernendam continuaretur. *Sic* enim nulla D ex parte diſſolueretur motus, qui à re viſibili proficiſceretur. Sed cùm ita non ſit, quo amplius porrigitur, eo longiùs cernatur, neceſſe eſt. Cauſæ diſcriminis oculorum, hæ ſunt.

CAPVT II.

De auditoriis ſenſibus, & olfactu, eorúmque ratione.

EAdem verò audiendi olfaciendique ratio eſt. Aut enim ita exquiſitè audiunt & olfaciunt, vt quàm maximè differentias omnes ſubiectarum ſenſibilium rerum ſentiant: aut E ita, vt procul audiant, aut odorentur. Vt igitur bene differentię iudicentur, cauſa ſenſorium eſt, quomodo in cernendo, videlicet ſi ſyncerum, tum ipſum, tum eius membrana eſt. Meatus enim ſenſoriorum omnium, vt dixi, cùm de ſenſibus agerem, tendunt ad cor, aut ad cordis proportionale, ſi corde carent. Itaque meatus audiendi, quoniam ſenſorium hoc aëris eſt, qua ſpiritus natiuus in aliis pulſum, in aliis ſpirationem facit, hac deſinit. Quapropter verba ediſcuntur, vt quod audieris, reddere ore poſſis. Qualis enim motus ſubierit per ſenſorium, talis quaſi ab vna eademque effigie motus per vocem agitur, vt quod audieris, idem dicas. Oſcitantes etiam, aut ſpiritum reddentes, accipientéſve, minùs audiunt,

quoniam extremum ſenſorij auditus ad partem A ſpiritalem terminetur, & quatiatur, moueaturque vnà cum inſtrumento ſpiritali, quoties illud ſpiritum mouet. Mouetur enim cùm mouet. Necnon temporibus anni, temperamentiſque humidis idem accidit, vt aures impleri ſpiritu videantur, quoniam vicinæ ſint origini loci ſpiritalis. Iudicium igitur exquiſitum differentiarum tum ſoni tum odoris, in ſynceritate ſenſorij ſummæque membranæ poſitum eſt. Ita enim omnes motus manifeſti, vt in viſu, in his etiam veniunt, quoniam & procul ſentire, aut non ſentire, ſimiliter atque in ratione videndi accidit. Quæ enim ante ſuas ſenſorias partes productiores, velvti B aquæ ductus poſſident, hæc procul ſentire poſſunt. Quamobrem quorum nares porrectę ſunt longiùs, vt catellorum Laconicorum, hæc valent olfactu. Ita enim motus non interpellantur, ſed à longè directi, ſenſorium ſubeunt integri: quomodo in iis qui manu admota fronti longiùs cernunt. Auriculæ etiam longæ, imbricatæque ampliùs, quaſi grundis, intúſque anfractu longiore intortæ (quales nonnullarum quadrupedum ſunt) meliùs adminiſtrant: quippe quæ motum eminus excipientes ad ſenſorium reddãt. Homo pro magnitudine minimè ferè omnium animalium procul ſentire poteſt, cùm tamen dif- C ferentiarum ſenſu maximè omnium valeat. Cuius rei cauſa eſt, quòd ſenſorium ſyncerum miniméque terrenum corpulentúmve obtinet. Cutem etiam tenuiſſimam præ cæteris animalibus homo ſuapte natura pro magnitudine habet. Vitulus marinus nimirum rectè à natura conſtitutus eſt. Cùm enim quadrupes ouiparum ſit, auribus caret, meatúſque tantùm habet, quibus audiat. Cauſa eſt, quòd vitam hic in humore traducit. Pars autem aurium abdita meatibus eſt, vt motus à longè delatus aëris ſeruaretur. Itaque nihilo vtiles ei auriculæ eſſent, imo verò offenderent, cùm intra ſe copiam reciperent humoris. De viſu, auditu olfactúque, dictum D iam eſt.

διὰ τὸ ἐπὶ τοῦ πνευματικοῦ μορίου τὴν τελευτὴν τοῦ αἰσθητηρίου εἶναι τοῦ τῆς ἀκοῆς, καὶ σείεσθαι καὶ κινεῖσθαι ἅμα κινοῦντος τοῦ ὀργάνου τὸ πνεῦμα. κινεῖται γὰρ κινοῦν τὸ ὄργανον. καὶ ἐν ταῖς ὑγραῖς ὥραις καὶ κράσεσι συμβαίνει τὸ αὐτὸ πάθος, καὶ τὰ ὦτα πληροῦσθαι δοκεῖ πνεύματος, διὰ τὸ γειτνιᾶν τῇ ἀρχῇ τοῦ πνευματικοῦ τόπου. ἡ μὲν οὖν περὶ τὰς διαφορὰς ἀκρίβεια τῆς κρίσεως καὶ τῶν ψόφων καὶ τῶν ὀσμῶν, ἐν τῷ τὸ αἰσθητήριον καθαρὸν εἶναι, καὶ τὸν ὑμένα τὸν ἐπιπολῆς. πᾶσαι γὰρ αἱ κινήσεις διάδηλοι καθάπερ καὶ ἐπὶ τῆς ὄψεως, καὶ ἐπὶ τῶν τοιούτων, συμβαίνουσι. καὶ τὸ πόρρωθεν δὲ αἰσθάνεσθαι, τὰ δὲ μὴ αἰσθάνεσθαι, ὁμοίως συμβαίνει ὥσπερ ἐπὶ τῆς ὄψεως. τὰ γὰρ ἔχοντα πρὸ τῶν αἰσθητηρίων οἷον ὀχετοὺς διὰ τῶν μορίων, ταῦτα πόρρωθεν αἰσθητικά εἰσι. διὸ ὅσων οἱ μυκτῆρες μακροί, οἷον τῶν Λακωνικῶν κυνιδίων, ὀσφραντικά. ἄνω γὰρ ὄντος τοῦ αἰσθητηρίου, πόρρωθεν αἱ κινήσεις οὐ διασπῶνται, ἀλλ' εὐθυποροῦσιν, ὥσπερ τοῖς ἐπηλυγιζομένοις πρὸ τῶν ὀμμάτων. ὁμοίως δὲ καὶ ὅσοις τὰ ὦτα μακρὰ καὶ ἀπογεγεισωμένα πόρρωθεν (οἷα ἔχει ἔνια τῶν τετραπόδων) καὶ ἔσω τὴν ἑλίκην μακράν. καὶ γὰρ ταῦτα ἐκ πολλοῦ λαμβάνοντα τὴν κίνησιν, ἀποδίδωσι πρὸς τὸ αἰσθητήριον. τὴν μὲν οὖν πόρρωθεν τῶν αἰσθήσεων ἀκρίβειαν, ἥκιστα (ὡς εἰπεῖν) ἄνθρωπος ἔχει, ὡς κατὰ μέγεθος τῶν ζῴων· τὰ δὲ περὶ τὰς διαφορὰς, μάλιστα πάντων εὐαίσθητον. αἴτιον δ', ὅτι τὸ αἰσθητήριον καθαρόν, καὶ ἥκιστα γεῶδες καὶ σωματῶδες· καὶ φύσει λεπτοδερμότατον τῶν ζῴων, ὡς κατὰ μέγεθος, ἄνθρωπός ἐστιν. εὐλόγως δ' ἀπείργασται ἡ φύσις τὰ περὶ τὴν φώκην. τετράπουν γὰρ ὂν καὶ ζῳοτόκον, οὐκ ἔχει ὦτα, ἀλλὰ πόρους μόνον. αἴτιον δὲ, ὅτι ἐν ὑγρῷ αὐτῇ ὁ βίος· τὸ δὲ τῶν ὤτων μόριον πρόσκειται τοῖς πόροις, πρὸς τὸ σώζειν τὴν τοῦ πόρρωθεν ἀέρος κίνησιν. οὐδὲν οὖν χρήσιμόν ἐστιν αὐτῇ, ἀλλὰ καὶ τοὐναντίον ἀπεργάζοιτο ἄν, δεχόμενα εἰς αὐτὰ ὑγροῦ πλῆθος. καὶ περὶ μὲν ὄψεως καὶ ἀκοῆς καὶ ὀσφρήσεως εἴρηται.

CAPVT III.

De pilorum in animantibus varietate, & quæ pilorum loco ſint.

PIli diſcrepant, & inter ſe in hominum genere per ætates, & cum cæteris animalibus, quæ habent pilos. Habent autem quæ intra ſe animal generant, ferè omnia. Iam & aculeos, qui à nonnullis vice pilorum geruntur, genus eſſe pilorum exiſtimandum eſt, vt herinaceorum aculeos, & ſi quid eiuſmodi aliud in E genere viuiparo eſt. Differentiæ verò pilorum exiſtunt, duritie, mollitie, longitudine, breuitate, rectitudine, criſpitudine, multitudine, paucitate: ad hæc coloribus, vt albedine, nigredine, eorúmque mediis. Sed nonnullas earum differentiarum per ætates quoque recipiunt, videlicet cùm minora natu aut maiora ſunt. Quod præcipuè in homine palàm fit. Piloſior enim ætate prouectus redditur homo, & parte priore capitis nonnulli caluefcunt. Pueri quidem mulieréſque non caluefcunt. Viri autem procedente ætate calui euadunt: necnon capite homines ſeneſcentes caneſcunt.

ΚΕΦΑΛ. γ'.

Περὶ τῶν τριχωμάτων.

ΤΑ δὲ τριχώματα διαφέρει καὶ πρὸς αὐτὰ τοῖς ἀνθρώποις κατὰ τὰς ἡλικίας, καὶ πρὸς τὰ γένη τῶν ἄλλων ζῴων, ὅσαπερ ἔχει τρίχας αὐτῶν. ἔχει δ', ὅσα ζῳοτοκεῖ πάντα σχεδὸν ἐν τοῖς αὐτῶν. καὶ γὰρ τὰ ἀκανθώδεις ἔχοντα, τῶν τοιούτων τριχῶν εἶδός τι ὑποληπτέον, οἷον τάς τε τῶν χερσαίων ἐχίνων, καὶ εἴ τι ἄλλο τοιοῦτόν ἐστι τῶν ζῳοτόκων. εἰσὶ δὲ διαφοραὶ τῶν τριχῶν κατά τε σκληρότητα καὶ μαλακότητα, καὶ κατὰ μῆκος καὶ βραχύτητα, καὶ εὐθύτητα καὶ οὐλότητα, καὶ πλῆθος καὶ ὀλιγότητα· πρὸς δὲ τούτοις, κατὰ τὰς χρόας, κατὰ λευκότητα καὶ μελανίαν, καὶ τὰς μεταξὺ τούτων. ἐνίαις δὲ τούτων τῶν διαφορῶν, καὶ κατὰ τὰς ἡλικίας διαφέρουσι νέα τε καὶ παλαιούμενα. μάλιστα δὲ τοῦτ' ἐπίδηλον ἐπὶ τῶν ἀνθρώπων. καὶ γὰρ δασύνεται μᾶλλον πρεσβύτερα γινόμενα, καὶ φαλακροῦνται τῆς κεφαλῆς ἔνιοι τὰ ἔμπροσθεν. καὶ παῖδες μὲν ὄντες, οὐ γίγνονται φαλακροί, οὐδὲ γυναῖκες· οἱ δ' ἄνδρες, προϊούσης τῆς ἡλικίας. καὶ πολιοῦνται δὲ τὰς κεφαλὰς γηράσκοντες οἱ ἄνθρωποι,

τῶν δ' ἄλλων οὐδενὶ τοῦτ' (ὡς εἰπεῖν) γίνεται ἐπίδηλον, μάλιστα δ' ἵππῳ τῶν ἄλλων. καὶ φαλακροῦνται μὲν οἱ ἄνθρωποι τὰ ἔμπροσθεν τῆς κεφαλῆς· πολιοὶ δὲ πρῶτον γίνονται τοὺς κροτάφους. φαλακροῦνται δ' οὐδεὶς οὔτε τούτους, οὔτε τὰ ὄπισθεν τῆς κεφαλῆς. ὅσα δὲ τῶν ζώων μὴ ἔχει τρίχας, ἀλλὰ τὸ ἀνάλογον αὐταῖς, οἷον ὄρνιθες μὲν πτερά, τὸ δὲ τῶν ἰχθύων γένος, λεπίδας, καὶ τούτοις συμβαίνει τῶν τοιούτων παθημάτων ἔνια, κατὰ τὸν αὐτὸν λόγον. τίνος μὲν οὖν ἕνεκα τὸ τῶν τριχῶν ἐποίησε γένος ἡ φύσις τοῖς ζώοις, εἴρηται πρότερον ἐν ταῖς αἰτίαις ταῖς περὶ τὰ μέρη τῶν ζώων. τίνων δ' ὑπαρχόντων, καὶ διὰ τίνας ἀνάγκας συμβαίνει τούτων ἕκαστον, δηλῶσαι τῆς μεθόδου τῆς νῦν ἐστι. παχύτητος μὲν οὖν καὶ λεπτότητος αἴτιον μάλιστα τὸ δέρμα. τοῖς μὲν γὰρ παχύ, τοῖς δὲ λεπτόν, τοῖς δὲ μανόν, τοῖς δὲ πυκνόν ἐστι· ἔτι δὲ συναίτιον καὶ τῆς ἐνούσης ὑγρότητος ἡ διαφορά. τοῖς μὲν γὰρ ὑπάρχει λιπαρά, τοῖς δὲ ὑδατώδης. ὅλως μὲν ἡ τοῦ δέρματος φύσις ὑπόκειται γεώδης. ἐπιπολῆς γὰρ οὖσα, ἐξατμίζοντος τοῦ ὑγροῦ, στερεὰ γίνεται καὶ γεώδης, αἱ δὲ τρίχες καὶ τὸ ἀνάλογον αὐταῖς, οὐκ ἐκ τῆς σαρκὸς γίνονται, ἀλλ' ἐκ τοῦ δέρματος, ἐξατμίζοντος καὶ ἀναθυμιωμένου ἐν αὐτοῖς τοῦ ὑγροῦ. διὸ παχεῖαι μὲν ἐκ τοῦ παχέος, λεπταὶ δὲ ἐκ τοῦ λεπτοῦ δέρματος γίνονται. ἂν μὲν οὖν ᾖ τὸ δέρμα μανότερον καὶ παχύτερον, παχεῖαι, διά τε τὸ πλῆθος τοῦ γεώδους, καὶ διὰ τὸ μέγεθος τῶν πόρων· εἰ δ' ἂν πυκνότερον, λεπτότεραι, διὰ τὴν στενότητα τῶν πόρων. ἔτι δ' ἂν ἡ ἰκμὰς ὑδατώδης, ταχὺ ἀναξηραινομένοις, οὐ λαμβάνουσι μέγεθος αἱ τρίχες· ἂν δὲ λιπαρά, τοὐναντίον. οὐ γὰρ εὐξήραντον τὸ λιπαρόν. διόπερ ὅλως μὲν τὰ παχυδερμότερα, παχυτριχώτερα τῶν ζώων· οὐ μέντοι τὰ μάλιστα μᾶλλον, διὰ τὰς εἰρημένας αἰτίας· οἷον τὸ τῶν ὑῶν γένος πρὸς τὸ τῶν βοῶν πέπονθε, καὶ πρὸς ἐλέφαντα, καὶ πολλὰ τῶν ἄλλων. διὰ τὴν αὐτὴν δ' αἰτίαν καὶ αἱ ἐν τῇ κεφαλῇ τρίχες τοῖς ἀνθρώποις πρὸς τὰς τοῦ λοιποῦ σώματος παχύταται. τοῦ γὰρ δέρματος τοῦτο παχύτατον, καὶ ἐν πλείστῃ ὑγρότητι. ἔτι δ' ἔχει μανότητα πολλήν. αἴτιον δὲ καὶ τοῦ μακρὰς ἢ βραχείας τὰς τρίχας εἶναι, τὸ μὴ εὐξήραντον εἶναι [τὸ μὴ ἐξατμίζον ὑγρόν.] τοῦ δὲ μὴ εὐξήραντον εἶναι, δύο αἰτίαι, τό, τε ποσὸν καὶ τὸ ποιόν. ἄν τε γὰρ πολὺ ᾖ τὸ ὑγρόν, οὐκ εὐξήραντον· καὶ ἂν ᾖ λιπαρόν. καὶ διὰ τοῦτο τοῖς ἀνθρώποις αἱ ἐκ τῆς κεφαλῆς τρίχες μακρόταται. ὁ γὰρ ἐγκέφαλος ὑγρὸς καὶ ψυχρὸς ὤν, πολλὴν παρέχει δαψίλειαν τοῦ ὑγροῦ. εὐθύτριχα δὲ καὶ οὐλότριχα γίνεται, διὰ τὴν ἐν ταῖς θριξὶν ἀναθυμίασιν. ἂν μὲν γὰρ ᾖ καπνώδης, θερμὴ οὖσα καὶ ξηρά, τὴν τρίχα οὔλην ποιεῖ. κάμπτεται γάρ, διὰ τὸ φέρεσθαι δύο φοράς. τὸ μὲν γὰρ γεῶδες, κάτω· τὸ δὲ θερμόν, ἄνω φέρεται. εὐκάμπτου δ' οὔσης, δι' ἀσθένειαν, στρέφεται. τοῦτο δ' ἐστὶν οὐλότης τριχός. ἐνδέχεται μὲν οὖν οὕτω λαβεῖν τὴν αἰτίαν. ἐνδέχεται δὲ καὶ διὰ τὸ ὀλίγον τὸ ὑγρὸν ἔχειν, πολὺ δὲ τὸ γεῶδες, ὑπὸ τοῦ περιέχοντος ξηραινομένας συσπᾶσθαι. κάμπτεται γὰρ τὸ εὐθύ, ἐὰν ἐξατμίζηται, καὶ συντρέχει ὥσπερ ἐπὶ τοῦ πυρὸς καομένη ἡ θρίξ· ὡς οὔσης τῆς οὐλότητος, συσπάσεως δι' ἔνδειαν ὑγροῦ, ὑπὸ τῆς τοῦ περιέχοντος θερμότητος. σημεῖον δ', ὅτι καὶ σκληρότεραι αἱ οὖλαι τρίχες τῶν εὐθειῶν εἰσί. τὸ γὰρ ξηρόν, σκληρόν. εὐθύτριχα δέ, ὅσα ὑγρότητα ἔχει πολλήν·

A Quod nulli ferè ex cæteris animalibus accidit manifeſtè, quamuis equus euidentiùs quàm cætera, ita afficiatur. Caluefcunt homines parte capitis priore. Caneſcunt primò temporibus: ſed nemo vel temporibus, vel occipite caluefcit. Quibus autem animalium pili non ſunt, ſed pilorum proportionale, vt auibus pennæ, piſcibus ſquamæ, iis etiam nonnulli ex iis affectibus veniunt ratione eadem. Sed cuiuſnam rei cauſa genus pilorum datum animalibus à natura eſt, diximus antè, cùm cauſas partium redderemus. Nunc præſentis operis atque officij eſt, vt quibuſnam præcedentibus rebus, & quas ob neceſſitates hæc eueniant, explicemus.

B Cauſa craſſitudinis tenuitatiſque pili, cutis potiſſimùm eſt.. Aliis enim cutis craſſa, aliis tenuis, & aliis rara, aliis denſa eſt. Tum differentia humoris inditi, conſors cauſæ eſt. Aliis enim pinguis, aliis aquoſa eſt. Omnino cutis naturam terrenam eſſe ſtatuimus. Cùm enim per ſumma ſit, humore euaporante, ſolida terrenáque redditur. Pili autem proportionaléque pilorum non ex carne ſed ex cute oriuntur, cùm humor in iis euaporetur, atque exhalet. Quamobrem craſſi ex craſſa, tenues ex tenui cute proueniunt. Quòd ſi cutis rarior & craſſior ſit, craſſi gignentur propter copiam portionis terrenæ, & meatuum laxitatem. Sed ſi ſpiſſior eſt, tenuio-

C res exeunt propter meatuum anguſtiam. Item ſi vapor aquoſus ineſt breui reſiceſcens, facit ne pili capiant magnitudinem. At ſi pinguis eſt, contrà euenit. Non enim facilè exiccari poteſt, quod pingue eſt. Quamobrem in totum animalia, quorum cutis craſſior eſt, pilo ſunt craſſiore, quamuis nō quę cute maximè ita conſtant, magis ita habeant pilū, propter eas, quas modò diximus cauſas, vt generi ſuum prę bubus, & elephantis, & multis aliis vſu euenit. Nam & ſi cutem craſſiorem boues, *elephanti*, & pleráque alia habent, quàm ſues, tamen pilo tenuiore teguntur. Eadem cauſa eſt cur hominum capilli craſſiſſimi ſint. Capitis enim cutis craſſiſſima eſt, & humoris

D plurimum continet. Rara etiam admodum eſt. Quinetiam vt pili longiores breuioréſve ſint, cauſa eſt, quòd humor, qui euaporetur, non facilè exiccari poteſt. Cauſa verò, ne facilè exiccetur, duplex eſt, ſcilicet quantitate & qualitate. Nam ſi humor aut multus aut pinguis eſt, non facilè exiccari poteſt. Ideóque hominum capilli longiſſimi ſunt. Cerebrum enim quod humidum & frigidum eſt, largam humoris copiam præbet. Simplex autem criſpúſve oritur pilus exhalatione pilorum. Nam ſi fumoſa eſt præ ſua caliditate, & ſiccitate, criſpum efficit pilum. Inflectitur enim, quoniam duplici delatione feratur. Terrenum enim deorſum, calidum ſurſum

E fertur: cúmque præ ſua imbecillitate inflecti facilè poſſit, intorquetur: quod pili criſpitudo eſt. Aut igitur ita cauſa reddenda eſt, aut quoniam parum humoris, multum autem portionis terrenæ ineſt, efficitur vt pili reſiccati ab aëre ambiēte contrahātur. Inflectitur enim quod rectū eſt, ſi euaporatur, & contrahitur, atque conuellitur pilus, quēadmodum cum igne aduritur, vtpote cum criſpitudo conuulſio ſit ob humoris inopiā ab aëris continentis calore. Indiciū rei eſt, quòd & duriores sūt pili criſpi, quàm recti: durum enim quod ſiccū eſt. Simplici autem pilo ſunt, quę humore abundant:

fluit

fluit enim humor in iis, non ſtillat. Quocirca Scythæ incolæ Ponti, & Thraces, pilo ſunt promiſſo, & ſimplici. Nam & ipſi humidi ſunt, & aër ambiens eos, humidus eſt. Æthiopes contrà, qui loca incolunt calida, criſpo ſunt pilo: ſiccum eſt enim & cerebrum eorum, & cœlum ambiens. Sed ſunt quæ quamuis cutem habeant craſſiorem, tamen tenuiori ſunt pilo, ea videlicet cauſa, quam antè expoſui. Quo enim meatus tenuiores ſint, eo pilos enaſci tenuiores neceſſe eſt. Quapropter ouium generi tales ſunt pili: vellus enim multitudo pilorum eſt. Sunt etiam, quæ mollem quidem habeant pilum, ſed minùs tenuem, vt lepores, contrà quàm oues: leporum enim pilus per ſumma cutis enaſcitur: quamobrem longitudine caret, & ſimile accidit, vt in iis quæ lino decerpuntur, quæ quamuis mollia ſint, tamen nullam longitudinem habent, nec implexum vllum recipiunt. Oues frigidi tractus contrà, quàm homines, afficiuntur. Scythæ enim molli ſunt pilo: at oues Sauromaticæ duro. Cauſa eadem, quæ in omnibus feris eſt. Frigus enim indurat propterea quòd cogendo exiccat. Cùm enim calor eximitur, humor vnà euaporatur. Itaque non ſolùm pilus, ſed etiam cutis terrena duráque euadit. Cauſa in feris vita agreſtis eſt, in cicuribus autem his loci frigiditas. Indicium vel echini pelagici faciunt, quorum vſus contra vrinæ ſtillicidia eſt: quippe qui frigiditate maris præalti, in quo degunt (ſexaginta enim atque etiam amplius paſſuum gurgite oriuntur) ipſi quidem exigui ſint, ſed aculeos grandes duróſque gerant. Cauſa magnitudinis eſt, quòd incrementum corporis diuerſum eo eſt. Cùm enim parum caloris obtineant, neque concoquere poſſint, multum ob eam rem habent excrementi. Aculei autem, & pili, & reliqua generis eiuſdem excremento naſcuntur. Duri verò & rigidi modo penè lapidis conſtant, propter frigus, & gelu: eodémque modo cætera, quæ terra gignit, duriora & terroſiora, lapidoſioráque gignuntur locis Aquiloniis, quàm Auſtrinis, & vento expoſitis, quàm concauis, & quietis: frigent enim omnia magis, humórque euaporatur. Indurat igitur tum calor, tum frigus. Namque euenit vt ab vtriſque humor euaporetur: ſcilicet à calore, per ſe; à frigore, per accidens. Vnà enim cum calore humor abſtrahitur: nullus enim humor ſine calore eſt. Sed frigus non modò indurat, ſed denſat etiam, calor verò laxat, rarioráque facit. Eadem cauſa eſt vt natu grandibus duriores & pili, & pennæ, & ſquamæ reddantur. Cutes enim duriores craſſioréſque efficiuntur ſeneſcente ætate: reſiccantur enim: & quidem ſenectus ipſa, vt nomen ſignificat, terrena eſt, quoniam ſine calore eſt, & cum calore humor defluit. Calui omnium maximè animalium homines apertè efficiuntur. Quod genus affectionis generale quodam modo eſt. Nam & plantarum aliæ ſemper frondent, aliæ frondem amittunt. Et aues, quæ certo tempore ſe abdunt, & latent, pennas amittunt. Qualis affectus caluitium in hominibus eſt, quibus accidit vt calueſcant. Cùm enim paulatim & frondes, & pennæ, &

A ῥέον γάρ, ἀλλ' οὐ στάζον περιέρχεται ἐν ταύταις τὸ ὑγρόν. καὶ διὰ τοῦτο οἱ μὲν ἐν τῷ Πόντῳ Σκύθαι καὶ Θρᾶκες, εὐθύτριχες· καὶ γὰρ αὐτοὶ ὑγροί, καὶ* ὁ περὶ αὐτοὺς ἀὴρ ὑγρός. * κ. ὁ περιέχων ἀ. Αἰθίοπες δ' οἱ ἐν τοῖς θερμοῖς, οὐλότριχες· ξηροὶ γὰρ οἱ ἐγκέφαλοι, καὶ ὁ ἀὴρ ὁ περιέχων. ἔστι δ' ἔνια τῶν παχυδερμοτέρων λεπτότριχα, διὰ τὴν εἰρημένην αἰτίαν πρότερον. ὅσῳ γὰρ ἂν λεπτότεροι ὦσιν οἱ πόροι, τοσούτον ἀναγκαῖον λεπτοτέρας γίνεσθαι τὰς τρίχας· διὸ τὸ τῶν προβάτων γένος τοιαύτας ἔχει τὰς τρίχας. τὸ γὰρ ἔριον, τριχῶν πλῆθός ἐστιν. ἔστι δ' ἔνια τῶν ζώων, ἃ μαB λακὴν μὲν ἔχει τὴν τρίχα, ἧττον δὲ λεπτήν· οἷον τὸ τῶν δασυπόδων πρὸς τὸ τῶν προβάτων πέπονθε. τῶν γὰρ τοιούτων ἐπιπολῆς ἡ θρὶξ τοῦ δέρματος. διὸ μῆκος οὐκ ἔχει, ἀλλὰ συμβαίνει παραπλήσιον, ὥσπερ τὰ ἀπὸ λίνων ξυόμενα. καὶ γὰρ ταῦτα μῆκος μὲν οὐθὲν ἔχει, μαλακὰ δ' ἐστί, καὶ οὐ δέχεται πλοκήν. τὰ δ' ἐν τοῖς ψυχροῖς πρόβατα, τοὐναντίον πέπονθε τοῖς ἀνθρώποις. οἱ μὲν γὰρ Σκύθαι, μαλακότριχες· τὰ δὲ πρόβατα τὰ Σαυρομάτικα, σκληρότριχα. τούτου δ' αἴτιον ταὐτό, ὃ καὶ ἐπὶ τῶν ἀγρίων πάντων. ἡ γὰρ ψυχρότης σκληρύνει, C διὰ τὸ ξηραίνειν πηγνύουσα. ἐκθλιβομένου γὰρ τοῦ θερμοῦ, συνεξατμίζει τὸ ὑγρόν, καὶ γίνονται καὶ αἱ τρίχες καὶ τὸ δέρμα γεώδες καὶ σκληρόν. αἴτιον δὲ τοῖς μὲν ἀγρίοις, ἡ θυραυλία· τοῖς δ', ὁ τόπος, τοιοῦτος ὤν. σημεῖον δὲ καὶ τὸ ἐπὶ τῶν ποντίων ἐχίνων συμβαῖνον, *οἷς χρῶνται πρὸς τὰς στραγγουρίας. * hiſt. li. 4. c. 5. καὶ γὰρ οὗτοι διὰ τὸ ἐν ψυχρᾷ εἶναι τῇ θαλάττῃ, διὰ τὸ βάθος, (καθ' ἑξήκοντα γὰρ καὶ ἔτι πλεόνων γίγνονται ὀργυιῶν) αὐτοὶ μὲν μικροί, τὰς δὲ ἀκάνθας μεγάλας ἔχουσι καὶ σκληράς· μεγάλας μέν, διὰ τὸ ἐνταῦθα τὴν τοῦ σώματος τετράφθαι αὔξησιν (ὀλιγόθερμοι γὰρ ὄντες καὶ οὐ πέττοντες, πολὺ περίττωμα ἔχουσιν. D αἱ δ' ἄκανθαι καὶ τρίχες, καὶ τὰ τοιαῦτα, γίνονται ἐκ περιττωμάτων) σκληρὰς δὲ καὶ λελιθωμένας, διὰ τὴν ψυχρότητα καὶ τὸν πάγον. τὸν αὐτὸν δὲ τρόπον καὶ τἆλλα τὰ φυόμενα σκληρότερα συμβαίνει γίνεσθαι καὶ γεωδέστερα, καὶ λιθωδέστερα τὰ ἐν τοῖς πρὸς Βορέαν, τῶν πρὸς τὸν Νότον· καὶ τὰ προσήνεμα, τῶν ἐν κοίλοις. ψύχεται γὰρ πάντα μᾶλλον, καὶ ἐξατμίζει τὸ ὑγρόν. σκληρύνει μὲν οὖν καὶ τὸ θερμὸν καὶ τὸ ψυχρόν. ἐξατμίζεσθαι γὰρ ὑπ' ἀμφοτέρων συμβαίνει τὸ ὑγρόν· ὑπὸ μὲν [οὖν] τοῦ θερμοῦ, καθ' αὑτό· ὑπὸ δὲ τοῦ ψυχροῦ, κατὰ συμβεβηκός. E μετὰ τοῦ θερμοῦ γὰρ συνεξέρχεται. οὐδὲν γὰρ ὑγρὸν ἄνευ θερμοῦ· ἀλλὰ τὸ μὲν ψυχρόν, οὐ μόνον σκληρύνει, ἀλλὰ καὶ πυκνοῖ· τὸ δὲ θερμόν, μανότερον ποιεῖ. διὰ τὴν αὐτὴν δ' αἰτίαν καὶ πρεσβυτέρων γιγνομένων, τοῖς μὲν τρίχας ἔχουσι, σκληρότεραι γίγνονται αἱ τρίχες· τοῖς δὲ πτερωτοῖς καὶ λεπιδωτοῖς, τὰ πτερὰ καὶ αἱ λεπίδες. τὰ γὰρ δέρματα γίνονται σκληρότερα καὶ παχύτερα πρεσβυτέρων γιγνομένων ξηραίνεται γάρ. καὶ τὸ γῆρας ἐστὶ κατὰ τοὔνομα γεηρόν, διὰ τὸ ἀπολείπειν τὸ θερμόν, καὶ μετ' αὐτοῦ τὸ ὑγρόν. φαλακροῦνται δὲ ἐπιδήλως οἱ ἄνθρωποι μάλιστα τῶν ζώων. ἔστι δέ τι καθόλου τὸ τοιοῦτον πάθος. καὶ γὰρ τῶν φυτῶν τὰ μέν, ἀείφυλλα· τὰ δέ, φυλλοβολεῖ· καὶ τῶν ὀρνίθων οἱ φωλεύοντες ἀποβάλλουσι τὰ πτερά. τοιοῦτον δέ τι πάθος καὶ ἡ φαλακρότης ἐστὶν ἐπὶ τῶν ἀνθρώπων, ὅσοις συμβαίνει φαλακροῦσθαι. κατὰ μέρος μὲν γὰρ ἀπορρεῖ καὶ τὰ φύλλα τοῖς φυτοῖς πᾶσι, καὶ τὰ πτερά, καὶ αἱ τρίχες τοῖς

ἔχουσιν. ὅταν δ' ἀθρόον συμβῇ τὸ πάθος, λαμβάνει τὰς εἰρημένας ἐπωνυμίας· φαλακροῦσθαί τε γὰρ λέγεται καὶ φυλλορροεῖν, [καὶ πτερορροεῖν.] αἴτιον δὲ τοῦ πάθους, ἔνδεια ὑγρότητος θερμῆς. τοιοῦτον δὲ μάλιστα τῶν ὑγρῶν τὸ λιπαρόν. διὸ καὶ τῶν φυτῶν τὰ λιπαρὰ μᾶλλον ἀείφυλλα. ἀλλὰ περὶ μὲν τούτων ἐν ἄλλοις τὸ αἴτιον λεκτέον· καὶ γὰρ ἄλλα συναίτια τοῦ τοιούτου πάθους αὐτοῖς. γίνεται δὲ τοῖς μὲν φυτοῖς ἐν τῷ χειμῶνι τὸ πάθος (αὕτη γὰρ ἡ μεταβολὴ κυριωτέρα τῆς ἡλικίας) καὶ τοῖς φωλεύουσι τῶν ζῴων· καὶ γὰρ ταῦτα ἧττον [τῶν ἀνθρώπων] ὑγρὰ καὶ θερμὰ τὴν φύσιν ἐστίν. οἱ δ' ἄνθρωποι ταῖς ἡλικίαις χειμῶνα καὶ θέρος ἄγουσι. διὸ, πρὶν ἀφροδισιάζειν, οὐ γίνεται φαλακρὸς οὐδείς. ποτὲ δὲ τοῖς τοιούτοις τὴν φύσιν μᾶλλον. φύσει γὰρ ἐστὶν ὁ ἐγκέφαλος τοῦ σώματος ψυχρότατος· ὁ δ' ἀφροδισιασμὸς καταψύχει. κάθαρσις γὰρ καὶ φυσικῆς θερμότητος ἀπόκρισίς ἐστιν. εὐλόγως οὖν ὁ ἐγκέφαλος αἰσθάνεται πρῶτον. τὰ γὰρ ἀσθενῆ καὶ φαύλως ἔχοντα, μικρᾶς αἰτίας καὶ ῥοπῆς ἐστιν. ὥστ' ἄν τις ἀναλογίσηται, ὅτι αὐτός τε ὀλιγόθερμος ὁ ἐγκέφαλος· ἔτι δ' ἀναγκαῖον τὸ περὶ ξ δέρμα τοιοῦτον εἶναι μᾶλλον, καὶ τούτου τὴν τῶν τριχῶν φύσιν, ὅσῳ πλεῖστον ἀφέστηκεν, εὐλόγως δόξειε, τοῖς σπερματικοῖς περὶ ταύτην τὴν ἡλικίαν συμβαίνειν φαλακροῦσθαι. διὰ τὴν αὐτὴν δ' αἰτίαν καὶ τῆς κεφαλῆς τὸ πρόσθιον μόνον γίνονται φαλακροί, καὶ τῶν ζῴων οἱ ἄνθρωποι μόνοι. τὸ μὲν γὰρ πρόσθιον, ὅτι ἐνταῦθα ὁ ἐγκέφαλος· τῶν δὲ ζῴων μόνον, ὅτι πολὺ πλεῖστον ἔχει ἐγκέφαλον, καὶ μάλιστα ὑγρόν, ὁ ἄνθρωπος. καὶ αἱ γυναῖκες οὐ φαλακροῦνται. παραπλησία γὰρ ἡ φύσις τῇ τῶν παίδων. ἄγονα γὰρ σπερματικῆς ἐκκρίσεως ἀμφότερα. καὶ εὐνοῦχος οὐ γίνεται φαλακρός, διὰ τὸ εἰς τὸ θῆλυ μεταβάλλειν· καὶ τὰς ὑστερογενεῖς τρίχας ἢ οὐ φύουσιν, ἢ ἀποβάλλουσιν, ἂν τύχωσιν ἔχοντες οἱ εὐνοῦχοι, πλὴν τῆς ἥβης. καὶ γὰρ αἱ γυναῖκες τὰς μὲν, οὐκ ἔχουσι, τὰς δὲ ἐπὶ τῇ ἥβῃ, φύουσιν. ἡ δὲ πήρωσις αὕτη, ἐκ τοῦ ἄρρενος εἰς τὸ θῆλυ μεταβολή ἐστι. τοῦ δὲ τὰ μὲν φωλεύοντα πάλιν δασύνεσθαι, καὶ τὰ φυλλοβολήσαντα πάλιν φύειν φύλλα, τοὺς δὲ φαλακροὺς μὴ ἀναφύεσθαι πάλιν, αἴτιον ὅτι τοῖς μὲν αἱ ὧραι, τροπαί εἰσι τοῦ σώματος μᾶλλον· ὥστ' ἐπεὶ μεταβάλλουσιν αὗται, μεταβάλλει καὶ τὸ φύειν, καὶ τὸ ἀποβάλλειν, τοῖς μὲν, τὰ πτερὰ καὶ τὰς τρίχας· τοῖς δὲ φύλλα, τὰ φυτά. τοῖς δ' ἀνθρώποις κατὰ τὴν ἡλικίαν γίνεται χειμὼν καὶ θέρος, καὶ ἔαρ, καὶ μετόπωρον. ὥστ' ἐπεὶ αἱ ἡλικίαι οὐ μεταβάλλουσιν, οὐδὲ τὰ πάθη τὰ διὰ ταύτας μεταβάλλει, καίπερ τῆς αἰτίας ὁμοίας οὔσης. καὶ περὶ μὲν τἆλλα πάθη τῶν τριχῶν σχεδὸν εἴρηται.

ΚΕΦΑΛ. δ'.

Τῶν πολιῶν αἰτία.

Τῶν δὲ χρωμάτων αἴτιον τοῖς μὲν ἄλλοις ζῴοις, καὶ τοῦ μονόχρωμα εἶναι, καὶ τοῦ ποικίλα, ἡ τοῦ δέρματος φύσις· τοῖς δ' ἀνθρώποις, οὐδέν, πλὴν τῶν πολιῶν, οὐ τῶν διὰ τὸ γῆρας, ἀλλὰ τῶν διὰ νόσον. ἐν γὰρ τῇ καλουμένῃ λεύκῃ λευκαὶ γίνονται αἱ τρίχες. ἐὰν δὲ αἱ τρίχες ὦσι λευκαί, οὐκ ἀκολουθεῖ τῷ δέρματι ἡ λευκότης. αἴτιον δ',

A pili defluant, vbi vniuerſim hic affectus euenerit, vocabula accipit hæc, caluéſcere, defrondeſcere, depenneſcere. Cauſa autem huius affectus, inopia humoris calidi eſt, qualis præcipuè eſt humor pinguis. Quocirca plantæ, quæ pingues ſunt, fronde perpetua virent. Sed de his aliàs. Sunt enim iis vel aliæ cauſæ huius comites affectionis. Euenit hoc plantis hyberno tempore. Mutatio enim hæc potior, quàm ætas earum eſt. Animalibus etiam, quæ latent, idem tempus iacturæ eſt. Sunt enim minùs, quàm homines, natura humida atque calida. Homines autem ſuis ætatibus hyemem æſtatémque agunt. Quamobrem nemo antè quàm coire incipiat, B caluéſcit, ſed à Venereo coitu potiùs id euenit, ſcilicet iis qui ſua natura ſint eò propenſiores. Cùm enim cerebrum frigidiſſimum omnium corporis partium ſit, tum rei Venereæ vſus refrigerat. Caloris namque ſynceri naturaliſque ſecretio eſt. Itaque cerebrum ſentit meritò priùs. Quæ enim imbecilla vitioſaque ſunt, cauſa parua exiguóque momento immutantur. Quapropter ſi quis cogitet, vt & ipſum cerebrum parum calidum eſt, magiſque talem eſſe obductam cutem neceſſe eſt, atque etiam magis naturam pilorum, videlicet quanto plus ipſa caloris origine diſtet, rectè id ita euenire exiſtimabit, vt qui ſemen ferant, ea ipſa ætate caluéſcant, qua ſemen C emittant. Eadem cauſa eſt & vt priore capitis parte caluéſcant, & vt hominibus ſolis omnium animalium id eueniat. Quòd enim parte priore cerebrum continetur, hinc ea parte caluéſcimus. Quòd autem homo maximum humidiſſimúmque cerebrum habet, hinc ſolus animalium ita afficitur. Mulieres non caluent, quoniam natura earum ſimilis puerorum naturæ eſt. Vtraque enim ſterilis ſeminalis excrementi eſt. Spadones etiam non caluéſcunt, quoniam in fœminam mutantur, & pilos, qui poſtea gignuntur, aut non producunt, aut amittunt, ſi fortè habent, præterquam pubem quam mulieres etiam habent, cùm cæteris illis careant. Oblæſio enim hæc, muD tatio de mare in fœminam eſt. Cauſa verò, vt quæ latent, rurſus pennas recipiant, quæque frondem amiſerint, denuo frondeſcant, caluis autem nunquam redeat pilus, quòd anni tempora illis mutationem corporis magis afferunt. Itaque pro temporum mutatione viciſſitudo gignendi amittendique ſequitur, vt animalia pennas piloſve, plantæ frondes aut dimittant, aut recipiant. At verò hominibus per ætatem euenit, ver, æſtas, autumnus, hyems. Itaque cùm ipſæ ætates non permutentur, fit, ne affectus, qui ob eas accidunt, permutentur. Quanquam ſimilis cauſa eſt, ac de cæteris pilorum affectionibus diximus fere.

E

CAPVT IV.

Quam ob cauſam homines caneſcant.

Colorum autem cauſa cæteris quidem animalibus cutis natura eſt, vt vnicolora ſint, & varia. Sed hominibus nihil cauſæ cutis affert, niſi ad canitiem, videlicet eam, quæ morbo, non quæ ſenio accidat. Nam eo vitio corporis, quod vitiligo vocatur, pili efficiuntur albi. Sed ſi albi ſunt pili, cutem albedo non ſequitur. Cuius rei cauſa eſt,

quòd pili è cute exeunt. Itaque ſi cutis ægrotat, extenuatáque eſt, pilus quoque ægreſcit. Ægritudo autem pili, canities eſt: ætatis verò illa canities inopia & exilitate caloris contrahitur. Omnis enim ætas labitur in frigiditatem, cùm iam corpus inclinatur, & conſeneſcit. Senectus enim frigida eſt, & ſicca. De alimento autem, quod quamcumque partem corporis ſubeat, ita intelligendum eſt, vt calore proprio concoquatur, qui cùm agere nequeat, deprauetur altio, & aut repletio ſequatur, aut ægritudo. Sed de eiuſmodi cauſa poſtea differemus, cùm de incremento & alimento agemus. Quibus igitur hominibus natura pilorum parum calida eſt, plúſque humoris ſubit, calor proprius nequit concoquere: atque ita humor putreſcit, calore aëris ambientis. Fit enim putredo quæque à calore, ſed non ſuo, natiuóque, vt alio loco expoſui. Putredo autem & aquæ, & terræ, & quorumuis eiuſmodi corporum fieri poteſt. Quamobrem terreni etiam vaporis putredinem nouimus, quæ ſitus vocatur: etenim ſitus, caries vaporis terreni eſt. Itaque in pilis quoque alimentum tale, cùm non concoquitur, putreſcit, atque ita efficitur ea quæ canities appellatur: quæ alba propterea eſt, quòd & ſitus vnus carioſorum fere albus eſt: cuius rei cauſa eſt, quòd multum aëris continet. Omnis enim vapor terrenus vim habet aëris craſſioris. Situs enim quaſi reſpondens pruinæ exiſtimatur. Nam ſi vapor ſe efferens concreſcit, pruina fit: ſin putreſcit, ſitus. Quapropter vtraque per ſumma hærent. Vapor enim per ſumma eſt: & rectè à poëtis in comœdiis transfertur conuitio in caniciem, cùm ſenectutis ſitum, pruinam nominant: alterum enim genere idem eſt. Vapor namque vtrumque eſt. Alterum, id eſt ſitus, ſpecie idem eſt. Putredo enim vtrumque eſt. Hoc ita eſſe indicium eſt,* quòd pleriſque per ægritudinem pili canuerint, mox valetudini reſtitutis nigruerint. Cauſa eſt, quòd per ægritudinem, vt totum corpus inopia caloris naturalis laborat, ſic partes etiam minimæ eadem participant labe. Multum autem excrementi conſiſtit in partibus corporis: quamobrem in pilis etiam cruditas eſt, quod canitiem faciat: pòſt verò cùm conualuerint, & vires receperint, denuò mutantur, & quaſi iuuenes ex ſenibus redduntur: affectionéſque proinde mutantur. Rectè etiam dixeris, morbum, eſſe aduentitiam ſenectutem: ſenectutem autem, eſſe morbum naturalem. Itaque morbi nonnulli idem faciunt quod ſenectus. Tempora autem primò caneſcunt, quòd occiput vacat humore, cùm non contineat cerebrum: ſinciput verò habet multum humoris. Quod autem multum eſt, difficilè id putreſcit. At in temporum pilis, nec tam parum humoris eſt, vt concoqui poſſit, nec tam multum, vt putreſcere nequeat. Cùm enim is locus medius inter vtroſque ſit, extra vtrumque affectum eſſe poteſt. Cauſa caniciei humanæ dicta iam eſt.

A ὅτι αἱ τρίχες ἐκ τοῦ δέρματος φύονται. * ἐκ νενοσηκότος οὖν καὶ * λεπτοῦ τοῦ δέρματος, καὶ ἡ θρὶξ συννοσεῖ. νόσος δὲ τριχὸς, πολιότης ἐστίν. ἡ δὲ διὰ ἡλικίαν τῶν τριχῶν πολιότης, γίνεται δι' ἀσθένειαν καὶ ἔνδειαν τῆς θερμότητος. καὶ γὰρ ἡλικία πᾶσα ῥέπει ἀποκλίνοντος τοῦ σώματος, καὶ ἐν τῷ γήρᾳ, ἐπὶ ψύξιν. τὸ γὰρ γῆρας ψυχρὸν καὶ ξηρόν ἐστι. δεῖ δὲ νοῆσαι τὴν εἰς ἕκαστον μόριον ἀφικνουμένην τροφὴν, ὅτι πέττει μὲν ἡ οἰκεία θερμότης· ἀδυνατούσης δὲ, φθείρεται, καὶ πήρωσις γίνεται, ἢ νόσος. ἀκριβέστερον δὲ περὶ τῆς τοιαύτης αἰτίας ὕστερον λεκτέον ἐν τοῖς περὶ αὐξήσεως καὶ B τροφῆς. ὅσοις οὖν τῶν ἀνθρώπων ὀλιγόθερμός ἐστιν ἡ τῶν τριχῶν φύσις, καὶ πλείων ἡ εἰσιοῦσα ὑγρότης ἐστὶ τῆς οἰκείας θερμότητος ἀδυνατούσης πέττειν, σήπεται ὑπὸ τῆς ἐν τῷ περιέχοντι θερμότητος. γίνεται δ' ἡ σῆψις ὑπὸ θερμότητος μὲν πᾶσα, οὐ τῆς συμφύτου δὲ, ὥσπερ εἴρηται ἐν ἑτέροις. ἔστι δ' ἡ σῆψις καὶ ὕδατος καὶ γῆς, καὶ τῶν σωματικῶν πάντων τῶν τοιούτων. διὸ καὶ τῆς γεώδους ἀτμίδος, οἷον ὁ λεγόμενος εὐρώς. καὶ γὰρ ὁ εὐρώς ἐστι, γεώδους ἀτμίδος σαπρότης. ὥστε καὶ ἡ ἐν ταῖς θριξὶ τοιαύτη οὖσα τροφὴ, οὐ πεττομένη σήπεται, καὶ γίνεται ἡ καλουμένη πολιά. λευκὴ δὲ, ὅτι καὶ ὁ εὐρὼς μόνον τῶν σαπρῶν (ὡς εἰπεῖν) λευ- C κόν. αἴτιον δὲ τούτου, ὅτι πολὺν ἔχει ἀέρα. πᾶσα γὰρ γεώδης ἀτμὶς, ἀέρος ἔχει δύναμιν παχέος. ὥσπερ γὰρ ἀντεστραμμένον τῇ πάχνῃ ὁ εὐρώς ἐστιν. ἂν μὲν γὰρ παγῇ ἀνιοῦσα ἀτμὶς, πάχνη γίνεται· ἂν δὲ σαπῇ, εὐρώς ἐστι. διὸ καὶ ἐπιπολῆς ἐστιν ἄμφω. ἡ γὰρ ἀτμὶς ἐπιπολῆς. καὶ εὖ δὴ οἱ ποιηταὶ ἐν ταῖς κωμῳδίαις μεταφέρουσι σκώπτοντες, τὰς πολιὰς καλοῦντες, γήρως εὐρῶτα πάχνην. τὸ μὲν γὰρ, τῷ γένει· τὸ δὲ, τῷ εἴδει ταὐτόν ἐστιν. ἡ μὲν γὰρ πάχνη, τῷ γένει (ἀτμὶς γὰρ ἄμφω) ὁ δὲ εὐρὼς, τῷ εἴδει· σῆψις γὰρ ἄμφω. σημεῖον δ' ὅτι τοιοῦτόν ἐστι. καὶ γὰρ ἐκ νόσων πολλοῖς πολιαὶ ἀνέφυσαν, ὕστερον δ' ὑγιασθεῖσι, μέλαιναι ἀντὶ τού- D των. αἴτιον δ', ὅτι ἐν τῇ ἀρρωστίᾳ, ὥσπερ καὶ τὸ ὅλον σῶμα ἐν ἐνδείᾳ φυσικῆς θερμότητός ἐστιν, οὕτω καὶ τῶν ἄλλων μορίων καὶ τὰ πάνυ μικρὰ μετέχει τῆς ἀρρωστίας ταύτης. περίττωμα δὲ πολὺ ἐγγίνεται [ἐν] τοῖς σώμασι καὶ τοῖς μορίοις· διόπερ ἡ ἐν ταῖς σαρξὶν ἀπεψία ποιεῖ τὰς πολιάς· ὑγιάναντες δὲ καὶ ἰσχύσαντες, πάλιν μεταβάλλουσι, καὶ γίνονται ὥσπερ ἐκ γερόντων νέοι. διὸ καὶ τὰ πάθη συμμεταβάλλουσιν. ὀρθῶς δ' ἔχει καὶ λέγειν τὴν μὲν νόσον, γῆρας ἐπίκτητον· τὸ δὲ γῆρας, νόσον φυσικήν. ποιοῦσι τοίνυν νόσοι τινὲς τοιαῦτα, ἅπερ καὶ τὸ γῆρας. τοὺς δὲ κροτάφους πολιοῦνται πρῶτον. τὰ μὲν γὰρ ὄπισθεν, κενὰ ὑγρότητός ἐστι, E διὰ τὸ μὴ ἔχειν ἐγκέφαλον· τὸ δὲ βρέγμα, πολλὴν ἔχει ὑγρότητα· τὸ δὲ πολὺ οὐκ εὔσηπτον. αἱ δ' ἐν τοῖς κροτάφοις τρίχες οὔθ' οὕτως ὀλίγον ἔχουσιν ὑγρὸν, ὥστε πέττειν, οὔτε πολὺ, ὥστε μὴ σήπεσθαι. μέσος γὰρ ὢν ὁ τόπος ἀμφοτέρων, εἰκότως ἀμφοτέρων ἐκτὸς τῶν παθημάτων ἐστί. περὶ μὲν οὖν τῆς τῶν ἀνθρώπων πολιότητος εἴρηται τὸ αἴτιον.

* [illegible]

* Gaza, [illegible]

CAPVT V.

Quam ob cauſam nonnulla animalia pilis, aut iis quæ pilorum vice funguntur, immutentur.

CÆteris autē animalibus, ne per eam ætatem hoc idem manifeſtè eueniat, cauſa eſt eadem

ΚΕΦΑΛ. ε΄.

Διὰ τί τὰ ἄλλα ζῷα οὐ πολιοῦ.

ΤΟῖς δὲ ἄλλοις ζῴοις τοῦ μὴ γίνεσθαι διὰ τὴν ἡλικίαν ταύτην τὴν μεταβολὴν ἐπιδήλως, τὸ αὐτὸ αἴτιον,

ὥσπερ εἴρηται καὶ ἐπὶ τῆς φαλακρότητος. ὀλίγον γὰρ ἔχουσι καὶ ἧττον ὑγρὸν τὸν ἐγκέφαλον· ὥστε μὴ ἐξαδυνατεῖν τὸ θερμὸν πρὸς τὴν πέψιν. τοῖς δ' ἵπποις [αὐτῶν] ἐπισημοτάτη μάλιστα ὧν ἴσμεν ζῴων, ὅτι λεπτότατον τὸ ὀστοῦν (ὡς κατὰ μέγεθος) ἔχουσι περὶ τὸν ἐγκέφαλον, τῶν ἄλλων. τεκμήριον δ', ὅτι καίριος ἡ πληγὴ ἡ εἰς τὸν τόπον τοῦτον γίνεται τούτοις. διὸ καὶ Ὅμηρος οὕτως ἐποίησεν·

ἵνα τε τρίχες ἵππων
Κρανίῳ ἐμπεφύασι· μάλιστα δὲ καίριόν ἐστι.

ῥᾳδίως οὖν ἐπιρρεούσης τῆς ὑγρασίας διὰ λεπτότητα τοῦ ὀστοῦ, τῆς δὲ θερμότητος ἐπιλειπούσης διὰ τὴν ἡλικίαν, ἐπιπολιοῦνται αἱ τρίχες αὗται· καὶ αἱ πυῤῥαὶ θᾶττον πολιοῦνται τρίχες τῶν μελαινῶν. ἔστι γὰρ καὶ ἡ πυῤῥότης ὥσπερ ἀῤῥωστία τριχός· τὰ δ' ἀσθενῆ γηράσκει πάντα θᾶττον. μελαντέρας δὲ γίνεσθαι γηρασκούσας λέγουσι τὰς γεράνους. αἴτιον δ' ἂν εἴη τοῦ πάθους, τὸ φύσει λευκοτέραν αὐτῶν εἶναι τὴν τῶν πτερῶν φύσιν, καὶ πλέον τε γηρασκόντων εἶναι τὸ ὑγρὸν ἐν τοῖς πτεροῖς, ἢ ὥστε εὐσηπτότερα εἶναι. ὅτι δὲ γίνεται ἡ πολιὰ σήψει τινὶ, καὶ ὅτι οὐκ ἔστιν (ὥσπερ οἴονταί τινες) αὔανσις, σημεῖον τὸ προτέρου ῥηθέντος, τὸ τὰς σκεπαζομένας τρίχας πίλοις ἢ καλύμμασι, πολιοῦσθαι θᾶττον (τὰ γὰρ πνεύματα, κωλύει τὴν σῆψιν· ἡ δὲ σκέπη, ἀπνοίας ποιεῖ) καὶ τὸ βοηθεῖν τὴν ἄλειψιν τοῦ ὕδατος καὶ τοῦ ἐλαίου μιγνυμένων. τὸ μὲν γὰρ ὕδωρ, ψύχει· τὸ δ' ἔλαιον μιγνύμενον, κωλύει ξηραίνεσθαι ταχέως. τὸ γὰρ ὕδωρ εὐξήραντον. ὅτι δ' οὐκ ἔστιν αὔανσις, οὐδ' ὥσπερ ἡ ἀπαυαινομένη πόα λευκαίνεται, οὕτω καὶ ἡ θρὶξ, σημεῖον ὅτι φύονται εὐθὺς ἔνιαι πολιαί· αὖον δ' οὐδὲν φύεται. λευκαίνονται δὲ καὶ ἐπ' ἄκρου πολιαί. ἐν γὰρ τοῖς ἐσχάτοις καὶ λεπτοτάτοις ἐλαχίστη θερμότης ἐγγίνεται. τοῖς δ' ἄλλοις ζῴοις ὅσαι γίνονται λευκαὶ τρίχες, φύσει, ἀλλ' οὐ πάθει συμβαίνει γίνεσθαι τοῦτο. αἴτιον δὲ τῶν χρωμάτων τὸ δέρμα τοῖς ἄλλοις (τῶν μὲν γὰρ λευκῶν, λευκὸν τὸ δέρμα· τῶν δὲ μελάνων, μέλαν. τῶν δὲ ποικίλων καὶ γινομένων ἐκ συμμίξεως, τῇ μὲν, λευκὸν, τῇ δὲ, μέλαν φαίνεται ὄν) ἐπὶ δὲ τῶν ἀνθρώπων οὐδὲν αἴτιον τὸ δέρμα. καὶ γὰρ οἱ λευκοὶ σφόδρα, μελαίνας ἔχουσιν. αἴτιον δὲ, ὅτι λεπτότατον πάντων δέρμα ἔχει ὁ ἄνθρωπος, ὡς κατὰ μέγεθος. διόπερ οὐδὲν ἰσχύει πρὸς τὴν τῶν τριχῶν μεταβολὴν. ἀλλὰ διὰ τὴν ἀσθένειαν, τὸ δέρμα καὶ μεταβάλλει αὐτὸ τὴν χρόαν, καὶ γίνεται ὑπὸ ἡλίων καὶ πνευμάτων μελάντερον· αἱ δὲ τρίχες οὐδὲν συμμεταβάλλουσιν. ἐν δὲ τοῖς ἄλλοις, τὸ δέρμα χώρας ἔχει δύναμιν, διὰ τὸ πάχος. διὸ αἱ μὲν τρίχες κατὰ τὰ δέρματα συμμεταβάλλουσι· τὰ δὲ δέρματα, οὐδὲν, κατὰ τὰ πνεύματα καὶ τὸν ἥλιον.

ΚΕΦΑΛ. ϛʹ.

Περὶ τῶν χρωμάτων τῶν ζῴων.

Τῶν δὲ ζῴων τὰ μέν εἰσι μονόχροα (λέγω δὲ μονόχροα, ὧν τὸ γένος ὅλον ἓν χρῶμα ἔχει· οἷον οἱ λέοντες πυῤῥοὶ πάντες· καὶ τοῦτο καὶ ἐπ' ὀρνίθων καὶ ἰχθύων ἐστὶ, καὶ τῶν ἄλλων ζῴων) τὰ δὲ, πολύχροα μὲν, ὁλόχροα δέ· (λέγω δὲ, ὧν τὸ σῶμα ὅλον τὴν αὐτὴν ἔχει χρόαν· οἷον ἐπὶ βοὸς, ὅλος λευκὸς, καὶ ὅλος μέλας) τὰ δὲ, ποικίλα. τοῦτο δὲ διχῶς· τὰ μὲν, τῷ γένει, ὥσπερ πάρδαλις καὶ ταὼς, καὶ τῶν ἰχθύων ἔνιοι, οἷον αἱ καλούμεναι θρᾶτται. τῶν δὲ, τὸ γένος μὲν ἅπαν οὐ ποικίλον, γίνονται δὲ ποικίλοι, οἷον βόες, αἶγες· καὶ ἐν τοῖς ὄρνισιν, οἷον αἱ περιστεραί· καὶ ἄλλα δὲ γένη τὸ αὐτὸ πάσχει τῶν ὀρνίθων.

A quam de caluitio diximus. Parum enim cerebri, idque minùs humidum habent, vt calor ad concoquendum ſufficiat. Equis maximè omnium, quæ nouerimus, animalium, canities innoteſcit: quòd os, in quo cerebrum, tenuius quàm cætera, pro magnitudine habeant. Argumentum eſt, quòd ictus in eo loco periculoſus eſt. Vnde illud Homeri:

Et quà ſetæ hærent capiti, lethaléque vulnus
Præcipuè fit equis.

Cùm igitur præ tenuitate oſſis affluat humor, & per ætatem calor deficiat, pili iſti caneſcunt. Ruſi etiam celeriùs quàm nigri, caneſcunt. Nam ru- B ſitas, quaſi imbecillitas pili eſt. Imbecilla autem quæque celeriùs ſeneſcunt. Grues ſeneſcentes effici nigriores aiunt. Cuius affectus cauſa eſſe poteſt, quòd pennarum natura earum albicet, plúſque humoris ſeneſcentibus iis conſtituitur in pennis, quàm vt faciliùs putredini pateat. Canitiem autem effici putredine quadam, nec eſſe, vt quidam putant, ariditatem, indicium eſt, quòd pili, qui vel pileo, vel alio tegmine operiuntur, celeriùs caneſcunt. Flatus enim putredinem prohibent: operimentum autem flatum arcet. Iuuat etiam olei aquæ miſti perunctio. Aqua enim re- C frigerat: oleum verò ne celeriter exſiccetur, prohibet: aqua enim facilè reſiccatur. Canitiem autem non eſſe ariditatem, nec pilum, vt herbam exiccatum albeſcere, indicium eſt, quòd pili nonnulli cani illico oriuntur: at nullum oritur aridum. Multi etiam ſuo extremo albeſcunt: in vltimis enim ac tenuiſſimis calor minimus habetur. Cæteris animalibus, quibus pili albi gignuntur, natura, non affectu, id euenit. Cauſa autem colorum in ceteris cutis eſt. Alborum enim alba eſt cutis, nigrorum nigra: variorum permiſtorúmque partim alba partim nigra eſſe conſpicitur. *At in homine cutis nulla cauſa eſt.* Qui enim ſunt albi admodum, nigros habent capil- D los. Cauſa eſt, quòd homo omnium maximè tenuem cutem habet. Pro magnitudine itaque nihil ad pilorum mutationem cutis valet, imò præ ſua imbecillitate ipſa mutatur, & vel à ſole, vel à flatu redditur nigrior, nec pili vllo pacto cum ea mutantur. At verò in cæteris, cutis vim loci præ ſua craſſitudine obtinet. Itaque fit vt pili pro cute immutentur, cutis autem ipſa nihil à flatu aut à ſole afficiatur.

CAPVT VI.

E *De coloribus animantium.*

Animalium verò alia vnicolora ſunt, (appello vnicolora, quorum genus totum vnum habet colorem, quomodo leones fului ſunt omnes. Idémque in auibus, & piſcibus, & reliquis animalibus omnibus intelligi volo) alia verſicolora ſunt. Sed toticolora ea dico, quorum corpus totum quidem eundem habet colorem: ſed non omnium eundem, vt bos totus albus eſt, aut totus eſt niger. Alia varia ſunt, idque dupliciter: aut enim genere, vt panthera, vt pauo, & piſcium nonnulli, vt quæ thraſſæ vocantur: aut non genere toto, ſed parte, vt boues, vt capræ interdum variæ generantur. In auium etiam genere columbæ, & alia pleraque.

Tranſeunt verò toticolora multo magis quàm vnicolora, tum in colorem ſui generis ſimplicem, vt ex albis nigra, & ex nigris alba reddantur, tum verò in miſtum ex iis, quoniam in totius generis natura ineſt, ne vnum habeat colorem. Hinc enim facilè vtroque verſus mouetur, vt viciſſim mutetur, & varium efficiatur. Vnicolora contrà: nunquam enim mutantur, niſi per affectum, idque rarò. Iam enim perdix viſa eſt alba, & coruus, & paſſer, & vrſa. Accidunt hæc cùm in generatione peruertuntur: facilè enim moueri deprauarique poteſt, quod paruum eſt. Tale autem, quod gignitur, eſt. Principium enim iis quæ gignuntur, in paruo conſiſtit. Aquis etiam immutantur ea potiùs quæ ſua natura toticolora, genere autem verſicolora ſunt. Calidæ enim aquæ pilum faciunt album, frigidæ nigrum: quomodo plantis etiam euenit. Cauſa eſt, quòd calida plus aëris habent, quàm aquæ. Aër autem perlucens, albedinem facit, quemadmodum ſpumam quoque effici certum eſt. Vt igitur cutes per affectum albæ differunt ab iis quæ tales natura ſunt: ſic pili inter ſe differunt, qui morbo, aut ætate, quique natura albuerint, ſcilicet eo quòd cauſa eſt diuerſa. Alteri enim calore naturali, alteri alieno albi efficiuntur. Albedinem verò omnibus aër vaporoſus præbet incluſus. Quamobrem quæ vnicolora non ſunt, ventre omnia pleniùs albent. Calidiora etiam ſuauioráque ſunt omnia alba ferè eadem de cauſa: concoctione enim dulce efficitur: concoctio autem calore. Eadem cauſa vnicoloribus quoque, ſed aut nigris aut albis reddenda eſt. Caliditas enim atque frigiditas cauſam habent naturæ cutis, & pilorum: membrum enim vnumquodque ſuum habet calorem. Quinetiam linguæ ſimplicium ac variorum inter ſe differunt, atque etiam ipſorum ſimplicium, ſed verſicolorum, vt alborum & nigrorum. Cauſa verò eſt, quod antè dixi, quòd variorum cutes variæ ſunt, alborum albæ, nigrorum nigræ: linguam autem perinde ac partem aliquam eſſe exteriorem putandum, qualis manus, aut pes eſt, quanquam ore operiatur. Itaque cùm variorum cutis non ſit vnicolor, cutis quoque linguam ambientis ea ipſa cauſa eſt. Mutant colores auium nonnullæ, atque etiam quadrupedum ſylueſtrium aliquæ per tempora anni. Cuius rei cauſa eſt, quòd vt homines per ætatem mutantur, ſic illa per tempora. Plus enim diſcrimen hoc in iis poteſt, quàm mutatio ætatis. Varia etiam magis ſunt, quæ vario magis cibo veſcuntur. Quod parte plurima dixerim, idque rectà ratione, vt apes vnicolores ſunt magis quàm crabrones, aut veſpæ. Nam ſi cibi cauſæ ſint mutationis, meritò ciborum varietas facit vt magis euarient motus, & alimenti excrementa, ex quibus & pili, & pennæ, & cutes gignuntur. Ac de coloribus & pilis ſatis definitum ſit ad hunc modum.

CAPVT VII.

De voce animantium, & eius mutatione.

DE voce, cùm animalium alia vocis grauioris ſint, alia acutioris, alia firmæ, ac in vtramque exuperantiam modicè conſtantis: cúmque etiam alia magnam vocem, alia paruam reddant, & læuitate, aut aſperitate, flexibilitatéque, aut

A μεταβάλλει δὲ τὰ ὁλόχροα πολλῷ μᾶλλον τῶν μονοχρόων, καὶ εἰς τὴν ἀλλήλων χρόαν τὴν ἁπλῆν· οἷον ἐκ λευκῶν μέλανα, καὶ ἐκ μελάνων λευκά, καὶ μεμιγμένα ἐξ ἀμφοτέρων· διὰ τὸ ὅλως τῷ γένει ὑπάρχειν ἐν τῇ φύσει τὸ μὴ μίαν ἔχειν χρόαν· εὐκίνητον γὰρ ὑπάρχει ἐπ' ἀμφότερα ὂν τὸ γένος· ὥστε καὶ εἰς ἄλληλα μεταβάλλειν, καὶ ποικίλλεσθαι μᾶλλον. τὰ δὲ μονόχροα τοὐναντίον. οὐ γὰρ μεταβάλλει, ἀλλ' ἢ μὴ διὰ πάθος· καὶ τοῦτο σπάνιον. ἤδη γὰρ ὦπται καὶ πέρδιξ λευκὴ, καὶ κόραξ, καὶ στρουθὸς, καὶ ἄρκτος. συμβαίνει δὲ ταῦτα, ὅταν διαστραφῇ ἐν τῇ γενέσει. εὔφθαρτον γὰρ καὶ εὐκίνητον τὸ μικρόν· τὸ δὲ γιγνόμενον, τοιοῦτον. ἐν μικρῷ γὰρ ἡ ἀρχὴ τοῖς γιγνομένοις. μάλιστα δὲ μεταβάλλουσι καὶ τὰ B φύσει ὁλόχροα μὲν ὄντα, τῷ γένει δὲ πολύχροα, διὰ τὰ ὕδατα. τὰ μὲν γὰρ θερμὰ, λευκὴν ποιεῖ τὴν τρίχα· τὰ δὲ ψυχρὰ, μέλαιναν, ὥσπερ καὶ ἐπὶ τῶν φυτῶν. αἴτιον δ', ὅτι τὰ μὲν θερμὰ, πλεῖον ἔχει πνεύματος ἢ ὕδατος· ὁ δὲ ἀὴρ διαφαινόμενος, λευκότητα ποιεῖ, καθάπερ καὶ τὸν ἀφρόν. διαφέρει μὲν οὖν, ὥσπερ καὶ τὰ δέρματα τὰ διὰ πάθος λευκὰ, τῶν διὰ τὴν φύσιν, οὕτω καὶ ἐν ταῖς θριξὶν, ἥ τε διὰ νόσον ἢ καὶ ἡλικίαν, καὶ ἡ διὰ φύσιν λευκότης τῶν τριχῶν, τῷ τὸ αἴτιον ἕτερον εἶναι. τὰς μὲν γὰρ ἡ φυσικὴ ποιεῖ θερμότης λευκὰς· τὰς δ', ἡ ἀλλοτρία. τὸ δὲ λευκὸν, ἀτμιδώδης ἀὴρ C περιέχεται ἐγκλειόμενος ἐν πᾶσι. διὸ καὶ ὅσα μὴ μονόχροα ἐστὶ, τὰ ὑπὸ τὴν γαστέρα πάντα λευκότερά ἐστι. καὶ γὰρ θερμότερα καὶ ἡδυχρεώτερα πάντα τὰ λευκὰ (ὡς εἰπεῖν) εἰσὶ, διὰ τὴν αὐτὴν αἰτίαν· ἡ μὲν γὰρ πέψις, γλυκέα ποιεῖ· τὴν δὲ πέψιν, τὸ θερμόν. ἡ δ' αὐτὴ αἰτία καὶ τῶν μονοχρόων μὲν, μελάνων δ' ἢ λευκῶν. θερμότης γὰρ καὶ ψυχρότης, αἰτία τῆς φύσεως τοῦ δέρματος καὶ τῶν τριχῶν. ἔχει γὰρ ἕκαστον τῶν μορίων θερμότητα οἰκείαν. αἱ γλῶτται δ' ἔτι διαφέρουσι τῶν ἁπλῶν καὶ ποικίλων· καὶ τῶν ἁπλῶν μὲν, διαφερόντων δὲ, οἷον λευκῶν καὶ μελάνων. αἴτιον δὲ, τὸ εἰρημένον πρότερον, ὅτι τὰ δέρματα ποικίλα τῶν ποικίλων· καὶ τῶν D λευκοτρίχων καὶ μελανοτρίχων, τῶν μὲν, λευκὰ, τῶν δὲ, μέλανα. τὴν δὲ γλῶτταν δεῖ ὑπολαβεῖν, ὥσπερ ἓν μόριον τῶν ἐξωτερικῶν εἶναι, μὴ ὅτι ἐν τῷ σώματι σκεπάζεται, ἀλλ' οἷον χεῖρα, ἢ πόδα· ὥστε ἐπεὶ τῶν ποικίλων τὸ δέρμα οὐ μονόχρων, καὶ τοῦ ἐπὶ τῇ γλώττῃ δέρματος τοῦτ' αἴτιον. μεταβάλλουσι δὲ τὰ χρώματα τῶν ὀρνίθων τινὲς, καὶ τῶν τετραπόδων τῶν ἀγρίων ἔνια, κατὰ τὰς ὥρας. αἴτιον δ', ὅτι ὥσπερ οἱ ἄνθρωποι κατὰ τὴν ἡλικίαν μεταβάλλουσι, τοῦτ' ἐκείνοις συμβαίνει κατὰ τὰς ὥρας. μείζων γὰρ ἡ διαφορὰ αὕτη τῆς κατὰ τὴν ἡλικίαν τροπῆς. εἰσὶ δὲ καὶ τὰ παμφαγότερα ποικιλώτερα, ὡς ἐπὶ τὸ πλῆθος εἰπεῖν εὐλόγως· οἷον αἱ μέλιτ- E ται, μονόχροα μᾶλλον ἢ αἱ ἀνθρῆναι καὶ σφῆκες. εἰ γὰρ αἱ τροφαὶ αἴτιαι τῆς μεταβολῆς, εὐλόγως αἱ ποικίλαι τροφαὶ πολυειδεστέρας ποιοῦσι τὰς κινήσεις, καὶ τὰ περιττώματα τῆς τροφῆς, ἐξ ὧν καὶ τρίχες, καὶ πτίλα, καὶ δέρματα γίνονται. καὶ περὶ μὲν χρωμάτων καὶ τριχῶν διωρίσθω τὸν τρόπον τοῦτον.

ΚΕΦΑΛ. ζ'.

Περὶ τῆς τῶν ζώων φωνῆς.

ΠΕρὶ δὲ φωνῆς, ὅτι τὰ μὲν βαρύφωνα τῶν ζώων ἐστὶ, τὰ δὲ, ὀξύφωνα, τὰ δ', εὔτονα, καὶ μέσως ἀμφοτέρας ἔχοντα τὰς ὑπερβολὰς συμμέτρως. ἔτι δὲ τὰ μὲν, μεγαλόφωνα, τὰ δὲ, μικρόφωνα, καὶ λειότητι καὶ τραχύτητι, καὶ εὐκαμψίᾳ,

καὶ ἀκμὴ διαφέρουσιν ἀλλήλων, ἐπισκεπτέον διὰ τίνας αἰτίας ὑπάρχει τούτων ἕκαστον. περὶ μὲν οὖν ὀξύτητος καὶ βαρύτητος, τὴν αὐτὴν αἰτίαν οἰητέον εἶναι, ἥνπερ ἐπὶ τῆς μεταβολῆς μεταβάλλει νέα ὄντα καὶ πρεσβύτερα. τὰ μὲν γὰρ ἄλλα πάντα νεώτερα ὄντα, ὀξύτερον φθέγγεται. * τῶν δὲ βοῶν οἱ μόσχοι, βαρύτερον. τὸ δ' αὐτὸ συμβαίνει καὶ ἐπὶ τῶν ἀρρένων καὶ θηλειῶν. ἐν μὲν γὰρ τοῖς ἄλλοις γένεσι τὸ θῆλυ ὀξύτερον φθέγγεται τοῦ ἄρρενος (μάλιστα δ' ἐπίδηλον ἐπὶ τῶν ἀνθρώπων τοῦτο. μάλιστα γὰρ ταύτην τὴν δύναμιν τούτοις ἀπέδωκεν ἡ φύσις, διὰ τὸ λόγῳ χρῆσθαι μόνους τῶν ζώων, τοῦ δὲ λόγου εἶναι τὴν φωνὴν ὕλην) ἐπὶ δὲ τῶν βοῶν τοὐναντίον. βαρύτερον γὰρ αἱ θήλειαι φθέγγονται τῶν ταύρων. τίνος μὲν οὖν ἕνεκα φωνὴν ἔχει τὰ ζῷα, καὶ τί ἐστι φωνή, καὶ ὅλως ψόφος, τὰ μέν, ἐν τοῖς περὶ αἰσθήσεως, τὰ δέ, ἐν τοῖς περὶ ψυχῆς εἴρηται. ἐπεὶ δὲ βαρὺ μέν ἐστιν ἐν τῷ βραδεῖαν εἶναι τὴν κίνησιν, ὀξὺ δὲ ἐν τῷ ταχεῖαν, τοῦ δὲ βραδέως, ἢ τοῦ ταχέως πότερον τὸ κινοῦν αἴτιον, ἢ τὸ κινούμενον, ἔχει τινὰ ἀπορίαν. φασὶ γάρ τινες τὸ μὲν πολύ, βραδέως κινεῖσθαι, τὸ δὲ ὀλίγον, ταχέως, καὶ ταύτην αἰτίαν εἶναι τοῦ, τὰ μέν, βαρύφωνα εἶναι, τὰ δέ, ὀξύφωνα· λέγοντες μέχρι τινὸς καλῶς, ὅλως δὲ οὐ καλῶς. τῷ μὲν γὰρ γένει, ὀρθῶς ἔοικε λέγεσθαι τὸ βαρὺ ἐν μεγέθει τινὶ εἶναι τοῦ κινουμένου. εἰ γὰρ τοῦτο, καὶ μικρὸν καὶ βαρὺ φθέγξασθαι οὐ ῥᾴδιον· ὁμοίως δὲ οὐδὲ βαρὺ καὶ ὀξύ. καὶ δοκεῖ γενναιοτέρας εἶναι φύσεως ἡ βαρυφωνία, καὶ ἐν τοῖς μέλεσι τὸ βαρὺ τῶν συντόνων βέλτιον. τὸ γὰρ τέλειον, ἐν ὑπεροχῇ· ἡ δὲ βαρύτης, ὑπεροχή τις. ἀλλ' ἐπειδὴ ἐστὶν ἕτερον τὸ βαρὺ καὶ ὀξὺ ἐν φωνῇ, μεγαλοφωνίας καὶ μικροφωνίας (ἔστι γὰρ καὶ ὀξύφωνα μεγαλόφωνα, καὶ μικρόφωνα βαρύφωνα ὡσαύτως) ὁμοίως δὲ καὶ κατὰ τὸν μέσον τόνον τούτων· περὶ ὧν τίνι ἄν τις ἄλλῳ διορίσειε, (λέγω δὲ μεγαλοφωνίαν καὶ μικροφωνίαν) ἢ πλήθει καὶ ὀλιγότητι τοῦ κινουμένου; εἰ οὖν κατὰ τὸν λεγόμενον ἔσται διορισμὸν τὸ ὀξὺ καὶ βαρύ, συμβήσεται τὰ αὐτὰ εἶναι βαρύφωνα καὶ μεγαλόφωνα, καὶ ὀξύφωνα καὶ μικρόφωνα. αἴτιον δ', ὅτι τὸ μέγα καὶ τὸ μικρόν, καὶ τὸ πολὺ καὶ τὸ ὀλίγον, τὰ μέν, ἁπλῶς λέγεται, τὰ δέ, πρὸς ἄλληλα. μεγαλόφωνον μὲν οὖν ἐστιν ἐν τῷ πολὺ ἁπλῶς εἶναι τὸ κινούμενον· μικρόφωνον δέ, ὀλίγον. βαρύφωνον δὲ καὶ ὀξύφωνον, ἐν τῷ πρὸς ἄλληλα ταύτην ἔχειν τὴν διαφοράν. ἐὰν μὲν γὰρ ὑπερέχῃ τὸ κινούμενον τῆς τοῦ κινοῦντος ἰσχύος, ἀνάγκη βραδέως φέρεσθαι τὸ φερόμενον· ἂν δ' ὑπερέχηται, ταχέως. τὸ δ' ἰσχυρόν, διὰ τὴν ἰσχύν, ὅτε μὲν πολὺ κινοῦν, βραδεῖαν ποιεῖται τὴν κίνησιν· ὅτε δέ, διὰ τὸ κρατεῖν, ταχεῖαν. κατὰ τὸν αὐτὸν λόγον καὶ τῶν κινούντων τὰ ἀσθενῆ, τὰ μὲν πλείω κινοῦντα τῆς δυνάμεως, βραδεῖαν ποιεῖται τὴν κίνησιν· τὰ δὲ δι' ἀσθένειαν ὀλίγον κινοῦντα, ταχεῖαν. αἱ μὲν οὖν αἰτίαι τῶν ἐναντιώσεων αὗται, τοῦ μήτε πάντα τὰ νέα ὀξύφωνα εἶναι, μήτε βαρύφωνα, μήτε τὰ πρεσβύτερα, μήτε τὰ ἄρρενα καὶ θήλεα. πρὸς δὲ τούτοις, καὶ τοῦ τοὺς κάμνοντας ὀξὺ φθέγγεσθαι, καὶ τοὺς εὖ τὸ σῶμα ἔχοντας· ἔτι δὲ καὶ γέροντας γινομένους, μᾶλλον ὀξυφωνοτέρους γίγνεσθαι, τῆς ἡλικίας ἐναντίας οὔσης τῇ τῶν νέων. τὰ μὲν οὖν πλεῖστα, νεώτερα ὄντα καὶ θήλεα, δι' ἀδυναμίαν, ὀλίγον κινοῦντα ἀέρα, ὀξύφωνά ἐστι.

* Hiſtor. lib. 5. c. 4.

A rigiditate diſcrepent, conſiderandum quas ob cauſas hæc ſingula habeantur. Igitur acuminis grauitatiſque cauſam eandem eſſe arbitrandum, quam mutationis, cùm minora maioráque natu mutantur. Cætera enim omnia, cùm natu minora ſunt, vocem mittunt acutiorem: vituli autem bubuli, grauiorem. Quod idem maribus etiam & fœminis eius generis euenit. Cùm enim in cæteris generibus fœmina vocem mittat quàm mas acutiorem (quod maximè in homine patet: hanc enim facultatem natura homini potiſſimùm tribuit, quoniam oratione ſolus animalium homo vtitur, orationis autem materia vox eſt) cùm, B inquam, cæteræ fœminæ acutiùs ſonent, contrà in bubus eſt. Vaccæ enim grauiùs quàm tauri, ſonant. Sed cuiuſnam gratia vocem animalia habeant, & quid vox ſit, & omnino quid ſonus, & ſtrepitus, partim in iis quæ de ſenſu, partim in iis quæ de anima diſſeruimus, explicatum eſt. Cùm autem graue in tarditate motus conſiſtat, acutum verò in velocitate, vtrùm quod moueat, an quod moueatur, cauſa ſit tardi, aut velocis, quærendum eſt. Quidam enim quod multum eſt, tardè moueri: quod parum, velociter id moueri aiunt: eámque eſſe C cauſam, vt alia vocem grauem emittant, alia acutam. Quod rectè aliquatenus dicitur, ſed non rectè in totum. Genere enim rectè dici videtur, graue in magnitudine quadam eſſe eius quod mouetur. Nam ſi hoc ita eſſet, paruam, candémque grauem emittere vocem non facilè liceret: nec magnam, & eandem acutam. Videtur etiam grauitas vocis naturę generoſioris eſſe: necnon in modulatu grauis modulus præſtantior incitato eſt: perfectum enim in ſuperantia conſiſtit. Grauitas autem ſuperantia quædam eſt. *Sed cum acutum & graue in voce diuerſa ſunt à magnitudine vocis, & paruitate,* (eſt enim & acuta magna, & parua grauis) ſimi- D li modo medius eorum tenor ambigit, quonam alio definienda ſit magnitudo vocis, & paruitas, niſi multitudine ejus quod mouetur, & paucitate. Quòd ſi definitione illa ſtatuendum ſit acutum, & graue, accidet vt eadem ſint grauis magnæque vocis, & acutæ paruæque vocalia. Sed enim cauſa eſt, quòd magnum, & paruum, & multum, ac paucum, non eodem accipiuntur modo: ſed altera ſimpliciter, altera reſpectu quodam. Magniuoca enim ſunt, eo quòd multum ſimpliciter eſt, quod mouetur: paruiuoca, eo quòd parum: grauiuoca autem & acutiuoca eo quòd E reſpectu inter ſe habito differentiam hanc recipiunt. Nam ſi quod mouetur, ſuperat vires eius quod mouet, tardè quod fertur, ferri neceſſe eſt: ſi ſuperatur, velociter. Itaque quod valet, interdum multum pro viribus mouens, tardum efficit motum: interdum velocem, ſi ſuperat. Eademque ratione, quod debile eſt, ſi plus mouet quàm vires patiuntur, tardum efficit motum: ſi parum præ ſua imbecillitate, velocem. Cauſæ contrarietatum hæ ſunt, ne aut omnia minora natu vocem mittãt acutã, aut maiora grauẽ, neque mares & fœminæ æquè omnes aut grauem aut acutam. Ad hæc, vt ægri acutũ ſonent, & qui bene valent, atque etiã vt ſeneſcẽtes vocẽ mittant acutiorem, quanquã ſenilis ætas cõtraria iuuenili eſt, plurima tamẽ parte minora natu & fœminę, acutę ſunt vocis, cum prę ſua imbecillitate paucũ aëris moueãt:

fertur enim velociter, quod parum eſt: velocitas autem acumen in voce eſt. Vituli & vaccæ partem, quam mouent, non habent validam, alteri propter ætatem, alteræ propter fœminei ſexus naturam: cùm tamen moueant, multùm graue ſonant. Graue eſt enim quod grauiter mouetur, multúmque aëris tardè fertur. Multum autem ea mouent, cùm cætera moueant, quia vas, per quod primum ſpiritus fertur, amplum in iis eſt, multúmque aëris mouere cogitur. Cæteris anguſtius ac parcius eſt. Ætate autem procedente, vires ea pars recipit, quæ in vnoquoque moueat. Itaque in contrarium mutatur, vt quæ vocem acutam mittebant, grauiorem quàm prius mittant: quæ autem grauem, acutiorem: quamobrem tauri acutiùs ſonant, quàm vituli, & vaccæ. Vires autem omnium neruis continentur: quapropter cùm ætate florent, robuſtiora ſunt. Minus enim compacta, neruatáque ſunt, quæ minora natu adhuc ſunt. Item recentiorum nerui nondum intenduntur, ſeneſcentium iam laxantur: quamobrem ad motum quoque ſunt imbecilliora. Sed potiſſimùm tauri neruoſi ſunt, & eorum cor ita conſtat. Itaque contentiorem eam obtinent partem, qua ſpiritum mouent, quaſi fidiculam intentam. Talem cordis bubuli eſſe naturam ſignificant, vel eo oſſe, quod in nonnullis gignitur: oſſa enim naturam neruorum requirunt. Execta omnia in fœminam mutantur. Et quoniam vires neruoſæ in ſuo originali principio laxantur, ſimilem fœminis mittunt vocem. Laxatio verò ſimilis fit, vt ſi quis fides intendens adhibuerit pondus, quod annexum reddat contentiores; quomodo textrices faciunt, quæ cùm ſtamina diſtenderint, annectunt quas leuas vocant. Ita enim natura quoque teſtium annexa meatibus ſeminalibus dependet, qui meatus ex vena tendunt, cuius origo ex corde eſt, iuxta ipſum principium, quod vocem moueat. Quamobrem meatibus ſeminalibus immutatis, ad eam, qua ſemen excernere poſſint, ætatem, pars illa quoque vnà cum iis immutatur, qua immutata, vox etiam mutatur, maximè ſcilicet maribus. Sed fœminis etiam idem accidit, quanquam obſcuriùs: quod quidam hircire appellant, cùm vox mittitur inæqualis: pòſt verò reſtituitur in ſequentis ætatis grauitatem, aut acumen. Sublatis igitur teſtibus, tentio quoque meatuum laxatur, quomodo in fidicula, & ſtamine, ſublato pondere. Laxatis his, principium, quod moueat vocem, eadem ratione laxatur. Cauſa hæc eſt quamobrem execta mutentur in fœminam, tum voce tum etiam reliqua forma: quoniam ita accidit vt principium laxetur, ex quo intentio corporis eſt, non, vt quidam exiſtimant, quòd teſtes ipſi copula ſunt multorum principiorum. Sed paruæ mutationes cauſam afferunt magnarum mutationum, non ſui ratione, ſed cùm euenit vt principium vnà cum iis ipſis mutetur. Principia enim quamuis magnitudine parua ſint, tamen facultate ſunt magna. Hoc eſt enim principium eſſe, vt ipſum quidem cauſa ſit multorum, ſed ipſius nulla ſit ſuperior cauſa. Caliditas etiam aut frigiditas loci confert eodem, vt natura tale conſtruatur animal, quod aut grauem aut acutam vocem emittat. Spiritus enim calidus craſſitudine ſua grauitatem efficit vocis:

A ταχὺ γὰρ ὁ ὀλίγος φέρεται· τὸ δὲ ταχὺ, ὀξὺ ἐν φωνῇ. οἱ δὲ μόσχοι καὶ αἱ βόες αἱ θήλειαι, οἱ μὲν, διὰ τὴν ἡλικίαν, αἱ δὲ, διὰ τὴν φύσιν τῆς θηλύτητος, οὐκ ἰσχυρὸν ἔχουσι τὸ μόριον ᾧ κινοῦσι.* πολὺ δὲ κινοῦντα, βαρύφθογγά ἐστι· βαρὺ γὰρ, τὸ βραδέως κινούμενον· ὁ δὲ πολὺς ἀὴρ φέρεται βραδέως. πολὺν δὲ κινοῦσι ταῦτα, τὰ δ᾽ ἄλλα ὀλίγον, διὰ τὸ ἀγγεῖον δι᾽ οὗ πρῶτον φέρεται τὸ πνεῦμα, τοῖς μὲν διάστημα ἔχειν μέγα, καὶ πολὺν ἀναγκάζεσθαι ἀέρα κινεῖν, τοῖς δ᾽ ἄλλοις εὐταμίευτον εἶναι. προϊούσης δὲ τῆς ἡλικίας, ἰσχύει τοῦτο τὸ μόριον τὸ κινοῦν ἐν ἑκάστοις· ὥστε μεταβάλλουσιν εἰς τοὐναντίον καὶ τὰ μὲν ὀξύφωνα, βαρυφωνότερα γίνεται αὐτὰ B αὑτῶν, τὰ δὲ βαρύφωνα, ὀξυφωνότερα. διὸ οἱ ταῦροι ὀξυφωνότεροι τῶν μόσχων, καὶ τῶν θηλειῶν βοῶν. ἔστι μὲν οὖν ἡ ἰσχὺς πᾶσιν ἐν τοῖς νεύροις. διὸ καὶ ἀκμάζοντα ἰσχύει μᾶλλον· ἄναρθρα γὰρ τὰ νέα μᾶλλον καὶ ἄνευρα. ἔτι δὲ τοῖς μὲν νέοις οὔπω ἐπιτέταται, τοῖς δὲ γηράσκουσιν ἤδη ἀνίεται ἡ συντονία. διὸ ἄμφω ἀσθενῆ καὶ ἀδύνατα πρὸς τὴν κίνησιν. μάλιστα δ᾽ οἱ ταῦροι νευρώδεις, καὶ ἡ καρδία. διόπερ σύντονον ἔχουσι τοῦτο τὸ μόριον ᾧ κινοῦσι τὸ πνεῦμα, ὥσπερ χορδὴν τεταμένην νευρίνην. δηλοῖ δὲ τοιαύτη οὖσα τὴν φύσιν ἡ καρδία τῶν βοῶν, τῷ καὶ ὀστοῦν ἐγγίνεσθαι αὐτῶν ἐνίαις· C τὰ δ᾽ ὀστᾶ ζητεῖ τὴν τοῦ νεύρου φύσιν. ἐκτεμνόμενα δὲ πάντα εἰς τὸ θῆλυ μεταβάλλει, καὶ διὰ τὸ ἀνίεσθαι τὴν ἰσχὺν τὴν νευρώδη ἐν τῇ ἀρχῇ, ὁμοίαν ἀφίησι φωνὴν ταῖς θηλείαις. ἡ δ᾽ ἄνεσις παραπλησίως γίνεται, ὥσπερ ἂν εἴ τις χορδὴν κατατείνας, σύντονον ποιήσειε, τῷ ἐξάψαι τι βάρος, * οἷον αἱ τοὺς ἱστοὺς ὑφαίνουσαι· καὶ γὰρ αὗται τὸν στήμονα κατατείνουσι, προσάπτουσαι τὰς καλουμένας λαιάς. οὕτω γὰρ καὶ ἡ τῶν ὀρχέων φύσις προσήρτηται πρὸς τοὺς σπερματικοὺς πόρους· οὗτοι δὲ ἐκ τῆς φλεβὸς, ἧς ἡ ἀρχὴ ἐκ τῆς καρδίας πρὸς αὐτῷ κινοῦντι τὴν φωνήν. διόπερ καὶ τῶν σπερματικῶν πόρων μεταβαλλόντων πρὸς τὴν ἡλικίαν, D ἢ δύνανται τὸ σπέρμα ἐκκρίνειν, συμμεταβάλλει καὶ τοῦτο τὸ μόριον. τούτου δὲ μεταβάλλοντος, καὶ ἡ φωνὴ μεταβάλλει, μᾶλλον μὲν τοῖς ἄρρεσι· συμβαίνει δὲ τοῦτο καὶ ἐπὶ τῶν θηλειῶν, ἀλλ᾽ ἀδηλότερον γίνεται· * ὃ καλοῦσί τινες τραγίζειν, ὅταν ἀνώμαλος ᾖ ἡ φωνή. μετὰ δὲ ταῦτα καθίσταται εἰς τὴν τῆς ἐπιούσης ἡλικίας βαρύτητα, ἢ ὀξυφωνίαν. ἀφαιρουμένων δὲ τῶν ὀρχέων, ἀνίεται καὶ ἡ τάσις τῶν πόρων, ὥσπερ ἀπὸ τῆς χορδῆς καὶ τοῦ στήμονος, ἀφαιρουμένου τοῦ βάρους. τούτου δὲ ἀνιεμένου, καὶ ἡ ἀρχὴ κινοῦσα τὴν φωνὴν ἐκλύεται κατὰ τὸν αὐτὸν λόγον. διὰ μὲν οὖν ταύτην τὴν αἰτίαν ἐκτεμνόμενα μεταβάλλει εἰς τὸ θῆλυ, τήν τε E φωνὴν καὶ τὴν ἄλλην μορφὴν, διὰ τὸ συμβαίνειν ἀνίεσθαι τὴν ἀρχὴν, ἐξ ἧς ἡ κατ᾽ ἀρχὰς τῷ σώματι ἡ συντονία, ἀλλ᾽ οὐχ ὥσπερ τινὲς ὑπολαμβάνουσιν αὐτοὺς τοὺς ὄρχεις εἶναι σύναμμα πολλῶν ἀρχῶν.* ἀλλὰ μικραὶ μεταστάσεις, μεγάλων αἴτιαι γίνονται, οὐ δι᾽ αὑτὰς, ἀλλ᾽ ὅταν συμβαίνῃ ἀρχὴν συμμεταβάλλειν. αἱ γὰρ ἀρχαὶ μεγέθει οὖσαι μικραὶ, τῇ δυνάμει μεγάλαι εἰσί. τοῦτο γάρ ἐστι τὸ ἀρχὴν εἶναι, τὸ αὐτὴν μὲν αἰτίαν εἶναι πολλῶν, ταύτης δ᾽ ἄλλο ἄνωθεν μηδέν. τῷ δὲ φύσει τὰ μὲν τοιαῦτα συνίστασθαι τῶν ζώων, ὥστε βαρύφωνα εἶναι, τὰ δ᾽ ὀξύφωνα, συμβάλλεται καὶ ἡ θερμότης τοῦ τόπου, καὶ ἡ ψυχρότης. τὸ μὲν γὰρ θερμὸν πνεῦμα, διὰ παχύτητα ποιεῖ βαρυφωνίαν·

* Qu. πολὺ, vt mox.

* Sup. lib. 1. c. 4.

* Hiſtor. lib. 7. c. 1.

* Sup. lib. 1. c. 2.

τὸ δὲ ψυχρὸν, διὰ λεπτότητα τοὐναντίον. δῆλον δὲ τοῦτο καὶ ἐπὶ τῶν αὐλῶν· οἱ γὰρ θερμοτέρῳ τῷ πνεύματι χρώμενοι, καὶ τοιοῦτον προϊέμενοι* οἷον οἱ αἰάζοντες, βαρύτερον αὐλοῦσι. τῆς δὲ τραχυφωνίας αἴτιον, καὶ τοῦ λείαν εἶναι τὴν φωνὴν, καὶ πάσης τῆς τοιαύτης ἀνωμαλίας, τὸ μόριον καὶ τὸ ὄργανον δι' οὗ φέρεται ἡ φωνὴ, τραχὺ ἢ λεῖον εἶναι, ἢ ὅλως ὁμαλὸν ἢ ἀνώμαλον. δῆλον δὲ, ὅταν ὑγρότης ὑπάρχῃ περὶ τὴν ἀρτηρίαν, ἢ τραχύτης γένηται ὑπό τινος πάθους. τότε γὰρ καὶ ἡ φωνὴ γίνεται ἀνώμαλος. τῆς δ' εὐκαμψίας, μαλακὸν ἢ σκληρὸν τὸ ὄργανον. τὸ μὲν γὰρ μαλακὸν, δύναται ταμιεύεσθαι, καὶ παντοδαπὸν γίνεσθαι· τὸ δὲ σκληρὸν, οὐ δύναται. καὶ τὸ μὲν μαλακὸν καὶ μικρὸν, δύναται καὶ μέγα φθέγγεσθαι· διὸ καὶ ὀξὺ καὶ βαρύ. ταμιεύεται γὰρ ῥᾳδίως ὑπὸ τοῦ πνεύματος, καὶ αὐτὸ γινόμενον ῥᾳδίως μέγα καὶ μικρόν· ἡ δὲ σκληρότης, ἀταμίευτον. περὶ μὲν οὖν φωνῆς ὅσα μὴ πρότερον ἐν τοῖς περὶ αἰσθήσεως διώρισται καὶ ἐν τοῖς περὶ ψυχῆς, τοσαῦτα εἰρήσθω.

* Scribo, οἷον αἰάζοντες.

frigidus præ ſua tenuitate contrarium facit: quod vel in tibiis patet. Qui enim calidiore vtuntur ſpiritu, & talem emittunt, qualem tibicines, & lamentantes, grauiorem ſonum inſpirant tibiis. Aſperioris autem vocis, aut læuioris, omnis denique huiuſmodi inæqualitatis cauſæ eſt, membrum, inſtrumentúmque, per quod vox fertur, cùm aut aſperum eſt, aut læue: denique aut æquale, aut inæquale. Conſtat hoc ita eſſe, cùm aliquid humoris in materia ineſt, aut aſperitas affectu aliquo fit: tunc enim vox redditur inæqualis. Flexibilis autem vocis, inſtrumentum molle cauſa eſt, vt rigidæ durum. Molle enim parciùs diſpenſari poteſt, & varium fieri, durum non poteſt. Et molle quidem tam magnam quàm paruam reddere vocem poteſt, & proinde tum grauem, tum acutam. Facilè enim ſpiritum diſpenſat, ipſúmque de facili magnum paruúmque fit. Quod autem durum eſt, indiſpenſabile eſt. De voce igitur, quæ non antè diſſeruimus, cùm de ſenſu aut de anima ageremus, hunc habeant modum.

ΚΕΦΑΛ. η'.

Περὶ ὀδόντων.

Περὶ δὲ ὀδόντων, ὅτι μὲν οὐχ ἑνὸς χάριν, οὐδὲ πάντα τοῦ αὐτοῦ ἕνεκα τὰ ζῷα ἔχουσιν, ἀλλὰ τὰ μὲν πρὸς τροφὴν, τὰ δὲ καὶ πρὸς τὸν ἐν τῇ φωνῇ λόγον, εἴρηται πρότερον. διότι δ' οἱ μὲν πρόσθιοι γίνονται πρότερον, οἱ δὲ γόμφιοι ὕστερον· καὶ οὗτοι μὲν οὐκ ἐκπίπτουσιν, ἐκεῖνοι δὲ ἐκπίπτουσι, καὶ φύονται πάλιν, τοῖς περὶ γενέσεως λόγοις τὴν αἰτίαν συγγενῆ δεῖ νομίζειν. εἴρηκε μὲν οὖν περὶ αὐτῶν καὶ Δημόκριτος· οὐ καλῶς δ' εἴρηκεν. οὐ γὰρ ἐπὶ πάντων σκεψάμενος, καθόλου λέγει τὴν αἰτίαν. φησὶ γὰρ ἐκπίπτειν μὲν, διὰ τὸ πρὸ ὥρας γίνεσθαι τοῖς ζῴοις· ἀκμαζόντων γὰρ (ὡς εἰπεῖν) φύεσθαι κατά γε φύσιν· τοῦ δὲ πρὸ ὥρας φύεσθαι, τὸ θηλάζειν αἰτιᾶται. καίτοι θηλάζει γε καὶ ὗς, οὐκ ἐκβάλλει δὲ τοὺς ὀδόντας. ἔτι δὲ τὰ καρχαρόδοντα θηλάζει μὲν πάντα, οὐκ ἐκβάλλει δὲ ἔνια αὐτῶν, πλὴν τοὺς κυνόδοντας, οἷον οἱ λέοντες. τοῦτο μὲν οὖν ἥμαρτε καθόλου λέγων, οὐ σκεψάμενος τὸ συμβαῖνον ἐπὶ πάντων. δεῖ δὲ τοῦτο ποιεῖν. ἀνάγκη γὰρ τὸν λέγοντα καθόλου τι, λέγειν περὶ πάντων. ἐπεὶ δὲ τὴν φύσιν ὑποτιθέμεθα, ἐξ ὧν ὁρῶμεν ὑποτιθέμενοι, οὔτ' ἐλλείπουσαν, οὔτε μάταιον οὐδὲν ποιοῦσαν τῶν ἐνδεχομένων περὶ ἕκαστον· ἀνάγκη δὲ τοῖς μέλλουσι λαμβάνειν τροφὴν μετὰ τὴν τοῦ γάλακτος ἀπόλαυσιν, ἔχειν ὄργανα πρὸς τὴν ἐργασίαν τῆς τροφῆς· εἰ οὖν συνέβαινεν (ὡς ἐκεῖνος λέγει) πρὸς ἥβην, ἐνέλειπεν ἂν ἡ φύσις τῶν ἐνδεχομένων αὐτῇ ποιεῖν τι, καὶ τὸ τῆς φύσεως ἔργον ἐγίγνετ' ἂν παρὰ φύσιν. τὸ γὰρ βίᾳ, παρὰ φύσιν. βίᾳ δέ φησι συμβαίνειν τὴν γένεσιν τῶν ὀδόντων. ὅτι μὲν οὖν τοῦτ' οὐκ ἀληθὲς, φανερὸν ἐκ τούτων καὶ τοιούτων ἄλλων. γίνονται δὲ πρότεροι οὗτοι τῶν πλατέων. πρῶτον μὲν, ὅτι καὶ τὸ ἔργον τούτων πρότερον. πρότερον γὰρ ἐστὶ τοῦ λεᾶναι τὸ διελεῖν. εἰσὶ δ' ἐκεῖνοι μὲν, ἐπὶ τὸ λεαίνειν· οὗτοι δὲ, ἐπὶ τὸ διαιρεῖν. ἔπειτα, ὅτι τὸ ἔλαττον, κἂν ὁρμηθῇ, θᾶττον πέφυκε γίνεσθαι τοῦ μείζονος.

CAPVT VIII.

Quare dentes à natura conſtituti ſint, & cur partim decidant, denuóque naſcantur, partim autem non.

DE dentibus, non rei vnius aut eiuſdem gratia animalia eos habere omnia, ſed alia ad cibum, alia ad vocis orationem, dictum antea eſt. Sed cur priores gignantur primò, maxillares poſt, & hi non decidant, illi decidant, ac denuo naſcantur, hanc rationem diſputationi de generatione cognatam eſſe putandum eſt. Diſſeruit igitur de his & Democritus, ſed non benè. Non enim omnibus conſideratis, cauſam reddidit vniuerſim. Ait enim decidere, quoniam properant, & ante tempus oriuntur. Nam ad ætatem penè florentem enaſci per naturam debere. Cauſam autem vt ante tempus gignantur, vſui tribuit lactis. Et ſus lactet, qui tamen dentes non amittit. Et quæ dentes habent ſerratos, omnia lactent: quanquam nonnulla eorum non amittunt niſi caninos, vt leones. Hoc igitur ille errauit, exponens vniuerſim, cùm id non animaduertiſſet, quod in omnibus eueniret. At agere ita oportet. Qui enim differit vniuerſim, de omnibus dicat, neceſſe eſt. Sed cùm naturam ita ſubiiciam, ſcilicet ratione ducta ex iis quæ cernimus, vt neque deficiat neque fruſtrà agat quicquam in ſingulis, quoad eius fieri poteſt: quæ autem cibum aſſumere debent poſt lactis vſum, inſtrumenta habeant neceſſe ſit ad cibum conficiendum: ſi ita eueniret, vt ille dicit, ad pubertatem natura profectò deficeret, agendo rem quam facere poſſet, atque opus naturæ fieret præter naturam. Violentum enim præternaturam eſt. Generationem autem dentium euenire violenter aſſeuerat. Sed hoc verum non eſſe apertum ex his aliiſque huiuſmodi rationibus eſt. Oriuntur autem priùs ij quàm lati, quod & officium eorum prius eſt. Secatur enim prius quàm molitur, quod comeditur. Sunt autem illi molendi officio delegati, hi verò ſecandi: tum etiam quòd res minor, etſi ſimul inchoatur, tamen celeriùs ſolet perfici quàm maior.

Minores autem primores, quàm maxillares ſunt: necnon maxillæ os à latere latum, in ore anguſtum eſt. Itaque ex ampliore plus alimenti affluere neceſſe eſt, ex arctiore minus. Lactis autem vſus ipſe nihil confert, quanquam lactis calor faciat vt dentes ij oriantur. Indicium eſt, quòd & ipſorum lactentium infantes, qui calidiore vtuntur lacte, ocyus dentiunt. Calor enim vim obtinet agendi. Decidunt qui prodierint primi, tum notæ melioris gratia, tum neceſſariò. Melioris ratione, inquam, quòd citò hebeteſcit, quod acutum eſt. Itaque alteros ſuccedere in officium oportet. Lati autem non hebetantur: ſed tempore duntaxat attriti læuigantur. Neceſſariò verò decidunt, quòd maxillarium radices in lata mittuntur maxilla, & valido oſſe continentur: primorum autem in tenui. Vnde fit vt infirmi & mobiles ſint. Naſcuntur autem denuò, quòd in oſſe adhuc naſcente oriuntur, & cùm tempus adhuc eſt ad dentium generationem idoneum. Cuius rei indicium, quòd maxillares diu oriuntur. Vltimi enim vigeſimo anno exeunt. Nonnullis etiam ſeneſcentibus omnino prodierunt, qui loco vltimo habentur: quoniam multum alimenti in amplitudine oſſis continetur. At verò prior pars oſſis præ ſua tenuitate citò perficitur, nec excrementum in eo fit, ſed in debitum incrementum abſumitur alimentum. Democritus verò miſſa ratione, cuius cauſa agatur, omnia referenda cenſet ad ea quibus natura vtitur. Quæ talia quidem ſunt, ſed alicuius cauſa, & notæ melioris gratia ſumuntur. Itaque nihil prohibet, quominus ita dentes fiant, & decidant: ſed non propterea, ſed propter finem. Hæc autem ipſa cauſæ ſunt, vt mouentia inſtrumenta & materia. Nam & ſpiritu magna ex parte agere conſentaneum, vt inſtrumento, eſt. Vt enim nonnulla artium *inſtrumenta vtilia ſunt ad plura*, verbi gratia in excuſoria, malleus & incus: ſic in rebus à natura inſtitutis ſpiritus varium exhibet vſum. Simile dici videtur, cùm cauſas neceſſariò eſſe dicunt: vt, ſi quis propter cultellum tantummodo aquam exiiſſe iis qui intercute laborant, nō etiam propter ſanitatem, cuius cauſa ſecuit cultellus, exiſtimet. Sed de dentibus cur partim decidant, ac denuò naſcantur, partim non: & omnino quam ob cauſam fiant, dictum eſt. Dixi etiam de cæteris membrorum affectibus, qui non alicuius cauſa, ſed neceſſariò veniant, & quam ob cauſam, videlicet eam cui motum tribuimus.

A εἰσὶ δὲ ἐλάττους οὗτοι τῶν γομφίων τῷ μεγέθει, * καὶ τοῦ ὀστοῦ τῆς σιαγόνος, ἐκεῖ μὲν πλατὺ εἶναι, πρὸς δὲ τῷ στόματι στενόν. ἐκ μὲν οὖν τοῦ μείζονος, πλείω ἀνάγκη ἐπιρρεῖν τροφήν· ἐκ δὲ [τοῦ] ἐλάττονος, στενοτέραν. τὸ δὲ θηλάζειν, αὐτὸ μὲν οὐθὲν συμβάλλεται· ἡ δὲ τοῦ γάλακτος θερμότης, ποιεῖ βλαστάνειν θᾶττον τοὺς ὀδόντας. σημεῖον δὲ, ὅτι καὶ αὐτῶν τῶν θηλαζόντων τὰ θερμοτέρῳ χρώμενα γάλακτι τῶν παιδίων, ὀδοντοφυεῖ θᾶττον. αὐξητικὸν γὰρ τὸ θερμόν. ἐκπίπτουσι δὲ γενόμενοι τοῦ μὲν βελτίονος χάριν, ὅτι ταχὺ ἀμβλύνεται τὸ ὀξύ· δεῖ οὖν ἑτέρους διαδέχεσθαι πρὸς τὸ ἔργον. τῶν δὲ πλατέων, οὐκ ἔστιν ἀμβλύνεσθαι, B ἀλλὰ τῷ χρόνῳ τριβόμενοι λεαίνονται μόνον. ἐξ ἀνάγκης δ' ἐκπίπτουσιν, ὅτι τῶν μὲν ἐν πλατείᾳ τῇ σιαγόνι, καὶ ἰσχυρῷ ὀστῷ αἱ ῥίζαι εἰσί, τῶν δὲ προσθίων, ἐν λεπτῷ· διὸ ἀσθενεῖς καὶ εὐκίνητοι. φύονται δὲ πάλιν, ὅτι ἐν φυομένῳ τοῦ ὀστοῦ ἡ ἐκβολὴ γίνεται, καὶ ἔτι ὥρας οὔσης γίνεσθαι ὀδόντας. τούτου δὲ σημεῖον, ὅτι καὶ οἱ πλατεῖς φύονται πολὺν χρόνον. οἱ γὰρ τελευταῖοι ἀνατέλλουσι περὶ τὰ εἴκοσιν ἔτη. ἐνίοις δὲ ἤδη καὶ γηράσκουσι γεγόνασι παντελῶς οἱ ἔσχατοι, διὰ τὸ πολλὴν εἶναι τροφὴν ἐν τῇ εὐρυχωρίᾳ τοῦ ὀστοῦ. τὸ δὲ πρόσθιον, διὰ τὴν λεπτότητα ταχὺ λαμβάνει τέλος, καὶ οὐ γίνεται περίττωμα ἐν αὐτῷ, ἀλλ' εἰς τὴν αὔξησιν ἀναλίσκεται ἡ τροφὴ τὴν οἰκείαν. Δημόκριτος δὲ, C τὸ οὗ ἕνεκα ἀφεὶς λέγειν, πάντα ἀνάγει οἷς χρῆται ἡ φύσις, οὖσι μὲν τοιούτοις, οὐ μὴν ἀλλ' ἕνεκά τινος οὖσι, καὶ τοῦ περὶ ἕκαστον βελτίονος χάριν. ὥστε γίνεσθαι μὲν οὐδὲν κωλύει οὕτω, καὶ ἐκπίπτειν· ἀλλ' οὐ διὰ ταῦτα, ἀλλὰ διὰ τὸ τέλος. ταῦτα δ' ὡς κινοῦντα, καὶ ὡς ὄργανα, καὶ ὡς ὕλης αἴτια. ἐπεὶ τὸ τῷ πνεύματι ἐργάζεσθαι τὰ πολλὰ εἰκὸς ὡς ὀργάνῳ, εἶναι γὰρ ἔνια πολύχρηστα ὥσπερ τῶν περὶ τὰς τέχνας, ὥσπερ ἐν τῇ χαλκευτικῇ ἡ σφῦρα καὶ ὁ ἄκμων, οὕτως καὶ τὸ πνεῦμα ἐν τοῖς φύσει συνεστῶσιν. ὅμοιον δὲ ἔοικε τὸ λέγειν τὰ αἴτια ἐξ ἀνάγκης, κἂν εἴ τις διὰ τὸ μαχαίριον μόνον οἴοιτο τὸ ὕδωρ ἐξεληλυθέναι τοῖς ὑδρωπιῶσιν, D ἀλλ' οὐ διὰ τὸ ὑγιαίνειν οὗ ἕνεκα τὸ μαχαίριον ἔτεμε. περὶ μὲν οὖν ὀδόντων, διότι οἱ μὲν ἐκπίπτουσι καὶ γίνονται πάλιν, οἱ δ' οὔ, καὶ ὅλως διὰ τίν' αἰτίαν γίνονται, εἴρηται. εἴρηται δὲ καὶ περὶ τῶν ἄλλων τῶν κατὰ τὰ μόρια παθημάτων, ὅσα γίνεσθαι συμβαίνει μὴ ἕνεκά του, ἀλλ' ἐξ ἀνάγκης, καὶ διὰ τὴν αἰτίαν τὴν κινητικήν.

* Gaza, &

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ ΘΑΥΜΑΣΙΩΝ ΑΚΟΥΣΜΑΤΩΝ.

ARISTOTELIS STAGIRITÆ DE MIRABILIBVS Auſcultationibus Liber.

A Ἐν τῇ Παιονίᾳ φασὶν ἐν τῷ ὄρει τῷ Ἡσαίνῳ καλουμένῳ, ὃ τὴν Παιονικὴν καὶ τὴν Μηδικὴν ὁρίζει, εἶναί τι θηρίον, τὸ καλούμενον βόλινθον, ὑπὸ δὲ τῶν Παιόνων μόναιπον. τοῦτο* λέγεσθαι τὴν μὲν ὅλην φύσιν παραπλήσιον εἶναι τῷ βοΐ. διαφέρειν δὲ τῷ μεγέθει καὶ τῇ εὐρωστίᾳ, προσέτι δὲ καὶ τῇ χαίτῃ· ἔχει γὰρ ἀπὸ τοῦ αὐχένος, ὥσπερ ὁ ἵππος, κατατείνουσαν βαθεῖαν σφόδρα, καὶ ἀπὸ τῆς κορυφῆς ἕως τῶν ὀφθαλμῶν· τὰ δὲ κέρατα, οὐχ ὥσπερ οἱ βόες, ἀλλὰ κατεστραμμένα, καὶ τὸ ὀξὺ κάτω παρὰ τὰ ὦτα· χωρεῖν δὲ αὐτὰ ἡμιχοῦ πλεῖον ἑκάτερον αὐτῶν, B καὶ μέλανα σφόδρα εἶναι, διαστίλβειν δὲ * ὡς εἶναι λελεπισμένα. ὅταν δὲ ἐκδαρῇ τὸ δέρμα, κατέχειν τόπον ὀκτακλίνου. ἐπειδὰν δὲ πληγῇ, φεύγειν, κἂν ἐξαδυνατῇ, μένειν. ἔστι δὲ ἡδύκρεων. ἀμύνεται δὲ λακτίζον καὶ προσαφοδεῦον ὡς ἐπὶ τέτταρας ὀργυιάς. ῥᾳδίως δὲ χρῆται τούτῳ πολλάκις τῷ εἴδει καὶ ἐπικαίει δέ, ὥστε ἀποψήχεσθαι τὰς τρίχας τῶν κυνῶν. τεταραγμένον μὲν οὖν,* τοῦτο ποιεῖν φασι τὸν ἄφοδον, ἀταράχου δὲ, μὴ ἐπικαίειν. ὅταν δὲ τίκτωσι, πλείους γενόμενοι, καὶ συναχθέντες ἅμα πάντες οἱ μέγιστοι, τίκτουσι, καὶ κύκλῳ προσαφοδεύουσι. πολὺ γάρ τι τοῦ τοιούτου περιττώ- C ματος τὸ θηρίον προΐεται. Τοὺς ἐν Ἀραβίᾳ φασὶ καμήλους μὴ ἀναβαίνειν ἐπὶ τὰς μητέρας· ἀλλὰ κἂν βιάσηταί τις, οὐ θέλουσι. καὶ γάρ ποτε λέγεται, ἐπεὶ οὐκ ἦν ὀχεῖον, τὸν ἐπιμελητὴν καλύψαντα ἐφεῖναι τὸν πῶλον. ὡς δ' ὀχεύων ἐπέβη, τότε μὲν, ὡς ἔοικε, συνετέλεσε, μικρῷ δ' ὕστερον δάκνων τὸν καμηλίτην ἀπέκτεινεν. * Τοὺς κόκκυγας φασὶ τοὺς ἐν Ἑλίκῃ, ὅταν μέλλωσι τίκτειν, μὴ ποιεῖν νεοττιάν, ἀλλ' ἐν ταῖς * φαττῶν, ἢ ταῖς τῶν τρυγόνων ἐντίκτειν, καὶ μήτ' ἐπῳάζειν, μήτ' ἐκκολάπτειν, μήτε τρέφειν αὐτούς· ἀλλ' ὅταν γεννηθῇ ὁ νεοττὸς καὶ ἐκτραφῇ, μεθ' ὧν ἂν ᾖ συνών, τούτους D ἐκ τῆς νεοττιᾶς ἐκβάλλειν. γίνεται δ', ὡς ἔοικε, μέγας καὶ καλός, ὥστε ῥᾳδίως κατακρατεῖν τῶν λοιπῶν. τούτῳ δὲ χαίρειν φασὶ καὶ τὰς φάττας οὕτως, ὥστε καὶ αὐτὰς συνεκβάλλειν ἐκείνῳ τοὺς ἰδίους νεοττούς.* Αἱ ἐν Κρήτῃ αἶγες, ὅταν τοξευθῶσι, ζητοῦσιν, ὡς ἔοικε, τὸ δίκταμνον, τὸ ἐκεῖ φυόμενον. ὅταν γὰρ φάγωσιν, εὐθὺς ἐκβάλλουσι τὰ τοξεύματα. * Φασί τινας ἐν Ἀχαΐᾳ τῶν ἐλάφων, ὅταν ἀποβάλωσι τὰ κέρατα, εἰς τοιούτους τόπους ἔρχεσθαι, ὥστε μὴ ῥᾳδίως εὑρεθῆναι. τοῦτο δ'

* Corrupta in hac hiſtoria nomina emendabis ex Hiſt. lib. 9. c. 45.

* κ. λέγεται.

* Interp. ὡσανεὶ λελεπισμένα. Geſne. legit ὡσανεὶ λελεπισμένα, vt in Hiſt. 9. 45. ἡ δὲ μελανία καλὴ & λιπαρὰ τὸ κέρας.

* Scrib. ποιοῦν. vel ſic πεταραγμένον μὲν οὖν τοῦτο π. vt in Hiſtor.

Hiſtor. lib. 9. c. 47.

* Hiſtor. lib. 9. cap. 29.

* κ. φαβῶν.

* Hiſt. li. 9. c. 6.

* Hiſt. li. 9. c. 5.

A In Pæoniæ monte Heſęno, qui Pæonicā Medicámque regionem terminat, feram quandam, alibi Bolinthum, à Pæonibus verò Monepon vocatam, inueniri tradunt, quæ omni quidem natura ad bouis ſimilitudinem accedat proximè, differat verò magnitudine, & robore, ac iuba inſuper. Eſt enim ea à ceruice illi, velvt equo, admodum promiſſa, áque vertice ad vſque oculos dependens. Cornua autem non quemadmodum bobus, ſed adunca in ſe inflexa, mucronibus deorſum verſus aures porrectis, magnitudine tam ampla vt B ſingula plus ſemiſextario capiant, colore maximè atro, & relucente períinde ac raſa decorticatáque. Tergus diſtentum, locum octo accubantium occupat. Percuſſa fugit, nec niſi curſu delaſſata ſubſiſtit. Carnem habet guſtu gratiſſimam. Calcibus ſeſe tuetur, & alui proluuie, quam ad paſſuum etiam quatuor ſpatium proiicit, (nam ea egerendi forma frequenter vtitur) feruentem adeò, vt canum, quà pertingat, pilos abſumat. Verùm concitatę tantùm belluæ, non etiam quieſcentis, ſtercora eam vim habent. Imminente partu, ſimul pluribus collectis, enitun- C tur adultiores, inque circulum egerunt, ac ſe quaſi vallo circumdant & muniunt: largam enim quandam eius ſimi copiam hoc genus animantis reiicere ſolet. In Arabia aiunt, camelos non inire matres ſuas, ſed etiam ſi quis cogat, non patiuntur. Porrò curatorem admiſſario aliquando deſtitutum, opertam matrem ſubmiſiſſe pullo, qui etſi coitum (vt videtur) abſoluit, paulò tamen pòſt eum, hominem morſibus necauit. Cuculos in Helice, inquiunt, generaturos, non nidificare, ſed in palumbium aut turturum nidis parere, ſed & nec incubare, nec excludere, D neque nutrire. Verùm natum iam pullum (ſingulos enim edit tantùm) nutritúmque reliquos ſuos coalumnos è nido deturbare: quippe qui ad tantum roboris pulchritudiniſque excreſcat, vt & reliquis facilè ſit ſuperior, & nutricem quoque in ſeſe conuertat, quę ſpecie eius exultans in eiiciendis ſuis fert opem. Capræ Creticæ, ſagittis percuſſæ, quærunt, vt apparet, Dictamnum, iſthic prouenies, cuius paſtu tela è corpore eiiciunt. Ceruos Achaicos, aiunt, cornua amiſſuros, loca difficilia, & quà inueniri nequeāt, petere,

propterea quòd armis deſtituti, tueri ſe nequeant, tum ob dolorem, quem ex auulſorum cornuum veſtigiis ſentiunt: vbi & enatam gerentes hederam plurimos viſos eſſe. In Armenia venenum quoddam naſci aiunt, quod pardalium vocant, id venatores lanæ illitum, vbi viſus eſt pardus, abiiciunt. Qui ſi ex eo deguſtauerit, humana excrementa remedio quærit. Quocirca venatores, vaſculo impoſita, ex arbore ſuſpendunt, vt aſſultatione frequenti, fracta viribus laſſatáque beſtia domari queat. In Ægypto aiunt, crocodilis hiantibus, trochilos aues, dentes expurgare, carunculis, quę in roſtris hærent, exeſis, atque hoc velut gratum officium cum voluptate admittere, nec vllo pacto nocere. In Cephalenia non bibunt capræ diebus ſingulis, vt videtur, pro reliquorum quadrupedum more, ſed ad flantem auram conuerſæ, hiantéſque, hauſto vento reficiuntur.

In Syria, inquiunt, inter ſylueſtres equos, vnum præire armento, vbi ſi iunior aliquis equam inituus conſcenderit, ducem indignari, & hunc tantiſper, dum comprehendat, perſequi, defixóque morſu verenda euellere. Teſtudines aiunt, quando ſerpentem deglutiuerunt, mox origanum inſuper vorare, id niſi promptum ſtatim inueniant, interire. Multóſque ruri agentes cùm id experiri vellent, captata opportunitate, origanum euulſam quærenti præripuiſſe, eóque animans in ipſorum conſpectu ſubitò interiiſſe.

Viuerris aiunt genitalia eſſe, reliquis animalibus plurimùm abſimilia, quòd ipſis quomodocumque affectis ſint inſtar oſſium firma, duráque. Singulare ſtranguria laborantibus remedium, ſi raſa tritáque exhibeantur. Picum martium, arbores ſcandere ferunt, quemadmodum aſcalaphum, tam reſupinum, quàm pronum, depaſcique vermiculos, quos adeo veſtigat auidè, vt totos ſtipites tundendo perforet. Pelecanos aiunt, conchas fluuiatiles vorare, multitudinémque ingeſtam mox vomere, ac eo, quod eſui eſt, veſci, cæterum à teſta abſtinere. Circa Cyllenen Arcadiæ, merulas candidas gigni tradunt, quod alibi nuſquam contingat, vocéſque varias ſonare. Luna lucente progredi, interdiu verò quantolibet ſtudio advigiletur, deprehendi non poſſe. A quibuſdam fertur, mel Anthinum, vt vocant, circa Melum Cnidúmque naſci, odore quidem ſuaui, ſed neutiquam durabile id erithacam fieri. Circa Cappadociam aiunt locis quibuſdam mella citra fauos comportari, olei inſtar craſſa. In Trapezunti vrbe, ea quæ in Ponto ſita eſt, mel ferunt è buxis produci graueolentiſſimum, quod ſanos quidem mentis loco moueat, ægros verò perculſóſque eiuſmodi ſtupore ſanet. In Lydia aiunt ex arboribus mella copioſa colligi, vnde paſtillos abſque cera indigenæ conficiunt, duritia tanta, vt niſi vehementiore attritu nihil demi inde poſſit. Fit & in Thracia mel non perinde ſolidum, ſed arenoſum. Cæterùm mella omnia concreta eandem craſſitiem ſeruant, diuerſa ab aqua, & liquidis reliquis. [Reliqua enim omnia concreta nonnihil ſicceſcunt, attenuantúrque.]

A ποιεῖν, διὰ τὸ μὴ ἔχειν ᾧ * ἀμυνῶνται, καὶ διὰ τὸ ποιεῖν τοὺς τόπους ὅθεν τὰ κέρατα ἀπέβαλον· πολλάκις δὲ κισσὸν ἐπιπεφυκότα ἐν τῷ τῶν κεράτων τόπῳ ἑωρᾶσθαι. * Ἐν Ἀρμενίᾳ φάρμακόν τι φασὶ φύεσθαι, ὃ καλεῖται παρδάλειον. τοῦτο οὖν, ὅταν ὀφθῇ πάρδαλις, χρίσαντες, τὸ ἱερεῖον ἀφιᾶσιν. ἡ δέ, ὅταν ἅψηται αὐτοῦ, ζητεῖ, ὡς ἔοικε, τὴν τοῦ ἀνθρώπου κόπρον. διὸ καὶ οἱ κυνηγοὶ εἰς ἀγγεῖον αὐτὴν * ἐμβάλλοντες, ἔκ τινος δένδρου κρεμῶσιν, ἵνα περιαλλομένη καὶ ὑπερκόπτος γινομένη, ὑπ' αὐτῶν παραλυθῇ καὶ ὑποχείριος γένηται. * Ἐν Αἰγύπτῳ δὲ τοὺς τροχίλους φασὶν εἰσπετομένους εἰς τὰ στόματα τῶν κροκοδείλων, καθαίρειν αὐτῶν τοὺς ὀδόντας, τὰ σαρκία τὰ ἐξερχόμενα τοῖς ῥύγχεσιν ἐξέλκοντας· τοὺς δὲ ἥδεσθαι, καὶ μηδὲν B βλάπτειν αὐτούς. Αἱ ἐν Κεφαλληνίᾳ αἶγες οὐ πίνουσιν, ὡς ἔοικεν, ὥσπερ καὶ τὰ ἄλλα τετράποδα, καθ' ἑκάστην ἡμέραν· ἀλλὰ πρὸς τὸ πνεῦμα αἰτία τὰ πρόσωπα ποιήσασαι, χάσκουσιν εἰσδεχόμεναι τὰ πνεύματα. Φασὶν ἐν Συρίᾳ τῶν ἀγρίων ἵππων ἕνα ἀφηγεῖσθαι τῆς ἀγέλης. ἐπειδὰν δέ τις νεώτερος ὢν τῶν ἄλλων, ἐπὶ τὴν θήλειαν ἀναβῇ, τὸν ἀφηγούμενον θυμοῦσθαι, καὶ διώκειν τέως τοῦτον, ἕως ἂν καταλάβῃ τὸν πῶλον· καὶ * ὑποκύψαντα ἀπὸ τῶν ὀπισθίων σκελῶν τῷ στόματι ἀποσπᾶσθαι τὰ αἰ- C δοῖα. Τὰς χελώνας φασίν, ὅταν ἔχεως φάγωσιν, ἐπεσθίειν τὸ ὀρίγανον· ἐὰν δὲ μὴ θᾶττον εὕρῃ, ἀποθνήσκειν. πολλοὺς δὲ ἀποπειράζοντας τῶν ἀγραυλούντων, εἰ τοῦτ' ἀληθές ἐστιν, ὅταν ἴδωσιν αὐτὴν τοῦτο πράττουσαν, ἐκτίλλειν τὸ ὀρίγανον. τοῦτο δὲ ὅταν ποιήσωσι, μετὰ μικρὸν αὐτὴν ὁρᾶσθαι ἀποθνήσκουσαν. Τὸ τῆς ἰκτίδος λέγεται αἰδοῖον εἶναι οὐχ ὅμοιον τῇ φύσει τῶν λοιπῶν ζώων, ἀλλὰ στερεὸν διὰ παντὸς εἶναι ὀστοῦν, ὅπως ἄν ποτε διακειμένη τύχῃ. φασὶ δὲ στραγγουρίας αὐτὸ φάρμακον εἶναι ἐν τοῖς ἀρίστοις, καὶ δίδοσθαι ἐπιξυόμενον. Τὸν δρυοκολάπτην τὸ ὄρνεον ἐπὶ τῶν δένδρων βαδίζειν φασίν, ὥσπερ τοὺς ἀσκαλα- D βώτας, καὶ ὕπτιον καὶ ἐπὶ τὴν γαστέρα. νέμεσθαι δὲ λέγεται καὶ τοὺς ἐκ τῶν δένδρων σκώληκας, καὶ οὕτως σφόδρα κατὰ βάθους ὀρύττειν τὰ δένδρα ζητοῦντα τοὺς σκώληκας ὥστε καὶ καταβάλλειν αὐτά. * Φασὶ τοὺς πελεκᾶνας τὰς ἐν τοῖς ποταμοῖς γινομένας κόγχας ὀρύττοντας καταπίνειν· ἔπειτα ὅταν πλῆθος * εἰσφορήσωσιν αὐτῶν, ἐξεμεῖν· εἶθ' οὕτως τὰ μὲν κρέα ἐσθίειν τῶν κογχῶν, τῶν δὲ ὀστράκων μὴ ἅπτεσθαι. Ἐν Κυλλήνῃ φασὶ τῆς Ἀρκαδίας, τοὺς κοσσύφους λευκοὺς τίκτεσθαι, ἄλλοθι δὲ οὐδαμῇ, καὶ φωνὰς ποικίλας προΐεσθαι, ἐκπορεύεσθαί τε πρὸς τὴν σελήνην. τὴν δὲ ἡμέραν εἴ τις ἐπιχειροίη, σφόδρα δυσθή- E ρατος εἶναι. Λέγεται δὲ ὑπό τινων μέλι τὸ καλούμενον ἀνθινὸν περὶ Μῆλον καὶ Κνίδον γίνεσθαι· καὶ εὐώδες μὲν τῇ ὀσμῇ, ὀλιγοχρόνιον δὲ κατὰ τὴν ἐριθάκην γίνεσθαι. Περὶ Καππαδοκίαν ἔν τισι τόποις ἄνευ κηρίου φασὶν ἐργάζεσθαι τὸ μέλι, γίνεσθαι δὲ τὸ πάχος ὅμοιον ἐλαίῳ. Ἐν Τραπεζοῦντι τῇ ἐν τῷ Πόντῳ γίνεται τὸ ἀπὸ τῆς πύξου μέλι, βαρύοσμον· καί φασι τοὺς μὲν ὑγιαίνοντας ἐξιστάναι, τοὺς δὲ ἐπιλήπτους, καὶ τελέως ἀπαλλάττειν. Φασὶ δὲ καὶ ἐν Λυδίᾳ ἀπὸ τῶν δένδρων τὸ μέλι γίγνεσθαι πολύ, καὶ ποιεῖν ἀπ' αὐτοῦ τοὺς ἐνοικοῦντας ἄνευ κηροῦ τροχίσκους, καὶ ἀποτέμνοντας χρῆσθαι διὰ τρίψεως σφοδροτέρας. γίνεται μὲν οὖν καὶ ἐν Θρᾴκῃ, οὐχ οὕτω δὲ στερεόν, ἀλλ' ὡσανεὶ ἀμμῶδες. ἅπαν δὲ μέλι πηγνύμενον, τὸν ἴσον ὄγκον ἔχειν φασίν, οὐχ ὥσπερ τὸ ὕδωρ καὶ τὰ ἄλλα ὑγρά.

* γρ. ἀμυνοῦνται.
* Hiſt.lib.9.c.6.
* κ. ἐμβαλόντες.
* Ibidem.
* κ. ὑποκύψας
Hiſt.li.9.c.6.
Ibidem.
Hiſtor.9.9.
Hiſtor 9.10.
* γρ. ἀθροίσωσιν

* Hiſtor. 9. 40. Ἡ Χαλκιδικὴ πόα καὶ τὰ * ἀμύγδαλα, χρησιμώτατα πρὸς τὸ μέλι ποιεῖν. πλεῖστον γὰρ γόνον φασὶν ἐξ αὐτῶν γίνεσθαι. * Τὰς μελίττας λέγεται ἀπὸ μύρων καρηβαρεῖσθαι, καὶ οὐκ ἀνέχεσθαι τὴν ὀσμήν. ἔνιοι δὲ λέγουσι μεθύσκεσθαι, καὶ τύπτεσθαι ὑπὸ τῶν ἄλλων, τὰς μεμυρισμένας.

* Ibidem.

Ἐν Ἰλλυριοῖς φασὶ τοῖς * Ταυλαντίοις καλουμένοις, ἐκ τοῦ μέλιτος ποιεῖν οἶνον. ὅταν δὲ τὰ κηρία ἐκθλίψωσιν, ὕδωρ ἐπιχέοντες, ἕψουσιν ἐν λέβητι ἕως ἂν ἐκλίπῃ τὸ ἥμισυ· ἔπειτα εἰς κεράμια ἐκχέαντες καὶ ἥδιστα ποιήσαντες, τιθέασιν εἰς σανίδας. ἐν ταύταις δέ φασιν ἔχειν πολυχρόνιον, καὶ γίνεσθαι οἰνώδες, καὶ ἄλλως ἡδὺ καὶ * εὔτονον. ἤδη δέ τινες καὶ ἐν Ἑλλάδι συμβεβηκέναι λέγουσι τοῦτο, ὥστε μηδὲν διαφέρειν οἴνου παλαιοῦ· καὶ ζητοῦντας ὕστερον τὴν κρᾶσιν, μὴ δύνασθαι εὑρεῖν.

* Meliùs αὐ. Ταυλαντίοις καλουμένοις.

* Fort. εὔστομον. Sylb.

Περὶ Θετταλίαν μνημονεύουσιν ὄφεις ζωογονηθῆναι τοσούτους, ὥστε εἰ μὴ ὑπὸ τῶν πελαργῶν ἀνῃροῦντο, ἐκχωρῆσαι ἂν αὐτούς. διὸ καὶ τιμῶσι τοὺς πελαργούς, καὶ κτείνειν οὐ νόμος· καὶ ἐάν τις κτείνῃ, ἔνοχος τοῖς αὐτοῖς γίνεται οἷσπερ καὶ ὁ ἀνδροφόνος.

Ὡσαύτως δὲ καὶ ἐν Λακεδαίμονι κατά τινας χρόνους μνημονεύεται γενέσθαι τοσοῦτον πλῆθος ὄφεων, ὥστε διὰ τὴν ἀσιτίαν, καὶ τροφῇ τοὺς Λάκωνας χρῆσθαι αὐτοῖς. ὅθεν καὶ τὴν Πυθίαν φασὶ προσαγορεύεσθαι αὐτοὺς ὀφιοδείρους.

Ἐν Κύπρῳ τῇ νήσῳ λέγεται τοὺς μῦς τὸν σίδηρον ἐσθίειν. Φασὶ δὲ καὶ τοὺς Χάλυβας ἔν τινι ὑπερκειμένῃ αὐτοῖς νησιδίῳ τὸ χρυσίον συμφορεῖσθαι παρὰ πλειόνων. διὸ καὶ ἐν τοῖς μετάλλοις ἀναιροῦσιν, ὡς ἔοικεν.

Λέγεται δὲ ἐκ Σούσων εἰς Μηδίαν ἰοῦσιν ἐν δευτέρῳ σταθμῷ σκορπίων ἄπλετόν τι πλῆθος γίνεσθαι. διὸ καὶ ὁ βασιλεὺς ὁ Περσῶν, ὅτε διοδεύοι, τρεῖς ἡμέρας ἔμενε, τοῖς αὐτοῦ πᾶσι συντάσσων ἐκθηρεύειν· τῷ δὲ πλείστους θηρεύσαντι, ἆθλον ἐδίδου.

Ἐν Κυρήνῃ δέ φασιν οὐχ ἓν εἶναι * μυιῶν γένος, ἀλλὰ πλείω καὶ διάφορα καὶ ταῖς μορφαῖς καὶ ταῖς χρόαις. ἐνίους γὰρ πλατυπροσώπους, ὥσπερ αἱ γαλαῖ, γίνεσθαι· τινὰς δὲ * ἐχινώδεις, οὓς καλοῦσιν ἐχῖνας.

* Interp. μυῶν. mendosè.

* Interpr. ἐχιώδεις. Geſner. ἐχινώδεις, & κ. ἐχῖνας.

Περὶ Σικελίαν δέ φασιν εἶναι ὕδατος συστρεμμάτιον, εἰς ὃ τὰ πεπνιγμένα τῶν ὀρνέων καὶ τῶν λοιπῶν ζώων, ὅταν ἀποβαφῇ, πάλιν ἀναβιοῖ.

Ἐν δὲ Σκύθαις τοῖς καλουμένοις Γελωνοῖς φασὶ θηρίον γίνεσθαι, σπάνιον μὲν ὑπερβολῇ, ὃ ὀνομάζεται τάρανδος· λέγεται δὲ τοῦτο μεταβάλλειν τὰς χρόας τῶν τριχῶν καθ᾽ ὃν ἂν καὶ τόπον ᾖ. εἶναι δὲ διά τε τοῦτο δυσθήρατον, καὶ διὰ τὴν μεταβολήν. καὶ γὰρ δένδρεσι καὶ τόποις, καὶ ὅλως ἐν οἷς ἂν ᾖ, τοιοῦτον τῇ χρόᾳ γίνεσθαι. θαυμασιώτατον δέ, τὸ τὴν τρίχα μεταβάλλειν· τὰ γὰρ λοιπά, τὸν χρῶτα, οἷον ὅ,τε χαμαιλέων καὶ ὁ πολύπους. τὸ δὲ μέγεθος ὡσανεὶ βοός. τοῦ δὲ προσώπου τὸν τύπον ὅμοιον ἔχει ἐλάφῳ.

Victori. Var. Lect. li. 3. c. 9.

Λέγεταί τινα ἐν Ἀβύδῳ παρακόψαντα τῇ διανοίᾳ, καὶ εἰς τὸ θέατρον ἐρχόμενον ἐπὶ πολλὰς ἡμέρας, θεωρεῖν, ὡς ὑποκρινομένων τινῶν, καὶ ἐπισημαίνεσθαι· καὶ ὡς κατέστη τῆς παρακοπῆς, ἔφησεν ἐκεῖνον αὐτῷ τὸν χρόνον ἥδιστα βεβιῶσθαι.

Καὶ ἐν Τάραντι δέ φασιν οἰνοπώλην τινά, τὴν μὲν νύκτα μαίνεσθαι, τὴν ἡμέραν δὲ οἰνοπωλεῖν. καί γε τὸ κλειδίον τοῦ οἰκήματος πρὸς τῷ ζωνίῳ διεφύλαττε· πολλῶν δὲ ἐπιχειρούντων [ὑφελέσθαι καὶ] λαβεῖν, οὐδέποτε ἀπώλεσεν.

Ἐν δὲ Λιπάρᾳ τῇ νήσῳ λέγουσιν εἶναί τινας γῆν, εἰς ἣν ἐὰν κρύψωσι χύτραν, ἐμβάλλοντες ὃ ἐθέλουσιν, ἕψουσιν.

A Chalcidica herba, & amygdala ad mella conficienda vſum præbent maximum. Tum etiam augere fœtum vehementer dicuntur. Apes aiunt ex vnguentis inebriari, neque odorem ferre poſſe. Itaque redolentes vnguenta à cæteris vapulaſe. Illyrios ferunt, quos Taulantios vocant, ex mellis vina reddere. Fauos enim aqua ſuperfuſa exprimunt, ac ſimul aheno ad mediam vſque partem incoctam, primùm fictilibus infundunt, iam tum dulciſſimam: dehinc vaſis ligneis reſeruant in multa tempora, donec per omnia vini ſapprem contrahat, cætera potus dulcis, & ſyncerus. Ea verò induſtria, in Græcia aliquando paratum ferunt, vt à vino vetere nihil differret. Verùm B miſtionem deinceps perquiſitam explorari non potuiſſe. Circa Theſſaliam tantam ſerpentum copiam generari memorant, vt à ciconiis niſi tollantur, inhabitabilis deſertáque reddatur regio: quocirca & has venerantur incolæ, & lege, ne quis noceat, cauetur, homicidij pœna tranſgreſſori conſtituta. Eodem pacto Lacedæmonem ferunt, ſerpentibus adeo refertam quondam, vt ob annonæ penuriam, his vice alimentorum vterentur Lacones: vnde & à Pythia ὀφιοδείρους vocatos. In Cypro inſula Metas aiunt ferrum deuorare. Aiunt & Chalybas, in iuxtà ſita parua inſula aurum comportatum conſtruere peculiari præ aliis omnibus ſtuC dio: quocirca in metallis, vt videtur, effoſſum ſecant. Fertur ex Suſis in Mediam iter facientibus ſtatione altera, immenſam ſcorpionum multitudinem generari. Quocirca tranſiens aliquando iſthac Perſarum rex triduò ibidem hæſit, ſuiſque omnibus ſcorpionum venationem imperauit, præmio iis qui captorum numero excellerent, propoſito. In Cyrene aiunt non vnum tantùm muſcarum genus reperiri, ſed plura, formiſque & colore diſtincta: *latifrontes enim alias velvt muſtelas*, alias viperis ſimiles eſſe, quas & echidnas vocant. In Sicilia ferunt aquæ verticem eſſe, in quem merſæ aues, reliquáve animantia ſuffocata, vitæ reſtituanD tur. In Scythis, quos Gelonas vocant, Tarandus reperitur, haud frequens, colorem mutat pro locorum, in quibus extiterit, varietate, & proinde rarò capitur. Nam & arborum & locorum, & in vniuerſum omnium quibus adpropinquarit, colorem reddit. Et, quod admiratione cum primis dignum eſt, habitus non ſolùm corpori tam varius, quod etiam cum Chamæleone illi commune eſt, ſed etiam *villo* datur. Magnitudo ei quæ boui, caput ceruino ſimile. Ferunt in Abydo quendam mente deſtitutum, in theatrum progreſſum vacuum, multóſque dies illic diligenter, tanquam in eo eſſent hiſtriones, applauſiſſe, acclamaſſéque adE mirabundè: cæterùm mente recepta dixit ſuauiùs ſe nunquam, atque eo tempore, vixiſſe. Tarenti aiunt cauponem noctu quidem inſaniiſſe, interdiu verò vina vendidiſſe: ſed & clauiculam domus ſuæ in zona ita conſeruaſſe, vt quamlibet multis ſurripere conantibus, nunquam tamen amiſerit. In Lipara inſula, aiunt quidam terram reperiri, qua ſi ollam obruas, quicquid inicias, lixetur.

In Media Pſittacine, regione Perſidis, ignes quidam iugiter æſtuant, illi quidem modicè, hi autem vehementer, flamma pura lucentéque efflagrantes, locis vtique planis, non accliuibus. Quamobrem & rex Perſarum iſtic coquinas extruxit. Conſpicui ſunt hi quidem diu, noctúque, alij verò in Pamphylia noctu tantùm. Aiunt, circa Atitaniam, iuxta colles Apolloniatidis petram eſſe, in qua latens ignis non appareat quidem, ſed ſuperinfuſo oleo exardeſcat. Ferunt, ex columnis Herculis incendia, alia quidem iugi flamma, omníque tempore flagrare, alia autem noctu tantùm, vt Periplus ſcribit: ſimilem & in Lipara, conſpicuum quidem ignem lucentémque, ſed noctu tantùm. Aiunt & in Pithecuſis inſulis æſtuaria eſſe, ignea quidem vi, feruentique ſupra modum ardore, nec tamen flammam mittere. Porrò alterum in Lipara, inquit Xenophanes, interdum annis ſexdecim prorſus extingui, decimo ſeptimo rurſum redire. Illum quoque ignis fauillam quæ ex monte Ætna ſolet erumpere, aiunt eſſe nec flammeam, nec continuam: ſed poſt multos annos redire. Ferunt, circa Lydiam ignes emergere immenſos, diebúſque ſeptem ardere. Cùm primis verò admiratione dignum eſt, quod circa Siciliæ craterem inquiunt, ignium emicantium latitudinem ſtadia quadraginta patere, altitudine autem vix ad tria vſque tolli. In Thracia aiunt, lapidem, quem ſpinum vocant, diſſectum ardere, compoſitúmque rurſus, quemadmodum & Smarillem aqua perfuſum accendi, vtrinque non abſimilem. Maritham quoque oſtendere.

Circa Philippos in Macedonia, ferunt metalla inueniri, quorum ramenta creſcant diſiecta, aurúmque manifeſtò producant.

Aiunt & in Cypro, circa Tyrrhiam quam vocant, ferrum natura æquè miranda prouenire; quod in minuta fruſta conciſum ſeritur, deinde aqua perfuſum augetur, ſurgitque vt colligi queat. In Melo inſula ferunt, effoſſas terræ cauernas, aliâ ſuccreſcente humo rurſum compleri. Circa Pæoniam dicunt, crebris imbribus terra liquefacta, aurum, quod apyrum vocant, inueniri. In Pæonia ferunt, adeò fertile auro ſolum eſſe, vt plurimis pondus minam excedens repertum ſit. Ex eo regi exhibêt glebas duas, quarum altera duas, altera tres libras appendat, atque eas aiunt menſæ principali apponi, primúmque ex iis cibum deguſtari. Aiunt & in Bactris, Ozum fluuium glebulas auri plurimas ferre, ſimiliter & in Theodoronte, circa litora ebullire aurum, & alueo quoque deferri. In Pieria Macedoniæ fertur aurum non ſignatum, in quatuor terræ hiatus defoſſum eſſe à regibus priſcis, ex quorum vno auri lamina palmi magnitudine excreuerit. Fertur autem peculiaris quædam generatio eſſe ferri Chalybici Myſinique, vt quod ex ſabulo fluuiorum comportatum. alij ſimpliciter lotum in fornace excoqui, alij illam etiam ex lotura frequentiore ſubſidentem hypoſtaſin inijci, ſimúlque igni purgari tradunt, adiecto Pyrimacho lapide, qui iſthic plurimus reperitur. Hoc genus ferri, alis eſt multo nitidius:

Ἔστι δὲ καὶ ἐν Μηδίᾳ καὶ ἐν Ψιττακήνῃ τῆς Περσίδος πυρὰ καιόμενα, τὰ μὲν ἐν Μηδίᾳ, ὀλίγον, τὰ δὲ ἐν Ψιττακήνῃ, πολὺ καὶ καθαρὸν τῇ φλογί. διὸ καὶ μαγειρεῖα πρὸς αὐτῷ κατεσκεύασεν ὁ Περσῶν βασιλεύς. ἄμφω δὲ ἐν ὁμαλοῖς τόποις καὶ οὐκ [ἐν] ἀνωμάλοις. ἐνταῦθα δὲ νύκτωρ καὶ μεθ' ἡμέραν φανερά· * τὰ δ' ἐν Παμφυλίᾳ, νύκτωρ μόνον. Φασὶ δὲ καὶ περὶ Ἀτιτανίαν πρὸς τοῖς ὁρίοις τῆς Ἀπολλωνιάτιδος εἶναί τινα πέτραν, ἐξ ἧς τὸ μὲν ἀνιὸν πῦρ οὐ φανερόν ἐστιν· ἐπειδὰν δὲ ἔλαιον ἐπιχυθῇ ἐπ' αὐτήν, ἐκφλογοῦται. Λέγεται δὲ καὶ τὰ ἔξω στηλῶν Ἡρακλείων καίεσθαι, τὰ μὲν, διὰ παντός· τὰ δὲ, νύκτωρ μόνον, ὡς Ἄννωνος περίπλους ἱστορεῖ. καὶ τὸ ἐν [τῇ] Λιπάρᾳ δὲ φανερὸν καὶ φλογῶδες, οὐ μὴν ἡμέρας, ἀλλὰ νυκτὸς μόνον. εἶναι δὲ καὶ ἐν Πιθηκούσαις φασὶ πυρῶδες μὲν καὶ θερμὸν ἐκτόπως, οὐ μὴν καιόμενον. τὸ δ' ἐν τῇ Λιπάρᾳ ποτὲ καὶ ἐκλείπειν φησὶ Ξενοφάνης ἔτη ἑκκαίδεκα, τῷ δὲ ἑβδόμῳ ἐπανελθεῖν. Τὸν δ' ἐν τῇ Αἴτνῃ ῥύακα, οὔτε φλογώδη φασὶν, οὔτε συνεχῆ, ἀλλὰ διὰ πολλῶν ἐτῶν γίνεσθαι. Λέγεται δὲ καὶ περὶ Λυδίαν ἀναφέρεσθαι πῦρ παμπληθὲς, καὶ καίεσθαι ἐφ' ἡμέρας ἑπτά. Θαυμαστότατον δὲ τὸ ἐν Σικελίᾳ περὶ τὸν ῥύακα γινόμενον. τὸ γὰρ πλάτος ἐστὶ τὸ τῆς τοῦ πυρὸς ἀναζέσεως τεσσαράκοντα σταδίων· τὸ δ' ὕψος οὗ φέρεται, τριῶν. Φασὶ δὲ τὸν ἐν τῇ Θρᾴκῃ λίθον τὸν καλούμενον σπίνον, διακοπέντα καίεσθαι, καὶ συντεθέντα πρὸς ἑαυτὸν, ὥσπερ τὴν σμαρίλην, οὕτως κἀκεῖνον εἰς ἑαυτὸν τεθέντα καὶ ἐπιρραινόμενον ὕδατι, καίεσθαι. τὸ δ' αὐτὸ ποιεῖν καὶ τὸν μαρίθαν. Περὶ Φιλίππους τῆς Μακεδονίας εἶναι λέγουσι μέταλλα, ἐξ ὧν τὰ ἐκβαλλόμενα ἀποσύρματα αὐξάνεσθαί φασι καὶ φύειν χρυσίον, καὶ τοῦτο εἶναι φανερόν. Φασὶ καὶ ἐν Κύπρῳ περὶ τὸν λεγόμενον Τυῤῥίαν χαλκὸν ὅμοιον γίνεσθαι. κατακόψαντες γὰρ, ὡς ἔοικεν, εἰς μικρὰ, σπείρουσιν αὐτόν· εἶτα ὑδάτων ἐπιγινομένων, αὐξάνεται καὶ * ἀνίεται, καὶ οὕτως συνάγεται. Φασὶ δὲ καὶ ἐν Μήλῳ τῇ νήσῳ ἐν τοῖς ἐξορυσσομένοις τόποις τῆς γῆς, πάλιν ἀναπληρώματα γίνεσθαι. Περὶ Παιονίαν λέγουσιν, ὅταν συνεχεῖς οἱ ὄμβροι γίνωνται, εὑρίσκεσθαι, περιτηκομένης τῆς γῆς, χρυσὸν τὸν καλούμενον ἄπυρον.

Λέγουσι δ' ἐν τῇ Παιονίᾳ οὕτω χρυσίζειν τὴν γῆν, ὥστε πολλοὺς εὑρηκέναι καὶ ὑπὲρ τὴν μνᾶν χρυσίου ὁλκήν. τῷ δὲ βασιλεῖ φασιν εὑρόντας ἀνενεγκεῖν δύο βώλους, τὸν μὲν, τρεῖς μνᾶς ἄγοντα, τὸν δὲ πέντε. οὕς φασιν ἐπὶ τῆς τραπέζης αὐτῷ παρακεῖσθαι, καὶ ἐπ' ἐκείνων πρῶτον, εἴ τι ἐσθίει, ἀπάρχεσθαι. Φασὶ δὲ καὶ ἐν Βάκτροις τὸν * Ὦζον ποταμὸν καταφέρειν βώλια χρύσια πολλά. καὶ ἐν Ἰβηρίᾳ δὲ τὸν καλούμενον Θεόδωρον ποταμὸν ἐκβράσσειν τε πολὺ περὶ τὰ χείλη χρυσίον, ὁμοίως δὲ καὶ καταφέρειν. Λέγεται δὲ καὶ ἐν Πιερίᾳ τῆς Μακεδονίας ἄσημόν τι χρυσίον κατορωρυγμένον ὑπὸ τῶν ἀρχαίων βασιλέων, χασμάτων τε τεττάρων ὄντων, ἐξ ἑνὸς αὐτῶν ἀναφῦναι χρυσίον, τὸ μέγεθος σπιθαμιαῖον.

Λέγεται δὲ ἰδιωτάτην εἶναι γένεσιν σιδήρου τοῦ Χαλυβικοῦ καὶ * τοῦ Μισηνοῦ. συμφύεται γὰρ, ὥς γε λέγουσιν, ἐκ τῆς ἄμμου τῆς καταφερομένης ἐκ τῶν ποταμῶν. ταύτην δὲ οἱ μὲν ἁπλῶς φασι * πλύναντας καμινεύειν· οἱ δὲ, τὴν ὑπόστασιν τὴν γινομένην ἐκ τῆς * πλύσεως πολλάκις πλυθεῖσαν συγκάειν· παρεμβάλλειν δὲ τὸν πυρίμαχον καλούμενον λίθον. εἶναι δὲ ἐν τῇ χώρᾳ πολύν. οὗτος δ' ὁ σίδηρος πολὺ τῶν ἄλλων γίνεται καλλίων.

* κ. τὰ δὲ ἀεὶ Παμφυλίας,

* κ. ἰξαίνεται,

* Scrib. Ὦξον.

* κ. τοῦ Ἀμισηνοῦ. quod vero ſimilius.

* κ. πλύναντες

* γρ. φύσεως

Meteor. l. 4. c. 6.

A εἰ δὲ μὴ ἐν μιᾷ καμίνῳ ἐκαίετο, οὐδὲν ἂν, ὡς ἔοικε, διέφερε τοῦ ἀργυρείου. μόνον δέ φασιν αὐτὸν ἄμικτον· οὐ πολὺν δὲ γίνεσθαι. Φασὶ δὲ καὶ ἐν Ἰνδοῖς τὸν χαλκὸν οὕτως εἶναι λαμπρὸν καὶ καθαρὸν καὶ ἀνίωτον, ὡς μὴ διαγινώσκεσθαι τῇ χρόᾳ πρὸς τὸν χρυσόν· ἀλλ' ἐν τοῖς Δαρείου ποτηρίοις *βατιακάς εἶναί τινας καὶ πλείους, ἃς εἰ μὴ τῇ ὀσμῇ, ἄλλως οὐκ ἦν διαγνῶναι πότερον εἰσὶ χαλκαῖ ἢ χρυσαῖ.

Τὸν κασσίτερον τὸν Κελτικὸν τήκεσθαί φασι πολὺ τάχιον μολύβδου. σημεῖον δὲ τῆς εὐτηξίας, ὅτι τήκεσθαι δοκεῖ καὶ ἐν τῷ ὕδατι. χρώζει γοῦν, ὡς ἔοικε, ταχύ. τήκεται δὲ καὶ ἐν τοῖς ψύχεσιν, ὅτε γίνοιτο πάγη, ἐγκατακλειομένου ἐντὸς (ὥς φασι) καὶ συνωθουμένου τοῦ θερμοῦ τοῦ ἐνυπάρχοντος αὐτῷ, διὰ τὴν ἀσθένειαν. Ἐν τῷ Πανθείῳ ἐστὶν ἐλαία, καλεῖται δὲ B καλλιστέφανος· ταύτης δὲ πάντα τὰ φύλλα ταῖς λοιπαῖς ἐλαίαις ἐναντία πέφυκεν. ἔξω γὰρ [ἀλλ'] οὐκ ἐντὸς ἔχει τὰ χλωρά· ἀφίησί τε τοὺς πτόρθους ὥσπερ ἡ μύρτος εἰς τοὺς στεφάνους συμμέτρως. ἀπὸ ταύτης δὲ φυτὸν λαβὼν ὁ Ἡρακλῆς ἐφύτευσεν Ὀλυμπίασιν, ἀφ' ἧς οἱ στέφανοι τοῖς ἀθληταῖς δίδονται. ἔστι δὲ αὕτη παρὰ τὸν Ἰλισσὸν ποταμὸν, σταδίους ἑξήκοντα τοῦ ποταμοῦ ἀπέχουσα. περιῳκοδόμηται δὲ, καὶ ζημία μεγάλη τῷ θιγόντι αὐτῆς ἐστίν. ἀπὸ ταύτης δὲ τὸ φυτὸν λαβόντες ἐφύτευσαν Ἠλεῖοι ἐν Ὀλυμπίᾳ, καὶ τοὺς στεφάνους ἀπ' αὐτῆς ἔδωκαν. Ἐν τοῖς περὶ Λυδίαν μετάλλοις τοῖς περὶ Πέργαμον, ἃ δὴ καὶ Κροῖσος εἰργάσατο, πολέμου τινὸς γενο- C μένου, κατέφυγον οἱ ἐργαζόμενοι ἐπ' αὐτά· τοῦ δὲ στομίου ἐποικοδομηθέντος, ἀπεπνίγησαν· καὶ ὕστερον χρόνῳ πολλῷ τῶν μετάλλων ἀνακαθαρθέντων, εὑρέθη οἷς ἐχρῶντο ἀγγείοις πρὸς τὰς ὑπὸ χεῖρα χρείας ἀπολελιθωμένα, οἷον ἀμφορεῖς καὶ τὰ τοιουτότροπα. ταῦτα δὴ πεπληρωμένα οὗ τινος ἔτυχον ὑγροῦ, ἐλελίθωτο, καὶ προσέτι τὰ ὀστᾶ τῶν ἀνθρώπων.

Ἐν τῇ Ἀσκανίᾳ λίμνῃ οὕτω νιτρῶδές ἐστι τὸ ὕδωρ, ὥστε τὰ ἱμάτια οὐδενὸς ἑτέρου ῥύμματος προσδεῖσθαι· κἂν πλείω χρόνον ἐν τῷ ὕδατι ἐάσῃ τις, διαπίπτει. Περὶ τὴν Ἀσκανίαν λίμνην Μυθόπολίς ἐστι, κώμη ἀπέχουσα Κίου ὡς σταδίους ἑκατὸν εἴκοσι· ἐν ᾗ τοῦ χειμῶνος ἀναξηραίνεται πάντα τὰ φρέατα, ὥστε μὴ ἐνδέχεσθαι βάψαι τὸ ἀγγεῖον· τοῦ δὲ θέρους πλη- D ροῦται ἕως τοῦ στόματος. Ὁ πορθμὸς ὁ μεταξὺ Σικελίας καὶ Ἰταλίας αὔξεται καὶ φθίνει ἅμα τῇ σελήνῃ· καὶ διότι ἐπὶ τῆς ὁδοῦ τῆς εἰς Συρακούσας κρήνη ἐστὶν ἐν λειμῶνι οὔτε μεγάλη, οὔτε ὕδωρ ἔχουσα πολύ· συναπαντήσαντος δὲ εἰς τὸν τόπον ὄχλου πολλοῦ, παρέσχεν ὕδωρ ἄφθονον. Ἔστι δὲ καὶ κρήνη τις ἐν Παλικοῖς τῆς Σικελίας, ὡς δεκάκλινος· αὕτη δὲ ἀναρρίπτει ὕδωρ εἰς ὕψος ἓξ πήχεις, ὥστε ὑπὸ τῶν ἰδόντων νομίζεσθαι κατακλυσθήσεσθαι τὸ πεδίον· καὶ πάλιν *εἰς ταὐτὸ καθίσταται. ἔστι δὲ καὶ ὅρκος, ὃς ἅγιος αὐτόθι δοκεῖ εἶναι· ὅσα γὰρ ὄμνυσί τις, γράψας εἰς πινακίδιον, ἐμβάλλει εἰς τὸ ὕδωρ. ἐὰν μὲν οὖν εὐορκῇ, ἐπιπολάζει τὸ πινακίδιον· ἐὰν δὲ μὴ εὐορκῇ, τὸ μὲν πινακίδιον, βαρὺ γενόμενον, ἀφανίζεσθαί φασι, τὸν δὲ ἄνθρωπον E πίμπρασθαι. διὸ δὴ λαμβάνειν τὸν ἱερέα παρ' αὐτοῦ ἐγγύας ὑπὲρ τοῦ καθαίρειν τινὰ τὸ ἱερόν. Δημόνησος ἡ Καρχηδονίων νῆσος, ἀπὸ Δημονήσου τοῦ πρώτου ἐργασαμένου, τὴν ἐπωνυμίαν εἴληφεν· ἔχει δὲ ὁ τόπος κυανοῦ τὸ μέταλλον, καὶ χρυσοκόλλης. ταύτης δ' ἡ καλλίστη πρὸς χρυσίον εὑρίσκεται τιμίαν. καὶ γὰρ φάρμακον ὀφθαλμῶν ἐστιν. ἔστι δὲ αὐτόθι χαλκὸς κολυμβητὴς ἐν δυεῖν ὀργυαῖς τῆς θαλάσσης· ὅθεν ὁ ἐν Σικυῶνι ἐστὶν ἀνδριὰς ἐν τῷ ἀρχαίῳ ναῷ τοῦ Ἀπόλλωνος,

A & niſi vnis tantùm ignibus, vnáque fornace purgetur, argento ſimile redditur. Solum hoc eſt impermiſtum, cæterùm minimè prouenit copioſè. Aiunt & apud Indos, æs adeò ſplendidum, purum, ſyncerúmque reperiri, vt colore & ſpecie nequaquam ab auro diſcerni queat: vnde & inter Darij pocula cados quoſdam eſſe, qui niſi olfactus iudicio ab auro diſtare non cognoſcantur. Stannum ferunt Celticum, multo quàm plumbū, citiùs liquefieri: argumento eſt, quòd etiam in aquis ſoluatur, & colore inficiat quæcunque attingit.

Sed & ex frigoribus liqueſcit, calore ſcilicet ex congelatione intrinſecus ob mollitiem incluſo & coacto. In Pantheo olea eſt, quam B Calliſtephanum vocant, omnia folia reliquis oliuis contraria forma producens. Quippe quæ ſupinam non pronam partem habeat viridiorem: ramos mittit quemadmodum myrtus. vnde & ſumpta plantula Hercules in Olympiis oleam plantauit, athletis coronas ſuppeditātē. Diſtat ab Iliſſo fluuio ſtadiis ſexaginta, muro circuniecto munita. Ac ne quis tangat, grandi pœna cauetur. Hinc & Elei decerptum ſurculum, in Olympio campo plantarunt, vt victores inde coronis donarentur.

In metallis Lydiæ circa Pergamum, quæ quondam extruxerat Crœſus, accidit, vt cùm bello orto opifices in ea confugiſſent, obſtru- C cto ab hoſtibus exitu, ſuffocati ſint, verùm longo pòſt temporum interuallo, apertis rurſum repurgatíſq; metallis, inuentæ ſunt amphoræ, aliáq; id genus vaſa, quæ ad manuarios vſus adhibuerant, repleta humore quodam, & in lapides indurata, & iuxta etiam oſſa humana.

Lacus Aſcanij aquas ferūt adeo nitroſas eſſe, vt veſtibus in hunc intinctis alia lotione nulla ſit opus, diffluere verò, ſi quis diutius paulò immerſerit. Fretum inter Siciliam & Italiam vnà cū Luna intumeſcit & ſubſidet. Porro in prato iuxta viam quæ Syracuſas ducit, fons eſt, neq; amplus, neque aqua larga ſcaturiens, ad quem cùm turba numeroſa conflu- D xiſſet, auctus ſubitò præbuit aquarum abundè liberalem copiam. Eſt & fons in Palice Siciliæ, amplitudine decaclini. Aquas ad ſex cubitorum altitudinem eiicit, vt inundaturus planitiem omnem videatur, verùm eodem loco diffluens conſiſtit: porro iuriiurando hic ſacer haberi ſolet. Quæ enim cunque libet, tabellæ inſcribunt, inque fontem abiiciunt: ea ſi vero iureiurando confirmentur, natans in ſuperficie tabula teſtabitur: ſin ſecus, velut pondere depreſſa eripitur ex oculis, ignéque corripitur periurus. Quocirca fideiuſſorē capit Sacerdos, qui iuſta numinis vindicta ſacrum execrandúmque, ſi peierarit, aſportet.

Demoneſus Carthaginienſium inſula à E Demoneſo primo cultore nomen traxit, vbi cæruleum metallum reperitur, & chryſocolla ad auri venas pulcherrima; oculiſque medicandis cùm primis vtilis. Sed & æs natans ibidem eſt, ſtagno paſſibus duobus in mare porrecto, vnde conflatæ ſtatuæ ſunt, in Sicyone vetuſto Apollinis templo:

inque Pheneo, orichalcei appellantur, inſcriptione eiuſmodi inſignitæ, Hercules Amphitryoniades Heli capta conſtituit. Eadem duce fœmina, cuius parentem necarat, Augiam occupauit. Foſſores metalli huius viſu redduntur acutiſſimo, & ſi palpebris fortè careant, tum naſcuntur. Quapropter ſimul æs, cinerémque Phrygium oculis medicandis adhibent. Eodem loco ſpelunca eſt, quam Glaphyram vocant, in qua columnæ ex guttis deſtillantibus excreuerunt, id quod apparet, quæ ex imo pauimento tolluntur, vbi ſpatium etiam anguſtiſſimum. Ex aquilarum paribus alternis haliæetus & aquila naſcuntur, quoad par eiuſdem generis coniugabile naſcatur. Ex haliæetis fulica, ex his accipitres vulturéſque generantur. Verùm vultures non diuerſum genus, ſed grandes rurſum vultures gignunt, eóſque ſteriles: indicio eſt, quòd vulturis magni nidus nemini mortalium viſus ſit. Stupenda vis apud Indos plumbi conſpecta eſt: liquefactum enim ſi aquæ frigidæ infundatur, exilire traditur.

Æs Moſſynœcum ſplẽdidiore candore eminere ferunt, non adiecto ſtanno, ſed terra quadam iſthic naſcente ſimul incoctum. Atque eius adtemperaturæ primum inuentorem celata arte neminem docuiſſe, & proinde priorum temporum æramenta iis in locis poſterioribus longè præſtantiora deprehenſa. Aiunt in Ponto auium quoddam genus reperiri, quę non egerant, ſinéque ſenſu doloris non deplumentur ſolùm, ſed obeliſco etiam ſuffigantur. Verùm ex ignis admoti calore ſenſum cieri.

Apes ſolſtitia denuntiare videntur, ſuo ad labores egreſſu, quod & melitopolis ſiue apiariis certo argumento eſt, quippe quæ tum quietem agant. Videntur & cicadæ poſt ſolſtitia demum canere. Echinum à cibo abſtinere ad annum vſque euolutum tradunt.

Stellionem cùm exuuias more ſerpentum reiicit, mox conuerſum deuorare aiunt: obſeruari enim à medicis ſolitum, ob vſum, quem in epilepſiæ curatione præclarum habent.

Vrſæ adipem aiunt hyeme, quo tempore ſomno indulgent, frigore concretam excreſcere, ſupráque vaſa, quibus repoſita fuerit, tolli. *In Cyrene ranas mutas, & ſine voce aiunt eſſe, & in Macedonia Ematheoticis ſuibus ſolidas vngulas eſſe. In Cappadocia ferunt mulas fœcundas eſſe, & in Creta alnos fructum ferre. In Seripho ranas aiunt eſſe mutas: quæ ſi aliò transferantur, canere incipiant. Piſciculos eſſe ferunt in eo quod Ceras vocant apud Indos, qui per ſiccos locos oberrent, ac mox in flumen ſe recipiant.

Circa Babylonem, aiunt quidam in cauernis aquoſis piſciculos latere: verùm arefacto flumine ad areas paſtum prodire, alarum ſubſidio, caudæque motu, cæterùm fugere perſequentes, capútque humo merſum, reliquo corpore tegere, quod multi inſequendo, irritandóque, explorarunt. caput habent ranæ marinæ ſimile, reliquum corpus gobio, branchias verò piſcibus aliis. Heracleæ piſcium genus aiunt eſſe, intra terræ cauernulas defoſſum, maximè circa flumina locáque humidiora.

A καὶ ἐν Φενεῷ οἱ ὀρείχαλκοι καλούμενοι. ἐπιγέγραπται δὲ αὐ-
τοῖς, Ἡρακλῆς ὁ Ἀμφιτρύωνος Ἦλιν ἑλὼν ἀνέθηκεν. αἱρεῖ
δὲ τὴν Ἦλιν, ἡγουμένης κατὰ χρησμὸν γυναικός, ἧς τὸν πατέρα
Αὐγείαν ἀπέκτεινεν. οἱ δὲ τὸν χαλκὸν ὀρύττοντες, ὀξυδερκέστα-
τοι γίνονται, καὶ οἱ βλεφαρίδας μὴ ἔχοντες, φύουσι. παρὸ καὶ
οἱ ἰατροὶ τῷ ἄνθει τοῦ χαλκοῦ καὶ τῇ τέφρᾳ τῇ Φρυγίᾳ χρῶν-
ται πρὸς τοὺς ὀφθαλμούς. Ἔστι [γὰρ] αὐτόθι σπήλαιον ὃ
καλεῖται γλαφυρόν· ἐν δὲ τούτῳ κίονες πεπήγασιν ἀπό τινων
σταλαγμῶν. ἀποδηλοῖ δὲ τοῦτο ἐν τῇ ἀναγωγῇ τῇ πρὸς τὸ
ἔδαφος. ἔστι γὰρ ταύτῃ * στενότατον. Ἐκ τῶν ζεύγους δὲ * κ. στενώτατον.
τῶν ἀετῶν θάτερον τῶν * ἀγρίων ἁλιάετος γίνεται παραλλάξ, * Geſnerus ἐκγόνων
B ἕως ἂν σύζυγα γένηται. ἐκ δὲ ἁλιαέτων φήνη γίνεται· ἐκ δὲ
τούτων, οἱ περκνοὶ καὶ γῦπες· οὗτοι δὲ οὐκέτι διορίζουσι περὶ τοὺς
γῦπας, ἀλλὰ γεννῶσι τοὺς μεγάλους γῦπας· οὗτοι δ' εἰσὶν ἄ-
γονοι. σημεῖον δὲ τοῦτο, διότι νεοττιὰν οὐδεὶς ἑώρακε γυπὸς με-
γάλου. Θαυμαστὸν δέ τι, φασίν, ἐν Ἰνδοῖς περὶ τὸν ἐκεῖ
μόλυβδον συμβαίνειν. ὅταν γὰρ τακεὶς εἰς ὕδωρ καταχυθῇ ψυ-
χρόν, ἐκπηδᾶν ἐκ τοῦ ὕδατος. Φασὶ τὸν Μοσσυνοίκων
χαλκὸν λαμπρότατον καὶ λευκότατον εἶναι, οὐ παραμιγνυμέ-
νου αὐτῷ κασσιτέρου, ἀλλὰ γῆς τινὸς αὐτοῦ γινομένης καὶ συνε-
ψομένης αὐτῷ. λέγουσι δὲ τὸν εὑρόντα τὴν κρᾶσιν, μηδένα
C διδάξαι. διὸ τὰ προγεγονότα ἐν τοῖς τόποις χαλκώματα,
διάφορα· τὰ δ' ἐπιγινόμενα, οὐκέτι. Ἐν τῷ Πόντῳ
λέγουσι τοῦ χειμῶνος τῶν ὀρνέων τινὰ εὑρίσκεσθαι [φωλεύον-
τα,] οὔτε δὲ ἀφοδεύοντα, οὔτε ὅταν τὰ πτερὰ αὐτῶν τίλλω-
σιν, αἰσθάνεσθαι, οὔτε ὅταν ἐπὶ τὸν ὀβελίσκον διαπαρῇ, [οὔ-
τε ὅταν ὑπὸ τοῦ πυρὸς διακαυθῇ. πολλοὺς δὲ καὶ τῶν ἰχθύων
λέγουσι περικοπέντας καὶ περιτμηθέντας μὴ αἰσθάνεσθαι,]
ἀλλ' ὅταν ὑπὸ τοῦ πυρὸς θερμανθῶσιν. Ἡ μέλιττα δο-
κεῖ τὰς τροπὰς σημαίνειν τῷ ἐπὶ τὰ ἔργα βαδίζειν· ᾧ καὶ οἱ
μελιττοπόλοι σημείῳ χρῶνται· ἠρεμία γὰρ αὐτῶν γίνεται. δο-
κοῦσι δὲ καὶ οἱ τέττιγες ᾄδειν μετὰ τροπάς. Φασὶ δὲ καὶ
τὸν ἐχῖνον ἄσιτον διαμένειν ἄχρις ἐνιαυτοῦ. Τὸν δὲ χα-
D λεώτην, ὅταν ἐκδύσηται τὸ δέρμα, καθάπερ οἱ ὄφεις, ἐπιστρα-
φέντα καταπίνειν. τηρεῖται γὰρ ὑπὸ τῶν ἰατρῶν, διὰ τὸ χρή-
σιμον εἶναι τοῖς ἐπιληπτικοῖς. Λέγουσι δὲ καὶ τὸ τῆς ἄρκτου
στέαρ, ὅταν διαπεπηγὸς ᾖ διὰ τὸν χειμῶνα, καθ' ὃν ἂν χρό-
νον ἐκείνη φωλεύῃ, αὐξάνεσθαι, καὶ ὑπεραίρειν τὰ ἀγγεῖα ἐν οἷς ἂν
ᾖ. Ἐν Κυρήνῃ φασὶ τοὺς ὄντας βατράχους ἀφώνους τὸ πα-
ράπαν εἶναι. καὶ ἐν Μακεδονίᾳ δὲ ἐν τῇ τῶν Ἠμαθιωτῶν χώρᾳ
τοὺς σῦς εἶναι μώνυχας. Ἐν Καππαδοκίᾳ φασὶν ἡμιόνους
εἶναι γονίμους· καὶ ἐν Κρήτῃ αἰγείρους καρποφόρους. [Φασὶ δὲ καὶ
ἐν Σερίφῳ τοὺς βατράχους οὐκ ᾄδειν· ἐὰν δὲ εἰς ἄλλον τόπον
E μετενεχθῶσιν, ᾄδουσιν. Ἐν Ἰνδοῖς ἐν τῷ Κέρατι καλου-
μένῳ ἰχθύδια φασὶ γίνεσθαι, ἃ ἐν τῷ ξηρῷ πλανᾶται, καὶ πάλιν
ἀποτρέχει εἰς τὸν ποταμόν.] Φασὶ δὲ καὶ περὶ Βαβυλῶνα τινὲς
ἰχθύδιά τινα μένειν ἐν ταῖς τρώγλαις ταῖς ἐχούσαις ὑγρότητα
ξηραινομένου τοῦ ποταμοῦ· τούτους ἐξιόντας ἐπὶ τὰς ἅλως νέ-
μεσθαι, καὶ βαδίζειν ἐπὶ τῶν πτερύγων, καὶ ἀνακινεῖν τὴν οὐράν·
καὶ ὅταν διώκωνται, φεύγειν· καὶ εἰσδύντες ἀντιπροσώπως ἵ-
στασθαι. πολλάκις γὰρ προσιέναι τινὰς καὶ ἐρεθίζειν. ἔχουσι δὲ
τὴν κεφαλὴν ὁμοίαν βατράχῳ θαλαττίῳ, τὸ δὲ ἄλλο σῶμα κω-
βιοῦ· βράγχια δὲ ὥσπερ καὶ οἱ ἄλλοι ἰχθύες. Ἐν Ἡρα-
κλείᾳ δὲ τῇ ἐν τῷ Πόντῳ καὶ ἐν Ῥηγίῳ γίνεσθαί φασιν ὀρυκτοὺς
ἰχθύας, τούτους μάλιστα κατὰ τὰ ποτάμια καὶ τὰ ἔνυδρα χωρία.

συμβαίνειν δέ ποτε, ἀναξηραινομένων τῶν χωρίων, κατὰ τινὰς χρόνους συστέλλεσθαι κατὰ τῆς γῆς, εἶτα μᾶλλον ἀναξηραινομένης, διώκοντας τὴν ὑγρότητα, δύεσθαι εἰς τὴν ὕλην· εἶτα ξηραινομένης, διαμένειν ἐν τῇ ἰκμάδι, ὥσπερ τὰ ἐν ταῖς φωλεαῖς διαχειμάζοντα. ὅταν δὲ ἀνασκάπτωνται, πρὶν ἢ τὰ ὕδατα ἐπιγενέσθαι, τότε κινεῖσθαι. Φασὶ δὲ καὶ περὶ Παφλαγονίαν τοὺς ὀρυκτοὺς γίνεσθαι ἰχθῦς κατὰ βάθους· τούτους δὲ τῇ ἀρετῇ ἀγαθούς, οὔτε ὑδάτων φανερῶν πλησίον ὄντων, οὔτε ποταμῶν ἐπιρρεόντων, ἀλλ' αὐτῆς ζωογονούσης τῆς γῆς. Τὰς ἐν Ἠπείρῳ ἐλάφους κατορύττειν φασὶ τὸ δεξιὸν κέρας, ὅταν ἀποβάλωσι, καὶ εἶναι πρὸς πολλὰ χρήσιμον.

Φασὶ δὲ καὶ τὴν φώκην ἐξεμεῖν τὴν πυτίαν, ὅταν ἁλίσκηται· εἶναι δὲ φαρμακῶδες, καὶ τοῖς ἐπιληπτικοῖς χρήσιμον.

Καὶ τὴν λύγκα δέ φασι τὸ οὖρον κατακαλύπτειν, διὰ τὸ πρός τε ἄλλα χρήσιμον εἶναι, καὶ τὰς σφραγῖδας.

Λέγεται δὲ περὶ τὴν Ἰταλίαν ἐν τῷ Κιρκαίῳ ὄρει φάρμακόν τι φύεσθαι θανάσιμον, ὃ τοιαύτην ἔχει τὴν δύναμιν, ὥστε ἂν προσρανθῇ τινι, παραχρῆμα πίπτειν ποιεῖ, καὶ τὰς τρίχας τὰς ἐν τῷ σώματι ἀπομαδᾶν, καὶ τὸ σύνολον τοῦ σώματος διαρρεῖν τὰ μέλη, ὥστε τὴν ἐπιφάνειαν τοῦ σώματος εἶναι τῶν ἀπολλυμένων ἐλεεινήν. τοῦτο δέ φασι μέλλοντας διδόναι Κλεωνύμῳ τῷ Σπαρτιάτῃ Παῦλον τὸν Πευκέστιον καὶ Γάιον φωραθῆναι, καὶ ἐξετασθέντας ὑπὸ* Ταραντίνων θανατωθῆναι. Ἐν τῇ Διομηδείᾳ νήσῳ, ἣ κεῖται ἐν τῷ Ἀδρίᾳ, φασὶν ἱερόν τι εἶναι τοῦ Διομήδους θαυμαστόν τε καὶ ἅγιον. περὶ δὲ τὸ ἱερὸν κύκλῳ περικαθῆσθαι ὄρνιθας μεγάλους τοῖς μεγέθεσι, καὶ ῥύγχη ἔχοντας μεγάλα καὶ σκληρά. τούτους λέγουσιν, ἐὰν μὲν Ἕλληνες ἀποβαίνωσιν εἰς τὸν τόπον, ἡσυχίαν ἔχειν· ἐὰν δὲ τῶν βαρβάρων τινὲς τῶν περιοίκων, ἀνίπτασθαι, καὶ αἰωρουμένους καταράσσειν αὐτοὺς εἰς τὰς κεφαλὰς αὐτῶν, καὶ τοῖς ῥύγχεσι τιτρώσκοντας ἀποκτείνειν. μυθεύεται δὲ τούτους γενέσθαι ἐκ τῶν ἑταίρων τοῦ Διομήδους, ναυαγησάντων μὲν αὐτῶν περὶ τὴν νῆσον, τοῦ δὲ Διομήδους δολοφονηθέντος ὑπὸ τοῦ Αἰνέου τοῦ τότε βασιλέως τῶν τόπων ἐκείνων γενομένου. Παρὰ τοῖς Ὀμβρικοῖς φασὶ τὰ βοσκήματα τρὶς τίκτειν τοῦ ἐνιαυτοῦ, καὶ τοὺς καρποὺς αὐτοῖς τὴν γῆν πολλαπλασίους ἀποδιδόναι τῶν καταβαλλομένων. εἶναι δὲ καὶ τὰς γυναῖκας πολυγόνους, καὶ σπανίως ἓν τίκτειν, τὰς δὲ πλείστας δύο καὶ τρία. Ἐν ταῖς Ἠλεκτρίσι νήσοις, αἳ κεῖνται ἐν τῷ μυχῷ τοῦ Ἀδρίου, φασὶν εἶναι δύο ἀνδριάντας ἀνακειμένους, τὸν μὲν, κασσιτέρινον, τὸν δὲ, χαλκοῦν, εἰργασμένους τὸν ἀρχαῖον τρόπον. λέγεται δὲ τούτους Δαιδάλου εἶναι ἔργα, ὑπόμνημα τῶν πάλαι, ὅτε Μίνω φεύγων ἐκ Σικελίας καὶ Κρήτης, εἰς τούτους τοὺς τόπους προσέβαλε. Ταύτας δὲ τὰς νήσους φασὶ προσκεχωκέναι τὸν Ἠριδανὸν ποταμόν. ἔστι δὲ λίμνη ἔοικε πλησίον τοῦ ποταμοῦ, ὕδωρ ἔχουσα θερμόν· ὀσμὴ δ' ἀπ' αὐτῆς βαρεῖα, καὶ χαλεπὸν ἀποπνεῖ· καὶ οὔτε ζῷον οὐδὲν πίνει ἐξ αὐτῆς, οὔτε ὄρνεον ὑπερίπταται, ἀλλὰ πίπτει καὶ ἀποθνήσκει. ἔχει δὲ τὸν μὲν κύκλον σταδίων διακοσίων, τὸ δὲ εὖρος, ἕως δέκα. μυθεύουσι δὲ οἱ ἐγχώριοι Φαέθοντα κεραυνωθέντα πεσεῖν εἰς ταύτην τὴν λίμνην. εἶναι δ' ἐν αὐτῇ αἰγείρους πολλάς, ἐξ ὧν ἐκπίπτειν τὸ καλούμενον ἤλεκτρον. οἱ δὲ λέγουσιν ὅμοιον εἶναι κόμμι, διὰ τὸ ἀποσκληρύνεσθαι ὡσανεὶ λίθον, καὶ συλλεγόμενον ὑπὸ τῶν ἐγχωρίων διαφέρεσθαι εἰς τοὺς Ἕλληνας. Εἰς ταύτας οὖν τὰς νήσους Δαίδαλόν φασιν ἐλθεῖν, καὶ κατασχόντα αὐτὰς, ἀναθεῖναι ἐν μιᾷ αὐτῶν τὴν αὐτοῦ εἰκόνα, καὶ τὴν τοῦ υἱοῦ Ἰκάρου ἐν τῇ ἑτέρᾳ.

* ἴσ. Ταρκυνίων

A Verùm areſcentibus iis locis, primùm contrahi aiunt, mox inualeſcente ſiccitate humorem in ſyluas vſque perſequi, donec eo quoque deſtituantur. Itaque latibulis vel mediocriter vdis ferarum inſtar hærere, immotóſq; defixóſque, cæterùm ſi ante ſuperuenientes aquas effodiantur, moueri.

In Paphlagonia piſces altè in terram defoſſos aiunt, virtute præſtantes, etiam ſi nec aquæ in proximo appareant, neque illabantur flumina, ſed ſola nudáque terra pariantur.

Ceruos in Epiro dextrum cornu abiicientes aiunt defodere, rebus multis vtile.

Phocam aiunt captum vomere coagulum, efficax epilepticis pharmacum. Ligiam B ferunt caudam ſtudioſè contegere, cùm ad alios vſus, tum maximè ſphragidis conficiendis idoneam. Fertur, circa Italiam, in Cyrceo monte lethale venenum naſci, tanta vi vt ſumptum mox pilis corpus totum nudet, ac ſoluat adeo membra cuncta, vt velut liqueſcentia cadauerum ſpeciem miſerabilem tota ſuperficie præbeant. Hoc ferunt Pemeſtium Gaiúmque, Cleonymo Spartiatæ inſidiatores eſſe, verùm deprehenſos examinatóſque, à Tarquiniis ſupplicio affectos. In Diomedæa inſula maris Adriatici, ferunt templum quoddam & admirandum, & religione ſacrum, ab auibus in circulum obſideri, ma- C gnitudine vaſtis, roſtris & prælongis, & turgidis. Qui Græcis quidem accedentibus quietem agant, cæterùm Barbaris, qui accolunt, venientibus, ſubuolent, ac pedibus roſtriſque capita eorum lacerent, inflictiſque multis vulneribus interimant. Fabulantur has quondam ex ſociis Diomedis extitiſſe, circáq; eam inſulam facto naufragio, ducem amiſiſſe ab Æneo gentium illarum rege dolo necatum.

In Ombricis inſulis aiunt pecora annis ſingulis ternos partus edere, terrámque multiplicem ſerentibus frugem reddere. Sed & mulieres fœcundas vehementer, vt quæ rarò vnos, ſed plerunque geminos aut ternos eni- D tantur. In Electridis inſulis maris Adriatici ſinu duæ ſtatuę recumbentes videntur, ad formam priſcam elaboratæ, ſtannea altera, altera verò ærea, Dædali opus, vt exiſtimatur, monumentúmque rerum iis temporibus geſtarum, quibus ipſe, Minoa ex Sicilia Cretáque fugiens, ad hæc loca appulit. Inſulæ ab Eridano præterlabente effuſæ traduntur.
Præterea & lacus iuxta flumen eſt, aqua calida feruens, tum odorem adeò exhalãs fœtidum, vt & armentis aquandis inutilis ſit, & aues etiã ſuperuolãtes necet. In hunc & Phaethonta fulmine ictum delapſum fabulantur incolæ. Ambitus eſt in circulum haud minor ducentorum ſtadiorum. Tum populi arbores in eo E frequentes. Vnde (quod vocamus) electrũ diſtillat, gummi ſimile, eo quòd ad inſtar lapidis indureſcat. Collectum autem ab incolis in Græciã deportatur. In has ergo inſulas deueniſſe Dædalum, occupaſſéq; ferunt, & imaginem in vna ſuã, in altera Icari filij conſtituiſſe.

Verùm ſoluentibus iam Græcis, Argóque excidentibus, Dædali ſtatuam velvt fuga ſibi conſulentem, in Icarum inſulam miraculosè abiiſſe. In Ætna Siciliæ monte eſt, vt inquiunt, ſpelunca, quam circa florum omnigena copia creſcit omni tempore, tum violis immenſum quoddam ſpatium obtegitur. Quæ finitima loca adeo fragrantia ſua replent, vt occupati hac ſuauitate odoris, venatici canes, lepores veſtigare nequeant. Ac ſub eodem hiatu obſcurum quoddam antrum latet, quò Proſerpinam rapuiſſe Pluto fertur: triticúmque reperitur nec domeſtico, quo vtuntur, neque alij importato ſimile, ſed peculiari proprietate inſigne. Quo argumento contendunt illic primum omnium triticum conſpectum eſſe: & proinde Cererem etiam ſibi, vt apud ſe natam, vendicant. In Creta lupos, vrſos, viperas, aliáſque id genus noxias feras nullas naſci dicunt, Iouis beneficio, qui iſtic natus perhibetur. Extra columnas Herculis aiunt in mari à Carthaginienſibus inſulam fertilem deſertámque inuentam: vt quæ tam ſyluarum copia, quàm fluminibus nauigationi idoneis abundet, cùm reliquis fructibus floreat vehementer, diſtans à continente plurium dierum itinere: in qua cùm Carthaginienſes quidam ob ſoli fertilitatem connubia agitare, ac habitare cœpiſſent, ferunt, præſides, ne quis deinceps inſulam ingrederetur, pœna capitis interdixiſſe, incoláſque eieciſſe, ne coitione (ſi habitare iſtic pergerent) facta, inſulæ principatum conſequerentur, & Carthaginienſes ea felicitatis parte priuarent. Ex Italia ferunt viã advſq; Celtas Gallos & Celtiberos protendi, Heracleam vocant, in qua & Græci & indigenæ tranſeuntes, ab incolis obſeruantur, ne quid iis malè fortè accidat, quippe quòd pœnas ij pendunt, damnúmque lege ſarciunt, in quorum finibus datum fuerit. Apud Celtas venenum reperiri tradunt, quod Xenicum ipſi appellant, tanta celeritate inficiens necánſque, vt venatores Celtæ cùm ceruum iaculo tincto percuſſerint, feſtinatò adcurrant, carnémque vulneratam excent, ne veneno promeante animal putreſiat, alimentóque inutilis caro reddatur. Verùm inuentum eſſe huic antipharmacum corticem quercinam, aut, vt volunt alij, folium quod κοράκιον ab ipſis appellatur, inde nimirum quòd obſeruatione compertum ſit, coruum ex guſtato veneno malè affectum herbam eam adiiſſe, móxque vt glutiuiſſet, doloribus liberatum eſſe. In Iberia aiunt combuſtis aliquando à paſtoribus ſyluis, calentéque ex ignibus terra, manifeſtum argentum defluxiſſe. Cúmque poſtmodum terræmotus ſuperueniſſent, eruptis hiatibus magnam copiam argenti ſimul collectam, atque inde etiam Maſſilienſibus prouentus non vulgares obtigiſſe. In Gymnaſiis inſulis, quæ ad Iberiam ſitæ ſunt, poſt ſeptem illas, maximæ, aiunt oleum non ex oliuis, ſed è terebintho magna copia reddi, ad vſus omnes accommodatum. Porrò ipſos Iberos in mulieres adeò pronos, vt pro vno fœmineo corpore, quatuor aut quinque maſcula cum mercatoribus commutent.

A ὕστερον δὲ ἐπιπλευσάντων Πελασγῶν τῶν ἐκπεσόντων ἐξ Ἄργους, φυγεῖν τὸν Δαίδαλον, καὶ ἀφικέσθαι εἰς Ἴκαρον τὴν νῆσον. *Ἐν τῇ Σικελίᾳ τῇ καλουμένῃ Αἴτνῃ, σπήλαιόν τι λέγεται εἶναι, περὶ ὃ κύκλῳ πεφυκέναι φασὶ τῶν τε ἄλλων ἀνθῶν πλῆθος διὰ πάσης ὥρας, πολὺ δὲ μάλιστα τῶν ἴων ἀπέραντόν τινα τόπον συμπεπληρῶσθαι· ἃ τὴν συνεγγὺς χώραν εὐωδίας πληροῖ· ὥστε τοὺς κυνηγοῦντας, τῶν κυνῶν κρατουμένων ὑπὸ τῆς ὀσμῆς, ἐξαδυνατεῖν τοὺς λαγὼς ἰχνεύειν. διὰ δὲ τούτου τοῦ χάσματος, ἀσυμφανής ἐστιν ὑπόνομος· καθ' ὃν φασὶ τὴν ἁρπαγὴν ποιήσασθαι τὸν Πλούτωνα τῆς Κόρης. εὑρίσκεσθαι δέ φασιν ἐν τούτῳ τῷ τόπῳ πυρούς, οὔτε τοῖς ἐγχωρίοις ὁ- B μοίους οἷς χρῶνται, οὔτε ἄλλοις ἐπεισάκτοις, ἀλλ' ἰδιότητά τινα μεγάλην ἔχοντας. καὶ τούτῳ σημειοῦνται τὸ * πρῶτον παρ' αὐτοῖς φανῆναι πύρινον καρπόν· ὅθεν καὶ τῆς Δήμητρος ἀντιποιοῦνται, φάμενοι παρ' αὐτοῖς τὴν θεὸν γεγονέναι.

* Sylb. Ἐν τῆς Σικελίας τῇ καλ. Αἴτνῃ σπ. περὶ τ.

* κ. πρώτως Fort. πρώτοις

Ἐν Κρήτῃ, λύκους καὶ ἄρκτους, τούς τ' ἔχεις, ὁμοίως δὲ καὶ τὰ παραπλήσια τούτοις θηρία οὔ φασι γίνεσθαι, διὰ τὸ τὸν Δία γενέσθαι ἐν αὐτῇ. Ἐν τῇ θαλάσσῃ τῇ ἔξω Ἡρακλείων στηλῶν, φασὶν ὑπὸ Καρχηδονίων νῆσον εὑρεθῆναι ἐρήμην, ἔχουσαν ὕλην τε * παντοδαπήν, καὶ ποταμοὺς πλωτούς, καὶ τοῖς λοιποῖς καρποῖς θαυμαστήν, ἀπέχουσαν δὲ πλειόνων ἡ- C μερῶν· ἐν ᾗ ἐπιμισγομένων τῶν Καρχηδονίων πλεονάκις, διὰ τὴν εὐδαιμονίαν, ἐνίων γε μὴν καὶ οἰκούντων, τοὺς προεστῶτας τῶν Καρχηδονίων ἀπείπασθαι θανάτῳ ζημιοῦν τοὺς εἰς αὐτὴν πλευσομένους, καὶ τοὺς ἐνοικοῦντας πάντας ἀφανίσαι, ἵνα μὴ διαγγέλλωσι, μηδὲ πλῆθος συστραφὲν ἐπ' αὐτῶν ἐπὶ τὴν νῆσον κυρίας τύχῃ, καὶ τὴν τῶν Καρχηδονίων εὐδαιμονίαν ἀφέληται. Ἐκ τῆς Ἰταλίας φασὶν ἕως τῆς Κελτικῆς καὶ Κελτολιγύων καὶ Ἰβήρων εἶναί τινα ὁδὸν Ἡράκλειαν καλουμένην. δι' ἧς ἐάν τε Ἕλλην ἐάν τε ἐγχώριός τις πορεύηται, τηρεῖσθαι ὑπὸ τῶν παροικούντων, ὅπως μηδὲν ἀδικηθῇ. τὴν γὰρ ζημίαν ἐκτίνειν καθ' οὓς γένηται τὸ ἀδίκημα.

* κ. παντοδαπῆ,

Φασὶ δὲ παρὰ τοῖς Κελτοῖς φάρμακον ὑπάρχειν τὸ καλού- D μενον ὑπ' αὐτῶν τοξικόν· ὃ λέγουσιν οὕτω ταχεῖαν ποιεῖν τὴν φθοράν, ὥστε τῶν Κελτῶν τοὺς κυνηγοῦντας, ὅταν ἔλαφον ἢ ἄλλο τι ζῷον τοξεύσωσιν, ἐπιτρέχοντας ἐκ σπουδῆς ἐκτέμνειν τῆς σαρκὸς τὸ τετρωμένον, πρὸ τοῦ φάρμακον μὴ * διαδοῦναι, ἅμα μὲν τῆς προσφορᾶς ἕνεκα, ἅμα δὲ ὅπως μὴ σαπῇ τὸ ζῷον. εὑρῆσθαι δὲ τούτῳ λέγουσιν ἀντιφάρμακον, τὸν τῆς δρυὸς φλοιόν· οἱ δ' ἕτερόν τι * φύλλον, ὃ καλοῦσι κοράκιον, διὰ τὸ κατανενοῆσθαι ὑπ' αὐτῶν κόρακα, γευσάμενον τοῦ φαρμάκου, καὶ κακῶς διατεθέμενον, ἐπὶ τὸ φύλλον ὁρμήσαντα τοῦτο, καὶ καταπιόντα, παύσασθαι τῆς ἀλγηδόνος.

* Sylb. διαδῦναι,

* Fort. φυτόν. & iterum mox, ἐπὶ τὸ φυτ. S.

E Ἐν τῇ Ἰβηρίᾳ λέγουσι τῶν δρυμῶν ἐμπρησθέντων ὑπό τινων ποιμένων, καὶ τῆς γῆς διαθερμανθείσης ὑπὸ τῆς ὕλης, φανερῶς ἀργύρῳ ῥεῦσαι τὴν χώραν, καὶ μετὰ χρόνον σεισμῶν ἐπιγενομένων, καὶ τῶν τόπων ῥαγέντων, πάμπληθες συναχθῆναι ἀργύριον. ὃ δὴ καὶ τοῖς Μασσαλιώταις πρόσοδον ἐποίησεν οὐ τὴν τυχοῦσαν. Ἐν ταῖς Γυμνασίαις ταῖς κειμέναις νήσοις κατὰ τὴν Ἰβηρίαν μετὰ τὰς λεγομένας ἑπτά, αἳ μέγισται δοκοῦσιν εἶναι, φασὶν ἔλαιον μὴ γίνεσθαι ἐξ ἐλαιῶν, ἐκ δὲ τῆς τερμίνθου κομιδῇ πολύ, καὶ εἰς πάντα ἁρμόττον. λέγουσι δὲ οὕτω τοὺς οἰκοῦντας αὐτὰς Ἴβηρας καταγυναίους εἶναι, ὥστε ἀντὶ ἑνὸς σώματος θηλυκοῦ διδόναι τοῖς ἐμπόροις τέτταρα καὶ πέντε σώματα ἄρρενα.

A στρατευόμενοι δὲ παρὰ Καρχηδονίοις τοὺς μισθοὺς ὅταν λάβωσιν, ἄλλο μὲν οὐδὲν [ὡς ἔοικεν] ἀγοράζουσι, γυναῖκας δέ. οὐ γὰρ χρυσίον οὐδὲ ἀργύριον ἔξεστι παρ' αὐτοῖς οὐδένα ἔχειν. ἐπιλέγεται δέ τι τοιοῦτον ἐπὶ τοῦ κωλύειν χρήματα εἰσάγειν αὐτούς, ὅτι τὴν στρατείαν Ἡρακλῆς ἐποιήσατο ἐπὶ τὴν Ἰβηρίαν, διὰ τοὺς τῶν ἐνοικούντων πλούτους. Ἐν τῇ τῶν Μασσαλιωτῶν χώρᾳ περὶ τὴν Λιγυστικήν φασιν εἶναί τινα λίμνην, ταύτην δὲ ἀναζεῖν καὶ ὑπερχεῖσθαι, καὶ τοσούτους ἰχθῦς ἐκβάλλειν τὸ πλῆθος, ὥστε μὴ πιστεύειν. ἐπειδὰν δὲ οἱ ἐτησίαι πνεύσωσιν, ἐπιχώννυσθαι τὸ ἔδαφος ἐπ' αὐτῆς, καὶ τοιοῦτον κονιορτὸν γίνεσθαι αὐτόθι, καὶ ἀποστερεοῦσθαι τὴν ἐπιφάνειαν αὐτῆς, ὡσανεὶ ἔδαφος. B τοῖς δὲ τριόδουσι διακόπτοντας τοὺς ἐγχωρίους, ἑτοίμως ὅσους ἂν βούλωνται ἰχθύας ἐξαιρεῖν ἐξ αὐτῆς.

Λέγεται δέ τινας τῶν Λιγυστίων οὕτως σφενδονᾶν, ὥστε ὅταν πλείους ἴδωσιν ὄρνιθας, * διερίζεσθαι πρὸς ἀλλήλους, ποῖον ἕκαστος παρασκευάζεται βαλεῖν, ὡς ἑτοίμως ἁπάντων τευξομένων. Ἴδιον δέ φασι καὶ τοῦτο παρ' αὐτοῖς εἶναι· αἱ γυναῖκες ἅμα ἐργαζόμεναι τίκτουσι, καὶ τὸ παιδίον ὕδατι περικλύσασαι, παραχρῆμα σκάπτουσι, καὶ σκάλλουσι, καὶ τἄλλα οἰκονομοῦσιν, ἃ μὴ τικτούσαις ἦν πρακτέον.

* γρ. διερίζεσθαι

Θαῦμα δὲ καὶ τοῦτο παρὰ τοῖς Λίγυσι· φασὶ γὰρ παρ' αὐτοῖς ποταμὸν εἶναι, οὗ τὸ ῥεῦμα αἴρεται μετέωρον καὶ ῥεῖ, ὥστε C τοὺς πέραν μὴ ὁρᾶσθαι. Ἐν δὲ τῇ Τυρρηνίᾳ λέγεταί τις νῆσος Αἰθάλεια ὀνομαζομένη, ἐν ᾗ ἐκ τοῦ αὐτοῦ μετάλλου πρότερον μὲν χαλκὸς ὠρύσσετο, ἐξ οὗ φασι πάντα κεχαλκευμένα * παρ' αὐτοῖς εἶναι, ἔπειτα μηκέτι εὑρίσκεσθαι· χρόνου δὲ διελθόντος πολλοῦ φανῆναι ἐκ τοῦ αὐτοῦ μετάλλου σίδηρον ᾧ νῦν ἔτι χρῶνται Τυρρηνοί, οἱ τὸ καλούμενον Ποπλώνιον οἰκοῦντες. Ἔστι δέ τις ἐν Τυρρηνίᾳ πόλις Οἰναρέα καλουμένη, ἣν * ὑπερβολῇ φασιν ὀχυρὰν εἶναι. ἐν γὰρ μέσῃ αὐτῇ λόφος ἐστὶν ὑψηλὸς τριάκοντα σταδίους ἀνέχων ἄνω, καὶ κάτω ὕλην * παντοδαπὴν καὶ ὕδατα. φοβουμένους οὖν τοὺς ἐνοικοῦντας λέγουσι, μή τις τύραννος γένηται, προΐστασθαι αὐτῶν τοὺς ἐκ τῶν οἰκετῶν ἠλευθερωμένους· D καὶ οὗτοι ἄρχουσιν αὐτῶν, κατ' ἐνιαυτὸν δὲ ἄλλους ἀντικαθίστανται τοιούτους. Ἐν τῇ Κύμῃ τῇ περὶ τὴν Ἰταλίαν δείκνυταί τις, ὡς ἔοικε, θάλαμος κατάγειος Σιβύλλης τῆς χρησμολόγου· ἣν πολυχρονιωτάτην γενομένην, παρθένον διαμεῖναί φασιν, οὖσαν μὲν Ἐρυθραίαν, ὑπό τινων δὲ τὴν Ἰταλίαν κατοικούντων, Κυμαίαν, ὑπὸ δέ τινων Μελάγχραιναν καλουμένην. τοῦτον δὲ τὸν τόπον λέγεται κυριεύεσθαι ὑπὸ * Λευκαδίων. εἶναι δὲ λέγουσιν ἐν ἐκείνοις τοῖς τόποις περὶ τὴν Κύμην ποταμόν τινα * Κετὸν ὀνομαζόμενον. εἰς ὅν φασι τὸ ἐμβληθὲν πρότερον περιφύεσθαι, καὶ τέλος ἀπολιθοῦσθαι. * Ἀλκι- E σθένει τῷ Συβαρίτῃ φασὶ κατασκευασθῆναι ἱμάτιον τοιοῦτον τῇ πολυτελείᾳ, ὥστε προτίθεσθαι αὐτὸ ἐπὶ τῇ ἐν Λακινίῳ πανηγύρει τῆς Ἥρας, εἰς ἣν συμπορεύονται πάντες Ἰταλιῶται· τῶν τε δεικνυμένων μάλιστα πάντων ἐκεῖνο θαυμάζεσθαι. οὗ φασι κυριεύσαντα Διονύσιον τὸν πρεσβύτερον ἀποδόσθαι Καρχηδονίοις ἑκατὸν καὶ εἴκοσι ταλάντων. ἦν δ' αὐτὸ μὲν ἁλουργές, τῷ μεγέθει πεντεκαιδεκάπηχυ, ἑκατέρωθεν δὲ διείληπτο ζωδίοις ἐνυφασμένοις, ἄνωθεν μὲν Σούσοις, κάτωθεν δὲ Πέρσαις· ἀνὰ μέσον δὲ ἦν Ζεύς, Ἥρα, Θέμις, Ἀθηνᾶ, Ἀπόλλων, Ἀφροδίτη. παρὰ δὲ ἑκάτερον πέρας Ἀλκισθένης ἦν, ἑκατέρωθεν δὲ Σύβαρις.

Victorius Var. 32.23.

* γρ. παρ' αὐτοῖς

* γρ. καθ' ὑπερβολὴν

* Quidam παντοδαπῶν

* Melius Λευκανῶν Sylb.

* γρ. Μακέστην

* γρ. Ἀλκιμένει al. Ἀντισθένει

A Quocirca Carthaginienſibus militantes ſtipendia in fœminarum coemptionem tantùm impendunt, quum poſſidere iſthic argentum non liceat. Hinc orta receptáque lege, quòd Hercules aliquando bellum Hiſpaniæ intuliſſet, diuitiis incolarum inuitatus. In finibus Maſſilienſium circa Ligyſticam, lacus eſſe fertur, qui ebulliens effuſúſque, piſcium multitudinem immenſam, veriq; fidem ſuperantẽ, eiiciat. Cæterùm flantib. Eteſiis tantum puluerem concitari, vt coaceruata in lacũm humo ſicca, ſuperficiem obtegat, inq; formã redigat areæ: vnde indigenis licet pertuſa ſiccitate in triuiis quotcunq; libitum eſt piſces ci- B tra negotium eximere. Quidam Ligyſtorum adeò dextrè ſolertérq; fundam agitare feruntur, vt conſpectis auib. ſingulas ictib. ſingulis deſtinent, tanquam certi momento omnes caſuras. Peculiare autem eſt huic genti, quòd mulieres opus facientes, pariunt, lotóq; infante, ad ſarculum mox foſſionémq; redeunt, ac alia obeunt munia puerperis [illegible]. Admiratione & hoc apud [illegible] dignum eſt, quòd fluuius quidam fertur curſu in ſublime attolli, adeò vt ex oppoſito ſtantes nequeant conſpici. In Hetruria ferunt inſulam eſſe, quam Æthaliam hodie vocant, in qua æriſodina eſt, vnde ęs eruitur, omne ſcilicet illud, ex C quo iſthic ærea vaſa conflantur: deficere autẽ, nec reddere quicquam aliquandiu, cæterùm temporũ procurſu, non æs, vt antè, ſed ferrum prouenire, id nempe quo etiamnum vtuntur, Poponiũ incolæ vocant. In Hetruria, vrbem ferunt, quam Cenarcam vocant, ſupra modũ munitã eſſe: quippe cuius mediũ tumulus occupat ad triginta ſtadiorum altitudinem ſurgens, & omnigena materie, & aquis abundãs. Vnde metuẽs ſibi à tyrannide populus, ſeruos manumiſſos ſummæ rerum in annũ præficit, quo euoluto alios eiuſdem ſortis ſurrogat. In Cuma circa oram Italiæ ferunt thalamum ſubterraneum Sibyllæ fatidicæ eſſe, eius ſcili- D cet, quæ ætate quamlibet prouecta virginitatẽ ſeruaſſe impollutam traditur. Erythræa fuit hæc, ſed à quibuſdam Italiæ incolis Cumana, ab aliis verò Melacræna nuncupatur. Locum hunc à Leucadiis occupatum aiunt. Porro circa Cumam fluuium eſſe inquiũt (Cetes ab ipſis appellatur) in quem iacta quæcunq; fuerint, enaſcantur, ac poſtremo in lapidem indureſcant. Alciſtheni Sybaritæ veſtem tradunt tanta magnificentia confectam eſſe, vt cùm in Laciniæ Iunonis panegyri, ad quam tota confluere ſolet Italia, propoſuiſſet ſpectandam, omnium oculos à reliquis in ſe conuerterit. Hanc aiunt Carthaginienſibus emptã à Dio- E nyſio ſeniore tum regnante, centum viginti talentorum pretio. Purpurea erat tota, amplitudine quindecim cubitorum animalculis intertextis diſtincta, ſupernè quidem Suſis, infernè verò Perſicis. In medio autem Iupiter, Iuno, Themis, Minerua, Apollo, Venus, elucebant, ad latera Antiſthenes, vtrinque autem Sybaris.

A Circa Iapygiam promontorium, vbi inter Herculem Gigantéſque depugnatum fabulæ teſtantur, fontem eſſe tradunt, qui cruore defluens ea parte mare innauigabile reddat fœtoris grauitate. Ferunt & paſſim etiamnũ in Italia Herculis monumenta extare, iuxta vias, quas ille tranſiuit, & circa Iapygiæ Pandoſiam veſtigia eius apparere, quæ nequeas pedibus calcare. Sed & in eadẽ inſula lapis inuenitur plauſtrali magnitudine, quem Hercules ſublatum transtuliſſe fertur: digito vno mobilis. In Orchomenia Bœotiæ vrbe vulpeculam viſam tradunt, quæ cùm canem perſequentem fugiens ad ſubterraneum meatum decurriſſet, ſimul ingreſſus ille latránſque ſonitum edidit, perinde vt in patenti campo reſonan- B tem. Vnde venatores numinis aliquid reſidere iſthic arbitrari, aditu erupto ingreſſi ſunt ipſi quoque, illuceſcentéque per hiatus, ceu feneſtras, lumine, oculis etiam reliqua ſubiecta ſunt: quæ regreſſi magiſtratibus expoſuerunt. In Sardinia inſula ſtructuras ferunt eſſe antiquarum, vetuſto Græcorum more compoſitas, & cùm alia plura eximia, tum tholos rhythmis innumeris exornatos. Exiſtimantur ab Iolao Iphiclis filio omnes extructæ, qui Theſpiadis Herculis nepotibus aſſumptis ad ea loca traiecit occupaturus, quippe qui ob cognationem Herculis, cui tum totus parebat Occidens, ea iure aliquo ad ſe pertinere arbi- C trabatur. Ichnuſa primùm appellata eſt, à veſtigij, vt videtur, humani ſimilitudine. Felicem olim rebus omnibus, & fertilem maximè fuiſſe perhibent. Ariſtæum enim, quem agri colendi peritiſſimum fuiſſe ſcriptores rerum teſtantur, præfuiſſe primum tradunt, antea à multis magniſque auibus occupatæ. Verùm hodie non eſt ea fertilitate ampliùs, quòd Carthaginienſes rerum potiti, omnes fructus alimento idoneos extirparunt, capitiſque pœna cauerũt ne quis incola rurſum ſerere fruges tentaret. In Lipara inſula Æolica ſepulchrum aiunt eſſe, circa quod cùm etiam alia prodigioſa eueniant, tum id, quòd ea loca ſe- D curè tutóque nemini accedere liceat, vno ore perhibent. Sonitum enim tympanorum, cymbalorúmque, & riſum cum ſtrepitu, plauſuque manuum audiri manifeſtò. Cæterùm cum primis monſtruosè id quoque circa antrum accidit, quòd antelucano quidam ebrius ſomno iſthic oppreſſus triduum totum cubauit, quæſitúſque à familiaribus, quarto demum die repertus eſt: qui mortuum rati ad proprium monumentum extulerunt, dúmque iuſta iam pro more celebrarent, ex improuiſo ſurrexit, quæque obtigiſſent, expoſuit. Quæ etſi ad fabulam propiùs, quàm veri fidem accedere videantur, non potui tamen E de locis his ſcribens, tacitus præterire. Circa Cumam Italiæ, lacum eſſe ferunt, quem Aornon vocant, forma circulari, profunditatéque immenſa, tumulis vndequaque ſeptum, trium ad minus ſtadiorum altitudine. Cúmq; cetera nihil habeat magnopere admi-

A Περὶ τὴν ἄκραν τὴν Ἰαπυγίαν φασὶν ἔκ τινος τόπου, ἐν ᾧ συνέβη γενέσθαι (ὡς μυθολογοῦσιν) Ἡρακλεῖ πρὸς γίγαντας μάχην, ῥεῖν ἰχῶρα πολὺν, καὶ τοιοῦτον ὥστε διὰ τὸ βάρος τῆς ὀσμῆς ἄπλουν εἶναι τὴν κατὰ τὸν τόπον θάλασσαν. λέγουσι δὲ, πολλαχοῦ τῆς Ἰταλίας Ἡρακλέους εἶναι πολλὰ μνημόσυνα, ἐν ταῖς ὁδοῖς ἃς ἐκεῖνος ἐπορεύθη. περὶ Πανδοσίαν τῆς Ἰαπυγίας ἴχνη τοῦ θεοῦ δείκνυται, ἐφ' ἃ οὐδενὶ ἐπιβατέον. Ἔστι καὶ περὶ ἄκραν Ἰαπυγίαν λίθος ἁμαξιαῖος, ὃν ὑπ' ἐκείνου ἀρθέντα μετατεθῆναί φασιν, ἀφ' ἑνὸς δὲ δακτύλου κινεῖσθαι συμβέβηκεν. Ἐν τῇ τῶν Ὀρχομενίων πόλει τῇ ἐν Βοιωτίᾳ, φανῆναί φασιν ἀλώπεκα, ἣν κυνὸς B διώκοντος εἰσδῦναι εἴς τινα ὑπόνομον, καὶ τὸν κύνα συνεισδῦναι αὐτῇ, καὶ ὑλακτοῦντα ἦχον μέγαν ποιεῖν ὡσανεὶ εὐρυχωρίας τινὸς ὑπαρχούσης* αὐτοῖς· τοὺς δὲ κυνηγέτας ἔννοιαν λαβόντας δαιμονίαν, διαρρήξαντας τὴν εἴσδυσιν, συνώσασθαι καὶ αὐτούς. ἰδόντας δὲ διά τινων ὀπῶν εἰσερχόμενον ἔσω φῶς, εὐσυνόπτως τὰ λοιπὰ θεάσασθαι· καὶ ἐλθόντας ἀπαγγεῖλαι τοῖς ἄρχουσιν. Ἐν τῇ Σαρδοῖ τῇ νήσῳ κατασκευάσματά φασιν εἶναι εἰς τὸν Ἑλληνικὸν τρόπον διακείμενα τῶν ἀρχαίων, ἄλλα τε πολλὰ καὶ καλὰ, καὶ θόλους περισσοῖς τοῖς ῥυθμοῖς κατεξεσμένους. τούτους δ' ὑπὸ Ἰολάου τοῦ Ἰφικλέους κατασκευασθῆναι, ὅτε τοὺς C Θεσπιάδας τοὺς ἐξ Ἡρακλέους παραλαβὼν, ἔπλευσεν εἰς ἐκείνους τοὺς τόπους ἐποικήσων, ὡς κατὰ συγγένειαν αὐτῷ τὴν Ἡρακλέους προσήκοντας, διὰ τὸ πάσης τῆς πρὸς ἑσπέραν κύριον Ἡρακλέα γενέσθαι. αὕτη δὲ ἡ νῆσος, ὡς ἔοικεν, ἐκαλεῖτο μὲν πρότερον Ἰχνοῦσσα, διὰ τὸ ἐσχηματίσθαι τῇ περιμέτρῳ ὁμοιότατα ἀνθρωπίνῳ ἴχνει· εὐδαίμων δὲ καὶ πάμφορος ἔμπροσθεν λέγεται εἶναι. τὸν γὰρ Ἀρισταῖον, ὅν φασι γεωργικώτατον εἶναι ἐπὶ τῶν ἀρχαίων, *τοῦτον αὐτῶν ἄρξασθαι μυθολογοῦσιν, ὑπὸ μεγάλων ὀρνέων ἔμπροσθεν καὶ πολλῶν κατεχομένων. νῦν μὲν οὖν οὐκέτι φέρει τοιοῦτον οὐδὲν, διὰ τὸ κυριευθεῖσαν ὑπὸ Καρχηδονίων, ἐκκοπῆναι πάντας τοὺς χρησίμους εἰς προσφορὰν D καρποὺς, καὶ θάνατον τὴν ζημίαν τοῖς ἐγχωρίοις τετάχθαι, ἐάν τις τῶν τοιούτων τι ἀναφυτεύῃ. Ἐν μιᾷ τῶν ἑπτὰ νήσων τῶν Αἰόλου καλουμένων, ἣ καλεῖται Λιπάρα, τάφον εἶναι μυθολογοῦσι, περὶ οὗ καὶ ἄλλα [μὲν] πολλὰ καὶ τερατώδη λέγουσι· τοῦτο δὲ, ὅτι οὐκ ἀσφαλές ἐστι προσελθεῖν πρὸς ἐκεῖνον τὸν τόπον τῆς νυκτὸς, συμφωνοῦσιν. ἐξακούεσθαι γὰρ τυμπάνων καὶ κυμβάλων ἦχον, γέλωτά τε μετὰ θορύβου καὶ κροτάλων ἐναργῶς. λέγουσι δέ τι τερατωδέστερον γεγονέναι περὶ τὸ σπήλαιον. πρὸ ἡμέρας γὰρ ἐγκοιμηθῆναί τινα ἐν αὐτῷ οἰνωμένον, καὶ τοῦτον ὑπὸ τῶν οἰκετῶν ζητούμενον ἐφ' ἡμέρας E τρεῖς διατελέσαι· τῇ δὲ τετάρτῃ εὑρεθέντα ὡς νεκρὸν, ἀποκομισθῆναι ὑπὸ τῶν οἰκείων εἰς τὸν ἴδιον τάφον· καὶ τῶν νομιζομένων τυχόντα πάντων, ἐξαίφνης ἀναστῆναι, καὶ διηγεῖσθαι τὰ καθ' ἑαυτὸν συμβεβηκότα. τοῦτο μὲν οὖν ἡμῖν φαίνεται μυθωδέστερον· ὅμως μέντοι ἔδει μὴ παραλιπεῖν ἀμνημόνευτον αὐτό, [τὴν] περὶ τῶν τόπων ἐκείνων ἀναγραφὴν ποιουμένους. Περὶ τὴν Κύμην* τὴν περὶ Ἰταλίας λίμνη ἐστὶν ἡ προσαγορευομένη Ἄορνος· αὕτη μὲν, ὡς ἔοικεν, οὐκ ἔχουσά τι θαυμαστόν· περικεῖσθαι γὰρ λέγουσι περὶ αὐτὴν λόφους κύκλῳ, τὸ ὕψος οὐκ ἔλαττον τριῶν σταδίων, καὶ αὐτὴν εἶναι τῷ σχήματι κυκλοτερῆ, τὸ βάθος ἔχουσαν ἀνυπέρβλητον.

* Quidam, αὐτῇ

* Fort. τῶν πτηνῶν

* γ. τὴν ἐν Ἰταλίᾳ

ἐκεῖνο δὲ θαυμάσιον φαίνεται. ὑπερκειμένων γὰρ αὐτῇ πυκνῶν δένδρων, καὶ τινων ἐν αὐτῇ καταϰεκλιμένων, οὐδέν ἐστιν ἰδεῖν ἐπὶ τοῦ ὕδατος φύλλον ἐστηκὸς, ἀλλ' οὕτως καθαρώτατόν ἐστι τὸ ὕδωρ, ὥστε τοὺς θεωμένους θαυμάζειν. περὶ δὲ τὴν ἀπέχουσαν ἤπειρον αὐτῆς οὐ πολὺ, θερμὸν ὕδωρ πολλαχόθεν ἐκπίπτει, καὶ ὁ τόπος ἅπας καλεῖται Πυριφλεγέθων. ὅτι δὲ οὐδὲν διίπταται ὄρνεον ἐν αὐτῇ, ψεῦδος. οἱ γὰρ παραγενόμενοι λέγουσι κύκνων πλῆθός τι ἐν αὐτῇ γίνεσθαι.

Φασὶ τὰς Σειρηνούσας νήσους κεῖσθαι μὲν ἐν τῇ Ἰταλίᾳ περὶ τὸν πορθμὸν ἐπ' αὐτῆς τῆς ἄκρας, ὃς κεῖται πρὸ τοῦ προπεπτωκότος τόπου, καὶ διακυμαίνοντος τοῖς κόλποις, τόν τε περιέχοντα τὴν Κύμην, καὶ τὸν διειληφότα τὴν καλουμένην Ποσειδωνίαν· ἐν ᾧ καὶ νεὼς αὐτῶν ἵδρυται, καὶ τιμῶνται καθ' ὑπερβολὴν ὑπὸ τῶν περιοίκων θυσίαις ἐπιμελῶς· ὧν καὶ τὰ ὀνόματα μνημονεύοντες, καλοῦσι τὴν μὲν, Παρθενόπην, τὴν δὲ, Λευκωσίαν, τὴν δὲ τρίτην, Λίγειαν.

Λέγεται δὲ μεταξὺ τῆς Μεντορικῆς καὶ [τῆς] Ἰστριανῆς ὄρος τι εἶναι τὸ καλούμενον Δέλφιον, ἔχον λόφον ὑψηλόν. ἐπὶ τοῦτον τὸν λόφον ὅταν ἀναβαίνωσιν οἱ Μέντορες οἱ ἐπὶ τοῦ Ἀδρίου οἰκοῦντες, ἀποθεωροῦσι τὰ εἰς τὸν πόντον εἰσπλέοντα πλοῖα. εἶναι δέ τινα καὶ τόπον ἐν τοῖς ἀνὰ μέσον διαστήμασιν, εἰς ὃν ἀγορᾶς κοινῆς γινομένης, πωλεῖσθαι παρὰ μὲν τῶν ἐκ τοῦ πόντου ἐμπόρων ἀναβαινόντων τὰ Λέσβια καὶ Χῖα καὶ Θάσια· παρὰ δὲ τῶν ἐκ τοῦ Ἀδρίου, τοὺς Κερκυραϊκοὺς ἀμφορεῖς. Φασὶ δὲ καὶ τὸν Ἴστρον ῥέοντα ἐκ τῶν Ἑρκυνίων καλουμένων δρυμῶν, σχίζεσθαι, καὶ τῇ μὲν εἰς τὸν πόντον ῥεῖν, τῇ δὲ εἰς τὸν Ἀδρίαν. σημεῖον δὲ κἀκεῖνο, οὐ μόνον ἐν τοῖς νῦν καιροῖς ἑωράκαμεν, ἀλλὰ καὶ ἐπὶ τῶν παλαιῶν μᾶλλον, * εἶναι τὰ ἐκεῖ ἄπλωτα εἶναι· καὶ γὰρ Ἰάσονα τὸν μὲν εἴσπλουν κατὰ τὰς Κυανέας, τὸν δὲ ἐκ τοῦ πόντου ἔκπλουν κατὰ τὸν Ἴστρον ποιήσασθαί φασι· καὶ φέρουσιν ἄλλα τε τεκμήρια οὐκ ὀλίγα, καὶ κατὰ μὲν τὴν χώραν βωμοὺς ὑπὸ τοῦ Ἰάσονος ἀνακειμένους δεικνύουσι, ἐν δὲ μιᾷ τῶν ἐν τῷ Ἀδρίᾳ νήσων πολυτελὲς ἱερὸν Ἀρτέμιδος ὑπὸ Μηδείας ἱδρυμένον. ἔτι δὲ λέγουσιν ὡς οὐκ ἂν παρέπλευσε τὰς Πλαγκτὰς καλουμένας, εἰ μὴ ἐκεῖθεν ἀπέπλει. Καὶ ἐν τῇ Αἰθαλείᾳ δὲ νήσῳ τῇ κειμένῃ ἐπὶ τοῦ Τυρρηνικοῦ πελάγους, ἄλλα τε δεικνύουσι μνημεῖα τῶν ἀριστέων, καὶ τὸ ἐπὶ τῶν ψήφων δὲ λεγόμενον. παρὰ γὰρ τὸν αἰγιαλὸν ψήφους φασὶν εἶναι ποικίλας. ταύτας δὲ οἱ Ἕλληνες οἱ τὴν νῆσον οἰκοῦντες, λέγουσι τὴν χροιὰν λαβεῖν ἀπὸ τῶν στλεγγισμάτων ὧν ἐποιοῦντο ἀλειφόμενοι. ἀπὸ γὰρ ἐκείνων τῶν χρόνων, οὔτε πρότερον ἑωρᾶσθαι μυθολογοῦσι τοιαύτας ψήφους, οὔθ' ὕστερον ἐπιγεγενημένας. ἔτι δὲ τούτων φανερώτερα σημεῖα λέγουσιν, ὅτι οὐ διὰ τῶν Συμπληγάδων ἐγένετο ἔκπλους αὐτοῖς, τῷ ποιητῇ οἱ ἐν ἐκείνοις τοῖς τόποις μάρτυρι χρώμενοι. τὴν γὰρ δυσχέρειαν τοῦ κινδύνου ἐμφανίζοντα, λέγειν ὅτι οὐκ ἔστι παραπλεῦσαι τὸν τόπον·

Meteorol. li. 1. c. 12. Suſpectus locus, videtur ſaltem negatio deeſſe. Fort. * τὰ ἐκεῖ ἀ. μὴ εἶ.

Ἀλλὰ θ' ὁμοῦ πίνακάς τε νεῶν καὶ σώματα φωτῶν
Κύμαθ' ἁλὸς φορέουσι, πυρός τ' ὀλοοῖο θύελλαι.

Odyſſ. μ.

περὶ μὲν οὖν τὰς Κυανέας οὐ λέγεται πῦρ ἀναπέμπειν· περὶ δὲ τὸν πορθμὸν τὸν διαλαμβάνοντα τὴν Σικελίαν· ἐφ' ἑκάτερα κειμένων τῶν τοῦ πυρὸς ἀναφυσημάτων καὶ τῆς τε νήσου συνεχῶς καιομένης, καὶ τοῦ περὶ τὴν Αἴτνην ῥεύματος πολλάκις τὴν χώραν ἐπιδεδραμηκότος.

Ἐν Τάραντι ἐναγίζειν κατά τινας χρόνους φασὶν Ἀτρείδαις καὶ Τυδείδαις καὶ Αἰακίδαις καὶ Λαερτιάδαις·

A ratione dignum, mirandum tamen hoc fortaſſe, quòd circumpoſitis vndequaque & ſuperincumbentibus denſiſſimis arboribus non cernas vllum in lacu natans folium, qua puritate ſui admirationem meritò ciet. Circa Epirum autem iſthinc non ita procul diſtantem calidas aquas paſſim ſcaturire ferunt, vnde locus Pyriphlegethon appellatur. Cæterùm auem nullam iſthac tranſuolare vanò aſſeritur, cùm cygnos eo loci haud paucos agere compertum ſit.

Circa Italiam Syrenes inſulæ ſunt, in ſummo freti vertice, eius nempe quod ſitum eſt ad porrectum in mare locum, inter alluentes ſinus, qui & Cumam cingit, & Poſſidoniam B diuidit. Vbi ab accolis ſtudioſè muneribus ſacrificiiſque coluntur, & ſacra quoque ipſarum ædes monſtratur. Porrò nomina recenſentes, Parthenopen vnam, alteram Leucoſiam, tertiam Ligiam vocant. Iuxta Mentoricen & Iſtram mons fertur eſſe, quem Delphium vocant, faſtigio altiſſimo, quod aſcendentes qui ad Adriam habitant, pontum, ac media interualla, quæque in illis geruntur, contueri poſſunt, quò mercatum confluentes paſſim mercatores, Pontici Thaſia, Chia, ac Lesbia vina, Adriatici verò Corcyrenſes amphoras coëmunt.

C Ferunt & Iſtrum ex Hercynia ſylua profluentem diuidi, partimque in Pontum, partim verò in Adriam decurrere. cuius rei argumentum non hoc tempore primùm, ſed à priſcis vſque ſeculis extat. Aras enim eò loci ab Iaſone poſitas oſtendunt. Ferunt & inſuper hoc indicio eſſe, quòd ea loca innauigabilia ſint, quando Iaſoni iuxta Cyaneas ingreſſum, exitum verò è Ponto fuiſſe per Iſtrum compertum eſt. Et quod ſimul memoratur, prætemauigare Planctas, vt appellant, inſulas, niſi iſthinc ſoluiſſet, non potuiſſe. Cæterū in Æthalia ad mare Tyrrhenum, cùm alia monumenta principum illius D expeditionis virorum, tum id quod de calculis memorant, monſtratur. Nam ad litus calculos inueniri perhibent coloris varii, tum ſcilicet ex deſtillationibus liquorum, quibus vngebantur, coloratos. Tales enim nec ante, nec poſt ea tempora inuentos. Sed enim & alia ſunt non obſcura indicia, non fuiſſe tranſitum illis per Symplegadas: teſtante ſcilicet id poëta. Nam, cùm periculi magnitudinem exprimere contenderet, declarat hæc loca nauigationi minimè peruia extitiſſe:

Quoniam ſimul tabuláſque nauium & corpora virorum
Maris vndæ rapiunt, & ignis pernicioſi procellæ.

Circa igitur Cyaneas non videtur ignis emitti, ſed iuxta fretum, quo Sicilia ab Italia diſtin- E guitur, ab vtraque parte euaporatio, tum quòd inſula continuè ipſa flagrat, tum quòd flammæ Ætnæ ſæpe totam regionem permeant. In Tarento ſolent interdum parentare Atridis, Æacidis, Tydidiſque, & Laërtiadis:

Agamemnoniadis autem, ſeorſimq; die conſtituta alia ſacrificia agere, quibus mulieribus immolata tangere lege interdicitur. Eſt & templum apud ipſos Achillis. Ferunt hunc locum olim Ionibus obtinẽntibus Plion vocatum eſſe. Verùm poſtquam à Tarentinis inhabitari cœptus eſt, Heracliam. cæterùm jam inde remotiùs à primis incolis Sigium appellatum. Apud Sybaritas aiunt Philoctetem coli, qui ex Troia profugus inhabitauit quæ vocantur mollia Crotoniadis, diſtantia à Troia, vt ferunt, centum viginti ſtadiis: ac Herculis arcus in Apollinis Halij templo conſecrauit, quos per vim à Crotoniatis in Apollonium translatos ferunt. Aiunt iis in locis mortuum eſſe auxilia ferentem Rhodiis, qui cum Tlepolemo ad ea loca delati, contra incolas depugnarant. Circa Italiam, quam Calabriam vocant, iuxta Metapontum aiunt Mineruæ Græcæ templum extare, inque eo Epei, qui & nomen impoſuit, inſtrumenta re[illegible]d equi Duriani fabricam comparatat: Mineruam enim in ſomnis viſam hæc vt opera conſecraret, flagitaſſe, cúmque exitus difficultate impediretur, loca implicitum enauigare non potuiſſe. Vnde Mineruæ Græcæ hodie fanum appellatur. Ferunt & circa Dauniæ locum templum eſſe Mineruæ Achaicæ, in quo ſecures æreæ, armáque cùm Diomedis, tum ſociorum eius collocata ſint. Aiunt & iſthic canes eſſe, qui venientes Græcos iniuria nulla impetant, ſed tanquam familiariſſimis blandiantur. Porro omnes Daunij accolæque tam viri quàm fœminæ atratis tantùm veſtibus vtuntur, ea nimirum de cauſa, quòd Troianæ mulieres dum captiuæ ad ea loca eſſent traductæ, metuentes ne grauem ſeruitutem ſub mulieribus Græcis experirentur, (nam tum ea loca inhabitabant) naues incenderunt, tum vt iugum ſeruile effugerent, tum vt viros, manendi neceſſitate impoſita detinerent. Vnde rectè à Poëta dictum eſt, Pepla trahentes, profundiſque ſinibus illas videre, vt apparet, iſthic licet.

In Peucetinis Dianæ templum eſt, in quo locatum eſt celebre illud æreum ſertum, inſcriptione hac inſignitum, Diomedes Dianæ. Id fabulantur ab eo collo ceruino applicitum accreuiſſe, itaque deinceps hoc pacto inuentum ab Agathocle Siculorum rege, in Iouis templo locatum. In Peloro Siciliæ promontorio tanta copia prouenit crocus, vt à quibuſdam etiam inquilinis Græcis flos cuiuſmodi ſit haud internoſcatur: curribus magnis hunc comportant, quibus libitum eſt. Tum verò ſtrata ex eo ſcenâſque conſtruunt.

Polycritus, rerum Sicularũ ſcriptor, loco mediterraneo ſtagnum eſſe ait ambitu ſuo ſcutum nihil excedens, aqua reſplendente quidẽ,

A καὶ Ἀγαμεμνονίδαις δὲ χωρὶς θυσίαν ἐπιτελεῖν ἐν ἄλλῃ ἡμέρᾳ ἰδίᾳ· ἐν ᾗ νόμιμον εἶναι ταῖς γυναιξὶ, μὴ γεύσασθαι τῶν ἐκείνοις θυομένων. ἔστι δὲ καὶ Ἀχιλλέως νεὼς παρ' αὐτοῖς. λέγεται δὲ, μετὰ τὸ *παραλαβεῖν τοὺς Ταραντίνους, Ἡράκλειαν τὸν τόπον καλεῖσθαι ὃν νῦν κατοικοῦσιν· ἐν δὲ τοῖς ἄνω χρόνοις τῶν Ἰώνων κατεχόντων, Πλεῖον· ἔτι δὲ ἐκείνων ἔμπροσθεν ὑπὸ τῶν Τρώων κατασχόντων αὐτὴν, Σίγειον ὀνομάζεσθαι. Παρὰ δὲ τοῖς Συβαρίταις λέγεται Φιλοκτήτην τιμᾶσθαι· κατοικῆσαι γὰρ αὐτὸν ἐκ Τροίας ἀνακομισθέντα τὰ καλούμενα μαλακὰ τῆς *Κροτωνιάδος, ἅ φασιν ἀπέχειν ἑκατὸν εἴκοσι σταδίων, καὶ ἀναθεῖναι ἱστοροῦσι τὰ τόξα τὰ Ἡράκλεια αὐτὸν εἰς τὸ τοῦ Ἀπόλλωνος τοῦ Ἁλίου. ἐκεῖθεν δέ φασι τοὺς Κροτωνιάτας κατὰ τὴν ἐπικράτειαν ἀναθεῖναι αὐτὰ εἰς τὸ Ἀπολλώνιον τὸ παρ' αὐτοῖς. λέγεται δὲ καὶ τελευτήσαντα ἐκεῖ κεῖσθαι αὐτὸν παρὰ τὸν ποταμὸν τὸν Σύβαριν, βοηθήσαντα Ῥοδίοις τοῖς μετὰ Τληπολέμου εἰς τοὺς ἐκεῖ τόπους ἀπενεχθεῖσι, καὶ μάχην συνάψασι πρὸς τοὺς ἐνοικοῦντας [τῶν βαρβάρων] ἐκείνην τὴν χώραν.

* Fort. παραβαλεῖν
* Malim, Κροτωνιάδος,

Περὶ δὲ *τὴν Ἰταλίαν τὴν καλουμένην Καλαβρίαν, ἐγγὺς Μεταποντίου, Ἀθηνᾶς ἱερὸν εἶναί φασιν Ἑλληνίας, ἔνθα τὰ τοῦ Ἐπειοῦ λέγουσιν ὄργανα ἀνακεῖσθαι, ἃ εἰς τὸν Δούρειον ἵππον ἐποίησεν, ἐκείνου τὴν ἐπωνυμίαν ἐπιθέντος. φανταζομένην γὰρ αὐτῷ τὴν Ἀθηνᾶν κατὰ τὸν ὕπνον ἀξιοῦν ἀναθεῖναι *τὰ ὄργανα, καὶ διὰ τοῦτο βραδυτέρας τυγχάνοντα τῆς ἀναγωγῆς, εἰλεῖσθαι ἐν τῷ τόπῳ, μὴ δυνάμενον ἐκπλεῦσαι· ὅθεν Ἑλληνίας Ἀθηνᾶς τὸ ἱερὸν προσαγορεύεσθαι. Λέγεται δὲ περὶ τὸν ὀνομαζόμενον τῆς Δαυνίας τόπον, ἱερὸν εἶναι Ἀθηνᾶς Ἀχαΐας καλούμενον, ἐν ᾧ δὴ [καὶ] πελέκεις χαλκοῦς καὶ ὅπλα τῶν Διομήδους ἑταίρων καὶ αὐτοῦ ἀνακεῖσθαι. ἐν τούτῳ τῷ τόπῳ φασὶν εἶναι κύνας οἳ τοὺς ἀφικνουμένους τῶν Ἑλλήνων οὐκ ἀδικοῦσιν, ἀλλὰ σαίνουσιν ὥσπερ τοὺς συνηθεστάτους. πάντες δὲ οἱ Δαύνιοι καὶ πλησιόχωροι *αὐτοῖς μελανειμονοῦσι καὶ ἄνδρες καὶ γυναῖκες, διὰ ταύτην (ὡς ἔοικε) τὴν αἰτίαν. τὰς γὰρ Τρῳάδας τὰς ληφθείσας αἰχμαλώτους, καὶ εἰς ἐκείνους τοὺς τόπους ἀφικομένας, εὐλαβηθείσας μὴ πικρᾶς δουλείας τύχωσιν ὑπὸ τῶν ἐν ταῖς πατρίσι προϋπαρχουσῶν τοῖς Ἀχαιοῖς γυναικῶν, λέγεται τὰς ναῦς αὐτῶν ἐμπρῆσαι, ἵν' ἅμα μὲν τὴν προσδοκωμένην δουλείαν ἐκφύγωσιν, ἅμα δ' ὅπως μετ' ἐκείνων μένειν ἀναγκασθέντων συναρμοσθεῖσαι, κατάσχωσιν αὐτοὺς ἄνδρας. πάνυ δὲ καὶ τῷ ποιητῇ καλῶς πέφρασται περὶ αὐτῶν. ἑλκεσιπέπλους γὰρ καὶ βαθυκόλπους *ἐκείνας, ὡς ἔοικεν, ἰδεῖν ἔστιν.

* Quidam, τὴν Ἰταλίας.
* κ. τὰ ἱερά,
* κ. αὐτοὺς

Ἐν δὲ τοῖς Πευκετίνοις εἶναί φασιν Ἀρτέμιδος ἱερὸν, ἐν ᾧ τὴν διωνομασμένην ἐν ἐκείνοις τοῖς τόποις χαλκῆν ἕλικα ἀνακεῖσθαι λέγουσιν, ἔχουσαν ἐπίγραμμα, Διομήδης Ἀρτέμιδι. μυθολογεῖται δ' ἐκεῖνον ἐλάφῳ περὶ τὸν τράχηλον περιθεῖναι, τὴν δὲ περιφῦναι· καὶ τοῦτον τὸν τρόπον εὑρεθεῖσαν ὑπὸ Ἀγαθοκλέους ὕστερον τοῦ βασιλέως Σικελιωτῶν εἰς τὸ τοῦ Διὸς ἱερὸν ἀνατεθῆναί φασιν. Ἐν τῇ ἄκρᾳ τῆς Σικελίας τῇ καλουμένῃ Πελωριάδι, τοσοῦτον γίνεσθαι κρόκον, ὥστε παρά τισι μὲν τῶν ἐν ἐκείνοις τοῖς τόποις κατοικούντων Ἑλλήνων, μὴ γνωρίζεσθαι ποῖόν τι ἐστὶ τὸ ἄνθος· ἐπὶ δὲ τῆς Πελωριάδος ἁμάξας κατακομίζειν μεγάλας *τοὺς βουλομένους, καὶ κατὰ τὴν ἐαρινὴν ὥραν τὰς στρωμνὰς καὶ τὰς σκηνὰς ἐκ κρόκου κατασκευάζειν. Φησὶν εἶναι ὁ Πολύκριτος ὁ τὰ Σικελικὰ γεγραφὼς ἐν ἔπεσιν ἔν τινι τόπῳ τῆς μεσογείου, λιμνίον τι ἔχον ὅσον ἀσπίδος τὸ περίμετρον. τοῦτο δ' ἔχειν ὕδωρ διαυγὲς μὲν,

* κ. κρημνὰς
* ι. τοὺς βουλομένους,

* μικρῷ δὲ θολερώτερον. εἰς τοῦτ' οὖν ἐάν τις εἰσβῇ, λούσασθαι χρείαν ἔχων, αὔξεσθαι εἰς εὖρος· ἐὰν δὲ καὶ * δεύτερον, μᾶλλον πλατύνεσθαι· τὸ δὲ πέρας ἕως εἰς πεντήκοντα ἀνδρῶν ὑποδοχὴν μεῖζον γινόμενον διευρύνεσθαι. ἐπειδὰν δὲ τοῦτον τὸν ἀριθμὸν λάβῃ, ἐκ βάθους πάλιν ἀνοιδοῦν, ἐκβάλλειν μετέωρα τὰ σώματα τῶν λουομένων ἔξω ἐπὶ τὸ ἔδαφος. ὡς δ' ἂν τοῦτο γένηται, εἰς τὸ ἀρχαῖον πάλιν σχῆμα τῆς περιμέτρου καθίστασθαι. οὐ μόνον δὲ ἐπὶ ἀνθρώπων τοῦτο περὶ αὐτὸ γίνεσθαι, ἀλλὰ καὶ ἐάν τι τετράπουν εἰσβῇ, τὸ αὐτὸ πάσχειν. Ἐν δὲ τῇ ἐπικρατείᾳ τῶν Καρχηδονίων φασὶν ὄρος εἶναι ὃ καλεῖται Γώνιον, παντοδαπῆς μὲν ὕλης γέμον, πολλοῖς δὲ διαπεποικιλμένον ἄνθεσιν· ὥστε τοὺς συνεχεῖς τόποις ἐπὶ πολὺ μεταλαμβάνοντας τῆς εὐωδίας αὐτοῦ, ἡδίστην τινὰ τοῖς ὁδοιποροῦσι προσβάλλειν τὴν ἀναπνοήν. πρὸς δὴ τοῦτον τὸν τόπον κρήνην ἐλαίου φασὶν εἶναι, τὴν δὲ ὀσμὴν ἔχειν τοῦ κέδρου τοῖς * ἀποπτίσμασιν ὁμοίαν. δεῖν δέ φασι τὸν προσιόντα πρὸς αὐτὴν, ἁγνεύειν· καὶ τούτου γινομένου, πλεῖον ἀναβλύζειν αὐτὴν τὸ ἔλαιον, ὥστε ἀσφαλῶς ἀρύεσθαι. Φασὶ καὶ ταύτης τῆς κρήνης πλησίον εἶναί τινα πέτραν, αὐτοφυῆ, μεγάλην τῷ μεγέθει. * ταύτης οὖν λέγουσιν, ἐπειδὰν μὲν ᾖ θέρος, φλόγα * ἀναπιτύειν πυρός· χειμῶνος δὲ γινομένου, ἐκ τοῦ αὐτοῦ τόπου κρουνὸν ὕδατος ἀναρραίνειν, οὕτω ψυχροῦ ὥστε χιόνι συμβαλλόμενον, μηδὲν διαφέρειν. καὶ τοῦτό φασιν οὐκ ἀπόκρυφον οὐδὲ μικρὸν χρόνον φαίνεσθαι, ἀλλὰ τὸ μὲν πῦρ ἀνιέναι τὴν θερείαν ὅλην, τὸ δὲ ὕδωρ πάντα τὸν χειμῶνα. Λέγεται δὲ καὶ περὶ τὴν τῶν * Σιντῶν καὶ Μαιδῶν χώραν καλουμένην τῆς Θρᾴκης, ποταμόν τινα Πόντον προσονομαζόμενον, ἐν ᾧ καταφέρεσθαί τινας λίθους οἳ καίονται, καὶ τοὐναντίον πάσχουσι τοῖς ἐκ τῶν ξύλων ἄνθραξι. ῥιπιζόμενοι γάρ, σβέννυνται ταχέως· ὕδατι δὲ ῥαινόμενοι, ἀναλάμπουσι καὶ ἀνάπτονται κάλλιον· παραπλησίαν δὲ ἀσφάλτῳ, ὅταν καίωνται, καὶ πονηρὰν ὀσμὴν οὕτω καὶ δριμεῖαν ἔχουσιν, ὥστε μηδὲν τῶν ἑρπετῶν ὑπομένειν ἐν τῷ τόπῳ καιομένων αὐτῶν.

Εἶναι δέ φασι καὶ τόπον τινὰ παρ' αὐτοῖς οὐ λίαν μικρόν, ἀλλ' ὡς ἂν εἴκοσί που σταδίων, ὃς φέρει κριθάς, αἷς οἱ μὲν ἄνθρωποι χρῶνται, οἱ δ' ἵπποι καὶ βόες οὐκ ἐθέλουσιν αὐτὰς ἐσθίειν, οὐδ' ἄλλο οὐδέν. ἀλλ' οὐδὲ τῶν ὑῶν οὐδὲ τῶν κυνῶν οὐδεμία τολμᾷ γεύσασθαι τῆς κόπρου τῶν ἀνθρώπων, οἵτινες ἂν ἐκ τῶν κριθῶν τούτων μάζαν φαγόντες ἢ ἄρτον, ἀφοδεύσωσι, τῷ θνήσκειν. Ἐν δὲ Σκοτούσαις τῆς Θετταλίας φασὶν εἶναι κρηνίδιόν τι μικρόν, ἐξ οὗ καὶ ῥεῖ τοιοῦτον ὕδωρ, ὃ τὰ μὲν ἕλκη καὶ θλάσματα ταχέως ὑγιεινὰ ποιεῖ καὶ τῶν ἀνθρώπων καὶ τῶν ὑποζυγίων· ἐὰν δέ τις ξύλον μὴ παντάπασι συντρίψας, ἀλλὰ σχίσας ἐμβάλῃ, συμφύεται, καὶ πάλιν εἰς τὸ αὐτὸ καθίσταται. Περὶ δὲ τὴν Θρᾴκην τὴν ὑπὲρ Ἀμφιπόλεως φασὶ γίνεσθαί τι τερατῶδες καὶ ἄπιστον τοῖς μὴ τεθεαμένοις. ἐξιόντες γὰρ οἱ παῖδες ἐκ τῶν κωμῶν καὶ τῶν ἐγγὺς χωρίων ἐπὶ θήραν τῶν ὀρνιθαρίων, συνθηρεύειν παραλαμβάνουσι τοὺς ἱέρακας· καὶ τοῦτο ποιοῦσιν οὕτως· ἐπειδὰν προσέλθωσιν εἰς τόπον ἐπιτήδειον, καλοῦσι τοὺς ἱέρακας ὀνομαστὶ κεκραγότες. οἱ δ', ὅταν ἀκούσωσι τῶν παίδων τὴν φωνήν, παραγενόμενοι παρασοβοῦσιν εἰς τοὺς θάμνους, ὅπου αὐτοὺς οἱ παῖδες ξύλοις τύπτοντες λαμβάνουσιν. ὃ δὲ πάντων ἂν μάλιστά τις θαυμάσειεν· οἱ μὲν γὰρ ἱέρακες, ὅταν αὐτοί τινα λάβωσι τῶν ὀρνίθων, καταβάλλουσι τοῖς θηρεύουσιν· οἱ δὲ παῖδες, ἁπάντων τῶν ἁλόντων μέρος τι τοῖς ἱέραξιν ἀποδόντες, ἀπέρχονται. Θαυμαστὸν δέ τι καὶ περὶ τοὺς Ἐνετοὺς φασὶ γίνεσθαι. ἐπὶ γὰρ

* γ. ἐν μικ.

* Quidam, δεύτερος

* Fort. ἀποπτίσμασι, Sylb.

* Melius ταύτην & mox, ἀναφύειν

Sic legendũ ex Stephano qui hunc locũ citat.

Hiſtor. l. 9. c. 36.

A ſed turbulentiore nonnihil: in quem ſi quis lauandi gratia ingrediatur, in latum extendi. quòd ſi iteret, ampliùs dilatari, adeo vt amplificatum ſpatium quinquaginta etiam viros capiat. verùm ad eam iam menſuram diffuſum ex imo intumeſcere, corporáque lauantum in ſublime rapta foras in pauimentum ſternere, ac mox ad veteris anguſtiæ ſpatium contrahi. Atque id non ſolùm humanis corporibus, ſed quadrupedibus etiam ingreſſis vſu venire perhibent. In Carthaginenſium ditione ferunt montem Comium cùm omnigena rerum materia, tum in primis variegatis floribus refertum eſſe. Vnde contigua loca ſuaueolentia participantes, viatoribus reſpirationem B gratiſſimam reddunt. Iuxta autem fontem oleo fluentem eſſe, ac odore, cedri guttis non abſimili. Verùm, vt inquiunt, tantùm imperitos naturæ eius oportet accedere: quibus adeò copioſè ſcaturit oleũ vt hauriri etiam queat. Iuxta eum fontem ſponte natam petram ferunt iuſta magnitudine, ex qua fertur caloribus æſtiuis, ignis flammam exilire, hyeme autem aquæ voraginem effundi. * * Sic & duos coruos ad Iouis templum aſſiduos extitiſſe, neque aliò vſpiam euolaſſe tradunt. Fertur & circa Scythas Medóſque, Thraciæ fluuium, C quem Pontum vocant, lapides deferre ardentes, contraria omnino natura prunis ligneis, quippe qui agitati ſufflatique reſtinguantur, aquis autem reſperſi exardeſcant reſplendeántque. Cæterùm vſtis, quemadmodum bitumini, adeò grauis fœtor eſt, vt reptilia penitus omnia è locis iis abigat. Eſſe aiunt apud illos locum quendam non exiguum, ad minus ſtadiorum viginti amplitudine, vbi hordeum prouenit, quod nulli animantium generi, niſi homini tantùm, ſit eſui. Nam equi bouéſque ab eo abſtinent, tum etiam canes & ſues vitant: vt ne excrementa quidem hominum hordeo veſcentium deguſtent, quippe quæ ipſis vorata certum interitum adferant. In D Scotuſis Theſſaliæ fonticulum eſſe aiunt, vnde aqua defluens vulnera conuulſionéſque cùm hominum tum iumentorum ſanat, lignáque iniecta, ſi fiſſa, non etiam confracta, fuerint, glutinat, & coniungit. Circa Thraciam quæ ſupra Amphipolim ſita eſt, rem monſtroſam & mirabilem iam antè ignaris videri tradunt. Egredientes enim pueri ex pagis agríſque finitimis, ope accipitrum aucupantur; locum enim opportunum nacti, accipitres nomine appellatos aduocant, qui ſtatim ad vocem auditam parent, prædamque agentes in vepres iuxta irruunt, vbi fuſtibus ligneis aues percutiũt pueri, & apprehendunt. Quin etiam, quod magis fortaſſis mirere, accipitres, comprehenſas à ſe aues aucupibus deiiciunt. E Viciſſim tamen partem prædæ aliquam ipſis pueri impartiuntur.

Porrò mirandum & hoc, quod circa Venetias euenire narratur. Cùm enim

regionem innumerabiles graculorum myriades frequenter infeſtent, ſementem iactam ex agris depaſcentes, ferunt Venetos ſub aduentum horum ad confinia loca omnis generis frugum ſemina, velvt diuûm donaria proiicere, quibus deguſtatis graculi velvt hoſtium incurſu mox ſuperuenturo ſubſiſtunt.

In Chalcide Thraciæ vrbe iuxta Olynthum aiunt locum eſſe, quem Cantharolethron vocant, paulò area maiorem, quem reliqua quidem animantia ingrediuntur illæſa: cancri verò nequaquam, quippe qui ingreſſi oberrantes in eo fame exanimantur.

Apud Cyclopas Thracenſes fons eſt aqua conſpectui quidem limpida, aliiſque ſimilis, B verùm hauſtus ab animante ſubitò necat.

Aiunt & in Biſaltorum regione bina iecinora in captis leporibus oſtendi, locúmque iugeri magnitudine eſſe, in quem animantia ingreſſa pereunt. Eſt & templum iſthic Dionyſij ornatu, magnitudinéque eximium, in quo dum feſta ſolemnia, ſacrificiáque celebrantur, ſi fertilitatem eius anni polliceatur Deus, fulgorem ignis emicare ingentem, ac circa templum agentibus conſpicuum fieri. Cæterùm ſterilitatem venturam denuntiari, ſi tenebræ, quemadmodum & reliquis noctibus, locum occupent. In Elide ædificium eſt (vt ferunt) ſtadiis diſtans octo ab vrbe, in C quo collocantur tres Dionyſio lebetes vacuæ: vocatiſque peregrinis, quibus ſcrutari hæc libeat, ianuarum clauſtra ſigillis obſignant, quæ deinde reſerant. Porrò ingreſſi lebetes vino plenas cernunt, pauimento, parietibus, omnibus integris, & illæſis, vt artis doloſæ ſuſpicio facilè abeſſe videatur. Aiunt & apud eos ipſos miluos eſſe, qui carnes quidem in foro rapiant, cæterùm inuiolatas non tangunt.

In Coronea Bœotiæ vrbe, talpæ nec viuere, nec terram fodere poſſunt, magna alioqui copia per totam Bœotiam redundante. In Colubris Arcadiæ ferunt fontem eſſe, in quo mures terreſtres natare, vitámque degere ſoleant, D atque idem etiam in Lampſaco contingere.

In Cranone Theſſaliæ vrbe duos eſſe tantùm coruos ferunt, qui ſe ipſos quidem aliò transferunt. Cæterùm alios totidem ex ſe natos relinquunt. In Apollonia, quæ iuxta regionem Taulanticam ſita eſt, naſci aiunt bitumen, picémque inſtar aquarum è terra ſubſilientium: ſolô eô, quòd atra magis denſiórque proueniat, Macedonicæ abſimilem.

Nec procul iſthinc ferunt accolæ ignem iugiter ardere, loco minimè amplo, vt qui pentaclini ſpatium complectatur, vnde odor ſulphuris aluminiſque redditur: creſcitque & circa hunc herba altiſſima, &, quod magis mirere, arbores excelſæ non plus quatuor paſſibus iſthinc diſtantes. Flagrat autē continuè circa Lyciam & Megaram Peloponneſi vrbem.

A τὴν χώραν αὐτῶν πολλάκις κολοιῶν ἀναριθμήτους* μυριάδας ἐπιφέρεσθαι, καὶ τὸν σῖτον αὐτῶν σπειράντων κατανεμίσκειν· εἰς τοὺς Ἐνετοὺς πρὸ τοῦ ἐφίπτασθαι μέλλειν, ἐπὶ τὰ μεθόρια τῆς γῆς προτιθέναι δῶρα, παντοδαπῶν καρπῶν καταβάλλοντας σπέρματα. ὧν ἐὰν μὲν γεύσωνται οἱ κολοιοί, οὐχ ὑπερβαίνουσιν ἐπὶ τὴν χώραν αὐτῶν. καὶ οἴδασιν οἱ Ἐνετοὶ ὅτι ἔσονται ἐν εἰρήνῃ· ἐὰν δὲ μὴ γεύσωνται, ὡσεὶ πολεμίων ἔφοδον αὐτοῖς γενομένην οὕτω προσδοκῶσιν.

Ἐν δὲ τῇ Χαλκίδι τῇ ἐπὶ Θρᾴκης πλησίον Ὀλύνθου φασὶν εἶναι Κανθαρώλεθρον ὀνομαζόμενον τόπον, μικρῷ μείζον τὸ μέγεθος ἅλω, εἰς ὃν τῶν μὲν ἄλλων ζώων ὅταν τι ἀφίκηται, πάλιν ἀπέρχεται· τῶν δὲ κανθάρων τῶν ἐλθόντων οὐδείς, B ἀλλὰ κύκλῳ περιιόντες τὸ χωρίον, λιμῷ τελευτῶσιν.

Ἐν δὲ* Κύκλωψι τοῖς Θρᾳξὶ, κρηνίδιόν ἐστιν ὕδωρ ἔχον, ὃ τῇ ὄψει καθαρὸν καὶ διαφανές, καὶ τοῖς ἄλλοις ὅμοιον· ὅταν δὲ πίῃ τι ζῷον ἐξ αὐτοῦ, παραχρῆμα διαφθείρεται. * κ. Χιαυψί. al. Κίγκωψι.

Φασὶ δὲ καὶ ἐν τῇ Κραστωνίᾳ παρὰ τὴν Βισαλτῶν χώραν τοὺς ἁλισκομένους λαγὼς δύο ἥπατα ἔχειν, καὶ τόπον τινὰ εἶναι ὅσον πλεθριαῖον, εἰς ὃν ὅ,τι ἂν εἰσέλθῃ ζῷον, ἀποθνήσκειν. Ἔστι δὲ καὶ ἄλλο αὐτόθι ἱερὸν Διονύσου μέγα καὶ καλόν, ἐν ᾧ τῆς ἑορτῆς καὶ τῆς θυσίας οὔσης, λέγεται, ὅταν μὲν ὁ θεὸς εὐετηρίαν μέλλῃ ποιεῖν, ἐπιφαίνεσθαι μέγα σέλας πυρός, καὶ τοῦτο πάντας ὁρᾶν τοὺς περὶ τὸ τέμενος διατρίβοντας· ὅταν δ' ἀκαρπίαν, μὴ φαίνεσθαι τοῦτο τὸ φῶς, C ἀλλὰ σκότος ἐπέχειν τὸν τόπον ὡς καὶ τὰς ἄλλας νύκτας.

Ἐν Ἤλιδι λέγουσιν εἶναί τι οἴκημα σταδίους ἀπέχον ὀκτὼ μάλιστα τῆς πόλεως, εἰς ὃ τιθέασι τοῖς Διονυσίοις λέβητας χαλκοῦς τρεῖς κενούς. τοῦτο δὲ ποιήσαντες παρακαλοῦσι τῶν Ἑλλήνων τῶν ἐπιδημούντων τὸν βουλόμενον ἐξετάσαι τὰ ἀγγεῖα, καὶ τοῦ οἴκου κατασφραγίζεσθαι τὰς θύρας. καὶ ἐπειδὰν μέλλωσιν ἀνοίγειν, ἐπιδείξαντες τοῖς πολίταις καὶ τοῖς ξένοις τὰς σφραγῖδας, οὕτως ἀνοίγουσιν. οἱ δ' εἰσελθόντες, εὑρίσκουσι τοὺς μὲν λέβητας οἴνου πλήρεις, τὸ δὲ ἔδαφος καὶ τοὺς τοίχους ὑγιεῖς, ὥστε μηδεμίαν ὑποψίαν [εἶναι] λαβεῖν D ὡς τέχνῃ τινὶ κατασκευάζουσιν.

Εἶναι δὲ φασὶ παρ' αὐτοῖς καὶ ἰκτίνους, οἳ παρὰ μὲν τῶν διὰ τῆς ἀγορᾶς τὰ κρέα φερόντων ἁρπάζουσι, τῶν δὲ ἱεροθύτων οὐχ ἅπτονται. Ἐν Κορωνείᾳ δὲ τῆς Βοιωτίας λέγεται τοὺς ἀσπάλακας τὰ ζῷα μὴ δύνασθαι ζῆν, μηδ' ὀρύσσειν τὴν γῆν, τῆς λοιπῆς Βοιωτίας πολὺ πλῆθος ἐχούσης. Ἐν* Λεύσοις δὲ τῆς Ἀρκαδίας, κρήνην εἶναί τινα φασίν, ἐν ᾗ χερσαῖοι μύες γίνονται, καὶ κολυμβῶσι, τὴν δίαιταν ἐν ἐκείνῃ ποιούμενοι. λέγεται δὲ αὐτὸ τοῦτο καὶ ἐν Λαμψάκῳ εἶναι. * κ. Κολύσοις Ἐν δὲ Κραννῶνι τῆς Θετταλίας, φασὶ δύο κόρακας εἶναι μόνους ἐν τῇ πόλει. οὗτοι ὅταν E ἐκνεοττεύσωσιν,* ἑαυτοὺς μὲν, ὡς ἔοικεν, ἐκτοπίζουσιν, ἑτέρους δὲ τοσούτους τῶν ἐξ αὐτῶν γεννωμένων ἀπολείπουσι.

Ἐν δὲ [τῇ] Ἀπολλωνίᾳ τῇ πλησίον κειμένῃ τῆς τῶν *Ταυλαντίων χώρας, φασὶ γίνεσθαι ἄσφαλτον ὀρυκτὴν καὶ πίσσαν, τὸν αὐτὸν τρόπον ἐκ τῆς γῆς ἀναπηδῶσαν τοῖς ὕδασιν, οὐδὲν διαφέρουσαν τῆς Μακεδονικῆς, μελαντέραν δὲ καὶ παχυτέραν πεφυκέναι ἐκείνης. οὐ πόρρω δὲ τούτου τοῦ χωρίου πῦρ ἐστι καιόμενον πάντα τὸν χρόνον, ὥς φασιν οἱ κατοικοῦντες περὶ τὴν χώραν ἐκείνην. ὁ δὲ καιόμενος τόπος, ἐστὶν οὐ πολύς, ὡς ἔοικεν, ἀλλ' ὅσον μάλιστα πεντακλίνου τὸ μέγεθος· ὄζει δὲ θείου καὶ στυπτηρίας, καὶ πέφυκε περὶ αὐτὸν πόα τε βαθεῖα, ὃ καὶ θαυμάσειεν ἄν τις μάλιστα, καὶ δένδρα μεγάλα, οὐκ ἀπέχοντα τοῦ πυρὸς πήχεις τέτταρας. καίεται δὲ συνεχῶς περὶ Λυκίαν καὶ Μεγάλην πόλιν τὴν ἐν Πελοποννήσῳ. * κ. Ἀτλαντίων

Λέγεται δὲ καὶ ἐν Ἰλλυριοῖς τίκτειν τὰ βοσκήματα δὶς τοῦ ἐνιαυτοῦ, καὶ τὰ πλεῖστα διδυμοτοκεῖν· καὶ πολλὰ δὲ τρεῖς ἢ τέσσαρας ἐρίφους τίκτειν, ἔνια δὲ καὶ πέντε καὶ πλείους· ἔτι δὲ γάλακτος ἀφιέναι ῥᾳδίως τρία ἡμίχοα. λέγουσι δὲ καὶ τὰς ἀλεκτορίδας, οὐχ ὥσπερ παρὰ τοῖς ἄλλοις ἅπαξ τίκτειν, ἀλλὰ δὶς καὶ τρὶς τῆς ἡμέρας. Λέγεται [δὲ] καὶ ἐν τῇ Παιονίᾳ τοὺς βοῦς τοὺς ἀγρίους πολὺ μεγίστους ἁπάντων τῶν ἐν τοῖς λοιποῖς ἔθνεσι γίνεσθαι.

Περὶ δὲ τοῦ πορθμοῦ τῆς Σικελίας καὶ ἄλλοι μὲν πλείους γεγράφασι, καὶ οὗτος δέ φησι συμβαίνειν τερατῶδες. ἐκ γὰρ τοῦ Τυρρηνικοῦ πελάγους πολλῷ ῥοίζῳ φερόμενον τὸν κλύδωνα, προσβάλλειν πρὸς ἀμφότερα τὰ ἀκρωτήρια, τὸ μὲν τῆς Σικελίας, τὸ δὲ τῆς Ἰταλίας, τὸ προσαγορευόμενον Ῥήγιον, ἐκ μεγάλου πελάγους εἰς στενὸν συγκλείεσθαι· τούτου δὲ γινομένου, κῦμα μετέωρον αἴρειν σὺν πολλῷ βρόμῳ ἐπὶ πάμπολυ τόπον τῆς ἄνω φορᾶς, ὥστε τοῖς μακρὰν ἀπέχουσι, συνοπτὸν εἶναι τὸν μετεωρισμόν, * οὐκ ὅμοιον φαινόμενον θαλάσσης ἀναφορᾷ, λευκὸν δὲ καὶ ἀφρῶδες· παραπλήσιον δὲ τοῖς συρμοῖς τοῖς γινομένοις ἐν τοῖς ἀνυπερβλήτοις χειμῶσι· καὶ ποτὲ μὲν ἀλλήλοις συμπίπτειν ἐπ' ἀμφοτέρων τῶν ἀκρωτηρίων τοὺς κλύδωνας, καὶ ποιεῖν * συγκλεισμὸν, ἄπιστον μὲν διηγεῖσθαι, ἀνυπομόνητον δὲ τῇ ὄψει θεάσασθαι· ποτὲ δὲ διισταμένους ἐκ τῆς πρὸς ἀλλήλους συρράξεως, οὕτω βαθεῖαν καὶ φρικώδη τὴν ἄποψιν ποιεῖν * τοῖς ἐξ ἀνάγκης θεωμένοις, ὥστε πολλοὺς μὲν μὴ κρατεῖν ἑαυτῶν, ἀλλὰ πίπτειν σκοτουμένους ὑπὸ τοῦ δέους. ἐπειδὰν δὲ προσπεσὸν τὸ κῦμα πρὸς ὁποτερονοῦν τῶν τόπων, καὶ μετεωρισθὲν ἕως τῶν ἄκρων, πάλιν εἰς τὴν ὑπορρέουσαν θάλασσαν κατενεχθῇ, τότε δὲ πάλιν σὺν πολλῷ μὲν βρυχηθμῷ, μεγάλαις δὲ καὶ ταχείαις δίναις τὴν θάλασσαν ἀναζεῖν καὶ μετεωρίζεσθαι κυκωμένην ἐκ βυθῶν, παντοδαπὰς δὲ χρόας μεταλλάσσειν. ποτὲ μὲν γὰρ ζοφεράν, ποτὲ δὲ κυανῆν, πολλάκις δὲ πορφυρίζουσαν διαφαίνεσθαι. τὸν δὲ δρόμον καὶ τὸ μῆκος αὐτῆς, ἔτι δὲ πρὸς τούτοις τὴν ἀναφορὰν, οὐδὲ ἀκούειν οὐδὲν ἑρπετὸν, οὐδ' ὁρᾶν ὑπομένειν, φεύγειν δὲ πάντα πρὸς τὰς ὑποκειμένας ὑπωρείας. λήγοντος δὲ τοῦ κλύδωνος, τὰς δίνας μετεώρους φέρεσθαι, ποικίλας οὕτω τὰς ἀναφορὰς ποιουμένας, ὥστε δοκεῖν πρηστῆρσιν ἤ τισιν ἄλλων μεγάλων ὄφεων σπειράματι παρομοίους τὰς κινήσεις ἀποτελεῖν. Φασὶν οἰκοδομούντων Ἀθηναίων τὸ τῆς Δήμητρος ἱερὸν τῆς ἐν Ἐλευσῖνι, περιεχομένην στήλην πέτραις εὑρεθῆναι χαλκῆν, ἐφ' ἧς ἐπεγέγραπτο, Δηιόπης τόδε σῆμα [Δημήτερος] ἣν οἱ μὲν λέγουσι Μουσαίου εἶναι γυναῖκα, τινὲς δὲ Τριπτολέμου μητέρα γενέσθαι.

Ἐν μιᾷ τῶν Αἰόλου προσαγορευομένων νήσων, πλῆθός τι φασὶ γενέσθαι φοινίκων· ὅθεν καὶ Φοινικώδη καλεῖσθαι. οὐκ ἂν οὖν εἴη τὸ λεγόμενον ὑπὸ Καλλισθένους ἀληθὲς, ὅτι ἀπὸ Φοινίκων τῆς Συρίας τὴν παραλίαν οἰκούντων, τὸ φυτὸν ἔλαβε τὴν προσηγορίαν· ἀλλὰ καὶ αὐτούς τους Φοίνικας ὑπὸ τῶν Ἑλλήνων φασί τινες προσαγορευθῆναι, διὰ τὸ πρώτους πλέοντας τὴν θάλασσαν, ᾗ ἂν ἀποβαίησαν, πάντας ἀποκτείνειν καὶ φονεύειν. καὶ κατὰ γλῶσσαν δέ ἐστι τὴν Περραιβῶν, τὸ αἱμάξαι, φοινίξαι.

* κ. οὐχ ὅμοιον

* Quidam, συγκινούμενον.

* Quidam, τοῖς ἀεὶ δ.

* κ. σπειράμασι

Ferunt & in Illyriis iumenta & bis in annos ſingulos, & pleraq. geminos, multa ternos, & quaternos parere, nonnulla etiam quinos, aut plures ſimul progignere, lactéque diurno tres ſemiſextarios implere. Tum gallinas nõ ſemel tantũ, ſed bis terve in dies ſingulos oua edere.

In Pæonia quoque eſſe aiunt feros boues omniũ maximos qui vbiuis alibi ſint. ** Itaq. igni collatũ nihil differre. Atq. hoc arcanum tempore non exiguo cerni: ignem enim æſtate tota emitti, aquã verò omni tempore. De Siculo freto cùm alij complures ſcribant, tum hic ſtupendam in eo rem euenire inquit. Tyrrheni enim maris æſtũ ſtrepitu ingenti vtrinque, cùm Siciliæ tum Italiæ oram, quam Regium vocant, ferire, delatúmq. ex mari vaſto in anguſtias poſtremò concludi, atq. ibi fluctũ ſublimem tolli, ſonitu magno ſpatióq. altiſſimo, vt procul diſtantibus conſpicua ſit hæc aquarum ebullitio, vtpute alba, & ſpumoſa, nec ſimilis maris incremento. Hæc vt incredibiliter narrantur, ita contueri oculis nemo ſuſtinet. Interdum enim diffuſi rurſus ex colliſione mutua æſtus adeò profundũ ac horribilem aſpectum neceſſario intuentibus præbent, vt nonnulli præ timore animi impotentes, vel vt offuſa oculis tenebra concidant. Poſtquam verò ad alterutram partem fluctus alliſi, ſublatique ad litus ſupremum, denuò in ſubiectum mare deuoluuntur, tum magno rugitu, cum vorticibus & immenſis, & crebris ex imo fundo ebullit, inque gyrum eleuatur, & omnigenos etiam colores reddit. Interdum enim ater, nonnunquam cæruleus frequenter purpureus apparet. Cæterùm curſum ac immẽſitatem fluxus refluxúſque ne reptilia quidem vel audire, vel videre ſuſtinent, quocirca ad radices montium iuxta confugiunt. Tempeſtate autem deſinente, in ſublime efferuntur voragines, ſpecie relucente varia, turbinibúſque, ac motibus ventorum, aut ingentium ſerpentum ſpiris non abſimiles. Aiunt Athenienſib. templũ Cereris Eleuſiniæ extruentibus, porrectã à petris columnã ęreã inuentam, cui inſcriptũ erat, Deiopes hoc ſepulchrum, quam, alij Muſæi vxorẽ, alij verò Triptolemi matrem fuiſſe perhibent. Iuxta Æolias inſulas, vt vocant, vnam ferunt palmis arboribus abundantem, nomen ex eo traxiſſe vt Phœnicuſa appellaretur. Itaque falsò Calliſthenes aſſerit à Phœnicibus Syriam litoralem incolentibus, arbori nomen hoc inditum. Verùm à Græcis aiunt quidam Phœnices appellatos, quòd primi maria nauigantes, quocunque appellerent, omnes necarent. Sed & Perœborum lingua φοινίξαι trucidare ſignificat. Circa Hypatam vrbem dicitur columna vetus reperta eſſe inſignita inſcriptione literis vetuſtis compoſita. Quas Acarnanes, cùm ea cuius eſſet, explorare cuperent, Athenas miſerunt quoſdam allaturos, qui dum per Bœotiã iter faciunt, caſu,

Τῆς καλουμένης Αἰνιακῆς χώρας περὶ τὴν ὀνομαζομένην Ὑπάτην λέγεται παλαιά τις στήλη εὑρεθῆναι. ἣν οἱ Αἰνιᾶνες τίνος ἦν εἰδέναι βουλόμενοι, ἔχουσαν ἐπιγραφὴν ἀρχαίοις γράμμασιν, ἀπέστειλαν εἰς Ἀθήνας τινὰς κομίζοντας αὐτήν. πορευομένων δὲ διὰ τῆς Βοιωτίας, καί τινι τῶν

missio-

miſſionis cauſam aduenis quibuſdam detegunt, à quibus Thebas ad Iſmenium, quod vocant, adducuntur, eò quòd iſthic monumentum literis ſimilibus conſcriptum cerneretur, & rhythmos etiam, donariis inſculptos, literis non abſimilibus, quas à peritis eatum edocti, legendo, propoſitam inſcriptionem aſſecuti ſunt, his ſcilicet carminibus compoſitam:

Abducta boue Geryonis, pulchráque Erythia,
Hæc luco Alcides Perſephonæ poſuit.
Victorem & deſiderio Dea candida vicit,
Nympharum vero de genere vna Erythe.
Hic puerum fago complexa Erythonta ſub alta,
Concubitus ſola hæc dat monumenta ſui.

Hoc epigrammate patet, eum locum Erythum appellatum, quòd iſthinc boues, non ex Erythia deduxerit. Neque enim vſpiam vel iuxta Libyam vel Hiſpaniam, nomen Erythia extare ferunt.

In Vtica Libyæ naſci fimum foſſilem aiunt trium paſſuum profunditate, aſpectu album, [illegible] firmum, ſed ſimilem viſcoſiſſimo glutino, qui in Solem prolatus adeò indureſcit, vt nihil à Pario lapide differat, quo cum animalcula & vaſcula poliuntur.

Primos Phœnices ferunt, cùm Tarteſſum nauigaſſent, tantam argenti vim oleo aliíſque nauticis ſordibus commutaſſe, vt nec capere naues, nec ferre poſſent: quocirca coactos ſub diſceſſum, cùm cætera, quibus vtebantur, tum anchoras etiam ex argento conflare.

Phœnices aiunt, qui Gadiram inhabitant, dum vltra columnas Herculis nauigarent, vento Subſolano impulſos ad regiones quaſdam applicuiſſe, vlua algâque plenas, quæ æſtibus maris rigantur, exundationibus verò prorſus obruuntur aquis. Thunnorum copiam iſthic innumerabilem inueniri tradunt, magnitudine denſitatéque incredibili, quos ſalſos vaſis impoſitos Carthaginem deportant, vnde ſoli non euehuntur, ſed ob ſingularem bonitatem planè abſumuntur.

In Pedaſia Cariæ vrbe Ioui ſacrificium peragitur, quò aiunt capram miſtam (quod admiratione dignum) ſtadiis ſeptuaginta ex Pedaſo per turbam frequentem, quæ ſpectare ſolet, progredi, neque interturbari, aut à via declinare. quódque reliquis gentibus magis ſtupendum eſt, cornua heminas quatuor capere.

In Illyriis, qui Ardiæi vocantur, iuxta Autoritarum confinia montem magnum, & in propinquo vallem eſſe inquiunt, vnde aqua proſilit copiòſa, non equidem omni tempore, ſed vêre tantùm, quã interdiu vaſi infuſam ſeruant, noctu ſub dio conſtituũt. Quod dum ita fit ſex diebus, vltimò cõgelatur, ac ſal omnium præſtantiſſimum efficitur. Studioſe hoc ob pecorum copiam potiſſimũ facere obſeruant.

A ξένων ὑπὸ τῆς ἀποδημίας ἀνακοινουμένων, λέγεται αὐτοὺς εἰσαχθῆναι εἰς τὸ καλούμενον Ἰσμήνιον ἐν Θήβαις. ἐκεῖθεν μὲν γὰρ μάλιστα ἂν εὑρεθῆναι τὴν τῶν γραμμάτων ἐπιγραφήν· λέγοντες εἶναί τινα ἀναθήματα ὁμοίους ἔχοντα τοὺς ῥυθμοὺς τῶν γραμμάτων ἀρχαῖα. ὅθεν αὐτοὺς φασὶν ἀπὸ τῶν γνωριζομένων, τὴν εὕρεσιν ποιησαμένους τῶν ἐπιζητουμένων, ἀναγράψαι τούσδε τοὺς στίχους·

Ἡρακλέους τεμένη τε Κυθήρα Φερσεφαάσσῃ,
* Τῇ δ᾽ ἀγέλην ἐλάων, ἠδ᾽ Ἐρύθε᾽ ἂν ἄγων.
Τὰς δ᾽ ἐδάμασσε πόθῳ Πασιφάεσσα θεά.
Τῇδε δέ μοι τέκνῳ τῷ δ᾽ Εὐρύθοντι δάμαρτι
Νυμφογενὴς Ἐρύθη δὴ τόδ᾽ ἔδωκα πέδον
B Μναμόσυνον φιλίας, φηγῷ ὑπὸ σκιερᾷ.

* γρ. πεδερεῦσας ἄγ.

τούτῳ τῷ ἐπιγράμματι ἐπεχώρησε καὶ ὁ τόπος ἐκεῖνος Ἐρυθὸς καλούμενος, καὶ ὅτι ἐκεῖθεν τὰς βοῦς καὶ οὐκ ἐξ Ἐρυθείας ἤγαγεν. οὐδὲ γὰρ ἐν τοῖς κατὰ Λιβύην καὶ Ἰβηρίαν τόποις οὐδαμοῦ τὸ ὄνομα λέγεσθαί φασι τῆς Ἐρυθείας.

Τῆς δὲ Λιβύης ἐν Ἰτύκῃ [τῇ] καλουμένῃ (ἣ κεῖται μὲν, ὡς λέγουσιν, ἐν τῷ κόλπῳ τῷ μεταξὺ* Ἑρμείας καὶ τῆς Ἱππου ἄκρας, ἐπέκεινα δὲ Καρχηδόνος [ὡς] σταδίους διακοσίους· ἣ καὶ πρότερον κτισθῆναι λέγεται αὐτῆς τῆς Καρχηδόνος ἔτεσι διακοσίοις ὀγδοήκοντα ἑπτὰ, ὡς ἀναγέγραπται ἐν ταῖς Φοινικικαῖς ἱστορίαις) γίνεσθαί φασιν ἅλας ὀρυκτοὺς, ἐπὶ τρεῖς C ὀργυιὰς τὸ βάθος, τῇ ὄψει λευκοὺς καὶ οὐ στερεοὺς, ἀλλ᾽ ὁμοίους τῷ γλισχροτάτῳ γλοιῷ· καὶ ὅταν ἀνενεχθῶσιν εἰς τὸν ἥλιον, ἀποστερεοῦσθαι, καὶ γίνεσθαι ὁμοίους τῷ Παρίῳ λίθῳ. γλύφεσθαι δὲ ἐξ αὐτῶν λέγουσι ζῴδια καὶ ἄλλα σκεύη.

* γρ. Ἑρμαίας

Τοὺς πρώτους τῶν Φοινίκων ἐπὶ Ταρτησσὸν πλεύσαντας, λέγεται τοσοῦτον ἀργύριον ἀντιφορτίσασθαι, ἔλαιον καὶ ἄλλον ναυτικὸν* ῥύπον εἰσαγαγόντας, ὥστε μηκέτι ἔχειν δύνασθαι μήτε ἐπιδέξασθαι τὸν ἄργυρον, ἀλλ᾽ ἀναγκασθῆναι ἀποπλέοντας ἐκ τῶν τόπων, τά τε ἄλλα πάντα ἀργυρᾶ οἷς ἐχρῶντο, κατασκευάσασθαι, καὶ δὴ καὶ τὰς ἀγκύρας πάσας.

* Melius ῥῶπον

Λέγουσι τοὺς Φοίνικας τοὺς κατοικοῦντας τὰ Γάδειρα καλούμενα, ἔξω πλέοντας Ἡρακλείων στηλῶν ἀπηλιώτῃ ἀνέμῳ D ἡμέρας τέτταρας, παραγίνεσθαι εἴς τινας τόπους ἐρήμους θρύου καὶ φύκους πλήρεις· οὓς, ὅταν μὲν ἄμπωτις ᾖ, [μὴ] βαπτίζεσθαι· ὅταν δὲ πλημμύρα, κατακλύζεσθαι· ἐφ᾽ ὧν εὑρίσκεσθαι ὑπερβάλλον θύννων πλῆθος, καὶ τοῖς μεγέθεσι καὶ τοῖς πάχεσιν ἄπιστον, ὅταν ἐποκείλωσιν· οὓς ταριχεύοντες καὶ συνθέντες εἰς ἀγγεῖα, διακομίζουσιν εἰς Καρχηδόνα. ὧν Καρχηδόνιοι* μόνον οὐ ποιοῦνται τὴν ἐξαγωγὴν, ἀλλὰ διὰ τὴν ἀρετὴν ἣν ἔχουσι κατὰ τὴν βρῶσιν, αὐτοὶ καταναλίσκουσιν.

* Melius μόνοι

Ἐν τῇ Πηδασίᾳ τῆς Καρίας θυσία τῷ Διὶ συντελεῖται, ἐν ᾗ πέμπουσιν αἶγά τινα, περὶ ἣν θαυμαστόν τι φασὶ γίνεσθαι· βαδίζουσα γὰρ ἐκ Πηδάσων σταδίους ἑβδομήκοντα δι᾽ ὄχλου πολλοῦ τοῦ θεωροῦντος, οὔτε διαταράττεται κατὰ τὴν πορείαν, οὔτ᾽ E ἐκτρέπεται τῆς ὁδοῦ· δεδεμένη δὲ σχοινίῳ, προπορεύεται τοῦ τὴν ἱερωσύνην ἔχοντος. καὶ τὰ κέρατα αὐτῆς χωρεῖν τέσσαρας χόας, ἐνίων δὲ καὶ πλεῖον. ** Θαυμαστὸν δ᾽ ἐστὶ καὶ τὸ δύο κόρακας εἶναι διὰ τέλους περὶ τὸ τοῦ Διὸς ἱερὸν, ἄλλον δὲ μηδένα πέτεσθαι τόπον, καὶ τὸν ἕτερον αὐτῶν ἔχειν τὸ περὶ τὸν τοῦ τραχήλου λευκόν.

Ἐν Ἰλλυριοῖς δὲ τοῖς Ἀρδιαίοις καλουμένοις, παρὰ τὰ μεθόρια τῶν Αὐταριατῶν, κἀκεῖνοί φασιν ὄρος εἶναι μέγα· τούτου δὲ πλησίον ἄγκος, ὅθεν ὕδωρ ἀναπηδᾶν, οὐ πᾶσαν ὥραν, ἀλλὰ τὸ ἔαρ, πολὺ τῷ πλήθει. ὃ λαμβάνοντες, τὰς μὲν ἡμέρας ἐν τῷ στεγνῷ φυλάττουσι, τὰς δὲ νύκτας εἰς τὴν αἰθρίαν τιθέασι. καὶ πέντε ἢ ἓξ ἡμέρας τοῦτο ποιησάντων αὐτῶν, πήγνυται τὸ ὕδωρ, καὶ γίνεται κάλλιστον ἅλας· ὃ ἕνεκεν τῶν βοσκημάτων μάλιστα διατηροῦσιν.

οὐ γὰρ εἰσάγονται πρὸς αὐτοὺς ἅλες, διὰ τὸ κατοικεῖν πόρρω αὐτοὺς θαλάσσης, καὶ εἶναι αὐτοὺς ἀμίκτους. πρὸς οὖν τὰ βοσκήματα πλείστην αὐτῶν χρείαν ἔχουσιν. ἁλίζουσι γὰρ αὐτὰ δὶς τοῦ ἐνιαυτοῦ. ἐὰν δὲ μὴ ποιήσωσι τοῦτο, συμβαίνει αὐτοῖς ἀπόλλυσθαι τὰ πλεῖστα τῶν βοσκημάτων. Ἐν Ἄργει δέ φασι γίνεσθαι ἀκρίδος τινὸς γένος, ὃ καλεῖται σκορπιομάχον. ὅταν γὰρ ἴδῃ [τάχιστα] σκορπίον, ἀνθίσταται αὐτῷ· ὡσαύτως δὲ καὶ ὁ σκορπίος ἐκείνῃ· καὶ κύκλῳ περιιοῦσα τρίζει περὶ αὐτόν· τὸν δὲ, κέντρον ἐπαίροντα, ἀντιπεριάγειν ἐν τῷ αὐτῷ τόπῳ, εἶτα κατὰ μικρὸν ἀνιέναι τὸ κέντρον, καὶ τέλος ὅλον ἐκτείνεσθαι, τῆς ἀκρίδος κύκλῳ τρεχούσης. τὰ τελευταῖα δὲ προσελθοῦσα, κατεσθίει αὐτόν. ἀγαθὸν δέ φασιν εἶναι πρὸς τὰς πληγὰς τοῦ σκορπίου ἐπιφαγεῖν αὐτήν. Τοὺς ἐν Νάξῳ σφῆκάς φασιν, ὅταν φάγωσι τοῦ ἔχεως, (προσφιλὴς δ᾽ αὐτοῖς ἡ σάρξ, ὡς ἔοικεν, ἐστὶν) ἐπειδὰν τινὰ κεντήσωσι, περιωδυνίους οὕτως ποιεῖν, ὥστε χαλεπωτέραν φαίνεσθαι τῆς πληγῆς τῶν ἔχεων.

Φασὶ τὸ Σκυθικὸν φάρμακον, ᾧ ἀποβάπτουσι τοὺς οἰστούς, συντίθεσθαι ἐξ ἐχίδνης. τηροῦσι δὲ, ὡς ἔοικεν, οἱ Σκύθαι τὰς ἤδη ζωοτοκούσας, καὶ λαβόντες αὐτὰς, τήκουσιν ἡμέρας τινάς. ὅταν δὲ ἱκανῶς αὐτοῖς δοκῇ σεσῆφθαι πᾶν, * τὸ τοῦ ἀνθρώπου αἷμα εἰς χυτρίδιον ἐγχέοντες, εἰς τοὺς κοπρίους κατορύττουσι πωμάσαντες. ὅταν δὲ καὶ τοῦτο σαπῇ, τὸ ὑφιστάμενον ἐπάνω τοῦ αἵματος, ὃ δή ἐστιν ὑδατῶδες, μιγνύουσι τῷ τῆς ἐχίδνης ἰχῶρι, καὶ οὕτω ποιοῦσι θανάσιμον.

* Quidam, τὸ ἀ. αἷ. ἐ. χ. ἐγχέοντες, εἰς τὰς κοπρίας κ.

Ἐν Κουρίῳ τῆς Κύπρου ὄφεών τι γένος εἶναί φασιν, ὃ τὴν δύναμιν ὁμοίαν ἔχει τῇ ἐν Αἰγύπτῳ ἀσπίδι, πλὴν ὅτι τοῦ χειμῶνος ἐὰν δάκῃ, οὐδὲν ἐργάζεται, εἴτε δι᾽ ἄλλην τινὰ αἰτίαν, εἴτε διότι τὸ ζῷον δυσκίνητον γίνεται ὑπὸ τοῦ ψύχους ἀποπηγνύμενον, καὶ τελέως ἀδύνατον, ἐὰν μὴ θερμανθῇ.

Ἐν Κέῳ φασὶν εἶναί τι γένος ἀχέρδου, ὑφ᾽ ἧς ἐάν τις πληγῇ τῇ ἀκάνθῃ, ἀποθνήσκει. Ἐν Μυσίᾳ φασὶν ἄρκτων τι γένος εἶναι λευκόν, * αἳ ὅταν κυνηγῶνται, ἀφιᾶσι τοιαύτην πνοὴν, ὥστε τῶν κυνῶν τὰς σάρκας σήπειν· ὡσαύτως δὲ καὶ τῶν λοιπῶν θηρίων ἀβρώτους ποιεῖν· ἐὰν δέ τις καὶ βιάσηται καὶ ἐγγίσῃ, ἀφιᾶσιν ἐκ τοῦ στόματος φλέγμα παμπολύ τι, ὡς ἔοικεν· ὃ προσφυσᾷ πρὸς τὰ πρόσωπα τῶν κυνῶν, ὡσαύτως καὶ τῶν ἀνθρώπων, ὥστε καὶ ἀποπνίγειν καὶ ἀποτυφλοῦν.

* χ. αἱ ἅμα κυν.

Ἐν δὲ τῇ Ἀραβίᾳ ὑαινῶν τι γένος φασὶν εἶναι, ὃ ἐπειδὰν προΐδῃ τι θηρίον, ἢ ἀνθρώπου ἐπιβῇ ἐπὶ τὴν σκιάν, ἀφωνίαν ἐργάζεται καὶ * πῆξιν τοιαύτην, ὥστε μὴ δύνασθαι κινεῖν τὸ σῶμα. τοῦτο δὲ ποιεῖν καὶ ἐπὶ τῶν κυνῶν.

* χ. πῆξιν

Κατὰ δὲ Συρίαν εἶναί φασί τι ζῷον ὃ καλεῖται λεοντοφόνον. ἀποθνήσκει γὰρ ὁ λέων ὡς ἔοικεν, ὅταν αὐτοῦ φάγῃ. ἑκὼν μὲν τοῦτο οὐ ποιεῖ, ἀλλὰ φεύγει τὸ ζῷον. ὅταν δὲ συλλαβόντες αὐτὸ οἱ κυνηγέται, καὶ ὀπτήσαντες ὥσπερ ἄλφιτα λευκὰ περιπάσωσιν ἄλλῳ ζῴῳ, τὸ γευσάμενον ἀπόλλυσθαί φασι παραχρῆμα. κακοῖ καὶ προσουρούμενον τὸν λέοντα τοῦτο τὸ ζῷον.

Λέγεται καὶ τοὺς γῦπας ὑπὸ τῆς τῶν μύρων ὀσμῆς ἀποθνήσκειν, ἐάν τις αὐτοὺς χρίσῃ ἢ δῷ τι μεμυρισμένον φαγεῖν· ὡσαύτως δὲ καὶ τοὺς κανθάρους ὑπὸ τῆς τῶν ῥόδων ὀσμῆς.

Καὶ ἐν Σικελίᾳ δέ φασι καὶ ἐν Ἰταλίᾳ τοὺς γαλεώτας θανάσιμον ἔχειν τὸ δῆγμα, καὶ οὐχ ὥσπερ τοὺς παρ᾽ ἡμῖν, ἀσθενὲς καὶ μαλακόν. εἶναι δὲ καὶ μυιῶν γένος ἐφιπτάμενον, ὃ ὅταν δάκῃ, ἀποθνήσκειν * ποιεῖ. Ἐν δὲ τῇ Μεσοποταμίᾳ τῆς Συρίας φασὶ καὶ ἐν Ἰσρουντι ὀφίδιά τινα γίνεσθαι, ἃ τοὺς ἐγχωρίους οὐ δάκνει, τοὺς ξένους δὲ καὶ ἀδικεῖ σφόδρα.

* χ. ποιεῖν.

A Neque enim ad eos ſal importatur, tum quod à mari longiùs habitant, & à commerciis ſunt alieniores. qui tamen ob pecora cùm primis opus habent: interitura, niſi bis in ſingulos annos eo reficiantur. In Argo genus locuſtæ ferunt eſſe (Scorpiomachum vocant) quod viſo ſcorpione ſtatim pugnæ accingitur, ipſo viciſſim ſe opponente. Itaque vndequaque circumcurrens ſtridore aſſultat: contrà aculeum ille eodem loco velvt in gyrum actus, vbique obtendit, donec auidiùs fortè ac nimis eductum totum amittat. Quocirca aduolans beſtiola velvt exarmatum iam deuorat. Scorpionum ictibus, hæc ſtatim comeſta, medetur.

B Veſpas ferunt in Naxo, ſi ſerpente guſtato, quorum caro pergrata eſt illis, aculeum infixerint alicui, tantos dolores excitare, vt tolerabiliores videantur ictus ſerpentum.

Scythicum venenum, quo ſagittæ inficiuntur, ex vipera parari aiunt. Obſeruant enim Scythæ parientes, & captas mox diebus aliquot liquefaciunt: cúmque ſatis computruiſſe videntur, infundunt ollulæ humanum ſanguinem, quam in ſterquilinio defoſſam cooperiunt. Ac vbi putridus iam is quoque apparet, liquorem ſupernatantem aquoſum, miſcent cruore viperæ, præſenſque & lethale hoc pacto venenum reddunt. In Curio Cypri vrbe, C ſerpentum quoddam genus eſſe vim habens aſpidi Ægyptio non abſimilem, niſi quòd hyeme morſus huius ſunt inefficaces, ſiue ob aliam quampiam cauſam, ſiue quòd ad motum languidum ex frigore redditur, & poſtremo prorſus collabitur, niſi calore reficiatur.

In Ceo aiunt genus eſſe acherdi, cuius ſpina, qui vulnerantur, intereunt. In Myſia verò vrſorum quoddam genus album eſſe aiunt, quod inter venandum canes flatu infectos putrefacit, eodemque modo & reliquarum ferarum carnem eſui inutilem reddit. Verùm vbi iam inſtant canes, & venatores, phlegmate vtrorumque faciem conſpuunt, quod pertina- D citer hærens ſuffocat & excæcat. Aiunt in Arabia hyænarum genus eſſe quoddam, quod ſimul ac feram aliquam viderit, aut ſuper hominis vmbram ingredi cœperit, vocem illis aufert, & conſternationem ſtuporémque tantum infert vt corpus mouere nequeant. Idem aiunt & canibus vſuuenire. In Syria animal eſſe aiunt, quod leonicidum vocant: eo enim ingeſto leones exanimantur. Volentes non tangunt, ſed fugiunt. Verùm venatores vt farinam candidam decoctam animalib. reliquis aſpergunt, quæ guſtata ſubitò necant, vrinam leonibus grauant. Feruntur & vultures ex vnguentorum odore exanimari, ſi qui vel vngantur ipſi, vel vncta vorent, & ſcarabeis E ex roſarum odore itidem euenire. Et in Sicilia, & in Italia aiunt felium morſum lethalem, nec vt apud nos & leuem, & imbecillem: & muſcarum genus, quod morſu necet, ad quæ deuolarit. In Meſopotamia Syriæ, & in Iſtrunte aiunt ſerpentes quoſdam exiguos naſci, qui indigenas non lædant, aduenas verò vehementer infeſtent.

A Circa verò Euphratem fluuium maximè id accidere inquiunt, vbi plurimi circa fluminis litora conſpiciuntur, qui in partem vtramque deuolui ſolent, vt cùm veſpere citerius litus occupent, illuceſcente luce vltra flumen videantur, ac Syros quidem non lædunt, ſed Græcis minimè parcunt.

In Theſſalia ferunt ſacrum ſerpentem non ſolùm morſu, ſed etiam contactu reliquos omnes perdere. Quocircà cùm apparet, aut vox tantùm auditur (quod rarò contingit) ſerpentes, ac viperæ, tum reliquæ etiam feræ omnes diffugiunt. Magnitudine eſt non perinde vaſta, ſed moderata.

B Aiunt, in Teno vrbe ipſum à muliere è medio ſublatum in hunc modum. Primum circulum deſcripſit fœmina, quem incantationibus habitis vnà cum filio ingreſſa, ac vocem beſtiæ imitata eſt: qua recinente, accedenteque, obdormiſcere cœpit, magiſque iam ad propinquante, ſomno abſtinere non potuit: quocirca filius matrem pulſauit (ita præcipiente ipſa) minatus, ſi obdormiret, vtrique C certum imminere interitum, verùm ſi periret, ac beſtiam abducere poſſet, ſaluos fore. Itaque circulum ingreſſus ſerpens ſtatim exanimatus eſt.

A Περὶ δὲ τὸν Εὐφράτην καὶ τελείως φασὶ τοῦτο γίνεσθαι. πολλοὺς γὰρ φαίνεσθαι περὶ τὰ χείλη τοῦ ποταμοῦ, καὶ διανέοντας ἐφ' ἑκάτερα· ὥστε τῆς δείλης ἐντεῦθεν θεωρουμένους, ἅμα τῇ ἡμέρᾳ ἐπὶ θατέρου μέρους φαίνεσθαι, καὶ τοῖς ἀναπαυομένοις τῶν μὲν Σύρων, μὴ δάκνειν, τῶν δὲ Ἑλλήνων μὴ ἀπέχεσθαι. Ἐν Θετταλίᾳ φασὶ τὸν ἱερὸν καλούμενον ὄφιν πάντας ἀπολλύειν, οὐ μόνον ἐὰν δάκῃ, ἀλλὰ καὶ ἐὰν θίγῃ. διὸ καὶ ὅταν φανῇ, καὶ τὴν φωνὴν ἀκούσωσι, (φαίνεται δὲ σπανίως) φεύγουσι καὶ οἱ ὄφεις καὶ αἱ ἔχεις, καὶ τἆλλα πάντα B θηρία. τῷ δὲ μεγέθει οὐκ ἔστι μέγας, ἀλλὰ μέτριος.

Ἐν Τήνῳ δέ ποτέ φασιν * αὐτῇ τῇ πόλει κατὰ Θετταλίαν ἀναιρεθῆναι ὑπὸ γυναικός· γενέσθαι δὲ τὸν θάνατον τοιόνδε· * Γυναῖκα κύκλον γράψασαν, καὶ τὰ φάρμακα θεῖσαν, εἰσβῆναι εἰς τὸν κύκλον, αὐτὴν καὶ τὸν υἱόν, εἶτα μιμεῖσθαι τὴν φωνὴν τοῦ θηρίου· τὸ δὲ ἀντᾴδειν, καὶ προσιέναι. ᾄδοντος δὲ, καταδαρθεῖν τὴν γυναῖκα, καὶ ἐγγυτέρω προσιόντος, μᾶλλον, ὥστε μὴ δύνασθαι κρατεῖν τοῦ ὕπνου. τὸν δὴ υἱὸν παρακαθήμενον ἐγείρειν, τύπτοντα, κελευούσης ἐκείνης, καὶ C λέγειν ὅτι ἐὰν μὲν καθυπνώσῃ, ἀπολεῖται καὶ αὐτὴ καὶ ἐκεῖνος· ἐὰν δὲ βιάσηται καὶ προσαγάγηται τὸ θηρίον, σωθήσονται. ὡς δὲ προσῆλθεν ὁ ὄφις εἰς τὸν κύκλον, αὖον εὐθὺς γενέσθαι αὐτόν.

* Quidam ... vox T ... caret ... ne mendi ...

PLERIQVE VETERES CODICES, QVIBVS VSVS eſt olim Henricus Stephanus cùm hunc libellum ederet, principium ſupra poſitum non agnoſcunt: ſed eius loco habent quæ ſequuntur.

Λέγεται περὶ τὰ Τύανα ὕδωρ εἶναι Ὁρκίου Διὸς * δὲ αὐτὸ Ἀσβαμαῖον, οὗ πηγὴ ἀναδίδοται πάνυ ψυχρά. παφλάζει δὲ ὥσπερ οἱ λέβητες. τοῦτο εὐόρκοις μὲν ἡδύ τε καὶ ἵλεων, ἐπιόρκοις δὲ παρὰ πόδας ἡ δίκη. ἀποσκήπτει γὰρ καὶ εἰς ὀφθαλμοὺς καὶ εἰς χεῖρας καὶ εἰς πόδας. ἁλίσκονταί τε ὑδέροις καὶ φθόαις· καὶ οὐδὲ πρόσθεν ἀπελθεῖν δυνατόν, ἀλλ' αὐτόθι ἔχονται, καὶ ὀλοφύρονται πρὸς τῷ ὕδατι, ὁμολογοῦντες ἃ ἐπιώρκησαν. Ἀθηναῖοί φασι τὸν ἱερὸν τῆς ἐλαίας θαλλὸν ἐν ἡμέρᾳ μιᾷ βλαστῆσαι, καὶ πλείονα γενέσθαι, ταχὺ δὲ αὖ πάλιν συστέλλεσθαι. Τῶν ἐν Αἴτνῃ κρατήρων ἀναρραγέντων καὶ ἀνὰ τὴν γῆν φερομένων ἔνθα καὶ ἔνθα, χειμάρρου δίκην, τὸ τῶν εὐσεβῶν γένος ἐτίμησε τὸ δαιμόνιον. περικαταληφθέντων γὰρ ὑπὸ τοῦ ῥεύματος, διὰ τὸ βαστάζειν γέροντας ἐπὶ τῶν ὤμων γονεῖς καὶ σώζειν, πλησίον αὐτῶν γενόμενον τὸ τοῦ πυρὸς ῥεῦμα ἐξεσχίσθη, παρέτρεψέ τε τοῦ φλογμοῦ, τὸ μὲν ἔνθα, τὸ δὲ ἔνθα· καὶ ἐτήρησεν ἀβλαβεῖς ἅμα τοῖς γονεῦσι τοὺς νεανίσκους. Λέγεται τὸν ἀγαλματοποιὸν Φειδίαν κατασκευάζοντα τὴν ἐν ἀκροπόλει Ἀθηνᾶν, * ἐν μεσότητι ταύτης τῆς ἀσπίδος τὸ ἑαυτοῦ πρόσωπον ἐντυπώσασθαι, καὶ συνδῆσαι τῷ ἀγάλματι διά τινος ἀφανοῦς δημιουργίας, ὥστε ἐξ ἀνάγκης, εἴ τις βούλοιτο αὐτὸ περιαιρεῖν, τὸ σύμπαν ἄγαλμα λύειν τε καὶ συγχεῖν. Φασὶν ὡς [ὁ] ἀνδριὰς ὁ τοῦ * Μίτυος ἐν Ἄργει ἀπέκτεινε [τὸν αἴτιον] τοῦ θανάτου τῷ Βίτυϊ, θεωροῦντι ἐμπεσών. ἔοικεν οὖν οὐκ εἰκῆ τὰ τοιαῦτα γίνεσθαι. Φασὶ τὰς κύνας μόνον διώκειν τὰ θηρία πρὸς τὰς κορυφὰς τῶν Μελαινῶν καλουμένων ὀρῶν, ἀλλ' ἀναστρέφειν, ὅταν ἄχρι τούτων διώκωσιν. Ἐν τῷ Φάσιδι ποταμῷ γίνεσθαι ῥάβδον ὀνομαζομένην Λευκόφυλλον, ἣν οἱ ζηλότυποι τῶν ἀνδρῶν δρεπόμενοι, ῥιπτοῦσι περὶ τὸν παρθένιον θάλαμον, καὶ ἀδιάφθορον τηροῦσι τὸν γάμον. Ἐν δὲ τῷ Τίγριδι γίνεσθαί φασι λίθον Μωδὼν κεκλημένον βαρβαρικῶς, τῇ χρόᾳ πάνυ λευκόν· ὃν ἐὰν κατέχῃ τις, οὐδὲν ὑπὸ θηρίων ἀδικεῖται. Ἐν δὲ τῷ Σκαμάνδρῳ γίνεσθαί φασι βοτάνην * Σίστρον καλουμένην, παραπλησίαν ἐρεβίνθῳ, κόκκους δὲ ἔχειν σειομένους· ὅθεν τὴν προσηγορίαν ἔλαβε. ταύτην τοὺς κατέχοντας, μήτε δαιμόνιον, μήτε φαντασίαν ἥντινα οὖν φοβεῖσθαι. Περὶ Λιβύην ἄμπελός ἐστιν ἣν καλοῦσι μαινομένην τινές, ἣ τῶν καρπῶν τοὺς μὲν πεπαίνει, τοὺς δὲ ὀμφακώδεις ἔχει, τοὺς δὲ ἀνθοῦντας καὶ βραχύν τινα χρόνον. Περὶ τὸ Σίπυλον ὄρος γίνεσθαί φασι λίθον παρόμοιον κυλίνδρῳ, ὃν οἱ εὐσεβεῖς υἱοὶ ὅταν εὕρωσιν, ἐν τῷ τεμένει τῆς μητρὸς τῶν θεῶν τιθέασι, καὶ οὐδέποτε χάριν ἀσεβείας ἁμαρτάνουσιν, ἀλλ' ἀεί εἰσι φιλοπάτορες. Ἐν ὄρει τῷ Ἡφίτῳ γίνεσθαι βοτάνην καλουμένην Χαρισίαν, ἣν γυναῖκες ἔρωτος ὀρεγόμεναι τοῖς τραχήλοις περιάπτουσι, καὶ ὑπὸ τῶν ἀνδρῶν συμπαθέστερον

Libro De mundo c. 6. ſcriptū eſt, ἐν μέσῳ τῷ ... ἀσπίδι.

De poetica c. 10.

* κ. Βίτυος

Melius σεῖστρον

ἐρῶνται. Αἱ ἐν Κρήτῃ αἶγες, ὅταν τοξευθῶσι, ζητοῦσι τὸ δίκταμον τὸ ἐκεῖ φυόμενον· ὅταν γὰρ φάγωσιν, εὐθὺς ἐκβάλλουσι τὰ τοξεύματα. Αἱ ἐν Κεφαλληνίᾳ αἶγες οὐ πίνουσιν, ὡς ἔοικεν, ὥσπερ καὶ τἄλλα τετράποδα, καθ᾽ ἑκάστην ἡμέραν· ἀλλὰ πρὸς τὸ πνεῦμα αὐτίκα τὰ πρόσωπα ποιήσασαι, χάσκουσιν εἰσδεχόμεναι τὰ πνεύματα. Φασί τινας ἐν Ἀχαΐᾳ τῶν ἐλάφων, ὅταν ἀποβάλωσι τὰ κέρατα, εἰς τοιούτους τόπους ἔρχεσθαι ἐν οἷς οὐκ ἔστι ῥᾴδιον εὑρεθῆναι. τοῦτο δὲ ποιεῖν, διὰ τὸ μὴ ἔχειν ᾧ ἀμυνοῦνται, καὶ διὰ τὸ πονεῖν τοὺς τόπους ὅθεν καὶ τὰ κέρατα ἀπέβαλον. πολλαῖς δὲ κισσὸν ἐπιπεφυκότα ἐν τῷ τῶν κεράτων τόπῳ ὁρᾶσθαι. Ὄθρυς ὄρος ἐστὶ Θετταλίας, ὃ φέρει ὄφεις τοὺς λεγομένους σῆπας, οἳ οὐκ ἔχουσι μίαν χροιάν, ἀλλ᾽ ἀεὶ ὁμοιοῦνται τῷ χώρῳ ἐν ᾧ οἰκοῦσι. τινὲς δὲ αὐτῶν ὅμοιον ἔχουσι τὸ χρῶμα τοῖς κόχλοις τῆς γῆς· ἄλλοις δὲ χλοάζουσα ἐστὶν ἡ φολίς. ὅσοι δὲ αὐτῶν ἐν ψαμμάθοις διατρίβουσι, ταύταις ἐξομοιοῦνται κατὰ τὸ χρῶμα. δάκνοντες δέ, ἐμποιοῦσι δίψος. ἔστι δὲ αὐτῶν τὸ δῆγμα, οὐ τραχὺ καὶ ἔμπυρον, ἀλλὰ κακόηθες. Τοῦ ἄρρενος ἔχιος τῇ ἐχίδνῃ συγγινομένου, ἡ ἔχιδνα ἐν τῇ συνουσίᾳ τὴν κεφαλὴν ἀποκόπτει· διὰ τοῦτο καὶ τὰ τέκνα, ὥσπερ τὸν θάνατον τοῦ πατρὸς μετερχόμενα, τὴν γαστέρα τῆς μητρὸς διαρρήγνυσιν. Ἐν τῷ Νείλῳ ποταμῷ γεννᾶσθαι λίθον φασὶ κυάμῳ παρόμοιον· ὃν αἱ κύνες ἰδοῦσιν, οὐχ ὑλακτοῦσι. συντελεῖ δὲ καὶ τοῖς δαιμονί τινι γενομένοις κατόχοις· ἅμα γὰρ τῷ προστεθῆναι ταῖς ῥισίν, ἀπέρχεται τὸ δαιμόνιον. Ἐν δὲ τῷ Μαιάνδρῳ ποταμῷ τῆς Ἀσίας λίθον φασὶν σώφρονα καλούμενον κατ᾽ ἀντίφρασιν· ὃν ἐάν τις εἴς τινος ἐμβάλῃ κόλπον, ἐμμανὴς γίνεται, καὶ φονεύει τινὰ τῶν συγγενῶν. Ῥῆνος καὶ [Ἴστρος] οἱ ποταμοὶ ὑπὸ ἄρκτον ῥέουσιν· ὁ μὲν Γερμανούς, ὁ δὲ Παίονας παραμείβων· καὶ θέρους μὲν ναυσίπορον ἔχουσι ῥεῖθρον, τοῦ δὲ χειμῶνος, παγέντες ὑπὸ κρύους ἐν πεδίου σχήματι καθιππεύονται. Περὶ τὴν Θουρίων πόλιν δύο ποταμούς φασιν εἶναι, Σύβαριν καὶ Κρᾶθιν. ὁ μὲν οὖν Σύβαρις, τοὺς πίνοντας ἀπ᾽ αὐτοῦ, πτυρτικοὺς εἶναι ποιεῖ· ὁ δὲ Κρᾶθις, τοὺς ἀνθρώπους ξανθότριχας, λουομένους. Ἐν δὲ Εὐβοίᾳ δύο ποταμούς εἶναι· ὧν ἀφ᾽ οὗ μὲν πίνοντα τὰ πρόβατα, λευκὰ γίνονται· ὃ ὀνομάζεται Κέρβης, ὁ δέ, Νηλεύς, ὃς μέλανα ποιεῖ. Παρὰ [τῷ] Λύκῳ ποταμῷ γεννᾶσθαι βοτάνην λόγχῃ παρόμοιον, συντελοῦσαν πρὸς ἀμβλυωπίας. Τὴν ἐν Συρακούσαις τῆς Σικελίας πηγὴν Ἀρέθουσαν, διὰ πενταετηρίδος κινεῖσθαι λέγουσιν. Ἐν ὄρει Βερεκύνθῳ γεννᾶσθαι λίθον καλούμενον μάχαιραν, ὃν ἐὰν εὕρῃ τις, τῶν μυστηρίων τῆς Ἑκάτης ἐπιτελουμένων, ἐμμανὴς γίνεται, ὡς Εὔδοξός φησιν. Ἐν ὄρει δὲ Τμώλῳ γεννᾶσθαι λίθον παρόμοιον κισσήρει, ὃς τετράκις τῆς ἡμέρας ἀλλάσσει τὴν χρόαν· βλέπεσθαι δὲ ὑπὸ παρθένων τῶν μὴ τῷ χρόνῳ φρονήσεως μετεχουσῶν. Ἐν Ἀρτέμιδος Ὀρθωσίας βωμῷ ταῦρον ἵστασθαι χρύσεον, ὃς κυνηγῶν εἰσελθόντων φωνὴν ἐπαφίησιν. Ἐν Αἰτωλοῖς φασὶν ὁρᾶν τοὺς ἀσπάλακας ἀμυδρῶς, καὶ οὐδὲ σιτεῖσθαι γῆν, ἀλλ᾽ ἀκρίδας. Τοὺς ἐλέφαντάς φασι κύειν ἔτη δύο· οἱ δέ, μῆνας ὀκτωκαίδεκα· ἐν δὲ τῷ ἐκτίκτειν δυστοκεῖν. Τημάρατον Τιμαίου τοῦ Λοκροῦ, ἀκουστὴν νοσήσαντα, ἄφωνόν φασιν ἐπὶ δέκα γενέσθαι ἡμέρας· ἐν δὲ τῇ ἑνδεκάτῃ αἰσθήσας βραδέως ἐκ τῆς παρακοπῆς, ἔφησεν ἐκεῖνον αὐτῷ ἥδιστα τὸν χρόνον βεβιῶσθαι. Ἐν Τήνῳ τῇ νήσῳ φασὶν εἶναι φιάλιον σύγκραμα ἔχον, ἐξ οὗ πῦρ ἀνάπτουσι (πάνυ) ῥᾳδίως. Καὶ ἐν Βιθυνίᾳ δὲ τῆς Θρᾴκης ἐν τοῖς μετάλλοις γίνεται ὁ καλούμενος ἄσπιος, ἐξ οὗ φασι πῦρ ἀνάπτεσθαι.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΦΥΣΙΟΓΝΩΜΟΝΙΚΑ.

ARISTOTELIS STAGIRITÆ PHYSIOGNOMONICΩN

Liber, incerto interprete.

CAPVT I.

Probat Phyſiognomoniam eſſe: hoc eſt, coniecturam de moribus ex lineamentis corporis fieri poſſe. Deinde phyſiognomoniæ modos explicat.

A QVOD animæ ſequuntur corpora, & ipſæ ſecundùm ſe ipſas non ſunt impaſſibiles à motibus corporis, id manifeſtum fit valde in ebrietatibus & ægritudinibus. multum namque animæ mutatæ videntur à paſſionibus corporis. Et econtrario quòd corpus B compatitur paſſionibus animæ, manifeſtum circa amores, & timores, & triſtitias, & delectationes. Ampliùs autem & in iis quæ natura fiunt, magis vtique aliquis conſpiciet, quòd corpus & anima ita ſe habent connaturalia, vt fiant cauſæ plurimarum paſſionum ad inuicem. Nunquam enim animal factum vel generatum eſt tale, quod formam haberet alterius animalis, animam verò alterius, ſed ſemper eiuſdem corpus & animam. Quare neceſſarium eſt conſequi tali corpori talem formam. Ampliùs autem & ſcientes circa vnumquodque C animalium ex forma poſſunt conſiderare: equites equos; & venatores, canes. Si autem hæc vera fuerint, (ſemper autem hæc vera ſunt,) erit ſanè ars quæpiam phyſiognomoniæ. Priores itaque phyſiognomones, iuxta tres modos adgreſſi ſunt hanc diſciplinam, quique iuxta vnum. Alij quidem ex generibus animalium phyſiognomonizant, ponentes ſecundùm vnumquodque genus figuram quandam animalis & ſpeciei animam. Alij autem in talibus corpori ſimilem habenti corpus & animam ſimilem putabant. Alij autem quidam hoc D quidem faciebant, non ex omnibus autem animalibus experiebantur, ſed diſtinguebant ex ipſo genere hominum ſecundùm gentes, quæcunque differunt ſecundùm vſus, & mores: vt Ægyptij, & Thraces, & Scythæ. Similiter electionem ſignorum faciebant. Quidam autem ex moribus à parentibus, quales mores diſpoſitionem ſequantur. Sequitur autem vnicuique mos, iracundo, timido, coeunti, & in vnaquaque aliarum paſſionum.

ΚΕΦΑΛ. α.

Ὅτι φυσιογνωμονεῖν ἐστι, καὶ πῶς.

A ὍΤΙ αἱ διάνοιαι ἕπονται τοῖς σώμασι, καὶ οὐκ εἰσὶν αὐταὶ καθ' ἑαυτὰς ἀπαθεῖς οὖσαι τῶν τοῦ σώματος κινήσεων, τοῦτο [δὲ] δῆλον [πάνυ] γίνεται, ἔν τε ταῖς μέθαις, καὶ [ἐν ταῖς] ἀρρωστίαις. πολὺ B γὰρ ἐξαλλαττούσας φαίνονται αἱ διάνοιαι ὑπὸ τῶν τοῦ σώματος παθημάτων. καὶ τοὐναντίον δὴ τοῖς τῆς ψυχῆς παθήμασι τὸ σῶμα συμπάσχον, φανερὸν γίνεται περί τε τοὺς ἔρωτας, καὶ τοὺς φόβους [τε] καὶ τὰς λύπας καὶ τὰς ἡδονάς. ἔτι δὲ ἐν τοῖς φύσει γινομένοις, μᾶλλον ἄν τις συνίδοι ὡς οὕτως ἔχει πρὸς ἄλληλα σῶμά τε καὶ ψυχὴ συμφυῆ, ὥστε τῶν πλείστων ἀλλήλοις αἴτια γίνεσθαι παθημάτων. οὐδὲν γὰρ πώποτε ζῷον γεγένηται τοιοῦτον, ὃ τὸ μὲν εἶδος ἔσχεν ἑτέρου ζῴου, τὴν δὲ C διάνοιαν ἄλλου· ἀλλ' ἀεὶ τοῦ αὐτοῦ τό τε σῶμα καὶ τὴν ψυχήν. ὥστε ἀναγκαῖον ἕπεσθαι τῷ τοιῷδε σώματι τοιάνδε διάθεσιν. ἔτι δὲ καὶ τῶν ἄλλων ζῴων, οἱ περὶ ἕκαστον ἐπιστήμονες, ἐκ τῆς ἰδέας δύνανται θεωρεῖν, ἱππικοί τε ἵππους, καὶ κυνηγέται κύνας.* Εἰ δὲ ταῦτα ἀληθῆ εἴη, (ἀεὶ δὲ ταῦτα ἀληθῆ ἐστιν) εἴη ἂν φυσιογνωμονεῖν. οἱ μὲν οὖν προγεγενημένοι φυσιογνώμονες, κατὰ τρεῖς τρόπους ἐπεχείρησαν φυσιογνωμονεῖν, ἕκαστος καθ' ἕνα. οἱ μὲν γὰρ, ἐκ τῶν γενῶν τῶν ζῴων φυσιο- D γνωμονοῦσι, τιθέμενοι καθ' ἕκαστον γένος, εἶδός τι ζῴου καὶ διάνοιαν.* οἱ δ' ἐπί τε τῶν τοιούτων σῶμά τι, εἶτα τὸν ὅμοιον τῷ τὸ σῶμα ἔχοντι, καὶ τὴν ψυχὴν ὁμοίαν ὑπελάμβανον. ἄλλοι δέ τινες τοῦτο μὲν ἐποίουν, οὐκ ἐξ ἁπάντων δὲ τῶν ζῴων ἐδοκίμαζον· ἀλλ' ἐξ αὐτοῦ τοῦ τῶν ἀνθρώπων γένους, διελόμενοι κατὰ τὰ ἔθνη, ὅσα διέφερε τὰς ὄψεις, καὶ τὰ ἤθη, οἷον Αἰγύπτιοι, καὶ Θρᾷκες, καὶ Σκύθαι, ὁμοίως τὴν ἐκλογὴν τῶν σημείων ἐποιοῦντο. οἱ δέ τινες ἐκ τῶν ἐπιφαινομένων ἠθῶν, οἷα διαθέσει ἕπεται ἕκαστον ἦθος τῷ ὀργιζομένῳ, τῷ φοβουμένῳ, τῷ ἀφροδισιάζοντι, καὶ τῶν ἄλλων δὴ παθημάτων ἑκάστῳ.

Priorum lib. 2. c. vlt.

* καὶ δὴ ταῦτα ἀληθῆ ἐστι, ἀληθὴς ἂν εἴη ἡ φυσιογνωμονία.

* κ. οἱ δ', ἐπὶ τούτοις σῶμά τι, εἶτα τὸν ὅμοιον τῷ τοιοῦτον σῶμα ἔχοντι

ἔστι δὲ κατὰ πάντας τούτους τοὺς τρόπους φυσιογνωμονεῖν, καὶ ἔτι κατ' ἄλλους, καὶ τὴν ἐκλογὴν τῶν σημείων ἀνομοίως ποιεῖσθαι. οἱ μὲν οὖν κατὰ τὰ ἤθη μόνον φυσιογνωμονοῦντες ἁμαρτάνουσιν ἄν, πρῶτον μέν, ὅτι ἔνιοι οὐχ οἱ αὐτοὶ ὄντες, τὰ ἐπὶ τῶν προσώπων ἤθη τὰ αὐτὰ ἔχουσιν, οἷον ὅ,τε ἀνδρεῖος καὶ ὁ ἀναιδὴς τὰ αὐτὰ ἔχουσι, τῆς διανοίας πολὺ κεχωρισμένοι. δεύτερον δέ, ὅτι κατὰ χρόνους τινὰς τὰ ἤθη οὐ τὰ αὐτά, ἀλλὰ ἕτερα ἔχουσι. δυσαρέστοις τε γὰρ οὖσιν, ἐνίοτε συνέβη τὴν ἡμέραν ἡδέως διαγαγεῖν, καὶ τὸ ἦθος λαβεῖν τὸ τοῦ εὐθύμου· καὶ τοὐναντίον εὔθυμον λυπηθῆναι, ὥστε τὸ ἦθος τὸ ἐπὶ τοῦ προσώπου μεταβαλεῖν. ἔτι πρὸς τούτοις περὶ ὀλίγων ἄν τις τοῖς ἐπιφαινομένοις τεκμαίροιτο. οἱ δὲ ἐκ τῶν θηρίων φυσιογνωμονοῦντες, οὐκ ὀρθῶς τὴν ἐκλογὴν τῶν σημείων ποιοῦνται. οὐ γὰρ δὴ ἑκάστου τῶν ζώων τὴν ἰδέαν διεξελθόντα ἔστιν εἰπεῖν, ὅτι ὃς ἂν ὅμοιος τούτῳ τὸ σῶμα ᾖ, καὶ τὴν ψυχὴν ὅμοιος ἔσται· πρῶτον μὲν γὰρ (ὡς ἁπλῶς εἰπεῖν οὕτως) ὅμοιον θηρίῳ ἄνθρωπον οὐδεὶς ἂν εὕροι, ἀλλὰ προσεοικότα μέν τι. ἔτι πρὸς τούτοις τὰ ζῷα ὀλίγα μὲν τὰ ἴδια ἔχει σημεῖα, πολλὰ δὲ τὰ κοινά· ὥστε ἐπειδὰν ὅμοιός τις ᾖ μὴ κατὰ τὸ ἴδιον, ἀλλὰ κατὰ τὸ κοινόν, τί μᾶλλον ἐστὶ λέοντι ἢ ἐλάφῳ ὁμοιότερος; εἰκὸς γὰρ τὰ μὲν ἴδια τῶν σημείων, ἴδιόν τι σημαίνειν· τὰ δὲ κοινά, κοινόν. τὰ μὲν οὖν κοινὰ τῶν σημείων, οὐδὲν ἂν διασαφηνείη τῷ φυσιογνωμονοῦντι. εἰ δέ τις τὰ ἴδια ἑκάστου τῶν θηρίων ἐκλέξειεν, οὐκ ἂν ἔχοι ἀποδοῦναι οὗ ἐστι ταῦτα σημεῖα· εἰκὸς γὰρ τοῦ ἰδίου. ἴδιον δὲ οὐδενὸς οὐδὲν τῶν ζώων τῶν φυσιογνωμονουμένων, ἔν γε τῇ διανοίᾳ ἔχοι ἄν τις λαβεῖν· οὔτε γὰρ ἀνδρεῖον μόνον ὁ λέων ἐστίν, ἀλλὰ καὶ ἄλλα πολλά· οὔτε δειλὸν ὁ λαγωός, ἀλλὰ καὶ ἄλλα μυρία. Εἰ οὖν μήτε τὰ κοινὰ σημεῖα ἐκλέξαντι σαφὲς γίνεται, μήτε καὶ τὰ ἴδια, οὐκ ἂν εἴη καθ' ἕκαστον τῶν ζώων σκέπτεσθαι· ἀλλ' ἐξ ἀνθρώπων τὴν ἐκλογὴν ποιητέον τῶν τὸ αὐτὸ πάθος παρόντων· οἷον, ἂν μὲν ἀνδρείου ἐπισκοπῇ τις τὰ σημεῖα, τὰ ἀνδρεῖα τῶν ζώων εἰς ἓν λαβόντα δεῖ ἐξετάσαι, ποῖα παθήματα τούτοις μὲν ἅπασιν ὑπάρχει, τῶν δὲ ἄλλων ζώων οὐδενὶ συμβέβηκεν. Εἰ γὰρ οὕτω τις ἐκλέξειεν, ὅτι ταῦτά ἐστι τὰ σημεῖα ἀνδρείας τοῖς προκειμένοις ζῴοις, μὴ μόνον ἀνδρείας κοινὸν ὑπάρχειν πάθημα τῶν [ἐν] τῇ διανοίᾳ, ἀλλὰ καὶ ἄλλο τι· οὕτω δὴ ἂν ἀπορήσειε πότερον ἀνδρείας ἢ θατέρου τὰ σημεῖά ἐστιν. ἀλλὰ δεῖ ἐκ πλείστων τε ἐκλέγεσθαι ζῴων, καὶ μηδὲν πάθος κοινὸν ἐχόντων ἐν τῇ διανοίᾳ ἄλλο τι, οὗ ἂν τὰ σημεῖα σκοπῇ. ὅσα μὲν οὖν τῶν σημείων μόνιμά ἐστι, μόνιμον ἄν τι καὶ σημαίνοι· ὅσα δὲ ἐπιγινόμενα, καὶ ἀπογινόμενά τε καὶ ἀπολείποντα, πῶς ἂν τὸ σημεῖον ἀληθὲς εἴη, τοῦ ἐν τῇ διανοίᾳ μὴ μένοντος; Εἰ μὲν γὰρ μόνιμον, ἐπιγινόμενόν τι καὶ ἀπολεῖπον σημεῖόν τις ὑπολάβοι, ἐνδέχοιτο μὲν ἂν αὐτὸ ἀληθὲς εἶναι, οὐ μὴν ἐπιεικὲς ἂν εἴη, μὴ ἀεὶ τῷ πράγματι συνεπόμενον· ὅσα δὲ παθήματα ἐγγινόμενα τῇ ψυχῇ μηδέν τι ἐνδιαλλάττει τὰ σημεῖα τὰ ἐν τῷ σώματι, οἷς χρῆται ὁ φυσιογνώμων, οὐκ ἂν εἴη τὰ τοιαῦτα γνωρίσματα τῇ τέχνῃ;

A Eſt autem ſecundùm omnes modos hoc phyſiognomizare. Et adhuc ſecundùm alios, & electionem ſignorum diſſimiliter fieri. Hi quidem igitur iuxta mores ſolùm phyſiognomizant: primum quidem quòd quidam non iidem cùm ſint, mores, qui ſunt in facie, eoſdem habent, vt fortis & inuerecundus eoſdem habent, animabus vel intellectibus multum ſeparantur. Secundò autem, quòd ſecundùm quædam tempora, mores non eoſdem, ſed aliorum habent: triſtibus enim exiſtentibus, quandoque contingit diem delectabiliter ducere, & morem accipere, qui eſt hilaris: & econtrario hilarem contriſtari, vt mos qui erat in facie permutetur. Adhuc cum his, de paucis vtique ſem-
B per apparentibus coniecturam quis accipiat. Qui autem ex feris phyſiognomizant, non rectè electionem ſignorum faciunt: non enim eſt vtique dicere percurrentem formam vniuſcuiuſque animalium, quòd quicunque vni ſimilis huic corpore erit, & anima ſimilis erit. Primùm enim, vt ſimpliciter dicam, nullus vtique videbis hominem ita ſimilem beſtiæ, ſed aſſimilantem in aliquo. Adhuc autem cum his, animalia pauca quædam propria habent ſigna, multa verò communia. Quare ſi quis ſimilis fuerit non ſecundùm proprium ſed ſecundùm commune aliquid, quo pacto magis ille leoni quàm ceruo ſimilior dicetur? Meritò enim propria ſigna proprium quid ſignificare, commu-
C nia autem commune. Communia ergo ſigna nihil vtique manifeſtabunt phyſiognomonizanti. Si autem aliquis propria vniuſcuiuſque ferarum elegerit, non vtique habebit aſſignare cuius ſunt hæc ſigna. Meritò enim proprij, proprium. Nihil autem proprium animalium phyſiognomonizatorum, in anima habebit vtique aliquis accipere: neque enim forte ſolùm leo eſt, ſed alia multa: neque timidum lepus, ſed & alia infinita. *Si ergo neque communia eligenti, manifeſtum aliquid fit,* neque ſecundùm propria, non vtique erit vnumquodque animalium aſpicere, ſed ex hominibus electionem facere oportet patientibus eandem paſſionem: vt ſi fortis inſpiciat aliquis ſigna, fortia
D animalium in vnum accipientem oportet perſcrutari, quæ paſſiones his quidem omnibus inſunt, aliorum autem animalium nulli accidant. Si enim ita quis elegerit, quòd eadem ſunt ſigna fortitudinis, prædictis animalibus non ſolùm fortitudinis communem ineſſe paſſionem eorum, quæ ſunt in intellectu, ſed & alia quædam, ſic vtique dubitabit, vtrùm fortitudinis aut alterius ſigna ſint. Sed oportet ex pluribus eligi animalibus, & non habentibus vllam paſſionem communem manifeſtam, cuius vtique ſigna reſpicias. Quæcunque itaque ſignorum manſiua ſunt, aliquid manſiuum ſignant. Quæ autem adueniunt, atque diſcedunt, & deficiunt, quomodo vtique ſignum ve-
E rum erit non manentis in anima? Siquidem enim manſiuum adueniens, & deficiens ſignum quis ſuſcipiet: contingeret vtique ipſum quidem verum eſſe, non tamen conueniens, ſi non perpetuò ſequatur rem. Quæcunque autem paſſiones factæ in anima non in aliquo permutant ſigna, quæ ſunt in corpore, quibus vtitur phyſiognomon, non erunt huiuſmodi cognitiones artis

vt quæ ſunt circa oppoſitiones, & ſcientias, medicum, aut citharœdum non contingit cognoſcere. Nam addiſcens aliquam diſciplinam, nullum mutat ſignorum, quibus vtitur phyſiognomon.

CAPVT II.

Phyſiognomonia circa quæ verſetur: & ex quibus generibus ſigna accipiantur.

OPortet ergo determinare circa qualia quædam eſt phyſiognomonia, quoniam non circa omnia, & ex quibus ſingula ſigna accipiantur: deinde conſequenter de manifeſtiſſimis circa vnumquodque manifeſtare. Phyſiognomonia ergo eſt, ſicvt & nomen ipſius dicit, de naturalibus paſſionibus, quæ ſunt in anima, & accidentibus, quæcunque adueniunt, & tranſmutant ſigna phyſiognomonizata. Qualia autem hæc ſint, poſterius declarabitur. Nunc autem dicam ex quibus generibus ſigna accipiuntur, & ſint omnia. Ex motibus enim phyſiognomonizant, & ex figuris, & coloribus, & ex moribus apparentibus in facie, & ex leuitate, & ex voce, & ex carne, & ex partibus, & ex figura totius corporis. Vniuerſaliter quidem huiuſmodi ſunt, quæ dicunt phyſiognomones de omnibus generibus, ſigna. Siquidem igitur immanifeſtus, aut non deſignatiuus foret talis tranſitus, ſufficiebant prædicta. Nunc autem fortaſſe melius eſt vnumquodque de ſingulis, quæcunque manifeſta de phyſiognomonizatis, certiùs explanare, enumerantem cuiuſmodi ſigna referantur ad ſingula, quæcunque ſcilicet ex prædictis manifeſta non fuere. COLORES ergo ſignificant, acuti quidem calidum & ſanguineum, albi cum rubore, bonam indolem, quando in læui corpore accidit hic color. PILI autem molles quidem, timidum: duri autem, fortem: Hoc autem ſignum ſumptum eſt ex omnibus animalibus. Timidiſſimum enim eſt ceruus, lepus, ouis, & pilum molliſſimum habent: fortiſſimum autem, leo, aper, & pilum duriſſimum habent. Eſt autem & in auibus hoc idem videre. Vniuerſaliter enim quæcunque quidem habent duram pennam, fortes: quæcunque autem mollem, timidæ. Et particulariter eſt hoc quidem videre in coturnicibus, & in gallis: ſimiliter autem & in generibus hominum hoc idem accidit. Quicunque enim apud Septentrionem habitant, fortes ſunt, & durorum pilorum. Qui autem apud meridiem, timidi, & mollem pilum habent. Piloſitas autem, quæ eſt circa ventrem, loquacitatem ſignificat: hoc autem refertur ad genus auium. Proprium enim auis eſt eorum quæ ſunt circa corpus, piloſitas quæ circa ventrem eſt: eorum autem quæ ſunt circa intellectũ, loquacitas. CARO autem, dura quidem, & habitus boni, inſenſibilem ſignificat: mollis autem & ingenioſum, & inſtabilem, niſi in forti corpore, & habenti extremitates fortes hoc accidit. MOTVS autem tardi quidem, mollem intellectum: acuti verò, calidum. In VOCE autem grauis quidem & intenſa fortem: acuta autem, & remiſſa, timidum.

A δεῖ τὰ περὶ τὰς δόξας καὶ τὰς ἐπιστήμας, ἰατρὸν ἢ κιθαριστὴν οὐκ ἐνδέχεται γνωρίζειν· ὁ γὰρ μαθὼν ὅ,τι μάθημα, οὐδὲν ἐξήλλαξε τῶν σημείων οἷς χρῆται ὁ φυσιογνώμων.

ΚΕΦΑΛ. β.

Περὶ ἃ ἔστιν ἡ φυσιογνωμονία· καὶ ἐξ ὧν γενῶν τὰ σημεῖα λαμβάνεται.

ΔΕῖ δὲ οὖν ὁρίσαι περὶ ποῖα ἄττα ἐστὶν ἡ φυσιογνωμονία, ἐπεὶ οὐ περὶ πάντα καὶ ἐκ τίνων ἕκαστα σημεῖα λαμβάνεται· ἔπειτ᾽ ἐφεξῆς καθ᾽ ἓν ἕκαστον περὶ τῶν ἐπιφανεστέρων δηλῶσαι. B ἡ μὲν οὖν φυσιογνωμονία ἐστί, καθάπερ καὶ τοὔνομα αὐτῆς λέγει, περὶ τὰ φυσικὰ παθήματα τῶν ἐν τῇ διανοίᾳ, καὶ τῶν ἐπικτήτων, ὅσα παραγινόμενα μεθίστησι τῶν σημείων τῶν φυσιογνωμονουμένων. ὁποῖα δὲ ταῦτά ἐστιν, ὕστερον δηλωθήσεται. ἐξ ὧν δὲ γενῶν τὰ σημεῖα λαμβάνεται, νῦν ἐρῶ, καὶ ἔστιν ἅπαντα. ἔκ τε γὰρ τῶν κινήσεων φυσιογνωμονοῦσι, καὶ ἐκ τῶν σχημάτων, καὶ ἐκ τῶν χρωμάτων, καὶ ἐκ τῶν ἠθῶν τῶν ἐπὶ τοῦ προσώπου ἐμφαινομένων, καὶ ἐκ τῶν τριχωμάτων, C καὶ ἐκ τῆς λειότητος, καὶ ἐκ τῆς φωνῆς, καὶ ἐκ τῆς σαρκὸς, καὶ ἐκ τῶν μερῶν, καὶ τοῦ τύπου ὅλου τοῦ σώματος· καθόλου μὲν οὖν τοιαῦτά ἐστιν, ἃ λέγουσιν οἱ φυσιογνώμονες περὶ ὅλων τῶν γενῶν σημεῖα. εἰ μὲν οὖν ἀσαφὴς, ἢ μὴ εὔσημος ἦν ἡ τοιαύτη διέξοδος, ἀπέχρησεν ἂν τὰ εἰρημένα. νυνὶ δὴ ἴσως βέλτιόν ἐστι καθ᾽ ἕκαστον περὶ πάντων, ὅσα ἐπιφανῆ * παρὰ τῶν φυσιογνωμονουμένων, ἀκριβέστερον φράσαι, τά τε σημεῖα λέγοντα, οἷά τ᾽ ἐστὶν ἕκαστα [καὶ ἐπὶ τί] διαφέρεται, ὅσα μὴ ἐν τοῖς προειρημένοις δεδήλωται. αἱ μὲν οὖν χροιαὶ σημαίνουσιν, αἱ μὲν ὀξεῖαι, θερμὸν καὶ ὕφαιμον· αἱ δὲ λευκέρυθροι, εὐφυΐαν, ὅταν ἐπὶ λείου χρωτὸς D συμβῇ τοῦτο τὸ χρῶμα. τὰ δὲ τριχώματα, τὰ μὲν μαλακὰ, δειλόν· τὰ δὲ σκληρὰ, ἀνδρεῖον. τοῦτο δὲ τὸ σημεῖον εἴληπται ἐξ ἁπάντων τῶν ζώων. δειλότατον μὲν γάρ ἐστιν ἔλαφος, λαγωὸς, πρόβατα, καὶ τὴν τρίχα μαλακωτάτην ἔχει· ἀνδρειότατον δὲ ὁ λέων, καὶ ἄγριος, καὶ τρίχα σκληροτάτην φέρει. ἔστι δὲ καὶ ἐν τοῖς ὄρνισι τὸ αὐτὸ τοῦτο ἰδεῖν. καθόλου τε γὰρ ὅσοι μὲν σκληρὸν τὸ πτερὸν ἔχουσιν, ἀνδρεῖοι· ὅσοι δὲ μαλακὸν, δειλοί. καὶ κατὰ μέρη ἐστὶ ταὐτὸ τοῦτο ἰδεῖν, ἔν τε τοῖς ὄρτυξι, καὶ ἐν τοῖς ἀλεκτρυόσιν. ὁμοίως δὲ καὶ ἐπὶ τῶν γενῶν τῶν ἀνθρώπων ταὐτὸ τοῦτο συμπίπτει. οἱ μὲν γὰρ ὑπὸ ταῖς ἄρκτοις οἰκοῦντες, ἀνδρεῖοί τε εἰσὶ καὶ σκληρότριχες· οἱ δὲ πρὸς μεσημβρίαν, δειλοί τε καὶ E μαλακὸν τρίχωμα φέρουσιν. ἡ δὲ δασύτης ἡ περὶ τὴν κοιλίαν, λαλιὰν σημαίνει. τοῦτο δὲ ἀναφέρεται εἰς τὸ γένος τῶν ὀρνίθων. ἴδιον γὰρ ὄρνιθος τῶν περὶ τὸ σῶμα, ἡ δασύτης ἡ περὶ τὴν κοιλίαν· τῶν δὲ περὶ διάνοιαν, ἡ λαλιά. Η δὲ σὰρξ, ἡ μὲν σκληρὰ καὶ εὐεκτικὴ φύσει, ἀναίσθητον σημαίνει· ἡ δὲ λεία, καὶ εὐφυέα καὶ ἀβέβαιον, ἐὰν μὴ ἐπὶ ἰσχυροῦ σώματος καὶ τὰ ἀκρωτήρια ἐγκρατῆ ἔχοντος τοῦτο συμβῇ. Αἱ δὲ κινήσεις, αἱ μὲν νωθραὶ, μαλακὴν διάνοιαν· αἱ δὲ ὀξεῖαι, ἔνθερμον. Ἐπὶ δὲ τῆς φωνῆς ἡ μὲν βαρεῖα καὶ ἐπιτεινομένη, ἀνδρεῖον· ἡ δὲ ὀξεῖα καὶ ἀνειμένη, δειλόν.

Τὰ δὲ σχήματα, καὶ τὰ παθήματα τὰ ἐπιφαινόμενα A ἐπὶ τοῦ * προσώπου, κατὰ τὰς ὁμοιότητας λαμβάνεται τῶν παθῶν. ὅταν γὰρ πάσχῃ τι, γίνεται δὴ εἰ τοιοῦτον ἔχοι. ὅταν τις ὀργίζηται, ὀργίλου τὸ σημεῖον τοῦ αὐτοῦ γένους. τὸ δὲ ἄρρεν τοῦ θήλεος μεῖζον καὶ ἰσχυρότερον· καὶ τὰ ἀκρωτήρια τοῦ σώματος, ἰσχυρότερα, καὶ λιπαρώτερα, καὶ ἕξιν ἔχοντα, καὶ βελτίω κατὰ πάσας τὰς ἀρετάς. Ἰσχυρότερα δὲ τῶν ἐπὶ τοῖς μέρεσι σημείων ἐστὶ, τὰ ἐν τοῖς ἤθεσι * τοῖς ἐν τοῖς ἐπιφαινομένοις λαμβανόμενα· καὶ [τὰ] κατὰ τὰς κινήσεις καὶ τὰ σχήματα. ὅλως δὲ τὸ ἑνὶ μὲν πιστεύειν τῶν σημείων, εὔηθες· ὅταν δὲ πλείω συμφωνοῦντα καθ' ἑνὸς λάβῃ, μᾶλλον ἤδη κατὰ τὸ εἰκὸς ἄν τις ὑπολαμβάνοι ἀληθῆ εἶναι τὰ σημεῖα. Ἔστι δὲ ἄλλος τρόπος, B καθ' ὃν ἄν τις φυσιογνωμονοίη· οὐδεὶς μέντοι ἐπικεχείρηκεν. εἰ ἀνάγκη ἐστὶ τὸν ὀργίλον καὶ τὸν δυσκόλον καὶ * μικρὸν τὸ ἦθος, φθονερὸν εἶναι, εἰ καὶ μή ἐστι * φθονεροῦ σημεῖα, ἐξ ἐκείνων δὲ τῶν προτέρων ἐνδέχοιτο ἂν τῷ φυσιογνώμονι καὶ τὸν φθονερὸν εὑρίσκειν· μάλιστα μὲν, ὅταν ὁ τοιοῦτος ἴδιος τρόπος εἴη τοῦ πεφιλοσοφηκότος. τὸ γὰρ διωρίσθαι τινὰ τῶν ὄντων * ἀναγκαῖον εἶναι, ἴδιον ὑπολαμβάνομεν φιλοσοφίας· ὃ γάρ ἐστιν ὅτε ἐναντιοῦται τοῦ τῷ κατὰ τὰ πάθη φυσιογνωμονεῖν καὶ τὰ κακά. Περὶ φωνῆς κατὰ μὲν τὸ πάθος ἐπιχειρῶν, ὀξεῖαν οἰηθείη ἄν τις δυεῖν ἕνεκεν τίθεσθαι τοῦ θυμοειδοῦς. ὁ γὰρ ἀγανακτῶν, καὶ ὀργι- C ζόμενος, ἐπιτείνειν εἴωθε τὸν φθόγγον καὶ ὀξὺ φθέγγεσθαι· ὁ δὲ ῥᾳθύμως διακείμενος, τόν τε τόνον ἀνίησι, καὶ βαρὺ φθέγγεται. τῶν δ' αὖ ζώων τὰ μὲν ἀνδρεῖα, βαρύφωνά ἐστι· τὰ δὲ δειλὰ, ὀξύφωνα· λέων μὲν καὶ ταῦρος, ὥσπερ καὶ κύων ὑλακτικὸς, καὶ τῶν ἀλεκτρυόνων οἱ εὔψυχοι, βαρύφωνοι φθέγγονται· ἔλαφος δὲ καὶ λαγωὸς, ὀξύφωνά ἐστι. ἀλλ' ἴσως καὶ ἐν τούτοις κρεῖττόν ἐστι μὴ ἐν τῷ βαρεῖαν ἢ ὀξεῖαν εἶναι τὴν φωνὴν αὐτῶν, ἀνδρεῖον, ἢ δειλὸν τίθεσθαι, ἀλλ' ἐν τῷ τὴν μὲν ἐρρωμένην, ἀνδρείου· τὴν δὲ ἀνειμένην καὶ ἀσθενῆ, δειλοῦ ὑποληπτέον εἶναι. ἔστι δὲ κράτιστον, ὅταν τὰ σημεῖα μὴ ὁμολογούμενα, ἀλλ' ὑπεναντιούμενα, μηδὲν τίθεσθαι, εἰ μή ἐστι τῶν εἰρημένων ποῖα ποίων πιστότερα· καὶ μάλιστα μὲν εἰς εἴδη, ἀλλὰ μὴ εἰς ὅλα τὰ γένη ἀναφέρειν. ὁμοιότερα γάρ ἐστι τοῖς ζητουμένοις. οὐ γὰρ ὅλον τὸ γένος τῶν ἀνθρώπων φυσιογνωμονοῦμεν, ἀλλά τινα τῶν ἐν τῷ γένει.

* γ. τοῦ προσώπου.

* Qu. πιστὸς ὢν ἐᾶν.

* Qu. μικρὸν

* γ. φθ. ἀδείκνυτα σημεῖα.

* Fort. τὸ ἀναγκαῖον εἶναι ἴδιον, vel ἀναγκαῖον ἴδ.

Figvræ autem & paſſiones, quæ apparent in facie, ſecundùm ſimilitudines accipiuntur paſſionis: quando enim dum patitur, aliquid fit, vt ſi hoc habet, quando aliquis iraſcitur, iraſcibile ſignum eiuſdem generis. Mas autem fœmina maior eſt, & fortior, & extrema corporis fortiora, & craſſiora, & habitus melioris, & potiora ſecundùm omnes virtutes. Signis autem, quæ ſunt in partibus corporis, fortiora ſunt ea quæ accipiuntur manifeſta in moribus: & ſecundùm motus, & figuras. Omnino autem vni quidem ſignorum credere ſtultum eſt. Quando autem plura conueniunt, quæ ſunt in vno, magis vtique conueniet vt quis accipiat vera eſſe ſigna. Eſt autem alius etiam modus, ſecundùm quem aliquis phyſiognomonizet. Nullus tamen aggreſſus eſt. Vt ſi neceſſe ſit iracundum, & triſtem, & paruum, ſecundùm morem inuidum eſſe, & ſi non ſint inuidi ſigna: ex illis autem prioribus contingat vtique phyſiognomoni & inuidum inuenire. Maximè quidem quando talis proprius modus fuerit philoſophantis. Poſſe enim quibuſdam exiſtentibus neceſſarium eſſe, proprium putamus philoſophiæ. Quod contrarium eſt huic quandoque, iuxta paſſiones phyſiognomonizare & mala. Secvndvm paſſionem intendens quiſpiam acutam putarit duplicem ob cauſam iracundi vocem ponendam eſſe. Indignatus enim, & iratus, diſtinguere conſueuit vocem, & acutè loquitur: qui autem remiſſus ſtat, remittit vocem, & grauiter loquitur. Rurſus autem animalium fortia quidem, grauis vocis ſunt, timida autem, acutæ vocis. Leo quidem, & taurus, & canis lattrabilis, & gallorum, qui ſunt boni animi, grauiter vociferantur. Ceruus autem, & lepus acutæ vocis ſunt. Sed fortè & in his melius eſt, non eo quòd ipſorum vox eſt acuta, & grauis, fortem aut timidum ponere: ſed arbitrandum eſt, fortem quidem fortis, remiſſam autem & imbecillem timidi. Eſt autem potiſſimum, quando ſigna non ſunt confeſſa, ſed ſubcontrariantia, nihil ponere, niſi ſint diſcrepantium inter ſe, alia credibiliora aliis. Et maximè quidem in ſpeciem, D ſed non in tota genera referre decet: ſimiliora enim ſunt quæſito. Non enim totum genus hominum phyſiognomonizamus, ſed quædam ſunt in genere.

ΚΕΦΑΛ. γ.

Τῶν παθημάτων σημεῖα καθ' ἕκαστον τῶν παθῶν.

Ἀνδρείου σώματος σημεῖα, τρίχωμα σκληρὸν, τὸ σχῆμα τοῦ σώματος ὀρθὸν, ὀστᾶ καὶ πλευραὶ καὶ τὰ ἀκρωτήρια τοῦ σώματος ἰσχυρὰ καὶ μεγάλα, καὶ κοιλία πλατεῖα καὶ περιεσταλμένη· ὠμοπλάται πλατεῖαι καὶ διεστηκυῖαι, οὔτε λίαν συνδεδεμέναι, οὔτε πάμπαν ἀπολελυμέναι· τράχηλος ἐρρωμένος, οὐ σφόδρα σαρκώδης· τὸ στῆθος σαρκῶδές τε καὶ πλατὺ· ἰσχίον περιεσταλμένον· γαστροκνημίαι κάτω περιεσπασμέναι· ὄμμα χαροπὸν, οὔτε λίαν ἀνεπτυγμένον, οὔτε πάμπαν συμμῦον· αὐχμηρότερον τὸ χρῶμα τὸ ἐπὶ τοῦ σώματος· ὀξὺ μέτωπον, ὀρθὸν, οὐ μέγα· * ἰσχνὸν οὔτε λεῖον, οὔτε πάμπαν ῥυτιδῶδες.

* γ. ἰσχνὸν

CAPVT III.

Signa affectionum animi ſigillatim.

Signa fortis corporis. Pili duri, figura corporis erecta, oſſa, & coſtæ, & extrema corporis fortia, & magna, & venter amplus, & contractus E ad ſe, armi lati, & diſtantes, nec valde colligati, nec omnino diſſoluti, collum forte, nõ vehementer carnoſum, pectus carnoſum, & lätũ, coxa contracta, pecten deorſum contractũ, oculus charopus, nec valde expanſus, nec omnino clauſus, ſquallidior color in corpore, acuta frõs, recta, non magna: gena, neque læuis, neque omnino rugoſa.

Signa TIMIDI. Pili molles, corpore inclinatus, non erectus, quæ ſunt ſub vmbilico ſurſum tracta, circa faciem ſubcroceus, oculi imbecilles, & mobiles, & extrema corporis imbecilla, & crura parua, manus longæ, & ſubtiles: lumbi autem parui, & imbecilles, figura contenſa in motibus, non vehemens, ſed ſupinus, & ſtupefactibilis: mos, qui eſt in facie, mobilis, ſolicitus. INGENIOSI ſigna. Caro humidior, & mollior, non boni-habitus, neque valde pinguis: quæ ſunt circa muſculos ſcapularum, & collum, macriora, & quæ ſunt circa faciem, incolligata: quæ ſunt circa muſculos ſcapularum, & inferiora, remiſſa: bene ſoluta, quæ ſunt circa coſtas: & ſecundùm dorſum non carnoſus: corpus album miſto rubore, & purum: cutis ſubtilis: pili non valde duri, nec valde nigri: oculus charopus, humidus. INSENSATI ſigna. Quæ ſunt circa collum & crura, carnoſa complexa, & colligata: cotyle rotunda: muſculi ſcapularum, ſurſum expanſi: frons magna, circularis, carnoſa: oculus croceus: crura circa talum groſſa, carnoſa, rotunda: mandibulæ magnæ, carnoſæ, lumbi carnoſi, crura longa, collum groſſum, facies carnoſa, ſublonga ſatis: motus autem & figuram & morem, qui apparet in facie, ſecundùm ſimilitudines accipit. INVERECVNDI ſigna. Oculus apertus, & ſplendidus, palpebræ ſanguineæ, & craſſæ, & parum curuus, muſculi ſcapularum ſurſum eleuati, figura non recta, ſed parum prona. In motibus autem acutus, rubeus corpore, color ſanguineus, facies rotunda, pectus ſurſum tractum. MODERATI ſigna. In motibus tardus, & loquens tardè: vox tarda, plena, ſpiritus mitis, oculus hilaris, non ſplendidus, niger, neque valde apertus, neque omnino clauſus, palpebrizans tardè. Oculorum enim, qui celeriter palpebrizant, hi quidem timidum, hi verò calidum ſignant. ANIMOSI ſigna. Frons bene magna, & carnoſa, & læuis, quæ ſunt circa oculos, videntur humiliora, & facies ſomnolentior, neque intenſè aſpiciens, neque remiſſè: in motibus tardus erit, & remiſſus figura, & more, qui eſt in facie, non præceps, ſed videtur bonus. INANIMOSI ſigna. Rugoſa facies; & macri oculi confracti, ſimul autem & confracta oculorum duo ſignificant, hoc quidem molle, & fœmininum, aliud verò demiſſum & pauidum: in figura humilis, & motibus remiſſus. Signa CINAEDI. Oculus confractus, genu flexibilis, inclinatio capitis ad dextram, motus manuum ſupini, & diſſoluti, & ambulationes duplices. Hæc quidem circumclinantis, alia verò tenentis lumbos, & oculorum circunſpectiones, qualis vtique fuerit Dionyſius ſophiſta. Signa AVARI. Facie remiſſus, nigri coloris, macer, quæ ſunt circa faciem quaſi abraſa: facies rugoſa, non carnoſus, recti crinis, & nigri.

A Δειλοῦ σημεῖα, τριχωμάτιον μαλακὸν, τῷ σώματι συγκεκαθικὸς, οὐκ ἐπανεστηκός· αἱ δὲ γαστροκνημίαι ἄνω ἀνεσπασμέναι· περὶ τὸ πρόσωπον ὕπωχρος· ὄμματα ἀσθενῆ, * καὶ [εἰ] σκαρδαμύττει. καὶ τὰ ἀκρωτήρια τοῦ σώματος ἀσθενῆ· τὰ σκέλη μικρὰ, καὶ χεῖρες λεπταὶ καὶ μακραί· ὀσφὺς δὲ μικρὰ καὶ ἀσθενής· τὸ σχῆμα σύντονον ἐν ταῖς κινήσεσιν· οὐκ ἰταμὸς, ἀλλ' ὕπτιος, καὶ * τεθαμβηκὼς τὸ ἦθος· τὸ ἐπὶ τοῦ προσώπου εὐμετάβολον, κατηφής. Εὐφυοῦς σημεῖα, σὰρξ ὑγροτέρα καὶ ἁπαλωτέρα, οὐκ εὐεκτικὴ, οὐδὲ πιμελώδης σφόδρα· τὰ περὶ τὰς ὠμοπλάτας καὶ τράχηλον, ἰσχνότερα, καὶ τὰ περὶ τὸ πρόσωπον· καὶ συνδέεται τὰ περὶ τὰς ὠμοπλάτας, καὶ τὰ κάτω ἀφειμένα· * εὔλυτα τὰ περὶ τὰς

* κ. σκαρδαμύττοντα.

* Melius τεθαμβηκὼς, ἢ ἦθος τ. ἐ. τ. π. εὐμετάβολον, κ. vel εὐμετάβολον, κατηφής.

B πλευράς· καὶ τὸ νῶτον ἀσαρκότερον· τὸ σῶμα λευκέρυθρον καὶ καθαρόν· τὸ δερμάτιον λεπτόν· * τριχωμάτιον μὴ λίαν σκληρὸν, μηδὲ λίαν μέλαν· ὄμμα χαροπὸν, ὑγρόν. Ἀναισθήτου σημεῖα· τὰ περὶ τὸν αὐχένα καὶ τὰ σκέλη σαρκώδη καὶ συμπεπλεγμένα καὶ συνδεδεμένα· κοτύλη στρογγύλη· ὠμοπλάται ἄνω ἀνεσπασμέναι· μέτωπον μέγα, περιφερὲς, σαρκῶδες· ὄμμα χλωρὸν κωφόν· κνῆμαι περὶ σφυρὸν παχεῖαι, σαρκώδεις, στρογγύλαι· σιαγόνες μεγάλαι, σαρκώδεις· ὀσφὺς σαρκώδης· σκέλη μακρά· τράχηλος παχύς· πρόσωπον σαρκῶδες, ὑπομακρὸν ἱκανῶς· τὰς δὲ κινήσεις

* κ. ἄλυτα

* κ. τρίχωμα, ἢ μὴ

C καὶ τὸ σχῆμα, καὶ τὸ ἦθος τὸ ἐπὶ τοῦ προσώπου ἐπιφαινόμενον, κατὰ τὰς ὁμοιότητας ἀναλαμβάνει.

Ἀναιδοῦς σημεῖα, ὀμμάτιον ἀναπεπταμένον καὶ λαμπρόν· βλέφαρα ὕφαιμα, καὶ παχέα· μικρὸν ἔγκυρτος· ὠμοπλάται ἄνω ἐπηρμέναι· τῷ σχήματι μὴ ὀρθὸς, ἀλλὰ μικρῷ προπετέστερος· ἐν ταῖς κινήσεσιν ὀξύς· ἐπίπυῤῥος τὸ σῶμα· τὸ χρῶμα ὕφαιμον· στρογγυλοπρόσωπος· τὸ στῆθος ἀνεσπασμένον. Κόσμιος, ἐν ταῖς κινήσεσι βραδὺς καὶ διαλεκτικός· φωνὴ βραδεῖα καὶ πνευματώδης, καὶ ἀσθενής· ὀμμάτιον ἀλαμπὲς, μέλαν, καὶ μήτε λίαν ἀναπεπταμένον, μήτε

D παντάπασι συμμεμυκὸς, σκαρδαμυκτικὸν βραδέως. τὰ γὰρ ταχέως σκαρδαμύττοντα τῶν ὀμμάτων, τὰ μὲν δειλὸν, τὰ δὲ θερμὸν σημαίνει. Εὐθύμου σημεῖα, μέτωπον εὐμέγεθες, καὶ σαρκῶδες, καὶ λεῖον· τὰ περὶ τὰ ὄμματα ταπεινότερα, καὶ ὑπνωδέστερον τὸ πρόσωπον φαίνεται, μήτε δεδορκὸς, μήτε συννοοῦν. ἔν τε ταῖς κινήσεσι βραδὺς ἔσω καὶ ἀνειμένος, τῷ σχήματι καὶ τῷ ἤθει τῷ ἐπὶ τοῦ προσώπου, μὴ ἐπισπερχὴς, ἀλλὰ ἀγαθὸς φαίνεσθαι. Τὰ ῥυπώδη τῶν προσώπων, καὶ ἰσχνὰ ὄμματα * καταχεχλασμένα, ἅμα δὲ καὶ τὰ κεχλασμένα τῶν ὀμμάτων, δύο σημαίνει, τὸ μὲν μαλακὸν καὶ θῆλυ, τὸ δὲ κατη-

* Qu. κατακεκλασμένα.

E φὲς καὶ ἄθυμον. ἐν τῷ σχήματι ταπεινὸς, καὶ ταῖς κινήσεσιν ἀπηγορευκώς. Κιναίδου σημεῖα, ὄμμα καταχεχλασμένον· γονύκροτος· ἔγκλισις τῆς κεφαλῆς εἰς τὰ δεξιά· αἱ φοραὶ τῶν χειρῶν ὕπτιαι καὶ ἔκλυτοι· καὶ βαδίσεις διτταὶ, ἡ μὲν περινεύοντος, ἡ δὲ κρατοῦντος τὴν ὀσφύν· καὶ τῶν ὀμμάτων περιβλέψεις· οἷος ἂν εἴη Διονύσιος ὁ σοφιστής. Πικρὸς, τὸ πρόσωπον σεσηρώς· μελανόχρως· ἰσχνὸς· τὰ περὶ τὸ πρόσωπον διεξυσμένος· τὸ πρόσωπον ῥυπώδης· ἄσαρκος, εὐθύθριξ, καὶ μελάνθριξ.

Θυμώδεις· ὀρθὸς τὸ σῶμα, τῷ σχήματι εὔπλευρος, εὔθυμος, ἐπίπυρρος· ὠμοπλάται διεστηκυῖαι, καὶ μεγάλαι, καὶ πλατεῖαι· ἀκρωτήρια μεγάλα, καὶ ἐγκρατῆ· λεῖος καὶ περὶ τὰ στήθη, καὶ περὶ βουβῶνας· εὐπώγων· εὐλυ-δὴς ὁ περίδρομος τῶν τριχῶν, κάτω κατεληλυθώς.

Πρᾳεῖς, ἰσχυρὸς τὸ εἶδος, εὔσαρκος· ὑγρὰ σὰρξ καὶ πολλή· εὐμεγέθης καὶ εὐμμελέστερος, ὕπτιος τῷ σχήματι· ὁ περίδρομος τῶν τριχῶν ἀνεσπασμένος. Εἴρων· πίονα τὰ περὶ τὸ πρόσωπον, καὶ τὰ περὶ τὰ ὄμματα ῥυτιδώδη· ὑπνώδες τὸ πρόσωπον τῷ ἤθει φαίνεται. Μικρόψυχοι, μικρομελὴς, μικρογλάφυρος, ἰσχνὸς, μικρόμματος, καὶ μικροπρόσωπος· οἷος ἂν εἴη Κορίνθιος ὁ Λευκάδιος. Φιλόκυβοι, γαλεαγκῶνες καὶ ὀρχησταί. Φιλολοίδοροι, οἷς τὸ ἄνω χεῖλος μετέωρον· καὶ τὰ εἴδη προπετεῖς, ἐπίπυρροι. Ἐλεήμονες, ὅσοι γλαφυροὶ, καὶ λευκόχροοι, καὶ λιπαρόμματοι, καὶ τὰ ῥῖνα ἄνωθεν διεξυσμένοι, καὶ ἀεὶ δακρύουσιν. αὐτοὶ οὗτοι φιλογύναιοι, καὶ θηλύγονοι, καὶ περὶ τὰ ἤθη ἐρωτικοὶ, καὶ ἀειμνήμονες, καὶ εὐφυεῖς, καὶ ἔνθερμοι. τούτων δὲ σημεῖα εἴρηται. Ἐλεήμων, [illegible], καὶ δειλὸς, καὶ κόσμιος· Ἀνελεήμων, ἀμαθὴς καὶ [illegible]. Ἀγαθοὶ φαγεῖν, οἷς τὸ ἀπὸ τοῦ ὀμφαλοῦ πρὸς τὸ στῆθος μεῖζόν ἐστιν, ἢ τὸ ἐντεῦθεν πρὸς τὸν αὐχένα. Λάγνοι, λευκόχροες, καὶ δασεῖς εὐθείαις θριξὶ καὶ παχείαις, καὶ μελαίναις· καὶ οἱ κρόταφοι δασεῖς εὐθείαις θριξί· λιπαρὸν τὸ ὀμμάτιον καὶ μάχλον. Φίλυπνοι, οἱ τὰ ἄνω μείζω ἔχοντες, καὶ γυπώδεις, καὶ θερμοὶ, εὐεκτικὴν σάρκα ἔχοντες, καὶ γλαφυροὶ τὰ εἴδη, καὶ δασεῖς τὰ περὶ τὴν κοιλίαν. Μνήμονες, οἱ τὰ ἄνω ἐλάττονα ἔχοντες, καὶ γλαφυρὰ, καὶ σαρκωδέστερα.

ΚΕΦΑΛ. δ.

Ὅτι ἡ ψυχὴ καὶ τὸ σῶμα συμπαθοῦσιν ἀλλήλοις.

Δοκεῖ δέ μοι ἡ ψυχὴ καὶ τὸ σῶμα συμπαθεῖν ἀλλήλοις· καὶ τῆς ψυχῆς ἕξις ἀλλοιουμένη, συναλλοιοῖ τὴν τοῦ σώματος μορφήν· πάλιν τε ἡ τοῦ σώματος μορφὴ ἀλλοιουμένη, συναλλοιοῖ τὴν τῆς ψυχῆς ἕξιν. ἐπειδὴ γάρ ἐστι ψυχῆς, τὸ λυπεῖσθαί τε καὶ εὐφραίνεσθαι, καταφανὲς ὅτι οἱ λυπούμενοι σκυθρωπότεροί εἰσι, καὶ οἱ εὐφραινόμενοι, ἱλαροί. εἰ μὲν οὖν ἦν τῆς ψυχῆς λελυμένης, ἔτι τὴν ἐπὶ τοῦ σώματος μορφὴν μένειν, ἦν μὲν ἂν καὶ οὕτως ἡ ψυχή τε καὶ τὸ σῶμα συμπαθῆ· οὐ μέντοι συνδιατελοῦντα ἀλλήλοις. νῦν δὲ καταφανὲς ὅτι ἑκάτερον ἑκατέρῳ ἕπεται· μάλιστα μέντοι ἐκ τοῦδε δῆλον γένοιτο. μανία γὰρ δοκεῖ εἶναι περὶ ψυχήν. καὶ οἱ ἰατροὶ φαρμάκοις καθαίροντες τὸ σῶμα, καὶ διαίταις τισὶ
* γ. περὶ αὐτὴν οἱ* πρὸς αὐτὸ χρησάμενοι, ἀπαλλάττουσι τὴν ψυχὴν τῆς μανίας. ταῖς δὴ τοῦ σώματος θεραπείαις, καὶ ἅμα ἥ τε τοῦ σώματος μορφὴ λέλυται, καὶ ἡ ψυχὴ μανίας ἀπήλλακται. ἐπειδὴ οὖν ἅμα ἀμφότερα λύονται, δῆλον ὅτι συνδιατελοῦσιν ἀλλήλοις.

Signa IRACVNDI. Rectus corpore, figura bene latus, animoſus, ſubrufus, ſcapulæ diſtantes, & magnæ, & latæ, extrema magna, & fortia, læuis & circa pectus, & circa bubones, barbatus probè, capillorum ambitus floridus, deorſum tendens. Signa MANSVETI. Fortis ſpecie, bene carnoſus, caro humida, multa, bonæ magnitudinis, & commenſuratus, figura curuus, curſus capillorum ſurſum vulſus. Eorum, qui ſunt aliorum REPREHENSORES, Oculi ſunt rugoſi, ſomnolenta facies de more videtur: quæ circa faciem ſunt, & oculos, pinguia. PVSILLANIMI. Paruorum membrorum, & paruorum articulorum, macer, & paruorum oculorum, & paruæ faciei, qualis fuerit Leucadius Corinthius. LVDI AMANTES. Iuſto breuiorem cubitum habent, gaudent victoria. AMATORES CONTVMELIARVM. Quibuſcunque eſt ſuperius labium eleuatum, & ſpecie proni ſunt, & rubicundi. MISERICORDES. Miſericordes ſunt, quicunque ſunt albi coloris, & puri, & habent oculos quaſi pingues, & nares deorſum diſtantes, & ſemper plorant. Iidem etiam amatores ſunt mulierum, & gignitores fœminarum, & circa mores interrogabundi, & ſemper memores, ingenioſi, & callidi: horum autem ſigna dicta ſunt. Miſericors, & ſapiens, & timidus, & moderatus. Immiſericors, & inſipiens, & inuerecundus. Signa VORACIS. Voraces ſunt hi, quibus id, quod eſt ab vmbilico ad pectus, maius eſt: aut quod inde eſt vſque ad collum. Signa LVXVRIOSI. Qui eſt albi coloris, & piloſus, rectis capillis, & craſſis, & nigris, & tempora piloſa, oculus pinguis & laſciuus. SOMNOLENTI ſigna. Amatores autem ſomni ſunt, qui habent ſuperiora maiora: calidi, habentes carnem boni habitus, eleganti ſpecie; hirſuti circa ventrem. Signa MEMORIS. Qui habent ſuperiora maiora, ſcita & carnoſa magis.

CAPVT IV.

De ſignis particulariter.

Videtur autem mihi anima & corpus compati ad inuicem, & animæ habitus alteratus ſimul alterat corporis formam, & iterum forma corporis alterata ſimul alterat animæ habitum. Quando enim animæ eſt triſtari & lætari, manifeſtum eſt quòd triſtes obſcuræ faciei ſunt, gaudentes autem hilaris. Siquidem igitur anima diſſoluta, formam, quæ eſt in corpore, adhuc exiſtere contigerit, ſanè & ita anima & corpus compatibilia forent, quamuis conferentes ad inuicem non forent. Nunc autem manifeſtum, quòd vtrunque ſeſe conſequitur. Maximè id ex hoc manifeſtum fiat: Mania videtur eſſe circa animam, & medici medicinis purgantes corpus, & diætis vtentes in ipſis, permutant animam à mania. Curationibus autem corporis, ſimul & corporis forma ſoluitur, & anima à mania permutatur. Quoniã igitur vtraque ſoluuntur, palam fit quoniam conferunt ad inuicem.

Manifeſtum inſuper eſt, quòd virtutibus animæ, ſimiles corporis formæ fiunt: quare erunt omnia ſimilia in animalibus, eiuſdem cuiuſpiam declaratiua. Multa autem animalia ſunt, & quæ operantur, hæ quidem propriæ paſſiones vniuſcuiuſque ſexus animalium ſunt, aliæ verò communes. in propriis igitur operibus animæ, propriæ paſſiones ſecundùm corpus, in communibus autem communes. Communes quidem ſunt, iniuria, & qui eſt circa Venerea exceſſus: laceratarum, & vilium, communis eſt iniuria: porcorum, & aſinorum, habitus qui eſt circa Venerea: maſticando coeunt. Proprium autem eſt, in canibus quidem contumelioſum: in aſinis autem non triſte. Quomodo igitur commune quidem & proprium conuenit diſtingui, dictum eſt. Opus autem eſt multa conſuetudine, ſi quis debet eſſe ſufficiens ad dicendum ſingula de his. Quoniam enim ea quæ videntur in corporibus, dicuntur referri ad ſimilitudines, quæ fiunt ab animalibus, & ab actibus: & differentiæ quidem aliæ à caliditate, & frigiditate fiunt. Sunt enim horum quædam apparentium in corporibus parua differentia vtentia, & eodem nomine appellata: vt pallores, qui fiunt à timoribus, & qui à laboribus: hi enim eodem nomine vtuntur, & differentiam paruam habent inter ſe: parua autem differentia exiſtente, non facile eſt cognoſcere, ſed ex conſuetudine formæ, apparentem quidem aſſumere conuenientiam oportet. Eſt autem optimus modus, & citiſſimus, qui eſt ab apparente conuenientia: & contingit ita eo modo vtentem multa cognoſcere: & non ſolùm vniuerſaliter vtile eſt, ſed ad electionem ſignorum ſingularium. Electorum enim quodque decere oportet tale, vt quod eligitur, vult. Amplius autem ſecundùm electionem ſignorum, & ſyllogiſmo, quo vti opus eſt, vbicunque contingat, adiungentes conuenientibus conuenientia: vt ſi inuerecundus erit, & paruiloquus, & fur vtique erit, & illiberalis: & fur quidem conſequens inuerecundiam, & paruiloquium, illiberalis. In talibus igitur quibuſque oportet hoc modo ſecundùm conuenientiam fieri methodum.

CAPVT V.

Diſtinctio maris & fœminæ ad phyſiognomoniam.

NVnc autem primum tentabo genera animalium diſtinguere, & quæ ipſorum conuenit permutari, vt ſint fortia, & timida, & iuſta, & iniuſta. Diſtinguendum autem animalium genus in duas formas, in maſculinam & in fœmininam, adiungentem paſſiones conuenientes vnicuique formæ. Sunt enim ſimilia. Et quæ conamur nutrire, ferarum manſuetæ magis, & molliores ſecundùm animas fœminæ maribus ſunt, minùs autem fortes, verùm nutrimenta, & aſſuetudinem manuum recipientes magis. Quare exiſtentes tales, erunt alicubi minùs iracundæ maribus. Manifeſtum autem id ex nobis alicui eſt:

A συμφανὲς δὲ καὶ ἐπὶ ταῖς δυνάμεσι τῆς ψυχῆς ὅμοιαι αἱ μορφαὶ τοῖς σώμασιν ἐπιγίνονται. ὥστε ἐστὶν ἅπαντα ὅμοια ἐν τοῖς ζώοις, τοῦ αὐτοῦ τινος δηλωτικά. παρὰ δὲ καὶ ὧν διαπράττονται τὰ ζῶα, τὰ μὲν ἴδια ἑκάστου γένους πάθη τῶν ζώων ἐστὶ, τὰ δὲ κοινά. ἐπὶ μὲν οὖν τοῖς ἰδίοις ἔργοις τῆς ψυχῆς, ἴδια τὰ πάθη κατὰ τὸ σῶμα· ἐπὶ δὲ τοῖς κοινοῖς, τὰ κοινά. κοινὰ μὲν οὖν ἐστιν ὕβρεις τε, καὶ ἡ περὶ τὰ ἀφροδίσια ἔκστασις. τῶν μὲν οὖν λοφούρων ἢ οὐ λοφούρων, κοινόν ἐστιν ὕβρεις· τῶν δὲ ὄνων τε καὶ συῶν, ἡ περὶ τὰ ἀφροδίσια * ἕξις. ἴδιον δ' ἐστὶν ἐπὶ μὲν τῶν κυνῶν, τὸ λοίδορον· ἐπὶ δὲ τῶν ὄνων, τὸ ἄλυπον. ὡς μὲν οὖν τὸ κοινόν Fort. ἔκστασις, paulo ante. Sylb.

B τε καὶ τὸ ἴδιον χρὴ διελέσθαι, εἴρηται. δεῖ μέντοι πρὸς ἅπαντα πολλῆς συνηθείας, εἰ μέλλοι τις αὐτὸς ἔσεσθαι ἱκανὸς περὶ τούτων ἕκαστα λέγειν. ἐπεὶ γὰρ τὰ ὁρώμενα ἐπὶ τῶν σωμάτων λέγεται ἀναφέρεσθαι ἐπὶ τὰς ὁμοιότητας, τάς τε ἀπὸ τῶν ζώων, καὶ τὰς ἀπὸ τῶν πράξεων γινομένας, καὶ ἰδέαι τινὲς ἄλλαι ἀπὸ θερμοτήτων καὶ ἀπὸ ψυχροτήτων γίνονται. ἔστι δὲ τούτων ἔνια τῶν ἐπιφαινομένων, ἐπί τε τοῖς σώμασι, μικραῖς διαφοραῖς κεχρημένα, καὶ τῷ αὐτῷ ὀνόματι προσαγορευόμενα, οἷον αἵ τε ἀπὸ φόβων ὠχρότητες, καὶ

C ἀπὸ πόνων. αὗται γὰρ ὀνόματί τε τῷ αὐτῷ κέχρηνται, καὶ διαφορὰν μικρὰν ἔχουσι πρὸς ἀλλήλας. μικρᾶς δὲ οὔσης τῆς διαφορᾶς, οὐ ῥᾴδιον γινώσκειν, ἀλλὰ ἢ ἐκ τῆς συνηθείας τῆς μορφῆς τὴν ἐπιπρέπειαν εἰληφότα. ἔστι μὲν οὖν καὶ τάχιστος καὶ ἄριστος ὁ ἀπὸ τῆς ἐπιπρεπείας. καὶ ἔστι γε οὕτως τούτῳ χρώμενον, πολλὰ διαγινώσκειν· καὶ οὐ μόνον καθόλου χρήσιμόν ἐστιν, ἀλλὰ καὶ πρὸς τὴν τῶν σημείων ἐκλογήν. ἕκαστον γὰρ τῶν ἐκλεγομένων, καὶ πρέπειν δεῖ τοιοῦτον, οἷον τὸ ἐκλεγόμενον θέλει. ἔτι τε καὶ κατὰ τὴν ἐκλογὴν τῶν σημείων, καὶ τῷ συλλογισμῷ, ᾧ δεῖ χρῆσθαι ὅπου ἂν τι τύχῃ, προστιθέντας τοῖς προσ-

D οῦσι, τὰ προσήκοντα· οἷον εἰ ἀναιδής τε εἴη καὶ μικρολόγος, καὶ κλέπτης ἂν εἴη καὶ ἀνελεύθερος· καὶ κλέπτης μὲν ἑπομένως τῇ ἀναιδείᾳ, τῇ δὲ μικρολογίᾳ ἀνελεύθερος. ἐπὶ μὲν οὖν τῶν τοιούτων ἑκάστου, δεῖ τοῦτον τὸν τρόπον προσαρμόζοντα, τὴν μέθοδον ποιεῖσθαι.

ΚΕΦΑΛ. ε.

Τοῦ τῶν ζώων γένους διαίρεσις εἰς ἄῤῥεν καὶ θῆλυ, πρὸς τὸ φυσιογνωμονεῖν περὶ δαλέως καὶ λέοντος παράδειγμα.

ΝΥνὶ δὲ πρῶτον πειράσομαι τῶν ζώων διελέσθαι, ὁποῖα αὐτῶν προσήκει διαλλάττειν, πρὸς τὸ εἶναι ἀνδρεῖα καὶ δειλὰ, καὶ δίκαια καὶ ἄδικα. διαιρετέον δὲ τὸ τῶν ζώων γένος εἰς δύο μορφὰς, εἰς ἄῤ-

E ῥεν καὶ θῆλυ, προσάπτοντα τὸ πρέπον ἑκατέρᾳ μορφῇ. ἔστι δὲ ὅμοια. ἐπιχειροῦμεν οὖν τρέφειν τῶν θηρίων [τὰ] πρᾳότερα· καὶ μαλακώτερα ψυχαὶ τὰ θήλεα τῶν ἀῤῥένων, ἧττόν τε ῥωμαλεούμενα, τάς τε τροφὰς καὶ τὰς χειροηθείας μᾶλλον προσδεχόμενα. ὥστε τοιαῦτα ὄντα, εἴη που ἂν ἀθυμότερα τῶν ἀῤῥένων. καταφανὲς δὲ τοῦτο ἐξ ἡμῶν που ἐστίν· Hiſt. l.9. initio.

* Melius δυσπαραπειστότεροι. Sylb.
* Fort. ἀμελέστερα. Sylb.
* Qu. ἡδίω μᾶλλον ἢ γεν.
* Sylb. λέγω,
* Sylb. οἷον ἀνάσιμον.
* ἢ, πάχει σύμμετρον.
* Sylb. ἐπιπολ.

A ὅτι ἐπειδὰν ὑπὸ θυμοῦ κρατηθῶμεν, * δυσπαραπειστότεροί τε, καὶ μάλιστα ἐρρώμεθα πρὸς τὸ μηδαμῇ μηδὲν εἶξαι· ἐπὶ τὸ βιάζεσθαι δὲ καὶ πρᾶξαι φερόμεθα, πρὸς ὃ ἂν ὁ θυμὸς ὁρμήσῃ. δοκεῖ δέ μοι καὶ κακουργότερα γίνεσθαι τὰ θήλεα τῶν ἀρρένων, καὶ προπετέστερά τε, * καὶ ἀμελέστερα, καὶ ἀναλκέστερα. αἱ μὲν οὖν γυναῖκες καὶ τὰ περὶ ἡμᾶς τρεφόμενα, καὶ πάνυ που φανερὰ ὄντα. τὰ δὲ περὶ τὴν ὕλην, πάντες ὁμολογοῦσιν οἱ νομεῖς τε καὶ θηρευταί, ὅτι τοιαῦτά ἐστιν οἷα προείρηται. ἀλλὰ μὴν καὶ τόδε δῆλον, ὅτι ἕκαστον ἐν ἑκάστῳ γένει τὸ θῆλυ, ἄρρενος μικροκεφαλώτερόν ἐστι, [καὶ] στενοπροσωπότερον καὶ λεπτοτραχηλότερον, καὶ τὰ στήθη ἀσθενέστερα ἔχει, B καὶ ἀπλευρότερά ἐστι, τά τε ἰσχία καὶ τοὺς μηροὺς περισαρκότερα τῶν ἀρρένων, γονύκροτα δέ, καὶ τὰς κνήμας λεπτὰς ἔχοντα, τούς τε πόδας κομψοτέρους· τήν τε τοῦ σώματος μορφὴν * ἡδίω μᾶλλον ἢ γενναιοτέραν. ἀνευρότερα δὲ καὶ μαλακώτερα, ὑγροτέραις σαρξὶ κεχρημένα. τὰ δὲ ἄρρενα, τούτοις ἅπασιν ἐναντία, τὴν φύσιν ἀνδρειοτέραν καὶ δικαιοτέραν εἶναι * γένει, τὴν δὲ τοῦ θήλεος δειλοτέραν καὶ ἀδικωτέραν.

Τούτων οὕτως ἐχόντων, φαίνεται τῶν ζῴων ἁπάντων λέων τελεώτατα μετειληφέναι τῆς τοῦ ἄρρενος ἰδέας. ἔ- C στι γὰρ ἔχων στόμα εὐμέγεθες· τὸ δὲ πρόσωπον τετραγωνότερον, οὐκ ἄγαν ὀστῶδες, τὴν ἄνω τε γνάθον οὐ προεξεστηκυῖαν, ἀλλὰ ἰσορροποῦσαν τῇ κάτω· ῥῖνα δὲ παχυτέραν ἢ λεπτοτέραν· χαροποὺς ὀφθαλμοὺς ἐγκοίλους, οὐ σφόδρα περιφερεῖς, οὔτε ἄγαν προμήκεις· μέγεθος δὲ μέτριον, ὀφρὺν εὐμεγέθη· μέτωπον τετράγωνον, ἐκ μέσου ὑποκοιλότερον· πρὸς δὲ τὰς ὀφρῦς καὶ τὴν ῥῖνα ὑπὸ τοῦ μετώπου, οἷον νέφος ἐπανεστηκός· ἄνωθεν δὲ τοῦ μετώπου κατὰ τὴν ῥῖνα ἔχει τρίχας ἐκκλινεῖς, * οἷον ἂν ἄσυλον· κεφαλὴν μετρίαν, τράχηλον εὐμήκη, * παχύν, σύμμετρον, θριξὶ ξανθαῖς κεχρημένον, οὐ φρικαῖς, οὔτε ἄγαν ἀπεστραμμέναις· τὰ περὶ τὰς D κλεῖδας, εὐλυτώτερα μᾶλλον, ἢ συμπεφραγμένα· ὤμους ῥωμαλέους, καὶ στῆθος νεανικόν, καὶ τὸ μετάφρενον πλατύ, καὶ εὔπλευρον, καὶ εὔνωτον ἐπιεικῶς· ζῷον ἀσαρκότερον τὰ ἰσχία, καὶ τοὺς μηρούς· σκέλη ἐρρωμένα καὶ νευρώδη, βάσιν τε νεανικήν, καὶ ὅλον τὸ σῶμα διαρθρῶδες καὶ νευρῶδες, οὔτε λίαν σκληρόν, οὔτε λίαν ὑγρόν. βαδίζον δὲ βραδέως, καὶ μεγάλα διαβαῖνον, καὶ διασαλεῦον ἐν τοῖς ὤμοις, ὅταν πορεύηται. τὰ μὲν οὖν περὶ τὸ σῶμα τοιοῦτον· τὰ δὲ περὶ τὴν ψυχήν, δοτικὸν καὶ ἐλεύθερον, μεγαλόψυχον καὶ φιλόνικον, καὶ E πρᾶον καὶ δίκαιον, καὶ φιλόστοργον πρὸς ἃ ἂν ὁμιλήσῃ. Ἡ δὲ πάρδαλις τῶν ἀνδρείων εἶναι δοκούντων, θηλυμορφότερόν ἐστιν, ὅτι μὴ κατὰ τὰ σκέλη. τούτοις δὲ συνεργεῖ, καί τι ἔργον ῥώμης ἀπεργάζεται. ἔστι γὰρ ἔχον πρόσωπον μικρόν, στόμα μέγα, ὀφθαλμοὺς μικρούς, ἐκλεύκους, ἐγκοίλους, αὐτοὺς δὲ * περιπολαιοτέρους· μέτωπον προμηκέστερον, πρὸς τὰ ὦτα περιφερέστερον, ἢ ἐπιπεδώτερον· τράχηλον μακρὸν ἄγαν, καὶ λεπτόν· στῆθος ἄπλευρον, καὶ μακρὸν νῶτον· ἰσχία σαρκώδη καὶ μηρούς· τὰ δὲ περὶ τὰς λαγόνας καὶ γαστέρα, ὁμαλὰ μᾶλλον· τὸ δὲ χρῶμα ποικίλον, καὶ ὅλον ἄναρθρόν τε καὶ ἀσύμμετρον.

A quoniam cùm ira vincimur, difficulter [illegible]tes, & maximè fortes ſumus ad nihil [illegible]dum: ferimur autem ad violentiam inferendam, & patrandum ad quodcunque ira impulerit. Videntur autem mihi magis malefica fieri fœminea maſculis, & proteruiora, & minùs defenſiua. Fœminæ igitur, & quæ circa nos nutriuntur, valde manifeſta ſunt. Quæ verò ſunt circa ſyluam, omnes confitentur paſtores, & venatores, quòd talia ſunt, qualia ſunt dicta. At verò & hoc manifeſtum eſt, quòd ſingularium in vnoquoque genere, fœmina mare minoris capitis, & anguſtioris faciei, & ſubtilioris colli ſit, & pectora imbecilliora habeant & minorum la- B terum ſunt, femora autem magis carnoſa manibus, genua mollia, & crura ſubtilia habent. Pedes verò pulchriores & formam totius corporis molliorem, quàm fortiorem. Minùs neruoſa autem ſunt, & molliora, prædita humidioribus carnibus. Maſculina autem his omnibus contraria habentia, natura ſunt fortiore, & iuſtiore genere, fœmina autem eſt timidior & iniuſtior natura. His ita ſe habentibus, videtur leo omnium perfectiſſimum in aſſumendo maris formam. LEO enim habet os magnum, faciem autem quadratam, non valde oſſeam, ſuperiorem mandibulam non eminentem: ſed æ- C qualiter pendentem deorſum: naſum autem magis craſſum, quàm ſubtilem, oculos charopos, concauos, non valde rotundos, neque valde protenſos: magnitudinem verò moderatam, ſupercilium magnum: frontem quadratam ex medio ſubcauam: ad ſupercilia autem, & naſum ſub fronte velut nubes ſuperſtat: ſupra frontem, iuxta naſum, habet pilos inclinatos: caput moderatum, collum bonæ longitudinis, groſſum, innodatum, crinibus flauis, non planis, neque valde criſpis: quæ ſunt circa iuncturam ſpatularum ſpacioſa magis, quàm coniuncta: ſcapulas fortes, & pectus iuuenile: & metaphrenon latum, robuſtis lateribus fultum: femora non carnoſa, D nec coxas: crura fortia, & neruoſa, greſſum iuuenilem, & totum corpus articulatum, & neruoſum, neque valde humidum, neque durum: ambulat autem tardè, magnificè incedens, & mouens ſe in ſpatulis cùm ambulat. Talis eſt ſecundùm ea quæ ſunt circa corpus. Quæ autem circa animam, datiuum & liberale, magnanimum, & amans victoriæ, & manſuetum & iuſtum, & amans eorum, cum quibus verſetur. PARDALIS autem, fortibus eſſe viſis, fœmineæ formæ magis eſt, niſi ſecundùm crura: his autem operatur, & aliquod opus fortitudinis facit. Habet faciem paruam, os magnum, ocu- E los paruos, albos, concauos, eoſdem autem ſuperficiales: frontem longam, aures rotundas magis quàm planas, collum longum valde, pectus expers laterum, & longum dorſum: femora carnoſa, & coxas: quæ verò ſunt circa illa, & ventrem, læuia magis. Color autem varius, & totum non articulatum, & abſque menſura eſt.

Forma

Forma corporis talis eſt. In his autem, quæ ſecundùm animam, puſillum eſt, & fraudulentum, & omnino dicere, doloſum. Animalium igitur, quæ videntur fortia, conuenientia aſſumpta animalia, maſculinæ formæ & fœmininæ dicta ſunt. Alia autem qualia ſint, facile eſt vtique pertranſire. Quæcunque autem ad phyſiognomonizandum inſpicere conueniet ab animalibus, in electione ſignorum dicetur.

CAPVT VI.

De electione ſignorum in hominibus.

ELectio autem ſignorum, quæ eſt ſecundùm homines, ſic accipitur. Quibuſcunque PEDES bene nati, magni, articulati, & neruoſi, fortes ſunt: ſecundùm ea quæ ſunt in anima, reducentur ad maſculinum genus. Quicunque autem pedes paruos, ſtrictos, inarticulatos habent, delectabiliores autem viſu, quàm fortiores, molles ſunt ſecundùm ea quæ ſunt in anima: referuntur ad fœmininum genus: quibus pedum digiti curui, inuerecundi, & quibus vngues curui, referuntur ad aues curuorum vnguium: quibus pedum digiti coniuncti ſunt, ſtercoroſi, referuntur ad ortygas ſtrictorum pedum in lacubus degentes. Quibuſcunque ea quæ circa TALOS ſunt, neruoſa, & articulata, fortes ſecundùm animam, referuntur ad maſculinum genus. Quicunque autem ſunt talis carnoſi, & inarticulati, molles ſecundùm animam, referuntur ad fœmininum genus. Quicunque CRVRA habent articulata, & neruoſa, & robuſta, fortes ſecundùm animam, referuntur ad maſculinum genus: quicunque crura ſubtilia neruoſáque habent, luxurioſi, referuntur ad aues. Quicunque crura ſuperflua habent, & ſunt parum dirupta, odibiles & inuerecundi, referuntur ad apparentem decentiã. Qui ſunt ſecundùm genua plani, cinædi, referuntur ad apparentem conuenientiam. Qui habent COXAS oſſeas, & neruos, fortes ſunt, referuntur ad maſculinum genus: qui habent coxas oſſulentas, & ſuperfluas, molles ſunt, & referuntur ad fœmininum genus. Quicunque PECTEN oſſeum, acutum habent, ſunt fortes: qui carnoſum & pingue habent, molles: Qui autem habent modicam carnem, ſiccam, deſiccatam, mali moris ſunt: referuntur ad ſimias. Quicunque autem bene LVMBOSI ſunt, amatores ferarum: referuntur ad canes & leones. Videbit vtique aliquis & canes valde venaticos lumboſos eſſe. Quibus ea, quæ ſunt circa VENTREM, pinguia, bene fortes: referuntur ad maſculinum. quicunque autem non pingues, molles: referuntur ad indecentiam. Qui SPINAM magnam, & bene fortem habent, fortes ſunt anima: referuntur ad maſculinum. Qui autem ſpinam ſtrictam, & imbecillem habent, molles, referuntur ad fœmininũ genus. Quicunque autẽ robuſtis LATERIBVS, fortes ſunt ſecundùm animam: referuntur ad maſculinum genus: qui autem non bene coſtati, molles ſunt ſecundùm animam: referuntur ad fœmininum genus: Quicunque ex lateribus circumducti ſunt, ſicvt inflati, loquaces, & ſtultiloqui, referuntur ad boues, vel ranas.

A ἡ μὲν οὖν τοῦ σώματος ἰδέα τοιαύτη· τὰ δὲ περὶ τὴν ψυχήν, * μικρὸν καὶ ἐπίκλοπον, καὶ ὅλως εἰπεῖν δολερόν. τὰ μὲν οὖν ἐκπρεπέστερα μετειληφότα ζῷα, τῶν δοκούντων ἀνδρείων εἶναι, τῆς τε τοῦ ἄρρενος ἰδέας, καὶ τῆς τοῦ θήλεος, εἴρηται. τὰ δὴ ἄλλα ὅσα τυγχάνει, ῥᾴδιον ἤδη μετιέναι. ὅσα δὲ πρὸς τὸ φυσιογνωμονῆσαι, συνιδεῖν ἁρμόττει ἀπὸ τῶν ζῴων, ἐν τῇ τῶν σημείων ἐκλογῇ ῥηθήσεται.

* Geſn. μικρόν. Sylb. μικρόν.

ΚΕΦΑΛ. ϛ.

Περὶ ἐκλογῆς τῶν σημείων τῆς κατὰ τοὺς ἀνθρώπους.

B Ἡ δὲ ἐκλογὴ τῶν σημείων ἡ κατὰ τοὺς ἀνθρώπους, ὧδε λαμβάνεται. Ὅσοις οἱ πόδες εὐφυεῖς τε καὶ μεγάλοι, διηρθρωμένοι τε καὶ νευρώδεις, ἐρρωμένοι τὰ περὶ τὴν ψυχήν· ἀναφέρεται ἐπὶ τὸ ἄρρεν γένος. Ὅσοι δὲ τοὺς πόδας μικροὺς, στενοὺς, ἀνάρθρους ἔχουσιν, ἡδίους τε ἰδεῖν ἢ ῥωμαλεωτέρους, μαλακοὶ τὰ περὶ ψυχήν· ἀναφέρεται ἐπὶ τὸ θῆλυ γένος. Οἷς τῶν ποδῶν οἱ δάκτυλοι καμπύλοι, ἀναιδεῖς· καὶ ὅσοις ὄνυχες καμπύλαι· ἀναφέρεται ἐπὶ τοὺς ὄρνεις τοὺς γαμψώνυχας. Οἷς τῶν ποδῶν τὰ δάκτυλα συμπεφραγμένα ἐστὶ, διμαλέοι· ἀναφέρεται ἐπὶ * τοὺς ὄρτυγας τοὺς στενόποδας τῶν λιμναίων. Ὅσοις τὰ περὶ τὰ σφυρὰ νευρώδη τε καὶ διηρθρωμένα, εὔρωστοι τὰς ψυχάς· ἀναφέρεται ἐπὶ τὸ ἄρρεν γένος. Ὅσοι τὰ σφυρὰ σαρκώδεις καὶ ἄναρθροι, μαλακοὶ τὰς ψυχάς· ἀναφέρεται ἐπὶ τὸ θῆλυ γένος. Ὅσοι τὰς κνήμας ἔχουσιν ἠρθρωμένας τε καὶ νευρώδεις καὶ ἐρρωμένας, εὔρωστοι τὴν ψυχήν· ἀναφέρεται ἐπὶ τὸ ἄρρεν.

* Geſn. τὰς ὀρτύγας τ.

Ὅσοι δὲ τὰς κνήμας λεπτὰς νευρώδεις ἔχουσι, λάγνοι· ἀναφέρεται ἐπὶ τοὺς ὄρνιθας. Ὅσοι τὰς κνήμας περιπλέους σφόδρα ἔχουσιν, οἷον ὀλίγον διαρρηγνυμένας, βδελυροὶ καὶ ἀναιδεῖς· ἀναφέρεται ἐπὶ τὴν ἐπιπρέπειαν. D Οἱ γονύκροτοι, κίναιδοι· ἀναφέρεται ἐπὶ τὴν ἐπιπρέπειαν. Οἱ τοὺς μηροὺς ὀστώδεις καὶ νευρώδεις ἔχοντες, εὔρωστοι· ἀναφέρεται ἐπὶ τὸ ἄρρεν.

Οἱ δὲ τοὺς μηροὺς ὀστώδεις καὶ περιπλέους ἔχοντες, μαλακοί· ἀναφέρεται ἐπὶ τὸ θῆλυ. Ὅσοι δὲ πυγὰς μὲν ὀξείας ὀστώδη ἔχουσιν, εὔρωστοι· ὅσοι δὲ σαρκώδη [καὶ] πίονα ἔχουσι, μαλακοί. Ὅσοι δὲ ἔχουσιν ὀλίγην σάρκα, οἷον ἀπομοργνυμένην, κακοήθεις· ἀναφέρεται ἐπὶ τοὺς πιθήκους. Οἱ ζωνοὶ, φιλόθηροι· ἀναφέρεται ἐπὶ τοὺς λέοντας καὶ τοὺς κύνας. ἴδοι δ᾽ ἄν τις καὶ τῶν κυνῶν τοὺς φιλοθηροτάτους * ζωνοὺς ἔχοντας.

* κ. ζωνοὺς ὄντας pro εὐζώνους.

Οἷς τὰ περὶ τὴν κοιλίαν λαπαρά, εὔρωστοι· ἀναφέρεται ἐπὶ τὸ ἄρρεν. Ὅσοι δὲ μὴ λαπαροί, μαλακοί· E ἀναφέρεται ἐπὶ τὴν ἐπιπρέπειαν. Ὅσοις τὸ νῶτον εὐμέγεθές τε καὶ ἐρρωμένον, εὔρωστοι τὰς ψυχάς· ἀναφέρεται ἐπὶ τὸ ἄρρεν. Ὅσοι δὲ τὸ νῶτον στενὸν καὶ ἀσθενὲς ἔχουσι, μαλακοί· ἀναφέρεται ἐπὶ τὸ θῆλυ. Οἱ δὲ εὔπλευροι, εὔρωστοι τὰς ψυχάς· ἀναφέρεται ἐπὶ τὸ ἄρρεν. Οἱ δὲ ἄπλευροι, μαλακοὶ τὰς ψυχάς· ἀναφέρεται ἐπὶ τὸ θῆλυ. Ὅσοι δὲ ἐκ τῶν πλευρῶν περίογκοί εἰσιν, οἷον πεφυσημένοι, λάλοι καὶ μωρολόγοι· ἀναφέρεται ἐπὶ τοὺς βοῦς, ἢ ἐπὶ τοὺς βατράχους.

Ὅσοι δὲ [τὸ] ἀπὸ τοῦ ὀμφαλοῦ πρὸς τὸ ἀκροστήθιον μεῖζον ἔχουσι, ἢ τὸ ἀπὸ τοῦ ἀκροστηθίου πρὸς τὸν τράχηλον, βοροὶ καὶ ἀναίσθητοι. βοροὶ μὲν, ὅτι τὸ τεῦχος μέγα ἔχουσιν, ᾧ δέχονται τὴν τροφήν· ἀναίσθητοι δὲ, ὅτι στενότερον τὸν τόπον ἔχουσιν αἱ αἰσθήσεις, συνειργμένον τε τῷ τὴν τροφὴν δεχομένῳ, ὥστε τὰς αἰσθήσεις βεβαρῦσθαι διὰ τὰς τῶν σιτίων πληρώσεις ἢ ἐνδείας.

Ὅσοι δὲ τὰ στήθια ἔχουσι μεγάλα καὶ διηρθρωμένα, εὔρωστοι τὰς ψυχάς· ἀναφέρεται ἐπὶ τὸ ἄρρεν. Ὅσοι δὲ τὸ μετάφρενον ἔχουσι μέγα καὶ εὔσαρκον καὶ διαρθρώδες, εὔρωστοι τὰς ψυχάς· ἀναφέρεται ἐπὶ τὸ ἄρρεν. Ὅσοι δὲ ἀσθενὲς καὶ ἄσαρκον καὶ ἄναρθρον, μαλακοὶ τὰς ψυχάς· ἀναφέρεται ἐπὶ τὸ θῆλυ. Ὅσοις δὲ τὸ μετάφρενον κυρτόν ἐστι σφόδρα, οἵ τε ὦμοι πρὸς τὸ στῆθος συνηγμένοι, κακοήθεις· ἀναφέρεται ἐπὶ τὴν ἐπιπρέπειαν, ὅτι ἀφανίζεται τὰ ἔμπροσθεν προσήκοντα φαίνεσθαι. Ὅσοι δὲ τὸ μετάφρενον ὕπτιον ἔχουσι, γαῦροι καὶ ἀνόητοι· ἀναφέρεται ἐπὶ τοὺς ἵππους. ἐπεὶ δὲ οὔτε κυρτὸν σφόδρα δεῖ εἶναι, οὔτε κοῖλον, τὸ μέσον ζητητέον τοῦ εὖ πεφυκότος. Ὅσοις αἱ ἐπωμίδες εὐηρθρωμέναι, καὶ οἱ ὦμοι, εὔρωστοι τὰς ψυχάς· ἀναφέρεται ἐπὶ τὸ ἄρρεν. Ὅσοις δὲ οἱ ὦμοι ἀσθενεῖς, ἄναρθροι, μαλακοὶ τὰς ψυχάς· ἀναφέρεται ἐπὶ τὸ θῆλυ. * Ταὐτὰ λέγω καὶ περὶ ποδῶν καὶ μηρῶν. Ὅσοις ὦμοι εὔλυτοί εἰσιν, ἐλεύθεροι τὰς ψυχάς· ἀναφέρεται δὲ * ἀπὸ τοῦ φαινομένου, ὅτι πρέπει τῇ φαινομένῃ μορφῇ ἐλευθεριότης. Ὅσοις δὲ οἱ ὦμοι δύσλυτοι, συνεσπασμένοι, ἀνελεύθεροι· ἀναφέρεται ἐπὶ τὴν ἐπιπρέπειαν. Οἷς τὰ περὶ τὰς κλεῖδας εὔλυτα, αἰσθητικοί. εὐλύτων γὰρ ὄντων τῶν περὶ τὰς κλεῖδας, εὐκόλως τὴν κίνησιν τῶν αἰσθήσεων δέχονται. Οἷς δὲ τὰ περὶ τὰς κλεῖδας συμπεριπεφραγμένα ἐστὶν, ἀναίσθητοι. δυσλύτων γὰρ ὄντων τῶν περὶ τὰς κλεῖδας, ἐξαδυνατοῦσι τὴν κίνησιν παραδέχεσθαι τῶν αἰσθήσεων.

Ὅσοι τὸν τράχηλον παχὺν ἔχουσιν, εὔρωστοι τὰς ψυχάς· ἀναφέρεται ἐπὶ τὸ ἄρρεν. Ὅσοι δὲ λεπτὸν, ἀσθενεῖς· ἀναφέρεται ἐπὶ τὸ θῆλυ. Οἷς τράχηλος παχὺς καὶ πλέως, θυμοειδεῖς· ἀναφέρεται ἐπὶ τοὺς θυμοειδεῖς ταύρους. Οἷς δὲ εὐμεγέθης μὴ ἄγαν παχὺς, μεγαλόψυχοι· ἀναφέρεται ἐπὶ τοὺς λέοντας. Οἷς λεπτὸς, μακρὸς, δειλοί· ἀναφέρεται ἐπὶ τοὺς ἐλάφους. Οἷς δὲ βραχὺς ἄγαν, ἐπίβουλοι· ἀναφέρεται ἐπὶ τοὺς λύκους.

Οἷς τὰ χείλη λεπτὰ, καὶ ἐπ' ἄκροις ταῖς συγχειλίαις χαλαρὰ, * ὡς ἐπὶ τοῦ ἄνω χείλους πρὸς τὸ κάτω ἐπιβεβλῆσθαι τὸ πρὸς τὰς συγχειλίας, μεγαλόψυχοι· ἀναφέρεται ἐπὶ τοὺς λέοντας. ἴδοι δ' ἄν τις τοῦτο καὶ ἐπὶ τῶν μεγάλων καὶ εὐρώστων κυνῶν. Οἷς τὰ χείλη λεπτὰ, σκληρὰ, * κατὰ τοὺς κυνόδοντας τὸ ἐπανεστηκὸς, οἱ οὕτως ἔχοντες, * δυσγενεῖς· ἀναφέρεται ἐπὶ τοὺς ὗς. Οἱ δὲ τὰ χείλη παχέα ἔχοντες, καὶ τὸ ἄνω τοῦ κάτω προκρεμάμενον, μωροί· ἀναφέρεται ἐπὶ τοὺς ὄνους τε καὶ πιθήκους. Ὅσοι δὲ τὸ ἄνω χεῖλος, καὶ τὰ οὖλα προεστηκότα ἔχουσι, φιλολοίδοροι· ἀναφέρεται ἐπὶ τοὺς κύνας. Οἱ δὲ τὴν ῥῖνα ἄκραν παχεῖαν ἔχοντες, ῥᾴθυμοι· ἀναφέρεται ἐπὶ τοὺς βοῦς.

* κ. ταῦτα λ. ἄρθρα.

* κ. ἐπὶ τὸ φαινόμενον.

* Interpres legiſſe videtur, ὡς τὸ ἄνω χεῖλος πρὸς τὸ κάτω ἐπιβεβλῆσθαι πρὸς τὰς συγχ. Sylb.

* Interpres, κατὰ τοὺς κυνόδοντας ἐπανεστηκότας.

* Interpres, ἀγεννεῖς.

A Quicunque autem maius habent quod ab VMBILICO eſt vſque ad extremum pectoris, eo quod eſt ab extremitate pectoris vſque ad collum, voraces & inſenſibiles. Voraces quidem, quoniam ventrem magnum habent, quo appetunt cibum. Inſenſibiles autem, quia anguſtum locum habent ſenſus, atque in arctum redactum, ab eo, qui recipit cibum, ita vt ſenſus grauentur propter repletiones ciborum, aut indigentiam. Quicunque autem PECTVS magnum habent, & articulatum, fortes ſunt ſecundùm animam: referuntur ad maſculinum genus. Quicunque autem METAPHRENON habent magnum, & bene carnoſum, & articulatum, fortes ſunt ſecundùm animam: referuntur ad maſculinum. Quicunque autem imbecille, & non carnoſum, & B inarticulatum, molles ſunt ſecundùm animam: referuntur ad fœmininum. Quibuſcunque autem metaphrenon curuum eſt valde, muſculique ad pectus coacti, mali moris ſunt: referuntur ad apparentem conuenientiam, quia pereunt antrorſum, conuenientia videri. Quicunque autem metaphrenon eminens habent, glorioſi, & non intelligentes: referuntur ad equos. Quoniam autem neque curuum vehementer oportet eſſe, neque concauum metaphrenon, medium quærendum bene nati. Quibuſcunque CERVIX articulis eminentibus, & ſcapulæ, fortes ſunt ſecundùm animam: referuntur ad maſculinum: quibus ceruix C imbecillis, & inarticulata, molles ſunt ſecundùm animam: referuntur ad fœmininum. Hæc dico, quæ dixi de pedibus & coxis. Quibuſcunque autem SCAPVLÆ bene ſolutæ ſunt, liberales ſunt ſecundùm animam: referuntur ad apparentem, quia conuenit apparenti formæ liberalitas: quibus verò difficulter ſolubiles, conuulſæ, illiberales: referuntur ad apparentem conuenientiam. Quibuſcunque autem ea quæ ſunt circa CLAVEM colli, bene ſolubilia, ſenſibiles: nam bene ſolubilibus exiſtentibus, quæ ſunt circa clauem facilè motum ſenſuum recipiunt: quibus verò quæ circa claues ſunt, concluſa ſunt, inſenſibiles: difficulter enim ſolubilibus exiſtentibus his, quæ circa cla- D uem, impotentes ſunt recipere motum ſenſuum. Qui COLLVM groſſum habent, fortes ſunt ſecundùm animam, referuntur ad maſculinum, qui autem habent ſubtile, imbecilles ſunt: referuntur ad fœminas. Quibuſcunque collum groſſum, & carnoſum, iracundi: referuntur ad iracundos tauros. Quibuſcunque autem eſt bene magnum, non valde groſſum, magnanimi: referuntur ad leones. Quibus eſt longum, ſubtile, timidi ſunt: referuntur ad ceruos. Quibus autem breue valde, doloſi, & inſidiatores: referuntur ad lupos. Quibus ſunt LABIA ſubtilia, & in extremitatibus laxa, ita vt ſuperius labium ad inferius protendatur ad coniunctionem labiorum, magnanimi ſunt, referuntur ad leones. Videbit vtique aliquis hîc & in E magnis & fortibus canibus, quibus labia ſubtilia, dura circa dentes caninos, ſupereminentes: qui ita habent, ignobiles: referuntur ad ſues. Qui autem groſſa labia habent, & ſuperius inferiori propendens, fatui: referuntur ad aſinos. Quicunque autem ſuperius labium & gingiuas præeminentia habent, amatores ſunt contumeliarum: referuntur ad canes. Quicunque autem NASVM extremũ groſſum habent, rathymi ſunt, id eſt, facilem animum habent ad concupiſcendum: referuntur ad boues.

Qui autem naſum in extremitate groſſum habent, A inſenſibiles ſunt: referuntur ad ſues. Qui naſum extremum acutum habent, difficulter iraſcibiles ſunt: referuntur ad canes. Qui naſum habent rotundum, & obtuſum, magnanimi: referuntur ad leones. Qui verò naſum extremum ſubtilem habent, auiculares. Qui habent à fronte mox curuum, inuerecundi ſunt: referuntur ad coruos. Quicunque autem aquilum habent, articulatum à fronte, magnanimi: referuntur ad aquilam. Quicunque naſum concauum habent, & frontem rotundam, & ruſum eminens rotundum, luxurioſi: referuntur ad gallos. Qui verò ſimum, luxurioſi: referuntur ad ceruos. Quibuſcunque nares ſunt apertæ, iracundi: referuntur ad paſſionem, quæ fit in ira. Quicunque FACIEM carnoſam habent, ra- B thymi, id eſt,* facilè concupiſcibiles ſunt: referuntur ad boues. Qui faciem macilentam habent, ſoliciti. Qui autem carnoſam, timidi: referuntur ad facies aſino & ceruo ſimiles. Qui valde paruam habent, puſillanimi: referuntur ad catum, & ad ſimiam. Quibus facies magna, tardi: referuntur ad aſinos, & boues. Qui verò neque paruam, neque magnam, oportet eſſe medios: habitus vtique horum medius erit conueniens. Quibus autem facies videtur paruifica, illiberales ſunt: referuntur ad apparentiam. Quibus autem ab OCVLIS tanquam veſiculæ dependent, amatores vini C ſunt: referuntur ad paſſionem. Quibus vehementer cadunt, quæ ante oculos apparent, vt veſiculæ, amatores ſomni, referuntur ad paſſionem, item ex ſomno ſurgentibus dependent quæ ſunt in oculis. Quicunque oculos paruos habent, puſillanimi: referuntur ad apparentiam, & ſimiam. Quicunque verò habent oculos magnos, referuntur ad boues. Igitur bene natum oportet neque magnos neque paruos habere oculos. Qui verò concauos habent, malefici: reducuntur ad ſimiam. Quicunque habent oculos eminentes, fatui: referuntur ad apparentiam, & aſinos. Quoniam autem neque eminentium oculorum, neque concauorum oportet eſſe, medius vtique habitus præſtabit. Quibuſcunque autem oculi ſunt parum concaui, ma- D gnanimi: reducuntur ad leones. Quibus verò plus, manſueti: referuntur ad boues. Quicunque FRONTEM paruam habent, indiſciplinabiles: referuntur ad ſues. Qui autem magnam valde, tardi: referuntur ad boues. Qui rotundam habent, inſenſati: referuntur ad aſinos. Qui autem minùs planam habent, ſagaces: referuntur ad canes. Quicunque quadratam & moderatam frontem habent, magnanimi: referuntur ad leones. Quicunque autem collectam habent, adulatores, referuntur ad paſſionem, quæ fit. Id in canibus videbit quiſpiam, qui cùm blandiuntur, contractam habent frontem. Quicunque autem nebuloſam, audaces: referuntur ad taurum, & leonem. Quando autem nebuloſus habitus, audaciam ſi- E gnificat: tranquillitas autem adulationem: medius habitus vtique horum bene decenter ſe habet. Quicunque triſtem habent frontem, mœſti: referuntur ad paſſionem, quoniam mœſti triſtem habent faciem.

A Οἱ δὲ τὴν ῥῖνα ἄκρωθεν παχεῖαν ἔχοντες, ἀναίσθητοι· ἀναφέρονται ἐπὶ τοὺς ὗς. Οἱ τὴν ῥῖνα ἄκραν [ὀξεῖαν] ἔχοντες, δυσόργητοι· ἀναφέρονται ἐπὶ τοὺς κύνας. Οἱ δὲ τὴν ῥῖνα περιφερῆ ἔχοντες, * ἄκραν μὲν, ἀμβλεῖαν δὲ, μεγαλόψυχοι· ἀναφέρονται ἐπὶ τοὺς λέοντας. Οἱ δὲ τὴν ῥῖνα ἄκραν λεπτὴν ἔχοντες, ὀρνιθώδεις· οἱ ἐπίγρυποι ἀπὸ τοῦ μετώπου εὐθὺς ἀγομένην, ἀναιδεῖς· ἀναφέρονται ἐπὶ τοὺς κόρακας. Οἱ δὲ γρυπὴν ἔχοντες, καὶ τοῦ μετώπου διηρθρωμένην, μεγαλόψυχοι· ἀναφέρονται ἐπὶ τοὺς ἀετούς. Οἱ δὲ τὴν ῥῖνα ἔγκοιλον ἔχοντες, τὰ πρὸ τοῦ μετώπου περιφερῆ, τὴν δὲ περιφέρειαν ἄνω ἀνεστηκυῖαν, λάγνοι· ἀναφέρεται ἐπὶ τοὺς ἀλεκτρυόνας.

B Οἱ δὲ σιμὴν ἔχοντες, λάγνοι· ἀναφέρονται ἐπὶ τοὺς ἐλάφους. Οἷς δὲ οἱ μυκτῆρες ἀναπεπταμένοι, θυμώδεις· ἀναφέρονται ἐπὶ τὸ πάθος, ὃ ἐν τῷ θυμῷ γινόμενον. Οἱ τὸ πρόσωπον σαρκῶδες ἔχοντες, ῥάθυμοι· ἀναφέρονται ἐπὶ τοὺς βοῦς. Οἱ τὰ πρόσωπα ἰσχνὰ ἔχοντες, ἐπιμελεῖς· οἱ δὲ σαρκώδη, δειλοί· ἀναφέρεται ἐπὶ τοὺς ὄνους, καὶ τοὺς ἐλάφους. Οἱ μικρὰ * τὰ πρόσωπα ἔχοντες, μικρόψυχοι· ἀναφέρεται ἐπὶ αἴλουρον καὶ πίθηκον. Οἷς τὰ πρόσωπα μεγάλα, νωθροί· ἀναφέρεται ἐπὶ τοὺς ὄνους καὶ βοῦς. ἐπεὶ δὲ οὔ-

C τε μικρὸν οὔτε μέγα δεῖ εἶναι, ἡ μέση ἕξις εἴη ἂν τούτων ἐπιεικής. Οἷς δὲ τὸ πρόσωπον φαίνεται μικροπρεπὲς, ἀνελεύθεροι· ἀναφέρονται ἐπὶ τὴν ἐπιπρέπειαν. Οἷς τὸ ἀπὸ τῶν ὀφθαλμῶν οἷον κύστιδες προσκρέμανται, οἰνόφλυγες· ἀναφέρεται ἐπὶ τὸ πάθος. * ἐπὶ γὰρ τοῖς σφόδρα ἐμπεπωκόσι τὰ περὶ τῶν ὀφθαλμῶν οἷον κύστιδες ἐφεστήκασι, φίλυπνοι· ἀναφέρεται ἐπὶ τὸ πάθος· ἐπεὶ τοῖς ἐξ ὕπνου ἀνεστηκόσιν ἐπικρέμανται τὰ ἐπὶ τοῖς ὀφθαλμοῖς. Οἱ τοὺς ὀφθαλμοὺς μικροὺς ἔχοντες, μικρόψυχοι· ἀναφέρεται ἐπὶ τὴν ἐπιπρέπειαν, καὶ ἐπὶ πίθηκον. Οἱ δὲ μεγαλόφθαλμοι, νωθροί· ἀναφέρονται ἐπὶ τοὺς βοῦς. τὸν ἄρα εὐφυῆ, δεῖ μήτε μι-

D κροὺς, μήτε μεγάλους ἔχειν τοὺς ὀφθαλμούς. Οἱ δὲ κοίλους ἔχοντες, κακοῦργοι· ἀναφέρεται ἐπὶ πίθηκον. Ὅσοι ἐξόφθαλμοι, ἀβέλτεροι· ἀναφέρεται ἐπὶ τὴν ἐπιπρέπειαν τε καὶ ὄνους. ἐπεὶ δὲ οὔτε ἐξόφθαλμον, οὔτε κοιλόφθαλμον δεῖ εἶναι, ἡ μέση ἕξις ἂν κρατοίη. Ὅσοις ὀφθαλμοὶ μικρὸν ἐγκοιλότεροι, μεγαλόψυχοι· ἀναφέρονται ἐπὶ τοὺς λέοντας· οἷς δ' ἐπὶ πλεῖον, πρᾳεῖς· ἀναφέρονται ἐπὶ τοὺς βοῦς. Οἱ τὸ μέτωπον μικρὸν ἔχοντες, ἀμαθεῖς· ἀναφέρονται ἐπὶ τοὺς ὗς. Οἱ δὲ μέγα ἄγαν ἔχοντες, νωθροί· ἀναφέρονται ἐπὶ τοὺς βοῦς. Οἱ δὲ περιφερὲς ἔχοντες, ἀναίσθητοι· ἀναφέρονται ἐπὶ τοὺς ὄνους. Οἱ μικρότεροι ἐπίπεδον ἔ-

E χοντες, ἀναίσθητοι· ἀναφέρονται ἐπὶ τοὺς κύνας. Οἱ δὲ τετράγωνον σύμμετρον τὸ μέτωπον ἔχοντες, μεγαλόψυχοι· ἀναφέρονται ἐπὶ τοὺς λέοντας. Οἱ δὲ σκυνιφὲς ἔχοντες, [αὐθάδεις· ἀναφέρονται ἐπὶ ταῦρον καὶ λέοντα. Οἱ δ' ἀτενὲς ἔχοντες,] κόλακες· ἀναφέρονται ἐπὶ τὸ γιγνόμενον πάθος. ἴδοι δ' ἄν τις ἐπὶ τῶν κυνῶν, ὅτι οἱ κύνες ἐπὰν θωπεύωσι, γαληνὲς τὸ μέτωπον ἔχουσιν. ἐπεὶ δ' οὖν ἥτε σκυνιφὴς ἕξις αὐθάδειαν ἐμφαίνει, ἥτε γαλήνη κολακείαν, ἡ μέση ἂν τούτων ἕξις εὐαρμόστως ἔχοι. Οἱ σκυθρωπὰ μέτωπα ἔχοντες, λυπηροί· ἀναφέρονται ἐπὶ τὸ πάθος, ὅτι οἱ λυπούμενοι, σκυθρωποί εἰσιν.

* κ. ἄκραν, apud Polemonem & Adamantium, vt notat Gel.

* κ. τὰ ὦτα

Interpres, ἐν δ' ὅσοις ἐμπ.

Οἱ δὲ κατηφεῖς, ὀδυρταί· ἀναφέρεται ἐπὶ τὸ πάθος, ὅτι οἱ ὀδυρόμενοι κατηφεῖς. Οἱ τὴν κεφαλὴν μεγάλην ἔχοντες, * ἀναίσθητοι· ἀναφέρεται ἐπὶ τοὺς ὄνους· οἱ δὲ μικρὰν, αἰσθητικοί· ἀναφέρεται ἐπὶ τοὺς κύνας. Οἱ τὰς κεφαλὰς φοξοί, ἀναιδεῖς· ἀναφέρεται ἐπὶ τοὺς γαμψώνυχας. Οἱ τὰ ὦτα μικρὰ ἔχοντες, πιθηκώδεις· οἱ δὲ μεγάλα, ὀνώδεις. ἴδοι δ' ἄν τις καὶ τῶν κυνῶν τοὺς ἀρίστους μέτρια ὦτα ἔχοντας. Οἱ ἄγαν μέλανες, δειλοί· ἀναφέρεται ἐπὶ τοὺς Αἰγυπτίους, καὶ Αἰθίοπας. Οἱ δὲ λευκοὶ ἄγαν, δειλοί· ἀναφέρεται ἐπὶ τὰς γυναῖκας. τὸ δὲ πρὸς ἀνδρείαν συντελοῦν χρῶμα, μέσον δεῖ τούτων εἶναι. Οἱ ξανθοί, εὔψυχοι· ἀναφέρεται ἐπὶ τοὺς λέοντας. Οἱ πυρροὶ ἄγαν, πανοῦργοι· ἀναφέρεται ἐπὶ τὰς ἀλώπεκας. Οἱ δὲ ἔνωχροι, καὶ τεταραγμένοι τὸ χρῶμα, δειλοί· ἀναφέρεται ἐπὶ τὸ πάθος, τὸ ἐκ τοῦ φόβου γιγνόμενον. οἱ δὲ μελίχλωροι, ἀπεψυγμένοι εἰσί· τὰ δὲ ψυχρὰ, δυσκίνητα· δυσκινήτων δὲ ὄντων τῶν κατὰ τὸ σῶμα εἶεν ἂν βραδεῖς. Οἷς τὸ χρῶμα ἐρυθρόν, ὀξεῖς· ὅτι πάντα τὰ κατὰ τὸ σῶμα ὑπὸ κινήσεως ἐκθερμαινόμενα, ἐρυθραίνεται. Οἷς δὲ τὸ χρῶμα φλογοειδές, μανικοί· ὅτι τὰ κατὰ τὸ σῶμα σφόδρα ἐκθερμανθέντα, φλογοειδῆ χροιὰν ἴσχει. οἱ δὲ ἄκρως θερμανθέντες, μανικοὶ ἂν εἴησαν. Οἷς δὲ περὶ τὰ στήθη ἐπιφλεγὲς ἐστὶ χρῶμα, δυσόργητοι· ἀναφέρεται ἐπὶ τὸ πάθος. τοῖς γὰρ ὀργιζομένοις ἐπιφλέγεται τὰ περὶ τὰ στήθη. Οἷς τὰ περὶ τὸν τράχηλον καὶ τοὺς κροτάφους αἱ φλέβες κατατεταμέναι εἰσί, δυσόργητοι· ἀναφέρεται ἐπὶ τὸ πάθος, ὅτι τοῖς ὀργιζομένοις ταῦτα συμβαίνει. Οἷς τὸ πρόσωπον ἐπιφοινίσσον ἐστίν, αἰσχυντηλοί εἰσιν· ἀναφέρεται ἐπὶ τὸ πάθος, ὅτι τοῖς αἰσχυνομένοις ἐπιφοινίσσεται τὸ πρόσωπον. Οἷς αἱ γνάθοι ἐπιφοινίσσουσιν οἰνόφλυγες· ἀναφέρεται ἐπὶ τὸ πάθος, ὅτι τοῖς μεθύουσιν ἐπιφοινίσσουσιν αἱ γνάθοι. Οἷς δὲ οἱ ὀφθαλμοὶ ἐπιφοινίσσουσιν, ἐκστατικοὶ ὑπὸ ὀργῆς· ἀναφέρεται ἐπὶ τὸ πάθος, ὅτι οἱ ὑπὸ ὀργῆς ἐξεστηκότες, ἐκφοινίσσονται τοὺς ὀφθαλμούς. Οἷς δὲ ὀφθαλμοὶ ἄγαν μέλανες, δειλοί. ἡ γὰρ ἄγαν μελαίνη χρόα, ἐφάνη δειλίαν σημαίνουσα. εἰ δὲ μὴ ἄγαν μέλανες, ἀλλὰ κλίνοντες πρὸς τὸ ξανθὸν χρῶμα, εὔψυχοι. Οἷς δὲ οἱ ὀφθαλμοὶ γλαυκοί, ἢ λευκοί, δειλοί· ἐφάνη γὰρ τὸ λευκὸν χρῶμα δειλίαν σημαῖνον. Οἱ δὲ μὴ γλαυκοί, ἀλλὰ χαροποί, εὔψυχοι· ἀναφέρεται ἐπὶ λέοντα καὶ ἀετόν. Οἷς δὲ * οἰνωποί, μῶροι· ἀναφέρεται ἐπὶ τὰς αἶγας. Οἷς δὲ * πυρώδεις, ἀναιδεῖς· ἀναφέρεται ἐπὶ τοὺς κύνας. Οἱ ἀχρώματοι, ἐντεταραγμένους ἔχοντες τοὺς ὀφθαλμούς, δειλοί· ἀναφέρεται ἐπὶ τὸ πάθος· ὅτι οἱ φοβηθέντες, ἔνωχροι γίνονται χρώματι οὐχ ὁμαλῷ. Οἱ δὲ τοὺς ὀφθαλμοὺς στιλπνοὺς ἔχοντες, λάγνοι· ἀναφέρεται ἐπὶ τοὺς ἀλεκτρυόνας καὶ κόρακας. Οἱ δασείας ἔχοντες τὰς κνήμας, λάγνοι· ἀναφέρεται ἐπὶ τοὺς τράγους. Οἱ δὲ περὶ τὰ στήθη καὶ τὴν κοιλίαν ἄγαν δασεῖς ἔχοντες, οὐδέποτε πρὸς τοῖς αὐτοῖς διατελοῦσιν· ἀναφέρεται ἐπὶ τοὺς ὄρνιθας, ὅτι ταῦτα τὰ στήθη καὶ τὴν κοιλίαν δασύτατην ἔχουσιν. Οἱ τὰ στήθη ψιλὰ ἄγαν ἔχοντες, ἀναιδεῖς· ἀναφέρεται ἐπὶ τὰς γυναῖκας. Ἐπειδὴ οὖν οὐδὲ ἄγαν δασέα δεῖ εἶναι, οὔτε ψιλά, ἡ μέση ἕξις κρατίστη.

* γρ. αἰσθητικοί· ἀναφέρεται ἐπὶ τοὺς κύνας. οἱ δὲ μικρὰν, ἀναίσθητοι· ἀναφέρεται ἐπὶ τοὺς ὄνους. & ita interpr.

* Geſnerus, αἰγωποί.

* ἢ πυρώδεις.

A Qui autem demiſſam, lamentabundi ſunt: referuntur ad paſſiones, quia lugentes demiſſæ ſunt frontis. Quicunque autem habent magnum CAPVT, ſenſati: referuntur ad canes. Qui verò paruum, inſenſati: referuntur ad aſinos. Qui habent capita pineata, inuerecundi: referuntur ad habentes vngues curuos. Quicunque AVRES paruas habent, ſimiales ſunt. Quicunque autem magnas, aſinini. Videbit vtique aliquis & canum optimos moderatas aures habere. Qui valde nigri ſunt: timidi: referuntur ad Ægyptios, & Æthiopes: valde autem albi, timidi ſunt: referuntur ad mulieres. Colorem autem, qui confert ad fortitudinem, medium horum oportet eſſe. Flaui, magni animi ſunt: referuntur ad leones. Rubei, valde B aſtuti: referuntur ad vulpes. Pallidi, colore turbati, timidi ſunt: referuntur ad paſſionem, quæ fit ex timore. Qui autem ſunt mellei coloris, ſunt frigidi: frigida autem mobilia difficulter: mobilibus autem difficulter exiſtentibus iis quæ iuxta ſunt corpus, erunt vtique tardi. Quibus color ruber eſt, acuti ſunt, quoniam omnia, quæ ſunt ſecundùm corpus, à motu calefacta erubeſcunt. Quibus color flammeus eſt, maniaci: quia ea, quæ ſunt in corpore vehementer calefacta, flammeum colorem habent. Qui autem ſunt extremè calefacti, maniaci vtique ſunt. Quibus autem eſt flammeus color circa pectus, difficilis iræ ſunt: referuntur ad paſſionem. Iratis namque ſuperacce- C duntur ea quæ ſunt circa pectus. Quibus autem circa collum & tempora venæ diſtenſæ ſunt, difficilis iræ: referuntur ad paſſionem, quia iratis hæc accidunt. Quibus facies ſupererubeſcens eſt, verecundi ſunt: referuntur ad paſſionem, quia verecundatis ſupererubeſcit facies. Quibus genæ ſupererubeſcunt, amatores ſunt vini: referuntur ad paſſionem, quia ebriis ſupererubeſcunt genæ. Quibus autem oculi ſupererubeſcunt, extra ſe feruntur ob iram: referuntur ad paſſionem, quia qui ab ira efferuntur, erubeſcunt oculis. Quibus autem oculi valde nigri, timidi: niger enim color valde, videtur timiditatem ſignificare. Qui autem non ſunt valde nigri, ſed declinant D ad flauum colorem, boni animi ſunt. Quibus autem oculi glauci, aut albi, timidi ſunt: viſus eſt albus color timiditatem ſignificare. Qui autem non ſunt glauci, ſed charopi, boni animi ſunt: referuntur ad leones, & aquilas. Qui autem vino colore ſimiles ſunt, ſtolidi ſunt: referuntur ad capras. Quibus ignei ſunt oculi, inuerecundi: referuntur ad canes. Qui autem oculos diſcoloratos habent, & turbatos, timidi: referuntur ad paſſionem: quia qui timuerint, pallidi fiunt colore non æqualiter. Quicunque oculos lucentes habent, luxurioſi: referuntur ad coruos & gallos. Qui tibias piloſas habent, Venerei ſunt: referuntur ad hircos. Qui autem ea quæ ſunt circa pectus, & ventrem, valde piloſa E habent, nunquam in eiſdem perſeuerant: referuntur ad aues: quia ea pectus & ventrem valde piloſa habent. Qui pectora habent valde nuda, vel non piloſa, inuerecundi ſunt: referuntur ad mulieres. Quoniam igitur non oportet valde piloſa eſſe, neque nuda, medius habitus eſt optimus.

Quicunque humeros piloſos habent, nunquam in eidem perſeuerant: referuntur ad aues. Qui dorſum habent piloſum valde, inuerecundi ſunt, referuntur ad beſtias. Quicunque autem collum retrò piloſum habent, liberales ſunt: referuntur ad leones. Qui autem mentum habent acutum, boni animi: referuntur ad canes. Quicunque habent ſupercilia coniuncta, triſtes ſunt: referuntur ad ſimilitudines paſſionis. Qui ſupercilia diuulſa habent ante naſum, & extenſa vſque ad tempora, fatui ſunt: referuntur ad porcos. Qui erectos pilos habent in capite, timidi: referuntur ad paſſiones: quia timentibus eriguntur. Qui capillos multum criſpos habent, timidi: referuntur ad Æthiopas. Quoniam igitur rigentes, & vehementer criſpi, timiditatem ferunt, qui in extremitate ſunt criſpi, ad bonum animum referuntur: referuntur autem & ad leonem. Qui id frontis, quod eſt ante caput, eleuatum habent, liberales ſunt: referuntur ad leones. Qui in capite adnatos habent capillos ad frontem iuxta naſum, ſunt liberales: referuntur ad decentem apparentiam. De manus, & cubiti, & brachij motu, eadem referuntur. Qui humeris rectis, tenſis, inſultant, galeangones: referuntur ad equos. Qui ſcapulis mouentur curui, ſunt elati: referuntur ad leones. Qui pedibus inuerſis ambulantes, & cruribus, fœminini: referuntur ad mulieres. Qui verò corporibus circuntorquentes ſe, & fricantes, adulatores ſunt: referuntur ad paſſiones. Inclinati autem ad dextram in ambulando, cinædi ſunt: referuntur ad apparentem decentiam. Quicunque oculos habent bene mobiles, acuti, rapaces: referuntur ad accipitres. Qui palpebrizant, timidi:, quia in oculis prima mouentur.

* * *

A Οἱ τοὺς ὤμους δασεῖς ἔχοντες, οὐδέ ποτε πρὸς τοῖς αὐτοῖς διατελοῦσιν· ἀναφέρεται ἐπὶ τοὺς ὄρνιθας. Οἱ τὸ νῶτον δασὺ ἔχοντες ἄγαν, ἀναιδεῖς· ἀναφέρεται ἐπὶ τὰ θηρία. Οἱ δὲ τὸν αὐχένα ὄπισθεν δασὺν ἔχοντες, *ἐλευθέριοι· ἀναφέρεται ἐπὶ τοὺς λέοντας. Οἱ δὲ ἀκρογένειοι, εὔψυχοι· ἀναφέρεται ἐπὶ τοὺς κύνας. Οἱ δὲ σύνοφρυες, δύσθυμοι· ἀναφέρεται ἐπὶ τὴν τοῦ πάθους *ὁμοιότητα. Οἱ δὲ τὰς ὀφρῦς κατεσπασμένοι πρὸς τῆς ῥινός, ἀνεσπασμένοι δὲ πρὸς τὸν κρόταφον, εὐήθεις· ἀναφέρεται ἐπὶ τοὺς σῦς. Οἱ φριξὰς τὰς τρίχας ἔχοντες B ἐπὶ τῆς κεφαλῆς, δειλοί· ἀναφέρεται ἐπὶ τὸ πάθος, ὅτι καὶ οἱ ἔκφοβοι γινόμενοι, φρίσσουσιν. Οἱ τὰς τρίχας σφόδρα οὔλας ἔχοντες, δειλοί· ἀναφέρεται ἐπὶ τοὺς Αἰθίοπας. Ἐπειδὴ οὖν αἵ τε φριξαί, καὶ αἱ σφόδρα οὖλαι δειλίαν ἀναφέρουσιν, αἱ ἀκρόουλοι δ᾽ ἂν εἶεν πρὸς εὐψυχίαν ἄγουσαι· ἀναφέρεται δὲ καὶ ἐπὶ τὸν λέοντα. Οἱ τοῦ μετώπου τὸ πρὸς τῇ κεφαλῇ ἀνάσιλλον ἔχοντες, ἐλευθέριοι· ἀναφέρεται ἐπὶ τοὺς λέοντας. Οἱ ἐπὶ τῆς κεφαλῆς προσπεφυκυίας ἔχοντες τὰς τρίχας ἐπὶ C τοῦ μετώπου κατὰ τὴν ῥῖνα, ἀνελεύθεροι· ἀναφέρεται ἐπὶ τὴν ἐπιπρέπειαν, ὅτι δουλοπρεπὲς τὸ φαινόμενον.

Μακροβάμων καὶ *βραδυβάμων, εἴη ἂν νωθρεπιθέτης τελεσικός· ὅτι τὸ *μακρὰ βαίνειν, ἀνυστικόν· τὸ βραδέως δέ, μελλητικόν. Βραχυβάμων, βραδυβάμων, νωθρεπιθέτης, οὐ τελεσικός· ὅτι τὸ βραχέα βαίνειν καὶ βραδέως, οὐκ ἀνυστικόν. Μακροβάμων, ταχυβάμων, οὐκ ἐπιθετικός, τελεσικός. ὅτι τὸ μὲν τάχος *εὐτελεστικόν· ἡ δὲ μακρότης, οὐκ ἀνυστικόν. Βραδυβάμων, ταχυβάμων, D ἐπιθετικός, οὐ τελεσικός. Περὶ δὲ χειρὸς καὶ πήχεως καὶ βραχίονος φορᾶς, αἱ τοιαῦται ἀναφέρονται.

Οἱ δὲ τοῖς ὤμοις ἐπισαλεύοντες ὀρθοῖς ἐκτεταμένοις, γαλεαγκῶνες· ἀναφέρεται ἐπὶ τοὺς ἵππους. Οἱ τοῖς ὤμοις ἐπωμασαλεύοντες ἐγκεκυφότες, μεγαλόφρονες· ἀναφέρεται ἐπὶ τοὺς λέοντας. Οἱ δὲ τοῖς ποσὶν ἐξεστραμμένοις πορευόμενοι, καὶ ταῖς κνήμαις θηλείαις, ἀναφέρεται ἐπὶ τὰς γυναῖκας. Οἱ δὲ τοῖς σώμασι περικλώμενοι καὶ ἐντριβόμενοι, κόλακες· ἀναφέρεται ἐπὶ τὸ πάθος. Οἱ ἐγκλινόμενοι εἰς τὰ δεξιὰ ἐν τῷ πορεύεσθαι, κίναιδοι· ἀναφέρεται ἐπὶ τὴν ἐπιπρέπειαν. Οἱ εὐκινήτους τοὺς ὀφθαλμοὺς ἔχοντες, ὀξεῖς, ἁρπαστικοί· ἀναφέρεται ἐπὶ τοὺς ἱέρακας. Οἱ σκαρδαμύκται, δειλοί· ὅτι ἐν τοῖς ὄμμασι πρῶτα τρέπονται.

Οἱ* καπιλλαυτιωειδῶν τε, καὶ οἷς τὸ ἕτερον βλέφαρον ἐπιβέβηκε τοῖς ὀφθαλμοῖς, κατὰ μέσον τῆς ὄψεως ἑστηκυίας, καὶ οἱ ὑπὸ βλέφαρα τὰ ἄνω τὰς *ὄψιας ἀνάγοντες, μαλακόν τε βλέποντες, καὶ οἱ τὰ βλέφαρα ἐπιβεβληκότες, ὅλως τε πάντες οἱ μαλακόν τε καὶ διακεχυμένον βλέποντες, ἀναφέρονται ἐπὶ τὴν ἐπιπρέπειαν καὶ τὰς γυναῖκας.

Qui oculos frequenti tempore mouentes, tincturam albuginis in oculo velut immotam habent, intellectiui. Si enim in quopiam intellectio vehementer fiat, in ea ſtat & viſus. Qui voce admodum magna vociferantur grauiter, iniurioſi, referuntur ad aſinos. Quicunque autem vocant à graui incipientes, & finiunt in acutum, iracundi, & lugentes: referuntur ad boues, & ad decentiam vocis. Quicunque autem vocibus acutis, mollibus, ac ruptis loquuntur, cinædi: referuntur ad mulieres, & ad decentiam. Quicunque grauiter vocant, magnum, ac perplexum: reducuntur ad fortes canes, & decentiam. Quicunque molliter ſine contentione vocant, manſueti: referuntur ad oues. Quicunque vocant acutè, & fortiter, iracundi: referuntur ad capras. Parvi valde, acuti ſunt: motu enim ſanguinis paruum locum continente,

E Οἱ τοὺς ὀφθαλμοὺς διὰ συχνοῦ χρόνου κινοῦντες, ἔχοντές τε βάμμα λευκώματος ἐπὶ τῶν ὀφθαλμῶν, ὡς προσεστηκότας, ἐννοητικοί. ἂν γὰρ πρός τι ἔννοια σφόδρα γίνηται ἡ ψυχὴ ἵσταται καὶ ἡ ὄψις. Οἱ μέγα φωνοῦντες βαρύτονον, ὑβρισταί· ἀναφέρεται ἐπὶ τοὺς ὄνους. Ὅσοι δὲ φωνοῦσιν ἀπὸ βαρέος ἀρξάμενοι, τελευτῶσι δὲ εἰς ὀξύ, δυσθυμικοί, ὀδυρταί· ἀναφέρεται ἐπὶ τοὺς βοῦς, καὶ ἐπὶ τὸ πρέπον τῇ φωνῇ. Ὅσοι δὲ ταῖς φωναῖς ὀξείαις, μαλακαῖς, κεκλασμέναις διαλέγονται, κίναιδοι· ἀναφέρεται ἐπὶ τὰς γυναῖκας, καὶ ἐπὶ τὴν ἐπιπρέπειαν. Ὅσοι βαρύτονον φωνοῦσι μέγα καὶ πεπλεγμένον, ἀναφέρονται ἐπὶ τοὺς εὐρώστους κύνας, καὶ ἐπὶ τὴν ἐπιπρέπειαν. Ὅσοι μαλακὸν ἄτονον φωνοῦσι, πρᾶοι· ἀναφέρεται ἐπὶ τὰς οἶς. Ὅσοι δὲ φωνοῦσιν ὀξὺ καὶ ἐγκεκραγότες, μάργοι· ἀναφέρεται ἐπὶ τὰς αἶγας. Οἱ μικροὶ ἄγαν, ὀξεῖς· τῆς γὰρ τοῦ αἵματος φορᾶς μικρὸν τόπον κατεχούσης,

* κ. ἐλευθέριοι.

* κ. βραχυβάμων,

* Quidam ἀνυστικὸν vel ἐπιτελεστικός, vt mox.

* κ. μακρὰ β.

* Mendoſa vox pro καμμαίνοντες aut καμμύοντες. Sylb.

* Qu. ὄψεις, vel κόρας.

A καὶ αἱ κινήσεις ταχὺ ἄγαν ἀφικνοῦνται ἐπὶ τὸ φρονοῦν. Οἱ δὲ ἄγαν μεγάλοι, βραδεῖς· τῆς γὰρ τοῦ αἵματος φορᾶς μέγαν τόπον κατεχούσης, αἱ κινήσεις βραδέως ἀφικνοῦνται ἐπὶ τὸ φρονοῦν. Ὅσοι τῶν μικρῶν ξηραῖς σαρξὶ κεχρημένοι εἰσίν, ἢ καὶ χρώμασιν, * ἃ διὰ θερμότητα τοῖς σώμασιν ἐπιγίνονται, οὐδὲν ἀποτελοῦσιν· οὔσης γὰρ τῆς φορᾶς ἐν μικρῷ καὶ ταχείας, διὰ τὸ πυρῶδες, οὐδέποτε κατὰ ταὐτόν ἐστι τὸ φρονεῖν, ἀλλὰ ἄλλοτ' ἐπ' ἄλλων, πρὶν τὸ ὑπάρχον ἀφεῖναι. Ὅσοι δὲ τῶν μεγάλων ὑγραῖς σαρξὶ κεχρημένοι, ἢ καὶ χρώμασιν ἃ διὰ ψυχρότητα ἐγγίνονται, οὐδὲν ἐπιτελοῦσιν. οὔσης γὰρ τῆς φορᾶς ἐν μεγάλῳ τόπῳ καὶ βραδείας διὰ B τὴν ψυχρότητα, οὐ συνανύει [τι] ἀφικνουμένη ἐπὶ τὸ φρονοῦν. Ὅσοι δὲ τῶν μικρῶν ὑγραῖς σαρξὶ κεχρημένοι εἰσί, καὶ * χρώμασι διὰ ψυχρότητα, γίνονται ἐπιτελεστικοί. οὔσης γὰρ τῆς κινήσεως ἐν μικρῷ, τὸ δυσκίνητον τῆς κράσεως συμμετρίαν παρέσχε τὸ πρῶτον ἐπιτελεῖν. Ὅσοι δὲ τῶν μεγάλων ξηραῖς σαρξὶ κεχρημένοι εἰσὶ * καὶ χρώμασι, διὰ θερμότητα, γίνονται ἐπιτελεστικοὶ καὶ αἰσθητικοί. τὴν γὰρ τοῦ μεγέθους ὑπερβολήν, σαρκῶν τε καὶ χρώματος, ἡ θερμότης ἠκέσατο· ὥστε σύμμετρον εἶναι πρὸς τὸ ἐπιτελεῖν. Τὰ μὲν οὖν με- C γέθεσιν ὑπερβάλλοντα τῶν σωμάτων, ἢ σμικρότησιν ἐλλείποντα, ὡς τυχόντα, ἐπιτελεστικά ἐστι, καὶ ὡς ἀτελῆ, εἴρηται. Ἡ δὲ τούτων μέση φύσις πρὸς τὰς αἰσθήσεις κρατίστη καὶ τελεστικωτάτη, οἷς ἂν ἐπιθῆται. αἱ γὰρ κινήσεις * οὐ διὰ πολλοῦ οὖσαι, ῥᾳδίως ἀφικνοῦνται πρὸς τὸν νοῦν· οὖσαί τε οὐ κατὰ μικρόν, * ὑπερχωροῦσιν. ὥστε τὸν τελεώτατον πρὸς τὸ ἐπιτελεῖν τε ἃ ἂν προθῆται, καὶ αἰσθάνεσθαι μέλλοντα, μέτριον δεῖ εἶναι τὸ μέγεθος. Οἱ ἀσύμμετροι, πανοῦργοι· ἀναφέρεται ἐπὶ τὸ πάθος, καὶ τὸ θῆλυ. Εἰ γὰρ οἱ ἀσύμμετροι πανοῦργοι, οἱ σύμμετροι δίκαιοι ἂν εἴησαν, καὶ ἀνδρεῖοι. D Τὴν δὲ τῆς συμμετρίας ἀναφοράν, πρὸς τὴν τῶν σωμάτων εὐαγωγίαν καὶ εὐφυΐαν ἀνοιστέον, ἀλλ' οὐ πρὸς τὴν τοῦ ἄρρενος ἰδέαν, ὥσπερ ἐν ἀρχῇ διῃρέθη. καλῶς δ' ἔχει καὶ πάντα τὰ σημεῖα, ὅσα προείρηται, ἀναφέρειν ἐπὶ τὴν ἐπιπρέπειαν, καὶ εἰς ἄρρεν, καὶ εἰς θῆλυ. Ταῦτα γὰρ τελεωτάτην διαίρεσιν διῄρηται, καὶ ἐδείχθη ἄρρεν θήλεος δικαιότερον, καὶ ἀνδρειότερον, καὶ ὅλως εἰπεῖν, ἄμεινον. ἐν ἁπάσῃ δὲ τῇ τῶν σημείων ἐκλογῇ, ἕτερα ἑτέρων σημεῖα μᾶλλον δηλοῦσιν ἐναργῶς τὸ ὑποκείμενον. ἐναργέστερα δὲ τὰ ἐν ἐπικαιροτάτοις τόποις ἐγγινόμενα. ἐπικαιρότατος δὲ τόπος, ὁ περὶ τὰ ὄμματά E τε καὶ τὸ μέτωπον, καὶ κεφαλὴν καὶ πρόσωπον· δεύτερος δέ, ὁ περὶ τὰ στήθη καὶ ὤμους· ἔπειτα, περὶ τὰ σκέλη τε καὶ πόδας· τὰ δὲ περὶ τὴν κοιλίαν, ἥκιστα. ὅλως δὲ εἰπεῖν, οὗτοι οἱ τόποι ἐναργέστατα σημεῖα παρέχονται, ἐφ' ὧν καὶ φρονήσεως πλείστης ἐπιπρέπεια γίνεται.

* χ. ἢ ἃ διὰ

* Malim χρώμασι, ἃ διὰ ψυχρότητα γίνεται, ἐπιτ. vt ſuprà.

* Et hîc ſcrib. χρώμασιν, ἃ διὰ θερμότητα γίνεται, ἐπ.

* Interp. οὐ πολλαὶ οὖσαι non rectè.

* Interpr. προχωροῦσι.

A motiones quoque valde velociter accedunt ad ſapere. Qui autem ſunt valde magni, tardi. Motu enim ſanguinis magnum locum continente, motus tardè accedunt ad ſapere. Quicunque autem paruorum ſiccis carnibus vtuntur, aut & coloribus, aut quæ per caliditatem corporibus ſuperfluunt, nihil perficiunt. Exiſtente enim motu in paruo & veloci propter igneum, nunquam ſecundum idem eſt ſapere: ſed aliud in alio priùs quàm excedens perficiat. Quicunque magnorum humidis carnibus vtentes, aut coloribus, qui propter frigiditatem innaſcuntur, nihil perficiunt: exiſtente enim motu in magno loco & tardo, per frigiditatem non permittit aliquid accedere ad B ſapere. Quicunque autem paruorum humidis carnibus vtuntur, & coloribus propter frigiditatem, fiunt perfectiui. Exiſtente enim motu in paruo, difficulter mobile complexionis commenſurationem præbuit primùm perficere. Quicunque magnorum duris carnibus vtuntur, & coloribus per caliditatem, fiunt perfectiui, & ſenſitiui: exiſtente enim latione in loco magna, & tarda propter frigiditatem, nihil conducet accedens ad ſapere; qui verò magni duris carnibus vtuntur, & coloribus propter caliditatem, fiunt perfectiui, & ſenſitiui: magnitudinis enim ſuperabundantiam, & carnium, & coloris, caliditas acquiſiuit: quare C commenſuratum eſſe ad perficiendum. Excedentia igitur corporum magnitudinibus, aut paruitudinibus deficientia, quomodo perfecta ſunt, & quomodo imperfecta, dictum eſt. Media autem natura horum ad ſenſus optima & perfectiſſima, quibus vtique ſupponitur ineſſe. Motus enim non multi exiſtentes, faciliùs ad mentem accedunt, nec etiam paulatim exiſtentes procedunt: quare perfectiſſimam & ad perficiendum quæ fuerint propoſita, & ad ſentiendum, oportet moderatam eſſe magnitudinem. INCOMMENSVRATI, aſtuti, vel doloſi, referuntur ad *paſſionem*, & ad fœminam. Si enim qui incommenſurati ſunt, aſtuti ſunt, commenſurati vtique erunt ſimul & iuſti, & D fortes. Relationem autem commenſurationis ad corporum bonam motionem, & bonam natiuitatem reducere oportet, ſed non ad formam maris, ſicvt in principio dictum eſt. Bene ſe habet autem & omnia ſigna, quæcunque prædicta ſunt, referre ad apparentem conuenientiam, & in maſculum & fœminam. Hæc enim perfectiſſima diuiſione diuiſa ſunt, & demonſtratum eſt quòd maſculus eſt fœmina iuſtior, & fortior, &, vniuerſaliter dicere, melior. In omni autem electione ſignorum, alia aliis ſignis magis declarant manifeſte ſubiectum. Manifeſtiſſima autem, quæ in principalibus locis fiunt. Principaliſſimus autem locus eſt, qui eſt cir- E ca oculos, & frontem, & caput, & faciem. Secundus autem, qui eſt circa pectus, & ſcapulas. Conſequenter circa crura, & pedes: qui autem circa ventrem, minimus. Omnino autem, vt ſic dicam, iſta loca manifeſtiſſima ſigna præbent, in quibus & ſapientiæ plurimæ decor apparet.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΜΗΧΑΝΙΚΑ ΠΡΟΒΛΗΜΑΤΑ.

ARISTOTELIS STAGIRITÆ QVÆSTIONES MECHANICÆ.

Nicolao Leoniceno interprete.

MIRACVLO ſunt ea quidem quæ natura contingunt, quorum ignorantur cauſæ: illa verò quæ præter naturam, quæcunque ad hominum vtilitatem arte fiunt. In multis enim natura ei quod nobis vſui eſſe poteſt, contrarium facit. Natura etenim eundem ſemper habet modum, & ſimpliciter: vtile autem multifariam commutatur. Quando igitur quippiam præter naturam oportuerit facere, difficultate ſua hæſitationem præſtat, artéque indiget. Quamobrem eam artis partem, quæ huiuſmodi ſuccurrit difficultatibus, mechanicam appellamus. Quemadmodum enim Antipho ſcribit poëta; ſic ſe res habet. Arte enim ſuperamus ea à quibus Natura vincimur. Huiuſmodi autem ſunt, in quibus & minora ſuperant maiora, & quæcunque momentum paruum habent, magna mouent pondera: & omnia ferè illa, quæ mechanica nuncupamus problemata. Sunt autem hæc neque naturalibus omnino quæſtionibus eadem, neque ſeiugata valde: verùm mathematicarum contemplationum naturaliúmque communia. De numero autem eorum quæ hoc in genere dubitantur, illa eſſe dicuntur, quæ circa vectem fiunt. Abſurdum enim eſſe videtur, magnum moueri pondus ab exigua virtute, cum pluri præſertim pondere. Quòd enim ſine vecte quiſpiam mouere non poteſt, idipſum ponderis citiùs mouet vectis ad illud pondus adiungens. Omnium autem huiuſmodi cauſæ principium habet circulus. Iſtud verò ratione contingit. ex admirabili etenim mirandum accidere quippiam non eſt abſurdum. Maximè autem eſt admirandum, ſimul contraria fieri. Circulus verò ex huiuſmodi eſt conſtitutus. Statim ex commoto effectus eſt, & manente, quorum natura ad ſe inuicem eſt contraria. Quamobrem iſthæc cernentes minùs admirari conuenit contingentes in illo contrarietates. In primis enim lineæ illi quæ circuli orbem amplectitur, nullam habenti latitudinem, contraria quodammodo ineſſe apparent, concauum ſcilicet, & curuum. Hæc autem eo à ſe inuicem diſtant modo, quo magnum & paruum. Illorum etenim medium eſt æquale: horum verò rectum. Qua-

A ΘΑΥΜΑΖΕΤΑΙ τῶν μὲν κατὰ φύσιν συμβαινόντων, ὅσον ἀγνοεῖται τὸ αἴτιον· τῶν δὲ παρὰ φύσιν, ὅσα γίνεται διὰ τέχνην πρὸς τὸ συμφέρον τοῖς ἀνθρώποις. ἐν πολλοῖς γὰρ ἡ φύσις ὑπεναντίον πρὸς τὸ χρήσιμον ἡμῖν ποιεῖ. ἡ μὲν γὰρ φύσις, ἀεὶ τὸν αὐτὸν ἔχει τρόπον, καὶ ἁπλῶς· τὸ δὲ χρήσιμον, μεταβάλλει πολλαχῶς. ὅταν οὖν δέῃ τι παρὰ φύσιν πρᾶξαι, διὰ τὸ χαλεπὸν, ἀπορίαν παρέχει, καὶ
B δεῖται τέχνης. διὸ καὶ καλοῦμεν τῆς τέχνης τὸ πρὸς τὰς τοιαύτας ἀπορίας βοηθοῦν μέρος, μηχανήν. καθάπερ γὰρ ἐποίησεν Ἀντιφῶν ὁ ποιητὴς, οὕτω καὶ ἔχει.

Τέχνῃ γὰρ κρατοῦμεν, ὧν φύσει νικώμεθα.

τοιαῦτα δέ ἐστιν, ἐν οἷς τὰ ἐλάττονα κρατεῖ τῶν μειζόνων, καὶ τὰ ῥοπὴν ἔχοντα μικρὰν, κινεῖ βάρη μεγάλα, καὶ πάντα σχεδὸν ὅσα τῶν προβλημάτων μηχανικὰ προσαγορεύομεν. ἔστι δὲ ταῦτα τοῖς φυσικοῖς προβλήμασιν οὔτε ταὐτὰ πάμπαν, οὔτε κεχωρισμένα
C λίαν, ἀλλὰ κοινὰ τῶν τε μαθηματικῶν θεωρημάτων, καὶ τῶν φυσικῶν. τὸ μὲν γὰρ ὡς διὰ τῶν μαθηματικῶν δῆλον· τὸ δὲ περὶ ὃ, διὰ τῶν φυσικῶν. περιέχεται δὲ τῶν ἀπορουμένων ἐν τῷ γένει τούτῳ τὰ περὶ τὸν μοχλόν. ἄτοπον γὰρ εἶναι δοκεῖ τὸ κινεῖσθαι μέγα βάρος ὑπὸ μικρᾶς ἰσχύος, καὶ ταῦτα μετὰ βάρους πλείονος· ὃ γὰρ ἄνευ μοχλοῦ κινεῖν οὐ δύναταί τις, τοῦτο ταὐτὸ βάρος, προσλαβὼν ἔτι τὸ τοῦ μοχλοῦ βάρος, κινεῖ θᾶττον. πάντων δὲ τῶν τοιούτων ἔχει τῆς αἰτίας τὴν
D ἀρχὴν ὁ κύκλος· καὶ τοῦτο εὐλόγως συμβέβηκεν· ἐκ μὲν γὰρ θαυμασιωτέρου συμβαίνειν τι θαυμαστὸν, οὐδὲν ἄτοπον, θαυμασιώτατον δὲ, τὸ τἀναντία γίνεσθαι μετ' ἀλλήλων. ὁ δὲ κύκλος συνέστηκεν ἐκ τοιούτων. εὐθὺς γὰρ ἐκ κινουμένου τε γεγένηται καὶ μένοντος· ὧν ἡ φύσις ἐστὶν ὑπεναντία ἀλλήλοις. ὥστ' ἐνταῦθα ἔστιν ἐπιβλέψασιν ἧττον θαυμάζειν τὰς συμβαινούσας ὑπεναντιώσεις περὶ αὐτόν. πρῶτον μὲν γὰρ τῇ περιεχούσῃ γραμμῇ τὸν κύκλον, πλάτος οὐδὲν ἐχούσῃ, τἀναντία πως προσεμφαίνεται, τὸ κοῖλον καὶ τὸ κυρτόν. ταῦτα δὲ διέστηκεν ἀλλήλων, ὃν τρόπον τὸ μέγα καὶ τὸ μικρόν. ἐκείνων τε γὰρ μέσον τὸ ἴσον, καὶ τούτων τὸ εὐθύ.

διὰ τὸ μεταβάλλοντα εἰς ἄλληλα, τὰ μὲν ἀναγκαῖον ἴσα γίνεσθαι πρότερον, ἢ τῶν ἄκρων ὁποτερονοῦν· τὴν δὲ γραμμὴν εὐθεῖαν, ὅταν ἐκ κυρτῆς εἰς κοῖλον ἢ πάλιν ἐκ ταύτης γίνηται κυρτὴ καὶ περιφερής. ἓν μὲν οὖν τοῦτο τῶν ἀτόπων ὑπάρχει περὶ τὸν κύκλον. δεύτερον δέ, ὅτι ἅμα κινεῖται τὰς ἐναντίας κινήσεις. ἅμα γὰρ εἰς τὸν ἔμπροσθεν κινεῖται τόπον, καὶ τὸν ὄπισθεν· ἥ τε γὰρ γράφουσα γραμμὴ τὸν κύκλον, ὡσαύτως ἔχει. ἐξ οὗ γὰρ ἄρχεται τόπου τὸ πέρας αὐτῆς, εἰς τὸν αὐτὸν τοῦτον ἔρχεται πάλιν. συνεχῶς γὰρ κινουμένης αὐτῆς, τὸ ἔσχατον πάλιν ἀπῆλθε πρῶτον. ὥστε καὶ φανερὸν ὅτι μετέβαλεν ἐντεῦθεν. διὸ, καθάπερ εἴρηται πρότερον, οὐδὲν ἄτοπον, τὸ πάντων εἶναι τῶν θαυμάτων αὐτὸν ἀρχήν. τὰ μὲν οὖν περὶ τὸν ζυγὸν γινόμενα, εἰς τὸν κύκλον ἀνάγεται· τὰ δὲ περὶ τὸν μοχλόν, εἰς τὸν ζυγόν· τὰ δ' ἄλλα πάντα σχεδὸν τὰ περὶ τὰς κινήσεις τὰς μηχανικὰς εἰς τὸν μοχλόν. ἔτι δέ, διὰ τό, μιᾶς οὔσης τῆς ἐκ τοῦ κέντρου γραμμῆς, μηδὲν ἕτερον ἑτέρῳ φέρεσθαι τῶν σημείων τῶν ἐν αὐτῇ ἰσοταχῶς, ἀλλ' ἀεὶ τὸ τοῦ μένοντος πέρατος, πορρώτερον ὄν, θᾶττον, πολλὰ τῶν θαυμαζομένων συμβαίνει περὶ τὰς κινήσεις τῶν κύκλων· περὶ ὧν ἐν τοῖς ἑπομένοις προβλήμασιν ἔσται δῆλον. διὰ δὲ τὸ τὰς ἐναντίας κινήσεις ἅμα κινεῖσθαι τὸν κύκλον, καὶ τὸ μὲν ἕτερον τῆς διαμέτρου τῶν ἄκρων, ἐφ' οὗ τὸ α, εἰς τοὔμπροσθεν κινεῖσθαι, θάτερον δὲ ἐφ' οὗ τὸ β, εἰς τοὔπισθεν, κατασκευάζουσί τινες ὥστε ἀπὸ μιᾶς κινήσεως πολλοὺς ὑπεναντίους ἅμα κινεῖσθαι κύκλους, ὥσπερ οὓς ἀνατιθέασιν ἐν τοῖς ἱεροῖς, ποιήσαντες τροχίσκους χαλκοῦς τε καὶ σιδηροῦς. εἰ γὰρ εἴη τοῦ α β κύκλου ἁπτόμενος ἕτερος κύκλος ἐφ' οὗ γ δ, τοῦ κύκλου ἐφ' οὗ α β κινουμένης τῆς διαμέτρου εἰς τοὔμπροσθεν, κινηθήσεται ἡ γ δ εἰς τοὔπισθεν τοῦ κύκλου, τοῦ ἐφ' ᾧ α, κινουμένης τῆς διαμέτρου περὶ τὸ αὐτό. εἰς τοὐναντίον ἄρα κινηθήσεται ἐφ' οὗ ὁ γ δ κύκλος, τῷ ἐφ' οὗ τὸ α β· καὶ πάλιν αὐτὸς τὸν ἐφεξῆς ἐφ' οὗ ε ζ, εἰς τοὐναντίον αὐτῷ κινήσει διὰ τὴν αὐτὴν [ταύτην] αἰτίαν. τὸν αὐτὸν δὲ τρόπον κἂν πλείους ὦσι, τοῦτο ποιήσουσιν ἑνὸς μόνου κινηθέντος. ταύτην οὖν λαβόντες ὑπάρχουσαν ἐν τῷ κύκλῳ τὴν φύσιν οἱ δημιουργοὶ κατασκευάζουσιν ὄργανον κρύπτοντες τὴν ἀρχήν, ὅπως ᾖ τοῦ μηχανήματος φανερὸν μόνον τὸ θαυμαστόν, τὸ δ' αἴτιον, ἄδηλον.

ΚΕΦΑΛ. β.

Πρῶτον μὲν οὖν τὰ συμβαίνοντα περὶ τὸν ζυγὸν ἀπορεῖται, διὰ τίνα αἰτίαν ἀκριβέστερά ἐστι τὰ ζυγὰ τὰ μείζω τῶν ἐλαττόνων. τούτου δὲ ἀρχή, διὰ τί ποτε ἐν τῷ κύκλῳ, ἡ πλεῖον ἀφεστηκυῖα γραμμὴ τοῦ κέντρου τῆς ἐγγὺς τῇ αὐτῇ ἰσχυῒ κινουμένης, θᾶττον φέρεται τῆς ἐλάττονος; τὸ γὰρ θᾶττον, λέγεται διχῶς. ἄν τε γὰρ ἐν ἐλάττονι χρόνῳ ἴσον τόπον διεξέλθῃ, θᾶττον εἶναι λέγομεν, καὶ ἐὰν ἐν ἴσῳ πλείω. ἡ δὲ μείζων, ἐν ἴσῳ χρόνῳ γράφει μείζονα κύκλον. ὁ γὰρ ἐκτός, μείζων τοῦ ἐντός. αἴτιον δὲ τούτων, ὅτι φέρεται δύο φοράς, ἡ γράφουσα τὸν κύκλον. ὅταν μὲν οὖν ἐν λόγῳ τινὶ φέρηται, ἐπ' εὐθείας ἀνάγκη φέρεσθαι τὸ φερόμενον, καὶ γίνεται διάμετρος αὐτὴ τοῦ σχήματος, ὃ ποιοῦσιν αἱ ἐν τούτῳ τῷ λόγῳ συντεθεῖσαι γραμμαί.

A propter cùm ad ſe inuicem commutantur, illa quidem priùs æqualia fieri neceſſe eſt, quàm extremorum vtrumlibet: lineam verò, rectam, quando ex curua concaua, aut ex huiuſmodi rurſum curua fit, & circularis. Vnum quidem igitur iſtuc abſurdum ineſt circulo. Alterum autem, quòd ſimul contrariis mouetur motionibus: ſimul enim ad anteriorem mouetur locum, & ad poſteriorem. Et ea quæ circulum deſcribit, linea, eodem ſe habet modo. Ex quo enim incipit loco illius extremum, ad eundem rurſus redit: illa enim continuò commota, extremum rurſus efficitur primum. Quamobrem manifeſtum quod inde mutatum eſt: quapropter (vt dictum eſt priùs) non eſt inconueniens B ipſum miraculorum omnium eſſe principium. Ea igitur quæ circa libram fiunt, ad circulum referuntur: quæ verò circa vectem, ad ipſam libram: alia autem ferè omnia, quæ circa mechanicas ſunt motiones, ad vectem. Præterea etiam, quoniam vnica exiſtente, quæ ex centro eſt, linea, nullum aliud alij, quæ in illa ſunt punctorum, æqua velocitate feratur, ſed citiùs ſemper quod à manente termino eſt remotius, pleraque miraculorum accidunt in circuli motionibus: de quibus in iis quæ poſthac adducentur, quæſtionibus, erit manifeſtum. Quoniam autem ſecundùm contrarias ſimul motiones mouetur circulus, & alterum quidem diametri extremum, vbi A, in antè mouetur: alte- C rum verò, vbi B, ad retro, efficiunt nonnulli vt ab vnica motione multi contrariò ſimul moueantur circuli: quemadmodum ſunt illi quos in locis proponunt ſacris, æneos & ferreos fabricantes orbiculos. Si enim A B circulum alter contigerit circulus, in quo C D: mota circuli, in quo A B, diametro in antè, mouebitur C D ad retro, diametro circuli vbi eſt A, circa idem mota. In contrarium igitur mouebitur circulus, vbi C D, ad illum vbi A B. Et rurſus ipſe contiguum, vbi E F, in contrarium ſibiipſi mouebit, propter eandem cauſam. Eodem etiam modo ſi plures fuerint, idem facient vno ſolo commoto. Hanc igitur in circulo exiſtentem animaduertentes D naturam architecti, inſtrumentum fabricant, celantes principium, vt machinæ ſolum manifeſtum ſit illud, quod admirationem præſtat, cauſa verò lateat.

CAPVT II.

IN primis igitur, quæ accidunt circa libram, dubitare faciunt, quamnam ob cauſam exactiores minoribus maiores ſunt libræ. Huius autem rei principium eſt, quamobrem in ipſo circulo quæ plus à E centro diſtat linea, eadem vi commota citiùs fertur, quàm illa quæ minùs diſtat. Citiùs enim bifariàm dicitur. Siue enim in minori tempore æqualē pertranſit locum, citiùs feciſſe dicimus: ſeu in æquali maiorem. Maior autem in æquali temporo maiorē deſcribit circulū. Qui enim extra eſt, maior eo qui intus eſt. Horum autē cauſa, quoniam duas fertur lationes ea quæ circulum deſcribit, linea: quandoquidem igitur in proportione fertur aliqua, id quod fertur, ſuper rectam ferri neceſſe: & hæc diameter efficitur figuræ, quam faciunt illæ, quæ in huiuſmodi proportione coaptantur, lineæ.

Sit enim proportio, ſecundùm quam latum fertur, quam habet A B ad A C: & A quidem feratur verſus B, A B verò ſubter feratur verſus M C. latum autem ſit A quidem ad D. vbi autem eſt A B, verſus E. Quoniam igitur lationis erat proportio, quam A B habet ad A C, neceſſe eſt, & A D ad A E hanc habere proportionem. Simile igitur eſt proportione paruum quadrilaterum maiori: quamobrem & eadem illorum eſt diameter: & A erit ad F. Eodem etiam oſtendetur modo vbicunque latio deprehendatur. Semper enim ſupra diametrum erit. Manifeſtum igitur, quòd id, quod ſecundùm diametrum duabus fertur lationibus, neceſſariò ſecundùm laterum proportionem fertur. Si enim ſecundùm aliam quampiam, non feretur ſecundùm diametrum. Si autem in nulla feratur proportione ſecundùm duas lationes nullo in tempore, rectam eſſe lationem eſt impoſſibile. Sit enim recta. Poſita igitur hac pro diametro & circùm repletis lateribus, illud quod fertur, ſecundùm laterum proportionem ferri neceſſe eſt. hoc enim demonſtratum eſt priùs. Non igitur rectam efficiet id quod ſecundùm nullam proportionem in nullo fertur tempore. [Si autem ſecundùm quampiam feratur proportionem, & in tempore quopiam, hoc neceſſe eſt tempus rectam eſſe lationem, per ea quæ retrò ſunt dicta.] Quamobrem circulare eſt id quod ſecundùm nullam proportionem nullo in tempore duas fertur lationes.

Quòd quidem igitur ea quæ circulum deſcribit, duas ſimul feratur lationes, manifeſtum eſt cùm ex iſtis tum quia ſecundùm rectum lata, ad perpendiculum peruenit, vt ſit rurſus ipſa à centro perpendiculum. Sit circulus A B C D: extremum autem, vbi eſt B, feratur ad ipſum D. peruenit ſanè aliquando ad ipſum C. Siquidem igitur in proportione feratur, quam habet B C, E C: fertur vtique ſecundùm diametrum, vbi B C. Nunc autem quoniam in nulla proportione, in circumferentia certè fertur vbi B E C. Si autem duobus ab eadem potentia latis, hoc quidem plus repellatur, illud verò minùs, rationi conſentaneum eſt tardiùs moueri id quod plùs repellitur, eo quod repellitur minùs: quod videtur accidere maiori & minori illarum quæ ex centro circulos deſcribunt. Quoniam enim propius eſt manenti, eius quæ minor eſt, extremum, quàm id, quod eſt maioris, velvti retractum in contrarium ad medium, tardiùs fertur minoris extremum. Omni quidem igitur circulum deſcribenti iſthuc accidit: ferturque eam, quæ ſecundùm naturam eſt, lationem ſecundùm circunferentiam: illam verò, quæ præter naturam, in tranſuerſum & ſecundùm centrum: maiorem autem ſemper eam quæ præter naturam eſt, ipſa minor fertur. quia enim centro eſt vicinior, quod retrahit, vincitur magis. Quòd autem magis, quod præter naturam eſt, mouetur ipſa minor quàm maior illarum, quæ ex centro circulos deſcribunt, ex iis eſt manifeſtum. Sit circulus, vbi B C D E: & alter in hoc minor, vbi M N O P, circa idem centrum A. & proiiciantur diametri in magno quidem, in quibus C D B E. in minori verò ipſæ M O N P, & altera parte longius quadratum ſuppleatur D K R C. ſi quidem A B. circulum deſcribens, ad id perueniet vnde eſt egreſſa, manifeſtum eſt quòd ad ipſam fertur A B. Similiter etiam A M ad ipſam A M perueniet. Tardiùs autem fertur A M, quàm A B, quemadmodum dictum eſt: quia maior fit repulſio, & magis retrahitur A M.

A ἔστω γὰρ ὁ λόγος ὃν φέρεται τὸ φερόμενον, ὃν ἔχει ἡ α β, πρὸς τὴν α γ· καὶ τὸ μὲν α γ φερέσθω πρὸς τὸ β, ἡ δὲ α β ὑποφερέσθω πρὸς τὴν η γ. ἐνηνέχθω δὲ τὸ μὲν α πρὸς τὸ δ, ἡ δὲ ἐφ' ᾗ α β, πρὸς τὸ ε. εἰ οὖν ἐπὶ τῆς φορᾶς ὁ λόγος ἦν, ὃν ἡ α β ἔχει πρὸς τὴν α γ, ἀνάγκη καὶ τὴν α δ, πρὸς τὴν α ε, τοῦτον ἔχειν τὸν λόγον. ὅμοιον ἄρα ἐστὶ τῷ λόγῳ τὸ μικρὸν τετράπλευρον* τῷ μείζονι. ὥστε καὶ ἡ αὐτὴ διάμετρος αὐτῶν, καὶ τὸ α ἔσται τὸ πρὸς ζ. τὸν αὐτὸν δὴ τρόπον δειχθήσεται κἂν ὁπουοῦν διαληφθῇ ἡ φορά. ἀεὶ γὰρ ἔσται ἐπὶ τῆς διαμέτρου. φανερὸν οὖν ὅτι τὸ κατὰ τὴν διάμετρον φερόμενον ἐν δύο φοραῖς, ἀνάγκη τὸν τῶν πλευρῶν φέρεσθαι B λόγον. εἰ γὰρ ἄλλον τινά, οὐκ οἰσθήσεται κατὰ τὴν διάμετρον. ἐὰν δὲ ἐν μηδενὶ λόγῳ φέρηται δύο φορὰς κατὰ μηδένα χρόνον, ἀδύνατον εὐθεῖαν εἶναι τὴν φοράν. ἔστω γὰρ εὐθεῖα. τεθείσης οὖν ταύτης διαμέτρου, καὶ παραπληρωθεισῶν τῶν πλευρῶν, ἀνάγκη τὸν τῶν πλευρῶν λόγον φέρεσθαι τὸ φερόμενον. τοῦτο γὰρ δέδεικται πρότερον. οὐκ ἄρα ποιήσει εὐθεῖαν τὸ ἐν μηδενὶ λόγῳ φερόμενον μηδένα χρόνον. *[ἐὰν γάρ τινα λόγον ἐνεχθῇ ἐν χρόνῳ τινί, τοῦτον ἀνάγκη τὸν χρόνον εὐθεῖαν εἶναι φορὰν διὰ τὰ προειρημένα.] C ὥστε περιφερὲς γίνεται δύο φερόμενον φορὰς ἐν μηδενὶ λόγῳ μηδένα χρόνον. ὅτι μὲν τοίνυν ἡ τὸν κύκλον γράφουσα φέρεται δύο φορὰς ἅμα, φανερὸν ἔκ τε τούτων, καὶ ὅτι τὸ φερόμενον κατ' εὐθεῖαν ἐπὶ τὴν κάθετον ἀφικνεῖται, ὥστε εἶναι πάλιν αὐτὴν ἀπὸ τοῦ κέντρου κάθετον. ἔστω κύκλος ὁ α β γ· τὸ δ' ἄκρον, τὸ ἐφ' οὗ β, φερέσθω ἐπὶ τὸ δ. ἀφικνεῖται δέ ποτε ἐπὶ τὸ γ. εἰ μὲν οὖν ἐν τῷ λόγῳ ἐφέρετο ὃν ἔχει ἡ β δ, πρὸς τὴν δ γ, ἐφέρετο ἂν τὴν διάμετρον τὴν ἐφ' ᾗ β γ. νῦν δέ, ἐπείπερ ἐν οὐδενὶ λόγῳ, ἐπὶ τὴν περιφέρειαν φέρεται τὴν ἐφ' ᾗ β ε γ. ἐὰν δὲ δυοῖν φερομένοιν ἀπὸ τῆς αὐτῆς ἰσχύος, τὸ μὲν ἐκκρούοιτο πλεῖον, τὸ δὲ ἔλαττον, εὔλογον βραδύτερον κινεῖσθαι D τὸ πλεῖον ἐκκρουόμενον τοῦ ἔλαττον ἐκκρουομένου· ὃ δοκεῖ συμβαίνειν ἐπὶ τῆς μείζονος καὶ ἐλάττονος, τῶν ἐκ τοῦ κέντρου γραφουσῶν τοὺς κύκλους. διὰ γὰρ τὸ ἐγγύτερον εἶναι τοῦ μένοντος τῆς ἐλάττονος τὸ ἄκρον, ἢ τὸ τῆς μείζονος, ὥσπερ ἀντισπώμενον εἰς τοὐναντίον, ἐπὶ τὸ μέσον βραδύτερον φέρεται τὸ τῆς ἐλάττονος ἄκρον. πάσῃ μὲν οὖν κύκλον γραφούσῃ τοῦτο συμβαίνει, καὶ φέρεται τὴν μὲν κατὰ φύσιν, τὴν δὲ παρὰ φύσιν κατὰ τὴν περιφέρειαν εἰς τὸ πλάγιον καὶ τὸ κέντρον. μείζω δ' ἀεὶ τὴν παρὰ φύσιν ἡ ἐλάττων φέρεται. διὰ γὰρ τὸ ἐγγύτερον εἶναι τοῦ E κέντρου τοῦ ἀντισπῶντος, κρατεῖται μᾶλλον. ὅτι δὲ μεῖζον τὸ παρὰ φύσιν κινεῖται ἡ ἐλάττων τῆς μείζονος, τῶν ἐκ τοῦ κέντρου γραφουσῶν τοὺς κύκλους, ἐκ τῶνδε δῆλον. ἔστω κύκλος ἐφ' οὗ β γ δ ε, καὶ ἄλλος ἐν τούτῳ ἐλάττων, ἐφ' οὗ χ ν μ ξ, περὶ τὸ αὐτὸ κέντρον τὸ α· καὶ ἐκβεβλήσθωσαν αἱ διάμετροι, ἐν μὲν τῷ μεγάλῳ, ἐφ' ὧν γ δ καὶ β ε, ἐν δὲ τῷ ἐλάττονι, αἱ μ χ ν ξ, καὶ τὸ ἑτερόμηκες παραπεπληρώσθω, τὸ δ ψ ρ γ. εἰ δὴ ἡ α β γράφουσα κύκλον, ἥξει ἐπὶ τὸ αὐτὸ ὅθεν ὡρμήθη ἐπὶ τὴν α β, δῆλον ὅτι φέρεται πρὸς αὐτήν. ὁμοίως δὲ καὶ ἡ α χ πρὸς τὴν α χ ἥξει. βραδύτερον δὲ φέρεται ἡ α χ τῆς α β, ὥσπερ εἴρηται, διὰ τὸ γίνεσθαι μείζονα τὴν ἔκκρουσιν, καὶ ἀντισπᾶσθαι μᾶλλον τὴν α χ.

* κ. τῷ μεγάλῳ;

Incluſa vt ſuperuacua cenſet eſſe tollenda Leonicen.

ἤχθω δὲ ἡ α θ κ, καὶ ἀπὸ τοῦ θ κάθετος ἐπὶ τὴν α β, ἡ θ ζ* ἐν τῷ κύκλῳ. καὶ πάλιν ἀπὸ τοῦ θ ἤχθω παρὰ τὴν α β, ἡ θ ω· καὶ ἡ ω υ, ἐπὶ τὴν α β κάθετον, καὶ ἡ κ χ. αἱ δὲ ἐφ' ὧν ω υ, καὶ θ ζ, ἴσαι. ἡ ἄρα β υ ἐλάττων τῆς χ ζ. αἱ γὰρ ἴσαι [εὐθεῖαι] ἐπ' ἀνίσους κύκλους ἐμβληθεῖσαι πρὸς ὀρθὰς τῇ διαμέτρῳ, ἔλαττον τμῆμα ἀποτέμνουσι τῆς διαμέτρου ἐν τοῖς μείζοσι κύκλοις. ἔστι δὲ ἡ ω υ ἴση τῇ θ ζ. ἐν ὅσῳ δὴ χρόνῳ ἡ α θ τὴν χ θ ἐνηνέχθη, ἐν τοσούτῳ χρόνῳ ἐν τῷ κύκλῳ τῷ μείζονι, μείζονα τῆς β ω ἐνήνεκται τὸ ἄκρον τῆς β α. ἡ μὲν γὰρ κατὰ φύσιν φορὰ, ἴση· ἡ δὲ παρὰ φύσιν, ἐλάττων· ἡ δὲ β υ, τῆς ζ χ. δεῖ δὲ ἀνάλογον εἶναι, ὡς τὸ κατὰ φύσιν πρὸς τὸ κατὰ φύσιν, τὸ παρὰ φύσιν πρὸς τὸ παρὰ φύσιν. μείζονα ἄρα περιφέρειαν διελήλυθε [τὴν κ β] τῆς ω β. ἀνάγκη δὲ τὴν κ β ἐν τούτῳ τῷ χρόνῳ διεληλυθέναι. ἐνταῦθα γὰρ ἔσται ὅταν ἀνάλογον ἀμφοτέρως συμβαίνῃ τὸ παρὰ φύσιν πρὸς τὸ κατὰ φύσιν. Εἰ δὴ μεῖζόν ἐστι τὸ κατὰ φύσιν ἐν τῷ μείζονι, καὶ τὸ παρὰ φύσιν μᾶλλον ἂν ἐνταῦθα συμπίπτοι μοναχῶς, ὥστε τὸ β ἐνηνέχθαι ἂν τὴν β κ ἐν τῷ ἐφ' οὗ χ σημεῖον. ἐνταῦθα γὰρ κατὰ φύσιν μὲν γίνεται τῷ β σημείῳ τὸ κ χ· ἔστι γὰρ αὕτη ἀπὸ τοῦ κ κάθετος· παρὰ φύσιν δὲ ἐς τὸ κ β. ἔστι δὲ ὡς τὸ κ χ πρὸς τὸ χ β, τὸ θ ζ πρὸς τὸ ζ χ. φανερὸν δὲ ἐὰν ἐπιζευχθῶσιν, ἀπὸ τῶν β χ ἐπὶ τὰ κ θ. Εἰ δὲ ἐλάττων * ἡ μείζων τῆς κ β ἔσται, ἣν ἠνέχθη τὸ β, οὐχ ὁμοίως ἔσται οὐδὲ ἀνάλογον ἐν ἀμφοῖν τὸ κατὰ φύσιν πρὸς τὸ παρὰ φύσιν. δι' ἣν μὲν τοίνυν αἰτίαν ἀπὸ τῆς αὐτῆς ἰσχύος φέρεται θᾶττον τὸ πλέον ἀπέχον τοῦ κέντρου* σημεῖον, δῆλον διὰ τῶν εἰρημένων. Διότι δὲ τὰ μὲν μείζω ζυγὰ ἀκριβέστερά ἐστι τῶν ἐλαττόνων, φανερὸν ἐκ τούτων. γίνεται γὰρ τὸ μὲν σπάρτον, κέντρον· μένει γὰρ τοῦτο· τὸ δὲ ἐπὶ ἑκάτερον μέρος τῆς πλάστιγγος, αἱ ἐκ τοῦ κέντρου. ἀπὸ οὖν τοῦ αὐτοῦ βάρους ἀνάγκη θᾶττον κινεῖσθαι τὸ ἄκρον τῆς πλάστιγγος, ὅσῳ ἂν πλεῖον ἀπέχῃ τοῦ σπάρτου· καὶ ἔνια μὲν μὴ δῆλα εἶναι ἐν τοῖς μικροῖς ζυγοῖς πρὸς τὴν αἴσθησιν ἐπιτιθέμενα βάρη· ἐν δὲ τοῖς μεγάλοις, δῆλα. οὐδὲν γὰρ κωλύει ἔλαττον κινηθῆναι μέγεθος, ἢ ὥστε εἶναι τῇ ὄψει φανερόν. ἐπὶ δὲ τῆς μεγάλης πλάστιγγος ποιεῖ ὁρατὸν τὸ αὐτὸ βάρος μέγεθος. ἔνια δὲ δῆλα μὲν ἀμφοῖν ἐστιν, ἀλλὰ πολλῷ μᾶλλον ἐπὶ τῶν μειζόνων, διὰ τὸ πολλῷ μεῖζον γίνεσθαι τὸ μέγεθος τῆς ῥοπῆς ὑπὸ τοῦ αὐτοῦ βάρους ἐν τοῖς μείζοσι. καὶ διὰ τοῦτο τεχνάζουσιν οἱ ἁλουργοπῶλαι πρὸς τὸ παρακρούεσθαι ἱστάντες, τό τε σπάρτον οὐκ ἐν μέσῳ τιθέντες, καὶ μόλυβδον τῆς φάλαγγος εἰς θάτερον μέρος ἐγχέοντες, ἢ τοῦ ξύλου τὸ πρὸς τὴν ῥίζαν, πρὸς ὃ βούλονται ῥέπειν, ποιοῦντες, ἢ ἐὰν ἔχῃ ὄζον. βαρύτερον γὰρ ἐν ᾧ μέρος ἡ ῥίζα τοῦ ξύλου ἐστίν. ὁ δὲ ὄζος, ῥίζα τίς ἐστι.

* Leonic. ὡ ι- λάτων κ.

* Leonic. ἡ μεί- ζων τῆς κ ζ, ἐστι λῶν κ.

* κ. σημείου. & μ- κάρπα μείζων, ᾱ.

ΚΕΦΑΛ. γ.

Διὰ τί ἐὰν μὲν ἄνωθεν ᾖ τὸ σπαρτίον, ὅταν κάτωθεν ῥέψαντος ἀφέλῃ τὸ βάρος, πάλιν ἀναφέρεται τὸ ζυγόν· ἐὰν δὲ κάτωθεν ὑποστῇ,

A Ducatur igitur ipſa A L F, & ab ipſo L perpendiculum ad ipſam A E, ipſa L Q in minore circulo. Et rurſum ab L ducatur iuxta A B, L S, & S T, ad ipſam A B perpendiculum, & ipſa F X. Ipſæ igitur vbi ſunt S T & L Q æquales: ipſa ergo B T minor eſt quam M Q. æquales enim rectæ lineæ in æqualibus coniunctæ circulis perpendiculares diametro, minorem diametri reſecant ſectionem in maioribus circulis. Eſt autem ipſa S T æqualis ipſi L Q. In quanto autem tempore ipſa A L ipſam M L lata eſt, in tanto temporis ſpatio in maiori circulo maiorem, quàm ſit B S, latum erit extremum ipſius B A. Latio quidem igitur ſecundùm naturam æqualis: ea autem, quæ præter naturam eſt, minor, vi-
B delicet B T, quàm M Q. Oportet autem proportionabiliter eſſe, ſicut quod eſt ſecundùm naturam, ad id quod eſt ſecundùm naturam: ita quod eſt præter naturam, ad id quod eſt præter naturam. Maiorem igitur circunferentiam pertranſiuit, quàm ſit ipſa S B. Neceſſe eſt autem ipſam F B in hoc tempore pertranſiſſe. Hic enim erit quando proportionabiliter vtrinque accidit quod eſt præter naturam, ad id quod eſt ſecundùm naturam. Si igitur maius eſt quod eſt ſecundùm naturam in maiori: & quod eſt præter naturam, magis vtique hic coincidet vno modo: ita quòd B ſit latum per ipſam B F in tanto tempore, in quo M punctum per ipſam M L. Hic enim ſecundùm naturam quidem ſigno B fit
C X F. Eſt enim ab ipſo F perpendiculum. Præter naturam verò ad ipſam X B. Eſt autem quemadmodum F X ad X B, ſic L Q ad M Q. Manifeſtum autem, ſi coniunguntur ab ipſa B M ad F L. Si autem minor aut maior quàm ſit F B, erit illa quàm latum eſt B, non ſimiliter erit, neque proportionabile in vtriſque quod eſt ſecundùm naturam, ad id quod eſt præter naturam. Quam igitur ob cauſam ab eadem potentia celeriùs fertur id quod plus à centro diſtat, punctum, ex iis quæ dicta ſunt, eſt manifeſtum. Cur autem maiores libræ exactiores ſunt minoribus, palam eſt ex iis. Spartum enim fit centrum: id namque manet. quod autem libræ vtrinque eſt, exeuntes à centro. Ab eodem igi-
D tur pondere citiùs moueri neceſſe eſt extremum libræ, quo plus à ſparto diſceſſerit. Et nonnulli quidem in paruis libris impoſita non manifeſta ſenſi ſunt pondera: in magnis autem manifeſta. Nihil enim prohibet minorem moueri magnitudinem, quàm vt viſioni ſit manifeſta. In magna autem libra idem pondus viſibile efficit magnitudo. Quædam verò manifeſta quidem ſunt in vtriſque, ſed multò magis in maioribus, quoniam multo maior inclinationis fit magnitudo ab eodem pondere in maioribus. Quamobrem machinantur ij, qui purpuram vendunt, vt pendendo defraudent, tum ad medium ſpartum non ponentes, tum plumbum in alterutram libræ partem
E infundentes, aut ligni, quod ad radicem vergebat, in eam, quam deferri volunt, partem conſtituentes: aut ſi nodum habuerit. ligni enim grauior illa pars, in qua eſt radix. nodus verò, radix quædam eſt.

CAPVT III.

CVr ſiquidem ſurſum fuerit ſpartū, quādo deorſum lato pondere quiſpiam id amouet, rurſum aſcendit libra: ſi autem deorſum conſtitutū fuerit,

non aſcendit, ſed manet? An quia rurſum quidem ſparto exiſtente, plus libræ extra perpendiculum ſit? ſpartum enim eſt perpendiculum: quare neceſſe eſt deorſum ferri id quod plus eſt, donec aſcendat, quæ biſariàm libram diuidit, ad ipſum perpendiculum, cùm onus incumbat ad libræ partem ſurſum raptam. Sit libra recta, vbi B C, ſpartum autem A D. Hoc igitur deorſum proiecto perpendiculum erit, vbi A D M. Si igitur in ipſo B ponatur onus, B quidem erit vbi E, C autem vbi H. quamobrem ea quæ biſariàm libram ſecat, primò quidem erit D M ipſius perpendiculi: incumbente autem onere erit D G. quare libræ ipſius, vbi E H, quod extra perpendiculum eſt A M, vbi eſt P Q, maius eſt dimidio. Si igitur amoueatur onus ab ipſo E, neceſſe eſt deorſum ferri H. minus enim eſt E. Siquidem igitur ſurſum habuerit ſpartum, rurſum propter hoc aſcendit libra. Si autem deorſum fuerit id quod ſubſtat, contrarium facit. Plus enim dimidio fit libræ, quæ deorſum eſt pars, quàm quod perpendiculum ſecet: quapropter non aſcendit. Eleuata enim pars leuior eſt. Sit libra recta vbi N G: perpendiculum autem K L M. Biſariàm igitur ſecatur K G. Impoſito autem onere in ipſo N, erit quidem N vbi O, ipſum autem G vbi R, K L autem vbi L P. Quare maius eſt K O, quàm L R, ipſo P K L. Et ablato igitur onere, neceſſe eſt manere. incumbit enim ceu onus exceſſus medietatis eius vbi eſt F.

CAPVT IV.

CVr exiguæ vires (quemadmodum à principio dictum eſt) vecte, magna mouent pondera, vectis inſuper onus accipientes? cùm facilius ſit minorem mouere grauitatem. minor autem eſt ſine vecte. an quoniam ipſe vectis eſt in cauſa, libra exiſtens, ſpartum infernè habens, in inæqualia diuiſa; hypomochlion enim eſt ſpartum: ambo namque ſtant vt centrum. Quoniam autem ab æquali pondere celeriùs mouetur maior earum, quæ à centro ſunt: duo verò pondera, quod mouet, & quod mouetur: quod igitur motum pondus ad mouens, longitudo patitur ad longitudinem, ſemper autem quanto ab hypomochlio diſtabit magis, tanto faciliùs mouebit. Cauſa autem eſt, quæ retro commemorata eſt: quoniam quæ plus à centro diſtat, maiorem deſcribit circulum: quare ab eadem potentia plus ſeparabitur mouens illud, quod plus ab hypomochlio diſtabit. Sit vectis vbi A B, pondus vbi C, quod mouet autem, vbi D. hypomochlion, vbi E, quod autem vbi eſt D, mouens, vbi F. motum autem vbi, C. pondus, vbi G.

CAPVT V.

CVr ij qui in nauis medio ſunt remiges, maximè nauem mouent? an quia remus vectis eſt, hypomochlion autem fit ſcalmus? ſtat enim ille: pondus verò mare eſt, quod propellit remus: vectem autem mouens ipſe eſt remex. Semper autem plus mouet ponderis, quanto magis ab hypomochlio diſtabit quicunque id mouet. maior enim ita fit, quæ ex centro.

A οὐκ ἀναφέρεται, ἀλλὰ μένει; ἢ διότι ἄνωθεν μὲν τοῦ σπαρτίου ὄντος, πλεῖον τοῦ ζυγοῦ γίνεται τὸ ἐπέκεινα τῆς καθέτου; τὸ γὰρ σπαρτίον ἐστὶ κάθετος. ὥστε ἀνάγκη ἐστὶ κάτω ῥέπειν τὸ πλέον, ἕως ἂν ἔλθῃ ἡ δίχα διαιροῦσα τὸν ζυγὸν ἐπὶ τὴν κάθετον αὐτήν, ἐπικειμένου τοῦ βάρους ἐν τῷ ἀνασπωμένῳ μορίῳ τοῦ ζυγοῦ. ἔστω ζυγὸν ὀρθόν, ἐφ' οὗ βγ, σπαρτίον δὲ τὸ αδ. * ἐκβαλλομένου δὴ τούτου κάτω, κάθετος ἔσται ἐφ' ἧς ἡ αδμ. ἐὰν οὖν ἐπὶ τὸ β ἡ ῥοπὴ ἐπιτεθήσεται, τὸ μὲν β, οὗ τὸ ε, τὸ δὲ γ, οὗ τὸ ζ ἔσται. ὥστε ἡ δίχα διαιροῦσα τὸν ζυγόν, πρῶτον μὲν ἦν ἡ δμ τῆς καθέτου αὐτῆς· ἐπικειμένης δὲ τῆς ῥοπῆς, ἔσται ἡ δθ. B ὥστε τοῦ ζυγοῦ ἐφ' ᾧ εζ, τὸ ἔξω τῆς καθέτου τῆς ἐφ' ἧς αβ, τοῦ ἐν ᾧ φπ, μεῖζον τοῦ ἡμίσεος. ἐὰν οὖν ἀφαιρεθῇ τὸ βάρος ἀπὸ τοῦ ε, ἀνάγκη κάτω φέρεσθαι τὸ ζ. ἔλαττον γάρ ἐστι τὸ ε. ἐὰν μὲν οὖν ἄνω τὸ σπαρτίον ἔχῃ, πάλιν διὰ τοῦτο ἀναφέρεται τὸ ζυγόν. ἐὰν δὲ κάτωθεν ᾖ τὸ ὑποκείμενον, τοὐναντίον ποιεῖ. πλεῖον γὰρ γίνεται τοῦ ἡμίσεος τοῦ ζυγοῦ τὸ κάτω μέρος, ἢ ὡς ἡ κάθετος διαιρεῖ· ὥστε οὐκ ἀναφέρεται. κουφότερον γὰρ τὸ ἐπηρτημένον. ἔστω ζυγὸν τὸ ν, ἐφ' οὗ νξ, τὸ ὀρθόν· κάθετος δὲ ἡ κλμ. δίχα δὴ διαιρεῖται τὸ νξ. ἐκτεθέντος δὲ βάρους C ἐπὶ τὸ ν, ἔσται τὸ μὲν ν, οὗ τὸ ο. τὸ δὲ ξ, οὗ τὸ ρ· ἡ δὲ κλ, οὗ τὸ λθ. ὥστε μεῖζόν ἐστι τὸ κο, τοῦ λρ, * τῷ θκλ. καὶ ἀφαιρεθέντος οὖν τοῦ βάρους, ἀνάγκη μένειν. ἐπίκειται γὰρ ὥσπερ βάρος ἡ ὑπεροχὴ ἡ τοῦ ἡμίσεος τοῦ ἐν ᾧ τὸ κ.

* Leonic. ἐκβαλλομένου δὴ τούτου κ.

* κ τῷ θ.

ΚΕΦΑΛ. δ.

ΔΙὰ τί κινοῦσι μεγάλα βάρη μικραὶ δυνάμεις τῷ μοχλῷ· ὥσπερ ἐλέχθη καὶ κατ' ἀρχήν· προσλαμβάνοντες βάρος ἔτι τὸ τοῦ μοχλοῦ; ῥᾷον δὲ τὸ ἔλαττόν ἐστι κινῆσαι βάρος. ἔλαττον δέ ἐστιν ἄνευ τοῦ μοχλοῦ. ἢ ὅτι αἴτιόν ἐστιν ὁ μοχλός, ζυγὸν [ὢν] κάτωθεν ἔχον τὸ σπαρτίον, καὶ εἰς ἄνισα διῃρημένον; τὸ γὰρ ὑπομόχλιόν ἐστι τὸ σπαρτίον. μένει γὰρ ἄμφω ταῦτα, ὥσπερ τὸ D κέντρον. ἐπεὶ δὲ θᾶττον ὑπὸ τοῦ ἴσου βάρους κινεῖται ἡ μείζων τῶν ἐκ τοῦ κέντρου· [ἔστι δὲ τρία τὰ περὶ τὸν μοχλόν, τὸ μὲν ὑπομόχλιον, σπαρτίον, καὶ κέντρον,] δύο δὲ βάρη, ὅ,τε κινῶν, καὶ τὸ κινούμενον· ὃ οὖν τὸ κινούμενον βάρος πρὸς τὸ κινοῦν, τὸ μῆκος πρὸς τὸ μῆκος ἀντιπέπονθεν. αἰεὶ δὲ ὅσῳ ἂν μεῖζον ἀφεστήκοι τοῦ ὑπομοχλίου, ῥᾷον κινήσει. αἰτία δέ ἐστιν ἡ προλεχθεῖσα, ὅτι ἡ πλεῖον ἀπέχουσα ἐκ τοῦ κέντρου, μείζονα κύκλον γράφει. ὥστε ἀπὸ τῆς αὐτῆς ἰσχύος πλέον μεταστήσεται τὸ κινοῦν, τὸ πλεῖον τοῦ ὑπομοχλίου ἀπέχον. ἔστω μοχλὸς ἐφ' οὗ E αβ· βάρος δέ, ἐφ' ᾧ τὸ γ· τὸ δὲ κινοῦν, ἐφ' ᾧ τὸ δ· ὑπομόχλιον, ἐφ' ᾧ τὸ ε· τὸ δὲ ἐφ' ᾧ τὸ δ κινῆσαν, ἐφ' ᾧ τὸ η· κινούμενον δέ, τὸ ἐφ' οὗ γ· βάρος, ἐφ' οὗ κ.

ΚΕΦΑΛ. ε.

ΔΙὰ τί οἱ μεσόνεοι μάλιστα τὴν ναῦν κινοῦσιν; ἢ διότι ἡ κώπη μοχλός ἐστιν; ὑπομόχλιον μὲν γὰρ ὁ σκαλμὸς γίνεται· μένει γὰρ δὴ τοῦτο· τὸ δὲ βάρος, ἡ θάλαττα, ἣν ἀπωθεῖ ἡ κώπη. ὁ δὲ κινῶν τὸν μοχλόν, ὁ ναύτης ἐστίν. ἀεὶ δὲ πλέον βάρος κινεῖ, ὅσῳ ἂν πλέον ἀφεστήκοι τοῦ ὑπομοχλίου ὁ κινῶν τὸ βάρος. μείζων γὰρ οὕτω γίνεται ἡ ἐκ τοῦ κέντρου.

ὁ δὲ σκαλμὸς, ὑπομόχλιον ὢν, κέντρον ἐστίν. ἐν μέσῃ δὲ τῇ νηῒ, πλεῖστον τῆς κώπης ἐντός ἐστιν. καὶ γὰρ ἡ ναῦς ταύτῃ εὐρυτάτη ἐστίν. ὥστε πλεῖον ἐπ' ἀμφότερα ἐνδέχεσθαι μέρος τῆς κώπης ἑκατέρου τοίχου ἐντὸς εἶναι τῆς νεώς. κινεῖται μὲν οὖν ἡ ναῦς, διὰ τὸ ἀπερειδομένης τῆς κώπης εἰς τὴν θάλασσαν, τὸ ἄκρον τῆς κώπης τὸ ἐντὸς προϊέναι εἰς τὸ πρόσθεν· τὴν δὲ ναῦν προσδεδεμένην τῷ σκαλμῷ προϊέναι, ᾗ τὸ ἄκρον τῆς κώπης. ᾗ γὰρ πλείστην θάλασσαν διαιρεῖ ἡ κώπη, ταύτῃ ἀνάγκη μάλιστα προωθεῖσθαι. πλείστην δὲ διαιρεῖ ᾗ πλεῖστον μέρος ἀπὸ τοῦ σκαλμοῦ τῆς κώπης ἐστί. διὰ τοῦτο οἱ μεσόνεοι μάλιστα κινοῦσιν. μέγιστον γὰρ ἐν μέσῃ νηῒ, τὸ ἀπὸ τοῦ σκαλμοῦ τῆς κώπης τὸ ἐντός ἐστιν.

ΚΕΦΑΛ. ϛʹ.

Διὰ τί τὸ πηδάλιον μικρὸν ὄν, καὶ ἐπ' ἐσχάτῳ τῷ πλοίῳ τοσαύτην δύναμιν ἔχει, ὥστε ὑπὸ μικροῦ οἴακος, καὶ ἑνὸς ἀνθρώπου δυνάμεως, καὶ ταύτης ἠρεμαίας, μεγάλα κινεῖσθαι μεγέθη πλοίων; ἢ διότι καὶ τὸ πηδάλιόν ἐστι μοχλός· τὸ δὲ βάρος, ἡ θάλασσα· ὁ δὲ κυβερνήτης, ὁ κινῶν; οὐ κατὰ πλάτος δὲ λαμβάνει τὴν θάλασσαν, ὥσπερ ἡ κώπη, τὸ πηδάλιον. οὐ γὰρ εἰς τὸ πρόσθεν κινεῖ τὸ πλοῖον, ἀλλὰ κινούμενον κλίνει, πλαγίως τὴν θάλατταν δεχόμενον. ἐπεὶ γὰρ τὸ βάρος ἦν ἡ θάλασσα, τοὐναντίον ἀπερειδόμενον κλίνει τὸ πλοῖον. τὸ γὰρ ὑπομόχλιον εἰς τοὐναντίον στρέφεται· ἡ θάλασσα δὲ ἐντός· ἐκεῖνο δὲ εἰς τὸ ἐκτός. τούτῳ δὲ ἀκολουθεῖ τὸ πλοῖον, διὰ τὸ συνδεδέσθαι. ἡ μὲν οὖν κώπη, κατὰ πλάτος τὸ βάρος ὠθοῦσα, καὶ ὑπ' ἐκείνου ἀντωθουμένη εἰς τὸ εὐθὺ προάγει· τὸ δὲ πηδάλιον, ὥσπερ κάθηται πλάγιον, τὴν εἰς τὸ πλάγιον, ἢ δεῦρο, ἢ ἐκεῖ, ποιεῖ κίνησιν. ἐπ' ἄκρου δὲ, καὶ οὐκ ἐν μέσῳ κεῖται, ὅτι ῥᾷστον τὸ κινούμενον κινῆσαι ἐπ' ἄκρου * κινοῦν. τάχιστα γὰρ φέρεται τὸ πρῶτον μέρος, διὰ τό, ὥσπερ ἐν τοῖς φερομένοις, ἐπὶ τέλει λήγειν τὴν φοράν, οὕτω καὶ τοῦ συνεχοῦς ἐπὶ τέλους, ἀσθενεστάτη ἐστὶν ἡ φορά. εἰ δὲ ἀσθενεστάτη, ῥᾳδία ἐκκρούειν. διά τε δὴ ταῦτα ἐν τῇ πρύμνῃ τὸ πηδάλιόν ἐστι, καὶ ὅτι ἐνταῦθα μικρᾶς κινήσεως γινομένης, πολλῷ μεῖζον τὸ διάστημα ἐπὶ τοῦ ἐσχάτου γίνεται, διὰ τὸ τὴν ἴσην γωνίαν ἐπὶ μείζονα καθῆσθαι· καὶ ἴσω ἂν μείζους ὦσιν αἱ περιέχουσαι. δῆλον δὲ ἐκ τούτου, καὶ δι' ἣν αἰτίαν μᾶλλον προέρχεται εἰς τοὐναντίον τὸ πλοῖον, ἢ ἡ τῆς κώπης πλάτη. τὸ αὐτὸ γὰρ μέγεθος, τῇ αὐτῇ ἰσχύϊ κινούμενον ἐν ἀέρι, πλέον ἢ ἐν τῷ ὕδατι πρόεισιν. ἔστω γὰρ ἡ αβ κώπη· τὸ δὲ γ, ὁ σκαλμός· τὸ δὲ α, τὸ ἐν τῷ πλοίῳ, ἡ ἀρχὴ τῆς κώπης· τὸ δὲ β, τὸ ἐν τῇ θαλάττῃ. Εἰ δὴ τὸ α, οὗ τὸ δ μετακεκίνηται, τὸ β οὐκ ἔσται οὗ τὸ ε. ἴση γὰρ ἡ βε, τῇ αδ. ἴσον οὖν μετακεχωρηκὸς ἔσται. ἀλλ' ἦν ἔλαττον. ἔσται δὴ οὗ τὸ ζ, [ἢ τὸ θ. ἄρα τοίνυν τὴν αβ, καὶ οὐχ ἡ τὸ γ, καὶ κάτωθεν.] ἐλάττων γὰρ ἡ βζ, τῆς αδ· ὥστε καὶ ἡ θζ, τῆς δθ. ὅμοια γὰρ τὰ τρίγωνα. καθεστηκὸς δὲ ἔσται καὶ [τὸ μέσον] τὸ ἐφ' οὗ γ. Εἰς τοὐναντίον γὰρ τῷ ἐν τῇ θαλάττῃ ἄκρῳ * τὸ β μεταχωρεῖ, ᾗπερ τὸ ἐν πλοίῳ ἄκρον τὸ α· μὴ ἐχώρει δὲ οὗ τὸ δ. ὥστε μετακινηθήσεται τὸ πλοῖον, καὶ ἐκεῖ οὗ ἡ ἀρχὴ τῆς κώπης μεταφέρεται. τὸ δ' αὐτὸ καὶ τὸ πηδάλιον ποιεῖ· πλὴν ὅτι εἰς τὸ πρόσθεν οὐδὲν συμβάλλεται τῷ πλοίῳ, ὥσπερ ἐλέχθη ἐπὶ ἄνω, ἀλλὰ μόνον

* Qu. κινοῦν, vt videtur legere Leon.

* κ. τοῦ.

Scalmus autem hypomochlion exiſtens, c[entrum] eſt. In medio autem nauis plurimum re[mi] interiu[s] eſt: illa enim parte latiſſima eſt nauis: qua[re] maior vtrinque remi pars vtrorumque nauis parie[tum] intrinſecus eſt. Mouetur autem nauis, quoniam impellente ad mare remo, extremum illius quod intus eſt, in antè promouetur: nauem verò ſcalmo alligatam ſimul promoueri contingit, quò remi extremum. Vbi enim plurimum maris diuidit remus, eò maximè propelli neceſſe eſt.

Plurimum autem diuidit, vbi pars plurima remi à ſcalmo eſt. Et eam ob cauſam remiges, qui in media ſunt naui, mouent illam maximè. Maxima enim remi pars à ſcalmo in nauis medio intus eſt.

CAPVT VI.

CVr paruum exiſtens gubernaculum, & in extremo nauigio tantas habet vires, vt ab exiguo temone, & ab hominis vnius viribus alioqui modicè vtentis, magnæ nauigiorum moueantur moles? an quoniam gubernaculum vectis eſt, onus autem mare, gubernator verò mouens eſt? Non autem ſecundùm latitudinem, velut remus, mare accipit gubernaculum: non enim in ante nauigium mouet, ſed ipſum commotum mare accipiens inclinat obliquè. Quoniam enim pondus eſt mare, contra innixum modo nauem inclinat. Hypomochlium enim in contrarium verſatur: mare verò anterius, & illud exteriùs: illud autem ſequitur nauis, quoniam illi eſt alligata. Et remus quidem ſecundùm latitudinem onus propellens, & ab eodem repulſus, in rectum propellit: gubernaculum autem vt obliquum iacet, hinc inde in obliquum motionem facit. In extremo autem, & non in medio iacet, quoniam mouenti facillimum eſt ab extremo motum mouere. *Prima enim pars celerrimè fertur: & quoniam quemadmodum in iis quæ feruntur, in fine* deficit latio, ſic ipſius continui in fine imbecilliſſima eſt latio. Imbecilliſſima autem ad expellendum eſt facilis. Propter hæc igitur in puppi gubernaculum ponitur: nec minus, quoniam parua ibi motione facta, multo maius interuallum fit in vltimo. Quia æqualis angulus ſemper maiorem ſpectat: tantóque magis quanto maiores fuerint illæ quæ continent. Ex iis etiam manifeſtum eſt, quam ob cauſam magis in contrarium procedit nauigium, quàm remi ipſius palmula: eadem enim magnitudo iiſdem mota viribus, in aere plus quàm in aqua progreditur. Sit enim A B remus, C verò ſcalmus: A autem in nauigio ſit remi principium, B verò in mari palmula. Si igitur A vbi D tranſlatum fuerit, non erit B vbi E. æqualis enim B E ipſi A D. æquale igitur tranſlatum erit: ſed erat minus: erit igitur vbi eſt F. minor enim B F ipſa A D, quare ipſa G F, ipſa D G. Similes enim ſunt trianguli. Stans autem erit medium, vbi eſt C. In contrarium enim ipſi quod in mari eſt, extremo videlicet B procedit, vbi extremum in nauigio eſt A. Non procederet autem vbi eſt D, niſi commoueretur nauigium, & eò transferretur, vbi remi eſt principium. Id ipſum etiam facit gubernaculum, niſi quòd (vt dictum eſt retro) nihil nauigio ad id quod in ante eſt, confert, ſed ſolùm

puppim

puppim in obliquum pellit, vbicunque fuerit. in contrarium enim eo modo vergit prora. Vbi igitur applicatum eſt gubernaculum, id oportet rei motæ ceu quoddam intelligere medium: & quemadmodum ſcalmus remo. Medium autem procedit ſecundùm quod gubernaculum transfertur. Siquidem introrſus agit, & puppis eò transfertur: prora verò ad contrarium vergit. In eodem enim exiſtente prora, totum transfertur nauigium.

CAPVT VII.

Cvr quanto antenna ſublimior fuerit, iiſdem velis & vento eodem celeriùs feruntur nauigia? An quia malus quidem fit vectis, hypomochlion verò mali ſedes, in qua collocatur: pondus autem quod moueri debet, ipſum nauigium: mouens verò is, qui vela tendit, ſpiritus? Si igitur quantò remotius fuerit hypomochlion, faciliùs eadem potentia, & citiùs idem mouet pondus, altiùs certè ſublata antenna velum à mali ſede, quæ hypomochlion eſt, remotius faciens, id efficiet.

CAPVT VIII.

Cvr quando ex puppi nauigare voluerint, non flante ex puppi vento, veli quidem partem, quæ ad gubernatorem vergit, conſtringunt; illam verò quæ proram verſus eſt, pedem facientes relaxant? An quia retrahere quidem multo exiſtente vento gubernaculum non poteſt: pauco autem poteſt, quem conſtringunt? Propellit quidem igitur ipſe ventus: in puppim verò illum conſtituit gubernaculum retrahens, & mare compellens: ſimul & nautæ ipſi cum vento contendunt: in contrariam enim ſe reclinant partem.

CAPVT IX.

Cvr ex figurarum genere quæcunque rotundæ ſunt & circinatæ, faciliùs mouentur? Trifariàm autem circulum rotari contingit. Aut enim ſecundùm abſidem centro ſimul moto, quemadmodum plauſtri vertitur rota: aut circa manens centrum: velvti trochleæ ſtante centro: aut in pauimento manente centro, ſicvt figuli rota conuertitur, an celerrima quidem huiuſmodi ſunt, quoniam parua ſui parte planum contingunt, velvti circulus ſecundùm punctum, & quoniam non offenſant? A terra enim ſemotus eſt angulus. Præterea etiam cui obuiam fiunt corpori, id rurſum ſecundùm puſillum tangunt. Si autem rectilineum eſſet, rectitudine ſua multum plani contingeret. Ad hæc, quo nutat pondus, eo motor mouet. Cùm igitur ad rectum ſuper plano circuli fuerit diameter, planum ſecundùm punctum contingente circulo æquale vtrinque pondus diſterminat diameter. Cùm autē mouetur, plus illico, ad quod mouetur, ceu inde nutans, ab impellente faciliùs in antè mouetur. Quò enim vnumquodque vergit, mouetur ex facili. Siquidem difficulter ad contrarium nutus ſui mouetur modum. Præterea nonnulli autumant quod circuli linea in perpetuo verſatur motu, quemadmodum manentia propter contrarium nixum manent: ſicvt maioribus contingit circulis ad minores. Celeriùs enim ab æquali mouentur potentia

A τὴν πρύμναν εἰς τὸ πλάγιον ἀπωθεῖ ἔνθα ἢ ἔνθα. εἰς τοὐναντίον γὰρ ἡ πρῷρα οὕτω νεύει. ᾗ μὲν δὴ τὸ πηδάλιον προσέζευκται, δεῖ οἷόν τι [τοῦ] κινουμένου μέσον νοεῖν, καὶ ὥσπερ ὁ σκαλμὸς τῇ κώπῃ. τὸ δὲ μέσον ὑποχωρεῖ, ᾗ ὁ οἴαξ μετακινεῖται. ἐὰν μὲν εἴσω ἄγῃ, καὶ ἡ πρύμνα δεῦρο μεθέστηκεν· ἡ δὲ πρῷρα, εἰς τοὐναντίον νεύει. ἐν γὰρ τῷ αὐτῷ οὔσης τῆς πρῴρας, τὸ πλοῖον μεθέστηκεν ὅλον.

ΚΕΦΑΛ. ζʹ.

B Διὰ τί, ὅσῳ ἂν ἡ κεραία ἀνωτέρα ᾖ, θᾶττον πλεῖ τὰ πλοῖα τῷ αὐτῷ ἱστίῳ καὶ τῷ αὐτῷ πνεύματι; ἢ διότι γίνεται ὁ μὲν ἱστὸς, μοχλός· ὑπομόχλιον δὲ, τὸ ἑδώλιον, ἐν ᾧ ἐμπέπηγεν. ὃ δὲ δεῖ κινεῖν βάρος, τὸ πλοῖον· τὸ δὲ κινοῦν, τὸ ἐν τῷ ἱστίῳ πνεῦμα. εἰ δ' ὅσῳ ἂν πορρώτερον ᾖ τὸ ὑπομόχλιον, ῥᾷον κινεῖ καὶ θᾶττον ἡ αὐτὴ δύναμις τὸ αὐτὸ βάρος· ἡ ἄνω κεραία ἀνώτερον ἀρθεῖσα, καὶ τὸ ἱστίον πορρώτερον ποιεῖ τοῦ ἑδωλίου ὑπομοχλίου ὄντος.

ΚΕΦΑΛ. ηʹ.

C Διὰ τί, ὅταν * ἐξ οὐρίας βούλωνται διαδραμεῖν, μὴ οὐρίου τοῦ πνεύματος ὄντος, τὸ μὲν πρὸς τὸν κυβερνήτην τοῦ ἱστίου μέρος στέλλονται, τὸ δὲ πρὸς τὴν πρῷραν * ποδιαῖον ποιησάμενοι ἐφιᾶσιν; ἢ διότι ἀντισπᾶν τὸ πηδάλιον, πολλῷ μὲν ὄντι τῷ πνεύματι, οὐ δύναται, ὀλίγῳ δὲ, ὃ ὑποστέλλονται. προάγει μὲν οὖν τὸ πνεῦμα, εἰς οὔριον δὲ καθίστησι τὸ πηδάλιον, ἀντισπῶν καὶ μοχλεῦον τὴν θάλασσαν. ἅμα δὲ καὶ οἱ ναῦται μάχονται τῷ πνεύματι. ἀνακλίνουσι γὰρ ἐπὶ τὸ ἐναντίον ἑαυτούς.

* χ. ἐκ κεραίας
* χ. πόδα ποιούμενοι

ΚΕΦΑΛ. θʹ.

D Διὰ τί τὰ στρογγύλα καὶ περιφερῆ τῶν σχημάτων εὐκινητότερα; τριχῶς δὲ ἐνδέχεται τὸν κύκλον κυλισθῆναι. ἢ γὰρ κατὰ τὴν ἁψῖδα, συμμεταβάλλοντος τοῦ κέντρου, ὥσπερ ὁ τροχὸς ὁ τῆς ἁμάξης, κυλίεται· ἢ περὶ τὸ κέντρον μόνον, ὥσπερ αἱ τροχιλέαι, τοῦ κέντρου μένοντος· ἢ παρὰ τὸ ἐπίπεδον, τοῦ κέντρου μένοντος, ὥσπερ ὁ κεραμεικὸς τροχὸς κυλινδεῖται. * εἰ μὲν δὴ τάχιστα τὰ τοιαῦτα, διά τε τὸ μικρῷ ἅπτεσθαι τοῦ ἐπιπέδου, ὥσπερ ὁ κύκλος, κατὰ στιγμὴν, καὶ διὰ τὸ μὴ προσκόπτειν. ἀφέστηκε γὰρ τῆς γῆς ἡ γωνία. καὶ ἔτι ᾧ ἂν ἀπαντήσῃ σώματι, πάλιν τούτου κατὰ μικρὸν ἅπτεται. εἰ δὲ εὐθύγραμμον ἦν τῇ εὐθείᾳ, ἐπὶ πολὺ ἥπτετο ἂν τοῦ ἐπιπέδου. E ἔτι ᾗ ῥέπει ἐπὶ τὸ βάρος, ταύτῃ κινεῖ ὁ κινῶν. ὅταν μὲν γὰρ πρὸς ὀρθὴν ἡ διάμετρος ᾖ, τοῦ κύκλου τῷ ἐπιπέδῳ, ἁπτομένου τοῦ κύκλου κατὰ στιγμὴν τοῦ ἐπιπέδου, ἴσον τὸ βάρος ἐπ' ἀμφότερα διαλαμβάνει ἡ διάμετρος. ὅταν δὲ κινῆται, εὐθὺς πλέον ἐφ' ᾧ κινεῖται, ὥσπερ ῥέπον ἐντεῦθεν, εὐκινητότερον τῷ ὠθοῦντι εἰς τοὔμπροσθεν. ἐφ' ὃ γὰρ ῥέπει ἕκαστον, εὐκίνητον ἐστὶν, εἴπερ καὶ τὸ ἐπὶ τὸ ἐναντίον τῆς ῥοπῆς δυσκίνητον. ἔτι λέγουσί τινες ὅτι καὶ ἡ γραμμὴ ἡ τοῦ κύκλου ἐν φορᾷ ἐστιν ἀεὶ, ὥσπερ τὰ μένοντα, διὰ τὸ ἀντιτερίδειν, ὃ καὶ τοῖς μείζοσι κύκλοις ὑπάρχει πρὸς τοὺς ἐλάττους. θᾶττον γὰρ ὑπὸ τῆς ἴσης ἰσχύος κινοῦνται οἱ

* Leon. ἅπτ.

μείζους, καὶ τὰ βάρη κινοῦσι, διὰ τὸ ῥοπήν τινα ἔχειν τὴν γωνίαν A τὴν τοῦ μείζονος κύκλου, πρὸς τὴν τοῦ ἐλάττονος, καὶ εἶναι * ὅσπερ ἡ διάμετρος πρὸς τὴν διάμετρον. ἀλλὰ μὴν πᾶς κύκλος μείζων πρὸς ἐλάττονα. ἄπειροι γὰρ οἱ ἐλάττονες. εἰ δὲ καὶ πρὸς ἕτερον ἔχει ῥοπὴν ὁ κύκλος, ὁμοίως δὲ εὐκίνητος, καὶ ἄλλην δ' ἂν ἔχοι ῥοπὴν ὁ κύκλος, καὶ τὰ ὑπὸ κύκλου κινούμενα, κἂν μὴ τῇ ἀψῖδι ἅπτηται τοῦ ἐπιπέδου, ἀλλ' ἢ παρὰ τὸ ἐπίπεδον, ἢ ὡς αἱ τροχιλέαι· καὶ γὰρ οὕτως ἔχοντα, ῥᾷστα κινοῦνται καὶ κινοῦσι τὸ βάρος. ἢ οὐ τῷ κατὰ μικρὸν ἅπτεσθαι καὶ προσκρούειν, ἀλλὰ δι' ἄλλην αἰτίαν. αὕτη δέ ἐστιν ἡ εἰρημένη πρότερον, ὅτι ἐκ δύο φορῶν γεγένηται ὁ κύκλος· ὥστε μίαν αὐτῶν αἰεὶ ἔχειν ῥοπήν, B καὶ οἷον φερόμενον αὐτὸν αἰεὶ κινοῦσιν οἱ κινοῦντες, ὅταν κινῶσιν κατὰ τὴν περιφέρειαν ὁπωσοῦν· φερόμενον γὰρ αὐτὴν κινοῦσι. τὴν μὲν γὰρ εἰς τὸ πλάγιον αὐτοῦ κίνησιν, ὠθεῖ τὸ κινοῦν· τὴν δὲ ἐπὶ τῆς διαμέτρου, αὐτὸς κινεῖται.

* Leon. ὥσπερ ἡ δ. πρὸς τ. δ. οὕτω κύκλος μ.

ΚΕΦΑΛ. ι´.

Διὰ τί τὰ διὰ τῶν μειζόνων κύκλων αἰρόμενα καὶ ἑλκόμενα, ῥᾷον καὶ θᾶττον κινοῦμεν· οἷον καὶ αἱ τροχιλέαι αἱ μείζους τῶν ἐλαττόνων, καὶ αἱ σκυτάλαι ὁμοίως; ἢ διότι ἴσῳ ἂν μείζων ἡ ἐκ τοῦ κέντρου ᾖ, ἐν τῷ ἴσῳ χρόνῳ, C πλέον κινεῖται χωρίον; ὥστε καὶ τοῦ ἴσου βάρους ἐπόντος ποιήσει τὸ αὐτὸ, ὥσπερ εἴπομεν, καὶ τὰ μείζω ζυγὰ τῶν ἐλαττόνων ἀκριβέστερα εἶναι. τὸ μὲν γὰρ σπαρτίον, ἐστὶ κέντρον· τοῦ δὲ ζυγοῦ αἱ ἐπὶ τάδε τοῦ σπαρτίου, αἱ ἐκ τοῦ κέντρου.

ΚΕΦΑΛ. ια´.

Διὰ τί ῥᾷον, ὅταν ἄνευ βάρους ᾖ, κινεῖται τὸ ζυγὸν, ἢ ἔχον βάρος; ὁμοίως δὲ καὶ τροχὸς, ἢ ἄλλο τι τοιοῦτο, τὸ βαρύτερον μὲν, μεῖζον δὲ τοῦ ἐλάττονος καὶ κουφοτέρου; ἢ ὅτι οὐ μόνον εἰς τοὐναντίον τὸ βαρὺ, ἀλλὰ καὶ εἰς τὸ πλάγιον δυσκίνητόν ἐστιν; ἐναντίον γὰρ τῇ D ῥοπῇ κινῆσαι, χαλεπῶς· ἐφ' ὃ δὲ ῥέπει, ῥᾳδίως· εἰς δὲ τὸ πλάγιον οὐ ῥέπει.

ΚΕΦΑΛ. ιβ´.

Διὰ τί ἐπὶ τῶν σκυτάλων ῥᾷον τὰ φορτία κομίζεται, ἢ ἐπὶ τῶν ἁμαξῶν, ἐχουσῶν τῶν μὲν μεγάλους τροχούς, τῶν δὲ μικρούς; ἢ διότι ἐπὶ τῶν σκυτάλων οὐδεμίαν ἔχει πρόσκοψιν· τὸ δὲ ἐπὶ τῶν ἁμαξῶν, τὸν ἄξονα, καὶ προσκόπτει αὐτῷ; ἔκ τε γὰρ τῶν ἄνωθεν πιέζει αὐτὸν, καὶ ἐκ τῶν πλαγίων. τὸ δὲ ἐπὶ τῶν σκυτάλων, E ἐπὶ δύο τούτων κινεῖται, τῇ τε κάτω χώρᾳ ὑποκειμένῃ, καὶ τῷ βάρει τῷ ἐπικειμένῳ. ἐπ' ἀμφοτέρων γὰρ τούτων κυλίεται τῶν τόπων ὁ κύκλος, καὶ φερόμενος ὠθεῖται.

ΚΕΦΑΛ. ιγ´.

Διὰ τί πορρωτέρω τὰ βέλη φέρεται ἀπὸ τῆς σφενδόνης, ἢ ἀπὸ τῆς χειρός, καίτοι κρατεῖ γε ὁ βάλλων τῇ χειρὶ μᾶλλον, ἢ ἀπαρτήσας * τὸ κρέμας; καὶ ἔτι οὕτω μὲν δύο βάρη κινεῖ, τότε τῆς σφενδόνης,

* Leon. τὸ βάρος.

A maiores circuli, mouéntque onera, quoniam circuli maioris angulus ad minoris angulum [illegible] nutum habet quendam: & ſicvti diameter [illegible] metrum, ita maior circulus ad minorem. [illegible] autem ſunt minores. Si autem ad alterum [illegible] tum habet circulus, ſimiliter eſt bene mobilis. Et aliam ſanè habet inclinationem circulus, & ea quæ à circulo mouentur, licèt planitiem abſide non contingat, ſed aut iuxta planitiem aut velvti trochleæ. Etenim hoc ſe habentes modo, facillimè mouentur, & onera commouent. An [illegible] quia parua ſui portione cùm tangit, tum [illegible] circulus, ſed aliam ob cauſam? ea autem eſt quæ dicta eſt priùs, quòd circulus ſcilicet ex duabus B effectus eſt lationibus: quamobrem illarum alteram pro nutu ſemper habet, & velvti continuò motum illum mouent quicunque mouent, quando ſecundùm circunferentiam illum mouerint: latam enim ipſam mouent. Eam quidem igitur, quæ in obliquum eſt, motionem, ipſum impellit mouens: ſecundùm verò illam, quæ ſuper diametrum eſt, ſe ipſum mouet circulus.

CAPVT X.

Cur ea quæ per maiores circulos tolluntur, & trahuntur, faciliùs & citiùs moueri contingit, velvti maioribus trochleis, quàm minoribus, & ſcytalis ſimiliter? An quoniam quanto maior fuerit illa quæ à centro eſt, in æqua-C li tempore maius mouetur ſpatium? Quamobrem æquali inexiſtente onere, idem faciet: quemadmodum diximus, maiores libras minoribus exactiores eſſe. Spartum enim in illis centrum eſt: libræ autem vtrinque partes, quæ ex centro ſunt, exiſtunt.

CAPVT XI.

Cur faciliùs quando ſine pondere eſt, mouetur libra, quàm cùm pondus habet? Similique modo rota, & huiuſmodi quippiam, quod grauius quidem eſt, maius autem minore & leuiore? An quia non ſolùm in contrarium quod D graue eſt, ſed in obliquum etiam difficulter mouetur? In contrarium enim ei ad quod vergit onus, mouere difficile eſt: quò autem vergit, eſt facile: in obliquum autem haudquaquam vergit.

CAPVT XII.

Cur ſuper ſcytalas faciliùs portantur onera, quàm ſuper currus, cùm tamen [illegible] magnas habeant rotas, illæ verò puſillas? An quoniam in ſcytalis nulla eſt offenſatio, in curribus autem axis eſt, ad quem offenſant? Deſuper enim illum premunt, & à lateribus. Quod autem eſt E in ſcytalis, ad iſthæc duo mouetur, & infernè ſubſtrato ſpatio, & onere ſuperimpoſito. In vtriſque enim iis reuoluitur locis circulus, & motus impellitur.

CAPVT XIII.

Cur longiùs ferũtur miſſilia, funda quàm manu miſſa, cùm alioqui proiector manu magis pondus comprehendat, quã cùm illud ſuſpendit? Præterea ſic quidẽ duo mouet pondera, fundæ vi-

delicet, & miſſilis: illo autē modo ſolū miſſile. An quia in funda quidem commotū miſſile funditor proiicit? Fundam enim circulo ſubinde rotans, id iaculatur: ex manu autem à quiete eſt initium: omnia autem cùm in motu ſunt, quam cùm quieſcunt, faciliùs mouentur. An & eam ob cauſam eſt, ſed nec minus etiam, quia in fundæ uſu, manus quidem fit centrum: funda verò, quod à centro exit? Quanto autem productius fuerit id quod à centro eſt, tanto citiùs mouetur. Iactus autem, qui manu fit, fundæ reſpectu breuis eſt.

A καὶ τὸ βέλος, ἐκείνως δὲ τὸ βέλος μόνον. πότερον ὅτι ἐν μὲν τῇ σφενδόνῃ κινούμενον τὸ βέλος, ῥιπτεῖ ὁ βάλλων. περιαγαγὼν γὰρ κύκλῳ πολλάκις, ἀφίησιν. ἐκ δὲ τῆς χειρὸς ἀπὸ τῆς ἠρεμίας ἡ ἀρχή. πάντα δὲ εὐκινητότερα κινούμενα ἢ ἠρεμοῦντα. ἢ διά τε τοῦτο, καὶ διότι ἐν μὲν σφενδονᾷν, ἡ μὲν χεὶρ γίνεται κέντρον, ἡ δὲ σφενδόνη ἡ ἐκ τοῦ κέντρου; *ὅσῳ ἂν ἡ μείζων, ἡ ἀπὸ τοῦ κέντρου κινεῖται θᾶττον. ἡ δὲ ἀπὸ τῆς χειρὸς βολὴ πρὸς τὴν σφενδόνην βραχεῖά ἐστι.

* Leon. ὅσῳ δ' ἂν ἡ μείζων ἀπὸ τοῦ κέντρου, τοσούτῳ κινεῖται θᾶττον.

CAPVT XIV.

B CVr circa idem iugum maiores collopes faciliùs quàm minores mouentur: & item ſuculæ, quæ graciliores ſunt, ab eadem vi, quàm craſſiores? An quia ſucula quidem & iugum, centrum eſt: prominentes autem longitudines, eæ quæ ſunt à centro? Celeriùs autē, & plus mouentur, quæ maiorum ſunt circulorum, ab eadem vi, quàm quæ minorum. Ab eadem enim vi plus transfertur id extremum, quod longiùs è centro diſtat. Quamobrem ad iugum quidam inſtrumenta faciunt collopas, quibus faciliùs verſant: in gracilibus autem ſuculis plus fit id quod extra lignum eſt. Hoc autem id efficitur quod à centro exit.

ΚΕΦΑΛ. ιδ'.

Διὰ τί ῥᾷον κινοῦνται περὶ τὸ αὐτὸ ζυγὸν οἱ μείζους τῶν ἐλαττόνων κόλλοπες, καὶ οἱ αὐτοὶ ὄνοι λεπτότεροι ὑπὸ τῆς αὐτῆς ἰσχύος τῶν παχυτέρων; ἢ διότι ὁ μὲν ὄνος καὶ τὸ ζυγὸν κέντρον ἐστὶ, τὰ δὲ ἀπέχοντα μεγέθη αἱ ἐκ τοῦ κέντρου; θᾶττον δὲ κινοῦνται, καὶ πλέον ἀπὸ τῆς αὐτῆς ἰσχύος, αἱ τῶν μειζόνων κύκλων, ἢ αἱ τῶν ἐλαττόνων; ὑπὸ τῆς αὐτῆς γὰρ ἰσχύος μεῖζον μεθίσταται τὸ ἄκρον τὸ πορρώτερον τοῦ κέντρου. διὸ πρὸς μὲν τὸ ζυγὸν τοὺς κόλλοπας ὄργανα ποιοῦνται, οἷς ῥᾷον στρέφουσιν· ἐν δὲ τοῖς λεπτοῖς ὄνοις, πλεῖον γίνεται τὸ ἔξω τοῦ ξύλου. αὕτη δὲ γίνεται ἡ ἐκ τοῦ κέντρου.

CAPVT XV.

C CVr eiuſdem magnitudinis lignum faciliùs genu frangitur, ſi quiſpiam æquè diductis manibus extrema comprehendens fregerit, quàm ſi iuxta genu: & ſi terræ illud applicās pede ſuperimpoſito, manu longè diducta confregerit, quàm propè? An quia ibi quidem genu centrum eſt, hîc verò ipſe pes? Quanto autem remotius à centro fuerit, faciliùs mouetur quodcunque. Moueri autem quod frangitur, neceſſe eſt.

ΚΕΦΑΛ. ιε'.

Διὰ τί τὸ αὐτὸ μέγεθος ξύλον ῥᾷον καταγνύται περὶ τὸ γόνυ, ἐὰν ἴσον *ἀποστήσωσι, τῶν ἄκρων ἐχόμενος κατάγνυῃ, ἢ παρὰ τὸ γόνυ ἐγγὺς ὄντος· καὶ ἐὰν πρὸς τὴν γῆν ἐρείσας, καὶ τῷ ποδὶ προσβὰς, πόρρωθεν τῇ χειρὶ καταγνύῃ, ἢ ἐγγύθεν; ἢ διότι ἔνθα μὲν τὸ γόνυ κέντρον, ἔνθα δὲ ὁ πούς; ὅσῳ δ' ἂν πορρώτερον ᾖ τοῦ κέντρου, ῥᾷον κινεῖται ἅπαν. κινηθῆναι δὲ ἀνάγκη καταγνύμενον.

* Leon. ἀποστήσας,

CAPVT XVI.

D CVr eæ quæ circa litora appellantur crocæ, rotunda ſunt figura, cùm alioqui à principio ex magnis ſint lapidibus, oſtreiſve? An quia ea quæ plus recedunt à medio in motionibus, feruntur celeriùs? Medium enim fit centrum: interuallum verò ea quæ è centro. Semper autem maior ab æquali motionē maiorem deſcribit circulum. Quod autem maius in æquali pertranſit tempore, celeriùs fertur. Quæ autem celeriùs ex æquali feruntur ſpatio, vehementiùs impetunt. Quæ autem magis impetunt, impetuntur & magis: quamobrem ea, quæ plus à medio diſtant, confringi neceſſe eſt: id autem cùm patiantur, rotunda fieri eſt neceſſarium. Crocis autem, propter maris motum, quoniam ſimul cum illo agitantur, in perpetuo eſſe accidit motione, cóque verſatas modo ſemper offenſare. Id autem ipſis maximè extremis contingere partibus eſt neceſſe.

ΚΕΦΑΛ. ις'.

Διὰ τί περὶ τοὺς αἰγιαλοὺς αἱ καλούμεναι κρόκαι στρογγύλαι εἰσὶν, ἐκ μακρῶν τῶν λίθων καὶ ὀστράκων τὸ ἐξ ὑπαρχῆς ὄντων; ἢ διότι τὰ πλεῖον ἀπέχοντα τοῦ μέσου ἐν ταῖς κινήσεσι, θᾶττον φέρεται. τὸ μὲν γὰρ μέσον, γίνεται κέντρον· τὸ δὲ διάστημα, ἡ ἐκ τοῦ κέντρου. ἀεὶ δὲ ἡ μείζων ἀπὸ τῆς ἴσης κινήσεως, μείζω γράφει κύκλον. τὸ δ' ἐν ἴσῳ χρόνῳ μείζω διεξιὸν, θᾶττον φέρεται. τὰ δὲ φερόμενα θᾶττον ἐκ τοῦ ἴσου ἀποστήματος, σφοδρότερον τύπτει. τὰ δὲ τύπτοντα μᾶλλον, καὶ αὐτὰ τύπτεται μᾶλλον. ὥστε ἀνάγκη θραύεσθαι ἀεὶ τὰ πλέον ἀπέχοντα τοῦ μέσου. E τοῦτο δὲ πάσχοντα, ἀνάγκη γίνεσθαι περιφερῆ. ταῖς δὲ κρόκαις, διὰ τὴν τῆς θαλάσσης κίνησιν, διὰ τὸ μετὰ τῆς θαλάσσης κινεῖσθαι, συμβαίνει ἀεὶ ἐν κινήσει εἶναι, καὶ κυλιομέναις προσκόπτειν. τοῦτο δὲ ἀνάγκη μάλιστα συμβαίνειν αὐτοῖς τοῖς ἄκροις.

CAPVT XVII.

CVr quanto longiora ſunt ligna, tanto imbecilliora fiunt: & ſi tollantur, inflectuntur magis, tametſi quod breue quidem eſt, ceu bicubitum fuerit tenue: quod verò cubitorū cen-

ΚΕΦΑΛ. ιζ'.

Διὰ τί ὅσῳ ἂν ᾖ μακρότερα τὰ ξύλα, τοσούτῳ ἀσθενέστερα γίνεται, καὶ κάμπτεται αἰρόμενα μᾶλλον, κἂν ᾖ τὸ μὲν βραχὺ, ὅσον δίπηχυ, λεπτόν. τὸ δὲ ἑκατὸν πη-

χῇ, παχύ; ἢ διότι μοχλὸς γίνεται καὶ βάρος καὶ ὑπομόχλιον ἐν τῷ αἴρεσθαι τοῦ ξύλου τὸ μῆκος; τὸ μὲν γὰρ πρότερον μέρος αὐτοῦ, ὃ ἡ χεὶρ αἴρει, οἷον ὑπομόχλιον γίνεται· τὸ δ' ἐπὶ τῷ ἄκρῳ, βάρος. ὥστε ὅσῳ ἂν ᾖ μακρότερον τὸ ἀπὸ τοῦ ὑπομοχλίου, τοσούτῳ ἀνάγκη κάμπτεσθαι μᾶλλον. ὅσῳ γὰρ ἂν πλέον ἀπέχῃ τοῦ ὑπομοχλίου, τοσούτῳ ἀνάγκη κάμπτεσθαι μεῖζον. ἀνάγκη οὖν αἴρεσθαι τὰ ἄκρα τοῦ μοχλοῦ. ἐὰν οὖν ᾖ * καμπτόμενος ὁ μοχλὸς, ἀνάγκη αὐτὸν κάμπτεσθαι μᾶλλον αἰρόμενον. ὅπερ συμβαίνει ἐπὶ τῶν ξύλων τῶν μακρῶν· ἐν δὲ τοῖς βραχέσιν, ἐγγὺς τὸ ἔσχατον τοῦ ὑπομοχλίου γίνεται τοῦ ἠρεμοῦντος.

* Leon. καμπτὸς

ΚΕΦΑΛ. ιη'.

Διὰ τί τῷ σφηνὶ, ὄντι μικρῷ, μεγάλα βάρη διΐσταται, καὶ μεγέθη σωμάτων, καὶ θλίψις ἰσχυρὰ γίνεται; ἢ διότι ὁ σφὴν, δύο μοχλοί εἰσιν ἐναντίοι ἀλλήλοις. ἔχει δὲ ἑκάτερος, * τὸ μὲν βάρος, τὸ δὲ ὑπομόχλιον, ὃ καὶ ἀνασπᾷ ἢ πιέζει. ἔτι δὲ ἡ τῆς πληγῆς φορὰ, τὸ βάρος ὃ τύπτει καὶ κινεῖ, ποιεῖ μέγα· καὶ διὰ τὸ κινούμενον κινεῖν τῇ ταχυτῆτι, ἰσχύει ἔτι πλέον. μικρῷ δὲ ὄντι τῷ μοχλῷ, μεγάλαι δυνάμεις ἀκολουθοῦσι. διὸ λανθάνει κινῶν, παρὰ τὴν ἀξίαν τοῦ μεγέθους. ἔστω σφὴν ἐφ' ᾧ α β γ· τὸ δὲ σφηνούμενον, δ η ζ. μοχλὸς δὴ γίνεται ἡ α β· βάρος δὲ τὸ τοῦ β κάτωθεν· ὑπομόχλιον δὲ τὸ ζ δ. ἐναντίος δὲ τούτῳ μοχλὸς, τὸ β γ. ἡ δὲ α γ κοπτομένη, ἑκατέρῳ τούτων χρῆται μοχλῷ. ἀνασπᾷ γὰρ τὸ β.

* Leon. [illegible]

ΚΕΦΑΛ. ιθ'.

Διὰ τί, ἐάν τις, δύο τροχιλείας ποιήσας ἐπὶ δυσὶ ξύλοις συμβάλλουσιν ἑαυταῖς, ἐναντίως αὐταῖς κύκλῳ περιβάλλῃ καλώδιον, ἔχον τὸ ἄρτημα ἐκ θατέρου τῶν ξύλων, θάτερον δὲ ἢ προσηρεισμένον ἢ προσεστηκὸς μένον κατὰ τὰς τροχιλείας, ἐὰν ἕλκῃ τις τῇ ἀρχῇ τοῦ καλωδίου, μεγάλα βάρη προσάγει, κἂν ᾖ μικρὰ ἡ ἕλκουσα ἰσχύς; ἢ διότι τὸ αὐτὸ βάρος ἀπὸ ἐλάττονος ἰσχύος εἰ μοχλεύεται, αἴρεται, ἢ ἀπὸ χειρός; ἡ δὲ τροχιλεία τὸ αὐτὸ ποιεῖ τῷ μοχλῷ· ὥστε ἡ μία ῥᾷον ἕλξει, καὶ ἀπὸ μιᾶς ὁλκῆς τοῦ κατὰ χεῖρα, πολὺ ἕλξει βαρύτερον. τοῦτο δὴ αἱ δύο τροχιλεῖαι πλέον ἢ διπλασίῳ τάχει αἴρουσαι. ἔλαττον γὰρ ἔτι ἡ ἑτέρα ἕλκει, ἢ εἰ αὐτὴ καθ' ἑαυτὴν εἷλκεν, ὅταν παρὰ τῆς ἑτέρας ἐπιβληθῇ τὸ σχοινίον. ἐκείνη γὰρ ἔτι ἔλαττον ἐποίησε τὸ βάρος. καὶ οὕτως ἐὰν εἰς πλείους ἐπιβάλληται τὸ καλώδιον ἐν ὀλίγαις τροχιλείαις, πολλὴ γίνεται διαφορά· ὥστε ὑπὸ τῆς πρώτης τοῦ βάρους ἑλκούσης τέτταρας μνᾶς, ὑπὸ τῆς τελευταίας ἕλκεσθαι πολλῷ ἔλαττον. καὶ ἐν τοῖς οἰκοδομικοῖς ἔργοις ῥᾳδίως κινοῦσι μεγάλα βάρη· μεταφέρουσι γὰρ ἀπὸ τῆς αὐτῆς τροχιλείας εἰς ἑτέραν, καὶ πάλιν ἀπ' ἐκείνης εἰς ὄνους καὶ μοχλούς. τοῦτο δὲ ταὐτόν ἐστι τῷ ποιεῖν πολλὰς τροχιλείας.

ΚΕΦΑΛ. κ.

Διὰ τί, ἐὰν μέν τις ἐπιθῇ ἐπὶ τὸ ξύλον πέλεκυν μέγαν, καὶ φορτίον μέγα ἐπ' αὐτοῦ, οὐ διαιρεῖ τὸ ξύλον, ὅ,τι καὶ λόγου ἄξιον· ἐὰν δὲ ἄρας τὸν πέλεκύν τις πατάξῃ, αὐτὸ διασχίζει, ἔλαττον βάρος ἔχοντος τοῦ τυπτομένου πολὺ μᾶλλον, ἢ τοῦ ἐπικειμένου καὶ πιέζοντος;

A tum, craſſum? An quia & vectis, & onus, & hypomochlion, in leuando ipſa fit ligni proc[illegible]. Prior namque illius pars ceu hypomochl[illegible] fit: quod verò in extremo eſt, pondus. Quam[illegible] quantò extenſius fuerit id quod ab hypomochlio eſt, tanto inflecti neceſſe eſt magis. Quo enim plus ab hypomochlio diſtat, eo magis incuruari neceſſe eſt. Neceſſariò igitur extrema vectis eleuantur. Si igitur flexilis fuerit vectis, ipſum inflecti magis cùm extollitur neceſſe eſt: quod longis accidit lignis: in breuibus autem quod vltimum eſt, quieſcenti hypomochlio [illegible]pe fit.

B CAPVT XVIII.

Cvr à paruo exiſtente cuneo, magna ſcinduntur pondera, & corporum moles, validáque fit impreſſio? An quia cuneus duo ſunt vectes ſibi inuicem contrarij? Vterque autem & pondus habet, & hypomochlion, quod diuellit, & comprimit. Plagæ quinetiam ipſius latio pondus, quod percutit & mouet, magnum facit: & quoniam motum mouet, ipſa celeritate valentius fit. Paruo autem exiſtente vecte, magnæ illum conſequuntur vires: quamobrem vltra magnitudinis decentiam latet mouens. Sit cuneus vbi A B C, quod verò cuneo ſcinditur, D E F G. vectis igitur
C fit ipſa A B, pondus verò ipſius B inferior pars, hypomochlion autem D G. huic autem contrarius vectis B C. Percuſſa igitur A C, vtroque illorum vtitur vecte. Scindit enim ipſum B.

CAPVT XIX.

Cvr ſi quiſpiam trochleas componens duas in tignis duobus ad ſe inuicem iunctis, contrario ad trochleas modo circulo funem circumduxerit, cuius alterum quidem caput tignorum [illegible]pendatur alteri, alterum verò trochleis ſit [illegible]xum, & à funis initio trahere cœperit, mag[illegible]hit pondera, licèt imbecillium fuerit virium? An
D quia idem pōdus à minori potētia ſi mouetur, vecte medio transfertur magis, quàm à manu? Trochlea autem idem vecti facit. Quamobrem ſi vna facilius trahet, & ab vnico tractu multo grauius trahet quàm facere poſſit manus, id ipſum duæ trochleæ plus quàm in dupla velocitate leuabunt. Minus enim alterā trahit quàm ſi ipſa per ſe ipſam traheret, quando circa alteram iniectus fuerit funis: illa namque minus etiam pondus effecit. Parique modo ſi ad plures iniectus fuerit funis in paucis trochleis, multa fit differentia: quamobrem à prima pondere quatuor minas trahente, ab vltima trahi multo minus. Et in re ædificatoria facilliter magna mouent pondera: tra-
E ducunt enim ab vna trochlea ad aliam, & rurſus ab illa ad ſuculas & vectes. Hoc autem idem eſt, ac ſi multas facerent trochleas.

CAPVT XX.

Cvr ſi quis ſuper lignum magnā imponat ſecurim, deſuperque illi magnum adiiciat pondus, ligni quippiā, quod curandum ſit, nō diuidit: ſi verò ſecurim extollens percutiat, illud ſcindit, cùm alioqui multo minus habeat pōderis id quod percutit, quàm id quod ſuperiacet, & premit?

An quia omnia cum motu fiunt: & graue ipſum, grauitatis magis aſſumit motum dum mouetur, quàm dum quieſcit? Incumbens igitur, connatam graui motionem non mouetur, motum verò & ſecundùm hanc mouetur, & ſecundùm eam quę eſt percutientis. Præterea, ſecuris ipſa efficitur cuneus. Paruus autem exiſtens cuneus magna diuidit, cùm ex duobus ſit vectibus contrario ad ſeſe inuicem modo conſtitutis.

A ἢ διότι πάντα τῇ κινήσει ἐργάζεται, καὶ τὸ βαρὺ τὴν τοῦ βάρους κίνησιν λαμβάνει μᾶλλον κινούμενον ἢ ἠρεμοῦν; ἐπικείμενον οὖν οὐ κινεῖται τὴν τοῦ βάρους κίνησιν· φερόμενον δὲ, ταύτην τε καὶ τὴν τοῦ τύπτοντος. ἔτι δὲ καὶ γίνεται σφὴν ὁ πέλεκυς· ὁ δὲ σφὴν, μικρὸς ὢν, μεγάλα διΐστησι, διὰ τὸ εἶναι ἐκ δύο μοχλῶν ἐναντίως συγκειμένων.

CAPVT XXI.

CVr ſtatera, qua carnes ponderantur, paruo appendiculo magna trutinat onera, cùm alioqui tota dimidiata exiſtat libra? vbi enim onus imponitur, ſolùm ſuſpenditur lanx: in altera verò parte ſola eſt ſtatera. An quia ſimul libram & vectem ipſam contingit eſſe ſtateram? Libram quidem, vbi ſpartorum quodcunque ſtateræ fit centrum. in altera enim parte lancem, in altera autem pro lance æquipondij appendiculum habet, quod libræ incumbit, ceu ſi quis alteram apponeret lancem, & illi pondus imponeret. Manifeſtum enim quòd tantundem trahit ponderis ei quod in altera iacet lance. Quemadmodum autem ſi vna libra multæ ſint libræ, ſic talia inſunt ſparta multa in eiuſmodi libra, quorum vniuſcuiuſque quod intrinſecus eſt ad appendiculum, ſtateræ eſt dimidium. & omnino iſthuc libra eſt, vnam quidem habens lancem in qua pondus appenditur: alteram verò vbi in ſtatera æquipondium. Quam ob rem appendiculum ad alteram ſui partem eſt ſtatera. Huiuſcemodi autem exiſtens, multæ ſunt libræ, tótque quot fuerint ſparta. Semper autem quod lanci propinquius eſt ſpartum, appenſóque oneri, maius trahit pondus: quoniam fit quidem omnis ſtatera inuerſus vectis: hypomochlion namque vnumquodque ſpartum supernè exiſtens, pondus verò id quod lanci ineſt. Quanto autem productior vectis fuerit longitudo ab ipſo hypomochlio, tanto ibi quidem faciliùs mouet, hic autem æquilibrium facit, pondúſque ſtateræ trutinat, quod ad æquipondij vergit appendiculum.

ΚΕΦΑΛ. κα.

Διὰ τί αἱ φάλαγγες τὰ κρέα ἱστᾶσιν ἀπὸ μικροῦ ἀρτήματος μεγάλα βάρη, τοῦ ὅλου ἡμιζυγίου ὄντος; οὗ μὲν γὰρ τὸ βάρος ἐντίθεται, κατήρτηται μόνον ἡ πλάστιγξ, B ἐπὶ θάτερον δὲ φάλαγξ ἐστὶ μόνον. ἢ ὅτι ἅμα συμβαίνει ζυγὸν καὶ μοχλὸν εἶναι τὴν φάλαγγα; ζυγὸν μὲν γὰρ, ᾗ τῶν ἀρτημάτων ἕκαστον γίνεται τὸ κέντρον τῆς φάλαγγος. τὸ μὲν οὖν ἐπὶ θάτερα ἔχει πλάστιγγα, τὸ δ᾽ ἐπὶ θάτερα, ἀντὶ τῆς πλάστιγγος τὸ σφαίρωμα, ὃ τῷ ζυγῷ πρόσκειται, ὥσπερ εἴ τις τὴν ἑτέραν πλάστιγγα, καὶ τὸν σταθμὸν, ἐπιθείη ἐπὶ τὸ ἄκρον τῆς πλάστιγγος. δῆλον γὰρ, ὅτι ἕλκει τοσοῦτον βάρος ἐν τῇ ἑτέρᾳ κείμενον πλάστιγγι. ὅπως δὲ τὸ ἓν ζυγὸν πολλὰ ᾖ ζυγὰ, τοιαῦτα τὰ ἀρτήματα πολλὰ ἐγκεῖται ἐν τῷ τοιούτῳ ζυγῷ, ὧν ἑκάστου τὸ ἐπὶ τάδε ἐπὶ τὸ σφαίρωμα C τὸ ἥμισυ τῆς φάλαγγός ἐστι, [* καὶ ὁ σταθμὸς δι᾽ ἴσου τῶν ἀπ᾽ ἀλλήλων τῶν ἀρτημάτων κινουμένων, ὥστε συμμετρεῖσθαι πόσον βάρος ἕλκει τὸ ἐν τῇ πλάστιγγι κείμενον· ὥστε γινώσκειν, ὅταν μὲν ὀρθὴ ἡ φάλαγξ ᾖ, ἀπὸ ποίου ἀρτήματος πόσον βάρος ἔχει ἡ πλάστιγξ, καθάπερ εἴρηται.] ὅλως μὲν ἐστι τοῦτο ζυγὸν, ἔχον μίαν μὲν πλάστιγγα, ἐν ᾗ ἵσταται τὸ βάρος, τὴν δὲ ἑτέραν, ἐν ᾗ τὸ σταθμὸν ἐν τῇ φάλαγγι. διὸ σφαίρωμά ἐστιν ἡ φάλαγξ ἐπὶ θάτερον. τοιοῦτον δὲ ὂν, πολλὰ ζυγά ἐστι, καὶ τοσαῦτα, ὅσαπερ ἐστὶ τὰ ἀρτήματα. ἀεὶ δὲ τὸ ἐγγύτερον ἀρτήμα τῆς πλάστιγγος καὶ τοῦ ἱσταμένου βάρους, μεῖζον ἕλκει βάρος, διὰ τὸ γίνεσθαι τὴν μὲν φάλαγγα πᾶσαν μοχλὸν ἀνεστραμμένον· D ὑπομόχλιον μὲν γὰρ τὸ ἀρτήμα ἕκαστον ἄνωθεν ὄν, τὸ δὲ βάρος τὸ ἐνὸν ἐν τῇ πλάστιγγι. ὅσῳ δ᾽ ἂν μακρότερον ᾖ τὸ μῆκος τοῦ μοχλοῦ τοῦ ἀπὸ τοῦ ὑπομοχλίου, τοσούτῳ ἐκεῖ μὲν ῥᾷον κινεῖ, ἐνταῦθα δὲ σήκωμα ποιεῖ, καὶ ἵστησι τὸ πρὸς τὸ σφαίρωμα βάρος τῆς φάλαγγος.

Leon. quæ incluſa ſunt, omiſit vt ſuperuacua & adulterina.

CAPVT XXII.

CVr medici faciliùs dentes extrahunt dentiforcipis onere adiecto, quàm ſi ſola vtantur manu? An quia ex manu magis quàm ex dentiforcipe lubricus elabitur dens? An ferro id potiùs accidit, quàm digitis, quoniam vndique dentem non comprehendunt: quod mollis digitorum facit caro: adhæret enim, & complectitur magis. An quia dentiforceps duo ſunt contrarij vectes, vnicum habentes hypomochlion, eius ſcilicet inſtrumenti connexionem? Hoc igitur ad extractionem vtuntur organo, vt faciliùs moueant. Sic dentiforcipis alterum quidem extremum vbi eſt A, alterum autem quod extrahit, B: vectis autem vbi A D F: alter verò vectis vbi B C E: hypomochlion autem C G D: connexio verò vbi G, dens autem pondus. Vtroque igitur B & F ſimul comprehendentes mouent: quando autem commotus fuerit, faciliùs manu trahitur, quàm inſtrumento.

ΚΕΦΑΛ. κβ.

Διὰ τί οἱ ἰατροὶ ῥᾷον ἐξαιροῦσι τοὺς ὀδόντας, προσλαμβάνοντες βάρος τῆς ὀδοντάγρας, ἢ τῇ χειρὶ μόνῃ ψιλῇ; πότερον διὰ τὸ μᾶλλον ἐξολισθαίνειν διὰ τῆς χειρὸς τὸν ὀδόντα, ἢ ἐκ τῆς ὀδοντάγρας; ἢ μᾶλλον ὀλισθαίνει τῆς χειρὸς ὁ σίδηρος, καὶ οὐ περιλαμβάνει αὐτὸν κύκλῳ; E μαλθακὴ γὰρ οὖσα ἡ σὰρξ τῶν δακτύλων, καὶ προσμένει μᾶλλον καὶ περιαρμόττει. ἀλλ᾽ ὅτι ἡ ὀδοντάγρα δύο μοχλοί εἰσιν ἀντικείμενοι, ἓν τὸ ὑπομόχλιον ἔχοντες τὴν σύναψιν τῆς θερμαστρίδος; τῷ ῥᾷον οὖν κινῆσαι χρῶνται τῷ ὀργάνῳ πρὸς τὴν ἐξαίρεσιν. ἔστω γὰρ τῆς ὀδοντάγρας τὸ μὲν ἕτερον ἄκρον, ἐφ᾽ ᾧ τὸ α· τὸ δὲ ἕτερον, τὸ β, ὃ ἐξαιρεῖ· ὁ δὲ μοχλὸς, ἐφ᾽ ᾧ α δ ζ· ὁ δὲ ἄλλος μοχλὸς, ἐφ᾽ ᾧ β γ ε· ὑπομόχλιον δὲ, τὸ γ θ δ· ὁ δὲ ὀδοὺς, ἐφ᾽ οὗ ι σύναψις· ὁ δὲ, τὸ βάρος. ἑκατέρῳ οὖν τῶν β ζ, καὶ ἅμα λαβὼν κινεῖ. ὅταν δὲ κινήσῃ, ἐξεῖλε ῥᾷον τῇ χειρὶ, ἢ τῷ ὀργάνῳ.

A

ΚΕΦΑΛ. κγ.

ΔΙὰ τί τὰ κάρυα ῥᾳδίως καταγνύουσιν ἄνευ πληγῆς ἐν τοῖς ὀργάνοις ἃ ποιοῦσι πρὸς τὸ καταγνύναι αὐτά; πολλὴ γὰρ ἀφαιρεῖται ἰσχὺς ἡ τῆς φορᾶς καὶ βίας. ἔτι δὲ σκληρῷ καὶ βαρεῖ συνθλίβων, θᾶττον ἂν κατάξῃ, ἢ ξυλίνῳ καὶ κούφῳ τῷ ὀργάνῳ. ἢ διότι οὕτως ἐπ' ἀμφότερα θλίβεται ὑπὸ δύο μοχλῶν τὸ κάρυον, τῷ δὲ μοχλῷ ῥᾳδίως διαιρεῖται τὰ βάρη; τὸ γὰρ ὄργανον ἐκ δύο σύγκειται μοχλῶν, ὑπομόχλιον ἐχόντων τὸ αὐτὸ, τὴν συναφὴν ἐφ' ἧς τὸ α. * ὥσπερ οὖν εἰ ἦσαν ἐκβεβλημέναι, ἐφ' ὧν κινουμένων εἰς τὰ τῶν γ δ ἄκρα, αἱ ε ζ συνήγοντο ῥᾳδίως ἀπὸ μικρᾶς ἰσχύος· ἣν οὖν ἐν τῇ πληγῇ τὸ βάρος ἐποίει, ταύτην ἢ κρείττων ταύτης, ἡ τὸ ε γ καὶ ζ δ μοχλοὶ ὄντες ποιοῦσι. τῇ ἄρσει γὰρ εἰς τοὐναντίον αἴρονται, καὶ θλίβοντες καταγνύουσι τὸ ἐφ' ᾧ κ. δι' αὐτὸ δὲ τοῦτο καὶ ὅσῳ ἂν ἐγγύτερον ᾖ τῆς α, τὸ α συντρίβεται θᾶττον. ὅσῳ γὰρ ἂν πλεῖον ἀπέχῃ τοῦ ὑπομοχλίου ὁ μοχλὸς, ῥᾷον κινεῖ καὶ πλεῖον ἀπὸ τῆς ἰσχύος τῆς αὐτῆς. ἔστιν οὖν τὸ μὲν α ὑπομόχλιον, ἡ δὲ δ α ζ μοχλὸς, καὶ ἡ γ α ε. ὅσῳ ἂν οὖν τὸ κ ἐγγυτέρω ᾖ τῆς γωνίας τῶν α, τοσούτῳ ἐγγύτερον γίνεται τῆς συναφῆς τῶν α. τοῦτο δέ ἐστι τὸ ὑπομόχλιον. ἀνάγκη τοίνυν ἀπὸ τῆς αὐτῆς ἰσχύος συναγούσης τὸ ζ ε, αἴρεσθαι πλέον. ὥστ' ἐπεὶ ἐστὶν ἐξ ἐναντίας ἡ ἄρσις, ἀνάγκη θλίβεσθαι μᾶλλον· τὸ δὲ μᾶλλον θλιβόμενον, καταγνυται θᾶττον.

* Leon. ita legiſſe videtur, ὥσπερ οὖν εἰ ἦσαν ἐκβεβλημέναι κατὰ τὰ ἄκρα κινουμένων τῶν γ δ αἱ ε ζ, οὕτω συνάγονται ῥᾳδίως ὑπὸ μικρ. ἰσχύος. Sylb.

B

C

ΚΕΦΑΛ. κδ'.

ΔΙὰ τί φερομένων δύο φορὰς ἐν τῷ ῥόμβῳ τῶν ἄκρων σημείων ἀμφοτέρων, οὐ τὴν ἴσην ἑκάτερον αὐτῶν εὐθεῖαν διέρχεται, ἀλλὰ πολλαπλασίαν θάτερον; ὁ αὐτὸς δὲ λόγος καὶ διὰ τί τὸ ἐπὶ τῆς πλευρᾶς φερόμενον ἐλάττω διέρχεται * τῆς φορᾶς. τὸ μὲν γὰρ, τὴν ἐλάττω διάμετρον· ἡ δὲ, τὴν πλευρὰν μείζω· καὶ ἡ μὲν, μίαν, τὸ δὲ, δύο φέρεται φοράς· φερέσθω γὰρ ἐπὶ τῆς α β, τὸ μὲν α πρὸς τὸ β, τὸ δὲ β πρὸς τὸ δ, τῷ αὐτῷ τάχει. φερέσθω δὲ καὶ ἡ α β ἐπὶ τῆς α γ, παρὰ τὴν γ δ, τῷ αὐτῷ τάχει τούτοις. ἀνάγκη δὴ τὸ μὲν α ἐπὶ τῆς α δ διαμέτρου φέρεσθαι, τὸ δὲ β ἐπὶ τῆς β γ, καὶ ἅμα διεληλυθέναι ἑκατέραν, καὶ τὴν α β * τὴν α γ πλευράν. ἐνηνέχθω γὰρ τὸ μὲν α, τὴν α ε, ἡ δὲ α β, τὴν α ζ, καὶ ἔστω ἐκβεβλημένη ἡ ζ η παρὰ τὴν α β, καὶ ἀπὸ τοῦ ε πεπληρώσθω. ὅμοιον οὖν γίνεται τὸ προσπληρωθὲν τῷ ὅλῳ. [ἴση ἄρα ἡ α ζ τῇ α ε. ἡ δὲ α β, τὴν α ζ εἴη ἂν ἐνηνεγμένη.] ἔσται ἄρα ἐπὶ τῆς διαμέτρου κατὰ τὸ θ. καὶ αἰεὶ δὲ ἀνάγκη αὐτὸ φέρεσθαι κατὰ τὴν διάμετρον. καὶ ἅμα ἡ πλευρὰ ἡ α β, τὴν πλευρὰν τὴν α γ δίεισι, καὶ τὸ α τὴν διάμετρον δίεισι τὴν α δ. ὁμοίως δὲ δειχθήσεται καὶ τὸ β ἐπὶ τῆς α γ διαμέτρου φερόμενον. ἴση γάρ ἐστιν ἡ β ε, τῇ β η. προσαναπληρωθέντος οὖν ἀπὸ τοῦ η, ὅμοιόν ἐστι τῷ ὅλῳ τὸ ἐντός· καὶ τὸ β ἐπὶ τῆς διαμέτρου ἔσται κατὰ τὴν συναφὴν τῶν πλευρῶν, καὶ ἅμα δίεισιν ἥ τε πλευρὰ τὴν πλευρὰν, καὶ τὸ β τὴν β γ διάμετρον. ἅμα ἄρα καὶ τὸ β τὴν πολλαπλασίαν τῆς α β δίεισι, καὶ ἡ πλευρὰ τὴν ἐλάττονα πλευρὰν, τῷ αὐτῷ τάχει φερόμενα, καὶ ἡ πλευρὰ μείζω τοῦ α διελήλυθε μίαν φορὰν φερομένη. ὅσῳ γὰρ ἂν ὀξύτερος γίνηται ὁ ῥόμβος,

* Leon. τῆς πλα-γίας.

* Qu. τὴν α γ. πλευράν, & τὸ α ε, β α.

D

E

CAPVT XXIII.

CVr nuces abſque ictu facilè confringunt inſtrumentis, quæ ad eum fiunt vſum. Multum enim aufertur virium, motionis ſcilicet, & violentiæ. Præterea, duro & graui comprimens inſtrumento citiùs confringet, quàm ligneo, & leui. An quia ſic vtrinque à duobus comprimitur vectibus ipſa nux: à vecte autem facilè diuiduntur onera? Id enim inſtrumentum ex duobus componitur vectibus, idem habentibus hypomochlion, connexionem videlicet ipſam, vbi eſt A. Quemadmodum igitur fuere diductæ ſecundum extrema motis CD, ipſæ FE: ſic à parua faciliter potentia conducuntur. Quod igitur cum percuſſione feciſſet pondus, id valentiores illa EC & FD vectes efficiunt. Eleuatione enim in contrarium elati, & comprimentes, frangunt vbi eſt K. Hanc etiam ob cauſam quanto vicinius fuerit K ipſum A confringitur celeriùs. Quanto enim ab hypomochlio plus diſtat vectis, faciliùs & plus mouet ab eadem potentia. Eſt igitur A quidem hypomochlion: ipſa autem DAF vectis. & item ipſa CAE. Quanto igitur ipſum k vicinius fuerit angulo ipſius A, tanto vicinius fit connexioni, vbi eſt A. Hoc autem eſt hypomochlion. Ab eadem igitur potentia applicante, FE plus extolli neceſſe eſt. Quam ob rem quoniam ex contrario eſt eleuatio, neceſſe eſt magis comprimi: quod autem comprimitur magis, citiùs frangitur.

CAPVT XXIV.

CVr ſi duo extrema in rhombo puncta duabus ferantur lationibus, haudquaquam æquale vtrumque eorum pertrãſit rectam, ſed multò plus alterum? Idem autem eſt ſermo, cur quod ſuper latus fertur, minùs pertranſit, quàm ipſum latus. Illud enim diametrum minorem, hoc verò maius latus. Et hoc quidem vnica, illud verò duabus fertur lationibus. Feratur enim ex ipſa AB, A quidem ad ipſum B, B verò ad ipſum D, eadem celeritate. Feratur autem & ipſa AB in ipſa AC iuxta CD eadẽ celeritate cum illis. Neceſſe igitur eſt A quidẽ in ipſa AD diametro ferri, B verò in ipſa BC, & vtramque ſimul pertranſiſſe, & ipſam AB ipſum latus AC: latum enim ſit ipſum A ipſam AE, AB autem ipſam AF, & proiecta ſit FG iuxta ipſum AB, & ab ipſo E ſimiliter repleatur. Simile igitur fit quod repletum eſt, ipſi toti: æqualis igitur AF ipſi AE. Ipſa autem AB ipſam AF lata erit: in diametro igitur erit ſecundum k. Et ſemper neceſſe eſt ipſum ferri ſecundùm diametrum: & ſimul AB latus pertanſit latus AC, & ipſum A diametrum pertranſit AD. Similiter etiam demonſtrabitur & ipſum B in ipſa BC diametro latum: æqualis enim eſt ipſa BE ipſi BG. Repleto igitur ab ipſo G quod intus eſt, toti eſt ſimile: & ipſum B in ipſa diametro erit ſecundùm laterum connexionem. Et ſimul latus pertranſit latus, & B ipſum BC diametrum. Simul igitur multò plus ipſa AB pertranſit, & ipſum latus minus latus eadem lata celeritate: & ipſum latus maiorem quàm B pertranſiuit vna latum latione. Quanto enim acutior fuerit rhombus,

diameter quidem minor fit, A C autem maior: [latus verò ipſius B C minus.] Abſurdum eſt enim [vt dictum eſt] id quod duabus fertur lationibus, aliquando ferri tardiùs illo quod fertur vnica: & vtriſque poſitis æquali velocitate punctis, alterum pertranſire maiorem. Cauſa autem eſt, quoniam ei quod ab obtuſo fertur angulo, ambæ ferè contrariæ fiunt lationes, & illa ſecundùm quam ipſum fertur, & illa ſecundùm quam ipſum à latere defertur. Ei autem quod ab acuto fertur, accidit vt ad idem feratur. Coadiuuat enim quæ ipſius eſt lateris, illam quæ eſt ſuper diametrum. Et quanto hunc quidem acutiorem feceris, illum verò obtuſum magis: hæc quidem tardior erit, illa verò celerior. Hæ quidem igitur magis contrariæ fiunt, quoniam obtuſior fit angulus: illæ verò ad idem magis, quoniam lineæ coarctantur. Ipſum enim A ferè ad idem fertur ſecundùm ambas lationes. Coadiuuatur igitur altera: & quanto ſanè acutior fuerit angulus, tanto magis ipſum A ad contrarium. Ipſum enim ad B fertur. Latus autem defert ipſum ad D. Et quanto ſanè obtuſior fuerit angulus, magis contrariæ fiunt lationes. Rectior enim efficitur linea. Si autem omnino recta fieret, penitus vtique eſſent contrariæ. Latus verò ſecundùm vnicam latum lationem, à nullo præpeditur. Rationabiliter igitur maiorem pertranſit.

CAPVT XXV.

DVbitatur quam ob cauſam maior circulus æqualem minori circulo conuoluitur lineã, quando circa idem centrum fuerint poſiti: ſeorſum autem reuoluti, quemadmodum alterius magnitudo ad magnitudinem ſe habet alterius, ſic & illorum ad ſe inuicem fiunt lineæ. Præterea vno etiam & eodem vtriſq; exiſtente centro, aliquãdo quidem tanta fit linea, quam conuoluuntur, quantam minor per ſe conuoluitur circulus, quandoq; vero quantam maior. Quòd quidem igitur maiorem conuoluitur maior, manifeſtum eſt. Angulus enim ſenſu videtur eſſe cuiuſq; circunferẽtia propriæ diametri, maioris circuli maior, minoris minor: quamobrem eandem habebũt proportionem ſecundùm ſenſum ad ſe lineæ, ſecũdùm quas fuerint conuoluti. Verumenimvero quod etiã æqualem conuoluuntur, quando circa idem fuerint poſiti centrum, manifeſtum eſt: & ſic fiunt aliquando quidem æquales lineæ, ſecundùm quam maior conuoluitur circulus, aliquando vero ſecundùm quam minor. Sit enim circulus maior quidem vbi D F G, minor vero vbi E G B, vtriſque autem centrum A. Et quam quidem per ſe magnus conuoluitur, ſit vbi F I, quam vero per ſe minor, vbi G K, æqualis A F. Si igitur minorem mouero, idem mouens centrum, vbi maior autem ſit annexus: quando igitur A B fuerit recta ad ipſam G K, ſimul & A C fit recta ad ipſam F I: quamobrem æqualem ſemper tranſlata erit, ipſam quidam G K, vbi eſt G B circunferentia: ipſam vero F L, quæ eſt vbi F C. Si autem quarta pars æqualem conuoluitur, manifeſtum eſt quòd totus circulus toti circulo æqualem conuoluetur. Quare quando B G linea ad ipſum peruenerit K, & ipſa F C circunferentia erit in ipſa C L, & vniuerſus erit conuolutus circulus. Similique modo ſi magnum mouero, illi paruum annectens, eodem exiſtente centro: ſimul cum A C ipſa A B perpendiculum, & recta erit: hæc quidem ad ipſam F I:

A ἡ μὲν διάμετρος ἡ ἐλάττων γίνεται, ἡ δὲ βγ μείζων, [ἡ δὲ πλευρὰ τῆς βγ ἐλάττων] ἄτοπον γάρ, ὥσπερ ἐλέχθη, τὸ δύο φορὰς φερόμενον ἐνίοτε βραδύτερον φέρεσθαι τοῦ μιᾶς, καὶ ἀμφοτέρων ἰσοταχῶν σημείων δοθέντων, μείζω διεξιέναι θάτερον. αἴτιον δέ, ὅτι τοῦ μὲν ἀπὸ τῆς ἀμβλείας φερομένου σχεδὸν ἐναντίαι ἀμφότεραι γίνονται, ἥν τε αὐτὸ φέρεται, καὶ ἣν ἀπὸ τῆς πλευρᾶς ὑποφέρεται. τοῦ δὲ ἀπὸ τῆς ὀξείας, ὥσπερ συμβαίνει φέρεσθαι ἐπὶ τὸ αὐτό. συνεπουρίζει γὰρ ἡ τῆς πλευρᾶς, τὴν ἐπὶ τῆς διαμέτρου· καὶ ὅσῳ ἂν τὴν μὲν ὀξυτέραν ποιήσῃ, τὴν δὲ ἀμβλυτέραν, ἡ μὲν βραδυτέρα ἔσται, ἡ δὲ θάττων. αἱ μὲν γὰρ ἐναντιώτεραι γίνονται, διὰ τὸ ἀμβλυτέραν γίνεσθαι
B τὴν γωνίαν· αἱ δὲ μᾶλλον ἐπὶ τὰ αὐτά, διὰ τὸ συνάγεσθαι τὰς γραμμάς. τὸ μὲν γὰρ β, σχεδὸν ἐπὶ τὸ αὐτὸ φέρεται κατ' ἀμφοτέρας τὰς φοράς. συνεπουρίζεται δὴ ἡ ἑτέρα, καὶ ὅσῳ ἂν ὀξυτέρα γίνηται ἡ γωνία, τοσούτῳ μᾶλλον· τὸ δὲ α, ἐπὶ τοὐναντίον. αὐτὸ μὲν γὰρ πρὸς τὸ β φέρεται· ἡ δὲ πλευρὰ, ὑποφέρει αὐτὸ πρὸς τὸ δ· καὶ ὅσῳ ἂν ἀμβλυτέρα ἡ γωνία ᾖ, ἐναντιώτεραι αἱ φοραὶ γίνονται. εὐθυτέρα γὰρ ἡ γραμμὴ γίνεται. εἰ δὴ ὅλως εὐθεῖα γένοιτο, παντελῶς ἂν εἶεν ἐναντίαι. ἡ δὲ πλευρὰ ὑπ' οὐθενὸς κωλύεται μίαν φερομένη φοράν. εὐλόγως
C οὖν τὴν μείζω διέρχεται.

ΚΕΦΑΛ. κε'.

Ἀπορεῖται διὰ τί ποτε ὁ μείζων κύκλος τῷ ἐλάττονι κύκλῳ ἴσην ἐξελίττεται γραμμήν, ὅταν περὶ τὸ αὐτὸ κέντρον τεθῶσι· χωρὶς δὲ ἐκκυλιόμενοι, ὥσπερ τὸ μέγεθος αὐτῶν πρὸς τὸ μέγεθος ἔχει, οὕτως καὶ αἱ γραμμαὶ αὐτῶν γίνονται πρὸς ἀλλήλας. ἔτι δὲ ἑνὸς καὶ τοῦ αὐτοῦ κέντρου ὄντος ἀμφοῖν, ὁτὲ μὲν τηλικαύτη γίνεται ἡ γραμμή, ἣν ἐκκυλίονται, ἡλίκην ὁ ἐλάττων κύκλος καθ' αὑτὸν ἐκκυλίεται· ὁτὲ δέ, ὅσην ὁ μείζων. ὅτι μὲν οὖν μείζω ἐκκυλίεται ὁ μείζων, φανερόν. γωνία μὲν γὰρ δοκεῖ κατὰ τὴν αἴσθησιν εἶναι ἡ περιφέρεια ἑκάστου τῆς οἰκείας δια-
D μέτρου, ἡ τοῦ μείζονος κύκλου μείζων, [ἡ δὲ τοῦ ἐλάττονος ἐλάττων.] ὥστε τὸν αὐτὸν τοῦτον ἕξουσι λόγον, καθ' ἃς ἐξεκυλίσθησαν αἱ γραμμαὶ πρὸς ἀλλήλας κατὰ τὴν αἴσθησιν. ἀλλὰ μὴν καὶ ὅτι τὴν ἴσην ἐκκυλίονται, ὅταν περὶ τὸ αὐτὸ κέντρον κείμενοι ὦσι, δῆλον· καὶ οὕτως γίνεται, ὁτὲ μὲν ἴση τῇ γραμμῇ, ἣν ὁ μείζων κύκλος ἐκκυλίεται, ὁτὲ δέ, ἐλάττων. ἔστω γὰρ κύκλος, ὁ μείζων μέν, ἐφ' οὗ τὰ δζγ· ὁ δὲ ἐλάττων, ἐφ' οὗ τὰ εηβ· κέντρον δὲ ἀμφοῖν, τὸ α· καὶ ἣν μὲν ἐξελίττεται καθ' αὑτὸν ὁ μέγας, ἡ ἐφ' ἧς ζι. ἔστω· ἣν δὲ ὁ ἐλάττων καθ' αὑτόν, ἡ ἐφ' ἧς ηκ, ἴση τῇ αζ. ἐὰν δὴ κινῶ τὸν ἐλάττονα, τὸ αὐτὸ κέντρον κινῶ, ἐφ' οὗ τὸ α, ὁ δὲ μέγας προσηρμόσθω. ὅταν οὖν ἡ αβ ὀρθὴ γένηται πρὸς τὴν ηκ, ἅμα καὶ ἡ αγ γίνεται ὀρθὴ πρὸς τὴν ζλ.
E ὥστε ἔσται ἴσην ἀεὶ διεληλυθυῖα· τὴν μὲν ηκ, ἐφ' ᾧ ἡ β περιφέρεια, τὴν δὲ ζλ, ἡ ἐφ' ἧς ζγ. εἰ δὲ τὸ τέταρτον μέρος ἴσην ἐξελίττεται, δῆλον ὅτι καὶ ὁ ὅλος κύκλος τῷ ὅλῳ κύκλῳ ἴσην ἐξελιχθήσεται. ὥστε ὅταν ἡ βη γραμμὴ ἔλθῃ ἐπὶ τὸ κ, καὶ ἡ ζγ, ἔσται περιφέρεια ἐπὶ τῆς ζλ, καὶ ὁ κύκλος ὅλος ἐξειλιγμένος. ὁμοίως δὲ καὶ ἐὰν τὸν μέγαν κινῶ, ἐναρμόσας τὸν μικρόν, τοῦ αὐτοῦ κέντρου ὄντος, ἅμα τῇ αγ ἡ αβ κάθετος καὶ ὀρθὴ ἔσται· ἡ μὲν πρὸς τὴν ζι,

ἡ δὲ πρὸς τὴν ηθ. ὥστε ὅταν ἴσην, ἡ μὲν τὴν ηθ ἔσται διεληλυθυῖα, ἡ δὲ τὴν ζι, καὶ γένηται ὀρθὴ πάλιν ἡ ζα πρὸς τὴν ζλ, καὶ ἡ αγ ὀρθὴ πάλιν, ὡς τὸ ἐξ ἀρχῆς ἔσονται ἐπὶ τῶν θι. τὸ δὲ μήτε στάσεως γινομένης * τὸ μείζονος τῷ ἐλάττονι, ὥστε μένειν τινὰ χρόνον ἐπὶ τοῦ αὐτοῦ σημείου. κινοῦνται γὰρ συνεχῶς ἄμφω. ἀμφοτεράκις μὲν ὑπερπηδῶντος τοῦ ἐλάττονος μηδὲν σημεῖον, τὸν μὲν μείζω τῷ ἐλάττονι ἴσην διεξιέναι, τὸν δὲ τῷ μείζονι, ἄτοπον. ἔτι δὲ * μιᾶς κινήσεως οὔσης, ἀεὶ τὸ κέντρον τὸ κινούμενον ὁτὲ μὲν τὴν μεγάλην, ὁτὲ δὲ τὴν ἐλάττονα ἐκκυλίεσθαι θαυμαστόν. τὸ γὰρ αὐτὸ τῷ αὐτῷ τάχει φερόμενον, ἴσην πέφυκε διεξιέναι. τῷ αὐτῷ δὲ τάχει, ἴσην ἐστὶ κινεῖν ἀμφοτεράκις. ἀρχὴ δὲ ληπτέα ἥδε περὶ τῆς αἰτίας αὐτῶν, ὅτι ἡ αὐτὴ δύναμις καὶ ἴση, τὸ μὲν βραδύτερον κινεῖ μέγεθος, τὸ δὲ ταχύτερον. Εἰ δή τι εἴη ὃ μὴ πέφυκεν ὑφ' ἑαυτοῦ κινεῖσθαι, ἐὰν τοῦτο ἅμα καὶ αὐτὸ κινῇ τὸ πεφυκὸς κινεῖσθαι, βραδύτερον κινηθήσεται, ἢ εἰ * αὐτὴ καθ' αὑτὴν ἐκινεῖτο· καὶ ἐὰν μὲν πεφυκὸς ᾖ κινεῖσθαι, μὴ συγκινεῖται δὲ μηδὲν, ὡσαύτως ἕξει. καὶ ἀδύνατον δὲ κινεῖσθαι πλέον ἢ τὸ κινοῦν. οὐ γὰρ * τὴν αὐτοῦ κινεῖται κίνησιν, ἀλλὰ τὴν τοῦ κινοῦντος. εἴη δὴ κύκλος, ὁ μὲν μείζων, τὸ α· ὁ δὲ ἐλάττων, ἐφ' ᾧ β. Εἰ ὠθοίη δ' ὁ ἐλάττων τὸν μείζω, μὴ κυλιομένου αὐτοῦ, φανερὸν ὅτι τοσοῦτον δίεισι τῆς εὐθείας ὁ μείζων, ὅσον ἐώσθη ὑπὸ τοῦ ἐλάττονος. τοσοῦτον δέ γε ἐώσθη, ὅσον ὁ μικρὸς ἐκινήθη. ἴσην ἄρα * τῆς εὐθείας διεληλύθασιν. ἀνάγκη τοίνυν, καὶ εἰ κυλιόμενος ὁ ἐλάττων τὸν μείζω ὠθοίη, κυλισθῆναι μὲν ἅμα τῇ ὤσει τοσοῦτον, ὅσον ὁ ἐλάττων ἐκυλίσθη, ἢ μηδὲν αὐτὸς * τῇ αὐτῇ κινήσει κινῆται. ὡς γὰρ καὶ ὅσον ἐκίνει, τοσοῦτον κεκινῆσθαι ἀνάγκη τὸ κινούμενον ὑπ' ἐκείνου. ἀλλὰ μὴν ὅ,τε κύκλος τοσοῦτον ἐκίνησε τὸ αὐτὸ, κύκλῳ τε καὶ ποδιαίαν (ἔστω γὰρ τοσοῦτον ὃ ἐκινήθη) καὶ ὁ μέγας ἄρα τοσοῦτον ἐκινήθη. ὁμοίως δὲ κἂν ὁ μέγας τὸν μικρὸν κινήσῃ, ἔσται κεκινημένος ὁ μικρὸς, ὡς καὶ ὁ μείζων. καθ' αὑτὸν μὲν δὴ κινηθεὶς ὁποτεροσοῦν, ἐάν τε ταχὺ, ἐάν τε βραδέως· τῷ αὐτῷ δὲ τάχει εὐθὺς ἴσην ὁ μείζων πέφυκεν ἐξελιχθῆναι γραμμήν. ὅπερ καὶ ποιεῖ τὴν ἀπορίαν· ὅτι οὐκ ἔτι ὁμοίως ποιοῦσιν ὅταν συναρμοσθῶσιν. τὸ δ' ἐστὶν εἰ ὁ ἕτερος ὑπὸ τοῦ ἑτέρου κινεῖται, οὐχ ἣν πέφυκεν, οὐδὲ τὴν αὐτοῦ κίνησιν. οὐδὲν γὰρ διαφέρει περιθεῖναι καὶ ἐναρμόσαι, ἢ προσθεῖναι ὁποτερονοῦν ὁποτέρῳ. ὁμοίως γὰρ ὅταν ὁ μὲν κινῇ, ὁ δὲ κινεῖται ὑπὸ τούτου· ὅσον ἂν κινῇ ἅτερος, τοσοῦτον κινηθήσεται ἅτερος. ὅταν μὲν οὖν προσκείμενον κινῇ, ἢ προσκρεμάμενον, οὐκ ἀεὶ κυλίει τις. ὅταν δὲ περὶ τὸ αὐτὸ κέντρον τεθῶσιν, ἀνάγκη κυλίεσθαι ἀεὶ τὸν ἕτερον ὑπὸ τοῦ ἑτέρου. ἀλλ' οὐδὲν ἧττον οὐ * τὴν αὐτοῦ κίνησιν ἅτερος κινεῖται, ἀλλ' ὥσπερ ἂν εἰ μηδεμίαν εἶχε κίνησιν· κἂν ἔχῃ, μὴ χρῆται δ' αὐτῇ, ταὐτὸ συμβαίνει. ὅταν μὲν οὖν ὁ μέγας κινῇ ἐνδεδεμένον τὸν μικρὸν, ὁ μικρὸς κινεῖται ὅσην περ οὗτος· ὅταν δὲ ὁ μικρὸς, πάλιν ὁ μέγας ὅσην οὗτος. χωριζόμενος δὲ, ἑκάτερος αὐτὸν κινεῖ αὐτός. ὅτι δὲ τοῦ αὐτοῦ κέντρου ὄντος καὶ κινοῦντος τῷ αὐτῷ τάχει, συμβαίνει ἄνισον διεξιέναι αὐτοὺς γραμμὴν, παραλογίζεται ὁ ἀπορῶν σοφιστικῶς. τὸ αὐτὸ μὲν γάρ ἐστι κέντρον ἀμφοῖν, ἀλλὰ κατὰ συμβεβηκὸς, ὡς μουσικὸν καὶ λευκόν.

* Leon. τῷ μείζονι
* Leon. μιᾶς κινήσεως αὐτ.
* Leon. αὐτὴ καθ' αὑτήν.
* Leon. τὴν αὑτοῦ
* Qu. τὴν εὐθεῖαν
* Leon. τῇ αὑτοῦ κιν.
* Leon. τὴν αὑτοῦ κ.

A illa verò ad G M. Quamobrem quando hæc quidem æqualem ipſi G M pertranſiuerit, illa verò ipſi F I, & rurſum facta fuerit recta ipſa F A ad ipſam F L, & ipſa A B rurſum recta, velut à principio erunt in ipſis M I. Hoc autem neque aliqua intercedente mora maioris ad minorem, vt ſcilicet per aliquod temporis ſpatium ſtaret in eodem puncto, neque tranſiliente minore aliquod punctum, maiorem quidem æqualem minori pertranſire, hunc autem maiori, abſurdum eſt. Præterea vnica etiam ſemper exiſtente motione, centrum motum interdum quidem magnam, nonnunquam verò minorem conuerti, admirandum eſt. Idem enim celeritate eadem latum æqualem natum hoc eſt pertranſire: eadem autem celeritate vtro-
B que modo æqualem licet mouere. Principium autem ſumendum eſt circa iſtorum cauſam, quòd eadem potentia & æqualis hanc quidem tardiùs mouet magnitudinē, illam verò celeriùs. Si enim fuerit quippiam, quod à ſe ipſo moueri natum non ſit, ſi ſimul & illud mouerit, quod natum eſt moueri, tardiùs mouebitur quàm ſi ipſum per ſe moueretur. Et ſi quidem natum fuerit moueri, non ſimul autem moueatur, ſimiliter ſe habebit. Et impoſſibile certè eſt, plus moueri, quàm mouens: non enim ſuam ipſius mouetur motionem. Sit igitur circulus maior vbi A, minor autem vbi B: ſi minor maiorem impellet non reuolutum ex ſe, manifeſtum eſt quòd tantum ipſius rectæ maior pertran-
C ſit, quantū eſt impulſus, quantū paruus eſt motus: æqualem igitur ipſius rectæ pertranſiuerunt. Neceſſe igitur eſt ſi reuolutus minor maiorem impellet, reuolui ſimul cum impulſione: tantum autem, quantū minor reuolutus eſt, ſi nihil ipſe ſui ipſius motione mouetur. Quomodo enim, & quantum mouit, tantum motum eſſe neceſſe eſt, quod mouetur ab illo. Sed profectò paruus circulus tantum ſeipſum circulariter mouit, quantum eſt pedalis quantitas (tantum enim ſit id, quod motus eſt) magnus igitur tantum motus erit. Similique modo ſi magnus paruum mouebit, motus erit paruus, quemadmodum maior. Per ſe autem motus illorum vtrumlibet, ſiue celeriter, ſeu tardè eadem
D velocitate, ſtatim quantum maior natus eſt circumferri lineam: quod difficultatem facit, quod non ſimiliter faciunt quādo fuerint connexi. Hoc autem eſt, ſi alter ab altero moueatur, non quam natus eſt, neque peculiarem motionem. Nihil enim refert circumponere, & annectere, aut coniungere vtrumlibet alteri. Similiter enim quando hic quidē mouet, ille verò mouetur ab iſto: quantum vtique mouerit alter, tantum alter mouebitur. Quando quidem igitur adiacens mouerit, aut propenſus, non ſemper conuoluitur: quando verò circa idem poſiti fuerint centrum, alterum ab altero ſemper conuolui neceſſe eſt. Sed nihilominus non ſuam ipſius motionem mouetur alter, ſed velut nullam haberet motionem: & ſi habuerit,
E illa autem non vtatur, tantundem accidit. Quando quidem igitur magnus mouerit ſibi alligatum paruum, paruus mouetur quantum ille: quando autem paruus, rurſus magnus quantum iſte: ſeparatus autem vterque ſe ipſum mouet. Quòd autem eodem exiſtente centro, & mouente eadem velocitate, accidit inæqualem illos pertranſire lineam, paralogiſmo ſophiſticè vtitur is qui dubitat. Idem enim ambobus eſt centrum, verùm per accidens, velut muſicum & album.

Eſſe enim vtriuſque circuli centro non eodem A vtitur. Quandoquidem igitur mouens fuerit paruus, vt illius centrum & principium: quando verò magnus, vt illius. Non igitur idem ſimpliciter mouet, ſed eſt quo modo.

CAPVT XXVI.

CVr lectulorum ſpondas ſecundùm duplam faciunt proportionem, hanc quidem ſex pedum, vel pauló ampliorem, illam verò trium? Curve non ſecundùm diametrum illos reſtibus extendunt? An tantos quidem magnitudine faciunt, vt corporibus ſint proportionem habentes? fiunt enim ſic ſecundùm ſpondas dupli, lon- B gitudine quidem cubitorum quatuor: latitudine verò duorum: Extendunt autem illos non ſecundùm diametrum, ſed ex oppoſito, vt & ligna minùs diſtrahantur. Celerrimè enim ſcinduntur ſecundùm naturam diuiſa, & eodem modo diſtenta laborant maximè. Amplius, quoniam opus eſt vt reſtes pondus ferre poſſint, ſi certè pondere impoſito, minùs laborabunt, ſi tranſuerſim, quàm ſi obliquè, extendantur. Præterea hoc etiam modo minùs abſumitur reſtium. Sit enim lectulus AFGK, & bifariam diuidatur ipſa FG ſecundùm B: æqualia certè foramina ſunt in ipſa FB, & in ipſa C FA: latera enim ſunt æqualia: nam totum FG duplum eſt. Extendunt autem, vt deſcriptum eſt, ab ipſo A ad ipſum B: ita vbi eſt C, ita eſt D, ita vbi H, poſtea vbi E, & eodem ſemper modo, donec ad angulum peruenerint alium. Duo enim anguli reſtis habent capita. Æquales autem ſunt reſtes ſecundùm curuaturas, videlicet AB & BC, ipſis CD & DH: & aliæ ſimili ſe habent modo, quoniam eadem demonſtratio: ipſa enim AB æqualis eſt ipſi HE: æqualia enim ſunt latera ſpatij BG, MA, & foramina æquè diſtant. Ipſa autem BC æqualis eſt ipſi MA. Angulus enim B æqualis eſt angulo C. In æqualibus enim hic quidem intus, ille verò extra: & B quidem eſt ſemirectus. Eſt enim FB æqualis FA. Et angulus vbi F, re- D ctus eſt: B autem angulus æqualis ei, vbi eſt G: quoniam quadratum altera parte longius, duplum eſt: & ad mediū eſt curuatura: quamobrem AD ipſi EC eſt æqualis, huic verò ipſa HM. Similique modo demonſtrantur aliæ, quoniam æquales ſunt duæ, quæ ſecundùm curuaturas ſunt, duabus. Quare manifeſtum eſt quòd tot ſunt reſtes in lectulo, quot ſunt quatuor, ſicut AB. Quanta autem foraminum eſt multitudo in ipſo FG latere, & in eius dimidio FB eſt medietas. Quamobrem in dimidiato lectulo tantæ reſtium magnitudines erunt, quantum eſt AB: multitudine verò tot, quot in BG ſunt foramina. Hoc autem nihil refert dicere, quàm quot ſunt in ipſis AF & BF ſimul ſumptis. Si autem ſecundùm diame- E trum extendantur reſtes, quemadmodum ſe habet in lectulo FBCD: dimidia non tot ſunt, quot amborum latera FA, FG, æqualia autem quot in ipſis FB, FA, ſunt foramina. Maiores autem ſunt ipſæ AF, BF, duæ exiſtentes, quàm AB. Quare reſtis in tantum maior, quantum ambo latera diametro ſunt maiora.

A τὸ γὰρ ἔστιν ἑκατέρου κέντρου τῶν κύκλων, οὐ τῷ αὐτῷ χρῆται. ὅταν μὲν οὖν ὁ κινῶν ᾖ ὁ μικρός, ὡς ἐκείνου κέντρου καὶ ἀρχή. ὅταν δὲ ὁ μέγας, ὡς ἐκείνου. οὐχ ἁπλῶς τὸ αὐτὸ κινεῖ ἁπλῶς, ἀλλ' ἔστιν ὡς.

ΚΕΦΑΛ. κϛʹ.

ΔΙὰ τί τὰς κλίνας ποιοῦσι διπλασιοπλεύρους, τὴν μὲν, ἓξ ποδῶν καὶ μικρῷ μείζω πλευρὰς, τὴν δὲ, τριῶν; καὶ διὰ τί ἐντείνουσιν οὐ κατὰ διάμετρον; ἢ τὸ μὲν μέγεθος τηλικαύτας, ὅπως τοῖς σώμασιν ὦσιν σύμμετροι; γίνονται γὰρ οὕτω διπλασιόπλευροι· τετραπήχεις μὲν B τὸ μῆκος, διπήχεις δὲ τὸ πλάτος. ἐντείνουσι δὲ οὐ κατὰ διάμετρον, ἀλλ' ἀπ' ἐναντίας, ὅπως τά τε ξύλα ἧττον διασπᾶται. τάχιστα γὰρ σχίζεται κατὰ φύσιν διαιρούμενα ταύτῃ, καὶ ἑλκόμενα πονεῖ μάλιστα. ἔτι, ἐπεὶ δεῖ βάρος δύνασθαι τὰ σπαρτία φέρειν, οὕτως ἧττον πονέσει λοξοῖς τοῖς σπαρτίοις ἐπιτιθεμένου τοῦ βάρους, ἢ πλαγίοις. ἔτι δὲ ἔλαττον οὕτως σπαρτίον ἀναλίσκεται. ἔστω γὰρ κλίνη ἡ αζκι, καὶ δίχα διῃρήσθω ἡ ζη κατὰ τὸ β. ἴσα δὴ τρυπήματά ἐστιν ἐν τῷ ζβ, καὶ ἐν τῷ ζα. καὶ γὰρ αἱ πλευραὶ ἴσαι εἰσίν· ἡ γὰρ ὅλη ζη, διπλασία ἐστίν. ἐντεί- C νουσι δὴ ὡς γέγραπται, ἀπὸ τοῦ α ἐπὶ τὸ β· εἶτα οὗ τὸ γ, εἶτα οὗ τὸ δ, εἶτα οὗ τὸ θ, εἶτα οὗ τὸ ε. καὶ οὕτως ἀεὶ, ἕως ἂν εἰς γωνίαν καταστρέψωσιν ἄλλην. δύο γὰρ ἔχουσι γωνίας τὰς ἀρχὰς τοῦ σπαρτίου. ἴσα δέ ἐστι τὰ σπαρτία κατὰ τὰς καμπὰς, τό, τε αβ, καὶ βγ, τῷ γδ καὶ δθ. καὶ τὰ ἄλλα δὲ τὰ τοιαῦτα ἐστιν, ὅτι οὕτως ἔχει ἡ αὐτὴ ἀπόδειξις. ἡ μὲν γὰρ αβ, τῇ εθ ἴση. ἴσαι γάρ εἰσιν αἱ πλευραὶ τοῦ βη, κα χωρίου, καὶ τὰ τρυπήματα ἴσα διέστηκεν. ἡ δὲ βη, ἴση τῇ κα. ἡ γὰρ β γωνία, ἴση τῇ η. ἐν ἴσοις γὰρ ἡ μὲν ἐκτὸς, ἡ δὲ ἐντός· καὶ ἡ μὲν ϐ ἐστιν ἡμίσεια ὀρθῆς· ἡ γὰρ ζϐ, ἴση τῇ ζα· καὶ γωνία δὲ ἡ κατὰ τὸ ζ, ὀρθή. ἡ δὲ ϐ γωνία, ἴση τῇ κατὰ τὸ η. ἡ γὰρ κατὰ D τὸ ζ, ὀρθὴ, ἐπεὶ διπλασιόπλευρον τὸ ἑτερόμηκες καὶ κατὰ μέσον κέκλασται. ὥστε ἡ αγ τῇ εη ἴση· ταύτῃ δὲ, ἡ κθ. [παράλληλος γάρ. ὥστε ἡ ϐγ, ἴση τῇ κθ· ἡ δὲ γε, τῇ δθ.] ὁμοίως δὲ καὶ αἱ ἄλλαι δείκνυνται, ὅτι ἴσαι εἰσὶν αἱ κατὰ τὰς καμπὰς δύο ταῖς δυσίν. ὥστε δῆλον ὅτι τὰ τηλικαῦτα σπαρτία ὅσον τὸ αϐ τέτταρα, τοσαῦτ' ἔνεστιν ἐν τῇ κλίνῃ· ὅσον δὴ ἐστὶ τὸ πλῆθος τῶν ἐν τῇ ζη πλευρᾷ τρυπημάτων, καὶ ἐν τῷ ἡμίσει τῷ ζϐ τὰ ἡμίση. ὥστε ἐν τῇ ἡμισείᾳ κλίνῃ, τηλικαῦτα μεγέθη σπαρτίων ἐστὶν, ὅσον τῷ ϐα ἔνεστι· τοσαῦτα δὲ τὸ πλῆθος, ὅσαπερ ἐν τῷ ϐη τρυπήματα. ταῦτα δὲ οὐδὲν διαφέρει λέγειν, ἢ ὅσα ἐν τῇ αζ καὶ ϐζ τὰ συνάμφω. εἰ δὲ κατὰ διάμετρον ἐνταθῇ τὰ σπαρτία, ὡς E ἐν τῇ αϐγδ κλίνῃ ἔχει, τὰ ἡμίσεα εἰσὶν οὐ τοσαῦτα, ὅσα αἱ πλευραὶ ἀμφοῖν, αἱ αζ, ζη· τὰ ἴσα δὲ, ὅσα ἐν τῷ ζϐ, ζα, τρυπήματα ἔνεστι. μείζονες δέ εἰσιν αἱ αζ, ϐζ, δύο οὖσαι, τῆς αϐ. ὥστε καὶ τὸ σπαρτίον μεῖζον τοσούτῳ, ὅσον αἱ πλευραὶ ἄμφω μείζους εἰσὶ τῆς διαμέτρου.

A

ΚΕΦΑΛ. κζ.

Διὰ τί χαλεπώτερον τὰ μακρὰ ξύλα * ἀπὸ μακροῦ φέρειν ἐπὶ τοῦ ὤμου, ἢ κατὰ τὸ μέσον, ἴσου τοῦ βάρους ὄντος; πότερον ὅτι σαλευομένου τοῦ ξύλου, τὸ ἄκρον κωλύει φέρειν; μᾶλλον ἀντισπῶν τῇ σαλεύσει τὴν φοράν; ἢ κἂν μηδὲν κάμπτηται, μηδ' ἔχῃ πολὺ μῆκος, ὅμως χαλεπώτερον φέρειν ἀπ' ἄκρου, ἀλλ' ὅτι καὶ * ῥᾷον αἴρεται ἀπ' ἄκρου ἐκ μέσου, διὰ τὸ αὐτὸ καὶ φέρειν ῥᾷδιον. αἴτιον δὲ, ὅτι ἐκ μέσου μὲν αἰρόμενον ἀεὶ ἐπικουφίζει ἄλληλα τὰ ἄκρα, καὶ θάτερον μέρος τὸ ἐπὶ θάτερον ἄνω αἴρει. ὥσπερ γὰρ κέντρον γίνεται τὸ μέσον, ἢ ἔχει * τὸ αἶρον ἢ φέρον. εἰς τὸ ἄνω οὖν κουφίζεται ἑκάτερον τῶν ἄκρων εἰς τὸ κάτω ῥέπον· ἀπὸ δὲ τοῦ ἄκρου αἰρόμενον ἢ φερόμενον, οὐ ποιεῖ τοῦτο, ἀλλ' ἅπαν τὸ βάρος ῥέπει ἐφ' ἓν μέρος, εἰς ὅπερ αἴρεται ἢ φέρεται. [ἔστω μέσον,] ἐφ' οὗ α, ἄκρα β γ. αἰρομένου οὖν ἢ φερομένου κατὰ τὸ α, τὸ μὲν β κάτω ῥέπον, ἄνω αἴρει τὸ γ· τὸ δὲ γ κάτω ῥέπον, τὸ β ἄνω αἴρει· ἅμα δὲ αἰρόμενα, ἄνω ποιεῖ ταῦτα.

* Leon. ἐπ' ἄκρου.

* Leon ῥᾷον αἴρεται ἐκ μέσου ἢ ἀπ' ἄκρου. διὸ καὶ ταύτῃ φέρειν ῥᾴδιον.

* Leon. ἐπαῖρον ἢ φέρον

CAPVT XXVII.

CVr difficilius eſt longa ligna ab extremo ſuper humeros ferre, quàm ſecundùm medium, æquali exiſtente pondere? An quia vibrato ligno ipſum extremum prohibet ferre, vibratione magis retrahens lationem? An quoniam licèt nihil inflectatur, neque multam habeat longitudinem, difficilius tamen ad ferendum eſt ab extremo, quoniam faciliùs ex medio eleuatur, quàm ab extremo, & ideo ſic ferre eſt facilius. Cauſa autem, quoniam ſecundùm medium quidem eleuato ligno ſemper ſeſe inuicem ſuſpendunt extrema, & altera pars alteram bene ſubleuat. B Medium enim velut centrum fit, vbi habet is, qui eleuat, aut fert. Extremorum igitur vtrunque deorſum vergens, ſurſum ſuſpenditur. Quod ſi ab extremo eleuetur, aut feratur, non ſanè facit: ſed vniuerſum pondus ad vnum vergit medium quo eleuatur, aut fertur. Sit medium vbi A, extrema B, C. Eleuato igitur aut portato ſecundùm A, ipſum quidem B deorſum nutans, ſurſum eleuat C: ipſum autem C deorſum nutans, B ſurſum eleuat: ambo autem ſurſum eleuata hoc faciunt.

ΚΕΦΑΛ. κη.

Διὰ τί, ἐὰν ᾖ λίαν μακρὸν τὸ αὐτὸ βάρος, χαλεπώτερον φέρειν ἐπὶ τοῦ ὤμου, κἂν μέσον φέρῃ τις, ἢ ἐὰν ἔλαττον ᾖ; πάλαι ἐλέχθη, ὡς οὐκ ἔστιν αἴτιον ἡ σάλευσις, ἀλλ' ἡ σάλευσις νῦν αἴτιόν ἐστιν. ὅταν γὰρ ᾖ μακρότερον, τὰ ἄκρα σαλεύεται. ὥστε εἴη καὶ τὸν φέροντα χαλεπώτερον φέρειν μᾶλλον. αἴτιον δὲ τοῦ σαλεύεσθαι μᾶλλον, ὅτι τῆς αὐτῆς κινήσεως οὔσης, μεθίσταται τὰ ἄκρα, ὅσῳπερ ἂν ᾖ μακρότερον τὸ ξύλον. ὁ μὲν γὰρ ὦμος, κέντρον, ἐφ' οὗ τὸ α· μένει γὰρ τοῦτο· αἱ δὲ α β, καὶ α γ, αἱ ἐκ τοῦ κέντρου. ὅσῳ δ' ἂν ᾖ μεῖζον τὸ ἐκ τοῦ κέντρου, ἢ τὸ α β, ἢ καὶ τὸ α γ, πλέον μεθίσταται μεγέθος. δέδεικται δὲ τοῦτο πρότερον.

CAPVT XXVIII.

C CVr ſi valde procerum fuerit idem pondus, difficiliùs ſuper humeros geſtatur, etiam ſi medium quiſpiam illud ferat, quàm ſi breuius ſit? Quod enim dudum dictũ eſt, vibratio cauſa non eſt, ſed vibratio nũc eſt cauſa. Quando enim productius fuerit, vibrantur extrema: quamobrem contingit portantem difficiliùs geſtare. Vibrationis autem cauſa eſt, quoniam ab eadem motione magis transferuntur extrema, quantò procerius fuerit lignum. Humerus quidem ſit centrum vbi A, manet enim is; ipſæ autem A B, A C, quæ ſunt ex centro: quanto autem maius fuerit id quod ex centro eſt, ſiue A B, ſeu A C, plus transfertur ſpatij. Demonſtratum autem eſt hoc priùs.

D

ΚΕΦΑΛ. κθ.

Διὰ τί ἐπὶ τοῖς φρέασι τὰ κηλώνεια ποιοῦσι τοῦτον τὸν τρόπον; προστιθέασι γὰρ βάρος ἐν τῷ ξύλῳ τὸν μόλυβδον, ὄντος βάρους τοῦ κάδου αὐτοῦ, καὶ κενοῦ καὶ πλήρους ὄντος. ἢ ὅτι ἐν δυσὶ χρόνοις διῃρημένου τοῦ ἔργου· (βάψαι γὰρ δεῖ, καὶ τοῦτ' ἄνω ἑλκύσαι) συμβαίνει καθιέναι μὲν κενὸν ῥᾳδίως, αἴρειν δὲ πλήρη χαλεπῶς; λυσιτελεῖ οὖν μικρῷ βραδύτερον εἶναι τὸ καταγαγεῖν πρὸς τὸ πολὺ κουφίσαι τὸ βάρος ἀνάγοντι. τοῦτο οὖν ποιεῖ ἐπ' ἄκρῳ τοῦ κηλωνείου ὁ μόλυβδος προσκείμενος, ἢ ὁ λίθος. καθιέντι μὲν γὰρ, γίνεται βάρος μεῖζον, [ἢ] εἰ μόνον κενὸν δεῖ κατάγειν τὸν κάδον. ὅταν δὲ πλήρης ᾖ, ἀνάγει ὁ μόλυβδος, ἢ ὅ,τι ἂν ᾖ τὸ προσκείμενον βάρος. ὥστ' ἐστὶ * ῥᾷον αὐτῷ τὰ ἄμφω ἢ ἐκεῖνο.

* Leon ῥᾷον οὕτω τὰ ἄμφω ἢ ἐκείνως.

CAPVT XXIX.

CVr iuxta puteos celonia faciunt eo, quo vtuntur, modo? Ligno enim plumbi adiungunt pondus, cùm alioqui vas ipſum & plenum & vacuum pondus habeat. An quoniam duobus temporibus hauriendi diuiſo opere, (intingere enim oportet, & id ſurſum trahere) contingit demittere quidem vacuum facilè, trahere verò plenum difficulter? Commodum igitur eſt paulò tardiùs illud demittere, cùm multò leuius effectum ſuſtollatur pondus: id autem facit in extremo celonio adiunctum plumbum, aut lapis. Demittenti quidem maius fit pondus, quàm ſi ſolummodo vacuum oporteret dimittere: E cùm verò plenum fuerit, ſurſum id rapit plumbum, aut quicquid illi ponderis inerit. Quamobrem faciliora hoc modo ambo ſunt, quàm illo.

ΚΕΦΑΛ. λ.

Διὰ τί, ὅταν φέρωσιν ἐπὶ ξύλου, ἤ τινος τοιούτου, δύο ἄνθρωποι ἴσον βάρος, οὐχ ὁμοίως θλίβονται, ἐὰν μὴ

CAPVT XXX.

CVr quando ſuper ligno, aut huiuſmodi quopiam duo portauerint homines æquale pondus, non ſimiliter premuntur, ſi ad vnum non

declinet pondus, ſed magis quanto vicinius fuerit A
geſtantibus? An quoniam vectis quidem lignum efficitur: pondus verò hypomochlion: qui autem propior eſt ponderi ex iis qui illud geſtant, id quod mouetur: alter vero portantium, quod mouet? Quanto igitur plus diſtat à pondere, tanto facilius mouet, & alterum premit magis inferius, velvti contranitente pondere impoſito, quod hypomochlion factum eſt. Si autem in medio inerit pondus, nihilo magis alteralteri fit pondus, aut mouet: ſed eodem modo alteri alter fit pondus.

CAPVT XXXI.

B
CVr ſurgentes omnes, femori crus ad acutum conſtituentes angulum, & thoraci ſimiliter femur, ſurgunt: quod ſi non, haud quaquam ſurgere poterunt? an quia id quod æquale eſt, quietis vbique eſt cauſa: rectus autem angulus æqualitatis eſt, ſtationémque facit: quam ob rem ad ſimiles fertur angulos ipſi terræ circunferentiæ: non enim quod ad rectum eſt ipſi pauimento. An quoniam ſurgens fit rectus, ſtantem verò neceſſe eſt perpendiculum eſſe ad terram? Siquidem igitur ad rectum debet eſſe: hoc autem eſt caput ſecundùm pedes habere, & fieri oportet cùm ſurgit. Quandoquidem igitur fuerit ſedens, ſecundùm parallelum pedes habet & caput: & non in vna C
æquali. Caput ſit A, thorax AB, femur BC, crura CD. Ad rectum autem fit & thorax, vbi AB, ipſi femori, & cruri femur, ſic ſedente: quam ob rem eo ſe habentem modo ſurgere eſt impoſſibile: neceſſe autem eſt crus reclinare, pedéſque conſtituere ſub capite. Hoc autem erit, ſi CD fiet vbi CF, & ſimul ſurgere continget, & in eadem æquali habere caput & pedes. Ipſa autem CF acutum facit angulum ad ipſam BC.

CAPVT XXXII.

CVr faciliùs mouetur commotum, quàm manens: veluti currus citiùs commotos agitant, quàm moueri incipientes? An quia difficillimum eſt pondus mouere, quod in contrarium mouetur? Aufe t enim quiddam ex motoris potentia, licèt multò ſit velocior. Neceſſe nanque eſt, tardiorem eſſe impulſionem illius, quod repellitur. Secundo autem loco, ſi quieuerit: reſiſtit enim ipſum quieſcens. Quod autem mouetur, ad id ipſum, ad quod impellitur, impellenti ſimile facit, ceu ſi quiſpiam mouentis potentiam & celeritatem augeret. Quod enim ab illo pateretur, vtique ipſum facit ex ſe commotum. D

CAPVT XXXIII.

CVr ea quæ proiiciuntur, ceſſant à latione? An quia impellens deſinit potentia, vel propter E
retractionem, vel propter rei proiectæ inclinationem, quando ea valentior fuerit, quàm proiicientis vires? aut iſthæc ambigere principium relinquentes abſurdum eſt.

CAPVT XXXIV.

CVr quippiam non peculiarem ſibi fertur lationem, impulſore alioqui non conſequente? An videlicet quoniam primum id efficit, vt alterum impellat: illúdque rurſum vt alterum.

A ἐπὶ τοῦ μέσου ᾖ τὸ βάρος, ἀλλὰ μᾶλλον ὅσῳ ἂν ἐγγύτερον ᾖ τῶν φερόντων; ἢ διότι μοχλὸς μὲν γίνεται, οὕτως ἐχόντων, τὸ ξύλον· τὸ δὲ βάρος, ὑπομόχλιον· ὁ δὲ ἐγγύτερος τοῦ βάρους τῶν φερόντων τὸ βάρος, τὸ κινούμενον· ἅτερος δὲ τῶν φερόντων τὸ βάρος, ὁ κινῶν, ὅσῳ πλέον ἀπέχῃ τοῦ βάρους, τοσούτῳ ῥᾷον κινεῖ, καὶ θλίβει μᾶλλον τὸν ἕτερον εἰς τὸ κάτω, ὥσπερ ἀντερείδοντος τοῦ βάρους τοῦ ἐπικειμένου, καὶ γινομένου ὑπομοχλίου. ἐν μέσῳ δὲ ὑποκειμένου τοῦ βάρους, οὐδὲν μᾶλλον ἅτερος θατέρῳ γίνεται βάρος, οὐδὲ κινεῖ, ἀλλ' ὁμοίως ἑκάτερος ἑκατέρῳ γίνεται βάρος.

ΚΕΦΑΛ. λα'.

B
Διὰ τί οἱ ἀνιστάμενοι πάντες, πρὸς ὀξεῖαν γωνίαν τῷ μηρῷ ποιήσαντες τὴν κνήμην ἀνίστανται, καὶ τῷ θώρακι πρὸς τὸν μηρόν· εἰ δὲ μή, οὐκ ἂν δύναιντο ἀναστῆναι; πότερον ὅτι τὸ ἴσον ἠρεμίας πανταχοῦ αἴτιον· ἡ δὲ ὀρθὴ γωνία, τοῦ ἴσου, καὶ ποιεῖ στάσιν· διὸ καὶ φέρεται πρὸς ὁμοίας γωνίας * τῇ περιφερείᾳ τῆς γῆς. * οὐ γὰρ ὅτι καὶ πρὸς ὀρθὴν ἔσται τῷ ἐπιπέδῳ. ἢ ὅτι ἀνιστάμενος γίνεται ὀρθός· ἀνάγκη δὲ τὸν ἑστῶτα, κάθετον εἶναι πρὸς τὴν γῆν. εἰ οὖν μέλλει ἔσεσθαι * πρὸς ὀρθήν, τοῦτο δ' ἐστὶ τὸ τὴν κεφαλὴν ἔχειν κατὰ τοὺς πόδας, καὶ * γίνεσθαι δὴ ὅτε ἀνίσταται. ὅταν μὲν οὖν καθήμενος ᾖ, παράλληλον ἔχει τὴν κεφαλὴν καὶ τοὺς πόδας, καὶ οὐκ ἐπὶ μιᾶς εὐθείας. ἡ κεφαλὴ α ἔστω, θώραξ αβ, μηρὸς βγ, κνήμη γδ. πρὸς ὀρθὴν δὲ γίνεται, ὅ τε θώραξ ἐφ' ὧν αβ τῷ μηρῷ, καὶ ὁ μηρὸς τῇ κνήμῃ οὕτως καθημένου. ὥστε οὕτως ἔχοντα ἀδύνατον ἀναστῆναι. ἀνάγκη δὲ ἐγκλῖναι τὴν κνήμην, καὶ ποιεῖν τοὺς πόδας ὑπὸ τὴν κεφαλήν. τοῦτο δὲ ἔσται, ἐὰν ἡ γδ ἐφ' ἧς τὰ γζ γένηται καὶ ἅμα [ἀνίστηται] ἀναστῆναι συμβήσεται, καὶ ἔχει ἐπὶ τῆς αὐτῆς ἴσης τὴν κεφαλήν τε καὶ τοὺς πόδας. ἡ δὲ γζ ὀξεῖαν ποιεῖ γωνίαν πρὸς τὴν βγ. C

* Quidam, τῇ ἐπιφανείᾳ τ.
* Quidam, οὕτω γ.
* Quidam, [illegible] ὀρθὴν, vt alibi.
* Leon. γίνεται [illegible]

ΚΕΦΑΛ. λβ'.

D
Διὰ τί ῥᾷον κινεῖται τὸ κινούμενον ἢ τὸ μένον, οἷον τὰς ἁμάξας θᾶττον κινουμένας ὑπάγουσιν, ἢ ἀρχομένας; ἢ ὅτι χαλεπώτατον μὲν τὸ εἰς τοὐναντίον κινούμενον κινῆσαι βάρος; ἀφαιρεῖται γάρ τι τῆς τοῦ κινοῦντος δυνάμεως, κἂν πολὺ θᾶττον ᾖ. ἀνάγκη γὰρ βραδυτέραν γίνεσθαι τὴν ὦσιν τοῦ ἀντωθουμένου. δεύτερον δέ, ἐὰν ἠρεμῇ. ἀντιτείνει γὰρ καὶ τὸ ἠρεμοῦν. τὸ δὲ κινούμενον ἐπὶ τὸ αὐτό, τῷ ὠθοῦντι ὅμοιον ποιεῖ, ὥσπερ ἂν εἰ αὐξήσειέ τις τὴν τοῦ κινοῦντος δύναμιν καὶ ταχυτῆτα. ὃ γὰρ ὑπ' ἐκείνου ἂν ἔπασχε, τοῦτο αὐτὸ ποιεῖ εἰς τὸ πρόσω ὁδοῦ κινούμενον.

ΚΕΦΑΛ. λγ'.

E
Διὰ τί παύεται φερόμενα τὰ ῥιφέντα; πότερον ὅταν λήγῃ ἡ ἰσχὺς ἡ ἀφεῖσα, ἢ διὰ τὸ ἀντισπᾶσθαι, ἢ διὰ τὴν ῥοπήν, ἐὰν κρείττων ᾖ τῆς ἰσχύος τῆς ῥιψάσης; ἢ ἄτοπον τὸ ταῦτ' ἀπορεῖν, ἀφέντα τὴν ἀρχήν.

ΚΕΦΑΛ. λδ'.

Διὰ τί φέρεταί τι οὐ τὴν αὐτοῦ φοράν, μὴ ἀκολουθοῦντος καὶ ὠθοῦντος τοῦ ἀφέντος; ἢ δῆλον ὅτι ἐποίησε τοιοῦτον τὸ πρῶτον, ὡς θάτερον ὠθεῖν, καὶ τοῦτο ἕτερον.

παύεται δέ, ὅταν μηκέτι δύνηται ποιεῖν τὸ προωθοῦν τὸ φερόμενον, ὥστε ὠθεῖν· καὶ ὅταν τὸ τοῦ φερομένου βάρος ῥέπῃ μᾶλλον τῆς εἰς τὸ πρόσθεν δυνάμεως τοῦ ὠθοῦντος.

A Ceſſat autem quando non poteſt amplius facere primum impellens id quod fertur, vt impellat: & quando ipſius lati grauitas nutu ſuo declinat magis, quàm impellentis in ante ſit potentia.

ΚΕΦΑΛ. λε.

ΔΙὰ τί οὔτε τὰ ἐλάττονα, οὔτε τὰ μεγάλα πόρρω φέρεται ῥιπτούμενα, ἀλλὰ δεῖ συμμετρίαν τινὰ ἔχειν πρὸς τὸν ῥιπτοῦντα; πότερον ὅτι ἀνάγκη τὸ ῥιπτούμενον καὶ ὠθούμενον * ἀντερείδειν ὅθεν ὠθεῖται. τὸ δὲ μηθὲν ὑπεῖκον διὰ μέγεθος, ἢ μηδὲν ἀντερεῖσαν δι' ἀσθένειαν, οὐ ποιεῖ ῥῖψιν, οὐδὲ ὦσιν. τὸ μὲν οὖν πολὺ ὑπερβάλλον τῆς ἰσχύος τῆς ὠθούσης, οὐθὲν ὑπείκει· τὸ δὲ πολὺ ἀσθενέστερον, οὐθὲν ἀντερείδει. B ἢ ὅτι τοσοῦτον φέρεται τὸ φερόμενον, ὅσον ἂν ἀέρα κινήσῃ εἰς βάθος; τὸ δὲ μηθὲν κινούμενον, οὐδ' ἂν κινήσειεν * οὐθὲν συμβαῖνον, εἰ δὴ ἀμφότερα τούτοις ἔχειν. τό τε γὰρ σφόδρα μέγα, καὶ τὸ σφόδρα μικρόν, ὥσπερ οὐθὲν κινούμενά ἐστι. * τὸ μὲν γὰρ αὐτὸ καθ' ἓν κινεῖ, τὸ δ' οὐθὲν κινεῖται.

* Fort. ὑπεῖκον τι πρὸς ὃ ὠθεῖται & ſequentia talem aliquam lectionem poſtulare videtur.

* Leon. οὐδέν. συμβαίνει δὴ ἀμφότερα ταῦτ' ἔχειν.

* Leon. τὸ μὲν γὰρ αὐτὸ οὐθὲν κι.

CAPVT XXXV.

CVr neque parua valde, neque magna longè proiici queunt, ſed commenſurationem quandam illa habere oportet ad id quod proiicit? An quia neceſſe eſt, quod proiicitur, & impellitur, contraniti ei vnde impellitur? Quod autem magnitudine ſua nihil cedit, aut imbecillitate nihil contranititur, non efficit proiectionem, neque impulſionem. Quod enim multo impellentis excedit vires, haudquaquam cedit: quod verò multo eſt imbecillius, nihil contranititur. An quia tantum fertur id quod fertur, quantum aëris mouerit ad profundum: quod autem non mouetur, neque mouebit quippiam. Accidit autem illis ambo iſthæc habere. Valde enim magnum & valde paruum, ceu non mota exiſtunt. alterum namque nihil mouet, alterum verò nihil mouetur.

ΚΕΦΑΛ. λϛ.

ΔΙὰ τί τὰ φερόμενα ἐν τοῖς δινουμένοις ὕδασιν, εἰς τὸ μέσον τελευτῶντα φέρεται ἅπαντα; πότερον ὅτι μέγεθος ἔχει τὸ φερόμενον, ὥστε ἐν δυσὶ κύκλοις εἶναι, τῷ μὲν ἐλάττονι, τῷ δὲ μείζονι, ἑκάτερον αὐτοῦ τῶν ἄκρων. ὥστε περισπᾷ ὁ μείζων, διὰ τὸ φέρεσθαι θᾶττον, καὶ πλάγιον ἀπωθεῖ αὐτὸν [εἰς τὸν] ἐλάττω. ἐπεὶ δὲ πλάτος ἔχει τὸ φερόμενον, καὶ οὗτος πάλιν τὸ αὐτὸ ποιεῖ, καὶ ἀπωθεῖ εἰς τὸν ἐντὸς, ἕως ἂν εἰς τὸ μέσον ἔλθῃ. * καὶ τότε μένει διὰ τὸ ὁμοίως ἔχειν πρὸς ἅπαντας τοὺς κύκλους τὸ φερόμενον, διὰ τὸ μέσον. καὶ γὰρ τὸ μέσον, ἴσον ἀπέχει ἐν ἑκάστῳ τῶν κύκλων. ἢ ὅτι ὅσων μὲν μὴ κρατεῖ ἡ φορὰ τοῦ δινουμένου ὕδατος, διὰ τὸ μέγεθος, ἀλλ' ὑπερέχει τῇ βαρύτητι, τῆς τοῦ κύκλου ταχυτῆτος, ἀνάγκη ὑπολείπεσθαι καὶ βραδύτερον φέρεσθαι. D βραδύτερον δὲ ὁ ἐλάττων κύκλος φέρεται. τὸ αὐτὸ γὰρ ἐν ἴσῳ χρόνῳ ὁ μέγας τῷ μικρῷ στρέφεται κύκλῳ, ὅταν ὦσι περὶ τὸ αὐτὸ μέσον. ὥστε εἰς τὸν ἐλάττονα κύκλον ἀναγκαῖον ἀπολείπεσθαι, ἕως ἂν ἐπὶ τὸ μέσον ἔλθῃ. * ὅσων δὲ πρότερον κρατεῖ ἡ φορά, λήγουσα, ταὐτὸ ποιήσει. δεῖ γὰρ τὸν μὲν εὐθύ, τὸν δὲ ἕτερον κρατεῖν τῇ ταχυτῆτι τοῦ βάρους, ὥστε εἰς τὸν ἐντὸς ἀεὶ κύκλον ὑπολείπεσθαι τὸ πᾶν. ἀνάγκη γὰρ αὐτὸ ἐντὸς ἢ ἐκτὸς κινεῖσθαι τὸ μὴ κρατούμενον. ἐν αὐτῷ δὴ τοίνυν, ἐν ᾧ ἐστιν, ἀδύνατον φέρεσθαι τὸ μὴ κρατούμενον· ἔτι δὲ ἧττον ἐν τῷ ἐκτός. θᾶττον γὰρ ἡ φορὰ τοῦ ἐκτὸς κύκλου. λείπεται δὲ εἰς τὸν ἐντὸς τὸ μὴ κρατούμενον μεθίστασθαι. E ἀεὶ δὲ ἕκαστον ἐπιδίδωσιν εἰς τὸ μὴ κρατεῖσθαι. ἐπεὶ [δὲ] πέρας τοῦ μὴ κινεῖσθαι ποιεῖ τὸ εἰς μέσον ἐλθεῖν, μένει δὲ τὸ κέντρον μόνον, ἅπαντα ἀνάγκη εἰς τοῦτο δὴ ἀθροίζεσθαι.

* Leon. ἢ διὰ τ.

* Leon. ἔπειτα.

CAPVT XXXVI.

CVr ea quæ in vorticoſis feruntur aquis, ad medium tandem aguntur omnia? An quia magnitudinem habet quodcunque fertur: quamobrem illius extrema in duobus ſunt circulis, hoc quidem minori, illo verò maiori: quare maior diſtrahit. quoniam celeriùs fertur, & tranſuerſum impellit illud ad minorem. Quoniam autem id quod fertur, latitudinem habet, & iſte rurſus idem efficit, & ad interiorem propellit, donec ad medium perueniat. An quia quod fertur, ſimili ſe habet modo ad omnes circulos propter medium? Medium enim in vnoquoque circulo æqualiter diſtat. An quia quorum quidem circumactæ aquæ latio non ſuperior propter magnitudinem, ſed grauitate ſua circuli celeritatem excellunt, ea neceſſe eſt relinqui, & tardiùs ferri? Tardiùs autem minor circulus fertur. Non idem enim in tempore æquali magnus cum paruo reuoluitur circulus, quando circa idem fuerint medium. Quamobrem in minori circulo relinqui eſt neceſſe, donec ad medium perueniant. Quorumcunque autem ſuperior à principio fuerit latio, ea finiens idem efficiet. Oportet enim hunc quidem ſtatim, alterum verò celeritate ſuperare grauitatem: quamobrem ad interiorem ſemper circulum relinquetur quodcunque. Neceſſe enim eſt quod non ſuperatur, aut in exteriori aut in interiori moueri. In illo autem, in quo eſt, impoſſibile eſt ferri, quod non ſuperatur: adhuc verò minus in exteriori. Celerior enim exterioris circuli eſt latio. Reſtat igitur vt id quod non ſuperatur, ad interiorem transferatur. Semper autem vnumquodque proficit, vt non ſuperetur. Quoniam verò peruenire ad medium, finem quidem efficit vt quippiam moueatur, ſtat autem ſolummodo ipſum centrum, ad hoc ſanè omnia congregari neceſſe eſt.

ΕΚ ΤΟΥ ΠΕΡΙ ΑΚΟΥΣΤΩΝ,

ΑΡΙΣΤΟΤΕΛΟΥΣ.

FRAGMENTVM LIBRI ARISTOTELIS, DE IIS QVÆ SVB AVDITVM CADVNT, ſiue de audibilibus.

Adriano Turnebo interprete.

VOCES omnes oriri ſolent & ſoni, aut corporibus, aut aëre in corpora incurrente: non quòd aër ipſe figuretur, vt quidam putant, ſed quòd ſimiliter ipſe contractus & extenſus & comprehenſus cieatur: prætereaque concuſſus ob ſpiritus & chordarum ictus. Nam cùm proximum aërem ſpiritus in eum incidens percuſſit, aër iam vi impulſus fertur, hærentem proximúmque ſibi deinceps præ ſe eodem modo ita agens, vt quoquouerſum vox eadem perueniat, quoad aëris agitatio peruadit. Vis enim & impetus motionis eius longiùs latiúſque diffunditur, vt & flatus à fluminibus & aliquo tractu ſpirans. Vocum autem quædam cææ & nubilæ ſunt, quæ illico ſtrangulantur: at claræ & limpidæ longe peruadunt, omnémque continentem implent locum. Cæterùm eundem omnes aërem ducimus & reſpiramus: ſpiritum tamen & voces diuerſas edimus, ob vaſorum ſubiectorum diſparem conditionem, qua cuiuſque ſpiritus foras commeat: ea ſunt guttur, pulmones, os. Ac magnam quidem vocis diſſimilitudinem efficiunt aëris ictus & oris conformatio: quod ex eo perſpicuum eſt, quia omnes ſonorum diſſimilitudines ob hanc cauſam exiſtunt: & eoſdem videmus imitari voces equorum, ranarum, luſciniarum, gruum, & aliarum ferè omnium animantium, eodem ſpiritu & gutture vtentes, quòd diſſimiliter ore ſpiritum emittant. ſed & pleræque auium, voces aliarum cùm audierint, imitantur, ob eam cauſam quam commemorauimus. Pulmones autem cùm ſunt parui, denſi, duri, neque in ſe multum aëris recipere poſſunt, neque viciſſim foras emittere, neque vehementi validóque ictu ſpiritum ferire. Nam cùm ſint duri, denſi & colligati, in magnum dilatari ſpatium non poſſunt: nec rurſum è magno interuallo ſeipſos contrahentes, ſpiritum validè extrudere: vt nec nos follibus, cùm duri ſunt, nec facilè poſſunt dilatari, aut comprimi.

A ΤΑΣ δὲ φωνὰς ἁπάσας συμβαίνει γίνεσθαι καὶ τοὺς ψόφους, ἢ τῶν σωμάτων, ἢ τοῦ ἀέρος πρὸς τὰ σώματα προσπίπτοντος, οὐ τῷ τὸν ἀέρα σχηματίζεσθαι, καθάπερ οἴονταί τινες, ἀλλὰ τῷ κινεῖσθαι παραπλησίως αὐτὸν συστελλόμενον καὶ ἐκτεινόμενον καὶ καταλαμβανόμενον· ἔτι δὲ συγκρούοντα, διὰ τὰς τοῦ πνεύματος καὶ τῶν χορδῶν γινομένας πληγάς. ὅταν γὰρ τὸν ἐφεξῆς ἀέρα πλήξῃ τὸ
B πνεῦμα τὸ ἐμπῖπτον αὐτῷ, ὁ ἀὴρ ἤδη φέρεται βίᾳ, τὸν ἐχόμενον αὐτοῦ προωθῶν ὁμοίως· ὥστε πάντη τὴν φωνὴν διατείνειν τὴν αὐτήν, ἐφόσον συμβαίνει γίνεσθαι καὶ τοῦ ἀέρος τὴν κίνησιν. διαχεῖται γὰρ ἐπὶ πλείονα ἡ βία τῆς κινήσεως αὐτοῦ γινομένης· ὥσπερ καὶ τὰ πνεύματα ἀπὸ τῶν ποταμῶν καὶ ἀπὸ τῆς χώρας ἀποπνέοντα. τῶν δὲ φωνῶν τυφλαὶ μέν εἰσι καὶ νεφώδεις, ὅσαι τυγχάνουσιν αὐτοῦ καταπεπνιγμέναι· λαμπραὶ δὲ οὖσαι, πόρρω διατείνουσι, καὶ πάντα πληροῦσι τὸν συνε-
C χῆ τόπον. ἀναπνέομεν δὲ τὸν μὲν ἀέρα πάντες τὸν αὐτόν, τὸ δὲ πνεῦμα καὶ τὰς φωνὰς ἐκπέμπομεν ἀλλοίας, διὰ τὰς τῶν ὑποκειμένων ἀγγείων διαφοράς, δι' ὧν ἑκάστου τὸ πνεῦμα περαιοῦται πρὸς τὸν ἔξω τόπον. ταῦτα δέ ἐστιν ἥ τε ἀρτηρία καὶ ὁ πνεύμων καὶ τὸ στόμα. πλείστην μὲν οὖν διαφορὰν ἀπεργάζονται τῆς φωνῆς αἵ τε τοῦ ἀέρος πληγαί, καὶ οἱ τοῦ στόματος σχηματισμοί. φανερὸν δέ ἐστι· καὶ γὰρ τῶν φθόγγων αἱ διαφοραὶ πᾶσαι γίνονται διὰ ταύτην τὴν αἰτίαν· καὶ τοὺς αὐτοὺς ὁ-
D ρῶμεν μιμουμένους καὶ ἵππων φωνὰς καὶ βατράχων καὶ ἀηδόνων καὶ γεράνων, καὶ τῶν ἄλλων ζῴων σχεδὸν ἁπάντων, τῷ αὐτῷ χρωμένους πνεύματι καὶ ἀρτηρίᾳ, παρὰ τὸ τὸν ἀέρα διαφόρως ἐκπέμπειν αὐτοὺς ἐκ τοῦ στόματος. πολλὰ δὲ καὶ τῶν ὀρνέων, ὅταν ἀκούσωσι, μιμοῦνται τὰς τῶν ἄλλων φωνάς, διὰ τὴν εἰρημένην αἰτίαν. ὁ δὲ πνεύμων, ὅταν ᾖ μικρὸς καὶ πυκνὸς καὶ σκληρός, οὔτε δέχεσθαι δύναται τὸν ἀέρα πολὺν εἰς αὑτόν, οὔτε ἐκπέμπειν πάλιν ἔξω, οὐδὲ τὴν πληγὴν ἰσχυρὰν οὐδὲ εὔρωστον ποιεῖσθαι τὴν τοῦ πνεύματος. διὰ γὰρ τὸ εἶναι σκληρὸς καὶ πυκνὸς καὶ συνδεδεμένος, οὐ δύναται λαμβάνειν τὴν διάστασιν ἐπὶ πολὺν τόπον· οὐδὲ πάλιν ἐκ πολλοῦ διαστήματος συνάγων ἑαυτόν, ἐκθλίβειν βίᾳ τὸ πνεῦμα· καθάπερ οὐδ' ἡμεῖς ταῖς φύσαις, ὅταν ὦσι σκληραί, καὶ μήτε διαπίμπλεσθαι μήτε πιέζεσθαι δύνωνται ῥᾳδίως.

τοῦτο γάρ ἐστι τὸ ποιοῦν τὴν τοῦ πνεύματος πληγὴν εὔρωστον, ὅταν ὁ πνεύμων ἐκ πολλοῦ διαστήματος συνάγων αὐτὸν, ἐκθλίβῃ τὸν ἀέρα βιαίως. δῆλον δὲ τοῦτ᾽ ἐστίν. οὐδὲ γὰρ τῶν ἄλλων μορίων οὐθὲν ἐκ μικρᾶς ἀποστάσεως δύναται ποιεῖσθαι τὴν πληγὴν ἰσχυράν. οὔτε γὰρ τῷ σκέλει δυνατόν ἐστιν οὔτε τῇ χειρὶ πατάξαι σφοδρῶς οὔτε ἀπορρίψαι πόρρω τὸ πληγὲν, ἐὰν μή τις αὐτῶν ἑκατέρῳ ἐκ πολλοῦ λάβῃ τῆς πληγῆς τὴν ἀπόστασιν. εἰ δὲ μὴ, σκληρὰ μὲν ἡ πληγὴ γίγνεται διὰ τὴν συντονίαν, ἐκβιάζεσθαι δὲ οὐ δύναται πόρρω τὸ πληγέν. ἐπεὶ, οὐδ᾽ οἱ καταπέλται μακρὰν δύνανται βάλλειν, οὐδ᾽ ἡ σφενδόνη, οὔτε τόξον, ἂν ᾖ σκληρὸν, καὶ μὴ δύνηται κάμπτεσθαι· μηδὲ τὴν ἀναγωγὴν ἡ νευρὰ λαμβάνειν ἐπὶ πολὺν τόπον. ἐὰν δὲ μέγας ὁ πνεύμων ᾖ καὶ μαλακὸς καὶ εὔτονος, πολὺν τὸν ἀέρα δύναται δέχεσθαι, καὶ τοῦτον ἐκπέμπειν πάλιν, ταμιευόμενος ὡς ἂν βούληται διὰ τὴν μαλακότητα, καὶ διὰ τὸ ῥᾳδίως αὐτὸν συστέλλειν. ἡ δὲ ἀρτηρία μακρὰ μὲν ὅταν ᾖ καὶ στενὴ, χαλεπῶς ἐκπέμπουσιν ἔξω τὴν φωνὴν καὶ μετὰ βίας πολλῆς, διὰ τὸ μῆκος τῆς τοῦ πνεύματος φορᾶς. φανερὸν δέ ἐστι· πάντα γὰρ τὰ τοὺς τραχήλους ἔχοντα μακροὺς, φθέγγεται βιαίως· οἷον οἱ χῆνες καὶ γέρανοι καὶ ἀλεκτρυόνες· μᾶλλον δὲ τοῦτο καταφανές ἐστιν ἐπὶ τῶν αὐλῶν. πάντες γὰρ χαλεπῶς πληροῦσι τοὺς βόμβυκας, καὶ μετὰ συντονίας πολλῆς, διὰ τὸ μῆκος τῆς ἀποστάσεως. ἔτι δὲ τὸ πνεῦμα διὰ τὴν στενοχωρίαν, ὅταν ἐκτὸς θλιβόμενον εἰς τὸν ἔξω τόπον ἐκπέσῃ, παραχρῆμα διαχεῖται καὶ σκεδάννυται, καθάπερ καὶ τὰ ῥεύματα φερόμενα διὰ τῶν εὐρίπων. ὥστε μὴ δύνασθαι τὴν φωνὴν * συμβαίνειν, μηδὲ διατείνειν ἐπὶ πολὺν τόπον. ἅμα δὲ καὶ δυσταμίευτον ἀνάγκη πάντων τῶν τοιούτων εἶναι τὸ πνεῦμα καὶ μὴ ῥᾳδίως ὑπηρετεῖν. ὅσων δέ ἐστι μέγα τὸ διάστημα τῆς ἀρτηρίας, τῶν τοιούτων ἔξω μὲν περαιοῦσθαι συμβαίνει τὸ πνεῦμα ῥᾳδίως, ἐντὸς δὲ φερόμενον, διαχεῖσθαι διὰ τὴν εὐρυχωρίαν, καὶ τὴν φωνὴν γίνεσθαι κενὴν καὶ μὴ συνεστῶσαν· ἔτι δὲ μὴ δύνασθαι διαιρεῖσθαι τῷ πνεύματι τοὺς τοιούτους, διὰ τὸ μὴ συνερείδεσθαι τὴν ἀρτηρίαν αὐτῶν. ὅσων δέ ἐστιν ἀνωμάλως καὶ μὴ πάντοθεν ἔχει τὴν διάστασιν ὁμοίαν, τούτοις ἀναγκαῖον ἁπασῶν μετέχειν τῶν δυσχερειῶν. καὶ γὰρ ἀνωμάλως αὐτοῖς ἀνάγκη τὸ πνεῦμα ὑπηρετεῖν καὶ θλίβεσθαι, καὶ καθ᾽ ἕτερον τόπον διαχεῖσθαι πάλιν. βραχείας δὲ τῆς ἀρτηρίας οὔσης, ταχὺ μὲν ἀνάγκη τὸ πνεῦμα ἐκπέμπειν, καὶ τὴν πληγὴν ἰσχυροτέραν γίνεσθαι τὴν τοῦ ἀέρος, πάντας δὲ τοὺς τοιούτους ὀξύτερον φωνεῖν, διὰ τὸ τάχος τῆς τοῦ πνεύματος φορᾶς. οὐ μόνον δὲ συμβαίνει τὰς τῶν ἀγγείων διαφορὰς, ἀλλὰ καὶ τὰ πάθη πάντας τὰς φωνὰς ἀλλοιοῦν. ὅταν μὲν γὰρ ὦσιν ὑγρασίας πλήρη πολλῆς ὅ,τε πνεύμων καὶ ἡ ἀρτηρία, διασπᾶται τὸ πνεῦμα, καὶ οὐ δύναται περαιοῦσθαι εἰς τὸν ἔξω τόπον συνεχῶς, διὰ τὸ προσκόπτειν, καὶ γίνεσθαι παχὺ καὶ ὑγρὸν καὶ δυσκίνητον· καθάπερ καὶ ἐπὶ τοῖς κατάῤῥοις καὶ ταῖς μέθαις. ἐὰν δὲ ξηρὸν ᾖ τὸ πνεῦμα, παντελῶς σκληροτέρα ἡ φωνὴ γίνεται καὶ διεσπασμένη. συνέχει γὰρ ἡ νοτὶς, ὅταν ᾖ λεπτὴ, τὸν ἀέρα, καὶ ποιεῖ τινα τῆς φωνῆς ἁπλότητα. τῶν μὲν οὖν ἀγγείων αἱ διαφοραὶ καὶ τῶν παθῶν τῶν περὶ αὐτὰ γιγνομένων, τοιαύτας ἑκάστοτε τὰς φωνὰς ἀποτελοῦσι.

Scrib. συμμένειν.

A hoc enim eſt quod plagam ſpiritus validam reddit, cùm pulmones è magno interuallo ſe colligentes, violenter aërem expellunt. quod quidem ex eo perſpici poteſt, quia nulla aliarum partium è parua diſtantia validam poteſt plagam inferre. Nam neque crure neque manu vehementer fortitérque pulſare quis poſſit, & quod pulſarit eiicere: niſi vtroque eorum è magna diſtantia plagam deſtinauerit. ſin minùs dura quidem plaga ob contentionem & conatum infertur: longè tamen exturbare percuſſa non poterit: præſertim cùm nec catapultæ longè tela mittere poſſint, neque fundæ, nec arcus ſi durus ſit, neque flecti lentarique queat, neque neruus B longè reduci poſſit. Quòd ſi pulmones molles ſint & firmi, multum aëris concipere poſſunt, eúmque rurſum reddere eo temperamento & moderatione qua commodum eſt ob mollitudinem & facilem contractionem. At guttur longum & anguſtum cùm eſt, difficilem vox emiſſionem foras habet, & magnopere violentam, ob longitudinem commeatus ipſius ſpiritus: quod ex eo conſtat, quia omnia quæ procerum collum habent, violentum quiddam clangunt, vt anſeres, grues, galli gallinacei. Id tamen etiam clariùs patet in tibiis: omnes enim vix implent bombycas, magnáque contentione & negotio ob longitudinem ſpatij. quin & ſpiritus ob angu- C ſtias cùm foras pulſus extra eruperit, ſtatim diffunditur & diſſipatur, vt & aquæ quæ per euripos feruntur, vt vox conſequi non poſſit, neque in longum ſpatium peruenire. his quoque omnibus neceſſe eſt eueniat, vt ſpiritum non facilè regant & temperent ad vocis miniſterium. Quorum autem guttur valde ſpatioſum eſt, eorum facilè commeat ſpiritus, ſed ob laxitatem loci intus labens diffunditur, & vox quædam inanis & inconſtans oritur: neque poteſt in illis diuidi *ſpiritus*, cùm *ipſorum* guttur vndique non conitatur. Quorum autem inæqualis eſt, neque vndique paria habet ſpatia, eos omnes ſentire incommoditates neceſſe eſt. nam & inæquabili- D ter ſpiritum voci miniſtrare neceſſe eſt, & premi, & in vicem alia ex parte diffundi. Quòd ſi breue guttur ſit, celeriter ſpiritum emitti neceſſe eſt, & aëris plagam vehementiorem fieri: omnes tamen eos acutè loqui propter celeriorem ſpiritus impetum. Nec verò tantùm vaſorum diſſimilitudo, ſed & euenta omnia voces mutare ſolent. Nam cùm multo ſuffuſi ſunt humore pulmones & guttur, diſtrahitur ſpiritus, neque continenter perpetuóque foras exire poteſt, propter offenſionem & obicem, & quòd plenus & humidus & torpidus euadat, vt in diſtillatione & ebrietate vſuuenire ſolet. quòd ſi penitus ſiccus ſit ſpiritus, tunc vox durior diſtra- E ctáque exiſtit. Humor enim præſertim tenuis aërem continet & perpetuat, & quandam vocis efficit teneritatem & mollitudinem. Ac vaſorum quidem diſpar conditio & euentorum ipſis accidentium, huiuſmodi voces reddunt.

A Voces autem videntur eſſe in illis quæque locis vbi & naſcuntur : ſed eas omnes audimus, vbi ad aures acciderunt noſtras. Aër enim quem ictus pepulit, aliquem ad finem continens labitur, deinde paulatim magis atque magis ſubinde diuerſus abit & dilabitur : atque hoc ipſo cognoſcimus omnes longinquiores propinquioréſque ſonos. quod ex eo intelligi poteſt, quia ſi quis cornu aut tibiam aut tubam ſumat, per eáque alterius auri admota loquatur, omnes videntur voces proximè aurem mitti, quòd aëris impetus non diſſipetur, ſed ab inſtrumento complectente vox ſimilis conſeruetur. Vt igitur in pictura cùm quis coloribus hoc ſimile diſtanti longinquóque depinxit, illud propinquo: vna picturæ pars nobis videtur in receſſu poſita eſſe, altera eminere & extare, cùm vtrunque tamen ſit in eadem planitie : ſic & in vocum ſonis, cùm aliqua iam diſſoluta ad auditum accidit, alia continua, ambabus ad eundem locum venientibus, vna procul ab auribus diſtare videtur, altera è propinquo eſſe, propterea quòd hæc ſimilis eſt longinquæ & remotæ, illa vicinæ. Manifeſtæ autem diſertæque voces vel maximè euadunt ex ſonorum ſubtilitate. nam fieri non poteſt, niſi hi modis omnibus expreſſi articulatique ſint, vt voces manifeſtæ reddantur : vt nec annulorum gemmæ, niſi ſubtiliter ſcalptæ ſint. Proinde nec pueruli ſermocinantur manifeſtè, neque ebrij, neque ſenes, neque natura balbi, neque in ſumma quorum linguæ oráque impeditiora ſunt tardioráque. Nam vt æramenta & cornua reſonando inſtrumentorum ſonos reddunt manifeſtiòres : ſic & in ſermone magnam parit obſcuritatem ſpiritus ex ore elabens non perinde impreſſus. neque enim ſolum quandam ſui obſcuritatem oſtendit, ſed etiam articulatos ſonos impedit, cùm diſſimilis eorum impetus ad auditum accidat. Itaque melius vnum audientes intelligimus, quàm plures eadem loquentes : vt & in fidibus : multóque minùs cùm quis ad tibiam citharam pulſat, confuſis ab aliis vocibus : quod & in concentibus vel maximè patet, ambobus ſe mutuò ſonis abſcondentibus. Ob has igitur quas diximus cauſas minùs manifeſtæ voces redduntur. Claritas autem eis comparatur, vt & in coloribus. nam & illic qui maximè poſſunt aſpectum permouere, eos contingit eſſe colorum clariſſimos. eodem modo voces illas clariſſimas exiſtimandum, quæ ad ſenſum adpulſæ auram maximè mouere poſſunt : tales ſunt manifeſtæ, denſæ, puræ, & quæ longè peruadere poſſunt. Nam & aliis omnibus in rebus, quæ ſenſibus percipiuntur, quicquid validius, denſius & purius eſt, certiorem quoque manifeſtiorémque ſenſum efficit. idque ex eo notum eſt, quòd voces omnes ad extremum obſurdeſcunt, aëre tandem diſſipato : quod & perſpicitur in tibiis. nam quæ ſecundarum lingulas habent obliquas, molliorem illæ quidem vocem edunt : verùm minùs tamen claram.

A αἱ δὲ φωναὶ δοκοῦσι μὲν εἶναι καθ' οὓς αἰεὶ ἕκασται γίγνονται τόπους. ἀκούομεν δὲ πασῶν αὐτῶν, ὅταν ἡμῖν προσπέσωσι πρὸς τὴν ἀκοήν. ὁ γὰρ ὠσθεὶς ὑπὸ τῆς πληγῆς ἀήρ, μέχρι μέν τινος φέρεται συνεχής, ἔπειτα κατὰ μικρὸν ἀεὶ κινεῖται μᾶλλον· καὶ τούτῳ γιγνώσκομεν πάντας τοὺς ψόφους καὶ τοὺς πόρρω γιγνομένους καὶ τοὺς ἐγγύς. δῆλον δέ ἐστιν· ὅταν γάρ τις λαβὼν κέραμον ἢ αὐλὸν ἢ σάλπιγγα, προσθείς τι ἑτέρῳ πρὸς τὴν ἀκοήν, διὰ τούτων λαλῇ, πᾶσαι δοκοῦσιν αἱ φωναὶ παντελῶς εἶναι πλησίον τῆς ἀκοῆς, διὰ τὸ μὴ σκεδάννυσθαι τὸν ἀέρα φερόμενον, ἀλλὰ διατηρεῖσθαι τὴν φωνὴν ὁμοίαν ὑπὸ τοῦ περιέχοντος ὀργάνου. B καθάπερ οὖν καὶ ἐπὶ τῆς γραφῆς, ὅταν τις τοῖς χρώμασι τὸ μὲν, ὅμοιον ποιήσῃ τῷ πόρρω, τὸ δὲ, τῷ πλησίον, τὸ μὲν, ἡμῖν ἀνακεχωρηκέναι δοκεῖ τῆς γραφῆς, τὸ δὲ, προέχειν, ἀμφοτέρων αὐτῶν ὄντων ἐπὶ τῆς αὐτῆς ἐπιφανείας· οὕτω καὶ ἐπὶ τῶν ψόφων τῆς φωνῆς, ὅταν ἡ μὲν ἤδη διαλελυμένη προσπίπτῃ πρὸς τὴν ἀκοήν, ἡ δέ τις συνεχής, ἀμφοτέρων αὐτῶν ἀφικνουμένων πρὸς τὸν αὐτὸν τόπον, ἡ μὲν ἀφεστηκέναι πόρρω δοκεῖ τῆς ἀκοῆς, ἡ δὲ, εἶναι σύνεγγυς, διὰ τὸ τὴν μέντοι πόρρωθεν ὁμοίαν εἶναι, τὴν δὲ πλησίον.

C σαφεῖς δὲ μάλιστα αἱ φωναὶ γίγνονται παρὰ τὴν ἀκρίβειαν τὴν τῶν φθόγγων. ἀδύνατον γάρ, μὴ τελέως τούτων διηρθρωμένων, τὰς φωνὰς εἶναι σαφεῖς· καθάπερ καὶ τὰς τῶν δακτυλίων σφραγῖδας, ὅταν μὴ διατυπωθῶσιν ἀκριβῶς. διόπερ οὔτε τὰ παιδία δύναται διαλέγεσθαι σαφῶς, οὔτε οἱ μεθύοντες, οὔτε οἱ γέροντες, οὔθ' ὅσοι φύσει τραυλοὶ τυγχάνουσιν ὄντες, οὔθ' ὅλως ὅσων εἰσὶν αἱ γλῶτται καὶ τὰ στόματα δυσκίνητα. ὥσπερ γὰρ καὶ τὰ χαλκεῖα καὶ τὰ κέρατα συνηχοῦντα, ποιεῖ τοὺς ἀπὸ τῶν ὀργάνων φθόγγους σαφεστέρους, οὕτως καὶ ἐπὶ τῆς διαλέκτου πολλὴν ἀσάφειαν ἀπεργάζεται τὰ ἐκπίπτοντα τῶν πνευμάτων D ἐκ τοῦ στόματος, ὅταν μὴ διατυπωθῶσιν ὁμοίως. οὐ μόνον δὲ ἑαυτῶν τινα περιεμφαίνουσιν ἀσάφειαν, ἀλλὰ καὶ τοὺς διηρθρωμένους τῶν φθόγγων ἐμποδίζουσιν, ἀνομοίας αὐτῶν γιγνομένης τῆς περὶ τὴν ἀκοὴν κινήσεως. διὸ καὶ μᾶλλον ἑνὸς ἀκούοντες συνίεμεν, ἢ πολλῶν ἅμα ταὐτὰ λεγόντων· καθάπερ καὶ ἐπὶ τῶν χορδῶν· καὶ πολὺ ἧττον, ὅταν προσαυλῇ τις ἅμα καὶ κιθαρίζῃ, διὰ τὸ συγχεῖσθαι τὰς φωνὰς ὑπὸ τῶν ἑτέρων. οὐχ ἥκιστα δὲ τοῦτο ἐπὶ τῶν συμφωνιῶν φανερόν ἐστιν. ἀμφοτέρους γὰρ ἀποκρύπτεσθαι συμβαίνει τοὺς ἤ- E χους ὑπ' ἀλλήλων. ἀσαφεῖς μὲν οὖν φωναὶ γίγνονται διὰ τὰς εἰρημένας αἰτίας. λαμπραὶ δὲ γίνονται, καθάπερ ἐπὶ τῶν χρωμάτων· καὶ γὰρ ἐκεῖ τὰ μάλιστα δυνάμενα τὰς ὄψεις κινεῖν, ταῦτα εἶναι συμβαίνει τῶν χρωμάτων λαμπρότατα. τὸν αὐτὸν τρόπον, τῶν φωνῶν ταύτας ὑποληπτέον εἶναι λαμπροτάτας, ὅσαι μάλιστα δύνανται προσπίπτουσαι κινεῖν τὴν ἀκοήν. τοιαῦται δέ εἰσιν αἱ σαφεῖς καὶ πυκναὶ καὶ καθαραί, καὶ πόρρω δυνάμεναι διατείνειν. καὶ γὰρ ἐν ταῖς ἄλλαις αἰσθήσεσιν ἅπασι τὰ ἰσχυρότερα καὶ πυκνότερα καὶ καθαρώτερα σαφεστέρας ποιεῖ τὰς αἰσθήσεις. δῆλον δέ. τὸ γὰρ τελευταῖον αἱ φωναὶ πᾶσαι γίγνονται κωφαί, τοῦ ἀέρος ἤδη διακεχυμένου. δῆλον δὲ ἐστι κἀπὶ τῶν αὐλῶν. τὰ γὰρ ἔχοντα * τῶν δευτέρων τὰς γλώττας πλαγίας, μαλακωτέραν μὲν ἀποδίδωσι τὴν φωνήν, οὐχ ὁμοίως δὲ λαμπράν.

* Quidam, [illegible]

τὸ γὰρ πνεῦμα φερόμενον, εὐθέως εἰς εὐρυχωρίαν ἐμπῖπτον, καὶ οὐκ ἐπιφέρεται σύντονον, οὐδὲ συνεστηκός, ἀλλὰ διεσκεδασμένον. ἐν δὲ ταῖς σκληροτέραις γλώτταις ἡ φωνὴ γίνεται σκληροτέρα καὶ λαμπροτέρα, ἂν πιέσῃ τις αὐτὰς μᾶλλον τοῖς χείλεσι, διὰ τὸ φέρεσθαι τὸ πνεῦμα βιαιότερον. αἱ μὲν οὖν λαμπραὶ τῶν φωνῶν γίνονται διὰ τὰς εἰρημένας αἰτίας· παρὸ καὶ δοκοῦσιν οὐ χείρους εἶναι τῶν λευκῶν αἱ καλούμεναι φαιαί. πρὸς γὰρ τὰ πάθη καὶ τὰς πρεσβυτέρας ἡλικίας μᾶλλον ἁρμόττουσιν αἱ τραχύτεραι, καὶ μικρὸν ὑποσυγκεχυμέναι, καὶ μὴ λίαν ἔχουσαι τὸ λαμπρὸν ἐκφανές. ἅμα δὲ καὶ διὰ τὴν συντονίαν οὐχ ὁμοίως εἰσὶν εὐπειθεῖς. τὸ γὰρ βίᾳ φερόμενον, δυσταμίευτον. οὐδὲ γὰρ ἐπιτεῖναι ῥᾴδιον ὡς βούλεταί τις, οὔτε ἀνεῖναι. ἐπὶ δὲ τῶν αὐλῶν γίνονται αἱ φωναὶ λαμπραὶ καὶ τῶν ἄλλων ὀργάνων, ὅταν τὸ ἐκπῖπτον πνεῦμα, πυκνὸν ᾖ καὶ σύντονον. ἀνάγκη γὰρ καὶ τοῦ ἔξωθεν ἀέρος τοιαύτας γίνεσθαι τὰς πληγάς, καὶ μάλιστα τὰς φωνὰς οὕτω διαπέμπεσθαι συνεστώσας πρὸς τὴν ἀκοήν, ὥσπερ καὶ τὰς ὀσμὰς καὶ τὸ φῶς καὶ τὰς θερμότητας. καὶ γὰρ πάντα ταῦτα ἀραιότερα φαινόμενα πρὸς τὴν αἴσθησιν, ἀτιμότερα γίνεται· καθάπερ καὶ οἱ χυλοὶ κεραννύντες τῷ ὕδατι καὶ ἑτέροις χυλοῖς. τὸ γὰρ ἑαυτοῦ παρέχον αἴσθησιν, ἀσαφεῖς ἑκάστου ποιεῖ τὰς δυνάμεις. ἀπὸ δὲ τῶν ἄλλων ὀργάνων οἱ τῶν κεράτων ἦχοι πυκνοὶ καὶ συνεχεῖς πρὸς τὸν ἀέρα προσπίπτοντες, ποιοῦσι τὰς φωνὰς ἀμαυράς. * διὰ δὴ τὸ κέρας τὴν φύσιν ἔχειν τῆς αὐξήσεως ὁμαλὴν καὶ λείαν καὶ μὴ ταχέως ἐκδεδραμηκυῖαν. ἀνάγκη γὰρ μαλακώτερα καὶ χαυνότερα γίνεσθαι τὰ τοιαῦτα τῶν κεράτων· ὥστε τοὺς ἤχους διασπᾶσθαι καὶ μὴ συνεχεῖς ἐκπίπτειν δι᾽ αὐτῶν, μηδὲ γεγωνεῖν ὁμοίως διὰ τὴν μαλακότητα καὶ τὴν ἀραιότητα τῶν πόρων, μηδὲ πάλιν εἶναι δυσαυξῆ τὴν φύσιν, μηδὲ τὴν σύμφυσιν ἔχειν πυκνὴν καὶ σκληρὰν καὶ δύσπορον. καθ᾽ ὅτι γὰρ ἂν προσκόψῃ φερόμενος ὁ ἦχος, αὐτοῦ λαμβάνει τὴν κατάπαυσιν, καὶ οὐκέτι περαιοῦται πρὸς τὸν ἔξω τόπον· ὥστε κωφοὺς καὶ ἀνωμάλους ἐκπίπτειν τοὺς ἤχους ἐκ τῶν τοιούτων κεράτων. ὅτι δὲ ἡ φορὰ γίνεται κατὰ τὴν εὐθυπορείαν, φανερόν ἐστιν ἐπὶ τῶν ἱστῶν, καὶ ὅλως ἐπὶ τῶν ξύλων τῶν μεγάλων, ὅταν αὐτὰ βασανίζωσιν. ὅταν γὰρ κρούσωσιν ἐκ τοῦ ἑτέρου ἄκρου, κατὰ τὸ ἕτερον ὁ ἦχος φέρεται συνεχής, ἐὰν μή τι ἔχῃ συντέτριμμα τὸ ξύλον· εἰ δὲ μή, μέχρι τούτου προελθὼν, αὐτοῦ καταπαύεται διασπασθείς. περικάμπτει δὲ καὶ τοὺς ὄζους, καὶ οὐ δυνατὸς δι᾽ αὐτῶν εὐθυπορεῖν. κατάδηλον δὲ τοῦτό ἐστι καὶ ἐπὶ τῶν χαλκείων, ὅταν ῥινῶσι τὰς ἀπηρτημένας στολίδας τῶν ἀνδριάντων, ἢ τὰ πτερύγια, τῷ συμμύειν· διὸ ῥοῖζον καὶ πολὺν ἦχον ἀφιᾶσι καὶ ψόφον. ἂν δέ τις αὐτὰ ταινίᾳ διαδήσῃ, παύεσθαι συμβαίνει τὸν ἦχον. ἕως γὰρ τούτου προελθὼν ὁ τρόμος, ὅταν προσκόψῃ πρὸς μαλακὸν, αὐτοῦ ποιεῖται τὴν κατάπαυσιν. πολὺ δὲ καὶ ἡ ὄπτησις ἡ τῶν κεράτων συμβάλλεται καὶ πρὸς εὐφωνίαν. μᾶλλον μὲν γὰρ κατοπτηθέντα, παραπλήσιον τὸν ἦχον ἔχουσι τῷ κεράμῳ, διὰ τὴν σκληρότητα καὶ τὴν σύγκαυσιν. ἐὰν δέ τις αὐτὰ καταδεέστερον ὀπτήσῃ, ἁπαλώτερον μὲν ἀφίησι διὰ τὴν μαλακότητα τὸν ἦχον, οὐ δύναται δὲ γεγωνεῖν ὁμοίως. διὸ καὶ τὰς ἡλικίας ἐκλέγονται. τὰ μὲν γὰρ τῶν γερόντων, ὅτι ξηρὰ καὶ πεπωρωμένα καὶ χαῦνα

* κ. διὸ

A labens enim aër protinus in ſpatioſam laxitatem incidit, neq. vlla contentione rapitur, neque collectus fertur, ſed diſperſus. In lingulis autem duriuſculis, vox & durior & clarior excitatur, ſi quis eas magis labris premat, quòd violentiore impetu ſpiritus feratur. Igitur ob eas quas diximus cauſas claræ redduntur voces: ex quo nec videntur deteriores eſſe candidis, quæ fuſcæ vocantur. nam & affectibus & grandioribus ætatibus aſperiores magis conueniunt, & paulum confuſæ, nec claritatem perinde inſignem habentes: ſed & ob contentionem & acrimoniam non perinde in poteſtate ſunt, nec facilè obtemperant. id enim quod impetu rapitur, arduum regere atque moderari. neque enim vt commodum eſt quiſquam facilè vel intendere
B vel remittere poteſt. In tibiis autem & aliis inſtrumentis voces exiſtunt claræ, cùm ſpiritus erumpens creber eſt atque contentus. nam & tales exterioris aëris pulſus conſequi neceſſe eſt, vocéſque vel maximè ſic ad ſenſum conſtantes tranſmitti, vt & odores, & lumen & calorem. omnia enim iſta rariora ſenſui occurrentia, minùs inſignia ſentiuntur vt & ſapores aqua diluti, & aliis ſaporibus. quod enim ſui ſenſum obiicit, cuiuſque obſcuras reddit vires & poteſtates. ex aliis autem inſtrumentis cornuum ſoni denſi & continentes in aerem incidentes voces non efficiunt
C claras. Itaque cornu oportet indolem accretionis ſuæ habere æquabilem & læuem, nec celeriter proſilientem. talia enim neceſſe eſt cornua molliora & laxiora eſſe: vt ſoni diſtrahantur, nec continentes ex eis efferantur, nec ſimiliter arguti clarique ſint, ob viarum mollitudinem & raritatem: neque rurſus oportet natura eſſe ad creſcendum maligna, neque concretione & coagmentatione eſſe denſa, rigida, tranſitu difficili. qua enim cunque offenderit illatus ſonus, ibi finem modúmque facit, nec extra perrumpit, vt ſurdi & inæquales ſoni ex huiuſmodi cornibus excidant. Quod autem recta regione & via eius impetus feratur, perſpicuum eſt in malis nauium,
D & in ſumma in omni prolixa materia, cùm eam probant. Nam ſi materia nihil læſa ſit, cùm ab vno extremo percuſſerint, ad alterum vſque continuus decurrit ſonus: ſin minùs, ad vitium vſque progreſſus, ibi interpellatus deſinit: ſed & nodos circunflectit, neque per eos rectà tranſire poteſt. Id autem etiam perſpicitur in ærariis officinis, cùm ſtatuarum ſtolas limant eas quæ ſeparatæ ſunt, aut alas, proptereáque conniuent comprimuntúrque. quocirca ſtridorem magnúmque ſtrepitum ſonitúmque edunt: ſed ſi quis ea faſcia obligarit, ſtrepitus deſinit. eò enim vſque progreſſus tremor, cùm ad molle offendit, ibi ceſſat. Multum autem & aſſatio cornuum ad bonitatem vocis confert: plus tamen iuſto aſſa, ſonum adipiſcuntur regulæ ſimilem, ex du-
E ritie & vſtione. ſin ea quis minus aſſet, ſonum quidem emittunt teneriorem ob mollitudinem, non tamen perinde arguta ſunt & canora. Itaque in his certæ ætatis delectus eſt. nam ſenum ſicca ſunt, meatus habent, laxa ſunt:

iuniorum tenera penitus, & in ſe magnam vim humoris habentia. Oportet autem eſſe cornu, vt dictum eſt, ſiccum, denſum, æquabiliter recti canalis & læue. ſic enim continget vt ſoni denſi, læues, æquabiles per ipſa ferantur, & pares ſimileſque ictus aër exterior excipiat. Nam & chordarum vt quæque læuiſſima eſt & omni ex parte æquabilis maximè, ita optima eſt, atque opere vndique ſimili & confectione conſtat, & neruorum commiſſuras latentes fallenteſque habet. Sic enim euenit vt aëris pulſus vndique perſimiles exiſtant. oportet autem & tibiarum lingulas denſas, læues & æquabiles eſſe, vt per eas ſpiritus læuis, æquabilis, nec diſtractus feratur. Itaque paria armamentorum iuga madefacta & ſaliua imbuta, vocaliora canoráque magis redduntur: ſicca deterius ſonant. Aër enim per humidum & lubricum mollis & æquabilis labitur: quod ex eo cerni poteſt, quia & ipſe ſpiritus, cum humorem aliquem habet, minus ad armamenta offendit, minúſque diſtrahitur. ſiccus autem cùm eſt, magis obhæreſcit & duriorem plagam infert ob violentiam. Igitur diſſimilitudines ſonorum ob eas quas diximus cauſas eueniunt. Cæterùm duræ ſunt voces quæcunque ad auditum violenter accidunt: proinde & ſuum maximè vigorem tenoremque præſtant. Tales ſunt quæ difficiliorem molitionem habent, & magna feruntur violentia. Nam quod celeriter cedit, ictum non moratur, ſed antè reſilit: quod hinc patet, quia tela grandiora vehementiſſimo feruntur impetu, & aquæ per euripos incitatæ. Nam hæ in anguſto luctantes, nec velociter cedentes, ſed magna vi impulſæ, vehementiſſimè incitantur: quod idem ſimiliter in vocibus & ſonis euenit. Cuius rei hinc fides eſt, quòd omnes violenti ſoni, iidem & duri euadunt, vt arcularum & cardinum cùm per vim aperiuntur, & aëris atque ferri. Nam & ex incudibus durus nec mollis reſonat, cùm iam refrigeratum & durum ferrum ducunt. præterea à lima, cùm ferramenta & ſerras limant & aſperant. quoniam & tonitrua, vt violentiſſima quæque, ita & duriſſima ſunt, & imbrium qui abrupti præcipiteſque vocantur ob violentiam. Nam celeritas ſpiritus reddit vocem acutam, violentia autem duram. itaque non tantùm vſuuenire ſolet, vt iiſdem interdum acutiorem, interdum grauiorem vocem mittant, ſed etiam duriorem & molliorem: & tamen nonnulli exiſtimant, ex arteriarum aſperitate voces dureſcere, non ſine errore, hoc enim paulum admodum confert, ſed ſpiritus violenta à pulmonibus percuſſio. Vt enim corpora horum humida ſunt & mollia, illorum dura atque contenta, eodem ſanè modo & pulmones. ita fit vt aliorum ſpiritus mollis exeat, aliorum durus atque coactus. Nam quòd arteria non magnum quoddam momentum adferat, facile eſt intellectu: nulla enim arteria tibiarum duritiam adæquat: attamen nihilo ſecius per arteriam & per tibias ſpiritu labente, alij molliter tibia canunt, alij duriter:

τὰ δὲ τῶν νέων, ἁπαλὰ παντελῶς καὶ πολλὴν ἔχοντα ἐν αὑτοῖς ὑγρασίαν. δεῖ δὲ εἶναι, καθάπερ εἴρηται, τὸ κέρας ξηρὸν καὶ πυκνὸν ὁμαλῶς καὶ εὐθύπορον καὶ λεῖον. οὕτω γὰρ ἂν μάλιστα συμβαίνοι καὶ τοὺς ἤχους πυκνοὺς καὶ λείους καὶ ὁμαλοὺς φέρεσθαι δι' αὐτῶν, καὶ τοῦ ἔξωθεν ἀέρος τὰς πληγὰς γίνεσθαι τοιαύτας· ἐπεὶ καὶ τῶν χορδῶν εἰσιν αἱ λειόταται, βέλτισται, καὶ τοῖς πᾶσιν ὁμαλώταται· καὶ τὴν κατεργασίαν ἔχουσι πάντοθεν ὁμοίαν, καὶ τὰς συμβολὰς ἀδήλους τὰς τῶν νεύρων. οὕτω γὰρ συμβαίνει καὶ ταύτας ποιεῖσθαι τὰς τοῦ ἀέρος πληγὰς ὁμοιοτάτας. δεῖ δὲ καὶ τῶν αὐλῶν εἶναι τὰς γλώττας πυκνὰς καὶ λείας καὶ ὁμαλάς, ὅπως ἂν καὶ τὸ πνεῦμα διαπορεύηται δι' αὐτῶν λεῖον καὶ ὁμαλὸν καὶ μὴ διεσπασμένον. διὸ καὶ τὰ βεβρεγμένα τῶν ζευγῶν καὶ τὰ πεπωκότα τοῦ σιάλου, εὐφωνότερα γίνεται, τὰ δὲ ξηρὰ, κακόφωνα. ὁ γὰρ ἀὴρ διὰ ὑγροῦ καὶ λείου φέρεται μαλακὸς καὶ ὁμαλός. δῆλον δέ. καὶ γὰρ αὐτὸ τὸ πνεῦμα, ὅταν ἔχῃ νοτίδα, πολὺ ἧττον προσκόπτει πρὸς τὰ ζεύγη καὶ διασπᾶται· τὸ δὲ ξηρὸν, μᾶλλον ἀντιλαμβάνεται, καὶ τὴν πληγὴν ποιεῖται σκληροτέραν, διὰ τὴν βίαν. αἱ μὲν οὖν διαφοραὶ τῶν ἤχων γίγνονται διὰ τὰς εἰρημένας αἰτίας. σκληραὶ δέ εἰσι τῶν φωνῶν, ὅσαι βιαίως πρὸς τὴν ἀκοὴν προσπίπτουσι· διὸ καὶ μάλιστα παρέχουσι τὸν τόνον. τοιαῦται δέ εἰσιν αἱ δυσκινητότεραι καὶ μετὰ πλείστης φερόμεναι βίας. τὸ γὰρ ὑπεῖκον ταχέως, οὐ δύναται τὴν πληγὴν ὑπομένειν, ἀλλ' ἀποπηδᾷ πρότερον. δῆλον δέ. τὰ γὰρ ὑπέρογκα τῶν βελῶν, βιαιοτάτην φέρεται τὴν φορὰν, καὶ τὰ ῥεύματα φερόμενα διὰ τῶν εὐρίπων· καὶ γὰρ ταῦτα γίνεται σφοδρότατα περὶ αὐτὰς τὰς στενοχωρίας, οὐ δυνάμενα ταχέως ὑπείκειν, ἀλλὰ ὑπὸ πολλῆς ὠθούμενα βίας. ὁμοίως δὲ τοῦτο συμβαίνει καὶ περὶ τὰς φωνὰς καὶ τοὺς ψόφους. φανερὸν δ' ἐστί. πάντες γὰρ οἱ βίαιοι, γίγνονται σκληροί· καθάπερ καὶ τῶν κιβωτίων καὶ τῶν στροφέων, ὅταν ἀνοίγωνται βιαίως, καὶ τοῦ χαλκοῦ καὶ τοῦ σιδήρου. καὶ γὰρ ἀπὸ τῶν ἀκμόνων γίγνεται σκληρὸς καὶ μαλακὸς, ὅταν ἐλαύνωσι κατεψυγμένον καὶ σκληρὸν ἤδη τὸν σίδηρον. ἔτι δὲ ἀπὸ τῆς ῥίνης, ὅταν ῥινῶσι καὶ χαράττωσι τὰ σιδήρια καὶ τοὺς πρίονας· ἐπεὶ καὶ τῶν βροντῶν αἱ βιαιόταται, γίγνονται σκληρόταται. καὶ τῶν ὑδάτων τὰ καλούμενα ῥαγδαῖα τὴν βίαν. ἡ μὲν γὰρ ταχυτὴς τοῦ πνεύματος, ποιεῖ τὴν φωνὴν ὀξεῖαν· ἡ δὲ βία, σκληράν. διόπερ οὐ μόνον συμβαίνει τοῖς αὐτοῖς ὁτὲ μὲν ὀξυτέραν, ὁτὲ δὲ βαρυτέραν, ἀλλὰ καὶ σκληροτέραν καὶ μαλακωτέραν. καίτοι τινὲς ὑπολαμβάνουσι, διὰ τὴν σκληρότητα τῶν ἀρτηριῶν, τὰς φωνὰς γίγνεσθαι σκληράς, διαμαρτάνοντες· τοῦτο μὲν γὰρ βραχύ τι συμβάλλεται παντελῶς· ἀλλ' ἡ τοῦ πνεύματος γινομένη πληγὴ βιαίως ὑπὸ τοῦ πνεύμονος. ὥσπερ γὰρ καὶ τὰ σώματα, τῶν μέν ἐστιν ὑγρὰ καὶ μαλακὰ, τῶν δὲ, σκληρὰ καὶ σύντονα· τὸν αὐτὸν τρόπον καὶ ὁ πνεύμων. διόπερ τῶν μὲν, μαλακὸν ἐκπίπτει τὸ πνεῦμα, τῶν δὲ, σκληρὸν καὶ βίαιον· ἐπεὶ, διότι γε τὴν ἀρτηρίαν αὐτὴν μικράν τινα συμβαίνει προσδέχεσθαι δύναμιν, ῥᾴδιον συνιδεῖν. οὐδεμία γὰρ ἐστὶν ἀρτηρία σκληρὰ τοῖς αὐλοῖς ὁμοίως· ἀλλ' οὐθὲν ἧττον δι' αὐτοῦ καὶ διὰ τούτων φερομένου τοῦ πνεύματος, οἱ μὲν μαλακῶς αὐλοῦσιν, οἱ δὲ, σκληρῶς.

δῆλον δὲ τοῦτ' ἐστὶ καὶ ἐπ' αὐτῆς τῆς αἰσθήσεως. καὶ γὰρ, ἂν ἐπιτείνῃ τις τὸ πνεῦμα βιαιότερον, εὐθέως ἡ φωνὴ γίνεται σκληροτέρα διὰ τὴν βίαν, κἂν ᾖ μαλακωτέρα. τὸν αὐτὸν δὲ τρόπον καὶ ἐπὶ τῆς σάλπιγγος. διὸ καὶ πάντες, ὅταν ἐπικωμάζωσιν, ἀνιᾶσιν ἐν τῇ σάλπιγγι τὴν τοῦ πνεύματος συντονίαν, ὅπως ἂν ποιῶσι τὸν ἦχον ὡς μαλακώτατον. φανερὸν δέ ἐστι καὶ ἐπὶ τῶν ὀργάνων. καὶ γὰρ αἱ κατεστραμμέναι χορδαί, καθάπερ εἴρηται, τὰς φωνὰς ποιοῦσι σκληροτέρας, καὶ τὰ κατωπτημένα τῶν κεράτων. κἂν τις ἅπτηται τῶν χορδῶν ταῖς χερσὶ βιαίως καὶ μὴ μαλακῶς, ἀνάγκη καὶ τὴν ἀνταπόδοσιν αὐτὰς οὕτω πάλιν ποιεῖσθαι βιαιοτέραν. αἱ δὲ ἧττον κατεστραμμέναι, καὶ τὰ ὠμότερα τῶν κεράτων, τὰς φωνὰς ποιεῖ μαλακωτέρας, καὶ τὰ μακρότερα τῶν ὀργάνων· αἱ γὰρ τοῦ ἀέρος πληγαὶ, καὶ βραδύτεραι καὶ μαλακώτεραι γίνονται, διὰ τὰ μήκη τῶν τόπων· αἱ δ' ἐπὶ τῶν βαρυτέρων, σκληρόταται διὰ τὴν * κατάτασιν τῶν χορδῶν. δῆλον δ' ἐστί· καὶ γὰρ αὐτῶν τοῦ ὀργάνου σκληροτέρας συμβαίνει γίνεσθαι τὰς φωνάς, ὅταν μὴ κατὰ μέσον πιέζηται τῶν χορδῶν, διὰ τὸ μᾶλλον αὐτῶν τὰ πρὸς αὐτοῖς τοῖς ζυγοῖς καὶ τοῖς χορδοτόνοις κατατείνεσθαι. συμβαίνει δὲ καὶ τὰ ναρθήκινα τῶν ὀργάνων τὰς φωνὰς ἔχειν ἁπαλωτέρας. οἱ γὰρ ἦχοι προσπίπτοντες, οὐχ ὁμοίως ἀποπηδῶσι μετὰ βίας. τραχύνεσθαι δὲ συμβαίνει τὰς φωνάς, ὅταν ἡ πληγὴ * μία γίνηται τοῦ ἀέρος πάντως, ἀλλὰ πολλαχῇ κατὰ μικρὰ διεσπασμένη. καθ' αὑτὸ γὰρ ἕκαστον τῶν τοῦ ἀέρος μορίων προσπίπτον πρὸς τὴν ἀκοήν, ὥσπερ ἀπὸ πληγῆς ἑτέρας, οὐ διεσπασμένην ποιεῖ τὴν αἴσθησιν, ὥστε τὴν μὲν διαλείπειν τὴν φωνήν, τὴν δὲ προσπίπτειν βιαιότερον, καὶ γίνεσθαι τὴν ἁφὴν τῆς ἀκοῆς ἀνομοίαν· ὥσπερ καὶ ὅταν τι τῶν τραχέων ἡμῖν προσπίπτῃ πρὸς τὸν χρῶτα. μάλιστα δὲ τοῦτο συμφανές ἐστιν ἐπὶ τῆς ῥίνης. διὰ γὰρ τὸ τὴν τοῦ ἀέρος πληγὴν ἅμα γίνεσθαι κατὰ μικρὰ καὶ πολλά, τραχεῖς οἱ ψόφοι προσπίπτουσιν ἀπ' αὐτῶν πρὸς τὴν ἀκοήν· καὶ μᾶλλον, ὅταν πρὸς σκληρόν τι παρατρίβωνται· καθάπερ καὶ ἐπὶ τῆς ἁφῆς· τὰ γὰρ σκληρὰ καὶ τραχέα, βιαιότερον ποιεῖται τὴν αἴσθησιν. δῆλον δὲ τοῦτό ἐστι καὶ ἐπὶ τῶν ῥευμάτων. τοῦ γὰρ ἐλαίου πολὺ πάντων τῶν ὑγρῶν ὁ ψόφος * εὐδηλότερος, διὰ τὴν συνέχειαν τῶν μορίων. λεπταὶ δέ εἰσι τῶν φωνῶν, ὅταν ὀλίγον ᾖ τὸ πνεῦμα τὸ ἐκπῖπτον. διὸ καὶ τῶν παιδίων γίνονται λεπταί, καὶ τῶν γυναικῶν καὶ τῶν εὐνούχων· ὁμοίως δὲ καὶ τῶν διαλελυμένων διὰ νόσον, ἢ πόνον, ἢ ἀτροφίαν. οὐ δύνανται γὰρ πολὺ τὸ πνεῦμα διὰ τὴν ἀσθένειαν ἐπιπέμπειν. δῆλον δέ ἐστι καὶ ἐπὶ τῶν χορδῶν· ἀπὸ γὰρ τῶν λεπτῶν καὶ τὰ φωνία γίνεται λεπτὰ καὶ στενὰ καὶ τριχώδη, διὰ τὸ καὶ τοῦ ἀέρος τὴν πληγὴν γίνεσθαι κατὰ στενόν. οἵας γὰρ ἂν τὰς ἀρχὰς ἔχωσι τῆς κινήσεως αἱ τοῦ ἀέρος πληγαί, τοιαύτας καὶ τὰς φωνὰς συμβαίνει γίνεσθαι προσπιπτούσας πρὸς τὴν ἀκοήν· οἷον ἀραιὰς ἢ πυκνάς, ἢ μαλακὰς ἢ σκληράς, ἢ λεπτὰς ἢ παχείας. ἀεὶ γὰρ ὁ ἕτερος ἀὴρ τὸν ἕτερον κινῶν ὡσαύτως, ποιεῖ τὴν φωνὴν ἅπασαν ὁμοίαν· καθάπερ ἔχει καὶ ἐπὶ τῆς ὀξύτητος καὶ τῆς βαρύτητος· καὶ γὰρ τὰ τάχη τὰ τῆς πληγῆς, τὰ ἕτερα τοῖς ἑτέροις συνακολουθοῦντα, διαφυλάττει τὰς φωνὰς ταῖς ἀρχαῖς ὁμοίας. αἱ δὲ πληγαὶ γίνονται μὲν τοῦ ἀέρος ὑπὸ τῶν χορδῶν, πολλαὶ καὶ κεχωρισμέναι· διὰ δὲ μικρότητα τοῦ μεταξὺ χρόνου, τῆς ἀκοῆς μὴ δυναμένης συναισθά-

* κ. κατάστασιν
* Qu. μία μὴ γ.
* Sylb. ἀδηλότερος

A quod & ſatis in ipſo ſenſu patet. Nam & ſi quis violentiùs ſpiritum intenderit, vis ſtatim illa vocem duriorem reddiderit, etiamſi mollior ſit: idque eodem modo in tuba. Quocirca omnes cùm comeſſatum eunt, in tuba de ſpiritus contentione remittunt, vt quàm molliſſimum reddãt ſonitum: quod & in inſtrumentis perſpici poteſt. nam & pluſculum tortæ chordæ, vt dictum eſt, voces duriores faciũt, & cornua pluſculum aſſata. & ſi quis tangat chordas manibus violenter, non molliter, neceſſe eſt eas ſic quoque violentius reſpondere. at quæ minus tortæ ſunt, & cornua crudióra, molliores reddunt voces, & organa quoque maiora. Nam aëris percuſſiones, ob locorum ſpatium, & molliores & tardiores exiſtunt: minimorum in-
B ſtumentorum contrà duriſſimæ, ob chordarum tentionem: quod quidem ex eo perſpici poteſt, quia eiuſdem inſtrumenti voces duriores elici cõtingit, cùm quis ad medium chordas non tangit, quòd & ad iugum & chordarum tendiculam vehementius intenduntur. ſed & inſtrumenta è ferula voces habere ſolent teneriores, quod illati ſoni non pari impetu reſiliant. Aſperari autem ſolent voces, cùm aëris totius non vna plaga eſt: ſed multifariam in parua diſtracta. nam quæque aëris particula, per ſe ad aurem accidens, velut ab alia plaga quandam ſenſus diſtractionem facit, vt vox vna intermittat, altera violentius inferatur, & auditus tactus diſpar diſſimiliſque eueniat. vt ſolet
C nobis vſuuenire, cùm quid aſperum in corpus noſtrum cadit. quod in lima intelligi facilè poteſt: quia enim ſimul aër feritur in parua multifariã, vel in minuta & multa, ab eis ad auditũ aſperi ſoni feruntur. magiſq. adeo ſi ad duram materiã atteratur, vt & in tactu accidit. quæ enim dura & aſpera ſunt, violentius ſenſum mouent. idque ſatis in liquidorum fluxu patet. nam olei ex omni humorũ genere ſonus obſcuriſſimus eſt, ob particularum continuationem. Cæterum tenues ſunt voces, cùm exiguus eſt ſpiritus qui exit. quare & puerorũ tenues ſunt & mulierũ & eunuchorum, ſimiliter & morbo defectorum, aut labore, aut alimenti inopia. non enim poſſunt ob imbecillitatem mul-
D tum ſpiritus emittere: idque in neruis patet. nam è tenuibus voculæ tenues, graciles, & quadam pili gracilitate funduntur, propterea quod aëris plaga in anguſto ſit. Qualia enim cunque principia impulſionis aeris plagæ habuerunt, tales proinde voces ad aurem accidere ſolent: verbi gratia raræ aut denſę, molles aut durę, tenues aut craſſæ. Semper enim aër alius alium ſimiliter impellens vocem omnem ſimilem efficit, vt aſſolet in acumine & grauitate. nam & celeritates plagæ aliæ alias conſequentes, ſimiliter ac principia voces conſeruant. plagæ autem aëri à chordis multæ ſeparatæque inflictæ, propter medij temporis exiguitatem, cùm intermiſſiones auditus non
E

poſſit attendere, vna continénſq; nobis vox vidē-atur eſſe, vt & in coloribus. nam & hi interdum diſtantes diſiunctique inter ſe, tamen commiſſi continuique videntur, cùm celeriter mouentur: atque idem iſtud accidit in concentu, quia enim ſoni alij alios aſſequuntur, vnáque tandem deſinunt, interiectæ nos fallunt voces. Sæpius enim in omnibus concentibus ab acutioribus ſonis aër verberatur, ob celeritatem motionis, ſed poſtremum eorum ſonum contingit à nobis ſimul exaudiri, & ſonum grauioris concentus. Itaque cùm ſenſus perſentiſcere non poſſit, vt dictum eſt, medias voces, exiſtimamus nos ſimul perpetuò exaudire vtroſque ſonos. Plenæ contra voces exiſtunt, cùm multus crebérque excurrit ſpiritus: quo fit vt virorum ſint pleniores & craſſiores, perfectarúmque tibiarum: eóque magis ſi quis eas ſpiritu impleuerit. quod ex eo liquet, quia ſi quis iuga preſſerit, acutior & exilior vox editur: & ſi fiſtulas quis dilatet, vel ſi obturet, multiplex vocis magnitudo ob multitudinem ſpiritus exoritur, vt & è craſſioribus fidibus. Sunt & craſſæ hirquitallorum & raucorum, & poſt vomitum ob arterias, & quia non expedita labatur, ſed ibi offendens vox glomerata voluatur, magnitudinémque adipiſcatur, ídque vel maximè ob humorem corporis. Argutæ porrò ſunt voces tenues & crebræ, vt in cicadis & locuſtis & luſciniis, atque adeò illæ omnes quarum gracilitati nullus alienus ſonus conſequitur. Omnino enim neque in magnitudine vocis argutia poſita eſt, neque in tenoris remiſſione & grauitate, neque in phthongorum tactu, ſed potius in acumine, tenuitate, ſubtilitate. Itaque inſtrumenta tenuia contenta cornu carentia, voces habent argutiores. Nam ſonus aquarum, atque in ſumma cùm ab aliquo exortus proſequitur, phthongorum continuationem retinet. fragiles autem ſunt & interruptæ voces, quæ aliquandiu perpetuatæ diſtrahuntur: quod maximè perſpicitur in fictilibus, quæ ex ictu fracta ſonitum fragilem efficiunt: interrupta in ictu motione, vt non iam ſoni exeuntes continui ſint. Quod idem & vſuuenire ſolet in cornibus fractis, & in chordis neruos malè coagmentatos habentibus. horum enim omnium aliquem ad finem perpetuus ſonus fertur, deinde diſſipatur, vbicunque materia non continuata eſt, ita vt non vna fiat plaga ſed interpellata, & ſonus fragilis eſſe videatur. Ferè enim ſimiles exiſtunt aſperis, niſi quòd hæ aliæ ab aliis exiguis particulis diſtractæ ſunt: at fragiles pleræque principia continua habent, deinde in plures partes diuiduntur. Aſpiratæ autem voces ſunt, quibuſcum intus ſpiritum ſtatim anhelamus cum ſonitibus & emittimus. Leues contrà, quæcunque citra ſpiritus anhelitum eduntur. abrumpi autem ſolent voces, cùm iam non poſſunt aërem cum plaga emittere,

A γίνεσθαι τὰς διαλείψεις, μία καὶ συνεχὴς ἡμῖν ἡ φωνὴ
φαίνεται· καθάπερ καὶ ἐπὶ τῶν χρωμάτων. καὶ γὰρ τού-
των τὰ διεστηκότα, δοκεῖ πολλάκις ἡμῖν συνάπτειν ἀλ-
λήλοις, ὅταν φέρωνται ταχέως. τὸ δὲ αὐτὸ συμβαίνει τοῦ-
το καὶ περὶ τὰς συμφωνίας. διὰ γὰρ τὸ περισυγκατα-
λαμβάνεσθαι τοὺς ἑτέρους ἤχους ὑπὸ τῶν ἑτέρων, καὶ γί-
γνεσθαι τὰς καταπαύσεις τῶν ἅμα, λανθάνουσιν ἡμᾶς
αἱ μεταξὺ γιγνόμεναι φωναί. πλεονάκις μὲν γὰρ ἐν πά-
σαις ταῖς συμφωνίαις ὑπὸ τῶν ὀξυτέρων φθόγγων αἱ τοῦ
ἀέρος γίγνονται πληγαὶ διὰ τὸ τάχος τῆς κινήσεως· τὸν δὲ
τελευταῖον τῶν ἤχων ἅμα συμβαίνει προσπίπτειν ἡμῖν
B πρὸς τὴν ἀκοήν, καὶ τὸν ἀπὸ τῆς βραδυτέρας γιγνόμε-
νον. ὥστε τῆς ἀκοῆς οὐ δυναμένης αἰσθάνεσθαι, καθά-
περ εἴρηται, τὰς μεταξὺ φωνάς, ἅμα δοκοῦμεν ἀμφοτέ-
ρων τῶν φθόγγων ἀκούειν συνεχῶς. παχεῖαι δ' εἰσὶ τῶν φω-
νῶν τοὐναντίον, ὅταν ᾖ τὸ πνεῦμα πολὺ καὶ ἀθρόον ἐκ-
πίπτον. διὸ καὶ τῶν ἀνδρῶν εἰσι παχύτεραι καὶ τῶν τε-
λείων αὐλῶν, καὶ μᾶλλον ὅταν πληρώσῃ τις αὐτοὺς τοῦ
πνεύματος. φανερὸν δέ ἐστι· καὶ γὰρ ἂν πιέσῃ τὰ ζεύγη,
μᾶλλον ὀξυτέρα ἡ φωνὴ γίγνεται καὶ λεπτοτέρα. κἂν
κατασπάσῃ τις τὰς σύριγγας, κἂν δὲ ἐπιλάβῃ, παμ-
C πλείων ὁ ὄγκος γίγνεται τῆς φωνῆς διὰ τὸ πλῆθος τοῦ
πνεύματος· καθάπερ καὶ ἀπὸ τῶν παχυτέρων χορδῶν.
παχεῖαι δὲ γίγνονται καὶ τῶν τραχυνόντων καὶ τῶν βραγ-
χώντων, καὶ μετὰ τοὺς ἐμέτους, διὰ τὴν τῆς ἀρτηρίας.
καὶ διὰ τὸ μὴ ὑπεξάγειν, ἀλλ' αὐτοῦ προσκόπτουσαν
ἀνειλεῖσθαι τὴν φωνὴν καὶ λαμβάνειν ὄγκον, καὶ μάλι-
στα διὰ τὴν ὑγρότητα τοῦ σώματος. λιγυραὶ δέ εἰσι τῶν
φωνῶν, αἱ λεπταὶ καὶ πυκναί, καθάπερ καὶ ἐπὶ τῶν τετ-
τίγων καὶ τῶν ἀκρίδων καὶ τῶν ἀηδόνων, καὶ ὅλως ὅσαις
λεπταῖς οὔσαις μηδεὶς ἀλλότριος ἦχος παρακολουθεῖ.
ὅλως γὰρ οὐκ ἔστιν οὔτ' ἐν ὄγκῳ φωνῆς τὸ λιγυρόν, οὔτ'
ἐν τόνοις ἀνειμένοις καὶ βαρέσιν, οὔτ' ἐν ταῖς τῶν φθόγγων
D ἀφαῖς, ἀλλὰ μᾶλλον ὀξύτητι καὶ λεπτότητι καὶ ἀκρι-
βείᾳ. διὸ καὶ τῶν ὀργάνων τὰ λεπτὰ καὶ στενώτερα καὶ μὴ
ἔχοντα κέρας, τὰς φωνὰς ἔχει λιγυρωτέρας. ὁ γὰρ ἀπὸ
τῶν ὑδάτων ἦχος, ὅλως ὅταν ἀπό τινος γιγνόμενος πα-
ρακολουθῇ, συνέχει τὴν ἀκρίβειαν καὶ τῶν φθόγγων. σα-
θραὶ δέ εἰσι καὶ περιερρωγυῖαι τῶν φωνῶν, ὅσαι μέχρι τι-
νὸς φερόμεναι συνεχεῖς, διασπῶνται. φανερώτατον δὲ
τοῦτό ἐστιν ἐπὶ τοῦ κεράμου. πᾶς γὰρ ὁ ἐκ πληγῆς ῥα-
γεὶς, ποιεῖ τὸν ἦχον σαθρόν, διασπωμένης τῆς κινή-
σεως τὰ κατὰ τὴν πληγήν, ὥστε μηκέτι γίγνεσθαι τοὺς
E ἐκπίπτοντας ἤχους συνεχεῖς. ὁμοίως δὲ τοῦτο συμβαί-
νει καὶ ἐπὶ τῶν ἐρρωγότων κεράτων καὶ ἐπὶ τῶν χορδῶν
τῶν παρανενευρισμένων. ἐπὶ πάντων γὰρ τῶν τοιούτων
μέχρι μέν τινος ὁ ἦχος φέρεται συνεχής, ἔπειτα δια-
σπᾶται, καθ' ὅτι ἂν ᾖ μὴ συνεχὲς τὸ ὑποκείμενον,
ὥστε μὴ μίαν γίγνεσθαι πληγήν, ἀλλὰ διεσπασμέ-
νην, καὶ φαίνεσθαι τὸν ἦχον σαθρόν. σχεδὸν γὰρ παραπλήσιαι τυγχάνουσιν οὖσαι ταῖς τραχείαις. πλὴν ἐκεῖ-
ναι μὲν εἰσιν ἀπ' ἀλλήλων κατὰ μικρὰ μέρη διεσπασμέναι. τῶν δὲ σαθρῶν αἱ πλεῖσται τὰς μὲν ἀρχὰς ἔχου-
σαι συνεχεῖς, ἔπειτ' εἰς πλείω μέρη τὴν διαίρεσιν λαμβάνουσι. δασεῖαι δέ εἰσι τῶν φωνῶν ὅσαις ἔσωθεν τὸ πνεῦ-
μα εὐθέως συνεκβάλλομεν μετὰ τῶν φθόγγων. ψιλαὶ δέ εἰσι τοὐναντίον, ὅσαι γίγνονται χωρὶς τῆς τοῦ πνεύματος
ἐκβολῆς. ἀπορρήγνυσθαι δὲ συμβαίνει τὰς φωνάς, ὅταν μηκέτι δύνωνται τὸν ἀέρα μετὰ πληγῆς ἐκπέμπειν,

* Sylb. τὰ σκέλη vel τὰς ἰγνύας pro τὰ σκεύη

ἀλλ' ὁ περὶ τὸν πνεύμονα τόπος αὐτῶν ἀπὸ τῆς διατά- A
σεως ἐκλυθῇ. ὥσπερ γὰρ καὶ * τὰ σκεύη καὶ τοὺς ὤμους ἐκλύεσθαι συμβαίνει τὸ τελευταῖον συντόνως, οὕτως καὶ τὸν περὶ τὸν πνεύμονα τόπον. κοῦφον γὰρ ἔξω φέρεσθαι τὸ πνεῦμα, διὰ τὸ μὴ γίνεσθαι βίαιον αὐτοῦ τὴν πληγήν· ἅμα δὲ καὶ διὰ τὸ τετραχῦνθαι τὴν ἀρτηρίαν αὐτῶν ἰσχυρῶς, οὐ δύναται τὸ πνεῦμα ἔξω φέρεσθαι συνεχές, ἀλλὰ διεσπασμένον, ὡς ἀπερρωγυίας γίνεσθαι τὰς φωνὰς αὐτῶν. καί τινες οἴονται διὰ τὴν τοῦ πνεύμονος γλισχρότητα, τὸ πνεῦμα οὐ δύνασθαι πορεύεσθαι B
περὶ τὸν ἔξω τόπον, διαμαρτάνοντες· φθέγγονται μὲν γάρ, ἀλλ' οὐ δύνανται γεγωνεῖν, διὰ τὸ μὴ γίνεσθαι μετὰ συντονίας τὴν τοῦ ἀέρος πληγήν, ἀλλὰ μόνον φωνοῦσιν, ὡς ἂν ὑπ' αὐτοῦ τοῦ φάρυγγος τὸ πνεῦμα βιαζόμενοι. τῶν δ' ἰσχνοφώνων, οὔτε περὶ τὰς φλέβας, οὔτε περὶ τὰς ἀρτηρίας ἐστὶ τὸ πάθος, ἀλλὰ περὶ τὴν κίνησιν τῆς γλώττης. χαλεπῶς γὰρ αὐτὴν μεταφέρουσιν, ὅταν ἕτερον δέῃ φθόγγον εἰπεῖν. διὸ καὶ πολὺν χρόνον τὸ αὐτὸ ῥῆμα C
λέγουσιν, οὐ δυνάμενοι τὸ ἑξῆς εἰπεῖν· ἀλλὰ συνεχοῦς τῆς κινήσεως καὶ τοῦ * πνεύμονος αὐτῶν ἐπὶ τὴν αὐτὴν ὁρμὴν φερομένου διὰ τὸ πλῆθος, καὶ τὴν βίαν τοῦ πνεύματος. ὥσπερ γὰρ καὶ τὸ σῶμα ὅλον τῶν τρεχόντων βιαίως, χαλεπόν ἐστιν ἐκ τῆς ὁρμῆς εἰς ἄλλην κίνησιν μεταστῆσαι, τὸν αὐτὸν τρόπον καὶ κατὰ μέρος. διὸ καὶ πολλάκις τὸ μὲν ἑξῆς εἰπεῖν οὐ δύνανται, τὸ δὲ μετὰ τοῦτο λέγουσι ῥᾳδίως, ὅταν ἄλλην ποιήσωνται τῆς κινήσεως ἀρχήν. δῆλον δέ ἐστι· καὶ γὰρ τοῖς ὀργιζομένοις τοῦτο συμβαίνει πολλάκις, διὰ τὸ βίαιον αὐτῶν γίγνεσθαι τὴν τοῦ πνεύματος φοράν.

* Qu. πνεύματος

ſed pulmonum regio ob dilatationem laborat & ſoluitur. vt enim & vaſa & humeros tandem ob conatum debilitari contingit atque laborare, ſic & pulmonum regionem. Leuis enim foras exit ſpiritus, quòd non violenta plaga exprimatur: ſimul quia eorum vehementer exaſperatur arteria, non poteſt ſpiritus foras continuè erumpere, ſed diremptus, vt interruptæ ipſorum voces ſint. ac nonnulli arbitrantur, ob pulmonum lentorem, ſpiritum non poſſe foras commeare: qui in errore verſantur. ſonant enim, ſed non argutè nec clarè: quòd robur & contentionem non habeat aëris plaga, ſed tantùm ita vocales ſunt, vt cunque ſpiritus per fauces vi eliditur. Eorum autem qui hæſitantia vocis laborant vitium neque in venis, neque in arteriis hæret, ſed in linguæ motu. Ægrè enim eam transferunt, cùm alium ſonitum edere oportet. itaque idem verbum diutius loquuntur, proximum eloqui cùm nequeant: ſed perpetuò idem eſt impetus, eorúmque pulmones, ob copiam vimque ſpiritus, eadem impulſione cientur. Vt enim & totum corpus currentium vehementer & concitatiſſimè, ex impetu in alium motum traducere difficile eſt, eodem ſanè modo & in parte accidit. proinde ſæpenumero verbum proximum effari non poſſunt, quod poſtea ſequitur nullo negotio eloquuntur, vbi aliud motus principium ceperint: quod ex iratis facilè intelligi poteſt, quibus hoc ipſum ſæpe accidit ex violento ſpiritus impetu.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΧΡΩΜΑΤΩΝ.

ARISTOTELIS STAGIRITÆ DE COLORIBVS LIBER.

Cœlio Calcagnino interprete.

CAPVT I.

De ſimplicibus coloribus.

A

EX Coloribvs hi ſimplices ſunt, quicunque elementorum naturam conſequuntur, ignis puta, aëris, aquæ, terræ. Nam aër & aqua ſuopte ingenio alba ſunt: ignis contrà & Sol flauo colore cenſentur: terra rurſus natura ſua alba eſt: intinctionis autem cauſa ſeſe multicolorem oſtendit. B Id confeſſum facit cinis. Aduſto enim humido tincturæ opifice, albus redditur cinis: ſed non planè albus, quòd fumo ſcilicet intingatur, qui niger exiſtit. Ob id & lixiuium flauum efficitur, eo ſcilicet, quod flammeum eſt, & nigrum, in aquam colorem inuehente. Atqui niger color conſequitur elementa, quoties inuicem commutantur. Reliqui autem, medij ſcilicet colores, ex iis facilè intelligi poſſunt, reciproca admiſtione ſuperueniente. Lucis autem deliquio obſcuritas. Trib. C præterea modis niger color nobis occurrit: vel cùm planè quod videtur, ſua natura nigrũ eſt: vel cùm ab iis quæ viſilia ſunt, nulla omnino lux ad viſum defertur. Quod enim non videtur, cùm locus ambiens videatur, ſpeciem præbet nigri. Occurrunt & alia omnia huiuſmodi nigra, à quibus & rara, & exigua lux reſilit: ob id & nigræ apparent vmbræ. Eodem modo aqua nigreſcit, exaſperata, & fluctibus percita, cùm ſcilicet mare inhorruerit: laceſſita enim & incitata ſuperficie, paucis in eam radiis incidentibus, luce iam diuulſa, ac diſſipata, vmbroſum ipſum nigrum ſe offert. D Nubes etiam, cùm egregiè denſa eſt, eadem ratione nigra exiſtimatur. Ob hæc & cum iis aqua & aër, non penetrante omnino luce, nigræ itidem videntur, cùm profunditatem habeant, ob id quòd rari admodum replodantur radij: ſiquidem lucem, quæ in ipſis eſt, intercurrentes particulæ, omnes nigræ videntur obſcuritatis gratia. Quòd autem obſcuritas non ſit color, ſed lucis priuatio, haud ſanè difficile eſt ex aliis multis cognoſcere, tum ex eo præcipuè, quòd non eſt intelligi, quanta, aut quali forma obſcuritas ſub ſenſum cadat, ceu ſolent reliqua viſilia.

ΚΕΦΑΛ. α΄.

Ποῖά ἐστι καὶ πόσα τὰ ἁπλᾶ τῶν χρωμάτων.

Α

ἉΠΛΑ τῶν χρωμάτων ἐστὶν, ὅσα τοῖς στοιχείοις συνακολουθεῖ· οἷον πυρὶ καὶ ἀέρι, καὶ ὕδατι, καὶ γῇ. ἀὴρ μὲν γὰρ καὶ ὕδωρ, καθ' ἑαυτὰ τῇ φύσει λευκά· τὸ δὲ πῦρ καὶ ὁ ἥλιος, ξανθά. καὶ ἡ γῆ δὲ, [ἐστὶ] φύσει λευκή· παρὰ δὲ τὴν βαφὴν, πολύχρους B φαίνεται. δῆλον δ' ἐπὶ τῆς τέφρας τοῦτ' ἐστίν. ἐκκαυθέντος γὰρ τοῦ τὴν βαφὴν πεποιηκότος ὑγροῦ, λευκὴ γίνεται· οὐ παντελῶς δὲ, διὰ τὸ τῷ καπνῷ βεβάφθαι, μέλανι ὄντι. διὸ καὶ ἡ κονία ξανθὴ γίνεται, τοῦ φλογοειδοῦς καὶ μέλανος ἐπιχρώζοντος τὸ ὕδωρ. τὸ δὲ μέλαν χρῶμα συνακολουθεῖ τοῖς στοιχείοις, εἰς ἄλληλα * μεταβάλλουσι. *γ. μεταβαλλόντων.* τὰ δ' ἄλλα ἐκ τούτων εὐσύνοπτα, τῇ μίξει κεραννυμένων ἀλλήλοις γίγνεται. τὸ δὲ σκότος, ἐκλείποντος τοῦ φωτὸς γίνεται. * τριχῇ γὰρ τὸ μέλαν ἡμῖν φαίνεται. *γ. τριχῶς* C ἢ γὰρ ὅλως τὸ μὴ ὁρώμενον ἐστὶ τῇ φύσει * μέλαν, ἢ ἀφ' ὧν *γ. μέλαν· ἀπὸ πάντων γὰρ τῶν τοιούτων ἀνακλᾶταί τι φῶς μέλαν.* μηδὲν ὅλως φέρεται φῶς πρὸς τὰς ὄψεις. τὸ γὰρ μὴ ὁρώμενον, ὅταν ὁ περιέχων τόπος ὁρᾶται, φαντασίαν ποιεῖ μέλανος. φαίνεται δὲ καὶ τὰ τοιαῦτα ἡμῖν ἅπαντα μέλανα, ἀφ' ὅσων ἀραιὸν καὶ ὀλίγον ἀνακλᾶται τὸ φῶς. διὸ καὶ αἱ σκιαὶ φαίνονται μέλαιναι. ὁμοίως δὲ καὶ τὸ ὕδωρ, ὅταν τραχυνθῇ, καθάπερ ἡ τῆς θαλάττης φρίκη. διὰ γὰρ τὴν τῆς ἐπιφανείας τραχύτητα, ὀλίγων τῶν αὐγῶν προσπιπτουσῶν, καὶ διασπωμένου τοῦ φωτὸς, τὸ σκιερὸν μέλαν D φαίνεται· καὶ τὸ νέφος, ὅταν ᾖ πυκνὸν ἰσχυρῶς, [μέλαν φαίνεται] διὰ τοῦτο. κατὰ τὰ αὐτὰ δὲ τούτοις καὶ τὸ ὕδωρ καὶ ὁ ἀὴρ, ὅταν ᾖ μὴ παντελῶς * διαδύνον τὸ φῶς. καὶ γὰρ ταῦτα *γ. διαπῖπτον* εἶναι δοκεῖ μέλανα, βάθος ἔχοντα, διὰ τὸ παντελῶς ἀραιὰς ἀνακλᾶσθαι τὰς ἀκτῖνας. τὰ γὰρ μεταξὺ μέρη τοῦ φωτὸς αὐτῶν, ἅπαντα εἶναι δοκεῖ μέλανα, διὰ τὸ σκότος. ὅτι δὲ τὸ σκότος οὐ χρῶμα, ἀλλὰ στέρησίς ἐστι φωτὸς, οὐ χαλεπὸν ἐξ ἄλλων τε πολλῶν καταμαθεῖν, καὶ μάλιστα ἐκ τοῦ μηδὲ αἰσθητὸν εἶναι τὸ πηλίκον καὶ ποῖόν τι τῷ σχήματι τετύχηκεν ὂν τὸ σκότος, καθάπερ ἐπὶ τῶν ἄλλων ὁρατῶν.

Τὸ δὲ φῶς ὅτι πυρός ἐστι χρῶμα, δῆλον ἐκ τοῦ μηδεμίαν ἄλλην ἢ ταύτην ἔχον εὑρίσκεσθαι χρόαν, *καὶ διὰ τὸ μόνον τοῦτο δι' ἑαυτοῦ ὁρατὸν γίνεσθαι, τὰ δ' ἄλλα διὰ τούτου. ἐπισκεπτέον δὲ τοῦτο. ἔνια γὰρ οὐκ ὄντα πῦρ, *οὐδὲ πυρὸς εἶδος τὴν φύσιν, φῶς ποιεῖν φαίνεται. εἰ μὴ ἄρα τὸ μὲν τοῦ πυρὸς χρῶμα φῶς ἐστι, οὐ μέντοι καὶ τὸ φῶς πυρός ἐστι χρῶμα μόνον, ἀλλ' ἐνδέχεται μὴ μόνῳ μὲν ὑπάρχειν τῷ πυρὶ τὴν χροιὰν ταύτην, εἶναι μέντοι χρῶμα τὸ φῶς αὐτοῦ. οὐδενὶ γοῦν ἄλλῳ τὴν ὅρασιν αὐτοῦ συμβαίνει γίνεσθαι, πλὴν τῷ φωτί· καθάπερ καὶ τὴν τῶν ἄλλων σωμάτων ἁπάντων, τῇ τοῦ σώματος φαντασίᾳ. τὸ δὲ μέλαν χρῶμα συμβαίνει γίνεσθαι, ὅταν ὁ ἀὴρ καὶ τὸ ὕδωρ ὑπὸ τοῦ πυρὸς διακαυθῇ. διὸ καὶ πάντα τὰ καόμενα μελαίνεται, καθάπερ ξύλα καὶ ἄνθρακες, σβεσθέντος τοῦ πυρός. καὶ ὁ ἐκ τοῦ κεράμου καπνός, ἐκκρινομένου τοῦ ἐνυπάρχοντος ἐν τῷ κεράμῳ ὑγροῦ, καὶ καομένου. διὸ καὶ τοῦ καπνοῦ γίνεται μελάντατος, ὁ ἀπὸ τῶν πιόνων καὶ λιπαρῶν, οἷον ἐλαίου, καὶ πίττης, καὶ δᾳδός, διὰ τὸ μάλιστα ταῦτα κάεσθαι, καὶ συνέχειαν ποιεῖν. μέλανα δὲ καὶ ταῦτα γίνεται, δι' ὅσων ῥεῖ τὸ ὕδωρ, ὅταν βρυωθέντων πρότερον ἀναξηρανθῇ τὸ ὑγρόν, καθάπερ καὶ τὰ ἐν τοῖς τοίχοις κονιάματα. ὁμοίως δὲ καὶ οἱ καθ' ὕδατος λίθοι. καὶ γὰρ οὗτοι βρυωθέντες, ὕστερον ἀποξηρανθέντες, τῷ χρώματι γίνονται μέλανες. τὰ μὲν οὖν ἁπλᾶ τῶν χρωμάτων, ταῦτα καὶ τοσαῦτά ἐστι.

* κ. ἢ διὰ τὸ μόνον τὸ.

* Scrib. οὐδὲ πυρὸς ὂν τὴν φ.

A Quòd autem lux ignis color ſit, ex hoc perſuaſum eſſe poteſt, quòd nullus alius præter hunc ignis color inuenitur: & ob id ſolus hic per ſe viſilis exiſtit, cùm cætera viſilia euadunt huius beneficio. Illud verò dignum animaduerſione, nonnulla eſſe ab igne diuerſa, quæque ignis naturam non habeant, & ea tamen lucem reddere. Et ſi igitur ignis color lux ſit, non tamen ignis ſolius color eſt. Nulli quippe alteri poſſumus ignis aſpectum ferre acceptum, niſi luci: ſicvti & omnium aliorum corporum, quà corporum imaginem præ ſe ferunt. Tunc verò nigrum colorem effici vſui venit, cùm aër & aqua igne aduſta ſunt: propter quod & omnia aduſta nigreſcunt, ſicvt ligna, & carbones extincto iam igne. Eodem modo B nigreſcit fumus exhalans è laterculo fictili, cùm inſitum laterculo humidum ſecernitur, & aduritur. Eadem ratio reddit fumum, qui à pinguibus adipoſiſque prouenit, nigerrimum: oleo puta, pice, tæda: quòd hæc maximè adurantur, continuáſque partes faciant. Nigra quoque illa fiunt, per quæ aqua effluit, cùm primo irrigatis ac perplutis humidum exiccatur: quod in tectoriis parietum eſt animaduerti. Pari pacto & aquatici lapides muſco contecti primùm, mox areſcentes atrum colorem contrahunt. Ex coloribus igitur tot ſunt, ac tales, qui ſimplices vocantur.

C

ΚΕΦΑΛ. β.

Περὶ τῶν συνθέτων χρωμάτων.

Τὰ δ' ἄλλα ἐκ τούτων τῇ κράσει, καὶ τῷ μᾶλλον καὶ τῷ ἧττον γιγνόμενα, πολλὰς καὶ ποικίλας ποιεῖ χρωμάτων φαντασίας. κατὰ μὲν τὸ μᾶλλον καὶ [τὸ] ἧττον, ὥσπερ τὸ φοινικοῦν καὶ τὸ *ἀλουργόν· κατὰ δὲ τὴν κρᾶσιν, ὥσπερ τὸ λευκόν, καὶ τὸ μέλαν, ὅταν μιχθέντα, φαιοῦ ποιήσῃ φαντασίαν. διὸ τὸ μέλαν καὶ σκιερὸν τῷ φωτὶ μιγνύμενον, φοινικοῦν. τὸ γὰρ μέλαν μιγνύμενον τῷ τε ἀπὸ τοῦ ἡλίου, καὶ τῷ ἀπὸ τοῦ πυρὸς φωτί, θεωροῦμεν ἀεὶ γιγνόμενον φοινικοῦν· καὶ τὰ μέλανα πυρωθέντα πάντα, εἰς χρῶμα μεταβάλλοντα φοινικοῦν. αἵ τε γὰρ καπνώδεις φλόγες, καὶ οἱ ἄνθρακες, ὅταν ὦσι διακεκαυμένοι, φαίνονται χρῶμα ἔχοντες φοινικοῦν. τὸ δ' ἀλουργές, εὐανθὲς μὲν γίνεται καὶ λαμπρόν, ὅταν τῷ μετρίῳ λευκῷ καὶ σκιερῷ κραθῶσιν ἀσθενεῖς αἱ τοῦ ἡλίου αὐγαί. διὸ καὶ περὶ ἀνατολὰς καὶ δύσεις, ὁ ἀὴρ πορφυροειδής ἐστιν, ὅτε φαίνεται περὶ ἀνατολὴν καὶ δύσιν ὄντος τοῦ ἡλίου. ἀσθενεῖς γὰρ οὖσαι τότε μάλιστα, πρὸς σκιερὸν ὄντα τὸν ἀέρα προσβάλλουσιν. φαίνεται δὲ καὶ ἡ θάλαττα πορφυροειδής, ὅταν τὰ κύματα μετεωριζόμενα, κατὰ τὴν ἔγκλισιν σκιασθῇ. πρὸς γὰρ τὸν ταύτης κλισμόν, ἀσθενεῖς αἱ τοῦ ἡλίου αὐγαὶ προσβάλλουσαι, ποιοῦσι φαίνεσθαι τὸ χρῶμα ἀλουργές· ὃ καὶ ἐπὶ τῶν πτερωμάτων θεωρεῖται γιγνόμενον· ἐκτεινόμενα γάρ πως πρὸς τὸ φῶς, ἀλουργὲς ἔχει τὸ χρῶμα. ἐλάττονος δὲ τοῦ φωτὸς προσβάλλοντος, ζοφερόν, ὃ καλοῦσιν *ὄρφνινον·* πολὺ δὲ καὶ τῷ πρώτῳ μέλανι κραθέν, φοινικοῦν. εὐανθὲς δ' ὂν καὶ εἷλκον, εἰς τὸ φλογοειδὲς χρῶμα μεταβάλλει.

* κ. ἀλουργές.

* κ. ὄρφνινον.

* κ. πολὺ δὲ τῷ πρώτῳ κρ.

CAPVT II.

De coloribus aliis qui ex ſimplicium temperamento oriuntur.

At reliqui ex horum fiunt temperamento, provt maior minórve fuerit admiſtio. Atque ita multas variáſque reddunt colorum ſpecies ſecundùm plus & minus: id eſt, provt intenſiores remiſſioréſve fuerint admiſtiones, quale eſt puniceum, & purpureum. Dicti autem temperamenti exemplum ſit album & nigrum, quæ commiſta imaginem præbent medij illius, quod φαιὸν Græci, nos pullum, ſiue fuſcum appellare poſſu- D mus. Proinde, & nigrum, & vmbroſum luci permiſtum, puniceum oſtendit. Si enim nigrum ei admiſceatur, quæ à Sole, vel ab igne emanat, luci, puniceum ſemper reddi intuemur: & nigra omnia ſimul ac incenſa ſunt, in puniceum abeunt colorem. Nam & fumidæ flammæ, & carbones, donec accenſi ſunt, puniceum colorem habent. At purpureum illud, floridum, atque illuſtre euadit, ſi id medioctri albo vmbroſóque, tenues & iam fracti Solis radij contemperent. Proinde in orientua & occidua parte aër purpureum colorem induit, tunc cùm Sol vel occidit, vel emergit: quòd eo tempore infirmi admodum atque imbecilles radij, obſcurum aërem percellant. Quin & mare purpureum ſeſe offert, cùm ſublati fluctus ſecun- E dùm impulſum inclinationémque maris inumbrantur: infirmi enim Solis radij ad maris ſubſidentiam coniecti, purpureum colorem oculis obiiciunt. Idem hoc euenire in auium pennis animaduertitur: extenſæ enim atque explicatæ certo modo ad lucem, purpureum colorem reddunt. Quòd ſi minor lux affulſerit, in ζοφερὸν, id eſt, obſcurum, abit, quem & Græci ὄρφνινον, id eſt, opacum, appellant. Quod ſi liberaliter nigro primæ notæ conditum ferit, puniceum euadit. Quòd ſi floridum, & coruſcans fuerit, in flammeum tranſmutatur.

A Nam quod dicimus, ſecundùm mutuum temperamentum, colorum diuerſitatem effici: ita accipiendum eſt, ceu ſi dicamus, ex ſubiecto & aſpectui noſtro propoſito colore, miſtionem fieri. Nec tamen ob id parem omnium generationem fieri putandum eſt: eſt enim proprium colorum munus, non ſimpliciter, ſed ad aliquam miſtorum rationem habere. Habent ſiquidem ad quempiam commiſtorum reſpectum: quemadmodum ſimplicia, quatenus ſimplicia ſunt, inuicem atque atque inter ſe reſpectum habent. Neque clarum & perſpectum eſt eodem in omnibus vtendum eſſe apparatu. Cùm enim de purpurei vel punicei temperamento verba facimus, neceſſe eſt ex iis permiſtis, & diuerſum colorem facientibus, perſimilem generationem enarrare, nec tamen eandem ſpeciem & apparentiam tribuere. B Quapropter aſſumendum ac proſpiciendum eſt temperamentum ex eo qui præceſſit apparatu: ſicvti cùm color οἰνωπὸς, id eſt, vinoſus, efficitur, ſi ſplendor aëreus puro ac minimè diluto nigro, eodémque coruſcanti contemperetur: quales botryorum acini, quorum planè color œnopus, id eſt, vinoſus, agnoſcitur, cùm matureſcunt. Nam deinde nigreſcentes puniceum habent, quem poſtmodum in purpureum commutant. Dignum autem eſt obſeruatione, omnes colorum differentias ad eum modum fieri, quem ſubſcripſimus. Ex motu enim & tranſitu coloris in colorem dum commiſcentur, differentiæ variantur, & ſimilitudinem accipiunt ſecundùm id quod ſe offert aſpectui: atque ita in vnoquoque commiſtionem exæquant, ex multis vnum colorum concentum reddentes, ita C vt nullus cernatur, cernantur tamen omnes, per partes confuſas, ac permiſtas. Ex qua quidem concretione & contemperatione, vna ſpecies vnúſque proſpectus euadit, qui colorum multitudini in vnam imaginem coaleſcenti fidem facit. Oportet autem hæc omnia in diſquiſitionem vocare, non vt pictores vocant, hos colores ſimul atterentes, ſed ex iis quæ dicta ſunt, rationem habentes refractorum radiorum, qui ad inuicem iaciuntur, & collimant: ſic enim quiſpiam poſſit ex præſcripto naturæ colorum temperamenta ſpectare. Ad veritatem autem certáſque ſimilitudines deprehendendas, oportet habere cognitas ac perſpectas procreationes & colorum ipſorum natales. Atqui horum cauſam optimatem dicimus lucem Solis, lucem ignis, aërem præterea, & a- D quam. Nam hæc plus aut minùs contemperata, omnes, vt ita dicam, colores perficiunt. Eadem indagine & aliorum colorum, qui radiis permiſcentur, imaginem & ſimilitudinem explorari oportet: quandoquidē & carbones & fumus & ærugo & ſulphur & pennæ auium contemperatæ, hæ quidem cum radiis Solis, hæ verò cum ſplendore ignis multas ac varias faciunt colorum commutationes. Sunt & quæ à concoctione ac maturitate conſideranda ſunt: qualia quæ fiunt in plantis, in fructibus, in capillis, & pennis auium, & cæteris aliis huiuſmodi.

κατὰ γὰρ τὴν πρὸς ἄλληλα κρᾶσιν, οὕτως ληπτέον, ἐξ ὑποκειμένου τεθεωρημένου χρώματος ποιοῦντας τὴν μίξιν, ἀλλὰ μὴ πάντων ὁμοίαν γένεσιν ποιοῦντας. ἔστι γὰρ ἴδια τῶν χρωμάτων, οὐχ* ἁπλᾶ μὲν, λόγον δ' ἔχει πρός τινα τὸν αὐτὸν τῶν συνθέτων, ὥσπερ τὰ ἁπλᾶ πρὸς ἑαυτά, διὰ τὸ τὰ ἁπλᾶ πρὸς μίξιν εἶδος ἔχειν, καὶ μὴ ἄσημον ἐν τῷ παντὶ, καὶ προτεθεωρημένον κατασκευάζειν ὁμοίως. τὴν γὰρ τοῦ ἁλουργοῦ ἢ φοινικοῦ κρᾶσιν λέγοντας, ἀνάγκη ὁμοίως τοῖς ἐκ τούτων μιγνυμένοις, καὶ ποιοῦσιν ἄλλην χρόαν τὴν γένεσιν διηγεῖσθαι, καὶ ὁμοίαν ἔμφασιν ποιεῖν. διόπερ ἐκ τοῦ προκατεσκευασμένου ληπτέον καὶ θεωρητέον τὴν κρᾶσιν, οἷον ὅτι τὸ οἰνωπὸν χρῶμα γίνεται, ὅταν ἀκράτῳ τῷ μέλανι καὶ στίλβοντι κραθῶσιν αὐγαὶ ἠεροειδεῖς, ὥσπερ καὶ αἱ τῶν βοτρύων ῥᾶγες. καὶ γὰρ τούτων οἰνωπὸν φαίνεται τὸ χρῶμα ἐν τῷ πεπαίνεσθαι· μελαινομένων δὲ, τὸ φοινικοῦν εἰς τὸ ἁλουργὸν μεταβάλλει. κατὰ δὲ τὸν ὑποδεδειγμένον τρόπον, θεωρητέον πάσας τὰς τῶν χρωμάτων διαφοράς,* ἐκ κινήσεως τὴν ὁμοιότητα λαμβάνοντας* κατ' αὐτὸ τὸ φαινόμενον, τὴν ἐν ἑκάστῳ μίξιν ὁμοιοῦντας, καὶ ἐπὶ τῶν κατὰ μέρος, ἐν γενέσει τινὶ καὶ κράσει ποιουμένων φαντασίαν, καὶ πίστιν προσφερομένους. δεῖ δὲ καὶ πάντων τούτων ποιεῖσθαι τὴν θεωρίαν, μὴ καθάπερ οἱ ζωγράφοι τὰ χρώματα ταῦτα κεραννύντας, ἀλλ' ἀπὸ τῶν εἰρημένων τὰς ἀνακλωμένας αὐγὰς, πρὸς ἀλλήλας συμβάλλοντας. μάλιστα γὰρ δύναιτ' ἄν τις κατὰ φύσιν θεωρῆσαι τὰς τῶν χρωμάτων κράσεις· τὰς δὲ πίστεις καὶ τὰ ὅμοια δεῖ [ἐκ τούτων λαβεῖν] ἐν οἷς ἡ γένεσις ἔσται φανερὰ τῶν χρωμάτων. ταῦτα δὲ μάλιστά ἐστι, τό τε ἀπὸ τοῦ ἡλίου φῶς, καὶ τὸ ἀπὸ τοῦ πυρὸς, καὶ ὁ ἀὴρ καὶ τὸ ὕδωρ. κεραννύμενα γὰρ τῷ μᾶλλον καὶ ἧττον, ταῦτα μάλιστα πάσας (ὡς εἰπεῖν) τὰς χρόας ἀποτελεῖ. ἐπιληπτέον δὲ* καὶ ἀπὸ τῶν ἄλλων χρωμάτων ταῖς αὐγαῖς κεραννυμένων, τὴν ὁμοιότητα. οἱ γὰρ ἄνθρακες καὶ ὁ καπνὸς, καὶ ὁ ἰὸς, καὶ τὸ θεῖον, καὶ τὰ πτερώματα κεραννύμενα, τὰ μὲν ταῖς τοῦ ἡλίου αὐγαῖς, τὰ δὲ ταῖς τοῦ πυρὸς, πολλὰς καὶ ποικίλας ποιοῦσι μεταβολὰς χρωμάτων. τὰ δὲ καὶ τῇ πέψει θεωρητέον, γινόμενα ἐν φυτοῖς, καὶ καρποῖς, καὶ τριχώμασι, καὶ τοῖς τοιούτοις πᾶσι.

* κ. ἁπλῶς

* κ. πλανήσεως.

* κ. καθ' αὐτὸ

* κ. ἐπὶ τῶν ἀ. Totus locus variè legitur, vide Portium.

CAPVT III.

Cauſæ multiformis illius & infinitæ colorum multitudinis.

E At illud neminem latêre debet, multiformem & infinitam illā colorum multitudinē quot modis fieri contingat. Eius rei hanc cauſam obſeruauimus, quòd à luce & vmbris, inæquales, & ſine ratione conſiant temperaturæ. Nam lux & vmbræ, ſecundùm plus & minus, varias inuehunt differentias: vt primò ſecundùm ſeipſas, mox ad-

ΚΕΦΑΛ. γ.

Τὸ πολυειδὲς καὶ τὸ ἄπειρον τῶν χρωμάτων διὰ πόσα συμβαίνει γίνεσθαι.

Δεῖ δὲ μὴ λανθάνειν τὸ πολυειδὲς καὶ τὸ ἄπειρον τῶν χρωμάτων, διὰ πόσα συμβαίνει γίνεσθαι. εὑρήσομεν γὰρ, ἤτοι διὰ τὸ τῷ φωτὶ καὶ ταῖς σκιαῖς ἀνίσως καὶ ἀνωμάλως τὰς κράσεις λαμβάνεσθαι· καὶ γὰρ αἱ σκιαὶ καὶ τὸ φῶς κατὰ τὸ μᾶλλον καὶ ἧττον, πολὺ διαφέρουσιν αὐτῶν. ὥστε καὶ καθ' αὐτὰς καὶ μετὰ τῶν

χρωμάτων μιγνύμεναι, ποιοῦσι μεταβολὰς χρωμάτων, ἢ τῷ τὰ κεραννύμενα, τῷ πλήθει καὶ ταῖς δυνάμεσι διαφέρειν, ἢ τῷ λόγους ἔχειν μὴ τοὺς αὐτούς. πολλὰς γὰρ καὶ τὸ ἁλουργὲς ἔχει καθ' αὑτὸ [τὰς] τὰς διαφοράς, καὶ τὸ φοινικοῦν, καὶ τὸ λευκόν, καὶ τῶν ἄλλων ἕκαστον, καὶ κατὰ τὸ μᾶλλον καὶ ἧττον, καὶ κατὰ τὴν πρὸς ἄλληλα μίξιν, καὶ εἰλικρίνειαν αὐτῶν. ποιεῖ δὲ διαφορὰν καὶ τὸ λαμπρὸν ἢ στίλβον εἶναι τὸ μιγνύμενον· ἢ τοὐναντίον, αὐχμηρὸν καὶ ἀλαμπές. ἔστι δὲ τὸ στίλβον, οὐκ ἄλλο τι ἢ ἡ συνέχεια φωτὸς καὶ πυκνότης. τὸ δὲ χρυσοειδὲς γίνεται, ὅταν τὸ ξανθὸν καὶ τὸ ἡλιῶδες πυκνωθὲν ἰσχυρῶς, στίλβῃ. διὸ καὶ οἱ τῶν περιστερῶν τράχηλοι, καὶ τῶν ὑδάτων οἱ σταλαγμοί, φαίνονται χρυσοειδεῖς, τοῦ φωτὸς ἀνακλωμένου. ἔστι δὲ ἃ λειούμενα τρίψει καὶ δυνάμεσί τισιν, ἀλλοίας ἴσχει καὶ ποικίλας χρόας, ὥσπερ καὶ ὁ ἄργυρος παρατριβόμενος, καὶ χρυσός, καὶ χαλκός, καὶ σίδηρος. καί τινα γένη λίθων διαφόρους ποιεῖ χρόας, [καθάπερ καὶ μέλαιναι οὖσαι, λευκὰς γράφουσι γραμμάς, διὰ τὸ πάντων τῶν τοιούτων, τὰς μὲν ἐξ ἀρχῆς συστάσεις, ἐκ μικρῶν εἶναι μορίων, καὶ πυκνῶν, καὶ μελάνων. ὑπὸ δὲ τῆς ἐν τῷ γίνεσθαι βαφῆς, ἁπάντων τῶν πόρων κεχρωσμένων, δι' ὧν διελήλυθεν αὐτῶν ἡ βαφή, ἄλλην ἐσχηκέναι τὴν τοῦ χρώματος φαντασίαν. ὁ δ' ἀποτριβόμενος ἀπ' αὐτῶν, οὐκέτι γίνεται χρυσοειδής, οὐδὲ χαλκοειδής, οὐδ' ἄλλην οὐδεμίαν [τοιαύτην] ἔχων χρόαν, ἀλλὰ πάντως μέλας, διὰ τὸ τοὺς μὲν πόρους παρατριβομένων αὐτῶν, διαρρήγνυσθαι, δι' ὧν ἡ βαφὴ διελήλυθε, φύσει δὲ καὶ τῶν αὐτῶν εἶναι.] τοῦ γὰρ προτέρου [τούτων] χρώματος οὐκέτι ὄντος ἡμῖν φανεροῦ, διὰ τὸ διασπᾶσθαι τὴν βαφὴν [ἐν τῇ τρίψει,] τὸ κατὰ φύσιν ὑπάρχον αὐτοῖς χρῶμα ὁρῶμεν. διὸ καὶ πάντα φαίνεται μέλανα. ἐν δὲ τῷ παρατρίβεσθαι πρὸς ὁμαλὲς καὶ λεῖον ἕκαστον τούτων, καθάπερ καὶ πρὸς τὰς βασάνους, ἀποβάλλοντα τὸ ἐνὸν αὐτοῖς χρῶμα, τὸ μέλαν δηλονότι, ἀπολαμβάνει πάλιν τὴν ἀπὸ γενέσεως χρόαν, [ἐν τῇ συναφῇ καὶ συνεχείᾳ, τὸ τῆς βαφῆς διαφαινόμενον.] ἔτι δὲ τῶν καυστῶν, καὶ διαλυομένων καὶ τηκομένων ἐν τῷ πυρί, ταῦτα πλείστας ἔχει χρόας, ὅσων ὁ καπνός ἐστι λεπτὸς καὶ ἀεροειδής, καὶ τὰ χρώματα σκιώδη· ὥσπερ ὅ,τε ἀπὸ τοῦ θείου, καὶ τῶν ἰωμένων χαλκείων, καὶ ὅσα ἐστὶ πυκνὰ καὶ λεῖα, καθάπερ ὁ ἄργυρος. ἔτι δὲ τῶν ἄλλων ὅσα σκιώδεις ἔχει τὰς χρόας, [καὶ] λειότητος μετέχει, ὥσπερ τὸ ὕδωρ καὶ τὰ νέφη, καὶ τὰ τῶν ὀρνίθων πτερώματα. καὶ γὰρ ταῦτα διά τε τὰς αὐγὰς τὰς προσπιπτούσας, καὶ τὴν λειότητα, ἄλλοτε ἄλλως κεραννυμένας, ποιεῖ διαφόρους τὰς χρόας, καθάπερ καὶ τὸ σκότος. τῶν δὲ χρωμάτων οὐδὲν ὁρῶμεν εἰλικρινὲς οἷόν ἐστιν, ἀλλὰ πάντα κεκραμένα ἑτέροις. καὶ γὰρ ἂν μηδενὶ τῶν ἄλλων, ταῖς γε τοῦ φωτὸς αὐγαῖς καὶ ταῖς σκιαῖς κεραννύμενα, ἄλλοια, καὶ οὐχ οἷά ἐστι, φαίνεται. διὸ καὶ τὰ ἐν σκιᾷ θεωρούμενα, καὶ ἐν φωτὶ καὶ ἡλίῳ, καὶ σκληρᾷ

A miſtæ coloribus, colorum commutationes efficiant: vel in eo quòd commiſta, & multitudine, & facultatibus differunt: vel quòd non habeant eaſdem rationes proportionéſque. Siquidem & ipſum purpureum ſecundùm ſe ipſum multas habet differentias: ſic & puniceum, & album, & aliorum vnumquodque. Item ſecundùm maius & minus, item ſecundùm mutuam inter ſe admiſtionem, eorúmque ſynceritatem. Facit prætera differentiam prout luminoſum, ac nitidum miſtum ipſum fuerit: aut ex contrario ſquallidum ac ſine lumine. Nihil enim eſt aliud τὸ στίλβον, id eſt, nitidum ac refulgens, niſi luminis quædam collectio, & denſitas.
B Species verò auri emergit, cùm xanthum, id eſt, flauum, & ſolare bene condenſatum eniteſcit. Ob id colla columbarum, & pluuiarum ſtillæ, colore viſuntur aureo tunc, cùm lux repercutitur. Sunt etiam quædam, quæ læuigata attritu & arcana quadam facultate, alios atque alios induunt colores: ſicut argentum perfrictum, & aurum, & æs, & ferrum. Quædam etiam lapidum genera differentes faciunt colores, ceu qui nigri exiſtentes albas inducunt lineas. Eius rei cauſa eſt, quòd iſtorum omnium conſtitutio ab ipſis incunabulis ex paruis adeò denſiſque, ac nigris conſtat par-
C ticulis. Ab ipſa autem, quæ fit, dum primùm generantur, tinctura, contingit aliam coloris ſpeciem admittere. Hic autem color ab his attritus ac deciduus, non amplius auream ſpeciem, aut aëream, aut omnino alium quempiam habet colorem, ſed planè niger eſt, quòd pori ac meatus illic perrumpantur, ac ſcindantur inter perfricandum, dum atteruntur, per quos tinctura penetrauit. Contingit & hanc ipſam diuerſitatem colorum natura fieri. Primogenio enim colore nondum nobis cognito, cùm tinctura in attritu conuellatur ac diſſipetur, euenit vt ipſum, qui ipſis ineſt, colorem perſpiciamus. Quapropter & omnia ſe offerunt nigra, dum
D perfricantur, prout horum quodlibet æquabile eſt ac læuigatum: ſicut in lapide, qui βάσανος à Græcis, à noſtris coticula dicitur, qui inſitum in ipſo colorem, nigrum videlicet, abiicit: aſſumit autem rurſus ingenitum ab ipſa vſque origine colorem, perſpicuum illud quod in tinctura eſt, ex contactu & continuatione. Cæterùm & quæ igni aduruntur, aut diſſoluuntur, aut liquefiunt, plures mutuantur colores: quorum fumus tenuis, & aëreus, horum & colores vmbroſi: ſicut cùm fumus exhalat à ſulphure, & æruginoſis æramentis, & ab iis quæcunque denſa ſunt, & læuigata: vt
E argentum. At in cæteris, quæcunque illa ſunt, quæ vmbroſos colores habent, eadem læuorem participant: ſicuti aqua, nebula, & auium pennæ: quippe hæc propter fulgores radióſve illabentes, & læuorem, aliter aliàs contemperatos, differentes colores inuehunt: ſicuti & obſcuritas varios colores inferre ſolet. At nos nullum colorem purum ſpectamus, qualis planè eſt: ſed omnes permiſtos, atque aliis confuſos. Nam etſi nulli aliorum colorum miſceantur, fulgoribus lucis & vmbris tamen confunduntur, & à ſe diuerſa, neque prorſus qualia ſunt, apparent. Ob id quæ in vmbra ſpectantur, quæque in luce, quæque in Sole,

quæque

quæque in intenſo, aut molli fulgore & ſecundùm varias inclinationes hoc aut illo modo ſe habentia, ſecundùm alias differentias diuerſa apparent. Fulgores etiam qui ab igne, Luna, lychniſque proueniunt, quòd hæc illave lux in vnoquoque variet, diuerſos colores imprimunt. Adde etiam, cùm varia ad inuicem facta eſt colorum permiſtio, ob mutuum illum inter ſe reſpectum, atque reſponſum, vario modo colorantur. Lux enim quando illapſa, ex nonnullis colorem mutuatur, & nunc punicei nunc herbacei fit coloris: & cùm temperamentū in alium quempiam colorem incidit, & ab eo rurſus contemperatur, aliam quoque quampiam coloris moderationem permiſtionémq. admittit. Et dum hoc patitur, continuè quidē id patitur, ſed ita, vt ſenſum fugiat. Interdum etiam ad ſenſus vſque peruenit, tunc ſcilicet cùm ex multis colorib. confuſis, vnus aliquis longè alios exuperans, ſenſum ipſum facit, & conciet. Quare & per aquam res aquea ſpecie plurimum apparent: & quæ in ſpeculis ſimiles habentia colores, colore ſpeculorum apparent. Id quod & circa aërem putandum eſt euenire. Ex tribus itaque miſtos colores omnes conſtare certum eſt: ex luce primùm, & ex iis per quæ lux apparet, ceu ex aqua, & aëre: tertio ex ſubiectis coloribus, à quibus lucem reflecti ac repercuti contingit. Atqui album & diaphanes, quod nos perſpicuum dicimus, quoties quidem rarum eſt, colore maxime aëreo ſe oſtendit. Quod ſi in iis eſt quæ denſa ſunt, in omnibus iis quædam occurrit obſcuritas, ſeu caligo, ſicvti in aqua, & vitro, aëre etiam, cùm denſior eſt. Radiis enim ob denſitatem & craſſitudinem vndequaque deficientibus, non poſſumus, quæ in ipſis penitiora ſunt, perſpicere. Aër quidem propè inſpectus, nullum videtur colorem habere: nam propter raritatem à fulgore peruincitur, ab eo diuiſus ac ſecretus. Eſt enim fulgor denſior, & per aërem perſpicuus: qui in profundo perſpectus, ex proximo colore videtur cyaneo, raritatis gratia. Qua enim parte lux deficit, eadem aër caligine diſiunctus, coloris cyanei repræſentatur. Denſatus autem in morem aquæ, albiſſimum omnium colorem contrahit.

CAPVT IV.

De iis quæ tincta colorem mutant.

OMnia verò quæ intinguntur, ab iis quę intingunt, colorē mutuātur. Multa autē floribus, multa terra naſcentibus, multa radicib. intinguntur: quin & corticibus, lignis, & foliis, & ſeminibus: multa etiam terra, multa ſpuma, multa & ſutorio atramento, quam Græci μελαντηρίαν vocant: nonnulla etiam, quę animalium liquore intinguntur, ſicvti purpureus color purpura, quæ inter murices cenſetur. His adde quædā vino, quędā fumo, quædā calce, quædā mari colorē trahere: ceu marinorum capillamenta. Hæc enim omnia mari ruſeſcūt, & in vniuerſum omnia, quæcunq; proprios ac vernaculos colores habent. Semper enim cùm hi omnes colores vi humidi & calidi ſimul coeūt, in eorum quæ intinguntur meatus exareſcentes, deinde ab illis colores aſſumunt. Ob id ſæpe colores florū eluuntur, ex poris ſeu meatibus effluentes. Multas etiam faciunt ipſę conſtipationes, & in intinctione differentias: multas etiam commiſtiones, & affectus intinctorum, quæ πάθη dicuntur:

A αὐγῇ ἢ μαλακῇ, καὶ κατὰ τὰς ἐγκλίσεις οὕτως ἢ οὕτως * ἔχοντα, καὶ κατὰ τὰς ἄλλας διαφοράς, ἀλλοῖα φαίνεται. καὶ ταῖς πρὸς τὸ πυρὶ καὶ τῇ σελήνῃ, καὶ ταῖς τῶν λύχνων αὐγαῖς, * διὰ τὸ καὶ τὸ φῶς ἑκάστου τούτων, ἀλλοιοτέραν ἔχειν χρόαν. καὶ τῇ πρὸς ἄλληλα δὲ μίξει τῶν χρωμάτων· δι' ἀλλήλων γὰρ φερόμενα, χρώζεται. τὸ γὰρ φῶς, ὅταν προσπεσὸν ὑπό τινος χρωσθῇ, καὶ γένηται φοινικοῦν, ἢ ποῶδες, καὶ τὸ * ἀνακλασθὲν προσπέσῃ πρὸς ἕτερόν τι χρῶμα, πάλιν ὑπ' ἐκείνου κεραννύμενον, ἄλλην τινὰ λαμβάνει τοῦ χρώματος κρᾶσιν. καὶ τοῦτο πάσχον συνεχῶς μέν, οὐκ αἰσθητῶς δέ, B ἐνίοτε παραγίνεται πρὸς τὰς ὄψεις, ἐκ πολλῶν μὲν κεκραμένον χρωμάτων, ἑνὸς δέ τινος τῶν μάλιστα ἐπικρατοῦντος ποιοῦν τὴν αἴσθησιν. διὸ καὶ [τὰ] καθ' ὕδατος ὑδατοειδῆ μᾶλλον φαίνεται· καὶ τὰ ἐν τοῖς κατόπτροις, ὁμοίας ἔχοντα χρόας ταῖς τῶν κατόπτρων. ὃ καὶ περὶ τὸν ἀέρα οἰητέον συμβαίνειν. ὥστε ἐκ τριῶν τὰς χρόας ἁπάσας μεμιγμένας, τοῦ φωτός· καὶ δι' ὧν φαίνεται τὸ φῶς, οἷον τοῦ τε ὕδατος καὶ τοῦ ἀέρος· καὶ τρίτου τῶν ὑποκειμένων χρωμάτων, ἀφ' ὧν ἀνακλᾶσθαι συμβαίνει τὸ φῶς. τὸ δὲ λευκὸν καὶ διαφανές, ὅταν μὲν ἀραιὸν ᾖ σφόδρα, φαίνεται τῷ χρώματι C ἀεροειδές· ἐπὶ δὲ τῶν πυκνῶν, ἐπὶ πάντων ἐπιφαίνεταί τις ἀχλύς, καθάπερ ἐπὶ τοῦ ὕδατος καὶ * ὑέλου, καὶ τοῦ ἀέρος, ὅταν ᾖ παχύς. τῶν γὰρ αὐγῶν διὰ τὴν πυκνότητα πανταχόθεν ἐκλειπουσῶν, οὐ δυνάμεθα τὰ ἐντὸς αὐτῶν * ἀκριβῶς διορᾶν. ὁ δ' ἀήρ, ἐγγύθεν μὲν θεωρούμενος, οὐδὲν ἔχειν φαίνεται χρῶμα· διὰ γὰρ τὴν ἀραιότητα, ὑπὸ τῶν αὐγῶν κρατεῖται, χωριζόμενος ὑπ' αὐτῶν, πυκνοτέρων οὐσῶν [καὶ] διαφαινομένων δι' αὐτοῦ. ἐν βάθει δὲ * θεωρουμένου, ἐγγύτατα φαίνεται τῷ χρώματι κυανοειδής, διὰ τὴν ἀραιότητα. ᾗ γὰρ λείπει τὸ φῶς, ταύτῃ σκότει διειλημμέ- D νος, φαίνεται κυανοειδής. ἐπιπυκνωθεὶς δέ, καθάπερ καὶ τὸ ὕδωρ, πάντων * λευκότατός ἐστιν.

ΚΕΦΑΛ. δ.

Πόθεν τὰς χρόας λαμβάνει τὰ βαπτόμενα.

ΤΑ δὲ βαπτόμενα πάντα τὰς χρόας ἀπὸ τῶν βαπτόντων λαμβάνει. * πολλὰ δὲ καὶ τοῖς ἄνθεσι καὶ τοῖς φυομένοις, καὶ ταῖς ῥίζαις βάπτεται, καὶ φλοιοῖς, καὶ ξύλοις, καὶ φύλλοις, καὶ καρποῖς. ἔτι δὲ πολλὰ μὲν E γῇ, πολλὰ δ' ἀφρῷ, πολλὰ δὲ καὶ μελαντηρίᾳ· τὰ δὲ καὶ τοῖς τῶν ζῴων χυλοῖς, καθάπερ καὶ τὸ ἁλουργὲς τῇ πορφύρᾳ· τὰ δέ, οἴνῳ· τὰ δέ, καπνῷ· τὰ δέ, κονίᾳ· τὰ δέ, θαλάττῃ, ὥσπερ τὰ τριχώματα τῶν θαλαττίων· καὶ γὰρ ταῦτα [πάντα] ὑπὸ τῆς θαλάττης γίνονται πυῤῥά. καὶ ὅλως ὅσα χρόας ἰδίας ἔχει. ἀεὶ γὰρ ἀπὸ πάντων αὐτῶν ἅμα τῷ τε ὑγρῷ καὶ τῷ θερμῷ, τῶν χρωμάτων συνεισιόντων εἰς τοὺς τῶν βαπτομένων πόρους, ὅταν ἀποξηρανθῇ, τὰς ἀπ' ἐκείνων χρόας * ἀπολαμβάνει. διὸ καὶ πολλάκις αὐτῶν ἐκπλύνεται, τῶν δυνάμεων ἐκ τῶν πόρων ἐκρυέντων. πολλὰς δὲ καὶ αἱ στύψεις ἐν τῇ βαφῇ ποιοῦσι διαφορὰς καὶ μίξεις, καὶ τὰ πάθη τῶν βαπτομένων,

ὥσπερ καὶ ἐπὶ τῆς κράσεως εἴρηται πρότερον. βάπτεται δὲ καὶ τὰ μέλανα τῶν ἐρίων. οὐ μὴν ὁμοίως γε [καὶ] τῷ χρώματι γίγνεται λαμπρά, διὰ τὸ βάπτεσθαι τοὺς πόρους αὐτῶν, εἰς τοὺς τῶν ἀνθῶν εἰσιόντας· τὰ δὲ μεταξὺ διαστήματα τῆς τριχὸς, μηδεμίαν λαμβάνειν βαφήν. * λευκὰ μὲν ὄντα, καὶ παράλληλα κείμενα τοῖς χρώμασι, ποιεῖ πάντα φαίνεσθαι τὰ ἄνθη λαμπρότερα· τὰ μέλανα δὲ, τοὐναντίον, σκιερὰ καὶ ζοφώδη. διὸ καὶ ὁ καλούμενος ὄρφνιος, εὐανθέστερος γίνεσθαι τῶν μελάνων ἢ τῶν λευκῶν· οὕτω γὰρ ἀκρατέστερον * αὐτοῖς φαίνεται τὸ ἄνθος, * κεραννύμενον ταῖς τοῦ μέλανος αὐγαῖς. καθ' αὑτὸ [μὲν] γὰρ τὸ μεταξὺ διάστημα τῶν πόρων, οὐχ ὁρᾶται διὰ σμικρότητα, καθάπερ οὐδὲ καττίτερος τῷ χαλκῷ κραθεὶς, οὐδὲ τῶν ἄλλων οὐδὲν τῶν τοιούτων. τῶν δὴ βαπτομένων τὰ χρώματα, ἀλλοιοῦται διὰ τὰς εἰρημένας αἰτίας.

* κ. ταῦτα μὲν λευκὰ ὄντα & παράλληλα κεί.

* κ. αὐτῶν

* κ. κεραννύμενα

A ſicvti & de craſi, id eſt, contemperatione, ſuperiùs dictum eſt. Imbuuntur etiam quædam nigro colore vellera, neque tamen ſimiliter colore hoc niteſcunt. Cauſa eſt, quòd vellerum meatus, ingredientibus colorum meatibus, tinguntur, pilorum autem interualla tincturam nullam recipiant. At quæ alba ſunt, atque dulcem coloribus obnoxia, omnia ſplendidiores flores videri faciunt: ex aduerſo autem nigra, vmbroſos & obſcuros videri faciunt. Ob id color ille, qui ὄρφνιος dicitur, ex nigris magis quàm albis effloreſcit: ſic enim purior & magis eximius apparet flos ipſe permiſtus: quod fit ob ipſius nigri fulgorem. Secundum enim hoc idem interiectum meatuum interuallum, ob exiguitatem B & tenuitatem non videtur, ſicvti neque ſtannum æri admiſtum, neque aliorum huiuſcemodi aliud quicquam: colores verò eorum quæ intinguntur, tranſmutantur ob eas quas diximus, cauſas.

ΚΕΦΑΛ. ε.

Τίνες εἰσὶ τοῖς ἄνθεσι καὶ τοῖς καρποῖς καὶ ἑκάστοις τῶν φυομένων ἀρχαὶ τῶν χρωμάτων.

Τὰ δὲ τριχώματα καὶ τὰ πτερώματα, καὶ τὰ ἄνθη, καὶ οἱ καρποὶ, καὶ τὰ φυτὰ πάντα, ὅτι μὲν ἅμα C τῇ πέψει πάσας τὰς τῶν χρωμάτων λαμβάνει μεταβολὰς, φανερὸν ἐκ πολλῶν. τίνες δέ εἰσιν ἑκάστοις τῶν φυομένων ἀρχαὶ τῶν χρωμάτων, καὶ ποίας τὰς μεταβολὰς ἐκ ποίων λαμβάνουσι, καὶ δι' ἃς αἰτίας ταῦτα πάσχει, κἂν εἴ τινας ἄλλας ἀπορίας αὐτοῖς συμβαίνει παρακολουθεῖν, περὶ πάντων τούτων ἐπισκεπτέον ἐκ τῶν τοιούτων. ἐν πᾶσι δὲ τοῖς φυτοῖς ἀρχὴ τὸ ποῶδές ἐστι τῶν χρωμάτων. καὶ γὰρ οἱ βλαστοὶ καὶ τὰ φύλλα, καὶ οἱ καρποὶ, γίνονται κατ' ἀρχὰς ποώδεις. ἴδοι δ' ἄν τις τοῦτο καὶ ἐπὶ τῶν ὀμβρίων ὑδάτων· ὅπου γὰρ πλείονα χρόνον συστῇ τὸ ὕδωρ, πάλιν ἀποξηραινόμενον, γίνεται τῷ χρώματι ποῶδες. κατὰ λόγον δὲ συμβαίνει, καὶ τὸ πρῶτον D ἐν πᾶσι τοῖς φυομένοις τοῦτο συνίστασθαι τῶν χρωμάτων. τὰ γὰρ ὕδατα πάντα χρονιζόμενα, κατ' ἀρχὰς μὲν γίνεται χλωρὰ, κεραννύμενα ταῖς τοῦ ἡλίου αὐγαῖς· κατὰ μικρὸν δὲ μελαινόμενα, πάλιν τῷ χλωρῷ μιγνύμενα, γίνεται ποώδη. τὸ γὰρ ὑγρὸν, ὥσπερ εἴρηται, καθ' ἑαυτὸ παλαιούμενον καὶ καταξηραινόμενον, μελαίνεται, καθάπερ καὶ τὰ ἐν ταῖς δεξαμεναῖς κονιάματα· καὶ γὰρ τούτων ὅσα μὲν ἐστὶν ἀεὶ καθ' ὕδατος, ταῦτα μὲν ἅπαντα γίγνεται μέλανα, διὰ τὸ καθ' αὑτὰ μὲν ξηραίνεσθαι * διαψυχόμενον τὸ ὑγρόν· ὅσα δ' ἀπαντλούμενα ἡλιοῦται, τὸ μὲν, ποῶδες γίνεται, διὰ τὸ τὸ ξανθὸν τῷ μέλανι κεράννυσθαι· * τὸ δὲ μᾶλλον τοῦ ὑγροῦ μελαινομένου, τὸ ποῶδες γίνεται κατακορὲς ἰσχυρῶς, καὶ πρασοειδές. διὸ καὶ πάντων οἱ παλαιοὶ βλαστοὶ, πολὺ μᾶλλον εἰσὶ τῶν νέων μέλανες· οἱ δὲ, ξανθότεροι, διὰ τὸ μήπω τὸ ὑγρὸν ἐν αὐτοῖς μελαίνεσθαι. τῆς γὰρ αὐξήσεως αὐτῶν βραδυτέρας * γινομένης, καὶ τῆς ὑγρασίας πολὺν χρόνον ἐμμενούσης, διὰ τὸ ψυχόμενον ἰσχυρῶς μελαίνεσθαι τὸ ὑγρὸν, γίνεται πρασοειδὲς, ἀκράτῳ τῷ μέλανι κεραννύμενον.

* κ. ψυχόμενον

* κ. μᾶλλον δὲ τοῦ.

* κ. γινομένων

CAPVT V.

De coloribus florum, fructuum, & aliorum quæ terræ fætu producuntur.

QVod autem capilli, & pennæ, & flores, & C fructus, & plantæ omnes vnà cum maturitate varias induunt mutationes, ex multis perſpicuum eſt. Sunt & nonnulla ſingulis plantarum, colorum principia, & qualia illa ſint, & ex qualibus mutationes ſuſcipiant, & quas ob cauſas talia patiantur, & ſi quas alias dubitationes contingat illa conſequi, de his omnibus ex ea quam inſtituimus, indagine conſiderandum eſt nobis. In omnibus autem plantis principium colorum eſt, qui herbaceus dicitur. Nam germina, & folia, & fructus, vel ſemina gignuntur in ipſis auſpiciis herbacea: id quod etiam animaduerti poteſt ex aquis compluentibus. Vbi enim pluſculum temporis conſiſtit aqua, rurſus exareſcens, colore fit herbaceo. Ratione autem D euenit, & hunc primum in omnibus ex terra naſcentibus colorem conſiſtere: ſiquidem omnes aquæ vetuſteſcentes à principio ſanè virides fiunt, Solis radiis admiſtæ: mox autem nigreſcunt: rurſus viridi permiſtæ, coloris fiunt herbacei. Nam humidum, vt præfati ſumus, ſponte naturæ ſuæ vetuſteſcens, & exareſcens, nigreſcit: ſicvt in ciſternis, ſeu aquarum conceptaculis tectoria: ex iis enim, quæcunque ſunt ſub aqua, hæc omnia atri coloris efficiuntur: quòd dum exareſcunt, humidum exhalet, & in aërem diſſipetur: quicquid autem exhauſtum Soli exponitur, in herbaceum colorem abit, ea cauſa, quòd flauum nigro permiſcetur. Hoc idem, humido magis, ac largiùs nigreſcente, herbacei fit coloris, eoque copioſiùs ſaturatur, & viridem E colorem concipit propè ad porri exemplum. Quod etiam eſt in cauſa vt in omnibus rami germina ætate confecta, multo nigrioris coloris viſantur, quàm quæ noua ſunt, & adhuc pubeſcentia: flauiores enim hi ſunt, quòd nondum in ipſis humidum nigreſcat. Horum enim cùm ſit tardius incrementum, inſideatque diutius humiditas, quoniam humidum ipſum exhalans vehementer nigreſcit, ex eo viride fit, & porracei coloris, vtpote nigro, eoque ſyncero permiſtum.

A At in iis omnibus, in quibus humidum non permiſcetur Solis radiis, albus color incolumis manet, niſi forte humidum diuturnitate temporis, & exareſactione prius nigrum euaſerit. Hæc ratio eſt cur plantarum omnium partes, quæ à terra extant, ab initio virides ſunt: quæ autem terræ proximæ, aut certè ſub terra, quales ſunt caules, ſeu ſcapi, & radices, albæ ſunt: ſic & germina, quæ terræ viciniora ſunt. Quòd ſi in ambitu terra moueatur, paſtinóque refodiatur, omnes quidem primò, vt dictum eſt, herbaceum colorem, quaſi à libero cælo fœnerantur, tum ob humorem, qui per germina in eas partes effluit, eámque coloris naturam imprimit, tum quòd celeriter idem humor in fructuum incrementum abſu-B matur. Cùm verò non ampliùs augentur, & increſcunt, ob id quòd calidum iam non queat peruinci alimento affluente, ſed vice verſa potiùs ab humido calor abſumatur, & fructus omnes maturentur, concocta humiditate, quæ in ipſis fructibus eſt, à Solis & aëris calore, ſic fructus aſſumunt à plantis colorem, ſicvti quæ intinguntur à floribus, propter id paulatim colorantur, eorúmque illi maximè, qui ad Solem ac teporem expoſiti ſunt: quare & eorum colores vnà cum tempore ac tempeſtiuitate permutant. Cùm enim primò ſint omnes herbacei coloris, ad maturita-C tem deinde prouecti variant in eum qui eorum naturæ conſentaneus eſt color. Nam & albi, & nigri, & phæi, id eſt, obſcuri, flaui etiam, & nigricantis coloris, quin & ymbratici efficiuntur, & propemodum omnia ſuſcipiunt colorum diſcrimina. Quoniam autem plurimi colores fiunt pluribus inuicem admiſtis, ita vt vnus fiat ex omnibus cinnus, illud quoque liquet, in plantis opus eſſe eadem fieri temperamenta. Nam propter earum humorem perfluentem, & per ſe ipſas corriuatum, omnes ſuſcipiunt colorum facultates, & hoc circa fructuum maturationes: & à Sole & ab aëris calore excocto, omnes pro ingenio ſuæ naturæ conſiſtunt colores, hi quidem ocyùs, illi verò tardiùs: velvt contingit circa tincturam D purpuræ, cùm illam atterunt, atque exprimunt, omnem ex ea humiditatem eliquant eliciúntque, quam deinde effuſam in cortinis percoquunt: & primò quidem nullus omnino certus color in tinctura perſpicitur. Eius rei cauſa eſt, quòd vnuſquiſque ipſorum colorum, cùm humor magis ac magis excoquitur, imò verò & illi ipſi, qui in cortinis permiſti ſunt, colores, multas paulatim ac varias ſuſcipiunt differentias: nam & nigrum, & album, & ὄρφνιον, id eſt, obſcurum, & aërium, denique omnes reddunt, qui vnà excocti ſunt. Propter temperamentum ergo nondum per ſe conE ſtitutum, nullus ex aliis coloribus certus eſt, atque perſpicuus. Atqui hoc idem quoque euenit in fructibus. In multis enim quia non omnes ſimul fiunt colorum maturitates, ſeu concoctiones, ſed alij priùs, alij poſteriùs conſiſtunt colores, idcirco ex alio in alium mutationes fiunt: ſicvt in botryis, & phœnicibus, id eſt, palmulis: iſti enim aliquando primò punicei apparent.

A ἐν ὅσοις δὲ τὸ ὑγρὸν μὴ μίγνυται ταῖς τοῦ ἡλίου αὐγαῖς, τούτων διαμένει τὸ χρῶμα λευκόν, ἐὰν μὴ χρονιζόμενον καὶ καταξηραινόμενον μελανθῇ πρότερον. διὸ καὶ τὰ μὲν ὑπὲρ γῆς, χλωρὰ πάντων [τῶν] φυομένων τὸ πρῶτόν ἐστι· τὰ δὲ κατὰ γῆς, [οἷον] καυλοὶ καὶ ῥίζαι λευκαί. καὶ οἱ βλαστοὶ κατὰ γῆς μὲν ὄντες, εἰσὶ λευκοί· περιαιρεθείσης δὲ τῆς γῆς, τὸ μὲν ἐξ ἀρχῆς (* ὥσπερ εἴρηται) πάντες γίγνονται ποώδεις, διὰ τὸ καὶ τὴν ὑγρασίαν τὴν διὰ τῶν βλαστῶν εἰς αὐτοὺς διηθουμένην, τοιαύτην ἔχειν τὴν τοῦ χρώματος φύσιν, καὶ ταχέως αὐτὴν εἰς τὴν αὔξησιν καταναλίσκεσθαι τὴν τῶν καρπῶν. B ὅταν δὲ μηκέτι αὐξάνωνται, διὰ τὸ μὴ κρατεῖν ἤδη τὸ θερμὸν τῆς ἐπιρρεούσης τροφῆς, ἀλλὰ καὶ τοὐναντίον ἀναλίσκηται τὸ ὑγρὸν ὑπὸ τῆς θερμότητος, καὶ πεπαίνωνται οἱ καρποὶ πάντες, συνεψομένης ὑπό τε τοῦ ἡλίου καὶ τῆς τοῦ ἀέρος θερμότητος, τῆς ἐν τοῖς καρποῖς ὑγρασίας, ἀπολαμβάνουσι τὰς ἀπὸ τῶν φυτῶν χρόας, καθάπερ καὶ τὰ βαπτόμενα τῶν ἀνθῶν. διὸ κατὰ μικρὸν χρώζονται, καὶ μάλιστα αὐτῶν τὰ πρὸς τὸν ἥλιον ἐστραμμένα, καὶ τὴν ἀλέαν. ὥστε καὶ τὰς χρόας αὐτῶν ἅμα ταῖς ὥραις μεταβάλλειν. C [φανερὸν δὲ τοῦτό ἐστι.] οἱ γὰρ τοῦ ποώδους χρώματος ἅπαντες ἤδη πεπαινόμενοι, μεταβάλλουσιν εἰς τὸ κατὰ φύσιν χρῶμα. καὶ γὰρ λευκοί, καὶ μέλανες, καὶ φαιοί, καὶ ξανθοί, καὶ μελανοειδεῖς, καὶ σκιοειδεῖς, [καὶ φοινίκειοι, καὶ οἰνωποί, καὶ κροκοειδεῖς] καὶ σχεδὸν ἁπάσας ἔχοντες γίγνονται τὰς τῶν χρωμάτων διαφοράς· [διὰ τὸ τὴν ὑγρασίαν τῶν βλαστῶν εἰς αὐτοὺς διηθουμένην, τοιαύτην ἔχειν τὴν τοῦ χρώματος φύσιν.] ἐπεὶ δὲ τὰ πλεῖστα τῶν χρωμάτων, πλειόνων κεραννυμένων ἀλλήλοις, φανερὸν ὅτι καὶ τὰς ἐν τοῖς φυτοῖς χρόας ἀνάγκη τὰς αὐτὰς ἔχειν κράσεις· διὰ γὰρ τούτων τὸ ὑγρὸν διηθούμενον, καὶ D μεθ' ἑαυτοῦ συνεκκλύζον, ἁπάσας λαμβάνει τὰς τῶν χρωμάτων δυνάμεις. καὶ τούτου συνεψομένου, περὶ τὰς τῶν καρπῶν πέψεις, ὑπό τε τοῦ ἡλίου καὶ τῆς τοῦ ἀέρος θερμότητος, ἕκαστα καθ' ἑαυτὰ συνίσταται τῶν χρωμάτων, τὰ μὲν θᾶττον, τὰ δὲ βραδύτερον, καθάπερ συμβαίνει καὶ περὶ τὴν βαφὴν τὴν τῆς πορφύρας. καὶ γὰρ ταύτην ὅταν κόψαντες ἅπασαν ἐξ αὐτῆς τὴν ὑγρασίαν ἐκκλύσωσι, καὶ ταύτην ἐγχέαντες, ἕψωσιν ἐν ταῖς χύτραις, τὸ μὲν πρῶτον οὐδὲν ὅλως ἐν τῇ βαφῇ τῶν χρωμάτων φανερόν ἐστι, E διὰ τὸ κατὰ μικρὸν ἕκαστον * αὐτῶν τοῦ ὑγροῦ συνεψομένου μᾶλλον, καὶ * τῶν ἐπὶ ὑπαρχόντων ἐν αὐτοῖς χρωμάτων μιγνυμένων ἀλλήλοις, πολλὰς καὶ ποικίλας λαμβάνειν διαφοράς. καὶ γὰρ μέλαν [καὶ λευκόν,] καὶ * ὄρφνινον, καὶ ἀεροειδές, [καὶ τότε τελευταῖον ἅπαντα τὰ πορφυροειδῆ τῶν αὐτῶν ἱκανῶς] συνεψηθέντων· ὥστε διὰ τὴν κρᾶσιν μηκέτι, καθ' αὐτὸ μηδὲν τῶν * ἄλλων χρωμάτων φανερὸν ᾖ. ὃ δὴ αὐτὸ τοῦτο συμβαίνει καὶ ἐπὶ τῶν καρπῶν. ἐν πολλοῖς γὰρ διὰ τὸ μὴ πάσας ἅμα γίνεσθαι τὰς τῶν χρωμάτων πέψεις, ἀλλὰ τὰ μὲν αὐτῶν συνίστασθαι πρότερον, τὸ δὴ ὕστερον, ἐξ ἑτέρων εἰς ἕτερα μεταβάλλουσιν, ὥσπερ καὶ οἱ βότρυες καὶ οἱ φοίνικες. καὶ γὰρ οὗτοι ἐνίοτε μὲν πρῶτον γίνονται φοινικοῖ

*κ. ὡς προείρηται
* κ. αὐτοῖς δι...
* κ. τῶν ... ὑπαρχόντων
* κ. ἐρυθρόν,
* Qu. αὐτῶν

τοῦ δὲ μέλανος ἐν ἑαυτῷ συνισταμένου, μεταβάλλουσι [πάλιν] εἰς τὸ οἰνωπόν. τὸ δὲ τελευταῖον γίνονται κυανοειδεῖς, ὅταν ἤδη καὶ τὸ φοινικοῦν πολλῷ καὶ ἀκράτῳ [τῷ] μέλανι μιχθῇ. τὰ γὰρ ὕστερον ἐπιγιγνόμενα τῶν χρωμάτων, ὅταν κρατήσῃ, τὰς προτέρας χρόας ἐξαλλάττει. μάλιστα δὲ τοῦτο ἐπὶ τῶν μελαινῶν καρπῶν φανερόν ἐστι. σχεδὸν γὰρ αὐτῶν οἱ πλεῖστοι, καθάπερ εἴρηται, κατ' ἀρχὰς μὲν ἐκ τοῦ ποώδους μεταβάλλοντες, μικρὸν ἐπιφοινικίζουσι, καὶ γίνονται πυρροί· ταχὺ δὲ μεθίστανται πάλιν ἐκ τοῦ πυρροῦ καὶ ἀκράτου τοῦ μέλανος ἐν τοῖς τοιούτοις ἐνυπάρχοντος. * δηλοῖ δέ· καὶ γὰρ τὰ κλήματα, καὶ τὰ ἔρια, καὶ τὰ φύλλα πάντων ἐστὶ τῶν τοιούτων μέλανα, διὰ τὸ πλείστην ἐν αὐτοῖς ὑπάρχειν τὴν τοιαύτην χρόαν. ἐπεὶ δ' ἐστί γε τῶν καρπῶν οἱ μέλανες, καὶ ἀμφοτέρων τῶν χρωμάτων μετέχουσι, φανερόν ἐστι. πάντων γὰρ ὁ χυλὸς γίνεται τῶν τοιούτων οἰνωπός. τὰ δὲ χρώματα ἐν τῷ ὑγρῷ * ὕστερον τὰ φοινίκεα τῶν μελάνων. δηλοῖ δέ· καὶ γὰρ τὰ ὑπὸ τοὺς σταλαγμοὺς ἔδαφη, καὶ ὅλως ὅπου συμβαίνει γίνεσθαι μετρίαν ὑδάτων ἔκρυσιν ἐν τόποις σκιεροῖς, ἅπαντα μεταβάλλει πρῶτον ἐκ τοῦ ποώδους εἰς τὸ φοινικοῦν χρῶμα, καὶ γίνεται [τὸ] ἔδαφος ὡς ἂν αἵματος ἀρτίως ἐπεσφαγμένου κατὰ τὸν τόπον τοῦτον, καθ' ὃν ἂν λάβῃ τὸ ποῶδες τῶν χρωμάτων τὴν πέψιν. τὸ δὲ τελευταῖον, καὶ τοῦτο μέλαν ἰσχυρῶς γίνεται καὶ κυανοειδές. ὅπερ συμβαίνει καὶ ἐπὶ τῶν καρπῶν. ὅτι δὲ χρωμάτων ὑστέρων ἐπιγιγνομένων, * ὅταν κρατῆται τὰ πρότερον, τὸ χρῶμα τῶν καρπῶν μεταβάλλει, καὶ διὰ τῶν τοιούτων ῥᾴδιον συνιδεῖν. καὶ γὰρ τῆς ῥοιᾶς ὁ καρπὸς, καὶ τὰ τῶν ῥόδων φύλλα, κατ' ἀρχὰς μὲν ἤδη γίνεται λευκά· τὸ δὲ τελευταῖον ἤδη * χρωζομένων ἐν αὐτοῖς τῶν χυλῶν, ὑπὸ τῆς πέψεως ἀποχραίνεται, καὶ μεταβάλλει [πάλιν] εἰς τὸ τῆς ἁλουργοῦς χρῶμα, καὶ τὸ φοινικοῦν. τὰ δὲ καὶ πλείους ἔτι ἐν αὐτοῖς ἔχει χρόας, καθάπερ καὶ ἐπὶ τῆς μήκωνος ὁ ὀπὸς, καὶ ἐπὶ τῆς ἐλαίας ὁ ἀμόργης. καὶ γὰρ οὗτος τὸ μὲν πρῶτον γίνεται λευκὸς, καθάπερ καὶ ὁ τῆς ῥοιᾶς καρπός. λευκανθεὶς δὲ, πάλιν εἰς τὸ φοινικοῦν μεταβάλλει χρῶμα· τὸ δὲ τελευταῖον πολλῷ τῷ μέλανι κραθεὶς, γίνεται κυανοειδής. * διὸ καὶ τὰ τῆς μήκωνος φύλλα, τὰ μὲν ἄνω, ἐστὶ φοινικοῦντα, διὰ τὸ γίνεσθαι ταχεῖαν αὐτῶν τὴν ἐκπέψιν· τὰ δὲ πρὸς ταῖς ἀρχαῖς, μέλανα, ἤδη τούτου τοῦ χρώματος ἐν αὐτοῖς ἐπικρατοῦντος, ὥσπερ καὶ ἐπὶ τοῦ καρποῦ. καὶ γὰρ τὸ τελευταῖον γίνεται μέλας. ἐν ὅσοις δ' ὑπάρχει τῶν φυτῶν ἓν χρῶμα μόνον, οἷον τὸ λευκὸν, ἢ τὸ μέλαν, ἢ τὸ φοινικοῦν, ἢ τὸ ἁλουργὸν, τούτων δὲ ἁπάντων οἱ καρποὶ διαμένουσιν ἀεὶ τὴν αὐτὴν ἔχοντες τοῦ χρώματος φύσιν, ὅταν ἅπαξ ἐκ τοῦ ποώδους εἰς ἄλλην χρόαν μεταβάλλωσι. τὰ δ' ἄνθη τοῖς καρποῖς, ἐπ' ἐνίων μὲν, ὁμόχροα συμβαίνει γίνεσθαι, καθάπερ ἔχει καὶ ἐπὶ τῆς ῥοιᾶς· καὶ γὰρ ὁ καρπὸς αὐτῆς γίνεται φοινικοῦς, καὶ τὸ ἄνθος. ἐπ' ἐνίων δὲ πολὺ τῷ χρώματι διαφέρει, ὥσπερ ἐπί τε τῆς δάφνης, καὶ τοῦ κιττοῦ. τὸ μὲν γὰρ ἄνθος ἐστὶν αὐτῶν ἁπάντων ξανθόν· ὁ δὲ καρπὸς, μέλας. φοινικοῦς δὲ καὶ ὁ τῆς μηλέας.

* [illegible] μέλ.

* [illegible]

* κ. δι. κρατῇ, τὸ πρότερον χρῶμα τῶν καρπῶν μεταβ.

* ἢ χρωζομένων

* κ. ὁμοίως δὲ τὰ τῆς μη.

A Nigro autem in ſe ipſo conſiſtente, tum in colorem vim tranſmutant, ac demum fiunt cyanei, ſiue cærulei, cùm iam puniceus multa ac pura nigredine permiſcetur: qui enim poſteriùs ſuccedunt colores, cùm exuperant, priſtinos colores immutant. Quod in nigris fructibus præcipuè manifeſtum eſt. Nam eorum pleríque fermè, vt ſuperiùs diximus, ab initio quidem ex herbaceo colore immigrantes, ſenſim in puniceum tranſeunt, fiúntque rufi: ſed ſeſtinè rurſus tranſmigrant ex rufo, & puro nigro, quod in huiuſmodi inſitum eſt. Declarant & hoc vites, & vellera, & folia: omnium enim huiuſmodi colores nigri, quòd plurimus inſit in ipſis huiuſmodi color. Nam & illud quo- B que confeſſum eſt, quòd ob id fructus nigri & vtrumque colorem participant: horum enim omnium ſuccus vinoſus eſt. Colores autem, qui ſunt in ipſis natalibus nigri, ſucceſſu temporis punicei fiunt: ſiquidem pauimenta, quæ ſtillis ac defluxionibus ſubiecta ſunt, & omnino vbi contingit vel mediocre aquarum profluuium fieri, locis præſertim opacis, omnia hæc, inquam, ex eo qui herbaceus primùm fuit, in puniceum colorem tranſeunt, pauimentúmque illud ita coloratur, ac ſi ſanguis recens in id perfluxerit, ſecundùm rationem loci, ſecundùm C quam herbaceus color maturitatem concoctionémque ſuſcipiat: demum & hic idem niger admodum fit, & cæruleus: quod in fructibus contingit. Quòd verò poſterioribus coloribus aduenientibus, priores exuperentur, & cedant, & color fructuum tranſmutetur, vel ex iis facile eſt cognoſcere. Nam & mali punicæ fructus, & roſarum folia, ab initio quidem alba ſunt: demum ſucco iam vetuſteſcente, ex maturitate palleſcunt, & rurſus commutant colorem in purpureum, ac puniceum: & hæc quoque plures in ſe ipſis colores habent, ſicvt & in papauere liquor, in olea amurca: ſiquidem hæc primùm fit alba, ceu mali punicæ fructus: cùm autem inalbere deſierit, rurſus in puniceum co- D lorem tranſmigrat: denique multo nigro permiſtus in cæruleum abit. Ob eam cauſam & papaueris folia, hæc quidem in ſuperiori parte ſunt punicei coloris, quòd in ipſis concoctio & maturitas ocyus fiat: hæc autem ab ipſis initiis nigra, hoc in eis colore iam exuperante, ſicvti & in fructu: nam poſtremò fit niger. In quibuſcunque autem plantis vnus eſt & ſingularis color, albus ſcilicet vel niger puniceus, vel purpureus, horum omnium fructus permanent, eandem ſemper coloris naturam ſeruantes, cùm ſemel ex herbaceo in alium colorem migrauerint. Atqui flores in nonnullis fructibus concolores eſſe contingit, ſicvt in malo punica videmus, in qua fructus æquè ac flos punicei coloris eſt. In nonnullis autem per- E multum inter ſe differunt colore: ſicvt in lauro, atque hedera: vtriuſque enim flos xanthus, id eſt, flauus eſt, fructus verò niger. Puniceus autem eſt & fructus mali, quam μηλέαν vocant.

huius enim flos albus, non ſine admiſtione purpuræ: at eius fructus eſt flauus. Rurſus papaueris puniceus quidem flos eſt, at fructus hic quidem niger, ille autem albus, prout inſiti illis ſucci aliis atque aliis temporibus ad maturitatem peruenerint. Quod facilè ex multis cognoſci poteſt: etenim [illegible] atque alij fructus, vt dictum eſt, multas differentias capiunt vnà cum maturitate, & in colore, & in odore, & in ſucco. Hæc enim cauſa eſt cur varij ac differentes odores, & ſucci, & in floribus & in fructibus deprehendantur. Amplius hoc magis eluceſcit ipſis in floribus: in iis enim ipſis eiuſdem ſæpe folij pars nigra, pars punicea: quorundam etiam pars hæc alba, illa purpurea. Neque hoc minùs in iride planum eſt: multas enim habet & huius flos in ſe ipſo varietates: prout eius etiam variæ ſunt concoctionis differentiæ: ſicut & botryorum, cùm eos etiam miteſcere contingit: ob id & florum omnium faſtigia plurimum concoquuntur, & miteſcunt. Hæc autem initio multo minus coloris habent: propemodum enim quorundam quaſi aduritur humidum priùs, quàm ad iuſtam & propriam concoctionem perueniat.* Proinde quorundam florum colores permanent, fructus autem concocti tranſmutantur. Florum enim colores propter paucitatem alimenti citò miteſcunt, & maturitatem accipiunt: ac fructus ob multitudinem humoris, vnà cum maturitate in omnes transmutantur ſuæ naturæ conſentaneos colores. Id quod clarum & illuſtre eſt, prout antea dictum eſt, in tinctoriis floribus. (flores nunc appello optimam atque ardentiſſimam purpuræ partem.) Quum enim à principio tinctores αἱματίδας, hoc eſt, ſanguinarias purpuras, ex quibus pretioſus ille liquor tingendis veſtibus natus elicitur, ſummittunt, eas orphnias, id eſt, obſcuras, & nigras, & aërei coloris fieri videmus. Quum verò flos abundè concoctus fuerit, bene floridum illud purpureum, & ſplendidum efficitur. Proinde neceſſe eſt, florum colores ex æquo, & colores fructuum in varios habitus ſe commutare: & hos quidem colores, qui ſecundùm naturam ſunt, exuperare, hos autem deliquium pati, prout horum aut illorum perfecta aut imperfecta fit concoctio. Verè itaque colligimus, flores fructúſque differre. Cæterùm multi plurimarum arborum flores poſtremò xanthi, id eſt, flaui, fiunt. Deficiente enim alimento ad id perueniunt, vt exareſcant priùs, quàm commutent colorem in eum qui eorum naturæ proprius & vernaculus eſt. Ob id & quidam fructus defluentes, ac decidui, colore xanthi, id eſt, flaui, efficiuntur, ea cauſa quòd horum concoctio ac digeſtio primùm ab alimento deſtituatur. Eodem prætereà modo ſeſe habet frumentum, & reliqua quæ ex terra producuntur: nam hæc demum flaueſcunt. Humidum enim illis innatum non vltra nigreſcens, quoniam citò exareſcit, coloris immutationem efficit. Nigrum enim viridi confuſum, vt anteà diximus, herbaceum euadit. Quum verò nigrum ſemper exoleſcat, fiátque imbecillius, rurſus colorem paulatim tranſmutat in viride: poſtremò verò flauum efficitur. Eadem ratione ἀχράδος, id eſt raphani ſylueſtris, folia, & portulacæ, & aliorum quorundam ad maturitatem perducta, punicei coloris fiunt, præter nonnulla ex his quæ citò areſcunt, eadémque in flauum colorē abeunt.

A καὶ γὰρ ταύτης τὸ μὲν ἄνθος ἐστὶ λευκὸν ἐπιπορφυρίζον· ὁ δὲ καρπὸς, ξανθός. τῆς δὲ μήκωνος, τὸ μὲν ἄνθος, φοινικοῦν· ὁ δὲ καρπὸς, ὁ μὲν μέλας, ὁ δὲ, λευκὸς, παρὰ τὸ καὶ τὰς πέψεις τῶν ἐνυπαρχόντων αὐτοῖς χυλῶν, κατ᾽ ἄλλους γίνεσθαι χρόνους. ῥᾴδιον δὲ τοῦτο ἐκ πολλῶν συνιδεῖν. καὶ γὰρ τῶν καρπῶν ἔνιοι, καθάπερ εἴρηται, πολλὰς διαφορὰς καὶ χρωμάτων καὶ ὀσμῶν καὶ χυμῶν, ἅμα τῇ πέψει λαμβάνουσι. διὸ καὶ τὰς ὀσμὰς, καὶ τοὺς χυλοὺς πολὺ διαφόρους συμβαίνει τοῖς ἄνθεσι καὶ τοῖς καρποῖς συνακολουθεῖν. ἔτι δὲ μᾶλλον τοῦτο ἐστὶν ἐπ᾽ αὐτῶν τῶν ἀνθῶν φανερόν. τοῦ γὰρ αὐτοῦ φύλλου, τὸ μὲν, ἐστὶ μέλαν, τὸ δὲ, φοινικοῦν. ἐνίων δὲ τὸ μὲν
B ἐστὶ λευκὸν, τὸ δὲ, πορφυροειδές. οὐχ ἥκιστα δὲ τοῦτο φανερόν ἐστιν ἐπὶ τῆς ἴριδος. πολλὰς γὰρ ἔχει καὶ τοῦτο τὸ ἄνθος ἐν αὑτῷ ποικιλίας, παρὰ τὰς τῆς πέψεως διαφορὰς, ὥσπερ καὶ τῶν βοτρύων, ὅταν ἤδη πεπαινόμενοι τυγχάνωσι. διὸ καὶ πάντων μάλιστα συμβαίνει πέττεσθαι τῶν ἀνθῶν τὰ ἄκρα. τὰ δὲ πρὸς ταῖς ἀρχαῖς, ἀχρούστερα γίνεται πολλῷ. σχεδὸν γὰρ ἐνίων ὥσπερ ἐκκαίεται τὸ ὑγρὸν πρότερον ἢ λαβεῖν τὴν οἰκείαν πέψιν. διὸ καὶ τὰ μὲν ἄνθη, τῷ χρώματι διαμένει· οἱ δὲ καρποὶ, πεττόμενοι μεταβάλλουσι. τὰ μὲν γὰρ, διὰ μικρότητα τῆς τροφῆς ταχέως ἐκπέττεται.
C οἱ δὲ καρποὶ, διὰ τὸ πλῆθος τῆς ὑγρασίας, εἰς πάσας ἅμα τῇ πέψει τὰς κατὰ φύσιν χρόας μεταβάλλουσι. φανερὸν δὲ τοῦτο ἐστὶ, καθάπερ εἴρηται πρότερον, * καὶ ἐπὶ τῶν βαπτομένων ἀνθῶν. τὰ μὲν γὰρ ἐξ ἀρχῆς, ὅταν βάπτοντες (τὴν πορφύραν) καθιῶσι * τὰς αἱματίδας, ὄρφναι γίνονται καὶ μέλαιναι, καὶ ἀεροειδεῖς· τοῦ δ᾽ ἄνθους συνεψηθέντος ἱκανῶς, ἁλουργὸν εὐανθὲς γίνεται καὶ λαμπρόν. ὥστ᾽ ἀνάγκη καὶ τῶν ἀνθῶν ὁμοίως πολλὰ τοῖς χρώμασι τῶν καρπῶν διαλλάττειν· καὶ τὰ μὲν ὑπερβαίνειν, τὰ δὲ ἀπολείπειν τῶν κατὰ φύσιν χρωμάτων, διὰ τὸ τὴν μὲν ἀτελῆ, τὴν δὲ
D τελείαν γίνεσθαι τὴν πέψιν. τὰ μὲν οὖν ἄνθη καὶ τοὺς καρποὺς [διὰ ταύτας τὰς αἰτίας συμβαίνει τοῖς χρώμασιν] ἀλλήλων διαφέρειν. τὰ δὲ φύλλα τῶν πλείστων δένδρων τὸ τελευταῖον γίνεται ξανθὰ, διὰ τὸ τῆς τροφῆς ἀπολειπούσης, φθάνειν αὐτὰ καταξηραινόμενα πρότερον ἢ μεταβάλλειν εἰς τὸ κατὰ φύσιν χρῶμα. ἐπεὶ καὶ τῶν * ἀπορρεόντων καρπῶν ἔνιοι γίνονται τῷ χρώματι * ξανθοὶ, διὰ τὸ καὶ τούτων τῆς πέψεως πρότερον τὴν τροφὴν ὑπολείπειν. ἔτι δὲ ὅτε σῖτος, καὶ τὰ φυόμενα πάντα. καὶ γὰρ ταῦτα τὸ τελευταῖον γίνεται ξανθά. τὸ γὰρ ὑγρὸν ἐν αὐτοῖς οὐκ ἔτι με-
E λαινόμενον, διὰ τὸ καταξηραίνεσθαι ταχέως, ποιεῖ τὴν τοῦ χρώματος μεταβολήν. μελαινόμενον γὰρ, καὶ τῷ χλωρῷ κεραννύμενον, γίνεται (καθάπερ εἴρηται) ποῶδες. ἀσθενεστέρου δὲ τοῦ μέλανος ἀεὶ γινομένου, πάλιν κατὰ μικρὸν εἰς τὸ χλωρὸν μεταβάλλει χρῶμα, καὶ τὸ τελευταῖον γίνεται ξανθόν· ἐπεὶ τά γε τῆς ἀπίου φύλλα, καὶ * τῆς ἀνδράχνης, καὶ τινων ἄλλων πεττόμενα γίνεται φοινικᾶ. πλὴν ὅσα καὶ τούτων καταξηραίνεται ταχέως, ταῦτα γίνεται ξανθὰ,

* γρ. ὥσπερ ἐπὶ τῶν βαπτομένων ἱματίων γίνεται
* Fortaſſe, τὰς ἁλουργίδας, ait Geſnerus.
* γρ. ἀπορρέοντων
* γρ. ξ. παρὰ τὸ ὄντα ἐπὶ τῷ φύσει τῷ οἰκείῳ χρώματι.
* Qu. τῆς ἀχράδος.

A διὰ τὸ τούτων περὶ τῆς πέψεως τὴν τροφὴν καταβάλλειν. τὰς μὲν οὖν τῶν φυτῶν διαφορὰς εὔλογον μάλιστα συμβαίνειν διὰ τὰς εἰρημένας αἰτίας.

ΚΕΦΑΛ. ϛʹ.

Διὰ τίνας αἰτίας τὰ τῶν ζώων τριχώματα, καὶ τὰ πτερώματα, καὶ τὰ δέρματα τοιαῦτα τὰς χρόας γίνεται.

Γίνεται δὲ καὶ τὰ τριχώματα καὶ τὰ πτερώματα καὶ τὰ δέρματα καὶ ἵππων καὶ βοῶν καὶ προβάτων, καὶ ἀνθρώπων, καὶ τῶν ἄλλων ζώων ἁπάντων, καὶ λευκὰ καὶ φαιά, καὶ πυῤῥὰ καὶ μέλανα, διὰ τὴν αὐτὴν B αἰτίαν. λευκὰ μὲν, ὅταν ἔτι ὑπὸ τῆς πέψεως τὸ ὑγρὸν τὸ οἰκεῖον ἔχον χρῶμα, καταξηρανθῇ. μέλανα δὲ, τοὐναντίον, ὅταν αὐτὸ ἐν τῇ γενέσει [τὸ περὶ τὸ τρίχωμα] ὑγρὸν, καθάπερ ἐν τοῖς ἄλλοις ἅπασι, παλαιὸν γινόμενον καὶ χρονιζόμενον, διὰ τὸ πλῆθος μελανθῇ. πάντων γὰρ τῶν τοιούτων, ὅ, τε χρὼς καὶ τὰ δέρματα γίνεται μέλανα. φαιὰ δὲ, καὶ πυῤῥὰ, καὶ ξανθὰ, καὶ τὰς ἄλλας ἔχοντα χρόας, ὅσα φθάνει καταξηραινόμενα πρότερον ἢ τελέως ἐν αὐτοῖς μεταβάλλειν εἰς τὸ μέλαν χρῶμα τὸ ὑγρόν. οἷς δὴ ἀνωμάλως τοῦτο συμβῇ, καὶ τὰ χρώματα C τοιαῦτα γίνεται ποικίλα. διὸ καὶ * πάντως τοῖς δέρμασι καὶ τὰ τριχώματα συνεπακολουθεῖ· ἐπεὶ καὶ τῶν ἀνθρώπων τῶν ἐμπύῤῥων καὶ τὰ τριχώματα λευκόπυῤῥα γίνεται· τῶν δὲ μελάνων, μέλανα· κἂν κατὰ μέρος τι τοῦ σώματος ἐξανθήσῃ λευκὸν, καὶ τὰς τρίχας ἴσχουσιν ἅπαντες λευκὰς κατὰ τὸν τόπον τοῦτον. καθάπερ καὶ τὰ ποικίλα τῶν ζώων. οὕτως ἅπαντα τὰ τριχώματα καὶ τὰ πτερώματα τοῖς δέρμασι συνακολουθεῖ, καὶ τὰ κατὰ μέρος, καὶ τὰ κατὰ σῶμα ὅλον. ὁμοίως δὲ καὶ τούτοις ὁπλαὶ, καὶ χηλαὶ, καὶ ῥύγχη, καὶ κέρατα. καὶ γὰρ ταῦτα, τῶν μὲν μελάνων γίνεται μέλανα· τῶν δὲ λευκῶν, λευκά· διὰ τὸ καὶ τούτοις ἅπασι, διὰ τοῦ δέρματος τὴν τροφὴν εἰς τὴν ἐκ- D τὸς ὑπεροχὴν διηθεῖσθαι. ὅτι δὲ τοῦτό ἐστιν αἴτιον, οὐ χαλεπὸν ἐκ πολλῶν συνιδεῖν. τῶν τε γὰρ παιδίων ἁπάντων αἱ κεφαλαὶ κατ᾽ ἀρχὰς μὲν γίνονται πυῤῥαὶ, διὰ τὴν τῆς τροφῆς ὀλιγότητα. φανερὸν δὲ τοῦτό ἐστι. καὶ γὰρ ἀσθενεῖς αἱ τρίχες καὶ ἀραιαὶ, διὰ τὴν αὐτὴν αἰτίαν. ἔτι δὲ καὶ βραχεῖαι τὸ πρῶτον ἅπασιν ἐπιγίνονται τοῖς παιδίοις. προϊούσης δὲ τῆς ἡλικίας, μελαίνονται, πάλιν * χρονιζομένοις αὖθις, διὰ τὸ πλῆθος τῆς ἐπιῤῥεούσης τροφῆς. ὁμοίως δὲ καὶ περὶ τὴν ἥβην καὶ τὸ γένειον, ὅταν ἄρχωνται τὸ πρῶτον ἡβᾷν καὶ γενειᾷν, καὶ αὗται γίνονται κατ᾽ ἀρχὰς μὲν πυῤῥαὶ ταχέως, διὰ τὴν ὀλιγότητα τῆς ὑγρασίας ἐν αὐταῖς καταξηραινομένης· τῆς τροφῆς δὲ πλέον ἐπὶ τὸν τόπον * φερο- E μένης, μελαίνονται πάλιν. αἱ δὲ ἐπὶ τοῦ σώματος, πλεῖστον χρόνον πυῤῥαὶ διαμένουσι, διὰ τὴν ἔνδειαν τῆς τροφῆς· ἐπεὶ καθ᾽ ὃν ἂν χρόνον αὐξηθῶσι, καὶ ταύτας ὁμοίως συμβαίνει μελαίνεσθαι, καθάπερ καὶ τὰς ἐπὶ τῆς ἥβης, καὶ [τὰς ἐπὶ] τῆς κεφαλῆς. φανερὸν δέ ἐστι. καὶ γὰρ ὅσα μῆκος ἔχει τῶν τριχωμάτων, ὡς τοπολὺ ἐστι, τὰ μὲν πρὸς τῷ σώματι, μελάντερα, τὰ δὲ πρὸς ταῖς ἄκραις, ξανθότερα. καὶ αἱ [λευκαὶ] τῶν προβάτων καὶ τῶν

* ἴσ. πάντως τ. δ. δ. τὰ χρώματα συν.

* ἴσ. χρονιζομένοις αὖθις.

* κ. ἐπιφερομένης.

A Cuius rei cauſa eſt quòd ante concoctionem alimento deſtituuntur. Eſt igitur admodum rationi conſentaneum, plantarum, & humi naſcentium multas differentias incidere.

CAPVT VI.

De pilorum, pennarum & his affinium in animalium corpore coloribus.

SEd non in his tantùm: nam & pili, & pinnæ, & coria equorum, boum, auium, & aliorum omnium animalium, modò alba, modò fuſca, modò rufa, nigra etiam aliquando, eandem ob cauſam fieri contingit. Alba quidem, quum adhuc B humidum ex maturitate proprium ac domeſticum habens colorem, arefactũ eſt. Nigra verò ex contrario, quando in ipſo ortu ſuperuacaneus color humidus, ſicvti in aliis omnib. iam antiquatus, & tempore confectus, ob humoris copiam nigreſcit. Cunctorum enim huiuſmodi & cutis & corium nigredinem accipit. Fuſca autem, & rufa, & flaua, aliiſque coloribus prædita, quotquot ad ariditatem perueniunt, priùs quàm humidum in ipſis abſolutè, & ex aſſe in nigrum colorem commutetur. In quibus autem hæc præter ordinem, & inconditè eueniunt, eorum etiam huiuſmodi colo- C res euariant. Propterea in vniuerſum videmus & coria & corpora mutuis vicibus ita ſe conſequi, vt colore reſpondeant. Nam & hominum ruforum τριχώματα λευκόπυῤῥα, hoc eſt, pili alborufi ſunt, id eſt, albo rufóque commiſti: nigrorum autem nigri: & particulatim quicquid in corpore album effloreſcit, ibidem ex natura loci omnes albi pili ſuffruticant: ſicvti in animalibus, quæ varia ſunt, eodem modo pili omnes omnéſque pinnæ coria conſequuntur: & hæc ſecundùm partem, hæc ſecundùm corpus tantùm eueniunt. Sed & ad eundem modum ſeſe habent vngulæ, chelæ, roſtra, & cornua. Nam hæc omnia in nigris nigra, in albis alba ſpectantur. Cuius rei cauſa eſt, quòd in his omni- D bus alimentum per corium in exteriorem ambitum profluit. Quòd autem hæc vera & legitima cauſa ſit, haud ſanè difficile eſt ex multis perſpicere. Siquidem puerorum omnium capita, dum parui ſunt, rufa exiſtunt ab initio: quod euenit ob paucitatem alimenti. Quod idem ex eo probatur, quòd ob eandem cauſam imbecilles rarique ſunt capilli. Quinetiam breues pueris omnib. ab initio gignuntur, procedẽte autẽ ætate nigreſcunt, tunc quum capilli rurſus colorẽ trahũt ex multitudine defluentis alimenti. Quod eodẽ modo contingit circa pubẽ & barbam, quando primùm incipiunt pubeſcere, & barbã emittere: quarũ vtraq. in ipſis exordiis citò rufeſcit ob paucitatem humiditatis, quæ & in pube exareſcit: quum autem eundem in locum copioſius alimentum demanare cœperit, E rurſus nigreſcunt. Sunt & pili, qui in corpore rufi plurimum temporis manent, ob inopiã alimenti: quoniam ſecundùm tempus, quo augentur, & hos ſimiliter contingit nigreſcere, ſicvt hoc idem euenit tam pilis pubis quàm capitis. Hoc autem ex eo liquet, quòd quæcunque longiores habent pilos, vt plurimùm ea parte quæ corpori proxima eſt, nigriores habent: qua parte autem in faſtigium exurgunt, flaueſcunt ma[illegible] males ouium, equo-

rum, & hominum. Illa enim pilorum pars ob alimenti paucitatem in eam defluentis, citò exareſcit. Eodem modo & nigrarum auium pinnæ, quæ corpori viciniores ſunt, cæteris omnibus ſunt nigriores: at quæ in ſummo, flauiores. Ad eundem modum ſe habent & quæ circa collum, & omnino quæcunque parcius habent alimentum. Quod hinc facilè patet, quòd omnia ſub perfectionis tempus, quúmque iam propè abſoluta ſunt, pilos tranſmutant, & rufa efficiuntur: quoniam alimento rurſus deficiente, celeriter ſiceſcunt: denique alba priùs fiunt, quàm humor nigreſcat, inſito in ipſis alimento iam excocto. Sed hoc maximè omnium in iumentis manifeſtum eſt: omniũ enim pili albi fiunt. Nam quum partes non poſſint ex æquo alimentum attrahere, ob caloris imbecillitatem humidum citò exareſcens fit album. Eadémque cauſa partes temporibus finitimæ omnium maximè caneſcunt: & in vniuerſum, circa loca infirma & laborantia hoc euenit. Præterea, & circa hæc loca in primis in hunc colorem fit mutatio, quum propriam naturam immutauerint. Nam & lepus iam factus eſt candidus: aliquando etiam niger viſus eſt: & ceruus, & vrſus, & cũ iſtis æquè coturnix, & perdix, & hirundo. Quando enim à primis natalibus huiuſmodi infirma gignuntur, ob inopiam alimenti intempeſtiuè ac præproperè matureſcentia, alba fiunt. Sic & pueri quidam protinus capita habent albicantia, & cilia, & ſupercilia, quod cæteris appetente ſenio contingit: idque indubitatò propter infirmitatem paucitatémque alimenti. Hoc enim illud eſt, quod canitiem inuehit. Proinde animalia alba pleraque omnia infirmiora ſunt, quàm nigra. Nam hæc antè quàm abſolutum incrementum capeſſant, propter paucitatem tenuitatémque alimenti iam matura, alba efficiuntur, eo more quo ſolent fructus, quotquot laborare & ægrotare contigerit: hi enim multum ante tempus ob imbecillitatem matureſcunt. Quæcunque autem fiunt alba, multùm à cæteris differunt: ſicvt equi, & canes. Huiuſmodi autem omnia tranſmutant eum qui ſecundùm naturam eſt, colorem in album. Quod non aliunde quàm ab inopia alimenti, prouenit. Humidum enim in huiuſmodi non vetuſteſcens, ſed abſumptum ab augmento, atrum efficitur. Plurima enim ſunt ex iis & humida, & infrugifera, ratione boni nutrimenti: ob id non commutant pilos in colorem album. Quod ex eo perſpectum eſt, quoniam nigra antè quàm caneſcant, rufa euadunt, alimento in illis deficiente, & plus nimio iam excocto: quæ demum poſtea exalbeſcunt. Sed enim nonnulli ſuſpicantur nigra omnia fieri, ea cauſa, quòd eorum alimentum à calido aduratur, ſicvti ſanguinem, & aliorum vnumquodque. qua in re falluntur. Quædam enim animalia protinus & ab ipſis vſque incunabulis nigra naſcuntur: ſicvt canes, capellæ, boues, & in vniuerſum omnia, quorum pili & coria à primis vſque initiis alimentum habent. Procedente autem ætate, minùs nigrum colorem defendunt. Quod non ſic decebat: ſiquidem omnium tales eſſe pilos in ipſo ætatis vigore par fuit tunc, quum in ipſis etiam plurimùm calor viget: atque ita omnia potiùs à principio caneſcere.

A ἵππων καὶ ἀνθρώπων, διὰ τὸ τὴν τροφὴν αὐτοῖς ἐλαχίστην ἐπὶ τούτοις φέρεσθαι τοῖς τόποις καὶ καταξηραίνεσθαι ταχέως. γίνονται δὲ καὶ τὰ πτερώματα τῶν μελάνων ὀρνίθων, τὰ μὲν πρὸς τῷ σώματι, μελάντερα πάντων, τὰ δὲ πρὸς τοῖς ἄκροις, ξανθότερα. τὸν αὐτὸν δὲ τρόπον, καὶ τὰ περὶ τὸν τράχηλον, καὶ ὅλως ὅσα βραχεῖαν τὴν τροφὴν λαμβάνει. δῆλον δέ· καὶ γὰρ * ὑπὸ τὴν τελείωσιν ἅπαντα τὰ τριχώματα μεταβάλλει, καὶ γίνεται πυρρὰ, διὰ τὸ πάλιν τὴν τροφὴν ὑπολείπουσαν, καταξηραίνεσθαι ταχέως. τὸ δὲ τελευταῖον, λευκὰ, πρότερον ἢ μελανθῆναι τὸ ὑγρὸν, τῆς τροφῆς ἐν αὐτοῖς ἐκπεττομένης. μάλιστα δὲ τοῦτο ἐπὶ τῶν ὑποζυγίων φανερόν B ἐστι. πάντων γὰρ τὰ τριχώματα γίνεται λευκά. τῶν γὰρ τόπων οὐ δυναμένων ὁμοίως ἐπισπᾶσθαι τὴν τροφὴν, διὰ τὴν ἀσθένειαν τὴν τοῦ θερμοῦ, ταχέως καταξηραινόμενον τὸ ὑγρὸν, γίνεται λευκόν. καὶ τὰ περὶ τοὺς κροτάφους μάλιστα πάντων πολιοῦται, καὶ ὅλως [illegible] περὶ τοὺς ἀσθενεῖς καὶ πεπονηκότας τῶν τόπων. πρὸ ἢ καὶ * περὶ τὰ μάλιστα εἰς τοῦτο τὸ χρῶμα μεταβάλλει, ὅταν τὴν φύσιν * παραλλάξῃ τὴν οἰκείαν. καὶ γὰρ λαγὼς γέγονεν ἤδη λευκὸς, * καὶ λευκὸς δή ποτε πέφηνε καὶ ἔλαφος καὶ ἄρκτος· ὁμοίως δὲ τούτοις καὶ ὄρτυξ, καὶ πέρδιξ, καὶ χελιδών. ὅταν γὰρ ἀσθενήσωσι τῇ γενέσει, πάντα τὰ τοιαῦτα, διὰ τὴν ὀλιγότητα τῆς τροφῆς C πρὸ ὥρας ἐκπεττόμενα, γίνεται λευκά. οὕτως καὶ τὰ τῶν παίδων εὐθὺς καὶ τὰς κεφαλὰς ἔχει λευκὰς, καὶ τὰ βλέφαρα καὶ τὰς ὀφρῦς, ὥσπερ καὶ τῶν ἄλλων ἑκάστῳ πρὸς τὸ γῆρας φανερῶς [ἅπασι,] δι᾽ ἀσθένειαν καὶ ὀλιγότητα [τῆς τροφῆς] συμβαίνει τοῦτο τὸ πάθος τὸ τῆς πολιώσεως. * διὸ καὶ τὰ πλεῖστα τῶν ζώων ἀσθενέστερα γίνεται τὰ λευκὰ τῶν μελάνων. πρὸ τοῦ γὰρ τὴν αὔξησιν αὐτῶν τελειωθῆναι, διὰ τὴν ὀλιγότητα τῆς τροφῆς ἐκπεττόμενα, γίνεται λευκά, καθάπερ καὶ τῶν καρπῶν ὅσοι νενοσηκότες τυγχάνουσι. καὶ γὰρ οὗτοι πολὺ μᾶλλον δι᾽ ἀσθένειαν ἐκπέττονται. ὅσα δὲ γίνεται λευκὰ, * πολὺ δια- D φέροντα [ἐκ] τῶν ἄλλων· οἷον ἵπποι καὶ κύνες. τὰ δὲ τοιαῦτα μεταβάλλει πάντα ἐκ τοῦ κατὰ φύσιν χρώματος εἰς τὸ λευκὸν, διὰ τὴν εὐτροφίαν. τὸ γὰρ ὑγρὸν ἐν τοῖς τοιούτοις οὐ χρονιζόμενον, ἀλλ᾽ ἀναλισκόμενον διὰ τὴν αὔξησιν, * γίνεται μέλαν. τὰ πλεῖστα γάρ ἐστι τῶν τοιούτων ὑγρὰ καὶ εὔκαρπα, διὰ τὴν * εὐτροφίαν. διόπερ οὐδὲ μεταβάλλει τὰ λευκὰ τῶν τριχωμάτων. φανερὸν δὲ τοῦτο ἐστί. καὶ γὰρ τὰ μέλανα πρότερον τῆς πολιώσεως, γίνεται πυρρὰ, ἤδη τῆς τροφῆς ἐν αὐτοῖς ἀπολειπούσης, καὶ μᾶλλον ἐκπεττομένης· τὸ δὲ τελευταῖον, λευκά. καί τινες ὑπολαμβάνουσι μέλανα γίνεσθαι πάντα, διὰ τὸ συγκαίεσθαι τὴν E τροφὴν αὐτῶν ὑπὸ τοῦ θερμοῦ, καθάπερ καὶ τὸ αἷμα, καὶ τῶν ἄλλων ἕκαστον· διαμαρτάνοντες. ἔνια γὰρ καὶ τῶν ζώων εὐθὺς ἐν ἀρχῇ γίνεται μέλανα, οἷον κύνες, καὶ αἶγες, καὶ βόες, καὶ ὅλως ὅσων τὰ δέρματα καὶ τὰ τριχώματα κατάρχεται [μὲν πλείω] ἔχει τροφήν· προϊούσης δὲ τῆς ἡλικίας, ἧττον. καίτοι γε ἐχρῆν· ἀλλὰ πάντως ἔδει τοιαῦτ᾽ εἶναι καὶ τὰ τριχώματα [* καὶ] τὴν ἀκμὴν, καθ᾽ ὃν χρόνον μάλιστα αὐτῶν ἡ ἰσχὺς καὶ τὸ θερμὸν, καὶ μᾶλλον ἅπαντα πολιοῦσθαι κατάρχεσθαι.

* γρ. περὶ τῆς τε.

* γρ. περὶ τὰ μάλιστα μ.

* γρ. ἀπαλλάξῃ.

* ἢ μέλας. mendosè vide De gener. anim. l.5. cap.6.

* γρ. διὸ καὶ ἐπὶ τὸ πλεῖστον τ. ζ.

* γρ. ἢ οὐ διαφέροντα, οἷον ἵπποι καὶ κύνες τὰ τ. ...

* γρ. οὐ γίνετ.

* Geſner. εὐτροφίας.

* γρ. κατὰ τὴν ἀ.

πολὺ γὰρ ἁπάντων ἀπὸ πρώτης [συστάσεως] ἀσθενέστερόν τι γίνεται τὸ θερμὸν, ἢ καθ' ὃν χρόνον ἄρχεται τὰ τριχώματα αὐτῶν λευκαίνεσθαι. φανερὸν δὲ τοῦτό ἐστι καὶ ἐπὶ τῶν λευκῶν. ἔνια μὲν γὰρ εὐθέως ἴσχει τὸ χρῶμα λευκότατον, ὅσα καὶ τούτων πλείστην ἔχει κατ' ἀρχὰς τὴν τροφὴν, καὶ μὴ πρὸ τοῦ τῆς ὥρας ἐν αὐτῇ καταξηραίνεται τὸ ὑγρόν. προϊούσης δὲ τῆς ἡλικίας, ξανθὰ, τροφῆς αὐτοῖς ἐλάττονος ὕστερον ἐπιρρεούσης. τὰ δὲ, *ἐν ἀρχῇ μὲν, γίνεται ξανθὰ κατὰ δὲ τὴν ἀκμὴν λευκότατα· καθάπερ καὶ τῶν ὀρνίθων μεταβάλλουσι *τὸ χρῶμα πάλιν, τῆς τροφῆς ἐν αὐτοῖς ὑπολειπούσης. *δῆλοι δέ· πάντα γὰρ αὐτὰ γίνεται ξανθὰ καὶ περὶ τὸν τράχηλον, καὶ ὅλως ὅσα σπανίζει τροφῆς τῆς ἐν αὐτοῖς [ὑγρασίας] ὑπολειπούσης. δῆλον δέ. ὥσπερ γὰρ καὶ τὸ πυρρὸν, εἰς τὸ λευκὸν μεταβάλλει, καὶ τὸ μέλαν πάλιν εἰς τὸ πυρρὸν, οὕτω καὶ τὸ λευκὸν εἰς τὸ ξανθόν. συμβαίνει δὲ τοῦτο καὶ ἐπὶ τῶν φυτῶν. ἔνια γὰρ ἐκ τῆς ὑστέρας πέψεως ἐπανατρέχει πάλιν ἐπὶ τὴν προτέραν. μάλιστα δὲ τοῦτο καὶ ἐπὶ τῆς ῥοιᾶς φανερόν ἐστι. τὸ μὲν γὰρ ἐξ ἀρχῆς οἱ κόκκοι γίνονται φοινικοῖ, καὶ τὰ φύλλα, δι' ὀλιγότητα τῆς τροφῆς ἐκπεττομένης· ὕστερον δὲ πάλιν μεταβάλλουσιν εἰς τὸ ποῶδες χρῶμα, πολλῆς τροφῆς ἐπιρρεούσης, καὶ τῆς πέψεως οὐ δυναμένης κρατεῖν ὁμοίως. τὸ τελευταῖον δὲ, πεττομένης ἤδη τῆς τροφῆς, πάλιν γίνεται τὸ χρῶμα φοινικοῦν. καθόλου δὲ εἰπεῖν, καὶ περὶ τῶν ἄλλων τριχωμάτων καὶ πτερωμάτων, ἅπαντα λαμβάνει τὰς μεταβολὰς, οἷα μὲν, (καθάπερ εἴρηται) τῆς τροφῆς ἐν αὐτοῖς ὑπολειπούσης, εἰς δὲ, τοὐναντίον πλεοναζούσης. διόπερ ἄλλα κατ' ἄλλους χρόνους τῆς ἡλικίας, καὶ λευκότατα καὶ μελάντατα γίνεται τῶν τριχωμάτων· ἐπεὶ καὶ τῶν κοράκων τὰ πτερώματα τὸ τελευταῖον εἰς τὸ ξανθὸν χρῶμα μεταβάλλει, τῆς τροφῆς ἐν αὐτοῖς ὑπολειπούσης. τῶν δὲ τριχωμάτων οὐδὲν οὔτε φοινικοῦν, οὔθ' ἁλουργὲς, οὔτε πράσινον, οὔτε ἄλλην οὐδεμίαν ἔχοι τοιαύτην γίνεται χρόαν, διὰ τὸ πάντα τὰ τοιαῦτα χρώματα γίνεσθαι, μιγνυμένων αὐτοῖς τῶν τοῦ ἡλίου αὐγῶν. *ἔτι δὲ τῶν τριχωμάτων τῶν ὑγρῶν, ἐν τοῖς τῆς σαρκὸς συμβαίνειν τὰς μεταβολὰς, καὶ μηδεμίαν *αὐτὰ λαμβάνειν μίξιν. δῆλον δ' ἐστί· καὶ γὰρ τῶν πτερωμάτων, τὰ μὲν, ἐξ ἀρχῆς οὐδὲν γίνεται τῷ χρώματι τοιοῦτον, ἀλλὰ καὶ τὰ ποικίλα τῶν ὀρνέων, πάντα (ὡς εἰπεῖν) μέλανα, οἷον ὅ,τι ταὼς, καὶ ἡ περιστερὰ, καὶ ἡ χελιδών· ὕστερον δὲ λαμβάνει πάσας τὰς τοιαύτας ποικιλίας, ἤδη τῆς πέψεως αὐτῶν ἔξω τοῦ σώματος γινομένης, ἔν τε τοῖς πτερώμασι καὶ τοῖς *καυλοῖς· ὥστε συμβαίνει (καθάπερ καὶ ἐπὶ τῶν φυτῶν) καὶ τούτων ἔξω τοῦ σώματος γίνεσθαι τὴν [τῶν χρωμάτων] πέψιν. διὸ καὶ τὰ λοιπὰ τῶν ζῴων, τά τε ἔνυδρα καὶ τὰ ἑρπετὰ, καὶ τὰ κογχύλια, παντοδαπὰς ἴσχει χρωμάτων μορφὰς, πολλῆς γε καὶ τούτοις τῆς πέψεως γινομένης. τὴν μὲν οὖν περὶ τὰ χρώματα θεωρίαν μάλιστ' ἄν τις ἐκ τῶν εἰρημένων δύναιτο συνιδεῖν.

* γρ. ἐν ἀρχαῖς

* γρ. τὸ χρῶμα

* γρ. δῆλον δέ.

* γρ. ἐπεὶ δὲ

* γρ. αὐτῶν. al. αὐτά

* γρ. καυλοῖς, al. καυλίοις, al. καλάμοις

A Multo enim imbecillior ab initio omnium calor
eſt, quàm eo tempore, quo eorum pili incipiunt
inalbeſcere. Perſpicuum & hoc eſt in iis quæ al-
ba ſunt: ex iis enim quædam protinus ſunt colo-
re candidiſſimo, quæcunque ſcilicet colum plu-
rimum habent à principio alimentum, neque in-
ſitus illi humor ante tempus exareſcit, poſt pro-
greſſu deinde ætatis, ξανθὰ, id eſt, flaua, euadunt, par-
ciore ſcilicet alimento poſtmodum in iis defluen-
te. Quæ autem in ipſis quidem crepundiis flaua
fiunt, poſtquam ad ætatis ſummum vigorem per-
uenerunt, candidiſſima: ſicvt & auium colores
rurſus tranſmutantur, alimento in ipſis deficien-
te. Et id ſanè patet: omnia enim hæc circa col-
B lum etiam flaueſcunt, & omnino omnia, quæ in-
ipſis rareſcunt, alimento in ipſis deficiente. Sed
& hoc quoque planum eſt. Sicvt enim rufum in
album commutatur, & nigrum rurſus in rufum,
eodem pacto & album in flauum. Contingit au-
tem & hoc in plantis. Nonnullæ enim ex poſte-
riore concoctione iterum recurrunt in priorem.
Et hoc præcipuè in malo punica compertum eſt,
& hoc ipſum ab initio: acini enim fiunt puniceí:
item & folia, ob paucitatem concocti elementi:
poſteriùs autem rurſus in herbaceum colorem
tranſmutantur, mullo alimento defluente, quum
concoctio non poteſt eodem modo peruincere,
C poſtremò, alimento iam concocto, rurſus fit co-
lor puniceus. Vt autem in vniuerſum dicamus &
de aliorum pilis & pennis, omnia commutationes
accipiunt: hæc quidem (vt dictum eſt) alimento in
ipſis deficiente, hæc autem ex aduerſo redundan-
te, propter quod alia aliis temporibus ætatis can-
didiſſimos aut nigerrimos habent pilos. Siquidem
& coruorum pennæ poſtremo in colorem flauum
tranſmutantur, quum ſcilicet ab alimento deſti-
tuuntur. Ex pilis autem nullus neque puniceum
neque purpureum, neque praſinum, ſeu viridem,
neque omnino alium huiuſmodi colorem ha-
bent: quoniam omnes huiuſmodi colores fiunt,
admiſto ipſis Solis ſplendore. Pilis autem etiam-
D num humidis in carnis colore mutationes contin-
gunt, & ipſi nullam admiſtionem capiunt. Id au-
tem manifeſtum eſt: ex pennis enim quæ gene-
rantur à principio, nulla eo modo fit, quo pili
fiunt. Sed auium quæcunque variæ ſunt, omnes
(vt ita dicam) nigræ ſpectantur, ſicvt pauo & co-
lumba, & hirundo. Poſteriùs autem tales omnes
varietates aſſumunt, quum ipſarum concoctio
iam extra corpus fit, tum in pennis, tum in vagi-
nis. Quare euenit, ſicvt & ipſis plantis, horum
ſcilicet concoctionem extra corpus fieri. ſiquidem
& reliqua animalium, tam aquatilia quàm repti-
lia, conchylia etiam, omnifarias capiunt colo-
E rum formas, tunc quum multa in ipſis fit conco-
ctio. Et ex iis quidem, quæ dicta ſunt, poſſit quiſ-
piam colorum ſpeculationem agnoſcere.

ΑΡΙΣΤΟΤΕΛΟΥΣ ΠΕΡΙ ΑΤΟΜΩΝ ΓΡΑΜΜΩΝ.

ARISTOTELIS LIBER DE INSECABILIBVS LINEIS,

Iulio Martiano Rota interprete.

NVNQVID vllæ reperiuntur lineæ, quæ ſecari nequeunt: & vt in vniuerſum res iſta pertractetur, eſt ne in omni quantitate, ſicvt nonnulli ſtatuunt, aliquid carens partibus? An confitendum eſt lineas aliquas inſecabiles eſſe: nam, ſi vt paucum, ſic & paruum eſt aliquid in rerum natura: quod autem infinitas fere ſectiones ſuſtinet, neque paucum, neque paruum eſt, ſed potiùs & multum & magnum, quæ pauco & paruo ſunt oppoſita: ſtatim manifeſtum euadit, paucum & paruum finitas habere diuiſiones. Quòd ſi finitas diuiſiones habẽt, neceſſe eſt magnitudinem inſecabilem aliquam extare. Quare omni quantitati inſecabile quiddam inerit, modò reperiatur quippiam, quod paucum & paruum nuncupari debeat. Deinde ſi lineæ extat forma, atque idea, fatendum eſt lineam indiuiduam eſſe: nam conſtat ideam omnium, de quibus prædicatur, primam eſſe. At partes totum natura ſemper antecedunt. Quare diuidua erit ipſa linea. Et eodem modo ipſum quadratum, ipſe triangulus, & aliarum figurarum ideæ, ac denique ſuperficies ipſa, & corpus ipſum. Continget enim ideis, priùs alia quædam eſſe. Ampliùs ſi elementa ſunt corpora, & elementis nihil eſt prius, ſuntque partes toto natura priores: indiuiduum proculdubio ignis erit, & vniuerſaliter quicquid corporis alicuius eſt elementum. Quare non ſolùm in rebus quas cognoſcimus intellectu, verum etiam in his quæ ſenſu percipiuntur, quippiam erit, quod partes non habet. Præterea per Zenonis argumentationem neceſſe eſt aliquam extare magnitudinem, quæ partibus careat, ſi modò fieri nequit vt res aliqua per ſingula quæque tangenda decurrens finito in tempore tangat infinita. Nam oportet vt ad medium mobile priùs veniat: At rei quæ partibus non vacat, medium ſublime ſemper aliquod ſupereſt. Sin autem tangit infinita, finito in tempore; id quod ſuper lineam fertur, & mobile celeriùs æquali in tempore plus ſpatij tranſigit, cogitationiſque noſtræ velociſſimus eſt motus, cogitatio quoque finito tempore in ſingulis rerum motibus, tangit infinita. Quare ſi cogitationi in omni rerum progreſſu ſingula tangere, nihil aliud eſt quàm numerare; continget finito in tempore cogitationem infinita numerare: quod ſi hoc fieri nequit, indiuidua ſanè dabitur aliqua linea.

A ΑΡΑ γε εἰσὶν ἄτομοι γραμμαὶ καὶ ὅλως ἐν ἅπασι τοῖς ποσοῖς ἐστί τι ἀμερές, ὥσπερ ἔνιοί φασιν; εἰ γὰρ ὁμοίως ὑπάρχει τό τε ὀλίγον καὶ τὸ μικρόν, τὸ δὲ ἀπείρους ἔχον σχεδὸν διαιρέσεις, οὐκ ἔστιν ὀλίγον, ἀλλὰ πολὺ καὶ μέγα, τὰ ἀντικείμενα τούτων· τότε φανερὸν ὅτι πεπερασμένας ἕξει τὰς διαιρέσεις τὸ ὀλίγον καὶ τὸ μικρόν. εἰ δὲ πεπερασμέναι αἱ διαιρέσεις, ἀνάγκη τι εἶναι ἀμερὲς μέγεθος. ὥστε ἐν ἅπασιν ὑπάρξει τι ἀ-
B μερές, ἐπείπερ καὶ τὸ ὀλίγον καὶ τὸ μικρόν. ἔτι, εἰ ἰδέα γραμμῆς, ἡ δὲ ἰδέα πρώτη τῶν συνωνύμων, τὰ δὲ μέρη, τοῦ ὅλου πρότερα τὴν φύσιν, διαιρετὴ ἂν εἴη αὐτὴ ἡ γραμμή· τὸν αὐτὸν δὲ τρόπον καὶ τὸ τετράγωνον, καὶ τὸ τρίγωνον, καὶ τὰ ἄλλα σχήματα, καὶ ὅλως ἐπίπεδον αὐτὸ καὶ σῶμα. συμβήσεται γὰρ πρότερα ἄττα εἶναι τούτων. ἔτι, εἰ σώματα, ἔσται στοιχεῖα, τῶν δὲ στοιχείων μηδὲν πρότερον, τὰ δὲ μέρη, τοῦ ὅλου πρότερα· ἀδιαίρετον ἂν εἴη τὸ πῦρ, καὶ ὅλως τῶν
C τοῦ σώματος στοιχείων ἕκαστον. ὥστε οὐ μόνον ἐν τοῖς νοητοῖς, ἀλλὰ καὶ ἐν τοῖς αἰσθητοῖς ἐστί τι ἀμερές. ἔτι δὲ κατὰ τὸν Ζήνωνος λόγον, ἀνάγκη τι μέγεθος ἀμερὲς εἶναι, εἴπερ ἀδύνατον μὲν ἐν πεπερασμένῳ χρόνῳ ἀπείρων ἅψασθαι, καθ' ἕκαστον ἁπτόμενον, ἀνάγκη δ' ἐπὶ τὸ ἥμισυ πρότερον ἀφικνεῖσθαι τὸ κινούμενον, τοῦ δὲ μὴ ἀμεροῦς πάντως ἔστιν ἥμισυ. εἰ δὲ καὶ ἅπτεται τῶν ἀπείρων ἐν πεπερασμένῳ χρόνῳ τὸ ἐπὶ τῆς γραμμῆς φερόμενον, τὸ δὲ θᾶττον ἐν
D τῷ ἴσῳ χρόνῳ πλεῖον διανύει· ταχίστη δὲ ἡ τῆς διανοίας κίνησις, κἂν ἡ διάνοια τῶν ἀπείρων ἐφάπτοιτο καθ' ἕκαστον ἐν πεπερασμένῳ χρόνῳ. ὥστε εἰ τὸ καθ' ἕκαστον ἅπτεσθαι τὴν διάνοιαν, ἀριθμεῖν ἐστιν, ἐνδέχεται ἀριθμεῖν τὰ ἄπειρα ἐν πεπερασμένῳ χρόνῳ. εἰ δὲ τοῦτο ἀδύνατον, εἴη ἂν ἄτομος γραμμή.

ἔτι, καὶ ἐξ ὧν αὐτοὶ οἱ ἐν τοῖς μαθήμασι λέγουσιν, εἴη ἂν τις ἄτομος γραμμή, ὥς φασιν, εἰ σύμμετροί εἰσιν αἱ τῷ αὐτῷ μέτρῳ μετρούμεναι· ὅσαι δέ εἰσι σύμμετροι, πᾶσαι εἰσὶ μετρούμεναι. εἴη γὰρ ἄν τι μῆκος ᾧ μετρηθήσονται πᾶσαι. τοῦτο δ' ἀνάγκη ἀδιαίρετον εἶναι. εἰ γὰρ διαιρετόν, καὶ τὰ μέρη τούτου οὐ μέτρου τινὸς ἔσται. σύμμετρα γὰρ τῷ ὅλῳ. ὥστε μέρους τινὸς εἶναι διπλάσια τὴν ἡμίσειαν· ἐπεὶ τοῦτ' ἀδύνατον, ἀδιαίρετον ἂν εἴη μέτρον. ὡσαύτως δὲ καὶ αἱ μετρούμεναι ἅπαξ ὑπ' αὐτοῦ, ὥσπερ πᾶσαι αἱ ἐκ τοῦ μέτρου συντεθεῖσαι γραμμαί, ἐξ ἀμερῶν σύγκεινται. τὸ αὐτὸ συμβήσεται καὶ τοῖς ἐπιπέδοις. πάντα γὰρ τὰ ἀπὸ τῶν ῥητῶν γραμμῶν, σύμμετρα ἀλλήλοις. ὥστε ἔσται τὸ μέτρον αὐτῶν ἀμερές. ἀλλὰ μὴν εἴ τι τμηθήσεται μέτρον τινὰ τεταγμένην καὶ ὡρισμένην γραμμήν, οὐκ ἔσται οὔτε ῥητή, οὔτ' ἄλογος, οὔτε τῶν ἄλλων οὐδεμία ὧν νῦν εἴρηται, οἷον ἀποτομὴ ἐκ δυοῖν ὀνομάτοιν· ἀλλὰ καθ' αὑτὰς μὲν, οὐδὲ τινὰς ἕξουσι φύσεις, πρὸς ἀλλήλας δὲ ἔσονται ῥηταὶ καὶ ἄλογοι. ἢ πρῶτον μὲν, οὐκ ἀνάγκη τὸ ἄπειρον ἔχον διαιρέσεις, μὴ εἶναι μικρὸν καὶ ὀλίγον. καὶ γὰρ τόπον καὶ μέγεθος καὶ ὅλως τὸ συνεχές, μικρὸν μὲν λέγομεν, καὶ ἐφ' ᾧ μὲν ἁρμόττει τὸ ὀλίγον, οὐ μὴν ἀλλ' ἀπείρους διαιρέσεις φαμὲν ἔχειν. ἔτι δ' εἰ ἐν ταῖς συνθέτοις γραμμαῖς, κατὰ τούτων τῶν ἀπείρων λέγεται τὸ μικρόν, καὶ ἄπειροι στιγμαὶ ἐνυπάρχουσιν. ἡ δὲ γραμμή, διαίρεσις κατὰ στιγμήν, καὶ ὁμοίως καθ' ὁποιανοῦν ἀπείρους ἂν ἔχοι διαιρέσεις ἅπασα, ὡς ἡ μὴ ἄτομος. ἔνιαι δὲ τούτων εἰς μακρὰ καὶ ἄπειροι ὀλίγον. πᾶσαν δὲ τμηθῆναι τὸν ἐπιταχθέντα λόγον, δυνατὸν τὴν μὴ ἄτομον. ἔτι εἰ τὸ μέγα ἐκ μικρῶν τινῶν σύγκειται, ἢ οὐθὲν ἔσται τὸ μέγα, ἢ τὸ πεπερασμένας ἔχον διαιρέσεις, οὐ μέγα ἔσται. τὸ γὰρ ὅλον τὰς μεγάλων ἔχει διαιρέσεις ὁμοίας. ἄλογον δ' ἐπεί τι, τὸ μικρὸν πεπερασμένας ἔχειν διαιρέσεις, καὶ τὸ μέγα ἀπείρους, οὕτως ἀξιοῦσιν. ὥστε φανερὸν ὅτι οὐκ ἐν τούτῳ λέγοιτο τὸ μέγα καὶ τὸ μικρόν, τῷ πεπερασμένας ἔχειν καὶ ἀπείρους διαιρέσεις. εἰ δ' ὅτι καὶ ἐν ἀριθμοῖς τὸ ὀλίγον πεπερασμένας ἔχει διαιρέσεις, καὶ ἐν γραμμαῖς τις ἀξιοῖ τὸ μικρόν, εὔηθες. ἐκεῖ μὲν γὰρ ἐξ ἀμερῶν τε ἡ γένεσις, καὶ ἔστι τις τῶν ἀριθμῶν ἀρχὴ ὅθεν, καὶ πᾶς ὁ μὴ ἄπειρος ἀριθμὸς πεπερασμένας ἔχει διαιρέσεις. ἐπὶ δὲ τῶν μεγεθῶν οὐχ ὁμοίως. οἱ δ' ἐν τοῖς εἴδεσι τὰς ἀτόμους κατασκευάζοντες, τὸ ζητούμενον ἴσως ἀξίωμα λαμβάνουσι τὸ προυπαρχούσης, τὸ πλεῖν τούτων ἰδέας· καὶ τρόπον τινὰ ταῦτ' ἀναιροῦσι δι' ὧν δεικνύουσι. καὶ γὰρ διὰ τούτων τῶν λόγων ἀναιρεῖται τὰ εἴδη. πάλιν δὲ τῶν σωματικῶν στοιχείων εὔηθες τὸ ἀμερῆ ἀξιοῦν. εἰ γὰρ καὶ ἀποφαίνονταί τινες οὕτως, ἀλλὰ πρός γε τὴν ὑποκειμένην σκέψιν αὐτὸ τὸ ἐξ ἀρχῆς λαμβάνουσι. μᾶλλον δὲ ὅσῳ μᾶλλον τὸ ἐξ ἀρχῆς δόξειεν ἀναλαμβάνεσθαι, τοσῷ μᾶλλον δοκεῖ διαιρετὸν εἶναι σῶμα καὶ μῆκος καὶ τοῖς ὄγκοις καὶ τοῖς διαστήμασιν. ὁ δὲ τοῦ Ζήνωνος λόγος οὐ συμβιβάζει, οὐ συμπεπε-

A Poſtremò & ex iis quæ tradunt Mathematicis imbuti diſciplinis, quiuis lineam aliquam inſecabilem eſſe concedet. Nam ſi, vt dicunt, illæ commenſurabiles ſunt lineæ, quæ eadem menſura dimetiri queunt: & quæcunque ſunt commenſurabiles, vt dimetiantur omnes, nihil impedit, dimitum longitudo aliqua extabit, qua menſurabuntur omnes, hanc autem neceſſe eſt indiuiduam eſſe. Nam ſi diuidua ſtatuatur, huius quoque menſuræ partes, menſuram aliam aliquam habebunt. partes enim toti commenſurabiles ſunt, ita vt partis portio, quæ dimidia fuerat, efficiatur dupla: quoniam verò hoc fieri nequit, indiuiſibilis eſſe menſura debet. Eodem modo & quæ ſemel ab ipſa menſura ſunt menſuratæ, ſicvt
B omnes ex menſura compoſitæ lineæ, ex indiuiduis componuntur. Idem etiam continget in figuris planis: nam omnes inter ſe ſunt à conſtitutis lineis procreatæ, commenſurabiles: quare ipſarum quoque menſura indiuidua erit. Cæterùm ſi quis menſuram diuidet, conſtitutam quandam & determinatam lineam, non erit amplius neque conſtituta, neque irrationalis linea, neque aliarum vlla, de quibus modò dictum eſt, velut quam ἀποτομὴν vocant ex duobus nominibus compoſitam. Verùm neque ſecundùm ſe aliquam definitam naturam habebunt, ſed collatæ ſibi ipſis & conſtitutæ, & irrationales erunt omnes. An primo quidem non oportet id quod infinitas habet
C diuiſiones, non eſſe paruum aut paucum? Nam locum, lineam, ſuperficiem, & ſummatim omne continuum, paruum dicimus, & in quibus conuenit paucum etiam, nec ob id tamen infinitis diuiſionibus ipſa carere affirmamus. Deinde ſi lineis hiſce indiuiduis, quæ ſunt in compoſito ex lineis, paruum dicitur, atque ipſis puncta inſunt infinita, fiatque diuiſio ſecundùm puncta, & in quibuſuis punctis æqualiter, poterit infinitas ſectiones ſuſcipere omnis linea, vt quæ non ſit inſecabilis. & quædam ipſarum in parua ſecari: eruntque infiniti puncti pauca: fieri verò poteſt vt omnis non indiuidua linea talibus ſoluatur diuiſionibus quibus coagmentata fuerit. Tertiò ſi ma-
D gnum ex paruis quibuſdam componitur, aut magnum nihil erit, aut quod finitas habet diuiſiones, non erit magnum. Nam totum qualecunque fuerit, magni ſectiones admittit. Eſt autem probabile, & paruum finitas & magnum infinitas habere diuiſiones, ſicque illi etiam arbitrantur. Quare manifeſtum euadit, non hac ratione paruum aut magnum quicquam dici, quia finitas aut infinitas ſectiones admittat. Quòd ſi quiſpiam propterea quod in numeris paucum definitas ſectiones habet, in lineis quoque putet finitas paruum habere, ſtolidum ſe prodit, eo quòd numerus è rebus partium expertibus procreatur, & ab initio quodam conſtituto originem ſumit. Hinc omnis numerus, modò infinitus non ſit, finitas diuiſiones
E habet, magnitudines autem tali ratione non conſiſtunt. Qui verò lineis indiuiduis ideam conſtituunt, minùs credibilia fortaſſe decernunt, quàm præſens affirmet opinio, quæ nunc in diſceptationem venit. Nam linearum ideam faciendo, modo quodam ideas tollunt, quibus demonſtrare quod inſtat, moliuntur. Hac enim ratione deſtruuntur ideæ. Rurſus quoque ſtultum eſt arbitrari elementa corporea partibus carere. nam etſi quidam ſic affirmant, tamen quantum ad præſentem quæſtionem attinet, principium petunt. Et quanto magis quod probandum eſt, aſſumere videntur, tanto plus diuiduam eſſe longitudine lineam, latitudine ſuperficiem, altitudine corpus, apparet. Zenonis autem ratio ſibi ipſa non conſonat, cum non ſic vno mo-

do velit finito in tempore rem motam tangere infinita. Atqui tempus & linea ſimili modo finita & infinita dicuntur, ac totidem vtraque diuiſiones ſuſcipiunt. Neque numerare eſt, ſingulas infiniti particulas animi cogitatione tangere, etiam ſi quis ita nos cogitatione ſingula infiniti puncta tangere concedat: quod quidem fortaſſe fieri non poteſt. Non enim in reb. cōtinuis & ſubſtractis cogitationis motus conſiſtit, ſicvt earū quæ feruntur rerum. Sed ſi quis animi cogitationem ſic etiam moueri conſentiat, non erit is motus numerus: numerare enim non niſi interpoſita quiete abſoluitur. Verùm abſurdum eſt fortaſſe quempiam præ ignauia ſuccumbere, propterea quòd non audeat oblatas argumentationes diſſoluere, atque ſic imbecillitatem ſuam fouendo, grauioribus inſuper fallaciis ſe decipere. Quod verò de commenſurabilibus lineis poſtremò dicunt, omnes vna quadam & eadem menſura oportere menſurari, falſum eſt admodum, & nequaquam Mathematicorum ſuppoſitionibus concordat. Non enim ita ſupponunt Geometræ, neque vtile ipſis illud foret, immo potiùs aduerſaretur, lineas omnes commenſurabiles eſſe, & omnium commenſurabilium linearum communem menſuram exiſtimare. Quamobrem ridiculum eſt, eos, qui dicunt ſe demonſtrare ex Geometrarum decretis, & ex quibus Mathematici docent, in contentioſam pariter atque fallacem diuertere argumentationem, præſertim tam inualidam: nam multis modis imbecillis eſt eiuſmodi ratio, & quouis modo licet euitare, ne aut inuſitata dicere, aut argui videamur. Præterea abſonum foret, ſi quis à Zenonis oratione vltra quàm par ſit, perſuaderetur, lineas indiuiduas concedere: quia ipſi reſpondere neſciat: ob rectæ verò lineæ motum in ſemicirculum diuiduas non credere: quam neceſſe eſt in rectum ita diuidere, vt infinitæ circumferentiæ, & interualla totidem interueniant. Rurſus quoque facile perſuaderi poteſt ex motu circulorum æqualium. Nam quiſquis horum moueatur, oportet per maius ſemicirculum moueri, & quæcunque alia eiuſmodi conſtituta ſunt de lineis, fieri non poſſe, vt talis vllus motus peragatur, quin priùs omnibus & ſingulis interiectis occurrat. atque hæc Mathematicorum ſcita multo magis ab omnibus conceſſa ſunt quàm iſtorum dicta. Quamuis autem ex confutatis nuper rationibus appareat, vt neque neceſſarium, neque probabile ſit lineas vllas indiuiduas extare, tamen ex iis etiam quę deinceps ſubiungam, multo magis perſpicuum euadet: & primo quidem per ea quæ Mathematici demonſtrant atque addiſcenda proponunt, quæ mutare non decet, niſi probabiliores rationes habeamus. Nam neque lineæ neque rectæ lineæ definitio cum inſecabili linea conſentit, vt quæ nec inter duo puncta extenſa ſit, nec medium vllum habeat: manifeſtum eſt igitur ex antedictis rationibus, quòd neque neceſſarium neque probabile

A ρασμένῳ χρόνῳ τῶν ἀπείρων ἅπτεσθαι τὸ φερόμενον ὡδί τινα αὐτὸν τρόπον. ὁ γὰρ χρόνος καὶ τὸ μῆκος, ἄπειρον καὶ πεπερασμένον λέγεται, καὶ τὰς ἴσας ἔχει διαιρέσεις. οὐδὲ δὴ τὸ καθ' ἕκαστον ἅπτεσθαι τῶν ἀπείρων τὴν διάνοιαν, οὐκ ἔστιν ἀριθμεῖν, εἰ ἄρα τις συνοήσειεν οὕτως ἐφάπτεσθαι τῶν ἀπείρων τὴν διάνοιαν. ὅπερ ἴσως ἀδύνατον. οὐ γὰρ ἐν συνεχέσι καὶ ὑποκειμένοις ἡ τῆς διανοίας κίνησις, ὥσπερ ἐπὶ τῶν φερομένων. εἰ δ' οὖν καὶ ἐγχωρεῖ οὕτως, οὐκ ἔστι τοῦτο ἀριθμεῖν. τὸ γὰρ ἀριθμεῖν ἐστι τὸ μετ' ἐπιστασίας. ἀλλ' ἄτοπον ἴσως τὸ μὴ δυναμένους λύειν τὸν λόγον, δουλεύειν τῇ ἀσθενείᾳ, καὶ προσεξαπατᾶν ἑαυ-
B τοὺς μείζοσιν ἀπάταις, βοηθοῦντας τῇ ἀδυναμίᾳ. τὸ δ' ἐπὶ τῶν συμμέτρων γραμμῶν, ὡς ὅτι αἱ πᾶσαι τῷ αὐτῷ τινι καὶ ἑνὶ μετροῦνται, κομιδῇ σοφιστικόν, καὶ ἥκιστα κατὰ τὴν ὑπόθεσιν τὴν ἐν τοῖς μαθήμασιν. οὔτε γὰρ ὑποτίθενται οὕτως, οὔτε χρήσιμον αὐτοῖς ἐστιν. ἅμα δὲ καὶ ἐναντίον, πᾶσαν μὲν γραμμὴν σύμμετρον γίνεσθαι, πασῶν δὲ τῶν συμμέτρων κοινὸν μέτρον εἶναι ἀξιοῦν. ὥστε γελοῖον τὸ κατὰ τὰς ἐκείνων δόξας καὶ ἐξ ὧν αὐτοὶ λέγουσι φάσκοντας δείξειν, εἰς ἐριστικὸν ἅμα καὶ σοφιστικὸν ἐκκλίνειν λόγον, καὶ τοῦτον οὕτως ἀσθενῆ. πολλαχῶς γὰρ ἀσθενής ἐστι, καὶ πάντα ἔστι τὸν διαφυγεῖν καὶ τὰ παράδοξα καὶ ἐλέγχους. ἔτι
C δ' ἄτοπον ἂν εἴη διὰ μὲν τὸν Ζήνωνος λόγον συμπεπεῖσθαί τινας, ἀτόμους ποιεῖν γραμμάς, τῷ μὴ ἔχειν ἀντειπεῖν· διὰ δὲ τῆς εὐθείας εἰς τὴν ἡμικύκλιον κίνησιν, ἣν ἀναγκαῖον εὐθὺ τέμνειν, ἀπείρων μεταξὺ πιπτουσῶν περιφερειῶν καὶ διαστημάτων ὄντων· καὶ πάλιν διὰ τὴν τῶν ἴσων κύκλων ἐπίπεδον, ὅτι ἀνάγκη κἂν ὅτι κινηθῇ, μεῖζον ἡμικυκλίου κινεῖσθαι· καὶ ὅσα ἄλλα τοιαῦτα τεθεώρηται περὶ τὰς γραμμὰς μὴ οἷόν τε ἐνδέχεσθαι τοιαύτην δή τινα γίνεσθαι κίνησιν, ὡς τῷ ἐφ' ἑκάστην τῶν μεταξὺ μὴ πίπτειν πρότερον. πολὺ γὰρ ταῦτα μᾶλλον ὁμολογούμενα ἐκείνων. ὅτι μὲν οὖν ἔκ γε τῶν εἰρημένων λόγων οὔτε ἀναγκαῖον ἀτόμους εἶναι γραμμάς, οὔτε πιθανόν,
D φανερόν. ἔτι δὲ καὶ ἐκ τῶν δε ἴσως ἂν φανερώτερον. πρῶτον μὲν, ἐκ τῶν ἐν τοῖς μαθήμασι δεικνυμένων καὶ τιθεμένων, ἃ οὐ δίκαιον ἢ πιστοτέροις λόγοις κινεῖν. οὔτε γὰρ ὁ τῆς γραμμῆς, οὔτε ὁ τῆς εὐθείας ὅρος ἐφαρμόσει τῇ ἀτόμῳ, διὰ τὸ μήτε μεταξύ τινων εἶναι, μήτ' ἔχειν μέσον. ἔπειτα πᾶσαι αἱ γραμμαὶ σύμμετροι ἔσονται. πᾶσαι γὰρ ὑπὸ τῶν ἀτόμων μετρηθήσονται, αἵ τε μήκει σύμμετροι, καὶ αἱ δυνάμει. αἱ δὲ ἄτομοι, σύμμετροι πᾶσαι μήκει· ἴσαι γάρ· ὥστε καὶ δυνάμει. εἰ δὲ τοῦτο, διαιρετὸν ἔσται τὸ τετράγωνον. ἔτι, εἰ ἡ παρὰ τὴν μείζω τὸ πλάτος ποιεῖ παραβαλλομένη τὸ ἴσον τῷ ἀπὸ τῆς ἀτόμου καὶ τῆς
E ποδιαίας παραβαλλομένων, περὶ τὸ δήπου ἐλάττω ποιήσει

ſic, lineas inſecabiles eſſe: ex his autem quæ ſubiicientur, manifeſtum adhuc magis fieri poterit: ac primò quidē per ea quæ in mathematicis demonſtrata ſuppoſitaq; ſunt: quæ iuſtum nō eſt aliter quàm certiorib. rationib. amouere. Nam ſi, quam inſecabilē lineam vocant, eſt & linea, & recta linea, nimirū ipſi & lineæ, & rectæ definitio conuenit: ſed neq; lineæ neq; rectæ definitio ipſi conuenit, cum neq; aliquorū media queat eſſe, neq; mediū omnino vllū habeat. Deinde omnes lineæ cōmenſurabiles erunt. Nam omnes ab indiuiduis lineis dimetientur, quæq; longitudine, quæq; potentia ſunt cōmenſurabiles; indiuiduæ autē lineæ ſibi ipſis cōmenſurabiles ſunt longitudine, cum inter ſe ſint æquales: quare potētia quoq. Quòd ſi hoc eſt, diuiduū erit quadratum. Tertiò cùm linea breuior grandiori copulata latitudinē faciat, ſi ſumātur æquales portiones ab indiuidua, & à pedali linea, bipedalique coniungantur, minorémque latitudinem indiuidua

τὸ πλάτος τῆς ἀμεροῦς ἔσται ἔλαττον τὸ περὶ τῆς ἀτόμου. ἔτι, εἰ ἐκ τριῶν δοθεισῶν εὐθειῶν συνίσταται τρίγωνον, καὶ ἐκ τῶν ἀτόμων συσταίη ἄν. ἐν ἅπαντι δὲ ἰσοπλεύρῳ ἡ κάθετος ἐπὶ μέσην πίπτει, ὥστε καὶ ἐπὶ τῆς ἀτόμου. ἔτι, εἰ τὸ τῶν ἀμερῶν διὰ μέσου μεσούσης καὶ καθέτου ἀχθείσης, ἡ τοῦ τετραγώνου τὴν κάθετον δύναται καὶ τὴν ἡμίσειαν τῆς διαμέτρου· ὥστε οὐκ ἐλαχίστη· οὐδὲ διπλάσιον τὸ ἀπὸ τῆς διαμέτρου χωρίον ἔσται τοῦ ἀπὸ τῆς ἀτόμου. ἀφαιρεθέντος γὰρ τοῦ ἴσου, ἡ λοιπὴ ἔσται ἐλάττων ἀτόμου. εἰ γὰρ ἴσως τετραπλάσιον ἀνέγραψεν ἡ διάμετρος. ἀλλὰ δὴ ἄν τις καὶ ἕτερα τοιαῦτα συνάγοι. πᾶσι γὰρ ὡς εἰπεῖν ἐναντιοῦνται τοῖς τοιούτοις μαθήμασι. *πάλιν τοῦ μὲν ἀμεροῦς μία ἡ συναφὴς, γραμμὴ δὲ δύο. καὶ γὰρ ὅλη ἅπτεται, καὶ κατὰ τὸ πέρας ἐξ ἐναντίου. ἔτι, γραμμὴ προστεθεῖσα, οὐ ποιήσει μείζω τὴν ὅλην. τὰ γὰρ ἀμερῆ συντεθέντα, οὐ ποιήσει μεῖζον τὸ περιττόν. ἔτι ἐκ δυοῖν ἀμεροῖν μηδὲν γίνεσθαι συνεχὲς, διὰ τὸ πλείους ἔχειν ἅπτομαι τὸ συνεχές. ἅπασα δὲ γραμμὴ παρὰ τὴν ἄτομον συνεχής. οὐκ ἂν εἴη γραμμὴ ἄτομος. ἔτι, εἰ ἅπασα γραμμὴ παρὰ τῆς ἀτόμου καὶ εἰς ἴσα καὶ ἄνισα διαιρεῖται, καὶ μὴ ἐκ τριῶν ἀτόμων καὶ ὅλως περιττῶν ἐστὶν ἀδιαίρετος ἡ ἄτομος. ὁμοίως δὲ καὶ εἰ δίχα τέμνονται. πᾶσα γὰρ ἡ ἐκ τῶν περιττῶν. εἰ δὲ δίχα μὲν μὴ πᾶσα τέμνεται, ἀλλ' ἡ ἐκ τῶν ἀρτίων, τὴν δὲ δίχα διαιρουμένην καὶ ὅσα δυνατὸν τέμνειν, διαιρεθήσονται καὶ οὕτως ἡ ἄτομος, ὅταν ἐκ τῶν ἀρτίων εἰς ἄνισα διαιρῆται. πάλιν εἰ τὸ κεκινημένον ἐν ᾧ χρόνῳ κινεῖται τὴν ὅλην ἐν τῷ ἡμίσει τὴν ἡμίσειαν κινηθήσεται, καὶ ἐν τῷ ἐλάττονι ἐλάττω ἢ τὴν ἡμίσειαν. ὥστε εἰ μὲν περιττῶν σύγκειται τῶν ἀτόμων τὸ μῆκος, διαιρεθήσονται ἡ μεσότης τῶν ἀτόμων, εἴπερ ἐν τῷ ἡμίσει χρόνῳ τὸ ἥμισυ διέεισιν· ὁμοίως γὰρ ὅ, τε χρόνος καὶ ἡ γραμμὴ τμηθήσονται. ὥστε οὐδεμία τῶν συγκειμένων τμηθήσεται εἰς ἴσα καὶ ἄνισα, οὐδὲ ὁμοίως τοῖς χρόνοις τμηθήσονται, οὐκ ἔσονται ἄτομοι γραμμαί. τὰ δὲ τοῦ αὐτοῦ λόγου ἐστὶ, καθάπερ ἐλέχθη, τὸ ταῦτα πάντα ποιεῖν ἐξ ἀμερῶν. ἔτι ἅπασα ἡ μὴ ἄπειρος δύο ἔχει πέρατα· γραμμὴ γὰρ ὥρισται τούτοις. ἡ δὲ ἄτομος, οὐκ ἄπειρος. ὥστε ἕξει πέρας. διαιρετὴ ἄρα. τὸ γὰρ πέρας ἄλλο καὶ οὗ πέρας. ἢ ἔσται τις οὔτ' ἄπειρος οὔτε πεπερασμένη γραμμὴ παρὰ ταῦτα. ἔτι οὐκ ἐν ἁπάσῃ γραμμῇ στιγμὴ ἔσται. εἰ μὴ γὰρ μάλιστα μόνη ὑπάρξει γραμμὴ, εἶτα στιγμή· εἰ δὲ πλείους, διαιρετὴ ἡ γραμμή. εἰ μὲν οὖν ἐν τῇ ἀτόμῳ μὴ ἐνυπάρχει στιγμὴ, οὐδ' ὅλως ἐν γραμμῇ ἔσται. αἱ γὰρ ἄλλαι ἐκ τῶν ἀτόμων. ἔτι, εἰ μηθὲν τῶν σημείων ἔσται μεταξὺ * ἢ γραμμή· εἰ δὲ μεταξὺ, ἀεὶ γραμμή· ἐν ἁπάσαις δὲ, πλείους στιγμαί, οὐκ ἔσται ἄτομος. ἔτι, οὐχ ἁπάσης ἔσται γραμμῆς τετράγωνον· ἕξει γὰρ μῆκος καὶ πλάτος· ὥστε διαι-

*Quidam γραφ.

* … in paraphraſi.

faciat quàm reliqua, minor erit latitudo quæ ab indiuidua prouenit. Quartò, ſi ex tribus datis rectis triangulus componitur, ex tribus quoque lineis indiuiduis componi poterit: in omni autem æquilatero perpendicularis in mediam baſim incidit. Quare & medium indiuiduæ diuidet. Quintò ſi quadratum ex quatuor inſecabilibus lineis conſiſtat, diametro protracta, & perpendiculari ducta, quadrati coſta potentia perpendicularem diametrumque dimidium æquat. Quare non erit minima, neque duplum erit ſpatium à diametro conſurgens illius; quod ab indiuiduo procreatur: nam æquali ablato reliquum erit minus indiuiduo. nam ſi æqualis diameter quadruplum deſcriberet, hæc atque huiuſmodi complura colligere quiſpiam poſſet, eo quod omnibus, vt ita dixerim, aduerſantur, quæ a Mathematicis traduntur, quorum nonnulla denuo ſubnectam. Eorum quæ partibus carent, vnus eſſe contactus poteſt, at linea duos habet: nam tota, totam & extremis vtrinque finibus tangit. Deinde hoc pacto vna linea alteri copulata non efficeret ex vtriſq; coniunctum maius, idcirco quia partibus carentia ſibi ipſis adiuncta maius non faciunt. Poſtea nihil continuum à duobus efficitur, quæ partes non habeant, propterea quòd omne continuum plures partes continet: omnis autem linea, præter indiuiduam, eſt continua; quamobrem linea non erit, quæ indiuidua fuerit. Amplius ſi quæuis linea, præter inſectilem, in partes diuidi poteſt, tum æquales tum inæquales, & non ſcindatur linea in tria fruſta, quæ non ex tribus inſecabilibus, & vniuerſaliter imparibus conſtet, diuidua fiet inſecabilis linea. Similiter autem ſi in duo diuidatur linea, quæ ex imparibus conſiſtit. Quòd ſi bifariàm quidem non omnis linea finditur, ſed quæ ſolùm ex paribus coagmentata fuerit, ſi iam in duas partes diuiſa in quæcunque diuidi poteſt, diuideretur, ſic quoque inſectilis linea diuidetur, quando ex paribus compoſita per inæqualia ſcindetur. Ruſus ſi mobile per totum ſpatium vna hora mouetur, horæ dimidio per medietatem ſpatij mouebitur, & in minori tempore per minus ſpatium, quàm ſit medietas: ergo ſiquidem ex imparibus indiuiduis ſpatium illud componitur, ſedibit inſectilium in medietates diuiſio: ſiquidem media hora, medium ſpatium, mobile pertranſit: ſimiliter enim tempus, & linea ſecabitur. Quare ſi nulla ex compoſitis lineis diuidetur in æqualia & inæqualia, neque ſicvti tempus ſcindetur, non erunt indiuiduæ lineæ. Eſt autem eiuſdem rationis, ſicvt dictum eſt ex indiuiduis omnia, vel affirmare, vel negare. Ad hæc, omnis linea modò non ſit infinita, duos fines habet, ſiquidem linea hiſce terminatur: at indiuidua linea non eſt infinita: fines igitur habebit: quare diuidua erit: finis enim aliud eſt, non illud cuius eſt finis: aut extabit aliqua linea præter iſtas, quæ neque finita ſit neque infinita. Præterea omnis linea vel eſt infinita vel fines habet: igitur inſecabilis linea non eſt infinita: fines ergo habebit atque diuidua erit: nam finis aliud eſt ab eo cuius eſt finis, vel erit aliqua linea, quæ neque finibus careat, neques fines habeat. Inſuper non erit in quauis linea punctus: non enim in indiuidua; nam ſi vnius punctus inſit, ipſa primùm linea ſola erit, & inde punctus: ſin plures inerunt, diuidua fiet: ergo ſi punctus indiuiduæ lineæ nullus ineſt, neque protſus inerit lineæ, cùm reliquæ ex indiuiduis, ſicvti dicunt, coaluerint. Poſtea, vel nihil inter duo puncta, vel linea, erit: quòd ſi linea, cùm in omnibus lineis puncta inſint, non erit inſecabilis vlla linea. Amplius non eſſet cuiuſuis lineæ quadratum: habebit enim longitudinem, & latitudinem: atque idcirco diuiſibi

uiſibile erit, cùm illa quidem aliquid, hæc autem aliquid aliud: quòd ſi quadratum diuiduum eſt, & linea vnde procreatur, diuiduum erit. Præterea finis lineæ, punctus eſt & non linea: finis enim extremum eſt: extremum verò, indiuiduum. igitur, ſi punctus eſt finis, indiuiduæ lineæ pars erit punctus: atque ita vna linea maior erit altera puncto: ſin indiuiduæ lineæ punctus ineſt, quia finis idem ſit continuatarum linearum, dabitur finis rei carentis partibus, & denium quid à linea punctus diſtabit, cùm proprium nihil habitura ſit indiuidua linea à puncto præter nomen. Adhuc etiam, vt linea, ſic & ſuperficies, & corpus erit impartibile: vno quippe indiuiduo exiſtente, cætera quoque conſequentur, idcirco quia vnum ad aliud diuiditur: at corpus indiuiduum non eſt, cùm in ſe latitudinem & altitudinem contineat. Quare nec linea poteſt eſſe indiuidua: corpus ſiquidem in ſuperficies; ſuperficies in lineas ſoluitur. Quoniam verò rationes, quib. iſti nituntur ſententiam ſuam perſuadere, debiles ſunt, & falſæ: aduerſæ autem opinionis omnes plurimum valēt ad fidem faciendam: vnicuique liquere iam arbitror quemadmodum nulla queat eſſe linea, quæ diuidi non poſſit. Ex his autem quæ ſubiicientur, manifeſtum euadit ne à punctis quidem componi lineam poſſe, quam inſecabilem affirmant: ad quod probandum illa mer pene quadrabunt argumenta, aut plurima ſaltem. Oportet enim punctum diuidi, quando linea, vel ex imparibus in æqualia ſecatur, vel ex paribus in non æqualia ſcinditur. Item lineæ partem non eſſe lineam, nec ſuperficiei ſuperficiē, & rurſus lineam puncto maiorem eſſe linea: ex quibus enim vnumquodq; componitur, his etiam quoduis aliud excedit. Atqui illud vnum eſt eorum quę nullo modo fieri queunt, & per ea quæ Mathematici docent, apertè falſum. Inſuper quoque contingit punctum eſſe illud, quod in tempore fertur, modò maior in longiori, æqualis in æquali tempore, motus fiat, exceſſúſq; temporis tempus ſit. Sed fortaſſe tempus quoque rem quandam eſſe ex inſtantibus compoſitam, ſuntque vtraque tempus & linea, ex ſuis quæque indiuiſibilib. compoſita, dicet aliquis. Atſi nunc eſt principium temporis & finis, itemque lineæ punctus: neque ſibi coniuncta ſunt principium & finis: ſed in medio ſemper aliquid habent: neque nunc neque puncta ſibi continua eſſe poterunt. Amplius ſi linea magnitudinem aliquam habet, punctorum autem iunctura magnitudinem nullam efficit, idcirco quia maiorem locum non occupant. Nam & quando linea, lineæ ſuperimponitur, eique coniungitur, nulla prouenit inde maior latitudo: ſunt autem in linea puncti, qui nec ipſi maiorem locum occupare queunt: proculdubio ſequetur, vt non poſſint longitudinem coniuncti facere. Præterea ſi res omnis, rem quamlibet aliam tangit, vel tota totam, vel pars partem, vel tota partem tangit: tanget & punctus vnus indiuiduus punctum alium indiuiduum, totus totum. At neceſſe eſt cùm totus tangit totum cum ipſo vnum fieri, nam ſi quid remanet, quod alteri non coniungatur, non tetigit totus totum: ſi nihil remanet, & ſimul ſunt hæc duo indiuidua puncta, eundem implebit locum id quod plura nunc eſt & prius vnum fuit. Duobus enim in vnum coeuntibus, quæ nullam ex ſe habeant extenſionem, idem locus ſufficit. Atque partibus carentia extenſionem non habent, quocirca nec ex indiuiduis vlla compaginabitur magnitudo: igitur neque è punctis linea, neque ex inſtantibus tempus componetur. Inſuper ſi qua ex punctis componitur linea, punctus tanget punctum: igitur ſi ex K ſigno protracta fuerit a B & g D, tanget ſe primum, & punctus, qui eſt in a K, & punctus qui eſt in K d.

A ρετόν· ἐπεὶ τὸ μὲν, τὸ δέ τι. Εἰ δὲ τὸ τετράγωνον διαιρετὸν, καὶ ἡ γραμμή. ἔτι τὸ πέρας τῆς γραμμῆς, στιγμή ἐστιν, ἀλλ' οὐ γραμμή. πέρας μὲν γὰρ τὸ ἔσχατον, ἔσχατον δὲ ἡ ἄτομος. εἰ γὰρ στιγμὴ τὸ πέρας τῆς ἀτόμου, ἔσται στιγμή. καὶ ἔσται γραμμὴ γραμμῆς στιγμῇ μείζων. εἰ δὲ ἐνυπάρχει τῇ ἀτόμῳ ἡ στιγμὴ, διὰ τὸ ταὐτὸ πέρας τῶν συνεχουσῶν γραμμῶν, ἔσται τὸ πέρας τῆς ἀμεροῦς. ὥστε τί διοίσει στιγμὴ γραμμῆς; οὐθὲν γὰρ ἴδιον ἕξει ἡ ἄτομος γραμμὴ παρὰ τὴν στιγμὴν, πλὴν τοὔνομα. ἔτι ὁμοίως * μὲν ἐπίπεδον καὶ σῶμά ἐστιν ἄτομον, ἑνὸς γὰρ ὄντος ἀδιαιρέτου, καὶ τἆλλα συνακολουθεῖ, διὰ τὸ θάτερον διῃρῆσθαι κατὰ θάτερον. σῶμα δὲ οὐκ ἔσται ἀδιαίρετον, διὰ τὸ εἶναι ἐν
B τῷ αὐτῷ βάθος καὶ πλάτος. οὐδὲ γραμμὴ εἴη ἂν ἀδιαίρετος. σῶμα μὲν γὰρ κατ' ἐπίπεδον, αὐτὸ δὲ κατὰ γραμμήν. ἐπεὶ δὲ οἵ τε λόγοι δι' ὧν ἐπιχειροῦσι πείθειν, ἀσθενεῖς εἰσι, καὶ ψευδεῖς, ἐναντίαι δὲ δόξαι πᾶσαι τοῖς ἰσχύουσι πρὸς πίστιν, φανερὸν ὅτι οὐκ ἂν εἴη γραμμὴ ἄτομος. δῆλον δ' ὅτι οὐκ ἐκ στιγμῶν ἡ γραμμή. σχεδὸν γὰρ οἱ πλεῖστοι λόγοι οἱ αὐτοὶ ἁρμόσουσιν. ἀνάγκη γὰρ διαιρεῖσθαι τὴν στιγμὴν, ὅταν ἡ ἐκ περιττῶν τέμνηται ἴσα, ἡ δ' ἐξ ἀρτίων εἰς ἄνισα. καὶ τὸ τῆς γραμμῆς μέρος μὴ εἶναι γραμμήν. μηδὲ τὸ τοῦ ἐπιπέδου, ἐπίπεδον, καὶ γραμμὴν δὲ γραμμῆς στιγμῇ εἶναι μείζων. ἐξ ὧν γὰρ σύγκειται, τούτων καὶ ὑπερέξει. τοῦτο δὲ ἀδύνατον ἔκ τε τῶν ἐν τοῖς μαθήμασι δῆλον, καὶ ἔτι συμ-
C βήσεται τὴν στιγμὴν ἐν χρόνῳ δὴ εἶναι τὸ φερόμενον κατὰ τὴν μείζω μὲν ἐν πλείονι χρόνῳ, τὴν δ' ἴσην, ἐν ἴσῳ· ἡ δὲ τοῦ χρόνου ὑπεροχὴ, χρόνος. ἀλλ' ἴσως καὶ ὁ χρόνος ἐστὶ καὶ ἐκ τῶν νῦν, καὶ τοῦ αὐτοῦ λόγου λέγει ἄμφω. εἰ δὴ τὸ νῦν ἀρχὴ καὶ πέρας τοῦ χρόνου καὶ ἡ γραμμὴ στιγμῆς, μὴ ἐστὶ δὲ συνεχὲς, ὧν ἡ ἀρχὴ καὶ τὸ πέρας, ἀλλ' ἔχουσί τι μεταξὺ, οὐκ ἂν εἴη οὔτε τὰ νῦν οὔτε στιγμαὶ ἀλλήλαις συνεχεῖς. ἔτι, ἡ μὲν γραμμὴ, μέγεθός ἐστιν· ἡ δὲ τῶν στιγμῶν σύνθεσις, οὐδὲν ποιεῖ μέγεθος, διὰ τὸ μηδ' ἐπὶ πλείω τόπον ἔχειν. ὅταν γὰρ ἐπὶ γραμμὴν γραμμὴ τεθῇ καὶ ἐφαρμόσῃ, οὐδὲν γὰρ μεῖζον τὸ πλάτος. ἐν δὲ τῇ
D γραμμῇ, καὶ στιγμαὶ ἐνυπάρχουσιν· οὐδ' ἂν αἱ στιγμαὶ, πλείω κατέχουσι τόπον. ὥστε οὐκ ἂν ποιῇ μέγεθος. ἔτι, εἰ ἅπαντα ἅπτεται παντὸς, ἢ ὅλου, ἢ τί τινος, ἢ ὅλον τινός· ἡ δὲ στιγμὴ ἀμερὴς ὅλως ἅπτοιτο. τὸ δ' ὅλον ὅλου ἁπτόμενον, ἀνάγκη ἓν εἶναι. Εἰ γάρ τι ἐστὶν, ἢ θάτερον μὴ ἐστὶν, οὐκ ἂν ὅλον ὅλου ἅπτοιτο. Εἰ δ' ἅμα ἐστὶ τὰ ἀμερῆ, τὸν αὐτὸν κατέχει τόπον πλείων ὢν καὶ πρότερον τὸ ἕν, τῶν καὶ ἅμα ὄντων καὶ μὴ ἐχόντων ἐπέκτασιν, κατὰ ταὐτὰ ὁ αὐτὸς ἀμφοῖν τόπος. τὸ δ' ἀμερὲς, οὐκ ἔχει διάστασιν. ὥστε οὐκ ἂν εἴη μέγεθος συνεχὲς ἐξ ἀμερῶν. οὐκ ἄρα οὐδ' ἡ γραμμὴ ἐκ στιγμῶν, οὐδ' ὁ χρόνος ἐκ τῶν νῦν.
E ἔτι, εἰ ἔστιν ἐκ στιγμῶν, ἅψεται στιγμὴ στιγμῆς· ἐὰν ἐκ τοῦ κ ἐκβληθῇ ἡ α β καὶ γ δ, ἅψεται τῆς κ, καὶ ἡ ἐν τῇ κ δὲ στιγμή.

* [illegible] in paraphraſi.

ὥστε καὶ ἄλλῳ τινί· τὸ γὰρ ἀμερὲς τοῦ ἀμεροῦς ὅλον ὅλου ἐφάπτεται. ὥστε τὸν αὐτὸν ἐφέξει τοῦ κ, καὶ ἁπτόμεναι στιγμαὶ ἐν τῷ αὐτῷ τόπῳ ἀλλήλαις. εἰ δ' ἐν τῷ αὐτῷ, καὶ ἅπτονται. τὰ γὰρ ἐν τῷ τόπῳ ὄντα πρῶτα ἅπτεσθαι ἀναγκαῖον, εἴπερ οὕτως εὐθεῖα ἅψεται κατὰ δύο στιγμάς· ἡ γὰρ ἐν τῇ α στιγμῇ καὶ τῇ κγ, καὶ ἑτέρας ἅψεται στιγμῆς. ὥστε ἡ ἐκ τοῦ γδ, κατὰ πλείους ἅψεται στιγμάς. ὁ αὐτὸς δὲ λόγος καὶ εἰ μὴ δι' ἀλλήλων ἀλλ' ὁποτερουοῦν ἅψαιτο γραμμῆς. ἔτι, καὶ ἡ τοῦ κύκλου τῆς εὐθείας ἅψεται κατὰ πλείω. τῆς γὰρ συναφῆς καὶ ἡ ἐν τῷ κύκλῳ καὶ ἡ ἐν τῇ εὐθείᾳ ἅπτεται καὶ ἀλλήλων. εἰ δὲ τοῦτο μὴ δυνατόν, οὐδὲ τὸ ἅπτεσθαι στιγμὴν στιγμῆς· εἰ δὲ μὴ ἅπτεσθαι, οὐδ' εἶναι τὴν γραμμὴν στιγμῶν. οὐδὲ γὰρ ἅπτεσθαι ἀναγκαῖον. ἔτι, πῶς ποτε εὐθεῖα ἔσται γραμμὴ καὶ περιφερής; οὐδὲν γὰρ διοίσει ἡ συναφὴ τῶν στιγμῶν ἐν τῇ εὐθείᾳ καὶ περιφερείᾳ. τὸ γὰρ ἀμερὲς τοῦ ἀμεροῦς ὅλον ὅλου ἅπτεται, καὶ οὐκ ἔστιν ὅλως ἅπτεσθαι. εἰ οὖν αἱ μὲν γραμμαὶ διάφοροι, ἡ δὲ συναφὴ ἀδιάφορος, οὐκ ἔσται δὴ γραμμὴ ἐκ τῆς συνάψεως, ὥστε οὐδὲ ἐκ στιγμῶν. ἔτι, ἀναγκαῖον ἢ ἅπτεσθαι ἢ μὴ ἅπτεσθαι τὰς στιγμὰς ἀλλήλων. εἰ μὲν τὸ ἐφεξῆς ἅπτεσθαι ἀνάγκη, ὁ αὐτὸς ἔσται λόγος· εἰ δὲ ἐνδέχοιτο τὸ ἐφεξῆς εἶναι μὴ ἁπτόμενον, τὸ δὲ συνεχὲς οὐδὲν ἄλλο λέγομεν, ἢ τὸ ἐξ ὧν ἐστιν ἁπτομένων· ὥστε καὶ οὕτως ἀνάγκη τὰς στιγμὰς ἅπτεσθαι ἀλλήλων, ἢ εἶναι γραμμὴν συνεχῆ. ἔτι, εἰ ἄτοπον στιγμὴν ἐπὶ στιγμῆς, ἵνα ἡ γραμμὴ καὶ ἐπὶ γραμμῇ, ἐπεὶ ἡ γραμμὴ ἐπίπεδον, ἀδύνατον τὰ εἰρημένα εἶναι. εἴτε γὰρ ἐφεξῆς αἱ στιγμαί εἰσι, καὶ κλασθήσεται ἡ γραμμὴ κατ' οὐδέτερας τῶν στιγμῶν, ἀλλ' ἀνὰ μέσον· εἴθ' ἅπτονται, γραμμὴ ἔσται τῆς μιᾶς στιγμῆς χώρα· τοῦτο δ' ἀδύνατον. ἔτι, διαιροῖτ' ἂν ἅπαντα καὶ ἀναλύοιτο εἰς στιγμάς, καὶ ἡ στιγμὴ μέρος σώματος· εἴπερ τὸ μὲν σῶμα ἐξ ἐπιπέδων, τὸ δ' ἐπίπεδον ἐκ γραμμῶν, αἱ δὲ γραμμαὶ ἐκ στιγμῶν. εἰ δ' ἐξ ὧν πρώτων ἐνυπαρχόντων ἕκαστα ἔστι, στοιχεῖα ἐστὶ ταῦτα, αἱ στιγμαὶ ἂν εἶεν στοιχεῖα σωμάτων· ὥστε συνώνυμα στοιχεῖα οὐδέτερα τῷ εἴδει. φανερὸν οὖν ἐκ τῶν εἰρημένων ὅτι οὐκ ἔστι γραμμὴ ἐκ στιγμῶν· ἀλλ' οὐδὲ ἀφαιρεθῆναι οἷόν τε στιγμὴν ἀπὸ γραμμῆς. εἰ γὰρ ἐνδέχεται ἀφαιρεθῆναι, καὶ προστεθῆναι δυνατόν· προστεθέντος δέ τινος, τὸ προστεθὲν μεῖζον ἔσται τοῦ ἐξ ἀρχῆς, ἐὰν τοιοῦτον ᾖ τὸ προστεθειμένον, ὥστε ἓν ὅλον ποιεῖν, ἔσται γραμμὴ γραμμῆς στιγμῇ μείζων. τοῦτο δὲ ἀδύνατον. ἀλλὰ καθ' ἑαυτὸν μὲν, οὐχ οἷόν τε, κατὰ συμβεβηκὸς δὲ ἐνδέχεται στιγμὴν ἀπὸ γραμμῆς ἀφελεῖν, τῷ ἐνυπάρχειν ἐν τῇ ἀφαιρουμένῃ γραμμῇ. εἰ τοῦ ὅλου ἀφαιρεῖται καὶ ἡ ἀρχὴ καὶ τὸ πέρας, γραμμῆς δ' ἦν ἡ ἀρχὴ καὶ τὸ πέρας, στιγμὴ καὶ γραμμή· ἐγχωρεῖ ἀφαιρεῖν καὶ στιγμὴν ἐνδέχοιτο. αὕτη δὲ ἡ ἀφαίρεσις κατὰ συμβεβηκός. εἰ δὲ τὸ πέρας ἅπτεται, οὗ τὸ πέρας ἢ αὐτοῦ, ἢ τῶν ἐκείνου τινός. ἡ δὲ στιγμή, ἢ πέρας γραμμῆς, ἅπτεται. ἡ μὲν οὖν γραμμῆς ἔσται στιγμῇ μείζων. ἡ δὲ στιγμὴ ἐκ στιγμῶν τῶν ἁπτομένων, οὐδὲν ἀνὰ μέσον. ὁ αὐτὸς λόγος καὶ ἐπὶ τῆς τομῆς, εἰ ἡ τομὴ ἐκ στιγμῆς, καὶ ἡ τομὴ ἅπτεταί τινος· καὶ ἐπὶ τοῦ στερεοῦ καὶ ἐπιπέδου.

A Quare & diuerſa parte tanget: nam res quæ partibus caret, tangit rem partibus carentem, tota totá. Ergo eundem locum poſſidebunt, quem K punctus obtinet, & ſeſe puncti coniungent in eodem loco: quòd ſi in eodẽ iuncti fuerint loco, ſe etiam tangent: quæ enim in eodem ſunt loco, primò ſe tangant oportet. Deinde hoc pacto recta rectam duob. punctis tanget: punctus enim in a, & punctus in K g alterũ etiam tangit punctum: quare linea ex g D plurib. tangit punctis. Eadem ratio fuerit, etiã ſi non ſe inuicẽ, ſed quouis alio modo lineã tetigerit. Quin etiã orbis circunferentia rectã lineã plurib. tanget pũctis: punctus enim cõtactus, quiq; eſt in circulo, quiq; in recta cõſiſtit, ſeſe mutuò tã-
B gunt; quòd ſi hoc fieri nõ poteſt, neq; punctus pũctum tangere valet; quòd ſi ſe tangere nequeunt, neq; linea punctis cõſtare poteſt: nam neq; punctũ tangere neceſſariũ eſt. Poſtea quonam pacto recta vlla eſt linea, & circularis: quãdo nihil differat cõtactus punctorũ in recta & circulari? Nam res quæ partib. careat, rem quæ partes nõ habeat, tota totá contangit, neque prorſus eo modo eſt tangere. Si ſunt ergo lineæ quidẽ differentes, cõtactus autem indifferentes, non fiet ex punctorũ contactu linea circularis, & recta: quare neq; è punctis conſtabit. Inſuper neceſſe eſt puncta vel ſeſe mutuò tangãt,
C vel non ſe inuicem tangant: ſi igitur id quod deinceps eſt, tangat oportet, eadem redibit ratio: ſin contingit quod deinceps eſt non tangere, non erit linea continuũ: nihil enim aliud cõtinuũ dicimus, quàm quod eſt ex ſe tangentib. compoſitũ. Quare oportebit, & hoc modo vel puncta ſeſe mutuò tangere, vel lineam continuam eſſe. Ampliùs ſi abſurdũ eſt puncto punctũ ſuperimponere, quo fiat linea, & lineæ lineã adiungere, quo fiat ſuperficies, impoſſibilia ſunt quæ ab eis dicta fuerũt: ſiue enim deinceps puncta, diuidetur linea per neutrũ ipſorum, ſed per id quod intercedit, ſiue ſe tangunt, linea erit vnius puncti ſpatiũ, hoc autem eſſe nõ poteſt. Poſtremò omnia diuiderentur, & reſoluerentur in puncta, corporiſq. pars pũctus eſſet, ſiquidẽ
D corpus è ſuperficieb. ſuperficies è lineis cõſiſtat, ſi verò illa, ex quib. primis inexiſtentib. ſingula cõſtãt, elementa ſunt, puncti corporũ elementa eſſe poterũt. Quare vniuocè corporum & linearũ elementa puncti erunt, non ſpecie diuerſa. Apparet itaq; ex dictis non eſſe lineam è punctis, neq; ab ea punctum auferri poſſe: nam ſi contingit punctum auferri, contingit & apponi: quoniam autem appoſito illud cui adiunctum eſt maius euadit quàm priùs fuerat: ſi tale ſit appoſitum, quale quod ſuſcipit, erat. Quare ex ambobus vnum totum facere licebit, & erit vna linea maior alia puncto: id quod fieri nequaquam poteſt. Verùm per ſe qui-
E dem non poteſt à linea punctus auelli, per accidens autem poteſt, eo quòd ablatum lineam ſequatur; cùm enim totum aufertur, totius & principium & finis auferatur oportet: at lineæ principium, & finis punctus erat; licet itaque partem de linea demere: quare & punctum auferre, ſed ea per accidens cenſebitur ablatio. Si verò finis tangit illud cuius eſt finis, vel ipſum vel aliquam eius partem, & punctus quatenus finis lineam tangit, ſequetur vt hæc quidem linea puncto maior alia ſit: hæc autem ex punctis nihil in medio comprehendentibus. Eadem ratio eſt, & in diuiſione. nam ſi diuiſio per punctum eſt, & diuiſio tangit aliquid tam in ſolido quàm ſuperficie.

Similiter enim & ſolidum è ſuperficiebus, & ſuperficies è linea conficitur. Non eſt autem verum dicere per punctum fieri diuiſionem, neque paruiſſimam aliquam lineam in minimum, quod inſit, diuidi: minimum quippe minus eſt etiam eorum quorum minimum dicitur: at lineæ nihil aliud quàm punctus ineſt, & linea, atque lineæ: linea verò puncto maior non eſt: nam neque ſuperficies eſt linea maior: quare punctus non erit in linea minimum. Si verò lineæ coniunctus eſt punctus, & minimum eſt quod à tribus faciebus, hoc eſt, à tribus partibus deficit, non erit punctus eorum quæ lineæ inſunt, minimum: nam & alia quædam inſunt longitudini præter puncta, & lineas. Non enim ex punctis longitudo conſiſtit. Si verò id quod eſt in loco, punctus eſt, longitudo quippe, ſuperficies & ſolidum, quædam ex iis compoſitæ res ſunt: illa ſiquidem ex quibus conſtat linea, ſunt in loco, etenim & linea eſt in loco, ac neque corpus, neque ſuperficies, neque ex his quippiam in linea ſunt, non aliquid penitus in longitudine præter puncta & lineas. Amplius ſi res, quæ maior dicitur eſſe, in loco eſt, vel longitudo, vel ſuperficies, vel corpus: eſt autem punctus in loco, nihilque longitudini prædictarum rerum inſit præter puncta, & lineas, ſic quoque non erit punctus rerum inexiſtentium minimum: præterea ſi vas aliquod, eorum quæ in domo ſunt, minimum appellatur, non domui comparatum, ſed per ſeipſum conſideratum, iſque & in aliis loquendi modus ſeruari ſolet, nihil eorum quæ ſunt in linea minimum erit ad lineam comparatum: quare puncto non conueniet minimi appellatio. Quoniam verò quod non eſt in domo, minimum eſſe non poteſt eorum quæ in domo ſunt, ita & in cæteris eſt iudicandum: contingit autem lineam ipſam per ſeipſam eſſe, non erit de puncto verum dicere, quod minimum ſit eorum quæ in linea ſunt. Poſtremo non eſt etiam punctus articulus indiuiduus, nam articuli ſemper duorum termini ſunt, punctus autem, & vnius lineæ terminus eſt. Inſuper punctus, finis; articulus, diuiſio potiùs eſt. Adhuc ſi lineam ſtatuamus articulos, ſuperficiem quoque articulos concedamus oportet, iccirco, quia proportionem inter ſe ſeruant. Præterea articulus quodammodo differentia eſt: quamobrem Empedocles in ſuis carminibus inquit:

Articuli ſemper conſtat iunctura duobus.

Punctus autem etiam inter immobilia collocatur: Poſtea verò nullus habet infinitos articulos in corpore, vel in manu, at puncta habet. Et denique lapidis articulus eſt nullus, neque ſaxum articulos vllos habet, puncta verò habet.

A ὡσαύτως δὲ καὶ τὸ στερεὸν ἐξ ἐπιπέδων καὶ γραμμῶν. οὐκ ἀληθὲς δὲ κατὰ στιγμὴν εἰπεῖν, οὐδ' ὅτι καὶ ἐλαχίστη τῶν ἐκ γραμμῆς εἰς ἐλάχιστον τῶν ἐνυπαρχόντων εἴρηται. τὸ δὲ ἐλάχιστον, ὧν ἐλάχιστόν ἐστι, καὶ ἔλαττόν ἐστιν. ἐν δὲ τῇ γραμμῇ οὐδὲν ἄλλο ἢ στιγμαὶ καὶ γραμμαὶ ἐνυπάρχουσιν. ἡ δὲ γραμμὴ τῆς στιγμῆς οὐκ ἔστι μείζων· οὐδὲ γὰρ τὸ ἐπίπεδον τῆς γραμμῆς, ὡς οὐκ ἔσται στιγμὴ τὸ ἐν γραμμῇ ἐλάχιστον. εἰ δὲ συμβλητὸν τῇ γραμμῇ ἡ στιγμή, τὸ δὲ ἐλάχιστον ἐν τρισὶ προσώποις, οὐκ ἔσται ἡ B στιγμὴ τῶν ἐν τῇ γραμμῇ ἐλάχιστον. καὶ ἄλλ' ἄττα ἐνυπάρχει παρὰ τὰς στιγμὰς καὶ τὰς γραμμὰς ἐν τῷ μήκει. οὐ γὰρ ἐκ στιγμῶν. εἰ δὲ τὸ ἐν τόπῳ ὂν ἡ στιγμή, μῆκος, ἢ ἐπίπεδον ἢ στερεὸν ἐκ τούτων τι· ἐξ ὧν δή ἐστιν ἡ γραμμή, ἐκεῖνα ἐν τόπῳ· καὶ γὰρ ἡ γραμμή, καὶ μήτε σῶμα μήτ' ἐπίπεδον, μήτε τι ἐκ τούτων ἐνυπάρχει τῇ γραμμῇ, οὐκ ἔσται οὐδὲν ὅλως παρὰ τὰς στιγμὰς καὶ τὰς γραμμὰς ἐν τῷ μήκει. ἔτι εἰ τοῦ ἐν τόπῳ ὄντος τὸ μεῖζον λεγόμενον μῆκος ἢ ἐπιφάνεια, στερεόν, ἡ δὲ στι- C γμὴ ἐν τόπῳ, τὸ δ' ἐν τῷ μήκει ὑπάρχον παρὰ τὰς στιγμὰς καὶ τὰς γραμμὰς οὐδὲν τῶν προειρημένων, ὥστ' οὐκ ἔσται ἡ στιγμὴ τῶν ἐνυπαρχόντων ἐλάχιστον. ἔτι εἰ ὃ ἐλάχιστόν τι τῶν ἐν τῇ οἰκίᾳ, μήτε τῆς οἰκίας συμβαλλομένη πρὸς αὐτὸ λέγεται· ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων· οὐδὲ τὸ ἐν γραμμῇ ἐλάχιστον πρὸς γραμμὴν συγκειμένον ἔσται· ὥστε οὐχ ἁρμόσει τὸ ἐλάχιστον ἐπὶ τὸ μὴ ὂν ἐν τῇ οἰκίᾳ, μὴ ἔστι τῶν ἐν τῇ οἰκίᾳ ἐλάχιστον. ὁμοίως δὲ καὶ ἐπὶ τῶν ἄλλων· ἐνδέχεται γὰρ αὐτὴν γραμμὴν D καθ' αὑτὴν εἶναι· οὐκ ἔσται κατὰ ταύτην ἀληθὲς εἰπεῖν ὅτι τὸ ἐν γραμμῇ ἐλάχιστον, ὅτι οὐκ ἔστιν ἡ στιγμὴ ἄρθρον ἀδιαίρετον. τὸ μὲν γὰρ ἄρθρον ἀεὶ δυοῖν ὅρος· ἡ δὲ στιγμή, καὶ μιᾶς γραμμῆς ὅρος ἐστίν. ἔτι, ἡ μὲν, πέρας, ἡ δέ, διαίρεσις μᾶλλον. ἔτι, ἡ γραμμὴ καὶ τὸ ἐπίπεδον, ἄρθρα ἔσονται· ἀνάλογον γὰρ ἔχουσιν· ἔτι τὸ ἄρθρον διαφορά πώς ἐστι. διὸ καὶ Ἐμπεδοκλῆς ἐποίησε, * διὸ δὴ ὀρθῶς. ἡ δὲ στιγμὴ καὶ τὸ ἐν τοῖς ἀκινήτοις. ἔτι οὐδεὶς ἔχει ἄπειρα ἄρθρα ἐν τῷ σώματι ἢ τῇ χειρί, στιγμὰς E δὲ ἀπείρους. ἔτι λίθου ἄρθρον οὐκ ἔστιν, οὐδ' ἔχει· στιγμὰς δὲ ἔχει.

ΓΕΩΡΓΙΟΥ ΠΑΧΥΜΕΡΙΟΥ,

ΩΣ ΦΑΣΙ ΤΙΝΕΣ, ΕΙΣ ΤΑ ΤΟΥ ΑΡΙΣΤΟΤΕΛΟΥΣ

περὶ ἀτόμων γραμμῶν παράφρασις.

IN ARISTOTELIS LIBRVM

DE INSECABILIBVS LINEIS COMMENTARIVS.

Iacobo Scheckio interprete.

ΚΕΦΑΛ. α'.

Ἔκθεσις τῶν ἐπιχειρημάτων οἷς χρώμενοί τινες τὰς ἀτόμους γραμμὰς κατασκευάζουσι.

ΤΟΥ Παρμενίδου λέγοντος ἓν τὸ ὄν, καὶ τὸ παρὰ τὸ ὂν οὐδέν, ὡς μὴ ὄν, ἵνα μὴ πολλὰ λέγων, εἰσάξῃ καὶ τὸ μὴ ὄν, (πάντα γάρ, φησι, τὰ ὄντα, καθὸ ὄντα, ἕν ἐστι· πολλὰ δ' ἂν εἶεν, εἰ καὶ τὸ ἕτερον B τοῦ ὄντος, καὶ παρὰ τὸ ὄν, τὸ μὴ ὂν δηλονότι ἐστί. καὶ ἄλλως δέ, ἵνα μὴ καὶ τὸ κενὸν εἰσαχθῇ, ὃ τὰ πολλὰ διορίζει, ὃ δὲ καὶ ἐκτόπως παρεισώρθιζεν) οἱ ἀμφὶ Ξενοκράτην καὶ Πλάτωνα, ἐνεδίδοσαν τῷ λόγῳ, καὶ τοῖς τῆς διχοτομίας, καὶ τῆς ἐπ' ἄπειρον διαιρέσεως τοῦ ὄντος εἰσάγουσιν, ὡς δὴ τὸ ἓν διαιρεθὲν ᾖ πολλά, καὶ οὐ κυρίως ἓν εἴη τὸ ὄν, εἰ διαιρετὸν εἴη, ὡς Παρμενίδης ἰσχυρίζετο, καὶ σὺν αὐτῷ Ζήνων, ἀναιρῶν τὰ πολλά, ὡς ἔστι μαθεῖν ἐκ τοῦ Πλατωνικοῦ Παρμενίδου. Τοῖς τοιούτοις οὖν οἱ ἀμφὶ C Ξενοκράτην καὶ Πλάτωνα ἀντιπίπτοντες, ἀδιαίρετα ἐποίουν μεγέθη, ὧν καὶ τὸ ἓν ἐκεῖνο ἐτίθουν, ὥστ' εἶναι καὶ ἕν, καὶ ἀδιαίρετον. ὁ τοίνυν φιλόσοφος, ὅτι οὐ δύναται εἶναι μέγεθος ἀδιαίρετον, ἀλλ' εἰς ἄπειρα διαιρετόν, πολλάκις μὲν τὸν αὐτὸν λόγον ὑπέκρουσεν, οὐ χαλεπὸν λέγων καὶ τὸ τὰς ἀτόμους γραμμὰς ἀναιρεῖν· μάλιστα δὲ ἐν τοῖς περὶ γενέσεως καὶ φθορᾶς, διαφόρως ἐκ τῆς ἐναντίας ἐπιχειρήσας, ὥσπερ τὴν οἰκείαν γνώμην ἐκτίθεται, τὴν περὶ τοῦ μὴ εἶναί ποτε μέγεθος ἀδιαίρετον, ἀλλὰ διαιρετὸν καὶ εἰς ἄπειρα. D

CAPVT I.

Argumentum huius commentarioli: Rationes aduerſariorum, qui aſtruebant eſſe lineas quaſdam inſecabiles.

CVM Parmenides ens vnum, & excepto ente reliquorum nihil eſſe, vt quæ non entia ritè appellari poſſint, diſputando aſſereret, eò videtur in hac ſententia perſtitiſſe, ne ſi ens multa concederet B exiſtere, ipſum quoque non ens, in rerum naturam induceret. Ita enim, ait, omnia, quæ ſunt, quoad eſſe dicuntur, vnum ſunt, cùm in ea ratione, qua ens dicuntur, conueniũt: multa verò eſſent, & non ens vnum, ſiquidem aliud quiddam, quàm ens, de his prædicaretur: atqui ab ente aliud diuerſumq; nihil eſt, excepto non ente. Ipſum igitur non ens exiſtere oportet, ſi præter ens aliud quiddam eſſe dicatur. Quamobrem ens cùm ratio eius ſit vna, ita de cæteris prædicabitur, vt cauſa ipſius omnia C vnum quiddam (ens ſcilicet) exiſtimentur, cùm excluſo ente nihil neq; eſſe neque cogitari poſſit. Proinde quò vacuum in rerum naturam ne induceretur, quod re vera non eſt ens, multitudinẽ ac numeroſitatem rerum inficiari maluerunt. Quò enim entia diſcernerentur, vacuum à phyſiologis, præſertim verò Pythagoricis, inducebatur antiquitus. Atque iſtius quidem hominis opinioni cùm Platonici Xenocraticique aſſenſi eſſent incogitanter admodum, his argumentis fidem dederunt, illis verò, qui ſectione indeſinenti, ac infi- D nita partitione eius quod eſt, atque vnum reputatur, multa eſſe demonſtrant, adeóq; planum facere videntur, ſimpliciter vnum non eſſe, quod ens appellatur, ſi ſecari illud, ac diuidi queat, quemadmodum Parmenides ac Zenon ſunt arbitrati, vt in Platonis Parmenide videre eſt, his, inquam, Plato, & Xenocrates contradicentes impartibiles quaſdam magnitudines confinxerũt, quibus vt eſſentiæ ratio propriè tribueretur, ita cum eſſentia impartibilis vnitas coniuncta foret, minimè verò diuiſionem, cùm eſſent ἑνάδες, admitterent. Ariſtoteles certè cùm multis in aliis libris hanc opinionem refellit, quòd ſcilicet inſecabiles nullæ ſunt magnitudines, ſed diuidi omnes ſine exceptione poſſe, vt in tertio φυσικῶν libro, cùm inquit, non difficile admodum eſſe lineas inſecabiles refutare: tum verò, atque in primis in libro, quem de generatione & corruptione, memoriæ prodidit, ex profeſſo illi opinioni contradicens, ſuam hac de re omnem opinionem expoſuit, qua ſtatuere videtur, quamlibet magnitudinẽ diuidi ad infinitum vſq; poſſe:

infinitum verò illud cuiuſmodi ſit, in Phyſicis oſtendit, cùm potentia non actu, infinitum hoc aſſerit: etenim diuiſio talis ſi finiri poſſit aliquando, eam conſiſtere aliquando ac ceſſare oportebit, nec quicquam, quod propterea diuidi poſſit, ſupereſſe. In hac quidem præſenti tractatione peculiari quadam & ſingulari diſputatione de hiſce rebus diſſerit, in primis more dialectico aduerſariorum argumenta proponens. Nam cùm ad alia vtilis dialectica ſit, tum verò aptiſſima eſt, qua diſſerens in vtramque partem, quod magis veriſimile exiſtat, indagare queat. *Suntne igitur,* inquit, *lineæ inſecabiles, aut magnitudines quæpiam? quarum ſunt quædam duplicem habentes protenſionem, vt ſuperficies: quædam tribus patent interuallis, vt corporeæ magnitudines.* Nam ſuperioribus duabus dimenſionibus tertia hæc ſpiſſitudinem addit: in ſumma magnitudo quæritur, an ſit aliqua inſecabilis, quemadmodum opinantur quidam.
Hac propoſita quæſtione primò argumenta in medium affert, quibus inſecabiles quantitates tueri quidam conantur, quorum illud primum eſt. Similiter in rebus vt paucitas cum paruitate, ita multitudo cum granditate deprehenditur: quapropter ſi in paruo ſectiones infinitæ (quemadmodum Ariſtotel. inquit) admittuntur, futurum eſt vt res ea pauca paruáque dici nequeat, ſed potiùs multa magnáque appelletur. Quomodo enim paucum illud dici queat, cùm infinitis partibus diſcerptum diſſectúmque ſit? Aut qui parua res erit, quæ infinitas ſectiones ſuſcipere poſſit? Quocirca pauca paruáque, aut nulla erunt, ſed magna omnia, & multa, aut quatuor hæc erunt eadem: aut ſi verum eſſe neutrum exiſtimandum ſit, magnitudines impartibiles eſſe neceſſe fuerit, quæ appellationem hanc ſortiantur, paruitatis ſcilicet paucitatiſque, vt quæ in exiliora ſe ipſis diuelli ampliùs nequeant, & in ſe ipſis plures diuiſiones admittere. Dicunt etiam aliter, quòd ſi infinitas ſectiones magnum pariter & paruum pati ſint idonea, nec magnum plures, pauciores verò paruum ac minores partes obtinebit, quid differre magnum & paruum inter ſe dicemus? Neceſſe igitur impertem magnitudinem exiſtere, cuius reſpectu magnum plures habeat eiuſmodi, paruum verò pauciores poſſideat, nec multitudine æquales cum his quæ in magno includuntur: Et quidem illud ab abſurdo ductum eſt argumentum. Attamen quòd ſi ideæ quædam ſunt, quemadmodum is, qui hæc aſſerere conatur, ſentit, & non hominis aut bouis ſolum, ſed lineæ etiam ac ſuperficiei, ac corporis erunt ideæ, neceſſe eſt, cùm lineæ quædam ſit idea, eam priorem reliquis numero differentibus lineis exiſtere, quæ nomen ac definitionem vniuocam obtinent, pro eo vt iſti etiam qui ideas aſtruunt, non inficiantur. At enim partes toto priores exiſtimantur; quocirca & hæc linea idea ſecabilis reputari debet, & ſi quidem non in partes infinitas, in numero certè finitas diuidi neceſſe erit; quod nec iſti negare in animum inducent. Priores igitur huiuſce lineæ partes fuerint, quæ idea ſtatuitur, quàm ſit ipſa linea, cuius partes eſſe dicuntur. Enimvero diuidi eam poſſe cùm ſit linea, omnes conſentiunt philoſophi, cùm quantitas omnis ſit ſecabilis. Erunt igitur huius lineæ partes priores, quàm ipſa tota ſit: at prima hæc linea, & non ex aliis enata, cùm idea ſit, dicitur. Mirari verò poſſet fortaſſe quiſpiam quid rationi huic authoritatis ex eo accedat, ſi primam lineam, quæ idea dicitur reliquarum, in partes non infinitas ſed finitas diuidi poſſe contendunt. An quòd conuenientiùs multóque aptiùs hoc dici videtur, ſi in partes finitas quantitatem ſecari concedant?

A καὶ τοῦτο δὴ ἐπειδὴ τὸ ἄπειρον ἐν τῇ Φυσικῇ δυνάμει λέγει τοῦτο, οὐκ ἐνεργείᾳ. εἰ γὰρ ἐνεργηθείη ἡ τοιαύτη διαίρεσις, στήσεται, καὶ λοιπὸν περατωθήσεται. τοῦτο ἄρα καὶ ἐνταῦθα ἐν ἰδίᾳ πραγματείᾳ ἐκτίθησιν, ἐπιχειρῶν πρότερον τὸν οἰκεῖον διαλεκτικὸν τρόπον ἐκ τῶν ἐναντίων. πρὸς γὰρ τοῖς ἄλλοις καὶ τοῦτο πάρεργον ἦν τῇ διαλεκτικῇ τὸ ἀμφοτέρωθεν δυναμένην τὸν λέγοντα ἐπιχειρεῖν, τὸ μᾶλλον δοκοῦν θεωρεῖσθαι. ἆρα πότερον, φησίν, εἰσὶν ἄτομοι γραμμαί, καὶ μέγεθός τι, ἢ δίχῃ διαιρετόν, ἢ καὶ σῶμα τριχῇ διαιρετόν, καὶ ὅλως ποσὸν ἀμερές τι, ὥσπερ ἔνιοί φασι. ἄρχεται τοίνυν καὶ ἐπιχειρεῖ, καὶ πρώτως οὕτως εἰσάγει τὸ ἀδιαίρετον B μέγεθος. ὁμοίως ἐστὶν ἐν πᾶσι, τό, τε ὀλίγον καὶ τὸ μικρόν, καὶ τὸ πολὺ καὶ τὸ μέγα. εἰ γοῦν καὶ ἐν τοῖς τῶν ὀλίγων καὶ μικρῶν μεγεθῶν, ἄπειροί εἰσι διαιρέσεις, ὡς ὁ φιλόσοφος ὑποτίθησιν, οὐκ ἔστιν ἐκεῖνο ὀλίγον καὶ μικρόν, ἀλλὰ πολὺ καὶ μέγα. πῶς γὰρ ὀλίγον, ὅπερ ἀπείρους ἕξει τὰς διαιρέσεις, καὶ πῶς μικρόν, τὸ τόσας * διαιρέσεις δυνάμενον; ἢ γοῦν οὐκ ἔσται που ὀλίγον καὶ μικρόν, ἀλλὰ πάντα πολλὰ καὶ μεγάλα· ἢ εἴπερ ἐστὶ καὶ ὀλίγον καὶ μικρόν, ταῦτα τῶν πολλῶν καὶ μεγάλων ἔσται· ἢ τὸ τρίτον ἔσται μέγεθος ἀδιαίρετον, ὅπερ ἕξει τὴν προσηγορίαν ταύτην τὴν τοῦ μικροῦ καὶ ὀλίγου, ὡς μὴ δυνάμενον εἰς ἐλάττω ἑαυτοῦ διαιρε- C θῆναι, καὶ ἀφ' ἑαυτοῦ πολλὰς διαιρέσεις παρέχειν. ἄλλως τε δέ, καὶ εἰ ἀπείρους διαιρέσεις ἕξει καὶ τὸ μέγα καὶ τὸ μικρόν, καὶ οὔτε τὸ μέγα πλείους, οὔτε τὸ μικρὸν ἐλάττους τε καὶ ὀλίγους, τί διοίσει τὸ μέγα τοῦ μικροῦ; ὥστε διὰ ταῦτα ἀνάγκη εἶναι ἀμερὲς μέγεθος, καθὸ τὸ μὲν μέγα, πολλὰς διαιρέσεις δέξεται, τὸ δὲ μικρὸν ὀλίγας, καὶ οὐχ ὅσας τὸ μέγα. κατὰ τοῦτο γὰρ καὶ διοίσει τὸ μέγα τοῦ μικροῦ. ἔστι δὲ ἡ δεῖξις δῆλον διὰ ἀδυνάτου. ἔτι εἰ κατ' ἐκεῖνον τὸν λέγοντα ταῦτα ἰδέαι τῶν ὄντων εἰσί, καὶ οὐ μόνον ἀνθρώπου καὶ βοός, ἀλλὰ καὶ σώματος, καὶ ἐπιπέδου, καὶ γραμμῆς, καὶ ἔ- D στι διὰ ταῦτα καὶ γραμμῆς ἰδέα· ἔστι δὲ καὶ προτέρα αὕτη τῶν καθ' ἕκαστα γραμμῶν, καὶ συνωνύμων, κατὰ τοὺς τιθεμένους ἰδέας· τὰ δὲ μέρη τοῦ ὅλου πρότερα τὴν φύσιν, * διαιρετὴ ἂν εἴη καὶ ἡ γραμμὴ ἐκείνη ἡ προτέρα τῶν γραμμῶν· καὶ εἰ μὴ εἰς ἄπειρα, τέως εἰς πεπερασμένα κατ' ἐκείνους, καὶ ἔσονται τὰ μέρη πρότερα τῆς ὑποκειμένης προτέρας πάντων γραμμῆς. τὸ γοῦν διαιρεῖσθαι ἐκείνην κοινὸν τοῖς φιλοσόφοις ὑπόκειται. μέγεθος γὰρ κἀκείνη. πᾶν δὲ τὸ μέγεθος διαιρετόν. τί δὲ τῷ λόγῳ τῷ εἰς πεπερασμένα διαιροῦντι, προστίθεται τὸ τοιοῦτον, εἰ ἀνάγκη διαιρεῖσθαι εἰς πεπερασμένα κατὰ τὸν ἐκείνων λόγον, καὶ οὐκ εἰς ἄπειρα; E

* Quædam, δυνάμενον δέχεσθαι, vel [illegible]

* Quidam, ἔστι διαιρ.

A μᾶλλον μὲν οὖν καὶ κάλλιον ἀπαλλάξοι ὁ εἰς πεπερασμένα διαιρῶν, ἢ ὁ εἰς ἄπειρα, ὅσῳ κἀκεῖνος μὲν τὰς ἀρχὰς τῆς γραμμῆς ἐκείνης, καὶ τὰ μέρη πεπερασμένα ποιήσει, οὗτος δὲ ἄπειρα. τῶν δ᾽ ἀπείρων οὔτ᾽ ἐπιστήμη, οὔτε * συνθέσις ἐστί τις. ἢ ῥητέον ὅτι πρὸς τὸ ἁπλῶς τὰς ἰδέας, ὁ λόγος μάχεται, ὅτι εἰ εἶεν, ἄρα κἀκεῖναι ὡς μεγέθη διαιρεθήσονται· ὥστε ἄρα καὶ τὸ ἐξ αὐτῶν δὴ τὸ αὐτογραμμὴν, αὐτοτρίγωνον καὶ αὐτοτετράγωνον, καὶ ὅλως πᾶν ἐπίπεδον, καὶ ἅπαν σῶμα. ἔστι δὲ εἰπεῖν καὶ ἄλλο, ὅτι ἐκεῖνοι ἰδέας τιθέμενοι, τὰς ἀτόμους δι᾽ ἐκείνας κατεσκεύαζον, ὡς δὴ τῆς αὐτογραμμῆς τεθείσης ὡς ἰδέας, μὴ ἀναγκάζοιντο καὶ ταύτην διαιρεῖν, καὶ τὸ ἀπαθὲς καὶ ἀκίνητον ἐκείνης ἀναιροῖτο, κατὰ τὴν αὐτῶν δόξαν. B ἀλλ᾽ ὡς ἀδιαίρετον δέχοιντο πολλῷ μᾶλλον ἐκείνην τὴν πρώτην γραμμήν· καὶ διὰ ταῦτ᾽ * εὐοδοῦνται τὸ δεύτερον ἐπιχείρημα. τρίτον, εἰ σώματά εἰσι τὰ στοιχεῖα, τῶν δὲ στοιχείων οὐδὲν πρότερον, τὰ δὲ μέρη τοῦ ὅλου πρότερα, ἀδιαίρετον ἂν εἴη τὸ πῦρ καὶ τὰ λοιπὰ στοιχεῖα, ὡς ἂν μὴ πρότερα τῶν πρώτων στοιχείων εὑρεθεῖεν τὰ μέρη. ὥστε οὐ μόνον ἐν τοῖς νοητοῖς τὸ ἀμερὲς ἔσται, ὡς θεῖον καὶ νοῦς, ἀλλὰ καὶ ἐν τοῖς αἰσθητοῖς ἔσται τι ἀμερὲς, τὸ στοιχεῖον. καί τοι τοῦτο φαίη τις ἂν πρὸς τὸν λόγον τὸν εἰς πεπερασμένα διαιροῦντα, καὶ οὐκ εἰς ἄπει- C ρα. ῥητέον τοίνυν, ὡς ἐκεῖνοι μὴ μόνον ἀδιαίρετον τὴν ἰδέαν ἐτίθουν, ἀλλὰ καὶ τὸ στοιχεῖον, οἷον πῦρ καὶ τὰ λοιπὰ, ἢ μᾶλλον τὸ αὐτοτρίγωνον καὶ αὐτοτετράγωνον· καὶ ἐντεῦθεν παρίστων, ὡς μὴ μόνον οὐ πᾶν σῶμα εἰς ἄπειρον διαιρετὸν, ἀλλ᾽ οὐδὲ ἁπλῶς πᾶν σῶμα διαιρετόν· τὰ γὰρ στοιχεῖα, σώματα ὄντα, ἀδιαίρετά εἰσιν· ἵνα μὴ πρότερα τῶν πρώτων * εὑρεθεῖεν· πρότερα γὰρ τὰ μέρη τοῦ ὅλου, τῶν δὲ στοιχείων οὐδὲν πρότερον. ἔστι δὲ ὁ συλλογισμὸς δεικτικός· τὰ στοιχεῖα, σώματα ὄντα, οὐ διαιρεθήσονται, ἵνα μὴ τῶν ἀρχῶν ἀρχαὶ * εὑρεθεῖεν, πρότερα τὰ μέρη τοῦ ὅλου. ὥστε τὰ τοιαῦτα σώματα οὐ διαιροῦνται. τὰ στοιχεῖα ἄρα οὐ διαιρεθήσονται. D καὶ ἔστιν ἡ μείζων πρότασις ἐξ ὑποθέσεως διὰ τοῦ διαζευκτικοῦ. τὰ τοιαῦτα γὰρ σώματα ἢ διαιροῦνται, ἢ οὐ διαιροῦνται. ἀλλ᾽ εἰ διαιροῦνται, ἔσονταί τινα πρότερα τῶν πρώτων. ἐπεὶ γοῦν οὐ πέφυκε διαιρεῖσθαι, ἀδιαίρετα ἄρα, κατὰ τὸν τρίτον τρόπον τῶν ὑποθετικῶν, τὸν τῷ ἀναιρεῖν θάτερον κατασκευάζοντα θάτερον. ἔτι δὲ καὶ ὁ τοῦ Ζήνωνος λόγος τὸ εἰς ἄπειρον τῶν μεγεθῶν διαιρετὸν ἀναιρεῖ, εἴπερ ἀδύνατον, ὡς ἐκεῖνος ἔλεγεν, ἐν πεπερασμένῳ χρόνῳ ἀπείρων ἅψασθαι. δι᾽ ὥρας γὰρ μιᾶς διέλθοι τις στάδιον. εἰ γοῦν τὸ στάδιον εἰς ἄπειρα διαιρετὸν, ἅψαιτο ἂν τις διερχόμενος τὸ στάδιον, ἀπείρων τῶν τοῦ σταδίου σημείων ἐν πεπερασμένῳ χρόνῳ, τῇ μιᾷ ὥρᾳ. E καὶ ἄλλως, ὅτι πρότερον δεῖ ἀφικέσθαι ἐπὶ τὸ ἥμισυ τὸν διερχόμενον. τοῦ δ᾽ αἰεὶ

* Quidam, συνθέσεις

* Quidam, ἀδέονται

* γρ. εὑρεθῶσι τὰ μέρη τοῦ ὅλου. ἔστι δὲ ὁ συλλογ. δεικτικὸς τῶν στοιχ.

* γρ. εὑρεθεῖεν. πρότερα γὰρ τὰ μέρη τοῦ ὅλου· τῶν δὲ στοιχείων οὐδὲν πρότερον ἄλλο τι τῷ τ.

A Protinus enim ex his partibus finitis magis appoſiti continuam lineam architectari videbuntur. Nam is qui in partes infinitas lineam diuidi poſſe adſtipulabitur, eadem ratione ex infinitis etiam componi eandem affirmabit. Principia autem finita rerum omnium potiùs videntur conſtituenda, cùm infinitorum neque ſcientia ſit vlla, neque apta coagmentatio. Aut dicendum fortaſſe hoc modo eſt, hæc Ariſtotelis verba aduerſus ideas inſtituta, quibus eas generatim refelleret, vt ſi quantitatum ideæ ſint, eas inſtar linearum diuidi poſſe, ita quæ ex his coaleſcunt figuræ, ſcilicet τὸ αὐτοτρίγωνον & αὐτοτετράγωνον, nata ἐκ τῆς αὐτογραμμῆς, & omnino fore vt ſuperficies quælibet, corpuſque quodcunque ſecari poſſe videatur. Plato autem inſecabiles & ἀπαθεῖς ponit ideas. B Licet autem aliter etiam reſpondere: Platonicos, cùm ideas harum rerum ſtatuunt, eos voluiſſe eo ipſo quod nominarent, ideas non ſecabiles, ſed indiuiduas quantitates quaſdam conſtituere, vt τῆς αὐτογραμμῆς poſita idea, neceſſe illi non eſſet & hanc admittere, quòd diuidi apta eſſet, eóque facto immobilitas huius, & τὸ ἀπαθὲς, id eſt, patiendi carentia, tolleretur, quemadmodum de ideis omnibus ſentiunt: quóque magis primam hanc lineam inſecabilem repræſentarent, hoc argumento vſos arbitrandum, &, ſi hoc modo alterum argumentum intelligatur, non C omnino peſſimum videbitur. Tertium eſt, ſi corpora quædam ſunt elementa: elementis verò prius nihil, partes autem toto priores, inſecabilia ſanè erunt elementa, vt ignis, & reliqua, propterea ne priùs aliquid ipſis elementis ſtatuatur: nam ſi diuidi poſſent, partes priores elementorum quàm ipſa tota elementa, videri poſſent. Ex quo ſequitur illud, vt non modò res intelligibiles, quemadmodum Deus, & intelligentia, ſint indiuiduæ ſubſtantiæ, ſed in rebus etiam corporeis & ſenſibilibus quiddam ſit, quod diuidi nequeat, vt elementum, vt αὐτοτρίγωνον & αὐτοτετράγωνον. Et quorſum hæc, dicat fortaſſe aliquis, quid ad præſens pertinebunt, quod iſti probare moliuntur, magnitudines non infinita ſed finita ſectione diduci poſſe? D Quare dicatur illud, & cuius gratia hoc argumento vtantur, mox planum faciat. Iſti quidem non modò ideam indiuiduam inſecabilémque poſuerunt, ſed elementa quoque vt ignem, & reliqua, vel potiùs τὸ αὐτοτρίγωνον & αὐτοτετράγωνον, & ex eo conuincere voluêre, nō modò nō omne corpus infinita partitione diſſecari, ſed ſimpliciter quædā corpora inſecabilia. Elementa enim cùm ſint corpora, non diuidi poſſe, quò non primis his corporibus priora conſtituantur quædam, ſcilicet partes toto priores: ſyllogiſmus autem demonſtratiuus videtur. Principiorum non ſunt principia, vt partes totius: elementa ſunt principia: quare eorum alia non erunt principia, vt partes totius: quare in partes non diuidi poterunt vllas. Maior per hypotheſin ita ſumi queat cum disiunctione: Hæc E corpora diuidi poſſunt: aut non diuidi: ſi diuidi poſſunt, ergo partes toto priores, & ita primis erit prius aliquid: elementa autem prima ſunt: diuidi igitur in partes non poſſunt, inſecabilia igitur. Syllogiſmus eſt in tertio modo hypotheticῶν, qui ſublato altero, ſtatuit alterum. Quartum, Zenonis eſt, cùm inquit, fieri non poſſe vt tempore finito infinita quiſpiam attingat cùm mouetur: vt hora vna ſi quis ſtadium tranſeat: quòd ſi ſtadium ſecari in partes infinitas poſſit, attinget: qui ſtadium pertranſit tempore finito, puncta infinita. Aliter quoque hanc diuiſionem infinitam deſtruere conatur: Prius, inquit, neceſſe eſt, quàm totum tranſeas ſpatium, dimidium perambulare. Prius verò quàm

hoc dimidium abſoluas, huius rurſus dimidium permeabis antea, & iterum huius, ita vt diuiſio hæc in dimidia nunquam deſinat. Proinde cùm infinita pertranſeat, tempore finito, quod ſuper lineam mouetur, & celeriùs tempore æquali plus ſpatij conficiat. Pernicius enim quod mouetur (vt in Phyſicis expoſitum eſt) æquali tempore maius interuallum, minori tempore æquale, & interdum maius abſoluit: motus animi, qui velociſſimus eſt, quamlibet diuiſionem percipiēs numerabit. Nam ſi hoc modo moueri dici ſolet, futurum me hercle eſt, vt finito tempore infinita enumeret. At ſi impoſſibile hoc ſit, erit profectò linea inſecabilis quædam. Aliud argumentum à mathematicis ductum eſt. Etenim ſi detur ſymmetras, id eſt, commenſurabiles eſſe lineas, neceſſe fuerit inſecabilem quandam lineam exiſtere. Symmetræ enim lineæ dicuntur, quæ linea eadem menſurantur. Quæcunque igitur ſymmetræ, hæ menſuram talem capiunt omnes. Erit itaque longitudo quæpiam, qua menſurabuntur omnes, quam inſecabilem eſſe neceſſe eſt: ſiquidem ea ſecari poſſit, partes hæ menſuram admittent reſpectu totius. Nam partes ſymmetræ ſunt toti: habebunt igitur partes & totum menſuram communem ex definitione ſymmetri, & rurſus hæc ipſa menſura diuidetur, & ſimili ratione alia veſtigabitur menſura, & huius iterum alia: quæ progreſſio nunquam ceſſatura eſt. Quo fiet vt non vna menſura omnium ſymmetrarum linearum dari queat. Erunt enim hoc modo infinitæ menſuræ, ſed ſymmetras omnes habere vnam menſuram conſtat. Stabitur igitur in vna aliqua prima, quæ inſecabilis erit, & cuius multiplicatione omnes ſymmetræ compoſitæ erunt. Idem quoque, inquiunt, accidit in ſuperficiebus, non modò in lineis, ex quibus deſcribuntur figuræ. Omnes figuræ etenim huiuſcemodi ex rationalibus vt vocant, lineis progenerantur. Sunt autem rationales, ſiue, vt Græci vocant, ῥηταὶ, ad quas rectè ſi comparentur, innumerabiles, vel ſymmetræ, vel aſymmetræ nominantur, ad ſe ipſas: viciſſim vero vel ſymmetræ ſunt, vel non ſunt, vel potentia ſolùm ſymmetræ. Omnes autem figuræ ab eiuſmodi lineis productæ, ſymmetræ exiſtunt: quam ob cauſam & hæ communi quadam ſuperficie menſurabuntur, & ſimilis ratio in his erit, quæ in lineis ponitur eſſe, & eodem modo menſura indiuidua, vt non ſolùm oporteat lineam inſecabilem, ſed ſuperficiem quoque eiuſmodi exiſtere. Quòd verò omnia non omnibus ſymmetra ſint, ea diuiſio oſtendit, quæ eſt in binomiis: vt in 10. Euclidis, pro 42. oſtenditur dilucidè, quo in loco inquit geometra, binomium vno duntaxat puncto in nomina diuidi: quæ quomodo intelligi debeant, mox explicabimus. Inquiunt autem, ſi quæ menſura ſecundùm certam lineam & definitam diuiſa ſit, neque ῥητὴν, neque ἄλογον fore, quemadmodum ſit apotome ex binomiis ſumpta. Secundùm ſe ipſas enim nullam habituras eiuſmodi naturam: ad alias enim comparatas fore & dici conſueuiſſe ῥηταί, & ἄλογοι.

A μὴ ἀμερεῖς, πάντως ἔσται ἀεὶ ἥμισυ. εἰ δὲ καὶ ἅπτεται τῶν ἀπείρων ἐν πεπερασμένῳ χρόνῳ τὸ ἐπὶ γραμμῆς φερόμενον, τὸ δὲ θᾶττον ἐν τῷ ἴσῳ χρόνῳ πλεῖον διανύει. θᾶττον γάρ ἐστι τὸ ἐν ἴσῳ πλεῖον, καὶ τὸ ἐν ἐλάττονι ἴσον, καὶ τὸ ἐν ἐλάττονι πλεῖον, (καθὼς ἐν τῇ φυσικῇ ἐλέγετο.) ταχίστη δὲ ἡ τῆς διανοίας κίνησις, πάσης διαστατικῆς καὶ σωματικῆς φορᾶς, κἂν ἡ διάνοια τῶν ἀπείρων ἐφάπτοιτο καθ' ἕκαστον ἐν πεπερασμένῳ χρόνῳ. ὥστε εἰ τὸ καθ' ἕκαστον ἅπτεσθαι τὴν διάνοιαν ἀριθμεῖν ἐστιν, ἐνδέχεται ἀριθμεῖν τὰ ἄπειρα ἐν πεπερασμένῳ χρόνῳ. εἰ δὲ τοῦτο ἀδύνατον, εἴη δὴ ἄτομος γραμμή.

B ἔτι ἐξ ὧν αὐτοὶ οἱ ἐν τοῖς μαθήμασι λέγουσιν, εἴη δή τις ἄτομος γραμμή, ὥς φασιν, εἴπερ σύμμετροί εἰσιν αἱ τῷ αὐτῷ μέτρῳ μετρούμεναι. ὅσαι δὲ εἰσι σύμμετροι, πᾶσαι εἰσι μετρούμεναι. εἴη γὰρ ἄν τι μῆκος ᾧ μετρηθήσονται πᾶσαι, τοῦτο δ' ἀνάγκη ἀδιαίρετον εἶναι. εἰ γὰρ διαιρετὸν, καὶ τὰ μέρη τούτου οὗ μέτρου τινὸς ἔσονται· σύμμετρα γὰρ τῷ ὅλῳ. καὶ ἐπεὶ σύμμετρα ταῦτα τῷ ὅλῳ, ἕξουσι καὶ ταῦτα μέτρον κοινόν· σύμμετρα γάρ εἰσι, τὰ τῷ αὐτῷ μέτρῳ μετρούμενα. ὥστε ἐπεὶ τοῦ μέτρου τὰ μέρη σύμμετρα τῷ ὅλῳ εἰσὶ, κοινὸν μέτρον ἄλλο τοῖς τε μέρεσι τοῦ μέτρου, καὶ τῷ ὅλῳ ἔσται. καὶ αὖθις ἐπ' ἐκείνῳ τῷ μέτρῳ τὸ τοιοῦτον ζητηθήσεται· καὶ εἰ

C διαιρετὸν κἀκεῖνο, τοῦτο καὶ ἐπ' ἐκείνῳ γενήσεται, καὶ τοῦτο εἰς ἄπειρον. εἰ δέ που στήσεται, καὶ ἄτομος εὑρεθήσεται, οὐδὲν κωλύει καὶ ἐπὶ τοῦ πρώτου μέτρου τὸ ἄτομον εἶναι. ὥστε πᾶσαι αἱ ἐκ τοῦ μέτρου συντεθεῖσαι γραμμαὶ, ἐξ ἀμερῶν συγκείσονται. τοῦτο δὲ συμβήσεται φασι, κἂν τοῖς ἐπιπέδοις σχήμασι, μὴ μόνον ἐπὶ ταῖς γραμμαῖς ἐξ ὧν τὰ σχήματα. πάντα γὰρ τὰ σχήματα τὰ ἀπὸ τῶν ῥητῶν γραμμῶν. ῥηταὶ δὲ εἰσι, πρὸς ἃς αἱ ἄλλαι εὐθεῖαι πλήθει ἄπειροι καὶ σύμμετροι, καὶ ἀσύμμετροι. πρὸς δ' ἀλλήλας εἰσὶ σύμμετροι, ἢ μήκει καὶ δυνάμει [ἢ δυνάμει] μόνον. πάντα οὖν τὰ ἀπὸ τῶν τοιούτων ῥητῶν

D γραμμῶν σχήματα, σύμμετρα ἀλλήλοις. ὥστε καὶ ταῦτα κοινῷ τινι μέτρῳ ἐπιπέδῳ μετρηθήσονται, καὶ ἀκολούθως ταῖς γραμμαῖς, φασιν, ἔσται καὶ αὐτὸ τὸ μέτρον ἀμερές. ὥστε μὴ μόνον ἀνάγκη εἶναι γραμμὴν ἄτομον τὴν τὰς συμμέτρους γραμμὰς μετροῦσαν, ἀλλὰ καὶ σχῆμα ἐπίπεδον ἄτομον, ὃ τὰ ἐπίπεδα σύμμετρα σχήματα μετρεῖ. ὅτι δὲ οὐ πάντα πᾶσι σύμμετρα κατά τι κοινὸν μέτρον, δείκνυσιν ἡ ἐκ δύο ὀνομάτων κατατομή, ὡς ἐν τῷ μβ' τοῦ δεκάτου βιβλίου τῶν στοιχείων τοῦ Εὐκλείδου κεῖται, λέγοντος ἐκεῖ τοῦ γεωμέτρου, ὅτι ἡ ἐκ δύο ὀνομάτων, κατὰ ἓν σημεῖον διαιρεῖται εἰς τὰ ὀνόματα· ὃ δὴ καὶ

E κατὰ τὸ δυνατὸν διασαφήσομεν προϊόντες. ἀλλὰ μὴν φασιν, εἴ τι τμηθήσεται μέτρον τινὰ τεταγμένην καὶ ὡρισμένην γραμμὴν, οὐκ ἔσται οὔτε ῥητὴ, οὔτε ἄλογος, οἷον ἀποτομὴ ἐκ δυοῖν ὀνομάτων· ἀλλὰ καθ' αὑτὰς μὲν οὐδεμίας ἕξουσι φύσεις, πρὸς ἀλλήλας δὲ ἔσονται ῥηταὶ καὶ ἄλογοι.

ΚΕΦΑΛ. β'.

Μαθηματικόν τι θεώρημα διασαφηνίζει, πρὸς ὃ τὸ πλεῖστον τῶν ἐναντίων ἐπιχείρημα συντείνει. Τί τὸ ῥητόν, τὸ ἄλογον, τὸ σύμμετρον, τὸ ἀσύμμετρον· καὶ τίνα τὰ ὀνόματα.

Πρῶτον οὖν σαφηνιστέον ὡς οἷόν τε τὸ θεώρημα, καὶ λεκτέον τί τὸ ῥητόν, καὶ τί τὸ ἄλογον, καὶ τί τὸ σύμμετρον, καὶ τί τὸ ἀσύμμετρον, καὶ τίνα τὰ ὀνόματα· καὶ μεθ' οὕτως τὰ τοῦ ἐπιχειρήματος ἐκθησόμεθα. σύμμετρα μὲν οὖν μεγέθη λέγονται, τὰ τῷ αὐτῷ μέτρῳ μετρούμενα· καὶ ἄλλως δὲ τὰ ἔχοντα λόγον, ὃν ἀριθμὸς πρὸς ἀριθμόν· οἷον ὁ ις' τῷ κδ' σύμμετρος. κοινὸν γὰρ μέτρον αὐτῶν ὁ δ'. ἀσύμμετρα δέ, ὧν μηδὲν ἐνδέχεται κοινὸν μέτρον γενέσθαι. καὶ ἐπὶ μὲν τῶν ἀριθμῶν, ἀδύνατον γενέσθαι τὸ ἀσύμμετρον πλατυκῶς. κἂν γὰρ οὐδεὶς ἀριθμὸς ὁ μετρῶν ᾖ, ἀλλ' οὖν ἡ μονὰς μόνη καθ' ἑαυτὴν μετρήσει ἀμφοτέρους, ὡς εἶναι καὶ τούτοις κατὰ μονάδα, τὸ κοινὸν μέτρον ἁπάντων τῶν ἀριθμῶν συμμέτροις. ἐπὶ δὲ τῶν μεγεθῶν οἱ Πυθαγόρειοι πρῶτοι εὑρήκασι τὸ ἀσύμμετρον, διὰ τὴν ἐπ' ἄπειρον διαίρεσιν αὐτῶν. εὐθεῖαι δὲ σύμμετροι εἰσίν, ἢ καὶ μήκει καὶ δυνάμει· ἀδύνατον γὰρ μήκει οὔσας συμμέτρους, μὴ καὶ δυνάμει εἶναι· ἢ δυνάμει μόνον, οὐ μὴν δὲ μήκει· εἴη ὡς ἐπὶ παραδείγματος. ἔστω γραμμὴ μονάδων ς'. καὶ ἄλλη μονάδων δ'. σύμμετροι αὗται μήκει. μετρεῖ γὰρ αὐτὰς γραμμὴ μονάδων δύο. δύνανται γοῦν αὗται καὶ σύμμετρα μεγέθη. ἑξάκις γὰρ τὰ ς', λς'· καὶ τετράκις τὰ δ', ις'. τὰ δὲ λς', καὶ τὰ ις', καὶ αὐτὰ σύμμετρα εἰσὶ τῷ δ' μετρούμενα. τὰ δὲ δυνάμει μόνον σύμμετρα, οὐ μὴν δὲ καὶ μήκει, ἡ διάμετρος καὶ ἡ πλευρὰ τοῦ αὐτοῦ τετραγώνου δείξει. ἔστω γοῦν κατὰ τετράγωνον ἀριθμὸν τὸν θ' σχῆμα ἐπίπεδον· ἕξει γοῦν τὸ τοιοῦτον τετράγωνον σχῆμα διάμετρον. τὸ δὲ ἀπὸ τῆς διαμέτρου γεγονὸς τετράγωνον, διπλάσιον ἔσται τοῦ ἀπὸ τῆς πλευρᾶς· ὥστε τὰ μὲν τετράγωνα πρὸς ἄλληλα σύμμετρα, ἐπεὶ τὸ ἀπὸ τῆς διαμέτρου, διπλάσιον τοῦ ἀπὸ τῆς πλευρᾶς. τὸ δὲ διπλάσιον γὰρ πρὸς τὸ ἥμισυ σύμμετρον. αὗται δὲ αἱ γραμμαὶ αἱ ποιοῦσαι τὰ τετράγωνα, ἥ τε πλευρὰ τοῦ τετραγώνου, καὶ ἡ διάμετρος, ἀσύμμετροι μήκει, εἰ καὶ σύμμετροί εἰσι δυνάμει. δύνανται γὰρ τὰ σύμμετρα τετράγωνα. ἐὰν γὰρ θῇ τις τεθῆναι ἡ πλευρὰ τῇ διαμέτρῳ σύμμετρος καὶ μήκει, ἔσται τὰ περιττά, ἤγουν τὰ θ', ἴσα τοῖς ἀρτίοις, ἤγουν τοῖς η'. τῶν γὰρ ις' τὸ ἥμισυ, ὀκτὼ ὁμολογουμένως. ἥμισυ δὲ καὶ τὸ ἀπὸ τῆς πλευρᾶς τετράγωνον, τοῦ ἀπὸ τῆς διαμέτρου τετραγώνου. ἔστι δὲ τὸ ἀπὸ τῆς πλευρᾶς τετράγωνον θ', μονάδων. εἰ γοῦν καὶ τὸ ἀπὸ τῆς διαμέτρου τετράγωνον, ἀπὸ συμμέτρου τῆς πλευρᾶς τῇ διαμέτρῳ ἀποτελεῖσθαι λέγοιτο,

CAPVT II.

Explicat mathematicum theorema, cuius vi efficere nitebantur aduerſarij lineas eſſe inſecabiles.

IN primis verò declarandum hoc loco eſt, quid ῥητόν, quid ἄλογον, quid σύμμετρον, quæve ſymm. deinde argumenti vim demonſtrabimus. Symmetræ quantitates dicuntur, quæ quantitate eadem menſurantur, ſiue quæ proportionem obtinent inter ſe collatæ, ſicuti numerus ad numerum, vt 16. ad 24 communis enim menſura quaternarius eſt. Aſymmetræ verò nominantur, quarum nulla communis menſura conſtat, & in numeris quidem ἀσύμμετρον nullo modo ſecundùm latitudinem, quemadmodum in ſuperficiebus deprehenditur. Nam tametſi nullus eos numerus communis menſuret, vnitas tamen aliquoties repetita vtroſque menſurabit: quo fit vt eiuſmodi numeri cum reliquis omnibus reſpectu vnitatis dici queant σύμμετροι. Primi autem Pythagorici in magnitudine rationem, & modum τοῦ ἀσυμμέτρου repererunt, ob diuiſionem, quæ in his ad infinitum vſque pergit. Lineæ verò rectæ ſymmetræ dicuntur longitudine ſimul & potentia: vel potentia ſolùm, non autem longitudine. Siquidem longitudine commenſurari queant, potentia quoque ſymmetras eſſe neceſſe eſt: viciſſim autem & è regione non oportet. Res autem meliùs iſthoc exemplo liquebit. Eſto linea ſex vnitatibus deſignata, altera, quatuor, erunt ſanè duæ illæ ſymmetræ ſecundùm longitudinem. Metitur enim menſura communis, binarius ſcilicet numerus, vel linea, quæ duas vnitates in ſe continent. Illæ etiam lineæ efficere magnitudines ac ſuperficies poſſunt, ac potentia in ſe ipſis ſuperficies commenſurabiles includunt. Senarius enim in ſe reductus efficit xxxvi. quaternarius verò in ſe ipſum xvi. procreat. Atqui xxxvi. & xvi. ſymmetra eſſe conſtat, adeóque quaternario menſurari. Quæ verò potentia commenſurantur, non protinus longitudine etiam commenſurabiles exiſtunt, quam rationem diameter & coſta eiuſdem quadrati dilucidè oſtendunt. Eſto igitur ſecundùm nouenarium deſcriptum quadratum, quod ſanè diametrum obtinebit, vt quadratum ex ea deſcriptum duplam habeat proportionem ad quadratum, cuius eſt diameter, ſiue ad lateris quadratum: quocirca quadrata quidem ſymmetra habebuntur. Nam duplum ad dimidium duplum eſſe nemo inficiabitur. Lineas verò ipſas, latus ſcilicet ad diametrum, incommenſurabiles longitudine eſſe neceſſe fuerit, quanquam poteſtate ſint ſymmetræ. Poſſunt enim hæ lineæ in ſe ipſas ductæ ſymmetra quadrata producere, quorum vnum ad alterum ſe proportione dupla habeat. Si verò quiſpiam contentioſiùs aſſerens, dicat eas lineas non potentia duntaxat ſed longitudine etiam ſymmetras, is abſurditatem hanc vitare non quibit, quin imparem numerum, ix. ſcilicet æqualem ſtatuat pari, viij. ſcilicet. Nam nemo neſcius eſt, partem dimidiatam xvi. eſſe viij. Porrò ex latere in ſe ducto, vt antea diximus, quadratum alterum ſubduplum maioris creabatur. Minus itaque quadratum hoc dimidium maioris quadrati ſortietur, viij. ſcilicet: minus verò quadratum nouenario cenſebatur numero. viij. igitur, & ix. pro eodem, & æquales haberi debent: quod magna abſurditate laborare cernis. Quòd ſi diametri quadratum à coſta, quæ diametro commenſurabilis ſit, generari dicatur,

vt ſi latus ſit ternarius, diametros autem quaternarius: hoc etenim modo lineæ commenſurabuntur etiam longitudine: efficietur quod à diametro producitur tetragonum ſedecim: erit me hercle is numerus & duplus ad octo, & rurſus ad nouem duplus. Nam quadratum lateris nouenarius eſt, quo duplo maior ſuperficies quadrati ex diametro producta geometricis demonſtrationibus oſtenditur: rurſúſque fit vt par numerus æqualis impari neceſſariò ſtatuatur, quod vt abſurdum, ita impoſſibile eſſe videtur. Porrò autem propoſita vna quapiam linea, qualiſcunq; ea ſit, ad quam reliquæ ſi comparentur, vel ſymmetræ inueniantur longitudine, & potentia, aut potentia ſolùm, vel aſymmetræ: eiuſmodi linea à Geometricis ῥητὴ appelletur, quaſi ſignum propoſitum quoddam dicas, & confeſſum. Nam quæ confeſſa & definita ſunt, ῥητὰ vocare ſolemus, vt cùm dicimus ἐπὶ ῥηταῖς συμφωνίαις, id eſt, conſtitutis & deſcriptis concentibus. Illud tamen nomen ceu ſuum quoddam vſurpant Geometræ. Quæcunque igitur propoſita linea fuerit, hæc ῥητὴ dici conſueuit: & quæ illi ſymmetræ exiſtunt, ſiue longitudine, ſiue potentia, ſiue vtroque modo, ῥηταὶ appellantur. Quæ verò ad eam ſunt aſymmetræ, ἄλογοι, inquit Geometres, vocentur, & quod à propoſita rationali deſcribitur, quadratum rationale, vel, vt Græci, ῥητὸν: quæ verò illi quadrato commenſurantur alia quadrata reſpectu eiuſdem ῥητὰ dici ſolent: aſymmetra verò illi ἄλογα nominant. Symmetron igitur, & aſymmetron, in magnitudine natura exiſtunt, ῥητὸν verò, & ἄλογον poſitione, vt exempli gratia, propoſitæ cuiuſdam lineæ hanc ſtatuamus eſſe ῥητὴν, vt ſymmetron: illam verò, ἄλογον, vt aſymmetron: & rurſus hanc ῥητὴν reſpectu alterius ἄλογον eſſe, & ἄλογον reſpectu alterius ῥητὴν pronuntiamus. Inquit autem Geometres, linea ex duobus nominibus compoſita, ſiue ex duabus rationalibus, ſiue confeſſis, ſecundùm vnicum tantummodo punctum diuidi poteſt in ſua nomina. Eiuſmodi itaque ῥηταὶ potentia tantùm ſunt ſymmetræ, cuiuſmodi lineæ communẽ menſuram, qua vtræque menſurentur, non habent, cùm tantùm hoc aſſequantur, quæ longitudine quoque ſymmetræ exiſtunt, non ſolùm potentia. Quocirca non quælibet cuilibet commenſuratur, ſed hæc quidem oblatæ cuipiam & longitudine & potentia ſymmetros cernitur, alteri fortaſſe potentia ſolùm ſymmetros exiſtit, vt in ſectionibus binomiorum accidere conſueuit, & comparatione lateris ad diametrum. Eiuſmodi enim lineæ cùm longitudine ſint aſymmetræ, quadrata tamen earum ſymmetra eſſe conſtat, quas lineas Euclides ῥητὰς appellat. Quædam verò ad quaſdam collatæ, neque longitudine, neque potentia ſymmetræ ſunt, quas vocat ἀλόγους. Cùm itaque ex duobus nominibus compoſita linea vno tantum ſigno, aut puncto diuidi queat, ita vt ambæ ῥηταὶ dici poſſint, & potentia ſymmetræ: quolibet autem puncto alio ſecari nequeat, vt ῥηταὶ partes illius lineæ dicantur, ſequi videtur, binomium eiuſmodi ex inſecabilibus compoſitum, eiúſque vnam duntaxat diuiſionem exiſtere, qua lineæ efficiuntur duæ menſuræ eorum quadratorum quæ ex ipſis producuntur, quæ ipſa quoque ſymmetra exiſtunt. quorum menſuræ etiam ſunt inſecabiles, vt modò oſtendimus. Etenim ſi diuidatur menſura ſecundùm lineam certã & definitam,

A ὡς εἶναι τὴν μὲν πλευρὰν τριῶν μονάδων, τὴν δὲ διάμετρον τεττάρων, (οὕτω γὰρ ἂν εἶεν αἱ γραμμαὶ καὶ μήκει σύμμετροι) γενήσεται τὸ ἀπὸ τῆς διαμέτρου τετράγωνον, μονάδων ις΄· διπλάσια καὶ τῶν ὀκτὼ κατὰ τὴν κοινὴν δόξαν, διπλάσια καὶ τῶν ἐννέα. τὸ γὰρ ἀπὸ τῆς πλευρᾶς τετράγωνον ἐννέα μονάδων ἦν, οὗ τινος τοῦτο δὴ τὸ ἀπὸ τῆς διαμέτρου τετράγωνον, γεωμετρικαῖς ἀποδείξεσι διπλάσιον ἀποδείκνυται. ἔσται τοίνυν ἴσα τὰ θ΄ τοῖς η΄, καὶ τὰ περιττὰ τοῖς ἀρτίοις· ὅπερ ἀδύνατον. ἡ γοῦν προτεθεῖσα εὐθεῖα ὁποία δήποτοῦν, πρὸς ἣν παραβαλλόμεναι αἱ λοιπαὶ, ἢ σύμμετροι εὑρίσκονται, ἢ καὶ μήκει
B καὶ δυνάμει, ἢ δυνάμει μόνον, ἢ ἀσύμμετροι· ἡ τοιαύτη εὐθεῖα ῥητὴ παρὰ τοῖς γεωμέτραις καλεῖται ὥσπερ τι σημεῖον προκείμενον καὶ ὁμολογούμενον. τὰ γὰρ ὁμολογούμενα καὶ ὡρισμένα, ῥητά φασιν· οἷον φαμὲν ἐπὶ ῥηταῖς συμφωνίαις. τοῦτο γοῦν καθὸ ῥητὸν τὸ ῥητὸν, καὶ ὡς κύριον ὄνομα οἱ γεωμέτραι λέγουσι. ῥητὴ γοῦν αὕτη ἡ προτεθεῖσα τὸ ὄνομα· καὶ αἱ ταύτῃ σύμμετροι, ῥηταὶ, εἴτε δυνάμει μόνον, εἴτε καὶ μήκει καὶ δυνάμει. αἱ δὲ ταύτῃ ἀσύμμετροι, ἄλογοι, φησὶ, καλείσθωσαν. καὶ τὸ ἀπὸ τῆς προτεθείσης ῥητῆς τετράγωνον, ῥητόν· καὶ τὰ τούτῳ σύμμετρα, ῥητά. τὰ δὲ τούτῳ ἀσύμμετρα, ἄ-
C λογα, φησὶ, καλείσθωσαν. τὸ τοίνυν ἀσύμμετρον καὶ τὸ σύμμετρον τῶν μεγεθῶν, φύσει ἐστί· τὸ δὲ ῥητὸν καὶ τὸ ἄλογον, θέσει, ὡς εἶναι τῇ προτεθείσῃ γραμμῇ. ταύτην μὲν φέρε ῥητὴν, ὡς σύμμετρον· ταύτην δὲ ἄλογον, ὡς ἀσύμμετρον· καὶ αὖθις τὴν ῥητὴν ταύτῃ ἑτέρᾳ ἄλογον εἶναι, καὶ τὴν ἄλογον ταύτῃ ἑτέρᾳ ἴσως ῥητήν. λέγει τοίνυν ὁ γεωμέτρης· ἡ ἐκ δύο ὀνομάτων συγκειμένη γραμμὴ, εἴτ᾽ οὖν ἡ ἐκ δύο ῥητῶν, κατὰ ἓν μόνον σημεῖον διαιρεῖται εἰς τὰ ὀνόματα. αὗται γοῦν αἱ ῥηταὶ, δυνάμει εἰσὶ σύμμετροι. αἱ δὲ δυνάμει σύμμετροι, κοινὸν μέτρον οὐκ ἔχουσιν, εἰ μὴ καὶ μήκει εἰσὶ σύμμετροι. ὥστε οὐ πᾶ-
D σα γραμμὴ πάσῃ σύμμετρος· ἀλλ᾽ ἡ μὲν, ταύτῃ καὶ μήκει καὶ δυνάμει σύμμετρος, ὡς γραμμὴ ποδῶν κ΄, γραμμῇ ποδῶν λ΄· τὸ γὰρ κοινὸν μέτρον αὐτῶν, ἡ τῶν πέντε ποδῶν γραμμή· ἡ δὲ ἄλλῃ, τυχὸν, εἰ καὶ μὴ μήκει, ἀλλὰ δυνάμει σύμμετρος, ὡς ἐπὶ τῶν ἀποτομῶν τῶν ἐκ δύο ὀνομάτων, τυχὸν, καὶ ἐπὶ τῆς τε πλευρᾶς καὶ τῆς διαμέτρου τοῦ αὐτοῦ καὶ ἑνὸς τετραγώνου. αὗται γὰρ ἀσύμμετροι μήκει οὖσαι, σύμμετρα τετράγωνα δύνανται· ἓν γὰρ θατέρου διπλάσιον· ἃς δὴ καὶ ῥητὰς λέγει. θατέρα πρὸς τὴν* ἐκτεθεῖσαν· ἄλλη δὲ ἄλλῃ οὔτε μήκει* κ. ἐκτεθεῖσαι
οὔτε δυνάμει σύμμετρος· ἣν καὶ ἄλογον καλεῖ πρὸς τὴν ἐκτεθεῖσαν. ἐπεὶ τοίνυν καὶ ἡ ἐκ δύο ὀνομάτων
E συντεθεῖσα γραμμὴ, καθ᾽ ἓν σημεῖον δύναται τέμνεσθαι, ὡς εἶναι τὰς ἀποτομὰς ῥητὰς, καὶ δυνάμει συμμέτρους· κατ᾽ ἄλλο δὲ οὐ δύναται διαιρεῖσθαι, εἰς τὸ ῥητὰς ποιεῖν τὰς ἀποτομάς· ἄρα ἡ τοιαύτη γραμμὴ ἐξ ἀμερῶν σύγκειται, καὶ ἡ διαίρεσις ταύτης μία ἔσται, εἰς τὸ ποιῆσαι γραμμὰς δύο μέτρα, τῶν ἐξ αὐτῶν γινομένων ἐπιπέδων, τῶν καὶ συμμέτρων ὄντων, ὧν τὰ μέτρα ἄτομα, ὡς ἐδείξαμεν. εἰ γὰρ διαιρεθείη μέτρον, φησὶ, τινὰ τεταγμένην καὶ ὡρισμένην γραμμὴν,

A οὔτε ῥητὴ ἐκείνη, οὔτε ἄλογος ἔσται καθ' αὑτήν. ἐπεὶ δὲ τινὰ γὰρ καθ' αὑτὰς ἕξουσι φύσιν, ἀλλὰ καὶ ῥηταὶ καὶ ἄλογοι πρὸς ἄλλας λέγονται. συνάγουσι τοίνυν ἐκεῖνοι ἐκ τούτων οὕτω λέγοντες, ὡς ἐπεὶ σύγκειται μὲν γραμμὴ ἐκ δύο ὀνομάτων, καὶ καθ' ἓν μόνον σημεῖον τέμνεται, εἰς τὸ ποιῆσαι ῥητὰς καὶ δυνάμει συμμέτρους, κατ' ἄλλο δὲ οὔ, ἄρα ἐξ ἀμερῶν ἡ γραμμὴ συνετέθη. ἔστι δὲ ὁ λόγος σοφισματώδης. οὐ γὰρ εἰ οὐ δύναται γραμμὴ εἰς λόγους τινὰς διαιρεῖσθαι, ἤδη καὶ ἁπλῶς ἀμερὴς καὶ ἄτομος.

ea neque ῥητὴ neque ἄλογος erit, ſi ipſam per ſe contempleris. Dicuntur enim menſuræ ac lineæ hoc modo, nominationéſque tales obtinent reſpectu aliarum. Concludunt verò ex his, atque inferunt ita, cùm linea compoſita ex duobus nominibus in vno ſolùm puncto diuidi queat, quo lineæ efficiantur ῥηταὶ, & potentia commenſurabiles, alio verò puncto nullo diuidi poſſit, ſequitur binomium ex impertibus compoſitum ſit lineis. Argumentum hoc planè ſophiſticum eſt. Non enim ſi linea in rationes aliquas, aut proportiones, diuidi apta non ſit, propterea ſimpliciter etiam indiuidua reputari debet, aut inſecabilem eſſe neceſſe eſt omni ex parte.

ΚΕΦΑΛ. γ.

B Λύσις τοῦ πρώτου τῶν ἐναντίων ἐπιχειρήματος.

ΤΑῦτα ὡς ἐκ τῶν ἀντιθέτων εἰπὼν ὁ φιλόσοφος, ἀντιλέγειν καὶ θεραπεύειν τὰ προεισενεχθέντα πειρᾶται ὡς οἷόν τε, καὶ πρῶτον πρὸς τὸ πρῶτον ἐκείνων ἵσταται ἐπιχείρημα· ἢ πρῶτον μὲν* λέγων, οὐκ ἀνάγκη τὸ * ἀπείρως ἔχον διαιρέσεις, μὴ εἶναι μικρὸν καὶ ὀλίγον, καθὼς ἐκεῖνοι ἔλεγον. καὶ γάρ φησι καὶ τόπον, καὶ μέγεθος, καὶ ὅλως τὸ συνεχές, μικρὸν μὲν λέγομεν. καὶ ἐφ' ὧν ἁρμόττει τὸ ὀλίγον· δεῖ ὅτε ὡς διωρισμένον ποσὸν ἐκλαμβανόμεθα τὸ συνεχές, ὡς ἐπὶ τοῦ χρόνου, συνεχοῦς ὄντος, λέγομεν καὶ μικρὸν χρόνον τὸ ἡμερινόν. φέρε λέγομεν καὶ ὀλίγον χρόνον τὰς δύο ἡμέρας, ἢ τὰς δύο ὥρας, ἢ ἄλλο τι τοιοῦτον. οὐ μὴν δέ, φησιν, ἀποκλειόμεθα, εἰς τὸ μὴ διαιρεῖν ἀπείρως τὸ συνεχές, διὰ τὴν ὀλιγότητα τοῦ πράγματος. τὸ γὰρ δύναμιν ἔχειν διαιρεῖσθαι αὐτό, ἔνεστι τούτῳ καὶ μικρῷ ὄντι. ἔτι δὲ εἰ καὶ αἱ σύνθετοι, καθὸ γραμμαὶ κατὰ σημεῖον διαιρεθήσονται. λέγεται δὲ κατὰ τῶν ἀτόμων τὸ μικρόν. τοῦτο γὰρ ἐκεῖνοι προτείνουσι. τέως δέ γε καὶ ἄπειρα τούτῳ σημεῖα ἐνυπάρχουσι δυνάμει. τοῦτο γὰρ καὶ αὐτοὶ ὁμολογήσαιεν ἄν, ὡς ἐν πάσῃ γραμμῇ, καὶ αὐτῇ τῇ κατ' αὐτοὺς ἀτόμῳ, ἄπειρα δυνάμει σημεῖα ἐνυπάρχουσι, καὶ διαιρεθείη ἂν καὶ αὕτη κατὰ σημεῖον, καὶ * ἀπείρους δὴ ἔχοι τὰς διαιρέσεις καὶ αὕτη, ὡς ἡ μὴ ἄτομος. πᾶσαν δὲ τμηθῆναι δυνατὸν τὸν ἐπιταχθέντα λόγον, τὴν μὴ ἄτομον. ἔτι τὸ μέγα ἐκ μικρῶν τινῶν σύγκειται. ἢ οὖν οὐδὲν ἔσται τὸ μέγα, ἢ ἐκ τῶν μικρῶν σύγκειται· ἄτομα δὲ καὶ ἀμερῆ τὰ μικρά, ὡς ἐκεῖνοι λέγουσιν. ἢ τὸ πεπερασμένας ἔχον διαιρέσεις, ὡς ἐκεῖνοι ἐποίουν, οὐ μέγα ἔσται. τί γὰρ ἂν εἴη μέγα, εἰ εἰς πόσα ὀλίγα πεπερασμένα διαιροῖτο, καὶ ταῦτα τοιούτου ὄντος ἀμεροῦς καὶ ἀτόμου τοῦ ὀλίγου; τὸ γὰρ ὅλον τὰς τῶν μεγάλων ἔχει διαιρέσεις, ὁμοίως κἂν δὴ ᾖ, μόνον δὲ ὅλον τι ὄν. εὔλογον δ' ἐστὶ τό, τε μικρὸν πεπερασμένας ἔχειν τὰς διαιρέσεις, καὶ τὸ μέγα, ἀπείρους. οὕτως ἐκεῖνοι ἀξιοῦσι. τὸ γὰρ μέγα, ἐφ' ὅσον ἐγχωρεῖ διαιρούμενον, πολλὰ καὶ ἄπειρα μικρὰ ἔσται. ὥστε ὃ λέγουσιν αὐτοί, ὡς ἄτομα ὀλίγον διαιρεθήσεται, καὶ ὅτε εἰς πεπερασμένα διαιρεθήσονται· ἀλλ' ἕκαστον τῶν τμημάτων ἐκείνων κατὰ τὴν τοῦ ὀλίγου φύσιν διαιρεθήσεται, κἂν εἰς πεπερασμένα.

* Qu. λέγει ὅτι,
* Qu. ἀπείρως
* ἀ. ἀπείρως

CAPVT III.

Solutio primi aduerſariorum argumenti.

HÆc ſunt quæ philoſophus de aduerſariorum ſentétia expoſuit, cui contradicere, & quantum fieri poteſt, eadem refutare argumenta nititur. Primum omnium, inquit, id, quod infinitas ſectiones admittit, non eo modo magnum paruúmque dici debere, quo illi putant. Dicimus verò, & pronunciamus, locum & magnitudinem, & quæcunque de genere continuorum ſunt, parua: in nonnullis etiam paucitatis nomen C vſurpamus, vt his, quibus hoc nomen propriò quadret, quando ſcilicet determinatam quantitatem continuam oſtendere lubet, vt in tempore & paruum & paucum temporis dicere conſueuimus, vt paucum tempus duas horas, aut tres arbitrantes, non verò, inquit, excludimur propter paruitatem à diuiſione continui. Potentia enim, qua diuidi quantitas quælibet continuò poteſt, etiam illi paruo inerit. Præterea, ſi compoſitæ lineæ, quatenus lineæ exiſtunt, in puncto diuidi poſſe dicantur, quanquam paruum eſſe prædicetur de inſecabilibus, quod ſtatim obiiciunt, nihilominus puncta tamen huic infinita inſunt, potentia: quod neceſſe eſt, vt ipſi quoque fatean- D tur, cùm lineæ omni puncta ineſſe concedunt. Hæc verò atomos linea, ſit linea: qua igitur ratione linea exiſtit, ea non minùs habebit puncta potentia infinita, quàm quælibet aliarum, quæ compoſitæ dicuntur. Quòd ſi punctis prædita ſit, ſecundùm quamlibet etiam proportionem eam diuidere licet, quemadmodum quælibet non inſecabilis diuidi poteſt. Ad hæc, conſtat magnum ex paruis quibuſdam componi: vt autem ex his quibuſdam videtur, atoma & impertia parua nominari debent: vel vt alterius huius ſectæ hominibus arridet, paruum dicitur, quod ſectiones ſubit definitas. At quæſo ab illis, quid tandem magnum erit, ſi magnum aliquod in pauca quædam inſecabilia diuidi accidat, totũ autem quodlibet magni inſtar diuiditur, qualecunque tan- E dem totum iſtud appelletur? Ad partes enim ſuas comparatum magnum dicetur. Melius autem dici videtur magnum eſſe, quod infinitarum ſectionum ſit capax: paruum verò, quod finita diuiſione conſumatur: Infinita autem eiuſmodi impertia inſecabilia erunt parua: aliquando etiam non protinus in hæc atoma parua, ſed parua, quæ diuidi rurſus poterunt numero quidem illa finita, diſſecabitur: quarum partium quælibet pro natura eorum quæ parua dicuntur, rurſus ſecabitur in partes finitas. Nam paruum definitum ita eſt, quod ſecaretur in partes finitas.

Rurſus verò partes huius parui in alias, rurſus hæ A in alias. Neceſſe enim illud eſt: ſiquidem ſi in minima infinita magnum totum ſecari neceſſe ſit, parua autem per hypotheſin ſemper diuidentur, quoniam definita ſunt mediante diuiſione, & hoc modo etiam neceſſe fuerit diuiſionem infinitam non deſinere. Manifeſtum igitur eam rationem parui magnique in eo non conſtare, quòd paruum definitas obtineat partes, magnum verò indeſinentes ſubeat diuiſiones, ita vt prope illi, qui hoc pacto definiunt, minimum illud & inſecabile abiicere repudiaréque videantur, cùm ne paruum quidem hoc auſint appellare. Siquidem, quemadmodum oſtendimus, paruum omne ſecabile exiſtit (paruo enim minus quiddam eſſe ſemper poterit,) B etiam ſi paruum finitis ſectionibus diuidi concedatur, nihilo minus paruo ſi minus ſemper capiatur, diuiſio nunquam ceſſabit. At verò ſi quis propterea quod in numeris, quod paucum dicitur, finitam diuiſionem obtineat, eo modo definiendam quoque in lineis paruitatem exiſtimet, perridiculè is arbitrabitur. In numeris enim ex inſecabilibus vnitatibus coagmentatio fit, atque in his principium quoddam eſt, & paucitas: definita verò ſuper ſtadio, definito tempore quippiam, ſuper infinitis, infinitáque attingens res vt moueatur neceſſe fuerit: & præterea C ſi quod celeriùs mouetur tempore æquali maius ſpatium conficit quàm tardius, motio verò animi celerrima perniciosiſſimáque eſt, quæ aliud tamen nihil ſit, quàm numeratio: numerabit igitur tempore finito, infinita. Zenon id quod potentia eſt, in id quod actu dicitur, tranſmutans, abſurda hæc concluſit. Hoc ſophiſma Philoſophus ita diſſoluit, inquiens: Non finito tempore, infinitas partes ſtadij, id quod ſuper eo fertur, contingit, ſed fertur quoque tempore infinito. Nam quo pacto ſtadium, eodem tempus quoque infinitum dicitur, atque finitum: & quemadmodum tempus finitum eſt ob extrema D quibus clauditur, ita longitudo quoque ſtadij: & quemadmodum tempus diuiſionis gratia infinitum appellari conſueuit, ita magnitudo etiam infinita dicitur ob diuiſionem. Zeno ita paralogiſmo vſus, aliter finitatem têmporis aliter ſtadij accepiſſe videtur. Tempus enim quod eſt ab ortu Solis vſque ad occaſum, cùm quemadmodum longitudo, ſecabile ſit, in partes infinitas, finitum ſumit eſſe propter terminos, non verò ad modum ſimilem ſtadium quoque extremis finitum conſtituitur. Proinde etiam inquit philoſophus, numerare non eſt ita ſingulas percurrere partes magnitudinis percenſendo, ſi fortè quis putet animum quodlibet infinitarum partium attingere: qui enim poſſet fieri vt tantillo tempore actu infinita attingeret? Motio enim animi non ita continua eſt, neque in ſubiecto aliquo continuo, quemadmodum quod loco cietur: & tametſi concedatur animum moueri modo quodam, tamen motus is numeratio non eſſet, cùm ſit enumeratio non continua, ſed quiete etiam quadam intercedente progrediatur. Sed admodum ridiculum eſt, cùm rationem ſoluere quampiam non poſſis, ſe imbecillitati ingenij mancipare, & infirmitate animorum incitatos, in grauiores errores immergi. Quod verò dicitur de ſymmetris lineis: ternarium enim, niſi quis dualitatem fortè dixerit, vel vnitatem, non appellamus numeros, ſed principia numerorum, hanc imparium, illam verò parium. Numerus etiam quilibet finitas habet diuiſiones, in magnitudine verò res non ita habet. Nam eam partiri in partes infinitas poſſumus, quemadmodum numerum infinita accumulatione augere, vnde in numeris paucitas eſt definita, multitudo infinita, in magnitudine vaſtitas determinata. Nam cuiuſque rei certa & definita magnitudo eſt, neque maius corpus cælo eſſe poſſit, paruitas autem indefinita. Et hæc quidem philoſophi ſunt reſponſa aduerſus primum epicherema.

A καὶ αὖθις ἐπ' ἐκείνοις οὕτω γενήσεται, καὶ αὖθις ἐπ' ἄλλοις. οὐδὲ γὰρ στήσεται τὸ ὀλίγον, ὃ ἀεὶ διαιρεῖσθαι τὲ δύναται κατὰ τὴν ὑπόθεσιν, καὶ πάλιν ἡ εἰς ἄπειρον ἔσται διαίρεσις. ὥστε φανερὸν ὅτι οὐκ ἐν τούτῳ λέγοιτο τὸ μέγα καὶ μικρὸν, τῷ πεπερασμένας μὲν τὸ ὀλίγον, ἀπείρους δὲ τὸ μέγα διαιρέσεις ἔχειν. ὡς ἐκείνοις δοκεῖν λέγειν, ἐκβάλλοντας τὸ ἀμερὲς ἐκεῖνο καὶ ἄτομον εἰς τὸ μηδὲ μικρὸν λέγεσθαι, εἴπερ ἐστὶν, ὡς δείκνυμεν, καὶ τὸ μικρὸν διαιρεῖσθαι. μικροῦ γὰρ μικρότερον καθ' ὅσον ἐγχωρεῖ ἔσεσθαι, καὶ εἰ πεπερασμένας τὸ ὀλίγον ἔχει τὰς διαιρέσεις. ἀλλ' ἕως τοῦ λαμβάνεσθαι μικρότερον, τὸ μικρότερον τοῦ μικροτέρου, ἄπειροι ἔσονται αἱ διαιρέσεις. εἰ δ' B ὅτι καὶ ἐν ἀριθμοῖς τὸ ὀλίγον πεπερασμένας ἔχει διαιρέσεις, καὶ ἐν γραμμαῖς τις ἀξιοίη τὸ μικρὸν, εὐήθης. ἐκεῖ μὲν γὰρ ἐξ ἀμερῶν τι, δηλαδὴ τῶν μονάδων, ἡ σύνθεσις, καὶ ἔστι τι ὃ τῶν ἀριθμῶν ἀρχή ἐστι, καὶ τὸ ὀλίγον περιορίζεται. τρία γάρ· εἰ μή τις λέγοι τὴν δυάδα, ἢ τὴν μονάδα οὐχ ὡς ἀριθμοὺς, ἀλλ' ὡς ἀρχὰς ἀριθμῶν, τὴν μὲν τῶν περιττῶν, τὴν δὲ δυάδα τῶν ἀρτίων. καὶ πᾶς ὁ μὴ ἄπειρος ἀριθμὸς πεπερασμένας ἔχει τὰς διαιρέσεις· ἐπὶ δὲ τῶν μεγεθῶν οὐχ ὁμοίως. C τὰ γὰρ μεγέθη ἐπὶ τὴν καθαίρεσιν ἔχει τὴν ἀπειρίαν, ὡς ἐν τῇ φυσικῇ ἐλέχθη· οἱ δὲ ἀριθμοὶ, ἐπὶ τὴν αὔξησιν. ὅθεν ἐπὶ μὲν τῶν ἀριθμῶν, τὸ ὀλίγον ὥρισται, τὸ δὲ πολὺ ἄπειρόν ἐστιν· ἐπὶ δὲ τῶν μεγεθῶν, τὸ μὲν πολὺ ὥρισται· ἔστι γὰρ ἐφ' ἑκάστῳ τῶν πραγμάτων λαβεῖν τὸ τέλειον, καὶ οὐδεὶς ἂν ἐννοήσειέ τι μέγεθος, φθάνον τὸ μέγεθος τὸν οὐρανὸν, καὶ ἔξω τοῦ οὐρανοῦ γενόμενον· τὸ δ' ὀλίγον, ἀόριστόν ἐστιν. ἄπειρον γὰρ τὸ μέγεθος ἐπὶ τὴν καθαίρεσιν. καὶ αὕτη μὲν φησὶν ὁ φιλόσοφος, πρὸς τὸ πρῶτον ἐπιχείρημα ἐνστάμενος.
D

ΚΕΦΑΛ. δ'.

Λύσις τοῦ δευτέρου ἐπιχειρήματος.

Δεύτερον δὲ ἐπιχείρημα ἦν, τὸ ἐκ τῶν ἰδεῶν. καὶ ταύτας γὰρ τιθέντες μεγέθη, ἀδιαιρέτους ἐποίουν, ὡς ἂν μὴ τῶν ἀρχῶν τούτων καὶ πρώτων, πρότερα εἶεν τὰ αὐτῶν μέρη. φησὶ τοίνυν· εἰ δ' ἐν τοῖς εἴδεσι τὰς ἀτόμους κατασκευάζοντες, ἔλαττον ἴσως ἀξίωμα λαμβάνουσι τοῦ προκειμένου, τὸ τιθέναι τούτων ἰδέας, καὶ ἔτι ποτὲ τινὰ ταῦτ' ἀναιροῦσι, δι' ὧν δὲ κινοῦσι. καὶ γὰρ διὰ τούτων τὸν λόγον ἀναιρεῖται τὰ εἴδη. ἔλαττον ἀξίωμα λέγων, τὸ ἔτι πλέον ἀπίθανον. πιθανώτερον γὰρ τὸ λέγειν, ἄτομα εἶναι μεγέθη, ἢ τὸ ἰδέας εἶναι. τὸ γοῦν δι' ἐλάττονος ἀξιώματος τὸ πιθανώτερον συνιστᾶν, παμπόλυ ἄτοπον. μᾶλλον μὲν οὖν καὶ ἐπεὶ διὰ τῶν πως ἐνδόξων τὸ λίαν ἄδοξον ἀναιρεῖσθαι πέφυκεν, ἀναιρεθήσονται αἱ ἰδέαι διὰ τούτων, ὅτι ἐπεὶ καὶ αἱ ἰδέαι μεγέθη· εἰσὶ δὲ τὰ μεγέθη εἰς ἄπειρον διαιρετά, ἢ καὶ διαιρετὰ ὅλως, διαιρεθήσονται [καὶ] αἱ ἰδέαι, εἰ ὅλως εἶεν· καὶ εἰ διαιρεθεῖεν, ἢ καὶ διαιρεῖσθαι πεφύκασιν, οὔτε ἀκίνητοι, οὔτε ἀπαθεῖς ἔσονται, ὡς τὸ βούλημα ἔχει τῶν τιθεμένων ἰδέας.

ΚΕΦΑΛ. ε'.

Λύσις τοῦ τρίτου ἐπιχειρήματος.

Πρὸς δὲ τὸ τρίτον ἐνιστάμενος ἐπιχείρημα, τὸ λέγον ὅτι τὰ στοιχεῖα μεγέθη· καὶ εἰ πᾶν μέγεθος διαιρετόν, διαιρεθῆναι ἂν συμβαίη καὶ ταῦτα, καὶ λοιπὸν ἔσονται ἀρχαὶ τῶν ἀρχῶν τὰ μέρη τοῦ ὅλου στοιχείου, οὕτως ἐνίσταται ὁ φιλόσοφος· πάλιν δὲ τῶν σωματικῶν στοιχείων εὐῆθες, τὸ ἀμερῆ ἀξιοῦν. εἰ γὰρ αὖ καὶ ἀποφαίνονταί τινες οὕτως, ἀλλὰ πρός γε τὴν ὑποκειμένην σκέψιν αὐτὸ τὸ ἐξ ἀρχῆς λαμβάνουσι. μᾶλλον δὲ ὅσῳ μᾶλλον τὸ ἐξ ἀρχῆς δόξαιεν ἀναλαμβάνεσθαι, τόσῳ μᾶλλον δοκεῖ διαιρετὸν εἶναι σῶμα καὶ μῆκος, καὶ τοῖς ὄγκοις ἐν τοῖς διαστήμασι. πῶς δὲ τὸ ἐξ ἀρχῆς λαμβάνουσιν, ὅτι ζητουμένου τούτου, εἰ ἀδιαίρετον εἴη σῶμα, εἴτε καὶ εἰς ἄπειρον διαιρετόν, ἐκεῖνοι ὡς ὁμολογούμενον ἐλάμβανον τοῦτο ἐπὶ τῶν στοιχείων, λέγοντες· ἰδοὺ σώματα τὰ στοιχεῖα, καὶ οὐ πέφυκε διαιρεῖσθαι· καὶ εἰ ταῦτα ἀδιαίρετα, καὶ ἄλλα τινὰ πέφυκεν ἂν ἀδιαίρετα εἶναι. ἐπεὶ δὲ οὕτω τὸ ἐξ ἀρχῆς λαμβάνουσιν, οὐδὲν ἄλλο ἐντεῦθεν κερδαίνουσιν, εἰ μὴ καὶ μᾶλλον παρεισάγουσι σώματά τινα λέγοντες ἄτομα, ἃ δεῖ καὶ μᾶλλον περὶ ἑαυτῶν ἔχουσι δεικνύειν, ὅτι διαιρετά εἰσι· καὶ οὕτω καὶ ἐπὶ τῶν λοιπῶν, καταλελυμένων αὐτῶν, καταλύειν τὸ ἀδιαίρετον. ὅτι δὲ εὐκατάλυτον ἐπὶ τῶν στοιχείων τὸ ἀδιαίρετον, αἴσθησις μαρτυρεῖ· τὸ γὰρ ὕδωρ καὶ ἡ γῆ, * ἐφ' ὅσον ἐγχωρεῖ, εἰς μέρη διαιρεῖται. ἀφέντας δὲ τὴν αἴσθησιν, τῷ λόγῳ μόνῳ βουλεύειν, ἄτοπόν τι καὶ μάταιον. ἐπεὶ καὶ ἐντεῦθεν πολλοί τινες τῆς ἀληθείας καὶ τοῦ πρέποντος ἐξετράπησαν,

CAPVT IV.

Solutio ſecundi argumenti.

Alterum argumentum fuit, quod ſumebatur ratione idearum. Eas enim cùm magnitudines quaſdam eſſe dicunt, indiuiduas faciunt, quò principiis iſtis, & primis, prius nihil ſtatueretur, partes harum ſcilicet. Inquit igitur, eos qui inter ideas collocent inſecabiles lineas, exiliorem non minùs aſtruere inaniorémque ſententiam afferre propoſita, quam nos refellere conamur: nam eo ipſo, quo confirmare propoſitum nituntur, ea demoliri ipſa, & tollere è medio videntur. Nam ratione hac conſiſtere ideæ non poſſunt. Vocat autem ἔλαττον ἀξίωμα Ariſtoteles, quod incredibilius alicui videatur: putatur enim verius inſecabiles quaſdam magnitudines, quàm ideas eſſe. Velle igitur in credibiliore ſententia, quod veri ſimilius eſt aſtruere, perquam abſurdum videtur, & eo quidem magis, cùm per ea quæ aliquo modo probabilia exiſtunt, id quod impendio incredibile videatur, refellere nos exiſtimemus. Certè his quoque conceſſis, ideas tolli neceſſe eſt, quoniam quidem cùm ideæ magnitudines quædam ſint, diuidi poſſe neceſſarium fuerit eaſdem. Quam ob cauſam neque immobiles erunt, neque ἀπαθεῖς, quemadmodum idearum authores ſtatuunt.

CAPVT V.

Solutio tertij argumenti.

Contra argumentum tertium inſtat philoſophus, quod ita habet: Elementa magnitudines quaſdam eſſe: eas verò, ſi diſſecari poſſint, tum principiorum fore principia alia, nempe partes elementorum, totis elementis: atque horum opinionem hoc modo refutat Ariſtoteles, inquiens leuiculum eſſe corporeorum elementorum inſecabilia quædam ſtatuere. Tametſi verò nonnulli hoc modo declarare videantur moliri conarique, id tamen quod à principio eſt propoſitum, non probare, ſed petere videntur. Multo enim magis, quòd id petere videntur quod probandum eſſet, videntur propterea confirmare magnitudinem quamlibet, ac corpus ſecabile exiſtere vaſtitatis ratione, diſtentioniſque reſpectu. Quomodo autem quod à principio eſt, petere videntur? Quoniam illo quæſito propoſito, an corpus quodlibet ſecari queat, an verò quoddam ſit inſecabile, iſti homines, quaſi confeſſum ſit, confeſtim ad elementa confugiunt, dicentes, Ecce tibi elementa ſunt corpora, & ea indiuidua, quare & aliæ quædam magnitudines eſſe poſſint. Quæ cùm ita defendunt, nihil conſecuti videntur aliud eſſe quàm vt ea corpora, quæ ipſi vocant atoma, ſuo ipſorum argumento ſecabilia demonſtrent, cùm ad probationem ea aſſumant, quæ ſine controuerſia diuidua oſtendi poſſint ab iſtis. quibus corporibus ſecabilibus demonſtratis, eadem ratio in reliquis etiam haberi videatur infinita ſectionis in magnitudine. Nullo autem negotio inſecabilitas elementorum refellit, nec ratione, ſed ſenſu duntaxat fides quærẽda. Senſum enim deſerere, & eo relicto rationem quærere, vt abſurdum, ita perquam ridiculum apparet. Qua peruerſitate pleriq; capti, & viri, & eius, quod deceret, nullam rationem perceperunt: vt Parme-

vt Parmenides quoque, qui ens vnum aſſerebat, & Zenon, qui motum negabat: & complures alij ſunt hallucinati.

ὡς καὶ Παρμενίδης ὁ λέγων ἓν τὸ ὄν. καὶ Ζήνων ὅτι οὐκ ἔστι κίνησις· καὶ ἄλλοι πλεῖστοι.

CAPVT VI.

Solutio reliquorum argumentorum ſuprà expoſitorum.

QVartum epicherema Zenonis eſt, quo ipſe vſus eſt, motum reſpiciens. Si, inquit, diuidi ſtadium in partes infinitas queat, moueátque eas communi quadam menſura, vniuerſas dimetiri nos poſſe, admodum ſophiſticum videtur, nec hypotheſes, quæ in geometria ſtatuuntur, illud mehercle admittunt: neque enimvero ſupponunt ad hunc modum, neque commodum etiam eſt vt illud concedant. Adhæc contraria videntur, omnem lineam ſymmetram fieri, deinde ſtatuere quarumlibet non fieri, ſed eſſe menſurabilium linearum menſuram. Quocirca ridicula admodum ſunt, quæ ſentiunt, & quibus demonſtrationes conficere ſe putant. Nam his neque litigioſam neque ſophiſticam rationem effugiunt. Etenim propter infirmitatem probationum minimè poteſt oratio illorum hominum, vel abſurda, quæ contrà proferuntur, vel redargutiones contradictionéſque euitare. Mathematici ſanè linearum, quæ commenſurantur, communem ſtatuunt eſſe menſuram, ſed eam non indiuiduam concedunt, ſed eiuſmodi quampiam, quæ & ipſa poſſit alteri cuipiam commenſurabilis exiſtere, accepta alia communi quadam ambarum menſura. Etenim nouem cum triginta ſex menſuret, vnúmque & octoginta, priorem quidem ſecundùm quaternarium, alterum ſecundùm nouenarium, nihil impedit quominus ix. & cum xxi. commenſuretur, cùm ternarius vtrorumque communis exiſtat menſura, illius quidem ſecundùm ternarium, huius verò ſecundùm ſeptenarium. Linea verò quælibet ad quaſdam commenſurabilis, ad alias verò quaſdam aſymmetros reputatur; quapropter non verè dicitur, quaſlibet quibuſlibet commenſurabiles eſſe, aut omnes menſura communi inter ſe comparari, cùm hæ ad hunc modum ſymmetræ, aliæ ſint ad modum alium commenſurabiles. Ex his itaque conſtat, has rationes valere nihil, nec concludi ex his indiuiduas eſſe lineas.

ΚΕΦΑΛ. ϛʹ.

Λύσις τῶν λοιπῶν ἐπιχειρημάτων.

Τέταρτον ἐπιχείρημα ἦν ἐκείνοις ἐπὶ τοῦ εἰς ἄπειρα ἀδιαίρετα τῶν μεγεθῶν, τὸ τοῦ Ζήνωνος, ὅπερ ἐκεῖνος ἰδίως ἐπὶ τῆς κινήσεως ἔλεγεν. εἰ γὰρ διαιρετὸν ἐπ᾽ ἄπειρον τὸ στάδιον, κινεῖται δέ τις αὐτὸ ἔν τινι ὡρισμένῳ χρόνῳ, ἄρα ἅψεται τῶν ἀπείρων ἐν πεπερασμένῳ χρόνῳ· καὶ εἰ τὸ θᾶττον ἐν ἴσῳ χρόνῳ πλεῖον διανύει, ἢ τὸ βραδύτερον. ταχίστη δὲ ἡ τῆς διανοίας κίνησις, κἂν ἡ διάνοια ἀριθμοίη τὰ ἄπειρα ἔν τινι πεπερασμένῳ χρόνῳ. Ζήνων μὲν οὖν τὸ δυνάμει εἰς τὸ ἐνέργεια ἐκλαμβανόμενος, ταῦτα δὴ τὰ ἄτοπα συνῆγεν. ἐνίσταται δὲ ὁ φιλόσοφος, ὡς καὶ ἐν ἄλλοις ἔλεγεν, ἐνίσταται πρὸς ταῦτα λέγων, καὶ σόφισμα τὸν λόγον ἀποδεικνύς. οὐδὲ γὰρ ἐν πεπερασμένῳ χρόνῳ, φησί, τῶν τοῦ σταδίου ἀπείρων ἅψεται τὸ φερόμενον, ἀλλὰ καὶ ἐν ἀπείρῳ αὐτῷ. ὁ γὰρ χρόνος ὡσαύτως καὶ τὸ μῆκος, ἄπειρον καὶ πεπερασμένον λέγεται· καὶ ὡς ὁ χρόνος πεπερασμένος τοῖς πέρασιν, οὕτω καὶ τὸ μῆκος πεπερασμένον τοῖς ἄκροις. ὡς δ᾽ αὖθις ὁ χρόνος ἄπειρος τῇ διαιρέσει, οὕτω καὶ τὸ μῆκος ἄπειρον τῇ διαιρέσει. Ζήνων οὖν παραλογιζόμενος, ἄλλως τὸ τοῦ χρόνου πεπερασμένον λαμβάνει, καὶ ἄλλως τὸ τοῦ σταδίου. τὸν γὰρ ἔξωθεν καὶ εἰς ἑκάτερα χρόνον, ἄπειρον ὄντα κατὰ τὴν διαίρεσιν, καθὼς καὶ τὸ μῆκός ἐστι κατὰ τὴν διαίρεσιν ἄπειρον, πεπερασμένον λαμβάνει κατὰ τὰ πέρατα, καὶ οὐ λαμβάνει. οὕτως καὶ τὸ στάδιον πεπερασμένον, κατὰ τὰ ἄκρα δηλαδή, ἀλλ᾽ ὅλως κατὰ τὴν διαίρεσιν. οὐδ᾽ αὖθις φησὶν ὁ φιλόσοφος, τὸ καθ᾽ ἕκαστον ἅπτεσθαι τῶν ἀπείρων τὴν διάνοιαν, οὐκ ἔστιν ἀριθμεῖν· εἰ ἄρα τις ἐννοήσειεν οὕτως ἐφάπτεσθαι τῶν ἀπείρων τὴν διάνοιαν, καθ᾽ ἕκαστον σημεῖον· ὅπερ ἴσως καὶ ἀδύνατον. πῶς γὰρ ἅψεται ἐνεργείᾳ καθ᾽ ἕκαστον τῶν ἀπείρων ἐν τοσῷδε χρόνῳ; οὐ γάρ ἐστιν ἐν συνεχέσι καὶ ὑποκειμένοις, φησίν, ἡ τῆς διανοίας κίνησις, ὥσπερ ἐπὶ τοῦ φερομένου. εἰ δ᾽ οὖν καὶ ἐγχωρεῖ κινεῖσθαι οὕτως, οὐκ ἔστι τοῦτο ἀριθμεῖν. τὸ γὰρ ἀριθμεῖν ἐστι τὸ μετ᾽ ἐπιστασίας. ἀλλ᾽ ἄτοπον ἴσως, τὸ μὴ δυναμένους λύειν τὸν λόγον, δουλεύειν τῇ ἀσθενείᾳ, καὶ προσεξαπατᾶν ἑαυτοὺς μείζους ἀπάτας, βοηθοῦντας τῇ ἀδυναμίᾳ. τὸ δ᾽ ἐπὶ τῶν συμμέτρων γραμμῶν, ὡς ὅτι αἱ πᾶσαι τῷ αὐτῷ τινι καὶ ἑνὶ μετροῦνται, κομιδῆ σοφιστικόν φησι, καὶ ἥκιστα κατὰ τὴν ὑπόθεσιν τὴν ἐν τοῖς μαθήμασιν. οὔτε γὰρ ὑποτίθενται οὕτως, οὔτε χρήσιμον αὐτοῖς ἐστιν. ἅμα δὲ καὶ ἐναντίωσιν ἔχει τό, πᾶσαν μὲν γραμμὴν σύμμετρον γίνεσθαι, πασῶν δὲ τῶν συμμέτρων κοινὸν μέτρον εἶναι ἀξιοῦν. ὥστε γελοῖον τὸ κατὰ τὰς ἐκείνων δόξας, καὶ ὅσ᾽ ὧν αὐτοὶ λέγουσι φάσκοντες δείξειν, εἰς ἐριστικὸν ἀμα καὶ σοφιστικὸν ἐκκλίνειν λόγον, καὶ ταῦθ᾽ οὕτως ἀσθενῆ· πολλαχῶς γὰρ ἀσθενής ἐστι καὶ πάντα τρόπον διαφυγεῖν καὶ τὰ παράδοξα καὶ τοὺς ἐλέγχους. ὑποτίθενται γὰρ οἱ μαθηματικοὶ κοινὸν μέτρον τῶν συμμέτρων μεγεθῶν, ἀλλ᾽ οὐκ ἄτομον τοῦτο, ἀλλὰ καὶ αὐτὸ δυνάμενον πρὸς ἄλλο σύμμετρον εἶναι, κατά τι ἄλλο κοινὸν μέτρον. καὶ γὰρ ὁ θʹ κοινὸν μέτρον ἐστί, τοῦ τε λϛʹ καὶ τοῦ παʹ, τοῦ μὲν κατὰ τὸ τετράκις, τοῦ δὲ κατὰ τὸ ἐννεάκις· ἔτι δὲ καὶ τοῦ μεʹ κατὰ τὸ πεντάκις. ἀλλ᾽ ἔστι καὶ αὐτὸς ὁ θʹ τῷ καʹ σύμμετρος. ὁ γὰρ γʹ, κοινὸν μέτρον καὶ ἀμφοτέρων, τοῦ μὲν κατὰ τὸ γʹ, τοῦ δὲ κατὰ τὸ ζʹ. καὶ γὰρ πᾶσα γραμμή, ἑτέρᾳ καὶ ἑτέρᾳ σύμμετρος, ἢ ἑτέρᾳ ἀσύμμετρος, πρὸς τὴν μὲν ἔχουσα τι κοινὸν μέτρον, πρὸς τὴν δὲ οὐκ ἔχουσα. ὥστε οὐ πᾶσαι τῷ αὐτῷ τινι καὶ ἑνὶ μετροῦνται; ἀλλ᾽ ἄλλαι μὲν τὰ οὕτως σύμμετρα, ἄλλαι δὲ τὰ ὡς ἐκείνας. ὅτι μὲν οὖν ἔκ γε τῶν εἰρημένων λόγων, οὔτε ἀναγκαῖον ἀτόμους εἶναι γραμμάς, οὔτε πιθανόν, φανερόν.

A

ΚΕΦΑΛ. ζʹ.

Ὅτι οὐκ ἔστι γραμμὴ ἄτομος καὶ ἀμερής, ἀλλὰ πᾶσα διαιρετή, καὶ εἰς ἄπειρα διαιρετὴ διὰ πλειόνων συμβιβάζει.

ΕΤι δὲ καὶ ἐκ τῶνδε γένοιτο ἂν φανερώτερον· πρότερον μὲν, ἐκ τῶν ἐν τοῖς μαθήμασι δεικνυμένων καὶ τιθεμένων, ἃ οὐ δίκαιον, ἢ πιστοτέροις λόγοις, κινεῖν. εἰ γὰρ ἡ ἄτομός ἐστι γραμμὴ καὶ εὐθεῖα, ἐφαρμόσειεν ἂν αὐτῇ ὅ τε τῆς γραμμῆς λόγος, καὶ ὁ τῆς εὐθείας. ἀλλ' οὐκ ἐφαρμόζουσι τῇ ἀτόμῳ, οὔτε ὁ τῆς γραμμῆς, οὔτε ὁ τῆς εὐθείας ὅρος, διὰ τὸ μήτε μεταξύ B τινων εἶναι, μήτε ἔχειν μέσον. ἡ γὰρ ἄτομος γραμμὴ πῶς ἔσται μῆκος καὶ ἀπλατές, ἐπεὶ ἄτομος οὖσα, μεταξὺ πλάτους οὐκ εἶναι πέφυκεν; ὡς γὰρ ἡ στιγμὴ μέση δύο γραμμῶν δυνάμει ἐστὶν, ἀδιαιρέτων μὲν οὐσῶν· ὅτε δὲ ἐνεργείᾳ διαιρεθῶσι, τότε ἡ στιγμὴ τοῖς * διχοτομήσασιν ἐνεργείᾳ διαίρεσις γίνεται· οὕτω καὶ γραμμὴ μέσον δύο δυνάμει ἐπιφανειῶν ἐστὶν, ἀδιαιρέτου καὶ μιᾶς τῆς ἐπιφανείας οὔσης. ὅτε δὲ ἐνεργείᾳ διαιρεθείη, καὶ γένοιντο δύο ἐπιφάνειαι, ἡ γραμμὴ ἐνεργείᾳ διαίρεσίς ἐστιν. ἄτομος δὴ οὖσα ἐκείνη, καὶ κατὰ τοῦτο C ἀδιάστατος, πῶς μέσον νοηθείη τῶν ἐπιφανειῶν τῶν κατὰ πλάτος διαιρουμένων; ἀνάγκη οὖν τῶν ἐπιφανειῶν κατὰ θάτερα διαιρουμένων, συνδιαιρεῖσθαι καὶ τὴν ἄτομον γραμμὴν, τὴν κατὰ θάτερα διαιροῦσαν, καὶ μέσον τῶν δύο ἐπιφανειῶν κειμένην. οὔτε γοῦν τινῶν ἐστι μεταξὺ εἰς τὸ τὴν φύσιν τῆς γραμμῆς δεικνύναι, οὔτε μέσον ἔχει ἄτομος οὖσα. καὶ πῶς ἐφαρμόσει ταύτῃ ὁ τῆς εὐθείας ὅρος; εὐθὺ γάρ ἐστιν, οὗ τὸ μέσον ἐπιπροσθεῖ τοῖς πέρασιν. ἔτι πᾶσαι αἱ γραμμαὶ σύμμετροι ἔσονται. τίς γὰρ ἡ ἀποκλήρωσις, τοῦ τὴν μὲν μετρεῖν, τὴν δὲ μὴ μετρεῖν, τὸ κοινὸν ἐκεῖνο καὶ ἄτομον μέτρον, τὴν ἄτομον δηλαδὴ γραμμήν; ἄτομος D γὰρ οὖσα καὶ ἀμερής, πάσαις ἐφαρμόσει, καὶ πᾶσαι ὑπὸ τῶν ἀτόμων μετρηθήσονται, αἵ τε μήκει σύμμετροι, καὶ αἱ δυνάμει· ἄτομοι δὲ οὖσαι καὶ αὐταὶ, σύμμετροι ἑαυταῖς ἔσονται μήκει, ἴσαι γάρ. ὥστε καὶ δυνάμει. τὰ γὰρ σύμμετρα μήκει καὶ δυνάμει σύμμετρα· οὐ μὴν δὲ τὸ ἀνάπαλιν, ὡς ἐλέγομεν. ἔτι εἰ ἐκ τριῶν δοθεισῶν εὐθειῶν συνίσταται τρίγωνον, καὶ ἐκ τῶν ἀτόμων συσταίη ἄν. ἐν ἅπαντι δὲ ἰσοπλεύρῳ, ἡ κάθετος ἐπὶ τὴν μέσην πίπτει. ἰσόπλευρον δὲ πάντως τὸ ἀπὸ τῶν ἀτόμων. ἴσαι γὰρ αἱ ἄτομοι. ὥστε καὶ ἐπὶ τὴν ἄτομον ἡ κάθετος πεσεῖται, E καὶ ἔσται μέση τῆς ἀτόμου· ὅπερ οὐ δύναται εἶναι. ἡ γὰρ ἄτομος μέσην οὐχ ἕξει. ἔτι γραμμὴ προστεθεῖσα γραμμῇ, οὐ ποιήσει μείζω τὴν ὅλην. τὰ γὰρ ἀμερῆ συντιθέμενα, οὐ ποιοῦσι μεῖζον τὸ πρότερον. ἔτι ἐκ δυοῖν ἀμερῶν μηδὲν γίνεσθαι συνεχές, διὰ τὸ πλείους ἔχειν ἁπλῶς τὸ συνεχές. ἅπασα δὲ γραμμὴ παρὰ τὴν ἄτομον, συνεχὴς οὐκ ἂν εἴη· ὥστε οὐκ ἄτομος.

* γρ. διχοτομήμασι

CAPVT VII.

Sententiam Ariſtotelis, quæ eſt, omnes lineas eſſe ſecabiles, pluribus argumentis confirmat.

POrrò autem ex his, quæ à mathematicis dicuntur, demonſtrantúrque, liquere euidentiſſimè poterit, quas ipſorum rationes, niſi probabilioribus nos opponamus pugnemúſque argumentis, refellere non debemus. Si enim linea ſit inſecabilis, & recta, nimirum illi definitio vtriuſque quadrabit & lineæ & rectæ: definitio autem impartibili vtriuſque conuenire nequit, cùm propterea quòd ea neque medium quorundam eſſe queat, tum quòd neque ipſa in ſe medium poſſideat. Nam linea inſectilis quomodo tandem ſit longitudo, & ſine latitudine, cùm ipſa inſecabilis exiſtens intra ſuperficiem dari nequeat? Quemadmodum enim punctum in medio duarum linearum potentia eſt, cùm vna & continua linea adhuc exiſtunt duæ illæ potentia, cùm verò actu diuiſa in puncto fuerit, tum punctum actu ſecundùm diuiſionem conſtituitur: ita quoque linea duas continens ſuperficies, cùm actu ſuperficies diſſecta fuerit, & duæ ſuperficies actu conſtitutæ ſint, linea ſanè actu exiſtens, actu diuiſionem factam commonſtrabit: ea verò cùm poſita ſit atomos, & dimenſionis expers, quo pacto medium fuerit inter ſuperficies duas quæ ratione latitudinis diuiduntur? Neceſſe itaque fuerit cùm ſuperficies in partes duas cadat, eam diſſectionem propter lineam accidere, atque iſto modo ratione inſecabilis etiam lineæ diſſecabitur ſuperficies: aut ſi reſpectu atomæ lineæ ſuperficies non diuidi poſſit, ſequitur etiam vt ſuperficies duæ ne coniungi quidem ſecundùm illam poſſint: quod tamen cum primis lineæ naturam non obſcurè indicat, neque proinde diuiſionem ſuſtinebit ipſa etiam cùm ſit atomos: quæ conditioni linearum ambo repugnant. Definitio quoque huic non quadrabit, ſi indiuidua recta linea ſtatuatur. Recta enim eſt, cuius medium extremis adiunctum æquabiliter eſt. Præterea ſecuturum eſt, lineas omnes eſſe ſymmetras. Quæ enim ratio differentiæ aſſignabitur, hanc inſecabilem vnam menſurare, alteram verò non poſſe menſurare? Cùm enim impartibilis exiſtat, omnibus ceu menſura, ex æquo accommodabitur, ſiue actu, ſiue potentia ſolùm commenſurabiles ſint. Tertiò cùm ex datis tribus lineis triangulus conflari queat, etiam ex tribus atomis triangulus componetur: in quolibet verò æquilatero, cathetus ducta in mediam cadit, ac in partes duas diſſecat. Sed fieri hoc non poſſet, ſi impartibilis foret linea: intermediam enim lineam indiuidua non admittit. Quartò, linea eiuſmodi atomos addita alteri compoſitam maiorem non efficiet: nam inſecabilia accumulata molem non attollunt, nec granditatem efficiunt. Quintò, ex impartibilibus duobus continuum nullum procreatur, quoniam continua linea plura ſemper duobus inſecabilibus obtinet. Futurum autem eſſet, vt præter inſecabilem hanc, nulla etiam reliquarum penitus linea continua exiſteret: quod falſum cùm ſit, neceſſe etiam fuerit, indiuiduā lineam nullam ſtatuere.

Sextò, linea omnis aut finita aut infinita eſt: atomos certè vt ſit finita oportet: quare & fines poſſidebit. Finis autem nullus, quàm ipſamet ſibi, fuerit, quod abſurdum eſt: aut fines ſi obtineat, diuidi poterit. Aliud enim finis, & id, cuius finis dicitur. Aut profectò linea dicetur eſſe quædam, neque finita, neque infinita. Septimò, non qualibet in linea punctum erit: nam in ea quæ diuiſionem reſpuit, nullum inerit. Quòd ſi in indiuidua linea nullum inſit punctum, in nulla profectò aliarum punctum deſignari queat: nam reliquæ ex his componuntur. Octauò, aut nihil inter puncta duo, aut omnino lineam interuenire oportet. In linea verò qualibet plura vno puncta deſignari poſſunt: quare inter puncta duo atomos linea poni non poterit. Impartibilitas enim ſoli puncto vndiquaque propria videtur. Nonò, quadratum omne partibile: ex lineolis verò eiuſmodi quadratum impartibile conficietur: quod perquam abſurdum deprehenditur, cùm quadratum vt ſuperficies & ſecundùm latitudinem & longitudinem protendatur: quapropter diuidi poterit. ſed quod à quatuor impartibilibus lineolis circumſcribitur, quo pacto tandem partitionem ſuſtinebit? quare lineas etiam poſſe diuidi in hoc quadrato conſtat. Decimò, Finis ac terminus lineæ eſt punctum: quod terminatur autem, linea ipſa eſt: punctum quidem eo quòd finis impartibilis exiſtit. Quare lineam, cùm finis ipſa non ſit, ſed cui finis accidit, partibilem eſſe neceſſe eſt. Quòd ſi lineam finem lineæ alterius contendat quiſpiam, deprehendetur linea quæpiam maior altera, ratione ac reſpectu puncti: ſiquidem linea & hæc inſecabilis pro termino conſtituitur. Linea verò quælibet, altera quacunque ſi maior dicatur, ſecundùm lineam maior dicitur: ſi verò inſit illi quoque indiuiduæ (quæ vt terminus alterius lineæ poſita eſt) punctum quo terminatur (nam continuatum linearum terminus idem eſt) ſequitur vt finis ac terminus totius lineæ, non ſit impartibilis. Nam ſecundùm hypotheſin hæc inſecabilis terminus alterius, rurſus ipſa etiam puncto terminari aſſeritur. Quod me hercle tantum abeſt vt cum ratione conſentiat, vt nihil magis ab ea videatur abhorrere. Omnino autem his conceſſis, punctum à linea nihil differre videbitur: nam excepto nomine, peculiare linea eiuſmodi à puncti natura nihil obtinebit. Vndecimò, Mox ſecuturum eſt, vt & ſuperficies, & corpus quoddam inſecabile concedatur: quoniam altero conceſſo, protinus reliquum dari oportet: quoniam alterum reſpectu alterius diuiſionis capax dicitur, vt corpus reſpectu ſuperficiei, & ſuperficies ratione lineæ: corpus autem, cùm tres habeat dimenſiones, ſecabile omne exiſtere neceſſe fuerit: quare lineam quamlibet partibilem eſſe oportet. Duodecimò, Si linea, & tempus quoddam impartibile eſt, ſed quæ in tempore inſecabilia ſtatuũtur, ſunt E inſtantia, & nunc ipſa, quare tempus ex inſtantibus conflabitur: ſed tempus ex inſtantibus non componitur: alioqui enim ſibi mutuò coaptata eſſent. Sed non poſſunt vllo modo cohæreſcere, cùm non conſiſtant: quare nec puncta ſibi continua dici poſſunt. Quam ob cauſam compoſita impartibilia magnitudinem nullam efficient, quoniam congeſta hæc maiorem locum non occupabunt. Linea quidem lineæ addita planitiem maiorem non efficiet, quotcunque numero tandem congeſſeris: ita quoque res habebit, ſi puncta infinita congeras, amplius ſpatium hæc non occupabunt, cùm ne locus quidem vllus ſecundùm ſe punctis attribuatur. Quocirca magnitudo continua nulla ex impartib. attolletur, nec puncta conficient lineam, neque inſtantia tempus conſtituent. Decimotertiò, Si linea ſit ex punctis, vt quidã dicunt, punctum puncto cohæreſcere neceſſe fuerit: ſed punctum cùm inſecabile ſit, connecti cum alio nequit.

A ἔτι πᾶσα γραμμή, ἢ ἄπειρος, ἢ πέρας ἔχει. ἡ δ' ἄτομος οὐκ ἄπειρος. ὥστε πέρας ἕξει. οὐδὲν δὲ ἄλλο τι τὸ πέρας, ἢ αὐτὴ ἡ ἄτομος. εἰ δέ γε πέρας ἕξει, καὶ διαιρετὴ ἔσται. τὸ γὰρ πέρας ἄλλο, καὶ οὗ πέρας. ἢ ἔσται τις γραμμὴ οὔτε ἄπειρος, οὔτε πεπερασμένη. ἔτι οὐκ ἐν ἁπάσῃ γραμμῇ στιγμὴ ἔσται. εἰ γὰρ τῇ ἀτόμῳ, οὐκ ἔσται· καὶ εἰ ἐν τῇ ἀτόμῳ οὐχ ὑπάρχει στιγμή, οὐδ' ὅλως ἐν γραμμῇ ἔσται. αἱ γὰρ ἄλλαι ἐκ τῶν ἀτόμων κατ' ἐκείνας εἰσίν. ἔτι εἰ μηδὲν τῶν στιγμῶν ἔσται μεταξύ, ἢ γραμμή· εἰ μεταξύ, ἄρα γραμμή· ἐν ἁπάσαις δὲ πλείους στιγμαί· οὐκ ἔσται ἄτομος. μόνον γὰρ τὸ ἄτομον τῆς στιγμῆς ἐστιν. ἔτι οὐχ ἁπάσης ἔσται γραμμῆς τετράγωνον. B πᾶν γὰρ τετράγωνον ἔχει μῆκος καὶ πλάτος. ὥστε διαιρετόν. πῶς γοῦν τὸ διαιρετὸν ἐξ ἀδιαιρέτων; εἰ δὲ τὸ τετράγωνον διαιρετόν, καὶ ἡ γραμμὴ ἄρα. ἔτι, τὸ πέρας τῆς γραμμῆς στιγμή ἐστιν. ἡ στιγμὴ δέ, ἄτομος ὡς πέρας· ἡ γραμμὴ δὲ ὡς περαινομένη, οὐκ ἄτομος. στιγμὴ μόνον, ἀλλ' οὐ γραμμὴ τὸ πέρας τῆς γραμμῆς. ἢ ἔσται γραμμὴ γραμμῆς στιγμῇ μείζων, εἰ γραμμὴ ἔσται τὸ πέρας καὶ τὸ ἄτομον. γραμμὴ γὰρ πᾶσα γραμμῆς μείζων γραμμῇ. εἰ δὲ συμβαίνει τῇ ὑποτεθείσῃ ἀτόμῳ γραμμῇ καὶ πέρατι ἡ στιγμή, διὰ τὸ ταὐτὸ πέρας τῶν συνεχῶν γραμ- C μῶν, ἔσται τὸ πέρας οὐκ ἀμερές, ἀλλὰ τῆς ἀμερείας, καὶ ἄλλο ἐκείνης· ἐπεὶ τὸ πέρας τοῦ περαινομένου ἕτερον. ὅλως δὲ οὐ διοίσει στιγμὴ γραμμῆς. οὐδὲν γὰρ ἴδιον ἕξει ἡ ἄτομος γραμμὴ παρὰ τὴν στιγμήν, πλὴν τοὔνομα. ἔτι ὁμοίως καὶ ἐπίπεδον καὶ σῶμα ἔσται ἄτομα. ἑνὸς γὰρ ὄντος ἀδιαιρέτου καὶ τἆλλα συνακολουθεῖ, διὰ τὸ θάτερον διῃρῆσθαι κατὰ θάτερον, καθάπερ σῶμα μὲν κατὰ ἐπιφάνειαν, ἐπιφάνειαν δὲ κατὰ γραμμήν. ἀλλὰ μὴν σῶμα ἀδιαίρετον οὐκ ἔσται, διὰ τὸ εἶναι ἐν αὐτῷ βάθος καὶ πλάτος. οὐδ' ἂν γραμμὴ εἴη ἂν ἀδιαίρετος. ἔτι εἰ γραμμὴ ἀμερής, καὶ χρόνος ἔσται ἀμερής. ἀμερῆ δὲ ἐν χρόνῳ τὰ νῦν. ὥστε καὶ ὁ χρόνος ἔσται τι ἐκ τῶν νῦν, καὶ τοῦ D αὐτοῦ λόγου λέγειν ἄμφω. ἀλλ' οὔτε τὰ νῦν ἀλλήλοις συνεχῆ· ἥπτοντο γὰρ ἄν· ἀλλ' οὐχ ἅπτονται· οὔτε αἱ στιγμαὶ ἀλλήλαις συνεχεῖς. ὥστε οὐδὲ ἡ σύνθεσις τῶν ἀδιαιρέτων, ποιήσει τι μέγεθος, διὰ τὸ μὴ πλείω τόπον ἔχειν. ὅταν γὰρ ἐπὶ γραμμῇ γραμμὴ τεθῇ καὶ ἐφαρμόσῃ, οὐδὲν γίνεται μεῖζον τὸ πλάτος, κἂν ὁπόσαι ἐπιτεθῶσιν. ὥστε καὶ ἐπὶ τῶν στιγμῶν τὸ αὐτὸ γενήσεται· καὶ οὐ πλείω καθέξουσι τόπον, κἂν ὅσαι προστεθεῖεν, ὅπου γε οὐδὲ τόπος οὐδεὶς ἔσται στιγμῆς καθ' αὑτήν. ὥστε οὐκ ἂν εἴη μέγεθος συνεχὲς ἐξ ἀμερῶν. οὐκ ἄρα οὐδ' ἡ γραμμὴ ἐκ στιγμῶν, οὐδ' ὁ χρόνος ἐκ τῶν νῦν. ἔτι εἰ ἔστι τι ἐκ στιγμῶν, ἅψεται στιγμὴ στιγμῆς. ἀλλ' ἀμερής ἐστι, καὶ οὐχ ἅπτεται.

τὸ γὰρ ἁπτόμενον, ἢ ὅλον ὅλου ἅπτεται, ἢ τὶ μέρος τινὸς μέρους, ἢ ὅλον μέρους· ἡ δὲ στιγμὴ ἀμερής· τὸ δ' ὅλον ὅλου ἁπτόμενον, ἀνάγκη ἓν εἶναι. ἔτι πῶς ποτε εὐθεῖα ἔσται γραμμὴ, καὶ περιφερής; οὐδὲν γὰρ διάφορος ἡ σύναψις, οὔτε τῶν στιγμῶν, οὔτε τῶν ἀμερῶν ἐν τῇ εὐθείᾳ καὶ τῇ περιφερεῖ. τὸ γὰρ ἀμερὲς, τοῦ ἀμεροῦς εἴπερ ἅπτοιτο, ὅλον ὅλου ἅπτεται. μᾶλλον μὲν οὖν οὐκ ἔστιν ὅλως τὰ ἀμερῆ ἀλλήλων ἅπτεσθαι. Εἰ γοῦν αἱ μὲν γραμμαὶ διαφέρουσι, ἡ δὲ σύναψις ἀδιάφορος, οὐκ ἔσται δὴ γραμμὴ ἐκ τῆς συνάψεως, εἰς τὸ γίνεσθαι μίαν τήν τε εὐθεῖαν καὶ τὴν περιφερῆ. ὥστε οὐδὲ ἐκ στιγμῶν. ἔτι διαιροῖτ' ἂν ἅπαντα καὶ ἀναλύοιτο εἰς στιγμάς. εἰ [δὲ] ἐκ στιγμῶν καὶ ἀμερῶν συνετέθησαν, καὶ ἡ στιγμὴ μέρος σώματος ἔσται, εἴπερ τὸ μὲν σῶμα ἐξ ἐπιπέδων, τὸ δ' ἐπίπεδον ἐκ γραμμῶν, αἱ δὲ γραμμαὶ ἐκ στιγμῶν. Εἰ δ' ἐξ ὧν πρώτων ἐνυπαρχόντων ἕκαστα ἐστὶ, στοιχεῖα ἐστὶ ταῦτα, αἱ στιγμαὶ ἂν εἴησαν στοιχεῖα σωμάτων. Φανερὸν οὖν ἐκ τῶν εἰρημένων ὅτι οὐκ ἔστι γραμμὴ ἐκ στιγμῶν, ἀλλ' οὐδὲ γραμμὴ ἄτομος καὶ ἀμερὴς, ἀλλὰ πᾶσα διαιρετὴ, καὶ εἰς ἄπειρα διαιρετή. ἔστι δὲ στιγμὴ ὡς πέρας τὸ ἐλάχιστον, γραμμὴ δὲ ἐλαχίστη οὐκ ἔσται, ἀλλ' ἀεὶ ἐλάττων τῆς προτέρας, καὶ ἀεὶ διαιρετή. ὥσπερ οὖν ὁ ἐλάχιστόν τι ὂν τῶν ἐν τῇ οἰκίᾳ, καὶ οὐδὲν συμβαλλόμενον πρὸς αὐτὴν, οὐ λέγεταί τι τῶν τῆς οἰκίας, καὶ ἐπὶ τῶν ἄλλων ὡσαύτως. τί γὰρ πρὸς τὴν σφαῖραν, φέρε, τὸ μέλαν συμβάλλεται; ἢ πρὸς τὸ ἀνδριάντα εἶναι, τὸ ἐπὶ δεξιὰ τῆς πόλεως ἵστασθαι; οὕτως οὐδὲ τὸ ἐν τῇ γραμμῇ ἐλάχιστον, ὅπερ ἐστὶ τὸ πέρας καὶ ἡ στιγμὴ, πρὸς γραμμὴν συγκεινόμενον ἔσταί τι. ὥστε οὐχ ἁρμόσει μὲν ἐπὶ γραμμῆς τὸ ἐλάχιστον. ἡ στιγμὴ δ' ἐν αὐτῇ ὡς πέρας ἔσται, καὶ τὸ ἐλάχιστον· ὅπερ οὐκ ἂν εἴη πρὸς τὴν γραμμὴν συμβαλλόμενον. οὐκ ἄρα ἔσται γραμμὴ ἄτομος.

A Quod enim connectitur cum altero, aut vt totum cum toto, aut vt pars cum parte coniungitur, aut vt parte aliqua cum toto cohæret. Sed partem linea non habet: quare eo modo non cohærent, & apta puncta ſunt inter ſeſe. Quòd ſi totum toti alteri puncto connexum ſtatuas, vnum plane & inſecabile fuerit quod ex vtriſque componetur. Decimoquartò. Quo pacto efficientur altera recta, altera circularis linea? Nam neque quo ad coaptationem, neque quo ad puncta, differentia vlla erit inter rectam & circularem. Impartibile B enim ſi attingat impartibile, totum cum toto coniungi neceſſe eſt: an potiùs minimè atoma cohærere inter ſeſe poſſe dicendum eſt? Conſtat autem, lineas ſpecie differre haſce inter ſe: coaptationis verò nulla differentia: quare ex impartibilium connexione linea nulla conſtabit: alioqui eandem rectam & circularem fateri adigeremur. Sequitur igitur vt ex atomis compoſitio nulla exiſtat. Decimoquintò, Si verum eſſet, quod iſti aſſerunt, tum reſolui omnia in puncta neceſſe foret. Nam corpora in ſuperficies, hæ verò in li- C neas, quæ porrò diſtraherentur ac diſcerperentur in puncta: quare meritò rerum omnium elementa ſtatuentur puncta eſſe. Ex his itaque oppidoquam conſpicuum eſt, lineam neque ex punctis componi, ad hæc lineam nullam impartibilem exiſtere, quin potiùs infinita ſectione diuidi quamlibet poſſe. Punctum ſanè cùm finis ſit lineæ, eſt minimum quiddam, linea verò minima nulla eſt, ſed data quacunque minor deſignari poteſt ſemper diuidua. Quemadmodum itaque quod in ædificio minimum eſt, nec quicquam il- D li, quod ad rationem ſtructuræ pertineat, adfert, pars ipſius nullo modo dicitur: ita ſimiliter in reliquis etiam, res habebit. Quid enim, quæſo te, ad ſphæram adiicit, ſeu albo, ſeu atro colore depicta ſit? quid ſtatua auctior erit, ſiue à dextra, ſiue ſiniſtrâ oppidi parte eam locatam dixeris? ita nec quod minimum eſt lineæ vllum momentum attulerit, punctum ſcilicet. Nam id ſubſtantiæ lineæ prorſus addit nihil. Quamobrem quod minimum quiddam appellatur, ea appellatio lineæ non quadrabit, in ipſa verò id, quod punctum, & terminus nuncupatur, rectè minimum appellari poterit, nihil ſcilicet lineæ adferens. Ex quo ſequitur, lineam indiuiduam nullam exiſtere.

ΑΡΙΣΤΟΤΕΛΟΥΣ, ΠΕΡΙ ΞΕΝΟΦΑΝΟΥΣ, ΠΕΡΙ ΖΗΝΩΝΟΣ, περὶ Γοργίου.

ΠΕΡΙ ΞΕΝΟΦΑΝΟΥΣ.

ARISTOTELIS DE XENOPHANE, ZENONE, ET GORGIA.

Ioanne Bernardo Feliciano, Interprete.

A ÆTERNVM eſſe inquit, quicquid eſt: ſi quidem fieri non poteſt, vt ex nihilo quippiam exiſtat. Siue enim omnia facta ſint, ſiue non omnia, vtroque modo efficietur vt ex nihilo fieri ipſa concedendum ſit. Nam ſi omnia fiant, nihil præexiſtere: ſi æterno alicui alia accedant, amplius & maius vnum ipſum effectum iri aſſerit. Quod autem amplius & maius ſit, id ex nihilo etiam proculdubio exiſtere: quippe cùm neque in pauciore amplius, neque in minore eſſe maius poſſit. Quod B verò eſt æternum, infinitum eſſe, cùm neque principium, vnde extiterit, habeat, neque finem in quem fieri aliquando deſierit: at infinitum eſſe vnum: ſi enim ſint duo, aut plura, fines ea eſſe inter ſe, ac ſeſe mutuò terminare, ſed vnũ ſimile ſibi vndequaq; eſſe: eo quòd ſi diſſimilia plura eſſent, nõ iam eſſet vnũ, ſed multa. Vnum autẽ ipſum cùm æternũ ſit, & immenſum, & ſibi vndequaq; ſimile, immobile etiam eſſe: non enim moueri poſſit, niſi exceſſerit. Quod autem excedit, neceſſe eſt, vt vel in plenum, vel in vacuum excedat. Quorum C alterum, hoc eſt, plenum, admittere nullo modo poſſit: alterum, quod eſt vacuum, nihil ſit. Sed ſi res ita ſe habeat, doloris quoque & ægritudinis, & morbi expers eſſe, atque eiuſmodi, vt neque ſitu tranſponi, neque forma diuerſificari, neque alteri poſſit commiſceri. Eo quod ex omnibus his, vt & vnum multa fiat, & quod non eſt, procreetur, & quod eſt, intereat, neceſſariò efficiatur, quæ ſanè fieri nullo modo poſſunt. Etenim ſi vnum quid mixtum ex plurib. dicatur, ſintque multæ res, quæ in ſe mutuò moueantur: vt mixtio, vel tanquã in D vno plurium compoſitio, vel receſſione quaſi mixtorũ ſuperadditio ſit, efficeretur vt illo modo, eorũ quæ à ſeſe mutuò ſepararẽtur, mixta eſſent: hoc ſi ſuperaddito eſſet in auerſione, ſingula, quæ ſub ſe mutuò poſita ex mixtis ſunt, detractis primis manifeſtarentur: quorum neutrum euenit. hoc autem modo etiam multa eſſent, nec nobis tantummodo eſſe viderentur. Quocirca quia res eſſe ita nequit, neq; fieri poteſt vt multa ſint, ea quæ ſunt, ſed non rectè eſſe ea videantur: quandoquidẽ multa etiã alia ſenſu omni apparent ratione neq; eadẽ gigni,

ΚΕΦΑΛ. α'.

A ἈΐΔΙΟΝ εἶναί φησιν εἴ τι ἔστιν, εἴπερ μὴ ἐνδέχεσθαι γενέσθαι μηδὲν ἐκ μηδενός. εἴτε γὰρ ἅπαντα γέγονεν, εἴτε μὴ πάντα, ἀΐδια ἀμφοτέρως. ἐξ οὐδενὸς γὰρ αὐτῶν ἂν γενόμενα. ἁπάντων τε γὰρ γινομένων, οὐδὲν προϋπάρχειν. εἴ τε τινῶν ὄντων ἀεὶ ἕτερα προσγίνοιτο, πλέον ἂν καὶ μεῖζον τὸ ἓν γεγονέναι. ᾧ δὴ πλέον καὶ μεῖζον, τοῦτο γενέσθαι ἂν ἐξ οὐδενός. ἐν γὰρ τῷ ἐλάττονι τὸ πλέον, ἢ δ' ἐν τῷ μικροτέρῳ τὸ μεῖζον οὐχ ὑπάρχειν. ἀΐδιον δὲ ὄν, ἄπειρον εἶναι, B ὅτι οὐκ ἔχει ἀρχὴν ὅθεν ἐγένετο, οὐδὲ τελευτὴν εἰς ὃ γινόμενον ἐτελεύτησέ ποτε. πᾶν γὰρ ἄπειρον, ἓν εἶναι. εἰ γὰρ πλέον ἢ δύο εἴη, πέρατα εἶναι ταῦτα πρὸς ἄλληλα. ἓν δὲ ὅμοιον εἶναι πάντα. εἰ γὰρ ἀνόμοια πλείω ὄντα, οὐκ ἂν ἔτι ἓν εἶναι, ἀλλὰ πολλά. ἀΐδιον δὲ ὄν, μέτριόν τε καὶ ὅμοιον πάντῃ ἀκίνητον εἶναι τὸ ἕν. οὐ γὰρ ἂν κινηθῆναι, μὴ ἔτι [ὑποχωρῆσαν] ὑποχωρῆσαν δέ, ἀνάγκην εἶναι ἤτοι εἰς πλῆρες ὄν, ἢ κενόν. τούτων δὲ τὸ μὲν οὐκ ἂν δέξασθαι τὸ πλῆρες, τὸ δὲ οὐκ εἶναι οὐδὲν ἢ τὸ κενόν. τοιούτων δὲ ὄντων ἀνωδύνων τε καὶ ἀναλγή- C των, ὑπερ καὶ ἄνοσον εἶναι, οὔτε μεταρρυθμιζόμενον θέσει, οὔτε ἑτεροιούμενον εἴδει, οὔτε μιγνύμενον ἄλλῳ. κατὰ πάντα γὰρ ταῦτα, πολλά τε τὸ ἓν γίνεσθαι, καὶ τὸ μὴ ὂν τεκνοῦσθαι, καὶ τὸ ὂν φθείρεσθαι ἀναγκάζεσθαι. ταῦτα δὲ ἀδύνατα εἶναι. καὶ γὰρ εἰ τὸ μεμίχθαι τι ἓν ἐκ πλειόνων λέγοιτο, καὶ εἴη πολλὰ κινούμενα εἰς ἄλληλα τὰ πράγματα, καὶ ἡ μίξις ἡ ὡς ἐν ἑνὶ, σύνθεσις εἴη τῶν πλειόνων, ἢ τῇ ἀπαλλάξει, οἷον ἐπιπρόσθεσις γίνοιτο τῶν μιχθέντων, ἐκείνως μὲν ἂν δι' ἀλλήλων χωριζόντων εἶναι τὰ μιχθέντα. ἐπιπροσθέσεως δ' οὔσης ἐν D τῇ τρίψει, γίνεσθαι ἂν ἕκαστον φανερόν, ἀφαιρουμένων τῶν πρώτων τὰ ὑπ' ἄλληλα τεθέντα τῶν μιχθέντων. ὧν οὐδέτερον συμβαίνειν. διὰ τούτων δὲ τὸν τρόπον κἂν εἶναι πολλὰ κἂν ἡμῖν, ὡς τὸ φαίνεσθαι μόνως. ὥστε ἐπειδὴ οὐχ οἷόν τε οὕτως, οὐδὲ πολλὰ δυνατὸν εἶναι τὰ ὄντα, ἀλλὰ ταῦτα δοκεῖν οὐκ ὀρθῶς. πολλὰ γὰρ καὶ ἄλλα κατὰ τὴν αἴσθησιν φαντάζεσθαι ἀπατᾷν. λόγον δ' οὔτε αἱρεῖ τὰ αὐτὰ γίνεσθαι,

οὔτε πολλὰ εἶναι τὸ ὄν, ἀλλ᾽ ἀΐδιόν τε καὶ ἄπειρον, καὶ πάντῃ ὅμοιον αὐτὸ αὑτῷ. ἆρ᾽ οὖν δεῖ πρῶτον μὲν μὴ πᾶσαν λαβόντα δόξαν ἄρχεσθαι, ἀλλ᾽ ἀεὶ μάλιστα ὂν βέβαιον. ὥστε εἰ μὲν ἅπαντα τὰ δοκοῦντα μὴ ὀρθῶς ὑπολαμβάνεται, οὐδὲν ἴσως προσήκει οὐδὲ τούτῳ προσέχεσθαι τῷ δόγματι, οὐκ ἄν ποτε οὐδὲν γένοιτο ἐκ μηδενός. μία γάρ τίς ἐστι δόξα καὶ αὕτη τῶν οὐκ ὀρθῶν, ἣν ἐκ τοῦ αἰσθάνεσθαί πως ἐπὶ πολλῶν ὄντες ὑπειλήφαμεν. εἰ δὲ μή, πάντα ἡμῖν ψευδῆ τὰ φαινόμενα· ἀλλὰ τινές εἰσι καὶ τούτων ὀρθαὶ ὑπολήψεις, ἢ ἐπιδεῖξαι τὰς τοιαύτας ποιότητας μάλιστα δοκούσας ὀρθάς, ταύτας ληπτέον, ἃς ἀεὶ βεβαιοτέρας εἶναι δεῖ, ἢ αἳ μέλλουσιν ἐξ ἐκείνων τῶν λόγων δειχθήσεσθαι. εἰ γὰρ καὶ εἶεν δύο δόξαι ὑπεναντίαι ἀλλήλαις, ὥσπερ οἴεται, εἰ μὴ πολλὰ γενέσθαι φησίν, ἀνάγκη εἶναι ἐκ μὴ ὄντων. εἰ δὲ τοῦτο μὴ οἷόν τε, οὐκ εἶναι τὰ ὄντα πολλά· γένοιτο γὰρ ἂν ὄν, ὅτι ἐστὶν ἄπειρον εἶναι. εἰ δ᾽ οὕτως καὶ ἕν. ὁμοίως μὲν δὴ ἡμῖν ὁ * ἀμφοτέρων τι οὐδὲν μᾶλλον τι ἕν, ἢ ὅτι πολλὰ δείκνυται. εἰ δὲ βέβαιος μᾶλλον ἡ ἑτέρα, ἀπὸ ταύτης ξυμπερανθέντα μᾶλλον δέδεικται. τυγχάνομεν δὲ ἔχοντες ἀμφοτέρας ταῖς ὑπολήψεις ταύτας, καὶ κινούμενα μὲν ἐστὶ τὰ ὄντα. ἀμφοῖν δὲ πιστὴ μᾶλλον αὕτη, καὶ θᾶττον ἂν προοῖντο πάντες ταύτην ἐκείνης τὴν δόξαν. ὥστ᾽ εἰ καὶ συμβαίνοιεν ἄν τις εἶναι ταῖς φύσεις, καὶ ἀδύνατον γενέσθαι τι ἐκ μὴ ὄντος, καὶ μὴ πολλὰ εἶναι τὰ πράγματα, ἐλέγχοιτο μὲν ἂν ὑπ᾽ ἀλλήλων ταῦτα. ἀλλὰ τί μᾶλλον οὕτως ἂν ἔχοι, ἴσως τε κἂν φαίη τις τούτοις τὰ ἐναντία. οὔτε γὰρ δείξας ὅτι ὀρθὴ δόξα ἀφ᾽ ἧς ἄρχεται, οὔτε μᾶλλον βέβαιον, ἢ περὶ ἧς δείκνυσι λαβών, διελέχθη. μᾶλλον γὰρ λαμβάνεται εἰκὸς εἶναι γίνεσθαι ἐκ μὴ ὄντος, ἢ μὴ πολλὰ εἶναι. λέγεταί τε καὶ σφόδρα ὑπὲρ αὐτῶν γίνεσθαί τε τὰ μὴ ὄντα, καὶ μὴ γεγονέναι πολλὰ ἐκ μὴ ὄντων, καὶ οὐχ ὅτι οἱ τυχόντες, ἀλλὰ καὶ τῶν δοξάντων εἶναι σοφῶν τινες εἰρήκασιν. αὐτίκα δ᾽ Ἡσίοδος,

Πρῶτον μὲν πάντων (φησὶ) χάος ἐγένετ᾽, αὐτὰρ ἔπειτα
Γαῖ᾽ εὐρύστερνος πάντων ἕδος ἀσφαλὲς αἰεί·
Ἠδ᾽ ἔρος, ὃς πάντεσσι μεταπρέπει ἀθανάτοισι.

τὰ δ᾽ ἄλλα φησὶ γενέσθαι, ταῦτα δ᾽ ἐξ οὐδενός. πολλοὶ δὲ καὶ ἕτεροι εἶναι μὲν οὐδέν φασι, γίνεσθαι δὲ πάντα· λέγοντες ἐξ οὐκ ὄντων γίνεσθαι τὰ γινόμενα. ὥστε τοῦτο μὲν δῆλον, ὅτι ἐν οἷς γε δοκεῖ, καὶ ἐξ οὐκ ὄντων ἂν γενέσθαι.

ΚΕΦΑΛ. β'.

ΑΛλ᾽ ἄρα εἰ μὲν δυνατά ἐστιν ἢ ἀδύνατα ἃ λέγει, ἐατέον. τὸ δὲ, πότερον συμπεραίνεται αὐτῷ ἐξ ὧν λαμβάνει, ἢ οὐδὲν κωλύει καὶ ἄλλως ἔχειν, ἱκανῶς σκέψασθαι, ἔπρεπέ γε ἀντὶ τοῦ τίς ἂν ἐκείνου εἴη, καὶ πρῶτον τεθεὶς, ὃ πρῶτον λαμβάνει μηδὲν γενέσθαι ἂν ἐκ μὴ ὄντος. ἆρα ἀνάγκη ἀγένητα πάντα εἶναι. ἢ οὐδὲν κωλύει γεγονέναι ἕτερα ἐξ ἑτέρων, καὶ τοῦτο εἰς ἄπειρον ἰέναι· ἢ καὶ ἀνακάμπτειν κύκλῳ, ὥστε τὸ ἕτερον ἐκ τοῦ ἑτέρου γεγονέναι. ἀεί τι οὕτως ὄντος τινὸς, καὶ ἀπειράκις, ἑκάστου γεγενημένου ἐξ ἀλλήλων. ὥστε οὐδὲν ἂν κωλύοιτο ἅπαντα γε γονέναι, κειμένου τοῦ μηδὲν γενέσθαι ἂν ἐκ μὴ ὄντος·

neque id quod eſt, multa, ſed æternum, & infinitum, & ſibi vndequaque ſimile eſſe conuincere affirmat. Nunquid igitur primum non omni ſumpta opinione, neque omni quod apparet, incipiendum eſt, ſed ſemper eo, quod maximè eſt firmum ac ſtabile? Quare ſi omnia, quæ in opinionem veniunt, & apparent, non rectè exiſtimantur, nihil fortaſſe conuenit vt huic etiam opinioni & dogmati acquieſcamus, quod nihil ex nihilo fieri ſtatuit: quippe cùm vna etiam quædam ex non rectis hæc opinio ſit, quam ex ſentiendo quodammodo cùm in multis eſſemus, exiſtimauimus. Sin autem non omnia falſa ſunt, quæ nobis apparent, ſed aliqua etiam horum rectæ exiſtimationes habentur vel ex demonſtratione, quæ maximè rectæ eſſe videantur ſumi debent, quas identidem certiores eſſe neceſſe eſt, vel quæ ex illarum rationibus demonſtrandæ ſunt. Si enim ſint duæ inter ſe contrariæ opiniones, quemadmodum, ſi multa facta fuiſſe dicat quiſpiam, neceſſe eſſe, vt ex iis quæ non ſunt, extiterint: ſi verò id eſſe non poteſt, ea quæ ſunt, multa minimè eſſe: efficeretur etiam vt ens quodcunque eſt, infinitum eſſet: atque idcirco, etiam vnum. ex vtriſque his ſanè ratio concluſa ſi ſimili modo probabilis eſt, nihilo magis vnum eſſe quàm multa demonſtrat. At ſi altera ſtabilior eſt ac certior, quæ ex ea collecta fuerint, magis fuiſſe demonſtranda cenſendum eſt: quæ quidem ſi in eum incidant, qui vtraſque has opiniones habuerit, licèt ea quæ ſunt, adhuc moueantur, probabilior tamen hæc eſt, citiùſque hanc quàm illam opinionem omnes admittent. Quorum etiam ſi eueniat vt contrariæ ſint enunciationes, & impoſſibile eſſe, vt & factum ſit quippiam ex eo quod non eſt, & non multæ res ſint, à ſe mutuò hæc conuincantur, quid magis ita rem ſe habere aſſereret quiſpiam? Neque enim vbi demonſtrauit, rectam eſſe opinionem, à qua incipit; neque magis certam, quàm de qua demonſtrat, ſumendo diſſeruit. Magis ſi quidem ſumitur veriſimile eſſe, vt ex eo quod non eſt, aliquid fiat, quàm non multa ſint ea quæ ſunt. Nam de ipſis his admodum dicitur, & fieri ea quæ non ſunt, & non multa facta fuiſſe ex iis quæ non ſunt, atque non hæc è vulgo quilibet, ſed ex iis nonnulli aſſeruerunt, qui ſapientes etiam habiti ſunt. Iam verò Heſiodus:

Primum ante omne aliud, inquit, *Chaos extitit, inde patenti*
Pectore cunctorum ſedes firmiſſima tellus,
Atque amor, is cunctis ſpecie inmortalibus anteit.

Ex quibus alia, genita fuiſſe, ipſa autem hæc ex nihilo. Multi præterea alij eſſe nihil, ſed fieri omnia aſſerunt: ex iis quæ non ſunt, omnia quæ fiunt, exiſtere affirmantes. Vt nonnullis videri, etiam ex iis quæ non ſunt gigni omnia quæ fiunt, perſpicuum iam ſit.

At verò fieri ne poſſint, nec ea quæ dicit, omittendum videtur, ſed illud conſiderandum vtrùm ex iis quæ ſumit, id conficiatur, an nihil vetet, quominus alio modo ſeſe habere res queat. Illud ſanè eſt, quod primum ſumit, fieri ex eo quod non eſt, nihil poſſe. Nunquid igitur omnia eſſe ingènita neceſſe eſt? An nihil prohibet, quin alia ex aliis exiſtant, atque id in infinitum progrediatur? An etiam reflexio in orbem ſit, vt alterum ex altero procreetur, dum ſemper ita aliquid eſt, & infinities ex ſeſe mutuò ſingula gignuntur? Nihil profectò obſtat quin omnia genita ſint, etiamſi nihil ex eo quod non eſt, fieri concedatur:

nullúmque ex nominibus quæ vnum conſequuntur, prohibet quin infinita etiam ea quę ſunt, apud ipſum appellemus: propterea quòd ille quoque infinito attribuit, vt omnia & ſit, & dicatur. Nihil item vetat etiamſi infinita non ſint, quominus in orbem generatio eorum circumuoluatur. Adde quòd ſi omnia gignuntur, & eſt nihil, vt nonnulli dicunt, quo pacto vnum æternum erit? Nam de vno quodam quod ſit, quaſi ſit, & concedatur, ita diſputat. Si enim, inquit, genitum non eſt, ſint æterna, quaſi eſſentiã rebus ineſſe neceſſe ſit. Præterea, etiamſi quàm maximè fieri nequeat, vt quod non eſt, factum ſit, aut quod eſt, interierit, quid impedit tamen, quin alia genita ſint, alia æterna, quemadmodum etiam Empedocles inquit? Nam cùm omnia etiam ille eadem conceſſerit, & quicquam eſſe impoſſibile ex non ente creari:

Quodque eſt diſrumpi, & conſumitur, interiturum,
Semper enim ſtabile mixtum, quocunque feretur.

Ex iis tamen quæ ſunt, quædam æterna eſſe inquit, ignem, aquam, terram, & aërem, reliqua ex his & genita eſſe, & gigni. Nulla enim alia iis quæ ſunt, vt exiſtimat, generatio eſt,

Mixtio ſed tantùm, & mixtorum abſtractio, cuius
Vis hæc, natura mortalibus appellatur.

Generationem autem æternis non ineſſe, neque ea generari dicit, quòd impoſſibile id prorſus ſit. Vnde inquit: Quî ſit enim vniuerſo eſſentia, & vnde profecta eſt? Sed, dum ignis & cætera miſcentur, & componuntur, multa hæc generari, dum ſegregantur, & abſtrahuntur, corrumpi aſſerit. Verumtamen mixtione & ſegregatione multa eſſe; natura autem quatuor abſque cauſis, vel vnum: vel ſi etiam infinita ſtatim extiterint hæc, ex quibus compoſitis gignuntur, ſegregatis corrumpuntur cætera. Quemadmodum Anaxagoram quoque affirmare nonnulli dicunt, ex iis quæ ſemper eſſent, & infinitis, generari ea quæ fierent. Quod ſi ita eſſet, nequaquam æterna omnia eſſent concedenda, ſed nonnulla etiam quæ & gignerentur, & genita ex iis, quæ ſunt, fuiſſent, necnon in ſubſtantias quaſdam alias corrumperentur. Accedit, quòd nihil vetat, quin vna quædam ſubſtantia & forma vniuerſum ſit, ſicut & Anaximander, & Anaximenes inquiunt, aliter quàm eſſe vniuerſum, Anaximenes aërem aſſerẽs, & quicunque alij ita vniuerſum eſſe vnum cenſuerunt. Id enim & figuris, & multitudinibus, & paucitatibus, & dum rarum, & déſum euadit, multa & infinita ea quæ & ſint, & gignantur, efficit. Cùm verò Democritus quoque aquam, & aërem & vnumquodque, quod ex multis his eſt, fluxione differre aſſerat, quid prohibet etiam ita multa & oriri, & interire, dum vnum ex ente in ens antedictis differentiis ſemper mutatur, & nihilo tamen aut amplius aut minus totũ ipſum efficitur? Quid item vetat, quin interdum ex aliis corpora & gignantur, & è contrario corrumpantur? Si autem etiam hæc quiſpiam conceſſerit, ſitque aliquid ingenitum, quid magis id infinitum eſſe demonſtratur? infinitum enim eſſe, inquit, ſi ſit quidem aliquid, ſed genitum tamen minimè fuerit: quippe cùm & generationis principium, & finis, termini eius ſint. At enim quid obſtat, id quod ingenitum eſt, ex antedictis finem habere? Nam ſi genitum eſt quippiam, id habere principium illud cenſet, vnde ea quæ gignuntur, exiſtunt. Sed quid vetat quæſo, quin etiamſi genitum non fuerit quicquam, principium, non ex quo genitũ ſit, ſed alterũ habeat? ſintq; ad ſeſe mutuò terminantia ea quæ æterna ſunt?

A ἢ ἄπειρα ὄντα πρὸς ἐκεῖνον προσαγορεῦσαι, οὐδὲν κωλύει τῶν ἐν τοῖς ἑνὶ ἑπομένων ὀνομάτων. ἅπαντα γὰρ εἶναι καὶ λέγεσθαι, καὶ ἐκεῖνος τῷ ἀπείρῳ προσάπτει. οὐδέν τε κωλύει, καὶ μὴ ἀπείρων ὄντων, κύκλῳ αὐτῶν εἶναι τὴν γένεσιν. ἔτι ἅπαντα γίγνεσθαι· ἔστι δὲ οὐδέν, ὥς τινες λέγουσιν, πρὸς ἓν ἀΐδιον. ὡς δέον ὑπάρχειν τὸ εἶναι τοῖς πράγμασιν. ἔτι εἰ καὶ ὅτι μάλιστα μήτε τὸ μὴ ὂν ἐνδέχεται γενέσθαι, μήτε ἀπολέσθαι τὸ μὴ ὄν, ὅμως τί κωλύει τὰ μὲν γενόμενα αὐτῶν εἶναι, τὰ δ' ἀΐδια, ὡς ἢ Ἐμπεδοκλῆς λέγει; ἅπαντα γὰρ κἀκεῖνος ταῦτα ὁμολογήσας, ἔτι ἔκ τε μὴ ὄντος ἀμήχανόν ἐστι γενέσθαι, τό, τε ὂν ἐξόλλυσθαι αἰώνυτον καὶ ἄρρηκτον. ἀεὶ γὰρ θήσεσθαι ὅπη καὶ τις αἰέν. ἐρεῖ δὲ ὅ-
B μως· τῶν ὄντων τὰ μέν, ἀΐδια εἶναί φησι, πῦρ καὶ ὕδωρ, καὶ γῆν καὶ ἀέρα· τὰ δ' ἄλλα γίνεσθαί τε, καὶ γεγονέναι ἐκ τούτων. οὐδεμία γὰρ ἑτέρα, ὡς οἴεται, γένεσίς ἐστι τοῖς οὖσιν,

Ἀλλὰ μόνον μίξις τε διάλλαξίς τε μιγέντων
Ἐστί· φύσις δ' ἐπὶ τοῖς ὀνομάζεται ἀνθρώποισιν.

τὴν δὲ γένεσιν προσιοῦσαν τοῖς ἀϊδίοις, καὶ τῷ ὄντι γίνεσθαι λέγει ἐπεὶ τοῦτό γε ἀδύνατον. ὥστε τὸ πῶς γ' ἂν φησί, καὶ ἐπάρξις ἴετο, πάντη τε καὶ πόθεν ἐλθόν· ἀλλὰ μισγομένων τε καὶ συντιθεμένων πυρός, καὶ τῶν μετὰ πυρός,
C γίγνεσθαι τὰ πολλά, διαλλαττομένων τε καὶ διακρινομένων φθείρεσθαι. πλὴν καὶ εἶναι τῇ μὲν μίξει πολλά τε καὶ τῇ διακρίσει· τῇ δὲ φύσει τέτταρα ἄνευ τῶν αἰτίων, ἢ ἕν· ἢ εἰ καὶ ἄπειρα εὐθὺς εἴη ταῦτα, ἐξ ὧν συντιθεμένων γίγνεται, διακρινομένων δὲ φθείρεται. ὡς καὶ τὸν Ἀναξαγόραν φασί τινες λέγειν, ἐξ ἀεὶ ὄντων καὶ ἀπείρων, τὰ γινόμενα γίνεσθαι. κἂν οὕτως, οὐκ ἂν εἴη ἀΐδια πάντα, ἀλλὰ καὶ γιγνόμενα ἄττα καὶ γενόμενά τ' ἐξ ὄντων, καὶ φθειρόμενα εἰς οὐσίας τινὰς ἄλλας. ἔτι οὐδὲν κωλύει μίαν τινὰ οὐσίαν τὸ πᾶν μορφήν, ὡς καὶ ὁ Ἀναξίμανδρος καὶ ὁ Ἀναξιμένης λέγουσιν· ὁ μέν, ὕδωρ εἶναι φάμενος τὸ πᾶν· ὁ δέ, ὁ Ἀναξιμένης, ἀέρα, καὶ ὅσοι ἄλλοι οὕ-
D τως εἶναι τὸ πᾶν ἓν ἠξιώκασι. τοῦτο ἤδη σχήμασί τε καὶ πλήθει, καὶ ὀλιγότητι, καὶ τὸ μανὸν ἢ πυκνὸν γίνεσθαι, πολλὰ καὶ ἄπειρα ὄντα τε καὶ γιγνόμενα ἀπεργάζεται τὸ ὅλον. φησὶ δὲ καὶ ὁ Δημόκριτος τὸ ὕδωρ τε καὶ τὸν ἀέρα, ἕκαστόν τε τῶν πολλῶν, ταὐτὸ ὄν, ῥυθμῷ διαφέρειν. τί δὴ κωλύει καὶ οὕτως τὰ πολλὰ γίγνεσθαί τε καὶ ἀπόλλυσθαι, ἐξ ὄντος ἀεὶ ἐς ὂν μεταβάλλοντος ταῖς εἰρημέναις διαφοραῖς τοῦ ἑνός, καὶ οὐδέν, οὔτε πλέονος, οὔτε ἐλάττονος γιγνομένου τοῦ ὅλου; ἔτι τί κωλύει ποτὲ μὲν ἐξ ἄλλων τὰ σώματα γίγνεσθαί τε καὶ ἀπόλλυσθαι πάλιν; εἰ δὲ καὶ ταῦτά τις συγχωροίη, καὶ εἴη τι καὶ ἀγένητον, εἴ τι μᾶλλον ἄπειρον δείκνυται. ἄ-
E πειρον γὰρ εἶναί φησιν, εἰ ἔστι μέν, μὴ γεγονέναι. πέρατα γὰρ εἶναι, τὴν τῆς γενέσεως ἀρχήν τε καὶ τελευτήν. καίτοι τί κωλύει, ἀγένητον ὄν, ἔχειν πέρας ἐκ τῶν εἰρημένων; εἰ γὰρ ἐγένετο, ἀρχὴν ἔχειν ἀξιοῖ ταύτην ὅθεν γίγνοιτο, εἰ γιγνόμενα. τί δὴ κωλύει, καὶ εἰ μὴ ἐγένετο, ἔχειν ἀρχήν; οὐ μέντοι γε ἐξ ἧς γε ἐγένετο, ἀλλὰ καὶ ἕτερα, καὶ εἶναι περαίνοντα πρὸς ἄλληλα ἀΐδια ὄντα.

ἔτι τί κωλύει τὸ μὲν ὅλον, ἀγένητον ὄν, ἄπειρον εἶναι, τὰ δὲ ἐν αὐτῷ γιγνόμενα πεπεράνθαι, ἔχοντα ἀρχὴν καὶ τελευτὴν γενέσεως; ἔτι καὶ ὡς ὁ Παρμενίδης φησί, τί κωλύει καὶ τὸ πᾶν ἓν εἶναι, καὶ ἀγένητον· ὅμως πεπεράνθαι, καὶ εἶναι

Πάντοθεν ἐγκύκλου σφαίρας ἐναλίγκιον ὄγκῳ,
Μέσσοθεν ἰσοπαλὲς πάντῃ;

τὸ γὰρ οὔτε τι μεῖζον, οὔτε τι βεβαιότερον εἶναι μέλλει ὂν ἐστι τῇ ἀρχῇ. ἔχον δὲ μέσον καὶ ἔσχατα, πέρας ἔχει ἀγένητον ὄν· ἐπεὶ εἰ καί, ὡς αὐτὸς λέγει, ἕν ἐστι, καὶ τοῦτο σῶμα ἔχει ἄλλα ἑαυτοῦ μέρη, εἰ τάδε ὅμοια πάντα. καὶ γὰρ ὅμοιον οὕτω λέγει τὸ πᾶν εἶναι οὐ ἄλλῳ τινὶ ὃ περαίνεσθαι ἐρᾷς, ἐλέγχει εἴ τι ὅμοιον τὸ ἄπειρον. τό γε ὅμοιον, ἑτέρῳ ὅμοιον. ὥστε δύο ἢ πλείω ὄντα, οὐκ ἂν ἓν οὐδ' ἄπειρον εἶναι, ἀλλ' ἴσως τὸ ὅμοιον πρὸς αὑτὸ λέγει, καὶ φησὶν αὐτὸ ὅμοιον εἶναι πᾶν, ὅτι ὁμοιομερὲς ὕδωρ ὂν ἅπαν ἢ γῆ, [ἢ] εἴ τι τοιοῦτον ἄλλο. δῆλος γὰρ οὕτως ἀξιῶν εἶναι ἕν, τῶν δὲ μερῶν ἕκαστον σῶμα ὄν, οὐκ ἄπειρόν ἐστι. τὸ γὰρ ὅλον, ἄπειρον. ὥστε ταῦτα περαίνει πρὸς ἄλληλα ἀγένητα ὄντα. ἔτι εἰ ἀΐδιόν τε καὶ ἄπειρόν ἐστι, πῶς ἂν εἴη ἓν σῶμα ὄν; εἰ μὲν γὰρ ἀνομοίων ἂν μερῶν εἴη, πολλά, καὶ αὐτὸς οὕτω γε εἶναι ἀξιοῖ. εἰ δὲ ἅπαν ὕδωρ, ἢ ἅπασα γῆ, ἢ ὅτι δὴ τὸ ὂν τοῦτ' ἐστι, πολλὰ ἂν ἔχοι μέρη, ὡς καὶ Ζήνων ἐπιχειρεῖ ὂν δεικνύναι τὸ οὕτως ὂν ἕν. εἴη οὖν καὶ πλείονα αὐτοῦ μέρη ἐλαττόνων τε καὶ μικροτέρων, ἀλλά τε πάντῃ ἂν ταύτῃ ἀλλοῖον εἴη οὐδενὸς προσγιγνομένου σώματος, οὐδ' ἀπογιγνομένου. εἰ δὲ μήτε σῶμα, μήτε πλάτος, μήτε μῆκος ἔχον μηδέν, πῶς ἂν ἄπειρον ἂν εἴη; τί κωλύει, πολλὰ καὶ ἀνάριθμα τοιαῦτα εἶναι; τί κωλύει, καὶ πλείω ὄντα ἑνός, μεγέθει ἄπειρα εἶναι; ὡς καὶ Ξενοφάνης ἄπειρον τό, τε βάθος τῆς γῆς καὶ τοῦ ἀέρος φησὶν εἶναι. δηλοῖ δὲ καὶ ὁ Ἐμπεδοκλῆς· ἐπιτιμᾷ γὰρ ὡς λεγόντων τινῶν τοιαῦτα ἀδύνατα εἶναι, οὕτως ἐχόντων ξυμβαίνειν αὐτά·

Εἴπερ ἀπείρονα γῆς τε βάθη, καὶ δαψιλὸς αἰθήρ,
Ὡς διὰ πολλῶν δὴ βροτέων ῥηθέντα ματαίως
Ἐκκέχυται στομάτων, [οὐδὲν] τοῦ παντὸς ἰδόντων.

ἔτι ὂν ἕν, οὐδὲν ἄτοπον, εἰ μὴ πάντῃ ὅμοιόν ἐστιν. εἰ γὰρ ἐστιν ὕδωρ ἅπαν, ἢ πῦρ, ἢ ὅτι δὴ ἄλλο τοιοῦτον, οὐδὲν κωλύει πλείω εἰπεῖν τοῦ ὄντος ἑνός· εἰ δὴ δ' ἕκαστον ὅμοιον αὐτὸ ἑαυτῷ. καὶ γὰρ μανόν, τὸ δὲ πυκνὸν εἶναι, μὴ ὄντος τοῦ τῷ μανῷ κενοῦ. οὐδὲν κωλύειν γάρ, τῷ μανῷ οὐκ ἔστιν ἔν τισι μέρεσι χωρὶς ἀποκεκριμένον τὸ κενόν· ὡς τὸ τοῦ ὅλου, τὸ μὲν εἶναι πυκνόν, καὶ τοῦτο δὲ ἐστι μανὸν τὸ πᾶν οὕτως ἔχοι· ἀλλ' ὁμοίως ἅπαν πλῆρες ὄν, ὁμοίως ἧττον πλῆρές ἐστι τοῦ πυκνοῦ. εἰ δὲ καὶ ἔστιν, ἀγένητόν ἐστιν, καὶ διὰ τοῦτο δοθείη ἄπειρον εἶναι, καὶ μηδὲ ἐνδέχεσθαι ἄλλο καὶ ἄλλο ἄπειρον εἶναι. διὰ τοῦτο καὶ ἐν τούτῳ ἤδη προσαγορευτέον καὶ ἀδύνατον. πῶς γὰρ ἂν τὸ ἄπειρον ὅσον; ἢ τί κενὸν μὴ ὅλον ἂν οἷόν τε εἶναι; ἀκίνητον δ' εἶναι φησίν, εἰ κενὸν μὴ ἐστιν. ἅπαντα γὰρ κινεῖται τῷ ἀλλάττειν τόπον. πρῶτον μὲν οὖν τοῦτο πολλοῖς οὐ συνδοκεῖ, ἀλλ' εἶναί τι κενόν· οὐ μέντοι τόγε τι σῶμα εἶναι ἀλλ' ὅπερ καὶ ὁ Ἡσίοδος ἐν τῇ γενέσει πρῶτον τὸ χάος φησὶ γενέ-

A Quid prætereà impedit, quominus totum ingenitum ſit, & infinitum, ea verò quæ in ipſo gignuntur, ſint terminata, cùm & principium generationis, & finem habeant? Porro etiam, ſicut Parmenides inquit, nihil prohibet vniuerſum eſſe vnum & ingenitum, & tamen eſſe terminatum,

Orbiculare, vt ait, *globoſe perſimile vndique moli,*
A cuius medio ſpacia in quaſcunque ferantur
Partes æqua, vt nec maius nec firmius vllum.

Cùm enim habeat medium & extrema, finem habet, quamuis ingenitum ſit: nam etiamſi, vt ipſe inquit, vnum ſit, atqui id corpus alias tamen ſui partes habet, quæ ſimiles inter ſe ſint. Simile enim ita dicit vniuerſum eſſe non alteri alicui, quod B terminatum eſſe arguit. Nam ſi infinitum eſt ſimile, & ſimile alteri eſt ſimile; duo igitur, vel plura entia ſunt, non vnum, neque infinitum. Sed fortaſſe ſimile ſibi eſſe ſimile dicit, ipſumque, inquit, ſimile eſſe vniuerſum, eo, quòd ſimilibus partibus conſtet, cum ſit vel aqua vniuerſum, vel terra, vel quippiam aliud huiuſmodi. Conſtat enim hunc cenſere vnum eſſe vnumquodque, quod duplicibus partibus conſtet, & corpus ſit, quod ſanè infinitum minimè eſt. Nam vniuerſum ipſum eſt infinitum. Quare hæc licèt ingenita ſint, ad ſeſe mutuò terminant. Adhæc, ſi æternum & infinitum ſit, quo pacto eſſe vnum corpus poteſt? nam ſi ſit diſſimilium partium, erunt multa, & ipſe quoque C ita exiſtimat: ſin autem tota aqua, vel tota terra, vel quodlibet aliud vnum id ſit, multas proculdubio partes habebit: quemadmodum Zeno etiam ens eſſe conatur demonſtrare id, quod ita vnum eſt: erunt igitur etiam plures eius partes paucioribus & minoribus, & diuerſæ prorſus, ſi ita nullo neque accedente, neque recedente corpore, alterabile ſit. At ſi neque corpus ſit, neque latitudine, neque longitudine vlla præditum, quomodo eſſe infinitum poteſt? Quid obſtat quin multa & numerabilia huiuſmodi ſint? Quid prohibet etiam quin licèt plura vno eſſe dicantur, infinita tamen magnitudine ſint? Sicvt Xenophanes quoque ipſe infinitam eſſe terræ profunditatem, & D aëris aſſerit. Id quod etiam Empedocles declarat, cùm quoſdam reprehendens, qui ea nullo modo eſſe poſſe dicebant, cùm tamen res ita eſſe videretur:

Quandoquidē, inquit, *eſt infinito terra ipſa profundo,*
Necnon ampla que & immenſa ſpatia ætheris alti,
Vaniloquo qui hominum multorum effunditur ore,
Naturam vniuerſi ipſius conſpicientium.

Nihil abſurdi inſuper eſt, ſi cùm vnum ſit, non vſquequaque ſimile fuerit. Si enim ſit aqua vniuerſum, vel ignis, vel quodcunque aliud tale, nihil vetat quin plura quàm vnū ens eſſe dicamus. Quandoquidem vnumquodque non prorſus ſimile ſibi ipſi eſt, cùm partim rarū partim denſum ſit, etiamſi E in raro vacuum non inſit. Nihil tamen obſtat quin in raro ſeparatim aliquibus in partibus ſecretum vacuum inſit. Quare ſi totum partim denſum partim rarum ſit, & ſimili modo plenū vniuerſum, rara pars minùs plena erit quàm quæ denſa eſt. Quod ſi etiam ingenitū ſit, ac propterea eſſe quoque infinitū concedatur, vt neque aliud atq. aliud eſſe infinitū poſſit, neq. ita continuò vnum erit appellandū. Quo pacto enim infinitū totum, vel vacuum non totum eſſe vnum poteſt? At verò immobile etiam eſſe inquit, ſiquidem vacuum non eſt. omnia enim dum mutāt locū, mouentur. Sed primum hoc nō omnib. probatur, ſed eſſe vacuū quoddā aiūt, quod tamē corpus nō ſit. Queādmodū Heſiodus quoq. in generatione, primū ante omne aliud chaos inquit ex-

titiſſe: quod quaſi ſedes quædam entibus ſubſterneretur. Tale quid etiam vacuum quaſi vas quoddam, ac receptaculum, quod medium intercedat, requirimus. Deinde etiam ſi vacuum nullum ſit, neque ita quippiam fortaſſe non moueretur. Nam Anaxagoras quoque cùm hoc ante ipſum tractarit, & non ſolum ſatis ſibi eſſet id pronuntiaſſe, vacuum non eſſe, moueri tamen ea quæ ſunt, inquit, etiam ſi vacuum non ſit. Simili modo etiam Empedocles moueri quidem ſemper, inquit, ea quæ ſimul tempus in omne mouentur aſſiduè, nihil eſſe in vniuerſo vacuum affirmans, vnde ſuperueniens fuerit quicquam: ſed cùm in vnam formam concreuerit, vnum vt iam ſit quicquam, neque, quod vacuum, neque, quod ſupereffluat, vllum eſſe inquit. Quid enim prohibet, quin in ſeſe mutuò ferantur, & deuoluantur omnia, dum hoc in aliud atque aliud in aliud, atque ita deinceps ſemper transmutatur, quo ad primum vltimum redierit? Quin etiam forma rei licèt in eodem loco permaneat, mutationem vel alterationem cùm alij tum ipſe ille aſſerit: vt ex iis etiam quæ ab ipſo dicuntur, nihil obſtet quominus res dum ex albo nigrum vel ex amaro dulce fit, moueantur. Nam ſiue non eſſe vacuum concedamus, ſiue plenum admittere nihil poſſe, id nulli impedimento eſt quin alteratio efficiatur. Quamobrem neque omnia æterna, neque vnum neq; infinitum eſſe neceſſe eſt. Sed neque infinita multa, neque vnum ſimile neque immobile ſiue vnum ſit, ſiue multa quædam. His autem ita conſtitutis, nihil ex iis quæ ab illo dicta ſunt, & tranſponi & alterari res vetat, cùm etſi vnum ſit vniuerſum, motio exiſtat, dum & multitudine & paucitate differt, & alteratur, nulla re alia accedente: nam ſi modò quicquã id eſt, quod accedit, corpus nõ eſt: etſi multa ſint, dum ea inter ſe ſimul commiſcentur, & ſecernuntur. Mixtionem enim neque ſuperadditionem eiuſmodi eſſe, neque compoſitionem, qualem inquit veriſimile eſt: vt vel ſtatim ſeparata inter ſe ſint, vel in auerſione dum alia aliis ſuperoccurrũt, à ſeſe mutuo ſeorſum ferantur: ſed ea quæ mixta ſunt, ita eſſe compoſita, vt quælibet pars cum qualibet confuſa ita ſit, vt non compoſita, ſed mixta eſſe videantur, neque deprehendi, qualeſnam partes eorum ſint, poſſit. Quia enim non eſt corpus aliquod, quod minimum ſit, vnaquæque pars, ſimili modo ac totum commixta eſt.

DE ZENONE.

Fieri non poſſe inquit, vt ſi quid eſt, id factum fuerit, hoc de Deo aſſerens: quippe cùm neceſſe ſit, vt quod factum fuerit, id vel ex ſimilibus vel ex diſſimilibus extiterit, quorum fieri neutrum queat. Neque enim ſimili magis conuenire vt à ſimili procreetur, quàm ſimile procreet: eo quòd æqualibus vel ſimilibus omnia eadem erga ſeſe mutuò inſint. neque diſſimile ex diſſimili poſſe exiſtere. Nam ſiue ex imbecilliori robuſtius, aut ex minore maius, aux ex peiore melius, ſiue è contrario præſtantiora ex deterioribus fierent, ex non ente quippiam efficeretur: id quod eſſe nullo pacto poteſt. Æternum igitur hac de cauſa eſſe Deum affirmat. Si autem Deus eſt id quod præſtantiſſimum omnium eſt, vnum debere eſſe ipſum inquit; nam ſi duo aut plures etiam eſſent, præſtantiſſimum & optimum omnium ipſum eſſe nullo modo liceret:

A σθαι· ὡς δὲ χώραν πρῶτον ὑπάρχειν τοῖς οὖσιν. τοιοῦτον δέ τι καὶ τὸ κενόν, οἷον ἀγγεῖόν τι διὰ μέσον εἶναι ζητοῦμεν. ἀλλὰ δὴ καὶ εἰ μή ἐστι κενόν, μηδέν τι ἴσως ἂν κινοῖτο· ἐπεὶ καὶ Ἀναξαγόρας τὸ πραγματευθεὶς, καὶ οὐ μόνον ἀποχρῆσαν αὐτῷ ἀποφήνασθαι ὅτι οὐκ ἔστιν, ὅμως κινεῖσθαί φησι τὰ ὄντα, οὐκ ὄντος κενοῦ. ὁμοίως δὲ καὶ ὁ Ἐμπεδοκλῆς κινεῖσθαι μὲν ἀεί φησι συγκρινούμενα τὸν ἅπαντα ἐνδελεχῶς χρόνον, οὐδὲν εἶναι λέγων ὡς τοῦ παντὸς, οὐδὲ κενεόν. πόθεν οὖν τί κ' ἐπέλθοι. ὅταν δὲ εἰς μίαν μορφὴν συγκριθῇ, ὡς ἓν εἶναι, οὐδέν φησι τό γε κενεὸν πέλει, οὐδὲ περισσόν.

B τί γὰρ κωλύει εἰς ἄλληλα φέρεσθαι καὶ περιίστασθαι ἅμα ὁποιουοῦν εἰς ἄλλο, καὶ τούτου εἰς ἕτερον, καὶ εἰς τὸ πρῶτον, ἄλλου μεταβάλλοντος ἀεί; ἔτι καὶ τὴν ἐν τῷ αὐτῷ μένοντος τοῦ πράγματος τόπῳ τοῦ εἴδους μεταβολὴν, ἣ ἀλλοίωσιν, οἵ τ' ἄλλοι κἀκεῖνος λέγει [οὐδὲν] ἐκ τῶν εἰρημένων αὐτῷ κωλύει κινεῖσθαι τὰ πράγματα, ὅταν ἐκ λευκοῦ μέλαν, ἢ ἐκ πικροῦ γίνηται γλυκύ. οὐδὲν γὰρ τὸ μὴ εἶναι κενόν, ἢ μὴ δέχεσθαι τὸ πλῆρες ἀλλοιοῦσθαι κωλύει. ὥστε οὔτε ἅπαντα ἀΐδια, οὔθ' ἕν, οὔτ' ἄπειρον ἀνάγκη εἶναι, ἀλλ'

C ἄπειρα πολλά. οὔτε ἓν δ' ὅμοιον, οὔτ' ἀκίνητον, οὔτ' εἰ πολλ' ἄττα. τούτων δὲ κειμένων καὶ μετακοσμεῖσθαι καὶ ἑτεροιοῦσθαι οὐδένα κωλύει ἐκ τῶν ὑπ' ἐκείνου εἰρημένων, καὶ ἑνὸς ὄντος τοῦ παντὸς κινήσεως οὔσης, καὶ πλήθει καὶ ὀλιγότητι διαφέροντος, καὶ ἀλλοιουμένου οὐδενὸς προσγιγνομένου. Εἰ δ' ἄρα τινὸς, οὐ τοῦ σώματος, καὶ εἰ πολλὰ συμμισγομένων καὶ συνδιακρινομένων ἀλλήλοις. τὴν γὰρ μίξιν, οὔτ' ἐπιπρόσθεσιν τοιαύτην εἶναι οὔτε σύνθεσιν εἰκὸς οἵαν λέγειν. ὥστε ἢ χωρὶς εὐθὺς εἶναι, ἢ καὶ ἀποστραφέντος ἐπιπροσθεν ἕτερα ἑτέρων φέρεσθαι χωρὶς ἀλλήλων ταῦτα, ἀλλὰ οὕτω συγκεῖσθαι ταχθέντα, ὥστε ὁποιουοῦν μιγνυμένου

D παρ' ὁποιουοῦν ὧ μίγνυσθαι μέρος, οὕτως ὡς μὴ ἀναληφθῆναι συγκείμενα, ἀλλὰ μεμιγμένα, μηδ' ὁποιαοῦν αὐτοῦ μέρη. ἐπεὶ γὰρ οὐκ ἔστι σῶμα τὸ ἐλάχιστον, ἅπαν τι μέρος μέμικται ὁμοίως καὶ τὸ ὅλον.

ΠΕΡΙ ΖΗΝΩΝΩΣ. ΚΕΦΑΛ. γ.

Ἀδύνατόν φησιν εἶναι εἴ τι ἔστι, γενέσθαι, τοῦτο λέγων ἐπὶ τοῦ θεοῦ. ἀνάγκη γὰρ ἤτοι ἐξ ὁμοίου [ἢ ἐξ] ἀνομοίου γενέσθαι τὸ γενόμενον. δυνατὸν δὲ οὐδέτερον. οὔτε

E γὰρ ὅμοιον ὑφ' ὁμοίου προσήκειν τεκνωθῆναι μᾶλλον, ἢ τεκνῶσαι. ταὐτὰ γὰρ ἅπαντα τοῖς γε ἴσοις ὁμοίοις ὑπάρχειν πρὸς ἄλληλα, οὔτ' ἂν ἐξ ἀνομοίου οὔτ' ἀνόμοιον γενέσθαι. Εἰ γὰρ γίγνοιτο ἐξ ἀσθενεστέρου τὸ ἰσχυρότερον, ἢ ἐξ ἐλάττονος τὸ μεῖζον, ἢ ἐκ χείρονος τὸ κρεῖττον, ἢ τοὐναντίον τὰ χείρω ἐκ τῶν κρειττόνων, τὸ οὐκ ἐξ ὄντος γενέσθαι· ὅπερ ἀδύνατον. ἀΐδιον μὲν οὖν διὰ ταῦτ' εἶναι τὸν θεόν. Εἰ δ' ἐστὶν ὁ θεὸς ἁπάντων κράτιστον, ἕνα φησὶ προσήκειν αὐτόν. εἰ γὰρ δύο, ἢ ἔτι πλείους εἶεν, οὐκ ἂν ἔτι κράτιστον καὶ βέλτιστον αὐτὸν εἶναι πάντων·

ἕκαστος γὰρ ἂν θεὸς τῶν πολλῶν ὅμοιος ὢν, τοιοῦτος εἴη. τοῦτο γὰρ θεὸν καὶ θεοῦ δύναμιν εἶναι, κρατεῖν, ἀλλὰ μὴ κρατεῖσθαι, καὶ πάντα κρατεῖσθαι εἶναι. ὥστε καθὸ μὴ κρείττων, κατὰ τοσοῦτον οὐκ εἶναι θεόν. πλειόνων οὖν ὄντων, εἰ μὲν εἶεν τὰ μὲν ἀλλήλων κρείττους, τὰ δὲ ἥττους, οὐκ ἂν εἶναι θεούς. πεφυκέναι γὰρ θεὸν μὴ κρατεῖσθαι. ἴσων δὲ ὄντων, οὐκ ἂν ἔχειν θεὸν φύσιν δεῖν εἶναι κράτιστον. τὸ δὲ ἴσον, οὔτε βέλτιον, οὔτε χεῖρον εἶναι τοῦ ἴσου. ὥστ' εἴπερ εἴη τε, καὶ τοιοῦτον εἴη θεὸς, ἕνα μόνον εἶναι τὸν θεόν. οὐδὲ γὰρ οὐδὲ πάντα δύνασθαι ἂν ἃ βούλοιτο. οὐδὲ γὰρ ἂν δύνασθαι πλειόνων ὄντων ἕνα μόνον. ἕνα δ' ὄντα, ὅμοιον εἶναι πάντῃ, ὁρᾶν τε καὶ ἀκούειν, τάς τε ἄλλας αἰσθήσεις ἔχοντα πάντῃ. εἰ γὰρ μὴ κρατεῖν ἂν καὶ κρατεῖσθαι ὑπ' ἀλλήλων τὰ μέρη θεοῦ ὄντα· ὅπερ ἀδύνατον. πάντῃ δ' ὅμοιον ὄντα, σφαιροειδῆ εἶναι. οὐ γὰρ τῇ μὲν, τῇ δ' οὐ τοιοῦτον εἶναι, ἀλλὰ πάντῃ. ἀΐδιον δ' ὄντα καὶ ἕνα καὶ σφαιροειδῆ, οὔτ' ἄπειρον, οὔτε πεπεράνθαι. ἄπειρον [γὰρ] τὸ μὴ εἶναι· τοῦτο γὰρ οὔτε μέσον, οὔτε ἀρχὴν, καὶ τέλος, οὔτε ἄλλο μέρος οὐδὲν ἔχειν. τοιοῦτον δὲ εἶναι τὸ ἄπειρον. οἷον δὲ τὸ μὴ ὂν, οὐκ ἂν εἶναι τὸ ὄν, περαίνειν δὲ πρὸς ἄλληλα, εἰ πλείω εἴη. τὸ δὲ ἓν οὔτε τῷ οὐκ ὄντι, οὔτε τοῖς πολλοῖς ὁμοιοῦσθαι. ἓν γὰρ οὐκ ἔχει πρὸς ὅτι περανεῖ. τὸ δὴ τοιοῦτον ὂν, ἓν ὂν, τὸν θεὸν εἶναι λέγει, οὔτε κινεῖσθαι, οὔτε κινητὸν εἶναι. ἀκίνητον μὲν γὰρ εἶναι τὸ μὴ ὄν. οὔτε γὰρ ἂν εἰς αὐτὸ ἕτερον, οὔτε ἐκεῖνο εἰς ἄλλο ἐλθεῖν. κινεῖσθαι δὲ τὰ πλείω ὄντα ἑνός. ἕτερον γὰρ εἰς ἕτερον δεῖν κινεῖσθαι. εἰ μὲν οὖν τὸ μὴ ὄν, οὐδὲν ἂν κινηθῆναι. τὸ γὰρ μὴ ὂν οὐδαμῇ εἶναι· εἰ δὲ εἰς ἄλληλα μεταβάλλοι, πλείω αὐτὸν εἶναι ἑνός. διὰ ταῦτα δὴ κινεῖσθαι μὲν ἂν τὰ δύο ἢ πλείω ἑνός. ἠρεμεῖν γὰρ ἀκίνητον εἶναι τὸ οὐδέν. τὸ δὲ ἓν οὔτε ἀτρεμεῖν, οὔτε κινεῖσθαι. οὔτε γὰρ τῷ μὴ ὄντι, οὔτε τοῖς πολλοῖς ὅμοιον εἶναι. κατὰ πάντα δὲ οὕτως ἔχειν τὸν θεὸν, ἀΐδιόν τε καὶ ἕνα, ὅμοιόν τε καὶ σφαιροειδῆ ὄντα, οὔτε ἄπειρον οὔτε πεπερασμένον, οὔτε ἠρεμεῖν, οὔτε ἀκίνητον εἶναι.

ΚΕΦΑΛ. δ'.

Πρῶτον μὲν οὖν λαμβάνει καὶ οὗτος τὸ γιγνόμενον γίγνεσθαι ἐξ ὄντος, ὥσπερ ὁ Μέλισσος. καίτοι τί κωλύει μήτ' ἐξ ὁμοίου τὸ γιγνόμενον γίγνεσθαι, ἀλλ' ἐκ μὴ ὄντος; ἔτι οὐδὲν μᾶλλον ὁ θεὸς ἀγένητος, εἰ καὶ τἆλλα πάντα, εἴπερ ἅπαντα ἐξ ὁμοίου ἢ ἀνομοίου γέγονεν· ὅπερ ἀδύνατον. ὥστε ἢ οὐδέν ἐστι παρὰ τὸν θεὸν, ἢ καὶ τἆλλα ἀΐδια πάντα. εἴπερ ἅπαντα ἐπικράτιστον τὸν θεὸν λαμβάνει· τοῦτο δυνατώτατον καὶ βέλτιστον λέγων. οὐ δοκεῖ δὲ τοῦτο κατὰ τὸν νόμον, ἀλλὰ πολλὰ κρείττους εἶναι ἀλλήλων οἱ θεοί. οὔκουν ἐκ τοῦ δοκοῦντος εἴληφε ταύτην κατὰ τοῦ θεοῦ τὴν ὁμολογίαν. τό τε κράτιστον εἶναι τὸν θεὸν, οὐχ οὕτως ὑπολαμβάνων λέγεται, ὡς πρὸς ἄλλο τι τοιαύτη ἡ τοῦ θεοῦ φύσις, ἀλλὰ πρὸς τὴν αὑτοῦ διάθεσιν. ἐπεὶ γὰρ τὸ πρὸς ἕτερον, οὐδὲν ἂν κωλύοι μὴ τῇ αὑτοῦ ἐπιεικείᾳ καὶ ῥώμῃ ὑπερέχειν, ἀλλὰ διὰ τὴν τῶν ἄλλων ἀσθένειαν.

A quippe cùm vnuſquiſque ex multis Deus ſimilis, atque iccirco talis foret. Deum enim & Dei potentiam eiuſmodi eſſe, vt præſideat & dominetur, non ſubiiciatur, vt in eo quòd non eſt præſtantior, Deus non ſit. Si igitur plures cùm ſint, partim ſint ſeſe mutuò præſtantiores, partim inferiores, Deôs nullo modo fore: cùm Deus inferior eſſe, & ſubiici natura non poſſit. Si ſint æquales, non fore ea natura Deum, vt præſtantiſſimum omnium ſit: propterea quod æquale neque melius, neque peius æquali ſit, neceſſe eſt. Quapropter ſi eſt, & talis eſt Deus, vnum ipſum ſolum eſſe: neque enim aliter omnia poſſet, quæcunque vellet, quippe cùm ſi eſſent plures, minimè ipſe eſſe ſolus poſſet. Cùm verò vnus ſit, ſimilem quoque ipſum ſibi vn-
B dequaque eſſe ait, quantum ad viſum & auditum, reliquóſque omnes ſenſus ſpectat: alioqui enim efficeretur vt non præſiderent, & dominarentur, ſed ſibi mutuò Dei partes ſubiicerentur, id quod fieri nullo pacto poteſt: ſi autem vndequaque ſit ſimilis, globoſum quoque eſſe: non enim partim eſſe, partim non eſſe, ſed vndequaque eſſe huiuſmodi debere aſſerit. Cùm itaque ſit æternus, & vnus, & globoſus, neque infinitum, neque finitum eſſe ipſum cenſet: eo quòd infinitum non ens ſit. Quod neque medium neque principium, neque finem, neque aliam quampiam partem habeat: eiuſmodi infinitum eſſe inquit: ens autem tale eſſe, quale eſt non ens, procul dubio nō poſſe: ſi plu-
C ra ſanè ſint, ea ſeſe mutuò terminare. Sed vnum neque non enti; neque multis ſimile eſſe debere. vnum enim nihil habet, ad quod terminari queat. Id prpterea quod huiuſmodi eſt vnū, quem Deum eſſe affirmat, neque moueri neque immobile eſſe inquit, quippe cùm immobile illud ſit, quod non eſt: nam neque aliud in ipſum, neque ipſum pertranſire in aliud poteſt: moueantur autem ea, quæ plus vno ſunt: alterum enim in alterum moueatur neceſſe eſt. Quòd ſi id quod non eſt, ne moueri quidem poteſt: cùm id quod non eſt, nuſquam ſit: quæ verò in ſe mutuò tranſmutantur, plura vno ſunt: propterea ſanè effici ait vt duo, vel quæ plura vno ſunt, moueantur: quieſcat autem nihil,
D quod immobile eſt: vnum verò neque quieſcat neque moueatur: cùm neque ei quod non eſt, neque multis ſimile ſit. In omnibus autem ita ſeſe habere Deum inquit, vt æternus & vnus, & ſimilis, & globoſus cùm ſit, neque infinitum eſſe, neque finitum, neque quieſcere, neque moueri ipſum aſſerat.

Ac primum quidem etiam iſte non ſecus ac Meliſſus, ſumit, id quod fit, ex eo quod eſt, gigni. At enim quid obſtat quin neque ex ſimili, neque ex diſſimili id quod fit, ſed ex nō ente exiſtat? Adde quòd nihilo magis efficietur, vt Deus ſit ingenitus, quàm vt reliqua etiam omnia: quandoquidem omnia ea ſimili vel diſſimili conſtiterunt: quod fieri non poteſt. Quare vel nihil erit præter
E Deum, vel reliqua etiam omnia erunt æterna. Præterea præſtantiſſimum eſſe Deum ſumit, potentiſſimum atque optimum ita appellans. Id autem ex lege minimè videtur: ſed in multis præſtantiores ſeſe mutuò eſſe Dii dicuntur. non igitur ex eo quod videtur, hanc de Deo conſenſionem ſumpſit. Accedit, quòd Deum eſſe præſtantiſſimum non eo ſenſu dicitur, vt erga aliud quippiam huiuſmodi ſit Dei natura, ſed quantum tantummodo ad ſuam ipſius affectionem attinet: nam ſi ad alterum ſpectemus, quid prohiberet, Deum non ſua ipſius æquitate & fortitudine, ſed ex aliorum imbecillitate excellere?

At Deum ita eſſe præſtantiſſimum intelligit nemo, ſed quia ipſe quàm optimè fieri poteſt, affectus eſt: nihilque ei, quominus bene & rectè ſeſe habeat, deeſt: quippe cùm ita ſeſe habenti ſimul illud etiam eueniat, neceſſe. Ita verò eſſe affectos etiam ſi plures ipſi ſint, nihil vetat: vt omnes quam optimè fieri poteſt, affecti, & præſtantiſſimi erga alios, nō erga ſe ſint: nam ſunt proculdubio etiam alia. Cùm enim præſtantiſſimum Deum eſſe dicat: id aliquorum eſſe neceſſe eſt: at verò vnum vndequaque videre & audire nihil conuenit: neque enim ſi non etiam hac parte videt, minùs videt, ſed ea parte non videt. Sed fortaſſe cùm inquit vndequaque ipſum ſentire, id ſibi vult: vt ipſum optimè ita affectum eſſe ſignificet, ſi ſimilis vndequaque ſit. At ſi ſit talis, cur globoſus potiùs quàm aliqua alia forma eſſe præditus debet, quia vndequaque audit, & vndequaque dominatur? Quemadmodum enim cùm ceruſſam vndequaque eſſe albam dicimus, nihil aliud ſignificare, quàm in omnibus eius partibus albedinem eſſe inſitam, volumus: quid impedimento eſt, quominus ita quoque illic vndequaque videre, & audire, & dominari dicatur, vt quamcunque eius partem quiſpiam ſumpſerit, eo modo eſſe affectam intelligamus? Sicvt igitur neque ceruſſam, ita neque Deum hac de cauſa globoſum eſſe neceſſe eſt. Porro neque infinitum neque finitum eſſe, corpus cùm ſit, magnitudinemque habeat, qui fieri poteſt? Præſertim cùm infinitum id ſit, quod finis capax finem non habeat. finis autem & terminus in magnitudine, & multitudine, & in omni demum quantitate ineſt. Quocirca quod finem non habet, magnitudo cùm ſit, infinitum eſt. Adde, quòd cùm ſit globoſus, finem quoque habeat neceſſe eſt. extrema enim habet: ſiquidem habet medium, à quo plurimùm abeſt: habet autem medium, cùm globoſum ſit. à medio verò extrema ignis circumeunt, extremum enim corpus, an fines habere, nihil refert. Neque prætèrea ſi non ens eſt infinitum, iccirco ens infinitum non erit. Quid enim obſtat quin nonnulla ſint, quæ eadem tam de ente quàm de non ente dici queant? Nemo ſiquidem eſt, qui non ens nunc ſentiat. ſed ens quoque non ſentire nunc quiſpiam poteſt. Quæ vtraque & dici & conſiderari ſanè poſſunt. Non album item non ens eſt: nunquid igitur propterea omnia quæ ſunt, eſſe alba dicendum erit, ne quippiam idem de ente, & de non ente ſignificemus? an nihil impediet quin ex iis etiam quæ ſunt, aliquid album non ſit: omitto quòd ita alterum quoque negationem admitteret infinitum, niſi id quod antea dictum eſt, magis ex eo quod habet, vel non habet, vnumquodque eſſe eſt exiſtimandum. Quare etiam ens vel infinitum erit, vel finem habebit. Fortaſſe etiam non enti infinitatem attribuere abſurdum eſt. non enim vnumquodque quod finem non habet, infinitum dicimus, ſicvt neque inæquale, id quod non eſt. Accedit, quòd Deus vnus cùm ſit, finem quantum ad alium Deum ſpectat, non habet. ſi verò vnum tantùm eſt Deus, vnum etiam tantùm partes ipſius Dei erunt. Nam illud quoque abſurdum eſt, ſi iis quæ multa ſunt, accidit, vt ad ſeſe mutuò ſint finita ac terminata, propterea ſequi vt vnum finem non habeat. multa ſiquidem ſunt, quæ & multis & vni eadem inſint: nam etiam eſſe ipſum commune vtriuſque eſt. Abſurdum itaq; fortaſſe eſſet, ſi propterea non eſſe Deum aſſereremus, quia multa ſint, ne in hoc ſimilis eſſe ipſis videretur. Ad hæc quid prohibet, Deum, etiam ſi vnus ſit, finitum eſſe, & fines habere? quemadmodum etiam Parmenides vnum eſſe ipſum inquit:

A θέλοι δ' ἂν οὐδεὶς οὕτω τὸν θεὸν φάναι κράτιστον εἶναι, ἀλλ' ὅτι αὐτὸς ἔχει ὡς οἷόν τε ἄριστα, καὶ οὐδὲν ἐλλείπει καὶ τὸ εὖ καὶ καλῶς ἔχειν αὐτοῦ. ἅμα γὰρ ἴσως ἔχοντι, κἀκεῖνο ἂν συμβαίη. οὕτω δὲ διακεῖσθαι καὶ πλείους αὐτοὺς ὄντας οὐδὲν κωλύει ἅπαντας, ὡς οἴονται ἄριστα διακειμένους, καὶ κρατίστους τῶν ἄλλων οὐχ αὑτῶν ὄντας. ἔστι δ' ὡς ἔοικε καὶ ἄλλα. κράτιστον γὰρ εἶναι τὸν θεόν φησι. τοῦτο δέ τινων εἶναι ἀνάγκη, ἕνα τε πάντα ὁρᾶν καὶ ἀκούειν, οὐδὲν προσήκει. οὐ γὰρ εἰ μὴ καὶ τῇδ' ὁρᾷ, χεῖρον ὁρᾷ ταύτῃ. ἀλλ' οὐχ ὁρᾷ. ἴσως τοῦτο βούλεται τὸ πάντῃ αἰσθάνεσθαι, ὅτι οὕτως ἂν βέλτιστα ἔχοι, ὅμοιος ὢν πάντῃ ἔτι τοιοῦτος ὤν.

B διότι σφαιροειδὴς ἂν εἴη, ἀλλ' οὐχ ὅτι ἑτέραν τινὰ μᾶλλον ἔχων ἰδέαν, ὅτι πάντῃ ἀκούει καὶ πάντῃ κρατεῖ. ὥσπερ γὰρ ὅταν λέγωμεν τὸ ψιμμύθιον, ὅτι πάντῃ ἐστὶ λευκόν, οὐδὲν ἄλλο τι σημαίνομεν, ἢ ὅτι ἐν ἅπασιν αὐτοῦ τοῖς μέρεσιν ἐγκέχρωσται ἡ λευκότης· τί δὴ κωλύει οὕτω κἀκεῖ τὸ πάντῃ ὁρᾶν καὶ ἀκούειν καὶ κρατεῖν λέγεσθαι, ὅτι ἅπαν ὃ ἂν τις αὐτοῦ λαμβάνοι μέρος, τοῦτ' ἔσται πεπονθός; ὥσπερ [δὲ] οὐδὲ τὸ ψιμμύθιον, οὐδὲ τὸν θεὸν ἀνάγκη διὰ τοῦτο εἶναι σφαιροειδῆ, ἔτι μήτε ἄπειρον, μήτε πεπεράνθαι. σῶμά γε καὶ ἔχον μέγεθος πῶς οἷόν τε, εἴπερ τοῦτ' ἔστιν ἄπειρον, ὃ ἂν μὴ ἔχοι πέρας δεκτικὸν ὂν πέρατος. πέρας δ' ἐν μεγέθει καὶ πλήθει ἐν γίνεται,

C καὶ ἐν ἅπαντι τῷ ποσῷ. ὥστε ἂν μὴ ἔχῃ πέρας μέγεθος ὂν ἄπειρόν ἐστιν. ἔτι δὲ σφαιροειδῆ ὄντα ἀνάγκη πέρας ἔχειν. ἔσχατα γὰρ ἔχει, εἴπερ μέσον ἔχει αὐτοῦ τὸ πλεῖστον ἀπέχειν. μέσον δ' ἔχει, σφαιροειδὲς ὄν, ἐκ τοῦ μέσου ὁμοίως πρὸς τὰ ἔσχατα, σῶμα ἔσχατα ἢ πέρατα ἔχειν, οὐδὲν διαφέρει. εἰ γὰρ καὶ τὸ μὴ ὂν ἄπειρον, οὐκ ἂν καὶ τὸ ὂν ἄπειρον. τί γὰρ κωλύει ἔνια ταῦτα λέγεσθαι τοῦ ὄντος καὶ μὴ ὄντος; τό τε οὐκ ὂν γὰρ οὐδεὶς νῦν αἰσθάνεται, καὶ ὂν δέ τις οὐκ αἰσθάνοιτο. ἃ νῦν ἄμφω δὲ λεκτά, ἔτι διανοητά. οὐ λευκὸν δὲ τὸ μὴ ὄν· εἰ οὖν διὰ τοῦτο τὰ ὄντα πάντα λευκά, ὅπως μή τι ταὐτὸ κατὰ τοῦ ὄντος σημαίνωμεν, καὶ

D μὴ ὄντος· ἢ οὐδὲν κωλύει καὶ τῶν ὄντων τι μὴ ὂν εἶναι λευκόν; οὕτω δὲ καὶ ἄλλην οὖν ἀπόφασιν δέξοιτο τὸ ἄπειρον, εἰ μὴ τὸ πάλαι λεχθέντι μᾶλλον, παρὰ τὸ μὴ ἔχειν, ἢ μὴ ἔχειν ἐστὶν ἅπαν. ὥστε καὶ τὸ ὂν ἢ ἄπειρον, ἢ πέρας ἔχον ἐστίν. ἴσως δὲ ἄτοπον καὶ τὸ προσάπτειν τῷ μὴ ὄντι ἀπειρίαν. οὐ γὰρ πᾶν, εἰ μὴ ἔχει πέρας, ἄπειρον λέγομεν, ὥσπερ οὐδ' ἄνισον οὐκ ἂν φαῖμεν εἶναι τὸ μὴ ὄν. ἔτι οὐκ ἂν ἔχοι ὁ θεὸς πέρας εἷς ὤν, ἀλλ' οὐ πρὸς θεόν. εἰ δὲ ἓν μόνον ἐστίν, ὁ θεὸς ἂν εἴη μόνον, καὶ τὰ τοῦ θεοῦ μέρη. ἐπεὶ γὰρ τοῦτ' ἄτοπον, εἰ τοῖς πολλοῖς συμβέβηκε πεπεράνθαι πρὸς ἄλληλα, διὰ τοῦτο τὸ ἓν μὴ ἔχειν πέρας.

E πολλὰ γὰρ τοῖς πολλοῖς, καὶ τῷ ἑνὶ ὑπάρχει ταὐτά. ἐπεὶ καὶ τὸ εἶναι κοινὸν αὐτοῖς ἐστιν. ἄτοπον οὖν ἴσως ἂν εἴη, εἰ διὰ τοῦτο μὴ φαῖμεν εἶναι τὸν θεόν. εἰ τὰ πολλά ἐστιν, ὅπως μὴ ὅμοιον ἔσται αὐτοῖς ταύτῃ. ἔτι τί κωλύει πεπεράνθαι τε ἔχειν πέρατα ἓν ὄντα, τὸν θεόν; ὡς καὶ ὁ Παρμενίδης λέγει, ἓν ὂν εἶναι αὐτόν,

Πάντοθεν εὐκύκλου σφαίρας ἐναλίγκιον ὄγκῳ,
Μεσσόθεν ἰσοπαλές.

τὸ γὰρ πέρας, τινὸς μὲν ἀνάγκη εἶναι, οὐ μέντοι πρός τί γε, οὐδὲ ἀνάγκη τὸ ἔχον πέρας, πρός τι ἔχειν, πέρας ὡς πεπερασμένον, πρὸς τὸ μὴ ἐφεξῆς ἄπειρον, ἀλλ᾽ ἔστι τὸ πεπεράνθαι ἔσχατα ἔχειν. ἔσχατα δ᾽ ἔχον, οὐκ ἀνάγκη πρός τι ἔχειν. ἐνίοις μὲν οὖν συμβαίνει πολὺ, καὶ πεπεράνθαι. πάλιν περὶ τοῦ ἀκίνητον εἶναι τὸ ἓν, καὶ τὸ ὄν, ὅτι καὶ τὸ ὂν κινεῖται, ἴσως ὁμοίως τοῖς ἔμπροσθεν ἄτοπον· καὶ ἔτι ἆρά γε οὐ ταὐτὸ ἄν τι ὑπολάβοι τὸ μὴ κινεῖσθαι, καὶ τὸ ἀκίνητον εἶναι, ἀλλὰ τὸ μὲν ἀπόφασιν κινεῖσθαι, ὥσπερ μὴ τὸ ἴσον, ὥσπερ καὶ κατὰ τοῦ μὴ ὄντος, εἴπερ ἀληθές. τὸ δὲ ἀκίνητον τῷ ἔχειν πῶς ἤδη λέγεσθαι, ὥσπερ τὸ ἄνισον. καὶ ἐπὶ τῷ ἐναντίῳ τοῦ κινεῖσθαι τὸ ἠρεμεῖν, ὡς καὶ σχεδὸν οἱ ἀπὸ τοῦ α ἀποφάσεις. ἐπὶ ἐναντίοις λέγονται. τὸ μὲν οὖν μὴ κινεῖσθαι, ἀληθὲς ἐπὶ τοῦ μὴ ὄντος· τὸ δὲ ἠρεμεῖν, οὐχ ὑπάρχει τῷ μὴ ὄντι. ὁμοίως δὲ οὐδὲ ἀκίνητον εἶναι σημαίνει ταὐτὸν, ἀλλ᾽ οὗτος ἐπὶ τῷ ἠρεμεῖν αὐτῷ χρῆται, καί φησιν τὸ μὴ ὂν ἠρεμεῖν, ὅτι οὐκ ἔχει μετάβασιν· ὅπερ καὶ ἐν τοῖς δύο εἴπομεν, ἄτοπον ἴσως, εἴ τι τῷ μὴ ὄντι προσάπτομεν, τοῦτο μὴ ἀληθὲς εἶναι κατὰ τοῦ ὄντος εἰπεῖν, ἄλλως τε κἂν ἀπόφασις ἢ τ᾽ ἐλεγχθέντων, καὶ τὸ μὴ κινεῖσθαι μηδὲ μεταλαμβάνειν ἐστί. πολλὰ γὰρ ἂν, καθάπερ καὶ ἐλέχθη, ἀφαιροῖτο τῶν ὄντων κατηγορεῖ. οὐδὲ γὰρ ἂν πολλὰ ἀληθὲς εἰπεῖν εἴη μὴ ἕν, εἴπερ καὶ τὸ μὴ ὂν ἐστὶ μὴ ἕν, εἴτε ἐπ᾽ ἐνίων τἀναντία ξυμβαίνειν δοκεῖ κατὰ τοσαύτας ἀποφάσεις· ὧν ἀνάγκη ἢ ἴσον ἢ ἄνισον ἄν τι πλῆθος, ἢ καὶ μὴ, ὡς ἢ καὶ ἄρτιον ἢ περιττὸν, ἂν ἀριθμὸς ᾖ. ὁμοίως δὲ ἴσως καὶ τὸ ἠρεμεῖν ἢ κινεῖσθαι ἀνάγκη ἂν σῶμα, ἢ ἔτι, εἰ καὶ διὰ τοῦτο μὴ κινεῖται ὁ θεός τε καὶ τὸ ἕν, ὅτι τὰ πολλὰ κινεῖται τῷ εἰς ἄλληλα ἰέναι, τί κωλύει καὶ τὸν θεὸν κινεῖσθαι εἰς ἄλλο; οὐδα τι μὲν, ἀλλ᾽ ὅτι εἷς μόνος θεός. εἰ δὲ καὶ αὐτὸς, τί κωλύει εἰς ἄλληλα κινουμένων τῶν μερῶν τοῦ κύκλωθεν ὄν; οὐ γὰρ δὴ τὸ τοιοῦτον ἕν, ὥσπερ ὁ Ζήνων πολλὰ εἶναι φησί. αὐτὸς γὰρ σῶμα λέγει εἶναι τὸν θεόν· εἴ τε δὲ τόδε τὸ πᾶν, εἴτε ὅτι δήποτε αὐτὸς λέγων. ἀσώματος γὰρ ὤν, πῶς ἂν σφαιροειδὴς εἴη ἐπιμόνως, ὅταν οὕτως [οὔτ᾽ ἂν κινοῖτο,] οὔτ᾽ ἂν ἠρεμοῖ μηδαμοῦ γε ὤν; ἐπεὶ δὲ σῶμά ἐστι, τί ἂν αὐτὸ κωλύει κινεῖσθαι ὡς ἐλέχθη;

A *Orbiculare globoſæ perſimile vndique moli,*
A cuius medio ſpatia in quaſcunque ferantur
Partes æqua.

Terminum enim & finem alicuius quidem eſſe neceſſe eſt,non tamen ad aliquid. Non enim neceſſe eſt vt quod habet finem, ad aliquid aliud finem habeat, tanquam finitum ad id referatur, quod deinceps ſubſequitur infinitum. Sed finitum eſſe, nihil aliud eſt, quàm extrema habere. quod autem extrema habet, vt ad aliquid ea habeat,neceſſe non eſt. aliquibus enim non accidit, vt finita ad ſeſe mutuò ſint. Præterea quod inquit de eo quod immobile eſt, & mouetur, ſimili modo vt ſuperiora, abſurdum fortaſſe eſt. neque B idem eſſe non moueri & immobile eſſe, exiſtimare quiſpiam poſſet: ſed non moueri eſſe negationem. quemadmodum etiam non æquale, quod de non ente etiam verum eſt. immobile verò de eo iam dici, quod quodammodo ſeſe habet, non ſecus ac inæquale. ſicvt etiam quieſcere. cui moueri contrarium eſt. nam negationes, quæ à primo exiſtunt, de contrariis etiam ferè dicuntur. Non moueri igitur de non ente etiam verum eſt, quieſcere autem non enti non ineſt. Simili modo autem neque immobile eſſe idem ſignificat. At iſte immobile eſſe pro quieſcere ſumit, & id quod C non eſt,quieſcere inquit, quia tranſitionem non habet. Sed ſicvt ſuperiùs etiam diximus, abſurdum fortaſſe eſt, ſi, quia aliquid non enti attribuimus,id de ente non eſſe verum dixerimus,præſertim ſi negatio fuerit, cuiuſmodi eſt non moueri, & non tranſire. Multa enim, vt etiam dictum eſt, de entibus ſimili modo dicuntur: alioqui verum non eſſet, ſi multa eſſe non vnum diceremus, eo quod non ens quoque non vnum eſt. In quibuſdam verò contraria videntur conuenire, cùm ex negationibus minimè loquimur. Neceſſe ſiquidem eſt, æquale vel inæquale eſſe quicquid multitudine & magnitudine conſtat: par item,vel impar, ſi numerus ſit, eodem modo moueri vel quieſcere, ſi ſit corpus. Præterea ſi etiam ea de cauſa D non mouetur Deus, & vnum, quia ea quæ multa ſunt, mouentur: dum in ſeſe mutuò tranſeunt, quid vetat quominus Deus quoque in aliud moueatur? Si autem ipſe non mouetur, quid vetat, partes ipſius omnia ambientis Dei in ſeſe mutuò moueri? quippe cùm vnum, quod Zeno inquit, multa natura eſſe videatur. Corpus enim Deum eſſe ſtatuit, ſiue vniuerſum hoc,ſiue quodcunque aliud ita appellet. Nam ſi eſſet incorporeus Deus, globoſus eſſe qui poſſet? Ita quidem ſanè, cùm nuſquam eſſet, neque etiam moueretur, neque quieſceret. At cùm ſit corpus, quin moueatur, ſicvt dictum eſt, nihil prohibet.

E

ΠΕΡΙ ΓΟΡΓΙΟΥ. ΚΕΦΑΛ. ε΄.

Οὐκ εἶναί φησιν οὐδέν· εἰ δ᾽ ἔστιν, ἄγνωστον εἶναι· εἰ δὲ καὶ ἔστι καὶ γνωστὸν, ἀλλ᾽ οὐ δηλωτὸν ἄλλοις. καὶ ὅτι μὲν οὐκ ἔστι συνθεὶς τὰ ἑτέροις εἰρημένα, ὅσοι περὶ τῶν ὄντων λέγοντες, τἀναντία, ὡς δοκοῦσιν, ἀποφαίνονται αὐτοῖς· οἱ μὲν, ὅτι ἕν, καὶ οὐ πολλά· οἱ δὲ αὖ, ὅτι πολλά, καὶ οὐχ ἕν· καὶ οἱ μὲν ἀγένητα, οἱ δ᾽ ὡς γενόμενα ἐπιδεικνύντες ταῦτα, συλλογίζεται κατ᾽ ἀμφοτέρων. ἀνάγκη γάρ, φησιν, εἴ τι ἐστι, μήτε ἕν, μήτε πολλὰ εἶναι,

DE GORGIA.

NOn eſſe quippiam inquit, & ſi ſit, cognoſci non poſſe, & ſi cognoſci poſſit, eſſe tamen eiuſmodi, vt nequeat manifeſtari. Præterea ſe nequaquam quæ ab aliis fuerint dicta, compoſuiſſe, qui de rebus diſputantes, contraria, vt videntur, inter ſe ſibi ipſi pronunciant: dum alij vnum & non multa, alij è contrario multa & non vnum quiddam, ingenita, nonnulli genita eſſe omnia demonſtrant. Ipſe enim aduerſus vtroſque ratiocinatur in hunc modum. Neceſſe, inquit, eſt vt ſi quid ſit, neque vnum, neque multa,

neque ingenita, neque genita, id nihil ſit. Nam ſi quicquam horum non ſit, altera his oppoſita proculdubio erunt: hoc eſt, neque vnum, neque multa, neque ingenita, neque genita non erunt. Atque hæc partim vt Meliſſus, partim vt Zeno aggreditur, demonſtrare poſt primam propriam ſuam demonſtrationem, in qua neque eſſe, neque non eſſe quippiam inquit. Si enim non eſſe, eſt non eſſe, non ens nihilo minùs erit, quàm ens: quippe cùm non ens ſit non ens, & ens ſit ens. Quare nihilo magis eſt res eſſe, quàm non eſſe. at ſi ſimili modo, inquit, ſicvt non eſſe, eſt eſſe, oppoſitum non erit. Nam, ſi non eſſe eſt eſſe, eſſe vel non eſſe conuenit. Quare nequaquam ita, inquit, quippiam erit, niſi eſſe & non eſſe idem ſit. eſt autem idem, atque ita nihil quicquam eſt. Nam non ens non eſt, & ens entium, quandoquidē idem eſt quod non ens. atq. hæc quidē ipſa, ratio illius eſt.

Sed ex iis quæ dicit, nullo modo efficitur vt nihil ſit. Cùm enim inquit, ſi non ens eſt, non ens, & ens eſt ens, ſimili modo & non ens, & ens eſt, perinde ac ſi eſt abſolutè ac ſimpliciter ſumatur: id neque apparet, neque neceſſe eſt. Sed ſicvt de duobus ente & non ente alterum eſſe, alterum non eſſe dicitur. quapropter non ens eſſe, verum non eſt. Quia igitur non eſt, non ſequitur vt neque eſſe neque non eſſe vtrunque, neque alterum non ſit. At nihil erit, inquit, ſi non eſſe & eſſe ſimiliter ſunt. quandoquidem erit aliquid etiam non eſſe. Sed nemo eſt, qui non eſſe, eſſe prorſus dicat. Nam ſi non ens eſt non ens, non propterea efficitur vt ſimili modo vt ens, non ens ſit: quippe cùm illud ſit non ens, ens autem ſit: adde quòd, ſi etiam abſolutè ac ſimpliciter verum eſſet, cùm dicimus non ens eſſe, mirum quidem profectò id videretur: ſed ſi tamen ita eſſet, verùm ex eo magis eueniret, vt omnia eſſent, quàm non eſſent? Ita enim contrarium proculdubio efficeretur. Si enim & non ens eſt, & ens eſt, omnia ſunt: cùm & ea quæ ſunt, & ea quæ non ſunt, ſimili modo ſint. Non etenim eſt neceſſe, ſi non ens eſt, vt etiam ens non ſit. Verumtamen ſi ita etiam quiſpiam conceſſerit, vt & non ens ſit, & ens non ſit, nihilominus omnia eſſent, eo quòd ea quæ non ſunt, ex illius ratione proculdubio eſſent. Præterea, ſi idem etiam ſit & eſſe & non eſſe, neque ita magis vt non ſit, quàm vt ſit, conficietur. Nam quemadmodum ille inquit, ſi non ens, & ens idem eſt, non ens autem non eſt, etiam ens non erit. quamobrem nihil erit: ita quoque vice verſa dicere omnia eſſe non poſſumus. ſi enim non ens eſt, & ens eſt, omnia erunt. Poſt hanc rationem ſubiungit ſi ſit aliquid, eſt vel ingenitum vel genitum eſſe. ſi verò ingenitum, infinitum id fore ex Meliſſi enuntiatis ſumit. Infinitum autem nullo modo eſſe, cùm neque in ſe ſit, neque in alio: duo enim ita, vel plura eſſent: ipſum vnum quod eſt, & illud in quo eſſet. nunquam autem cùm ſit, neque eſſe prorſus, ex Zenonis ratione de ſede aſſeritur. Hac de cauſa igitur ingenitum non eſſe affirmat. quin etiam neque genitum: eo quòd nihil neque ex eo quod eſt, neque ex eo quod non eſt, gigni queat. Si enim ens, inquit, tranſmutetur, nequaquam ens ampliùs erit, ſicvt ſi non ens gigneretur, non ens ampliùs non eſſet. Sed neque ex non ente genitum eſt: ſi enim non ens non eſt, genitum nihil ex nihilo eſſet. Sin autem eſt non ens, quia neque ex ente quicquam gignitur, iccirco neque ex non ente.

A μήτε ἀγένητα, μήτε γενόμενα, οὐδὲν ἂν εἴη. εἰ γὰρ μὴ εἴη τι, τούτων δὲ θάτερα εἴη, ὅτι οὐκ ἔστιν οὔτε ἓν, οὔτε πολλὰ, οὔτε ἀγένητα, οὔτε γενόμενα. τὰ μὲν ὡς Μελίσσος, τὰ δὲ ὡς Ζήνων ἐπιχειρεῖ δεικνύειν μετὰ τὴν πρώτην ἴδιον αὐτοῦ ἀπόδειξιν, ἐν ᾗ λέγει ὅτι οὐκ ἔστιν οὔτε εἶναι, οὔτε μὴ εἶναι. εἰ μὲν γὰρ τὸ μὴ εἶναι, ἔστι μὴ εἶναι, οὐδὲν ἂν ἧττον, τὸ μὴ ὂν τοῦ ὄντος εἴη. τό, τε γὰρ μὴ ὂν, ἐστὶ μὴ ὂν, καὶ τὸ ὂν, ὄν. ὥστε οὐδὲν μᾶλλον ἢ εἶναι, ἢ οὐκ εἶναι τὰ πράγματα. εἰ δ᾽ ὅμως τὸ μὴ εἶναί ἐστι, τὸ εἶναί φησιν, οὐκ ἔστι τὸ ἀντικείμενον. εἰ γὰρ τὸ μὴ εἶναί ἐστι, τὸ εἶναι, ἢ μὴ εἶναι προσήκει. ὥστε οὐκ ἂν οὕτως φησὶν, B οὐδὲν ἂν εἴη, εἰ μὴ ταὐτόν ἐστιν, εἶναί τε καὶ μὴ εἶναι. ἔστι δὲ ταὐτό. καὶ οὕτως οὐκ ἂν εἴη οὐδέν. τό, τε γὰρ μὴ ὂν, οὐκ ἔστι, καὶ τὸ ὂν, ἐπείπερ ταὐτὸ τῷ μὴ ὄντι. οὗτος μὲν οὖν ὁ αὐτὸς λόγος ἐκείνου.

ΚΕΦΑΛ. ϛʹ.

Οὐδαμόθεν δὲ συμβαίνει ἐξ ὧν εἴρηκεν, μηδὲν εἶναι. ἃ γὰρ ἀποδείκνυσιν, οὕτως διαλέγεται· εἰ τὸ μὴ ὄν ἐστιν ἢ ἔστιν, ἁπλῶς εἰπεῖν εἴη, καὶ ἔστιν ὅμοιον μὴ ὄν. τοῦτο δὲ οὔτε φαίνεται οὕτως, οὔτε ἀνάγκη, ἀλλ᾽ ὡς περὶ δυοῖν, ὄντος, τοῦ δ᾽ οὐκ ὄντος, τὰ μέν ἐστι, τὰ δ᾽ οὐκ ἀληθὲς, ὅτι ἐστὶ τὸ μὲν μὴ ὄν. διότι οὖν οὐκ ἔστιν, οὔτε εἶναι, οὔτε μὴ εἶναι τὰ ἄμφω, οὐδ᾽ ἕτερον οὐκ ἔστιν. οὐδὲν γὰρ C φησιν εἴη ἂν τὸ μὴ εἶναι, τοῦ εἶναι, εἴπερ εἴη τι καὶ τὸ μὴ εἶναι. οὐδεὶς φησιν εἶναι τὸ μὴ εἶναι οὐδαμῶς. εἰ δὲ καὶ ἔστι τὸ μὴ ὂν, μὴ ὄν, οὐδ᾽ οὕτως ὁμοίως εἴη ἂν τὸ μὴ ὂν, τῷ ὄντι. τὸ μὲν γὰρ ἐστὶ μὴ ὄν, τὸ δὲ καὶ ἔστιν. ἔτι εἰ δεῖ καὶ ἁπλῶς εἰπεῖν ἀληθὲς, ὡς δὴ θαυμάσιον τ᾽ ἂν εἴη, τὸ μὴ ὂν ἐστιν. ἀλλ᾽ εἰ δὴ οὕτω, πότερον μᾶλλον ξυμβαίνει τὰ πάντα εἶναι ἢ μὴ εἶναι; αὐτὸ γὰρ οὕτω γε τοὐναντίον ἔοικε γίνεσθαι. εἰ γὰρ τό τε μὴ ὄν ἐστι, καὶ τὸ ὄν, ὄν ἐστιν, ἅπαντά ἐστι. καὶ γὰρ τὰ ὄντα, καὶ τὰ μὴ ὄντα ἐστίν. οὐκ ἀνάγκη γὰρ, εἰ τὸ μὴ ὂν ἐστι, καὶ τὸ ὂν μὴ εἶναι. εἰ δὴ καὶ οὕτω τις ξυγχωρεῖ, καὶ τὸ μὲν μὴ ὂν εἴη, τὸ δὲ ὂν μὴ εἴη, ὅμως D οὐδὲν ἧττον εἴη ἄν. τὰ γὰρ μὴ ὄντα, εἴη κατὰ τὸν ἐκείνου λόγον. εἰ δὲ ταὐτόν ἐστι καὶ τὸ εἶναι, καὶ τὸ μὴ εἶναι, οὐδ᾽ οὕτως μᾶλλον οὐκ εἴη, ἂν τι εἴη. ὡς γὰρ κἀκεῖνος λέγει, ὅτι εἰ ταὐτὸν μὴ ὄν, καὶ ὄν, τό, τε ὂν οὐκ ἔστι, καὶ τὸ μὴ ὄν. ὥστε οὐδὲν ἐστιν ἀντιστρέψαντι, ἔστιν ὁμοίως φάναι, ὅτι πάντα ἐστί. τό, τε γὰρ μὴ ὄν ἐστι, καὶ τὸ ὄν· ὥστε πάντα ἐστί. μετὰ δὲ τοῦτον τὸν λόγον φησίν· εἰ δὲ ἐστιν, ἤτοι ἀγένητον, ἢ μὴ γενόμενον εἶναι. καὶ εἰ μὲν ἀγένητον, ἄπειρον αὐτὸ τοῖς τοῦ Μελίσσου ἀξιώμασι λαμβάνει· τὸ δὲ ἄπειρον, οὐκ ἂν εἶναί ποτε. οὔτε γὰρ ἐν αὐτῷ, οὔτ᾽ ἂν ἐν ἄλλῳ εἶναι. δύο γὰρ ἂν, οὕτως ἢ πλείω εἶναι, τό, τε ἐν ὄν, καὶ τὸ ἐν ᾧ, μη-E δαμοῦ· δέον οὐδὲ εἶναι κατὰ τὸν Ζήνωνος λόγον περὶ τῆς χώρας. ἀγένητον μὲν οὖν διὰ ταῦτ᾽ οὐκ εἶναι, οὐ μὴν οὐδὲ γενόμενον γενέσθαι τὸν οὐδὲν ἂν οὔτ᾽ ἐξ ὄντος, οὔτ᾽ ἐκ μὴ ὄντος. εἰ γὰρ τὸ ὂν μεταπέσοι, οὐκ ἂν ἔτ᾽ εἶναι τὸ ὄν, ὥσπερ γ᾽ εἰ καὶ τὸ μὴ ὂν γένοιτο, οὐκ ἂν ἔτι εἴη μὴ ὄν· οὐδὲ μὴν οὐδ᾽ ἐξ ὄντος ἂν γενέσθαι. εἰ μὲν γὰρ μὴ ἐστὶ τὸ μὴ ὄν, οὐδὲν ἂν ἐκ μηδενὸς ἂν γενέσθαι. εἰ δ᾽ ἔστι τὸ μὴ ὄν, δι᾽ ἅπερ οὐδ᾽ ἐκ τοῦ ὄντος, διὰ ταῦτα οὐδ᾽ ἐκ τοῦ μὴ ὄντος γενέσθαι.

Εἰ οὖν ἀνάγκη μὲν, εἴπερ ἔστι τι, ἢ τὸ ἀγένητον εἶναι ἢ γενόμενον· ταῦτα δὲ ἀδύνατα, ἀδύνατόν τι καὶ εἶναι. ἔτι εἴπερ ἔστιν ἓν ἢ πλείω φησὶν ἐστὶν, [illegible] ἕν, μήτε πολλά, οὐδὲν ἂν εἴη· καὶ ἓν μὲν ὅτι ἀσώματον ἂν εἴη τὸ ἕν. ἢ ἐσχομένῳ γε τῷ τοῦ Ζήνωνος λόγου· ἑνὸς δὲ ὄντος, οὐδ' ἂν εἶναι οὐδὲ μὴ μήτε πολλά. εἰ γὰρ μήτε ἕν, μήτε πολλά ἐστιν, οὐδ' ἂν κινηθῆναί φησιν. οὐδὲν γὰρ κινηθείη, ἢ οὐκ ἂν ἔτι, ἢ ὡσαύτως ἔχον, ἀλλὰ τὸ μὲν οὐκ ἂν εἴη, τὸ δ' οὐκ ὂν γεγονὸς εἴη. ἔτι δὲ ἢ κινεῖται, καὶ εἰ μεταφέρεται οὐ συνεχὲς ὄν, διῄρηται τὸ ὄν, οὔ τέ τι ταύτῃ· ὥστε πάντῃ κινεῖται, πάντῃ διῄρηται. εἰ δ' οὕτως, πάντα οὐκ ἔστιν, ἐκλιπὲς γὰρ ταύτῃ φησίν, ᾗ διῄρηται τοῦ ὄντος· ἀντὶ τοῦ κενοῦ τὸ διῃρῆσθαι λέγων, καθάπερ ἐν τοῖς Λευκίππου καλουμένοις λόγοις γέγραπται. Εἰ μὲν οὖν οὐδὲ τὰς ἀποδείξεις λέγειν ἅπαντα. δεῖ γὰρ τὰ φρονούμενα εἶναι, καὶ τὸ μὴ ὄν, εἴπερ μὴ ἔστι μηδὲ φρονεῖσθαι. Εἰ δ' οὕτως, οὐδὲν ἂν εἶναι ψεῦδος οὐδείς φησιν, οὐδ' εἰ ἐν τῷ πελάγει φαίη ἁμιλλᾶσθαι ἅρματα. πάντα γὰρ ἂν ταῦτα εἴη. καὶ γὰρ τὰ ὁρώμενα καὶ ἀκουόμενα διὰ τοῦτο ἔστιν, ὅτι φρονεῖται ἕκαστα αὐτῶν· εἰ δὲ μὴ διὰ τοῦτο, ἀλλ' ὥσπερ οὐδὲν μᾶλλον ὁρῶμεν ἔστιν οὕτω μᾶλλον ἃ ὁρῶμεν ἢ διανοούμεθα; καὶ γὰρ ὥσπερ ἐκεῖ, πολλοὶ ἂν ταῦτα ἴδοιεν, καὶ ἐνταῦθα πολλοὶ ἂν ταῦτα διανοηθείημεν. τὸ οὖν μᾶλλον δὴ τοιάδ' ἐστί· ποῖα δὲ τἀληθῆ, ἄδηλον. ὥστε καὶ εἰ ἔστιν, ἡμῖν γε ἄγνωστα εἶναι τὰ πράγματα. Εἰ δὲ γνωστά, πῶς ἄν τις φασί, δηλώσειεν ἄλλῳ; ὃ γὰρ εἶδε, πῶς ἄν τις φησί τοῦτο εἴποι λόγῳ; ἢ πῶς ἂν ἐκείνῳ δῆλον ἀκούσαντι γίγνοιτο μὴ ἰδόντι; ὥσπερ γὰρ οὐδὲ ἡ ὄψις τοὺς φθόγγους γιγνώσκει, οὕτως οὐδὲ ἡ ἀκοὴ τὰ χρώματα ἀκούει, ἀλλὰ φθόγγους· καὶ λέγει ὁ λέγων, ἀλλ' οὐ χρῶμα, οὐδὲ πρᾶγμα. Εἰ οὖν τις μὴ ἐννοεῖ πῶς αἰτεῖ παρ' ἄλλου λόγῳ ἢ σημείῳ τινὶ ἑτέρου πράγματος ἐννοήσειεν, ἀλλ' ἢ ἐὰν μὲν χρῶμα ἰδών· ἐὰν … μος ἀρχὴν γὰρ οὐ λέγει γρειδὲ χρῶμα. ὥστε οὐδὲ διανοεῖσθαι χρῶμά ἐστιν, ἀλλ' ὁρᾶν, οὐδὲ ψόφον, ἀλλ' ἀκούειν. Εἰ δὲ καὶ ἐνδέχεται, γινώσκει τε καὶ ἀναγινώσκει λέγων. ἀλλὰ πῶς ὁ ἀκούων τὸ αὐτὸ ἐννοήσει; οὐ γὰρ οἷόν τε τὸ αὐτὸ ἅμα ἐν πλείοσι καὶ χωρὶς οὖσιν εἶναι. δύο γὰρ ἂν εἴη τὸ ἕν. Εἰ δὲ καὶ εἴη, φησὶν, ἐν πλείοσι καὶ ταὐτὸν, οὐδὲν κωλύει μὴ ὅμοιον φαίνεσθαι αὐτοῖς, μὴ πάντῃ ὁμοίοις ἐκείνοις οὖσι καὶ ἐν τῷ αὐτῷ, εἴ τι ἐν τοιούτου εἴησαν, ἀλλ' οὐ δύο εἶεν. φαίνεται δὲ οὐδ' αὐτὸς αὐτῷ ὅμοια αἰσθανόμενος ἐν τῷ αὐτῷ χρόνῳ, ἀλλ' ἕτερα τῇ ἀκοῇ καὶ τῇ ὄψει, καὶ νῦν τε καὶ πάλαι διαφόρως. ὥστε σχολῇ ἄλλῳ πᾶν ταὐτὸ αἴσθοιτό τις. οὕτως οὐκ ἔστιν, εἰ ἔστι γνωστόν, οὐδεὶς ἂν αὐτὸ ἑτέρῳ δηλώσειεν, διά τε τὸ μὴ εἶναι τὰ πράγματα λεκτά, καὶ ὅτι οὐδεὶς ἕτερον ἑτέρῳ ταὐτὸ ἐννοεῖ. ἅπαντες δὲ καὶ οὗτοι ἑτέρων ἀρχαιοτέρων εἰσὶν ἀπορίαι. ὥστε ἐν τῇ περὶ ἐκείνων σκέψει καὶ ταῦτα ἐξεταστέον.

A Quocirca ſi neceſſe eſt, vt ſi quicquam eſt, id vel ingenitum ſit, vel genitum: hæc autem fieri nequeunt: vt quicquam ſit, fieri etiam nullo modo poteſt. Præterea, ſi quicquam eſt, inquit, id vnum eſt, vel plura: ſi autem neque vnum, neque plura, nihil eſt. Si enim vnum eſſet, incorporeum id eſſet, ſicvt in Zenonis ratione dictum eſt. Si verò vnum ſit, nihil eſſe: quin neque etiam multa. Si enim vel vnum eſſet, vel multa, neque moueretur quidem quippiam, inquit. Si enim moueretur, vel non vnum amplius eſſet, vel non ſimili modo ſeſe haberet: ſed partim non eſſet: partim non ens genitum eſſet. ſi item mouetur, transfertur, ſi transfertur, non continuum ens diuiſum eſt, neque quicquam hac parte eſt. Quare ſi vndequaque B mouetur, vndequaque etiam diuiſum eſt: vndequaque igitur etiam non eſt. Deficit enim ea parte, inquit, qua diuiſum ab ente eſt; diuiſum loco vacui appellans, quemadmodum in Leucippi rationibus, quæ vocantur, ſcriptum eſt. Si igitur nihil hæ demonſtrationes conficiant, omnia eſſe. Oportet enim vt quæ cogitantur, ſint: & non ens, ſiquidem non eſt, ne cogitari quidem poſſit. Quod ſi ita ſit, nullum eſſe mendacium inquit, neque ſi in mari currus decertare quiſpiã dixerit, eo quod ea omnia etiam ſint. Nam quę videmus quoque & audimus ſingula, propterea ſunt, quia cogitantur. Si enim non propterea, cur ſicvt ea quæ videmus [illegible] ſunt, ita magis ea quæ videmus eſſe dicendum eſt, C quàm quæ cogitamus? quippe cùm, ſicvt illic multi eadem poſſent videre, ita hîc multi cogitare eadem poſſemus. Ac quæ quidem cogitantur, talia ſunt. Sed quænam ſint vera, incertum eſt. Efficitur ergo, vt etiam ſi quippiam ſit, cognoſci à nobis res minimè*queant. Si verò, inquit, cognoſci etiam poſſunt, quo pacto manifeſtare eas quiſpiam alteri poterit? Quod enim vidit quiſpiam, id quo modo oratione alteri explicabit? vel quomodo id alteri audienti & non videnti poterit manifeſtari? Nam ſicvt viſus ſonos non percipit: ita neque auditus audire colores poteſt; ſed ſonos tantummodo. Et dicit quidem ille qui loquitur, ſed non colorem, neque rem dicit. Quomodo igitur D rem quiſpiam ab altero vel verbis, vel ſigno aliquo alio ſibi exponi petit, quam ille conſiderauit? Qui enim colorem intuitus non eſt, ſed orationem audiuit, ignorat colorem, & orationem percipit: qui verò è contrario colorem inſpexit oratione auditu minimè percepta, non colorem, ſed orationem ignorat. Quare cogitari neque color, ſed videri, neque ſonus, ſed audiri tantummodo poteſt. Sed ſi etiam cogitari poteſt: & cognoſcit quidem ac recognoſcit ille qui dicit: qui audit tamen quo pacto idem cogitabit? non enim fieri poteſt vt idem in pluribus, & ſeorſum collocatis ſit. vnum enim duo eſſet. Verùm ſi etiam idem, inquit, in pluribus ſit, nihil obſtat quin id non ſimile diuerſis appareat, qui non prorſus ſimiles inter E ſe ſunt. Quin etiam in eodem quamuis vnum, & non duo ſint, idem non prorſus ſimile ineſt. quippe cùm neque idem ipſe ſimilia in eodem etiam tempore ſentire videatur: ſed alia auditu, viſu alia, & antea & nunc diuerſo modo percipiat, vt difficulter admodum omnia eadémque aliter ſentire quiſpiam queat. Ita fit vt etiam ſi cognoſci res poſſit, eam alteri explicare quiſpiam poſſit: propterea quod, & res ipſæ explicabiles verbis non ſunt, & idem prorſus quod alter, cogitare poteſt nemo. Sed omnes quidem etiam hæ veterum aliorum dubitationes ſunt. Quocirca hæc quoque perpendenda atque excutienda in diſputatione de illis videntur.

ΑΝΕΜΩΝ ΘΕΣΕΙΣ ΚΑΙ ΠΡΟΣΗΓΟΡΙΑΙ, ΕΚ ΤΩΝ Ἀριστοτέλους, περὶ Σημείων.

VENTORVM SITVS ET APPELLATIONES, EX Ariſtotelis libro, de Signis.

BOREAS, *Aquilo.* Hic in [Ciliciæ] A Mallo *Pagreus* dicitur: flat namq; a magnis & pendulis rupibus, ac mōte duplici, qui cùm alter prope alterum ſitus ſit, Pagrici montes appellantur. In Cauno *Meſes* nominatur: in Rhodo *Caunias*, quoniam à Cauno ſpirat, portum eorum Acaniam infeſtans. in Olbia prope Mygalum Pamphyliæ, *Gaureus* dicitur, quia flat ab inſula cui nomen Gauris. CÆCIAS. Hic in Leſbo *Thebanas* vocatur. flat namq; à Thebe campo, ſupra Myſiæ ſinū Elæaticum ſito: infeſtatq; Mytelenæorum portum, maximè verò Maloentem. apud *Aecaunias* dicitur: quem alij B Boream eſſe putant: inter quos & Lyrnatiēſes prope Phaſelidē. APELIOTES, *Subſolanus.* Hic in Phœniciæ Tripoli *Potameus* vocitatur, flátq; à campo qui ad ſimilitudinem magnæ areæ à Libano & Bapyro mōte cingitur: quamobrem & *Potameus* vocitatur. infeſtat autem [inter alia] & Poſidonium. in Iſſico ſinu & circa Roſſum nomiñatur *Syriandus*. flat namq; à Syriis portis, quæ Taurū & Roſſios montes diſpeſcunt. in Tripolitico ſinu *Marſeus* nominatur, à Marſo vico. in Proconneſo, Teo, Creta, Eubœa & Cyrene, dicitur *Helleſpontias*: quoniam ab Helleſponto ſpirat. maximè vero infeſtat Eubœæ Caphareum, & Cyrenæū C portum, nomine Apolloniam. apud Sinopenſes vocatur *Berecynthias*, quoniam à Phrygiæ locis (Berecyntho monte) ſpirat. in Sicilia *Cataporthmias* (ſeu *Porthmias*) appellatur: quoniam à freto (ſeu anguſto Siculi maris traiectu) ſpirat, quidam eum *Cæciam* eſſe putant, ac *Thebanam* appellitant. EVRVS, *Vulturnus.* Hic apud Ægas Syriæ vocatur *Scopeleus*, à Roſſiorum ſcopulo. Cyrenis *Carbas* nominatur, à Carbanis Phœniciæ: quamobrem & *Phœnicias* à quibuſdā nuncupatur. ſunt qui & *Apelioten* eum eſſe arbitrantur. ORTHONOTVS, *Rectus ac germanus Notus.* (niſi fortè legendum *Euronotus*) Hunc alij *Eurum*, alij *Amneum* appellitant. NOTVS, *Auſter*, eodem apud D omnes vocatur nomine. nomen autem traxit ex eo quòd humidus ſit, ac plerunq; imbribus madens: & vtroque nomine morboſus. LEVCONOTVS, *Albus notus*: ex effectu nomen ſortitus: quia [diſcuſſo nubium atrore, cœlum] ſerenat. LIBS, *Africus.* Et hic à Libya nomen ſortitus: quippe ab ea ſpirans. ZEPHYRVS, *Fauonius.* Huic quoque nomen ex eo impoſitum, quoniam ab Heſperia plaga ſpirat. Veſpera vero, [diurnæ lucis finem ferens, à ſolis occaſu incumbit.] IAPIX. Hic Tarenti *Scyletinus* dicitur, à loco: *Scylacinus* circa Dorylaium Phrygiæ. à quibuſdam *Pharangites* appellatur: quoniam è cōualle qua- E dam ad Pegæum ſita ſpirat: à multis *Argeſtes* nominatur. THRACIAS, in Thracia quidem *Strymonias* vocitatur, quippe qui à Strymone fluuio ſpirat: in Megarico tractu *Sciron* dicitur, à Scironiis ſaxis. in Italia & Sicilia *Circias* (ſeu *Cyrcias*) appellatur, quoniam à Circæo ſpirat. in Eubœa & Leſbo nominatur *Olympias*, à Pierico Olympo tracto vocabulo. infeſtat autem Pyrrhæos. Delineaui porro tibi & ſitus eorum, prout ſiti ſunt & ſpirant, deſcripto terrarum orbe, vt euidenter tibi ob oculos ponerentur.

ΒΟΡΡΑΣ, ἔστι ἐν μὲν Μαλλῷ Παγρεύς· πνεῖ γὰρ ἀπὸ κρημνῶν μεγάλων, καὶ ὀρῶν διπλῶν, περὶ ἀλλήλοις κειμένων, ἃ καλεῖται Παγρικά· ἐν δὲ Καύνῳ Μέσης· ἐν δὲ Ῥόδῳ, Καυνίας· πνεῖ γὰρ ἀπὸ Καύνου, ἐνοχλῶν τὸν λιμένα αὐτῶν, τὸν Ἀκανίαν. ἐν δὲ Ὀλβίᾳ τῇ κατὰ Μυγαλὸν τῆς Παμφυλίας, Γαυρεύς· πνεῖ γὰρ ἀπὸ νήσου ἣ καλεῖται Γαυρίς. τινὲς δὲ αὐτὸν βορρᾶν οἴονται εἶναι, ἐν οἷς καὶ Λυρνατεῖς οἱ κατὰ Φασηλίδα. Καικίας· ἔστι ἐν μὲν Λέσβῳ καλεῖται Θηβανάς· πνεῖ γὰρ ἀπὸ Θήβης πεδίου τοῦ ὑπὲρ τὸν Ἐλαιατικὸν κόλπον τῆς Μυσίας, ἐνοχλεῖ δὲ τὸν Μιτυληναίων λιμένα, μάλιστα δὲ τὸν Μαλόεντα· παρὰ δὲ Αἰκαυνίας, ὃν ἄλλοι βορρᾶν οἴονται εἶναι. Ἀπηλιώτης· ἔστι ἐν μὲν Τριπόλει τῆς Φοινίκης, Ποταμεὺς καλεῖται· πνεῖ [δὲ] ἐκ πεδίου ὁμοίου ἅλωνι μεγάλῃ, περιεχομένου ὑπό τε τοῦ Λιβάνου καὶ τοῦ Βαπύρου ὄρους· παρὸ καὶ Ποταμεὺς καλεῖται. ἐνοχλεῖ δὲ καὶ Ποσειδώνειον. ἐν δὲ τῷ Ἰσικῷ κόλπῳ, καὶ περὶ Ῥωσσόν, Συριανδός· πνεῖ δὲ ἀπὸ τῶν Συρίων πυλῶν, ἃς διέστηκεν ὅ τε Ταῦρος καὶ Ταυρόσια ὄρη· ἐν δὲ τῷ Τριπολιτικῷ κόλπῳ Μαρσεύς, ἀπὸ Μάρσου κώμης. ἐν δὲ Προκοννήσῳ καὶ ἐν Τήῳ καὶ ἐν Κρήτῃ καὶ Εὐβοίᾳ, καὶ Κυρήνῃ, Ἑλλησποντίας· μάλιστα δὲ ἐνοχλεῖ τόν τε τῆς Εὐβοίας Καφηρέα, καὶ τὸν Κυρηναῖον λιμένα, καλούμενον δὲ Ἀπολλωνίαν· πνεῖ δὲ ἀφ' Ἑλλησπόντου. ἐν δὲ Σινώπῃ Βερεκυντίας ἀπὸ τῶν κατὰ Φρυγίαν τόπων πνέων· ἐν δὲ Σικελίᾳ, Καταπορθμίας, πνέων ἀπὸ τοῦ πορθμοῦ. τινὲς δὲ αὐτὸν Καικίαν οἴονται εἶναι Θηβανὰν προσαγορεύοντες. Εὖρος· ἔστι ἐν μὲν Αἰγαῖς τῆς κατὰ Συρίαν Σκοπελεὺς καλεῖται, ἀπὸ τοῦ Ῥωσίων σκοπέλου· ἐν δὲ Κυρήνῃ, Καρβᾶς, ἀπὸ τῶν Καρβανῶν τῶν κατὰ Φοινίκην· διὸ καὶ τὸν αὐτὸν Φοινικίαν καλοῦσί τινες. εἰσὶ δὲ οἳ καὶ Ἀπηλιώτην νομίζουσιν εἶναι. Ὀρθόνοτος· τοῦτον οἱ μὲν Εὖρον, οἱ δὲ Ἀμνέα προσαγορεύουσι. Νότος δὲ ὁμοίως παρὰ πᾶσι καλεῖται· τὸ γὰρ ὄνομα, διὰ τὸ νοσώδη εἶναι· ἔξω δὲ κάτομβρον, καὶ ἀμφότερα δὲ νότον. Λευκόνοτος· τὸ δὲ ὄνομα ἀπὸ τοῦ συμβαίνοντος. λευκαίνεται γὰρ · · · Λίψ. καὶ τοῦτο τὸ ὄνομα ἀπὸ Λιβύης, ὅθεν πνεῖ. Ζέφυρος· καὶ ἔστι τόδε τὸ ὄνομα, διὰ τὸ ἀφ' ἑσπέρας πνεῖν· ἡ δὲ ἑσπέρα · · · Ἰάπυξ· ἔστι ἐν Τάραντι Σκυλήτιος, ἀπὸ χωρίου Σκυλαττήμου κατὰ Δορυλαέιον τῆς Φρυγίας· ὑπὸ δέ τινων Φαραγγίτης· πνεῖ γὰρ ἔκ τινος φάραγγος τῆς κατὰ τὸ Πηγαῖον· παρὰ πολλοῖς δὲ Ἀργέστης. Θρακίας κατὰ μὲν Θρᾴκην, Στρυμονίας· πνεῖ γὰρ ἀπὸ τοῦ Στρυμόνος ποταμοῦ· κατὰ δὲ τὴν Μεγαρικὴν Σκίρρων, ἀπὸ τῶν Σκιρρωνίδων πετρῶν. ἐν δὲ Ἰταλίᾳ καὶ Σικελίᾳ Κιρκίας, διὰ τὸ πνεῖν ἀπὸ τοῦ Κιρκαίου· ἐν δὲ Εὐβοίᾳ καὶ Λέσβῳ, Ὀλυμπίας. τὸ δὲ ὄνομα ἀπὸ τοῦ Πιερικοῦ Ὀλύμπου· ὀχλεῖ δὲ Πυρραίους. ὑπογέγραφα δέ σοι καὶ τὰς θέσεις αὐτῶν, ὡς κεῖνται καὶ πνέουσιν, ὑπογράψας τὸν τῆς γῆς κύκλον, ἵνα καὶ πρὸ ὀφθαλμῶν σοι τεθῶσι.

ΤΕΛΟΣ.

INDEX RERVM ET VERBORVM QVÆ NOTATV DIGNIORA IN ARISTOTELIS OPERVM PRIMO TOMO CONTINENTVR.

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alec, omnium piſcium fœcundiſſimus 873 d
aleces bruma pariunt: cæteri qui pelagici ſunt,æſtate magna ex parte ibid.
alga fucaria vnde proueniat 870.b
alimenti attractio,elaboratióque non ſolùm pòſt,ſed & priùs quàm integris ſuis partibus animal ſit abſolutum, in vtero peragitur 751.d
alimenti motus reſpirationem præcedit, ibidem
alimenti per corpus diſtributio 1021.e
de alimento ſeu nutrimento quomodo fiat, an contrarium contrario vel potiùs ſimile ſimili nutriatur 615.d e
alimento, ex quo iam partes animaliũ fiunt, natura ſanguinis eſt 722.e
alimentum vltimum animalibus ſanguineis, ſanguis eſt 982.d
alimentum refrigerationem ingrediendo facit 718.c
alites fere omnes quibus vngues adunci, pullos cùm primùm prouolandi facultas fuerit, nido expellunt, percutientéſque cogunt diſcedere 864 c.d
alitibus magnis,et anſeri,aquilæ,& aliis quãtum temporis incubationi à natura ſtatutum ſit 864 b
aloidæ quid facere aggreſſi ſint 601.a
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aluconis auis victus 902.c eiuſdem magnitudo ibid.
aluntur omnia eiſdem quibus conſtant 321.e
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aluum eam partem nominamus,quæ eſt ſicci excrementi conceptaculum 765.a
ab Ambiguitate ſeu amphibologia,locus ſophiſticus 283.d
ambulatio abſq. flexione fieri nequit 754.b
amia vbi optima euadat 913.e
amiæ piſcis victus 900.c 901.b
amiæ, cùm belluam viderint aliquam, colligunt ſeſe: & quæ magnitudine præſtant, luſtrantes eas circumuallant, & ſi qua violatur, defendunt 941.a
ab amicis, locus problematum de comparatione 208.c
ab amicorum bono, locus problematum de comparatione ibid.
amnium ſeu fluuiorum cur alij perennes ſint alij non 548.c
amnium ſeu fluuiorum corpus neque totum alicubi ſitum eſt,neque ſtabile eſt,ſed quotidie ſemper fieri videtur 551.c
amnium effluxio nonniſi ſubuerſio quædam exiſtit 570.a
amygdala & chalcidica herba ad mella conficienda vſum præbent maximum. tum etiam augere fœtum vehementer dicuntur 1152.a
anacharſidis hyperbolica demõſtratio, Apud Scythas tibicines non eſſe, quia illic vites non eſſent 1144
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anaphyſema,quaſi efflatus terræ dicitur ventus ſublimem ſeſe rapiens,cùm aut ſpecu altiùs depreſſo flatus emicuerit, aut terra in hiatum diſcedente 606.c
anas quibus locis degat 903.c
anas, gauia & harpa inuicem diſſident 923.d
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anaxagoras errore opinari videtur, fel eſſe morborum cauſam acutorum 1020.b
anaxagoras mentem principium maximè omnium ponit: ſolam namque omnium rerum ipſam ſimplicem & non miſtam & puram eſſe ſinceramque dixit 620.d
anaxagoras quid de elementis ſentiat 478.b
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anguilla neque ouum, neque ſemen ſortita eſt 871.b
anguilla quomodo capiatur 827.b
anguilla neque mas,neque fœmina eſt, neq: prolem ex ſe aliquã poteſt procreare 831.c
anguillæ de lacu & fluuio in mare veniunt 871.c
anguillarũ in genere meliores ſunt quas fœminas nominant: quæ nomen fœminæ temerè acceperunt: non ſunt enim fœminæ: ſed quia aſpectu à cæteris diſcrepant, fœminæ appellantur 911.d
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anima quonam modo corpora moueat 684. c & ſ.
anima animalium duobus hiſce definita eſt, diſcernendi potentia (quod quidem eſt opus officiúmque mentis & ſenſus) & inſuper etiam mouendi motu ad locum accommodato facultate 656.d

Anima eſt vt manus: manus enim eſt inſtrumentorum inſtrumentum, & intellectus formarum eſt forma, & ſenſus itidem ſenſibilium forma ibid. b.c
anima ſine phantaſmate, ſeu imaginatione, nunquam intelligit 655.c
Anima non actu ſed potentia tantùm in conceptu & ſemine eſt 1077.b
anima vegetatrix in habentibus, actu vna ſimpléxque eſt, potentia vero multiplex & plures 716.a
de anima ſcientiam omnium eſſe præſtantiſſimam atque difficillimam 616.c
anima nutritiua quid 634.c.d
de anima opiniones antiquorum 619.a
de anima omni docere, vtrùm ſcientiæ naturalis ſit 969.d
animæ definitio & declaratio eiuſdem 630.a
animæ mouentis principium eſſe in medio corporis 707.d
animæ potentiæ ſunt, nutritiuũ, ſenſitiuum, appetitiuum, loco motiuũ atque intellectiuum 633.c
animæ conuenientia cum figuris ibid.c
animæ omnes affectus videntur eſſe cum corpore, ira, manſuetudo, timor, miſericordia, confidentia, gaudium, odium denique & amor: nam vnà cum his ipſum corpus aliquid patitur 618.a
animæ varia partitio 656.c 657.a
animæ mouendi vis quid 656.d
animæ vegetalis inſtrumenta 1085.b
animam nec à ſe nec ab alio moueri poſſibile eſt 625.d
animam omnes his tribus, motu, ſenſu, incorporeóque definiunt 621.a.b
animam quodammodo eſſe omnia entia 656.b
animam quamuis ſine vllo diſcrimine quoduis corpus ingredi, Pythagoricorum fabulæ dicunt 624.a
animam iraſci vel timere, ſimile eſt atque ſi quiſpiam animam texere dicat vel ædificare: nam melius eſt fortaſſe dicere, non animam, ſed hominem anima miſereri, vel diſcere, vel ratiocinari 625.b.c
animam ſentientem vnam actu habent animantia omnia 1007.b
animam non componi ex corporeo ſubtiliſſimo, ſicut nonnulli arbitrantur 626.c
animam non eſſe harmoniam contrà quàm nonnullis videatur 624.b
animam ignem eſſe, malè quidam arbitrati 986.a b
animal quodque humorem habere, aliter tamen vel huic vel illi ineſſe 765.c.d
animal, natura ſua humidum eſt calidúmque 712.c.d
animal cur nullum branchias & pulmonem ſimul habeat 715.b.c
animal ea parte eſt animal, in qua ſenſus habetur 984.c
animal moueri & intellectu & appetitu 658.a
animal eſt ob ſenſum primo: nam & ea quæ non cientur motu, nec mutant locum, ſenſum autem habent, non ſolùm viuere dicimus, ſed etiam animalia nuncupare ſolemus 631.a
animal mouetur cogitatione, phantaſia, ſelectione, voluntate & cupiditate 704.d
animal nullum eſt, quod aut ſemper dormiat, aut ſemper vigilet, ſed vtrumque eidẽ tributum à natura eſt 685.c.d
animal quod volucre tantũ ſit, vt piſcis natatile ſolummodo eſt, nullum nouimus 763.b.c
animalia quæ lambendo, quæ ſorbendo quæve mordendo bibant, quibúſq. rebus corpore nigera omnia paſcantur 905.b toto capite
animalia quæ viſcera & inteſtina habeant, quæ non 1021.b
animalia perfectiora quæ ſint 1071.a.b
animalia non omnia omni tempore proſperè valere, & quæ tempora aliis ſalubria, aliis inſalubria & noxia 613.c
animalia multa ſunt quæ ſenſum quidem habent, manent tamen & ſemper immobilia ſunt 657.c
animalia ex quibus refrigerationem ſibi cõcilient 718.c
animalia, vt moueantur etiam extrinſecus, aliud ab ipſis eſſe oportere quod quieſcat 704.b.c
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animalia perfecta in tres partes diuiduntur: vna eſt qua cibum capiunt, altera qua excrementum emittunt, tertia quæ inter illas media eſt, in qua principium nutritiuæ facultatis poſitum eſt 715.c.d
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animalia quæ perfectum animal, quæ oua, quæ vermem gignant, quóve ritu quæque incedant 766.a
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animalia probiùs aluntur & augentur conſopita quàm vigilantia 686.c
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animalium quadrupedum ac multipedũ motus per diametrum agitur 778.e
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animaliũ partes aut ſimplices ſunt, quæ ſcilicet in ſimiles ſibi partes diuiduntur, vt caro in carnes, & ob eam rem ſimilares appellantur: aut cõpoſitæ, quæ aptæ ſecari in partes diſſimiles ſint, non in ſimiles: quapropter diſſimilares vocantur 761.a
animalium quæ inter ſe gerant inimicitias, & quamobrem 922.b
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apeda, id eſt quæ pedibus carent, ſummum habent ad id quod in vniuerſo eſt mediũ 736.d
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aſili auiculæ victus 902.c
aſili, quo agitantur piſces, deſcriptio 914.d
aſilus vnde & vbi enaſcitur 850.a
aſilus thunnorum qualis 857.a
aſinæ cur conceptus incontinens 1093.c
aſini paſtus & potus 906.b
aſini locis frigidis non gignuntur 1095.c
aſini coitus & partus 842.b.c
de Aſini coitu, & Aſinæ partu, déque maris ac fœminæ ætate 881.c.d
aſini nulli ſunt in Gallia & Scythia propter frigus immodicum 919.d.e parui habentur in terra Illyrica, & Thracia, & in Epiro ibid.
aſinos vno morbo laborare, frigoríſque impatientes eſſe 918.b
aſinus equi genituram corrumpit, ſed equus aſini minimè 881.d.e
aſinus & ſpinus inimici inter ſe ſunt, & quá ob cauſam 914.c
aſinus cur hoſtis colotæ ibid.b
aſinus felle caret 789.c
aſinus Indicus & vnicornis & ſolipes eſt 780.b
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aſionis auis victus 902.b.c eiuſdem magnitudo ibid.
de Aſionum duplici genere 936.b
aſpis in Africa gignitur, cuius ictui nullum remedium eſt 920.d
aſſa cur elixis minùs arida 586.e
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auditorij meatus auium 992.d
de Auditu & ſono 640.a.& ſeq.
auditum eiúſque partem ſenſoriam, id eſt aures, à latere habemus, eodem in orbe quo oculos 773.d
auditus natura & locus in corpore 991.d & ſeq.
augmentatio, ſeu accretio, an differat à cæteris motibus 502.a
auem appellamus genus pennatum 767.a
aues cùm ægrotant, plumæ indicium proferunt: turbâtur enim, nec poſituram eandé ſeruant, quam habent cùm rectè valent 913.d
aues paruæ, ſalaces præfœcundæque ſunt, & quamobrem 1095.d
aues quæ carne veſcuntur quoties anno pariant 864.a
aues cur maximè, bipedes exiſtentes, ſtare valeant 742.b
aues magna ex parte anniculæ nequeunt generare 863 b c
aues volaces notantur quæ vngues habent aduncos: calcarigeræ, quæ præ ſua grauitate ſunt ad volandum ineptiores 787.a
aues omnes oua parere, diuerſis tamen anni temporibus, nec in ouorum numero omnes conuenire 858.d & ſ.
aues omnes vncæ, breui ſunt collo, lingua lata, aptæque ad imitandum 908.c
aues crura inflectunt ad concauam circuli circumferentiam 743.a
aues quomodo quatuor notis moueri queãt, & de ratione volatus earum 741.a
aues nonnullæ nuncupãtur apedes à paruitate pedum 763.c
auibus aduncis nullus omnino vſus bibendi eſt, præterquam pauciſſimis quibuſdam, quæ & ipſæ raro vtuntur 903.d
auibus quæ tempora ad ſanitatem proſint, quæve incommoda ſint 913.b.c
de auibus quæ hyeme occultantur 91.e
de auibus quæ pro actionibus afficiuntur, moribúſque immutantur 954.d.& ſ.
de auibus quæ nidum non ædificant, vt coturnicibus, perdicibus, & huiuſmodi 919.c.& ſeq
auium victus, & quæ carniuoræ, quæ frugiuoræ, quæve omniuoræ ſint, quæ item cibum è terra, quæ ex aquis petant 902.a
auium agreſtium domicilia 931.b.c
de auium generibus quæ apud aquas degũt ibid.e
auium ratione vocis, diſcrimina 829.d
auium roſtri diſcrimen & vſus 1000.a.b
auium partes exteriores, & earum differentiæ, quáſque ob cauſas ſic à natura poſitæ ſint 1040.c.d
auium oua quid à piſcium ouis differant, & quamobrem 1102.b.c
auium magna pars incubat, fœminæ mare ſuccedente: aliqui mares incubandi munus tantiſper ſubeunt, dum fœminæ intermiſſo incubitu cibum ſibi quærunt 865.b
auium fœtura: & quoties, quibúſve anni temporibus coëant atque pariant 840. c,d
auium piſciúmque oua, maris ſemine fœcunda reddi 1105.d.e
de auium natura, & quibus cum cæteris terræ animantibus conueniant 785.a
auium pulli quot dierum ſpatio in ouis generentur, déque eorum creationis ordine 861.c
auium nonnulla genera, omnium maximè animalium poſt hominem literas proferre queunt, videlicet ea præcipuè, quibus lingua latior eſt 786.e
auium ſemen genitale & incubandi officiũ 859.c
auium linguæ functio 997 b.c
aura dicitur expiratio quæ ex humore prodit 605.c
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auratæ vbi pariant 839.c
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auratæ quomodo capiantur 831 a
aures orbem capitis æquis portionibus ſecant tenéntque medium 992.a
aures ſeu auriculæ quæ quorum morum indices 770.c.d
aures homini tantùm immobiles ibid.b
auricula pars auris exterior, cuius pars ſuperior, pinna: inferior, fibra 770.c tota ex cartilagine, carnéque conſtituta eſt ibid.
auricularum ſitus in quadrupedibus 992.c
auriculas habent omnia quę animal generãt, excepto vitulo marino, & delphino ac reliquis item cetariis 770.b.c
auris quid ibid.a.b
aurium ſigna phyſiognomonica 1180.a
auriuittis auiculæ victus 902.d
aurum quatenus dicatur elixari 587.a
auſter & boreas ſeu aquilo, contrarij venti 565 d.e
auſter flaturus, priùs, quàm cœperit, denunciat 568.c
auſter ab æſtiuo ſolſtitio, & non ab altera viſa ſpirat 562.a.b
auſtri qui venti dicantur 560.c
auſtrinus aër quàm ſeptentrionalis meliùs in aquam mutari ſolet 582 d
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axioma ſeu pronunciatum, quid 132.b
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B

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Balænæ & delphini, & quæ fiſtulam gerunt aquatilia, quomodo dormiant 811.a
Balænæ fiſtulam habent à fronte, delphini verò à dorſo 766.a
Balænarum partus 868.c
Balænarum victus ſeu viuendi ratio qualis ſit 898.d & ſeq.
Baleri piſcis partus 871.b
Balerus piſcis quo morbo afficiatur 915.a
Balneæ calidæ, quæ circa Ædepſum poſitæ ſunt, qua ex cauſa prouenere 567.c
barba non pari modo effunditur omnibus, ſed aliis tã maxillæ, quã muſtax, & mentũ pilorum frequentia teguntur: aliis mẽtum lęue & muſtax, maxillæ piloſę cernũtur 806.b
bathea Ponti 546.c
beſtię omnes ferè efferatiores in Aſia ſunt, fortiores in Europa, multiformiores in Africa 920.a
bibendi varij animantium modi 905 b
bicorne ſimulque ſolipes nullum animal eſt quod nos adhuc norimus 780.b
bipeda, ſummum ſeu partem ſuperiorem habent ad id quod in vniuerſo eſt ſummum 736.c
biſulca, binis fiſſuris vtrinque, id eſt, à parte priore, poſterioréque diducuntur 780.a
bitumen inſtar aquę è terra ſubſilientis vbi naſcatur 1163.d
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Bœotię terræ in agro Orchomenio talpę habentur multę, at in Lebadico vicino nullę ſunt: neque ſi aliunde portatę eò fuerint, volunt infodere 919.a
de Bolintho fera mirabile quid 1150.a
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bombyx quid 851.c
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bombycia vnde deducantur 850.e vbi & à quo primùm texta ibid.
de Bonaſi natura, ſpecie, moribus, & partu 952.c
bonaſis excrementi profuſionem natura pro auxilio dedit, vt & aliis quibuſdam animãtibus 1001.b
bonaſus interiora omnia bubus ſimilia continet 790.b
bonaſus qui in Pæonia terra & Medica gignitur, & biſulcus eſt, & iubam habet ac bina cornua orbem inflexu mutuo colligentia 780 c
à Boni ſimilitudine, locus problematum de comparatione 208.a
Boreas flat ab Vrſa 606.a
Boſphorus cur aſſiduè fluat 549.a.b
boſca auis cui ſimilis ſit, quibúſque locis degat 903.c
Bos, fœmina, cùm coitum affectat, leuiter purgatur, quantum heminæ dimidium aut paulo plus: tempus autem coeundi tunc potiſſimum eſt cùm purgatur 876.b
bos etiam annicula peperit, vt educari augerique quantum genus exigeret, licuerit 842.c
bos ſi à recenti caſtratu ineat, procreare poteſt 956.c
boues, minimè peruicaces, mites, remiſſi 764.c.d
boues quibus rebus paſcantur, & de eorumdem incremento 905.e cornua iuniorum tepefacta in cera flectuntur, ducunturque facilè quò volueris ibidem
boues quomodo bibant 905.b
boues quales in Syria 919.c
boues circa Toronam paucis ante partum diebus lacte carent, reliquo tempore habent perpetuò 812.c
boum ſocietas 916.a
de Boum coitu, partu, vitę longitudine, tam maris quàm fœminę 879.a
boum gregalium morbi 9.6.e

Boum quoddam genus ſuo in corde oſſiculum continere aiunt 789.b
Brachia cur homines ad cauum, anteriorem autem & quadrupeda animalia contrario modo flectant 742.e
Brachia ex latere corporis ſiniſtro dextróq. dependent atq. ſe introflectunt, ita vt homini potiſſimùm deuexa crurum & brachiorum aduerſa inter ſe ſint 771.d
brachiale vocatur is nodus, quo cū brachio manus iungitur coarctaturque 772.c
brachium ad gibberum inflectitur ibid.
brachium ſeu vlna quid ibid.d
branchiæ detectæ ſunt muſtelo, raiæ, & reliquis generis eiuſdem 766.a
branchiæ peculiares ſunt piſcibus, quibus humorem, quem ore acceperint, reddunt 787.c
branchiæ & pulmo quid differant 725.e
branchiarum ratione vt differant inter ſe piſces 787.d.e
branchias quæ habeant 725.d
branchiata penè omnia, acutis ſerratiſque dentibus ſunt 726.c
branchiata, cibum per os recipere ſolēt, humore tantùm per branchias emiſſo, nullā enim habent arteriam ibid.
braſtæ terræmotus vocantur ij qui ſurſum & deorſum ad angulos rectos iactant: ſic dicti à ſimilitudine aquæ efferueſcentis 607.e
Brenthi domicilium 931.d
de Brutis & eorum fœtura 855.c
Bryſonis demonſtratio qualis fuerit, qua circulum quadrare, conabatur probare 139.a
bubo, ſpecie ſimilis noctuæ eſt, ſed magnitudine non minor quàm aquila 901.b
bubonis victus ibid.
bubulum lac craſſiſſimum omnium 811.a
bubulum lac fertilius caſeo eſt quàm caprinum ibid.d
buccina & purpuræ, canis exortu dies circiter tricenos conduntur 910.d
buccina, teſtaceorum ſpecies 819.c
buccinæ partus 840.b
buccinarum fauificatio 843.e
buccinis quales ſint teſtæ 819.a.b
buteo, præcipuum genus accipitrum 939.e
buteo hoſtis ranæ & rubetæ & anguis eſt, rapit enim eos, atque excedit 923.d
Butconis victus 902.a.b

C

CÆcias ventus ſerenus non eſt, quòd in ſe reflectatur: vnde & illud prouerbium dici ſolet, Vt Cæcias nubem, perinde ad ſe trahens 565.a
Cæcias quando ſpirat 564.c
Cæcias & Africus, venti oppoſiti & contrarij 561.e
Cænei captio, qua oſtendere conabatur ignem gigni per proportionem multiplicatam 142.d
de Cæruleo aue, & eius forma 935.a
Cæcitatis cauſa 1136.d
Calcaria auium ex quo gignantur 1089.a
Calefaciunt vehementiùs ſolida firmioráq; omnia, quàm humida 983.e
Calida humiditas vitæ ac incrementi cauſa exiſtit 715.b
Calidi & frigidi variæ acceptiones 980.a
Calidum & frigidum, elementorum qualitates actiuæ 583.e.584.a
Calidum innatum, ſeu calor naturalis, principium omnium animalium & ſtirpium 981.a.b
Calidum quid 515.c
Caliginis & nubis differentia 540.c
Calor naturalis, deficiente alimento extrinſecus aſſumpto, ipſum animal & plantam conſumit 715.c
Calor, ſpiritus regioni non conuenit 7[illegible].a
Calor vitalis ineſt in ſemine omnium, efficit vt fœcundum ſit ſemen 10[illegible].e
Calor ad exequenda animæ officia, omnium maximam vim obtinet 9[illegible]6.a
Calor quam ob cauſam fiat [illegible].a
Calor naturalis, dùm educitur, quæ ſegregata ſunt, conſiſtere facit 585.b
de Calore qui eſt inanimalium corporibus, & de eius effectibus 555.c.& ſ.
caloris & refrigerationis in animali vis 724.d
caloris eſt concoctio: concoctionis verò maturatio, elixatio, aſſatio 585.b
caloris vis diuerſa pro materiæ varietate 981.b
calua quid 768.c
caluæ deſcriptio 802.d
calueſcere minùs ſolent, qui mento ſunt bipartito 806.b
caluities plantis & animalibus cōmunis affectio 1141.c
caluities qua parte capitis accidat 1140.a
caluitij mulieres eſſe immunes & pueros & ſpadones, apertum eſt 805.e non accidit prius quàm cœptus coitus Venereus ſit, ibidem.
caluitium quid ibid.
caluus parte capitis poſteriore nemo efficitur ibid.
calx quid 773.a
Cameli fœminæ caſtrantur, cùm eis vti in prælio libet, ne concipiant vtero. Nonnulli ſuperioris Aſiæ incolæ, camelos vel ad tria millia poſſident: currūt cameli celeriùs quàm equi Niſſani, propter laxiorem ſui gradus glomerationem 936.e
cameli Bractianæ ab Arabiis differunt: alteris enim bina, alteris ſingula tubera habentur 779.c.d
cameli lac & caro ſuauiſſima: bibitúrq. eius lac ad vnam menſuram, duabus aut tribus aquæ admiſtis 88.e
cameli deſcriptio 779.c
cameli lac tenuiſſimum eſt 811.a
cameli venter 1016.d
camelus ruminat more cornigerorum ibid.e
cameli partus 843.b
cameli quomodo coëunt 834.d.e
camelis genitale neruo ita conſtat, vt vel ex eo confici poſſit, quo arcus fidiſſimè intendatur 834.e
de Cameli vtero & ætate 852.e
camelorum vitæ longitudo 956.d
camelorum libido 874.e
camelos eas quæ per exercitum longiore itinere fatiſcunt, calceant carbatinis 779.e
camelum, nunquam matrem ſuperuenire, etiamſi cogatur 951.e
camelus proprium inter cæteras quadrupedes habet in dorſo quod tuber appellant 779.c.d
camelus in ventre mammas duas cum papillis quatuor habet, vt & bos 779.d
camelus fel non diſcretum, ſed venulis quibuſdam confuſum habet 1020.a
cancelli deſcriptio 821.b
cancellorum piſciculorum pedes 103.a
cancer, quartum genus cruſta molli intectorum animalium 815.d
cancer vnus quaternis pedibus regi ſolitus eſt 767.e
cancri exuunt ſenectutem, molliores quidē perſpicuè, ſed etiam duriores exuere aiūt, vt maias 913.a
cancri quomodo coëunt 857.a.b
cancri, cruſta ſua exuuntur per ver, vt angues ſua membrana 847.c.d
cancrorum ſpecies 816.e
cancrorum generatio 845.e
cancrorum partes 1029.e
cancrorum oris vſus 1039.e
canis muſtelini partus 867.e
canes an mutent dentes, quóve modo vetuſtiores à recentioribus dignoſcantur 782.a
canes animoſi, [illegible], aſſentatores 764.d
canes Laconici ex vulpe & cane generantur 20.b canes Indicos ex tigride & cane gigni confirmant, verùm nō ſtatim, ſed tertio coitu ibid.
canes cùm lumbricis infeſtantur, herbā tritici comedunt 927.c
canum morbi 916.d
canum libido 876.a
canum partus 842.a
de Canum coitu & fœtura, eorúmque vitæ longitudine 877.d.e
caneſcere pilos ocyùs opertos quàm detectos difflatóſque aduertimus 805.c
canities qua parte capitis accidit 1140.a
canities non ariditate committitur, vt quidā volunt, & cur 805.c
canitiei cauſa 1137.e 1142.e 1143.a 1143.e & 1144.a & quæ partes celeriùs canitiem ſentiant 805.d
canitiei remedium 1144.b.c
canthari, vbi metuerint, motu ceſſant, totóque corpore indureſcunt 1028.b
cantharidæ vnde gignantur 850.d
capella auis quibus locis degat 903.c.d
capi vt fiant 956.b
capitoni pluuia nocet, quæ piſcibus aliis ferè omnibus prodeſt 914.a
capitonis partus 873.c
capitonum victus 900.e
capræ, anniculæ coëunt, atque vterum ferūt 841.e.
capræ tondentur in Cilicia, vt alibi oues 919.c
capræ ſylueſtres in Creta inſula, ſagitta trāſfixæ dictamnum herbam quærunt, hac enim ſpicula ex corpore eiici dicitur 927.c
capræ, cùm gerunt partum, pingueſcunt, edúntque amplius 876.c.d
capræ & torres qua de cauſa in ſummo aëre appareant 533.a
capræ quibus herbis veſcantur, & de cauſa impinguationis earundem 906.d.e
caprarum mores 925.d.e
caprarum montis Octæ vbera vt mulgeantur à paſtoribus 811.b
caprarum coitus & fœtus & vitæ longitudo 877.a.b
de Capris Syriæ 919.b
capro (in Lemno inſula) ex mammis, quas geminas iuxta genitale gerit, tantùm lactis emulgebatur, vt coloſtra inde conficerent. Quod idem etiam proli maſculæ capri illius eueniſſe accepimus. Sed hæc oſtentis annumeranda potiùs ducunt 811.b
caprea, minima cornigerorum animantium, quos nouimus 1001.a
capreis inutilia ſunt ad defenſionem cornua 1001.a
capriceps auis liene omnino caret 789.b
caprimulgi auis deſcriptio 937.a.b
caprinum lac miſcere cum ouillo Siculi, & quibuſcunque ſit copia caprini, conſueuerunt 811.c
caprire quid 887.c
caput hominis quale 991.a

caput humanum plurimas ſuturas ſeu iuncturas habet, pluréſque mas quàm fœmina 987.b
Caput an abſciſſum loqui poſſit 1014.c hiſtoria ſeu fabula de capite quod abſciſſum loquutum fuiſſe ferunt ibid.
caput viri,viſum eſt ſine vlla ſutura 802.c
caput quo ordine generetur 1017.c
caput quot oſſibus conſtat 801.e
caput ſuperiorem obtinet ſitum in corpore 773.c
capitis ſigna phyſiognomonica 1180.a
carbonatilia quæ 596 d
carduelis victus 902 d
carô vndique viſibilis eſt, nec venarum aut neruorum more in longum ſecari tantû idonea 803.a
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de Carne ſine iis quæ vice carnis habeantur 987.d
carne dûri, ſunt hebetiores: quibus verò mollis eſt caro, ij ſunt ingenioſi mentéq; dextri 642.c
carnis ſigna phyſiognomonica 1171.d e
Carthaginienſibus militâtes ſtipendia in coemptionem fœminarum tantùm impendere, & quamobrem 1158.a
de Cartilagine & vt differat ab oſſe 803.d.e
cartilaginis & oſſis diſcrimen 989.e
cartilaginea, viuipera quidem ſunt, ſed non intra ſe 715.c
cartilaginei generis nonnulla ſtridere videtur: verùm ab iis vocem emitti vllam, rectè dici non poteſt: at ſonum, ſiue ſtrepitum reddi, veriùs dixeris 819.a
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catulus quibus locis degat 903.c
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caſtrare ſolent duobus modis: aut enim teſtes nouellos adhuc frangunt, aut adultos iam firmóſque excidunt 791.a
caſtrata auctiora, quàm incaſtrata, euadunt 956.c
caſtratione vt immutentur animalia ibid.a.b
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D

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I N D E X.

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Empedocles non rectè dixit, ideo incrementa plantas ſuſcipere tum in radicibus infrà, tum in ramis etiam ſuprà, quia terra deorſum ſuapte natura, & ignis ſurſum identidem pergit 635.b
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F

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Inſectorum, & præcipuè apum morbi 918.d
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Inſectorum in genere ſunt quæ omnino ſexus diſcrimen non habeant 1048.a
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Intellectus contemplatiuus, nihil eorum quę ſub actionem cadunt, contemplatur, neq. dicit quicquam omnino ſi ſit fugiendum an perſequendum 657.d
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Intellectus aliquo valde intelligibili intellecto, non minùs ſanè ſed magis percipit intelligitque inferiora 652.a b
Intellectus, potentia eſt quodammodo intelligibilia ipſa, actu verò nihil eſt eorum antea quàm intelligat ipſa 653.b
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ab Interrogationibus duabus quaſi vna acceptis, locus ſophiſticus 286.d.e
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Iphicles & Hercules quomodo procreati ſint, ſi fabulis credatur 892.c
Iris cur ab æquinoctio autumnali die decreſcente quacunque hora fiat, & eo rurſus creſcente ab æquinoctio verno vſque ad alterum per meridiẽ non cernatur 581.d
Iris ſeu arcus cæleſtis quid, & vnde generetur 575.a de eius accidentibus & coloribus ibid c & ſeq.
de Iride tractatio partim phyſica eſt, partim optica nam quòd ſit, eſt phyſici ſcire; cur verò ſit, optici 144.b.c & ſeq.
iſter fluuius 545.d
in Ithaca inſula lepores ſi aliunde illati dimittantur, viuere nequeunt: ſed eodẽ reuerſi, vnde maris introierint inſulam, moriuntur 919.b
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iumentorum paſtus & potus 906.b
iupiter, ſeu Stella Iouis quanto ſpatio ſuum orbem metiatur & peragat 612.c
iunco auis quibus locis degat 903.b
iuuenca, recentior quàm annicula non patitur Venerem, niſi oſtento 879.d cùm plures iuuencæ grauidæ ſunt, & facilè initum patiuntur, pro ſigno hyemis & imbrium id accipitur ibid.
iuuencæ augentur ampliùs cùm plus temporis expertes Veneris degunt 906.a
iuniores, ſeu mares ſeu fœminæ, exigua imperfectáque generant 883.c
de iuuentute & ſenectute 714.d & in ſ.
iuuenta quid 730.d.
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iyngis auis deſcriptio 786.b
iyngis auis digiti 1143.c

L

LAbeo ex mugilibus quando coeat & quandiu vterum ferat 871.b
Labiorum ſigna phyſiognomonica 1178.d.e
de Labris 771.a
labrorum natura & officium 996.d
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lactis copiam quæ efficiant, quæve eandem extinguant 811.d & ſeq.
lac quadrupedũ fieri incipit ad ſpeciem puris, initio coitus, ſed vtile poſtea eſt cùm pepererint 876.a
lac in maribus etiam fieri poteſt 771.c
lac ad alendum validius, in quo plus caſei eſt: ſed infantibus ſalubrius quod minus caſei contrahat 812.d
de Lactis aduentu in muliere, & de eiuſdem duratione 816.c
de Lactis muliebris bonitate, & eiuſdẽ malignitate 892.e & ſeq.
lac diu edurat omnibus, ſi nõ coeant, nec paſtu careant copioſo 811.c
de Lacte 810.c & ſeq.
Lac mulierum cõmodius lactẽribus eſt quod liuorẽ trahit, quàm quod candidum eſt: & fuſcæ ſalubrius habent quã candidæ 811.d

I N D E X.

Lactis futuræ copiæ indicium ibid.
Lac quæ animalia habeant,& quã ob cauſam à natura datum ſit 1131.& ſeq.
Lac ſi nihil aut parum habeat caſei, ad aquã potiùs ſpectat, atque nullatenus alit 591.a
de Lacteo circulo, qui & lac dicitur 558.a.b & in ſeq.
Lacerta quomodo crura inflectat quum incedit 778.c
Lacertarum oua 858.a
Lacertus pars brachij 772.c
Lacertus vbi teſtes habeat 795.e
Lacertis ex quadrupedibus ouiparis lingua bifida vt ſerpentibus, partéque extrema piloſa admodum 1038.e
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lacertorum latitatio 884.a
lacertæ quomodo coeant 835.b
lacheſis, quam inter tres Parcas functionem habeat 616.b
lacrymæ concoctionem receperũt cùm ſordes in oculis obortæ ſunt 585.d
Laconas cur Pythia vocarit [illegible] 1152.b
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lactes vbi collocati 775.b
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lacus commoditate loca prædita piſces poſſident optimos 914.b.c
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Lapides molares adeò colliqueſcunt, vt diffluant 590.e
Laſer, ſerpens quidam puſillus Africæ 920.d eius ictui quodnam remedium ſit ibid.
latax ad quem ordinem ſeu genus aquarum pertineat 762.a
latax quibus veſcatur 905.d
latio quid 376.
latio omnis, aut circularis eſt, aut recta, aut miſta 427.b & 338.b
de Latione circulari 423.& ſ.
latio quæ ab alio eſt, diuiditur in quatuor genera: quæ ſunt, tractus, pulſus, vectio, volutatio 401.a & ſeq.
latio è quopiam in quippiam generatio eſt 490.e
lationis duæ ſunt ſpecies: nam quicquid fertur, aut à ſe mouetur aut ab alio 401.a
lationis ſeu motionis per locum, modi quibus animalia vtuntur 714.c
lationem cur generatione prioré eſſe oporteat 524.d
lationem eſſe motuum primum, & nullum præter eam eſſe continuum 401.a & ſeq.
Laterum ſigna phyſiognomonica 1010.a & ſeq.
leo ſuis in oſſibus medullam nullam habere videtur, quòd admodum exiguam ac tenuem habeat, eámque in paucis oſſibus: ſolis enim inferioribus atque brachiis 805.b
leonis natura & mores, & genera 952.a & ſ.
leonis deſcriptio 1176.b
de Leonum partu, & pullorum numero, déque dentium mutatione 884.d
leones quomodo coeant 854.b
leonum libido 874.e
leonis collum inflexile & oſſe perpetuo rigens 1033.a
leonis oſſa qualia 803.b
leo & lupus ceruarius inimici ſunt 924.d
leones quomodo gradiantur 778.e
leones, liberales, fortes, nobiles 764.d
leones in Europa potiùs ſunt, & ea Europæ parte, quæ inter Acheloum amnem & Neſſum eſt 919.e
leonis victus 904.d
leænæ ſterilitatis cauſa 1096.c
leænæ partus 884.d & ſeq. quod de leæna fertur, vuluam cum partu emittere, delira fabula eſt, facta ex eo quòd rarum genus hoc animalis eſt, nec rationem cur ita eſſet, comperire autor illius fabulæ poterat ibid.
lepores quomodo coeant 885.b.c
leporum fœcunditatis cauſa 1119.a.b
lepores, ingenioſi ac timidi 764.d
lepori vni pili & in bucca intus, & ſub pedibus ſunt: cùm cætera animalia nec intra os habeant pilos, nec in parte pedum reſupina ſed prona 807.a
de Leporum coitu & fœtura 885.b.c
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lien venæ vni maiori adnexus eſt: vena enim inde ad lienem pertendit 776.d
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lien quibus animalibus ſit 789.b
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ligulæ, quæ Græcè ἐπιγλωττίς dicitur, vſus 726.b.c
ligurini auiculæ, & vita & colore ignobiles ſunt, ſed valent vocis amœnitate 954.b
ligurini victus 902.d
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linea quid 431.b
lineæ rectæ ſemper additio fieri poteſt, circulari nunquam 456.d
linea ea perfecta eſt quæ circulũ cõtinet ib.
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lingua, pars oris quæ ſaporem ſentit 771.a
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lingua ſentire poteſt omnia quæ cum, poteſt 771.a
lingua ſumma ſerpentum & lacertorum bifida: vitulo etiam marino lingua [illegible] 791.a.b
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lingua carne ſoluta, rara & fungoſa con[illegible] 771.a
lingua quæ optima ſit ibid.
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de Linguæ natura, ſitu, vſu, & varietate in quibuſque animalibus 997.a & ſeq.
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munere atque officio definita ſunt vniuerſa, nam quæ ſuo fungi munere queunt, ſingula verè ſunt, vt oculus ſi cernat: quæ verò nequeunt, æquiuocè 599.c
muræna pinnis caret 787.d
muræna quomodo natet 766.c
murænæ ex quo piſcium genere ſint 909.b
murænæ quomodo coeant 835.c
murænæ partus 839.b
murænarum victus 900.c.d
murænæ latitatio 911.a
murænarum inceſſus ſeu motio 738.c.d
murus & muræna quid differant 839.b
mures quomodo bibant 905.b
de Murium natura & eius generibus, déque pullorum varietate 886.c
murium aquatilium victus ſeu viuendi ratio qualis 898.c & ſ.
mures Arabiæ quales 919.a
muſcæ vnde gignantur 850.c
muſcæ quomodo coeant 837.c.d
muſculus piſcis pilos in ore intus habet vice dentium, quibus omnino caret, ſuillis ſimiles 806.a
muſica appellatur, tum ipſa quæ mathematicarum ſcientiarum vna eſt, tum illa quæ auribus demulcendis modos aptos nouit adhibere 144.a.b
muſica ad Arithmeticam quodammodo affecta eſt 144.a
muſtela quoties dimicatura cum ſerpente eſt, rutam comedit: odor enim huius herbæ infeſtus ſerpentibus eſt 927.e
muſtela cur eſt inimica cornicis 923.c
muſtelam habere vuluam, modo cæterarum quadrupedum, nec ore parere 1105.a
muſtelarum partus 867.a.e
muſtum quatenus elixari dicatur 587.a
mutari quid quot modis dicatur 373.c
quod Mutatur, ſemper aut in ſubſtantia aut in quantitate, aut in qualitate, aut in loco mutatur 339.d
quæ Mutantur ex vno in vnum, vno corrupto: quæ ex duobus in vnum, corruptis pluribus gignuntur 518.c
mutatio non ſubit rationem ſubiecti 375.e
mutatio magis ab eo quod eſt, quàm ab eo ex quo eſt, nuncupatur 374.a
mutatio per accidens, eſt in omnibus, & ſemper ac omnium, ibid.b.c ea verò mutatio quæ non per accidens eſt, non in omnibus eſt ſed in contrariis, & in mediis, & in contradictione ibid.c
mutationes tres eſſe neceſſe eſt: eam quæ è ſubiecto eſt ad ſubiectum: & eam, quæ è ſubiecto eſt ad nõ ſubiectum: & eam quæ è non ſubiecto eſt ad ſubiectum 374.d.e
mutatio quid differat à motu 373.c.d
mutatio nulla eſt infinita 398.b
mutatio per accidens duntaxat mutari poteſt 376.c
mutis piſcis natura 1016.d
mycetiæ terræmotus qui dicantur 608.a
myrrha quomodo exiſtat 597.e
myrtoum mare 604.a

N

NAres natura voluit eſſe mobiles, nec ſicvt aures immobiles ſua compage 770.e.
Nares quomodo in hominibus, cæteríſque animantibus collocatæ 995.b.c
Narium ſitus, & eius ratio 991.a
Naſi ſigna phyſiognomonica 1178.e 1179.a
de Naſo 770.d
Natatilium quæ pedibus carent, hæc aut pinnis natant, aut nullas omnino habent, ſed ita mari vtuntur, vt terra ſerpentes, modóque ſimili repunt in humore 766.c.d
Natantium animalium diuiſio 766.c
Natatus non eſt, non exiſtente flexu 739.e
de Naribus 771.a.c
Nares quem vſum præſtent ibid.
Nati ob quas cauſas, vel parentibus vel aliis ſint ſimiles aut diſſimiles 1119.c.d
Naticis deſcriptio 821.d
Naticum generatio 845.a
Natices quomodo capiantur 828.b
Natrix ad quem ordinem ſeu genus aquatilium pertineat 762.d
Natura nihil contra naturam facit 743.d
Natura quot modis dicatur 325.a.b
Natura quæcunque fiunt, aut contraria, aut ex contrariis ſunt 321.e
Naturam finis cauſa agere 336.c.d.e
Natura infinitum vitat 1048.b
à Natura locus refutationis inter problemata de proprio 233.e 234.a
Naturam bifariàm intelligi 328.c
Natura priora & notiora quænam dicantur 151.d
Naturæ opera ordine certo diſpoſita ſunt 968.c
Naturæ definitio 327.d
Naturalis hiſtoriæ limites 966.c
ad Naturalem philoſophum pertinere de omnibus cauſis ſcire 335.d
Naturalis philoſophus quid differat à Mathematico 329.b & ſ.
Naturales ſubſtantiæ omnes, aut corpora ſunt, aut cum corporibus ac magnitudinibus fiunt 472.c.d.e
Naturalis ſcientia ferè plurima circa corpora, magnitudines, atque horum affectus, & circa principia quæ ſunt ſubſtantiæ talis, verſari videtur 431.a.b
Naturalis philoſophus ſolus verſatur circa materiæ affectiones non ſeparabiles, & vt non ſeparabiles ſunt 618.c.d
Nauis cur maximè moueatur à remigibus qui ſunt in nauis medio 1187.e. cur exiguo gubernaculo magnæ nauigiorũ moueantur moles 1188.a.b
circa Nauigia quæſtiones mechanicæ 1187.e & ſeq.
Nauplius ager terræ Argiuæ 914.b
Nauta, polypi ſpecies 815.c
Nautica qualis ſcientia 144.a.b
Nebulæ definitio 605.a.b
Neceſſitas duplex: vna, quæ eſt ſecundùm naturam, & ingenitam appetitionem ſeu inclinationem: altera, quæ vim adfert & violenta eſt, ac naturali cuiuſque rei inclinationi repugnat 171.d

Neceſſitas quo pacto ſit in rebus naturalibus 338.b.c
Neceſſitatem nihil aliud quàm Deum dici cenſuerim & intelligi, cui Anance ex eo nomen eſt, quòd natura quædam ſit immobilis 615.c
Neceſſitas quid ſignificet 971.a
Neceſſarium ex non neceſſariis interdum concluditur 137.a
ex Neceſſariis nihil niſi neceſſarium concluditur 137.b
Necydalus quid 850.e
Negatio vna, quæ 40.d
à Negatione, locus ad probandum non conſtare ex prioribus definitionem 248.a.b
Negationis ſi negatio cauſa eſt, neceſſe eſt etiam vt affirmationis cauſa ſit affirmatio 143.d
negationibus demonſtrandis ſemper adhibendæ ſunt affirmationes 157.c.d
negatio aut affirmatio, in quacunque re vera eſt 141.c
negatio & affirmatio non poſſunt in eadem re ſimul eſſe veræ 141.a.b
negatum, ſeu quod ſub negationem cadit, nō idem eſt quod negatio 31.c
Nemeſis, Deus cur dicatur 616.a
neruus & arteria quid differant inter ſe 751.c.d
Nerui calor vehementiſſimus, naturæ eius qui in venis eſt, plurimum habet 753.a
nerui vtrùm ab oſſibus alimentum capiant, an contrà 753.c
nerui vbi finiant ibid.
neruorum origo & deſcriptio 801.c
nerui ex quo gignuntur 1088.d.e
neruorum conuulſiones & diſſenſiones, ſpiritus motiones ſunt 568.a
Neſſus amnis è Scombro monte defluit 545.e
de Nictatione, ſeu quomodo conniueant homines, aues & quadrupedes 992.e & 993.a & ſeq.
nidor quid 596.c
nidus quibus auibus non proſit 928.e
Nili fluentum primū è monte cui Argenteo nomen eſt, ortum habet 545.e
Nili omnia oſtia, præter vnum Canobicum, manu inſtituta, non ab amne facta videntur 547.d
niphetos, quid 605.d
nitrum cur eliquari, non humectari poteſt; terra verò vtrumque poteſt 594.a.b
nitrum cur humore, non igni eliquabile ſit 594.a
nitrum, humore ſoluitur, non tamen quolibet, ſed algido 590.e
nix quomodo gignatur 605.e
noctua cum cornice cur diſſidet 923.c
noctuam auiculæ ferè omnes circumuolant: (quod mirari vocatur) aduolantéſq. percutiūt: quapropter aucupes ea conſtituta, auicularum genera multa & varia capiūt ibid.
noctuæ victus 902.a.b
noctuarum venatio 939.a
nomen pro nomine redditum, non eſt definitio, ſed ad definitionem refertur 182.d 183.a
nominum ſimplicium & compoſitorum nō eſt eadem ratio 37.c.& ſ.
à Nominis mutatione locus accidentis 197.c.d & ſ.
à Nominum diuerſæ notionis commutatione locus probl. definitionis 255.d.e
nomen nullum natura ſed ex inſtituto conſtat 37.c
à Nomine communi, locus inter problem. de definitione 243.b.c
Nomina & verba reſpondent ei animi perceptioni quæ à vero & falſo abeſt 37.c
de Nomine, & nomine infinitō, & caſibus nominis 37.c.d
à Nomine communi, locus inter problemata de proprio 228.d
à Nomine otioſo: locus problematum de proprio ibid.e
à Nominibus inuſitatis, locus inter problemata de definitione 242.d
notiora dicuntur duobus modis: alia enim omnino & per ſe ſeu naturâ notiora ſunt, alia nobis 131.d
à Notioribus nobis ad notiora naturâ progreditur noſter intellectus 315.a
notus flat à meridie 606.a
noctes diebus tranquilliores propter ſolis abſentiam exiſtunt 567.b
nubes, & in aquam concretio, cur in æthere non gignuntur 530.e 531.d
nubis definitio 605.c
nubis & caliginis differentia 540.b.c & ſ.
nugationis conficiendæ ratio, qui quartus eſt ſophiſtæ ſcopus 295.d & ſeq.
nulli quid ineſſe qui demonſtrat, demonſtrat etiam non omni id ineſſe 154.b & ſ.
à Numero, locus comparationis 206.b c & ſeq.
nunc, quid ſit 370.c.d
nunc, eſſe indiuiſibile, & in ipſo neque motum neque quietem eſſe 387.b & ſ.
à Nunc, ſeu ab ipſo nunc & tēpore præſenti, locus inter problemata de proprio 230.a.b
nuper, quid ſit 371.b
nutrimentum vtrùm contrarium an ſimile rei quæ nutritur 635.d & ſeq.
nutritio, idem exiſtit quod accretio, ratio tamen eſt diuerſa 504.d & ſ.
nutritiua anima & cæteris ineſt, & prima eſt, & maximè communis animæ vis & potentia, qua cuncta viuentia viuunt 634.c.d huius operationes officiáve ſunt generare nutrimentóque vti ibid.
Nyſes fluuius ex Æthiopum montibus defluit 545.e

O

OBeſa ſanguinem habent impuridum, quanquam ſanguis, & quæ ſanguinea ſunt, facilè putrent, ac præcipuè quæ ad oſſa propiùs applicantur 809.d
ab Obiectione locus accidentis 196.a
de Obſtetricis cura & officio 895.c.d
Occiput quid 768.e
Occiput venis vacuum eſt 992.a
de Occultatione 267.c
de Oceano 604.b
de Oculis 769.b.c
Oculi condiri clariſſimè cernunt 769.e
Oculi quo ordine generentur 1087.d
Oculi ſinguli qui quorum morum indices 769.e
Oculos quæ animalia habeant, quæ non habeant ibid.c.d
de Oculorum varietate in quibuſdam animantibus 769.e & ſ.
Oculorum ſitus & figura quæ quorum morum index ibid
Oculi auium humidiores 993.a oculi piſciū lubrici 993.e
Oculorum ſigna phyſiognomonica 1178.c.d
Oculis ſerpentum laceratis, ſubnaſci alios referunt 792.c
Oculos hominum, auium & quadrupedum contectos eſſe palpebra 992.e 963.a & ſeq
de Oculorum differentiis in animalibus, & earum cauſis 1124.d.e
Oculi omnibus piſcibus ſine palpebris, ſed non duri 788.b
Odorandi ſenſus homini non eſt exactus, ſed inferior compluriu̅m animalium ſenſu 643.e
de Odore & odorabili 642.b
Oenantha auis, ac ſi vitiſſiorum diuerſis, quādo deliteſcat, & quando appareat 955.a
de Oleo mirabile quiddam 1154.b
Oleum vbi non ex oliuis ſed è terebintho redditur [illegible]
Oleum quomodo & à frigore & abigni [illegible] ſetur [illegible]
Oleum cur aſſiccari nequeat [illegible]
Oleum cur non elixetur 587.[illegible]
oleum nec decoquitur, nec craſſeſcit, quòd exhalabile, non euaporabile ſit, at aqua haudquaquam exhalabilis eſt, ſed euaporabilis 596.c
oleo nullum eſt ſedimen propter tenuitatem 589.d
oleum cur inconcretile 593.d
olfactus, id eſt ſenſus odoris, qua parte ſubminiſtretur 770.e
de olfactu eiúſque ratione 1138.d
oleum quid ſit 371.b
olor quibus locis degat 903.c
olores, maximè in volucrum genere, alter alterum deuorat 924.c
olores vbi degant 932.a.b. canère ſoliti ſunt & præcipuè iam iam morituri ibid.
olera quamuis rigentur, tamen non tantùm proficiunt, quantum imbre 913.e
olympias ventus 564.a
olympica olea 1154.b
omaſi ſitus & deſcriptio 791.a.b
ombricarum inſularum fœcunditas tum, pecorum tum frugum 1156.c.d
omenti deſcriptio 897.c.d
omenti natura & officium 1023.a.b
de omni κατὰ παντὸς, quid ſit 142.a.b
omni quid ineſſe qui demonſtrat, demōſtrat etiam alicui id ineſſe 194.b.c
omni in re aut affirmationem aut negationē dici neceſſe eſt 134.d
onus non in mouentem partem, ſed in motam inſidere oportet 735.e
onera faciliùs portantur ſuper ſcytalas quàm ſuper currus, & quamobrem 1190.d.e
operationes actionéſque potentiis viribúſq. priores ſunt ratione 634.c
opinio ſemper eſt infirma atque incerta 161.b
opinio in veris quidem aut falſis cernitur, ſed quæ aliter atque ſunt eſſe poſſunt, ita vt opinio nihil ſit aliud quàm propoſitionis nullo certo argumento confirmatæ comprehenſio non neceſſaria 161.a
opinio ſeu exiſtimatio non eſt in noſtra poteſtate ſita 651.b.c quid differat à fictione ſeu imaginatione 651.c.& ſeq.
opinio & opinabile quid differat à ſcientia & eo quod ſub ſcientiam cadit 161.a & ſ.
opinionem ſequitur fides: quippe cùm fieri nequeat, vt hiſce quiſquam non credat, quorum habet opinionem 651.c.d.e
opiniones contrariæ non ſunt quòd contrariorum ſint, ſed potiùs, quòd contrario modo ſuſceptæ 50.a.b
de Opportunitate, locus problematum de comparatione 207.c.d
ab Oppoſitis caſibus & coniugatis locus problem. de eodem & diuerſo 260.b.c
ab Oppoſitis vel ſimul natura, vel poſteriore locus problematum de proprio 256.a.b & ſ.
de Oppoſitis categorias conſequentibus 30.a & ſ.

ab Oppoſitorum conſecutione loci accidentis 201.c
ab Oppoſitis immediatis locus accidentis 199.c.d.& ſeq.
ab Oppoſitis ſecundùm affirmationem & negationem,locus inter probl.de proprio 236.a.b.& ſeq.
Optice, ad Geometriam quodammodo eſt affecta 138.b
Oratio quantitas deiuncta ſeu diſcreta 20.a
Oratio & eius genera 38.b
ab Orationis longitudine, locus reprehenſionis ſophiſticæ 297.a
Oratoriæ artis initiis, quæ à primis inuentoribus profecta erant, Tiſias primus addere cœpit: poſt hunc Thraſymachus, Theodorus,aliíque permulti 314 b c
Orchilus cum noctua cur diſſidet 923.c
orcinæ vbi pariant 819.c
ordo & ratus certúſque ſtatus longè magis in rebus patet cœleſtibus quàm in nobis: incerta autem,inconſtans,& fortuita conditio in genere mortali potiùs eſt 970.a
ordo noſtræ cognitionis 315.a & ſ.
ordo proprius, ſenſibilium natura eſt 476.a
Oreſtes à Tantalo genus duxit 2.a
organicæ partes ex quibus conſtent 977.d.e
Orion & cùm oritur & cùm occidit cur incertus ac difficilis eſſe videatur 561.c
orſodagnæ, quas mordellas quis appellet, vnde naſcantur 850.d
ortus,ſeu generatio, eſt in prima vegetatricis animæ cum calore participatio 710 d
ortum, ſeu rem ortam, interitu carere non poſſe 449.b & ſ.
orix & vnicornis eſt & biſulcus 780.b
os,& eius partes 771.a.b
os quale piſcibus 788.a.b
os quæcunque obtinent, iis & voluptas per ſaporum attrectationem euenit, & dolor 828.a
oris ratione vt differant inter ſe animalia 783.c.d
oris officium 981.a. b & 999.e & ſ.
oſſa laterum functionem habent vt claudant 754.b. à ſpina habent originem ibid.
oſſa manus, pedis, tibiæ & cubiti ad motum inſtituta fuerunt: idque bifariàm flectendi ſcilicet & ambulandi 754.a.b ſed & fulcimenta in his ipſis fere conſiſtunt ibid.
oſſa ſuis diſpoliata mēbranis ſiderātur 807.c
oſſa an triplici functionis cauſa ſic extiterint, vt alia ad motum, alia ad fulciendum comparata ſint, alia vt contegant,capiántque 754.a
oſſa capitis & quæcunque medullam in ſe habent,contegunt,capiúntque 754.b
oſſium vſus 989.b
oſſa & cartilagines qua in re conueniant & differant 989.e
oſſa quo ordine & ex quo generentur 1088.d.e
de Oſſibus, eorúmque differentiis 802.d
oſſium ratione quomodo inter ſe differant animalia 801 b.c
oſſium natura & origo 988.d.e
oſſolis, polypi ſpecies 815.c
oſſifraga pullum aquilæ eiectum excipit atque educat 864.b
oſſifragæ victus 901.a.b
oſſifragæ aquilæ deſcriptio 639.a b
oſphis quid 771.d
oſtæ terræmotus qui dicantur 608.a
oſtrea ad quem ordinem ſeu genus aquatilium pertineant 763.b
oſtreæ quando in cibum optimæ 910.a
oſtreæ vnde generentur 844.d
oſtrearum teſtæ quales 819.c
oſtreacei generis quæcunque ſunt turbinata vndique dextra ſunt 736 a
oſtreaceorum motus 747.c
oues grauidæ, glandibus copioſiùs eſitatis, abortum faciunt 916.c
oues ad quod vſque tempus parere poſſint 841.d
oues quibus herbis veſcantur,& de cauſa impinguationis earundem 9 6.c
oues ſecùm gerunt partum, pingueſcunt, edúntque ampliùs 876 c d
oues anniculæ coeunt, atque vterum ferunt 841.e
ouium in grege, ſi maiores natu tempeſtiuè libidine incitantur, annum eſſe felicem gregi confirmant paſtores: ſed ſi minores, infelicem 877 d
ouium coitus & fœtus, & vitæ longitudo 877.a.b
ouium mores 915.e
ouibus lac diutiſſimè omnium quadrupedū edurat: quippe quibus mulctra menſium octo ſpatio continetur 8[illegible].c
de Ouibus Syriæ 919 c
ouibus lethale eſt renes habere pingues cùm tamen cæteris animalibus proficiat 1013.c
ouum quæ perfectum, quæve imperfectum pariant 1071.d
ouum id ex fœtibus perfectis vocatur, cuius ex parte principiò animal conſiſtit: reliquum verò alimento ei, quod gignitur,eſt 766.a b
ouum,aut putamine continetur teſtaceo, & bicolor eſt: aut cute molli obducitur, vnicolórque eſt 766 b
ouum piſcium non bicolor, vt auium, ſed vnicolor omnium eſt, & plus albi trahens, quàm lutei, tam antè quàm poſtea, cùm fœtus inſidet 866 b
oui principium 1098.d.e
oui & vermis differentia 1071.c
in Ouo luteum & candidum naturā contrariam habent 1100.b.c
ouorum duræ teſtæ cauſa 1052.d
ouorum in vtero incrementum 1098.e
oua piſcium cur mollia ſint, contrà quàm auium 1101.c.d.e quomodo foris augeantur 110[illegible]d
ouorum omnium auium natura & diuerſitas 859.c
oua à quibus animalibus gignantur 766.b.c
ouorum ſubuentaneorum & cæterorum natura, & quam ob cauſam alia vnicolora ſunt, alia verò bicolora 1094. e & in ſeq.
oua pariunt piſces omnes, qui ſquama conteguntur: animal vero pariunt quicunque genere cartilagineo continentur, excepta rana 788.b
ouiparorum & ſanguineorum animaliū generatio 1094.e
ouiparorum quadrupedum fœtura 857.e
ozus fluuius aurifer 1153.d

P

PAbuli genus, quod lactis copiam extinguat, quódque idem augeat 812.b
in Pæonia quid mirabile 1151.d
Pagri ex quo piſcium genere ſint 909.b
Paguri & Heracleotici,ſecūdùm cancrorum genus 815.e
in Palæſtina quendam lacum eſſe ferunt, in quem ſi à quoquam homo vinctus aut iumentum iniicitur, per ſumma natat, nec in aquis mergitur 557.d
de Palato 7[illegible].b
Palatum carnoſum nonnullis animalibus, pro lingua eſt 826.a
Palma pars manus 772.d
Palmatiæ terræmotus qui dicantur 608 a
de Palpebris 769.c
Palpebrarum vſus & officium 992.a
Palpebrarum pili nunquam plus iuſto excreſcunt, defluunt rebus Venereis inceptis, eóque magis quò vſus Veneris fuerit amplior: eoſdem etiam lentiſſimè omnium caneſcere clarum eſt 806.a
Palpitatio quid 731.b
Palumbes maximi inter columbos 840.e
Palumbes & turtures nidulantur ſemper locis eiſdem 929.b
Palumbes quot oua pariant 864.b
Palumbium victus 902.c
Palumbium fœmina incubat à pomeridiano tempore incipiens, totáque nocte & vſq; ad tempus ientaculi perſeuerans: reliquo tempore munus idem mas ſubit 86[illegible].c
Palumbium migratio 908.b
Palumbium vita vel ad quadraginta annos durare exiſtimatur 863.d
Pamphila Platis filia prima texiſſe bombycia in Co inſula dicitur 8[illegible].e
Pamphylium mare 604.a
Pantheræ in Aſia, in Europa nullæ 919 c
Panthera fœmina, animoſior ſuo mare 921 d
Pantheræ quaternas ventre medio papillas gerunt 781.a
Panthera cùm venenum ederit, ſtercus hominis quærit: eo enim iuuatur 927.c qua ratione capiatur à venatoribus ibid.
Papauer excrementum 1024.d
Papilio quo malo infeſtetur 918 e
Papiliones vnde naſcantur 850.b
Papilionum partus 850 a
ad Paradoxa eruenda locus, qui tertius eſt ſophiſtæ ſcopus 294 c d
Paralogiſmi,ſcientiarum proprij, quinam dicantur 181.b
Parcas tres, priſci tria in tēpora partiti ſunt, filúmque fuſi partim iam peractum, partim futurum, partim iam intorqueri dixerunt: earum vnam ſtatuentes in eo quod iam profligatum eſt quam Atropō ideò nuncuparunt, quoniam ea quæ iam præteriere, retrorſus agi nequeunt: at Lacheſis functio futuris deſtinata eſt: omnium enim quæ ſecundū naturam ſunt ſors ſua quodque manet. Præſentibus autem rebus aut inſtantibus Clothus opera attributa eſt, quæ netu vnicuique conficit quod ſuum eſt 636 a.b
Pardali auiculæ deſcriptio 925.c
Parelij & virgæ apud meteorologos quid & vnde generentur 575.b & 582.c
Parentum cura erga prolem 1100.a
à Pari locus inter problemata ad genus pertinentia 214 a.b
Parium ſeu ſimilium comparatione loci 203.c
Pariendi tempus multiplex homini datum, aliis animantibus vnum eſt ſtatutum 891.c.d
Pariendi difficultatis cauſa 1053.c.d
Parmenides, mulieres eſſe viris calidiores vnde coniiciat 979.e
Parmenidis opinio de principiis 316.a
de Paronymis 14.c
Paropamiſus vel Parpamiſus,aut Parpaniſus maximus mons in Aſia 545.b
Pars ad partem ſeſe habet quemadmodum totum ſe habet ad totum 761.c
à Partis additione toti facta, locus inter problemata de proprio 244.c

Partes dextræ calidiores ſiniſtris 1116.c.d
à Partis remotione, locus inter problemata de definitione 255.c
Partium defectus cauſa 1126.a
à Partibus quæ nihil componere poſſunt, locus problematum definitionis 257.c.& ſ.
de partibus anterioribus & poſterioribus: item ſuperioribus & inferioribus 736.b.c & ſeq.
particularia quàm vniuerſalia faciliùs definiri 176.a
particularia quomodo cognoſcãtur & ignorentur, cognitis ſolùm vniuerſalibus 150.a & ſeq.
particularia nobis dicuntur notiora 131.e & ſ.
à Participatione, locus refutationis inter problemata de proprio 232.c
partus quare omnibus animalibus in caput verſis fiat 1133.c
partus humanus, ſi viuit, deſcendit ex vtero menſe octauo: ſed ſi mortuus eſt, non deſcendit, nec vterus dehiſcit 890.e
partus quare aliis vnifer, aliis paucifer, aliis multiplex 1124.a.b
de Partu animalium 838.c & ſeq.
de Partus humani multiplicitate, id eſt quot vno partu fœtus edantur. 891.d.e
parturire interdum mulieres videntur, cùm tamen tempus non ſit; ſed quoniam fœtus mutârit ſuum caput, ideò initium hoc eſſe parturiendi videtur 890.c
parturiendi difficultatis in mulieribus cauſa 1150.e
parus plurima oua edit 933.c.d
pari victus 901.c eiuſdem quot ſint genera ibidem & ſeq.
paſſerum vitæ longitudo 919.b
paſſerum in genere cur mares breuiorem quàm fœminæ vitam obtinent 713.a.& 919.b.c
paſſeris victus 902.c
à Paſſione, & paſſionis ſubiecto, locus problematum de genere 225.b
paſtinaca quomodo coëat 835.c
paſtinaca ex quo piſcium genere ſit 909.b
paſtinacæ ingenium & aſtutia 940.d
patella, teſtaceorum ſpecies 819.b
patellarum generatio 845.a
pati, niſi per vacuum, nihil omnino poteſt 510.a
pati & generari inter ſeſe vel ſub ſeſe mutuò ſunt 512.a
de Patiendi modo 508.c.d & in ſeq.
patiens, aut humidum, aut aridum, aut ex vtroque conflatum exiſtit 589.b
patiens & agens, contraria ſunt 507.c
patiens & agens partim ſimilia, partim diſſimilia ſint neceſſe eſt ibid.
patiens à ſimili non pati, ſed à diſſimili, quomodo intelligendum ſit ibid.& ſeq.
patiens vt id mutetur, quod agendi vim obtinet, neceſſe eſt ibid.
pauo quandiu viuat, & quando quotiéſque in anno pariat 865.d& ſeq.
pectines vbi proueniant 845.a.b & ſeq.
pectines quomodo ſeſe tueantur 1024.a
pectus, & eius partes 771.b.c
pectoris ſitus ac forma in homine, & in cæteris animantibus 1035.b
pectus animalia omnia humano proportionatum pectori habere viſuntur, verùm non ſimile: latum enim pectus humanum eſt, cætera anguſta 778.a.b
pectoris ſigna phyſiognomonica 1178.a
pediculi vnde generentur 856.c
pelecanum ſeu platearum migratio 907.e
pella, ardeolæ ſpecies, quibuſcum inimicitias gerat 614.b
pellæ mores & natura 934.b.c
Penelops aquila dicta marina, quibus locis degit 903.c.d
penis vbi ſitus 771.e
penis iniuſto maioris vel minoris ſemen infœcundum 1051.e & ſeq. 1052.a
pennæ auium vt mutentur 806.c.d
pennæ auium nullæ per ætates mutãtur, pręterquam gruum, quas nigreſcere in ſenecta perſpectum eſt ibid.
pennæ inſectorum differentes 1028.a
pennæ, ab inciſura non poſſunt reparari, ſed cadant neceſſe eſt 807.a
pentathli cur plus ſaliunt ſi halteras habuerint, quàm ſi non habuerint 734.d
pepromene, Deus cur dicatur 615.e
per ſe, καθ' αὑτό, quid ſit 154.a
percæ partus 870.d
percnopteri aquilæ deſcriptio 937.e
perdicis aſtutia, vt venantes fallat, & fœturam ſuam conſeruet 929.c alia quædam notatu digna de perdicibus ibid. & ſeq.
perdices, ſi aduerſæ maribus ſteterint, ventúſque inde afflet vbi mares ſtant, concipiunt & maritantur: plerunque etiam voce marium, vtero ingraueſcunt, ſi geſtiũt, ac libidine turgent 836.c
perdicum vita ampliùs quàm ad ſexdecim annos durare exiſtimatur 863.d
perdicum incubitus 865.c
perdicum alij caccabant, alij ſtrident 830.a
perdicum oua 860.b. perdices vt pariant oua ſubuentanea 860.c & ſeq.
perdicum nidus 859.a
perdicibus olfactus eſt exquiſitus 801.a
à Perfectione & habitu, locus inter problem. de definitione 257.b
perfectum vnumquodque tum dicitur, cùm ſuam ipſius virtutem nactum eſt, quippe cùm maximè ſecundùm naturam tum habeat 403.a
perfectũ nihil eſt prorſus quod non habeat finem 348.e
peritia quid, & quod periti hominis officium ſit 966.b
perſpicuum ipſum, necnon *inuiſibile*, colore vacat 639.a.b perſpicuum quid ibid.
Pes appellatur pars illa quę ad pedeſtrem eſt notam, motricem per locum 736.c
de Pede & partibus eius 773.a
pedes carnoſos nullũ animal habet, excepto homine 779.e
pedes, nomen à pedo, hoc eſt ſolo, deduxiſſe videntur 736.c
pedes pari numero omnia poſſident, quæcunque ambulant 766.c
pedeſtre omne animal cur pares neceſſariò pedes habeat 739.b
pedeſtria omnia animalia cur per diametrũ moueantur 744.c
Phager lapidem habet in capite: quo fit vt algore maximè infeſtetur 914.a
phalangia quomodo coëant 837.d
de Phalangiorum generibus 943.b
phalangij aranei 854.d.e
phalaris auis quibus locis degat 903.c
phalerica apua membradas gignit, ex quibus ſardinæ naſcuntur 872.b
phantaſmata veluti ſenſibilia ſunt, attamen ſine materia 656.c
phaſianæ aues pediculis intęreunt, niſi ſe puluerent 856.d
phaſianarum oua 859.c
phacis amnis cum aliis pleriſque ex Caucaſo monte delabitur 545.c
Phaſmatum, ſeu eorum quæ nocte ſerena in cælo apparent cauſæ 534.a
Phebol inſula 604.c
Pherecydem Syrium, pediculorum fœditate obiiſſe proditum eſt 856.d
Phidias, quum Mineruæ ſtatuam coagmentaret, fertur in medio eius ſcuto faciem ſuam expreſſiſſe, oculóſque fallenti artificio ita deuinxiſſe ſimulachro, eximere inde vt ipſam ſiquis cuperet, minimè poſſet, aliter quidem certè, quàm vt ipſum ſolueret ſimulachrum, opúſque eiuſmodi compactile confunderet 613.e
Philoctetes vbi colatur 1161.a
Philoſophus veritatem, dialecticus opinionem ſectatur 189.c
Philoſophiæ, eius potiſſimùm quæ in naturæ cognitione verſatur, laudes 600.d.& ſeq.
Phlegræus ager quaſi terræ motu concuſſus fuerit 579
Phocæ coagulum epilepſiæ remedium 11[illegible] a
Phocænæ partus 868.c
Phœnicuſa inſula 1164.d
Phoicis ardeolæ natura 934.c
pholis piſcis, mucorem, quem ipſa emittit, ſibi obducit, ita vt in eo quaſi cubili quieſcat 940.c
phoxini ſtatim cùm nati ſunt, & admodum parui, adhuc oua habent 869.c
phuca mutat colorem: cùm enim cæteris temporibus candida ſit, verno varia redditur 421.b.c ſolam hanc ex marinis piſcibus nidum ſibi conſternere, atque in ſtragula parere aiunt ibid.c
phucæ victus 901.b
phucæ puſillæ ex piſcibus ouiparis ſolæ bis pariunt anno 869.e
phyſicæ tractationis vnde ducendum ſit initium: & qua via & ratione progrediendum 315.a & ſeq.
phyſicus vtrùm circa materiam an circa formam verſetur, & quatenus circa vtrũque 329.d.e
phyſici omnes fere, quicunque concinnitatis aliquid habent, tractationem naturæ vſque ad medicinæ principia perſequuntur 731.d.e
de Phyſiognomonica *ſeu de coniectandę naturæ ratione, apud Dialect.* 129.b
phyſiognomoniam eſſe, & quot eius modi 1163.a & ſeq. circa quæ verſetur 1171.a & ſeq.
picare quid, & quando mulieribus contingat 891.b
picarum partus & nidificatio 932.d
de Pico martio, & tribus generibus eiuſdem, déque eius victu 930.d
de Pico martio mirabile quid 1151.c
pilare malum quid 896.c
de Pilis & iis quæ pilorum vice funguntur 804.c.d & ſeq.
pili cur caneſcant 805.c
pilos habentia omnia, animal progignunt 767.e & 768.a & ſeq.
pilos habent quæ pedeſtria, eadémque viuipara ſunt 804.d
de Pilorum in animantibus varietate, & de iis quæ pilorum loco ſint 1139.d & ſeq.
pilorum ſigna phyſiognomonica 1171.e & ſ.
pilorum vſus 994.b.c piloſi capitis humani cauſa ibid.& ſeq.
pilorum color in ſenectute mutatur, candidíque pili efficiuntur in hominibus: quod vel cæteris animalibus accidit. ſed non ſatis aperte, præterquam in equo 805.b.c
pilorum, aut eorum quæ pro pilis ſunt, immutationis cauſa 1144.d
pili ex quo gignantur 1089.b
pili candeſcunt à parte ſui extrema, & plerumi candicantes illico exiſtunt 805.c
pinguedo excrementum eſt bonitate ſubſtantiæ ſalubre 1063.a

pingue

Pingue omne, exangue 809.d
Pinguia cur putreſcere non ſolent 712.d
pingueſcunt intra carnem quibus partus eſt venter 868.b
pingueſcunt, ætate prouecta potiùs quàm nouella, ſed præcipuè cùm iam ſuæ longitudinis ac latitudinis modum adepta, augeri in profundum incipiunt 809.a
pinnæ vnde proueniant 844.d.e
pinnas magna ex parte quaternas gerunt piſces 787.c
pinnarum teſtæ quales 819.c
pipo cum lutea cur diſſidet 923.b
pipo inimica ardeolæ eſt 923.d.e
piponis victus 902.d
piraſticus ſyllogiſmus quid differat ab aliis 292.d
piraſticum, nullum habere certum genus ſubiectum 292.d
piſces vocis quidem expertes ſunt: quippe qui neque pulmonem, neque arteriam, aut guttur obtineant: ſed ſonos quoſdam, ſtridoreſque mouent, qui vocales eſſe exiſtimantur 828.e
piſces omnes fœturam ſuo tempore deuorant: reliqua victus ratio non eadem omnibus eſt 900.c
piſces circa Phœnicem vel mutuo ſexuum aſpectu capi dicuntur 839.b
piſces ægrotare, vnde dignoſcatur 914.e
piſces in aere intereunt, & inſtar eorum quæ præfocantur, palpitare videntur 720.b
piſces cartilaginei mares quare ſemen ſpargere non viſuntur, nec fœminæ ſuos conceptus 105.c
piſces ocyſſimè in coitu abſoluuntur 1031.c
piſces, etſi lingua non carent, tamen explanatam non habent 998.a.b
piſces ſi ſomno dati immorentur, noctu ab innumera multitudine pediculorum & pulicum abſumuntur: & niſi ab illis beſtiolis ſollicitarentur, vel manu facilè caperentur dum dormiunt 830.c.d
piſces quibus menſibus maiori ex parte pariant 859.c.d.&ſeq.
piſces vbi optimi generentur 911.c
piſces ſanguinem ſuum ſagaciter odorari dicuntur, quæ res eo paret argumento, quòd quoties ſanguis effuſus piſcium eſt, fugiunt & loca petunt longinqua 827.b.c
piſces qui oua edunt, ſemel pariunt anno: præter phucas puſillas, quæ bis pariunt anno 869.c
piſces non reſpirare 719.c &ſeq.
piſcium genera quo tempore præſtantiora in cibum reddantur 921.a & ſeq.
de Piſcium actionibus, déque eorundem migratione in alia loca 909.a & ſeq.
piſcium mares tempore coitus, meatus plenos ſeminis genitalis ita habent, vt attritu facilè ſemen ipſum effluat candidum 867.d
piſcium oua imperfecta ſunt: foris enim perficiuntur & augentur 1052.c
de Piſcium partu, eiuſdémque inter eos diuerſitate, & vuluæ forma 866.a.b
piſcium dentes quales 788.a
piſcium plurima pars gregatilis eſt, nec vllus grex caret duce 909.c
piſcium ſomnus 830.c & ſ.
piſcium ouiparorum partus, déque ſexus maris & fœminæ diſcrimine 867.d & ſeq.
de Piſcium coitu 835.c
piſcium viuiparorũ partus & pullorum numerus 868.b & ſeq.
piſcium partes exteriores, déque cauſis quare ſic à natura inſtitutæ ſint 1043.d
piſcium capiendorum opportunitas 914.c
Piſcibus vbi fel poſitum 789.c & ſ.
piſcium omne genus ſanguinis eſt particeps 788.c
piſcibus quæ tempora ad ſanitatem proſint, quæue incommoda ſint 913.c & ſ.
de Piſcium genere eiúſque differentiis 787.b.& ſeq.
piſcium omne genus celeriter adoleſcit, & præcipuè in Ponto 874.a
piſcium lacuſtrium atque fluuiatilium partus & generatio 870.b & ſeq.
piſcium oua, ſemine maris aſperſa, fœcunda redduntur 168.c.d
piſcium fluuiatilium & lacuſtrium morbi 915.a
de Piſcium generibus quæ vel limo, vel arena, vel ſpuma maris ex imbre excitata procreantur 871.c.d & ſeq.
piſcium dentes 999.d
piſcium omne genus pedibus caret: qui pedes habere videntur, eos pinnis ſimiles gerunt 725.d.e & ſeq.
piſcium oua quid ab ouis auium differant, & quamobrem 1101.a.b
de Piſcibus mirabilia quædam 1155.d.e
de Piſcibus qui gregatim, amicéque viuunt, quive non gregatim, inimicive ſunt 925.a.b
piſcium planorum inceſſus natando 740.d.e
de Piſcium cartilagineorum ortu: eóſque qui piſces omnes eſſe fœminas putãt, non rectè ſentire 1103.a.b & ſ.
piſcium partus 838.d 873.a.b.& ſeq.
piſcium molle genus quando pariat 840.a.
de Piſcium vtero & partus tempore, quomodóque inter ſe differant in fœtibus emittendis 873.a.b & ſ.
piſcium in genere ſunt quæ omnino ſexus diſcrimen non habeant 831.d.e
piſcium ſenſus 826.a
de Piſcibus nonnullis qui hyeme frigoris cauſa conduntur, quique æſtate propter calorem 910.c & 611.a & ſeq.
piſcationis modi quidam 915.a. & ſeq.
pituita alimenti vtilis excrementum eſt, 1061.c
pix inſtar aquæ è terra ſubſilientis vbi naſcatur 1163.d
pici nullum eſt ſedimen, ſcilicet propter tenacitatem 589.d
planctæ inſulæ 1160.c & ſeq.
plangæ aut clangæ aquilæ deſcriptio 917.d
planta, pars pedis 773.a
plantæ cur viuere videantur 612.a
plantarum generationes 111.c
plantæ, ſicut & inſecta, etiam diuiſæ ſeiunctæque viuunt, ac duæ ex vna atque etiam plures procreantur 714.a
plantæ, vbique tam radicem quàm caulem potentia habent ibid.
plantarum in genere quæ caput prægraue & ponderoſum geſtant, longiùs vitæ curſum protrahunt 714.b
plantarum ſeminis principium 1150.e
plantis ſubſidium illud quod per alimentum & ambientem aërem paratur, ſit eſt ad caloris naturalis tutelam atque ſalutem 718.b.c
plantis, cùm ſtabiles ſint, cibúmque ex imo capiant, ſuperior pars neceſſariò infra poſita ſemper eſt 715.c
plantæ minores, ſunt interdum maioribus fertiliores, & quamobrem 195.d
plantis nutritiua animæ potentia eſt, cæteræ deſunt 633.c
plantarum munus & officium 1069.e
platea fluuiatilis quomodo conchas maiuſculas læuéſque deuoret 931.b
Platearum ſeu pelecanum migratio 907.e
Plato ſolus, tempus genitum eſſe ait: etenim vnà cum cœlo dicit ipſum ortum fuiſſe, cœlúmque factum eſſe aſſerit. 409.a
Plato in Timæo materiam & receptaculum idem eſſe dicit 553.b
Plato infinita duo facit, magnum & paruum 343.a.b
Plato animam ex elementis conſtare cenſet 610.a
Platonis opinio de principiis 319.b.c
Platonis de reſpiratione ſententia refellitur 721.c
Platonica quæſtio, Nos aut omnino nihil diſcere, aut id quod iam antè ſciebamus, quomodo ſoluenda 130.c
pleniluniio quare teſtata pleniora 1024.c
plumbum quam ob cauſam non humore ſed igni eliquabile ſit 593.c
plumbi ſtupenda vis apud Indos 1155.b
de Pluuia & eius cauſis 540.b & ſ.
pluuiæ definitio 605.c
pluuia & ros quid differant 541.c
pluuia quibus proſit, quibuſve noceat animalibus 913.d.e
pluuio tempore quam ob cauſam terra quati ſoleat 565.c 567.d
pollex vno inflectitur nodo, cæteri digiti binis adducuntur 772.d
pollex quem vſum præſtet manui 1034.e
polorum is qui apud nos videtur, infera cœli pars eſt: is autem qui nobis manifeſtus non eſt, partis rationem ſuperæ ſubit 455.a
Polybij ſententia de venarum ordine, & falſarum opinionum refutatio 797.c & ſeq.
polycritus rerum Sicularum ſcriptor quid admirabile referat 1161.e
à Polyonymis locus accidentis 200.a
polypi deſcriptio 815.a
polypus, nautanatura eſt: nauigat enim per ſumma maris elatus 941.d
polypi quomodo coeant 836.d
polypi partus 847.d
polypus fatuus quidem eſt, cùm ad manum demiſſam hominis accedit: ſed prudẽs rei familiaris, cùm omnia colligat & ſuo in domicilio recondat: ſui mutatione coloris venatur piſces: trahit enim ſibi colorem ſimilem iis quibus appropinquarit, ſaxis: quod idem etiam cum metuerit, facit 942.a.b
polypi, odore eſcarum allectati capiuntur: & ita adhæreſcunt vt auelli inde non poſſint ſed truncari potiùs patiantur 827.c
polypi partus 840.a.b
polyporum victus atque viuendi modus 900.c
polypus vnus mollium exit in ſiccum, graditur per aſperiora, vitat læuia 942.d
polypi partes 1031.b & ſeq.
polypi quando in cibum præſtantiores 921.b
pomilionis forma qualis 1033.b.c
pompilus, polypi ſpecies 815.c
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ſexus diſcrimen in plantis 1048.c
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ſexus vtriuſque partes & functiones 1048.b. & ſeq.
ſibyllæ Cumanæ antrum 1158.c
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ſiccum & humidum quot modis dicantur 515.e & ſeq.
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ſiccæ inter ſimilares partes quæ 978.b.c
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ſimilares partes quæ 597.a & ſeq.
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Socrates interrogabat ſemper, reſpondebat nunquam, quia ſe nil quicquam ſcire profitebatur 313.d
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qui ſomniarint nunquam, viri & fœminæ, 831.b.c
ſomnio viſo mutati aliqui habitu corporis 831.c
ſomnium nullum contrahitur editis nuper in lucem: & infantibus adhuc: ſed plurimis anno circiter quarto aut quinto ætatis viſa incipiunt 831.b
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Somnia non eſſe à Deo, ſed à natura 697. b
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Nonnulla ſic reſtituet æquus Lector, quæ in mole operis exciderunt: & quorum pars maxima in pauca tantùm irrepſit exemplaria.

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